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# GAZE

UNITED STATES PATENT AND TRADEMAR

July

U.S.  
DEPARTMENT  
OF COMMERCE

Patent  
and  
Trademark  
Office



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OFFICIAL GAZETTE of the  
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Number 1

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	984 OG 2
Update of Information Concerning the Patent Cooperation Treaty . .	984 OG 2
Board of Appeals Decisions Rendered in the Month of May 1979 . .	984 OG 8
Reissue Applications Filed . . . . .	984 OG 9
Patent Notices	
Certificates of Correction for the Week of July 3, 1979 . . . . .	984 OG 10
Disclaimers . . . . .	984 OG 10
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	984 OG 11
Condition of Patent Applications . . . . .	984 OG 12
Defensive Publications (T984,001) . . . . .	1
Reissue Patents Granted (30,040) . . . . .	3
Patents Granted	
General and Mechanical (4,159,542) . . . . .	5
Chemical (4,159,892) . . . . .	123
Electrical (4,160,117) . . . . .	189
Design Patents Granted (252,236) . . . . .	251
Index of Patentees . . . . .	PI 1
Indices of Applicants of Defensive Publications, Reissues, and Designs .	PI 27
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Defensive Publications . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Applicants of Defensive Publications . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT): Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,  
Nov. 7, 1978. Commissioner of Patents and Trademarks.

## Update of Information Concerning the Patent Cooperation Treaty

TOPIC 1: INCREASE IN INTERNATIONAL FEES EFFECTIVE AUGUST 1, 1979

Effective August 1, 1979, any international fees (basic and designation fees) for the processing of International applications must be paid in the revised amounts indicated below. The amount of the basic fee portion of the International fee under PCT Rule 15.1(i) is being increased from \$165 to

\$190 for an International application containing 30 sheets or less, effective August 1, 1979.

The amount of the supplement fee to the basic fee for each page of the International application in excess of 30 sheets is being raised from the current \$3 per page to \$3.50 per page, effective August 1, 1979.

The amount of the designation fee portion of the International fee under PCT Rule 15.1(ii) is being raised from \$40 to \$45, effective August 1, 1979.

These fee increases were adopted by the PCT Assembly on May 1, 1979 to help cover the operating costs of the International Bureau. There is no change in the \$35 transmittal fee or \$300 search fee which are set by the Commission of Patents and Trademarks. Applicants are reminded that the basic fee and any supplement to the basic fee must be paid in full upon filing to avoid withdrawal of the International application. The use of deposit accounts and specifically the authorization for the United States Receiving Office to use deposit accounts to correct any deficiency in PCT fees is strongly encouraged.

## TOPIC 2: LIST OF CONTRACTING STATES AS OF MAY 25, 1979

State	Ratification or Accession	Date of Ratification or Accession	Date From Which State May Be Designated
(1) Central African Empire*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978
(21) Austria**	Ratification	23 January 1979	23 April 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	23 April 1979	23 July 1979

\* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member states. A designation of any state is an indication that all OAPI states have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

\*\* Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, except for France, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional patent" must follow the designation of the State or States. Note: only one designation fee is due if the regional patent protection is sought.

## TOPIC 3: CHANGES IN THE PCT RULES

The following PCT Rule changes, adopted by the PCT Assembly on May 1, 1979 become effective on August 1, 1979 with the exception of the changes in PCT Rule 47 which become available on May 1, 1979.

### RULE 15

#### The International Fee

#### 15.1 Basic Fee and Designation Fee

Each International application shall be subject to the payment of a fee for the benefit of the International Bureau

("International fee") to be collected by the receiving Office and consisting of,

(i) a "basic fee," and

(ii) as many "designation fees" as there are national patents and regional patents sought by the applicant in the International application, except that, where Article 44 applies in respect of a designation, only one designation fee shall be due.

#### 15.2 Amounts

(a) The amounts of the basic fee and of the designation fee are as set out in the Schedule of Fees.

JULY 3, 1979

U. S. PATENT AND TRADEMARK OFFICE

984 OG 3

(b) The amounts of the basic fee and of the designation fee shall be established, for each receiving Office which, under Rule 15.3, prescribes the payment of those fees in a currency or currencies other than Swiss currency, by the Director General after consultation with that Office and in the currency or currencies prescribed by that Office ("prescribed currency"). The amounts in each prescribed currency shall be the equivalent, in round figures, of the amounts in Swiss currency set out in the Schedule of Fees. They shall be published in the Gazette.

(c) Where the amounts of the fees set out in the Schedule of Fees are changed, the corresponding amounts in the prescribed currencies shall be applied from the same date as the amounts set out in the amended Schedule of Fees.

(d) Where the exchange rate between Swiss currency and any prescribed currency becomes different from the exchange rate last applied, the Director General shall establish new amounts in the prescribed currency according to directives given by the Assembly. The newly established amounts shall become applicable two months after the date of their publication in the Gazette, provided that the interested Office and the Director General may agree on a date falling amounts shall become applicable for that Office from that date.

#### 15.3 Mode of Payment

The International fee shall be payable in the currency or currencies prescribed by the receiving Office, it being understood that, when transferred by the receiving Office to the International Bureau, the amount transferred shall be freely convertible into Swiss currency.

#### 15.4 Time of Payment

(a) Subject to paragraph (c), the basic fee shall be due on the date of receipt of the International application.

(b) Subject to paragraph (c), the designation fee shall be paid on the date of receipt of the international application or on any later date prior to the expiration of one year from the priority date.

(c) The receiving Office may permit applicants to pay either the basic fee or the designation fee or both of the fees later than on the dates provided for in paragraphs (a) and (b), provided that:

- permission shall not be given to pay the basic fee or the designation fee later than one month after the date of receipt of the International application;
- permission may not be subject to any extra charge. Such later payment of the said fees shall be without loss, in the case of the basic fee, of the international filing date, or, in the case of the designation fee, of the designations to which the payment relates.

#### 15.5 Partial Payment

(a) Where the amount of the International fee received by the receiving Office is not less than that of the basic fee and at least one designation fee but less than the amount required to cover the basic fee and all the designations made in the international application, the amount received shall be applied as follows:

- to cover the basic fee, and
- to cover as many designation fees as, after deduction of the basic fee, may be covered in full by the amount received in the order indicated in paragraph (b).

(b) The order in which the said amount shall be applied to the designations shall be established as follows:

- where the applicant indicates to which designation or designations the amount is to be applied, it shall be applied accordingly but, if the amount received is insufficient to cover the designations indicated, it shall be applied to as many designations as are covered by it in the order chosen by the applicant in indicating the designations;
- to the extent that the applicant has not given the indications under item (i), the amount or the balance thereof shall be applied to the designations in the order in which they appear in the international application;
- where the designation of a State is for the purposes of a regional patent and provided that the required designation fee is, under the preceding provisions

available for that designation, the designation of any further States for which the same regional patent is sought shall be considered as covered by that fee.

15.6: [No change]

### RULE 16

#### The Search Fee

#### 16.1 Right to Ask for a Fee

(a) [No change]

(b) The search fee shall be collected by the receiving Office. The said fee shall be payable in the currency or currencies prescribed by that Office ("the receiving Office currency"). It being understood that, if any receiving Office currency is not that, or one of those, in which the International Searching Authority has fixed the said fee ("the fixed currency or currencies"), it shall, when transferred by the receiving Office to the International Searching Authority, be freely convertible into the currency of the State in which the International Searching Authority has its headquarters ("the headquarters currency"). The amount of the search fee in any receiving Office currency, other than the fixed currency or currencies, shall be established by the Director General after consultation with that Office. The amounts so established shall be the equivalents, in round figures, of the amount established by the International Searching Authority in the headquarters currency. They shall be published in the Gazette.

(c) Where the amount of the search fee in the headquarters currency is changed, the corresponding amounts in the receiving Office currencies, other than the fixed currency or currencies, shall be applied from the same date as the changed amount in the headquarters currency.

(d) Where the exchange rate between the headquarters currency and any receiving Office currency, other than the fixed currency or currencies, becomes different from the exchange rate last applied, the Director General shall establish the new amount in the said receiving Office currency according to directives given by the Assembly. The newly established amount shall become applicable two months after its publication in the Gazette, provided that any interested receiving Office and the Director General may agree on a date falling during the said two-month period in which case the said amount shall become applicable for that Office from that date.

(e) Where, in respect of the payment of the search fee in a receiving Office currency, other than fixed currency or currencies, the amount actually received by the International Searching Authority in the headquarters currency is less than that fixed by it, the difference will be paid to the International Searching Authority by the International Bureau, whereas, if the amount actually received is more, the difference will belong to the International Bureau.

(f) As to the time of payment of the search fee, the provisions of Rule 15.4 relating to the basic fee shall apply.

16.2: [No change]

16.3: [No change]

### RULE 47

#### Communication to Designated Offices

#### 47.1 Procedure

(a) [No change]

(b) Such communication shall be effected promptly after the international publication of the International application and, in any event, by the end of the 19th month after the priority date. Where the time limit under Rule 46.1 has not expired when the communication is effected and the International Bureau has neither received amendments from the applicant nor a declaration that the applicant does not wish to make amendments before the International Bureau, the International Bureau shall, at the time of the communication, notify the applicant and the designated Offices accordingly; it shall, immediately after receipt, communicate any amendment received subsequently to the designated Offices and notify the applicant accordingly. Where, under Article 17(2)

(a), the International Searching Authority has made a declaration that no international search report will be established, the communication shall be effected, unless the international application is withdrawn, within 1 month from the

date on which the International Bureau has been notified of the said declaration by the International Searching Authority; such communication shall be accompanied by an indication of the date of the notification sent to the applicant under Article 17(2)(a).

- (c) [No change]
- (d) [No change]
- (e) [No change]

#### 47.2 Copies

- (a) [No change]
- (b) [No change]
- (c) Except to the extent that any designated Office notifies the International Bureau otherwise, copies of the pamphlet under Rule 48 may be used for the purposes of the communication of the international application under Article 20.

#### RULE 57

##### The Handling Fee

#### 57.1 Requirement to Pay

(a) Each demand for international preliminary examination shall be subject to the payment of a fee for the benefit of the International Bureau ("handling fee") to be collected by the International Preliminary Examining Authority to which the demand is submitted.

(b) Where, because of a later election or elections, the international preliminary examination report must, in application or Article 36(2), be translated by the International Bureau into one or more additional languages, a "supplement to the handling fee" shall be collected by the International Bureau.

#### 57.2 Amounts of the Handling Fee and the Supplement to the Handling Fee

(a) The amount of the handling fee is as set out in the Schedule of Fees. The amount payable in any particular case shall be the amount as so set out, increased by as many times the same amount as the number of languages into which the international preliminary examination report must, in application of Article 36(2), be translated by the International Bureau.

(b) The amount of the supplement to the handling fee is as set out in the Schedule of Fees. The amount payable in any particular case shall be the amount as so set out, multiplied by the number of additional languages referred to in Rule 57.1(b).

(c) The amount of the handling fee shall be established, for each International Preliminary Examining Authority which, under Rule 57.3(c), prescribes the payment of the handling fee in a currency or currencies other than Swiss currency, by the Director General after consultation with that Authority and in the currency or currencies prescribed by that Authority ("prescribed currency"). The amount in each prescribed currency shall be the equivalent, in round figures, of the amount of the handling fee in Swiss currency set out in the Schedule of Fees. The amounts in the prescribed currencies shall be published in the Gazette.

(d) Where the amount of the handling fee set out in the Schedule of Fees is changed, the corresponding amounts in the prescribed currencies shall be applied from the same date as the amount set out in the amended Schedule of Fees.

(e) Where the exchange rate between Swiss currency and any prescribed currency becomes different from the exchange rate last applied, the Director General shall establish the new amount in the prescribed currency according to directives given by the Assembly. The newly established amount shall become applicable two months after its publication in the Gazette, provided that the interested International Preliminary Examining Authority and the Director General may agree on a date falling during the said two-month period in which case the said amount shall become applicable for that Authority from that date.

#### 57.3 Time and Mode of Payment

(a) The handling fee shall be due at the time the demand is submitted.

(b) Any supplement to the handling fee shall be due at the time the later election is submitted.

(c) The handling fee shall be payable in the currency or currencies prescribed by the International Preliminary Examining Authority to which the demand is submitted, it being understood that, when transferred by that Authority to the

International Bureau, it shall be freely convertible into Swiss currency.

(d) Any supplement to the handling fee shall be payable in Swiss currency.

#### 57.4 Failure to Pay (Handling Fee)

(a) Where the handling fee is not paid as required, the International Preliminary Examining Authority shall invite the applicant to pay the fee within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the demand shall be considered as if it had been received on the date on which the International Preliminary Examining Authority receives the fee, unless, under Rule 60.1(b), a later date is applicable.

(c) If the applicant does not comply with the invitation within the prescribed time limit, the demand shall be considered as if it had not been submitted.

#### 57.5 Failure to Pay (Supplement to the Handling Fee)

(a) Where the supplement to the handling fee is not paid as required, the International Bureau shall invite the applicant to pay the supplement within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the later election shall be considered as if it had been received on the date on which the International Bureau receives the supplement, unless, under Rule 60.2(b), a later date is applicable.

(c) If the applicant does not comply with the invitation within the prescribed time limit, the later election shall be considered as if it had not been submitted.

#### 57.6 Refund

In no case shall the handling fee, or the supplement to the handling fee, be refunded.

#### RULE 96

##### The Schedule of Fees

#### 96.1 Schedule of Fees Annexed to Regulations

The amounts of the fees referred to in Rules 15 and 57 shall be expressed in Swiss currency. They shall be specified in the Schedule of Fees which is annexed to these Regulations and forms an integral part thereof.

##### SCHEDULE OF FEES

Kind of Fee	Amount
<b>1. Basic Fee:</b>	
(Rule 15.2(a))	
If the international application contains not more than 30 sheets	325 Swiss francs
If the international application contains more than 30 sheets	325 Swiss francs plus 6 Swiss francs for each sheet in excess of 30 sheets
<b>2. Designation Fee:</b>	
(Rule 15.2(a))	78 Swiss francs
<b>3. Handling Fee:</b>	
(Rule 57.2(b))	100 Swiss francs
<b>4. Supplement to the Handling Fee:</b>	
(Rule 57.2(a))	100 Swiss francs

#### TOPIC 4: CHANGES IN THE ADMINISTRATIVE INSTRUCTIONS

The following modifications in the Administrative Instructions have been promulgated by the Director General of the World Intellectual Property Organization in accordance with PCT Rule 89.2 with effect from November 9, 1978.

#### SECTION 107

##### Identification of International Authorities

[Only the modification is specified]

The example of Section 107(b), is modified to read "(e.g., 'RO/JP,' 'ISA/US,' 'IPEA/SU')."

#### SECTION 201

##### Names of States: Cancellation of Designations

(a) The name of any State referred to in the request shall be indicated either by the full name of the State or by a

#### SECTION 317

##### Procedure in the Case of the Designation of a State being Considered Not To Have Been Made

generally accepted short title which, if the indications are in English or French, shall be as appears in Annex A. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request form, the two-letter country code as appears in Annex B (for example, where France is the third designated State in Box V of the request form, "FR 3, France" or "FR 3, French Republic").

(b) The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action. If the international application has already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify promptly that Bureau and that Authority. In any event, the International Bureau shall, where the receiving Office fails to do so, cancel *ex-officio* the designation of States other than Contracting States and inform the applicant, the receiving Office and the International Searching Authority promptly of such action.

#### SECTION 203bis

##### National and Regional Patents

Where the request of the international application contains a designation of a Contracting State without an indication of the wish to obtain a regional patent and also a designation of the same Contracting State with an indication of the wish to obtain a regional patent and the national law of the Contracting State does not contain a provision referred to in Article 45(2), the receiving Office shall calculate the designation fees on the basis that a separate fee is payable in respect of the designation of the Contracting State in addition to the designation fee payable in respect of that Contracting State as a Contracting State or as one of a group of Contracting States for which a regional patent is sought.

#### SECTION 412

##### Fee for Copies of Certain Documents

(a) The International Bureau shall make a charge of 6 Swiss francs to designated and elected Offices for a copy of any document cited in the international search report requested under Rule 44.3(c) or any document cited in the international preliminary examination report requested under Rule 71.2(c).

(b) When mailing by air is requested the actual cost of such mailing shall be additionally charged.

#### SECTION 503

##### Method of Identifying Documents Cited in the International Search Report

[Only the modification is specified]

In the example given in Section 503(a), the number of the patent document is modified to read: "JP, B, 50-14535."



## ANNEX C

Standard Code for Identification of Different Kinds  
of Patent Documents  
[Only the modification is specified]

The entries concerning Japan and the United States of America appearing in Appendix II of this Annex are modified to read as follows:

Japan	公開特許公報 (Kōkai tokkyo kōhō)	Published unexamined patent application	Patent application published before examination as to novelty in the sense of paragraphs 6(i) and 6(ii).	A	
	特許公報 (Tokkyo kōhō)	Published examined patent application	Patent application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii). - 1st publication. A Kōkai tokkyo kōhō not published. "T" headed the numerical number of Tokkyo kōhō published from 1922 to 1926. - 2nd publication. Normally following an A Kōkai tokkyo kōhō.	B	1
	特許発明明細書 (Tokkyo hatsumei meisaisyō)	Patent specification	Patent (old law) published in the sense of paragraphs 6(i) and 6(ii). - 1st publication. Tokkyo kōhō not published. - 2nd publication. Normally following a B 1 Tokkyo kōhō.	C	1
	特許審判請求公告 (Tokkyo shinpan Seikyū kōkoku)	Corrected patent specification	Corrected patent published in the sense of paragraphs 6(i) and 6(ii).	C	2
	意匠公報 (Isyō kōhō)	Registered design publication	Registered design application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii).	H	
	公開実用新案公報 (Kōkai jitsuyō shinan kōhō)	Published unexamined utility model application	Utility model application published before examination as to novelty in the sense of paragraphs 6(i) and 6(ii).	S	
				U	

Standard Code for Identification of Different Kinds of Patent Documents (Continued)

Japan (contd)	実用新案公報 (Jitsuyō shinan kōhō)	Published examined utility model application	Utility model application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii). - 1st publication. U Kōkai jitsuyō shinan kōhō not published. "T" headed the numerical number of Jitsuyō shinan kōhō published from 1922 to 1926. - 2nd publication. Normally following a U Kōkai jitsuyō shinan kōhō.	Y	1
	登録実用新案 (Tōroku jitsuyō shinan)	Registered utility model specification	Registered utility model published in the sense of paragraphs 6(i) and 6(ii). - 1st publication Jitsuyō shinan kōhō not published - 2nd publication. Normally following a Y 1 Jitsuyō shinan kōhō.	Y	2
	登録実用新案審判請求公告 (Tōroku jitsuyō shinan shinpan seikyū kōkoku)	Corrected registered utility model specification	Corrected registered utility model published in the sense of paragraphs 6(i) and 6(ii).	Z	1
				Z	2
				I	
United States of America	Patent Plant Patent Design Patent		Patent published in the sense of paragraph 6(ii)	A	
	Reissue Patent		Patent reissued and republished in the sense of paragraph 6(ii)	P	
	Defensive Publication		Patent application published without examination or assertion as to novelty, in the sense of paragraph 6(i)	S	
	Defensive Publication		Patent document published in the sense of paragraph 5: Entry of an abstract of the application in the Official Gazette	E	
	Defensive Publication		Patent document published in the sense of paragraph 6(ii): Abstract of an application published in a discreet document form distinctively numbered in a numerical series unique to Defensive Publications.	H	

## TOPIC 5: PATENT COOPERATION TREATY DOCUMENTS AVAILABLE

## 1. Documents Concerning the PCT Available From the United States Patent and Trademark Office

PCT Document	Price
Patent Cooperation Treaty including Regulations (48 pages).	Free
Request forms, including fee calculation sheet (form PCT/RO/101 and annex, 6 pages). Note: the Request form is a necessary part of the international application.	Free
PCT International Application transmittal letter (form PTO-1382).	Free
Declaration form under 37 CFR 1.70 for entering the national stage in the United States of America as a designated office.	Free
Transmittal form for use when filing in the United States of America as a designated office.	Free

Orders for PCT Documents available from the U.S. Patent and Trademark Office may be office by mail or by telephone.

Mail Order Address:  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

## Telephone Order:

PCT operations  
(703) 557-2003

## 2. Documents Concerning the PCT Available From the World Intellectual Property Organization (WIPO) (Prices in U.S. dollars per copy, including mailing charges). Note: Prices are subject to change. Consult the OFFICIAL GAZETTE of the U.S. Patent and Trademark Office for a listing of current prices. These prices remain valid for all orders received up to December 31, 1979.

Prices in US dollars per copy, including mailing charges

	By surface mail	By airmail
PCT Published International Application (pamphlet) and Search Report	\$3.50	\$4.50
PCT Applicant's Guide:		
English edition, December 1978	30.00	40.00
French edition, April 1979		
PCT (Treaty and Regulations)	4.50	5.50
PCT (Gazette):		
subscription for 1978	50.00	60.00
subscription for 1979	145.00	155.00
single issues (1978 and/or 1979)	7.00	8.00
Items of Non-Patent Literature under PCT Rule 34.1(b) (included in the PCT Gazette No. 2/78 (previously document PCT/INT/1))	7.00	8.00
Administrative Instructions under the Patent Cooperation Treaty (included in the PCT Gazette No. 1)	7.00	8.00
As a separate A4 brochure	4.00	5.00
With its Annexes (all PCT Forms) (previously document PCT/INT/2)	25.00	30.00
Receiving Office Guidelines for the Processing of International Applications under the Patent Cooperation Treaty (document PCT/INT/4)	3.50	4.50
Guidelines for International Search to be Carried Out under the Patent Cooperation Treaty (document PCT/INT/5)	2.50	3.00
Guidelines for International Preliminary Examination to be Carried Out Under the Patent Cooperation Treaty (document PCT/INT/6)	3.50	4.50
Guidelines for Drawings under the Patent Cooperation Treaty (document PCT/INT/7)	First copy free of charge. For each additional copy: 0.50	1.00
Guidelines for Preparation of Abstracts under the Patent Cooperation Treaty (document PCT/INT/8)	First copy free of charge. For each additional copy: 0.50	1.00
Guidelines for Publication under the Patent Cooperation Treaty (document PCT/INT/9)	5.00	6.00
Time Limits under the Patent Cooperation Treaty (document PCT/INT/10)	6.00	6.00
Records of the Washington Diplomatic Conference (1970)	63.00	76.00

## Mode of ordering and paying

Orders should be addressed to:  
WIPO—World Intellectual Property Organization  
PCT Division—Fees, Sales and Statistics Section

If by mail:  
34, chemin des Colombettes  
1211 Geneva 20  
Switzerland

If by telex:  
22376 WIPO CH

If by telephone:  
99 91 11 (ask for the PCT Division—Fees, Sales & Statistics Section)  
Payments may be effected by check or by transfer to the account of the International Bureau at the Swiss Credit Bank, 1211 Geneva 11 (Switzerland).  
On request, the International Bureau will send you an invoice.

## TOPIC 6: REMINDERS FOR PCT INTERNATIONAL APPLICATION APPLICANTS

- a. Applicants are responsible for filing a copy of any priority document with the International Bureau in Geneva, Switzerland within 16 months of the priority date. Applicants filing international applications with the United States Receiving Office may at the time of filing request the Receiving Office to prepare a certified copy of the priority document and forward it to the International Bureau. Such request must include payment for the certified copy by check or authorization to charge a deposit account. Item 1 of form PTO-1382, PCT International Application Transmittal Letter, may be used to request certified copy preparation and to indicate means of payment.
- b. Any amendments to the claims under PCT Article 19 filed after receiving the search report must be sent directly to the International Bureau in Geneva, Switzerland. Such amendments should not be sent by the applicant to either

the Receiving Office or the International Searching Authority.

- c. Any questions concerning the filing of international applications or processing under the Patent Cooperation Treaty may be addressed to the PCT operations staff in person in Building 2, Room 4C08 or by telephone to (703) 557-2003.

June 4, 1979. DONALD W. BANNER,  
Commissioner of Patents and Trademarks.

## Board of Appeals Decisions Rendered in the Month of May 1979

Affirmed	201
Affirmed in Part	38
Reversed	85
Total	324

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,305,873, Re. S.N. 002,144, Filed Jan. 9, 1979, Cl. 346/112, GRAPHIC RECORDER, Jean Mourier, Owner of Record: Benson France, Fonlenay-Sous-Bois, France, Attorney or Agent: A. D. Caesar, et al., Ex. Gp.: 211

3,886,949, Re. S.N. 030,227, Filed Apr. 16, 1979, Cl. 128/360, BABY SOOTHER, Eric Kenneth Hurst, et al., Owner of Record: Lewis Woolf Greeting Limited, Birmingham, England, Attorney or Agent: Marcus B. Finnegan, et al., Ex. Gp.: 335

3,981,360, Re. S.N. 032,515, Filed Apr. 23, 1979, Cl. 166/224 R, WELL TUBING DRAIN, Anil Marthe, Owner of

Record: Cook Testing Co., Long Beach, Calif., Attorney or Agent: James P. Lower, Ex. Gp.: 354

4,045,988, Re. S.N. 031,558, Filed Apr. 19, 1979, Cl. 72/108, ROTARY FORMING MACHINE AND TOOL, Marvin R. Anderson, Owner of Record: Anderson-Cook, Inc., Fraser, Mich., Attorney or Agent: Richard P. Barnard, et al., Ex. Gp.: 321

4,077,213, Re. S.N. 032,162, Filed Apr. 23, 1979, Cl. 60/500, WAVE DRIVEN GENERATOR, Glenn E. Hagen, Owner of Record: Williams, Inc., New Orleans, La., Attorney or Agent: Arthur M. Dula, et al., Ex. Gp.: 341

4,083,389, Re. S.N. 958,665, Filed Nov. 8, 1978, Cl. 141/179, STAR-WHEEL INDEXING SYSTEM FOR AUTOMATIC FILLING MACHINES, Sidney Rosen, et al., Owner of Record: National Instrument Company, Baltimore, Md., Attorney or Agent: Paul M. Craig, et al., Ex. Gp.: 243

# PATENT NOTICES

## Certificates of Correction for the Week of July 3, 1979

3,795,380	4,087,130	4,127,558	4,136,245
3,806,097	4,087,386	4,127,734	4,136,390
3,848,148	4,092,308	4,127,997	4,136,397
3,878,763	4,093,600	4,128,591	4,136,955
3,898,304	4,094,698	4,129,220	4,137,192
3,928,425	4,095,977	4,129,242	4,137,247
3,962,193	4,096,557	4,130,719	4,138,256
3,970,973	4,098,090	4,130,775	4,138,445
4,001,569	4,101,127	4,131,227	4,138,730
4,002,886	4,102,631	4,131,303	4,139,476
4,007,363	4,103,193	4,131,435	4,140,123
4,008,250	4,106,251	4,131,518	4,140,555
4,009,171	4,108,268	4,131,551	4,140,587
4,013,757	4,108,512	4,131,772	4,140,848
4,020,137	4,109,224	4,131,871	4,141,076
4,020,660	4,109,325	4,131,951	4,141,164
4,022,988	4,110,898	4,132,182	4,141,324
4,030,704	4,112,009	4,132,450	4,141,563
4,033,911	4,112,869	4,132,581	4,141,632
4,039,351	4,113,146	4,132,615	4,141,679
4,046,068	4,114,730	4,132,882	4,141,866
4,047,007	4,115,352	4,132,920	4,142,032
4,051,526	4,116,855	4,132,980	4,142,311
4,053,515	4,116,939	4,132,998	4,142,532
4,055,932	4,119,360	4,133,117	4,142,864
4,063,849	4,120,778	4,133,221	4,143,655
4,067,456	4,121,562	4,133,234	4,143,678
4,067,864	4,121,665	4,134,054	4,144,848
4,070,795	4,122,217	4,134,129	4,145,285
4,071,836	4,123,864	4,134,465	4,145,346
4,075,672	4,124,150	4,134,672	4,145,513
4,081,677	4,124,800	4,134,872	4,145,733
4,082,678	4,124,986	4,134,925	4,146,573
4,082,801	4,125,129	4,134,936	4,148,841
4,084,746	4,125,404	4,134,967	4,149,240
4,085,599	4,125,471	4,134,975	
4,085,704	4,126,616	4,136,196	
4,086,422	4,127,502	4,136,241	

## Disclaimers

3,769,330.—Edward J. Nikawitz, Glen Rock, and Robert F. Tavares, Cedar Grove, and William M. Easter, Jr., Hasbrouck Heights, N.J. 2-BUTYL-1-ALKYNYL-CYCLOALKAN-1-OLS AND DERIVATIVES THEREOF. Patent dated Oct. 30, 1973. Disclaimer filed Sept. 7, 1978, by the assignee, Giraudan Corporation.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

984 OG 10

3,869,182.—Nils Bertil Gullberg, Staffanstorps, Sweden. BALL BEARING. Patent dated Mar. 4, 1975. Disclaimer filed Apr. 17, 1979, by the inventor.

Hereby enters this disclaimer to claim 4 of said patent.

3,952,711.—John A. Kimberley, East Granby, Conn., and Richard D. Kraus, Chilopee, Mass. DIESEL INJECTION NOZZLE WITH INDEPENDENT OPENING AND CLOSING CONTROL. Patent dated Apr. 27, 1976. Disclaimer filed June 27, 1978, by the assignee, AMBAC Industries, Inc.

Hereby enters this disclaimer to claims 1-6 of said patent.

4,020,197.—Horst Steffen, Geldern, Germany. PROCESS FOR THE CATALYTIC SENSITIZATION OF NON-METALLIC SURFACES FOR SUBSEQUENT ELECTROLESS METALLIZATION. Patent dated Apr. 26, 1977. Disclaimer filed Mar. 5, 1979, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 4, 5, 8-11 inclusive and 14 of said patent.

4,050,608.—Roy E. Smith, Columbus, Ohio. CROSS-SHAPED JOINT COVER MEMBER FOR GENERALLY RECTANGULAR COMPOSITE INSULATING PANELS FORMING WALL PORTION OF INSULATED CRYOGENIC LIQUID CONTAINER. Patent dated Sept. 27, 1977. Disclaimer filed Oct. 30, 1978, by the assignee, Owens-Corning Fiberglass Corporation.

Hereby enters this disclaimer to claims 22 through 95 of said patent.

4,099,999.—Robert D. Burnham, Los Altos Hills, and Donald R. Seifres, Los Altos, Calif. METHOD OF MAKING ETCHED-STRIPED SUBSTRATE PLANAR LASER. Patent dated July 11, 1978. Disclaimer filed Apr. 2, 1979, by the assignee Xerox Corporation.

Hereby enters this disclaimer to claim 2 of said patent.

4,150,062.—William E. Garwood, Haddonfield, and Philip D. Caesar, Princeton, and James A. Brennan, Cherry Hill, N.J. LIGHT OLEFIN PROCESSING. Patent dated Apr. 17, 1979. Disclaimer filed June 1, 1979, by the assignee, Mobil Oil Corporation.

The term of this patent subsequent to Mar. 9, 1995, has been disclaimed.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
	Denver Public Library	(303) 573-5152 Ext. 223
Colorado	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Georgia	Chicago Public Library	(312) 269-2814
Illinois	Boston Public Library	(617) 536-5400 Ext. 265
Massachusetts	Detroit Public Library	(313) 833-1458
Michigan	Kansas City: Linda Hall Library	(816) 363-4600
Missouri	St. Louis Public Library	(314) 241-2288 Ext. 214
	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
Nebraska	Newark Public Library	(201) 733-7740
New Jersey	Albany: New York State Library	(518) 474-5125
New York	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
	Dallas Public Library	(214) 748-9071
Texas	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Seattle: Engineering Library, University of Washington	(206) 543-0740
Washington	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
Wisconsin	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.

984 OG 11



## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Holography; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING AND MEASURING, GROUP 240—A. L. SMITH, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 260—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	5-17-77
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Apparatuses; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 600, 70th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,553 to 3,031,668, inclusive  
Plant Patents..... Numbers 2,135 to 2,142, inclusive

984 OG 12

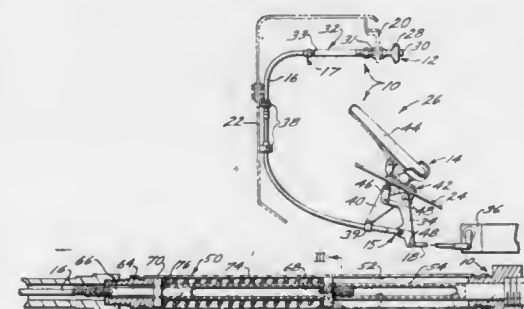
## DEFENSIVE PUBLICATIONS

PUBLISHED JULY 3, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

**T984,001**  
**DECELERATOR MECHANISM**  
Orson K. Kelly, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.  
Filed Apr. 24, 1978, Ser. No. 899,432  
Int. Cl.<sup>2</sup> F16C 1/10  
U.S. Cl. 74—501 R  
1 Sheet Drawing. 6 Pages Specification



A decelerator mechanism for a vehicle has a speed control with a releasable lock and a complementing pivotal control connected by a control cable. Movement of the cable is controlled by a force biasing device. The force biasing device has first and second rods and associated stop elements co-acting with a spring for initially setting and holding a base engine operating speed, selectively reducing the base speed, in response to moving the pivotal control and automatically returning to the base speed in response to releasing the pivotal control.

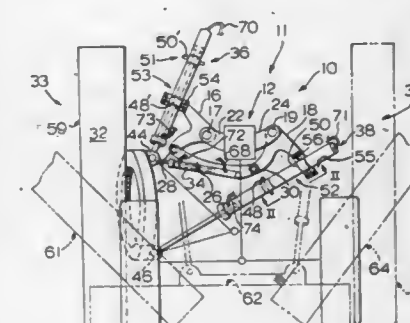
**T984,002**  
**METHOD OF PRODUCING REVERSAL COLOR IMAGES**  
William H. Faul, and Patrick H. Saturno, both c/o Kodak Park Division, Rochester, N.Y. 14650  
Continuation of Ser. No. 662,308, Mar. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 487,084, Jul. 10, 1974, abandoned. This application May 30, 1978, Ser. No. 910,398  
Int. Cl.<sup>2</sup> G03C 5/50, 7/16  
U.S. Cl. 96—59  
No Drawing. 31 Pages Specification

Reversal color images are produced in photographic elements which contain a ballasted primary aromatic amine and conventional ballasted color couplers. The photographic element is imagewise-exposed and a negative silver image is formed without forming a dye image. The residual silver halide in the photographic element is then fogged and developed to silver while concurrently forming a color dye image in the nonimagewise-exposed areas of the element. The developed silver is removed without removing the dye image.

**T984,003**  
**RECOVERY OF HIGH VISCOSITY NATIVE CRUDE SAMPLES**  
Thomas R. Sifferman, and Michael W. Britton, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.  
Filed Sep. 25, 1978, Ser. No. 945,675  
Int. Cl.<sup>2</sup> E21B 47/00  
U.S. Cl. 166—264  
No Drawing. 4 Pages Specification

Native bottomhole samples of very viscous crude oil (bitumen, tar) are obtained by injecting water plus a suitable surfactant mixture down a hollow sucker rod whereby mixing occurs downhole, producing a resultant oil-in-water emulsion, and recovering the crude oil from the emulsion. Contamination of the crude oil sample with light hydrocarbons is avoided.

**T984,004**  
**GRADER BLADE ACTUATOR**  
Carlisle S. Morris, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.  
Continuation of Ser. No. 826,213, Aug. 19, 1977, abandoned. This application Aug. 11, 1978, Ser. No. 932,839  
Int. Cl.<sup>2</sup> E02F 3/76  
U.S. Cl. 172—793  
1 Sheet Drawing. 8 Pages Specification



A grader blade actuator comprises a frame, a pair of pivot arms connected to said frame, a link member pivotally interconnecting the arms, a blade member, and a diagonal fluid cylinder connecting the link member to the blade member. The blade actuator further comprises a pair of fluid lift cylinders which are of a construction sufficient for connecting each pivot arm to a respective end portion of the blade member. One or both of the lift cylinders has two or more spaced apart releasable connectors 48 and 50 or 48' and 50' which are selectively connectable to the respective pivot arm for providing vertical positioning of the blade member.

T984,005

## YELLOW-DYE-FORMING COUPLERS

Philip T. S. Lau, Rochester, N.Y., assignor to Eastman Kodak Co., Rochester, N.Y.

Division of Ser. No. 892,070, Mar. 31, 1978. This application

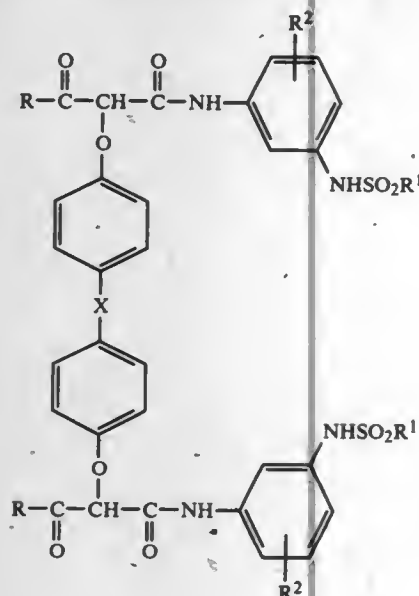
Dec. 18, 1978, Ser. No. 970,497

Int. Cl.<sup>2</sup> C07C 143/75

U.S. Cl. 260-401

No Drawing. 29 Pages Specification

Novel bis yellow-dye-forming couplers are incorporated in photographic emulsions and elements. The couplers are represented by the structural formula



where:

R is an aryl group of 6 to 12 carbon atoms; an aryloxyalkylene or arylthioalkylene group having 6 to 12 carbon atoms in the aryl portion of the group and 1 to 4 carbon atoms in the alkylene portion of the group, or an alkyl group of 1 to 8 carbon atoms;

R<sup>1</sup> is an alkyl group of 4 to 16 carbon atoms;

R<sup>2</sup> represents one or more halogen, lower alkyl, lower alkoxy, carboxy or lower alkoxycarbonyl substituents wherein the alkyl group and the alkyl portion of the alkoxy and alkoxycarbonyl groups contains 1 to 6 carbon atoms; and

X is sulfonyl, carbonyl or alkylenedisulfonamido containing 1 to 4 carbon atoms.

T984,006

## COOLING TUBULAR EXTRUDATES

Michael L. Clifford, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 1, 1977, Ser. No. 856,515

Claims priority, application United Kingdom, Dec. 14, 1976, 52078/76

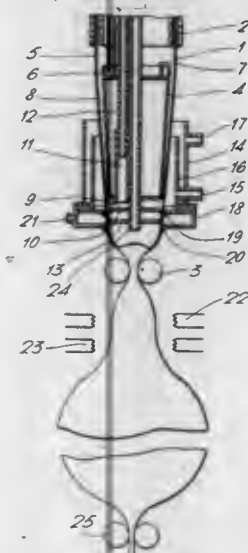
Int. Cl.<sup>2</sup> B29C 25/00

U.S. Cl. 264-89

1 Sheet Drawing. 17 Pages Specification

An improved method of cooling an extruded tube of plastics material such as a substantially crystalline polymer of propylene, is disclosed in which the extruded tube is fed, in the direction of extrusion, in heat-transfer relationship with an adjacent cooling surface, such as an internal mandrel extending axially within the extruded tube, while maintaining this cooling surface at a temperature below the melting point of the plastics material. Interposed between and in contact with the tube and the cooling surface is a continuous sheath of a heat transfer liquid having a dynamic viscosity at 20° C. of from 2 to 20,000 centipoise. Preferably the heat transfer liquid has a boiling point below that of the die during extrusion of the tube. An aqueous dispersion or solution of a viscosity modifier, such as a cellulosic resin, is used and supplied to the sheath at a rate of

from 0.02 to 0.5 liters/minute/centimeter width of tube surface. The thus cooled tube is subsequently withdrawn from the cooling surface.



Further processing steps of reheating the cooled tube to its orienting temperature, transversely expanding the reheated tube by introducing a pressurizing gas into the tube and longitudinally extending the expanded tube to form a biaxially oriented tubular film may be used.

T984,007

## JIG-SAW PUZZLES

John C. Richardson, Hitchen, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 810,372, Jun. 27, 1977, abandoned.

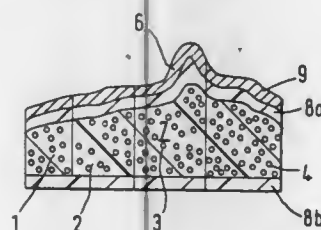
This application Jul. 26, 1978, Ser. No. 928,293

Claims priority, application United Kingdom, Jul. 9, 1976, 28677/76

Int. Cl.<sup>2</sup> A63F 9/12

U.S. Cl. 273-157 R

1 Sheet Drawing. 15 Pages Specification



A jig-saw puzzle comprises interfitting pieces (1, 2, 3, 4) which when fitted together side-by-side form a three-dimensional upper surface simulating for example hills and valleys. Each piece is formed of a molded open or closed cell thermoplastics foamed core 7 sandwiched between upper and lower thermoplastics skins 8a and 8b. A printed sheet 9 is stuck on to the upper skin 8a. The skins 8a and 9a may be made from any conventional moldable thermoplastics. A preferred thermoplastics is a copolymer of propylene with from 5 to 20% by weight of ethylene made by injecting ethylene into the final stages of an otherwise propylene homopolymerization. The core may be made of the same or different plastics as the skins. Polyurethane is a preferred core material. The printed sheet, which may be paper or fabric, may be stuck on to the upper sheet with adhesive or by penetration or fusing of the skin material into the sheet during molding of the pieces.

## REISSUES

JULY 3, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,040

## VESSEL FOR FLOTATION LOADING AND UNLOADING AND PARTIAL BUOYANCY SUPPORT OF BARGES AND OTHER FLOATING CARGOES

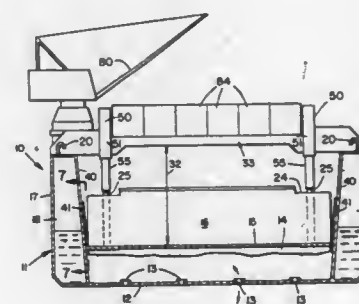
William E. Kirby, Hong Kong, and David J. Seymour, Daly City, Calif., assignors to Wharton Shipping Corporation, Edificio Vallarino, Panama

Original No. 3,913,512, dated Oct. 21, 1975, Ser. No. 511,492, Oct. 2, 1974. Continuation-in-part of Ser. No. 415,968, Nov. 8, 1973, abandoned. Application for reissue Sep. 27, 1977, Ser. No. 837,167

Int. Cl.<sup>2</sup> B63B 35/28

U.S. Cl. 114-260

51 Claims



35. A vessel for transport of a floating buoyant cargo such as barges, lighters, and pontoons, wherein said cargo can be partially supported in the vessel by its own buoyancy, including in combination:

a hull having a bottom shell with rigid submarine cargo-supporting and hull-reinforcing structure, a bow, a stern, and side walls providing a series of buoyancy compartments, a hollow enclosed interior including a cargo hold, and conduit means communicating with said hold for passage of sea water into and out from said hold,

means for introducing and expelling water from said buoyancy compartments to adjust the draft, trim, and list of said vessel, gate means in said hull for opening to enable flotation loading and unloading of said floating cargo and for closing during transportation thereof, and

securing means for releasably locking said cargo in place in said hold against movement relative to said hull all during a voyage of said vessel, with a lower portion of said cargo engaging said submarine cargo-supporting structure, said securing means including means for engaging an upper portion of said cargo,

whereby water in the flooded hold enables the buoyancy of the cargo to support the cargo, at least in part.

Re. 30,041

## CARBONLESS MANIFOLD BUSINESS FORMS

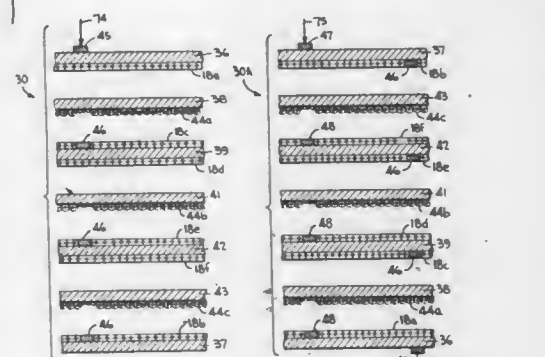
George E. Maalouf, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Original No. 4,036,511, dated Jul. 19, 1977, Ser. No. 664,941, Mar. 8, 1976. Division of Ser. No. 561,623, Nov. 24, 1975, Pat. No. 3,981,523. Application for reissue Sep. 1, 1977, Ser. No. 829,825

Int. Cl.<sup>2</sup> B41M 5/22

U.S. Cl. 282-27.5

2 Claims



1. A manifold set of carbonless recording sheets, comprising: a stack including at least two superimposed sheets; each of said sheets having on each of its surfaces, a coating comprising an initially colorless color forming reactive component,

a reactive component of each of the coatings of one of said sheet being in a transferable form such that the same will be transferred from said one sheet to an adjacent sheet in response to application of pressure to said stack and being capable of reacting to produce a colored mark with a reactive component of each of the coatings of a second of said sheets upon coming into reactive contact therewith, said reactive component of each of the coatings of said second sheet being in a non-transferable form such that the produced mark is presented on said second sheet,

said one sheet being disposed in overlying relationship to said second sheet such that one of its coatings is disposed against one of the coatings of said second sheet, whereby upon application of pressure to said stack, said one coating of said one sheet is forced into said reactive contact with said one coating of the second sheet to thereby produce a colored mark,

said sheets being capable of rearrangement such that said one sheet overlies said second sheet with its other coating disposed against the other coating of the second sheet, whereby upon application of pressure to said stack said other coating of said one sheet is forced into said reactive contact with said other coating of the second sheet to thereby produce another colored mark.



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# PATENTS

GRANTED JUL. 3, 1979

## ERRATA

For CLASS	See PATENT NO.
405-174.....	4,159,630
414-460.....	4,159,778
435-015.....	4,159,923
252-356.....	4,159,952
250-540.....	4,159,971
525-091.....	4,159,975
525-441.....	4,159,978
568-576.....	4,160,000
525-230.....	4,160,001
424-048.....	4,160,054
542-426.....	4,160,095
364-400.....	4,160,271
364-602.....	4,160,272
364-900.....	4,160,273
365-002.....	4,160,274
365-149.....	4,160,275

# PATENTS

GRANTED JULY 3, 1979

## GENERAL AND MECHANICAL

### 4,159,542 TIE HOLDER

Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207  
Filed Feb. 28, 1978, Ser. No. 882,620  
Int. Cl.<sup>2</sup> A41D 25/08

U.S. Cl. 2—152 R

8 Claims



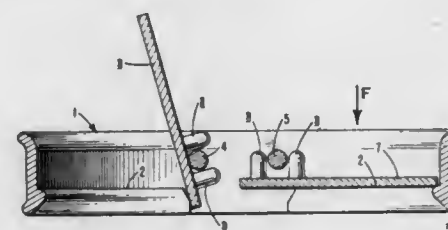
1. A tie holder for supporting a necktie adjacent to the front of a closed shirt collar, said tie holder comprising:
- (a) a plate member having front and back surfaces, top and bottom edges, and opposing side edges;
  - (b) grasping members connected with said back surface and including a resilient hook member having first and second side edges, and first and second outwardly projecting lug members positioned adjacent to the first and second hook member side edges respectively; said first and second lug members cooperating with said hook member to form mutually engageable members for detachably connecting said plate member to said closed shirt collar;
  - (c) receiving means connected with said plate member for engaging and supporting a necktie thereon and positioning said necktie adjacent said closed shirt collar, said receiving means including at least two movable arm members each having opposite end portions thereof detachably connected to said plate member adjacent to said side edges, and extending transversely thereacross;
  - (d) said movable arm opposite end portions each being connectible to said plate member by fastener means; and
  - (e) said fastener means including a locking snap having a protuberance and an opening engageable with said protuberance.

### 4,159,543 HEART VALVE PROSTHESIS

Alain Carpentier, 96, rue Didot, 75 - Paris 14eme, France  
Filed Nov. 11, 1976, Ser. No. 740,879  
Claims priority, application France, Nov. 19, 1975, 75 36074  
Int. Cl.<sup>2</sup> A61F 1/22

U.S. Cl. 3—1.5

3 Claims



1. A heart valve comprising:
- (a) a substantially circular ring having at least one seat and known types of suture means, and
  - (b) two substantially semicircular movable flaps adapted to rest on the said seat, comprising means permitting the said

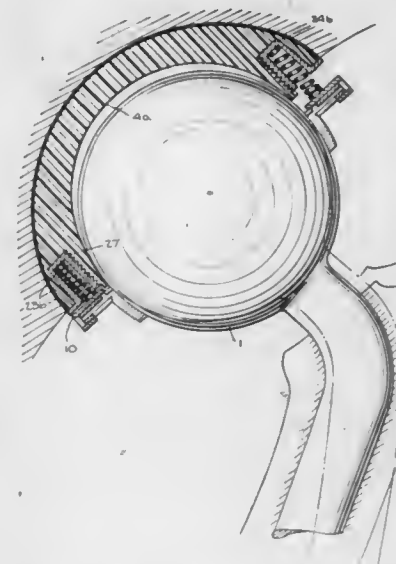
flaps to undergo movements of rotation through an angle less than 90°, as well as of translation, the said flaps being adapted to swing, each through an angle of less than 90°, between the said seat and two substantially parallel and transverse shafts serving as stops and limiting the displacements of the said flaps in rotation and in translation, the said shafts being constituted by cylindrical rods which are parallel and each having a fixed position with respect to the ring, the said rods cooperating with pegs disposed on the same face of the said flaps with respect to the said rods.

### 4,159,544 HIP JOINT PROSTHESIS

Zafer A. Termanini, Brooklyn, N.Y., assignor to Zafmedico Corporation, Brooklyn, N.Y.  
Filed Nov. 28, 1977, Ser. No. 855,336  
Int. Cl.<sup>2</sup> A61F 1/24

U.S. Cl. 3—1.912

8 Claims



1. In a hip joint prosthesis of the type having separate ball and socket members for being implanted respectively in femoral and acetabular openings, the improvement wherein the socket member comprises:
- means providing a cup-shaped bearing surface for the ball member;
  - means for retaining the ball member in an assembled position within the socket member; and
  - spring means connected between said cup-shaped bearing surface means and said ball member retaining means for absorbing forces applied in a direction tending to separate the assembled ball and socket members.

### 4,159,545 WORKING ARTIFICIAL HAND COMBINATION

Willie D. Manning, Bradford, and Jerry Whitehead, Trenton, both of Tenn., assignors to M-W Handicapped Enterprises, Inc., Trenton, Tenn.  
Filed Sep. 26, 1977, Ser. No. 836,651  
Int. Cl.<sup>2</sup> A61F 1/06

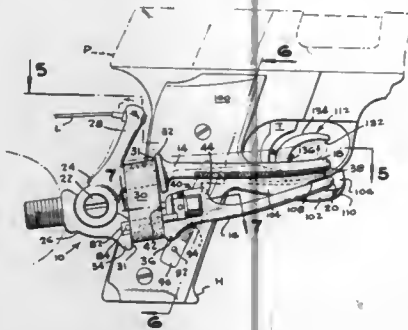
U.S. Cl. 3—12.8

66 Claims

1. In an artificial hand for operation of various implements such as tools and useful devices and the like, having a pair of fingers including facing gripping surfaces extending from a pivot for movement into and out of engagement, tensioning means engaging the fingers to urge movement of the fingers

toward such engagement, means selectively operated by the wearer to open and close the fingers, the improvement comprising,

positioning means in the form of an opening having slide means connected there to for slidably receiving said implement,



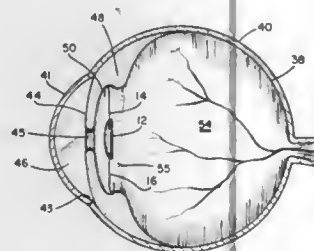
said positioning means being secured to one of the fingers to hold the implement in preselected position independent of said other finger and located more closely adjacent to said pivot than the working end of said fingers, and locking means connected to said positioning means for releasably locking said implement to said positioning means.

**4,159,546**  
**INTRAOCCULAR LENS**  
Steven P. Shearing, 2320 S. Rancho Dr., #103, Las Vegas, Nev. 89102

Filed Jun. 15, 1977, Ser. No. 806,957  
Int. Cl.<sup>2</sup> A61F 1/16, 1/24

U.S. Cl. 3—13

4 Claims

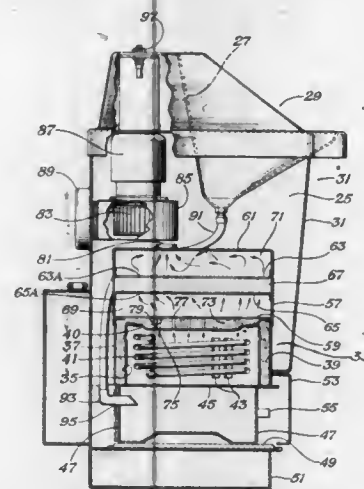


2. In cataract surgery following capsular extraction, a method of implanting an intraocular lens having a plastic lens body and first and second flexible and memory retaining curved looped strands wherein one end of each strand is secured adjacent the peripheral edge of said lens body and the other end is unsecured, comprising inserting said lens through the pupil with said first strand first followed by said lens body, directing said first strand into the posterior chamber, further urging said lens through the pupil and into the posterior chamber thereby compressing said first strand within the posterior chamber until said second strand passes through said pupil and into the posterior chamber, and directing said second strand opposite said first strand in the posterior chamber, whereby the entire lens is located and fixed within the posterior chamber and posterior to the iris.

**4,159,547**  
**INCINERATOR URINAL**  
Ernest B. Blankenship, Dallas, Tex., assignor to Research Products/Blankenship Corporation, Dallas, Tex.  
Filed Dec. 7, 1977, Ser. No. 858,185  
Int. Cl.<sup>2</sup> A47K 11/02

U.S. Cl. 4—111.1

9 Claims



1. An incinerator urinal, comprising:  
a housing,  
incinerator chamber means located in said housing,  
bowl means located above said incinerator chamber means for receiving liquid effluent,  
pan means adapted to be located below said incinerator chamber means and in fluid communication with said incinerator chamber means,  
a drain tube located exteriorly at said incinerator chamber means and extending from the lower end of said bowl means to said pan means exteriorly of said incinerator chamber means for allowing the flow of liquid effluent from said bowl means to said pan means,  
heater means for applying heat to the effluent deposited in said pan means, and  
a heat activated catalyst for reducing the odor of said effluent during operation of said heater means.

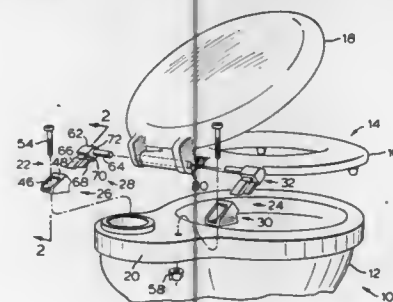
**4,159,548**  
**LIFT-OFF HINGE ASSEMBLY FOR TOILETS AND THE LIKE**

Clifford B. Hewson, Toronto, Canada, assignor to Moldex Limited, Barrie, Canada

Filed Feb. 15, 1978, Ser. No. 878,043  
Int. Cl.<sup>2</sup> A47K 13/12; E05D 7/12

U.S. Cl. 4—236

8 Claims



1. A hinge assembly for use in releasably and pivotally connecting a toilet seat or lid to a toilet, comprising:  
(a) a lift-off hinge pin having  
(i) a head portion having a base surface and a side surface,  
(ii) a clip portion extending from the base surface of the

head portion and consisting of a flexible first jaw member having an outwardly-facing surface and a second jaw member having an oppositely outwardly-facing surface spaced from the outwardly-facing surface of the first jaw member, the first jaw member having a notch extending laterally across its outwardly-facing surface, and

(iii) a pin portion extending from the side surface of the head portion and adapted to pivotally mate with a toilet seat or lid, and

(b) a hinge block securable to a toilet, the hinge block having  
(i) a hollow interior,

(ii) a substantially flat lower exterior surface for contacting said toilet when said hinge block is secured to said toilet

(iii) a pair of solid walls extending upwardly and forwardly from said substantially flat lower surface,

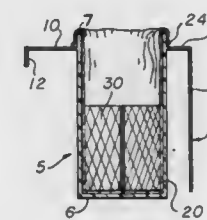
(iv) a first side facing upwardly and forwardly adapted to be brought into proximity with the base surface of said hinge pin, the said side having an entry opening permitting access to the interior and adapted to snugly receive the jaw members of the hinge pin,

(v) a second side facing upwardly and rearwardly having a release opening permitting access to substantially the entire interior of said hinge block for cleaning purposes, and a bridge portion separating the entry opening of the said first side from the release opening in the said second side, the bridge portion defining a retaining member, so that, when the jaw members of the hinge pin are snugly received by the entry opening of the hinge block, the notch on the outwardly facing surface of the first jaw member engages the retaining member to mate the hinge pin to the hinge block, the outwardly facing surface of the first jaw member then being accessible through the release opening so that, upon the inward deflection of the first jaw member towards the second jaw member, the notch is released from engagement with the retaining member, thereby allowing the hinge pin to be removed from the hinge block, and  
(vi) the first jaw member being dimensioned to close substantially entirely the release opening when the hinge pin is mated with the hinge block.

**4,159,549**  
**CUSPIDOR**  
Guy V. Layton, Jr., 2230 4th St., Port Neches, Tex. 77651  
Filed Jan. 26, 1977, Ser. No. 762,506  
Int. Cl.<sup>2</sup> A61J 19/00

U.S. Cl. 4—285

1 Claim



1. A cuspidor comprising:  
a. a hollow cylindrical member having a lower closed end and an open upper end;  
b. a lateral projection extending therefrom adjacent, but spaced from said open upper end of said member, said projection having a longitudinal extension on the end thereof;  
c. handle means on said member comprising a lateral projection and a longitudinal extension;  
d. a plastic liner for said member having one end closed and one end open, with the open end of said liner extending

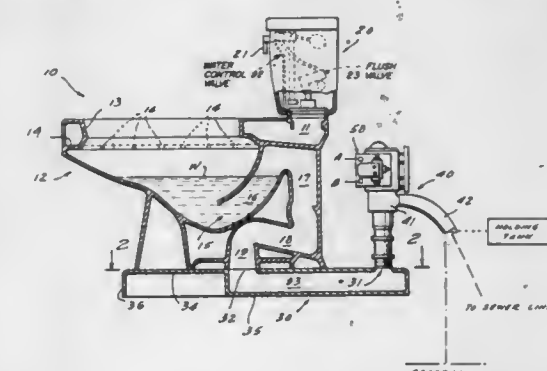
over said open end on said member, and having means for sealing said liner; and

e. a cylindrical body of honeycomb type cellular paper material conforming with and contained in said hollow member with said body of cellular material being positioned adjacent said lower closed end of said member and filling approximately one-half of said hollow member.

**4,159,550**  
**TOILET FACILITY**  
Leo W. Tobin, Jr., Darien, Conn., assignor to American Standard Inc., New York, N.Y.  
Filed Aug. 22, 1977, Ser. No. 826,495  
Int. Cl.<sup>2</sup> E03D 1/00, 3/00

U.S. Cl. 4—319

6 Claims



1. In a toilet facility of the type having a modified water closet bowl of the siphon type and which utilizes a minimum amount of flush water sufficient to wash the water closet bowl after each flush cycle so that only clean, uncontaminated water remains in the bowl after all waste is evacuated therefrom, said toilet facility comprising:

a hollow rim formed around the upper edge of said bowl, said hollow rim having a water inlet opening and a plurality of spaced outlet openings formed therein and disposed adjacent said bowl surfaces so that all water entering said hollow rim will pass through said outlet openings to wash said bowl surfaces;

flush valve means mounted in fluid tight connection with said water inlet opening of said hollow rim;

said bowl including an integrally formed up-leg having a bowl waste inlet opening and a down-leg having a bowl waste outlet opening so as to define a bowl waste passageway of the siphon type;

a sump tank having a waste passageway therein and waste inlet and waste outlet openings formed at each end respectively of said passageway;

said bowl mounted on said sump tank in fluid tight connection with said sump waste inlet opening and said bowl waste outlet opening so that said bowl waste passageway and said sump waste passageway are in fluid communication to provide a continuous waste passageway;

a macerator pump mounted on said sump tank in fluid tight connection with said sump waste outlet opening, said macerator pump having waste inlet and outlet openings;

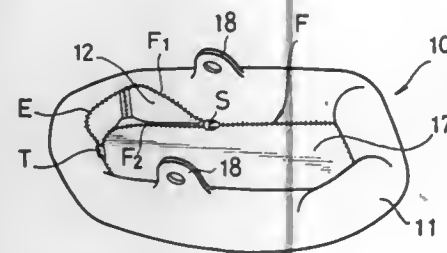
actuating means operatively connected to said flush valve means for opening said flush valve to permit water to enter said hollow rim through said water inlet opening;

a control circuit including flush cycle control means electrically connected to said valve actuator means and said macerator pump so that when said flush valve is opened by said actuator means to permit water to enter said hollow rim through said water inlet opening, said flush cycle control means is electrically energized and simultaneously electrically energizes said macerator pump to pump waste rapidly from said bowl without siphonic action and is electrically deenergized when waste is removed from said bowl whereby a minimum of flush water of less than one



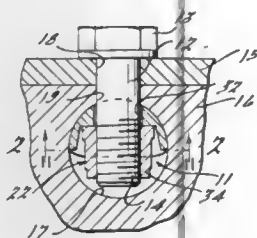
gallon is utilized and is sufficient to wash the water closet bowl of waste so that only clean uncontaminated water remains in said bowl and provides a water seal when the flush cycle is completed, said control circuit including sensing means operably associated with said pump for shutting off said pump when only air is being pumped therethrough.

**4,159,551**  
**SEPARABLE BOAT**  
 Kazuo Iwai, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan  
 Filed Aug. 15, 1977, Ser. No. 824,814  
 Claims priority, application Japan, Aug. 17, 1976, 51/109788[U]  
 Int. Cl.<sup>2</sup> B63B 7/00  
 U.S. Cl. 9-2 A



1. A boat which comprises a plurality of floatable units disposed endwise in relation to one another about a closed path; a plurality of slide fasteners each releasably connecting together, at respective end portions, a pair of corresponding adjoining floatable units to define with said plurality of floatable units an annular floatable member; a cover having peripheral portions disposed to embrace said annular floatable member; a slide fastener extending along said closed path and operable to releasably connect said peripheral portions together to secure the cover to the annular floatable member with said peripheral portions of the cover embracing the annular floatable member, said peripheral portions of the cover, when connected together by said slide fastener along said closed path, defining a hollow casing for receiving therein said annular floatable member.

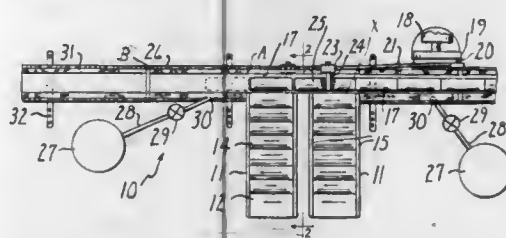
**4,159,552**  
**METHOD OF MANUFACTURING A BARREL NUT**  
 Imre Berecz, Dana Point, Calif., assignor to Microdot Inc., Greenwich, Conn.  
 Division of Ser. No. 772,128, Feb. 25, 1977, Pat. No. 4,119,130.  
 This application Jul. 10, 1978, Ser. No. 923,188  
 Int. Cl.<sup>2</sup> B21K 1/68, 1/70  
 U.S. Cl. 10-86 F



1. A method of manufacturing a barrel nut comprising the steps of forming a cylindrical slug of metal, reforming said slug in a closed die by striking said slug in a radial direction thereby to form a semi-cylindrical barrel having a convex side and a recessed side, the recess having a flat bottom and radially extending side walls and end walls thereby to define a rectangular recess, drilling a bolt receiving aperture centrally of said

recess bottom and normal thereto and through the convex surface of said barrel element, forming ear-receiving apertures at opposite ends of opposite side walls of said recess, forming a nut element having a rectangular base and a tubular threaded portion extending upwardly therefrom, forming ears on the opposite side edges of said nut element base, placing said nut element base in said barrel element recess so that said ears are aligned with said recess side wall apertures, and forcing said opposite ends of the side walls toward said nut element base so that said ears at least partially enter said apertures.

**4,159,553**  
**CONTINUOUS PROCESS FOR DECONTAMINATING AND CLEANING THE OUTER SURFACE OF PLASTIC CONTAINERS TO PERMIT PRINTING THEREON**  
 Sinibaldo Graziano, 516 Front St., Union Beach, N.J. 07735  
 Filed Aug. 24, 1977, Ser. No. 827,121  
 Int. Cl.<sup>2</sup> B67C 1/00  
 U.S. Cl. 15-101

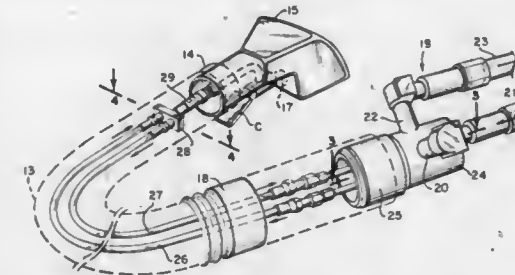


1. A round container continuously operated cleaning and decontaminating machine, comprised of a gravity feed trough designed to retain a plurality of particularly sized containers in aligned abutting rolling relationship, said gravity feed trough connected to an abutting level extended carrier trough at its lower exit, said abutting and level extended carrier trough being of a round shape with a feed portion to accept said containers one by one, a cycle operated pusher piston fitted to said carrier trough to move said containers one at a time to the left the length of said container to thus permit the next container to drop into said carrier trough when the piston retracts in its cycled continuous operation, said containers pushed outward from said initially charged position along said carrier trough, said carrier trough lined along a portion of its length with an absorbent resilient material such as toweling, said lined trough divided into two separated portions, a first portion being positioned adjacent said feed trough, a tank containing a cleaning solution such as alcohol connected to the first portion of said lined trough with a gravity feed and having a valve to control the fluid flow, a second portion of said lined trough separated from said first portion and provided with a dry absorbent material to wipe said containers clean and dry, said containers being ejected from the end of said trough by the movement of the pusher piston.

**4,159,554**  
**FABRIC CLEANING HAND TOOL WITH RECIRCULATING SYSTEM**  
 Arlen M. Knight, 1141 N. Patterson, and William R. Hachtmann, 5072 Walnut Park Dr., both of Santa Barbara, Calif. 93111  
 Filed May 6, 1977, Ser. No. 794,353  
 Int. Cl.<sup>2</sup> A47L 7/00, 11/34  
 U.S. Cl. 15-321

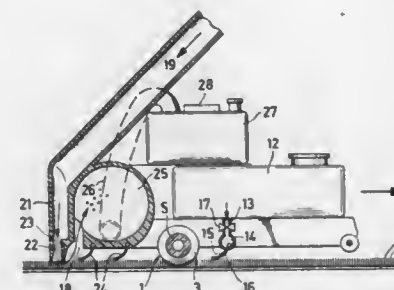
1. A fabric cleaning hand tool with a recirculating system for use with a cleaning machine including a recovery tank, a heated fluid solution dispensing tank and a pump having an inlet and outlet in said dispensing tank for recirculating fluid solution, comprising, in combination:  
 (a) a hand-held head structure defining in its interior a suction chamber and an adjacent spray nozzle;

(b) a vacuum hose having one end connected to said head in communication with said suction chamber and its other end extending to said recovery tank;  
 (c) a dispensing fluid inlet line connecting to the outlet of said pump in said fluid solution dispensing tank and a fluid outlet line connecting to the inlet of said pump to return said fluid solution to said dispensing tank so that fluid is circulated by said pump in said tank; and,



(d) a member secured to said head connecting to said fluid inlet line and said fluid outlet line and to said spray nozzle so that a portion of heated fluid passing through said fluid inlet line is continuously recirculated back through said member and said fluid outlet line to said fluid dispensing tank and another portion is passed to said nozzle, when said nozzle is operated whereby the portion of fluid passed to said nozzle is maintained in a heated state as a consequence of the recirculation of the said first mentioned portion of fluid.

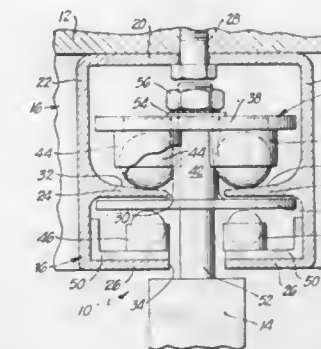
**4,159,555**  
**SOIL-RELEASING ROLLER FOR WET OR DRY CARPET-CLEANING APPARATUS**  
 Helmut Schneider, Mainz, Fed. Rep. of Germany, assignor to Werner & Mertz GmbH, Mainz, Fed. Rep. of Germany  
 Filed Nov. 18, 1977, Ser. No. 852,725  
 Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652894; Feb. 28, 1977, 2708681; Sep. 8, 1977, 2740360  
 Int. Cl.<sup>2</sup> A47L 5/30  
 U.S. Cl. 15-366



1. A rapid-rotation soil-loosening roller for a carpet-cleaning machine comprising:  
 an elongated body of shape-retentive material having an axis and a multiplicity of annular projections with continuous peripheries of circular outline in projection on a plane perpendicular to said axis, the periphery of each projection having at least two points of maximum excursion angularly offset from one another about said axis and lying on opposite sides of a median plane therebetween perpendicular to said axis, the periphery of each projection undergoing axial excursion with respect to the carpet upon rotation of said body about said axis, said projections having oppositely facing cheeks lying at right angles to said axis and defining annular grooves between said projections, said projections being angularly offset from one another along the length of the roller with the maximum excursion points of successive projections being angularly offset from each other so that the net axial reaction force

on said roller when said roller is rotated in contact with the pile of a carpet because of opposite deflection of said pile is zero.

**4,159,556**  
**SUSPENSION SYSTEM PRIMARILY DESIGNED FOR USE WITH OPERABLE WALLS AND PARTITIONS**  
 Wesley B. Dickson, Brea, Calif., assignor to Advanced Equipment Corporation, Anaheim, Calif.  
 Filed May 30, 1978, Ser. No. 910,605  
 Int. Cl.<sup>2</sup> A47H 13/00  
 U.S. Cl. 16-87.4 R



1. A suspension system including an elongated track system having a junction between individual tracks and a trolley supported by said track system, said trolley being movable along the length of said tracks and from one track to another at said junction in which the improvement comprises:  
 said trolley including a first plate, a second plate, connecting means connecting said plates so as to position said plates so that they are parallel to and spaced from one another, and a plurality of downwardly extending spherical bearings mounted on the undersurface of said first plate, each of said tracks including two normally used flanges located in the same plane and holding means connecting said normally used flanges for holding said flanges so that they are spaced apart to define a slot extending between said flanges and so that said flanges are parallel and in the same plane, said flanges of all of said tracks being located in the same plane, at least one of said downwardly extending spherical bearings resting on each of said flanges of one of said tracks with the connecting means extending through said slot of said one of said tracks when said trolley is not located at said junction, an upwardly extending spherical bearing located adjacent to each of said flanges of each of said tracks adjacent to said junction, and mounting means connecting said upwardly extending spherical bearings with said tracks in positions in which said upwardly extending spherical bearings will engage said second plate so as to support said trolley as said trolley is moved across said junction.

**4,159,557**  
**CABINET HINGE**  
 Willi Pittasch, and Johannes Dalbert, both of Herford, Fed. Rep. of Germany, assignors to Firma Richard Heinze, Westfalen, Fed. Rep. of Germany  
 Filed Oct. 20, 1977, Ser. No. 844,118  
 Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647776; Oct. 23, 1976, 2648095  
 Int. Cl.<sup>2</sup> E05D 5/02, 7/04  
 U.S. Cl. 16-129

1. A hinge for articulated connection of two furniture components, said hinge comprising first and second hinge parts,

This diagram shows an exploded view of a mechanical assembly. The components are numbered as follows: 1 (a small circular part), 2 (a rectangular block), 3 (a small circular part), 4 (a small circular part), 5 (a small circular part), 6 (a small circular part), 7 (a small circular part), 8 (a small circular part), 9 (a small circular part), 10 (a long cylindrical rod), 11 (a small circular part), 12 (a small circular part), 13 (a small circular part), 14 (a small circular part), 15 (a small circular part), 16 (a small circular part), 17 (a small circular part), 18 (a small circular part), 19 (a small circular part), 20 (a small circular part), 21 (a small circular part), 22 (a small circular part), 23 (a small circular part), 24 (a small circular part), 25 (a small circular part), 26 (a small circular part), 27 (a small circular part), 28 (a small circular part), 29 (a small circular part), 30 (a small circular part), 31 (a small circular part), 32 (a small circular part), 33 (a small circular part), 34 (a small circular part), 35 (a small circular part), 36 (a small circular part), 37 (a small circular part), 38 (a small circular part), 39 (a small circular part), 40 (a small circular part), 41 (a small circular part), 42 (a small circular part), 43 (a small circular part), 44 (a small circular part), 45 (a small circular part), 46 (a small circular part), 47 (a small circular part), 48 (a small circular part), 49 (a small circular part), 50 (a small circular part).

Technical drawing of a mechanical device, likely a pump or engine component, showing a cross-section and a side view. The cross-section view (top) shows a central shaft (1) with a piston (2) and a connecting rod (3). The piston is connected to a crankshaft (4) which is part of a larger mechanism (5). The side view (bottom) shows the device mounted on a base (6) with a flywheel (7) and a crankshaft (8). Various components are labeled with numbers 1 through 34.

A schematic diagram of a magnetic field measurement system. On the left, a rectangular circuit is shown with a circle containing a tilde symbol (~) representing an AC power source. This circuit is connected to a central horizontal assembly. The assembly consists of a central sample, labeled 1, which is flanked by two vertical magnetic poles, labeled 10 on the left and 14 on the right. The sample 1 is positioned between two horizontal layers, labeled 13 on top and 14 on the bottom. Arrows indicate the direction of the magnetic field lines, which are directed vertically through the sample and poles.

(c) ion implanting selected conductivity modifiers through said selected isolated silicon gates, through the underlying gate insulator and into the channel region of the selected IGFETs, thereby modifying the threshold voltage characteristics of said selected IGFETs.

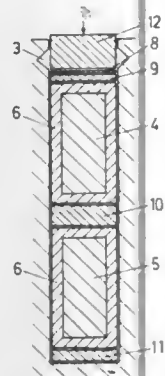


**4,159,562**  
**METHOD FOR SECURING WINDING COMPONENTS IN THE SLOT OF A ROTARY ELECTRIC MACHINE**  
 Gabor Liptak, Baden, and Roland Schuler, Wetztingen, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 12, 1977, Ser. No. 841,474  
 Claims priority, application Switzerland, Nov. 17, 1976, 14458/76

U.S. Cl. 29—596

Int. Cl.<sup>2</sup> H02K 15/06



1. The method of securing insulated winding components in the slots of a rotary electrical machine against displacement which includes the steps of substantially filling the slot with the insulated winding components, there being included in the slot at least one deformable and heat-hardenable insert in contact with an adjoining side of one of the winding components, subjecting the winding components and non-hardened insert to pressure applied at the entrance of the slot thereby to effect a deformation thereof to match any tolerance irregularity in the profile of the adjacent surface of the winding component, heating the insert while under pressure to harden the same, and closing off the entrance to the slot by means of a wedge after completion of the insert hardening operation.

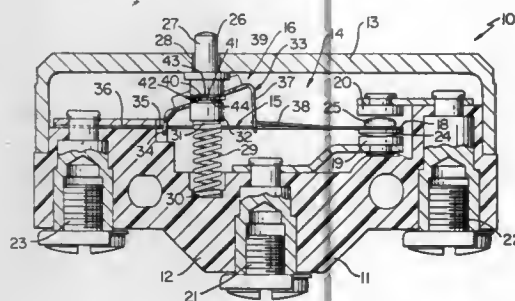
**4,159,563**  
**ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME**

Werner R. Bauer, Radnor, and William N. Smith, Hatboro, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 707,635, Jul. 22, 1976, Pat. No. 4,109,121. This application Feb. 9, 1978, Ser. No. 876,479

U.S. Cl. 29—622

Int. Cl.<sup>2</sup> H01H 11/00



1. A method of making an electrical switch construction comprising the steps of forming a housing means to carry a pair of spaced contact stops and a snap switch blade having a contact portion for being snapped between said stops when said blade is moved overcenter, forming a movable actuator means to be carried by said housing means for moving said blade overcenter in one direction when said actuator means is

moved in one direction thereof and for moving said blade overcenter in the opposite direction when said actuator means is moved in the opposite direction thereof, forming said actuator means with an adjustable means for adjusting the movement differential of said actuator means without adjusting the air gap between said control stops, forming part of said actuator means with an actuator plunger, forming part of said actuator means with an actuator spring that is moved by movement of said actuator plunger, operatively interconnecting said actuator spring to said blade to move said blade as said actuator spring is moved, and forming said adjustable means of said actuator means with an adjustable gap in said actuator plunger that defines a pair of spaced shoulders on said actuator plunger that are adapted to respectively engage said actuator spring.

21 Claims

**4,159,564**  
**MANDREL FOR HYDRAULICALLY EXPANDING A TUBE INTO ENGAGEMENT WITH A TUBESHEET**  
 Frank W. Cooper, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,532

U.S. Cl. 29—727

Int. Cl.<sup>2</sup> B23P 15/26

18 Claims



1. A mandrel for hydraulically expanding a tube into engagement with a hole in a tubesheet, said mandrel comprising: a body portion covered with an electrically isolating material and having a leading and a trailing end; said body portion having an elongated circumferential groove disposed in each of said ends; an elastomer sealing member disposed in each of said grooves; an elastomer back-up member disposed in each of said grooves outboard of said sealing members; and means disposed in said trailing end for introducing pressurized fluid between said grooves whereby the pressurized fluid hydraulically expands that portion of the tube between the seals into engagement with the tubesheet.

**4,159,565**  
**COVER AND STRAIN RELIEF APPLICATOR APPARATUS**

Glendon H. Schwalm, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 8, 1978, Ser. No. 904,082

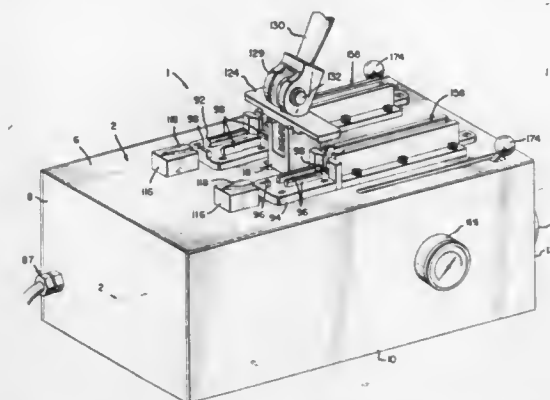
U.S. Cl. 29—759

Int. Cl.<sup>2</sup> H01R 43/00

2 Claims

1. Apparatus for assembling a cover and strain relief clip to a multiconductor cable having the individual conductors thereof terminated with a multicontact connector, comprising:

a housing,  
 a work station on said housing,  
 a magazine on said housing for supplying serially a plurality of strain relief clips to said work station,  
 a ram internally of said housing and reciprocating from said housing to said work station,  
 a support tower from the floor of said housing to said work station and supporting said ram,  
 a fixture on said housing for positioning a multicontact connector at said work station,



a boss projecting from said housing and in alignment with said fixture for aligning and slidably guiding a cover first along said boss and then a slidable assembly on said connector,  
 said tower extending outwardly of said housing beyond said work station and supporting a pressure platen,  
 first means on said tower for actuating said platen toward a work station to clamp a multicontact connector in position at said work station, and  
 second means for slidably actuating said ram to engage and insert a clip into a cover positioned and clamped at said work station together with said connector.

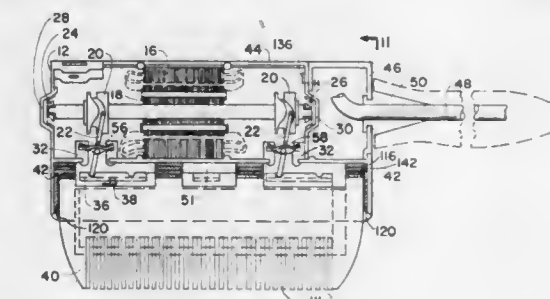
**4,159,566**  
**ELECTRIC RAZORCOMB**  
 Raymond A. Patrin, GPO Box 731, New York, N.Y. 10001

Filed Apr. 5, 1976, Ser. No. 673,817

U.S. Cl. 30—30

Int. Cl.<sup>2</sup> B26B 21/12

12 Claims



1. An electric razorcomb, comprising:  
 a housing,  
 a comb removeably secured in the slot of the housing,  
 a slot formed in an inner portion of the comb,  
 a razor mounted in the slot of the comb, said comb secured by magnetic means in the housing and  
 means attached to the housing and connected to the razor to move the razor within the slot in the comb, whereby the razor comb may cut hair from an individual.

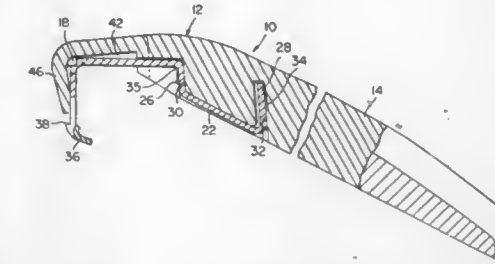
**4,159,567**  
**SHAVING INSTRUMENT**  
 Evan N. Chen, Fairfield, and Peter Bowman, Sandy Hook, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 1, 1977, Ser. No. 820,503

U.S. Cl. 30—62

Int. Cl.<sup>2</sup> B26B 21/24

9 Claims



1. An injector razor comprising:  
 a molded main frame having a handle;  
 an integral resilient blade seat having a tail section secured to said main frame and a pivotable blade rest portion for selectively receiving and clamping a shaving blade against said main frame, said main frame being recessed and said tail section including a pair of laterally oppositely extending lugs adjacent said pivotable blade rest portion, said lugs being set into slots provided in said recessed under portion of said main frame and establishing along a line extending therebetween, a position about which said blade rest portion of said blade seat may be pivoted for receiving and clamping said blade against said main frame.

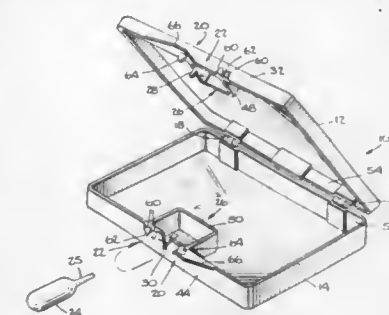
**4,159,568**  
**CAPSULE BOX**  
 Howard E. Berner, Summit, N.J., assignor to Pharmcaps, Inc., Elizabeth, N.J.

Filed Feb. 22, 1978, Ser. No. 879,858

U.S. Cl. 30—124

Int. Cl.<sup>2</sup> B25F 3/00

11 Claims



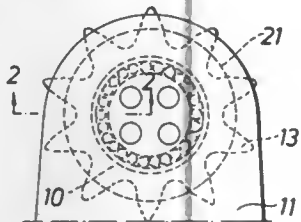
1. A container for holding elastic capsules and the like comprising a lower container portion and an upper container portion hingedly connected thereto, said container portions forming a first enclosure when hinged closed, a first cutting member secured to one of said upper and lower container portions and a second cutting member secured to the other of said upper and lower container portions, said cutting members having cooperating cutting surfaces which are adapted to cut an elastic capsule upon closure of said container portions and sever the elastic capsule into two parts, said cutting members including engaging means adapted to engage the elastic capsule during cutting to facilitate cutting and severing of the elastic capsule.

4,159,569

## CHAIN SAW GUIDE BAR

Erik W. Sundstrom, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden  
Continuation of Ser. No. 725,122, Sep. 20, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,605  
Int. Cl.<sup>2</sup> B23D 57/02

U.S. Cl. 30—384



3 Claims

1. In a chain saw of the type comprising a guide bar around which a saw chain is to travel, said guide bar including a pair of spaced side plates defining a nose portion at one end of said guide bar, and rotary support means mounted in said nose portion between said side plates for supporting the saw chain during travel around said nose portion, said rotary support means comprising:

- a bearing center fastened to and between said side plates, cylindrical roller bearing means disposed around an outer periphery of said bearing center,
- a sprocket wheel journaled on said bearing means, and
- a pair of flange plates attached to said bearing center and extending radially outwardly a distance sufficient to surround said bearing center, said bearing means, and an inner portion of said sprocket wheel so that said sprocket wheel, cylindrical roller bearing means, bearing center, and flange plates form a unit for removal from and insertion into said nose portion, the spacing between said flange plates being greater than the thickness of said sprocket wheel disposed therebetween to avoid interference with rotation of the sprocket wheel.

4,159,570

## DISPOSABLE MIXING SYRINGE

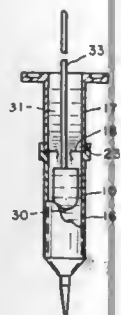
Morris J. Baskas, New Rochelle, and Sidney I. Berger, New York, both of N.Y., assignors to Dentipressions Incorporated, New York, N.Y.

Filed Oct. 31, 1977, Ser. No. 847,270

Int. Cl.<sup>2</sup> A61C 7/00; A61M 5/00; B65D 25/08

U.S. Cl. 32—66

13 Claims



1. A disposable syringe and mixing assembly comprising a syringe barrel of uniform inside diameter having an exiting orifice at one end and an opening at the opposite end, a diaphragm seated within said barrel and separating the interior of the barrel into a lower chamber at said one end and an upper chamber at the opposite end, a first component of a mixture to be formed within the lower chamber, a second component of the mixture to be formed within the upper chamber, said diaphragm being constituted wholly of thin flexible foil sheet

material that is readily punctured but without fracturing into separate pieces, said barrel being divided into upper and lower parts joined at said diaphragm location, one of said barrel parts having at the junction an annular groove, the other of said barrel parts having at the junction an annular projecting tongue fitted within and mating with said annular groove, said foil sheet being seated between the tongue and groove and being mechanically locked thereby into position within the barrel, and a removable closure at said opposite end of the barrel, removal of the closure allowing insertion of a mixing tool for puncturing of the diaphragm and mixing of the two components within the syringe barrel.

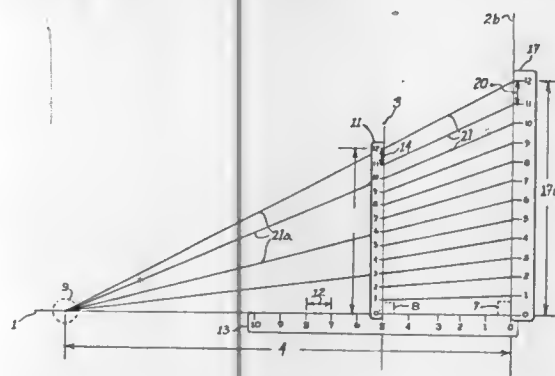
4,159,571

## GEOMETRICAL INSTRUMENT

John H. Jervis, Jr., 48 Cliff Rd., West Milford, N.J. 07480  
Filed Dec. 30, 1977, Ser. No. 865,842  
Int. Cl.<sup>2</sup> B43L 13/14

U.S. Cl. 33—403

1 Claim



1. A measuring device used to construct an accurate perspective drawing with as many vanishing points and from any viewpoint deemed necessary, without the actual use of vanishing points, said device having two scales thereon adjacent marginal edge portions thereof, the first being a height scale marked off in the same number of units similar to, but proportionately smaller than, a standard ruler or architect's scale used to graduate a centerline arranged perpendicular to a horizon line, said height scale having a total length which is a predetermined length shorter than the total length of the standard ruler, and the second being a distance scale marked off in units equal to the difference in length between the height scale and the total length of the standard ruler or architect's scale, whereby the height scale is used to calibrate a vertical line parallel to the centerline with the vertical line placed to the side of the centerline a distance determined by the distance scale and where lines drawn between similar points on the centerline and vertical line will intersect the horizon line at a point whose distance from the centerline is equal to the space between the vertical line and the centerline in distance scale units times the total length of the scale or ruler used to graduate the centerline.

4,159,572

## DYNAMIC GAGE AVERAGING AND LENGTH DETERMINING DEVICE AND METHOD FOR CONTINUOUS SHEET MATERIAL

James A. Nunes, Martinez, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 2, 1977, Ser. No. 847,880

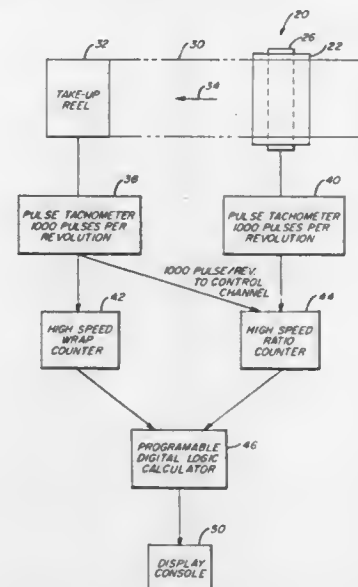
Int. Cl.<sup>2</sup> G01B 7/04; B21B 37/02

U.S. Cl. 33—142

11 Claims

1. A dynamic gage averaging apparatus for use in conjunction with continuous sheet material passing about a first rotatable roller of a known diameter to be subsequently wound upon a take-up reel, said gage averaging apparatus including: means for measuring take-up reel angular velocity;

means for measuring the first roller angular velocity, said first roller's angular velocity being equal to the linear velocity of the sheet material being passed thereabout; means for comparing the first roller velocity to the take-up reel velocity to determine a ratio therebetween for a given time period;



means for measuring number of revolutions of the take-up reel for said given time period; and means for automatically factoring the change in diameter of the coil on the take-up reel for said given time period by twice the number of revolutions of the take-up reel for obtaining the average gage of the product wound upon the take-up reel during said given period of time.

4,159,573

## APPARATUS FOR MANUFACTURING THE PARTS OF ROTARY VESSELS

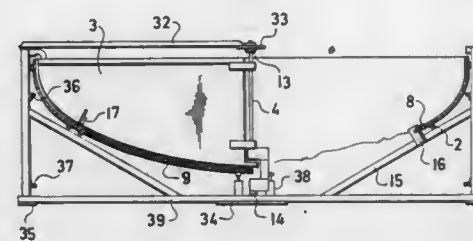
Karel Plihal, Brno, Czechoslovakia, assignor to Prvni Brnenska strojirna, narodni podnik, Brno, Czechoslovakia  
Filed Mar. 29, 1978, Ser. No. 891,348

Claims priority, application Czechoslovakia, Mar. 31, 1977, 2136-77

Int. Cl.<sup>2</sup> G01B 3/14, 5/20; B23Q 3/00

U.S. Cl. 33—174 G

3 Claims



1. An apparatus for manufacturing parts for cylindrical vessels comprising a supporting structure provided with adjustable bearings and stop elements for positioning preformed curved sections of sheet material, a template defining a profile corresponding to the desired shape of a portion of the cylindrical vessel pivotably and removably mounted on said structure by means of an axle, the angular positions of said template in relation to the supporting structure being adjustable by means of angular position indexing means carried by said supporting structure and said template.

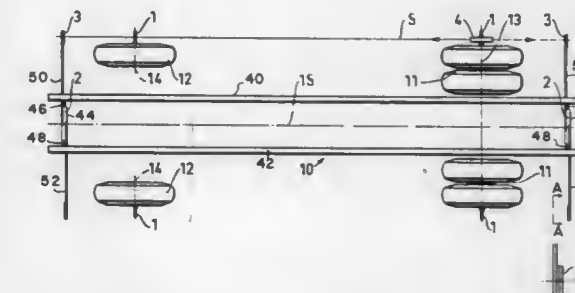
4,159,574

## METHOD OF MEASURING THE ANGULAR POSITION OF THE AXIS OF ROTATION OF A WHEEL

Erik Samuelsson, 6 Nygatan, Rättvik, Sweden (79500), and Jonas Samuelsson, 15 Syrénvägen, Örebro, Sweden (70220)  
Continuation of Ser. No. 691,440, Jun. 1, 1976, abandoned, which is a continuation of Ser. No. 530,426, Dec. 6, 1974, abandoned. This application Mar. 21, 1978, Ser. No. 888,616  
Claims priority, application Sweden, Dec. 7, 1973, 7316572  
Int. Cl.<sup>2</sup> G01B 11/275

U.S. Cl. 33—228

6 Claims



1. A method for measuring the angular position of a fixed axis of rotation of a wheel of a wheeled vehicle in relation to the longitudinal axis of such vehicle, which comprises:

- determining the longitudinal axis of the vehicle;
- determining the true axis of rotation of the wheel;
- arranging a sight line across an extension of said axis of rotation so that the sight line and the axis of rotation form a right angle between each other, said sight line being placed substantially in a plane in common with said longitudinal axis of said vehicle;
- establishing a first reference scale an arbitrary distance from said axis of rotation having a zero point a predetermined distance from said longitudinal axis;
- establishing a second reference scale at another distance from said axis of rotation and having a zero point at the same predetermined distance from said longitudinal axis;
- determining the amount the optical extension of said sight line varies from said zero point on said first scale;
- determining the amount the optical extension of said sight line varies from said zero point on said second scale; and
- comparing said first scale zero-point variant to said second scale zero-point variant to determine the angular position of said fixed axis of rotation with respect to said vehicle longitudinal axis.

6. A method for measuring the angular position of a fixed axis of rotation of a wheel of a wheeled vehicle in relation to the longitudinal axis of such vehicle, which comprises:

- determining the axis of rotation of the wheel;
- establishing a sight line across an extension of said axis of rotation and extending in parallel with said longitudinal axis of said vehicle, said sight line being produced by an optical device arranged in front of said vehicle;
- mounting a mirror parallel to said axis of rotation in a plane perpendicular to said sight line so that said sight line will be reflected;
- determining the direction of said reflected sight line; and
- determining the difference between the incident and reflected sight line.

4,159,575

## SIGHTING DEVICE FOR ARCHERY BOWS

Philip Kalmbach, 921 Sixth Ave. N.E., Minot, N. Dak. 58701  
Filed Jun. 5, 1978, Ser. No. 912,411  
Int. Cl.<sup>2</sup> F41G 1/46, 1/08

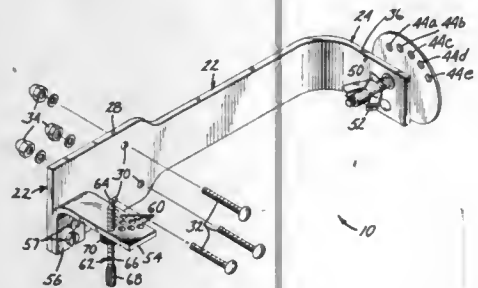
U.S. Cl. 33—265

9 Claims

1. A sighting device for archery bows comprising an elongated body adapted to be attached intermediate its ends to one side of a bow, first and second arms extending laterally from

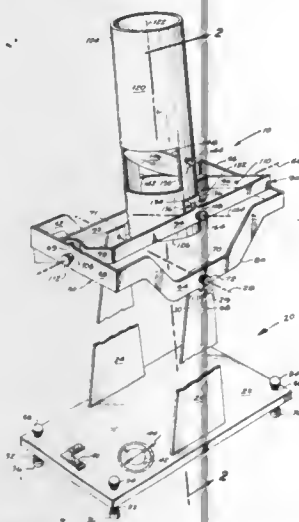


the opposite ends of said body, first sighting means carried on said first arm including a member having a sight opening therein, and second sighting means carried on said second arm



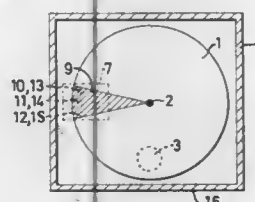
including a sighting pin, said member constituting a disc mounted on said first arm for rotation about an axis provided by said first arm.

**4,159,576**  
**RADIATION SHADOW INDICATOR**  
Richard A. Campbell, 1302 Toney Dr., Huntsville, Ala. 35802  
Continuation of Ser. No. 778,311, Mar. 16, 1977, abandoned.  
This application Oct. 31, 1978, Ser. No. 956,167  
Int. Cl.<sup>2</sup> G01C 1/00; G02B 21/24, 23/16  
U.S. Cl. 33—281 7 Claims



1. A portable instrument for establishing a period of time during which a terrestrial object adjacent a selected terrestrial location will occlude a celestial source of radiation comprising:
  - (a) a base positionable at said selected location;
  - (b) a first member selectively pivotal on the base about a latitude axis and having an azimuth axis perpendicular to the latitude axis;
  - (c) a second member selectively pivotal on the first member about the azimuth axis and having a declination axis perpendicular to and intersecting the azimuth axis;
  - (d) a sight tube selectively pivotal on the second member about the declination axis, the sight tube having an optic axis perpendicular to the declination axis and passing through a point at which the declination axis intersects the azimuth axis; and
  - (e) means on the base for positioning the latitude axis such that the first member can be rotated on the base about the latitude axis to a selected position at which the azimuth axis is aligned with the terrestrial axis of rotation.

**4,159,577**  
**DEVICE FOR INDICATING A HORIZONTAL DIRECTION AND ONE OR MORE ANGLE SECTORS ABOUT SAID DIRECTION**  
Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden  
Filed Dec. 13, 1977, Ser. No. 860,046  
Claims priority, application Sweden, Dec. 14, 1976, 7614074  
Int. Cl.<sup>2</sup> G01C 9/06  
U.S. Cl. 33—366 6 Claims

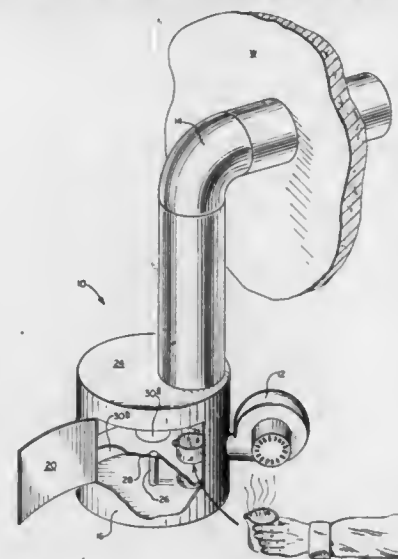


1. A device for indicating both a horizontal direction and at least one angle sector about said direction, said device comprising a housing, a disc rotatably mounted with said housing surrounded by same and means on the disc offsetting the center of gravity of said disc relative to the axial center of rotation thereof, said disc including a substantially sector-shaped area having a light-transmissivity different from the remainder of said disc, reading means including plural light sources and light-sensitive elements arranged in source-receiver pairs with the disc passing between each source and respective receiver and said source-receiver pairs responsive to change in light-transmissivity for indicating the position of said disc relative to the orientation of said housing, said sector-shaped area being movable with the rotation of said disc between at least two conditions, the first of said conditions occurring where all the source-receiver pairs are covered by said sector-shaped area when the orientation of the housing indicates a first horizontal direction, the second of said conditions occurring when said housing is differently oriented whereby to rotate said disc angularly a given degree, said sector-shaped area of said disc being moved with said rotation uncovering at least one of said source-receiver pairs whereby to indicate an angle sector along said horizontal direction but within said area yet other than assumed at said first condition, said disc being capable of being rotated with change of orientation of said housing whereby to expose all of said source-receiver pairs when the degree of rotation is greater than said angle sector represented by said area.

**4,159,578**  
**DRYING OVEN**  
Ronald D. Walton, 5480 Dickens Dr., Baton Rouge, La. 70812  
Filed Nov. 21, 1977, Ser. No. 853,579  
Int. Cl.<sup>2</sup> F26B 11/02  
U.S. Cl. 34—344 3 Claims

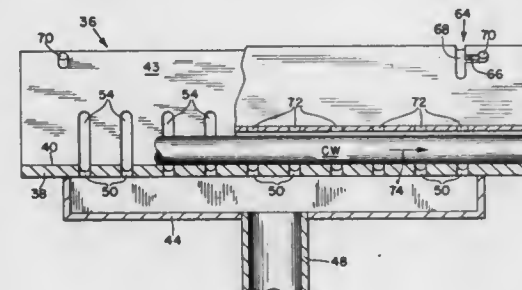
1. An apparatus for drying material which apparatus comprises:
  - a. a drying chamber which includes,
    - i. a circular planar top wall having an eccentric exhaust port,
    - ii. an annular sidewall downwardly depending from said top wall, said annular sidewall having an intake port radially located at a point beneath said exhaust port and said annular sidewall having an openable and closeable doorway for introducing said material to said drying chamber, and
    - iii. a circular, planar bottom wall closing off the bottom of said annular sidewall;
  - b. holding means enclosed within said drying chamber holding said material at a level adjacent said intake port;

- c. a blower for heating and introducing dry gas to the interior of said drying chamber through said intake port; and



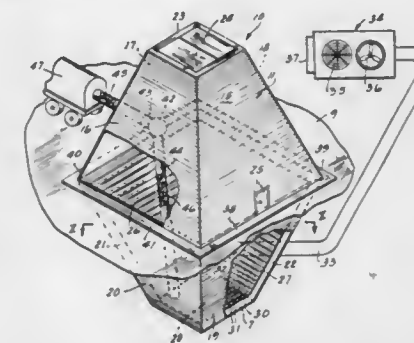
- d. conduit means for routing exhaust gas from said drying chamber through said exhaust port to a disposal site.

**4,159,579**  
**STRAND DRYING APPARATUS**  
David C. Hoddinott, Preston, and Edwin L. Jette, Jr., Mystic, both of Conn., assignors to Crompton & Knowles Corporation, New York, N.Y.  
Filed Apr. 11, 1978, Ser. No. 895,313  
Int. Cl.<sup>2</sup> F26B 13/02  
U.S. Cl. 34—155 8 Claims



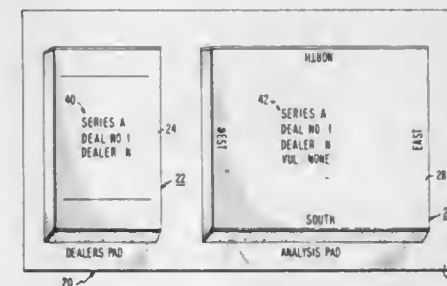
1. Apparatus for drying a wet continuous strand which is being advanced along its longitudinal axis comprising:
  - (a) an elongated trough member having a bottom and two surfaces extending upwardly from the base at an angle of less than 90° from the horizontal plane which passes through the base,
  - (b) a plenum chamber beneath the trough member,
  - (c) means for creating subatmospheric pressure in the plenum chamber, and
  - (d) a plurality of openings extending through the trough member substantially at the base and into the plenum chamber and at least one groove in at least one of said upwardly extending surfaces for each opening which extends beyond the point at which said surface is substantially tangent with a strand passing through said trough, whereby air is drawn about said wet strand and through said grooves and said openings into said plenum chamber to dry said strand.

**4,159,580**  
**GRAIN DRYING BIN**  
Richard Welch, Jr., 2016 W. Division, Grand Island, Nebr. 68801  
Filed Nov. 25, 1977, Ser. No. 854,599  
Int. Cl.<sup>2</sup> F26B 17/12  
U.S. Cl. 34—168 5 Claims



5. A grain drying bin for rapid drying of stored grains and having a simplified structural supporting system, comprising:
  - (a) an upper truncated pyramidal shaped housing section having at least three inwardly sloping planar side walls and a horizontal roof portion with a grain entry way;
  - (b) a lower inverted truncated pyramidal shaped housing section having the same number of planar inwardly sloping side walls as the upper housing section, ends of side walls of the bottom section joining directly to ends of side walls of the upper section, a lower horizontal floor portion also being provided;
  - (c) ventilation panels mounted in the lower housing section substantially parallel to and at a predetermined spacing from the side walls and floor portion; and
  - (d) a hot gas inlet aperture connected to the lower housing section to channel hot gas into spaces between the side walls and the ventilation panels.

**4,159,581**  
**DEVICE FOR INSTRUCTION IN THE GAME OF BRIDGE AND METHOD OF AND DEVICE FOR DEALING PREDETERMINED BRIDGE HANDS**  
Edward Lichtenberg, 615 Kings Hwy., Moorestown, N.J. 08057  
Filed Aug. 22, 1977, Ser. No. 826,774  
Int. Cl.<sup>2</sup> G09B 19/22; A63F 1/00  
U.S. Cl. 35—8 B 9 Claims

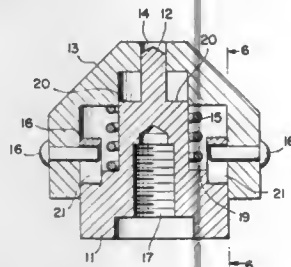


1. A device for use in the game of bridge comprising:
  - a plurality of first chart sheets each associated with a deal of bridge and supplying chart information for controlling the dealing of predetermined hands of cards to the four players of a bridge game without the players identifying the cards in the hands dealt to other players;
  - a plurality of second chart sheets individually associated with said first chart sheets, each for supplying the players with results of the deal corresponding to the associated first chart;



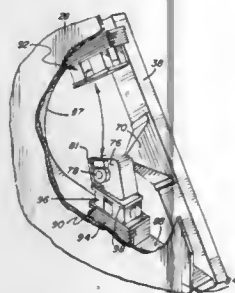
said first chart sheets including a first section for directing a cut of a pre-sorted deck of cards, a second section for directing the dealing of the cut deck into four identifiable hands of the deal, and a third section directing the distribution of the dealt hands to the four players in accordance with their positions around a bridge table.

**4,159,582**  
**GRIPPER ELEMENT FOR SPORTS SHOES**  
Eugene J. Ostrowski, 1088 Manor La., Bayshore, N.Y. 11706  
Filed Jul. 10, 1978, Ser. No. 923,475  
Int. Cl.<sup>2</sup> A43C 15/00; A43B 5/00  
U.S. Cl. 36—67 D 9 Claims



1. A non-slip gripper element for sports shoes, such as a shoe for use on artificial turf, comprising:
  - a. A base member adapted for securing to the outsole of a sports shoe, and having a spike projecting axially therefrom;
  - b. A cover, having an axial bore, slideably mounted on said spike;
  - c. Resilient means housed within the cover, for urging the cover away from the base member; and
  - d. Means for limiting the axial movement of the cover.

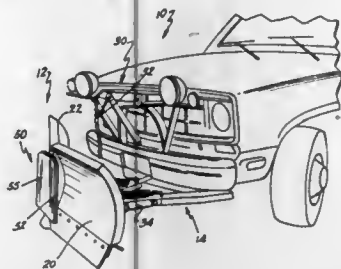
**4,159,583**  
**ELEVATING SCRAPER UP-STOP MECHANISM**  
William J. Black, Wilmington; Warner G. Richardson, and Eugene M. Wilson, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.  
Filed Jul. 18, 1977, Ser. No. 816,831  
Int. Cl.<sup>2</sup> E02F 1/36  
U.S. Cl. 37—8 3 Claims



1. In a self-loading scraper having a bowl with a cutting blade at the forward end thereof, an elevator having a frame, a linkage assembly carried by said frame and being pivotally mounted about a fixed pivot on the inside of said bowl for positioning the lower portion of the elevator relative to said blade, said linkage assembly being such that the lower portion of the elevator will move upwardly and forwardly relative to said blade and the upper portion of the elevator will move upwardly and rearwardly relative to said bowl, laterally projecting stop means carried by an upper intermediate portion of the frame of said elevator, and vertically spaced apart, fixed stop means carried by said bowl, said laterally projecting stop means moving between said vertically spaced, fixed stop means for limiting upward and downward movement of said elevator relative to said bowl, said laterally projecting stop

means is carried by a bracket on the frame of the elevator and comprises a block having planar contact faces for contacting a stop plate on each of said fixed stop means.

**4,159,584**  
**PUSH BUMPER**  
W. Wally Niemela, Box 145E, Chassell, Mich. 49916  
Filed May 2, 1977, Ser. No. 793,085  
Int. Cl.<sup>2</sup> E01H 5/04  
U.S. Cl. 37—44 10 Claims



1. A push bumper attachment to a conventional snow plow for use in pushing vehicles, said attachment comprising:
  - a support member attachable to the front of the snow plow and extending outwardly therefrom;
  - a rigid push plate; and
  - means for hingedly securing said push plate to said support member and for permitting said push plate to pivot about a generally vertical axis so as to pivot with and follow the vehicle being pushed, said means for hingedly securing said push plate to said support member including:
    - a first knuckle carried by said support member;
    - a second knuckle carried at the rear face of said push plate at the vertical centerline of said push plate;
    - a third knuckle carried at the rear face of said push plate in vertically spaced, coaxial alignment with said knuckles;
    - a manually removable hinge pin extending through said first, said second and said third knuckles;
    - a fourth knuckle secured to the rear face of said push plate in vertically spaced, coaxial alignment with said second and said third knuckles; and
    - a fifth knuckle carried by said support member in vertically spaced, coaxial alignment with said first knuckle, said hinge pin extending through said fourth and said fifth knuckles, said fourth knuckle being positioned below said fifth knuckle when said hinge pin extends therethrough, said support member dimensioned to position said hinge means outwardly and spaced from the snow plow to allow pivoting of said push plate.

**4,159,585**  
**ROTARY TRENCHER AND SHOE ASSEMBLY THEREFOR**  
Stanley L. Brown, Lenox, Iowa, assignor to Roscoe Brown Corporation, Lenox, Iowa  
Division of Ser. No. 772,558, Feb. 28, 1977, Pat. No. 4,110,920.  
This application Jan. 16, 1978, Ser. No. 869,453  
Int. Cl.<sup>2</sup> E02F 5/08  
U.S. Cl. 37—97 4 Claims

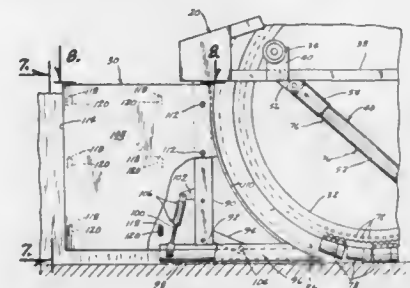
1. A trench excavating device comprising:
  - a support frame having forward and rearward ends;
  - a movable member having a continuous outer peripheral edge;
  - mounting means movably mounting said movable member to said frame for causing said outer peripheral edge to move in a continuous enclosed path;
  - power means for causing movement of said peripheral edge in said continuous path;
  - elevating means connected to said frame for causing raising

and lowering of said movable member with respect to the ground;

a plurality of excavating members connected around said peripheral edge of said movable member for engaging said ground to excavate a trench therein;

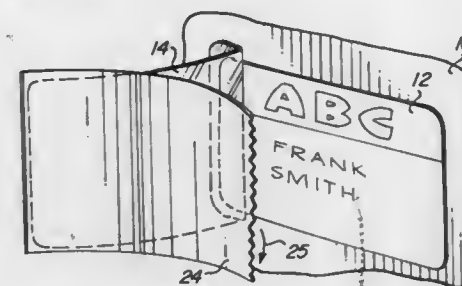
wheels rotatably supporting said frame for movement in a forward direction during excavation of said trench;

a shoe assembly mounted to said frame and positioned rearwardly of said movable member, said shoe assembly comprising a vertical shoe post rigidly connected to said support frame;



- a pair of spaced apart shoe casing plates having forward ends fixed to said shoe post and having rearward ends trailing rearwardly therefrom in spaced relation;
- said rearward ends of said shoe casing plates being sufficiently flexible to be laterally displaceable with respect to said forward ends when a curved trench is cut by said excavating members;
- a plurality of cross members interconnecting said spaced apart casing plates rearwardly of said shoe post, each of said cross members being hingeably mounted at its opposite ends to said plates for hinged movement about a vertical axis.

**4,159,586**  
**MULTILAYERED LABELING SYSTEM**  
Julian J. Blum, 7211 N. 3rd St., Phoenix, Ariz. 85020  
Filed Sep. 15, 1977, Ser. No. 833,474  
Int. Cl.<sup>2</sup> A44C 3/00  
U.S. Cl. 40—2 R 4 Claims

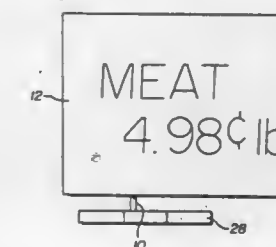


1. A multilayered labeling system comprising:
  - (a) a label having an information surface and a back surface, said back surface having a pressure-sensitive adhesive thereon;
  - (b) a removable backing sheet releasably contacting the pressure-sensitive adhesive on the back surface of said label, said backing sheet extending beyond said label along one edge of said label;
  - (c) a transparent cover sheet having an inside and an outside surface, and having a pressure-sensitive adhesive on said inside surface facing the information surface of said label, said transparent cover sheet extending beyond said label with the pressure-sensitive adhesive on the inside surface thereof releasably contacting said removable backing sheet along said one edge of said label, said transparent

cover sheet also contacting the information surface of said label along said one edge; and

(d) a removable separator sheet releasably contacting the pressure-sensitive adhesive on the inside surface of said transparent cover sheet.

**4,159,587**  
**WEIGHTED PRICER**  
Robert J. Slavsky, Southfield, Mich., assignor to Shaw & Slavsky, Inc., Detroit, Mich.  
Filed Jul. 11, 1977, Ser. No. 814,443  
Int. Cl.<sup>2</sup> G09F 3/14  
U.S. Cl. 40—11 A 2 Claims

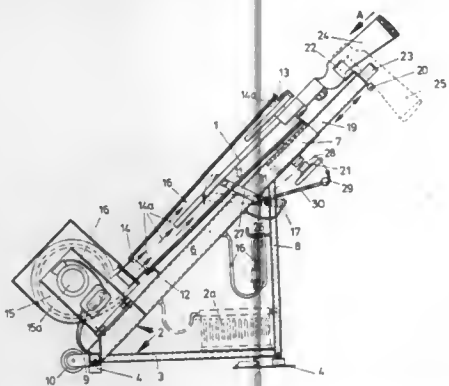


1. A weighted pricer comprising a wire support; a price tag or similar article secured to an upper end of the wire support to be supported by it; and a weight secured to a lower end of the support for supporting the pricer and the article upon a food item whose price is to be displayed;
- said support comprising a piece of wire whose upper end is curled and is bent roughly M-shaped in one plane to provide three locations for rivets to secure the support to the price tag occupying the same plane;
- said wire also having its lower end bent transversely from the remainder of the support, so as to occupy a transverse plane, and having its lower end curled to provide a location for a rivet to secure the lower end to a sheet like weight;
- said weight comprising a thin piece of heavy pliable lead-like material riveted to the lower end of the wire;
- said weight being sufficiently pliable so as to be easily bent to conform to a contoured surface of the food item;
- said weight being sufficiently heavy to maintain the pricer in a stable position on said food item; and
- the lower end of said support, including said weight, are coated with a heavy, plastic, sanitary coating.

**4,159,588**  
**APPARATUS FOR SUPPORTING SPORTING GUNS DURING TESTING INTERVALS**  
Hans W. Pfeiffer, Am Eisenwerk, Plettenberg, Fed. Rep. of Germany  
Filed Jul. 27, 1977, Ser. No. 819,616  
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637368  
Int. Cl.<sup>2</sup> F41C 29/00; A47F 7/00  
U.S. Cl. 42—90 9 Claims

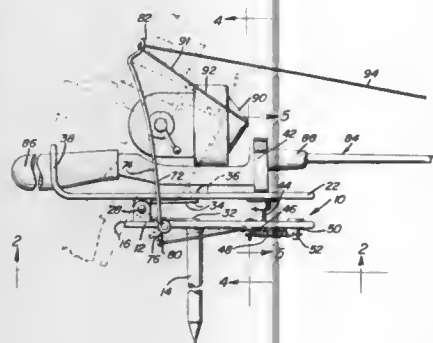
1. An apparatus for supporting sporting guns having a gun barrel following test-firing intervals to effect a cooling of said gun barrel, comprising a frame and support means for supporting said sporting gun, said frame including a conduit extending

in an inclined relationship to the ground for receiving at least said gun barrel and means for effecting a conducting of a



gaseous cooling medium through said conduit and around said gun barrel to effect a cooling thereof.

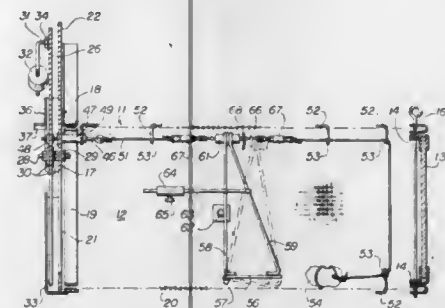
**4,159,589**  
**AUTOMATIC HOOK SETTER**  
Alfred E. Pendegraft, Box #1, Main St., Summerfield, Ill. 62289  
Filed Nov. 29, 1977, Ser. No. 855,911  
Int. Cl.<sup>2</sup> A01K 97/12  
U.S. Cl. 43—15 2 Claims



1. An automatic hook setter including an elongated horizontal base having first and second ends, an elongated horizontal mount having first and second ends, said mount being spaced above and overlying and extending along said base with the first end of said mount swingably supported from the first end of said base for angular displacement of said mount relative to said base about an axis extending transversely of said base and mount and between a first position with the second end of said mount spaced closely adjacent the second end of said base and a second position with said second end of said mount displaced away from the second end of said base, said second end of said base having an upstanding opening formed therethrough, said second end of said mount including a depending shank having a notch formed therein and projectable through said opening upon movement of said mount from said second position toward said first position, an elongated latch lever having first and second ends and underlying said base with said first end of said lever pivotally supported from said base for swinging about an upstanding axis between an inactive position with the second end of said lever spaced laterally to one side of said opening and an active position with the second end of said lever registered with said opening and engaged in the notch in said shank to prevent the latter from being withdrawn from said opening and swinging of said mount from said first position toward said second position, spring means connected between said lever and base yieldingly biasing said lever toward said active position, an elongated trigger arm having opposite ends, said trigger arm being pivotally supported from said base intermediate the opposite ends of said trigger arm for

angular displacement of the latter about a transverse axis generally paralleling said axis extending transversely of said base, one end of said trigger arm being of a configuration adapted to be engaged by a fishing line supported from a fishing rod, an elongated connecting link extending and pivotally connected between the other end of said trigger arm and the other end of said latch lever, said one end of said trigger arm being adapted to have the fishing line engaged thereover in a manner such that tensioning of said line beyond a predetermined value will cause angular displacement of said trigger arm and thus angular displacement of said latch lever from said active position to said inactive position.

**4,159,590**  
**ANIMAL TRAP**  
Paul Palfalvy, 1105 Woodside Rd., Redwood City, Calif. 94061  
Filed Sep. 26, 1977, Ser. No. 836,857  
Int. Cl.<sup>2</sup> A01M 23/18  
U.S. Cl. 43—61 6 Claims

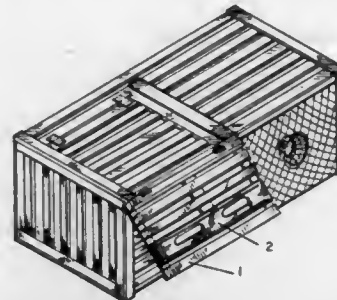


1. An animal trap comprising a body having an entrance end, a substantially planar cover for said entrance end formed with a first aperture for entrance of an animal into said body, a closure formed with a second aperture, means mounting said closure parallel to said cover for oscillation between a first position with said apertures aligned and a second position with said closure blocking said first aperture, said closure being weighted to fall from first to second positions, a trigger pin, said closure being formed with a third aperture in alignment with said pin when said closure is in first position and fitting through said closure to hold said closure in first position, means mounting said trigger pin relative to said cover for reciprocation, and trigger pin actuating means to pull said pin away from said closure, said actuating means being actuated by an animal from within said body, said actuating means before being actuated applying no pulling force on said trigger pin and a counter weight on said closure, whereby said closure in first position does not interfere with reciprocation of said trigger pin, said means mounting said trigger pin comprising a horizontal sleeve fixed to said cover through which said pin passes and a bushing on said closure having a bore larger than said pin, said pin fitting through said bushing.

**4,159,591**  
**PANELS FOR LOBSTER TRAPS**  
Emile A. P. Plante, 74 Badgers Island, Kittery, Me. 03904  
Filed Oct. 3, 1977, Ser. No. 839,126  
Int. Cl.<sup>2</sup> A01K 69/08  
U.S. Cl. 43—100 2 Claims

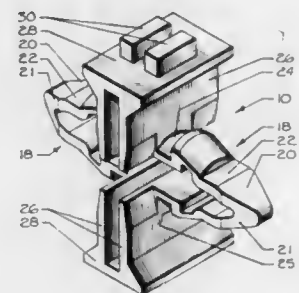
1. A substantially elongated rigid rectangular panel for lobster and crab traps, said panel constructed of water resistant plastic material such as polyethylene and having two spaced rectangular vents therethrough with rounded ends, said vents being of the order of one and three quarters inches (1 3/4") to one and seven eights inches (1 7/8") by six inches (6") and having semi-circular ends, the outer longitudinal edges of the panels having two reinforcing ribs adjacent said edges and spaced

narrow slots extending through the ribs adjacent the said rectangular vents, said panels to be used to replace at least two of



the lower laths of a conventional lobster trap or the lower side portion of a wire trap.

**4,159,592**  
**CLOSE COUPLING STRUT FOR CONSTRUCTION SET HAVING CLIP FASTENERS**  
Richard J. Gabriel, Beaverton, Oreg., assignor to Matrix Toys, Inc., Portland, Oreg.  
Filed Jan. 10, 1978, Ser. No. 868,274  
Int. Cl.<sup>2</sup> A63H 33/10  
U.S. Cl. 46—26 6 Claims



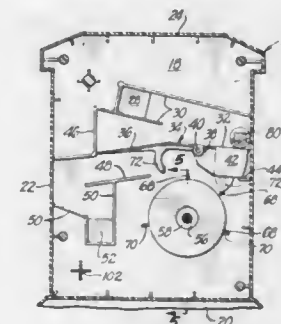
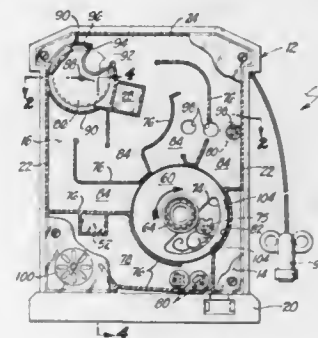
1. In a construction set having multi-faceted joint elements with a joint opening located in each facet, and elongate struts which have compressibly releasable clips at each end arranged to be engaged in said joint openings so as to interconnect adjacent ones of said joint elements, a close coupling strut comprising:

- (a) paired clips, said clips facing in opposite directions generally along a common axis;
- (b) said clips being elastically compressible for insertion into or removal from said joint openings, and having means for interlocking with said joint elements upon return to their released position when seated in said joint openings;
- (c) a bridge interconnecting said paired clips, said bridge operably associated with said clips so that application of squeezing pressure on said bridge causes both of said clips associated therewith to be depressed.

**4,159,593**  
**GAME EMPLOYING MOVEMENT TO CONTROL THE OPERATION OF THE GAME**  
Anthony D. Miller, Redondo Beach, Calif., assignor to Tomy Corporation, Carson, Calif.  
Filed Dec. 29, 1977, Ser. No. 865,498  
Int. Cl.<sup>2</sup> A63F 7/02  
U.S. Cl. 46—42 8 Claims

1. An apparatus in which objects are moved from an upper location to a lower location in which the improvement comprises:  
an elongated lever adapted to receive downwardly passing objects from said upper location, said lever having a receiving end and a discharge end and being pivotally

mounted intermediate said ends, said lever being weighted so that said receiving end will tend to move downwardly when there is no weight applied to said lever, stop means for limiting the downward movement of said receiving end to a position in which said receiving end is located generally beneath said upper location and is positioned so as to receive at least one object passing downwardly from said upper location, said lever being located with respect to said upper location so that after at least one object is delivered from said upper location and held on said receiving end an additional one of said objects passing from said upper location will engage said lever approximate the opposite side of



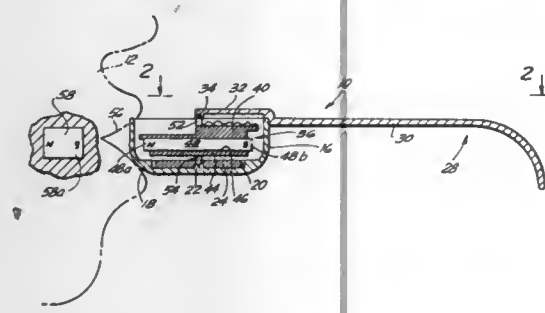
said pivot so as to rotate said discharge end downwardly to a position in which all of said objects on said lever move off of said lever, a wheel rotatably mounted adjacent to said lever, motion imparting means for rotating said wheel, escapement teeth means mounted on said wheel equidistant from one another for positioning said wheel, an escapement pawl located on said lever so as to interact with said teeth to permit limited rotation of said wheel each time said lever is rotated to said position in which said objects move off of said lever and means for permitting said objects to be moved from said lower location to said upper location.

**4,159,594**  
**DOLL AND SIMULATED FEEDING APPARATUS**  
Lawrence L. Reiner, 1 Hickory La., Woodbury, L.I., N.Y. 11797, and John O'Shaughnessy, Staten Island, N.Y., assignors to Lawrence L. Reiner, Woodbury, N.Y.  
Filed Nov. 17, 1977, Ser. No. 852,191  
Int. Cl.<sup>2</sup> A63H 33/26  
U.S. Cl. 46—239 7 Claims

1. Apparatus for simulating the feeding of food to a baby doll having a mouth portion, comprising  
a toy spoon including a hollow bowl having an open-top front end portion and a rear end portion,  
a handle projecting from the rear end portion of said bowl, a cover member covering over the rear end portion of said bowl,



a circular disc rotatably mounted in said bowl portion and overlying the bottom wall thereof, said circular disc having a first half-section having a flat upper surface serving as a false bottom of said bowl, and a second, opposite half-section decorated to simulate food, said disc being turnable between a first operative position in which said first half section is in registry with and exposed at the front end portion of said bowl with said second half section in registry with the rear end portion of said bowl and concealed by said cover member, and a second operative position in which said second half section is in registry with and exposed at the front end portion of said bowl with said first half section in registry with the rear end portion of the bowl and concealed by said cover member, a bar magnet mounted on the under surface of said disc and extending diametrically from one edge portion of said disc



to the opposite edge portion thereof, said magnet having at one end a first pole located beneath the first half section of said disc and at the other end a second opposite pole located beneath the second half section of said disc, and a permanent magnet fixedly mounted adjacent the mouth portion of the doll to be fed by said spoon, said permanent magnet being positioned with one of its poles facing and located proximate to the doll mouth opening, said one pole being of the same polarity as the second pole of said bar magnet, whereby when said spoon, in said second operative position with said second half section exposed to view, is brought into proximity with the mouth portion of said doll, the second pole of said bar magnet is repelled by said one pole of said permanent magnet to turn said disc to said first position in which its first half section is exposed to view.

4,159,595

## INSTALLATION FOR CULTIVATING PLANTS

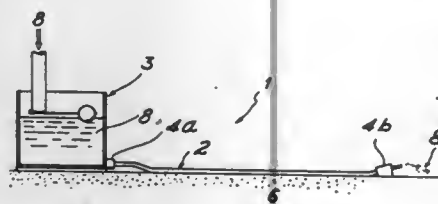
Jean L. Dalle, Manduel; Maurice Dumont, Grenoble; Andre Fourcy, Biviers; Aime Freychet, Grenoble, and Andre Gouzy, St. Nazaire-les-Eymes, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 539,106, Jan. 7, 1975, abandoned. This application Oct. 13, 1976, Ser. No. 732,090

Int. Cl.<sup>2</sup> A01G 13/00

U.S. Cl. 47-2

12 Claims



1. An installation for regulating the temperature of soil for cultivating plants, comprising:

- (a) a plurality of elongated hoses arranged in parallel and placed on the surface of the soil;
- (b) each hose being formed of a non-self-supporting thin wall material defining an inner passage which can carry liquid therethrough so that when the hose is filled with liquid the

hose will expand and lay flat with its width greater than its height and effectively regulate the temperature of the soil by transmitting the liquid temperature through the thin wall to the soil;

- (c) means for preventing the hose from rolling and creating turbulence when liquid is circulated through the hose including said thin wall material forming upper and lower wall portions which are connected to each other at a plurality of places spaced apart along the length of said hose;
- (d) circulation means for circulating said liquid from one end to the other through each of said hoses at a preselected regulated temperature in an amount sufficient to occupy substantially the entire inner passage of each hose; and
- (e) temperature regulation means for regulating the temperature of said liquid.

4,159,596

## MEANS AND A METHOD FOR THE SELF-POLLINATION OF CORN

Gilbert Downing, 2380 Harrison Rd., New Madison, Ohio 45346

Filed Feb. 3, 1978, Ser. No. 874,837

Int. Cl.<sup>2</sup> A01G 7/00; A01H 1/02

U.S. Cl. 47-58

11 Claims



1. A bag for use in the self-pollination of a corn plant having an ear shoot, a tassel and a tassel base portion, said bag comprising an elongated tubular member, said bag having a lower end portion configured to receive and surround the ear shoot of said corn plant, said bag having an upper end portion with means enabling said tassel base portion to extend from outside said upper end portion through and into said upper end portion and enabling said upper end portion to surround and enclose the tassel of said corn plant, the remainder of said bag being free of said corn plant and comprising a conduit connecting said upper portion enclosing said tassel and said lower portion surrounding said ear shoot whereby the pollen from said tassel is concentrated on the silk of said ear shoot to produce a well filled ear of excellent inbred purity and yield.

4,159,597

## PLANTING SYSTEM INCLUDING ARTICLES OF MANUFACTURE

Robert C. Olsen, Streamwood, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 773,027, Feb. 28, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,728

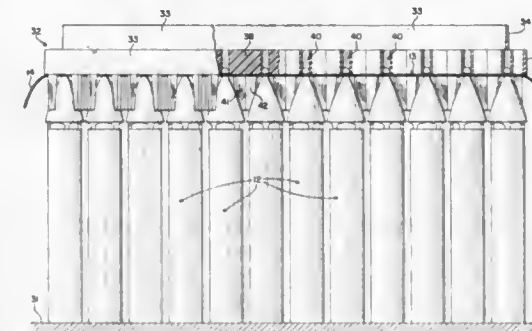
Int. Cl.<sup>2</sup> A01C 11/02

U.S. Cl. 47-58

6 Claims

1. In a planting system including a carrier of a sheet of flexible elastic plastic material in which a plurality of containers for growing plants are held by the bottom ends thereof in said carrier in a pattern of a plurality of parallel rows and ranks transversely of said rows and in which the carrier is provided

with openings between said containers, the method of assembling and filling said containers for growing a plurality of plants in said containers as a unit comprising the steps of: inverting said carrier and said plurality of containers on a substantially horizontal supporting surface, providing and applying an inverted tray having a plurality of upstanding posts onto the bottom portions of said containers through said openings in said carrier, inverting said plurality of containers and said tray to an upright position on said horizontal supporting surface,



providing and applying a filler plate having a plurality of holes therethrough arranged in the pattern of said containers in said carrier in said tray over the upper end of said containers,

depositing a bulk quantity of growing medium on the upper surface of said filler plate, and brushing said growing medium repeatedly over the upper surface of said filler tray to cause the growing medium to fall through the openings in said filler tray into said containers to fill said containers with said growing medium.

4,159,598

## DOOR OPERATOR WITH INSTANT REVERSE FEATURE

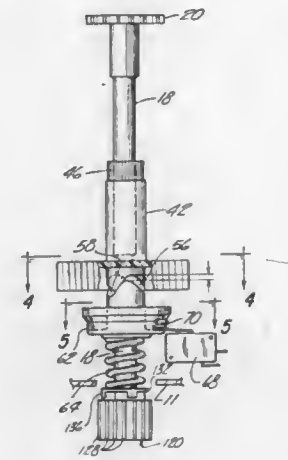
Geoffrey H. Gatland, Walled Lake, Mich., and Kenneth L. Robitaille, Windsor, Canada, assignors to Vemco Products, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 584,620, Jun. 6, 1975, Pat. No. 4,055,023. This application Oct. 25, 1977, Ser. No. 845,289

Int. Cl.<sup>2</sup> E05F 15/10

U.S. Cl. 49-28

5 Claims



1. In a door operator, a motor for moving the door between up and down limits; an operator body; an integral drive shaft supported by the body for rotation relative thereto and having opposite ends extending from said body; means on one end of the shaft and operated by said shaft for mechanical connection to the door to move the door as the shaft rotates; a first cam element disposed on the shaft and mechanically keyed thereto

for rotation with the shaft and spaced from the operator body; a second cam element rotatably disposed on the shaft for at least limited rotation relative thereto between the first cam element and the operator body and bearing against the operator body; gear means connecting the motor directly to the second cam element independently of said shaft, said first and second cam elements being urged into complementary contact with one another to form a torque coupling between the motor and the shaft capable of transmitting torques to said shaft of less than a preset value and responsive to torques in excess of said value to cause said cam elements to slip relative to one another and to cause axial shift of the first cam element away from the second element and the body; adjustment means rotatably disposed on the other end of the shaft to manually selectively vary said preset value; and means carried by the body responsive to the axial shift of said first element to reverse the direction of operation of said motor, said cam elements each comprising alternating lobes and troughs in axially spatial complementary meshing engagement, said lobes and troughs being configured to permit relative slip between the elements at a lower torque level for rotation in one direction and a higher torque level for rotation in the other direction.

4,159,599

## GATE-OPENING AND CLOSING ASSEMBLY

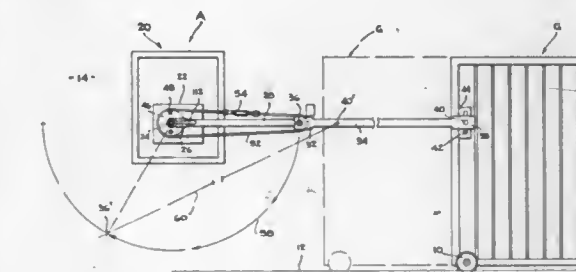
Moscow K. Richmond, 2819 Butler Ave., Los Angeles, Calif. 90066

Filed May 2, 1977, Ser. No. 792,506

Int. Cl.<sup>2</sup> E05F 11/12, 15/00

U.S. Cl. 49-363

43 Claims



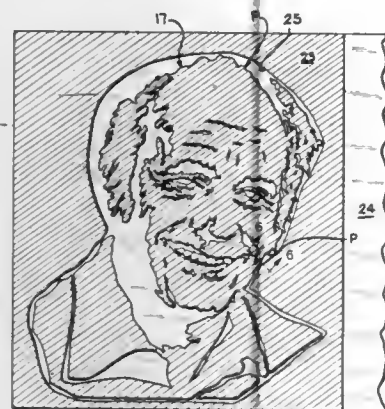
1. An assembly for shifting a gate from a closed position across an access opening to an opened position and from the opened position to the closed position, said assembly comprising:

- (a) a drive motor,
- (b) a first lever arm operatively coupled to said drive motor, and capable of being driven through an arcuate path upon energization of said motor,
- (c) a second lever arm pivotally coupled to said first lever arm by a pivotal connection, said second lever arm also moving through a somewhat arcuate path upon movement of said first lever arm, said first and second lever arms each being substantially smaller in length than the length of movement of said gate across said access opening and said first lever arm having its longitudinal axis generally parallel in space to the longitudinal axis of said second lever arm and when the gate is in the closed position, said lever arms being aligned with one another when said gate has moved over a portion of the access opening between the closed and opened positions, said lever arms crossing over one another when said gate has moved over a further portion of the access opening in the direction of travel and said lever arms separating away from the aligned position after crossing over one another in the same direction of travel so that said gate further moves across said access opening in the same direction of travel,
- (d) and means pivotally coupling said second lever arm to said gate.

4,159,600  
**METHOD FOR REPRODUCING PHOTOGRAPHS, DRAWINGS, OR THE LIKE, ON MARBLE OR GRANITE**  
 Gerald P. Kaminski, 7395 Middlebury, Lambertville, Mich. 48144

Filed Apr. 20, 1978, Ser. No. 898,302  
 Int. Cl.<sup>2</sup> B24C 1/04  
 U.S. Cl. 51—312

4 Claims



1. A method for reproducing an original representation, such as a photograph, a drawing or the like, on stone such as granite, marble or the like, said method comprising the steps of:

- (1) cutting areas corresponding to shaded areas of the original out of a first sheet of tough material that is capable of withstanding the impingement of blasted sand and that is a top layer of a laminate which also comprises a transparent backing sheet;
- (2) cutting out of said laminate the entire area defined by the perimeter of the original;
- (3) placing a second sheet of tough material that is larger in area than the original onto the surface of the stone;
- (4) cutting out of said second sheet of tough material the entire area defined by the perimeter of the original;
- (5) "dusting" the area of the stone from which the entire area of the original on the second sheet has been removed;
- (6) placing the cutout laminate in the open area of said second sheet and adhering the laminate to the stone;
- (7) sand blasting through all of the cutout areas of said sheets of tough material and
- (8) removing said sheets and said laminate from the stone.

4,159,601  
**BEARER PANEL WITH MOVABLE SUPPORTING DEVICES**

Claus Ebert, Kronberg, and Wolfgang Fabian, Mannheim, both of Fed. Rep. of Germany, assignors to Isopol A.G., Switzerland

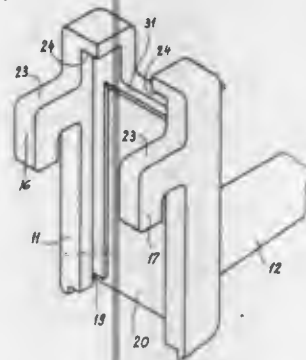
Filed Apr. 25, 1977, Ser. No. 790,670  
 Claims priority, application Switzerland, Apr. 23, 1976, 5123/76; Feb. 10, 1977, 1595/77  
 Int. Cl.<sup>2</sup> E04D 13/00

U.S. Cl. 52—36

12 Claims

1. A bearer panel comprising; a panel body; and devices for supporting tools and the like, the devices being supportable by the body, which for this purpose has horizontal transverse grooves inwardly expanding in a sectional profile thereof, and each supporting device having a down-turned hook-shaped lug, disposed in an upper region thereof and insertable in one of the grooves, and having a slide-piece having an ear insertable

in said groove, said slide-piece being movable vertically along a grooved portion of the supporting device upwards until the



top edge of said ear is above an upper face of the lug, for locking the supporting device on the panel.

4,159,602  
**THREE-DIMENSIONAL CONSTRUCTION ELEMENT COMPRISING A BODY OF GENERALLY POLYHEDRAL FORM**

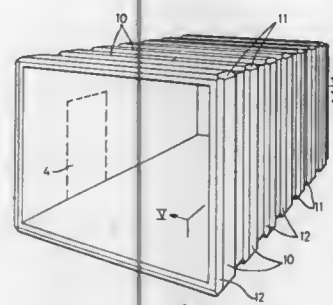
Andre M. Polack, Brussels, Belgium, assignor to Matrpa S.A., Geneva, Switzerland

Filed Apr. 7, 1977, Ser. No. 785,571  
 Claims priority, application Switzerland, Apr. 9, 1976, 04577/76

U.S. Cl. 52—79.9

Int. Cl.<sup>2</sup> E04B 1/348

27 Claims



1. A three-dimensional construction element comprising a body of generally polyhedral form with an aperture therethrough, characterized in that it comprises at least one peripheral rib forming a closed frame, the sides of said rib and the corners of said element are bevelled, and in that grooves located beside the rib form, separately or together, a geometric figure which is complementary to the figure formed by the rib thereby providing for the engagement of another complementary rib therein.

4,159,603  
**CIRCULAR BUILDING**

Leonard F. Schroeder, Houston, Tex., assignor to Concept Fiberglass Homes, Inc., Grand Island, Nebr.

Filed May 22, 1978, Ser. No. 907,980  
 Int. Cl.<sup>2</sup> E04B 7/00

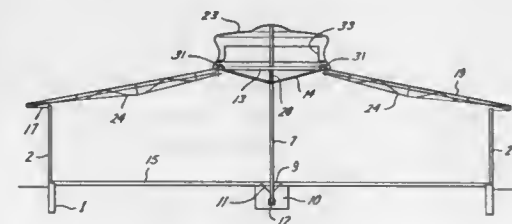
U.S. Cl. 52—82

1 Claim

1. In a building, a circular foundation, a center column mounted in said foundation, vertically extended wall panels anchored in said foundation, roof sections mounted on said vertical panels at one end and secured to said center column at the other end, each roof panel being provided with longitudinal reinforcing bars, said reinforcing bars having one end protruding past the inner end of said roof panel, stirrups on said

center ring adapted to receive said protruding end of said reinforcing bar and each roof panel being upwardly turned at

flanges on said lower chord being substantially parallel with said web member.



its inner end, and overturned at its inwardly extending terminal forming a hook extending over and resting on said center ring.

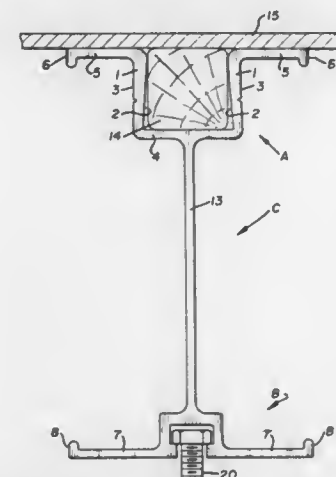
4,159,604  
**JOIST**

Michael P. Burrell, Mississauga, Canada, assignor to Anthes Equipment Limited, Ontario, Canada

Filed Jan. 5, 1978, Ser. No. 867,458  
 Int. Cl.<sup>2</sup> E04C 3/292, 3/04

U.S. Cl. 52—376

6 Claims



1. A joist for shoring concrete slabs, said joist consisting of an extruded, elongated channel member presenting an upper chord, a lower chord, and chord connecting means intermediate said chords;

said upper chord defining a channel, substantially U-shaped in cross-section, having side walls with inner and outer faces, and a bottom wall with a flat inner face and an outer face, the inner faces of said side walls being angulated with respect to said planar bottom wall, and converging towards one another in the direction of the upper portion of the channel, the outer faces of said side walls being parallel to one another such that each of said side walls increases in transverse cross-section from the bottom wall to the free end thereof, said side walls being elastically deformable so that they can be sprung outwardly to permit the introduction of a removable insert into said channel, the transverse dimension of the inner face of the bottom wall being greater than the transverse dimension of the removable insert; each of said side walls terminating, at its upper free end in an upper outwardly extending horizontal flange which, in itself, terminates, in a downwardly extending stub-flange parallel with and spaced from its associated said side wall;

said lower chord being defined by a pair of lower horizontal flanges each parallel with and spaced from said upper flanges and terminating in an upwardly extending stub-flange;

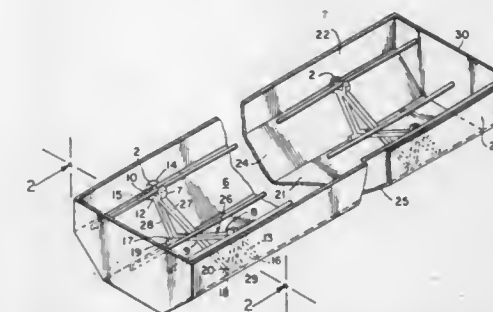
said chord connecting means comprising a central web extending between said upper and lower chords, the stub-

4,159,605  
**PARKING CURB REINFORCING BAR SUPPORT**  
 Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries Ltd., Plainview, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,783  
 Int. Cl.<sup>2</sup> E04C 5/20

U.S. Cl. 52—687

3 Claims



1. A plurality of parallel reinforcing rods and at least one monolithic parking curb reinforcing rod support; said support including a frame having first and second support portions and a third optional support portion receiving and retaining said reinforcing rods, the first and second support portions being located at a higher level than the optional third of the support portions; said first and second support portions opening directly upwards and including a surrounding wall with an opening through which a reinforcing rod can be inserted, means connecting said first and second support portions and projecting members defining a plurality of support points by which said parking curb reinforcing rod support can be stably supported in a form and the reinforcing rods placed at predetermined positions within said form whereby upon the casting of concrete within said form the reinforcing rods will be placed at predetermined positions therein; said first and second support portions each mutually aligned with two parallel projections and said connecting means comprising diagonal connection pieces joining said projections to the bases of the first and second support portions, the juncture of the intersection of said connection pieces defining the third optional support portion for receiving a reinforcing rod, said projecting members including one pair of arms extending diagonally from the bases of the first and second support portions respectively.

4,159,606  
**BEAM AND METHOD OF MAKING IT**  
 Bengt A. Kindberg, Kadettvagen 29, 230 50 Bjärred, Sweden  
 Filed Sep. 19, 1977, Ser. No. 834,594  
 Claims priority, application Sweden, Sep. 24, 1976, 7610600  
 Int. Cl.<sup>2</sup> E04C 3/02

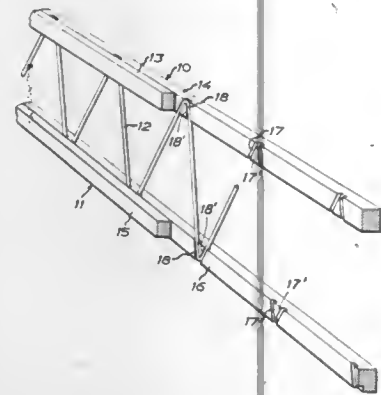
U.S. Cl. 52—692

10 Claims

1. An elongated beam comprising  
 a metal wire web member bent alternately back and forth to lie in a plane with a plurality of bent portions defining a pair of lines;  
 a first wood lath member having in a first surface thereof a first plurality of recesses shaped substantially to conform to the bent portions of one of said pair of lines of said wire web member while leaving within said first plurality of recesses the wood conforming to the open centers of said bent portions of said one of said pair of lines, the bent portions of said one of said pair of lines being positioned in said first plurality of recesses;  
 a second wood lath member having in a first surface thereof a second plurality of recesses shaped substantially to conform to the bent portions of the other of said pair of lines



of said wire web member while leaving within said second plurality of recesses the wood conforming to the open centers of said bent portions of said other of said pair of lines, the bent portions of said other of said pair of lines being positioned in said second plurality of recesses; a third wood lath member substantially coextensive with said first wood lath member and glued to said first surface



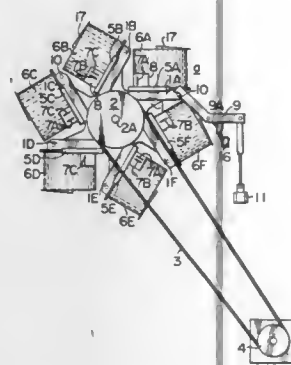
of said first wood lath member to cover the recesses thereof and to retain therein said bent portions of said one of said pair of lines; and a fourth wood lath member substantially coextensive with said second wood lath member and glued to said first surface of said second wood lath member to cover the recesses thereof and to retain therein said bent portions of said other of said pair of lines.

**4,159,607**  
**WRAPPING PAPER SELECTING SYSTEM FOR USE IN COIN PACKAGING MACHINE**  
Isamu Uchida; Kenkichi Watanabe, and Katsuke Furuya, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Japan

Filed Feb. 3, 1978, Ser. No. 874,751  
Int. Cl.<sup>2</sup> B65B 57/08

U.S. Cl. 53—64

3 Claims



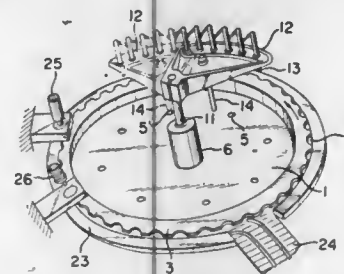
1. A wrapping paper selecting system for use in a coin packaging machine including a coin selecting dial for selecting a desired type of coin, a wrapping paper supporting table having a plurality of loading stations each for wrapping paper for a different type of coin, a wrapping paper feeding station and a drive for driving the supporting table so as to bring a desired one of the loading stations into the feeding station, said wrapping paper selecting system comprising a selected coin signal generating means associated with said coin selecting dial for producing a signal indicative of the type of coin which has been selected to be wrapped, a plurality of markings each provided in a corresponding one of said loading stations to identify the corresponding loading station, a selected paper signal generating means provided in said feeding station for detecting said markings and producing a signal indicative of

which loading station has been brought into said feeding station, and a controlling means for initiating operation of said drive when said coin selecting dial is set in a position to select a desired type of coin and stopping the operation of said drive when a signal from said selected paper signal generating means coincides with a signal from said selected coin signal generating means, said markings having means to enable exchangeable mounting onto each of said loading stations thereby allowing the loading of a spare roll of wrapping paper of any type onto any of the loading stations.

**4,159,608**  
**BOTTLING MACHINE**  
Sinzo Masuda, Shimizu, and Tsuneyuki Okochi, Shizuoka, both of Japan, assignors to Package Engineering Corporation, Shizuoka, Japan

Filed Apr. 28, 1978, Ser. No. 901,172  
Int. Cl.<sup>2</sup> B65B 3/04, 7/28; B67B 1/04, 5/06  
U.S. Cl. 53—282

4 Claims



1. A bottling machine comprising a round table which is equipped with bottle-holding pockets disposed on the periphery thereof and is intermittently rotatable, a liquid charging mechanism, and a mechanism for corking or applying a cap-bond on the neck of a bottle, wherein a nozzle holder equipped with a plurality of charging nozzles and capable of rotation and vertical movement is disposed above said table, a working member for elevating said nozzle holder, a member for always biasing said nozzle holder so as to rotate opposite to the direction of rotation of said table, and engagement members provided on said nozzle holder and table which engage with each other when the nozzle holder descends and disengages from each other when the holder ascends, whereby at the time when the nozzle holder descends and rotates together with the table, the charging in the bottles is performed by the nozzles, and after completion of the charging, the foregoing working member elevates the nozzle holder to allow it to return to its original position.

**4,159,609**  
**PROCESS AND DEVICE FOR INSERTION OF TWO ROWS OF OBJECTS INTO A PACKAGE**  
Heinz Focke, Moorestrasse, 309 Verden, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 633,136, Nov. 18, 1975, Pat. No. 4,057,950, which is a division of Ser. No. 390,263, Aug. 21, 1973, Pat. No. 3,937,391, which is a continuation-in-part of Ser. No. 83,581, Oct. 23, 1970, abandoned. This application Sep. 14, 1977, Ser. No. 833,209

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1969, 1953350

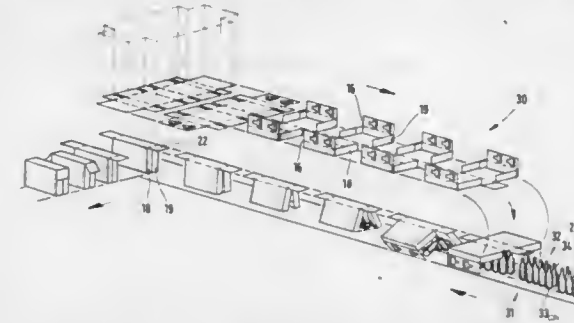
Int. Cl.<sup>2</sup> B65B 11/10

U.S. Cl. 53—452

6 Claims

1. A process for inserting two rows of articles such as bottles, cans or the like into a container which is formed from a one-piece planar blank of foldable material having a one-piece undivided rectilinear top wall, side walls integral with said top wall on both sides thereof, bottom walls integral with the side walls and edge flaps integral with the bottom walls comprising folding the bottom walls and edge flaps simultaneously relative to said top wall and side walls so as to dispose said bottom

walls and edge flaps at right angles to said top wall and side walls, initially spreading the two rows of articles relative to each other, placing the folded blank on the two rows of articles with the top wall of the blank in engagement with the tops of the articles, simultaneously further spreading the bottoms of the two rows of articles apart and folding the side walls of the container relative to the top wall of the container until said side



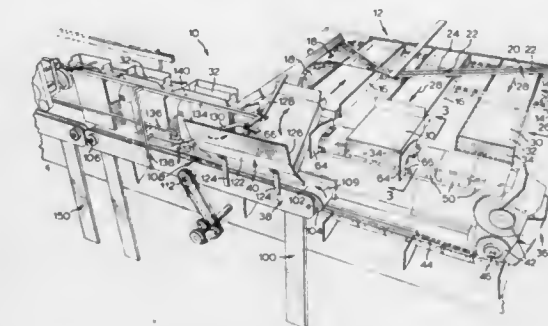
walls contact the sides of the articles and the previously folded bottom walls of the container contact the bottoms of the articles, bending the edge flaps upwardly between the two rows into engagement with the opposed sides of the two rows of articles, pressing the edge flaps together by bringing the two rows of articles together and adhesively securing the flaps together.

**4,159,610**  
**CLOSURE MECHANISM FOR CLOSING END OF LOADED CARTONS**  
Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Filed Jan. 27, 1978, Ser. No. 872,999  
Int. Cl.<sup>2</sup> B65B 5/04, 7/20, 63/00, 1/22

U.S. Cl. 53—525

12 Claims

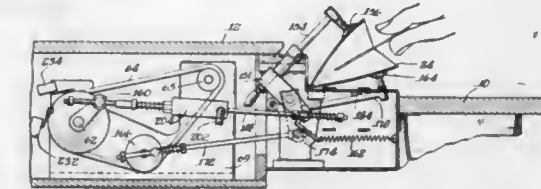


1. In a packaging machine having a first conveyor for supporting and transporting a plurality of loaded cartons to an end closure station, the cartons being supported by the first conveyor in a configuration in which each carton has an open end and a closed end disposed opposite one another and oriented in substantially vertical planes and means for laterally discharging said cartons from said first conveyor, the improvement of:  
(a) a transfer mechanism including transfer conveyor means having a forward run, means mounting at least a portion of said forward run in a side-by-side relationship in substantially the same plane with at least a portion of said first conveyor for receiving cartons which are laterally displaced from said first conveyor, said transfer mechanism including means to reorient said cartons to a second position in which the open ends thereof open upwardly,  
(b) closure means for closing the open ends of said cartons after the cartons are located in said second position, and  
(c) drive means for driving said transfer conveyor at a speed synchronized with the speed of said first conveyor.

**4,159,611**  
**ENVELOPE PROCESSING MACHINE AND METHOD**  
Robert J. Russell, Camden, N.J., assignor to Mail-Ex Corporation, Skokie, Ill.  
Continuation-in-part of Ser. No. 707,723, Jul. 22, 1976, abandoned. This application May 31, 1977, Ser. No. 801,454  
Int. Cl.<sup>2</sup> B65B 43/30

U.S. Cl. 53—569

21 Claims

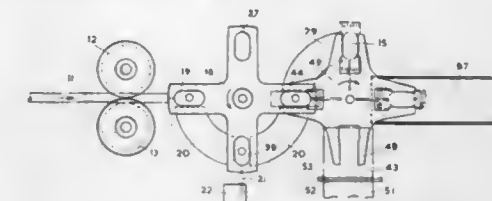


1. An envelope processing machine comprising a supply hopper for envelopes, cutting means for severing one edge of an envelope, means for removing envelopes in one by one relationship from the supply hopper and for transmitting the removed envelopes in substantially horizontal disposition to the cutting means, means for transmitting the envelopes from the cutting means in substantially horizontal disposition to an envelope processing station, and envelope opening means comprising a pair of suction cups operable upon opposing faces of the envelope at said envelope processing station for opening an envelope by moving each side thereof upwardly from horizontal position and holding it open for manual removal of envelope contents.

**4,159,612**  
**PRODUCTION OF LOLLIPOPS OR LIKE SWEETS**  
Reginald F. Johnson, and Leonard Sutton, both of Gainsborough, England, assignors to Baker Perkins Holdings Limited, Peterborough, England

Filed Oct. 26, 1977, Ser. No. 845,633  
Int. Cl.<sup>2</sup> B29C 3/02; B29D 3/00; A23G 3/12  
U.S. Cl. 53—594

6 Claims



1. Apparatus for producing sweets, said apparatus comprising an intermittently movable pocketed forming conveyor, means for feeding a toffee rope in timed relationship with said conveyor for its leading portion to be presented in register with successive pockets of said conveyor, means for severing such leading portion and compressing it into the pocket of the conveyor for the time being at rest at a first forming station roughly to form an individual sweet, means for indexing said conveyor to carry the sweet to a stick-inserting station, means for feeding a stick into and through stick-guiding means on said conveyor, and means for pressing said stick into said sweet, and means, operating substantially simultaneously with the stick-feeding means, for compressing the sweet in the pocket finally to form it, the conveyor indexing means then again operable to carry the pocket to a delivery station, said apparatus being characterized by the provision of means for resiliently nipping the stick against a surface of said stick-guiding means during the stick-inserting operation and for maintaining the nipping pressure during movement of the sweet in said pocket to the delivery station.

4,159,613  
MOWER ATTACHMENT WITH DRIVE SUBASSEMBLY  
ADAPTED FOR DETACHABLE CONNECTION TO A  
TRACTOR

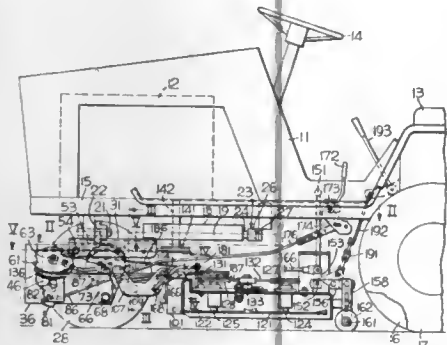
Henry T. Knudson, Grafton, and Kenneth H. Klač, Port Washington, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 18, 1977, Ser. No. 825,532

Int. Cl.<sup>2</sup> A01D 35/26

U.S. Cl. 56—11.3

16 Claims



1. A mower attachment for a riding tractor having a power unit, a power take-off shaft with a drive pulley and a mower clutch operating lever shiftable between clutching and de-clutching positions, said attachment comprising:

- a mower subassembly including
  - a rotating cutting blade,
  - drive means for said blade including a driven pulley, and
  - a brake mechanism for stopping said blade,
- a drive subassembly including
  - a frame adapted for releasable mounting on said tractor and pivotally connected in draft relation to said mower subassembly permitting the latter to be lowered and raised relative to said drive subassembly between mowing and transport positions,
  - a mower clutch pulley support bracket mounted on said frame for swinging about a first axis, and
  - a mower clutch pulley mounted on said bracket for rotation about a second axis spaced from said first axis, said clutch pulley being shifted between clutching and de-clutching positions upon pivoting of said bracket away from and toward said drive pulley on said tractor,
  - belt means operable to drivingly connect said drive pulley to said driven and clutch pulleys when said frame is mounted on said tractor and said clutch pulley is in its clutching position,
  - an operating linkage connected at one end to said clutch pulley support bracket and adapted at its other end for connection to said clutch operating lever, whereby movement of the latter between its clutching and de-clutching positions causes the clutch pulley to move between its clutching and de-clutching positions thereby connecting said blade to and disconnecting said blade from said power unit, and
  - motion transmitting means operatively connecting said operating linkage to said brake mechanism whereby the latter is actuated to stop rotation of said blade when said clutch pulley is moved to its de-clutching position.

4,159,614  
LAWN MOWER CONTROLS  
George A. Thomas, Des Moines, and C. Dean Peterson, Ankeny, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed Oct. 27, 1977, Ser. No. 846,233

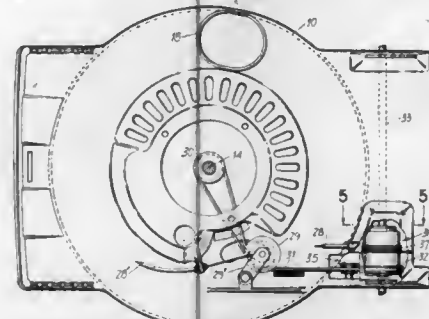
Int. Cl.<sup>2</sup> A01D 35/26

U.S. Cl. 56—11.6

3 Claims

1. In a rotary type lawn mower comprising a mower deck,

front and rear pairs of wheels for said deck, a grass cutting blade below said deck, power means on said deck including a shaft extending through said deck from said power means to said blade, and a handle for the guiding said mower along the ground, said handle extending to the rear of said mower; improved means for driving one pair of said wheels and controlling said mower, comprising a drive axle for said one pair of wheels and a speed reducer on said drive axle for reducing the speed between said shaft and axle, a drive connection between said shaft and speed reducer, said speed reducer having a drive and no drive condition with respect to said axle, a clutch on



said speed reducer for controlling said condition, and a manual control on said handle for controlling said clutch; said drive connection between said shaft and speed reducer comprising a variable one to provide different speeds to said axle for varying the speed of said mower along the ground, and another manual control on said handle for controlling said variable drive connection; said clutch comprising a wrap around spring on said speed reducer, and said variable drive connection comprising a split V pulley on said shaft, another V pulley on said speed reducer, a V drive belt interconnecting the two pulleys, and means controlled by said another manual control for controlling the tension of said belt on said pulleys.

4,159,615  
COLLECTION AND RECYCLING APPARATUS FOR  
CROP MATERIAL PARTICLES IN A ROLL FORMING  
MACHINE

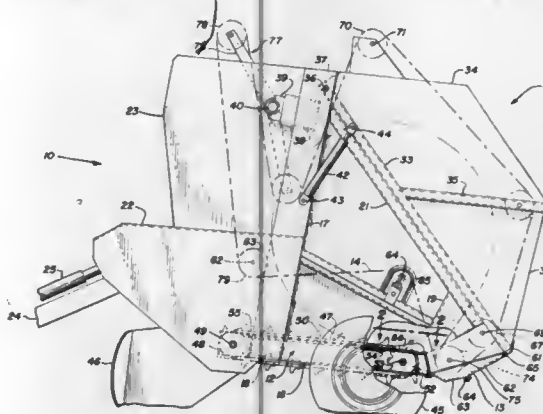
Edward T. Eggers; Thomas W. Waldrop; Donald L. Sheesley, all of New Holland, and Willis R. Campbell, Ephrata, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 2, 1977, Ser. No. 847,994

Int. Cl.<sup>2</sup> A01D 39/00

U.S. Cl. 56—341

11 Claims



1. A roll forming machine for crop material comprising:
  - (a) a mobile frame adapted to move across an open field, said frame having a front end, two opposing sides, and a rear end;
  - (b) conveying means fixed to said frame, said conveying means having a front end, two opposing sides and a rear

end thereby defining a transport plane along which crop material is moved from said front end towards said rear end, said front end, opposing sides and rear end of said conveying means further being in substantially the same orientation as said front end, opposing sides and rear end of said frame;

- (c) pickup means mounted to said frame adjacent said front end of said conveying means for engaging crop material and depositing it on said transport plane of said conveying means;
- (d) bale forming means mounted to said frame substantially above said conveying means defining therebetween a bale forming region, said bale forming means including a movable motion-imparting curvilinear surface extending at least from a first location substantially in the same plane as said transport plane to a second location above said transport plane;
- (e) drive means operably connected to said bale forming means to impart motion thereto such that crop material delivered to the bale forming region by said conveying means is rotated to form a substantially cylindrical bale;
- (f) collection means supported on said frame adjacent said conveying means' rear end, said collection means positioned below said transport plane and at least partially below said first location of said bale forming means; and
- (g) stripping means operably associated with said conveying means at the rear end of said transport plane to strip off and elevate the crop material from said conveying means and direct said crop material into contact with said bale forming means so as to initiate rotation of said crop material for inclusion in the crop, said stripping means further including at least a pair of transversely adjustable stripping elements positioned along said transport plane adjacent said rear end of said conveying means and extending forwardly therefrom a predetermined distance, each stripping element including a tapered stripping surface extending inwardly and upwardly from said transport plane to a first predetermined height such that at least a portion of said conveying means travels beneath and between said stripping surfaces thereby reducing the amount of crop material that is directed into said collection means for ultimate recycling to said bale forming region for inclusion in the crop roll.

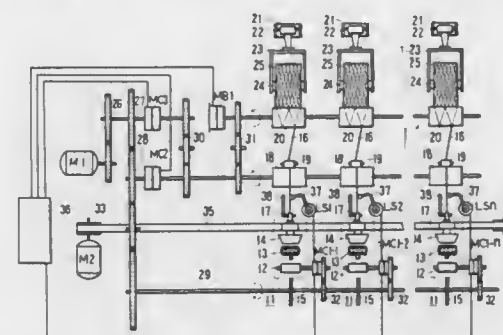
4,159,616  
METHOD FOR CONTROLLING AN OPEN-END  
SPINNING FRAME AND AN APPARATUS THEREFOR  
Tatsuo Takeuchi, Chita; Kazuyoshi Ono, Chiryu; Naotake Furukawa, Chita; Katsuaki Sugiura, Okazaki; Osamu Suzuki, Obu, and Takeshi Shimizu, Kariya, all of Japan, assignors to Kabushiki Kaisha, Toyoda Iidoshokki Seisakusho, Kariya, Japan

Filed Jan. 19, 1978, Ser. No. 870,687

Int. Cl.<sup>2</sup> D01H 13/18, 1/12

U.S. Cl. 57—83

3 Claims



3. In an apparatus for controlling an open-end spinning frame which includes a plurality of spinning units and wherein discrete fibers are supplied by fiber feed means into rotary spinning chambers to form yarns which are drawn out of said

spinning chambers to form yarn packages due to the rotation of take-up rollers; the improvements comprising:

- electromagnetic clutches provided one for each spinning unit between fiber feed means of respective spinning units and a common driving source for driving said fiber feed means;
- a fiber feed control circuit operative to hold all said electromagnetic clutches in a released or disengaged condition at the time of starting said common driving source and operative to simultaneously change-over all said electromagnetic clutches into an engaged condition in the course of yarn ending which is being effected by returning the end of yarn back to said rotary spinning chambers;
- means for detecting occurrence of yarn breakage provided one for each of said spinning unit; and
- a yarn breakage detecting circuit operative to individually disengage any one of said electromagnetic clutches in said spinning units in response to a detecting signal from said detecting means, said yarn breakage detecting circuit being adapted to be change-over into an operative condition by said fiber feed control circuit after said electromagnetic clutches have been changed-over into an engaged condition.

4,159,617  
RESILIENT POLYESTER FIBERS  
John T. Allan, Charlotte, N.C., assignor to Fiber Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 877,470, Nov. 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 806,721, Mar. 12, 1969, abandoned. This application May 27, 1971, Ser. No. 147,688

Int. Cl.<sup>2</sup> D02G 3/04, 1/00, 3/02

U.S. Cl. 57—247

28 Claims

1. A resilient drawn polyester textile fiber comprising at least 50 mol percent of poly(tetramethylene terephthalate), said fiber having a toughness (tenacity  $\times$  elongation  $\div$  200) of at least 0.75 grams/denier and a bending recovery at 20 percent surface strain of at least 55%.

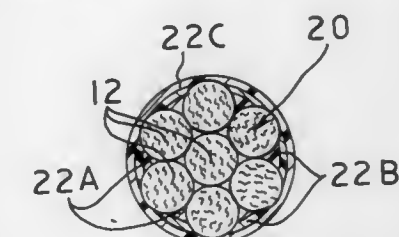
4,159,618  
COMPOSITE YARN  
Jerry G. Sokaris, Troy, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,756

Int. Cl.<sup>2</sup> D02G 3/18, 3/36

U.S. Cl. 57—251

10 Claims



1. A high temperature resistant, composite yarn having the appearance and physical characteristics of a monofilament yarn, which comprises:
  - a core of a twisted, multi or spun filament yarn, said filament being of a high temperature resistant, synthetic material; and
  - an outer coating of a high temperature resistant, synthetic, polymeric resin, said coating comprising a plurality of coating layers, including a plurality of inner layers intimately bonded to the core and filling the helix of the twist in the core yarn only and outer layers being bonded to the inner layers and encapsulating the inner layers and the



core so as to give the composite yarn the appearance and characteristics of a mono-filament.

4,159,619

**METHOD FOR PRODUCING NOVELTY YARNS**

Ernest J. Griset, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

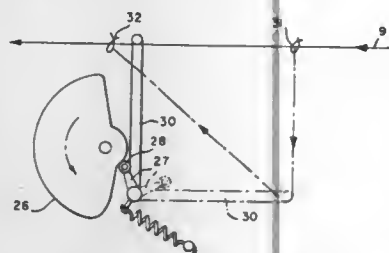
Division of Ser. No. 722,881, Sep. 13, 1976, Pat. No. 4,080,777.

This application Oct. 25, 1977, Ser. No. 845,043

Int. Cl.<sup>2</sup> D02G 3/34, 3/36, 3/44

U.S. Cl. 57—295

8 Claims



1. A method of making a novelty yarn comprising a core strand and an effect strand comprising the steps of feeding the core strand at a first predetermined rate into a tangling zone and withdrawing the core strand from the tangling zone at a second predetermined rate that is less than the first predetermined rate; simultaneously feeding an effect strand at a third predetermined rate to the tangling zone and alternately positively and abruptly tensioning and relaxing the effect strand at the tangling zone and withdrawing the effect strand with the core strand at the second predetermined rate to form a composite yarn wherein the effect yarn is alternately compacted and fluffed relative to the core yarn; said third predetermined rate being higher than the second predetermined rate and at least equal to the first predetermined rate, said abrupt tensioning and relaxing of the yarn being effected by intermittently and abruptly changing the path of the yarn, said yarn being stretched during the tensioning step and abruptly made slack during the relaxing step.

4,159,620

**YARN-PIECING AND CLEANING SYSTEM FOR A SPINNING MACHINE**

Régis LaFlaquiere, and Radé Janousek, both of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, France

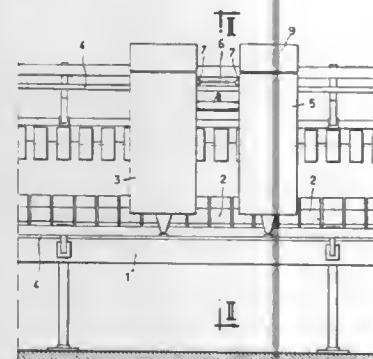
Filed Jan. 31, 1978, Ser. No. 873,944

Claims priority, application France, Feb. 2, 1977, 77 02838

Int. Cl.<sup>2</sup> D01H 11/00, 15/00

U.S. Cl. 57—301

6 Claims



1. A yarn-piecing and cleaning system for an open-ended spinning machine, comprising:  
a first carriage means travelling on a track along the machine, for carrying out piecing operations;  
second carriage means, distinct from said first carriage

means, for carrying out cleaning operations, said second carriage means including means mechanically coupling both of said carriage means to each other;

an air generator means for at least blowing air into said machine, said air generator means being mounted upon said second carriage;

first flexible duct means, connected to said air generator and connecting an interior of said first carriage means to an interior of said second carriage means, said second carriage means including a reservoir to collect dirt and yarn waste from said machine;

a second duct means with at least one nozzle connected to said air generator for directing said blowing air into said machine; and

filter means for retaining waste in said second carriage.

4,159,621

**FRICTION DISC FOR FALSE TWISTING**

Christian Bru, Renaison, France, assignor to ASA S.A., Roanne, France

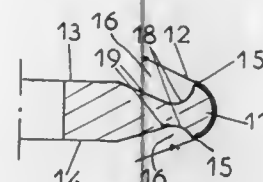
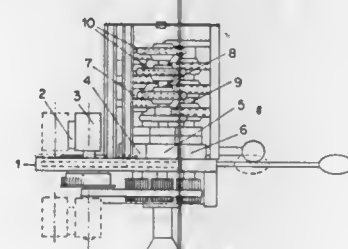
Filed May 23, 1978, Ser. No. 908,674

Claims priority, application France, May 25, 1977, 77 16634

Int. Cl.<sup>2</sup> D02G 1/04

U.S. Cl. 57—338

12 Claims



10. A false twisting spindle having at least two axles, there being, on each axle, at least one friction disc, the friction discs overlapping and at least some of the discs comprising a convex peripheral surface to be contacted by a yarn and upper and lower faces, a recess having a cylindrical outer side wall provided in at least one of said faces, and a sharp edge defined at a position between said recess and said convex peripheral surface.

4,159,622

**ELECTRONIC TIMEPIECE HAVING A MAIN OSCILLATOR CIRCUITRY AND SECONDARY OSCILLATOR CIRCUITRY**

Yoshikazu Akahane, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,808

Claims priority, application Japan, Jun. 30, 1976, 51/77579; Jul. 8, 1976, 51/81357

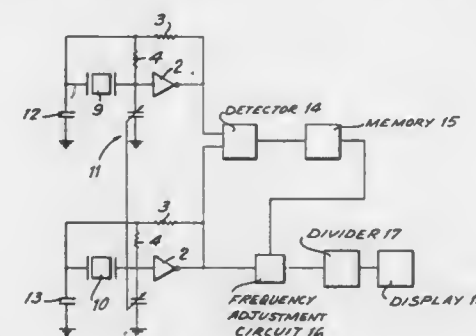
Int. Cl.<sup>2</sup> G01R 21/12; G04C 3/00; H03B 3/04

U.S. Cl. 58—23 AC

21 Claims

1. An electronic timepiece comprising in combination a main oscillator means including a first time standard having a first temperature characteristic, said oscillator means being adapted to produce a first high frequency time standard signal having a

first predetermined frequency rate determined at least in part by the temperature characteristic of said first time standard, a second oscillator means including a second time standard having a second temperature characteristic, said second oscillator means being adapted to produce a second high frequency time standard signal having a second predetermined frequency determined at least in part by the temperature characteristic of said second time standard, phase detection means for producing a phase detection signal in response to detecting a predeter-



mined difference in phase between said first high frequency time standard signal and said second high frequency time standard signal, first divider means for producing a low frequency time signal, display means for displaying actual time in response to said low frequency time signal applied thereto, and frequency adjustment means coupled intermediate said phase detection means and said first divider means for adjusting the frequency of said low frequency signal produced by said first divider means in response to said phase detection signal being applied thereto.

4,159,623

**AUTOMOTIVE STEP-TURBINE ENGINE**

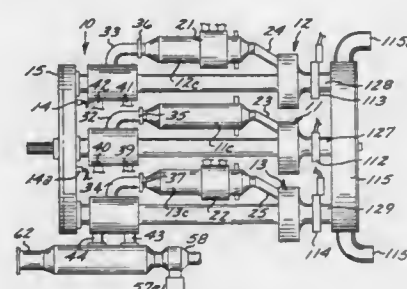
William W. McReynolds, 6148 Elsa St., Lakewood, Calif. 90713

Filed Nov. 7, 1977, Ser. No. 849,336

Int. Cl.<sup>2</sup> F02C 7/02; F02D 25/00

U.S. Cl. 60—39.15

29 Claims



1. A step-turbine engine comprising in combination:

a. one or more primary gas turbine assemblies and one or more power boost gas turbine assemblies, said one or more primary turbine assemblies for supplying continuous engine power output when said engine is operating and said power boost turbine assemblies for successively augmenting said primary turbine assemblies as required by engine load conditions, each of said assemblies separately comprising in combination,

a radial-flow air compressor having an air inlet duct in a compressor housing front member of a compressor housing for admitting air into the compressor and having an outlet duct in the compressor housing rearwardly disposed from the inlet duct and disposed radially therefrom for discharging from the compressor high pressure compressed air therethrough,

an air-fuel mixture burner can having an air inlet sealably connected to the compressor outlet duct by a duct seal

means for directing said high pressure air into a burner can combustion chamber portion having a fuel injection means for injecting fuel thereinto from a fuel delivery means for mixing said fuel with the air therein forming an air-fuel mixture, said chamber further having an electrical igniter means therein, said igniter means being energized by an electrical ignition control means, said igniter means for igniting said air-fuel mixture in said chamber, said can further having a hot gas expansion chamber portion rearwardly disposed from the combustion chamber portion for directing therethrough a high velocity gas ignition product, derived from ignition of the air-fuel mixture, and out thereof through a burner can outlet duct, said outlet duct being sealably connected by a seal clamp means to a gas turbine inlet duct for directing said gas product therethrough into a gas turbine,

the said gas turbine having said inlet duct coupled to the burner can outlet duct for directing the high velocity gas ignition product into a turbine wheel chamber of a turbine housing and impinging against a plurality of radially extending turbine blades of a turbine wheel mounted therein for rotating said turbine wheel and a turbine power shaft to which the turbine wheel is fixedly and coaxially mounted, said shaft being rotatably and sealably mounted in sealed bearing and gas seal means at a turbine housing front end and at a turbine housing rearward end, said shaft further being rotatably drivingly coupled at a shaft forward extending end to a compressor rotor of said radial-flow air compressor through a shaft encircling compressor sealed bearing means mounted in a compressor rear housing member, said shaft further having fixedly and coaxially attached on a shaft rearward extending end a gear drive pinion for driving a drive gear of a reduction gear drive assembly, said turbine housing further having spent ignition product exhaust duct means for directing a spent ignition product therethrough and into an exhaust system for discharging said spent ignition product to the atmosphere.

b. the said reduction gear drive assembly having said gear drive pinion of each of the turbine assemblies being rotatably drivingly coupled to the said drive gear portion of said reduction gear drive assembly rotatably mounted within a reduction gear housing, said drive gear being coaxially with and rotatably drivingly coupled to a gear coupling member of a power output drive shaft of said reduction gear drive assembly for delivering rotational power to a rotatable load coupling member of said power output drive shaft, assembly, said drive shaft assembly having a front bearing mounting portion rotatably mounted within a front bearing means, said bearing means being mounted within a front bearing chamber portion of a housing front member, said shaft assembly having a rear bearing mounting portion rotatably mounted within a rear bearing means, said bearing means being mounted within a rear bearing portion of a rear housing member, said reduction gear drive assembly further including a load torque change indicating means for indicating changes in load torque of a load applied to said load coupling member;

c. a power demand sensor means for detecting changes indicated by said load torque change indicating means and converting said changes into an electrical power demand signal and conducting said demand signal to an electrical control means, said electrical control means step-wise successively energizing the one or more power boost gas turbine assemblies for augmenting power output of the continuously energized one or more primary power turbine assemblies as power output requirements increase by opening a fuel valve means in the said fuel delivery system, one valve for each power boost turbine assembly energized, thereby permitting fuel to be injected into the energized power boost turbine assemblies as said assem-

blies are successively energized in accordance with detected power demand requirements and further for stepwise closing successively said valves in the fuel delivery system as power output requirements are decreased and power augmentation is no longer required;

- d. a mounting bar means for mounting compressor housings of each of the said turbine assemblies thereto, said bar further having means for mounting onto a front engine mounting means for front mounting the engine in a vehicle, said turbine housings for each of the turbine assemblies have rear mounting means for fixedly mounting the turbine assemblies to said front gear reduction housing member whereby gear teeth of the said pinion gears are inserted into said housing and mesh drivingly with said drive gear teeth thereby providing for synchronous rotation of rotating parts of said power boost turbine assemblies with rotating parts of said primary turbine assemblies, said reduction gear housing further providing a transmission mounting means on said rear housing member for mounting to a vehicle rear mounting means, and means for coupling said drive shaft coupling member to a conventional vehicle transmission; and
- e. a starter means rotatably drivingly coupled to said drive gear for rotating said drive gear for starting the engine upon opening a primary fuel valve of said fuel delivery means and energizing a primary burner can igniter means upon energizing said electrical ignition control means, and said electrical control means.

#### 4,159,624 CONTRA-ROTATING ROTORS WITH DIFFERENTIAL GEARING

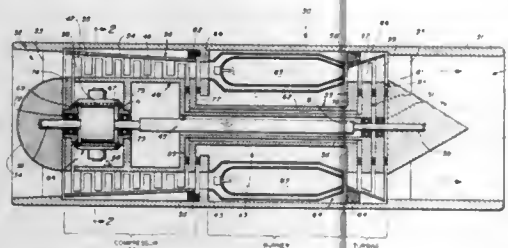
George P. Gruner, 13 Bradley Rd., Andover, Mass. 01810

Filed Feb. 6, 1978, Ser. No. 875,046

Int. Cl.<sup>2</sup> F02C 7/02

U.S. Cl. 60—39.16 C

7 Claims



1. A gas turbine power plant of the type having an elongated casing with an air intake end, a gas discharge end, a centrally located burner chamber, a compression stage between the air intake end and the burner chamber, a turbine stage between the gas discharge end and the burner chamber, a fixed shaft extending axially of said casing from said intake end to said discharge end, said plant characterized by;

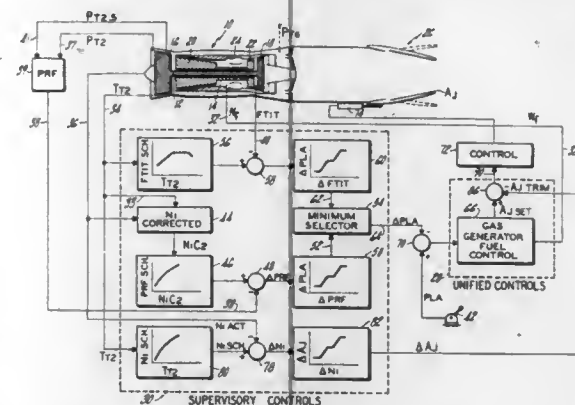
an inner vaned rotor mounted on bearings supported on said shaft for rotation therearound said rotor having outward projecting spaced vanes in said compression stage and in said turbine stage rotatable as a unit;

an outer vaned rotor mounted on bearings supported on said shaft for rotation therearound, said rotor having inward projecting spaced vanes in said compression stage and in said turbine stage rotatable as a unit;

the vanes of said inner rotor alternating with the vanes of said outer rotor and being interdigitated therewith and differential gear means operably connecting said inner vaned rotor to said outer vaned rotor to rotate in mutually opposite angular directions around said fixed shaft.

#### 4,159,625 CONTROL FOR GAS TURBINE ENGINE

Walter B. Kerr, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.  
Filed Feb. 1, 1977, Ser. No. 764,610  
Int. Cl.<sup>2</sup> F02K 3/02; F02C 9/08  
U.S. Cl. 60—204 9 Claims



1. Control means for controlling a twin-spool gas turbine engine during a subsonic or transonic flight mode having variable area exhaust nozzle powering aircraft, said twin spool including a fan driven by a low turbine, and a compressor driven by a high turbine, and burner means for generating hot gases for driving said turbine, engine control means independently controlling the flow of fuel to said burner and controlling the area of said variable exhaust nozzle, said control means including means responsive to a pressure ratio across a station in said engine for generating a first signal, means responsive to engine rotor speed and engine inlet temperature for generating a second signal indicative of a schedule of said pressure ratio, means responsive to said first signal and said second signal for generating a third signal indicative of pressure ratio error, and means responsive to a function of said third signal for generating a fourth signal for biasing said independent engine control means to further adjust said fuel flow to maintain the pressure ratio schedule of said second signal.

#### 4,159,626 SECONDARY AIR CONTROL VALVE DEVICE

Norio Shibata, and Tatsumi Furukubo, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

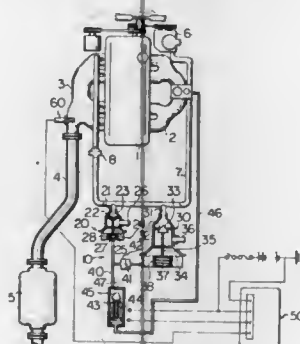
Filed Oct. 4, 1977, Ser. No. 839,290

Claims priority, application Japan, Aug. 27, 1977, 52-102185

Int. Cl.<sup>2</sup> F01N 3/10

U.S. Cl. 60—276

10 Claims



1. A secondary air control device disposed in a system for supplying secondary air into an exhaust system of an internal combustion engine, which exhaust system is provided with a catalytic converter for purifying exhaust gas emitted from said engine, said secondary air control device being actuated by an

ON-OFF vacuum signal for controlling the amount of said secondary air supplied, wherein said secondary air control device is characterized by:

- a first valve means actuated by said ON-OFF vacuum signal for stepwisely controlling the flow of secondary air in response to said ON-OFF vacuum signal, and;
- a second valve means, which is a delay system with a predetermined delay time, actuated by said ON-OFF vacuum signal for controlling the flow of secondary air, whereby said secondary air control device can control the flow of secondary air, which comprises a step flow generated by said first valve means and a delayed flow generated by said second valve means, in accordance with said ON-OFF vacuum signal.

#### 4,159,627 EXHAUST PIPE FOR AN INTERNAL COMBUSTION ENGINE

Werner Mönch, Ilvesheim, and Walter Ziemer, Viernheim, both of Fed. Rep. of Germany, assignors to Motoren-Werk Mannheim AG vorm. Benz Abt. Stat. Motorenbau, Mannheim, Fed. Rep. of Germany

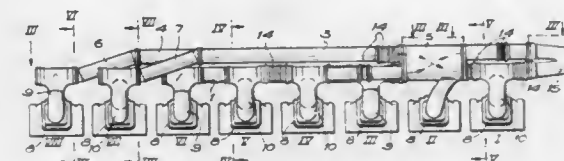
Filed May 20, 1977, Ser. No. 799,122

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625788

Int. Cl.<sup>2</sup> F01N 7/10

U.S. Cl. 60—322

7 Claims



1. An exhaust arrangement for connecting an exhaust gas outlet of each of a plurality of in-line cylinders of a turbo-supercharged internal combustion engine to a turbine of an exhaust-gas turbo-supercharger, the exhaust arrangement comprising: four separate pipes having first and second ends and including parallel portions extending rectilinearly over a major part of the lengths of the pipes, the pipes being arranged so that the axes of said parallel portions are located at the corners of a substantially equal sided quadrilateral having one side positionable adjacent said gas outlets and an opposite side positionable remote from said gas outlets; a plurality of branch, pipes each of said branch pipes connecting the exhaust-gas outlet of each cylinder to one of said first-mentioned pipes, each of said branch pipes leading to one of the two corners of said one side of the quadrilateral; a connecting part provided is said first-mentioned pipes intermediate said first and second sides; and upstream and downstream parts of said first-mentioned pipes interconnected by said connecting part, said connecting part being arranged to twist said first-mentioned pipes whereby the parallel portions of said upstream part and associated with said opposite side of the quadrilateral communicate with the parallel portions of said downstream part and associated with said one side of the quadrilateral; an expansion member positioned in each of said first-mentioned pipes between junctions of said branch pipes; two of said first-mentioned pipes leading to two cylinders farthest from an outlet of said first-mentioned pipes extending obliquely from respective branch pipes to two corners of said opposite side of said quadrilateral; said connecting part being an integral uniform casting comprising helically twisted dividing walls arranged in form of a cross and one outside wall, said connecting part having an axial extent only in the region of one cylinder and connecting to only one of said branch pipes; said branch pipes comprising a plurality of pairs of pipe members of substantially equal length.

#### 4,159,628 TORQUE CONVERTER WITH AN IMPROVED HOUSING CONSTRUCTION

Kazuyoshi Hiraiwa, Ome, and Kotel Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

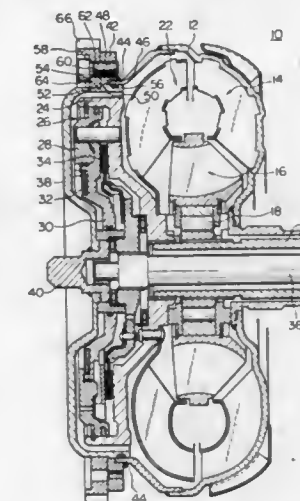
Filed Jul. 14, 1977, Ser. No. 815,942

Claims priority, application Japan, Jul. 14, 1976, 51-92729[U]

Int. Cl.<sup>2</sup> F16D 33/00; F16L 23/00

U.S. Cl. 60—364

6 Claims



1. A torque converter having first and second housings which are respectively formed with first and second open ends connectable with each other to form therein an enclosed chamber, said first housing being provided at the inner surface thereof with a plurality of blades forming an impeller and said second housing being firmly connected to an engine driven shaft to be rotatable therewith, said torque converter comprising:

a first annular portion forming said first open end of said first housing;

a second annular portion forming said second open end of said second housing and including a first cylindrical section snugly disposed in said first annular portion, and a second cylindrical section the diameter of which is smaller than that of said first cylindrical section thereby forming a step portion between said first and second cylindrical sections;

a first ring member firmly and coaxially mounted on said first annular portion;

a second ring member coaxially but snugly mounted on said second cylindrical section and formed at the outer cylindrical surface thereof with a plurality of external teeth which are adapted to be meshingly engaged with an engine starter gear, the inner diameter of said second ring member being smaller than the outer diameter of said first cylindrical section;

a sealing member disposed between said first annular portion and said first cylindrical section; and means for detachably connecting said second ring member to said first ring member in such a manner that said second ring member abuts upon the step portion.

#### 4,159,629 APPARATUS FOR THE COLLECTION AND CONVERSION OF SOLAR ENERGY

Abraham L. Korr, Philadelphia, Pa.; Evan H. Walker, Aberdeen, Md., and Bernard T. Svibel, Laverock, Pa., assignors to A. L. Korr Associates, Inc., Philadelphia, Pa.

Filed Mar. 30, 1977, Ser. No. 783,069

Int. Cl.<sup>2</sup> F03G 7/02; F24J 3/02

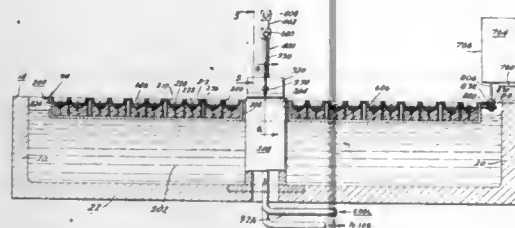
U.S. Cl. 60—641

22 Claims

16. In combination with a farm irrigation system comprising



pump means for pumping irrigation water and water reservoir means for storing irrigation water, and an energy source for operating said pump means, the improvement wherein said energy source comprises at least one array of solar radiation reflectors for focusing solar radiations in the region of the foci of said reflectors, radiation-absorbent means positioned at said foci for developing thermal energy in response to said focused solar radiations, common platform means supporting said reflectors and said radiation-absorbent means, means for rotating said platform means about a substantially vertical axis to cause said reflectors to track the apparent daytime motion of the sun and maintain said solar radiations focused on said radiation-



absorbent means, energy conversion means responsive to thermal energy of high temperature for producing useful work, and means for conveying to said energy conversion means said thermal energy developed by said radiation-absorbent means; wherein said platform means comprises a toroidal boat floating upon water in said reservoir means, said energy source also comprising column means extending from the earth to said platform means for stabilizing it against tilt and against lateral motion, said column means extending slidably into the opening in the center of said boat, whereby said boat can rise and fall in accordance with the changes in the level of said reservoir water.

4,159,630

# ASSEMBLY SUCH AS FOR A TILE CHUTE TOOL FOR USE WITH A DITCHING OR TRENCHING MACHINE

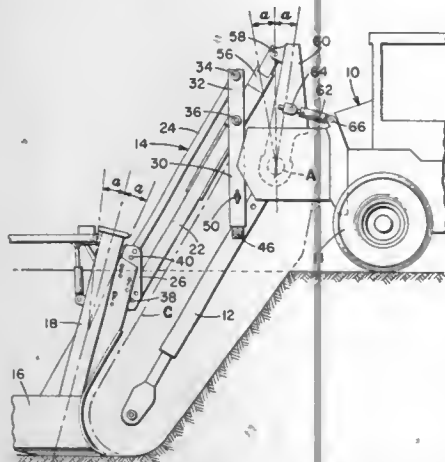
Kenneth W. Schuermann, Perry, Okla., assignor to The Charles Machine Works, Inc., Perry, Okla.

Filed Aug. 2, 1977, Ser. No. 821,308

Int. Cl.<sup>2</sup> F16L 1/02

U.S. Cl. 405—174

4 Claims



1. An assembly such as for a tile chute tool to be attached to the digging boom and mobile chassis of a ditching or trenching machine comprising:

a four-bar linkage in the form of a parallelogram having an element such as a tile chute tool carried by one of the members of said linkage, means for pivotally connecting said linkage to the mobile chassis of the machine, said connecting means extending

from said linkage for attachment to a tiltable control lever supported relative to the mobile chassis of the ditching or trenching machine,

extensible means for pivotally connecting said linkage to the digging boom, said extensible means including a pair of parallel telescoping arms, two of the members of said four-bar linkage extending between said arms and being pivotally connected to said arms at spaced positions defining a portion along the length of each of said pair of arms which portion forms another member of said linkage, said two of the members being pivotally connected at spaced positions on the linkage member carrying said element, and

releasable means associated with said extensible means to retain it at a fixed length against extending movement to retain the boom and said linkage in a predetermined operating relationship to each other but being releasable to permit the boom to proceed with digging independent of the assembly position.

4,159,631

# PERFUMED VAPOR DISPENSING JEWELRY

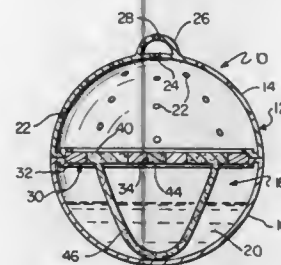
Ki S. Lee, 1010 Fanshawe St., Philadelphia, Pa. 19111

Filed Jun. 1, 1978, Ser. No. 911,490

Int. Cl.<sup>2</sup> A61L 9/04

U.S. Cl. 63—1 R

10 Claims



1. An article of jewelry for dispensing perfumed vapors, the combination comprising:

a hollow housing having upper and lower portions coupled together to form said housing, said lower portion forming a reservoir for containing a quantity of perfume; coupling means attached to said housing for coupling the jewelry to another object;

a central disc located inside said housing;

support means for supporting said disc in said housing;

a plurality of orifices located in said housing upper portion through which perfumed vapors may exit;

a central orifice located in said housing upper portion through which perfume may be introduced into said housing;

said disc having a plurality of cutouts, each said cutout being filled with absorbent material; and

wick means extending from said absorbent material into said lower portion.

4,159,632

# AUTOMATIC CLEANING APPARATUS

Frederick W. Grantham, 12055 Goshen Ave., Los Angeles, Calif. 90066

Filed Nov. 22, 1976, Ser. No. 743,965

Int. Cl.<sup>2</sup> D06F 15/00

U.S. Cl. 68—9

28 Claims

1. Automated laundry apparatus, which comprises:

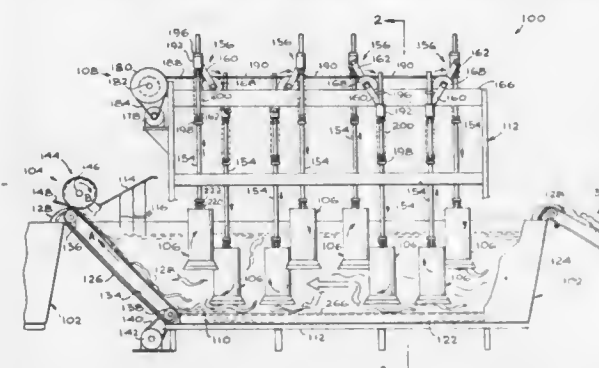
at least one tank adapted for containing a liquid and articles to be laundered;

a plurality of plungers movable relative to the tank for processing articles within the tank, said plungers comprising a piston, a cylinder encasing said piston and axially mov-

able relative thereto, and means for engaging the cylinders by the pistons to cause movement of the cylinders by movement of the pistons;

means for selectively driving the plungers to process said laundry articles including a plurality of piston rods, each coupled to an associated piston, for driving the plungers in generally vertical reciprocating motion relative to the tank and means for driving the plungers in a selected phase relationship relative to each other;

the driving means further including a rotatable crank having rotatably connected to each opposite end portion thereof an upper end portion of one of the piston rods, the end portions of the crank being laterally offset on a crankshaft, and a driving member affixed to a central portion of the crankshaft; the crank having sleeves slidably mounted



over upper end portions of the piston rods, the sleeves being rotatably mounted to the end portions of the crank and further including selectively movable upper and lower slidable stops affixed to each piston rod for limiting the extent of sliding of the piston rods through the sleeves, an upper stop being mounted above a corresponding sleeve and a lower stop being mounted below the corresponding sleeve, and a compression spring installed around each connecting rod between a lower portion of the sleeve and the lower stop, the spring thereby biasing the associated piston rod downwardly;

means for rotatably driving the driving member to thereby cause rotation of the crank and reciprocating motion of the piston rods connected thereto; and control means for controlling the driving means.

4,159,633

# METALLIC ROD PRODUCT, AND METHOD FOR PRODUCING SAME

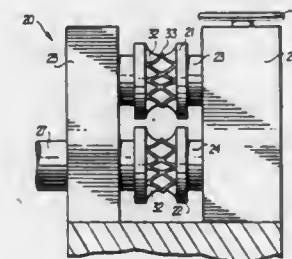
Robert S. Linne, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 749,570, Dec. 10, 1976, Pat. No. 4,087,898, which is a continuation-in-part of Ser. No. 598,976, Jul. 24, 1975, abandoned, which is a division of Ser. No. 543,058, Jan. 22, 1975, abandoned. This application Feb. 9, 1978, Ser. No. 876,400

Int. Cl.<sup>2</sup> B21H 8/02

U.S. Cl. 72—198

5 Claims



1. Apparatus for producing an improved metallic rod prod-

uct intended for subsequent drawing into wire through a die comprising:

means for providing a smooth surfaced metallic rod product substantially free of protrusions at a hot-forming temperature,

means for passing the rod product in rolling relation between rotating roll means having surfaces characterized by a number of protrusions extending outwardly from a rod rolling surface which is otherwise substantially smooth so that the exterior surface of said rod product is formed to a texture complementary to the texture of the rolling surfaces of said rolls,

said roll means having a rod rolling surface which is uniformly covered with a network of substantially interconnected ridges.

4,159,634

# TOGGLE MECHANISM FOR PINCHING METAL TUBES

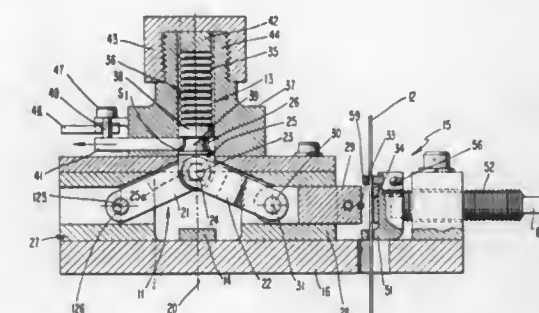
Edwin O. Stengard, College Park, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 19, 1978, Ser. No. 909,100

Int. Cl.<sup>2</sup> B21J 7/00; F16L 15/10

U.S. Cl. 72—436

8 Claims



1. Apparatus for pinching a metal tube and for maintaining the tube in a pinched condition without fracturing the tube comprising a stop block against which a first side of the tube bears, a toggle mechanism including: a plunger translatable along a longitudinal axis, a first link having a longitudinal axis and first and second ends respectively pivoted about a fixed first axis at right angles to the longitudinal axis of the plunger and a second axis through the plunger, the first and second axes being parallel to each other, a second link having a longitudinal axis and a first end pivoted about the second axis and a second end free to translate along a line at right angles to the longitudinal axis of the plunger and the second axis, a push link extending from the free end of the second link toward a second side of the tube opposite from the first side, said toggle mechanism having an initial position so the second axis is at first position on one side of an aligned position for the longitudinal axes of the first and second links and a free end of the push link is proximate the second side of the tube; a stored, potential energy source for suddenly and irreversibly driving the plunger along its longitudinal axis so the second axis is at a second position slightly on the other side of the aligned position for the longitudinal axes of the links and the free end of the push link abuts against the second side of the tube to pinch the second side of the tube against the first side of the tube; and means for limiting the longitudinal translation of the plunger so the second axis remains at the second position and the free end of the push link remains abutted against the second side of the tube to continue to pinch the second side of the tube against the first side of the tube.

4,159,635

## ISOKINETIC AIR SAMPLER

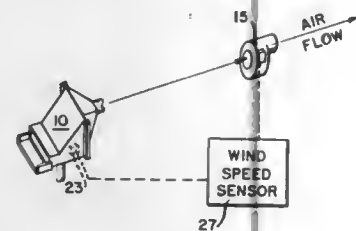
George A. Schmel, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 24, 1978, Ser. No. 936,461

Int. Cl.<sup>2</sup> G01N 15/00

U.S. Cl. 73-28

6 Claims



1. An isokinetic air sampler comprising a filter, a holder for the filter, means for drawing air through the filter at a fixed, predetermined rate, an inlet assembly for the sampler having an inlet opening therein of less cross-sectional area than the filter, the size of the opening being such that isokinetic air sampling is obtained at a particular air speed, a closure for the inlet opening and means for simultaneously opening the closure and operating the means for drawing air through the filter when the air speed is such that isokinetic air sampling is obtained.

4,159,636

## METHOD FOR CONTINUOUSLY MONITORING THE CLEARANCES IN ROTATING EQUIPMENT BY FLOW MEANS

Jan Jicha; Karel Kopecek, both of Brno, and Bretislav Langer, Zebetin, all of Czechoslovakia, assignors to Prvni Brnenska strojirna, narodni podnik, Brno, Czechoslovakia

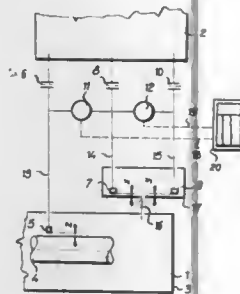
Filed Apr. 12, 1978, Ser. No. 895,599

Claims priority, application Czechoslovakia, Apr. 16, 1977, 2513/77

Int. Cl.<sup>2</sup> G01B 13/12

U.S. Cl. 73-37.6

2 Claims



1. An apparatus for the continuous measurement of clearances, gaps and feeds between moving and stationary machine parts which comprises three paths for compressible fluid flow between a first pressure area between the moving part, whose clearance is to be monitored and the stationary part, to a second pressure area, said first flow path comprising a first measuring nozzle mounted on the stationary part with its orifice facing the moving part, a first conveying means connected to said first measuring nozzle for conveying the compressible fluid between the first pressure area to said second area, said first conveying means having a first measuring orifice mounted therein between the measuring nozzle and the second pressure area and having a first side of a first differential pressure measuring means interconnected with said first conveying means between the first measuring nozzle and the first measuring orifice, a second fluid conveying means open to the fluid in the

area between the moving part and the stationary part, which clearance is to be monitored; a second measuring nozzle mounted with its orifice facing in a surface and adapted to convey a portion of the fluid in said second fluid conveying means through a third fluid conveying means between the second pressure space and the first pressure space, said third fluid conveying means having connected therewith a second side of said first differential pressure measuring means and a first side of a second differential pressure measuring means interconnected with said third fluid conveying means between said second measuring nozzle and said orifice of said second measuring nozzle; a third measuring nozzle mounted with its orifice facing a surface and adapted to convey a portion of the fluid in said second fluid conveying means through a fourth fluid conveying means between the second pressure space and the first pressure space, said fourth fluid conveying means having connected therewith a third measuring orifice, said second side of said second differential pressure measuring means being interconnected with said fourth fluid conveying means between said third measuring nozzle and said third measuring orifice whereby the clearance between the stationary and moving parts can be measured by the differential pressures measured by the two differential pressure measuring means.

4,159,637

## HYDRAULIC TEST TOOL AND METHOD

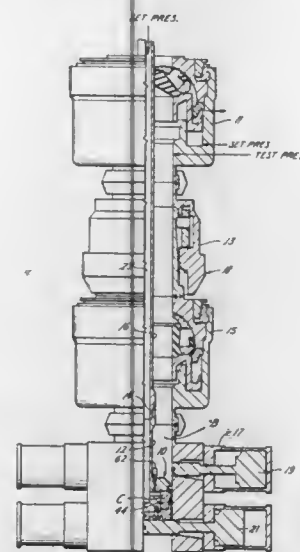
Raymond K. Lamb, and Stephen J. Walker, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Dec. 5, 1977, Ser. No. 857,159

Int. Cl.<sup>2</sup> G01M 3/28

U.S. Cl. 73-46

15 Claims



1. A test tool for hydraulic testing of apparatus having a bore and a landing area comprising, a housing adapted to fit within the bore, means on the housing for connection to pipe having a passage therethrough for lowering and raising the housing in the bore, the housing including a sleeve movable with respect to the housing, the housing and sleeve having annularly extending and facing shoulders, packing disposed between the shoulders adapted to be compressed and expanded into sealing engagement with the cylindrical bore on movement of the shoulders toward each other, means in the housing for applying hydraulic pressure to the sleeve, a landing surface on the housing adapted to land on the

4,159,639

## APPARATUS AND METHOD FOR MEASURING THE DEGREE OF REFINING OF PULP FIBERS IN THE PREPARATION OF FURNISH FOR PAPER MAKING

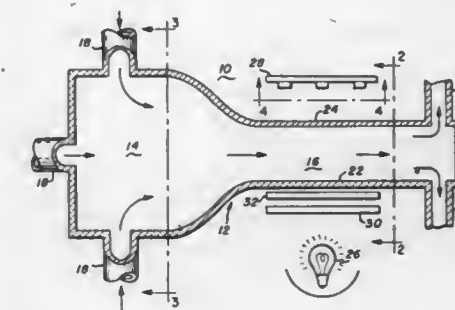
Romilly J. Simms, Menlo Park, and Byron K. Madsen, Saratoga, both of Calif., assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,817

Int. Cl.<sup>2</sup> G01N 15/04

U.S. Cl. 73-63

11 Claims



1. The method of measuring the quality of a refined pulp suspension comprising the steps of: preparing a sample of the refined pulp suspension having a preselected consistency which is less than normal consistency; agitating the sample so that the fibers are uniformly distributed throughout the volume of the sample; discontinuing agitation to allow the fibers in the pulp suspension to settle; measuring a descent characteristic of the fiber-water interface in the pulp suspension; and using that descent characteristic to determine the quality of the pulp suspension.

4,159,640

## APPARATUS FOR MEASURING THE CONSISTENCY OR HARDNESS OF A MATERIAL

Jean-Luc Lévêque, Montfermeil; Gilbert Gras, Aulnay-Sous-Bois, and Jean Scot, Paris, all of France, assignors to L'Oreal, Paris, France

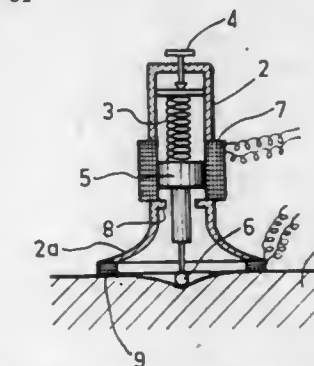
Filed Mar. 1, 1978, Ser. No. 882,163

Claims priority, application France, Mar. 4, 1977, 77 06505

Int. Cl.<sup>2</sup> G01N 3/42

U.S. Cl. 73-81

14 Claims



landing surface in the bore restricting downward movement of the housing after such landing, a passage in the housing communicating with the passage in the string of pipe and with the means for applying hydraulic pressure to the sleeve, a pressure-relief valve disposed on the housing above the packing operable to open at a pre-determined pressure and being in fluid communication with the passage in the housing, whereby the test tool can be lowered in the bore, landed on the landing area in the bore, hydraulic pressure then applied in the passages in the pipe and thus in the housing, a seal effected in the bore by the packing, and hydraulic testing pressure applied to the bore above the packing through the relief valve.

4,159,638

## THERMISTOR DETECTOR CIRCUIT AND DISCRIMINATING NETWORK FOR HEAT ABSORPTIVE MEDIA

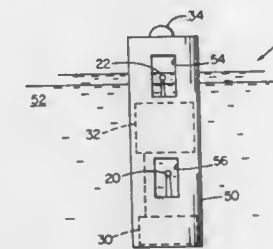
Bronson M. Potter, R.F.D. 1, Greenville, N.H. 03048

Continuation-in-part of Ser. No. 752,199, Dec. 20, 1976, Pat. No. 4,116,045, and a continuation-in-part of Ser. No. 785,347, Apr. 7, 1977. This application Aug. 18, 1977, Ser. No. 825,670

Int. Cl.<sup>2</sup> G01N 25/18; G01F 1/00; G01W 1/00

U.S. Cl. 73-61.1 R

20 Claims



1. A detector to discriminate at least one condition from a set of two or more different conditions of a heat absorptive medium that are related to heat transfer properties, comprising an electrical sensing network that includes a set of monitoring elements corresponding to the number of said conditions, each said element of said set disposed in a different relationship to said set of conditions and each said element having an electrical characteristic that changes as a single valued function of temperature, a restorative energizing circuit supplying heating power to said overall network, said circuit including reference means representing a predetermined desired value for the electrical characteristic of said overall network and responsive to change in the actual value of said characteristic of said overall network from said predetermined value to vary the flow of power to said network in the manner to restore said actual value of said characteristic of said overall network toward said predetermined value, and means to derive an output signal dependent upon the actual values of said characteristics of said individual elements and related to the thermal loss of each of said individual elements to said medium, and indicating said one condition.

1. Apparatus for measuring the hardness of a material by application of the apparatus against the material to be tested, comprising (a) a support (b) feeler means carried by said support for displacement relative to said support, (c) means for causing said feeler means to bear on the said material with a predetermined force; (d) a pressure sensor carried by said support for sensing the bearing pressure of the apparatus on said material and for providing an output signal indicative of the sensed pressure, and (e) means for selectively and automatically detecting the displacement of the feeler means only for a predetermined value  $P_0$  of the bearing pressure of the appa-



tus on the material sensed by the pressure sensor, said means comprising, means for comparing the output signal of the pressure sensor with a predetermined threshold and for actuating an indicator to indicate the detected displacement of the feeler means when said output signal reaches the threshold.

4,159,641

**VIBRATING WIRE STRESS METER**

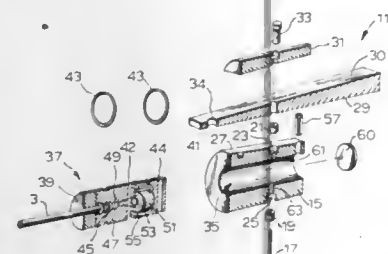
Ivor Hawkes, Lyme, N.H., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 3, 1974, Ser. No. 502,265

Int. Cl.<sup>2</sup> G01B 7/16

U.S. Cl. 73—778

6 Claims



1. A combined vibrating wire stress meter and mount assembly comprising:

an elongated cylinder having a major hollow inner portion which extends substantially the entire length thereof; a highly tensioned wire transversely intersecting said hollow portion, said wire being anchored into opposite walls of said cylinder by two tubes which have been extruded over the opposite ends of said wire;

electromagnetic actuating means contained in said hollow cylinder portion for causing said wire to vibrate at a known frequency, said actuating means being capable of detecting variations from said known frequency caused by forces acting on the cylinder; and

means for fixedly mounting said cylinder into a borehole, said mounting means being in contact with the outer surface of the cylinder.

4,159,642

**AIRCRAFT TRANSMISSION TEST SET**

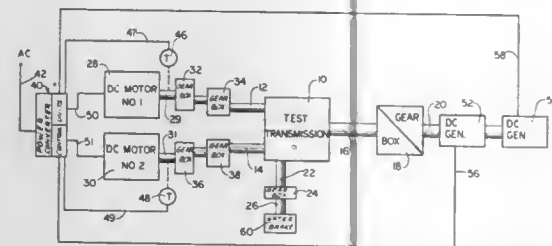
George S. Hudson, Hamden, and Madan M. Roy, Milford, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Mar. 2, 1978, Ser. No. 882,870

Int. Cl.<sup>2</sup> G01M 13/02

U.S. Cl. 73—118

8 Claims



1. A test set for performing life cycle measurements on a large sized transmission having ratio changing gearing therein, said transmission including at least one input shaft, each such input shaft being useful for receiving driving power from an engine source, said transmission including both a main output shaft and an auxiliary output shaft, said test set comprising:

at least one variable speed DC motor, each of said motors having voltage input terminals and having an output shaft, said output shaft being connected by first coupling means

to an input shaft of said transmission, each of said motors being sized to equal the full load power rating of the transmission input shaft to which said motor is coupled; a power converter having as many sets of DC voltage output terminals as there are DC motors, each of such sets of terminals encircuited with the input terminals of each of said variable speed DC motors, the input of said power converter being encircuited with a prime power source; means for monitoring the rotational speed of each of said motor output shafts, said means including generation of a voltage output signal whose parameters are proportional to the rotational speed of said motor output shaft, said output signal being encircuited to provide a feedback control voltage to said power converter for use in correcting the speed of each of said DC motors;

power absorbing means coupled to the auxiliary output shaft of said transmission for loading the auxiliary output to its full rated value; and

generator means drivingly coupled to the main output shaft of said transmission, said generator means being sized to equal the full power rating of said transmission, said generator means having output terminals for supplying electric energy to a load, said load serving to load down said transmission, the magnitude of said load being adjustable by control of the field current of said generator means, the output terminals of said generator means being encircuited to supplement the power drain from said prime power source whereby the net system power consumption is only the amount needed to overcome test set and transmission internal losses.

4,159,643

**METHOD OF AND APPARATUS FOR MEASURING BOTTOM HOLE WELL PRESSURE**

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jul. 31, 1978, Ser. No. 929,154

Int. Cl.<sup>2</sup> E21B 47/06

U.S. Cl. 73—155

12 Claims



1. A method of measuring bottom hole pressure in the tubing of a well comprising

install an isolation assembly in the tubing by a locking seal device, said assembly including first and second ports in communication between the interior of the assembly and the interior of the tubing, said first port being open for flowing through the first port,

releasably install a sensor prong in the isolation assembly

including a pressure measuring instrument which is connected to the prong, close the first port in the assembly by actuation of the prong, measuring through the second port the pressure below the assembly by the pressure measuring instrument, after completion of the measurement, retrieve the measuring instrument.

4,159,644

**SHIP'S LOG AND SPEEDOMETER**

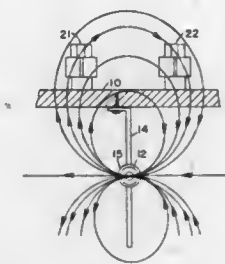
Carl G. Svala, 79 William St., Norwalk, Conn. 06851

Filed May 15, 1978, Ser. No. 906,075

Int. Cl.<sup>2</sup> G01C 21/10

U.S. Cl. 73—187

15 Claims



7. A ship's log for measuring the distance traveled by a vessel through water comprising:

a rotator assembly adapted to be mounted outside the hull of a vessel and below its water line, said assembly comprising a shaft, low-friction bearing means supporting said shaft, a vane rotator for turning said shaft in response to movement through the water, and a permanent magnet affixed to said shaft with its axis of magnetization oriented in a plane substantially at right angles to said shaft;

a balanced pair of magnetometers adapted to be mounted inside the hull of said vessel substantially in said plane and substantially equidistant from said shaft, said magnetometers being in sufficiently close proximity to said magnet to respond to its magnetic field;

electrical circuit means for providing energizing current to said magnetometers and interconnecting them so that their output signals due to said field are added electrically; said magnetometers and circuit means generating a resultant electrical signal that has cyclic variations which are a direct function of the rotation of said magnet; phase detection means energized by said circuit means for detecting phase reversals in said signal due to said rotation;

digital means for counting and displaying the number of phase reversals with the proper scaling factor, as determined by the pitch of said vane rotator, thereby to represent the nautical distance travelled by said vessel through the water.

4,159,645

**ELECTROMAGNETIC FLUID FLOW METER WITH TOLERANCE TO SPURIOUS SIGNALS**

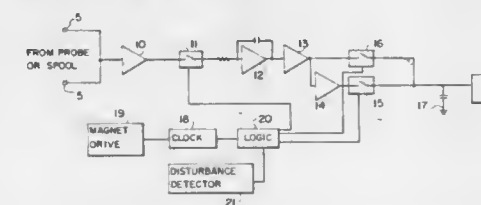
Vincent J. Cushing, Northbrook, Ill., assignor to Monitek, Inc., Redwood City, Calif.

Filed Nov. 11, 1977, Ser. No. 850,521

Int. Cl.<sup>2</sup> G01F 1/58

U.S. Cl. 73—194 EM

16 Claims



1. An electromagnetic flow meter for measuring fluid flow

velocities by use of electromagnetically induced voltages having a signal processing chain including sensing electrodes and an amplifier coupled thereto, a sampling switch coupled to said amplifier for sampling said amplifier, signal processing means coupled to said sampling switch, a phase sensitive demodulator coupled to said signal processing means and at least one utilization circuit coupled to said phase sensitive demodulator, wherein the improvement comprises means for disabling said demodulator in the presence of spurious signals and a storage device for providing to said utilization circuit a signal representative of flow velocity prior to the disablement of said phase sensitive demodulator.

4,159,646

**APPARATUS FOR MEASURING THE FLOW QUANTITY OR ASSOCIATED PARAMETERS OF A LIQUID WITH TWO ULTRASONIC TRANSDUCERS**

Mogens T. Paulsen, and Bertel Birker, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

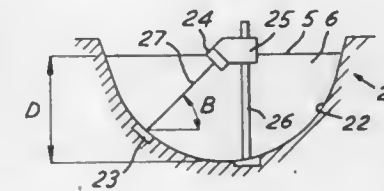
Filed Jan. 20, 1978, Ser. No. 870,990

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703439

Int. Cl.<sup>2</sup> G01F 1/66

U.S. Cl. 73—194 A

2 Claims



1. Apparatus for measuring the flow quantity or associated parameters such as depth of liquid and mean flow speed of a liquid flowing with a free surface in a channel, comprising, a channel through which a liquid is flowable, two ultrasonic transducers operating alternately with respect to each other as transmitter and receiver, one of said transducers being mounted in the defining wall of said channel below the intended surface level of said liquid, a float member floatable on the surface of said liquid, said other transducer being mounted on said float member, said float member being positioned so that said transducers are spaced from each other and form between each other a measuring path with a component in the direction of flow, a measuring circuit for determining the transit times of the ultrasonic waves in both directions, an evaluating circuit for determining the desired quantities with regard to said transit times, and each said transducer emitting a sound cone with a sufficient aperture angle so that within the range of expected liquid level fluctuations the receiving transducer is still within the reflection space of the emitting sound cone.

4,159,647

**APPARATUS FOR MEASURING THE FLOW QUANTITY OR ASSOCIATED PARAMETERS OF A LIQUID WITH TWO ULTRASONIC TRANSDUCERS**

Mogens T. Paulsen, and Bertel Birker, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jan. 20, 1978, Ser. No. 870,991

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703439

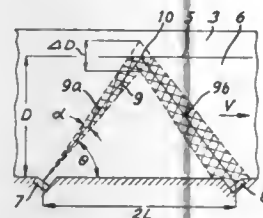
Int. Cl.<sup>2</sup> G01F 1/66

U.S. Cl. 73—194 A

7 Claims

1. Apparatus for measuring the flow quantity or associated parameters such as depth of liquid and mean flow speed of a liquid flowing with a free surface in a channel, comprising, a channel through which a liquid is flowable, two ultrasonic transducers operable alternately with respect to each other as

transmitter and receiver, said transducers being mounted in longitudinally spaced relation to each other in the defining wall of said channel below the intended surface level of the liquid, said transducers being mutually positioned and directed so that the effective measuring path therebetween is reflected from the underside of the liquid surface level and has components in the vertical direction and in the direction of flow, a



measuring circuit for determining the transit times of the ultrasonic waves in both directions, an evaluating circuit for determining the desired quantities with regard to said transit times, and each said transducer emitting a sound cone with a sufficient aperture angle so that within the range of expected liquid level fluctuations the receiving transducer is still within the reflection space of the emitting sound cone.

4,159,648

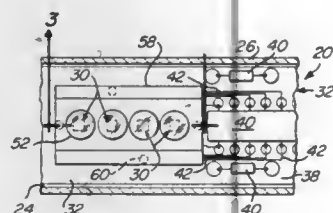
#### ELECTRICAL CIRCUIT BOARD WITH DIRECTLY ATTACHED DISPLAY UNIT AND METHOD OF ASSEMBLING SAME

Howard S. Prosky, Arapahoe County, Colo., assignor to Electromedics, Inc., Denver, Colo.

Filed Nov. 3, 1977, Ser. No. 848,090

Int. Cl.<sup>2</sup> G01K 7/00

U.S. Cl. 73—362 AR



11. An electronic thermometer utilizing an electrical circuit assembly therein, said electrical circuit assembly comprising: at least one display unit including a plurality of individual light emitting elements, said light emitting elements each include light emitting diode segments, an electrical circuit board having a component mounting surface of substantially larger area than said display unit, means for directly and permanently affixing said display unit to the component mounting surface of said circuit board, a plurality of electrical conductors permanently attached to the component mounting surface of said circuit board, at least a few of said electrical conductors being positioned on said component mounting surface proximate to said display unit, and at least a few of said electrical conductors extending to positions on said component mounting surface separated from said display unit, means for electrically connecting each light emitting diode segments of said display unit to an electrical conductor attached proximate to said display unit, at least one electronic component other than said display unit positioned on said component mounting surface of said circuit board and separated from said display unit, said electronic component including at least one electrical lead conductor extending therefrom, and means electrically connecting said component lead conduc-

tor to at least one electrical conductor attached to said circuit board at a position separated from said display unit.

4,159,649

#### APPARATUS FOR THE GENERATION OF SPECIFIED DEFORMATIONS IN SPECIMEN

Eckard Feldmann, Feldstedter Weg 6, D 1 Berlin 49, Fed. Rep. of Germany

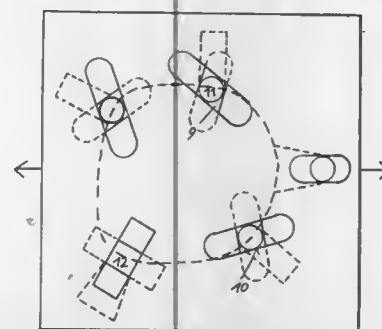
Filed Oct. 31, 1977, Ser. No. 813,752

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645474

Int. Cl.<sup>2</sup> G01N 3/08

U.S. Cl. 73—788

8 Claims



1. Apparatus for the generation of definite homogeneous and nonhomogeneous deformations in a specimen, the apparatus consisting of bars and plates having parallel bordered slots, characterized by two pairs of plates, each of the plates of one pair belonging to a different class, the two classes differing by the geometry of slots, the plates being parallel to each other, slots belonging to different classes of plates corresponding one to one and intersecting in the projection onto a plane parallel to the plates, bars put through the intersection of corresponding slots, the bars being attached to the specimen, having an axis in the region of slots being collinear with a line in the surface of the specimen if the specimen is deformed nonsymmetrically relative to the bar, the operation of the device results in a definite deformation of the specimen if the plates of the two classes are displaced relative to each other.

4,159,650

#### WELD TESTING APPARATUS

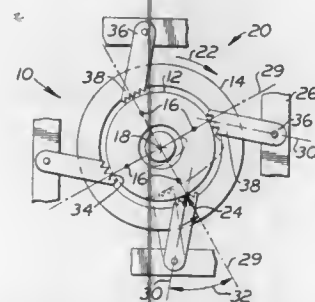
Roy L. Maguire, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1978, Ser. No. 909,758

Int. Cl.<sup>2</sup> G01N 3/22

U.S. Cl. 73—847

6 Claims



1. A testing apparatus for testing a welded assembly having first and second portions connected one to the other by welds about a common axis, comprising: means for holding one of the portions against rotation about said axis and for controllably exerting a torquing force of a preselected magnitude on the other portion, said torquing

ing force being about said axis and oriented relative to said one of the portions for controllably exerting a radial force component of a preselected magnitude through each of said welds.

4,159,651

#### FLEXURE POSITIONING MECHANISM

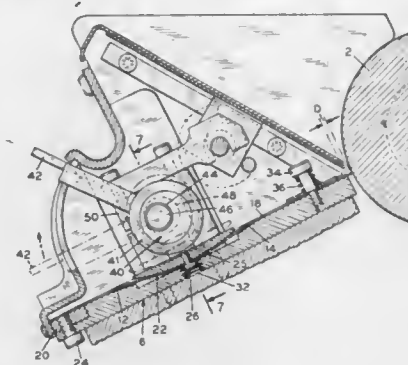
John MacPhee, Rowayton, Conn., assignor to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed May 9, 1977, Ser. No. 795,368

Int. Cl.<sup>2</sup> F16H 25/08

U.S. Cl. 74—55

14 Claims



1. A positioning mechanism comprising: (a) a stationary base member; (b) means including contoured blocks on said base in spaced apart relationship, said blocks being contoured so that the upper surfaces thereof curve toward one another; (c) a flexure beam positioned on the upper surfaces of said contour blocks; (d) means fixedly attaching one end of said flexure beam to one of said contour blocks, the other end of said flexure beam being a free end and extending beyond the other contour block; (e) means limiting the movement of the free end of said flexure beam to rectilinear movement; (f) means located between said contour block for flexing said flexure beam to thereby cause rectilinear movement of said free end of the flexure beam.

4,159,652

#### BICYCLE DRIVE ASSEMBLY

Earl M. Trammell, Jr., St. Louis, Mo., assignor to Cycle-Drive Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 417,060, Nov. 19, 1973, Pat. No. 3,906,807. This application May 31, 1977, Ser. No. 802,130

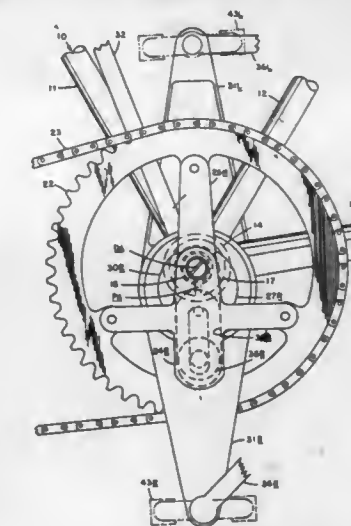
Int. Cl.<sup>2</sup> F16H 29/04

U.S. Cl. 74—117

6 Claims

1. A drive assembly for a physically propelled vehicle, comprising: (a) a drive member rotatively mounted on a drive axis, (b) a crank arm operatively connected to the drive member for rotating the drive member, (c) a power arm rotatively mounted on a power axis for relative angular movement between the power arm and crank arm, the drive axis and power axis being relatively offset, (d) a pedal means operatively connected to the power arm for rotating the power arm, (e) control means interconnecting the power arm and crank arm for rotating the crank arm and drive member, and for accelerating the power arm ahead of the crank arm during one portion of the crank arm cycle and decelerating the power arm behind the crank arm during another portion of the crank arm cycle, and

(f) power-adjusting means connected to the power arm for moving the power axis relative to the drive axis for changing the point in the cycle of the crank arm when the acceleration and deceleration of the power arm occurs.



4,159,653

#### TORQUE-EQUALIZING MEANS

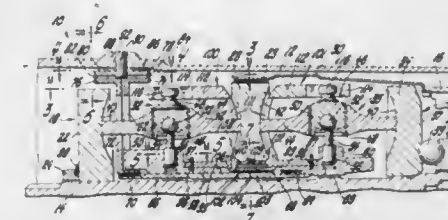
Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1977, Ser. No. 839,649

Int. Cl.<sup>2</sup> F16H 15/32, 15/36, 15/38

U.S. Cl. 74—200

4 Claims



1. In a transmission including a housing, input means, output means, and dual traction drive transmission sections operatively connected therebetween, each of the sections including input and output annular race means and a plurality of rollers rotatably disposed therebetween with opposed portions of the circular perimeters thereof in frictional contact with the input and output annular race means, torque-equalizing means for equalizing the torque in the dual traction drive sections, said torque-equalizing means comprising first and second sets of support means for each of the pluralities of rollers of the dual traction drive sections, first and second support members secured at one end thereof to the first and second sets of support means, respectively, a balance lever pivotally mounted on the housing, and oppositely disposed pivot members formed on the balance lever and operatively connected to the other ends of the respective first and second support members for pivoting about the axis of the balance lever in response to any higher torque being transmitted by the pluralities of rollers of one of the dual traction drive sections as compared to the other of the dual traction drive sections as a result of the build-up of manufacturing tolerances within the respective dual sections, to thus permit the two pluralities of rollers to attain a torque balance as a result of comparable ratio changes occurring in each of the dual sections.



4,159,654

**AUTOMATIC TRANSMISSION APPARATUS**

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

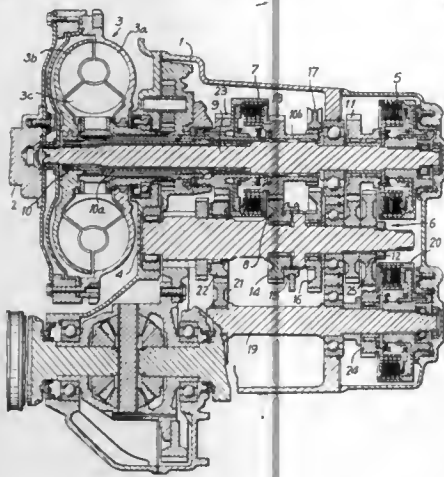
Filed Aug. 24, 1977, Ser. No. 827,618

Claims priority, application, Japan, Sep. 2, 1976, 51/117036

Int. Cl.<sup>2</sup> F16H 3/08

U.S. Cl. 74—331

4 Claims



1. An automatic transmission comprising a casing, an input shaft outside of said casing, a first driving shaft inside of the casing and constituting an elongation of said input shaft and directly coupled thereto, an output shaft within the casing and parallel to said input shaft, a second driving shaft including first and second portions encircling said first driving shaft, a torque convertor coupling said input shaft to the first portion of said second driving shaft, a low-speed clutch coupled between said first and second portions whereby said second portion can be selectively driven by the input shaft through said torque convertor, a high-speed clutch and a high-speed transmission cooperatively and selectively coupling said first driving shaft to said output shaft for the selective driving of the latter, and gear means coupling the second portion of the second driving shaft to said output shaft.

4,159,655

**ADJUSTABLE ECCENTRIC**

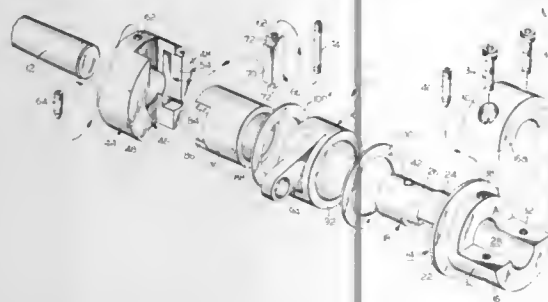
Arthur R. Johnson, deceased, late of Hartford, Conn.; by Paul A. Hudon, administrator, and Martin Kesten, both of West Hartford, Conn., assignors to Preston Engravers, Inc., Windsor, Conn.

Filed Dec. 29, 1977, Ser. No. 865,716

Int. Cl.<sup>2</sup> G05G 1/12

U.S. Cl. 74—571 L

17 Claims



12. In an adjustable eccentric assembly, the combination comprising:

- a. first collar means having a bore extending axially there-through, a mounting portion adapted to mount said first collar means to a rotatable shaft member for rotation therewith about an axis of rotation, a first guide surface extending perpendicularly of the axis of rotation, and

locking means adapted to lock said first collar means non-rotatably to the associated rotatable shaft member; b. an arbor extending axially outwardly from said first guide surface of said first collar means and adapted to be seated upon the associated rotatable shaft member, and terminating in a collar seat;

c. second collar means having a bore extending axially there-through and adapted to be seated upon the collar seat of said arbor, and mounting means adapted to non-rotatably mount said second collar means on said collar seat for rotation with said first collar means about the axis of rotation, said second collar means having a second guide surface extending parallel to and facing said first guide surface and being spaced apart therefrom along the common axis of rotation;

d. a hub member having a longitudinally extending cylindrical outer bearing surface and being non-rotatably supported between said first and second collar means for rotation therewith, said hub member having a longitudinal axis disposed parallel to the common axis of rotation and opposite ends extending perpendicularly of its longitudinal axis and slidably seated on, respectively, said first and second guide surfaces, and an axially extending interior passageway, both said bores and said interior passageway being axially aligned and adapted to receive the associated rotatable shaft member therethrough; and

e. adjusting means operatively connected to said hub member and at least one of said collar means for radially moving said hub member along said guide surfaces to any one of selected positions relative to said collar means to displace the longitudinal axis of said hub member radially relative to the common axis of rotation of said collar means whereby to adjust the eccentricity of rotation of said hub member about the common axis of rotation, said hub member being guided by said guide surfaces to maintain the longitudinal axis of said hub member parallel to the common axis of rotation and said interior passageway of said hub member being sized and configured to provide clearance for such radial displacement of said hub member.

4,159,656

**POSITIVE HOLD DIFFERENTIAL MECHANISM**

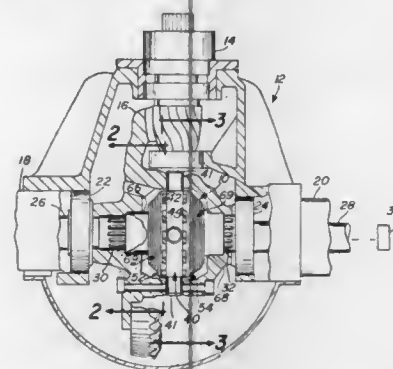
Michael G. Tomich, 20519 Catalano Dr., Mt. Clemens, Mich. 48043

Continuation-in-part of Ser. No. 668,473, Mar. 19, 1976, Pat. No. 4,104,931. This application Nov. 10, 1977, Ser. No. 850,404

Int. Cl.<sup>2</sup> F16H 35/04

U.S. Cl. 74—650

6 Claims



1. In a differential mechanism including an annular driving member, a pair of driven clutch members coaxially arranged at opposite ends of, and axially displaceable relative to, said driving member, respectively, the opposed faces of said driving and clutch members having interengaging clutch teeth, respectively, an annular center cam member arranged concentrically within, and connected for limited rotation relative to said driving member, the opposed faces of said center cam and

clutch members having interengaging cam teeth, respectively, and means biasing said driven clutch members axially inwardly toward said driving member, thereby to normally effect engagement between said clutch teeth on said driving and driven clutch members, respectively, and between said cam teeth on said driven clutch and center cam members, respectively, said cam teeth having profile configurations and heights to cause, when one driven clutch member overruns the driving member, axial displacement and corresponding disengagement of the clutch teeth of said one driven clutch member; the improvement which comprises

(a) means defining on one face of each pair of adjacent faces of said central cam and driven clutch members in equally spaced relation within the arrangement of cam teeth thereon a smaller number of indexing teeth, the width of each indexing tooth corresponding with the distance between the remote side surfaces of a given number of said cam teeth; and

(b) means defining on the other face of each pair of adjacent faces in corresponding equally spaced relation within the arrangement of cam teeth thereon a number of indexing spaces corresponding with the number of indexing teeth, the width of each indexing space being at least as great as the width of each indexing tooth, whereby when the said one clutch member overruns the driving member, said clutch member is normally disengaged and is axially indexed into driven engagement with said driving member only when the indexing teeth are opposite the indexing spaces, respectively.

5. A differential mechanism for compensating for the difference in driving wheel travel, said mechanism comprising:

a spider member having a plurality of arcuately spaced drive teeth on opposite sides thereof;

a pair of clutch members sandwiching said spider member therebetween, said clutch members each having a plurality of driven teeth releasably engageable with said spider drive teeth for transmitting torque from said spider member to said clutches;

a plurality of arcuately spaced first cams carried by said spider member;

a plurality of arcuately spaced second cams carried by each of said clutch members and axially aligned with said spider member cams for lifting said clutch member teeth out of engagement with said spider member teeth to permit relative movement between said spider member and on of said clutch members; and

a plurality of enlarged projections and mating enlarged slots carried between said spider member and clutch members for maintaining said relative movement between said spider member and one clutch member for an arcuate distance greater than the arcuate distance between adjacent spider member cams, said enlarged projections being of a one-piece construction with one of said members; wherein said projections are formed on said spider member in the form of a T-shape in a location adjacent the periphery of said spider, said slots being formed on said clutches adjacent the periphery thereof in axial alignment with said spider projections.

4,159,657

**PLANETARY OUTER END**

Herschel H. Stille, Edwardsburg, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 6, 1978, Ser. No. 883,550

Int. Cl.<sup>2</sup> F16H 1/28, 57/00, 35/00; B60K 17/34

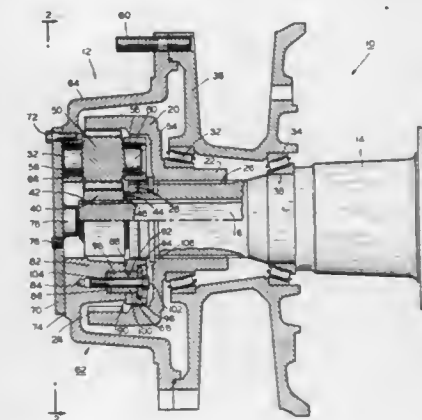
U.S. Cl. 74—801

17 Claims

1. In a drive axle of the type having an elongate axle housing, an axle drive shaft, a wheel structure rotatably mounted on said housing by bearing means, and a planetary outer end drivably connected with said axle drive shaft at one end of said housing for imparting rotation to said wheel structure, said planetary outer end having a plurality of members including a

planet carrier assembly having a carrier housing and a carrier plate, wherein the improvement comprises in combination:

- a. first means for locating and securing said carrier housing and carrier plate against angular movement relative to one another; and



- b. second means, concentric with said first means, for axially fastening and abuttingly securing said carrier housing and carrier plate against axial movement relative to one another whereby said first means is subject only to torsional shear loading and said second means is subjected only to axial tensile loading.

4,159,658

**ROTARY INDEX TABLES**

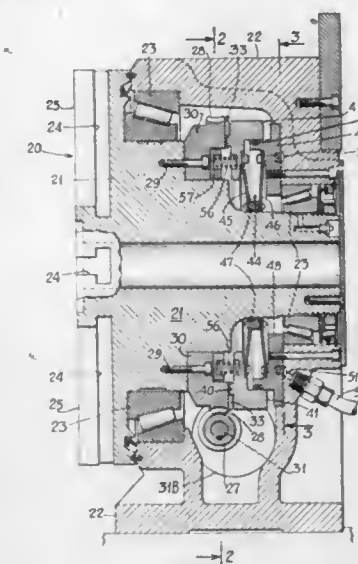
Edward J. Parkinson, Shelton, Conn., assignor to Bridgeport Machines Division of Textron Inc., Bridgeport, Conn.

Filed Apr. 4, 1977, Ser. No. 784,275

Int. Cl.<sup>2</sup> B23B 17/00; B23Q 17/00

U.S. Cl. 74—813 L

13 Claims



1. A rotary worktable and indexing control unit comprising:

- (A) a housing;
- (B) a worktable rotatably secured to the housing;
- (C) drive means for controllably rotating the worktable;
- (D) a curvic coupling incorporating
  - (a) a first tooth member mounted for rotation with said worktable, and
  - (b) a second tooth member mounted to the housing and movable from a first disengaged position to a second locking position engaged with the first tooth member, preventing rotation of the worktable; and
- (E) a bellows assembly, responsive to a pneumatic source for

controlled expansion and contraction thereof, and comprising

- (a) two ring-shaped spring-steel members
    - (1) sealingly interconnected at their respective interior edges, with
    - (2) the exterior edge of one of said spring-steel members being secured to the housing; and
  - (b) a movable locking plate having
    - (1) the exterior edge of the other spring-steel member securely mounted to a portion thereof, and with
    - (2) the second tooth member being mounted to another portion thereof, thereby controllably moving said second tooth member into and out of engagement with the first tooth member, and
- (F) control means for activating and deactivating the pneumatic source in response to the position of the worktable.

4,159,659

**ELECTRICAL MARKING DEVICE**

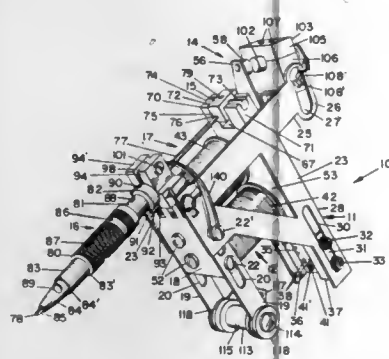
Carol Nightingale, Rte. #2, Box 159, Taneytown, Md. 21787

Filed May 16, 1978, Ser. No. 906,657

Int. Cl.<sup>2</sup> B41B 1/00; A61B 17/20

U.S. Cl. 81-9.22

18 Claims



1. An electric marker device comprising a frame, an armature bar, adjustable resilient support means for supporting said armature bar on said frame for oscillation thereon, electromagnet means supported on said frame for oscillating said armature, a control circuit for energizing said electromagnet means, an interrupter switch in said control circuit for cyclically energizing and de-energizing said electromagnet means in response to the oscillation of said armature bar, an elongated hollow needle guide assembly having a supported end and a free end, a needle guide assembly holder means pivotally supported on said frame for detachably supporting said supported end of said needle guide assembly in a predetermined position, a needle assembly comprising an elongated needle shaft and needle marker means affixed to one end of said shaft, said needle assembly being reciprocally mounted in said hollow needle guide assembly with said needle marker means projecting from said free end and with said needle shaft projecting from said supported end, a needle assembly holder removably secured to the end of said needle shaft opposite said needle marker means, and bearing means on said armature bar for pivotally supporting said needle assembly holder and for reciprocating said needle assembly holder and needle assembly as said armature bar is oscillated by said electromagnet.

4,159,660  
**BIAXIAL TURNING MACHINE WITH MEANS FOR  
BIDIRECTIONAL INDEPENDENT TOOL  
COMPENSATION**

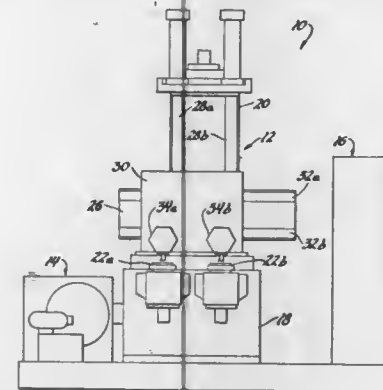
James E. Buckley, Sterling Heights; Thomas E. McKendrick, Westland; Lee E. North, Farmington, and Nathan Mendelsohn, Southfield, all of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Feb. 21, 1978, Ser. No. 879,527

Int. Cl.<sup>2</sup> B23B 3/20, 3/30

U.S. Cl. 82-3

10 Claims



1. A biaxial turning machine comprising:
  - support means,
  - first and second spindle means, mounted on the support means, for rotating respective first and second workpieces, the first and second spindle means having parallel axes of rotation;
  - compound slide member means, mounted on the support means in sliding relation thereto, for motion in a first direction with respect to the spindle means axes;
  - cross slide member means mounted on the compound slide member means in sliding relation thereto, for motion in a second direction transverse to the first direction;
  - first tool holder member means mounted on the cross slide member means in sliding relation thereto, for holding a workpiece machining tool and for motion parallel to the first direction;
  - second tool holder member means, mounted on the cross slide member means in sliding relation thereto, for holding another workpiece machining tool, and for motion parallel to the second direction;
  - a plurality of axis drive means, one each of the axis drive means associated with each of the member means, for moving each of the associated member means;
  - a plurality of sensor means, one each of the sensor means associated with each of the axis drive means, for sensing motion of each of the member means and outputting a signal representative thereof; and
  - control means, responsive to a position command signal for a specific member means and to the output signal of the sensor means associated with the specific member means, for controlling the axis drive means to position the specific member means in accordance with the command signal.

4,159,661

**ROTARY CUTTER**

Alfred G. Russell, Lebanon, and Michael W. Schwetz, Warren, both of N.J., assignors to Egan Machinery Company, Somerville, N.J.

Filed Jul. 5, 1977, Ser. No. 812,658

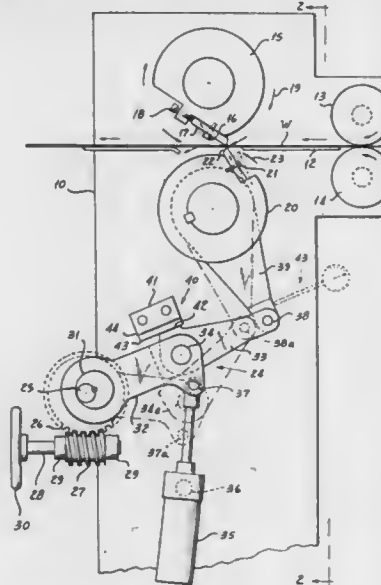
Int. Cl.<sup>2</sup> B26D 1/38, 1/56

U.S. Cl. 83-305

10 Claims

1. A rotary cutter comprising:
  - a frame;
  - a rotary knife rotatably mounted to said frame;

a bed knife; means displacably mounting said bed knife in said frame to travel in a path between an operative position adjacent said rotary knife in an inoperative position remote from said rotary knife; extendable linkage means connected with said bed knife to define said operative position of said bed knife when said linkage means is disposed in fully extended position and



said extendable linkage to contract during travel of said bed knife from said operative position; actuating means connected to said extendable linkage intermediate the ends thereof to cause said bed knife to travel in said path between said operative and inoperative positions; and means to adjust said extendable linkage means to said fully extended position to thereby adjust the operative position of said bed knife.

4,159,662

**MUFFIN SPLITTER**

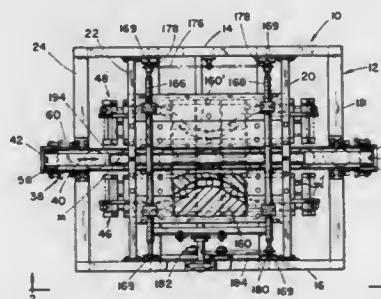
John A. Weaver, York, Pa., assignor to Alto Corporation, York, Pa.

Continuation of Ser. No. 847,662, Nov. 1, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,797

Int. Cl.<sup>2</sup> B26D 3/28, 4/76

U.S. Cl. 83-867

34 Claims



1. A muffin splitter comprising a frame; a muffin conveying assembly on the frame including a conveyor for moving muffins from an infeed end to a discharge end; a pair of muffin time assemblies on the frame located to either side of the muffin conveyor assembly, each muffin time assembly including a plurality of elongate muffin-piercing tines, first means supporting the tines, second means for moving the first means and tines downstream along the muffin conveyor assembly at the same speed and in the same direction as the conveyor moves muffins

along the conveyor, a first cam mounted on the frame between the conveyor and the normal path of movement of the first means along the muffin conveying assembly, a second cam movable on the frame between a retracted position located outwardly of the normal path of movement of the first means along the muffin conveying assembly and an extended position adjacent said first cam and in the path of normal movement of said first means along the muffin conveying assembly, said cams having smooth cam surfaces such that when the second cam is extended the second means moves the first means into engagement with said second cam to extend the tines into muffins on the conveyor path and to retract the tines from the muffins; and a cam moving device on the frame extending transversely past the cams and the muffin conveying assembly, drive connections between said device and each of said second cams of said pair of muffin time assemblies operable, upon actuation of the cam moving device, to simultaneously shift said second cams between the retracted and extended positions, whereby, depending upon the location of said second cams by the cam moving device, timed or untimed muffins may be moved along the conveyor from the infeed end to the discharge end.

4,159,663

**ELECTRONIC MUSICAL INSTRUMENT WITH  
DIFFERENT TYPES OF TONE FORMING SYSTEMS**

Etichiro Aoki, and Tsutomu Suzuki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

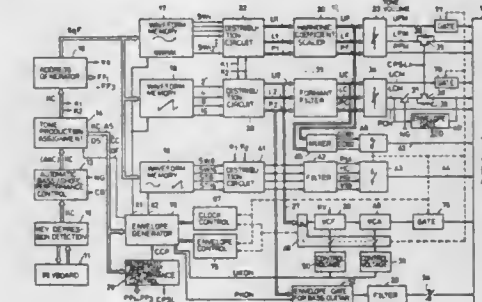
Filed Oct. 26, 1977, Ser. No. 845,593

Claims priority, application Japan, Oct. 28, 1976, 51/129825

Int. Cl.<sup>2</sup> G10H 1/02

U.S. Cl. 84-1.24

12 Claims



1. An electronic musical instrument having keys and a plurality of musical tone forming systems capable of concurrently producing tones of different tonal quality for notes designated by selection of the same subset of keys, the outputs of all of said tone forming systems being connected to a common output unit, said instrument also having selection means for facilitating selection by a performer of which tone forming systems shall be employed for one production, which instrument comprises:

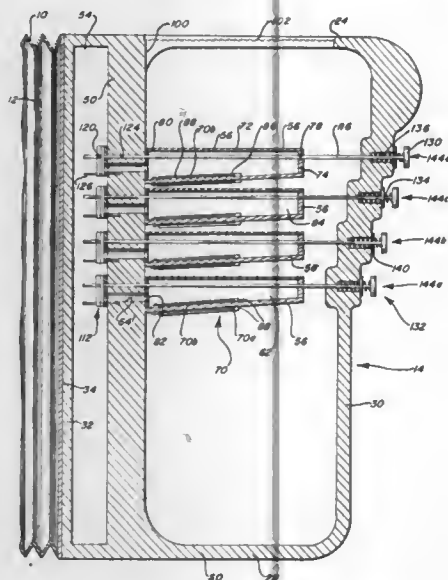
priority means, cooperating with said selection means, for establishing a priority order among said musical tone forming systems to employ for musical tone production that one tone forming system having a highest priority out of one or plural systems selected by a performer from said plurality of musical tone forming systems; and ensemble selection means, cooperating with said selection means and with said priority means and operative upon selection of ensemble production by said performer, for enabling predetermined plural systems among said musical tone forming systems to be employed concurrently for musical tone production instead of musical tone production by one system according to said priority order.



4,159,664  
**KEYBOARD ASSEMBLY FOR AN ACCORDION**  
 Enrico M. Mastronardi, P.O. Box 267, Rte. 1, Chillicothe, Ill. 61523

Filed Feb. 3, 1978, Ser. No. 874,793  
 Int. Cl.<sup>2</sup> G10D 11/00, 11/02  
 U.S. Cl. 84—376 R

16 Claims



1. In an accordion having a bellows defining a flexible air chamber and an end box at each end of said air chamber, the improvement comprising:

a casing defining each of said end boxes including a back wall adapted to be placed adjacent the body of the accordion, a front wall, and a side wall connected between said back and front walls extending away from the accordion;

a plurality of means in each end box each producing a single tone when air is delivered thereto from said bellows, each tone producing means being selected to generate one note of the chromatic scale and together generating a consecutive series of notes corresponding to each half step of the chromatic scale along a selected interval, each tone produced by one of said tone producing means in one end box being dissimilar to the tones produced by each of the other tone producing means in said one end box; and

a corresponding number of keys one associated with each of said tone producing means and having means for operating its respective tone producing means by controlling delivery of air thereto from said bellows, said keys being located on the exterior of said side walls of said casing, extending and actuated in a direction generally parallel to said back and front walls and arranged in longitudinal and transverse rows for manual manipulation by an accordionist, the physical arrangement of the keys on one end casing being the mirror image of that on the other end casing and corresponding keys on each end casing operating tone producing means for notes having the same note names, the interval between notes generated by the tone producing means operated by adjacent keys in the longitudinal rows being in major thirds and the interval between notes generated by the tone producing means operated by adjacent keys in the transverse rows being in minor seconds.

7. In a musical instrument including a bellows defining a flexible air chamber and an end box at each end of said air chamber, each end box comprising:

a casing secured to said bellows;  
 a reed block plate mounted between said casing and said bellows to define an internal chamber within said casing, said casing having an opening to provide communication between said internal chamber and the exterior thereof;  
 enclosure means for defining a tone chamber within said

internal chamber including walls spaced from said casing with an opening therein to permit air to pass from said tone chamber into the space between said casing and said walls;

a plurality of reed blocks within said tone chamber each being mounted to said reed block plate, each reed block defining at least one cell including passage means at one end of each cell providing communication between said flexible air chamber and its respective cell;

a plurality of reeds mounted on said reed blocks with at least one overlying each cell to at least partially define the cell such that air moved through the cell flows past the respective reed to effect vibration thereof to generate a tone, each reed selected to generate one note of the chromatic scale and together generating a consecutive series of notes corresponding to each half step of the chromatic scale along a selected interval, the tone generated by each reed being dissimilar to the tones generated by any of the other reeds;

a keyboard on said casing including an external key associated with each passage and adapted to be manually depressed by an accordionist, said keys being arranged on the exterior of said casing in longitudinal and transverse rows, the interval between notes generated by the reeds associated with adjacent keys in the longitudinal rows being in major thirds and the interval between notes generated by the reeds associated with adjacent keys in the transverse rows being in minor seconds;

a plurality of valve rods one secured to each key at one end thereof and extending through said internal chamber and said reed block plate to move axially inward as its associated key is depressed;

a plurality of valve members one secured to the other end of each valve rod, a valve member being disposed at said one end of each cell and being adapted to be moved axially outward toward a closed position over said one end to prevent air from moving between said flexible air chamber and said cell and axially inward toward an open position spaced from said one end to permit air to move between said flexible air chamber and said cell and flow past the respective reed; and

biasing means for urging each of said valve members axially outward to said closed position over their respective open ends.

10. In a musical instrument including a bellows defining a flexible air chamber and an end box at each end of said air chamber, each end box comprising:

a casing secured to said bellows;

a reed block plate mounted between said casing and said bellows to define an internal chamber within said casing, said casing having an opening to provide communication between said internal chamber and the exterior thereof;  
 enclosure means for defining a tone chamber within said internal chamber including walls spaced from said casing with an opening therein to permit air to pass from said tone chamber into the space between said casing and said walls;

a plurality of reed blocks within said tone chamber each being mounted to said reed block plate, each reed block defining at least one cell and passage means at one end of each cell providing communication between said flexible air chamber and its respective cell;

a plurality of reeds mounted on said reed blocks with at least one overlying each cell to at least partially define the cell such that air moved through the cell flows past the respective reed to effect vibration thereof to generate a tone, the tone generated by each reed being dissimilar to the tones generated by any of the other reeds within the end box;

a keyboard on said casing including an external key associated with each cell and adapted to be manually depressed by an accordionist;

a plurality of valve rods one secured to each key at one end thereof and extending through said internal chamber and

said reed block plate to move axially inward as its associated key is depressed;

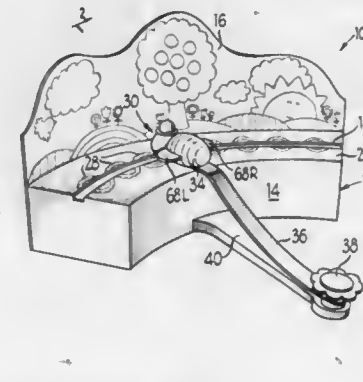
a plurality of valve members one secured to the other end of each valve rod, a valve member being disposed at said one end of each cell and being adapted to be moved axially outward toward a closed position over said one end to prevent air from moving between said flexible air chamber and said cell and axially inward toward an open position spaced from said one end to permit air to move between said flexible air chamber and said cell and flow past the respective reed; and

biasing means for urging each of said valve members axially outward to said closed position over their respective open ends.

4,159,665  
**MUSICAL TOY**  
 Rouben T. Terzian, Chicago, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 26, 1978, Ser. No. 872,427  
 Int. Cl.<sup>2</sup> G10D 13/08  
 U.S. Cl. 84—404

8 Claims



1. A musical toy, comprising:

a housing;

a plurality of tone bars mounted within the housing for producing a musical note upon being struck;

means for striking a selected tone bar to produce an audible signal, said striking means comprising a movable housing, drive means and a rotatable striker element connected thereto rotatably mounted within the movable housing;

means for energizing said drive means;  
 selectively operable switch means on said movable housing for selectively connecting said drive means to said energizing means; and

means for guiding said striking means along a path of travel adjacent each of said tone bars, said guide means comprises an elongated portion of the housing having a pivot axis defined on the end thereof and a resilient connecting arm pivotally secured to said pivot axis at one end and secured to said movable housing on the other.

4,159,666  
**EXPANDING HEAD RIVETING METHOD AND SYSTEM**  
 Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625  
 Division of Ser. No. 732,869, Oct. 15, 1976, Pat. No. 4,051,592, which is a continuation-in-part of Ser. No. 645,242, Dec. 29, 1975, Pat. No. 4,000,680. This application Apr. 28, 1977, Ser. No. 791,715

The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.  
 Int. Cl.<sup>2</sup> F16B 19/04

U.S. Cl. 85—37

11 Claims

1. In combination with a workpiece having a bore, a first counterbore which is substantially cylindrical, and a second counterbore which is frusto-conical and tapers forwardly

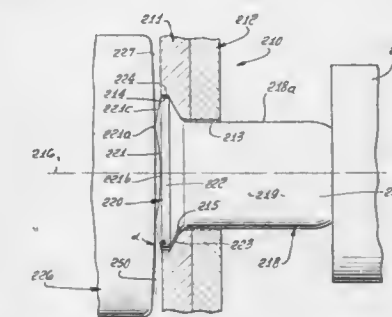
between the first counterbore and the bore and toward the bore,

(a) a rivet having an axially extending shank received in the workpiece and defining an axis,

(b) the rivet including a head having an end face, a first section located forwardly of said end face, and a second and forwardly tapered frusto-conical section located forwardly of the first section,

(c) the first section having an initial undeformed outer surface of a diameter which is less than but about the same as the initial diameter of the first counterbore, the rivet first section being radially deformed to have peripheral engagement with the first counterbore,

(d) said head end face being substantially flush with the work surface,



(e) said head end face initially defining an undeformed ring-shaped dome extending about said axis and in substantial axial alignment with the outer surface of the shank,

(f) the dome having an annular crest portion in axial alignment with said shank outer surface, and the dome radially outer extent which defines only about half of the dome being located in axially spaced relation to a forward taper defined by said second and forwardly tapered section, said dome crest portion being rearwardly convex in axial radial planes,

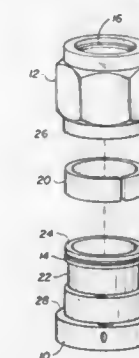
(g) the head end face forming a concave central recess radially inwardly of said crest portion, the outermost annular extent of said recess located approximately in alignment with the outer surface of the shank.

4,159,667  
**TORQUE LIMITING RF CONNECTOR**  
 Donald B. Nordstrom, Stuart, Fla., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,602  
 Int. Cl.<sup>2</sup> F16B 31/02

U.S. Cl. 85—61

2 Claims



1. A coupling nut comprising:

a base ring that is adapted to receive a member to be coupled by the nut, said base ring having internal threads at one end for the coupling of the nut, a shoulder at the one end

and an elongated body above said shoulder, said elongated body having first and second grooved areas in said body; a tension ring rotatably supported within said first grooved area in said base ring, said tension ring having a cross sectional thickness such that it presents an external diameter from within said first grooved area greater than the external diameter of said elongated body but less than the external diameter of said shoulder; and

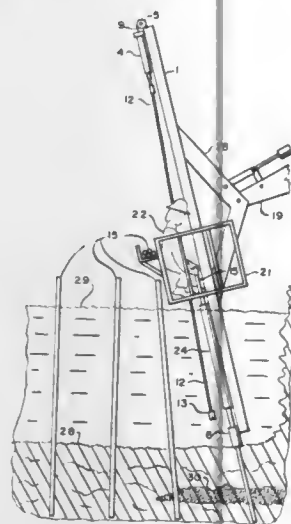
a hex ring having an internal bore that permits it to be assembled about said tension ring to said base ring, said bore of a diameter that on assembly is less than the external diameter of the tension ring to compress said tension ring between the hex ring and the base ring providing a frictional connection of said base ring and said hex ring, said frictional connection being torque limiting whereby said hex ring may be wrenched to bidirectionally drive said base ring via said tension ring to effect a coupling of the nut, said hex ring being free to rotate relative to the tension ring and base ring when torqued in excess of the forces of the frictional contact of said tension ring between said base ring and hex ring, said hex ring having a projecting flange located within said second grooved area of said base ring when assembled to said base ring, said projecting flange and said second grooved area connecting said hex ring to said base ring while allowing said hex ring to rotate when torqued in excess of the forces of the frictional connection in relation to said base ring.

**4,159,668**  
**METHOD FOR PLACING EXPLOSIVES IN SUBMERGED ROCK**

Roy N. Sonomura, P.O. Box 1452, Hilo, HI. 96720  
Division of Ser. No. 688,551, May 17, 1976, Pat. No. 4,102,412.  
This application Jul. 20, 1977, Ser. No. 817,245  
Int. Cl.<sup>2</sup> E21B 7/12

U.S. Cl. 86—20 C

2 Claims



1. A method of placing explosives in holes drilled in submerged rock by use of a rock drill mounted for reciprocation along a strut having a debris guard tube extending beyond the terminus of the strut comprising:
  - a. forcing the debris guard tube against the rock at the point to be drilled;
  - b. extending the drill head into the rock through the debris guard tube;
  - c. drilling and cleaning the hole with the drill;
  - d. retracting the drill out of the debris guard tube;
  - e. deflecting the drill rod to one side of the debris guard;
  - f. inserting an explosives placement tube into the hole through the debris guard tube;
  - g. raising the strut until the debris guard tube is completely free of the explosives placement tube whereby the drill operator can move to another location for drilling the next

- hole without waiting for completion of the explosives placement;
- h. inserting the explosives and detonator into the hole through the explosives placement tube; and
- i. stuffing packing into the tube; whereby the explosives placement tube being inserted into the hole through the debris guard tube keeps the hole clean and clear of debris after the drilling apparatus is removed thereby insuring placement of the explosives at the required point and allowing separation of drilling and explosives placement operations.

**4,159,669**  
**HATCH FOR ARMORED VEHICLES**  
Theodore A. Jackson, Utica, and James D. Crabtree, St. Clair Shores, both of Mich., assignors to Cadillac Gage Company, Warren, Mich.

Filed Oct. 14, 1977, Ser. No. 842,215  
Int. Cl.<sup>2</sup> B60J 7/00

U.S. Cl. 89—36 L

17 Claims

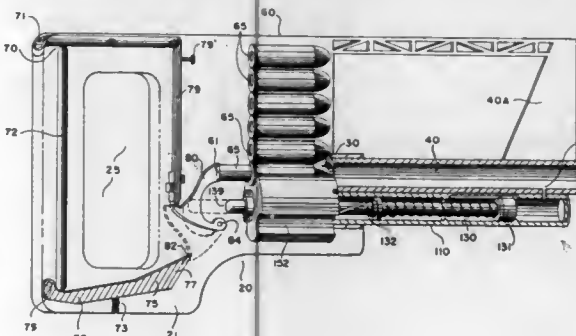


1. A hatch arrangement for armored vehicles for providing a closure for an opening extending into an oblique frontal armored surface of said vehicle, the hatch arrangement comprising:
  - a hatch configured to provide a closure for said vehicle opening;
  - means providing for guided movement of said hatch between an open and closed position with respect to said opening, said means including guide means guiding said hatch for movement away from said opening in a frontal direction along said sloping surface down from said opening whereby said hatch is positioned in said open position at an oblique angle corresponding to said oblique frontal surface of said armored vehicle.

**4,159,670**  
**HANDGUN**  
Laurence E. Turner, 6 Woodward Ave., Norwalk, Conn. 06854  
Filed Jun. 3, 1977, Ser. No. 803,140  
Int. Cl.<sup>2</sup> F41D 7/04

U.S. Cl. 89—155

25 Claims



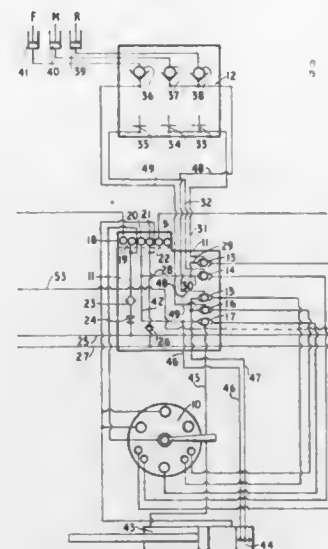
1. A handgun, comprising:

- a housing including a grip portion having an aperture therein to receive the fingers of a hand and a frontal breech-enclosing portion disposed forwardly of said grip portion; a breech mounted in said frontal housing portion;
- a barrel mounted forwardly of said breech, said breech and barrel being aligned with the approximate vertical center of the aperture of said gripping portion;
- a magazine for receiving a stack of horizontally oriented cartridges disposed above said frontal housing portion and communicating with said breech;
- a sight mounted in raised relation to said barrel and aligned with the top of said magazine and the top of said gripping portion;
- a hammer mounted behind said breech; and
- a thumb-actuated trigger assembly including a thumb trigger mounted above and behind said aperture and a trigger linkage adapted to mechanically actuate said hammer upon depression of said thumb trigger.

**4,159,671**  
**SELF-ADVANCING MINE ROOF SUPPORTS**  
Archelaus D. Allen, 6 Brookdale Close, Leyland, Preston, England  
Continuation of Ser. No. 592,997, Jul. 3, 1975, abandoned. This application Dec. 2, 1977, Ser. No. 857,016  
Claims priority, application United Kingdom, Aug. 20, 1974, 36490/74

Int. Cl.<sup>2</sup> F15B 13/04, 11/00  
U.S. Cl. 91—32

7 Claims

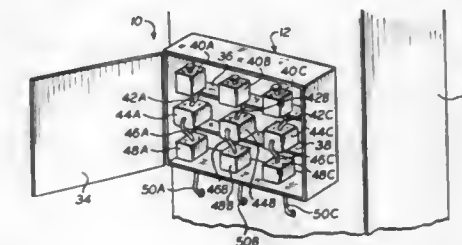


1. A self-advancing mine roof support system which comprises a plurality of mine roof supports arranged side-by-side and means for passing an automatic sequencing control signal between adjacent supports; each of said supports including manually operable control valve means, an automatic sequence control valve means operable in response to said control signal passed thereto, each of said manually operable and automatic sequence control valve means providing for controlling the operations of the support, isolating valve means arranged so that either one of said manually operable control valve means and said automatic sequence control valve means can effect operation of said support independently of the other, and a manually operable signal generator means operable independently of either of said control valve means and arranged to apply an output signal to the automatic sequence control valve means of a next adjacent support to permit selective control of that next adjacent support through an automatic advance sequence thereof.

**4,159,672**  
**SCENT PRODUCING APPARATUS FOR FORCED AIR SYSTEM**  
Michael Garguilo, 1812 Westminster Blvd., and Ronald DeVito, 1106 Westminster Blvd., both of Parlin, N.J. 08859  
Filed Oct. 31, 1977, Ser. No. 846,714  
Int. Cl.<sup>2</sup> F24F 7/06

U.S. Cl. 98—30

12 Claims

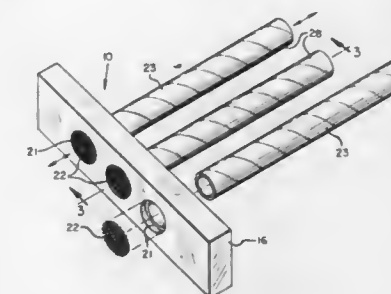


1. Apparatus for automatically and controllably introducing a scent on demand into a forced air temperature changing system of the type having a blower, and an air filter positioned in the air path of said blower; said apparatus comprising:
  - a container for retaining a fluid having the desired scent; spray means adapted to be connected to said system adjacent the air filter and positioned to direct fluid exiting through said spray means on to the filter; a conduit connecting said container with said spray means to provide a passage for the flow of fluid from said container to said spray means; and manually operable control means serially connected in said conduit between said container and said spray means for controlling the amount and timing of the flow of fluid to said spray means whereby the presence and the apparent strength of the scent added to the air is controllable at will, by the operator.

**4,159,673**  
**VENT BLOCK**  
James F. Weirich, 200 Posada Del Sol #40, Novato, Calif. 94947  
Filed Nov. 14, 1977, Ser. No. 851,394  
Int. Cl.<sup>2</sup> F24F 7/00

U.S. Cl. 98—37

15 Claims

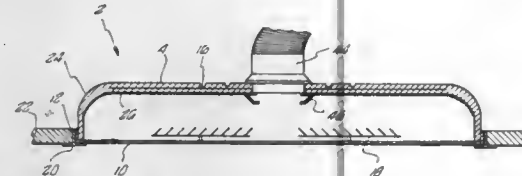


1. A vent block for attic ventilation in a building, comprising:
  - an elongate wooden member adapted to fit beneath the roof line of the building, between adjacent rafters;
  - said wooden member having at least one circular bore there-through, positioned to establish ventilating communication between the attic and the exterior of the building;
  - a circular patch of screen pressed into each such circular bore, the screen being of slightly larger original diameter than the portion of the bore into which it is pressed, so that it bows inwardly and is locked into the bore; and
  - an air conduit tube extending axially from each bore, so that when the vent block is installed with the tube inclined upwardly into the attic, the tube is positioned to pass through attic floor insulation, thereby to prevent vent blockage by the insulation.



**4,159,674**  
**UNIVERSAL DIFFUSER ASSEMBLY AND METHOD OF MANUFACTURING**  
 Edward C. Brumleu, Jr., 18612 Marapose Dr., Villa Park, Calif. 92667

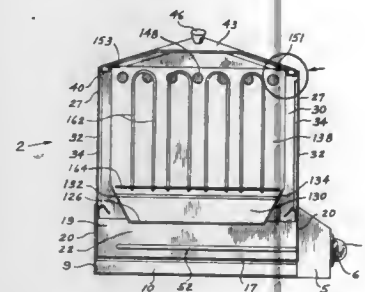
Filed Apr. 26, 1977, Ser. No. 791,064  
 Int. Cl.<sup>2</sup> F24F 7/00; B32B 5/14  
 U.S. Cl. 98—40 R 25 Claims



1. In a diffuser assembly for connection to an air delivery system the improvement comprising:  
 a plenum chamber having a base connector member and an outwardly extending wall defining an approximately concave configuration, the wall and connector member formed from molded glass fibers and plastic binders to provide a cross-sectional configuration having an interior fibrous textured surface and a comparatively more densely fibrous packed exterior housing surface to provide a lightweight sound absorbing diffuser assembly, the total density of the base connector member being less than the total density of the wall whereby the wall is provided with greater structural strength while the base connector member has greater insulation and sound absorbing capabilities, and means for connecting the plenum chamber to the air delivery system.

**4,159,675**  
**WIENER HEATING UNIT**  
 John F. Schwarz, and Ralph J. Tinkham, both of St. Louis, Mo., assignors to Peabody International Corporation, Stamford, Conn.

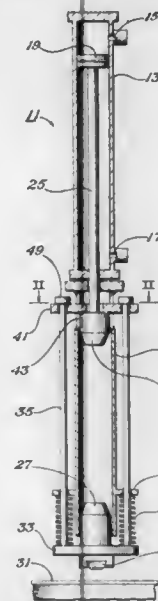
Filed Jan. 25, 1978, Ser. No. 872,043  
 Int. Cl.<sup>2</sup> A47J 27/00  
 U.S. Cl. 99—444 15 Claims



15. In a wiener steam heating device having a steam heating source, a wiener support assembly comprising:  
 (a) a pan assembly having a catch tray positioned above the steam heating source;  
 (b) the pan assembly having a pair of walls extending above the catch tray;  
 (c) a wiener support grill in the pan assembly within the walls and means to support the grill at least partially above the tray with a location space for wieners formed between the walls and above the lower edge of the walls, the walls being solid from their lower edges to above the wiener cooking space; and  
 (d) the walls having an opening at the upper ends of the walls above the wiener location space for allowing steam from the steam heating source to pass from the outside of

the walls to the inside of the walls to steam heat the wieners at the top of the wiener location space.

**4,159,676**  
**STAMPING MACHINE**  
 Darrell L. Joyce, and Richard E. Kessler, both of Houston, Tex., assignors to Gachman Steel Company, Fort Worth, Tex.  
 Filed Oct. 31, 1977, Ser. No. 847,247  
 Int. Cl.<sup>2</sup> B44B 5/00  
 U.S. Cl. 101—3 R 8 Claims

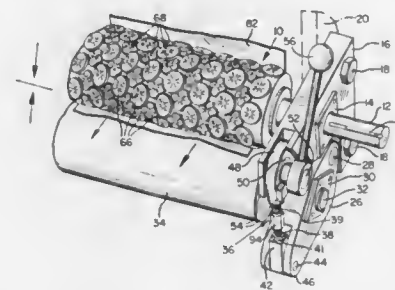


1. A stamping machine, comprising:  
 a guide track;  
 a hammer reciprocally carried by the guide track;  
 reciprocating means for reciprocating the hammer in a down stroke and an upward return stroke;  
 an anvil reciprocally carried by the guide track for receiving blows from the hammer, the anvil having a die on its lower end for stamping a workpiece, and having a platform extending outwardly from the anvil;  
 spring means compressed between the platform and a point on the guide track above the platform, for urging the anvil and die downward into contact with the workpiece;  
 a linking member, connected to the platform and extending upward substantially the length of the hammer stroke; and  
 lifting means, cooperating with the hammer, for engaging and lifting the linking member on the return stroke thereby lifting the die a selected distance from the workpiece and compressing the spring.

**4,159,677**  
**EMBOSSER**  
 Franklin G. Smith, 2944 SE. Tibbetts, Portland, Ore. 97202, assignor to Franklin G. Smith, Portland, Ore.  
 Filed Apr. 25, 1977, Ser. No. 790,478  
 Int. Cl.<sup>2</sup> B44B 5/00  
 U.S. Cl. 101—23 3 Claims

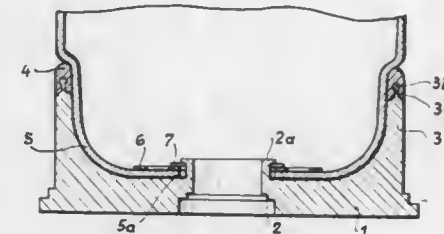
1. In an embosser,  
 a resilient backing member,  
 a cylindrical roll paralleling the member,  
 a plurality of embossing segments having arcuate inner

surfaces and raised embossing portions on the outer surfaces,  
 and an adhesive fastening the segments to the roll,



the roll having a screw thread swaged crosswise in at least portions thereof to form overhangs.

**4,159,678**  
**PROPELLANT CHARGE CASING**  
 Hans-Werner Luther, Kaarst, and Peter Bender, Dusseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall G.m.b.H., Dusseldorf, Fed. Rep. of Germany  
 Filed Sep. 15, 1977, Ser. No. 833,713  
 Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 26416659  
 Int. Cl.<sup>2</sup> F42B 5/26  
 U.S. Cl. 102—44 5 Claims

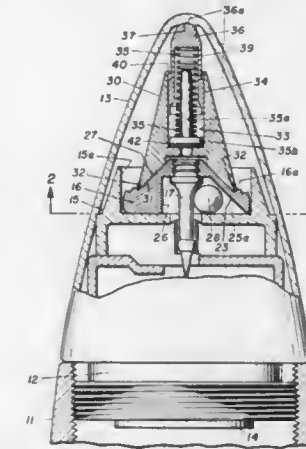


1. A casing for a propellant comprising:  
 a cylindrically symmetric base having a muzzle end and a primer end, in which said base includes a rim extending out from said primer end, forming a cup and ending in a lip, and in which base, said primer end includes axially centered means for connecting a primer cap,  
 a combustible charge container disposed within said cup formed by said rim, and having an aperture through which said means for connecting a primer cap extends;  
 a resilient bearing plate member disposed about said means for connecting a primer cap and within said combustible container, said resilient bearing plate is formed from spring steel, has a plurality of apertures extending there-through and has a plurality of radial slits extending inward from a periphery, and  
 fastening means for attaching said resilient bearing plate to said means for connecting a primer cap, whereby said combustible propellant case is confined within said base.

**4,159,679**  
**PROJECTILE FUZE**  
 Melvin Eneman, New York, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
 Continuation-in-part of Ser. No. 703,711, Jul. 9, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,684  
 Int. Cl.<sup>2</sup> F42C 15/22, 1/00  
 U.S. Cl. 102—237 5 Claims

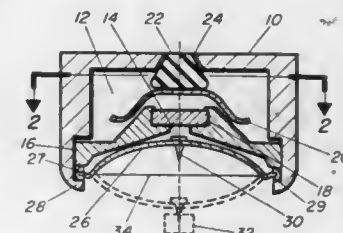
1. In a point detonating spin stabilized projectile having a

tapered forward nose member and a fuze forward housing secured in said nose member,  
 said fuze forward housing having a central longitudinal passage accommodating a longitudinally movable firing pin, said fuze forward housing having a forwardly opening recess containing a firing pin assembly, said firing pin assembly including said firing pin and an element having a plurality of slotted inclined walls, a camming ball adjacent each of said slotted inclined walls, each of said balls being responsive to centrifugal force for forwardly camming said firing pin assembly to arm said firing pin assembly,



a graze sensor having means for rearwardly camming said armed firing pin assembly to operatively actuate said firing pin, said graze sensor having a forwardly opening cylindrical recess,  
 said firing pin assembly element having means including an annular forwardly protruding beveled surface for limiting lateral movements of said graze sensor,  
 a rearwardly opening tubular sleeve slidably mounted in said cylindrical recess, and  
 a compression spring in said sleeve for forwardly biasing said sleeve against said nose member.

**4,159,680**  
**RANDOM DELAY TIMER**  
 Alexey T. Zacharin, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
 Filed May 1, 1978, Ser. No. 901,876  
 Int. Cl.<sup>2</sup> F42C 9/06  
 U.S. Cl. 102—277 5 Claims



1. A fuze for a munition, comprising:  
 an airtight enclosed housing,  
 an internal partition secured within said housing and defining a primary chamber and a secondary chamber on either side of said partition,  
 an external pressure port in said housing communicating with said primary chamber,  
 diaphragm means mounted in said housing for isolating said secondary chamber from external pressure outside said housing and said secondary chamber, said diaphragm

means being dependable between a static condition and a pressurized condition,  
 means in said partition for metering gaseous flow from said primary to said secondary chamber,  
 movable seal means operatively related to said external pressure port for releasably communicating said primary chamber to external pressure outside said housing and sealing said port against said pressure,  
 resilient biasing force means bearing against said movable seal means for biasing said movable seal means toward sealing relationship with said external pressure port, and  
 detonation means operatively connected with said diaphragm means for causing detonation of said munition when said diaphragm means is deformed into said pressurized condition.

4,159,681

**REINFORCED, LIGHT-WEIGHT PALLET**

Daniel D. Vandament, 527 Fairview Ave., Mill Valley, Calif. 94941

Filed Oct. 3, 1977, Ser. No. 838,728

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> B65D 19/26

U.S. Cl. 108—51.1

10 Claims



1. A light-weight, load carrying pallet, adapted for use with a fork lift or the like, comprising

a reinforced pallet structure having an upper sheet member and a lower sheet member with a flexible member arranged in the form of an arch there between and secured at its ends to the lower sheet member, adhesive foam material intimately contacting both sides of the flexible arched member and the inner surfaces of the sheet members to completely fill the spaces between the flexible arched member and the sheet members and to effectively rigidize and maintain the arched member in its arched configuration, and

recess forming means arranged in longitudinally spaced apart relation adjacent the lower sheet member to receive elongated load carrying tines of a fork lift, the spaced apart recess forming means being structurally interconnected with the ends of the arched member in order to transfer the weight of a load carried upon the upper sheet to the load carrying tines substantially through the arched member.

4,159,682

**FLUID BED COMBUSTION WITH PREDRYING OF MOIST FEED USING BED SAND**

Elliot B. Fitch, Pittsburgh, Pa., and Orris E. Albertson, Salt Lake City, Utah, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Dec. 1, 1977, Ser. No. 856,379

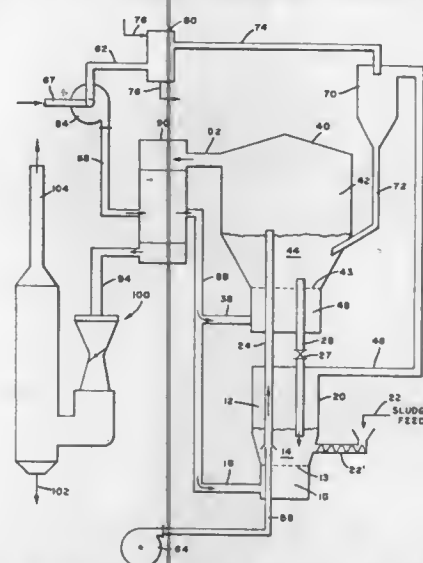
Int. Cl.<sup>2</sup> F23G 5/04

U.S. Cl. 110—245

33 Claims

1. A process for combustion of moist combustible feed wherein said moist feed is first dried and then introduced into a fluidized bed of hot, inert, particulate material for combustion comprising, withdrawing a quantity of said hot particulate material from said fluidized bed, intimately contacting said moist feed with said hot particulate bed material to evaporate the water in the feed at a relatively low temperature, separating the dried solids from the gas stream containing the evaporated water, charging the separated dried feed and the particulate bed material associated therewith into said fluidized bed

for combustion, treating the separated gas stream to remove and dispose of the water vapor therein and forwarding the



4,159,683

**METHOD FOR REDUCING THE FORMATION OF SLAG AND SOOT FORMED FROM THE COMBUSTION OF CARBONACEOUS WASTE MATERIAL**

John Hughes, Arlington Heights, and Peter L. Maul, Addison, both of Ill., assignors to American Colloid Company, Skokie, Ill.

Filed Mar. 13, 1978, Ser. No. 885,660

Int. Cl.<sup>2</sup> F23G 7/00

U.S. Cl. 110—343

11 Claims

1. A method for reducing the amount of slag and soot formed by the combustion of carbonaceous waste material in a furnace which comprises combusting said carbonaceous waste material in said furnace in the presence of at least 0.0001%, by weight, of sodium bentonite based on the weight of said carbonaceous waste material.

4,159,684

**METHOD FOR INCINERATING WASTE SLUDGES**

William M. Kirkup, Blunham, England, assignor to Esmil-Envirotech, Ltd., Huntingdon, England

Filed Nov. 23, 1976, Ser. No. 744,413

Int. Cl.<sup>2</sup> F23G 5/00

U.S. Cl. 110—346

8 Claims

1. A method of incinerating a sewage sludge comprising incinerating a sludge, in dewatered but wet condition, when mixed with wet coal fines as a supplementary fuel recovered from a wet beneficiation process for coal, in the form of one of a coal filter cake and ex-lagoon sludge.

4,159,685

**FORMATION OF VARIABLE WIDTH CUTTING SPACE BUTTONHOLE PATTERNS IN AN ELECTRONICALLY CONTROLLED SEWING MACHINE**

John W. Wurst, Dover, and William H. Dunn, Branchville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,938

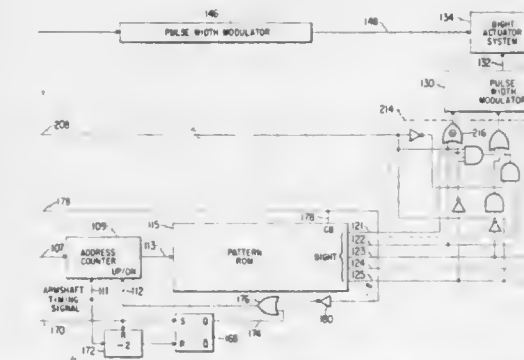
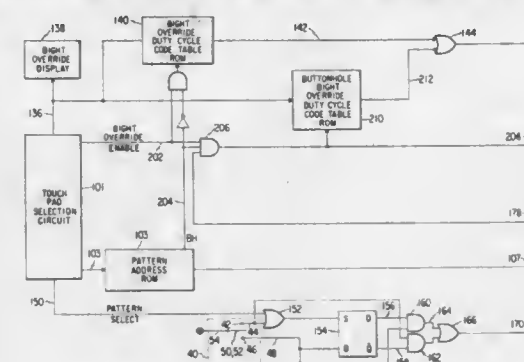
Int. Cl.<sup>2</sup> D05B 3/06, 3/02

U.S. Cl. 112—158 B

2 Claims

1. In a sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, static memory means for storing pattern stitch

information, means operating in timed relation with said sewing machine for recovering selected pattern stitch information from said static memory means, separate actuating means responsive to said pattern stitch information for influencing the feed and bight motions respectively to produce a pattern of stitches corresponding to the selected pattern stitch information and controllable bight alteration means effective to alter the operation of said bight actuating means to an amount of motion different from that dictated by said pattern stitch information, wherein a buttonhole pattern includes two parallel rows of zig-zag stitches forming a pair of buttonhole side bars, the inner stitches of said side bars defining a cutting space therebetween and the outer stitches of said side bars defining



the width of said buttonhole pattern, the improvement comprising means for selectively varying the width of the cutting space while maintaining constant the overall buttonhole pattern width including:

override memory means for storing bight actuating means motion alteration values in addressable memory locations; operator controlled means for providing an address signal corresponding to a desired alteration value; means utilizing said address signal for retrieving from said override memory means said desired alteration value; and converting means operative only during the inner stitches of said side bars for converting said desired alteration value into a control signal for rendering effective said bight alteration means.

4,159,686

**PROCESS FOR SMOOTHING THE EYE OF A NEEDLE AND NEEDLE MADE THEREBY**

Helmut Heim, Membach, Belgium, assignor to Manufacture Belge d'Aiguilles S.A., Eupen, Belgium

Filed Nov. 23, 1976, Ser. No. 744,313

Claims priority, application United Kingdom, Dec. 1, 1975, 49291/75

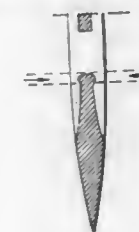
Int. Cl.<sup>2</sup> D05B 85/00

U.S. Cl. 112—222

38 Claims

1. A process for smoothing the eye of a needle including the

step of subjecting an area of the needle eye to one or more pulses of high power density radiation to melt the surface of



said area, and subsequently permitting said surface to solidify thereby to smooth said surface.

4,159,687

**AUTOMATIC GUIDING METHOD FOR WORKPIECE IN SEWING MACHINE**

Koji Masuda, Sagamiyama, and Nobuyoshi Haniuda, Yokohama, both of Japan, assignors to Kayabe Industry Co., Ltd., Tokyo, Japan

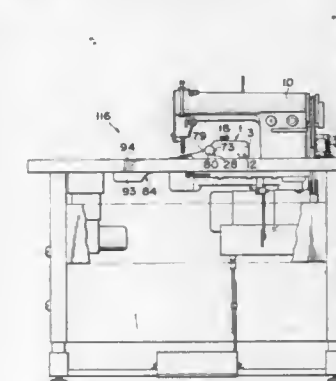
Filed Feb. 25, 1977, Ser. No. 772,340

Claims priority, application Japan, Feb. 27, 1976, 51-20924; Apr. 5, 1976, 51-37904; Apr. 5, 1976, 51-37905

Int. Cl.<sup>2</sup> D05B 21/00, 35/10

U.S. Cl. 112—262.3

3 Claims



1. A method of automatically guiding a work piece in a sewing machine, comprising the steps of:

detecting the deviation of the position of the side edge of a work piece from a control position only when the side edge moves in a direction toward the line of stitching in the sewing machine, said detection being effected at a point prior to the stitching point relative to the direction of feed of the work piece;

moving said work piece transversely of the stitch line back toward the control position in response to the detected deviation until said side edge of the work piece is brought back to said control position; and

blocking the movement of the side edge of said work piece from said control position in the direction transversely away from the stitch line at a point prior to of the stitching point relative to the direction of the feed of the work piece by applying a force to the edge of the work piece at a point spaced laterally of the control point toward the stitching line, the detection of deviation from said control point being detected sufficiently close to said blocking point so that the edge of the work piece is always detected as being deviated from the control point, whereby the step of moving the work piece back toward the control point is carried out constantly, and the work piece is supplied to the stitching point with the side edge of the work piece maintained in the control position.



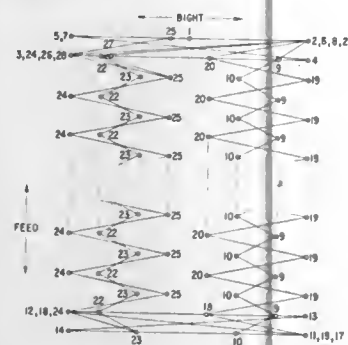
2. A method of automatically guiding a work piece in a sewing machine, comprising the steps of:  
continuously detecting minor deviations of the position of the side edge of a work piece from a control position only when the side edge moves in a direction toward the line of stitching in the sewing machine, said detection being effected at a point prior to the stitching point relative to the direction of feed of the work piece;  
moving said work piece transversely of the stitch line back toward the control position by contacting a rotary wheel with the surface of the work piece and driving the rotary wheel in response to a detected deviation in a direction and for a time until said side edge of the work piece is brought back to said control position; and  
blocking the movement of the side edge of said work piece from said control position in the direction transversely away from the stitch line at a point prior to the stitching point relative to the direction of feed of the work piece; whereby the work piece is supplied to the stitching point with the side edge of the work piece maintained in the control position.

**4,159,688**  
**METHOD OF FORMING A BUTTONHOLE PATTERN**  
Stephen A. Garron, Elizabeth, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,939  
Int. Cl.<sup>2</sup> D05B 3/06

U.S. Cl. 112-264.1

3 Claims



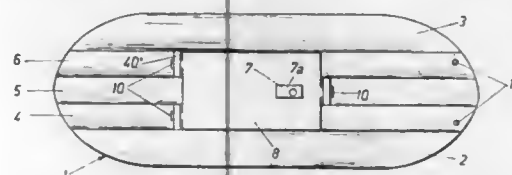
1. A method of operating a zig zag sewing machine to produce a buttonhole pattern including two spaced-apart rows of zig zag stitches, each row having a width less than one half the total width of the two parallel rows side by side, there being a separation between the two parallel rows to define the cutting space of the buttonhole pattern, said method comprising the steps of:

- sewing a first row of narrow zig zag cording stitches in a first direction extending the length of the buttonhole pattern, said cording stitches having a width less than the width of one of said parallel rows;
- sewing one of said parallel rows of zig zag stitches in a second direction opposite said first direction extending the length of said buttonhole pattern and overlying said first row of cording stitches;
- sewing a second row of narrow zig zag cording stitches in said first direction extending the length of the buttonhole pattern, said cording stitches having a width less than the width of one of said parallel rows, said second row of cording stitches being parallel to said first row of cording stitches and spaced therefrom by a distance greater than said cutting space; and
- sewing the second of said parallel rows of zig zag stitches in said second direction extending the length of said buttonhole pattern and overlying said second row of cording stitches.

**4,159,689**  
**WINDSURFER**  
Gerhard Odoj, Munich, Fed. Rep. of Germany, assignor to Semperit Aktiengesellschaft, Vienna, Austria  
Filed Aug. 1, 1977, Ser. No. 820,924  
Claims priority, application Switzerland, Aug. 12, 1976, 10248/76

Int. Cl.<sup>2</sup> B63B 35/00  
U.S. Cl. 114-339

17 Claims



4. In a windsurfer apparatus including a generally planar horizontal floating body member, a vertical mast connected with said body member, and sail means secured to said mast for capturing the wind to propel the windsurfer, the improvement wherein said horizontal body member comprises:

- at least three successively connected parallel contiguous cylindrical inflatable members arranged parallel to the direction of travel of the windsurfer including an outer side pair of inflatable members each having a first outer diameter and inner inflatable members arranged between said outer side inflatable members each inner inflatable member having a second outer diameter, said inflatable members having longitudinal axes arranged in a common plane;
- a rigid planar horizontal platform member arranged adjacent the upper surface of said inner inflatable members and approximately centrally of the length of the inflatable members, said platform member spanning the spacing distance between said pair of outer side inflatable members and having a length approximately one-third the length of the horizontal body member; and
- means connecting said platform member in contiguous relation with the upper surfaces of said inner inflatable members.

**4,159,690**  
**AUTOMATIC LANDING SYSTEM FOR HYDROFOIL CRAFT**

William E. Farris, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 7, 1977, Ser. No. 858,237

Int. Cl.<sup>2</sup> B63B 1/30

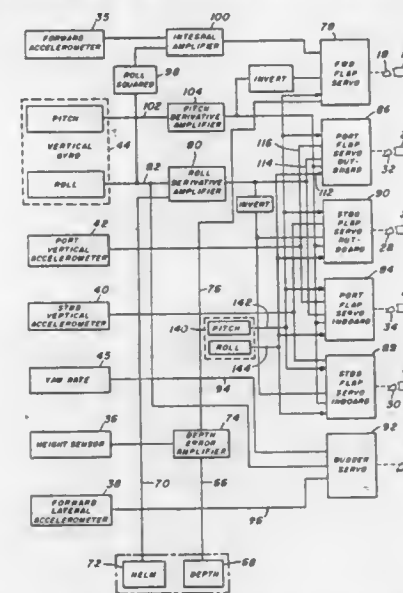
U.S. Cl. 114-275

5 Claims

1. In a control system for a hydrofoil craft of the type having at least one control surface, primary electrical circuit means including a primary servo system for controlling said surface during normal operation of the hydrofoil, and a primary source of electrical power for said primary electrical circuit means, the improvement of:

- auxiliary electrical circuit means including a secondary servo system and a secondary source of electrical power therefor for automatically positioning said surface to cause said hydrofoil craft to descend from a foil-borne to a hull-borne mode of operation upon the occurrence of a failure in said primary power source; and
- gyroscope means in said auxiliary electrical circuit means and operable when a failure in said primary power source

occurs when the hydrofoil craft is turning for automatically causing the craft to roll out of an inclined deck



attitude to an essentially level deck attitude as the craft descends to a hull-borne mode of operation.

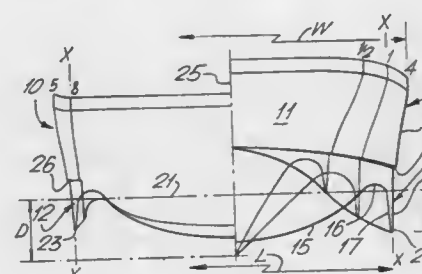
**4,159,691**  
**MARINE CRAFT EMPLOYING BOW-WAVE LIFT**  
Roland K. Paxton, 13, Calbourne Rd., Carisbrooke, Isle of Wight, England

Filed Jul. 12, 1977, Ser. No. 814,821

Claims priority, application United Kingdom, Jul. 15, 1976, 29448/76

Int. Cl.<sup>2</sup> B63B 1/18  
U.S. Cl. 114-290

10 Claims



1. A marine craft comprising at least one hull, having downwardly-depending walls disposed symmetrically on each side of the longitudinal axis of the hull, so that in operation of the craft, the walls extend into the water over which the craft travels, said craft having a form defining bow and stern halves wherein, starting from a vertical plane containing the longitudinal axis of the hull and extending in a lateral direction:

- with respect to the bow half of the craft, the underside of the hull has symmetrical innermost parts which rise outwardly and upwardly, then symmetrical intermediate parts which curve downwardly to merge with the walls, said innermost parts gradually increasing in outward inclination as they extend sternwards;
- with respect to the stern half of the craft, the underside of the hull has symmetrical innermost parts which extend outwardly and upwardly, then symmetrical intermediate parts which curve downwardly to merge with the walls;
- said intermediate parts of said bow and stern halves, together with the walls thereof, define tunnels of inverted "U" form and having uppermost points forming a line which inclines downwardly from the bow to the stern, through which bow-wave water tending to move out-

wardly and rearwardly, relative to the craft hull, is diverted and accelerated by way of converging bow parts of the walls; and,  
(d) the foremost parts of said walls are laterally spaced from said longitudinal axis of the hull.

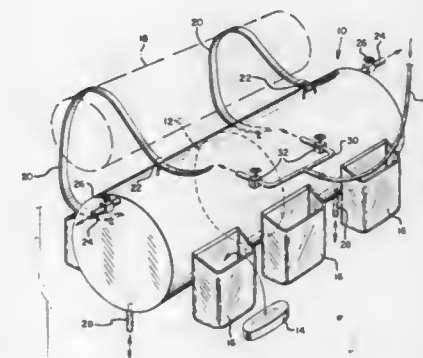
**4,159,692**  
**METHOD OF SUBMERGING FLOATATION BODIES AND APPARATUS FOR PERFORMING SAME**  
Wayne K. Dye, Jr., 1701 Clackamette Dr., Oregon City, Oreg. 97045

Filed Oct. 25, 1977, Ser. No. 844,787

Int. Cl.<sup>2</sup> B63G 8/00

U.S. Cl. 114-333

9 Claims



5. Apparatus for positioning a high buoyancy floatation body beneath a structure floating in a body of water comprising:

- an elongate tank, having a top, a bottom and sides;
- means of releasably securing said floatation body to said tank;
- said tank having, when filled with water, a negative buoyancy force which is greater than the buoyancy force of said floatation body, and having a volume which is sufficient to cause said tank to float when it is filled with air;
- said tank being divided along its longitudinal axis into at least two isolated compartments;
- fluid passageway means located proximate the bottom of said tank, one entering each said compartment, for allowing water to enter and to be evacuated from said compartment;
- air outlet means located proximate the top of said tank, one entering each said compartment, each said air outlet means including a valve configured for selectively releasing air from its associated compartment so as to allow inflow of water into said compartment through its respective fluid passageway; and
- air inlet means located in the tank, one entering each said compartment, each said air inlet means including a control valve arranged for selectively admitting pressurized air into its associated compartment so as to force water out of said compartment through its respective fluid passageway means.

**4,159,693**  
**ARTICLE AND METHOD FOR ADDING MARKINGS TO A SPEEDOMETER**

Roland Rappoport, 830 Turquoise, New Orleans, La. 70124

Filed Jun. 15, 1977, Ser. No. 806,693

Int. Cl.<sup>2</sup> G01P 1/08; G09F 3/00

U.S. Cl. 116-62.2

11 Claims

1. An article for modifying an automobile speedometer of the type having a single series of miles per hour speed markings to include a series of kilometers per hour speed markings, the article comprising:

- a backing sheet;

- [illegible]

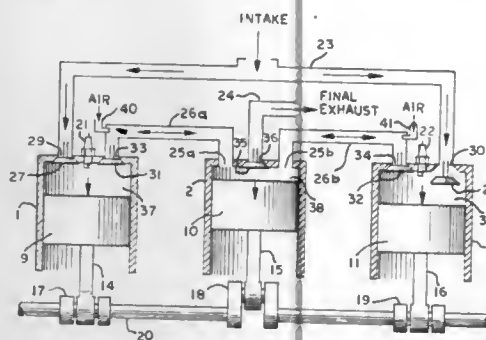
[illegible][illegible]

(a) primary cylinders and secondary cylinders, each primary cylinder connected to at least one closely-disposed secondary cylinder by means of a conduit compounding said cylinders to form an operable engine unit and serving as a passageway carrying gases transferred and shared between said compounded cylinders during each period in which those cylinders are made to coact by sharing their expansion and exhaust events in a manner effecting a



substantial overlap and extension of those events, respectively;

- (b) each primary cylinder being a four-cycle prime mover in which fuel combustion is initiated for creating engine working medium therein;
- (c) means for supplying primary air and fuel only to said primary cylinders and in quantities effecting the equivalent of ignitable fuel-rich mixtures;
- (d) means for timely igniting said mixtures in the primary cylinders, respectively;
- (e) means including pistons, connecting rods and a crankshaft arranged for converting the effects of combustion of the fuel into propulsive mechanical force as engine output;
- (f) an exhaust valve and port in each primary cylinder serving as means for effecting coaction between compounded whereby means are provided to which gases are transferred, intermixed and shared between those cylinders caused to coact by the conduit-controlling exhaust valve in said primary cylinder via opening said exhaust valve early during the expansion event of that cylinder, and as the secondary cylinder expansion event is occurring, so as to effect an early sharing, overlapping, and compounding of those expansion events via said conduit and a substantial extension of each expansion phase of the engine's operating cycle;



- (g) each said conduit connecting a primary-cylinder exhaust port to the combustion chamber of each secondary cylinder in the same engine unit whereat said conduit terminates as a constantly-open port through which gases including working medium may pass in either direction whenever said exhaust port is open, whereby the said gases are shared between the coacting compounded cylinders;
- (h) each secondary cylinder adapted to operate according to a two-event work cycle and to receive secondary air and subsequently share same between coacting compounded cylinders as said working medium also is simultaneously shared by those cylinders, said secondary air serving to support the burning of leftover combustibles in said medium whereby the expansive force of said medium is increased to effect improved engine power from a given amount of fuel, combustion is made more complete within the engine, and contaminants in engine exhaust are substantially reduced; and
- (i) a conventional exhaust system connected to the exhaust ports of said medium-sharing secondary cylinders for transferring therefrom the engine's final exhaust to the atmosphere.

4,159,700

**INTERNAL COMBUSTION COMPOUND ENGINES**  
William H. McCrum, Candlewood Mountain Rd., New Milford, Conn. 06776

Continuation-in-part of Ser. No. 734,638, Oct. 18, 1976, Pat. No. 4,086,882. This application May 1, 1978, Ser. No. 901,646  
Int. Cl.<sup>2</sup> F02B 75/20

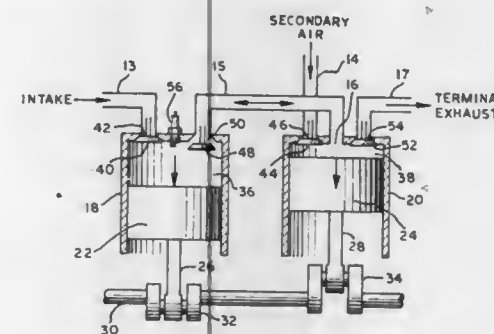
U.S. Cl. 123—59 EC

3 Claims

1. An internal combustion compound reciprocating engine

of the type operating according to the known four-stroke cycle and comprising in combination:

- (a) primary cylinders and secondary cylinders arranged alternately in a bank of in-line cylinders, each primary cylinder distinguished from secondary cylinders by serving as a prime mover in conventional manner, and initiating a combustion phase of the engine's operating cycle as an expansion event;
- (b) means including a reciprocable piston in each cylinder, a crankshaft, and connecting rods conventionally connecting the respective pistons to said crankshaft for converting the effects of fuel combustion into propulsive mechanical force as engine output;
- (c) means for supplying primary air and fuel only to said primary cylinders and in quantities effecting the equivalent of ignitable fuel-rich mixtures;
- (d) means for timely igniting said mixtures in primary cylinders to effect engine working medium;
- (e) means including an intake and an exhaust port and valve in each cylinder for effecting and controlling admission, discharge and transfer of gases to, from and between the cylinders, respectively;
- (f) gas transfer conduits, each compounding one primary and an adjacent secondary cylinder to form one of the engine's compound units, and particularly connecting the exhaust port of that primary cylinder to a valveless port at and forming part of the combustion chamber of that secondary cylinder, whereby means are provided to which gases are shared between those cylinders during their coaction



caused by the conduit-controlling exhaust valve in said primary cylinder via opening said exhaust valve early during the expansion event of that cylinder, and specifically as the secondary-cylinder expansion event commences, so as to effect an early sharing, overlapping, and compounding of those expansion events and a substantial extension of the expansion phase of the engine's operating cycle;

- (g) each primary-cylinder exhaust valve serving as means for effecting coaction between compounded cylinders and for controlling the transfer and sharing of gases between said cylinders, the open-time duration of said valve being the total period during which those compounded cylinders coact;
- (h) a separate manifold connecting intake valve ports of secondary cylinders to a conventional air filter system through which secondary air is inducted during respective intake events of those cylinders, compressed during successive compression events, respectively, and subsequently mixed with said working medium to support burning of combustibles in that medium as it is shared between coacting compounded cylinders during their combined expansion events;
- (i) means for opening and closing said valves in accordance with timing required by the engine's operating cycle events regulated by said crankshaft;
- (j) the cranks having crankpins disposed such that there is effected equal spacing of primary-cylinder expansion events, equally-spaced secondary-cylinder expansion

events, and alternation of said primary and secondary events in a manner causing a substantial overlap of those events as they occur in and are shared by said coacting compounded cylinders, the minimal duration of said overlap in any engine arrangement equating with 60° of crankshaft rotation; and

- (k) an exhaust system for transferring the engine's final exhaust from secondary cylinders to the atmosphere.

4,159,701

# SYSTEM FOR CONTROLLING FUEL SUPPLY IN INTERNAL COMBUSTION ENGINE

Chigaku Murata, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

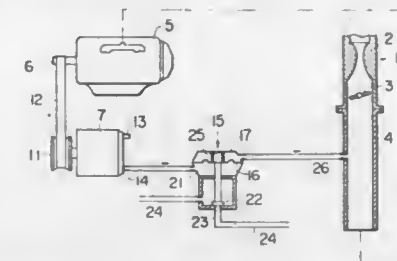
Filed Mar. 3, 1977, Ser. No. 773,931

Claims priority, application Japan, Aug. 26, 1976, 51/113498[U]

Int. Cl.<sup>2</sup> F02D 31/00, 11/08

U.S. Cl. 123—97 B

12 Claims



- 1. A system for controlling fuel supply in an internal combustion engine, comprising:

an air pump driven by an output shaft of said engine; and a pressure responsive valve including two chambers separated by a diaphragm; a valve body coupled to said diaphragm; a valve seat; said valve body and said valve seat cooperating with each other so as to open and close a fluid passage, means biasing said diaphragm and valve body in a valve closing direction, one of said two chambers being supplied a discharge pressure from said air pump whenever it is operating to act directly on said diaphragm against the bias of said biasing means and the other of said chambers being supplied a vacuum from the engine intake system, downstream of a throttle valve in a carburetor, to also act directly on said diaphragm against the bias of said biasing means.

4,159,702

# ENGINE IGNITION TIMING CONTROL WITH MULTI-STAGE ADVANCES, RETARD, AND ALTITUDE COMPENSATION FUNCTIONS

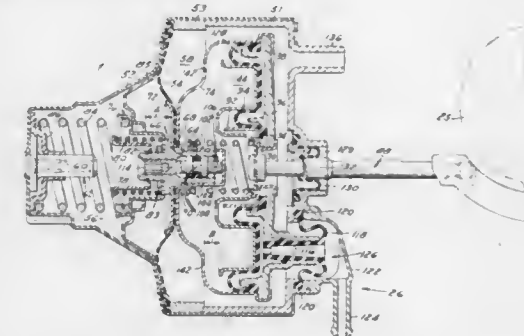
Ahmet R. Akman, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1977, Ser. No. 864,886

Int. Cl.<sup>2</sup> F02P 5/04

U.S. Cl. 123—117 A

30 Claims



- 1. A multi-stage ignition timing control for an internal com-

bustion engine having a carburetor mounted thereon with an induction passage connected to the engine intake manifold and having a throttle valve movable to open and close the passage, a pressure sensitive part throttle spark port opening into the passage and adapted to be traversed by the edge of the throttle valve during its opening movement to progressively vary the pressure in the port from a maximum ambient/atmospheric pressure level to the level of the manifold vacuum, an engine driven air pump providing a source of above atmospheric pressure that varies as a function of changes in engine speed, a distributor ignition timing change means having movable lever means in an initial set engine timing position movable in an advance direction from the set position to advance the ignition timing and movable in an opposite retard direction to return the lever means to the set position and beyond to retard the ignition timing, and a servo mechanism having diaphragm means operatively connected to the distributor lever means for moving the same in response to the application of the various pressures to the diaphragm means, conduit means connecting the pressure from the spark port and air pump to the servo-mechanism to act on the diaphragm means, first means in the servomechanism providing an advance movement of the lever means in response to the application of spark port vacuum to the diaphragm means, second means in the servomechanism providing an advance movement of the lever means in response to the application of above atmospheric pressure from the air pump to the diaphragm means, and third means in the servomechanism providing a retard movement of the lever means from the set position in response to the switching of spark port vacuum to air pump pressure to act on the first means.

4,159,703

# AIR ASSISTED FUEL ATOMIZER

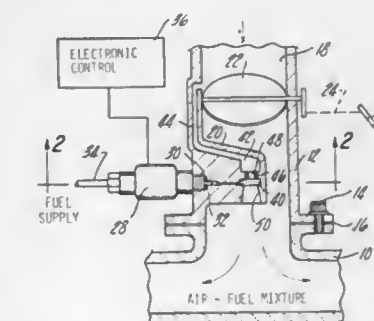
Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 10, 1976, Ser. No. 748,864

Int. Cl.<sup>2</sup> F02M 69/00; F02D 3/00, 3/02; F02M 69/04

U.S. Cl. 123—139 AW

25 Claims



- 1. A delivery system for providing an atomized air/fuel mixture to the intake manifold of an internal combustion engine comprising:

a throttle body connected to the intake manifold having a primary air passageway therethrough providing an air flow path from an external source to the intake manifold; throttle valve means disposed in said throttle body for controlling the air flow through said primary air passageway in response to operator commands; means for generating signals having a value indicative of the engine's fuel requirement; fuel delivery means for delivering a quantity of fuel in response to said signals, said fuel delivery means including at least one fuel control valve having an input port receiving fuel under pressure from an external source and an output port outputting said quantity of fuel; atomizer means disposed in said air passageway downstream of said throttle valve means, said means comprising an air

chamber having a cylindrical inner surface, a secondary air passageway conducting air from said primary air passageway upstream of said throttle valve means to said air chamber tangential to said cylindrical surface, an orifice concentric with said air chamber restricting the air flow through the said air chamber, a generally circular fuel swirl chamber disposed adjacent to said orifice, connecting means connecting the output port of said fuel control valve with said fuel swirl chamber for injecting said quantity of fuel into said fuel swirl chamber tangential to the inner surface of said fuel swirl chamber to form a fuel ring therein, and an exit port conducting the air received by said air chamber and the fuel injected into said fuel swirl chamber back into said air passageway downstream of said atomizer means.

4,159,704

# ARTICULATED, SPRING-CONTROLLED INTAKE VALVE

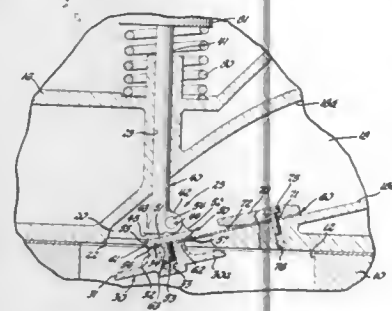
Harold V. Wiknich, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,775

Int. Cl.<sup>2</sup> F01L 3/00, 7/00

U.S. Cl. 123—188 AP

3 Claims



1. A valve controlled induction system for an internal combustion engine including a cylinder head having an induction passage therein terminating at an annular beveled valve seat defining an inlet port to a combustion chamber on the combustion side of the cylinder head, a through stem guide bore in said cylinder head opening into said induction passage concentric with said valve seat, a valve stem reciprocably journaled in said stem guide bore, a flexure spring of flat spring material, a clamp means fixed to said cylinder head within said induction passage with one end of said flexure spring secured between said clamp means and said cylinder head, a valve head, and a hinge means, said hinge means having one end thereof pivotally connected to said valve stem off-center of the axis thereof and having its opposite end fixed to said valve head, with the opposite end of said flexure spring sandwiched therebetween, whereby said valve head is positioned for movement upon reciprocation of said valve stem between a closed position at which said valve head is in seated engagement with said valve seat and an open position at which said valve head is in pivoted and axially spaced-apart relation relative to said valve seat.

4,159,705

# TOY PROJECTILE LAUNCHING DEVICE

Ian H. Jacoby, Rd. 1, Mt. Hope Rd., Middletown, N.Y. 10940

Filed Feb. 3, 1978, Ser. No. 874,856

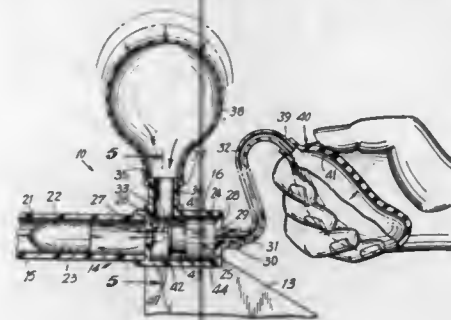
Int. Cl.<sup>2</sup> A63H 33/18; F41F 1/04

U.S. Cl. 124—63

7 Claims

1. A toy pneumatic projectile launching device comprising a housing having a bore, barrel means connected to said housing for receiving and guiding a projectile to be launched, an air pressure storage reservoir connected to said bore adjacent said barrel means, a flow passage extending between said barrel means and said bore, a pilot member movably mounted in said bore for selectively closing and opening said flow passage between said barrel and reservoir, and pump means opera-

tively connected to said bore for charging said reservoir and maintaining said pilot in said closing position responsive to super-atmospheric pressure generated by said pump means and



for shifting said pilot member from said closing to said opening position of said passage responsive to pressures in said pump means below the pressure in said reservoir.

4,159,706

# SOLAR COLLECTOR COMPRISING AN EVACUATED ABSORBER COVER TUBE

Faramarz Mahdjuri, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

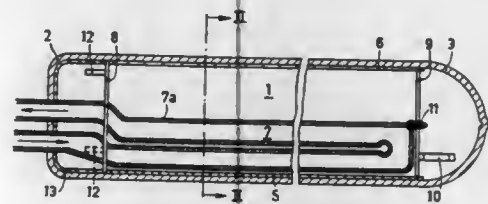
Filed Mar. 14, 1977, Ser. No. 777,037

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612171

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—270

6 Claims



1. A solar collector, which comprises an evacuated, transparent essentially straight cover tube substantially circular in cross-section and sealed at its ends, a selective absorber associated with said cover tube, a selective heat-reflective layer provided on the inner surface of said cover tube along its entire cylindrical length and over a cross-sectional area of at least 180°, and a metallic reflective layer provided on the inner surface of at least one end of the cover tube.

4,159,707

# SOLAR ENERGY COLLECTOR AND INSTALLATION EMPLOYING SAME

Jean-Francois Miquel, L'Hay-les-Roses, France, assignor to Agence Nationale de Valorisation de la Recherche, Neuilly, France

Filed May 25, 1977, Ser. No. 800,527

Claims priority, application France, May 26, 1976, 76 16055

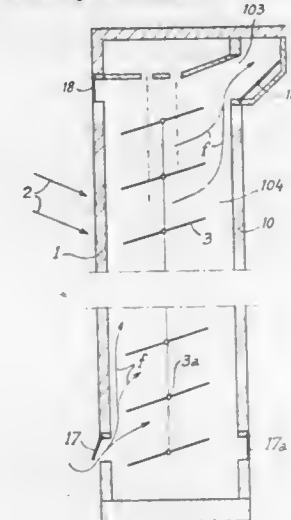
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—270

17 Claims

1. In a solar energy collector, of the type comprising: a pick-up receiving the solar radiation and converting at least a part of this radiation into heat, and heat-exchanger means bringing a heat-exchange fluid into thermal contact with the pick-up and evacuating this fluid towards a user station, said pick-up comprising an assembly of juxtaposed plates which are substantially parallel to one another and form a layer, the distance between two adjacent plates is chosen so as to

constitute a well of heat in which the solar radiation is subjected to at least two reflections, at least one of the opposite faces of this well of heat is selectively absorbent for the infrared part of the solar radiation, the two faces of this well are substantially reflecting for the rest of the solar spectrum, and



the layer of plates is disposed between a front transparent wall receiving the solar radiation and a rear wall, these walls being substantially parallel to said layer and defining therebetween an enclosure in which a heat-exchange fluid circulates.

4,159,708

# SOLAR ENERGY COLLECTOR AND HEAT EXCHANGER

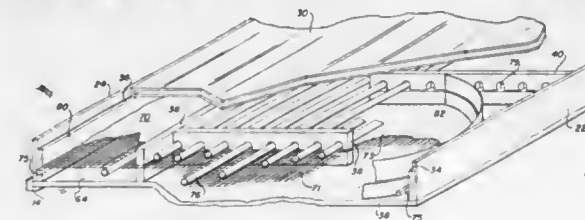
Donald L. Pyle, Midland, Tex., assignor to Near Star Solar, Inc., Midland, Tex.

Filed Jun. 17, 1977, Ser. No. 807,443

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—270

17 Claims



1. A solar energy collector and heat exchanger, which comprises:

- a housing having an open top and a closed bottom;
- a metallic sheet positioned in said housing to define a lower chamber;
- a first set of baffles in said lower chamber defining a first serpentine channel for directing air flow through said lower chamber;
- a second set of baffles above said metallic sheet in said housing defining a second serpentine channel for directing air flow therealong;
- an air inlet port extending into said housing and communicating with said lower chamber at one end of said first channel;
- an air outlet port extending out of said housing and communicating with the lower chamber at the other end of said first channel;
- structure forming flow openings in said sheet at the ends of said second channel and positioned for air flow there-through upon air flow through said first channel;
- a fluid system including a tube defining a serpentine path

through said housing above said metallic plate, said fluid system having an inlet and an outlet; and  
(i) a transparent panel covering the top of said housing to complete an upper chamber in said housing and to permit the transfer of radiant energy from the sun to said metallic sheet and to said tube of said fluid system thereby heating air passing through the upper and lower chambers of the housing and heating fluid passing through said fluid system.

4,159,709

# LOW COST SOLAR PANEL

Mario Palazzetti, Avigliana, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed Jul. 19, 1977, Ser. No. 816,991

Claims priority, application Italy, Jul. 20, 1976, 68809 A/73

Int. Cl.<sup>2</sup> F24J 3/02; F24F 3/14

U.S. Cl. 126—271

3 Claims



1. A solar panel for absorbing luminous and infra-red radiation for the heating of water, comprising a first plastics layer transparent to said radiation, a second plastics layer also transparent to said radiation and a third plastics layer opaque to said radiation, said second layer being secured to said third layer, a portion of said first layer being coextensive with said second layer, said first and second layers being secured together at spaced apart locations to define therebetween a plurality of interconnected preheating flow ducts, inlet means disposed between said first and second layers to provide for the supply of fluid to said preheating flow ducts, a second portion of said first layer extending beyond said second layer in spaced relation to said third layer, said second portion of said first layer being connected about the periphery thereof to said third layer to define additional flow ducts between said first and third layers in fluid communication with said preheating flow ducts and outlet means for the fluid disposed between said first and third layers.

4,159,710

# SOLAR COLLECTOR COMPRISING SOLAR TRACKING MEANS

Gijsbert Prast, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

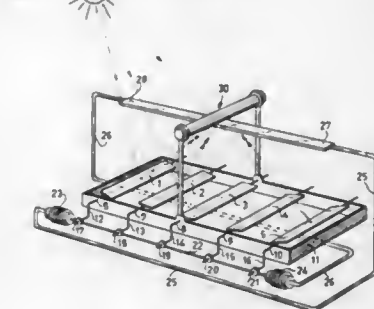
Filed Aug. 15, 1977, Ser. No. 824,273

Claims priority, application Netherlands, Sep. 20, 1976, 7610401

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

13 Claims

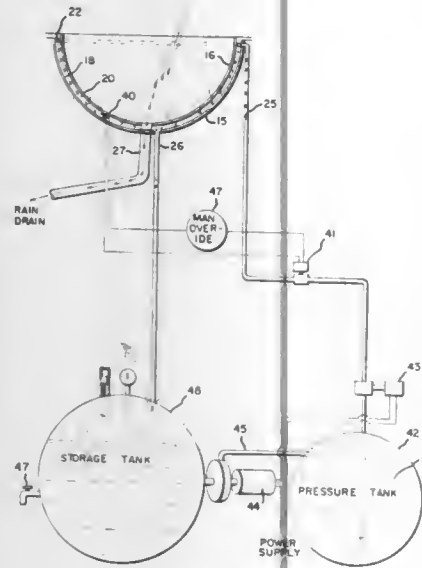


1. A solar collector, which comprises a plurality of elongate, mutually parallel individual reflectors mounted on a frame for rotation about their respective longitudinal axes, an adjusting



mechanism coupled to the individual reflectors for simultaneously rotating the same, an elongate absorber arranged parallel to the individual reflectors and serving to collect solar radiation focussed and concentrated thereon by the reflectors, and tracking means responsive to solar radiation for operating the adjusting mechanism, said tracking means including two elongate sensor reservoirs positioned opposite the reflectors and extending, when viewed from the reflectors, at least substantially on different sides of the absorber relative to each other, one end of each reservoir being situated in the immediate vicinity of the absorber, a vaporizable/condensible working medium partly in the liquid phase and partly in the vapour phase in each reservoir, the vapour pressure of said working medium in each reservoir being proportional during operation to the quantity of solar radiation received from the reflectors by the respective reservoirs, and means to enable the two working medium vapour pressures to act on the adjusting mechanism in mutually opposed senses to correct the focussing of solar radiation by the reflectors on the absorber in accord with any differential working medium vapour pressure.

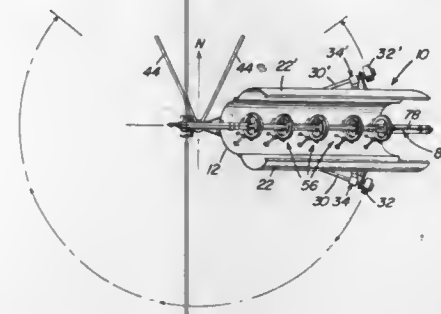
**4,159,711**  
**SOLAR HEATING APPARATUS**  
George P. Johnson, 1951 Hollywood Pkwy., York, Pa. 17403  
Filed Oct. 7, 1977, Ser. No. 840,157  
Int. Cl.<sup>2</sup> F24J 3/02  
U.S. Cl. 126-271



1. Apparatus for solar heating of water or other heat-conducting liquid, comprising, in combination:  
an upwardly open, substantially hemispherical outer bowl mounted out of doors in full view of the sun, the inner surface of the outer bowl being treated to absorb heat from the sun's rays;  
a transparent, substantially hemispherical inner bowl within and spaced from the outer bowl to form a substantially hemispherical passageway for liquid to be heated;  
the outer bowl and inner bowl being positioned so that the planes of their rims are substantially horizontal;  
dispensing means for introducing the heat-conducting liquid at the rim of the outer bowl so that liquid so introduced will run down the inside of the outer bowl, thereby being heated by the combined effects of the sun's rays and the heat absorbed by the outer bowl;  
outlet means at the bottom of the outer bowl for allowing heated liquid to drain from the outer bowl at a rate at least equal to the rate such liquid is introduced;  
a pressure tank containing heat-conducting liquid;  
a delivery pipe connecting the liquid in the pressure tank with the dispensing means;  
means for maintaining sufficient pressure on the liquid in the

delivery pipe to force liquid from the pressure tank through the delivery pipe and the dispensing means, to thereby cause said liquid to run down the inside of the outer bowl; and  
means responsive to the temperature in the passageway for permitting flow of liquid through the delivery pipe when the passageway temperature exceeds a predetermined value and preventing such flow when the passageway temperature is below such value.

**4,159,712**  
**SOLAR ENERGY CONVERSION UNIT**  
Howard W. Legg, 2229 North Park, Grand Island, Nebr. 68801  
Filed Oct. 20, 1977, Ser. No. 844,031  
Int. Cl.<sup>2</sup> F24J 3/02  
U.S. Cl. 126-271

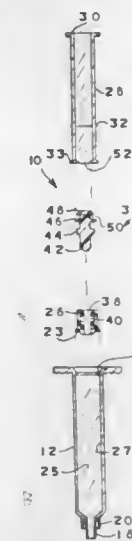


1. A solar energy conversion unit, comprising, in combination:  
(a) a collector forming a focal area for radiation received from the sun;  
(b) frame means for mounting the collector for movement with the sun;  
(c) core means forming a fluid passage and mounted on the frame and arranged at the focal area of the collector for receiving solar radiation from the collector and heating a fluid passing through the passage formed by the core means, wherein the collector is a longitudinally extending trough substantially semicircular in cross section, with the core means including a plurality of tubes arranged extending longitudinally of the extent of the trough and forming a further trough having a semicircular cross section, the tubes and collector being arranged substantially concentrically with one another with the tubes being disposed within the trough, wherein the collector has a pair of substantially parallel, spaced, longitudinally extending, peripheral edges, and includes a cover comprising a pair of cooperating doors arranged pivotally mounted on the edges of the collector by longitudinally extending hinges for swinging movement toward and away from one another.

**4,159,713**  
**BLOOD GAS SYRINGE**  
Alois G. Praiss, Garfield, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.  
Filed Jun. 2, 1977, Ser. No. 802,786  
Int. Cl.<sup>2</sup> A61B 5/00  
U.S. Cl. 128-765

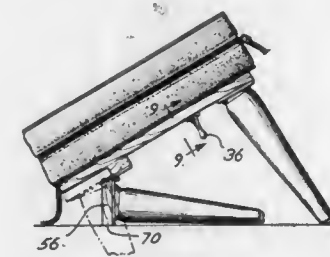
1. A blood gas syringe, which comprises:  
a barrel having a first open end for receiving a slidable plunger, a second open end adapted to mount a needle on the opening thereof and a bore communicating between said ends; and  
a plunger slidably mounted in the bore of said barrel, said plunger being at least partially withdrawable from said barrel through said first open end, said plunger comprising;

(a) an elastomeric piston having an upper end and a lower end, a body joining said upper and lower ends, said body having a diameter less than the diameter of said bore, and a sealing flange radially disposed about the outer periphery of said body between the upper and lower ends, said flange forming a light sliding seal with the inner walls of said barrel;  
(b) a plunger rod having a first end extending out of the first open end of said barrel and a second end within the bore of said barrel; and  
(c) means for coupling without a rigid connection, said second end of said rod to the lower end of said piston, said means permitting the displacement of the first end of said rod out of axial alignment with said piston, without mov-



ing said piston out of said alignment, said means also permitting free rotation and axial movement of the rod without moving the piston, and  
wherein said means comprises a stud mounted in said piston and an opening in the second end of said rod, said stud including a spacing bar component extending distally from the connection with the piston and a stud cap at the terminal end of the spacing bar, said stud spacing bar being inserted in and retained in said opening by engagement of the stud cap with the portions of said rod defining said opening, said spacing bar being of a dimension permitting the rod to float thereon without a rigid connection between rod and piston, said rod being rotatable and axially displaceable upon the spacing bar.

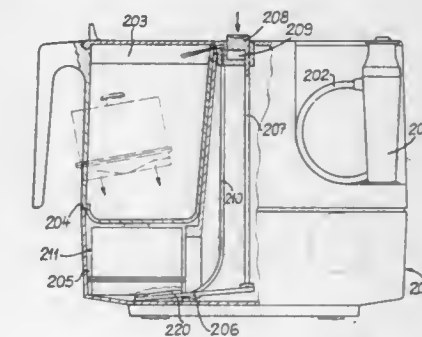
**4,159,714**  
**FOOTSTOOL**  
Samuel F. Peterson, Chicago, and Clifford E. Grube, Niles, both of Ill., assignors to Associated Mills, Inc., Chicago, Ill.  
Filed Nov. 29, 1977, Ser. No. 855,609  
Int. Cl.<sup>2</sup> A61H 21/00, 1/00  
U.S. Cl. 128-24.2



1. A footstool comprising in combination:  
a rigid substantially flat base having a top and a bottom;  
a plurality of leg members, at least two of said leg members

rigidly attached to said bottom in an extended position and the remainder of said leg members hingedly mounted on said bottom of said base for rotation between an extended position and a retracted position, said leg members cooperating when said remainder are in said extended position to support said base in a substantially horizontal position and cooperating when said remainder are in said retracted position to support said base in a position inclined from said horizontal position;  
means on said base for releasably fastening said remainder in said extended position;  
a cushion on said top having an upper section and a lower section;  
cooperative means defined on said top and on said lower section for releasably fastening said cushion to said base;  
an electrically operated vibrating element mounted between said upper section and said lower section;  
an electrically operated grid-type heating element mounted on said upper section; and  
a manually operated means for controlling said heating element and said vibrating element, said control means having at least a heating mode, a vibrating mode, a heating and vibrating mode and an off mode, said control means in said heating mode permitting electrical current to flow to only said heating element, in said vibrating mode permitting electrical current to flow to only said vibrating element, in said heating and vibrating mode permitting electrical current to flow to both said heating element and said vibrating element, and in said off mode preventing electrical current from flowing to either said vibrating element or said heating element;  
whereby said cushion may be used alone, on said base in said horizontal position and on said base in said inclined position to heat, massage or simultaneously heat and massage a localized portion of the body.

**4,159,715**  
**LIQUID TREATMENT APPARATUS FOR BODY CARE**  
Philippe G. E. Woog, Vesenz; Michel A. Moret, Chene Bourg; Pierre-Jean Jousson, Geneva, and Jean-Pierre Musy, Puplinge, all of Switzerland, assignors to Les Produits Associes LPA S.A., Switzerland  
Continuation-in-part of Ser. No. 704,330, Jul. 12, 1976, Pat. No. 4,078,558. This application Dec. 19, 1977, Ser. No. 861,708  
Claims priority, application Switzerland, Dec. 28, 1976, 16365/76; Dec. 28, 1976, 16366/76; May 26, 1977, 6484/77; Nov. 28, 1977, 14517/77  
Int. Cl.<sup>2</sup> A61H 9/00  
U.S. Cl. 128-66

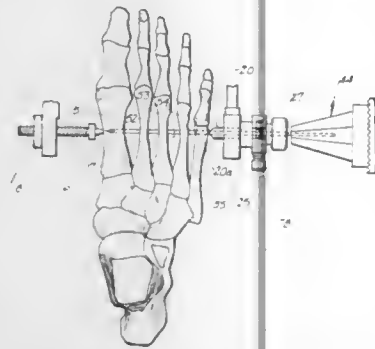


1. Apparatus for personal hygiene, in particular for oral hygiene comprising:  
a casing, a reservoir fitted on the casing for containing a liquid supply, a dispenser of an additive for addition to the liquid in the reservoir, the casing including means for receiving the dispenser, the receiving means comprises a housing situated below the reservoir, means for connect-

ing the outlet of the dispenser to the interior of the reservoir, and means for activating said dispenser.

**4,159,716**  
**METHOD OF COMPRESSING AND REALIGNING BONE STRUCTURES TO CORRECT SPLAY FOOT**  
 Clinton H. Borchers, 740 Reading Rd., Mason, Ohio 45040  
 Filed Oct. 17, 1977, Ser. No. 842,625  
 Int. Cl.<sup>2</sup> A61F 5/00; A61B 17/18  
 U.S. Cl. 128—80 R

1 Claim



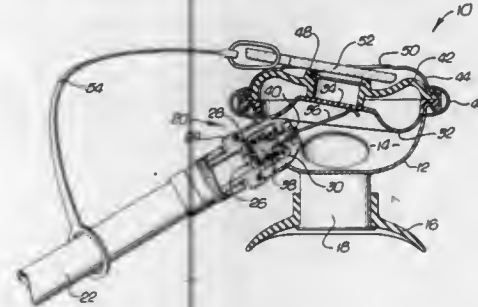
1. A method of compressing and realigning animal bone structures and passing a drill pin therethrough to retain said structures in a desired alignment, as applied to the correction of splay foot deformity in the human foot, comprising the steps of aligning two adjustable members on opposite sides of said bone structures of said human foot, one of said members being aligned on the medial side of the first metatarsal shank and the other of said members being aligned on the lateral side of the fifth metatarsal head, moving said members inwardly toward and in axial alignment with one another, thereby compressing and realigning said bone structures, clamping said members in relatively immovable positions, inserting a threaded drill pin through an axial passage in one of said members, advancing said drill pin by rotation thereof through said passage toward the other of said members and in axial alignment therewith through said fifth metatarsal head, under the fourth, third and second metatarsal shafts successively, and into said first metatarsal shank, thereby causing said drill pin to pierce and traverse said bone structures, stopping the advance of said drill pin when the end thereof has penetrated the interior of the most remote therefrom of the bone structures, and severing said drill pin at its point of entry into said fifth metatarsal head, the closest thereto of the bone structures, whereby a portion of said drill pin interconnects said most remote and closest bone structures to hold them in a desired relatively compressed alignment.

**4,159,717**  
**ANTISEPTIC PROTECTOR FOR SECOND STAGE SCUBA REGULATORS**  
 Mike R. Cossey, Huntington Beach, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.  
 Filed Jun. 7, 1977, Ser. No. 804,231  
 Int. Cl.<sup>2</sup> B63C 11/16; A62B 9/02  
 U.S. Cl. 128—142.2

5 Claims

1. In a demand regulator of a scuba apparatus:  
 (a) a regulator case;  
 (b) a pressure sensing element mounted in the case for movement in a path;  
 (c) means forming in the case, an inhalation chamber exposed to one side of the sensing element;  
 (d) means forming in the case, an ambient chamber exposed to the other side of the sensing element, there being at least one access opening through the case to said ambient chamber;  
 (e) a demand valve attached to the case and having a valve closure, and a seat relatively movable to admit breathable

gas into said inhalation chamber, and a resilient sealing element between the closure and the seat;  
 (f) spring means urging said closure and seat to clamp the sealing element between the seat and the closure;  
 (g) linkage means between the sensing element and said demand valve to move said valve closure and seat away from each other entirely to free the sealing element from clamping engagement in response to a reduction in pres-

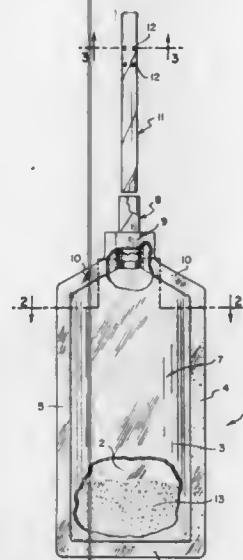


sure in said inhalation chamber; the combination therewith of:

(h) spacer means selectively interposed between said sensing element and said case and retractable from within said case and operative to move and hold said closure and seat entirely away from each other whereby, during storage or nonuse of said demand regulator, said resilient sensing element is entirely uncompressed and thereby protected from compression set.

**4,159,718**  
**DISPOSABLE DOUCHE**  
 Earle S. Bower, 633 Third Ave., New York, N.Y. 10017  
 Filed Jul. 19, 1977, Ser. No. 817,049  
 Int. Cl.<sup>2</sup> A61M 7/00  
 U.S. Cl. 128—248

7 Claims

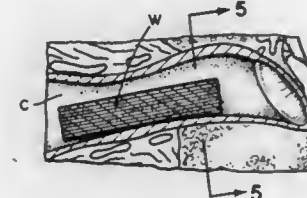


1. A disposable douche comprising two sheets of a thin plastic material sealed together along a major portion of their edges to form a bag having a closed end, a tubular joiner section extending into an end of the bag opposite said closed end with said sheets being heat sealed to the outer surface of said joiner section along a portion of its length to form a permanent seal and to each other to form a filler end of the bag, and an axially slidable tubular probe section sealingly engaging the interior of said tubular joiner section whereby when said probe is axially slid from said joiner section the bag may be filled with a liquid through said joiner section and whereby

when said probe is axially slid into said joiner section said douche is ready for use.

**4,159,719**  
**MOISTURE-EXPANDABLE EAR WICK**  
 Raymond H. Haerr, Cincinnati, Ohio, assignor to Xomed, Inc., Cincinnati, Ohio  
 Filed May 9, 1977, Ser. No. 794,917  
 Int. Cl.<sup>2</sup> A61F 1/18; A61M 31/00  
 U.S. Cl. 128—260

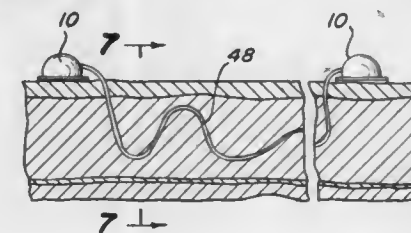
10 Claims



1. An elongate, spirally wound, compressed moisture-expandable ear canal wick for applying medicament to the interior surface of an ear canal, the wick comprising an initially flat length of moisture-expandable dehydrated sponge-like material said material being coiled up and compressed into an elongate device which is insertable into an ear and has a pair of ends and an outside diameter of approximately 2 to 3 mm, said material being characterized in that when hydrated by a liquid medicament said material uncoils so that the outer surface of said elongate device engages the interior surface of an ear canal in which the device is inserted prior to hydration, said outer surface contacting an ear canal inner surface to apply medicament to the interior surface of the ear canal, said uncoiling causing said device to expand radially outward and defining an open, unobstructed passage through the wick, said passage extending longitudinally of said device for essentially the entire length thereof and connecting said device ends together and permitting substantially free unobstructed passage of sound waves through the wick from one end of said device to the other end thereof whereby a user's hearing is essentially unimpaired when said wick is positioned within said user's ear canal and expanded into contact with the inner surfaces of that ear canal, said material being characterized such that when hydrated while unconfined said device will expand and completely uncoil to its original flat, non-compressed dimensions.

**4,159,720**  
**INFUSION OF LIQUIDS INTO TISSUE**  
 Andrew F. Burton, 1453 Whittier Pl., NW., Washington, D.C. 20012  
 Filed Nov. 28, 1977, Ser. No. 855,451  
 Int. Cl.<sup>2</sup> A61M 31/00  
 U.S. Cl. 128—260

16 Claims

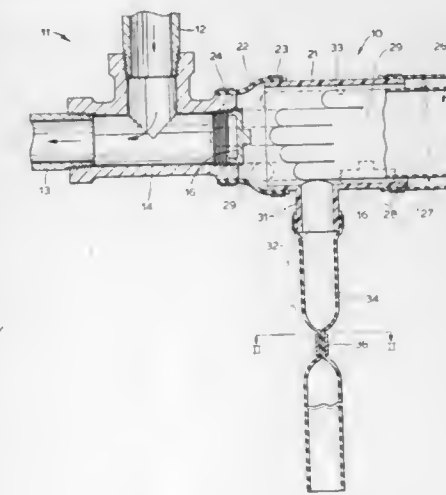


1. A means for treating the living subcutaneous tissue of a body, the means including wick means for continuously delivering a medicinal or other prescribed fluid from temporary reservoir means in which the liquid is stored, said reservoir means having a surface contoured to a portion of and releasably attached to that portion of the body containing the tissue to be treated, comprising an elongated flexible wick means of

substantial length which is adapted to be installed in the tissue to be treated, said wick means having a known rate of absorption for said fluid to feed fluid into said tissue, at least one end of said wick means being in contact with the fluid in said reservoir means, needle means for engaging with the other end of said wick means to lead said wick means into its installed position and then be disconnected from the wick means, and said wick means following in the path through which said needles means is guided during installation of the wick means in the tissue so that the wick means is led to a desired position so as to feed the absorbed fluid directly to the area in the tissue needing attention.

**4,159,721**  
**SANITARY PRESSURE RELIEF DEVICE**  
 Robert Horter, 11740 Maywood Dr., Sparta, Mich. 49345  
 Filed Jun. 30, 1977, Ser. No. 811,465  
 Int. Cl. F16k 43/00  
 U.S. Cl. 137—317

5 Claims



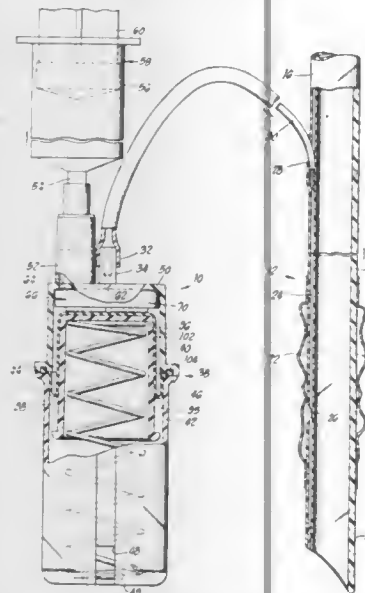
1. In a pressure relief device for attachment to a drain clean-out fitting having a removable plug for permitting controlled discharge of liquid from a drain system, the improvement wherein said pressure relief device comprises:

a rigid sleeve defining therein a chamber and having first and second openings formed in the opposite axial ends thereof for communication with said chamber;  
 releasable annular seal means for creating a sealed fluid-tight engagement with said fitting in surrounding relationship to the removable plug, said seal means including an axially elongated seal sleeve of flexible rubberlike material having one end thereof connected to and sealingly engaged with said body in surrounding relationship to said first opening, said seal sleeve having the other end thereof sealingly connectible to said fitting;  
 discharge conduit means connected to said rigid sleeve and communicating with said chamber for permitting discharge of liquid therefrom, said conduit means being fixed to the peripheral sidewall of said rigid sleeve intermediate the ends thereof;  
 manually operable flow control means connected to said discharge conduit means for selectively opening and closing same;  
 flexible boot means fixedly connected to said rigid sleeve in surrounding relationship to said second opening for sealingly closing same, said boot means including an elongated flexible glove portion which is insertable into and through said rigid sleeve for permitting engagement with the plug and removal thereof from the fitting;



said boot means also including a flexible sleeve portion integrally connected to said flexible glove portion, said sleeve portion being engaged with said rigid sleeve in surrounding relationship to said second opening; and releasable clamping means coacting with said sleeve portion and said rigid sleeve for holding said sleeve portion in clamped and sealed engagement with said rigid sleeve, said clamping means being releasable to permit removal of said boot means from said rigid sleeve.

**4,159,722**  
**PRESSURE REGULATOR FOR ENDOTRACHEAL TUBE CUFF OR THE LIKE**  
 Clarence L. Walker, Webster Groves, Mo., assignor to Sherwood Medical Industries, Inc., St. Louis, Mo.  
 Filed Mar. 28, 1977, Ser. No. 782,221  
 Int. Cl.<sup>2</sup> A61M 25/00  
 U.S. Cl. 137—496

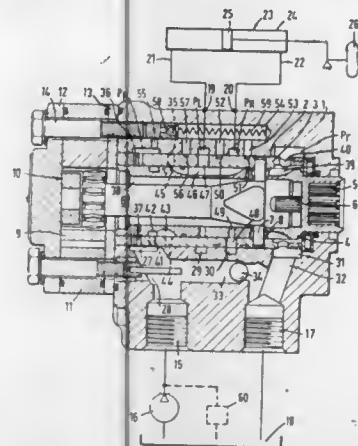


1. An improved pressure regulator for regulating the fluid pressure in an inflatable cuff on an endotracheal tube or the like comprising:

- a pressure regulator housing;
- means defining first and second openings in said pressure regulator housing; said first opening being adapted to be connected to an inflatable cuff, and said second opening being adapted to be connected to a source of fluid under pressure for inflating an inflatable cuff connected to said first opening;
- a valve housing disposed in said pressure regulator housing; said valve housing defining a valve chamber in fluid communication with said first and second openings;
- a valve member disposed in said valve chamber;
- a piston chamber in said pressure regulator housing exterior of said valve chamber;
- a piston member in said piston chamber; and
- means defining a fluid flow passage between said valve chamber and said piston chamber;
- said valve member being responsive to relatively rapid increases in fluid pressure in said first opening in said housing to block said fluid flow passage between said valve chamber and said piston chamber.

**4,159,723**  
**CONTROL DEVICE FOR STEERING APPARATUS OR THE LIKE**  
 Johannes V. Baatrup, and Ivar Rasmussen, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark  
 Filed Feb. 3, 1978, Ser. No. 874,886  
 Int. Cl.<sup>2</sup> F15B 13/04  
 U.S. Cl. 137—596.13

2 Claims



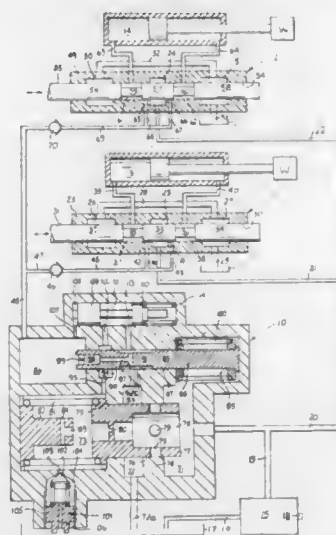
1. A control device for steering apparatus or the like comprising a housing having (1) a longitudinally extending bore (2) inlet and outlet ports and (3) two motor ports, outer and inner rotary slide members disposed in said bore and having supply, exhaust and switching passages interconnecting said ports, switching means wherein said slide members are in axially fixed relation relative to each but have limited rotary movement relative to each other to cause switching of said passages for alternately and selectively connecting said inlet port to either one of said motor ports and said outlet port to the other one of said motor ports, two axially spaced annular grooves being formed in the interface between said bore and said outer rotary slide member being respectively connected to said motor ports, said inner slide member having a steering shaft connection, a measuring motor connected to said inner slide member having the input side thereof connected to said inlet port and the output side thereof selectively connectable to either of said motor ports, three axially spaced auxiliary annular grooves formed in the interface between said housing bore and said outer rotary slide member in straddling relation to said two motor port annular grooves to impede the shortcircuiting flow of pressure fluid between said motor ports and from one of said motor ports to said outlet port, means for pressurizing all of said auxiliary annular grooves for all rotary positions of said inner slide member including the neutral position thereof.

**4,159,724**  
**LOAD RESPONSIVE CONTROL VALVE**  
 Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022  
 Continuation-in-part of Ser. No. 635,294, Nov. 26, 1975. This application Apr. 10, 1978, Ser. No. 895,041  
 Int. Cl.<sup>2</sup> F15B 13/08  
 U.S. Cl. 137—596.13

20 Claims

1. A valve assembly comprising at least one housing having an inlet chamber, a load chamber, and exhaust means communicable with reservoir means, first valve means for selectively interconnecting said load chamber with said inlet chamber and said exhaust means, load sensing port means selectively communicable with said load chamber by said first valve means, bypass valve means between said inlet chamber and said exhaust means having actuating means, pilot valve means having signal generating means responsive to pressure differential between pressure in said inlet chamber and pressure in said load sensing port means, said signal generating means of said pilot valve means operable through said actuating means of said bypass valve means to vary bypass flow between said inlet

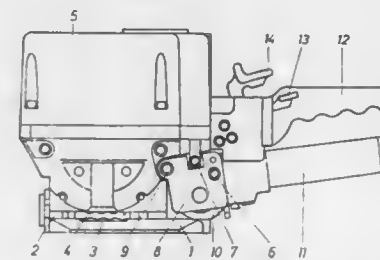
chamber and said exhaust means to maintain a constant pressure differential between said inlet chamber and said load sensing port means when pressure in said load sensing port means is above a certain predetermined level, and unloading



valve means having means responsive to pressure in said pressure sensing port means, said unloading valve means operable through said actuating means of said bypass valve means to lower pressure in said inlet chamber when pressure in said load sensing port means is below said certain predetermined level.

**4,159,725**  
**APPARATUS FOR TENSIONING AND LOCKING HOOPING BANDS**  
 Hans Bachmann, Fahrweid, and Ernst Albiez, Widen, both of Switzerland, assignors to Borbe-Wanner AG., Switzerland  
 Filed Nov. 28, 1977, Ser. No. 855,190  
 Claims priority, application Switzerland, Dec. 3, 1976, 15274/76  
 Int. Cl.<sup>2</sup> B21F 9/02  
 U.S. Cl. 140—93.2

8 Claims



1. An apparatus for tensioning a strap about a package and locking the strap by permanently deforming two superimposed portions thereof, comprising

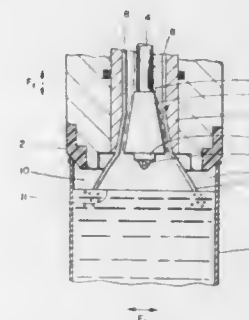
- a tensioning roller;
- first thrust drive means coupled to said tensioning roller for moving said tensioning roller toward and away from the superimposed portions;
- motor drive means coupled to said tensioning roller for rotating the tensioning roller in a direction to tension the strap;
- a locking device;
- second thrust drive means coupled to said locking device for moving said locking device toward the superimposed portions to deform same and away from the superimposed portions; and
- control means operably coupled to said motor drive means and said second thrust means for deactivating said motor drive means and actuating said second thrust means to move said locking device toward the superimposed por-

tions when the tension of the strap exceeds a predetermined value, said control means comprising

- a thrust rod;
- rotary cam means, coupled to said rod and said motor drive means, for rotating in response to a frictional force exerted thereon by said motor drive means and corresponding to the tangential force exerted on said tensioning roller for moving said rod in one direction, spring biasing means coupled to said rod for resiliently biasing said rod in a direction opposite to said one direction, and
- retaining lever means coupled to said second thrust means and to said rod for maintaining said locking device in a position away from the superimposed portions when said rod is in a first position and for permitting said locking device to move toward the superimposed portions when said rod is in a second position.

**4,159,726**  
**LIQUID FILLING DEVICE WITH AUTOMATIC SHUT-OFF SENSOR**  
 Manfred Mette, Hamburg, Fed. Rep. of Germany, assignor to Ortman & Herbst GmbH, Hamburg, Fed. Rep. of Germany  
 Filed Nov. 21, 1977, Ser. No. 853,244  
 Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653246  
 Int. Cl.<sup>2</sup> B65B 3/26, 31/00  
 U.S. Cl. 141—40

7 Claims

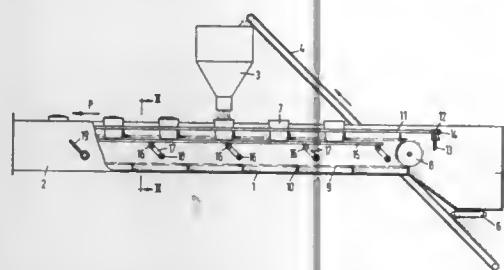


1. A device for filling liquid containers and having a housing with a lower edge and including a valve for automatically shutting off the flow of liquid into said containers at a pre-selected level comprising:

- a. a sealing means (2) mounted on said lower edge of said housing engaging the outer edge of said container with an airtight seal;
- b. a dispensing tube (1) mounted in said housing and connected to said valve, having means by which the liquid falls freely downwardly and outwardly in a paraboloid bell-shaped stream into said containers;
- c. a return air pipe (4) having an opening (15) mounted within said dispensing tube;
- d. sensor means mounted on said housing and located in the space enclosed by said bell-shaped stream and activated by the presence of liquid droplets;
- e. signal carrying means operatively connecting said sensor means and said valve for shutting off the liquid flow to said containers before said pre-selected level reaches said sensor means; and
- f. said bell-shaped stream (7) forms a pocket of trapped air in an outer area (10) which is enclosed and sealed airtight between said bell-shaped stream (7) said container (3) said sealing means (2) and dispensing tube (1) until the rising liquid in said container causes said bell-shaped stream to collapse and to spatter liquid droplets onto said sensor when said liquid reaches a predetermined level below said sensor, thereby activating said sensor and terminating the filling of said container.

4,159,727  
**POTTING AND REPOTTING MACHINE**  
 Anthony Visser, 's-Gravendeel, Netherlands, assignor to Visser  
 Tuinbouwtechniek en Hout B.V., 's-Gravendeel, Netherlands  
 Filed Jan. 27, 1978, Ser. No. 873,066  
 Claims priority, application Netherlands, Jan. 27, 1977,  
 7700839

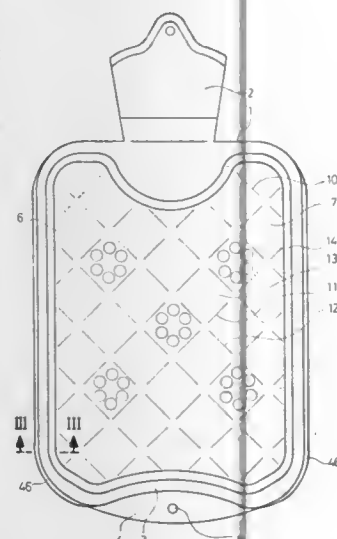
Int. Cl.<sup>2</sup> B65B 1/04  
 U.S. Cl. 141—131



1. In a potted and repotted machine which forms part of an apparatus for filling pots, in particular filling with potting soil of flower pots and the like, said machine being provided with an elongated bin which is open at the top and accommodating an endless chain conveyor fitted with carriers extending transversely to the transport direction, the improvement comprising at least one continuous pot guideway extending in longitudinal direction of the bin, and having a variable width and depth, the carriers of the endless chain conveyor comprising pushing means to push the pots along the pot guideway, said carriers extending in the upper part of the chain above the bottom level of the guideway or guideways.

4,159,728  
**HOT WATER BAG**  
 Friedrich Kraus, Stuttgart, and Berthold Kalbas, Krumbach, both of Fed. Rep. of Germany, assignors to Gummi-Kraus GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Feb. 23, 1978, Ser. No. 880,891  
 Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 7707739[U]

Int. Cl.<sup>2</sup> A61F 7/04  
 U.S. Cl. 150—2.1

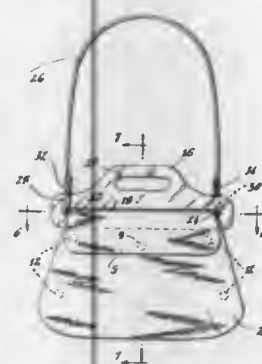


1. A hot water bag having a substantially rectangular configuration and a filling neck at a narrow side thereof, comprising in combination two heat radiating side walls made of a soft, rubber-like synthetic material, a pliant coat provided on at least one of said side walls and including a plastic foil and an under-

lining of foam material connected to said foil, the periphery of said foil being secured to said side wall by welding.

4,159,729  
**HANDBAG WITH ADJUSTABLE HANDLE AND STRAP**  
 Lawrence B. Schwartz, Fairfield, Conn., assignor to Acricite Company, Inc., Bridgeport, Conn.  
 Filed Jul. 28, 1978, Ser. No. 928,903  
 Int. Cl.<sup>2</sup> A45C 13/26

U.S. Cl. 150—33



1. An adjustable handbag including:  
 a first and second receptacle and means positioned between said receptacles for joining said receptacles together;  
 said first and second receptacles each having front and rear surfaces, said means for joining said receptacles being formed of a flexible material such that said first and second receptacles can be folded relative to each other so that said respective rear surfaces are adjacent to each other, means on said rear surfaces for selectively detachably affixing said rear surfaces to each other,  
 a handle defining a slot, said slot being of sufficient dimension to receive either said first or second receptacle, said handle being slideable along either of said receptacles until said slot engages with said means for joining said first and second receptacles,  
 said first and second receptacles depending from said handle when said rear surfaces of said receptacles are affixed to each other and said handle is in engagement with said means for joining said receptacles,  
 whereby said handle is selectively attachable to and removable from said handbag by sliding said handle along said receptacles.

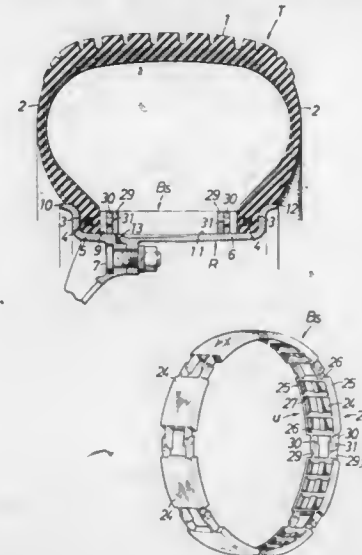
4,159,730  
**SAFETY WHEEL**  
 Isao Osada, Izumi, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Ohtsu Tire & Rubber Co., Ltd., Izumi-ohsuna and Honda Gikenkogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed Jul. 7, 1977, Ser. No. 813,770  
 Claims priority, application Japan, Jul. 17, 1976, 51-85408  
 Int. Cl.<sup>2</sup> B60C 5/00, 17/00

U.S. Cl. 152—158

13 Claims  
 1. A safety wheel comprising a circumferentially divided rim having a pair of spaced opposite flanges, a tubeless tire mounted on said divided rim about the periphery thereof, and an annular bead lock fitted in said tire to grip the bead portions thereof in co-operation with said flanges of said divided rim thereby to hold the bead portions against axial displacement relative to said divided rim, said bead lock comprising an endless train of rigid lock elements and flexible joint means flexibly connecting the rigid lock elements for movement between a fully expanded circular configuration and a retracted configuration and wherein in the expanded fully con-

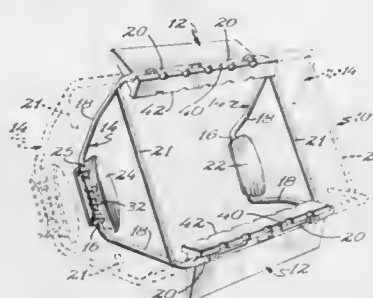
figuration the lock elements fit over the periphery of the medial portion of said divided rim and in the retracted configura-



tion the lock elements lie in the plane of said tire within the inner peripheral circle thereof.

4,159,731  
**TRACTION DEVICE**  
 Gerald L. Dyrda, Rte. 1 - Box 198A, Bagley, Minn. 56621  
 Filed Aug. 19, 1977, Ser. No. 826,043  
 Int. Cl.<sup>2</sup> B60C 27/20, 27/04  
 U.S. Cl. 152—228

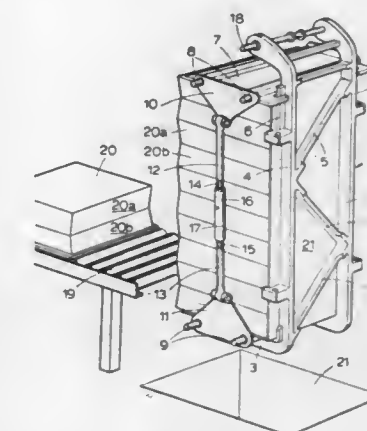
8 Claims



1. A traction device for assisting a drive wheel of a vehicle in gaining traction on slippery surfaces comprising a pair of traction plates adapted to overlie the rolling surface of a vehicle tire at circumferentially spaced intervals therearound, a pair of generally U-shaped tire side wall gripping elements each having a bight portion and radially outwardly extending legs, the free end portions of the legs of each gripping element connecting the ends of said plates and maintaining said plates in spaced relation to one another, traction increasing means on said plates projecting both radially outwardly and inwardly therefrom for respectively contacting the surface engaged by the rolling surface of the tire and the tread surface of the tire on which the device is mounted, a spring loaded spirally arcuate shoe swingably mounted adjacent one end thereof on the bight portion of one of said gripping elements and curving inwardly toward the tire side wall and then away from the tire side wall, said spring normally biasing said shoe axially inwardly for engagement with the tire side wall to retain the device in place on the tire when in use.

4,159,732  
**METHOD OF CASTING**  
 Herbert K. Handkammer, 76 Guinions Rd., High Wycombe, Buckinghamshire, England  
 Filed Jun. 13, 1977, Ser. No. 805,713  
 Claims priority, application United Kingdom, Jun. 11, 1976, 24286/76  
 Int. Cl.<sup>2</sup> B22C 9/20; B22D 33/04  
 U.S. Cl. 164—137

6 Claims



1. A method of casting utilizing boxless molds, the method comprising the steps of:

- (1) conveying molds at a first level to a frame maintained in a vertical position, the frame comprising a lower support surface for molds and a rear abutting plate, the lower support surface being initially substantially at the first level;
- (2) stacking a plurality of boxless molds one on another in the frame to form a substantially vertical stack, each mold being in a substantially horizontal position and abutting against the rear plate;
- (3) lowering the frame into a pit therebeneath during stacking of the molds on the frame, so as to maintain the top surface of the uppermost mold substantially at the first level;
- (4) lifting said frame from said pit and securing the molds within the frame, then pivoting the frame with the molds therein to an angle of approximately 90° so that each mold stands substantially vertically, the molds resting upon the abutting plate; and
- (5) filling the molds with molten metal while maintaining the molds in the substantially vertical position.

4,159,733  
**MOLDING MACHINE**  
 Masanobu Kuroda; Kazuo Noda, both of Kumagaya, and Shini-  
 chi Kobayashi, Fukaya, all of Japan, assignors to Hitachi  
 Metals, Ltd., Japan  
 Filed Feb. 14, 1978, Ser. No. 877,618  
 Int. Cl.<sup>2</sup> B22C 15/08

U.S. Cl. 164—211

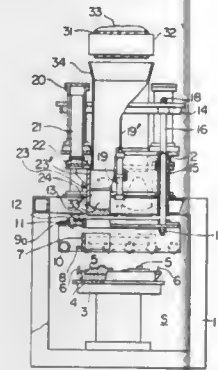
7 Claims

1. In an improved molding machine including upper and lower sections, a molding table disposed in said lower machine section and adapted to support thereon at least one pattern around which sand is formed into a mold, a squeeze means including at least one fluid-actuated squeeze cylinder disposed at a level above said molding table and squeeze plate means operatively associated with said squeeze cylinder so that said squeeze plate means is substantially vertically moved into and out of squeezing engagement with a sand mold around said pattern, and rapping means disposed in said upper machine section;

the improvement which comprises:  
 an open-topped hollow tubular member operatively connected to said squeeze cylinder;



said squeeze plate means being mounted on said tubular member for pivotal movement between open and closed positions to open and close the bottom of said tubular member;



said tubular member and said squeeze plate means when in closed position cooperating together to define a sand retaining space and to form a squeeze head operable by said squeeze cylinder.

4,159,734

## CONTINUOUS CASTING APPARATUS

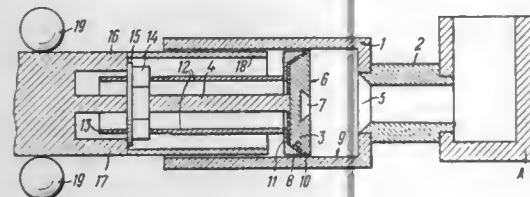
Vladimir T. Sladkoshtev, ulitsa Dzerzhinskogo, 34, kv. 11; Oleg A. Shatagin, ulitsa Melnikova, 47, kv. 9; Samuil F. Khalemsky, ulitsa Kharkovskikh divizy, 7/1, kv. 31; Viktor V. Sachko, ulitsa Danilevskogo, 10, kv. 147/148; Ivan A. Yakunin, ulitsa Zernovaya, 6/4, kv. 87, and Boris F. Abramov, ulitsa 23 Avgusta, 47, kv. 65, all of Kharkov, U.S.S.R.

Filed Jan. 26, 1977, Ser. No. 762,733

Int. Cl.<sup>2</sup> B22D 11/08

U.S. Cl. 164—426

3 Claims



1. A continuous casting apparatus comprising a tundish; a mold connected to said tundish by a refractory conduit capable of withstanding a plurality of casting cycles; a dummy-bar fed into said mold and equipped with a head section packed with a heat-resistant material on its surface adjacent the mold walls, sides of said dummy-bar head adjoining the mold wall being formed with bevelled portions decreasingly tapering in the direction of withdrawal of the cast ingot from the mold, said bevelled portions together with the mold wall forming a gap expanding in the direction of withdrawal of the cast ingot; and a sealing material placed in said gap and means for tamping the seal into position, said means for tamping being disconnectable relative to the dummy-bar head and located behind the dummy-bar head.

4,159,735

## PLATE-FIN HEAT EXCHANGER WITH CONTROLS THEREFOR

J. Hilbert Anderson, York, Pa., assignor to Sea Solar Power, York, Pa.

Filed Oct. 28, 1977, Ser. No. 846,319

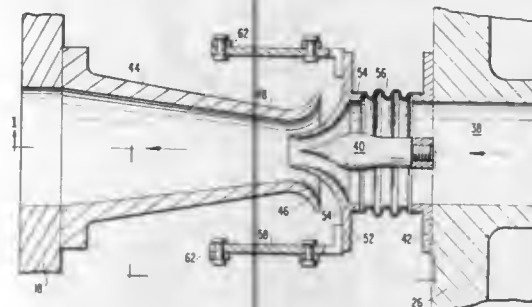
Int. Cl.<sup>2</sup> B60H 1/00; F25B 41/04; F04F 5/48

U.S. Cl. 165—40

9 Claims

1. A control for a heat exchanger having a plurality of plates arranged in pairs in spaced parallel relation to one another with each pair of plates defining a passage therebetween and each pair of plates defining a passageway between adjacent pairs of

plates, cover members for the top, bottom and sides of said plates, one of said cover members having a liquid inlet and a vapor outlet, a nozzle core member connected to said cover member in alignment with said inlet and certain of said passageways, a nozzle member suspended in said cover member in



alignment with said nozzle core member, a diffuser arranged in alignment with said nozzle member with said nozzle member interposed between said core member and diffuser and means connected to said nozzle member for moving same towards and away from said core member and said diffuser to control the liquid flowing through said inlet and into said passageways.

4,159,736

## METHOD OF AND ARRANGEMENT FOR THE SEASONAL STORAGE AND USE OF HOT WATER PRODUCED IN PARTICULAR BY ELECTRICAL POWER-GENERATING THERMAL AND NUCLEAR STATIONS

Louis H. D. Denis, Puteaux-Bellini; Abel J. H. Bedue, Versailles, and Jacques Malherbaud, Chatou, all of France, assignors to Technip, Rueil-Malmaison, France

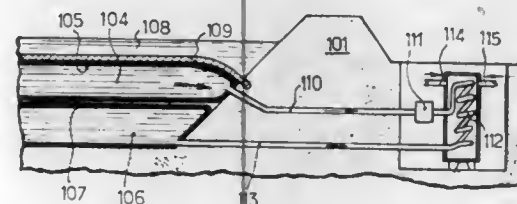
Filed Mar. 18, 1976, Ser. No. 668,000

Claims priority, application France, Mar. 20, 1975, 75 08747; Jun. 19, 1975, 75 19253; Aug. 27, 1975, 75 26419

Int. Cl.<sup>2</sup> F28D 17/04; F24H 7/00; F01K 3/02

U.S. Cl. 165—104 S

6 Claims



1. A large-capacity tank for seasonal storage of hot water, produced for example by electric power-generating thermal and nuclear stations, and for their seasonal use, for example for the heating of buildings, comprising:

a water containing basin of large surface area; two superposed individual inflatable pockets contained in said basin, the bottom pocket being for storage of cold water, and the upper pocket being for storage of hot water at a temperature near 90° C., both of said pockets lying under water contained in said basin; at least one of said pockets having an impervious plastic sheet deformable wall located between the contents of said upper and bottom storage pockets; first means coupled to said bottom storage pocket for supplying and recovering cold water stored in said bottom storage pocket; second means coupled to said upper storage pocket for supplying and recovering hot water stored in said upper storage pocket; and means coupled to said first and second means for controlling the flows of water such that an instantaneous supply of hot

water into said upper storage pocket is balanced by a corresponding drawing off of cold water into said bottom storage pocket, and such that an instantaneous drawing off of hot water into said upper storage pocket is balanced by a corresponding supply of cold water into said bottom storage pocket, said bottom and upper storage pockets providing together a substantially constant volume body of storage water.

4,159,737

## HEAT PIPE

Udo K. P. Biermann; Willem L. N. van der Sluys, and Johannes C. M. Roelofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

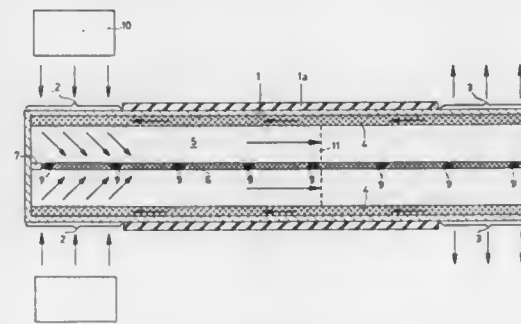
Filed Aug. 29, 1977, Ser. No. 828,478

Claims priority, application Netherlands, Nov. 8, 1976, 7612360

Int. Cl.<sup>2</sup> F28D 15/00

U.S. Cl. 165—105

7 Claims



1. A heat pipe which comprises a closed reservoir having at least one vaporization wall and at least one condensation wall; a heat transport medium in said reservoir for flowing in the vapour phase from the vaporization wall via at least one duct for vapour to the condensation wall during operation and for returning in the liquid phase via at least one duct for liquid to the vaporization wall; and at least one getter for gaseous impurities provided in said vapour duct and extending from the vaporization wall to the condensation wall and active at least at the operating temperature.

4,159,738

## FAN-ASSISTED FORCED FLOW AIR-COOLING HEAT EXCHANGER SYSTEM

Marcel Sedille, Paris, France, assignor to Societe des Condenseurs Delas S.A., Paris, France

Filed Mar. 8, 1977, Ser. No. 775,686

Claims priority, application France, Mar. 8, 1976, 76 06528

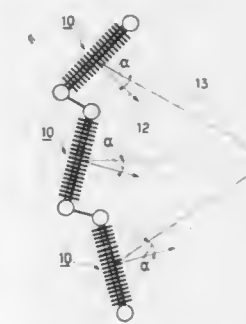
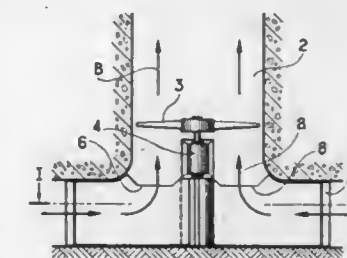
Int. Cl.<sup>2</sup> F28F 13/06

U.S. Cl. 165—125

5 Claims

1. In a forced flow system for heat exchange between a first fluid flowing inside ducts of a set of flat planar heat exchangers and a second fluid passing over the outside surfaces of the heat exchangers, said system including a vertical chimney terminating at its bottom in a radially enlarged chamber opening horizontally to admit air flow to said chimney, a fan placed in said chimney above said chamber and said heat exchangers positioned within said chamber such that said second fluid passes over the outside surfaces of the heat exchangers, the improvement wherein said heat exchangers are vertically oriented, are positioned within said chamber at a radial distance in excess of the radius of said chimney, constitute a circumferential array, and are angularly oriented relative to each other, and said heat exchangers including means defining horizontal air flow paths through said heat exchangers such that the streams of said second fluid emerging from the heat exchangers form on the average, in a plane perpendicular to the axis of rotation of the fan, an angle  $\alpha$  with the local radii emanating from the meeting point of said axis with said perpendicular plane, said angle  $\alpha$

being calculated such that during average operation of the assembly, the angular momentum of said second fluid in relation to the axis of the fan, at the output of the heat exchangers, is substantially equal but in the opposite direction to the angular



lar momentum imparted to said second fluid by the rotation of the fan, such that the angular momentum resulting from the second fluid in relation to the axis of the fan will be close to zero at the output of the fan.

4,159,739

## HEAT TRANSFER SURFACE AND METHOD OF MANUFACTURE

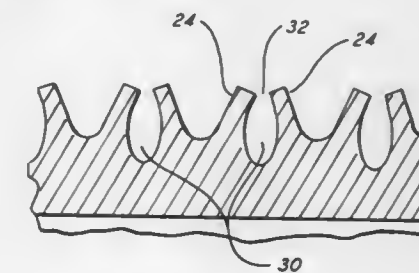
Warren S. Brothers, Skaneateles, and Albert J. Kallfelz, Camillus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,116

Int. Cl.<sup>2</sup> F28F 1/36, 13/02

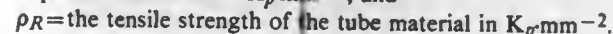
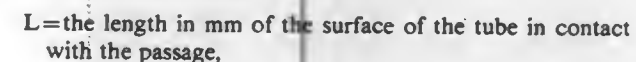
U.S. Cl. 165—133

8 Claims



1. A thermally conductive surface for transferring heat to a boiling liquid in a heat exchange apparatus comprising at least one gapped cavity wherein vapor is trapped to promote nucleate boiling, said cavity being defined by a wall and spaced ridges affixed to the wall, the ridges having a base portion attached to the wall and two fins mounted to the base portion such that a fin from each ridge is angled over the cavity forming a narrow gap therebetween, said cavity being elliptical in configuration and having curvilinear surfaces throughout, such that from the portion of the cavity adjacent the wall portion of the surface the cavity increases in width to a point and thereafter decreases in width to a gap at the end of the cavity formed by the fins, said gap serving to allow limited flow of the heat transfer fluid into and out of the cavity.

## 8 Claims

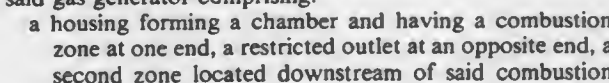


## 10 Claims

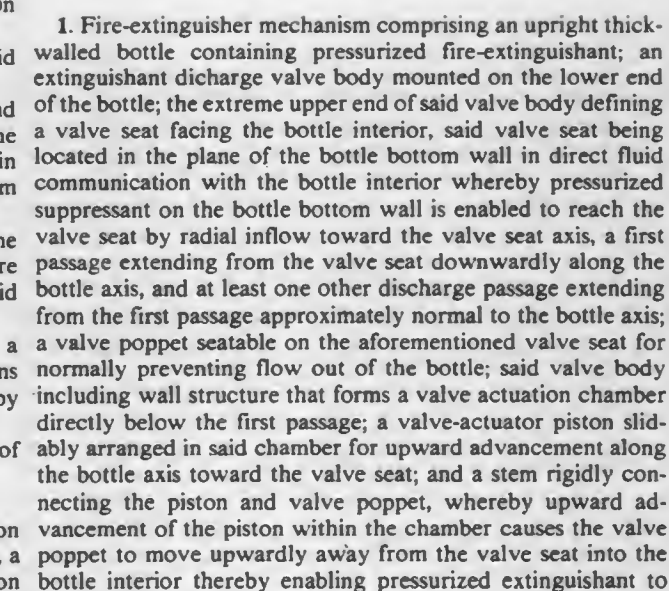


means for attaching said cables to said pipe at a plurality of axially spaced apart points to form a double helix about said pipe, said helix including a plurality of segments outwardly bowed from said pipe, wherein said segments extend outwardly from said pipe to substantially completely contact the walls of said well bore during rotation and reciprocation of said pipe.

## 2 Claims



## 9 Claims





flow downwardly from the bottle through the aforementioned passages; an explosive squib (50) mounted on the valve body in fluid communication with the chamber space below the piston, said squib being capable of generating a sufficiently high gaseous pressure on the lower face of the piston to produce rapid upward advancement of said piston within the actuation chamber; and means for filling and pressurizing the bottle comprising a fitting (64) mounted on the upper end of the bottle to define a central chamber (68) on the bottle axis, a check valve mounted on the fitting for admitting fluid to the central chamber (68), and a filler tube extending from the fitting downwardly into the bottle for transporting fluid from the central chamber (68) to a point in the bottle adjacent the aforementioned poppet valve; said filler tube constituting a mechanism for supplying a pressurizing agent to the lower portion of the bottle whereby said agent is allowed to bubble upwardly through the liquid extinguishant before pressurizing the space above the liquid surface.

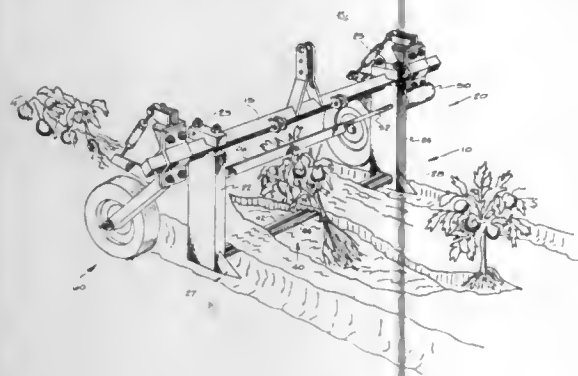
4,159,745

**CROP UPROOTING AND SOIL WORKING APPARATUS**  
Clarence E. Hood; Byron K. Webb, both of Clemson, S.C., and Yekutiel Alper, Bet Dagan, Israel, assignors to Clemson University, Clemson, S.C.

Filed Dec. 9, 1977, Ser. No. 859,227  
Int. Cl.<sup>2</sup> A01B 39/12, 39/19

U.S. Cl. 172-44

12 Claims



9. Crop uprooting and soil working apparatus comprising:
- a pair of vertically oriented, horizontally spaced support standards, with each standard including means located adjacent an upper edge of said standards for attachment to a transport means;
  - a pair of shaped bars rotatably supported by said standards in parallel relationship in a horizontal plane, said bars having angled edges thereon, and being located proximate each other to permit angled edges of same to sever foliage passing therebetween; and
  - drive means for said bars supported on said standards for synchronally rotating said bars whereby advancement of said bars beneath the surface of a crop bed will effect an uprooting of plants grown on said bed, and severing of foliage between said bars will preclude foliage build up around said bars.

4,159,746

**BIT OF CIRCULAR CROSS-SECTION**

Herwig Wrulich, Zeltweg; Karlheinz Gehring, Trofaiach, and Alfred Zitz, Zeltweg, all of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Apr. 13, 1977, Ser. No. 787,221

Claims priority, application Austria, Apr. 14, 1976, 2750/76

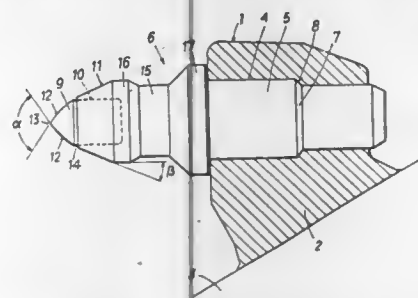
Int. Cl.<sup>2</sup> E21B 9/08

U.S. Cl. 175-354

7 Claims

1. A cutting bit comprising a bit shaft of circular cross-section having one end portion adapted to be inserted into a bore in a bit holder and carrying in a bore in its other end the inner

end of a hard bit tip made of carbide metal, said bit tip having a tapered outer end portion which is of circular cross-section coaxial with the bit shaft and which has the shape of a body of revolution with convex generatrices, the portion of said shaft adjacent said bit tip tapering toward said bit tip and having the shape of a truncated cone with straight generatrices, the angle of the truncated conical portion being approximately equal to



the angle of the outer end portion of said bit tip, and the truncated conical portion terminating adjacent the beginning of the taper of the outer end portion of said bit tip, said shaft having a collar portion adjacent said one end portion for covering the bore in the holder, and said shaft having a portion of reduced diameter located between said collar portion and the location at which the taper toward said bit tip begins.

4,159,747

**TEMPERATURE-COMPENSATED WEIGHING APPARATUS**

Enrico Realini, Uster, Switzerland, assignor to Mettler Instrument AG, Greifensee, Switzerland

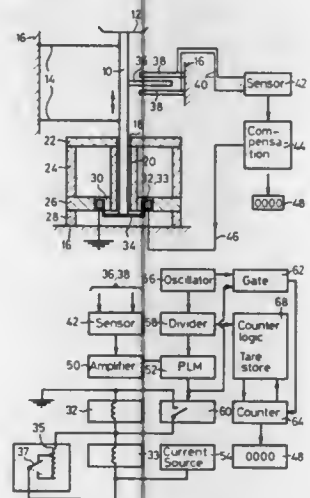
Filed May 1, 1978, Ser. No. 901,986

Claims priority, application Switzerland, Jun. 29, 1977, 8013/77

Int. Cl.<sup>2</sup> G01G 7/02

U.S. Cl. 177-210 EM

6 Claims



1. In a weighing system of the electromagnetic compensation type including load support means for supporting a load for movement from a normal first position relative to a stationary frame; sensing means for generating a signal that is a function of the extent of displacement of said load support means by the load from said first position; permanent magnet means connected with said frame to define an air gap relative to said load supporting means; compensation coil means including first and second compensation coils connected with said load support means and arranged within said air gap; compensating current supply means operable by said sensing means for supplying compensating current to said compensation coil means,

said compensating current supply means including a source of compensating current, said second compensation coil being connected in series between said compensating current source and said first compensation coil, means including a switch connected in parallel across said first compensation coil for dividing the compensating current into a continuous first current portion which generally corresponds with the preloading effect of said load support means, and a second portion that is periodically supplied to said first coil means for periods of time that are a function of the magnitude of the load applied to said load support means; control means operable by said sensing means for operating said switch as a function of the position of said load support means relative to said frame; and indicating means for indicating the magnitude of the load as a function of the compensating current required to restore the load supporting means to the first position, said indicating means being responsive only to said second compensating current portion, whereby said indicating means affords an indication of the load being weighed substantially independently of the no-load preloading effect of said load supporting means;

the improvement which comprises temperature compensation means for varying the preloading effect to compensate for changes in temperature of said weighing system, said temperature compensation means including impedance means connected in parallel with said second coil, said impedance means being physically spaced in non-heat conducting relation relative to said second coil.

4,159,748

**WEIGHING SCALE**

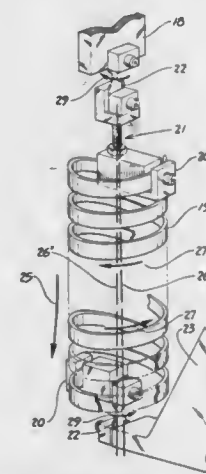
Frederick J. Staudinger, North Salem, N.Y., and Paul M. Kasarskas, Stamford, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,864

Int. Cl.<sup>2</sup> G01G 3/02

U.S. Cl. 177-225

4 Claims



1. A suspension apparatus for a Weighing scale, comprising: a movable load support that deflects in response to a load being weighed; a coil spring for supporting said load support for deflection through a given weighing range; a frame for carrying said coil spring; and a pair of spring hangers, one hanger of said pair connecting said spring to said frame, and the other hanger of said pair connecting said spring to said load support, each hanger of said pair comprising a flexure pivot consisting of a torsion-free member whose ends are fixedly restrained, whereby as said load support deflects in response to said load, said coil spring is free to uncoil such that the load support will obtain a linear deflection characteristic with respect to the load being weighed.

4,159,749

**HARVESTING MACHINE FRAME**

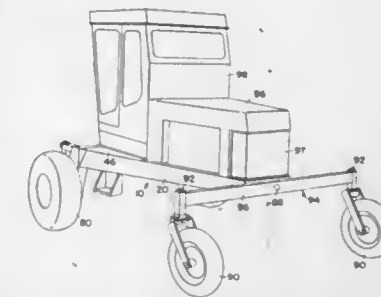
Sidney J. Boushek, Jr., Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 28, 1977, Ser. No. 846,377

Int. Cl.<sup>2</sup> B62D 21/00; A01D 67/00

U.S. Cl. 180-305

10 Claims



9. An improved frame for a self-propelled machine comprising:

a horizontal transverse front beam having opposite ends; a pair of opposite generally horizontal side beams having their forward ends respectively attached to the opposite ends of the front beam and converging rearwardly therefrom;

means connecting the rearward ends of the side beams to form a generally triangular horizontal subframe in the form of a regular trapezoid;

a casting rear wheel means supporting the rearward end of the subframe;

a pair of front wheel support housings respectively directly attached to and extending downwardly from the opposite ends of the front beam and the forward portions of the adjacent side beams, each support housing including an outer side wall, an upper portion of the side wall abutting and being welded to the front beam and overlapping and being welded to a forward portion of the outer lateral side of the adjacent side beam, and an inner generally vertical side wall opposite the outer side wall, the upper end of the inner wall abutting and being welded to the under side of the front beam;

and a pair of forward drive wheel means respectively supported on the lower ends of the wheel support housings.

4,159,750

**ADAPTER FOR PRELOADING BEARINGS**

Robert E. Brown, East Peoria; David L. Johnson, and John F. Lindquist, both of Morton, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 4, 1977, Ser. No. 848,634

Int. Cl.<sup>2</sup> B62D 55/12

U.S. Cl. 180-9.62

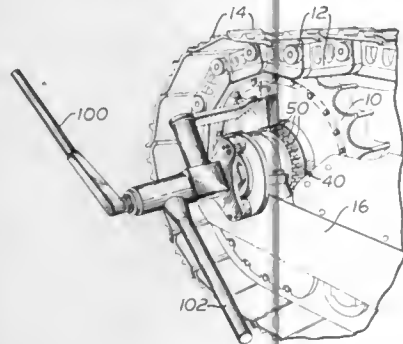
7 Claims

1. An adapter for use in preloading bearings in the final drive of a crawler-type vehicle, comprising:

a plate having opposite sides and adapted to be mounted concentrically with the sprocket shaft of a final drive; means associated with said plate for securing the plate in concentric relation to the sprocket shaft;

a stub shaft extending from one side of said plate; an arm rotatably mounted on said stub shaft and having a radial part extending beyond the periphery of the plate and an axial part terminating in an end on the side of the plate opposite said one side;

A jaw mounted on said end and adapted to engage a bearing adjusting nut on the final drive; and

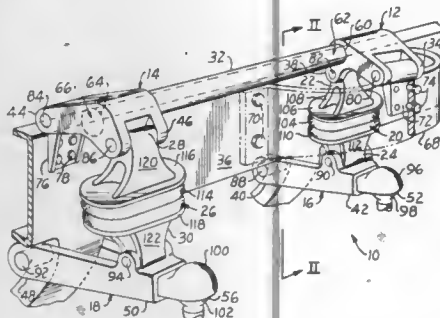


means on said arm for receiving a rotative force from a torque wrench or the like generally concentrically with said stub shaft.

**4,159,751**  
**SUSPENSION SYSTEM FOR TANDEM AXLE VEHICLES**  
James A. Garman, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 15, 1977, Ser. No. 787,817  
Int. Cl.<sup>2</sup> B62A 61/10  
U.S. Cl. 180—22

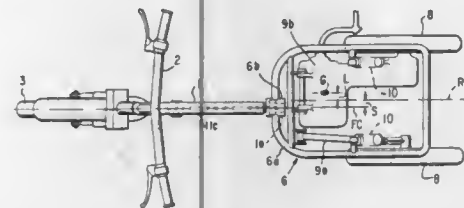
5 Claims



1. A tandem axle vehicle suspension system, comprising: first and second torque arms each having a first end pivotally connected to a frame portion of an associated tandem axle vehicle; first and second suspension arms each having a first end pivotally connected to the frame; a first resilient suspension member having a torque end pivotally connected to a second end of the first torque arm and having a suspension end pivotally connected to a second end of the first suspension arm, the second end of the first suspension arm being ball and socket connected to a first wheel of the associated vehicle; a second resilient suspension member having a torque end pivotally connected to a second end of the second torque arm and having a suspension end pivotally connected to a second end of the second suspension arm, the second end of the second suspension arm being ball and socket connected to a second wheel of the vehicle; and a torsion equalizer member fixedly connected to each of the first and second torque arm members.

**4,159,752**  
**TRICYCLE**  
Nobuyuki Kanno, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan  
Filed Oct. 13, 1977, Ser. No. 841,754  
Claims priority, application Japan, Oct. 14, 1976, 51-137019[U]; May 28, 1977, 52-69262[U]  
Int. Cl.<sup>2</sup> B60G 9/02, 11/18  
U.S. Cl. 180—210

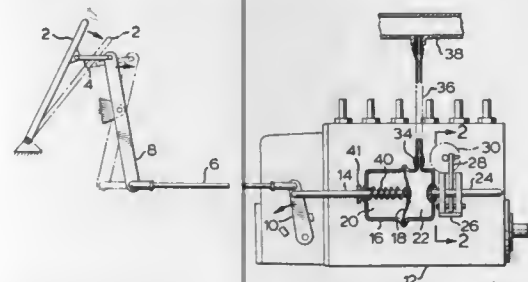
5 Claims



1. A tricycle comprising: a rear frame having provided thereon two rear wheels and having a central longitudinal axis; a front frame rotatably and resiliently coupled to said rear frame at a single point such that a longitudinal axis of said front frame is offset to one side of said central longitudinal axis of said rear frame; a seat coupled to said front frame; and a motor coupled to said rear frame and driving said rear wheels, said motor further being coupled to said rear frame such that a center of gravity of said motor is offset to another side of said tricycle relative to said central longitudinal axis of said rear frame whereby the stability of the tricycle is increased.

**4,159,753**  
**CRUISE CONTROL DEVICE FOR VEHICLES**  
Paul H. Boche, 210 Waneta Dr., Oakville, Ontario, Canada  
Filed Sep. 2, 1977, Ser. No. 830,071  
Int. Cl.<sup>2</sup> B60K 31/00  
U.S. Cl. 180—177

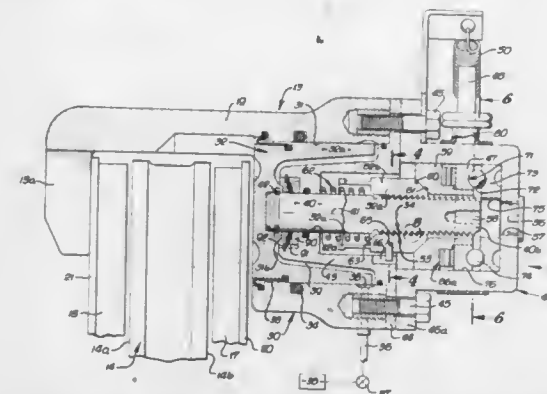
5 Claims



1. A speed control device for an internal combustion engine comprising a movable actuator member for connection to and conjoint movement with an accelerator linkage of the engine, a normally freely movable abutment member, a clamp device operable to clamp the abutment member in any of a range of positions, and a resilient connection established between the actuator member and the abutment member through a vacuum actuator in pneumatic connection with an inlet manifold of the engine.

**4,159,754**  
**PARKING BRAKE ASSEMBLY**  
Franklin B. Airheart, Sylmar, and Emilio L. Agarpao, Northridge, both of Calif., assignors to Airheart Products, Inc., Chatsworth, Calif.  
Filed Dec. 5, 1977, Ser. No. 857,385  
Int. Cl.<sup>2</sup> F16D 65/52  
U.S. Cl. 188—71.8

15 Claims



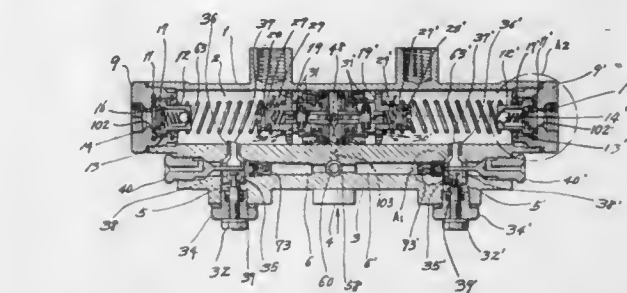
1. In a brake assembly, the combination comprising (a) a carrier having a bore, and a piston slidable axially in the bore to transmit force of fluid pressure acting on the piston to a brake pad, (b) a shaft having an axis extending axially to transmit auxiliary thrust to the piston, (c) a rotary actuator member rotatable about said axis, and (d) coupling means responsive to rotation of said member in one direction to effect axial advancement of the shaft toward the piston accompanied by gripping of the shaft, and responsive to rotation of said member in the opposite direction to allow retraction of the shaft, said coupling means including a collet having spring fingers spaced about the shaft, the collet and shaft having mutually engageable elements to effect said axial advancement of the shaft in response to radially inward displacement of said spring fingers, said shaft element comprising a screw thread, (e) the rotary actuator member extending about the shaft axis and having a central opening extending axially there-through, the shaft being in alignment with said central opening and having an end portion remote from the piston and to which access may be had for adjustably rotating the shaft relative to the collet, the shaft also having an end portion proximate the piston and rotatably coupled thereto to allow shaft rotation relative to the piston.

**4,159,755**  
**SAFETY HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES**  
Byung K. Kang, 379-2, Jungneun-dong, Sungbook-ku, Seoul; Jin C. So, 151-3, Choonglim-dong, Choong-ku, Seoul; Tae H. Chung, 132-74, 1-ka, Do-dong, Yongsan-ku, Seoul, and Won Choi, 167-77, Chunho-dong, Gangnam-ku, Seoul, all of D.P.R. of Korea  
Filed Nov. 30, 1977, Ser. No. 855,999  
Int. Cl.<sup>2</sup> B60T 11/32  
U.S. Cl. 188—151 A

7 Claims

1. A safety hydraulic brake system for automotive vehicles having at least one set of front wheels and one set of rear wheels and brake cylinders at each wheel, a control cylinder having a first outlet communicated with brake cylinders at said front wheels and a second outlet communicated with brake cylinders at said rear wheels, said control cylinder having an inlet communicated with hydraulic pressure developing means, said control cylinder including bore means communicated with said first and second outlets, first and second piston means in said bore means, first and second valve means in said

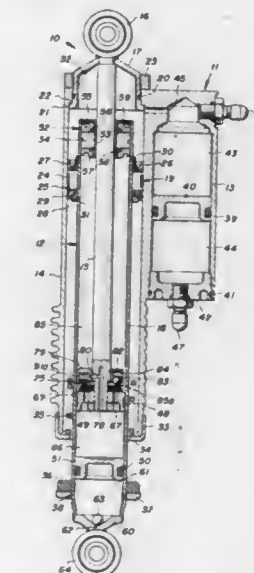
bore means and operable to permit pressurization of said front and rear wheel brake cylinders upon actuation of said hydraulic pressure developing means, said first and second piston means being operable to effect closing of said first or second valve means upon actuation of said hydraulic pressure developing means and upon loss of pressure at said front or rear wheel cylinders, respectively, whereby to prevent loss of pressure at the other of said front and rear wheel cylinders,



said first and second piston means each including a bypass valve means operable to permit hydraulic fluid to pass said piston means, said bypass valve means closing upon initial pressurization of said front and rear wheel brake cylinders, and upon fluid pressure release, said bypass valve means shifts initially to an open position and then to another closed position while said first and second valve means shift to a closed position.

**4,159,756**  
**ADJUSTING DEVICE FOR DAMPING FORCE OF REAR SHOCK-ABSORBERS OF MOTORCYCLES**  
Tomoharu Murakami, Kagamihara, and Tadashi Jo, Kani, both of Japan, assignors to Kayaba K.K., Tokyo, Japan  
Filed Jan. 17, 1978, Ser. No. 870,193  
Int. Cl.<sup>2</sup> F16F 9/44  
U.S. Cl. 188—319

3 Claims



1. A damping force adjusting device for use in the rear shock-absorber of motorcycles, comprising a damper cylinder; a piston rod inserted from the outside and penetrating through an end member of said damper cylinder; a piston fixed to a lower end of said piston rod to separate said damper cylinder into upper and lower working chambers; a valve installed in the piston to determine the damping force in the medium and high speed range of the piston by



providing resistance to the working fluid flowing throughout said upper and lower working chambers; a passage in the piston rod to connect the upper and lower working chambers in parallel to a flow passage of the working fluid through the valve; an adjusting member having a plurality of orifices, different in diameter, which are selectively connected to a port opening into the upper working chamber of said passage; said adjusting member being fitted rotationally to the piston rod; and a stop member which blocks the rotation of said adjusting member by frictional contact with it as the piston reaches the extreme of expansion.

4,159,757

**BULK MATERIAL HANDLING SYSTEM**

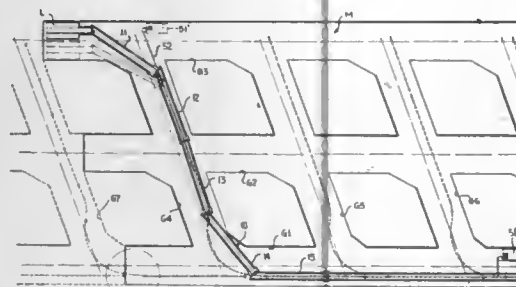
William K. Kleysteuber, Wexford, and William D. Mayercheck, New Stanton, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 4, 1977, Ser. No. 793,664

Int. Cl.<sup>2</sup> B65G 65/02, 41/02

U.S. Cl. 198—303

15 Claims



1. A bulk material handling system comprising:
  - a. a monorail and means for supporting said monorail from an overhead supporting surface;
  - b. a plurality of substantially identical conveyors, each having input and output end portions, the output end portion of a first of said conveyors being positioned above the input end portion of a second of said conveyors;
  - c. first drive means for moving each of said conveyors in a direction to move bulk material from the input end portions to the output end portions;
  - d. support means for suspendingly supporting the input end portion of said second conveyor from said output end portion of the first conveyor, said support means including means for pivotally connecting the output end portion of said first conveyor and the input end portion of said second conveyor relative to each other, and trolley means rollingly supported by said monorail for permitting said plurality of conveyors to be moved along said monorail, said pivoted connecting means and said trolley means being connected and aligned to permit said first and second conveyors to be moved between in-line and out-of-line position about an axis generally normal to said monorail so that the center-to-center alignment is maintained between said first and second conveyors relative to the bulk material passing therebetween; and
  - e. cable means for coupling said trolleys of said plurality of conveyors, and second drive means for pulling said cable means to move said plurality of conveyors along said monorail.

4,159,758

**TRANSPORTATION APPARATUS**

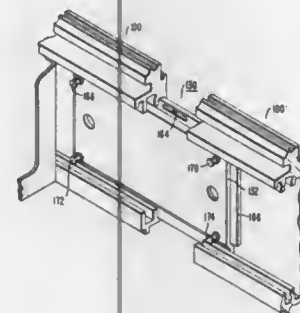
Iber C. Courson, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 19, 1977, Ser. No. 834,365

Int. Cl.<sup>2</sup> B66B 9/14

U.S. Cl. 198—335

5 Claims



1. Transportation apparatus for transporting persons between spaced landings, comprising:
  - a supporting structure,
  - a conveyor mounted on said supporting structure, said conveyor having an upper load bearing run and a lower return run,
  - first and second skirts mounted in spaced relation on said supporting structure, on opposite sides of said conveyor, to form substantially vertical walls adjacent to the load bearing run,
  - each of said skirts including a plurality of skirt sections disposed in end-to-end relation,
  - each of said skirt sections having a wall portion and first and second members spaced from a common side of said wall portion which define upper and lower slots, respectively, the openings of which face one another,
  - and expandable splice means disposed to interconnect at least first and second adjacent skirt sections,
  - said expandable splice means including a plate member having upper and lower edges disposed in the upper and lower slots, respectively, of said adjacent skirt sections, and adjustable pressure means in contact with said plate member and the common side of the wall portions of said adjacent skirt sections, said adjustable pressure means providing forces which tend to separate the plate member from said wall portions, to laterally align said adjacent skirt sections and lock them in end-to-end relation,
  - said plate member including first and second openings therein disposed adjacent to a selected one of the upper and lower edges, with the portions of the plate member located between each opening and the adjacent edge being bent outwardly away from the associated openings, said first and second openings being spaced from one another such that the bent edges associated with the first and second openings contact the bottoms of the associated slots in the first and second adjacent skirt sections, respectively, to force the opposite edge of the plate member against the bottom of its associated slots in the first and second adjacent skirt sections, to vertically align the first and second adjacent skirt sections.

4,159,759

**DEVICE FOR TOPPLING ARTICLES DURING CONVEYANCE**

Odo Nimmrichter, Gailingen, Fed. Rep. of Germany, assignor to S I G Schweizerische Industrie-Gesellschaft, Rheinfald, Switzerland

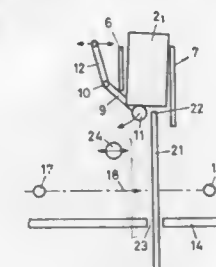
Filed Dec. 2, 1977, Ser. No. 857,178

Claims priority, application Switzerland, Dec. 7, 1976, 15383/76

Int. Cl.<sup>2</sup> B65G 47/24

U.S. Cl. 198—407

4 Claims



1. In a device for toppling articles having two opposed long sides and two opposed short sides while conveying such articles, which device includes means defining a discharge path provided with carrier elements extending perpendicular to both the long sides and the short sides of the article for moving the articles after toppling in a discharge direction extending perpendicular to both the long sides and the short sides of the articles, the improvement comprising means defining at least two input paths above said discharge path for conveying such articles in an input direction transverse to the discharge direction, with the long and short sides of each article perpendicular to the input direction and the long sides of each article vertical; and a plurality of lowering and toppling mechanisms, each associated with a respective input path and disposed for transferring articles from its associated input path to said discharge path while lowering and toppling the articles, each said mechanism including a supporting element movable between a position for supporting articles received from the associated input path and a release position for permitting such articles to drop, a pickup element for supporting and lowering such articles when said supporting element is moved to its release position, and a toppling element movable from a starting position for toppling such articles onto said discharge path upon lowering of such articles by said pickup element, so that the short sides of each such article are vertical on said discharge path; said supporting element being a supporting rod mounted for pivotal movement into the release position, said pickup element being a pickup plate presenting an upper edge on which the articles are supported during lowering, and said toppling element being a toppling rod which extends transversely to said discharge path and arranged for moving articles which have been lowered almost down to said discharge path at a speed which exceeds the speed of said carrier elements until the articles topple over in the discharge direction.

4,159,760

**METHOD OF AND APPARATUS FOR FEEDING RANDOMLY RECEIVED ITEMS**

Lloyd Kovacs, and Charles G. Hart, Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Apr. 13, 1977, Ser. No. 787,061

Int. Cl.<sup>2</sup> B65G 47/31

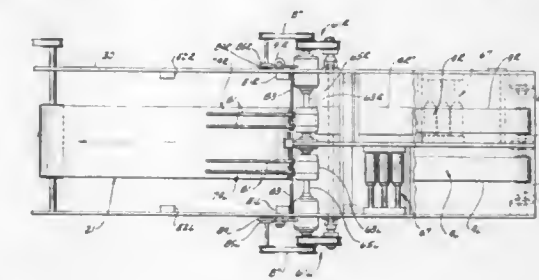
U.S. Cl. 198—419

27 Claims

1. The method of feeding items to apparatus, such as a flight conveyor, which cycles continuously at a steady cycling rate with a predetermined grouping of items being placed on the apparatus during a portion of each cycle thereof, said cycle portion being referred to as a window and the latter having a leading and a trailing boundary, said items being randomly

received from a plurality of sources, the method comprising the steps of:

- accumulating, for each source, a backlog of items randomly received from that source, the items in each backlog being in substantially end-to-end abutting relationship one with another;



- releasing a selected plurality of items from each of said backlogs during each cycle of said apparatus to form said grouping, the items so released from each backlog remaining in substantially end-to-end abutting relationship one with another; and conveying forward said grouping in timed relation to said apparatus and placing said grouping in a respective window of said apparatus.

4,159,761

**COOKIE DISPENSING APPARATUS**

Walter W. Egee, Wallingford, Pa., and Clarence W. Cramer, Burlington, N.J., assignors to Campbell Soup Company, Camden, N.J.

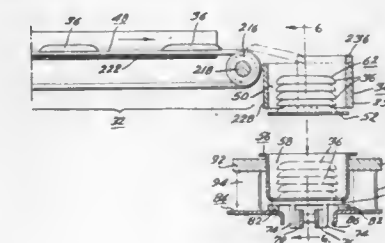
Division of Ser. No. 764,190, Jan. 31, 1977, Pat. No. 4,085,563.

This application Nov. 14, 1977, Ser. No. 851,068

Int. Cl.<sup>2</sup> B65G 47/26, 57/00

U.S. Cl. 198—422

4 Claims



1. Apparatus for segregating wafer-like objects into groups each containing a preselected number of said objects, and for dispensing said groups of objects separately onto predetermined different receiving surface regions, comprising:
  - a storage chamber for receiving and temporarily storing said groups of objects;
  - controllably actuable dispensing means for dispensing said groups of objects from said chamber;
  - object-receiving means having a plurality of receiving surface regions upon each of which a different one of said groups is to be dispensed;
  - means for successively moving said receiving surface regions adjacent said dispensing means to receive said groups of objects on said receiving surface regions, upon sequential appropriately-timed actuations of said dispensing means;
  - delivery-line means for receiving a generally horizontal edge-supported face-abutting array of said wafer-like objects and for delivering said objects sequentially into said chamber to form said groups of objects; and
  - control means for controlling said dispensing means to effect said dispensing of said groups of objects from said chamber onto said surface regions;

rotatable gate forming the bottom of said storage chamber, and gate actuating means for rotating said gate upon signal from said control means to temporarily open the bottom of said storage chamber to permit discharge of said groups of objects;

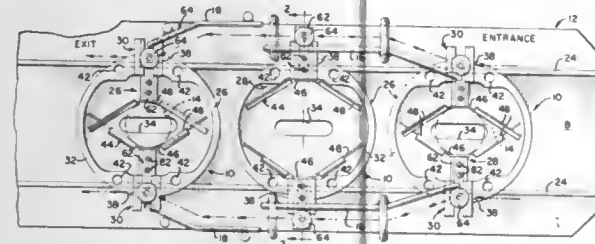
said gate actuating means comprising a continuously rotating shaft, and clutch means connected with said shaft and said gate for rotating said gate through a predetermined arcuate path upon receipt of a signal from said control means;

said control means comprising means for sensing times at which each of said groups of objects is in said chamber and when one of said receiving surface regions is in position to receive each said group of objects, and for actuating said dispensing means only at such times;

means for sensing times at which an additional object is about to be delivered to said storage chamber while said chamber contains a group of said selected number of said objects, and means for delaying the delivery of said additional object so that it is not delivered to said chamber until after the group of objects in said chamber has been dispensed;

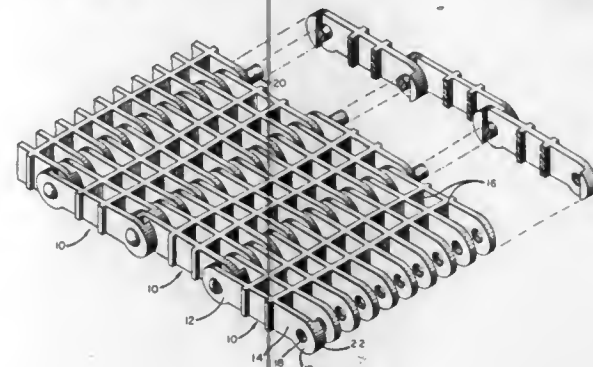
wherein said means for delaying operation of said delivery-line means comprises means for stopping said delivery-line means when said additional object is about to be delivered to said chamber, thereby to prevent said delivery of said additional object until after said predetermined number of said objects have been dispensed.

**4,159,762**  
**ARTICLE TRANSFERRING APPARATUS**  
 Joseph P. Bulwith, Wayne, N.J., assignor to Avon Products, Inc., Suffern, N.Y.  
 Continuation of Ser. No. 722,124, Sep. 10, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,917  
 Int. Cl.<sup>2</sup> B65G 37/00  
 U.S. Cl. 198—472



1. A transfer apparatus which comprises in combination,
  - (a) housing means defined by a cylindrical shell-type walled member having a bottom;
  - (b) gripping means disposed within the housing means and having an opposed pair of interfitting gripping members each of which is fixedly connected to oppositely disposed actuating means for movement between gripping and non-gripping positions;
  - (c) a plurality of retaining bores disposed in said housing to removably receive driving projections of a transfer mechanism;
  - (d) said actuating means having sliding means and contacting means, said sliding means disposed within a guide housing and supporting a cam follower; and
  - (e) said contacting means having an adjusting member to control the amount of frictional forces to be exerted on the guide housing to inhibit movement of the sliding means;
  - (f) whereby movement of the cam follower causes the sliding means of the actuating means to move the interfitting gripping members between gripping and non-gripping positions.

**4,159,763**  
**INSPECTABLE MODULAR CONVEYOR**  
 Monte L. Kewley, New Orleans, and LeRoy E. Demarest, Kenner, both of La., assignors to The Laitram Corporation, New Orleans, La.  
 Filed Aug. 2, 1977, Ser. No. 821,136  
 Int. Cl.<sup>2</sup> B65G 17/06  
 U.S. Cl. 198—853

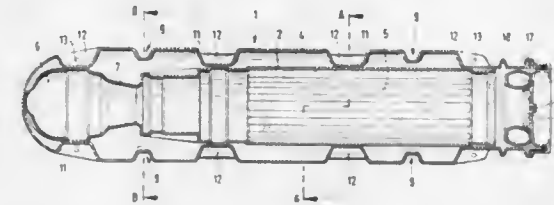


1. A conveyor belt comprising in combination:
  - a plurality of like modules, each of said modules including a first plurality of link ends of like width, a second plurality of link ends each of said like width, and an intermediate section integrally formed with and joining said first and second plurality of link ends;
  - said link ends of each said modules being releasably engaged between link ends of an adjacent module except for individual link ends disposed at the extreme sides of said module;
  - a pivot rod for pivotally connecting said modules at engaged link ends;
  - said link ends of each of said modules being of a width substantially less than the spacing between confronting link ends along the pivotal axes thereof to provide a substantial space between confronting link ends thereby to expose for inspection and cleaning a substantial portion of the pivot rod connecting adjacent modules;
  - said modules being arranged in staggered relation with a side edge of each module being disposed intermediate the side edges of an adjacent pivotally connected module;
  - a spacer means positioned between at least one pair of confronting link ends along each pivot rod, said spacer means extending along the direction of the pivotal axis and in engagement with the confronting surfaces of said pair of link ends, thereby to maintain the spaced confronting relation between the other connected link ends for exposure of the interconnecting pivot rod; and
  - the link ends associated with said spacers being resilient to permit lateral movement of a module relative to an adjacent connected module along the pivotal axis to expose normally concealed portions of the interconnecting pivot rod.

**4,159,764**  
**PLASTIC PACKING CONTAINER**  
 Friedel Schinke, Hämelingerstrasse 11, 4900 Herford, Fed. Rep. of Germany  
 Filed Apr. 25, 1978, Ser. No. 899,730  
 Int. Cl.<sup>2</sup> F42B 37/00, 39/00  
 U.S. Cl. 206—3

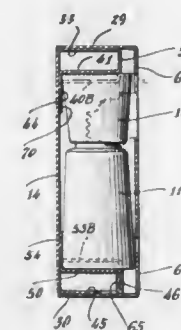
1. A plastic packing container for individually packing goods susceptible to shock, the packing container comprising an inner container and an outer container, said outer container being provided with closure means, said inner container being adapted to the outer shape of the goods to be packed, said inner and said outer container comprising an elastically deformable

plastic material, said outer container having a substantially larger diameter than the outer diameter of the inner container and having corrugations forming wall portions to support the inner container such that said inner container is essentially surrounded by cavities formed by wall portions of said inner



container and said outer container, so that a local support in only restricted areas is formed between said inner container and said outer container whereby the forces generated upon impact or fall are absorbed by an elastic deformation of the walls defining said cavities.

**4,159,765**  
**DISPLAY CARTON**  
 Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.  
 Filed Mar. 29, 1978, Ser. No. 891,069  
 The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.  
 Int. Cl.<sup>2</sup> B65D 5/50  
 U.S. Cl. 206—45.19



1. A blank made of paperboard and adapted to be folded into a display carton of generally rectangular and tubular shape, comprising:
  - a substantially rectangular sheet of said paperboard, said sheet having opposed vertical lateral edges and opposed horizontal top and bottom edges;
  - four vertically spaced parallel hinge lines intermediate the lateral edges thereof defining a pair of side walls, a front panel, a back panel, and a manufacturer's glue flap positioned at one lateral edge thereof;
  - said side walls and said front panel having end closure flaps hingedly attached to the top and bottom edges thereof along said top and bottom horizontal edges;
  - said front panel having means for displaying the contents of the carton;
  - said back panel having a first rectangular flap hingedly attached along the bottom edge thereof;
  - said first flap having a bottom cushioning structure hingedly attached thereto along a horizontal fold line and a rectangular reinforcement panel cut therein along a score line whose ends terminate at said horizontal fold line;
  - said bottom cushioning structure having a pair of elongated apertures formed therein aligned substantially perpendicular to said bottom edge of said back panel, each of said apertures having spaced apart inner and outer lateral edges;
  - said structure including a second flap hingedly connected along a horizontal fold line to said first flap and defined on the opposite side by a first intermediate fold line extending

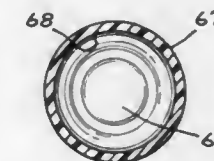
between the ends of said elongated apertures as well as a first pair of colinear fold lines spaced between the lateral edges of said structures and said outer lateral edges of said apertures;

said inner lateral edges of said apertures and said first intermediate fold line together with a second intermediate fold line spaced from said first intermediate fold line defining a center support panel adapted to have said reinforcement panel abutted therebeneath;

said outer lateral edges of said apertures and said first pair of colinear fold lines together with a second pair of colinear fold lines parallel to said first pair defining a pair of restraining panels on either lateral side of said bottom cushioning structure; and

a glue flap connected to said center section along said second intermediate fold line and to said restraining panels along said second pair of colinear fold lines.

**4,159,766**  
**COVER FOR TEMPERATURE SENSING PROBE**  
 Douglas J. Kluge, Minneapolis, Minn., assignor to Diatek, Inc., San Diego, Calif.  
 Continuation of Ser. No. 737,913, Nov. 1, 1976, abandoned, which is a division of Ser. No. 662,587, Mar. 1, 1976, Pat. No. 4,054,057. This application Nov. 30, 1977, Ser. No. 856,169  
 Int. Cl.<sup>2</sup> B65D 85/20  
 U.S. Cl. 206—306



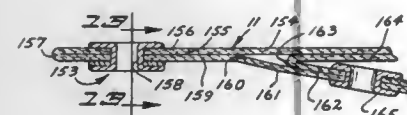
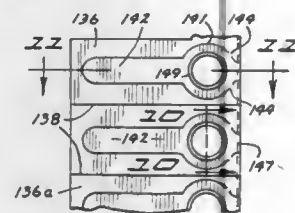
1. A cover for use with a temperature sensing probe having an elongated member, a tip secured to one end of the elongated member, said tip having a forwardly converging annular and relatively thin side wall,
  - said side wall having an outward convex shape, a temperature responsive element secured to the tip, means having a head surrounding the elongated member for holding the cover on the probe, said head having means cooperating with the cover to releasably latch the cover to the probe comprising: a tubular body having a generally cylindrical elastic side wall forming a chamber for accommodating part of the elongated member, and an end member secured to the body for accommodating the tip, said elastic side wall having an open end section having means engageable with the means on the head to releasably hold the cover in assembled relation with the elongated member and tip, said end member having a closed end and a forwardly converging annular relatively thin thermal window section adjacent the closed end, said closed end having a thickness greater than said window section, said window section having a flexible annular wall dimensioned to be deformed into closely fitting surface engagement with the convex shaped side wall of the probe tip when inserted therein whereby heat from the environment around the thermal window section is preferentially transferred through said thin thermal window section to the tip and the temperature responsive element secured thereto, said elastic side wall being operable to bias the flexible annular wall into surface engagement with the convex shaped side wall of the tip, and wherein the dimensioning of said closed end including the said thickness thereof precludes significant heat transfer therethrough as compared to said annular thermal window section.



**4,159,767**  
**FOLDER-TANG ASSEMBLY APPARATUS**  
 Philip O. Jesme, South St. Paul, and John A. Calkins, Hastings, both of Minn., assignors to The Smead Manufacturing Company, Hastings, Minn.

Filed Jul. 7, 1977, Ser. No. 813,653  
 Int. Cl.<sup>2</sup> B65D 85/54, 27/26  
 U.S. Cl. 206—343

11 Claims



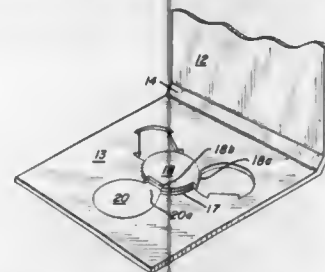
1. A transversely elongated web for having tangs mechanically punched therefrom and cinched to a file folder, comprising a transversely elongated first transverse leg having a first edge and an opposite second edge, and a transversely elongated second leg having a first transverse edge integrally joined along a fold line to the first leg first edge, and a second edge generally parallel to the fold line and substantially longitudinally more remote from the fold line than the first leg second edge, the first leg having a plurality of transversely spaced first ring portions and first tab portions extending between the fold line and the first ring portions, and longitudinally elongated first prongs having first edges integrally joined to the first ring portions opposite the first tab portions, and first tang border portions at least partially surrounding the first ring portions, the second leg having a plurality of transversely spaced, longitudinally elongated second prongs having first edges, second ring portions integrally joined to the second prongs first edges, second tab portions integrally joined to the second ring portions opposite the second prongs, and second tang border portions at least partially surrounding the second prongs and second ring portions, the first tab portions being integrally joined to the second tab portions at the fold line, each ring portion having a central opening therethrough, and cinchable flange integrally joined to one ring portion adjacent the edge thereof defining its central opening and relatively narrow width strips for each of one of the legs tang border portions integrally joining the respective tang border portion to at least one of the adjacent tab portion and ring portion.

**4,159,768**  
**FOLDABLE DEVICE FOR SUPPORTING A REEL**  
 Charles A. Manis, Arlington, and Gary B. Overcash, Haltom City, both of Tex., assignors to Packaging Corporation of America, Evanston, Ill.  
 Continuation of Ser. No. 605,769, Aug. 18, 1975, abandoned.  
 This application Aug. 7, 1978, Ser. No. 931,858  
 Int. Cl.<sup>2</sup> B65D 85/02, 85/67  
 U.S. Cl. 206—396

8 Claims

1. A foldable support for a reel having a hub opening, comprising a panel, and a plurality of struck-out elements foldably connected to said panel and disposed in face-to-face overlapping stacked relation relative to each other and to one surface

of said panel and forming a protuberance projecting from said panel one surface and disposed within the periphery thereof,

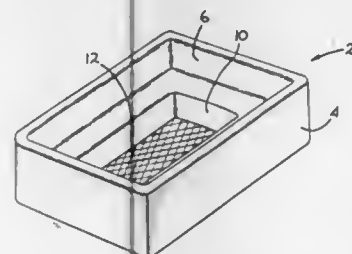


said protuberance being adapted to extend into the hub opening when the reel overlies the panel one surface.

**4,159,769**  
**VENDING MACHINE ADAPTER**  
 Philip A. Hatten, 1909 N. Beachwood Dr. #20, Hollywood, Calif. 90068, and Jerome H. Hyman, 108 S. Las Palmas Ave., Los Angeles, Calif. 90004

Filed Sep. 29, 1977, Ser. No. 837,914  
 Int. Cl.<sup>2</sup> B65D 1/34, 1/36  
 U.S. Cl. 206—527

3 Claims



1. A vending machine adapter for allowing an item not normally capable of being vended through a vending machine to be vended, said adapter comprising a generally rectangular container of substantially the same size and shape as a package of cigarettes normally vended by a vending machine, said container having one recess configured to hold said item normally not capable of being vended, and a second recess adjacent the bottom of said first recess, said second recess being smaller than said first recess and configured to increase the strength of said container, said first and second recesses forming a ledge therebetween upon which said item normally not capable of being vended is seated.

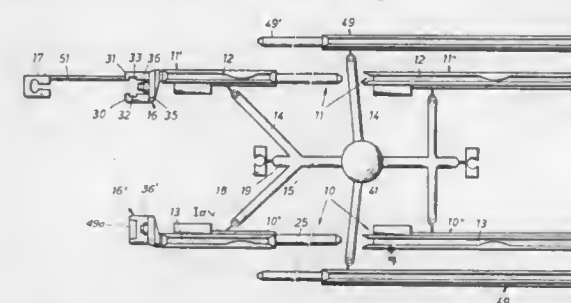
**4,159,770**  
**RETAINING DEVICE FOR PLUG-IN UNIT COACTING WITH A CONTACT CARRIER**

Willi Beyerle, Rur/Düssel-Strasse, 4044 Kaarst, Neuss, Fed. Rep. of Germany  
 Filed Oct. 26, 1977, Ser. No. 845,676  
 Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648661  
 Int. Cl.<sup>2</sup> B65D 69/00, 85/54  
 U.S. Cl. 206—577

19 Claims

1. A kit for building a retaining device adapted to hold a contact carrier and a coacting plug-in unit, comprising an assembly of integrally molded elements detachably interconnected by a runner structure, said elements including a pair of elongate guide members and a pair of connectors engageable with respective ends of said plug-in unit, each of said connectors being attached to an extremity of one of said guide members, at least one of said connectors being divided into a male part and a female part matingly engageable with each other

and interconnected by a flexible link, said link forming a loop adapted to embrace a bundle of wire leads emanating from said

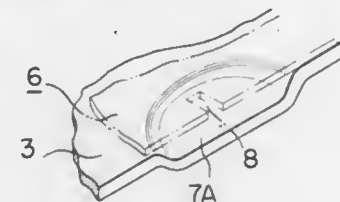


plug-in unit upon a snap-type interfitting of said male and female parts to engage said plug-in unit.

**4,159,771**  
**CONTAINER HAVING MULTIPLE INDEPENDENTLY UNSEALABLE COMPARTMENTS**

Kenji Komatsu, Mitaka, and Teruyoshi Wakamatsu, Chofu, both of Japan, assignors to Meiji Seika Kabushiki Kaisha and Dai Nippon Insatsu Kabushiki Kaisha, both of Tokyo, Japan  
 Filed Nov. 22, 1977, Ser. No. 853,847  
 Int. Cl.<sup>2</sup> B65D 11/22, 17/24  
 U.S. Cl. 206—620

4 Claims



1. A container comprising a container main structure having a plurality of hollow receptacles for containing portions of a product or products in a sealed state, adjacent receptacles being integrally connected at their adjacent rims by a common connective rim flange, other outer rims of the receptacles having outer rim flanges and a lid sheet sealingly attached to the connective rim flanges and the outer rim flanges thereby to seal the interiors of the receptacles and thereby to form individually sealed compartments, the lid sheet having at edge portions thereof tear-facilitating means each comprising a slit cut into the edge of the lid sheet at the position of each connective rim flange and thus forming two adjacent free corners of the lid sheet each of which can be pried and pulled upward to partially tear off the lid sheet, the lid sheet being not attached to the container main structure in the neighborhood of each slit, one of said outer rim flanges of the container main structure being formed at its outer edge with slits each at a position coinciding with one slit of the lid sheet and with a pair of slanted score lines connecting the inner end of each of said slits in said outer rim flange with the outer edges of the same at both sides of each slit, thereby to enable depression of a portion of the outer rim flanges defined by the slit and score line so as to facilitate the prying up of a selected free corner of the lid sheet for tearing off the sheet.

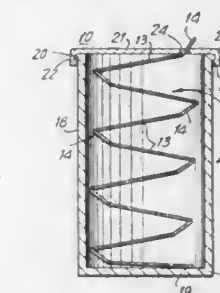
**4,159,772**  
**TREATED PAD DISPENSING DEVICE**  
 Harold Beck, Wantagh, N.Y., assignor to Tissue Products Co., Inc., Bronx, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,502  
 Int. Cl.<sup>2</sup> B65D 5/72  
 U.S. Cl. 206—820

7 Claims

1. A dispensing device comprising a stack of pads consisting essentially of a long substantially flat, unitary, fibrous web

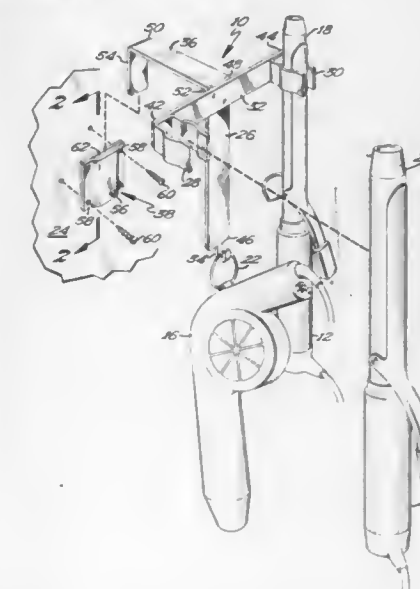
including longitudinally spaced enlarged sections impregnated with an active ingredient and interconnected at their proximate edges by integrally formed relatively narrow pull tabs, said web being accordian folded along transverse lines



proximate said pull tabs and said enlarged sections being superimposed into said stack in which said impregnated enlarged sections are in face-to-face contact and with said pull tabs proximate the periphery of said stock.

**4,159,773**  
**BEAUTICIAN'S TOOL HANGER**  
 Luigi G. Losenno, 4525 Drexel Ave. South, Edina, Minn. 55424  
 Filed Aug. 9, 1976, Ser. No. 712,933  
 Int. Cl.<sup>2</sup> A47F 7/00  
 U.S. Cl. 211—60 T

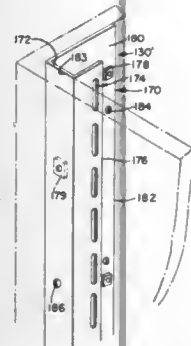
3 Claims



1. Beautician's tool hanger for attachment of a beautician's tool having a heated portion, a curling iron having a heated portion, and another beautician's tool to a vertical wall, comprising, in combination: an elongated, flat bar-shaped main frame; an elongated, flat, bar-shaped arm having at least one vertical face, with the arm attached substantially perpendicularly to the main frame with the vertical face oriented outwardly toward an operator and away from the main frame to thus form a T-shaped member; a first pressure clip for receiving the heated portion of the beautician's tool; a second pressure clip for receiving the heated portion of the curling iron; with the first and second pressure clips being vertically attached adjacent the opposite ends of the arm and on the vertical face of the arm so that the beautician's tool and the curling iron hang vertically down therefrom; a hook formed adjacent an end of the main frame for receiving a portion of and for attaching the other beautician's tool to the main frame; a stand-off, extension bracket attached to the main frame for spacing the main frame, the arm, and the hook from the wall and for

thermally insulating the main frame and the beautician's tool and the curling iron, located in the first and second pressure clips, from the wall by spacing the main frame and the beautician's tool and the curling iron from the wall to thus provide an air insulation barrier therebetween; and means for attaching the stand-off extension bracket to the wall, wherein at least the beautician's tool and the curling iron are held in a spaced, thermally insulated position away from the wall to thus prevent the beautician's tool and the curling iron from burning the wall and also allowing the beautician's tool, the curling iron, and the other beautician's tool to be easily accessible to the operator and out of the way of the operator when not in use.

**4,159,774**  
**SHELF-SUPPORTING STANDARDS**  
Bruce Young, Jr., 105 Master Rd., Hixson, Tenn. 37343  
Division of Ser. No. 679,794, Apr. 23, 1976, Pat. No. 4,083,458.  
This application Feb. 17, 1978, Ser. No. 879,001  
Int. Cl.<sup>2</sup> A47F 5/00  
U.S. Cl. 211—86 2 Claims

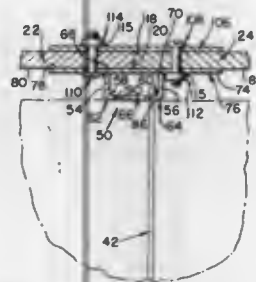


1. A corner connector for joining together two panels to form a corner, comprising:
  - a first elongate wall having a front face and a pair of longitudinal side edges, said first wall having a plurality of first fastener receiving holes defined therethrough to be longitudinally spaced apart on said first wall, said first wall front face being a panel abutting face for abutting a panel;
  - a plurality of anchor nuts attached to said first wall front face to be concentric with some of said first fastener receiving holes with the remaining holes being free;
  - a second elongate wall attached at one longitudinal side edge thereof to one of said front face longitudinal side edges to extend rearwardly therefrom at right angles therewith, the other end of said second elongate wall being free, said second wall having defined therein a plurality of bracket receiving holes which are spaced apart longitudinally on said second wall;
  - a third elongate wall attached at one longitudinal edge thereof to another longitudinal side edge of said first wall to extend rearwardly thereof at right angles therewith, said third elongate wall having another edge which is free, said third wall having a plurality of second fastener receiving holes defined therein to be spaced apart longitudinally of said third wall, a panel abutting face for abutting a face of a panel, and an opposite face, said second and third elongate walls being in spaced parallelism with each other for essentially the entire lengths and widths thereof so that a J-shape is formed by said elongate walls;
  - a plurality of anchor nuts attached to said third wall opposite face and located to be concentric with some of said second fastener receiving holes with the remaining fastener receiving holes being free, said free fastener receiving holes in said third wall corresponding to the anchor nut encircled holes of said second wall whereby alignment of a pair of corner connectors aligns anchor nut encircled holes with free holes so that a fastener inserted through a free hole on one corner connector of the pair of corner con-

nectors engages an anchor nut encircling a hole aligned therewith on the other one of the pair of corner connectors;

a plurality of fasteners some of which are inserted through a panel for engaging said anchor nuts to attach said panel to said wall, the remaining fasteners being inserted through the remaining holes to engage anchor nuts on the other side of said panel whereby a pair of panels are each connected together via the panel connector to form a corner.

**4,159,775**  
**SHELF-SUPPORTING STANDARDS**  
Bruce Young, Jr., 105 Masters Rd., Hixson, Tenn. 37343  
Division of Ser. No. 679,794, Apr. 23, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,981  
Int. Cl.<sup>2</sup> A47F 5/10  
U.S. Cl. 211—86 4 Claims

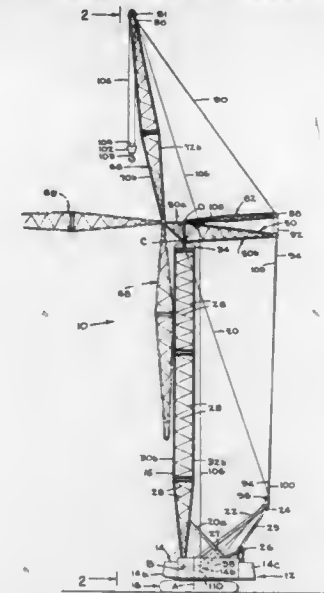


1. A wall mounted standard for use with shelf-supporting brackets comprising:
  - an elongate body including a front wall having side edges and sides attached to said front wall side edges to extend rearwardly away from said front wall, said sides being spaced apart to define a back of said elongate body; and
  - panel attaching means on said elongate body for attaching two separate panels to said elongate body in a manner such that said two separate panels can be connected together in abutting contact with each other via the wall mounted standard, said panel attaching means comprising an anchor plate fixed to said sides and extending across said elongate body back, and a bolt receiving nut fixed to said anchor plate and a backing plate fixed to said anchor plate by a bolt engaging said backing plate and received in said bolt receiving nut.

**4,159,776**  
**TOWER CRANE**  
Carl F. Holter, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.  
Continuation of Ser. No. 668,366, Mar. 19, 1976, abandoned.  
This application Aug. 19, 1977, Ser. No. 825,890  
Int. Cl.<sup>2</sup> B66C 23/62  
U.S. Cl. 212—59 R 4 Claims

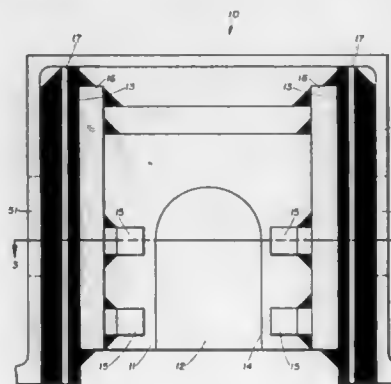
1. In a tower crane comprising a lower works, an upper works pivotally connected to said lower works for rotation about a vertical axis, a tower having front chords and having rear chords, said tower pivotally connected to said upper works for rotation about a horizontal axis, means to hold said tower in a vertical position, a balance arm pivotally mounted on said tower, said arm engaging said tower only on a laterally extending pivot axis midway between the front chords of the tower and the rear chords of the tower, a boom pivotally connected to the front end of said balance arm for swinging movement between a lowermost position along said tower and an elevated position, a live mast pivotally connected at one end to said balance arm, a pendant connected between the other end of said live mast and the boom, wherein the improvement comprises means including a backstay line to connect the rear end of said balance arm to said upper works independent of

any connection to the tower to maintain the balance arm in a substantially horizontal operating position on said tower when



the tower is in a vertical position, and reeving connected between said other end of said live mast and the rear end of said balance arm to control the attitude of said boom.

**4,159,777**  
**UNIVERSAL FABRICATED BACKSTOP/BUFFSTOP**  
Thomas W. Howe, Jr., Clarkston, Ga., assignor to Halliburton Company, Duncan, Okla.  
Filed Nov. 7, 1977, Ser. No. 848,860  
Int. Cl.<sup>2</sup> B61G 7/10, 9/20  
U.S. Cl. 213—10 10 Claims

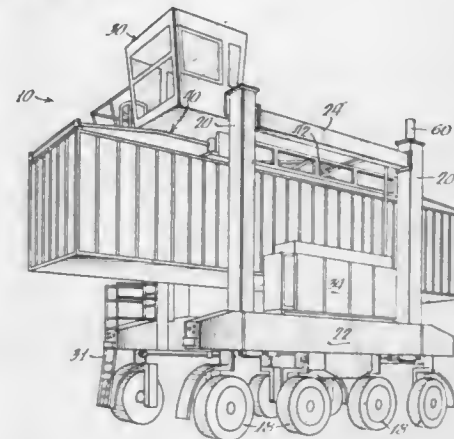


5. A universal backstop/buffstop adapted for use in the center sill of a railcar having a channel in each side wall thereof, said universal backstop/buffstop comprising:
  - a pair of parallel, juxtaposed side plates, each side plate having a channel therein and key means secured in each channel, said key means having a portion protruding from each side plate;
  - a forward transverse member having the ends thereof secured to said pair of parallel, juxtaposed side plates, and having a slot located in the center of said forward transverse member; and
  - a rear transverse member having the ends thereof secured to said pair of parallel, juxtaposed side plates whereby said universal backstop/buffstop is adapted to be received within the center sill of a railcar having a channel in each side wall thereof with the portion of said key means protruding from each side plate slidably engaging the channel in each side wall of said center sill.

**4,159,778**  
**STRADDLE CARRIERS FOR CONTAINERS**  
Philip Poeschner, Wausau; William K. Holmes; Duane L. Thiele, both of Schofield; Richard A. Stearn, Sturgeon Bay; Norbert W. Lenius, Sturgeon Bay, and Lynn L. Keller, Sturgeon Bay, all of Wis., assignors to J. I. Case Company, Racine, Wis.

Continuation of Ser. No. 729,402, Oct. 4, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,170  
Int. Cl.<sup>2</sup> B60P 3/00

U.S. Cl. 414—460 2 Claims



1. A vehicle having an inverted U-shaped frame defining an elongated container carrying bay between first and second legs with each leg of said U-shaped vehicle having a plurality of ground engaging wheels; first and second engines respectively supported on respective legs of said vehicle; first drive means between said first engine and at least one wheel on said first leg; second drive means between said second engine and at least one wheel on said second leg; a reservoir; first and second pairs of pumps connected to said reservoir and respectively driven by said first and second engines; a hydraulic power steering system for turning said wheels with one of said first pair of pumps supplying fluid thereto; first and second longitudinally spaced transversely extending beams each having opposite ends respectively guided for vertical movement in said bay; a spreader having opposite ends respectively supported on said beams; first and second spreader fluid rams respectively interposed between said beams and respective ends of said spreader; spreader circuit means for supplying hydraulic fluid to said spreader fluid rams with one of said second pair of pumps supplying hydraulic fluid thereto, said spreader circuit means including centering means for automatically centering said spreader between said legs in response to actuation thereof; hoisting fluid ram means supporting said spreader for vertical movement in said bay; said hoisting fluid ram means including first and second cylinder and piston rod assemblies located on respective legs and respectively connected to respective ends of said spreader; hoisting circuit means for supplying hydraulic fluid to opposite ends of said cylinders, said hoisting circuit means including first and second pairs of conduits respectively connected to first and second ends of respective cylinders with first and second control valve means respectively in the respective pairs of conduits, said reservoir being connected to both of said valve means and the other of said pairs of pumps respectively connected to the respective control valve means; a pressure responsive valve means in each of said first conduits normally preventing flow therethrough, each pressure responsive valve means being connected to an associated second conduit to open in response to pressurized fluid in the second conduit and a normally closed valve means between the first end of each cylinder and each pressure responsive valve means and being operable to connect the first end of an associated cylinder to the pressure responsive valve means so that the pressure responsive valve means is opened in response to pressurized fluid in said first end of an associated



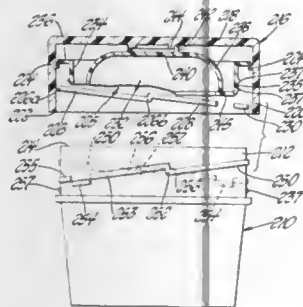
cylinder; each of said piston rods having a first pulley rotatable thereon and first and second operative connections between opposite ends of said spreader and the respective first pulleys; each connection including three elongated flexible members extending parallel to each other with one end connected to said frame and being entrained over a first pulley, a second pulley adjacent an upper corner of said U-shaped frame with an intermediate flexible member entrained over said second pulley, and a third pulley adjacent an opposite upper corner of said U-shaped frame with both outer flexible members entrained over the third pulley and connected to an adjacent corner of said spreader; attitude control means forming part of said hoisting circuit means for limiting the angular attitude of said spreader with respect to a reference plane; and interconnection means for selectively connecting said power steering system and said spreader fluid rams to one pump of a pair of pumps and both of said hoisting fluid rams to another pump of a pair of pumps when one engine fails.

4,159,779

**SAFETY PACKAGE WITH THREADED STOP LOCK**  
Peter Hedgewick, Windsor, Canada, assignor to International Tools (1973) Limited, Windsor, Canada

Filed Aug. 7, 1978, Ser. No. 930,221  
Int. Cl.<sup>2</sup> B65D 55/02, 85/56; A61J 1/00  
U.S. Cl. 215—214

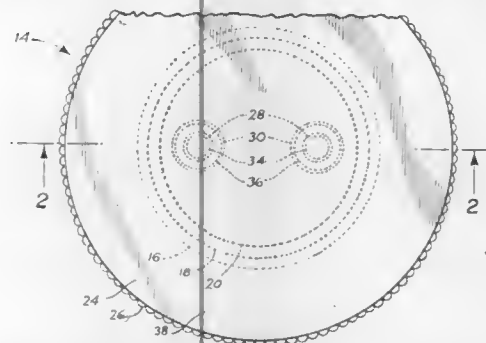
5 Claims



1. A safety closure assembly comprising: a cap having an end wall with a skirt projecting axially from the periphery thereof and having a free end spaced axially from said end wall with cap locking means formed on the inner surface of the skirt adapted to be engaged with and disengaged from complementary container locking means on a container by combined axial and rotary motion of the cap relative to the container; a spring and sealing member for sealingly engaging a container to which the cap is adapted to be applied and at the same time biasing the cap locking means into locked engagement with the container locking means, said spring and sealing member including an axially extending sealing surface adapted to be received in the mouth of the container for sealing engagement with the inner surface thereof; retention means on the cap for preventing axial separation of said spring and sealing member from said cap; said cap locking means including at least two sets of cap locking elements, each set of cap locking elements being disposed in two helical paths on the inner surface of said skirt and extending from a trailing end to a leading end in the direction from said end wall to the free end of said skirt, each set of cap locking elements including an elongated thread-like rib having a trailing end located at the trailing end of said first helical path and a leading end; said cap locking elements further including a pair of spaced locking lugs located in the second helical path; offset from said first helical path on the side of said first helical path opposite the free end of the skirt, the second lug being located between said first lug and the leading end of said thread-like rib and spaced from said first lug.

4,159,780  
**CHILD-RESISTANT CONTAINER ASSEMBLY**  
Richard A. Romaine, 475 View Crest Dr., Gresham, Oreg. 97030  
Filed Oct. 2, 1978, Ser. No. 947,351  
Int. Cl.<sup>2</sup> B65D 55/02, 85/56  
U.S. Cl. 215—215

7 Claims



1. A child-resistant container assembly comprising in combination:

- (a) a container having a neck,
- (b) a closure insertable in the neck with the plane of its upper surface extending not substantially beyond the plane of the upper surface of the neck,
- (c) rotary interengaging means interengaging the closure and the container neck,
- (d) a key adapted to overlies the closure, and gravity-actuated pin and socket means releasably interengaging the closure and the key, and operative to engage the closure with the neck and to disengage it therefrom.

4,159,781

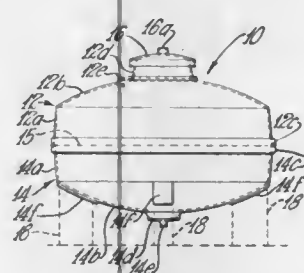
**GLASS FIBER REINFORCED THERMOSETTING RESIN TANK FOR PROCESSING OLIVES**

David H. Bartlow, Conroe, Tex., and Robert M. Sommerkamp, Mt. Union, Pa., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 10, 1978, Ser. No. 922,946  
Int. Cl.<sup>2</sup> B65D 7/02, 7/00

U.S. Cl. 220—5 A

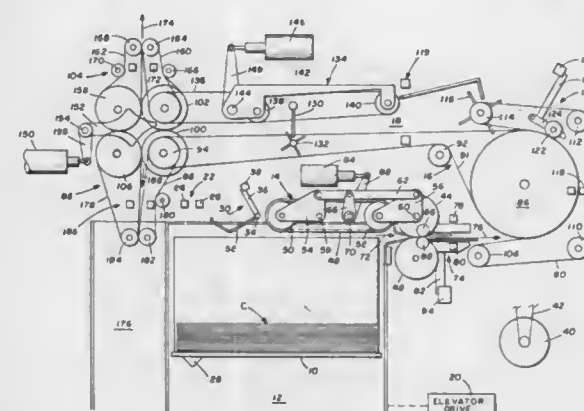
8 Claims



1. A glass fiber reinforced thermosetting resin olive processing tank comprising upper and lower tank halves each including a generally cylindrical portion and a generally spherical portion, the cylindrical portions being joined together and the spherical portions respectively forming the top and bottom of the tank, the upper spherical portion being provided with an upwardly convergent frustoconical manway, and a pair of perforated semicircular olive retaining plates removably mounted in the upper tank half adjacent the lower end of the manway with straight peripheral edge portions thereof abutting each other.

4,159,782  
**BANKING MACHINE CONTROL**  
Robert F. Swartzendruber, Plano, Tex., assignor to Docutel Corporation, Irving, Tex.  
Filed May 2, 1977, Ser. No. 792,930  
Int. Cl.<sup>2</sup> B65H 7/14, 7/12, 29/60  
U.S. Cl. 221—1

19 Claims



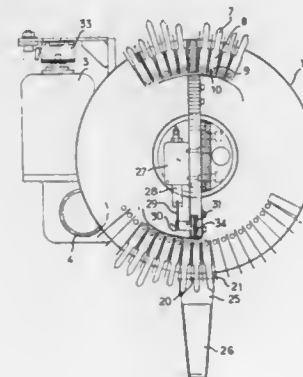
1. A method of controlling the dispensing of bank notes from a banking machine responsive to externally generated control signals, comprising the steps of:  
feeding back notes from a storage bin along a transport path of a transport system,  
returning all but one bank note fed to the transport system back to the storage bin,  
timing the travel of a bank note past a check point displaced from the start of the transport path of the transport system to monitor for an overlapping note condition,  
sensing for the presence of multiple notes traveling together through the transport system only after completion of the timing function at a location displaced downstream from the check point along the transport path by a distance such that the bank note has partially passed the location at the completion of the timing function,  
assembling bank notes delivered from the transport system in an escrow station, and  
transporting the assembled notes from the escrow station to an exit throat.

4,159,783

**SELECTOR-DISPENSER OF FLAT KEY BLANKS**  
Serge Crasnianski, Grenoble, France, assignor to Kis-France, Grenoble, France

Filed Sep. 20, 1977, Ser. No. 835,172  
Claims priority, application France, Oct. 1, 1976, 76 29616  
Int. Cl.<sup>2</sup> G07F 11/00  
U.S. Cl. 221—13

15 Claims



1. In an apparatus for automatic selecting and dispensing a

key blank corresponding to a specimen key to be reproduced having

a rotatable drum structure (1) radial cells (20) in each of which stacked blanks of the same model can be located provided in said drum structure; and ejector means (27, 28, 32) for ejecting a blank opposite to which a cell, containing blanks of the selected type has been moved by a rotary movement of the drum structure controlled by insertion of a specimen key (40) to be reproduced into a template (35) formed with at least one slot (36) having, in cross-section, a form identical to that of the specimen key,

wherein in accordance with the invention, a number of superposed series of cells (20) are uniformly distributed on the periphery, of said drum structure (1), the cells of said series of cells being in vertical alignment, and each cell being capable to store a magazine (6) containing a supply of key blanks (7, 8) of a same type;

an electric motor (3) is provided connected to rotate the drum; and a magnetic brake (33) is provided for blocking the motor when the drum has reached a preselected position;

said drum structure being formed with a central axially extending aperture;

a fixed support located within said aperture of the drum, the ejector means (27, 28, 32) being carried by said support and including one ejector device provided for each of said superposed series of cells,

all ejector devices being disposed in a same diametrical plane of the drum; said template including a control panel strip (35), the number of slots (36) in said strip corresponding to the total number of cells, for introduction of specimen keys (40), said slots being arranged in groups each of which have the number of slots corresponding to the number of superposed series of cells;

means (37) controlled by insertion of a specimen key in a slot for establishing power supply to the motor circuit to start the motor (3), cam means (22) associated with each of said superposed series of cells, a cam operated switch (24) associated with each of said cam means to coact therewith when a selected cell containing a desired blank is brought in front of the ejector devices, and a relay controlled circuit means in which said switch is inserted for cutting off the motor (3), for operating the magnetic brake (33) and for operating the ejector means (27, 28, 32) corresponding to the selected one of said superposed series of cells.

4,159,784

**DEVICE FOR DISPENSING ADJUSTABLE VOLUMES OF A LIQUID**

Eric M. d'Autry, 69-72, rue Gambetta, 95400 Villiers-le-Bel, France

Filed Jul. 18, 1977, Ser. No. 816,448  
Claims priority, application France, Aug. 18, 1976, 76 25082  
Int. Cl.<sup>2</sup> B67D 5/26

U.S. Cl. 222—32

12 Claims

1. In a device for dispensing adjustable volumes of a liquid, the combination of:

a stopper mounted on the neck of a flask or like recipient containing a liquid, which incorporates a device with valves arranged to allow the taking and dispensing of the liquid and which comprises a suction tube immersed in the liquid, as well as a dispensing tube;

a calibrated cylinder which is hermetically mounted in said stopper, which communicates with said suction tube and which comprises, near its free upper end an outwardly projecting fixed annular stop;

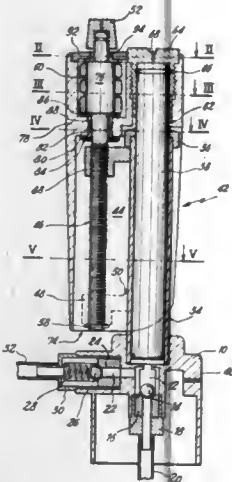
a calibrated cylindrical plunger adapted to cooperate with said calibrated cylinder;

a body for actuating said calibrated plunger, internally defining a first cavity in which a threaded adjusting shaft is adapted to be housed, wherein said shaft is immobile in

translation in said first cavity and which, when rotated, may modify the vertical position of a nut immobilised in rotation which, by cooperation with said annular stop, acts as stop limiting the upward stroke of said calibrated plunger;

a digital display system mounted on the upper part of said threaded shaft so as to be controlled by the rotation of said shaft so as to furnish an indication of the translation of the vertical position of said nut and therefore the value of the volume of liquid to be dispensed;

a member for driving said shaft in rotation, and



means for connecting said actuator body with the upper part of said calibrated plunger wherein said means for connecting the plunger with said plunger actuating body are in the form of a second cylindrical cavity in said body, a cap fast with said plunger being adapted to be removably fixed in said second cavity wherein, in the vicinity of said calibrated cylinder, the lateral wall defining said body presents an opening extending from the lower end of said body substantially as far as the upper end of the calibrated cylinder with allowing the disengagement of said body, thus enabling it to be disconnected from the rest of the device once the plunger and its cap have been removed.

**4,159,785**  
**METHOD FOR LOADING PARTICULATE MATTER IN A VESSEL**

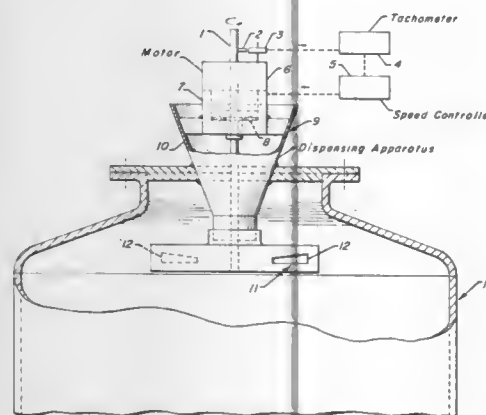
William M. Berry, Jr., Woodridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 691,723, Jun. 1, 1976, abandoned. This application Jul. 14, 1977, Ser. No. 815,876

U.S. Cl. 222—63

Int. Cl.<sup>2</sup> B67D 5/08

1 Claim



1. A method for loading solid catalytic particulate matter to

an elongated catalytic hydrocarbon conversion vessel, at a substantially constant rate of loading, uniformly across a given area of said vessel by discharge of said particles from a rotatable discharge member consisting of a fluid operated driving means having a variable drive speed and dispensing apertures situated on the trailing edge of said discharge member wherein said solid catalytic particulate matter is deposited in a down-flow direction to said vessel at a rate of fill of said vessel of up to twenty vertical inches per minute and at an average free fall distance of said particulate matter through a gaseous medium of at least one foot after exit from said discharge member's dispensing aperture which comprises:

- (a) sensing the rotational speed of said rotatable discharge member's drive means;
- (b) generating a first signal representative of said drive mean's rotational speed;
- (c) comparing said generated signal with a predetermined signal representative of the desired rotation speed of said discharge member's drive means;
- (d) generating a second signal representative of the differential between said generated signal and said predetermined signal; and
- (e) transmitting said resultant second signal to said fluid operating driving means to vary the rotational speed of said discharge member to the desired rotational speed.

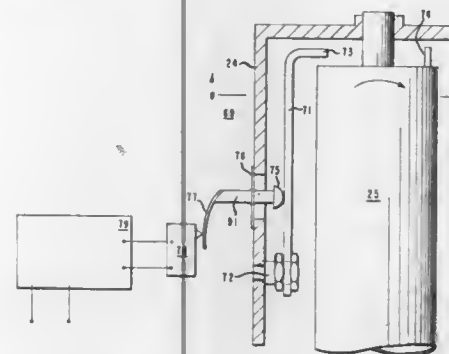
**4,159,786**  
**PERIODICALLY EXCITED LEVEL CONTROL PROBE**  
Nicholas Biddle, III, and Roger A. Patterson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 11, 1977, Ser. No. 850,670

Int. Cl.<sup>2</sup> G03G 13/00

U.S. Cl. 222—64

9 Claims



1. An apparatus for controlling the level of toner particles in the sump of a decorator adapted to apply toner particles to a latent image said decorator containing at least one rotatable member, adapted to periodically strike a probe rod located within said sump and capable of vibrating whereby said probe is caused to vibrate, sensor means to sense whether or not the vibration of the probe is being damped by toner particles in the sump, drive means actuated by said sensor means adapted to add toner to said sump when the vibration of the probe is not being damped by toner.

**4,159,787**  
**CLAMP FOR TUBE DISPENSERS**  
Steven Wright, 22632 Main St., Hayward, Calif. 94541

Filed Aug. 24, 1977, Ser. No. 827,178

Int. Cl.<sup>2</sup> F65D 35/20

U.S. Cl. 222—103

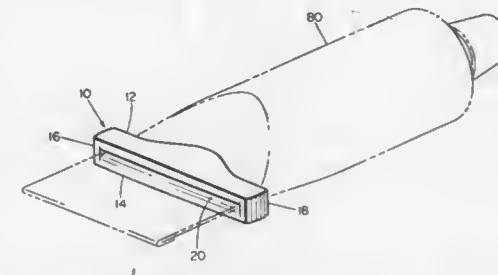
10 Claims

1. A clamp device for effectively evacuating the contents of a flexible tube dispenser comprising:

A. upper and lower arm portions of sufficient length to

accept the width of a tube dispenser, said arm portions being further characterized as having:

1. a straight trailing side;
2. a forward side having a centrally located protruding curved portion which merges into straight sections at the ends of said arm portions;
3. opposing lengthwise arcuate surfaces such that said arm portions are thickest at their centers;



4. opposing rounded lengthwise side edges on said trailing and forward sides; and
- B. end members being connected to said upper and lower arm portions for maintaining separation between said upper and lower arm portions said separation defining a gap therebetween to accept said flexible tube dispenser.

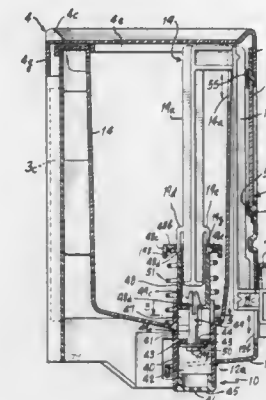
**4,159,788**  
**WALL MOUNTED FLUID DISPENSER**  
John S. Doyl, 404 W. 20th St., New York, N.Y. 10011

Filed Sep. 12, 1977, Ser. No. 832,731

Int. Cl.<sup>2</sup> B67D 5/60

U.S. Cl. 222—144.5

7 Claims



1. A dispensing apparatus comprising: a facade member having an upper peripheral edge; container means, mounted on said facade member, for retaining a fluid substance to be dispensed and having an open-mouthed top with an upper peripheral edge and an interior rim; wall-mounting means, having an upper peripheral edge, for mounting said facade member and said container means on a wall; cover means, extending over said upper peripheral edges, for covering said facade member, said container means and said wall-mounting means and having means on its under side, cooperating with said interior rim, for sealing the top of said container means;
- valve means in the bottom of said container means for controlling the dispensing of said fluid substance therefrom; means for operating said valve means comprising: a first arm extending substantially vertically into the interior of said container means and connected to said valve means;

a second arm extending substantially vertically between said container means and said facade member; means for connecting the upper ends of said first and second arms; means on said second arm, extending through said facade member, for receiving a finger-operated button thereon; means for urging said valve means in the upward direction; and means defining a slot in the lower portion of said facade member for accommodating said button receiving means in up and down motion, the upper edge of said slot limiting the upward motion of said button receiving means.

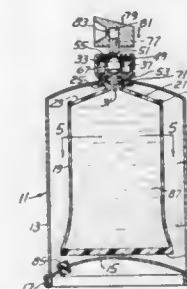
**4,159,789**  
**UNIVERSAL DISPENSING SACK AND VALVE ASSEMBLY FOR PRESSURIZED DISPENSERS**  
William R. Stoody, 15472 Collins, Romulus, Mich. 48174

Filed Dec. 14, 1977, Ser. No. 860,354

Int. Cl.<sup>2</sup> B65D 83/14

U.S. Cl. 222—148

14 Claims



1. A pressurized dispenser comprising an apertured vessel having a pressure chamber; at least one impervious sack of flexible material loosely nested and suspended within said chamber and spaced from the walls thereof holding a fluid-like material to be dispensed; a neck on one end of and integral with said sack having a bore, projected through and secured to said vessel, suspending said sack within said vessel; said neck defining a valve housing; and a valve component assembly and an apertured valve retainer enclosing and overlying said neck and sealingly secured thereto; said valve component assembly projected down into and movably nested in said neck; there being a pressurized propellant sealed within said pressure chamber for applying continuous pressure to said sack over substantially all its exterior surfaces; manual unseating of said valve component assembly releasing controlled quantities of said fluid-like material through said neck and nozzle, said sack walls gradually collapsing until all material therein is dispensed said neck having an annular groove therein; the securing of said neck within said vessel including an annular outturned lip on said vessel engaging said neck and sealingly nested within said groove; the securing of said valve retainer to said neck including an intumed annular flange means on said retainer engaging said container lip and snugly rested within said groove.

**4,159,790**  
**DISPENSING CONTAINER**  
Vincent R. Bailey, 2914 N. Flagler Dr., W. Palm Beach, Fla. 33407

Filed Dec. 19, 1977, Ser. No. 862,108

Int. Cl.<sup>2</sup> B65D 37/00

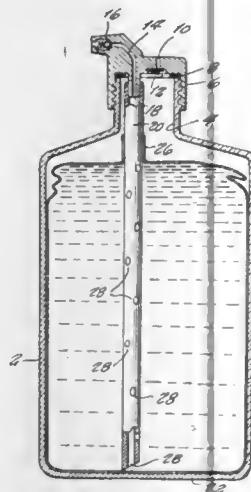
U.S. Cl. 222—211

6 Claims

1. A dispensing container comprising a compressible bottle

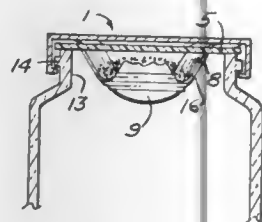


having a neck portion, a cap comprising a cylindrical wall portion, a top portion and spout portion attached to said neck portion, said cap having an inlet passageway extending through said top portion of said cap in a direction axially of said bottle, a first one-way valve disposed in said inlet passageway and operable to permit flow of air through said inlet passageway into said bottle, said cap having an outlet passageway extending through said spout portion of said cap, said spout portion being fixed at an angle to the axis of said bottle, said outlet passageway having a chamber therein, a second one-way valve disposed in said outlet passageway chamber and operable to permit flow of liquid from said bottle through said outlet passageway, said cap having as an integrally molded



portion thereof a cylindrical protrusion extending into said neck portion along a line off-set from said axis of said bottle, said outlet passageway extending axially of said protrusion and parallel to said inlet passageway, a tube fitted upon said protrusion and extending toward a bottom portion of said bottle, and a flexible bag having a cylindrical neck portion off-set from a lengthwise axis of said bag and fixed upon said tube, said bag being disposed in said bottle and being adapted to retain said liquid therein, a portion of said tube disposed within said bag having opening means to facilitate flow of said liquid into said tube, said opening means comprising a plurality of holes in wall portions of said tube disposed within said bag, said tube being devoid of openings in a portion thereof outside of said bag.

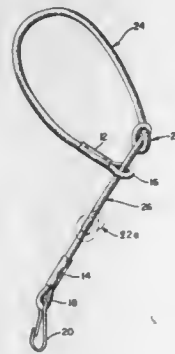
**4,159,791**  
**MEASURING AND DISPENSING DEVICE**  
 William C. Crutcher, 178 North St., Middlebury, Conn. 06762  
 Filed Apr. 4, 1977, Ser. No. 784,244  
 Int. Cl.<sup>2</sup> G01F 11/26  
 U.S. Cl. 222-454 6 Claims



1. A measuring and dispensing device for the contents of a container having a cylindrical neck with a rim, said container provided with a removable top having means cooperating with the container neck for tightening the top against the rim, said measuring and dispensing device comprising:  
 a cup member having a cup portion sized to hold a preselected measure of the contents of the container and also

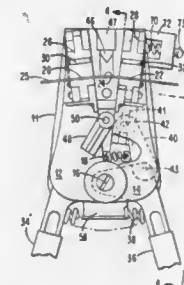
having a plurality of spaced flexible support legs extending away from the open end of the cup portion, and a substantially flat sealing member having a peripheral edge adapted to form a seal between the rim of the container and the top and also adapted to retain the sealing member in said top, said sealing member being provided with at least one aperture inside said peripheral edge arranged to receive the ends of said support legs, said flexible legs being adapted to be flexed and inserted for attachment of the cup member to the sealing member to hold the cup portion suspended and spaced from the top inside the upper part of the container, whereby a measured portion of the container contents may be caught in the cup portion when the container is inverted and then righted, and the measured portion then dispensed when the top is removed from the container and tilted over a receptacle.

**4,159,792**  
**SKI GLOVE LEASH**  
 Sanford Siegal, 8045 NW. 36th St., Miami, Fla. 33166  
 Filed Jan. 23, 1978, Ser. No. 871,892  
 Int. Cl.<sup>2</sup> A44C 5/00  
 U.S. Cl. 224-267 7 Claims



1. A glove tether for attaching a glove around the wrist area of a wearer; and comprising a single length of flexible cord between a formation at one end with the cord terminal portion looped and secured to itself to provide a free end eyelet formation and the opposite end threaded through the eyelet formation providing a loop or band portion to encircle the wrist area of a wearer and a tether portion extending therefrom; wherein said opposite end has means for attachment to a glove permitting the glove to be temporarily removed from hand covering position while maintained connected to the band portion which remains in encirclement with the wrist area of the wearer holding the glove in accessible position to be re-applied as a hand covering; wherein the cord terminal portion at each end of the cord is secured to itself within an adjacent eyelet formation by a clamp of predetermined transverse cross-section relative to the eyelet formation at said one end of the cord and wherein the eyelet formation at said one end is slightly larger than the eyelet formation at the opposite end whereby to facilitate threading of the latter and its associated clamp through the eyelet formation at said one end of the cord in forming the loop or band portion; and wherein the cord is knotted along the length thereof for size adjustment before threading of said opposite end through the eyelet formation at said one end of the cord with the said eyelet formation in proximate position relative said knot to prevent undue tightening of the band portion.

**4,159,793**  
**HAND-HELD TOOL FOR OPTICAL FIBER WAVEGUIDE END PREPARATION**  
 Carl Belmonte, Somerville; Mark L. Dakss, Sudbury, and John E. Fulenwider, Concord, all of Mass., assignors to GTE Laboratories Incorporated, Stamford, Conn.  
 Continuation-in-part of Ser. No. 778,885, Mar. 18, 1977, Pat. No. 4,074,840. This application Feb. 16, 1978, Ser. No. 878,217  
 Int. Cl.<sup>2</sup> B26F 3/00  
 U.S. Cl. 225-96.5 16 Claims

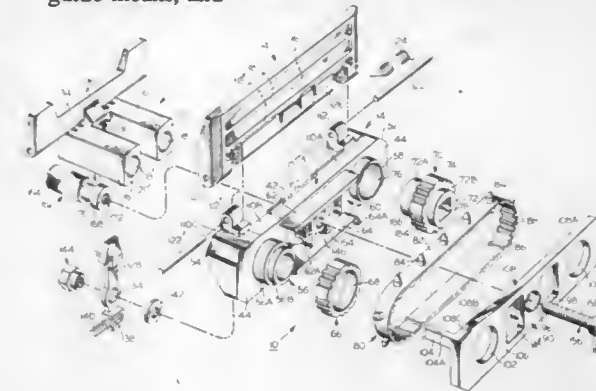


1. A hand-held tool for the preparation of optical fiber waveguide ends comprising  
 a pair of jaw members coupled for separating rotational movement about a pivot axis;  
 means for biasing the jaw members in a comparatively unseparated position;  
 first and second fiber supporting surfaces respectively located on a different one of the jaw members for receiving and supporting an optical fiber waveguide generally circumferentially about the pivot axis;  
 a third fiber supporting surface between the first and second fiber supporting surfaces and generally aligned therewith;  
 a pair of spaced-apart handle members adapted for movement by a squeezing human hand;  
 fiber clamping means responsive to movement of the handle members for exerting a waveguide securing force against the first and second fiber supporting surfaces and for exerting a jaw member separating force in response to further movement of the handle members thereby inducing a tensile stress along the waveguide;  
 a descendable cutting blade releasable from a position above the third fiber supporting surface for contacting the portion of the fiber waveguide thereon to produce a micro-crack in the waveguide periphery whereby the induced tensile stress in the waveguide coupled with the circumferential support thereof causes a diametric propagation of the crack across the waveguide to produce an appropriately prepared fiber end; and  
 stop means for limiting movement of said cutting blade to prevent the cutting blade from contacting the third fiber supporting surface.

**4,159,794**  
**SHEET FEED TRACTOR**  
 Alan F. Seitz, Harwinton, Conn., assignor to Data Motion Incorporated, Torrington, Conn.  
 Filed Oct. 31, 1977, Ser. No. 847,236  
 Int. Cl.<sup>2</sup> B65H 17/34  
 U.S. Cl. 226-75 18 Claims

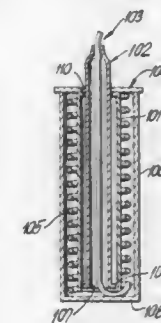
1. A self-contained drive tractor adapted to be mounted upon a printer support and engaged by a drive member for driving web material comprising:  
 (a) an elongated base member having guide means extending transversely thereof and base mounting means for locking said base member on a printer support;  
 (b) a chassis movably mounted on said base member, said chassis having tacking means engaged with said guide means for movement therealong;  
 (c) web driving means movably mounted on and contained within said chassis and adapted to be operatively con-

nected to a drive member to be driven thereby in a path of travel, said web driving means including web engaging means thereon adapted to engage a web material for driving thereof along a portion of said path of travel defining a drive path extending transversely of said base member guide means; and



(d) threaded positioning means operatively connected between said chassis and said base member to selectively laterally shift said chassis transversely of said base member and said drive path, said tracking means following said base member guide means whereby said shifting of said chassis and thereby of said web engaging means is guided transversely of said drive path.

**4,159,795**  
**TELESCOPING WIRE DISPENSER**  
 Louis Friedman, 62 Cardinal Dr., East Hills, N.Y. 11576  
 Filed Jan. 16, 1978, Ser. No. 869,591  
 Int. Cl.<sup>2</sup> B65H 49/04  
 U.S. Cl. 226-127 16 Claims



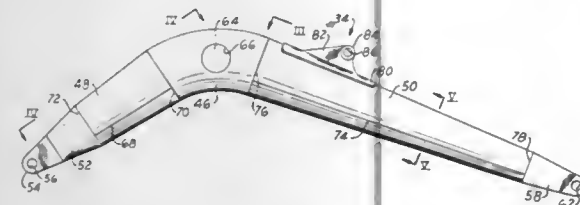
1. Apparatus for dispensing wire comprising a first elongate cylindrical tube having an aperture at one end thereof, and a blocking wall at the opposite end thereof, a second elongate cylindrical tube positioned within said first tube and having a first aperture at the upper end thereof, and a second aperture at the lower end thereof, said upper end of said second tube extending through the first tube aperture, and a length of flexible wire coiled outside the outer circumference of said second tube and within the inner circumference of said first tube, one portion of said wire extending through said second tube from said second aperture thereof to said first aperture thereof, whereby said second tube and the wire portion contained therein can be extended outwardly from said first tube aperture.

4,159,796

**METHOD FOR MAKING A BOOM**

Arthur B. M. Braithwaite, Ickleton, near Saffron Walden, England, assignor to Caterpillar Tractor Co., Peoria, Ill.  
Division of Ser. No. 712,555, Aug. 9, 1976, Pat. No. 4,069,637.  
This application Jun. 23, 1977, Ser. No. 809,571  
Int. Cl.<sup>2</sup> E02F 3/38; B23K 31/02  
U.S. Cl. 228—151

4 Claims



1. A method of making a boom comprising the steps of cutting first and second plates; rolling said plates into first and second tubular members, each having a circular cross section and abutting edges extending longitudinally thereof; welding said abutting edges together by forming a longitudinally extending weld seam which is located at a position below a horizontal axis of a respective one of said tubular members and circumferentially between the horizontal axis and a vertical axis of said respective one of said tubular members, when such tubular member is viewed in cross section, whereby said weld seam is disposed on a lower side of said boom; selecting elbow means having a circular cross section on each end thereof equal to the cross section of one end of each of said tubular members; and welding said one end of each of said tubular members to an end of said elbow.

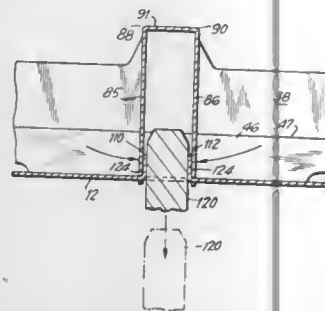
4,159,797

**SHIPPING CONTAINER AND BLANK THEREFOR**

William F. Roozee, Covina, Calif., assignor to International Paper Company, New York, N.Y.  
Filed Feb. 27, 1978, Ser. No. 881,169  
Int. Cl.<sup>2</sup> B65D 5/48

U.S. Cl. 229—27

12 Claims



1. A blank for forming a shipping container tray comprising at least two compartments separated by a divider wall, said blank having portions for providing, in the erected tray, top structure, a bottom, side walls, and end walls; the top structure portion including a transverse bridge part and a pair of divider wall panel flaps hingedly connected to the margins of the transverse bridge part so that when, during erection of the tray, they are turned downwardly, they extend toward the bottom of the tray, thereby forming a hollow strut; and the bottom portion having a pair of center wall tab portions arranged to be turned upwardly along hinge lines that are spaced apart a distance substantially equal to the width of the bridge part, each tab being arranged to be substantially under a margin of the bridge portion in the erected tray so that the down-

turned divider wall panel flaps are parallel to each other and vertical when they are secured to the center wall tab portions.

4,159,798

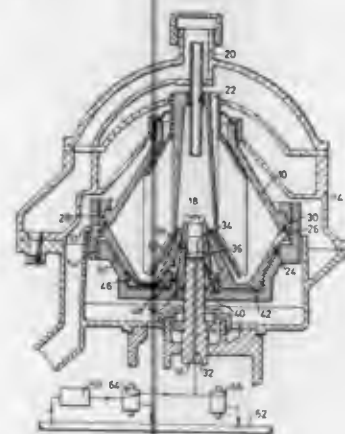
**DESLUDGER TYPE DISC BOWL CENTRIFUGES**

Geoffrey L. Grimwood, Shaley House, Wooldale, Holmfirth, near Huddersfield, and Joseph F. Jackson, 1, W. Royd Villas, Kingcross Rd., Halifax, both of England  
Filed May 22, 1978, Ser. No. 908,436  
Claims priority, application United Kingdom, May 24, 1977, 21773/77

Int. Cl.<sup>2</sup> B04B 1/14

U.S. Cl. 233—20 A

5 Claims



1. A disc bowl centrifuge comprising a bowl adapted to be rotated about a vertical axis, means for introducing material to be processed into the bowl interior, an annular piston disposed within an annular operating chamber in the lower part of said bowl, the outer periphery of said piston defining an upwardly-extending, first annular valve member, a second downwardly-extending annular valve member contained in the wall of said bowl, said first and second valve members co-operating to form a discharge valve controlling at least one discharge port provided in the wall of said bowl, and means for introducing pressure fluid into said piston chamber, said piston being arranged to be displaceable between an upper position in which said first and second valve members co-operate to close said valve to prevent discharge of material from said bowl, and a lower position in which said first and second valve members are mutually spaced to open said valve and permit discharge from said bowl under the action of centrifugal force, said means for introducing pressure fluid into said piston chamber is such as to admit it at a pressure substantially higher than atmospheric pressure, the magnitude of said pressure being such that, when said valve is in its closed position, the pressure in said chamber beneath said piston is sufficient to hold said valve closed irrespective of the magnitude of opening forces exerted on said piston resulting from pressurisation of its upper face by process material subjected to centrifugal force in said bowl.

4,159,799

**CASSETTE UNIT AND FIXTURE FOR LOADING THE UNIT WITH A PLANAR MEMBER**

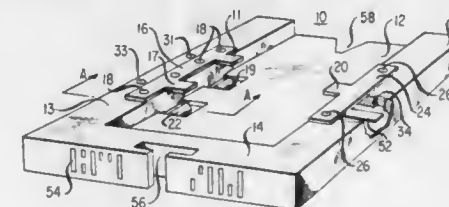
David S. Alles, Convent Station, and Joseph Hill, Middlesex, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Dec. 14, 1977, Ser. No. 860,338  
Int. Cl.<sup>2</sup> G06K 7/00, 7/04, 13/16

U.S. Cl. 235—486

8 Claims

3. Apparatus for positioning a planar member in a stress-free way in a cassette unit that includes a three-assembly suspension system having a fixed-location spring-loaded clamp member included in each suspension assembly, said apparatus comprising a base member,

unit hold-down means mounted on said base member for securely holding a cassette unit in place, clamp-member actuators mounted on said base member for maintaining said spring-loaded clamp members in an open position when said unit is secured in place by said hold-down means, movable means slidably mounted on said base member and spaced apart from said holding means for receiving a planar member to be loaded into said unit, said movable means including retractable means for initially engaging the edges of said member to establish a predetermined position of said member on said movable means, and member hold-down means for holding said member in said predetermined position as said movable means is moved toward said unit, said movable means being adapted to move said member into adjacent non-contacting relationship with said unit



free of any side-wall portions thereof and encompassed between but not in contact with said open clamp members during said movement, said movable means also including a reference stop member for engagement with said unit when said member has been moved into loading registry with said unit, and means responsive to said stop member engaging said unit for releasing said unit hold-down means and said member hold-down means so that said spring-loaded clamp members are enabled to move relative to said actuators to securely engage said member and said unit is at the same time released from said apparatus.  
4. Apparatus as in claim 3 wherein each cassette unit designed to be held in said apparatus includes code information thereon uniquely identifying the unit, and wherein said apparatus further includes means for reading the code information contained on a unit held in said apparatus.

4,159,800

**FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE**

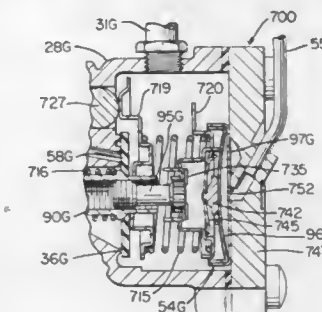
Charles D. Branson, and Roy C. Deml, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.  
Continuation of Ser. No. 742,910, Nov. 17, 1976, abandoned, which is a division of Ser. No. 570,863, Apr. 23, 1975, Pat. No. 4,007,872, which is a division of Ser. No. 530,605, Dec. 9, 1974, Pat. No. 3,989,064, which is a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,389, Jul. 18, 1973, abandoned. This application Feb. 24, 1978, Ser. No. 880,762  
Int. Cl.<sup>2</sup> F16L 5/00

U.S. Cl. 236—15 A

4 Claims

1. In a fuel control device having a valve means to be thermostatically controlled by an expandable and contractible power element having a movable wall for operating said valve means and a fixed wall for being carried by said control device, the improvement comprising a one-piece relatively thick manifold having opposed substantially flat parallel sides, said manifold being secured to said device and having passage means therethrough leading from one of said sides of said manifold external to said control device to the other of said sides of said manifold internal of said control device, said power element having said fixed wall secured to said other side of said mani-

fold to be carried thereby and be in fluid communication with said passage means thereof, said one side of said manifold having a substantially flat external surface disposed at an angle relative to said one side other than parallel and being interrupted by said passage means, said flat surface having a part thereof extending into said one side of said manifold and an-



other part thereof extending outwardly from said one side approximately the same distance said part of said flat surface extends into said one side, and a conduit means secured in said passage means at said flat external surface of said one side of said manifold to be carried thereby and be in fluid communication with said passage means thereof.

4,159,801

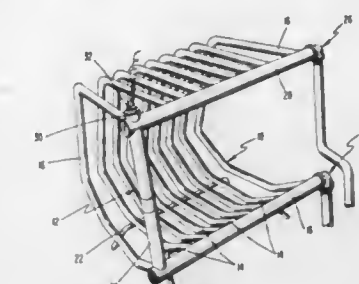
**FIREPLACE BOILER**

Albert E. Roland, Box 198, Stoney Garden Rd., Kinterville, Pa. 18930

Filed Sep. 19, 1977, Ser. No. 834,493  
Int. Cl.<sup>2</sup> F24D 3/00

U.S. Cl. 237—8 R

16 Claims



1. A fireplace boiler for heating a liquid, which is adapted to be fitted into a fireplace, comprising:  
grate means in which a fire is built, including a plurality of heating tubes, each tube having a first location and a second location thereon,  
a first header connected at the first location of each of the heating tubes, said first header having an inlet port at one end thereof, and  
a second header connected at the second location of each of the heating tubes, said second header having an outlet port at one end thereof;  
sampling means connected between said first and second headers for allowing a liquid to flow between the headers; and  
a temperature sensor included in said sampling means for sensing the temperature of the liquid flowing therein.



4,159,802

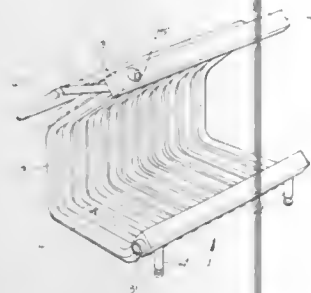
HEATING SYSTEM UTILIZING FUEL BEARING  
MULTI-TUBE WATER JACKETHerman Ficker, 10461 Lockcrest Dr., Cincinnati, Ohio 45231,  
and John Konrad, 4219 Runningfawn Dr., Cincinnati, Ohio  
45239

Filed May 22, 1978, Ser. No. 908,564

Int. Cl.<sup>2</sup> F24D 5/00, 9/00

U.S. Cl. 237—8 R

15 Claims



1. A heating system comprising a fuel bearing multi-tube water jacket, said jacket having a lower header, an upper header vertically spaced from said lower header, a plurality of spaced curvilinear hollow heat exchanging tubes connecting said manifolds, and a hollow plate-like baffle connected between said manifolds, said upper manifold having a fluid outlet for exhausting fluid from said water jacket, said lower manifold having a fluid inlet for receiving fluid, said heat exchanging tubes extending rearwardly from said lower manifold to form a support for bearing combustible fuel, the rearward ends of said tubes forming said platform extending upwardly to form the back wall of said jacket, the uppermost ends of said tubes forming said back extending forwardly to said upper manifold to form an awning-like canopy overlying said fuel bearing support, said baffle being positioned to overlie said fuel bearing support and having an inlet connected to said lower manifold and an outlet connected to said upper manifold, whereby fluid introduced at said lower manifold inlet may be circulated through said heat exchanging tubes and said baffle, said fluid being heated as a result of heat produced by burning said combustible fuel positioned on said fuel bearing support, said heated fluid being withdrawn from said upper manifold outlet for heating an enclosed area and the like.

4,159,803

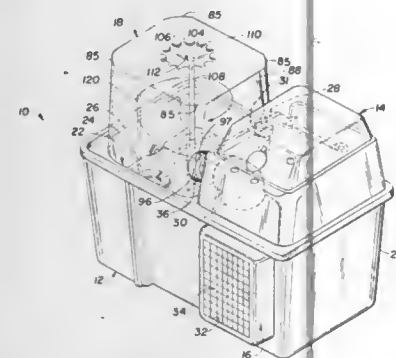
CHAMBER FOR ULTRASONIC AEROSOL  
GENERATIONLeon R. Cameto, Oakland, and John R. Edmund, Berkeley, both  
of Calif., assignors to MistO<sub>2</sub>Gen Equipment Company,  
Oakland, Calif.

Filed Mar. 31, 1977, Ser. No. 783,105

Int. Cl.<sup>2</sup> B05B 17/06

U.S. Cl. 239—102

4 Claims



1. A nebulizing chamber for use with an ultrasonic electro-

acoustic transducer adapted to interface with said chamber, said chamber comprising:

a thin-walled inflatable bag adapted to enclose a liquid and having outlet means comprising a plurality of slits forming flaps in the upper, normally horizontally disposed chamber wall, wherein said slits are arranged in a ring with the arcuate flaps disposed to direct said exhaust radially inwardly so as to generate an ascending convergent outlet flow pattern wherein said chamber includes a retaining means maintaining a depression within said ring upon inflation of said chamber for directing a portion of said exhaust in a convergent, substantially horizontal direction.

4,159,804

## MEANS FOR ATOMIZING COSMETIC PRODUCTS

Oscar Rigamonti, Via P. Toselli 21, Milan, Italy

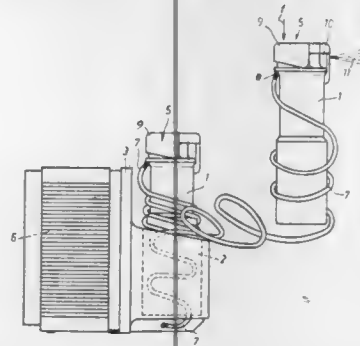
Filed Jul. 11, 1977, Ser. No. 814,447

Claims priority, application Italy, Feb. 25, 1977, 20748/77[U]

Int. Cl.<sup>2</sup> B05B 7/24

U.S. Cl. 239—346

4 Claims



1. A atomizer for cosmetic products in particular hair lacquers, said atomizer comprising:

- (A) a pair of lacquer-containing bombs,
  - (B) a portable compressed air-source,
  - (C) a housing body having seats for reception of said bombs and for said compressed air-source,
  - (D) hoses connecting said portable compressed air-source to said bombs,
  - (E) each bomb comprising
    - (I) a lacquer containing lower part and
    - (II) a detachable head mounted on said lower part
      - (a) said head including a depressible cover with a flat crown,
    - (III) said head having an atomizing unit, said atomizing unit constituting
      - (a) a compressed air-nozzle and
      - (b) a lacquer supplying nozzle,
  - (IV) passageway means connecting the air-hose for that bomb with the compressed air-nozzle,
  - (V) a controllable biased check valve interposed in said passageway means,
  - (VI) passageway means connecting the lacquer in said lower part with said lacquer supply nozzle
  - (VII) said check valve being in operative relationship to said crown whereby depression of said crown opens said valve
  - (VIII) said compressed air-nozzle terminating at an orifice
  - (IX) said lacquer supplying nozzle terminating in a conic end near said orifice
  - (X) said orifice being separated from said conic end by a notch
- (F) each said hose being wound around its associated bomb to provide a combination transverse dimension of the bomb and hose small enough to be received in the seat of the housing body.

4,159,805

## BUBBLER SPRINKLER

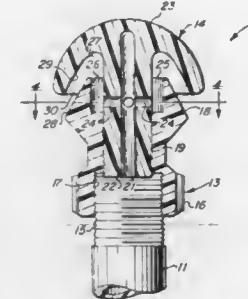
Robert W. von Lutzow, 4840 Grandview La., Phoenix, Ariz.  
85018

Filed Nov. 7, 1977, Ser. No. 848,984

Int. Cl.<sup>2</sup> B05B 1/30

U.S. Cl. 239—457

4 Claims



1. A bubbler head for an irrigation system comprising: a valve body comprising two axially interconnected elongated hollow parts, one end of one of said parts being internally threaded for threadedly engaging a threaded pipe of an irrigation system, the other end of said one of said parts being internally threaded for threadedly receiving the other of said parts, the other of said parts being provided with an end having a dish shaped configuration having an externally threaded stem of smaller diameter than the outer diameter of said dish shaped configuration extending axially out of said dish shaped configuration, said stem threadedly engaging with the threads of said other end of said one of said parts for moving a predetermined distance, said stem being provided with a first passageway extending axially from its free end toward said dish shaped configuration, a second passageway interconnecting with said first passageway between its ends and extending laterally thereof to the outside periphery of said stem, said first part being provided with a bore extending into said other end thereof a predetermined distance and being of a larger diameter than the diameter of said stem to provide a reservoir for water around said stem, said second passageway interconnecting with said reservoir during a part of said predetermined movement of said stem, said stem during said predetermined movement moving said second passageway gradually out of alignment with said reservoir to control water flow through the first and second passageways into said reservoir and against said dish shaped configuration for deflection out of said bubbler head.

4,159,806

## OPERATION SEQUENCE CONTROL SYSTEM

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Sep. 12, 1977, Ser. No. 832,439

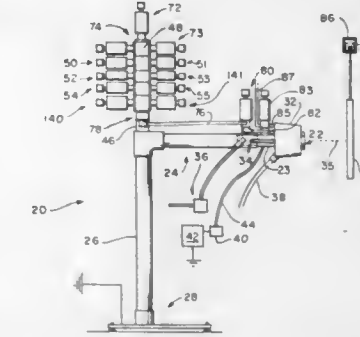
Int. Cl.<sup>2</sup> B05B 5/02

U.S. Cl. 239—708

23 Claims

7. Apparatus for timing an operation sequence comprising a source of fluid under pressure, a fluid motor coupled to the source for actuation thereby, the fluid motor including an output shaft, a program wheel coupled to the output shaft for rotation, and a plurality of switches mounted adjacent the program wheel and including means responsive to rotation of the program wheel for actuation thereby, the program wheel comprising a drum-type programmer having a plurality of

axially spaced-apart cam surfaces, at least one of the switches being located adjacent a respective cam surface and including



means contacting its respective cam surface for control thereby.

4,159,807

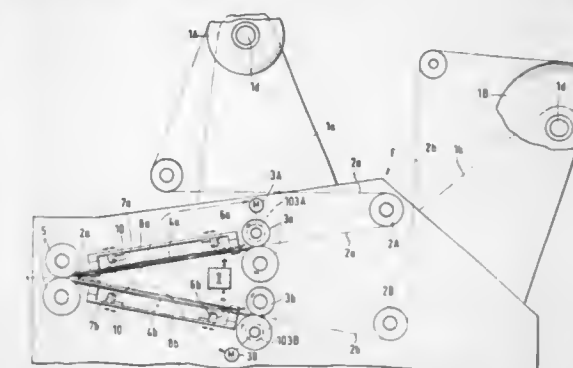
APPARATUS FOR FEEDING SERIATIM DISCRETE  
WEBS OF PAPER OR THE LIKEKarl-Heinz Honsel, Bielefeld; Hans-Rudolf Niehaus, Enger, and  
Karl Mühlenweg, Bielefeld, all of Fed. Rep. of Germany,  
assignors to Karl-Heinz Honsel, Bielefeld, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,681

Claims priority, application Fed. Rep. of Germany, Dec. 23,  
1976, 2658385Int. Cl.<sup>2</sup> B65H 25/04

U.S. Cl. 242—57

10 Claims



1. In an apparatus for feeding seriatim webs of paper or the like, the combination of first and second support means for discrete sources of finite lengths of webs; transporting means for successive webs; first intermittently actuatable web advancing means between a source in said first support means and said transporting means; second intermittently actuatable web advancing means between a source in said second support means and said transporting means; first guide means defining a first path for movement of a web from said first advancing means into the range of said transporting means; second guide means defining a second path for movement of a web from said second advancing means into the range of said transporting means; and a pair of detectors adjacent to each of said paths, one detector of each pair being nearer to the respective advancing means and including means for generating a signal in response to detection of the trailing end of a web in the respective path, and the other detector of each pair having means for generating a signal in response to detection of the trailing end of a web in the respective path.

4,159,808

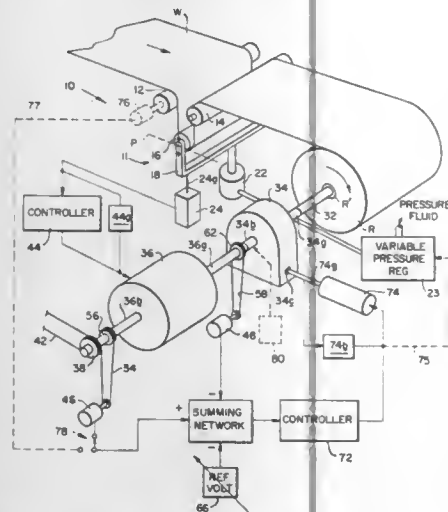
## VARIABLE RATIO WINDER

Edward F. Mehofer, Norfolk, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Filed Jan. 6, 1978, Ser. No. 867,385  
Int. Cl.<sup>2</sup> B65H 59/38

U.S. Cl. 242—75.51

8 Claims



1. Web winding apparatus comprising
  - A. means for rotatively supporting a web roll;
  - B. a variable speed transmission having an input shaft and an output shaft connected to rotate the roll support means;
  - C. means for changing the gear-in ratio of the transmission in response to an input signal;
  - D. a torque coupling device for rotating the transmission input shaft, the torque coupling of the device being controllable in response to a control signal;
  - E. means for sensing the tension in the winding web to produce a control signal for the coupling device so that the angular velocity of the roll support means is varied to compensate for tension upsets in the web; and
  - F. means for matching the winder's speed characteristics at the input shaft of the transmission to the torque coupling device characteristics at all roll diameters so that the winder requires only a minimum size torque coupling device for given web speed and tension conditions.

4,159,809

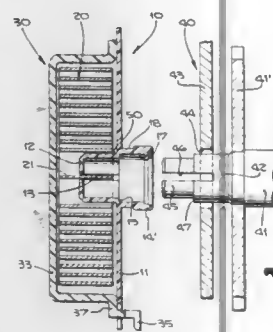
## PREWOUND RETRACTOR SPRING HOUSING ASSEMBLY

Gerry Rawson, Valencia, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Jan. 6, 1978, Ser. No. 867,475  
Int. Cl.<sup>2</sup> B65H 75/48; F03G 1/08

U.S. Cl. 242—107

12 Claims



1. A prewound retractor spring housing assembly for mounting to a safety belt retractor having side walls and a belt stor-

age reel shaft end protruding through one side thereof, comprising:

- spring mounting base means for receiving a retractor coil spring to be prewound thereon, said base means having frangible means for holding a first end of said coil spring stationary relative said base means until selectively broken to release said first end of said spring from said base means;
- spring cup means for encompassing said coil spring when prewound on said base means, said cup means having second spring end engaging means for holding a second end of said coil spring stationary relative to said cup means;
- means for locking said cup means to said base means; and
- means for mounting said assembly to said retractor in a manner to place said first spring end in biasing relation to said reel shaft end.

4,159,810

## CASSETTE RE-WINDING DEVICE

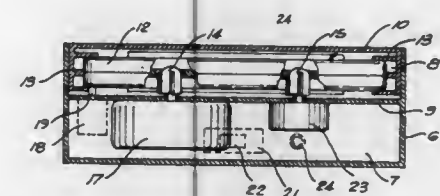
Trevor Hodgkinson, 6 Larool Pl., Engadine, Sydney, New South Wales, Australia, assignor to Trevor Hodgkinson; Control Switchboards Pty, Ltd. and Neil Charles McCormack, all of New South Wales, Australia

Filed Dec. 12, 1977, Ser. No. 859,738

Claims priority, application Australia, Dec. 15, 1976, PC8503  
Int. Cl.<sup>2</sup> G03B 1/04; G11B 15/32

U.S. Cl. 242—198

5 Claims



1. A battery operated magnetic tape cassette rewinding device for automatically rewinding a cassette having independently mounted spools holding a magnetic tape, comprising:
  - a generally rectangular housing having a partition therein which divides said housing into first and second compartments and a hinged lid mounted onto said housing over said first compartment, said hinged lid being adapted to receive and pivot to a closed position in which such cassette is in an operative position in said first compartment of said housing;
  - first and second spindles mounted in said partition for rotation, said spindles being adapted to engage the spools of such cassette in said operative position in said first compartment of said housing;
  - electric rewind motor means mounted in said second compartment in driving connection with said first spindle;
  - friction braking means mounted in said second compartment in engagement with said second spindle for applying a substantially constant drag to said second spindle; and,
  - switch means mounted in said second compartment and projecting through said partition into said first compartment for activating said electric rewind motor means in response to direct engagement by such cassette in said operative position in said first compartment in order to automatically rewind the cassette upon placement in said first compartment of said housing.

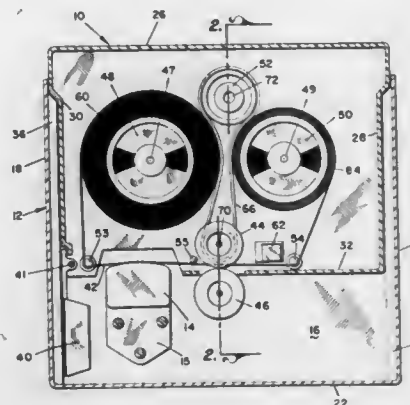
4,159,811

## TAPE TRANSPORT CARTRIDGE

Frederic F. Grant, 14505 Eastbrook, Bellflower, Calif. 90706  
Filed Nov. 22, 1976, Ser. No. 743,594Int. Cl.<sup>2</sup> G11B 15/32, 23/10

U.S. Cl. 242—192

9 Claims



1. A tape cartridge comprising:
  - shell means defining an enclosure having a cutaway portion along one edge;
  - a pair of reel hubs supported for rotation on spaced, parallel axes within said enclosure;
  - means defining a tape path extending between said hubs from that side of a first one of said hubs which is away from the other to the side of a second one of said hubs which is away from the first and past said cutaway portion of the enclosure;
  - a length of tape extending along said path with its sensitive surface facing toward said edge and being wound convolutely around said hubs to form two tape rolls, one on each hub;
  - driving means for driving said tape rolls such that one tends to revolve faster than the other by utilizing the difference in velocity at the opposite faces of a drive belt as it is moved through an arc;
  - said driving means comprising a first roller supported within said housing on a fixed axis located at the side of said tape rolls toward said edge of said enclosure;
  - said driving means further comprising a second roller disposed on an axis parallel with that of said first roller and said hubs and being translatable within said enclosure at the side of said tape rolls away from said edge; and
  - said driving means further comprising an endless flexible belt having an inner surface and an outer surface and extending around said first roller with a portion of its inner surface in engagement with an arcuate portion of the outer surface of one of said tape rolls to a point of disengagement from said one of said tape rolls and thence around said second roller with its inner surface in engagement with the outer surface of said second roller from a point of engagement opposite said point of disengagement from said second roller and thence extending between said tape rolls from a point of engagement opposite the point of disengagement of said belt from said second roller and thence back to said first roller;
  - said belt having a length such that it engages said tape rolls and said rollers without significant slipping and without significant differential stretching along its length.

4,159,812

## APPARATUS FOR LOADING A TAPE CASSETTE

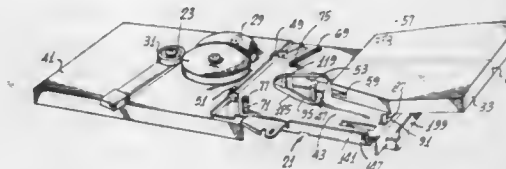
Paul D. Cary, Fountain Valley, Calif., assignor to BASF Aktiengesellschaft, Rheinland, Fed. Rep. of Germany

Filed Dec. 8, 1977, Ser. No. 858,634

Int. Cl.<sup>2</sup> G03B 1/04

U.S. Cl. 242—192

15 Claims



5. Cassette loading apparatus for use with a cassette having opposite sides hinged together, and a tape transport device having a drive capstan, a take-up reel and a carriage mounted supply reel, the supply reel being initially located within the cassette, said apparatus comprising:

- a chassis;
- first and second pivot arms for engaging opposite sides of the hinged cassette, and being movable with respect to each other to open the cassette, each of said pivot arms having a coupled end and a remote end;
- means for coupling together the respective coupled ends of said first and second pivot arms;
- said first and second pivot arms being movable relative to each other from a closed position, wherein the cassette is held closed, to an open position, wherein the cassette is held open, the centerline of the opening formed in the cassette being simultaneously moved a predetermined distance in a direction generally lateral to the direction toward the capstan;
- guide means for receiving portions of said first and second pivot arms and guiding each of said arms along a predetermined path between said closed and open positions; and
- control means operable to move said first and second pivot arms automatically between said closed and open position.

4,159,813

## RECIPROCATING TRAVERSE MECHANISM

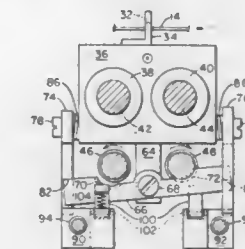
Thomas L. Yale, Yarmouth, Me., assignor to Yale Engineering Inc., Yarmouth, Me.

Filed Oct. 19, 1977, Ser. No. 843,588

Int. Cl.<sup>2</sup> B65H 54/28

U.S. Cl. 242—158.4 A

12 Claims



1. In a traverse mechanism comprising a pair of parallel lead screws, a carriage support, a carriage mounted on the support for reciprocating movement longitudinally of the lead screws, a rocker arm pivotal on the carriage and having a pair of ends extending in opposite directions from its pivotal axis, each end having a partial nut thereon, said rocker arm being pivotal between a first position in which one of the partial nuts is engaged with one of the lead screws and a second position in which the other partial nut is engaged with the other lead screw, the lead screws rotating in directions for causing reversal of carriage movement when the rocker arm is moved from one position to the other.



each said position to the other, the combination with said mechanism of

means for mounting the rocker arm pivotally about an axis parallel to the direction of movement of the carriage, a pair of latches on the carriage each movable to and from a latching position engaging one end of the rocker arm to retain the partial nut on the opposite end thereof in engagement with a lead screw, and

a pair of latch actuators each located in a predetermined position relative to the carriage support and comprising an abutment engageable directly by a latch and operable thereupon to move said latch from its latching position when the latch reaches a position in which the carriage is at a predetermined limit of movement, and

means to move the rocker arm from one to the other of said first and second positions upon each said movement of a latch from its latching position.

4,159,814

## FRAMING FOR SHELVES

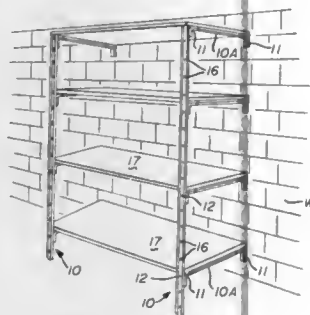
C. Kenneth Fibus, Youngstown, Ohio, assignor to The Steel City Corporation, Youngstown, Ohio

Filed Jun. 27, 1977, Ser. No. 810,648

Int. Cl.<sup>2</sup> A47B 96/06

U.S. Cl. 248—243

2 Claims



1. Framing for shelves incorporating sections of elongated slotted channel members and apertured L-shaped corner pieces fastened thereto so as to form vertical and horizontal supports for a plurality of shelves, said elongated channel members having a transversely arcuate base portion and oppositely disposed longitudinally extending cross sectionally arcuate flanges joining said transversely arcuate base portion in continuously curving sections and oppositely coplanar outwardly extending continuous substantially flat edge flanges on said arcuate flanges, said L-shaped corner pieces each having an arcuate base portion and arcuate flanges which curve outwardly from said corner piece base portion to define a configuration corresponding to that configuration of said channel members mating with said channel members for intimate contact therewith in nesting relation with said corner piece base received in said channel member base so that said base members contact each other and corresponding ones of said flanges contact each other, said nested, correspondingly configured corner pieces and channel members adding rigidity and shear strength to the framing.

4,159,815  
ARRANGEMENT FOR FINE-ADJUSTING THE  
LONGITUDINAL POSITION OF A VEHICLE SEAT  
Willibald Strowik, Remscheid-Lennep, and Paul Werner, Remscheid, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co KG, Remscheid-Lennep, Fed. Rep. of Germany

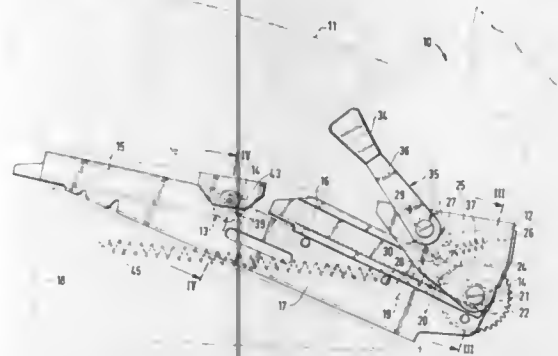
Filed Dec. 15, 1977, Ser. No. 861,015

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657181

Int. Cl.<sup>2</sup> F16M 13/00

U.S. Cl. 248—429

11 Claims



1. An adjustable seat, particularly for use in motor vehicles, comprising a seat component having front, rear and lateral portions; a stationary base component including a front region rising at an angle with respect to the horizontal and a rear region rising at another angle with respect to the horizontal; means for mounting said seat component on said base component for frontward and rearward adjustment relative thereto within an adjustment range, including a pair of guiding arrangements each extending along one of said lateral portions of said seat component and each including a front guide track movably supported on said front region and a rear guide track movably supported on said rear region of said base component, and support members mounted on said seat component and respectively engaging said guide tracks to support said seat component thereon; and means for arresting said seat component in a multitude of adjusted positions relative to said base component within said adjustment range, including at least one rack rigid with said base component, a pinion rotatably mounted on said seat mounting means and meshing with said rack in said adjustment range, a ratchet connected to said pinion for joint rotation therewith, a pawl displaceably mounted on said seat mounting means, and means for displacing said pawl between an arresting position in which said pawl engages, and a releasing position in which said pawl is disengaged from, said ratchet.

4,159,816

## COLLAPSIBLE UNIVERSAL FISHING ROD HOLDING APPARATUS

Toshiaki Miyamae, 36-8, Aramoto, Higashi-Osaka, Osaka, Japan

Filed Dec. 19, 1977, Ser. No. 861,575

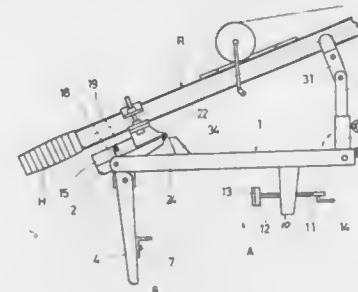
Int. Cl.<sup>2</sup> A01K 97/10

U.S. Cl. 248—515

3 Claims

1. A collapsible universal fishing rod holding apparatus, comprising a platform provided adjacent to one end of said apparatus with a long leg portion pivotally movable about said one end to a position at right angles to the plane of said platform, said platform at a selected position opposite to said one end being provided with a short leg portion movable parallel to said platform; a base plate pivotally supported on a first axis at said one end of said platform and being movable relative to the plane of said platform; a receiving means supported on the

plane of said base plate for movement about a second axis perpendicular to the plane of said base plate; a rod holder means fixed on said receiving means and adapted to hold a fishing rod portion in screwably tightened relation; and a telescopic fishing rod supporting means pivotally supported at said opposite end of said platform and movable to a position at right angles to said plane of said platform; wherein said base plate has downwardly extending bilateral edges; said receiving means having an inner rectangular space and being supported on said base plate in movable relation with respect to the plane thereof, with a slit formed substantially intermediate of one side of said receiving means across the axis thereof; and wherein there is provided a traversing rod extending from said slit across said space and having an end supported adjacent to an upper edge of the side of said receiving means opposite to said slit, and wherein there is provided a pressure spring stretched around said slit to normally keep the other end of said traversing rod pressed down along said slit diagonally with respect to said rectangular space of said receiving means; and wherein there is provided head means connected to said other end of said traversing rod and protruding outwardly through said slit; and upwardly curved tongue formed integrally in the extremity of said base plate, said rod holder means being insertable into said receiving means through said space; and wherein said rod holder means has an upwardly curved tang integrally formed in the extremity to be insertable through



said space into the inner recess of said receiving means and a downwardly curved tongue formed opposite said upwardly curved tang and being slightly longer than said upwardly curved tongue and engageable with the upwardly curved tongue between said bilateral edges of said base plate, said upwardly curved tongue being extended integrally from said base, an engageable relation between said rod holder means and said receiving means being effected by permitting said upwardly curved tang to pass beyond the head of said traversing rod raised up manually against the resilience of said spring; whereby said base plate, said receiving means and said holder means are permitted to pivotally move as a unit relative to the plane of said platform by slidably engaging said downwardly curved tongue of the rod holder means with said bilateral edges of said base plate; and whereby said downwardly curved tongue is releasable from an engaged position with said edges of said base plate by slidably moving said upwardly curved tang of the rod holder means to come into contact with said traversing rod normally pressed down by the pressure force of said spring whereby said base plate, receiving means and said rod holder means are pivotally movable together relative to the plane of the platform about said first axis while permitting said receiving means and said rod holder means to rotatively move together relative to the plane of said base plate about said second axis.

4,159,817

## MOLD FOR MANUFACTURING DISTILLATION COLUMN PACKING

Reiji Ikawa, Tokyo, Japan, assignor to Tokyo Special Wire Netting Co., Ltd., Tokyo, Japan

Division of Ser. No. 809,329, Jun. 23, 1977, Pat. No. 4,113,810.

This application May 24, 1978, Ser. No. 909,126

Claims priority, application Japan, Jun. 2, 1976, 51-78733

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 249—98

1 Claim

1. An apparatus for manufacturing one subassembly which can be joined to another subassembly of the same structure to form a spherical distillation column packing, comprising: a female mold part having a hemispherical cavity and an inlet port for feeding moldable material into said cavity, said female mold part having a pillar projection extending diametrically from the center of the wall of said cavity toward the open end of said cavity; a male mold part extending across and closing off the open end of said cavity, said male mold part having a generally hemispherical forming projection extending into said cavity, said forming projection having a central opening for receiving said pillar projection, said forming projection having surface portions opposed to the wall of said cavity and defining therewith a hollow generally hemispherical mold recess shaped to define a plurality of cutouts and covering portions formed alternately in the side surface of said mold recess, said forming projection also having means to form an engaging tube on the inner surface of one of said covering portions and projecting toward the open end of said cavity, said forming projection also having means to form an engaging post on the inner surface of a different one of said covering portions which post is shaped to fit into the engaging tube of another like subassembly, said forming projection also having means for forming a plurality of contact pieces which are integral with said engaging tube and said post respectively and which extend toward the center with their adjacent ends being spaced from each other, said pillar projection and said central opening of said projecting portion defining a space for forming a connecting piece connecting the inner end edges of said contact pieces with one another.

4,159,818

## ROTARY VALVE TOP SEAL ASSEMBLY

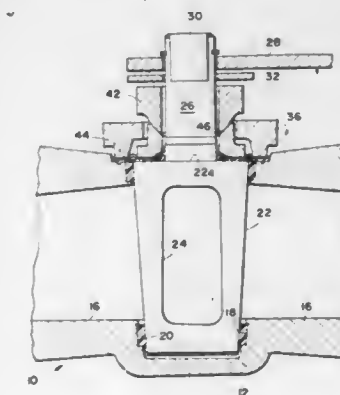
Pieter F. Hoos, Royersford, Pa., assignor to Walworth Company, Valley Forge, Pa.

Filed Sep. 6, 1977, Ser. No. 830,745

Int. Cl. F16k 31/44

U.S. Cl. 251—214

7 Claims

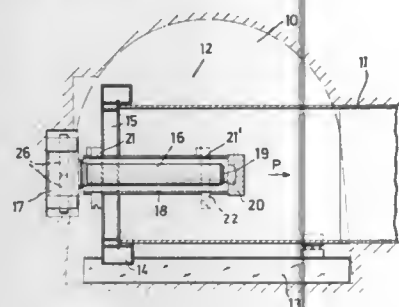


1. In a rotary valve comprising:  
a valve body having flow passages therethrough;  
a cavity in said valve body opening from the top thereof;  
a top closure bolted to said valve body over said cavity;  
a valve closure member;  
a stem on said closure member rotatable in said top closures;  
and,

a seal surface on said closure member around said stem and extending generally radially thereof;  
 a top seal assembly for said valve comprising;  
 a membrane of semi-rigid, distortable material extending over said cavity opening with outer portions thereof clamped between said valve body and said top closure;  
 a generally circular opening in said membrane snugly receiving and sealing around said stem;  
 an under-turned lip around said opening with an annular edge thereof engaging said seal surface;  
 a loading ring around said stem mounted for movement therealong, the under surface of said loading ring being relieved around the inner diameter thereof overlying said lip; and  
 means for forcing said loading ring downward to bias said lip against said seal surfaces.

**4,159,819**  
**TUBE-DRIVING APPARATUS**  
 Günther Bargel, and Heinz Hüseemann, both of Werne, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Westfalen, Fed. Rep. of Germany  
 Filed Jan. 26, 1976, Ser. No. 652,477  
 Claims priority, application Fed. Rep. of Germany, Feb. 6, 1975, 2504967

Int. Cl.<sup>2</sup> E21B 19/00  
 U.S. Cl. 254—29 R



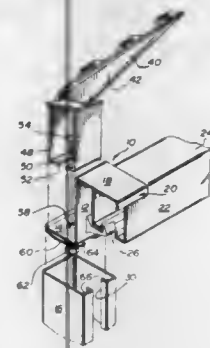
1. Tube driving apparatus having collar means engagable with one end of a pipe to be driven for transmitting force thereto, a plurality of piston and cylinder units for producing said force, and a plurality of separate tension members, each tension member being acted upon by a single piston and cylinder unit, the improvement comprising: clamping devices carried by said collar means, and location means on said tension members for receiving and locating said clamping devices at alternate positions displaced in the direction of driving said pipe.

**4,159,820**  
**FENCE POST CAP AND BARBED WIRE ARM**  
 Rudolph E. Parisien, 891 Rainbow St., Ottawa, Ontario, Canada  
 Filed Oct. 6, 1977, Ser. No. 840,047  
 Claims priority, application Canada, Nov. 1, 1976, 264519  
 Int. Cl.<sup>2</sup> E04H 17/06

U.S. Cl. 256—11

1. A fence post cap said cap having a side wall, and a bottom wall adapted to be received in an open upper end of a channel type fence post, a top wall including a depending flange, a projection on said side wall adapted to engage a horizontal top rail of said fence and a curved sheet metal member secured to said bottom wall by adjustable means capable of being tightened, said curved sheet metal member and adjustable means being constructed and arranged whereby tightening of said

adjustable means causes said sheet metal member to flatten to the extent that edges of said sheet metal member are wedged

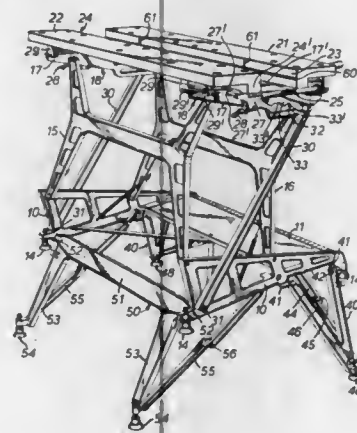


against inner walls of said post to hold said cap against upward movement.

**4,159,821**  
**COLLAPSIBLE DUAL-HEIGHT WORKBENCH**  
 Ronald P. Hickman, Waltham Abbey, England, assignor to Inventec International Limited, Point Robert, Channel Islands  
 Division of Ser. No. 642,742, Dec. 22, 1975, abandoned, which is a continuation of Ser. No. 511,017, Oct. 1, 1974, abandoned, which is a continuation of Ser. No. 277,118, Aug. 1, 1972, abandoned. This application Mar. 28, 1977, Ser. No. 781,841  
 Claims priority, application United Kingdom, Aug. 2, 1971, 36269/71; Nov. 22, 1971, 54165/71  
 Int. Cl.<sup>2</sup> A47B 3/08; B25B 1/10, 1/24  
 U.S. Cl. 269—139

9 Claims

52 Claims



1. A workbench comprising a top structure, including (a) a vise structure incorporating a pair of vise members having elongate clamping faces and having upper surfaces lying in substantially the same plane, and (b) vise operating means arranged to move the vise members positively relatively toward and away from one another;  
 at least one row of at least two smooth cylindrical walls formed in one of said vise members and defining two smooth-walled cylindrical bores having axes perpendicular to said plane, said cylindrical walls opening through the upper surface of said one vise member and defining therein at least one row of at least two circular apertures, said row extending generally parallel to the direction of elongation of the clamping face of said one vise member;  
 at least one smooth cylindrical wall in the other vise member defining a smooth cylindrical bore having an axis perpendicular to said plane, said cylindrical wall opening through the upper surface of said other vise member and defining therein a circular aperture;

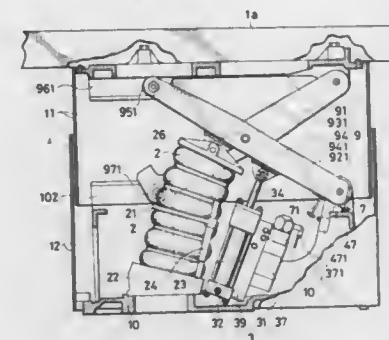
a plurality of abutment members each having a shank portion snugly, slidably and swivelably receivable in said cylindrical bores and having an abutment portion projecting above said plane, said abutment portion presenting a workpiece-engaging planar surface parallel to the axis of said bore;

convertible support means, including a horizontal structure and a first set of legs pivotally connected thereto, for supporting said workbench top structure in a first workmode condition at sawhorse height when said first set of legs are folded up and for supporting said workbench top structure in a second workmode condition at workbench height when said first set of legs are folded down;  
 an additional set of legs connected to said top structure and said convertible support means, and collapsible between a storage condition, in which the top structure and additional set of legs are juxtaposed, and said first workmode condition, in which the top structure and said convertible support means are vertically spaced and said horizontal structure is a floor level foot-thrust member.

**4,159,822**  
**WORKING MECHANISM FOR A TREATMENT TABLE**  
 Sadayasu Ota, Kyoto, and Keizo Inoue, Uji, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan  
 Filed Feb. 27, 1978, Ser. No. 881,627  
 Claims priority, application Japan, Sep. 12, 1977, 52-110229  
 Int. Cl.<sup>2</sup> A61G 13/00

U.S. Cl. 269—325

12 Claims



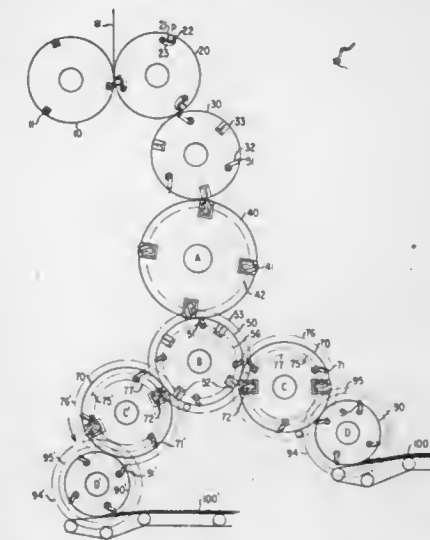
1. A working mechanism for moving at least a portion of a treatment table comprising:  
 an expandable and contractable pneumatic spring coupled to said table;  
 a hydraulic checker coupled to said treatment table; and  
 a pneumatic control pressure circuit for controlling the expansion and contraction of said pneumatic spring and for controlling said hydraulic checker whereby the treatment table is smoothly moved and easily maintained in any position.

**4,159,823**  
**MULTIPLE PRODUCT FOLDER**  
 Jack Bryer, Paramus, N.J.; Dominick Padalino, Brooklyn, N.Y., and Burton C. Polglase, Plainfield, N.J., assignors to Wood Industries, Inc., Middletown, N.J.  
 Filed Aug. 12, 1977, Ser. No. 823,949  
 Int. Cl.<sup>2</sup> B41F 13/56

U.S. Cl. 270—21

1. In a high speed web fed printing press comprising a web feeding and cutting means and having at least two sets of folding and transfer means for folding and transferring sheets cut from the web; a gear transmission means for driving said folding and transfer means at different speeds and having a plurality of gear members in which at least two of said gear members have different diameters and numbers of teeth; said gear transmission means having a movable coupling means

carrying said at least two gear members and mounted for alternatively engaging one of said gear members to selectively

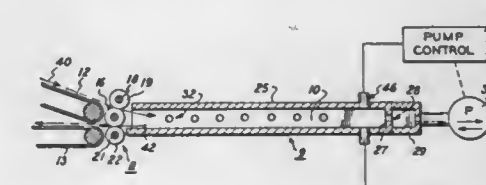


change the relative speed of at least one of said sets of folding and transfer means.

**4,159,824**  
**METHOD FOR REVERSING THE DIRECTION OF TRAVEL OF A SHEET**  
 Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
 Continuation of Ser. No. 794,691, May 6, 1977, abandoned, which is a continuation of Ser. No. 664,847, Mar. 8, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,329  
 Int. Cl.<sup>2</sup> B65H 5/22, 9/00

U.S. Cl. 271—3

3 Claims



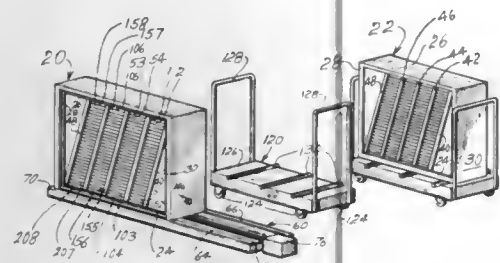
1. A method for reversing the direction of movement of sheets of paper of varying dimensions comprising the steps of:  
 providing a substantially enclosed pneumatic pocket having greater dimensions than said sheets for receiving said sheets and containing said sheets fully within said pocket;  
 mechanically inserting a paper sheet into an open side of said pocket in a first direction of movement with a first continuously operating mechanical sheet transport;  
 releasing said sheet inside said pocket from said first mechanical sheet transport;  
 applying a reversing fluid stream through said pocket, after said sheet has been released inside said pocket, in a second direction opposite from said first direction of movement of said sheet, to reverse the direction of movement of said sheet and to move said sheet back out of the same open side of said pocket into a second continuously operating mechanical sheet transport;  
 wherein said reversing fluid stream is actuated for a predetermined time interval in response to the sensing of the presence of the lead edge of said sheet at a known position inside said pocket by sheet detection means, after said sheet has been released by said first mechanical sheet transport;  
 aligning said sheet in said pocket by applying a transverse



fluid stream in said pocket after said sheet is released by said first mechanical sheet transport, said transverse fluid stream being applied in a direction transverse said second direction of said reversing fluid stream to bias said sheet against a side wall of said pocket to align said sheet as it is moved out by said pocket to said second mechanical sheet transport by said reversing fluid stream; and transporting said sheet away from said pocket with said second mechanical sheet transport in said second direction of movement.

**4,159,825**  
**REMOVABLE BIN SYSTEM IN A COLLATOR**  
David H. Holliday, 15521-15th Ave. NE., Seattle, Wash. 98155  
Filed Oct. 11, 1977, Ser. No. 841,113  
Int. Cl.<sup>2</sup> B65H 39/10  
U.S. Cl. 271-173

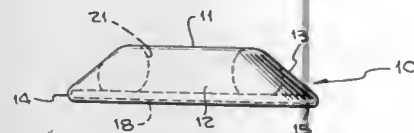
18 Claims



14. A removable collator bin system comprising:  
a. a collator frame;  
b. a bin section and a bin section frame integral therewith;  
c. A guide means for said bin section frame on said collator frame;  
d. a platform;  
e. a guide means for said bin section frame on said platform; and  
f. an aligning means for aligning the two guide means to allow said bin section frame to move onto and off of said collator and said platform.

**4,159,826**  
**PNEUMATIC JOGGING PLATFORM**  
John J. Hancock, 4820 W. Slauson Ave., #12, Los Angeles, Calif. 90056  
Filed Aug. 19, 1977, Ser. No. 826,257  
Int. Cl.<sup>2</sup> A63B 5/00  
U.S. Cl. 272-65

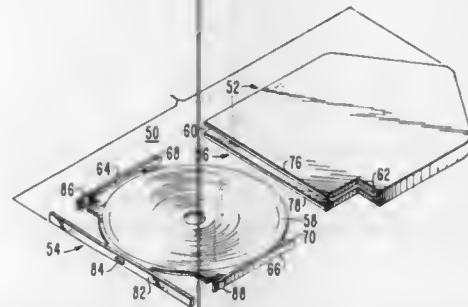
4 Claims



1. A pneumatically sustained trampoline jogging apparatus comprising a flat rigid base having a peripheral edge; a continuous flexible covering stretching horizontally above said base, downwardly (at outward angle) beyond said peripheral edge and back under said base; means cinching the margin of said covering under said base; pneumatic tubing means positioned between the top surface of the base and the covering inwardly of said peripheral edge; and inflation valve means in said tubing means whereby on inflation of said pneumatic tubing means said flexible covering forms a pneumatically sustained surface of a trampoline jogging apparatus.

**4,159,827**  
**VIDEO DISC PACKAGE**  
Leslie A. Torrington, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.  
Filed May 31, 1977, Ser. No. 801,603  
Claims priority, application United Kingdom, Dec. 20, 1976, 53173/76  
Int. Cl.<sup>2</sup> G11B 25/04; B65D 85/30  
U.S. Cl. 274-9 B

5 Claims



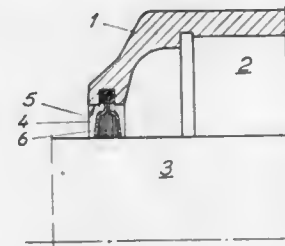
1. A protective cover for a disc record suitable for use with a record player having a record extracting member; said protective cover comprising:  
(A) an enclosure having an edge opening in communication with a record enclosing cavity; and  
(B) a record retaining member slidably mounted within said cavity for to-and-fro movement therein along a path; said record retaining member including a spine portion and an annular portion having an opening; said opening in said annular portion receiving a record during its containment in said cavity so that said to-and-fro movement of said record retaining member causes corresponding movement of said record; said spine portion extending into said edge opening in said enclosure when said record retaining member is fully inserted therein such that the foremost surface of said spine portion, disposed orthogonally to said path, is substantially even with the surfaces of said enclosure defining said edge opening therein; said spine portion having a receiving hole extending from said orthogonally-disposed foremost surface along said path toward said annular portion such that when said record retaining member is fully inserted into said enclosure, access to said receiving hole by said record extracting member is permitted only through said edge opening; wherein translation of an occupied cover into said player along a direction parallel to said to-and-fro movement effects reception of said record extracting member into said receiving hole during said translation.

**4,159,828**  
**SEALING DEVICE**  
Sture Östling, and Stig Persson, both of Katrineholm, Sweden, assignors to Aktiebolaget SKF, Goteborg, Sweden  
Filed Nov. 25, 1977, Ser. No. 854,725  
Claims priority, application Sweden, Dec. 23, 1976, 7614503  
Int. Cl.<sup>2</sup> F16J 15/32, 15/24  
U.S. Cl. 277-184

4 Claims

1. A sealing device for an interspace between two surfaces, characterized thereby, that it incorporates a flexible, elongated body (7, 14) with a longitudinal recess (8), which body is intended firmly to engage against a first one of said surfaces, two plates (9, 10) having a form corresponding to the form of at least a part of said interspace and such profiles that they on one hand can be pushed into the said recess in said body for mutual positioning and on the other hand when pushed into said recess in said body between themselves define a channel

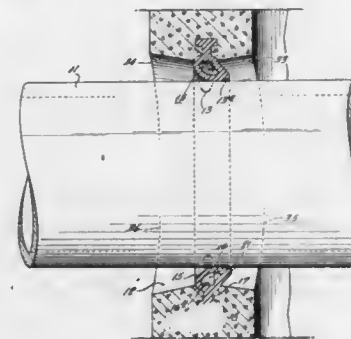
(11), and a sealing member (12, 14a) intended to be fitted in said channel, in such a manner that it in the assembled position of



the sealing device engages against the second one of said surfaces.

**4,159,829**  
**GASKET SEAL BETWEEN SEWER PIPE AND MANHOLE OPENING**  
John Ditcher, Langhorne, Pa., assignor to A-Lok Products Corporation, Trenton, N.J.  
Division of Ser. No. 710,264, Jul. 30, 1976, Pat. No. 4,073,048.  
This application Sep. 9, 1977, Ser. No. 32,015  
Int. Cl.<sup>2</sup> F16L 21/02; F16J 15/32  
U.S. Cl. 277-189

4 Claims



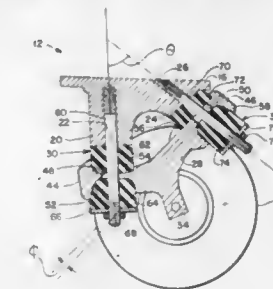
1. For use in forming a fluid-tight seal between a sewer pipe and an opening in a manhole through which said pipe passes, a length of a linear extrusion of elastomeric material having a hollow tubular head portion of pear shape in cross section and a foot portion integral therewith, comprising a base flange portion and a web portion of substantial thickness connecting the mid-region of said flange portion with the mid-region of the lower face of the head portion, whereby to provide a pair of longitudinally-extending channels disposed on opposite sides of said web portion and adapted for embedment in cementitious materials between the facing surfaces of the head portion and the flange portion, said length of the extrusion being curved and spliced in the form of a right cylinder with the height of the extrusion extending in an axial direction.

**4,159,830**  
**WHEEL TRUCK FOR STEERABLE PLATFORM**  
John S. Solimine, San Francisco, Calif., assignor to Fausto Vitello and Eric L. Swenson, both of San Francisco, Calif.  
Filed Aug. 23, 1977, Ser. No. 826,982  
Int. Cl.<sup>2</sup> A63C 17/02  
U.S. Cl. 280-11.28

11 Claims

1. A wheel truck for a steerable platform with a base frame carried by the platform, including the combination of an axeltree for mounting wheel means for rotation, first support means for resiliently mounting a first portion of the axeltree on the platform, said first support means including a first shaft mounted on and extending vertically from the frame together with first elastomeric bushing means mounted about the shaft, second support means for resiliently mounting a second por-

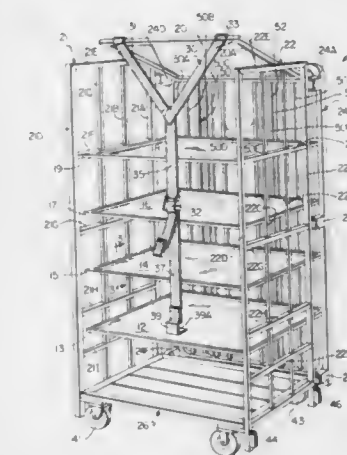
tion of the axeltree on the platform, said second support means including a second shaft carried by the frame and inclining downwardly at an angle with respect to the first shaft together with second elastomeric bushing means mounted about the second shaft, said second support means permitting pivotal movement of the axeltree relative to the platform about an axis inclined at an angle from vertical whereby movement of the



axeltree about the inclined axis relative to the platform creates a steering action as the platform is rolled on the wheel means over a surface, said first and second support means providing the sole direct connection between the base frame and axeltree, and fastener means for locking the second elastomeric bushing means under a selected compressive force whereby steering responsiveness of the wheel truck can be selectively varied.

**4,159,831**  
**MOBILE EXTRA DISPLAY CONTAINER**  
Frederick D. Schorr, Decatur, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.  
Filed Dec. 14, 1977, Ser. No. 860,646  
Int. Cl.<sup>2</sup> B62B 5/00  
U.S. Cl. 280-79.3

10 Claims



1. A mobile display cart comprising:  
a movable support including at least one track extending vertically thereof;  
a plurality of individually, vertically adjustable shelves for supporting and displaying a plurality of products thereon, said shelves being spring-loaded so as to pivot upwardly against said track after all products are removed from a respective shelf;  
means for mounting said shelves for movement in said at least one vertical track;  
retaining means for each shelf for preventing said products from sliding off of said each shelf;  
a vertically adjustable top member mounted for movement in said track;  
linkage means coupled to a lower portion of said frame and to said top member; and  
means for adjusting said linkage means for compressing all of

said shelves together to secure said products between said shelves.

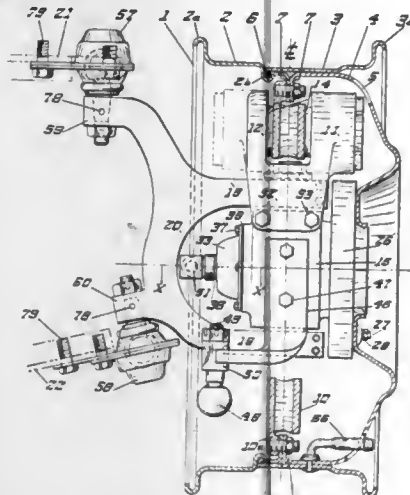
**4,159,832**  
**CENTERLINE TWO PIECE WHEEL AND BRAKE ASSEMBLY**

Melvin R. Inbody, Findlay, Ohio, assignor to The Centerline Steering Safety Axle Corporation, Findlay, Ohio  
Continuation of Ser. No. 638,069, Dec. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,438, Jul. 29, 1974, Pat. No. 3,963,260. This application Sep. 26, 1977, Ser. No. 836,673

Int. Cl.<sup>2</sup> B62D 7/08

U.S. Cl. 280—96.3

7 Claims



1. A dirigible wheel assembly for a surface vehicle, comprising: a wheel member; a hub; a wheel spindle journaled in said hub; means supporting said hub for turning movement about a steering axis lying in a plane normal to the axis of rotation of said spindle and comprising a yoke member having parallel arms extending above and below said hub, and bearing means between said arms and said hub and forming a pivot for swinging said hub about said steering axis; said wheel member comprising a tire rim and a spider attached to said spindle by an attaching member, and an inwardly directed annular flange on the inner periphery of said wheel member; an annular brake rotor disc presenting annular brake shoe engaging surfaces lying in planes normal to the axis of rotation of said spindle; attaching means on said brake rotor disc for rigidly attaching the brake rotor disc to the inwardly directed annular flange, and a brake caliper and bracket assembly having a brake caliper housing secured thereto, and at least one brake surface pad for selectively applying pressure against said brake shoe engaging surfaces, said hub having vertical surfaces on each side substantially parallel to the axis of rotation of said wheel spindle, said brake caliper and bracket assembly having supports for said brake caliper housing on opposing sides of said brake caliper housing extending over said yoke and parallel to said axis of rotation of said wheel spindle and mating with said hub surfaces, and securing means for securing said supports to said hub at the mating surfaces.

**4,159,833**  
**WIDE RANGE BUMPER MOUNTED HITCH WITH SHOCK ABSORBER ATTACHMENT FOR TOW VEHICLE**

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.  
Filed Jan. 23, 1978, Ser. No. 871,390

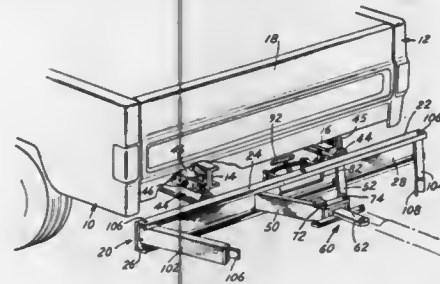
Int. Cl.<sup>2</sup> B60D 1/00

U.S. Cl. 280—478 R

3 Claims

1. An improved tow bar for vehicles comprising:  
(a) a horizontal base member with an inside and an outside, said outside including an elongated horizontal channel;  
(b) first and second horizontal pivot arms, each arm having

an outside and an inside end, said arms slidably and pivotally mounted at their outside ends in the channel;  
(c) hitch means pivotally connected to the inside ends of the pivot arms;  
(d) releasable latch means in the base member for engaging and holding the hitch means in fixed position relative to the channel; and  
(e) abutment means at the opposite ends of the channel to maintain the slidably pivot arms and hitch means in the channel; and  
the improvement comprising in combination:  
(f) means for attaching the base member to a vehicle, said means including shock absorbing means said shock absorbing means including:  
(i) a cylinder for attachment to the vehicle;



(ii) a rod attached to the base member and projecting into the cylinder;  
(iii) a transverse flange plate attached to the end of the rod within the cylinder, said plate being longitudinally slideable in the cylinder; and  
(iv) four compression coil springs within the cylinder, said springs having a substantially constant diameter slightly less than the internal diameter of the cylinder, two of said springs having spring constants less than the other two springs, one each of said springs of lesser spring constant and one of said springs of greater spring constant being positioned on opposite sides of the flange plate in opposed relation with each other and intermediate one end of the cylinder and the flange plate, whereby the force absorbed by said spring is a summation of forces dependent upon spring constants.

**4,159,834**  
**PASSIVE LAP AND SHOULDER BELT SYSTEM**

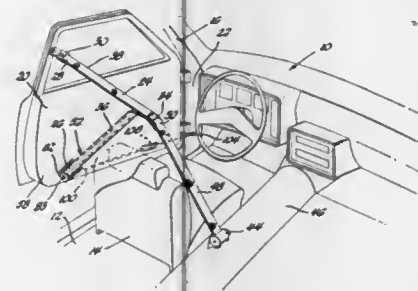
Larry D. Miller, Warren; Laird E. Johnston, Birmingham; John T. Valus, Troy, and Thomas M. Powell, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1978, Ser. No. 899,717

Int. Cl.<sup>2</sup> B60R 21/02

U.S. Cl. 280—802

5 Claims



1. In combination with a vehicle body having a door movable between open and closed positions laterally adjacent a seat mounted in the occupant compartment of the vehicle body, a

passive belt arrangement for restraining a seated occupant comprising:

a shoulder belt mounted on the door generally adjacent the shoulder of the occupant and having an inboard end;  
a lap belt having an outboard end mounted on the door generally adjacent the hip of the occupant and having an inboard end;  
a control belt connected to the inboard ends of the lap and shoulder belts;  
a seat belt retractor mounted on the vehicle body generally adjacent the inboard hip of the occupant for winding the control belt to establish the inboard lap and shoulder belt ends adjacent the hip of the occupant so that the lap belt is disposed across the lap of the occupant and the shoulder belt is disposed diagonally across the chest of the occupant;  
a segmented belt stiffener encased within the lap belt and comprising a plurality of serially stacked elements hingedly abutting one another to normally allow the lap belt to fall limp across the lap of the occupant and having a cable extending therethrough to stiffen the elements into an erect rigid column to lift the lap belt to an inclined vertical position adjacent the door panel when the cable is pulled taut;  
and means for tensioning the cable when the door is open whereby the lap belt is lifted away from the lap of the occupant when the door is opened.

**4,159,835**  
**VEHICLE PROTECTIVE FRAME WITH INTERNAL REINFORCING MEMBERS**

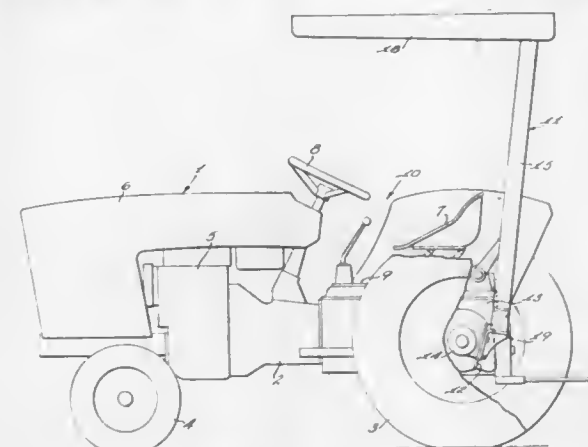
Ronald J. Leja, Greenfield, and Hugh K. Williams, Milwaukee, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 12, 1977, Ser. No. 859,437

Int. Cl.<sup>2</sup> B62D 25/06

U.S. Cl. 280—756

10 Claims



1. A protective frame for a vehicle comprising, a vehicle chassis, tubular uprights including a base fastened to said vehicle chassis, a plurality of reinforcing leaves mounted within each of said tubular uprights fastened at their lower ends at the base of the tubular uprights and having a cross sectional area substantially as great as the cross sectional area of the tubular uprights, each of said reinforcing leaves defining progressively shorter lengths for progressively decreasing the cross sectional area of the reinforcing leaves and the stiffness of said uprights from the base toward the top of said uprights.

**4,159,836**  
**BOOK HOLDER AND READING LOCATOR**

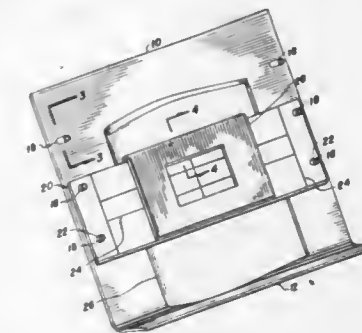
Hazel Tarr, 819 Paseo Grande, Corona, Calif. 91720

Filed Jan. 3, 1978, Ser. No. 866,535

Int. Cl.<sup>2</sup> B42D 17/00; G02B 27/02

U.S. Cl. 281—45

2 Claims



1. A device for supporting printed publications with a transparent viewing position comprising:

a substantially flat holder body member with an angular base integral with said body or attached thereto having a support leg on the opposed side fixable attached with a plurality of connecting means changing the angle of recline of said leg, also being rotatable from parallel to wide angles to said body and a plurality of rigid equally spaced attaching pins located vertically near the edge of said body to which a retainer plate of optically clear material rectangular in shape with a plurality of bores is slidable affixed to said pins allowing retention of printed matter reclining upon said body, the retainer including a plurality of integral hairlines located vertically and horizontally on or about the surface and a locator member of opaque material slidable attached to said retainer with a longitudinal juncture adapted to cooperate with the upper surface of said retainer including a rectangular opening removed from the material forming a window to view the exposed indicia.

**4,159,837**  
**COMBINATION DOOR STOP AND LATCHING DEVICE**

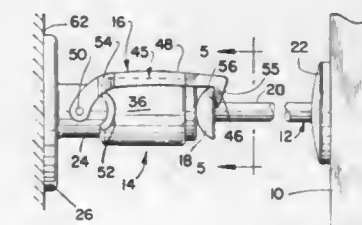
Mike Y. Morita, Los Angeles, Calif., assignor to Morita Hardware Manufacturing, Inc., Carson, Calif.

Filed Jul. 27, 1978, Ser. No. 928,721

Int. Cl.<sup>2</sup> E05B 3/04

U.S. Cl. 292—127

2 Claims



1. In combination, a door stop and latching device to releasably latch a door in an open position, wherein the device comprises:

a main body adapted to be substantially fixed in relationship to said door;  
means for securing said body in a fixed position;  
a bumper member slidably mounted to said main body;  
a biasing means interposed between said body and said bumper member to force said bumper in an outwardly direction;  
means for releasably latching said door in an open position;



means to actuate said releasable-latching means to allow said door to be closed; and

keeper means affixed to said door for engagement with said latching means and said bumper member, wherein said keeper means comprises a mounting plate member; a shaft member extended outwardly from said mounting plate; and an enlarged head member formed on one end of said shaft member; and wherein said releasable latching means comprises a latching lever having a latching tongue located at one end thereof, the opposite end thereof being rotatably connected to said main body, said tongue arranged to engage said keeper means;

and wherein said actuating means comprises a rotatable shaft mounted in said main body, said shaft having said latching lever attached thereto for arcuate movement therewith; a fulcrum member secured to said shaft; and a fulcrum-lever arm connected to said fulcrum member at one end of said fulcrum lever, the opposite end thereof being secured to said bumper member to move longitudinally with said bumper member whereby said shaft and said latching lever are actuated thereby.

4,159,838

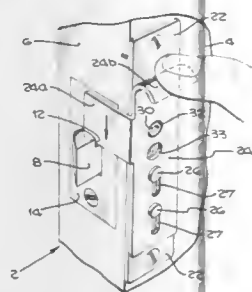
**DOOR LATCH BOLT LOCKING DEVICE**

Herbert Wilzig, Montebello; Charles J. Schuessler, Covina, and Mark W. Stephens, Tustin, all of Calif., assignors to Mark W. Stephens, Tustin, Calif.

Filed Aug. 29, 1977, Ser. No. 828,436

Int. Cl.<sup>2</sup> E05C 1/04; E05B 15/00

U.S. Cl. 292—150



1. A door latch bolt locking device for use with a latch bolt having a transverse groove in its top surface to positively prevent the withdrawal of the latch bolt and the opening of the door, comprising:

a slideable member adapted to be disposed flushly with the intersecting edge surface of the door and the inner surface of the door, said member having a first flat portion adapted to be substantially flush with the inner surface of the door, and an integral tongue portion at a right angle to said first portion and adapted to be substantially flush with the edge surface of the door;

means for allowing said slideable member to be moved through a limited vertical distance in a substantially flush relationship with said door surfaces so that said tongue portion can move into and out of a received relationship with the transverse groove in the latch bolt; and

means for positively maintaining said slideable member in the latch bolt-locked position when subjected to vertical forces, said maintaining means comprising a horizontally-extending member fixed to the inner surface of the door, and adapted to be received by an opening in the slideable member; and

said slideable member having an opening adapted to receive said horizontally-extending member in a snapping-in action and wherein said slideable member acts to receive and release said horizontally-extending member when said slideable member is pulled outwardly from its substantially flush engagement with the inner surface of the door, said slideable member being made of a material which will

provide a biasing return force when the slideable member is pulled outwardly.

4,159,839

**TABLEWARE IMPLEMENT**

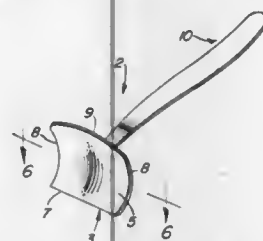
Eston D. Sigler, 1506 1st St., Lake Charles, La. 70601

Filed Mar. 15, 1978, Ser. No. 886,875

Int. Cl.<sup>2</sup> A47G 21/00

U.S. Cl. 294—1 R

3 Claims



1. A tableware implement having a bowl head with a concave front face, and a rear convex face, the bowl head boundary being defined by multiple peripheral edges varyingly contoured to serve as scraping edges, wherein one peripheral edge is flattened to conform to the surface of a plate, and another peripheral edge is arched to conform to the concave rounded inner surface of a bowl, and a handle rigidly attached to the convex face of the bowl head at a substantially central point on the bowl head removed from all peripheral edges, said handle extending in a plane substantially normal to the said point of attachment allowing ready rotation of the bowl head and selective use of the varyingly contoured edges.

4,159,840

**LOAD-CARRYING NET FOR SUSPENSION EXTERNALLY OF AIRCRAFT SUCH AS HELICOPTERS**

Gerd Fengers, Hagen, Fed. Rep. of Germany, assignor to Brüggemann & Brand KG, Fed. Rep. of Germany

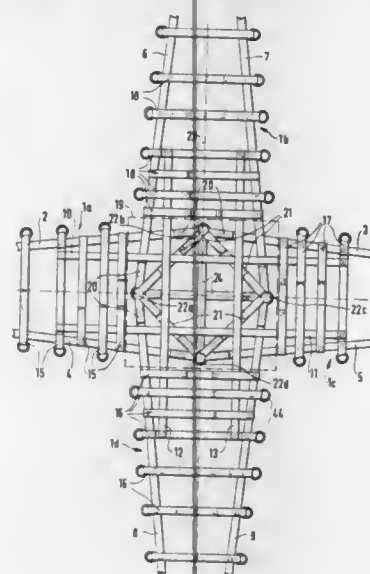
Filed Sep. 29, 1977, Ser. No. 837,882

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644044

Int. Cl.<sup>2</sup> B66C 1/12

U.S. Cl. 294—77

16 Claims



1. A load-carrying net for suspension externally of aircraft such as helicopters, said net comprising: a network of interwoven belts provided with suspension rings for use in suspending said net from suspension tackle of an aircraft, said net having a

central load-supporting portion and opposed pairs of arms which are provided with said suspension rings and which radiate outwardly from said central portion, at least some load-carrying ones of said belts each being secured at their ends in an opposed pair of said arms and extending freely through said central portion so as to make a sliding adjustment in the central portion for load equalization purposes, each arm being additionally connected to the opposite one of said arms by a further belt which is slidable through a number of guide points, said further belts being connected to said arms at the ends thereof adjacent to said suspension rings, and said suspension rings being disposed adjacent to the outer ends of said arms.

4,159,841

**BOTTLE CARRIER**

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 586,328, Jun. 12, 1975, abandoned.

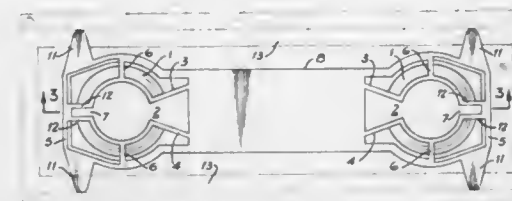
This application Apr. 25, 1977, Ser. No. 790,383

The portion of the term of this patent subsequent to Nov. 11, 1989, has been disclaimed.

Int. Cl.<sup>2</sup> B65D 71/00

U.S. Cl. 294—87.2

3 Claims



1. In a bottle carrier made of relatively rigid flexible plastic material and comprising a plurality of spaced collars for receiving and supporting therein the enlarged neck-shoulders of bottles and a structural member interconnecting said collars, the improvement which comprises at least one flexible tab attached to said carrier at opposite sides thereof and projecting outwardly beyond the confines of said carrier, said tabs being arranged to temporarily support said carrier on spaced tracks of a loading machine above a group of bottles and being of sufficient flexibility to readily bend upwardly and thus to release said carrier from said tracks as it is forced downwardly onto the tops of said bottles, said collars being surrounded by individual frames and said flexible tabs being attached to said individual frames adjacent the ends of said carrier.

4,159,842

**SUPPORTING GLASS SHEETS**

Alfred D. Perkowski, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 556,594, Mar. 10, 1975,

abandoned. This application Jan. 22, 1976, Ser. No. 651,387

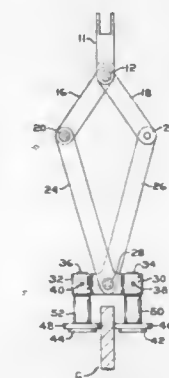
Int. Cl.<sup>2</sup> B66C 1/48

U.S. Cl. 294—118

10 Claims

1. In the art of supporting a glass sheet by self-closing tongs during thermal treatment comprising first heating said glass sheet to an elevated temperature and then cooling said heated sheet wherein said glass is gripped between opposing glass contacting members of said self-closing tongs that engage the opposite surfaces of said glass sheet and tend to damage said surfaces during said thermal treatment thereof, the improvement comprising engaging said glass sheet surfaces under oxidizing conditions with glass contacting members composed of a tungsten-nickel composite that is essentially free of cobalt and iron to enable said glass sheet to be essentially free of vents, to have minimum marring and minimum weakening in the vicinity of the areas contacted by said glass contacting members as a consequence of said contact during said thermal

treatment, said composite being composed essentially of at least 90 percent by weight tungsten and sufficient alloying



4,159,843

**PICKUP TRUCK AIR DEFLECTOR**

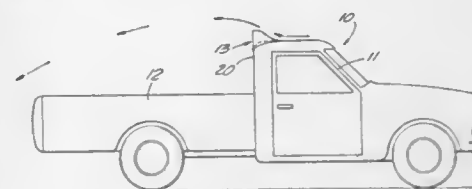
Milton R. Crossman, 8212 Eth ! Ave., North Hollywood, Calif. 91605

Filed Sep. 28, 1977, Ser. No. 837,605

Int. Cl.<sup>2</sup> B62D 37/00

U.S. Cl. 296—1 S

3 Claims



1. A wind deflector for securement to the cab of a truck having an open bed to deflect the airstream beyond the open truck bed, thereby eliminating a retarding force component from acting on the truck, said cab having a top, back wall and side walls, said deflector comprising:

a pair of elongated deflector segments, each segment having a back wall, a contoured top wall integral with said back wall, a sloping front wall, and an end wall, the other end and bottom being open;

said deflector segments being telescoped to one another at their open ends and located on the truck cab top to extend transversely of the cab, each segment back wall being fittingly received onto and intimately contacting the cab back wall, the sloping front wall extending downwardly from the contoured top wall to contact the cab along a continuous line, and the end wall smoothly contacting the side wall; and

means securing the segments back wall, sloping front wall and end walls to the cab.

4,159,844

**STORAGE DRAWER FOR MOBILE HOMES**

Carl B. Welner, Bloomfield Hills, Mich., assignor to Metal Awning Components, Inc., Clawson, Mich.

Filed Sep. 22, 1976, Ser. No. 725,498

Int. Cl.<sup>2</sup> B60R 7/00; B62D 25/20

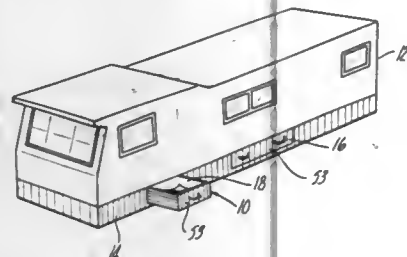
U.S. Cl. 296—37.1

4 Claims

3. A storage arrangement in combination with a mobile home structure supported above the ground with a clearance space between a bottom section of said mobile home and the ground, the storage arrangement comprising:

a storage assembly consisting of a rectangular drawer structure having four connected sides and a bottom panel

mounted thereto, wherein said rectangular drawer structure is dimensioned with one side dimension longer than the other, and wherein said means supporting said storage enclosure includes means engageable with both said longer and shorter sides, whereby said drawer may thereby be supported so as to be oriented with either said longer or shorter sides extending into said clearance space; support means supporting said storage enclosure assembly for movement into and out of said clearance space, including a track groove in said drawer structure side extending entirely about the periphery of said drawer structure and



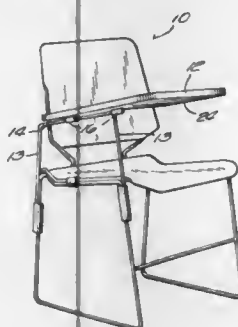
also including support means adapted to supportingly engage a portion of said groove during said movement in and out of said clearance space, including a pair of support rails and means mounting said pair of support rails in said clearance space including a plurality of concrete pads supported on the ground and clamping means affixed to said concrete pads supporting said pair of support rails and a plurality of rollers supported on each of said support rails and adapted to be received into said groove, whereby said support is provided by said rollers, whereby access to said clearance space for storage purposes is provided.

**4,159,845**  
**AIRSTREAM DEFLECTOR FOR MOTOR VEHICLES**  
Glenn N. Bratsberg, P.O. Box 723, Lewiston, Id. 83501  
Filed Mar. 22, 1978, Ser. No. 889,007  
Int. Cl.<sup>2</sup> B60J 1/20  
U.S. Cl. 296—95 R



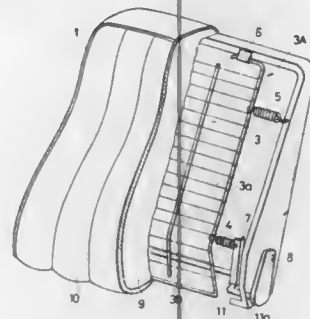
1. An airstream deflector, comprising, in combination, a transverse extending baffle, secured in a frame, supported at a front of an automotive vehicle, said baffle deflecting air upwardly as said vehicle travels forward; and said deflector additionally including a transverse extending vertical plate in front of a rearwardly pivotable louver, forming a throat therebetween; an airflow actuator automatically pivoting said louver rearwardly by air pressure within said throat, said actuator including a compression coil spring between said louver and a stationary positioned, collar-like member; and said airstream deflector being made in right and left-side sections, which at their outer ends are rearwardly inclined, said sections including a plurality of parallel, spaced-apart, vertical baffles extending between said transverse baffle and into said throat, said parallel baffles being all parallel to a forward-rearward direction of said vehicle.

**4,159,846**  
**TABLET ARM FOR WIRE ROD CHAIR**  
Thomas H. Tolleson, Green Bay, Wis., assignor to Krueger Metal Products, Inc., Green Bay, Wis.  
Filed Jun. 30, 1978, Ser. No. 920,916  
Int. Cl.<sup>2</sup> A47B 39/00; E05D 11/04  
U.S. Cl. 297—162



1. In a tablet arm attachment for a chair including a tablet arm, support rod and depending struts for securing the attachment to a chair, the improvement comprising means to clamp the tablet arm to said support rod to afford rotational movement of the tablet arm between first and second positions, said means comprising a bracket having an elongated U-shaped channel with outwardly projecting mounting flanges, a flexible bearing insert, said bearing insert including a circular wall portion sized to interfit in said channel, a flap portion hingedly connected to said circular wall portion and movable between an open position permitting insertion of said bearing insert over said support rod and a closed position in which said bearing portion encapsulates said support rod and said flap being flush with said tablet arm when said bracket is secured to said tablet arm.

**4,159,847**  
**SEAT FOR A MOTOR VEHICLE OR THE LIKE**  
Tomiji Arai, Tokorozawa, Japan, assignor to Nissan Motor Company, Limited, Japan  
Filed May 27, 1977, Ser. No. 801,396  
Claims priority, application Japan, Jun. 7, 1976, 51/73341[J]  
Int. Cl.<sup>2</sup> A47C 3/00  
U.S. Cl. 297—284

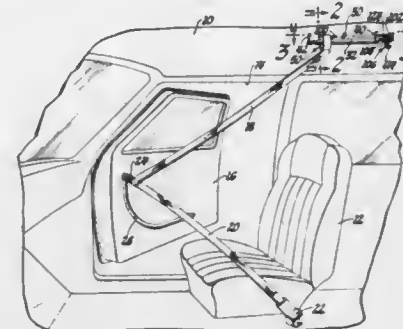


1. A seat backrest comprising:  
a rigid main frame supporting a contourable cushion portion having a flexible protective cover and a layer of padding interposed between said cover and said frame;  
a second frame hingedly mounted on said main frame proximate the upper edge of said main frame, said second frame being disposed to abut said layer of padding and disposed so that the pendulous motion thereof between first and second positions varies the contour of said protective cover and layer of padding;  
a crank rotatably mounted on said main frame proximate the

base of said main frame, said crank being operatively connected to said second frame so that rotation of said crank produces said pendulous motion of said second frame and vice versa;

first biasing means for biasing said crank to rotate in a direction for urging said second frame via said operative connection therebetween toward said first position and against said layer of padding; and  
means for disengageably locking said crank in a desired angular position with respect to said main frame so that said second frame is held in a desired position between said first second positions, said means for disengageably locking said crank comprising:  
a lever connected to said crank and integrally movable therewith;  
a gear fixed to said frame, said gear having a toothed portion and a recessed portion;  
a manually operable lock lever mounted to said lever so as to be pivotal between first and second positions relative to said lever and having a portion arranged to abut said lever when said lock lever assumes said second position, said lock lever being formed with a first pawl and a second pawl, said first pawl lockingly engaging with said toothed portion when said lock lever assumes said first position thereof so that said lever is locked relative to said main frame and said second pawl engaging said recessed portion when said lock lever assumes said second position thereof to permit said crank to rotate between first and second angular positions whereby said second frame can pendulously move between said first and second positions thereof; and  
second biasing means for biasing said lock lever toward said second position thereof.

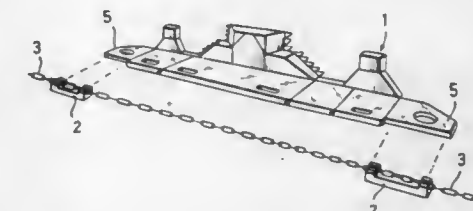
**4,159,848**  
**LINEAR LOCKING SEAT BELT RETRACTOR**  
David F. Manz, Bloomfield Hills; Clarence C. Irwin, and Theodore M. Salamon, both of Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.  
Filed Jun. 12, 1978, Ser. No. 914,394  
Int. Cl.<sup>2</sup> A62B 35/00; B60R 21/10  
U.S. Cl. 297—474



1. A seat belt locking and retracting mechanism comprising:  
a longitudinally extending track member;  
a belt carriage member mounted on the track member for movement therealong and having a belt attached thereto;  
a locking means mounted on one of the members and actuable to a locked position engaging the other member to lock the carriage member against movement along the track member;  
an actuating element extending longitudinally adjacent the track member along the path of carriage movement and being selectively movable relative thereto to actuate the locking means;  
and an inertia sensing means operatively engageable with the actuating element for moving the actuating element whereby the locking means is actuated by the actuating element in response to a sensed acceleration condition to

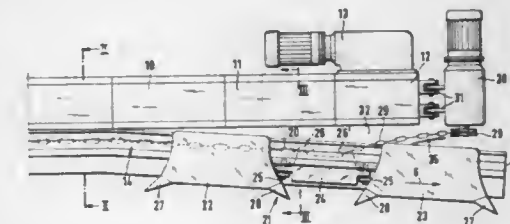
lock the carriage member against movement along the track member.

**4,159,849**  
**HOLDING DEVICE FOR A CHAIN**  
Friedhelm Rehbein, Menden-Oesbern, Fed. Rep. of Germany, assignor to Fa. August Thiele, Iserlohn, Fed. Rep. of Germany  
Filed Jul. 29, 1977, Ser. No. 820,128  
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643264  
Int. Cl.<sup>2</sup> E21C 29/06  
U.S. Cl. 299—34



1. A holding device for a chain, particularly a chain associated with a coal cutter and having chain members located in two mutually transverse planes, the holding device comprising a one-piece chain block mountable on a support and having two portions which are of one piece with and immovable relative to each other, said chain block having a U-shaped recess formed in said relatively immovable two portions and dimensioned for receiving one end section of one of the chain members which is located in one of the planes without displacement of said two portions relative to one another and so that said end section is embraced by said two portions in said one plane at both sides of said end section and is also embraced by said two portions in said other plane at both other sides of said end section, said chain block further having a slot which is bounded by said relatively immovable two portions and located in the other of said planes and which is dimensioned for receiving the other chain member which is located in the other of said planes also without displacement of said two portions relative to one another.

**4,159,850**  
**MINERAL MINING INSTALLATION WITH FACE END WINNING**  
Armin Lobbe, Oberaden, and Bernd Steinkuhl, Lunen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Fed. Rep. of Germany  
Filed Feb. 2, 1978, Ser. No. 874,675  
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704809  
Int. Cl.<sup>2</sup> E21C 27/35  
U.S. Cl. 299—34



1. In a mineral mining installation for winning material in a longwall working, the installation comprising a conveyor, a guide provided at the face-side of the conveyor, a drive frame at each end of the conveyor, a plough movable along the guide, and a plough driving chain passing around a pair of end sprockets, each end sprocket being associated with a respective



one of the drive frames, the improvement comprising constituting the plough by two longitudinally spaced plough bodies each of which is provided with cutter means, the two plough bodies being connected together by means of an intermediate member pivotally connected to each of the plough bodies, the intermediate member being connected to the two ends of the plough driving chain, and the plough being of sufficient length to enable material to be won at least as far as each end sprocket, wherein the guide defines a pair of guide channels for the two runs of the plough driving chain, and wherein the guide is off-set away from the conveyor, and towards the longwall face, in the region of each of the drive frames whereby a gap is formed between each drive frame and the adjacent portion of the guide, each of said gaps constituting an access area for the plough driving chain to pass between the associated end sprocket and the guide channels.

4,159,851

### DRIVE FRAME AND ASSEMBLY FOR MINING APPARATUS

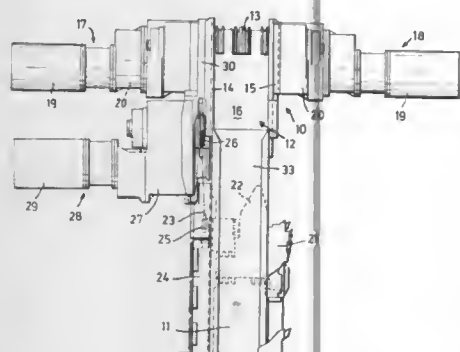
Wulff Rösler, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhütte Westfalen, Lunen, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,215

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623066

Int. Cl.<sup>2</sup> E21C 29/16

U.S. Cl. 299—43



1. A drive frame for the drive assembly of a mining installation constituted by a winning machine and a conveyor, comprising: a pair of side plates for said drive frame, a connector fastened to one of the side plates, the connector including means for the connection of respective drive units for the conveyor and the winning machine, the connector having a respective mounting plate for each of the drive units and each of the mounting plates being connected to one another in a tension-proof manner, an annular collar extending into an aperture in said one side plate to support and align the connector, and coupling means for locking the connector to said one side plate in a non-rotational manner, the coupling means being spaced from the annular collar.

4,159,852

### CONTINUOUS MINING MACHINE WITH IMPROVED CUTTER HEAD SLIDE MEANS

Warren G. Montgomery, 1146 Berwood Rd., Morgantown, W. Va. 26505

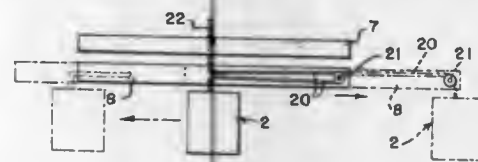
Filed Mar. 14, 1978, Ser. No. 886,478

Int. Cl.<sup>2</sup> E21C 31/06

U.S. Cl. 299—56

1. A continuous mining machine comprising a carrier, a support bar mounted on said carrier, a feed bar substantially coextensive in length with and slidably mounted on said support bar to move along the longitudinal axis thereof, a cutter head slidably mounted on said feed bar to move along the longitudinal axis thereof, double-acting drive means for sliding said feed bar in alternate directions on said support bar, a

sheave rotatably mounted on said feed bar and a cable extending over said sheave having one end fixed to said cutter head



and the other end fixed to said support bar whereby when said drive means slides said feed bar with respect to said support bar, said cutter head will slide with respect to said feed bar.

4,159,853

### PRESSURE CONTROL UNIT FOR A VEHICULAR HYDRAULIC BRAKING SYSTEM

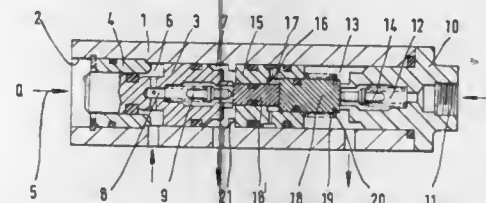
Heinrich Oberthuer, Offenbachrumpfenheim; Jochen Burgdorf, Offenbach, and Hans-Henning Luepertz, Darmstadt, all of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Jul. 8, 1977, Ser. No. 813,929

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637278

Int. Cl.<sup>2</sup> B60T 13/00

U.S. Cl. 303—6 C



1. An improvement to a pressure-control unit for a vehicular hydraulic braking system including a housing having an axis incorporating at one end thereof a pressure-reducing valve coaxial of said axis and at the other end thereof a pressure-limiting valve coaxial of said axis, and an intermediate piston disposed between said pressure-reducing valve and said pressure-limiting valve, said intermediate piston being acted thereon by output pressure at both ends thereof; said improvement comprising:

- a first stop formed in said housing to limit the displacement travel of said intermediate piston toward said pressure-reducing valve,
- an axial bore disposed in said intermediate piston,
- an auxiliary piston disposed in said bore acted upon by said output pressure at both ends thereof, said auxiliary piston being supported at one end by said pressure-reducing valve and at the other end by said pressure-limiting valve, and
- a second stop formed in said intermediate piston to limit the displacement travel of said auxiliary piston in said intermediate piston in the direction of said pressure-reducing valve.

4,159,854

### BRAKE SYSTEM WITH PILOT ACTUATION

Wayne A. Peterson, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 8, 1978, Ser. No. 903,462

Int. Cl.<sup>2</sup> B60T 8/26

U.S. Cl. 303—6 M

1. A brake system for a vehicle, having a first set of brakes and a second set of brakes and a source of pressurized fluid and a sump, comprising:

- a valve body;

a first spool slidably disposed in a first bore defined by the valve body;

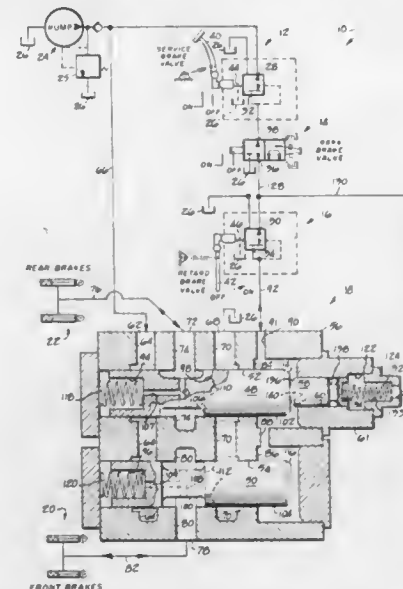
a second spool slidably disposed in a second bore defined by the valve body;

a first communication means for placing the source of fluid in fluid communication with the first and second bores;

a second communication means for placing the sump in fluid communication with the first and second bores;

a third communication means for placing the first bore in fluid communication with the first set of brakes;

a fourth communication means for placing the second bore in fluid communication with the second set of brakes;



first positioning means for positioning the first spool in the first bore to provide communication selectively between the source fluid and the first set of brakes and between the sump and the first set of brakes, and for positioning the second spool in the second bore to provide communication selectively between the source of fluid and the second set of brakes and between the sump and the second set of brakes;

second positioning means for positioning the first spool relative to the second spool for providing a variance in braking force between the first and the second set of brakes.

4,159,855

### LOAD SENSING PROPORTIONING VALVE

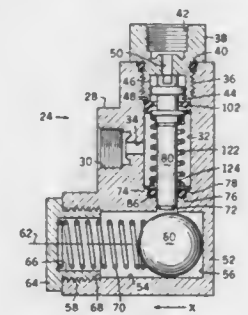
Edward J. Falk, St. Louis, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Feb. 3, 1978, Ser. No. 874,801

Int. Cl.<sup>2</sup> B60T 8/14

U.S. Cl. 303—24 F

21 Claims



1. A valve for a vehicle hydraulic brake system comprising:

- (a) an inlet and an outlet;
- (b) a valve member interposed between said inlet and said

outlet, said valve member being movable between an open position and a closed position for controlling the pressure relationship between said inlet and said outlet; and

(c) means operative when only the load carried by the vehicle exceeds a single preselected weight level for disabling said valve member in its open position during the entire range of inlet pressure so that the pressure at said outlet will be equal to the pressure at said inlet for all levels of inlet pressure.

4,159,856

### RUNNING PAD FOR AN ENDLESS TRACK

Ludwig Pietzsch, Rittnerstrasse 36, D-7500 Karkruhe, Fed. Rep. of Germany; Harald Kauer, Ettlingen, and Rudolf Hartmann, Karlsbad-Auerbach, both of Fed. Rep. of Germany, assignors to Ludwig Pietzsch Karkruhe, Fed. Rep. of Germany

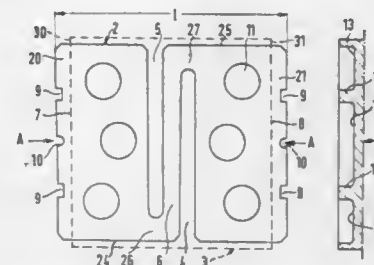
Filed Dec. 12, 1977, Ser. No. 859,814

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657906

Int. Cl.<sup>2</sup> B62D 55/28

U.S. Cl. 305—51

5 Claims



1. A running pad for an endless track for vehicles and the like, comprising

- (a) a resilient running pad body (3); and
- (b) a unitary resilient generally planar plate member (2) embedded within and extending horizontally completely through said running pad body, a pair of opposite ends (20, 21) of said plate member extending outwardly beyond said pad body, said plate member containing at least one zone of weakness for permitting elastic compressional deformation of said plate inwardly in the direction between said opposite ends, whereby the plate, when in the compressed condition, may be mounted between a pair of opposed longitudinally spaced recesses (13) contained on the endless track, so that upon subsequent expansion of the plate, the running pad is mounted on the track.

4,159,857

### TRACK ASSEMBLY WITH MID-PITCH DRIVE LUG AND REPLACEABLE RAIL

Robert J. Purcell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 30, 1978, Ser. No. 910,251

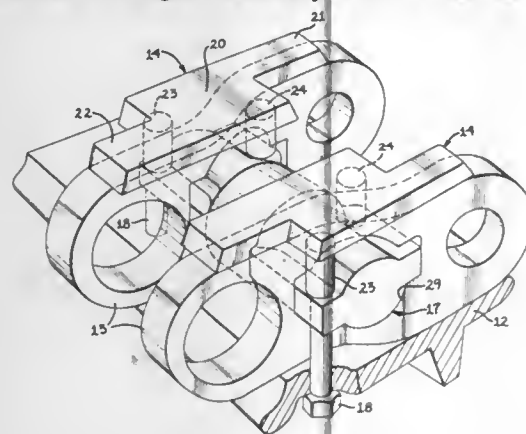
Int. Cl.<sup>2</sup> B62D 55/28

U.S. Cl. 305—54

12 Claims

- 1. A track assembly comprising:
- a pair of laterally spaced links,
- a track shoe disposed on an underside of said pair of links,
- a rail segment disposed on an upper side of each link of said pair of links,
- a drive lug disposed intermediate the ends of said links and further disposed in transverse relationship relative therebetween, and
- fastening means releasably securing said track shoe and drive lug to each of said links and to the rail segment disposed thereon,
- wherein said fastening means comprises a plurality of fasten-

ers each extending sequentially through said track shoe and said drive lug and releasably secured to said rail seg-



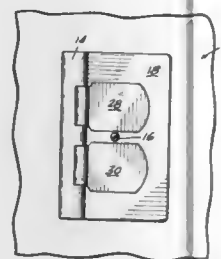
ment whereby each said link is clamped between said rail segment and said track shoe.

#### 4,159,858 COVER PLATE

Juan E. Toraya, 12433 SW. 30th St., Miami, Fla. 33175  
Filed Feb. 10, 1978, Ser. No. 876,925  
Int. Cl.<sup>2</sup> H01R 11/30

U.S. Cl. 339—12 R

5 Claims



1. A safety lock escutcheon plate adapted to be positioned in covering relation of an energized electrical receptacle, said plate having an opening and a cap in covering relation of the opening, pivot means connecting the cover to the escutcheon plate, said plate having a socket adjacent the cap and keeper means in the socket and in blocking relation of pivotal movement of the cap, said keeper means comprising a ferrous metal member and a magnet means for moving the ferrous metal member into and out of blocking relation of pivotal movement for gaining access through the opening by using the magnetic member as a key.

#### 4,159,859

#### CRADLE TYPE GROUND LUG FOR CONDUIT

Sami Shemtov, Central Islip, N.Y., assignor to Gould Inc., East Farmingdale, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,096

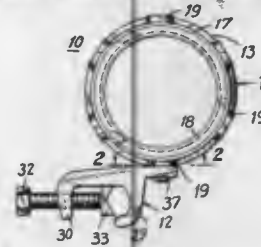
Int. Cl.<sup>2</sup> H01R 3/06

U.S. Cl. 339—14 L

11 Claims

1. An electrical cable coupling device comprising a metal coupling member electrically and mechanically connectable to a member of an electrical installation and including a first coupling section, a wire connector member including a second coupling section coaxially engageable with said first coupling section in a plurality of discrete preselected, incrementally separated relatively angularly related positions, one of said coupling sections including a plurality of peripherally spaced radially offset first longitudinally extending abutment faces and the other of said coupling sections including at least one radially offset second abutment face whereby when said coupling sections are in engaged position said second abutment face engages a first abutment face to positively restrict said wire

connector member against axial rotation from a preselected angular position and means for releasably locking said wire



connector member to said coupling member with said coupling sections in mutual engagement.

#### 4,159,860

#### HIGH VOLTAGE CABLE COUPLER WITH TERMINATION ADAPTOR

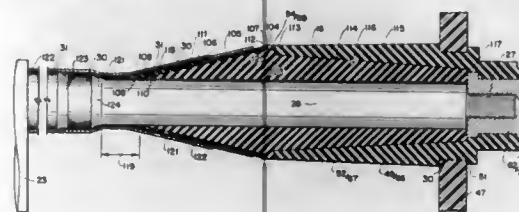
Roy M. Broad, San Carlos, Calif., assignor to The Scott & Fetzer Company, Cleveland, Ohio

Continuation of Ser. No. 577,439, May 14, 1975, abandoned, which is a division of Ser. No. 403,455, Oct. 4, 1973, Pat. No. 3,932,933. This application Nov. 17, 1976, Ser. No. 743,054

Int. Cl.<sup>2</sup> H01R 13/52

U.S. Cl. 339—60 M

25 Claims



1. A cable termination adaptor comprising in combination an insulating elastomeric tubular body defining a bore for the insertion of an insulated electrical conductor and having on one end portion thereof a frusto-conical outer surface with the smallest diametrical extent of said frusto-conical surface terminating at an outside end of said body; an annular flange formed on said body at the largest diametrical extent of said frusto-conical surface; a semiconductive elastomeric frusto-conical layer integrally bonded on said surface and having a large and a small annular end edge with the larger annular edge thereof contiguous with a perimetric edge of said flange and the smaller annular edge thereof flared to a point ending beyond said outside end of said body; an electric transmission cable having a covering layer containing conductive shielding properties which overlies an insulative covered conductor with a portion of said conductive shielding stripped from the terminal end of said cable leaving an exposed terminal end of insulative covered conductor; said exposed terminal end received in said bore with a portion of said insulative covering being permissibly exposed between said flared smaller annular edge of said semiconductive elastomeric frusto-conical layer and the terminus of said cable covering layer; and a layer of shielding material having metallic properties snugly covering without voids over the combination of a terminus portion of said cable covering layer and said permissibly exposed cable insulation layer and a portion of said semiconductive elastomeric frusto-conical layer at the smaller annular end thereof without gaps.

#### 4,159,861

#### ZERO INSERTION FORCE CONNECTOR

John W. Anhalt, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,031

Int. Cl.<sup>2</sup> H01R 13/62; H05K 1/12

U.S. Cl. 339—75 MP

21 Claims

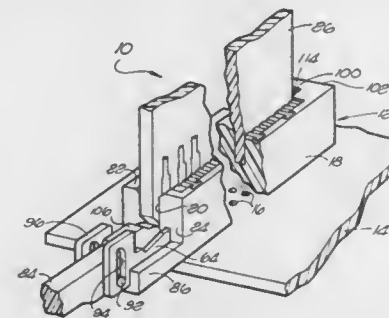
1. A zero insertion force electrical connector comprising: an elongated insulative housing having a row of contacts

therein, said housing having an opening to the top for receiving therein conductors on an electrical component;

each said contact having a mounting portion and a spring contacting portion extending upwardly from said mounting portion at an angle in one direction toward a vertical plane passing through said opening;

an arm on the spring contacting portion of each said contact extending downwardly at an angle in a direction away from said vertical plane;

means for retracting said contacting portions of said contacts away from said vertical plane, said retracting means comprising contact shifting means and cam actuator means;



said contact shifting means being disposed between said spring contacting portions and said arms of said contacts and movable vertically relative to said arms between a lower position and an upper position;

said contact shifting means embodying cam surface means slidably engaging the inside surfaces of said arms for retracting said contacting portions of said contacts away from said vertical plane when moved from said lower position to said upper position; and

said cam actuator means being operable to move said contact shifting means from said lower position to said upper position.

#### 4,159,862

#### REMOVABLE FEMALE POLARIZING GUIDE FOR ELECTRICAL CONNECTORS

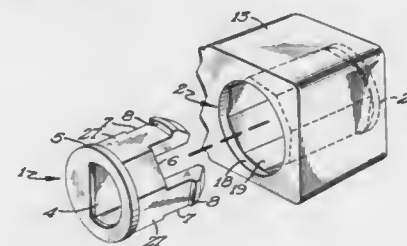
Gordon W. Funck, Crystal, and Robert J. Melcher, Edina, both of Minn., assignors to Fabri-Tek Incorporated, Minneapolis, Minn.

Filed Dec. 12, 1977, Ser. No. 859,382

Int. Cl.<sup>2</sup> H01R 13/64

U.S. Cl. 339—186 M

13 Claims



1. A removable female polarizing guide for separable electrical connectors, comprising

(a) a connector body having a bore with axially aligned flange, body and shoulder apertures, the body aperture having a smaller diameter than either the flange or shoulder apertures with the body aperture longitudinally located between the flange and the shoulder aperture, the body aperture having a polygonal shape; and

(b) a bushing matingly engaged with the bore having

- (i) a flange;
- (ii) a polygonal body section axially aligned with the flange having a diameter smaller than that of the flange and having a nonround keyway extending longitudinally through the body and through the flange; and

(iii) at least one finger extending longitudinally from a side of the body having a shoulder which extends radially from the finger in a direction away from a longitudinal axis through the bushing, said flange and shoulder being received in said flange and shoulder apertures, respectively.

#### 4,159,863

#### COUPLING OF OPTICAL GLASS FIBRES

William J. Stewart, Towcester, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

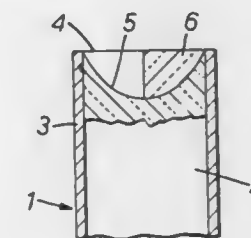
Filed Oct. 12, 1977, Ser. No. 841,381

Claims priority, application United Kingdom, Oct. 13, 1976, 42483/76

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.18

7 Claims



1. An optical fibre and lens arrangement comprising an optical fibre having a chemically etched well formed in an end thereof, said well being provided with an optical lens, said optical lens having a convex surface, said convex surface being in intimate contact with the entire surface of said well.

#### 4,159,864

#### APERTURE STOP CONTROL DEVICE FOR A ZOOM LENS SYSTEM

Mitsuo Yasukuni; Takashi Iida, both of Sakai, and Hiroshi Kiten, Mino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

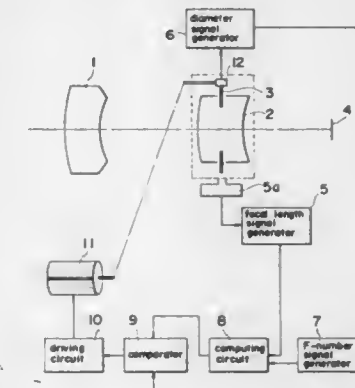
Filed Jan. 24, 1978, Ser. No. 871,820

Claims priority, application Japan, Jan. 25, 1977, 52/7444

Int. Cl.<sup>2</sup> G02B 15/14

U.S. Cl. 350—184

10 Claims



8. An aperture stop control device for a zoom lens system comprising:

an aperture stop means capable of being electrically controlled;

means for electrically generating an F number signal;

means for electrically generating a focal length signal; and

means for electrically computing the F number signal with the focal length signal to generate an electrical signal for controlling the aperture stop means despite any variation in the focal length of the zoom lens system.



4,159,865

**ZOOM LENS SYSTEM**

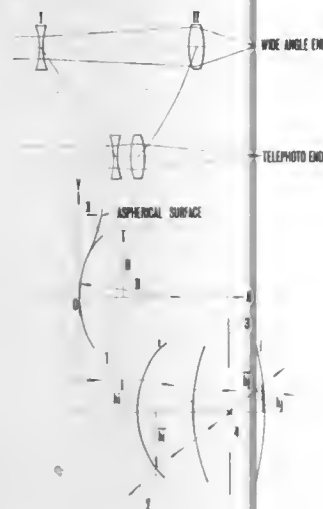
Naoto Kawamura, Inagi, and Akira Tajima, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 715,496, Aug. 18, 1976, abandoned.

This application May 16, 1978, Ser. No. 906,762

Claims priority, application Japan, Aug. 22, 1975, 50-101860  
Int. Cl.<sup>2</sup> G02B 15/14

U.S. Cl. 350—184

5 Claims



1. A zoom lens comprising, from front to rear in the direction in which light enters said zoom lens from an object, a first lens component having negative focal length and having a plurality of elements moving together during zooming between a wide angle position and a telephoto position, said lens component elements including a front negative meniscus lens which is convex to the front and whose diameter is the longest in said zoom lens, and a rearmost positive lens, one of said lens component elements having an aspherical surface for removing barrel distortion in the wide angle position, said aspherical surface being located to have an aspherical influence on a main light ray off the optical axis in the wide angle position without having an aspherical influence on the main light ray in the telephoto position; and a second lens component of positive focal length having a plurality of elements moving together during zooming between the wide angle and telephoto positions, said second lens component elements including a diaphragm of said zoom lens incorporated therein and including at least one positive lens, one double concave lens and at least one positive lens consecutively arranged on the image side of said diaphragm, said first and said second lens components defining therebetween an air space which is variable and largest at the wide angle position and narrowest in the telephoto position.

4,159,866

**SETTING OR ADJUSTING MEANS FOR REARVIEW MIRRORS OF MOTOR VEHICLES OR THE LIKE**

Erich Wunsch; Udo Wunsch, and Eckart Wunsch, all of Im Hofrain 12, 7141 Schwieberdingen, Fed. Rep. of Germany  
Filed Sep. 22, 1976, Ser. No. 725,667

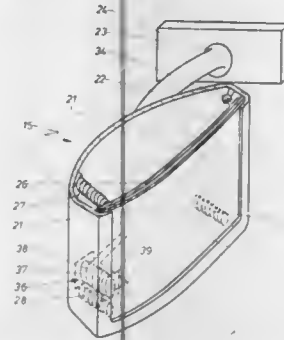
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1975, 2543512; Oct. 15, 1975, 2546091; Dec. 23, 1975, 2558457; Mar. 4, 1976, 2608919; Aug. 25, 1976, 2638143  
Int. Cl.<sup>2</sup> G02B 5/08

U.S. Cl. 350—289

10 Claims

1. A setting and adjusting means for rearview mirrors mounted on a vehicle body comprising a mirror housing adapted to be mounted on the vehicle body,

a mirror plate having a rear surface and a front reflecting surface, means for adjustably mounting said mirror plate in said housing for pivotal tilting simultaneously superimposed both about a substantially vertical axis and a substantially horizontal axis, stop means mounted in said housing in a path of pivoting of said mirror plate for directly abuttingly limiting the pivoting of said mirror plate and for defining a rest position of the latter thereagainst, controllable adjusting means upon actuation and release thereof, respectively, for pivotally tilting said mirror plate simultaneously superimposed about both said horizontal and vertical axes into predetermined lateral and vertical positions and against said stop means, respectively,



said mounting means for adjustably mounting said mirror plate being disposed at an off-center edge region of said mirror housing and of said mirror plate, said adjusting means for operatively pivoting said mirror plate about said mounting means, said adjusting means for engaging said mirror plate at another edge region of said mirror plate substantially opposite said mounting means, said another edge region being off-center in a direction relative to both said vertical and said horizontal axes, such that upon actuation of said adjusting means said mirror plate pivots about said mounting means simultaneously about said substantially vertical and horizontal axes out of said rest position away from said stop means.

4,159,867

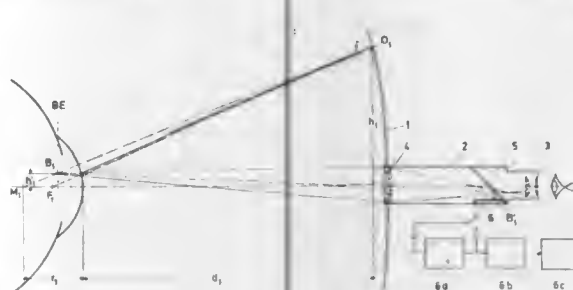
**DEVICE AND METHOD FOR MEASURING THE CURVATURE OF THE CORNEA**

Manfred Achatz, Heusenstamm; Rasmus Beck, Neu-Isenburg, and Werner Bockelmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Battelle-Institute e. V., Frankfurt am Main, Fed. Rep. of Germany  
Filed Sep. 9, 1977, Ser. No. 831,996

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2641004  
Int. Cl.<sup>2</sup> A61B 3/10, 3/00

U.S. Cl. 351—6

13 Claims



1. A device for measuring the curvature of a cornea comprising:

- (a) a continuous surface plate positioned in front of the cornea to be measured;
- (b) a telescope extending through said continuous surface plate having its optical axis located at the center of said surface;
- (c) means to generate a plurality of object points on said surface plate, the object points forming image points on the image plane of the cornea;
- (d) reflecting means in said telescope for reflecting incident light from the image plane of the cornea;
- (e) detecting and measuring means for detecting the light reflected by said reflecting means and for measuring the position of the image points with respect to the optical axis to thereby determine the curvature of the cornea.

4,159,868

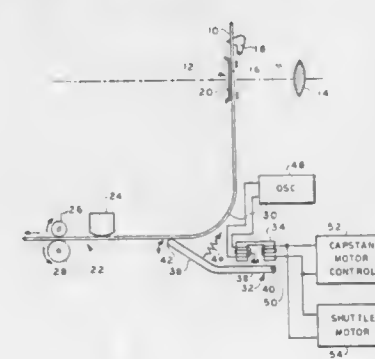
**FILM LOOP FORMING DEVICE**

Kotaro Sano, Kodaira, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan  
Filed Jul. 3, 1978, Ser. No. 921,671

Claims priority, application Japan, Jul. 4, 1977, 52-87596[U]  
Int. Cl.<sup>2</sup> G03B 31/00

U.S. Cl. 352—14

8 Claims



1. In a camera for recording sound and images wherein the film is advanced intermittently past an image recording station by a first drive means and advanced at a constant speed past a sound recording station by a second drive means, and wherein a detector senses the size of a film loop developed between the image recording station and the sound recording station, a film loop size control, comprising:

control means responsive to the detector sensing a slack film loop when the film is stationary for actuating only the second drive means to reduce the slack, and responsive to the detector sensing an absence of slack in the film for de-actuating the second drive means; and switch means adapted to be actuated when the film slack has been reduced for actuating both the first and second drive means for advancing the film past the image recording station and the sound recording station for recording of images and sound on the film, whereby synchronism is maintained between the film at the image recording station and the film at the sound recording station by the removal of slack in the film loop prior to advancing the film for the recording of images thereon.

4,159,869

**CURSOR FOR USE IN MICROFILM READER**

Yutaka Watanabe, Hon, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan  
Filed Sep. 26, 1977, Ser. No. 836,326

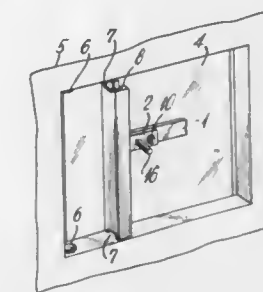
Claims priority, application Japan, Oct. 1, 1976, 51-133182[U]  
Int. Cl.<sup>2</sup> G03B 21/00; B43L 13/04

U.S. Cl. 353—122

6 Claims

1. A cursor mechanism for use in a microfilm reader having

a vertically extending rectangular projection screen and a rectangular frame surrounding said screen, comprising:  
a cursor member extending laterally across and proximate to and parallel to the plane of said screen and having a longitudinal opening proximate an end thereof;  
a support member swingably mounting said cursor member by means of a pivot and having a bore therein;  
a cursor pole provided along one side of said screen frame for vertically slidably supporting said support member; and  
an angle adjusting means for adjusting the angle of said cursor member;



wherein said angle adjusting means comprises, a pivot member rotatably projecting through said support member bore, a cam member engaging said longitudinal opening and affixed to one end of said pivot member, a knob affixed to the other end of said pivot member for turning said cam member and adjusting the angle of said cursor member and means including a friction cushion and a loading spring entrapped between the confronting faces of said knob and said support member for frictionally preventing the rotation of said cam member by said cursor member under the influence of gravity while permitting the manual rotation of said knob to turn said cam member and adjust the angle of said cursor member.

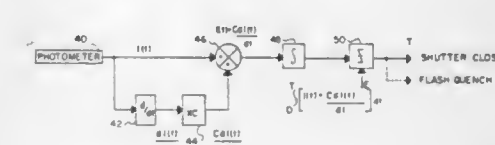
4,159,870

**EXPOSURE CONTROL APPARATUS INCLUDING GENERAL PURPOSE LAG COMPENSATION**

George P. Corey, and Paul Haas, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Filed Feb. 21, 1978, Ser. No. 879,525

Int. Cl.<sup>2</sup> G03B 7/08, 15/05  
U.S. Cl. 354—32

8 Claims



1. In a photographic camera adapted to expose a photosensitive recording medium to scene light whose intensity either substantially varies or remains substantially constant during the exposure, improved exposure control apparatus comprising:

(a) means for initiating exposure of the photosensitive medium;  
(b) means for receiving photoflash apparatus;  
(c) means coupled to said photoflash apparatus receiving means and said exposure initiating means for operating received photoflash apparatus to produce light of substantially varying intensity in timed relation to operation of said exposure initiating means;  
(d) means responsive to an exposure termination signal for terminating the exposure;  
(e) light-responsive timing means, coupled to said exposure

terminating means, adapted when actuated for generating a photosignal proportional to scene light and for generating the exposure termination signal a time interval after being actuated, the time interval being related to the time integral of said photosignal, and thereby to the time integral of said scene light, said exposure terminating means exhibiting a characteristic time delay between the generation of the exposure termination signal and actual termination of the exposure;

- (f) first means, coupled to said light-responsive timing means, for compensating for the characteristic time delay including means for actuating said timing means a predetermined time prior to initiation of exposure; and
- (g) second means, coupled to said light-responsive timing means, for compensating for the characteristic time delay, said second means, operating independently of whether photoflash apparatus is utilized to effect the exposure, for adjusting the time interval in proportion to the time rate of change of said photosignal from the beginning to the end of the time interval, and thereby to the time rate of change of said scene light from the beginning to the end of the time interval,
- whereby the adjusted time interval results in substantially the desired exposure whether the intensity of the scene light is substantially constant or is substantially varying during the time interval.

4,159,871

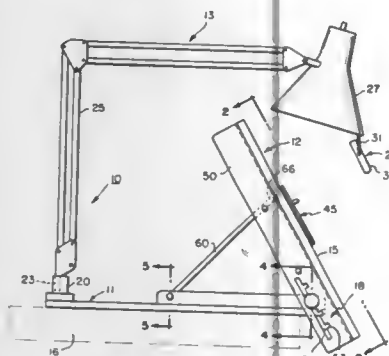
## PHOTOGRAPHIC RETOUCHING APPARATUS

Joseph A. Arnone, 258 Briggs St., Syracuse, N.Y. 13208

Filed Aug. 9, 1978, Ser. No. 932,130

Int. Cl.<sup>2</sup> G03D 15/00

U.S. Cl. 354-350



1. Apparatus for retouching photographic prints including a planar base member that is capable of being seated upon relatively flat support surface,
- a work board having a flat working surface and two opposite side walls depending downwardly therefrom which are arranged to pass over the side margins of the base member,
- a slide formed in each of said opposite side walls of the base that includes an elongated slot passing through said side wall that is generally parallel to the working surface of the board and having a plurality of spaced-apart notches formed in the upper wall thereof,
- a pair of hinge pins supported in the side margins of the base member and being arranged so that one of said pins passes outwardly through each of the adjacently positioned slides whereby the board may be selectively located in said notches and simultaneously rotated about said hinge pins to adjust both its elevation and angular positioning,
- locking means associated with said hinge pins for securing said board in a selected position,
- a vibratory disc centrally mounted in said board with the top surface of said disc being co-planar with the working surface of the board whereby a photographic print having a surface area greater than the surface area of the disc can

be supported in a flat condition upon the working surface of the board, said disc being supported in noncontiguous relation with said board, and

vibrating means operatively associated with the vibratory disc for vibrating the disc at a predetermined frequency.

4,159,872

## OPTICAL DISTORTION DEVICE

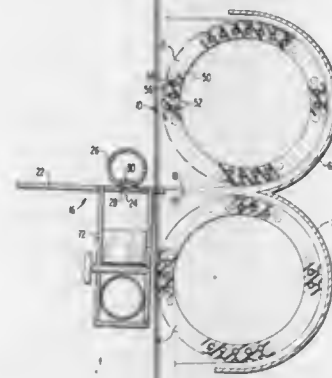
Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22980

Filed Nov. 29, 1977, Ser. No. 855,640

Int. Cl.<sup>2</sup> G03B 27/20

U.S. Cl. 355-91

11 Claims



1. A device for producing a print on a photosensitive sheet from a photographic image on a copy sheet with a predetermined change in one dimension comprising a frame, light source means mounted in said frame, a housing surrounding said light source means including a flat upper surface having an elongated light slit therein, positive air pressure means disposed above said slit in spaced parallel relation thereto for holding said sheet in superimposed relation against said upper surface as said sheet passed over said light slit, first and second roller means rotatably mounted in said frame with the axis thereof disposed parallel to each other and said elongated light slit and disposed in a plane perpendicular to the plane of said flat surface, each of said rollers having vacuum means for holding a respective one of said sheets to the surface of each roller and variable speed driving means for rotating said rollers to pull said sheets passed said light slit at the desired relative speed.

4,159,873

## RANGEFINDER AND DIGITAL SINGLE SHOT CIRCUIT

Robert P. Farnsworth, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 27, 1977, Ser. No. 836,937

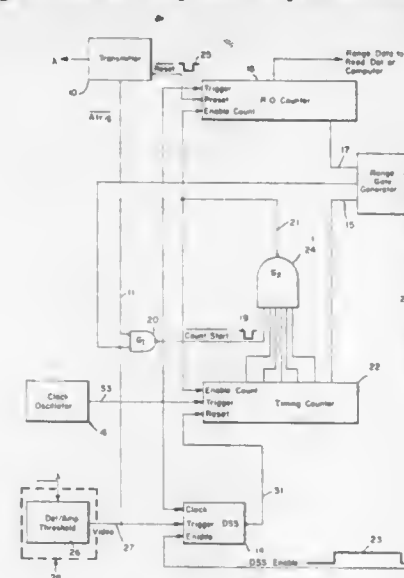
Int. Cl.<sup>2</sup> G01C 3/08; H03K 3/30, 3/10

U.S. Cl. 356-5

11 Claims

1. A ranging system for providing the range of remote targets comprising:
- (a) transmitting means for transmitting energy pulses to remote targets;
- (b) detector means for receiving portions of the energy pulse reflected by the remote targets and for developing video pulses;
- (c) first and second counters, said second counter coupled to said first counter for being controlled by said first counter when said first counter counts to a predetermined value; and
- (d) digital single shot means responsive to the video pulses from said detecting means for applying reset pulses to said first counter, said digital single shot means including an enabling terminal further comprising first gating means

coupled to said first and second counters and to said enabling terminal and responsive to predetermined counts of



said counters for developing a pulse for enabling and disabling said digital single shot means.

4,159,874

## OPTICAL PROPERTY MEASUREMENT SYSTEM AND METHOD

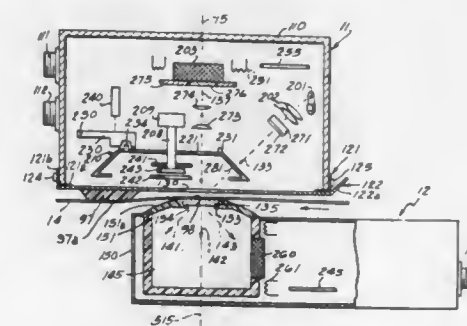
Leonard R. Dearth, Appleton, and Fred P. Lodzinski, Port Edwards, both of Wis., assignors to Nekoosa Papers Inc., Port Edwards, Wis.

Continuation-in-part of Ser. No. 438,993, Feb. 4, 1974, Pat. No. 3,992,190. This application Jul. 19, 1976, Ser. No. 706,827. The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> G01N 21/53, 21/30; G01J 3/50

U.S. Cl. 356-73

45 Claims



16. Apparatus for measuring an optical property of single thickness sheet material, comprising an optical measuring system including light source means, sheet receiving means for receiving light energy therefrom, photometric sensor means for receiving light energy from the sheet receiving means for providing respective reflectance and transmittance output signal components as a function of respective reflectance and transmittance parameters of a single thickness sheet material at the sheet receiving means, and further means operable in conjunction with said photometric sensor means for providing a quantitative output based on the reflectance and transmittance output signal components and in accordance with an optical measurement spectral response function for characterizing the optical property, said further means comprising an optical window member disposed in optical coupling relation to said sheet receiving means during the sensing of the reflectance and transmittance parameters of sheet material at said sheet receiving means and comprising translucent diffusing material exhibiting

an absolute reflectance of substantial magnitude and an absolute transmittance of substantial magnitude.

4,159,875

## SPECIMEN HOLDER

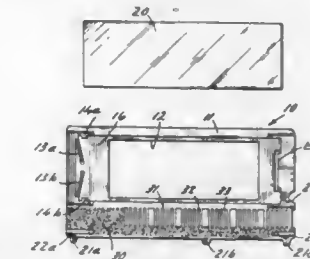
Stephen G. Hauser, Tarzana, Calif., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 21, 1976, Ser. No. 734,582

Int. Cl.<sup>2</sup> G02B 21/34

U.S. Cl. 356-244

9 Claims



9. A specimen holder which comprises:

- (a) an integral planar specimen slide;
- (b) a frame encompassing said slide;
- (c) nesting means defined by opposing sides of said frame to cooperate with corresponding nesting means of vertically stacked adjacent specimen holders to permit movement of one slide holder in one direction while preventing movement in a direction substantially transverse thereto; and,
- (d) transport means operatively associated with said frame to permit mechanical transfer of said specimen holder.

4,159,876

## FLAMELESS ATOMIZATION

Edward G. Egan, Mulgrave, and Ian S. Jackson, Glen Waverley, both of Australia, assignors to Varian Techtron Proprietary Limited, Victoria, Australia

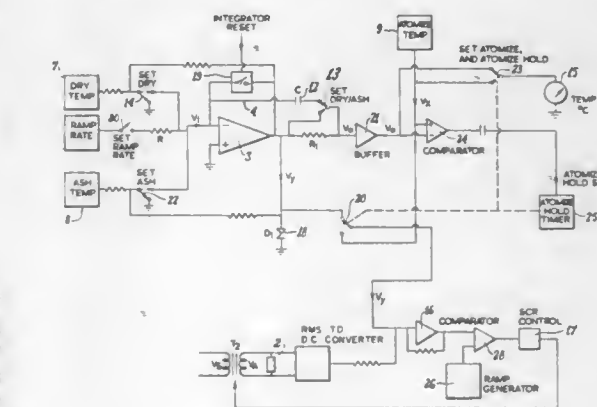
Filed Dec. 16, 1976, Ser. No. 751,767

Claims priority, application Australia, Dec. 18, 1975, PC4332

Int. Cl.<sup>2</sup> G01J 3/30

U.S. Cl. 356-312

10 Claims



8. In a spectrophotometer, an atomizer for receiving a sample to be analyzed and connectable to an electrical power source to be heated by resistance heating;
- control means operable to vary the power input to said atomizer so as to change the temperature of said atomizer, and including means for selecting temperatures suitable for dry-ash, and atomized modes of operation; and
- a feedback circuit connected between said atomizer and said control means and including means operable to generate an electrical analogue which at least approximates the heating response characteristics of said atomizer;



said circuit being operative to modify said power input by application of said analogue such as to substantially compensate for said heating response characteristics.

4,159,877

# MATERIALS HANDLING AND APPLICATION MECHANISM

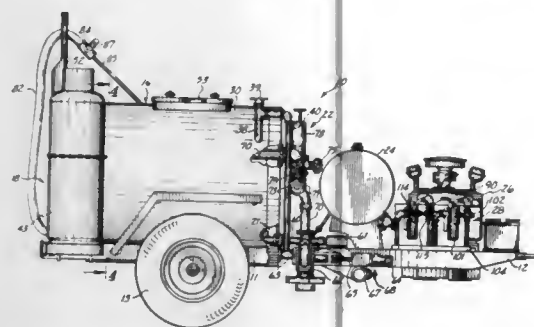
Carl C. Jacobson, Tempe; Mark C. Manning, Gilbert, and Francis K. Hill, Wickenburg, all of Ariz., assignors to Crafo, Inc., Phoenix, Ariz.

Filed Apr. 10, 1978, Ser. No. 894,892

Int. Cl.<sup>2</sup> B28C 1/22

U.S. Cl. 366—22

18 Claims



1. A mechanism for preparing, handling and application of liquid materials comprising:

- (a) a materials tank having a fill port for receiving materials and having an outlet;
- (b) primary heater means in communication with said materials tank for melting and maintaining the molten state of the materials receivable in said materials tank;
- (c) mixing means in said materials tank for mixing the materials receivable in said materials tank;
- (d) a materials delivery plumbing system including,
  - I. a materials delivery pump having an inlet and an outlet,
  - II. a materials supply pipeline having one end connected to the outlet of said materials tank and the other end connected to the inlet of said materials delivery pump,
  - III. a materials delivery line having one end coupled to the outlet of said materials delivery pump, and
  - IV. an applicator means coupled to the opposite end of said delivery line; and
- (e) said materials delivery line including,
  - I. a rigid portion extending from the outlet of said materials delivery pump through said materials tank so that said rigid portion is heated by said primary heater means, and
  - II. a flexible portion connected to said rigid portion and having said applicator means connected thereto.

4,159,878

# DEVICE FOR FORMING STICKS, BLOCKS AND OTHER FORMED PARTS FROM DOUGH MATERIAL

Willem H. Willemsen, 83, Westervolge, Warffum, Netherlands

Filed Feb. 22, 1978, Ser. No. 879,911

Claims priority, application Netherlands, Feb. 22, 1977, 7701870; Aug. 9, 1977, 7708771

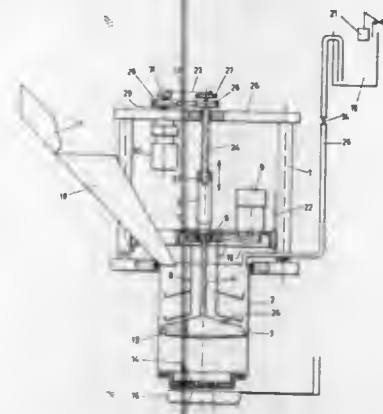
Int. Cl.<sup>2</sup> A21C 1/00

U.S. Cl. 366—69

4 Claims

1. In an apparatus for producing shaped-dough pieces, a frame, a movable platform mounted for movement upwards and downwards on said frame, a cylinder connected to said frame and having a lower portion forming an extrusion chamber and an upper portion forming a mixing chamber, an extrusion piston reciprocally mounted in said cylinder and having a piston rod,

supply means to supply powdery material and liquid to said mixing chamber, stirring means surrounding said piston rod in said mixing chamber and rotatably mounted relative to said frame, said piston being at least movable into said mixing chamber to a position where said mixing chamber communicates with said extrusion chamber, a press plate over the end of said cylinder opposite from said piston and having extrusion holes therethrough, means to form spacing of the periphery of said piston from



the walls of said cylinder during the movement of the piston away from said press plate, said powdery material and said liquid flowing from said mixing chamber to said extrusion chamber due to a suction action and having a resident time in said chambers to form a dough, means to form a suction action upon movement of said piston away from said press plate including residue dough over the extrusion holes in said press plate, and at least one cutting means mounted under said press plate.

4,159,879

# BREAD MAKING MACHINE

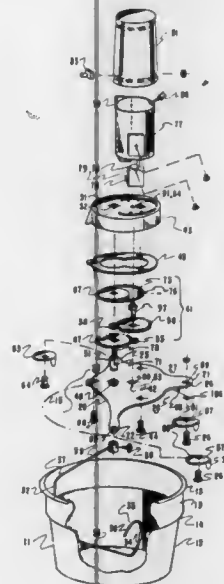
Robert G. Coucher, Salt Lake City, Utah, assignor to Pioneer Associates #2, Salt Lake City, Utah

Filed Mar. 18, 1976, Ser. No. 668,227

Int. Cl.<sup>2</sup> B01F 7/16

U.S. Cl. 366—98

9 Claims



1. A machine adapted to rotate a dough hook within an

open-topped mixing vessel during a mixing mode of operation at a speed of at least about 75 rpm to mix ingredients into bread dough and during a subsequent kneading mode of operation at a speed of no more than about 50 rpm to knead said dough, comprising:

driven axle means removably fixed in approximately axial alignment with said vessel and adapted to couple with said dough hook; and a universal type, AC-DC, series wound induction motor rated between about 1/10 and about 1/15 horsepower with an unloaded speed of at least about 8,000 rpm and a speed at full load of no more than about 5,000 rpm connected to said driven axle through a speed-reducing transmission effecting a reduction of at least about 80:1; wherein said motor is removably fixed with respect to said vessel so that said vessel is prevented from moving with respect to said motor during the kneading mode of operation; and said kneading mode of operation is effected by an increasing load transmitted to the motor through the transmission from the dough hook.

4,159,880

# CIRCULATION MIXER

Friedrich W. Herfeld, Wall 1, 5982 Neuenrade, Fed. Rep. of Germany

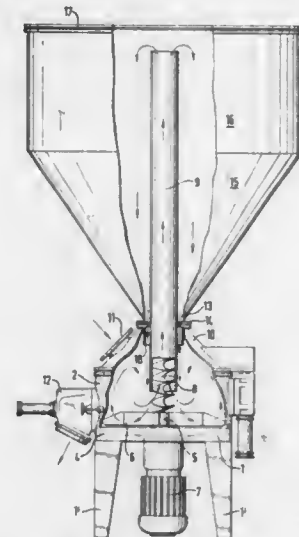
Filed Apr. 20, 1978, Ser. No. 898,116

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2717887

Int. Cl.<sup>2</sup> B01F 5/12, 15/02

U.S. Cl. 366—266

8 Claims



1. A circulation mixer comprising: means defining a mixing chamber; a central vertical rotary shaft in said chamber and having a centrifugal mixing device thereon; a supply chamber above said mixing chamber and having an outlet opening communicating with said mixing chamber; a conveying pipe extending from said mixing chamber into said supply chamber through said outlet opening substantially coaxial to said shaft, there being an annular space between said conveying pipe and said outlet opening; and means for circulating mixed materials from said mixing chamber, through said conveying pipe, to said supply chamber.

4,159,881

# TURBULENT FLOW CONVEYING DEVICE FOR A MIXTURE

Achille Gogneau, 17, Avenue Jules Ferry, Montlucon, France (03100)

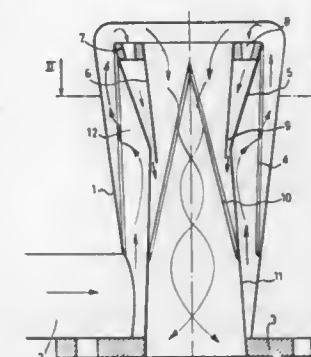
Filed Aug. 28, 1977, Ser. No. 827,683

Claims priority, application France, Sep. 2, 1976, 76 26823

Int. Cl.<sup>2</sup> B01F 5/00

U.S. Cl. 366—337

9 Claims



1. A stirring and conveying device for a fuel-air mixture comprising: a housing, means for supplying the mixture to be treated to said housing, a first blade means for receiving a part of the material to be treated, said first blade means including a plurality of first blades arranged in a generally conical configuration with the surfaces of the respective first blades being inclined to divide the mixture into layers and to impart a swirling motion to said layer, and means for receiving another part of the mixture at an inlet thereof and to impart thereto an increased velocity at an outlet of said receiving means, at least one of said first blade means and said receiving means being formed to mix the materials exiting the outlets by a venturi action.

4,159,882

# HIGH QUALITY PRINTER

Royden C. Sanders, Jr., Wilton; Michael I. Lerer, Bedford, both of N.H., and John P. Conant, Chelmsford, Mass., assignors to R. C. Sanders Technology Systems, Inc., Derry, N.H.

Filed Jun. 30, 1977, Ser. No. 811,991

Int. Cl.<sup>2</sup> B41J 3/12

U.S. Cl. 400—124

9 Claims



1. Apparatus for impact printing on paper high quality alphanumeric characters from coded data using a printing means capable of producing dots of predetermined nominal diameter approximating ten mils; means for generating a bit map timing signal having a period which is preselectable; means responsive to said bit map timing signal for traversing said printing means across the width of a printing media in reversing passes at a speed such that the increment of head travel corresponding to the period of the bit map timing signal is essentially an order of magnitude smaller than the nominal dot diameter and about one mil; means for advancing the paper between successive passes in increments which are substantially larger than said increment.

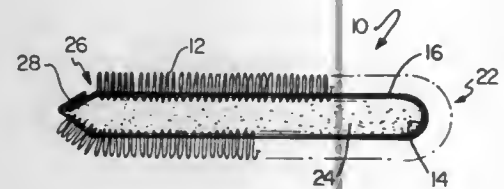
ment but are substantially smaller than the nominal dot diameter so that vertically overlapping dots may be printed on successive reversing passes; means controlled by said bit map timing signal and operable during a traverse of said head for energizing said printing means in accordance with a stored bit map representing portions of characters to be printed on the current traverse, the lateral resolution of the bit map corresponding to the period of the bit map timing signal, the minimum distance between repeated operations of said print means being a multiple of said increment but less than said nominal dot diameter, whereby characters may be printed on successive traverses of the print head during which interlaced dot strings are printed with a horizontal resolution which is essentially an order of magnitude finer than the nominal dot diameter.

#### 4,159,883 CLEANING PAD

Louis R. Mizell, Woodbury, N.Y., assignor to I.W.S. Nominee Company Limited, London, England  
Filed Jul. 18, 1977, Ser. No. 816,752  
Claims priority, application United Kingdom, Jul. 22, 1976, 30665/76

Int. Cl.<sup>2</sup> A47K 5/12

U.S. Cl. 401-201



1. A cleaning pad with an internal well for cleaning agent, said pad characterized in that at least one external surface thereof is formed from a fabric and a cleaning agent impervious plastic film, yarn tufts penetrating said fabric and said plastic film, and the inner ends of the yarns forming the tufts of the tufted fabric communicating with cleaning agent in the internal well, solely through yarn-containing openings in said plastic film.

#### 4,159,884 CUTTING TOOL

Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223  
Continuation-in-part of Ser. No. 812,450, Jul. 5, 1977. This application Aug. 19, 1977, Ser. No. 825,967  
Int. Cl.<sup>2</sup> B26D 1/00

U.S. Cl. 407-113



1. In a cutting tool comprising a plate of a single hard material having a bottom surface, a top surface and a peripheral surface whereby said peripheral surface and at least said top surface forms a cutting edge at their junction defining at least one cutting tip, the improvement of a perimetric shallow groove in at least said top surface, said perimetric shallow groove having an edge disposed at said cutting edge and extending radially from said cutting edge at least at said cutting tip for promoting the formation of a false cutting tip build-up during use of said cutting tool, said perimetric shallow groove

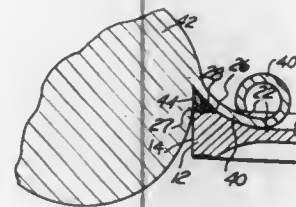
having a rough surface providing an anchoring surface for said false cutting tip build-up.

#### 4,159,885 CUTTING TOOL

Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223  
Filed Jul. 5, 1977, Ser. No. 812,450  
Int. Cl.<sup>2</sup> B26D 1/00

U.S. Cl. 407-114

28 Claims



1. A cutting tool for removing chips from a workpiece comprising a plate of a single hard material having a bottom surface, a top surface and a peripheral surface whereby said peripheral surface and at least said top surface form a cutting edge at their junction, a recess in at least said top surface, said recess having an edge extending proximate said cutting edge and forming a perimetric ledge of substantially constant width extending radially from said cutting edge to said recess edge, and said recess being of a depth sufficient to cause a continuous chip to flow from said cutting edge into said recess and said perimetric ledge being in the form of a shallow groove such as to promote the formation of a false cutting tip build-up during use of said cutting tool, said perimetric ledge providing an anchoring surface for said false cutting tip build-up.

12. A cutting tool for removing chips from a workpiece comprising a plate of a single hard material having a bottom surface, a top surface and a peripheral surface whereby said peripheral surface and at least said top surface form a cutting edge at their junction, a recess in at least said top surface, said recess having an edge extending proximate said cutting edge and forming a flat perimetric ledge of substantially constant width extending radially from said cutting edge to said recess edge, and said recess being of a depth sufficient to cause a continuous chip to flow from said cutting edge into said recess, said flat perimetric ledge having a roughened surface such as to promote the formation of a false cutting tip build-up during use of said cutting tool, said roughened surface of said perimetric ledge providing an anchoring surface for said false cutting tip build-up.

#### 4,159,886

##### PRESSURIZED CONVEYOR

Warrick L. Sage, Littleton, Colo., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,718

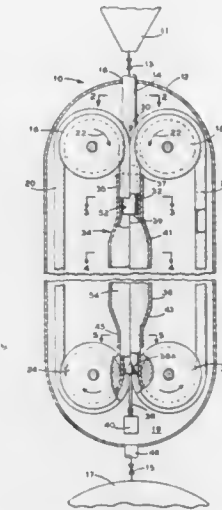
Int. Cl.<sup>2</sup> B65G 65/42

U.S. Cl. 414-292

8 Claims

1. An apparatus for conveying pulverized material to a higher pressure zone, and comprising an upright pressure vessel having an inlet and an outlet, a pair of endless flexible belts disposed within the vessel, upper and lower rotatable means for urging continuous travel of the belts, the upper rotatable means causing opposed sections of the belts to unite and form a downward traveling belt tube, a pulverized material feed pipe extending through the vessel inlet and into the belt tube and cooperating therewith to form a first pressure seal therebetween, a guide tube disposed between the upper and lower rotatable means and circumscribing both the belt tube and feed pipe, the guide tube acting on the belt tube to

compact the pulverized material therein to form a second pressure seal, and the lower rotatable means causing the belts



to separate and discharge the pulverized material from said belt tube.

#### 4,159,887 LOAD CAP

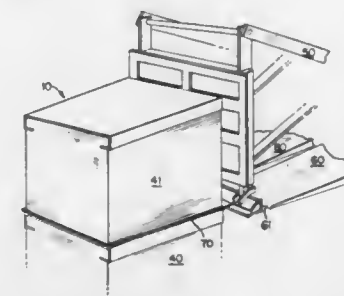
Lloyd C. Dick, Cincinnati, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 3, 1977, Ser. No. 838,823

Int. Cl.<sup>2</sup> B65G 61/00

U.S. Cl. 414-786

1 Claim



1. A method for undecking stacked, unitized sheeted material, a portion of the bottom stacked deck of said stacked sheeted material having a load cap inserted therein comprising:

- positioning the platen of conventional forklift apparatus in abutting relationship with the front flap of said load cap;
- gripping the lifting skid pallet on which the upper stacked deck of sheeted material is resting with gripping means attached to said forklift apparatus; and
- (c) pulling said lifting skid pallet on which the upper stacked deck of sheeted material is resting onto the platen of said forklift apparatus without removing said platen from their original abutting relationship with the front flap of said load cap, said load cap preventing movement of said sheeted material contained in said lower stacked portion.

#### 4,159,888

##### THRUST BALANCING

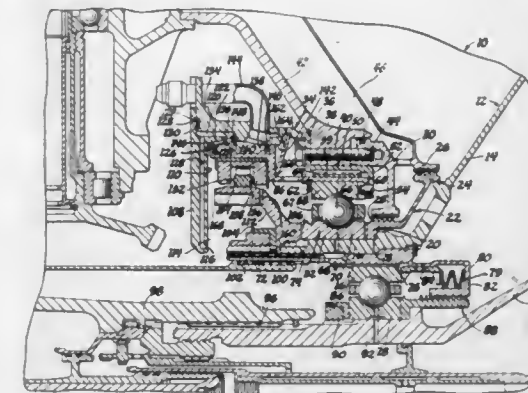
Douglas K. Thompson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1977, Ser. No. 840,267

Int. Cl.<sup>2</sup> F01D 3/00, 3/04

U.S. Cl. 415-105

4 Claims



1. A rotor thrust compensator assembly for association with a gas turbine engine comprising: a rotor extension having a fore and aft segment and being axially movable in response to variable gas loads on a rotor element of a gas turbine engine, a thrust bearing having inner and outer races with anti-friction means therebetween, one of said races fixed to said rotor extension for axial movement therewith, bearing support means for the other of said races, variable axial load integrating means including a pair of relatively rotating pistons with a cavity therebetween, a pressurizable fluid system, flow regulator means including a movable carriage engageable with the other of said races and including means thereon for directing fluid into said fluid system and for directing a quantity of fluid into said cavity in accordance with rotor thrust loads acting on the one of said races, the movement of said movable carriage controlling a throttling gap for said fluid, a preload spring biased between said carriage and said bearing support and operative to compensate axial bearing loads when a first predetermined rotor thrust load is imposed on said bearing, one of said relatively rotating pistons being connected to said rotor extension, said one of said relatively rotating pistons rotating fluid within said cavity so as to produce a dynamic, rotor speed responsive centrifugal fluid head on said rotor extension to compensate second predetermined rotor thrust loadings on said bearing.

#### 4,159,889

##### METHOD OF AND APPARATUS FOR TREATING THE OUTER SURFACE AND INNER SURFACE OF A PIPE OF A THERMOPLASTIC RESINOUS MATERIAL PRODUCED BY EXTRUSION

Kazuo Yagi, Iwakuni, and Kazuhiro Masumoto, Yamaguchi, both of Japan, assignors to Mitsui Petrochemical Industries, Inc., Tokyo, Japan

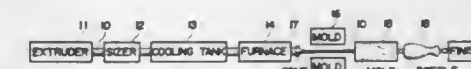
Division of Ser. No. 507,276, Sep. 19, 1974, abandoned. This application Feb. 24, 1977, Ser. No. 771,423

Claims priority, application Japan, Sep. 26, 1973, 48-107543; Sep. 26, 1973, 48-111459

Int. Cl.<sup>2</sup> B29C 17/07

U.S. Cl. 425-71

4 Claims



2. In an apparatus for manufacturing a pipe of a crystalline mono- $\alpha$ -olefin polymer having a smooth outer surface, which



is suitable for manufacturing a biaxially orientated container by blow molding, comprising:

extruding means having an extruder for extruding a crystalline polyolefin continuous pipe;  
means having a sizing die through which the pipe extruded by said extruding means is passed, said sizing die having a front end portion and a pipe-receiving sizing cavity extending inwardly from said front end portion;  
a cooling tank containing cooling water therein for receiving pipe from said sizing die;  
means having a furnace for heating the pipe passed through said cooling tank to a temperature which is below the crystalline melting point of the pipe,  
means for elongating the pipe passed through said furnace lengthwise thereby stretching the pipe,  
a mold for receiving the stretched pipe and means for applying fluid pressure within a pipe portion inside said mold to expand the pipe portion to the contour of the mold, the improvement comprising:

means on said sizing die for supplying a water soluble surface active agent to lubricate the outer surface of a pipe being introduced into said sizing cavity, said means having a surface active agent supply opening formed at said front end portion of said sizing die above said sizing cavity,  
a surface active agent supply line in communication with said supply opening,  
a recess formed in said front end portion of said sizing die in the vicinity of said supply opening,  
a groove formed in said front end portion of said sizing die and extending downwardly from said recess to said sizing cavity,  
and at least one ring-shaped groove formed in said sizing cavity and disposed slightly inwardly of said front end portion to provide a continuous film of surface active agent which adheres to said pipe.

#### 4,159,890 PAVING MATERIAL EXTRUSION MOLDING APPARATUS

Koji Ogaki, Yokohama; Katsu Hirose, Masashi Kaminishi, both of Hiratsuka; Yoshinori Nozawa, Tokyo; Hiroshi Kakuta, Isehara, and Akio Aoki, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

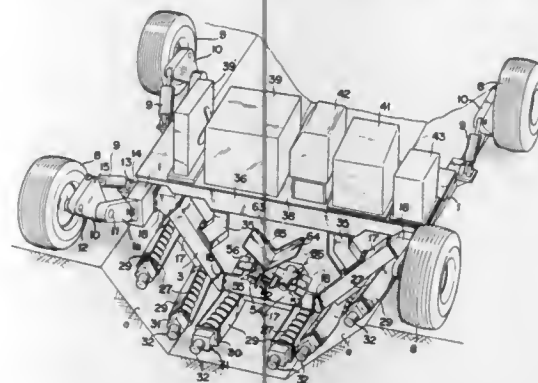
Filed Dec. 7, 1977, Ser. No. 858,380  
Claims priority, application Japan, Dec. 9, 1976, 51/147160; Dec. 9, 1976, 51/147161; Dec. 9, 1976, 51/148586  
Int. Cl.<sup>2</sup> B28B 13/02

U.S. Cl. 425—59

13 Claims

1. A paving material extrusion molding apparatus adapted for laying a paving material of a predetermined thickness on the surface of a trench which has previously been excavated under the ground, comprising: (a) a body formed by a pair of parallel frames and a stand extending on and carried by the frames; (b) power generating means mounted on said body; (c) molding means having a predetermined shape, said predetermined shape being similar to that of said excavated trench and being mounted at a predetermined spaced interval therefrom on the lower part of said body; (d) a plurality of paving material conveyor means mounted in the front of said molding means; and (e) a paving material lifting means mounted in the front and lower part of the molding means and in the approximately central part of the extrusion molding apparatus so that

paving material piled on a central horizontal part of the excavated trench can be raised up on inclined parts formed on both



sides of the trench thereby enabling the paving material to be scattered uniformly.

#### 4,159,891 CRUCIBLE

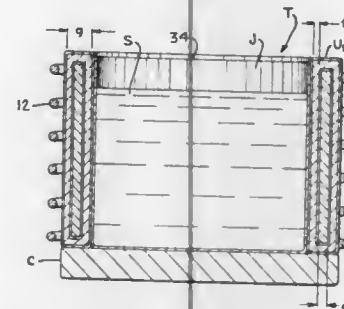
Walter Schmidt, Schaffhausen, Switzerland; Franz Sperner, Hanau, Fed. Rep. of Germany, and Walter Stählin, Schaffhausen, Switzerland, assignors to Prolizenz AG, Chur, Switzerland

Continuation of Ser. No. 664,700, Mar. 8, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 825,990  
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1975, 2510684

Int. Cl.<sup>2</sup> F27B 14/00, 14/10

U.S. Cl. 432—264

16 Claims



1. A crucible for use in heating and retaining melts at elevated temperatures of 1800° C. or above comprising, in combination:

a circumferential side wall portion;  
a bottom wall portion adapted to form with said circumferential side wall portion a crucible chamber;  
said circumferential side wall portion comprises a support body composed of a refractory metal alloy;  
a continuous coating layer composed of a metal or combination of metals chosen from the group consisting of the platinum metals and completely enveloping said support body; and a high-temperature resistant oxide intermediate layer disposed between said support body and said coating layer wherein said intermediate layer prevents diffusion between the coating layer and the support body.

## CHEMICAL

#### 4,159,892 METHOD OF PRINT DYEING TEXTILE MATERIALS FROM A PHOTOGRAPH AND PRODUCTS MADE THEREFROM

Jon M. Blumenaus, Dalton, Ga., assignor to World Carpets, Inc., Dalton, Ga.

Filed Aug. 30, 1977, Ser. No. 829,250  
Int. Cl.<sup>2</sup> G03C 5/00; G03F 5/00

U.S. Cl. 8—62

4 Claims

1. A method for continuously print dyeing textile fabrics with a continuous pattern wherein the image to be reproduced is taken from a photograph and provides a continuous pattern having a three dimensional appearance on the face of the fabric which comprises setting off a selected area of the photograph to form a pattern within a predetermined outline to establish the basic repeat for the pattern, preparing a plurality of continuous tone color separations of the selected pattern to provide red, green, blue and black continuous tone negatives which represent the colors of the original image, preparing a posterized and half-tone positive of each color separation, combining the posterized and half-tone positives to provide a negative, engraving one or more screens with the combined negative, passing the fabric to be dyed under the engraved screens and selectively applying dye stuff through the screens to reproduce the pattern on the face of the fabric.

3. A method for continuously print dyeing flat dyeable textile material with a continuous pattern wherein the image to be reproduced is taken from a photograph and provides a continuous pattern having a three dimensional appearance on the face of the material which comprises setting off a selected area of the photograph to form a pattern within a predetermined outline to establish the basic repeat for the pattern, preparing a plurality of continuous tone color separations of the selected pattern to provide red, green, blue and black continuous tone negatives which represent the colors of the original image, preparing a posterized and a half-tone positive of each color separation, combining the posterized and half-tone positive to provide a positive, engraving one or more screens with the combined positives, passing the material to be dyed under the engraved screens and selectively applying dye stuff through the screens to reproduce the pattern on the face of the material.

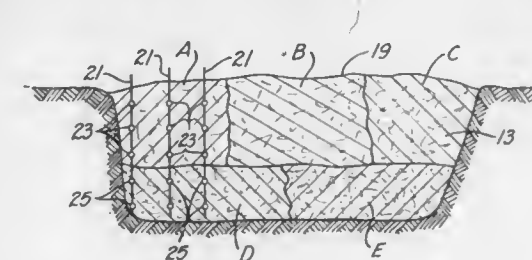
#### 4,159,893 METHOD OF TESTING A LANDFILL FOR ITS METHANE POTENTIAL

Robert K. Ham, Madison, Wis., assignor to Reserve Synthetic Fuels, Inc., Signal Hill, Calif.

Filed Dec. 5, 1977, Ser. No. 857,574  
Int. Cl.<sup>2</sup> G01N 33/24

U.S. Cl. 23—230 EP

11 Claims



1. A method of testing a landfill for its methane potential comprising:

selecting a landfill which contains a selected fraction with said selected fraction consisting essentially of cellulose;  
locating a plurality of zones within the landfill with each of said zones acting substantially uniformly with respect to decomposition of the selected fraction;  
taking at least one sample of the material of the landfill at each of said zones;

measuring the selected fraction content of each of said samples; and  
utilizing the measured selected fraction content of at least some of said samples to find the approximate methane potential of the landfill.

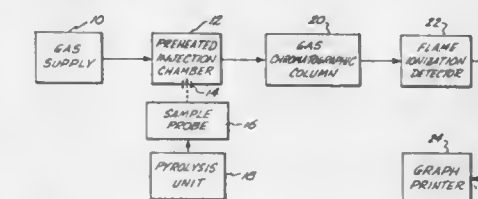
#### 4,159,894 METHOD FOR DETERMINING FORMULATION AND CHEMICAL STRUCTURE OF MATERIALS BY IMPROVED PYROLYSIS GAS CHROMATOGRAPHY

John C. Hu, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 13, 1978, Ser. No. 877,336  
Int. Cl.<sup>2</sup> G01N 1/10, 1/22

U.S. Cl. 23—230 PC

20 Claims



1. A method for separating and analyzing a sample containing at least one volatile component and at least one nonvolatile, pyrolyzable component comprising:

establishing a flow of gaseous carrier fluid a sample injection chamber and thereafter through a chromatographic column,  
preheating the carrier gas flowing said injection chamber to a first predetermined temperature sufficiently high to vaporize said volatile component and below the pyrolysis temperature of said nonvolatile, pyrolyzable component, inserting said sample into said injection chamber while maintaining the temperature of said carrier gas passing through said chamber at said first predetermined temperature, allowing said volatile component to vaporize and pass through said chromatographic column with said carrier gas,  
after said volatile component has been vaporized from said sample and eluted from said column, heating said sample to a second predetermined temperature at which said nonvolatile component will be pyrolyzed to a gaseous reaction product, and  
allowing said reaction product to pass through said chromatographic column with said carrier gas.

#### 4,159,895 METHOD AND APPARATUS FOR THE DETECTION OF BETA THALASSAEMIA MINOR

Ian B. Shine, Lexington, Ky., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 24, 1978, Ser. No. 889,869  
Claims priority, application United Kingdom, Mar. 30, 1977, 12779/77

Int. Cl.<sup>2</sup> G01N 33/16

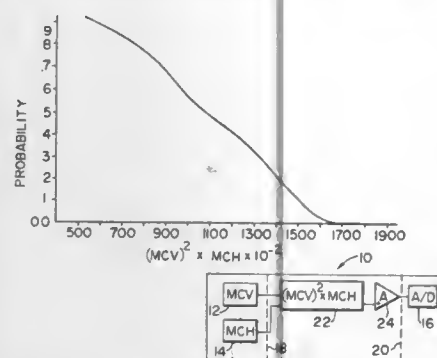
U.S. Cl. 23—230 B

12 Claims

1. A method for detecting carriers of thalassaemias, especially beta thalassaemia minor, comprising the steps of: obtaining from a blood sample the measurements of mean corpuscular volume of the red blood cells and the mean corpuscular haemoglobin; developing as a thalassaemia index value the mathematic product of said two parameter measurements; and comparing said product with a predetermined thalassaemia index threshold value, the amount that the thalassaemia index value is less than the threshold value being proportional to the probability that the sample is from a thalassaemia carrier.

10. Apparatus for use in detecting carriers of thalassaemias, especially beta thalassaemia minor, said apparatus comprising: means for obtaining from a blood sample the measurements of the parameters of the mean corpuscular volume of the red

blood cells and the mean corpuscular haemoglobin; means for developing as a thalassaemia index value the mathematic product of the two parameter measurements; and means for pres-



enting the developed thalassaemia index value so that it can be compared with at least one predetermined standard thalassaemia index value, whereby the probability of the sample being from a carrier of thalassaemia can be ascertained.

4,159,896

#### ENHANCEMENT OF SEPARATION OF CELL LAYERS IN CENTRIFUGED BLOOD SAMPLE

Robert A. Levine, Guilford, and Stephen C. Wardlaw, Branford, both of Conn., assignors to James V. Massey, III, Trumbull, Conn., a part interest

Continuation-in-part of Ser. No. 758,065, Jan. 10, 1977, abandoned. This application May 30, 1978, Ser. No. 910,807

Int. Cl.² A61B 5/14; G01N 33/16

U.S. Cl. 23—230 B

7 Claims



1. A method for clarifying the interface between an enhanced white cell layer and the red cell layer in a centrifuged sample of blood including the step of adding to the blood sample an additive in an amount effective to prevent any immature red cells from being suspended in the adjacent white cell layer by increasing the specific gravity of the red cells without significantly altering the specific gravity of a significant number of the white cells.

4,159,897

#### PRODUCING FLUID FUEL FROM COAL

David H. Doehler, Earleville, Md., assignor to Fluid Coal Corporation, Wilmington, Del.

Filed Oct. 13, 1977, Ser. No. 841,831

Int. Cl.² C10L 9/10, 1/32; C10G 1/00

U.S. Cl. 44—51

6 Claims

1. A process for producing a fluid fuel from a quantity of coal comprising the steps of:

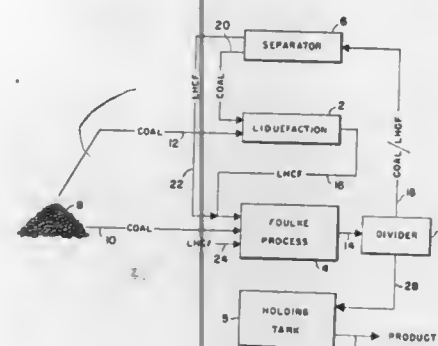
treating a portion of said quantity of coal to produce a liquid hydrocarbon fuel; and

combining the remainder of said quantity of coal with said liquid hydrocarbon fuel to produce a product;

the process also including the step of reducing said remainder to a sufficiently small particle size to permit said product to flow as a suspension;

in which said remainder of said quantity of coal is combined with said liquid hydrocarbon fuel by introducing both said liquid hydrocarbon fuel and said remainder into a concentrator, cleaning said remainder in the concentrator using said liquid hydrocarbon fuel as a cleaning medium, by

effecting settling of undesired particles, and removing from the concentrator a suspension of coal particles in said liquid hydrocarbon fuel as the product; and in which at least a portion of said product is treated to sepa-



rate coal therefrom, and at least part of the coal thus separated from said product is combined with said portion of said quantity of coal and treated along with said portion of said quantity of coal to form said liquid hydrocarbon fuel.

4,159,898

#### ALKYL-GUANIDINO-HETEROCYCLIC COMPOUNDS, THEIR MANUFACTURE AND USE AS ADDITIVES FOR FUELS AND LUBRICANTS

Choua Cohen, and Bernard Sillion, both of Grenoble, France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

Division of Ser. No. 608,966, Aug. 29, 1975, Pat. No. 4,071,459.

This application Nov. 7, 1977, Ser. No. 849,277

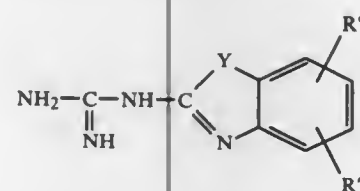
Claims priority, application France, Sep. 10, 1974, 74 30819

Int. Cl.² C10L 1/24

U.S. Cl. 44—63

10 Claims

1. A fuel composition comprising a major amount of gasoline, and in sufficient proportion to obtain dispersing properties at least one alkyl-guanidino benzimidazole compound produced by alkylation at 100°-250° C. with a halogenated hydrocarbon of the general formula  $RX_n$ , of a guanidino-heterocyclic compound (A) of the formula



in which R is a hydrocarbon radical containing about 10 to 200 carbon atoms, X is a halogen atom and n is 1 or 2; Y is —NH—, R' and R'' are each a hydrogen atom, or an alkyl radical having from 1 to 10 carbon atoms, or a —Z—Ar group in which Z is —O—, —S—, or alkylene and Ar is aromatic hydrocarbyl or R' and R'' together, when they are in ortho position, represent a carbocyclic ring fused to the benzene ring, the proportion of the reactants being 0.7-2.5 moles of (A) per gm. atom of halogen in  $RX_n$ .

4,159,899

#### PRECLEANER ASSEMBLY

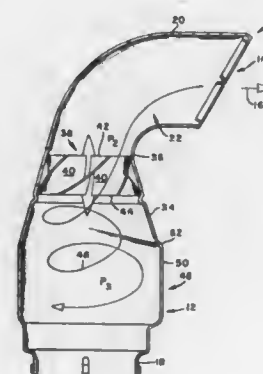
Charles L. Deschenes, N. Attleboro, Mass., assignor to Fram Corporation, East Providence, R.I.

Filed Aug. 26, 1977, Ser. No. 827,924

Int. Cl.² B01D 45/12

U.S. Cl. 55—454

9 Claims



1. In a vehicle, a precleaner assembly for the engine air intake system for separating particulate material from the entering air comprising a housing having an inlet and an outlet facing a direction other than the direction faced by said inlet, said housing defining a flow path between said inlet and said outlet and having a converging conduit section having a bend communicated with the inlet and turning the air communicating through the inlet into the direction faced by the outlet, and a diverging conduit section communicated with an outlet conduit section, wherein the entrance to said diverging conduit section presents a smaller cross-sectional area than the cross-sectional area at the exit of said diverging conduit section so that air communicated through the diverging conduit section is expanded, the exit from the converging conduit section presenting a smaller cross-sectional area than the entrance to the converging conduit section so that air communicated through the converging conduit section is compressed, the exit from the converging conduit section and the entrance to the diverging conduit section joining to define a throat whereby fluid entering said inlet is compressed by said converging conduit section to a maximum pressure level at said throat, means in said diverging conduit section for turning the fluid into a spiral path so that centrifugal forces generated by movement of the particulate material in said spiral path urge said particulate material toward the wall of said housing, said turning means having an inlet, the inlet of said turning means being located substantially at said throat, and means for ejecting from said outlet conduit section the portion of the fluid adjacent the wall of said outlet conduit section in which said particulate material is concentrated, the rest of said air being communicated in an axial direction to said outlet.

4,159,900

#### METHOD OF CONNECTING OPTICAL FIBERS AND CONNECTION BENCH

Jacques Eldin, Viroflay, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Oct. 15, 1976, Ser. No. 732,742

Claims priority, application France, Oct. 22, 1975, 75 32298

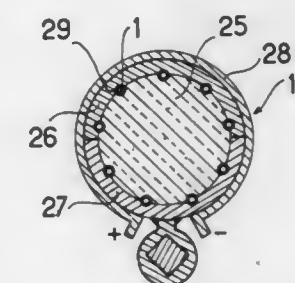
Int. Cl.² C03B 37/00

U.S. Cl. 65—4 B

5 Claims

1. An optical fiber connection bench for connecting two bundles each of n optical fibers in n capillary tubes each of which has a bore whose diameter, at least over a central portion of the bore length, is very slightly greater than each diameter of the two fibers to be accommodated therein for connection, wherein the fibers are guided into the tube until their faces are in contact with each other in the central portion of the tube and transverse vibrations of small amplitude are applied to the

fibers while they are being guided into the tube, comprising a beam mounted on a support, a vibrator in mechanical contact with the beam for applying transverse vibrations to the beam, two fiber support parts supported by said beam, one of said parts for each bundle of optical fibers, each fiber support part being slideably mounted on the beam and including a plurality of fiber retaining passages aligned with the beam, a capillary tube support part also supported by said beam and being disposed in between the fiber support parts and including a plural-



ity of capillary tubes retaining passages aligned with the beam, the disposition of the fiber and the tube retaining passages being identical so that, in operation, fibers from the two bundles may be clamped in respective ones of the fiber retaining passages with an appropriate length of bared fiber end projecting towards the tube support part, the tube support part fitted with capillary tubes, and the fiber support parts moved towards each other and the tube support part with the vibrator in operation until the ends of the corresponding fibers are properly spaced in their respective tubes.

4,159,901

#### CORROSION INHIBITED AGRICULTURAL COMPOSITIONS

George B. Beestman, St. Louis, and Erhard J. Prill, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 797,083, May 16, 1977,

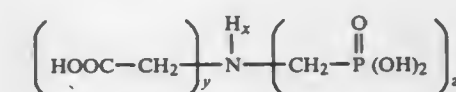
abandoned. This application Dec. 27, 1977, Ser. No. 862,691

Int. Cl.² A01N 9/36

U.S. Cl. 71—86

24 Claims

1. A herbicidal or plant growth regulant composition comprising an active ingredient selected from the aminomethylene-phosphonic acids of the formula



wherein y and z are each individually 1 or 2, and x is 0 or 1, the sum of x, y and z being 3, and the agriculturally acceptable salts and esters thereof, at least one of water or a surfactant, and a metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

21. A method which comprises contacting a plant with a phytotoxic amount of an aqueous herbicidal composition comprising an amine salt of N-phosphonomethylglycine, a surfactant and a metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.



4,159,902

**1,3,3-TRIMETHYL-6-AZABICYCLO-(3.2.1)-OCTANE-6-CARBOXYLIC ACID ESTER, HERBICIDES, PROCESS FOR MAKING SAME AND COMPOSITION CONTAINING SAME**

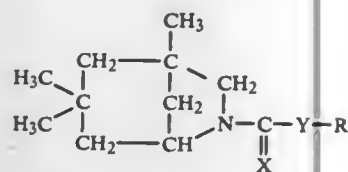
Friedrich Arndt, and Ludwig Nüsslein, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,415  
Int. Cl.<sup>2</sup> C07D 209/02; A01N 9/22

U.S. Cl. 71-95

18 Claims

1. 1,3,3-trimethyl-6-azabicyclo-(3.2.1)-octane-6-carboxylic acid ester of the formula



in which R is alkyl of 1 to 7 carbon atoms, chloro-alkyl of 1 to 7 carbon atoms, alkenyl of 2 to 7 carbon atoms, chloroalkenyl of 2 to 7 carbon atoms, alkynyl of 2 to 7 carbon atoms, benzyl, chlorobenzyl, phenyl, naphthyl, chlorophenyl, alkylphenyl having 1 to 4 carbon atoms in the alkyl moiety of chloroalkyl-phenyl having again 1 to 4 carbon atoms in the alkyl portion and wherein X and Y are oxygen or sulphur.

17. A herbicidal composition comprising at least one active agent as defined in claim 1 in an amount from about 10 to 80% by weight and a liquid or solid carrier material in an amount of about 90 to 20% by weight.

4,159,903

**ENHANCEMENT OF POLYISOPRENE LATEX PRODUCTION**

Albert J. Bauman, Sierra Madre, Calif., assignor to California Institute of Technology, Pasadena, Calif.

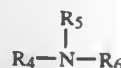
Filed Jul. 27, 1977, Ser. No. 819,263  
Int. Cl.<sup>2</sup> A01N 9/12, 9/22, 9/24, 9/20

U.S. Cl. 71-98

10 Claims

1. A method of stimulating the production of polyisoprene latex having a molecular weight above 300,000 in a Guayule plant comprising the step of:

administering to the plant an amount effective to increase production of polyisoprene by at least 20% of a bioinducing agent of the formula:



where R<sub>5</sub> and R<sub>6</sub> are selected from phenyl, —CH<sub>2</sub>(CH<sub>2</sub>)<sub>q</sub>R<sub>7</sub> where q is an integer from 1 to 6, R<sub>7</sub> is hydrogen; phenyl; an electron withdrawing group; R<sub>9</sub> phenyl- where R<sub>9</sub> is alkyl of 1 to 6 carbon atoms or an electron withdrawing group; —(CH<sub>2</sub>)<sub>p</sub>—O—R<sub>8</sub> or —(CH<sub>2</sub>)<sub>p</sub>—S—R<sub>8</sub> where p is an integer from 2 to 6, R<sub>8</sub> is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or phenyl R<sub>9</sub>, and R<sub>4</sub> is hydrogen or R<sub>5</sub>, and at least one of R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> has the structure: —CH<sub>2</sub>—(CH<sub>2</sub>)<sub>q</sub>—R<sub>7</sub>.

4,159,904

**PROCESS FOR EXTRACTING BISMUTH FROM A BISMUTH-BEARING MATERIAL**

Robert H. Maes, Hove, and Luc M. Fontaines, Antwerp, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Antwerp, Belgium

Filed Jun. 7, 1978, Ser. No. 913,576

Claims priority, application Luxembourg, Jun. 14, 1977, 77538

Int. Cl.<sup>2</sup> C22B 4/04

U.S. Cl. 75-10 R

10 Claims

1. A process for extracting bismuth from a sulfur-containing bismuth-bearing charge, comprising smelting the charge in an electric furnace with submerged electrodes with addition of at least one flux capable of slagging the gangue, and tapping a matte phase containing the bismuth and a separate slag phase from the furnace, said process being further characterized in that the sulfur content of the charge is sufficiently high so that the bismuth content of the matte does not exceed 20% by weight and said sulfur content being sufficiently low so that the bismuth content of the matte is at least 3% by weight.

4,159,905

**METHOD OF MANUFACTURING GREEN HOT BRIQUETTES FROM FINE COAL FOR USE IN SHAFT FURNACES**

Werner Peters, Wattenscheid; Josef Langhoff, Dinslaken; Siegfried Henkel, Blankenstein, and Klaus D. Haverkamp, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Rhein Stahl Huttenwerke AG, both of, Fed. Rep. of Germany

Continuation of Ser. No. 96,258, Dec. 8, 1970, abandoned. This application Jan. 24, 1975, Ser. No. 543,888

Int. Cl.<sup>2</sup> C21B 5/00

U.S. Cl. 75-42

3 Claims

1. A method of operating blast furnaces, by using green hot briquettes produced from fine coal as fuel and wherein the green briquettes are formed by carbonizing the coal at a temperature of from about 600° to 900° C., mixing the carbonized coal with approximately 20 to 40% of fine, cold, well-caking coal, and hot-briquetting the mixture at temperatures between around 300° and 500° C. and directing the briquettes into the blast furnace without further processing thereof.

3. A method of operating a shaft furnace by using briquettes as fuel made by carbonizing fine coal of a grain size less than 3 mm at a temperature of from about 600° to 900° C., then mixing it with about 20 to 40% of fine well-caking coal, and thereafter briquetting this mixture at a temperature of about 300° to 500° C. and directly using this fuel in the blast furnace without coking it.

4,159,906

**METHOD AND COMPOSITION FOR THE DESULFURIZATION OF MOLTEN METALS**

Walter Meichsner, Homberg; Heinrich Röck, Trostberg; Alfred Freissmuth, Trostberg; Horst Prietzel, Trostberg; Heinrich Reller Meyer, Duisburg-Hamborn; Wolfgang Ullrich, Rheinkamp-Baerl; Erich Pflüger, Trostberg, and Raymund Sindermann, Tacherting, all of Fed. Rep. of Germany, assignors to Süddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Division of Ser. No. 408,954, Oct. 23, 1973, Pat. No. 4,078,915. This application May 18, 1977, Ser. No. 797,973

Int. Cl.<sup>2</sup> C21C 7/02

U.S. Cl. 75-58

39 Claims

1. Composition for the desulfurization of molten metals comprising at least one member selected from the group consisting of calcium carbide and calcium cyanamide as the desulfurizing agent present in an amount of at least 30 percent by weight and, in addition, a solid substance yielding water at desulfurization temperatures selected from the group consisting of calcium hydroxide, aluminum hydroxide, clay, perlite,

kaolin, a carbohydrate, phthalic acid, glucolic acid, an organic polymer containing hydrogen and oxygen, and a polyalcohol.

4,159,907

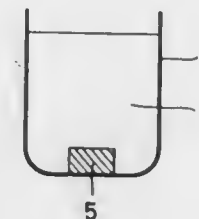
**METHOD FOR MELTING ALUMINUM SCRAPS**  
Kunio Amino, Tokyo, Japan, assignor to Amino Aluminium Industries, Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 863,051

Claims priority, application Japan, Dec. 23, 1976, 51-154223  
Int. Cl.<sup>2</sup> C22B 21/00

U.S. Cl. 75-68 R

4 Claims



1. A method for the melting of aluminum scraps in a single molten aluminum bath which is open to the atmosphere, which method comprises shredding said aluminum scraps into particles most of which have maximum diameters of between 2 mm and 20 mm, removing from said particles paint, synthetic resin, paper and iron debris mingling therein, then compressing the resultant aluminum particles at ambient temperatures under a magnitude of pressure greater than the yield strength of aluminum into compressed masses having an apparent specific gravity of said molten aluminum bath, and subsequently introducing and melting said compressed masses in said molten aluminum bath.

4,159,908

**ALKALI METAL CONTAINING BATTERY GRID LEAD ALLOY**

M. Vikram Rao, Princeton Junction; George S. Foerster, Hightstown, both of N.J., and Ranna K. Hebbar, Bombay, India, assignors to N L Industries, Inc., New York, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,425

Int. Cl.<sup>2</sup> C22F 11/10

U.S. Cl. 75-167

11 Claims

1. A lead alloy characterized by good ductility and being resistant to corrosion in an acid environment consisting essentially of from 0.5% to 3.0% antimony, from 0.01% to 0.7% arsenic, from 0.001% to 0.7% tin, a member selected from the group consisting of from 0.001% to 0.015% sulfur, from 0.001% to 0.05% selenium, and admixtures thereof, a member selected from the group consisting of from 0.001% to 0.05% of an alkali metal and admixtures thereof, balance essentially lead.

4,159,909

**CATHODE TARGET MATERIAL COMPOSITIONS FOR MAGNETIC SPUTTERING**

Richard W. Wilson, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 818,681, Jul. 25, 1977, Pat. No. 4,094,761. This application Mar. 9, 1978, Ser. No. 884,948

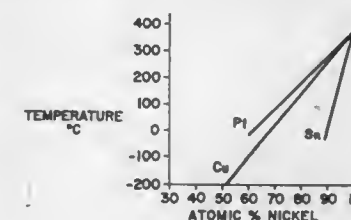
Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 75-170

9 Claims

1. A method for forming a cathode target for a magnetron sputtering apparatus, which comprises: forming said target of an alloy of a ferromagnetic material and a non-ferromagnetic

material such that said alloy has a Curie temperature lower than the temperature attained by said cathode target during a



4,159,910

**COLOR PHOTOGRAPHIC MATERIALS CONTAINING COLOR IMAGE FADING INHIBITOR**

Mitsuo Fujiwara; Takashi Sasaki, and Takashi Uchida, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

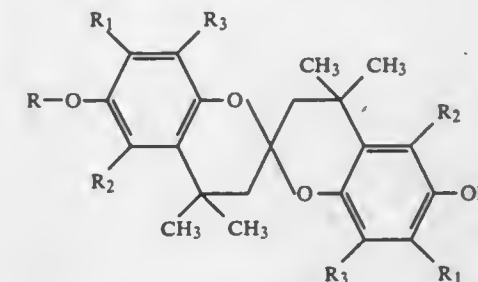
Filed Aug. 8, 1977, Ser. No. 822,635

Claims priority, application Japan, Aug. 9, 1976, 51-94667  
Int. Cl.<sup>2</sup> G03C 1/76

U.S. Cl. 96-74

13 Claims

1. A color photosensitive material comprising a support and a silver halide photosensitive layer, said material containing a compound represented by the formula:



wherein R<sub>1</sub> represents an alkyl, alkenyl, aryl, alkoxy, alkenoxy or aryloxy group; R<sub>2</sub> and R<sub>3</sub> individually represent hydrogen, halogen, or an alkyl, alkenyl, or alkoxy group; R<sub>4</sub> represents an alkyl, alkenyl, cycloalkyl, aryl or heterocyclic group selected from imidazolyl, furyl, pyridyl, or thiazolyl or a R<sub>6</sub>CO—, R<sub>7</sub>SO<sub>2</sub>— or R<sub>8</sub>NHCO— group; R' is hydrogen or an R<sub>6</sub>CO—, R<sub>7</sub>SO<sub>2</sub>—, or R<sub>8</sub>NHCO— group; in which R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> individually represent an alkyl, alkenyl, cycloalkyl, aryl or heterocyclic group selected from imidazolyl, furyl, pyridyl and thiazolyl; and, when R' represents the R<sub>6</sub>CO—, R<sub>7</sub>SO<sub>2</sub>— or R<sub>8</sub>NHCO—group, R can be either the same as or different from R'.

4,159,911

**METHOD OF MIXING STEEL FIBER REINFORCED CONCRETE**

Takeshi Takazuka, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,498

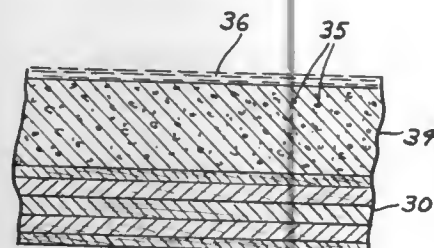
Claims priority, application Japan, Feb. 28, 1977, 52-20109  
Int. Cl.<sup>2</sup> C04B 7/02, 31/04

U.S. Cl. 106-99

6 Claims

1. A method of mixing steel fibers having a surface to weight ratio of over 900 mm<sup>2</sup>/g into a concrete mix comprising the steps of orientating said steel fibers in a predetermined direction and randomly directing said orientated steel fibers into said concrete mix through grating means having a grating space which is about 2 to 4 times the length of each of said steel fibers.

4,159,912  
**ACOUSTICAL FLOOR PREPARATION AND METHOD**  
 Ronald M. Jorgenson, Minneapolis, Minn., assignor to Acoustical Floors, Inc., Hamel, Minn.  
 Filed Mar. 9, 1977, Ser. No. 775,738  
 Int. Cl.<sup>2</sup> C04B 11/00  
 U.S. Cl. 106—109



1. A fluid, watery, self-leveling, sand-containing flooring preparation for pouring an acoustical floor curable with minimal expansion to form a hard, strong floor having sand substantially homogeneously distributed therethrough, the preparation comprising a well-mixed slurry containing
- 10 parts by weight of a composition including at least about 90% by weight of calcium sulfate hemihydrate and capable, when violently mixed with sand and water in the weight ratio of 1/0.68 and poured into a 1/4 in. deep layer, of hardening within 20-60 minutes at 70° F. without significant settling of the sand;
  - about 13 to about 30 parts by weight of sand; and
  - sufficient water in the range of about 5 to about 8.5 parts by weight to provide the slurry, when mixed violently, with a runny, watery fluid, self-leveling consistency.

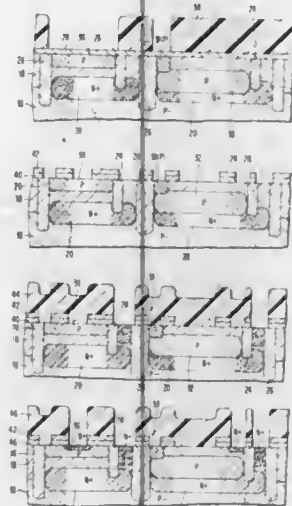
4,159,913  
**SILICEOUS MATERIALS**  
 James D. Birchall, and Roger M. Pybus, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England  
 Filed Jun. 3, 1977, Ser. No. 803,232  
 Claims priority, application United Kingdom, Jun. 4, 1976, 23157/76  
 Int. Cl.<sup>2</sup> C09C 1/44, 1/28  
 U.S. Cl. 106—307

1. In a process for the manufacture of a siliceous filler which comprises contacting a particulate siliceous filler with an organic compound at elevated temperature, whereby the organic compound is catalytically decomposed to form an adherent carbonaceous coating on the surface of the said particulate siliceous filler, the improvement which comprises treating the siliceous filler particles which contain alkali metal ions in a quantity sufficient to impede catalytic decomposition to form the carbonaceous coating first with a solution of an ammonium salt or a salt of an organic base so as to displace alkali metal ions therefrom and then removing the solution so as to leave the siliceous filler particles depleted of at least a portion of their alkali metal ion content.

4,159,914  
**PHOTOVOLTAIC CELL**  
 John F. Jordan, and Curtis M. Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.  
 Continuation-in-part of Ser. No. 631,815, Nov. 14, 1975, Pat. No. 4,086,101, which is a continuation-in-part of Ser. No. 508,570, Sep. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,705, Jan. 8, 1974, Pat. No. 3,880,633. This application Mar. 31, 1978, Ser. No. 892,375  
 The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.  
 Int. Cl.<sup>2</sup> H01L 31/06  
 U.S. Cl. 136—89 TF

1. A photovoltaic cell, comprising an electrically conductive substrate, a first layer containing CdS, a second layer of Cu<sub>x</sub>S superposed on said first layer and forming a photovoltaic heterojunction therewith, and an electrode contacting said second layer, said first layer containing a compound of a selected metal in an amount effective to provide at least a portion of said CdS in said first layer with an amorphous structure resistant to permeation by said Cu<sub>x</sub>S through said first layer to said electrically conductive substrate.

4,159,915  
**METHOD FOR FABRICATION VERTICAL NPN AND PNP STRUCTURES UTILIZING ION-IMPLANTATION**  
 Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia, Wappingers Falls, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
 Filed Oct. 25, 1977, Ser. No. 844,767  
 Int. Cl.<sup>2</sup> H01L 21/265, 21/74  
 U.S. Cl. 148—1.5



1. Method for fabricating vertical NPN and PNP structures on the same semiconductor body comprising: providing a P monocrystalline semiconductor substrate; forming a pattern of N regions in said substrate; growing an N epitaxial layer on the surface of said substrate having said N regions; forming isolated regions of monocrystalline semiconductor in said substrate having said epitaxial layer thereon wherein said N regions are within the isolated regions designated to have NPN and PNP devices formed therein; implanting a buried P emitter region in the PNP designated regions; simultaneously forming the P base region in the NPN designated regions and a P emitter reachthrough in the PNP designated regions; simultaneously forming an N reachthrough to the collector

region in the NPN regions and the N region under the PNP regions; simultaneously forming the N emitter region in the NPN regions, an N contact region to the collector reachthrough in the NPN regions, and N contact region to the N region under the PNP regions, and an N base contact region to the said N epitaxial layer in the PNP regions; forming a Schottky Barrier collector contact in the PNP regions; and forming electrical contacts to the NPN and PNP regions in said body, and to the N region under the PNP region for the junction isolation of the PNP structures from the rest of said semiconductor body.

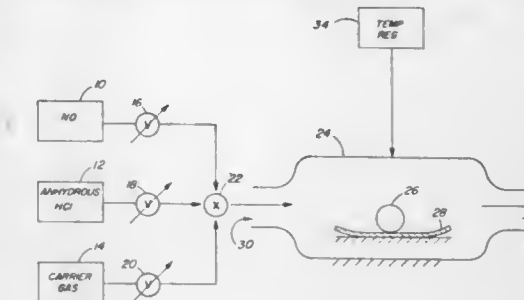
4,159,916  
**THERMAL MIGRATION OF FINE LINED CROSS-HATCHED PATTERNS**  
 Douglas E. Houston, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
 Filed Sep. 13, 1978, Ser. No. 941,922  
 Int. Cl.<sup>2</sup> H01L 21/225  
 U.S. Cl. 148—1.5

1. In the method of moving a melt of metal-rich semiconductor material in the configuration of at least two intersecting wire lines of no greater than 2 mils in width through a solid body of semiconductor material by thermal gradient zone melting processing comprising the steps of selecting a matrix body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one major surface having a preferred planar crystal structure orientation of (100), the vertical axis of the body being substantially aligned with a first axis of the crystal structure; preparing the surface having the preferred planar crystal structure orientation to accommodate one or more physical configurations of a layer of metal thereon; depositing a layer of a metal on the selected surface of the body of semiconductor material; heating the body and the metal to a temperature sufficient to form a melt of metal-rich material on the surface of the body; establishing a temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure; p1 migrating the metal-rich melt through the body along the first axis of the crystal structure to divide the body into a plurality of regions of first type conductivity and to form at least one array of regions of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one dopant impurity material therein to impart a second and opposite type conductivity and a selected level of resistivity thereto, then improvement in the method of processing which includes orienting the at least two intersecting wire lines in a preferred crystal axis direction which is parallel to <011> for one wire line and <011> for the other line, and establishing the unidirectional thermal gradient at from 2° to 10° off the crystal axis of migration.

4,159,917  
**METHOD FOR USE IN THE MANUFACTURE OF SEMICONDUCTOR DEVICES**  
 Ronald M. Gluck, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.  
 Filed May 27, 1977, Ser. No. 801,434  
 Int. Cl.<sup>2</sup> H01L 21/302, 7/34  
 U.S. Cl. 148—1.5

1. In a method for the manufacture of a silicon semiconductor device, said method comprising at least one step in which such device is exposed to a high-temperature gaseous environment, the improvement of gettering metallic gold and other impurities from the silicon of said device comprising the step of exposing said device for a period of less than ten minutes, prior

to said exposure to said gaseous environment, to an anhydrous cleaning gas mixture containing nitric oxide and hydrogen chloride together with a carrier gas of molecular nitrogen, said



cleaning gas mixture being in the temperature range of 850° C. to 1100° C., and being comprised of a gas mixture of at least four parts of molecular nitrogen to one part of the combination of nitric oxide and hydrogen chloride.

4,159,918  
**METHOD OF MANUFACTURING A COMPOUND STEEL MATERIAL OF A HIGH CORROSION RESISTANCE**  
 Ludwig von Bogdandy, Oberhausen-Sterkrade, and Hans Kosmider, Bremen, both of Fed. Rep. of Germany, assignors to Klöckner-Werke AG, Duisburg, Fed. Rep. of Germany  
 Filed Jul. 19, 1978, Ser. No. 926,142  
 Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732778  
 Int. Cl.<sup>2</sup> C21D 1/74

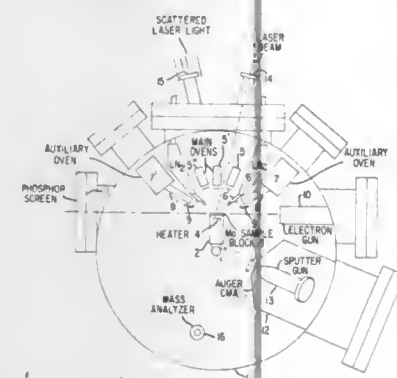
1. A method of manufacturing a compound steel material having at least one chromium steel coating layer, comprising the steps of alloying a carbon steel carrier material with a carbide and nitride forming substance; compounding the alloyed carrier material with a chromium steel material of normal carbon content; hot-rolling the compound steel material to a sheet; and increasing the corrosion resistance of the chromium steel material of the sheet to that of a superferritic material, including annealing the compound steel material at a temperature and for a time period sufficient for the carbon content of the ferritic chromium steel coating layer to be reduced to between 0.001 and 0.003%.

4,159,919  
**MOLECULAR BEAM EPITAXY USING PREMIXING**  
 James H. McFee, Colts Neck, and Barry I. Miller, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Jan. 16, 1978, Ser. No. 869,779  
 Int. Cl.<sup>2</sup> H01L 21/203  
 U.S. Cl. 148—175

1. A molecular beam epitaxy method of growing an epitaxial film of predetermined chemical composition comprising the steps of: loading a plurality of ovens with predetermined quantities of chemical feedstocks, preparing a substrate on a sample holder, evacuating said apparatus, heating said sample and said plurality of ovens to predetermined temperatures, and directing an atomic beam from each of said ovens at said substrate, whereby an epitaxial film is formed on said substrate from said atomic beams; characterized in that at least one of said plurality of ovens contains a mixture of independently adjustable quantities of two alloying elements in a first predetermined feedstock ratio and in that said first predetermined feedstock

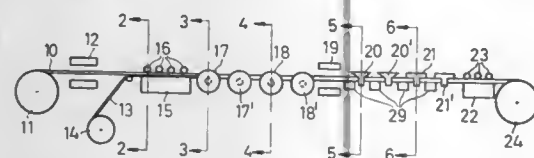


ratio is such that said atomic beam from said at least one oven contains said two alloying elements in a first predetermined flux ratio different from said first predetermined feedstock ratio.



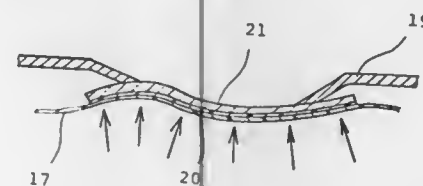
terminated flux ratio different from said first predetermined feedstock ratio.

**4,159,920**  
**METHOD FOR APPLICATION OF A TAPE OF INSULATING MATERIAL IN THE LONGITUDINAL DIRECTION OF A SUBSTANTIALLY RECTANGULAR ELECTRICAL CONDUCTOR**  
 Gunnar Andersson, and Gunnar Borgstrom, both of Vesteras, Sweden, assignors to ASEA Aktieföretag, Vesteras, Sweden  
 Filed Apr. 22, 1977, Ser. No. 789,836  
 Claims priority, application Sweden, Apr. 26, 1976, 7604759  
 Int. Cl.<sup>2</sup> H01B 13/10  
 U.S. Cl. 156—54 9 Claims



1. Method of applying a tape of insulating material provided with a heat-fixing binder to a substantially elongated rectangular electrical conductor in the longitudinal direction thereof in apparatus comprising a series of successively positioned operating stations, comprising the steps of:  
 heating the conductor at a heating station to fix said binder upon contact of said tape with said conductor;  
 contacting a tape portion with a first conductor side at a contacting station subsequent to said step of heating to fix said tape portion to said conductor;  
 subsequently successively contacting in turn the respective other tape portions with at least two other respective adjacent conductor sides at successively positioned contacting stations; and  
 conveying the conductor through said heating station, and conveying the conductor and tape through said contacting station, and said successively positioned contact stations.

**4,159,921**  
**METHOD OF CONNECTING AN ELEMENT HAVING MULTIPLE TERMINALS AND A MULTI-LEAD FLEXIBLE CONNECTOR**  
 Akio Inohara, Osaka; Koji Takahashi, Akashi, and Ryoji Inoue, Muro, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan  
 Continuation of Ser. No. 712,044, Aug. 6, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 870,041  
 Claims priority, application Japan, Aug. 6, 1975, 50-96102  
 Int. Cl.<sup>2</sup> B29C 27/02; B32B 31/26  
 U.S. Cl. 156—272 8 Claims



1. A method for electrically connecting two substrates at least one of which is flexible comprising the steps of: superimposing a first flexible substrate onto a second substrate in such a manner that electrode patterns formed on both substrates confront each other;  
 supporting the two substrates on one surface of a flexible film in such a manner that the first flexible substrate is sandwiched between the second substrate and the film surface;  
 applying a predetermined gas pressure to the other surface of the film while retaining said substrates against said film by pressure along a peripheral portion only of said second substrate; and  
 applying heat energy to the substrates to connect said electrode patterns.

**4,159,922**  
**ACCELERATED PROCESS FOR CAUSTICIZATION OF KRAFT GREEN LIQUOR**  
 David R. Cosper, Downers Grove, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.  
 Filed Oct. 12, 1978, Ser. No. 950,767  
 Int. Cl.<sup>2</sup> D21C 11/04  
 U.S. Cl. 162—30 K 5 Claims

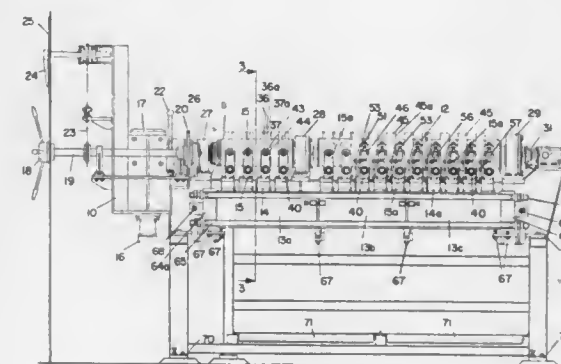
1. In the causticization conversion process of Kraft green liquor to white liquor by the reaction of calcium hydroxide and sodium carbonate yielding sodium hydroxide and calcium carbonate, the improvement which comprises using as an additive reagent to increase the causticization conversion of the Kraft green liquor one member of the group selected from nitrilotris(methylenephosphonic acid), 2-phosphonobutane-1,2,4-tricarboxylic acid, and hexamethylenediaminetetrakis(methylenephosphonic acid) in a dosage of 0.5–2.0 weight percent based on calcium carbonate (theoretical).

**4,159,923**  
**KINETIC ASSAY FOR INORGANIC PHOSPHATES AND COMPOSITION THEREFOR**  
 Kenneth J. Pierre; Ker-Kong Tung, and Henriette Nadj, all of Vista, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.  
 Division of Ser. No. 758,518, Jan. 11, 1977, Pat. No. 4,097,336, which is a continuation-in-part of Ser. No. 657,976, Feb. 13, 1976, Pat. No. 4,036,697. This application Dec. 12, 1977, Ser. No. 859,412  
 Int. Cl.<sup>2</sup> G01N 31/14, 33/16  
 U.S. Cl. 435—15 18 Claims

1. A reagent system for an inorganic phosphate assay comprising:

(a) maltose;  
 (b) maltose phosphorylase;  
 (c) a co-enzyme selected from a group consisting of beta-nicotinamide-adenine dinucleotide, beta-nicotinamide-adenine dinucleotide phosphate, and mixtures thereof;  
 (d) glucose-6-phosphate dehydrogenase;  
 (e) beta-D-phosphoglucosaminase; wherein the above are present in amounts such that the inorganic phosphate to be assayed is the limiting component, and  
 (f) a non-phosphate buffer having a pH of from about 6 to about 8.  
 13. An inorganic phosphate assay comprising:  
 (a) performing coupled reactions, at a pH of from about 6 to about 8, which comprise:  
 (i) reacting maltose with an inorganic phosphate specimen in the presence of maltose phosphorylase to form glucose and beta-D-glucose-1-phosphate;  
 (ii) reacting beta-D-glucose-1-phosphate in the presence of beta-D-phosphoglucosaminase to form glucose-6-phosphate; and  
 (iii) reacting glucose-6-phosphate in the presence of glucose-6-phosphate dehydrogenase and a co-enzyme selected from a group consisting of beta-nicotinamide-adenine dinucleotide, beta-nicotinamide-adenine dinucleotide phosphate and mixtures thereof to form the reduced form of said co-enzyme and 6-phosphogluconate; and  
 (b) measuring the production of said reduced co-enzyme, wherein the inorganic phosphate being measured is the limiting component and wherein a non-phosphate buffer is used to control said pH.

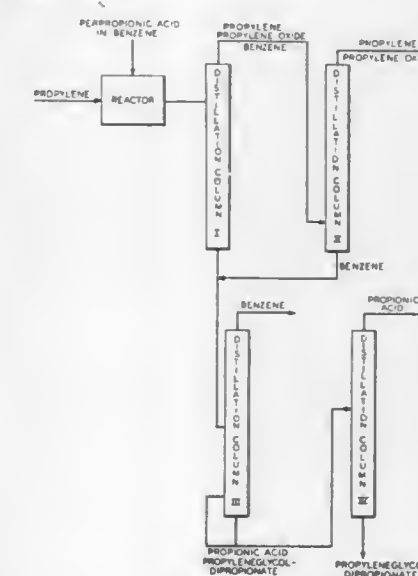
**4,159,924**  
**COMBINED CONTROL DEVICE FOR THE OPERATION OF COKE OVEN BATTERIES TO EFFECT SWITCHING OF THE REGENERATIVE HEATING SYSTEM FROM ONE GROUP OF FLUES TO ANOTHER AND FOR CONVERTING FROM ONE HEATING GAS TO ANOTHER**  
 Otto Lemke, Recklinghausen, and Manfred Krause, Herten-Langebochum, both of Fed. Rep. of Germany, assignors to Firma Carl Still Recklinghausen, Fed. Rep. of Germany  
 Filed Aug. 15, 1977, Ser. No. 824,697  
 Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637314  
 Int. Cl.<sup>2</sup> C10B 5/16, 21/14, 21/06  
 U.S. Cl. 202—142 9 Claims



1. A combined control device for the operation of coke oven batteries, including both a part for converting from heating from a strong gas to a lean gas, and vice versa, and a second part for switching the regenerative heating system from one group of heating flues to another, comprising a support frame, a single rotary switching control cylinder rotatably mounted on said frame, a rotary conversion control cylinder rotatably mounted on said frame alongside, and concentric with, said switching control cylinder, means mounting said rotary conversion control cylinder for both rotation and axial displacement into and out of engagement with said rotary switching

control cylinder, said rotary conversion control cylinder being rotatable with said rotary switching control cylinder when they are interengaged, coupling means for coupling said rotary conversion control cylinder and said rotary switching control cylinder together for combined rotation together, drive means driving at least one of said rotary switching control cylinder and said rotary conversion control cylinder, a plurality of axially spaced, circumferentially arranged cams on said rotary switching control cylinder and said rotary conversion control cylinder a plurality of switching valves for the switching of the regenerative heating system from one group of heating flues to the other arranged in spaced axial location in respect to and alongside of said rotary switching control cylinder in lateral alignment with and of a number corresponding to said cams on said rotary switching control cylinder, a plurality of converting operation valves arranged in spaced axial relationship in respect to and alongside said rotary conversion control cylinder in lateral alignment with and of a number corresponding to said cams on said rotary conversion control cylinder, follower means mounted on said frame engaged with lateral surfaces of respective ones of said cams on said rotary switching control cylinder and with said switching valves for selectively operating said switching valves and engaged with lateral surfaces of respective cams on said rotary conversion control cylinder and with said converting operation valves for selectively operating said converting operation valves.

**4,159,925**  
**PROCESS FOR ISOLATING PROPYLENE GLYCOL DIESTERS IN THE PREPARATION OF PROPYLENE OXIDE**  
 Gerd Schreyer; Rolf Wirthwein, both of Hanau; Karl-Hermann Reissinger, Leverkusen, and Jörg Krekel, Essen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of, Fed. Rep. of Germany  
 Continuation of Ser. No. 678,827, Apr. 28, 1976, abandoned.  
 This application Dec. 9, 1977, Ser. No. 858,319  
 Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519291  
 Int. Cl.<sup>2</sup> B01D 3/14; C07D 301/02  
 U.S. Cl. 203—28 10 Claims



1. In a process for the production of propylene oxide wherein propylene is contacted with percarboxylic acid in an organic solvent to produce a reaction mixture comprising, in the solvent, 1–50 weight percent of propylene oxide and 1–50 weight percent of the carboxylic acid corresponding to the percarboxylic acid, propylene, and as by-product, up to 25 mol percent based upon the amount of propylene oxide of a mixture

of propylene glycol, propylene glycol monocarboxylate and propylene glycol dicarboxylate, the carboxylate group of the by-product being of said carboxylic acid, said solvent being present in an amount of 20 to 90 weight percent, the boiling point of the solvent being lower than that of the carboxylic acid and higher than of propylene oxide, distilling the reaction mixture in a first distillation zone into an overhead fraction rich in propylene oxide and propylene and a bottoms fraction rich in the carboxylic acid, the by-product, and the solvent, the improvement which comprises, for the recovery of the by-product as propylene glycol dicarboxylate, in a second distillation zone, distilling the bottoms fraction at a pressure of 1.5-6 bars, a sump temperature of 130°-250° C., a reflux ratio of 0.2-10 and an average sump residence time of 10-90 minutes to form propylene glycol dicarboxylate and taking overhead a fraction rich in the solvent and a bottoms fraction rich in the carboxylic acid and the so-formed propylene glycol dicarboxylate virtually only propylene glycol dicarboxylate is formed under said distillation conditions and recovering propylene glycol dicarboxylate from the bottoms fraction of the second distillation zone.

4,159,926

## NICKEL PLATING

Clive Barnes, and John J. B. Ward, both of Wantage, England, assignors to BNF Metals Technology Centre, England  
Filed Nov. 30, 1977, Ser. No. 856,158  
Claims priority, application United Kingdom, Dec. 3, 1976, 50607/76

Int. Cl.<sup>2</sup> C25D 3/12

U.S. Cl. 204-49

7 Claims

1. A method of electrodepositing nickel on an object having a metallic surface, which method comprises providing a nickel electroplating bath consisting essentially of, in aqueous solution at a pH of from 4.0 - 6.5:

Constituent	Molar Concentration
Nickel ions	at least 0.25
Chloride	at least 0.25
Sulphate (optional)	less than 0.25

and a weak complexant for the nickel selected from citrate, glutamate, anions and lactones of polyhydroxy C5 and C6 acids, and anions and lactones of acids having the formula



where

X is OH or NH<sub>2</sub> and

n is 1 to 5, present at a Molar concentration of from 1.0 to 4.0 times that of the nickel, providing the object as the cathode to be plated in the bath, and an anode, and passing an electric current between the anode and the cathode.

4,159,927

## ANODIZING ALUMINUM IN BORIC ACID BATH CONTAINING HYDROXY ORGANIC ACID

Walter J. Bernard, and John J. Randall, Jr., both of Williams-town, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jun. 27, 1977, Ser. No. 810,130

The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.

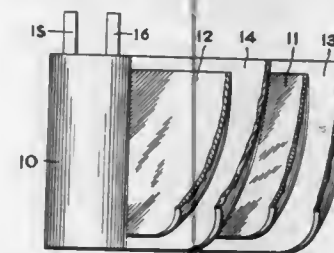
Int. Cl.<sup>2</sup> C25D 11/10, 11/08

U.S. Cl. 204-58

9 Claims

1. A process for producing an aluminum electrolytic capacitor anode having thereon a dielectric barrier oxide layer modified by the incorporation therein of no more than 1% of carbonaceous material calculated as carbon, including the step of producing said modified barrier layer by carrying out the usual anodization step on etched foil in a conventional boric acid electrolyte containing  $5 \times 10^{-5}$  to  $1.5 \times 10^{-2}$

mols/liter of an additive chosen from the group consisting of alpha- and ortho- hydroxycarboxylic acids containing two through seven carbon atoms and salts of these acids, thus producing said layer modified by the incorporation



therein of no more than 1% carbonaceous material calculated as carbon, and subsequently processing the anode in the usual manner and assembling it in an electrolytic capacitor.

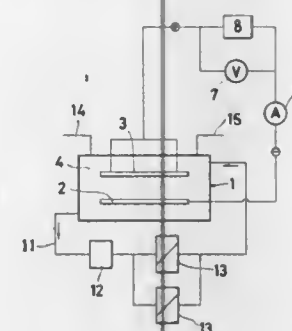
4,159,928

## PROCESS FOR PRODUCTION OF ALUMINUM

Yoshihige Tsumura, Tokyo, Japan, assignor to Mitsui Aluminium Co., Ltd., Tokyo, Japan  
Division of Ser. No. 798,457, May 19, 1977, Pat. No. 4,108,741.  
This application Apr. 24, 1978, Ser. No. 899,460  
Int. Cl.<sup>2</sup> C25C 3/06; C25D 1/00

U.S. Cl. 204-67

7 Claims



1. A process for the production of aluminum by low-temperature electrolysis of aluminum chloride, which process comprises: a first step of:

electrolyzing in an electrolytic cell an electrolytic bath containing not less than 50% by weight of aluminum chloride, from 0 to 30% by weight of potassium chloride and from 10 to 40% by weight of sodium chloride while using as the anode one member selected from the group consisting of a tungsten plate, a silicon carbide plate and an aluminum plate and causing the current density for the anode to fall in the range of from 0.5 A/dm<sup>2</sup> to 200 A/dm<sup>2</sup>, the current density for the cathode to fall in the range of from 0.5 A/dm<sup>2</sup> to 200 A/dm<sup>2</sup>, the bath temperature to fall in the range of from 120° C. to 250° C. and cell voltage in the range of from 2.7 V to 11.4 V and, at the same time,

circulating the bath by causing it to flow out of the electrolytic cell, then to pass through a filter to thereby separate filter residue therefrom and subsequently to flow into the cell,

so as to reduce aluminum on the cathode by the electrolysis and cause the reduced aluminum to be split from the cathode by the shocks of the outflow of the bath from and the inflow of the bath into the cell and to form in the bath a muddy substance to be filtered by the filter and collected as filter residue in the circulation of the bath; and a second step of melting the collected filter residue to give rise to an alumi-

num phase and a fusion flag phase and isolating the aluminum phase.

4,159,929

## CHEMICAL AND ELECTRO-CHEMICAL PROCESS FOR PRODUCTION OF ALKALI METAL CHLORATES

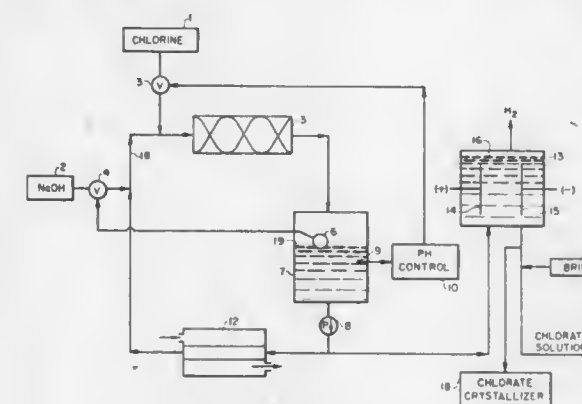
Morris P. Grotheer, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 17, 1978, Ser. No. 906,796

Int. Cl.<sup>2</sup> C25B 1/14, 1/26

U.S. Cl. 204-95

13 Claims



1. A continuous process for the preparation of alkali metal chlorate-containing solutions which comprises (I) preparation of a reaction product (c) comprising an aqueous solution of an alkali metal chloride, alkali metal chlorate and alkali metal hypochlorite, said reaction product (c) prepared by mixing and chemically reacting (a) a solution comprising alkali metal hydroxide and (b) chlorine in an amount sufficient to maintain the pH of the reaction mixture at about 5 to 7.5 without further dilution and acidification during the process and to promote conversion of the alkali metal hypochlorite to alkali metal chlorate, the reactant (a) being prepared by diluting the alkali metal hydroxide with at least a portion of reaction product (c), and (II) electrolyzing at least a portion of reaction product (c) in an electrolysis cell for preparation of a solution having at least 335 grams per liter alkali metal chlorate and at least 100 grams per liter alkali metal chloride.

4,159,930

## PROCESS FOR RECOVERING HEAVY METAL IONS FROM DILUTE AQUEOUS SOLUTION

David J. Degenkolb, Granada Hills, and Fred J. Scobey, Hollywood, both of Calif., assignors to De Luxe General, Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 826,571, Aug. 22, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,839

Int. Cl.<sup>2</sup> C01G 5/00; C25C 1/20; C01G 37/14, 49/00

U.S. Cl. 204-111

16 Claims

1. The process of recovering an anionic complex ion selected from the group consisting of silver as thiosulfate; iron as ferricyanide, iron as ferrocyanide, and chromium as dichromate from a dilute aqueous solution having a concentration of said ion within the range of 0.04 and 25 parts per million in the presence of thiosulfate ion at a concentration in excess of 30 to 1 with respect to the concentration of said anionic complex ion, that comprises the process steps of;

- flowing said solution into contact with an anion ion exchange resin selected from the group consisting of a cross-linked polystyrene resin with quaternary ammonium functional groups, an epoxy-amine, a polyacrylic, and a polyfunctional amine phenolic resin,
- flowing the effluent of said solution from said resin,
- subsequently flowing into contact with said resin a concentrated solution in excess of 17% concentration of a compound selected from the group consisting of ammonium chloride, sodium chloride, sodium bromide, sodium

iodide, sodium thiosulfate and ammonium thiosulfate at a pH in excess of 7 to recover the said anionic ion from said resin, and

(d) isolating the said anionic ion from said concentrated solution of a compound as a solid.

16. The process of recovering a silver as thiosulfate anionic complex ion from a dilute aqueous solution having a concentration of said ion within the range of 0.04 and 25 parts per million in the presence of thiosulfate ion at a concentration in excess of 30 to 1 with respect to the concentration of said anionic complex ion, that comprises the process steps of;

- flowing said solution into contact with an anion ion exchange resin selected from the group consisting of a cross-linked polystyrene resin with quaternary ammonium functional groups, an epoxy-amine, a polyacrylic, and a polyfunctional amine phenolic resin,
- flowing the effluent of said solution from said resin,
- subsequently flowing into contact with said resin a concentrated solution in excess of 17% concentration of a compound selected from the group consisting of ammonium chloride, sodium chloride, sodium bromide, sodium iodide, sodium thiosulfate and ammonium thiosulfate at a pH in excess of 7 to recover the said anionic ion from said resin, and
- electroplating out metallic silver from said concentrated solution after flowing the same from said resin.

4,159,931

## COLOR-TELEVISION SCREEN-COATING ROOM

Uwe Viobl, Aichwald, and Rolf Zondler, Stuttgart-Neugereut, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

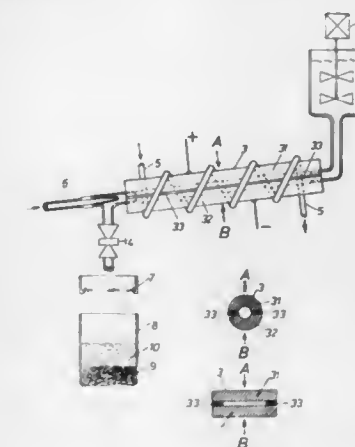
Filed May 1, 1978, Ser. No. 901,369

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720668

Int. Cl.<sup>2</sup> C25C 1/00; C02C 5/12

U.S. Cl. 204-152

6 Claims



1. A method of separating a red rare-earth phosphor of a color-television picture tube from the sediment in the drain channels of a screen-coating room, which sediment contains, in addition to various impurities, zinc-sulfide-base and zinc-cadmium-sulfide-base green and blue phosphors, characterized by the following steps:

- removing coarse foreign matter by sieving;
- washing out constituents soluble in water, such as polyvinyl alcohol, ammonium bichromate, etc.;
- heating to approximately 450° C., thus volatilizing further organic constituents;
- cooling down and pulverizing;
- stirring into an aqueous ammonium-halide solution;
- electrolysis during passage between graphite electrodes;
- filtering off sulphur and cathode deposit;



- h. collecting in a tank, allowing solid constituents to deposit, and decanting the liquid;  
i. optionally repeating the steps (c) to (h), and  
k. carrying out one of the known methods of regenerating only slightly contaminated rare-earth phosphors.

**4,159,932**  
**PROCESS FOR ACTIVATING CHITIN BY MICROWAVE TREATMENT AND IMPROVED ACTIVATED CHITIN PRODUCT**

Quintin P. Peniston, Rte. 7, Box 7710, Bainbridge Island, Wash. 98110, and Edwin L. Johnson, Rte. 5, Box 4246, Issaquah, Wash. 98027

Filed Jan. 3, 1978, Ser. No. 866,792

Int. Cl.<sup>2</sup> B01J 1/10

U.S. Cl. 204—158 R

7 Claims

1. A process for enhancement of the reactivity of chitin, that comprises, conditioning the chitin with one of water or a strong alkali mixable with the chitin, and radiating the conditioned chitin with microwave energy.

**4,159,933**  
**SAMPLE CONCENTRATOR**

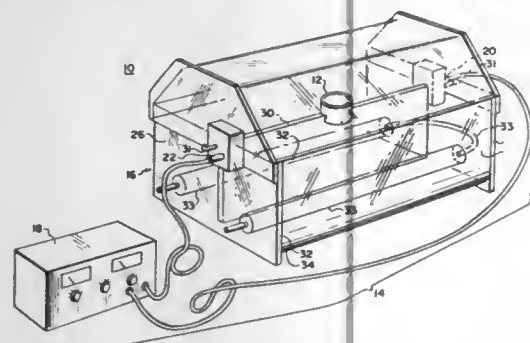
William B. Allington, deceased, late of Lincoln, Nebr. (by Richard T. Emery, executor); James W. Nelson, Lincoln, Nebr.; Arthur L. Cordry, Lincoln, Nebr.; Gail A. McCullough, Lincoln, Nebr., and Don E. Mitchell, Lincoln, Nebr., assignors to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Mar. 25, 1977, Ser. No. 781,176

Int. Cl.<sup>2</sup> G01N 27/40, 27/26, 27/28

U.S. Cl. 204—180 R

9 Claims



1. A method of removing at least one molecular species from a sample, comprising the steps of:  
moving the sample to a first location;  
transporting said one molecular species to a second location spaced from the first location on a first side of a membrane having pores sufficiently small to hold said molecular species;  
said step of transporting said one molecular species including the steps of establishing an electrical field between said first location and a third location spaced a greater distance from said first side of said membrane than said first location and establishing a path for ion flow between the third location and the second side of said membrane, whereby the one molecular species is moved by electrophoresis from the sample to a position against the first side of the membrane;  
removing at least a portion of the first molecular species from the first side of the membrane;  
the step of transporting said one molecular species to a second location including the step of transporting said one molecular species to a second location spaced from the first location on a first side of a first membrane;  
said step of moving the sample to a first location including the step of placing said sample on a first side of a second membrane; and  
the step of establishing an electrical field between the first location and a third location including the step of estab-

lishing an electrical potential between the second side of the second membrane and the second side of the first membrane.

**4,159,934**  
**SELECTIVE PLATING BRUSH APPLICATOR**

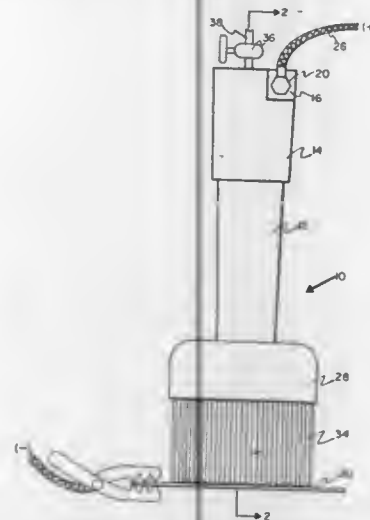
Igor V. Kadija, 1210 Davis Dr., NW., Cleveland, Tenn. 37311

Filed Dec. 5, 1977, Ser. No. 857,320

Int. Cl.<sup>2</sup> C25D 17/14, 17/00

U.S. Cl. 204—224 R

9 Claims



1. A selective plating brush applicator comprising:  
(a) an electrically conducting core;  
(b) a holding means attached to one end of the core for holding the plating brush;  
(c) a plating current application means attached to the core for applying a plating current to the core;  
(d) a brush head attached to the other end of the core for applying a selective plating solution to a workpiece, wherein the brush head is comprised of anodic electrically conducting flexible fibers and electrically non-conducting fibers, wherein the non-conducting fibers are attached to the ends of the conducting fibers, and the conducting fibers are conductively attached to the core, wherein the conducting and non-conducting fibers are positioned in the brush head in such a manner that when the plating brush is used to apply the plating solution to the workpiece the conducting fibers do not come in contact with the workpiece; and  
(e) a plating solution supply means for supplying the plating solution to the brush head;  
whereby when the brush head is placed in contact with the workpiece, plating current applied to the conducting core and workpiece and plating solution supplied to the brush head, the workpiece is selectively plated.

**4,159,935**  
**CONVERSION OF HYDROCARBONACEOUS BLACK OILS**

Norman H. Scott, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 30, 1978, Ser. No. 938,183

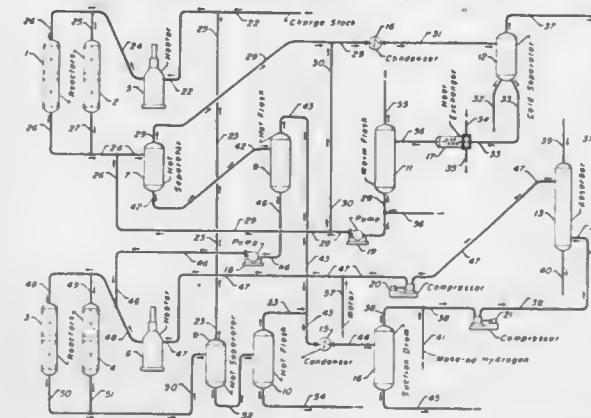
Int. Cl.<sup>2</sup> C10G 37/02, 37/06

U.S. Cl. 208—59

12 Claims

1. A process for the conversion of a black oil charge stock, of which at least 10.0% by volume boils above about 1050° F., which process comprises the sequential steps of:  
(a) reacting said charge stock and hydrogen, in a first catalytic reactor system, at a temperature above about 700° F. and a pressure greater than about 1000 psig.;  
(b) separating the resulting first reaction product effluent, in

- a first separation zone, under substantially the same pressure and a temperature not substantially exceeding 750° F., to provide a first vaporous phase and a first liquid phase;  
(c) cooling said first vaporous phase to a temperature in the range of about 50° F. to about 150° F., and separating the cooled vaporous phase, in a second separation zone at substantially the same pressure as said first separation zone, to provide (i) a hydrogen-rich second vaporous phase and, (ii) a methane-containing second liquid phase;  
(d) increasing the temperature of said second liquid phase, and separating the heated liquid phase, in a third separation zone at a substantially reduced pressure, said temperature and pressure being selected to provide (i) a third



- liquid phase and, (ii) a third vaporous phase containing at least about 70.0% of the methane contained in said second liquid phase;  
(e) admixing a first portion of said third liquid phase with said first vaporous phase and a second portion with said first reaction product effluent;  
(f) separating said first liquid phase at substantially the same temperature, in a fourth separation zone under a substantially reduced pressure below about 1000 psig., to provide (i) a fourth liquid phase and, (ii) a fourth vaporous phase; and  
(g) further reacting said fourth liquid phase with hydrogen, in a second catalytic reactor system at an increased pressure above about 1000 psig.

**4,159,936**  
**PROCESS FOR HYDROGENIZED RECONDITIONING OF CRUDE OIL OR RESIDUES DERIVED THEREFROM INTO SATURATED LIGHT HYDROCARBONS**

Rainer Dorn, Bräuningshof; Christian Koch; Kurt Reiter, both of Erlangeo, and Konrad Künstle, Röttenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,110

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2645132

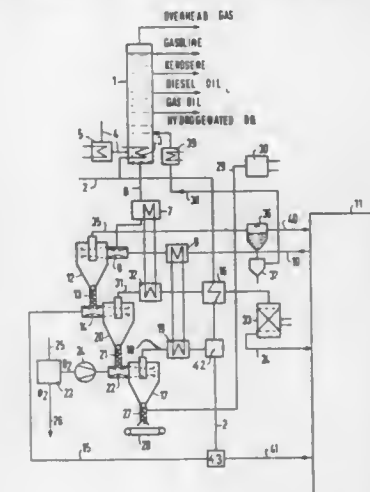
Int. Cl.<sup>2</sup> C10G 13/00, 37/00

U.S. Cl. 208—93

4 Claims

1. A process for the refining of petroleum which comprises subjecting crude petroleum to fractional distillation in a distillation zone under substantially atmospheric pressure to separate the crude oil into more volatile fractions and less volatile distillate bottoms, maintaining a sufficiently low temperature in the distillation zone to cause the distillate bottoms to separate in a fraction of at least 50% of the crude oil, passing the distillate bottoms into a first reaction zone into which is also introduced hydrogen at a temperature above 700° C. in intimate contact with the distillate bottoms to hydrogenate the distillate bottoms to a major amount of substantially saturated normally liquid hydrocarbons with the concomitant production of a lesser amount of solid carbonaceous material, and minor amounts of noncondensable components including nor-

mally gaseous hydrocarbons and unreacted hydrogen, separating the solid carbonaceous material from the remaining reaction products of hydrogenated oil and noncondensable components, passing the separated solid carbonaceous material into a second reaction zone in intimate contact with a mixture, at a temperature in excess of 750° C., of steam, gaseous hydrocarbons having less than 3 carbon atoms, and the gaseous combustion products of a third separator containing CO<sub>2</sub>, O<sub>2</sub> and CO, to produce as reaction products a reduced amount of solid carbonaceous material, consumption of the O<sub>2</sub>, reduction in H<sub>2</sub>O content, with production of H<sub>2</sub> and increased amounts of CO and CO<sub>2</sub>, separating the remaining solid carbonaceous material from the reaction products of the second reaction zone, passing said remaining carbonaceous material into a third reaction zone into which is introduced excess oxygen to effect substantially complete combustion of the carbonaceous mate-



rial to produce gaseous combustion products containing CO<sub>2</sub>, O<sub>2</sub> and CO and a solid residue containing unburned material and ash, separating in said third separator the gaseous combustion products from the solid residue containing unburned material and ash, passing the separated gaseous combustion products into said second reaction zone, extracting heat from the reaction products of the second reaction zone separated from the carbonaceous material to superheat said steam entering the second reaction zone and to preheat the distillate bottoms prior to entrance into the first reaction zone, cooling the separated reaction products of hydrogenated oil and noncondensable components to condense the hydrogenated oil, separating the hydrogenated oil condensate from the noncondensable components, and returning the hydrogenated oil condensate to the distillation zone for fractional distillation into fractions of different volatility.

**4,159,937**  
**MIXED-PHASE REACTION PRODUCT EFFLUENT SEPARATION PROCESS**

Norman H. Scott, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 30, 1978, Ser. No. 938,182

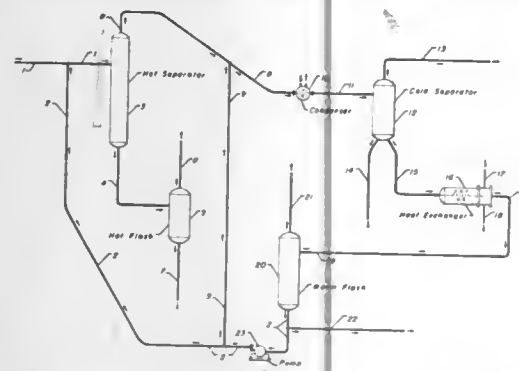
Int. Cl.<sup>2</sup> C10G 37/06, 37/02

U.S. Cl. 208—104

8 Claims

1. A process for separating a mixed-phase hydrocarbonaceous reaction product effluent, said product effluent (1) resulting from the conversion of a hydrocarbon charge stock boiling above a temperature of about 400° F. and, (2) containing hydrogen to be recycled to the conversion zone, normally liquid hydrocarbons and normally vaporous hydrocarbons, which separation process comprises the sequential steps of:  
(a) separating said product effluent, in a first separation zone at substantially the same pressure as said effluent, to provide (i) a first liquid phase and, (ii) a first vaporous phase;  
(b) cooling said first vaporous phase to a temperature in the

range of about 50° F. to about 150° F., and separating the cooled vaporous phase, in a second separation zone at substantially the same pressure as said first separation zone, to provide (i) a hydrogen-rich second vaporous phase and, (ii) a methane-containing second liquid phase; (c) increasing the temperature of said second liquid phase, and separating the heated liquid phase, in a third separa-



tion zone at a substantially reduced pressure, said temperature and pressure being selected to provide (i) a third liquid phase and, (ii) a third vaporous phase containing at least about 70.0% of the methane in said second liquid phase; and, (d) admixing at least a portion of said third liquid phase with said first vaporous phase.

4,159,938

#### START-UP PROCEDURE FOR REFORMING WITH PLATINUM-IRIDIUM CATALYSTS

William B. Lewis, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.  
Filed Dec. 23, 1977, Ser. No. 863,865

Int. Cl.<sup>2</sup> C10G 35/08

U.S. Cl. 208—139

18 Claims

1. In a process for catalytically reforming a hydrocarbon feed boiling within the gasoline range by contacting said feed at reforming conditions with a bed of catalyst comprised of platinum, iridium and halide components composited with inorganic oxide, the improvement which comprises contacting and pretreating said catalyst at temperatures ranging from about 600° F. to about 1000° F., prior to contact of said hydrocarbon feed with said catalyst, with hydrogen, to reduce the platinum and iridium components, equilibrating and wetting said catalyst with water, and maintaining said catalyst in wetted condition throughout said pretreatment while adding an admixture comprised of water, halogen, and hydrogen sulfide, and thereafter introducing said hydrocarbon feed into contact with said catalyst at reforming conditions to initiate the catalytic reforming reaction.

4,159,939

#### HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application May 26, 1978, Ser. No. 910,301

Int. Cl.<sup>2</sup> C10G 35/08

U.S. Cl. 208—139

21 Claims

1. A catalytic process for conversion of a hydrocarbon which comprises contacting said hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective

amounts of a platinum group component, which is maintained in the elemental metallic state, and of a tantalum component.

4,159,940

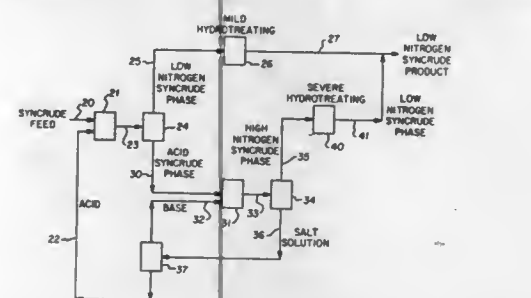
#### DENITROGENATION OF SYNCRUDE

Robert H. Smith, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 803,834, Jun. 6, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,765  
Int. Cl.<sup>2</sup> C10G 23/00, 17/06

U.S. Cl. 208—254 H

5 Claims



1. A method for reducing the nitrogen content of a syncrude feed obtained from at least one of oil shale, tar sands, and coal, comprising mixing at least one acid selected from the group consisting of sulfuric, phosphoric, and hydrochloric with said feed, settling said mixture to form a first phase composed of a syncrude low in nitrogen and a second phase composed of acid and a syncrude high in nitrogen, separating said first and second phases from each other, neutralizing said second phase with a base to form a salt with the acid in said second phase, settling said neutralized second phase to form a high nitrogen syncrude phase and a salt solution, separating said salt solution from said high nitrogen syncrude phase, and catalytically hydrotreating said high nitrogen syncrude phase to remove nitrogen and produce a product composed of syncrude low in nitrogen, said first phase and said product containing at least 20 percent by weight lower nitrogen concentration than said high nitrogen syncrude phase.

4,159,941

#### SEPARATOR

Hugh E. Avery, Jr., Houston, Tex., assignor to Allied Industries, Inc., Houston, Tex.

Continuation of Ser. No. 688,678, May 21, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 848,028

Int. Cl.<sup>2</sup> B07B 7/04

U.S. Cl. 209—3

3 Claims

1. Apparatus for separating a pellet-like product from fines mixed therewith, comprising: a substantially symmetrical housing having a vertical axis of symmetry, an upper fines outlet, a lower product outlet, and an intermediate cylindrical portion, an inlet conduit for receiving quantities of said product and fines, along with a pressurized propellant fluid, said inlet extending into said cylindrical housing portion and having an upwardly facing inlet nozzle intermediate said fines outlet and said product outlet, an imperforate conical impact baffle supported within said housing and having a concave impact surface facing said inlet nozzle spaced apart from said inlet nozzle to allow vertical entry of said product and fines and located to intercept substantially the entirety of said product issuing from said inlet nozzle, said impact baffle having an axis of symmetry coincident with the vertical axis of symmetry of said housing, said impact baffle sized to define with said cylindrical housing portion an annular flow orifice for said propellant fluid between said baffle and said housing, a second conical baffle supported in said housing above said

impact baffle aligned with said cylindrical housing portion and tapered in an upward direction to define, with said cylindrical housing portion, an annular flow conduit having a conduit cross section that gradually increases in area in a direction away from, and that communicates with, said annular flow orifice, said baffles supported with their circumferences substantially aligned at the annular flow orifice, a valve means for controlling the exit velocity of said fines and propellant fluid through said fines outlet, said valve



means including an inwardly tapering portion of said housing adjacent said fines outlet and an imperforate body within said housing having an exterior surface shaped to substantially match the shape of the tapering housing portion, rod means extending from the second baffle to the valve means for supporting the imperforate body, and means for moving said body to adjust the annular gap between said body and said tapering housing portion while also supporting said body; and a wash air inlet in the wall of said housing intermediate said impact baffle and said product outlet.

4,159,942

#### METHOD AND APPARATUS FOR SEPARATING PARTICLES

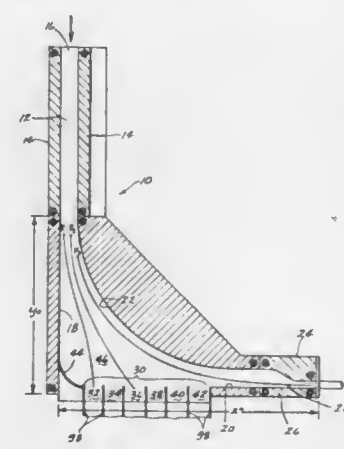
Raymond T. Greer; Kenneth G. McConnell, and Arthur Akers, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Sep. 22, 1977, Ser. No. 835,502

Int. Cl.<sup>2</sup> B07B 7/08, 11/04

U.S. Cl. 209—143

17 Claims



1. Apparatus for separating by density a plurality of particles

which are dispersed in a fluid stream, said apparatus comprising:

- a housing having a plurality of walls defining a separation chamber, said housing having spaced apart inlet and outlet openings for permitting said fluid stream to enter into said chamber and exit from said chamber respectively; said outlet opening being in communication with an outlet passageway;
- an elongated inlet passageway connected to said inlet opening for introducing said fluid stream into said chamber in a first line of direction of fluid flow;
- said outlet opening being located laterally from said first line of direction of fluid flow whereby said fluid stream changes direction as it passes through said chamber and out through said outlet opening;
- said housing having a collector wall defining one boundary of said chamber, said collector wall being spaced from said inlet opening and extending transversely to said first line of direction;
- said housing having a curved wall defining another boundary of said chamber and extending from said inlet opening to said outlet opening;
- a collector movably mounted to said collector wall for movement in a direction transverse to said first line of direction of fluid flow, said collector being adapted to capture and carry away particles which strike said collector;
- power means connected to said collector for causing selective movement of said collector to a plurality of positions along a line transverse to said first line of direction of fluid flow; and
- velocity sensing means within said chamber for sensing the velocity of said fluid stream, control means connected to said sensing means and said power means and being responsive to varying velocities of said fluid stream for causing said power means to selectively move said collector to a plurality of preselected positions each of which corresponds to a different fluid velocity.

4,159,943

#### FROTH FLOTATION OF ORES USING HYDROCARBYL BICARBONATES

Vojislav Petrovich, 1935 W. Schiller St., Chicago, Ill. 60622  
Filed Feb. 16, 1978, Ser. No. 878,385

Int. Cl.<sup>2</sup> B03D 1/02

U.S. Cl. 209—166

3 Claims

1. A method of beneficiating ores selected from the group of earth alkaline metal carbonates and sulfates of magnesium, calcium, strontium, and barium, also ores selected from the group of base metal carbonates, silicates, sulfates, sulfides, of copper, silver, lead, and zinc, as well as ores selected from the group of heavy metal oxides, carbonates, sulfides, arsenides of nickel, cobalt, oxides, carbonates of iron, and manganese by froth flotation process to produce a froth concentrate of desired metal value leaving gangue minerals, such as silica and the aluminosilicates in tailing which comprises; effecting the froth flotation of the said metallic ores and nonmetallic minerals by means of alkali or ammonium salts of alkyl, alkaryl, aralkyl, aryl, cyclo, cycloalkyl bicarbonates or di-bicarbonates as promoter-collectors, which make collecting and floating the desired metal values at a pH value of the flotation circuit from 6 to 8; said hydrocarbyl bicarbonates forming mineral-hydrocarbon complexes which form bubbles provided by agitating the pulp of mineral slurry in the presence of air; and recovering a froth concentrate relatively rich in the desired metal value, leaving tailing relatively poor in the desired metal value.



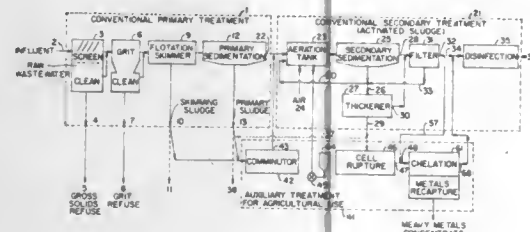
4,159,944

**WASTEWATER ENERGY RECYCLING METHOD**  
Lennart G. Erickson, 1070 E. Meadow Cir., Palo Alto, Calif. 94303, and Howard E. Worne, Lyon Industrial Pk., Rte. 73, Berlin, N.J. 08009

Filed Feb. 13, 1978, Ser. No. 877,195  
Int. Cl.<sup>2</sup> C02C 1/06

U.S. Cl. 210—6

9 Claims



1. In the processing of wastewater by primary and secondary treatments, which includes a biochemical reaction according to the activated sludge process wherein the wastewater is separated into a sludge component and a clarified effluent, the improvement for salvaging and recycling the valuable components thereof comprising: comminuting primary sludge separated from said primary treatment and adding the comminuted mass to the organic input for said secondary treatment, subjecting sludge separated from the biochemical reaction of said secondary treatment to sufficient pressure to substantially rupture all of the walls of cells in said sludge and discharge the contents of the cells as part of a colloidal suspension, combining said colloidal suspension with the clarified effluent, and contacting said clarified effluent and colloidal suspension with a metal chelating substrate to remove heavy metals therefrom.

4,159,945

**METHOD FOR DENITRIFICATION OF TREATED SEWAGE**

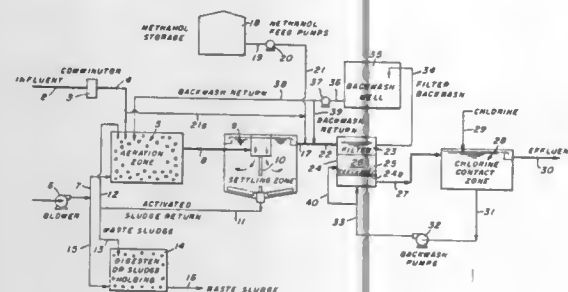
Elton S. Savage, Wexford, Pa., assignor to Dravco Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 302,398, Oct. 31, 1973, abandoned, which is a division of Ser. No. 68,917, Sep. 2, 1970, Pat. No. 3,709,364. This application Jan. 31, 1974, Ser. No. 438,466

Int. Cl.<sup>2</sup> C02C 1/06

U.S. Cl. 210—8

7 Claims



1. The process for treating wastewater which contains nitrates in solution and also suspended solids, which comprises flowing the wastewater downwardly through a deep bed filter having a filter media comprising hard, gravel-like material comprised of particles in the size range between 1 mm and 6 mm providing between them voids capable of releasably entrapping bubbles of nitrogen gas and thereby provide additional filtering media to said bed, said deep bed filter being inoculated with bacteria capable of decomposing the dissolved nitrates and releasing nitrogen gas into the bed and thereby generate nitrogen bubbles that are so entrapped in said media and which thereby effectively reduces the nitrate con-

tent of said water while solid particles in the wastewater are at the same time being trapped in the filter, intermittently backwashing the filter with clean water to remove entrapped bubbles and the gas contained therein and wash away solid particles arrested in the passage of the wastewater through the filter and also removing some of said bacteria while still maintaining in the filter bed at all times, both during normal filtering operations and during backwashing, adequate denitrifying bacteria to sustain denitrification activity and nitrogen gas generation upon startup after each backwashing operation.

4,159,946

**TREATMENT OF AQUEOUS SYSTEMS**

Malcolm J. Smith; Peter Miles, both of Stockport; Norman Richardson, Middleton, and Michael A. Finan, Macclesfield, all of England, assignors to Ciba Geigy (UK) Limited, London, England

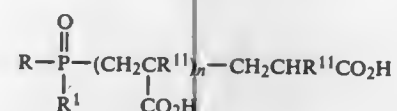
Division of Ser. No. 755,605, Dec. 29, 1976, Pat. No. 4,127,483, which is a division of Ser. No. 582,402, May 29, 1975, Pat. No. 4,046,707. This application Jan. 24, 1978, Ser. No. 871,986  
Claims priority, application United Kingdom, Jun. 11, 1974, 25853/74

Int. Cl.<sup>2</sup> C02B 5/06

U.S. Cl. 210—58

7 Claims

1. A method of inhibiting the precipitation of the scale forming salts of calcium, magnesium, barium and strontium from aqueous systems comprising adding to the aqueous system a scale inhibiting amount in the range of 1-200 ppm of a product comprising a telomeric compound of the formula:



and the salt-forming derivatives thereof, wherein R<sup>11</sup> is H, CH<sub>3</sub> or C<sub>2</sub>H<sub>5</sub>, R<sup>1</sup> is a residue —OX wherein X is an alkyl residue having 1-4 carbon atoms or hydrogen, R is hydrogen, an alkyl residue having 1-18 carbon atoms, a cycloalkyl residue having from 5-12 carbon atoms, a phenyl residue or a benzyl residue, and n is a positive integer of at most 100.

4,159,947

**DEWATERING SYSTEM**

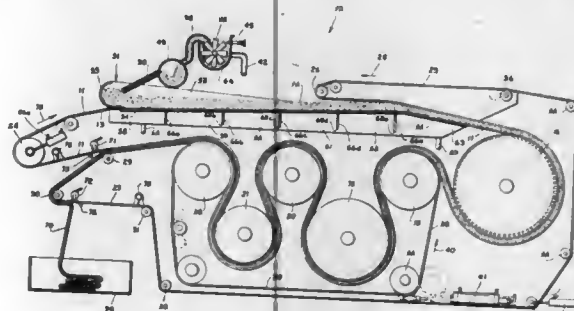
Larry L. Brooks, and David A. McMillon, both of P.O. Box 2323, Birmingham, Ala. 35201

Continuation of Ser. No. 687,377, May 17, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,318

Int. Cl.<sup>2</sup> B01D 33/14

U.S. Cl. 210—108

11 Claims



1. Apparatus for dewatering flowable aqueous material or the like comprising a first endless porous belt movable along its length through an upper flight toward a rotatable dewatering drum, then through a downward arc around a portion of said dewatering drum, then through a lower return flight in a sinusoidal path in sequence around the arcuate upper and lower

surfaces of a series of rollers, feed means for depositing flowable aqueous material on the upper surface of said first belt at a first position along the upper flight, a second endless porous belt movable along its length toward said dewatering drum into sandwiched relationship with said first endless belt about the material and movable with said first endless belt along the upper flight of said first endless belt toward said dewatering drum and around a portion of said dewatering drum and around the arcuate upper and lower surfaces of said series of rollers, and a third endless belt means movable into sandwiched relationship with said first and second endless belts and the material carried by said first and second endless belts as the first and second endless belts move along the lower return flight for urging the first and second endless belts and the material carried thereby in compression against the surfaces of the series of rollers of said plurality of rollers as said first and second endless belts move through the lower return flight, means for applying tension to said third endless belt means, said third endless belt means and said plurality of rollers being arranged to apply progressively increased pressures to the sandwiched first and second belts and the material carried thereby as the first and second endless belts move around subsequent ones of the series of rollers in the return flight.

4,159,948

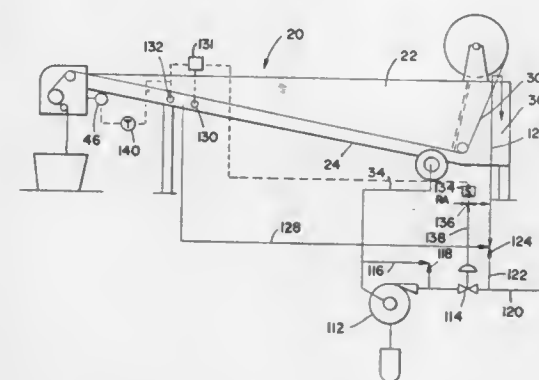
**BELTLESS VACUUM FILTER**

William D. Crowe, San Francisco, Calif., assignor to J. R. Schneider Co., Tiburon, Calif.

Continuation-in-part of Ser. No. 779,715, Mar. 21, 1977, abandoned. This application Mar. 1, 1978, Ser. No. 882,320  
Int. Cl.<sup>2</sup> B01D 33/04

U.S. Cl. 210—111

21 Claims



1. A filter apparatus comprising: wall means including spaced apart side walls forming a receiving tank for dirty liquid to be filtered, a collection tank below said receiving tank for clean filtered liquid and an auxiliary reservoir for clean liquid adjacent said receiving tank; a fixed inclined pervious means for supporting a layer of movable filter media forming the bottom of said receiving tank; means for supplying an elongated sheet of filter media to the upper side of said pervious means; means for sealing the periphery of said collection tank to prevent dirty liquid from migrating from said receiving tank around the side edge of the filter media into said collection tank; means at the forward end of said apparatus for pulling the filter media over said pervious means; a suction pump attached to an outlet from said collection tank for reducing pressure therein during the operation of said apparatus to increase the flow of liquid through said filter media; means responsive to a predetermined low pressure level within said collection tank due to accumulation of filtered out material on said filter media for temporarily substan-

tially equalizing the pressure in said collection and receiving tanks and thereafter for automatically controlling said media pulling means to move said media up said inclined pervious support means.

4,159,949

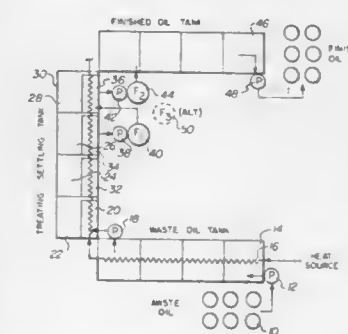
**CONTAMINANT REMOVER**

Edmon F. Oden, 2611 Stoney Brook, Houston, Tex. 77063  
Filed Sep. 28, 1978, Ser. No. 946,551

Int. Cl.<sup>2</sup> B01D 35/18; C02B 1/02

U.S. Cl. 210—180

10 Claims



1. A system for removing contaminants from a continuous fluid supply, said system including in combination: a waste oil tank having a plurality of chambers; a treating and settling tank positioned near said waste oil tank, said treating and settling tank having a plurality of compartments each of which has a trough; a heating source positioned in said waste oil tank and in each of the troughs of said treating and settling tank to heat the fluid being processed; pump means for pumping fluid being processed from said waste oil tank to said treating and settling tank; filter means coupled to said treating and settling tank to remove partially treated fluid from said treating and settling tank; and a finished oil tank connected to said filter means for storing fluid after said fluid has passed through said filter means.

4,159,950

**FILTER APPARATUS**

Sanae Hayashida, 1 Shimomisu-Yamaden, Yoko-Ohji, Fushimi-ku, Kyoto, and Gorou Sasaki, 3-41, Senrioka, 4-chome, Settsu-shi, Osaka, both of Japan

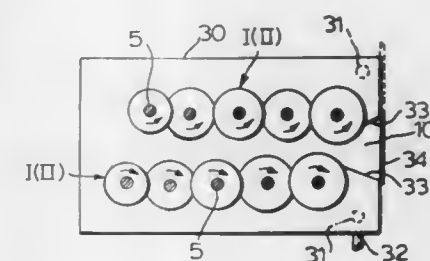
Continuation-in-part of Ser. No. 761,526, Jan. 24, 1977, abandoned. This application Jan. 26, 1978, Ser. No. 872,376

Claims priority, application Japan, Apr. 1, 1976, 51-36770

Int. Cl.<sup>2</sup> B01D 33/24, 33/06, 35/16

U.S. Cl. 210—330

8 Claims



1. A filter apparatus comprising (A) a container having one or more openings for supplying unfiltered material and one or more exits for removing filtered liquid material;

(B) at least one line of sets of rotatable filter elements disposed within said container, each set comprising

- (i) a plurality of circular first plates having a first diameter, each plate having at least one hole at a predetermined distance from the center thereof,
- (ii) a plurality of circular second plates having a diameter larger than said first diameter, each plate having at least one hole at said predetermined distance from the center thereof, and being of a size and shape substantially similar to said at least one hole in said first plates,
- (iii) a plurality of interleaving circular plates of a third diameter smaller than said first diameter, and
- (iv) means for holding said first plate, interleaving plate, and second plate in that order in each set with their centers in substantially the same axis and within said container in substantially sealed manner, whereby said at least one hole of each of said first and second plates are aligned with said one or more exits with one set disposed adjacent the other set with the first plate of one set adjacent the second plate of the other set and in the same plane; and

(c) means for moving said sets in the same line of filter elements in the same rotary direction, whereby unfiltered material is supplied to said one or more opening of said container and by centrifugal force of the rotating plates sludge is separated from liquid and moved toward the outer periphery of the plates and then transferred from one plate to the next down the line and accumulated toward the end of the line, and filtered liquid material remaining after the separation passes through said at least one hole of said first and second plates and sludge remaining in said filtered liquid material is on the lower next level separated by similar rotating of said plates, moved toward the outer peripheries of the plates, then transferred from plate to plate in a line and accumulated toward the end of the line at said next lower level, with the again filtered liquid material dropping level by level until substantially filtered liquid is removed from said one or more exits.

4,159,951

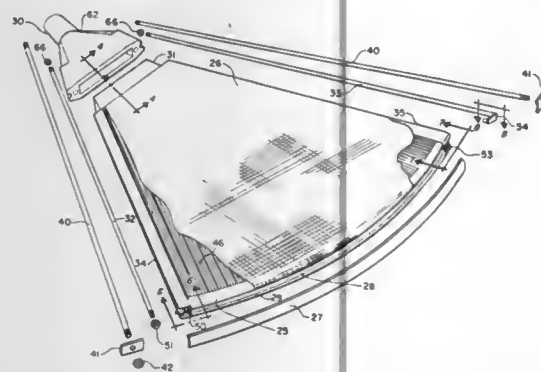
## SECTOR ASSEMBLY

Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 25, 1978, Ser. No. 872,123

Int. Cl.<sup>2</sup> B01D 25/04

U.S. Cl. 210—331



1. In a rotary disc vacuum filter of the type having a disc filter which includes a series of fan-shaped filter sector assemblies secured at intervals around a rotatable supporting shaft, each assembly including a fan-shaped sector body covered with a filter medium to provide filtering on opposing faces of the body and a bell member interconnecting passageways of the body with a conduit formed in the supporting shaft and through which a vacuum is drawn to draw liquid filtered through the filter medium along the passageways and through the bell member to the conduit, as a new article of manufacture, a sector comprising a body of generally fan-shaped con-

figuration having two opposed faces which have grooves formed therein for filtrate drainage, said body further having two radially extending sides, each side having a concave channel formed therein along which a radial rod securing said body to a supporting shaft extends and formed within said channel a concave slot along which a sector rod securing said body to a bell member extends; said channel and slot on each radial side of said body being formed to extend lengthwise along said sides.

4,159,952

## POWDERED HYDRATED EMULSIFIERS AND THEIR METHOD OF PREPARATION

Clifford A. Jackson, Sanford, Fla., assignor to Southland Corporation, Dallas, Tex.

Filed Dec. 21, 1977, Ser. No. 862,908

Int. Cl.<sup>2</sup> B01F 17/34

U.S. Cl. 252—356

10 Claims

1. A method for the preparation of powdered hydrated emulsifiers, said method comprising the steps of:

- a. selecting said emulsifier from the group consisting of fatty acid partial esters of polyhydric alcohols, half esters of succinic acid of a mono-acylated polyalcohol, alkoxylated condensates of monoglycerides, stearoyl 2 lactylate and calcium and sodium salts thereof, alkoxylated fatty acid partial esters of polyhydric alcohols, diacetyl tartaric acid esters of fatty acid partial esters of polyhydric alcohols, and mixtures of said emulsifiers;
- b. heating the emulsifier until melted;
- c. pumping said heated emulsifier through a conduit;
- d. injecting water at a temperature above 100° F. into the stream of said heated emulsifier; and
- e. spraying the water-emulsifier mixture through a spray nozzle into a cooling chamber to obtain said powdered hydrated emulsifiers containing 2-15% by weight water of hydration.

4,159,953

## SLIDE PLATE FILTERS FOR THERMOPLASTIC AND SIMILAR MATERIALS

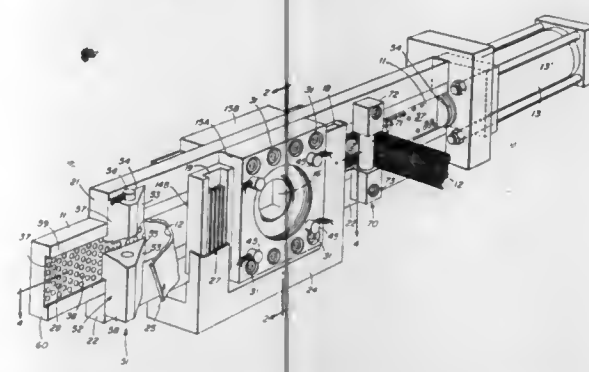
James P. Paquette, Uxbridge, Mass., assignor to The Berlyn Corporation, Worcester, Mass.

Filed Jun. 5, 1978, Ser. No. 912,538

Int. Cl.<sup>2</sup> B01D 35/16

U.S. Cl. 210—396

14 Claims



1. In slide filter apparatus for filtering contaminants from a fluid working material flowing in a defined path, the working material having the property that it can stiffen in response to temperature change, the apparatus having rigid self-supporting filter plate means for carrying on an up-stream surface replaceable filter media means from an inlet port passageway across the path of fluid flow to an outlet port passageway, the cross section of the outlet port passageway being larger than the cross section of the filter plate means so as to form a gap into which fluid working material can escape from said path, and temperature control means to form a seal of stiffened working

material binding said filter media means to said filter plate means in the gap, the improvement comprising means to brake and strip said filter plate means provided at a predetermined positioning outside the exit end of said outlet port passageway for separating said filter media means together with the stiffened working material and contaminants collected therein from said upstream surface of the filter plate means exiting from said outlet port passageway, and means at said inlet port passageway to force said filter plate means into said inlet port passageway and through said passageways against said stripper means, said predetermined positioning providing a filter plate means sufficiently clean so that it can be reused without requiring treatment to remove spent filter media and collected contaminants from it after said filter plate means is passed by said means to brake and strip said filter plate means.

4,159,954

## ISOLATOR FILTER

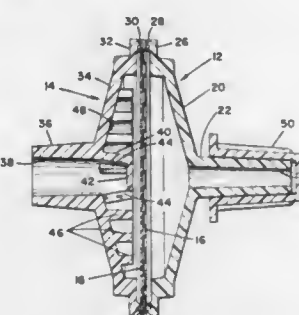
Ronald J. Gangemi, 15598 Producer La., Huntington Beach, Calif. 92649

Filed Feb. 24, 1978, Ser. No. 880,802

Int. Cl.<sup>2</sup> B01D 25/04

U.S. Cl. 210—446

8 Claims



1. In a filter device, the combination comprising: first and second generally funnel-shaped housings, each of said housings having a generally conical portion and a spout portion with an aperture extending therethrough, the outer peripheries of said first and second housings being generally identically configured; a microporous film membrane having a dimension generally equal to the dimension of said periphery; porous support means configured for abuttingly engaging said membrane; means securing the peripheries of said first and second housings together with said membrane and said support means interposed therebetween; a generally cup-shaped deflector member secured to the interior of the conical portion of one of said housings with the bottom of said deflector member in general alignment with the aperture of the spout portion of said housing, said deflector member having a plurality of radially outwardly disposed openings for passage of fluid therethrough; and rib means on the inner surface of the conical portion of said housing in radial relation to said openings, said deflector member and said rib means dispersing fluid injected into said housing generally radially for uniformly dispersing such fluid over the surface of said support means.

4,159,955

## FOOD DISPENSING BIN

David Asmus, Jr., Rte. 1, Box 582, Laramie, Wyo. 82070

Filed Nov. 9, 1977, Ser. No. 849,758

Int. Cl.<sup>2</sup> B01D 23/02

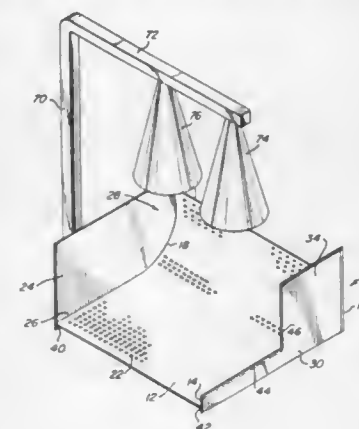
U.S. Cl. 210—473

7 Claims

1. A food dispensing bin comprising: a perforated bottom wall extending from the front of said bin horizontally toward near the rear of said bin and then smoothly curving upward and reentrantly as to captivate food segments urged toward the rear of said bin, the

perforations in said bottom wall being of a size to permit drainage of liquid from said segments carried on said bottom wall;

a first upright side wall extending from the front to the rear of said bin along one side margin of said bottom wall and



having a height sufficient to form a closure of the reentrant portion of said bottom wall; and a second upright side wall extending from the front to the rear of said bin along the other side margin of said bottom wall and having a height sufficient to form a closure of the reentrant portion of said bottom wall.

4,159,956

## SUCCINIMIDE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,876

Int. Cl.<sup>2</sup> C10M 1/32, 3/26, 5/20, 7/30

U.S. Cl. 252—33.4

8 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and
  - (A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 20 to 300 carbon atoms, and
  - (B) from 0.5 to 20 weight percent of an alkenyl mono-succinimide wherein the alkenyl group contains about 50 to 300 carbon atoms.

4,159,957

## MANNICH BASE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,873

Int. Cl.<sup>2</sup> C10M 1/32, 3/26, 5/20, 7/30

U.S. Cl. 252—33.4

8 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and
  - (A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 50 to 300 carbon atoms, and
  - (B) from 0.5 to 20 weight percent of a high-molecular-weight Mannich base or a borated complex thereof.



4,159,958

## SUCCINATE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,874

Int. Cl.<sup>2</sup> C10M 1/32, 3/26, 5/20, 7/30

U.S. Cl. 252—33.4

8 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and

(A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 20 to 300 carbon atoms, and

(B) from 0.5 to 20 weight percent of an ester of hydrocarbon-substituted succinic acid wherein the hydrocarbon group contains at least 50 carbon atoms.

4,159,959

## THIOPHOSPHONATE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,875

Int. Cl.<sup>2</sup> C10M 1/32, 3/26, 5/20, 7/30

U.S. Cl. 252—33.4

6 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and

(A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 20 to 300 carbon atoms, and

(B) from 0.5 to 20 weight percent of a mono-hydroxyalkyl hydrocarbyl thiophosphonate.

4,159,960

## LUBRICANT COMPOSITIONS

Gerassimos Frangatos, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1977, Ser. No. 793,014

Int. Cl.<sup>2</sup> C10M 1/10

U.S. Cl. 252—49.9

8 Claims

1. A lubricant composition comprising a mineral oil, synthetic oil or greases thereof and an antiwear amount of a product prepared by reacting from about 1 mole to about 2 moles of a methallyl halide and from about 1 to about 2 moles of a halogen with one mole of a trialkyl phosphate containing 1 to 6 carbon atoms, the reaction being carried out at from about -5° C. to about 80° C., the product containing from about 5% to about 24% of halide and from about 4% to about 10% of phosphorus, all by weight.

4,159,961

## DIELECTRIC AND NON-MAGNETIC CERAMIC FOR HIGH FREQUENCY APPLICATIONS

Roland Sroussi, Jean Nicolas, and Jacques Claudon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 4, 1976, Ser. No. 738,842

Claims priority, application France, Nov. 7, 1975, 75 34161

Int. Cl.<sup>2</sup> H01B 3/00

U.S. Cl. 252—63.2

11 Claims

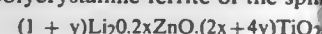
1. A dielectric and non-magnetic ceramic suitable for high frequency applications, which comprises: a polycrystalline ferrite of the formula:



wherein Me is Ge, Si or Ti,  $0 \leq y \leq 2$ ,  $0 \leq z \leq 1$  and  $x$  is 2, wherein  $Fe^{+3}$  ions present in the octahedral sites of the parent ferrite are replaced by non-magnetic ions.

8. A dielectric and non-magnetic ceramic suitable for high frequency applications, which comprises:

a polycrystalline ferrite of the spinel type of the formula:



4,159,962

## METHOD OF PREPARING LAYERED CHALCOGENIDES

Francis J. Di Salvo, Jr., Florham Park, and Donald W. Murphy, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

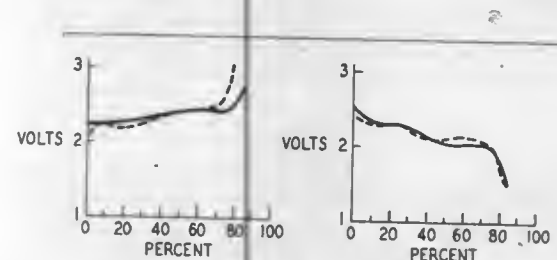
Division of Ser. No. 810,176, Jun. 27, 1977, Pat. No. 4,125,687.

This application May 30, 1978, Ser. No. 910,193

Int. Cl.<sup>2</sup> H01M 4/88

U.S. Cl. 252—182.1

7 Claims



1. A method of preparing a compound having the nominal atom composition  $M_xN_{1-x}S_2$  where M is selected from the group consisting of Mn, Fe, Ni and Co and mixtures thereof, and N is selected from the group consisting of V, Cr, and mixtures thereof; when N is V and M is Fe,  $x$  is less than or equal to a maximum value of 0.5; when N is V and M is Mn, Ni or Co,  $x$  is less than or equal to a maximum value of 0.33; and when N is Cr,  $x$  is less than a maximum value of 0.33, said maximum value scaling linearly with atom percent, comprising the steps of adding an oxidizing agent having an oxidizing potential of at least 2.8 volts to  $Li_yM_xN_{1-x}S_2$ , said  $Li_yM_xN_{1-x}S_2$  being prepared by reacting stoichiometric quantities of the alkali metal carbonate, an oxide of M, and an oxide of N with sulfur, where  $y$  is less than or equal to one.

4,159,963

## CATALYST FOR PRODUCING POLYOLEFINS

Hisaya Sakurai, Hideo Morita, Tadashi Ikegami, and Masayoshi Miya, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1978, Ser. No. 873,630

Claims priority, application Japan, Feb. 16, 1977, 52-14940

Int. Cl.<sup>2</sup> C08F 4/64

U.S. Cl. 252—429 B

15 Claims

1. In a catalyst useful for polymerizing olefins comprising a magnesium compound, a titanium compound, an electron donor, and an organometallic compound, the improvement which is characterized in that a solid (I) is obtained by reacting one mole of organomagnesium component (i) represented by the general formula



wherein

 $\alpha$  is a number of 0 or greater than 0; $\beta > 0$ ; $p, q, r$  and  $s$  are each numbers 0 or greater than 0, respectively, having the relationship of  $p+q+r+s=ma+2\beta$ ; $M$  is a metal component of the 1st to the 3rd group of the Periodic Table; $m$  is the valency of  $M$ ; $R^1$  and  $R^2$  are the same or different hydrocarbon groups having 1-20 carbon atoms; $X$  and  $Y$  are the same or different groups selected from the group consisting of halogen,  $OR^3$ ,  $OSiR^4R^5R^6$ ,  $NR^7R^8$  and  $SR^9$ ,

wherein

$R^3, R^4, R^5, R^6, R^7$  and  $R^8$  are hydrogen atoms or hydrocarbon groups having 1-20 carbon atoms, and  $R^9$  is a hydrocarbon group having 1-20 carbon atoms, with 0.01-100 moles of chlorosilane compound (ii) containing Si-H bonds and represented by the general formula



wherein

 $0 < a \leq 2$ , $b$  is a number greater than 0, $a+b \leq 4$ , and

$R$  is a hydrocarbon group having 1-20 carbon atoms, that a solid catalyst component (A) is obtained by reacting said solid (I), a titanium compound (2) selected from a tetravalent titanium halide and/or a trivalent titanium halide, and a carboxylic acid or a derivative thereof (3) selected from a carboxylic acid having up to 30 carbon atoms, an acid halide having up to 30 carbon atoms, an acid anhydride or a carboxylic acid ester having up to 30 carbon atoms in the carboxylic portion, and that said catalyst component (A) is used with a component (B) comprising an organometallic compound of a metal selected from Groups I, II, III of the Periodic Table mixed with a carboxylic acid or derivative thereof selected from a carboxylic acid having up to 30 carbon atoms, an acid halide having up to 30 carbon atoms, an acid anhydride or a carboxylic acid ester having up to 30 carbon atoms in the carboxylic portion.

4,159,964

## METAL CHELATE CATALYST AND ALKANOLAMINE HYDROXIDE ON ADSORPTIVE SUPPORT

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

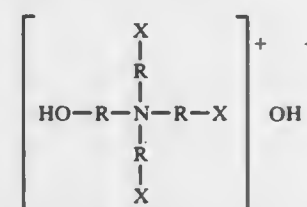
Continuation-in-part of Ser. No. 868,600, Jan. 11, 1978, Pat. No. 4,124,494. This application Jul. 28, 1978, Ser. No. 928,925

Int. Cl.<sup>2</sup> B01J 31/12, 31/02

U.S. Cl. 252—428

12 Claims

1. A catalytic composite comprising a metal chelate mercaptan oxidation catalyst and an alkanolamine hydroxide impregnated on a solid adsorptive support, said alkanolamine hydroxide being represented by the structural formula



wherein  $R$  is an alkylene radical containing up to about 3 carbon atoms and  $X$  is a hydroxyl radical or hydrogen.

4,159,965

## CATALYST USEFUL FOR POLYMERIZING OLEFINS

Hisaya Sakurai, Hideo Morita, Tadashi Ikegami, and Shigeo Tsuyama, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1977, Ser. No. 836,343

Claims priority, application Japan, Sep. 28, 1976, 51-115400; Dec. 6, 1976, 51-145695

Int. Cl.<sup>2</sup> C08F 4/64, 4/68

U.S. Cl. 252—429 B

16 Claims

1. In a catalyst useful for polymerizing olefins comprising a solid catalyst component (A) obtained from a magnesium compound plus a titanium or vanadium compound, and an organometallic compound (B) of a metal selected from Groups I, II, III of the Periodic Table,

the improvement which comprises forming said solid catalyst component (A) by reacting one mole of an organomagnesium component (i) represented by the general formula



wherein  $\alpha$  is a number of 0 or greater than 0;  $\beta > 0$ ;  $p, q, r$  and  $s$  are each a number of 0 or greater;  $p+q+r+s=ma+2\beta$  wherein  $m$  is the valency of  $M$ ;  $M$  is a metal element of the 1st to the 3rd group of the Periodic Table;  $R^1$  and  $R^2$  are the same or different hydrocarbon radicals having 1 to 20 carbon atoms;  $X$  and  $Y$  are the same or different radicals selected from the group consisting of halogen,  $OR^3$ ,  $OSiR^4R^5R^6$ ,  $NR^7R^8$  and  $SR^9$  wherein  $R^3, R^4, R^5, R^6, R^7$  and  $R^8$  are each hydrogen atom or a hydrocarbon radical having 1 to 20 carbon atoms and  $R^9$  is a hydrocarbon radical having 1 to 20 carbon atoms, with 0.01-100 moles of a chlorosilane compound (ii) containing Si-H bond and having the general formula



wherein  $a$  and  $b$  are each a number greater than 0, having the relationships  $a \leq 2$  and  $a+b \leq 4$  wherein  $R$  is a hydrocarbon radical having 1 to 20 carbon atoms

to form a solid (I),

and reacting and/or contacting by grinding, said solid (I) with a titanium and/or vanadium halide or alkoxyhalide.

4,159,966

## CHROMATOGRAPHIC COLUMN PACKING

Charles B. Roberts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1977, Ser. No. 864,414

Int. Cl.<sup>2</sup> B01J 31/02; B01D 15/08

U.S. Cl. 252—430

8 Claims

1. A chromatographic column packing comprising a chemically bond chromatographic partitioning agent selected from the group consisting of aliphatic alcohols, aliphatic polyols, polyglycol ethers, polyglycol amines, polyamines, aliphatic and aromatic amides thio-compounds and alkoxy amides, having molecular weights of from about 200 to 20,000, and sugars bonded through O, S or N to a Group III metal atom which is bound to a silica and/or alumina support through oxygen said group III metal having been incorporated into the structure as a metal hydride and having any hydrogen atoms not replaced by said partitioning agent replaced with a low molecular weight, below 200, alcohol.

8. A method for preparing bonded chromatographic column packings comprising reacting by contacting an active hydrogen containing silica, alumina or silica-alumina solid support which has been modified by reaction with a Group III metal hydride selected from the group consisting of aluminum, boron, gallium or indium then reacted with a chromatographic partitioning agent selected from the group consisting of aliphatic alcohols, aliphatic polyols, polyglycol ethers, polyglycol amines, polyamines, aliphatic and aromatic amides and alkoxy amides, having molecular weights of from about 200 to 20,000, and sugars neat or in the presence of an inert solvent at from about room temperature to about 100° C. until the evolution of hydrogen is ceased, said partitioning agent being employed in amounts to react with from a few to all of the activated sites on said activated support, and reacting any unreacted hydrogen atom sites of said Group III metal hydride with a low molecular weight, below 200, compound of the class afore set forth.

**4,159,967**  
**CATALYST FOR THE OXIDATION OF A CONJUGATED DIOLEFIN**

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
 Division of Ser. No. 721,645, Sep. 8, 1976, Pat. No. 4,095,037.  
 This application Mar. 3, 1978, Ser. No. 883,014  
 Int. Cl.<sup>2</sup> B01J 23/04, 27/08, 27/24, 31/12

U.S. Cl. 252—438 6 Claims

1. A composition consisting essentially of a bismuth compound, an alkali metal compound and a source of nitrate ion wherein the bismuth compound is selected from the group consisting of oxides, nitrates, halides and mixtures thereof, the alkali metal compound is selected from the group consisting of halide, carboxylate, oxide, nitrate and mixtures thereof, and the source of nitrate ion is provided by an inorganic compound in which the cationic portion of the compound is essentially inert under oxidizing conditions when said cationic portion is other than bismuth or an alkali metal.

**4,159,968**  
**CATALYST FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE**

William J. Kroenke, Brecksville; Richard T. Carroll, Cuyahoga Falls, and Angelo J. Magistro, Brecksville, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio  
 Division of Ser. No. 669,896, Mar. 24, 1976, Pat. No. 4,102,935.  
 This application Mar. 16, 1978, Ser. No. 887,152  
 Int. Cl.<sup>2</sup> B01J 21/04, 23/10, 23/74

U.S. Cl. 252—462 8 Claims

1. A solid solution catalyst consisting essentially of iron cations substituted for aluminum cations in a host lattice of  $\alpha\text{-Al}_2\text{O}_3$  and having an iron content of from about 0.1 percent to about 20 percent by weight expressed as the oxide; stabilized with a total lanthanide content of from about 0.1 percent to 20 percent by weight expressed as the oxide; and having an X-ray diffraction pattern having peak positions different than that of the host lattice, all weight percents based upon the weight of the catalyst.

**4,159,969**  
**PROCESS FOR THE PREPARATION OF AGGLOMERATES OF POROUS ALUMINUM OXIDE**

Rudolf A. J. Moné, Avenhorn, and Gijsbertus Klaver, IJpendam, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.  
 Filed Jan. 20, 1978, Ser. No. 871,049  
 Claims priority, application Netherlands, Nov. 30, 1977, 7700810

Int. Cl.<sup>2</sup> B01J 21/04 5 Claims

1. A process for the preparation of agglomerates of aluminum oxide comprising contacting a hydrous aluminum oxide gel with an organic liquid which is essentially immiscible with water, the amount of liquid utilized being such that the weight ratio of said liquid to water, as contained in the gel, lies within a portion of a curve which plots said ratio versus the pore volume of aluminum oxide obtained after being dried and calcined, expressed in terms of milliliters per gram, which portion has a slope equal to or greater than about 4.0, and agglomerating the gel subsequent to being contacted with the organic liquid.

**4,159,970**  
**ALKALINE EARTH OXIDES PROMOTED WITH MANGANESE OXIDE AND/OR RHENIUM OXIDE AS CATALYSTS FOR CRACKING AND DEHYDROCYCLIZING OF ALKANES**

Louis F. Heckelsberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
 Division of Ser. No. 580,010, May 22, 1975, Pat. No. 4,093,536, which is a continuation-in-part of Ser. No. 460,935, Apr. 15, 1974, abandoned. This application Mar. 3, 1978, Ser. No. 883,017

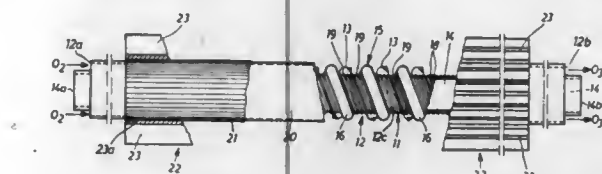
Int. Cl.<sup>2</sup> B01J 23/02, 23/34, 23/36 11 Claims

1. A composition of matter consisting essentially of components selected from the group consisting of:  
 A. two alkaline earth metal oxides wherein the alkaline earth metal is selected from the group consisting of magnesium, calcium, strontium and barium and a promoting amount of a mixture of manganese oxide and rhenium oxide  
 B. at least one alkaline earth metal oxide wherein the alkaline earth metal is selected from the group consisting of magnesium, calcium, strontium and barium and a promoting amount of rhenium oxide  
 C. an alkaline earth metal oxide wherein the alkaline earth metal is selected from the group consisting of strontium and barium, and a promoting amount of a mixture of manganese oxide and rhenium oxide.

**4,159,971**  
**OZONE GENERATOR**  
 Arthur Gneupel, Bitzberg 5, Bachenbulach, Switzerland  
 Filed Jan. 31, 1977, Ser. No. 764,219

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606731; Aug. 2, 1976, 2634720

Int. Cl.<sup>2</sup> C01B 13/11 26 Claims



1. A substantially tubular-shaped ozone generator comprising:  
 an inner electrode of substantially hollow cylindrical configuration, said inner electrode consisting of a metallic grid, an outer electrode coaxially arranged to and surrounding said inner electrode,  
 a tubular member formed of dielectric material arranged between said inner electrode and said outer electrode, said tubular member being in contact with said outer electrode,  
 a substantially cylindrical core arranged within said inner electrode and surrounded by said inner electrode, and  
 helix means extending around said core throughout the length of said core, said helix means also extending from the outer surface of said core and pressing said inner electrode against said tubular member, said helix means defining at least one substantially helically-shaped groove extending substantially in the axial direction of said core, and said at least one groove providing the only through-pass channel for a medium to be ozonized and the ozone which is formed.

**4,159,972**  
**DISSOLUTION OF POLYURETHANE FOAMS AND RE-USE OF THE PRODUCTS THEREFROM**

Jacob Braslaw, and Purnachandra Pai, both of Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.  
 Filed Oct. 17, 1977, Ser. No. 842,865  
 Int. Cl.<sup>2</sup> C08J 9/38

U.S. Cl. 260—2.3 5 Claims

1. In a method for recovery of flexible urethane foam made from reacting a mixture comprising polyisocyanate and polyol having a number average weight exceeding about 1000, wherein the foam is liquified at elevated temperatures in the presence of aliphatic diol of the formula HO-A-OH wherein A is oxy interrupted alkylene and up to 6 carbons, an improvement that permits recovery of products suitable for use in preparing new flexible foam, which comprises:

- dissolving the foam in the presence of the diol at a temperature in a range up to 210° C. for a time sufficient to form a single or substantially single liquid layer;
- admixing after the dissolution of (a), liquid polyol (B) having a number average molecular weight of about 1000-10,000, that is suitable for use in preparation of flexible foam;
- removing under vacuum at least about 70% by weight of the diol from the liquid admixture of (b) at a temperature in a range exceeding about 100° C.; and
- collecting the liquid polyol residue from the distilled admixture.

**4,159,973**  
**STABILIZER SYSTEMS AND VINYL HALIDE RESIN COMPOSITIONS CONTAINING SAME**

Samuel Hoch, Brooklyn, N.Y.; Robert E. Lally, Englishtown, N.J., and Mario Q. Ceprini, Cedarhurst, N.Y., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.  
 Filed Mar. 6, 1978, Ser. No. 883,964  
 Int. Cl.<sup>2</sup> C08F 14/06; C08K 5/50; C08L 27/06

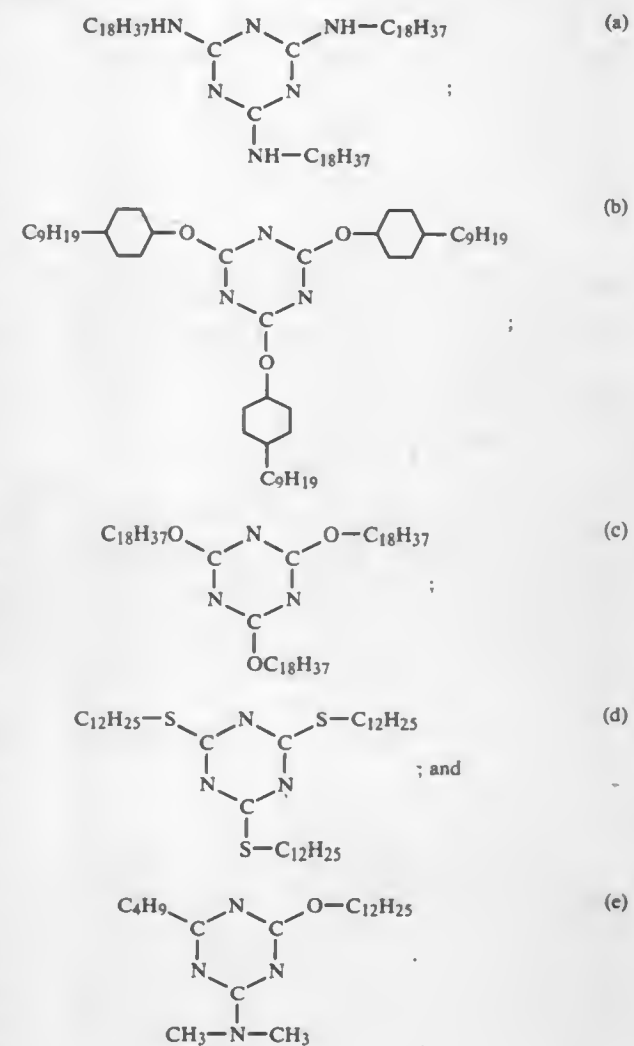
U.S. Cl. 260—23 XA 30 Claims

1. A stabilizer system for vinyl halide resin compositions that comprises  
 (a) a liquid, oil-soluble, epoxidized-vegetable oil-compatible overbased barium salt complex that is the product obtained by  
 (i) forming a reaction mixture that consists essentially of  
 (a) a basic barium compound,  
 (b) an alkylphenol having from 1 to 3 alkyl groups, each of which has from 8 to 12 carbon atoms, and  
 (c) an inert liquid organic diluent, in the amounts of at least 0.75 mole of said alkylphenol per mole of said barium compound and 10% to 50% by weight of said diluent, based on the weight of the reaction mixture, and  
 (ii) maintaining said reaction mixture at a temperature of at least 180° C. while treating it with carbon dioxide to reduce its basicity;  
 (b) at least one polyvalent metal salt selected from the group consisting of cadmium, zinc, zirconium, tin, and calcium salts of benzoic acid, alkylbenzoic acids, halobenzoic acids, hydroxybenzoic acids, and alkanolic acids having 2 to 22 carbon atoms;  
 (c) at least one organic phosphite selected from the group consisting of secondary and tertiary aryl, alkyl, and alkyl aryl phosphites in which the alkyl groups have from 3 to 18 carbon atoms and the aryl groups are phenyl, alkylphenyl, halophenyl, or hydroxyphenyl; and  
 (d) an aromatic or aliphatic hydrocarbon solvent, in the amounts of 0.1 part to 5 parts by weight of the polyvalent metal salt component, 0.1 part to 5 parts by weight of the organic phosphite component, and 0.1 part to 5 parts by weight of the hydrocarbon solvent per part by weight of the overbased barium salt complex.

**4,159,974**  
**PLASTICIZED POLYCARBONATE COMPOSITION**  
 Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 29, 1977, Ser. No. 811,068  
 Int. Cl.<sup>2</sup> C08K 5/34 4 Claims

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an organic plasticizer selected from the group having the following formulae:



**4,159,975**  
**POLYETHER LUBRICANTS FOR USE IN THE PROCESSING OF PLASTICS**  
 Heinz Praetorius; Karl Seibert, both of Duren, and Werner Holtvoigt, Lonne-Riessel, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.  
 Filed Dec. 14, 1977, Ser. No. 860,508  
 Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656927

Int. Cl.<sup>2</sup> C08L 27/06, 27/08 7 Claims

1. A composition comprising a thermoplastic polymer and from about 0.05 to about 2.0 percent, based on the weight of the polymer, of a polyalkylene oxide lubricant made from a monomer selected from the group consisting of aliphatic, non-substituted 1,2-alkylene oxides containing from about 6 to about 40 carbon atoms, and mixtures thereof, said polyalkylene



oxides having an average molecular weight from 1,000 to about 6,000.

4,159,976

**CURABLE SYSTEMS CONTAINING EPOXY RESIN AND METHANOL OR ETHANOL SOLVENT TO SUPPRESS THE CATALYTIC REACTION BETWEEN EPOXY RESIN AND AN IMIDAZOLE CATALYTIC CURING AGENT**  
James P. Moran, Jr., Waterbury, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Mar. 10, 1977, Ser. No. 776,142.

Int. Cl.<sup>2</sup> C08G 59/00, 59/18; C08L 63/02, 63/00

U.S. Cl. 260—33.4 EP

6 Claims

1. A curable adhesive having a relatively long pot life comprising polymer material including at least one curable epoxy resin, at least one imidazole catalytic curing agent for the resin, and solvent for the resin capable of suppressing catalytic reaction between the resin and the curing agent at least at about room temperature, said solvent being selected from the group consisting of methanol, ethanol and mixtures thereof.

4,159,977

**METHOD OF REDUCING THE GEL AND CURE TIMES FOR POLYESTER-ALUMINA TRIHYDRATE DISPERSIONS BY BLENDING THEREWITH SMALL QUANTITIES OF ACTIVATED ALUMINA**  
Hsiun P. Hsieh, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 20, 1978, Ser. No. 944,186

Int. Cl.<sup>2</sup> C08K 3/22

U.S. Cl. 260—40 R

7 Claims

1. In a process for making an alumina trihydrate filled polyester product comprising the steps of dispersing a polyester resin with up to 65% alumina trihydrate, based on the total weight of the resin and the trihydrate, and a catalyst, the improvement comprising reducing the time required to accomplish the gelling and subsequent curing of the polyester resin by blending from about 2.0 to 10.0 percent activated alumina, based on the total weight of alumina, with the alumina trihydrate prior to the mixing with the polyester resin, said activated alumina having a loss on ignition of less than 10.0 percent.

4,159,978

**NOVEL POLYACETAL POLYMERS AND THEIR APPLICATION AS SOIL RELEASE AND ANTI-SOIL REDEPOSITION AGENTS FOR TEXTILE SUBSTRATES**  
Robert Violland, Lyons, and Alain Lagasse, Villeurbanne, both of France, assignors to Rhone Poulenc Industries, Paris, France

Division of Ser. No. 703,827, Jul. 9, 1976, Pat. No. 4,107,056.

This application Mar. 9, 1978, Ser. No. 884,827

Claims priority, application France, Jul. 10, 1975, 75 22626

Int. Cl.<sup>2</sup> C08G 12/04

U.S. Cl. 525—441

9 Claims

1. A hydrophilic polyacetal polymer prepared by reacting Reactant composition I comprising:

(A) 20–60 percent of a reaction product

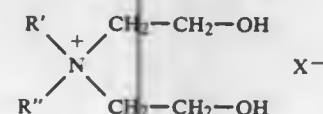
(A) of a phthalic acid, phthalic anhydride of a phthalic diester and at least one saturated diol having a molecular weight less than 300, said reaction product having a hydroxyl number of between 150 and 500 and an acid number of less than 2.

(B) 40–80 percent of a component (B) comprising:

1. A mixture comprising:

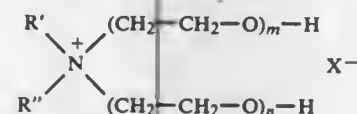
(a) 50 to 100 weight percent of a hydroxylated compound represented by the general formula  $R-(OC_xH_{2x})_n-OH$  wherein R represents a hydrogen or a hydrocarbyl radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl containing 1 to 20 carbon atoms, x is 2, 3, or 4 and n is an integer such that molecular weight ranges from between 300 and 10,000

(b) 0–50 weight percent of a quaternary dialkyl diethanol-amine represented by the general formula:

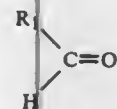


wherein R' and R'' represents the same or different alkyl groups containing less than 5 carbon atoms or a benzyl radical and X<sup>-</sup> is a halogen or methylsulfate ion, or

2. 100 weight percent of a quaternary ammonium compound containing both oxyalkylene units and quaternized nitrogen atoms represented by the general formula:



wherein R' and R'' represent the same or different members selected from alkyl radicals containing less than 5 carbon atoms or benzyl radicals, and m and n are numbers the sum of which is less than 15 and X<sup>-</sup> is a halide or methylsulfate ion. With Reactant Composition II comprising an aldehyde is represented by the general formula:



wherein R<sub>1</sub> represents a hydrogen atom, an alkyl, an aryl or an alkenyl group containing 1 to 10 carbon atoms; wherein the number of mols of aldehyde is at least equal to half the total number of hydroxyl groups contained in Reactant Composition I.

4,159,979

**PROTECTED AMINO ACIDS OR PEPTIDES**

Masahiko Fujino, Takarazuka; Tsunehiko Fukuda, Minoo, and Chieko Kitada, Sakai, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1978, Ser. No. 897,640

Claims priority, application Japan, Apr. 22, 1977, 52/47030

Int. Cl.<sup>2</sup> C07C 103/52

U.S. Cl. 260—112.5 R

18 Claims

1. An amino acid selected from the group of lysine, α,β-diaminopropionic acid, α,γ-diaminobutyric acid and ornithine having a protective group or a peptide containing the residue of such a protected amino acid, where the protective group is p-methylbenzylsulfonyl.

4,159,980

**PROCESS FOR PREPARING THE RELEASING HORMONE OF LUTEINIZING HORMONE (LH) AND OF FOLLICLE STIMULATING HORMONE (FSH), SALTS AND COMPOSITIONS THEREOF, AND INTERMEDIATES THEREFOR**

Hans U. Immer; Verner R. Nelson, both of Montreal, and Manfred K. Gotz, Hudson, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 226,508, Feb. 15, 1972, Pat. No. 3,835,108.

This application Mar. 29, 1974, Ser. No. 456,343

Int. Cl.<sup>2</sup> C07C 103/52

U.S. Cl. 260—112.5 LH

1 Claim

1. N-[N-(N-Carboxy-N<sup>G</sup>-nitro-L-arginyl)-L-prolyl]-glycinamide N-t-butyl ester.

4,159,981

**PEPTIDES AND PROCESS FOR THEIR MANUFACTURE**  
Werner Rittel, Basel; Max Brugger, Birsfelden; Bruno Kamber, Basel; Bernhard Riniker, Frenkendorf; Peter Sieber, Reinach, all of Switzerland, and Hendrik M. Greven, Heesch, Netherlands, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 641,480, Dec. 17, 1975, abandoned, which is a continuation of Ser. No. 271,873, Jul. 14, 1972, Pat. No. 3,934,008, which is a continuation of Ser. No. 850,254, Aug. 14, 1969, abandoned. This application Oct. 4, 1977, Ser. No. 842,122

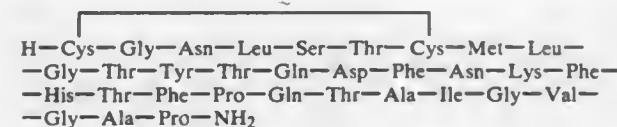
Claims priority, application Switzerland, Aug. 23, 1968, 12691/68; Aug. 27, 1968, 12811/68; Aug. 30, 1968, 13067/68; Oct. 10, 1968, 15147/68; Nov. 19, 1968, 17235/68

Int. Cl.<sup>2</sup> C07C 103/52

U.S. Cl. 260—112.5 T

6 Claims

1. A process for the manufacture of a compound of the formula



and corresponding compounds in which one or more of the asparagine and glutamine residues are replaced by the aspartic acid or glutamic acid residue, respectively, or the aspartic acid residue is exchanged for the asparagine residue, wherein a compound corresponding to any of these compounds in which compound both amino groups of Cys in 1-position and of Lys in 18-position are protected by a member selected from the group consisting of an aliphatic or cycloaliphatic oxycarbonyl group used as amino protecting group in peptide syntheses, an aralkyl group used as amino protecting group in peptide syntheses, an arylmethoxycarbonyl group used in peptide syntheses which is unsubstituted in the aryl moiety or is substituted by lower alkyl or alkoxy groups or halogen atoms in the aryl moiety, and derivatives of these substituents which are substituted by lower alkyl groups on the methylene group of said arylmethoxy carbonyl group, and one or more of the carboxyl groups present are protected by a carboxyl protecting group used in peptide syntheses and selected from the group consisting of a lower tertiary alkyl ester group and an aryl lower alkyl ester group, and in which compound any hydroxyl groups are free or are protected by a hydroxy protecting group used in peptide syntheses and selected from the group consisting of tetrahydropyranyl ether groups, tertiary lower alkyl ether groups and the 2,2,2-trifluoro-1-tert. butyloxycarbonylaminoethyl group, and the histidine imino group is free or is protected by the trityl or the adamantyloxycarbonyl group, the protective groups are split off.

4,159,982

**PROTEIN/STARCH COMPLEX**

Anne-Marie I. Hermansson, S-416 60 Göteborg, Sweden

Filed Apr. 4, 1978, Ser. No. 893,412

Int. Cl.<sup>2</sup> A23J 1/20

U.S. Cl. 260—119

20 Claims

1. A protein/starch complex having (a) protein in the form of casein or caseinate and (b) a protein/starch weight ratio of from 1:20 to 3:2.

983 O.G. 6

4,159,983

**PURE AND SUBSTANTIALLY PURE ASYMMETRIC 1:2 COBALT COMPLEXES OF MONOAZO COMPOUNDS**  
Jacky Dore, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

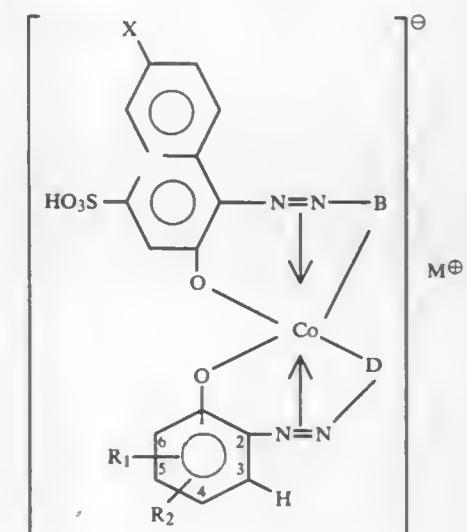
Continuation-in-part of Ser. No. 707,140, Jul. 20, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,480  
Claims priority, application Switzerland, Jun. 14, 1977, 7292/77; Dec. 12, 1977, 15216/77; Jul. 25, 1975, 9738/78

Int. Cl.<sup>2</sup> C09B 45/20, 45/48

U.S. Cl. 260—145 A

29 Claims

1. A complex of the formula



said complex being at least substantially pure, or a mixture of such complexes, wherein

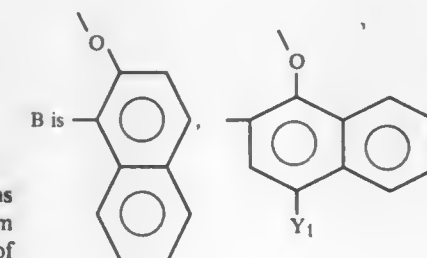
R<sub>1</sub> is hydrogen, C<sub>1-4</sub>alkyl, C<sub>1-4</sub>alkoxy, chloro, bromo or nitro,

R<sub>2</sub> is hydrogen, C<sub>1-4</sub>alkyl, C<sub>1-4</sub>alkoxy, chloro, bromo, nitro or —SO<sub>2</sub>NR<sub>3</sub>R<sub>4</sub>, wherein

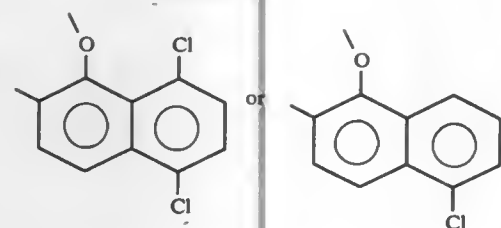
R<sub>3</sub> is hydrogen, C<sub>1-4</sub>alkyl or C<sub>1-4</sub>alkyl substituted by 1 or 2 substituents each of which is independently halo, hydroxy, cyano, C<sub>1-4</sub>alkoxy or phenyl, and

R<sub>4</sub> is hydrogen; C<sub>1-4</sub>alkyl; C<sub>1-4</sub>alkyl substituted by 1 or 2 substituents each of which is independently halo, hydroxy, cyano, C<sub>1-4</sub>alkoxy or phenyl; C<sub>5-7</sub>cycloalkyl; C<sub>5-7</sub>cycloalkyl substituted by 1 to 3 methyl groups; phenyl or phenyl substituted by 1 to 3 substituents each of which is independently halo, C<sub>1-4</sub>alkyl, C<sub>1-4</sub>alkoxy or nitro, with the proviso that the maximum number of nitro substituents is 2, or

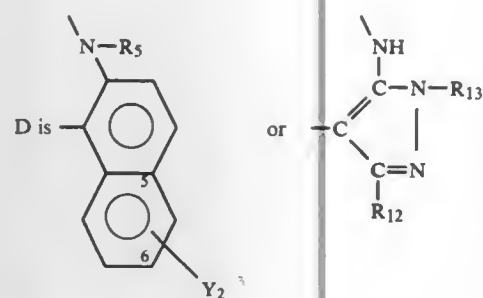
R<sub>3</sub> and R<sub>4</sub> taken together and with the nitrogen atom to which they are joined are pyrrolidino, piperidino or morpholino, with the proviso that when R<sub>2</sub> is —SO<sub>2</sub>NR<sub>3</sub>R<sub>4</sub>, R<sub>1</sub> must be hydrogen, chloro or nitro and one of R<sub>1</sub> and R<sub>2</sub> must be in the 4-position and the other must be in the 5-position,



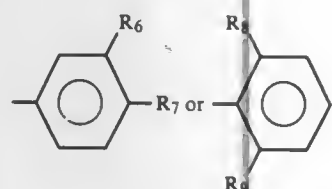
-continued



wherein  $Y_1$  is hydrogen,  $C_{1-2}$ alkyl,  $C_{1-2}$ alkoxy, chloro or bromo,



wherein  $R_5$  is hydrogen,  $C_{1-4}$ alkyl,



wherein one of  $R_6$  and  $R_7$  is hydrogen and the other is hydrogen, chloro, bromo,  $C_{1-2}$ alkyl,  $C_{1-2}$ alkoxy or trifluoromethyl,  $R_8$  is hydrogen or methyl, and  $R_9$  is methyl, chloro or bromo, with the proviso that  $R_8$  must be hydrogen when  $R_9$  is chloro or bromo,  $R_{12}$  is hydrogen,  $C_{1-4}$ alkyl,  $C_{1-2}$ alkoxy or phenyl,  $R_{13}$  is hydrogen,  $C_{1-4}$ alkyl, phenyl( $C_{1-4}$ alkyl), 2-pyridyl, cyclohexyl, phenyl, phenyl monosubstituted by fluoro, chloro, bromo,  $C_{1-4}$ alkyl,  $C_{1-2}$ alkoxy, nitro or trifluoromethyl; 2,3-, 2,4-, 2,5-, 2,6- or 3,4-dichlorophenyl; 2,4- or 3,5-dibromophenyl; 2,3-, 2,4-, 2,5-, 2,6- or 3,5-dimethylphenyl; 3,4-dimethoxyphenyl; 3-, 4- or 5-chloro-2-methylphenyl; 4-bromo-2-methylphenyl or 5-chloro-2-methoxyphenyl, and

$Y_2$  is hydrogen or 5- or 6- $SO_2NHR_{10}$ , wherein  $R_{10}$  is hydrogen,  $C_{1-4}$ alkyl or  $C_{2-4}$ hydroxyalkyl,  $X$  is hydrogen or nitro,  $M^+$  is hydrogen or an equivalent of a non-chromophoric cation, and

$M$  is an equivalent of a non-chromophoric cation, with the provisos that (i)  $Y_2$  must be hydrogen when  $R_2$  is  $-SO_2NR_3R_4$  and (ii) the complex is free of



#### 4,159,984 REDUCTIVE CLEAVAGE OF OXAZOLIDINE COMPOUNDS

Mitsuru Yoshioka, Toyonaka; Teruji Tsuji, Takatsuki; Yasuhiro Nishitani, Izumi, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

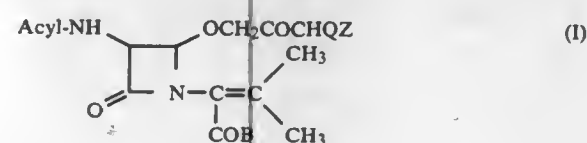
Filed Apr. 25, 1977, Ser. No. 790,618

Claims priority, application Japan, Apr. 27, 1976, 51/49274  
Int. Cl. C07D 205/08

U.S. Cl. 260—239 A

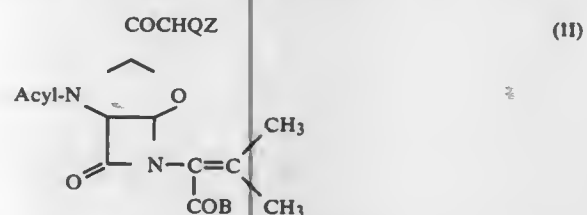
1 Claim

1. A process for preparing compounds of the following formula:



wherein

Acyl is an acyl of a carboxylic acid group;  
COB is carboxy or protected carboxy;  
Q is hydrogen, lower alkyl, phenyl, tolyl, methoxyphenyl, chlorophenyl or isopropylphenyl; and  
Z is hydrogen or a nucleophilic group which comprises reducing a compound of the formula



by means of a reducing agent which is a reducing metal selected from the group consisting of zinc, iron, tin, magnesium, aluminum and titanium in combination with a proton donor selected from the group consisting of hydrogen chloride, hydrogen bromide, ammonium chloride, ammonium bromide, toluene-p-sulfonic acid, benzenesulfonic acid, methane-sulfonic acid, sulfuric acid, phosphoric acid, nitric acid, acetic acid, trichloroacetic acid, and trifluoroacetic acid, said nucleophilic group being selected from the group consisting of halogen, alkoxy, aralkoxy, aryloxy, acyloxy, hydroxy, alkylthio, aralkylthio, arylthio, acylthio, mercapto, sulfo, alkylsulfonyl, aliphatic or aromatic amino, and amino said nucleophilic groups which contain carbon atoms containing up to 10 carbon atoms.

#### 4,159,985 HETEROCYCLIC PHENYL ESTER ULTRAVIOLET STABILIZERS

Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 484,844, Jul. 1, 1974, Pat. No. 4,020,080.

This application Feb. 1, 1977, Ser. No. 765,509

Int. Cl. C07D 285/12

U.S. Cl. 260—302 D

11 Claims

1. A composition of matter having the formula

is attached to one of the positions  $\alpha$  to the sulfur atom.

#### 4,159,987 PROCESS FOR PREPARING SUBSTITUTED CYCLIC ACETALS OF OXYACETALDEHYDES AND SAID CYCLIC ACETALS

Mark A. Sprecker, Sea Bright; John J. Kryschuk, Howell, and John B. Hall, Rumson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

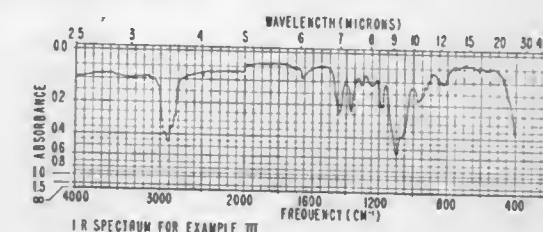
Continuation-in-part of Ser. No. 811,480, Jun. 30, 1977,

abandoned. This application May 3, 1978, Ser. No. 902,390

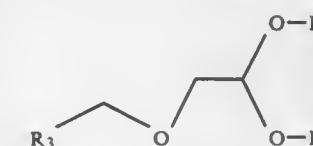
Int. Cl. C07D 317/10

U.S. Cl. 260—340.9 R

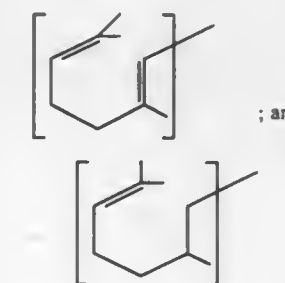
2 Claims



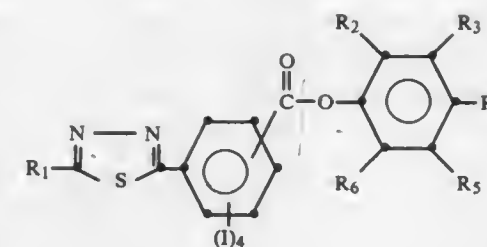
1. A compound having the structure:



wherein  $R_3$  is selected from the group consisting of moieties having the structures:



and  $R_1$  and  $R_2$  taken together form a  $C_2-C_4$  alkylene moiety.



wherein

$R_1$  is hydrogen, chloro, bromo, lower alkyl, chloro substituted lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy containing 1 to 20 carbon atoms, dimethyl substituted amino, phenyl substituted with not more than two members of the group consisting of chloro, phenyl, cyano, lower alkyl and alkoxy containing 1 to 20 carbon atoms, and cyano;

$I$  is the same as  $R_1$  and is present on all four available positions of the benzenoid ring, the carboxyl connecting group being attached to the benzenoid ring in either the meta or para position from the carbon atom attached to the heterocyclic ring; and at least one of  $R_2$  or  $R_6$  is hydrogen and the other  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$  and  $R_6$  are hydrogen or not more than three members of the group consisting of lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, alkoxy containing 1 to 20 carbon atoms, phenyloxy, hydroxy, nitrile, chloro and bromo.

#### 4,159,986 NOVEL THIOPHENE-ACETIC ACIDS

Francois Clémence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Continuation-in-part of Ser. No. 229,554, Feb. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 88,125, Nov. 9, 1970, abandoned. This application Sep. 4, 1975, Ser. No. 610,110

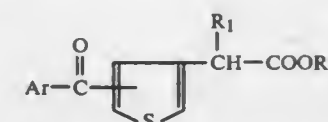
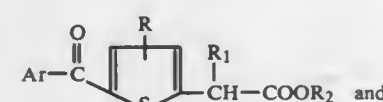
Claims priority, application France, Nov. 12, 1969, 69.38734; Mar. 11, 1971, 71.08476

Int. Cl. C07D 333/24; A01N 9/00

U.S. Cl. 260—332.2 A

19 Claims

1. A thiophene-acetic acid compound of the formula selected from the group consisting of



wherein  $R$  is selected from the group consisting of hydrogen and methyl,  $R_1$  is selected from the group consisting of lower alkyl of 1 to 4 carbon atoms and hydrogen and  $R_2$  is selected from the group consisting of hydrogen, lower alkyl of 1 to 7 carbon atoms, 2,3-dihydroxy-propyl, di-lower alkylamino-lower alkyl, alkali metals, alkaline earth metals, aluminum and —H, NH (lower alkyl)<sub>2</sub> and Ar is selected from the group consisting of phenyl, phenyl substituted with a member selected from the group consisting of chlorine, methoxy and trifluoromethyl; wherein the second formula



#### 4,159,988 SYNTHETIC PHOSPHOLIPIDS, A PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Hansjörg Eibl, Boven; Walter Diembeck, Göttingen, and Stephen Kovatchev, Göttingen-Röringen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 602,181, Aug. 5, 1975, abandoned. This application Jan. 18, 1978, Ser. No. 870,326

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1974, 2437832

Int. Cl. C07D 317/00; A23J 7/00; C07F 9/02; C11C 3/00

U.S. Cl. 260—340.9 R

9 Claims

8. 1-myristoyl-propanediol-3-phosphoric acid-4-trimethylaminobutylester.



4,159,989

## PROCESS FOR PREPARING ETHYLENE GLYCOL DIACYLATE

George R. Wood, Winfield, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 2, 1977, Ser. No. 792,882

Int. Cl.<sup>2</sup> C07D 307/32; C07C 69/16

U.S. Cl. 260—343.6

9 Claims

1. The process of disproportionating an acyloxyethylmercuric acylate to ethylene glycol diacylate which comprises heating a composition consisting essentially of an aliphatic carboxylic acid and an acyloxyethylmercuric acylate with a catalytic concentration of perchloric acid.

4,159,990

## REDUCTION OF 2,5-DIKETOGLUCONIC ACID

Glenn C. Andrews, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 749,509, Dec. 10, 1976,

abandoned. This application Oct. 20, 1977, Ser. No. 843,946

Int. Cl.<sup>2</sup> C07D 307/62

U.S. Cl. 260—343.7

16 Claims

1. A process for preparing a 2-ketogulonate and 2-ketogulonate mixture which comprises contacting a 2,5-diketogulonate with from about 0.8 to 1.1 equivalents per mole of an alkali metal borohydride in solution at a pH greater than 5 and a temperature between about -30° C. and 50° C., said 2,5-diketogulonate being selected from 2,5-diketogluconic acid, a normal alkyl ester of said acid wherein said alkyl group is of 1 to 4 carbon atoms, and a salt of said acid having a counterion selected from an alkali metal, an alkaline earth metal, ammonium and tetraalkylammonium having from 1 to 4 carbon atoms in each alkyl group.

4,159,991

## ACYLOXY-N,N'-DIACYLMALONAMIDES AND METHODS FOR THEIR PREPARATION

Bernard Dubreux, Francheville le Bas; Serve Y. Delavarenne, Francheville le Haut, and Jean-Pierre Schirmann, Oullins, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 22, 1977, Ser. No. 826,478

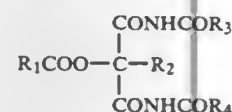
Claims priority, application France, Sep. 1, 1976, 76 26324

Int. Cl.<sup>2</sup> C07C 143/90; C11D 1/28; C09F 5/00

U.S. Cl. 260—401

12 Claims

1.  $\alpha$ -Acyloxy-N,N'-diacylmalonamides of the formula



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are the same or different and are hydrogen, straight-chain or branched-chain alkyl radicals having from one to eleven carbon atoms, or hydrocarbon radicals having from six to twelve carbon atoms and containing at least one aromatic ring.

2.  $\alpha$ -Acyloxy-N,N'-diacylmalonamides according to claim 1 wherein at least one radical is substituted by a nitro, hydroxy, alkoxy, carboxylic ester or amide, ether oxide, amino, sulfoxide, sulfone, or sulfonic acid group; by fluorine, chlorine, bromine, or iodine; or by a halogenated hydrocarbon group.

4,159,992

## REMOVAL OF PLASTIC POLYMER FINES FROM TALLOW

Constantine D. Miserlis, Arlington, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Filed Jul. 3, 1978, Ser. No. 921,735

Int. Cl.<sup>2</sup> C11B 1/12; C11C 1/04; C09F 5/10

U.S. Cl. 260—412.6

16 Claims

14. In the rendering of raw animal fat to produce tallow,

wherein a raw animal fat feedstock in plastic polymer containers is digested to produce a tallow product having fine particles of said plastic polymer suspended therein, the method of removing said fine particles of plastic polymer which comprises: adjusting said tallow product to just above its freezing point and contacting said tallow with a selected organic solvent to form a solution comprising said solvent and dissolved tallow and containing undissolved fine particles of plastic polymer; filtering said solution to remove said undissolved fine particles of plastic polymer and recover a filtrate which is substantially free of said plastic polymer; treating said filtrate to separate said solvent and dissolved tallow, and recycling said separated solvent for contacting additional tallow.

4,159,993

## 3-METALLO SUBSTITUTED NAPHTHALENES

Henry Rapoport, Berkeley, and Clinton D. Snyder, Monte Sereno, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

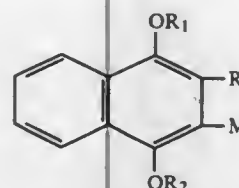
Division of Ser. No. 565,473, Apr. 7, 1975, Pat. No. 4,089,873, which is a continuation-in-part of Ser. No. 540,450, Jan. 13, 1975, abandoned. This application Jul. 14, 1977, Ser. No. 815,771

Int. Cl.<sup>2</sup> C07F 1/08

U.S. Cl. 260—438.1

12 Claims

1. Compounds of the formula



wherein R is lower alkyl and R<sub>1</sub> and R<sub>2</sub> are lower alkyl, or aralkyl of 7 to about 12 carbon atoms, and M is selected from the group consisting of (CuLi)<sub>3</sub> and Cu.

4,159,994

## KAOLIN INTERCALATION COMPLEXES AND PROCESSES FOR FORMING THE SAME

Herbert Seto, Orleans; Maria I. Cruz, Marcilly en Villette, and Jose J. Fripiat, Orleans, all of France, assignors to Unibra Societe Anonyme, Brussels, Belgium

Filed Feb. 2, 1978, Ser. No. 874,603

Claims priority, application United Kingdom, Feb. 4, 1977, 04642/77; Nov. 1, 1977, 45392/77

Int. Cl.<sup>2</sup> C07F 5/06

U.S. Cl. 260—448 C

31 Claims

1. Process for preparing new intercalation complexes of kaolin materials having organic compounds or radicals in their chemical structure, said compounds or radicals being selected from

the ammonium salts of carboxylic acids having more than two carbon atoms, the alkali metal salts of carboxylic acids having more than two carbon atoms, said process comprising

(1) reacting a member selected from the group consisting of a kaolin-hydrazine complex and a kaolin-ammonium acetate complex with a solution of an ammonium or alkali metal salt of a carboxylic acid having more than two carbon atoms.

4,159,995

## CONVERSION OF SYNTHESIS GAS TO HYDROCARBON MIXTURES UTILIZING DUAL REACTORS

Werner O. Haag, Lawrenceville, and Tracy J. Huang, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,487

Int. Cl.<sup>2</sup> C07C 1/04

U.S. Cl. 260—450

6 Claims

1. In a process for converting synthesis gas comprising carbon monoxide and hydrogen to gasoline boiling components wherein synthesis gas is contacted in a first reactor under conditions of elevated temperatures and pressure with an iron containing Fischer-Tropsch catalyst and the total product from said first reactor is passed to a second reactor containing an acidic crystalline zeolite having a pore diameter greater than about five Angstroms, a silica to alumina ratio of at least 12, a crystal density substantially below 1.6 grams per cubic centimeter and a constraint index of from 1 to 12 the improvement which comprises:

- carrying out said contact in said first reactor at a temperature of from 450° to 670° F., a pressure of from atmospheric to 1500 psig and a weight hourly space velocity of from 0.1 to 10.
- operating said second reactor at a temperature of from 530° F. to about 850° F., a pressure of from atmospheric to about 1500 psig and at a weight hourly space velocity of from 0.2-30, and
- recovering a C<sub>5</sub>+ gasoline fraction in a yield of at least 40 weight percent based on the total hydrocarbons produced, said gasoline fraction having a boiling range of less than 400° F. at a 90% overhead, and
- producing methane plus ethane in a amount no greater than 25 weight percent.

4,159,996

## PREPARATION OF ALKANE DIAMINES

Richard F. Love; Stanley R. Newman, both of Fishkill, N.Y., and John M. Larkin, Austin, Tex., assignors to Texaco Inc., New York, N.Y.

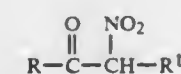
Filed Oct. 31, 1977, Ser. No. 847,193

Int. Cl.<sup>2</sup> C07C 85/08

U.S. Cl. 260—570.5 P

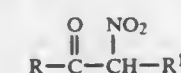
25 Claims

1. A method for the preparation of an alkane diamine which comprises contacting a vicinal nitroketone corresponding to the formula:



where R is an alkyl group of from 1 to 20 carbon atoms and where R<sup>1</sup> is hydrogen or an alkyl group having 1 to 20 carbon atoms and a primary amine hydrochloride thereby forming a nitroalkyliminoalkane or a nitrooximinoalkane and thereafter catalytically hydrogenating said nitroalkyliminoalkane or said nitrooximinoalkane.

14. A method for the preparation of a nitrooximinoalkane or a nitroalkyliminoalkane which comprises contacting a vicinal nitroketone corresponding to the formula:



where R is an alkyl group of from 1 to 20 carbon atoms and where R<sup>1</sup> is hydrogen or an alkyl group having 1 to 20 carbon atoms and a primary amine hydrochloride.

4,159,997

2-DECARBOXY-2-HYDROXYMETHYL-6-HYDROXY-PGE<sub>1</sub> COMPOUNDS

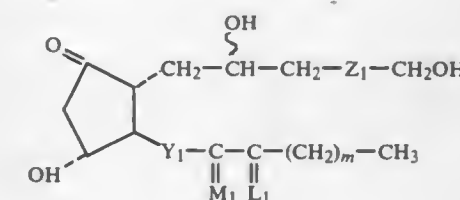
Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich. Continuation-in-part of Ser. No. 812,794, Jul. 5, 1977, Pat. No. 4,131,738. This application Jun. 23, 1978, Ser. No. 918,525

Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 260—586 R

34 Claims

1. A prostacyclin analog of the formula



wherein Z<sub>1</sub> is

- (CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—CH<sub>2</sub>—,
- (CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—CF<sub>2</sub>—, or
- trans-(CH<sub>2</sub>)<sub>g</sub>—CH=CH—,

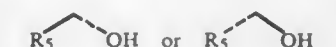
wherein g is the integer one, 2, or 3;

wherein Y<sub>1</sub> is

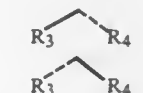
- trans-CH=CH—,
- cis-CH=CH—,
- CH<sub>2</sub>CH<sub>2</sub>—,
- trans-CH=C(Hal)—, or
- C≡C—,

wherein Hal is chloro or bromo;

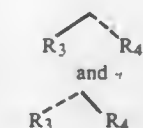
wherein M<sub>1</sub> is



wherein R<sub>5</sub> is hydrogen or alkyl with one to 4 carbon atoms, inclusive; wherein L<sub>1</sub> is



or a mixture of



wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro; and wherein m is the integer one to 5, inclusive.

4,159,998

## PROCESS FOR THE PREPARATION OF 2-(7-HYDROXYALKYL)-4R, 4S OR 4RS-HYDROXY-CYCLOPENT-2-ENONE

Harold C. Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.

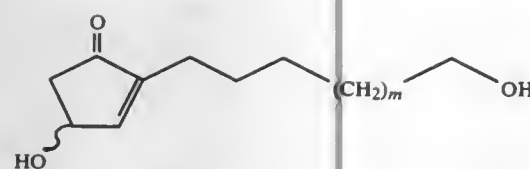
Filed Sep. 11, 1978, Ser. No. 940,977

Int. Cl.<sup>2</sup> C07C 45/00

U.S. Cl. 260—586 R

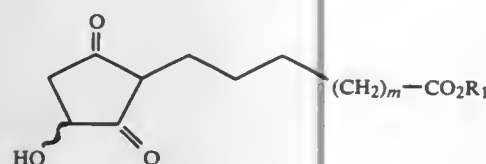
25 Claims

1. A process for the preparation of 2-(ω-hydroxyalkyl)-4R,4S or 4RS-hydroxy-cyclopent-2-enone corresponding to the formula:



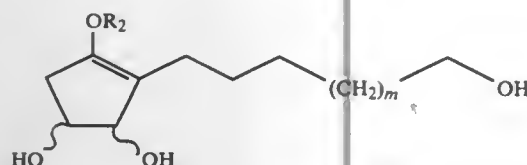
wherein m is an integer of from 2 to 4, which process comprises the steps of:

A. reacting in an inert solvent under a dry atmosphere a 2-(ω-carboalkoxyalkyl)-4R,4S or 4RS-hydroxycyclopentan-1,3-dione corresponding to the formula:



wherein m is an integer of from 2 to 4 and R<sub>1</sub> is an alkyl group containing from 1 to 4 carbon atoms, with mesitylenesulfonyl chloride, a lower alkyl iodide of from 1 to 4 carbon atoms or benzoyl chloride in the presence of an excess of a tertiary or aromatic amine to convert the starting material to the corresponding enol sulfonate, enol ether or enol benzoate;

B. reacting in an inert solvent and under an inert atmosphere the so-formed enol sulfonate, enol ether or enol benzoate with an excess of a metallic hydride reducing agent capable of reducing the ester and carbonyl group on the enol sulfonate, ether or benzoate to primary and secondary alcohol groups respectively, at a temperature not in excess of about 35° C. to reduce the carbonyl group on the starting material to a hydroxyl group and to reduce the ester group on the starting material to an alcohol group to thereby form an intermediate material corresponding to the formula:



wherein R<sub>2</sub> is mesitylenesulfonyl, lower alkyl or benzoyl and m is an integer from 2 to 4;

C. adding a dilute aqueous solution of a mineral acid and a water immiscible organic solvent to the reaction mass to convert unreacted amine to its corresponding amine salt and cause the amine salt to reside in the so-formed aqueous phase and cause the intermediate material formed in step B to reside in the so-formed organic phase;

D. separating the aqueous phase from the organic phase;

E. washing the organic phase with an aqueous base to remove the acid therefrom;

F. separating the intermediate material formed in step B from the organic phase; and

G. dissolving the intermediate material in chloroform, methylene chloride, a lower alcohol or a mixture thereof and reacting it with sodium oxalate and oxalic acid to form the desired product.

#### 4,159,999 HYDROFORMYLATION OF OLEFINS

Adin L. Stautzenberger, James L. Paul, and Jerry D. Unruh, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

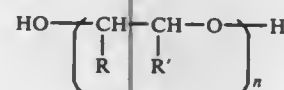
Filed Nov. 22, 1974, Ser. No. 526,298

Int. Cl.<sup>2</sup> C07C 45/08

U.S. Cl. 260—604 HF

8 Claims

1. In the process for the hydroformylation of olefins with hydrogen and carbon monoxide in a reaction zone to form aldehydes, alcohols and mixtures thereof in which a catalytic complex comprising a Group VIII metal, carbon monoxide and a ligand is formed in situ, the improvement comprising the introduction of the Group VIII metal into said zone in the form of a water-soluble inorganic salt dissolved in a solvent comprised of at least about 40% of a polyalkylene glycol selected from compounds having the following structure and mixtures thereof:



wherein n is 1-3, and R and R' are selected from —H and —CH<sub>3</sub>.

#### 4,160,000 EXTRACTION OF HYDROPEROXIDES

John F. Hutto, and Alfred A. Hoffman, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

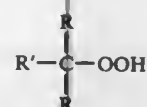
Filed Mar. 13, 1978, Ser. No. 886,029

Int. Cl.<sup>2</sup> C07C 179/02

U.S. Cl. 568—576

9 Claims

1. A process for the recovery of an organic hydroperoxide, said hydroperoxide being represented by the following general formula



in which R can be hydrogen, an alkyl radical of 1 to 4 carbon atoms, taken together the R groups can form a cycloalkyl ring of from 4 to 7 carbon atoms, R' can be R, an aryl radical of from 6 to 10 carbon atoms, an alkyl substituted aryl radical of from 7 to about 22 carbon atoms and said hydroperoxides contain from 4 to about 30 carbon atoms per molecule from a reaction mixture containing the same and unreacted corresponding hydrocarbon from which it has been produced which comprises, in a first step, extracting said mixture with an aqueous alcoholic solvent having a concentration in the approximate range of 80-95 wt. % alcohol to obtain an extract containing a higher percentage of hydroperoxide and, in a second step, adding to said extract a limited amount of water only sufficient to reject primarily only an oily layer containing a minor proportion of hydroperoxide and a major proportion of the hydrocarbon and an aqueous alcoholic solution phase containing hydroperoxide suitable for use in the acid-catalyzed decomposition for the production of carbonyl and hydroxy compounds, the amount of water added to said extract being limited to between from about 2 to about 50 wt. % based on the weight of the extract.

#### 4,160,001 COPOLYMER BLENDS

Irving Rosen, Warrensville Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

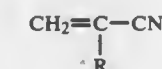
Filed Aug. 18, 1977, Ser. No. 825,643

Int. Cl.<sup>2</sup> C08L 51/04

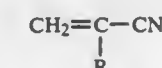
U.S. Cl. 525—230

6 Claims

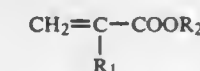
1. A blend of from 2 to 60% by weight of  
I. a copolymer of from about 50 to 70% by weight of methyl methacrylate and correspondingly from about 50 to 30% by weight of styrene, and from 98 to 40% by weight of  
II. a copolymer prepared by the polymerization of 100 parts by weight of  
(A) more than 50% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,  
(B) less than 50% by weight based on the combined weights of (A) plus (B) of styrene, in the presence of from 0 to 40 parts by weight of  
(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene, a nitrile monomer having the structure



wherein R has the foregoing designation, and an ester having the structure



wherein R<sub>1</sub> is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R<sub>2</sub> is an alkyl group having from 1 to 6 carbon atoms, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

#### 4,160,002 STEAM INJECTORS

Viacheslav J. Janovitchik, 16, Hedley Ct., 67 Putney Hill, London SW15 3NS, England

Continuation of Ser. No. 804,657, Jun. 8, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,994

Claims priority, application United Kingdom, Jun. 9, 1976, 23895/76

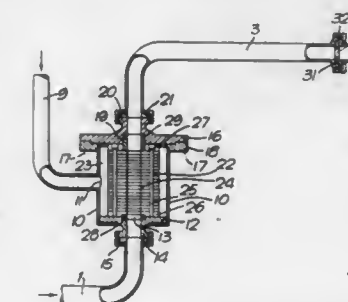
Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 261—76

7 Claims

1. A steam injector for heating a flowable product, comprising: a closed injection chamber having an inlet to said chamber for the product to be heated, an outlet from said chamber for the heated product, and an inlet for steam under pressure, a stack of planar discs held together within the chamber, between the product inlet and outlet with a space for steam under pressure around the periphery of the stack, each disc having a central hole, which holes define a central passage communicating at one end with said inlet for the product to be heated and at the other end with said outlet for the treated product, the planes of the discs being perpendicular to the direction of flow of the product, one face of each disc being formed with a plurality of non-radial chordal channels running parallel to each other from the periphery of the disc to the central hole,

the chordal channels being offset from the radial chords of the disc, and a steam supply pipe connected to the steam inlet to



maintain steam under pressure in the space around the stack of discs for injection through the chordal channels into the product flowing through the central passage.

#### 4,160,003

METHOD OF MOLDING CEMENTITIOUS MATERIAL  
Mikio Kozuka, Yokohama; Isao Ono, Kawasaki, and Takashi Fukuwatari, Tokyo, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 659,081, Feb. 18, 1976, abandoned.

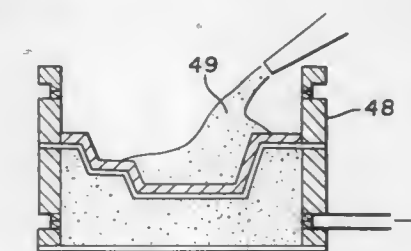
This application Dec. 1, 1977, Ser. No. 856,588

Claims priority, application Japan, Feb. 18, 1975, 50-19429; Feb. 18, 1975, 50-19430

Int. Cl.<sup>2</sup> B28B 1/26

U.S. Cl. 264—87

11 Claims



1. A method of molding cementitious material comprising: charging wet cementitious material into a molding mold; disposing a first mold frame about the wet cementitious material; charging filler material under air permeable conditions directly onto the wet cementitious material; disposing a shield layer which is impermeable over the filler material; fixing the filler material under reduced pressure caused by suction applied through a source of suction to form a hardening mold; retaining the cementitious material on the hardening mold; and permitting the cementitious material is set upon the hardening mold.

10. A method of molding a wet cementitious material comprising:

charging a slurry of wet cementitious material into a molding mold;  
placing a frame, equipped with a filter connected to a suction pump around the molding mold;  
charging a filler material directly onto the wet cementitious material;  
disposing a shield layer which is impermeable to cover the filler material;  
fixing the filler material within the frame under a reduced



pressure condition caused by suction through the filter to form a hardening mold;  
detaching the molded cementitious material from the molding mold and retaining the molded cementitious material with respect to the hardening mold; and  
discontinuing the reduced pressure within the frame after the mold cementitious material has set.

11. A method of molding a cementitious material comprising:
- placing a first frame, equipped with a first filter connected to a suction pump, around a master model having a first shield layer thereon;
  - charging first filler material into the first frame to cover the first filter under permeable conditions;
  - disposing a second shield layer which is impermeable to cover the first filler material;
  - turning upside down the master model, the first and second shield layers, the first frame and the first filler material;
  - fixing the first filler material under a reduced pressure condition caused by suction through the first filter to form a first mold;
  - removing the master model;
  - charging a slurry of cementitious material into the first mold;
  - placing a second frame, equipped with a second filter connected to the suction pump, upon the first frame;
  - charging a second filler material onto the cementitious material;
  - disposing a third shield layer which is impermeable to cover the second filler material;
  - fixing the second filler material within the second frame under a reduced pressure condition caused by suction through the second filter to form a second mold;
  - detaching the molded cementitious material from the first mold and retaining the molded cementitious material with respect to the second mold; and
  - discontinuing the reduced pressure within the second frame after the molded cementitious material has set.

4,160,004

# PRODUCTION OF FIBROUS SHEET MATERIAL

Harold G. Curry, Hambrook, Nr. Bristol; Brian W. Attwood, Hanham, Nr. Bristol; Derek G. W. White, Bristol, all of England; John M. Christensen, Risskov, and Karl K. K. Kroyer, Viby J, both of Denmark, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 375,094, Jun. 29, 1973, abandoned.

This application Jul. 26, 1976, Ser. No. 708,384

Claims priority, application United Kingdom, Jul. 8, 1972, 32098/72

Int. Cl.<sup>2</sup> D04H 1/64

U.S. Cl. 264—120

12 Claims



1. A method of producing a self-sustaining sheet including essentially cellulosic fibrous material comprising:
- (a) dry laying a web of essentially cellulosic fibres upon a movable support surface, wherein the web includes a binder,
  - (b) moistening said dry-laid web with water in an amount into subsequently bond the web to a consolidated sheet under subsequently applied pressure,
  - (c) moving said moistened web with said movable support surface to a first pressure nip between a first pressure roll and a heated consolidating surface, with a supporting band located against the web on the side thereof opposite from the consolidating surface, wherein the consolidating surface together with the first pressure roll, the latter acting through the supporting band, exert on the moist-

ened heated web therebetween uniformly across the width of the web a pressure of between 150 to 500 pounds per linear inch to consolidate the web,

- (d) maintaining the supporting band against the web after the web leaves the first pressure nip to continue to urge the web against the heated consolidating surface between the first pressure nip and a second pressure nip spaced from the first pressure nip to maintain, between the first and second pressure nips, a pressure exerting the web against the consolidating surface,
- (e) moving the web into the said second pressure nip, which is formed between the said heated consolidating surface and a second pressure roll with the supporting band against the web on the side thereof opposite from said heated consolidating surface, wherein the heated consolidating surface and the second pressure roll, the latter acting through the supporting band, exert on the moistened heated web therebetween uniformly across the width of the web a pressure of between 150 to 500 pounds per linear inch to further consolidate the web to strengthen it, and
- (f) removing the web, now a self-sustaining sheet, from the second pressure nip.

4,160,005

# METHOD OF FABRICATING A SELECTIVELY SHAPED AND APERTURED PART OF FIBER REINFORCED PLASTIC

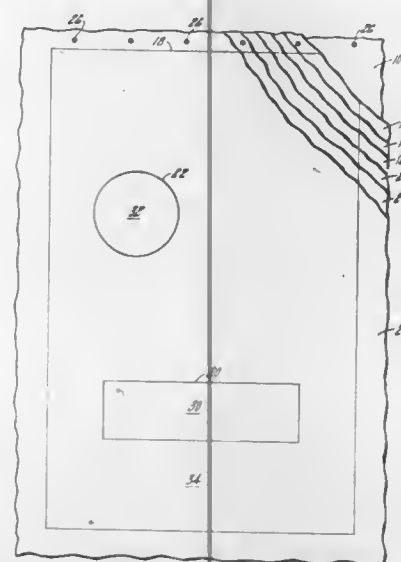
Robert K. Renkowsky, Bridgeport, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 7, 1977, Ser. No. 848,954

Int. Cl.<sup>2</sup> B29G 5/00; B29D 3/02

U.S. Cl. 264—137

3 Claims



1. The method of fabricating a selectively shaped, contoured and apertured part of fiber reinforced plastic comprising the steps of:

- (A) providing a mold of the part final shape,
- (B) laying-up upon the mold the desired number of layers of preimpregnated and uncured fiber reinforced plastic,
- (C) cutting through the layers so laid-up around the outer periphery of the part being fabricated and around the periphery of all apertures therein,
- (D) curing the layers so laid-up with the waste material so cut in place,
- (E) removing the cured material from the mold, and
- (F) pressing the cured waste material so cut away from the cured material of the part being fabricated to cause severance of the waste material from the finished part along the smooth lines established by the cutting process.

4,160,006

# PROCESS AND DEVICE FOR THE MANUFACTURE OF A TUBE BEND OF A THERMOPLAST

Alfred Patzner, Schwalbach, and Josef Kruger, Kahlbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

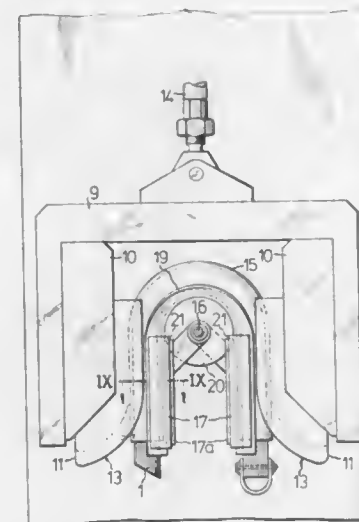
Filed Mar. 6, 1978, Ser. No. 883,939

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709996

Int. Cl.<sup>2</sup> B29C 17/02

U.S. Cl. 264—292

1 Claim



1. Process for the manufacture of a tube bend of a thermoplastic by heating a straight tube length to a temperature in the optimum thermoforming range of the plastic material, introducing a supporting core into the interior of the tube and bending the tube length around a bending template, which comprises heating the tube length, introducing into the hot tube a core consisting of lamellae capable of being shifted against one another, placing an elastic, extensible insert between the tube and a circular disk the radius of which disk corresponds to the inner bending radius of the tube bend to be produced less the thickness of the insert and bending the tube round the circular disk, whereby the stretching insert causes an expansion of the inner surface of the tube bend.

4,160,007

# METHOD AND IMPROVED APPARATUS FOR AUTOMATICALLY HANDLING A MOLD FOR TIRES WITH A RIGID SEGMENTED CORE

Augusto Pizzorno, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

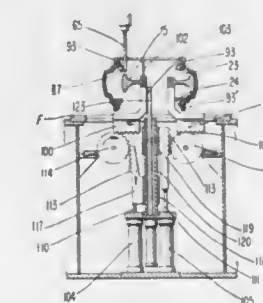
Filed Sep. 6, 1977, Ser. No. 830,870

Claims priority, application Italy, Sep. 13, 1976, 27139 A/76

Int. Cl.<sup>2</sup> B29H 17/38

U.S. Cl. 264—334

2 Claims



1. A method of disassembling and reassembling a mold for

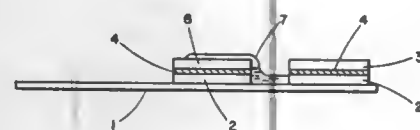
making a tire, said mold consisting essentially of an outer envelope and an inner body joined to define the required shape of the tire, said inner body consisting of a core having sectors which can be radially taken into pieces, with radial extensions towards the inside of the core and at least two annular elements, an upper one and a lower one, separable from each other and from the core in the direction of the core axis, said annular element having at least two surfaces forming axially inner surfaces for the bead of the tire to be made, said method consisting essentially of the following phases:

- (a) removing the outer envelope of the mold around the tread of the tire already molded and vulcanized as well as of those zones of the envelope that prevent the sectors of the core from entering;
- (b) supporting the sectors of the core in such a way that their center line plane is horizontal and coincides with the equatorial plane of the tire;
- (c) applying forces to the lower annular element sufficient to remove it from the core in the direction of the core axis in order to spread out the sidewall of the tire below the center line plane of the core and then sufficient to thrust the sidewall overhanging said center line plane and the zone of the tread near said overhanging sidewall against the corresponding profiles of the sectors and at the same time for locking the bead below the center line plane in such a way as to keep it in contact with the surface of the lower annular element that formed the axially inner surface of said bead below;
- (d) discontinuing said forces applied to the lower annular element to remove it from the core during phase (c) and at the same time stopping said lower annular element with further forces in such a way as to go on with pressing the sidewall overhanging said center line plane and the zone of the tread near said sidewall overhanging the corresponding profiles of the sectors;
- (e) applying to the upper annular element the forces previously applied during phase (c) to the lower annular element with the same intensity and in the opposite direction in such a way as to remove said upper annular element from the core in order to spread out the sidewall of the tire overhanging the center line plane in such a way as to keep it in contact with the surface of the upper annular element that formed the axially inner surface of said overhanging bead;
- (f) stopping said upper annular element when it reaches a position which is symmetrical with respect to the position reached at the end of phase (c) by the lower annular element relative to the equatorial plane of the mold;
- (g) radially moving a first part of the sectors towards the axis of the core and then in the direction of the core axis in order to allow the radial contraction of the remaining sectors and to contract said remaining sectors;
- (h) releasing the bead below said center line plane from the lower annular element and at the same time dragging the whole tire, by now released from the lower annular element, with the upper annular element over the sectors and starting with the extraction of the tire;
- (i) expanding all the sectors against an annular stiffening structure for the tire placed in such a manner as to have the median line aligned with the center line plane;
- (l) applying forces to the upper annular element to bring it again in contact with the sectors;
- (m) discontinuing said further forces which kept the lower annular element in the final position reached at the end of phase (d);
- (n) applying to the lower annular element the forces applied in phase (l) to the upper annular element in the opposite direction in order to bring said lower annular element into contact with the sectors;
- (o) rebuilding the outer envelope of the mold to mold and vulcanize a new tire; and
- (p) repeating the preceding phases cyclically for the manufacture of additional tires.

**4,160,008**  
**MULTILAYERED TEST DEVICE FOR DETERMINING THE PRESENCE OF A LIQUID SAMPLE COMPONENT, AND METHOD OF USE**  
 Leonard P. Fenocketti, Tolland, Conn., and Myron C. Rapkin, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 26, 1978, Ser. No. 872,560  
 Int. Cl.<sup>2</sup> G01N 31/22, 33/16  
 U.S. Cl. 422—56

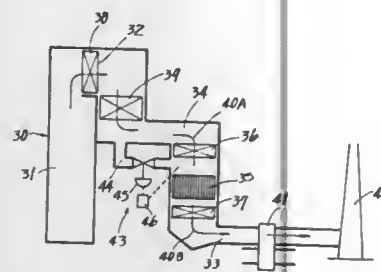
16 Claims



1. Test means for determining the presence of a constituent in a liquid sample, said test means comprising a layer of absorbent material having fixedly laminated to each of the opposite faces thereof respectively, a substantially liquid impervious layer, and a reagent layer overlaying at least one of said liquid impervious layers.

**4,160,009**  
**BOILER APPARATUS CONTAINING DENITRATOR**  
 Ko'hei Hamabe, Osaka, Japan, assignor to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan  
 Filed Jul. 14, 1977, Ser. No. 815,722  
 Claims priority, application Japan, Jul. 27, 1976, 51-89972; Jul. 27, 1976, 51-100548[U]  
 Int. Cl.<sup>2</sup> B01J 8/02; C01B 21/00  
 U.S. Cl. 422—108

9 Claims



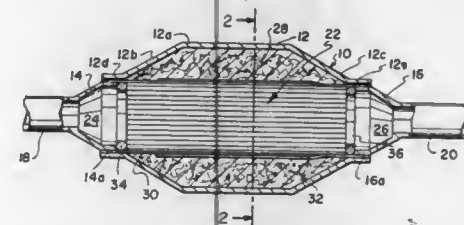
1. In a boiler apparatus having a furnace and a plurality of heat exchangers disposed in a combustion gas channel between the furnace and boiler apparatus exits, the improvement comprising,

a denitrator having a catalyst disposed in said combustion gas channel downstream of at least one of said heat exchangers,  
 a bypass duct for said combustion gas channel connecting a first region thereof in which said denitrator is disposed with a second region upstream of said first region,  
 control valve means disposed in said duct, and  
 a temperature detector disposed in said first region and connected to said control valve means so as to control the opening and closing of said valve means in response to the temperature detected in said first region by said detector.

**4,160,010**  
**DEVICE FOR PURIFYING EXHAUST GASES**  
 Walter Öttele, Faurndau, Fed. Rep. of Germany, assignor to J. Eberspächer, Fed. Rep. of Germany  
 Continuation of Ser. No. 690,864, May 28, 1976, abandoned.  
 This application Nov. 14, 1977, Ser. No. 851,306  
 Int. Cl.<sup>2</sup> B01J 35/04, 8/02, 3/15

U.S. Cl. 422—180 12 Claims  
 1. A device for purifying exhaust gases in an internal combustion engine, comprising a tubular housing having an outer

wall with a first end having an inlet for exhaust gases and an opposite second end having an exhaust gas discharge, a catalyst carrier disposed in said housing and having a plurality of axially extending catalyst containing gas passages extending therethrough defining individual catalyst gas flow passages from said inlet to said outlet, said catalyst carrier having an end wall at each end and a side peripheral wall, first and second foil sheets, each having inner portions covering a portion of said catalyst carrier and outer portions extending beyond the respective end of the catalyst carrier, ring means securing the outer ends of each first or second sheet to the interior of said



housing beyond the respective end of the catalyst carrier, said sheets extending over said peripheral wall by an amount sufficient to prevent gases from flowing into the space around said peripheral side wall of said carrier and said tubular housing, said side periphery of said catalyst carrier with the portions of the first and second sheets thereon being spaced inwardly from said outer wall of said tubular housing to define an insulation space therebetween, and a compacted insulation material disposed in said insulation around the periphery of said carrier and bearing against said foil sheets and said carrier to hold said carrier in position in said housing.

**4,160,011**  
**CRYSTALLINE ALUMINOSILICATE PRECURSOR**  
 John H. Estes, Wappingers Falls, Stanley Kravitz, Fishkill, and Robert M. Suggitt, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.  
 Continuation-in-part of Ser. No. 536,711, Dec. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 272,089, Jul. 14, 1972, abandoned. This application Dec. 29, 1977, Ser. No. 865,452  
 Int. Cl.<sup>2</sup> C01B 33/28

U.S. Cl. 423—328 17 Claims  
 1. A process for preparing an amorphous precursor for crystalline aluminosilicates which comprises:

(a) forming under ambient conditions a sodium aluminum silicate water mixture sufficient for the formation a type 4A zeolite and having a composition, in terms of oxide mole ratios, of Na<sub>2</sub>O/SiO<sub>2</sub> from 0.8 to 3.0, H<sub>2</sub>O/Na<sub>2</sub>O from 35 to 200 and SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> from 1.3 to 2.5;  
 (b) removing water from said mixture by extracting the mixture with a water miscible solvent;  
 (c) recovering the resultant solid material; and  
 (d) drying the resultant material to produce an amorphous powder.

**4,160,012**  
**PROCESS OF REFINING SODIUM HEXAFLUOROSILICATE CONTAINING GYPSUM**  
 Tetsuhiro Ono; Minoru Aramaki; Tamotsu Mizuno, and Masao Fujinaga, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan  
 Filed Nov. 30, 1977, Ser. No. 856,134  
 Claims priority, application Japan, Dec. 3, 1976, 51-144697  
 Int. Cl.<sup>2</sup> C01B 33/10

U.S. Cl. 423—341 9 Claims  
 1. A process of refining a crude sodium hexafluorosilicate containing calcium sulfate as an impurity, comprising the steps of:

(a) preparing an aqueous slurry of the crude sodium hexafluorosilicate;  
 (b) adding an alkali metal compound, which can neutralize sulfuric acid and which is selected from the group consisting of sodium hydroxide, sodium carbonate, sodium hydrogen carbonate, potassium hydroxide, potassium carbonate, potassium hydrogen carbonate and lithium hydroxide, to said slurry to form a solid phase consisting essentially of calcium fluoride and silicon dioxide through decomposition of sodium hexafluorosilicate and calcium sulfate accompanied by the formation of a water soluble sulfate by neutralization of sulfuric acid formed during said decomposition with said alkali metal compound;  
 (c) separating said solid phase from the product of step (b);  
 (d) making said solid phase react with an acid, which can form a water soluble calcium salt, in an aqueous solution comprising sodium ions; and  
 (e) recovering solid phase sodium hexafluorosilicate from the product of step (d).

**4,160,013**  
**PROCESS FOR THE OXIDATION OF NITRIC OXIDE TO NITROGEN DIOXIDE**  
 James M. Whelan, La Canada, Calif., assignor to University of Southern California, Los Angeles, Calif.  
 Division of Ser. No. 712,002, Aug. 5, 1976, Pat. No. 4,082,837, which is a division of Ser. No. 556,670, Mar. 10, 1975, Pat. No. 3,976,599, which is a division of Ser. No. 194,769, Oct. 28, 1971, Pat. No. 3,855,020. This application Dec. 8, 1977, Ser. No. 858,559  
 Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—402 1 Claim  
 1. A process for the selective oxidation of a nitric oxide to nitrogen dioxide in the presence of elemental nitrogen with minimal oxidation thereof, which comprises combining the nitric oxide with a predetermined amount of oxygen containing gas to give at least a 1% stoichiometric excess of oxygen for the oxidation of the nitric oxide to nitrogen dioxide and passing the resulting mixture over a ceramic catalyst of the following empirical formula at a temperature between about 100° C. and 400° C.



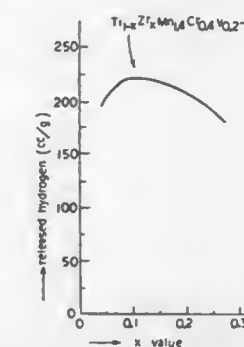
wherein

W is Zirconium, Tin or Thorium or mixtures thereof;  
 X is an alkaline earth metal or mixture thereof;  
 J is scandium, yttrium or a rare-earth element or mixture thereof;  
 Z is a metal of the first transition series or a mixture thereof, at least 0.01% of said metal having an oxidation state other than +3;  
 k is a number having a value between 0 and about 0.1;  
 m is a number having a value of from 0 to about 0.26; and  
 n is a number having a value from 0 to about 0.51, provided when n has a value of 0, k has a value between 0 and about 0.05.

**4,160,014**  
**HYDROGEN STORAGE MATERIAL**  
 Takaharu Gamo, Fujiidera; Yoshio Moriwaki, Moriguchi; Toshio Yamashita, Katano, and Masataro Fukuda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan  
 Filed May 10, 1978, Ser. No. 905,176  
 Claims priority, application Japan, May 10, 1977, 52-54140  
 Int. Cl.<sup>2</sup> C01B 6/02

U.S. Cl. 423—644 6 Claims  
 1. A material for storage of hydrogen comprising an alloy represented by the formula AB<sub>α</sub> in which A comprises from 50 to below 100 (exclusive) atomic percent of titanium and remainder being zirconium, B comprises from 30 to below 100 (exclusive) atomic percent of manganese and the remainder

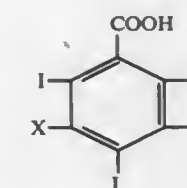
containing vanadium and one element selected from the group consisting of chromium and molybdenum, and α is a value indicating the ratio of B to A, and is in the range of 1.0 to 3.0.  
 6. A hydride of an alloy represented by the formula AB<sub>α</sub> in which A comprises from 50 to below 100 (exclusive) atomic percent of titanium and remainder being zirconium, B com-



prises from 30 to below 100 (exclusive) atomic percent of manganese and the remainder containing vanadium and one element selected from the group consisting of chromium and molybdenum, and α is a value indicating the ratio of B to A, and is in the range of 1.0 to 3.0, said hydride being produced by reacting said alloy with hydrogen.

**4,160,015**  
**2,4,6-TRIiodOBENZOIC ACID DERIVATIVES AND THEIR USE AS X-RAY CONTRAST AGENTS**  
 Philip E. Wiegert, Glens Falls, N.Y., assignor to Mallinckrodt, Inc., St. Louis, Mo.  
 Division of Ser. No. 715,974, Aug. 19, 1976, Pat. No. 4,125,599.  
 This application Aug. 28, 1978, Ser. No. 937,099  
 Int. Cl.<sup>2</sup> A61K 29/02; C07C 101/44, 101/72, 103/24  
 U.S. Cl. 424—5 7 Claims

6. An x-ray contrast medium comprising an aqueous solution of an effective amount of a salt of a compound of the formula:



wherein X is selected from the group consisting of lower acylamino, N-(lower alkyl)-lower acylamino, N-(hydroxy lower alkyl)-lower acylamino, carbamyl and N-(lower alkyl) carbamyl and Y is tris(hydroxymethyl)acetamido, with at least one pharmaceutically acceptable cation.

**4,160,016**  
**RECEPTOR FLUORESCENT IMMUNOASSAY**  
 Edwin F. Ullman, Atherton, Calif., assignor to Syva Company, Palo Alto, Calif.  
 Continuation-in-part of Ser. No. 796,916, May 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 751,838, Dec. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 402,693, Oct. 2, 1973, Pat. No. 3,998,943. This application Aug. 11, 1977, Ser. No. 823,765  
 The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.  
 Int. Cl.<sup>2</sup> G01N 21/38, 31/00, 33/16  
 U.S. Cl. 424—8 7 Claims  
 1. A method for detecting the presence of a ligand in a sample, when the ligand is of a molecular weight in the range of about



125 to 2,000 and free of heavy atoms of atomic number greater than 35, said method comprising:  
combining in an aqueous medium said sample;

ligand analog-fluorescer wherein said ligand analog has at least one common epitope with said ligand so as to be specifically recognizable by a common antibody, and the ligand analog and fluorescer are linked sufficiently close by a linking group, so that the binding of antiligand to ligand analog reduces the emission intensity of said fluorescer having an absorption maximum above 300 mμ;

antiligand;

determining at at least one wavelength the intensity of the emission from said medium as compared to a standard having a known amount of ligand, by irradiating said medium with light in the absorption band of said fluorescer.

4,160,017

#### HERBICIDAL COMPOSITIONS

George E. Davies, Wilmslow, and David M. Foulkes, Henley-on-Thames, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 716,801, Aug. 23, 1976, Pat. No. 4,046,552. This application Sep. 6, 1977, Ser. No. 830,765  
Claims priority, application United Kingdom, Apr. 15, 1976, 15584/76

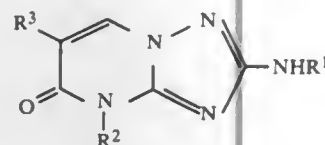
The portion of the term of this patent subsequent to Sep. 6, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 31/395; A01N 9/22

U.S. Cl. 424—10

1 Claim

1. A method of avoiding the toxifying effect of a salt of a herbicidal bipyridylum quaternary cation which has been ingested by a human which comprises inducing emesis in said human with consequent removal of the herbicidal salt from said human before lethal amounts of the herbicide can be assimilated by the body, said emesis being induced by administering to said human an emetically effective amount of an emetically active s-triazolo (1,5-a) pyrimidine derivative of the formula:



wherein R¹ is hydrogen, a C<sub>1-4</sub> alkyl radical, or a COOEt radical; R² is a C<sub>1-4</sub> alkyl radical or an allyl radical, and R³ is a C<sub>1-4</sub> alkyl radical; or an addition salt thereof.

4,160,018

#### STABILIZED CANCER ASSOCIATED POLYPEPTIDE ANTIGEN AND PREPARATION THEREOF

Knut B. Björklund, Appelviksvägen 26., 161 36 Bromma, Sweden

Division of Ser. No. 373,004, Jun. 25, 1973, Pat. No. 3,960,827, which is a continuation-in-part of Ser. No. 270,273, Jul. 10, 1972, abandoned. This application Mar. 5, 1976, Ser. No. 664,258

Int. Cl.<sup>2</sup> A61K 37/00, 39/00; C07G 7/00; G01N 31/00

U.S. Cl. 424—12

6 Claims

1. A method of making an antigen albumen complex comprising the steps of:

mixing, in acid solution, at a pH not exceeding about 5, the antigen, said antigen being:

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, having a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being

based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluorescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and, if not protected by complexing with albumen, denaturing irreversibly at pH's exceeding about 5,

and albumen, and

raising the pH of the solution to about neutral to cause interaction between the components and production of a relatively stable antigen albumen complex.

3. A complex, useful as a stabilized antigen for diagnostic purposes, comprising:

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, having a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluorescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and, if not protected by complexing with albumen, denaturing irreversibly at pH's exceeding about 5,

and a stabilizing amount of albumen complexed therewith by the method of claim 1.

4,160,019

#### DETECTION OF CANCER ASSOCIATED POLYPEPTIDE ANTIGEN AND PREPARATION OF ANTIBODIES THERETO

Knut B. Björklund, Appelviksvägen 26, 161 36 Bromma, Sweden  
Division of Ser. No. 373,004, Jun. 25, 1973, Pat. No. 3,960,827, which is a continuation-in-part of Ser. No. 270,273, Jul. 10, 1972, abandoned. This application Mar. 5, 1976, Ser. No. 664,285

Int. Cl.<sup>2</sup> A61K 37/00, 39/00; C07G 7/00; G01N 31/00

U.S. Cl. 424—12

12 Claims

1. A process for preparing antibodies monospecific with regard to an antigen, said antigen being:

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, having a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluorescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and, if not protected by complexing with albumen, denaturing irreversibly at pH's exceeding about 5,

comprising the steps of:

(a) preparing an aqueous solution at a pH less than about 3 of said antigen;

(b) preparing an oil emulsion, wherein the solution result-

ing from step (a) is enclosed phase so as to be protected by the surrounding oil phase;

(c) injecting said oil emulsion into a living animal body, whereby the antigen, carried by the emulsion, is transported to antibody-producing cells.

5. A method of determining the presence of;

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, having a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluorescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and, if not protected by complexing with albumen, denaturing irreversibly at pH's exceeding about 5,

by investigating material selected from the group consisting of serum, tissues, secretions and extracts from a living animal body under examination, comprising the steps of:

(a) preparing a series of samples of said material by serial dilution;

(b) adding to each of said samples a predetermined amount of antiserum containing antibodies specific to the antigen;

(c) adding, after incubation, to each of said incubated samples a predetermined amount of the antigen complexed with albumen which is in the form of a particulate carrier labelled therewith;

(d) comparing the resulting series of treated samples with control samples of decreasing known amounts of the albumen-complexed antigen providing inhibition of predetermined amounts of antiserum containing said antibodies, and thereafter adding to each of said control samples a predetermined amount of albumen-complexed antigen, in the form of a particulate carrier labelled therewith; and

(e) establishing, by comparison of sample series and said control samples, the amount of antigen, in the material of said living animal body to indicate the possibility of the presence of cancer and its possible stage of progress.

4,160,020

#### THERAPEUTIC DEVICE FOR OSMOTICALLY DOSING AT CONTROLLED RATE

Atul D. Ayer, Mt. View, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 634,859, Nov. 24, 1975, Pat. No. 4,077,407. This application Dec. 27, 1977, Ser. No. 864,954  
The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.

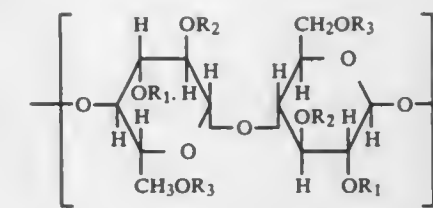
Int. Cl.<sup>2</sup> A61M 31/00; A61K 9/24, 9/44

U.S. Cl. 424—15

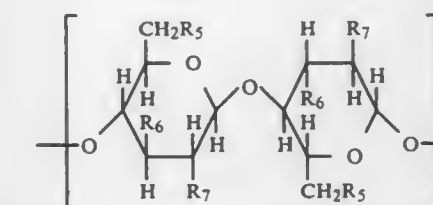
10 Claims

1. An osmotic device for dispensing a drug to an animal comprising:

(a) a shaped wall that is substantially inert and maintains its physical and chemical integrity during the controlled dispensing of the drug, said wall a composition comprising (1) a polymer that is permeable to the passage of an external fluid and substantially impermeable to the passage of drug, said polymer having the following formula:



wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are a member selected from the group consisting of hydrogen; alkyl; alkenyl; amino; alkanoyl; alkanoyl substituted with a member selected from the group consisting of alkoxy, halogen, hydroxyl, alkanoyl, carboalkyl, carboalkoxy and cyanoalkoxy; aroyl; aroyl substituted with a member selected from the group consisting of hydroxyl, carboxyl, carboalkyl and cyano; benzyl; carboalkyl; carboxyalkyl; dialkoxyalkyl; dithiocarbonyl; hydroxyalkyl; cyanoalkyl; nitro; phenyl; sulfoalkyl; the alkali metal salts thereof; and wherein said polymer exhibits a degree of substitution at R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> of greater than 0 up to 3, and n is greater than 5, and (2) a wall forming polymer that is a different polymer than (1) which polymer (2) has the following formula:



wherein R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> are a member selected from the group consisting of hydroxyl, nitrate; hydroxyalkyl; alkoxy; aryloxy; hydroxyalkoxy; hydroxyalkalkoxy; trityloxy; with at least one of R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> a member selected from the group consisting of aryloxy; alkanoyloxy; carboxyalkoxy; carbamoyloxyalkoxy; carboxyalkoxyalkoxy; carboxy; carboxybenzoyl; carboxybenzoyloxy; carboxybenzoyloxyalkoxy; and dialkylaminohydroxyalkoxy; the alkali metal salts thereof; and wherein n is greater than 5 up to 3 × 10<sup>6</sup> and the polymer exhibits a degree of substitution at R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> of greater than 0 up to 3;

(b) a compartment formed by the shaped wall, said compartment containing a drug formulation selected from the group consisting of locally and systemically acting physiologically and pharmacologically acceptable drugs;

(c) a passageway in the wall communicating with the compartment and the exterior of the device for dispensing drug from the device; and

(d) wherein in operation, when the device is dispensing the drug to the animal, fluid from the environment is imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby forming a solution containing drug which is dispensed through the passageway at a controlled rate, with the device substantially maintaining its physical and chemical integrity in the presence of the drug and solution thereof during the dispensing period over a prolonged time.

4,160,021  
SUBSTITUTED 2H-PYRAN-2,6(3H)-DIONE  
DERIVATIVES

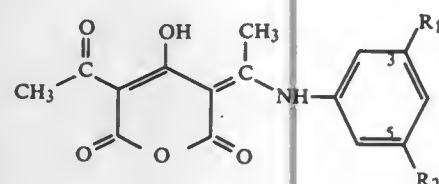
Kenneth M. Snader, Hatboro, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 799,625, May 23, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,142 Int. Cl.<sup>2</sup> A61L 9/04; A61K 31/35; C07D 309/16

U.S. Cl. 424-45

17 Claims

1. A compound represented by the formula:



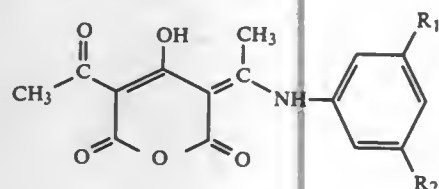
wherein:

R<sub>1</sub> is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl;

R<sub>2</sub> is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl, and when R<sub>1</sub> is lower alkoxy carbamoyl, R<sub>2</sub> is also hydrogen, and when R<sub>2</sub> is not hydrogen R<sub>1</sub> and R<sub>2</sub> are the same; and

the lower alkoxy moieties have 1 or 2 carbon atoms, or a mono- or di-alkali metal salt of said compound.

16. A method of inhibiting the symptoms of asthma which comprises administering to an animal in need of said inhibition a therapeutically effective amount for producing said inhibition of a compound represented by the formula:



wherein:

R<sub>1</sub> is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl;

R<sub>2</sub> is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl, and when R<sub>1</sub> is lower alkoxy carbamoyl, R<sub>2</sub> is also hydrogen, and when R<sub>2</sub> is not hydrogen R<sub>1</sub> and R<sub>2</sub> are the same; and

the lower alkoxy moieties have 1 or 2 carbon atoms, or a mono- or di-alkali metal salt of said compound.

4,160,022  
TOOTH PASTE

Thomas J. Delaney, Piscataway, and William G. Pierson, Flinders, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 613,397, Sep. 15, 1975, abandoned, which is a division of Ser. No. 419,741, Nov. 28, 1973, Pat. No. 3,937,321, which is a continuation-in-part of Ser. No. 295,094, Oct. 4, 1972, abandoned, and Ser. No. 389,827, Aug. 20, 1973, abandoned. This application Mar. 30, 1978, Ser. No. 891,776 The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 7/18; B65D 85/14, 81/24, 81/26

U.S. Cl. 424-52

13 Claims

1. A dental cream in an unlined aluminum tube having an aqueous vehicle and containing an abrasive content comprising (1) at least about 20% sodium bicarbonate and (2) over 1% of at least one water-insoluble dental abrasive material compatible and which does not tend to form gas on storage with said bicarbonate in the dental cream and said tube which is selected from the group consisting of silica, alumina, calcined alumina, silicates and carbonates non-reactive with the bicarbonate and

(3) about 0.01% to 1% fluorine selected from the group of water-soluble fluorine salts consisting of sodium, potassium, ammonium, lithium and amine fluorides; monofluorophosphates salts; complex water-soluble fluorine salts selected from the group consisting of fluorosilicate, fluorozirconate, fluorogermanate and organic fluorides selected from the group consisting of mono-, di- and triethanolamine hydrofluoride and having a bicarbonate to water ratio of about 3:1 to 6:1.

4,160,023  
TOXOIDS DERIVED FROM PROTEASE AND ELASTASE  
OF *PSEUDOMONAS AERUGINOSA* AND PRODUCTION  
THEREOF

Yuzuru Homma, Tokyo, and Kazuyuki Morihara, Osaka, both of Japan, assignors to Shionogi & Co., Ltd., Japan

Filed Jan. 31, 1977, Ser. No. 764,454

Claims priority, application Japan, Feb. 5, 1976, 51-10836; Feb. 5, 1976, 51-10837

Int. Cl.<sup>2</sup> A61K 39/40, 39/02

U.S. Cl. 424-87

22 Claims

1. Toxoid derived from protease of *Pseudomonas aeruginosa*, which is obtained by inactivating the purified protease by treating purified protease produced from *Pseudomonas aeruginosa* in a suitable buffer solution with 4-10% formalin or 0.04-3M oxymethanesulfonic acid in the presence of lysine, with the subsequent steps of dialysis and lyophilization, said toxoid having the following physicochemical properties:

- (1) molecular weight: 63,000 (gel filtration)
- (2) ultraviolet absorption spectrum: maximum 280 mμ (E<sub>1%</sub><sup>1cm</sup> 280 9.27 0.1 M KCl), minimum 250 mμ
- (3) isoelectric point: pH 5.2 (forcal electrophoresis)
- (4) constituent amino acids: (amino acid (g)/100 g of protein) aspartic acid (15.6), glutamic acid (9.5), leucine (8.7), alanine (8.5), glycine (7.7), serine (7.6), tyrosine (6.9), phenylalanine (5.9), threonine (5.0), valine (5.0), lysine (4.1), isoleucine (3.9), arginine (2.3), tryptophan (2.3), proline (2.1), histidine (1.9), ammonia (1.4) (total 98.5 g)
- (5) appearance: colorless powder
- (6) antigen activity: positive
- (7) protease activity: negative.

4,160,024

MAREK'S DISEASE VACCINE

Karel A. Schat, and Bruce W. Calnek, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 1, 1978, Ser. No. 901,635

Int. Cl.<sup>2</sup> A61K 39/32

U.S. Cl. 424-89

8 Claims

1. A method of immunizing chickens against Marek's disease without thereby causing tumors in vaccinated chicks comprising the step of inoculating susceptible chicks with a nononcogenic, unattenuated Marek's disease virus vaccine prepared in accordance with a process which comprises the step of serially passing nononcogenic SB strain of Marek's disease virus or a cloned derivative thereof through cell cultures to increase the virus titer to a useful level but without attenuating the original characteristics of the virus.

4,160,025

METHOD OF PRODUCING A  
BLOOD-COAGULATION-PROMOTING PREPARATION  
FROM HUMAN BLOOD PLASMA

Johann Eibl, Otto Schwarz, and Fritz Elsinger, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Vienna, Austria

Filed Aug. 8, 1977, Ser. No. 822,679

Claims priority, application Austria, Aug. 30, 1976, 6405/76

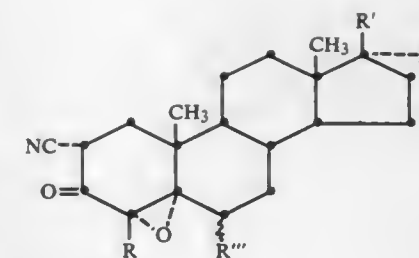
Int. Cl.<sup>2</sup> A61K 35/16

U.S. Cl. 424-101

15 Claims

1. A method of producing a blood-coagulation promoting preparation having Factor VIII inhibitor bypassing activity

comprising treating plasma containing coagulation Factors II, VII, IX and X in the absence of free calcium ions with a water-insoluble inorganic coagulation-physiologically-surface-active substance selected from the group consisting of diatomaceous earths and substances composed of silicon dioxide and aluminum oxide to generate the Factor VIII inhibitor bypassing active (FEIBA) substance, said plasma being non-coagulating when treated with said surface-active substance; separating the water-insoluble substances; treating the supernatant with a basic ion exchanger to adsorb the FEIBA substance and said coagulation Factors II, VII, IX and X; eluting the FEIBA substance and the coagulation factors II, VII, IX and X from the basic ion exchanger; and concentrating the FEIBA substance and coagulation Factors II, VII, IX and X.



wherein

R is hydrogen or methyl;

R' is hydroxy or lower-alkanoyloxy;

R'' is lower-alkyl, lower-alkenyl or loweralkynyl; or R' and

R'' together represent ethylenedioxy;

R''' is hydrogen or methyl; or 3-enol lower-alkanoate esters thereof; with the proviso that when R is hydrogen, R''' is

α-methyl; and when R is methyl, R''' is hydrogen or β-methyl.

12. A composition for disrupting pregnancy in a female mammal which comprises an interceptively effective amount of a compound according to claim 1 incorporated in a pharmaceutical carrier suitable for oral administration.

4,160,028

SUBSTITUTED 2-CYCLOPROPYL-CHROMONES AND  
PHARMACEUTICAL COMPOSITIONS AND USE  
THEREOF

Gianfederico Doria, Milan; Ciriaco Romeo, Serino; Maria L. Corno; Francesco Lauria, both of Milan; Piero Sberze, Varese, and Marcellino Tibolla, Canale d'Agordo, all of Italy, assignors to Carlo Erba S.p.A., Milan, Italy

Filed Jul. 3, 1978, Ser. No. 921,853

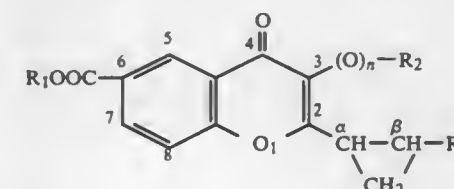
Claims priority, application Italy, Aug. 2, 1977, 26399 A/77; Jun. 22, 1978, 24824 A/78; Jun. 22, 1978, 24825 A/78; Jun. 30, 1978, 25157 A/78

Int. Cl.<sup>2</sup> A61K 31/35, 31/38, 31/44; C07D 311/22

U.S. Cl. 424-248.51

12 Claims

1. A compound of formula (I)



(1)

1. A process for the production of SF-1130-x<sub>1</sub> substance and SF-1130-x<sub>2</sub> substance, which comprises cultivating a strain of the genus *Streptomyces myxogenes* SF-1130 identifiable as FERM-P. 676 or ATCC 31,305 capable of producing SF-1130-x<sub>1</sub> substance and/or SF-1130-x<sub>2</sub> substance in an aqueous liquid culture medium containing assimilable carbon and nitrogen sources under aerobic conditions for a period of time sufficient to produce and accumulate the SF-1130-x<sub>1</sub> substance, the SF-1130-x<sub>2</sub> substance or both of them in the culture, and then recovering a pure product consisting essentially of at least one of the SF-1130-x<sub>1</sub> substance and SF-1130-x<sub>2</sub> substance from the culture.

4,160,027  
STERIOD CYANOKETONES AND INTERMEDIATES  
Robert G. Christiansen, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

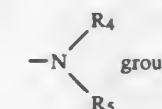
Filed Dec. 20, 1977, Ser. No. 862,417

Int. Cl.<sup>2</sup> A61K 31/58; C07J 43/00

U.S. Cl. 424-241

22 Claims

1. A compound of the formula

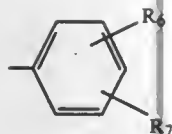


wherein each of R<sub>4</sub> and R<sub>5</sub> is independently selected from the group consisting of hydrogen and C<sub>1</sub>-C<sub>10</sub> alkyl, or R<sub>4</sub> and R<sub>5</sub>, taken together with the nitrogen atom, form a N-pyrrolidinyl, piperidino or morpholino radical;

R<sub>2</sub> is C<sub>1</sub>-C<sub>8</sub> alkyl or C<sub>3</sub>-C<sub>4</sub> alkenyl;

R<sub>3</sub> is (a) furyl, thienyl or pyridyl, the furyl, thienyl and pyridyl groups being unsubstituted or substituted by a methyl group; or (b) the group





wherein each of  $R_6$  and  $R_7$  is independently selected from the group consisting of (a) hydrogen; (b) halogen; and (c) the group  $-(O)_{n_1}-R_8$ , wherein  $n_1$  is zero or 1 and  $R_8$  is  $C_3-C_4$  alkenyl or  $C_1-C_6$  alkyl, the alkenyl and the alkyl groups being unsubstituted or substituted by one or more  $C_1-C_2$  alkoxy or hydroxy groups, and a pharmaceutically acceptable salt thereof.

9. Trans-6-carboxy-3-propyl-2-[2-(2-methyl-phenyl)-cyclopropyl]-chromone, as well as the pharmaceutically acceptable salts and the  $C_1-C_6$  alkyl esters thereof.

4,160,029

# PROCESS FOR THE PREPARATION OF A WATER-SOLUBLE COMPLEX OF 2-(4'-THIAZOLYL)BENZIMIDAZOLE AND FOR THE PREPARATION OF ANTHELMINTIC FUNGICIDAL COMPOSITIONS

Werner Duyfjes, Bloemendaal, Netherlands, assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 6, 1977, Ser. No. 794,505

Claims priority, application Netherlands, May 10, 1976, 7604976

Int. Cl.<sup>2</sup> C07D 277/20

U.S. Cl. 424-258

7 Claims

1. A water soluble complex of 2-(4'-thiazolyl) benzimidazole with glycolic acid.

2. Anthelmintic and fungicidal composition containing an anthelmintically or fungicidally effective amount of a water-soluble complex of 2-(4'-thiazolyl) benzimidazole with glycolic acid, optionally containing one or more glycolic acid complexes of a pesticidal nitrogen base.

4,160,030

# N-OXY AND N-AMINO GUANIDINES

Graham J. Durant; Charon R. Ganellin, and Geoffrey R. Owen, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

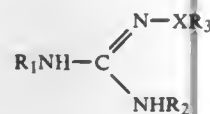
Division of Ser. No. 786,729, Apr. 11, 1977, Pat. No. 4,093,729, which is a division of Ser. No. 585,898, Jun. 11, 1975, Pat. No. 4,034,101. This application Feb. 22, 1978, Ser. No. 879,936

Int. Cl.<sup>2</sup> C07D 213/53, 285/08; A61K 31/44, 31/425

U.S. Cl. 424-263

10 Claims

1. A compound of the formula:



wherein  $R_1$  represents a grouping of the structure shown in the formula:

Het  $-(CH_2)_mZ(CH_2)_n$

FORMULA II

wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring such as pyridine which is optionally monosubstituted by lower alkyl, hydroxyl, chlorine or bromine, 1,2,4-triazole, 1,3,4-thiadiazole or 2-amino-1,3,4-thiadiazole; Z is sulphur or a methylene group; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4;  $R_2$  is hydrogen, lower alkyl or a grouping of the structure shown in Formula II wherein Het, m, n and Z are as defined above; X is oxygen or when  $R_2$  is a grouping of the structure shown in Formula II, X

may be NH; and  $R_3$  is hydrogen, lower alkyl, phenyl or benzyl, or a pharmaceutically acceptable acid addition salt thereof.

4,160,031

# ANTI-HISTAMINIC AND APPETITE STIMULATING 10,11-DIHYDRO-3-CARBOXYCYPROHEPTADINE

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 563,285, Mar. 28, 1975, abandoned, and a continuation-in-part of Ser. No. 522,676, Nov. 11, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,562

Int. Cl.<sup>2</sup> A61K 31/445; C07D 211/34

U.S. Cl. 424-267

5 Claims

1. 10,11-Dihydro-3-carboxycyproheptadine or a nontoxic pharmaceutically acceptable salt thereof.

4. A method of stimulating appetite comprising administering to a patient in need of such treatment an effective appetite stimulating amount of 10,11-dihydro-3-carboxycyproheptadine or a nontoxic pharmaceutically acceptable salt thereof.

5. A method of inducing an antihistaminic effect comprising administering to a patient in need of such treatment an effective antihistaminic amount of 10,11-dihydro-3-carboxycyproheptadine or a nontoxic pharmaceutically acceptable salt thereof.

4,160,032

# OXINDOLES AS SLEEP-INDUCERS

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

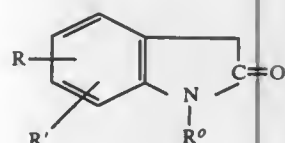
Continuation-in-part of Ser. No. 417,815, Nov. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 338,997, Mar. 7, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 525,005

Int. Cl.<sup>2</sup> A61K 31/40

U.S. Cl. 424-274

17 Claims

1. The method of inducing sleep in an animal comprising administering to an animal in which said treatment is desired a sleep-inducing effective amount of a compound of the formula:



wherein

R is halo of atomic weight of from 18 to 36,  
R' is hydrogen or halo of atomic weight of from 18 to 36, and  
R'' is hydrogen or alkyl of 1 to 4 carbon atoms.

4,160,033

# METHOD FOR THE CONTROL OF MOSQUITOS BY THE USE OF FILM-FORMING MATERIALS

William D. Garrett, Oxon Hill, and William R. Barger, Camp Springs, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,310

Int. Cl.<sup>2</sup> A01N 9/28, 9/24

U.S. Cl. 424-285

7 Claims

1. A method for eradicating mosquitos by applying to a body of water containing immature forms of mosquitos, in an amount sufficient to provide and maintain an approximately monomolecular film of a nonionic, autophobic, organic material with a density less than that of water, a boiling point of 170° C. or higher, a freezing point of less than 5° C., an HLB number of 10 or less, a bulk viscosity of less than 1000 centistokes at the temperature of use, a spreading velocity of 10 cm/sec for the first 100 cm, and a surface tension effectiveness

4,160,036

# 4-HYDROXY-1,3-BENZENEDIMETHANOL DERIVATIVES

John Bradshaw, and Ian Collins, both of Ware, England, assignors to Allen & Hanburys Limited, London, England

Continuation of Ser. No. 709,926, Jul. 29, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,658

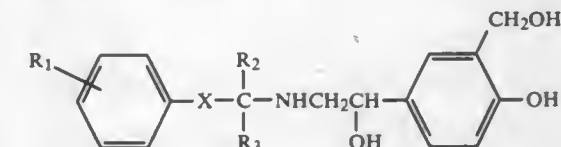
Claims priority, application United Kingdom, Jul. 29, 1975, 31678/75

Int. Cl.<sup>2</sup> A01N 9/20, 9/24; C07C 91/22

U.S. Cl. 424-330

23 Claims

1. Compounds of the formula



wherein  $R_1$  represents fluorine, chlorine or dimethylamino, X represents  $(CH_2)_n$  where n is 2 or 3,  $R_2$  and  $R_3$  are hydrogen or methyl.

23. A method for the treatment of a patient to relieve bronchospasm which comprises administering an effective amount of a compound as claimed in claim 1.

4,160,037

# COMPOUNDS, COMPOSITIONS AND METHODS OF COMBATTING PEST EMPLOYING THIOUREAS

Girts Kaugars, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

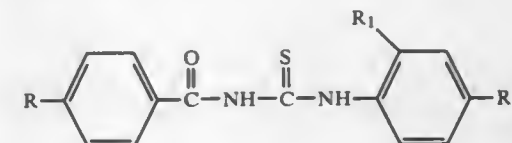
Filed Sep. 30, 1977, Ser. No. 838,165

Int. Cl.<sup>2</sup> A01N 9/12; C07C 157/07

U.S. Cl. 424-322

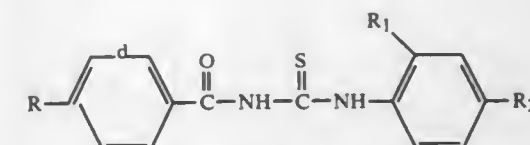
9 Claims

1. New 1-aryl-3-benzoyl-2-thioureas of the formula



wherein R is hydrogen; and  $R_1$  is lower alkyl of from one to four carbon atoms, inclusive and  $R_2$  is selected from the group consisting of bromo and chloro.

7. A method of controlling insect pests which comprises contacting susceptible insect pests with a pesticidally effective amount of a compound having the formula



wherein R is hydrogen; and  $R_1$  is lower alkyl of from one to four carbon atoms, inclusive, and  $R_2$  is selected from the group consisting of bromo and chloro.

4,160,038

# LACTIC ACID FERMENTATE FLAVORED PET FOOD

Richard L. Groben; Alfred J. Gryczka, and Alfred A. Franklin, all of Sarasota, Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Aug. 9, 1976, Ser. No. 712,492

Int. Cl.<sup>2</sup> A23K 1/10, 1/00

U.S. Cl. 426-53

10 Claims

1. A semi moist pet food composition for carnivorous lower animals comprising a deformable shape retaining hydrated

which lowers the surface tension of said body of water to 30 dynes/cm or less.

5. The method of claim 1 wherein said material is selected from the class consisting of sorbitan monooleate; a solution of 70 volume percent to less than 100 volume percent of sorbitan monooleate and 2-ethyl butanol; saturated, branched-chain alcohols with a carbon total from 15 to 19 carbon atoms, and one to three oxyethylene groups; unsaturated cis-alcohols with a 15 to 19 carbon atom chain length; unsaturated ethers with a chain length of 12 to 18 carbon atoms and three to five oxyethylene groups; and oleyl ether with two oxyethylene groups and mixtures thereof.

4,160,034

# SUBSTITUTED CARBAMATES

Richard F. Sauer, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 812,316, Jul. 1, 1977,

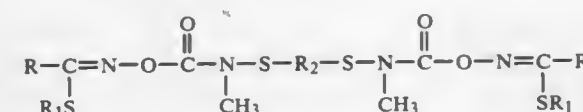
abandoned. This application Mar. 10, 1978, Ser. No. 885,251

Int. Cl.<sup>2</sup> A01N 9/12; C07C 119/18

U.S. Cl. 424-298

12 Claims

1. A compound of the formula

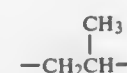


wherein

R is branched or straight chain alkyl containing 1 to 3 carbon atoms or methoxymethyl;

$R_1$  is branched or straight chain alkyl containing 1 to 3 carbon atoms;

$R_2$  is  $-CH_2CH_2-$ ,



or  $-CH_2CH_2ZCH_2CH_2-$ ; and  
Z is O or S.

4,160,035

# PLANT PROTECTING AGENTS AND METHODS FOR THEIR USE

László Lévai; Gyula Mikite, both of Budapest, and Attila Kis-Tamás, Pilisvörösvár, all of Hungary; assignors to Egyt Gyógyszervegyészeti Gyar, Budapest, Hungary

Division of Ser. No. 811,901, Jun. 28, 1977. This application Nov. 3, 1977, Ser. No. 848,351

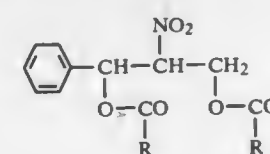
Claims priority, application Hungary, Jul. 6, 1976, EE 2430

Int. Cl.<sup>2</sup> A01N 9/24

U.S. Cl. 424-311

2 Claims

1. A plant protecting composition with fungicidal, acaricidal, aphicidal and insect antifeedent effects, containing an effective amount of a compound of the formula



wherein R is a  $C_{1-20}$  alkyl group, and a diluent in an amount necessary to make up the final weight of the composition.

matrix of meaty protein and vegetable protein with a moisture content between about 15 and 30% by weight which matrix is in admixture with bacteriostatic low molecular weight solids and an effective level of an antimycotic agent to prevent mold formation said composition packagable under non-sterile conditions and further comprising a flavoring from an edible material fermentate of lactic acid producing bacteria in an amount sufficient to produce a pH from about 3 to less than 6 which flavored food is palatable to dogs and flavor stable, wherein the edible material fermentate is prepared by growing the bacteria in the presence of a meaty protein, vegetable protein or mixture thereof until the pH from lactic acid and the flavoring is produced.

4,160,039

# METHOD FOR PREPARING SIMULATED DEEP FAT FRIED POTATOES

Philip G. Schnell, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 19, 1977, Ser. No. 825,863

Int. Cl.<sup>2</sup> A23L 1/216

U.S. Cl. 426—60

11 Claims

1. A method for preparing simulated french fried potatoes comprising:

- (a) forming a blend comprising from about 2 to about 10 weight percent inactive dried yeast, from about 50 to about 100 parts by weight vegetable oil, and from about 0 to about 50 parts by weight water;
- (b) emulsifying the blend;
- (c) coating the raw french fries with the emulsified blend; and
- (d) baking the coated french fries at from about 375 to about 450° F. for from about 5 to about 20 minutes.

4,160,040

# FREELY-FLOWING POWDERED FRESH BAKER'S YEAST PREPARATION AND METHOD OF PRODUCING IT

Sebastiano F. Luca, Berlin; Jürgen Thommel, Delingsdorf, and Walter K. Bronn, Berlin, all of Fed. Rep. of Germany, assignors to Versuchsanstalt der Hefeindustrie e.V., Berlin, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,256

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2614348

Int. Cl.<sup>2</sup> C12C 11/26, 11/18

U.S. Cl. 426—62

2 Claims

1. A free-flowing powdery baker's yeast preparation which consists of a mixture of finely dispersed yeast, having a residual water content of 65 to 75% by weight with 0.01 to 5.0% by weight related to the yeast of hydrophobic silicon dioxide in colloidal dispersed form and with 0.2 to 10.0% by weight related to the yeast of hydrophilic silicon dioxide in colloidal dispersed form, said preparation having a better stability of its fermentation activity during storage compared with compressed yeast of the same residual water content.

4,160,041

# METHOD OF PREPARING A SOLID ANIMAL FEED SUPPLEMENT

Jack J. Schroeder, Rollings Hills, and James W. Sawhill, Canoga Park, both of Calif., assignors to Jack J. Schroeder, Long Beach, Calif.

Filed Feb. 14, 1977, Ser. No. 768,324

Int. Cl.<sup>2</sup> A23K 1/22

U.S. Cl. 426—69

18 Claims

1. The method of preparing a solid animal feed supplement block product which comprises the steps of:

- (a) admixing at least about 0.5 weight percent based on the supplement product of a metal oxide selected from the class consisting of magnesium oxide, aluminum oxide, calcium oxide and mixtures thereof with an aqueous sugar

solution containing from 10 to about 90 weight percent sugar;

(b) hydrating said metal oxide to provide a sugar solution with soluble metal ions having a pH value from 9 to about 11;

(c) thereafter reacting said solution with a monoalkali metal or ammonium orthophosphate or phosphoric acid at a concentration, expressed as P<sub>2</sub>O<sub>5</sub>, from 2 to about 5 weight percent based on the supplement product sufficient to react with said soluble metal ions and produce a product having a pH value from 3 to about 6, the amounts of said phosphate additive and metal ions being sufficient to solidify said supplement into a solid block; and

(d) recovering a solid feed supplement block product.

4,160,042

# PROCESS FOR TREATING AN AQUEOUS EXTRACT OF A VEGETABLE MATERIAL

David R. Farr, Brent, and Ian Horman, Corseaux, both of Switzerland

Filed Oct. 17, 1977, Ser. No. 842,987

Claims priority, application Switzerland, Jul. 29, 1977, 9410/77

Int. Cl.<sup>2</sup> A23F 1/10, 1/09, 3/00

U.S. Cl. 426—387

22 Claims

1. A process for treating an aqueous extract of a vegetable material containing caffeine and chlorogenic acid to reduce its caffeine and/or chlorogenic acid content, which comprises:

- (a) contacting said aqueous extract with a solid ligneous adsorbent of vegetable origin in divided form at a temperature of from 0° to 100° C;
- (b) separating said adsorbent from said aqueous extract;
- (c) washing said adsorbent with water at a temperature of from 0° to 30° C. so as to displace non-specifically associated soluble constituents and combining washing waters with said aqueous extract;
- (d) subjecting said adsorbent to lixiviation with hot water at at least 60° C. so as to desorb caffeine and chlorogenic acid and regenerate said adsorbent; and
- (e) contacting regenerated adsorbent with said aqueous extract and repeating the preceding cycle until a desired preselected decaffeination and/or deacidification level is obtained.

4,160,043

# METHOD OF MAKING TACO SHELLS

Daniel T. Stickle, deceased, late of Dallas, Tex., and Hortencia M. Stickle, executrix, 4332 Mill Creek Rd., Dallas, Tex. 75234

Continuation of Ser. No. 390,164, Aug. 20, 1973, Pat. No. 3,928,638, which is a division of Ser. No. 222,493, Feb. 1, 1972, Pat. No. 3,785,273. This application Jan. 13, 1975, Ser. No. 540,709

The portion of the term of this patent subsequent to Dec. 12, 1972, has been disclaimed.

Int. Cl.<sup>2</sup> A21D 10/00

U.S. Cl. 426—439

8 Claims

1. The method of forming and frying a crisp, edible product comprising:

- placing tortillas one by one on a flexible pliable elongated web,
- placing a plunger to cover at least half of each of the tortillas,
- folding the web lengthwise over each of the plungers,
- pushing the folded web, plunger and tortilla through a vat of hot grease, thus
- frying the tortilla into a crisp, edible product.

## 4,160,044 PREPARATION OF PROCESSED CHEESES CONTAINING NUTMEATS

Rutilio Invernizzi, Milan, and Giovanni Prella, Vercelli, both of Italy, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 26, 1975, Ser. No. 562,002

Claims priority, application Switzerland, Apr. 1, 1974, 4490/74

Int. Cl.<sup>2</sup> A23C 19/12

U.S. Cl. 426—582

4 Claims

1. A process for the production of processed cheeses containing walnuts, wherein the walnuts are contacted with three successive immersions of demineralized water free from iron salts and salts of heavy metals having cations capable of reacting with tannin and tannic acids to form substantially insoluble tannates for periods of time of 14–16 hours, 4 hours and 4 hours, respectively, to remove tannin from the walnuts and thereafter are combined with a mass of processed cheese.

4,160,045

## METHOD FOR PRODUCING A SCABROUS PHOTOSENSITIVE SURFACE

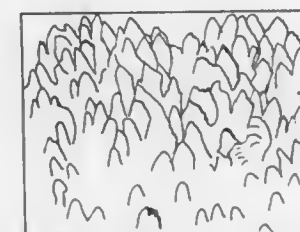
Randolph E. Longshore, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 25, 1978, Ser. No. 928,033

Int. Cl.<sup>2</sup> B05D 3/06

U.S. Cl. 427—38

3 Claims



1. A method for producing, in a vacuum, a scabrous finish on a surface, including the steps of: depositing on said surface small islands of a protective material; and bombarding said surface and said islands with charged particles to remove said islands and the surface between said islands by sputtering.

4,160,046

## METHOD OF MAKING AN IMAGING SYSTEM

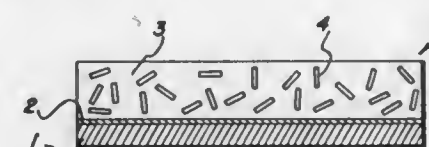
Koji Okumura, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 663,182, Mar. 2, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,579

Int. Cl.<sup>2</sup> B95D 3/12

U.S. Cl. 427—57

7 Claims



1. A method of making a binder configuration orientation imaging member comprising the steps of: (a) providing a softened electrically insulating material which has a viscosity of at least about 10<sup>5</sup> poise at 70° C.; (b) adding photosensitive electret particles to said softened material in a weight ratio of at least 1:1; and (c) forming a layer of combined materials and allowing them

to rigidify sufficiently to resist orientation of said electrets while a continuous vibration is being applied thereto to provide random orientation of said particles.

5. In a method for improving image contrast while utilizing an imaging device comprising a base or substrate, and an electrically insulating matrix layer containing dispersed electret imaging particles, the improvement comprising initially coating the electret particles with a photoconductive material and dispersing the resulting treated particles into a softenable insulating organic binder as matrix in a ratio by weight of particles-to-matrix of at least 1:1, the initial dispersion being effected into the softened or liquified matrix in the presence of continuous vibration to provide random orientation of said particles and, in the absence of light or other activating radiation, followed by applying and cooling the treated matrix, in situ, on the base or substrate.

4,160,047

## POSITIVE NICKEL ELECTRODE FOR ALKALINE STORAGE BATTERIES AND PROCESS FOR ITS PRODUCTION

Nikolaus Saridakis, Brunswick, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,829

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731064

Int. Cl.<sup>2</sup> B05D 5/12

U.S. Cl. 427—115

14 Claims

1. In a process for the production of a positive nickel electrode for alkaline storage batteries wherein a porous supporting grid of conducting material is immersed in an impregnating solution containing a nickel salt dissolved in a solvent, and said grid is subsequently immersed in an alkaline medium for precipitating out hydroxides, the improvement wherein said impregnating solution contains a least one aluminum salt in solution and wherein prior to impregnation with the impregnating solution, the supporting grid is immersed in a pre-impregnating solution comprising an aluminum salt solution.

4,160,048

## METHOD OF MAKING A COMPOSITE CAST IRON DRYER OR THE LIKE

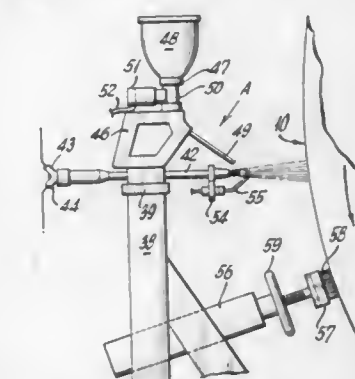
Frederick T. Jaeger, Rosemere, Canada, assignor to Eutectic Corporation, Flushing, N.Y.

Continuation of Ser. No. 752,739, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 728,077, Sep. 30, 1976, Pat. No. 4,064,608. This application May 24, 1978, Ser. No. 909,169

Int. Cl.<sup>2</sup> B23P 7/00; B05D 1/08

U.S. Cl. 427—142

13 Claims



1. The method of using a gas torch in the spray-coating of a convex cylindrical metal workpiece surface, which comprises rotating the workpiece on a horizontal axis, orienting the torch for discharge generally horizontally and radially toward the cylindrical surface at a given longitudinal location and at a first general peripheral location, adding a flow of metal powder to the torch flow, whereby a coating of metal is locally deposited on the workpiece surface in the course of workpiece rotation,



concurrently abrasively scouring the cylindrical surface at said longitudinal location and at a second general peripheral location angularly offset from the region of instantaneous torch discharge, the direction of workpiece rotation being such that the cylindrical surface moves downward past the region of torch discharge thereon, and horizontally traversing along the workpiece the longitudinal region of torch discharge and abrasive scouring, the effective longitudinal extent of the region of torch discharge and abrasive scouring being relatively great compared to the traverse advance per workpiece revolution, whereby multiple coats of sprayed metal are applied to the workpiece for a given traverse, and whereby in the course of said given traverse the abrasive scouring step is performed after application of each coat and before application of the next coat, to thereby remove metal powder which is not densely compacted and fused between coat applications so that more densely compacted sprayed metal will characterize the coat produced in the course of continuous rotation of the workpiece.

4,160,049

#### BRIGHT ELECTROLESS PLATING PROCESS PRODUCING TWO-LAYER NICKEL COATINGS ON DIELECTRIC SUBSTRATES

Harold Narcus, 15 Vesper St., Worcester, Mass. 01602  
Filed Nov. 7, 1977, Ser. No. 849,165  
Int. Cl.<sup>2</sup> C23C 3/02

U.S. Cl. 427—277

11 Claims

1. Method of producing adherent, decorative, two-layer nickel coatings on dielectric substrates comprising, activating the substrate surface, electrolessly depositing a first dull nickel alloy layer thereon comprising 6–12% phosphorus, balance essentially nickel, in a first electroless coating bath, the layer being dense and levelled, and subsequently producing a second nickel-phosphorus alloy layer of self building brightness over the first layer by electroless coating in a second, different electroless coating bath, the second bath also producing a 6–12% phosphorus, balance essentially nickel, composition, and wherein the coating rates in both the first and second baths are controlled to be 0.0006"–0.0008" per hour with the first layer coating step being long enough to produce an adherent 0.00010"–0.00015" thickness (i.e., 2500–37,500 Angstroms) first layer and the second layer coating being carried out long enough to produce a second coating layer which is even thicker than the first coating layer.

4,160,050

#### CATALYZATION PROCESSES FOR ELECTROLESS METAL DEPOSITION

Francis J. Nuzzi, Freeport, and Daniel F. Vitellaro, Huntington Station, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.  
Continuation of Ser. No. 676,527, Apr. 13, 1976, abandoned.  
This application Feb. 18, 1977, Ser. No. 770,063  
Int. Cl.<sup>2</sup> C23C 3/02

U.S. Cl. 427—304

16 Claims

1. In a process for providing a substrate with a layer of electrolessly deposited metal, the method of catalyzing said substrate to the electroless deposition of metal comprising the steps:

- (a) contacting the portion(s) of said substrate to be metallized with a liquid seeder comprising the admixture of:
  - (1) a source of cuprous ions;
  - (2) a reducing agent capable of reducing cupric ions to cuprous ions, but incapable of reducing cuprous ions to elemental copper in the environment of said admixture;
  - (3) a source of hydrogen ions;
  - (4) a source of halogen ions; and
  - (5) at least one organic solvent for said source of cuprous

ions, said solvent being present in at least an amount sufficient to solubilize said source of cuprous ions; and (b) without drying, treating said portion(s) of said substrate contacted with said admixture with water.

4,160,051

#### ZIRCONIUM FLAME-RESIST TREATMENT

Ladislav Benisek, Ilkley, England, assignor to I.W.S. Nominee Company Limited, London, England  
Continuation of Ser. No. 235,866, Mar. 17, 1972, abandoned.  
This application Jul. 9, 1976, Ser. No. 703,912  
Int. Cl.<sup>2</sup> D06M 13/50

U.S. Cl. 427—352

8 Claims

1. A process for improving the flame resist properties of natural and synthetic polyamide fibers which comprises applying to scoured natural or synthetic polyamide fibers having a residual methylene chloride extract of not more than 0.8% an aqueous solution containing an anionic zirconium complex ion selected from the group consisting of a fluorozirconate and a complex of zirconium with an organic chelating agent, said solution having a pH in the range of 0.5 to 4.0, whereby to impregnate the substance of said fibers with said anionic zirconium complex and thereafter drying said fibers, the proportion of said zirconium complex in relation to said fibers being sufficient to satisfy at least the minimum requirements of the Vertical Flame Test—A.A.T.C. Test Method 34-1969, Fire Resistance of Textile Fabrics.

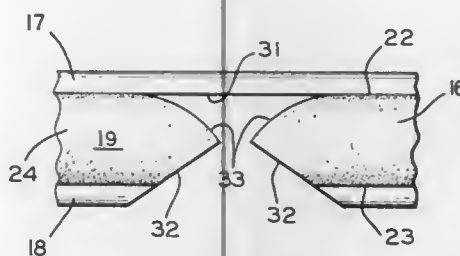
4,160,052

#### CORNER FOR DECORATIVE AND PROTECTIVE MOLDING STRIP

Brian T. Krysiak, North Royalton; James M. Kunevicius, Richfield, and Bruce C. Leslie, Garfield Heights, all of Ohio, assignors to Lof Plastics Inc., Detroit, Mich.  
Filed Aug. 15, 1977, Ser. No. 824,410  
Int. Cl.<sup>2</sup> B60R 13/02, 13/04

U.S. Cl. 428—31

17 Claims



1. In a method of forming a corner in an elongated decorative and protective molding strip for application to a supporting surface, the improvement comprising the steps of making a longitudinal cut through said strip spaced inwardly from and parallel to one side edge of said strip forming a continuous side portion therealong, making diagonal cuts partially across said strip from the other side edge in the form of a V with its apex midway between the ends of said longitudinal cut and its sides intersecting said other edge transversely across from the ends of said longitudinal cut, making a connecting cut through said strip from each end of said longitudinal cut to an intersection with the corresponding one of said diagonal cuts, removing the portion of said strip bounded by said longitudinal, diagonal and connecting cuts, and deflecting said molding strip to bring the edge walls formed by said diagonal cuts and the edge walls formed by said connecting and longitudinal cuts into abutting relationship, with said side portion forming a continuous band around the exterior of said corner.

10. In a decorative and protective molding strip for mounting upon a supporting surface along a predetermined path, the improvement comprising a continuous elongated resilient member having portions removed at a selected location there-

along forming a corner portion to permit mounting of said continuous strip to follow said path, said removed portions including a V-shaped notch extending inwardly from one side edge of said strip and generally triangular portions spaced from the other side edge and contiguous with said V-shaped notch.

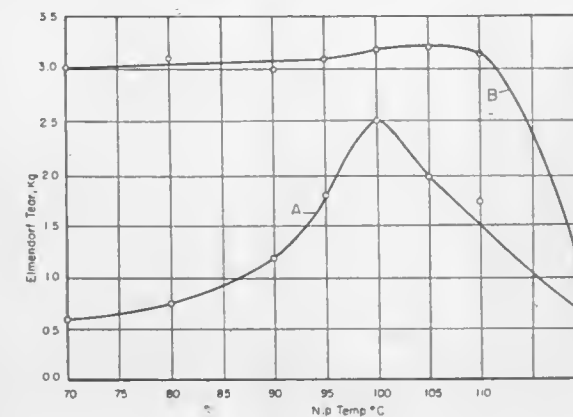
4,160,053

#### BLOCKED FILM LAMINATE OF LOW DENSITY POLYETHYLENE

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.  
Continuation-in-part of Ser. No. 651,675, Jan. 23, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,407  
Int. Cl.<sup>2</sup> B65D 31/00

U.S. Cl. 428—35

6 Claims



1. A laminate of at least two low density polyethylene films blocked together at a temperature between about 80° C. and 100° C. and below the fusion temperature of the polyethylene.

4,160,054

#### PLAQUE INHIBITING COMPOSITION AND METHOD

Austin C. Wagenknecht, deceased, late of Golden Valley, Minn. (by Don A. Wagenknecht, personal representative); George V. Daravinas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.  
Filed Nov. 28, 1977, Ser. No. 855,535  
Int. Cl.<sup>2</sup> A61K 9/68

U.S. Cl. 424—48

9 Claims

1. A chewing gum comprising:
- (a) from about 0.001% to about 15% by weight of an alkyl sulfate salt;
  - (b) from about 0.001% to about 15% by weight of a stearyl-2-lactylate salt;
  - (c) from about 0.001% to about 5% by weight of a zinc compound;
  - (d) from about 0.05% to about 10% by weight of a plaque inhibiting flavor selected from the group consisting of cinnamon oil, peppermint oil, and spearmint oil and mixtures thereof; and,
  - (e) from about 10% to about 95% by weight of a gum base.

4,160,055

#### CONTROLLED POROSITY OF UNCURED REINFORCED THERMO-SETTING PLASTIC MATERIAL

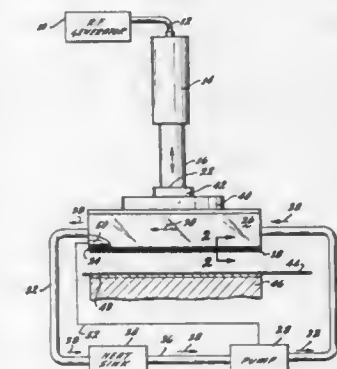
Clyde H. Reed, Riverside, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.  
Division of Ser. No. 846,457, Oct. 28, 1977, Pat. No. 4,132,519.  
This application Jul. 17, 1978, Ser. No. 925,118  
Int. Cl.<sup>2</sup> B29F 5/00; B29D 7/20

U.S. Cl. 428—131

3 Claims

1. A process for penetrating a sheet of uncured reinforced thermosetting plastics material and locally curing to "3" stage said material adjacent resulting perforations in said material, comprising: penetrating through a sheet of said uncured ther-

mosetting material with a plurality of sharpened pins, vibrating said pins within said material at sonic frequency and maintain-



ing said vibrating within said material for a sufficient length of time for said thermosetting material to cure to "B" stage in limited areas only adjacent said pins.

4,160,056

#### STEEL SHEET FOR DRD CANS AND DI CANS

Tadashi Tanaka, Yokohama; Tatsuro Obi, Tokyo; Nobuichi Arai, Sagami, and Teruo Koyama, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan  
Filed Sep. 16, 1977, Ser. No. 834,005  
Claims priority, application Japan, Sep. 20, 1976, 51-112577  
Int. Cl.<sup>2</sup> B65D 65/42, 7/42; B32B 15/08

U.S. Cl. 428—220

2 Claims

1. A steel sheet for production of DRD or DI cans comprising a cold rolled steel sheet, a solvent type thermo-setting paint baked on the steel sheet in a completely cured state, said paint containing 1 to 30% ethylene-vinyl acetate copolymer on the basis of the solid substance of the paint and having a thickness of 3 to 15  $\mu$ m in a dried state.

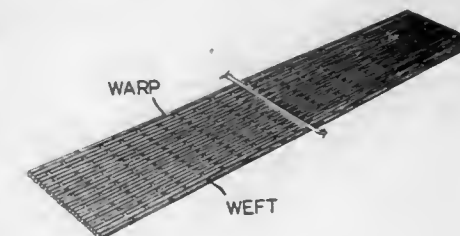
4,160,057

#### SPLIT RESISTANT STRAPPING TAPE

Calvert S. Kogan, Westmount, and Marty Kogan, Pointe Claire, both of Canada, assignors to Plastic Monofil Co. Ltd., Colchester, Vt.  
Continuation-in-part of Ser. No. 687,500, May 18, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,656  
Claims priority, application Canada, May 21, 1975, 227402  
Int. Cl.<sup>2</sup> D03D 15/00

U.S. Cl. 428—245

21 Claims



1. A strapping tape resistant to splitting in a transverse direction and having high strength, wherein said strapping tape has: a width of about  $\frac{1}{2}$  inch to about  $1\frac{1}{2}$  inches, about 22 to about 52 warp elements per inch wherein each of said warp elements has a denier of about 840 to about 3000 and the total denier of all warp elements does not exceed about 73,000 denier/in, and 1 to 5 weft elements per inch wherein each of said weft elements has a denier of about 50 to about 1000.



4,160,058

**WATERPROOF COVERING DEVICE, ESPECIALLY FOR TERRACES, AND METHOD FOR MANUFACTURING SAME**

Jean-Yves K-Gall, 26, rue de l'Eglise, 92200 Neuilly-sur-Seine, France

Filed Dec. 20, 1976, Ser. No. 752,547

Claims priority, application France, Dec. 23, 1975, 75 39578; Aug. 30, 1976, 76 26166

Int. Cl.<sup>2</sup> B23B 3/26; E02D 27/00; B32B 5/18; D04H 1/00 U.S. Cl. 428—286

31 Claims

1. A waterproof covering on a base or support, including a base or support and a waterproof covering thereon, said waterproof covering comprising:

a first thin continuous pellicle adhering to the base or support;

a textile layer on said first pellicle having a portion of its thickness impregnated by the material constituting said first pellicle and another portion of its thickness non-impregnated thereby; and

on the face of said textile layer opposite to the face coming in contact with said first pellicle, a second continuous watertight pellicle impregnated into said textile layer a distance sufficiently thin to leave a portion of the thickness of the textile layer non-impregnated by both the material constituting said first pellicle and the material constituting said second pellicle, said non-impregnated portion of the textile layer being sufficiently thick to preserve the external pellicle from excessive mechanical stress in case of cracking of the base or support.

20. A process for manufacturing a waterproof covering on a basis or support comprising:

depositing a first fluid, film-forming product onto the surface of the basis or support to be waterproofed, said film-forming product being one in which the formed film is adhering and continuous;

before said first film-forming product completes film formation, while a portion thereof is still in the fluid state, laying a textile layer onto said first film-forming product in such a way that a portion of said textile layer becomes impregnated with said first product but the central portion of said textile layer does not become impregnated with said first product; and

depositing a second fluid, film-forming product onto said textile layer in such a way that a portion of said textile layer opposite that portion impregnated with said first product becomes impregnated with said second product but the central portion of said textile layer is not impregnated, said second film-forming product being one in which the formed film is an elastic waterproof film.

4,160,059

**ADSORPTIVE NONWOVEN FABRIC COMPRISING FUSED FIBERS, NON-FUSED FIBERS AND ADSORPTIVE MATERIAL AND METHOD OF MAKING SAME**

Tadanori Samejima, Fuji, Japan, assignor to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 685,687, May 12, 1976,

abandoned. This application May 24, 1978, Ser. No. 908,922

Int. Cl.<sup>2</sup> B32B 5/26, 5/30, 23/10, 31/26

U.S. Cl. 428—288

28 Claims

1. An adsorptive nonwoven fabric web comprising a support consisting of a thin sheet of paper or the like having superposed thereon an adsorptive layer, said adsorptive layer consisting essentially of (1) short-length supporting fibers which consist of a mixture of (a) a short-length natural cellulose main supporting fiber and (b) a short-length heat-fusible fiber; and (2) a powdered adsorptive material, said mixture having been disintegrated in air before it was joined in an air current by said adsorptive material added thereto to be pneumatically admixed and dispersed on a wire screen of a web-forming machine with said thin sheet interposed between said wire screen and the resulting mixture of said fibers and said adsorptive material to

form a web on said wire screen, which web was subjected to heat treatment at a temperature above the melting point of said heat-fusible fiber in order to firmly fix the adsorptive material and the main supporting fiber in the web by fusion of at least part of said heat-fusible fiber, said adsorptive material being fixed to said heat-fusible fiber substantially only at points of contact between said heat-fusible fiber and adsorptive material such that all but a very small part of the surface area of the adsorptive material remains exposed, and said main supporting fiber being fixed in the web substantially only at points of contact between said heat-fusible fiber and said main supporting fiber such that all but a very small part of the surface area of said main supporting fiber remains exposed.

8. A liquid-holding nonwoven fabric web comprising a support consisting of a thin paper of the like having superposed thereon a liquid-holding layer, said liquid-holding layer consisting essentially of (1) short-length supporting fibers which consist of a mixture of (a) a short-length natural cellulose fiber and (b) a short-length heat-fusible fiber; and (2) a liquid-holding or swelling material, said mixture having been disintegrated in air before it was joined in an air current by a liquid-holding or swelling material added thereto to be pneumatically admixed and dispersed on a wire screen of a web-forming machine with said thin sheet interposed between said wire screen and the resulting mixture of said fibers and said liquid-holding or swelling material to form a web on said wire screen, which web was subjected to heat treatment at a temperature above the melting point of said heat-fusible fiber in order to firmly fix the liquid-holding or swelling material in the web by fusion of at least part of said heat-fusible fiber, said liquid-holding or swelling material being fixed to said heat-fusible fiber substantially only at points of contact between said heat-fusible fiber and liquid-holding or swelling material such that all but a very small part of the surface area of the liquid-holding or swelling material remains exposed, and said main supporting fiber being fixed in the web substantially only at points of contact between said heat-fusible fiber and said main supporting fiber such that all but a very small part of the surface area of said main supporting fiber remains exposed.

15. A method of making an adsorptive nonwoven fabric web which comprises the steps of:

shredding a natural short-length cellulose fiber in air; adding a short length heat-fusible fiber to said cellulose fiber to form a mixture;

feeding said mixture to a disintegrator to form disintegrated short-length supporting fibers;

adding a powdered adsorptive material to said disintegrated short-length supporting fibers;

pneumatically conveying said mixture containing said adsorptive material to a wire screen of a web-forming machine where it is formed into a web;

applying a thin sheet of paper or the like between said mixture containing said adsorptive material and said wire screen of said web-making machine;

applying heat to said mixture containing said adsorptive material to bring the temperature thereof above the melting point of said heat-fusible fibers to fix said adsorptive material in the web by heat fusion via said heat-fusible fibers, resulting in said adsorptive material being fixed to said heat-fusible fiber substantially only at points of contact between said heat-fusible fiber and adsorptive material such that all but a very small part of the surface area of the adsorptive material remains exposed, and said main supporting fiber being fixed in the web substantially only at points of contact between said heat-fusible fiber and said main supporting fiber such that all but a very small part of the surface area of said main supporting fiber remains exposed.

4,160,060

**PLATFORM SAFETY BARRIER**

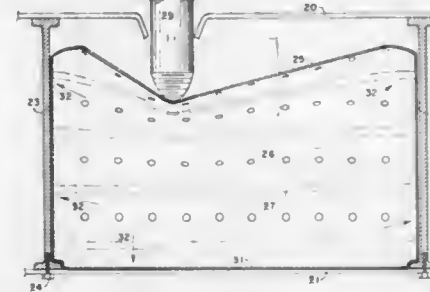
Douglas Bynum, Jr., Spring, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 23, 1978, Ser. No. 871,295

Int. Cl.<sup>2</sup> B32B 3/26

U.S. Cl. 428—310

17 Claims



1. A safety barrier to prevent falling objects from penetrating horizontal surfaces of offshore structures and entering space below said surfaces comprising,

(a) a penetration resistant layer overlying (b) an impact absorbing material of sufficient thickness to absorb anticipated impact energy, disposed (c) beneath said horizontal surface of said structure, and (d) over said space to be protected beneath said surface.

5. A safety barrier as described in claim 1 wherein the impact absorbing material is selected from the group consisting of natural rubber, synthetic rubber, mixtures of natural and synthetic rubber, or foamed thermoplastic materials.

6. A safety barrier as described in claim 5 wherein the impact absorbing material is a foamed thermoplastic selected from the group consisting of polystyrene foams or polyurethane foams.

4,160,061

**HEAT-REFLECTING GLASS PLATE AND METHOD OF PRODUCING SAME**

Seiki Okino, Matsusaka; Takao Mori, Ise; Toshiharu Yanai, Matsusaka, and Toshikazu Sawa, Mie, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Continuation of Ser. No. 671,550, Mar. 29, 1976, abandoned.

This application Aug. 19, 1977, Ser. No. 826,126

Claims priority, application Japan, Mar. 29, 1975, 50-38144

Int. Cl.<sup>2</sup> B05B 5/06, 3/02; B32B 17/06

U.S. Cl. 428—334

4 Claims

1. In a heat-reflecting glass plate having a metal oxide film coated on one side of the glass plate, said metal oxide film comprising the oxides of chromium, cobalt, and iron, and having a thickness ranging from about 30 to 80 millimicrons, the improvement wherein the metal oxide film, in addition to said oxides, contains aluminum oxide, the aluminum being present in an amount of from 5 to 35% by weight of the total metals contained therein, whereby a lowering of the reflectivity of the heat-reflecting glass plate for solar energy resulting from subsequent heat treatment to temper or bend the heat-reflecting glass plate is suppressed.

3. In a method of producing a heat-reflecting glass plate having a metal oxide coating on one side of the glass plate comprising coating one side of the glass plate with a solution containing acetyl acetates of chromium, cobalt, and iron dissolved in an organic solvent, heating the coated glass plate to a temperature between from about 400° to the softening point of the glass plate, thereby causing the acetyl acetates to decompose to form a film having a thickness ranging from about 30 to about 80 millimicrons and forming oxides of chromium, cobalt, and iron, the improvement comprising: adding aluminum acetyl acetate to the solution in such a quantity that the metal oxide film consists essentially of oxides of aluminum, chromium, cobalt, and iron, with the aluminum being present in an amount of from 5 to 35% by weight of the total metals, so as to suppress the lowering of the reflectivity of the

glass plate resulting from subsequent heat treatment of the glass plate for tempering or bending thereof.

4,160,062

**PYROTECHNICAL SEALING CORD**

Heinz Gawlick, Vagen, Fed. Rep. of Germany; Axel Homburg, Troisdorf, Fed. Rep. of Germany; Werner Siegelin, Nuremberg, Fed. Rep. of Germany, and Gunther Marondel, deceased, late of Erlangen, Fed. Rep. of Germany (by Gisela M. Marondel, executrix), assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

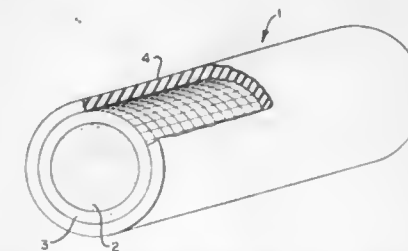
Filed Mar. 29, 1976, Ser. No. 671,062

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513568; Apr. 18, 1975, 2517323

Int. Cl.<sup>2</sup> B32B 1/04, 3/02, 33/00

U.S. Cl. 428—365

11 Claims



1. A pyrotechnical sealing material wherein a heat-foamable synthetic resin is foamed with the aid of heat generated from a burnable pyrotechnical composition that is capable of being burned without the evolution of gas, said sealing material being in the form of a cord, said cord having a core comprising the pyrotechnical composition and a casing separated from the core by a flexible sheath formed of metal or a synthetic resin thread, said metal not being a low melting or readily oxidizable metal and, said casing comprising the heat-foamable synthetic resin.

4,160,063

**METHOD FOR PREVENTING THE ADHERENCE OF OIL TO SURFACES**

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 614,093, Sep. 17, 1975, Pat. No. 4,039,717, which is a division of Ser. No. 416,712, Nov. 16, 1973, abandoned. This application May 12, 1977, Ser. No. 796,271

Int. Cl.<sup>2</sup> B32B 15/04

U.S. Cl. 428—389

4 Claims

1. A method for reducing the adherence of viscous crude oil to sucker rods in oil wells wherein the high-viscosity of the crude oil limits production by reducing the speed of sucker rod descent during each stroke comprising coating the sucker rods with a film of carboxymethylcellulose cross-linked in the presence of water with a salt of a polyvalent metal, whereby the film tends to reduce failing of the sucker rods and increase the speed of descent during each stroke of the sucker rods.

4,160,064

**EPOXY ADHESIVE SEALANT**

Edward A. Nodiff, Philadelphia, Pa., assignor to Theodore R. Flint, Valley Forge, Pa.

Filed Jun. 15, 1977, Ser. No. 806,279

Int. Cl.<sup>2</sup> B32B 27/38; D06P 3/00, 5/00

U.S. Cl. 428—413

15 Claims

1. In a putty-like epoxy adhesive sealant comprising a first band of an uncured epoxy resin composition and a second band, said second band comprising a composition capable of curing of said epoxy resin when said first and second bands are combined to form a substantially uniform mixture, the improvement wherein said uncured epoxy resin composition



contains from about 0.02 to about 5%, by weight, of a coloring agent effective to impart latently transient color to said epoxy resin composition which contrasts with the color of said curing composition, said colored epoxy resin composition forming a substantially uniformly colored composition when said epoxy resin composition and said curing composition are combined to form a substantially uniform mixture, said uniformly colored composition becoming essentially colorless with curing of said epoxy resin composition.

4,160,065

**POLYURETHANE LATEXES FROM NCO PREPOLYMERS CHAIN EXTENDED WITH POLYEPOXIDES, POLYANHYDRIDES OR POLYALDEHYDES, AND LAYERED PRODUCTS**  
Peter Loewigkeit, Wyckoff; Kenneth A. Van Dyk, Franklin Lakes, and Thomas T. McGimpsey, Newark, all of N.J., assignors to Witco Chemical Corporation, New York, N.Y.  
Filed Dec. 14, 1976, Ser. No. 750,476

Int. Cl.<sup>2</sup> C08G 12/06, 18/34, 18/32, 18/30

U.S. Cl. 428—425 27 Claims  
1. A storage-stable latex of a quaternized polyurethane-urea comprising the chain-extended product of an isocyanate terminated quaternized polyurethane prepolymer, a chain-extending reagent and water, said chain-extending reagent having at least two groups reactive with primary amines, said groups selected from terminal epoxides, aldehydes and cyclic anhydrides said prepolymer being the reaction product of a polyol, a tertiary alkanolamine and a polyisocyanate quaternized with a di-lower alkyl sulfate.

4,160,066

**AGE-HARDENABLE WELD DEPOSIT**  
Edwin R. Szumachowski, Springettsbury Township, York County, and Robert F. Miller, Dover Township, York County, both of Pa., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 840,897, Oct. 11, 1977, abandoned.

This application Mar. 3, 1978, Ser. No. 883,139

Int. Cl.<sup>2</sup> B32B 15/18

U.S. Cl. 428—683 6 Claims  
1. An age hardenable iron-base alloy weld deposit consisting essentially of, in weight percent,

Carbon	0.2 maximum
Manganese	1.3 maximum
Silicon	1.0 maximum
Phosphorus	0.02 maximum
Sulfur	0.02 maximum
Chromium	3 to 10
Molybdenum	9 to 13.5
Cobalt	15 to 25
Nickel	0.3 maximum
Iron	Balance

wherein the ratio of (% chromium plus % molybdenum) of (% cobalt plus % nickel) is between about 0.75 and about 1.10

4,160,067

**MOLTEN CARBONATE FUEL CELL CORROSION INHIBITION**

Elias H. Camara, Bolingbrook; Leonard G. Marianowski, South Holland, and Rafael A. Donado, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

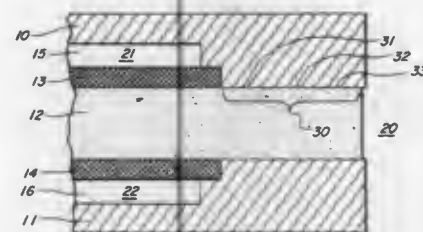
Filed Mar. 13, 1978, Ser. No. 886,257

Int. Cl.<sup>2</sup> H01M 2/02

U.S. Cl. 429—16 16 Claims  
1. Ferrous metal cell housing for use in high temperature molten carbonate fuel cells having an anode and a cathode ferrous metal cell housing defining a fuel chamber and an oxidant chamber, respectively, and separated by an electrolyte tile, the peripheral portion of said housings having a wet seal

area surface in contact with said electrolyte tile comprising alkali metal carbonates and inert support material and operating at about 500° to about 700° C., said cell housing surface in the wet seal area comprising about 2 to about 70 weight percent aluminum prior to cell operation providing corrosion inhibition during fuel cell operation.

9. A method for inhibiting corrosion of ferrous metal hous-



ings defining a fuel chamber and an oxidant chamber separated by an electrolyte tile, the peripheral portion of said housings having a wet seal area surface in contact with an electrolyte tile comprising alkali metal carbonates and an inert support material and operating during fuel cell operation at about 500° to about 700° C., comprising providing in said cell housing surface wet seal area about 2 to about 70 weight percent aluminum prior to cell operation.

4,160,068

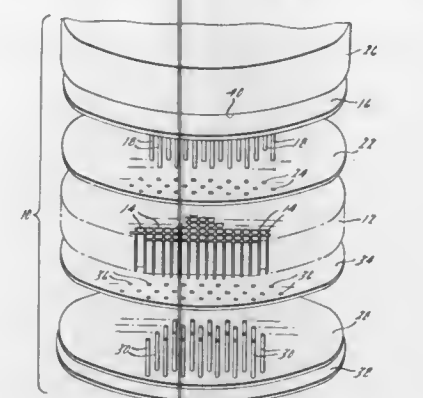
**STORAGE BATTERY**

Joseph T. Kummer, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 21, 1978, Ser. No. 962,579

Int. Cl.<sup>2</sup> H01M 2/12

U.S. Cl. 429—82 10 Claims



1. A high power, low total energy storage battery comprising:

a honeycomb separator having a plurality of cells therein to define a plurality of separate anode and cathode compartments, said honeycomb separator being formed of a material having a porosity in the range which permits ions of electrolyte to flow therethrough, but does not permit flow of electrochemical materials therethrough, said honeycomb material also being resistant to attack by the materials forming the battery;

an anode in the form of a base with a plurality of projecting electrodes extending therefrom having a cross section smaller than the cross section of the cells of said honeycomb separator, said electrodes being received in a plurality of said cells to form anode compartments;

a cathode in the form of a base with a plurality of projecting electrodes extending therefrom having a cross section smaller than the cross section of said cells of said honeycomb separator, said electrodes being received in a plurality of said cells to form cathode compartments, said pro-

jecting electrodes of said anode and said cathode being so arranged in association with said cells that said anode and said cathode compartments are in a side-by-side relationship throughout said honeycomb separator;

sealing, gas venting and electrical insulating means for sealing off the ends of said anode and cathode compartments to make them fluid tight, to permit the escape of generated gases therefrom, and to electrically insulate said anode from said cathode;

an electrolyte in said anode compartments and said cathode compartments;

an anodic electrochemical material in said anode compartments;

a cathodic electrochemical material in said cathodic compartments; and

housing means for holding said honeycomb separator, said anode, said cathode, said sealing, gas venting and electrical insulating means, said electrolyte, and said electrochemical materials in an assembled condition.

4,160,069

**ELECTRICALLY CONDUCTIVE AND CORROSION RESISTANT CURRENT COLLECTOR AND/OR CONTAINER**

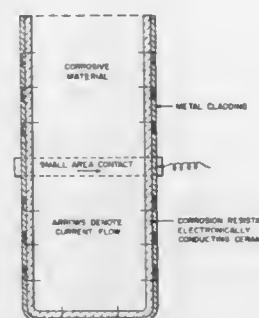
Owen W. Johnson; Gerald R. Miller, both of Salt Lake City, Utah, and Paul S. Beutler, Richland, Wash., assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 658,975, Feb. 18, 1976,

abandoned. This application Feb. 18, 1977, Ser. No. 769,997

Int. Cl.<sup>2</sup> H01M 6/20

U.S. Cl. 429—104 18 Claims



1. An improved electrically conductive current collector suitable for use in high temperature applications in the presence of corrosive environments, comprising:

(a) a high strength, noncorrosive electronically conductive, polycrystalline ceramic member of rutile which is doped with ionic metal species having a stable valence in said polycrystalline ceramic of at least +5 which serves as the primary load bearing member of said current collector, said ceramic being substantially impervious to materials constituting said corrosive environment; and

(b) a highly electronically conductive metal cladding intimately attached to a substantial portion of one surface of said ceramic member, said metal cladding having a thickness sufficiently thin to be plastically deformable in relation to said ceramic which preserves the function of said ceramic member as the primary load bearing element of said current collector and being based on the relative elastic modulus of the metal of said metal compared to that of the ceramic member, said metal cladding being adapted to direct current flow through said ceramic member and to shunt said current between said member and an external contact.

4,160,070

**ADDITIVE FOR HIGH DRAIN RATE LITHIUM CELLS**  
Nehemiah Margalit, Levittown, and Philip E. Krouse, Yardley, both of Pa., assignors to ESB United States, Inc., Philadelphia, Pa.

Filed Sep. 25, 1978, Ser. No. 945,414

Int. Cl.<sup>2</sup> H01M 6/14

U.S. Cl. 429—194 10 Claims

1. An improvement in a high rate electrochemical cell having a lithium anode, a non-aqueous electrolyte comprised of a solvent and solute and a cathode, the improvement comprising having as an additive a minor portion of a tetra alkyl onium salt dissolved in the electrolyte.

4,160,071

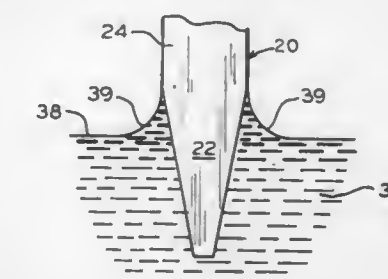
**TAPERED PLATE LUG FOR CAST-ON POST COLLECTION BARS**

John R. Parker, Toledo, Ohio, assignor to Barrett Battery, Inc., Toledo, Ohio

Filed May 12, 1978, Ser. No. 905,223

Int. Cl.<sup>2</sup> H01M 4/02

U.S. Cl. 429—211 2 Claims



1. A secondary battery plate having a grid and a lug extending outwardly from one side edge of said grid in the same plane of the plate and of the same thickness as said side edge, said lug having a rectangular cross-section for about the first two-thirds of its length from said side edge, and then having at one end a wedge-shaped outer third of its length tapering to about one-quarter of said thickness of said lug whereby when the lug is inserted into the mold for a collector bar to be integrally cast thereon with the lugs of adjacent plate grids in a machine, said tapered ends are less than completely immersed in the melted metal in the mold so that the capillary action of the molten metal fills in the unimmersed tapered portion of the lug to produce a lug connection from the grid to the collector bar which connection has a uniform cross-section of at least that of the untapered rectangular cross-section of the lug.

4,160,072

**FOAMABLE AND CROSSLINKABLE POLYETHYLENE COMPOSITION, PROCESS FOR ITS PRODUCTION, AND PROCESS FOR PRODUCING CROSSLINKED POLYETHYLENE FOAMS USING SAID COMPOSITION**

Ken Shinkai, Hirakata; Norio Chiba, Mukou, and Yutaka Ozaki, Mishima, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 668,251, Mar. 18, 1976. This application Oct. 31, 1977, Ser. No. 846,845

Claims priority, application Japan, Mar. 20, 1975, 50-33763  
Int. Cl.<sup>2</sup> C08J 9/10

U.S. Cl. 521—86 31 Claims

1. A foamable and crosslinkable polyethylene composition comprising

(a) modified polyethylene obtained by chemically bonding a silane compound containing at least one unsaturated group to polyethylene in the presence of a radical generator,

(b) zinc stearate as the silanol condensation catalyst, and

(c) azodicarbonamide as heat-decomposable blowing agent,

said ingredients (a), (b) and (c) having been melt-kneaded with one another at a temperature lower than the decomposition temperature of the heat-decomposable blowing agent.

**4,160,073**  
**FIRE PROOFING COMPOSITIONS**  
John B. Lloyd-Lucas, Pinvin, Nr. Pershore, and Christopher Lloyd-Lucas, Hunt End, Nr. Redditch, both of England, assignors to Advanced Fireproofing Systems Limited, England  
Filed Mar. 9, 1977, Ser. No. 776,090  
Claims priority, application United Kingdom, Mar. 12, 1976, 09928/76

Int. Cl.<sup>2</sup> C08J 9/00  
U.S. Cl. 521—122 19 Claims  
1. An intumescent coating composition comprising a film-forming epoxy resin binder and a spumific agent in a weight ratio of less than 7.5:1 and, uniformly dispersed therethrough, from about 1 to about 15 percent by weight, based on the weight of the other components of the composition, of inorganic fibres having a silica content, expressed as SiO<sub>2</sub>, of less than 50 percent by weight, and an aluminum oxide content, expressed as Al<sub>2</sub>O<sub>3</sub>, of at least 13% by weight.

**4,160,074**  
**POLYISOCYANATE FOAM HAVING ISOTROPIC CELLS AND METHOD AND APPARATUS FOR PREPARING SAME**  
Hiroshi Komada, Kobe; Kuniyasu Nakamura, Osaka, and Ryoichi Miyagaki, Kobe, all of Japan, assignors to Nihon Soflan Chemical & Engineering Co., Ltd., Osaka City, Japan  
Continuation-in-part of Ser. No. 625,526, Oct. 24, 1975, abandoned. This application Jan. 26, 1978, Ser. No. 872,678  
Claims priority, application Japan, Sep. 12, 1975, 50-111453  
Int. Cl.<sup>2</sup> C08J 9/00

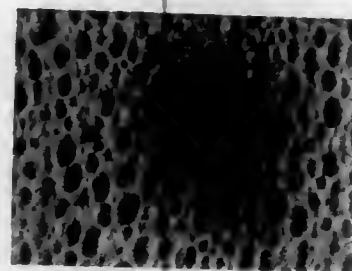
U.S. Cl. 521—155 13 Claims  
1. A method of manufacturing a polyisocyanate foam molded product having a substantially isotropic cell structure, utilizing a mold having a closed bottom wall, an open top and upstanding side wall means defining a mold cavity having a closed perimeter, said side wall means comprising interconnected relatively movable wall portions capable of moving horizontally to expand the cross-sectional area of the mold cavity in the two mutually perpendicular horizontal directions of width and length while maintaining the perimeter of said mold cavity closed, and extending means connected to said wall portions for positively mechanically moving said wall portions in said two mutually perpendicular horizontal directions from an inner contracted position to an outer expanded position, said bottom wall having a size such that it closes the bottom of the mold cavity in all positions of said side wall means, which comprises the steps of:

placing a charge of liquid polyisocyanate foamable composition onto said bottom wall of said mold cavity while said wall portions are in said inner contracted position;  
allowing the composition freely to rise vertically in said mold cavity toward the open top thereof by expansion caused by foaming of said composition, and, while the composition is still fluid and expanding and is free of externally applied pressure on the upper surface of said composition, operating said extending means and thereby positively mechanically moving said wall portions outwardly in said two mutually perpendicular horizontal directions to similar extents to expand the cross-sectional area of the mold cavity in both the width and length directions while maintaining the perimeter of said mold cavity closed whereby the composition expands also in said two mutually perpendicular horizontal directions to form a substantially isotropic cell structure.

**4,160,075**  
**PROCESS FOR THE PRODUCTION OF FOAMED PLASTICS WITH IMPROVED COMBUSTION CHARACTERISTICS**  
Leopold Golser, Leonding, Austria, assignor to Chemie Linz Aktiengesellschaft, Austria  
Filed Jul. 11, 1978, Ser. No. 923,724  
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732105

Int. Cl.<sup>2</sup> C08J 9/00  
U.S. Cl. 521—158 7 Claims  
1. In a process for the production of foamed plastics with improved combustion characteristics by a condensation reaction of aminoplast precondensates with organic isocyanates which are at least bifunctional in the presence of an acid curing catalyst and an accelerator for polyurethane formation selected from the group consisting of tertiary amines and tin salts containing metal organic bonds, whereby an aqueous solution of a water soluble precondensate of formaldehyde and an aminoplast forming compound selected from the group consisting of urea and melamine, the solution having a water content of 13 to 40% by weight, is added to the organic isocyanate which is already mixed with the accelerator for polyurethane formation, being used in an amount of 0.5 to 5% by weight relative to the foamable mixture and at the same time as the aqueous solution of the aminoplast precondensate but separately from it the acid curing catalyst is added, which is also used in an amount of 0.5 to 5% by weight, relative to the foamable mixture, whereby the ratio of water to organic isocyanate prior to the start of the reaction is 0.14 to 1.5 parts by weight of water to 1 part by weight of organic isocyanate the improvement wherein the water soluble aminoplast precondensate employed is a precondensate of this type in the form of an aqueous solution which has been obtained by reacting formaldehyde with the aminoplast-forming compound in a molar ratio of 1.80 to 4.5:1 at elevated temperature, the maximum temperature being the boiling point, and at pH values of 4 to 9.5, subsequently cooling the reaction mixture, adjusting the pH value to 7.0 to 8.0 and dissolving urea in an amount such that the molar ratio of formaldehyde to the total amount of aminoplast forming compound present in the solution is 1.0-2.1:1.

**4,160,076**  
**SIMULATED NATURAL SPONGE BASED ON HYDROPHILIC POLYURETHANE**  
James L. Guthrie, Ashton, and Donald J. Bach, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.  
Continuation-in-part of Ser. No. 577,969, May 15, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 816,055  
Int. Cl.<sup>2</sup> C08G 18/14, 18/10, 18/48  
U.S. Cl. 521—159 8 Claims



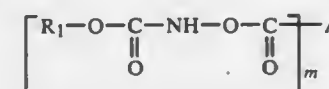
1. A method for preparation of new improved hydrophilic crosslinked polyurethane foams which simulate natural sponges which comprises reacting a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, said polyol being substantially void of reactive hydroxy groups and having a molecular weight of from about 200 to about 20,000, with a second component comprising aqueous reactant, the ratio of moles H<sub>2</sub>O/-moles NCO groups being about 6.5 to about 390 in said second

and first components respectively, said aqueous reactant having dissolved therein a liquid defoaming agent and non-ionic surface-active agent, the non-ionic surface-active agent having a high hydrophilic/lipophilic balance in the range of about HLB 14 to about HLB 18, whereas the liquid defoaming agent has a low hydrophilic/lipophilic balance of about HLB 5.5 to about HLB 8, and wherein the concentration of the liquid defoaming agent in the aqueous water phase prior to the foaming reaction is from about 0.3% to about 3.0% by weight of the aqueous phase, and the concentration of the non-ionic surface-active agent in the aqueous water phase prior to the foaming reaction is from about 0.05% to about 0.3% by weight of the aqueous phase.

**4,160,077**  
**PROCESS OF CROSSLINKING UNSATURATED HYDROCARBON POLYMERS EMPLOYING NOVEL CARBAMATES**

John L. Brooks; Richard Budziarek, and David J. Harper, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England  
Continuation of Ser. No. 767,330, Feb. 10, 1977. This application Jan. 6, 1978, Ser. No. 868,062  
Claims priority, application United Kingdom, Feb. 25, 1976, 7419/76

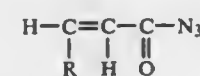
Int. Cl.<sup>2</sup> C08C 19/12, 19/22, 19/28; C08J 3/24  
U.S. Cl. 525—332 7 Claims  
1. A process for the cross-linking of hydrocarbon polymers which contain ethylenically unsaturated groups which comprises forming an intimate mixture of the polymer with a carbamate of the formula:



wherein R<sub>1</sub> is an alkyl or alkenyl group of 1 to 20 carbon atoms, benzyl or phenyl, m is 1 or 2, when m is 1, A is H, an alkyl or alkenyl group of 1 to 20 carbon atoms, phenyl, hydroxyphenyl, carboxyphenyl, nitrophenyl or chlorophenyl and when m is 2, A is phenylene or an alkylene or alkenylene radical of 2 to 4 carbon atoms.

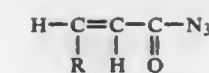
**4,160,078**  
**POLYMERS CONTAINING LATERALLY SUBSTITUTED ISOCYANATE GROUPS AND THEIR PREPARATION**  
David H. Kohn, Haifa, and Aharon Liebersohn, Kiryat Bialik, both of Israel, assignors to Technion Research and Development Foundation, Ltd., Haifa, Israel  
Filed Jul. 8, 1976, Ser. No. 703,536  
Int. Cl.<sup>2</sup> C08F 4/04, 26/00, 20/70  
U.S. Cl. 526—218 15 Claims

1. Polymers containing laterally substituted isocyanate groups obtained by polymerizing acyl azide monomers of the formula



where R is an aromatic radical with at least one vinyl monomer, in a free-radical initiator system wherein the polymers contain only isocyanate groups that have replaced acyl azide groups and contain no residual acyl azide groups.

7. A method for the preparation of polymers containing laterally substituted isocyanate groups, by the polymerization of acyl azide monomers of the formula

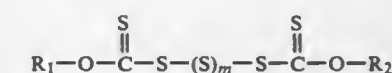


where R is an aromatic radical with at least one vinyl monomer in the presence of a free radical initiator system.

**4,160,079**  
**NOVEL SULFUR COMPOUND MODIFIERS FOR CHLOROPRENE POLYMERIZATION**  
Morris S. Edmondson, Alvin, Tex., assignor to Denka Chemical Corporation, Houston, Tex.  
Continuation of Ser. No. 605,308, Aug. 18, 1975, abandoned, which is a division of Ser. No. 541,237, Jan. 15, 1975, Pat. No. 3,923,763, which is a continuation-in-part of Ser. No. 289,521, Sep. 15, 1972, abandoned. This application Sep. 9, 1977, Ser. No. 831,773

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C08F 2/00, 4/28, 214/14, 34/00  
U.S. Cl. 526—295 4 Claims  
1. A polychloroprene composition having excellent aging stability as measured by controllable Mooney viscosity and producing cured rubber having high tensile strength and modulus properties, produced by the process which comprises polymerizing chloroprene in the presence of from about 0.05 to 5 parts by weight per 100 parts of polymerizable monomer of a modifier having the formula



wherein R<sub>1</sub> is a hydrocarbon radical having from 1 to 8 carbon atoms, R<sub>2</sub> is a hydrocarbon radical having 1 to 8 carbon atoms and m is 1 to 4.

**4,160,080**  
**PROCESS FOR THE PREPARATION OF ALLOPHANATES WHICH CONTAIN ISOCYANATE GROUPS**  
Klaus Koenig, Leverkusen; Wolfgang Reichmann, Dusseldorf, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany.  
Filed Jun. 29, 1978, Ser. No. 920,562

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2729990

Int. Cl.<sup>2</sup> C08G 18/79; C07C 118/00  
U.S. Cl. 528—59 13 Claims  
1. Process for the preparation of allophanates containing aliphatically and/or cycloaliphatically bound isocyanate groups comprising reacting organic compounds which contain urethane groups with organic polyisocyanates containing aliphatically and/or cycloaliphatically bound isocyanate groups, characterized in that the reaction is carried out in the presence of strong acids which form a mixed carbamic acid anhydride with aliphatic or cycloaliphatic isocyanates.

10. A process for the production of storage stable allophanate polyisocyanates comprising reacting

(i) organic compounds which contain urethane groups with (ii) organic polyisocyanates containing aliphatically and/or cycloaliphatically bound isocyanate groups, characterized in that the reaction is carried out in the presence of strong acids which form a mixed carbamic acid anhydride with aliphatic or cycloaliphatic isocyanates and any excess isocyanate is removed from the reaction mixture.



4,160,081

# IMIDYL- AND ISOIMIDYL-PHTHALIC ANHYDRIDES, PROCESS FOR THEIR MANUFACTURE AND THEIR USE FOR CURING EPOXIDE RESINS

Vratislav Kvita, Muttentz; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 707,923, Jul. 22, 1976, Pat. No. 4,131,613, which is a division of Ser. No. 531,030, Dec. 9, 1974, Pat. No. 3,979,393. This application Jul. 10, 1978, Ser. No. 922,894

Claims priority, application Switzerland, Dec. 20, 1973, 17903/73

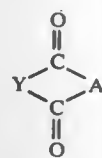
Int. Cl.<sup>2</sup> C08G 59/42

U.S. Cl. 528—93

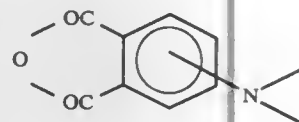
3 Claims

1. A curable mixture which is suitable for the manufacture moldings, impregnations, coatings and adhesive bonds comprising:

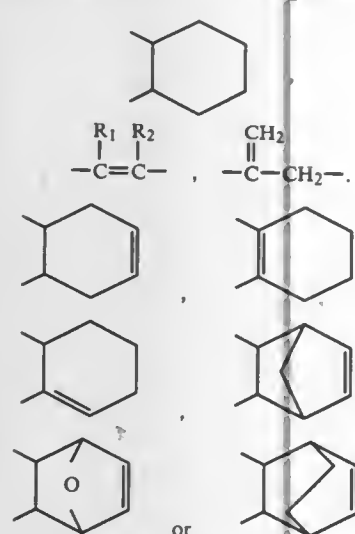
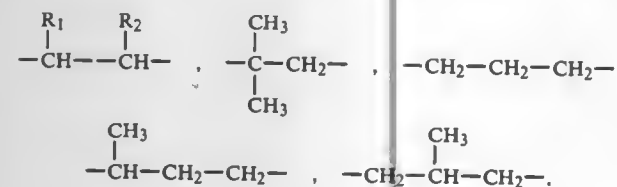
- an epoxide compound containing at least two epoxide groups per molecule; and
- a curing agent selected from the group consisting of compounds with at least one imidyl-phthalic anhydride of the formula



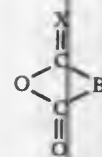
wherein Y represents the divalent radical



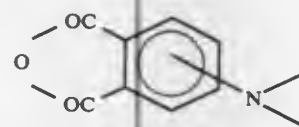
and A represents a divalent radical selected from the group consisting of



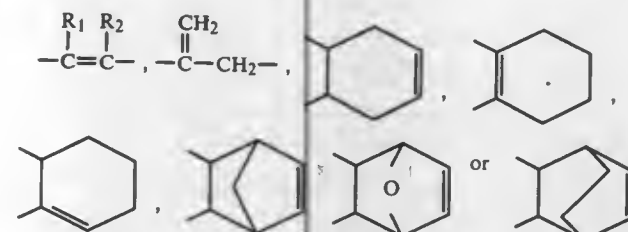
R<sub>1</sub> and R<sub>2</sub> independently of one another denote hydrogen, chlorine, bromine or methyl, or compounds with at least one isoimidyl-phthalic anhydride of the formula



wherein X represents the divalent radical



and B represents a divalent radical selected from the group consisting of



where R<sub>1</sub> and R<sub>2</sub> independently of one another denote hydrogen, chlorine, bromine or methyl.

4,160,082

# INTERMEDIATES FOR AMINOGLYCOSIDE ANTIBIOTICS

William A. Million, Ramsgate; Rhona M. Plews, and Kenneth Richardson, both of Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

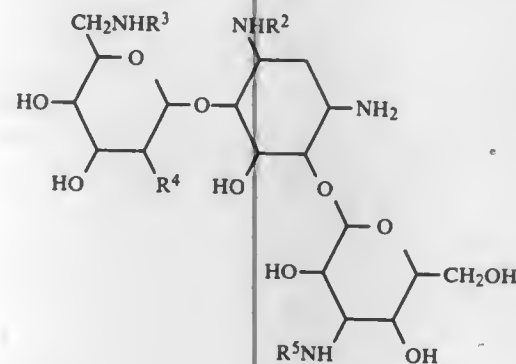
Continuation-in-part of Ser. No. 784,979, Apr. 6, 1977, abandoned. This application Nov. 14, 1977, Ser. No. 851,400 Claims priority, application United Kingdom, Apr. 14, 1976, 15421/76

Int. Cl.<sup>2</sup> C07H 15/22; C07G 11/00

U.S. Cl. 536—10

1. A compound of the formula

11 Claims



wherein

R<sup>2</sup> is selected from the group consisting of hydrogen and benzyl;

R<sup>4</sup> is selected from the group consisting of hydroxy and R<sup>6</sup> NH;

and R<sup>3</sup>, R<sup>5</sup> and R<sup>6</sup> are each selected from the group consisting of formyl, alkanoyl having from 2 to 5 carbon atoms, fluoroacetyl, difluoroacetyl, trifluoroacetyl, chloroacetyl, dichloroacetyl, trichloroacetyl, alkoxycarbonyl having from 2 to 5 carbon atoms and benzoyl; provided that R<sup>3</sup>, R<sup>5</sup> and R<sup>6</sup> are always the same.

4,160,083

# PROCESS FOR THE SEPARATION OF ANTIBIOTIC MACROLIDES

Lucille J. Cole, Roselle Park, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

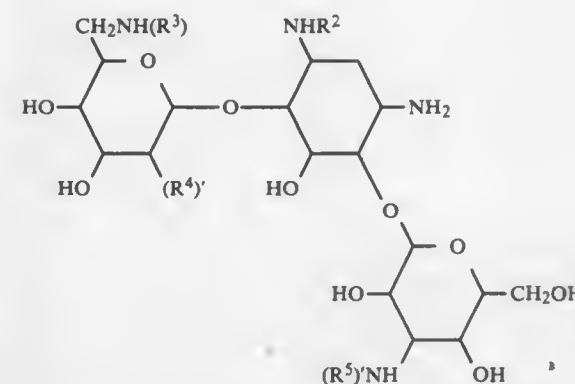
Filed Oct. 3, 1977, Ser. No. 838,710

Int. Cl.<sup>2</sup> C07H 17/08

U.S. Cl. 536—17 A

2 Claims

1. A method for the separation of C-076 compounds wherein said C-076 compounds have the formula:



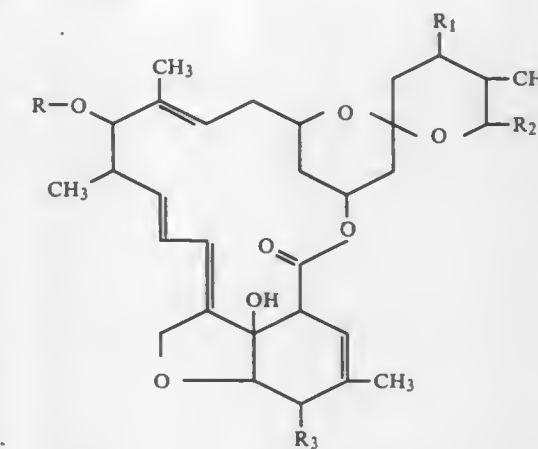
wherein

R<sup>2</sup> is selected from the group consisting of hydrogen and benzyl;

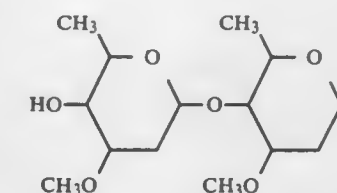
(R<sup>4</sup>)' is selected from the group consisting of hydroxy and NH(R<sup>6</sup>)';

and (R<sup>3</sup>)', (R<sup>5</sup>)' and (R<sup>6</sup>)' are each selected from the group consisting of formyl, alkanoyl having from 2 to 5 carbon atoms, fluoroacetyl, difluoroacetyl, trifluoroacetyl, chloroacetyl, dichloroacetyl and trichloroacetyl; provided that (R<sup>3</sup>)', (R<sup>5</sup>)' and (R<sup>6</sup>)' are always the same; which comprises:

(a) reacting a compound of the formula



wherein R is:

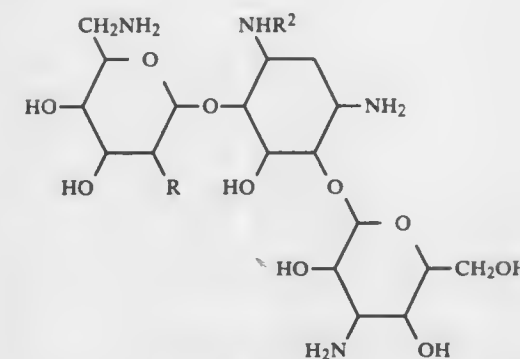


and wherein the broken line indicates a single or a double bond; R<sub>1</sub> is hydroxy an is present only when said broken line indicates a single bond.

R<sub>2</sub> is propyl or butyl; and

R<sub>3</sub> is methoxy or hydroxy

into components A and B from a solution containing a mixture of said components obtained from the extraction of the fermentation broth of a C-076 producing strain of *Streptomyces avermitilis* wherein said solution is applied to a column of Sephadex LH-20 and subsequently eluted with a solvent mixture of from 8 to 10 parts of methylene chloride or chloroform, from 8 to 10 parts of hexane or heptane and from 0.5 to 2 parts of methanol or ethanol.



wherein R is selected from the group consisting of hydroxy and amino and R<sup>2</sup> is selected from the group consisting of hydrogen and benzyl, with an excess of formic-acetic anhydride or (R<sup>7</sup>CO)<sub>2</sub>O, in a reaction-inert solvent, at a pH below about 5 to achieve selective O-acylation of the reactive hydroxy groups, wherein R<sup>7</sup> is selected from the group consisting of alkyl having from 1 to 4 carbon atoms, fluoromethyl, difluoromethyl, trifluoromethyl, chloromethyl, dichloromethyl and trichloromethyl;

(b) neutralizing a solution of the product of step (a), in a reaction-inert organic solvent, and at a temperature of from about 0° to about 50° C., to achieve O→N acyl migration; and

(c) hydrolyzing the product of step (b) at a temperature of from about 0° to about 100° C., to remove any remaining O-acyl groups.

4,160,084

# METHOD FOR THE SEPARATION OF ANTIBIOTIC MACROLIDES

Thomas W. Miller, Carteret; Kenneth E. Wilson, Woodbridge, and Robert E. Ormond, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

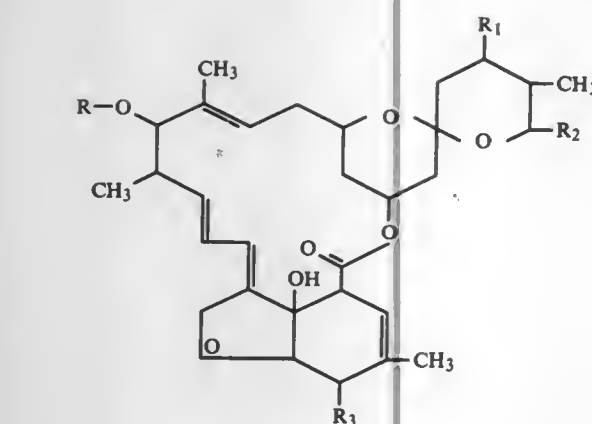
Filed Oct. 11, 1977, Ser. No. 840,921

Int. Cl.<sup>2</sup> C07H 17/08

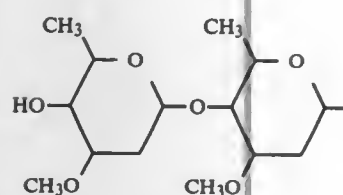
U.S. Cl. 536—17 A

6 Claims

1. A process for the preparation of C-076 B1 and B2 components, wherein said C-076 B1 and B2 components have the structure:



wherein  
R is:



and wherein the broken line indicates a single or a double bond; R<sub>1</sub> is hydroxy and is present only when said broken line indicates a single bond;

R<sub>2</sub> is propyl or butyl; and  
R<sub>3</sub> is hydroxy, from a solution containing a mixture of said C-076 B1 and B2 components obtained from the extraction of the fermentation broth of a C-076 producing strain of *Streptomyces avermitilis*, wherein said solution is chromatographed on a column containing hydroxyalkylated dextran gel and eluting said components with a solvent mixture of low boiling hydrocarbons: toluene, benzene or xylene: lower alcohols in the ratio of 30-90:10-60:5-25 and recovering said components.

4,160,085

#### CYCLIZATION TO FORM CEPHEM RING AND INTERMEDIATES THEREFOR

Teruji Tsuji, Takatsuki; Yoshio Hamashima, Kyoto; Mitsuru Yoshioka, Toyonaka; Masayuki Narisada, Ibaraki; Hiroshi Tanida; Taichiro Komeno, both of Osaka, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 658,665, Feb. 17, 1976, Pat. No. 4,079,181. This application Dec. 1, 1977, Ser. No. 856,806

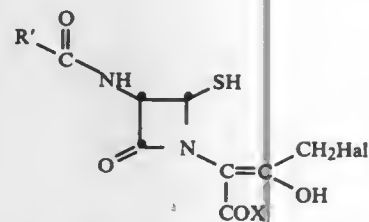
Claims priority, application Japan, Feb. 17, 1975, 50-19612; Feb. 21, 1975, 50-22229; Mar. 7, 1975, 50-28452; Mar. 30, 1975, 50-33808

Int. Cl.<sup>2</sup> C07D 501/02

U.S. Cl. 544-16

5 Claims

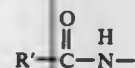
1. A process for cyclizing a compound represented by the formula



wherein

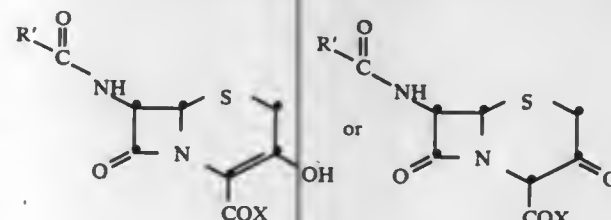
R' represents a member selected from the group consisting

of (1) hydrogen, (2) C<sub>1</sub> to C<sub>4</sub> alkyl, (3) phenyl, (4) α-chlorobenzyl, (5) Ar-CO, (6) Ar-G-CO where Ar represents hydrogen or methyl, G represents oxygen or sulfur and Ar represents (a) phenyl, (b) dihydrophenyl, (c) monocyclic heterocyclic aromatic containing from 1 to 4 hereto atoms selected from the group of nitrogen, oxygen and sulfur or (d) one of said groups (a) to (c) substituted by an inert group selected from the group of alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, chlorine, bromine, iodine, fluorine, trifluoromethyl hydroxy, cyano, aminoethyl, amino and nitro, or



represents phthalimido.

COX represents carboxy or protected carboxy, and Hal represents a halogen atom, which comprises the step of treating the said compound with a member of the group consisting of acid, base, solvent and a solvent together with a catalyst selected from the group of a neutral or basic silica gel, alumina, diatomaceous earth and fluorisil to give a compound represented by the formula



4,160,086

#### 3-HETEROCYCLICTHIO-7-α-CARBOXY 2-ARYL ACETAMIDO CEPHALOSPORANIC ACID

George Burton, Coulsdon, and Elzbieta Watson, Carshalton, both of England, assignors to Beecham Group Limited, England

Filed Apr. 8, 1975, Ser. No. 566,060

Claims priority, application United Kingdom, Apr. 27, 1974, 18557/74; Jul. 25, 1974, 32806/74

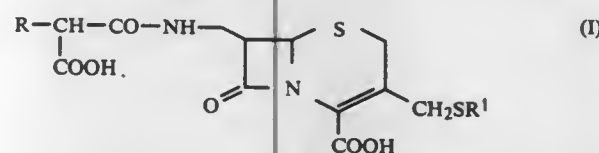
The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 501/36

U.S. Cl. 544-26

10 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt or 4-carboxylic acid mono-ester thereof:



wherein R is 2- or 3-thienyl or phenyl or 4-hydroxyphenyl, and R<sup>1</sup> represents thiadiazolyl or tetrazolyl unsubstituted or substituted by lower alkyl.

4,160,087

#### N-ACYLAMINO-α-ARYLACETAMIDO CEPHALOSPORINS

Hirotsada Yamada, Nishinomiya; Kousaku Okamura, Takarazuka; Hisao Tobiki, Kobe; Norihiko Tanno, Ashiya; Kozo Shimago, Toyonaka; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, Kawanishi; Hiroshi Noguchi, Nishinomiya; Kenji Irie, Takarazuka, and Yasuko Eda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 611,104, Sep. 8, 1975. This application May 10, 1977, Ser. No. 795,596

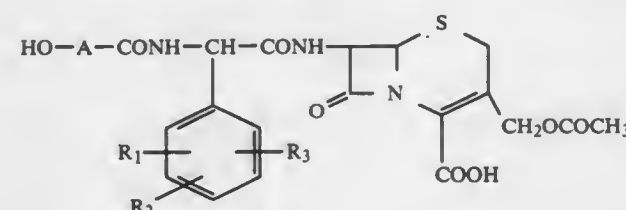
Claims priority, application Japan, Sep. 6, 1974, 49-103183; Sep. 19, 1974, 49-108428; Sep. 19, 1974, 49-108429; Mar. 20, 1975, 50-33824

Int. Cl.<sup>2</sup> C07D 501/34; A61K 31/545

U.S. Cl. 544-28

1 Claim

1. A compound of the formula,



wherein A is cinnoline, naphthyridine, pyridopyrazine, thiazolopyrimidine, pyridopyrimidine, pyridine, pyrimidine, or pyridazine, each of which can be substituted with one or more substituents selected from the group consisting of a (C<sub>1</sub>-C<sub>4</sub>)alkyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkoxy group, a (C<sub>1</sub>-C<sub>4</sub>)alkylthio group and a hydroxy group and wherein the hydroxy group attached to A is ortho to the amido group attached to A; R<sub>1</sub> is an amino group, a hydroxy group, a hydroxymethyl group or a ureido group; and R<sub>2</sub> and R<sub>3</sub>, which may be the same or different, each is chloro, fluoro, methoxy or hydroxy, and the non-toxic pharmaceutically acceptable salts thereof.

4,160,089

#### UTILIZATION OF ORTHOPHOSPHORIC ESTERS FOR THE PRODUCTION OF AQUEOUS FLUIDS FOR WORKING METALS

Giancarlo Bussi, and Pierpaolo Baradel, both of Trieste, Italy, assignors to Aquila S.p.A., Trieste, Italy

Continuation of Ser. No. 702,127, Jul. 2, 1976, abandoned, which is a division of Ser. No. 516,029, Oct. 18, 1974, Pat. No. 3,983,098. This application Jul. 15, 1977, Ser. No. 816,508

Claims priority, application Italy, Oct. 18, 1973, 30279 A/73 Int. Cl.<sup>2</sup> A23J 7/00; C07F 9/02; C11C 3/00

U.S. Cl. 544-78

4 Claims

1. The product obtained by the steps consisting essentially of esterifying phosphorus pentoxide with at least one fatty acid alcohol having 10 to 20 carbon atoms and at least one carbon-carbon double bond to form a mixture of phosphoric esters, chlorinating said esters by addition of chlorine to the carbon-carbon double bond in the molecules of said esters obtained from the esterifying step, and salifying the thus chlorinated esters obtained at the end of the chlorinating step, with at least one base selected from the group consisting of an alkali, an amine and ammonia.

4. The product of claim 1, wherein said amine is selected from the group consisting of morpholine and triethanolamine.

4,160,090

#### NITROPHENYLHYDRAZINE COMPOUNDS

Don L. Hunter, Anaheim; William G. Woods, Fullerton; James D. Stone, Whittier, all of Calif., and Cecil W. LeFevre, Franklin, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

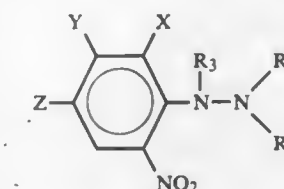
Division of Ser. No. 657,664, Feb. 12, 1976, which is a division of Ser. No. 529,655, Dec. 4, 1974. This application Nov. 7, 1977, Ser. No. 849,385

Int. Cl.<sup>2</sup> C07D 211/06, 295/00

U.S. Cl. 544-164

8 Claims

1. A compound of the formula



wherein X is selected from hydrogen and nitro, Y is halo, Z is selected from halo and trifluoromethyl, R<sub>3</sub> is selected from hydrogen and lower alkyl, and R<sub>1</sub>-R<sub>2</sub> taken together represent an alkylene, alkyleneimino or alkyleneoxy linkage having two to six carbon atoms in the chain.

4,160,088

#### DIHYDROOXADIAZINONES AND METHOD FOR MAKING

George E. Niznik, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 608,450, Aug. 28, 1975, Pat. No. 4,097,671. This application Apr. 21, 1977, Ser. No. 789,420

Int. Cl.<sup>2</sup> C07D 273/04

U.S. Cl. 544-68

19 Claims

1. In the process for making an α-halo ketone involving the halogenation of an α-dihydro ketone in the presence of an effective amount of a mineral acid catalyst or a Lewis Acid catalyst resulting in the production of the α-halo ketone along with significant amounts of poly α-halogenated ketone, the improvement which comprises halogenating the α-dihydro ketone in the range of from 0° C. to 50° C. in the presence of the Lewis Acid catalyst or mineral acid catalyst along with from 1 to 20 parts, per part of the ketone of a C<sub>(1-8)</sub> aliphatic alcohol, to provide for the recovery of α-halo ketone substantially free of poly α-halogenated ketone.

4,160,091

#### PROCESS FOR PREPARATION OF 3-HALO-3-METHYLCEPHAMS

David K. Herron, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

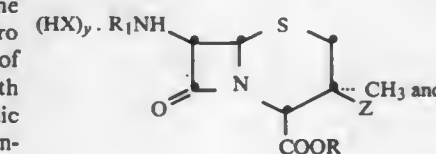
Filed Nov. 21, 1977, Ser. No. 853,065

Int. Cl.<sup>2</sup> C07D 501/02

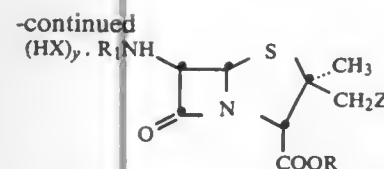
U.S. Cl. 544-16

10 Claims

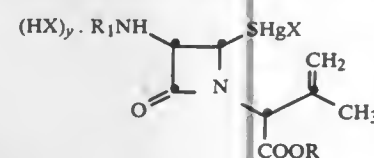
1. A process for preparing compounds of the formula







which comprises reacting a compound of the formula

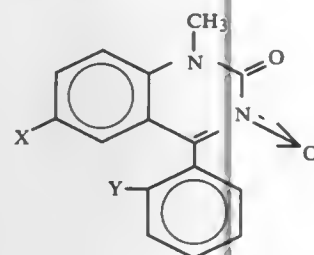


with at least at equivalent of a positive halogenating agent selected from the group consisting of chlorine, sulfonyl chloride, tert-butylhypochlorite, bromine and sulfonyl bromide in an inert organic solvent

wherein in the above formula, X is chloro or bromo, R is hydrogen or a carboxylic acid ester protecting group, R<sub>1</sub> is hydrogen or an acyl group derived from a carboxylic acid, Z is chloro or bromo and y is 0 or 1 provided that when R<sub>1</sub> is an acyl group y is 0.

**4,160,092**  
**QUINAZOLINONE OXIDES AND THEIR USE AS INTERMEDIATES FOR PHARMACEUTICAL AGENTS**  
Elena M. Bingham, Wilmington, Del., and Arthur J. Elliott, Cedar Grove, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 16, 1977, Ser. No. 807,074  
Int. Cl.<sup>2</sup> C07D 239/82  
U.S. Cl. 544—286  
1. A compound of the formula:



where  
X is Cl, Br, NO<sub>2</sub> or CF<sub>3</sub>; and  
Y is H, Br, Cl, or F.

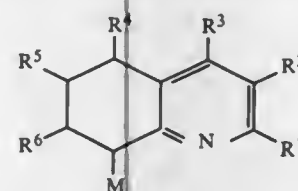
**4,160,093**  
**6-ETHYL-6,9-DIHYDRO-9-OXOPYRAZOLO[3,4-f]QUINOLINE-9-CARBOXYLIC ACID**  
Thomas J. Schwan, and Raymond Freedman, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,372  
Int. Cl.<sup>2</sup> C07D 471/04  
U.S. Cl. 546—82  
1. The compound 6-ethyl-6,9-dihydro-9-oxopyrazolo[3,4-f]quinoline-8-carboxylic acid.

**4,160,094**  
**TETRAHYDROQUINOLINE DERIVATIVES**  
Adrian C. W. Curran, Newcastle-upon-Tyne; Roger Crossley, Reading, and David G. Hill, Cookham, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, United Kingdom

Continuation-in-part of Ser. No. 460,265, Apr. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,903

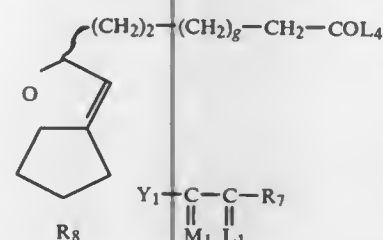
Int. Cl.<sup>2</sup> C07D 215/16  
U.S. Cl. 546—152  
12 Claims  
1. An organic solution of a compound of formula



wherein M is sodium, potassium or lithium, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are the same or different and represent hydrogen or a lower alkyl group of 1-6 carbon atoms, with the proviso that when any two of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> or R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are present on adjacent carbon atoms and are both lower alkyl, they are selected from normal and secondary alkyl groups.

**4,160,095**  
**7,8-DIDEHYDRO-PGI<sub>1</sub> AMIDES**  
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

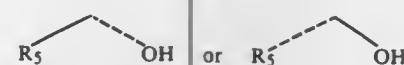
Continuation-in-part of Ser. No. 869,141, Jan. 13, 1978. This application Jul. 3, 1978, Ser. No. 921,630  
Int. Cl.<sup>2</sup> C07D 307/93  
U.S. Cl. 542—426  
63 Claims  
1. A prostacyclin intermediate of the formula



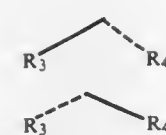
wherein g is the integer one, 2, or 3;  
wherein R<sub>8</sub> is hydrogen, hydroxy, or hydroxymethyl;  
wherein Y<sub>1</sub> is



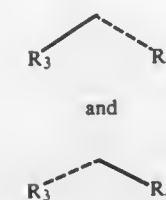
wherein M<sub>1</sub> is



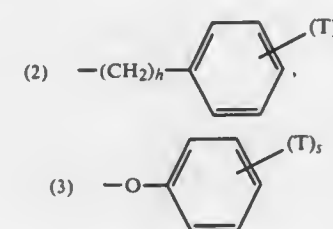
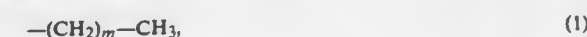
wherein R<sub>5</sub> is hydrogen or methyl;  
wherein L<sub>1</sub> is



or a mixture of



wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro; wherein R<sub>7</sub> is

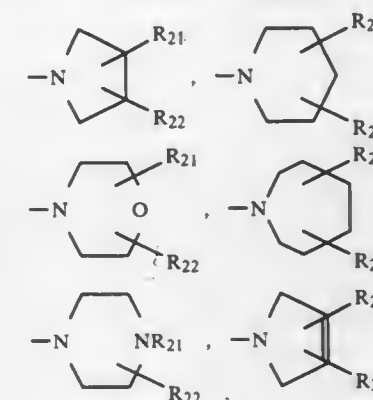


wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl; and

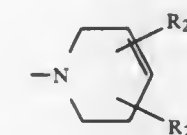
wherein L<sub>4</sub> is

- (a) amino of the formula —NR<sub>21</sub>R<sub>22</sub>; wherein R<sub>21</sub> and R<sub>22</sub> are  
(i) hydrogen;  
(ii) alkyl of one to 12 carbon atoms, inclusive;  
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;  
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;  
(v) phenyl;  
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxy, carbonyl of one to 4 carbon atoms, inclusive, or nitro;  
(vii) carboxyalkyl of one to 4 carbon atoms, inclusive;  
(viii) carbamoylalkyl of one to 4 carbon atoms, inclusive;  
(ix) cyanoalkyl of one to 4 carbon atoms, inclusive;  
(x) acetylalkyl of one to 4 carbon atoms, inclusive;  
(xi) benzoylalkyl of one to 4 carbon atoms, inclusive;  
(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxy, carbonyl of one to 4 carbon atoms, inclusive, or nitro;  
(xiii) pyridyl;  
(xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;  
(xv) pyridylalkyl of one to 4 carbon atoms, inclusive;  
(xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive;  
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;

- (xviii) dihydroxyalkyl of one to 4 carbon atoms, or  
(xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R<sub>21</sub> and R<sub>22</sub> is other than hydrogen or alkyl;  
(b) cycloamino selected from the group consisting of



or



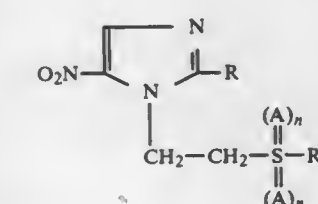
wherein R<sub>21</sub> and R<sub>22</sub> are as defined above;  
(c) carbonylamino of the formula —NR<sub>23</sub>COR<sub>21</sub>, wherein R<sub>23</sub> is hydrogen or alkyl of one to 4 carbon atoms and R<sub>21</sub> is as defined above;  
(d) sulfonylamino of the formula —NR<sub>23</sub>SO<sub>2</sub>R<sub>21</sub>, wherein R<sub>21</sub> and R<sub>23</sub> are as defined above; or  
(e) hydrazino of the formula —NR<sub>23</sub>R<sub>24</sub>, wherein R<sub>23</sub> is as defined above and R<sub>24</sub> is amino of the formula —NR<sub>21</sub>R<sub>22</sub>, as defined above, or cycloamino, as defined above.

**4,160,096**  
**PROCESS FOR PRODUCTION OF 5-NITROIMIDAZOLE DERIVATIVES**

Franjo Kajfez, Vitomir Sunjic, and Vesna Sunjic, all of Chiasso, Switzerland, assignors to CRC Compagnia di Ricerca Chimica S.A., Chiasso, Switzerland

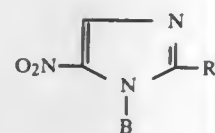
Continuation of Ser. No. 720,613, Sep. 3, 1976, which is a continuation of Ser. No. 569,383, Apr. 18, 1975, abandoned. This application Jul. 27, 1978, Ser. No. 928,832  
Claims priority, application Switzerland, Apr. 19, 1974, 5459/74

Int. Cl.<sup>2</sup> C07D 233/94  
U.S. Cl. 548—338  
3 Claims  
1. A process for making derivatives of 5-nitroimidazoles of the formula I:



wherein  
R is alkyl having 1-4 carbon atoms,  
R<sub>1</sub> is alkyl having 1-4 carbon atoms,  
A is oxygen, and  
n is 1,

which comprises reacting a compound having the formula II:



wherein

R is as defined in Formula I,

B is a 2'-haloethyl group (CH<sub>2</sub>CH<sub>2</sub>Hal), where Hal is a halogen atom, or an ethylsulfinio group (-CH<sub>2</sub>CH<sub>2</sub>SO<sub>2</sub>H) in the form of its alkali or alkaline earth salts, with compounds of the formula III:

Z—R,

(III)

wherein

(a) when B is 2'-haloethyl as defined above, Z is —SO<sub>2</sub>—M wherein M is a metal selected from the group consisting of an alkali metal and an alkaline earth metal and R<sub>1</sub> is as defined above,

(b) when B is —CH<sub>2</sub>CH<sub>2</sub>SO<sub>2</sub>M wherein M is as defined above, Z is halo as defined above and R<sub>1</sub> is as defined above, and wherein said reactions are carried out in dimethylformamide.

4,160,097

#### 1-(2-PHENYLUREYLENE)IMIDAZOLES

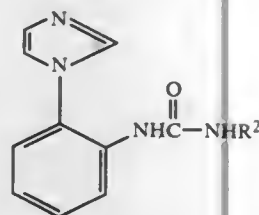
Paul L. Warner, Jr., Clarence, and Edward J. Luber, Jr., Buffalo, both of N.Y., assignors to Westwind Pharmaceuticals, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 757,640, Jan. 7, 1977, abandoned. This application Dec. 8, 1977, Ser. No. 858,515 Int. Cl.<sup>2</sup> C07D 233/60

U.S. Cl. 548—346

39 Claims

1. A 1-(2-phenylureylene)imidazole of the formula:



wherein: R<sup>2</sup> is a radical bonded to the nitrogen by a carbon to nitrogen linkage and is selected from the group consisting of phenyl and mono, di- or tri-substituted phenyl wherein the substituent is selected from the group consisting of alkyl, isoalkyl, alkoxy, acyloxy, halogen, cyano, acetyl, nitro, alkyl mercapto, phenoxy, alkyl phenoxy and trifluoro methyl.

4,160,098

#### PYRAZOLE DERIVATIVES

Elke Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

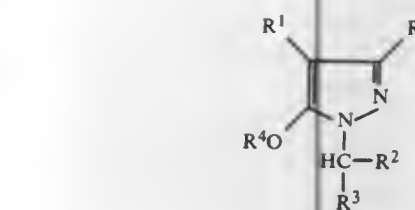
Division of Ser. No. 691,891, Oct. 6, 1975, Pat. No. 4,096,152, which is a division of Ser. No. 532,311, Dec. 13, 1974, Pat. No. 4,002,641. This application Apr. 28, 1977, Ser. No. 791,840 Claims priority, application Fed. Rep. of Germany, Dec. 20, 1973, 2363511

Int. Cl.<sup>2</sup> C07D 403/12, 405/12, 409/12

U.S. Cl. 548—374

1. A compound of the formula:

10 Claims



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen or lower alkyl;

R<sup>1</sup> is hydrogen or lower alkyl;

R<sup>2</sup> is lower alkyl;

R<sup>3</sup> is phenyl substituted by:

(a) one or two of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, and alkoxy of 1 to 6 carbon atoms;

(b) one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro;

(c) one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro and one or two substituents selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkoxy of 1 to 6 carbon atoms, halogen and trifluoromethyl; or

R<sup>3</sup> is naphthyl; and

R<sup>4</sup> is R<sup>5</sup>CO wherein R<sup>5</sup> is pyrrol, thienyl, furyl, dihydrofuryl, tetrahydrofuryl, tetrahydropyranyl or tetrahydrothiopyranyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, and nitro.

4,160,099

#### LABILE, NON-HETEROCYCLIC QUATERNARY AMMONIUM SALT/ESTERS AS TRANSIENT DERIVATIVES

Nicolae S. Bodor, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence

Continuation-in-part of Ser. No. 482,513, Jun. 24, 1974, Pat. No. 3,998,815. This application Sep. 20, 1976, Ser. No. 724,914

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C07C 93/18

U.S. Cl. 560—110

7 Claims

1. A compound selected from the group consisting of ω-(diethyl-pivaloyloxymethyl-ammonium)-2,6-dimethyl-acetanilide chloride; N-ethylephedrine (α-acetyloxyethyl) chloride; 2-diethylaminopropiophenone heptanoyloxymethyl chloride; 6-dimethylamino-4,4-diphenyl-3-heptanone-N-heptanoyloxymethyl chloride; 6-dimethylamino-4,4-diphenyl-3-heptanone-N-acetyloxymethyl chloride; and 4-dimethylamino-3-methyl-1,2-diphenyl-2-butanol propionate N-hexanoyloxymethyl chloride.

4,160,100

#### OXAMIC ACID DERIVATIVES

John H. Sellstedt, Pottstown; Charles J. Guinasso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

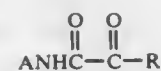
Continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,567

Int. Cl.<sup>2</sup> C07C 101/54

U.S. Cl. 560—43

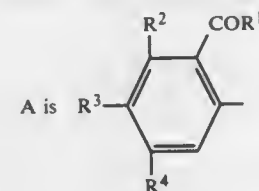
1. A compound of the formula:

31 Claims



in which

R is a member selected from the group consisting of lower alkoxy, cyclohexyloxy and phenoxy; and



wherein

R<sup>1</sup> is a member selected from the group consisting of hydroxyl, lower alkyl, lower alkoxy, lower alkylamino and amino radicals;

R<sup>2</sup> is a member selected from the group consisting of hydrogen, lower alkoxy, hydroxy(lower)alkoxy, N-mono and di-lower alkylamino(lower)alkoxy, halo, phenoxy(lower)alkoxy, 2-(lower alkoxy oxalyloxy)ethoxy, benzyloxy, mono- and di-lower alkylamino with the proviso that when R<sup>2</sup> is hydrogen R<sup>1</sup> is other than hydroxyl or lower alkoxy;

R<sup>3</sup> is a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo and nitro; and

R<sup>4</sup> is a member selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; with the proviso that one of R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> must be other than hydrogen.

4,160,101

#### ω-ARYL-13,14-DIDEHYDRO-INTER-OXA PGE COMPOUNDS

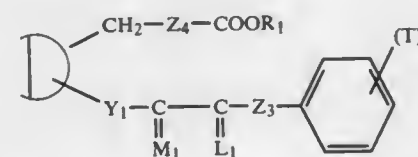
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 776,552, Mar. 7, 1977, which is a division of Ser. No. 657,739, Feb. 13, 1976, Pat. No. 4,029,681. This application Apr. 28, 1978, Ser. No. 900,970 Int. Cl.<sup>2</sup> C07C 177/00

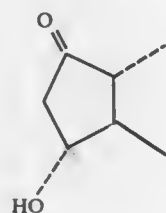
U.S. Cl. 560—53

37 Claims

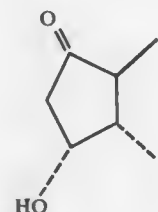
1. A prostaglandin analog of the formula:



wherein D is



or



wherein Y<sub>1</sub> is —C≡C—;

wherein Z<sub>4</sub> is

(1) —CH<sub>2</sub>—O—CH<sub>2</sub>—(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—,

(2) —(CH<sub>2</sub>)<sub>2</sub>—O—(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—, or

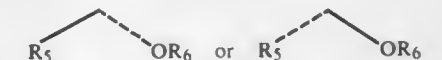
(3) —(CH<sub>2</sub>)<sub>3</sub>—O—(CH<sub>2</sub>)<sub>g</sub>—,

wherein g is one, 2, or 3;

wherein Z<sub>3</sub> is oxa or methylene;

wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein M<sub>1</sub> is

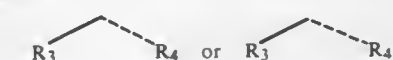


wherein R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen;

wherein L<sub>1</sub> is



or a mixture of



wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro and Z<sub>3</sub> is methylene; and

wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,102

#### ω-ARYL-INTER-OXA-9-DEOXY-PGD<sub>1</sub> COMPOUNDS

David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

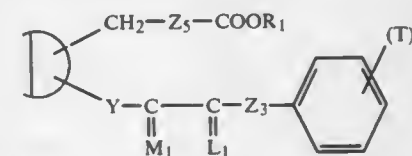
Division of Ser. No. 809,249, Jun. 23, 1977, which is a division of Ser. No. 614,244, Sep. 17, 1975. This application May 8, 1978, Ser. No. 903,625

Int. Cl.<sup>2</sup> C07C 177/00

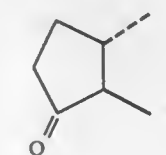
U.S. Cl. 560—53

25 Claims

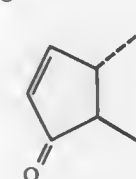
1. A prostaglandin analog of the formula



wherein D is



or





wherein

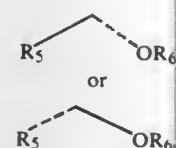
Y is cis-CH=CH-, trans-CH=CH-, or -CH<sub>2</sub>CH<sub>2</sub>-;

wherein Z<sub>5</sub> is

- (1) -CH<sub>2</sub>-O-CH<sub>2</sub>-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-,
- (2) -(CH<sub>2</sub>)<sub>2</sub>-O-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-, or
- (3) -(CH<sub>2</sub>)<sub>3</sub>-O-(CH<sub>2</sub>)<sub>g</sub>-

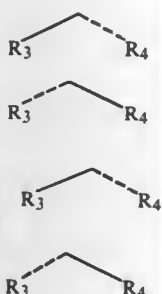
wherein g is one, 2, or 3;

wherein M<sub>1</sub> is



wherein

R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen; wherein L<sub>1</sub> is



or a mixture of

and

wherein

R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is hydrogen or fluoro only when the other is hydrogen or fluoro;

wherein

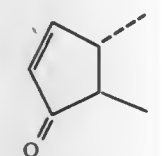
Z<sub>3</sub> is oxa or methylene;

wherein

T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that Z<sub>3</sub> is oxa only when R<sub>3</sub> and R<sub>4</sub> are hydrogen or methyl, being the same or different; and

wherein

R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; with the further proviso that D is



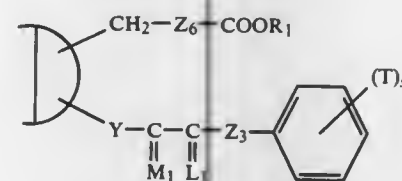
only when Y is -CH<sub>2</sub>CH<sub>2</sub>-.

4,160,103  
ω-ARYL-CIS-13-PGA COMPOUNDS  
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,184  
Int. Cl.<sup>2</sup> C07C 177/00

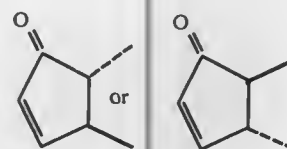
U.S. Cl. 560-53

37 Claims

1. A prostaglandin analog of the formula:



wherein D is



wherein Y is cis-CH=CH-;

where Z<sub>6</sub> is

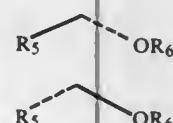
- (1) cis-CH=CH-CH<sub>2</sub>-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-,
- (2) cis-CH=CH-CH<sub>2</sub>-(CH<sub>2</sub>)<sub>g</sub>-CF<sub>2</sub>-,
- (3) cis-CH<sub>2</sub>-CH=CH-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-,
- (4) -(CH<sub>2</sub>)<sub>3</sub>-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-, or
- (5) -(CH<sub>2</sub>)<sub>3</sub>-(CH<sub>2</sub>)<sub>g</sub>-CF<sub>2</sub>-,

wherein g is one, 2, or 3;

wherein Z<sub>3</sub> is oxa or methylene;

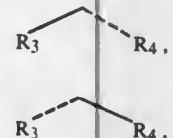
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein M<sub>1</sub> is

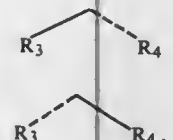


wherein R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen;

wherein L<sub>1</sub> is



or a mixture of



and

and

wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being

the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro and Z<sub>3</sub> is methylene; and

wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,104

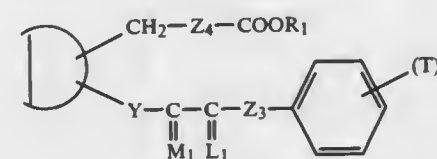
ω-ARYL-CIS-13-INTER-OXA-PGE COMPOUNDS  
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,187  
Int. Cl.<sup>2</sup> C07C 177/00

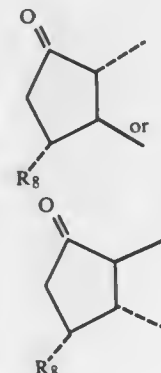
U.S. Cl. 560-53

37 Claims

1. A prostaglandin analog of the formula:



wherein D is



wherein R<sub>8</sub> is hydrogen or hydroxy;

wherein Y is cis-CH=CH-;

wherein Z<sub>4</sub> is

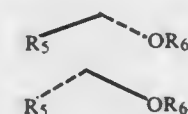
- (1) -CH<sub>2</sub>-O-CH<sub>2</sub>-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-,
- (2) -(CH<sub>2</sub>)<sub>2</sub>-O-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-, or
- (3) -(CH<sub>2</sub>)<sub>3</sub>-O-(CH<sub>2</sub>)<sub>g</sub>-

wherein g is one, 2, or 3;

wherein Z<sub>3</sub> is oxa or methylene;

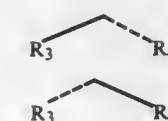
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein M<sub>1</sub> is

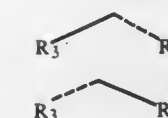


wherein R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen;

wherein L<sub>1</sub> is



or a mixture of



wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro and Z<sub>3</sub> is methylene; and

wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,105

ω-ARYL-13,14-DIDEHYDRO-INTER-OXA PGF COMPOUNDS

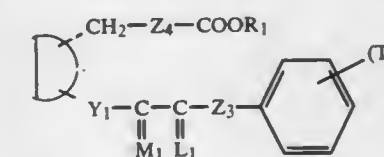
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 776,552, Mar. 7, 1977, which is a division of Ser. No. 657,739, Feb. 13, 1976, Pat. No. 4,029,681. This application Apr. 28, 1978, Ser. No. 901,167  
Int. Cl.<sup>2</sup> C07C 177/00

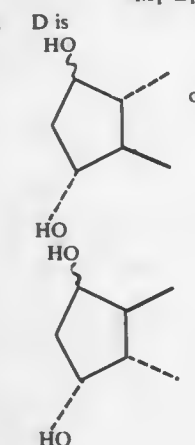
U.S. Cl. 560-55

37 Claims

1. A prostaglandin analog of the formula:



wherein



wherein

Y<sub>1</sub> is -C≡C-;

wherein Z<sub>4</sub> is

- (1) -CH<sub>2</sub>-O-CH<sub>2</sub>-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-,
- (2) -(CH<sub>2</sub>)<sub>2</sub>-O-(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-, or
- (3) -(CH<sub>2</sub>)<sub>3</sub>-O-(CH<sub>2</sub>)<sub>g</sub>-

wherein

g is one, 2, or 3;

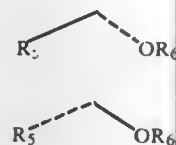
wherein

Z<sub>3</sub> is oxa or methylene;

wherein

T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

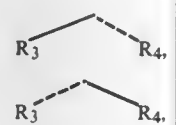
wherein M<sub>1</sub> is



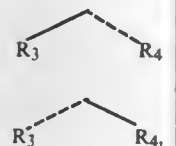
or

wherein

R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen; wherein L<sub>1</sub> is



or a mixture of



and

wherein

R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro and Z<sub>3</sub> is methylene; and

wherein

R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

#### 4,160,106

$\omega$ -ARYL-CIS-13-INTER-OXA-PGF COMPOUNDS  
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

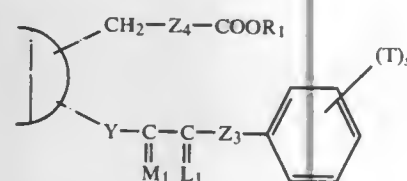
Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,186

Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 560—55

37 Claims

1. A prostaglandin analog of the formula:



wherein D is

wherein R<sub>8</sub> is hydrogen or hydroxy;

wherein Y is cis-CH=CH-

wherein Z<sub>4</sub> is

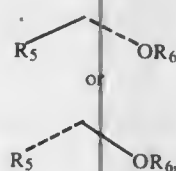
(1) —CH<sub>2</sub>—O—CH<sub>2</sub>—(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—,  
(2) —(CH<sub>2</sub>)<sub>2</sub>—O—(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—, or  
(3) —(CH<sub>2</sub>)<sub>3</sub>—O—(CH<sub>2</sub>)<sub>g</sub>—

wherein g is one, 2, or 3;

wherein Z<sub>3</sub> is oxa or methylene;

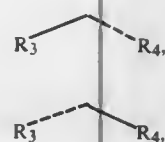
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein M<sub>1</sub> is

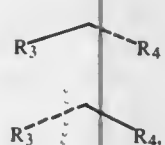


wherein R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen;

wherein L<sub>1</sub> is



or a mixture of



wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other hydrogen or fluoro and Z<sub>3</sub> is methylene; and

wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

#### 4,160,107

##### PROCESS FOR THE PREPARATION OF ESTERS OF OXALIC ACID

Giovanni Agnès, Giuseppe Bimbi, Franco Guerrieri, and Guglielmo Rucchi, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 783,047, Mar. 30, 1977, abandoned.

This application Sep. 11, 1978, Ser. No. 941,400

Claims priority, application Italy, Apr. 12, 1976, 22169 A/76  
Int. Cl.<sup>2</sup> C07C 69/36

U.S. Cl. 560—204

12 Claims

1. Process for the preparation of esters of oxalic acid having the formula ROOC—COOR by oxidative reaction in the presence of palladium-based catalysts, characterized in that the oxalic esters are obtained by the reaction of a copper (II) compound having the formula Cu(OR)<sub>2</sub>, wherein R represents a radical selected from among alkyls having from 1 to 8 carbon atoms, and X is chosen from between chlorine and bromine atom, with carbon monoxide in the presence of a catalyst selected from the group consisting of Pd salts, metal Pd and zero valent Pd complexes, at a temperature of between 20° and about 200° C., in the absence of O<sub>2</sub>.

#### 4,160,108

##### PROCESS FOR PRODUCING TEREPHTHALIC ACID

Motoo Shigeyasu, and Nobuo Kusano, both of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc., Osaka, Japan

Filed Feb. 18, 1977, Ser. No. 770,145

Claims priority, application Japan, Feb. 24, 1976, 51/18421  
Int. Cl.<sup>2</sup> C07C 51/33

U.S. Cl. 562—416

14 Claims

1. In a process for producing terephthalic acid which comprises subjecting p-xylene to a liquid-phase oxidation in a lower aliphatic carboxylic acid solvent in the presence of a cobalt compound-manganese compound-bromine or bromine compound catalyst and molecular oxygen, the improvement which comprises

the % by weight based on the weight of said lower aliphatic carboxylic acid solvent of the cobalt component (as cobalt) in the catalyst being within the range of

$$-6.00 \times 10^{-4} + 1.65 \times 10^{-1} \text{ to } -2.50 \times 10^{-3} + 6.25 \times 10^{-1}$$

wherein t is the reaction temperature of 180° to 225° C.; the weight ratio of the manganese component (as manganese) in the catalyst to the cobalt component in the catalyst ranges from 0.25:1 to 1:1 and also the amount of the manganese component in the catalyst is 0.05% by weight or less based on the weight of said lower aliphatic carboxylic acid solvent; and

the % by weight based on the weight of said lower aliphatic carboxylic acid solvent of the bromine component (as atomic bromine) in the catalyst is within the range of

$$-4.40 \times 10^{-3} + 1.08 \text{ to } -1.00 \times 10^{-2} + 2.50$$

wherein t is as defined above.

#### 4,160,109

##### CYCLOHEXENE-(1)-DIONE-(3,6)-TETRAALKYLDIKETALS AND PROCESS

Rudolf Pistorius, Ober-Mörlen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,450

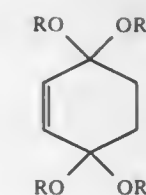
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703453

Int. Cl.<sup>2</sup> C07C 41/00, 43/00

U.S. Cl. 568—667

9 Claims

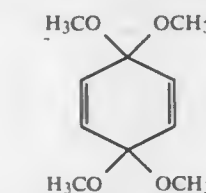
1. Cyclohexene-(1)-dione-(3,6)-tetraalkyl diketals of the formula



(II')

wherein each R represents a primary or secondary C<sub>1-4</sub> alkyl radical.

3. A process for the preparation of a cyclohexene-(1)-dione-(3,6)-tetraalkyl diketal as claimed in claim 1, which comprises reducing p-benzoquinone tetramethyl diketal of the formula



with about 1 mol of hydrogen per mol of diketal in the presence of a hydrogenation catalyst, in a basic medium, at a temperature of from about +10° to +50° C., and optionally reketonizing the cyclohexene-(1)-dione-(3,6)-tetramethyl diketal by treating it with an alcohol having a primary or secondary alkyl moiety of from 2 to 4 carbon atoms, at a temperature of from about -10° to +35° C. in a slightly acidic medium, with substantial exclusion of water.

#### 4,160,110

##### METHOD FOR STABILIZING BISPHENOLS UNDER MELT OR DISTILLATION CONDITIONS

James C. Carnahan, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,636

Int. Cl.<sup>2</sup> C07C 37/22

U.S. Cl. 568—703

8 Claims

1. A method for stabilizing a bisphenol against decomposition while the bisphenol is in the molten state, or while it is being distilled, which comprises, heating the bisphenol in the presence of an effective amount of stabilizer selected from the group consisting of phthalic anhydride or a phthalic anhydride derivative.

#### 4,160,111

##### PROCESS FOR RECOVERING PHENOL FROM AQUEOUS PHENOLIC MIXTURES

David F. Strahorn, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 27, 1977, Ser. No. 801,440

Int. Cl.<sup>2</sup> C07C 37/38

U.S. Cl. 568—749

9 Claims

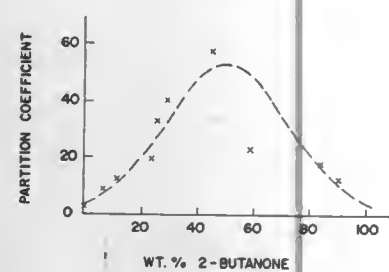
1. In a method for separating phenol from water wherein a phenol-water mixture is distilled in a distillation column to form a liquid fraction comprising phenol and a vapor fraction containing water and phenol in concentrations in accordance with the normal phenol-water azeotrope, the improvement comprising:

fractionating said phenol-water mixture in the presence of an organic mixture comprising a ketone component and a hydrocarbon component, said organic mixture being present at a concentration of from 1 to 20 volumes per volume of water in said phenol-water mixture, said organic mixture including from about 0.1 to 9 parts, by weight, of said ketone component for each part of said hydrocarbon component, said ketone component comprising at least one ketone containing from 3 to 7 carbon atoms, and said hydrocarbon component comprising from about 25 vol-

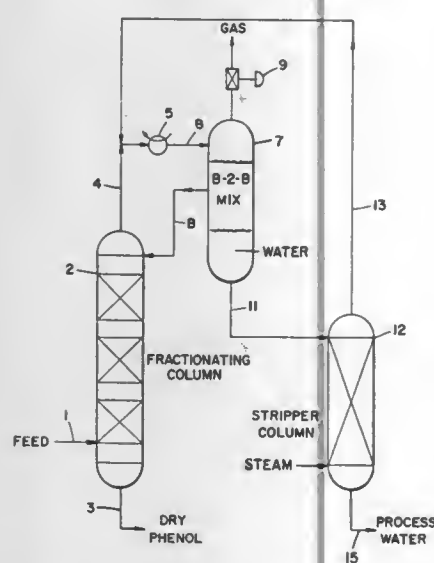


ume percent to 100 volume percent of at least one aromatic hydrocarbon selected from the group consisting of benzene and lower alkyl substituted benzenes containing

PARTITION COEFFICIENTS<sup>(1)</sup> FOR  
BENZENE-2-BUTANONE (B-2-B) MIXTURES



(1)  $K = \frac{\text{WT. \% PHENOL IN B-2-B MIXTURES}}{\text{WT. \% PHENOL IN WATER PHASE}}$



less than 4 alkyl substituent groups and from 0 volume percent to about 25 volume percent of a normally liquid non-aromatic hydrocarbon solvent, whereby the concentration of phenol in said vapor fraction is reduced.

#### 4,160,112 PROCESS FOR THE ISOLATION OF PENTABROMOPHENOL

Robert P. Levek; Rastko I. Mamuzic, and John L. Sands, all of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Feb. 13, 1978, Ser. No. 877,189

Int. Cl.<sup>2</sup> C07C 37/38, 39/24

U.S. Cl. 568—755 10 Claims  
1. A process for reducing the occurrence of carbonyl-group-containing impurities in pentabromophenol recovered from the reaction mixture of phenol with bromine comprising the steps of:

- contacting the reaction mixture comprising crude pentabromophenol with at least one aqueous strong acid selected from the group consisting of hydrochloric acid, phosphoric acid, sulfuric acid, and hydrobromic acid;
- applying heat to the mixture resulting from step (a) at temperature of about 40°–160° C. to remove free bromine therefrom by distillation; and
- removing pentabromophenol from the mixture resulting from step (b).

4,160,113

#### PROCESS FOR THE MANUFACTURE OF RESORCINOL

Werner H. Müller, Kelkheim; Knut Riedel, Hofheim, and Hans Krekeler, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 602,028, Aug. 5, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,815

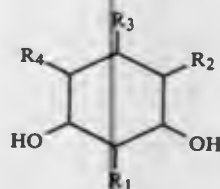
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1974, 2437983

Int. Cl.<sup>2</sup> C07C 39/08

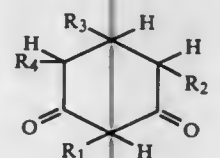
U.S. Cl. 568—772

7 Claims

1. A process for making a resorcinol having the formula



wherein R<sub>1</sub> to R<sub>4</sub> are members selected from the group consisting of H, straight-chain, branched chain, cyclic alkyl, each having up to 12 carbon atoms, phenyl and naphthyl, which comprises catalytically dehydrogenating in liquid phase a cyclohexane dione-(1,3) of the formula



wherein R<sub>1</sub> to R<sub>4</sub> have the above-mentioned meaning; by adding said cyclohexane dione-(1,3) to a solvent mixture consisting essentially of a solvent selected from the group consisting of diethylene glycol dialkyl ether, triethylene glycol dialkyl ether and tetraethylene glycol dialkyl ether, wherein said alkyl contains up to 6 carbon atoms and a catalyst selected from the group consisting of palladium, platinum, ruthenium and rhodium; catalytically dehydrogenating said cyclohexane dione-(1,3) at about atmospheric pressure and a temperature of from 180° to 260° C., controlling the concentration of said cyclohexanone dione-(1,3) at no more than 30% by weight, based on weight of the liquid phase; and separating and recovering said resorcinol.

4,160,114

#### CO-CATALYTIC METHOD FOR OBTAINING IMPROVED CHLORINATION OF PHENOLS

Frederic J. Shelton, Tacoma; William H. Wetzel, Federal Way; John E. Wilkinson, Gig Harbor, and Robert J. Goodwin, Puyallup, all of Wash., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,439

Int. Cl.<sup>2</sup> C07C 39/36, 37/00

U.S. Cl. 568—776

7 Claims

1. In a process for producing relatively pure commercially acceptable pentachlorophenol, comprising reacting at a temperature ranging from about 10° to about 190° C., (A) a phenol which is at least one member selected from a group consisting of phenol and lower chlorophenols and mixtures thereof, and (B) chlorine, in the presence of (C) an acid catalyst from about 0.005 moles to about 0.016 moles per mole of (A) used, consisting essentially of aluminum chloride, ferric chloride, metal iron, aluminum tris-butoxide, antimony chloride, metallic antimony, stannous chloride, metallic tin, cuprous chloride and metallic copper; the improvement consisting of using (D) a sulfur containing co-catalyst selected from the group consist-

4,160,116

#### PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS

Michihiro Mieno, Yokohama; Hideki Mori, Kawasaki; Jun Nakanishi, and Juichi Kasai, both of Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

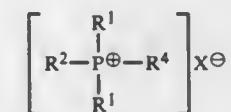
Filed Aug. 28, 1978, Ser. No. 937,460

Int. Cl.<sup>2</sup> C07C 29/00

U.S. Cl. 568—867

9 Claims

1. A process for the production of an alkylene glycol, in which the hydration of an alkylene oxide is carried out at a temperature of from 50° C. to 200° C. in the presence of 0.05 to 1.0 mole, per mole of alkylene oxide, of carbon dioxide and in the presence of, as a catalyst, a quaternary phosphonium salt of the formula



4,160,115

#### PROCESS FOR THE MANUFACTURE OF BUTENEDIOL

Charles H. Vasey, and Dhafir Y. Waddan, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 5, 1978, Ser. No. 939,917

Claims priority, application United Kingdom, Sep. 22, 1977, 39533/77; Jan. 23, 1978, 2600/78

Int. Cl.<sup>2</sup> C07C 31/18

U.S. Cl. 568—857

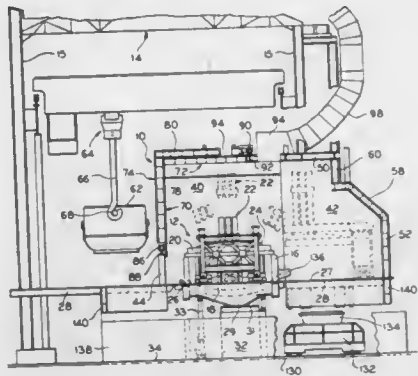
10 Claims

1. A process for the manufacture of 2-butene-1,4-diol which comprises reacting butadiene with water and oxygen in the presence of a copper, nickel, cobalt, chromium, manganese or molybdenum catalyst.

wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup>, independently from each other, represent an alkyl, alkenyl or aryl group, and X represents an iodine, bromine or chlorine atom.

ELECTRICAL

4,160,117  
ARC FURNACE ENCLOSURE  
Eberhard G. Schempp, 115 Kinross La., Pittsburgh, Pa. 15237  
Filed Oct. 12, 1977, Ser. No. 841,344  
Int. Cl.<sup>2</sup> F27D 23/00  
U.S. Cl. 13—1 4 Claims

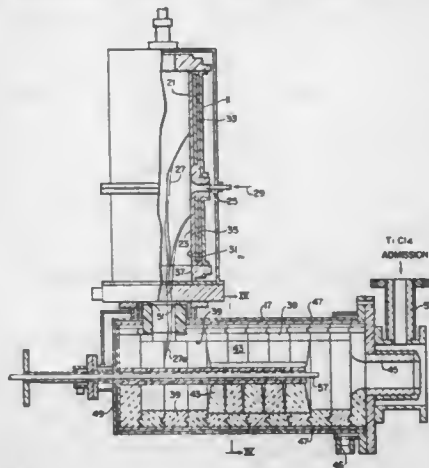


1. An enclosure for a tiltable electric arc furnace having a furnace body and a cover swingable from a position above the furnace body to a remote position to permit the charging of materials into said furnace body, electrode means extending through said cover and swingable therewith, said enclosure including:  
front, side and rear walls and a roof,  
a tiltable platform within said enclosure and disposed adjacent said front wall for supporting said furnace, said furnace roof being adjacent said rear wall in its remote position,  
a first opening in said front wall to permit the movement of a charging vessel into and out of said enclosure,  
a second opening in said roof above said furnace body and exposing a major portion of said furnace body and cover to permit the passage of ladle support means into and out of the enclosure, said second opening also permitting access to furnace electrodes and associated circuitry,  
door means for closing said first and second openings, means for supporting said door means for movement between a closed position relative to said openings and an open position wherein said openings are exposed, said door means including a vertical portion for closing said first opening and a generally horizontal top portions for covering a major portion of said second opening,  
said top door portion being shaped such that when it is in its closed position a third opening is defined above said furnace to permit a ladle support means to extend there-through when said door means is closed, and air curtain means disposed adjacent said third opening for directing air thereacross for sealing the same, and vent means opening into said enclosure roof for removing gases therefrom.

4,160,118  
METHOD AND APPARATUS FOR SUPERHEATING GASES  
Maurice G. Fey, Plum Boro, and Charles B. Wolf, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Division of Ser. No. 837,655, Sep. 29, 1977. This application Feb. 27, 1978, Ser. No. 881,350  
Int. Cl.<sup>2</sup> H05H 1/00; H05B 7/00  
U.S. Cl. 13—2 P 7 Claims

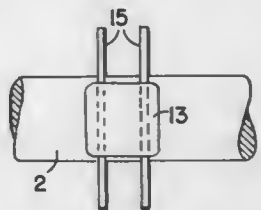
1. An arc heater system as a high energy heat source for producing metal oxide, comprising a housing forming a mixing compartment, a plurality of arc heaters mounted on the housing and extending substantially radially thereon, each arc heater comprising a downstream electrode adjacent to the housing and an upstream electrode remote therefrom, the upstream and downstream electrodes having a gap therebetween, each arc heater having an arc chamber communicating with the compartment, a reactor communicating with the

downstream end of the mixing compartment, inlet means at the downstream end of the compartment for introducing an oxidiz-



able metal compound into the reactor, and the reactor being axially aligned with the compartment.

4,160,119  
HIGH VOLTAGE ELECTRICAL CABLES  
Jan Artbauer, Langenhagen, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany  
Continuation of Ser. No. 270,585, Jul. 11, 1972, abandoned. This application Oct. 24, 1975, Ser. No. 625,583  
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1972, 2134888  
Int. Cl.<sup>2</sup> H01B 9/04, 17/58  
U.S. Cl. 174—28 2 Claims



1. A high voltage cable comprising:  
an inner elongated conductor;  
a tubular member encompassing and continuously disposed about said inner conductor, said tubular member having a diameter exceeding that of said inner elongated conductor and at least a portion thereof corrugated to exhibit enhanced flexibility, said corrugated portion including a plurality of adjacent ridges and furrows characterized by a longitudinal cross-section displaying a regular and periodic deformation pattern in the form of a plurality of adjacent peaks and troughs; and  
a plurality of spacers positioned along the longitudinal axis of said high voltage cable formed and extending between said inner conductor and said tubular member through an insulating environment, wherein said spacers have surfaces adjacent said inner conductive member which comprise conductive materials and wherein the remaining portions of such spacers are substantially non-conductive, said plurality of spacers each having a surface portion thereof in contact with an interior surface of said tubular member, said contacting surface portion of each of said plurality of spacers being configured to substantially follow an interval of the profile of said corrugated portion which includes at least one trough and portions of a pair of peaks adjacent to said at least one trough, said contacting



surface portion of each spacer thereby extending across an interval of the profile of said corrugated portion occupied by said at least one trough and terminating between said portions of a pair of peaks in contact with interior surfaces of said tubular member over said interval, whereby the resistance of said cable to sparkover due to high potential is substantially increased while each of said plurality of spacers is maintained in position during flexing of said cable, each of said spacers being comprised of at least two support members and a spring-acting element, the latter being positioned in a corrugation trough of said tubular member and engaging said support members to maintain said support members in a plane perpendicular to said longitudinal axis.

4,160,120

## LINK ENCRYPTION DEVICE

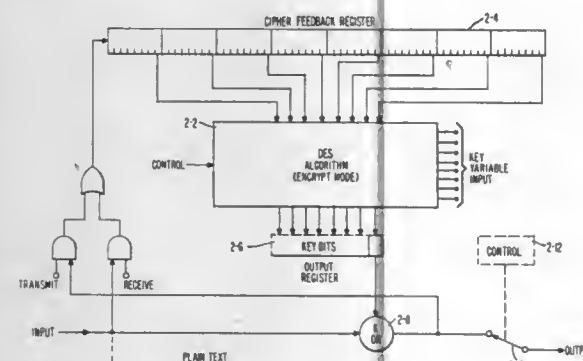
Vera L. Barnes, Wayne; Thomas J. Dodds, Jr., Drexel Hill; Harold F. Gibson, Downingtown, and Carl M. Campbell, Jr., Newtown Square, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 17, 1977, Ser. No. 852,443

Int. Cl.<sup>2</sup> H04L 9/00

U.S. Cl. 178—22

26 Claims



1. An apparatus for providing data communications security in point-to-point and multipoint communications networks, wherein plain text data on a communications line is enciphered on a bit-by-bit basis when received from said communications line, comprising:

- means for receiving said plain text data from said communications line on a bit-by-bit basis;
- means for generating a plurality of key bits for each bit of said plain text data received from said communications line;
- means for storing said plurality of key bits;
- means for exclusive ORing each bit of said plain text data with one of said plurality of key bits generated for the bit previous to each of said bits of plain text data, whereby a bit of enciphered data is produced corresponding to each of said bits of plain text data; and
- means for transmitting each of said bits of enciphered data onto said communications line, whereby each of said bits of plain text data is replaced by the corresponding bit of reciphered data.

4,160,121

## FREQUENCY SHIFT KEYED TONE GENERATOR

Barry M. Kaufman, Pine Brook, N.J., assignor to RFL Industries, Inc., Boonton, N.J.

Filed Jan. 5, 1977, Ser. No. 756,996

Int. Cl.<sup>2</sup> H04B 1/04

U.S. Cl. 178—66 A

1 Claim

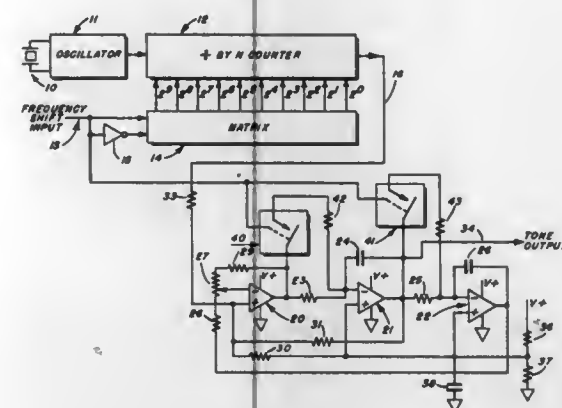
1. A frequency shift keyed tone generator for providing an output tone frequency in response to an applied control signal, said generator comprising,

- a—digital frequency synthesizer whose output is program-

mable to any one of a plurality of tone frequencies in response to said control signal,

- b—a tracking active bandpass filter driven by the output of the synthesizer and comprising a pair of operational integrators each having a resistor establishing the time constant thereof, and an operational phase inverter, said integrators and said inverter being connected in a feedback loop and the operating frequency of the filter being controlled by the time constants of said integrators,

- c—third and fourth resistors,



- d—a first switch controlling the connection of said third resistor to the resistor of one of said pair of integrators to change the time constant thereof,

- e—a second switch controlling the connection of said fourth resistor to the resistor of the other of said pair of integrators to change the time constant thereof, and

- f—means applying the said control signal simultaneously to the first and second switches, the arrangement being such that the operating frequency of the filter corresponds to the output frequency of said synthesizer.

4,160,122

## TELEPHONE EARPHONE AMPLIFIER

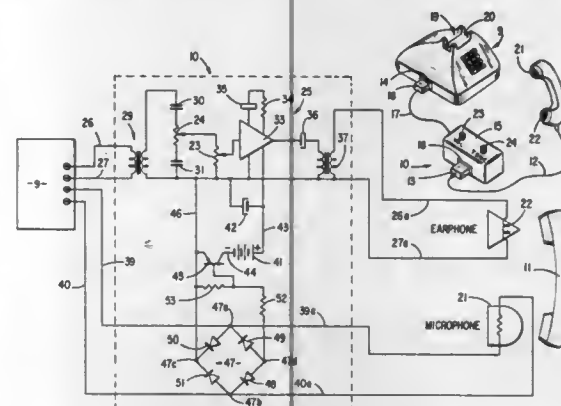
Sava W. Jacobson, 8130 Orion Ave., Van Nuys, Calif. 91406

Filed May 23, 1978, Ser. No. 908,589

Int. Cl.<sup>2</sup> H04M 1/60

U.S. Cl. 179—1 A

7 Claims



1. For use with a telephone instrument of the type having a handset with an earphone and a microphone, an earphone amplifier system comprising:

- an amplifier connectable in circuit with said earphone to amplify the audio signal going to said earphone,
- a source of power for said amplifier, and
- switch means, actuated by the dc bias supplied to said microphone from the telephone line when the handset is taken off-hook, for connecting said source of power to said amplifier so long as said handset is off-hook.

4,160,123

## METHODS OF AND APPARATUS FOR THE ENCODED TRANSMISSION OF INFORMATION

Gustav Guanella, Zurich, and Alban Graf, Gebenstorf, both of Switzerland, assignors to Patenhold Patentverwertungs- & Elektro-Holding AG, Glarus, Switzerland

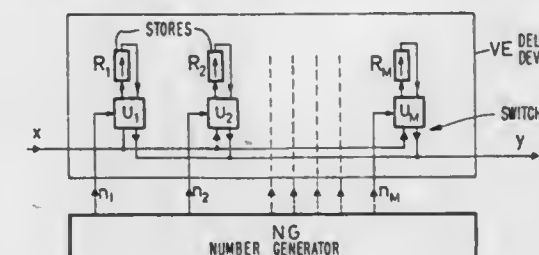
Filed Feb. 2, 1976, Ser. No. 654,373

Claims priority, application Switzerland, Feb. 26, 1975, 2432/75

Int. Cl.<sup>2</sup> H04K 1/06

U.S. Cl. 179—1.5 R

54 Claims



1. A method for coded transmission of data comprising the steps of:

- (A) at a transmitting station including first and second memories each having a plurality of storage locations;

- (1) dividing a signal to be transmitted into a succession of discrete message elements of equal length;

- (2) generating a first set of age signals in a random fashion wherein each of said age signals are chosen from the real integers  $n = 0, 1, 2, 3, \dots, N$ , one of said age signals being generated during each of a plurality of successive time periods;

- (3) storing a different one of said message elements in said first memory each time a new random age signal is generated, the memory location into which a message element is stored during any given time period being determined by the value of the random age signal generated during said given time period;

- (4) assigning a predetermined age number to each said message element as said message element is placed in storage and storing said assigned age numbers in a second memory, said predetermined age number being integer and indicating that the message element to which it has been assigned has just been placed in storage;

- (5) altering the value of each of said stored age numbers by one integer during each of said successive time periods whereby the instantaneous value of each of said stored age numbers indicates the number of said time periods its respective message element has been in storage;

- (6) comparing said stored age numbers with said random age signals and transmitting a different one of said stored message elements during each of said time periods, the message element transmitted during any given time period being that message element whose corresponding age number is equal to the random age signal generated during said given time period;

- (7) said step of storing said message elements in a storage location determined by the value of the random age signal generated during any given time period comprising the step of storing the next occurring discrete message element in the storage location of said first memory previously occupied by the message element most recently transmitted;

- (B) at a receiving station including third and fourth memories each having a plurality of memory locations;

- (1) generating a second set of random age signals at said receiver, said second set of random age signals being identical in sequence and frequency to said first set of random age numbers;

- (2) receiving said transmitted message element in the same sequence in which they are transmitted;

- (3) storing each of said received message elements in said third memory in the order in which said message elements are received;

- (4) assigning an age number to each message element as it is stored in said third memory, the age number assigned to a message element stored in said third memory during any given time period being equal to the value of the random age signal generated during said given time period whereby the age number initially assigned to each message element stored in said third memory indicates the number of time periods said message element was stored at said transmitter;

- (5) storing said assigned age numbers in said fourth memory;

- (6) alternating each of said age numbers stored in said fourth memory by one integer in the same sense as the age numbers stored in said second memory are being altered such that the instantaneous value of each of said age numbers stored in said fourth memory is indicative of the total amount of time its corresponding message element has been in storage; and

- (7) reading the message element whose corresponding age number reaches a predetermined value out of said third memory such that the message elements are read out of said third memory in the same order as they are read into said first memory.

4,160,124

## MULTIPLE DIAL ADAPTER

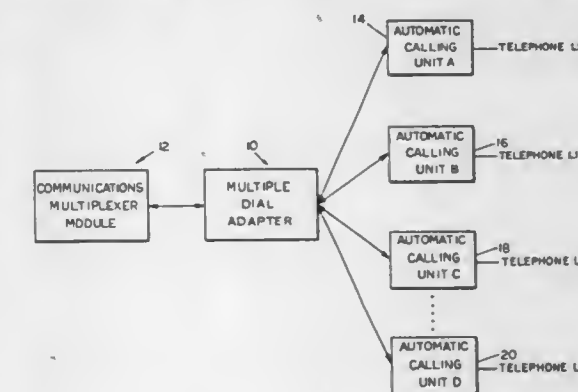
Wendell A. Law, Kaysville, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,988

Int. Cl.<sup>2</sup> H04M 11/00

U.S. Cl. 179—2 DP

6 Claims



1. A multiple dial adapter to interface between a communications multiplexer module and a plurality of automatic calling units connected to an equal plurality of telephone lines, said module being programmed to generate a coded command specifying which one of said units is to perform a telephone number dialing operation and then to successively generate a coded command specifying the telephone number said unit is to dial, said adapter comprising:

- decoder means connected to said module for receiving said coded commands from said module and decoding the same to provide unit selecting and dialing instructions;
- a plurality of interfaces, each connected with one of said units for receiving and presenting the status of said unit and for transferring dialing instructions thereto for performance of a telephone number dialing operation by said unit;

- selector means connected to said decoder means and to each of said interfaces, said selector means being initially set in a cleared condition for receiving a unit selecting instruc-



tion from said decoder means and interrogating the status of a selected one of said units presented on said one of said interfaces connected to said selected one unit, said selector means capable of switching to an active condition in communication with said selected one of said units through its associated interface if the status of said selected unit is presented as being set for performance of a dialing operation; and

generator means connected to said selector means and to said module for receiving from said selector means the status of said selected unit as presented by its associated interface to said selector means, interpreting said received status, and generating a code to said module for instructing said module as to said status of said selected unit in response to each coded command generated by said module to said decoder;

said selector means when switched to said active condition being capable of successively receiving from said decoder means said dialing instructions corresponding to consecutive digits of the telephone number to be dialed and of transferring the same to said selected unit through its associated interface for performance of the dialing operation on said transferred instructions, said selector means further capable of interrogating the status of said selected unit presented by its associated interface to said selector means after the performance of the dialing operation on each transferred instruction;

said generator means receiving from said selector means the status of said selected unit after the performance of the dialing operation on each transferred instruction and, if the status is interpreted by said generator means as a request to present the next digit, said generator means then generates a code to said module instructing the same to send the coded command representing the next digit of the telephone number to said decoder means.

4,160,125

## TELEPHONE POLLING APPARATUS

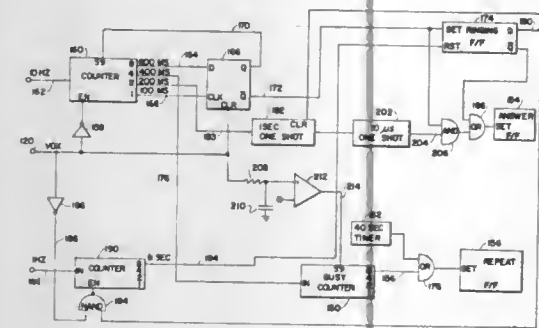
David S. Bower, Sunrise, and Fred J. Smith, Plantation, both of Fla., assignors to Digital Products Corporation, Fort Lauderdale, Fla.

Filed May 23, 1977, Ser. No. 799,141

Int. Cl.<sup>2</sup> H04M 3/46, 3/50

U.S. Cl. 179—6 D

8 Claims



1. Apparatus for sending and receiving messages on a telephone line comprising:

means for generating a start signal;

dialing means responsive to said start signal for providing dial signals indicative of a telephone number to said telephone line and a number complete signal upon completion of said providing;

means rendered effective by said number complete signal and responsive to energy on said telephone line for providing a first signal in response to an energy condition on said telephone line indicative of an answer condition, and for providing a second signal in response to an energy condition on said telephone line indicative of a response condition other than said answer condition;

means responsive to said first signal for transmitting a prerecorded message over said telephone line;

means responsive to the end of said prerecorded message for generating an end of message signal;

selectable switching means, connected to said end of message signal generating means, for conveying said end of message signal to a selected one of a first or a second terminals;

means responsive to said end of message signal being at said first terminal for generating a third signal;

means responsive to said end of message signal being at said second terminal for coupling one or more recording means to said telephone line, and response timer means connected to said coupling means for timing a predetermined interval upon the occurrence of said end of message signal at said second terminal and for generating a fourth signal at the termination of said predetermined interval;

and means responsive to any of said second, third, or fourth signals for actuating said start signal generating means.

4. Apparatus for supplying a prerecorded message to a telephone line comprising:

means for storing a telephone number to be called;

means for generating a start signal;

dialing means responsive to said start signal for providing dial signals indicative of a telephone number to said telephone line and a number complete signal upon completion of said providing, said dialing means including a counter,

means for setting said counter with a digit of said telephone number, said counter setting means including a shift register having a leading end and a trailing end, the number of bit positions in said shift register being one more than the maximum number of digits to be dialed, means for inserting in said shift register a plurality of consecutive ONES starting at said leading end, the number of said ONES equaling the difference between the number of shift register bit positions and the number of digits of the telephone number to be called, means for scanning said shift register bit positions starting at the leading end, means for inserting into said counter the digits of the telephone number in sequence in synchronism with the scanning of said shift register whenever a ONE is detected in a bit position of said shift register, means for decrementing said counter, means responsive to said counter being decremented for generating a dial pulse, and means responsive to said counter reaching a count of zero for terminating said dial pulse generating;

means responsive to said number complete signal for incrementing the stored telephone number by a predetermined number;

means rendered effective by said number complete signal and responsive to energy on said telephone line for providing a first signal in response to an energy condition on said telephone line indicative of an answer condition, and for providing a second signal in response to an energy condition on said telephone line indicative of a response condition other than said answer condition;

means responsive to said first signal for transmitting said prerecorded message over said telephone line;

means responsive to the end of said prerecorded message for generating a third signal; and

means responsive to either said second signal or said third signal for actuating said start signal generating means.

4,160,126

## MODULAR MULTIPLEX/DEMULTIPLEX APPARATUS

Robert J. Bojanek, Newton, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 1, 1978, Ser. No. 901,928

Int. Cl.<sup>2</sup> H04J 3/02

U.S. Cl. 179—15 AT

6 Claims

1. A modular multiplex/demultiplex apparatus comprising: a plurality of multiplex/demultiplex module units arranged in series in a group and each comprising:

a plurality of multiplex input lines each adapted to receive a multiplexed signal thereon, the multiplexed signal on each line being in a serial bit format;

shift register means comprising a plurality of stages connected in series;

selection circuit means operative to cause a selected one of the multiplexed signals on the multiplex input lines to be transferred to the shift register means;

said shift register means being operative to shift bits of the multiplex signal transferred thereto serially along the stages thereof and to be stored in succession in said stages;

counter means operative to count the bits shifted into and stored in the shift register means and when the count reaches a predetermined value to produce an output count signal;

storage means having a plurality of storage locations each coupled to a corresponding one of the plurality of stages of the shift register means;

counter circuit means coupled to the counter means, to the shift register means and to the counter circuit means of the next succeeding module unit in the series;

designation means designating the counter circuit means as the first counter circuit means of the series of module units or as other than the first counter circuit means of the series;

said counter circuit means being operative when designated by the designation means as the first counter

circuit means in the series of module units and, in response to the counter means producing an output count signal, to produce and apply a transfer signal to the storage means and to produce and apply a full output signal to the counter circuit means of the next succeeding module unit in the series, and said counter circuit means being operative when designated by the designation means as other than the first counter circuit means in the series of module units and, in response to a full output signal from the counter circuit means of the preceding module unit in the series, to produce and apply, upon the occurrence of the next output count signal of the counter means following the receipt by the counter circuit means of the full output signal, a transfer signal to the storage means and a full output signal to the counter circuit means of the next succeeding module unit in the series;

the storage means of each module unit being operative in response to a transfer signal being received thereby to receive the bits of data then stored in the associated shift register means and to store said bits of data in the storage locations thereof in a demultiplexed format;

a plurality of demultiplex output lines each coupled to a different one of the storage locations of the storage means; and

readout means operative to cause the data stored in the storage means to be applied in parallel to the demultiplex output lines.

1. A communications switching system comprising a switching network, a group of line interface units connected to said network, a corresponding group of communication lines connected to said interface units, a plurality of time-slot memories associated with said line interface units for controlling the transfer of data through said line interface units, and error detection circuits for detecting faults in said line interface units and for generating error signals indicative of a fault in an identifiable interface unit of said group of units;

CHARACTERIZED IN THAT

said system comprises a spare interface unit connected to all lines of said group of lines, a time-slot memory associated with said spare interface unit for controlling the transfer of data through said spare interface unit, and circuit means responsive to said error signals for transferring data between said spare unit and a line connected to a unit of said group of units identified by said error signals and for transferring information from a time-slot memory associated with the interface unit identified by said error signals to the time-slot memory associated with said spare line interface unit.

4,160,127

## TIME-SLOT INTERCHANGE WITH PROTECTION SWITCHING

Matthew F. Slana, Naperville, Ill., and Henry E. Vaughan, deceased, late of Whispering Pine, N.C. (by Emily Heiland Vaughan, executrix), assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 27, 1978, Ser. No. 919,444

Int. Cl.<sup>2</sup> H04J 3/00

U.S. Cl. 179—15 AQ

9 Claims

1. A communications switching system comprising a switching network, a group of line interface units connected to said network, a corresponding group of communication lines connected to said interface units, a plurality of time-slot memories associated with said line interface units for controlling the transfer of data through said line interface units, and error detection circuits for detecting faults in said line interface units and for generating error signals indicative of a fault in an identifiable interface unit of said group of units;

CHARACTERIZED IN THAT

said system comprises a spare interface unit connected to all lines of said group of lines, a time-slot memory associated with said spare interface unit for controlling the transfer of data through said spare interface unit, and circuit means responsive to said error signals for transferring data between said spare unit and a line connected to a unit of said group of units identified by said error signals and for transferring information from a time-slot memory associated with the interface unit identified by said error signals to the time-slot memory associated with said spare line interface unit.

4,160,128

## DIGITAL DATA TRANSMISSION SYSTEM PROVIDING MULTIPPOINT CONNECTIONS

Alain G. Texier, 32, avenue de General de Gaulle, 92360 Meudon-La-Forêt, France

Continuation-in-part of Ser. No. 781,296, Mar. 25, 1978, abandoned. This application Jun. 23, 1978, Ser. No. 918,429

Int. Cl.<sup>2</sup> H04J 3/02

U.S. Cl. 179—15 BA

4 Claims

1. A digital transmission system providing multipoint connections in which a main data transceiver can communicate with a plurality of secondary data transceivers and the secondary data transceivers can each, in turn, communicate with the main data transceivers, transmission occurring via component digital words at low rates which are different from but multiples of one another, said digital transmission system comprising:

first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

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first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

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first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

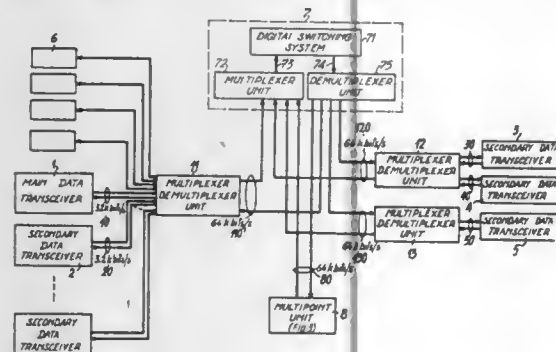
first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said



first multiplexing means and being selectively assigned to said main and secondary transceivers;  
 second means for multiplexing a plurality of said intermediate rate incoming digital channels into an incoming highway having a high rate, said input words being given by a second partial address in said second multiplexing means;  
 means for selectively switching said input component words from said high rate incoming highway to output word positions in an outgoing highway having said high rate according to said first and second partial addresses thereof;  
 first means for demultiplexing said high rate outgoing highway into a plurality of outgoing digital channels having said intermediate rate;  
 second means for demultiplexing each of said intermediate rate outgoing digital channels into output component words to be received by said main and secondary transceivers; and



a multipoint unit connected to said switching means by said second multiplexing means and first demultiplexing means via an outgoing digital channel and an incoming digital channel having said intermediate rate, said multipoint unit including means for simultaneously transferring the input words assigned to the main transceiver of each of said multipoint connections on said intermediate rate incoming digital channel to output word positions assigned to the secondary transceivers of said multipoint connection on said intermediate rate outgoing digital channel and means for sequentially transferring the input words assigned to the secondary transceiver of said multipoint connection which communicates with said main transceiver on said intermediate rate incoming digital channel to output word positions assigned to said main transceiver on said intermediate rate outgoing digital channel.

#### 4,160,129 TELEPHONE COMMUNICATIONS CONTROL SYSTEM HAVING A PLURALITY OF REMOTE SWITCHING UNITS

Alan Peyser, McLean, Va., and William Von Meister, Silver Spring, Md., assignors to TDX Systems, Inc., Vienna, Va.  
 Filed May 3, 1977, Ser. No. 793,428  
 Int. Cl.<sup>2</sup> H04M 3/42; H04Q 3/58

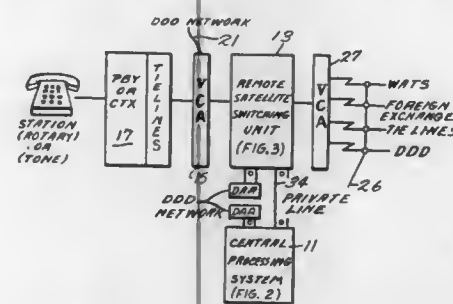
U.S. Cl. 179-18 E 11 Claims

1. A telephone communication lines control system for controllably connecting local subscriber telephone units to long distance lines comprising:

a plurality of remote switching means for connecting local subscriber telephone units to selected long distance telephone lines;

a central control means positioned at a location remote from said switching means for controlling the connection of said local subscriber telephone units to said long distance telephone lines at each of said plurality of remote switching means, said central control means including means for selecting said long distance lines with a predetermined

priority for each of a plurality of said subscriber telephone units; and  
 means for interconnecting said central control means to said plurality of remote switching means, said interconnecting means transmitting data signals between said remote



switching means and said remotely positioned central control means wherein voice communications signals being transmitted by said local subscriber telephone units are connected to selected long distance lines at said remote switching means without being connected through said remotely positioned control means.

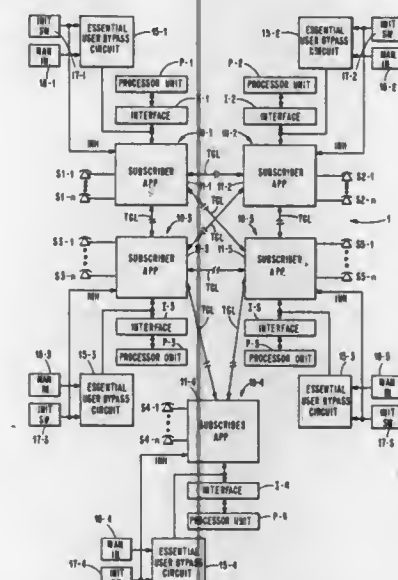
#### 4,160,130 ESSENTIAL USER BYPASS CIRCUIT FOR TELEPHONE SWITCHING SYSTEM

Charles R. Marchetti, Wellesley, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 20, 1978, Ser. No. 920,946  
 Int. Cl.<sup>2</sup> H04M 3/42; H04Q 3/42

U.S. Cl. 179-18 EA

7 Claims



1. A switch unit for a telephone system for establishing connections between telephone subscribers assigned to the switch unit and subscribers assigned to other switch units, said switch unit being adapted to be interconnected with other switch units by trunk lines, said switch unit comprising:

subscriber subsets for initiating call operations;

subscriber apparatus means coupled to the subscriber subsets and to trunk lines to other switch units, said subscriber apparatus means having an address input for receiving address signals relating to call processing operations initiated by subscribers assigned to the switch unit, said subscriber apparatus means being operative in response to address signals received at its address input to establish

connections between subscribers assigned to the switch unit or between subscribers assigned to the switch unit and trunk lines to other switch units; and

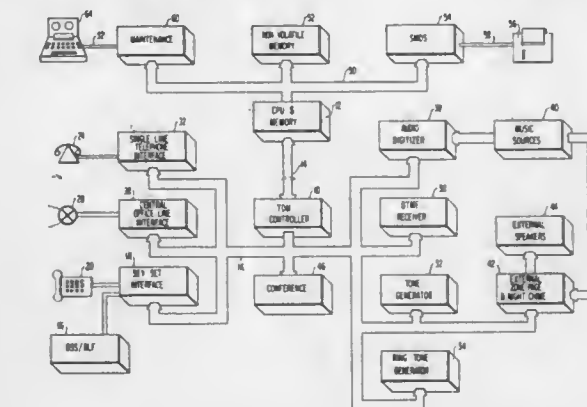
essential user bypass means coupled to the address input of the subscriber apparatus means and adapted to store a predetermined number of address signals specifying connections between preselected ones but less than all of the subscribers assigned to the switch unit and trunk lines to other switch units, each of said address signals including a first address portion identifying a particular one of the preselected subscribers and a second address portion identifying a particular trunk line, said essential user bypass means being adapted to be enabled to supply the address signals stored therein to the address input of the subscriber apparatus means in place of address signals applied to the address input prior to the enablement of the essential user bypass means; and

said subscriber apparatus means being operative in response to address signals received at its address input from the essential user bypass means to establish connections between the preselected ones of the subscribers assigned to the switch unit and trunk lines to other switch units as specified by the address signals.

4,160,131  
ELECTRONIC KEY TELEPHONE SYSTEM  
Pradeep P. Kaul; Thomas H. Scholl, both of Rockville; Deepak R. Muzundar, Gaithersburg; Daniel R. Wendling, Gaithersburg; Bob D. Buschman, Gaithersburg, all of Md.; Michio Ikawa; Akira Miura, both of Tokyo, Japan, and David A. Love, Silver Spring, Md., assignors to Nippon Electric Company, Ltd., Tokyo, Japan  
 Filed Oct. 7, 1977, Ser. No. 840,451  
 Int. Cl.<sup>2</sup> H04Q 5/20

U.S. Cl. 179-99 M

30 Claims



1. A telephone exchange for selectively connecting a plurality of telephones to a plurality of telephone lines, said telephone exchange comprising:

a plurality of interface units, at least one of which is a key-set telephone interface unit for connection to a plurality of key-set telephones,

a TDM bus for carrying time division multiplexed digital data, according to a first frame format, between said interface units,

TDM controller means connected to said interface units for controlling the access of said interface units to said TDM bus and for controlling the frame format of the digital data on said TDM bus,

each said key-set telephone being respectively connected to said key-set telephone interface by means of a receiving wire pair and a transmitting wire pair for carrying digital data according to a second frame format, said digital data on said receiving wire pair provided by said key-set telephone interface and including multiplexed digitally encoded audio signals and digital control data, said digital data on said transmitting wire pair provided by said key-

set telephone and including multiplexed digitally encoded audio signals and digital request data, encoding means for digitally encoding audio signals, means for connecting said digitally encoded audio signals onto said transmitting wire pair, means for decoding digitally encoded audio signals received on said receiving wire pair, means for generating digital request data representing selectable functions of said key-set telephone, means responsive to a digital scan code received via said receiving pair of wires from said key-set interface unit for transmitting said digital request data to said key-set interface unit by multiplexing same with said digitally encoded audio signals onto said transmitting wire pair, and said key-set telephone interface unit comprising means for synchronizing the said second frame rate with the first frame rate.

#### 4,160,132 ELECTROMAGNETIC ACOUSTIC TRANSDUCER WITH ITS AIR GAP ESTABLISHED AT ASSEMBLY BY COUNTERACTING SPRINGS

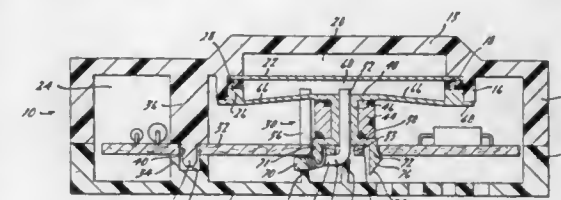
Irvin B. Rea, Royal Oak, and Juhan Telmet, Fraser, both of Mich., assignors to Lectron Products, Inc., Troy, Mich.

Filed Jun. 20, 1978, Ser. No. 917,174

Int. Cl.<sup>2</sup> H04R 13/00

U.S. Cl. 179-114 R

17 Claims



1. In a tone generator of the type having a housing provided with primary and secondary sound cavities and an annular seat at the juncture of said cavities,

a diaphragm separating said cavities disposed with the peripheral marginal portion thereof supported by said annular seat, and

retaining means overlaying the marginal portion of said diaphragm and said seat, the improvement comprising mounting means in said secondary sound cavity including a board element connected to said housing and positioned thereby a predetermined distance from said diaphragm, and

electromagnetic means for vibrating said diaphragm carried by said mounting means, said electromagnetic means including a bobbin disposed between said diaphragm and said board element and detachably fastened to the latter, and a pole piece extending through said bobbin and engaging said board element to locate an end of said pole piece spaced precisely a predetermined distance from said diaphragm, and

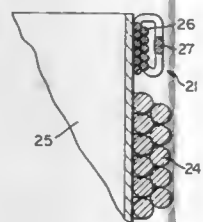
resilient means interconnecting said bobbin and said retaining means adapted to be flexed automatically at assembly of said tone generator, flexure of said resilient means urging said retaining means toward said seat whereby to clamp and hold the marginal portion of said diaphragm and simultaneously holding the bobbin in secure engagement with said board.

11. In a tone generator of the type having a housing formed by interconnected case and cover portions and provided with primary and secondary sound cavities separated by a diaphragm, the improvement comprising mounting means detachably held between cooperating portions of said case and said cover and disposed thereby in predetermined spaced relation with respect to said diaphragm,

electromagnetic means including a bobbin and a pole piece, said bobbin being detachably fastened to said mounting means and having diaphragm retaining means associated therewith adapted to move automatically at assembly into operative clamping association with said diaphragm, said pole piece engaging said mounting means and positioned by the latter precisely in predetermined spaced relation with respect to said diaphragm, and resilient means interacting between said housing and said pole piece holding the latter in engagement with said mounting means and in precise spaced relation with respect to said diaphragm.

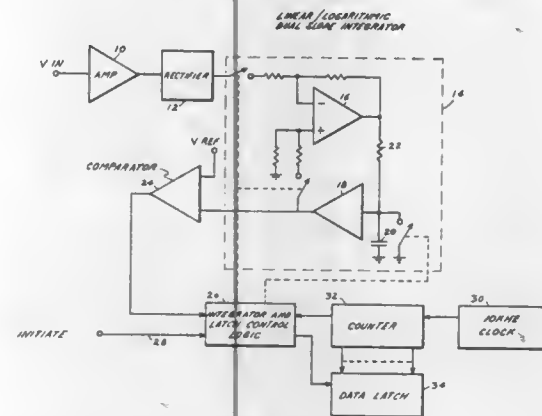
13. In a tone generator of the type having a housing, a diaphragm in said housing defining separate primary and secondary sound cavities at opposite sides thereof, mounting means in said secondary sound cavity, and electromagnetic means carried by and detachably fastened to said mounting means, said electromagnetic means including a bobbin and a pole piece and being disposed with said pole piece in operative association with said diaphragm to vibrate the latter, the improvement comprising counteracting spring means associated with said bobbin and said pole piece, respectively, one of said spring means coaxing with and acting through said bobbin to hold said electromagnetic means securely assembled with said mounting means, the other of said spring means coaxing with said pole piece to hold the latter spaced a predetermined distance from said diaphragm to assure a desired quality of sound from the vibration of said diaphragm.

**4,160,133**  
**MOVING VOICE COIL LOUDSPEAKER WITH MAGNETIC DAMPING INCREASING AT LARGE EXCURSIONS**  
Tore H. Wiik, Verlegt. 46, N-1500 Moss, Norway  
Filed Mar. 1, 1978, Ser. No. 882,464  
Claims priority, application Norway, Mar. 1, 1977, 770687; Aug. 16, 1977, 772855  
Int. Cl.<sup>2</sup> H04R 9/02, 9/06  
U.S. Cl. 179—115.5 VC



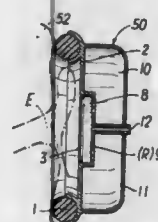
1. An electrodynamic loudspeaker comprising:  
a voice coil;  
a diaphragm to which said voice coil is fixed,  
a magnet system having an air gap in which said voice coil is resiliently suspended for oscillatory movement to either side from a neutral position, and a short-circuit ring at least one end of said voice coil,  
wherein said short-circuit ring is disposed in such a position relative to a central portion of said voice coil that it is located outside the air gap of said magnet system when said voice coil is in its neutral position.

**4,160,134**  
**DIGITAL SIGNAL LEVEL MEASUREMENT**  
James C. Carroll, Apex, N.C., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.  
Filed Aug. 25, 1977, Ser. No. 827,508  
Int. Cl.<sup>2</sup> H04B 3/46; H03K 13/02  
U.S. Cl. 179—175.3 R



1. An instrument for measuring the level of an input ac electrical signal comprising:  
rectification means having said ac input signal coupled thereto for deriving a dc voltage having an amplitude which is substantially linearly proportional to the RMS value of said input ac signal;  
means for providing a reference voltage;  
integration means having said dc voltage coupled thereto to derive an exponentially decaying integration voltage wherein said integration means comprises a dual slope integrator for generating a ramp voltage having a rate of change of voltage with respect to time which is substantially linearly proportional to the output of said rectification means;  
means for comparing said reference voltage and said exponentially decaying integration voltage and for generating a comparator output signal when said compared reference voltage and said integration voltage are equal; and  
logic means for converting said comparator output into a digital indication in decibels of the level of said input ac electrical signal.

**4,160,135**  
**CLOSED EARPHONE CONSTRUCTION**  
Rudolf Görike, Vienna, Austria, assignor to AKG Akustische u. Kino-Geräte Gesellschaft m.b.H., Austria  
Filed Apr. 10, 1978, Ser. No. 895,047  
Claims priority, application Austria, Apr. 15, 1977, 2652/77  
Int. Cl.<sup>2</sup> H04R 1/28  
U.S. Cl. 179—182 R

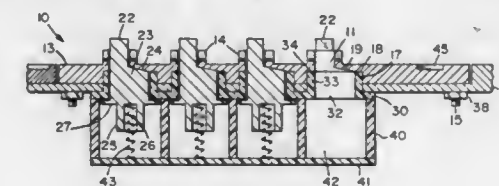


1. An earphone construction, comprising a housing having a partition plate with an opening therethrough, an electroacoustic converter having a sound-transmitting diaphragm disposed in the opening with a front side disposed toward a wearer's ear and with an opposite backside, an annular ear cushion secured

to the periphery of said partition adapted to engage around the wearer's ear, said ear cushion when engaged with the wearer, forming a coupling space with said diaphragm, a back covering connected to said partition plate and having a portion spaced from said partition plate and defining a sound-proof cavity behind said partition plate, a partial wall spaced from said partition plate on the opposite side thereof from said diaphragm and defining a high restoring force cavity with said partition plate, a duct connected from said high restoring force cavity to the exterior of said housing and partly enclosing an air mass acting as an acoustic mass, and an acoustic frictional resistance defining a communication between said restoring force cavity and said soundproof cavity.

**4,160,136**  
**ANTI-VANDALISM ARRANGEMENT FOR PROTECTING THE TOUCH CALLING UNIT OF A COIN TELEPHONE**

Gerald B. McGough, Huntsville, Ala., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.  
Filed May 25, 1978, Ser. No. 909,739  
Int. Cl.<sup>2</sup> H04M 1/23  
U.S. Cl. 179—184

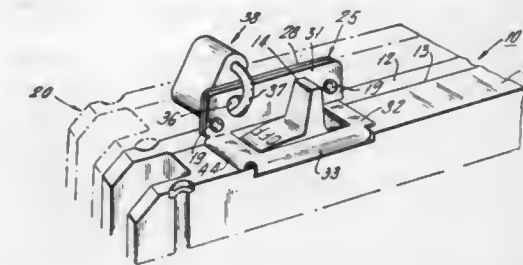


1. Anti-vandalism means for use on a telephone station apparatus including an external casing, said casing including a plurality of apertures therein, a touch calling unit mounted internally within said casing and including guide collars each extending thru a different one of said apertures, and a plurality of cavities each in alignment with said guide collars, said anti-vandalism means comprising:  
a plurality of pushbuttons each slidably mounted within one of said cavities and moveable between an extended position and a depressed position and normally biased toward said extended position, said pushbuttons each including an upper section, said upper section arranged in a L-shaped structure including a horizontal stop member having a top surface and an operating member vertically oriented and perpendicular to said stop member top surface extending outward from a portion of said upper section;  
a shield plate including a plurality of apertures therein adapted to be mounted on said telephone station apparatus casing in alignment with said touch calling unit guide collars, said shield plate apertures including protective portions arranged to encompass each of said operating members and said operating members extending outward of said protective portions;  
whereby said touch calling unit is operable by application of normal manual pressure to said operating members and said touch calling unit is protected from application of excessive mechanical pressure to said operating members.

**4,160,137**  
**BRACKET MEANS TO MOUNT A PADLOCK FOR BLOCKING MOVEMENT OF A SWITCH HANDLE**  
Ralph C. Clement, and William R. Latimer, both of Bellefontaine, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.  
Filed Dec. 28, 1977, Ser. No. 865,224  
Int. Cl.<sup>2</sup> H01H 27/00  
U.S. Cl. 200—42 T

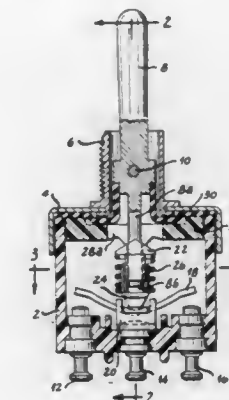
1. An electrical switch and a field installable device to receive a padlock in operative position blocking movement of a switch operating handle to ON position; said switch including an insulating housing and an operating handle mounted for

movement between ON and OFF positions, said handle projecting outside of said housing for manual engagement; said device including bracket means comprising first and second elements having respective first and second feet in holding positions inserted into external recesses of said housing for



mounting said device on said switch, securing means holding said first and second elements fixed with respect to each other and in operative position wherein said feet are maintained in said holding positions, said bracket means including aperture means to receive a lock shackle and thereby position such lock to block movement of said handle to its said ON position.

**4,160,138**  
**SWITCH WITH INDEXING DETENT BLOCK**  
Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.  
Filed Sep. 1, 1977, Ser. No. 829,808  
Int. Cl.<sup>2</sup> H01H 21/04  
U.S. Cl. 200—67A



1. An electric switch comprising:  
a housing;  
contact means mounted in said housing;  
operator means movably mounted to said housing;  
first and second actuator means carried by said operator means, said first actuator means being engageable with said contact means for actuation thereof in response to movement of said operator means;  
indexing detent means disposed in said housing and engageable with said second actuator means in indexing relation; and  
means biasing said first and second actuator means apart such that said first actuator means is biased into engagement with said contact means and said second actuator means is biased into engagement with said indexing detent means whereby a positive position feel of said operator means is provided by said indexing detent means corresponding to a condition of said contact means;  
wherein said operator means has a shaft extending down into said housing, said first actuator means comprises a lower plunger disposed on said shaft at the bottom thereof for sliding movement along the longitudinal axis of said shaft,



said second actuator means comprises an upper plunger disposed on said shaft above said lower plunger for sliding movement along said longitudinal axis of said shaft, and said biasing means bears between said upper and lower plungers to bias said lower plunger downwardly into engagement with said contact means and to bias said upper plunger upwardly into engagement with said indexing detent means;

wherein said indexing detent means comprises a stationary detent member disposed in said housing above said upper plunger, the undersurface of said detent member engaging the top surface of said upper plunger in detenting relation, and wherein said operator means is movable between at least two positions, a first position corresponding to an off condition of said contact means and a second position corresponding to an on condition of said contact means, and wherein said detent member has at least two detent portions formed on said undersurface thereof, a first detent portion engaging said top surface of said upper plunger in stable indexed detented relation when said operator means is in said first position and a second detent portion engaging said top surface of said upper plunger in stable indexed detented relation when said operator means is in said second position.

4,160,139

## PRESSURE SENSITIVE SWITCH

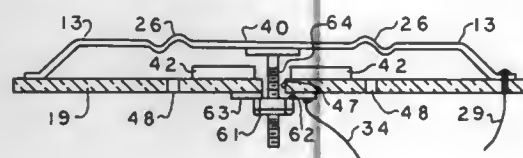
Samuel A. Johnston, Fontana, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 29, 1977, Ser. No. 828,622

Int. Cl.<sup>2</sup> H01H 35/38

U.S. Cl. 200—83 N

30 Claims



1. A pressure sensitive switch comprising:
  - a housing including a cap having a top wall and a continuous side wall,
  - a spacer tightly disposed within said housing and including a support surface,
  - a dielectric substrate secured to said support surface of said spacer,
  - a metal diaphragm mounted about its periphery on said substrate and forming a first cavity with said top wall of said cap and a second cavity with said substrate,
  - said first cavity communicating with a source of fluid pressure,
  - said metal diaphragm having a large resilient surface portion movable toward and away from said substrate in response to variations in fluid pressure within said first cavity,
  - a first contact supported by said substrate in a preselected position relative to said diaphragm, and
  - a second contact supported by said diaphragm and arranged for movement with said diaphragm,
  - said second contact engaging and disengaging said first contact in response to variations in fluid pressure within said first cavity.

4,160,140  
CONTACT ARRANGEMENT FOR PRESSURIZED-GAS  
CIRCUIT BREAKER

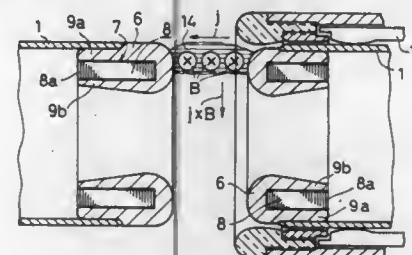
Klaus-Peter Roloff, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Filed May 16, 1977, Ser. No. 797,481

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626245

Int. Cl.<sup>2</sup> H01H 33/18

U.S. Cl. 200—147 A

4 Claims



1. In a contact arrangement for use in a pressurized-gas circuit breaker, the contact arrangement including a nozzle-shaped arc electrode into which an arc runs in the course of the interrupting action of said breaker, said electrode having an annular slot formed by a cross-section of the electrode between its interior and exterior surfaces which is U-shaped with first and second legs bordering the space, the improvement comprising:
  - (a) an annular body of ferromagnetic material arranged in said slot between said first and second legs; and
  - (b) means insulating said annular body from said electrode.

4,160,141

## ELECTROSTATIC SWITCH

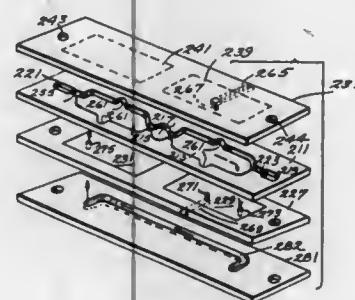
Ronald E. Graf, Rte. 3, Box 520, Crozet, Va. 22932  
Division of Ser. No. 502,224, Aug. 30, 1974, Pat. No. 3,955,059.

This application Jan. 12, 1976, Ser. No. 648,571

Int. Cl.<sup>2</sup> H01H 57/00

U.S. Cl. 200—181

11 Claims



1. An electrostatically controlled switch comprising
  - a dielectric structure having a plurality of chambers formed therein each of said chambers being joined to at least one other chamber of the group by a constricted region between said pair of chambers, the volume of any said constricted region or regions being substantially smaller than any of said chambers,
  - a pair of conductive plates positioned on opposite sides of each of said chambers, each such pair of plates substantially sandwiching one and only one chamber, and each pair of plates extending to partially sandwich any said constricted region adjoining the chamber upon whose opposite sides the plates are,
  - a liquid positioned in one of said chambers and extending somewhat beyond the chamber into but not beyond any said adjoining constricted region when no voltage is applied to the system so that said liquid is also between a portion of the plates associated with any chamber adjoining mutually to the liquid containing chamber through a said constricted region,
  - at least some respective area on the surface of any given said constricted region, each said constricted region having its own separate area, which respective area is an area of overlap, being contacted at all points by said liquid extending from its chamber whenever the said liquid is resting in any said chamber adjoining the given said constricted region with no voltage applied to the system, the same said area of overlap being contacted at all points by said liquid no matter which adjoining said chamber contains the main body of the liquid at rest,
  - means for establishing a voltage across the conductive plates of any one of said chambers,
  - and means positioned at a plurality of points in said at least one chamber for conducting light energy with respect to said at least one chamber, said light being affected by the presence of said liquid in said at least one chamber but not being similarly affected in the absence of said liquid in said at least one chamber, said liquid being moved into a selected chamber when a voltage is established across the conductive plates positioned on opposite sides of said chamber providing that the liquid to be moved is resting in an adjoining chamber at the time of establishment of a sufficient voltage, that no voltage is being simultaneously applied across any chamber other than said selected chamber which could interfere with liquid movement, and that said sufficient voltage is held for a sufficient time.

plied to the system so that said liquid is also between a portion of the plates associated with any chamber adjoining mutually to the liquid containing chamber through a said constricted region,

at least some respective area on the surface of any given said constricted region, each said constricted region having its own separate area, which respective area is an area of overlap, being contacted at all points by said liquid extending from its chamber whenever the said liquid is resting in any said chamber adjoining the given said constricted region with no voltage applied to the system, the same said area of overlap being contacted at all points by said liquid no matter which adjoining said chamber contains the main body of the liquid at rest,

means for establishing a voltage across the conductive plates of any one of said chambers,

and means positioned at a plurality of points in said at least one chamber for conducting light energy with respect to said at least one chamber, said light being affected by the presence of said liquid in said at least one chamber but not being similarly affected in the absence of said liquid in said at least one chamber, said liquid being moved into a selected chamber when a voltage is established across the conductive plates positioned on opposite sides of said chamber providing that the liquid to be moved is resting in an adjoining chamber at the time of establishment of a sufficient voltage, that no voltage is being simultaneously applied across any chamber other than said selected chamber which could interfere with liquid movement, and that said sufficient voltage is held for a sufficient time.

4,160,142

## CIRCUIT BREAKER MAIN AND DISCONNECT CONTACT STRUCTURE

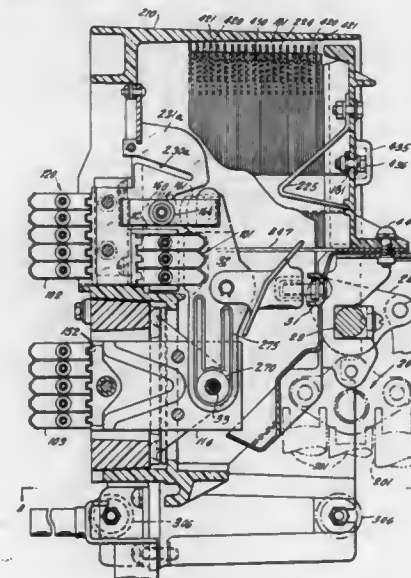
Charles I. Clausen, Marlton, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 16, 1978, Ser. No. 869,857

Int. Cl.<sup>2</sup> H01H 1/50, 3/00

U.S. Cl. 200—254

20 Claims



1. In a circuit breaker having a stationary contact structure and a complementary blade contact structure;
  - said stationary contact structure comprising at least one pair of contact jaws; said blade being receivable in said jaws to establish current carrying connection between said blade and said jaws;
  - a current carrying bar in said circuit breaker;
  - means for connecting said pair of contact jaws at one end of said current carrying bar;

said pair of contact jaws each comprising an elongated member identical to each other, facing each other; said means for connecting said jaws on said current carrying bar including further means biasing said jaws toward each other; one end of each of said jaws being biased into current connecting engagement with said current carrying bar;

the other end of each of said jaws extending beyond said bar and being biased toward each for effective current carrying connection to said blade when said blade is inserted therebetween;

and a second pair of contact jaws at the opposite end of said current carrying bar;

said second pair of contact jaws being mounted in the same manner as said first set of contact jaws and forming disconnect contacts for said circuit breaker;

said second pair of contact jaws being identical in structure and shape to said first pair of contact jaws and being mounted on said opposite end of said current carrying bar in the same manner as said first pair of contact jaws.

4,160,143

## SLIDE KEY

Herbert Schlesier, Hildesheim, and Alfred Scheuer, Bad Salzdetfurth, both of Fed. Rep. of Germany, assignors to Petrick GmbH Elektro-Mechanische Bauelemente, Bad Salzdetfurth, Fed. Rep. of Germany

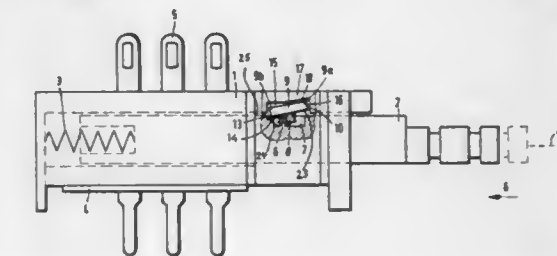
Filed Dec. 22, 1977, Ser. No. 863,302

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722813

Int. Cl.<sup>2</sup> H01H 9/20

U.S. Cl. 200—328

10 Claims



1. A slide key comprising, in combination, a housing having a socket defining an axis and having a recess at a predetermined location therein, the recess communicating with the socket; a slide bar correspondingly shaped relative to the socket so as to be fittable therein and having a hollow depression positioned at a portion thereof corresponding to said predetermined location and being communicable with the recess, said slide bar having a projection having a rear surface and extending radially within the depression and an inclined surface extending from said projection for a predetermined distance along said slide bar, said slide bar further having a notch into which said inclined surface extends and which is a remote end of said inclined surface relative to said projection; a spring in said housing projecting into the socket along the axis, whereby said slide bar is spring-biased in an axial direction outwardly of the socket; and a lock locatable within the recess and having a peg extending therebelow, said peg being alternately engageable with said rear surface of said projection so as to lock said slide bar into a particular axial position and disengageable from said rear surface of said projection so as to release said slide bar, said lock having a front and a rear stop surface and a front portion extending from said peg to said front stop surface, said front stop surface of said lock engaging said notch as said front portion lies against said inclined surface and said peg of said lock engages said rear surface of said projection of said slide bar.

**4,160,144**  
**SINGLE-SIDED MICROWAVE APPLICATOR FOR SEALING CARTONS**

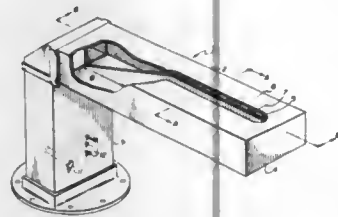
Satish C. Kashyap, Hazeldean, and Walter Wyslouzil, Carlsbad Springs, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 25, 1978, Ser. No. 872,228

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 A

5 Claims



1. A single-sided microwave applicator comprising:  
a section of rectangular microwave waveguide having two narrow sides and two wide sides, one end of the waveguide section being open to receive microwave energy for producing standing waves within the waveguide section and the other end of said waveguide section being shorted, the waveguide section further having an elongated slot in the first wide side, extending along the center line of the wide side from the shorted end of the waveguide section; and  
a conductive ridge mounted within the waveguide section along the center line of the second wide side, the ridge extending through the slot with one end in contact with the first wide side at the shorted end of the waveguide section and the other end of the ridge being tapered from within the slot to the second wide side of the waveguide, whereby a non-uniform electric field having at least one maximum is produced between the ridge and the first wide side.

**4,160,145**  
**MICROWAVE APPLICATOR DEVICE**

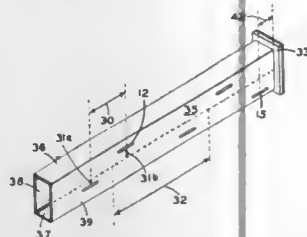
Werner Rueggeberg, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 16, 1978, Ser. No. 878,285

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 F

8 Claims



1. In a microwave applicator including a rectangular waveguide section having a plurality of resonant slot means communicating through one of the broadwalls of the waveguide for coupling microwave energy out of the waveguide, the improvement which comprises:  
positioning the centers of said slot means outward from the longitudinal center line of said broadwall by varying distances in order to provide for the coupling of varying

amounts of energy through said slot means out of said waveguide.

**4,160,146**  
**METHOD FOR MAKING REINFORCING BASKETS FOR STEEL REINFORCED HOLLOW CONCRETE BODIES**

Günter Mundel, and Jean-Claude Poutet, both of Kehl, Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

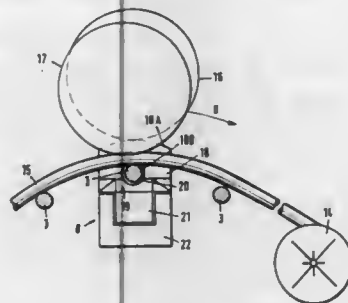
Filed Jul. 11, 1977, Ser. No. 814,428

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631501

Int. Cl.<sup>2</sup> B23K 11/06

U.S. Cl. 219—58

7 Claims



1. The method of making reinforcing grids from weldable wires, especially reinforcing grids for hollow concrete bodies which comprises; moving first wires in circumferentially spaced grouped relation in substantially the direction of the length of the wires, winding a second wire about said group of wires along a substantially helical path, engaging said second wire by a welding electrode, sensing each point intersection of said second wire with a said first wire by a contact electrode adapted electrically to engage the respective first wire, exerting pressure on said welding electrode at each said point of intersection of said wires while supplying welding current to said electrodes, and relieving said welding electrode from pressure during movement thereof along said second wire between points of intersection of said second wire with said first wire, the development of pressure on said welding electrode being generated by movement of the contact electrode relative thereto.

**4,160,147**  
**MULTI-SPOT WELDING APPARATUS**

Soichi Matsubara, Gunma; Ryo Niiikawa, Sayama, and Morikuni Numata, Omiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

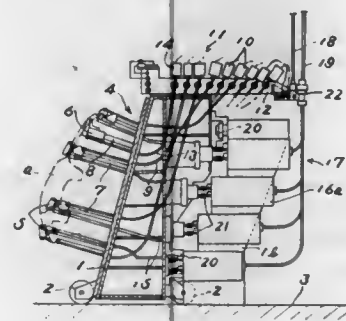
Filed Jun. 29, 1977, Ser. No. 811,671

Claims priority, application Japan, Jul. 2, 1976, 51-77769

Int. Cl.<sup>2</sup> B23K 11/10

U.S. Cl. 219—87

1 Claim



1. A multi-spot welding apparatus comprising: a machine

**4,160,149**  
**METHOD FOR WELDING WORKPIECE PARTS BY MEANS OF AN ENERGY BEAM**

Wilhelm Scheffels, Puchheim, and Johannes Koy, Germering, both of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

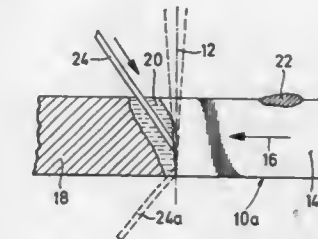
Filed Jul. 29, 1977, Ser. No. 820,325

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634833

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—121 EM

7 Claims



frame, said machine frame being formed with a front frame and a rear frame being detachably coupled together; a jig table on the front figure of said machine frame; a plurality of welding guns on said jig table and located along the contour shape of a workpiece to be worked, each of said guns being formed with stationary and movable arms; electric supply means located on said rear frame having a plurality of electric supply units connected to said welding guns through respective electric supply cables; pressure applying means located on said front frame having a plurality of operational cylinders each connected to said respective welding guns through respective flexible wires at said respective moveable arms and located on the rear side and upper side of said machine frame; clamping means actuable by said operational cylinders after a workpiece is placed on said jig table on the front surface of said machine frame, said operation cylinders actuating said clamping means through said flexible wires, fixedly clamp said workpiece and make ready for a subsequent working operation, said welding guns being operated by said operation cylinders through said flexible wires so that said workpiece has applied thereto a substantially large number of spot-welds at a substantially large number of points on said workpiece, said electric supply guns being connected to said electric units through said supply cables so that an electrical current passes between opposing electrodes through said workpiece to produce a spot-weld, said clamping means being released after said spot-weld is produced for removing said workpiece therefrom.

1. A method for welding relatively thick workpiece parts, by means of an energy beam, more particularly an electron beam, in the case of which the energy beam is moved with the production of a welding channel, which comprises fused workpiece material, along a joint gap to be closed by welding in relation to the workpiece parts forming the joint gap and filler material is introduced into the welding zone for filling the joint gap, characterized in that the position, speed and force with which the filler material is introduced into the fused workpiece material are selected to exert physical and thermal forces on the fused material which reduce the tendency of the fused material to flow out of said joint gap.

**4,160,148**  
**STUD WELDING APPARATUS**

John C. Jenkins, Lorain, Ohio, assignor to TRW Inc., Cleveland, Ohio

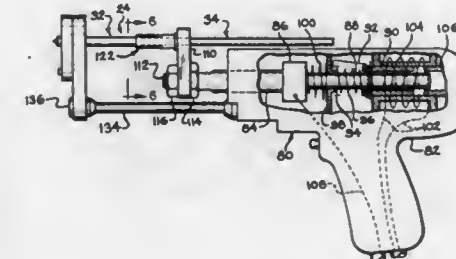
Division of Ser. No. 663,056, Mar. 2, 1976, Pat. No. 4,085,307.

This application Dec. 30, 1977, Ser. No. 865,910

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—98

1 Claim



1. A welding tool for welding an elongate metal stud to a workpiece, said stud having an elongate rod-like member extending from one end thereof, the rod-like member having a transverse dimension smaller than a corresponding dimension of the stud, said welding tool comprising a welding tool body, a chuck leg extending forwardly from said body, an offset member of conductive material affixed to an end of said chuck leg and extending transversely beyond one side of said tool, a chuck affixed to said offset member, said chuck having a passage extending completely therethrough, said passage having a shoulder therein for engaging and backing up an end of the stud from which the elongate rod-like member extends, said chuck having resilient fingers for engaging an outer surface of the stud adjacent the end engaged by said shoulder, said chuck positively preventing rearward movement of the stud in said chuck, a welding foot, a spark shield member carried by said welding foot for holding a ferrule, said spark shield member having resilient means for engaging the ferrule, and means carried by said welding tool body for positioning said spark shield member in alignment with said chuck and spaced forwardly thereof away from said tool body.

**4,160,150**  
**METHOD AND APPARATUS FOR ENERGY BEAM WELDING**

Dieter König, Munich, Fed. Rep. of Germany, assignor to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

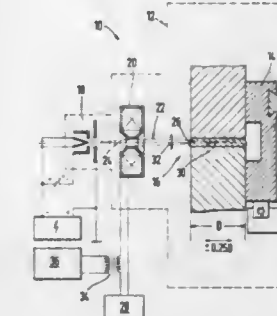
Filed May 9, 1978, Ser. No. 904,293

Claims priority, application United Kingdom, May 11, 1977, 19832/77

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—121 EB

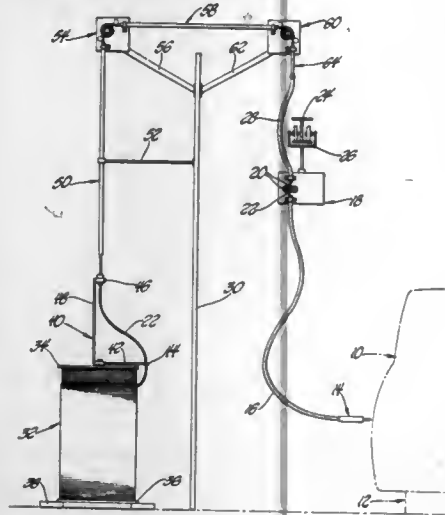
9 Claims



1. A method for energy beam welding by means of an energy beam which has its beam axis directed onto a welding zone of a workpiece and is focussed in a focal point along the beam axis and which in the welding zone produces a molten mass which has the tendency to flow out of the welding zone, characterized in that the tendency of the molten mass to flow out of the welding zone is reduced by continuously changing the focusing condition of the beam.



**4,160,151**  
**WELDING WIRE FEED SYSTEM**  
 Peter Tonita, Windsor, Canada, assignor to C. H. Symington & Co., Inc., Royal Oak, Mich.  
 Filed Jun. 30, 1977, Ser. No. 811,649  
 Int. Cl.<sup>2</sup> B23K 9/12  
 U.S. Cl. 219—137.8



1. A welding wire feed system of the type including a welding gun, a welding wire containing spool having axially spaced flanges, said spool being remotely located relative to said welding gun and supported upon one of said flanges, means associated with said spool for uncoiling the welding wire therefrom and paying out said wire in an upwardly direction coaxially of said spool, means proximate said welding gun for engaging and feeding the welding wire from said spool to the welding gun, and means for guiding said welding wire between said wire feeding means and said wire uncoiling means; the improvement comprising: welding wire guiding means which includes first and second wire direction changing means vertically spaced above both said spool and said wire feeding means; a first straight length of welding wire receiving conduit means aligned between said uncoiling means and said first wire direction changing means and being coaxial with said spool; a second straight length welding wire receiving conduit means disposed between one of said wire direction changing means and said wire feeding means, said wire direction changing means maintaining said welding wire substantially out of sliding engagement with said straight lengths of welding wire receiving conduit means when said feeding means is transmitting welding wire from said spool to said welding gun; each wire direction changing means including a pulley having a circumferential groove surface adapted to receive said welding wire, first and second rollers disposed about the periphery of each pulley for maintaining said welding wire in circumferential contact with each pulley groove surface and in coaxial alignment with said first and second conduit means.

**4,160,152**  
**HEATING UNIT**  
 John W. Wightman, 201 E. Norman Dr., Palatine, Ill. 60067, and Lawrence W. Wightman, 3 Ridgecreek, St. Louis, Mo. 63141  
 Filed Dec. 4, 1978, Ser. No. 966,015  
 Int. Cl.<sup>2</sup> F27D 11/02

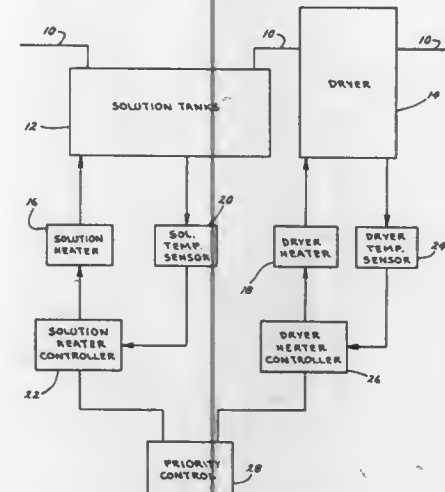
U.S. Cl. 219—438 11 Claims  
 1. A heating unit comprising an open-topped container having a side wall and a bottom; a plurality of bosses on the inside surface of said side wall, each of said bosses having a plate-receiving groove extending in a direction parallel with said bottom and all lying in the same plane; elongated terminal seat-defining flanges on the upper surface of said bottom; a barrier wall projecting between and extending laterally be-

yond a pair of facing seat-defining flanges to separate said seats and to separate a pair of wires; labyrinth walls defining a strain-relief circuitous wire passage one end of which communicates with an opening through said container and the other with said seats; a pair of spring terminal contacts each having a U-shaped part defined by two divergent leg parts one of which is seated in one of said seats and the other of which extends upwardly away from said bottom to a free end, the free ends of the two terminals being spaced from one another; a pair of electrical conductors having an insulating sheath intermediate their ends, and electrically connected at one end to the seated legs of said terminal-contacts, said conductor being separated adjacent said ends by said barrier wall, lying within the passage defined



by said labyrinth walls and extending through said opening in said container; a disc of PTCR material mounted on and in electrical contact with said spaced free ends of said upwardly extending terminal legs; a plate, shaped complementarily to the inside of said side wall and of a size to extend into the plate-receiving grooves of the said bosses, the height of the said grooves above the bottom, the height of the terminal-contact legs, and the thickness of the disc being such as to cause the disc to compress the terminal legs against their spring bias, whereby the disc is held in snug electrical and mechanical contact with the terminal legs, and the terminals are held against upward movement by the disc and sideways movement by the terminal seat-defining flanges.

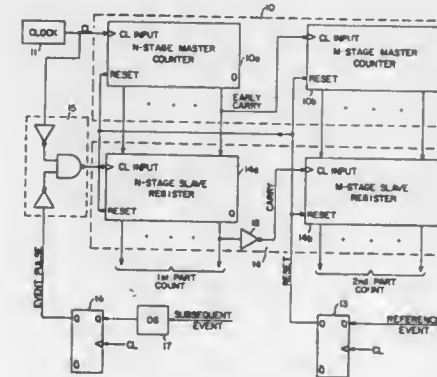
**4,160,153**  
**DUTY CYCLE SHARED PROPORTIONAL TEMPERATURE CONTROL**  
 Theodore A. Melander, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.  
 Filed Jun. 24, 1977, Ser. No. 809,844  
 Int. Cl.<sup>2</sup> H02M 7/00; H02J 3/00  
 U.S. Cl. 219—485 14 Claims



1. In a processor of photosensitive material having a solution heater and a dryer heater, a control system comprising: solution heater control means for controlling input power provided to the solution heater;

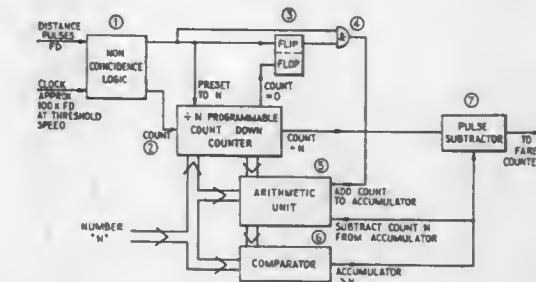
dryer heater control means for controlling input power provided to the dryer heater; and priority means for coordinating the operation of the solution heater control means and the dryer heater control means to give the solution heater priority to input power until power demand of the solution heater control means decreases to a predetermined level and then permitting the solution heater control means and the dryer heater control means to share input power.

**4,160,154**  
**HIGH SPEED MULTIPLE EVENT TIMER**  
 Richard A. Jennings, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.  
 Filed Jan. 10, 1977, Ser. No. 757,827  
 Int. Cl.<sup>2</sup> H03K 21/08  
 U.S. Cl. 235—92 EA 10 Claims



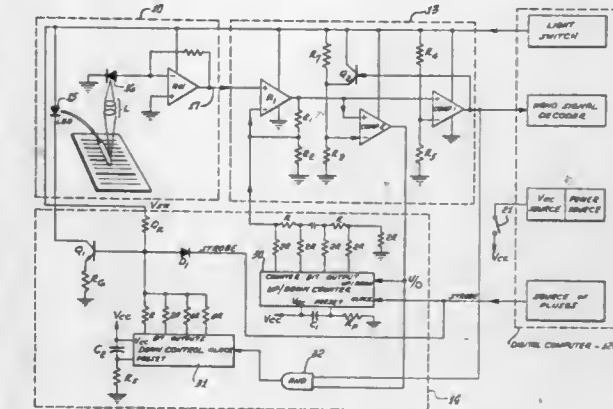
1. Apparatus for measuring the time of a plurality of successive event pulses with respect to a reference time or event by counting clock pulses, where each event pulse is of sufficient duration to allow for propagation of any carries through at least N counting stages and for thereafter reading out the count in parallel, said apparatus comprising, a source of said clock pulses, a master circuit divided into first and second parts of N and M stages, respectively, for counting said clock pulses, where N and M are integers, means for causing said second part of said master circuit to respond to a transition of the most significant stage of said first part of said master circuit to a maximum value, whereby the second part is advanced in its normal count of clock pulses by a predetermined amount, a slave circuit divided into first and second parts of N and M stages, means for causing said first part of said slave circuit to follow said first part of said master circuit, except during the presence of an event pulse, means for producing a normal carry from said first part of said slave circuit in response to a transition of the most significant stage thereof from a maximum value to a minimum value, and means responsive to said normal carry for causing said second part of said slave circuit to be set to the state of the second part of said master circuit, whereby the output of said first and second parts of said slave circuit provide a running count of clock pulses since said reference time or event, and the running count present at the time of each successive event pulse is captured during the presence of the event pulse.

**4,160,155**  
**TAXIMETER INDICATING DEVICES**  
 David J. Steele, Newham; Andrew I. O. McLean, Northampton, and Martin B. Anderson, London, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland  
 Filed Feb. 22, 1978, Ser. No. 880,061  
 Int. Cl.<sup>2</sup> G07B 13/00  
 U.S. Cl. 235—92 TC 3 Claims



1. In a charge indicating device for a taximeter that is responsive to distance pulses proportional to the distance traveled, and time pulses proportional to the time elapsed, the improvement comprising counter means for performing a predetermined count, the counter means being reset on reaching the said count; said counter means including the counter clock input means for receiving the time pulses whereby the counter is clocked towards the predetermined count, and counter reset input means for receiving the distance pulses whereby the counter is reset when each distance pulse is received; counter output means for providing an output pulse whenever the counter means is reset; residual count sensing means for sensing a residual count of the counter means when reset by a first distance pulse immediately following the reaching of the said predetermined count; and subtraction means for receiving output pulses provided by the counter output means and for subtracting a pulse in dependence upon the said residual count whereby the subtraction means provides a pulse train representative of an indicated charge.

**4,160,156**  
**METHOD AND APPARATUS FOR READING BAR CODED DATA WHEREIN THE LIGHT SOURCE IS PERIODICALLY ENERGIZED**  
 Paul Sherer, Costa Mesa, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.  
 Filed May 4, 1978, Ser. No. 902,892  
 Int. Cl.<sup>2</sup> G06K 7/14; G08C 9/06  
 U.S. Cl. 235—463 17 Claims



1. Apparatus for optically reading bar coded data wherein the binary bits are encoded in terms of bars of different widths of the same optical characteristics separated by areas of the opposite optical characteristic comprising optical sensing means for producing electrical signals repre-

sentative of the optical characteristics of a surface presented thereto upon the production of relative movement between the surface and the sensing means, said sensing means having a light source and a light sensor for receiving the light rays from the light source reflected from the surface being sensed, the sensor output signals including an unknown offset voltage,

analog signal processing means for processing the signals from the sensor and providing analog signals representative of the sensed bars of the different optical characteristics,

digital signal processing means for storing and continuously signalling the analog value of the offset signals generated and coupled to the analog signal processing means, and control circuit means including means for automatically and periodically energizing the light source and the analog signal processing means and maintaining the energization of same in response to a signal representative of a bar of one optical characteristic and automatically de-energizing said same elements in response to a signal representative of a bar of the other optical characteristic.

#### 4,160,157 SIGNAL TRANSMISSION CIRCUIT WITH IMPROVED DIGITAL SIGNAL RECOVERY

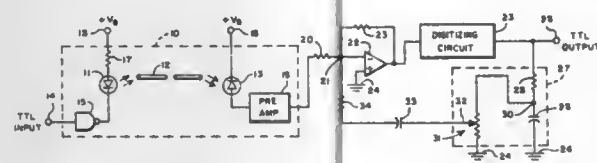
John C. Freeborn, West Covina, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1976, Ser. No. 752,228

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 250—199

4 Claims



4. A digital signal transmission circuit with feedback means for achieving enhanced high frequency performance comprising:

input means for supplying a digital input signal; signal transmission means connected to receive the digital input signal, said signal transmission means comprising a fiber-optic element, a light emitting diode for supplying an optical signal corresponding to the digital input signal to said fiber-optic element, and a photodetector device for receiving the optical signal from said fiber-optic element and producing a corresponding electrical output signal, the frequency response characteristics of said signal transmission means being such that the output signal is a degenerate form of the digital input signal;

digitizing means responsive to a variable amplitude input signal for producing a digital output signal having first or second values if the amplitude of the input signal is respectively less than or greater than a digitizing threshold; summing means connecting said signal transmission means to said digitizing means;

feedback means having frequency response characteristics substantially identical to the frequency response characteristics of said signal transmission means; means for supplying the digital output signal to said feedback means, whereby said feedback means produces a feedback signal which is a delayed inverted replica of the output signal of said signal transmission means; and means for connecting said feedback means to said summing means so that said summing means supplies a signal to said digitizing means representative of the combined feedback signal and the output signal of said signal transmission means.

#### 4,160,158 OPTICAL TRACER BACK-UP CIRCUIT

Enn Vali, Burlington, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

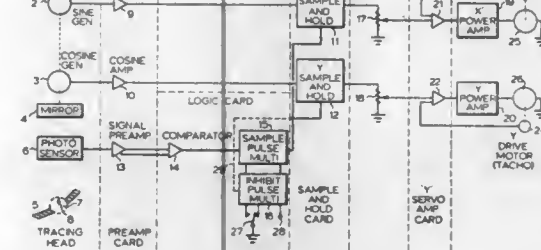
Filed Jan. 16, 1978, Ser. No. 869,819

Claims priority, application Canada, May 16, 1977, 278522

Int. Cl.<sup>2</sup> G05B 1/00

U.S. Cl. 250—202

4 Claims



1. In a pattern tracing system, a circular scanning electro-optical scanner having a center of optical scan, means to produce from said scanner a first pulse indicative of the relative position of said pattern in advance of said center, means to produce a second pulse indicative of the relative position of said pattern behind said center, a first gate and a second gate, means to apply said pulses to said gates, means associated with each of said gates and responsive to the transmission of a pulse through a gate, to inhibit the transmission of the immediately succeeding pulse received by such gate, a bistable device, means to cause said gates to be alternatively exclusively transmissive in accordance with the condition of said bistable device, selection means, coupling means, coupling said selection means to said bistable device, whereby said selection means determines the condition of said bistable device, but a change of condition of said selection means causes a change of condition of said bistable device only upon the structure of one of said pulses.

#### 4,160,159 AUTOMATIC FOCUSING APPARATUS

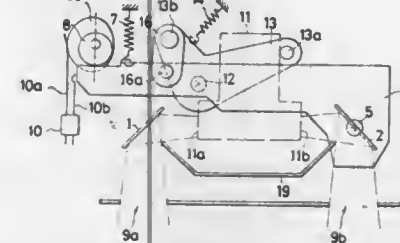
Masatoshi Kakukawa, and Hideyuki Kondo, both of Suwa, Japan, assignors to Sankyo Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Nov. 30, 1977, Ser. No. 856,038

Int. Cl.<sup>2</sup> G01J 1/36; G03B 7/08

U.S. Cl. 250—204

7 Claims



1. In an automatic focussing apparatus including a stationary reflecting mirror and a movable reflecting mirror which are disposed behind respective light entry windows and which reflect entering light to respective light receiving surfaces for comparison of the amount of light received by the respective surfaces for movement of a focussing lens to perform an automatic focussing operation responsive to such comparison; the apparatus comprising first drive means operable to repeatedly effect an angular movement of said movable reflecting mirror; second drive means operable to move said focussing lens; means producing a first signal when the amount of light re-

ceived from said movable reflecting mirror is equal to that received from said stationary reflecting mirror; means producing a second signal indicative of the position of said focussing lens; and control means operable to determine the direction in which the focussing lens is to be moved in accordance with the relative timing of the occurrence of the first signal and the second signal; said means producing the second signal comprises a member movable as a unit with said movable reflecting mirror, and another member mounted for movement as a unit with said focussing lens, said members conjointly forming a switch.

#### 4,160,160 CIRCUIT FOR INTEGRATING A QUANTITY OF LIGHT IN AN AUTOMATIC CONTROL TYPE FLASH UNIT

Hiroshi Hasegawa, Tokyo; Yoshiaki Ohtsubo, Kawasaki; Sakuji Watanabe, Yono, all of Japan, and Kouichi Takahata, deceased, late of Tokyo, Japan (by Kosaku Takahata, legal successor), assignors to Nippon Kogaku K.K., Tokyo, Japan

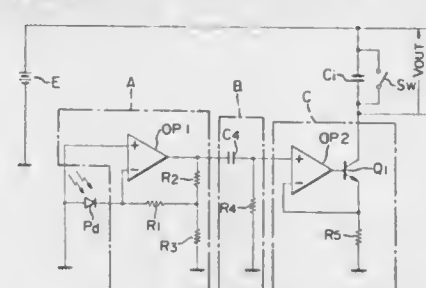
Filed May 20, 1977, Ser. No. 798,835

Claims priority, application Japan, May 28, 1976, 51-61935

Int. Cl.<sup>2</sup> G01J 1/46; G03B 7/08

U.S. Cl. 250—214 P

3 Claims



1. A circuit for integrating a quantity of light in an automatic control type flash unit having flash means for providing flash illumination, comprising:

light responsive means positioned for receiving light resulting from the flash illumination and for converting the received light into a corresponding electrical signal;

an amplifier circuit for amplifying said electrical signal and generating an output voltage which consist of a signal component corresponding to the amplified electrical signal and an error component corresponding to DC and low frequency error voltages;

a high-pass filter for eliminating said error voltages from the output voltage of said amplifier circuit and for putting out only the voltage corresponding to said electrical signal;

a voltage-current conversion circuit for putting out a current corresponding to the voltage put out by said high-pass filter; and

a capacitor charged with the current from said voltage-current conversion circuit, whereby the charging voltage of said capacitor assumes a value which is the result of integration of the intensity of the light received by said light responsive means.

#### 4,160,161 LIQUID CHROMATOGRAPH/MASS SPECTROMETER INTERFACE

Robert L. Horton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 30, 1978, Ser. No. 910,728

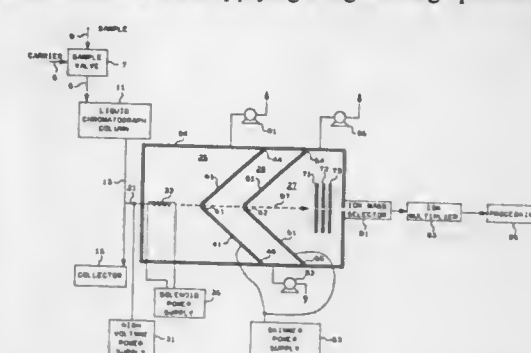
Int. Cl.<sup>2</sup> B01D 59/44

U.S. Cl. 250—281

40 Claims

1. In liquid chromatography wherein a mass spectrometer is utilized as a detector, an improved interface between a liquid chromatograph column and a mass spectrometer comprising: an ion source having at least first and second chambers, said first chamber and said second chamber being divided by at

least one skimmer plate, said at least one skimmer plate having a small hole therein; first pumping means operatively connected to said first chamber; second pumping means operatively connected to said second chamber; a conduit means for supplying solvent and solute from said liquid chromatograph column to said first chamber of said ion source; means for applying a high voltage potential to



said conduit means, said high voltage potential being sufficient to at least partially ionize said solute, said conduit means being sealed to but electrically insulated from said ion source; means for passing the ionized portion of said solute through said small hole in said at least one skimmer plate into said second chamber of said ion source; and means for supplying said ionized portion of said solute from said ion source to said mass spectrometer to therein analyze said ionized portion of said solute.

#### 4,160,162 METHOD FOR THE PICTORIAL DISPLAY OF A DIFFRACTION IMAGE IN A TRANSMISSION-TYPE, SCANNING, CORPUSCULAR-BEAM MICROSCOPE

Karl-Heinz Müller, and Volker Rindfleisch, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

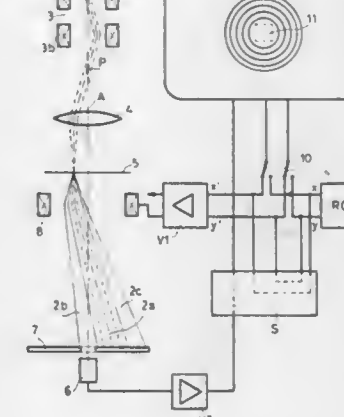
Filed Nov. 1, 1977, Ser. No. 847,439

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2652273

Int. Cl.<sup>2</sup> G01N 23/00

U.S. Cl. 250—311

5 Claims



1. In a method for pictorially displaying a diffraction image in a transmission-type, scanning, corpuscular-beam microscope in which beam detector means is scanned by a diffraction image moved by deflection means in line-raster fashion in a first, predetermined direction over said beam detector means,



said beam detector means generating an output signal for controlling the brightness of a television monitor for displaying said diffraction image, the improvement comprising the step of additionally exciting said deflection means so as to move said diffraction image in another second, predetermined direction over said beam detector means which is perpendicular to said first, predetermined direction so that a predetermined area of said diffraction image including at least part of the cross-section of maximum intensity of the null reflex of said beam is prevented from striking said beam detector means and is thereby excluded during scanning of said beam detector and said diffraction image displayed by said television monitor is blanked in an area corresponding to the cross-section of said diffraction image which is excluded during scanning.

4,160,163

## FLAME SENSING SYSTEM

Shunsaku Nakauchi, Mitaka, Japan, assignor to Security Patrols Co., Ltd., Tokyo, Japan

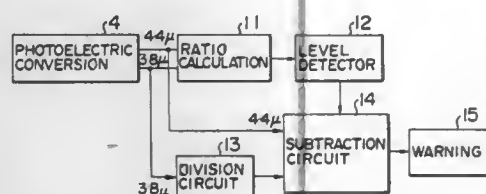
Filed Aug. 17, 1977, Ser. No. 825,386

Claims priority, application Japan, Feb. 15, 1977, 52-14640

Int. Cl.<sup>2</sup> G01J 1/00

U.S. Cl. 250—339

2 Claims



1. A flame sensing apparatus comprising detecting means for producing a first electric output corresponding to the intensity of a first radiation of wavelengths produced by resonant radiation of carbon dioxide and a second electric output corresponding to the intensity of a second radiation of wavelengths which are in the vicinity of the wavelengths of the first radiation and in which there is little absorption by the carbon dioxide in the air and calculating a ratio of said first and second electric outputs, a level detector for comparing said ratio with a reference level and generating a signal when the ratio exceeds the reference level, means responsive to said signal for increasing said first electric output and also for decreasing said second electric output, means for calculating a first difference between said increased first electric output and said second electric output and also for calculating a second difference between said first electric output and said decreased second electric output, and a warning device for indicating the existence of a flame when either of said differences exceeds a predetermined level.

4,160,164

## FLAME SENSING SYSTEM

Shunsaku Nakauchi, Mitaka, Japan, assignor to Security Patrols Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1977, Ser. No. 825,387

Claims priority, application Japan, Feb. 15, 1977, 52-14639

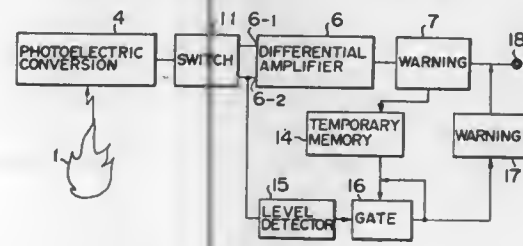
Int. Cl.<sup>2</sup> G01J 1/00

U.S. Cl. 250—339

3 Claims

1. A flame sensing apparatus comprising a warning device for indicating the existence of a flame, detecting means for detecting a difference in intensity between a first radiation of wavelengths produced by resonant radiation of carbon dioxide and a second radiation of wavelengths which are in the vicinity of the wavelengths of the first radiation and in which there is little absorption by the carbon dioxide in the air, a level detector for producing a warning device actuating signal when the intensity of the second radiation exceeds a predetermined level, gating means for controlling passage of said warning device actuating signal from said level detector to said warning device, and gate controlling means for opening said gating

means for a predetermined time when said difference detected by said detecting means exceeds a predetermined value, thereby permitting said warning device actuating signal to pass



through said gating means to be applied to said warning device so that the warning device may provide an indication of the existence of a flame.

4,160,165

## X-RAY DETECTING SYSTEM HAVING NEGATIVE FEEDBACK FOR GAIN STABILIZATION

Allan K. McCombs, Bedford, and Jay A. Stein, Framingham, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

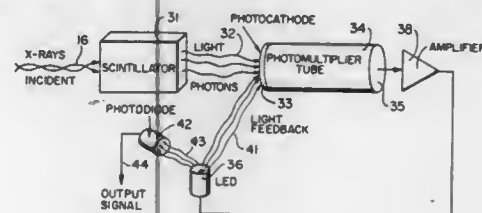
Continuation of Ser. No. 745,093, Nov. 26, 1976, abandoned.

This application Dec. 15, 1977, Ser. No. 860,771

Int. Cl.<sup>2</sup> G01J 1/42

U.S. Cl. 250—354

15 Claims



1. Apparatus for detecting nonconforming radiant energy comprising, a source of nonconforming radiant energy, scintillation means responsive to said radiant energy for converting said radiant energy for providing a light signal representative of the intensity of said radiant energy incident upon said scintillation means, first photoelectric transducing means having an input surface responsive to incident light energy for converting incident light energy on said input surface into a corresponding electrical signal, second photoelectric transducing means responsive to an electrical signal for providing an output light signal representative of the input electrical signal, means for illuminating said first photoelectric transducing means input surface with light energy from said scintillation means and from said second photoelectric transducing means so that said first photoelectric transducing means provides an electrical output signal representative of the incident combined light signal provided by said scintillation means and said photoelectric transducing means, means for coupling the output signal from said first photoelectric transducing means to the input of said second photoelectric transducing means whereby a reduction in the intensity of nonconforming radiant energy is accompanied by an increase in the light energy provided by said second photoelectric transducing means to said first photoelectric transducing means, third photoelectric transducing means for converting incident light energy into a representative electrical signal, and means for coupling light energy from said second photoelectric transducing means to said third photoelectric

transducing means to provide an output signal from said third photoelectric transducing means representative of the nonconforming radiant energy incident upon said scintillation means.

4,160,166

## SYSTEM FOR REGULATING MOLECULAR FLUX AND ITS APPLICATION TO CO-EVAPORATION TECHNIQUES

Patrick Etienne, Jean Massies, and Nguyen T. Linh, all of Paris, France, assignors to Thomson-CSF, Paris, France

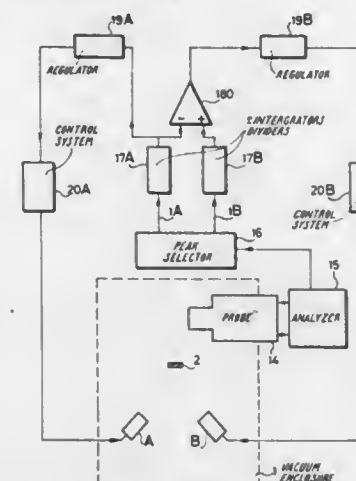
Filed Nov. 2, 1977, Ser. No. 847,907

Claims priority, application France, Nov. 5, 1976, 76 33471

Int. Cl.<sup>2</sup> H01J 27/00

U.S. Cl. 250—423 R

6 Claims



1. A system for regulating molecular flux, including a vacuum enclosure, units for evaporating a molecular jet turned towards a sample-holder intended to receive an epitaxy substrate, a gas analyzer consisting of a mass sweep device coupled to a peak selector able to supply n signals, n being a whole number greater than or equal to two, which measure the flux content in n predetermined molecular types respectively, and at least one servo-control loop which includes electronic means that enable an error signal to be produced by comparison of said signal with a predetermined value of said flux to be controlled as a function of said error signal.

4,160,167

## DEVICE FOR MEASURING THE ABSORPTION OF RADIATION IN A SLICE OF A BODY

Hermann Weiss, and Günter Kowalski, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

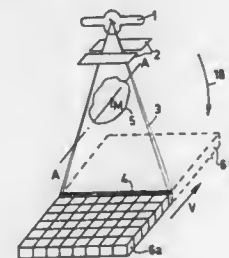
Filed May 16, 1977, Ser. No. 796,968

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622177

Int. Cl.<sup>2</sup> A61B 6/02; G01T 1/29

U.S. Cl. 250—445 T

7 Claims



1. A device for measuring the absorption of radiation in a slice of a body, comprising a radiator means for generating a fan-shaped radiation beam which irradiates the body during a

measurement, and a detection device which is disposed in the radiation beam and which measures measuring values describing the absorption of radiation in the slice of the body, the radiator and the detection device occupying a large number of rotary positions around an axis of rotation which extends perpendicularly to the radiation and the slice during the measurement, wherein the detection device comprises a series of detection elements disposed in a direction parallel to the axis of rotation, the length of the said series being larger than the thickness of the fan-shaped radiation beam, and further comprising displacement means for displacing the series during the measurement in a direction parallel to the axis

4,160,168

## METHOD OF AND MEANS FOR DETERMINING THE LEVEL OF A METALLIC BATH

Alfred Funck, Esch, Luxembourg, assignor to ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg

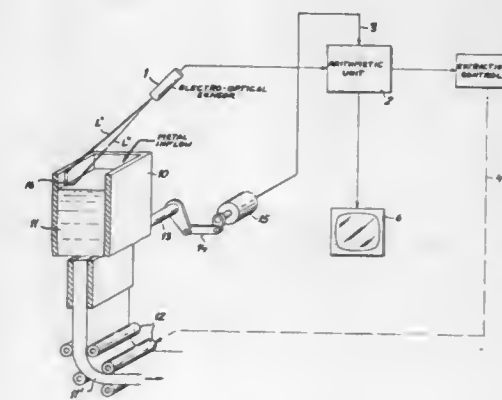
Filed Oct. 26, 1977, Ser. No. 845,775

Claims priority, application Luxembourg, Oct. 26, 1976, 76077

Int. Cl.<sup>2</sup> B22D 1/02, 11/16; G01F 23/00; G05D 9/12

U.S. Cl. 250—564

8 Claims



1. A method of determining the level of a metallic melt in a vessel subjected to an oscillatory motion, comprising the steps of electro-optically scanning a part of the inner vessel wall and of the adjoining melt surface in a succession of sweeps, detecting the location of the boundary between the wall and the melt in each sweep, translating the detected locations into signal voltages, modifying said signal voltages to offset the effect of said oscillatory motion, and averaging said signal voltages to establish a resulting level reading.

4,160,169

## PARALLEL SCANNING SYSTEM

Donald L. Endicott, Jr., San Diego, Calif., and Daniel J. Solarek, Jr., Swanton, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1978, Ser. No. 876,974

Int. Cl.<sup>2</sup> G06K 7/10

U.S. Cl. 250—570

10 Claims

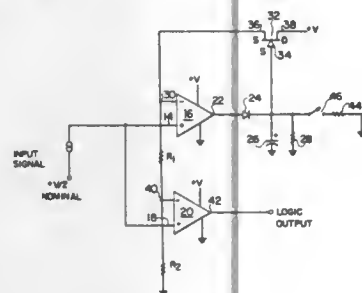
1. Apparatus for scanning graphic information contained upon plates arrayed in a matrix of rows and columns, all of the graphic information contained upon each of said plates being included in one of a plurality of scan lines and all of the graphic information included in each of said scan lines being further included in one of a plurality of picture elements, said apparatus comprising:

a light source for projecting light toward said plates;  
a light sensing device corresponding to each column of said matrix, a given light sensing device for successively re-

1. An adaptive reference threshold detector for sensing a drop of predetermined magnitude in the level of an input signal from its peak value during an interval of time comprising:  
a voltage follower circuit including an operational amplifier having a positive input port coupled to said input signal and an output coupled through a diode to a capacitor, whereby said capacitor charges to the maximum voltage level at the output of said voltage follower circuit and



thereby establishes a reference voltage derived from said input signal in cooperation with said voltage follower; an FET device having its gate coupled to said capacitor and its source coupled to the negative input port of said voltage follower circuit operational amplifier in a manner such that negative feedback is applied thereto; and



a comparator circuit having a positive input port coupled to said input signal and a negative input port coupled to the source of said FET device through a resistive divider, thereby continuously comparing said input signal with said reference level and producing a logic level output signal whenever the difference in magnitude between said input signal and said reference level exceeds a preselected value.

4,160,176

## ELECTRONIC WATCH

Norio Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

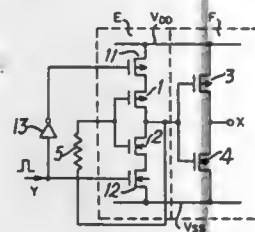
Filed Aug. 23, 1977, Ser. No. 826,986

Claims priority, application Japan, Aug. 23, 1976, 51-100429

Int. Cl.<sup>2</sup> H03K 3/353, 5/18; G08B 21/00

U.S. Cl. 307-362

7 Claims



1. A circuit for detecting battery voltage comprising first and second NOT circuits connected between positive and negative terminals of a battery, each of said circuits comprising a P-channel MOS transistor and an N-channel MOS transistor, means connecting the output of said first NOT circuit to the input of said second NOT transistor and resistance means interconnecting the output and input of said first NOT circuit, the output of said second NOT circuit being the output of said battery voltage connecting circuit for connection to indicating means.

4,160,177

## VIBRATORY ELECTROMAGNETIC MOTOR

Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Oct. 3, 1977, Ser. No. 838,537

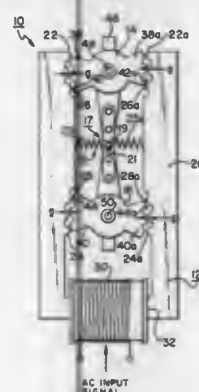
Int. Cl.<sup>2</sup> H02K 7/06

U.S. Cl. 310-22

19 Claims

1. A vibratory electromagnetic motor comprising: stator means having first and second pairs of opposed poles; first and second pivotally movable armature means each with armature poles, said first armature being pivotally mounted on a first axis of rotation with said first armature poles located adjacent to said first pair of stator poles and

said second armature being pivotally mounted on a second axis of rotation with said second armature poles located adjacent to said second pair of stator poles to permit said first and second armature means to synchronously move about said first and second axes in opposite directions in response to a magnetic force; and



resilient coupling means connected between said first and second armature means for combining drive power generated by said first moving armature means with drive power generated by said second moving armature means.

4,160,178

## METHOD OF COATING AN ARTICLE WITH A SOLVENTLESS ACRYLIC EPOXY IMPREGNATING COMPOSITION CURABLE IN A GAS ATMOSPHERE WITHOUT HEAT

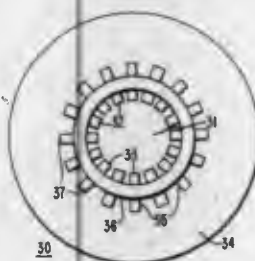
James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 1, 1978, Ser. No. 911,577

Int. Cl.<sup>2</sup> H02K 1/04; B32B 15/08

U.S. Cl. 310-43

18 Claims



1. A method of applying cured resinous material to an article, comprising the steps of:

(A) applying a solventless, insulating resin to an article, the resin containing dissolved oxygen therein and having a viscosity of between about 1 cps. and 2,000 cps. at 25° C., said resin consisting essentially of an admixture of aliphatic polyacrylic resin selected from the group consisting of diacrylates, triacrylates and their mixtures; aliphatic monoacrylic resin; epoxy resin; aromatic reactive vinyl monomer; anhydride in a weight ratio of from 10:0 to 20:0.1 to 100:0 to 120:0 to 60, said insulating resin also containing effective amounts of: organic free radical reaction stabilizer, organic free radical initiator, organic free radical accelerator, and organic co-accelerator, and

(B) contacting the resin with an inert diffusion gas selected from the group consisting of nitrogen, carbon dioxide, argon, helium, methane, hydrogen and mixtures thereof, in an amount effective to permeate into the resin to displace the dissolved oxygen in the resin to a level below

about 0.5 volume % to initiate cure without the application of heat, to provide a deep cured resinous coating on the article without metal contact catalysis.

2. The method of claim 1, wherein the free radical initiator is an organic peroxide, the free radical accelerator is an organic tertiary amine, and the organic co-accelerator is an organic sulfimide.

11. An insulated, high voltage electric motor, comprising a metal stator having slots therein surrounding a metal armature, and conducting electrical coil windings disposed within the slots of the stator, and a body of cured resinous insulation applied to and completely impregnating the electrical coil windings, the insulation comprising a cured insulating resin applied by the method of claim 2.

4,160,179

## RECTIFIER AND BRUSH ASSEMBLY FOR AN ALTERNATOR

Maurice J. Allport, Stourbridge, and Herbert J. T. Cotton, Hollywood, both of England, assignors to Lucas Industries Limited, Birmingham, England

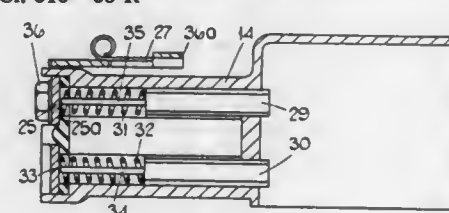
Filed Oct. 18, 1977, Ser. No. 843,242

Claims priority, application United Kingdom, Oct. 23, 1976, 44096/76

Int. Cl.<sup>2</sup> H02K 11/00

U.S. Cl. 310-68 R

4 Claims



1. A rectifier and brush assembly for an alternator comprising, a rectifier having a plurality of field diodes, said field diodes having a corresponding plurality of terminals, a common electrical connector interconnecting said terminals and having an integral apertured flange, an electrically insulating brush housing contacting alternator brushes, an electrically conductive member mounted on said electrically insulating brush housing, a fixing screw securing said apertured flange to said electrically conductive members, and a biasing spring for biasing one of said alternator brushes, said electrically conductive member being electrically connected with one of said brushes and in the form of a relatively rigid detachable plate having a portion forming an abutment for said spring biasing said one of said brushes.

4,160,180

## ROTOR LAMINATION SUPPORT FOR VERTICAL HYDRO-GENERATOR

Evgeny N. Vinogradov, ulitsa Belgradskaya, 6, korpus 2, kv. 45; Jury A. Ivanov, ulitsa Syzranskaya, 18, kv. 56; Nikolai A. Filatov, Moskovsky prospekt, 175, kv. 60; Viktor S. Fomichev, linia Bulvarnaya, 35, kv. 49, and Samuil A. Prutkovsky, linia Lensovet, 73, korpus 2, kv. 67, all of Leningrad, U.S.S.R.

Filed Jul. 12, 1978, Ser. No. 923,992

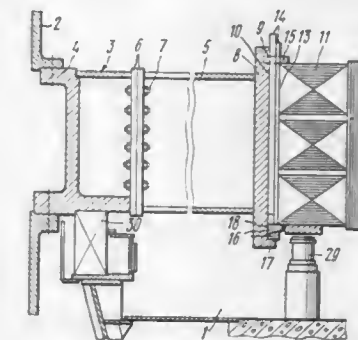
Int. Cl.<sup>2</sup> H02K 1/22

U.S. Cl. 310-157

4 Claims

1. A rotor of a vertical hydro-generator, comprising: a shaft; a frame having a hub connected with said shaft and a plurality of radial spokes attached to said hub, said frame further including a plurality of wedge strips, each said radial spoke having at least one said wedge strip secured thereto; a rim with poles, connected to said wedge strips, each said wedge strip having on the outside of its lower portion a

horizontal transverse slot and a support means supporting said rim with poles and including oppositely directed



wedges disposed in said horizontal transverse slot and partially projecting beyond this slot towards said rim.

4,160,181

## METHOD FOR GENERATING AUXILIARY ELECTRIC ENERGY ON A VEHICLE

Alfred Lichtenberg, Herzogenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

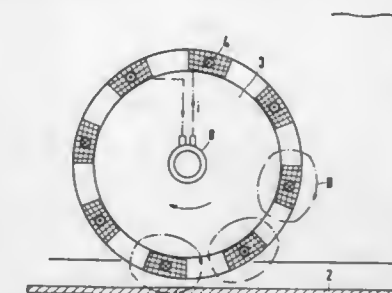
Filed Aug. 30, 1977, Ser. No. 829,245

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642682

Int. Cl.<sup>2</sup> H02K 17/44

U.S. Cl. 310-166

2 Claims



2. Apparatus for generating auxiliary electric energy for a vehicle supported by an electrodynamic support system comprising:

- (a) a magnet pole wheel constructed without iron disposed in the vehicle above an electrically conducting support rail of the electrodynamic support system; and
- (b) an electric generator mechanically coupled to said magnet wheel.

4,160,182

## LAMINATED CORE MANUFACTURE

Yoshiaki Mitsui, Kitakyushu, Japan, assignor to Mitsui Mfg. Co., Ltd., Kitakyushu, Japan

Filed Jul. 27, 1977, Ser. No. 819,478

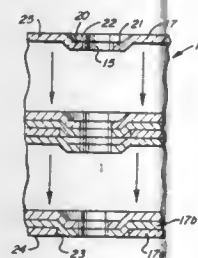
Int. Cl.<sup>2</sup> H02K 3/48

U.S. Cl. 310-214

23 Claims

1. In a dynamoelectric device having a wound core provided with a plurality of circumferentially spaced, radially opening slots disposed in an annular array, and windings in said slots, the improvement comprising an annular slot closure coaxial of said annular array, said slot closure being formed of magnetic material and having a

plurality of through openings disposed one each centrally of the open end of said slots and having an extent trans-



versely to the slots substantially less than the width of the slots.

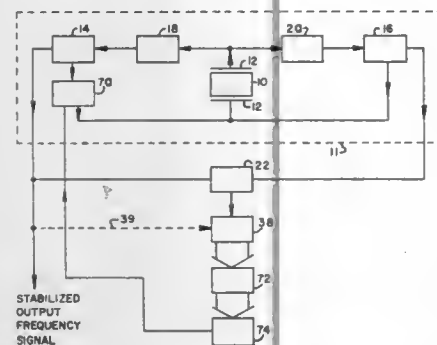
#### 4,160,183 OSCILLATOR HAVING A QUARTZ RESONATOR CUT TO COMPENSATE FOR STATIC AND DYNAMIC THERMAL TRANSIENTS

John A. Kusters, Cupertino, Calif.; Jerry G. Leach, Snyder, Tex., and Michael C. Fischer, Santa Clara, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 26, 1978, Ser. No. 910,044  
Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—315

10 Claims



1. Signal generation apparatus comprising:  
a quartz crystal resonator having a selected crystallographic orientation that is equal to  $(\gamma x w l) 21.93^\circ/33.93^\circ \pm 2^\circ$  for providing static and dynamic thermal transient compensation, and having first and second thickness modes of vibration in response to an electric field applied thereto, vibration in each of said modes being characterized by a selected frequency-temperature deviation characteristic;  
oscillator means for generating and supplying said electric field to said quartz crystal resonator, for isolating the first and second frequency signals of said first and second modes of vibration, respectively, and for shifting the phase of at least one of said first and second frequency signals; and  
compensation means coupled to receive at least the other of said first and second frequency signals for production of a correction control signal for application to the oscillator means to control the phase shift necessary to stabilize the one of said first and second frequency signals for temperature induced frequency variations, the other of said first and second frequency signals received by the compensation means being representative of the temperature of said quartz crystal resonator and used to generate the correction control signal.

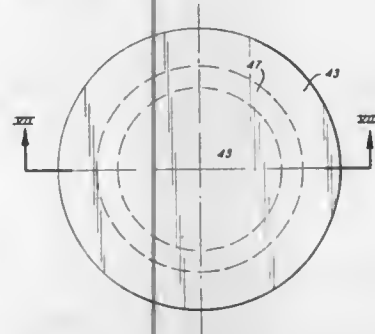
#### 4,160,184 PIEZOELECTRIC ACTUATOR FOR A RING LASER

Bo H. G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 9, 1978, Ser. No. 868,067  
Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—328

14 Claims



1. An improved piezoelectric actuator for controlling path length in a ring laser gyroscope comprising:  
(a) a plurality of piezoelectric discs, arranged in a stack, each of said piezoelectric discs having a central region exhibiting a first polarity and a circumferential area exhibiting an opposite polarity behavior with an area in each of said discs between said inner area and circumferential area exhibiting no polarity behavior, and having annular cut-outs in said area exhibiting no polarity behavior in the top and/or bottom of each disc in order to increase flexibility, said discs arranged so that the areas of the same polarity lie adjacent each other on adjacent discs;  
(b) a rigid coupling member at one end of said stack of discs;  
(c) a flexible mirror having a central portion, a circumferential portion and a flexible annular area between said central portion and circumferential portion, at the other end of said stack;  
(d) means for holding said coupling member discs and flexible mirror together such that said coupling member is rigidly attached to both the central region and circumferential area of the disc at said one end, the circumferential areas of adjacent discs are attached to each other, the central areas of adjacent discs are attached to each other, the central portion of said mirror is attached to the central region of the disc at the other end and the circumferential portion of said mirror is attached to the circumferential area of the disc at said other end; and  
(e) means for coupling a voltage to the faces of said discs.

#### 4,160,185 RED SENSITIVE PHOTOCATHODE HAVING AN ALUMINUM OXIDE BARRIER LAYER

Charles M. Tomasetti, Leola, and Arthur F. McDonie, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,562  
Int. Cl.<sup>2</sup> H01J 39/06; B05D 5/12

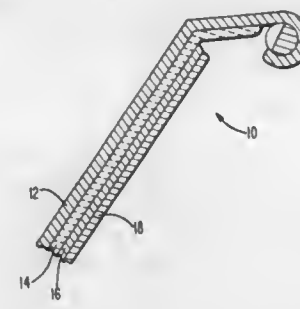
U.S. Cl. 313—94

7 Claims

1. In a method of making an electron emissive electrode including a supporting substrate of nickel and a base layer of antimony, comprising the steps of:  
(a) baking said electrode at a temperature from 260° C. to 285° C. at a pressure of less than  $10^{-4}$  torr; then  
(b) sensitizing said base layer by exposing a surface portion thereof to the vapors of at least one alkali metal at a temperature lower than said bake temperature at a pressure of less than  $10^{-4}$  torr; wherein the improvement comprises the step of:  
forming between said nickel substrate and said antimony layer an aluminum oxide film for preventing the alloying of said nickel substrate with said antimony layer during bake and

for providing oxygen to oxidize said electrode and increase the red photosensitivity of said electrode.

6. An electron emissive electrode comprising:  
a supporting substrate of nickel;  
a base layer of antimony on said substrate, said base layer being sensitized with the vapors of at least one alkali metal; and



an aluminum oxide film between said nickel substrate and said antimony layer for preventing alloying of said nickel substrate with said antimony layer at processing temperatures in the range from 260° C. to 285° C. and for providing oxygen to oxidize said electrode and increase the red photosensitivity of said electrode.

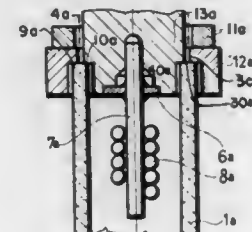
#### 4,160,186 CLOSURE STRUCTURE OF ELECTRIC DISCHARGE TUBES

Béla Kerekes, Budapest, Hungary, assignor to Egysült Iz-zólampa és Villamossági Reszvenytársaság, Budapest, Hungary

Filed Nov. 14, 1977, Ser. No. 851,596  
Claims priority, application Hungary, Jan. 6, 1977, EE 2471  
Int. Cl.<sup>2</sup> H01J 61/36

U.S. Cl. 313—220

9 Claims



1. An electric discharge tube comprising  
a tubular bulb means formed from ceramic material having first and second open end portions;  
a first closing member fitted substantially over at least one of said open end portions of said bulb means;  
a second closing member fitted over a portion of said one of said open end portions and spaced from said first closing member by a distance such that capillary action will occur therebetween; and,  
said first and second closing members being so spaced from said one end portion of said bulb means that capillary action between said closure members and said end portion will occur.

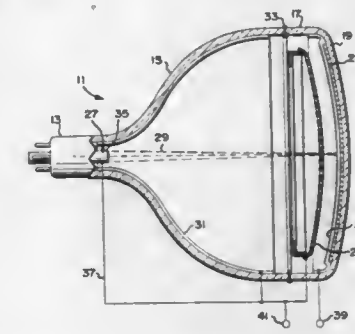
#### 4,160,187 POST-DEFLECTION ACCELERATION CRT SYSTEM

Donald L. Say, Waterloo; Harry E. Smithgall, and Kenneth Spiegel, both of Seneca Falls, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 629,143, Nov. 5, 1975, which is a continuation of Ser. No. 504,999, Sep. 11, 1974, abandoned. This application Sep. 23, 1976, Ser. No. 725,793  
Int. Cl.<sup>2</sup> H01J 29/80, 39/20

U.S. Cl. 313—408

3 Claims



1. Improvement in a system relating to a color cathode ray tube of the post-deflection acceleration type, said tube having an envelope wherein an electron gun assembly is oriented to direct a plurality of scanning electron beams through a multi-apertured color-selection electrode member having a given potential supplied thereto from an external source to provide defined beam focusing upon discrete areas of a spatially related patterned cathodoluminescent screen having a metallic backing film disposed thereover, said screen having a higher potential applied thereto from a second external source thereby effecting a definitive voltage differential ( $\Delta V$ ) between said color-selection electrode and said screen, said system improvement comprising:

a screen potential within the range of substantially 20 to 40 kilovolts;  
a color-selection electrode potential or more than substantially 72 percent and less than 85 percent of said screen voltage to effect said voltage differential ( $\Delta V$ ) therebetween, said color-selection electrode being substantially of the same potential as that of the terminal electrode of said electron gun assembly; and  
definitive electron barrier means effected within said tube by said backing film, said metallic film being of specific uniform thickness within the range of substantially 3,000 to 5,000 angstroms adheringly disposed as a single layer on the surface of said screen toward said color-selection electrode to provide a barrier for the secondary electrons prevalent in substantially the region between said screen and said color-selection electrode, the specific thickness of said barrier providing a defined voltage penetration threshold directly relatable to said voltage differential ( $\Delta V$ ), such ( $\Delta V$ ) being substantially equal to or less than the voltage penetration threshold of said film to provide improved contrast and color purity of the display and minimize background luminescence of the screen resultant from spurious impingement of secondary electrons thereon.

#### 4,160,188 ELECTRON BEAM TUBE

Gilbert N. Butterwick, Leola, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1976, Ser. No. 680,003  
Int. Cl.<sup>2</sup> H01J 29/02, 29/48, 29/46

U.S. Cl. 313—446

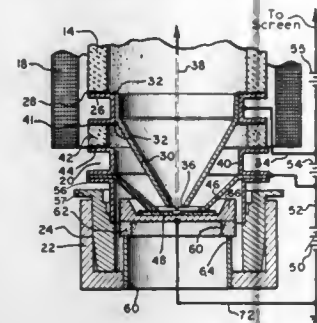
4 Claims

1. In an electron beam tube apparatus having a face section, neck section, and cathode section constructed to generate an



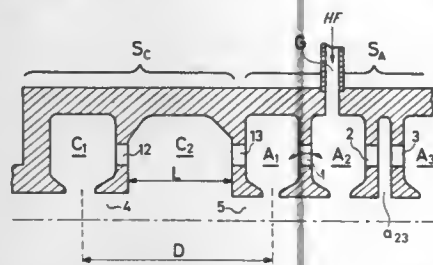
electron beam in a vacuum, the improvement in said cathode section comprising:

- a cathode assembly including,
- a first electrically conductive member attached to said neck section,
- an electrically insulating member attached to said first member,
- a second electrically conductive member attached to said insulating member and constructed at one end to form a tapered surface, all of said members being constructed and attached in such a manner as to form an opening surrounded by said tapered surface at one end,
- a resilient metal contact attached to said second conductive member and extending within said opening, and



- a field electrode attached to said first conductive member and positioned within said opening; and
- a cap including,
- a first electrically conductive portion slidably engaged with said tapered surface to form a vacuum seal therewith,
- an electrically insulating portion attached to said first portion,
- an electrically conductive plate attached to said insulating portion, and
- a cathode attached to said electrically conductive plate in such manner that said cathode will abutably engage said resilient contact in response to the slidable engagement of said first conductive portion with said tapered surface.

**4,160,189**  
**ACCELERATING STRUCTURE FOR A LINEAR CHARGED PARTICLE ACCELERATOR OPERATING IN THE STANDING-WAVE MODE**  
 Duc Tien Tran, and Dominique Tronc, both of Buc, France, assignors to C.G.R.-Mev, Buc, France  
 Filed Mar. 28, 1978, Ser. No. 891,058  
 Claims priority, application France, Mar. 31, 1977, 77 09809  
 Int. Cl.<sup>2</sup> H01J 25/10  
 U.S. Cl. 315—5.41



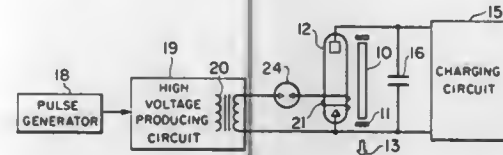
1. An accelerating structure for a linear charged particle accelerator comprising at least an accelerating section formed by a series of resonant cavities operating in the stationary-wave mode; a complementary cavity section disposed upstream said accelerating structure in the path of said particles, said complementary cavity section being joined to and electromagnetically

coupled with said accelerating section, said cavities of the accelerating section, which comprise axial orifices for the passage of the beam, being electromagnetically coupled with one another; and means for injecting a hyperfrequency signal into said accelerating sections; said complementary section comprising at least a first resonant cavity and a second resonant cavity electromagnetically coupled with one another, said second resonant cavity having a length L such that the distance D separating the interaction spaces of the first cavity of the complementary section and of the first cavity of the accelerating section is equal to:

$$D = (2k + n/2) \pi \beta \lambda_0 \quad (1)$$

when n and k are integers at least equal to 1,  $\beta$  is the mean reduced velocity v/c of the charged particles, and  $\lambda_0$  is the free-space wavelength of the H.F. signal injected into the accelerating structure, said second cavity of said complementary section, which has predetermined dimensions, being electromagnetically coupled with said first cavity of the complementary section and said first cavity of the accelerating section in such a manner that the H.F. accelerating field is zero in said second cavity of the complementary section.

**4,160,190**  
**CIRCUIT COMPRISING AN AIR GAP FOR DRIVING A LASER**  
 Kazutoyo Akase, and Isao Kobayashi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan  
 Filed Oct. 3, 1977, Ser. No. 838,836  
 Int. Cl.<sup>2</sup> H05B 41/32  
 U.S. Cl. 315—168



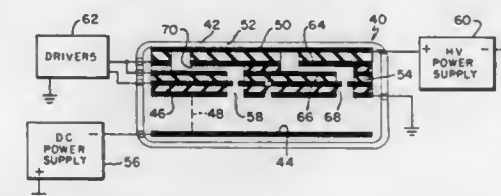
1. In a driving circuit used together with a flash lamp comprising a pair of discharge electrodes and supplied with an exciting voltage, said circuit being for energizing a laser device placed adjacent to said lamp in response to a trigger pulse and comprising a transformer having a pair of output terminals, means for supplying said trigger pulse to said transformer to develop a pulse voltage across said output terminals, means for connecting one of said output terminals to one of said discharge electrodes, exciting means connected to the other of said output terminals and to be placed outwardly of said lamp for causing a discharge for energizing said laser device to occur in said flash lamp in response to said pulse voltage, and suppress means for preventing a parasitic voltage from being developed across said output terminals as a result of said discharge, the improvement wherein said suppress means comprises a pair of conductors connected to said exciting means and said other output terminal, said conductor pair opposing each other with an air gap therebetween, said air gap being capable of allowing said pulse voltage to pass therethrough and preventing said parasitic voltage from being supplied from said other output terminal to said exciting means.

**4,160,191**  
**SELF-SUSTAINING PLASMA DISCHARGE DISPLAY DEVICE**  
 A. David Hausfeld, 1833 S. Ocean Dr., Hallandale, Fla. 33009  
 Filed Dec. 27, 1977, Ser. No. 864,259  
 Int. Cl.<sup>2</sup> H05B 37/00, 39/00, 41/00  
 U.S. Cl. 315—169.4

1. A plasma discharge display assembly comprising in combination:

a sealed enclosure;

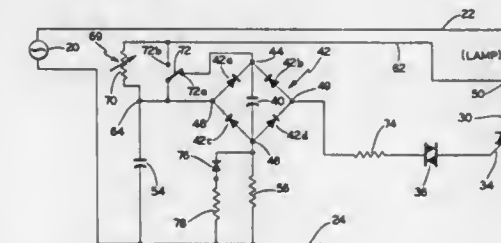
a gas disposed in said enclosure at a predetermined pressure P;  
 cathode means disposed in said enclosure for generating electrons;  
 cathodoluminescent target means, disposed within said enclosure and spaced from said cathode means, said target means generating light in response to electrons striking said target means;  
 electrode means disposed between said cathode means and target means and including at least one passageway for conducting electrons between said cathode means and said target means, said electrode means further including anode means disposed at a distance d from said cathode means, for maintain-



ing a self-sustained discharge from said cathode means to said anode means, control means for selectively controlling the conduction of electrons through said passageway, and means for limiting substantial positive ion space charge within said passageway;

wherein electron mean free path through said passageway is such that substantial positive ion space charge can form within said passageway and the product Pd is that product where a self-sustained plasma discharge occurs between said cathode means and said anode means when the electrical potential between the cathode means and anode means is substantially equal to the Paschenminimum voltage of said gas.

**4,160,192**  
**DELAYED TURN-OFF SWITCHING CIRCUIT**  
 Raymond J. McAllise, 1812 Bruce St., Canal Fulton, Ohio 44614  
 Filed Jun. 3, 1977, Ser. No. 803,137  
 Int. Cl.<sup>2</sup> G05F 1/00; H05B 37/02, 39/04, 41/36  
 U.S. Cl. 315—194



1. A lamp dimmer circuit having delayed turn-off, comprising:
- a voltage source;
  - a load adapted to be energized from said source;
  - a gate controlled switch operative for controlling energization of said load, said controlled switch including a pair of output terminals connected in circuit with said source and said switch, and a gate for controlling an on-off state of said switch;
  - means derived from said voltage source for supplying a control current to the gate of said switch;
  - a turn-off capacitor connected between said gate current means and said gate;
  - diode means connected in series with said turn-off capacitor and said gate for causing unidirectional current flow through said capacitor for operating said gate controlled switch in a one-half wave mode of operation;
  - dimmer means for controlling a firing angle of said gate

controlled switch, said dimmer means including an RC circuit means having variable resistance means, said RC circuit means connected in circuit with said turn-off capacitor and said gate current means;

switch means selectively by-passing the variable resistance means of said RC circuit, said switch means being closed for by-passing said variable resistance means in a delayed turn-off mode of operation and being open in a dimmer mode of operation; and

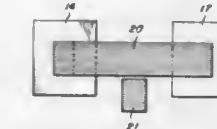
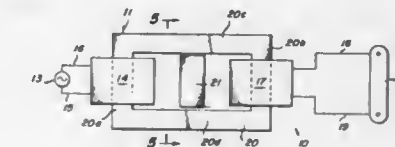
means for enabling said one-half wave mode operating means only during the delayed turn-off mode.

**4,160,193**  
**METAL VAPOR ELECTRIC DISCHARGE LAMP SYSTEM**  
 Abraham W. Richmond, 162 Haven Dr., West Melbourne, Fla. 32901

Filed Nov. 17, 1977, Ser. No. 852,552  
 Int. Cl.<sup>2</sup> H05B 41/16, 41/24

U.S. Cl. 315—281

18 Claims



1. A metal vapor electric discharge lamp system, comprising, a low-medium-high pressure metal vapor electric discharge lamp having a rated full radiation power in the range of about 200 to 400 watts per inch of said lamp, and transformer and control means including, a transformer comprising, a primary winding energized on alternating current electrical supply, a secondary winding loosely magnetically coupled with said primary winding by a main magnetic core portion of said transformer and connected in series electrical circuit with said metal vapor electric discharge lamp, having the latter consist essentially the load in said circuit, and magnetic shunt core means, and means for said magnetic shunt core means to be controlled to move to and from any one of at least two positions relative to said main magnetic core portion, said magnetic shunt core means in a first of said positions being substantially fully magnetically isolated from said main magnetic core portion to have said main magnetic core portion link magnetic flux from said primary winding with said secondary winding, and said magnetic shunt core means in the other of said positions, including a second position, being within the magnetic field of said main magnetic core portion and forming a magnetic shunt path with said main magnetic core portion physically between said primary and secondary windings to have said main magnetic core portion link a reduced amount of magnetic flux from said primary winding with said secondary winding, and said transformer and said low-medium-high pressure metal vapor electric discharge lamp being interrelated with one another according to properties so that with said magnetic shunt core means being in said first position said secondary winding is energized on operation of said transformer to have a relatively high power output level for striking an arc at a relatively high voltage across said metal vapor electric discharge lamp, whereupon voltage across said lamp sharply drops and current through said lamp sharply increases and is limited by impedance of said transformer, and with continued operation of said metal vapor electric discharge lamp, current through said lamp is decreased as voltage across

said lamp increases for current and voltage across said metal vapor electric discharge lamp to stabilize at a relatively high radiation power level of operation of said metal vapor electric discharge lamp, and so that upon movement of said magnetic shunt core means from said first position to said second position relative to said main magnetic core portion in response to operation of said control means, operation of said transformer and said metal vapor electric discharge lamp is continued and said secondary winding is energized to have a relatively low power output level and said metal vapor electric discharge lamp accordingly thereafter stably operates at a radiation power level being less than about 70% full radiation power of said lamp.

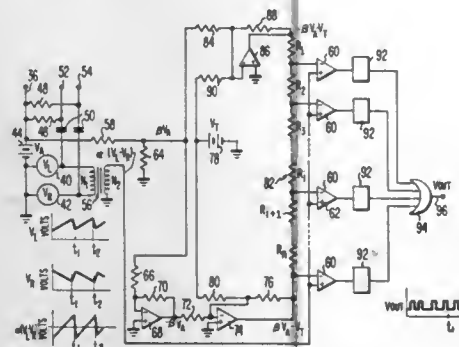
4,160,194

**SYSTEM AND METHOD FOR KEYING VIDEO INFORMATION TO ELECTRON BEAM DEFLECTION**  
Charles H. Anderson, Rocky Hill, and Frank J. Marlowe, Kingston, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,511  
Int. Cl.<sup>2</sup> H01J 29/70

U.S. Cl. 315—366

6 Claims



1. A system for determining the position of an electron beam with respect to points on a screen of a cathodoluminescent display device, said system comprising:  
means for generating at least one reference voltage proportional to an instantaneous anode voltage; and  
means for comparing a reference voltage with the electron beam deflection voltage for the display device, said comparing means including at least one comparator having one of its inputs connected to the reference voltage generating means and the other input connected to the deflection voltage and having its output connected to a monostable multivibrator.

4,160,195

**TAPE CONTROL APPARATUS**

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1977, Ser. No. 836,145  
Claims priority, application Japan, Sep. 28, 1976, 51/116170  
Int. Cl.<sup>2</sup> B65H 77/00

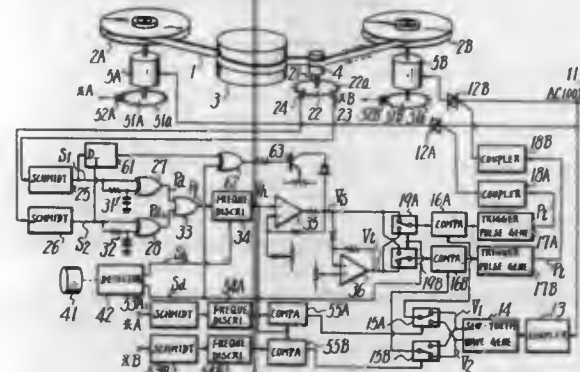
U.S. Cl. 318—7

15 Claims

1. Tape control apparatus comprising:  
first and second reel members for supplying and taking up tape;  
first and second drive motors coupled to said first and second reel members, respectively, for applying oppositely directed torques to said first and second reel members, thereby bi-directionally driving tape between said reel members and applying tension to the driven tape;  
speed detecting means for detecting the transport speed of said tape and for generating a speed control signal proportional to said detected tape speed;  
torque voltage generating means responsive to said speed control signal for generating first and second torque volt-

ages determinative of said torques respectively applied to said first and second reel members by said first and second drive motors, said first and second torque voltages changing differentially with respect to each other as said speed control signal changes;

first and second motor drive means responsive to said first and second torque voltages, respectively, for applying first and second drive signals to said first and second drive motors to control the torques applied by said drive motors to said reel members, whereby said tape is transported at a substantially constant speed;  
means for applying said first and second torque voltages to said first and second motor drive means;  
command signaling means for generating command signals to establish the speed and direction at which said tape is transported; and



means responsive to said command signals for adjusting said first and second torque voltages applied to said first and second motor drive means to differentially change the torques applied by said first and second drive motors to said first and second reel members;  
said first and second motor drive means comprising means for generating alternating reference signals, comparator means for comparing said first and second torque voltages applied thereto to said alternating reference signals to determine the respective locations in the cycles of said reference signals whereat said first and second torque voltages are equal to said reference signals, and first and second means for applying first and second alternating drive signals to said first and second motors, said first and second alternating drive signals having conduction angles established by said comparator means.

4,160,196

**TWO-PHASE AC ELECTRIC MOTOR CONTROL CIRCUIT**

Sagdulla K. Ismatkhodzhaev, Massiv Severo-Vostok-2, 51, kv. 56; Salikh Z. Usmanov, proezd Morozova, 3, kv. 7, both of Tashkent; Mirmakhmud A. Mirsagatov, poselok Salar, ulitsa Khamza, 13, Tashkentskaya oblast Ordzhonikidzevskiy raion; Nasim G. Dzhabarov, Ts-13, dom 11, kv. 35, Tashkent-128; Makhirdzhan Takhirdzhanov, ulitsa Kurskaya, 15, Tashkent, and Anvardzhan F. Mumindzhanov, ulitsa Raskovoi, 44, Tashkent, all of U.S.S.R.

Continuation of Ser. No. 576,096, May 8, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 809,046

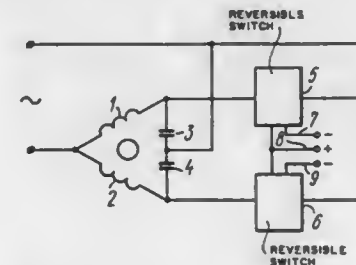
Int. Cl.<sup>2</sup> H02P 1/40

U.S. Cl. 318—749

2 Claims

1. A control circuit of a two-phase AC electric motor with windings and two series capacitors delta-connected, a power source with two terminals, the midpoint of said windings being connected to one terminal of said power source, switching means with two shunt switching elements, each shunt switching element being connected between the other terminal of said source and a separate junction of said windings and said capacitors, the leads of said windings being connected to said capaci-

tors and being brought to the other terminal of the power source, through said shunt switching elements, the midpoint of ing means (19) is connected to the other input of the said gate circuit (15).



4,160,197

**CIRCUIT ARRANGEMENT FOR RECORD PLAYERS PERFORMING THE SETTING BACK OF THE DISC INTO A PRE-DETERMINED START POSITION**

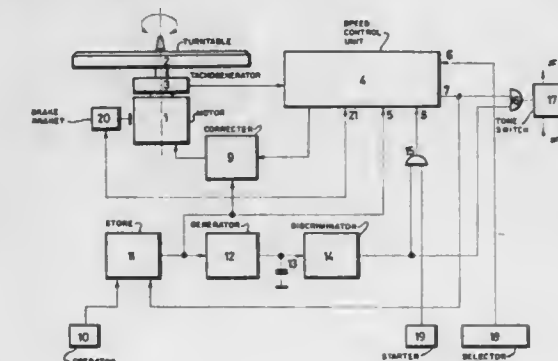
György Rothman; György Babos; Mária Gyarmati nee Hardik; Árpád Hegedűs, and Ottó Rófa, all of Budapest, Hungary, assignors to Mechanikai Laboratorium Híradastechnikai Kiserleti Vallalat, Budapest, Hungary

Filed Jan. 24, 1978, Ser. No. 871,790

Int. Cl.<sup>2</sup> G05B 13/02

U.S. Cl. 318—396

3 Claims



1. A circuit arrangement for record players performing the setting back of the disc into a predetermined start position comprising a turntable being rigidly coupled to its driving motor on the one hand and to a tachogenerator on the other hand whereas the tachogenerator is coupled to one input of a speed control unit, and the circuit arrangement comprises also a start-operating means, a brake magnet, and a correcting means being coupled over its first input to the first output of the said speed control unit and over its output to the operating input of the said motor, and the second output of the said speed control unit is connected to the operating input of the said brake magnet whereas the improvement consists in that the third output (7) of the said speed control unit (4) is connected to the first input of a store (11), the output of the said store (11) is connected to one output of a controllable current generator (12) as well as to one input of the said correcting means (9) and one input of the said speed control unit (4), the output of the current generator (12) is connected on the one hand to one plate of a storing capacitor (13) the other plate of which being connected to a constant potential such as the common potential of the circuit arrangement and on the other hand to the input of a threshold level discriminator (14) the output of which being connected to one input of a logical gate circuit (15) whereas the output of the said gate circuit (15) is connected to the third input (8) of the said speed control unit (4), and the operating means (10) of the circuit arrangement is connected to the second input of the said store (11) whereas its start-operat-

4,160,198

**NUMERICALLY-CONTROLLED MACHINE TOOL**  
Günter Brümer, Spardorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

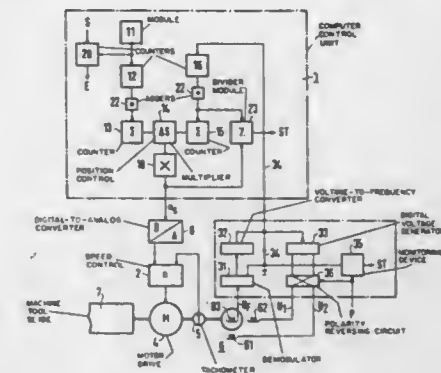
Filed Oct. 12, 1977, Ser. No. 841,283

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649115

Int. Cl.<sup>2</sup> G05B 23/02

U.S. Cl. 318—565

3 Claims



1. In a numerically-controlled machine tool including means for adding incremental set values, which depend on a programmed input, and incremental actual values, generated by a self-balancing distance measuring system, at defined time intervals to a set distance value and an actual distance value, and means for forming a set speed value for a controller of an input drive by the difference between the set distance value and the actual distance value, said difference being proportional to a lag distance, said self-balancing distance measuring system comprising an inductive measuring transducer which is fed from a primary side thereof and which generates a secondary error voltage on the secondary side thereof, the magnitude and polarity of which depends on the position of a flux vector generated on said primary side relative to the position of a secondary winding of said transducer, and means for generating pulse signals which are proportional to the secondary error voltage for servoing the flux vector in the direction toward balance and measuring the actual value of the distance travelled by said secondary winding, the improvement comprising, said measuring transducer including means for briefly rotating said flux vector through defined angles in sensing intervals of an incremental actual-value interrogation, and means for detecting polarity changes in said secondary error voltage.

4,160,199

**LINE OR PATTERN FOLLOWING SYSTEM**

Francis G. Bardwell, Elmhurst, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jul. 5, 1977, Ser. No. 812,787

Int. Cl.<sup>2</sup> G05B 19/36

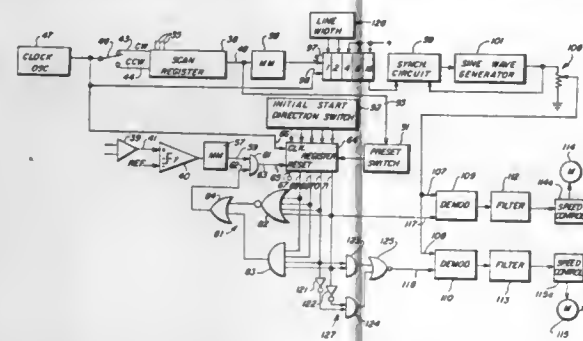
U.S. Cl. 318—577

14 Claims

1. A system for tracing a line or pattern, comprising a plurality of angularly spaced light-sensitive devices, arranged in an array, which has a reference point, a first drive motor for moving said array in a first direction, a second drive motor for moving said array in a second direction which is at substantially a right angle to said first direction, said array being adapted to be positioned adjacent said line or pattern and an image of an edge of the line or pattern falling on said array and making an angle  $\theta$  with said reference point, means for sequentially sampling said devices, and means responsive to said



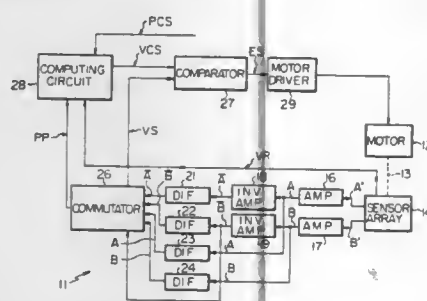
reference point and to said sampling means and powering said first drive motor at a speed which is a function of sine  $\theta$  and



powering said second drive motor at a speed which is a function of  $\cos \theta$ .

**4,160,200**  
**SERVO CONTROL APPARATUS**  
Tomoatsu Imamura; Shigeyuki Araki; Nobuo Iwata, and Masahiro Yoshimi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
Filed Jun. 27, 1977, Ser. No. 810,208  
Claims priority, application Japan, Jun. 29, 1976, 51/76854; Oct. 2, 1976, 51/118855

Int. Cl.<sup>2</sup> G05B 5/01  
U.S. Cl. 318—616 13 Claims

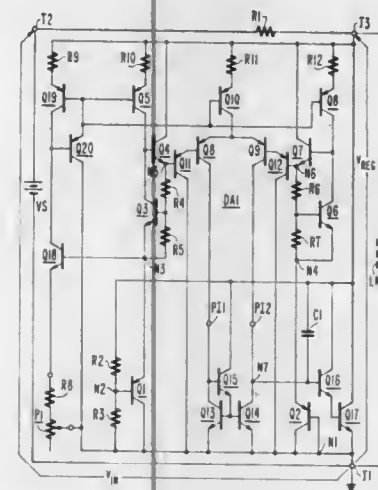


1. A servo control apparatus comprising:
  - a servo motor;
  - a light source;
  - a photosensor array including first and second identical photosensors, the first photosensor being continuously illuminated by the light source;
  - an occluder disc formed with at least one light transmitting aperture, the disc being rotatably driven by the motor between the light source and the second photosensor to alternately cover and uncover the second photosensor, the second photosensor producing electrical position signals in response to said covering and uncovering thereof, the position signals having a D.C. component;
  - computing means responsive to the position signals and a position command signal for producing a velocity command signal to drive the motor and disc from an initial position to a position corresponding to the position command signal;
  - differentiating means for differentiating the position signals to produce a velocity signal;
  - comparator means responsive to the velocity signal and the velocity command signal for producing an error signal corresponding to a difference therebetween and feeding the error signal to the motor to drive the motor;
  - sensor means responsive to an output signal of the first photosensor;
  - intensity control means responsive to the sensor means for adjusting an intensity of the light source so that the output

signal of the first photosensor has a predetermined value; and  
amplifier means connected between the second photosensor and the computing means, the intensity control means adjusting a bias voltage applied to the amplifier means to remove the D.C. component from the position signals in accordance with the output signal of the first photosensor.

**4,160,201**  
**VOLTAGE REGULATORS**  
Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.  
Filed Jun. 8, 1978, Ser. No. 914,236  
Int. Cl.<sup>2</sup> G05F 1/56, 1/60

U.S. Cl. 323—8 11 Claims

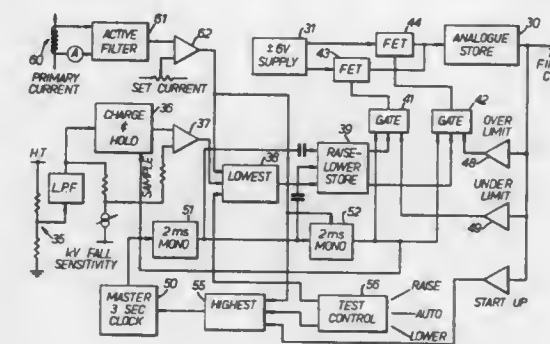


6. A voltage regulator of the type wherein the regulated voltage is with reference to a multiple of the difference between first and second voltages, the first voltage being the offset potential provided between first and second nodes by a first circuit connected therebetween, which first voltage equals  $(m+n)$  times the offset potential across a first forward-biased semiconductor junction operated at a relatively high current density, and the second voltage being the offset potential provided between third and fourth nodes by a second circuit connected therebetween, which second voltage equals  $m$  times the offset potential across a second forward-biased semiconductor junction operated at a relatively low current density,  $m$  and  $n$  being positive numbers, improved in that said first circuit includes:

- a transistor having an emitter electrode at said first node, having a base electrode, having an emitter-base junction corresponding to said first semiconductor junction, and having a collector electrode connected for permitting collector current flow and direct coupled to said second node; and divider means for dividing the potential appearing between said first and second nodes for application between said first node and the base electrode of said transistor, which divider means includes first and second resistive elements respectively connecting said first node and said second node to the base electrode of said transistor.

**4,160,202**  
**ANALOGUE AUTOMATIC VOLTAGE CONTROLLER**  
Barry K. James, Solihull, and David R. Terry, Nettleham, both of England, assignors to Dresser Industries, Inc., Dallas, Tex.  
Filed Nov. 21, 1977, Ser. No. 853,788  
Claims priority, application United Kingdom, Dec. 15, 1976, 52240/76

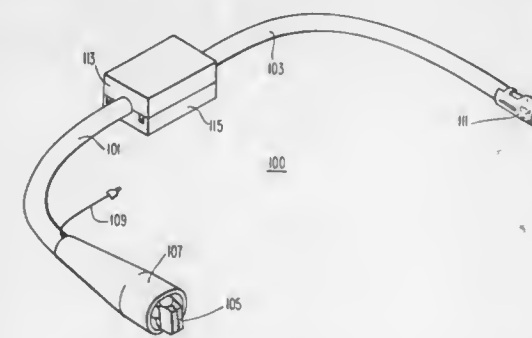
Int. Cl.<sup>2</sup> B03C 3/68  
U.S. Cl. 323—24 4 Claims



1. A control circuit for an electrostatic precipitator, comprising an analogue store for providing an output voltage representative of a desired precipitator electrode voltage, switch means for selectively increasing or decreasing the voltage in the analogue store, a switch control circuit connected with the switch means for selecting an increase or a decrease in the stored voltage, and a sensing circuit adapted to be responsive to a falling electrode voltage to provide an output signal for switching said switch control circuit to cause a decrease in the stored voltage, said sensing circuit including a comparator to which are supplied a voltage indicative of the electrode voltage and a delayed sample of that voltage.

**4,160,203**  
**AUTOMOTIVE SPARK INDICATOR**  
Richard G. Volk, York, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.  
Filed Dec. 12, 1977, Ser. No. 859,435  
Int. Cl.<sup>2</sup> F02P 17/00

U.S. Cl. 324—15 10 Claims

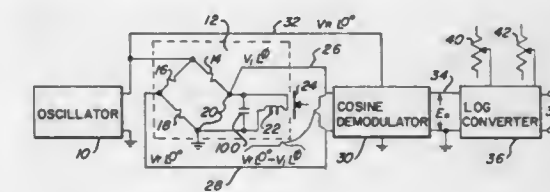


1. A spark indicator apparatus for use in detecting automotive ignition spark at various points in an auto ignition system comprising:
  - electrical transmission means for electrically connecting a one of said various ignition system points to automotive ground, said transmission means having an interruption therein providing a spark air gap;
  - means for encasing said spark air gap, said encasing means including a transparent housing completely surrounding said spark air gap, a straight channel passing through said housing, said channel having two larger diameter sections and a smaller diameter section separating said two larger diameter sections, and a pair of abutment shoulders, situated one each at an interface of said smaller diameter

channel section with one of said two larger diameter sections; and  
means for venting said spark air gap through said encasing means, said venting means traversing at least one change in direction.

**4,160,204**  
**NON-CONTACT DISTANCE MEASUREMENT SYSTEM**  
William A. Holmgren; John S. Hasling, and Richard W. Denny, all of Colorado Springs, Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.  
Filed Nov. 11, 1974, Ser. No. 522,509

Int. Cl.<sup>2</sup> G01R 33/12  
U.S. Cl. 324—207 12 Claims



1. Apparatus for measuring distance to an object, comprising:
  - means for generating an AC signal at a predetermined substantially constant frequency;
  - distance-related impedance means connected to said signal generating means and excited by said constant frequency AC signal for indicating object distance by variations in its impedance characteristic, said distance-related impedance means including at least first and second interconnected impedance elements, said first impedance element being inductive means whose impedance varies in proportion to object distance, said second impedance element having a selectively set impedance value which combines with said first impedance element to produce a resultant impedance characteristic for said distance-related impedance means which is substantially a logarithmic function of object distance over a first range of distance, said first range commencing at substantially zero distance and increasing up to an ascertainable point, whereby the magnitude of the electrical signal generated across said distance-related impedance means is logarithmically proportional over said first range to object distance;
  - wherein said AC signal is a high frequency signal;
  - wherein said second impedance element is capacitive means;
  - wherein said second impedance element is connected in parallel with said first impedance element;
  - including means responsive to the electrical signal generated across said distance-related impedance means for generating therefrom an output signal linearly proportional over said first range to object distance; and,
  - wherein said linear output generating means comprises means for generating a selected bias signal and a log converter circuit; said log converter circuit being responsive to the electrical signal generated across said distance-related impedance means to generate said output signal linearly proportional over said first range to object distance; said log converter circuit further being responsive to said selected bias signal to produce an offset in the remaining portion of said output signal, which represents object distances outside of said first range, to render said remaining signal portion also substantially linearly proportional to object distance.

4,160,205

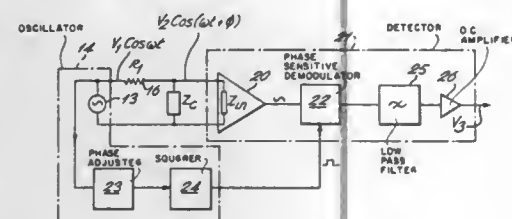
## DETECTION OF BACTERIAL ACTIVITY

Geoffrey Hobbs; Alfred C. Jason, both of Aberdeen, and John C. S. Richards, Old Aberdeen, all of Scotland, assignors to National Research Development Corporation, London, England  
Filed Oct. 19, 1977, Ser. No. 843,493

Claims priority, application United Kingdom, Oct. 19, 1976, 43334/76

Int. Cl.<sup>2</sup> G01R 27/02  
U.S. Cl. 324—65 R

16 Claims



1. A method of detecting bacterial activity comprising inoculating the bacteria into a suitable nutrient medium; maintaining this culture at a substantially constant temperature; and monitoring the resistive component of the electrical impedance of the culture for a period of time sufficient for a change in said resistive component due to metabolising bacteria to be detectable and in such a manner that the value obtained is influenced by the temperature coefficient of the resistive component to a degree which is equivalent to a change in temperature of not more than  $\pm 0.01K$ .

4,160,206

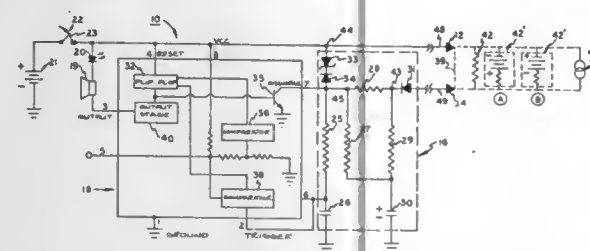
## AUDIBLE VOLTAGE-IMPEDANCE TESTER

Victor Bojarski, Bridgeport, Conn., assignor to Bengt Berendsonk, Whittier, Calif.

Filed Dec. 14, 1977, Ser. No. 860,598

Int. Cl.<sup>2</sup> G01R 15/12, 19/16, 27/00, 31/02  
U.S. Cl. 324—73 R

25 Claims



15. An audible voltage-impedance tester comprising:  
(A) a battery with a constant voltage and with a reference terminal;  
(B) means for removably contacting across an unknown voltage or impedance source, said means having first and second probes, the first probe switchably interconnected to the battery;  
(C) input means interconnected to at least the second probe of the unknown source contacting means and to the reference terminal of the battery and including a resistor and a capacitor serially connected to each other for electrically sensing the current passing through the unknown source;  
(D) a multi-vibrator interconnected to the resistor and capacitor and powered by the battery, the multi-vibrator having an output with a signal generated thereon that changes state when the capacitor of the input means charges and discharges between two voltage states, the first state being a first fraction of the battery voltage and the second state being a second, smaller, fraction of the battery voltage; and  
(E) an electroacoustic transducer connected to the output of

the multi-vibrator for generating a sound representative of the output signal of the multi-vibrator;  
whereby the audible tester senses resistances or voltages without coupling the unknown source to the battery in a manner so as to be in series with the multivibrator, but connects the unknown source to the battery so as to influence the charge and discharge rate of the resistor-capacitor network of the input module, thereby generating a distinct output by the multi-vibrator which drives the electroacoustic transducer.

4,160,207

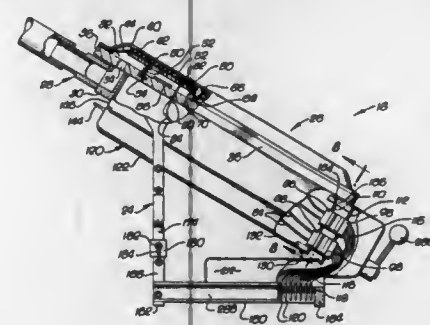
## PRINTED CIRCUIT BOARD TESTER WITH REMOVABLE HEAD

Fred E. Haines, 2444 Cabrillo Ave., Torrance, Calif. 90501

Filed Jun. 27, 1977, Ser. No. 810,574

Int. Cl.<sup>2</sup> G01R 31/02, 15/12  
U.S. Cl. 324—158 F

17 Claims



1. In a printed circuit board circuit tester having a testing head,  
head electrical wires and joined head contact means extending into said head,  
said head electrical contact means being fitted in a non-conducting environment supported in the head,  
support means within said head adapted to support a circuit board to be tested,  
said head electrical contact means extending through said non-conducting environment to a position adjacent said circuit board support means and said circuit board,  
means associated with said head for moving said circuit board into testing contact with said head electrical contact means,  
the improvement comprising:  
head electrical connector means carried by said head,  
said head electrical wires extending from said head electrical connector means,  
a base for removably supporting said head,  
base electrical connector means carried in said base and being adapted to mate with said head electrical connector means when said head is supported on said base,  
base electrical wires and joined electrical contact means extending from said base connector means into said base,  
said base electrical contact means being exposed through said base for connection to an electrical supply to test said circuit board,  
upwardly extending spaced arms on one side of said base having means to slidably engage with and support said head adjacent one end thereof,  
means extending from said head to respectively slidably engage said arms, and  
head stop means extending from an opposite side of said base to slidably engage with said head when said means extending from said head slidably engages with said arms,  
said stop means and said arms being adapted to support said head on said base.

4,160,208

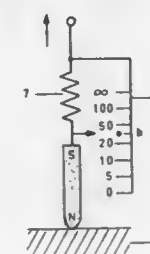
## METHOD OF CALIBRATING MAGNETIC THICKNESS GAUGES

Erich A. Steingrover, Bonn, and Hans F. Nix, Cologne, both of Fed. Rep. of Germany, assignors to Elektro-Physik, Hans Nix & Dr.-Ing E. Steingrover KG., Cologne, Fed. Rep. of Germany

Filed Jan. 27, 1976, Ser. No. 652,669

Int. Cl.<sup>2</sup> G01R 35/00  
U.S. Cl. 324—202

8 Claims



1. Method of calibrating magnetic thickness gauges of the type having a direct reading scale and being equipped with at least one movable magnetized pole piece for contact with a layer to be measured, said layer being supported on a base composed of a material capable of exerting force on said pole piece when said magnetized pole piece is in contact with said layer which is a function of the thickness of the supported layer, comprising the steps of placing said magnetized pole piece in contact with a test sheet composed of a material having a uniformity distributed composition throughout its thickness which exerts a lesser magnetic force on said pole piece than the same thickness of said base material, said force being the equivalent of the force exerted by said base material when supporting a layer of known thickness, and adjusting the attractive force of said pole piece to obtain the reading on said scale indicative of said known thickness.

4,160,209

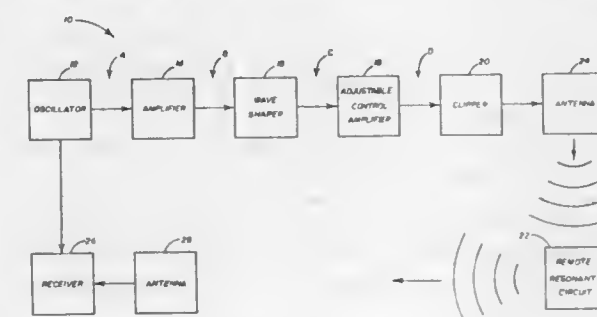
## RESONANT CIRCUIT EXCITATION METHOD AND APPARATUS

Thomas F. Thompson, 3891 E. Amazon Dr., Eugene, Oreg. 97405

Filed Jul. 1, 1977, Ser. No. 812,133

Int. Cl.<sup>2</sup> H04B 1/59, 7/145  
U.S. Cl. 325—64

3 Claims



2. A method of exciting a resonant circuit operable at one frequency through the use of a signal producing means operable at a lower frequency, where the resonant circuit responds to an edge of a periodic signal having a predetermined time-level slope extending over a required predetermined signal-level range, said method comprising  
generating, with such a signal-producing means, and at said lower frequency, a periodic electrical signal having an

edge characterized by a time-level slope smaller than said predetermined time-level slope,  
amplifying said signal,  
by said amplifying, producing an amplified signal having an edge exhibiting said predetermined time-level slope and extending at least over said required predetermined signal-level range, and  
transmitting said amplified signal to said resonant circuit.

4,160,210

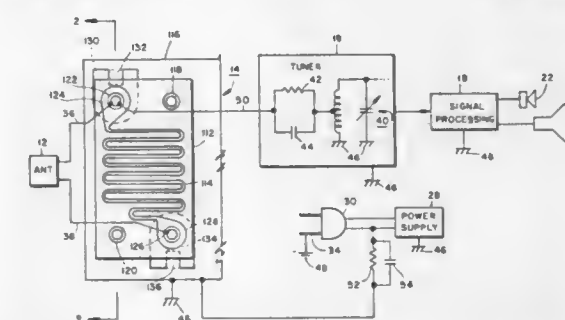
## PRINTED CIRCUIT IMPEDANCE TRANSFORMATION NETWORK WITH AN INTEGRAL SPARK GAP

Thomas E. Mollnari, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1977, Ser. No. 829,169

Int. Cl.<sup>2</sup> H04B 1/18  
U.S. Cl. 325—362

10 Claims



1. Apparatus for coupling an antenna network to an RF signal processing circuit, comprising:  
a printed circuit board having a first conductor formed on one side thereof and coupled between said antenna network and said signal processing circuit;  
a second conductor comprising a planar metal member positioned in a fixed relationship with respect to said first conductor to form a transmission line having characteristics selected to match the impedances of said antenna network and said RF signal processing circuit; and  
discharging means including a third conductor extending from one of said first and second conductors toward the other of said first and second conductors to form a spark gap therebetween for discharging excessively high energies developed at said antenna network.

4,160,211

## METHOD AND INSTRUMENT FOR MEASURING THE SENSITIVITY OF A RADIO RECEIVER

Glen R. Wittrock, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.

Filed Sep. 8, 1977, Ser. No. 831,513

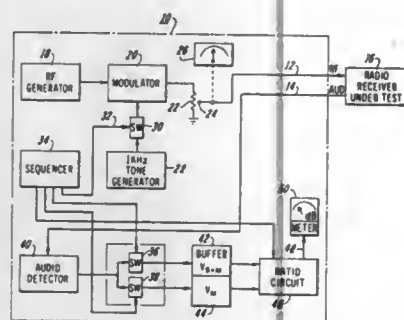
Int. Cl.<sup>2</sup> H04B 17/00  
U.S. Cl. 325—363

2 Claims

1. An instrument for use in measuring the sensitivity of a radio receiver comprising  
a radio frequency generator providing a radio frequency carrier,  
an audio frequency generator providing a constant frequency audio signal,  
modulator means for modulating said radio frequency carrier with an audio signal applied thereto,  
means for sequentially applying said audio signal to said modulator means,  
means coupling the output signal from said modulator means to the radio frequency input of said receiver,  
detecting means for providing a dc output voltage proportional to the level of an audio frequency signal applied thereto,  
means coupling the audio output signal from said receiver to said detecting means,



first and second signal storage devices, switching means coupling the output of said detecting means to said first signal storage device only during the period when said audio signal is applied to said modulator means and coupling the output of said detecting means to said second signal storage device only during the period when said audio signal is not applied to said modulator means, means responsive to the signals stored by said storage devices for displaying the ratio of the signals respectively stored by first and second signal storage devices, means for adjusting the level of the output signal from said modulator means applied to said RF input to set said ratio at a predetermined value, ramp wave generating means for providing a ramp wave



having a slope proportional to the value of said signal stored by said first storage device, means for displaying the level of said output signal applied to said RF input, said means for displaying the ratio comprising, means for developing a dc voltage signal when the voltage level of said ramp wave is greater than the voltage level of said signal stored by said second storage device, means for periodically resetting said ramp wave generating means at a rate sufficient to prevent the voltage of said ramp wave from exceeding the voltage stored by said first storage device, meter means for displaying the average value of a variable dc voltage applied thereto, and means coupling said dc voltage signal to said meter means.

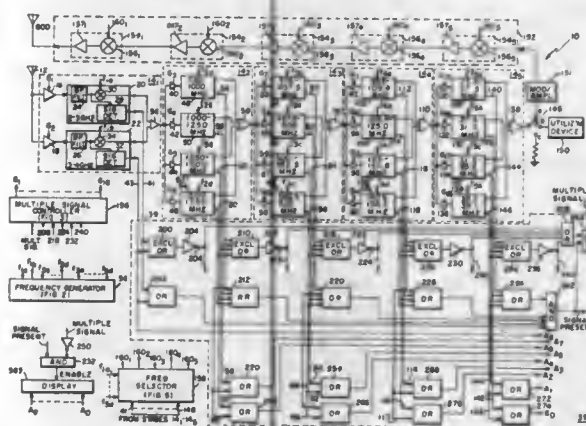
**4,160,212**  
**RADIO FREQUENCY RECEIVER HAVING SERIALY COUPLED HETERODYNING STAGES, EACH STAGE HAVING FILTERS WITH DIFFERENCE CENTER FREQUENCIES**  
William S. Barquist, Jr., Solvang, and Robert S. Hutcheon, Goleta, both of Calif., assignors to Raytheon Company, Lexington, Ky.

Filed May 26, 1977, Ser. No. 800,994  
Int. Cl.<sup>2</sup> H04B 1/26

U.S. Cl. 325—432 4 Claims  
1. A radio frequency signal receiver for determining the frequency of a received signal, comprising:

- (a) a plurality of serially coupled frequency converter stages having successively smaller bandwidths, each one of said frequency converter stages including:
  - (i) a plurality of bandpass filters adapted to pass signals within a first predetermined band of frequencies, each one of the plurality of filters having a different center frequency and being adapted to pass signals within a different portion of the first predetermined band of frequencies; and
  - (ii) heterodyning means for converting the frequency of a signal passed by any one of the plurality of bandpass filters to a frequency within a second, smaller predetermined band of frequencies, such signal being fed to the next succeeding smaller bandwidth stage;
  - (iii) a plurality of signal detector means coupled to the output of a corresponding one of the plurality of band-

pass filters, for providing detection signals indicating which one or ones of the bandpass filters passes the received signal; and

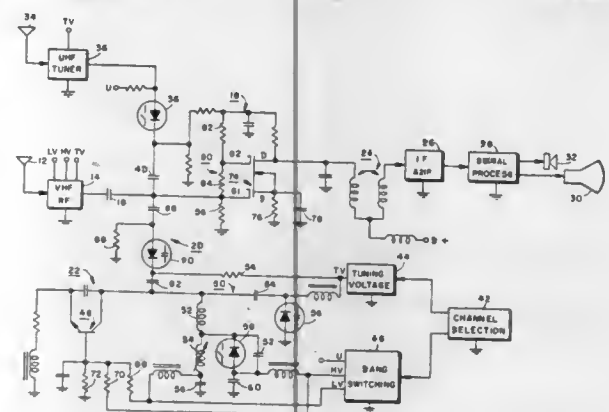


(b) frequency measuring means, responsive to the detection signals of the signal detector means, for providing an indication of the frequency of the received signal.

**4,160,213**  
**MIXER INJECTION VOLTAGE COMPENSATION CIRCUIT**  
George W. Carter, Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,780  
Int. Cl.<sup>2</sup> H04B 1/26

U.S. Cl. 325—439 6 Claims



1. In a system for tuning a receiver to radio frequency signals in response to respective amplitudes of a tuning signal generated when a user selects corresponding tuning positions, apparatus comprising:

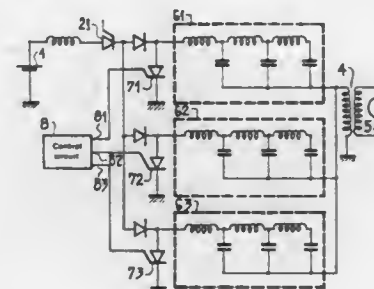
- local oscillator means for generating at least a first local oscillator signal at a first frequency in response to a first amplitude of said tuning signal and a second local oscillator signal at a second frequency and having an amplitude substantially different than the amplitude of said first local oscillator signal in response to a second amplitude of said tuning signal;
- mixer means having an input and an output;
- first coupling means including a first varactor diode serially coupled between said local oscillator means in response to said second amplitude of said tuning signal, said second injection signal for developing at said input of said mixer means a first injection signal at said first frequency in response to said first amplitude of said tuning signal and a second injection signal at said second frequency and having an amplitude substantially equal to the amplitude of said first injection signal; and

second coupling means for coupling said radio frequency signals to said input of said mixer;  
said mixer means combining said radio frequency signals and said injection signals to develop an intermediate frequency signal at said output thereof.

**4,160,214**  
**MODULAR MODULATOR FOR RADAR TRANSMITTERS**  
Lucien Colin, and André Chesnel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1977, Ser. No. 827,110  
Claims priority, application France, Aug. 27, 1976, 76 25956  
Int. Cl.<sup>2</sup> H03K 1/00

U.S. Cl. 328—65 7 Claims



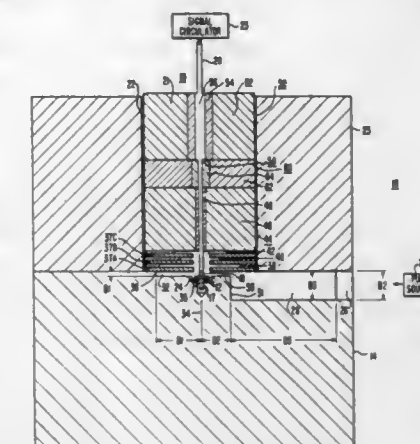
1. A modular modulator for use in a transmitter of the type including a power supply, a modulator generating pulses, a separating circuit coupling power from said power supply to said modulator, a transmission tube, and a coupling circuit carrying pulses from said modulator to said transmission tube, said modular modulator comprising:

- a plurality of elementary delay cells, each having first and second terminals and each having a predetermined delay associated therewith, said elementary delay cells being coupled in switchable parallel relationship between said separating circuit and said coupling circuit, said second terminal of each of said elementary delay cells being coupled to said coupling circuit;
- a diode element associated with each of said elementary delay cells, coupling said separating circuit to said elementary delay cell and arranged with polarity such that power flows from said separating circuit to said elementary delay cell, and not from said elementary delay cell to said separating circuit;
- an electronic switching element associated with each of said elementary delay cells, each element having an input electrode, an output electrode and a control gate associated therewith, said input electrode coupled to said first terminal of said elementary delay cell and said output terminal coupled to said coupling circuit such that the activation of said control gate controls the coupling of said first terminal of said elementary delay cell to said coupling circuit; and
- a control circuit for generating gate control pulses, said control circuit having outputs coupled to each of said control gates of said electronic switching elements such that the relative timing of said gate control pulses controls the coupling of each of said elementary delay cells to said coupling circuit, permitting the independent control of loading and discharge of each of said elementary delay cells in order to generate pulses having desired pulse width and desired timing.

**4,160,215**  
**SINGLE DIODE UPPER SIDEBAND TERMINATED PARAMETRIC AMPLIFIER**  
Edward C. Niehenke, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1978, Ser. No. 900,955  
Int. Cl.<sup>2</sup> H03F 7/04

U.S. Cl. 330—4.9 9 Claims

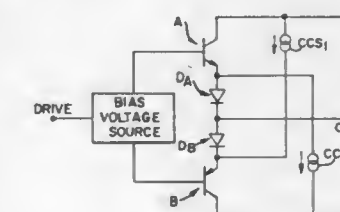


1. A parametric amplifier comprising:  
a diode,  
an input signal source coupled to said diode for providing an input signal,  
a pump signal source coupled to said diode for providing a pump signal,  
said diode amplifying said input signal through interaction of said input signal and said pump signal and generating thereby an upper sideband signal and an idler signal,  
waveguide means for coupling said pump signal to said diode,  
a terminating waveguide coupled to said waveguide means at the place of coupling said diode to said waveguide means,  
said terminating waveguide having predetermined dimensions to provide a one-half wavelength operating condition at the upper sideband signal frequency and a cutoff operating condition at said idler signal frequency to suppress said upper sideband signal and said idler signal respectively from entering said waveguide means and  
an approximate one-quarter wavelength operating condition at the pump signal frequency to provide efficient coupling of said diode at the pump signal frequency to said waveguide means.

**4,160,216**  
**APPARATUS FOR ELIMINATING ON-OFF TRANSITIONAL GAIN VARIATIONS IN CLASS AB, B AND C ACTIVE ELEMENT AMPLIFIERS**  
Barry W. Thornton, 2340 Selma St., Sacramento, Calif. 95815

Filed Jan. 16, 1978, Ser. No. 870,011  
Int. Cl.<sup>2</sup> H03F 3/26

U.S. Cl. 330—267 18 Claims



1. A high fidelity audio amplifier comprising:

input means to the amplifier adapted to receive an input signal to be amplified;  
 a pair of cooperating active amplifying devices having their respective control inputs operatively connected to said input means and connected to drive a common output in response to an input signal in a mode wherein one active amplifying device is driven more conductive in response to changes of input signal from a zero level while the other active amplifying device is driven less conductive, and vice versa;  
 bias means for maintaining both of said active amplifying devices in a conductive state when no input signal is provided to the amplifier;  
 circuit means for providing a current to each of said active amplifying devices;  
 first and second diode means respectively associated with said active amplifying devices for controlling the current to said active amplifying devices for maintaining said active amplifying devices in a conductive state for input signal values which, when combined with the bias from said bias means would render one or the other of said active amplifying devices nonconductive without said circuit means; and  
 output means operatively connected to said active amplifying devices for cooperatively combining the respective output signals from said active amplifying devices to provide an amplified output signal from the amplifier.

4,160,217

## PHASE LOCKED LOOP CIRCUIT

Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 780,243, Mar. 22, 1977, abandoned.

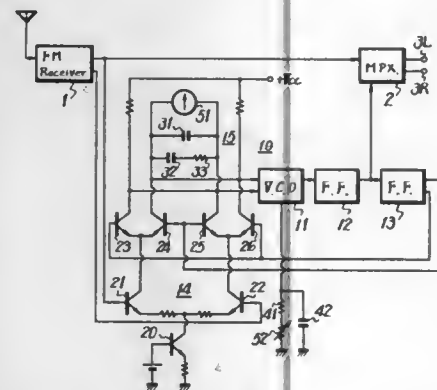
This application Aug. 8, 1978, Ser. No. 931,987

Claims priority, application Japan, Apr. 1, 1976, 51-36525

Int. Cl.<sup>2</sup> H03B 3/04

U.S. Cl. 331-8

1 Claim



1. A phase-locked loop circuit comprising a voltage controlled oscillator providing an output signal and having a free-running frequency that may vary with time; a phase comparator comparing the phase of a reference signal with the phase of a compared signal which is derived from said output signal of the voltage controlled oscillator for providing a D.C. control voltage in dependence on a variation of the phase relation of said compared signal with said reference signal, said phase comparator including a first pair of transistors each having an input electrode supplied with said reference signal and an output electrode, a second pair of transistors connected to said output electrode of one of said first pair of transistors, and a third pair of transistors connected to said output electrode of the other of said first pair of transistors, said second and third pairs of transistors each having an input electrode supplied with said compared signal; a filter circuit connected to said phase comparator between output electrodes of said second and third pairs of transistors and to said voltage controlled oscillator and through which said control voltage is

applied to said voltage controlled oscillator so as to shift the actual frequency of said output signal from the oscillator in respect to said free-running frequency for eliminating said variation of the phase relation; indicator means including a meter whose center is null and which is connected in parallel with said filter circuit for indicating the value and polarity of said D.C. control voltage, and manually actuable means connected with said voltage controlled oscillator for adjusting said free-running frequency of the voltage controlled oscillator in the sense, and to the extent indicated by said meter for eliminating said control voltage due to a variation of said free-running frequency with time.

4,160,218

## LASER MONITOR AND CONTROL SYSTEM

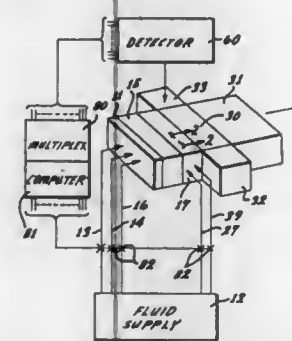
Frederic H. White, III, Simi, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 23, 1977, Ser. No. 809,234

Int. Cl.<sup>2</sup> H01S 3/095, 3/13, 3/101

U.S. Cl. 331-94.5 P

11 Claims



1. In a chemical laser wherein a plurality of different fluids are discharged into a laser cavity to establish a laser active medium, there being a plurality of different fluid feed paths provided to the laser, the laser cavity including plural reflector means establishing an optical cavity and including means for extracting an output beam from the cavity, the improvement comprising: detection means disposed in relation to the extracting means for detecting the contour of the beam as extracted in representation of the beam profile in the cavity along a direction of fluid flow in the cavity; and control means connected to the detection means for controlling at least one fluid as passing through the respective feed paths to obtain a change in a laser gain profile, for avoiding passage of the laser beam in the cavity through a portion of negative gain.

4,160,219

## TRANSDUCER ELECTRODES FOR FILTERS OR DELAY LINES UTILIZING SURFACE WAVE PRINCIPLES

Wilhelm Kuny, Gruenwald, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,837

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618210

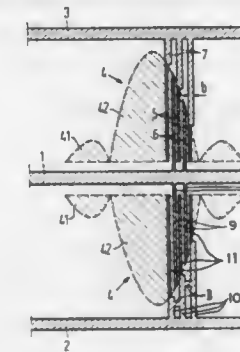
Int. Cl.<sup>2</sup> H03H 9/04, 9/30, 9/26; H01L 41/10

U.S. Cl. 333-151

8 Claims

1. Transducer electrodes on piezoelectric substrates for passband filters or delay lines utilizing surface waves wherein the transducers are in the form of interdigital structures with longitudinally weighted electrode fingers (5, 6, 9, 11) the width of which is  $\lambda_0/4$  and the distance between centers of adjacent fingers is  $\lambda_0/2$ , characterized in that outside of the active overlap zone (4) the electrode fingers (5, 11) are fed by feeders

(7, 10) with a width of  $b = \lambda_0/2 = v/2f_0$  where  $\lambda_0$  = the wavelength of the surface wave at the center frequency  $f_0$ ; and



$v$  = propagation velocity of the surface wave, and the distance between centers of adjacent feeders (7, 10) is  $\lambda_0$ .

4,160,220

## PRECISION MICROWAVE DELAY CIRCUIT AND METHOD

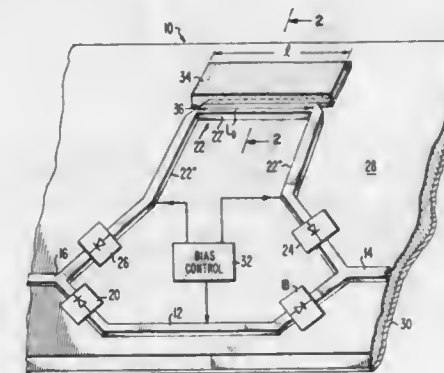
Vitaly Stachejko, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,760

Int. Cl.<sup>2</sup> H01P 1/18, 11/00, 3/08

U.S. Cl. 333-161

13 Claims



1. In a microwave delay circuit, in combination:  
 a transmission line having a given impedance;  
 an input terminal coupled to said line to which a signal at a given microwave frequency, which it is desired to delay, may be applied;  
 an output terminal spaced from said input terminal, also coupled to said line; and  
 resistive means having an electromagnetic radiation resonance at a microwave frequency sufficiently different than said given microwave frequency so that negligible microwave energy at said given frequency is attenuated by said resistive means, said resistive means being positioned adjacent a portion of said transmission line between said input and output terminals, and having a dielectric constant and a permeability sufficiently close in value so as to have negligible effect on said given impedance, whereby said resistive means delays a microwave signal at said given frequency, when such a signal is applied to said input terminal and is propagating along said portion of said transmission line, an amount dependent upon the position of said resistive means with respect to said transmission line and upon the values of said dielectric constant and permeability and with negligible impedance mismatch and negligible attenuation of said microwave signal.

4,160,221

## UNIQUE TIMING DEVICE CONSTRUCTION

Isamu Ohara, Okayama; Tsutomu Muranaka, Tamano, and Hideo Elzumi, Okayama, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

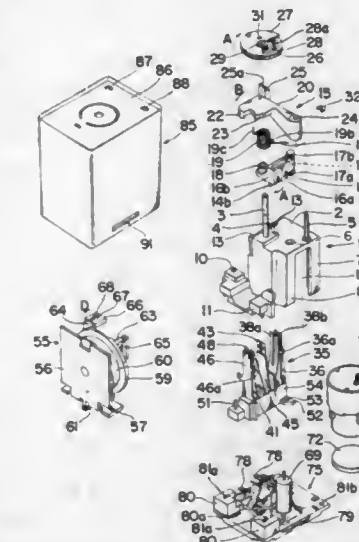
Filed Oct. 4, 1977, Ser. No. 839,302

Claims priority, application Japan, Oct. 4, 1976, 51-133552[U]; Oct. 12, 1976, 51-137260[U]

Int. Cl.<sup>2</sup> H01H 3/42

U.S. Cl. 335-68

11 Claims



1. A timing device comprising:  
 a contact assembly;  
 a contact actuator for actuating said contact assembly;  
 an electromagnet for resetting said contact actuator in response to a reset signal;  
 a driven gear containing a cam surface thereon controlling movement of said contact actuator;  
 a motor for driving said driven gear;  
 means for coupling said motor to said driven gear;  
 a molded frame to which said contact assembly, said contact actuator, said electromagnet, said means for coupling and said motor are attached;  
 a housing covering said molded frame; and  
 a base member to which said electromagnet is attached, said molded frame being partially sandwiched and fixed between said base member and electromagnet.

4,160,222

## MONOSTABLE ELECTROMAGNETIC RELAY WITH PERMANENT MAGNETIC BIAS

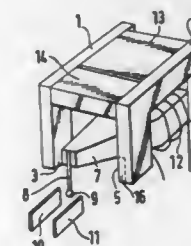
Hans-Werner Reuting, Peine, Fed. Rep. of Germany, assignor to Elmeg-Elektro-Mechanik Gesellschaft mit beschränkter Haftung, Peine, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,338

Int. Cl.<sup>2</sup> H01H 51/22

U.S. Cl. 335-85

16 Claims



1. In an electromagnetic relay having two magnetic circuits



which include respectively at least one pole shoe per circuit, permanent magnet means common to the two circuits and being coupled to the pole shoes, an armature movably disposed to assume positions of abutment with one or the other one of the two pole shoes thereby completing respectively a first one and a second one of the two magnetic circuits, the relay having in addition spring contact means, the armature being provided with means for engaging the spring contact means, the relay further being provided with coil means to obtain electromagnetic energization to place the armature into a position of abutment with one or the other one of the pole shoes depending upon the direction of the electromagnetic energization, said spring contact means being biased in said positions of abutment tending to move said armature out of either of said positions of abutment, the improvement comprising:

the magnetic reluctance of the first circuit being larger than the magnetic reluctance of the second circuit and said spring contact means providing a force exceeding the magnetic attraction of the armature in a position of abutment for completing the first circuit to place the armature always in a position to complete said second circuit upon de-energization of the coil means irrespective of the position the armature had immediately preceding the de-energization of the coil means.

4,160,223

# PLURAL REED SWITCHES HAVING AN INTEGRAL, INTERCONNECTING WEB

Vaughan Morrill, Jr., and Stanley F. Jackes, both of St. Louis, Mo., assignors to Morex, Inc., St. Louis, Mo.

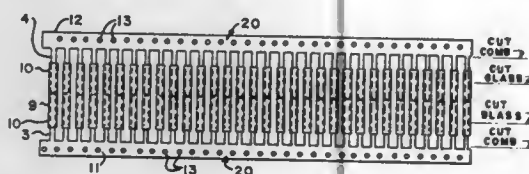
Division of Ser. No. 729,005, Oct. 4, 1976, Pat. No. 4,055,888.

This application Aug. 22, 1977, Ser. No. 826,727

Int. Cl.<sup>2</sup> H01H 1/66

U.S. Cl. 335-152

1 Claim



1. An article of manufacture comprising a multiplicity of reed switches each having a glass envelope and two, electrically conductive reeds each with a seal section fused into said envelope and a reed section projecting from said envelope, said switches being in parallel, spaced, side by side relation to one another, and an electrically conductive web integral with and of a piece with all of the lead sections of reeds projecting from one end of said switches.

4,160,224

# TRANSFORMER

Donald W. Owen, 334 Foreman Ave., Norman, Okla. 73069

Filed May 11, 1977, Ser. No. 795,754

Int. Cl.<sup>2</sup> H01F 21/12

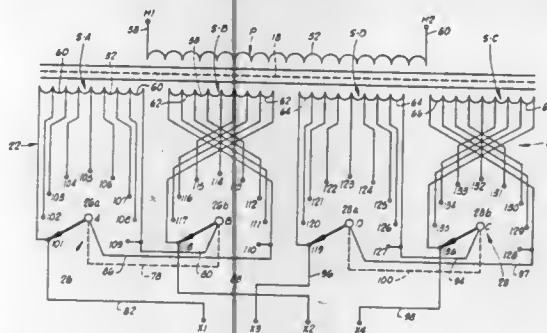
U.S. Cl. 336-147

14 Claims

1. A transformer comprising:  
a first electrical winding;  
two physically spaced, co-directionally wound inductive subwindings having an equal number of turns therein and each of said subwindings having a plurality of first through  $n + 1$  section outputs connected thereto with each consecutive pair of outputs defining first through  $n$  winding sections each having a predetermined number of turns within the respective winding section;  
means for inductively linking said first winding with said two inductive subwindings;  
a tandem switch having two synchronously operative wiper contacts, each wiper contact being in coaction with a respective plurality of first through  $n + 1$  selectively connectable contacts which are connected to a respective

one of said first through  $n + 1$  section outputs for a respective one of said subwindings; and

output terminals connected to said contacts whereby, when said wiper contacts are at a synchronized first position relative to said selectively connectable contacts, said two inductive windings are in total parallel, and when said wiper contacts are at a synchronized  $n + 1$  position relative to said selectively connectable contacts, said two inductive windings are in total series, and when said wiper



contacts are at intermediate positions relative to said selectively connectable contacts, said two inductive windings are in a series-parallel-series configuration in which the paralleled sections are asymmetrically positioned in relation to said first electrical winding whereby the sections of a first one of said two inductive windings, which sections are those in parallel with sections of the other of said two inductive windings, are relatively spatially closer to said first electrical winding than are the respective paralleled sections to the other of said two inductive windings.

4,160,225

# TEMPERATURE RESPONSIVE CONTROL DEVICE WITH IMPROVED HYDRAULIC DIAPHRAGM

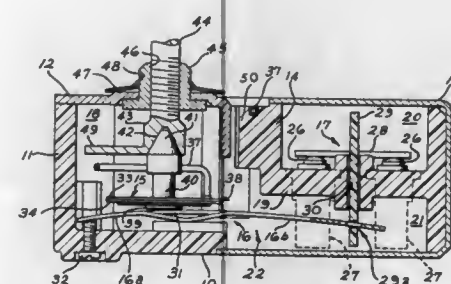
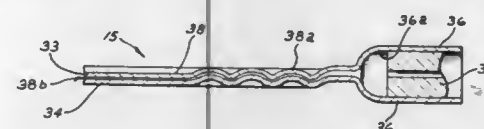
Paul T. Durst, Brookfield, Ill., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 14, 1977, Ser. No. 851,010

Int. Cl.<sup>2</sup> H01H 37/38, 37/40, 37/42

U.S. Cl. 337-321

4 Claims



1. A temperature responsive control device comprising:  
(a) a housing;  
(b) electrical switching means within said housing for making and breaking an electric circuit;  
(c) a temperature sensitive expansible member including a hydraulic diaphragm located within said housing, said hydraulic diaphragm comprising two plates joined to-

gether at their outer edges and connected by a fluid filled capillary tube to a remote temperature-sensing means, each of said plates including a first raised portion extending inwardly from the edge thereof, said plates being joined together with said first raised portions in juxtaposition to form a channel directly in the said diaphragm, said diaphragm being adapted to produce mechanical movement through expansion and contraction in accordance with the direction and extent of the temperature changes experienced by the remote temperature-sensing means, said capillary tube being connected directly to said hydraulic diaphragm by receipt of said capillary tube in said channel and securing said capillary tube therein;

(d) a spring mechanism mounted within said housing, said spring mechanism including a first portion engageable by said diaphragm and a second portion engaging said switching means, said spring mechanism transferring said mechanical movement of said diaphragm to effect the opening and closing of said switching means; and

(e) manually adjustable means engaging said diaphragm for moving said diaphragm with respect to said spring mechanism so as to vary the amount of mechanical movement of said expansible member required to cause the opening and closing of said switching means.

4,160,226

# SNAP-ACTING THERMALLY RESPONSIVE ACTUATORS

John C. Taylor, 9 Homefield Park, Ballasalla, Castletown, Isle of Man

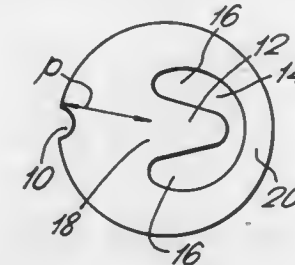
Continuation-in-part of Ser. No. 639,856, Dec. 11, 1975, abandoned. This application Jan. 31, 1978, Ser. No. 874,012

Claims priority, application United Kingdom, Dec. 12, 1974, 53847/74; Oct. 30, 1975, 45024/75

Int. Cl.<sup>2</sup> H01H 37/52

U.S. Cl. 337-379

20 Claims



1. A snap-acting thermally responsive bimetallic actuator comprising a bimetallic sheet member having an aperture with an outer perimeter and an inner perimeter defining a tongue free at one intermediate two lobe portions of said aperture, said inner perimeter and arcuate portions of said outer perimeter smoothly merging at rounded ends of the aperture adjacent the tongue root, an area of said member surrounding said tongue and in relation to which said tongue at least in part is generally centrally disposed having been deformed in a die pressing operation to conform in shape to a die of domed configuration, said domed area being such as to reverse its curvature with a snap action with change in temperature, the width of the domed area surrounding said tongue measured radially from the centre of the domed area being greatest in the region of the tongue root, and the length of the tongue being greater than the width of the tongue as measured at the mid-point of the length of the tongue.

4,160,227

# THERMISTOR COMPOSITION AND THICK FILM THERMISTOR

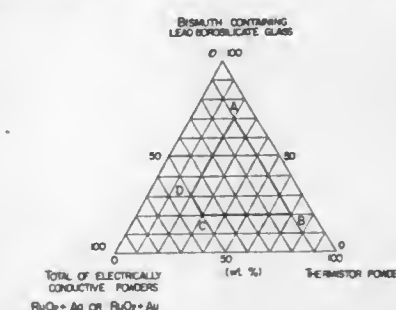
Akira Ikegami; Hiromi Tosaki; Jun Yamada; Teruo Mozume, all of Yokohama; Ichiro Tsubokawa, Fujisawa, and Kiyoshi Sakashita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 778,954

Int. Cl.<sup>2</sup> H01C 7/10

U.S. Cl. 338-22 R

10 Claims



1. A thermistor composition comprising a thermistor characteristic powder consisting of a reaction product obtained by solid phase reaction of  $MnO_2$ ,  $CoO$  and  $NiO$ , a bismuth-containing lead borosilicate glass frit, an electrically conductive powder selected from the group consisting of a mixture of silver powder and ruthenium oxide powder and a mixture of gold powder and ruthenium oxide powder, characterized in that a mixing ratio of the thermistor characteristic powder, the glass frit and the electrically conductive powder is in the area of the quadrilateral ABCD in the accompanying triangular diagram of FIG. 1 and the amount of ruthenium oxide powder in the electrically conductive powder is 15-95% by weight of the total weight of the electrically conductive powder, with the vertices A, B, C and D of the quadrilateral ABCD being the points showing the following compositions:

Thermistor characteristic powder (% by weight)	Electrically conductive powder (% by weight)	Glass frit (% by weight)
A 20	10	70
B 70	10	20
C 30	50	20
D 20	50	30

4,160,228

# METHOD AND APPARATUS FOR TESTING MARINE SEISMIC CABLES

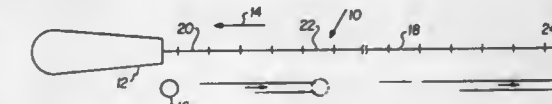
Larry J. Hix, Plano; Phillip W. Wise, Richardson, and David H. Bennyhoff, Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 651,894, Jan. 23, 1976, abandoned. This application Mar. 1, 1977, Ser. No. 773,376

Int. Cl.<sup>2</sup> G01V 1/38

U.S. Cl. 340-7 R

2 Claims



1. A method of testing a marine seismic cable of the type having a plurality of electro-acoustic transducer groups disposed therealong, each of said groups having a common output comprising the steps of:

- (a) positioning an acoustic energy source at a substantially fixed location in a body of water;
- (b) energizing said source so as to inject repetitive acoustic pulses into the water;
- (c) towing said marine seismic cable past said energy source in a normally deployed condition along a course such that the amplitude of the resultant output signal of each of said plurality of transducer groups resulting from directly travelling, non-reflected waves varies substantially with distance from said source;
- (d) recording said varying output signals from said directly travelling waves for each of said transducer groups; and
- (e) visually comparing by means of said recordings the polarity and the amplitude progression of each of said output signals in order to detect the existence of anomalies in said output signals.

4,160,229

**CONCENTRIC TUBE HYDROPHONE STREAMER**  
 Ronald B. McGough, Bellevue, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 703,493, Jul. 8, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,316  
 Int. Cl.<sup>2</sup> G01V 1/38

U.S. Cl. 340—7 R

16 Claims



1. In hydrophone streamer apparatus having an elongated hollow jacket with means at one end for connection to a marine vessel, and along which are located spaced hydrophone transducer elements for producing electrical signals indicative of pressure variations in the medium surrounding the streamer, improved mechanical isolation means for effecting two stages of isolation between the transducer elements and the jacket comprising:

- a compliant tubular member positioned within the jacket and having an outer diameter smaller than the inner diameter of the jacket;
- a plurality of compliant support devices between the inner surface of the jacket and the outer surface of said tubular member at spaced locations therealong for maintaining said tubular member in a generally central position within the jacket, each support device comprising at least three separated elements spaced around said tubular member; and
- compliant mounting means for supporting a plurality of spaced transducer elements within said tubular member so that individual transducer elements are located between adjacent support devices.

4,160,230

**ACOUSTIC ANTENNA**

Philippe H. Cluzel, Six-Fours-Les-Plages, France, assignor to Etat Francais, France

Filed Feb. 10, 1977, Ser. No. 767,293

Claims priority, application France, Mar. 8, 1976, 76 06457  
 Int. Cl.<sup>2</sup> H04B 13/00

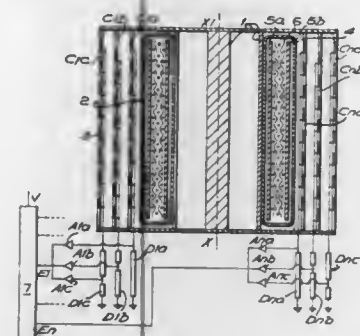
U.S. Cl. 340—9

12 Claims

1. An acoustic antenna having a widened pass band extending over a plurality of octaves, said antenna comprising:
  - a support;
  - an acoustic reflector, having a reflecting surface, enveloping said support and supported thereby;
  - a plurality of piezoelectric transducers arranged forwardly of said acoustic reflector in the direction of reception for cooperating therewith, said transducers being disposed on a plurality of columns located at respective different distances from said acoustic reflector, at the respective intersections of a plurality of surfaces extending parallel to said

reflecting surface with a plurality of planes extending perpendicular to said reflecting surface;

sensitivity compensation means for reducing the relative sensitivities of said transducers so that the sensitivity of each transducer spaced more distant from the reflector is reduced relative to the sensitivity of each transducer spaced closer to said reflector; and



signal combining means for forming listening channels, said signal combining means having a plurality of inputs and the outputs of all said sensitivity compensations means corresponding to all the columns of transducers located in each plane perpendicular to said reflecting surface being connected in parallel to the said inputs of said signal combining means.

4,160,231

**LOW FREQUENCY DIPOLE HYDROPHONE TRANSDUCER**

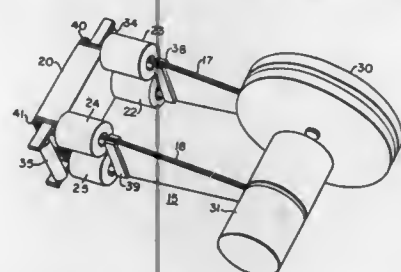
John H. Thompson; George R. Douglas, both of Pittsburgh, Pa., and Charles R. Wilson, Glen Burnie, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1973, Ser. No. 352,820

Int. Cl.<sup>2</sup> H04B 13/00

U.S. Cl. 340—11

12 Claims



1. A dipole hydrophone for use in an ambient medium comprising:

- (A) a coupling member,
- (B) a first magnetostrictive multilaminar arm portion connected to said coupling member;
- (C) a second magnetostrictive multilaminar arm portion connected to said coupling member;
- (D) each of said arm portions including an end defining a plurality of legs;
- (E) means for establishing a magnetic biasing flux in said legs;
- (F) winding means disposed about said legs;
- (G) a radiation target connected to the other end of said first arm portion and responsive to ambient medium particle velocity to bend said arm portion in response thereto, to provide a corresponding signal in its associated winding means;
- (H) a counterbalancing mass connected to the other end of said second arm portion and being constructed to present a substantially smaller area to ambient medium particle

velocity, normal to its associated arm portion, than that of said radiation target;

- (I) said first and second arm portions being connected to said coupling member such that said winding means are located between said connection and radiation target for said first arm portion, and between said connection and counterbalancing mass for said second arm portion.

4,160,232

**LOW FREQUENCY DIPOLE HYDROPHONE TRANSDUCER**

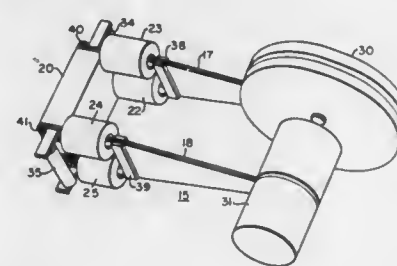
Charles R. Wilson, Glen Burnie, and Raymond U. Sims, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1973, Ser. No. 352,821

Int. Cl.<sup>2</sup> H04B 13/00

U.S. Cl. 340—11

9 Claims



1. A dipole hydrophone for use in an ambient medium comprising:

- (A) a first magnetostrictive multilaminar arm portion;
- (B) first winding means coupled to said arm portion;
- (C) a radiation target connected to said arm portion and responsive to ambient medium particle velocity to bend said arm portion in response thereto, to provide a corresponding signal in said winding means; and
- (D) means for cancelling signals caused by mechanical movement of said hydrophone.

4,160,233

**SEISMIC ARRAY**

William H. Mayne; William S. Hawes, and Algernon S. Badger, all of Houston, Tex., assignors to Geosource Inc., Houston, Tex.

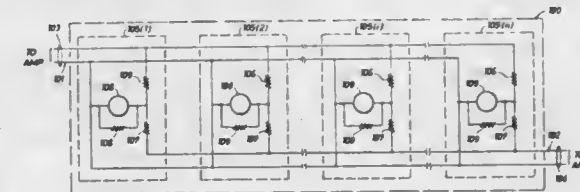
Continuation of Ser. No. 727,019, Sep. 27, 1976, abandoned. This application Aug. 16, 1977, Ser. No. 825,117

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> G01V 1/20

U.S. Cl. 340—15.5 MC

20 Claims



1. A seismic array which comprises:

- a plurality of seismic detector connection points;
- a seismic detector at each seismic detector connection point;
- a weighting resistor at each seismic detector connection point, said weighting resistor having one end thereof connected to one output of the seismic detector;
- damping resistor at each seismic detector connection point, said damping resistor being connected across the outputs of the seismic detector, the parallel combination of the weighting resistor and the damping resistor at each seismic detector connection point being substantially the

same for all seismic detector connection points in the array;

- a pair of wires which interconnects the seismic detector connection points in the array and which emerges from one end of the array, the first wire of said pair being connected to the second terminal of the weighting resistor at each seismic detector connection point and the second wire of said pair being connected to the other output of each seismic detector at each seismic detector connection point;
- an amplifier which is connected to the pair of wires emerging from the array; and
- a feedback network, including a feedback resistor which is associated with the amplifier, the ratios of the value of the feedback resistor to the value of the weighting resistors at the seismic detector connection points defining the elements of a ratio set, each said element determining the magnitude of signal appearing at the output of the amplifier from the response of the seismic detector at a given seismic detector connection point.

4,160,234

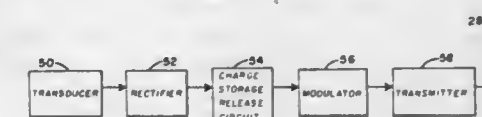
**ABNORMAL TIRE CONDITION SENSING SYSTEM**  
 Donald J. Karbo, Shaker Heights; David A. Betts, Euclid, and Lyle A. Pauer, Rocky River, all of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 29, 1976, Ser. No. 671,471

Int. Cl.<sup>2</sup> B60C 23/06

U.S. Cl. 340—58

12 Claims



1. An abnormal tire condition indicating system comprising:
  - transducer means including a piezoelectric crystal means for producing electrical energy in response to mechanical pressure exerted by the rotation of a tire resulting from an abnormal condition in said tire;
  - transmitter means powered by the energy produced for transmitting a radio frequency abnormal condition signal;
  - receiver means adapted to receive and recognize said abnormal condition signal for providing a warning of the condition;
  - charge storage means for storing the energy generated by the transducer means, said charge storage means including rectifier means for transforming the electrical energy of the transducer means into direct current pulses and capacitor means connected to the rectifier means for storing direct current pulses; and
  - release means for releasing the energy stored by the charge storage means to the transmitter means.

4,160,235

**PULSE GENERATOR**

Gerhard Krumrein, Neuenstadt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 841,312

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647569

Int. Cl.<sup>2</sup> B60Q 1/46; H03B 3/282; H03K 1/08

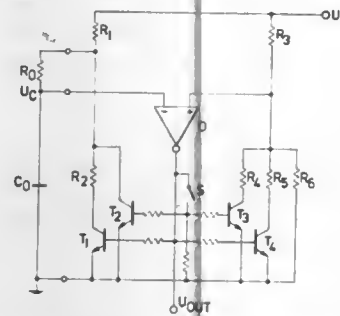
U.S. Cl. 340—81 R

5 Claims

1. A pulse generator with a switchable output frequency and a selectable clock pulse ratio in the different output frequencies from a comparator, to the input of which is connected a voltage divider and a capacitor which is chargeable by the supply voltage, whereby an output signal dependent on the ratio of the input voltages arises at the output of the comparator, as well as having two transistors connected at the output of the

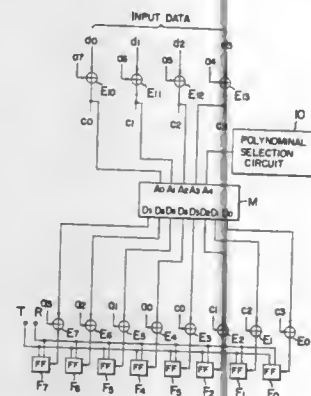


comparator, whereby the voltage ratio of the voltage divider is adjusted by one transistor so as to determine the frequency, while the other transistor forms a discharge current path for the capacitor, characterized in that at least two further transistors are connectible to the output of the comparator via a switch whereby the divider ratio of the voltage divider may be set by one transistor so as to change the frequency, while the other transistor path represents a further discharge current path for the capacitor.



**4,160,236**  
**FEEDBACK SHIFT REGISTER**  
Takafumi Oka, Odawara, and Hiroshi Nakanishi, Sayama, both of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Public Corporation, both of Japan  
Filed Sep. 7, 1977, Ser. No. 831,140  
Claims priority, application Japan, Sep. 10, 1976, 51-107755  
Int. Cl.<sup>2</sup> G06F 11/12  
U.S. Cl. 340-146.1 AL

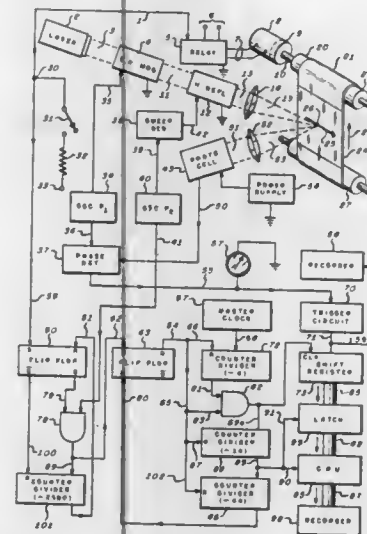
8 Claims



4. A circuit for generating an error check and correction code for data transferred between devices comprising:  
a register for storing an error check and correction code which consists of a plurality of bits;  
address generating means responsive to said data and the contents of said register for generating addresses, said addresses being different from each other corresponding to the states of the data received and the contents of said register;  
memory means responsive to said addresses for providing information stored in respective addressable locations representing the results of a predetermined logical operation on different selected data to obtain error check and correction codes; and  
renewing means responsive to an output from said memory means for setting new error check and correction codes into said register.

**4,160,237**  
**OPTICAL READER FOR MULTILINE IMAGE PROCESSING**  
Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.  
Filed Feb. 2, 1978, Ser. No. 874,450  
Int. Cl.<sup>2</sup> G06K 9/00  
U.S. Cl. 340-146.3 F

20 Claims



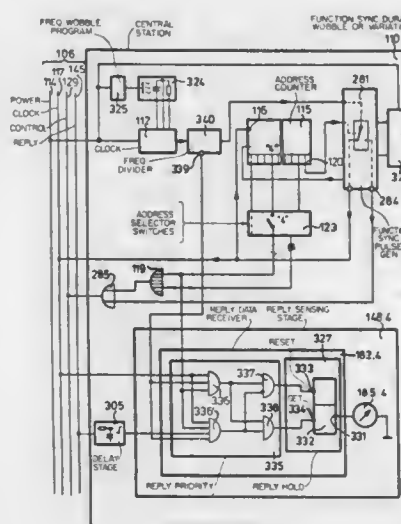
1. In optical pattern inspection apparatus:  
source means for generating a light beam, first signal generator means,  
modulator means responsive to said first signal generator means for cyclically shifting the polarization of said light beam between first and second polarization states,  
focusing means responsive to said first and second polarization states for cyclically forming, at least at one point on said pattern, successive first and second spots of light of respective first and second different diameters,  
light detector means for receiving light scattered by said pattern when illuminated by said first or second spots of light,  
phase detector means responsive to said light detector means and to said first signal generator means for providing a variable polarity output representative of the difference in light scattered by said pattern from said first and second spots of light, and  
utilization means for utilizing said variable polarity output.

**4,160,238**  
**REMOTE CONTROL ADDRESSING AND REPLY INDICATING SYSTEM**  
Albert Weckenmann, Ahrensburg; Jürgen Wesemeyer, Nürnberg; Georg Haubner, Berg; Werner Meier, Schwabach, and Hartmut Zöhl, Fürth, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Sep. 26, 1977, Ser. No. 836,979  
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644106  
Int. Cl.<sup>2</sup> H04Q 11/04  
U.S. Cl. 340-147 R

36 Claims

1. Remote control system for selection of at least one of a plurality of selectively switchable loads (122) from a central station (110) comprising  
a bus system (106) connected to said central station and having a power bus (114), a clock bus (117), a load switching control bus (129), and a load reply bus (145);  
said central station (110) including a clock source (112);  
timing means (115, 281) defining a selection cycle and connecting said clock (112) to said clock bus (117) for a predetermined number of clock pulses;

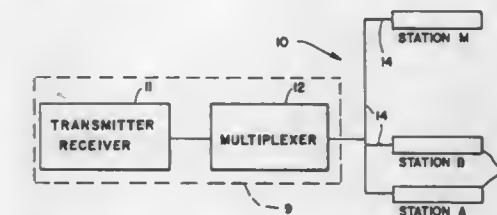
load address means (123) to select connection of the selected load (122.4) to the power bus (114);  
means (115) providing control signals synchronized with the clock pulses, coded in accordance with the load addressing means;  
a load reply sensing stage (148) connected to the reply bus (145) to decode acknowledgment reply signals received from addressed loads;  
and indicator means (185, 352) responsive to the output of the reply sensing stage;  
at least some of said loads comprising  
a load control receiver (111) having a decoding stage (130, 131, 135) connected to both said clock bus (117) and said control bus (129) to decode address command signals on the control bus appearing in synchronism with a clock pulse on the clock bus;  
reply signal generator means (149) generating a signal indicative of response by the respective addressed load to the commanded switching function;



reply transmitting logic means (146) connected to the reply bus (145) and to the reply signal generator means (149) providing an operating function acknowledgment signal to said reply bus (145) substantially synchronously with the occurrence of said address command signal and hence the respective clock pulse on the clock bus (117), wherein, in accordance with the invention,  
at least one of the reply signal generator means (149) of one of said receivers (111) comprises a data generating stage (341, 341', 174);  
and, in the central station, the reply decoding stage (148) comprises  
a data receiving stage (182) connected to the reply bus (145) and the clock bus (117) and including a holding circuit (327; 332; 357),  
and means (335, 337; 335', 357, 336, 336') cyclically resetting the holding circuit in accordance with the duration or time passage of sequential selection cycles.

**4,160,239**  
**TRANSPONDER SYSTEM INCLUDING AN OSCILLATOR/RIPPLE COUNTER CONTROLLING A FIXED GRAY CODE LOGIC NETWORK IN CIRCUIT WITH A DECODER/DRIVER NETWORK FOR GENERATING "RED ALERT" END CONDITION DIGITAL SIGNALS IN A STORAGE TANK GAUGING SYSTEM**  
John S. Adamson, La Habra, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
Filed Nov. 25, 1977, Ser. No. 854,916  
Int. Cl.<sup>2</sup> H04Q 9/00; G08B 21/00  
U.S. Cl. 340-152 T

14 Claims



1. Transponder network for generating a "red-alert" digital code upon (i) occurrence of an overflow condition within a storage tank under survey and (ii) receipt of a square wave interrogation signal from a transmitter/receiver of a tank gauging system located at a central station remote from said storage tank but electrically connected to said transponder network through an INTERROGATION, a MARK and a SPACE line of said tank gauging system, comprising:

- I/O network for receiving said interrogation signal including voltage divider means for generating a microcircuit drive voltage for a period coincident with the pulse width of said interrogation signal;
- an oscillator/ripple counter formed essentially of MSI's connected to said I/O network and including at an input, a power-on-reset network for generating a reset pulse for said oscillator/ripple counter, said oscillator/ripple counter generating, in response to said reset pulse, sets of square wave pulses of differing repetition rates and pulse widths;
- a logic network means and multi-segment decoder/driver means connected to each other and to (B) responding to selected sets of said square wave pulses to generate a synthetic digital code at microcircuit signal levels at an output means of said decoder/driver means;
- switching transistor means having one or more inputs connected to said decoder/driver means of (C), and one or more output means connected to said MARK and SPACE lines through said I/O of (A), switching transistor means being controllable as a function of said synthetic digital code to drive said MARK and SPACE lines between tank gauging operating potentials for generating said "red-alert" digital code of interest at said central station whereby said overflow condition within said storage tank can be indicated.

**4,160,240**  
**BINARY DIGITAL PAGER HAVING AN EIGHT FUNCTION CODE READ-OUT**  
Phillip Partipilo, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.  
Filed Jan. 13, 1978, Ser. No. 869,394  
Int. Cl.<sup>2</sup> G06F 7/02; H04L 1/10; H04M 11/02; H04Q 3/02  
U.S. Cl. 340-311

18 Claims

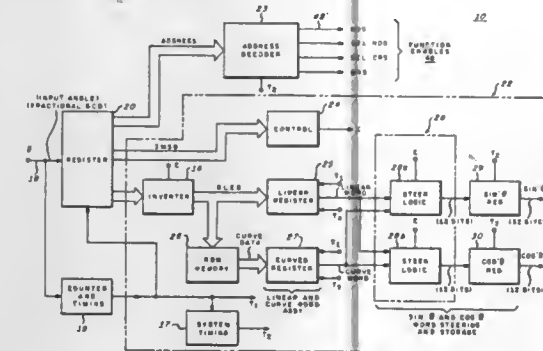
1. In a communications device for responding to a predetermined two-word binary address code within a stream of received data bits, logic circuitry for providing multiple function code displays comprising in combination;  
first register means for sampling and temporarily retaining the received data bits;





representative of the sine and cosine components of the digital input angular data wherein the pseudo sine and pseudo cosine components are represented by a linear portion for one of the components and a curved portion for the other component in predetermined angular octants identified by the 3 MSB of said digital signal and wherein in each of said octants the ratio of the pseudo sine to the pseudo cosine components is equal to the true tangent of the input angular data comprising:

first means responsive to  $n$  bits of the digital signal for linearly decoding said  $(n)$  bits to provide a first digital signal representative of a value of the linear portion of one of said pseudo sine and pseudo cosine components of said input angular data,



second means including addressable memory means responsive to said  $(n)$  bits of the digital signal for providing a second digital signal corresponding to a value of the curved portion of said other component which when algebraically combined with said first digital signal represents the other of said pseudo sine and pseudo cosine components, and

third means responsive to the three most significant bits of said digital signal and said first and second digital signals for identifying said angular octant and algebraically combining appropriate ones of said pseudo sine and pseudo cosine components such that the ratio of said pseudo sine to said pseudo cosine component is equal to the true tangent of said digital input angular data in said octants with an  $(n+3)$  bit resolution.

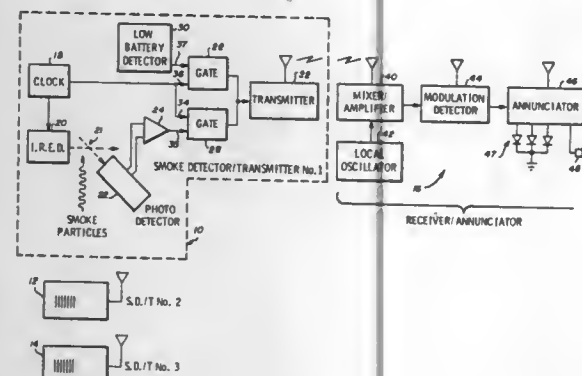
4,160,246

**WIRELESS MULTI-HEAD SMOKE DETECTOR SYSTEM**  
Stephen M. Martin, Pleasanton, and Ralph P. Miller, Sunnyvale, both of Calif., assignors to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Oct. 3, 1977, Ser. No. 839,074  
Int. Cl.<sup>2</sup> G08B 17/10

U.S. Cl. 340—630

9 Claims



1. A detector/transmitter unit for a wireless smoke detector system comprising at least one detector/transmitter unit and a receiver/annunciator unit for producing alarm signals in response to actuating signals transmitted by radio frequency

waves from said at least one detector/transmitter unit, said detector/transmitter unit comprising:

pulse means for repetitively generating a clock signal;  
an infrared source for repetitively generating a beam of infrared radiation responsive to said clock signal and substantially coincident in time with said clock signal;  
a photodetector having a collection axis angularly intersecting said beam for detecting infrared radiation reflected from smoke particles encountered by said beam and for developing an infrared detection signal whenever smoke particles are detected;

low battery voltage detecting means for monitoring the voltage across a power source for the detector/transmitter unit and for developing a low battery signal whenever said voltage falls below a predetermined level; and  
transmitter means (1) for generating a first actuating signal for said receiver/annunciator unit in response to both said clock signal and said low battery signal, and (2) for generating a second actuating signal for said receiver/annunciator in response to both said clock signal and said detection signal.

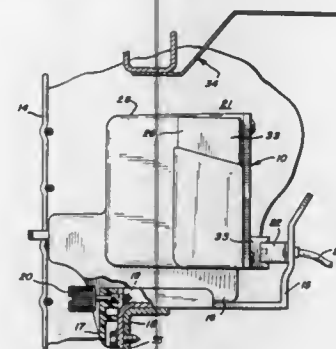
4,160,247

**MEANS FOR HOUSING AN ELECTRICAL CONTROL**  
James P. Laughlin, Jr., Evansville, Ind.; Mark C. Loessel, St. Joseph, Mich., and Robert H. O. Kraemer, Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 3, 1977, Ser. No. 765,498  
Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 340—693

16 Claims



1. In an electrical apparatus having structural means defining a partially enclosed control space, the improvement comprising:

electrical control means provided with a control circuit and a replaceable component;  
housing means housing said control means; and  
means for removably mounting the housed control means in said control space, said structural means being arranged to preclude access to said control circuit in said housing means when said housed control means is in said control space, said replaceable component precluding access to a portion of said control circuit when said component is associated with said control circuit.

4,160,248

**SOLID STATE PULSED COHERENT DOPPLER RADAR**  
Theodore Hubka, Pleasantville, and Robert W. Slater, Bardonia, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 25, 1977, Ser. No. 854,570  
Int. Cl.<sup>2</sup> G01S 9/44

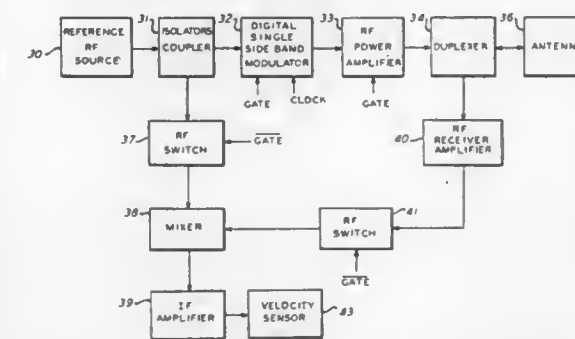
U.S. Cl. 343—8

4 Claims

1. A Doppler radar comprising:  
a transmitter,  
a receiver,

a common antenna connected to said transmitter and said receiver for transmission and reception of radar signals, a source of rf signals having a constant frequency, means in said receiver for obtaining an IF frequency by sampling a portion of said rf signals for use as a local oscillator and combining said local oscillator signals with return signals in a mixer,

means in said transmitter for translating the frequency of said rf signals to a frequency representing the addition of said IF frequency with the frequency of said rf signals during transmit time and reverting back to the frequency of said rf signals during receive time, and



means for simultaneously gating on said rf signals during transmit time and gating off said rf signals during receive time whereby leakage amplitude modulation signals are not demodulated into said receiver wherein said frequency translating means comprises a digital binary counter for translating said rf signals whereby leakage amplitude modulation sideband signals are not demodulated into the mixer of said receiver and said leakage signals lie outside the centered passband Doppler frequency.

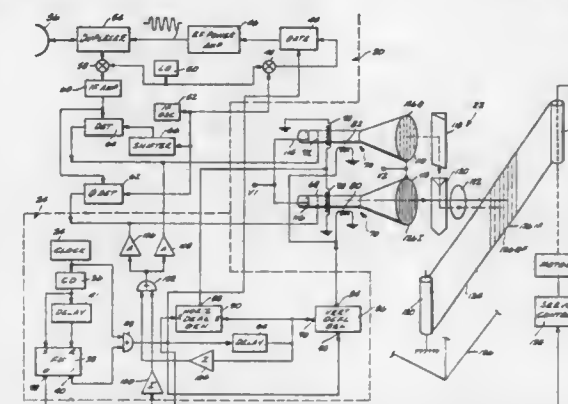
4,160,249

**ANALOGUE STORAGE AND PROCESSING SYSTEM**  
Joseph R. Kotlarski, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 8, 1967, Ser. No. 638,696  
Int. Cl.<sup>2</sup> G01S 9/44

U.S. Cl. 343—9 PS

13 Claims



1. A system for the storage, retrieval and processing of a plurality of signals comprising:  
a signal source for providing a plurality of simultaneously occurring first data signals;  
means, including a storage surface, coupled to said signal source for recording the plurality of first data signals on said storage surface in a spatially interleaved pattern along a first dimension of said storage surface; and  
readout means for scanning said storage surface along a dimension transverse to the first dimension.

4,160,250

**ACTIVE RADAR MISSILE LAUNCH ENVELOPE COMPUTATION SYSTEM**

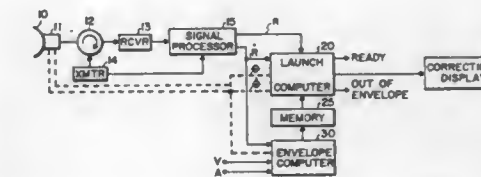
Walker Butler, and Randolph G. Moore, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 734,585, Oct. 21, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,254

Int. Cl.<sup>2</sup> G01S 9/04

U.S. Cl. 343—9 R

6 Claims



1. An active radar missile launch envelope computation system adapted to be mounted on a missile for control thereof comprising:

- a radar including a transmitter and a receiver for providing output signals indicative of the range to a target and the rate of change of the range;
- angle determining means incorporated in said radar for providing output signals indicative of the angular position and angular rate of the target relative to a predetermined axis fixed in relation to the missile and the rate of change of the angular position;
- computation means connected to receive the output signals from said radar and said angle determining means;
- memory means connected to said computation means and including storage means for signals indicative of maximum and minimum capabilities of the missile; and
- said computation means comparing received output signals to the maximum and minimum capabilities signals stored in said memory means and providing a ready output signal when the comparison lies within the stored capabilities.

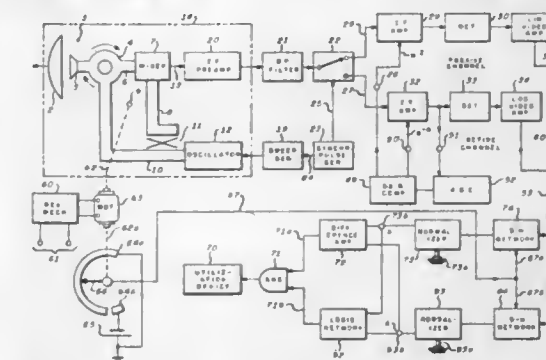
4,160,251

**HYBRID DUAL MODE RADIOMETRIC SYSTEM**  
Robert E. Lazarchik, Largo, and Robert S. Roeder, Dunedin, both of Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,752  
Int. Cl.<sup>2</sup> G01W 1/00

U.S. Cl. 343—100 ME

11 Claims



1. A high frequency radiometric system having azimuth scanning directive antenna means and receiver means and characterized by cyclic operation in an active mode wherein transmitted high frequency energy is radiated and received and a passive mode wherein radiometric noise signals are received, said high frequency radiometric system comprising:  
synchronizer means,  
voltage controlled high frequency generator means for producing a cyclic signal having successive swept and con-

stant carrier frequency portions in response to said synchronizer means during said respective active and passive modes,

isolator means for coupling a first portion of said cyclic signal from said voltage controlled high frequency oscillator means for illumination of a target by said directive antenna means in a terrain radiating radiometric noise signals,

coupler means for coupling a second portion of said cyclic signal from said voltage controlled high frequency oscillator means to said receiver means for generating therein a beat frequency signal,

active and passive signal detector means,

switch means responsive to said synchronizer means for coupling said beat frequency signal to said active signal detection means during said active mode and to said passive signal detector means during said passive mode,

computer means responsive to said active and passive detector means for yielding a response substantially only in the presence of said target while suppressing effects of said radiometric signals,

said computer means including at least:

first sample-and-hold means responsive to said passive detector means,

second sample-and-hold means responsive to said active detector means,

sampling control means cyclically actuated by said azimuth scanning directive antenna means for sampling the contents of said first and second sample-and-hold means for yielding processed passive and active signals, and

respective normalizer means for normalizing said processed passive and active signals,

utilization means responsive to said normalizer means in the presence of said response.

4,160,252

#### METHOD OF DETERMINING THE DIRECTION OF A RADIO SOURCE AND RADIO INTERFEROMETER SYSTEM

David A. Lucas, Crawley Down, and Richard P. Vincent, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

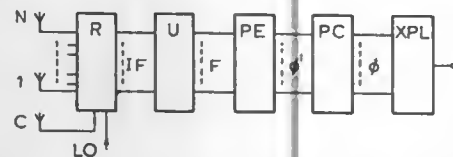
Filed Mar. 22, 1978, Ser. No. 888,839

Claims priority, application United Kingdom, Mar. 25, 1977, 12628/77

Int. Cl.<sup>2</sup> G01S 3/48

U.S. Cl. 343—113 R

5 Claims



1. A method of finding the direction of a radio source using a circular array of evenly-spaced aerial elements to find the phase differences between the signals from the source and received by successive pairs of aerial elements, from said phase differences a position on the circle being determined indicative of the direction of the radio source, characterized in that in digital form a plurality of phase differences are measured, the magnitude of the phase differences occurring for successive pairs of aerial elements having a sinusoidal variation, in that each digitally-expressed phase difference is examined to determine at least one point where the sinusoid crosses the zero axis and in that from this zero crossing point a position on the circle is derived indicative of the angle of incidence of the rays from the source relative to a reference direction.

#### 4,160,253 RADIO CONTROLLED, BATTERY-OPERATED MODEL TOY

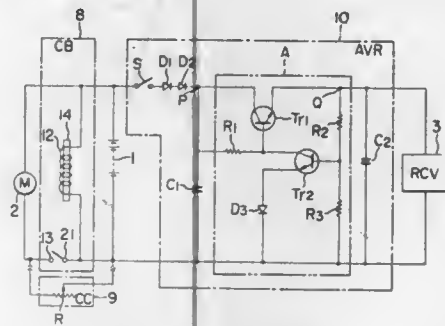
Kenichi Mabuchi; Yoshihisa Tsuchimochi, and Koziro Komatsu, all of Tokyo, Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,486

Claims priority, application Japan, Aug. 28, 1975, 50-104302 Int. Cl.<sup>2</sup> H04B 7/00

U.S. Cl. 343—225

4 Claims



1. A radio controlled, battery-operated model toy, comprising a radio controlled receiver, an electric motor, a battery device for supplying energy to the motor through an electric supply circuit, a servo-mechanism coupled to and operated by the output from the radio controlled receiver, a voltage responsive automatic circuit breaker connected between the battery device and the electric motor which opens the electric supply circuit of the electric motor in response to a voltage drop of the battery device and maintains the circuit in an open state, and a voltage regulator/noise filter connected between the battery device and the radio controlled receiver, the voltage regulator/noise filter comprising a filter circuit consisting of at least one diode and a capacitor, said diode series-connected between the battery device and the capacitor, and a voltage regulating circuit connected in parallel with the capacitor, and wherein said at least one diode is connected in the forward direction between the positive terminal of the battery device and the capacitor to prevent discharge of the capacitor upon a voltage drop of the battery, and further comprising a detecting transistor which detects the output voltage of the voltage regulating circuit and whose base current is controlled by the detected output voltage, and wherein the voltage regulating circuit comprises a current controlling transistor which is connected between the diode and the radio controlled receiver and whose base current is controlled by the detecting transistor, whereby the output voltage is maintained at a predetermined level despite voltage fluctuations and pulse-like noise from the battery device, and wherein a current limiter is provided in series between the battery device and the electric motor to supply current to the electric motor by shunting the supply current from the battery device to the electric motor when the voltage responsive automatic circuit breaker operates.

4,160,254

#### MICROWAVE DICHROIC PLATE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Thomas E. Wise, Derwood, Md.

Filed Feb. 16, 1978, Ser. No. 878,542

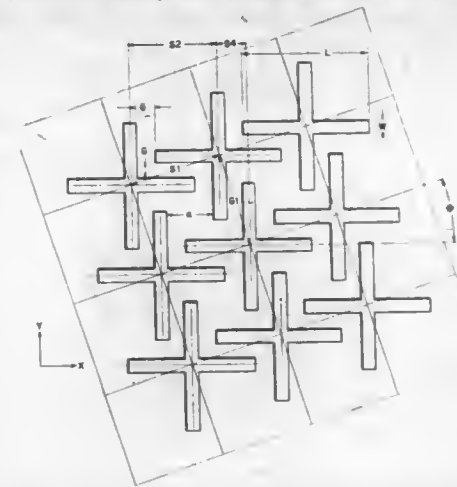
Int. Cl.<sup>2</sup> H01Q 15/00

U.S. Cl. 343—909

7 Claims

1. A dichroic plate for reflecting microwave energy within a certain frequency band and for passing microwave energy within another frequency band, said plate having an array of interlaced elements, each of said elements having first and second orthogonal arms of approximately the same length which are crossed at a point at the middle thereof, said arms

being arranged with their center lines aligned parallel to the X and Y axes of the array, the arrangement of said elements being



such that a line between the points of crossing of the arms of the closest adjacent elements has differing component values relative to said X and Y axes.

4,160,255

#### RECORDING APPARATUS WITH INTERMITTENT POWER USAGE

Keigo Kobayashi, Ibaraki, Japan, assignor to Mitogiken, Ltd., Japan

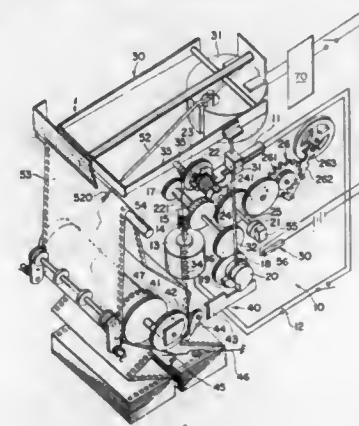
Filed Sep. 19, 1977, Ser. No. 834,497

Claims priority, application Japan, Oct. 4, 1976, 51-119699; Oct. 4, 1976, 51-134160[U]; Oct. 13, 1976, 51-138298[U]

Int. Cl.<sup>2</sup> G01D 15/04

U.S. Cl. 346—79

14 Claims



1. In dot type recording apparatus which has a power source, and dotting means and recording paper feed means, both being operated by said power source, and in which recording is executed by said dotting means causing a pointer of a meter operated by a measuring instrument to hit the recording paper, the improvement in such recording apparatus comprising:

said dotting means and said recording paper feed means having, a motor driving at least two cams and being driven by said power source, and a clock mechanism operated by rotation of said motor;

an electrical switch in circuit between said power source and said instrument and having "on" and "off" periods of time determined by said clock mechanism;

said dotting means pressing the pointer of the meter against the recording paper for a fixed dotting period of time by means of one of said cams rotated by said motor;

said paper feed means intermittently feeding recording paper a fixed length in a short fixed feeding period of time other

than the dotting period of time of said dotting means by means of another of said cams being rotated by said motor; and

means for operating said instrument and said meter only during a fixed period of time greater than and including said dotting period of time as determined by said "on" and "off" periods of time of said switch, in interlocking relationship with said dotting means, and thus operating said measuring instrument intermittently.

4,160,256

#### TUBULAR PEN FOR RECORDING APPARATUS

Peter Dziuk, Nuremberg, Fed. Rep. of Germany, assignor to J. S. Staedtler, Nuremberg, Fed. Rep. of Germany

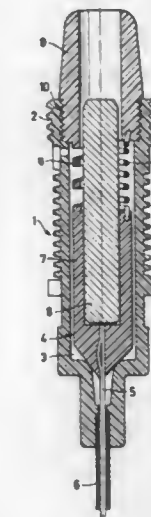
Filed Oct. 12, 1977, Ser. No. 841,565

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648319

Int. Cl.<sup>2</sup> G01D 15/16

U.S. Cl. 346—140 A

9 Claims



1. A tubular pen for recording apparatus and the like comprising a hollow body having an end cap, a freely displaceable weight within said body, said weight comprising a casing of synthetic resin material and a metallic core in said casing, and means firmly attached to each of said cap and weight for undetachably connecting said cap and weight such that there is a relative movement therebetween and the connected cap and weight define a single assembly.

4,160,257

#### THREE ELECTRODE SYSTEM IN THE GENERATION OF ELECTROSTATIC IMAGES

Jeffrey J. Carrish, Hopkinton, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jul. 17, 1978, Ser. No. 925,667

Int. Cl.<sup>2</sup> G03G 15/044; H01J 61/06

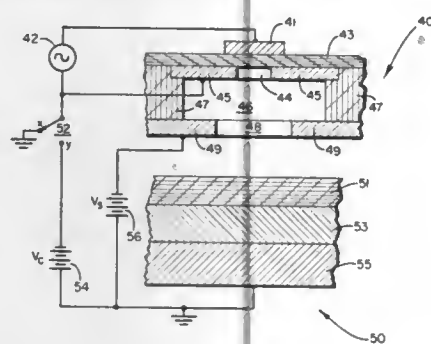
U.S. Cl. 346—159

16 Claims

1. An improved method for generating electrostatic images by means of an ion generating assembly of the type in which an alternating potential is applied between a "driver" electrode substantially in contact with one side of a solid dielectric member and a "control" electrode substantially in contact with an opposite side of the solid dielectric member, said control electrode having an edge surface disposed opposite said driver electrode to define an air region at the junction of the edge surface and the solid dielectric member, to induce ion producing electrical discharges in the air region between the solid dielectric member and the edge surface of the control electrode, and ions are extracted by an extraction potential  $V_c$  between the control electrode and a further electrode member and these ions



applied to a dielectric surface, in which the improvement comprises the steps of controlling the extraction of ions by providing an apertured "screen" electrode which is separated from the control electrode by an apertured solid dielectric member and which lies between the control electrode and the dielectric surface, and



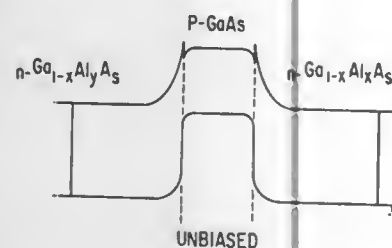
applying a "screen" voltage  $V_S$  between the screen electrode and the further electrode member, wherein  $V_S$  has a magnitude greater than or equal to zero and the same polarity as  $V_C$ ; and forming an electrostatic image with the extracted ions.

#### 4,160,258 OPTICALLY COUPLED LINEAR BILATERAL TRANSISTOR

Larry R. Dawson, Albuquerque, N. Mex., and Stephen Knight, Murray Hill, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1977, Ser. No. 852,728  
Int. Cl.<sup>2</sup> H01L 29/161

U.S. Cl. 357-16



1. A heterojunction phototransistor comprising a first epitaxial layer, said first layer having a first bandgap, a first carrier concentration, and a first conductivity type; a second epitaxial layer, said second layer being disposed on said first layer and having a second bandgap, a second carrier concentration, and a second conductivity type, said second bandgap being smaller than said first bandgap; a third epitaxial layer, said third layer being disposed on said second layer and having a third bandgap, a third carrier concentration, and said first conductivity type, said third bandgap being greater than said second bandgap; said first, second and third epitaxial layers each consisting essentially of semiconducting material, at least two electrical contacts, at least one of said contacts contacting said first layer and at least one of said contacts contacting said third layer characterized in that said first carrier concentration and said third carrier concentration are less than said second carrier concentration.

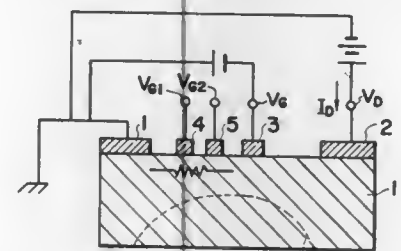
#### 4,160,259 SEMICONDUCTOR DEVICE

Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed Dec. 27, 1976, Ser. No. 757,583  
Int. Cl.<sup>2</sup> H01L 29/76

U.S. Cl. 357-22

15 Claims



1. A field effect semiconductor device of variable characteristics, comprising:

a high resistivity semiconductor region of one conductivity type including a current channel, the high resistivity semiconductor region having predetermined impurity concentration and dimensions;

said predetermined impurity concentration and dimensions being chosen such that the semiconductor device selectively exhibits non-saturating current versus voltage characteristics at least in a portion of the operative range of the semiconductor device;

a pair of current electrode structures formed on the two ends of said current channel and forming ohmic contacts therewith; and

at least two control electrode means formed adjacent to the current channel for controlling the resistivity of the effective current channel to vary thereby the current versus voltage characteristic of said device.

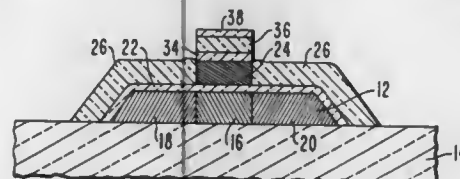
#### 4,160,260 PLANAR SEMICONDUCTOR DEVICES AND METHOD OF MAKING THE SAME

Charles E. Weitzel, Plainsboro, and Joseph H. Scott, Princeton, both of N.J., assignors to RCA Corp., New York, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,565  
Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357-23

3 Claims



1. A semiconductor device comprising:

a body of semiconductor material having a planar surface thereon and spaced drain and source portions embedded therein at the surface, the drain and source portions spaced one from the other defining a channel portion therebetween;

a region of polycrystalline silicon disposed over the channel portion of the semiconductor body; and

a layer of oxidized polycrystalline silicon disposed over the drain and source portions of the semiconductor body, the oxidized polycrystalline silicon layer extending up to and contacting the polycrystalline silicon region, with the surface of the oxidized polycrystalline silicon layer being substantially coplanar with the surface of the polycrystalline silicon region.

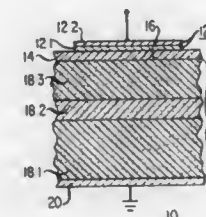
#### 4,160,261 MIS HETEROJUNCTION STRUCTURES

Horace C. Casey, Jr.; Alfred Y. Cho, both of Summit, and Edward H. Nicollian, Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 13, 1978, Ser. No. 869,369  
Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357-23

9 Claims



1. A semiconductor device comprising a single-crystal semiconductor body, an insulative layer formed on a major surface of said body, and a metal electrode formed on said insulative layer CHARACTERIZED IN THAT

said insulative layer comprises a single-crystal layer having a resistivity in excess of about  $10^8$  ohm-cm and adapted to prevent any substantial flow of current therethrough, said insulative layer having a wider bandgap than, but substantially the same lattice constant as, said body so as to form a substantially lattice-matched heterojunction at the interface between said body and said insulative layer.

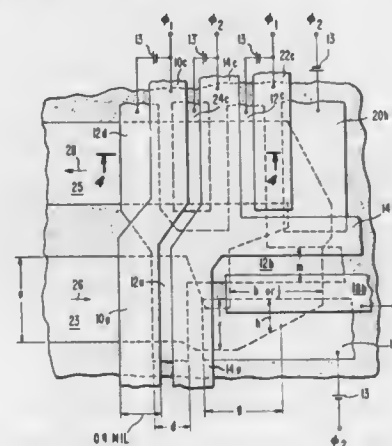
#### 4,160,262 CCD ELECTRODE AND CHANNEL STRUCTURE FOR 180° TURN

Michael G. Kovac, Sudbury, Mass., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 786,402, Apr. 11, 1977, abandoned.  
This application Sep. 18, 1978, Ser. No. 943,146  
Int. Cl.<sup>2</sup> H01L 29/78; G11C 19/28

U.S. Cl. 357-24

8 Claims



1. In a charge-coupled device (CCD) which includes a semiconductor substrate, a channel in the substrate for the propagation of charge in said substrate, said channel making a turn of approximately 180°, the edges of said channel being defined by potential barriers in the substrate for confining any charge which may be present in the channel to the channel, the channel comprising an input first channel region having an output end, a second channel region, receptive of charge from the output end of said first channel region, said second channel region having an input end and an output end, and a third channel region receptive of charge from the second channel region, said third channel region having an input end, said first,

second and third channel regions each having a length dimension in the direction of charge propagation along that channel region, and a width dimension at right angles to its length dimension and which extends between the edges defined by said potential barriers of said channel region, the length dimension of the second channel region being at an angle of approximately 90° to the length dimension of the first channel region, and the length dimension of the third channel region being at approximately 90° to the length dimension of the second channel region, said CCD including also electrode means insulated from the substrate over said channel and receptive of potentials for forming potential wells in the channel for the storage of charge and for the propagation of charge from the first to the second to the third channel regions, each electrode means having a length dimension in the direction of charge transfer along the channel region it is over and an effective width dimension at right angles to the length dimension equal to the width of the channel region the electrode is over, the improvement in said structure comprising:

a first one of said electrode means over the first channel region;

a second one of said electrode means over the output end of the first channel region and the input end of the second channel region;

a third one of said electrode means over the output end of the second channel region and the input end of the third channel region;

said first electrode means having a given effective length over said first channel region in the direction of the length dimension of said first channel region which is sufficiently small that during the transfer of charge from a substrate region beneath said first electrode means, charge propagation at a desired propagation speed will take place;

said second electrode means having an effective first length in the direction of the length dimension of said first channel region which is substantially greater than said given length and an effective second length in a second direction at approximately 90° to said length dimension of said first channel region, that is, in the direction of the length dimension of said second channel region, which is not substantially greater than said given effective length;

said third electrode means having an effective first length in the direction of the length dimension of said second channel region which is substantially greater than said given length and an effective second length in the direction of the length dimension of said third channel region which is not substantially greater than said given effective length; first means including said first and said second electrode means responsive to applied potentials for propagating charge in the direction of the length dimension of said first channel region from a substrate region beneath said first electrode means to a substrate region beneath said second electrode means;

second means including said second and said third electrode means responsive to applied potentials for propagating charge in the direction of the length dimension of said second channel region from said substrate region beneath said second electrode means to a substrate region beneath said third electrode means; and

third means including said electrode means, responsive to applied potentials, for propagating charge in the direction of the length dimension of said third channel region from said substrate region beneath said third electrode means into said third channel region.

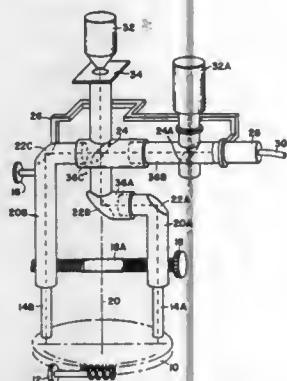
# 4,160,263 DUAL OR MULTIPLE OBJECTIVE VIDEO MICROSCOPE FOR SUPERIMPOSING SPACED IMAGES

Harold Christy, Phoenix, and Robert R. Bernham, Apache Junction, both of Ariz., assignors to George R. Cogar, Frankfort, N.Y.

Filed May 15, 1978, Ser. No. 905,576  
Int. Cl.<sup>2</sup> H04N 9/02

U.S. Cl. 358—1

30 Claims



1. An optical vidicon apparatus comprising, in combination, multiple objective lenses, a vidicon optically coupled to said multiple objective lenses, display means coupled to said vidicon to display images received by said vidicon, means for moving at least one of said multiple objective lenses toward and away from at least another of said multiple objective lenses, and means for maintaining the length of the optical path between said one of said multiple objective lenses and said vidicon substantially equal to the length of the optical path between said other multiple objective lenses and said vidicon.

19. An optical vidicon apparatus in accordance with claim 1 wherein said vidicon having means for permitting images viewed by said vidicon received from said multiple objective lenses to be viewed in color.

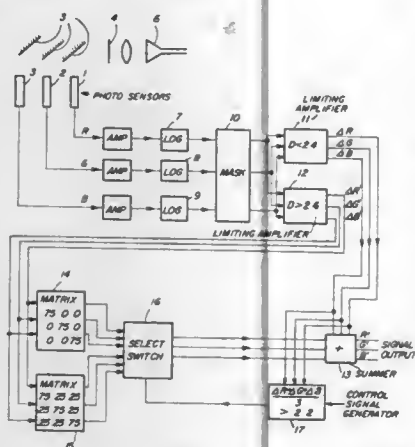
# 4,160,264 MATRIX COMPENSATOR FOR COLOR VIDEO SIGNALS

Keith R. Hailey, Watford, and Michael Quinton, Abbots Langley, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,931  
Int. Cl.<sup>2</sup> H04N 9/52, 9/535

U.S. Cl. 358—29

15 Claims



1. For use with a device for scanning a image, point-by-point, and in response thereto for producing a set of color video signals, the level of any given signal thereof representing

the density or brightness of the respective color of the image at the point being scanned, a matrix compensator for modifying the color video signals, comprising:

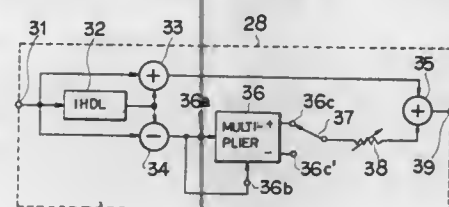
- (a) matrix means, capable of providing at least first and second matrixing effects, for receiving the color video signals and for modifying these signals, said auxiliary matrix means being effective when providing said first matrixing effect to shift said color video signals toward a representation of neutral density; and
- (b) switch means responsive to the levels of the color signal(s) for selectively controlling, point-by-point, the matrixing effect provided by said auxiliary matrix means.

# 4,160,265 VERTICAL APERTURE CORRECTION CIRCUIT Sadaaki Tanaka, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,426  
Claims priority, application Japan, Apr. 25, 1977, 52-46784  
Int. Cl.<sup>2</sup> H04N 5/14

U.S. Cl. 358—37

16 Claims



11. In a color image pickup device having an image pickup tube including a photo-electric conversion layer, means for forming on said layer a color-separated image of an object being televised, means for applying an alternating potential pattern to said layer, means for deriving from said photo-electric conversion layer a composite signal which includes a chrominance signal, an index signal due to said alternating potential pattern and having a frequency equal to the carrier frequency of said chrominance signal and a luminance signal which undergoes level changes in successive horizontal intervals due to said alternating potential pattern, and means for separating said chrominance, index and luminance signals; a vertical aperture correction circuit for eliminating said level changes from the separated luminance signal comprising delay circuit means for providing a delayed luminance signal delayed by one horizontal interval in respect to said separated luminance signal, signal squaring means for squaring the difference in level between said separated luminance signal and said delayed luminance signal, and signal mixing means for mixing at least said separated luminance signal with the squared signal from said signal squaring means and thereby providing a vertical aperture corrected luminance signal.

# 4,160,266 X-RAY TELEVISION APPARATUS Tetsuro Kurihara, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

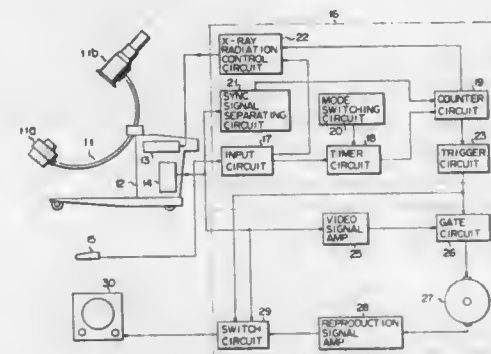
Filed May 1, 1978, Ser. No. 901,795  
Claims priority, application Japan, May 4, 1977, 52-51516  
Int. Cl.<sup>2</sup> H04N 5/32

U.S. Cl. 358—111

6 Claims

1. An X-ray television apparatus comprising:  
means for radiating X-rays to an object to be examined;  
means for transducing the X-ray image of said object to a television signal;  
switching means for enabling said radiating means to operate;  
first timer means for producing a signal in accordance with the operation of said switching means;

second timer means for producing a signal at the end of the operation of said switching means;  
means for selecting one of said first and second timer means;  
means for separating a synchronizing signal from said television signal;  
means for producing a first signal in response to the signal from the selected one of said first and second timer means and said synchronizing signal and a second signal after a lapse of a predetermined time interval of said first signal;



means for energizing said X-ray radiating means in response to the operation of said switching means and deenergizing the same in response to said second signal;  
means for recording a desired part of said television signal in response to said first signal; and means for displaying selectively said television signal and said desired part of said television signal which are provided through said transducing means and recording means, respectively.

# 4,160,267 SWITCHING METHOD FOR MEASURING TWO NEIGHBORING FLYING TARGETS OR OBJECTS IN SUCCESSION

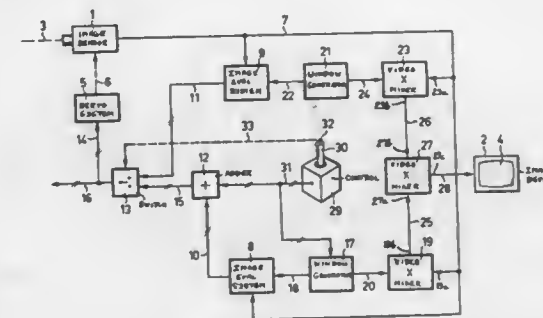
Walter Eicher, Gockhausen, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed May 8, 1978, Ser. No. 903,668  
Claims priority, application Switzerland, May 26, 1977, 6487/77

U.S. Cl. 358—126

Int. Cl.<sup>2</sup> H04M 7/18

6 Claims



1. A switching method for measuring two neighboring flying targets in succession by means of a measuring installation, comprising the steps of:  
providing a measuring installation having an electronic observation system with image sensor and image device, a regulation system for automatically aligning the image sensor at a flying target to be measured and containing at least one first image evaluation system where there are formed from signals of the observation system a first pair of first deviation signals, one of the deviation signals constituting a measure of the momentary angular deviation in azimuth and the other deviation signal constituting a

measure of the momentary angular deviation in elevation between the direction of a first flying target and the line of sight of the image sensor and delivered to the regulation system as an actual value;  
generating at the observation system an electronic window; framing the trace of the line of sight by means of the electronic window at the image device;  
limiting the processing of the signals of the observation system in the image evaluation system to such signals which correspond to an image point located at the image device within the electronic window;  
forming in the observation system during the automatic aligning of the image sensor at the first flying target by means of the first image evaluation system a second electronic window;  
positioning the second electronic window at the image device by means of a manually actuatable control means as a frame about the image of a second flying target;  
producing in a second image evaluation system a second pair of second deviation signals;  
said second pair of second deviation signals comprising such signals of the observation system which correspond to an image point located at the image device within the second electronic window;  
one of the second signals constituting a measure for the momentary angular deviation in azimuth and the other of said signals a measure of the momentary angular deviation in elevation between the direction of the second flying target and said line of sight; and  
after positioning the second electronic window at the image of the second flying target switching the actual value of the regulation system from the first pair of deviation signals to the second pair of deviation signals.

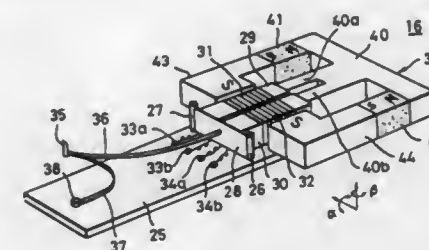
# 4,160,268 SIGNAL PICKUP DEVICE WITH TRACKING CONTROL AND JITTER COMPENSATION FOR A VIDEO DISC Kunio Goto, Yokohama; Osamu Tajima, Ayase, and Hideaki Miyatake, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 29, 1978, Ser. No. 891,492  
Claims priority, application Japan, Mar. 31, 1977, 52-35502; Apr. 11, 1977, 52-41151; Sep. 29, 1977, 52-130924[U]; Oct. 7, 1977, 52-119999; Oct. 12, 1977, 52-122230

U.S. Cl. 358—128

Int. Cl.<sup>2</sup> G11B 3/38, 21/10

10 Claims



1. A signal pickup device in an apparatus for reproducing an information signal recorded on a track on a rotary recording medium in a horizontal surface, said signal pickup device comprising:  
a reproducing stylus for tracking the track on the rotary recording medium thereby to reproduce the information signal;  
a cantilever provided at a free distal end thereof with the reproducing stylus;  
means for supporting said cantilever so as to be rotatable about substantially proximal root end thereof and movable in a longitudinal direction thereof;  
coil means including at least two movable coils fixed to said support means;



means for generating a control signal current in response to deviation of the tracing position of said reproducing stylus from a track to be traced, and supplying the control signal to said coils; and

magnetic field forming means secured at a predetermined position of a main body of the device and adapted to apply to said coils a magnetic field in a direction parallel with the rotary recording medium,

said coils undergoing a motion due to a mutual interaction between the magnetic field and the current flowing there-through, whereby said reproducing stylus is displaced by way of said cantilever at least in the width of said track and is thereby tracking controlled.

4,160,269

**APPARATUS FOR OPTICALLY READING A PHASE-MODULATED OPTICAL RECORD CARRIER**  
Pieter Kramer; Klaas Compaan, both of Eindhoven, Netherlands, and Robert F. K. Forsthuber, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 618,215, Sep. 30, 1975, Pat. No. 4,041,530, which is a continuation of Ser. No. 396,399, Sep. 12, 1973, abandoned, which is a continuation of Ser. No. 229,285, Feb. 25, 1972, abandoned. This application May 27, 1977, Ser. No. 801,018

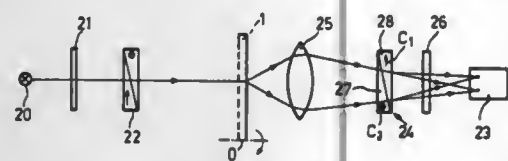
Claims priority, application Netherlands, Mar. 4, 1971, 7102863

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H04N 5/76; G11B 7/12

U.S. Cl. 358—128

14 Claims



1. Apparatus for detecting with a light beam information stored in a disc-shaped record carrier provided with a spiral pattern of regions having flat, substantially parallel upper surfaces of variable length separated by flat, substantially coplanar areas of variable length, where the plane of the areas is parallel to the plane of the regions and is separated therefrom by an amount sufficient to introduce a phase difference of  $nL/2$  between portions of the light beam which coact with the flat areas and those which coact with the regions, where  $n$  is a positive odd integer and  $L$  is a wavelength of the light beam; the apparatus comprising means for directing the light beam to the record carrier, whereby the beam is modulated by the stored information; and a radiation-sensitive detection system means for converting the modulated beam from the record carrier into an electrical signal corresponding to the information.

4,160,270

**TRACKING SERVO SYSTEM FOR VIDEO DISC PLAYER/RECORDER**

Arthur M. Goldschmidt, Moorestown, and Lee V. Hedlund, Cinnaminson, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1977, Ser. No. 835,589

Int. Cl.<sup>2</sup> H04N 5/76; G11B 17/00, 21/10

U.S. Cl. 358—128

7 Claims

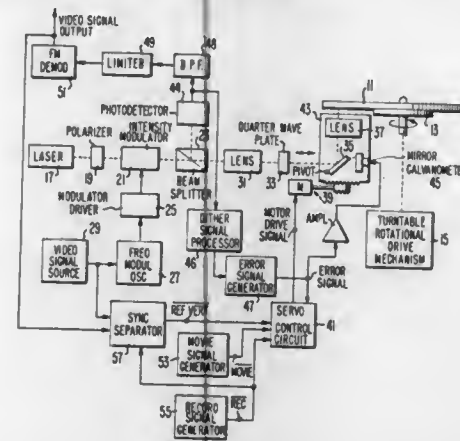
1. In a disc record recorder/player system selectively operable in either of an information recording mode or an information playback mode, said system comprising: a turntable; means for producing a focused beam of light; and means for detecting the leading, lagging or centered position of a scanning spot imaged by the beam on a record carried by said turntable with respect to an information track of such record

during system operation in said playback back mode; an apparatus comprising the combination:

means for establishing radial relative motion between said focused beam and said turntable;

means providing an output pulse train of a given frequency, said pulse train having a given number of pulses in a given time interval, for normally energizing said motion establishing means in a manner providing a first constant rate radial relative motion;

first means for altering the given number of pulses in said given time interval provided in said output pulse train by said energizing means in a manner providing said motion establishing means with radial relative motion at a second rate which is lesser than said first rate, in response to the occurrence of spot leading position detection during system operation in said playback mode;



second means for altering the given number of pulses in said given time interval provided in said output pulse train by said energizing means in a manner providing said motion establishing means with radial relative motion at a third rate which is greater than said first rate, in response to the occurrence of spot lagging position detection during system operation in said playback mode; and

means for preventing said first and second altering means from affecting the given number of pulses in said time interval of said output pulse train of said energizing means in response to the occurrence of either (a) spot centered position detection during system operation in said playback mode, or (b) system operation in said recording mode.

4,160,271

**COSMETIC SELECTION AND DISPLAY SYSTEM**

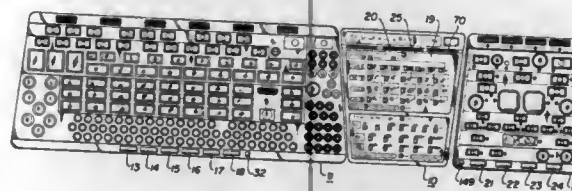
Suzanne Grayson, Englewood, N.J., and Dora Schaefer, New York, N.Y., assignors to Helena Rubinstein, Inc., New York, N.Y.

Filed Oct. 21, 1977, Ser. No. 844,300

Int. Cl.<sup>2</sup> A45D 44/00; G06F 3/00

U.S. Cl. 364—400

17 Claims



1. A cosmetic selection device, comprising:

a numerical accumulator;

a keyboard comprising a first series of rows of keys for generating first coded signals representing numerical values corresponding to various personal color character-

istics, and a second series of rows of keys for generating second coded signals representing numerical values corresponding to various personal skin characteristics;

means for coupling said first and second coded signals to said accumulator to cause said accumulator to store (i) a color index signal having a value corresponding to the algebraic sum of the values corresponding to said first coded signals, and (ii) a skin index signal having a value corresponding to the algebraic sum of the values corresponding to said second coded signals,

said color index signal being indicative of selected ones of a group of skin color imparting cosmetics most suitable for use by an individual having said personal color characteristics, and said skin index signal being indicative of selected ones of a group of skin preparation cosmetics most suitable for use by an individual having said personal skin characteristics;

first selection means for designating the suitable selected ones of said color imparting cosmetics corresponding to said color index signal; and

second selection means for designating the suitable selected ones of said skin preparation cosmetics corresponding to said skin index signal.

4,160,272

**DIGITAL VOLTAGE ACCUMULATOR**

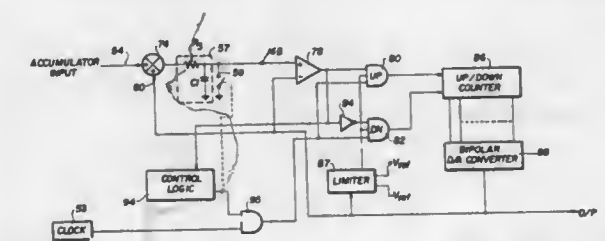
Frank J. Thomas, Wellesley Hills, Mass.; Donald L. Gay, Daytona Beach, and Chester A. Winsor, Orlando, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Jan. 5, 1978, Ser. No. 867,214

Int. Cl.<sup>2</sup> G06J 1/00

U.S. Cl. 364—602

12 Claims



1. A signal accumulator functioning to store a signal over an extended period of time, the stored signal representing the accumulated sum of values of an input signal as sampled over a plurality of processing cycles, comprising:

storage means for storing an electrical signal,

means for receiving an input signal,

summing means for producing the arithmetic sum of said stored electrical signal and said received input signal,

comparator means for comparing said stored signal with the sum signal output for said summing means, the output from said comparator means being indicative of the relative levels of the inputs thereto,

said signal storage means being interconnected with said summing means and said comparator means, with such interconnection representing a feedback arrangement for supplying said stored signal to said summing means and said comparator means,

means, responsive to said comparator output, for modifying the stored electrical signal in accordance with the varying values of said sampled input signal, and

control means for selectively enabling said stored signal modifying means during a processing cycle to modify the value of the stored signal in accordance with the value of the input signal during the processing cycle as compared to the value of signal stored in the storage means during a previous processing cycle.

4,160,273

**DIGITAL MEMORY ADDRESSING SYSTEM**

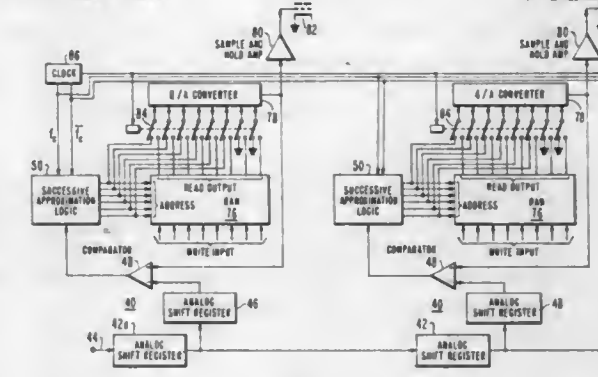
Frank J. Marlowe, Kingston, and Robert H. Dawson, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 852,086

Int. Cl.<sup>2</sup> G11C 8/00

U.S. Cl. 364—900

9 Claims



1. A system for addressing a digital memory with an analog signal and for converting the digital output of the memory to an analog signal, said system comprising:

a digital to analog converter;

a comparator having a first input terminal connected to the output terminal of the digital to analog converter and a second input terminal connected to the analog addressing signal;

means for generating a digital number in response to the output signal from the comparator, said means having an output terminal for coupling the digital number to the addressing input terminal of the memory; and

means for alternately switching the input terminal of the digital-to-analog converter to the output terminal of the digital memory and to the output terminal of the means for generating the digital number.

4,160,274

**SINGLE CHIP MOLDED MAGNETIC BUBBLE MEMORY PACKAGE**

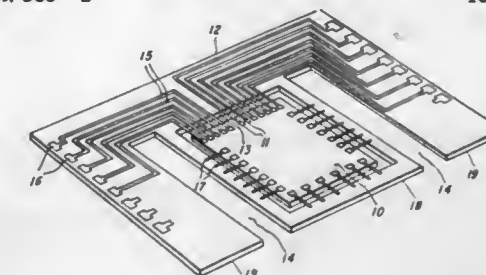
Alvis D. Stephenson, Jr., Dallas, and James T. Carlo, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1976, Ser. No. 752,039

Int. Cl.<sup>2</sup> G11C 5/04

U.S. Cl. 365—2

10 Claims



1. A packaging assembly for magnetic bubble domain chips comprising:

a housing,

an insulating interconnect member disposed within said housing, said interconnect member being provided with an aperture extending through a central portion thereof and having a pattern of electrical conductors disposed thereon, the central portion of said interconnect member being coplanar with the remainder of said interconnect member,

a magnetic bubble domain chip mounted in the central por-

tion of said interconnect member within the aperture defined therethrough in supported relationship, said magnetic bubble domain chip being in electrical contact with said electrical conductors disposed on said interconnect member and its surface lying substantially in the same plane of the corresponding surface of said interconnect member,

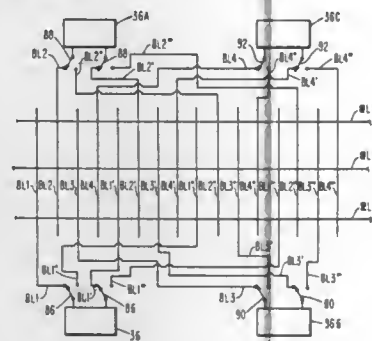
- a lead frame disposed within said housing and having a plurality of signal leads extending outwardly of said housing, respective signal leads being in electrical contact with corresponding electrical conductors disposed on said interconnect member,
- coil means within said housing surrounding said magnetic bubble domain chip and operable to produce an in-plane rotary magnetic field at the surface of said magnetic bubble domain chip in response to electrical energization thereof, said coil means being in electrical contact with corresponding ones of said signal leads,
- magnetic bias field means disposed within said housing in spaced relation to said magnetic bubble domain chip for producing a magnetic field at least substantially perpendicular to the surface of said magnetic bubble domain chip, and
- a body of insulating material filling said housing and in which said interconnect member, said magnetic bubble domain chip, said coil means, and said magnetic bias field means are embedded.

#### 4,160,275 ACCESSING ARRANGEMENT FOR MEMORIES WITH SMALL CELLS

Hsing-San Lee, Williston; Wilbur D. Pricer, Burlington, and Norbert G. Vogl, Jr., Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,605  
Int. Cl.<sup>2</sup> G11C 11/24, 7/06

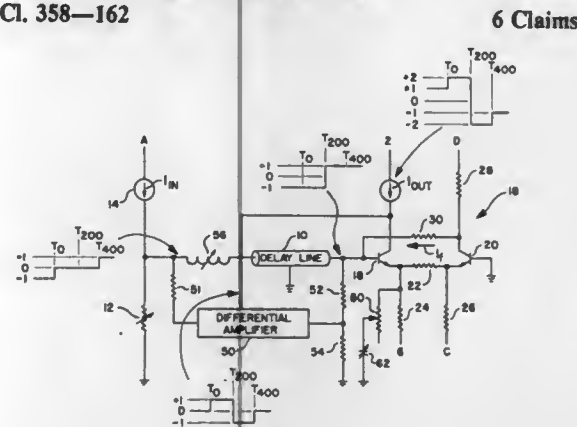
U.S. Cl. 365—149



1. A memory system comprising:
  - a semiconductor substrate,
  - an insulating layer disposed on said substrate,
  - a plurality of spaced apart conductive films disposed on said layer defining a plurality of groups of storage capacitors,
  - a group of sensing means,
  - means including a conductive strip disposed on said insulating layer between said films to cause conduction between the capacitors within each of said groups of capacitors,
  - a plurality of charge source means,
  - means for applying charges from one of said plurality of charge source means to a selected group of said plurality of groups of storage capacitors while isolating the other of said plurality of groups of capacitors from said plurality of charge source means, and
  - means for coupling said group of sensing means to said selected group of capacitors to sense charge displacement in the capacitors of said selected group.

#### 4,160,276 APERTURE CORRECTION CIRCUIT

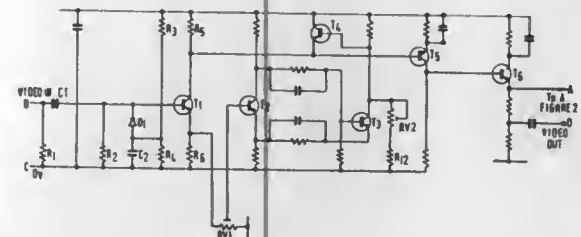
Daniel G. Baker, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.  
Filed Oct. 31, 1977, Ser. No. 846,742  
Int. Cl.<sup>2</sup> H04N 5/14  
U.S. Cl. 358—162



2. A variable aperture corrector circuit for correcting aperture distortion in a television video signal, comprising:
  - a delay line having an input terminal responsive to the television signal and an output terminal for supplying a delayed television video signal;
  - means operatively disposed between said input terminal and said output terminal for comparing the signal levels at said terminals to provide a correction output signal; and
  - termination means coupled to said output terminal of said delay line for providing a negative terminating impedance to compensate for losses in said delay line.

#### 4,160,277 TELEVISION PICTURE ENHANCEMENT CIRCUIT

Peter Worsfold, Northolt, England, assignor to Evershed-Power Optics Limited, Chertsey, England  
Filed Aug. 19, 1977, Ser. No. 826,086  
Claims priority, application United Kingdom, Aug. 19, 1976, 34637/76  
Int. Cl.<sup>2</sup> H04N 5/14  
U.S. Cl. 358—166

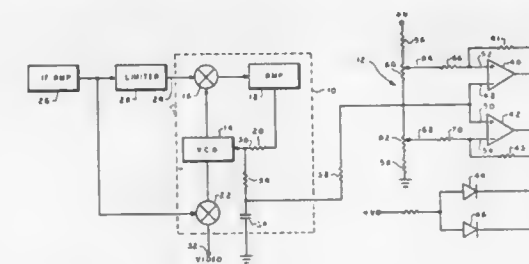


1. An image-responsive apparatus for generating a signal suitable for application to a television receiver to enhance the video picture thereof, comprising:
  - (a) a television camera for generating an output signal representative of a scanned scene,
  - (b) means for controlling the response of the camera to input light reflected from the scene,
  - (c) a signal attenuating circuit connected in series between the camera and a video output line for attenuating selected portions of a video signal in response to a control signal applied thereto,
  - (d) control means for generating a control signal when the camera output signal exceeds a predetermined threshold value,
  - (e) means coupling the camera output signal to an input of

- the control means prior to the application of the camera output signal to the attenuating circuit,
- (f) means coupling an output signal from the control means to the attenuating circuit, whereby the attenuation circuit reduces the maximum amplitude of the signal applied to the video output line to a given value below the threshold value when the camera output signal is above said threshold value, and
  - (g) means coupling the output of the attenuating circuit to the means for controlling the response of the camera.

#### 4,160,278 FINE TUNING INDICATOR FOR TV WITH SYNCHRONOUS DETECTOR

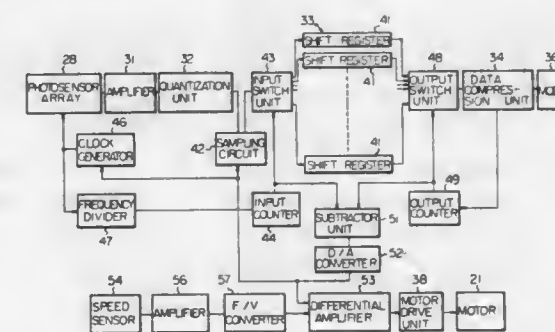
Ronald C. Nelson, Forest Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.  
Filed Dec. 12, 1977, Ser. No. 859,420  
Int. Cl.<sup>2</sup> H04N 5/50  
U.S. Cl. 358—192



1. In combination in a television receiver;
  - a synchronous detector receiving a variable frequency input signal and generating a variable DC control voltage when locked to the frequency of the input signal, said control voltage having a predetermined value when the input signal is of a nominal frequency indicative of proper tuning of the receiver and having values which deviate from said predetermined value in accordance with deviations from the nominal frequency of the input signal; and
  - indicating means responsive to said control voltage for generating a visual indication of the deviation of said control voltage from said predetermined value, whereby said indicating means provides a visual indication of the deviation from proper tuning of the television receiver.

#### 4,160,279 OPTOELECTRONIC READING APPARATUS

Jyolchi Fuwa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan  
Filed Sep. 27, 1977, Ser. No. 836,973  
Claims priority, application Japan, Sep. 29, 1976, 51-116905  
Int. Cl.<sup>2</sup> H04N 1/17  
U.S. Cl. 358—288

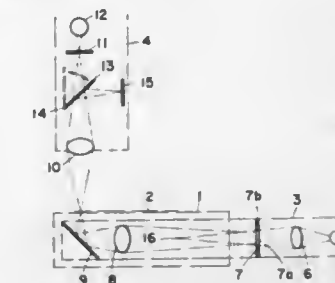


1. An optoelectronic reading apparatus comprising:

photosensor means;  
optical means for focussing a light image of a portion of an original document onto the photosensor means;  
scan drive means for producing relative scanning movement between the document, optical means for photosensor means;  
buffer memory means for storing electrical data signals produced by the photosensor means corresponding to the light image;  
data compression means for reading the data signals from the buffer memory means and performing data compression thereon in a predetermined manner;  
control means for sensing an amount of data signals in the buffer memory and controlling a scanning speed of the scan drive means in accordance therewith, the control means comprising input rate sensing means for sensing an input rate at which data signals are being stored in the buffer memory means, output rate sensing means for sensing an output rate at which the data signals are being read from the buffer memory means by the data compression means and first comparator means for comparing the input and output rates and producing an electrical analog control signal corresponding to a difference therebetween; and  
sensing means for sensing the scanning speed of the scan drive means and producing an electrical analog speed signal corresponding thereto and second comparator means for comparing the control signal and the speed signal and adjusting a scanning speed in accordance with a difference therebetween.

#### 4,160,280 PICTURE SCANNER WITH A SCANNING LIGHT POSITION DETECTOR

Hitomi Atoji, Kyoto; Masuo Kunisawa, Uji; Riyo Shimooka, and Seiji Okazaki, both of Kyoto, all of Japan, assignors to Dai-nippon Screen Seizo Kabushiki Kaisha, Japan  
Filed Nov. 25, 1977, Ser. No. 854,698  
Int. Cl.<sup>2</sup> H04N 1/24  
U.S. Cl. 358—294



1. A picture scanner with a scanning light position detector comprising:
  - an original picture cylinder rotatable around its axis;
  - a light projector for scanning an original picture attached on the surface of the original picture cylinder, including in series along its optical axis a light source, a first projecting lens, a mask plate having an aperture, and a second projecting lens;
  - and a scanning head which receives a light beam from the original picture and includes in series a pick-up lens and a photoelectric transducer element on its optical axis;wherein a pivot mirror and a screen are provided, and the pivot mirror is arranged between the pick-up lens and the photoelectric transducer element and can be pivoted into the optical axis of the scanning head so as to divert the light beam onto the screen, and wherein the first projecting lens is movable in the axial direction of the light projector over a range including two positions, in one of which the first projecting lens forms an image of the light



source at the focal point in front of the second projecting lens, said position being the normal operating position, and in the other position of which the first projecting lens forms an image of the light source in the plane of the mask plate, said other position being for lateral adjustment of the source, thus allowing an image of the light source superimposed on the mask to be projected onto the screen when the mirror is pivoted to the position where it diverts the light beam onto the screen.

4,160,281

## CASSETTE CHANGER

Seizi Sato, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

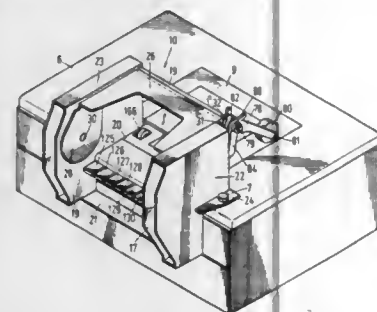
Filed Feb. 9, 1978, Ser. No. 876,263

Claims priority, application Japan, Feb. 21, 1977, 52-17927

Int. Cl.<sup>2</sup> G11B 15/68, 23/04

U.S. Cl. 360-92

16 Claims



1. A cassette changer for exchanging cassettes automatically in a cassette recording and/or reproducing apparatus in which an operating mode selector is moved from a first position to a second position to effect a recording or reproducing operation and said selector is returned to said first position at the end of said operation, and in which a cassette holder for holding a first cassette is movable between a recording or reproducing position and an eject position and is movable to said eject position in response to selection of an eject mode: said cassette changer comprising a plurality of resilient members; cassette loading means for receiving a second cassette; means for charging each of said resilient members with elastic energy when said second cassette is loaded in said loading means of the changer; and means driven by elastic energy discharged from said resilient members in order starting in response to the return of said operating mode selector to said first position for exchanging said second cassette for said first cassette in the cassette holder and then restoring said operating mode selector to said second position for continuing said recording or reproducing operation with said second cassette.

4,160,282

## OVERCURRENT PROTECTION APPARATUS

Kevin D. Dolinar, Canonsburg, and John F. Burr, Pittsburgh, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Oct. 3, 1977, Ser. No. 838,735

Int. Cl.<sup>2</sup> H02H 7/085

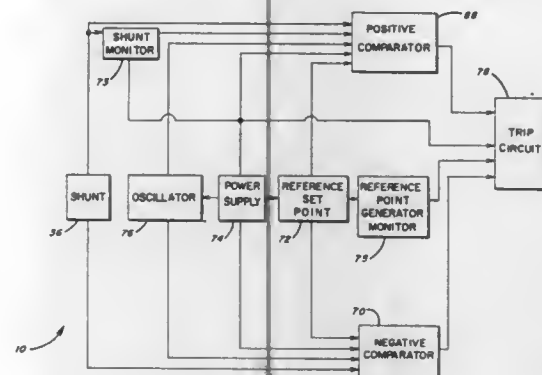
U.S. Cl. 361-31

12 Claims

1. Apparatus for detecting an overcurrent flowing through a conductor and protecting the conductor from the overcurrent comprising,

a circuit breaker adapted to be connected in series with a direct current conductor, said circuit breaker being operable in a closed position to permit the flow of direct current through the conductor and in an open position to terminate the flow of direct current through the conductor, a shunt adapted to be connected in series with the conductor

so that direct current flows through said shunt to the conductor, said shunt being operable to generate an input signal at a voltage proportional to the direct current flowing through the conductor, reference means for generating a reference signal at a voltage of a magnitude proportional to the maximum direct current permitted to flow through the conductor, a monitor circuit connected to said reference means and said circuit breaker for monitoring the operability of said reference means to generate a reference signal, said monitor circuit being responsive to said reference signal generated by said reference means to actuate said circuit breaker to close and thereby permit the flow of direct current through the conductor, said monitor circuit being operable upon failure of said reference means to generate a reference signal to open said circuit breaker and prevent flow of direct current through the conductor,



comparator means connected to receive the input signal from said shunt and the reference signal from said reference means, said comparator means being operable to generate an output signal in response to the magnitude of the input signal and the reference signal from said shunt and said reference means respectively, a trip circuit connected to receive the output signal from said comparator means, said trip circuit including a relay, and said relay being normally energized by the output signal of said comparator means to normally maintain said circuit breaker in a closed position and permit direct current flow through said circuit breaker so that when the input signal from said shunt exceeds the reference signal from said reference means the output signal of said comparator means is terminated and said relay is deenergized to open said circuit breaker and terminate flow of direct current through said circuit breaker and the conductor.

4,160,283

## MAGNETIZING AND DEMAGNETIZING TOOL

Ralph W. Adams, Plentywood, Mont., assignor to Howard A. Spoklie, Plentywood, Mont., a part interest

Filed Apr. 26, 1978, Ser. No. 900,151

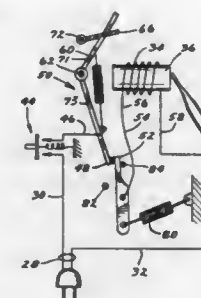
Int. Cl.<sup>2</sup> H01F 13/00

U.S. Cl. 361-143

5 Claims

1. A magnetizing tool for use with a source of alternating electromotive force to magnetize a magnetizable object, said tool including a case; a magnetizable core mounted with respect to the case in position to allow a magnetizable object to be situated adjacent the core; a solenoid coil situated in surrounding relation to at least a portion of said core; power switch means for connecting said solenoid coil across a source of alternating electromotive force; and a normally closed dwell

switch in series with said coil and activated by magnetization of said core to move to an open condition to interrupt flow of



electrical energy through said solenoid after first permitting current to flow in said solenoid for a short period of time.

4,160,284

## CAPACITORS AND PROCESS FOR MAKING SAME

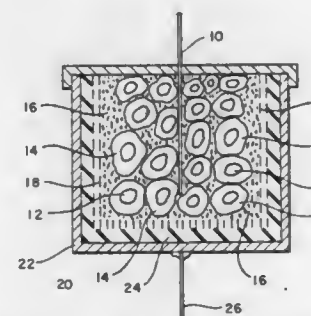
Robert J. Deffeyes, Arlington, and Harris W. Armstrong, Fort Worth, both of Tex., assignors to Graham Magnetics, Inc., Graham, Tex.

Filed Jul. 27, 1977, Ser. No. 819,362

Int. Cl.<sup>2</sup> H01G 9/00

U.S. Cl. 361-433

12 Claims



1. A capacitor of the type comprising a porous mass of dielectric oxide-coated metal between an anode and a cathode, said oxide forming the dielectric of said capacitor, the improvement wherein said porous mass is impregnated with an electroconductive metal powder-containing paste, said powder having an average diameter of less than about 1 micron.

4,160,285

## POINT LOCATING APPARATUS

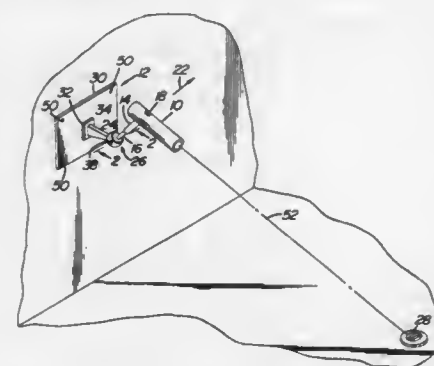
James N. Shible, 78 Aronimink Pl., Macungie, Pa. 18062

Filed Aug. 12, 1977, Ser. No. 823,895

Int. Cl.<sup>2</sup> F21S 1/02

U.S. Cl. 362-145

10 Claims



1. Apparatus for locating a point, such as an oil fill pipe or

the like, on a reoccurring basis, comprising: a collimated light source, bracket means having a structure adapted for permanent mounting to a permanent structure in the vicinity of the point to be located on a reoccurring basis, said bracket means including a keyed mounting means for slidably removably mounting a mating portion of said collimated light source, said keyed mounting means being at least partially positionable with respect to two orthogonal directions whereby said collimated light source may be directed at the point to be located in the future, means for locking said keyed mounting means in a predetermined position such that said collimated light source is directed at the point to be relocated when said bracket is permanently mounted to said permanent structure, said collimated light source being slidably removable from said keyed mounting means of said bracket and slidably mountable on said keyed mounting means at a later time when said point is to be relocated.

4,160,286

## LUMINAIRE SHIELD

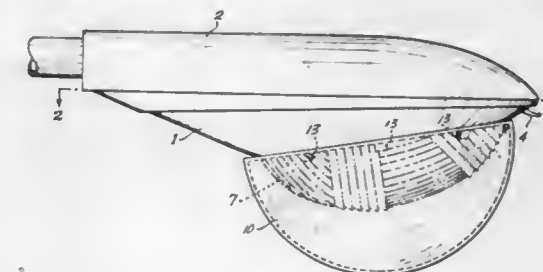
William H. Merritt, Seattle, Wash., assignor to Plastics Engineering & Manufacturing Co., Seattle, Wash.

Filed Jul. 18, 1977, Ser. No. 816,451

Int. Cl.<sup>2</sup> F21V 13/02, 3/02, 3/04

U.S. Cl. 362-311

11 Claims



1. In a luminaire including a frame, a door connected to the frame, a light-diffusing lens mounted in an aperture in the door and light-producing means enclosed by the frame, door and lens, the improvement comprising a transparent shell at the side of the lens opposite the light-producing means for protecting the lens, a flange projecting inward from the margin of said shell, and means for securing said flange to the luminaire door.

4,160,287

## ELECTROLYZER POWER SUPPLY

Nicole Chiller-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Continuation-in-part of Ser. No. 748,283, Dec. 7, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,625

Claims priority, application France, Dec. 12, 1975, 75 38151

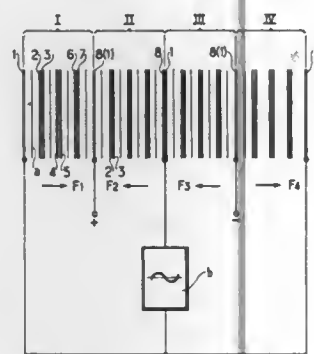
Int. Cl.<sup>2</sup> H02M 7/28

U.S. Cl. 363-13

14 Claims

1. An electrolyzer power supply comprising a bridge rectifier circuit having four rectifying arms, each arm comprising a filter press structure group of series connected rectifying electrolyzer cells to form a full-wave bridge rectifier circuit, each of said series connected electrolyzer cells including a first negative electrode having a rectifying effect and a second counter-electrode and an electrolyte therebetween, the second electrode of a cell being electrically connected to the first electrode of the next series connected cell; said four groups being connected in series with first and second groups in series aiding and third and fourth groups in series aiding, the polarities of said first and second groups being connected with opposite polarities relative to said third and fourth groups, the end

electrodes of said filter-press structure being interconnected to form an input electrode of the rectifier bridge and the other



electrodes of the bridge comprising the intermediate end electrodes of said groups.

4,160,288

### ACTIVE FILTER CIRCUIT FOR REGULATED DC TO DC POWER SUPPLIES

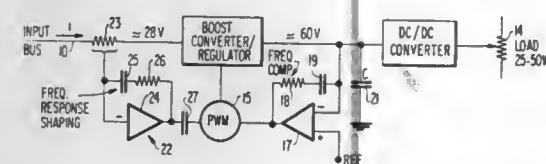
Kenneth L. Stuart, Riviera Beach, and William E. Baker, Jr., Frederick, both of Md., assignors to Communications Satellite Corp., Washington, D.C.

Filed May 17, 1978, Ser. No. 906,706

Int. Cl.<sup>2</sup> H02M 1/14, 3/335

U.S. Cl. 363—41

5 Claims



1. In a regulated DC to DC power supply of the type having an input bus for supplying a first predetermined DC voltage, regulator means connected to said input bus for converting said first predetermined DC voltage to a second predetermined DC voltage at an output of said regulator means, voltage feedback means connected to said output for generating a control signal to said regulator means which regulates said second predetermined DC voltage for changes having a first predetermined frequency range, and means for connecting said output to a variable load which exhibits a low frequency cyclical power change, the improvement comprising an input bus current-sensing servo means for generating a control signal to said regulator means which regulates the input current to said regulator means, thereby regulating said second DC voltage for changes having a second predetermined frequency range, said low frequency being above said first predetermined frequency range but within said second predetermined frequency range.

4,160,289

### MICROPROGRAM-CONTROL UNIT FOR DATA PROCESSOR

Mario Bambara, Milan, and Adriano Querze, Castelfranco Emiliano, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 6, 1977, Ser. No. 839,883

Claims priority, application Italy, Oct. 7, 1976, 28067 A/76

Int. Cl.<sup>2</sup> G06F 9/16, 9/20

U.S. Cl. 364—200

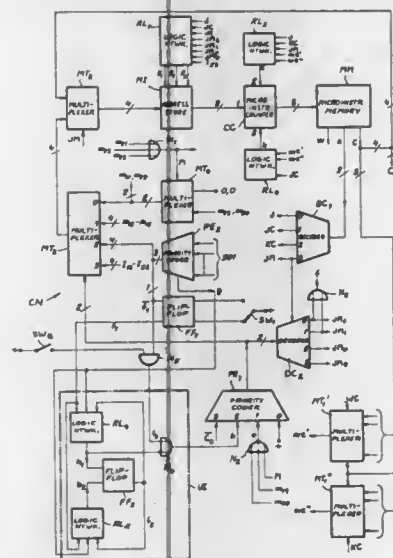
16 Claims

1. In an electronic data processor serving a number of peripheral units and including a program memory containing binary macroinstructions, a program counter steppable to make the bits of successive macroinstructions of a given program available at respective output leads of said program

memory, an instruction register with respective stages connected to said output leads for temporarily storing a current macroinstruction extracted from said program memory, and execution means connected to said instruction register for carrying out data-processing operations specified by the extracted macroinstructions, the combination therewith of a control unit executing a microroutine for carrying out any extracted macroinstruction, said control unit comprising:

a microinstruction memory with an address input and with output means connected to said execution means; logical circuitry responsive to external signals and to microinstruction words read out from said microinstruction memory for determining the execution of a microroutine in progress and the changeover to a new microroutine following the one in progress;

a microprogram counter having an output connected to said address input for identifying successive microinstruction words for readout from said microinstruction memory; an address store connected to a loading input of said microprogram counter for supplying same with a reference address, said microprogram counter further having a stepping input activable for progressively incrementing the reference address last entered therein and an enabling



input activable to replace the latter address with one appearing in said loading input; decoding means in said logical circuitry connected to said output means for generating switching signals alternatively activating said stepping and enabling inputs in response to the microinstruction words read out during a microroutine, said decoding means generating a changeover command invariably activating said enabling input in response to a final microinstruction word read out at the end of a microroutine; and

selection means with input connections to certain stage outputs of said instruction register and to certain output leads of said program memory and with output connections to said address store for identifying a reference address, to be entered in said microprogram counter, in response to bits of the read-out microinstruction word upon activation of said enabling input by a switching signal and in response to external signals upon activation of said enabling input by a changeover command, said external signals including bits of an extracted macroinstruction appearing on said certain stage outputs and bits of a forthcoming macroinstruction immediately following said extracted macroinstruction appearing on said certain output leads.

4,160,290

### ONE-BIT MULTIFUNCTION ARITHMETIC AND LOGIC CIRCUIT

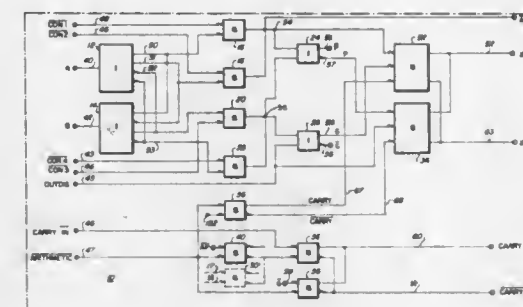
Rolfe D. Armstrong, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 10, 1978, Ser. No. 894,795

Int. Cl.<sup>2</sup> G06F 7/50; H03K 19/08

U.S. Cl. 364—716

21 Claims



4,160,291

### PRECHARGE CIRCUITRY FOR AN ELECTRICALLY ALTERABLE NON-VOLATILE MEMORY

Philip C. Smith, Laurel, and John L. Fagan, Pasadena, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

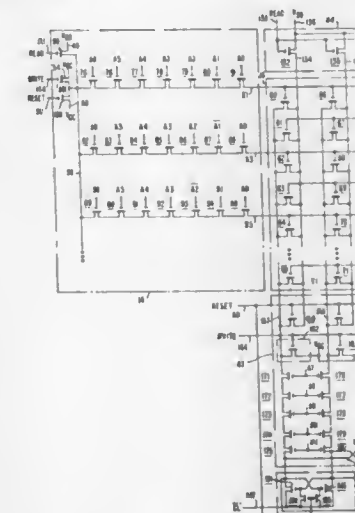
Division of Ser. No. 837,791, Sep. 29, 1977, Pat. No. 4,124,900.

This application Jul. 31, 1978, Ser. No. 929,626

Int. Cl.<sup>2</sup> G11C 7/00

U.S. Cl. 365—203

3 Claims



1. A non-volatile semiconductor memory array row decoder for precharging a plurality of rows of memory cells in said array at a first time and for selecting one of said rows at a second time following said first time comprising,

a first circuit node, a plurality of circuit paths from said first circuit node to each of said rows, each of said circuit paths including a plurality of field effect transistors, each having a gate, source and drain electrode, connected in series between the source and drain electrodes, means for coupling a plurality of address signals to said gates of said transistors to cause one circuit path to conduct current in response to said plurality of address signals, each address signal may be represented by its true or complement level, means for coupling said first circuit node to a first supply voltage in response to a write signal, means for coupling said first circuit node to a second supply voltage in response to a read signal, and means for coupling said first circuit node to a third supply voltage in response to a reset signal to precharge to a predetermined voltage through said plurality of said circuit paths, said plurality of rows at times when the potential of said plurality of address signals are all at a voltage to cause said transistors to conduct current.

1. An arithmetic circuit having first and second arithmetic inputs, a plurality of control inputs, and a carry in input, said arithmetic circuit comprising:

- first and second inverting means responsive to the arithmetic inputs for producing a plurality of wire OR-able inverting outputs and non-inverting outputs;
- first, second, third, and fourth two-input NOR gates each having a wire OR-able output and a first input responsive to a respective one of the control inputs and a second input responsive to respective ones of the plurality of wire OR-able inverting outputs and non-inverting outputs of said first and second inverting means;
- first means responsive to the wire OR-able outputs of said first and second two-input NOR gates and said third and fourth two-input NOR gates for producing a propagate signal and a generate signal respectively; and
- second means responsive to a carry signal, to said propagate signal, to said generate signal, and to the output of said first two-input NOR gate for producing a sum output.



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# DESIGN PATENTS

GRANTED JUL. 3, 1979

## ERRATA

For CLASS	See PATENT NO.
D21-234 .....	252,289
D21-128 .....	252,290
D21-131 .....	252,291
D21-114 .....	252,292
D21-114 .....	252,293
D03-039 .....	252,294
D20-041 .....	252,295

DESIGNS

JULY 3, 1979

252,236

SHOELACE TASSLE

David N. McCrary, 1304 Leone Ave., Valdosta, Ga. 31601

Filed May 9, 1977, Ser. No. 784,162

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-316



252,237

INCLINABLE BENCH

Anthony J. Demaio, North Hollywood, Calif., assignor to Marcy

Gymnasium Equipment Company, Glendale, Calif.

Filed Mar. 28, 1977, Ser. No. 781,673

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-17



252,238

CHAIR

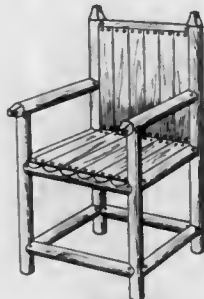
Lorraine A. Van Sant, 111 16th St. North, Wisconsin Rapids, Wis. 54494

Filed Apr. 25, 1977, Ser. No. 790,463

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-73



252,239

TUBSEAT

Harold M. Smith, 437 Charlotte St., London, Ontario, Canada (N5W 4A5)

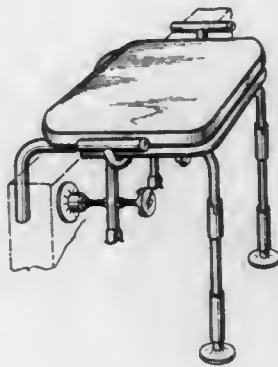
Filed Mar. 28, 1977, Ser. No. 781,702

Claims priority, application Canada, Oct. 25, 1976, 2510764

Term of patent 14 years

Int. Cl. D6-06

U.S. Cl. D6-86



252,240

WALL MOUNTED CLOTHES HANGER

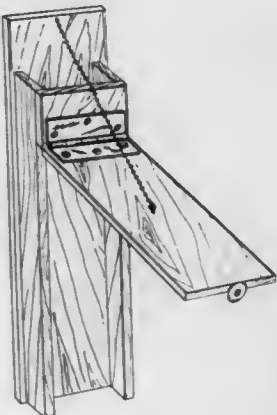
Ray Barr, and Roxye Hamilton, both of 622 E. Main St., Florence, Colo. 81226

Filed Aug. 30, 1977, Ser. No. 829,158

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-124





252,241

## COFFEE TABLE OR THE LIKE

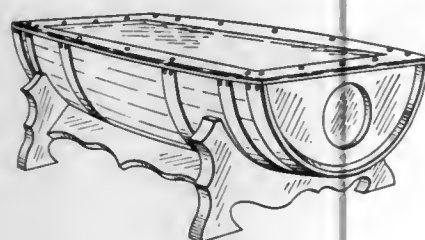
Scott T. Nicolson, 5286 NE. 72nd Ave., Portland, Oreg. 97218

Filed Jun. 9, 1977, Ser. No. 805,086

Term of patent 14 years

Int. Cl. D6—03

U.S. Cl. D6—147



252,242

## TABLE OR THE LIKE

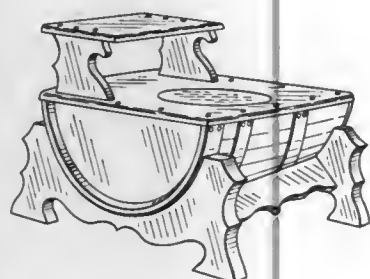
Scott T. Nicolson, 5286 NE. 72nd Ave., Portland, Oreg. 97218

Filed Jun. 9, 1977, Ser. No. 805,088

Term of patent 14 years

Int. Cl. D6—03

U.S. Cl. D6—147



252,243

## CABINET

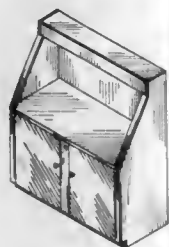
Morton L. Reitman, Pepper Pike, Ohio, assignor to The AAV Companies, Solon, Ohio

Filed Jul. 18, 1977, Ser. No. 816,351

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—168



252,244

## COUNTER DISPLAY STAND

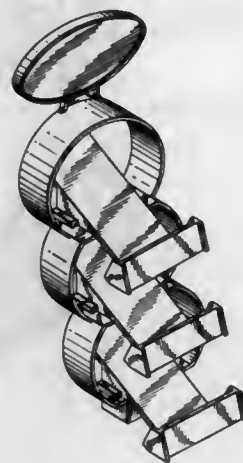
Sydney Edson, East Meadow, N.Y., assignor to Howard Displays, Inc., New York, N.Y.

Filed Mar. 18, 1977, Ser. No. 778,908

Term of patent 14 years

Int. Cl. D20—02

U.S. Cl. D6—186



252,245

## COUNTER DISPLAY STAND

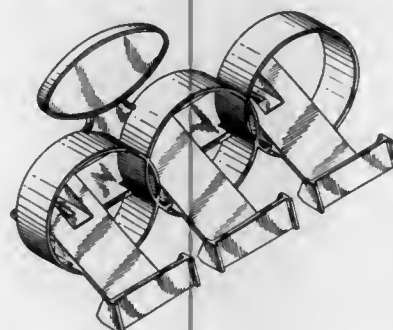
Sydney Edson, East Meadow, N.Y., assignor to Howard Displays, Inc., New York, N.Y.

Filed Mar. 18, 1977, Ser. No. 778,909

Term of patent 14 years

Int. Cl. D20—02

U.S. Cl. D6—186



252,246

## MIRROR CLIP

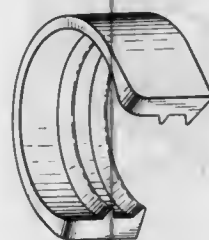
Robert J. Christian, 3500 Hillcrest Dr., Waco, Tex. 76708

Filed Nov. 4, 1977, Ser. No. 848,664

Term of patent 14 years

Int. Cl. D6—07

U.S. Cl. D6—246



252,247

## CARPET-LINED COASTER FOR BEVERAGE GLASSES

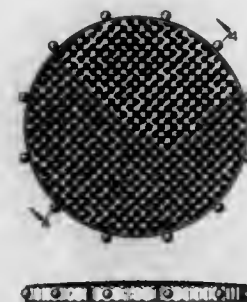
John E. Chiotte, 91 E. Bonita Ave., Sierra Madre, Calif. 91024

Filed Dec. 16, 1977, Ser. No. 861,195

Term of patent 14 years

Int. Cl. D7—06

U.S. Cl. D7—45



252,250

## LIQUID SOAP DISPENSER

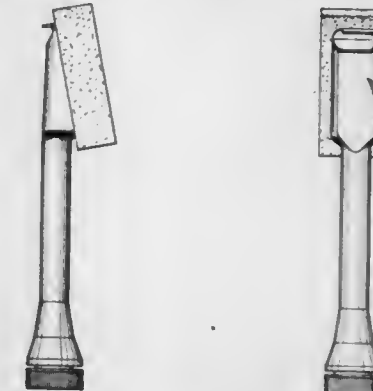
Leonard E. Hobbs, 719 Ocean Blvd., Apt. 410, Pompano Beach, Fla. 33062

Filed Jul. 5, 1977, Ser. No. 813,126

Term of patent 14 years

Int. Cl. D7—05

U.S. Cl. D7—179



252,248

## GAS BARBEQUE GRILL

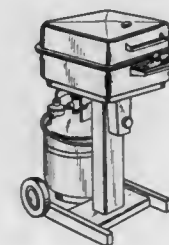
George L. Huff, Greenville, Tenn., assignor to Metals Engineering Corporation, Greenville, Tenn.

Filed Sep. 28, 1977, Ser. No. 837,592

Term of patent 14 years

Int. Cl. D7—02

U.S. Cl. D7—108



252,251

## PLATE RACK

Per A. Lundahl, Gula Kvarnen i Aby, 360 40 Rottne, Sweden, assignor to Terts i Wexlöv AB, Rottne, Sweden

Filed May 10, 1977, Ser. No. 795,662

Term of patent 14 years

Int. Cl. D7—05

U.S. Cl. D7—188



252,249

## HAND-HELD VACUUM CLEANER

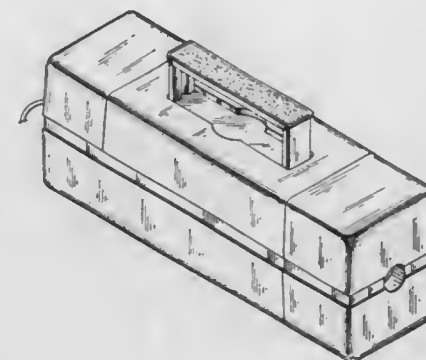
Marvin Cooper, New Rochelle, N.Y., assignor to Dynamic Classics, Ltd., New York, N.Y.

Filed Nov. 30, 1977, Ser. No. 856,198

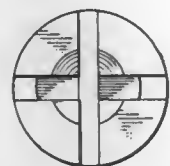
Term of patent 14 years

Int. Cl. D7—05; D15—05

U.S. Cl. D7—164



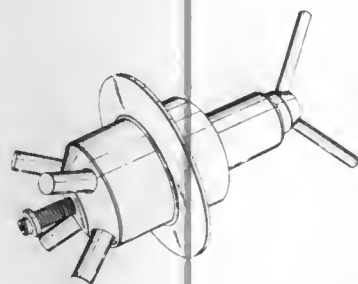
- 252,252**  
**HEAD FOR A SCREW JIG POLE**  
 Noble H. Abney, 580 Weddell Dr., No. 1, Sunnyvale, Calif. 94086  
 Filed Apr. 1, 1977, Ser. No. 783,951  
 Term of patent 14 years  
 Int. Cl. D8—05  
 U.S. Cl. D8—87
- 252,255**  
**EXHAUST MANIFOLD CLAMP**  
 Richard Uyeda, 416 E. Prairie St., Marengo, Ill. 60152  
 Filed May 16, 1977, Ser. No. 797,560  
 Term of patent 14 years  
 Int. Cl. D8—08  
 U.S. Cl. D8—394



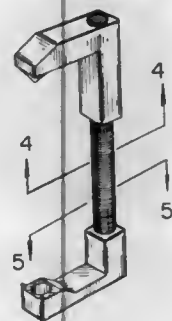
- 252,253**  
**SCREW JIG POLE**  
 Noble H. Abney, 580 Weddell Dr., No. 1, Sunnyvale, Calif. 94086  
 Filed Apr. 1, 1977, Ser. No. 783,952  
 Term of patent 14 years  
 Int. Cl. D8—05  
 U.S. Cl. D8—87



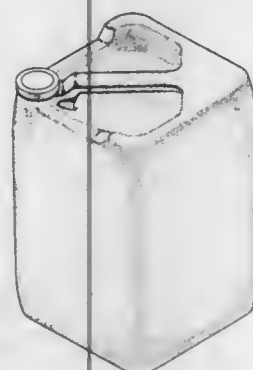
- 252,254**  
**HUB ASSEMBLY, PARTICULARLY FOR A CABLE DRUM WHEEL**  
 Oswald Westin; Owe Westin, and Jan Westin, all of Föreningsgatan 11, S-951 43 Luleå, Sweden  
 Filed May 26, 1977, Ser. No. 800,945  
 Claims priority, application Sweden, Dec. 2, 1976, 762344  
 Term of patent 7 years  
 Int. Cl. D8—99  
 U.S. Cl. D8—358



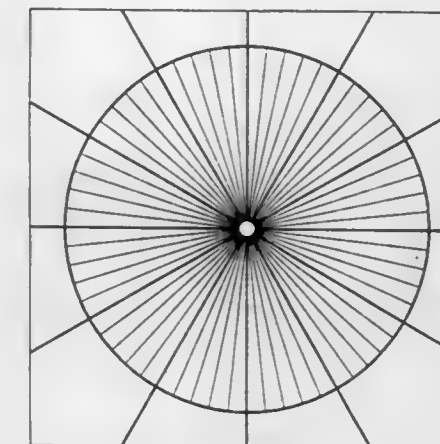
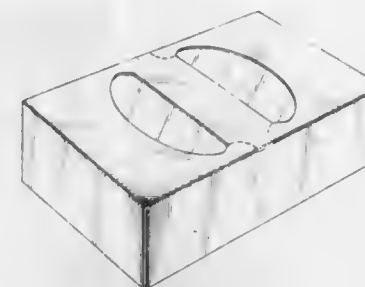
- 252,256**  
**TEMPERATURE PRESET CLIP FOR A THERMOSTAT**  
 Donald F. Kline, 12820 NE., 39th, Bellevue, Wash. 98006  
 Filed Jan. 24, 1977, Ser. No. 761,892  
 Term of patent 14 years  
 Int. Cl. D8—08  
 U.S. Cl. D8—395



- 252,257**  
**LIQUID CONTAINER**  
 Fred R. Dobbs, Dallas, Tex., and Robert G. Squibb, Cordova, Tenn., assignors to Southeastern Steel Container Company, Birmingham, Ala.  
 Filed Jan. 31, 1977, Ser. No. 764,469  
 Term of patent 14 years  
 Int. Cl. D9—01  
 U.S. Cl. D9—52



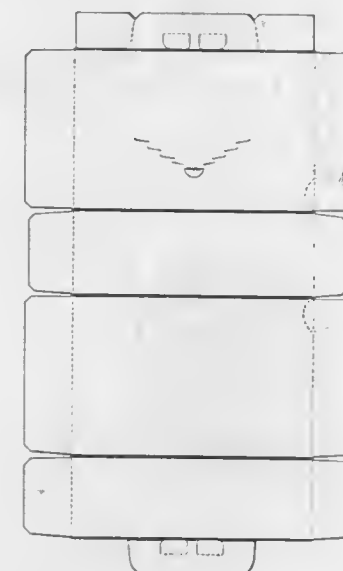
- 252,258**  
**DISPENSING CARTON OR SIMILAR ARTICLE**  
 Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.  
 Filed Feb. 25, 1977, Ser. No. 771,907  
 Term of patent 14 years  
 Int. Cl. D9—03  
 U.S. Cl. D9—224
- 252,260**  
**TIMEPIECE DIAL**  
 Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011  
 Filed Nov. 1, 1977, Ser. No. 847,680  
 Term of patent 14 years  
 Int. Cl. D10—07  
 U.S. Cl. D10—125



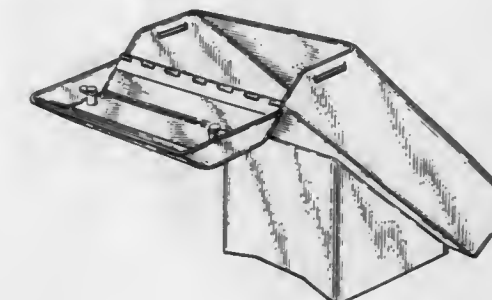
- 252,261**  
**PENDANT FOR A KEY CHAIN OR THE LIKE**  
 Arlen D. Weibert, 3127 E. Belmont, and Edwin D. Weibert, 4696 E. Clinton, both of Fresno, Calif.  
 Filed Oct. 11, 1977, Ser. No. 840,663  
 Term of patent 14 years  
 Int. Cl. D11—01  
 U.S. Cl. D11—82



- 252,259**  
**ARTICLE CARRIER BLANK**  
 Alfred J. Rinehart, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio  
 Filed Mar. 28, 1977, Ser. No. 782,501  
 Term of patent 14 years  
 Int. Cl. D9—03  
 U.S. Cl. D9—245



- 252,262**  
**SECURITY CONTAINER FOR A CITIZENS BAND RADIO**  
 Forrest E. Baker, 1891 Foxworthy Ave., San Jose, Calif. 95124  
 Filed Aug. 25, 1977, Ser. No. 827,823  
 Term of patent 14 years  
 Int. Cl. D12—16  
 U.S. Cl. D12—155





252,263

**MOTOR HOME**

Gerald A. Van Stockum, 5763 Paizano Way, Riverside, Calif. 92509, and Oliver J. Hawkins, 2905 Mountain View Dr., Laguna Beach, Calif. 90031

Filed Aug. 29, 1977, Ser. No. 828,559

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-100



252,265

**TRASH CART OR THE LIKE**

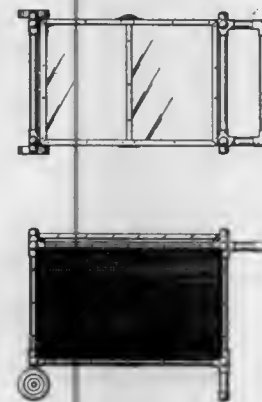
Jerry N. Gardner, 3149 Stratton Rd., Jacksonville, Fla. 32221

Filed Apr. 17, 1978, Ser. No. 897,525

Term of patent 14 years

Int. Cl. D12-02

U.S. Cl. D12-33



252,264

**SHOPPING CART**

Stephen Paterson, 106 28 Queens Blvd., Forest Hills, N.Y. 11375

Filed Oct. 17, 1977, Ser. No. 842,670

Term of patent 14 years

Int. Cl. D12-02

U.S. Cl. D12-33



252,266

**WHEEL**

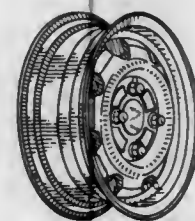
Hirotsune Taitani, Seto, and Yoshihiro Hamasaki, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 29, 1977, Ser. No. 811,368

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-211



252,267

**CIRCUIT CONNECTOR MODULE**

Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.

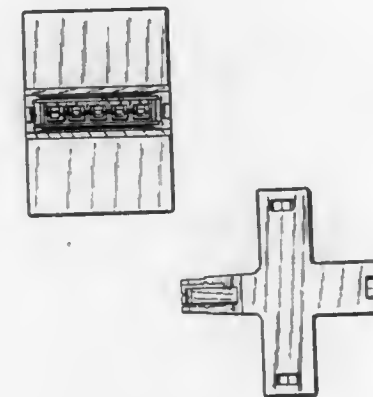
Continuation-in-part of Ser. No. 837,756, Sep. 29, 1977. This

application Jan. 16, 1978, Ser. No. 869,481

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



252,270

**ELECTRICAL CIRCUIT CONNECTOR**

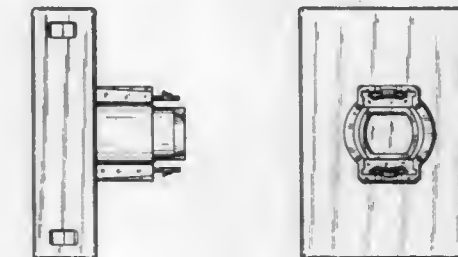
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed May 23, 1978, Ser. No. 908,692

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



252,271

**CIRCUIT CONNECTOR MODULE**

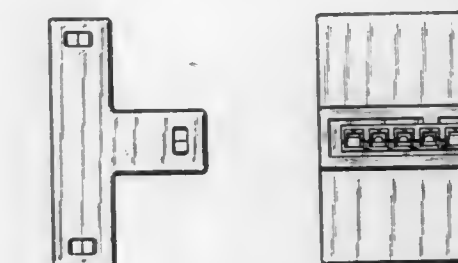
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 869,481, Jan. 16, 1978, and Ser. No. 837,756, Sep. 29, 1977. This application May 23, 1978, Ser. No. 908,693

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



252,268

**ELECTRICAL CONNECTOR**

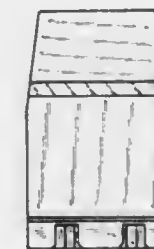
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Sep. 19, 1977, Ser. No. 834,811

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



252,269

**ELECTRICAL CONNECTOR**

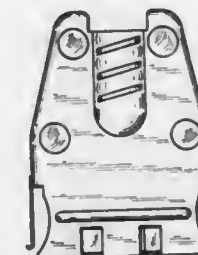
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Sep. 19, 1977, Ser. No. 834,813

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



252,272

**DECOLLATOR**

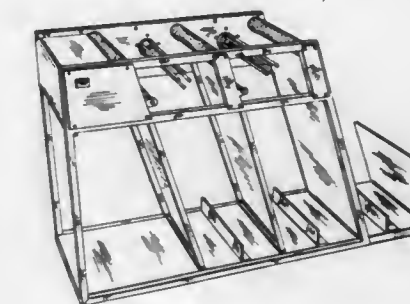
Edward E. Barrett, Massapequa Park, N.Y., assignor to Swing-line Inc., Long Island, N.Y.

Filed Jul. 13, 1976, Ser. No. 704,942

Term of patent 14 years

Int. Cl. D14-02; D16-99; D18-99

U.S. Cl. D18-22

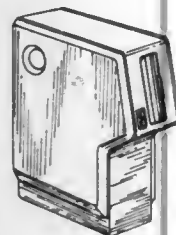


252,273  
MAGNETIC DISK CONTROL UNIT FOR WORD PROCESSORS

Farouk Arjani, Foster City; Thomas J. Kramer, San Jose; Richard E. Johnson, Los Altos; Ralph M. Swan, Sunnyvale; David C. Andersen, Cupertino, and David D. Pharmer, Gilroy, all of Calif., assignors to Artec International Corporation, Palo Alto, Calif.

Filed Mar. 14, 1977, Ser. No. 777,114  
Term of patent 14 years  
Int. Cl. D14-02

U.S. Cl. D14-46

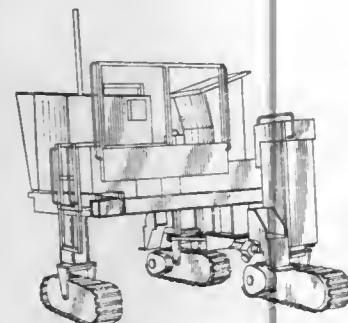


252,274  
CURB FORMING MACHINE

Joseph T. Gregorich, Rockford; William C. Goers, Dundee, and Walter B. Seefeldt, Naperville, all of Ill., assignors to Barber-Greene Company, Aurora, Ill.

Filed May 2, 1977, Ser. No. 793,169  
Term of patent 14 years  
Int. Cl. D15-04

U.S. Cl. D15-22

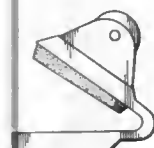
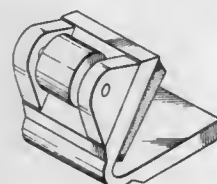


252,275  
SUBSTRATE CLAMP FOR A SLITTING APPARATUS

James E. McCrea, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1977, Ser. No. 773,727  
Term of patent 14 years  
Int. Cl. D16-03

U.S. Cl. D16-32

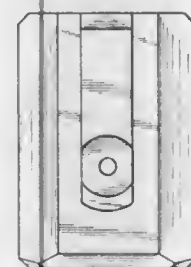
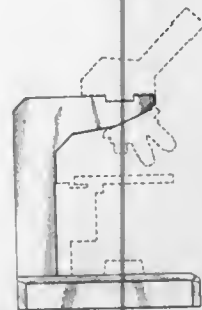


252,276  
MICROSCOPE STAND

Howard A. Griffith, San Jose, Calif., assignor to Swift Instruments, Inc.

Filed Apr. 6, 1978, Ser. No. 894,050  
Term of patent 14 years  
Int. Cl. D16-06

U.S. Cl. D16-57

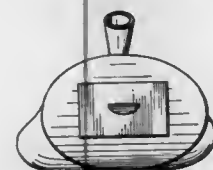


252,277  
COMBINED PAPERWEIGHT AND PEN HOLDER

George O. Chaires, P.O. Box 5175, Tallahassee, Fla. 32301

Filed Apr. 18, 1977, Ser. No. 788,380  
Term of patent 14 years  
Int. Cl. D19-02

U.S. Cl. D19-97

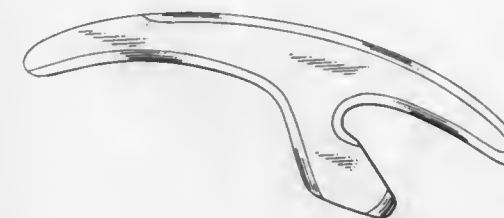


252,278  
HANDLE FOR A FISHING DEVICE

Bernard J. Struntz, 1002 Woodbridge St., St. Paul, Minn. 55117

Filed Apr. 25, 1977, Ser. No. 790,562  
Term of patent 3 years  
Int. Cl. D22-05

U.S. Cl. D22-23



252,279  
FISHING LURE

Arthur F. Daws, Jr., P.O. Box 203, Brownsville, Tenn. 38012

Filed Jul. 5, 1977, Ser. No. 813,114  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-28

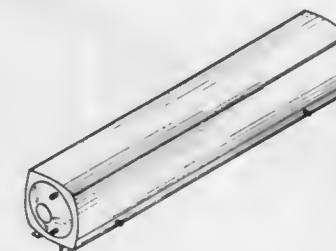


252,280  
STORAGE TANK

Harry J. Riley, Perth, Australia, assignor to S. W. Hart and Co. Pty. Ltd., Australia

Filed Oct. 5, 1976, Ser. No. 729,918  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-2

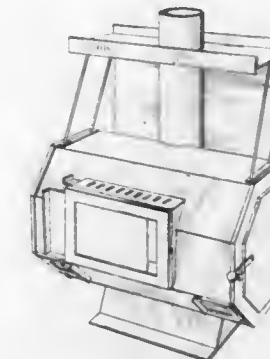


252,281  
FIREPLACE STOVE

Duane P. Kincaid, Rte. 1, Box 471, Sandpoint, Id. 83864

Filed Jul. 7, 1977, Ser. No. 813,735  
Term of patent 14 years  
Int. Cl. D23-03

U.S. Cl. D23-97

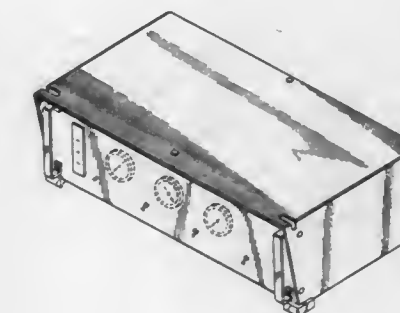


252,282  
CABINET WHICH HOUSES COMPONENTS EMPLOYED IN SURGERY

Ludwig A. Wettermann, Arlington Heights, and William F. Auer, Des Plaines, both of Ill., assignors to Richard Wolf Medical Instruments Corporation, Rosemont, Ill.

Filed Dec. 23, 1977, Ser. No. 864,156  
Term of patent 14 years  
Int. Cl. D24-02

U.S. Cl. D24-8





252,283

**TENDON HAMMER**

Ralph Reeves-Saunders, 175 Parkside Ave., Bexleyheath, Kent, DA7 6NP, England

Filed Mar. 21, 1977, Ser. No. 779,944

Claims priority, application United Kingdom, Sep. 29, 1976, 97736176; Sep. 29, 1976, 97736276; Jan. 25, 1977, 97866077

Term of patent 14 years

Int. Cl. D24—02

U.S. Cl. D24—17



252,284

**HEMODIALYSIS RESERVOIR OR THE LIKE**

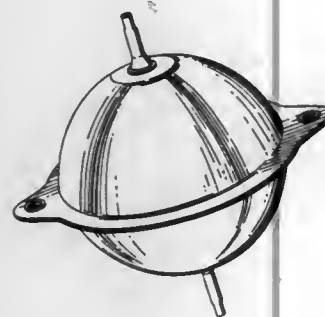
Jacques M. Calzia, Saint-Genis Laval, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 26, 1977, Ser. No. 791,144

Term of patent 14 years

Int. Cl. D24—01

U.S. Cl. D24—21



252,285

**FRAME MEMBER FOR STORM WINDOWS OR THE LIKE**

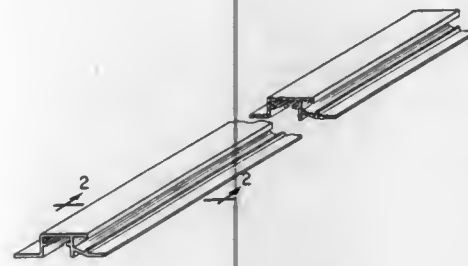
Warren H. Brockway, Newnan, Ga., assignor to The William L. Bonnell Company, Ga.

Filed Jun. 27, 1977, Ser. No. 810,151

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—74



252,286

**FRAME MEMBER FOR STORM WINDOWS OR THE LIKE**

Warren H. Brockway, Newnan, Ga., assignor to The William L. Bonnell Company, Ga.

Filed Jun. 27, 1977, Ser. No. 810,580

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—74



252,287

**FRAME MEMBER FOR STORM WINDOWS OR THE LIKE**

Warren H. Brockway, Newnan, Ga., assignor to The William L. Bonnell Company, Ga.

Filed Jun. 27, 1977, Ser. No. 810,581

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—74



252,288

**HUMMINGBIRD FEEDER**

Peter Kilham, Foster, R.I., assignor to Droll Yankees, Inc., Kiyoji Asano, 2-27-23, Sumida, Sumida-ku, Tokyo, Japan

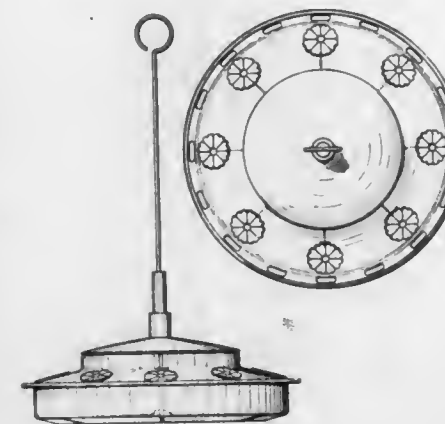
Foster, R.I.

Filed Mar. 27, 1978, Ser. No. 891,131

Term of patent 14 years

Int. Cl. D30—03

U.S. Cl. D30—14



252,289

**GOLF BALL MARKER BAND**

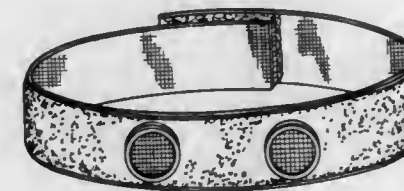
Frank E. Furin, 30896 Lorain Rd., North Olmsted, Ohio 44070

Filed Nov. 28, 1975, Ser. No. 636,164

Term of patent 14 years

Int. Cl. D21—02

U.S. Cl. D21—234



252,290

**TOY VEHICLE**

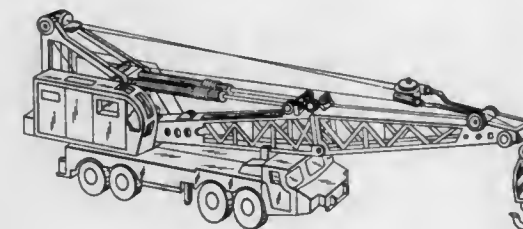
Kiyoji Asano, 2-27-23, Sumida, Sumida-ku, Tokyo, Japan

Filed Dec. 2, 1975, Ser. No. 637,095

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D21—128



252,291

**TOY VEHICLE**

Kiyoji Asano, 2-27-23, Sumida, Sumida-ku, Tokyo, Japan

Filed Dec. 4, 1975, Ser. No. 637,772

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D21—131



252,292

**TOY STORE**

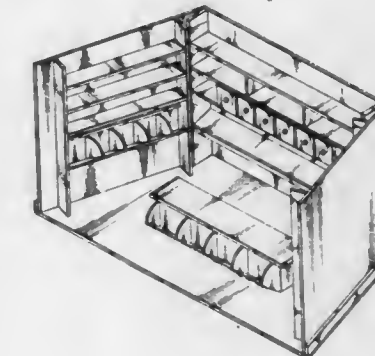
Wilma I. Johnson, 692 Palisade St., Pasadena, Calif. 91103

Filed Nov. 18, 1976, Ser. No. 742,861

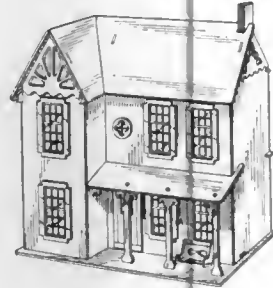
Term of patent 14 years

Int. Cl. D21—01

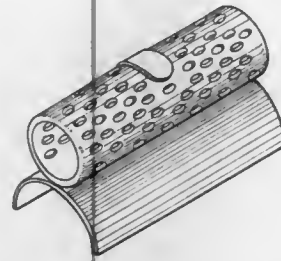
U.S. Cl. D21—114



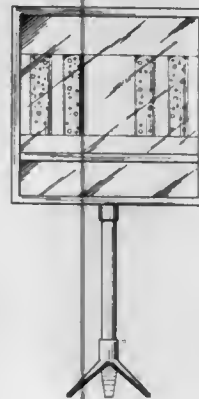
252,293  
**TOY HOUSE**  
 William D. Gordon, Sr., Glenview, Ill., assignor to Arvey Corporation, Chicago, Ill.  
 Filed Jun. 20, 1977, Ser. No. 808,168  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—114



252,294  
**HAIR NET CONTAINER**  
 Muriel A. Mack, 312 Marion Ct., Rte. 3, Rawlings, Md. 21557  
 Filed Jun. 16, 1977, Ser. No. 807,311  
 Term of patent 3 years  
 Int. Cl. D28—03  
 U.S. Cl. D3—39



252,295  
**BUBBLE DISPLAY DEVICE**  
 Billie M. Crutchfield, 11060 NW. 44th St., Coral Springs, Fla. 33065  
 Filed Apr. 11, 1977, Ser. No. 786,255  
 Term of patent 14 years  
 Int. Cl. D20—03  
 U.S. Cl. D20—41



## LIST OF PATENTEEES

TO WHOM

### PATENTS WERE ISSUED ON THE 3RD DAY OF JULY, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. L. Korr Associates, Inc.: See—  
 Korr, Abraham L.; Walker, Evan H.; and Svihel, Bernard T., 4,159,629, Cl. 60-641.000.
- A-Lok Products Corporation: See—  
 Ditcher, John, 4,159,829, Cl. 277-189.000.
- Abbott Laboratories: See—  
 Hauser, Stephen G., 4,159,875, Cl. 356-244.000.
- Abraimov, Boris F.: See—  
 Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; Sachko, Viktor V.; Yakunin, Ivan A.; and Abraimov, Boris F., 4,159,734, Cl. 164-426.000.
- Achatz, Manfred; Beck, Rasmus; and Bockelmann, Werner, to Battelle-Institute e. V. Device and method for measuring the curvature of the cornea. 4,159,867, Cl. 351-6.000.
- Acoustical Floors, Inc.: See—  
 Jorgenson, Ronald M., 4,159,912, Cl. 106-109.000.
- Acricite Company, Inc.: See—  
 Schwartz, Lawrence B., 4,159,729, Cl. 150-33.000.
- Adams, Ralph W., to Spoklie, Howard A., a part interest. Magnetizing and demagnetizing tool. 4,160,283, Cl. 361-143.000.
- Adamson, John S., to Chevron Research Company. Transponder system including an oscillator/ripple counter controlling a fixed Gray code logic network in circuit with a decoder/driver network for generating "red alert" end condition digital signals in a storage tank gauging system. 4,160,239, Cl. 340-152.00T.
- Advanced Equipment Corporation: See—  
 Dickson, Wesley B., 4,159,556, Cl. 16-87.40R.
- Advanced Fireproofing Systems Limited: See—  
 Lloyd-Lucas, John B.; and Lloyd-Lucas, Christopher, 4,160,073, Cl. 521-122.000.
- Agarpao, Emilio L.: See—  
 Airheart, Franklin B.; and Agarpao, Emilio L., 4,159,754, Cl. 188-71.800.
- Agence Nationale de Valorisation de la Recherche: See—  
 Miquel, Jean-Francois, 4,159,707, Cl. 126-270.000.
- Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, to Montedison S.p.A. Process for the preparation of esters of oxalic acid. 4,160,107, Cl. 560-204.000.
- Ahmed, Adel A. A., to RCA Corporation. Voltage regulators. 4,160,201, Cl. 323-8.000.
- Airheart, Franklin B.; and Agarpao, Emilio L., to Airheart Products, Inc. Parking brake assembly. 4,159,754, Cl. 188-71.800.
- Airheart Products, Inc.: See—  
 Airheart, Franklin B.; and Agarpao, Emilio L., 4,159,754, Cl. 188-71.800.
- Akahane, Yoshikazu, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece having a main oscillator circuitry and secondary oscillator circuitry. 4,159,622, Cl. 58-23.0AC.
- Akase, Kazutoyo; and Kobayashi, Isao, to Nippon Electric Co., Ltd. Circuit comprising an air gap for driving a laser. 4,160,190, Cl. 315-168.000.
- Akers, Arthur: See—  
 Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, 4,159,942, Cl. 209-143.000.
- AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: See—  
 Gorike, Rudolf, 4,160,135, Cl. 179-182.00R.
- Akman, Ahmet R., to Ford Motor Company. Engine ignition timing control with multi-stage advances, retard, and altitude compensation functions. 4,159,702, Cl. 123-117.00A.
- Aktiebolaget SKF: See—  
 Ostling, Sture; and Persson, Stig, 4,159,828, Cl. 277-184.000.
- Akzona Incorporated: See—  
 Griset, Ernest J., Jr., 4,159,619, Cl. 57-295.000.
- Mone, Rudolf A. J.; and Klaver, Gijsbertus, 4,159,969, Cl. 252-463.000.
- Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,159,975, Cl. 525-91.000.
- Albany International Corp.: See—  
 Sokaris, Jerry G., 4,159,618, Cl. 57-251.000.
- Albertson, Orris E.: See—  
 Fitch, Elliot B.; and Albertson, Orris E., 4,159,682, Cl. 110-245.000.
- Albiez, Ernst: See—  
 Bachmann, Hans; and Albiez, Ernst, 4,159,725, Cl. 140-93.200.
- Alexander, Granison T., Jr., to Chromalloy American Corporation. Well bore cleaning tool. 4,159,742, Cl. 166-173.000.
- Allan, John T., to Fiber Industries, Inc. Resilient polyester fibers. 4,159,617, Cl. 57-247.000.
- Allen, Archelaus D. Self-advancing mine roof supports. 4,159,671, Cl. 91-32.000.
- Allen & Hanburys Limited: See—  
 Bradshaw, John; and Collins, Ian, 4,160,036, Cl. 424-330.000.
- Alles, David S.; and Hill, Joseph, to Bell Telephone Laboratories, Incorporated. Cassette unit and fixture for loading the unit with a planar member. 4,159,799, Cl. 235-486.000.
- Allied Industries, Inc.: See—  
 Avery, Hugh E., Jr., 4,159,941, Cl. 209-3.000.
- Allington, William B., deceased (by Emery, Richard T., executor); Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., to Instrumentation Specialties Company. Sample concentrator. 4,159,933, Cl. 204-180.00R.
- Allis-Chalmers Corporation: See—  
 Knudson, Henry T.; and Klas, Kenneth H., 4,159,613, Cl. 56-11.300.
- Leja, Ronald J.; and Williams, Hugh K., 4,159,835, Cl. 280-756.000.
- Allport, Maurice J.; and Cotton, Herbert J. T., to Lucas Industries Limited. Rectifier and brush assembly for an alternator. 4,160,179, Cl. 310-68.00R.
- Alper, Yekutieli: See—  
 Hood, Clarence E.; Webb, Byron K.; and Alper, Yekutieli, 4,159,745, Cl. 172-44.000.
- Alto Corporation: See—  
 Weaver, John A., 4,159,662, Cl. 83-867.000.
- Aluminum Company of America: See—  
 Hsieh, Hsiun P., 4,159,977, Cl. 260-40.00R.
- Alza Corporation: See—  
 Ayer, Atul D.; and Theeuwes, Felix, 4,160,020, Cl. 424-15.000.
- American Colloid Company: See—  
 Hughes, John; and Maul, Peter L., 4,159,683, Cl. 110-343.000.
- American Home Products Corporation: See—  
 Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., 4,159,980, Cl. 260-112.5LH.
- Sellstedt, John H.; Guinasso, Charles J.; and Begany, Albert J., 4,160,100, Cl. 560-43.000.
- American Safety Equipment Corporation: See—  
 Rawson, Gerry, 4,159,809, Cl. 242-107.000.
- American Science and Engineering, Inc.: See—  
 McCombs, Allan K.; and Stein, Jay A., 4,160,165, Cl. 250-354.000.
- American Standard Inc.: See—  
 Tobin, Leo W., Jr., 4,159,550, Cl. 4-319.000.
- AMF Incorporated: See—  
 Seiling, Samuel O., 4,159,740, Cl. 165-147.000.
- Thomas, George A.; and Peterson, C. Dean, 4,159,614, Cl. 56-11.600.
- Amino Aluminium Industries, Co., Ltd.: See—  
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- Amino, Kunio, to Amino Aluminium Industries, Co., Ltd. Method for melting aluminum scraps. 4,159,907, Cl. 75-68.00R.
- AMP Incorporated: See—  
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- Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., to International Business Machines Corporation. Method for fabrication vertical NPN and PNP structures utilizing ion-implantation. 4,159,915, Cl. 148-1.500.
- Anderson, Charles H.; and Marlowe, Frank J., to RCA Corporation. System and method for keying video information to electron beam deflection. 4,160,194, Cl. 315-366.000.
- Anderson, J. Hilbert, to Sea Solar Power. Plate-fin heat exchanger with controls therefor. 4,159,735, Cl. 165-40.000.
- Anderson, Martin B.: See—  
 Steele, David J.; McLean, Andrew I. O.; and Anderson, Martin B., 4,160,155, Cl. 235-92.0TC.
- Andersson, Gunnar; and Borgstrom, Gunnar, to ASEA Aktiebolag. Method for application of a tape of insulating material in the longitudinal direction of a substantially rectangular electrical conductor. 4,159,920, Cl. 156-54.000.
- Andrews, Glenn C., to Pfizer Inc. Reduction of 2,5-diketogluconic acid. 4,159,990, Cl. 260-343.700.
- Anhalt, John W., to International Telephone and Telegraph Corporation. Zero insertion force connector. 4,159,861, Cl. 339-75.0MP.
- Anthes Equipment Limited: See—  
 Burrell, Michael P., 4,159,604, Cl. 52-376.000.
- Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,159,939, Cl. 208-139.000.
- Aoki, Akio: See—  
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- Aoki, Eiichiro; and Suzuki, Tsutomu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with different types of tone forming systems. 4,159,663, Cl. 84-1.240.
- Aoki, Kiyoshi, to Tokyo Shibaura Electric Co., Ltd. Logic circuit with two pairs of cross-coupled NAND/NOR gates. 4,160,173, Cl. 307-289.000.



- Aquila S.p.A.: See—  
Bussi, Giancarlo; and Baradel, Pierpaolo, 4,160,089, Cl. 544-78.000.
- Arai, Nobuichi: See—  
Tanaka, Tadashi; Obi, Tatsuhiro; Arai, Nobuichi; and Koyama, Teruo, 4,160,056, Cl. 428-220.000.
- Arai, Tomiji, to Nissan Motor Company, Limited. Seat for a motor vehicle or the like, 4,159,847, Cl. 297-284.000.
- Araki, Shigeyuki: See—  
Imamura, Tomotsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, 4,160,200, Cl. 318-616.000.
- Aramaki, Minoru: See—  
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- ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A.: See—  
Funch, Alfred, 4,160,168, Cl. 250-564.000.
- Armstrong Cork Company: See—  
Rueggeberg, Werner, 4,160,145, Cl. 219-10.55F.
- Armstrong, Harris W.: See—  
Deffeyes, Robert J.; and Armstrong, Harris W., 4,160,284, Cl. 361-433.000.
- Armstrong, Rolf D., to NCR Corporation. One-bit multifunction arithmetic and logic circuit, 4,160,290, Cl. 364-716.000.
- Arndt, Friedrich; and Nusslein, Ludwig, to Schering Aktiengesellschaft. 1,3,3-Trimethyl-6-azabicyclo-(3,2,1)-octane-6-carboxylic acid ester, herbicides, process for making same and composition containing same, 4,159,902, Cl. 71-95.000.
- Arnone, Joseph A. Photographic retouching apparatus, 4,159,871, Cl. 354-350.000.
- Artbauer, Jan, to Kabel-und Metallwerke Gutehoffnungshuette AG. High voltage electrical cables, 4,160,119, Cl. 174-28.000.
- ASA S.A.: See—  
Bru, Christian, 4,159,621, Cl. 57-338.000.
- Asahi Glass Company, Ltd.: See—  
Kozuka, Mikio; Ono, Isao; and Fukuwatari, Takashi, 4,160,003, Cl. 264-87.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: See—  
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Miya, Masayoshi, 4,159,963, Cl. 252-429.00B.
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- Ascoli, Enzo, to Gillette Company, The. Vibratory electromagnetic motor, 4,160,177, Cl. 310-22.000.
- ASEA Aktiebolag: See—  
Andersson, Gunnar; and Borgstrom, Gunnar, 4,159,920, Cl. 156-54.000.
- Asmus, David, Jr. Food dispensing bin, 4,159,955, Cl. 210-473.000.
- Associated Mills, Inc.: See—  
Peterson, Samuel F.; and Grube, Clifford E., 4,159,714, Cl. 128-24.200.
- Atlantic Richfield Company: See—  
Hix, Larry J.; Wise, Phillip W.; and Bennyhoff, David H., 4,160,228, Cl. 340-7.00R.
- Smith, Robert H., 4,159,940, Cl. 208-254.00H.
- Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, to Dainippon Screen Seizo Kabushiki Kaisha. Picture scanner with a scanning light position detector, 4,160,280, Cl. 358-294.000.
- Attwood, Brian W.: See—  
Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., 4,160,004, Cl. 264-120.000.
- Avco Corporation: See—  
Hudson, George S.; and Roy, Madan M., 4,159,642, Cl. 73-118.000.
- Avery, Hugh E., Jr., to Allied Industries, Inc. Separator, 4,159,941, Cl. 209-3.000.
- Avon Products, Inc.: See—  
Bulwith, Joseph P., 4,159,762, Cl. 198-472.000.
- Ayer, Atul D.; and Theeuwes, Felix, to Alza Corporation. Therapeutic device for osmotically dosing at controlled rate, 4,160,020, Cl. 424-15.000.
- B. F. Goodrich Company, The: See—  
Kroenke, William J.; Carroll, Richard T.; and Magistro, Angelo J., 4,159,968, Cl. 252-462.000.
- Baatrup, Johannes V.; and Rasmussen, Ivar, to Danfoss A/S. Control device for steering apparatus or the like, 4,159,723, Cl. 137-596.130.
- Babcock & Wilcox Company, The: See—  
Sage, Warrin L., 4,159,886, Cl. 414-292.000.
- Babos, Gyorgy: See—  
Rothman, Gyorgy; Babos, Gyorgy; Gyarmati nee Hardik, Maria; Hegedus, Arpad; and Rofa, Otto, 4,160,197, Cl. 318-396.000.
- Bach, Donald J.: See—  
Guthrie, James L.; and Bach, Donald J., 4,160,076, Cl. 521-159.000.
- Bachmann, Hans; and Albiez, Ernst, to Borbe-Wanner AG. Apparatus for tensioning and locking hooping bands, 4,159,725, Cl. 140-93.200.
- Badger, Algernon S.: See—  
Mayne, William H.; Hawes, William S.; and Badger, Algernon S., 4,160,233, Cl. 340-15.5MC.
- Badger Company, Inc.: See—  
Miserlis, Constantine D., 4,159,992, Cl. 260-412.600.
- Bailey, Vincent R. Dispensing container, 4,159,790, Cl. 222-211.000.
- Baker, Daniel G., to Tektronix, Inc. Aperture correction circuit, 4,160,276, Cl. 358-162.000.
- Baker Perkins Holdings Limited: See—  
Johnson, Reginald F.; and Sutton, Leonard, 4,159,612, Cl. 53-594.000.
- Baker, William E., Jr.: See—  
Stuart, Kenneth L.; and Baker, William E., Jr., 4,160,288, Cl. 363-41.000.
- Baldwin-Gegenheimer Corporation: See—  
MacPhee, John, 4,159,651, Cl. 74-55.000.
- Bambara, Mario; and Querze, Adriano, to Societa Italiana Telecomunicazioni Siemens S.p.A. Microprogram-control unit for data processor, 4,160,289, Cl. 364-200.000.
- Baradel, Pierpaolo: See—  
Bussi, Giancarlo; and Baradel, Pierpaolo, 4,160,089, Cl. 544-78.000.
- Bardong, Helmut: See—  
Nonnenmann, Manfred; and Bardong, Helmut, 4,159,741, Cl. 165-173.000.
- Bardwell, Francis G., to Stewart-Warner Corporation. Line or pattern following system, 4,160,199, Cl. 318-577.000.
- Bargel, Gunther; and Husemann, Heinz, to Gewerkschaft Eisenhutte Westfalen. Tube-driving apparatus, 4,159,819, Cl. 254-29.00R.
- Barger, William R.: See—  
Garrett, William D.; and Barger, William R., 4,160,033, Cl. 424-285.000.
- Barnes, Clive; and Ward, John J. B., to BNF Metals Technology Centre. Nickel plating, 4,159,926, Cl. 204-49.000.
- Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., to Burroughs Corporation. Link encryption device, 4,160,120, Cl. 178-22.000.
- Barquist, William S., Jr.; and Hutcheon, Robert S., to Raytheon Company. Radio frequency receiver having serially coupled heterodyning stages, each stage having filters with difference center frequencies, 4,160,212, Cl. 325-432.000.
- Barrett Battery, Inc.: See—  
Parker, John R., 4,160,071, Cl. 429-211.000.
- Bartlow, David H.; and Sommerkamp, Robert M., to Owens-Corning Fiberglass Corporation. Glass fiber reinforced thermosetting resin tank for processing olives, 4,159,781, Cl. 220-5.00A.
- BASF Aktiengesellschaft: See—  
Cary, Paul D., 4,159,812, Cl. 242-192.000.
- Baskas, Morris J.; and Berger, Sidney I., to Dentipressions Incorporated. Disposable mixing syringe, 4,159,570, Cl. 32-66.000.
- Battelle-Institute e. V.: See—  
Achatz, Manfred; Beck, Rasmus; and Bockelmann, Werner, 4,159,867, Cl. 351-6.000.
- Bauer, Werner R.; and Smith, William N., to Robertshaw Controls Company. Electrical switch construction and method of making the same, 4,159,563, Cl. 29-622.000.
- Bauman, Albert J., to California Institute of Technology. Enhancement of polyisoprene latex production, 4,159,903, Cl. 71-98.000.
- Bayer Aktiengesellschaft: See—  
Koenig, Kalus; Reichmann, Wolfgang; and Pedain, Josef, 4,160,080, Cl. 528-59.000.
- Moller, Elke; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,160,098, Cl. 548-374.000.
- Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Kreckel, Jorg, 4,159,925, Cl. 203-28.000.
- Baylor College of Medicine: See—  
Lamb, Raymond K.; and Walker, Stephen J., 4,159,637, Cl. 73-46.000.
- BBC Brown Boveri & Company Limited: See—  
Liptak, Gabor; and Schuler, Roland, 4,159,562, Cl. 29-596.000.
- Beck, Harold, to Tissue Products Co., Inc. Treated pad dispensing device, 4,159,772, Cl. 206-820.000.
- Beck, Rasmus: See—  
Achatz, Manfred; Beck, Rasmus; and Bockelmann, Werner, 4,159,867, Cl. 351-6.000.
- Beckman Instruments, Inc.: See—  
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,159,923, Cl. 435-15.000.
- Becton, Dickinson and Company: See—  
Prais, Alois G., 4,159,713, Cl. 128-765.000.
- Bedue, Abel J. H.: See—  
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,159,736, Cl. 165-104.00S.
- Beecham Group Limited: See—  
Burton, George; and Watson, Elzbieta, 4,160,086, Cl. 544-26.000.
- Beestman, George B.; and Prill, Erhard J., to Monsanto Company. Corrosion inhibited agricultural compositions, 4,159,901, Cl. 71-86.000.
- Begany, Albert J.: See—  
Sellstedt, John H.; Guinasso, Charles J.; and Begany, Albert J., 4,160,100, Cl. 560-43.000.
- Bell Telephone Laboratories, Incorporated: See—  
Alles, David S.; and Hill, Joseph, 4,159,799, Cl. 235-486.000.
- Casey, Horace C., Jr.; Cho, Alfred Y.; and Nicollan, Edward H., 4,160,261, Cl. 357-23.000.
- Dawson, Larry R.; and Knight, Stephen, 4,160,258, Cl. 357-16.000.
- De Salvo, Francis J., Jr.; and Murphy, Donald W., 4,159,962, Cl. 252-182.100.
- McFee, James H.; and Miller, Barry I., 4,159,919, Cl. 148-175.000.
- Slana, Matthew F.; and Vaughan, Henry E., deceased, 4,160,127, Cl. 179-15.0AQ.
- Belmonte, Carl; Dakss, Mark L.; and Fulenwider, John E., to GTE Laboratories Incorporated. Hand-held tool for optical fiber waveguide end preparation, 4,159,793, Cl. 225-96.500.
- Bender, Peter: See—  
Luther, Hans-Werner; and Bender, Peter, 4,159,678, Cl. 102-44.000.
- Bendix Corporation, The: See—  
Mayer, Endre A., 4,159,703, Cl. 123-139.0AW.

- Sweet, Charles R., 4,159,697, Cl. 123-32.0EH.
- Benisek, Ladislav, to I.W.S. Nominee Company Limited. Zirconium flame-resist treatment, 4,160,051, Cl. 427-352.000.
- Bennyhoff, David H.: See—  
Hix, Larry J.; Wise, Phillip W.; and Bennyhoff, David H., 4,160,228, Cl. 340-7.00R.
- Berez, Imre, to Microdot Inc. Method of manufacturing a barrel nut, 4,159,552, Cl. 10-86.00F.
- Berenbaum, Marvin, to Las Vegas Research, Inc. Anti-pollution method and apparatus for combustion engines, 4,159,698, Cl. 123-41.310.
- Berendonk, Bengt: See—  
Bojarski, Victor, 4,160,206, Cl. 324-73.00R.
- Berger, Sidney I.: See—  
Baskas, Morris J.; and Berger, Sidney I., 4,159,570, Cl. 32-66.000.
- Bergkvist, Lars A. Device for indicating a horizontal direction and one or more angle sectors about said direction, 4,159,577, Cl. 33-366.000.
- Bergwerksverband GmbH: See—  
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.
- Berlyn Corporation, The: See—  
Paquette, James P., 4,159,953, Cl. 210-396.000.
- Bernard, Walter J.; and Randall, John J., Jr., to Sprague Electric Company. Anodizing aluminum in boric acid bath containing hydroxy organic acid, 4,159,927, Cl. 204-58.000.
- Berner, Howard E., to Pharmacs, Inc. Capsule box, 4,159,568, Cl. 30-124.000.
- Bernham, Robert R.: See—  
Christy, Harold; and Bernham, Robert R., 4,160,263, Cl. 358-1.000.
- Berry, William M., Jr., to UOP Inc. Method for loading particulate matter in a vessel, 4,159,785, Cl. 222-63.000.
- Betts, David A.: See—  
Karbo, Donald J.; Betts, David A.; and Pauer, Lyle A., 4,160,234, Cl. 340-58.000.
- Beutler, Paul S.: See—  
Johnson, Owen W.; Miller, Gerald R.; and Beutler, Paul S., 4,160,069, Cl. 429-104.000.
- Beyerle, Willi. Retaining device for plug-in unit coating with a contact carrier, 4,159,770, Cl. 206-577.000.
- Bhatia, Harsaran S.: See—  
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,159,915, Cl. 148-1.500.
- Biddle, Nicholas, III; and Patterson, Roger A., to Du Pont de Nemours, E. I., and Company. Periodically excited level control probe, 4,159,786, Cl. 222-64.000.
- Biermann, Udo K. P.; van der Sluis, Willem L. N.; and Roelofs, Johannes C. M., to U.S. Philips Corporation. Heat pipe, 4,159,737, Cl. 165-105.000.
- Bimbi, Giuseppe: See—  
Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, 4,160,107, Cl. 560-204.000.
- Bingham, Elena M.; and Elliott, Arthur J., to Du Pont de Nemours, E. I., and Company. Quinazolinone oxides and their use as intermediates for pharmaceutical agents, 4,160,092, Cl. 544-286.000.
- Birchall, James D.; and Pybus, Roger M., to Imperial Chemical Industries Limited. Siliceous materials, 4,159,913, Cl. 106-307.000.
- Birker, Bertel: See—  
Paulsen, Mogens T.; and Birker, Bertel, 4,159,646, Cl. 73-194.00A.
- Paulsen, Mogens T.; and Birker, Bertel, 4,159,647, Cl. 73-194.00A.
- Bjorklund, Knut B. Stabilized cancer associated polypeptide antigen and preparation thereof, 4,160,018, Cl. 424-12.000.
- Bjorklund, Knut B. Detection of cancer associated polypeptide antigen and preparation of antibodies thereto, 4,160,019, Cl. 424-12.000.
- Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., to Caterpillar Tractor Co. Elevating scraper up-stop mechanism, 4,159,583, Cl. 37-8.000.
- Blankenship, Ernest B., to Research Products/Blankenship Corporation. Incinerator urinal, 4,159,547, Cl. 4-111.100.
- Blum, Julian J. Multilayered labeling system, 4,159,586, Cl. 40-2.00R.
- Blumenaus, Jon M., to World Carpets, Inc. Method of print dyeing textile materials from a photograph and products made therefrom, 4,159,892, Cl. 8-62.000.
- BNF Metals Technology Centre: See—  
Barnes, Clive; and Ward, John J. B., 4,159,926, Cl. 204-49.000.
- Boche, Paul H. Cruise control device for vehicles, 4,159,753, Cl. 180-177.000.
- Bockelmann, Werner: See—  
Achatz, Manfred; Beck, Rasmus; and Bockelmann, Werner, 4,159,867, Cl. 351-6.000.
- Bodor, Nicolae S., to Interx Research Corporation. Labile, non-heterocyclic quaternary ammonium salt/esters as transient derivatives, 4,160,099, Cl. 560-110.000.
- Boeing Company, The: See—  
Farris, William E., 4,159,690, Cl. 114-275.000.
- Hu, John C., 4,159,894, Cl. 23-230.0PC.
- Bojanek, Robert J.; and Mason, Marvin S., to GTE Sylvania Incorporated. Modular multiplex/demultiplex apparatus, 4,160,126, Cl. 179-15.0AT.
- Bojarski, Victor, to Berendonk, Bengt. Audible voltage-impedance tester, 4,160,206, Cl. 324-73.00R.
- Borbe-Wanner AG.: See—  
Bachmann, Hans; and Albiez, Ernst, 4,159,725, Cl. 140-93.200.
- Borchers, Clinton H. Method of compressing and realigning bone structures to correct splay foot, 4,159,716, Cl. 128-80.00R.
- Borgstrom, Gunnar: See—  
Andersson, Gunnar; and Borgstrom, Gunnar, 4,159,920, Cl. 156-54.000.
- Boushek, Sidney J., Jr., to Deere & Company. Harvesting machine frame, 4,159,749, Cl. 180-305.000.
- Bower, David S.; and Smith, Fred J., to Digital Products Corporation. Telephone polling apparatus, 4,160,125, Cl. 179-6.00D.
- Bower, Earle S. Disposable douche, 4,159,718, Cl. 128-248.000.
- Bowman, Peter: See—  
Chen, Evan N.; and Bowman, Peter, 4,159,567, Cl. 30-62.000.
- Bradshaw, John; and Collins, Ian, to Allen & Hanburys Limited. 4-Hydroxy-1,3-benzenedimethanol derivatives, 4,160,036, Cl. 424-330.000.
- Braithwaite, Arthur B. M., to Caterpillar Tractor Co. Method for making a boom, 4,159,796, Cl. 228-151.000.
- Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls Company. Fuel control system and control device therefor or the like, 4,159,800, Cl. 236-15.00A.
- Braslaw, Jacob; and Pai, Purnachandra, to Ford Motor Company. Dissolution of polyurethane foams and re-use of the products therefrom, 4,159,972, Cl. 260-2.300.
- Bratsberg, Glenn N. Airstream deflector for motor vehicles, 4,159,845, Cl. 296-95.00R.
- Bridgeport Machines Division of Textron Inc.: See—  
Parkinson, Edward J., 4,159,658, Cl. 74-813.00L.
- Briles, Franklin S. Expanding head riveting method and system, 4,159,666, Cl. 85-37.000.
- Broad, Roy M., to Scott & Fetzer Company, The. High voltage cable coupler with termination adaptor, 4,159,860, Cl. 339-60.00M.
- Bromer, Gunter, to Siemens Aktiengesellschaft. Numerically-controlled machine tool, 4,160,198, Cl. 318-565.000.
- Bronn, Walter K.: See—  
Luca, Sebastiano F.; Thommel, Jurgen; and Bronn, Walter K., 4,160,040, Cl. 426-62.000.
- Brooks, John L.; Budziarek, Richard; and Harper, David J., to Imperial Chemical Industries Limited. Process of crosslinking unsaturated hydrocarbon polymers employing novel carbamates, 4,160,077, Cl. 525-332.000.
- Brooks, Larry L.; and McMillon, David A. Dewatering system, 4,159,947, Cl. 210-108.000.
- Brothers, Warren S.; and Kallfelz, Albert J., to Carrier Corporation. Heat transfer surface and method of manufacture, 4,159,739, Cl. 165-133.000.
- Brown, Harry W., to Cutler-Hammer, Inc. Switch with indexing detent block, 4,160,138, Cl. 200-67.00A.
- Brown, Robert E.; Johnson, David L.; and Lindquist, John F., to Caterpillar Tractor Co. Adapter for preloading bearings, 4,159,750, Cl. 180-9.620.
- Brown, Stanley L., to Roscoe Brown Corporation. Rotary trencher and shoe assembly therefor, 4,159,585, Cl. 37-97.000.
- Bru, Christian, to ASA S.A. Friction disc for false twisting, 4,159,621, Cl. 57-338.000.
- Bruggemann & Brand KG: See—  
Fengels, Gerd, 4,159,840, Cl. 294-77.000.
- Brugger, Max: See—  
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., 4,159,981, Cl. 260-112.50T.
- Brumleu, Edward C., Jr. Universal diffuser assembly and method of manufacturing, 4,159,674, Cl. 98-40.00R.
- Bryer, Jack; Padalino, Dominick; and Polglase, Burton C., to Wood Industries, Inc. Multiple product folder, 4,159,823, Cl. 270-21.000.
- Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, to Ex-Cell-O Corporation. Biaxial turning machine with means for bidirectional independent tool compensation, 4,159,660, Cl. 82-3.000.
- Budziarek, Richard: See—  
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,077, Cl. 525-332.000.
- Budzieh, Tadeusz. Load responsive control valve, 4,159,724, Cl. 137-596.130.
- Bulwith, Joseph P., to Avon Products, Inc. Article transferring apparatus, 4,159,762, Cl. 198-472.000.
- Bunker Ramo Corporation: See—  
Jennings, Richard A., 4,160,154, Cl. 235-92.0EA.
- Johnston, Samuel A., 4,160,139, Cl. 200-83.00N.
- Burgdorf, Jochen: See—  
Oberthuer, Heinrich; Burgdorf, Jochen; and Luepertz, Hans-Henning, 4,159,853, Cl. 303-6.00C.
- Burr, John F.: See—  
Dolinar, Kevin D.; and Burr, John F., 4,160,282, Cl. 361-31.000.
- Burrell, Michael P., to Anthes Equipment Limited. Joist, 4,159,604, Cl. 52-376.000.
- Burroughs Corporation: See—  
Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., 4,160,120, Cl. 178-22.000.
- Burton, Andrew F. Infusion of liquids into tissue, 4,159,720, Cl. 128-260.000.
- Burton, George; and Watson, Elzbieta, to Beecham Group Limited. 3-Heterocyclychthio-7-a-carboxy-2-aryl acetamido cephalosporanic acid, 4,160,086, Cl. 544-26.000.
- Buschman, Bob D.: See—  
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.



- Bussi, Giancarlo; and Baradel, Pierpaolo, to Aquila S.p.A. Utilization of orthophosphoric esters for the production of aqueous fluids for working metals. 4,160,089, Cl. 544-78.000.
- Butler Automatic, Inc.: See—
- Meihofer, Edward F., 4,159,808, Cl. 242-75.510.
- Butler, Walker; and Moore, Randolph G., to Motorola, Inc. Active radar missile launch envelope computation system. 4,160,250, Cl. 343-9.00R.
- Butterwick, Gilbert N., to United States of America, Navy. Electron beam tube. 4,160,188, Cl. 313-446.000.
- Bynum, Douglas, Jr., to Continental Oil Company. Platform safety barrier. 4,160,060, Cl. 428-310.000.
- C.G.R.-Mev: See—
- Tran, Duc Tien; and Tronc, Dominique, 4,160,189, Cl. 315-5.410.
- C. H. Symington & Co., Inc.: See—
- Tonita, Peter, 4,160,151, Cl. 219-137.800.
- Cadillac Gage Company: See—
- Jackson, Theodore A.; and Crabtree, James D., 4,159,669, Cl. 89-36.00L.
- California Institute of Technology: See—
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- Shimizu, Shotaro; and Fujikawa, Toyoharu, 4,160,241, Cl. 340-763.000.
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- Cole, Lucille J., to Merck & Co., Inc. Process for the separation of antibiotic macrolides. 4,160,083, Cl. 536-17.00A.
- Colgate Palmolive Company: See—
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- Collins, Ian: See—
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- Stuart, Kenneth L.; and Baker, William E., Jr., 4,160,288, Cl. 363-41.000.
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- Eldin, Jacques, 4,159,900, Cl. 65-4.00B.
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- Sanders, Royden C., Jr.; Lerer, Michael I.; and Conant, John P., 4,159,882, Cl. 400-124.000.
- Concept Fiberglass Homes, Inc.: See—
- Schroeder, Leonard F., 4,159,603, Cl. 52-82.000.
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- Bynum, Douglas, Jr., 4,160,060, Cl. 428-310.000.
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- Cossey, Mike R., to Under Sea Industries, Inc. Antisett protector for second stage scuba regulators. 4,159,717, Cl. 128-142.200.
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- Coucher, Robert G., to Pioneer Associates 2. Bread making machine. 4,159,879, Cl. 366-98.000.
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- Crabtree, James D.: See—
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- Jacobson, Carl C.; Manning, Mark C.; and Hill, Francis K., 4,159,877, Cl. 366-22.000.
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- Crasnianski, Serge, to Kis-France. Selector-dispenser of flat key blanks. 4,159,783, Cl. 221-13.000.
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- Kajfez, Franjo; Sunjic, Vitomir; and Sunjic, Vesna, 4,160,096, Cl. 548-338.000.
- Crompton & Knowles Corporation: See—
- Hodkinson, David C.; and Jette, Edwin L., Jr., 4,159,579, Cl. 34-155.000.
- Crossley, Roger: See—
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- Crossman, Milton R. Pickup truck air deflector. 4,159,843, Cl. 296-1.00S.
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- Crutcher, William C. Measuring and dispensing device. 4,159,791, Cl. 222-454.000.
- Cruz, Maria I.: See—
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- Curran, Adrian C. W.; Crossley, Roger; and Hill, David G., to John Wyeth & Brother Limited. Tetrahydroquinoline derivatives. 4,160,094, Cl. 546-152.000.
- Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., to Karl Kroyer St. Anne's Limited. Production of fibrous sheet material. 4,160,004, Cl. 264-120.000.
- Cushing, Vincent J., to Monitek, Inc. Electromagnetic fluid flow meter with tolerance to spurious signals. 4,159,645, Cl. 73-194.00EM.
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- Brown, Harry W., 4,160,138, Cl. 200-67.00A.
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- Trammell, Earl M., Jr., 4,159,652, Cl. 74-117.000.
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- Komatsu, Kenji; and Wakamatsu, Teruyoshi, 4,159,771, Cl. 206-620.000.
- Dainippon Screen Seizo Kabushiki Kaisha: See—
- Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, 4,160,280, Cl. 358-294.000.
- Dakss, Mark L.: See—
- Belmonte, Carl; Dakss, Mark L.; and Futenwider, John E., 4,159,793, Cl. 225-96.500.
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- Daravinas, George V.: See—
- Wagenknecht, Austin C., deceased; Daravinas, George V.; and Koski, William E., 4,160,054, Cl. 424-48.000.
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- Dawson, Larry R.; and Knight, Stephen, to Bell Telephone Laboratories, Incorporated. Optically coupled linear bilateral transistor. 4,160,258, Cl. 357-16.000.
- Dawson, Robert H.: See—
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- Degenkolb, David J.; and Scobey, Fred J., 4,159,930, Cl. 204-111.000.
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- Deere & Company: See—
- Boushek, Sidney J., Jr., 4,159,749, Cl. 180-305.000.
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- Delavarenne, Serve Y.: See—
- Dubreux, Bernard; Delavarenne, Serve Y.; and Schirmann, Jean-Pierre, 4,159,991, Cl. 260-401.000.
- Demarest, LeRoy E.: See—
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- Denka Chemical Corporation: See—
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- Dennison Manufacturing Company: See—
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- Baskas, Morris J.; and Berger, Sidney I., 4,159,570, Cl. 32-66.000.
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- Deschenes, Charles L., to Fram Corporation. Precleaner assembly. 4,159,899, Cl. 55-454.000.
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- Dick, Lloyd C., to Mead Corporation. The Load cap. 4,159,887, Cl. 414-786.000.
- Dickson, Wesley B., to Advanced Equipment Corporation. Suspension system primarily designed for use with operable walls and partitions. 4,159,556, Cl. 16-87.40R.
- Diembeck, Walter: See—Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephen, 4,159,988, Cl. 260-340.90R.
- Digital Products Corporation: See—Bower, David S.; and Smith, Fred J., 4,160,125, Cl. 179-6.00D.
- Dingwall, Andrew G. F., to RCA Corporation. Method of making a substrate contact for an integrated circuit. 4,159,561, Cl. 29-571.000.
- Ditcher, John, to A-Lok Products Corporation. Gasket seal between sewer pipe and manhole opening. 4,159,829, Cl. 277-189.000.
- Docutel Corporation: See—Swaritzendruber, Robert F., 4,159,782, Cl. 221-1.000.
- Dodds, Thomas J., Jr.: See—Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., 4,160,120, Cl. 178-22.000.
- Doehrlert, David H., to Fluid Coal Corporation. Producing fluid fuel from coal. 4,159,897, Cl. 44-51.000.
- Dolinar, Kevin D.; and Burr, John F., to Consolidation Coal Company. Overcurrent protection apparatus. 4,160,282, Cl. 361-31.000.
- Donado, Rafael A.: See—Camara, Elias H.; Marianowski, Leonard G.; and Donado, Rafael A., 4,160,067, Cl. 429-16.000.
- Dore, Jacky, to Sandoz Ltd. Pure and substantially pure asymmetric 1:2 cobalt complexes of monoazo compounds. 4,159,983, Cl. 260-145.00A.
- Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcelino, to Carlo Erba S.p.A. Substituted 2-cyclopropyl-chromones and pharmaceutical compositions and use thereof. 4,160,028, Cl. 424-248.510.
- Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, to Kraftwerk Union Aktiengesellschaft. Process for hydrogenized reconditioning of crude oil or residues derived therefrom into saturated light hydrocarbons. 4,159,936, Cl. 208-93.000.
- Dorr-Oliver Incorporated: See—Fitch, Elliot B.; and Albertson, Orris E., 4,159,682, Cl. 110-245.000.
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- Dunn, William H.: See—Wurst, John W.; and Dunn, William H., 4,159,685, Cl. 112-158.00B.
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- Durst, Paul T., to General Electric Company. Temperature responsive control device with improved hydraulic diaphragm. 4,160,225, Cl. 337-321.000.
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- Eggers, Edward T.; Waldrop, Thomas W.; Sheesley, Donald L.; and Campbell, Willis R., to Sperry Rand Corporation. Collection and recycling apparatus for crop material particles in a roll forming machine. 4,159,615, Cl. 56-341.000.
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- Eutectic Corporation: See—Jaeger, Frederick T., 4,160,048, Cl. 427-142.000.
- Evershed-Power Optics Limited: See—Worsfold, Peter, 4,160,277, Cl. 358-166.000.
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- Exxon Research & Engineering Co.: See—Lewis, William B., 4,159,938, Cl. 208-139.000.
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- Fabri-Tek Incorporated: See—Funck, Gordon W.; and Melcher, Robert J., 4,159,862, Cl. 339-186.00M.
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- Farnsworth, Robert P., to Hughes Aircraft Company. Rangefinder and digital single shot circuit. 4,159,873, Cl. 356-5.000.
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- Farris, William E., to Boeing Company, The. Automatic landing system for hydrofoil craft. 4,159,690, Cl. 114-275.000.
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- Fenocchetti, Leonard P.; and Rapkin, Myron C., to Miles Laboratories, Inc. Multilayered test device for determining the presence of a liquid sample component, and method of use. 4,160,008, Cl. 422-56.000.
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- Fiat Societa per Azioni: See—Palazzetti, Mario, 4,159,709, Cl. 126-271.000.
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- Fibus, C. Kenneth, to Steel City Corporation, The. Framing for shelves. 4,159,814, Cl. 248-243.000.
- Ficker, Herman; and Konrad, John. Heating system utilizing fuel bearing multi-tube water jacket. 4,159,802, Cl. 237-8.00R.
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- Fluid Coal Corporation: See—Doehrlert, David H., 4,159,897, Cl. 44-51.000.
- FMC Corporation: See—Holter, Carl F., 4,159,776, Cl. 212-59.00R.
- Focke, Heinz. Process and device for insertion of two rows of objects into a package. 4,159,609, Cl. 53-452.000.
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- Fontaines, Luc M.: See—Maes, Robert H.; and Fontaines, Luc M., 4,159,904, Cl. 75-10.00R.
- Ford Motor Company: See—Akman, Ahmet R., 4,159,702, Cl. 123-117.00A.
- Braslaw, Jacob; and Pai, Purnachandra, 4,159,972, Cl. 260-2.300.
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- Foulkes, David M.: See—Davies, George E.; and Foulkes, David M., 4,160,017, Cl. 424-10.000.
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- Freissmuth, Alfred: See—Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeier, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, 4,159,906, Cl. 75-58.000.
- Freychet, Aime: See—Dalle, Jean L.; Dumont, Maurice; Fourcy, Andre; Freychet, Aime; and Gouzy, Andre, 4,159,595, Cl. 47-2.000.
- Friedman, Louis. Telescoping wire dispenser. 4,159,795, Cl. 226-127.000.
- Fripiat, Jose J.: See—Seto, Herbert; Cruz, Maria I.; and Fripiat, Jose J., 4,159,994, Cl. 260-448.00C.
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- Fujitsu Limited: See—Moriya, Takao; Yamasawa, Masao; and Gambe, Hirohisa, 4,160,243, Cl. 340-347.00C.
- Fujiwhara, Mitsuo; Sasaki, Takashi; and Uchida, Takashi, to Konishiroku Photo Industry Co., Ltd. Color photographic materials containing color image fading inhibitor. 4,159,910, Cl. 96-74.000.
- Fukuda, Masataro: See—Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,160,014, Cl. 423-644.000.
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- Fulenwider, John E.: See—Belmonte, Carl; Dakss, Mark L.; and Fulenwider, John E., 4,159,793, Cl. 225-96.500.
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- Funck, Gordon W.; and Melcher, Robert J., to Fabri-Tek Incorporated. Removable female polarizing guide for electrical connectors. 4,159,862, Cl. 339-186.00M.
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- Fuwa, Jyoichi, to Ricoh Company, Ltd. Optoelectronic reading apparatus. 4,160,279, Cl. 358-288.000.
- Gabriel, Richard J., to Matrix Toys, Inc. Close coupling strut for construction set having clip fasteners. 4,159,592, Cl. 46-26.000.
- Gachiman Steel Company: See—Joyce, Darrell L.; and Kessler, Richard E., 4,159,676, Cl. 101-3.00R.
- Gambe, Hirohisa: See—Moriya, Takao; Yamasawa, Masao; and Gambe, Hirohisa, 4,160,243, Cl. 340-347.00C.
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- Gangemi, Ronald J.: Isolator filter, 4,159,954, Cl. 210-446.000.
- Garguilo, Michael; and DeVito, Ronald: Scent producing apparatus for forced air system, 4,159,672, Cl. 98-30.000.
- Garman, James A.: to Caterpillar Tractor Co. Suspension system for tandem axle vehicles, 4,159,751, Cl. 180-22.000.
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- Garron, Stephen A.; and Odermann, Charles R.: to Singer Company, The. Method of forming a buttonhole pattern, 4,159,688, Cl. 112-264.100.
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- Gay, Donald L.: See—  
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- Gehring, Karlheinz: See—  
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- General Electric Company: See—  
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- Geosource Inc.: See—  
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Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., 4,160,120, Cl. 178-22.000.
- Gillette Company, The: See—  
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- Gluck, Ronald M.: to Eastman Kodak Company. Method for use in the manufacture of semiconductor devices, 4,159,917, Cl. 148-1.500.
- Gneupel, Arthur: Ozone generator, 4,159,971, Cl. 250-540.000.
- Gogneau, Achille: Turbulent flow conveying device for a mixture, 4,159,881, Cl. 366-337.000.
- Goldschmidt, Arthur M.; and Hedlund, Lee V.: to RCA Corporation. Tracking servo system for video disc player/recorder, 4,160,270, Cl. 358-128.000.
- Golser, Leopold: to Chemie Linz Aktiengesellschaft. Process for the production of foamed plastics with improved combustion characteristics, 4,160,075, Cl. 521-158.000.
- Goodwin, Robert J.: See—  
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- Gorike, Rudolf: to AKG Akustische u.Kino-Gerate Gesellschaft m.b.H. Closed earphone construction, 4,160,135, Cl. 179-182.00R.
- Goto, Kunio; Tajima, Osamu; and Miyatake, Hideaki: to Victor Company of Japan, Ltd. Signal pickup device with tracking control and jitter compensation for a video disc, 4,160,268, Cl. 358-128.000.
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- Karbo, Donald J.; Betts, David A.; and Pauer, Lyle A., 4,160,234, Cl. 340-58.000.
- Shemtov, Sami, 4,159,859, Cl. 339-14.00L.
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- Graf, Ronald E.: Electrostatic switch, 4,160,141, Cl. 200-181.000.
- Graham Magnetics, Inc.: See—  
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- Grant, Frederic F.: Tape transport cartridge, 4,159,811, Cl. 242-192.000.
- Grantham, Frederick W.: Automatic cleaning apparatus, 4,159,632, Cl. 68-9.000.
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- Grayson, Suzanne; and Schaefer, Dora, to Helena Rubinstein, Inc. Cosmetic selection and display system, 4,160,271, Cl. 364-400.000.
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- Great Lakes Chemical Corporation: See—  
Levek, Robert P.; Mamuzic, Rastko I.; and Sands, John L., 4,160,112, Cl. 568-755.000.
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- Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, to Iowa State University Research Foundation, Inc. Method and apparatus for separating particles, 4,159,942, Cl. 209-143.000.
- Greven, Hendrik M.: See—  
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., 4,159,981, Cl. 260-112.50T.
- Grimwood, Geoffrey L.; and Jackson, Joseph F.: Desludger type disc bowl centrifuges, 4,159,798, Cl. 233-20.00A.
- Griset, Ernest J., Jr.: to Akzona Incorporated. Method for producing novelty yarns, 4,159,619, Cl. 57-295.000.
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- Grotheer, Morris P.: to Hooker Chemicals & Plastics Corp. Chemical and electro-chemical process for production of alkali metal chlorates, 4,159,929, Cl. 204-95.000.
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- Say, Donald L.; Smithgall, Harry E.; and Speigel, Kenneth, 4,160,187, Cl. 313-408.000.
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- Guinosso, Charles J.: See—  
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Kraus, Friedrich; and Kalbas, Berthold, 4,159,728, Cl. 150-2.100.
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- Haag, Werner O.; and Huang, Tracy J., to Mobil Oil Corporation. Conversion of synthesis gas to hydrocarbon mixtures utilizing dual reactors, 4,159,995, Cl. 260-450.000.
- Haas, Paul, Jr.: See—  
Corey, George P.; and Haas, Paul, Jr., 4,159,870, Cl. 354-32.000.
- Hachtmann, William R.: See—  
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- Haerr, Raymond H.: to Xomed, Inc. Moisture-expandable ear wick, 4,159,719, Cl. 128-260.000.
- Hailey, Keith R.; and Quinton, Michael, to Eastman Kodak Company. Matrix compensator for color video signals, 4,160,264, Cl. 358-29.000.
- Haines, Fred E.: Printed circuit board tester with removable head, 4,160,207, Cl. 324-158.00F.
- Hall, John B.: See—  
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,159,987, Cl. 260-340.90R.
- Halliburton Company: See—  
Howe, Thomas W., Jr., 4,159,777, Cl. 213-10.000.
- Ham, Robert K.: to Reserve Synthetic Fuels, Inc. Method of testing a landfill for its methane potential, 4,159,893, Cl. 23-230.0EP.
- Hamabe, Kohei, to Hitachi Shipbuilding & Engineering Co., Ltd. Boiler apparatus containing denitrator, 4,160,009, Cl. 422-108.000.

- Hamashima, Yoshio: See—  
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- Hamlin, Thomas J.: See—  
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,159,824, Cl. 271-3.000.
- Hamrick, Joseph T.: See—  
Rose, Leslie C.; and Hamrick, Joseph T., 4,159,743, Cl. 166-302.000.
- Hancock, John J.: Pneumatic jogging platform, 4,159,826, Cl. 272-65.000.
- Handkammer, Herbert K.: Method of casting, 4,159,732, Cl. 164-137.000.
- Haniuda, Nobuyoshi: See—  
Masuda, Koji; and Haniuda, Nobuyoshi, 4,159,687, Cl. 112-262.300.
- Harco Corporation: See—  
Merrick, Larry H., 4,160,171, Cl. 307-95.000.
- Hardtmann, Goetz E.: to Sandoz, Inc. Oxindoles as sleep-inducers, 4,160,032, Cl. 424-274.000.
- Harner, Kermit I.; Kos, Joseph M.; and Patrick, John P., to United Technologies Corporation. Wind turbine generator pitch control system, 4,160,170, Cl. 290-44.000.
- Harper, David J.: See—  
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- Hart, Charles G.: See—  
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- Hartmann, Rudolf: See—  
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- Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased (by Takahata, Kosaku, legal successor), to Nippon Kogaku K.K. Circuit for integrating a quantity of light in an automatic control type flash unit, 4,160,160, Cl. 250-214.00P.
- Hasling, John S.: See—  
Holmgren, William A.; Hasling, John S.; and Denny, Richard W., 4,160,204, Cl. 324-207.000.
- Hatten, Philip A.; and Hyman, Jerome H.: Vending machine adapter, 4,159,769, Cl. 206-527.000.
- Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission apparatus, 4,159,654, Cl. 74-331.000.
- Haubner, Georg: See—  
Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.
- Hauser, Stephen G.: to Abbott Laboratories. Specimen holder, 4,159,875, Cl. 356-244.000.
- Hausfeld, A.: David. Self-sustaining plasma discharge display device, 4,160,191, Cl. 315-169.400.
- Haverkamp, Klaus D.: See—  
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.
- Hawes, William S.: See—  
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- Hawkes, Ivor, to United States of America, Interior. Vibrating wire stress meter, 4,159,641, Cl. 73-778.000.
- Hayashida, Sanae; and Sasaki, Gorou. Filter apparatus, 4,159,950, Cl. 210-330.000.
- Hayssen Manufacturing Company: See—  
Kovacs, Lloyd; and Hart, Charles G., 4,159,760, Cl. 198-419.000.
- Hebban, Ranna K.: See—  
Rao, M. Vikram; Foerster, George S.; and Hebban, Ranna K., 4,159,908, Cl. 75-167.000.
- Heckelsberg, Louis F.: to Phillips Petroleum Company. Alkaline earth oxides promoted with manganese oxide and/or rhenium oxide as catalysts for cracking and dehydrocyclizing of alkanes, 4,159,970, Cl. 252-471.000.
- Hedgewick, Peter, to International Tools (1973) Limited. Safety package with threaded stop lock, 4,159,779, Cl. 215-214.000.
- Hedlund, Lee V.: See—  
Goldschmidt, Arthur M.; and Hedlund, Lee V., 4,160,270, Cl. 358-128.000.
- Hegedus, Arpad: See—  
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- Heim, Helmut, to Manufacture Belge d'Aiguilles S.A. Process for smoothing the eye of a needle and needle made thereby, 4,159,686, Cl. 112-222.000.
- Helena Rubinstein, Inc.: See—  
Grayson, Suzanne; and Schaefer, Dora, 4,160,271, Cl. 364-400.000.
- Henkel, Siegfried: See—  
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- Herfeld, Friedrich W.: Circulation mixer, 4,159,880, Cl. 366-266.000.
- Hermansson, Anne-Marie I.: Protein/starch complex, 4,159,982, Cl. 260-119.000.
- Herron, David K.: to Eli Lilly and Company. Process for preparation of 3-halo-3-methylcephams, 4,160,091, Cl. 544-16.000.
- Hewlett-Packard Company: See—  
Kusters, John A.; Leach, Jerry G.; and Fischer, Michael C., 4,160,183, Cl. 310-315.000.
- Hewson, Clifford B.: to Moldex Limited. Lift-off hinge assembly for toilets and the like, 4,159,548, Cl. 4-236.000.
- Hickman, Ronald P.: to Inventec International Limited. Collapsible dual-height workbench, 4,159,821, Cl. 269-139.000.
- Hill, David G.: See—  
Curran, Adrian C. W.; Crossley, Roger; and Hill, David G., 4,160,094, Cl. 546-152.000.
- Hill, Francis K.: See—  
Jacobson, Carl C.; Manning, Mark C.; and Hill, Francis K., 4,159,877, Cl. 366-22.000.
- Hill, Joseph: See—  
Alles, David S.; and Hill, Joseph, 4,159,799, Cl. 235-486.000.
- Hiraiwa, Kazuyoshi; and Takahashi, Kotei, to Nissan Motor Company, Limited. Torque converter with an improved housing construction, 4,159,628, Cl. 60-364.000.
- Hirosawa, Katsu: See—  
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.
- Hisamatsu, Takashi: See—  
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.
- Hitachi, Ltd.: See—  
Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, 4,160,227, Cl. 338-22.00R.
- Oka, Takafumi; and Nakanishi, Hiroshi, 4,160,236, Cl. 340-146.1AL.
- Hitachi Metals, Ltd.: See—  
Kuroda, Masanobu; Noda, Kazuo; and Kobayashi, Shinichi, 4,159,733, Cl. 164-211.000.
- Hitachi Shipbuilding & Engineering Co., Ltd.: See—  
Hamabe, Kohei, 4,160,009, Cl. 422-108.000.
- Hix, Larry J.; Wise, Phillip W.; and Bennyhoff, David H., to Atlantic Richfield Company. Method and apparatus for testing marine seismic cables, 4,160,228, Cl. 340-7.00R.
- Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., to National Research Development Corporation. Detection of bacterial activity, 4,160,205, Cl. 324-65.00R.
- Hoch, Samuel; Lally, Robert E.; and Ceprini, Mario Q., to Tenneco Chemicals, Inc. Stabilizer systems and vinyl halide resin compositions containing same, 4,159,973, Cl. 260-23.0XA.
- Hoddinott, David C.; and Jette, Edwin L., Jr., to Crompton & Knowles Corporation. Strand drying apparatus, 4,159,579, Cl. 34-155.000.
- Hodkinson, Trevor, to Hodkinson, Trevor; Control Switchboards Pty. Ltd.; and McCormack, Neil Charles. Cassette re-winding device, 4,159,810, Cl. 242-198.000.
- Hoechst Aktiengesellschaft: See—  
Muller, Werner H.; Riedel, Knut; and Krekeler, Hans, 4,160,113, Cl. 568-772.000.
- Patzner, Alfred; and Kruger, Josef, 4,160,006, Cl. 264-292.000.
- Pistorius, Rudolf, 4,160,109, Cl. 568-667.000.
- Hoffman, Alfred A., Jr.: See—  
Hutto, John F.; and Hoffman, Alfred A., Jr., 4,160,000, Cl. 568-576.000.
- Holliday, David H.: Removable bin system in a collator, 4,159,825, Cl. 271-173.000.
- Holmes, William K.: See—  
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.
- Holmgren, William A.; Hasling, John S.; and Denny, Richard W., to Kaman Sciences Corporation. Non-contact distance measurement system, 4,160,204, Cl. 324-207.000.
- Holter, Carl F., to FMC Corporation. Tower crane, 4,159,776, Cl. 212-59.00R.
- Holtvoigt, Werner: See—  
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,159,975, Cl. 525-91.000.
- Homburg, Axel: See—  
Gawlick, Heinz; Homburg, Axel; Siegelin, Werner; and Marondel, Gunther, deceased, 4,160,062, Cl. 428-365.000.
- Homma, Yuzuru; and Morihara, Kazuyuki, to Shionogi & Co., Ltd. Toxoids derived from protease and elastase of *Pseudomonas aeruginosa* and production thereof, 4,160,023, Cl. 424-87.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Hattori, Torao, 4,159,654, Cl. 74-331.000.
- Matsubara, Soichi; Niikawa, Ryo; and Numata, Morikuni, 4,160,147, Cl. 219-87.000.
- Honda Gikenkogyo Kabushiki Kaisha: See—  
Osada, Isao; and Sano, Shoichi, 4,159,730, Cl. 152-158.000.
- Honeywell Inc.: See—  
Freeborn, John C., 4,160,157, Cl. 250-199.000.
- McGough, Ronald B., 4,160,229, Cl. 340-7.00R.
- Honsel, Karl-Heinz; Niehaus, Hans-Rudolf; and Muhlenweg, Karl, to Karl-Heinz Honsel. Apparatus for feeding seriatim discrete webs of paper or the like, 4,159,807, Cl. 242-57.000.
- Honshu Seishi Kabushiki Kaisha: See—  
Samejima, Tadanori, 4,160,059, Cl. 428-288.000.
- Hood, Clarence E.; Webb, Byron K.; and Alper, Yekutiel, to Clemson University. Crop uprooting and soil working apparatus, 4,159,745, Cl. 172-44.000.
- Hooker Chemicals & Plastics Corp.: See—  
Grotheer, Morris P., 4,159,929, Cl. 204-95.000.
- Hoos, Pieter F., to Walworth Company. Rotary valve top seal assembly, 4,159,818, Cl. 251-214.000.
- Horman, Ian: See—  
Farr, David R.; and Horman, Ian, 4,160,042, Cl. 426-387.000.



Horstmann, Harald: See—  
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,160,098, Cl. 548-374.000.

Horter, Robert. Sanitary pressure relief device. 4,159,721, Cl. 137-317.000.

Horton, Robert L., to Phillips Petroleum Company. Liquid chromatograph/mass spectrometer interface. 4,160,161, Cl. 250-281.000.

Houston, Douglas E., to General Electric Company. Thermal migration of fine lined cross-hatched patterns. 4,159,916, Cl. 148-1.500.

Howe, Thomas W., Jr., to Halliburton Company. Universal fabricated backstop/buffstop. 4,159,777, Cl. 213-10.000.

Hsieh, Hsiun P., to Aluminum Company of America. Method of reducing the gel and cure times for polyester-alumina trihydrate dispersions by blending therewith small quantities of activated alumina. 4,159,977, Cl. 260-40.00R.

Hu, John C., to Boeing Company. The. Method for determining formulation and chemical structure of materials by improved pyrolysis gas chromatography. 4,159,894, Cl. 23-230.0PC.

Huang, Tracy J.: See—  
Haag, Werner O.; and Huang, Tracy J., 4,159,995, Cl. 260-450.000.

Hubka, Theodore; and Slater, Robert W., to Singer Company, The. Solid state pulsed coherent Doppler radar. 4,160,248, Cl. 343-8.000.

Hudon, Paul A., administrator: See—  
Johnson, Arthur R., deceased; Hudon, Paul A., administrator; and Kesten, Martin, 4,159,655, Cl. 74-571.00L.

Hudson, George S.; and Roy, Madan M., to Avco Corporation. Aircraft transmission test set. 4,159,642, Cl. 73-118.000.

Hughes Aircraft Company: See—  
Farnsworth, Robert P., 4,159,873, Cl. 356-5.000.

Kotlarski, Joseph R., 4,160,249, Cl. 343-9.000.

Hughes, John; and Maul, Peter L., to American Colloid Company. Method for reducing the formation of slag and soot formed from the combustion of carbonaceous waste material. 4,159,683, Cl. 110-343.000.

Hughey, Terence D.: See—  
Fowler, Gerald C.; and Hughey, Terence D., 4,160,242, Cl. 340-711.000.

Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., to United States Borax & Chemical Corporation. Nitrophenylhydrazine compounds. 4,160,090, Cl. 544-164.000.

Husemann, Heinz: See—  
Bargel, Gunther; and Husemann, Heinz, 4,159,819, Cl. 254-29.00R.

Hutcheon, Robert S.: See—  
Barquist, William S., Jr.; and Hutcheon, Robert S., 4,160,212, Cl. 254-432.000.

Hutto, John F.; and Hoffman, Alfred A., Jr., to Phillips Petroleum Company. Extraction of hydroperoxides. 4,160,000, Cl. 568-576.000.

Hyman, Jerome H.: See—  
Hatten, Philip A.; and Hyman, Jerome H., 4,159,769, Cl. 206-527.000.

I.W.S. Nominee Company Limited: See—  
Benisek, Ladislav, 4,160,051, Cl. 427-52.000.

Mizell, Louis R., 4,159,883, Cl. 401-201.000.

Iida, Takashi: See—  
Yasukuni, Mitsuo; Iida, Takashi; and Kiten, Hiroshi, 4,159,864, Cl. 350-184.000.

Ikawa, Michio: See—  
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.

Ikawa, Reiji, to Tokyo Special Wire Netting Co., Ltd. Mold for manufacturing distillation column packing. 4,159,817, Cl. 249-98.000.

Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, to Hitachi, Ltd. Thermistor composition and thick film thermistor. 4,160,227, Cl. 338-22.00R.

Ikegami, Tadashi: See—  
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Miya, Masayoshi, 4,159,963, Cl. 252-429.00B.

Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,159,965, Cl. 252-429.00B.

Illinois Tool Works Inc.: See—  
Olsen, Robert C., 4,159,597, Cl. 47-58.000.

Ilukowicz, Robert J., to Preco Industries Ltd. Parking curb reinforcing bar support. 4,159,605, Cl. 52-687.000.

Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, to Ricoh Company, Ltd. Servo control apparatus. 4,160,200, Cl. 348-616.000.

Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., to American Home Products Corporation. Process for preparing the releasing hormone of luteinizing hormone (LH) and of follicle stimulating hormone (FSH), salts and compositions thereof, and intermediates thereof. 4,159,980, Cl. 260-112.5LH.

Immuno Aktiengesellschaft fur chemisch-medizinische Produkte: See—  
Eibl, Johann; Schwarz, Otto; and Elsinger, Fritz, 4,160,025, Cl. 424-101.000.

Imperial Chemical Industries Limited: See—  
Birchall, James D.; and Pybus, Roger M., 4,159,913, Cl. 106-307.000.

Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,077, Cl. 525-332.000.

Davies, George E.; and Foulkes, David M., 4,160,017, Cl. 424-10.000.

Vasey, Charles H.; and Waddan, Dhafir Y., 4,160,115, Cl. 568-857.000.

Inbody, Melvin R., to Centerline Steering Safety Axle Corporation. The. Centerline two piece wheel and brake assembly. 4,159,832, Cl. 280-96.300.

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Pizzorno, Augusto, 4,160,007, Cl. 264-334.000.

Inohara, Akio; Takahashi, Koji; and Inoue, Ryoji, to Sharp Kabushiki Kaisha. Method of connecting an element having multiple terminals and a multi-lead flexible connector. 4,159,921, Cl. 156-272.000.

Inoue, Keizo: See—  
Ota, Sadayasu; and Inoue, Keizo, 4,159,822, Cl. 269-325.000.

Inoue, Ryoji: See—  
Inohara, Akio; Takahashi, Koji; and Inoue, Ryoji, 4,159,921, Cl. 156-272.000.

Inoue, Shigeharu: See—  
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.

Institut Francais du Petrole: See—  
Cohen, Choua; and Sillion, Bernard, 4,159,898, Cl. 44-63.000.

Institute of Gas Technology: See—  
Camara, Elias H.; Marianowski, Leonard G.; and Donado, Rafael A., 4,160,067, Cl. 429-16.000.

Instrumentation Specialties Company: See—  
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,159,933, Cl. 204-180.00R.

International Business Machines Corporation: See—  
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,159,915, Cl. 148-1.500.

Lee, Hsing-San; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., 4,160,275, Cl. 365-149.000.

International Flavors & Fragrances Inc.: See—  
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,159,987, Cl. 260-340.90R.

International Paper Company: See—  
Roozee, William F., 4,159,797, Cl. 229-27.000.

International Standard Electric Corporation: See—  
Viohl, Uwe; and Zondler, Rolf, 4,159,931, Cl. 204-152.000.

International Telephone and Telegraph Corporation: See—  
Anhalt, John W., 4,159,861, Cl. 339-75.0MP.

Carroll, James C., 4,160,134, Cl. 179-175.30R.

International Tools (1973) Limited: See—  
Hedgewick, Peter, 4,159,779, Cl. 215-214.000.

Interx Research Corporation: See—  
Bodor, Nicolae S., 4,160,099, Cl. 560-110.000.

Inventec International Limited: See—  
Hickman, Ronald P., 4,159,821, Cl. 269-139.000.

Invernizzi, Rutilio; and Prella, Giovanni, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of processed cheeses containing nutmeats. 4,160,044, Cl. 426-582.000.

Iowa State University Research Foundation, Inc.: See—  
Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, 4,159,942, Cl. 209-143.000.

Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Heterocyclic phenyl ester ultraviolet stabilizers. 4,159,985, Cl. 260-302.00D.

Irie, Kenji: See—  
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, To-shiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.

Irwin, Clarence C.: See—  
Manz, David F.; Irwin, Clarence C.; and Salamon, Theodore M., 4,159,848, Cl. 297-474.000.

Ishikawajima-Harima Heavy Industries Co., Ltd.: See—  
Simms, Romilly J.; and Madsen, Byron K., 4,159,639, Cl. 73-63.000.

Ismathodzhayev, Sagdulla K.; Usmanov, Salikh Z.; Mirsagatov, Mir-makhmud A.; Dzhabarov, Nasim G.; Takhirdzhanov, Makhirdzhan; and Mumindzhanov, Anvardzhan F. Two-phase AC electric motor control circuit. 4,160,196, Cl. 318-749.000.

Isopol A.G.: See—  
Ebert, Claus; and Fabian, Wolfgang, 4,159,601, Cl. 52-36.000.

ITT Industries, Incorporated: See—  
Oberthuer, Heinrich; Burgdorf, Jochen; and Luepertz, Hans-Henning, 4,159,853, Cl. 303-6.00C.

Ivanov, Jury A.: See—  
Vinogradov, Evgeny N.; Ivanov, Jury A.; Filatov, Nikolai A.; Fomichev, Viktor S.; and Prutkovsky, Samuil A., 4,160,180, Cl. 310-157.000.

Iwai, Kazuo, to Yoshida Kogyo Kabushiki Kaisha. Separable boat. 4,159,551, Cl. 9-2.00A.

Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, to Meiji Seika Kaisha, Ltd. Antibiotics SF-1130-x<sub>1</sub> and -x<sub>2</sub> substances and production and use thereof. 4,160,026, Cl. 424-116.000.

Iwata, Nobuo: See—  
Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, 4,160,200, Cl. 318-616.000.

Izawa, Akio: See—  
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, To-shiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.

J. I. Case Company: See—  
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.

J. R. Schneider Co.: See—  
Crowe, William D., 4,159,948, Cl. 210-111.000.

J. S. Staedler: See—  
Dziuk, Peter, 4,160,256, Cl. 346-140.00A.

Jacks, Stanley F.: See—  
Morrill, Vaughan, Jr.; and Jackes, Stanley F., 4,160,223, Cl. 335-152.000.

Jackson, Clifford A., to Southland Corporation. Powdered hydrated emulsifiers and their method of preparation. 4,159,952, Cl. 252-356.000.

Jackson, Ian S.: See—  
Egan, Edward G.; and Jackson, Ian S., 4,159,876, Cl. 356-312.000.

Jackson, Joseph F.: See—  
Grimwood, Geoffrey L.; and Jackson, Joseph F., 4,159,798, Cl. 233-20.00A.

Jackson, Theodore A.; and Crabtree, James D., to Cadillac Gage Company. Hatch for armored vehicles. 4,159,669, Cl. 89-36.00L.

Jacobson, Carl C.; Manning, Mark C.; and Hill, Francis K., to Crafcro, Inc. Materials handling and application mechanism. 4,159,877, Cl. 366-22.000.

Jacobson, Sava W. Telephone earphone amplifier. 4,160,122, Cl. 179-1.00A.

Jacoby, Ian H. Toy projectile launching device. 4,159,705, Cl. 124-63.000.

Jaeger, Frederick T., to Eutectic Corporation. Method of making a composite cast iron dryer or the like. 4,160,048, Cl. 427-142.000.

James, Barry K.; and Terry, David R., to Dresser Industries, Inc. Analogue automatic voltage controller. 4,160,202, Cl. 323-24.000.

Janousek, Rade: See—  
LaFlaquiere, Regis; and Janousek, Rade, 4,159,620, Cl. 57-301.000.

Janovitchik, Viacheslav J. Steam injectors. 4,160,002, Cl. 261-76.000.

Jason, Alfred C.: See—  
Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., 4,160,205, Cl. 324-65.00R.

Jenkins, John C., to TRW Inc. Stud welding apparatus. 4,160,148, Cl. 219-98.000.

Jennings, Richard A., to Bunker Ramo Corporation. High speed multiple event timer. 4,160,154, Cl. 235-92.0EA.

Jervis, John H., Jr. Geometrical instrument. 4,159,571, Cl. 33-403.000.

Jesme, Philip O.; and Calkins, John A., to Smead Manufacturing Company. The. Folder-tang assembly apparatus. 4,159,767, Cl. 206-343.000.

Jette, Edwin L., Jr.: See—  
Hoddinott, David C.; and Jette, Edwin L., Jr., 4,159,579, Cl. 34-155.000.

Jicha, Jan; Kopecek, Karel; and Langer, Bretislav, to Prvni Brnenska strojirna, narodni podnik. Method for continuously monitoring the clearances in rotating equipment by flow means. 4,159,636, Cl. 73-37.600.

Jo, Tadashi: See—  
Murakami, Tomoharu; and Jo, Tadashi, 4,159,756, Cl. 188-319.000.

John Wyeth & Brother Limited: See—  
Curran, Adrian C. W.; Crossley, Roger; and Hill, David G., 4,160,094, Cl. 546-152.000.

Johnson, Arthur R., deceased; by Hudon, Paul A., administrator; and Kesten, Martin, to Preston Engravers, Inc. Adjustable eccentric. 4,159,655, Cl. 74-571.00L.

Johnson, David L.: See—  
Brown, Robert E.; Johnson, David L.; and Lindquist, John F., 4,159,750, Cl. 180-9.620.

Johnson, Edwin L.: See—  
Peniston, Quintin P.; and Johnson, Edwin L., 4,159,932, Cl. 204-158.00R.

Johnson, George P. Solar heating apparatus. 4,159,711, Cl. 126-271.000.

Johnson, Owen W.; Miller, Gerald R.; and Beutler, Paul S., to University of Utah. Electrically conductive and corrosion resistant current collector and/or container. 4,160,069, Cl. 429-104.000.

Johnson, Reginald F.; and Sutton, Leonard, to Baker Perkins Holdings Limited. Production of lollipops or like sweets. 4,159,612, Cl. 53-594.000.

Johnston, Laird E.: See—  
Miller, Larry D.; Johnston, Laird E.; Valus, John T.; and Powell, Thomas M., 4,159,834, Cl. 280-802.000.

Johnston, Samuel A., to Bunker Ramo Corporation. Pressure sensitive switch. 4,160,139, Cl. 200-83.00N.

Jordan, John F.; and Lampkin, Curtis M., to Photon Power, Inc. Photo-voltaic cell. 4,159,914, Cl. 136-89.0TF.

Jorgenson, Ronald M., to Acoustical Floors, Inc. Acoustical floor preparation and method. 4,159,912, Cl. 106-109.000.

Jousson, Pierre-Jean: See—  
Woog, Philippe G. E.; Moret, Michel A.; Jousson, Pierre-Jean; and Musy, Jean-Pierre, 4,159,715, Cl. 128-66.000.

Joyce, Darrell L.; and Kessler, Richard E., to Gachman Steel Company. Stamping machine. 4,159,676, Cl. 101-3.00R.

K-D Manufacturing Company: See—  
Volk, Richard G., 4,160,203, Cl. 324-15.000.

Kabel-und Metallwerke Gutehoffnungshuette AG: See—  
Artbauer, Jan, 4,160,119, Cl. 174-28.000.

Kabushiki Kaisha Daini Seikosha: See—  
Takahashi, Norio, 4,160,176, Cl. 307-362.000.

Kabushiki Kaisha Komatsu Seisakusho: See—  
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Kabushiki Kaisha Morita Seisakusho: See—  
Ota, Sadayasu; and Inoue, Keizo, 4,159,822, Cl. 269-325.000.

Kabushiki Kaisha Suwa Seikosha: See—  
Akahane, Yoshikazu, 4,159,622, Cl. 58-23.0AC.

Kabushiki Kaisha, Toyota Jidoshokki Seisakusho: See—  
Takeuchi, Tatsuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuki; Suzuki, Osamu; and Shimizu, Takeshi, 4,159,616, Cl. 57-83.000.

Kadja, Igor V. Selective plating brush applicator. 4,159,934, Cl. 204-224.00R.

Kajfez, Franjo; Sunjic, Vitomir; and Sunjic, Vesna, to CRC Compagnia di Ricerca Chimica S.A. Process for production of 5-nitroimidazole derivatives. 4,160,096, Cl. 548-338.000.

Kakukawa, Masatoshi; and Kondo, Hideyuki, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Automatic focussing apparatus. 4,160,159, Cl. 250-204.000.

Kakuta, Hiroshi: See—  
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Kalbas, Berthold: See—  
Kraus, Friedrich; and Kalbas, Berthold, 4,159,728, Cl. 150-2.100.

Kallfelz, Albert J.: See—  
Brothers, Warren S.; and Kallfelz, Albert J., 4,159,739, Cl. 165-133.000.

Kalmbach, Philip. Sighting device for archery bows. 4,159,575, Cl. 33-265.000.

Kaman Sciences Corporation: See—  
Holmgren, William A.; Hasling, John S.; and Denny, Richard W., 4,160,204, Cl. 324-207.000.

Kamber, Bruno: See—  
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Grevend, Hendrik M., 4,159,981, Cl. 260-112.50T.

Kaminishi, Masashi: See—  
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Kaminski, Gerald P. Method for reproducing photographs, drawings, or the like, on marble or granite. 4,159,600, Cl. 51-312.000.

Kang, Byung K.; So, Jin C.; Chung, Tae H.; and Choi, Won. Safety hydraulic brake system for automotive vehicles. 4,159,755, Cl. 188-151.00A.

Kanno, Nobuyuki, to Yamaha Hatsudoki Kabushiki Kaisha. Tricycle. 4,159,752, Cl. 180-210.000.

Karbo, Donald J.; Betts, David A.; and Pauer, Lyle A., to Gould Inc. Abnormal tire condition sensing system. 4,160,234, Cl. 340-58.000.

Karl-Heinz Honsel: See—  
Honsel, Karl-Heinz; Niehaus, Hans-Rudolf; and Muhlenweg, Karl, 4,159,807, Cl. 242-57.000.

Karl Kroyer St. Anne's Limited: See—  
Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., 4,160,004, Cl. 264-120.000.

Kasai, Juichi: See—  
Mieno, Michihiro; Mori, Hideki; Nakanishi, Jun; and Kasai, Juichi, 4,160,116, Cl. 568-867.000.

Kasarauskas, Paul M.: See—  
Staudinger, Frederick J.; and Kasarauskas, Paul M., 4,159,748, Cl. 177-225.000.

Kashyap, Satish C.; and Wyslouzil, Walter, to Canadian Patents and Development Limited. Single-sided microwave applicator for sealing cartons. 4,160,144, Cl. 219-10.55A.

Kauer, Harald: See—  
Pietzsch, Ludwig; Kauer, Harald; and Hartmann, Rudolf, 4,159,856, Cl. 305-51.000.

Kauffman, Robert N.: See—  
Smith, James D. B.; and Kauffman, Robert N., 4,160,178, Cl. 310-43.000.

Kaufman, Barry M., to RFL Industries, Inc. Frequency shift keyed tone generator. 4,160,121, Cl. 178-66.00A.

Kaugars, Girts, to Upjohn Company, The. Compounds, compositions and methods of combatting pest employing thioureas. 4,160,037, Cl. 424-322.000.

Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., to Nippon Electric Company, Ltd. Electronic key telephone system. 4,160,131, Cl. 179-99.00M.

Kawamura, Naoto; and Tajima, Akira, to Canon Kabushiki Kaisha. Zoom lens system. 4,159,865, Cl. 350-184.000.

Kayaba K.K.: See—  
Murakami, Tomoharu; and Jo, Tadashi, 4,159,756, Cl. 188-319.000.

Kayabe Industry Co., Ltd.: See—  
Masuda, Koji; and Haniuda, Nobuyoshi, 4,159,687, Cl. 112-262.300.

Keiper Automobiltechnik GmbH & Co KG: See—  
Strowik, Willibald; and Werner, Paul, 4,159,815, Cl. 248-429.000.

Keller, Lynn L.: See—  
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.



Kelly, Charles A.: See—  
Irick, Gether, Jr.; and Kelly, Charles A., 4,159,985, Cl. 260-302.00D.

Kerekes, Bela, to Egysult Izzolampa es Villamossagi Reszvenytarsasag. Closure structure of electric discharge tubes. 4,160,186, Cl. 313-220.000.

Kerr, Walter B., to United Technologies Corporation. Control for gas turbine engine. 4,159,625, Cl. 60-204.000.

Kessler, Richard E.: See—  
Joyce, Darrell L.; and Kessler, Richard E., 4,159,676, Cl. 101-3.00R.

Kesten, Martin: See—  
Johnson, Arthur R., deceased; Hudon, Paul A., administrator; and Kesten, Martin, 4,159,655, Cl. 74-571.00L.

Kewley, Monte L.; and Demarest, LeRoy E., to Laitram Corporation. The Inspectable modular conveyor. 4,159,763, Cl. 198-853.000.

K-Gall, Jean-Yves. Waterproof covering device, especially for terraces, and method for manufacturing same. 4,160,058, Cl. 428-286.000.

Khalemsky, Samuil F.: See—  
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; Sachko, Viktor V.; Yakunin, Ivan A.; and Abramov, Boris F., 4,159,734, Cl. 164-426.000.

Kindberg, Bengt A. Beam and method of making it. 4,159,606, Cl. 52-692.000.

Kirkup, William M., to Esmil-Envirotech, Ltd. Method for incinerating waste sludges. 4,159,684, Cl. 110-346.000.

Kis-France: See—  
Crasnianski, Serge, 4,159,783, Cl. 221-13.000.

Kis-Tamas, Attila: See—  
Levai, Laszlo; Mikite, Gyula; and Kis-Tamas, Attila, 4,160,035, Cl. 424-311.000.

Kitada, Chieko: See—  
Fujino, Masahiko; Fukuda, Tsunehiko; and Kitada, Chieko, 4,159,979, Cl. 260-112.50R.

Kiten, Hiroshi: See—  
Yasukuni, Mitsuo; Iida, Takashi; and Kiten, Hiroshi, 4,159,864, Cl. 350-184.000.

Klann, Paul A. Optical distortion device. 4,159,872, Cl. 355-91.000.

Klas, Kenneth H.: See—  
Knudson, Henry T.; and Klas, Kenneth H., 4,159,613, Cl. 56-11.300.

Klaver, Gijsbertus: See—  
Mone, Rudolf A. J.; and Klaver, Gijsbertus, 4,159,969, Cl. 252-463.000.

Kleysteuber, William K.; and Mayercheck, William D., to United States of America, Energy. Bulk material handling system. 4,159,757, Cl. 198-303.000.

Klockner-Werke AG: See—  
von Bogdandy, Ludwig; and Kosmider, Hans, 4,159,918, Cl. 148-12.100.

Kluender, Harold C., to Miles Laboratories, Inc. Process for the preparation of 2-(7-hydroxyalkyl)-4R, 4S or 4RS -hydroxy-cyclopent-2-enone. 4,159,998, Cl. 260-586.00R.

Kluge, Douglas J., to Diatek, Inc. Cover for temperature sensing probe. 4,159,766, Cl. 206-306.000.

Knight, Arlen M.; and Hachtmann, William R. Fabric cleaning hand tool with recirculating system. 4,159,554, Cl. 15-321.000.

Knight, Stephen: See—  
Dawson, Larry R.; and Knight, Stephen, 4,160,258, Cl. 357-16.000.

Knudson, Henry T.; and Klas, Kenneth H., to Allis-Chalmers Corporation. Mower attachment with drive subassembly adapted for detachable connection to a tractor. 4,159,613, Cl. 56-11.300.

Kobayashi, Isao: See—  
Akase, Kazutoyo; and Kobayashi, Isao, 4,160,190, Cl. 315-168.000.

Kobayashi, Keigo, to Mitogiken, Ltd. Recording apparatus with intermittent power usage. 4,160,255, Cl. 346-79.000.

Kobayashi, Shinichi: See—  
Kuroda, Masanobu; Noda, Kazuo; and Kobayashi, Shinichi, 4,159,733, Cl. 164-211.000.

Koch, Christian: See—  
Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, 4,159,936, Cl. 208-93.000.

Koenig, Kalus; Reichmann, Wolfgang; and Pedain, Josef, to Bayer Aktiengesellschaft. Process for the preparation of allophanates which contain isocyanate groups. 4,160,080, Cl. 528-59.000.

Kogan, Calvert S.; and Kogan, Marty, to Plastic Monofil Co. Ltd. Split resistant strapping tape. 4,160,057, Cl. 428-245.000.

Kogan, Marty: See—  
Kogan, Calvert S.; and Kogan, Marty, 4,160,057, Cl. 428-245.000.

Kohn, David H.; and Liebersohn, Aharon, to Technion Research and Development Foundation, Ltd. Polymers containing laterally substituted isocyanate groups and their preparation. 4,160,078, Cl. 526-218.000.

Koivunen, Erkki A., to General Motors Corporation. Torque-equalizing means. 4,159,653, Cl. 74-200.000.

Kojima, Michio: See—  
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.

Kollmorgen Technologies Corporation: See—  
Nuzzi, Francis J.; and Vitellaro, Daniel F., 4,160,050, Cl. 427-304.000.

Komada, Hiroshi; Nakamura, Kuniyasu; and Miyagaki, Ryoichi, to Nihon Soflan Chemical & Engineering Co., Ltd. Polyisocyanate foam having isotropic cells and method and apparatus for preparing same. 4,160,074, Cl. 521-155.000.

Komatsu, Kenji; and Wakamatsu, Teruyoshi, to Meiji Seika Kabushiki Kaisha; and Dai Nippon Insatsu Kabushiki Kaisha. Container having multiple independently unsealable compartments. 4,159,771, Cl. 206-620.000.

Komatsu, Koziro: See—  
Mabuchi, Kenichi; Tsuchimochi, Yoshihisa; and Komatsu, Koziro, 4,160,253, Cl. 343-225.000.

Komatsu, Toshiaki: See—  
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.

Komono, Taichiro: See—  
Tsuiji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hitoshi; Komono, Taichiro; and Nagata, Wataru, 4,160,085, Cl. 544-16.000.

Kondo, Hideyuki: See—  
Kakukawa, Masatoshi; and Kondo, Hideyuki, 4,160,159, Cl. 250-204.000.

Konig, Dieter, to Steigerwald Strahltechnik GmbH. Method and apparatus for energy beam welding. 4,160,150, Cl. 219-121.0EB.

Konishiroku Photo Industry Co., Ltd.: See—  
Fujiwara, Mitsuo; Sasaki, Takashi; and Uchida, Takashi, 4,159,910, Cl. 96-74.000.

Konrad, John: See—  
Ficker, Herman; and Konrad, John, 4,159,802, Cl. 237-8.00R.

Kopecek, Karel: See—  
Jicha, Jan; Kopecek, Karel; and Langer, Bretislav, 4,159,636, Cl. 73-37.600.

Korr, Abraham L.; Walker, Evan H.; and Svihel, Bernard T.; to A. L. Korr Associates, Inc. Apparatus for the collection and conversion of solar energy. 4,159,629, Cl. 60-641.000.

Kos, Joseph M.: See—  
Harner, Kermit I.; Kos, Joseph M.; and Patrick, John P., 4,160,170, Cl. 290-44.000.

Koski, William E.: See—  
Wagenknecht, Austin C., deceased; Daravinas, George V.; and Koski, William E., 4,160,054, Cl. 424-48.000.

Kosmider, Hans: See—  
von Bogdandy, Ludwig; and Kosmider, Hans, 4,159,918, Cl. 148-12.100.

Kotlarski, Joseph R., to Hughes Aircraft Company. Analogue storage and processing system. 4,160,249, Cl. 343-9.000.

Kovac, Michael G., to RCA Corporation. CCD electrode and channel structure for 180° turn. 4,160,262, Cl. 357-24.000.

Kovacs, Lloyd; and Hart, Charles G., to Hayssen Manufacturing Company. Method of and apparatus for feeding randomly received items. 4,159,760, Cl. 198-419.000.

Kovatchev, Stephen: See—  
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephen, 4,159,988, Cl. 260-340.90R.

Kowalski, Gunter: See—  
Weiss, Hermann; and Kowalski, Gunter, 4,160,167, Cl. 250-445.00T.

Koy, Johannes: See—  
Scheffels, Wilhelm; and Koy, Johannes, 4,160,149, Cl. 219-121.0EM.

Koyama, Teruo: See—  
Tanaka, Tadashi; Obi, Tatsuro; Arai, Nobuichi; and Koyama, Teruo, 4,160,056, Cl. 428-220.000.

Kozuka, Mikio; Ono, Isao; and Fukuwatari, Takashi, to Asahi Glass Company, Ltd. Method of molding cementitious material. 4,160,003, Cl. 264-87.000.

Kraemer, Robert H. O.: See—  
Laughlin, James P., Jr.; Loessel, Mark C.; and Kraemer, Robert H. O., 4,160,247, Cl. 340-693.000.

Kraftwerk Union Aktiengesellschaft: See—  
Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, 4,159,936, Cl. 208-93.000.

Kramer, Pieter; Compaa, Klaas; and Forsthuber, Robert F. K., to U.S. Philips Corporation. Apparatus for optically reading a phase-modulated optical record carrier. 4,160,269, Cl. 358-128.000.

Kraus, Friedrich; and Kalbas, Berthold, to Gummi-Kraus GmbH. Hot water bag. 4,159,728, Cl. 150-2.100.

Krause, Manfred: See—  
Lemke, Otto; and Krause, Manfred, 4,159,924, Cl. 202-142.000.

Kravitz, Stanley: See—  
Estes, John H.; Kravitz, Stanley; and Suggitt, Robert M., 4,160,011, Cl. 423-328.000.

Krekel, Jorg: See—  
Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Krekel, Jorg, 4,159,925, Cl. 203-28.000.

Krekeler, Hans: See—  
Muller, Werner H.; Riedel, Knut; and Krekeler, Hans, 4,160,113, Cl. 568-772.000.

Kroenke, William J.; Carroll, Richard T.; and Magistro, Angelo J., to B. F. Goodrich Company. The Catalyst for the preparation of ethylene and vinyl chloride from ethane. 4,159,968, Cl. 252-462.000.

Krouse, Philip E.: See—  
Margalit, Nehemiah; and Krouse, Philip E., 4,160,070, Cl. 429-194.000.

Kroyer, Karl K. K.: See—  
Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., 4,160,004, Cl. 264-120.000.

Krueger Metal Products, Inc.: See—  
Tolleson, Thomas H., 4,159,846, Cl. 297-162.000.

Kruger, Josef: See—  
Patzner, Alfred; and Kruger, Josef, 4,160,006, Cl. 264-292.000.

Krumrein, Gerhard, to Licentia Patent-Verwaltungs-G.m.b.H. Pulse generator. 4,160,235, Cl. 340-81.00R.

Kryschuk, John J.: See—  
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,159,987, Cl. 260-340.90R.

Krysiak, Brian T.; Kunevicius, James M.; and Leslie, Bruce C., to Lof Plastics Inc. Corner for decorative and protective molding strip. 4,160,052, Cl. 428-31.000.

Kummer, Joseph T., to Ford Motor Company. Storage battery. 4,160,068, Cl. 429-82.000.

Kunevicius, James M.: See—  
Krysiak, Brian T.; Kunevicius, James M.; and Leslie, Bruce C., 4,160,052, Cl. 428-31.000.

Kunisawa, Masuo: See—  
Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, 4,160,280, Cl. 358-294.000.

Kunstle, Konrad: See—  
Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, 4,159,936, Cl. 208-93.000.

Kuny, Wilhelm, to Siemens Aktiengesellschaft. Transducer electrodes for filters or delay lines utilizing surface wave principles. 4,160,219, Cl. 333-151.000.

Kurihara, Tetsuro, to Tokyo Shibaura Electric Co., Ltd. X-ray television apparatus. 4,160,266, Cl. 358-111.000.

Kuroda, Masanobu; Noda, Kazuo; and Kobayashi, Shinichi, to Hitachi Metals, Ltd. Molding machine. 4,159,733, Cl. 164-211.000.

Kusano, Nobuo: See—  
Shigeyasu, Motoo; and Kusano, Nobuo, 4,160,108, Cl. 562-416.000.

Kusters, John A.; Leach, Jerry G.; and Fischer, Michael C., to Hewlett-Packard Company. Oscillator having a quartz resonator cut to compensate for static and dynamic thermal transients. 4,160,183, Cl. 310-315.000.

Kvita, Vratislav; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Imidyl- and isoimidyl-phthalic anhydrides, process for their manufacture and their use for curing epoxide resins. 4,160,081, Cl. 528-93.000.

LaFlaquiere, Regis; and Janousek, Rade, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Yarn-piecing and cleaning system for a spinning machine. 4,159,620, Cl. 57-301.000.

Lagasse, Alain: See—  
Violand, Robert; and Lagasse, Alain, 4,159,978, Cl. 525-441.000.

Laitram Corporation, The: See—  
Kewley, Monte L.; and Demarest, LeRoy E., 4,159,763, Cl. 198-853.000.

Lally, Robert E.: See—  
Hoch, Samuel; Lally, Robert E.; and Ceprini, Mario Q., 4,159,973, Cl. 260-23.0XA.

Lamb, Raymond K.; and Walker, Stephen J., to Baylor College of Medicine. Hydraulic test tool and method. 4,159,637, Cl. 73-46.000.

Lampkin, Curtis M.: See—  
Jordan, John F.; and Lampkin, Curtis M., 4,159,914, Cl. 136-89.0TF.

Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Closure mechanism for closing end of loaded cartons. 4,159,610, Cl. 53-525.000.

Langer, Bretislav: See—  
Jicha, Jan; Kopecek, Karel; and Langer, Bretislav, 4,159,636, Cl. 73-37.600.

Langhoff, Josef: See—  
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.

Larkin, John M.: See—  
Love, Richard F.; Newman, Stanley R.; and Larkin, John M., 4,159,996, Cl. 260-570.50P.

Las Vegas Research, Inc.: See—  
Berenbaum, Marvin, 4,159,698, Cl. 123-41.310.

Latimer, William R.: See—  
Clement, Ralph C.; and Latimer, William R., 4,160,137, Cl. 200-42.00T.

Laughlin, James P., Jr.; Loessel, Mark C.; and Kraemer, Robert H. O., to Whirlpool Corporation. Means for housing an electrical control. 4,160,247, Cl. 340-693.000.

Laurel Bank Machine Co., Ltd.: See—  
Uchida, Isamu; Watanabe, Kenkichi; and Furuya, Katsuke, 4,159,607, Cl. 53-64.000.

Lauria, Francesco: See—  
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Szerbe, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.

Law, Wendell A., to Sperry Rand Corporation. Multiple dial adapter. 4,160,124, Cl. 179-2.0DP.

Layton, Guy V., Jr.; Cuspidor, 4,159,549, Cl. 4-285.000.

Lazarchik, Robert E.; and Roeder, Robert S., to Sperry Rand Corporation. Hybrid dual mode radiometric system. 4,160,251, Cl. 343-100.0ME.

Leach, Jerry G.: See—  
Kusters, John A.; Leach, Jerry G.; and Fischer, Michael C., 4,160,183, Cl. 310-315.000.

Lectron Products, Inc.: See—  
Rea, Irvin B.; and Telmet, Juhan, 4,160,132, Cl. 179-114.00R.

Lee, Hsing-San; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., to International Business Machines Corporation. Accessing arrangement for memories with small cells. 4,160,275, Cl. 365-149.000.

Lee, Ki S. Perfumed vapor dispensing jewelry. 4,159,631, Cl. 63-1.00R.

LeFevre, Cecil W.: See—  
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,160,090, Cl. 544-164.000.

Legg, Howard W. Solar energy conversion unit. 4,159,712, Cl. 126-271.000.

Leja, Ronald J.; and Williams, Hugh K., to Allis-Chalmers Corporation. Vehicle protective frame with internal reinforcing members. 4,159,835, Cl. 280-756.000.

Le Martret, Odile: See—  
Clemence, Francois; and Le Martret, Odile, 4,159,986, Cl. 260-332.20A.

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 Meiners, Elmo R., 4,159,833, Cl. 280-478.00R.
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 Manning, Willie D.; and Whitehead, Jerry, 4,159,545, Cl. 3-12.800.
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 Kroenke, William J.; Carroll, Richard T.; and Magistro, Angelo J., 4,159,968, Cl. 252-462.000.
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 Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,159,736, Cl. 165-104.00S.
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 Wiegert, Philip E., 4,160,015, Cl. 424-5.000.
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 Heim, Helmut, 4,159,686, Cl. 112-222.000.
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 Camara, Elias H.; Marianowski, Leonard G.; and Donado, Rafael A., 4,160,067, Cl. 429-16.000.
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 Anderson, Charles H.; and Marlowe, Frank J., 4,160,194, Cl. 315-366.000.
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- Martin Marietta Corporation: See—  
 Thomas, Frank J.; Gay, Donald L.; and Winsor, Chester A., 4,160,272, Cl. 364-602.000.
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 Terzian, Rouben T.; and Meyer, Burton C., 4,159,665, Cl. 84-404.000.
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- Massey, James V., III: See—  
 Levine, Robert A.; and Wardlaw, Stephen C., 4,159,896, Cl. 23-230.00B.
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 Etienne, Patrick; Massies, Jean; and Linh, Nguyen T., 4,160,166, Cl. 250-423.00R.
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 Yagi, Kazuo; and Masumoto, Kazuhiro, 4,159,889, Cl. 425-71.000.
- Matrapa S.A.: See—  
 Polack, Andre M., 4,159,602, Cl. 52-79.900.
- Matrix Toys, Inc.: See—  
 Gabriel, Richard J., 4,159,592, Cl. 46-26.000.
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- Matsushita Electric Industrial Co., Ltd.: See—  
 Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,160,014, Cl. 423-644.000.
- Matsuyama Petrochemicals Inc.: See—  
 Shigeyasu, Motoo; and Kusano, Nobuo, 4,160,108, Cl. 562-416.000.
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 Hughes, John; and Maul, Peter L., 4,159,683, Cl. 110-343.000.
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 Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, 4,159,942, Cl. 209-143.000.
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 Hodgkinson, Trevor, 4,159,810, Cl. 242-198.000.
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 Allington, William B.; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,159,933, Cl. 204-180.00R.
- McDonie, Arthur F.: See—  
 Tomasetti, Charles M.; and McDonie, Arthur F., 4,160,185, Cl. 313-94.000.
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- McGimpsey, Thomas T.: See—  
 Loewigkeit, Peter; Van Dyk, Kenneth A.; and McGimpsey, Thomas T., 4,160,065, Cl. 428-425.000.
- McGough, Gerald B., to GTE Automatic Electric Laboratories Incorporated. Anti-vandalism arrangement for protecting the touch calling unit of a coin telephone, 4,160,136, Cl. 179-184.000.
- McGough, Ronald B., to Honeywell Inc. Concentric tube hydrophobic streamer, 4,160,229, Cl. 340-7.00R.
- McKendrick, Thomas E.: See—  
 Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, 4,159,660, Cl. 82-3.000.

- McLean, Andrew J. O.: See—  
 Steele, David J.; McLean, Andrew J. O.; and Anderson, Martin B., 4,160,155, Cl. 235-92.0TC.
- McMahon, Donald H., to Sperry Rand Corporation. Optical reader for multiline image processing, 4,160,237, Cl. 340-146.30F.
- McMillon, David A.: See—  
 Brooks, Larry L.; and McMillon, David A., 4,159,947, Cl. 210-108.000.
- McReynolds, William W. Automotive step-turbine engine, 4,159,623, Cl. 60-39.150.
- Mead Corporation, The: See—  
 Calvert, Rodney K., 4,159,841, Cl. 294-87.200.
- Dick, Lloyd C., 4,159,887, Cl. 414-786.000.
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 Hegedus, Arpad; and Rofa, Otto, 4,160,197, Cl. 318-396.000.
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- Meier, Werner: See—  
 Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.
- Meihofer, Edward F., to Butler Automatic, Inc. Variable ratio winder, 4,159,808, Cl. 242-75.510.
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 Komatsu, Kenji; and Wakamatsu, Teruyoshi, 4,159,771, Cl. 206-620.000.
- Meiji Seika Kaisha, Ltd.: See—  
 Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.
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- Melander, Theodore A., to Pako Corporation. Duty cycle shared proportional temperature control, 4,160,153, Cl. 219-485.000.
- Melcher, Robert J.: See—  
 Funck, Gordon W.; and Melcher, Robert J., 4,159,862, Cl. 339-186.00M.
- Mendelsohn, Nathan: See—  
 Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, 4,159,660, Cl. 82-3.000.
- Meng, Karl: See—  
 Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,160,098, Cl. 548-374.000.
- Merck & Co., Inc.: See—  
 Cole, Lucille J., 4,160,083, Cl. 536-17.00A.
- Duyfjes, Werner, 4,160,029, Cl. 424-258.000.
- Miller, Thomas W.; Wilson, Kenneth E.; and Ormond, Robert E., 4,160,084, Cl. 536-17.00A.
- Remy, David C., 4,160,031, Cl. 424-267.000.
- Merrick, Larry H., to Harco Corporation. Method and apparatus for determining the reference voltage in an impressed current corrosion protection system, 4,160,171, Cl. 307-95.000.
- Merritt, William H., to Plastics Engineering & Manufacturing Co. Luminaire shield, 4,160,286, Cl. 362-311.000.
- Metal Awning Components, Inc.: See—  
 Weiner, Carl B., 4,159,844, Cl. 296-37.100.
- Metallurgie Hoboken-Overpelt: See—  
 Maes, Robert H.; and Fontainas, Luc M., 4,159,904, Cl. 75-10.00R.
- Mette, Manfred, to Ortmann & Herbst GmbH. Liquid filling device with automatic shut-off sensor, 4,159,726, Cl. 141-40.000.
- Mettler Instrument AG: See—  
 Realini, Enrico, 4,159,747, Cl. 177-210.0EM.
- Meyer, Burton C.: See—  
 Terzian, Rouben T.; and Meyer, Burton C., 4,159,665, Cl. 84-404.000.
- Microdot Inc.: See—  
 Berecz, Imre, 4,159,552, Cl. 10-86.00F.
- Microlife Technics, Inc.: See—  
 Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., 4,160,038, Cl. 426-53.000.
- Mieno, Michihiro; Mori, Hideki; Nakanishi, Jun; and Kasai, Juichi, to Showa Denko K.K. Process for the production of alkylene glycols, 4,160,116, Cl. 568-867.000.
- Mikite, Gyula: See—  
 Levai, Laszlo; Mikite, Gyula; and Kis-Tamas, Attila, 4,160,035, Cl. 424-311.000.
- Miles Laboratories, Inc.: See—  
 Fenocketti, Leonard P.; and Rapkin, Myron C., 4,160,008, Cl. 422-56.000.
- Kluender, Harold C., 4,159,998, Cl. 260-586.00R.
- Miles, Peter: See—  
 Smith, Malcolm J.; Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,159,946, Cl. 210-58.000.
- Miller, Anthony D., to Tomy Corporation. Game employing movement to control the operation of the game, 4,159,593, Cl. 46-42.000.
- Miller, Barry I.: See—  
 McFee, James H.; and Miller, Barry I., 4,159,919, Cl. 148-175.000.
- Miller, Gerald R.: See—  
 Johnson, Owen W.; Miller, Gerald R.; and Beutler, Paul S., 4,160,069, Cl. 429-104.000.
- Miller, Larry D.; Johnston, Laird E.; Valus, John T.; and Powell, Thomas M., to General Motors Corporation. Passive lap and shoulder belt system, 4,159,834, Cl. 280-802.000.
- Miller, Ralph P.: See—  
 Martin, Stephen M.; and Miller, Ralph P., 4,160,246, Cl. 340-630.000.
- Miller, Robert F.: See—  
 Szumachowski, Edwin R.; and Miller, Robert F., 4,160,066, Cl. 428-683.000.
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- Minolta Camera Kabushiki Kaisha: See—  
 Watanabe, Yutaka, 4,159,869, Cl. 353-122.000.
- Yasukuni, Mitsuo; Iida, Takashi; and Kiten, Hiroshi, 4,159,864, Cl. 350-184.000.
- Miquel, Jean-Francois, to Agence Nationale de Valorisation de la Recherche. Solar energy collector and installation employing same, 4,159,707, Cl. 126-270.000.
- Mirsagatov, Mirmakhmud A.: See—  
 Ismathodzhayev, Sagdulla K.; Usmanov, Salikh Z.; Mirsagatov, Mirmakhmud A.; Dzhabarov, Nasim G.; Takhirdzhanov, Makhirdzhan; and Mumindzhanov, Anvardzhan F., 4,160,196, Cl. 318-749.000.
- Miserlis, Constantine D., to Badger Company, Inc., The. Removal of plastic polymer fines from tallow, 4,159,992, Cl. 260-412.600.
- MistO2Gen Equipment Company: See—  
 Cameto, Leon R.; and Edmund, John R., 4,159,803, Cl. 239-102.000.
- Mitchell, Don E.: See—  
 Allington, William B.; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,159,933, Cl. 204-180.00R.
- Mitogiken, Ltd.: See—  
 Kobayashi, Keigo, 4,160,255, Cl. 346-79.000.
- Mitsui Aluminium Co., Ltd.: See—  
 Tsumura, Yoshishige, 4,159,928, Cl. 204-67.000.
- Mitsui Mfg. Co., Ltd.: See—  
 Mitsui, Yoshiaki, 4,160,182, Cl. 310-214.000.
- Mitsui Petrochemical Industries, Inc.: See—  
 Yagi, Kazuo; and Masumoto, Kazuhiro, 4,159,889, Cl. 425-71.000.
- Mitsui, Yoshiaki, to Mitsui Mfg. Co., Ltd. Laminated core manufacture, 4,160,182, Cl. 310-214.000.
- Miura, Akira: See—  
 Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.
- Miya, Masayoshi: See—  
 Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Miya, Masayoshi, 4,159,963, Cl. 252-429.00B.
- Miyagaki, Ryoichi: See—  
 Komada, Hiroshi; Nakamura, Kuniyasu; and Miyagaki, Ryoichi, 4,160,074, Cl. 521-155.000.
- Miyamae, Toshiaki. Collapsible universal fishing rod holding apparatus, 4,159,816, Cl. 248-515.000.
- Miyatake, Hideaki: See—  
 Goto, Kunio; Tajima, Osamu; and Miyatake, Hideaki, 4,160,268, Cl. 358-128.000.
- Mizell, Louis R., to I.W.S. Nominee Company Limited. Cleaning pad, 4,159,883, Cl. 401-201.000.
- Mizuno, Tamotsu: See—  
 Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,160,012, Cl. 423-341.000.
- Mobil Oil Corporation: See—  
 Clayton, William J., 4,160,053, Cl. 428-35.000.
- Frangatos, Gerassimos, 4,159,960, Cl. 252-49.900.
- Haag, Werner O.; and Huang, Tracy J., 4,159,995, Cl. 260-450.000.
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 Hewson, Clifford B., 4,159,548, Cl. 4-236.000.
- Molinari, Thomas E., to RCA Corporation. Printed circuit impedance transformation network with an integral spark gap, 4,160,210, Cl. 325-362.000.
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 Cushing, Vincent J., 4,159,645, Cl. 73-194.0EM.
- Monsanto Company: See—  
 Beestman, George B.; and Prill, Erhard J., 4,159,901, Cl. 71-86.000.
- Monte, Anthony J.; and Wahoski, Ernest C. Fire extinguishant mechanism, 4,159,744, Cl. 169-26.000.
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- Montgomery, Warren G. Continuous mining machine with improved cutter head slide means, 4,159,852, Cl. 299-56.000.



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Schwan, Thomas J.; and Freedman, Raymond, 4,160,093, Cl. 546-82.000.  
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Partipilo, Phillip, 4,160,240, Cl. 340-311.000.  
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De Salvo, Francis J., Jr.; and Murphy, Donald W., 4,159,962, Cl. 252-182.100.  
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Rao, M. Vikram; Foerster, George S.; and Hebbbar, Ranna K., 4,159,908, Cl. 75-167.000.  
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Tsuiji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komono, Taichiro; and Nagata, Wataru, 4,160,085, Cl. 544-16.000.  
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Komada, Hiroshi; Nakamura, Kuniyasu; and Miyagaki, Ryoichi, 4,160,074, Cl. 521-155.000.  
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Oka, Takafumi; and Nakanishi, Hiroshi, 4,160,236, Cl. 340-146.1AL.  
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Narcus, Harold. Bright electroless plating process producing two-layer nickel coatings on dielectric substrates. 4,160,049, Cl. 427-277.000.  
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Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., 4,160,205, Cl. 324-65.00R.  
National Semiconductor Corporation: See—  
Solomon, James E.; and Cecil, James B., 4,160,244, Cl. 340-347.00A.  
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Armstrong, Rolfe D., 4,160,290, Cl. 364-716.000.  
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Pyle, Donald L., 4,159,708, Cl. 126-270.000.  
Nekoosa Papers Inc.: See—  
Dearth, Leonard R.; and Lodzinski, Fred P., 4,159,874, Cl. 356-73.000.  
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Love, Richard F.; Newman, Stanley R.; and Larkin, John M., 4,159,996, Cl. 260-570.50P.  
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Sroussi, Roland; Nicolas, Jean; and Claudon, Jacques, 4,159,961, Cl. 252-63.200.  
Nicollian, Edward H.: See—  
Casey, Horace C., Jr.; Cho, Alfred Y.; and Nicollian, Edward H., 4,160,261, Cl. 357-23.000.  
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Honsel, Karl-Heinz; Niehaus, Hans-Rudolf; and Muhlenweg, Karl, 4,159,807, Cl. 242-57.000.  
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Sano, Kotaro, 4,159,868, Cl. 352-14.000.  
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Komada, Hiroshi; Nakamura, Kuniyasu; and Miyagaki, Ryoichi, 4,160,074, Cl. 521-155.000.  
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Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.  
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Matsubara, Soichi; Niikawa, Ryo; and Numata, Morikuni, 4,160,147, Cl. 219-87.000.  
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Akase, Kazutoyo; and Kobayashi, Isao, 4,160,190, Cl. 315-168.000.  
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Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,160,160, Cl. 250-214.00P.  
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Tanaka, Tadashi; Ohi, Tatsuro; Arai, Nobuichi; and Koyama, Teruo, 4,160,056, Cl. 428-220.000.  
Nippon Telegraph and Telephone Public Corporation: See—  
Oka, Takafumi; and Nakanishi, Hiroshi, 4,160,236, Cl. 340-146.1AL.  
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Nissan Motor Company, Limited: See—  
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Hiraiwa, Kazuyoshi; and Takahashi, Kotei, 4,159,628, Cl. 60-364.000.  
Nix, Hans F.: See—  
Steingrover, Erich A.; and Nix, Hans F., 4,160,208, Cl. 324-202.000.  
Niznik, George E., to General Electric Company. Dihydrooxadiazones and method for making. 4,160,088, Cl. 544-68.000.  
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Kuroda, Masanobu; Noda, Kazuo; and Kobayashi, Shinichi, 4,159,733, Cl. 164-211.000.  
Nodiff, Edward A., to Flint, Theodore R. Epoxy adhesive sealant. 4,160,064, Cl. 428-413.000.  
Noguchi, Hiroshi: See—  
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.  
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North, Lee E.: See—  
Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, 4,159,660, Cl. 82-3.000.  
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Matsubara, Soichi; Niikawa, Ryo; and Numata, Morikuni, 4,160,147, Cl. 219-87.000.  
Nunes, James A., to United States Steel Corporation. Dynamic gage averaging and length determining device and method for continuous sheet material. 4,159,572, Cl. 33-142.000.  
Nusslein, Ludwig: See—  
Arndt, Friedrich; and Nusslein, Ludwig, 4,159,902, Cl. 71-95.000.  
Nuzzi, Francis J.; and Vitellaro, Daniel F., to Kollmorgen Technologies Corporation. Catalytic processes for electroless metal deposition. 4,160,050, Cl. 427-304.000.  
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Tanaka, Tadashi; Obi, Tatsuro; Arai, Nobuichi; and Koyama, Teruo, 4,160,056, Cl. 428-220.000.  
Oden, Edmon F. Contaminant remover. 4,159,949, Cl. 210-180.000.  
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Garron, Stephen A.; and Odermann, Charles R., 4,159,688, Cl. 112-264.100.  
Odoj, Gerhard, to Semperit Aktiengesellschaft. Windsurfer. 4,159,689, Cl. 114-39.000.  
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Ohtsu Tire & Rubber Co., Ltd.: See—  
Osada, Isao; and Sano, Shoichi, 4,159,730, Cl. 152-158.000.  
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Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,160,160, Cl. 250-214.00P.  
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Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, 4,160,280, Cl. 358-294.000.  
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Okochi, Tsuneyuki: See—  
Masuda, Sinzo; and Okochi, Tsuneyuki, 4,159,608, Cl. 53-282.000.  
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Olsen, Robert C., to Illinois Tool Works Inc. Planting system including articles of manufacture. 4,159,597, Cl. 47-58.000.  
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Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.  
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Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,160,221, Cl. 335-68.000.  
Ono, Isao: See—  
Kozuka, Mikio; Ono, Isao; and Fukuwatari, Takashi, 4,160,003, Cl. 264-87.000.  
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Takeuchi, Tatsuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugimura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,159,616, Cl. 57-83.000.  
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Miller, Thomas W.; Wilson, Kenneth E.; and Ormond, Robert E., 4,160,084, Cl. 536-17.00A.  
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Metz, Manfred, 4,159,726, Cl. 141-40.000.  
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Reiner, Lawrence L.; and O'Shaughnessy, John, 4,159,594, Cl. 46-239.000.  
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Ottle, Walter, to Eberspacher, J. Device for purifying exhaust gases. 4,160,010, Cl. 422-180.000.  
Overcash, Gary B.: See—  
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Owen, Donald W. Transformer. 4,160,224, Cl. 336-147.000.  
Owen, Geoffrey R.: See—  
Durant, Graham J.; Ganellin, Charon R.; and Owen, Geoffrey R., 4,160,030, Cl. 424-263.000.  
Owens-Corning Fiberglass Corporation: See—  
Bartlow, David H.; and Sommerkamp, Robert M., 4,159,781, Cl. 220-5.00A.  
Ozaki, Yutaka: See—  
Shinkai, Ken; Chiba, Norio; and Ozaki, Yutaka, 4,160,072, Cl. 521-86.000.  
Package Engineering Corporation: See—  
Masuda, Sinzo; and Okochi, Tsuneyuki, 4,159,608, Cl. 53-282.000.  
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Manis, Charles A.; and Overcash, Gary B., 4,159,768, Cl. 206-396.000.  
Padalino, Dominick: See—  
Bryer, Jack; Padalino, Dominick; and Polglase, Burton C., 4,159,823, Cl. 270-21.000.  
Pai, Purnachandra: See—  
Braslaw, Jacob; and Pai, Purnachandra, 4,159,972, Cl. 260-2.300.  
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Melander, Theodore A., 4,160,153, Cl. 219-485.000.  
Palazzetti, Mario, to Fiat Societa per Azioni. Low cost solar panel. 4,159,709, Cl. 126-271.000.  
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Guanella, Gustav; and Graf, Alban, 4,160,123, Cl. 179-1.50R.  
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Harner, Kermit L.; Kos, Joseph M.; and Patrick, John P., 4,160,170, Cl. 290-44.000.



- Patrin, Raymond A. Electric razorcomb. 4,159,566, Cl. 30-30.000.
- Patterson, Roger A.: See—  
Biddle, Nicholas, III; and Patterson, Roger A., 4,159,786, Cl. 222-64.000.
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- Pauer, Lyle A.: See—  
Karbo, Donald J.; Betts, David A.; and Pauer, Lyle A., 4,160,234, Cl. 340-58.000.
- Paul, James L.: See—  
Stautzenberger, Adin L.; Paul, James L.; and Unruh, Jerry D., 4,159,999, Cl. 260-604.0HF.
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- Paxton, Roland K. Marine craft employing bow-wave lift. 4,159,691, Cl. 114-290.000.
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Schwarz, John F.; and Tinkham, Ralph J., 4,159,675, Cl. 99-444.000.
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Koenig, Kalus; Reichmann, Wolfgang; and Pedain, Josef, 4,160,080, Cl. 528-59.000.
- Pehr, Harold T. Tie holder. 4,159,542, Cl. 2-152.00R.
- Pendegrift, Alfred E. Automatic hook setter. 4,159,589, Cl. 43-15.000.
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Ostling, Sture; and Persson, Stig, 4,159,828, Cl. 277-184.000.
- Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., to Bergwerksverband GmbH; and Rhein Stahl Huttenwerke AG. Method of manufacturing green hot briquettes from fine coal for use in shaft furnaces. 4,159,905, Cl. 25-42.000.
- Peterson, C. Dean: See—  
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- Peterson, David C., to Upjohn Company. The  $\omega$ -Aryl-inter-oxa-9-deoxy-PGD compounds. 4,160,102, Cl. 560-53.000.
- Peterson, Samuel F.; and Grube, Clifford E., to Associated Mills, Inc. Footstool. 4,159,714, Cl. 128-24.200.
- Peterson, Wayne A., to Caterpillar Tractor Co. Brake system with pilot actuation. 4,159,854, Cl. 303-6.00M.
- Petric GmbH Elektro-Mechanische Bauelemente: See—  
Schlesier, Herbert; and Scheuer, Alfred, 4,160,143, Cl. 200-328.000.
- Petrovich, Vojislav. Froth flotation of ores using hydrocarbyl bicarbonates. 4,159,943, Cl. 209-166.000.
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- Pfeiffer, Hans W. Apparatus for supporting sporting guns during testing intervals. 4,159,588, Cl. 42-90.000.
- Pfizer Inc.: See—  
Andrews, Glenn C., 4,159,990, Cl. 260-343.700.
- Million, William A.; Plews, Rhona M.; and Richardson, Kenneth, 4,160,082, Cl. 536-10.000.
- Violland, Robert; and Lagasse, Alain, 4,159,978, Cl. 525-441.000.
- Pfluger, Erich: See—  
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- Pharmacaps, Inc.: See—  
Bernier, Howard E., 4,159,568, Cl. 30-124.000.
- Phillips Petroleum Company: See—  
Heckelsberg, Louis F., 4,159,970, Cl. 252-471.000.
- Horton, Robert L., 4,160,161, Cl. 250-281.000.
- Hutto, John F.; and Hoffman, Alfred A., Jr., 4,160,000, Cl. 568-576.000.
- Stapp, Paul R., 4,159,967, Cl. 252-438.000.
- Photon Power, Inc.: See—  
Jordan, John F.; and Lampkin, Curtis M., 4,159,914, Cl. 136-89.0TF.
- Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, to Beckman Instruments, Inc. Kinetic assay for inorganic phosphates and composition therefore. 4,159,923, Cl. 435-15.000.
- Pierson, William G.: See—  
Delaney, Thomas J.; and Pierson, William G., 4,160,022, Cl. 424-52.000.
- Pietzsch, Ludwig; Kauer, Harald; and Hartmann, Rudolf. Running pad for an endless track. 4,159,856, Cl. 305-51.000.
- Pioneer Associates 2: See—  
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- Pistorius, Rudolf, to Hoechst Aktiengesellschaft. Cyclohexene-(1)-dione-(3,6)-tetraalkyldiketals and process. 4,160,109, Cl. 568-667.000.
- Pitney-Bowes, Inc.: See—  
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- Pittasch, Willi; and Dalbert, Johannes, to Richard Heinze, Firma. Cabinet hinge. 4,159,557, Cl. 16-129.000.
- Pizzorno, Augusto, to Industrie Pirelli, S.p.A. Method and improved apparatus for automatically handling a mold for tires with a rigid segmented core. 4,160,007, Cl. 264-334.000.
- Plante, Emile A. P. Panels for lobster traps. 4,159,591, Cl. 43-100.000.
- Plastic Monofil Co. Ltd.: See—  
Kogan, Calvert S.; and Kogan, Marty, 4,160,057, Cl. 428-245.000.
- Plastics Engineering & Manufacturing Co.: See—  
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- Plessey Handel und Investments A.G.: See—  
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- Stewart, William J., 4,159,863, Cl. 350-96.180.
- Plews, Rhona M.: See—  
Million, William A.; Plews, Rhona M.; and Richardson, Kenneth, 4,160,082, Cl. 536-10.000.
- Plihal, Karel, to Prvni Brnenska strojirna, narodni podnik. Apparatus for manufacturing the parts of rotary vessels. 4,159,573, Cl. 33-174.00G.
- Polack, Andre M., to Matrapa S.A. Three-dimensional construction element comprising a body of generally polyhedral form. 4,159,602, Cl. 52-79.900.
- Polglase, Burton C.: See—  
Bryer, Jack; Padalino, Dominick; and Polglase, Burton C., 4,159,823, Cl. 270-21.000.
- Potter, Bronson M. Thermistor detector circuit and discriminating network for heat absorptive media. 4,159,638, Cl. 73-61.10R.
- Poutet, Jean-Claude: See—  
Mundel, Gunter; and Poutet, Jean-Claude, 4,160,146, Cl. 219-58.000.
- Powell, Thomas M.: See—  
Miller, Larry D.; Johnston, Laird E.; Valus, John T.; and Powell, Thomas M., 4,159,834, Cl. 280-802.000.
- PPG Industries, Inc.: See—  
Perkowski, Alfred D., 4,159,842, Cl. 294-118.000.
- Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, to Akzona Incorporated. Polyether lubricants for use in the processing of plastics. 4,159,975, Cl. 525-91.000.
- Prais, Alois G., to Becton, Dickinson and Company. Blood gas syringe. 4,159,713, Cl. 128-765.000.
- Prast, Ojlsbert, to U.S. Philips Corporation. Solar collector comprising solar tracking means. 4,159,710, Cl. 126-271.000.
- Preco Industries Ltd.: See—  
Ilukowicz, Robert J., 4,159,605, Cl. 52-687.000.
- Prella, Giovanni: See—  
Invernizzi, Rutilio; and Prella, Giovanni, 4,160,044, Cl. 426-582.000.
- Preston Engravers, Inc.: See—  
Johnson, Arthur R., deceased; Hudon, Paul A., administrator; and Kesten, Martin, 4,159,655, Cl. 74-571.00L.
- Pricer, Wilbur D.: See—  
Lee, Hsing-San; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., 4,160,275, Cl. 365-149.000.
- Prietzel, Horst: See—  
Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, 4,159,906, Cl. 75-58.000.
- Prill, Erhard J.: See—  
Beestman, George B.; and Prill, Erhard J., 4,159,901, Cl. 71-86.000.
- Produits Chimiques Ugine Kuhlmann: See—  
Dubreux, Bernard; Delavarente, Serve Y.; and Schirmann, Jean-Pierre, 4,159,991, Cl. 260-401.000.
- Prolenz AG: See—  
Schmidt, Walter; Sperner, Franz; and Stahlin, Walter, 4,159,891, Cl. 432-264.000.
- Prosky, Howard S., to Electromedics, Inc. Electrical circuit board with directly attached display unit and method of assembling same. 4,159,648, Cl. 73-362.0AR.
- Prutkovsky, Samuil A.: See—  
Vinogradov, Evgeny N.; Ivanov, Jury A.; Filatov, Nikolai A.; Fomichev, Viktor S.; and Prutkovsky, Samuil A., 4,160,180, Cl. 310-157.000.
- Prvni Brnenska strojirna, narodni podnik: See—  
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- Plihal, Karel, 4,159,573, Cl. 33-174.00G.
- Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., to J. I. Case Company. Straddle carriers for containers. 4,159,778, Cl. 414-460.000.
- Purcell, Robert J., to Caterpillar Tractor Co. Track assembly with mid-pitch drive lug and replaceable rail. 4,159,857, Cl. 305-54.000.
- Pybus, Roger M.: See—  
Birchall, James D.; and Pybus, Roger M., 4,159,913, Cl. 106-307.000.
- Pyle, Donald L., to Near Star Solar, Inc. Solar energy collector and heat exchanger. 4,159,708, Cl. 126-270.000.
- Querze, Adriano: See—  
Bambara, Mario; and Querze, Adriano, 4,160,289, Cl. 364-200.000.
- Quinton, Michael: See—  
Hailey, Keith R.; and Quinton, Michael, 4,160,264, Cl. 358-29.000.
- R. C. Sanders Technology Systems, Inc.: See—  
Sanders, Royden C., Jr.; Lerer, Michael I.; and Conant, John P., 4,159,882, Cl. 400-124.000.
- Ramseier, Serge: See—  
Durville, Gerard; Moulin, Michel; Ramseier, Serge; and Zurcher, Erwin, 4,159,558, Cl. 26-10.00R.

- Randall, John J., Jr.: See—  
Bernard, Walter J.; and Randall, John J., Jr., 4,159,927, Cl. 204-58.000.
- Ransburg Corporation: See—  
Scharfenberger, James A., 4,159,806, Cl. 239-708.000.
- Rao, M. Vikram; Foerster, George S.; and Hebbard, Ranna K., to N L Industries, Inc. Improved alkali metal containing battery grid lead alloy. 4,159,908, Cl. 75-167.000.
- Rapkin, Myron C.: See—  
Fenocketti, Leonard P.; and Rapkin, Myron C., 4,160,008, Cl. 422-56.000.
- Rapoport, Henry; and Snyder, Clinton D., to University of California. The Regents of the. 3-Metallo substituted naphthalenes. 4,159,993, Cl. 260-438.100.
- Rappoport, Roland. Article and method for adding markings to a speedometer. 4,159,693, Cl. 116-62.200.
- Rasmussen, Ivar: See—  
Baatrup, Johannes V.; and Rasmussen, Ivar, 4,159,723, Cl. 137-596.130.
- Rawson, Gerry, to American Safety Equipment Corporation. Pre-wound retractor spring housing assembly. 4,159,809, Cl. 242-107.000.
- Raytheon Company: See—  
Barquist, William S., Jr.; and Huicheon, Robert S., 4,160,212, Cl. 325-432.000.
- RCA Corporation: See—  
Ahmed, Adel A. A., 4,160,201, Cl. 323-8.000.
- Anderson, Charles H.; and Marlowe, Frank J., 4,160,194, Cl. 315-366.000.
- Carter, George W., 4,160,213, Cl. 325-439.000.
- Dingwall, Andrew G. F., 4,159,561, Cl. 29-571.000.
- Goldschmidt, Arthur M.; and Hedlund, Lee V., 4,160,270, Cl. 358-128.000.
- Kovac, Michael G., 4,160,262, Cl. 357-24.000.
- Marinelli, Donald P., 4,159,694, Cl. 118-401.000.
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- Molinari, Thomas E., 4,160,210, Cl. 325-362.000.
- Stachejko, Vitaly, 4,160,220, Cl. 333-161.000.
- Tomasetti, Charles M.; and McDonie, Arthur F., 4,160,185, Cl. 313-94.000.
- Torrington, Leslie A., 4,159,827, Cl. 274-9.00B.
- Weitzel, Charles E.; and Scott, Joseph H., 4,160,260, Cl. 357-23.000.
- Rea, Irvin B.; and Telmet, Juhan, to Lectron Products, Inc. Electromagnetic acoustic transducer with its air gap established at assembly by counteracting springs. 4,160,132, Cl. 179-114.00R.
- Realini, Enrico, to Mettler Instrument AG. Temperature-compensated weighing apparatus. 4,159,747, Cl. 177-210.0EM.
- Reed, Clyde H., to Rohr Industries, Inc. Controlled porosity of uncured reinforced thermo-setting plastic material. 4,160,055, Cl. 428-131.000.
- Rehbein, Friedhelm, to Fa. August Thiele. Holding device for a chain. 4,159,849, Cl. 299-34.000.
- Reichhold Chemicals, Inc.: See—  
Shelton, Frederic J.; Wetzel, William H.; Wilkinson, John E.; and Goodwin, Robert J., 4,160,114, Cl. 568-776.000.
- Reichmann, Wolfgang: See—  
Koenig, Kalus; Reichmann, Wolfgang; and Pedain, Josef, 4,160,080, Cl. 528-59.000.
- Reiner, Lawrence L.; and O'Shaughnessy, John, to Reiner, Lawrence L. Doll and simulated feeding apparatus. 4,159,594, Cl. 46-239.000.
- Reissinger, Karl-Hermann: See—  
Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Kreckel, Jorg, 4,159,925, Cl. 203-28.000.
- Reiter, Kurt: See—  
Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, 4,159,936, Cl. 208-93.000.
- Rellermeyer, Heinrich: See—  
Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, 4,159,906, Cl. 75-58.000.
- Remy, David C., to Merck & Co., Inc. Antihistaminic and appetite stimulating 10,11-dihydro-3-carboxycycloheptadine. 4,160,031, Cl. 424-267.000.
- Renkowsky, Robert K., to United Technologies Corporation. Method of fabricating a selectively shaped and apertured part of fiber reinforced plastic. 4,160,005, Cl. 264-137.000.
- Research Products/Blankenship Corporation: See—  
Blankenship, Ernest B., 4,159,547, Cl. 4-111.100.
- Reserve Synthetic Fuels, Inc.: See—  
Ham, Robert K., 4,159,893, Cl. 23-230.0EP.
- Reuting, Hans-Werner, to Elmeg-Elektro-Mechanik Gesellschaft mit beschrankter Haftung. Monostable electromagnetic relay with permanent magnetic bias. 4,160,222, Cl. 335-85.000.
- RFL Industries, Inc.: See—  
Kaufman, Barry M., 4,160,121, Cl. 178-66.00A.
- Rheinmetall G.m.b.H.: See—  
Luther, Hans-Werner; and Bender, Peter, 4,159,678, Cl. 102-44.000.
- Rhein Stahl Huttenwerke AG: See—  
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.
- Richard Heinze, Firma: See—  
Pittasch, Willi; and Dalbert, Johannes, 4,159,557, Cl. 16-129.000.
- Richards, John C. S.: See—  
Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., 4,160,205, Cl. 324-65.00R.
- Richardson, Kenneth: See—  
Million, William A.; Plews, Rhona M.; and Richardson, Kenneth, 4,160,082, Cl. 536-10.000.
- Richardson, Norman: See—  
Smith, Malcolm J.; Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,159,946, Cl. 210-58.000.
- Richardson, Warner G.: See—  
Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., 4,159,583, Cl. 37-8.000.
- Richmond, Abraham W. Metal vapor electric discharge lamp system. 4,160,193, Cl. 315-281.000.
- Richmond, Moscow K. Gate-opening and closing assembly. 4,159,599, Cl. 49-363.000.
- Ricoh Company, Ltd.: See—  
Fuwa, Jyoichi, 4,160,279, Cl. 358-288.000.
- Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, 4,160,200, Cl. 318-616.000.
- Riedel, Knut: See—  
Muller, Werner H.; Riedel, Knut; and Kreckler, Hans, 4,160,113, Cl. 568-772.000.
- Rigamonti, Oscar. Means for atomizing cosmetic products. 4,159,804, Cl. 239-346.000.
- Rindfleisch, Volker: See—  
Muller, Karl-Heinz; and Rindfleisch, Volker, 4,160,162, Cl. 250-311.000.
- Riniker, Bernhard: See—  
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., 4,159,981, Cl. 260-112.50T.
- Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., to Ciba-Geigy Corporation. Peptides and process for their manufacture. 4,159,981, Cl. 260-112.50T.
- Robert Bosch GmbH: See—  
Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.
- Roberts, Charles B., to Dow Chemical Company. The. Chromatographic column packing. 4,159,966, Cl. 252-430.000.
- Robertshaw Controls Company: See—  
Bauer, Werner R.; and Smith, William N., 4,159,563, Cl. 29-622.000.
- Branson, Charles D.; and Dem, Roy C., 4,159,800, Cl. 236-15.00A.
- Robinson, Thomas L., Sr., to T. L. Robinson Co., Inc. Method of making plastic EL lamp. 4,159,559, Cl. 29-25.140.
- Robitaille, Kenneth L.: See—  
Gatland, Geoffrey H.; and Robitaille, Kenneth L., 4,159,598, Cl. 49-28.000.
- Roccaforte, Harry I., to Champion International Corporation. Display carton. 4,159,765, Cl. 206-45.190.
- Rock, Heinrich: See—  
Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, 4,159,906, Cl. 75-58.000.
- Rockwell International Corporation: See—  
White, Frederic H., III, 4,160,218, Cl. 331-94.50P.
- Roeder, Robert S.: See—  
Lazarchik, Robert E.; and Roeder, Robert S., 4,160,251, Cl. 343-100.0ME.
- Roelofs, Johannes C. M.: See—  
Biermann, Udo K. P.; van der Sluys, Willem L. N.; and Roelofs, Johannes C. M., 4,159,737, Cl. 165-105.000.
- Rofa, Otto: See—  
Rothman, Gyorgy; Babos, Gyorgy; Gyarmati nec Hardik, Maria; Hegedus, Arpad; and Rofa, Otto, 4,160,197, Cl. 318-396.000.
- Rohr Industries, Inc.: See—  
Reed, Clyde H., 4,160,055, Cl. 428-131.000.
- Roland, Albert E. Fireplace boiler. 4,159,801, Cl. 237-8.00R.
- Rolf, Klaus-Peter, to Siemens Aktiengesellschaft. Contact arrangement for pressurized-gas circuit breaker. 4,160,140, Cl. 200-147.00A.
- Romaine, Richard A. Child-resistant container assembly. 4,159,780, Cl. 215-215.000.
- Romeo, Ciriaco: See—  
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.
- Roozee, William F., to International Paper Company. Shipping container and blank therefor. 4,159,797, Cl. 229-27.000.
- Roscoe Brown Corporation: See—  
Brown, Stanley L., 4,159,585, Cl. 37-97.000.
- Rose, Leslie C.; and Hamrick, Joseph T., to World Energy Systems. Process and system for recovering hydrocarbons from underground formations. 4,159,743, Cl. 166-302.000.
- Rosen, Irving, to Standard Oil Company, The. Copolymer blends. 4,160,001, Cl. 525-230.000.
- Rosler, Wulf, to Gewerkschaft Eisenhutte Westfalen. Drive frame and assembly for mining apparatus. 4,159,851, Cl. 299-43.000.
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- Roussel Uclaf: See—  
Clemence, Francois; and Le Martret, Odile, 4,159,986, Cl. 260-332.20A.
- Roy, Madan M.: See—  
Hudson, George S.; and Roy, Madan M., 4,159,642, Cl. 73-118.000.



- Rucci, Guglielmo: See—  
Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, 4,160,107, Cl. 560-204.000.
- Rueggeberg, Werner, to Armstrong Cork Company. Microwave applicator device. 4,160,145, Cl. 219-10.55F.
- Russell, Alfred G.; and Schwetz, Michael W., to Egan Machinery Company. Rotary cutter. 4,159,661, Cl. 83-305.000.
- Russell, Robert J., to Mail-Ex Corporation. Envelope processing machine and method. 4,159,611, Cl. 53-569.000.
- S I G Schweizerische Industrie-Gesellschaft: See—  
Nimmrichter, Odo, 4,159,759, Cl. 198-407.000.
- Sachko, Viktor V.: See—  
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; Sachko, Viktor V.; Yakunin, Ivan A.; and Abramov, Boris F., 4,159,734, Cl. 164-426.000.
- Sage, Wannie L., to Babcock & Wilcox Company. The. Pressurized conveyor. 4,159,886, Cl. 414-292.000.
- Sakamoto, Hitoshi, to Sony Corporation. Tape control apparatus. 4,160,195, Cl. 318-7.000.
- Sakashita, Kiyoshi: See—  
Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, 4,160,227, Cl. 338-22.000.
- Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Miya, Masayoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst for producing polyolefins. 4,159,963, Cl. 252-429.00B.
- Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Tsuyama, Shigeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst useful for polymerizing olefins. 4,159,965, Cl. 252-429.00B.
- Salamon, Theodore M.: See—  
Manz, David F.; Irwin, Clarence C.; and Salamon, Theodore M., 4,159,848, Cl. 297-474.000.
- Samejima, Tadanori, to Honshu Seishi Kabushiki Kaisha. Adsorptive nonwoven fabric comprising fused fibers, non-fused fibers and absorptive material and method of making same. 4,160,059, Cl. 428-288.000.
- Samuelson, Erik; and Samuelsson, Jonas. Method of measuring the angular position of the axis of rotation of a wheel. 4,159,574, Cl. 33-228.000.
- Samuelsson, Jonas: See—  
Samuelson, Erik; and Samuelsson, Jonas, 4,159,574, Cl. 33-228.000.
- Sanders, Royden C., Jr.; Lerer, Michael I.; and Conant, John P., to R. C. Sanders Technology Systems, Inc. High quality printer. 4,159,882, Cl. 400-124.000.
- Sandoz, Inc.: See—  
Hardmann, Goetz E., 4,160,032, Cl. 424-274.000.
- Sandoz Ltd.: See—  
Dore, Jacky, 4,159,983, Cl. 260-145.00A.
- Sands, John L.: See—  
Levek, Robert P.; Mamuzic, Rastko I.; and Sands, John L., 4,160,112, Cl. 568-755.000.
- Sandvik Aktiebolag: See—  
Sundstrom, Erik W., 4,159,569, Cl. 30-384.000.
- Sankyo Kogaku Kogyo Kabushiki Kaisha: See—  
Kakukawa, Masatoshi; and Kondo, Hideyuki, 4,160,159, Cl. 250-204.000.
- Sano, Kotaro, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Film loop forming device. 4,159,868, Cl. 352-14.000.
- Sano, Shoichi: See—  
Osada, Isao; and Sano, Shoichi, 4,159,730, Cl. 152-158.000.
- Saridakis, Nikolaus, to Volkswagenwerk Aktiengesellschaft. Positive nickel electrode for alkaline storage batteries and process for its production. 4,160,047, Cl. 427-115.000.
- Sasaki, Gorou: See—  
Hayashida, Sanae; and Sasaki, Gorou, 4,159,950, Cl. 210-330.000.
- Sasaki, Takashi: See—  
Fujiwhara, Mitsuto; Sasaki, Takashi; and Uchida, Takashi, 4,159,910, Cl. 96-74.000.
- Sato, Seizi, to Sony Corporation. Cassette changer. 4,160,281, Cl. 360-92.000.
- Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Substituted carbamates. 4,160,034, Cl. 424-298.000.
- Savage, Elton S., to Dravco Corporation. Method for denitrification of treated sewage. 4,159,945, Cl. 210-8.000.
- Sawa, Toshikazu: See—  
Okino, Seiki; Mori, Takao; Yanai, Toshiharu; and Sawa, Toshikazu, 4,160,061, Cl. 428-334.000.
- Sawhill, James W.: See—  
Schroeder, Jack J.; and Sawhill, James W., 4,160,041, Cl. 426-69.000.
- Say, Donald L.; Smithgall, Harry E.; and Speigel, Kenneth, to GTE Sylvania Incorporated. Post-deflection acceleration CRT system. 4,160,187, Cl. 313-408.000.
- Sberze, Piero: See—  
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.
- Schaefer, Dora: See—  
Grayson, Suzanne; and Schaefer, Dora, 4,160,271, Cl. 364-400.000.
- Scharfenberger, James A., to Ransburg Corporation. Operation sequence control system. 4,159,806, Cl. 239-708.000.
- Schat, Karel A.; and Calnek, Bruce W., to Cornell Research Foundation, Inc. Marek's disease vaccine. 4,160,024, Cl. 424-89.000.
- Scheffels, Wilhelm; and Koy, Johannes, to Steigerwald Strahltechnik GmbH. Method for welding workpiece parts by means of an energy beam. 4,160,149, Cl. 219-121.0EM.
- Schempp, Eberhard G. Arc furnace enclosure. 4,160,117, Cl. 13-1.000.
- Schering Aktiengesellschaft: See—  
Arndt, Friedrich; and Nusslein, Ludwig, 4,159,902, Cl. 71-95.000.
- Scheuer, Alfred: See—  
Schlesier, Herbert; and Scheuer, Alfred, 4,160,143, Cl. 200-328.000.
- Schinke, Friedel. Plastic packing container. 4,159,764, Cl. 206-3.000.
- Schirmann, Jean-Pierre: See—  
Dubreux, Bernard; Delavarenne, Serve Y.; and Schirmann, Jean-Pierre, 4,159,991, Cl. 280-401.000.
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- Schwan, Thomas J.; and Freedman, Raymond, to Morton-Norwich Products, Inc. 6-Ethyl-6,9-dihydro-9-oxopyrazolo[3,4-f]quinoline-9-carboxylic acid. 4,160,093, Cl. 546-82.000.
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- Sencore, Inc.: See—  
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Inohara, Akio; Takahashi, Koji; and Inoue, Ryoji, 4,159,921, Cl. 156-272.000.
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- Shearing, Steven P. Intraocular lens. 4,159,546, Cl. 3-13.000.
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- Shell Oil Company: See—  
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Mieno, Michihiro; Mori, Hideki; Nakanishi, Jun; and Kasai, Juichi, 4,160,116, Cl. 568-867.000.
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Gawlick, Heinz; Homburg, Axel; Siegelin, Werner; and Marondel, Gunther, deceased, 4,160,062, Cl. 428-365.000.
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Bromer, Gunter, 4,160,198, Cl. 318-565.000.
- Kuny, Wilhelm, 4,160,219, Cl. 333-151.000.
- Lichtenberg, Alfred, 4,160,181, Cl. 310-166.000.
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- Sims, Raymond U.: See—  
Wilson, Charles R.; and Sims, Raymond U., 4,160,232, Cl. 340-11.000.
- Sindermann, Raymond: See—  
Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymond, 4,159,906, Cl. 75-58.000.
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Garron, Stephen A.; and Odermann, Charles R., 4,159,688, Cl. 112-264.100.
- Hubka, Theodore; and Slater, Robert W., 4,160,248, Cl. 343-8.000.
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- Smith, Franklin G., to Smith, Franklin G. Embosser. 4,159,677, Cl. 101-23.000.
- Smith, Fred J.: See—  
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Durant, Graham J.; Ganellin, Charon R.; and Owen, Geoffrey R., 4,160,030, Cl. 424-263.000.
- Smith, Malcolm J.; Miles, Peter; Richardson, Norman; and Finan, Michael A., to Ciba Geigy (UK) Limited. Treatment of aqueous systems. 4,159,946, Cl. 210-58.000.
- Smith, Philip C.; and Fagan, John L., to Westinghouse Electric Corp. Precharge circuitry for an electrically alterable non-volatile memory. 4,160,291, Cl. 365-203.000.
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- Smith, Robert H., to Atlantic Richfield Company. Denitrogenation of syncrude. 4,159,940, Cl. 208-254.00H.
- Smith, William N.: See—  
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- Smithgall, Harry E.: See—  
Say, Donald L.; Smithgall, Harry E.; and Speigel, Kenneth, 4,160,187, Cl. 313-408.000.
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Snader, Kenneth M., 4,160,021, Cl. 424-45.000.
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Kang, Byung K.; So, Jin C.; Chung, Tae H.; and Choi, Won, 4,159,755, Cl. 188-151.00A.
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Bambara, Mario; and Querze, Adriano, 4,160,289, Cl. 364-200.000.
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LaFlaquiere, Regis; and Janousek, Rade, 4,159,620, Cl. 57-301.000.
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Invernizzi, Rutilio; and Prella, Giovanni, 4,160,044, Cl. 426-582.000.
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Sedille, Marcel, 4,159,738, Cl. 165-125.000.
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Chillier-Duchatel, Nicole; and Verger, Bernard, 4,160,287, Cl. 363-13.000.
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Endicott, Donald L., Jr.; and Solarek, Daniel J., Jr., 4,160,169, Cl. 250-570.000.



- Solimine, John S., to Vitello, Fausto; and Swenson, Eric L. Wheel truck for steerable platform. 4,159,830, Cl. 280-11.280.
- Soliton Devices, Inc.: See—  
Nordstrom, Donald B., 4,159,667, Cl. 85-61.000.
- Solomon, James E.; and Cecil, James B., to National Semiconductor Corporation. Conversion circuit. 4,160,244, Cl. 340-347.0DA.
- Sommerkamp, Robert M.: See—  
Bartlow, David H.; and Sommerkamp, Robert M., 4,159,781, Cl. 220-5.00A.
- Sonomura, Roy N. Method for placing explosives in submerged rock. 4,159,668, Cl. 86-20.00C.
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Ohsawa, Mitsuo, 4,160,217, Cl. 331-8.000.  
Sakamoto, Hitoshi, 4,160,195, Cl. 318-7.000.  
Sato, Seizi, 4,160,281, Cl. 360-92.000.  
Tanaka, Sadaaki, 4,160,265, Cl. 358-37.000.
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Jackson, Clifford A., 4,159,952, Cl. 252-356.000.
- Southwire Company: See—  
Linne, Robert S., 4,159,633, Cl. 72-198.000.
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Say, Donald L.; Smithgall, Harry E.; and Speigel, Kenneth, 4,160,187, Cl. 313-408.000.
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Schmidt, Walter; Sperner, Franz; and Stahlin, Walter, 4,159,891, Cl. 432-264.000.
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Eggers, Edward T.; Waldrop, Thomas W.; Sheesley, Donald L.; and Campbell, Willis R., 4,159,615, Cl. 56-341.000.  
Law, Wendell A., 4,160,124, Cl. 179-2.0DP.  
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- McMahon, Donald H., 4,160,237, Cl. 340-146.30F.
- Scott, Charles H., 4,160,245, Cl. 340-347.0SY.
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Adams, Ralph W., 4,160,283, Cl. 361-143.000.
- Sprague Electric Company: See—  
Bernard, Walter J.; and Randall, John J., Jr., 4,159,927, Cl. 204-58.000.
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- Stahlin, Walter: See—  
Schmidt, Walter; Sperner, Franz; and Stahlin, Walter, 4,159,891, Cl. 432-264.000.
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Rosen, Irving, 4,160,001, Cl. 525-230.000.
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Schnell, Philip G., 4,160,039, Cl. 426-60.000.  
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- Steel City Corporation, The: See—  
Fibus, C. Kenneth, 4,159,814, Cl. 248-243.000.
- Steele, David J.; McLean, Andrew I. O.; and Anderson, Martin B., to Plessey Handel und Investments A.G. Taximeter indicating devices. 4,160,155, Cl. 235-92.0TC.
- Steigerwald Strahltechnik GmbH: See—  
Konig, Dieter, 4,160,150, Cl. 219-121.0EB.
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McCombs, Allan K.; and Stein, Jay A., 4,160,165, Cl. 250-354.000.
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- Steinkuhl, Bernd: See—  
Lobbe, Armin; and Steinkuhl, Bernd, 4,159,850, Cl. 299-34.000.
- Stengard, Edwin O., to United States of America, National Aeronautics and Space Administration. Toggle mechanism for pinching metal tubes. 4,159,634, Cl. 72-436.000.
- Stephens, Mark W.: See—  
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Bardwell, Francis G., 4,160,199, Cl. 318-577.000.
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- Stickie, Hortencia M., executrix: See—  
Stickie, Daniel T., deceased, and Stickie, Hortencia M., executrix, 4,160,043, Cl. 426-439.000.
- Stille, Herschel H., to Clark Equipment Company. Planetary outer end. 4,159,657, Cl. 74-801.000.
- Stone, James D.: See—  
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,160,090, Cl. 544-164.000.
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Meichner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prielzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymond, 4,159,906, Cl. 75-58.000.
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Nonnenmann, Manfred; and Bardong, Helmut, 4,159,741, Cl. 165-173.000.
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Estes, John H.; Kravitz, Stanley; and Suggitt, Robert M., 4,160,011, Cl. 423-328.000.
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Takeuchi, Tatsuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,159,616, Cl. 57-83.000.
- Sumitomo Chemical Company, Limited: See—  
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, To-shiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.
- Sundstrom, Erik W., to Sandvik Aktiebolag. Chain saw guide bar. 4,159,569, Cl. 30-384.000.
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Kajfetz, Franjo; Sunjic, Vitomir; and Sunjic, Vesna, 4,160,096, Cl. 548-338.000.
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Kajfetz, Franjo; Sunjic, Vitomir; and Sunjic, Vesna, 4,160,096, Cl. 548-338.000.
- Sutton, Leonard: See—  
Johnson, Reginald F.; and Sutton, Leonard, 4,159,612, Cl. 53-594.000.
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Takeuchi, Tatsuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,159,616, Cl. 57-83.000.
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Robinson, Thomas L., Sr., 4,159,559, Cl. 29-25.140.
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Kawamura, Naoto; and Tajima, Akira, 4,159,865, Cl. 350-184.000.
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Goto, Kunio; Tajima, Osamu; and Miyatake, Hideaki, 4,160,268, Cl. 358-128.000.
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- Tanno, Norihiko: See—  
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, To-shiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.
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Kohn, David H.; and Liebersohn, Aharon, 4,160,078, Cl. 526-218.000.
- Technip: See—  
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,159,736, Cl. 165-104.00S.
- Tektronix, Inc.: See—  
Baker, Daniel G., 4,160,276, Cl. 358-162.000.
- Teledyne Industries, Inc.: See—  
Szumachowski, Edwin R.; and Miller, Robert F., 4,160,066, Cl. 428-683.000.
- Telmet, Juhan: See—  
Rea, Irvin B.; and Telmet, Juhan, 4,160,132, Cl. 179-114.00R.
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Hoch, Samuel; Lally, Robert E.; and Ceprini, Mario Q., 4,159,973, Cl. 260-23.0XA.
- Termanini, Zafer A., to Zafmedico Corporation. Hip joint prosthesis. 4,159,544, Cl. 3-1.912.
- Terry, David R.: See—  
James, Barry K.; and Terry, David R., 4,160,202, Cl. 323-24.000.
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- Texaco Inc.: See—  
Estes, John H.; Kravitz, Stanley; and Suggitt, Robert M., 4,160,011, Cl. 423-328.000.
- Love, Richard F.; Newman, Stanley R.; and Larkin, John M., 4,159,996, Cl. 260-570.50P.
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Stephenson, Alvis D., Jr.; and Carlo, James T., 4,160,274, Cl. 365-2.000.
- Texier, Alain G. Digital data transmission system providing multipoint connections. 4,160,128, Cl. 179-15.0BA.
- Theeuwes, Felix: See—  
Ayer, Atul D.; and Theeuwes, Felix, 4,160,020, Cl. 424-15.000.
- Thiele, Duane L.: See—  
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.
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Luca, Sebastiano F.; Thommel, Jurgen; and Bronn, Walter K., 4,160,040, Cl. 426-62.000.
- Thompson, Douglas K., to General Motors Corporation. Thrust balancing. 4,159,888, Cl. 415-105.000.
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Collin, Lucien; and Chesnel, Andre, 4,160,214, Cl. 328-65.000.
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Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.
- Tinkham, Ralph J.: See—  
Schwarz, John F.; and Tinkham, Ralph J., 4,159,675, Cl. 99-444.000.
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Beck, Harold, 4,159,772, Cl. 206-820.000.
- Titus, Paul E., to Shell Oil Company. Method for preventing the adherence of oil to surfaces. 4,160,063, Cl. 428-389.000.
- Tobiki, Hisao: See—  
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- Tobin, Leo W., Jr., to American Standard Inc. Toilet facility. 4,159,550, Cl. 4-319.000.
- Tokyo Shibaura Electric Co., Ltd.: See—  
Aoki, Kiyoshi, 4,160,173, Cl. 307-289.000.
- Kurihara, Tetsuro, 4,160,266, Cl. 358-111.000.
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Ikawa, Reiji, 4,159,817, Cl. 249-98.000.
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Miller, Anthony D., 4,159,593, Cl. 46-42.000.
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- Torrington, Leslie A., to RCA Corporation. Video disc package. 4,159,827, Cl. 274-9.00B.
- Tosaki, Hiromi: See—  
Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, 4,160,227, Cl. 338-22.00R.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Murata, Chigaku, 4,159,701, Cl. 123-97.00B.
- Shibata, Norio; and Furukubo, Tatsumi, 4,159,626, Cl. 60-276.000.
- Trammell, Earl M., Jr., to Cycle-Drive Corporation. Bicycle drive assembly. 4,159,652, Cl. 74-117.000.
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- TRW Inc.: See—  
Jenkins, John C., 4,160,148, Cl. 219-98.000.
- Tsubokawa, Ichiro: See—  
Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, 4,160,227, Cl. 338-22.00R.
- Tsuchimochi, Yoshihisa: See—  
Mabuchi, Kenichi; Tsuchimochi, Yoshihisa; and Komatsu, Koziro, 4,160,253, Cl. 343-225.000.
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- Tsuiji, Teruji: See—  
Yoshioka, Mitsuru; Tsuiji, Teruji; Nishitani, Yasuhiro; and Nagata, Wataru, 4,159,984, Cl. 260-239.00A.
- Tsumura, Yoshishige, to Mitsui Aluminium Co., Ltd. Process for production of aluminum. 4,159,928, Cl. 204-67.000.
- Tsuyama, Shigeo: See—  
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,159,965, Cl. 252-429.00B.
- Tung, Ker-Kong: See—  
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,159,923, Cl. 435-15.000.
- Turner, Laurence E. Handgun. 4,159,670, Cl. 89-155.000.
- Uchida, Isamu; Watanabe, Kenkichi; and Furuya, Katsuke, to Laurel Bank Machine Co., Ltd. Wrapping paper selecting system for use in coin packaging machine. 4,159,607, Cl. 53-64.000.
- Uchida, Shingo: See—  
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.
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Fujiwhara, Mitsuo; Sasaki, Takashi; and Uchida, Takashi, 4,159,910, Cl. 96-74.000.



- Ullman, Edwin F., to Syva Company. Receptor fluorescent immunoassay. 4,160,016, Cl. 424-8.000.
- Ullrich, Wolfgang: See—  
Meichner, Walter; Rock, Heinrich; Freismuth, Alfred; Prielzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymond, 4,159,906, Cl. 75-58.000.
- Under Sea Industries, Inc.: See—  
Cossey, Mike R., 4,159,717, Cl. 128-142.200.
- Unibra Societe Anonyme: See—  
Seto, Herbert; Cruz, Maria I.; and Friplat, Jose J., 4,159,994, Cl. 260-448.000.
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Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,160,090, Cl. 544-164.000.
- United States of America  
Army: See—  
Eneman, Melvin, 4,159,679, Cl. 102-237.000.  
Longshore, Randolph E., 4,160,045, Cl. 427-38.000.  
Zacharin, Alexey T., 4,159,680, Cl. 102-277.000.
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Kleystuber, William K.; and Mayercheck, William D., 4,159,757, Cl. 198-303.000.  
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Hawkes, Ivor, 4,159,641, Cl. 73-778.000.
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Wise, Thomas E. Microwave dichroic plate. 4,160,254, Cl. 343-909.000.
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Stengard, Edwin O., 4,159,634, Cl. 72-436.000.
- Navy: See—  
Butterick, Gilbert N., 4,160,188, Cl. 313-446.000.  
Endicott, Donald L., Jr.; and Solarek, Daniel J., Jr., 4,160,169, Cl. 250-570.000.  
Garrett, William D.; and Barger, William R., 4,160,033, Cl. 424-285.000.  
Trout, Philip A., 4,160,175, Cl. 307-358.000.
- U.S. Philips Corporation: See—  
Biermann, Udo K. P.; van der Sluys, Willem L. N.; and Roelofs, Johannes C. M., 4,159,737, Cl. 165-105.000.
- Kramer, Pieter; Compaa, Klaas; and Forsthuber, Robert F. K., 4,160,269, Cl. 358-128.000.
- Lucas, David A.; and Vincent, Richard P., 4,160,252, Cl. 343-113.000.
- Mahdjuri, Faramarz, 4,159,706, Cl. 126-270.000.
- Prast, Gijbert, 4,159,710, Cl. 126-271.000.
- Weiss, Hermann; and Kowalski, Gunter, 4,160,167, Cl. 250-445.000.
- United States Steel Corporation: See—  
Nunes, James A., 4,159,572, Cl. 33-142.000.
- United Technologies Corporation: See—  
Harner, Kermit L.; Kos, Joseph M.; and Patrick, John P., 4,160,170, Cl. 290-44.000.
- Kerr, Walter B., 4,159,625, Cl. 60-204.000.
- Renkowsky, Robert K., 4,160,005, Cl. 264-137.000.
- University of California, The Regents of the: See—  
Rapoport, Henry; and Snyder, Clinton D., 4,159,993, Cl. 260-438.100.
- University of Southern California: See—  
Whelan, James M., 4,160,013, Cl. 423-402.000.
- University of Utah: See—  
Johnson, Owen W.; Miller, Gerald R.; and Beutler, Paul S., 4,160,069, Cl. 429-104.000.
- Unruh, Jerry D.: See—  
Stautzenberger, Adin L.; Paul, James L.; and Unruh, Jerry D., 4,159,999, Cl. 260-604.0HF.
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Antos, George J., 4,159,939, Cl. 208-139.000.  
Berry, William M., Jr., 4,159,785, Cl. 222-63.000.  
Frame, Robert R., 4,159,964, Cl. 252-428.000.  
Scott, Norman H., 4,159,935, Cl. 208-59.000.  
Scott, Norman H., 4,159,937, Cl. 208-104.000.
- Upjohn Company, The: See—  
Kaugars, Girts, 4,160,037, Cl. 424-322.000.  
Peterson, David C., 4,160,102, Cl. 560-53.000.  
Sih, John C., 4,160,095, Cl. 542-426.000.  
Smith, Herman W., 4,159,997, Cl. 260-586.00R.  
Smith, Herman W., 4,160,101, Cl. 560-53.000.  
Smith, Herman W., 4,160,105, Cl. 560-55.000.  
Yankee, Ernest W., 4,160,103, Cl. 560-53.000.  
Yankee, Ernest W., 4,160,104, Cl. 560-53.000.  
Yankee, Ernest W., 4,160,106, Cl. 560-55.000.
- Usmanov, Salikh Z.: See—  
Ismatkhodzhaev, Sagdulla K.; Usmanov, Salikh Z.; Mirsagatov, Mirmakhmud A.; Dzhabarov, Nasim G.; Takhirdzhanov, Makhirdzhan; and Mumindzhanov, Anvardzhan F., 4,160,196, Cl. 318-749.000.
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- Valus, John T.: See—  
Miller, Larry D.; Johnston, Laird E.; Valus, John T.; and Powell, Thomas M., 4,159,834, Cl. 280-802.000.
- Vandament, Daniel D. Reinforced, light-weight pallet. 4,159,681, Cl. 108-51.100.
- van der Sluys, Willem L. N.: See—  
Biermann, Udo K. P.; van der Sluys, Willem L. N.; and Roelofs, Johannes C. M., 4,159,737, Cl. 165-105.000.
- Van Dyk, Kenneth A.: See—  
Loewigkei, Peter; Van Dyk, Kenneth A.; and McGimpsey, Thomas T., 4,160,065, Cl. 428-425.000.
- Varian Techtron Proprietary Limited: See—  
Egan, Edward G.; and Jackson, Ian S., 4,159,876, Cl. 356-312.000.
- Vasey, Charles H.; and Waddan, Dhafir Y., to Imperial Chemical Industries Limited. Process for the manufacture of butenediol. 4,160,115, Cl. 568-857.000.
- Vaughan, Emily Heiland, executrix: See—  
Slana, Matthew F.; and Vaughan, Henry E., deceased, 4,160,127, Cl. 179-15.0AQ.
- Vaughan, Henry E., deceased: See—  
Slana, Matthew F.; and Vaughan, Henry E., deceased, 4,160,127, Cl. 179-15.0AQ.
- Vemco Products, Inc.: See—  
Gatland, Geoffrey H.; and Robitaille, Kenneth L., 4,159,598, Cl. 49-28.000.
- Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: See—  
Wrulich, Herwig; Gehring, Karlheinz; and Zitz, Alfred, 4,159,746, Cl. 175-354.000.
- Verger, Bernard: See—  
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,160,287, Cl. 363-13.000.
- Versuchsanstalt der Hefeindustrie e.V.: See—  
Luca, Sebastiano F.; Thommel, Jurgen; and Bronn, Walter K., 4,160,040, Cl. 426-62.000.
- Victor Company of Japan, Ltd.: See—  
Goto, Kunio; Tajima, Osamu; and Miyatake, Hideaki, 4,160,268, Cl. 358-128.000.
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Lucas, David A.; and Vincent, Richard P., 4,160,252, Cl. 343-113.000.
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- Violland, Robert; and Lagasse, Alain, to Pfizer Inc. Novel polyacetal polymers and their application as soil release and anti-soil redeposition agents for textile substrates. 4,159,978, Cl. 525-441.000.
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Visser, Anthony, 4,159,727, Cl. 141-131.000.
- Vitellaro, Daniel F.: See—  
Nuzzi, Francis J.; and Vitellaro, Daniel F., 4,160,050, Cl. 427-304.000.
- Vitello, Fausto: See—  
Solimine, John S., 4,159,830, Cl. 280-11.280.
- Vogl, Norbert G., Jr.: See—  
Lee, Hsing-San; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., 4,160,275, Cl. 365-149.000.
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- Volkswagenwerk Aktiengesellschaft: See—  
Saridakis, Nikolaus, 4,160,047, Cl. 427-115.000.
- von Bogdandy, Ludwig; and Kosmider, Hans, to Klockner-Werke AG. Method of manufacturing a compound steel material of a high corrosion resistance. 4,159,918, Cl. 148-12.100.
- von Lutzow, Robert W. Bubbler sprinkler. 4,159,805, Cl. 239-457.000.
- Von Meister, William: See—  
Peyser, Alan; and Von Meister, William, 4,160,129, Cl. 179-18.00E.
- W. R. Grace & Co.: See—  
Guthrie, James L.; and Bach, Donald J., 4,160,076, Cl. 521-159.000.
- Waddan, Dhafir Y.: See—  
Vasey, Charles H.; and Waddan, Dhafir Y., 4,160,115, Cl. 568-857.000.
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- Wagenknecht, Don A., personal representative: See—  
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,054, Cl. 424-48.000.
- Wagner, Alfred, to Swiss Aluminium Ltd. Equipment for extrusion in particular for the extrusion of aluminum billets into sections and the like. 4,159,560, Cl. 29-33.00C.
- Wagner Electric Corporation: See—  
Falk, Edward J., 4,159,855, Cl. 303-24.00F.
- Wahoski, Ernest C.: See—  
Monte, Anthony J.; and Wahoski, Ernest C., 4,159,744, Cl. 169-26.000.
- Wakamatsu, Teruyoshi: See—  
Komatsu, Kenji; and Wakamatsu, Teruyoshi, 4,159,771, Cl. 206-620.000.
- Waldrop, Thomas W.: See—  
Eggers, Edward T.; Waldrop, Thomas W.; Sheesley, Donald L.; and Campbell, Willis R., 4,159,615, Cl. 56-341.000.
- Walker, Clarence L., to Sherwood Medical Industries, Inc. Pressure regulator for endotracheal tube cuff or the like. 4,159,722, Cl. 137-496.000.

- Walker, Evan H.: See—  
Korr, Abraham L.; Walker, Evan H.; and Svihel, Bernard T., 4,159,629, Cl. 60-641.000.
- Walker, Stephen J.: See—  
Lamb, Raymond K.; and Walker, Stephen J., 4,159,637, Cl. 73-46.000.
- Walsh, James L.: See—  
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,159,915, Cl. 148-1.500.
- Walton, Ronald D. Drying oven. 4,159,578, Cl. 34-344.000.
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Hoos, Pieter F., 4,159,818, Cl. 251-214.000.
- Ward, John J. B.: See—  
Barnes, Clive; and Ward, John J. B., 4,159,926, Cl. 204-49.000.
- Wardlaw, Stephen C.: See—  
Levine, Robert A.; and Wardlaw, Stephen C., 4,159,896, Cl. 23-230.00B.
- Warner-Lambert Company: See—  
Chen, Evan N.; and Bowman, Peter, 4,159,567, Cl. 30-62.000.
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- Watanabe, Hiroshi: See—  
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.
- Watanabe, Kenkichi: See—  
Uchida, Isamu; Watanabe, Kenkichi; and Furuya, Katusuke, 4,159,607, Cl. 53-64.000.
- Watanabe, Sakuji: See—  
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,160,160, Cl. 250-214.00P.
- Watanabe, Yutaka, to Minolta Camera Kabushiki Kaisha. Cursor for use in microfilm reader. 4,159,869, Cl. 353-122.000.
- Watkins, Fred E., to Camco, Incorporated. Method of and apparatus for measuring bottom hole well pressure. 4,159,643, Cl. 73-155.000.
- Watson, Elzbieta: See—  
Burton, George; and Watson, Elzbieta, 4,160,086, Cl. 544-26.000.
- Weaver, John A., to Alto Corporation. Muffin splitter. 4,159,662, Cl. 83-867.000.
- Webb, Byron K.: See—  
Hood, Clarence E.; Webb, Byron K.; and Alper, Yekutiell, 4,159,745, Cl. 172-44.000.
- Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, to Robert Bosch GmbH. Remote control addressing and reply indicating system. 4,160,238, Cl. 340-147.00R.
- Wehinger, Egbert: See—  
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,160,098, Cl. 548-374.000.
- Weiner, Carl B., to Metal Awning Components, Inc. Storage drawer for mobile homes. 4,159,844, Cl. 296-37.100.
- Weirich, James F. Vent block. 4,159,673, Cl. 98-37.000.
- Weiss, Hermann; and Kowalski, Gunter, to U.S. Philips Corporation. Device for measuring the absorption of radiation in a slice of a body. 4,160,167, Cl. 250-445.00T.
- Weitzel, Charles E.; and Scott, Joseph H., to RCA Corporation. Planar semiconductor devices and method of making the same. 4,160,260, Cl. 357-23.000.
- Welch, Richard, Jr. Grain drying bin. 4,159,580, Cl. 34-168.000.
- Wendling, Daniel R.: See—  
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.
- Werner & Mertz GmbH: See—  
Schneider, Helmut, 4,159,555, Cl. 15-366.000.
- Werner, Paul: See—  
Strowik, Willibald; and Werner, Paul, 4,159,815, Cl. 248-429.000.
- Wesemeyer, Jurgen: See—  
Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.
- Westinghouse Canada Limited: See—  
Vali, Enn, 4,160,158, Cl. 250-202.000.
- Westinghouse Electric Corp.: See—  
Cooper, Frank W., Jr., 4,159,564, Cl. 29-727.000.  
Courson, Iker C., 4,159,758, Cl. 198-335.000.  
Fey, Maurice G.; and Wolf, Charles B., 4,160,118, Cl. 13-2.00P.  
Niehenke, Edward C., 4,160,215, Cl. 330-4.900.  
Smith, James D. B.; and Kauffman, Robert N., 4,160,178, Cl. 310-43.000.  
Smith, Philip C.; and Fagan, John L., 4,160,291, Cl. 365-203.000.  
Thompson, John H.; Douglas, George R.; and Wilson, Charles R., 4,160,231, Cl. 340-11.000.  
Wilson, Charles R.; and Sims, Raymond U., 4,160,232, Cl. 340-11.000.
- Westwind Pharmaceuticals, Inc.: See—  
Warner, Paul L., Jr.; and Lubert, Edward J., Jr., 4,160,097, Cl. 548-346.000.
- Wetzel, William H.: See—  
Shelton, Frederic J.; Wetzel, William H.; Wilkinson, John E.; and Goodwin, Robert J., 4,160,114, Cl. 568-776.000.
- Whelan, James M., to University of Southern California. Process for the oxidation of nitric oxide to nitrogen dioxide. 4,160,013, Cl. 423-402.000.
- Whirlpool Corporation: See—  
Laughlin, James P., Jr.; Loessel, Mark C.; and Kramer, Robert H. O., 4,160,247, Cl. 340-693.000.
- White, Derek G. W.: See—  
Curry, Harold G.; Altwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., 4,160,004, Cl. 264-120.000.
- White, Frederic H., III, to Rockwell International Corporation. Laser monitor and control system. 4,160,218, Cl. 331-94.50P.
- Whitehead, Jerry: See—  
Manning, Willie D.; and Whitehead, Jerry, 4,159,545, Cl. 3-12.800.
- Wiegert, Philip E., to Mallinckrodt, Inc. 2,4,6-Triiodobenzoic acid derivatives and their use as x-ray contrast agents. 4,160,015, Cl. 424-5.000.
- Wightman, John W.; and Wightman, Lawrence W. Heating unit. 4,160,152, Cl. 219-438.000.
- Wightman, Lawrence W.: See—  
Wightman, John W.; and Wightman, Lawrence W., 4,160,152, Cl. 219-438.000.
- Wiik, Tore H. Moving voice coil loudspeaker with magnetic damping increasing at large excursions. 4,160,133, Cl. 179-115.5VC.
- Wiknich, Harold V., to General Motors Corporation. Articulated, spring-controlled intake valve. 4,159,704, Cl. 123-188.0AP.
- Wilkinson, John E.: See—  
Shelton, Frederic J.; Wetzel, William H.; Wilkinson, John E.; and Goodwin, Robert J., 4,160,114, Cl. 568-776.000.
- Willemsen, Willem H. Device for forming sticks, blocks and other formed parts from dough material. 4,159,878, Cl. 366-69.000.
- Williams, Hugh K.: See—  
Leja, Ronald J.; and Williams, Hugh K., 4,159,835, Cl. 280-756.000.
- Wilson, Charles R.; and Sims, Raymond U., to Westinghouse Electric Corp. Low frequency dipole hydrophone transducer. 4,160,232, Cl. 340-11.000.
- Wilson, Charles R.: See—  
Thompson, John H.; Douglas, George R.; and Wilson, Charles R., 4,160,231, Cl. 340-11.000.
- Wilson, Eugene M.: See—  
Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., 4,159,583, Cl. 37-8.000.
- Wilson, Kenneth E.: See—  
Miller, Thomas W.; Wilson, Kenneth E.; and Ormond, Robert E., 4,160,084, Cl. 536-17.00A.
- Wilson, Phillip S.: See—  
Mark, Victor; and Wilson, Phillip S., 4,159,974, Cl. 260-30.200.
- Wilson, Richard W., to Motorola, Inc. Cathode target material compositions for magnetic sputtering. 4,159,909, Cl. 75-170.000.
- Witzig, Herbert; Schuessler, Charles J.; and Stephens, Mark W., to Stephens, Mark W. Door latch bolt locking device. 4,159,838, Cl. 292-150.000.
- Winsor, Chester A.: See—  
Thomas, Frank J.; Gay, Donald L.; and Winsor, Chester A., 4,160,272, Cl. 364-602.000.
- Wirthwein, Rolf: See—  
Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Kreckel, Jorg, 4,159,925, Cl. 203-28.000.
- Wise, Phillip W.: See—  
Hix, Larry J.; Wise, Phillip W.; and Bennyhoff, David H., 4,160,228, Cl. 340-7.00R.
- Wise, Thomas E.: See—  
United States of America, National Aeronautics and Space Administration; and Wise, Thomas E., 4,160,254, Cl. 343-909.000.
- Witco Chemical Corporation: See—  
Loewigkei, Peter; Van Dyk, Kenneth A.; and McGimpsey, Thomas T., 4,160,065, Cl. 428-425.000.
- Wittrock, Glen R., to Sencore, Inc. Method and instrument for measuring the sensitivity of a radio receiver. 4,160,211, Cl. 325-363.000.
- Wolf, Charles B.: See—  
Fey, Maurice G.; and Wolf, Charles B., 4,160,118, Cl. 13-2.00P.
- Wood, George R., to Standard Oil Company (Indiana). Process for preparing ethylene glycol diacrylate. 4,159,989, Cl. 260-343.600.
- Wood Industries, Inc.: See—  
Bryer, Jack; Padalino, Dominick; and Polglase, Burton C., 4,159,823, Cl. 270-21.000.
- Woods, William G.: See—  
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,160,090, Cl. 544-164.000.
- Woog, Philippe G. E.; Moret, Michel A.; Jousson, Pierre-Jean; and Musy, Jean-Pierre, to Les Produits Associes LPA S.A. Liquid treatment apparatus for body care. 4,159,715, Cl. 128-66.000.
- World Carpets, Inc.: See—  
Blumenaus, Jon M., 4,159,892, Cl. 8-62.000.
- World Energy Systems: See—  
Rose, Leslie C.; and Hamrick, Joseph T., 4,159,743, Cl. 166-302.000.
- Worne, Howard E.: See—  
Erickson, Lennart G.; and Worne, Howard E., 4,159,944, Cl. 210-6.000.
- Worsfold, Peter, to Evershed-Power Optics Limited. Television picture enhancement circuit. 4,160,277, Cl. 358-166.000.
- Wright, Steven. Clamp for tube dispensers. 4,159,787, Cl. 222-103.000.
- Wrulich, Herwig; Gehring, Karlheinz; and Zitz, Alfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Bit of circular cross-section. 4,159,746, Cl. 175-354.000.
- Wunsch, Eckart: See—  
Wunsch, Erich; Wunsch, Udo; and Wunsch, Eckart, 4,159,866, Cl. 350-289.000.



Wunsch, Erich; Wunsch, Udo; and Wunsch, Eckart. Setting or adjusting means for rearview mirrors of motor vehicles or the like. 4,159,866, Cl. 350-289.000.

Wunsch, Udo: See—

Wunsch, Erich; Wunsch, Udo; and Wunsch, Eckart, 4,159,866, Cl. 350-289.000.

Wurst, John W.; and Dunn, William H., to Singer Company, The. Formation of variable width cutting space buttonhole patterns in an electronically controlled sewing machine. 4,159,685, Cl. 112-158.00B.

Wyslouzil, Walter: See—

Kashyap, Satish C.; and Wyslouzil, Walter, 4,160,144, Cl. 219-10.55A.

Xerox Corporation: See—

Okumura, Koji, 4,160,046, Cl. 427-57.000.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,159,824, Cl. 271-3.000.

Xomed, Inc.: See—

Haerr, Raymond H., 4,159,719, Cl. 128-260.000.

Yagi, Kazuo; and Masumoto, Kazuhiro, to Mitsui Petrochemical Industries, Inc. Method of and apparatus for treating the outer surface and inner surface of a pipe of a thermoplastic resinous material produced by extrusion. 4,159,889, Cl. 425-71.000.

Yakunin, Ivan A.: See—

Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; Sachko, Viktor V.; Yakunin, Ivan A.; and Abrahimov, Boris F., 4,159,734, Cl. 164-426.000.

Yale Engineering Inc.: See—

Yale, Thomas L., 4,159,813, Cl. 242-158.40A.

Yale, Thomas L., to Yale Engineering Inc. Reciprocating traverse mechanism. 4,159,813, Cl. 242-158.40A.

Yamada, Hirota; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, to Sumitomo Chemical Company, Limited. N-acetylamino- $\alpha$ -arylacetylcephalosporins. 4,160,087, Cl. 544-28.000.

Yamada, Jun: See—

Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, 4,160,227, Cl. 338-22.00R.

Yamaha Hatsudoki Kabushiki Kaisha: See—

Kanno, Nobuyuki, 4,159,752, Cl. 180-210.000.

Yamasawa, Masao: See—

Moriya, Takao; Yamasawa, Masao; and Gambe, Hirohisa, 4,160,243, Cl. 340-347.00C.

Yamashita, Toshio: See—

Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,160,014, Cl. 423-644.000.

Yanai, Toshiharu: See—

Okino, Seiki; Mori, Takao; Yanai, Toshiharu; and Sawa, Toshikazu, 4,160,061, Cl. 428-334.000.

Yankee, Ernest W., to Upjohn Company, The.  $\omega$ -Aryl-cis-13-PGA compounds. 4,160,103, Cl. 560-53.000.

Yankee, Ernest W., to Upjohn Company, The.  $\omega$ -Aryl-cis-13-inter-oxa-PGE compounds. 4,160,104, Cl. 560-53.000.

Yankee, Ernest W., to Upjohn Company, The.  $\omega$ -Aryl-cis-13-inter-oxa-PGF compounds. 4,160,106, Cl. 560-55.000.

Yasukuni, Mitsuo; Iida, Takashi; and Kiten, Hiroshi, to Minolta Camera Kabushiki Kaisha. Aperture stop control device for a zoom lens system. 4,159,864, Cl. 350-184.000.

Yoshida Kogyo Kabushiki Kaisha: See—

Iwai, Kazuo, 4,159,551, Cl. 922.00A.

Yoshimi, Masahiro: See—

Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, 4,160,200, Cl. 318-616.000.

Yoshioka, Mitsuru; Tsuji, Teruji; Nishitani, Yasuhiro; and Nagata, Wataru, to Shionogi & Co., Ltd. Reductive cleavage of oxazolidine compounds. 4,159,984, Cl. 260-239.00A.

Yoshioka, Mitsuru: See—

Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,160,085, Cl. 544-16.000.

Young, Bruce, Jr. Shelf-supporting standards. 4,159,774, Cl. 211-86.000.

Young, Bruce, Jr. Shelf-supporting standards. 4,159,775, Cl. 211-86.000.

Zacharin, Alexey T., to United States of America, Army. Random delay timer. 4,159,680, Cl. 102-277.000.

Zafmedico Corporation: See—

Terminini, Zafer A., 4,159,544, Cl. 3-1.912.

Zaidan Hojin Handotai Kenkyu Shinkokai: See—

Nishizawa, Jun-ichi, 4,160,259, Cl. 357-22.000.

Zenith Radio Corporation: See—

Nelson, Ronald C., 4,160,278, Cl. 358-192.000.

Ziemer, Walter: See—

Monch, Werner; and Ziemer, Walter, 4,159,627, Cl. 60-322.000.

Zitz, Alfred: See—

Wrulich, Herwig; Gehring, Karlheinz; and Zitz, Alfred, 4,159,746, Cl. 175-354.000.

Zobl, Hartmut: See—

Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.

Zondler, Rolf: See—

Viohl, Uwe; and Zondler, Rolf, 4,159,931, Cl. 204-152.000.

Zucker, Myron. Power capacitor mounting and indicator light structure. 4,160,174, Cl. 307-328.000.

Zurcher, Erwin: See—

Durville, Gerard; Moulin, Michel; Ramseier, Serge; and Zurcher, Erwin, 4,159,558, Cl. 26-10.00R.

## LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 3RD DAY OF JULY, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Britton, Michael W.: See—

Sifferman, Thomas R.; and Britton, Michael W., T984,003, Cl. 166-264.000.

Caterpillar Tractor Co.: See—

Kelly, Orson K., T984,001, Cl. 74-501.00R.

Morris, Carlisle S., T984,004, Cl. 172-793.000.

Clifford, Michael L., to Imperial Chemical Industries Limited. Cooling tubular extrudates. T984,006, 7-3-79, Cl. 264-89.000.

Continental Oil Company: See—

Sifferman, Thomas R.; and Britton, Michael W., T984,003, Cl. 166-264.000.

Eastman Kodak Co.: See—

Lau, Philip T. S., T984,005, Cl. 260-401.000.

Faul, William H.; and Saturno, Patrick H. Method of producing reversal color images. T984,002, 7-3-79, Cl. 96-59.000.

Imperial Chemical Industries Limited: See—

Clifford, Michael L., T984,006, Cl. 264-89.000.

Richardson, John C., T984,007, Cl. 273-157.00R.

Kelly, Orson K., to Caterpillar Tractor Co. Decelerator mechanism. T984,001, 7-3-79, Cl. 74-501.00R.

Lau, Philip T. S., to Eastman Kodak Co. Yellow-dye-forming couplers. T984,005, 7-3-79, Cl. 260-401.000.

Morris, Carlisle S., to Caterpillar Tractor Co. Grader blade actuator. T984,004, 7-3-79, Cl. 172-793.000.

Richardson, John C., to Imperial Chemical Industries Limited. Jig-saw puzzles. T984,007, 7-3-79, Cl. 273-157.00R.

Saturno, Patrick H.: See—

Faul, William H.; and Saturno, Patrick H., T984,002, Cl. 96-59.000.

Sifferman, Thomas R.; and Britton, Michael W., to Continental Oil Company. Recovery of high viscosity native crude samples. T984,003, 7-3-79, Cl. 166-264.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Kirby, William E.; and Seymour, David J., to Wharton Shipping Corporation. Vessel for flotation loading and unloading and partial buoyancy support of barges and other floating cargoes. Re. 30,040, Cl. 114-260.000.

Maalouf, George E., to Moore Business Forms, Inc. Carbonless manifold business forms. Re. 30,041, Cl. 282-27.500.

Moore Business Forms, Inc.: See—

Maalouf, George E., Re. 30,041, Cl. 282-27.500.

Seymour, David J.: See—

Kirby, William E.; and Seymour, David J., Re. 30,040, Cl. 114-260.000.

Wharton Shipping Corporation: See—

Kirby, William E.; and Seymour, David J., Re. 30,040, Cl. 114-260.000.

## LIST OF DESIGN PATENTEEES

AAV Companies, The: See—

Reitman, Morton L., 252,243, Cl. D6-168.000.

Abney, Noble H. Head for a screw jig pole. 252,252, 7-3-79, Cl. D8-87.000.

Abney, Noble H. Screw jig pole. 252,253, 7-3-79, Cl. D8-87.000.

Andersen, David C.: See—

Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,273, Cl. D14-46.000.

Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., to Artec International Corporation. Magnetic disk control unit for word processors. 252,273, 7-3-79, Cl. D14-46.000.

Artec International Corporation: See—

Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,273, Cl. D14-46.000.

Arvey Corporation: See—

Gordon, William D., Sr., 252,293, Cl. D21-114.000.

Asano, Kiyoji. Toy vehicle. 252,290, 7-3-79, Cl. D21-128.000.

Asano, Kiyoji. Toy vehicle. 252,291, 7-3-79, Cl. D21-131.000.

Auer, William F.: See—

Wettermann, Ludwig A.; and Auer, William F., 252,282, Cl. D24-8.000.

Baker, Forrest E. Security container for a citizens band radio. 252,262, 7-3-79, Cl. D12-155.000.

Barber-Greene Company: See—

Gregorich, Joseph T.; Goers, William C.; and Seefeldt, Walter B., 252,274, Cl. D15-22.000.

Barr, Ray; and Hamilton, Roxye. Wall mounted clothes hanger. 252,240, 7-3-79, Cl. D6-124.000.

Barrett, Edward E., to Swingline Inc. Decollator. 252,272, 7-3-79, Cl. D18-22.000.

Brockway, Warren H., to William L. Bonnell Company, The. Frame member for storm windows or the like. 252,285, 7-3-79, Cl. D25-74.000.

Brockway, Warren H., to William L. Bonnell Company, The. Frame member for storm windows or the like. 252,286, 7-3-79, Cl. D25-74.000.

Brockway, Warren H., to William L. Bonnell Company, The. Frame member for storm windows or the like. 252,287, 7-3-79, Cl. D25-74.000.

Calzia, Jacques M.; and Sausse, Andre, to Rhone-Poulenc Industries. Hemodialysis reservoir or the like. 252,284, 7-3-79, Cl. D24-21.000.

Chaires, George O. Combined paperweight and pen holder. 252,277, 7-3-79, Cl. D19-97.000.

Champion International Corporation: See—

Roccaforte, Harry I., 252,258, Cl. D9-224.000.

Chiotte, John E. Carpet-lined coaster for beverage glasses. 252,247, 7-3-79, Cl. D7-45.000.

Christian, Robert J. Mirror clip. 252,246, 7-3-79, Cl. D6-246.000.

Cooper, Marvin, to Dynamic Classics, Ltd. Hand-held vacuum cleaner. 252,249, 7-3-79, Cl. D7-164.000.

Crutchfield, Billie M. Bubble display device. 252,295, 7-3-79, Cl. D20-41.000.

Daws, Arthur F., Jr. Fishing lure. 252,279, 7-3-79, Cl. D22-28.000.

Day, Edwin A. Timepiece dial. 252,260, 7-3-79, Cl. D10-125.000.

Demaio, Anthony J., to Marcy Gymnasium Equipment Company. Inclinable bench. 252,237, 7-3-79, Cl. D6-17.000.





## CLASSIFICATION OF PATENTS

CLASS 229	332.2 A	4,159,986	252 M	4,160,172	15.5 MC	4,160,233	602	4,160,272	131	4,160,055
27	4,159,977	340.9 R	289	4,160,173	58	4,160,234	716	4,160,290	220	4,160,056
CLASS 233	343.6	4,159,989	328	4,160,174	81 R	4,160,235	900	4,160,273	245	4,160,057
20 A	4,159,798	343.7	358	4,160,175	146.1 AL	4,160,236			286	4,160,058
CLASS 235	412.6	4,159,990	362	4,160,176	146.3 F	4,160,237			288	4,160,059
92 EA	4,160,154	401			147 R	4,160,238	2	4,160,274	310	4,160,060
92 TC	4,160,155	412.6	CLASS 310	22	152 T	4,160,239	149	4,160,275	334	4,160,061
463	4,160,156	438.1	4,160,177	43	311	4,160,240	203	4,160,291	365	4,160,062
486	4,159,799	448 C	4,160,178	43	347 C	4,160,241			389	4,160,063
		450	4,160,179	43	347 DA	4,160,244			413	4,160,064
		570.5 P	4,159,996	157	347 SY	4,160,245	22	4,159,877	425	4,160,065
CLASS 236	586 R	4,159,997	166	4,160,181	630	4,160,246	98	4,159,878	683	4,160,066
15 A	4,159,800	4,159,998	214	4,160,182	693	4,160,247	266	4,159,879		
		604 HF	315	4,160,183	711	4,160,248	337	4,159,880	CLASS 429	
CLASS 237			328	4,160,184	763	4,160,249			16	4,160,067
8 R	4,159,801	CLASS 261							82	4,160,068
	4,159,802	76	CLASS 313	94	CLASS 343				104	4,160,069
				4,160,185	8	4,160,248	124	4,159,882	194	4,160,070
CLASS 239		CLASS 264		4,160,186	9 R	4,160,249			211	4,160,071
102	4,159,803	87	CLASS 315	220	100 ME	4,160,250	201	4,159,883	CLASS 432	
346	4,159,804	120	4,160,187	408	113 R	4,160,251			264	4,159,921
457	4,159,805	137	4,160,188	446	125	4,160,252	174	4,159,630	CLASS 435	
708	4,159,806	292	4,160,006	5.41	139	4,160,253			15	4,159,923
		334	4,160,007	168	194	4,160,254			86	4,160,072
CLASS 242		CLASS 269		169.4	CLASS 346				122	4,160,073
57	4,159,807	139	4,159,821	194	79	4,160,255	113	4,159,884	155	4,160,074
75.51	4,159,808	325	4,159,822	366	140 A	4,160,256	114	4,159,885	158	4,160,075
107	4,159,809				159	4,160,257			159	4,160,076
158.4 A	4,159,810	CLASS 270							CLASS 415	
192	4,159,811	21	4,159,823	7	CLASS 350				91	4,159,975
198	4,159,812	3	4,159,824	396	96.18	4,159,863	292	4,159,886	230	4,160,001
	4,159,810	173	4,159,825	565	184	4,159,864	460	4,159,778	332	4,160,077
CLASS 248		CLASS 271		577	289	4,159,865	786	4,159,887	441	4,159,978
243	4,159,814	65	4,159,826	616	CLASS 351	4,159,867			218	4,160,078
429	4,159,815	CLASS 272		749	6	4,159,868			295	4,160,079
515	4,159,816	9 B	4,159,827	8	CLASS 352	4,159,869			328	4,160,080
CLASS 249		CLASS 274		24	CLASS 353	4,159,870			402	4,160,081
98	4,159,817	9 B	4,159,827	14	CLASS 354	4,159,871			644	4,160,082
CLASS 250		CLASS 277			CLASS 355				5	4,160,083
199	4,160,157	184	4,159,828	15	4,159,872				8	4,160,084
202	4,160,158	189	4,159,829	65 R	91	4,159,873			10	4,160,085
204	4,160,159			73 R	CLASS 356	4,159,874			12	4,160,086
214 P	4,160,160	CLASS 280		158 F	5	4,159,875			15	4,160,087
281	4,160,161	11.28	4,159,830	202	73	4,159,876			45	4,160,088
311	4,160,162	79.3	4,159,831	207	244	4,159,877			48	4,160,089
339	4,160,163	96.3	4,159,832	207	312	4,159,878			52	4,160,090
	4,160,164	478 R	4,159,833	64	CLASS 357	4,160,258			87	4,160,091
	4,160,164	756	4,159,835	362	16	4,160,259			89	4,160,092
354	4,160,165	802	4,159,834	432	22	4,160,260			101	4,160,093
423 R	4,160,166	CLASS 281		439	23	4,160,261			116	4,160,094
445 T	4,160,167	45	4,159,836	439	24	4,160,262			241	4,160,095
540	4,159,971	CLASS 282			CLASS 358	4,160,263			248.51	4,160,096
564	4,160,168	27.5	Re.30,041	65	1	4,160,264			258	4,160,097
570	4,160,169	CLASS 290			29	4,160,265			263	4,160,098
CLASS 251		44	4,160,170	4.9	37	4,160,266			267	4,160,099
214	4,159,818	CLASS 292		267	111	4,160,267			274	4,160,100
CLASS 252		127	4,159,837	8	126	4,160,268			285	4,160,101
33.4	4,159,956	150	4,159,838	94.5 P	128	4,160,269			298	4,160,102
	4,159,957	CLASS 294			162	4,160,270			311	4,160,103
	4,159,958	1 R	4,159,839	151	166	4,160,271			322	4,160,104
	4,159,959	77	4,159,840	161	192	4,160,272			330	4,160,105
49.9	4,159,960	87.2	4,159,841	126	288	4,160,273			59	4,159,890
63.2	4,159,961	118	4,159,842	147	294	4,160,274			71	4,159,889
182.1	4,159,962	CLASS 296			CLASS 360	4,160,281			53	4,160,038
356	4,159,952	68	4,160,221	321	CLASS 361	4,160,282			60	4,160,039
428	4,159,964	85	4,160,222	379	CLASS 362	4,160,283			62	4,160,040
429 B	4,159,963	152	4,160,223		CLASS 363	4,160,284			69	4,160,041
	4,159,965	CLASS 297			CLASS 364	4,160,285			387	4,160,042
430	4,159,966	162	4,159,846	12 R	CLASS 365	4,160,286			439	4,160,043
438	4,159,967	284	4,159,847	14 L	CLASS 366	4,160,287			582	4,160,044
462	4,159,968	474	4,159,848	60 M	CLASS 367	4,160,288			38	4,160,045
463	4,159,969	CLASS 299		75 MP	CLASS 368	4,160,289			57	4,160,046
471	4,159,970	34	4,159,849	186 M	CLASS 369	4,160,290			115	4,160,047
		43	4,159,850	CLASS 340	CLASS 370	4,160,291			142	4,160,048
29 R	4,159,819	56	4,159,852	7 R	CLASS 371	4,160,292			277	4,160,049
CLASS 256		CLASS 303		9	CLASS 372	4,160,293			304	4,160,050
11	4,159,820	6 C	4,159,853	11	CLASS 373	4,160,294			352	4,160,051
CLASS 260		24 F	4,159,855	200	CLASS 374	4,160,295			31	4,160,052
2.3	4,159,972	CLASS 305		400	CLASS 375	4,160,296			35	4,160,053
23 XA	4,159,973	51	4,159,856		CLASS 376	4,160,297				
30.2	4,159,974	54	4,159,857		CLASS 377	4,160,298				
33.4 EP	4,159,975	CLASS 307			CLASS 378	4,160,299				
40 R	4,159,976	95	4,160,171		CLASS 379	4,160,300				
112.5 LH	4,159,980				CLASS 380	4,160,301				
112.5 R	4,159,979				CLASS 381	4,160,302				
112.5 T	4,159,981				CLASS 382	4,160,303				
119	4,159,982				CLASS 383	4,160,304				
145 A	4,159,983				CLASS 384	4,160,305				
239 A	4,159,984				CLASS 385	4,160,306				
302 D	4,159,985				CLASS 386	4,160,307				

## CLASSIFICATION OF DESIGNS

D2—	316	252,236			252,245		394	252,255		155	252,262		57	252,276		28	252,279			
D3—	39	252,294		246	252,246		395	252,256		211	252,266		22	252,272		2	252,280			
D6—	17	252,237	D7—	45	252,247		52	252,257		D13—	24	252,267	D18—	97	252,277	D23—	97	252,281		
	73	252,238		108	252,248		224	252,258			252,268		41	252,295		8	252,282			
	86	252,239		164	252,249		245	252,259			252,269		D20—	114	252,292		17	252,283		
	124	252,240		179	252,250		125	252,260			252,270		D21—	128	252,293		21	252,284		
	147	252,241		188	252,251		D10—	82	252,261			252,271		131	252,291	D25—	74	252,285		
		252,242	D8—	87	252,252		D11—	33	252,264		D14—	46	252,273		234	252,286			252,287	
	168	252,243			252,253		D12—	32	252,265		D15—	22	252,274		D22—	23	252,278	D30—	14	252,288
	186	252,244		358	252,254			100	252,263		D16—	32	252,275							

## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

74—	501 R	T984,001															
96—	59	T984,002	166—	264	T984,003	172—	793	T984,004	260—	401	T984,005	264—	89	T984,006	273—	157 R	T984,007

GEOGRAPHICAL INDEX  
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

4 : 4,160,250	4,159,986	4,159,792	4,160,210	4,159,660	4,159,561
4,160,263	4,159,987	4,159,858	4,160,213	4,159,669	4,159,568
4,159,554	4,159,988	4,159,952	4,160,247	4,159,697	4,159,571
4,159,593	4,159,989	4,160,038	4,159,585	4,159,702	4,159,581
4,159,599	4,159,993	4,160,125	4,159,614	4,159,703	4,159,611
4,159,623	4,160,013	4,160,191	4,159,749	4,159,704	4,159,661
4,159,639	4,160,016	4,160,193	4,159,776	4,159,721	4,159,672
4,159,673	4,160,020	4,160,240	4,159,942	4,159,744	4,159,680
4,159,797	4,160,041	4,160,251	4,159,542	4,159,789	4,159,685
4,159,812	4,160,085	4,159,633	4,159,895	4,159,834	4,159,688
4,159,826	4,160,090	4,159,777	4,159,578	4,159,844	4,159,694
4,159,873	4,160,111	4,159,831	4,159,693	4,159,848	4,159,713
4,159,903	4,160,154	4,159,841	4,159,742	4,159,884	4,159,762
4,160,122	4,160,156	4,159,892	4,159,763	4,159,885	4,159,799
4,160,218	4,160,157	4,159,668	4,159,839	4,159,966	4,159,823
4,160,244	4,160,169	4,159,845	4,159,938	4,159,972	4,159,919
4,160,008	4,160,183	4,159,583	4,159,591	4,159,997	4,159,960
4,159,576	4,160,207	4,159,589	4,159,813	4,160,037	4,159,962
4,159,947	4,160,212	4,159,597	4,159,634	4,160,068	4,159,987
4,160,242	4,160,216	4,159,645	4,159,659	4,160,095	4,159,995
4,159,586	4,160,239	4,159,650	4,159,897	4,160,101	4,160,022
4,159,805	4,160,246	4,159,664	4,160,033	4,160,102	4,160,032
4,159,877	4,160,249	4,159,665	4,160,076	4,160,103	4,160,065
4,159,909	4,160,290	4,159,683	4,160,131	4,160,104	4,160,083
4,160,245	4,159,648	4,159,714	4,160,141	4,160,105	4,160,084
4,159,552	4,159,886	4,159,750	4,160,175	4,160,106	4,160,121
4,159,556	4,160,204	4,159,751	4,160,215	4,160,132	4,160,142
4,159,572	4,159,550	4,159,765	4,160,232	4,160,174	4,160,184
4,159,590	4,159,567	4,159,785	4,160,254	4,159,731	4,160,194
4,159,632	4,159,579	4,159,833	4,160,288	4,159,766	4,160,201
4,159,666	4,159,642	4,159,854	4,160,291	4,159,767	4,160,220
4,159,674	4,159,651	4,159,857	4,159,624	4,159,773	4,160,260
4,159,681	4,159,655	4,159,922	4,159,793	4,159,862	4,160,261
4,159,717	4,159,658	4,159,935	4,159,808	4,159,912	4,160,270
4,159,754	4,159,670	4,159,937	4,159,899	4,160,054	4,160,271
4,159,769	4,159,699	4,159,939	4,159,927	4,160,153	4,160,273
4,159,787	4,159,700	4,159,943	4,159,953	4,159,652	4,160,258
4,159,803	4,159,729	4,159,964	4,159,992	4,159,675	Re.30,041
4,159,809	4,159,791	4,159,989	4,160,049	4,159,722	4,159,544
4,159,811	4,159,794	4,160,039	4,160,126	4,159,855	4,159,559
4,159,830	4,159,896	4,160,067	4,160,130	4,159,901	4,159,566
4,159,836	4,159,976	4,160,127	4,160,165	4,160,223	4,159,570
4,159,837	4,159,990	4,160,152	4,160,237	4,160,283	4,159,582
4,159,838	4,160,008	4,160,199	4,160,257	4,159,580	4,159,594
4,159,843	4,160,170	4,160,225	4,160,278	4,159,712	4,159,605
4,159,860	4,160,206	4,160,278	4,159,806	4,159,933	4,159,618
4,159,861	4,159,786	4,160,272	4,159,584	4,159,546	4,159,679
4,159,875	4,160,034	4,159,827	4,159,587	4,159,695	4,159,705
4,159,923	4,160,092	4,159,888	4,159,600	4,159,698	4,159,718
4,159,930	4,159,720	4,159,974	4,159,653	4,159,638	4,159,739
4,159,944	4,159,625	4,160,091	4,159,656	4,159,641	4,159,748
4,159,948	4,159,667	4,160,112	4,159,657	4,159,882	4,159,772
4,159,954	4,159,790	4,160,136		4,159,553	4,159,788

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,159,795	4,159,619	4,159,677	4,160,031	4,159,603	50 : 4,160,275
4,159,824	4,160,134	4,159,692	4,160,064	4,159,637	51 : 4,159,740
4,159,859	4,159,575	4,159,780	4,160,066	4,159,643	4,159,743
4,159,870	4,159,596	4,160,209	4,160,070	4,159,676	4,159,872
4,159,871	4,159,644	4,160,276	4,160,100	4,159,708	4,160,045
4,159,883	4,159,716	4,159,563	4,160,117	4,159,768	4,160,129
4,159,915	4,159,719	4,159,564	4,160,118	4,159,781	4,159,635
4,159,916	4,159,724	4,159,615	4,160,120	4,159,782	4,159,690
4,159,917	4,159,802	4,159,629	4,160,145	4,159,914	4,159,825
4,159,929	4,159,814	4,159,631	4,160,172	4,159,940	4,159,894
4,159,973	4,159,832	4,159,662	4,160,178	4,159,941	4,159,932
4,159,996	4,159,887	4,159,682	4,160,185	4,159,949	4,160,114
4,160,011	4,159,968	4,159,696	4,160,188	4,159,999	4,160,229
4,160,015	4,160,001	4,159,711	4,160,203	4,160,043	4,160,286
4,160,024	4,160,052	4,159,735	4,160,231	4,160,060	54 : 4,159,852
4,160,027	4,160,071	4,159,757	4,160,282	4,160,063	55 : 4,159,613
4,160,046	4,160,137	4,159,758	4,160,285	4,160,079	4,159,760
4,160,050	4,160,148	4,159,761	4,159,745	4,160,171	4,159,778
4,160,053	4,160,192	4,159,800	4,160,211	4,160,228	4,159,835
4,160,088	4,160,234	4,159,801	4,159,545	4,160,233	4,159,846
4,160,093	4,159,630	4,159,818	4,159,774	4,160,274	4,159,874
4,160,097	4,159,967	4,159,829	4,159,775	4,160,284	4,159,893
4,160,110	4,159,970	4,159,842	4,159,934	4,159,879	4,159,998
4,160,187	4,160,000	4,159,945	4,159,985	4,159,951	4,160,138
4,160,248	4,160,161	4,159,977	4,159,547	4,160,069	4,160,139
4,159,565	4,160,224	4,159,021	4,159,549	4,160,124	56 : 4,159,955
4,159,617	4,159,592				

DESIGN PATENTS

6 : 252,247	252,292	252,285	24 : 252,294	252,245	252,242
252,261	252,240	252,286	25 : 252,267	252,249	44 : 252,288
252,262	252,260	252,287	11 : 252,268	252,264	47 : 252,248
252,263	252,260	252,281	12 : 252,269	252,272	252,279
252,273	252,265	252,270	16 : 252,271	252,275	48 : 252,246
252,237	252,277	252,258	17 : 252,274	252,271	252,257
252,252	252,277	252,255	27 : 252,278	39 : 252,243	53 : 252,256
252,253	252,236	252,274	36 : 252,244	41 : 252,241	55 : 252,238
252,276	252,259	252,293			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

17 : T984,001	T984,004	36 : T984,002	T984,005	40 : T984,003	
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OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE

July 10, 1979

Volume 984

Number 2

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	984 OG 14
Registration to Practice . . . . .	984 OG 14
Reissue Applications Filed . . . . .	984 OG 14
Patent Notices	
Certificates of Correction for the Week of July 10, 1979 . . . . .	984 OG 15
Adverses Decisions in Interferences . . . . .	984 OG 15
Disclaimers . . . . .	984 OG 15
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	984 OG 17
Condition of Patent Applications . . . . .	984 OG 18
Reissue Patents Granted (30,042) . . . . .	263
Plant Patents Granted (4,432) . . . . .	265
Patents Granted	
General and Mechanical (4,160,292) . . . . .	267
Chemical (4,160,642) . . . . .	389
Electrical (4,160,867) . . . . .	455
Design Patents Granted (252,296) . . . . .	515
Index of Patentees . . . . .	PI 1
Indices of Reissues, Plants and Designs . . . . .	PI 26
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Plants . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Plants . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT): Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,  
Nov. 7, 1978. Commissioner of Patents and Trademarks.

## Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before July 31, 1979.

Beasley, Bernard, 451 Ridout St., North London, Ontario, Canada  
Blunk, Evon C., 8701 Highgate Rd., Alexandria, Va. 22308  
Claffy, Kathleen H., 2301 Jefferson Davis Hwy., No. 722, Arlington, Va. 22202  
Gorenstein, Charles, 26 Goodport Lane, Gaithersburg, Md. 20760  
Reynolds, David D., 1600 S. Eads St., No. 203N, Arlington, Va. 22202  
Ross, Thomas L., 5100 Marine Dr., No. 21G, Chicago, Ill. 60604  
Shannon, John P., Jr., 30 E. Chapman St., Alexandria, Va. 22301  
Sprague, Kenneth W., 6619 Lone Oak Dr., Bethesda, Md. 20034

June 12, 1979.

LUTRELLE F. PARKER,  
Chairman, Committee on Enrollment.

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,019,334, Re. S.N. 033,650, Filed Apr. 26, 1979, Cl. 405/169, METHOD AND APPARATUS FOR MAKING SUBSEA PIPE CONNECTIONS, Albert R. Sinclair, et al., Owner of Record: Exxon Production Research Company, Houston, Tex., Attorney or Agent: John S. Schneider, et al., Ex. Gp.: 351

4,049,158, Re. S.N. 034,329, Filed Apr. 30, 1979, Cl. 222/95, PRESSURIZED CONTAINER-DISPENSERS AND FILING METHOD, Vincent Lo, et al., Owner of Record: S. C. Johnson & Son, Inc., Racine, Wis., Attorney or Agent: Joseph T. Kinlin, Jr., et al., Ex. Gp.: 311

4,122,681, Re. S.N. 035,622, Filed May 3, 1979, Cl. 405/261, MINE ROOF SUPPORT METHOD AND ASSEMBLY, George S. Vass, et al., Owner of Record: The Eastern Company, Naugatuck, Conn., Attorney or Agent: Charles S. McGuire, Ex. Gp.: 351

4,124,301, Re. S.N. 035,381, Filed May 2, 1979, Cl. 356/432, DEVICE FOR MEASURING LIGHT TRANSMITTED THROUGH A MATERIAL, Sydney Norman Pocock, Owner of Record: National Research Development Corporation, London, England, Attorney or Agent: John W. Malley, et al., Ex. Gp.: 257

4,135,424, Re. S.N. 034,925, Filed Apr. 25, 1979, Cl. 84/1.13, VARIABLE FUNCTION GENERATOR, Shimaji Okamoto, Owner of Record: Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-Ken, Japan, Attorney or Agent: James R. Longacre, et al., Ex. Gp.: 217

# PATENT NOTICES

## Certificates of Correction for the Week of July 10, 1979

Re. 20,857	4,008,058	4,133,912	4,141,480
Re. 29,934	4,100,602	4,134,189	4,141,501
D. 249,019	4,101,913	4,134,574	4,141,736
D. 251,606	4,102,938	4,134,966	4,142,005
3,451,352	4,105,335	4,135,929	4,142,037
3,889,189	4,107,218	4,135,930	4,142,216
3,904,657	4,107,297	4,136,006	4,142,409
3,955,947	4,109,084	4,136,085	4,142,523
3,956,292	4,110,029	4,136,099	4,142,533
4,016,054	4,111,141	4,136,128	4,142,827
4,020,651	4,111,619	4,136,208	4,142,943
4,020,713	4,112,032	4,136,837	4,143,084
4,021,457	4,114,229	4,137,146	4,143,257
4,023,092	4,117,786	4,137,151	4,143,288
4,025,642	4,118,237	4,137,154	4,143,616
4,036,478	4,118,396	4,137,460	4,144,209
4,041,181	4,118,492	4,137,826	4,145,279
4,051,079	4,119,753	4,138,080	4,145,889
4,051,307	4,120,816	4,138,275	4,146,221
4,053,352	4,121,056	4,138,287	4,146,469
4,057,260	4,121,291	4,138,326	4,146,543
4,058,676	4,122,876	4,138,420	4,147,018
4,062,703	4,123,765	4,138,472	4,148,144
4,064,255	4,123,779	4,138,505	4,148,717
4,066,665	4,124,817	4,138,731	4,148,847
4,071,187	4,127,320	4,138,764	4,148,884
4,075,618	4,127,381	4,139,038	4,149,369
4,077,528	4,127,569	4,139,234	4,149,414
4,077,610	4,127,579	4,139,340	4,149,499
4,077,687	4,127,631	4,139,417	4,149,756
4,078,145	4,127,706	4,139,577	4,150,722
4,080,051	4,128,701	4,139,712	4,150,874
4,083,077	4,129,727	4,139,821	4,151,012
4,084,203	4,130,563	4,139,931	4,151,580
4,086,188	4,130,901	4,140,118	4,151,708
4,088,464	4,131,411	4,140,490	4,152,521
4,088,645	4,132,724	4,140,518	4,152,758
4,089,587	4,133,467	4,140,523	4,153,392
4,089,972	4,133,559	4,141,169	4,153,478
4,093,815	4,133,747	4,141,232	
4,097,003	4,133,807	4,141,380	

## Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,061,998, G. Bloch, BULKED CONTINUOUS FILAMENT YARNS, Interference No. 95,927, decided July 31, 1972, claims 1, 2 and 3.

Patent No. 3,578,819, T. M. Atkins, SKID CONTROL SYSTEM, Interference No. 98,683, decided Jan. 15, 1979, claims 11, 12 and 21-26.

Patent No. 3,883,218, R. J. Slaughter, OPTICAL GUIDES, Interference No. 99,492, decided Feb. 8, 1979, claim 1.

Patent No. 3,896,137, C. A. Baile, P. E. Bender and B. Loev, 8-ALKYL AND ALKENYL-10-HYDROXY-5H[1] BENZOPYRANOPYRIDINE DERIVATIVES AND USES THEREOF, Interference No. 99,586, decided Mar. 21, 1978, claim 1.

Patent No. 3,935,424, T. L. Donnelly and E. J. Mullen, FLASH FUSING APPARATUS, Interference No. 99,419, decided Oct. 24, 1978, claims 1 and 2.

Patent No. 3,940,158, H. Wehrli, SKI BRAKE, Interference No. 99,921, decided Mar. 13, 1979, claims 1, 2, 3 and 6.

Patent No. 3,978,478, L. S. Schmitz, RESET CIRCUIT FOR A SECURITY SYSTEM, Interference No. 99,820, decided Mar. 27, 1979, claims 1 and 3.

Patent No. 3,984,126, G. W. Goetz and R. G. Gehrig, INFLATOR FOR VEHICLE OCCUPANT RESTRAINT SYSTEM, Interference No. 99,971, decided Mar. 20, 1979, claims 1-4, 9-15, 18 and 19.

Patent No. 4,013,329, P. E. Hugin, MULTIPLE PLATE ASSEMBLY FOR FORMING ELECTRICAL CONNECTOR OR SWITCH, Interference No. 99,790, decided Mar. 13, 1979, claims 1, 3, 7, 9 and 12.

Patent No. 4,015,390, R. Howorth, GLAZING STRUCTURES, Interference No. 100,038, decided Mar. 15, 1979, claims 1 and 3.

Patent No. 4,018,865, L. V. Gallacher, SOLVENT-EXTRACTION PROCESS FOR RECOVERY AND SEPARATION OF METAL VALUES, Interference No. 99,868, decided Mar. 15, 1979, claims 1-4, 5, 7-9, 11, 12, 20 and 21.

Patent No. 4,024,976, D. D. Acton, TAMPERPROOF MOLDED PACKAGE, Interference No. 99,832, decided Mar. 14, 1979, claims 36-53.

## Disclaimers

Design No. 236,682.—La Verne E. Clayton, Rockford, Ill. ESCUTCHEON. Patent dated Sept. 9, 1975. Disclaimer filed May 10, 1979, by the assignee, Amerock Corporation. Hereby disclaims said claim of said patent.

3,211,035.—Lawrence V. Whistler, Sr. and Lawrence V. Whistler, Jr., Kenmore, N.Y. PUNCH STRIPPER APPARATUS. Patent dated Oct. 12, 1965. Disclaimer filed Apr. 27, 1979, by the inventors.

Hereby enters this disclaimer to claims 1, 2, 3 and 14 of said patent.

3,622,624.—Yael Arazi, Tel Aviv and Moshe Levy and David Yofsi, Rehovot, Israel. PROCESS FOR THE PRODUCTION OF ADIPIC ACID. Patent dated Nov. 23, 1971. Disclaimer filed May 24, 1979, by the assignee, U.C.B., Societe Anonyme.

Hereby enters this disclaimer to all claims of said patent.

4,017,759.—Donald E. Miller, Asbury, N.J. DISPLAY PANEL FOR DISPLAYING A BAR OF LIGHT. Patent dated Apr. 12, 1977. Disclaimer filed May 31, 1979, by the assignee, Burroughs Corporation.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,132,656.—Donald L. De Vries, South Holland and James M. De Jovine, Homewood, Ill. SOLID PARTICLES CONTAINING LUBRICATING OIL COMPOSITION AND METHOD FOR USING SAME. Patent dated Jan. 2, 1979. Disclaimer filed May 21, 1979, by the assignee, Atlantic Richfield Company.

The term of this patent subsequent to June 13, 1995, has been disclaimed.

4,134,844.—Donald L. De Vries, South Holland and James M. De Jovine, Homewood, Ill. SOLID PARTICLES CONTAINING LUBRICATING OIL COMPOSITION AND METHOD FOR USING SAME. Patent dated Jan. 16, 1979. Disclaimer filed May 21, 1979, by the assignee, Atlantic Richfield Company.

The term of the patent subsequent to June 13, 1995, has been disclaimed.

4,088,639.—Piergiorgio Zappelli, Monterotondo, Luciano Re, Rome, and Walter Marconi, San Donato Milanese, Italy. MACROMOLECULAR ADENINE NUCLEOTIDE DERIVATIVES. Patent dated May 9, 1978. Disclaimer filed May 30, 1979, by the assignee, Hudson Pulp & Paper Corp.

Hereby enters this disclaimer to claim 4 of said patent.



3,649,666.—Yael Arad, Tel Aviv and Moshe Levy, Israel R. Miller, and David Vofsi, Rehovoth, Israel. PROCESS FOR THE HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated Mar. 14, 1972. Disclaimer filed May 24, 1979, by the assignee, U.C.B., Societe Anonyme.

Hereby enters this disclaimer to all claims of said patent.

3,686,269.—Yael Arad and Moshe Levy, Tel Aviv, and David Vofsi, Rehovoth, Israel. PROCESS FOR THE HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated Aug. 22, 1972. Disclaimer filed May 24, 1979, by the assignee, U.C.B., Societe Anonyme.

Hereby enters this disclaimer to all claims of said patent.

3,686,270.—Yael Arad, Tel Aviv and Moshe Levy and David Vofsi, Rehovoth, Israel. PROCESS FOR THE HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated Aug. 22, 1972. Disclaimer filed May 24, 1979, by the assignee, U.C.B., Societe Anonyme.

Hereby enters this disclaimer to all claims of said patent.

3,732,276.—Cyrille Van Eygen, Boltsfort and Antonin Hendrickx, Brussels, Belgium. HYDRODIMERIZATION PROCESS OF ACRYLIC COMPOUNDS. Patent dated May 8, 1973. Disclaimer filed May 24, 1979, by the assignee, U.C.B., Societe Anonyme.

Hereby enters this disclaimer to all claims of said patent.

3,982,140.—George C. Lockwood, Dayton, Ohio. HIGH SPEED BISTABLE MULTIVIBRATOR CIRCUIT. Patent dated Sept. 21, 1976. Disclaimer filed May 9, 1979, by the assignee, NCR Corporation.

Hereby enters this disclaimer to all claims of said patent.

4,149,389.—Floyd C. Hayes, Onalaska and Merle A. Renaud and Paul R. Glamm, La Crosse, Wis. HEAT PUMP SYSTEM SELECTIVELY OPERABLE IN A CASCADE MODE AND METHOD OF OPERATION. Patent dated Apr. 17, 1979. Disclaimer filed May 18, 1979, by the assignee, The Trane Company.

Hereby enter this disclaimer to claims 1-3, 6-12, 22 and 23 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

State	Name of Library	Telephone Contact
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.

# PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Arts; Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 260—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	5-17-77
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders; Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. ORAY, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,553 to 3,031,668, inclusive  
Plant Patents..... Numbers 2,135 to 2,142, inclusive

984 OG 18

# REISSUES

JULY 10, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,042  
**EXHAUST SYSTEM CONNECTOR SEAL**  
John R. Hiemstra, Rosemount, and Wayne M. Wagner, Apple Valley, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.  
Original No. 3,944,265, dated Mar. 16, 1976, Ser. No. 524,061, Nov. 15, 1974. Application for reissue Apr. 7, 1977, Ser. No. 785,755

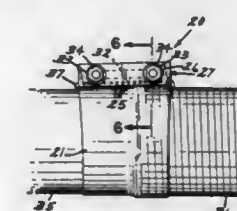
Int. Cl.<sup>2</sup> F16L 21/06

U.S. Cl. 285—419

19 Claims

1. The method of joining two substantially incompressible tubular members axially which comprises bending a flat band of ductile metal around the adjacent ends of the members in direct superficial contact with said members and circumferen-

tially stressing the band beyond its elastic limit to cause it to conform to the surfaces of the members throughout substan-



tially their entire circumference the ductile metal band being such that it yields before the material of said member.

263



PLANT PATENTS

GRANTED JULY 10, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,432  
**STRAWBERRY PLANT**  
Andre Marionnet, Soligns en Sologne, France, assignor to Jeanne  
Marionnet-Rabler, Mur de Sologne, France  
Filed Jun. 9, 1977, Ser. No. 805,246  
Int. Cl.<sup>2</sup> A01H 5/08

U.S. Cl. Plt.—49 1 Claim  
1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by the fact that it is an everbearing and very productive variety with the particularity of not producing any stolons.

4,433  
**AFRICAN VIOLET PLANT**  
Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor  
to Gesellschaftsvertrag uber die Erfindergemeinschaft "OP-  
TIMARA", Isselburg, Fed. Rep. of Germany  
Filed Feb. 22, 1978, Ser. No. 880,050  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—69 1 Claim  
1. A new and distinct cultivar of African violet known by the cultivar name Minnesota and characterized by the combined features of large-star-shaped, non-dropping red-purple flowers, strong upright flower stems, with 5-7 flowers on each stem and 10-12 stems on each plant, dark green leaves, and vigorous growth habit.

4,434  
**POINSETTIA PLANT**  
Alexander Hrebenluk, 7 Corner Rd., Perkasié, Pa. 18944  
Filed Apr. 5, 1978, Ser. No. 893,758  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—86 1 Claim  
1. A new and distinct variety of poinsettia plant substantially as illustrated and described, characterized particularly as to

novelty by its compact growth, self-branching habit, non-drooping foliage, and its ability to maintain its beauty and life at a temperature range of 50° F. to 60° F.

4,435  
**NECTARINE TREE (43-G-587)**  
Frederic W. Anderson, Merced, Calif., assignor to Reedley  
Nursery, Inc., Reedley, Calif.  
Filed Aug. 17, 1978, Ser. No. 934,542  
Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—41 1 Claim  
1. A new and distinct variety of nectarine tree, substantially as illustrated and described, particularly characterized by fruit having a ripening period between the Aurelio Grand and May Grand; the fruit being of a firmness which permits long distance shipping and provides a substantial shelf life.

4,436  
**CHERRY TREE**  
Marvin L. Nies, 9296 E. Kettleman La., Lodi, Calif. 95240  
Filed Sep. 5, 1978, Ser. No. 939,900  
Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—37 1 Claim  
1. A new and distinct variety of cherry tree, substantially as illustrated and described, characterized, in particular, by large to medium size fruit which is crack-resistant, sizes well, is borne heavily and regularly on relatively short stems, is uniform in size and ripens evenly with the ripening period shortly after Burlat but before Larian and Bing, is firmer with darker red flesh than Larian but softer than Bing, is sweet flavored, and is of an attractive glassy red exterior color; the fruit, in shape, generally resembling the Bing but is slightly more round in cross section and not quite as flattened on the ventral side.

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## PATENTS

GRANTED JUL. 10, 1979

### ERRATA

For CLASS	See PATENT NO.
091-483 .....	4,160,404
414-749 .....	4,160,507
414-004 .....	4,160,508
414-607 .....	4,160,509
406-098 .....	4,160,567
422-106 .....	4,160,647
435-101 .....	4,160,695
435-025 .....	4,160,696
435-194 .....	4,160,697
435-173 .....	4,160,698
435-287 .....	4,160,699
435-298 .....	4,160,670
209-152 .....	4,160,711
585-475 .....	4,160,788
525-411 .....	4,160,789
525-179 .....	4,160,790
525-469 .....	4,160,791
525-148 .....	4,160,792
525-230 .....	4,160,793
128-607 .....	4,160,854
350-120 .....	4,160,942
361-388 .....	4,161,016
361-412 .....	4,161,017



# PATENTS

GRANTED JULY 10, 1979

## GENERAL AND MECHANICAL

4,160,292

### BATH CHAIR

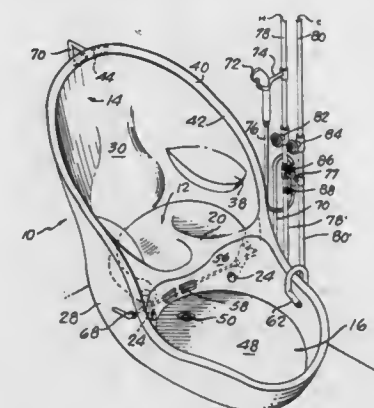
Christian L. Knether, 1516 Oakdale, Houston, Tex. 77004, and  
Edith L. Knether, 3708 Stewart Dr., Chevy Chase, Md. 20015  
Continuation of Ser. No. 800,024, May 24, 1977, abandoned.

This application Jun. 16, 1978, Ser. No. 916,358

Int. Cl.<sup>2</sup> A47K 3/022

U.S. Cl. 4-146

19 Claims



1. A bath chair, particularly for invalids, comprising: a substantially horizontal seat; a semicylindrical wall extending upwardly with respect to said seat for closely surrounding the back and sides of an invalid, the upper edge of said semi-cylindrical wall lying in plane inclined downwardly and forwardly to the level of said seat and said edge being curled forwardly and inwardly to form a channel with an intumed lip; a spray tube having openings in its bottom seated in said channel for directing water downwardly along the back and lateral surfaces of the body and the arms and thighs of an invalid seated in the chair; a deep well reservoir formed around and below said seat and separating said seat from the semi-cylindrical wall; a shallow foot pan disposed below and forward of the seat and having a rim whose rear portion is extended upwardly adjacent to the front of the seat, the forward edge of said rim being well below the level of said seat; a drain opening in said foot pan; a drain passage leading from said deep well reservoir to said foot pan, a valve in said passage; and means for supplying wash water independently to said spray tube and foot pan.

4,160,293

### DRAIN VALVE ASSEMBLY

James E. Nlemann, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

Continuation of Ser. No. 766,167, Feb. 7, 1977, abandoned. This application Apr. 20, 1978, Ser. No. 898,005

Int. Cl.<sup>2</sup> E03C 1/262

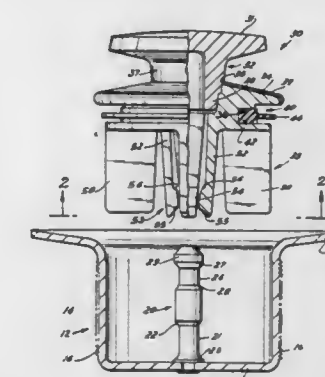
U.S. Cl. 4-295

5 Claims

1. A drain valve assembly of the finger lift type for mounting in a drain port of a plumbing fixture, said assembly consisting essentially of:

- a unitary drain sleeve for mounting in the drain port of a plumbing fixture and a stopper mounted in said drain sleeve and being shiftable to an open and closed position in said sleeve;
- said unitary drain sleeve having an open outer end and an open inner end for the passage of waste therethrough;
- a radially extending flange integrally formed around the open outer end of said sleeve;
- a beveled surface provides valve seat formed at the junction of the flange and said open outer end of said sleeve;

a screen integrally formed with said drain sleeve and disposed across the open inner end of said sleeve;  
an elongated stud fixedly positioned in axial relation within said sleeve along the longitudinal axis thereof and mounted on said screen in fixed position;  
said stud having a height measured from its mounting location on said screen and extending to the lower edge of said beveled surface which surface forms said valve seat;  
stop means formed adjacent each end of said stud;  
said stud including spaced upper and lower symmetrical annular rings having corresponding beveled surfaces which function alternately as camming surfaces when said stopper is shifted to its opened and closed positions and as stop means when said stopper is in its opened or closed position;



said stopper removably mounted on said stud and having gripping means for cooperating with said stop means for holding said stopper in a raised or opened position to permit waste water to drain from said plumbing fixture and a closed or lowered position;  
said gripping means including a plurality of elongated spaced, circumferentially disposed, inwardly tapered fingers, the ends of said fingers having converging beveled surfaces extending radially inwardly which, when mounted on said stud, form a sliding frictional grip when said stopper is shifted alternately from a closed to an open position; and  
a resilient seal means mounted on said stopper and extending radially therefrom for mating with said valve seat at said outer end of said drain sleeve in fluid tight relation when said stopper is shifted to its closed or lowered position.

4,160,294

### TWO-STAGE FLUSH MECHANISM FOR TOILETS

John T. Crumby, Tri-County Blvd., Oliver Springs, Tenn. 38740  
Filed Oct. 14, 1977, Ser. No. 842,336

Int. Cl.<sup>2</sup> E03D 1/14, 1/33

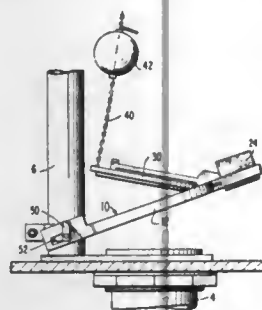
U.S. Cl. 4-324

5 Claims

1. A flush valve assembly for controlling the flow of water from a storage tank to a toilet bowl through a discharge pipe opening at its upper end into the tank through its open upper end in order to selectively produce a larger or a smaller flow of water from the tank to the bowl, comprising:

- a. an open frame adapted to be pivotally supported with respect to and adjacent the upper end of the discharge pipe within the tank, the frame being formed by side arms which are constructed and adapted to be positioned on opposite sides of the upper end of the discharge pipe and spaced therefrom,
- b. a first float carried by the frame at a location remote from the pivoted support of the frame,

- c. a single flap valve for controlling passage of water from the tank into the upper end of the discharge pipe, the valve being pivotally mounted on the frame at a location adjacent the position remote from the pivotal support of the frame said flap valve extending through said frame member for direct engagement with the discharge pipe;
- d. means on the flap valve and the frame for limiting upward pivotal movement of the flap valve, with respect to the frame;



- e. a strand connected at its lower end to the flap valve at a point remote from the pivotal support of the flap valve on the frame and extending upwardly therefrom for connection at its upper end to an operating lever for the toilet;
- f. a second float adjustably connected to the strand between its ends with the pivotal support for the frame member to provide a yieldable detent feel to the user when the frame member is pivoted after the flap valve has pivoted to its upward limit of pivotal movement with respect to the frame.

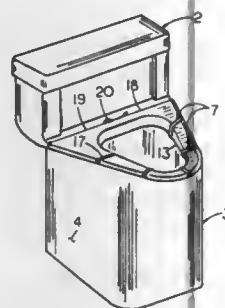
4,160,295

## TOILET SHROUD

Donald J. Putyra, 659 Chapman Dr., Corte Madera, Calif. 94925  
Filed Dec. 23, 1977, Ser. No. 863,872  
Int. Cl.<sup>2</sup> E03D 11/02

U.S. Cl. 4—420

1 Claim



1. A toilet shroud comprising:
- an elongated flexible washable material having an outer surface selected to present an aesthetic appearance and dimensioned to substantially cover the portion of a toilet between the floor and the rim of the bowl;
  - re-useable attachment means including a grip portion to removably attach said material to said attachment means and a hook portion to attach said means to said toilet;
  - said grip portion of said attachment means includes a U-shaped portion dimensioned to hold a portion of said flexible material;
  - said flexible material is folded and tacked along one edge to form a loop for receiving the U-shaped portion of said attachment means;
  - said hook portion of said attachment means includes a

- J-shaped portion adapted for attachment to the inner edge of a toilet bowl; and
- f. said attachment means is formed from a washable material having sufficient rigidity to support said elongated flexible material and sufficient resiliency so that said J-shaped portion can be sprung outwardly as it is forced over said toilet bowl rim and so that it will automatically return to its original shape or nearly so to cling tightly to said rim.

4,160,296

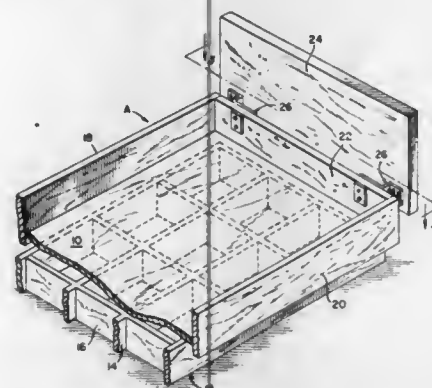
## WATERBED HEADBOARD BRACKET

Isaac Fogel, Silver Spring, Md., assignor to Classic Products Corporation, Beltsville, Md.

Filed Feb. 23, 1978, Ser. No. 880,472  
Int. Cl.<sup>2</sup> A47G 9/00

U.S. Cl. 5—285

5 Claims



1. A waterbed headboard bracket for supporting a headboard comprising:
- an elongated member having a first right angle bend and a second right angle bend forming a first leg and a second leg integrally joined by a transverse element;
  - a first pair of elongated slots in said first leg;
  - a second pair of elongated slots in said second leg; and
  - reinforcement means on the inside of said first right angle bend and said second right angle bend.

4,160,297

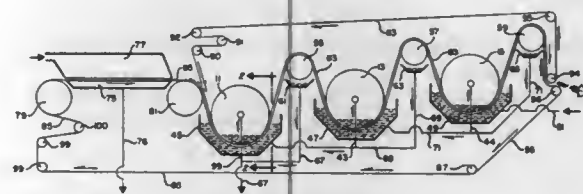
## PULP WASHER

Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Nov. 21, 1977, Ser. No. 853,068  
Int. Cl.<sup>2</sup> D06B 3/02

U.S. Cl. 8—156

11 Claims



1. A machine for washing paper stock pulp and similar free filtering materials comprising:
- two or more horizontally-disposed wash drums each having a sidewall through which liquid can pass and end closure walls, said wash drums being mounted for rotation about their horizontal axes and disposed in side-by-side, vertically-stepped relationship with the first of said drums being the lowest and the last being the highest;
  - two or more open tanks mounted to encompass the lower half or less of respective ones of said wash drums, said tanks being constructed to contain liquid exterior to said wash drums;

- (c) roller members mounted for rotation at spaced-apart locations above each of said wash drums;
- (d) first and second endless filter belts trained to pass under each of said wash drums and over each of said roller members in face-to-face relationship with each other to hold a mat of material to be washed;
- (e) a first set of guide means mounted above said wash drums to guide said first endless filter belt from the last of said wash drums to the first of said wash drums, and a second set of guide means mounted below said wash drums to guide said second endless filter belt from the last of said wash drums to the first of said wash drums;
- (f) drive means mounted to drive said first and second endless belts;
- (g) liquid inlet means to introduce liquid into said wash tank associated with the highest of said wash drums; and
- (h) syphon means connected in communication with each of said wash drums to draw liquid from the interiors of said drums to provide a hydrostatic head differential between the interiors of said wash drums and the liquid contents of the associated said tanks thereby to force liquid through the material held between said first and second endless belts.

11. In a machine including two or more wash drums mounted in associated open tanks which contain liquid exterior of the wash drums, which drums have perforated sidewalls and are arranged in vertically-stepped relationship to one another, the first drum being the lowest and the last drum being the highest, a method of washing paper stock pulp and like free-filtering materials comprising:

- training a pair of endless filter belts in face-to-face relationship to pass under each of said filter drums;
- forming a mat of the material between the two belts;
- driving the two belts to carry the mat of material under each of the drums from the first to the last;
- introducing liquid into the interior of the tank associated with the last said drum to flow through the mat of material and then through the perforated sidewall of that drum and then into the drum, whereby the pulp mat is washed by the liquid;
- conveying without pumping, the once-used liquid from the interior of the last drum to the tank associated with a lower drum;
- removing the washed mat of pulp from between the two belts after the belts have passed under the last drum; and
- removing the liquid from the first drum.

4,160,298

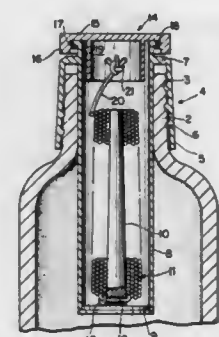
## CAPSULE FOR A LIFE SAVING LINE AND FLOAT

Al DeShano, 3693 Scott Ave., Shandon, Ohio 45063  
Filed Feb. 22, 1978, Ser. No. 880,049

Int. Cl.<sup>2</sup> B63B 21/52

U.S. Cl. 9—14

10 Claims



1. A life saving capsule for storing a life saving line within a standard container and thereafter dispensing the line when the container sealed by a portion of the capsule is thrown to a person within open water, said capsule being a replacement cap for a standard product container, said capsule including:

- an annular threaded portion for a telescopic threaded engagement with the neck of the container;
- a line holder releasably attached to said annular portion;
- a fixed length of line having one end secured to said line holder and its opposite end secured by said annular portion to said container;
- means to be held within said container by said annular portion for storing the line in an easily dispensable condition immediate its ends within the container;
- means sealing the neck of the container when the annular portion is in tight threaded engagement with the neck of the container with the line holder removed and permitting dispensing of the full length of line between the line holder and container as the container is thrown across open water from a position where the line holder is retained.

4,160,299

## UNITARY SEAT FOR INNER TUBE FLOAT

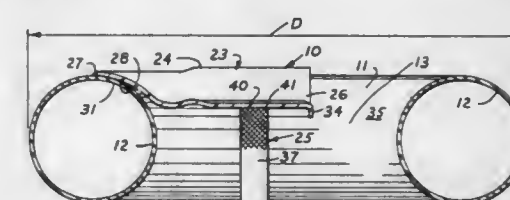
Tom Hilbern, Spokane, Wash., assignor to Melcher Manufacturing Co., Inc., Spokane, Wash.

Filed Nov. 16, 1977, Ser. No. 852,109

Int. Cl.<sup>2</sup> B63C 9/08

U.S. Cl. 9—347

4 Claims



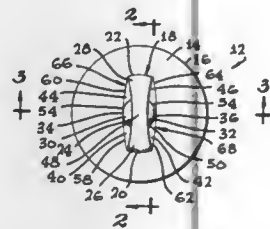
1. A unitary seat for attaching to an inflatable toroidal inner tube float to enable a user to comfortably sit thereon and extend his legs downwardly into a body of water to manually propel the inner tube float, said tube float having a closed curve toroidal surface extending angularly about a circular central opening with a tube float having an inner diameter defining a parameter of the circular central opening and an outer diameter defining the parameter of the tube float, comprising:

- a semi-rigid elongated seat member, formed of a single sheet of synthetic resin having a uniform thickness dimension, having a length dimension corresponding substantially to the outer diameter of the tube float and a width dimension less than the inner diameter of the tube float;
- said seat member having a central seat section for extending across a first portion of the circular central opening while leaving a second portion of the circular central opening unrestricted to enable the user to project his legs there-through into the body of water to manually propel the inner tube float;
- said seat member having curved end sections that are formed integrally with the central seat section that extend initially outward and upward from the seat section and then outward and downward in a concave shape conforming to the curved surface of the inner tube float for extending over angularly spaced locations of the inner tube float to support the seat section on the inner tube float above water level; a curved front section that is formed integrally with the seat section and extends downward from the seat section to present a smooth curved front surface between the end sections against which the user's legs may rest;
- said seat member having a curved rear section that is (1) formed initially with the seat section and extends upward and outward from the seat section conforming to the curved surface of the inner tube float, and (2) formed integrally with the end sections extending annularly about the seat section between the end section complementary with a portion of the parameter of the circular central opening for engaging the tube float between the spaced



locations to additionally support the central seat section above the water level; and  
fastening means at the end sections for releasably securing the seat member to the inflatable inner tube float.

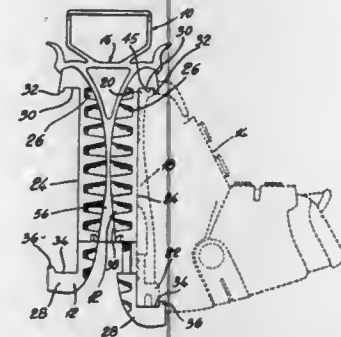
**4,160,300**  
**HAMMER FOR FORMING AN UNDERCUT FASTENER DRIVING SLOT**  
Emilio R. Marroquin, Lawndale, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.  
Filed Sep. 15, 1977, Ser. No. 833,540  
Int. Cl.<sup>2</sup> B23G 9/00; B21K 1/48  
U.S. Cl. 10—7



1. A hammer for forming a fastener slot in a fastener head comprising:

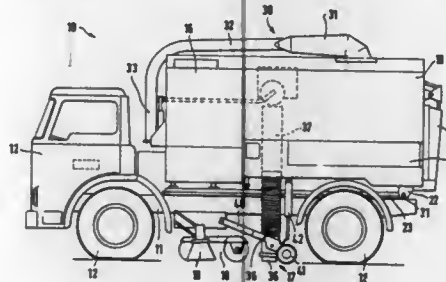
- (a) a primary surface,
- (b) longitudinally-extending convex plateau defining a longitudinal axis having spaced-apart lines of origin generally transverse to said axis and common with said primary surface between said lines of origin to an intermediate region of maximum elevation from said primary surface,
- (c) said plateau having a reduced dimension transverse to said plateau longitudinal axis at said region of maximum elevation and dimensionally flaring transversely outwardly in opposite directions to a greater transverse dimension at each of said lines of origin,
- (d) spherical convexities adjacent said reduced dimension extending outwardly from said primary surface to a maximum elevation above said primary surface but less than the elevation of said plateau region of maximum elevation, said spherical convexities spaced-apart by said plateau in juxtaposition therewith,
- (e) concave spherical-triangle wedges extending along and adjacent to said plateau, and extending below said primary surface from said lines of origin to said spherical convexities, said wedges coupled in pairs with the paired ones of said wedges spaced-apart by said plateau in juxtaposition therewith,
- (f) adjacent ones of said paired wedges merging with a juxtaposed one of said spherical convexities therebetween at a merger line,
- (g) an outer edge of each of said adjacent ones of said paired wedges extending from said merger line to an associated one of said lines of origin, said outer edges of said adjacent ones of said paired wedges and said merger line developing an ellipsoidal line of elevational demarcation between said primary surface and the said paired wedges and juxtaposed spherical convexity, and
- (h) a planar and generally triangular surface on each of the opposite sides of said convex plateau at said intermediate region extending between and adjacent to said maximum elevation of said intermediate region and said associated one of said convex partial spheres, said triangular surfaces interrupting the continuity of said opposite sides.

**4,160,301**  
**COMBINED HOLDER AND SOLE ACCESSORY**  
George C. Woolley, 55 Lakeshore Rd., Pointe Claire, Province of Quebec, Canada  
Filed Nov. 4, 1977, Ser. No. 848,755  
Int. Cl.<sup>2</sup> A43D 5/00; A43B 5/00  
U.S. Cl. 12—120.5



1. A holder adapted to engage a pair of sole accessories for carrying a pair of boots, wherein the sole accessories include toe sections and convexly curved ground engaging surfaces, the holder including a handle, a stem extending from the handle, the stem including a pair of opposed curved surfaces adapted to mate with the ground engaging surfaces of a pair of opposed sole accessories, and retaining means on the holder for detachably retaining the sole accessories to the holder.

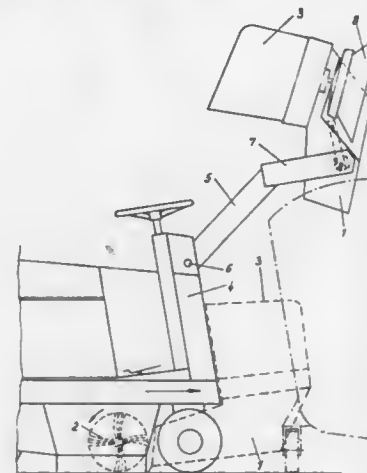
**4,160,302**  
**REFUSE COLLECTING VEHICLES**  
Peter B. Hirst, Billingshurst, and Anthony J. Duthie, Horsham, both of England, assignors to Johnston Brothers (Engineering) Limited, Redhill, England  
Filed Nov. 17, 1977, Ser. No. 852,527  
Claims priority, application United Kingdom, Nov. 18, 1976, 48226/76  
Int. Cl.<sup>2</sup> A47L 9/00  
U.S. Cl. 15—340



1. A vacuum operated refuse collecting vehicle comprising in combination an air-tight container mounted on the chassis of the vehicle and having an outlet communicating with means for generating a vacuum within the container, brush means carried by the vehicle, a suction conduit for each side of the vehicle, each suction conduit extending at one end into the interior of the container and being provided at the other end with a nozzle which may be disposed at a short distance from the ground, and means mounted at said one end of each conduit and operable from outside the container for separately closing off said one end of each suction conduit to prevent refuse entering said one end of the conduit when it is closed, in which said one ends of said suction conduits communicate with the container in positions one on each side of a central longitudinal plane of the container and adjacent one end of the container, said outlet is positioned in the upper part of the container adjacent the other end of the container and continuously curved air-deflector means are provided above said one

end of each suction conduit, the arrangement being such that, in use, with one suction conduit open and the other closed, air entering the container through said one of the suction conduits is diverted by the respective air-deflector means up around the upper part of the container and down towards the central lower part of the container before passing out through the outlet, to prevent refuse being deposited on and around said one end of said other suction conduit.

**4,160,303**  
**MECHANICAL SWEEPERS**  
Helmut Hasenpath, Kolberg-Körlin-Str. 86, D-2060 Bad Oldesloe and Hergen Rohde, Paul V. Schoenaich-Str. 1, D 2067 Reinfeld, both of Fed. Rep. of Germany  
Filed Sep. 30, 1976, Ser. No. 728,265  
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1975, 2539496  
Int. Cl.<sup>2</sup> D47L 9/10; B60P 1/34; E01H 1/04  
U.S. Cl. 15—349



1. In a mechanical sweeper comprising a roller brush arranged to throw rubbish forwardly of the sweeper, a hopper mounted on the sweeper to receive rubbish from the roller brush, suction means, and a filter interposed between the hopper and the suction means, the improvement comprising: a support frame mounted on the sweeper; a lifting arm pivotably mounted at one end thereof to the upper end of said support frame; a fork carried at the other end of the lifting arm, the fork pivotably mounting said hopper; arm-pivoting and hopper-tilting means mounted on the support frame, the lifting arm and the fork, for pivoting said lifting arm to thereby raise said hopper and maintain said hopper in an upright state during sweeping and lifting respectively, and for tilting the hopper from the upright state to thereby empty the hopper after the lifting arm has been raised to a predetermined pivoted position.

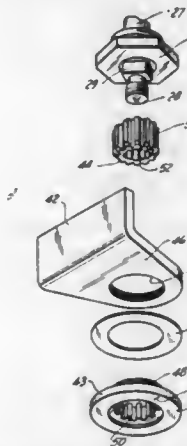
**4,160,304**  
**HOLD-OPEN ACCESSORY FOR A DOOR CLOSER**  
Gordon S. Smith, Dover, and Theodore R. Comstock, Durham, both of N.H., assignors to IMC Magnetics Corp., Westbury, N.Y.  
Filed Jan. 10, 1978, Ser. No. 868,254  
Int. Cl.<sup>2</sup> E05F 3/16

U.S. Cl. 16—49

1. A hold-open accessory for use with a door closer which applies a closing force to a door whenever it is open, the door closer having a body intended to be mounted on a hinged door or the door jamb and a shaft which rotates with respect to the body when the door is moved about its hinged axis, the accessory comprising:

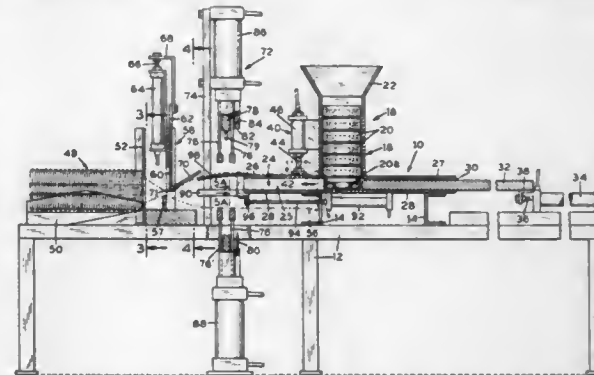
- a first member fixed with respect to the door closer body,
- a second member fixed with respect to the door closer shaft,
- and
- clutch means threaded into one of said members and rotat-

able with the other of said members in a direction in which said clutch means progressively tightens against said one member in response to opening movement of the door, to thereby progressively increase the frictional resistance to rotation between said members as the door is opened,



whereby at a predetermined open position of the door the resistance to rotation is strong enough to overcome the closing force applied to the door by the door closer and hence the door remains in the predetermined open position until manually moved toward its closed position.

**4,160,305**  
**APPARATUS AND METHOD FOR INSERTING A SIZING DISC INTO A TUBULAR CASING**  
Oliver J. Tysver, Flossmoor, Ill., assignor to Union Carbide Corporation, New York, N.Y.  
Filed Mar. 9, 1978, Ser. No. 884,961  
Int. Cl.<sup>2</sup> A22C 7/00, 11/00  
U.S. Cl. 17—49



1. An apparatus suitable for inserting a sizing disc into an unshirred end of a shirred tubular casing wherein the sizing disc has a larger periphery than the unstretched inner periphery of the unshirred end of said tubular casing which comprises in combination a frame, disc storage means and disc dispensing means positioned on said frame, securing means associated with said dispensing means adapted to detachably secure an unshirred end portion of a shirred tubular casing to said dispensing means, disc advancing means communicating with said dispensing means for advancing said sizing disc disposed in planar relation to said dispensing means in a direction substantially parallel to the longitudinal axis of said dispensing means and said unshirred portion of said tubular casing and into said unshirred end of said tubular casing, and disc rotating means for rotating said disc in said unshirred portion in a direction perpendicular to the longitudinal axis of said tubular casing.

12. A method for inserting a sizing disc into an unshirred end portion of a shirred tubular casing wherein the sizing disc has a larger periphery than the unstretched inner periphery of the unshirred end of said tubular casing which comprises, unshir-

ring an open end portion of a shirred casing length, positioning at least a part of said unshirred open end portion of casing length around an exit of a sizing disc dispenser, securing said unshirred open end portion of casing length to said exit, inserting a sizing disc into said unshirred end portion such that the plane of the disc is parallel to the central longitudinal axis of said secured unshirred casing, rotating said disc through about 90° while advancing it through said unshirred casing end portion, stretching locally said unshirred casing through said simultaneous rotation and advancement of said sizing disc, continuing the advancement of said disc into said unshirred open end portion of said casing and positioning said disc a predetermined distance from the shirred portion of said casing length with the center of said disc coincident with the center of said unshirred casing and with said unshirred casing stretched about said disc, and thereafter releasing said secured portion of said unshirred casing from said exit.

**4,160,306**  
**METHOD AND AN APPARATUS FOR INDICATING LENGTH ON A ZIP FASTENER**

Luigi Pizzoccaro, Tirano, Italy, assignor to Interbrev S.A., Luxembourg, Luxembourg

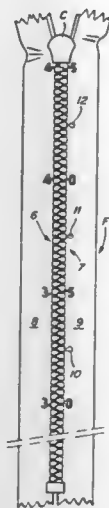
Filed Mar. 21, 1977, Ser. No. 779,517

Claims priority, application Switzerland, Mar. 20, 1976, 3457/76

Int. Cl.<sup>2</sup> A44B 19/24

U.S. Cl. 24—205 R

5 Claims



1. A zipper fastener comprising:
  - a set of support strips;
  - a row of coupling elements molded on an edge of each support strip, said coupling elements adapted to engage the coupling elements of the other support strip;
  - a slider for engaging and disengaging of said rows of coupling elements; and
  - a plurality of molded characters extended along the length of at least one of said support strips, each of said characters constructed to indicate the length of said fastener at the approximate position of said character along said support strip, each of said characters being in contact with at least one of said coupling elements and spaced from the edge of said support strip.

**4,160,307**  
**IMPROVEMENTS IN THERMOPLASTIC YARN REBOUND TEXTURIZING METHODS**

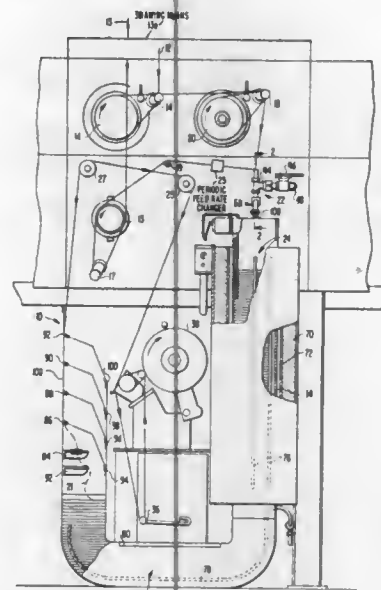
David Soutar, Jr., Glen Burnie; Philip C. Feffer, Columbia, and Lloyd M. Guenther, Severna Park, all of Md., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 16, 1976, Ser. No. 742,085

Int. Cl.<sup>2</sup> D02G 1/16

U.S. Cl. 28—220

10 Claims



1. A method of producing a thermoplastic multi-filament effect yarn, which method comprises:
  - (a) advancing first and second multi-filament yarns longitudinally of themselves in a stream of heated fluid advancing longitudinally of the yarns in a bounce crimper unit, the first yarn being advanced at a rate at least twice the rate of advance of the second yarn;
  - (b) hurling the yarns toward a foraminous surface within the bounce crimper unit by means of the stream of fluid while passing at least part of the stream of fluid through the foraminous surface;
  - (c) impinging the advancing yarns on the foraminous surface with sufficient force to induce a compression crimp in the filaments of at least the first yarn;
  - (d) instantaneously rebounding the yarn from the surface in a continuous strand-like stream into a laterally extending zone within the bounce crimper unit, the filaments of the first yarn in said zone being entangled with each other and the first yarn being entangled with the second yarn, with filaments of the first yarn protruding laterally in loop configurations of bounce crimped filament sections; and
  - (e) delivering the entangled rebounded yarn away from said zone and out of said unit without tensioning the yarn and while controlling the axial compression of the body of yarn exiting said zone.

**4,160,308**  
**OPTICALLY COUPLED ISOLATOR DEVICE AND METHOD OF MAKING SAME**

Thomas Courtney, Redwood City, and Vijay K. Lumba, Mountain View, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 654,443, Feb. 2, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,685

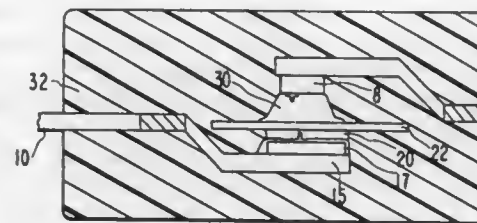
Int. Cl.<sup>2</sup> B01J 17/00

U.S. Cl. 29—588

2 Claims

1. A method of increasing the capability of an optically coupled isolator to withstand high voltage stresses applied thereto, the steps comprising:
  - forming a plurality of sets of electrically conductive leads;

attaching a semiconductor light detector to a lead in one set and a semiconductor light emitter to a lead in another set; attaching electrically conductive wires between the detector and leads in the set in which the detector is attached; attaching electrically conductive wires between the emitter and leads in the set in which the emitter is attached; applying a first layer of junction coat material over the exposed portion of the detector including over locations where the wires are attached to the detector; heating the first layer until it hardens;



applying a second layer of junction coat material over the first layer; placing a layer of glass on the second layer; heating a second layer until it hardens; placing the set of leads containing the emitter over the set of leads containing the detector so that the emitter faces the detector across a space therebetween; applying a third layer of junction coat material in the space between the glass and the emitter; and heating the third layer until it hardens.

**4,160,309**  
**METHOD AND APPARATUS FOR MAKING BATTERY GRIDS**

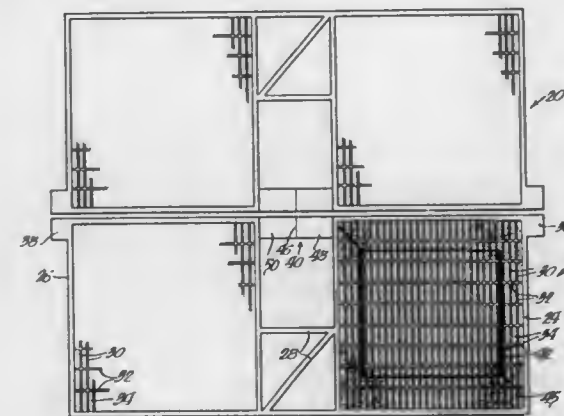
William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Division of Ser. No. 762,756, Jan. 26, 1977, Pat. No. 4,091,192. This application Jul. 21, 1977, Ser. No. 817,701

Int. Cl.<sup>2</sup> B29C 5/00; B23P 13/00

U.S. Cl. 29—2

19 Claims



1. A method for making a paired battery grid structure, comprising molding a lead lug with integral lead conductors extending from opposite ends thereof, and molding an integral plastics member around said lead lug and said conductors, said member being formed of a pair of side-by-side rectangular frames each with a latticework of intersecting components in a center area thereof, a severable leg extending between facing sides of said frames securing said frames in said side-by-side relationship, and a pair of severable lugs each extending peripherally outward from a respective outer side of each of said frames opposite from said facing sides, said plastics molding step including molding said latticeworks to surround with said components thereof a respective one of said lead conductors,

and molding facing sides of each of said frames to surround a respective opposite end of said lead lug, said severable plastics lugs being formed with sufficient rigidity to support said grid structure therebetween, whereby two separate battery grids are obtainable by severing said plastics lugs and leg from said frames, and severing said lead lug centrally thereof.

**4,160,310**  
**METAL-DIELECTRIC ELECTRON BEAM SCANNING STACK**

William G. Manns, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

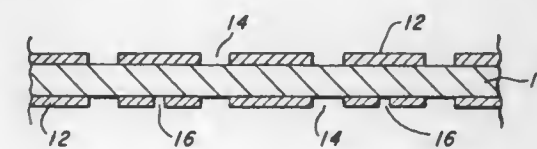
Filed Dec. 2, 1976, Ser. No. 746,910

The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.

Int. Cl.<sup>2</sup> H01J 9/02

U.S. Cl. 29—25.14

8 Claims



1. A method of fabricating an electron beam scanning stack comprising the steps of:
  - fabricating a matrix of apertures in a first and second plurality of metal plates having first and second planar surfaces; fabricating a groove pattern in said first planar surface of at least two of said first plurality;
  - coating said first and said second surfaces of one of said second plurality with dielectric material;
  - aligning said apertures of said first plurality having said groove pattern with said apertures of said one of said second plurality to form a matrix of electron channels therein, said groove pattern of said first plurality being aligned to said first and said second surfaces of said one of said second plurality;
  - bonding said first plurality having said groove pattern to said one of said second plurality by means of said dielectric material;
  - fabricating said groove pattern into an isolation channel from said second planar surface of said first plurality, thereby fabricating a subassembly;
  - coating said first planar surface of at least one of said second plurality with dielectric material;
  - aligning said apertures of at least two of said second plurality forming a matrix of electron channels therein, at least one of said second plurality having said dielectric coating thereon;
  - bonding said second aligned plurality together by means of said dielectric material to form a matrix of electron channels therein;
  - aligning said electron channels of said subassembly with said electron channels of said bonded second plurality; and
  - bonding said bonded second plurality to said second planar surface of said subassembly by means of a layer of dielectric material.



4,160,311

# METHOD OF MANUFACTURING A CATHODE RAY TUBE FOR DISPLAYING COLORED PICTURES

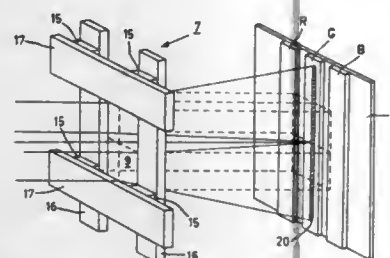
Hubertus J. Ronde, and Peter C. Van Loosdregt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 757,674, Jan. 7, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 893,065

Claims priority, application Netherlands, Jan. 16, 1976, 7600417

Int. Cl.<sup>2</sup> H01J 9/02  
U.S. Cl. 29—25.15

18 Claims



1. In the manufacture of a color cathode ray tube having an apertured shadow mask comprising an electrode structure for producing an electron field in the mask apertures, the method comprising the steps of securing a first electrically conductive plate having a plurality of parallel ridges joined together by relatively thin strips to a second electrically conductive plate having a plurality of apertures aligned with said strips by insulating material interposed between said plates to thereby form an electrode structure, removing at least portions of said strips to form in said first plate elongated apertures which are aligned with the apertures in said second plate to thereby form in said electrode structure openings for passage of electron beams, and mounting said electrode structure in an envelope of said tube.

4,160,312

# METHOD AND APPARATUS FOR MAKING MULTI-LAYER SPIRAL PIPE

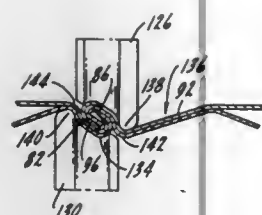
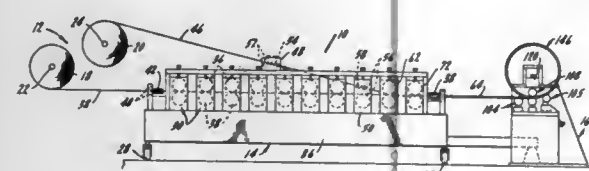
James Nyssen, 10045 Kenswood Dr., Chilliwack, British Columbia, Canada

Filed Jan. 5, 1978, Ser. No. 867,139

Int. Cl.<sup>2</sup> B23P 19/00, 19/04

U.S. Cl. 29—429

14 Claims



1. In an apparatus for continuously forming multi-layer pipe from plural elongated sheets of ductile material, the pipe having a corrugated exterior wall and a substantially smooth interior wall, and the apparatus having a rolling device for positioning the sheets in contiguous layers and driving the sheets,

a pipe forming device for accepting the drive sheets and spiralling the layered sheets into successive, adjacent helical convolutions having a central axis formed at an oblique angle to the longitudinal axis of the layered sheets, and a seaming device to join adjacent helical convolutions, the improvement comprising:

- a first means in said rolling device for impressing continuous longitudinal corrugations in a first sheet forming the exterior wall of the pipe,
- a second means in said rolling device for positioning a second flat sheet in a contiguous layer upon the first sheet, forming a multi-layer sheet, with the edges of said first and second sheets being generally coextensive, and
- means for forming a single, helical corrugation in the inner wall of the pipe, comprising:
  - first rolling means adjacent one marginal edge of said multi-layer sheet to shape therein a first portion of said single corrugation, said first rolling means including means to form a first partial lock seam element in said one marginal edge,
  - second rolling means adjacent the other marginal edge of said multi-layer sheet to shape therein a second portion of said single corrugation complementary to said first portion, said second rolling means including means to form a second partial lock seam element in said other marginal edge,
  - said first and second portions being joined by said seaming device to form said single corrugation.

9. In an apparatus for continuously forming a multi-layer sheet from a plurality of elongated, continuous sheets of material, the apparatus having sources of first and second elongated sheets, a rolling device for forming longitudinal corrugations in the first sheet, and a device for guiding the second sheet into contiguous abutment with the corrugated first sheet, the improvement comprising:

the guiding device including at least one module removably mounted in said rolling device, said module comprising a framework having mounted therein a pair of elongated pinch rolls positioned on opposite sides of the second sheet and a pair of edge guide rolls positioned at opposite edges of the second sheet, said pinch and guide rolls being located to maintain the second sheet vertically and laterally stable.

12. A method of continuously forming multi-layer pipe from plural elongated sheets of material, the pipe having a helically corrugated exterior wall and a substantially smooth interior wall having a single, helical corrugation, including the steps of

- fashioning continuous longitudinal corrugations in a first sheet positioned for forming the exterior wall of the pipe,
- forming a multi-layer sheet by positioning a second flat sheet in a contiguous layer upon the first sheet with the edges of said first and second sheets being generally coextensive,
- shaping a first portion of said single corrugation in one marginal edge of said multi-layer sheet and shaping a first partial lock seam element in said one marginal edge,
- shaping a second portion of said single corrugation in the other marginal edge of said multi-layer sheet and shaping a second partial lock seam element in said other marginal edge,
- spiralling said multi-layer sheet into successive, adjacent helical convolutions having said first and second portions abutting to form said single corrugation, and
- joining the edges of said convolutions at the juncture of said abutting first and second portions by forming said partial lock seam elements into a helical seam located in said single corrugation.

4,160,313

# METHOD OF MAKING A WAX PATTERN FOR A SHELL MOULD

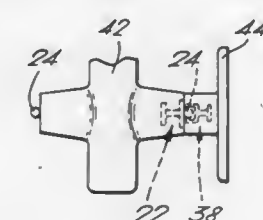
William H. Radford, Littleover, England, assignor to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 725,154, Sep. 21, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,561

Claims priority, application United Kingdom, Sep. 25, 1975, 39238/75

U.S. Cl. 29—525  
Int. Cl.<sup>2</sup> B23P 19/02

7 Claims



1. A method of making a wax pattern for a shell mould including the steps of:

moulding at least one wax former with a first portion of a connector embedded in the at least one former, separately moulding a wax runner with at least one further portion of the connector embedded therein and partially projecting therefrom, said at least one further portion of the connector being complementary to and lockable in said at least first portion of the connector, removing the solidified former and runner mouldings from their moulds, then locking the former to the runner by inserting the complementary said further portion of the connector into said first portion of the connector to provide a joint at the interface between the former and the runner.

5. A method of making a wax pattern from articles comprising a former and a runner for a shell mould including the steps of:

moulding one of the articles with a socket connector therein which has a stud locked into the socket connector by an interference fit so as to pre-stress the socket wall, the socket connector being positioned in the said one moulded article so that the free end of the stud projects from that face of the one moulded article which forms the interface with the other article on assembly of the pattern, then removing the stud from the socket of the one moulded article to relieve the stress on the socket wall, moulding the other of said articles with a stud partially projecting therefrom, and then joining the one moulded article with the other moulded article by inserting the stud of the other moulded article into the socket which has room to expand in the one moulded article.

4,160,314

# DEGRAINING, A THREE STEP PROCESS TO OBTAIN PROPELLANT SAMPLES FROM CASE BONDED MOTORS

Levi G. Fridy, Hillcrest Heights, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 901,163

Int. Cl.<sup>2</sup> B23P 1/00, 13/04

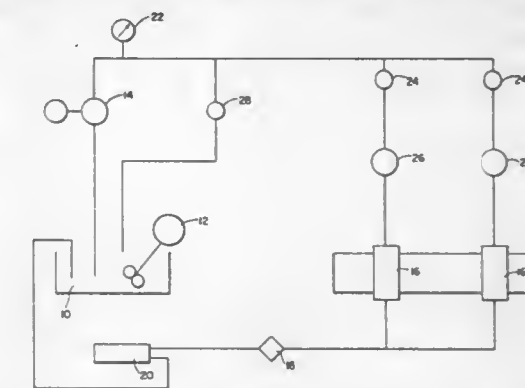
U.S. Cl. 29—558

3 Claims

1. A degreasing process for obtaining propellant samples from metal case-bonded rocket motors, comprising the steps of:

- electrolytically machining two circumferential slots through the metal case to expose the propellant liner;
- using a piano wire cutter to cut through the two exposed strips of the propellant liner and the adjacent propellant

thereby separating a metal case-bonded section from the balance of the metal case-bonded rocket motor; and



(3) using a rotational piano wire cutter to cut and separate the propellant from the metal case.

4,160,315

# METHOD OF MAKING A MAGNETIC HEAD ASSEMBLY

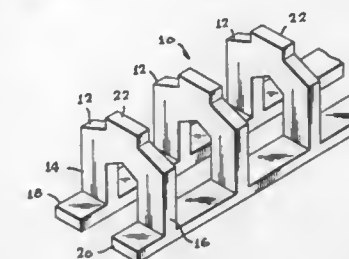
Sirjang L. Tandon, Northridge, and John P. Moon, Thousand Oaks, both of Calif., assignors to Tandon Magnetics Corporation, Chatsworth, Calif.

Filed Apr. 17, 1978, Ser. No. 896,635

Int. Cl.<sup>2</sup> G11B 5/42

U.S. Cl. 29—603

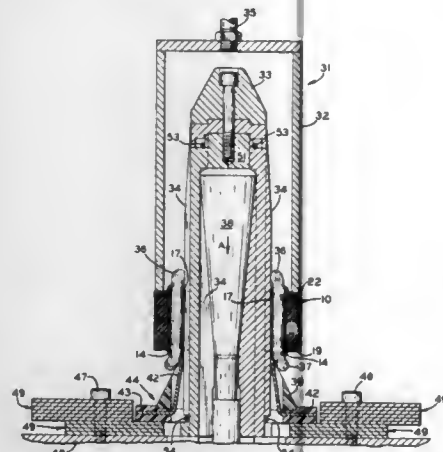
19 Claims



1. The method of making a magnetic head assembly having erase heads laterally disposed relative to a read/write head in a slider member, with precise alignment and spacing of critical elements comprising the steps of:

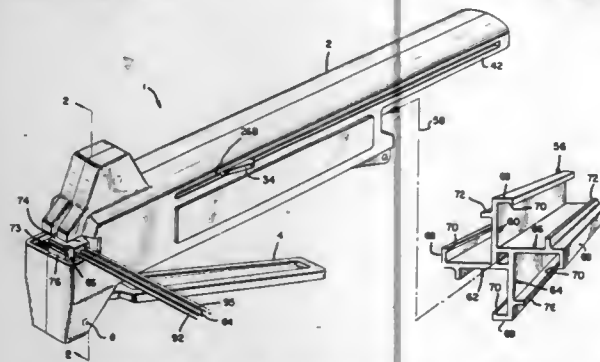
embedding a number of erase heads at regular spacing along the side face of a slider half member, with pole pieces of said erase heads lying substantially flush with a recording plane substantially normal to the side face; removing material from the side face of the slider half member to provide a planar side surface with a given lateral spacing between the furthest edge of the erase head and the planar side surface to define an erase track width; indenting the side face to a selected depth at each erase head to define predetermined erase gap length; preparing a comb-like series of read/write cores having regular spacings like those of the erase heads, the side faces of the read/write cores being planar and parallel; bonding a pair of complementary slider half members to the read/write cores with the side faces of the slider half members being oppositely disposed and each abutting a different side planar face of the read/write cores, and with the pole pieces of the individual erase heads being adjacent the non-magnetic gaps of the different read/write cores; and segmenting the assembled structure into individual head elements.

**4,160,316**  
**APPARATUS FOR POSITIONING INSULATING MEMBERS IN MAGNETIC CORE SLOTS**  
 Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.  
 Division of Ser. No. 779,777, Mar. 21, 1977, Pat. No. 4,104,788.  
 This application Mar. 6, 1978, Ser. No. 883,462  
 Int. Cl.<sup>2</sup> H02K 15/10  
 U.S. Cl. 29—734



1. Apparatus for use in axially repositioning insulators that have been previously positioned in axially extending slots of a magnetic core, said apparatus including arbor means for guiding a stator assembly therealong and in a predetermined aligned relationship therewith, said apparatus further including means for contacting and arresting movement of at least some of the previously positioned insulators while the core is moved relative to such means for contacting whereby the at least some of the previously positioned insulators may be repositioned relative to the core, and said apparatus further including means for moving the core axially along the arbor means.

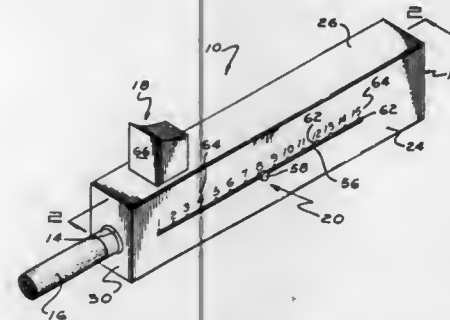
**4,160,317**  
**APPLICATOR TOOL WITH MULTIPLE CHAMBER MAGAZINE**  
 Ronald G. Sergeant, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.  
 Filed Sep. 5, 1978, Ser. No. 939,515  
 Int. Cl.<sup>2</sup> H01R 43/04  
 U.S. Cl. 29—749



1. In a tool for serially feeding a plurality of connectors and connecting the same one at a time to electrical wires, the improvement comprising:  
 a casing;  
 a fixed anvil at one end of said casing;  
 a handle pivotally connected to said casing;  
 a ram slideably mounted in said casing and pivotally connected to said handle for reciprocation toward and away from said anvil;

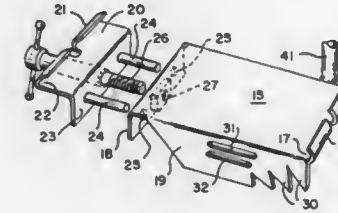
a passageway within said casing and communicating with a work station defined between said anvil and said ram;  
 a thrust member slideably mounted on a first side wall of said casing for reciprocation along said passageway;  
 a spring for urging said thrust member along said passageway toward said work station;  
 a magazine slideably received in said passageway and so constructed and arranged for containing a plurality of connectors in serial arrangement;  
 means on said casing for positioning each connector in turn at said work station;  
 said magazine being aligned offset toward one side of said ram;  
 said ram having a moveable surface portion moveable into and out of alignment with said magazine for changing the size of said ram in correspondence with the size of connectors contained within said magazine.

**4,160,318**  
**APPARATUS FOR SEVERING PREDETERMINED LENGTHS FROM CIGARETTES OR CIGARS**  
 Richard E. Morel, 295 Silver St., Greenfield, Mass. 01301  
 Filed Feb. 9, 1978, Ser. No. 876,533  
 Int. Cl.<sup>2</sup> A24C 5/12  
 U.S. Cl. 30—113



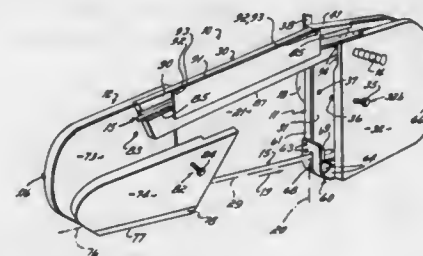
1. A device for severing predetermined lengths from cigarettes, cigars and the like, said device comprising:  
 a tubular channel for receiving said cigarette or cigar, said tubular channel including a longitudinal slot therethrough along substantially the entire length thereof, and being grooved opposite said longitudinal slot,  
 a blade for severing the end of said cigarette or cigar disposed in said tubular channel, said blade being movable laterally through said tubular channel and biased away from the interior of said tubular channel,  
 stop means disposed within said tubular channel and adjustably positionable along substantially the entire length thereof whereby predetermined lengths of said cigarette or cigar may be positioned in said tubular channel for severing by said blade, said stop means comprising a plug conforming to the interior of said tubular channel, said plug including a guide extending from an edge thereof, said guide being slidably received within said groove for maintenance of the proper alignment of said plug with said tubular channel and  
 indexing means, said indexing means comprising an arm extending from said plug and received within said longitudinal slot, said plug being adjustably positionable within said tubular channel by the longitudinal movement of said arm along said slot.

**4,160,319**  
**CIRCULAR TO CHAIN SAW CONVERSION APPARATUS**  
 Patsy Caruso, 547 S. Liberty St., Blairsville, Pa. 15717  
 Filed Apr. 25, 1978, Ser. No. 900,006  
 Int. Cl.<sup>2</sup> B27B 7/14  
 U.S. Cl. 30—122



1. A chain saw conversion unit for a portable power driven circular saw having a housing, a drive shaft removably carrying a circular saw blade and a generally flat base plate on said housing comprising a main attachment plate having one end bent upwardly and back parallel to the plate forming a generally U-shaped channel adapted to receive one end of the base plate of the saw and the other end and one side bent downwardly to form a right angle flange, an L-shaped handle fixed to said main attachment plate adjacent said one end and curving upwardly and over said main attachment plate generally parallel thereto, a secondary attachment plate having one end bent upwardly and back parallel to the plate forming a second generally U-shaped channel adapted to receive the other end of the base plate of the saw and the other end of said secondary attachment plate being bent downwardly to form a right angle flange parallel to and spaced from the flange on the other end of said main attachment plate, guide means extending between said flanges to maintain them in alignment, fastener adjusting means extending between said flanges for moving said main and secondary plates together to engage the base plate of the saw within the two U-shaped channels and firmly in contact with said plates, elongate cutter guide bar means, removably and adjustably fastened to the side flange of said main attachment plate at an angle to the base plate of the saw, sprocket means removably attached to the drive shaft and an endless saw chain disposed around said sprocket and cutter guide bar means at an angle forward of the drive shaft.

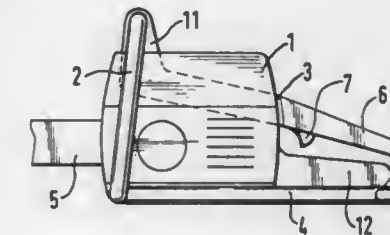
**4,160,320**  
**HAND HELD BAND SAW**  
 Mark W. Wikoff, Cincinnati, Ohio, assignor to Best & Donovan, Cincinnati, Ohio  
 Continuation-in-part of Ser. No. 785,037, Apr. 6, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,734  
 Int. Cl.<sup>2</sup> B27B 13/02, 13/08  
 U.S. Cl. 30—380



1. A hand held band saw comprising  
 a driven wheel housing, said driven wheel housing including a door hingedly mounted thereon,  
 an idler wheel housing, said idler wheel housing including a door hingedly mounted thereon, and  
 a crossbar section, said crossbar section rigidly connecting said driven wheel housing and said idler wheel housing, said crossbar section including a cover plate adapted to

enclose the return run of an endless saw blade there-through, said cover plate being held in assembled housing relation with said crossbar section upon closure of said idler wheel housing door and upon closure of said driven wheel housing door.

**4,160,321**  
**PORTABLE GAS-MOTOR-DRIVEN CUTTING IMPLEMENT**  
 Tommy K. Killberg, Lindome, and Bo Rangert, Mölnlycke, both of Sweden, assignors to Aktiebolaget Partner, Molndal, Sweden  
 Filed Dec. 22, 1977, Ser. No. 863,320  
 Claims priority, application Sweden, Dec. 29, 1976, 7614660  
 Int. Cl.<sup>2</sup> B27B 17/02  
 U.S. Cl. 30—383



1. A portable gas-motor-driven cutting implement comprising  
 a motor unit comprising a gas-motor, a fuel tank attached to said gas-motor, and tool driving means operated by said motor,  
 a tool carrier and a cutting tool supported thereby, said tool carrier being attached to said motor unit and extending forwards therefrom, and said tool being arranged to be driven by said motor through said driving means,  
 means for carrying said motor unit, said means comprising, a curved front handle member extending substantially transversely of the longitudinal axis of the tool carrier and at least partially surrounding the front end of the motor unit,  
 a handlebar member connected at its front extremity to an upper portion of said front handle member and having a handle portion located at the rear of the motor unit, and,  
 a brace member connecting the rear extremity of said handle portion with a lower portion of said front handle, said front handle member, said handlebar member and said brace member being rigidly connected with each other so as to form a rigid, closed frame, and,  
 resilient means connecting said rigid frame with said motor unit, said resilient means comprising,  
 a first resilient member connecting the front end of said rigid frame to a top portion of said motor unit,  
 a second resilient member connecting the front end of said rigid frame to a bottom portion of said motor unit, and,  
 a third resilient member connecting a portion of said rigid frame located at the rear of said motor unit to a rear portion of said motor unit.

**4,160,322**  
**METHOD OF CONSTRUCTING AN ORTHODONTIC APPLIANCE**  
 Paul D. Frazier, 6709 Old Stage Rd., Rockville, Md. 20852  
 Filed Dec. 29, 1976, Ser. No. 755,439  
 Int. Cl.<sup>2</sup> A61C 13/22  
 U.S. Cl. 32—14 C

1. A method for constructing an orthodontic appliance to be



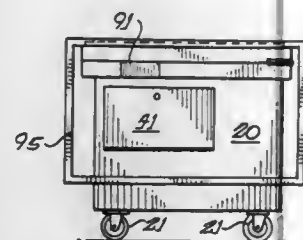
placed in a patient's mouth so as to effect desired tooth repositioning, comprising the steps of:

- (a) forming a model of a patient's malocclusion consisting of an impression of the patient's teeth only;
- (b) separating and repositioning individual teeth with respect to the each other and the opposing arch on said model of a patient's malocclusion to form an ideal model;
- (c) providing a template which conforms to the arch size and form of said ideal model, and moving said template into juxtaposition relative to said ideal model;
- (d) fixing orthodontic brackets to the teeth of said ideal model to form a base means in accordance with the positional characteristics of said template while being held in an ideal position by means of said template so that each bracket is ideally positioned upon each tooth of said model; and
- (e) transferring said brackets in conjunction with said base means and affixing said brackets to the teeth of said patient with all tip, torque and tooth thickness considerations compensated for on each tooth and each arch.

#### 4,160,323 PORTABLE DENTAL CABINET

Ronald J. Tracy, 2603 E. Main St., Sumner, Wash. 98390  
Filed Jun. 20, 1977, Ser. No. 808,198  
Int. Cl.<sup>2</sup> A61C 19/00

U.S. Cl. 32-22



1. A compact, lightweight, mobile dental unit, having a low center of gravity, comprising a wheeled cabinet, defining a lower compartment and a planar-top upper compartment, the cabinet compartments having a stacked height sufficient to locate the upper compartment top at a height convenient for dental operations use by either a standing or sitting dentist, the lower compartment containing a source of compressed air comprising a horizontally disposed tank of the type offered for use with self-contained underwater breathing apparatus, a vacuum chamber, and a vacuum pump connected to the vacuum chamber so as to draw gas from the vacuum chamber while permitting liquids and solids to be retained in the vacuum chamber, the upper compartment containing a storage space, a pressurizable water reservoir, and an amalgamator for preparing dental cement, the unit further comprising a first dental handpiece, a first dental handpiece pneumatic drive, first flexible pneumatic conduit means leading from the source of compressed air to the first dental handpiece pneumatic drive, first flexible water conduit means leading from the pressurizable water reservoir to the dental handpiece the unit further comprising a foldable patient support for supporting the patient in a supine position, and support frame means removably mounted on said cabinet for carrying the foldable patient support and for supporting the patient at a convenient operating elevation, and at a location spaced apart, if desired, from the cabinet, said frame means defining a recess sufficiently large to permit the frame means to be placed in a surrounding, overlying position on and around the wheeled mobile dental unit cabinet for transporting the cabinet and patient support, and to permit the frame means and patient support to be removed from contact with the wheeled cabinet for patient support use.

#### 4,160,324 TOOL FOR LAYOUT OF BASEBALL DIAMONDS (DU-BER)

Cecil C. Dunn, 1900 W. 9th, Apt. 212, Ft. Stockton, Tex. 79735  
Filed Dec. 19, 1977, Ser. No. 861,866  
Int. Cl.<sup>2</sup> G01B 3/10

U.S. Cl. 33-137 R

2 Claims



1. A tool for laying out of baseball diamonds, comprising, in combination, a measuring device of elongated shape, and which is made of a flexible material, such as tape or the like, a reel to which one end of said tape is attached, so that when not in use, said tape can then be wound up around said reel, an opposite end of said tape having a master ring defining a first hole along said tape, and said tape including a plurality of other openings along said tape, at specific calibrated distances from said master ring, for defining distances of components of said baseball diamonds; said measuring device, additionally, including a whip pivotally attached to said tape, said whip comprising a second tape member, snap-fastened through one of said holes along the first said tape, said whip including a hole at one end thereof, a snap-fastener element secured at an opposite end thereof, a short length of a third tape member secured, at its one end, to an intermediate portion of said second tape member, while an opposite end of said third tape member has a mating snap-fastener element engagable with said snap-fastener element of said second tape member.

#### 4,160,325 EXTENSOMETER

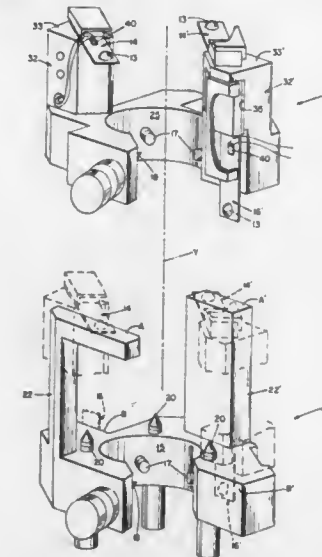
Joseph P. DeNicola, Hingham, Mass., assignor to Instron Corporation, Canton, Mass.  
Filed Nov. 4, 1977, Ser. No. 848,584  
Int. Cl.<sup>2</sup> G01B 7/16

U.S. Cl. 33-148 D

11 Claims

1. An extensometer for simultaneous separate measurement of each of axial strain and torsional strain of a specimen with its axis along a test axis, which comprises  
a first gauge member,  
said gauge member including a clamping ring for clamping said first gauge member to said specimen at a first location along said axis,  
a second gauge member,  
said second gauge member including a second clamping ring for clamping said second gauge member to said specimen at a second location along said axis and axially spaced therealong from said first location,  
a first guide means,  
a second guide means,  
a first follower means, and  
a second follower means,  
said first follower means being guided by said first guide means,

said first guide means being a planar surface parallel to said axis, and  
said first guide means being fixedly carried by one of said first gauge member and said second gauge member,  
said first follower means being carried by the other of said gauge members,  
said first follower means carrying sensing means for sensing deflection of said first follower means by said first guide means,  
said second follower means being guided by said second guide means,



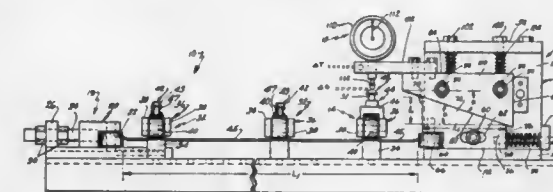
said second guide means being a planar surface perpendicular to said axis and  
said second guide means being fixedly carried by one of said gauge members,  
said second follower means being carried by the other of said gauge members,  
said second follower means carrying sensing means for sensing deflection of said second follower means by said second guide means,  
whereby said first guide means and first follower means produce a pure torsional strain readout and said second guide means and said second follower means provide a pure axial strain readout.

#### 4,160,326 THICKNESS RESPONSIVE BLANK GAUGE

Melbourne L. Griesbach, Muskegon, Mich., assignor to E.M.F., Inc., Muskegon, Mich.  
Filed Dec. 30, 1977, Ser. No. 865,899  
Int. Cl.<sup>2</sup> G01B 5/02, 5/06

U.S. Cl. 33-174 R

17 Claims



1. A thickness responsive blank gauge for comparing the thickness and length of a flat blank to a standard blank having a predetermined length and thickness to determine if the length of the blank is equal to the standard length plus a predetermined constant times the change in thickness from the standard blank, said gauge comprising:  
means for sensing the thickness of said blank; and  
means operatively associated with said thickness sensing

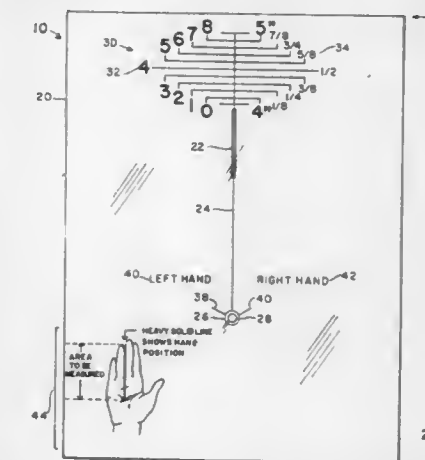
means for sensing the change in length of said blank from said standard and comparing the change in length to the sensed thickness to determine if the change in length equals the change in thickness from the standard times a predetermined constant, said means associated with said thickness sensing means comprising:  
a first member engaged by said blank and shiftable laterally a distance equal to the change in length from said standard;  
a second member operatively associated with said first member and shiftable a distance equal to the change in length times the reciprocal of said predetermined constant; and  
output means carried by said second member for indicating when the distance of shift of said second member equals the change in thickness of said blank from said standard.

#### 4,160,327 RACQUET GRIP FITTER SYSTEM

Rodger L. Martin, 340 Somerset Rd., and Donald P. Nadwodny, 350 Somerset Rd., both of Pasadena, Md. 21122  
Continuation-in-part of Ser. No. 795,628, May 10, 1977, abandoned. This application Nov. 30, 1977, Ser. No. 855,942  
Int. Cl.<sup>2</sup> G01B 5/02

U.S. Cl. 33-174 D

8 Claims



1. A hand-measuring system for determining appropriate racquet handle circumference to fit particular human hands, comprising: means for aligning with the palm and fingers of a hand including a plate, a fixed fin as said plate at an intermediate location and projecting perpendicularly from one side thereof said fixed fin proportioned for longitudinally aligning with and extending between second and third fingers of a hand and maintaining longitudinal orientation of the plate; a fixed pointer on the plate in longitudinal alignment with said fin and proportioned for positioning by longitudinal sliding of the plate to point at the center of a palm of a hand, and fixed scale means on the plate for indicating distance along said alignment from the pointer, when the pointer is pointing at the center of a palm of a hand, to the end of the third finger of the hand.

#### 4,160,328 SEGMENTED LONGITUDINAL MEASURING DEVICE

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heldenhain GmbH, Traunreut, Fed. Rep. of Germany  
Filed Jun. 2, 1978, Ser. No. 911,940  
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2727769

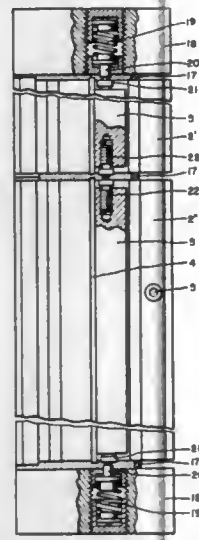
U.S. Cl. 33-125 R

Int. Cl.<sup>2</sup> G01B 11/04

11 Claims

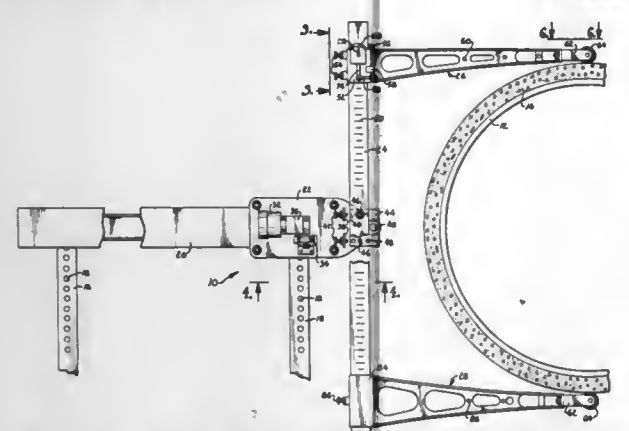
1. A segmented longitudinal measuring device comprising: a plurality of housing segments arranged to form an enclosure;

a plurality of intermediate support members, with means for securing each support member to the interior of one of the housing segments in a longitudinally displaceable manner; a plurality of measuring scale segments having thermal



expansion coefficients substantially equal to the coefficient of thermal expansion of the support members, each scale segment secured to one of the support members; means for compressing said support members against each other end to end in an adjustable manner.

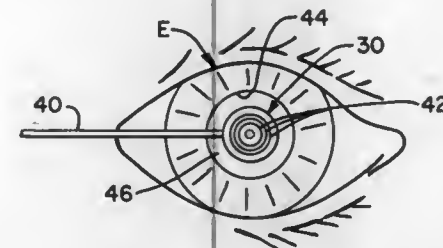
**4,160,329**  
**METHOD AND APPARATUS FOR MEASURING PIPE COATING THICKNESS**  
Martin R. Scrimshaw, Immingham, England, assignor to Bredero Price, B.V., Hague, Netherlands  
Filed Sep. 12, 1979, Ser. No. 832,536  
Int. Cl.<sup>2</sup> G01B 5/08, 5/10  
U.S. Cl. 33—178 D



1. A device for monitoring the amount of coating material applied to the outside of a rotating cylindrical pipe which is unaffected by any whipping action of the pipe, said device comprising:  
rigid support means;  
elongated mounting means coupled with said support means and disposed in a generally vertical plane;  
first and second sensing arms carried by said mounting means for contacting the surface of the coated pipe, one of said arms being pivotally coupled with said mounting means at a point above the second arm, the outer end of said one arm being pivotally movable up and down in accordance with variations in the thickness of the pipe coating; and  
means for pivotally coupling said mounting means with said support means, said means for pivotally coupling said mounting means with said support means being disposed

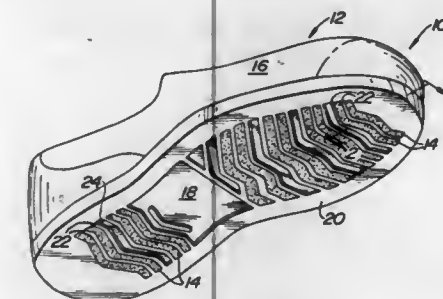
between a vertical plane passing through the outer ends of said sensing arms and a vertical plane passing through the combined center of gravity of said sensing arms plus said mounting means.

**4,160,330**  
**APPARATUS AND METHOD FOR MAKING OPHTHALMIC MEASUREMENTS**  
Bernard Grolman, Worcester, Mass., assignor to American Optical Corporation, Southbridge, Mass.  
Filed Feb. 24, 1978, Ser. No. 881,093  
Int. Cl.<sup>2</sup> A61B 3/10  
U.S. Cl. 33—200



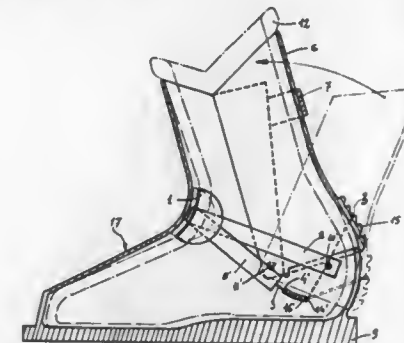
1. Ophthalmic measuring apparatus attachable to a spectacles frame having a pair of lens rims and including means for supporting and adjusting an alignment reticle vertically and horizontally approximately in the plane of each of said lens rims wherein the improvement comprises, in each case of each reticle the structure of:  
a circularly light diffracting disc of a diametral size less than that of the aperture of a person's pupil, said disc having circular striations for producing a perceivable bright ring pattern of light about an also perceivable bright spot target when such a target is located distantly of said disc and further when said disc is positioned before the person's pupil with fixation of the eye upon said target.

**4,160,331**  
**OUTER SHOE WITH GRIPPING SURFACE**  
Michael Bell, P.O. Box 400, Warrington, Pa. 18976  
Filed Feb. 21, 1978, Ser. No. 879,163  
Int. Cl.<sup>2</sup> A43B 23/28  
U.S. Cl. 36—59 B



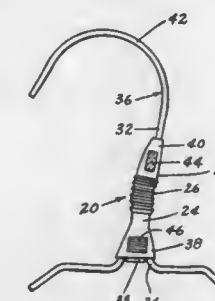
1. A shoe having a bottom surface formed from a flexible, water-proof material, said material being selected from the group consisting of natural rubber, synthetic rubber and polyvinyl chloride, said bottom surface having a plurality of discrete channels formed therein, and a gripping material in some, but not all, of said channels, said gripping material comprising an adhesive and a grit, whereby there are discrete areas of said gripping material in said bottom surface.

**4,160,332**  
**SKI BOOT**  
Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France  
Filed Mar. 24, 1977, Ser. No. 781,044  
Claims priority, application France, Mar. 24, 1976, 76 08543  
Int. Cl.<sup>2</sup> A43B 5/04  
U.S. Cl. 36—119



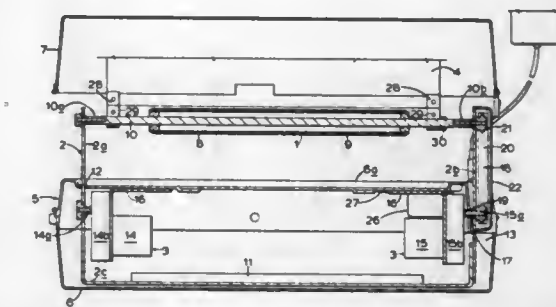
1. A ski boot comprising:  
(a) a shell comprising a fixed part and a part hinged to said fixed part;  
(b) means for closing said hinged part on said fixed part; and  
(c) a foot-retaining system located between said shell and a skier's foot to enable the skier to immobilize his foot in the boot after placing his foot therein;  
(d) said foot-retaining system being caused to bear against the foot by said hinged part when the latter is moved to be secured to said fixed part by said closing means.

**4,160,333**  
**SIGNAL TUBE**  
Alphonse Indelicato, 7612 Wydown Blvd., Clayton, Mo. 63105  
Filed Apr. 21, 1978, Ser. No. 898,634  
Int. Cl.<sup>2</sup> G09F 3/00  
U.S. Cl. 40—322



1. A signal tube for use with a hook-shaped member such as a clothing hanger having an arcuate shaped hook to suspend the hanger from a support, a body adapted to support articles of clothing therefrom, and a neck interconnecting the hook with the body; the signal tube comprising a tube means about 1/4 inch or 18 mm to about 2 inches or 50.8 mm in length, having a central cavity extending the length thereof and adapted to receive and pass therethrough a hook of a hanger, said central cavity having a diameter approximately 3 times that of the neck, the tube means having a relatively stiff unbendable section and an integral continuous flexible bellows section, the latter allowing substantial bending of said tube means to facilitate the passage of said tube means over the hook as the signal tube is installed or removed from the hanger, and means to encode the tube means so that information about the hanger and its contents may be determined by observing said encoded tube means.

**4,160,334**  
**REVERSIBLE PAGE TURNER**  
Gordon Willis, London, England, assignor to Symot Limited, Oxon, England  
Filed Nov. 9, 1977, Ser. No. 849,768  
Claims priority, application United Kingdom, Nov. 9, 1976, 46653/76  
Int. Cl.<sup>2</sup> G09F 11/00  
U.S. Cl. 40—531



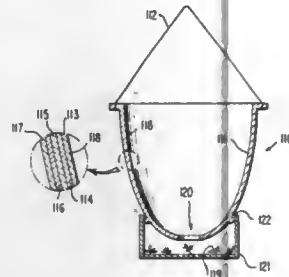
1. A page turner comprising a support for a book, means for holding said book open, a roller having an axis of rotation, said roller mounted above said support to engage in a first extreme position a first page lying on one side of the book spine and movable to a second extreme position to engage a second page lying on the opposed side of the book spine, a mounting carrying said roller such that said axis of rotation is maintained parallel to the book spine, means independent of engagement of said roller with the pages of said book for moving said mounting with said roller in an arcuate path from one of said first and second extreme positions to the other of said first and second extreme positions, means for driving said roller in opposed senses so that in use when said roller is in said first position rotation in one sense displaces said first page under said roller and releases said first page and when said roller is in said second position rotation in the opposite sense displaces said second page under said roller and releases said second page, a flap carried on said mounting, said flap extending alongside said roller, means for moving said flap relative to said support so that in use said flap moves a released page to the opposed side of the book spine and control means for controlling said mounting moving means and said roller drive means.

**4,160,335**  
**DISPENSERS FOR THE CONTROLLED RELEASE OF PEST-CONTROLLING AGENTS AND METHODS FOR COMBATING PESTS THEREWITH**  
Henry Von Kohorn, Greenwich, Conn., and Agis F. Kydonieus, Kendall Park, N.J., assignors to Herculite Protective Fabrics Corporation, New York, N.Y.  
Continuation of Ser. No. 535,658, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 305,032, Nov. 9, 1972, abandoned. This application Jan. 31, 1977, Ser. No. 764,312  
Int. Cl.<sup>2</sup> A01M 1/20  
U.S. Cl. 43—131

1. A trap for insects comprising:  
a chamber formed at least in part from a laminated dispenser material, said chamber having at least one opening to allow outward passage of the vapors of a volatile insect attractant agent evaporating from the surface of said laminated dispenser material, and also to allow ingress of insects attracted by said volatile insect attractant agent, wherein said laminated dispenser material comprises:  
at least a first solid, non-porous, polymeric wall element having at least a first outer surface exposed to the environment of said dispenser,  
connector means on said trap for mounting said trap on another structure,



at least one inner layer of said laminate between said first and second wall elements comprising a layer of a solid, polymeric composition, said inner layer comprising:  
at least one pest controlling agent and at least one volatile insect attractant agent, said agents being capable of migrating through said first wall element and being present in said inner layer in sufficient amount so that upon migration of at least a portion of each of said agents through said



first wall element, effective levels of said pest controlling agent and said volatile insect attractant agent are present on said first outer surface of said wall element, and said pest controlling agent and said volatile insect attractant agent having rates of migration through said wall element so that said agents become available upon said first outer surface of said first wall element and in the surrounding environment in accordance with a desired dosage regimen for effective control of a target insect species.

4,160,336

## METHOD FOR TREATING FIREANTS

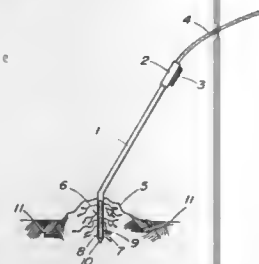
Grady W. Query, 1725 Matthews Mint Hill Rd., Matthews, N.C. 28105, and O. Grady Query, 1742 Sam Rittenburg Blvd., Charleston, S.C. 29407

Filed Feb. 9, 1978, Ser. No. 876,204

Int. Cl.<sup>2</sup> A01M 7/00

U.S. Cl. 43—132 A

8 Claims



1. A method of treating fireants in ant hills comprising:  
(a) combining an insecticide and a refrigerant into a mixture;  
(b) injecting said mixture into said ant hills;  
whereby said refrigerant immobilizes said fireants long enough for said insecticide to treat said fireants.

4,160,337

## HOLLOW STRUCTURAL ELEMENT FOR ASSEMBLING A STRUCTURE

Artur Fischer, Weinhalde 34,, D-7244 Waldachtal Tumlingen, Fed. Rep. of Germany

Filed Aug. 24, 1977, Ser. No. 827,310

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 7628472[U]

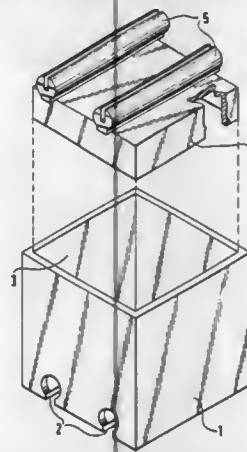
Int. Cl.<sup>2</sup> A63H 33/08

U.S. Cl. 46—26

7 Claims

1. A hollow structural element for assembling a structure, comprising a hollow body part having one end face and a hollow which extends in one direction and has an open end at said one end face, said hollow body part further having another end face and being provided with at least one undercut

groove in the other end face, for connecting said body part with another structural element; a separate cover which is not connected with said body part and has dimensions in two opposite directions transverse to said one direction, corresponding to those of said hollow of said body part so that said cover is connectable to said body part by being fully inserted into said hollow of said body part by movement in said one direction through said open end, said cover having a first surface facing toward said hollow of said body part and a second surface facing away from the latter; and at least one



elongated undercut projection arranged on said second surface of said cover and extending in one of said transverse directions over the entire cover member and projecting outwardly beyond a side margin of the latter so as to abut against said one end face of said body part when said cover is fully inserted in said hollow of said body part, whereby said elongated projection simultaneously can connect said cover to a further structural element and prevents said cover from excessive movement inwardly of said open end of said hollow of said body part.

4,160,338

## SOUND EMITTING AND WETTING DOLL

Paul Lyons, Darenth, England; Fred Zant, Boonton, N.J., and Charles Resnick, Great Neck, N.Y., assignors to Ned Strongin Associates, Inc., New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,253

Claims priority, application United Kingdom, Dec. 29, 1976, 54203/76

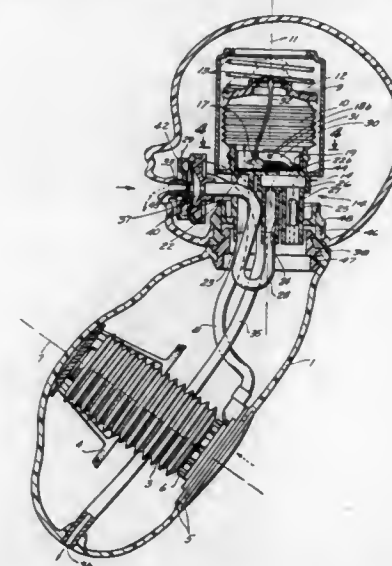
Int. Cl.<sup>2</sup> A63H 29/16

U.S. Cl. 46—44

10 Claims

1. A doll comprising a hollow head and a hollow body communicating with said head and having a flexible wall, a body bellows mounted within said body and operatively associated with said flexible wall for compression when said flexible wall is depressed inwardly, said body bellows having an air outlet opening, a head bellows mounted within the interior of said hollow head and having an inlet port, and outlet port, an outlet valve normally closing said outlet port, and biasing means urging said head bellows to a compressed position, pneumatically-operated sound producing means mounted within said head and communicating with the outlet port of said head bellows through said outlet valve, conduit means connecting the air outlet opening of said body bellows to the inlet port of said head bellows for supplying a charge of air to the interior of said head bellows with each compression of said body bellows, said head bellows being adapted to expand in successive increments from said compressed position to an expanded release position upon successive compressions of said body bellows, and valve release means mounted within said head bellows and operatively connected to a movable portion of said head bellows and to said outlet valve for opening said outlet

valve in response to expansion of said head bellows to said release position, whereby upon opening of said outlet valve, said biasing



means moves said head bellows to said compressed position, causing air in said head bellows to escape through said outlet port in a sudden flow through said sound producing means.

4,160,339

## TOY FLYING VEHICLE INCLUDING SOUND EFFECT GENERATOR

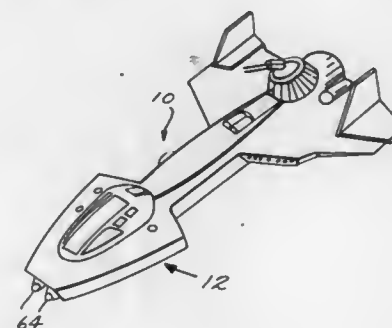
Scott Dankman; Richard C. Levy, and Bryan McCoy, all of 1001 Spring St., Silver Spring, Md. 20910

Filed May 18, 1978, Ser. No. 907,281

Int. Cl.<sup>2</sup> A63H 27/00

U.S. Cl. 46—227

29 Claims



1. A toy flying craft comprising:

a body;  
attitude sensing means, fixed to said body, for generating an electrical signal in accordance with the attitude of said body;  
electronic means, responsive to said attitude signal for generating a multi-tone engine noise simulation signal having frequencies in accordance with said attitude; and  
transducer means responsive to electrical input signals applied thereto for generating audio representations of said input signals, said engine noise simulation signal being applied as an electrical input signal to said transducer means.

4,160,340

## PLANT PROTECTION DEVICE

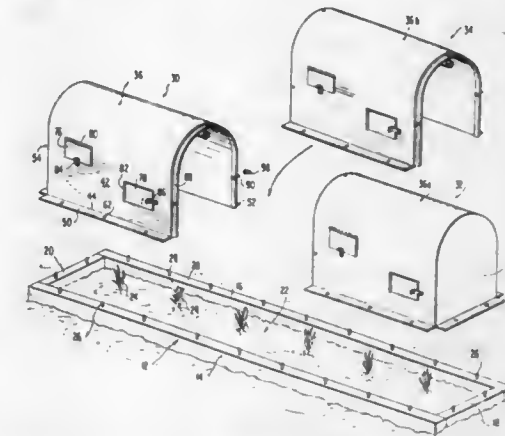
Albert M. Levett, 1685 Michigan Ave., Miami Beach, Fla. 33139

Filed Nov. 17, 1977, Ser. No. 852,430

Int. Cl.<sup>2</sup> A01G 9/16, 9/24

U.S. Cl. 47—27

2 Claims



1. Means for the protection and treatment of growing crops comprising:

a ground based heavy enclosure including side stringers and end blocks;  
a series of connector elements fixedly secured at spaced intervals along the stringers and end blocks, said connector elements comprising upstanding bolts partially embedded in the stringers and end blocks;  
the ground based enclosure surrounding a plurality of growing plants;  
a vertically removable sectional cover assembly for said enclosure including a plurality of end-to-end joined vertically removable light weight sheet metal sections including an elongated arch form body portion; the arch form body portions having a top portion and sides with opposite lower side edges;  
ventilation means for the cover assembly comprising a series of ports formed in the sides of the body portions and having doors pivotally mounted on the sides adjacent the ports;  
a horizontal flange extending outwardly from each of said lower side edges;  
a first end wall on the body portion of one of said sections having a bottom end edge, and a horizontal end flange projecting outwardly from said edge;  
a closed end wall on another of said sections having a bottom end edge with an outwardly projecting flange; the flanges having a plurality of holes formed therein;  
the cover assembly being dimensioned to overlie the enclosure with the flanges of the side edges resting on the side stringers and the end flanges of said sections on the end blocks, with said bolts extending through the holes provided therein;  
wing nuts threaded to the ends of the bolts projecting vertically from the holes within said flanges to releasably clamp said cover assembly in place for ready vertical lift removal from said ground based heavy enclosure;  
a liquid spray system including an inlet hose extending through an end wall of said cover assembly and being connected to a liquid source outside the cover assembly, and an outlet spray tube extending along the top portion of the cover assembly, said spray tube comprising end-to-end joined tube sections corresponding to the cover assembly section and being fixed to the bottom of said cover assembly section at the center thereof, said outlet spray tube having orifices to form the spray at spaced intervals; said one end wall having a port formed therein;  
a bracket on said one end wall below and adjacent the port; and

a heat transfer device removably mounted on the bracket, said heat transfer device having fan means therein to introduce heated or cold air into the cover assembly, the connecting ends between adjacent sections for one of said sections bearing a depressed lip and receiving the edge of the other adjacent section such that said edge overlies said lip; whereby, the outside surfaces of the adjacent sections are flush with each other, and bolts extending perpendicularly from said lip and fixed thereto and extending through holes within the edge of the adjacent section to lock said sections against longitudinal movement but permitting ready vertical lift of said sections from said ground based heavy enclosure upon unthreading of said wing nuts, and threaded connector means for threadably connecting the ends of the respective outlet spray tubes of adjacent sections to permit rapid completion and disconnection of the flow path for the liquid spray system throughout the length of said removable sectional cover assembly and permitting rapid placement and removal of said vertically removable sectional cover assembly and the components carried thereby.

4,160,341

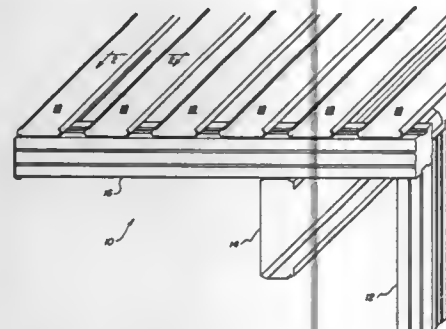
## GARDEN CANOPY

James A. Drake, 1132 Burgess Blvd., Dallas, Tex. 75207

Filed Jul. 26, 1977, Ser. No. 819,171

Int. Cl.<sup>2</sup> A01G 13/00

U.S. Cl. 47—28 R



1. A canopy for covering a garden or plant growing area, comprising:
- an elevated support structure including a plurality of spaced support elements; and
  - a plurality of uniformly spaced-apart elongated panel members extending transverse to said support elements and being supported therefrom, said panels being in a spaced parallel arrangement, each of said panels being formed from uniform thickness material and having a uniform cross section with a flat bottom portion and inwardly curved edge sections attached from each of the longitudinal edges of the bottom portion and extending upwardly therefrom to form a trough between the edge sections and above the bottom portion of each said panel, said inwardly curved edge sections being exclusively semicircular and integrally formed with the flat bottom portion of each said panel.

4,160,342

## POTS FOR GROWING PLANTS

Grant M. Dryer, Houston, Tex., assignor to Canaird Sales Ltd., Scarborough, Canada

Filed Jul. 1, 1977, Ser. No. 812,344

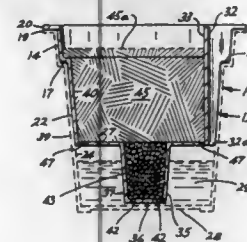
Int. Cl.<sup>2</sup> A01G 9/02

U.S. Cl. 47—80

10 Claims

1. Pot apparatus for growing plants, comprising an outer pot structure having a surrounding upstanding side wall and a horizontally disposed bottom, an inner pot structure having a surrounding upstanding side wall and a horizontally disposed bottom including a central well portion extending down-

wardly from its center having a surrounding side wall and a horizontally disposed bottom, said inner pot structure being removably disposed within said outer pot structure and including means around its upper end releasably sealedly engaged with said outer pot structure, the upper ends of said outer and inner pot structures terminating upwardly at substantially the same level, said inner pot bottom being spaced well above said outer pot bottom and said well bottom being closely spaced above said outer pot bottom, opening means through said inner pot bottom and opening means through said well bottom, said side wall of said inner pot structure being offset inwardly at a circumferential portion thereof to form a vertical passage



means between said outer and inner pot structures extending from said upper ends of said outer and inner pot structures downwardly to said inner pot bottom and providing an entrance for introducing water into the lower part of said outer pot structure around said well without removal of said inner pot structure, said well including means for causing water to rise upwardly through said well to wet soil placed in said inner pot structure above said well, any excess water in the soil above said bottom of said inner pot structure draining through said opening means through said inner pot bottom to be returned to said lower part of said outer pot structure around said well.

4,160,343

## WINDOW SHUTTER AND MOUNTING THEREFOR

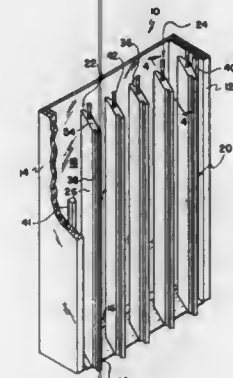
Junius P. Hubbard, P.O. Box 555, Aransas Pass, Tex. 78336

Filed Sep. 30, 1977, Ser. No. 838,217

Int. Cl.<sup>2</sup> E06B 7/086

U.S. Cl. 49—90

16 Claims



1. A shutter arrangement for selectively obscuring and uncovering a window, comprising
- a plurality of elongate slats, at least one end surface of each slat is concave toward the slat; and
  - means mounting the slats for movement between a first position for obscuring the window and a multiplicity of second positions transverse to the first position for at least partially uncovering the window, the mounting means comprising
  - means individually mounting each slat for movement about an axis extending longitudinally of the slats; and
  - means for individually holding each slat in any one of the

second positions including a resilient deformable member mounted in non-rotating relation to the window and of convex configuration complementary to the concave end surface of the slats, the resilient member being deformed only when the slats are in any one of the second positions.

4,160,344

## SUSPENSION DEVICE FOR A SUPPORT

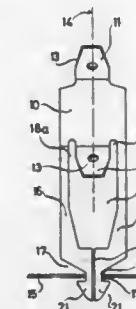
Johannes A. H. Brugman, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Dec. 15, 1977, Ser. No. 860,877

Int. Cl.<sup>2</sup> E04B 5/52

U.S. Cl. 52—39

9 Claims



1. A suspension device for a support, having an opening, in particular a support for fixing panels, said device comprising, in combination:
- (a) a body portion;
  - (b) an upper arm of resilient material projecting laterally from a junction point on said body portion;
  - (c) a lower clamping arm projecting laterally from a junction point on said body portion, said upper and lower arms diverging from one another;
  - (d) means defining an orifice in each of said arms, said orifices being axially aligned to receive a support bar;
  - (e) a pair of legs which extend downwardly from said body portion and having lower free ends, the legs extending at least up to the junction point of said lower lateral arm, the legs extending past opposite sides of the lower arm;
  - (f) locking feet portions formed on the lower ends of said legs;
  - (g) means defining an opening in the body between the legs for rendering said legs flexible, the width of the opening being at least equal to the width of the lower arm;
  - (h) said opening having portions which extend alongside the lower clamping arm at least up to the junction point of the latter with the body; and
  - (i) said locking feet portions being formed to engage in said opening in said support by snap-in action.

4,160,345

## DOME STRUCTURE AND METHOD OF CONSTRUCTION

David L. Nalick, 10789 Freer St., Temple City, Calif. 91780

Division of Ser. No. 705,074, Jul. 14, 1976, Pat. No. 4,075,813.

This application Aug. 22, 1977, Ser. No. 826,344

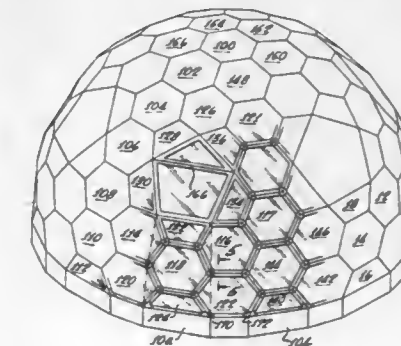
Int. Cl.<sup>2</sup> E04B 1/32

U.S. Cl. 52—81

8 Claims

1. A geodesic dome comprising a plurality of hexagonal units, each said unit comprising a plurality of elongated structural elements and continuous, bendable connector means secured to adjacent elements for joining said elements in end to end relation in a hexagonal configuration for relative angular motion with respect to one another, and means for interconnecting said hexagonal units to one another to form a dome-like structure with the elements of one unit contiguous to elements of a plurality of adjacent units throughout a major portion of the lengths of such elements, all units of a group of said units being initially formed with mutually congruent regu-

lar hexagonal shapes, at least some of the units of said group being distorted from said initial regular hexagonal shape upon



assembly of said dome to allow said units to interfit more closely with one another.

4,160,346

## ROOF COATING COMPOSITION AND CONSTRUCTION

John H. Kaufmann, Somerset Parish, Bermuda, assignor to Global Coatings Limited, Hamilton, Bermuda

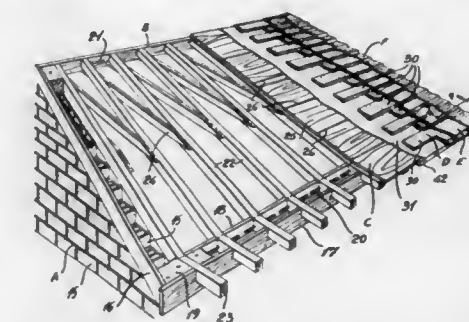
Filed May 11, 1977, Ser. No. 795,888

Claims priority, application United Kingdom, May 11, 1976, 19410/76

Int. Cl.<sup>2</sup> E04B 7/00; E04D 11/00

U.S. Cl. 52—96

11 Claims



1. A roof structure comprising, a deck covered by an insulating blanket of synthetic resin foam,
- a continuous protective sheath covering the blanket and adhering tenaciously to the surface thereof and made up of a thin hard load supporting shell having high impact, flexural and tensile, and thin section strength from about 1.5 mm to about 5.0 mm thick of reinforced concrete made with hydraulic cement modified with a minor amount of a synthetic resin latex cement modifier, a fine aggregate and reinforcing material,
  - said shell covered by a soft weather-resistant rubbery-textured microporous membrane adhering tenaciously to its surface and having a thickness from about 0.75 mm to about 3 mm thick and laid down from a binder material of a non-plasticized latex of elastomeric type polymer filled with finely divided extender.

4,160,347

## ROOF FLASHING STRUCTURE

Duane D. Logsdon, Fullerton, Calif., assignor to The Logsdon Foundation, Stanton, Calif.

Filed Mar. 6, 1978, Ser. No. 883,420

Int. Cl.<sup>2</sup> E04B 7/00

U.S. Cl. 52—199

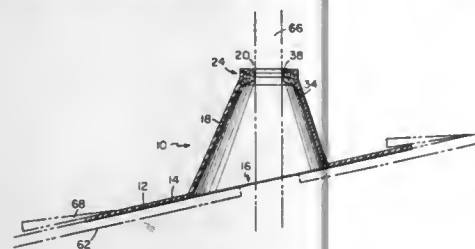
7 Claims

1. A roof flashing structure used to form a seal between a roof and a pipe, extending through the roof, of the type



wherein a generally flat plate having a centralized opening of a larger dimension than said pipe, and an upstanding tapered housing having an internal dimension larger than said pipe are integrally formed of a rigid material such that said housing extends upward from said plate and said centralized hole in said plate forms the lowermost opening in said housing, the improvement which comprises:

said housing having an annular retaining means extending around the uppermost periphery of said housing, said retaining means consisting of an interior wall and an exterior wall which are opposite to each other, said exterior wall being formed integrally with and forming the uppermost portion of said housing, a top wall connecting said interior and exterior walls, said walls forming a circular channel opening generally downward toward said plate;



a resilient, elastomeric sealing means, said sealing means having a groove extending circularly around the upper surface of said sealing means, and said groove dividing the upper portion of said sealing means into an outer rib and an inner rib of such dimension that when said sealing means is fitted into said retaining means said outer rib of said sealing means fits closely within said channel in said retaining means;

said inner rib of said sealing means having a plurality of sealing flanges extending circularly around said rib and projecting radially toward the center of said sealing means, said flanges each being independently capable of engaging with and forming a seal with said pipe.

4,160,348

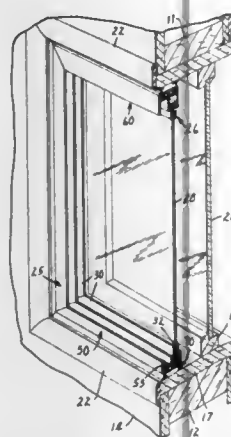
## INTERIOR STORM WINDOW CONSTRUCTION

Harvey A. Chapman, Richfield; John S. Fowler; John C. P. Huang, both of Roseville, all of Minn., and James B. Leslie, Wheatridge, Colo., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1977, Ser. No. 852,059  
Int. Cl.<sup>2</sup> E06B 3/26

U.S. Cl. 52—202

8 Claims



1. An interior storm window construction comprising a pair of identical and reversible window sashes having window panes which sashes, when placed in a frame, will

interlock at the adjacent edges to seal and provide a mutual support for the sashes, and a frame structure adapted to form the frame for the window sashes, said frame comprising four frame members which are joined together at their ends and adapted to fit in a window casement and define a rectangular opening, each of said frame members being formed of a polymeric material and being formed with a pair of parallel longitudinally extending channels adapted to receive an edge of said window sashes and said channels each having means for adjusting the position of the frame member with respect to the window casement supporting the same to seal the frame members with relation to the window casement and having openings to accommodate permanent fastening members to secure said frame members to the interior of the window casement to define a rectangular opening, one of said frame members being formed with a cross-section differing from the other three said frame members to afford a channel of increased depth for forming a top frame member.

4,160,349

## INSULATING MODULAR PANEL UNITS

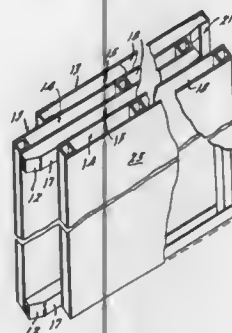
Camiel R. DeSchutter, 20907 Ardmore Pk., St. Clair Shores, Mich. 48081

Division of Ser. No. 680,037, Apr. 26, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,209

Int. Cl.<sup>2</sup> E04B 5/52

U.S. Cl. 52—481

31 Claims



1. An insulating barrier to cold, heat, moisture and sound comprising a plurality of modular panel units in side by side relationship, each said modular unit comprising at least two spaced parallel pressboard panel members each having parallel outer and inner surfaces and opposed top and bottom and opposed side edges, reflective means on the entire outer and inner surfaces of each of said pressboard panels, a first set of generally parallel spacer members between said panels overlying said inner reflective surfaces secured to said inner surfaces of said pressboard panels and extending between one pair of opposed edges of said pressboard panels to space them from one another, each said spacer member of said first set comprising an enclosed tubular member spaced from and isolated from adjacent spacer members of said first set, a second set of parallel spacer members overlying said outer reflective surfaces of each of said pressboard panels secured to said outer surfaces of each of said pressboard panels and extending between the other pair of opposed edges of each of said pressboard panels, each said spacer members of said second set comprising an elongated member spaced from and isolated from adjacent spacer members of said second set, and an additional panel secured to each of the second sets of spacer members, whereby when the modular units are assembled in side-by-side and top-to-bottom relation, the

first set of spacer members are aligned and the second sets of spacer members are aligned.

4,160,350

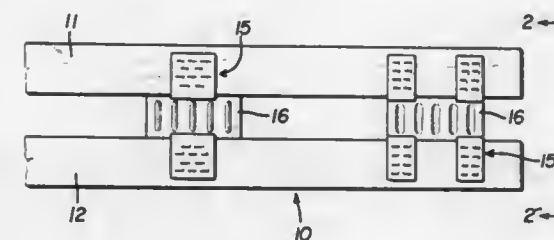
## FLOOR JOIST PLATE

Rupert G. Craib, 45654 Sherri Ct., Mt. Clemens, Mich. 48044  
Filed Jul. 3, 1978, Ser. No. 921,280

Int. Cl.<sup>2</sup> E04C 3/12

U.S. Cl. 52—696

5 Claims



1. In a joist formed of a pair of horizontally arranged, vertically spaced apart, parallel wood strips, as for example wood 2x4's, and connector plates rigidly interconnecting and relatively positioning these strips, an improved connector plate comprising:

said connector plate being formed of an initially flat, thin, stiff metal sheet having a central, roughly rectangular shaped spacer web section arranged in the vertical plane between the facing edges of the wood strips; the upper and lower portions of the sheet, i.e., the portions above and below said section, each being vertically slit to form separate upper and lower legs, each integrally joined to its respective upper and lower section edge; at least one of the upper legs and at least one of the lower legs being bent horizontally to form a horizontal support portion, and then being bent vertically to form a vertical connector portion, with the horizontal support portion arranged to engage the facing edge of its adjacent wood strip for holding and spacing the strips, and all of the legs having connector portions overlapping the parallel vertical faces of said strips, with the connector portions of adjacent legs being alternately arranged on the opposite faces of its respective wood strip so that the wood strip is closely received in a channel-like holder formed by the adjacent legs at each of the upper and lower edges of the spacer web section; and means formed on the leg connector portions for mechanically fastening them to the wood strips.

4,160,351

## FRONT FLAP OPENER

James W. Mais, South Euclid; David L. Bianchi, Kent, and Theodore L. Barker, Hudson, all of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed Jan. 19, 1978, Ser. No. 870,619

Int. Cl.<sup>2</sup> B65B 43/39

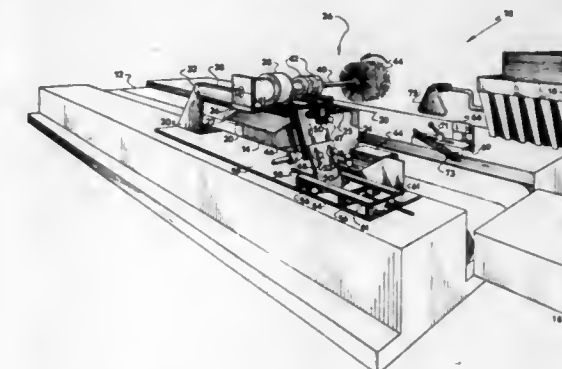
U.S. Cl. 53—76

19 Claims

1. Apparatus for opening the front flap of a container, comprising:

first means for transporting containers in a predetermined direction, the containers having the front flap thereof folded inwardly of the container; second means comprising a brush rotatably mounted upon a shaft and positioned above said first means for engaging the front flap of the container; third means connected to said second means for transporting said second means in said predetermined direction; and

fourth means operatively connected to said second and third means for sensing the presence of a container beneath said



second means and thereupon actuating said second and third means.

4,160,352

## PACKAGING METHOD AND APPARATUS

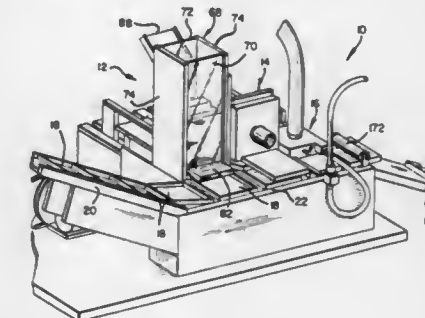
Elias Neff, Yellow Springs, Ohio, assignor to Antioch Bookplate Company, Yellow Springs, Ohio

Filed Nov. 17, 1977, Ser. No. 852,209

Int. Cl.<sup>2</sup> B65B 7/28; B65C 1/02

U.S. Cl. 53—137

8 Claims



1. Packaging apparatus comprising: means for conveying a first box component along a first path, means for conveying a second box component along a second path intersecting said first path, said box components including main wall portions and side wall portions projecting from said main wall portions and one of said box components being smaller than and receivable in the other of said box components, means for synchronizing movement of said box components along their respective paths such that said components are aligned at the intersection of their paths, means for imposing a negative pressure above a leading edge of one of said components as it reaches the intersection of the paths of said components for raising the leading edge of said one of said components such that the adjacent side wall portions of said components are clear of each other, said means for conveying said second box components including a pusher plate for pushing individual ones of said second box components across the path of said first box components and thereby sliding said individual ones of said second box components across individual ones of said first box components, and means urging said individual ones of said second box components down onto said individual ones of said first box components.

4,160,353

**BOTTLE PACKAGING MACHINE**

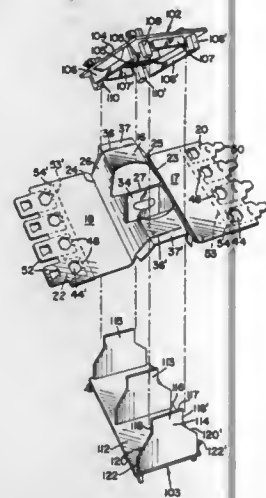
Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Division of Ser. No. 805,885, Jun. 13, 1977, Pat. No. 4,100,715. This application Apr. 7, 1978, Ser. No. 894,501

Int. Cl.<sup>2</sup> B65B 61/14, 21/24

U.S. Cl. 53—393

10 Claims



1. In a machine for packaging an assembly of articles, which are in row arrangement, in a wrap-around type wrapper of foldable sheet material having a top wall panel, adjoining side wall forming panels and bottom wall forming panels, with certain panels cut therein and adapted to be folded inwardly on a transverse hinge line for positioning between top portions of adjacent articles, a mechanism for folding certain of said panels prior to positioning the wrapper on the articles which mechanism comprises a pair of endless traveling conveyors arranged with oppositely disposed confronting runs and having mounted thereon cooperating forming die members which extend in an outboard direction on the conveyors and which are arranged to mate with each other when advancing along said confronting conveyor runs, means for advancing successive wrappers between said mating die members, and said die members having means for engaging on opposite faces of the wrappers so as to fold certain of the panels on each said wrapper into predetermined position.

4,160,354

**PACKING HEAD FILL SAFETY DEVICE**

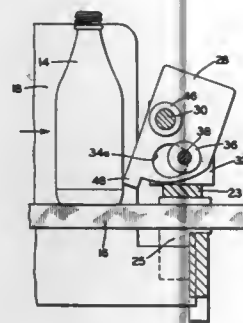
Wayne E. Asper, Albany, Ga., assignor to A-T-O Inc., Willoughby, Ohio

Filed May 19, 1978, Ser. No. 907,483

Int. Cl.<sup>2</sup> B65B 57/10

U.S. Cl. 53—497

6 Claims



1. A safety device for a case packer filling head wherein a plurality of rows of abutted articles are fed into the filling head, an individual pivotally positioned stop member is provided for

each of the rows of articles being fed to the filling head, and wherein an article moved completely into the filling head strikes a stop member to move it to an operative position but with the stop member having a normally inoperative safety position, the improvement comprising a control bar extending transversely of the filling head and extending through a non-circular aperture provided in each stop member, means urging said control bar axially, and a stop collar on the control bar for each of the stop members and sized complementary to a portion of the aperture provided in said stop member to be movable into such aperture only when the stop member is moved to an operative position at which time when all stop members are so operatively positioned, the control bar is moved axially for a control action on the filling head and articles positioned therein.

4,160,355

**FORAGE HARVESTER AND ROW CROP ATTACHMENT THEREFOR**

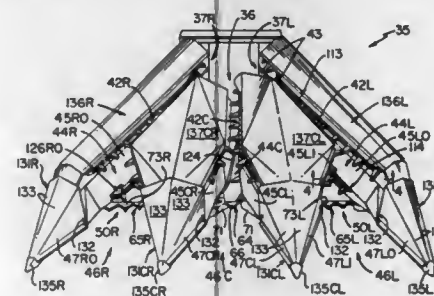
Nathan L. Blake, Coldwater, and Robert A. Stelzer, Celina, both of Ohio, assignors to Avco Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 599,929, Jul. 28, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 746,673

Int. Cl.<sup>2</sup> A01D 45/02

U.S. Cl. 56—98

3 Claims



1. A forage harvester unit adapted to move forwardly to harvest simultaneously three rows of crops spaced from one another by a distance within a range of 28 to 42 inches, comprising:

- a main body having
- a left hand outer divider,
- a left hand inner divider,
- a right hand inner divider and
- a right hand outer divider,
- the left hand dividers having opposed walls extending forwardly and outwardly to the left and successively defining a channel section and diverging throat and mouth sections forming a left hand crop receiving passage, the inner dividers having opposed walls extending forwardly and successively defining a channel section and diverging throat and mouth sections forming a central crop receiving passage, and the right hand dividers having opposed walls extending forwardly and outwardly to the right and successively defining a channel section and diverging throat and mouth sections forming a right hand crop receiving passage;

left hand cutter means disposed across the left hand throat, central cutter means disposed across the central throat and right hand cutter means disposed across the right hand throat,

the central cutter means being adapted to cut the center row of a three row group of crops, the left hand and right hand throat sections and cutter means each having a width substantially greater than the width of the central throat section and cutter means, so that the harvester requires no adjustments to harvest variously spaced groups of three rows of crops within said range;

an upper pair of gatherers individually operatively positioned along the opposed walls of the left hand passage, a second upper pair of gatherers individually operatively positioned along the opposed walls of the right hand passage, a lower pair of gatherers individually operatively positioned along the opposed walls of the left hand passage, a second lower pair of gatherers individually operatively positioned along the opposed walls of the right hand passage, and gathering means in the central passage, the lower pair of gatherers in the left hand passage sweeping across and over the left hand cutter means, the lower pair of gatherers in the right hand passage sweeping across and over the right hand cutter means; the inboard wall of the left hand passage being formed with an outboard extending shoulder proximate to the left hand cutter means and the inboard wall of the right hand passage being formed with an outboard extending shoulder proximate to the right hand cutter means.

4,160,356

**DRIVE FOR MOWER**

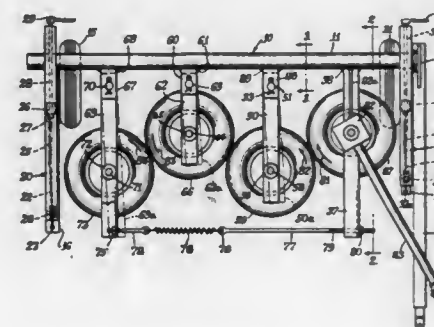
Bernard C. Mathews, 8606 Rte. 176, Crystal Lake, Ill. 60014

Filed Feb. 6, 1978, Ser. No. 875,747

Int. Cl.<sup>2</sup> A01D 56/26

U.S. Cl. 56—192

15 Claims



1. A drive for a mower having a wheel supported frame, a plurality of horizontally disposed cutters adapted to be rotated about their centers in a generally horizontal plane, means carrying said cutters on said frame, a plurality of horizontally disposed generally transversely positioned pneumatic tired wheels adapted to be rotated about their centers in a generally horizontal plane, means carrying said pneumatic tired wheels on said frame, means imparting rotational drive to one of said pneumatic tired wheels, means causing said pneumatic tired wheels to have frictional engagement at their adjoining surfaces, means imparting drive from said pneumatic tired wheels to said cutters, whereby said driven pneumatic tired wheel imparts drive to all of said pneumatic tired wheels and said means imparting drive from said pneumatic tired wheels to said cutters causes said cutters to be rotatably driven.

4,160,357

**CATCHING SURFACE SEAL AND ROTATING TRUNK FOR A CONTINUOUS TREE CHOP HARVESTER**

Donald L. Peterson, East Lansing, Mich., and Gordon E. Monroe, Warner Robins, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 28, 1978, Ser. No. 882,003

Int. Cl.<sup>2</sup> A01D 46/24

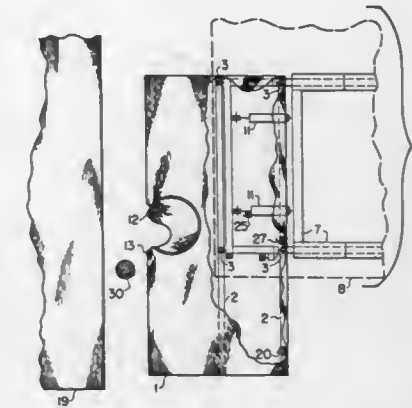
U.S. Cl. 56—329

8 Claims

1. An apparatus for sealing the catching surface of a continuous tree crop harvester comprising in combination:

- (a) a right catching surface;

- (b) a track system comprising two parallel channel tracks affixed to one side of said right catching surface;
- (c) a support means for said track system consisting essentially of four bearings which allow the track system to freely slide over said bearings, and said support means also allowing said track system to freely slide over said support means;
- (d) four vertical columns affixed to and supporting said support means;
- (e) two rigid horizontal members affixed to and supporting said four vertical columns;



- (f) two support housings supporting said horizontal members but with said horizontal members capable of sliding through said housing;
- (g) a main frame of one half of a continuous moving harvester rigidly fastened to said support housings;
- (h) a left catching surface to be overlapped by said right catching surface;
- (i) hydraulic cylinders which when energized move the right catching surface over and away from the left catching surface;
- (j) a first micro-switch to activate said hydraulic cylinders.

4,160,358

**FEEDING WAGONS**

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

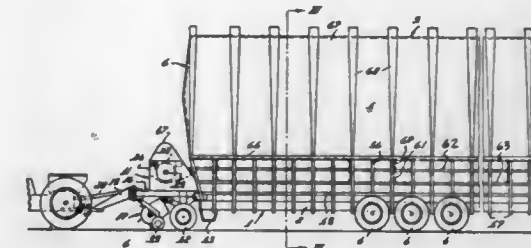
Filed Jul. 21, 1976, Ser. No. 707,568

Claims priority, application Netherlands, Jul. 23, 1975, 7508767; Apr. 22, 1976, 7604253

Int. Cl.<sup>2</sup> A01D 87/00; A01K 5/00

U.S. Cl. 56—344

60 Claims

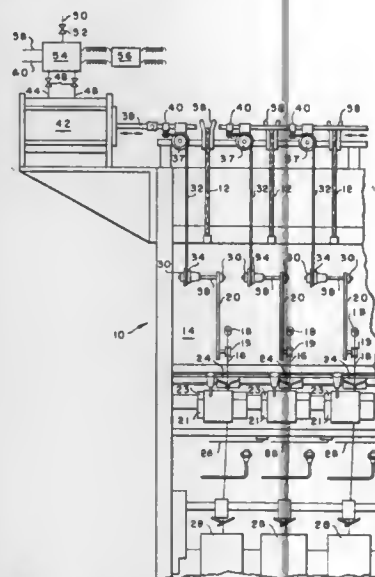


1. A feeding wagon for cattle comprising a substantially horizontally disposed frame and forward and rearward ground wheels on said frame supporting said frame above the ground, a crop containing receptacle being mounted on said frame, said receptacle having a pair of side walls and a substantially flat as seen from the side floor, each wall having a plurality of beam means extending upwardly from said floor secured to a horizontal beam in their higher aspects above said floor, said beam means arranged through the length of said receptacle and defining opening means in said receptacle of a height and width whereby crop within the receptacle is accessible



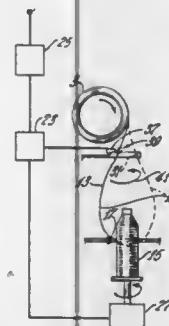
through said opening means to cattle from outside thereof beginning at the level of said floor and above, said receptacle having forward and rearward end walls for containing crop therein, said forward end wall defining an entrance substantially at the level of said floor, a crop feeding device adjacent said entrance that is adapted to move crop into said receptacle at the level of said floor for loading said wagon from the floor up, said device being coupled to the forward end of said frame by coupling means and comprising a pick-up member for picking crop up off the ground and an advancing member positioned to cooperate with said pick-up member and move crop through said entrance into the receptacle in a substantially horizontal direction.

**4,160,359**  
**RANDOM SIGNAL GENERATOR FOR THE**  
**MANUFACTURE OF SLUB OPEN END SPUN YARN**  
 Zane Frentress, Stone Mountain, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.  
 Filed Apr. 24, 1978, Ser. No. 899,151  
 Int. Cl.<sup>2</sup> D01H 1/12  
 U.S. Cl. 57—58.89



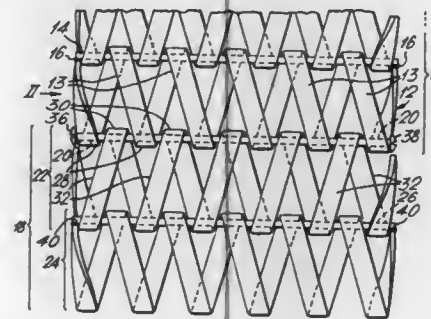
1. Apparatus to produce slub open end spun yarn comprising: a frame, a housing on said frame, means in said housing to produce open end spun yarn, a doff means in communication with said means to produce the open end spun yarn, a yarn take-up roll mounted on said frame, a pair of rolls in nip forming relationship mounted in said frame receiving open end spun yarn from said doff means and supplying said yarn to said take-up roll and means operably associated with said doff means to periodically increase the length of the yarn path between said doff means and said nip rolls and to abruptly decrease the velocity of the yarn from the doff means to substantially zero to allow a fiber build-up in said means to produce an open end spun yarn and to produce a slub in the subsequent open end yarn exiting from said doff tube, said means to periodically increase the length of the yarn path includes a random signal generator, said random signal generator includes a means to allow the number of slubs per unit time to be preselected.

**4,160,360**  
**OPTICAL STRAND SENSOR FOR DETECTING A**  
**FILAMENT BEING WOUND AND TWISTED ON A**  
**SPOOL**  
 Robert L. Carvalho; Sheldon A. Canfield, both of Newark, and Gary Steinbaugh, St. Louisville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio  
 Filed Jul. 27, 1978, Ser. No. 928,343  
 Int. Cl.<sup>2</sup> D01H 13/16  
 U.S. Cl. 57—81



1. An apparatus for detecting a continuous filamentary material comprising a means for guiding said filamentary material placed in the path of the material, a supply for said material, a means for twisting and collecting said material as it is removed from said supply, the path of said material from said supply being substantially a free twist path to said means for collecting said material, said apparatus having a sensor mounted for detecting the presence of the material in the path defined by said supply, collecting means and said guide means.

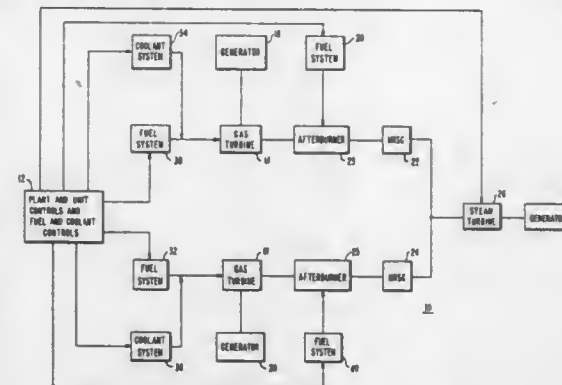
**4,160,361**  
**JEWELRY BRACELETS**  
 Harvey J. East, Holsworthy, England, assignor to Aurifex Limited, Holsworthy, England  
 Filed May 24, 1978, Ser. No. 908,955  
 Claims priority, application United Kingdom, Jun. 2, 1977, 23547/77  
 Int. Cl.<sup>2</sup> F16G 15/00  
 U.S. Cl. 59—82



1. A detachable link assembly for a chain link bracelet comprising  
 a pair of oppositely handed flattened helices including convolutions having meeting ends in the form of arcs which intercalate and cooperatively form a tunnel, said helices having respective free ends;  
 a captive hinge pin passing through the tunnel formed by said intercalating arcs and engaged by the free ends of one of said helices, the convolutions of one of said helices including exposed end arcs defining a tunnel; and  
 a releasable headed pin adapted to pass through the tunnel formed by the exposed end arcs, the free ends of the helix

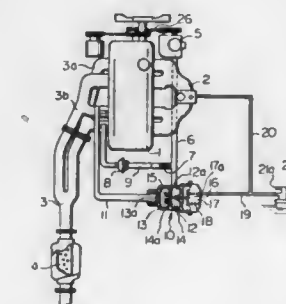
including the exposed end arcs being foreshortened so as not to obturate said tunnel.

**4,160,362**  
**GAS TURBINE AND COMBINED CYCLE POWER PLANT**  
**HAVING REDUCED EMISSION OF NITROGEN OXIDE**  
**AND IMPROVED COOLANT INJECTION FLOW**  
**CONTROL SYSTEM THEREFOR**  
 Alan Martens, Wayne, Pa.; Thomas J. Radkevich, Wilmington, Del., and Jack R. Smith, Ross Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Mar. 31, 1977, Ser. No. 783,248  
 Int. Cl.<sup>2</sup> F02C 7/02, 9/02  
 U.S. Cl. 60—39.18 B



1. An electric power plant comprising a gas turbine which drives an electric generator, a system for supplying fuel to combustors included as a part of said turbine, means for controlling the fuel flow to said combustors to control the turbine speed and load, a system for injecting varying amounts of water into said combustors to control the level of NOx emission, and means for controlling said water injecting system to vary the amount of injected water and limit the NOx emissions as a function of a representation of the load and a representation of the combustor mass air flow including a representation of the position of inlet guide vanes provided for said turbine.

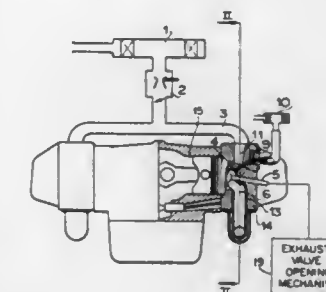
**4,160,363**  
**APPARATUS FOR PURIFYING EXHAUST GAS**  
 Tatsumi Furukubo, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan  
 Filed Sep. 28, 1977, Ser. No. 837,100  
 Claims priority, application Japan, Jul. 22, 1977, 52-087263  
 Int. Cl.<sup>2</sup> F01N 3/10  
 U.S. Cl. 60—290



1. An apparatus for purifying exhaust gas discharged from an internal combustion engine having a plurality of cylinders, which apparatus comprises:  
 an exhaust pipe means provided with two entrance pipes wherein a first entrance pipe of said entrance pipes is communicated with one half of said cylinders and a second entrance pipe of said entrance pipes is communicated with the other half of said cylinders, a joint joining said

entrance pipes together and an exit pipe extending from said joint;  
 a three way catalyzer for converting said exhaust gas disposed at a position downstream of said joint;  
 a secondary air means for supplying secondary air into said exhaust pipe means, said secondary air means being communicated with said first entrance pipe of said exhaust pipe means;  
 an air switching means, the entrance of which is communicated with said secondary air means and the exit of which is communicated with said second entrance pipe, for switching secondary air from said secondary air means toward said second entrance pipe; and  
 a means for detecting an operating characteristic of the engine and for actuating said air switching means so as to stop supplying said secondary air through said air switching means after detection of the fact that said engine characteristic is within a predetermined range, and to cause the alternate oscillation between different air fuel ratios in the exhaust gas passing through said three way catalyzer.

**4,160,364**  
**INTERNAL COMBUSTION GASOLINE ENGINE**  
 Haruo Mori, Tokyo; Tadashige Ueda, and Isamu Endo, both of Musashino, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan  
 Continuation of Ser. No. 605,145, Aug. 15, 1975, abandoned.  
 This application Aug. 8, 1977, Ser. No. 822,620  
 Claims priority, application Japan, Sep. 12, 1974, 49-105360  
 Int. Cl.<sup>2</sup> F01N 3/10  
 U.S. Cl. 60—293



1. An exhaust gas purification system for internal combustion engines having at least two adjacent cylinders each defining a combustion chamber and a displacement volume thereof and each having an exhaust port communicating with the combustion chamber, respectively, comprising  
 an exhaust valve in the exhaust port for each of said cylinders, respectively,  
 a pair of the exhaust ports and a corresponding pair of said exhaust valves of the at least two adjacent cylinders, respectively, being arranged adjacent to each other,  
 a cylinder head having therein a branch port passage communicating with and following the exhaust port of each of a corresponding of said exhaust valves, respectively, a pair of said branch port passages being adjacent one another and communicating with said pair of the adjacent exhaust ports and with said corresponding pair of said adjacent exhaust valves of the at least two adjacent cylinders, respectively,  
 said cylinder head further having therein a common port passage communicatively connected at one end thereof to both adjacent of said branch port passages of said pair of branch port passages forming therewith a siamese port passage,  
 a secondary air intake passage means including a check valve communicating with said branch port passage near said exhaust valve for introducing secondary air into said branch port passage through said check valve by exhaust gas pulsations,

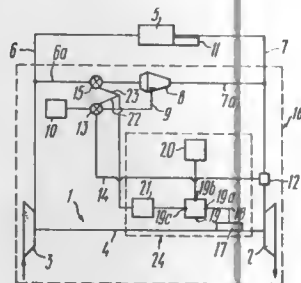
an exhaust pipe connected to another end of said common port passage, said exhaust pipe having a constant cross-section portion of a fixed diameter over its length, without connection to any other exhaust pipe for effective introduction of the secondary air, heat insulation members disposed along said siamese port passage and along at least a region of said exhaust pipe, respectively, the total volume of said siamese port passage and said heat insulated region of said exhaust pipe being equal to the total displacement volume of the corresponding operatively communicating cylinders for effective oxidation of unburned exhaust gas constituents.

#### 4,160,365 COMPRESSION IGNITION ENGINE REGULATION SYSTEM

Alexandr P. Petrov; Evgeny S. Kovalevsky; Anatoly F. Kosyak, and German G. Bondarev, all of Leningrad, U.S.S.R., assignors to Tsentralny Nauchno-Issledovatel'skiy Dizeiny Institut, Leningrad, U.S.S.R.

Filed Aug. 12, 1977, Ser. No. 825,161  
Claims priority, application U.S.S.R., Aug. 23, 1976, 2397628(I)

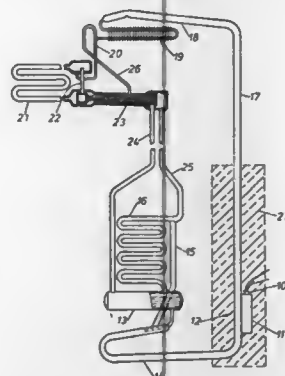
Int. Cl.<sup>2</sup> F02B 37/00  
U.S. Cl. 60—606 2 Claims



1. A compression ignition engine regulation system comprising: a turbocompressor; a turbine forming part of the turbocompressor; a compressor disposed in said turbocompressor and driven by said turbine; a turbocompressor shaft mounting said turbine and said compressor; a compression ignition engine with a low pressure ratio having an air inlet and exhaust outlet, and a crankshaft formed thereof; an air line in communication with said inlet of said engine and said compressor; an exhaust gas line in communication with said outlet of said engine and said turbine; a portion of a further air line connected to said air line; a portion of a further exhaust gas line connected to said exhaust gas line; a combustion chamber having inlet means connected to said portion of the air line and having outlet means connected to said portion of the exhaust gas line in parallel with said engine; a fuel line connected to said combustion chamber; an air control valve arranged to control the delivery of air into said combustion chamber and being formed in said portion of the air line between said combustion chamber; a temperature pickup disposed in said exhaust gas line at the point of entry of hot gases into said turbine; a fuel control valve arranged to control the delivery of fuel into said combustion chamber, said valve being in said fuel line and controlled by said temperature pickup; a turbocompressor speed control circuit comprising, a turbocompressor speed setting unit, a turbocompressor speed pickup, a comparison unit having a first input connected with the output of said setting unit and second input connected with the output of said speed pick-up; and an amplifying unit having an input connected to the output of said comparison unit, the output of said amplifying unit is connected with said air control valve for controlling the delivery of air into said combustion chamber and to said fuel control valve for controlling the delivery of

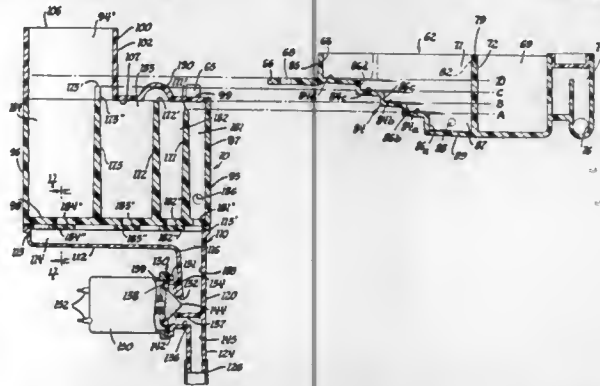
fuel into said combustion chamber, for automatic control of the turbocompressor speed in different modes.

4,160,366  
ABSORPTION REFRIGERATING APPARATUS  
Bengt R. Reistad, Bromma, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden  
Filed Jun. 29, 1977, Ser. No. 811,282  
Claims priority, application Sweden, Jul. 8, 1976, 7607802  
Int. Cl.<sup>2</sup> F25B 15/00, 33/00  
U.S. Cl. 62—476 7 Claims



1. An absorption refrigerating apparatus comprising a boiler system including a pump for the liquid solution therein, a standpipe, said standpipe containing a rectifier, means for supplying heat to said boiler, a flow path provided for the liquid lifted by said pump and opening into said standpipe at a location between said rectifier and said boiler, a pump pipe located within said standpipe for the weak absorption solution supplied by said pump, and a liquid collecting conduit surrounding said pump pipe whereby a flow path is formed therein, the lower end of said conduit communicating with said standpipe, and said liquid collecting conduit being open at its upper end and extending to a plane above the upper opening of said pump pipe.

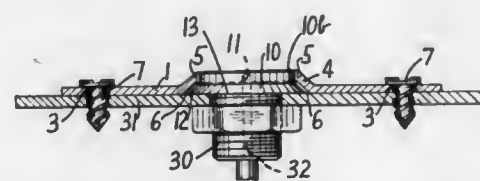
4,160,367  
DUAL CONTAINER ADDITIVE DISPENSER FOR APPLIANCE  
Nick Vona, Jr., Springboro, Ohio, assignor to General Motors Corporation, Detroit, Mich.  
Filed Sep. 11, 1978, Ser. No. 941,274  
Int. Cl.<sup>2</sup> D06F 39/02  
U.S. Cl. 68—17 R 1 Claim



1. In combination, a washing machine comprising a cabinet having water container means, liquid additive dispenser means for said machine including a liquid receiving container and a storage container, said receiving container having a top inlet opening and an outlet formed in the bottom thereof discharging gravitationally through first conduit means into said stor-

age container whereby said storage container may be supported on said cabinet at a location remote from said liquid receiving member, said receiving container having at least one sloping wall formed with a plurality of vertically spaced liquid level indicating means each defining a horizontal plane whereby each said plane is disposed at a predetermined ascending liquid storage indicia level, the lowermost indicating means disposed at a first indicia level above said receiving container outlet, said storage container having a bottom, side walls and floor means separating said container into an upper chamber and a lower chamber, said lower chamber having an outlet formed in the bottom thereof discharging into second conduit means in communication with said water container means, dispenser valve means for selectively discharging all the liquid stored in said dispenser means from said lower chamber outlet into said second conduit means, said upper chamber having a plurality of vertical spaced weir-like partitions dividing same into a plurality of separate reservoirs disposed one adjacent the other, said partitions having their upper free edges serially arranged at predetermined ascending levels substantially corresponding with the liquid level indicia means of said receiving container whereby the first partition, having the lowermost upper free edge, separates the first and second reservoirs; the second portion, having the second lowermost upper free edge, separates the second and third reservoirs and so forth; whereby upon the first reservoir being completely filled with liquid from said receiving container the liquid will overflow the free edge of said first partition into the second reservoir and so forth, said first conduit means connecting said receiving container outlet with said first reservoir, each said reservoir with the exception of said first reservoir having individual reservoir valve means each operable when open to drain its associated reservoir into said lower chamber, said first reservoir having outlet means draining same into said lower chamber, each said reservoir valve means operated to its closed position responsive to a predetermined liquid head pressure in said lower chamber established by the filling with liquid of said lower chamber and said first reservoir, whereby upon said receiving container and said upper chamber being filled with liquid to a level coincident with a preselected receiving container indicating means, the opening of said dispensing valve means results in the reservoir valve means of each reservoir having liquid therein being moved to its open position in response to the drainage of liquid from said lower chamber and said first reservoir such that the total premeasured quantity of liquid stored in said dispensing means is discharged into said water container.

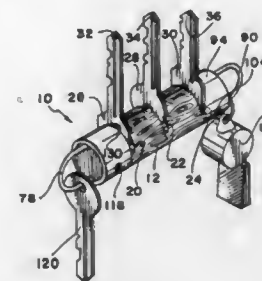
4,160,368  
AUTOMOBILE TRUNK LOCK GUARD  
Joseph E. Solow, 54 Mitchell Ave., Plainview, N.Y. 11803  
Filed Nov. 25, 1977, Ser. No. 854,795  
Int. Cl.<sup>2</sup> E05B 63/00  
U.S. Cl. 70—417 10 Claims



1. An automobile trunk lock guard for securing a key-operated lock cylinder disposed within a mounting aperture formed in the exterior trunk lid surface of an automobile, comprising:  
a guard plate having an aperture formed therethrough, wherein the surface of the guard plate adjacent the guard plate aperture is outwardly beveled with respect to the plate surface to form, with the trunk surface, an annular retaining groove when the guard plate is mounted to the trunk surface;  
a circular insert plate having an outside edge correspond-

ingly beveled to said outwardly beveled surface of said guard plate and adapted to be rotatably retained by the guard plate when said plate is mounted to the trunk surface; and  
means for attaching the guard plate to the trunk surface of the automobile.

4,160,369  
COMBINED KEY HOLDER AND SECURITY DEVICE  
John S. Pearson, 232 S. Pinecrest, Wichita, Kans. 67218  
Filed Jul. 10, 1978, Ser. No. 923,065  
Int. Cl.<sup>2</sup> A47G 29/10  
U.S. Cl. 70—456 R 12 Claims



1. A combined key holder and security device comprising an elongated body having transverse dimensions of a size to be readily gripped by the hand, said body having a plurality of longitudinally spaced transverse slots in one side thereof, with each of the slots having a width sufficient to accommodate reception of the head of a key therein, said slots having longitudinal spacings approximating the widths of the fingers of a body gripping hand, and means carried by the body for releasably retaining the head portion of a key in each of the slots, whereby a selected plurality of keys can be held by the body for selective individual key use while so held, and whereby the body can be gripped in the hand with the shanks of the keys extending outwardly from between the fingers of a gripping hand.

4,160,370  
WATER EMULSIFIABLE LUBRICANT AND COOLANT  
Kenneth J. Hacias, Sterling Heights, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.  
Filed Nov. 15, 1976, Ser. No. 741,901  
Int. Cl.<sup>2</sup> C10M 1/44, 3/38, 5/24, 7/24  
U.S. Cl. 72—42 6 Claims

1. A lubricant and coolant composition for application as an aqueous emulsion to a metal surface prior to cold forming, consisting essentially of: about 47 parts by weight oleic acid, about 12 parts by weight of an ethanolamine, about 23 parts by weight of a heavy mineral oil, about 36 parts by weight of dialkylphenoxypoly(ethyleneoxy)ethanol, about 34 parts by weight of a sodium salt of an alkylpoly oxyethylene phosphate ester, about 98 parts by weight of a light lubricating ingredient selected from the group consisting of a light mineral oil, paraffin wax and an oxazoline wax, and about 750 parts by weight water, the emulsion having a pH ranging from about 7 to about 9.5.



4,160,371

## APPARATUS FOR MAKING A SPIRAL COIL HAVING SPACED TURNS

Hermann Wilkening, Dusseldorf-Kaiserwerth, and Hans-Joachim Loges, Dusseldorf, both of Fed. Rep. of Germany, assignors to Iog Industrie-Ofenbau GmbH, Dusseldorf, Fed. Rep. of Germany

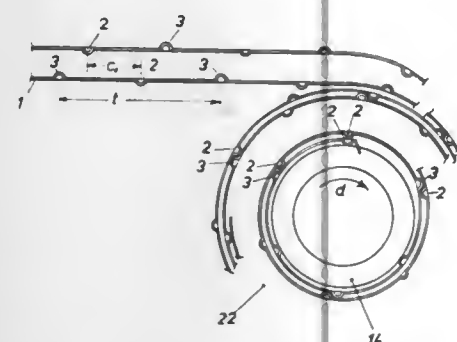
Division of Ser. No. 692,430, Jun. 3, 1976, Pat. No. 4,102,170. This application Dec. 7, 1977, Ser. No. 858,203

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1975, 2524763

Int. Cl.<sup>2</sup> B21C 47/04

U.S. Cl. 72-147

21 Claims



1. Apparatus for making a spiral coil comprising:
  - (a) a winding mandrel including drive means to rotate the mandrel,
  - (b) means for moving a band in uncoiled condition toward, onto and about said mandrel to form the band into a coil,
  - (c) means in advance of said mandrel for continuously forming a succession of regularly spaced deformations in the edges of the band, the deformations alternately protruding from opposite surfaces of the band to determine the spacing of adjacent turns of a coil formed on the mandrel, and
  - (d) means for progressively shifting said succession of deformations along said band for each successive turn of the coil by a predetermined dimension such that all oppositely protruding deformations in adjacent turns come into tangential interlocking engagement with each other, such predetermined dimension of shift taking into account the increase in turn length due to band thickness and coil spacing and the spacing between deformations.

4,160,372

## TRANSFER PRESS HAVING QUICK CHANGE DIE SETS

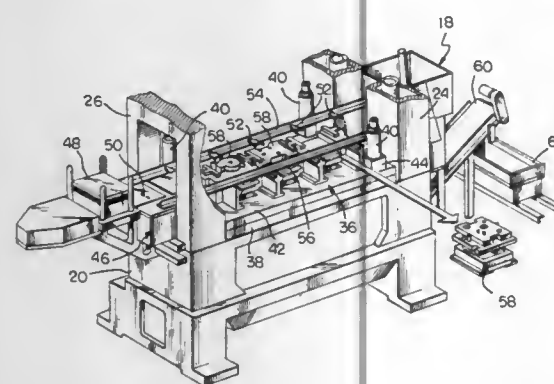
Roland J. Bergman, Richard J. Meyer, and Richard F. Fortman, all of Minster, Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Nov. 28, 1977, Ser. No. 855,313

Int. Cl.<sup>2</sup> B21J 13/02

U.S. Cl. 72-404

25 Claims



1. In a transfer press having a bed, a slide, a plurality of

generally linearly spaced die stations on said bed and slide the improvement comprising: said die stations including an upper and lower quick change die fixture means for supporting and accurately locating matched pairs of cooperating die parts mounted on interchangeable die plates, said fixture means including releasable clamp means for exerting clamping pressure on the die plates when activated, and when deactivated for releasing said die plates so that the upper and lower die plates can be readily removed from said respective die fixtures, and transfer means for advancing the work pieces through the transfer press successively from one said die station to the next each cycle of the transfer press.

4,160,373

## VEHICLE EXHAUST GAS ANALYSIS SYSTEM WITH GAS BLOCKAGE INTERLOCK

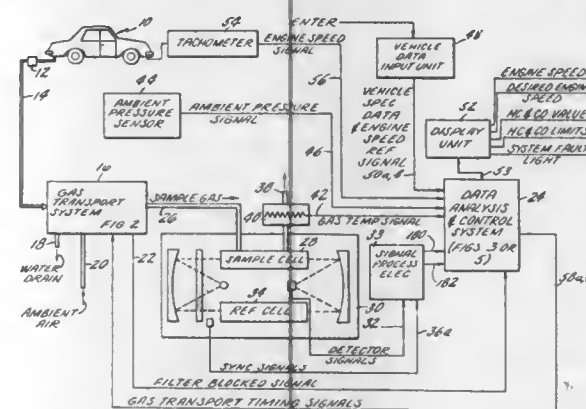
Anthony J. Fastala, Vernon, and Thomas A. Cross, Winsted, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 718,444, Aug. 26, 1976, abandoned, which is a continuation of Ser. No. 639,670, Dec. 13, 1975, abandoned, which is a continuation of Ser. No. 534,494, Dec. 19, 1974, abandoned. This application Feb. 27, 1978, Ser. No. 881,229

Int. Cl.<sup>2</sup> G01N 21/26

U.S. Cl. 73-23

1 Claim



1. An engine exhaust gas analysis system for measuring the amount of a selected contaminant contained within a sample of engine exhaust gas comprising:
  - a gas sample cell adapted to contain a gas;
  - a reference cell containing a reference gas;
  - means including a gas transport system for filling said sample cell with a sample of exhaust gas;
  - sampling means associated with said cells for producing electrical signals related to the concentration of the selected contaminant within the sample of gas;
  - pressure means connected to said gas transport system and responsive to the pressure of gas therein to generate a blockage signal alternatively indicative of whether or not said gas pressure is in excess of a preselected pressure below which blockage of said gas transport is to be presumed; and
  - a data analysis and control system responsive to said sampling means and to said pressure means, for receiving said electrical signals and calculating therefrom the concentration of the selected gas contaminant and providing an output signals indicative thereof, only in concurrence with said blockage signal indicating the pressure in said gas transport system being in excess of said preselected magnitude.

4,160,374

## APPARATUS FOR MEASURING THE DIFFUSIVE RESISTANCE OF PLANT STOMATA

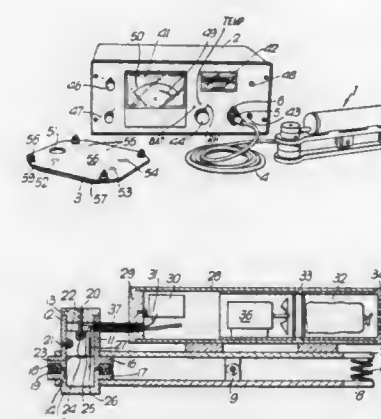
Terence J. Crump, and Janet M. Crump, both of Carlone House, Church Rd., Ramsden Bellhouse, Billerica, Essex CM11 IRR, England

Filed Apr. 24, 1978, Ser. No. 899,600

Int. Cl.<sup>2</sup> G01N 33/00

U.S. Cl. 73-76

7 Claims



1. Apparatus for measuring the diffusive resistance of plant stomata, comprising:
    - a cup;
    - means for sealingly clamping said cup to a plant leaf being tested to define an enclosed air volume in said cup adjacent the surface of the leaf; of humidity sensor in said cup for providing a signal indicative of the humidity of the air in said cup;
    - a counter;
    - control means for receiving the output signal from said humidity sensor and operative to start said counter at a lower set humidity value and to stop said counter at an upper set humidity value, thereby to time the rise in humidity between said lower and upper humidity values in a measurement cycle; and drying means for drying the air within said cup down to a value below said lower set humidity value after each measurement cycle;
- in which apparatus the improvement comprises said control means being adjustable to vary at least one of said lower and upper set humidity values and to vary the difference between said lower and upper set humidity values.

4,160,375

## INDICATOR COMPOSITIONS

Philip I. Brittain, Bray, and Michael R. J. Lyons, Iver, both of England, assignors to Brent Chemicals International Limited, Iver, England

Filed Mar. 13, 1978, Ser. No. 886,325

Claims priority, application United Kingdom, Mar. 17, 1977, 11285/77

Int. Cl.<sup>2</sup> C09K 11/06; G01N 19/08, 21/16

U.S. Cl. 73-104

12 Claims

1. A method of detecting flaws in the surface of an object which comprises applying to the surface a water washable, wash resistant biodegradable dye penetrant composition comprising one or more dyes and at least 70% by weight of a primary alcohol ethoxylate component, the said component consisting essentially only of one or more compounds of formula  $RO(CH_2CH_2O)_mH$  wherein R is the hydrocarbon residue of a substantially straight chain saturated aliphatic alcohol of 8 to 18 carbon atoms and m is 2 to 4 and wherein at least 50% of the composition is provided by introducing into the composition one or more compounds of said formula, the introduced compounds together having a value of m of 2.5 to 3.5 and R in each compound contains 9 to 13 carbon atoms,

washing the surface and thereby gelling the composition in the flaws, and observing the gelled composition.

4,160,376

## METHOD AND DEVICE FOR ESTIMATING FUEL CONSUMPTION

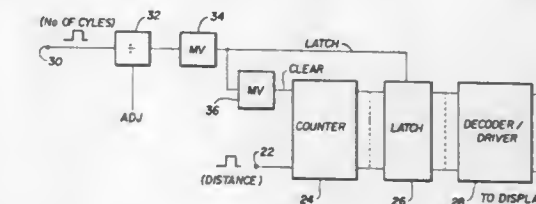
William N. Borkan, 3031 Prairie Ave., Miami Beach, Fla. 33140

Filed Jun. 3, 1977, Ser. No. 803,101

Int. Cl.<sup>2</sup> G01F 9/00

U.S. Cl. 73-113

16 Claims



1. In a fuel consumption estimating and indicating device including means for generating a first signal representing distance traversed by a vehicle, means for generating a second signal representing fuel consumed, and means responsive to said first and second signal for generating a third signal representing distance traversed per volume of fuel, the improvement being said second signal means which comprises:
  - means for sensing the number of cycles of operation of the cylinders of the vehicle's engine; and
  - means for modifying said sensed number by a constant representing an estimate of fuel delivered to a cylinder to generate said second signal.

4,160,377

## LOAD CELL

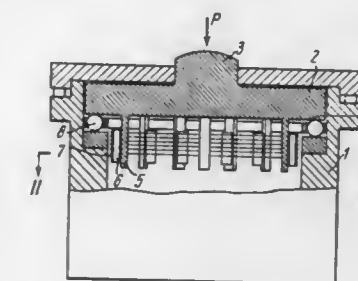
Vasily I. Pechuk; Vladimir M. Pompeev, and Nikolai B. Karikh, all of Kiev, U.S.S.R., assignors to Kievskiy Institut Avtomatiki Imeni XXV S'ezda KPSS, Kiev, U.S.S.R.

Filed Apr. 18, 1977, Ser. No. 788,458

Int. Cl.<sup>2</sup> G01L 1/22

U.S. Cl. 73-141 A

9 Claims



1. A load cell comprising:
  - a housing having internal projections;
  - a resilient element accommodated within said housing having a lug on one side thereof to take up the load and a back side spaced from said projections in opposition thereto, a group of spaced props on said back side of said resilient element arranged along concentric circles;
  - a plurality of balls interposed between said projections and said back side, whereby rolling contact is established therebetween; and,
  - a resistance strain gauge drawn between said props and extending substantially radially of said circles.

4,160,378

## TIRE TESTING MACHINE

Günther Himmler, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann G.m.b.H. & Co., KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

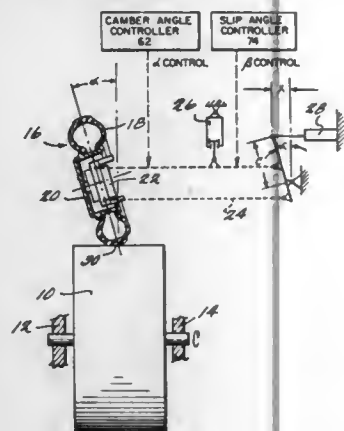
Filed May 24, 1978, Ser. No. 909,187

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726927

Int. Cl.<sup>2</sup> G01L 15/16; G01M 17/02

U.S. Cl. 73—146

9 Claims



1. A method for the determination of characteristic values for tires and rims forming wheels and the attitude of the endurance limit of said tires and rims comprising the steps of:

rolling said wheel about its axis on a cylindrical drum at a predetermined contact pressure between said wheel and said drum and at camber angle  $\alpha$  and a slip angle  $\beta$  so as to generate forces at the contact area between said wheel and said drum said forces having lateral and vertical force components R and S and so as to generate a redress couple MR;

measuring, with a torque indicator, rotational forces about said axis resulting from said rolling step;

releasing said forces applied to said wheel according to a preset test program;

transforming said measured forces into a set of forces at the contact area of said wheel with said cylinder, said transforming step taking into consideration the mutual influence of forces depending on at least one of the slip angle  $\beta$ , and the camber angle,  $\alpha$ , of said wheel; and

readjusting all of said forces by altering at least one of said slip angle,  $\beta$ , said camber angle,  $\alpha$ , and the contact pressure of said wheel on said drum.

4,160,379

## COMPOSITE FLUID FLOWMETER WITH SLOTTED ARCuate AXIAL EXHAUST

Dwight A. Knapp, Union Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 3, 1978, Ser. No. 892,458

Int. Cl.<sup>2</sup> G01F 1/06

U.S. Cl. 73—229

9 Claims

1. A composite tangential exhaust and axial exhaust fluid flowmeter comprising

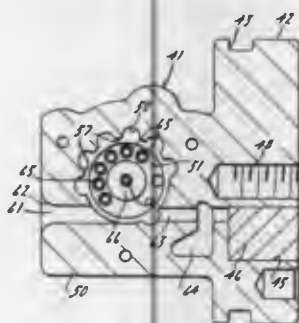
elongated housing means of substantially rectangular cross-section and having a substantially cylindrical cavity therein,

fluid inlet port means and fluid outlet port means communicating with and extending generally longitudinally of said housing means and tangentially of said cavity,

axial exhaust fluid outlet port means including a generally arcuate shaped, elongated slotted opening formed in said housing means and communicating with said inlet port means to exhaust fluid axially transversely of said cavity in parallel with said tangentially extending fluid outlet port means, said slotted opening displaced radially from the

center of the cavity and located in a region past the tangential outlet port means in the direction of rotation of the fluid around the cavity, and

rotor means contained in and journaled for rotation on the geometrical central axis of said cavity and rotatable by all



of the fluid admitted through said inlet port means and exhausting from said rotor containing cavity through any of said tangentially extending fluid outlet port means and said axial exhaust outlet port means formed in said rotor containing cavity.

4,160,380

## PUMP ENCLOSED FLUID FLOWMETER

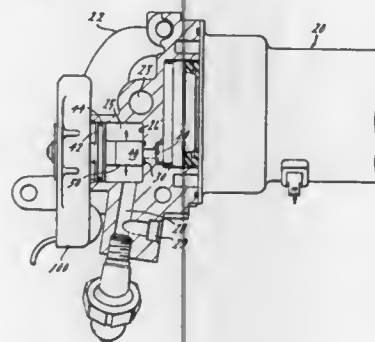
Carroll J. Dunne, Jr., Toledo, Ohio, and Ian J. C. Scott, Madison Heights, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 3, 1978, Ser. No. 892,459

Int. Cl.<sup>2</sup> G01F 1/06, 15/18

U.S. Cl. 73—229

10 Claims



1. In combination with a fluid metering pump having a pump housing and a cover for said housing having a cylindrical outlet chamber therein, said cylindrical chamber open at one end thereof and having a passage in its other end communicating with the high pressure side of said pump through said pump cover;

a fluid flowmeter bodily received within the open end of said cylindrical outlet chamber in said cover and including a cylindrical header portion, a reduced body portion of integral formation with and stemming from said header portion and having a fluid chamber therein, a rotor element journaled for rotation in said body portion, and electrical sensor means contained in said body portion for sensing rotation of said rotor element in said fluid chamber,

said body portion having fluid inlet port means and seating against the said other end of said cylindrical outlet chamber with the fluid inlet port means in the body portion in direct registration and open communication with said communicating passage in said pump cover to receive all of the fluid discharged from said pump directly into said fluid chamber in said body portion of said flowmeter, and fluid outlet port means in said reduced body portion to

exhaust fluid from said fluid chamber externally of said body portion and into said cylindrical outlet chamber in said pump cover, said header portion readily attachable to and removable from said cover without disassembly of said flowmeter and pump cover, and sealing means between said header portion and said pump cover to seal the open end of said chamber in said pump

4,160,381

## FLOATS AND METHOD FOR MAKING SAME

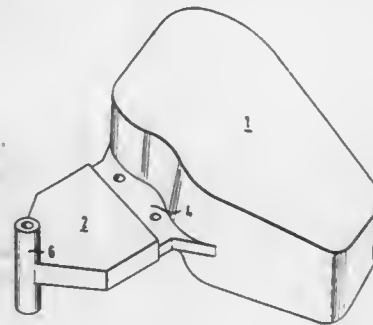
Anthony D. Jackman, Woking, England, assignor to Bettix Limited, Surrey, England

Filed Nov. 7, 1977, Ser. No. 849,421

Int. Cl.<sup>2</sup> G01F 23/06

U.S. Cl. 73—322.5

6 Claims



1. A float for the control of liquid level, comprising one or more blow moulded float bodies, each with an integral compression moulded tag, and an injection moulded mounting or bridge having a structure and an integral interconnection to one or more tags characterized by its having been moulded directly and integrally during its formation in the injection mould to the said one or more tags and shaped to support the float in a carburettor or other reservoir.

3. A method of making a float for the control of a liquid level comprising the steps of:

blow moulding a float body in the shape of the float including compression moulding an integral tag extending outwardly from the body of the float;

attaching the moulded float body to an injection moulding machine with the tag located within the injection mould cavity, and

injecting material into the injection mould to form a mounting or bridge directly, integrally secured to the tag and shaped to support the float in a carburettor or other reservoir.

4,160,382

## SAMPLE TAKING DEVICE FOR TOXIC AND/OR RADIOACTIVE SUBSTANCES

Lorenz Finsterwalder; Horst Zeh, both of Karlsruhe, and Ulrich Schaarschmidt, Stutensee, all of Fed. Rep. of Germany, assignors to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH, Eggenstein-Leopoldshafen, Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 834,253

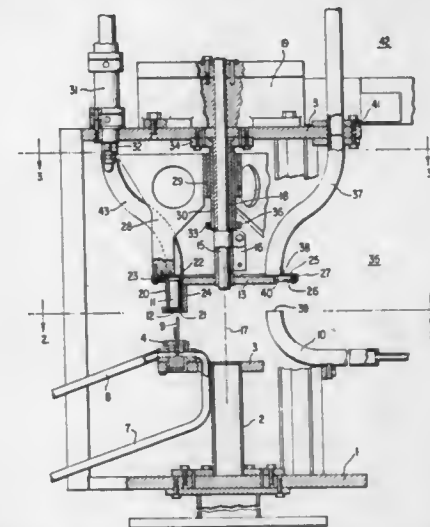
Int. Cl.<sup>2</sup> G01N 1/10

U.S. Cl. 73—422 R

8 Claims

1. In apparatus for taking samples of toxic and/or radioactive substances by introducing such substances into sample vessels, which apparatus includes a holder for holding such a vessel, at least one needle head filling system composed of upwardly pointing hollow needles for introducing a sample of one such substance into such vessel at a filling position, and inlet and outlet conduits for conveying vessels to or from the holder at a transfer position, the improvement wherein: said holder comprises a turntable having a sleeve for accommodating such sample vessel, said turntable being mounted to undergo rotary movement to convey a sample vessel in said

sleeve between the filling and transfer positions, and an assembly of a cover and a disc between which said turntable is disposed and presenting a circular space for guiding said sleeve over said filling system, and said apparatus comprises a stand



supporting said filling system below said holder, and a lifting device connected for imparting a translational movement to said holder to bring a vessel in said holder into operative association with said filling system, which translational movement is independent of the rotary movement of said turntable.

4,160,383

## UNITARY SAMPLE-VENT-VALVE ASSEMBLY

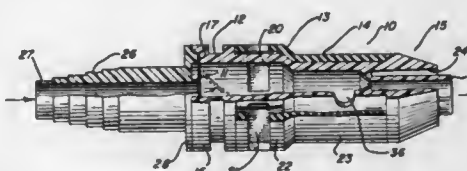
Richard A. Rauschenberger, Brookfield, Wis., assignor to Will Ross Inc., Milwaukee, Wis.

Filed Dec. 27, 1977, Ser. No. 864,580

Int. Cl.<sup>2</sup> G01N 1/20; A61F 5/44

U.S. Cl. 73—422 R

5 Claims

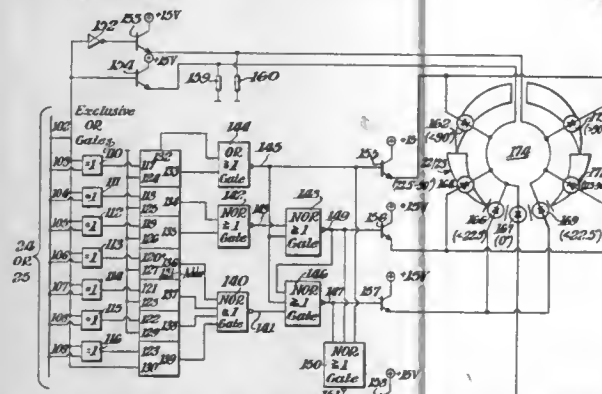


1. A unitary sample-vent-valve assembly comprising: a tubing connector having a first end and a second end, said first end being adapted for attachment to accessory patient tubing and said second end terminating in a first flange having first and second concentric ribs on the face thereof, said second rib being of greater diameter than said first rib; a tubular body having a second flange at one end thereof joined to said tubing connector and adapted to engage a fluid line at the other end thereof, said second flange having a circular recess on its face to cooperatively engage said second rib and align said tubular body with said tubing connector, said tubular body defining at least one first opening through its sidewall and a second opening through its sidewall; valve means retained between said first and second flanges, said first rib forming a seat for said valve means; vent means formed of a semi-permeable material layer overlying said first opening, and sampling means formed of a resealable, pierceable material overlying said second opening.



**4,160,384**  
**PROCESS FOR THE TURNING-IN OF A PART TO BE BALANCED AFFECTED BY IMBALANCE**  
 Volker Guyot, Buettelborn; Otfried Maus, Darmstadt, and Martin Müller, Bickenbach, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany  
 Filed Feb. 13, 1978, Ser. No. 877,231  
 Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724624

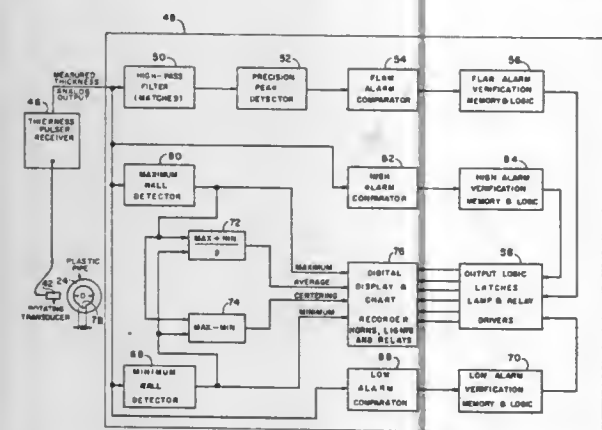
Int. Cl.<sup>2</sup> G01M 1/22  
 U.S. Cl. 73-462 7 Claims



1. A process for the turning-in of a part to be balanced affected by imbalance, particularly a motor vehicle wheel, in a balancing machine having a shaft, storing angular information, having light signals relating to the balancing position, which is adjusted into a balancing position by a comparison of the particular angular positions of the shaft with the stored angular information and light signals relating to the balancing position as an indication for the resulting adjustment, comprising the steps of illuminating the light signals to indicate the direction to turn the part toward the balancing position from a momentary out-of-balance position, and illuminating in sequence several light signals signifying progressively shorter intervals as the balancing position is approached whereby the balancing position may be gradually approached without overshooting.

**4,160,385**  
**PIPE QUALITY MONITORING MECHANISM**  
 Roy J. Gromlich, Wrightstown, N.J.; Kilian H. Brech, deceased, late of New Hope, Pa. by Avis Brech, executrix, and John D. Cist, Wilmington, Del., assignors to E. I. duPont de Nemours and Co., Wilmington, Del. and Sonic Instruments, Inc., Trenton, N.J.

Filed Jun. 30, 1977, Ser. No. 811,975  
 Int. Cl.<sup>2</sup> G01N 29/04; G01B 17/02  
 U.S. Cl. 73-622 21 Claims



8. A system for inspecting tubular material in which the tubular material passes through an inspection apparatus including a chamber supplied with liquid to fill the path between the tubular material and ultrasonic transducer means providing

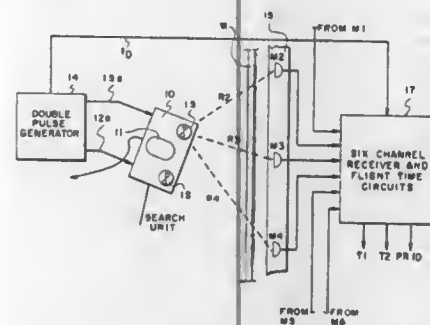
means to transmit ultrasonic pulses inwardly to the tubular material and receive pulses reflected at least from the outer and inner wall surfaces of said tubular material and means to provide relative rotation of the ultrasonic transducer means around the tubular material as said tubular material passes generally axially through said chamber, comprising:

- a pulse generating source for the ultrasonic transducer means to provide pulses at a rate sufficiently frequent to permit examination of the entire tubular material;
- a pulse receiving and interpreting means for generating a signal representative of rate-of-change of wall thickness of the tubular material at successive measurement intervals around the tube;
- comparison means for comparing the dimensional wall thickness rate-of-change signals with at least one predetermined rate-of-change tolerance limit to identify flaws; and
- out-of-tolerance indicator means receiving an output signal from the comparison means indicating a flaw.

**4,160,386**  
**ULTRASONIC INSPECTION SYSTEM INCLUDING APPARATUS AND METHOD FOR TRACKING AND RECORDING THE LOCATION OF AN INSPECTION PROBE**

Jerry L. Jackson; Theodore L. Allen, Jr.; Wayne T. Flach; William D. Jolly, and Steve A. Cerwin, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jun. 9, 1977, Ser. No. 804,931  
 Int. Cl.<sup>2</sup> G01N 29/04  
 U.S. Cl. 73-625 41 Claims

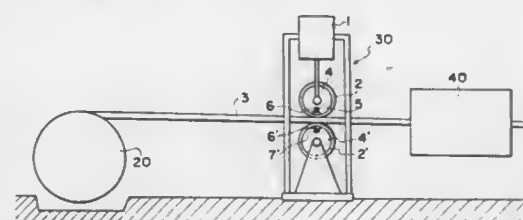


1. In an ultrasonic inspection system for randomly inspecting along the surface of an object, said system including an inspection probe having at least one ultrasonic transducer, means for periodically pulsing the transducer to cause it to emit ultrasonic waves, and ultrasonic signal receiving and processing means including means for receiving echo signals from said object being inspected and for acting on the received echo signals to provide useful information concerning the condition of said object in the area being inspected, the improvement comprising, apparatus for providing tracking information relating to the location of the inspection probe at different and random locations on said object, and with respect to a fixed reference on said object, said apparatus comprising at least one source of radiant energy located at a known distance from one of said transducer or fixed reference, to provide a plurality of airborne sound tracking signals during the inspection operation; at least two signal receiving devices located at a known distance from one of said fixed reference or said at least one ultrasonic transducer, and located with respect to each other so that the distance from the source of radiant energy to each of said receiving devices can be detected and utilized to determine the location of said source of radiant energy with respect to the receiving devices; and means connected to receive the output signals from said receiving devices for responding to tracking signals received to detect the flight time of the airborne sound signals from said radiant energy source to each of

the receiving devices and provide output signals indicative of the distances detected and also indicative of the orientation of the ultrasonic transducer with respect to the object being inspected.

**4,160,387**  
**METHOD AND APPARATUS FOR DETECTING INTERNAL CAVITIES IN CASTING BARS**  
 Susumu Ihara; Hiroyuki Yoshimoto; Katsumi Mizuuchi, all of Osaka; Hideo Nishiumi, and Takanobu Suzuki, both of Kawasaki, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

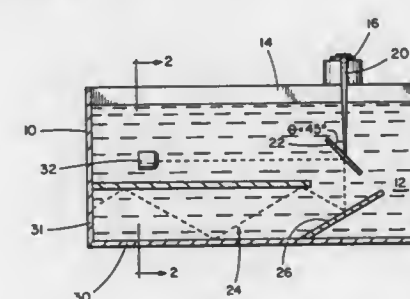
Filed Dec. 27, 1977, Ser. No. 864,910  
 Claims priority, application Japan, Dec. 28, 1976, 51-159718; Nov. 16, 1977, 52-138210  
 Int. Cl.<sup>2</sup> G01N 29/04  
 U.S. Cl. 73-639 4 Claims



1. A method of detecting the internal cavities in a continuous casting bar, comprising:  
 holding between first and second rollers with a predetermined holding pressure, two opposite surfaces of a casting bar delivered from a continuous casting machine, each said roller having a hollow portion;  
 transmitting through said casting bar, through a crown-shaped outer wall of said first roller in contact with said casting bar, an ultrasonic wave having a predetermined frequency generated by an ultrasonic wave device for transmission disposed within the hollow portion in said first roller; and  
 detecting, by means of an ultrasonic wave device for reception disposed within the hollow portion of said second roller, the amount of said ultrasonic wave which is transmitted through said casting bar and through a planar surface of the outer wall of said second roller in contact with said casting bar.

**4,160,388**  
**POWER MEASURING APPARATUS FOR ULTRASONIC TRANSDUCERS**  
 Victor Carriere, London, Canada, assignor to Bach-Simpson Limited, London, Canada

Filed Jun. 19, 1978, Ser. No. 916,474  
 Int. Cl.<sup>2</sup> G01N 29/00  
 U.S. Cl. 73-646 10 Claims

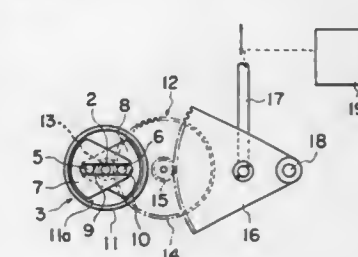


1. Apparatus for measuring the power output of a transducer comprising:

- (a) a taut-band meter movement positionable as a function of applied electric current,
- (b) an arm connected to said meter movement for displacement therewith,
- (c) a target vane suspended from said arm, the energy to be measured being directed at said vane from said transducer,
- (d) means for applying current to said meter movement to position said arm at a null point or position,
- (e) means for altering the current applied to said meter movement, responsive to the force produced by said energy impinging on said target vane, to maintain said vane at the null point,
- (f) means for determining the magnitude of the current required to maintain the target vane at said null point before and during operation of said transducer, the change in current being a measure of transducer power.

**4,160,389**  
**CENTRIFUGAL CLUTCH AND DRIVE MECHANISM FOR REMOTE CONTROL APPARATUS**  
 Takashi Kubono, Omiya, Japan, assignor to Toyo Kogyo Company Limited, Hiroshima and Tanaka Instrument Company Limited, Yono, both of Japan

Filed Jan. 11, 1977, Ser. No. 758,367  
 Claims priority, application Japan, Jan. 13, 1976, 51-1789[U]  
 Int. Cl.<sup>2</sup> F16H 21/40; F16D 43/18  
 U.S. Cl. 74-89.18 8 Claims



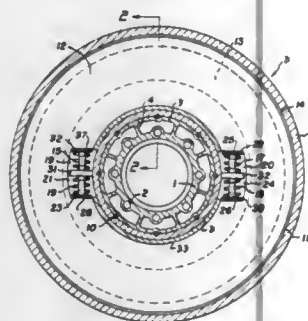
1. An apparatus for driving a remote controlled mechanism, comprising:  
 (a) an electric motor having a rotatable drive shaft,  
 (b) centrifugal clutch means comprising a plurality of weight members, a weight mounting means secured to said drive shaft for rotation therewith and including means loosely mounting and confining said weight members such that they are freely movable in a radial direction but are constrained to rotate with said weight mounting means, and a cylindrical member freely rotatably mounted to said drive shaft and including an inner wall surrounding said weight members, whereby the latter are moved radially outwardly by centrifugal force when said motor is energized, and frictionally engage and drive said cylindrical member,  
 (c) a pinion gear secured to said cylindrical member,  
 (d) reduction gear means engaging said pinion gear,  
 (e) a pivotally mounted sector gear engaging said reduction gear means and adapted to swing over a predetermined angular range in response to the rotation of said reduction gear means, and  
 (f) an actuating member connected to said sector gear and adapted to move in a substantially linear manner for operating said remote controlled mechanism in response to the energization of said motor.

**4,160,390**  
**TUNED TORSIONAL VIBRATION DAMPER**  
 Theodore W. Spaetgens, 6963 Fremlin Ave., Vancouver, B.C., Canada V6P 3W3

Filed Jun. 16, 1977, Ser. No. 807,279  
 Int. Cl.<sup>2</sup> F16F 15/00

U.S. Cl. 74—574

3 Claims

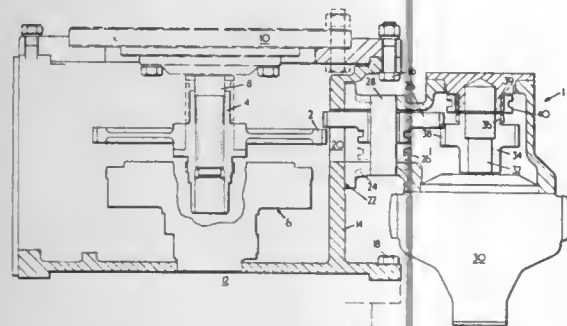


1. A tuned viscous torsional vibration damper comprising: a central hub for connecting the damper to a rotatable shaft; a hollow cylindrical housing with a circular inner wall surrounding the hub, a circular outer wall, and disc-shaped side walls; an annular-shaped inertia disc within the housing with two slots extending outwardly from the inner wall of the housing; a bearing between the inner wall of the housing and the inertia disc for rotation of the inertia disc within the housing; silicone fluid between the disc and the housing; two abutment plates connected to the inner wall of the housing and extending radially outwards into the slots in the inertia disc; disc tuning means comprising four coil springs, each coil spring extending between the disc and one of the abutment plates perpendicularly to the one abutment plate; a ring surrounding the hub and radially spaced-apart therefrom, the inner wall of the housing being mounted on the ring; and housing tuning means comprising a plurality of spoke springs fixedly connected to the hub at a first end, extending radially outwards between the hub and the ring and fixedly connected to the ring at a second end.

**4,160,391**  
**AUXILIARY DRIVE MECHANISM**  
 Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England  
 Filed Dec. 22, 1976, Ser. No. 753,471  
 Claims priority, application United Kingdom, Jan. 15, 1976, 01572/76

Int. Cl.<sup>2</sup> F16H 37/06  
 U.S. Cl. 74—661

1 Claim



1. A conveyor chain tensioning and driving mechanism comprising a transmission input shaft, hydrodynamic torque transmitting means

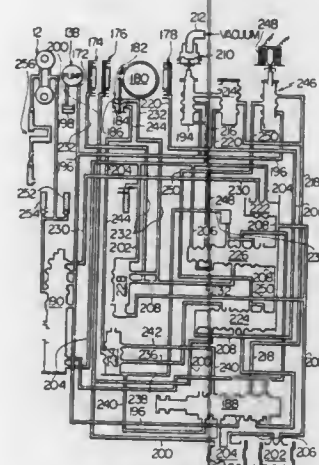
comprising a casing, an electrical chain drive motor mounted on the casing, a hydraulic clutch mounted within the casing and having a driving stage connected to be driven by the chain drive motor, and having a driven stage, a gear box having an input shaft drivingly connected to the driven stage of the hydraulically actuated clutch and having an output driving a conveyor chain, a gear wheel fixedly mounted on the driven stage of the clutch and positioned within the casing, the casing having an aperture, a housing having a mounting connected to the casing around the aperture, a shaft secured to the housing, an intermediate gear rotatable on and slidable along the shaft and extending through the aperture to drivingly engage the gear wheel, the intermediate gear being adapted for selective sliding into or out of meshing engagement with the gear wheel, means for sliding the intermediate gear, an auxiliary motor mounted on the housing and having an output shaft extending into the housing, a stepped pinion mounted on the output shaft for rotation therewith, the pinion having first teeth for engaging the intermediate gear and having a second teeth, a stub shaft mounted in the housing in axial alignment with the auxiliary motor output shaft and having splines, an internally splined locking member slidable on the stub shaft for engaging the splines and the second teeth on the pinion and locking the pinion, whereby when the intermediate gear is slid into driving engagement with the pinion first teeth and the gear wheel, the auxiliary motor drives the gear wheel and gear box input shaft and gear box for tensioning a chain driven by the gearbox and whereby when the locking member is slid into engagement with the second teeth on the pinion, the pinion, intermediate gear, gear wheel input shaft gearbox and conveyor chain are held fixed, whereupon the intermediate wheel may be slid out of engagement with the gear, an electrical circuit connected to the chain drive motor, and circuit braking means connected to the circuit and connected to the intermediate gear sliding means for breaking the circuit to the chain drive motor when the intermediate gear sliding means slides the intermediate gear into engagement with the gear wheel and for re-establishing the circuit when the intermediate gear is slid out of engagement within the gear wheel.

**4,160,392**  
**AUTOMATIC POWER TRANSMISSION WITH DIRECT-DRIVE CLUTCH**  
 Yoshio Sunohara; Kunio Ohtsuka, both of Yokohama; Wataru Ishimaru, Fujisawa; Takahiro Yamamori, Tokyo, and Toshio Shibuya, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 18, 1977, Ser. No. 770,031  
 Claims priority, application Japan, Feb. 20, 1976, 51-17791  
 Int. Cl.<sup>2</sup> F16H 47/00

U.S. Cl. 74—732

8 Claims



1. In an automatic power transmission including a transmission input shaft, hydrodynamic torque transmitting means

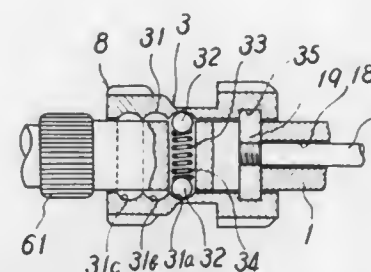
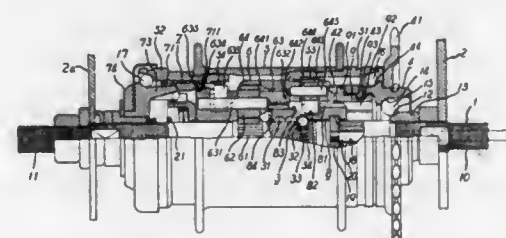
connected between the transmission input shaft and the output shaft of an engine of an automotive vehicle, fluid-operated direct-drive clutch means combined with the hydrodynamic torque transmitting means and forming a variable-volume chamber into which a control fluid pressure is to be directed when the clutch means is to be coupled, a gear mechanism having a plurality of forward-drive gear ratios including a top-gear ratio and a hydraulic control system including first fluid circuit means for developing therein a first control fluid pressure when the top-gear ratio is in use and second fluid circuit means for developing therein a second control fluid pressure when any of said forward-drive gear ratios is in use, direct-drive control valve means responsive to the first and second control fluid pressures and operative to cause said direct-drive clutch means to be coupled substantially simultaneously when said top-gear ratio is produced in said gear mechanism under high-load operating conditions of the engine and to cause said direct-drive clutch means to be coupled at a retarded timing after the top-gear ratio has been produced in the gear mechanism under low-load operating conditions of the engine.

**4,160,393**  
**MULTIPLE-SPEED HUB FOR BICYCLES**  
 Seiji Fukui, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 14, 1977, Ser. No. 787,489  
 Claims priority, application Japan, Apr. 21, 1976, 51/45864  
 Int. Cl.<sup>2</sup> F16H 3/44

U.S. Cl. 74—750 B

11 Claims



1. A multiple-speed hub for a bicycle, comprising
  - (a) a shaft fixable to a bicycle frame,
  - (b) a tubular driving member rotatably supported at an axial one side of said shaft,
  - (c) a hub shell rotatably supported between said driving member and axially the other side of said shaft,
  - (d) a transmission housed within said hub shell, said transmission changing the speed of the driving force to be transmitted from said driving member to said hub shell,
  - (e) a control means for operating said transmission, said control means including a control wire of the push-pull type, a rod positioned within the shaft and a bell crank having two arms pivotally attachable to the bicycle frame, one of said arms connected to said control wire and the other attached to said rod,
  - (f) a control member movable axially of said shaft by means of said control means, and
  - (g) a member within the hub for positioning the transmission and maintaining it at the position, said member being provided between said control member and either the

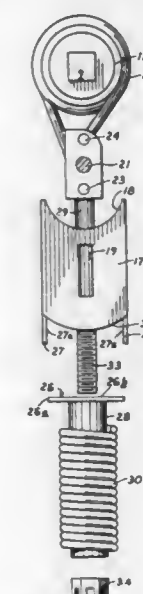
shaft or the hub shell, which is axially unmovable, so that the position controlled by said control means is defined to a desired speed-change stage.

**4,160,394**  
**WRENCH**  
 William H. Crumacker, 1538 School Ave., Walla Walla, Wash. 99362

Filed Mar. 30, 1978, Ser. No. 891,701  
 Int. Cl.<sup>2</sup> B25B 13/52

U.S. Cl. 81—64

11 Claims



1. A wrench adapted to turn a rotatable workpiece or tool about its central axis, comprising:
  - an elongated handle having an inner end and an outer end located along a longitudinal axis;
  - a bracket having inwardly facing surface means formed thereon for engagement against a workpiece or tool;
  - pivot means operably connecting said bracket to the inner end of said handle about a pivot axis perpendicular to said longitudinal axis;
  - loop means extending inwardly beyond said surface means of the bracket for encircling a workpiece or tool engaged by said surface means, said loop means comprising a flexible element having one end operably mounted to the inner end of said handle at one side of the pivot axis and its remaining end operably mounted to the inner end of said handle at the opposite side of the pivot axis;
  - and adjustment means operably mounted between said handle and said bracket for movably locating them relative to one another.

**4,160,395**  
**THREAD-CUTTING MACHINE**  
 Georges C. Mulot, Carrieres sur Seine, France, assignor to Cri-Dan, Paris, France  
 Filed Oct. 5, 1977, Ser. No. 839,561  
 Claims priority, application France, Oct. 26, 1976, 76 32233  
 Int. Cl.<sup>2</sup> B23B 21/00; B23G 3/08

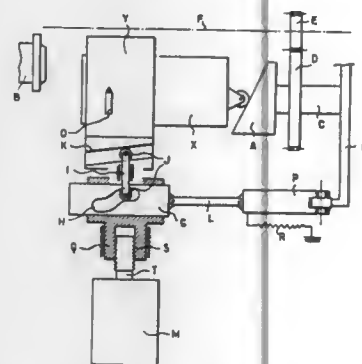
U.S. Cl. 82—5

2 Claims

1. A thread-cutting machine, of the type comprising a longitudinal carriage whose reciprocal movements are obtained from a first cam, called pitch cam, a transverse carriage carrying a tool and whose reciprocal movements are obtained from a second cam, called forward and backward movement cam, and means for ensuring the progression of the tool towards the work piece during successive threading cuts, characterized in that the tool progression means are formed by a numerical



control motor capable of ensuring the transverse movement of the forward and backward movement cam and a third cam operatively connected between the pitch cam and forward and



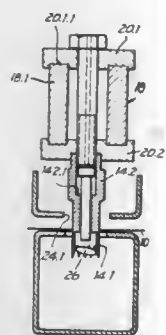
backward movement cam for synchronizing the reciprocal movement of the forward and backward movement cam with the pitch cam.

#### 4,160,396 APPARATUS FOR THE PERFORATION OF TRACKS OF GOODS

Peter Matzner, Winnenden, and Ehrhart Schulze, Fellbach, both of Fed. Rep. of Germany, assignors to Felix Stiegler Maschinenfabrik, Stuttgart, Fed. Rep. of Germany  
Filed Apr. 7, 1978, Ser. No. 894,436  
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716278

Int. Cl.<sup>2</sup> B26D 7/18; B29C 17/10  
U.S. Cl. 83—100

12 Claims



1. An apparatus for perforation of tracks of goods which are transportable substantially in their plane, particularly of thermoplastic synthetic material foils, comprising

at least one sleeve-shaped hollow punching tool adapted to be moved back and forth relative to the track of goods perpendicularly to the plane of transportation and parallel to its longitudinal axis,

an ejector pin coaxially disposed and engaged in said hollow punching tool and adapted to discard stamping cuttings, a stationary first carrier means for carrying the track of goods, said first carrier means being arranged on a side of the track of goods which faces away from said ejector pin, said first carrier means extending transversely to the direction of transportation thereof,

a second carrier means for operatively carrying said ejector pin, said second carrier means being disposed parallel to said first carrier means and extending over the entire width of the latter,

said second carrier means carries said punching tool apart from said ejector pin, said second carrier means for being moved parallel to its longitudinal axis in a forward stroke with a velocity exceeding the accelerated rate of fall in the

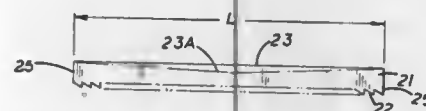
gravitational field of the earth toward said stationary first carrier means of the track of goods, and said ejector pin being guided coaxially in said punching tool and freely moveably mounted therein limited with such an axial play that said ejector pin can push the stamping cuttings out from said punching tool.

#### 4,160,397 SAW BLADE CONSTRUCTION AND METHOD OF MAKING SAME

Milo Bertini, 679 Garden St., Trumbull, Conn. 06611  
Filed Oct. 17, 1977, Ser. No. 842,618  
Int. Cl.<sup>2</sup> B27B 33/06

U.S. Cl. 83—661

10 Claims



1. A method for making an endless band saw blade comprising the steps of:  
forming a blade stock with a plurality of cutting teeth to define a cutting edge,  
shaping the back edge of said blade opposite said cutting teeth whereby said back edge is inclined in opposite directions relative to said cutting edge from an intermediate point on said back edge,  
and connecting the opposed edges of said blade in abutting end to end relationship to define an endless band saw blade wherein the back edge of said blade progressively diverge relative to said cutting teeth in opposite direction from said intermediate point.

#### 4,160,398 METHOD AND APPARATUS FOR MANUFACTURE OF INSULATING SLEEVES

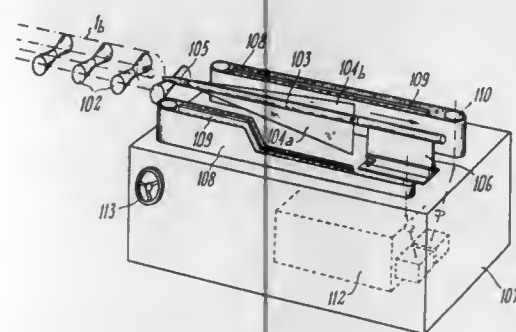
Bernard H. Bichot, Clermont, and René Gest, Rantigny, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 578,087, May 16, 1975, abandoned.  
This application Mar. 1, 1978, Ser. No. 882,441

Int. Cl.<sup>2</sup> B26D 3/08

U.S. Cl. 83—865

4 Claims



1. Apparatus for making longitudinally slit fibrous sleeves including means for feeding sleeves to be slit in a feed path; means for slitting the sleeves in said path; and means for supplying sleeves to the feeding means; the supply means including means for delivering separate sleeves endwise and in end-to-end relation into the feed path of the feeding means; the slitting means comprising a centering rod adapted to engage and pass through the bore of sleeves being slitted, the rod carrying a slitting knife having a slitting edge inclined with respect to the feed path and positioned to enter the interior of the sleeves when they are advanced in said feed path and form

a radial slit in the wall of the sleeves, the slitting knife having a leading end and a trailing end, and supporting means for the centering rod and slitting knife, the supporting means being connected with the centering rod downstream of the slitting knife and lying in the plane of the knife thereby providing for projecting of the supporting means radially through the slit formed in each sleeve by the knife carried by the centering rod; and the feeding means including means for advancing the sleeves sequentially in end-to-end relation comprising a pair of conveyor belts having conveyor runs lying in planes parallel to and spaced at opposite sides of the slitting knife to engage and grip opposite outside surfaces of the sleeves, the conveyor runs in engagement with the sleeves being driven in a direction from the leading end of the knife to the trailing end of the knife and the conveyor runs in engagement with the sleeves being of sufficient length to extend throughout the length of and beyond the knife.

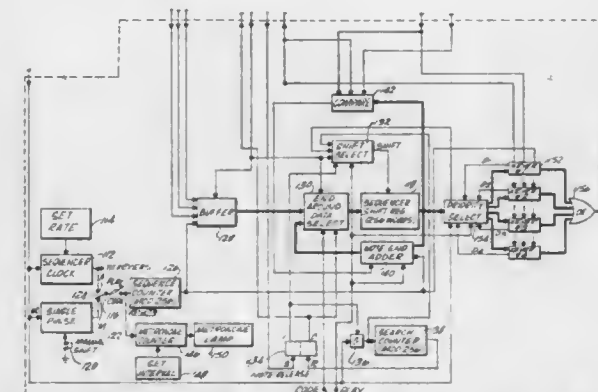
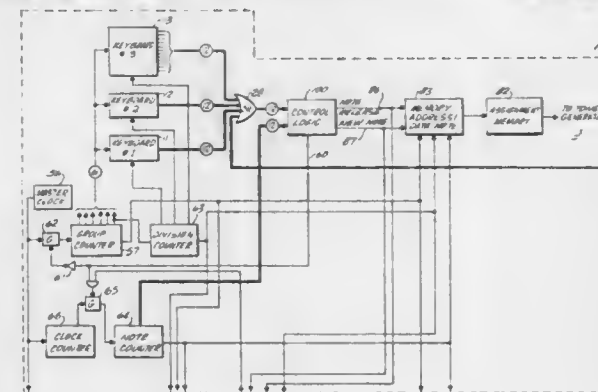
#### 4,160,399 AUTOMATIC SEQUENCE GENERATOR FOR A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan  
Filed Mar. 3, 1977, Ser. No. 773,804

Int. Cl.<sup>2</sup> G10F 1/00

U.S. Cl. 84—1.03

14 Claims



1. An automatic sequencer for a keyboard instrument on which each key operates a switch for generating an on-off signal which indicates when the associated key is depressed and released for initiating and terminating a musical note generated by a tone generator when the key is respectively depressed and released, the sequencer comprising: a sequencer memory for storing data identifying the notes to be played by the sequencer, means responsive to the key-operated switches when one or more keys are depressed during a coding mode of operation for loading the sequencer memory with a data word for each depressed key, each data word identifying one of the depressed keys, time generating means for counting the musical beats of the notes played by operation of the keys, said means responsive to the key-operated switches, including means for storing the count condition of the time generating means at the time the keys are depressed with each word loaded in the sequencer memory, the count condition indicat-

ing the relative beat time at which the associated key identified by the data word was depressed, and means responsive to the release of any of the depressed keys for storing the count condition of the time generating means with the word in the sequence memory associated with the released key, the count condition indicating the relative beat time at which the associated key identified by the data word was released.

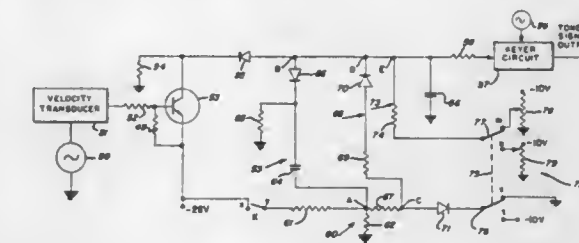
#### 4,160,400 TOUCH RESPONSIVE KEYING UNIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Ray B. Schrecongost, Park Ridge, Ill., assignor to Marmon Company, Chicago, Ill.  
Filed Sep. 29, 1975, Ser. No. 617,538

Int. Cl.<sup>2</sup> G10H 3/00

U.S. Cl. 84—1.13

26 Claims



1. An apparatus for use in an electronic musical instrument having a plurality of juxtapositioned keys forming a keyboard and a tone circuit to produce a different tone signal output corresponding to the depression of each of said keys comprising:

source means for providing an AC signal;  
a velocity transducer connected to said source means and to said keys and comprising:  
capacitor means having a stationary plate and a movable plate for passing said AC signal in proportion to the impulsive force applied to one of said keys during depression by the instrument player;  
linking means responsive to said keys for momentarily contacting said movable plate of said capacitor means and transferring said impulsive force applied to one of said keys to said movable plate;  
said linking means after momentarily contacting said movable plate disengages from said movable plate regardless of maintained key depression by the instrument player;  
said movable plate responsive to said linking means temporarily overlaps said stationary plate if said impulsive force exceeds a minimum value and said overlap is in proportion to said impulsive force and independent of maintained key depression by the instrument player whereby the value of capacitance increases with the degree of plate area overlap; and,  
circuit means responsive to said passed AC signal for generating a voltage signal envelope to control said tone circuit.

#### 4,160,401 STRING VIBRATION TRANSDUCER BRIDGE FOR ELECTRIC STRINGED INSTRUMENTS

Michiaki Tomioka, Koufu, Japan, assignor to Chushin Gakki Seizo Kabushiki Kaisha, Nagano, Japan  
Filed Oct. 12, 1977, Ser. No. 841,366

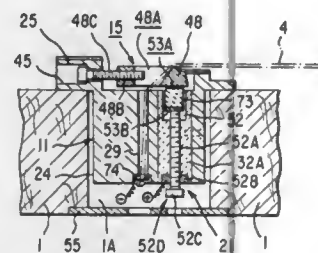
U.S. Cl. 84—1.16

6 Claims

1. A string vibration transducer bridge for an electric instrument having strings comprising:  
a bridge box;  
a plurality of independent string tension mechanisms provided side by side in said bridge body and which are

adjustably movable along the direction of said string, said string tension mechanism further including a plurality of independent electrically conductive string supporting electrode parts independently slidably movable in said bridge body along the direction of said strings and independently rotatable along the direction perpendicular to said string;

a plurality of independent piezoelectric transducers provided in said bridge box which each engage with an un-



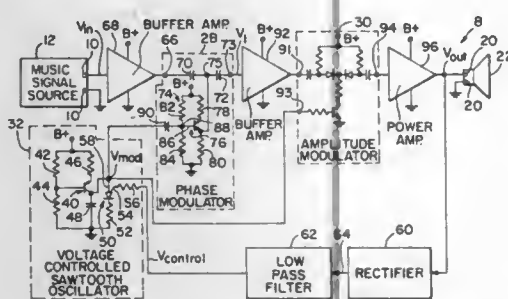
dersurface of an electrode parts to form an electrical connection therewith and are substantially perpendicular to said tension mechanisms; and

a plurality of piezoelectric transducer pushing mechanisms provided in said bridge box for pushing said piezoelectric transducer against said electrode parts whereby the tension of said string maybe set by both said string tension mechanism and said transducer pushing mechanism and the vibration of each string is independently sensed.

**4,160,402**  
**MUSIC SIGNAL CONVERSION APPARATUS**  
Louis A. Schwartz, 35 E. 9th St., Derby, Conn. 06418  
Filed Dec. 19, 1977, Ser. No. 861,682  
Int. Cl.<sup>2</sup> C10H 1/02

U.S. Cl. 84—1.24

4 Claims

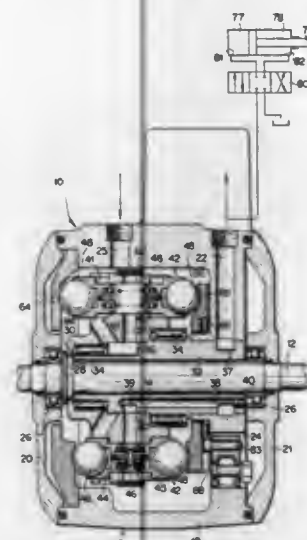


1. Apparatus for converting an input music signal composed of note signals of generally constant frequency having envelopes characterized by a relatively rapid rise time and a relatively slow fall time to an output music signal composed of note signals having a frequency generally constantly increasing over the duration of each note signal and having envelopes characterized by a relatively slow rise time and a relatively rapid fall time, said apparatus comprising: an input port adapted to be coupled to a source for said input music signal; an output port; and modulator means having an input terminal coupled to said input port for simultaneously modulating both the amplitude and phase of said input music signal in accordance with a modulation signal, said modulator means having an output terminal coupled to said output port; oscillator means for generating a modulation signal of sawtooth shape; said oscillator means being coupled to said modulator means for supplying said modulation signal thereto, said modulator means being configured to convert said input music signal to said output music signal in response to said modulation signal.

**4,160,403**  
**VARIABLE DELIVERY HYDRAULIC EQUIPMENT**  
Kinzo Takagi, 4-15, 5-chome, Kurichara, Niiza-shi, Saitama-ken, Japan  
Division of Ser. No. 665,194, Mar. 9, 1976, Pat. No. 4,086,845.  
This application Jan. 11, 1978, Ser. No. 868,574  
Claims priority, application Japan, Mar. 14, 1975, 50-30917  
Int. Cl.<sup>2</sup> F01B 3/10, 13/04

U.S. Cl. 91—483

7 Claims

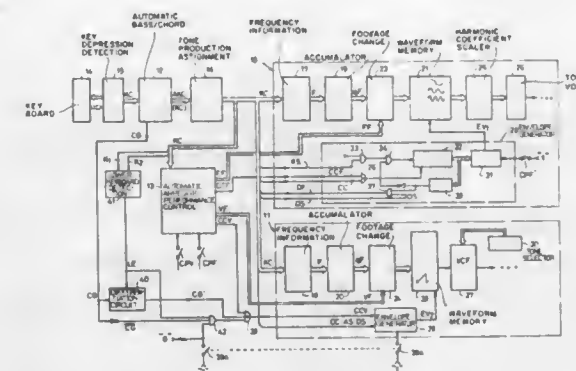


1. A variable delivery hydraulic equipment, comprising: a rotary shaft rotatably supported on a housing; a cylinder block disposed coaxially with and connected to the rotary shaft and having a plurality of axial cylinder bores provided on the periphery thereof and disposed coaxial with the rotary shaft; a plurality of plunger assemblies each having a pair of plungers oppositely disposed within the respective cylinder bore, so as to define a chamber therebetween and slideably movable within the respective cylinder bore, and a pair of cam followers revolvingly mounted on the outer end of each plunger; and, a pair of cams between which the cylinder block is disposed, the cams being adapted to contact with the cam followers of the plunger assembly to impart a plurality of reciprocating movements in one cycle to the opposite plungers, each having a cam surface substantially perpendicular to the rotary shafts, and being so designed as to impart different and ever-changing moving speeds to the opposite plungers respectively, in all phase positions except when the moving speeds of both plungers are zero, one of which being swingable relative to the other cam by a piston-cylinder assembly adapted to be operated by an operational fluid within the equipment and being free with respect to the rotary shaft and the housing, and the other cam being fixed to the housing, said swingable cam having a radial groove at the side on which it does not face the cam follower and said piston-cylinder assembly having an operating element fixedly mounted on a piston rod and fitted into the radial groove of the swingable cam.

**4,160,404**  
**ELECTRONIC MUSICAL INSTRUMENT**  
Shigeru Yamada, and Eiichiro Aoki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan  
Filed Oct. 21, 1977, Ser. No. 844,463  
Claims priority, application Japan, Oct. 29, 1976, 51/130187  
Int. Cl.<sup>2</sup> G10H 1/02, 5/10

U.S. Cl. 84—1.26

7 Claims

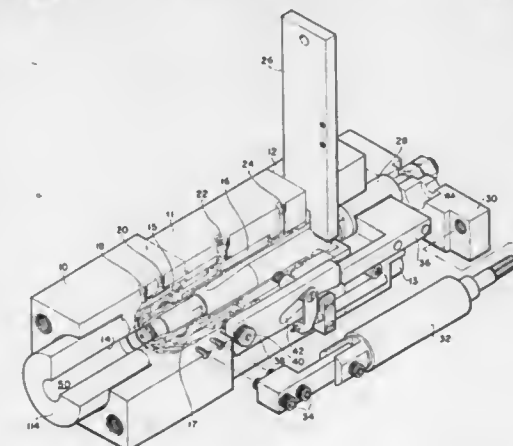


1. An electronic musical instrument comprising: a plurality of keys; key identification information generating means responsive to said keys for generating key identification information; a plurality of musical tone forming systems each producing musical tone signals according to the same key identification information from said key identification information generating means; and means for controlling the simultaneous or sequential order and the envelope shape of the musical tone signals formed by one system independently from, and so as to differ with respect to each of the other musical tone forming system; the circuitry for establishing the tone color of the musical tone signals in the respective musical tone forming systems being different from the tone color circuitry of each other system.

**4,160,405**  
**LIQUID PROPELLANT GUN, POSITIVE DISPLACEMENT SINGLE VALVE**  
Steven E. Ayler, China Lake, and John W. Holtrop, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Feb. 21, 1978, Ser. No. 879,555  
Int. Cl.<sup>2</sup> F41F 1/04

U.S. Cl. 89—7

10 Claims



1. An injection system for a liquid propellant gun comprising:

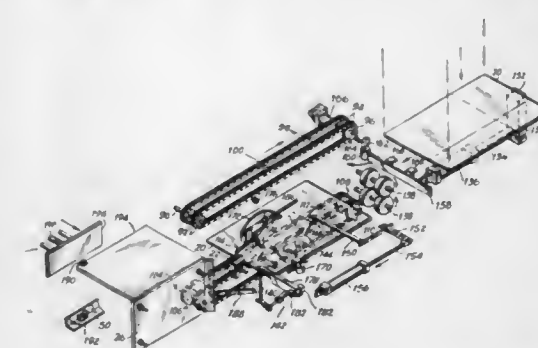
a chamber for receiving propellant and oxidizer liquids; a receiver connected to said chamber; a manifold within said receiver and having passages in fluid communication with said chamber; a valve mounted within said manifold for selective movement between two positions, one position providing fluid communication between said passages in said manifold and said chamber and one position in fluid sealing relation between said passages in said manifold and said chamber; a piston slidably mounted within said valve and configured relative to said valve to form two recesses therebetween; and

actuation means operatively connected to said piston and said manifold for selectively moving said manifold means to said fluid communication position and to move said piston so as to change the dimensions of said two recesses when said valve in said fluid communication with said chamber, whereby the contents of said recesses may be transferred to said chamber.

**4,160,406**  
**METHOD AND APPARATUS FOR ERECTING A CARTON**  
Ulrich G. Nowacki, Leisure City, Fla., assignor to International Paper Company, New York, N.Y.  
Filed Jun. 21, 1978, Ser. No. 917,483  
Int. Cl.<sup>2</sup> B31B 1/06, 1/26, 1/62

U.S. Cl. 93—36.3

15 Claims

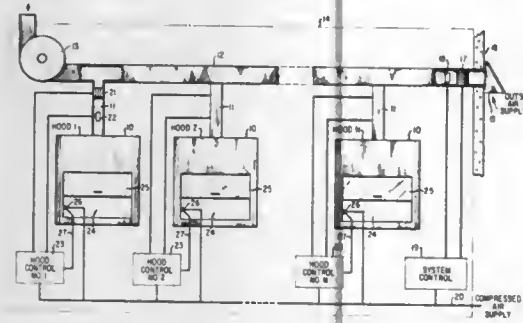


1. A process for erecting and sealing a folded carton blank comprising four side panels joined at opposite edges and having two bottom side flaps and two bottom end flaps each of which is joined respectively to one of said side panels, the steps comprising: positioning a plurality of said carton blanks in a blank feeding station of a carton erecting and sealing machine to form a vertical column with each of said carton blanks lying in a horizontal plane; feeding in timed sequence the lowermost carton blank from said vertical column of carton blanks into a pinch roll driving means; driving said carton blank longitudinally through said erecting and sealing machine into a carton erecting and folding station; erecting said carton blank by applying a turning moment to the trailing side panel of said carton blank while maintaining the lower side panel of said carton blank stationary in a horizontal plane; driving said erected carton blank longitudinally through said erecting and sealing machine, sequentially folding the trailing bottom end flap and then the leading bottom end flap to a plane normal to the plane of the side panel to which each of said trailing and leading bottom flaps is respectively connected, partially folding said upper and lower side flaps toward said folded trailing and leading bottom end flaps, applying adhesive material between the surfaces of said bottom end flaps facing said bottom side flaps, and bringing said erected and partially folded carton blank to rest against squaring stops in a sealing station in said erecting and sealing machine; driving said partially folded carton blank transversely clear of said squaring stops and against a fixed anvil in said sealing station whereby said bottom side flaps are folded in sealing relationship against said bottom end flaps; holding said bottom side flaps and said bottom



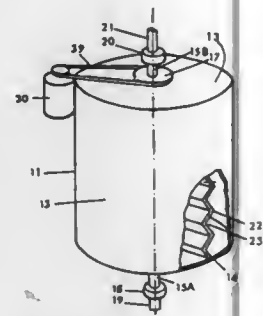
flaps in sealing relationship until said adhesive material has adhered said bottom end flaps to said bottom side flaps; and ejecting said completed erected and sealed carton from said erecting and sealing machine.

**4,160,407**  
**VENTILATING SYSTEM**  
Arthur Duym, Fanwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Nov. 18, 1977, Ser. No. 852,663  
Int. Cl.<sup>2</sup> F23J 11/00  
U.S. Cl. 98—115 R 2 Claims



1. A ventilating system for an enclosure, said enclosure containing a plurality of ventilating hoods, each connected by a hood exhaust duct to a common draft system exhausting outside the enclosure, wherein the improvement comprises an atmospheric air supply having its source outside the enclosure and discharging into said draft system, an intake damper controlling the amount of air entering said draft system from said air supply and means responsive to the pressure within said draft system for maintaining a substantially constant pressure in said system by opening or closing said intake damper whenever the flow of air from the hoods to the draft system is reduced or increased, so as to increase or decrease the supply of outside air to the system in corresponding amounts and thus maintain the draft system in balance even though periodically hoods connected to the system are partially or completely shut off from the system, and further wherein at least one of said hoods is in enclosed hood having an access window equipped with a closure and wherein the hood exhaust valve associated with said hood is responsive to a pressure sensor in the corresponding hood exhaust duct between said valve and said hood to maintain a set pressure in said duct.

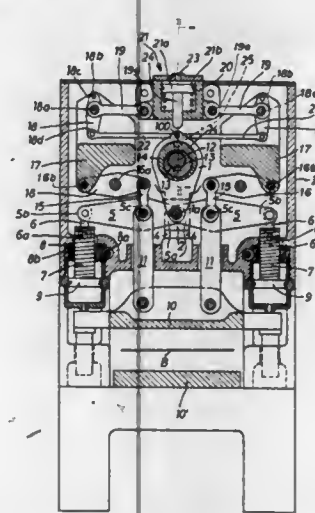
**4,160,408**  
**APPARATUS FOR TREATMENT OF PUMPABLE MATERIALS**  
Ole P. Ulvestad, Nyheimsveien 45, N-7058 Jakobsli, Norway  
Filed Dec. 1, 1976, Ser. No. 740,935  
Int. Cl.<sup>2</sup> A47J 37/00  
U.S. Cl. 99—348 6 Claims



1. Apparatus for the treatment of pumpable materials, such as foodstuffs and fodder, which comprises a cylindrical con-

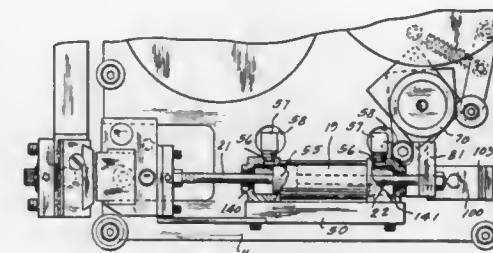
tainer in which the bulk material is to be subjected to at least a treatment selected from at least one of pressure and heat, said container having side and end walls and an axially mounted, radial wall disposed closely against said side and end walls, said radial wall having a shaft having the supply and removal of said material on opposite sides of said wall, said wall and said container being rotatable relative to each other enabling components of said material to remain substantially at rest relative to said wall during the treatment.

**4,160,409**  
**DRIVE FOR THE MOVABLE WORK COMPONENT, SUCH AS THE RAM OF A PRESS, STAMPING MACHINE OR THE LIKE**  
August T. Portmann, Arbon, Switzerland, assignor to Bruderer AG, Arbon, Switzerland  
Continuation of Ser. No. 602,047, Aug. 5, 1975, abandoned. This application Jan. 30, 1978, Ser. No. 873,642  
Claims priority, application Switzerland, Sep. 3, 1974, 11979/74  
Int. Cl.<sup>2</sup> B30B 5/00  
U.S. Cl. 100—257 3 Claims



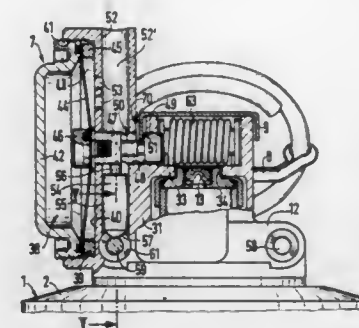
1. A punch press machine comprising:  
a machine housing;  
a crank drive mounted within the machine housing and including a crankshaft;  
hydraulic drive means connected to drive the crankshaft;  
source means for providing hydraulic fluid under pressure, said source means being connected to the hydraulic drive means for operation thereof;  
a punch member connected drivingly to the crank drive so as to be reciprocated thereby along an axis defined by the machine; and  
adjustment means whereby the position along said axis of the mean position of said punch member during reciprocation thereof may be adjusted, said adjustment means including an externally threaded spindle member, an internally threaded nut member in threaded engagement with said spindle member, one of said threaded members being connected to said punch member and the other threaded member being so located in the machine that rotation of said other member brings about linear movement of said one member thereby to adjust the mean position of said punch member, said adjustment means further including hydraulic locking means for locking said other member against rotation, said hydraulic locking means being connected to said source means for operation by hydraulic fluid provided thereby.

**4,160,410**  
**MARKING DEVICE UTILIZING DUAL ROD POWER CYLINDER**  
Robert Fichter, Woodridge, Ill., assignor to Norwood Marking & Equipment Co., Downers Grove, Ill.  
Filed Oct. 25, 1977, Ser. No. 845,044  
Int. Cl.<sup>2</sup> B41F 17/00, 1/44  
U.S. Cl. 101—41 13 Claims



1. An imprint marker device utilizing transfer tape comprising: a movable marker head having raised indicia thereon, the head movable towards and away from an imprint station, a frame member, tape supply and take-up reels rotatably carried by said frame member, guide means guiding transfer tape from the supply reel to the take-up reel across the imprint station, said guide means carried by said frame, a rotatable tape drive roll and opposed spring biased idler roll carried by said frame with said tape passing between said rolls, a pneumatic power cylinder carried by said frame having first and second moving power rods projecting from opposite ends thereof, said first rod connected to said marker head to move the same, said second rod operatively connected to said drive roller to rotate the same to advance said tape, means connecting said drive roll to said take-up reel whereby rotation of the drive roll rotates said take-up reel and said power arms commonly operated by said pneumatic power cylinder whereby when one power arm is projected from said cylinder the other power arm is drawn into said cylinder.

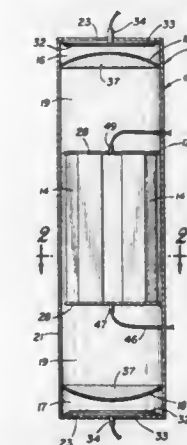
**4,160,411**  
**SOUND SIGNAL BODY FOR GENERATING UNDERWATER SOUND SIGNALS**  
Adolf Weber, Neunkirchen; Erhard Münster, Winkelhaid, and Dieter Buckley, Nürnberg, all of Fed. Rep. of Germany, assignors to Diehl, Nürnberg, Fed. Rep. of Germany  
Filed Oct. 12, 1977, Ser. No. 841,459  
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 2645914  
Int. Cl.<sup>2</sup> F42B 22/20, 27/00  
U.S. Cl. 102—7 9 Claims



1. A sound signal body, for generating underwater sound signals, which comprises:  
an explosive body;  
an explosive charge arranged within said explosive body;  
detonator means arranged within said explosive body;

a pyrotechnical delay composition associated with said detonator means;  
a hammer associated with said sound signal body and movable from a first position representing a safety position to a second position representing a striking position for igniting said composition;  
spring means associated with said sound signal body and said hammer for constantly urging said hammer into said striking position;  
a locking mechanism associated with said hammer and operable to arrest said hammer in the safety position and to release said hammer so that said spring means moves said hammer into said striking position;  
a hydraulic pressure switch associated with said sound signal body and including a diaphragm, said pressure switch being operable in response to a specific fluid pressure to permit said locking mechanism to release said hammer, said hydraulic pressure switch including a pressure chamber, inlet means for connecting said pressure chamber to the environment, and a release bolt connected to said diaphragm and movable thereby into different control positions to control said locking mechanism, said diaphragm being located in said pressure chamber, said locking mechanism comprising a blocking bolt and a locking slide, said locking slide being operable to arrest said hammer in the safety position, said blocking bolt being arranged between said release bolt and said locking slide and being axially displaceable by the latter out of a locked position into an unlocked position in accordance with the control position of said release bolt.

**4,160,412**  
**EARTH FRACTURING APPARATUS**  
William H. Snyder, Littleton; Ralph E. Williams, and John Wisotski, both of Denver, all of Colo., assignors to Thomas A. Edgell and Roberta K. Tillinghast, both of Houston, Tex.  
Filed Jun. 27, 1977, Ser. No. 810,072  
Int. Cl.<sup>2</sup> E21B 43/11  
U.S. Cl. 102—20 22 Claims

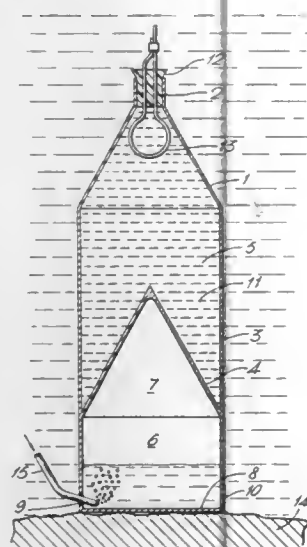


1. An improved earth fracturing apparatus of the kind having an elongated casing containing a pair of opposed end charges and a laterally directed intermediate charge, wherein the improvement comprises:  
(a) said laterally directed charge being substantially centrally located along the axial length between the oppositely directed end charges for creating a central area of high pressure upon detonation;  
(b) each of the end charges having a liner of reactive metal on its respective inwardly directed face for forming a metallic vapor upon detonation of the end charge;  
(c) the end charges and the centrally located laterally directed charge being substantially spaced along the axis of the casing to form a void area between the central charge and each end charge, the void containing an oxidizer that

reacts with the metallic vapor upon detonation of the end charges to enhance the period of high pressure resulting from detonation of the end charges; and  
(d) detonating means for exploding the centrally located charge and the end charges, the end charges being detonated substantially simultaneously at a time no sooner than the detonation of the centrally located charge, the shock waves of the end charge detonations meeting near the position of the centrally located charge to reinforce the pressures generated by explosion of the centrally located charge.

**4,160,413**  
**SHAPED EXPLOSIVE CHARGE DEVICE FOR UNDER WATER USE**  
John J. Ridgeway, Aix-en-Provence, France, assignor to Imperial Chemical Industries Limited, London, England  
Filed Sep. 21, 1977, Ser. No. 835,285  
Claims priority, application United Kingdom, Oct. 20, 1976, 43516/76

Int. Cl.<sup>2</sup> F42B 3/08  
U.S. Cl. 102—24 HC 9 Claims

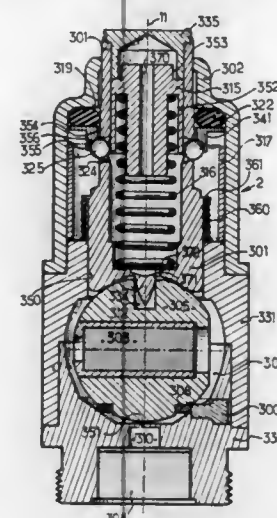


1. A casing for a shaped explosive charge device for under-water use, said casing defining a compartment for the shaped explosive charge and a cavity space and stand-off space for said explosive charge, said spaces being in communication with ambient fluid pressure, and means for introducing gas under a pressure higher than the ambient pressure when said casing is submerged, so that water will be expelled and so that the gas will be retained in said spaces.

**4,160,414**  
**PROJECTILE HAVING A DELAY-ACTION FIRING MECHANISM**  
Suzanne Stockman, and Leon Stockman, both of Avenue des Aubépines, 156, 1180 Brussels, Belgium  
Filed Jun. 6, 1977, Ser. No. 803,859  
Claims priority, application Belgium, Jun. 10, 1976, 167781; Mar. 31, 1977, 176279

Int. Cl.<sup>2</sup> F42C 15/02, 15/24  
U.S. Cl. 102—65.2 20 Claims  
1. A rifle grenade having an orifice or passage with edges leading to the explosive charge thereof, comprising a tail tube and a nose fuze provided with a delay-action firing mechanism including a striker arranged along the axis of the grenade and protruding beyond the front of the grenade, a detonator carried by a barrel and associated with the striker so as to be fired when the front of the grenade meets an obstacle, a charge fired by the detonator and a striker blocking device with inertia unlocking on shooting of the grenade, the said device being

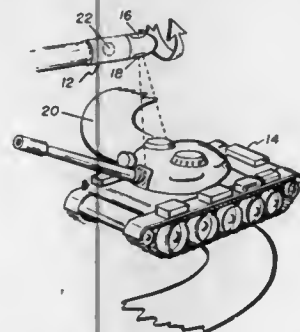
intended to hold the striker and the detonator in a safety position so long as the grenade has not been fired and for a certain time after the shooting of the grenade, wherein the barrel is provided with an annular or otherwise suitably shaped element, made for example at least partially from stainless metal, attached to and protruding from the barrel to form a surface by



which the latter in safety position bears upon the edges of the orifice or passage leading to the explosive charge of the grenade, the said annular element, when the barrel is in its safety position, bearing upon a first stationary abutment preventing the barrel from rotating in the wrong direction when it is released by the striker.

**4,160,415**  
**TARGET ACTIVATED PROJECTILE**  
Lewis C. Cole, Chester, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1978, Ser. No. 903,330  
Int. Cl.<sup>2</sup> F42C 13/04; F42B 13/10  
U.S. Cl. 102—214 7 Claims



1. A target activated spin stabilized projectile fired in a substantially flat trajectory against metal armored ground targets comprises:

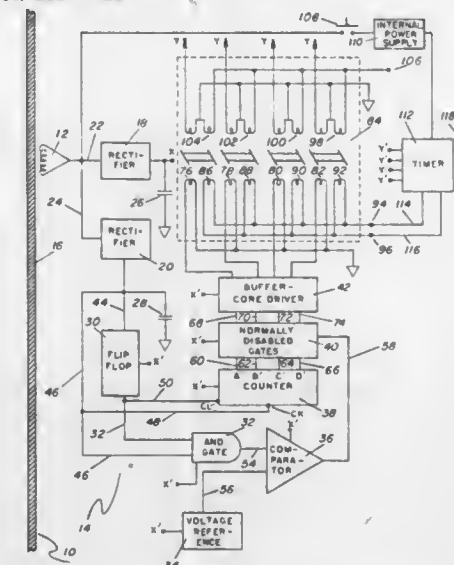
a tubularly shaped housing having an ogive shaped forward end and a cylindrically shaped rear end;  
double ended warhead means, transversely operatively disposed intermediate said forward end and said rear end of said housing, for firing a self-forging armor piercing fragment from one end of said double ended warhead means at said armored target in a direction normal to said flat trajectory of said projectile when said projectile passes directly over said target;  
set back actuated radiometer means for detecting the presence of said target along a ground search pattern beneath

said flat trajectory of said projectile, and for initiating a firing signal to fire said double ended warhead means in response to radiation detection of said armored target when said armored target is aligned with one end of said double ended warhead means; and  
set back activated detonator means for safing and arming said projectile during launch and for initiating said warhead means upon receipt of said firing signal from said radiometer means.

**4,160,416**  
**PROGRAMMED SELF-DESTRUCT SYSTEM FOR A MUNITION**

Andrew J. Baracz, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 20, 1978, Ser. No. 898,050  
Int. Cl.<sup>2</sup> F42C 11/06  
U.S. Cl. 102—215 5 Claims



1. A device for electromagnetically encoding prior to launch an energy passive munition to self destruct after deployment in accordance with stored instructions which comprises:

a secondary receiving coil proximately positioned adjacent to an interior wall of said munition, for receiving signals from a high frequency external energy source;  
first rectifier-capacitor means electrically coupled to said secondary receiving coil for energizing said device during a charging period;  
second rectifier-capacitor means electrically coupled to said secondary receiving coil, for generating substantially square wave encoding pulse signals in response to high frequency programming pulses for said external energy source;

logic circuitry means electrically connected to said second rectifier-capacitor means adapted for generating binary coded output signals in response to said substantially square wave encoding pulse signals received from said second rectifier-capacitor means;

memory means electrically coupled to said logic circuitry means for storing said binary coded output signals of said logic circuitry means and for transferring said binary coded output signals to memory output terminals upon receipt of an interrogate pulse at memory interrogate terminals;

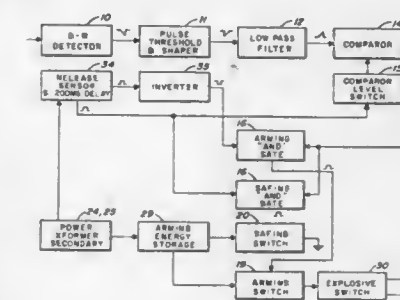
timer means for initiating said interrogate pulse upon deployment of said munition and for generating a self destruct signal to explode said munition in accordance with encoded information transferred from said memory means to said timer means;

acceleration responsive switch means, electrically coupled

to said secondary, receiving coil for closing an electrical circuit upon deployment of said munition; and  
passive squib initiated internal power source means electrically connected in series with said acceleration responsive switch means and said timer means, for generating energy in response to receipt of a relatively short high frequency arming pulse after deployment of said munition from said secondary receiving coil, said internal power source means being adapted to start said timer means.

**4,160,417**  
**ARMING-SAFING SYSTEM FOR AIRBORNE WEAPONS**  
Ronald J. Fowler, Columbus, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1969, Ser. No. 823,242  
Int. Cl.<sup>2</sup> F42C 15/12, 15/40, 13/04, 11/04  
U.S. Cl. 102—221 7 Claims



1. A system for arming an airborne weapon in time delayed relation with respect to the release of the weapon from an aircraft in flight, the aircraft being provided with an unmodulated gamma radiation source for irradiating a predetermined volume of space below the aircraft, comprising:

means for detecting gamma radiation;  
means for comparing the magnitude of the detected radiation to a predetermined radiation level and for generating a pulse when the radiation exceeds that level; and  
means responsive to a pulse from said comparing means for initiating the arming sequence for said weapon.

**4,160,418**  
**MOBILE APPARATUS FOR CONTINUOUS TRACK RENEWAL**

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Aug. 29, 1977, Ser. No. 828,337  
Claims priority, application Austria, Oct. 15, 1976, 7719/76  
Int. Cl.<sup>2</sup> E01B 27/11, 29/05  
U.S. Cl. 104—2 6 Claims



1. In a mobile apparatus for the continuous renewal of a track consisting of ties and two rails, which comprises a train of freight cars mounted for continuous movement along a right of way consisting of an old track section, a new track section and an intermediate right of way section wherein the track is renewed, a first section of the train being mounted for movement on the old track section, a second section of the train being mounted for movement on the new track section, and an intermediate train section consisting of a carrier frame and linking the first and second train sections and bridging the



intermediate right of way section, the carrier frame having two ends respectively carried on undercarriages respectively running on the old and the new track sections, the carrier frame ends being mounted for pivoting about a substantially vertical axis in a plane substantially parallel to the track, and the train sections carrying equipment arranged to transport old and new ties, to remove old ties from the intermediate right of way section and to lay new ties thereat, and to lift and spread the rails in the intermediate right of way section and to guide the rails substantially without friction: the carrier frame consisting of two parts, a substantially vertical pivot coupling the two carrier frame parts together for pivotal movement in a plane substantially parallel to the track, and a device for pivoting the two carrier frame parts in said plane and for fixing the same in selected pivotal positions.

#### 4,160,419 TAMPING TOOL

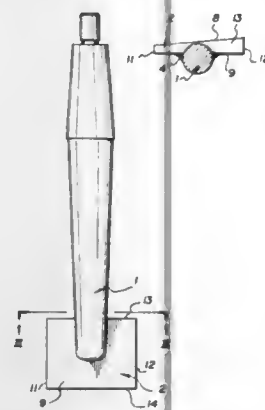
John K. Stewart, Lexington, S.C., assignor to Canron, Inc., New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,335

Int. Cl.<sup>2</sup> E01B 27/13

U.S. Cl. 104—10

2 Claims



1. A tamping tool comprising a shank and a foot mounted on the lower end of said shank, said foot having a planar front face, a rear face, upper and lower faces and side edges spaced from said shank, one of said side edges being of greater thickness than the other and said upper and lower faces tapering gradually from said one side edge to said other side edge, whereby said tool is adapted for longer life.

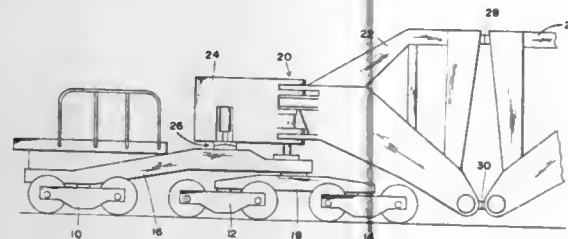
#### 4,160,420 ARTICULATED SCHNABEL CAR

Richard W. Hackbarth, Roseville; Douglas A. Puarica, St. Paul, and Philip J. Kramlinger, Roseville, all of Minn., assignors to The Maxson Corporation, St. Paul, Minn.

Filed Sep. 8, 1977, Ser. No. 831,366

Int. Cl.<sup>2</sup> B61D 3/16, 49/00; B61F 1/10, 5/22  
U.S. Cl. 105—367

6 Claims



1. A schnabel-type railway car comprising a pair of separable end units adapted to be interconnected and to be connected

to each end of a load carried therebetween in which each end unit comprises:

- load support members;
- a plurality of trucks connected together by span bolster members;
- a torque box carried at a first end on said span bolster members, said torque box including a massive hinge at the other end adapted to engage the load support members, the pivot axis of said hinge forming a reduced longitudinal distance of pivoting between the end units;
- load force transfer means at the first end of the torque box including a vertical pin rotatably carried by said span bolster and slidably inserted into said torque box so as to transfer horizontal forces and further including bearing pad means between said bolster members and said torque box so as to transfer vertical forces; and
- lateral position determining means on said bolster members connected to said hinge at said reduced pivot axis so as to adjust the lateral position of said reduced pivot axis.

#### 4,160,421 FIRE DOOR ASSEMBLY

Hans D. Heinen, Malmedy, Belgium, assignor to Intellectual Trade Cy S.A., Grand-Duché de Luxembourg, Luxembourg

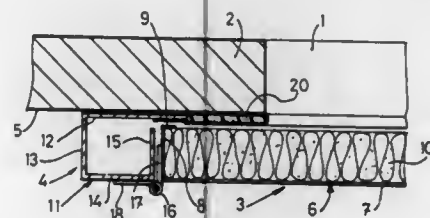
Filed Sep. 23, 1977, Ser. No. 835,921

Claims priority, application Belgium, Sep. 24, 1976, 75867

Int. Cl.<sup>2</sup> F23M 7/00

U.S. Cl. 110—173 R

3 Claims



1. In a fire-proof small door assembly for providing access to an enclosure such as a furnace, duct, tank, cistern or the like, the combination comprising:

- (a) a fixed frame mounted on a wall of the enclosure around an access aperture in said wall and comprising a metal plate, said metal plate having a flat base positioned against the outer face of said wall around said aperture and secured to said outer face and two flanges, the first one of said flanges projecting perpendicularly from the base and the second of said flanges projecting perpendicularly from the first flange;
- (b) a flat seal mounted on said outer face of said wall around said aperture partially between said wall and said base of said fixed frame;
- (c) a door flap comprising a casing formed from a metal plate having edge portions which are bent twice at right angles in the same direction, said casing containing a block of insulating material, said block being continuously applied against said seal in the closed position of said door flap; and
- (d) means connecting said door flap with said fixed frame.

#### 4,160,422 PROGRAMMABLE SEWING SYSTEM WITH AUXILIARY MEMORY

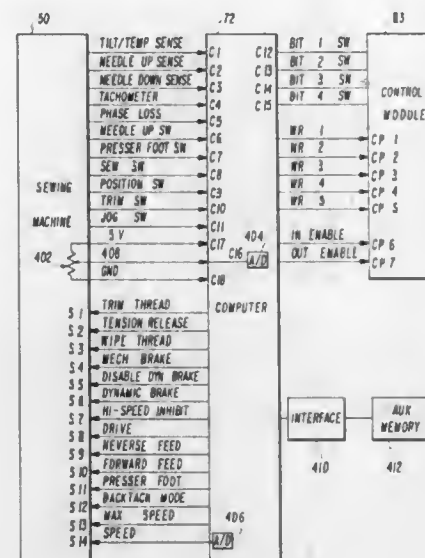
Warren A. Barber, Martinsville, and Henry A. Seesselberg, South Plainfield, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,505

Int. Cl.<sup>2</sup> D05B 19/00

U.S. Cl. 112—121.11

6 Claims



1. In a programmable sewing system comprising:
  - a sewing machine having a plurality of manually and automatically operable components;
  - a computer having a memory, a plurality of input terminals coupled to said sewing machine for receiving thereat input signals indicative of operation of said components of said sewing machine and a plurality of output terminals coupled to said sewing machine for providing thereat output signals for controlling the operation of said components of said sewing machine;
  - manually actuated control means coupled to said computer for entering sewing instructions;
  - said sewing system having a first mode of operation selected by way of said control means wherein said computer receives at said plurality of input terminals, and retains in said memory, signals indicative of manual operation of said components of said sewing machine, including a count of the repetitive component operation of certain of said components, and a time duration for operation of certain others of said components;
  - said sewing system further having a second mode of operation selected by way of said control means wherein said computer provides said output signals for controlling the operation of said components of said sewing machine, including said count of said repetitive component operation of said certain of said sewing machine components and said time duration for operation of certain others of said sewing machine components according to said signals retained in said memory in said first mode of operation;
- the improvement comprising:
  - an auxiliary memory unit; and
  - interface means operatively connecting said auxiliary memory unit to said computer for transferring information between said computer memory and said auxiliary memory unit.

#### 4,160,423 DEVICE FOR MAKING SLIT FACINGS OF A GARMENT

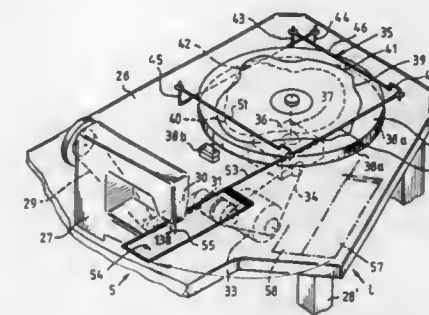
Hans Scholl, Oberlinghausen-Lipperrelhe, and Helmut Tiemann, Bielefeld, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Aug. 17, 1978, Ser. No. 934,543

Int. Cl.<sup>2</sup> D05B 21/00

U.S. Cl. 112—121.12

11 Claims



1. A device for infolding margins of a binding strip, folding said strip about a longitudinally directed main fold line, sewing said folded binding strip to one edge of a slit of a shirt sleeve or a tubular garment and securing the area where the two edges of said slit meet, by means of a stitch row, said device comprising:
  - a support,
  - a sewing machine having
    - a reciprocating needle,
    - a throat plate and
    - a workpiece press pad,
  - a workpiece receiving and folding unit, comprising
    - a binding strip receiving plate for supporting said strip with margins projecting therefrom and consisting of a left half and a right half pivotally connected in the longitudinal direction,
    - a defining blade arranged above said binding strip receiving plate and determining the form of said binding strip, and including a left blade half and a right blade half in swivel connection,
    - infolding blades cooperating with said defining blade, for folding said margins of said binding strip about the edges of said defining blade,
    - means for turning one of said halves of said binding strip receiving plate, one of said halves of said defining blade together with one half of said binding strip being clamped to said defining blade by said infolding blades about said longitudinally directed main fold line of said strip into a receiving position for said slitted shirt sleeve, and clamping said folded binding strip between said two halves of said binding strip receiving plate, and
    - means for retracting said infolding blades and releasing said edges to be sewn from said defining blade halves, and
    - means for moving said binding strip clamped to said shirt sleeve relatively to said needle of said sewing machine in order to stitch said infolded edges of said binding strip to said one edge of said slit and producing said stitch row for securing the area where said two edges of said slit meet.

#### 4,160,424 STITCH COUNTER FOR A SEWING MACHINE

Robert C. Newell, Hillsdale, and Robert F. Kinning, Rutherford, both of N.J., assignors to Dan River Incorporated, Danville, Va.

Filed Feb. 13, 1978, Ser. No. 877,184

Int. Cl.<sup>2</sup> D05B 69/22, 69/20

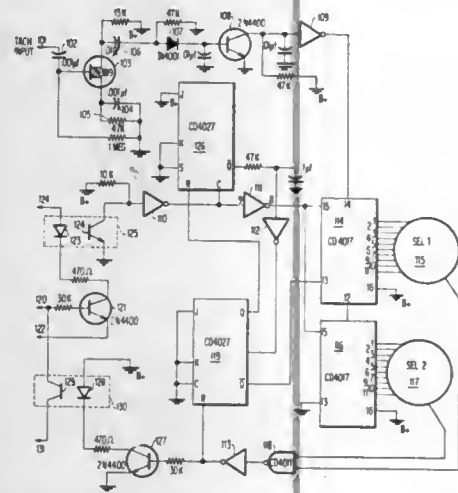
U.S. Cl. 112—275

6 Claims

1. In a sewing machine having a reciprocating needle actuated by a main shaft; a motor drivingly connected to said shaft;

and means to control the operation and speed of said motor, the improvements comprising:

- (a) pulse generating means driven by said main shaft, the number of pulses generated being proportional to the number of stitches of said sewing machine;
- (b) electrical circuit pulse counting means to count the number of pulses generated by said pulse generating means;
- (c) detecting means to detect the end of the cloth being sewn and generate an electrical signal when the end is detected, said generated electrical signal actuating said electrical circuit pulse counting means;
- (d) selector means to select the number of pulses to be counted electrically connected to said electrical circuit pulse counting means so as to produce an output signal when the selected number of pulses are counted;
- (e) reset means electrically connected to said detecting means to reset and enable said electrical circuit pulse counting means upon receipt of an electrical signal from said detecting means; and



- (f) means responsive to electrical signals from said electrical circuit pulse counting means to produce an output signal which stops the sewing machine when the selected number of pulses have been counted, said means comprising:
  - (i) a NAND gate electrically connected to the output of said selector means so as to produce an output signal when a signal is received from all selector means,
  - (ii) transistor means electrically connected to the output of said NAND gate such that the transistor means becomes conductive upon receipt of an electrical signal from said NAND gate; and
  - (iii) photo isolator means electrically connected to said detecting means and said transistor means such that upon receipt of an electrical signal from said transistor means, said photo isolator means becomes conductive and creates a return signal path from said detecting means to the motor, thereby causing said motor to stop.

4,160,425

## FUEL SYSTEM FOR AQUATIC CRAFT

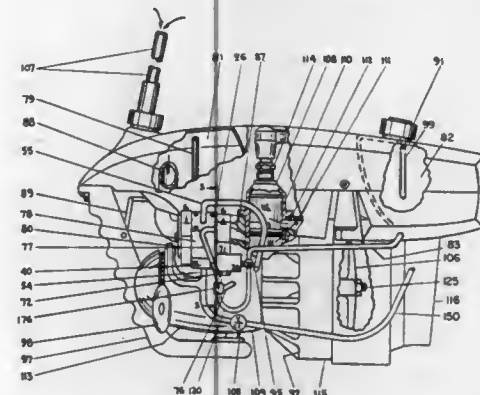
Robert S. Curtis, 93 Woodbury Rd., Huntington, N.Y. 11743  
Continuation-in-part of Ser. No. 709,900, Jul. 29, 1976,  
abandoned. This application Dec. 29, 1977, Ser. No. 865,385  
Int. Cl.<sup>2</sup> B63B 35/00

U.S. Cl. 115-6.1

7 Claims

1. An improved self-powered aquatic craft for moving objects and individuals through water of the type having an internal combustion engine mounted in a housing wherein a propeller is mounted on a rotating shaft, said propeller drawing in water through the sides of said housing and thrusting said water through suitably positioned passageways, wherein the improvement comprises:

- (a) a diaphragm carburetor having an atmospheric chamber and a diaphragm cover;
- (b) a metering diaphragm mounted within the diaphragm carburetor;
- (c) an integral fuel pump built into said diaphragm carburetor;



- (d) means to automatically remove water from the atmospheric chamber of the diaphragm carburetor; and
- (e) means to provide corrosion protection to the craft's internal moving parts during periods of non-use.

4,160,426

## APPARATUS FOR CONTINUOUSLY MARKING AN INSULATED CONDUCTOR

Percy Lambelet, Garbsen, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

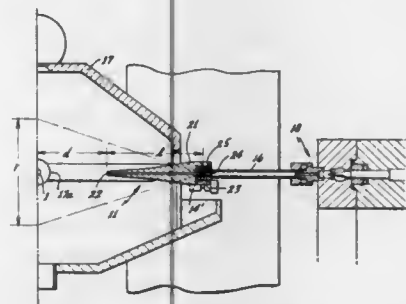
Filed Dec. 1, 1977, Ser. No. 856,346

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655479

Int. Cl.<sup>2</sup> B05C 5/00

U.S. Cl. 118-323

2 Claims



1. Apparatus for continuously marking an insulated conductor which is being moved in a longitudinal direction and at a relatively high speed, comprising:
  - a nozzle made of light metal and having an internal, straight duct and an outer contour which tapers from a relatively thick portion adjacent to a nozzle entrance towards a thin nozzle tip;
  - means for positioning the nozzle in relation to a first axis in which the conductor is being moved longitudinally, so that the nozzle tip has a distance from the first axis of about 20 to 30 millimeters, the length of the nozzle between the tip and a second axis extending parallel to the first axis being larger than first said distance, a ratio of said length to the said distance is between 6 and 7 to 5;
  - means connected for oscillating the nozzle about the second axis within a particular range; and
  - means for feeding ink or dye to said nozzle entrance.

4,160,427

## AQUARIUM WATERFALL

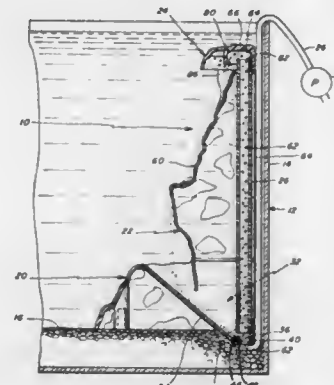
Arthur J. Holbrook, Lynnfield, Mass., assignor to Rolf C. Hagen (USA) Corp., Mansfield, Mass.

Filed Jan. 20, 1978, Ser. No. 870,950

Int. Cl.<sup>2</sup> A01K 63/00, 64/00

U.S. Cl. 119-5

10 Claims



1. An aquarium waterfall comprising
  - a base having a well for collecting sand particles,
  - a vertical member secured to the base and having an outer surface that simulates a generally vertical rock formation over which water may fall,
  - a lift tube secured to the base and having an opening at the lowest portion of the well and adapted to accept sand particles from the well,
  - a pump and air hose mounted on the aquarium with the discharge end of the hose positioned to discharge air into the bottom of the lift tube,
  - a cap secured to the top of the vertical member and having an inverted trough on its lower surface with a discharge end positioned over and in front of the forward face of the vertical member, the upper end of the lift tube discharging into the inverted trough,
  - and a baffle at the discharge end of the inverted trough to direct the discharge of the lift tube downwardly over the face of the vertical member into the well in the base.

4,160,428

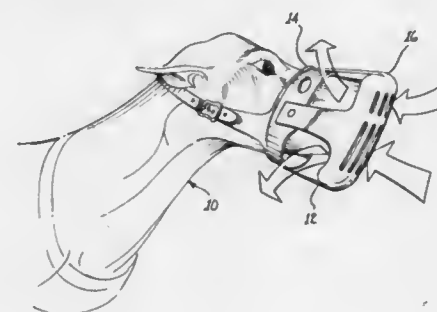
## RACING MUZZLE FOR DOGS

Victor E. Wilkinson, 301 W. Cambridge, Phoenix, Ariz. 85003  
Continuation-in-part of Ser. No. 873,788, Jan. 31, 1978. This  
application Sep. 28, 1978, Ser. No. 946,580

Int. Cl.<sup>2</sup> A01K 25/00

U.S. Cl. 119-133

8 Claims



1. A muzzle for enhancing respiration of racing dogs, said muzzle comprising in combination:
  - (a) a rear guard piece for encircling the dog's upper and lower jaws forward of the dog's stop, said rear guard piece having a top, a bottom and opposed sides;

- (b) band means extending from said rear guard piece for securing said muzzle upon the dog;
  - (c) a forward guard piece disposed forwardly of said rear guard piece for enclosing the distal end of the dog's upper and lower jaws, said forward guard piece having a vertical axis and a horizontal axis and defining substantially a U-shape in horizontal cross-section and wherein the legs of said U-shape are adjacent the respective sides of the dog's jaws and the base of said U-shape is forwardly proximate the dog's nostrils and distal end of the dog's jaws whereby, during forward movement of the dog, said U-shape defines an aerodynamic body for establishing a higher than ambient pressure environment adjacent said base and a lower than ambient pressure environment adjacent said sides;
  - (d) means for attaching said forward guard piece to said rear guard piece;
  - (e) said forward guard piece including:
    - i. a central member defining said base;
    - ii. intake aperture means disposed in said central member for channeling air directly into the dog's mouth in response to presence of the higher than ambient pressure environment, said first aperture means including a series of vertical slots approximately 1/8 inch wide and extending horizontally laterally from the center of said central member, said slots being approximately 2 inches long, whereby the width of said slots restricts the flow of particulate matter into said forward guard piece; and
  - (f) exhaust aperture means disposed within the sides of said muzzle for exhausting air out of said muzzle during exhalation by the dog in response to presence of the lower than ambient pressure environment;
- whereby, said muzzle is aerodynamically structured to promote inhalation of fresh air and evacuation of exhaled air when the dog is racing.

4,160,429

## ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Seiji Morino, Okazaki, and Hisasi Kawai, Toyohashi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

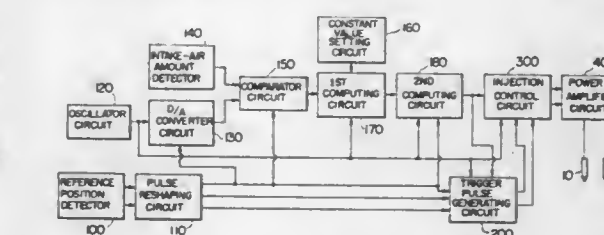
Filed Jul. 1, 1977, Ser. No. 812,597

Claims priority, application Japan, Aug. 8, 1976, 51-94117

Int. Cl.<sup>2</sup> F02B 5/02

U.S. Cl. 123-32 EB

5 Claims



1. A fuel injection system for internal combustion engines comprising:
  - an electromagnetic injector for injecting fuel into an internal combustion engine during the opening thereof;
  - a reference position detector for generating a synchronizing signal at each time when the crankshaft of said engine rotates to a predetermined reference angular position;
  - means, connected to said reference position detector, for computing an injection interval in response to said synchronizing signal, said injection period being varied in accordance with the operating conditions of said engine and indicative of the fuel injection amount;
  - means, connected to said reference position detector, for computing a rotation interval between two said synchronizing signals successively generated by said reference position detector;
  - a subtracting circuit means, connected to said means for



computing the injection interval and said means for computing the rotation interval, for subtracting said injection interval from said rotation interval to thereby compute a differential interval therebetween; a trigger circuit means, connected to said reference position detector and said subtracting circuit means, for generating a trigger signal when said differential interval passes after the generation of said synchronizing signal; and an injection control circuit means, connected to said means for computing the injection interval and said trigger circuit means, for opening said electromagnetic injector during said injection period in synchronism with said trigger signal, whereby start of fuel injection is varied in accordance with said operating conditions and termination of fuel injection is attained substantially at said predetermined reference angular position.

4,160,430

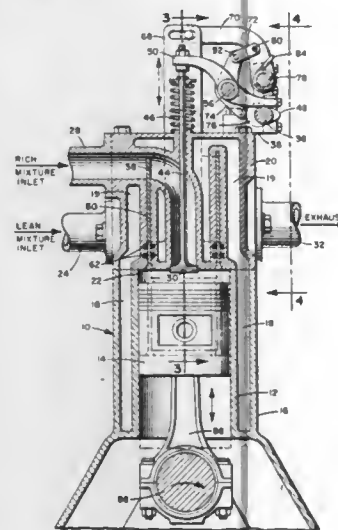
### STRATIFIED CHARGE INTERNAL COMBUSTION ENGINE

John L. Bell, Rte. 1, P.O. Box 15, Severna Park, Md. 21146  
Filed Dec. 1, 1977, Ser. No. 856,518

Int. Cl.<sup>2</sup> F02B 19/00

U.S. Cl. 123—75 B

30 Claims



1. A stratified charge internal combustion engine comprising:

- a cylinder;
- a piston mounting for reciprocating movement in said cylinder;
- a cylinder head mounted to overlie said cylinder, the combination of said cylinder head, the walls of said cylinder and a face of said piston forming a combustion chamber;
- dividing means supported by said cylinder head for dividing said combustion chamber into first and second combustion chambers;
- actuator means connected to said dividing means for moving said dividing means between a retracted position in said cylinder head and an extended position in said combustion chamber for dividing said combustion chamber;
- fuel supply means mounted on said cylinder head for supplying a rich air-fuel mixture to said first combustion chamber and a lean air-fuel mixture to said second combustion chamber;
- ignition means mounted on said cylinder head adjacent said first combustion chamber for igniting the rich air-fuel mixture in said first combustion chamber which in turn ignites the lean air-fuel mixture in said second combustion chamber to drive said reciprocating piston.

29. In an internal combustion engine having a combustion chamber formed by the combination of a cylinder, a cylinder head and a four stroke reciprocating piston contained in said cylinder, said reciprocating piston having intake, compression,

power and exhaust strokes, a method for stratifying the charge in said combustion chamber comprising the steps of:

- introducing a movable septum into said combustion chamber at the start of the intake stroke of said reciprocating piston to divide said combustion chamber into first and second combustion chambers;
- supplying a rich air-fuel mixture to said first combustion chamber and a lean air-fuel mixture to said second combustion chamber during the intake stroke of said reciprocating piston;
- compressing both the rich and lean air-fuel mixtures in said first and second compression chambers respectively during the compression stroke of said reciprocating piston;
- withdrawing said movable septum from said combustion chamber to a retracted position just prior to the power stroke of said reciprocating piston;
- igniting the rich air-fuel mixture in said first combustion chamber to start the power stroke of said reciprocating piston which in turn ignites the lean air-fuel mixture in said second combustion chamber; and
- retaining said movable septum in its retracted position during the power and exhaust strokes of said reciprocating piston.

4,160,431

### INSERT LINER FOR DIVIDED AUXILIARY COMBUSTION CHAMBER OF ENGINE

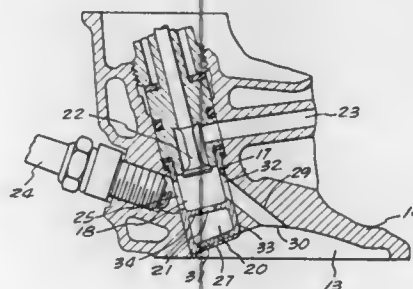
Shizuo Yagi, Asaka; Hiroshi Kogure, Tokorozawa, and Saburo Matsuoka, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,533

Int. Cl.<sup>2</sup> F02B 19/18, 75/02

U.S. Cl. 123—75 B

3 Claims



1. In an internal combustion piston engine, the combustion of: a cylinder head, a main combustion chamber, means forming an auxiliary combustion chamber in the cylinder head, means dividing said auxiliary combustion chamber into a primary cavity and a secondary cavity, an opening connecting said primary and secondary cavities, spark ignition means communicating with said primary cavity, both cavities being contained within an integral insert liner having an end wall exposed to the main combustion chamber, means for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including an auxiliary intake valve for supplying a relatively rich air-fuel mixture to said primary cavity, a relatively long primary torch passage extending from said primary cavity to said main combustion chamber and having an outlet end positioned near the center of said main combustion chamber, and at least one relatively short secondary torch passage extending from said secondary cavity to said main combustion chamber and having an outlet end positioned adjacent a peripheral zone of said main combustion chamber.

4,160,432

### INTERNAL COMBUSTION ENGINE HAVING MAIN AND AUXILIARY COMBUSTION CHAMBERS

Saburo Tsutsumi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

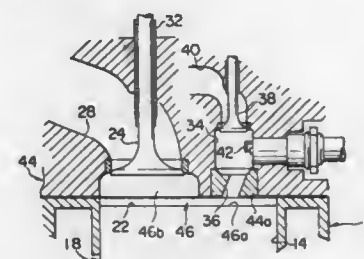
Division of Ser. No. 698,501, Jun. 22, 1976, Pat. No. 4,127,089, which is a division of Ser. No. 532,395, Dec. 13, 1974, abandoned. This application Aug. 15, 1978, Ser. No. 933,906

Claims priority, application Japan, Dec. 22, 1973, 49/3636; Dec. 22, 1973, 49/3638

Int. Cl.<sup>2</sup> F02B 17/00, 19/00

U.S. Cl. 123—75 B

6 Claims



1. A flame ignition type internal combustion engine comprising:

- a cylinder block having therein a cylinder bore;
- a reciprocating piston movable in said cylinder bore;
- a cylinder head positioned atop the cylinder block to form a main combustion chamber above said cylinder bore and having therein an auxiliary combustion chamber in the vicinity of said main combustion chamber, said main combustion chamber consisting of first and second volume portions which are different in form to each other and are bounded at the tops thereof by a lower end face of said cylinder head defining said main combustion chamber and at the bottoms thereof by the top face of said piston in the top-dead center position, said first volume portion being formed into a bathtub shape and being larger than said second volume portion, said second volume portion being formed between a flat section of said lower end face of said cylinder head and a flat section of said top face of said piston;
- intake and exhaust valves operatively located at the top of said first volume portion and respectively associated with intake and exhaust ports formed in said cylinder head;
- an auxiliary intake valve operatively located at the top of said auxiliary combustion chamber and associated with an auxiliary intake port formed also in said cylinder head;
- a spark plug projecting into said auxiliary combustion chamber; and
- means for forming a flame passageway providing communication between said main and auxiliary combustion chambers, said passageway having an outlet end open into said second volume portion of said main combustion chamber.

4,160,433

### MODULATING AIR CONTROL VALVE

Donel R. Olson, Huntington Beach, Calif., assignor to Olson Engineering Inc., Huntington Beach, Calif.

Filed Feb. 17, 1978, Ser. No. 878,640

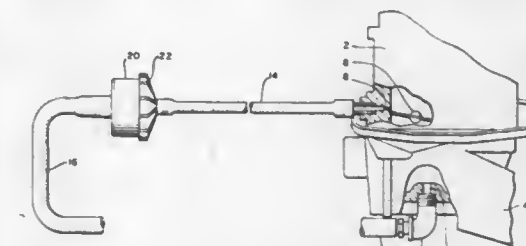
Int. Cl.<sup>2</sup> F02M 23/04

U.S. Cl. 123—124 R

14 Claims

1. In an internal combustion engine comprising an intake manifold maintained at partial vacuum and having an air injection port formed thereon, a carburetor having a throttle valve pivotally mounted therein, a vacuum advance port located adjacent said throttle valve to produce a variable vacuum source, a first conduit connected to said vacuum advance port, and a second conduit connected to said air injection port, a modulating air control valve connected to be controlled by said first conduit, said valve, under such control, supplying regulated amounts of ambient air to said second conduit to

selectively introduce ambient air into said intake manifold in an amount regulated by engine vacuum, said valve comprising: a valve body having an aperture therethrough with an annular seat; orifice means for admitting ambient air into said valve; diaphragm means for cooperating with said annular seat, said diaphragm being movable from said annular seat in



response to a pressure differential to permit ambient air to flow into said intake manifold; and a unidirectional flow valve responsive, when said diaphragm admits ambient air into said valve, to the pressure differential between ambient and said intake manifold to allow air to flow into said intake manifold, but preventing hydrocarbon gases contained in said intake manifold from flowing toward said diaphragm or said orifice means.

4,160,434

### EXCESS FUEL STARTING DEVICE FOR FUEL INJECTION ENGINES

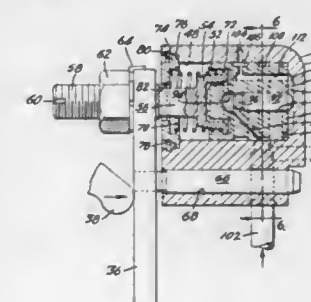
Ignace J. Daborowski, Springfield, and Leon A. Galis, Ludlow, both of Mass., assignors to Ambac Industries, Inc., Springfield, Mass.

Filed Jan. 19, 1978, Ser. No. 870,761

Int. Cl.<sup>2</sup> F02D 1/04, 1/06; F02M 39/00

U.S. Cl. 123—140 FG

4 Claims

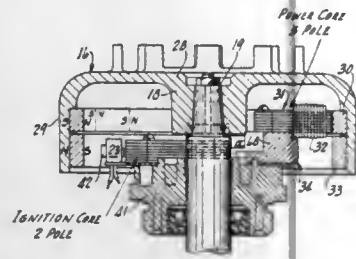


1. An excess fuel starting device for a fuel injection engine having a full load stop coacting with the engine throttle linkage to limit the fuel input thereto comprising, a hydraulic actuator operatively connected to the full load stop for movement thereof between a normal operating full load position and an excess fuel starting position, said actuator comprising a housing having a cylindrical bore therein, an excess fuel piston slidably disposed within said bore and forming a first chamber at one end thereof, means operatively connecting the full load stop plate with said excess fuel piston, spring means urging said excess fuel piston and stop plate into an excess fuel position, a coaxial bore within said excess fuel piston opening into said first chamber, a free piston slidably disposed within said coaxial bore and forming a second chamber at one end thereof, a fluid inlet port in said housing opening into said housing bore, conduit means connecting said fluid inlet port with a source of fluid pressurized during running of the engine, fluid passage means in said excess fuel piston connecting said fluid inlet port with said second chamber when said excess fuel piston is in the excess fuel position to thereby upon engine starting pressurize said second chamber, move said free piston against the end of said housing bore and move said excess fuel piston and full load



stop into a normal operating full load position, said fluid inlet port opening into said first chamber in the normal operating full load position of said excess fuel piston to pressurize said chamber and provide a holding force acting against said excess fuel piston while the engine is running.

**4,160,435**  
**ALTERNATOR DRIVEN CD IGNITION WITH AUXILIARY POWER**  
Richard L. Sleder, Fond Du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.  
Filed Apr. 15, 1977, Ser. No. 787,770  
Int. Cl.<sup>2</sup> F02P 1/02; H05B 41/36  
U.S. Cl. 123—148 CC 21 Claims

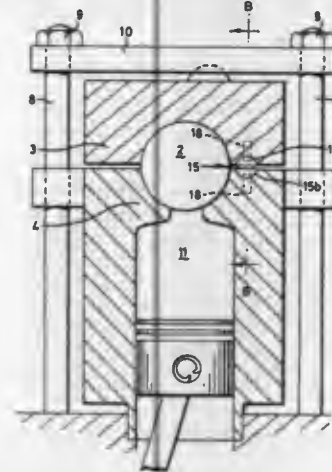


1. An alternator apparatus for a capacitor discharge ignition circuit having an ignition capacitor connected in a discharging circuit including a triggered switch means and for a separate power load, comprising a rotor means having first ignition magnet means having a plurality of circumferentially spaced magnets for providing an output for operating of the ignition circuit and a second power magnet means having a different and greater plurality of circumferentially spaced magnets for producing an alternating current power output, a common rotating support having an axis of rotation and having said first and second magnet means mounted thereon in axially close spaced relation, ignition charging and trigger coil means secured in radial alignment with said first ignition magnet means to produce time spaced trigger signals and coupled by leakage flux to said second power magnet means, a power coil means secured in radial alignment with said second power magnet means, and said second power magnet means including said plurality of magnets selected to produce leakage flux coupled to said ignition charging and trigger coil means creating a symmetrical ripple voltage in the trigger coil means and thereby maintaining symmetrical trigger signals from the trigger coil means and thereby a symmetrical ignition timing characteristic.

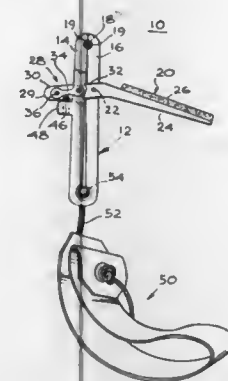
**4,160,436**  
**ROTARY VALVES**  
Ralph F. J. Flower, Littledean, Bath Rd., Devizes, Wiltshire, England  
Filed Mar. 22, 1978, Ser. No. 889,130  
Claims priority, application United Kingdom, Mar. 25, 1977, 12761/77  
Int. Cl.<sup>2</sup> F01L 7/16; F16K 25/00; F16C 11/06  
U.S. Cl. 123—190 B 14 Claims

13. A rotary valve for controlling the flow of inlet gases to and combustion products from the combustion chamber of an internal combustion engine, which valve comprises in combination an internal combustion engine cylinder having a cylinder axis, a base valve housing part formed as a part of said cylinder a cap valve housing part mounted on said base valve housing part with the join therebetween lying in a plane normal to said cylinder axis, the base and cap housing parts together defining a bore, an opening in the base housing part and communicating said bore to said cylinder, a rotatable valve member fitted within said bore and having at least one port which comes into and out of registration with said opening on rotation of said valve member about a rotational axis, an engine crankcase which slidably supports said cylinder for movement

parallel to said cylinder axis, loading means anchored to said crankcase and bearing on said cap part to load said cap part against said base part, resilient means to urge said cylinder away from said crankcase thereby to maintain engagement between said loading means and said cap part, and an element interconnecting said base and cap parts which element allows relative hinging movement between said two housing parts



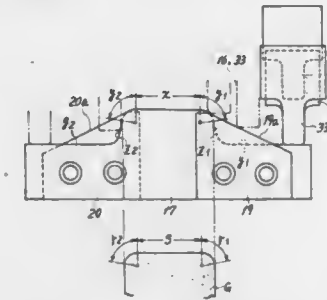
**4,160,437**  
**ARCHERY BOW STRING RELEASE DEVICE**  
James D. Fletcher, P.O. Box 218, Bodfish, Calif. 93205  
Filed Dec. 12, 1977, Ser. No. 859,330  
Int. Cl.<sup>2</sup> F41B 5/00  
U.S. Cl. 124—35 A 10 Claims



1. An improved archery bowstring release device comprising, in combination:  
a. a unitary bowstring-holding member in the form of a resilient one piece frame having an integral pair of spaced, opposed, engageable resilient clamp jaws;  
b. a trigger member intersecting said frame and pivotably connected to one of said jaws; and,  
c. a link pivotably connected to the other of said jaws and to said trigger member, whereby movement of said trigger member in a first direction acts through said link to force said jaws toward each other into a bowstring holding closed position, and whereby movement of said trigger member in the opposite second direction permits sudden

bowstring-releasing springing open of said jaws due to their inherent resiliency.

**4,160,438**  
**PROFILING APPARATUS FOR A DISK-LIKE ARTICLE HAVING A CYLINDRICAL FACE AND ROUNDED CORNERS**  
Michio Fujita, Nagoya, Japan, assignor to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan  
Filed Feb. 17, 1978, Ser. No. 878,888  
Claims priority, application Japan, Feb. 17, 1977, 52/18904[U]  
Int. Cl.<sup>2</sup> B24B 53/06  
U.S. Cl. 125—11 TP 8 Claims



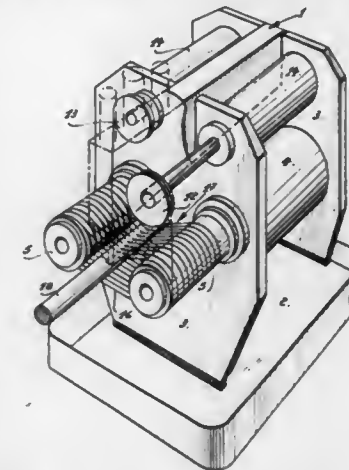
1. An apparatus for forming a cylindrical face and rounded corners joining both ends thereof on a disc-like article rotatably carried, having a traverse slide for movement in parallel relation with said cylindrical face, a cross slide slidably mounted on said traverse slide for movement in a direction transversal to the movement of said traverse slide, traverse feed means for reciprocally moving said traverse slide, a profiling tool carried on said cross slide, a full form template having a straight portion and rounded corners joining both ends thereof, a non-extensible stylus fixed to said cross slide, and means for urging said cross slide to maintain contact between said stylus and said template, the improvement comprising:

first and second assistant templates fixedly disposed and respectively presenting outwardly downward gentle slopes from said rounded corners of said full form template, extensible stylus means extensibly provided on said cross slide for contact engagement with said first and second assistant templates, and stylus actuation means for moving said extensible stylus means so as to bring the extensible stylus means into contact with said first assistant template when said non-extensible stylus ascends one of said rounded corners of said full form template and with said second assistant template when said non-extensible stylus ascends the other of said rounded corners of said full form template.

**4,160,439**  
**CUTTING-OFF MACHINE FOR HARD BODIES**  
Jean Piat, La Varenne-St-Hilaire, France, assignor to Sotarem S.A., Fribourg, Switzerland  
Continuation of Ser. No. 739,722, Nov. 4, 1976, abandoned. This application Feb. 24, 1978, Ser. No. 880,982  
Claims priority, application Switzerland, Nov. 7, 1975, 14405/75  
Int. Cl.<sup>2</sup> B28D 1/06  
U.S. Cl. 125—16 R 5 Claims

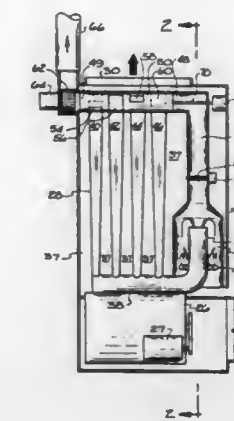
1. A machine for cutting hard bodies, comprising a pair of rotatable drums with parallel axes, each said drum having a grooved peripheral surface, a motor individual to each said drum for reversibly driving said drums in rotation, an abrasive metal wire wound on both drums to produce at least one layer of parallel strands of wire extending between said drums, a feeding spool on which one end of said wire is secured, a

receiving spool on which the other end of said wire is secured, means for reversibly driving in rotation said feeding and receiving spools, a support for an elongated hard body to be cut, said support comprising means for mounting said elongated body with its axis parallel to the plane of said layer and transverse to said strands of said layer, means for moving said



support toward said layer in a direction perpendicular to the plane of said layer, and means selectively to move said drums and motors simultaneously toward each other or simultaneously away from each other, thereby to permit said hard body to deflect said strands from said plane of said layer a predeterminedly variable distance at different times during the cutting of said hard body.

**4,160,440**  
**HEAT EXCHANGER**  
Andrew Barnickle, 608 Gideon Rd., Middletown, Ohio 45042  
Filed Feb. 6, 1978, Ser. No. 875,325  
Int. Cl.<sup>2</sup> F24H 3/02; F23L 11/00; F23N 3/00; F24H 3/00  
U.S. Cl. 126—110 R 10 Claims



1. An improved heat exchanger of a type used in a heater comprising, in combination: means for producing heated gases at base of the heat exchanger; a plurality of vertical flues passing through the heat exchanger carrying the heated gases upward by natural draft; and a smoke pipe above the flues into which the heated gases are discharged; in which the improvement comprises:

a rotating damper means for cyclically opening and closing the flues, the damper means being interposed between the flues and the smoke pipe and having an opening means for cyclically opening and closing the flues in such order that at least one flue, at any one time, is open for venting the heated gases to the smoke pipe and recharging while at least one other flue is closed for temporarily holding the

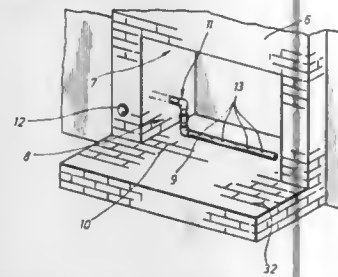


heated gases to provide increased time for the transfer of heat in the heat exchanger; and means for driving the rotating damper means.

**4,160,441**  
**FIREPLACE UTENSIL**  
Frank M. Fuller, 5415 Verdant Way, Houston, Tex. 77069  
Filed Jun. 2, 1977, Ser. No. 802,647  
Int. Cl.<sup>2</sup> F24C 3/12

U.S. Cl. 126—127

7 Claims



1. A fireplace utensil, for use in a log burning fireplace which has upper and lower portions, wherein said fireplace includes an elongated gas inlet pipe disposed with its longitudinal axis lying in a plane substantially parallel with the bottom portion of the fireplace, said gas inlet pipe having a plurality of gas jets disposed along its longitudinal axis and facing generally toward the upper portion of said fireplace for igniting the logs which comprises:

an elongated imperforate cover member having an upper portion and depending side portions, wherein the upper portion and the depending side portions of said cover member define a generally concave enclosure having a cross-sectional configuration which generally conforms to the cross-sectional configuration of said gas inlet pipe whereby undesired particulate matter from the burning logs is prevented from passing through the cover member and accumulating between the cover member and the gas inlet pipe;

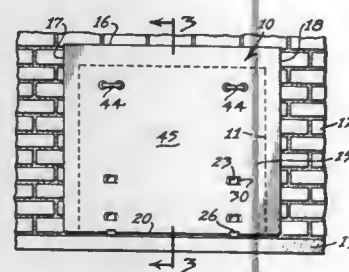
an elongated handle attached to said cover member and extending outwardly from said cover member and of said fireplace; and

said fireplace utensil adapted to be placed upon the gas inlet pipe, with a longitudinal axis of said cover member being generally aligned with the longitudinal axis of the gas inlet pipe to prevent particulate matter from the burning logs from entering and blocking the gas jets of the gas inlet pipe and from accumulating within the gas inlet pipe.

**4,160,442**  
**FIREPLACE COVER**  
Charles T. Fox, Signal Mountain, and Edward P. Graham, Chattanooga, both of Tenn., assignors to United States Stove Company, Chattanooga, Tenn.  
Filed Dec. 7, 1977, Ser. No. 858,168  
Int. Cl.<sup>2</sup> F24C 15/10

U.S. Cl. 126—140

9 Claims



1. A cover for a fireplace having a front opening above a hearth, comprising:

(a) a flat sheet member of generally the same shape as, but of

greater marginal extent in height and width than, the fireplace opening which said sheet member is adapted to cover,

(b) said sheet member having a front surface and a rear surface, an upper marginal portion, a horizontal bottom marginal portion, and opposite side portions,

(c) at least one foot member having a horizontal foot,

(d) means attaching said foot member to said sheet member so that said foot extends substantially normal to the plane of said sheet member adjacent said bottom marginal portion and rests upon the hearth for the free-standing support of said sheet member to cover said fireplace opening in operative position,

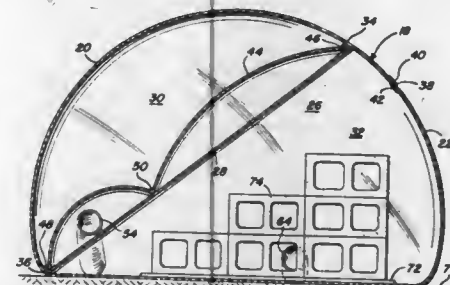
(e) a U-shaped reinforcing member having a bight portion and two arm portions,

(f) means securing said U-shaped reinforcing member against the rear surface of said sheet member so that said bight portion is generally adjacent to, but spaced from, the upper marginal portion of said sheet member, and each of said arm portions is spaced generally adjacent to, but spaced from, the opposite side portions of said sheet member.

**4,160,443**  
**INFLATABLE SOLAR HEAT COLLECTOR**  
Dannie K. Brindle, 12797 W. 7th Ave., Golden, Colo. 80401, and Donald Y. Shanfelt, 12844 W. Illiff Ave., Lakewood, Colo. 80215, assignors to Donald Y. Shanfelt; Dannie K. Brindle; Dennis D. Kiser; David W. Armagast and Patrick J. Lynch, part interest to each  
Filed Jul. 21, 1977, Ser. No. 817,992  
Int. Cl.<sup>2</sup> F24J 3/02; F24H 7/02

U.S. Cl. 126—270

20 Claims



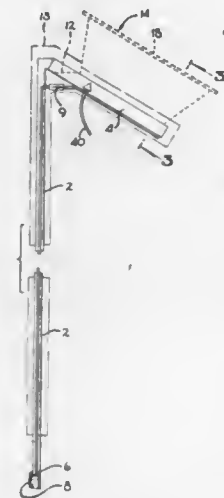
1. A solar heat collector including an elongated tubular housing formed of flexible film material defining an inflatable and flexible enclosure, said tubular housing including front and rear wall portions, said front wall portion being constructed of solar radiation transparent material, a panel of solar radiation absorbing material mounted in said housing and extending between opposite sides thereof dividing the interior of said housing into front and rear compartments between said panel and said front and rear walls, respectively, air inlet means operative to introduce pressurized air to be heated into said front compartment and said housing, air pass means operative to pass air from said front compartment into said rear compartment, the pressurized air introduced being received within the enclosure to inflate the tubular housing to structurally maintain said collector in an operative condition, the rear wall portion of said tubular housing adapted to contact a support surface from which said collector is supported, said solar radiation absorbing panel extending in a generally planar condition between opposite sides of said inflated tubular housing in generally spaced apart relation with respect to the portion of the rear wall contacting a support surface, and air outlet means operative to exhaust heated air from said rear compartment, said front compartment and air pass means including means insuring airflow through said front compartment at least substantially over the entire area of said solar radiation absorbing

panel, said rear compartment and air pass means including means insuring airflow through said rear compartment and out of said collector.

**4,160,444**  
**OMNIDIRECTIONAL HEAT PIPE**  
Ralph A. Hamilton, 1836 Lake St., Glendale, Calif. 91201  
Filed Jul. 22, 1977, Ser. No. 818,106  
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

7 Claims



1. Thermal energy transfer apparatus comprising:

a first elongate conduit closed at both ends and adapted to hold a liquid at a first end thereof

a second elongate conduit closed at both ends and adapted to hold a liquid at a first end thereof

means defining a first unidirectional fluid passage from said first end of said first conduit to the second end of said second conduit;

means defining a second unidirectional fluid passage from said first end of said second conduit to the second end of said first conduit;

a normally-liquid fluid partially filling said first ends of each of said conduits; and

means for first applying heat sufficient to vaporize said fluid at said first end of said first conduit and thereafter applying said heat to said first end of said second conduit, whereby any liquid condensate of said fluid tending to accumulate at the second end of said first conduit will be transferred back via said second unidirectional passage means as a result of the differential pressure established thereacross to the first end of said second conduit and thereafter any liquid condensate tending to accumulate at the second end of said second conduit will be transferred back via said first unidirectional passage defining means as a result of the differential pressure established thereacross to the first end of said first conduit.

**4,160,445**  
**PRESSURE VESSEL AND METHOD FOR COOKING FOOD IN A PRESSURE VESSEL**  
Paul Kunz, Deishardtstr. 3, 5419 Döttesfeld, Fed. Rep. of Germany  
Filed Feb. 25, 1977, Ser. No. 772,158  
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610221

U.S. Cl. 126—369.1

11 Claims

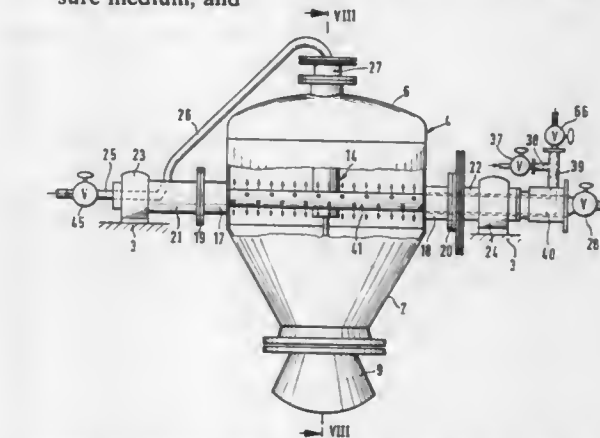
1. A pressure vessel for treatment of solid material with a pressure medium, comprising:

means for supporting said pressure vessel for pivotal movement about a predetermined axis;

a first vessel zone having a closable opening for introducing said solid material into said first vessel zone, said first vessel zone being disposed in an upper portion of said pressure vessel;

a second vessel zone adjacent to said first vessel zone, said second vessel zone being disposed in a bottom portion of said pressure vessel;

operating means for opening and closing said closable opening, said operating means being controlled by said pressure medium; and



means separating said first vessel zone from said second vessel zone and having a plurality of openings there-through, said openings having dimensions selected for allowing passage of liquid material but preventing passage of said solid material from said first vessel zone to said second vessel zone;

whereby liquid material is allowed to flow through said separating means and between said first and second vessel zones during said pivotal movement of said pressure vessel and said solid material is retained in said first vessel zone.

**4,160,446**  
**APPARATUS FOR AND METHOD OF STERILIZATION BY THE DELIVERY OF TUBAL-OCCLUDING POLYMER**  
James E. Barrington, Woburn, Mass., assignor to Abcor, Inc., Wilmington, Mass.  
Filed Aug. 12, 1977, Ser. No. 823,929  
Int. Cl.<sup>2</sup> A61B 19/00

U.S. Cl. 128—1 R

12 Claims



1. An occluding-polymer delivery system for tubal sterilization by polymer occlusion of the fallopian tubes in a female, which apparatus comprises:

(a) first, second and third elongated delivery tubes respectively and concentrically arranged, each tube having a one end and another end;

(b) a resilient expandable balloon element secured about the one end of the third outermost delivery tube, the balloon element adapted to move between a relaxed noninflated condition and a pressurized inflated condition, the balloon element characterized by a first proximal chamber and a

second distal chamber, each chamber separately inflatable;

- (c) a source of an occluding polymer;
- (d) means to introduce the occluding polymer from its source into the outer end of the first innermost tube and to discharge the polymer from a discharge head at the one end of the innermost tube;
- (e) a discharge head at the one end of the innermost tube;
- (f) a source of pressurized fluid;
- (g) means to introduce the pressurized fluid into the second and third tubes to effect the separate expansion of the first proximal and second distal chambers of the balloon-sheath element in a desired sequence; and
- (h) sealing means peripherally positioned about the balloon element and approximately between the proximal and distal chambers and which moves with the balloon element between an inflated and a noninflated position to provide for a seal between the inner wall of the uterus and the first proximal chamber in the inflated condition; whereby, on insertion of the delivery head into the uterine cavity, positioned approximately opposite the uterine fundus, the proximal and distal chambers may be inflated in sequence by the introduction of fluid from the source of fluid, firstly, to effect a seal between the interior wall of the uterus and the expanded balloon sheath, and, thereafter, to permit the introduction of an occluding polymer, and, thereafter, the forcing of the occluding polymer into the fallopian tubes by the full pressurization of the second distal chamber of the balloon-sheath element, and the subsequent deflation of both chambers and the withdrawal of the device from the uterus.

4,160,447

#### DEVICE FOR DETECTING PARTICULAR POINT OF HUMAN BODY

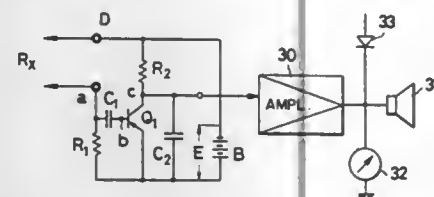
Toru Teshima, Hadano, and Yoshinori Uchiyama, Machido, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 798,002

Claims priority, application Japan, May 20, 1976, 51/64152[U]; May 21, 1976, 51/65176[U]; Jun. 11, 1976, 51/76047[U]

Int. Cl.<sup>2</sup> A61B 5/05; A61H 39/02

U.S. Cl. 128—735



1. A device for detecting a particular point of a human body comprising:

- a searching probe adapted to selectively contact different points of a human body for detecting an impedance value of skin resistance as a function of electric current flowing through the human body;
- a source of power (B);
- means (D) for stationarily connecting a first pole of said power source to the skin of the human body;
- a first resistor (R<sub>1</sub>) connecting a second pole of said power source to said probe;
- a first capacitor (C<sub>1</sub>), one terminal of which is coupled between said first resistor (R<sub>1</sub>) and said probe;
- a transistor (Q<sub>1</sub>) having a base connected to the other terminal of said first capacitor; an emitter coupled to said second pole of said power source and a collector;
- a second resistor (R<sub>2</sub>) coupling said collector to said first pole of said power source;

a second capacitor (C<sub>2</sub>) coupled between said collector and emitter of said transistor; and  
indicating means coupled to said collector of said transistor, said indicating means including at least a luminous diode for indicating a change in impedance detected by said searching probe;

said transistor, first and second resistors and first and second capacitors comprising a time limit circuit for permitting substantially immediate actuation of said indicating means only one time immediately responsive to an impedance change detecting signal from said searching probe, said time limit circuit cutting off the supply of electrical current from said power source to said searching probe a predetermined period of time after generation of said detecting signal.

4,160,448

#### BLOOD PRESSURE MEASURING CATHETER

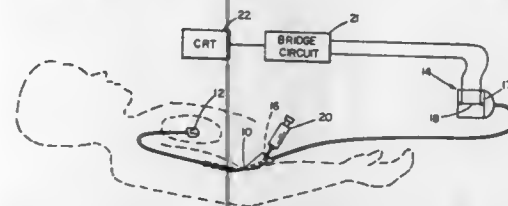
Richard R. Jackson, Eight Trinity Rd., Marblehead, Mass. 01947

Filed May 23, 1977, Ser. No. 799,432

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—673

6 Claims



1. A catheter sized for insertion through a needle-like probe into a blood vessel for the purpose of determining blood pressure, the portion of said catheter insertable through said needle-like probe having a liquid-impermeable, flaccid wall positioned to enter directly into the bloodstream and a cannula communicating from the exterior side of said flaccid wall to a blood pressure-responsive indicator, means for admitting liquid to said cannula to establish a static isolated liquid volume from the flaccid wall to said indicator, said flaccid wall arranged to deflect while in said bloodstream in direct response to the pressure of the blood in the manner to transmit said blood pressure directly to the said isolated static liquid within said cannula and said cannula adapted to transmit the pressure of said isolated liquid out of said blood vessel to said pressure-responsive indicator whereby blood pressure can be determined directly.

4,160,449

#### EARPLUG

Kenneth L. Wade, Box 22, Croton-on-Hudson, N.Y. 10520

Filed Sep. 28, 1977, Ser. No. 837,530

Int. Cl.<sup>2</sup> A61F 11/02

U.S. Cl. 128—152

9 Claims



1. An earplug comprising a generally cylindrical plug of soft compressible resilient spongy material, said plug having a diameter in relaxed condition slightly greater than the average diameter of the outer canal of a human ear, and a tubular

envelope of thin flexible plastic material which is closed at its inner end and receives said plug snugly but not tightly, said envelope having an outer end portion that extends beyond the outer end of said plug, means at least partially closing said extending portion of said envelope at a distance from the outer end of said plug to retain said plug in said envelope, said extending portion of said envelope being twistable to compress said plug and thereby reduce its diameter to facilitate introduction of said plug into the outer ear canal, whereupon said envelope is released to permit said plug to expand to conform to the outer ear canal.

4,160,450

#### OUTSIDE-THE-NEEDLE CATHETER DEVICE WITH NEEDLE HOUSING

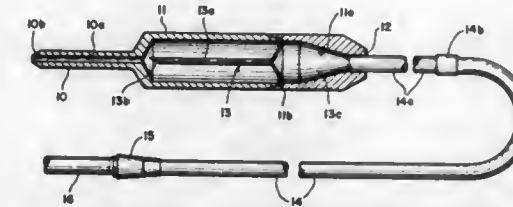
George O. Doherty, 2301 River Rd., Missoula, Mont. 59801

Filed Jul. 15, 1977, Ser. No. 815,806

Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—214.4

10 Claims



1. A catheter device, comprising a catheter having a free end for insertion in a venipuncture; a housing connected liquid-tight at one of its ends to an end of the catheter for liquid flow therebetween, said housing being adapted to define an elongate, liquid flow chamber internally thereof and being itself liquid-tight except for an opening through its end opposite the catheter; a hollow, stylet needle having a sharp end adapted to extend beyond the free end of the catheter to effect venipuncture, and a shank adapted to extend through the catheter internally thereof and into the said flow chamber of the housing during venipuncture, the length of the portion of the needle disposed within the catheter and extending beyond the free end thereof during venipuncture being less than the maximum length of said liquid flow chamber of the housing, so extended movement of the needle relative to the housing or vice versa following venipuncture will protectively position the sharp end of the needle within said housing and liquid supplied through the hollow interior of the needle will flow into said chamber and thence into and through said catheter; a tube for the supply of a venoclysis liquid extending through and substantially closing said opening and connected liquid-tight to the needle; and means by which said opening is closed liquid-tight.

4,160,451

#### UNIDIRECTIONAL CATHETER PLACEMENT UNIT

Richard M. Chittenden, Grayslake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 25, 1977, Ser. No. 854,858

Int. Cl.<sup>2</sup> A61M 5/00

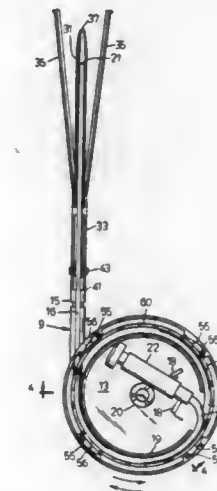
U.S. Cl. 128—214.4

10 Claims

1. In a catheter placement unit comprising:  
an enclosed container having a base portion including an outlet from said container and an upper portion including a reel for a catheter, said upper portion rotatably mounted on said base portion;  
a hollow needle having a pointed distal end and a proximal end secured to said container in communication with said outlet therefrom; and  
a catheter wound on said reel of said container and extending through said outlet into said hollow needle so that rotating said upper portion relative to said base portion advances or retracts said catheter out of or into said nee-

dle; the improvement which comprises the addition to said catheter placement unit of:

- a clutch cooperable with said upper portion to allow said upper portion to be manually rotated only in the direction that advances said catheter,



- said clutch including a rotatably mounted cover overlying and concealing said upper portion and means for coupling said cover to said upper portion only when said cover is rotated in the direction predetermined to rotate said upper portion in the direction that advances said catheter.

4,160,452

#### OSMOTIC SYSTEM HAVING LAMINATED WALL COMPRISING SEMIPERMEABLE LAMINA AND MICROPOROUS LAMINA

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Apr. 7, 1977, Ser. No. 785,582

Int. Cl.<sup>2</sup> A61M 31/00

U.S. Cl. 128—260

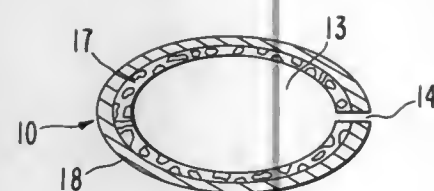
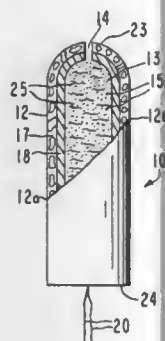
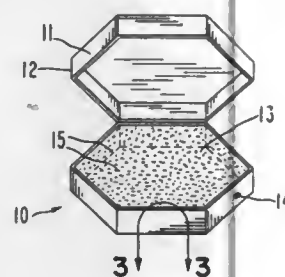
14 Claims

1. An osmotic therapeutic system for the controlled dispensing of a beneficial drug formulation to a biological fluid environment of use comprising:

- (a) a shaped laminated wall comprising: a semipermeable lamina that is formed of a material permeable to the passage of an external fluid, substantially impermeable to the passage of drug, and essentially maintains its physical and chemical integrity in the biological environment of use, said semipermeable lamina in laminar arrangement with a lamina formed of a material that forms in the environment of use a microporous lamina having a plurality of micropores with paths through the lamina, said laminated wall surrounding and forming:
- (b) a compartment containing a beneficial drug formulation;
- (c) a passageway in the laminated wall communicating with the compartment and the exterior of the system for dispensing drug formulation from the system; and,
- (d) wherein in operation, when the system is in the environment of use, fluid from the environment is imbibed through the laminated wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the laminated wall and the



osmotic pressure gradient across the laminated wall, mounted in mutual sliding engagement with said first handle to thereby forming a solution containing the drug formula- which second handle said push rod is secured; and means for



tion that is dispensed through the passageway at a controlled rate over a prolonged period of time.

4,160,453

## APPARATUS FOR IMPLANTING HAIR

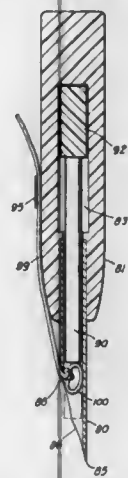
Paul W. Miller, Atlanta, Ga., assignor to Hairegenics, Inc., Atlanta, Ga.

Division of Ser. No. 637,843, Dec. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 516,887, Oct. 22, 1974, Pat. No. 3,998,230. This application Sep. 6, 1977, Ser. No. 830,449 Int. Cl.<sup>2</sup> A61B 17/00, 17/34

U.S. Cl. 128—330

2 Claims

1. Apparatus for implanting hair having a bulbous end into human skin comprising a tubular needle having a beveled cylindrical end providing a pointed tip for penetrating the skin and a notch formed in said tubular needle beveled end through which the hair may extend with the bulbous hair end held within the tubular needle in engagement with an inner surface of the needle adjacent the beveled end notch; a cylindrical push rod slidably disposed within said tubular needle; a first handle to which said hollow needle is secured; a second handle



releasably holding a hair extending through said needle notch in a taut configuration firmly against said first handle.

4,160,454

## IMPLANTABLE CATHETER SYSTEM

Amnon Foux, Haifa, Israel, assignor to University of Utah, Salt Lake City, Utah

Continuation of Ser. No. 594,374, Jul. 9, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,520

Int. Cl.<sup>2</sup> A61M 25/00, 05/00

U.S. Cl. 128—348

10 Claims



1. An implantable catheter comprising an elongate hollow member adapted for subcutaneous placement in a person, said member being constructed of a material which is penetrable by a needle, the hollow of the member being divided into two portions neither of which is in communication with the other, said hollow member including wire coil reinforcing structure extending about the hollow of said hollow member to prevent collapse of the member when fluid is withdrawn therefrom, a first tubular member extending from near one end of said hollow member to enable communication between the tubular member and one of said hollow portions, and a second tubular member extending from near the other end of said hollow member to enable communication between the second tubular member and the other of said hollow portions, said second tubular member being spaced apart from and having a different length than said first tubular member, each of said tubular members having at least one opening therein to enable the flow of fluid between the interior and the exterior of said tubular members, the tubular members further including protuberances on the exterior surface thereof to project above the openings, and the exterior surface of said hollow member being adapted to accommodate human tissue growth thereon.

4,160,455

## HEATER FOR HEATING FLUID IN A BODY CAVITY

James T. Law, Edinburgh, Scotland, assignor to Ferranti Limited, Hollinwood, England

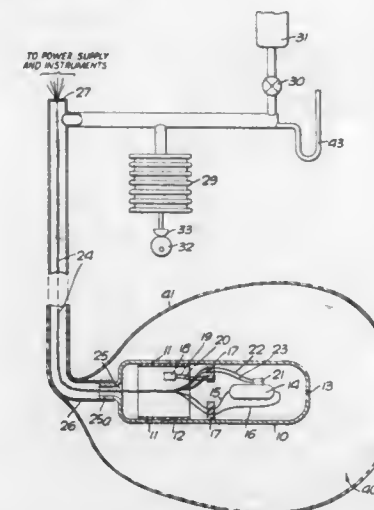
Filed Jul. 13, 1977, Ser. No. 815,282

Claims priority, application United Kingdom, Jul. 14, 1976, 29194/76

Int. Cl.<sup>2</sup> A61F 7/00

U.S. Cl. 128—400

17 Claims



1. A heater for heating fluid within a body cavity of an animal including a container adapted to be inserted into the body cavity and having inlet and outlet ports, pumping means for causing fluid to be drawn from the cavity into the container through the inlet port and expelled into the cavity through the outlet port, and a heating element located within the container between the inlet and outlet ports so that at least some of the fluid passing through the container will be heated by said element.

4,160,456

## 2-SPEED ROTOR GEAR CASE

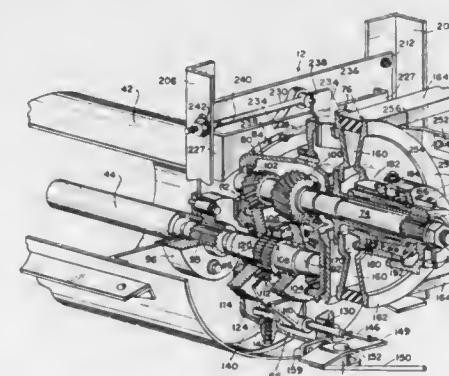
Robert W. Hawkins, Rapids City; Paul G. Togami, East Moline, and T. Gary Drayer, Silvis, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 16, 1977, Ser. No. 833,775

Int. Cl.<sup>2</sup> A01F 12/56

U.S. Cl. 130—27 T

14 Claims



1. In a self-propelled axial flow combine having a mobile chassis mounted on wheels, a threshing concave provided with a cooperating rotor including a rotor shaft which extends in the longitudinal direction of the combine, and an engine including an engine drive shaft, the combination therewith of improved transmission means drivingly connecting said drive shaft to said rotor shaft, said transmission means comprising a

first V-belt sheave mounted on said chassis for rotation about a fixed axis, said first sheave is effectively a fixed sheave, means operatively connecting the drive shaft to said first sheave in driving relationship, a gear case housing having a forwardly projecting output shaft and a rearwardly projecting input shaft, said output and input shafts being disposed in spaced apart parallelism, means operatively connecting said output shaft to the rotor shaft in driving relationship, speed change gearing connecting said input shaft and output shaft, a second V-belt sheave mounted on said input shaft for rotation in unison therewith, a V-belt trained around said first and second sheaves, the second sheave is a variable diameter sheave and includes a pair of sheave sections capable of relative axial shifting movement toward and away from each other, and a compression spring yieldingly urges said sheave sections toward each other in V-belt-engaging relationship, said housing being capable of limited tilting movement about the axis of said output shaft in order to shift said input shaft and sheave carried thereby toward and away from said first sheave for belt tension regulating purposes, releasable means for securing said housing in selected positions of inclination, said engine being disposed rearwardly of the gear case housing, and wherein the means for operatively connecting the engine drive shaft to said first sheave includes a jackshaft on which such first sheave is mounted, and a belt, pulley and idler arrangement effectively extends between said engine drive shaft and the jackshaft.

4,160,457

## TOOL JOINT CLEANER

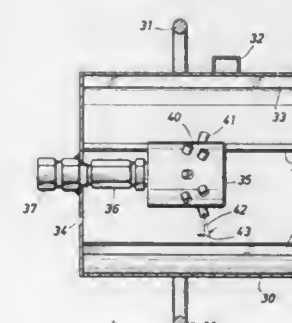
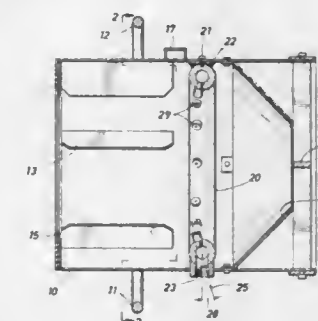
Leon L. Dickson, Jr., and Early B. Denison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1977, Ser. No. 846,750

Int. Cl.<sup>2</sup> B08B 3/02, 9/02

U.S. Cl. 134—167 C

3 Claims



1. A hand-held cleaner for cleaning the pin ends of a tubular member using a source of high-pressure liquid as the cleaning medium, said cleaner comprising: a tubular housing, said housing having at least one open end for receiving said tubular member; handle means secured to the exterior of said housing for use by an operator; a circular tubular manifold, said manifold being mounted in

the interior of said tubular housing with the plane of the manifold being substantially at right angles to the axis of said housing;

a plurality of jet nozzles mounted on said manifold with their discharge openings pointed inwardly, the axis of said nozzles being disposed at an angle of 15 degrees to radii of said housing to create a swirling flow pattern and at an angle of 15 degrees to the plane of the manifold;

means for coupling the source of high-pressure liquid to said manifold; and,

control means mounted on said handles for operation by said operator, said control means being disposed to control the flow of the high-pressure liquid.

4,160,458

## AWNING CONTROL APPARATUS

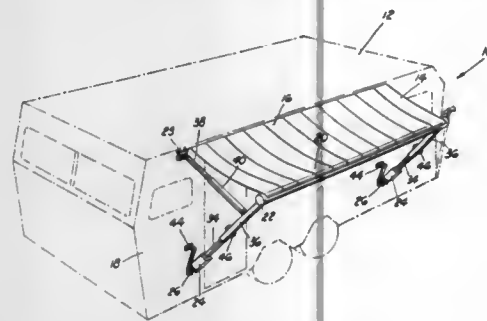
Donald O. Marcellus, 1505 E. Grand, Haysville, Kans. 67060

Filed Dec. 9, 1977, Ser. No. 859,025

Int. Cl.<sup>2</sup> E04F 10/06

U.S. Cl. 135—5 AT

13 Claims



1. An awning control apparatus for connecting to a support structure, the apparatus comprising:
  - an awning having a support end and a roll end, the support end attached to the support structure;
  - drive means attached to the support structure;
  - an elongated drive shaft attached to said drive means and rotated thereby;
  - a telescoping support arm attached to said drive shaft and the roll end of said awning, said drive shaft extending said support arm and said awning outwardly from the support structure; and
  - a telescoping brace arm attached to said drive shaft and the support structure, said drive shaft extending said brace arm outwardly from the support structure.

4,160,459

## LOW POUR CRUDE OIL COMPOSITIONS

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

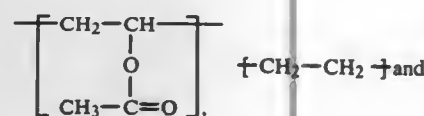
Filed Nov. 23, 1977, Ser. No. 854,305

Int. Cl.<sup>2</sup> H01M 4/20

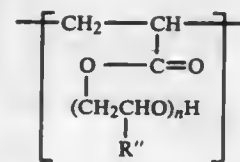
U.S. Cl. 137—13

6 Claims

1. A residual fuel oil composition having improved pour point characteristics comprising a waxy crude oil and an effective pour depressant amount of an oil-soluble terpolymer comprising recurring units of:



-continued



wherein R'' is selected from the group consisting of —CH<sub>3</sub> and hydrogen and n is an integer of from 1 to 5.

6. In the transportation of crude oils, the improvement which comprises introducing into a pipeline the crude oil composition of claim 1.

4,160,460

## FIRE-SAFE VALVE STRUCTURE

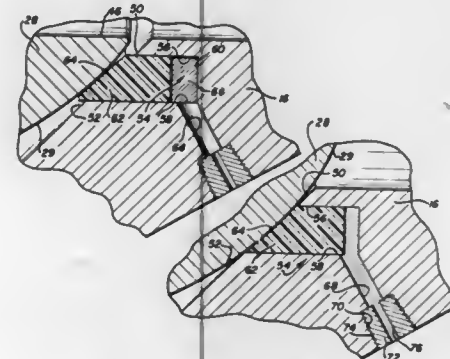
Willard E. Kemp, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 11, 1977, Ser. No. 823,787

Int. Cl.<sup>2</sup> F16K 5/06

U.S. Cl. 137—72

16 Claims



1. A fire-safe valve structure comprising:
  - a valve body having a flow passage therethrough and a valve chamber, a valve member mounted within the valve chamber movable between open and closed positions relative to said flow passage, an annular metallic seat about the flow passage having an annular groove facing the adjacent valve member, a sealing ring mounted in the annular groove for contacting the adjacent valve member in sealing relation to provide a face seal, said annular groove having a space therein behind the sealing ring to permit displacement of the sealing ring, a fusible material chamber associated with said space; and
  - a fusible material in said fusible material chamber adapted to melt at a predetermined high temperature, means mounting said valve member and associated sealing ring for limited displacement toward the fusible material, and passage relieving means for the fusible material chamber to permit the fusible material to flow therein after melting, said fusible material upon reaching a predetermined high temperature melting and flowing from the material chamber to permit displacement of the sealing ring and valve member whereby said valve member contacts the adjacent metallic seat to provide a tight metal-to-metal seal between the valve member and the seat upon reaching said predetermined high temperature.

4,160,461

## WATER AND ENERGY CONSERVATION SYSTEM

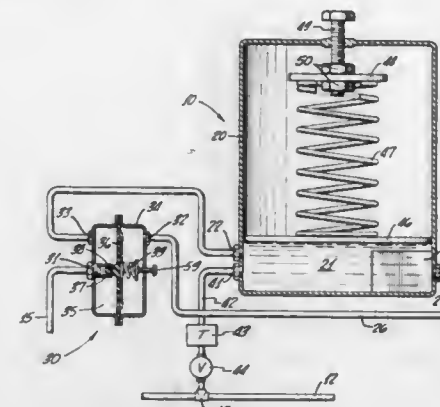
Marcel Vataru, 523 Kings Rd., Los Angeles, Calif. 90048; Leo Miller, 1062 Maybrook Dr., Beverly Hills, Calif. 90210, and Dennis W. Schwesinger, 22708 Roda St., Canoga Park, Calif. 91304

Filed Feb. 21, 1978, Ser. No. 879,475

Int. Cl.<sup>2</sup> E03C 1/02

U.S. Cl. 137—337

15 Claims



1. A water conservation system connectable between a hot water line and a hot water faucet comprising:
  - a reservoir having an inlet and an outlet;
  - first control means connectable to said hot water line, said faucet, and said reservoir inlet for permitting the flow of water from said line into said reservoir when said faucet is open and for preventing the flow of water from said line into said reservoir when said faucet is closed; and
  - second control means connectable between said reservoir outlet and said faucet for permitting the flow of water from said reservoir to said faucet when said water in said reservoir is at or above a predetermined temperature and for preventing the flow of water from said reservoir to said faucet when said water in said reservoir is below said predetermined temperature.

4,160,462

## ADJUSTABLE RELIEF VALVES AND PRESSURE COOKERS INCORPORATING SUCH VALVES

Alan G. Rossi-Ashton, Oxted, England, assignor to The Prestige Group Limited, London, England

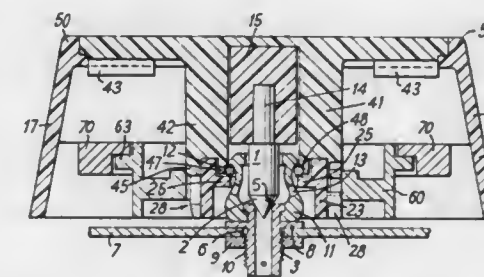
Filed Jul. 12, 1977, Ser. No. 814,978

Claims priority, application United Kingdom, Jul. 19, 1976, 30040/76

Int. Cl.<sup>2</sup> F16K 15/00

U.S. Cl. 137—529

17 Claims



1. An adjustable relief valve comprising a valve member and a valve seating member, said valve member and valve seating member being operative under the weight of one of said members to close a valve port of said valve seating under a predetermined force, a weight adapted to be removably secured to one of said members to increase the relative closing force of said members beyond said predetermined force, said remov-

able weight being of an annular configuration, bayonet connection means between said removable weight and one of said members for removably securing the same to each other, said bayonet connection means including at least two L-shaped slots carried by one of said members and weight removably interlockable with at least two pins carried by the other of said one member and weight, and each L-shaped slot having an entrance portion and a re-entrant portion remote therefrom whereby said pins are introduced into said slots through said entrance portions and seat within said re-entrant portions to retain said weight and one member in secured relationship.

4,160,463

## FLOW LINE MONITOR PILOT VALVE ASSEMBLY

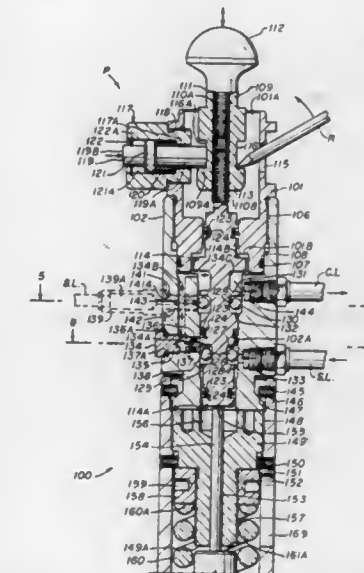
Neil H. Akkerman; Stephen R. Foster, and Kip B. Goans, all of New Orleans, La., assignors to Baker CAC, Inc., Belle Chasse, La.

Filed Oct. 13, 1977, Ser. No. 841,940

Int. Cl.<sup>2</sup> F16K 11/16, 31/122

U.S. Cl. 137—596.18

21 Claims



13. A control fluid valve assembly for controlling flow of a first fluid source and respondable to a pressure monitored fluid, comprising: a housing; valve means within said housing having valve seat means thereon; free travelable spherical means immediately said valve means defining valve head means and sealingly engagable onto said valve seat means and wipable thereoff to selectively open and close said valve means to control fluid flow therethrough; spool means shiftable in at least one of linear and rotary directions within said housing immediate said valve means and operably associatable with said valve seat means and said valve head means to permit selective movement of said head means to said seat means and selective engagement of said head and seat means upon only one of linear and rotational shuttling of said spool means; and a plurality of seal means, securable between said housing and said spool means to prevent fluid communication therebetween and defining flow passageways within said housing and across said spool means, said spool means being shiftable in each of first and second directions whereby subsequent to shifting in one of said first and second directions pressure is substantially equalized through said flow passageways by said seal means and said spool means is statically stabilized by one of said seal means, within said housing and whereby when said spool means is shifted in the other of said first and second directions differential pressure is thereafter defined across one of said seal means to urge and hold said spool means in said other direction.



4,160,464

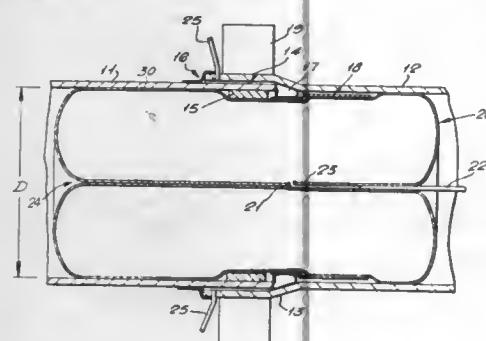
## SEALING MEMBERS

Hugh A. Ballinger, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England  
Filed Dec. 5, 1974, Ser. No. 529,726  
Claims priority, application United Kingdom, Dec. 6, 1973, 56692/73

Int. Cl.<sup>2</sup> F16L 55/12

U.S. Cl. 138—93

7 Claims



1. A method for explosively welding pipes together under water, including the steps of inserting into the bore formed by the pipes to be welded, when filled with water, a sealing member in the form of a flexible, inflatable toroidal bag having a central hole along the axis thereof, said bag, upon insertion being in a deflated generally flat condition which floats in the water in the pipe, inflating the toroidal bag to expand it radially outwards across the bore into sealing engagement with the bore of the pipes around its entire outer circumference and radially inwards to bring the inwardly facing walls of the torus together to close off the said central hole of the torus to thereby obturate the pipes concurrently completely displacing water from the bore of the pipes for a distance sufficiently great to extend on each side of the region where the pipes are to be welded and assuring that the expanded bag is located adjacent the joint to be welded, extending axially on each side thereof.

4,160,465

## EMERGENCY WATER LEAK PLUG

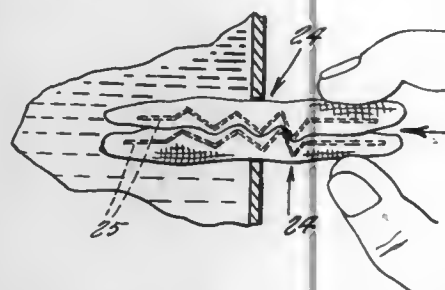
Charles J. Hsu, Box 460, Grand Central Station, New York, N.Y. 10017

Filed Apr. 19, 1977, Ser. No. 788,784

Int. Cl.<sup>2</sup> F16L 55/18

U.S. Cl. 138—97

1 Claim



1. An emergency water leak plug, comprising in combination, an elongated bag of porous fabric, said bag being partly filled with a powder of Sterculia Lychnophora Hance which has the characteristic of substantially swelling up in water, said bag additionally including an elongated stiffener member therewithin, said stiffener member comprising a spiral shaped stiff wire, said bag being polygonal in shape, and said spiral shaped stiff wire member having spiral turns progressively spread apart toward one end.

4,160,466

## FLEXIBLE MULTI-CONDUIT TUBE AND ITS MANUFACTURE

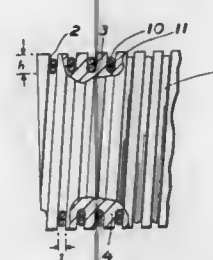
Pierre J. Jousson, Geneva, Switzerland, assignor to Les Produits Associés LPA SA, Geneva, Switzerland  
Filed Dec. 29, 1976, Ser. No. 755,216

Claims priority, application Switzerland, Feb. 24, 1976, 2242/76

Int. Cl.<sup>2</sup> F16L 11/04

U.S. Cl. 138—115

6 Claims



1. A flexible multi-conduit tube comprising: juxtaposed conduits having in cross-section a large side and a small side, the large side having a height defined by a plurality of said conduits, the small side having a width defined by a number of conduits which is less than the plurality of conduits defining said large side; and the conduits having a helical configuration in which the tube is wound on its small side, the height of the large side being measurable along the direction of the diameter of the helix.

4,160,467

## HAND LOOM HAVING ROTARY HEDDLE ASSEMBLY

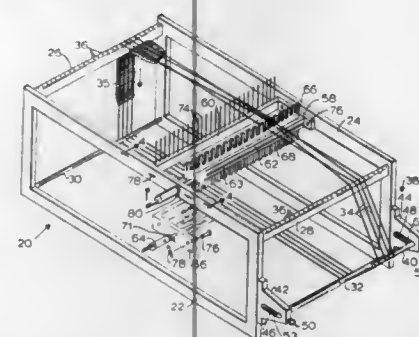
Jed R. Woodruff, 3042 N. 175 W., North Ogden, Utah 84404

Filed Jan. 5, 1978, Ser. No. 867,196

Int. Cl.<sup>2</sup> D03D 29/00; D03C 13/00

U.S. Cl. 139—33

22 Claims



1. A hand loom for making woven fabric comprising: frame means for supporting warp threading installed longitudinally as a band about the periphery thereof and providing a shuttle location thereon; warp alignment means on said frame means for maintaining the relative alignment of each thread of warp threading at said shuttle location; warp threading installed as a band in longitudinal alignment about the periphery of said frame means; hand operated shuttle means to which a weft thread is attached for movement transversely through predetermined ones of said warp threading at said shuttle location; transverse demountable heddle spindle means rotatably mounted in an operating position at the periphery of said frame means adjacent to said shuttle location generally perpendicular to said warp threading, and removable from said frame means to facilitate installation of said warp threading;

a first set of slideably positionable heddle fingers retained in a first locking slot in said spindle means lying in a plane in axial alignment along said heddle spindle means, each finger extending radially outward from said first slot, said fingers adapted and positioned to lift predetermined ones of said warp threading;

at least a second set of slideably positionable heddle fingers retained in a second locking slot in said spindle means lying in a plane in axial alignment along said heddle spindle means and radially displaced from said first set of heddle fingers to a position out of contact with said warp threading when said first set is brought into contact therewith by rotation of said spindle means, each finger extending radially outward from said second slot, the fingers of said second set adapted and positioned to lift predetermined others of said warp threading as said spindle means is rotated;

whereby said woven fabric is made when said spindle means is rotated so that said first set of heddle fingers lifts said predetermined ones of said warp threading, said shuttle means is then passed between said warp threading and said lifted ones thereof, said spindle means is then rotated so that said second set of heddle fingers lifts said predetermined others, said shuttle means is again moved therebetween, with the foregoing process repeated to provide said woven fabric.

4,160,468

## WEFT SELECTOR MECHANISM

Anselmo B. Camprubi, Barcelona, Spain, assignor to Incotex S.A., Sabadell, Spain

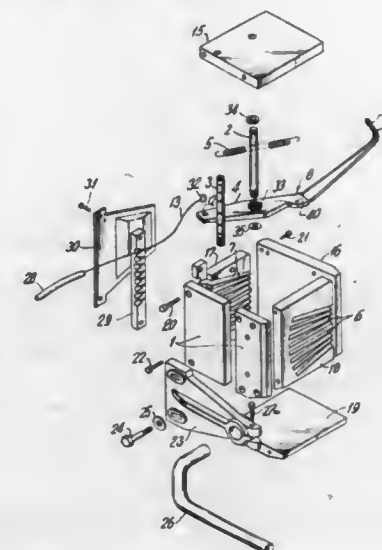
Continuation-in-part of Ser. No. 746,204, Dec. 1, 1976, abandoned, which is a continuation of Ser. No. 621,367, Oct. 8, 1975, abandoned. This application Mar. 17, 1978, Ser. No. 887,842

Claims priority, application Spain, Oct. 11, 1974, 206,559

Int. Cl.<sup>2</sup> D03D 47/38

U.S. Cl. 139—453

4 Claims



1. A weft selector mechanism for looms comprising a casing, a plurality of weft selector levers each having a first and a second end, shaft means within said casing, swivel bearing means comprising flexible bushings mounting each of said weft selector levers on said shaft means at points intermediate said ends of each lever for swiveling pivotal motion about said shaft means, means defining slots in said casing, said slots extending in a direction obliquely to said shaft means and having said weft selector levers guidingly engaged therein to effect movement of said first ends of said weft selector levers through a common point when said levers are pivoted about said shaft means, and drive means engaging said levers at said second

ends to selectively effect pivoting thereof about said shaft means.

4,160,469

## TWISTING DEVICE FOR A MACHINE FOR BINDING PACKAGES WITH WIRE

Jean V. Joannic, Paris, France, assignor to Botalam, Paris, France

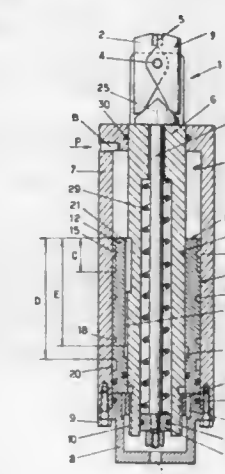
Filed Jan. 19, 1978, Ser. No. 870,816

Claims priority, application France, Feb. 25, 1977, 77 05576

Int. Cl.<sup>2</sup> B21F 15/04

U.S. Cl. 140—115

2 Claims



1. A twisting device for a machine for binding packages with wire, the device having a twisting head in the form of nippers with means for rotating them and causing their opening and closing about the ends of the binding wire, the twisting head being integral with a first piston-like member mounted to be movable in translation in a fixed cylindrical body and having a threaded part engaged with a corresponding thread provided in said cylindrical body to cause a progressive translational movement of the twisting head in the direction of the package to be tied up as it rotates, and characterized in that the means for rotating the twisting head comprises a second annular piston slidably mounted and keyed on the first piston-like member and engaging at its periphery with the inner wall of the fixed cylindrical body by means of a large pitch screw thread, the annular piston being actuated by the pressure of a fluid.

4,160,470

## LOG SHEARING AND SPLITTING DEVICE

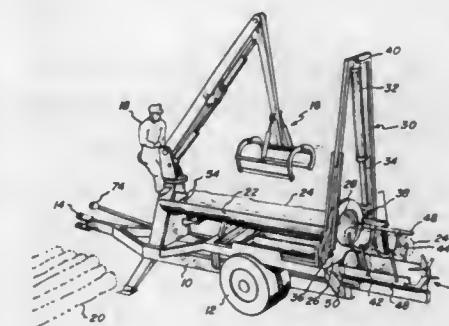
Richard W. Sigmund, Medford, Wis., assignor to Timbern, Ltd., Medford, Wis.

Filed Mar. 13, 1978, Ser. No. 885,612

Int. Cl.<sup>2</sup> A47J 42/09; B27L 7/00

U.S. Cl. 144—3 B

17 Claims



1. A firewood making machine comprising:

first substantially horizontal trough means for receiving logs;  
clamshell loading means for loading logs into the first trough means;  
advancing means for advancing the logs in the first trough means a predetermined length past a cutting location;  
cutting means located at the cutting location for cutting log sections of the predetermined length from the logs after the advancing means has advanced the logs;  
second substantially horizontal trough means positioned to receive the log sections, the second trough means being positioned essentially parallel to the first trough means and below the cutting means;  
log guiding means for receiving the log sections after the cutting means cuts the log sections and lowering the log sections to the second trough means;  
splitting blade means positioned at a fixed position along the second trough; and  
ram means for driving the log sections in the second trough against the splitting blade means to split the logs into split firewood logs of the predetermined length.

4,160,471

## POWER INFEEED FOR CHIPPER

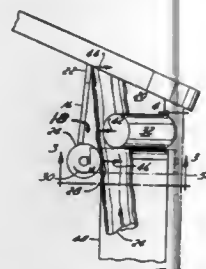
Joseph A. Lapointe, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Aug. 22, 1977, Ser. No. 826,411

Int. Cl.<sup>2</sup> B27C 1/12

U.S. Cl. 144—176

8 Claims



1. An infeed for a chipper comprising an anvil member forming a support having limited surface contact with a log to be chipped, a chipping head cooperating with said anvil and a backing member spaced from said anvil member along a feed path of a log to said chipper, a power roll, means to rotate said power roll to advance a log towards said chipper, means mounting said power roll for movement in a path traversing said feed path between said anvil and said backing member, said anvil and said backing member forming a pair of support means spaced along said feed path, said pair of support means providing a pair of adjacently spaced contact points for said log as it is fed to said chipper, means for moving said power roll in said path traversing said feed path, said contact points and said power roll defining means whereby said logs simulates a beam supported by said adjacently spaced contact points against a concentrated load applied therebetween by said power roll as said log is fed to said chipper.

4,160,472

## APPARATUS FOR SPLITTING WOOD

George H. Blackstone, Toledo, Ohio, assignor to Arnold Industries, Inc., Toledo, Ohio

Filed Jul. 25, 1977, Ser. No. 818,389

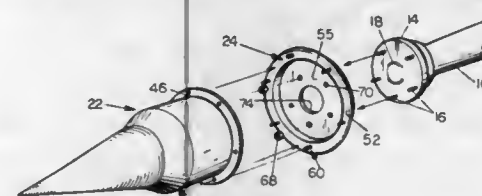
Int. Cl.<sup>2</sup> B27L 7/00; F16H 37/00

U.S. Cl. 144—194

9 Claims

1. A wood splitter comprising wall means forming a cone having a tip and a base edge, said cone tapering away from said base edge to said tip, said cone having at least one spiral groove extending substantially from said tip to said base edge, wall means forming a truncated conical portion having a small diameter outer edge substantially equal to the diameter of the base edge of said cone and affixed thereto and having a larger

diameter inner edge, said truncated conical portion being formed with an included angle which is effective to enable said truncated conical portion to further aid in splitting the wood when coming into contact therewith, wall means forming a



cylindrical base wall having a diameter substantially equal to the larger diameter of said truncated conical portion and affixed thereto, and means for connecting said cylindrical base wall to drive means for rotating said cone.

4,160,473

## PLASTIC CONTAINER WITH AUXILIARY TUBE RETENTION MEANS

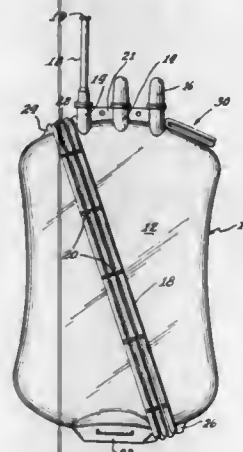
David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 19, 1978, Ser. No. 907,367

Int. Cl.<sup>2</sup> B65D 1/00

U.S. Cl. 150—0.5

14 Claims



8. In a plastic container defining sealed, opposed ends, one of said ends carrying access port means, the improvement comprising:

retention member means positioned at the edge of each end of said plastic container, said retention member means being integrally attached to said container and comprising open transverse grooves proportioned to receive a length of flexible tubing wound about the ends of said container.

4,160,474

## LUBRICATION IN DC CASTING OF COPPER BASE ALLOYS

Michael J. Pryor, Woodbridge, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 20, 1977, Ser. No. 862,371

Int. Cl.<sup>2</sup> B22D 11/00

U.S. Cl. 164—73

27 Claims

1. A composition which is particularly useful as a mold dressing material in the direct chill casting of copper base alloys, said composition consisting essentially of a dispersion of a combination of 50 to 99% by volume boron nitride particles, balance carbonaceous particles, in a volatile liquid carrier, wherein the carrier constitutes from 30 to 80% by volume of the dispersion.

4,160,475

## WARM WATER HEATER

Thomas Wilbs, Wiesenstr. 5, Wutöschlingen, Fed. Rep. of Germany

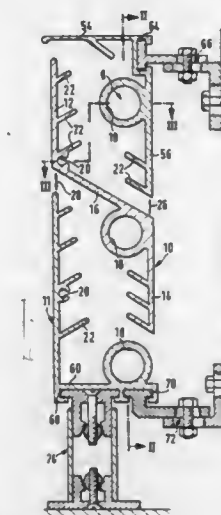
Filed Jul. 5, 1977, Ser. No. 812,591

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630524

Int. Cl.<sup>2</sup> F24H 9/08

U.S. Cl. 165—55

9 Claims



1. A warm water heater apparatus having a front member in a vertical plane; rear walls; a plurality of vertically spaced horizontal water pipes, said pipes having ends connected with support posts provided with water channels, wherein: said front and rear walls each being defined by a plurality of vertically spaced front wall portions (12) and vertically spaced rear wall portions (14), said rear wall portions (14) having a horizontal air inlet gap (26) formed therebetween and said front wall portions (12) having a horizontal air outlet gap (28) therebetween; one of said front wall portions, a rear wall portion, an intermediate wall (16) and an integral profile element (10) being provided with a constant cross-section, whereby said intermediate wall is disposed to connect the lower edge of the front wall portion (12) with the upper edge of the rear wall portion (14); and at least one water pipe (18) being integrally formed in said profile element (10).

4,160,476

## SECUREMENT OF HEAT EXCHANGER SURFACES TO TUBES BY LOCK SEAMING AND METHOD OF FABRICATION

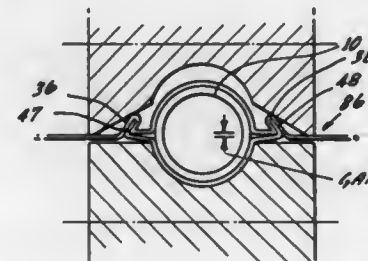
Larry J. Ashton, Thousand Oaks, and Leo Block, Westlake Village, both of Calif., assignors to Raypak, Inc., Westlake Village, Calif.

Continuation-in-part of Ser. No. 506,226, Sep. 16, 1974, abandoned, and Ser. No. 602,592, Aug. 7, 1975. This application Feb. 14, 1977, Ser. No. 768,071

Int. Cl.<sup>2</sup> B23P 15/26

U.S. Cl. 165—171

18 Claims



1. A securement between first and second pieces of material

comprising in combination, a lock seam formed between portions of the first and of the second pieces of material, the lock seam being formed by a portion of one piece of material and by an intermediate portion of the second piece of material remote from edges thereof, said pieces of material being formed, adjacent said seam, to extend around a heat exchange tube whereby said second piece of material defines a continuous flow path for heat to said tube.

6. A method of forming a joint between first and second sections of sheet material including forming a lock seam between an edge portion of a first piece of material and an intermediate portion of the second piece of material, forming the first and second pieces of material on one side of said seam to fit around a heat exchange tube, and securing the material to the tube in heat exchange relationship by forming the lock seam adjacent one side of the tube as a heat exchange surface to provide a continuous path for heat transfer along said second piece and through said seam.

4,160,477

## SPACER GRID FOR PARALLEL CYLINDRICAL TUBES

Josua Roffler, Raterschen, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

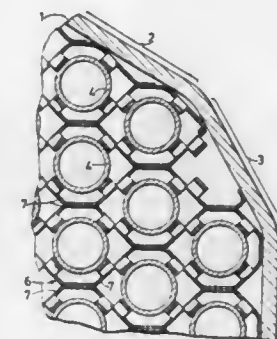
Filed Aug. 29, 1977, Ser. No. 828,423

Claims priority, application Switzerland, Sep. 6, 1976, 11279/76

Int. Cl.<sup>2</sup> F28F 9/00

U.S. Cl. 165—172

9 Claims



1. In combination, a plurality of parallel heat exchanger tubes disposed in a regular triangular grid with constant pitch; and a grid spacing said tubes from each other, said grid comprising a plurality of bent metal strips, each said strip having alternating angular sides and flat sides and being secured to an adjacent strip at alternating flat sides to form a series of hexagonal spaces therebetween with one of said tubes being disposed in each respective one of said spaces, and a pair of adjacent spring tabs bent out of each of said angular sides in alternating manner to project into an adjacent hexagonal space to effect support of a respective tube therein.

4,160,478

## WELL TOOLS

Michael B. Calhoun, Carrollton, and John V. Fredd, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 790,566, Apr. 25, 1977, abandoned.

This application May 10, 1978, Ser. No. 904,431

Int. Cl.<sup>2</sup> E21B 29/00

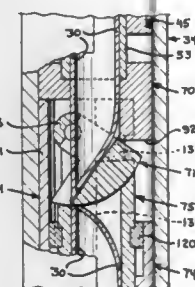
U.S. Cl. 166—55.1

19 Claims

14. A well tool comprising: a tubular body having an axially extending flow passage therethrough; means secured in said tubular body along said flow passage providing a spherical seat surface generated about a center positioned eccentric relative to the longitudinal axis of said flow passage; an operator ele-



ment rotatably secured in said body on an eccentric axis coincident with said center of said spherical seat, said operator element having a spherical surface portion generated about an eccentric center coincident with the center of said spherical seat and having a bore therethrough having an axis spaced from said center of said spherical surface, said operator element being rotatable relative to said seat surface between a first open position at which said bore through said operator element is aligned with said flow passage through said tubular body and



a second closed position at which said bore is misaligned from said flow passage through said tubular body; and an actuator member for rotating said operator element from said first position to said second position, said actuator member having a force applying surface engageable with said operator element along a surface on said operator element spaced from said eccentric axis of rotation of said operator element for rotating said operator element about said axis of rotation responsive to longitudinal movement of said actuator member.

4,160,479

## HEAVY OIL RECOVERY PROCESS

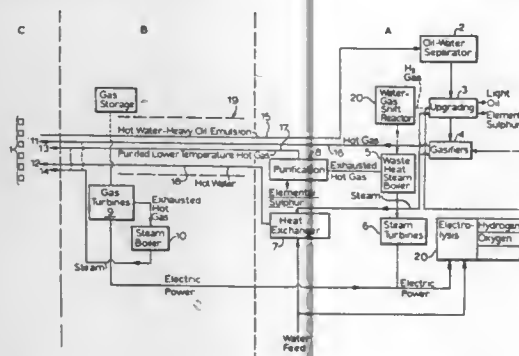
Reginald D. Richardson, 53 Valecrest Dr., and Robert H. Shannon, 59 Valecrest Dr., both of Islington, Ontario, Canada M9A 4P5

Filed Apr. 24, 1978, Ser. No. 899,758

Int. Cl.<sup>2</sup> C10G 1/02; E21B 43/24

U.S. Cl. 166—267

18 Claims



1. A process for the recovery and upgrading of oil containing deposits such as heavy oil, tar sands, shale and coal, which once initiated is essentially energy sufficient, said process comprising the steps of:

- recovering the deposit;
- treating the deposit to obtain a feedstock;
- desulfurizing the feedstock with hydrogen and recovering therefrom a light oil, elemental sulphur and a heavy residual oil;
- electrolyzing water to produce hydrogen and oxygen, said hydrogen being utilized in step (c);
- gasifying said heavy residual oil in a series of gasifiers using air-oxygen mixtures to produce hot gases, wherein the concentration of air and oxygen may vary from gasifier to gasifier, the oxygen being supplied from step (d); and

(f) utilizing said gasifier hot gases to provide energy for use in the process.

4,160,480

## HIGH CONFORMANCE OIL RECOVERY PROCESS

Vernon H. Schiévelbein, and Jack H. Park, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,505

Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 166—269

16 Claims

1. A method of recovering petroleum from a subterranean, petroleum-containing formation, the temperature of said formation being not greater than 150° F., said formation containing water whose salinity is from 10,000 to 200,000 parts per million total dissolved solids, said formation containing at least two distinct petroleum-containing strata or layers, the permeability of at least one of said strata being at least 50 percent greater than the permeability of the other stratum, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with at least two of said formation strata, comprising

- injecting a first aqueous oil-displacing fluid into the formation via the injection well, said fluid passing through at least one of the more permeable strata of said formation and displacing oil therein toward the production well, from which it is recovered to the surface of the earth;
- after said first aqueous oil displacing fluid has passed substantially through at least one of said more permeable strata to the production well, discontinuing injecting said fluid and injecting into said stratum an aqueous emulsifying fluid containing an emulsifying surfactant combination comprising (1) from 0.01 to 10.0 percent by weight of an alkylpolyalkoxy sulfate or alkylarylalkoxy sulfate having the following formula:



wherein R is an alkyl group, linear or branched, having from 9 to 25 carbon atoms, or an alkylaryl group selected from the group consisting of benzene, toluene and xylene having attached thereto at least one alkyl group, linear or branched, having from 9 to 15 carbon atoms; R' is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher alkylene; n is a number including fractional numbers, from 2 to 10; and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium, and (2) from about 0.1 to about 5.0 percent by weight of a low HLB, water insoluble nonionic surfactant having the following formula:



wherein  $R_a$  is a branched or linear alkyl group, containing from 9 to 25 carbon atoms, or an alkylaryl group selected from the group consisting of benzene, toluene or xylene having attached thereto at least one alkyl group, linear or branched, containing from 9 to 15 carbon atoms,  $R_a'$  is ethylene or a mixture of ethylene and propylene with relatively more ethylene than propylene; and n is a number either whole or fractional, from 1 to 10, said emulsifying surfactants forming a macroemulsion in the more permeable strata of the formation, thereby reducing the permeability of the strata invaded by the emulsifying fluid; and

- thereafter injecting a second aqueous oil displacing fluid into the formation; said fluid invading at least one stratum not invaded by the first oil displacing fluid of step (a) and displacing oil therein toward the production well where it is recovered to the surface of the earth.

4,160,481  
METHOD FOR RECOVERING SUBSURFACE EARTH SUBSTANCES

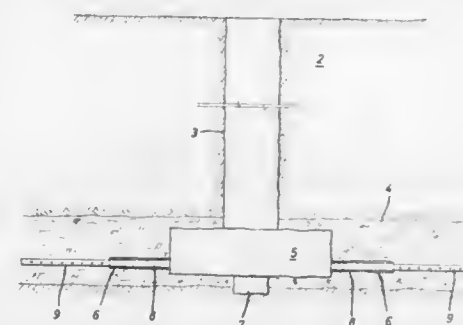
L. Jan Turk, and Ralph O. Kehle, both of Austin, Tex., assignors to The HOP Corporation, Houston, Tex.

Filed Feb. 7, 1977, Ser. No. 766,523

Int. Cl.<sup>2</sup> E21B 43/24; E21C 41/10

U.S. Cl. 166—272

16 Claims



1. A method of recovering solid and semi-solid petroleum substances and the like from a subsurface earth formation, comprising

- establishing at least one substantially vertical shaft hole extending from the surface of the earth to said earth formation,
- forming a subterranean operating chamber connecting said shaft hole with said formation,
- drilling a plurality of boreholes extending substantially laterally and radially outward from said chamber into said formation,
- thereafter injecting steam down said one shaft hole and into said boreholes during a discrete steam injection cycle of predetermined duration to increase the temperature and pressure within the portion of said formation substantially surrounding said chamber and generally defined by the ends of said boreholes, and
- thereafter stoppering said boreholes and trapping said steam in said defined portion of said formation during a discrete steam soak cycle of predetermined duration to extend said temperature and pressure increase within said defined portion of said formation and to reduce the viscosity of said petroleum substances lying therewithin.

4,160,482

## BALL SEALER DIVERSION OF MATRIX RATE TREATMENTS OF A WELL

Steven R. Erbstoesser; Thomas W. Muecke, and Claude E. Cooke, Jr., all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 830,728, Sep. 6, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,649

Int. Cl.<sup>2</sup> E21B 33/13, 43/27

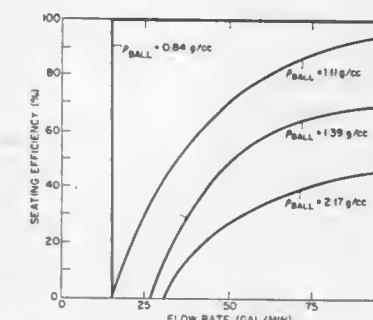
U.S. Cl. 166—284

17 Claims

1. A method of sealing perforations in a well casing comprising:

- injecting into said casing a carrying fluid containing ball sealers having a tentacle-free outer surface and a density less than that of the carrying fluid, said fluid being injected at a matrix flow rate which is less than that which would

fracture a formation surrounding said casing and at a velocity which is sufficient to overcome the buoyancy of



said ball sealers and downwardly transport them to the perforations to be sealed.

4,160,483

## METHOD OF TREATING A WELL USING FLUOBORIC ACID TO CLEAN A PROPPED FRACTURE

Ronnie L. Thomas, Tulsa, Okla., and Frederick A. Suhay, Mobile, Ala., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 21, 1978, Ser. No. 927,000

Int. Cl.<sup>2</sup> E21B 43/27

U.S. Cl. 166—307

5 Claims

1. A method for increasing the conductivity of a fracture in a subterranean formation penetrated by a borehole wherein at least some point in time prior to the partial hydrolysis of an effective amount of the fluoboric acid which is injected into the borehole in carrying out the method, the fracture contains a propping agent having siliceous fines or clays dispersed therein, comprising injecting fluoboric acid into the borehole and thereafter permitting the fluoboric acid to at least partially hydrolyze so that at least part of the propping agent pack is contacted with hydrofluoric acid and hydroxyfluoboric acid generated from said fluoboric acid.

4,160,484

## SURFACE CONTROL WELL SAFETY VALVE

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jan. 16, 1978, Ser. No. 869,556

Int. Cl.<sup>2</sup> E21B 43/12

U.S. Cl. 166—317

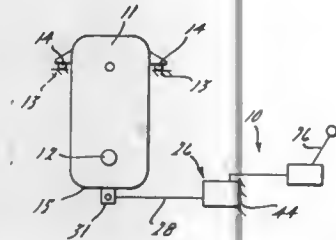
9 Claims



1. In a well safety valve for controlling the fluid flow through a well tubing, the valve adapted to be positioned in the well tubing and having a valve closure member moving be-

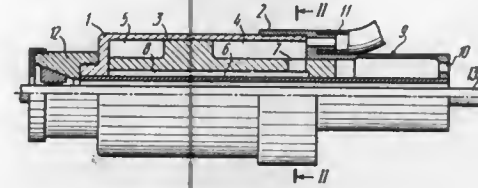
tween open and closed positions, a longitudinally movable tubular member for controlling the movement of the valve closure member, first means for moving the tubular member in a first direction, second means for moving the tubular member in a second direction, the improvement comprising, said tubular member including a first upper and a second lower telescoping section, releasable locking means normally securing the telescoping sections together and releasable upon a predetermined opening force while the valve is in the open position, and means for moving the second telescoping section relative to the valve closure member in a direction for actuating the closure of the valve member when the locking means is released.

**4,160,485**  
**TRACTOR WITH DRAFT LOAD CONTROL SYSTEM**  
 Douglas H. McLean, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.  
 Filed Dec. 23, 1977, Ser. No. 864,076  
 Int. Cl.<sup>2</sup> A01B 63/112  
 U.S. Cl. 172-9



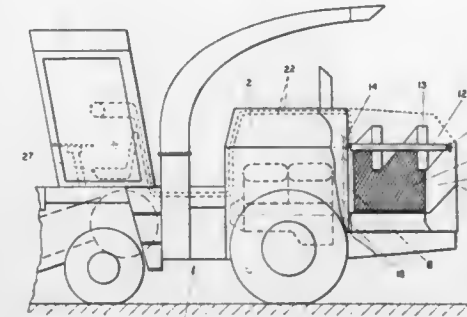
1. In a tractor having an engine and transmission power unit coupled to a drive shaft, resilient mounts mounting the power unit on a frame of the tractor, the resilient mounts permitting measurable angular displacement of the power unit relative to the frame about the drive shaft axis in reaction to changes in the drive shaft torque, the resilient mounts being located relatively high on the power unit thereby to increase the degree of lateral movement of the bottom of the power unit, the lateral movement being approximately proportional to the drive shaft torque, hydraulic lift means for raising and lowering an earth working implement coupled to the tractor, a control valve assembly connected to a source of fluid under pressure, and connecting means interposed between the power unit and the control valve assembly operative to transmit angular displacement of the power unit to an actuating member of the control valve assembly to cause hydraulic actuation of the hydraulic lift means to change the working depth of the implement to compensate for changes in draft load, the connecting means being connected to the bottom of the power unit.

**4,160,486**  
**PNEUMATIC IMPACT MECHANISM**  
 Alexandr D. Kostylev, ulitsa Derzhavina, 19, kv. 70; Boris N. Smolyanitsky, ulitsa Oleko Dundicha, 27, kv. 18; Vladimir P. Boginsky, ulitsa Lenina, 59, kv. 58; Konstantin S. Gurkov, ulitsa Derzhavina, 18, kv. 13, and Vladimir V. Klimashko, ulitsa Novogodnyaya, 44, kv. 24, all of Novosibirsk, U.S.S.R.  
 Filed Apr. 22, 1977, Ser. No. 789,864  
 Claims priority, application U.S.S.R., Apr. 24, 1976, 2356969  
 Int. Cl.<sup>2</sup> E21B 1/00  
 U.S. Cl. 173-135



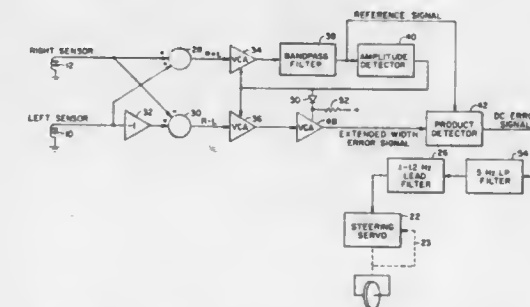
1. A pneumatic impact device for driving rod-like elements axially individually comprising, a tubular guide member for receiving individually rod-like elements axially therein to be driven axially; a tubular casing circumferentially of said tubular guide member secured thereto and coaxial therewith defining a cylinder jointly with said guide member; a clamp for rigidly, releasably securing a leading front end portion of the casing to a rod-like element in said guide member; an elongated tubular hammer piston reciprocally driven in said cylinder to effect working strokes and move cyclically from a rear position toward a forward position to said front end portion of said casing and intermittently impact a front end of said casing; said piston having minor diameter portions and a major diameter portion intermediate opposite minor diameter end portions of the piston defining two coaxial, annular chambers in said cylinder on opposite sides of the major diameter portion and varying in volume as the piston moves reciprocally, one of said chambers being closer to a forward end of the cylinder constituting a front chamber and the other chamber constituting a rear chamber; said piston having a blind axial bore open toward said front end of said casing and communicating with said front chamber when said piston moves away from the front end of the casing toward a rear end of the casing; means for supplying an expandible gaseous fluid under pressure into said rear chamber for reciprocally driving said hammer to intermittently impact the front end of the casing to drive the rod-like element axially; a tubular rear extension on said casing extending axially away from said cylinder and not in communication with said cylinder and into which a rear end portion of said piston extends during axial travel and has reached its rear position; said piston having radial passages on said rear end portion thereof and spaced axially from a rear end of the piston for providing communication between said rear chamber and said blind axial bore when the piston nearly reaches its forward position thereof during a working stroke, said radial passages being disposed in said rear extension when said piston reaches its rear position during said working stroke; said rear extension having an axial length thereof of larger diameter than the remainder thereof disposed at a remote axial position spaced axially from said rear chamber for providing communication between said radial passages and said forward chamber to externally of said casing and thereby to atmospheric pressure when said piston reaches said rear position; whereby application of said gaseous fluid under pressure into said rear chamber moves said piston toward said front end to impact said front end and gaseous fluid enters said front chamber as said piston nears its forward position and returns the piston toward its rear position and said piston is cyclically reciprocated and intermittently impacts said front end for driving a rod-like element axially.

**4,160,487**  
**ENGINE COOLING SYSTEM FOR AN AGRICULTURAL VEHICLE**  
 Dieter Kunze, Wehrsdorf; Ernst Leonhardt, Buatzen, and Christian Noack, Guttan, all of German Democratic Rep., assignors to VEB Kombinat Fortschritt Landmaschinen, Neustadt in Sachsen, German Democratic Rep.  
 Filed Dec. 30, 1977, Ser. No. 865,926  
 Claims priority, application German Democratic Rep., Dec. 31, 1976, 196733  
 Int. Cl.<sup>2</sup> B60K 11/04  
 U.S. Cl. 180-68 R



6. In a cooling system comprising an air chamber through which air is induced by a fan and a radiator traversable by a stream of air passing through an opening in said chamber, the improvement which comprises air deflector means in the form of oppositely facing and angularly offset conical shells at least partly arcuately surrounding said fan and coaxial therewith and pivotable thereabout for alternatively guiding air through said chamber in different directions, said fan constituting an axial fan traversing an additional opening in said chamber.

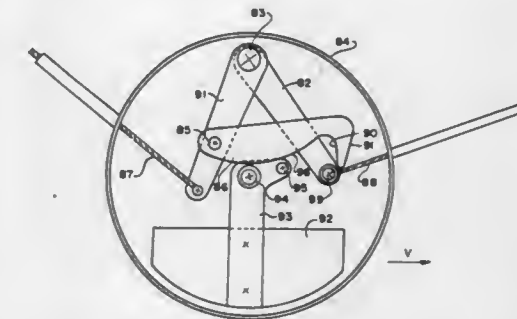
**4,160,488**  
**EXTENDED WIDTH SENSOR**  
 Thomas R. Blakeslee, Woodside, Calif., assignor to Logisticon, Inc., Sunnyvale, Calif.  
 Filed Oct. 11, 1977, Ser. No. 840,643  
 Int. Cl.<sup>2</sup> B62D 1/28  
 U.S. Cl. 180-168



1. An improvement for extending the control width of an automatic guidance system for steering a vehicle along a guide path, the guidance system being of the type having vehicle mounted left and right sensors for producing left and right error signals, respectively, which are proportional to the distance of the sensors from the guide path and electromechanical steering means supplied with the error signals for steering the vehicle along the guide path in response to the error signals, wherein the improvement comprises first, second and third amplifiers each having separate signal inputs and outputs and gain control inputs, means for combining the error signals to produce a sum signal which is supplied to the input of the first amplifier, means for subtracting one error signal from the other to

produce a difference signal which is supplied to the input of the second amplifier, the output of the second amplifier being connected to the input of the third amplifier, means connected to the output of the first amplifier for generating a negative feedback gain control signal which is supplied to the first and second amplifiers, the negative feedback signal causing the first amplifier to have a gain such that the steady state output of the first amplifier has a substantially constant amplitude, extended sensor width means for supplying the negative feedback signal to control the gain of the third amplifier only after the negative feedback signal exceeds a predetermined magnitude, and synchronous detecting means connected to the outputs of the first and third amplifiers for producing a direct current electromechanical steering means control signal whose magnitude represents the distance of the vehicle from the guide path and whose polarity indicates on which side of the guide path the vehicle is positioned.

**4,160,489**  
**THROTTLE CONTROL DEVICE**  
 Albert Van Dillen, Kroonprins 21, Haaksbergen, Netherlands  
 Filed Sep. 26, 1977, Ser. No. 836,798  
 Int. Cl.<sup>2</sup> B60K 31/00  
 U.S. Cl. 180-282

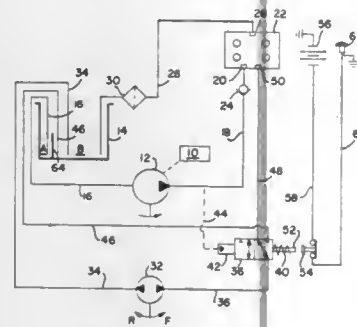


1. A device for restraining the throttle plate of a vehicle engine from returning to closed condition whereby to maintain a predetermined throttle setting, which comprises in combination: a holding member adapted to be connected to the throttle control of a vehicle engine so as to be movable back and forth along a predetermined path in response to opening and closing movements of such throttle plate; a locking member mounted for movement along said path and means for selectively fixing said locking member along said path whereby to establish said predetermined throttle setting; latching means on said locking member for engaging said holding member to prevent return movement of said holding member when said holding member reaches a certain position along said path as established by the fixed position of said locking member; and inertia means responsive to deceleration force acting on the associated vehicle for disengaging said latching means from said holding member to allow return movement of said holding member.



**4,160,490**  
**AUXILIARY STEERING SYSTEM**  
 Eugen Bexten, Ancaster; Robert W. Logue, Hamilton, and Ken J. Wiebe, Dundas, all of Canada, assignors to International Harvester Company, Chicago, Ill.  
 Filed Jun. 9, 1977, Ser. No. 804,973  
 Int. Cl.<sup>2</sup> B62D 5/08  
 U.S. Cl. 180—133

2 Claims



1. In a log-skidder machine having front and rear frame portions hinged together about a vertical axis for articulated steering, a dozer blade mounted on the front frame and capable of being raised and lowered, and a transmission with gear ratios which permit relatively high speeds in forward and relatively low speeds in reverse; an improved steering system comprising:

a normal steering circuit including a reservoir, a main pump, a check valve and a steering valve connected in series;  
 a first conduit connecting said steering valve to said reservoir;  
 a ground-driven pump capable of fluid output in either direction of rotation;  
 a forward-suction, reverse-output conduit connecting said ground-driven pump and said reservoir;  
 a diverter valve having three ports and capable of being moved to two positions;  
 a second conduit connecting the ground-driven pump and diverter valve;  
 a third conduit connecting the diverter valve and the reservoir;  
 a fourth conduit connecting the diverter valve and the steering valve;

bias means urging the diverter valve to one of its two positions wherein the second and fourth conduits are in communication and the third conduit is blocked;  
 actuator means responsive to fluid pressure output from said main pump to shift the diverter valve to the other of its two positions wherein the second and third conduits are in communication and the fourth conduit is blocked;  
 whereby said actuator means normally holds said diverter valve in its said other position and said second, third and forward-suction, reverse-output conduits form a closed path between said ground-driven pump and reservoir for travel in both forward and reverse directions; and loss of pressure to said actuator means permits said bias means to shift said diverter valve to its said one position so that travel in a forward direction will permit the ground-driven pump to supply fluid pressure to said steering valve and travel in a reverse direction can be controlled by lowering said blade to the ground.

**4,160,491**  
**PERLITE SOUND ABSORBING PLATE AND SOUND INSULATING WALL COMPOSED OF THE SAME**  
 Masayasu Matsumoto, Zushi; Susumu Sakamoto, Yokohama; Nobufumi Matsudaira, Zushi; Kazuyoshi Iida, Yokohama; Yoshikazu Kondo, Tokyo; Kazuo Kondo, Yokohama; Haruo Watanabe, Chigasaki; Shosuke Suzuki, Zushi, and Yasushi Onizaki, Yokohama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan  
 Filed Jul. 25, 1978, Ser. No. 928,030  
 Int. Cl.<sup>2</sup> E04B 1/82; C04B 43/00  
 U.S. Cl. 181—284

7 Claims



1. A perlite sound absorbing plate composed of a mixture including 1,000 cm<sup>3</sup> by bulk volume of foamed perlite particles each having a diameter of 0.1 to 7.0 mm, 100 to 140 g of cement, liquid rubber latex containing 5 to 20 g of solid ingredients and a suitable amount of water and produced by agitating said mixture, charging said agitated mixture into a desired metal mold, press molding with a compression ratio of 1.10 to 1.30 to form a molded plate and curing and hardening said molded plate into a final plate.

**4,160,492**  
**CONTROL SYSTEM FOR MOBILE SELF-PROPELLED AERIAL LIFT**

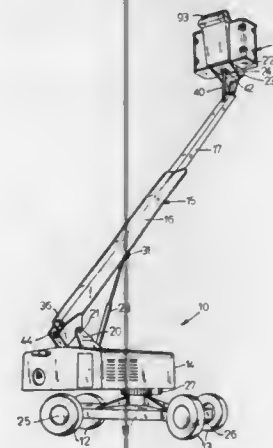
Roger L. Johnston, Muskego, Wis., assignor to Simon-Krause, Inc., Milwaukee, Wis.

Filed Oct. 6, 1977, Ser. No. 840,012

Int. Cl.<sup>2</sup> B66F 11/04

U.S. Cl. 182—2

8 Claims

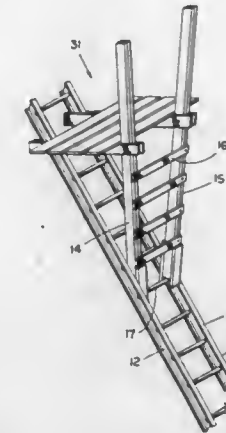


1. In an aerial lift machine:  
 a movable work platform;  
 a hydraulic motor operable at variable speeds to move said work platform;  
 a pump having a pressure port and a control port and being of a type wherein a change in the rate of fluid flow to said control port effects a change in the fluid pressure at said pressure port;  
 means for driving said pump;  
 a conduit for supplying fluid from said pressure port to said control port;  
 a selector valve operable to permit fluid flow from said pressure port to said hydraulic motor;  
 means located on said work platform for operating said selector valve;

a modulatable flow control valve connected to said conduit for controlling the rate of fluid flow to said control port to thereby control the speed of said hydraulic motor when said selector valve is operated;  
 and means located on said work platform for modulating said flow control valve.

**4,160,493**  
**PLATFORM ATTACHMENT**  
 Robert D. Brice, 537 Yandees St., Franklin, Ind. 46131  
 Filed Jan. 3, 1978, Ser. No. 866,265  
 Int. Cl.<sup>2</sup> E06C 7/16; E04G 1/30  
 U.S. Cl. 182—122

10 Claims



1. A platform attachment, for a ladder having side rails and several rungs extending therebetween, which comprises:  
 first and second posts, each post having a first end and a second end,  
 first attachment means for attaching said first post to a first ladder rung with the first end of said first post supported upon the first ladder rung;  
 second attachment means for attaching said second post to the first ladder rung with the first end of said second post supported upon the first ladder rung;  
 a cross member connected to and extending between said first and second posts;  
 a first pair of arms, each of said first pair of arms having a first end and a second end, the first ends of said first pair of arms being pivotally attached to said first post on opposite sides of said first post;  
 a second pair of arms, each of said second pair of arms having a first end and a second end, the first ends of said second pair of arms being pivotally attached to said second post on opposite sides of said second post;  
 third attachment means for attaching the second ends of said first pair of arms on opposite sides of a first ladder rail with one of said first pair of arms supported upon a second ladder rung;  
 fourth attachment means for attaching the second ends of said second pair of arms on opposite sides of a second ladder rail with one of said second pair of arms supported upon the second ladder rung;  
 a platform; and  
 mounting means for removably mounting said platform upon said first and second pairs of arms between said posts and the ladder.

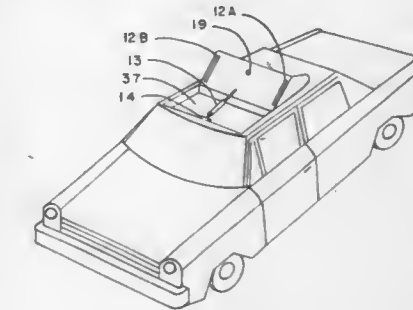
**4,160,494**  
**FLUID-DYNAMIC EMERGENCY BRAKES**  
 Joseph McCambridge, 12 Watson La., Setauket, N.Y. 11733  
 Filed Jul. 28, 1977, Ser. No. 819,938  
 Int. Cl.<sup>2</sup> B60R 19/02; B61F 19/04

U.S. Cl. 188—270

19 Claims

1. Apparatus for fluid-dynamic braking of a high speed vehicle comprising:

(a) a wing member attached to said vehicle and positioned generally transversely across said vehicle,  
 (b) an elevator attached to the rear portion of said wing member,  
 (c) a rudder attached to said wing member and positioned generally in the vertically plane,

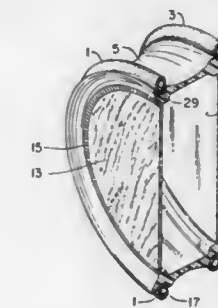


(d) an eductor symmetrically positioned in said elevator surface,  
 (e) means for positioning the upper surface of said elevator surface at an angle in the range from 0° to 180° with respect to the upper surface of said wing member, and  
 (f) means for positioning said wing at an obtuse angle to said vehicle.

**4,160,495**  
**SUITCASE WITH TRANSPORTING RIMS**  
 Donald D. Conard, 900 N. Point St., San Francisco, Calif. 94109  
 Filed Feb. 16, 1978, Ser. No. 878,364  
 Int. Cl.<sup>2</sup> A45C 5/14

U.S. Cl. 190—18 A

5 Claims



1. A suitcase for rolling movement over the ground comprising: a suitcase having side walls and end wall cooperatively joined together to form an enclosed article receiving volume; at least first and second raceways mounted to the end wall of said suitcase and extending around said suitcase in an endless track; at least first and second rims forming complementary endless tracks for reception into said first and second raceways; means for permitting relative rotation between said rims and said raceways to permit rolling movement of said suitcase over said ground.

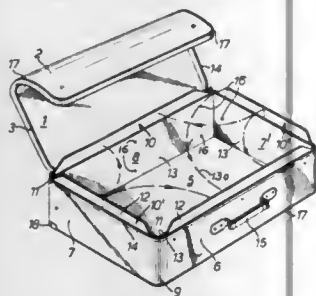
**4,160,496**  
**FOLDABLE HAND BAGGAGE**  
 Kenneth R. Knight, 11 Kendal Close, Reigate, Surrey, England  
 Filed May 10, 1977, Ser. No. 795,634  
 Int. Cl.<sup>2</sup> A45C 7/00, 13/00

U.S. Cl. 190—43

6 Claims

1. A foldable item of hand baggage which comprises a body portion and rear, front and a pair of lateral walls, adjacent walls being interconnected through rounded corner sections forming an outer covering, and a hand grip attached to the front wall of the body portion, and a lid comprising a top

portion which lies parallel to said base when the item of hand baggage is in its unfolded state and closed and a side wall region at right angles thereto extending around the periphery of the top portion and providing rear, front and a pair of lateral free edges adjacent the body portion, the sidewall region extending in alignment with said walls and rounded corner sections of the body portion, the lid being attached to the rear wall of the body portion at the rear free edge of its side wall region, and the remaining free edges of its side wall region of the lid, and corresponding edges of the walls of the body portion being provided with a zip-fastener, wherein (a) each wall of the body portion includes an inner rigid element, the inner rigid element in each of the lateral walls being held to the rest of the body portion in a manner permitting it to be moved towards one of the front and rear walls when the item of hand baggage is to be folded; (b) the base of the body portion and said four walls of the body portion are formed of a material which is flexible so



as to facilitate folding; and (c) at least two intermediate members are located between the inner rigid elements and the outer covering, which intermediate members are rigid in the depthwise direction of the item of hand baggage over their entire height, are continuous in the region of, and extend around, the corner sections between adjacent walls of the body portion to constitute a radius corner at each corner of the body portion, and have a height greater than the depth of the body portion over at least a substantial portion of their length, said members being foldable at the radius corners towards one of the front and rear walls of said body portion when the lateral rigid elements have been moved towards one of the front and rear walls, and the arrangement being such that, when the lid of the item of hand baggage is zip-fastened to the body portion thereof, a substantial part of the upper edges of said intermediate members extends beyond the upper portion of the inner rigid elements associated with the walls of the body portion into the lid.

4,160,497

#### TRANSMISSION ASSEMBLY WITH A BRAKING DEVICE, PARTICULARLY FOR VEHICLES

Georges Galicher, Neuilly-sur-Seine, France, assignor to Etudes et Recherches Avancees, Saint-Etienne, France

Filed Jun. 13, 1977, Ser. No. 806,305

Claims priority, application France, Jun. 17, 1976, 76 18405; Jul. 20, 1976, 76 22091

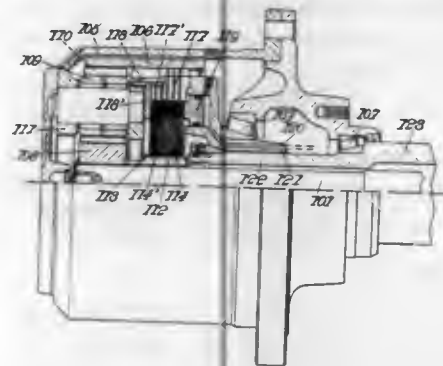
Int. Cl.<sup>2</sup> B60K 29/02; F16H 57/10

U.S. Cl. 192—4 A

6 Claims

1. A transmission and braking assembly for a vehicle having a driving shaft, a driven member, a speed reduction gear system having a sun gear coupled to said driving shaft, a stationary ring gear and a plurality of planet gears in engagement therewith and mounted in a carrier coupled to said driven member, and a braking device comprising a fixed casing, at least one fixed disc mounted in said casing, and at least one rotatable disc mounted on said carrier, a sleeve keyed to said driving shaft for conjoint rotation therewith, and a plurality of brake discs mounted on said sleeve, said brake discs being mounted so as to be non-rotatable and axially slidable relative

to said sleeve, and means for causing said brake discs to slide into engagement engagement with each of said fixed discs and



rotatable discs to effect braking of said driving shaft and said driven member.

4,160,498

#### ELECTROMAGNETIC COUPLING

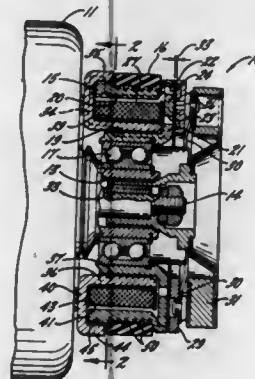
Paul P. Newton, Beloit, and Robert A. Olsen, Janesville, both of Wis., assignors to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Dec. 14, 1977, Ser. No. 860,582

Int. Cl.<sup>2</sup> F16D 27/10

U.S. Cl. 192—84 C

6 Claims



1. An electromagnetic coupling comprising an annular rotor having inner and outer concentric rings, one end of each of said rings defining a pole face, an armature mounted for rotation relative to said rotor and adapted to be drawn axially toward said pole faces by magnetic flux threading through said rotor and said armature, a stationary magnet core defined by inner and outer radially spaced concentric rings and by a bridge which spans such rings, the inner ring of said core being disposed between the inner and outer rings of said rotor and being spaced radially outwardly from the inner ring of said rotor by a narrow radial air gap of predetermined width, the bridge of said core extending alongside the opposite end of the outer ring of said rotor and being spaced axially from said opposite end by a narrow axial air gap of predetermined width, the outer ring of said core being spaced radially outwardly from the outer ring of said rotor by a narrow radial air gap of predetermined width, and means located between the outer ring of said rotor and the inner ring of said core for producing magnetic flux which threads radially across said radial air gaps and axially across said axial air gap whereby the controlled flux transfer between said core and the outer ring of said rotor occurs both in a radial direction and in an axial direction.

4,160,499

#### TWO-LEVER CONTROL UNIT

Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Hyogo, Japan

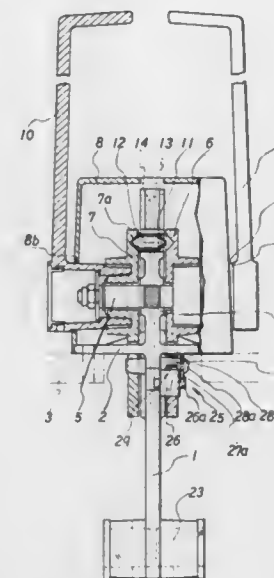
Filed Sep. 12, 1977, Ser. No. 832,641

Claims priority, application Japan, Aug. 9, 1977, 52-107080

Int. Cl.<sup>2</sup> G05G 5/08; F16H 57/06; 192 0.096; 0.098

U.S. Cl. 192—0.098

5 Claims



1. A two-lever control unit comprising:

- a main body having a bore;
  - a shaft mounted on said main body;
  - a clutch operating plate rotatably supported by said shaft, said clutch operating plate being provided with three locking cavities of equal depth and having tapered walls;
  - a clutch lever for rotatably driving said clutch operating plate;
  - a throttle operating plate rotatably supported by said shaft, said clutch operating plate being provided with a locking cavity of the same depth as the clutch operating plate locking cavities and having a tapered wall;
  - a throttle lever for rotatably driving said throttle operating lever;
  - a locking rod slidably extending through said bore, said locking rod having tapered opposite ends, one tapered end being engageable in one of said three locking cavities formed in said clutch operating plate and the other tapered end being engageable in the locking cavity formed in said throttle operating plate, the length of the locking rod being equal to the length of said bore plus the depth of one of said locking cavities;
- wherein rotation of one of said operating plates causes said locking rod to lock the other of said operating plates, and said tapered walls of said locking cavities and said cooperating locking rod tapered ends form ramps or release surfaces for facilitating unlocking of said locking rod from said clutch and throttle operating plate locking cavities.

4,160,500

#### TURN CONVEYOR

Hubert R. VerMehren, Florissant, Mo., assignor to Ga-Vehren Engineering Company, St. Louis, Mo.

Filed Sep. 12, 1977, Ser. No. 832,401

Int. Cl.<sup>2</sup> B65G 47/30

U.S. Cl. 198—457

15 Claims

15. A turn conveyor for carrying a flat article from a first conveyor to a second, angularly related conveyor, said turn conveyor including:

- (a) support means,
- (b) a first rotatable element mounted to said support means

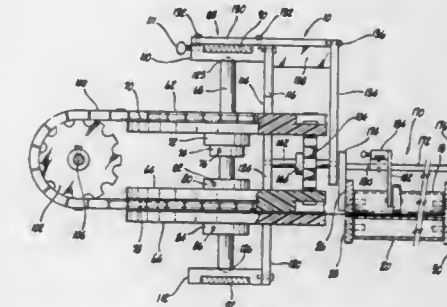
and rotating about an axis transverse to the direction of conveyance of said first conveyor,

(c) a second rotatable element mounted to said support means and rotating about an axis transverse to the direction of conveyance of said second conveyor,

(d) an endless flexible element disposed about said first and second rotatable elements including friction means disposed outwardly of the outer face thereof,

(e) drive means moving said flexible element about said first and second rotatable elements, and

(f) a corner disc assembly mounted to said support means between said first and second elements and rotatable about



an axis transversely related to said first and second axes, said disc assembly including:

- (1) shaft means,
- (2) an upper guide disc receiving the upper span of said flexible element,
- (3) a lower guide disc receiving the lower span of said flexible element, and
- (4) a base disc disposed below said lower guide disc and having an annular surface disposed adjacent the flexible element and cooperating with said friction means to carry said flat articles in an arcuate path between said angularly related conveyors.

4,160,501

#### SIDE-FOLD CONVEYOR

Thorkil J. Johannsen, 2480 Mississauga Rd., Mississauga, Ontario, Canada

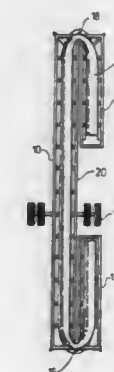
Filed Aug. 12, 1977, Ser. No. 824,009

Claims priority, application Canada, Jul. 19, 1977, 283012

Int. Cl.<sup>2</sup> B65G 21/00, 41/00

U.S. Cl. 198—632

2 Claims



1. An improved conveyor comprising an elongated hollow truss structure having a plurality of longitudinally spaced idler rolls journaled for rotation transversely thereof along its length, said plurality of idler rolls arranged to form an elongated trough shape, an elongated endless flexible belt mounted on said rolls and extending from one end of said truss structure to the other for travel in one direction on said rolls and return in the opposite direction below the rolls within the truss struc-



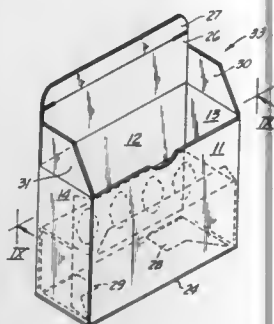
ture, said truss structure comprising at least two sections pivotally joined together about an upright axis intermediate the ends of the truss structure, said axis free of vertical belt obstructions in proximity to adjacent upper idler rolls, for substantially pivotal horizontal movement about said axis whereby one of said sections is swingable from a collapsed position side-by-side the other section to an extended position in longitudinal alignment with the other section and whereby said belt on the rolls folds longitudinally and transversely upon itself substantially about said upright axis and foreshortens to release belt tension and the belt below the rolls is free to turn in a vertical plane about said upright axis when said truss structure is in a collapsed position.

4,160,502

## PLATFORM CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.  
Filed Apr. 20, 1978, Ser. No. 898,468  
Int. Cl.<sup>2</sup> B65D 5/50

U.S. Cl. 206—45.14



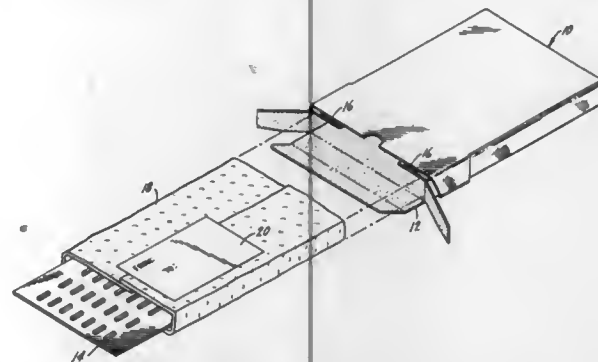
1. A platform carton for fragile articles comprising: generally parallel front and back panels, each having a top edge and a bottom edge; generally parallel side panels connecting said front and back panels, each of said side panels having a top edge and a bottom edge; a top cover flap extending from the top edge of said back panel, said top cover flap terminating in a tuck flap, and two side flaps, each extending from a top edge of one of said side panels;
- a platform section bridging the space between said front and back panels, said platform section further comprising an integral arrangement of:
  - a base panel having one edge connected to said bottom edge of said front panel at a fold line, said base panel extending toward said bottom edge of said back panel,
  - a riser panel connected to the opposite edge of said base panel, said riser panel extending upwardly along the inner surface of said back panel,
  - a platform panel connected along one edge to said riser panel, said platform panel extending toward said front panel, said platform panel having at least one aperture therein for receiving a fragile article to be firmly supported by the platform carton, and
  - a glue flap extending from the opposite edge of said platform panel toward the top edge of said front panel, said glue flap being bonded to the inside surface of said front panel; and
- a bottom cover flap extending from the bottom edge of said back panel, said bottom cover flap including an adhesive strip adjacent its free edge for securing said flap to said base panel.

4,160,503  
SHIPPING CONTAINER FOR PRINTED CIRCUIT  
BOARDS AND OTHER ITEMS

Ralph C. Ohlbach, 417 Green Park Ct., Deerfield, Ill. 60015  
Filed Aug. 7, 1978, Ser. No. 931,867  
Int. Cl.<sup>2</sup> B65D 81/14, 85/30

U.S. Cl. 206—328

5 Claims



1. A paper board shipping container having at least an openable end for receiving a printed circuit board or other electronic article to be protected against a charge of static electricity, erected from folding carton board or corrugated board at least of the strength of E-flute to present six walls defining an interior cavity for insertion of said article, all inside paper surfaces opposite outside paper surfaces of the container board being coated with particles of conductive carbon black contained in a printing ink vehicle and of such concentration as to prevent a charge of static electricity originating outside the container from passing through the container, and said container containing an electronic component or module unit sensitive to a charge of static electricity.

4,160,504

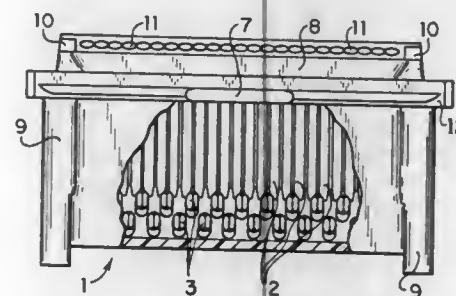
PACKAGING UNIT FOR SEMICONDUCTOR DISCS  
Walter Kudlich; Hans Herrmann; Gunther Lechner, and Kurt Berger, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemtronik Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,911  
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702464

Int. Cl.<sup>2</sup> B65D 57/00, 85/58

U.S. Cl. 206—334

12 Claims



1. A stackable, tray-type packaging unit for securing semiconductor discs, comprising:
  - a lower housing portion for receipt of the discs having a base, two generally upright, elongated, longitudinally-extending, spaced-apart sidewalls joined to said base and two generally-upright, laterally-extending end walls joined to said base and to said sidewalls along opposite ends thereof, said sidewalls having an inwardly-tapered lower end portion;
  - a plurality of parallel, laterally-extending guide ribs formed

opposite each other on said sidewalls, each adjacent pair of ribs on one sidewall cooperating with an oppositely-disposed pair of ribs on the other sidewall to serve as guides to facilitate the introduction of discs therebetween prior to their full receipt in said housing;

- a plurality of stabilizing ribs each of which is formed on said base on the joining line between a pair of oppositely-disposed guide ribs, formed on said sidewalls, said ribs serving to stabilize said discs during their introduction and prior to their full receipt in said housing portion;
- a plurality of centrally-notched knobs formed opposite each other on said sidewalls in said lower end portions thereof, each of said knobs on one sidewall cooperating with an oppositely-disposed knob the other sidewall to provide only two support points on which a disc may rest when fully received in said housing portion, and said knobs cooperating to maintain said discs in an upright position;
- a lid for said housing including snap-fit means for releasably securing said lid to said sidewalls and endwalls of said housing portion, said lid having an inner surface and having formed on its inner surface two parallel, longitudinally-extending rows of downwardly-directed retention cones, each adjacent pair of cones in one row of which cooperate with an adjacent pair of cones in the other row to provide a maximum of two support points which engage and support the outer periphery of a single disc, said cones and said knobs providing the sole support for said discs when fully received in said packaging unit with each disc being thus supported solely by a maximum of four support points provided by said knobs and cones.

4,160,505

## CATHETERIZATION TRAY

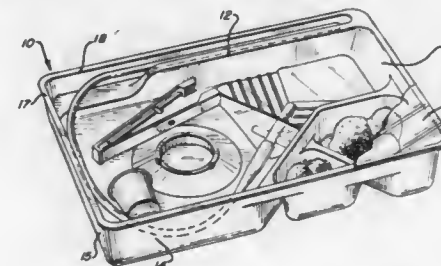
Richard A. Rauschenberger, Brookfield, Wis., assignor to Will Ross Inc., Milwaukee, Wis.

Filed Dec. 19, 1977, Ser. No. 862,074

Int. Cl.<sup>2</sup> B65D 85/54

U.S. Cl. 206—571

2 Claims



1. A catheterization tray providing a sterile, self-contained catheterization package and work area comprising:
  - a generally rectangular dish having a bottom, four upstanding side walls and a continuous outwardly extending flange integral with the top of said walls,
  - at least two independent compartments within said dish for separately retaining absorbent material in each compartment;
  - a wall on the bottom of said dish defining a circular recess for receiving and holding upright a specimen container;
  - a raised wall section in said dish extending substantially the length of said dish and having a horizontal portion and an inclined portion;
  - a channel adapted to receive a catheter located in the top of said raised wall and extending substantially the length of said horizontal and inclined portions; and
  - a releasable cover sheet sealed to said flange, said cover sheet being permeable to sterilizing gases.

4,160,506

## SHELF-SUPPORTING STANDARDS

Bruce Young, Jr., 105 Masters Rd., Hixson, Tenn. 37343  
Division of Ser. No. 679,794, Apr. 23, 1976, Pat. No. 4,083,458.  
This application Feb. 17, 1978, Ser. No. 879,000  
Int. Cl.<sup>2</sup> A47F 5/00

U.S. Cl. 211—86

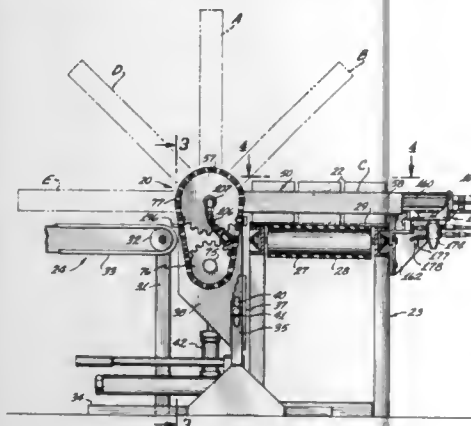
2 Claims



1. A corner connector for joining together two panels to form a corner, comprising:
  - a first elongate wall having a front face, a pair of longitudinal side edges and a plurality of bracket receiving openings defined therein to be spaced apart longitudinally of said first wall;
  - a second elongate wall attached at one longitudinal side edge thereof to one longitudinal side edge of said first wall to extend rearwardly therefrom, said second wall having a plurality of fastener receiving holes defined therein to be spaced apart longitudinally of said second wall, said second wall having a front face being a panel abutting face for abutting a first panel and another longitudinal side edge which is free and forms a panel abutting edge for abutting a second panel;
  - a plurality of anchor nuts attached to said second wall to be concentric with some of said fastener receiving holes with the remaining fastener receiving holes being free;
  - a third elongate wall attached at one longitudinal side edge thereof to another longitudinal side edge of said first wall to extend rearwardly therefrom to be in spaced parallelism with said second elongate wall;
  - a fourth elongate wall attached at one longitudinal side edge thereof to another longitudinal side edge of said third wall to extend at a substantially right angle thereto, said fourth wall having a plurality of fastener receiving holes defined therein to be spaced apart longitudinally of said third wall, said fourth wall having a panel abutting surface thereon for abutting said first panel, said fourth wall panel abutting surface and said second wall free longitudinal side edge being essentially coplanar with each other;
  - a plurality of second anchor nuts attached to said fourth wall to be concentric with some of said fastener receiving holes, with the remaining holes being free, whereby alignment of a pair of corner connectors aligns said fastener receiving holes so that a fastener inserted through a free hole in a second wall of one corner connector of a pair of corner connectors engages an anchor nut encircled hole of a second wall which is aligned therewith on the other one of the pair of corner connectors;
  - a plurality of fasteners some of which are inserted through a panel for engaging said anchor nuts to attach said panel to said wall the remaining fasteners being inserted through the remaining holes to engage anchor nuts on the other side of said panel whereby a pair of panels are each connected to the panel connector and are thereby connected together via the panel connector to form a corner.

**4,160,507**  
**COMBINATION LIFT TURN-OVER/PUSH-OFF BLOCK TRANSFER APPARATUS**  
 Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254  
 Filed Aug. 8, 1977, Ser. No. 822,439  
 Int. Cl.<sup>2</sup> B65G 47/52  
 U.S. Cl. 414—749

6 Claims



1. An apparatus for removing a plurality of cementitious blocks from a pallet on a first conveyor and transferring those blocks to a second conveyor in either an inverted or upright position, said apparatus comprising:

- (a) a frame for aligned positioning between a block pick-up position on the first conveyor and a block delivery position on the second conveyor, said frame including a flat plate disposed between the block pick-up position on the first conveyor and the block delivery position on the second conveyor;
- (b) a block lift and turn-over mechanism mounted on said frame for liftingly removing the plurality of blocks from the pallet on the first conveyor and transferring those blocks to the second conveyor in an inverted position;
- (c) a block push-off mechanism mounted on said frame for pushing the plurality of blocks from the pallet on the first conveyor onto the top plate of said frame and slidingly moving the blocks across that plate onto the second conveyor; and
- (d) switching means on said frame for deactivating said block push-off mechanism in a retracted inoperative position during operation of said block lift and turn-over mechanism and for deactivating said block lift and turn-over mechanism in an inoperative position which provides an unobstructed path across the top plate of said frame during operation of said block push-off mechanism.

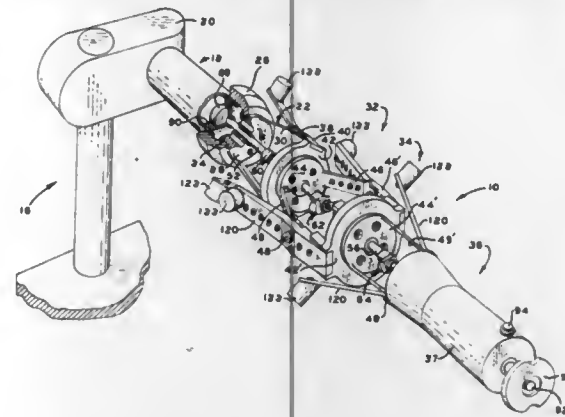
**4,160,508**  
**CONTROLLER ARM FOR A REMOTELY RELATED SLAVE ARM**  
 Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of John K. Salisbury, Jr., Palo Alto, Calif.  
 Filed Aug. 19, 1977, Ser. No. 826,202  
 Int. Cl.<sup>2</sup> B25J 3/04  
 U.S. Cl. 414—4

11 Claims

1. In a manipulator system characterized by an articulated slave arm having a plurality of pivotally connected segments for performing a variable task at a work site, and a controller remotely related to the work site and connected to the slave arm, the improvement comprising:

an articulated controller arm characterized by a segmented controller shaft including a plurality of controller shaft segments, each segment of said plurality being configured and dimensioned to form a miniature kinematic replica of a corresponding segment of the slave arm and supported for relative angular displacement about a pair of intersecting axes duplicatable by the slave arm, said pair of axes

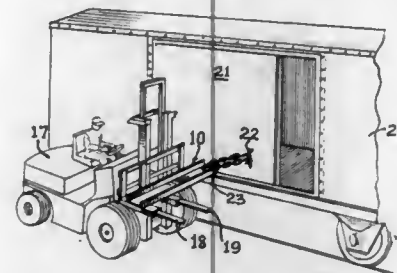
intersecting and defining therebetween a constant included angle of 45°; an articulated skeletal body for supporting said controller



shaft including a plurality of pivotal segments symmetrically related to said controller shaft and supported for angular displacement about pivotal axes normally related to one axis of said pair of intersecting axes.

**4,160,509**  
**FREIGHT CAR DOOR OPENER**  
 Ralph V. Switzer, 3410 Sunset, Waukegan, Ill. 60085  
 Filed Jan. 3, 1978, Ser. No. 866,532  
 Int. Cl.<sup>2</sup> B66F 9/19  
 U.S. Cl. 414—607

4 Claims

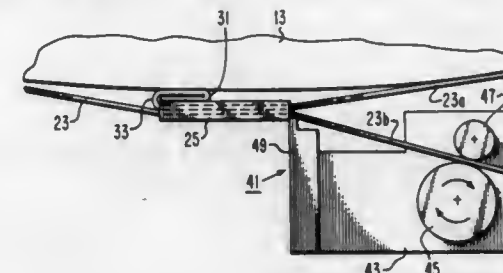


1. A freight car door opener for attachment to a powered industrial fork lift truck and the like providing a pair of elongated forwardly projecting prongs comprising

- (a) a framelike body having a pair of elongated members extending in spaced relation to each other,
- (b) a beam carried by said members and extending transversely thereto and of a length to project beyond the side of the fork lift truck,
- (c) said members providing sleeves extending longitudinally therethrough and adapted to receive therein the prongs of the fork lift truck so as to attach the framelike body thereto for movement therewith,
- (d) a chain connected to the end of said beam extending beyond the side of said members, and
- (e) means on the end of said chain for connection to a freight car door for exerting movable force thereto parallel to the travel of the door as said fork lift truck is moved in one direction.

**4,160,510**  
**CRT WITH TENSION BAND ADAPTED FOR PUSHER-TYPE TENSIONING AND METHOD FOR PRODUCING SAME**  
 Myron H. Wardell, Jr., Lititz, Pa., assignor to RCA Corporation, New York, N.Y.  
 Filed Jan. 30, 1978, Ser. No. 873,613  
 Int. Cl.<sup>2</sup> H01J 29/87  
 U.S. Cl. 220—2.1 A

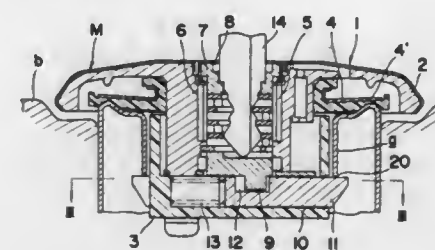
10 Claims



1. A cathode-ray tube in combination with a notch-sealed tension band around the tube characterized in that the inner end portion of said band adjacent said tube is folded at least twice upon itself and is positioned between the tube and the notched seal, said inner end portion comprising an extreme end, a series of connected sections of band material with a fold between adjacent sections, the one section furthest from said end being within said seal, another section connected to said one section being adjacent said tube and the remaining sections being between said another section and said seal.

**4,160,511**  
**DEVICE FOR CAPPING SUPPLYING OPENING OF FUEL-TANK**  
 Masakazu Hukuta, Tsushima, and Hirotsugi Kobayashi, Aichi, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Selsakusho, Aichi, Japan  
 Filed Sep. 7, 1978, Ser. No. 940,508  
 Claims priority, application Japan, Sep. 12, 1977, 52-122557[U]  
 Int. Cl.<sup>2</sup> B65D 55/14  
 U.S. Cl. 220—210

4 Claims

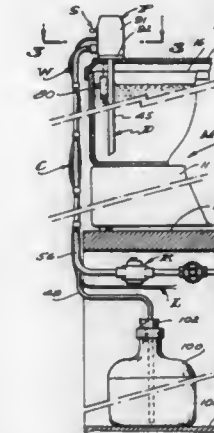


1. A device for capping a supplying opening of a fuel-tank of a motor vehicle and the like, comprises a capping outer casing, including a covering portion for covering an upper peripheral surface of said supplying opening therewith, a plug portion to be closely fitted to an inner surface of said supplying opening therewith, and means for maintaining said covering portion in a resilient condition when said covering portion is forcibly attached to said supplying opening, a pair of locking bars accommodated in a lower portion of said plug portion, said locking bar being backwardly positioned by resilient member to project from a shell of said plug portion, and cylinder-lock means mounted on said outer casing, said cylinder-lock means including a rotary member, a pair of lugs mounted on said rotary member for frictionally driving said locking bars when said rotary member is actuated, and a detachable key for actuating said rotary member, said rotary member being arranged not to permit said key to be fitted thereto for actuating said rotary member and detached therefrom even after said locking

bar being fully extended without further actuation thereof through said key beyond an autorelaxing state concerning said locking bar having been frictionally driven in an autorelaxing direction thereof.

**4,160,512**  
**LIQUID METERING AND BLENDING MEANS**  
 Robert K. Cleland, 11051 Via El Mercado, Los Alamitos, Calif. 90720  
 Filed Dec. 1, 1977, Ser. No. 856,313  
 Int. Cl.<sup>2</sup> B67D 5/56  
 U.S. Cl. 222—56

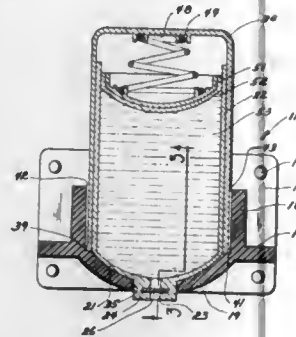
5 Claims



1. A proportional mixing device in combination with a non-carbonated beverage dispensing machine including a beverage holding tank with a top wall having a vertical through opening; said device is operable to intermittently deliver volumes of water with proportional volumes of liquid additive admixed therewith into the tank and includes a unitary body with a bottom surface in supported engagement with said wall, an elongate aspirator chamber with upstream and downstream ends within the body, an elongate nozzle passage with upstream and downstream ends, within the body with its downstream end concentric with and communicating with the upstream end of the aspirator chamber, an elongate water supply duct with upstream and downstream ends in the body with its downstream end communicating with the upstream end of the passage and its upstream end connected with a pressurized water supply remote from the body and the machine, an on and off valve means in the body and interposed between the ends of the water supply duct, a liquid additive port in the body communicating with the upstream end portion of the aspirator chamber, an elongate suction hose with a downstream end portion entering the body and communicating with the port and an upstream end portion extending from the body into a static supply of liquid additive remote from the body and the machine, a receiver chamber communicating with the downstream end of the aspirator chamber, an elongate delivery tube with an upper end portion entering the bottom of the body and communicating with the receiver chamber and a lower end portion depending from the body through said through opening and into said tank below a normal liquid level therein, an anti-syphon vent in the upper portion of said delivery tube, and bypass means to control the flow rate and volume of additive into and through the device and including an elongate bypass duct in the body, having an upstream end communicating with the receiver chamber and a downstream end communicating with the upstream end of the aspirator chamber and manually operable metering valve means in the bypass duct and operable to adjust the pressure differential between the receiver chamber and the upstream end portion of the aspirator chamber.

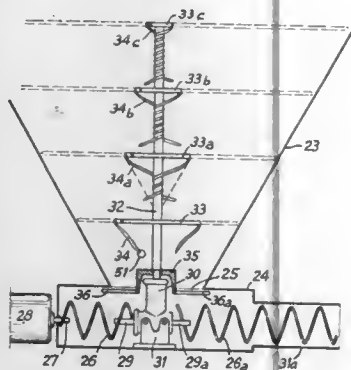


**4,160,513**  
**TOOTHPASTE DISPENSER**  
 Terry L. Cockerham, 3105 Canterbury Dr., Bloomington, Ind. 47401  
 Filed Nov. 7, 1977, Ser. No. 849,162  
 Int. Cl.<sup>2</sup> B67D 5/06  
 U.S. Cl. 222—181



1. A dispenser comprising:  
 a bracket for mounting to a support;  
 an elongated cup having an open end received in said bracket, with locking means thereon for locking said cup to said bracket, said cup having a plunger longitudinally movable therein, and biasing means urging said plunger toward the open end of said cup;  
 a disposable cartridge of material to be dispensed, said cartridge being disposed in said cup, and said cartridge and bracket having cooperating means for reception and support of said cartridge in said bracket, said cartridge having an outlet for material to be dispensed, and said cartridge having a manually operable valve associated with said outlet and operable, when manually actuated, to open said outlet for dispensing said material from said cartridge, said valve being attached to said cartridge independent of said bracket;  
 said cartridge having a movable wall engaged by said plunger when said cartridge is in said cup and supported by said bracket, said movable wall being urged by said plunger toward said outlet to pressurize said material for discharge when said valve is actuated to open said outlet.

**4,160,514**  
**DEVICE FOR FLUIDIZING AND DISCHARGING DIVIDED MATERIAL**  
 Jean-Paul Taupin, Le Vivier, 53130 Urzy, France  
 Filed Dec. 9, 1976, Ser. No. 748,904  
 Claims priority, application France, Dec. 16, 1975, 75 38506  
 Int. Cl.<sup>2</sup> B65G 33/14  
 U.S. Cl. 222—228

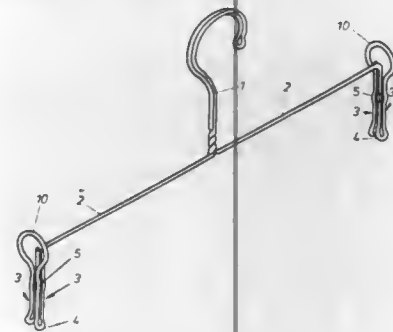


1. A device for fluidizing and discharging divided material from a silo comprising a rotatable shaft arranged to extend internally of the base of the silo, hub members carried for rotation on the shaft and extending in successive spaced planes

10 Claims

perpendicular to the axis of the shaft, and at least one elongate flexible and deformable element attached to each of the hub members, the elements having a length no greater than the radial distance between the outer edge of the associated hub member and the wall of the base of the silo, and the hub members having different radial dimensions so that for the lowest member nearest the bottom of the silo the radial dimension is at a maximum and for the uppermost member nearest the top of the silo the dimension is at a minimum, and the dimensions of the intermediate hub members progressively decrease between the lowest and the uppermost members.

**4,160,515**  
**CLOTHES HANGER**  
 Ernst Frei, Markstrasse 40, A-6971 Hard, Vorarlberg, Austria  
 Filed Dec. 19, 1977, Ser. No. 862,012  
 Int. Cl.<sup>2</sup> A47J 51/14  
 U.S. Cl. 223—96



1. A clothes hanger which is integrally formed from a single piece of wire and comprises an upwardly projecting hook, two arms extending from the hook in opposite directions, and, at the free end of each of the arms, a downwardly projecting pair of spring jaws adapted to grip an article of clothing and opening and closing by a relative swinging movement in planes laying substantially perpendicular to the extension of the arms, wherein each of the pair of jaws is formed by the wire leading from the end of a respective one of the arms bent substantially 90° downwardly and extending downward to a 180° bend to form a free end and upwardly to form one of the jaws, over an open, bulbous bend to form a springy hinge part lying in a plane substantially perpendicular to said arm, and downwardly to a 180° bend to form a free end and upwardly to form the other of the jaws and terminating adjacent the end of the arm, whereby each jaw is formed by two wire portions which run substantially parallel to one another and are corrugated in a direction towards and away from the other jaw of that pair so that the two jaws of the pair lie closely adjacent to one another at two positions between the springy hinge part and the free ends of the jaws and bulge apart between these two positions, and the free ends of the two jaws diverging away from one another to admit clothing to said jaws.

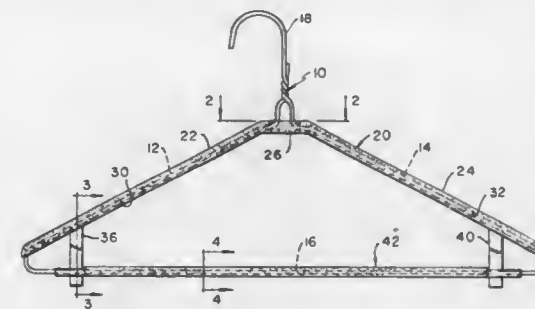
2 Claims

**4,160,516**  
**GARMENT HANGER CONSTRUCTION**  
 Marjorie L. Rice, 1507 SW. Blvd., Kansas City, Kans. 66103  
 Filed Aug. 3, 1978, Ser. No. 930,687  
 Int. Cl.<sup>2</sup> A47J 51/086  
 U.S. Cl. 223—98

1. A garment hanger construction comprising a wire garment hanger including a triangular garment hanger portion having a pair of downwardly inclined hanger bars joined together at their lower ends by a pants bar and with a suspending hook extending upwardly from the juncture of said hanger bars, a hanger bar attachment secured on said hanger bars, said hanger bar attachment including a pair of hanger bar attachment elements of substantially greater width than said hanger

2 Claims

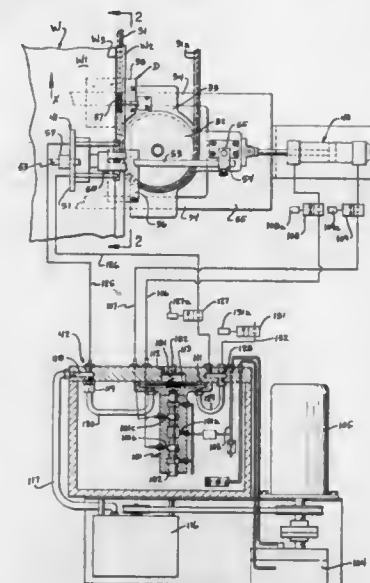
bars and each having a groove on the underside thereof in which said hanger bars are received, said hanger bar attachment elements being joined together at their upper ends, an opening at the juncture of the hanger bar attachment elements, said suspending hook extending through said opening, strut means extending downwardly from each of said hanger bar attachment elements into engagement with said pants bar, a pants bar attachment of substantially greater width than said pants bar, secured on said pants bar, said pants bar attachment



having a groove on the underside thereof in which said pants bar is received, and strut means extending from each end of the pants bar attachment, each into engagement with the strut means of one of the hanger bar attachment elements; said strut means of the hanger bar attachment elements comprising a pair of spaced apart struts which extend around said pants bar, said strut means of said pants bar attachment each comprising a pair of spaced apart struts which extend over the struts of the hanger bar attachment elements.

**4,160,517**  
**WEB ALIGNING APPARATUS FOR MULTI-LEVEL WEB MATERIAL**  
 Raymond A. Buisser, Rockford, Ill., assignor to Rockford Servo Corporation, Rockford, Ill.  
 Filed Jan. 9, 1978, Ser. No. 868,046  
 Int. Cl.<sup>2</sup> B65H 25/26  
 U.S. Cl. 226—19

12 Claims

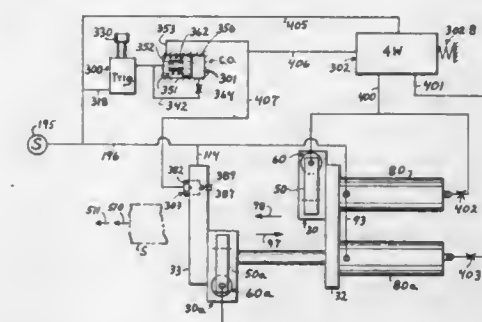


1. A web aligning apparatus for use with multi-level web material having a backing and a pile on the backing inwardly of the edge of the latter to maintain the pile edge in a preselected lateral position relative to a device that operates on the web, the web aligning apparatus including a main support adapted to be mounted at a sensing location along the course of travel of the web, a secondary support member mounted on the main support for pivotal movement relative thereto about

an axis crosswise of the course of travel of the web and generally parallel to and spaced from the face of the web at the sensing location, a pile engaging member adapted to engage the pile edge, means mounting the pile engaging member on said secondary support member for movement relative thereto only along a first path crosswise of the course of travel of the web and generally parallel to the face of the web at the sensing location to sense movement of the pile edge laterally of the course of travel of the web, said pile engaging member being supported by said secondary support member for movement therewith about said pivot axis in a second arcuate path generally tangent to the course of travel of the web from a first position alongside the web backing at said sensing location toward a second position displaced along said arcuate path in the direction of travel of the web when the pile engaging member rides on top of the pile, a first motion detector for detecting movement of the pile engaging member along said first path, said first motion detector including a detector body mounted on the secondary support member for movement therewith about said pivot axis and a movable detector member connected to said pile engaging member and movable relative to said detector body for providing a signal correlative in amplitude with the position of the pile engaging member along said first path, power means for effecting relative shifting of the web and the device that operates on the web, a first control means responsive to the signal provided by said first motion detector for operating the power means to maintain the pile edge in a preselected lateral position relative to the device that operates on the web, a second motion detector for sensing movement of said pile engaging member along said second arcuate path, and additional control means responsive to said second motion detector means for operating the power means to relatively shift the web and the device that operates on the web in a direction to cause the pile engaging member to move outwardly of the pile on the web.

**4,160,518**  
**DOUBLE STROKE FEEDER**  
 Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820  
 Filed Feb. 6, 1978, Ser. No. 875,619  
 Int. Cl.<sup>2</sup> B65H 17/42  
 U.S. Cl. 226—115

30 Claims



1. A duplex type feeder for intermittently advancing stock into the work station of a press having a reciprocating ram; said feeder being adapted to be controlled so as to execute two successive incremental stock feeding strokes in response to each cyclic operation of said press: comprising  
 a frame;  
 a pair of feed slides mounted on said frame for reciprocation in feed and index directions;  
 stock gripping means carried by each of said feed slides and being movable between stock gripping and stock release positions;  
 motor means for actuating said pair of feed slides and said stock gripping means so that each of said feed slides may be moved through feed and index strokes;

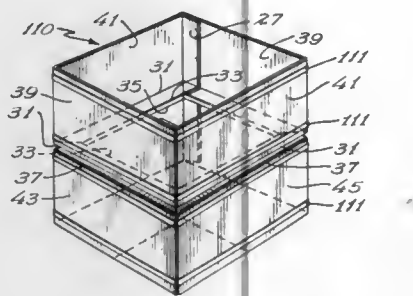
a first control means adapted to be operated in response to each cyclic operation of said press;  
a second control means operative in response to the actuation of said first control means for causing one of said feed slides to execute a feed stroke; and  
a third control means operative for causing the other of said feed slides to execute a feed stroke after said one feed slide completes its said feed stroke, whereby each cyclic operation of said first control means causes said two feed slides to serially execute two stock feed strokes.

#### 4,160,519 PAPERBOARD BULK BIN

Jack C. Gorham, Keokuk, Iowa, assignor to Champion International Corporation, Stamford, Conn.  
Continuation of Ser. No. 809,085, Jun. 23, 1977, abandoned.  
This application Jun. 7, 1978, Ser. No. 913,525  
Int. Cl.<sup>2</sup> B65D 5/02

U.S. Cl. 229—37 R

1 Claim



1. A paperboard blank for use in the construction of a bulk bin and having opposed first and second surfaces said blank comprising:

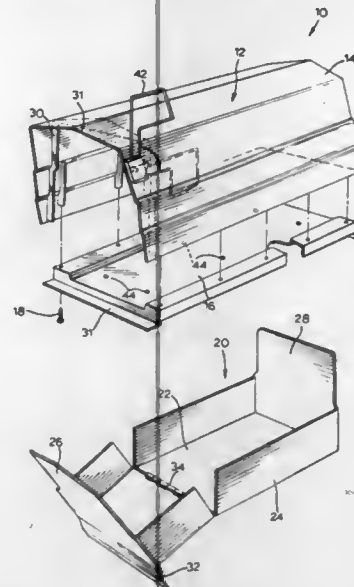
first and second rectangular side wall panels hingedly connected to each other in side-by-side relationship by a vertical fold line defining the inner edge of each side wall panel;  
a glue flap hingedly connected to the outer side edge of said second side wall panel; and  
a cover flap hingedly connected to the bottom edge of each side wall panel, each of said side walls having four, parallel, horizontal fold lines, the two outermost fold lines being scored into said first blank surface, and the two innermost fold lines being scored into said second blank surface, thus subdividing each of said side walls into a top portion, a bottom portion, and three intermediate portions, said outermost horizontal fold lines extending across the width of said glue flap, said side walls further including a first cutout disposed on the outer lateral edge of said first side wall panel, second and third cutouts disposed on the interior edges of said first and second side wall panels, said second and third cutouts being diagonally opposed to one another and partially overlapping one another, a fourth cutout disposed on the outer edge of said second side wall panel, and a fifth cutout partially extending across the entire width of the glue flap such that said glue flap comprises a top portion, a bottom portion and two spaced apart intermediate portions, said fifth cutout being diagonally opposed to and partially overlapping said fourth cutout such that when two of said blanks are connected side by side and folded to form the bin, said cutout portions cooperate with the three intermediate portions to form on each side wall an integrally locked inwardly protruding, substantially rectangular, horizontal rib portion such that one of said intermediate portion being substantially perpendicular to the other intermediate portions which are substantially parallel to each other, said rib portion reinforcing said wall to prevent bulging as said bin is filled to near capacity.

#### 4,160,520 RURAL MAIL BOX

George J. Cluthe, Breslau, Canada, assignor to The Geo. Cluthe Manufacturing Co. Limited, Waterloo, Canada  
Filed Mar. 13, 1978, Ser. No. 885,969  
Int. Cl.<sup>2</sup> B65D 91/00

U.S. Cl. 232—17

10 Claims



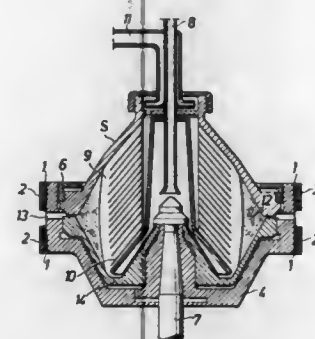
1. A rural mail box, comprising  
an elongate enclosure having an open end, and  
a tray slidably mounted in said enclosure and including an integral front wall closing said open end of said enclosure when said tray is located wholly within said enclosure and opening said enclosure when said tray is slid outwardly from said enclosure,  
said tray being constituted by two portions hingedly connected together about a transverse hinge, whereby when said tray is slid from said enclosure a distance such that said hinge is just outside said enclosure the forward one of said tray portions hinges downwardly relative to the rearward one of said tray portions.

#### 4,160,521 FIBRE-REINFORCED ROTOR

Mats Lindgren, Stockholm, Sweden, assignor to Fiber Mechanics AB, Stockholm, Sweden  
Filed Jun. 24, 1977, Ser. No. 809,711  
Claims priority, application Sweden, Jul. 29, 1976, 7608542  
Int. Cl.<sup>2</sup> B04B 1/00

U.S. Cl. 233—27

12 Claims



1. A fibre-reinforced rotor comprising:  
an internal rotor member (3) having a substantially smooth frusto-conical outer surface;  
an internally frusto-conical intermediate sleeve (1) posi-

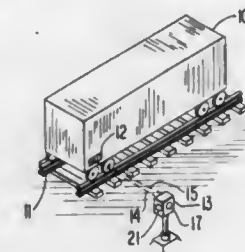
tioned on said frusto-conical outer surface of said internal rotor member (3), the frusto-conicity of said intermediate sleeve (1) being substantially smooth and corresponding to the frusto-conicity of said internal rotor member (3); and  
an external fibre-reinforced member (2) positioned coaxially about the outer surface of said intermediate sleeve (1); said intermediate sleeve (1) with said external fibre-reinforced member (2) being slidably attached over said internal rotor member (3) with a press fit therebetween to pre-stress said internal rotor member (3) due to the press fit.

#### 4,160,522 AUTOMATIC CAR IDENTIFICATION SYSTEM

Daumantas V. Dikinis, 110-3B Seminary Dr., Mill Valley, Calif. 94941

Filed Apr. 3, 1978, Ser. No. 892,533  
Int. Cl.<sup>2</sup> G06K 7/10, 19/06; G08C 9/06  
U.S. Cl. 235—454

16 Claims



1. A system for identifying objects moving along a path past a stationary location comprising: means adapted to be placed at said location for defining a source of a radiation beam, said defining means being operable to direct a radiation beam in the form in a generally vertical column across the path of travel of the moving object when the source is at said location; a label adapted to be mounted on an object moveable along said path for identifying the same, the label having at least a pair of side-by-side radiation receiving and transmitting columns alignable across the path of the radiation beam when the label is on the object and when the source is at said location, each column having means selectively located thereon for blocking at least a portion of the light beam to thereby define a radiation entrance port and a radiation exit port for the column, each column further having radiation transmitting means therein for connecting the entrance and exit ports thereof so that a radiation beam entering the entrance port can pass into the column and exit therefrom at the exit ports; and radiation receiving means adapted to be placed at said location adjacent to said radiation source for receiving the radiation beam leaving each column through the exit port thereof, said radiation receiving means being operable to generate electronic signals in response to the radiation transmitted from each column, whereby the locations of the entrance and exit ports relative to a specific reference point on the corresponding column, provide a coded identification for each object to distinguish it from other objects moving past the location.

#### 4,160,523 AIR STRUCTURE

Graham A. Stevens, 55 Colebrooke Row, London N.1., England  
Filed Apr. 8, 1977, Ser. No. 786,441  
Claims priority, application United Kingdom, Apr. 9, 1976, 14500/76

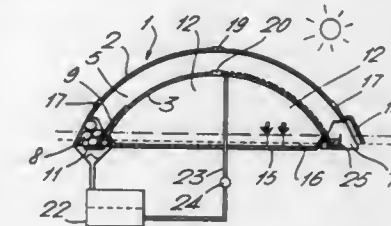
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 237—1 A

17 Claims

1. An air-supported structure comprising a double-skin wall construction having an inner skin and an outer skin, the wall construction having the configuration of a large-span arch rising from a perimeter of the construction, the inner and outer skins being of flexible material at least substantially imperme-

able to air and defining therebetween an inter-skin space, the outer skin being at least substantially transparent to short wave solar radiation but relatively opaque to long wave heat radiation, air filling the inter-skin space for supporting the double-skin wall construction, and a plurality of radiation converter elements disposed in the inter-skin space, the converter elements being diaphragms spaced at intervals between the inner



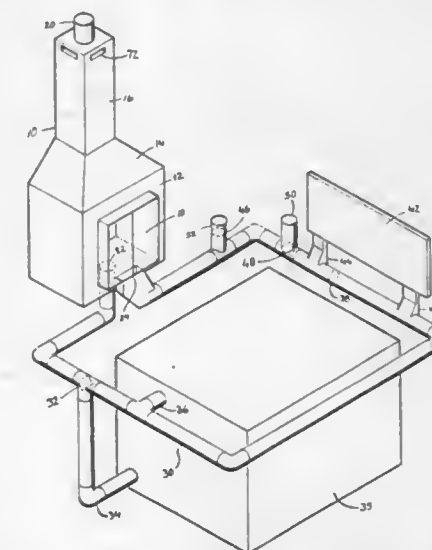
and outer skins, the diaphragms linking the skins, dividing the inter-skin space into tunnel-like spaces, and extending in parallel planes at right angles to the axis of curvature of the arch whereby the tunnel-like spaces extend upwardly from the perimeter to the apex of the arch, effective to absorb solar radiation and to convert the solar radiation to heat energy whereby the air filling the inter-skin space is heated.

#### 4,160,524 CIRCULATING FIREPLACE WITH ADJUSTABLE CONTROLS FOR SELECTIVELY HEATING ONE OR MORE ROOMS

Clifford W. Stiber, 1958 Winterville Rd., Athens, Ga. 30605  
Filed Sep. 30, 1977, Ser. No. 838,386  
Int. Cl.<sup>2</sup> F24B 7/04

U.S. Cl. 237—51

1 Claim



1. A closed loop heating system for selectively heating one or more zones within a structure, said system comprising:  
(a) a metal fireplace (10) including a firebox (12) having a floor (60), two sidewalls and a rear wall for receiving the fuel to be consumed,  
(b) a removable closure (18) for sealing the open face of the fireplace,  
(c) a chimney (16),  
(d) a combustion dome (14) joining the firebox to the chimney,  
(e) said firebox, said combustion dome, and said chimney being formed of three spaced metallic shells (54, 54a, 54b; 56, 56a, 56b; 58, 58a, 58b) with air passages defined between adjacent shells,



- (f) the innermost of the shells (58b) projecting upwardly above the other shells to function as a flue for said chimney;
- (g) an annular cap (66) extending across the upper ends of the two outermost shells (FIG. 6);
- (h) a metal casing (62) secured to the lower end of the outer shell with a portion of said casing extending forwardly below the floor of said firebox but spaced therefrom;
- (i) said casing being in fluid communication with the tortuous passage defined between said shells (FIG. 3);
- (j) air inlet means defined in said casing for freely admitting large quantities of air into the continuous tortuous passage defined between the several shells, the tortuous passage terminating in the space defined between the bottom of said firebox and the portion of said casing spaced therebelow;
- (k) a first passage (22) in fluid communication with the tortuous passage defined between the several shells, said passage opening downwardly through the casing;
- (l) a second passage (24) opening upwardly through the casing adjacent to the front of the firebox and in fluid communication therewith;
- (m) said first and second passages normally being in direct fluid communication;
- (n) ductwork (30) having at least one heat exchanger connected between said first and second passages for distributing heated air to the remote zones and returning the spent air to the front of the firebox; and
- (o) adjustable barrier means (64) located in said second passage below the floor of the firebox;
- (p) said barrier means being movable to a first position to block direct communication between the first and second passages defined in the firebox so that air heated along the tortuous path is forced into the ductwork for distribution;
- (q) said barrier means being movable to a second position to allow unimpeded direct communication between the first and second passages in the firebox and isolate the fireplace from the ductwork.

4,160,525

## SPRAY GUN CONSTRUCTION

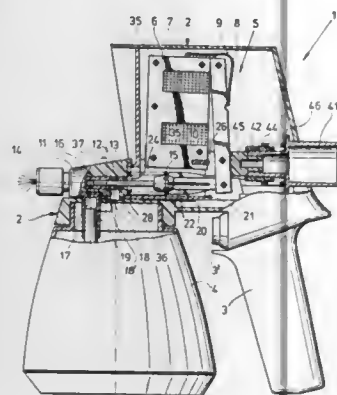
Josef Wagner, Friedrichshafen, Fed. Rep. of Germany, assignor to Firma Josef Wagner GmbH, Fed. Rep. of Germany  
Filed Nov. 21, 1977, Ser. No. 853,348

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653981

Int. Cl.<sup>2</sup> B05B 9/043

U.S. Cl. 239—332

9 Claims



1. A spray gun for spraying liquid comprising a housing part having a suction bore and a return bore positioned rearwardly of said suction bore, a sheet metal U-shaped bridge member engageable on said housing part having first and second spaced apart leg portions and a base portion connected between said leg portions and engageable on said housing part, a spray nozzle and surge chamber member in front of said bridge

member having a suction line portion engaged through the suction bore for drawing liquid into said chamber member and a return line portion engaged through the return bore, an electromagnetic pump having a coil portion connected to and supported in said bridge member on said base portion between said leg portions, a piston portion disposed with a piston part in said surge chamber of said spray nozzle and surge chamber member and an armature pivoted on said coil portion and engageable with said piston portion to advance it to move liquid taken into said surge chamber from said suction line portion out through said nozzle, means on said housing part for energizing said coil portion to move said armature, spring means biasing said armature in a return direction away from the direction of movement affected by said armature to move said armature to a return position, each of said housing part and said bridge member and said spray nozzle and surge chamber member having interengageable pin and recess means for interconnecting them together in aligned and fixed relative positions.

4,160,526

## LIQUID FUEL ATOMIZING NOZZLE

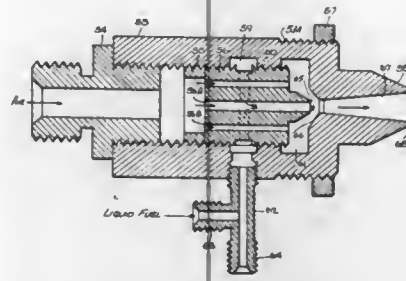
Paul Flanagan, Princeton, N.J., assignor to Flynn Burner Corporation, New Rochelle, N.Y.

Division of Ser. No. 780,852, Mar. 24, 1977, Pat. No. 4,130,388, which is a continuation of Ser. No. 723,542, Sep. 15, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,769

Int. Cl.<sup>2</sup> B05B 7/06

U.S. Cl. 239—427

6 Claims



1. A liquid fuel atomizer nozzle comprising:

- A. a cylindrical housing having a nose section at the forward end thereof to emit air-atomized liquid fuel, said nose section having a bore provided with a converging inlet leading to a diverging outlet;
- B. an air distributor disposed within said housing at a position spaced from the inlet of the nose section to define a mixing zone, said distributor having a central air passage along the longitudinal axis of the housing and at least one off-center secondary air passage, said passages leading into said mixing zone;
- C. means to feed atomizing air at high velocity into the rear end of said housing for forward flow through said passages;
- D. liquid fuel supply means constituted by an annular channel which encircles the distributor at an intermediate point thereon and which communicates with radial ducts extending between the channel and the central air passage to feed liquid fuel into the central passage to be intermingled with and atomized by the air flowing therethrough, atomization taking place due to the turbulent interaction of the incoming fuel and the forwardly rushing air, whereby the liquid is projected in an atomized stream into said mixing zone, the periphery of the stream in said mixing zone being subjected to the force of the air from the secondary passage to effect further atomization thereof so that both internal and external atomization takes place within the housing.

4,160,527

## APPARATUS FOR REPLACEMENT OF A CABLE DRUM OR SIMILAR OBJECT ON A SHAFT WITH ANOTHER CABLE DRUM

Sven S. Nordblad, Spånga, and Karl-Erik Svensson, Hågersten, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

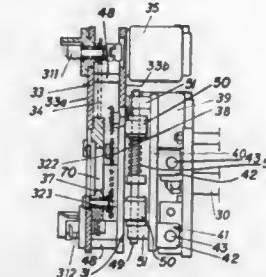
Filed Nov. 7, 1977, Ser. No. 848,811

Claims priority, application Sweden, Nov. 18, 1976, 7612929

Int. Cl.<sup>2</sup> B65H 67/00

U.S. Cl. 242—47

7 Claims



1. Apparatus for replacing an object secured to a shaft with a similar object, said apparatus comprising locking means releasably attachable to the shaft for holding an object on said shaft, said locking means including an actuable release member for releasing the locking means from said shaft, a displaceable control arm, first catch means coupled to said arm for movement therewith for releasably engaging the object secured to said shaft, second catch means coupled to said arm for movement therewith for releasably engaging said locking means, and means coupled to said arm for actuating said release member when said first and second catch means are positioned by said arm for respectively releasably engaging said object and said locking means.

4,160,528

## CARPET ROLL WINDING APPARATUS

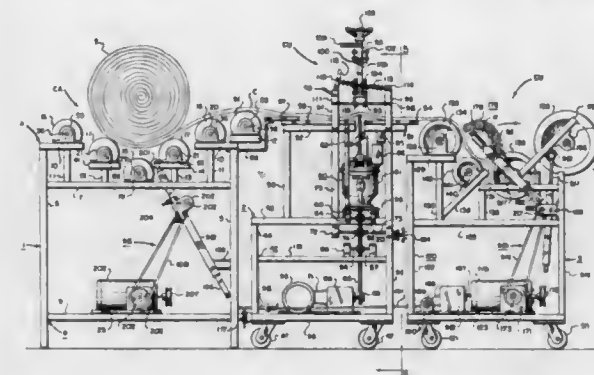
Fermer A. Malone, Sr., Kemp, and Fermer A. Malone, Jr., Duncanville, both of Tex., assignors to F. A. Malone & Son, Inc., Cedar Hill, Tex.

Filed Jan. 5, 1978, Ser. No. 867,283

Int. Cl.<sup>2</sup> B65H 19/20, 17/08

U.S. Cl. 242—56 R

18 Claims



1. An apparatus for unwinding a predetermined length of pliable material, such as carpet from a supply roll, for measuring, cutting and rewinding the unwound length of material into a roll comprising

first means having driven rollers forming a cradle for rotatably supporting a supply roll of pliable material and for unwinding and advancing a predetermined length thereof, second means for receiving the unwound material from the first means and supporting said material during measure-

ment and severing of the predetermined length of material, the second means having means for severing the predetermined length of material and means for preventing movement of said material relative to the severing means during the cutting of said length thereof, said second means having means mounting said severing means for pivotal movement about an upright axis to permit alignment thereof with the transverse axis of said unwound length of material, third means for receiving said length of material from said second means and having driven rollers forming a cradle for rotatably supporting and rewinding said length of material, the rewind cradle being mounted for pivotal movement about an upright axis to permit continual orientation of said cradle relative to said length of material for squaring the ends thereof and preventing coning of said ends.

4,160,529

## ROLLER WINDING MACHINE FOR THE FORMATION OF SINGLE REELS

Armin S. P. Hutzenlaub, Am Stichelberg 24, and Klaus Pack, Im Sonnenwinkel 16, both of 5276 Wiehl-1, Fed. Rep. of Germany

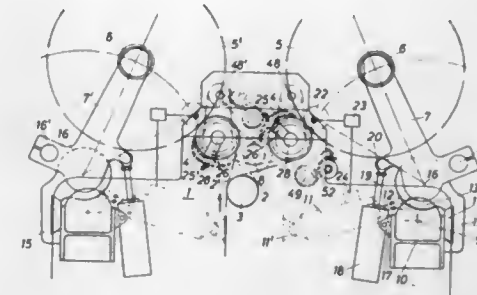
Filed May 30, 1978, Ser. No. 911,047

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724955

Int. Cl.<sup>2</sup> B65H 35/04, 75/34

U.S. Cl. 242—56.6

10 Claims



1. In a machine for forming rolls of strips from longitudinally cut sheets and having at least one rotatable support roll for a strip, a gravity actuated arm urging a take-up roll toward said support roll, means for swinging said arm away from said support roll, means for transversely cutting said strip, and a sickle shaped table rotatable concentrically about said support roll from a position free of contact with said sheet material to a position to cooperate with said cutting means and between said strip and support roll, the improvement comprising:

at least one adhesive label dispenser swingable about an axis parallel to the axis of said support roll for movement to said support roll to place spaced adhesive labels on said strip; means for moving said take-up roll away from said support roll to form a gap therebetween to accommodate said sickle shaped table; a slidable cutter movable parallel to the axis of said support roll; said sickle shaped table having a slit therealong between said spaced labels, to accommodate a portion of said cutter and a suction chamber on the side of said slit downstream of the direction of movement of said sheet; said table being arranged to apply pressure to a starting sleeve for a take-up roll to adhere one of said labels to said sleeve.

4,160,530

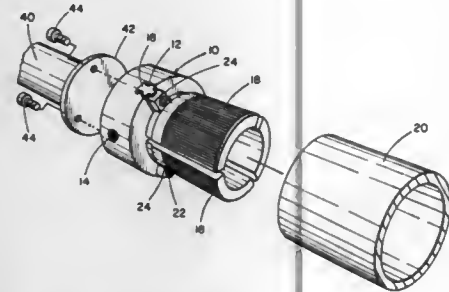
## CORE CHUCK

Edward F. Plach, Appleton, Wis., assignor to Appleton Machine Company, Appleton, Wis.

Filed Jun. 15, 1978, Ser. No. 915,812

Int. Cl.<sup>2</sup> B65H 17/02, 75/15

U.S. Cl. 242—68.2



1. A core chuck comprising:
  - (a) a chuck body of the lathe chuck type including a rotatable circular plate containing screw threads on one surface thereof and at least one adjustable pin engaging said plate to control rotation of the plate;
  - (b) at least two counterbored, radially aligned keyways formed in said body permitting access to said threaded surface of said plate;
  - (c) a keyway element disposed in each of said keyways and in contact with said plate, said element including a plurality of raised segments on the plate side of said element for interengaging the screw threads on said plate, whereby the keyway element may be accurately positioned at a desired location within said keyway by rotation of said pin;
  - (d) jaw sections secured to the side of said keyway element remote from said plate for movement therewith, said jaw sections, in combination with each other, forming a split ring expandable gripping surface, cylindrical in cross-section and adapted to be inserted into a core and then expanded to permit each jaw section to securely engage the inner diameter of said core as function of rotation of said pin.

4,160,531

## APPARATUS AND METHODS FOR UNTELESCOPING AND REWINDING REELS OF SHEET MATERIAL SUCH AS STEEL

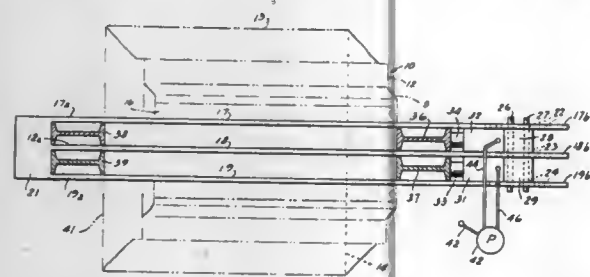
James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Oct. 25, 1977, Ser. No. 845,386

Int. Cl.<sup>2</sup> B21C 47/02; B65H 17/02

U.S. Cl. 242—78.1

8 Claims



1. Apparatus for rewinding reeled material having a central opening comprising a pair of side frame members, a central shaft connected to said frame members and extendible through said central opening of said reeled material, means for clamping the outer end of said reeled material, and means for rotating the inner coil of said reeled material so as to tighten said reel,

and wherein said clamping means comprises a hydraulic ram engageable with said outer end.

4,160,532

## KNOT HOLE BEAM

Hans Demuth, and Walter Stumpp, both of Winterthur, Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland

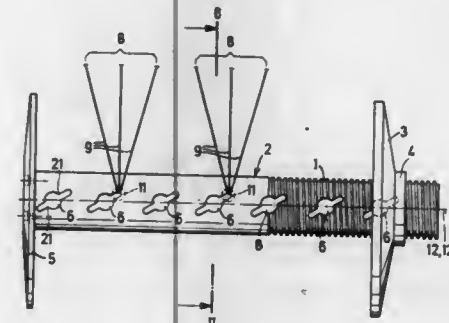
Filed Jun. 22, 1977, Ser. No. 809,127

Claims priority, application Switzerland, Jul. 2, 1976, 008486/76

Int. Cl.<sup>2</sup> B65H 75/28

U.S. Cl. 242—125.1

5 Claims



1. A knot hole beam, especially a warp beam for a loom, for winding-up yarn or the like, comprising:
  - a winding tube having a lengthwise axis and a peripheral portion provided with knot holes;
  - an insertion bore serving for the insertion of a bundle of knotted together yarn ends provided for each knot hole;
  - means for providing at least one knot arresting opening merging with the insertion bore and being narrower than said insertion bore;
  - an arresting projection provided for each knot hole for the inserted knot, said arresting projection being disposed between the insertion bore and the knot arresting opening at least at one side of an edge of the knot hole and extending towards a line which is substantially axially parallel to the lengthwise axis of the winding tube, said axially parallel line passing through the center of the insertion bore;
  - said arresting projection being situated closer to said axially parallel line than an outer peripheral portion of the knot arresting opening which is situated furthest from such axially parallel line; and
  - the arresting projection being formed by an inclined arrangement of the sides of the knot arresting opening relative to the axially parallel line.

4,160,533

## CONTAINER WITH OCTAGONAL INSERT AND CORNER PAYOUT

Frank W. Kotzur, Mahopac, and Ronald E. Zajac, East White Plains, both of N.Y., assignors to Windings, Inc., Goldens Bridge, N.Y.

Filed Jan. 24, 1978, Ser. No. 872,018

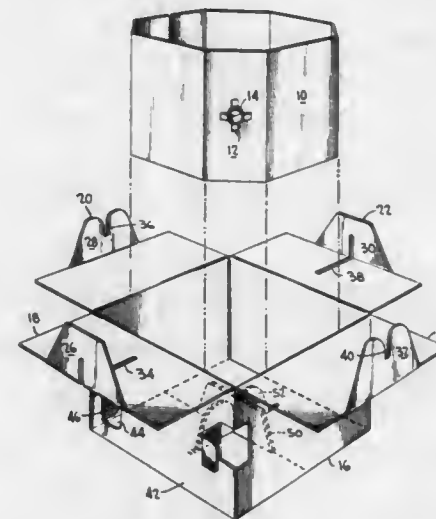
Int. Cl.<sup>2</sup> B65H 49/18

U.S. Cl. 242—137.1

6 Claims

1. A package for retaining wound material, comprising:
  - a container enclosing material wound in a FIGURE-8 configuration and including a radial hole extending from the central core space thereof to the outer periphery thereof, said container including a perforated portion in a corner thereof for feeding material from the winding;
  - a polygonally-sided insert having opposing sides engaging the outer periphery of the winding and including a feedout tube inserted in said radial hole for feeding the inner end of the material and having opposing sides engaging the

inner surfaces of the container, said feedout tube being aligned with said perforated hole; and



said container including bottom and upper surfaces each having intersecting cone sections for supporting the inner windings of said material.

4,160,534

## OPERATING STATION FOR AIRCRAFT REFUELING BOOM

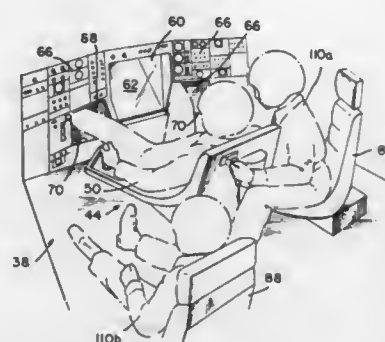
Thomas H. White, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1977, Ser. No. 865,833

Int. Cl.<sup>2</sup> B64D 39/00

U.S. Cl. 244—135 A

26 Claims



14. In an aircraft comprising a fuselage with a longitudinal centerline, a transverse axis, a forward and a rear end, said aircraft having a refueling boom extending rearwardly from said aircraft and having a refueling boom envelope within which said boom operates during a refueling operation, said envelope having upper, lower and side envelope boundaries, the improvement comprising an operating station for said boom, said station comprising:
  - a. an operator seat at a lower portion of said fuselage, said seat having a platform and a back rest arranged to establish a rearwardly directed eye reference point for an operator positioned on said seat;
  - b. two leg accommodating structures in the form of leg wells extending rearwardly and divergently from said operator seat in a manner to receive legs of an operator positioned in said seat;
  - c. a window structure positioned rearwardly of said eye reference point at a location between said leg accommodating structures, with said leg accommodating structures extending rearwardly from said window structure, said

- window structure providing a direct viewing area defined by upper, lower, and side viewing limits,
- d. said seat, leg accommodating structures, and said window structure being positioned and arranged relative to each other and to said refueling envelope in a manner that:
  1. the upper viewing limit through said window structure is located at least as high as a plane extending from the upper envelope boundary to the eye reference point,
  2. said leg accommodating structures and the side viewing limits through said window structure are positioned laterally outside of planes extending from the refueling envelope side boundaries to the eye reference point,
  3. the lower viewing limit of the window structure is below a plane extending from the lower envelope boundary to the eye reference point.

4,160,535

## CONICAL FILTER HOLDER

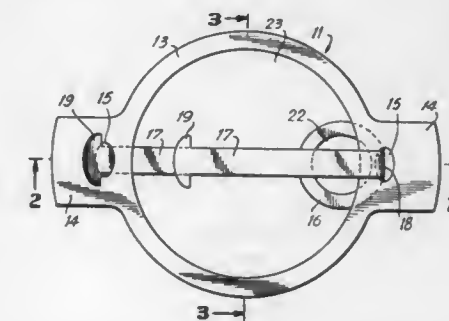
Thomas S. Wallsten, Chapel Hill, N.C., assignor to Berkshire Paper Company, Great Barrington, Mass.

Filed May 3, 1978, Ser. No. 902,295

Int. Cl.<sup>2</sup> B01D 23/28; B65B 39/00; B67C 11/00

U.S. Cl. 248—94

9 Claims



1. A filter holder transferrable between a lay flat collapsed condition and an expanded operable condition comprising a first substantially flat frame member formed from a flexible sheet material having a relatively large first opening, a second substantially flat frame member also formed from a flexible sheet material having a relatively small second opening and collapsible support means for suspending and deforming said second frame member below and substantially parallel to said first frame member with said first and second openings in vertical coaxial alignment when said first filter holder is in its expanded condition, said support means being collapsible to said holder lay flat collapsed condition with said first and second frame members and said support means lying along and proximate a common flat plane; said first and second frame members being united to each other by means to enable said frame members to slide to and from their expanded and collapsed conditions.

4,160,536

## COUNTERBALANCED ARM

Jens C. Krogsrud, Oslo, Norway, assignor to Jac. Jacobsen A/S, Oslo, Norway

Continuation-in-part of Ser. No. 735,988, Oct. 27, 1976, Pat. No. 4,080,530. This application Mar. 20, 1978, Ser. No. 888,576

The portion of the term of this patent subsequent to Mar. 21, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> F21V 21/26

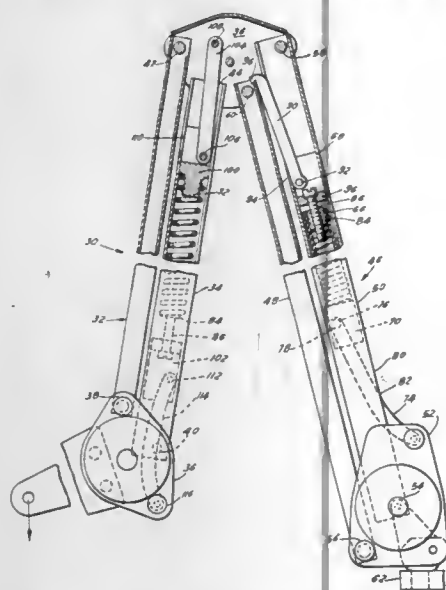
U.S. Cl. 248—280.1

17 Claims

1. A counterbalanced arm assembly comprising, in combination, a parallelogram arm assembly including a pair of parallel extending arms and a pair of brackets respectively positioned at opposite ends of said arms; means for pivotally connecting each end of each of said arms to its adjacent bracket at pivot axes whereby the arms and brackets define a parallelogram; at



least one of said arms being hollow and defining an elongated cavity therein; an extensible spring positioned within said cavity; means for operatively connecting one end of said spring to one of said brackets; a shoe operatively connected to the other end of said spring and being slidable within said hollow arm and means for operatively connecting said shoe to the other of said brackets along a line which is at an angle to the



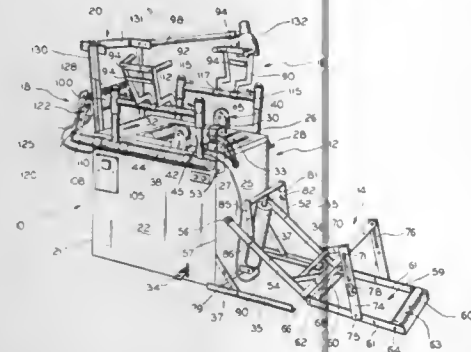
hollow arm to transmit counterbalancing forces from the spring through said shoe to said other bracket and arm assembly whereby the counterbalancing forces are a function of the tangent of the angle between said connecting means and the hollow arm; said means for operatively connecting said one end of said spring to said one of the brackets comprises a second shoe slidably positioned in said cavity and a rigid link operatively connecting said one bracket to the second shoe.

**4,160,537**  
**TIRE SPREADING AND INSPECTING MACHINE**  
Larry A. Severson, West Fargo, N. Dak., assignor to Applied Power, Inc., Milwaukee, Wis.

Filed Jan. 23, 1978, Ser. No. 871,529  
Int. Cl.<sup>2</sup> B60C 25/14

U.S. Cl. 254—50.3

30 Claims



1. A machine for rotating and inspecting a tire comprising: a support assembly for supporting a tire in a vertical position, said support assembly including drive means for rotating a tire about its axis, two tire bead spreading arm means mounted to said support assembly, said arm means being adapted for spreading apart the beads of a tire to permit inspection thereof and including an offset whereby said beads are also pulled downwardly by said arm means, each of said arm means including at least one arm element comprising first and

second perpendicular elongate sections and a third section connected to the free end of said second section, an obtuse angle being formed between said second and third sections,

roller means on the free end of said first section of said arm means for engaging the inside of the beads of the tire to be inspected on said machine to permit a tire to be rotated while said arm means spread and pull downwardly on said tire beads, and

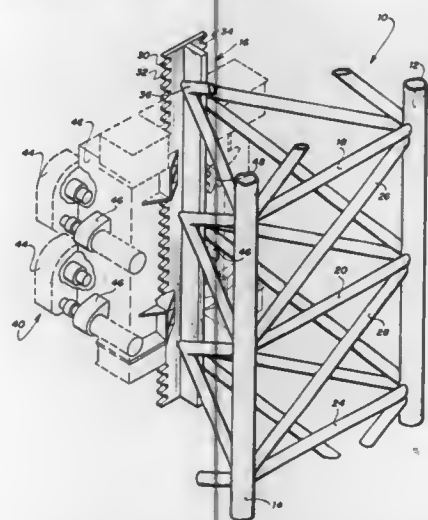
means for moving the roller means of one arm means toward and away from the roller means of the other arm means.

**4,160,538**  
**LEG STRUCTURE FOR JACK-UP PLATFORM WITH SINGLE POINT JACKING**  
James E. Armstrong, Crosby, Tex., assignor to Pool Company, Dallas, Tex.

Filed May 2, 1977, Ser. No. 792,929  
Int. Cl.<sup>2</sup> B66F 7/12

U.S. Cl. 254—89 R

11 Claims



1. A leg structure for engagement by a jacking unit on an offshore platform for moving the platform relative to the leg structure, comprising:

first and second elongated, laterally spaced apart parallel column members;  
a third elongate column member parallel to both of said first and second column members;  
cross-bracing extending between said first, second and third members to rigidly interconnect the same and provide a unitary structure having a triangular cross-sectional configuration; and

a single elongated rack means carried on said third elongate member to provide for jacking of the leg only on said rack means, said rack means comprising a flat, plate-like member having a set of rack teeth extending along each edge for meshed engagement with a separate one of a pair of pinions on the jacking unit.

**4,160,539**  
**HAND OPERATED JACK FOR A MULTIPURPOSE JIG APPARATUS OF THE TYPE INCLUDING A LENGTH OF PIPE AND A PLURALITY OF RELEASABLE, PIPE-GRIPPING TAIL STOPS**

Harold R. Johnson, Ste. 102, 195-21st, West Vancouver, British Columbia, Canada V7V 4A4

Filed Jan. 26, 1978, Ser. No. 872,468  
Int. Cl.<sup>2</sup> B66F 1/02

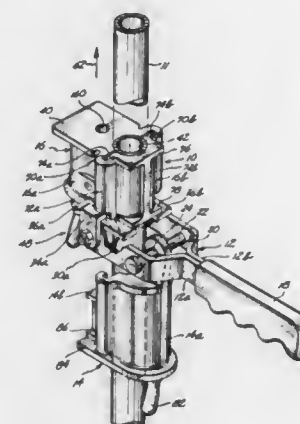
U.S. Cl. 254—106

13 Claims

1. A manually operated jack lever for use with a jig apparatus of the type that includes a rigid, elongate section of pipe

and at least first and second tail stops mounted on the pipe and each releasably gripping it in such a manner that a force applied to either of said tail stops in one lengthwise direction causes the tail stop to increase its grip on the pipe and thereby resist movement in such direction, while a force applied to either of said tail stops in the opposite lengthwise direction causes the tail stop to release its grip on the pipe and slide freely therealong, said jack lever comprising:

an elongate lever means having first and second ends and having a handle disposed adjacent said first end;  
fulcrum support means, said lever means being pivotally mounted on said fulcrum support means at a location adjacent said second end of said lever means;  
attachment means for attaching said fulcrum support means to a pipe so that the axis of the pivotal mounting of said lever means on said fulcrum support means extends transversely adjacent to said pipe;



camming means affixed to said lever means adjacent the second end thereof for movement generally lengthwise of the pipe in the reaction to manual reciprocation of said handle of said lever means when said fulcrum support means is attached to said pipe, by said attachment means, between the first and second tail stops, and said camming means being detachably engageable with the adjacent end of the second tail stop so that when said lever means is stroked one way said camming means thereon forcibly displaces the second tail stop in said opposite lengthwise direction along the pipe while the first tail stop reactively braces said fulcrum support means against displacement in said one lengthwise direction and so that once the second tail stop has been displaced to a desired position, said camming means is detachable from the second tail stop allowing removal of said jack lever from the pipe while leaving the second tail stop gripping the pipe at such desired position.

**4,160,540**  
**FAST ACTION DISCONNECT FOR USE ON A DOG NUT OF A POWER LINE INSULATOR AND THE LIKE**  
Keith E. Lindsey, Pasadena, Calif., and Hoyt W. Bozeman, Jr., Arlington, Tex., assignors to Lindsey Manufacturing Company, Azusa, Calif.

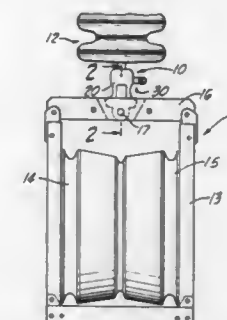
Filed Dec. 27, 1977, Ser. No. 864,669  
Int. Cl.<sup>2</sup> B66D 1/36

U.S. Cl. 254—134.3 PA

8 Claims

1. A fast action disconnect for use in detachably connecting equipment to the dog nut of a power line insulator comprising: a rigid body member having means for connecting the same to equipment at a first end thereof;  
the opposite end of said body member having a T-shaped passage opening through one lateral side and the adjacent end of said main body and having a socket at the junction of the T-stem and T-head thereof for receiving and seating a dog nut at the lower end of a power line insulator; barrier means supported in a portion of said T-head for

movement between a retracted position effective to lock a dog nut positively assembled within said passage and an extended position permitting free movement of a dog nut into and out of assembly into said passage; and



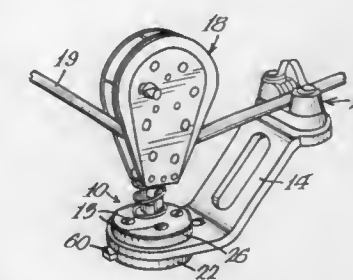
said barrier means including manually-controlled spring biased means cooperating with said main body effective to lock said barrier means in said extended position.

**4,160,541**  
**SWIVEL BASE**  
Peter O. Harken, Pewaukee, Wis., and William E. Lawson, Stillwater, Minn., assignors to Vanguard, Inc., Pewaukee, Wis.

Filed Dec. 27, 1977, Ser. No. 864,512  
Int. Cl.<sup>2</sup> B66D 1/36

U.S. Cl. 254—192

6 Claims



1. A swivel base for rotatably supporting a bearing block and one end of an arm having a line securement device at the other end, said base comprising a pair of interfitting plate members, one of said plate members having a boss forming a connecting central portion between said plate members, means in said central portion for rotatably receiving a support post for said bearing block, said one end of said arm having an opening extending around said central portion, an annular recess between each of said plates and said one end of the arm located outwardly of the opening therein, and a plurality of rotatable bearing means in each annular recess for rotatably supporting opposite surfaces of said arm.

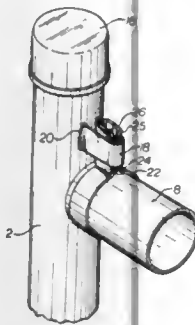
**4,160,542**  
**POST AND RAIL INTERCONNECTION**  
Donald R. Winters, 1810 S. 11th St., Yakima, Wash. 98903  
Filed Jun. 2, 1978, Ser. No. 912,062  
Int. Cl.<sup>2</sup> E04H 17/06

U.S. Cl. 256—70

7 Claims

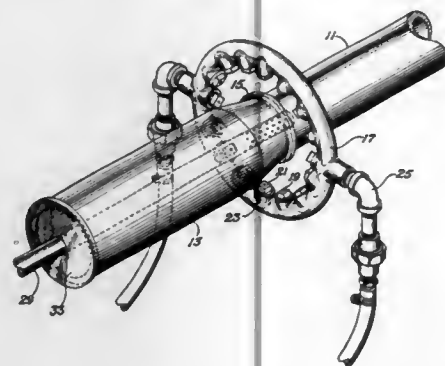
1. Means for securing a horizontal fencing member to an upright, comprising:  
an outwardly extending, generally horizontal, loop member on the upright, wherein the opening in the loop member faces in a substantially vertical direction; and  
a collar member on the horizontal member, said collar member having first and second radially outwardly extending portions, said first and second portions being so spaced

and of such a resilient material that they may be squeezed toward each other from a rest position and slipped through the opening loop in the loop member, where,



upon rebound to their rest position, said first and second portions act to secure the horizontal member to the upright.

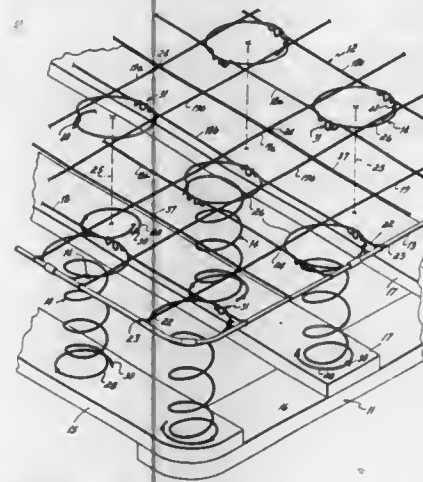
**4,160,543**  
**HEAT TREATMENT OF WELDS**  
Herbert C. Dill, and Allen E. Wisler, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.  
Continuation of Ser. No. 741,006, Nov. 11, 1976, abandoned, which is a division of Ser. No. 524,919, Nov. 18, 1974, Pat. No. 3,997,374, which is a continuation of Ser. No. 269,648, Jul. 7, 1972. This application Nov. 25, 1977, Ser. No. 854,963  
Int. Cl.<sup>2</sup> C21D 1/10  
U.S. Cl. 266—252



1. An apparatus for heat treating the weld and heat affected zone between a steel pipe and a steel connector, the apparatus comprising the combination of:

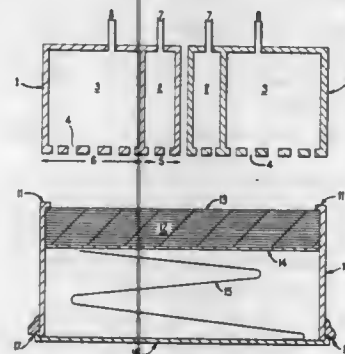
- a generally ring shaped manifold;
- nozzle means carried by the manifold to direct flow inwardly;
- a mandrel;
- nozzle means carried by the mandrel to direct fluid flow outwardly;
- positioner means for controlling the axial position of the nozzle means of the mandrel so that it discharges flow against the weld and heat affected zone, and for maintaining the mandrel stationary with respect to the pipe during quenching;
- heating means for heating the weld and heat affected zone, to a selected temperature across the entire cross-sectional thickness of the weld and heat affected area for hardening the entire cross-sectional thickness of the weld and heat affected zone; and
- pumping means connected with the ring shaped manifold and the mandrel to supply gaseous fluid thereto for quenching the weld and heat affected area.

**4,160,544**  
**SMALL DIAMETER, SINGLE CONE COIL SPRING FOR USE IN A BOX SPRING ASSEMBLY**  
Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.  
Division of Ser. No. 784,439, Apr. 4, 1977, Pat. No. 4,112,528, which is a continuation-in-part of Ser. No. 726,811, Sep. 27, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,159  
Int. Cl.<sup>2</sup> F16F 1/08  
U.S. Cl. 267—166



- 3 Claims
1. A small diameter single cone coil spring for use in a box spring, said single cone coil spring comprising a single strand of round cross section wire formed into a top loop and at least three additional helically wound loops of decreasing diameter, the end of said top loop being wrapped around the next adjacent loop to form a knot in said coil, the improvement wherein said top loop of said spring has a diameter of less than  $3\frac{1}{2}$  inches so that said spring has increased firmness relative to otherwise identical springs having top loops of substantially greater diameter, and so that said spring exhibits a substantially straight line deflection curve over a major portion of its possible range of deflection.

**4,160,545**  
**FILM HANDLING APPARATUS**  
Harry A. H. Spence-Bate, 115 Cheam Plate, Morley, Australia 6062  
Filed Jul. 8, 1975, Ser. No. 594,095  
Claims priority, application Australia, Jul. 11, 1974, 8172/74; Jul. 23, 1974, 8301/74  
Int. Cl.<sup>2</sup> B65G 59/04; B65H 3/12  
U.S. Cl. 271—106



- 7 Claims
1. In a film handling apparatus which comprises a holder having means for engaging at least one marginal portion of a

lamina positioned at a pick-up station, the improvement comprising

a handling device positionable at the pick-up station in adjacent relationship to the lamina, said device including platen means having first suction means engagable with a central area of the lamina and having additional suction means engagable with another area of the lamina adjacent the lamina edge, the first suction means and additional suction means forming a plane platen face, and means to apply suction first to said first suction means and thereafter to apply suction to said additional suction means.

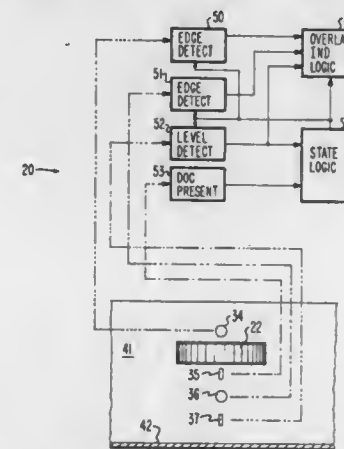
**4,160,546**  
**DOCUMENT OVERLAP-DETECTING APPARATUS AND PROCESS**

Andrew H. McMillan, Wayne, and Daniel A. Wisner, Milan, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1977, Ser. No. 873,082  
Int. Cl.<sup>2</sup> B65H 7/12

U.S. Cl. 271—263

21 Claims



20. A process for moving documents and detecting when documents are overlapped, comprising:

- (a) providing a transport path for guiding the documents;
- (b) moving documents along the transport path;
- (c) indicating when the present translucency of a first portion of one of the documents has suddenly changed significantly from the immediately previous translucency of the same document;
- (d) indicating when the present translucency level of a second portion of the same document differs by at least a given amount from the translucency level prior to the sudden change in translucency; and
- (e) indicating overlapped documents when
  - (1) there is coincidence between the output indications of steps c and d; and
  - (2) the output indication of step d continuously exists for a given time.

**4,160,547**  
**DOCUMENT HANDLING APPARATUS**  
Peter Barton, Sling near Coleford, and Phillip W. J. Lamb, Heron Estate, both of England, assignors to Xerox Corporation, Stamford, Conn.  
Filed Mar. 24, 1977, Ser. No. 780,894  
Claims priority, application United Kingdom, Jun. 25, 1976, 26584/76  
Int. Cl.<sup>2</sup> B65H 5/02

U.S. Cl. 271—275

14 Claims

1. In a document handling apparatus including a document-transport belt for engaging a document on a document-receiving surface and means for driving the belt to convey a said document across the surface; a document hitch supporting the belt intermediate document engaging zones thereof spaced

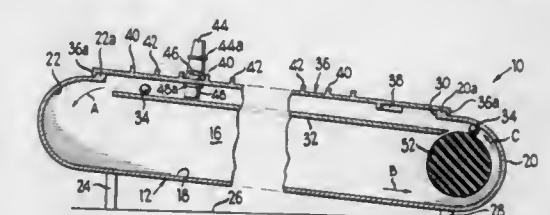
apart in the direction of travel of the belt; said hitch comprising a base portion defining a surface supporting the belt and side-walls for guiding the belt, the base portion having a transversely extending channel in the belt-support surface defining at least one cleaning edge, said cleaning edge including a sharp



corner that deforms the belt whereby as the belt passes over said edge it is scraped clean of undesired materials; wherein said hitch member comprises a moulding of plastics material; wherein said sidewalls of said hitch member include longitudinal depressions to permit said member to be received as a snap fit to insert said member in a support.

**4,160,548**  
**ACTION GAME APPARATUS**  
Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.  
Filed Nov. 23, 1977, Ser. No. 854,220  
Int. Cl.<sup>2</sup> A63F 9/14  
U.S. Cl. 273—1 M

8 Claims



3. A game apparatus, comprising:
- a thin transparent sheet forming a playing surface;
  - magnetic means manually movable over one face of said playing surface, said magnetic means including a magnet face movable in contact with said one face of the playing surface;
  - a magnetic playing piece positioned on an opposite face of said playing surface attracted by said magnetic means for movement therewith, said playing piece including a magnet face movable in contact with said opposite face of said playing surface when held against said face by magnetic attraction from the magnet face of said magnetic means in juxtaposition therewith with said transparent sheet therebetween;
  - a goal including wall means on the opposite face of said sheet for limiting movement of said playing piece in at least one direction on said face when said playing piece is positioned in said goal; and
  - wall means on said one face including a plurality of wall segments defining at least one tortuous path for movement of said magnetic means toward said goal.
4. A game apparatus, comprising:
- a thin transparent sheet forming a playing surface;
  - a manually movable magnet for movement over one face of said playing surface;
  - a magnetic playing piece positioned on an opposite face of said playing surface and attracted by said magnet for movement therewith toward a goal; and
  - means for breaking the magnetic holding attraction between said magnet and said playing piece, said means comprising an apparatus for shooting projectiles randomly to strike said playing piece and knock said playing piece away from a position of concentrated magnetic attraction between the playing piece and said magnet.

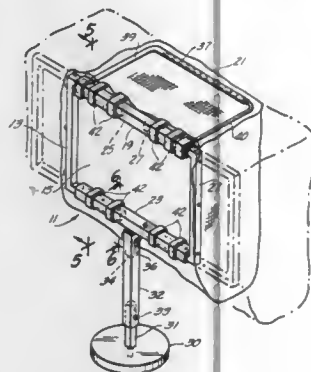


4,160,549

**TENNIS SERVE TRAINING AND PRACTICE DEVICE**

John P. Simpson, 36 Winthrop Rd., Brentwood, N.Y. 11717  
Continuation-in-part of Ser. No. 726,676, Sep. 27, 1976,  
abandoned. This application Jan. 19, 1978, Ser. No. 871,082  
Int. Cl.<sup>2</sup> A63B 69/38

U.S. Cl. 273—29 A



1. A tennis serve training device having an adjustable frame defining an adjustable target area, said frame defining a rectangular enclosure through which a tennis ball may pass; said frame including two mutually slidable U-shaped members having upper and lower legs and an upper and lower tubular member intermediate said U-shaped members for receiving respectively, said upper and lower legs of said U-shaped members; and coupling means for releasably coupling said frame members in selected adjusted position; a base, an upright means attached to said base and supporting said frame, a U-shaped brace, said brace comprising a pair of angle members, one end of each angle member releasably connected to the upper part of respective U-shape members of said frame and the other end having telescoping means for adjusting one angle member with respect to the other whereby said brace is adjustable with said frame, said U-shaped brace extending laterally from said upper part of said frame; a net, said net being suspended over said brace and being connected with upper and lower parts of said frame and defining a relatively large pocket for receiving and collecting balls passing through said frame, said net being connected to said frame by a plurality of snap fasteners.

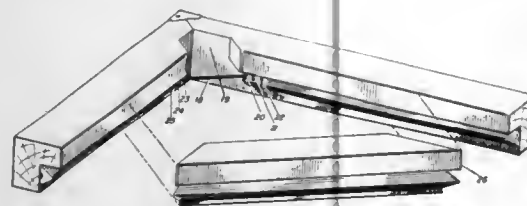
4,160,550

**GOLF PUTTING FRAME GAME DEVICE**

Donald R. Barrett, Rte. 1, Box 116, Gable, S.C. 29051  
Filed Jan. 9, 1978, Ser. No. 867,679  
Int. Cl.<sup>2</sup> A63B 69/36; A63G 31/00

U.S. Cl. 273—176 F

1 Claim



1. A golf putting frame game device played with conventional golf equipment comprising a frame suitable for use on a flat floor surface having a cushion on each interior wall thereof to provide for uniform ball rebounds during utilization of said device, a retaining projection extending over the cushion so as to retain played balls within the bounds of the frame and enhance uniformity of ball rebounds, an adjustable and removable corner capturing device, and a cushioned corner insert

combined with said frame to provide a continuously cushioned interior framed wall.

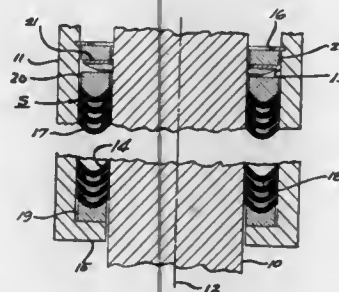
4,160,551

**SEAL ASSEMBLY**

Jeddy D. Nixon, and Fred K. Fox, both of Houston, Tex., assignors to Engineering Enterprises, Inc., Houston, Tex.  
Filed Oct. 3, 1977, Ser. No. 838,556  
Int. Cl.<sup>2</sup> F16J 15/24

U.S. Cl. 277—124

9 Claims



1. In apparatus wherein an annular recess is formed between the inner and outer, generally concentrically arranged cylindrical surfaces of relatively movable members; an improved assembly contained within the recess for sealing between said surfaces, comprising alternate, generally "V"-shaped layers of graphite and a spring metal which are nested within one another and which have inner and outer diameters approximating the diameters of the inner and outer cylindrical surfaces, respectively, of the recess, said layers being sufficiently thin to permit them to be flexed about their apices, in response to the predominant fluid pressure on one end of the assembly, whereby the metal layers deform the graphite layers so as to maintain their inner and outer edges sealably engaged with said recess surfaces.

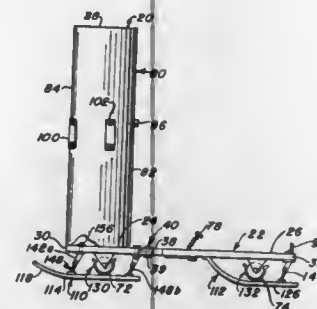
4,160,552

**SKI SCOOTER**

Rudolph J. Kupka, 9101 Sheridan Ave., Brookfield, Ill. 60513  
Filed Dec. 5, 1977, Ser. No. 857,378  
Int. Cl.<sup>2</sup> B62B 13/08

U.S. Cl. 280—21 R

14 Claims



1. A foot-propelled scooter, comprising: a wheeled scooter having an elongated support platform for supporting the weight of a child, wheel means secured to the underside of said elongated support platform including at least two wheels longitudinally spaced from each other for movement upon a paved surface during summer, and steering means operatively connected to said elongated support platform for maneuvering said elongated support platform; and removable ski means having a snow-engaging portion positioned substantially beneath the bottom of said wheel means for skiing upon snow and ice during winter, said removable ski means having snap-fitting connection

means for releasable snap-fitting interlocking engagement with said wheel means to removably connect said removable ski means to said wheel means and convert said scooter to a ski scooter in winter and vice versa.

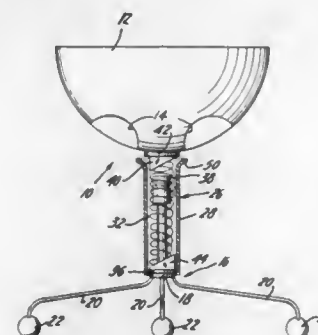
4,160,553

**CHILD HOLDING DEVICE AND JOINT THEREFOR**

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424  
Filed Jan. 12, 1977, Ser. No. 758,799  
Int. Cl.<sup>2</sup> B62M 1/00

U.S. Cl. 280—87.02 W

25 Claims



1. A joint adapted to be used in a child holding, carrying and amusement system, said joint comprising, in combination, an outer sleeve, said outer sleeve including an upper end having a flared end portion, resilient means disposed within the outer sleeve, and a shock absorbing member employed in conjunction with the resilient means and spaced from the internal walls of said outer sleeve, said shock absorbing member including a lower portion and an upper portion, means for limiting movement of said lower portion of said shock absorbing member, whereby said upper portion of said shock absorbing member is free to move up and down and from side to side within said outer sleeve, said flared end portion of said outer sleeve permitting increased side-to-side movement of said shock absorbing member, said joint being adapted to be removably connected to and between a child holding device and a support base for said holding device, said resilient means in conjunction with said shock absorbing member providing up and down motion and side-to-side motion with respect to said outer sleeve, further including connecting means for connecting said joint to a child holding device and a support base therefor, said connecting means comprising upper connecting means connected to said upper portion of said resilient means and shock absorbing member for connecting said shock absorbing member to a child holding device, and said means for limiting movement of said lower portion of said shock absorbing member comprising lower connecting means connected to said lower portion of said shock absorbing member and said resilient means for connecting said shock absorbing member to a support base therefor.

4,160,554

**SKATEBOARD ACCESSORY**

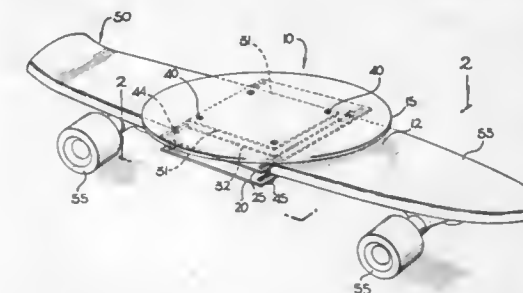
Robert M. Cooney, Fullerton, Calif., assignor to Apollo Spinner, Inc., Los Angeles, Calif.  
Filed Sep. 14, 1977, Ser. No. 833,182  
Int. Cl.<sup>2</sup> B62K 9/00

U.S. Cl. 280—87.04 A

20 Claims

1. A skateboard accessory for coupling to the footboard of a skateboard, which comprises: a platform member adapted to support both feet of the skateboard operator; bearing means coupled to said platform member; mounting means for coupling said bearing means to said footboard, said mounting means being adjustable for coupling to footboards of varying thickness and width, said bearing means and said mounting means adapted to allow

rotation of said platform member through 360° with respect to said footboard;



whereby said platform member is rotatable with respect to said skateboard.

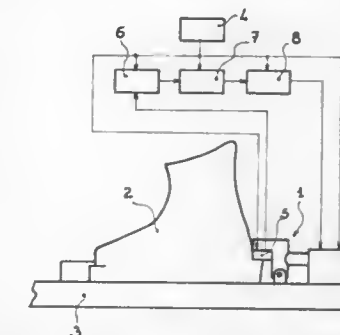
4,160,555

**SAFETY BINDINGS FOR SKIS**

Georges P. J. Salomon, Annecy, France, assignor to S.A. des Ets Francois Salomon & Fils, Annecy, France  
Filed May 13, 1977, Ser. No. 796,811  
Claims priority, application France, May 18, 1976, 76 14892  
Int. Cl.<sup>2</sup> A63C 9/08

U.S. Cl. 280—612

5 Claims



1. A ski safety binding, said binding having an electric release, comprising: at least one boot clamping member on the ski; locking means for locking said member; a release control circuit acting on said locking means, defining means for detecting a force exercised on a skier's leg and thereafter producing an electric signal as a function of said force; threshold circuit means and means electrically controlling said locking means to effect release of said binding in response to an output of said threshold circuit, said detecting means in circuit relation to said threshold circuit, and low-pass filter circuit means interposed between said detecting means and said threshold circuit, for increasingly attenuating an output electrical signal in response to the duration of said signal coming from said detecting means which substantially follows a hyperbolic function, wherein: the attenuating circuit comprises means for suppressing the filter when the signal received becomes in value equal to the filtered signal and is defined by an arrangement formed by an operational amplifier and a diode in series, said arrangement being connected in parallel with a filter resistance.

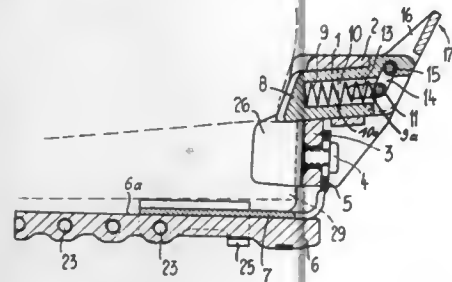
**4,160,556**  
**HEEL OR SOLE HOLDER FOR A SOLE PLATE OF A SAFETY SKI BINDING AND SOLE PLATE EQUIPPED WITH SUCH HOLDER**

Ulrich Gertsch, Matten, Switzerland, assignor to E. & U. Gertsch AG, Interlaken, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,491  
 Claims priority, application Switzerland, Feb. 23, 1976, 2153/76

Int. Cl.<sup>2</sup> A63C 9/08  
 U.S. Cl. 280—618

32 Claims



1. A heel- or sole holder mounted on a sole or release plate of a ski binding, comprising:  
 guide means on the sole or release plate;  
 holddown means for locking the heel or sole of a boot on the sole or release plate independent of any automatic or safety release action of the ski binding;  
 means for movably guiding said holddown means in said guide means for movement downwardly and at an inclination in a direction towards a plane containing said plate;  
 said holddown means being inclinably movable between an operating position for holding down the heel or sole of a ski boot against a support surface of said plate for supporting a ski boot thereon and an ineffectual position;  
 a spring for biasing the holddown means into its operating position;  
 said holddown means being movable into its ineffectual position against the force of said spring;  
 said holddown means comprising a substantially wedge-shaped forward portion engaging the heel of the boot and being provided with a deflection surface which, in the operating position of the holddown means, is located over the ski boot-support surface of the plate and is directed in the direction of the spring force towards the plate;  
 said guide means sloping towards the plate in the direction of the line of action of the force of the spring.

**4,160,557**  
**COLLAPSIBLE REFUSE BAG CART**  
 Richard E. Taylor, 14487 SE. Johnson Rd., Milwaukie, Ore. 97222

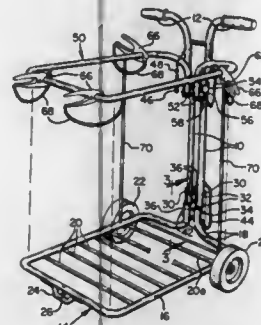
Filed Mar. 31, 1978, Ser. No. 892,167  
 Int. Cl.<sup>2</sup> B62B 11/00  
 U.S. Cl. 280—652

4 Claims

1. A collapsible cart for supporting and transporting flexible refuse bags comprising:  
 (a) medial uprights having handles located on their upper extremities, said uprights include spaced apart cylindrical tubes;  
 (b) lower bag support means, located at the lower extremity of said uprights, for supporting the bottom of said refuse bag, said lower bag support means includes spaced apart cylindrical end portions which extend upward perpendicularly thereto, on one side thereof, substantially coaxially with said cylindrical tubes;  
 (c) first connection means fixedly attached to the lower extremity of said uprights and pivotally attached to said lower bag support means in a manner so that said lower bag support means can be rotated between an operative position substantially normal to said upright support and a

collapsed position substantially adjacent to and parallel with said uprights, said first connection means comprising paired, U-shaped brackets arranged to encircle associated ones of said cylindrical tubes and said end portions, fixed fasteners for fixedly attaching said brackets to said cylindrical tubes, and a pivotal fastener pivotally attaching said end portions to said brackets;

- (d) locking means associated with said first connection means for locking said lower bag support means in its operative position;  
 (e) an open centered upper bag support located medially on said uprights and arranged for supporting said refuse bag in an open upright orientation when the upper periphery of said refuse bag is attached to said upper bag support;



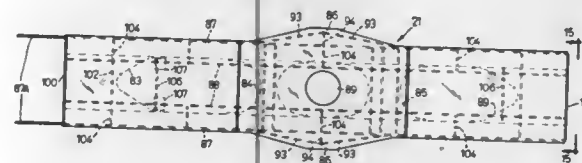
- (f) means for releasably attaching the upper periphery of said refuse bag to said upper bag support;  
 (g) second connection means fixedly attached medially to said uprights and pivotally attached to said upper bag support in a manner so that said upper bag support can be rotated between an operative position substantially normal to said uprights and a collapsed position substantially adjacent to and parallel with said uprights on the same side thereof as said lower bag support means;  
 (h) locking means associated with said second connection means for locking said upper bag support in its operative position; and  
 (i) wheels rotatably joined to said lower bag support means in a manner to allow transport of said cart thereon when said lower bag support is locked in its operative position.

**4,160,558**  
**CARRIER FRAME FOR MOBILE CRANE**  
 Robert A. Fritsch, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Oct. 19, 1977, Ser. No. 843,486  
 Int. Cl.<sup>2</sup> B62D 21/00

U.S. Cl. 280—797

13 Claims



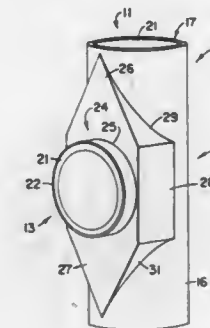
1. A vehicle carrier frame for supporting a load near the center thereof and adapted to be supported by outriggers at opposite ends thereof, said carrier frame comprising:  
 a top plate having a longitudinal centerline;  
 and a pair of longitudinally extending hollow beams located beneath said top plate on opposite sides of said centerline and spaced apart a predetermined distance from each other, each beam comprising an upper side including a portion of said top plate, a lower side, a vertical outer side, and an inner side which slopes toward said centerline, each vertical outer side and each inner side being con-

ected to and between said top plate and a lower side, said outer sides and said inner sides of said beams adapted to be in edge compression when said carrier frame is supporting a load.

**4,160,559**  
**REINFORCE TEE SECTION FOR CHIMNEY**  
 Joseph J. Nickels, Jr., Kalamazoo, Mich., assignor to Van-Packer Co., Beach Haven, N.J.

Filed Jun. 6, 1977, Ser. No. 803,813  
 Int. Cl.<sup>2</sup> F16C 11/06; F16D 1/12; F16J 1/16  
 U.S. Cl. 285—156

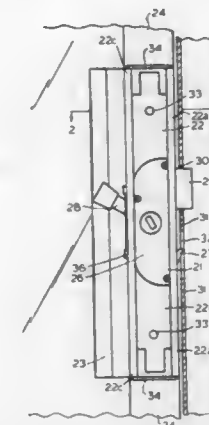
8 Claims



1. A chimney section comprising:  
 jacket means being elongated, hollow and having open ends, said jacket means having a breeching aperture formed through a side thereof, said jacket means having a cylindrical conformation;  
 breech means being elongated, hollow and having open ends, said breech means being attached to said jacket means over said breeching aperture, one of said breech means open ends communicating with said breeching aperture, said breech means having first and second portions, said first portion engaging and partially encircling said jacket means, said second portion being contiguous with said first portion and extending outwardly away from said jacket means; and  
 reinforcement means for strengthening and supporting said jacket means and said breech means, said reinforcement means including first and second means for stress transfer, said first means being elongated in the direction of said jacket means' elongation and having a supporting aperture formed therethrough, said second means being attached about the periphery of said first means, said reinforcement means being attached over said breech means, said breech means being received through said supporting aperture, said second means interconnecting said jacket means and said first means, said second portion being received through said supporting aperture and supported by said first means, said first means being substantially planar and having a rectangular central portion and end portions, each end portion being contiguous with, and disposed on opposite sides of, said rectangular portion, each end portion extending away from said central portion, and having side surfaces which meet, toward a jacket means' end, said supporting aperture being formed through said central portion, said second means including central and end side members, said central side members being affixed normal to, and adjacent the longitudinal edges of, said central portion, said end side members being affixed normal to, and adjacent said side surfaces of, said end portions, said central and end side members being disposed to the same side of said first means and being attached to said jacket means.

**4,160,560**  
**SLIDING DOOR LOCK ASSEMBLY**  
 Peter F. Hauber, 7846 Shady Spring Dr., Burbank, Calif. 91504  
 Filed Feb. 17, 1978, Ser. No. 878,681  
 Int. Cl.<sup>2</sup> E05C 19/12; E05B 9/08  
 U.S. Cl. 292—101

10 Claims

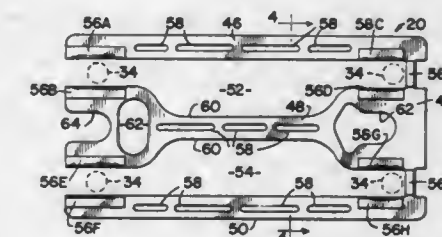


1. A sliding closure lock assembly comprising:  
 a bracket adapted to be secured to said closure, comprising a bracket wall having a front wall panel with a slot therein normal to the plane of movement of said closure;  
 a separately formed lock cartridge comprising a housing insertable through said slot in the closure secured condition of said bracket, said housing having a front face with a dimension greater than the corresponding dimension of said slot and a projecting front face portion registered within said slot and defining a mounting locus, said housing being contoured in its longitudinal dimension for relatively angled insertion into said slot in a direction parallel to the plane of movement of said closure, and for reorientation in said plane to position said face registration with said front wall panel slot; and means rearwardly of said housing engaging said bracket cooperatively with said front wall panel slot blocking said housing into fixed engagement at its mounting locus with said front wall panel slot in said face portion registered relation, said cartridge including a latch member selectively extendible out of said housing face portion parallel to said closure movement plane.

**4,160,561**  
**VEHICLE BUMPER SHIM AND METHOD**  
 Robert G. Farnam, Stevens Point, Wis., and Alexander Lomik, Brighton, Mich., assignors to F. D. Farnam Co., Lyons, Ill.  
 Filed Aug. 31, 1977, Ser. No. 829,451  
 Int. Cl.<sup>2</sup> B60R 19/02

U.S. Cl. 293—1

17 Claims

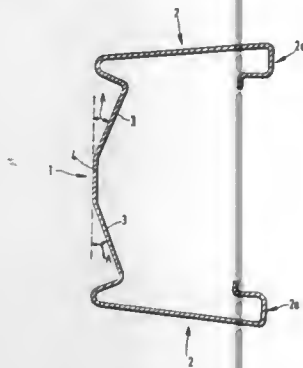


1. An article of manufacture comprising a shim for establishing a desired spacing between two vehicle components clamped toward one another by at least one shanked fastener having a head, the shim being in the form of a unitary planar body of sheet material having a thickness equal to a fraction of said spacing; at least one opening extending through said body



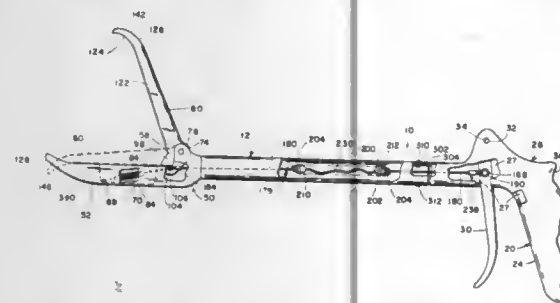
for receiving said fastener shank, a substantial portion of the surface area of the shim being a single thickness of the sheet material, said shim having at least one load bearing region on opposite sides of said opening and adapted to be positioned at least in part under the head of said fastener, said load bearing region comprising superimposed multiple thicknesses of said sheet material.

**4,160,562**  
**AUTOMOTIVE BUMPER**  
Giovanni Crestetto, Via Torino 73, Beinasco (Turin), Italy  
Filed Dec. 5, 1977, Ser. No. 857,387  
Int. Cl.<sup>2</sup> B60R 19/00, 21/14; B61F 19/04  
U.S. Cl. 293—120



1. An automotive vehicle bumper of the type having a single shaped element of thin sheet steel having in cross-section a substantially C-shaped profile comprising a web and two flanges, wherein the free edges of said flanges are turned toward the interior of the bumper profile and wherein the end portions of the web which join the flanges are abruptly turned inwardly toward the interior of the bumper extending a given distance therein and which are thereafter turned back toward the exterior of the bumper profile tapering toward and joining an intermediate flat central portion of the web residing in the plane defined by the ends of the web, and wherein the thickness of the sheet steel is on the order of 1 to 2 mm.

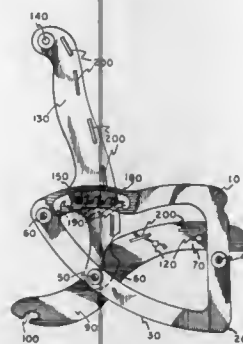
**4,160,563**  
**PICK-UP TOOL**  
Donald S. Whitney, 1118 Baldwin St., Harlan, Iowa 51537  
Filed Nov. 24, 1976, Ser. No. 744,934  
Int. Cl.<sup>2</sup> B25J 1/00  
U.S. Cl. 294—19 R



1. A pick-up tool comprising an elongated shank, a fixed jaw attached to a forward end of said shank, a moveable jaw, means attaching said moveable jaw to said fixed jaw for the pivoting of said moveable jaw about a jaw-axis disposed at a right angle to the elongation of said shank, said fixed jaw and shank defining a jaw and shank assembly, resilient means connecting said moveable jaw with said jaw and shank assembly in a manner for urging said moveable jaw into open position with respect to said closed jaw, a connection unit attached to said moveable jaw and extending rearwardly along said shank,

connection unit tensioning means disposed at the rearward end of said shank and manually operable for tensioning said connection unit so as to urge said moveable jaw toward said fixed jaw, said connection unit having a flexible slacking section, a resilient assembly comprising a resilient means and means connected to said connection unit at each end of said slacking section and engageable by said resilient means in a manner such that said resilient means urges the ends of said slacking section towards each other for putting slack in said connection unit.

**4,160,564**  
**CONVERTABLE CHAIR**  
Gordon L. Kyle, 211 Great Neck Rd., Waterford, Conn. 06385  
Filed May 19, 1978, Ser. No. 907,594  
Int. Cl.<sup>2</sup> A47C 3/02, 13/00  
U.S. Cl. 297—131

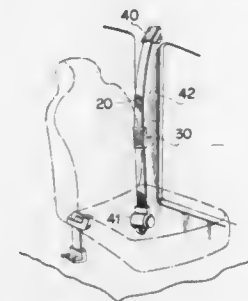


1. An adjustable chair which can be adjusted to serve as a rocking chair when desired and as a stationary chair when desired, comprising:  
a frame having two like parallel and vertically oriented side pieces, each side piece having a curved lower edge that always touches a floor;  
an elongated and generally rectangular back piece with a generally rectangular platform at its top connected between the side pieces and extending generally upwardly therefrom; and  
an elongated seat piece with a generally square platform in its front located between the side pieces in a generally horizontal orientation and being adjustable between a rocking chair position and a stationary chair position, with the seat piece being suspended from the floor and allowing the chair to rock on the curved lower edges of the side pieces when the seat piece is in the rocking chair position and with the seat piece touching the floor at its end remote from the platform and supporting the chair along with the side pieces when the seat piece is adjusted to the stationary chair position, the rectangular platform and the square platform always being so disposed that they form a surface which is generally L-shaped in side view to support a cushion.

**4,160,565**  
**SEAT BELT DEVICE**  
Katsuhiko Matsumoto, Kunitachi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 5, 1977, Ser. No. 821,994  
Claims priority, application Japan, Aug. 31, 1976, 51-116604[U]

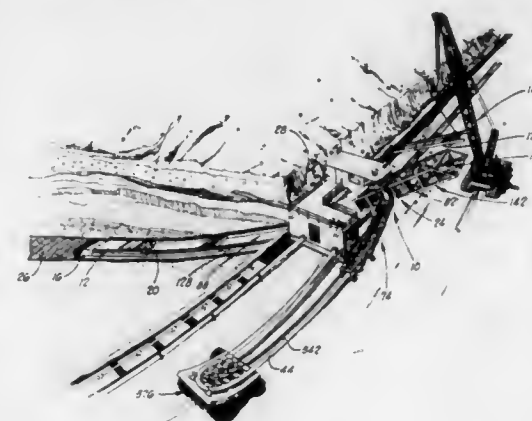
Int. Cl.<sup>2</sup> A62B 35/00; A44B 17/00  
U.S. Cl. 297—483  
1. A one-belt type tongueless seat belt device comprising:  
a belt which is fixed at one end thereof;  
said belt is wound up at the other end thereof so as to be free to pay out;  
said belt is payed out to be fitted and locked in its intermediate portion with a tongueless buckle so as to press the shoulder, breast and waist of a person using said belt; and

a belt grip fitted with said belt to be slidable in the lengthwise direction of said belt so as to enclose said belt;



said belt grip having hinge parts formed in the front and rear portions of said belt grip in the widthwise direction of said belt so as to be bent with said portion as hinges.

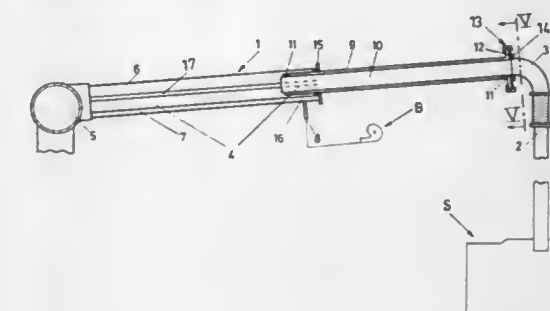
**4,160,566**  
**MINING APPARATUS**  
Dean A. McGee, Oklahoma City; James E. Ingle, Edmond, both of Okla., and Alan J. Lane, Lexington, Mass., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.  
Filed Feb. 14, 1977, Ser. No. 768,650  
Int. Cl.<sup>2</sup> E21C 25/52, 29/02  
U.S. Cl. 299—30



1. A mining apparatus for forming a borehole in an earth formation utilizing a working fluid comprising:  
a miner, comprising:  
a frame, having a forward end, a rearward end, a first side and a second side; and  
a forward cutter assembly movably connected to the forward end of the frame for excavatingly engaging the earth formation, the mined material being suspended in a working fluid thereby forming a slurry comprising the working fluid in the mined material excavated via the forward cutter assembly comprising:  
a forward cutter;  
a forward cutter frame having a forward end, a rearward end, a first side and a second side, the rearward end of the forward cutter frame being disposed near and spaced a distance from the forward end of the frame, the forward cutter being rotatably mounted on the forward end of the forward cutter frame for excavatingly engaging the material to be mined;  
a forward cutter positioning assembly connected to the forward cutter for movably positioning the forward cutter about horizontal and vertical axes to guidingly steer the miner through portions of the earth formation;  
a forward cutter drive assembly connected to the forward cutter for driving the forward cutter to excavatingly engage the materials to be mined;

a rearward cutter assembly connected to the rearward end of the frame, comprising:  
a rearward cutter frame having a forward end and a rearward end, movably connected to the rearward end of the frame;  
a rearward cutter rotatably mounted on the rearward cutter frame for excavatingly engaging the material to be mined;  
a rearward cutter drive assembly connected to the rearward cutter for driving the rearward cutter to excavatingly engage the material to be mined; and  
a rearward cutter positioning assembly connected to the rearward cutter frame for movably positioning the rearward cutter frame and the rearward cutter connected thereto in a storage position and in a material engaging position, the rearward cutter being positioned to excavatingly engage the material to be mined in the material engaging position;  
means for moving the working fluid into the borehole to maintain the miner substantially submerged in the working fluid during the operation of the miner to excavate a portion of the earth formation thereby forming the borehole;  
a control unit connected to the forward cutter positioning assembly, the control unit operating the forward cutter positioning assembly to position the forward cutter in predetermined positions for guidingly steering the miner through portions of the earth formation as the miner is being moved in one direction through the earth formation via the positioning of the forward cutter; and  
a launching assembly for moving the miner into the earth formation and withdrawing the miner from the earth formation.

**4,160,567**  
**PNEUMATIC UNLOADING DEVICE**  
Walter Merz, Küssnacht, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland  
Filed Nov. 9, 1977, Ser. No. 849,950  
Claims priority, application Switzerland, Dec. 13, 1976, 15675/76  
Int. Cl.<sup>2</sup> B65G 53/20  
U.S. Cl. 406—98



1. A pneumatic conveying device for transporting material such as alumina, grain or the like from a ship's hold comprising:  
at least one pipe means having a material inlet and a material outlet, said pipe means being substantially horizontally disposed;  
at least one elongated fluidizing base means provided within said at least one pipe means extending substantially from said inlet to said outlet;  
motive means for introducing air under pressure into said at least one fluidizing base means so as to move said material from said inlet of said pipe means to said outlet thereof;  
adjustment means associated with said pipe means for varying the effective length of said at least one fluidizing base so as to optimize the conveying efficiency of said device for the particular material transported;  
said adjustment means comprises a second pipe means tele-

scopically received within said at least one pipe means and movable between a first position wherein said at least one fluidizing base means is completely covered to a second position wherein said at least one fluidizing base means is completely uncovered;

said second pipe means comprises an intermediate pipe and an inner pipe, said inner pipe being provided with a curved section at the end thereof extending beyond the inlet of said at least one pipe means, said curved section being adapted with means for connecting said inner pipe to a vertical pipe;

wherein said intermediate pipe at its end adjacent said curved section of said inner pipe is provided with coupling means, said coupling means including means for connecting a coupling facility provided on said curved section of said inner pipe with a coupling facility provided on said at least one pipe section.

3. A pneumatic conveying device for transporting material such as alumina, grain or the like from a ship's hold comprising:

at least one pipe means having a material inlet and a material outlet, said pipe means being substantially horizontally disposed;

at least one elongated fluidizing base means provided within said at least one pipe means extending substantially from said inlet to said outlet;

motive means for introducing air under pressure into said at least one fluidizing base means so as to move said material from said inlet of said pipe means to said outlet thereof; adjustment means associated with said pipe means for varying the effective length of said at least one fluidizing base so as to optimize the conveying efficiency of said device for the particular material transported;

said at least one pipe means is provided with a plurality of elongated fluidizing base means of different transporting characteristics wherein one of said fluidizing base means is functional while the others are not.

4,160,568

#### STABLE PRELOAD SHOCK MOUNTED BEARING ASSEMBLY

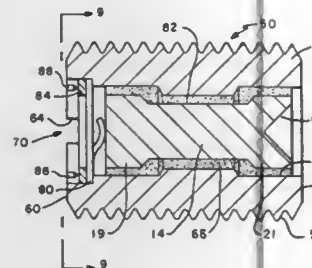
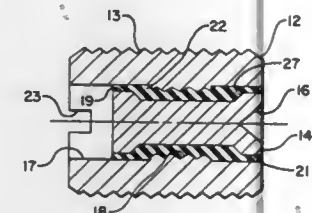
Richard D. Marquess, Concord, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Continuation-in-part of Ser. No. 673,113, Apr. 2, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,389

Int. Cl.<sup>2</sup> F16C 17/04, 17/22

U.S. Cl. 308—159

29 Claims



1. A bearing assembly for engaging a pivot comprising a bearing housing having a passage extending therethrough, a land on the wall of said passage, a bearing member disposed in

said passage, a bearing surface on one end of said bearing member for contact with the pivot, a shoulder on each end of said bearing member disposed in spaced relation on opposite sides of said land, and a resilient mass extending between each of said shoulders and one side of said land, whereby said bearing member is retained in said bearing housing so that transmission to said bearing member of shock and vibration applied to said bearing housing is reduced, and temperature induced dimensional change in said resilient mass produces similar force magnitude on each of said shoulders, whereby resultant force urging axial displacement of said bearing member relative to said bearing housing is minimized.

21. A bearing assembly for engaging a pivot comprising a bearing housing having a front end, a back end and a passage extending therethrough from said front end to said back end, a bearing member having a front end and back end and being disposed within said passage, said member including on the front end thereof a bearing surface located adjacent the front end of said housing and adapted for engagement with said pivot, said bearing member being axially movable within said passage relative to said housing whereby to preload said bearing surface against said pivot, first means located between said bearing housing and said bearing member for reducing the transmission to said bearing member of shock and vibration applied to said housing and for applying a shear force against said bearing member in the direction of said bearing surface for preloading said surface against said pivot, said first means being such that said shear force varies to a limited degree with changes in temperature, and second means connected with said housing adjacent the back end thereof for applying an additional force against the back end of said bearing member in the direction of said bearing surface to aid said shear force in preloading said surface against said pivot, said second means being such that said additional force remains substantially constant regardless of temperature changes at said second means.

4,160,569

#### BEARING SUPPORT FOR A LIFT PUMP

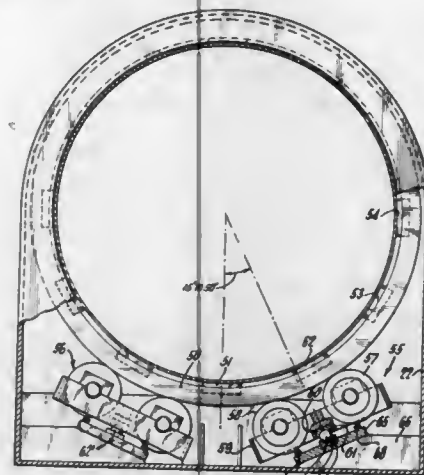
Robert A. Reld, Charlton City, Mass., assignor to CPC Engineering Corporation, Sturbridge, Mass.

Continuation of Ser. No. 792,705, May 2, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,306

Int. Cl.<sup>2</sup> F16C 13/04

U.S. Cl. 308—203

3 Claims



1. In a cylindrical lift pump for liquids, sewage and the like having an elongated cylindrical housing, a screw fixed within the housing and support means on at least one end thereof for rotatably maintaining said pump in a selected axial position and means for rotating said cylindrical housing, a roller bearing support for cooperating with said support means for maintain-

ing said pump in a selected inclined position, said roller bearing support comprising an annular ring surrounding and secured to said cylindrical housing, a first base member, a pair of spaced axially aligned rollers carried on one side of said first base member, said first base member having a hemispherical socket formed in the other side thereof, a second fixedly supported base member having a hemispherical socket therein, a ball bearing in engagement with both of said sockets, and said ring resting on said rollers whereby said rollers support said cylindrical housing and maintain engagement with said ring during rotation thereof without the need for flanges or other guiding means and are dynamically self-aligned with the ring and maintain line contact therewith notwithstanding deviations of said ring from a true cylindrical surface.

4,160,570

#### WALL MOUNTED MODULES FOR PACKAGING, MERCHANDISING AND STORAGE

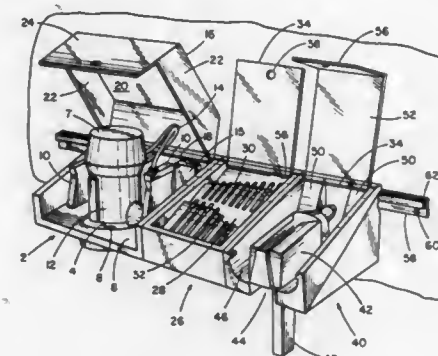
John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Feb. 3, 1978, Ser. No. 874,865

Int. Cl.<sup>2</sup> A47F 3/14, 5/08

U.S. Cl. 312—245

16 Claims



1. A merchandising display and storage module comprising a hollow structure constituted by upper and lower sections, said upper section having an exposed transverse display portion and side walls around the periphery thereof extending downwardly therefrom, said lower section having a transverse portion and side walls around the periphery thereof extending upwardly therefrom, the confronting side walls of said upper and lower sections on each side of the unit being attached to each other to form a hollow structure having a top, bottom and side walls, said upper section having at least one element formed on said transverse display portion shaped to encompass at least a portion of an article to be displayed and stored, means formed in one side wall of the unit for mounting the unit on a vertically extending supporting surface and a transparent cover extending substantially over said transverse portion.

4,160,571

#### SHOE CABINET

Alberto Bigotti, 1446 Pine St., San Francisco, Calif. 94109

Filed Aug. 7, 1978, Ser. No. 931,860

Int. Cl.<sup>2</sup> A47F 7/08

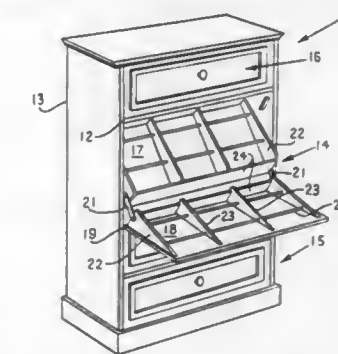
U.S. Cl. 312—327

1 Claim

1. A shoe cabinet comprising: a frame having front and rear portions, an inner shoe-holding shelf vertically disposed within the frame with its upper end hingedly connected to the rear portion of the frame, an outer shoe-holding shelf vertically disposed within the frame with its lower end hingedly connected to the lower end of the inner shelf, the lower end of the outer shelf also being hingedly connected to the frame along its front portion such that the outer shelf can be pivoted away from the frame to a substantially horizontal position, thereby

causing the inner shelf to pivot to a diagonal position within the frame,

the inner and outer shelves further having triangularly shaped sides with their bases disposed at the lower end of each shelf and backing members running from one triangular base of each side to the other side, the shelves being hingedly connected by a metal bar running from an approximate mid-point on each of the triangular sides, the mid-point being located substantially above the base of each triangular side,



a pair of dowels spaced apart and running from one triangular side to the other for holding shoes on the shelves as the shelves are pivoted into open and closed positions, said shoe cabinet additionally comprising stops disposed on the frame toward the upper front portion thereof for limiting fold-up of the outer shelf, and two shoe compartments, each containing a pair of inner and outer shelves, with one shoe compartment being disposed above the other.

4,160,572

#### CONNECTOR HOUSING

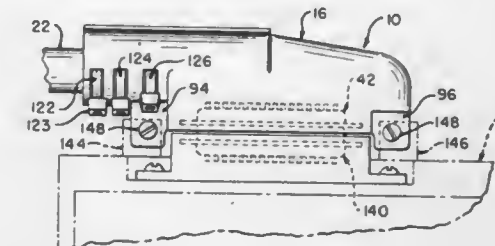
Donald L. Adelberger, Dayton, and William Pangos, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 16, 1977, Ser. No. 861,318

Int. Cl.<sup>2</sup> H01R 3/06

U.S. Cl. 339—14 P

15 Claims



1. A connector housing comprising:

first and second sections; means enabling said first and second sections to be assembled to form said housing; said first and second sections being shaped to form a cable insert end and a connector opening when assembled to form said housing; means for securing a cable in said cable insert end; and retaining means located in at least one of said first and second sections for enabling a connector to be retained in said housing at said connector opening; said retaining means comprising first and second areas in at least one of said first and second sections; said first and second areas having recesses therein to enable said connector to be retained therein to also provide a free floating connection with a mating connector; said securing means comprising a securing area in each of



said first and second sections at said cable insert end of said housing;  
each said securing area having an opening therein to enable a band to be passed through said openings and around said cable to secure said cable in said cable insert end;  
said securing area in each of said first and second sections having a second opening therein; and  
said first and second sections having an electrically conductive surface on an interior side thereof to enable a second band to be passed through said second openings and around a grounding sheath on said cable to electrically connect said grounding sheath to said electrically conductive surface.

4,160,573

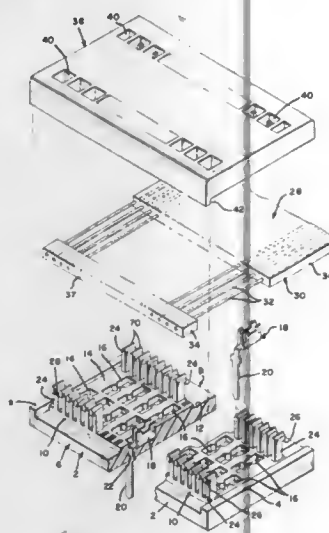
## FLAT CABLE CONNECTOR

Lawrence P. Weisenburger, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 21, 1977, Ser. No. 853,608  
Int. Cl.<sup>2</sup> H01R 13/38

U.S. Cl. 339—99 R

6 Claims



1. In an electrical connector having first and second cooperating housing portions containing electrical contacts for connection to spaced conductors of a multi-conductor cable, the improvement comprising:

first and second rows of parallel and elongated vane members projecting from a first housing portion and defining first and second rows of conductor receiving channels, said vane members having relatively thin elongated top edges merging with thickened base portions which substantially reduce the widths of said conductor receiving channels approximately to the widths of said conductors, electrical contacts between said first and second rows of vane members and having conductor contacting portions in alignment with said reduced width conductor receiving channels,  
each of said contacts having electrical lead portions externally projecting from said first housing, and means on said thickened base portions for latchable engagement with said second housing portion,  
each said contact includes first and second wire gripping jaws for gripping opposite sides of a corresponding conductor in two locations along the length thereof,  
each said contacts includes first and second plates connected by a web, the outside corner edges of said plates being coined, and the inside corner edges projecting diagonally inward toward each other and defining said first and second pairs of wire gripping jaws for slicing engagement on opposite sides of a conductor inserted between said plates and between pairs of said inside corner edges.

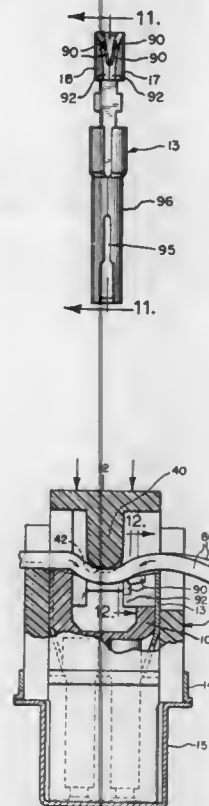
4,160,574  
CONNECTOR FOR FLAT WIRE CABLES HAVING  
IMPROVED CONTACTS AND INTEGRAL STRAIN  
RELIEF MEANS

Robert W. DeRoss, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 786,342, Apr. 11, 1977, abandoned. This application Nov. 29, 1977, Ser. No. 855,636  
Int. Cl.<sup>2</sup> H01R 13/38

U.S. Cl. 339—99 R

30 Claims



1. A connector for making intimate electrical contact with an insulated conductor having a longitudinal axis comprising: contact means including at least one contact element, each said contact element including a pair of oppositely disposed members for piercing and stripping a longitudinal portion of the insulation from opposite sides of said conductor, each said longitudinal portion having a broad longitudinal surface area relative to the diameter of said conductor, and a conductor contact portion extending substantially parallel to the axis of said longitudinal portions when said conductor is engaged therewith, each said piercing and stripping member of each said contact element including first and second elongate component portions longitudinally aligned at an angle relative to each other, each said component portion having elongate cutting means defined by beveled surface means; and means for moving said insulated conductor into successive engagement with said piercing and stripping members and said contact portion of said contact element for first piercing and continuously stripping the insulation along said opposing longitudinal portions of said conductor and for thereafter positioning said longitudinal conductor portions adjacent said contact portion, said contact portion being adapted to exert a force against said longitudinal conductor portions in a direction normal to the conductor to effect a broad intimate flat surface contact therewith.

4,160,575

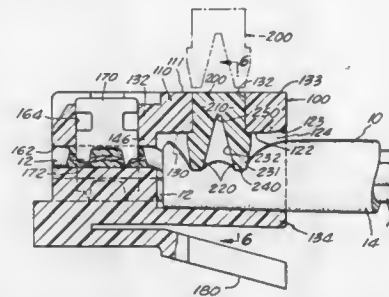
## TELEPHONE CORD CONNECTOR

Eugene H. Schraut, Covina, Calif., assignor to Vari-Tronics Co., Duarte, Calif.

Filed Feb. 24, 1978, Ser. No. 880,889  
Int. Cl.<sup>2</sup> H01R 13/58

U.S. Cl. 339—103 M

20 Claims



1. In a modular connector for making electrical connections with a cord composed of a plurality of mutually-insulated conductors encased within a plastic insulating jacket and with another component external to the connector, which connector includes an insulating housing that has a cord-receiving cavity with an aperture at the cord end thereof and a plurality of conductor-receiving cells at the terminal end thereof and passages providing communication from said cavity to said cells and terminal receiving openings in association with the cells, whereby, when such a cord is inserted longitudinally into said cavity from said cord end, exposed ends of said conductors extend longitudinally through said apertures from said cavity toward said terminal end into said cells, and terminals may extend into said cells through said openings into electrical communication with said exposed ends,

the improvement wherein said housing has a lateral opening through a side wall thereof in communication with said cavity and has an edge at said opening that extends transversely of said housing,

said improvement also including a separate anchoring member that extends from said lateral opening into said cavity and which comprises a projecting part for engaging said edge to clamp said anchoring member against outward escape through said lateral opening, said anchoring member also comprising at least two spaced cross members that extend transversely of said housing on the cavity side thereof to compress said jacket to fit tightly against the wall of said cavity opposite said lateral opening and with a portion of said jacket captivated between said spaced cross members, whereby said cord is restrained both against being pulled longitudinally out of said housing and against axial rotation within said housing.

4,160,576

ELECTRIC POWER SUPPLY CONNECTOR  
ESPECIALLY FOR A FAN OF THE FLAT TYPE

Claude Vettori, Neauphle le Chateau, France, assignor to Etudes Techniques et Représentations Industrielles E.T.R.I., Neuilly-sur-Seine, France

Filed Mar. 23, 1978, Ser. No. 889,211

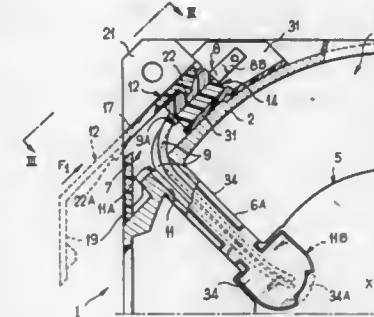
Claims priority, application France, Apr. 13, 1977, 77 11096  
Int. Cl.<sup>2</sup> H01R 13/42

U.S. Cl. 339—119 R

9 Claims

1. An electric power supply connector, especially for a fan of the flat type comprising a hollow housing and a cylindrical shell defining an axial duct for an impeller, said impeller being driven by an electric motor which is secured to the cylindrical shell by means of substantially radial arms, the connector being mounted externally on the cylindrical shell and constituted by a cavity for receiving at least one anchoring block provided with retaining means for an internal portion of each connector terminal which is connected to the motor by means of a con-

ductor placed within a channel of one of the radial arms, the connector terminal being constituted by a projecting external portion which can be connected to an electric power supply, a cover-plate being provided for covering the cavity in the service position as well as maintaining the anchoring block and the end portion of each associated conductor in said position, wherein the anchoring block is made up of two complemen-



4,160,577

## HEAT RECUPERATOR

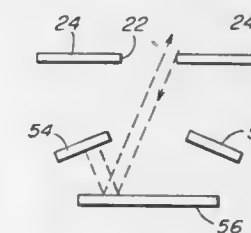
Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corporation, Buckfield, Me.

Continuation-in-part of Ser. No. 663,370, Mar. 3, 1976, Pat. No. 4,082,414, and Ser. No. 773,687, Mar. 2, 1977, abandoned. This application Oct. 11, 1977, Ser. No. 840,632

Int. Cl.<sup>2</sup> G02B 5/124

U.S. Cl. 350—1.1

18 Claims



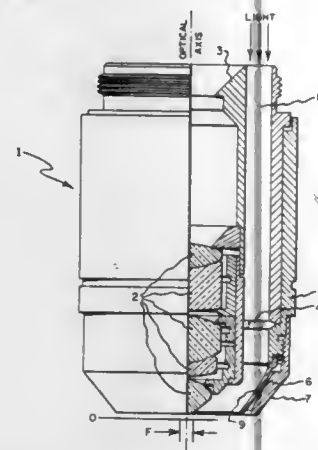
1. A heat recuperator for returning an incident beam of radiative energy to its source, said beam incident from any direction within a predetermined solid angle, said recuperator comprising a main array of radiant heat reflecting cells each comprising a substrate defining at least three planar surfaces intersecting each other in angles of approximately 90°, each said planar surface being in the form of a geometric figure having at least four edges, front substrate surfaces facing said solid angle being reflective of a major fraction of incident electromagnetic radiation in the wavelength band of about 1 micron to about 20 microns said incident beam of radiation having direction cosines (a,b,c) in the coordinate system oriented with the intersections of said planar surfaces, the recuperator further including at least one secondary array of said reflecting cells, said secondary array positioned with respect to said main array at a direction defined by a set of direction cosines chosen from the following group:

-a,	b,	c;
-a,	-b,	c;
a,	-b,	c;

-continued

a, a, -a,	-b, b, b,	-c; -c; -c.
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**4,160,578**  
**ANNULAR REFLECTOR FOR MICROSCOPE**  
**OBJECTIVE**  
 Nathan Gottlieb, Kenmore, and Milton H. Sussman, Amherst,  
 both of N.Y., assignors to American Optical Corporation,  
 Southbridge, Mass.  
 Filed Apr. 17, 1978, Ser. No. 896,969  
 Int. Cl.<sup>2</sup> G02B 21/10  
 U.S. Cl. 350-89 4 Claims



1. In a dark-field, vertically-illuminated microscope objective having an effective power of 6.5X, a numerical aperture of 0.15, and a working distance of 18.35 mm the improvement comprising an annular reflector for providing substantially uniform object illumination having the following parameters.

Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches	Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches
.420	.2320	.472	.2419
.422	.2324	.474	.2423
.424	.2328	.476	.2426
.426	.2332	.478	.2430
.428	.2336	.480	.2434
.430	.2339	.482	.2438
.432	.2343	.484	.2441
.434	.2347	.486	.2445
.436	.2351	.488	.2449
.438	.2355	.490	.2453
.440	.2359	.492	.2456
.442	.2362	.494	.2460
.444	.2366	.496	.2464
.446	.2370	.498	.2467
.448	.2374	.500	.2471
.450	.2378	.502	.2475
.452	.2381	.504	.2478
.454	.2385	.506	.2482
.456	.2389	.508	.2486
.458	.2393	.510	.2490
.460	.2396	.512	.2493
.462	.2400	.514	.2497
.464	.2404	.516	.2501
.466	.2408	.518	.2504
.468	.2411	.520	.2508
.470	.2415	.522	.2512
.524	.2515	.576	.2609
.526	.2519	.578	.2613
.528	.2523	.580	.2617
.530	.2526	.582	.2620

-continued

Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches	Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches
.532	.2530	.584	.2624
.534	.2533	.586	.2627
.536	.2537	.588	.2631
.538	.2541	.590	.2635
.540	.2544	.592	.2638
.542	.2548	.594	.2642
.544	.2552	.596	.2645
.546	.2555	.598	.2649
.548	.2559	.600	.2652
.550	.2563	.602	.2656
.552	.2566	.604	.2660
.554	.2570	.606	.2663
.556	.2573	.608	.2667
.558	.2577	.610	.2670
.560	.2581	.612	.2674
.562	.2584	.614	.2677
.564	.2588	.616	.2681
.566	.2591	.618	.2685
.568	.2595	.620	.2688
.570	.2599	.622	.2692
.572	.2602	.624	.2695
.574	.2606	.626	.2699
.628	.2702	.680	.2794
.630	.2706	.682	.2798
.632	.2709	.684	.2801
.634	.2713	.686	.2805
.636	.2716	.688	.2808
.638	.2720	.690	.2812
.640	.2724	.692	.2815
.642	.2727	.694	.2819
.644	.2731	.696	.2822
.646	.2734	.698	.2826
.648	.2738	.700	.2829
.650	.2741	.702	.2833
.652	.2745	.704	.2836
.654	.2748	.706	.2840
.656	.2752	.708	.2843
.658	.2755	.710	.2847
.660	.2759	.712	.2851
.662	.2762	.714	.2854
.664	.2766	.716	.2858
.666	.2769	.718	.2861
.668	.2773	.720	.2865
.670	.2776	.722	.2868
.672	.2780	.724	.2872
.674	.2784	.726	.2875
.676	.2787	.728	.2879
.678	.2791	.730	.2882
.732	.2886	.784	.2981
.734	.2889	.786	.2985
.736	.2893	.788	.2988
.738	.2897	.790	.2992
.740	.2900	.792	.2996
.742	.2904	.794	.3000
.744	.2907	.796	.3004
.746	.2911	.798	.3008
.748	.2914	.800	.3011
.750	.2918	.802	.3015
.752	.2922	.804	.3019
.754	.2925	.806	.3023
.756	.2929	.808	.3027
.758	.2932	.810	.3031
.760	.2936	.812	.3035
.762	.2940	.814	.3038
.764	.2943	.816	.3042
.766	.2947	.818	.3046
.768	.2951	.820	.3050
.770	.2954	.822	.3054
.772	.2958	.824	.3058
.774	.2962	.826	.3062
.776	.2966	.828	.3066
.778	.2969	.830	.3069
.780	.2973	.832	.3073
.782	.2977	.834	.3077
.836	.3081	.888	.3182

-continued

Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches	Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches
.838	.3085	.890	.3186
.840	.3089	.892	.3190
.842	.3093	.894	.3193
.844	.3097	.896	.3197
.846	.3100	.898	.3201
.848	.3104	.900	.3205
.850	.3108	.902	.3209
.852	.3112	.904	.3213
.854	.3116	.906	.3217
.856	.3120	.908	.3220
.858	.3124	.910	.3224
.860	.3128	.912	.3228
.862	.3131	.914	.3232
.864	.3135	.916	.3236
.866	.3139	.918	.3240
.868	.3143	.920	.3244
.870	.3147	.922	.3247
.872	.3151	.924	.3251
.874	.3155	.926	.3255
.876	.3159	.928	.3259
.878	.3162	.930	.3263
.880	.3166	.932	.3267
.882	.3170	.934	.3270
.884	.3174	.936	.3274
.886	.3178	.938	.3278
.888	.3182	.940	.3282
.890	.3186	.942	.3286
.892	.3190	.944	.3290
.894	.3194	.946	.3294
.896	.3198	.948	.3298
.898	.3202	.950	.3302
.900	.3206	.952	.3306
.902	.3210	.954	.3310
.904	.3214	.956	.3314
.906	.3218	.958	.3318
.908	.3222	.960	.3322
.910	.3226	.962	.3326
.912	.3230	.964	.3330
.914	.3234	.966	.3334
.916	.3238	.968	.3338
.918	.3242	.970	.3342
.920	.3246	.972	.3346
.922	.3250	.974	.3350
.924	.3254	.976	.3354
.926	.3258	.978	.3358
.928	.3262	.980	.3362
.930	.3266	.982	.3366
.932	.3270	.984	.3370
.934	.3274	.986	.3374
.936	.3278	.988	.3378
.938	.3282	.990	.3382
.940	.3286	.992	.3386
.942	.3290	.994	.3390
.944	.3294	.996	.3394
.946	.3298	.998	.3398
.948	.3302	1.000	.3402
.950	.3306	1.002	.3406
.952	.3310	1.004	.3410
.954	.3314	1.006	.3414
.956	.3318	1.008	.3418
.958	.3322	1.010	.3422
.960	.3326	1.012	.3426
.962	.3330	1.014	.3430
.964	.3334	1.016	.3434
.966	.3338	1.018	.3438
.968	.3342	1.020	.3442
.970	.3346	1.022	.3446
.972	.3350	1.024	.3450
.974	.3354	1.026	.3454
.976	.3358	1.028	.3458
.978	.3362	1.030	.3462
.980	.3366	1.032	.3466
.982	.3370	1.034	.3470
.984	.3374	1.036	.3474
.986	.3378	1.038	.3478
.988	.3382	1.040	.3482
.990	.3386	1.042	.3486
.992	.3390	1.044	.3490
.994	.3394	1.046	.3494
.996	.3398	1.048	.3498
.998	.3402	1.050	.3502
1.000	.3406	1.052	.3506
1.002	.3410	1.054	.3510
1.004	.3414	1.056	.3514
1.006	.3418	1.058	.3518
1.008	.3422	1.060	.3522
1.010	.3426	1.062	.3526
1.012	.3430	1.064	.3530
1.014	.3434	1.066	.3534
1.016	.3438	1.068	.3538
1.018	.3442	1.070	.3542
1.020	.3446	1.072	.3546
1.022	.3450	1.074	.3550
1.024	.3454	1.076	.3554
1.026	.3458	1.078	.3558
1.028	.3462	1.080	.3562
1.030	.3466	1.082	.3566
1.032	.3470	1.084	.3570
1.034	.3474	1.086	.3574
1.036	.3478	1.088	.3578
1.038	.3482	1.090	.3582
1.040	.3486		
1.042	.3490		
1.044	.3494		
1.046	.3498		
1.048	.3502		
1.050	.3506		
1.052	.3510		
1.054	.3514		
1.056	.3518		
1.058	.3522		
1.060	.3526		
1.062	.3530		
1.064	.3534		
1.066	.3538		
1.068	.3542		
1.070	.3546		
1.072	.3550		
1.074	.3554		
1.076	.3558		
1.078	.3562		
1.080	.3566		
1.082	.3570		
1.084	.3574		
1.086	.3578		
1.088	.3582		
1.090	.3586		

4,160,579

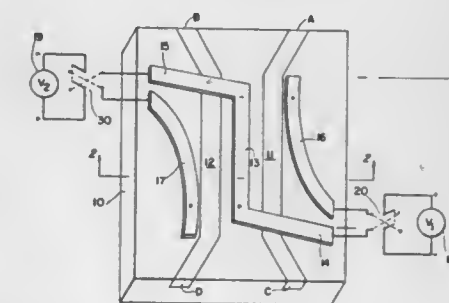
# TAPERED VELOCITY ELECTRO-OPTICAL WAVEGUIDE SWITCH

A. Fenner Milton, Washington, D.C., assignor to The United  
 States of America as represented by the Secretary of the Navy,  
 Washington, D.C.

Filed May 3, 1978, Ser. No. 896,075  
 Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350-96.14

3 Claims



1. A four part electro-optical switch for selectively switching radiation from one light path to another comprising:  
 a substrate of an electro-optic material;  
 a first optical waveguide;  
 a second optical waveguide;  
 said waveguides being spaced from each other and parallel-  
 ing each other along the major portion of their length with  
 the ends of said waveguides diverging from each other;  
 at least one pair of curved electrodes with one electrode  
 disposed on said substrate along the outer surface of each  
 of said waveguides with one end adjacent a divergent end  
 with the opposite end of each of said electrodes curved  
 away from its adjacent waveguide;  
 an electrode disposed on said substrate equidistant between  
 said waveguides, said electrode including a first and sec-  
 ond end;  
 means for connecting a first voltage source to said first end  
 of said third electrode and to the end of one of said curved  
 electrodes which end is curved away from said wave-  
 guide, adjacent to said curved electrode;  
 means for connecting a second voltage source to the second  
 end of said third electrode and to the end of the other  
 electrode of said pair of electrodes which end is curved  
 away from its adjacent waveguide,  
 whereby in the "on" state the voltage of said first and  
 second sources is applied so that the difference in propaga-  
 tion constant between said waveguide channels varies  
 slowly over their length changing sign in the mid-point of  
 their length thereby switching optical radiation from one  
 waveguide to the other.



4,160,580

**DEVICE FOR TERMINATING THE FIBERS OF AN OPTICAL FIBER RIBBON WITH CONNECTORS**

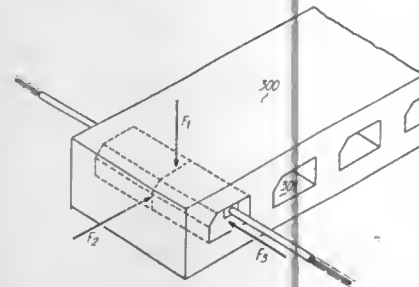
Georges E. Le Noane, Kerrougant Bras, Tregastel, and André M. Mathern, Rte. du Rusquet Brelevenez, Lannion, both of France

Filed Jun. 15, 1978, Ser. No. 915,660

Claims priority, application France, Jun. 17, 1977, 77 18675  
Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.21

6 Claims



1. A device for providing the end portions of the fibers of a flat optical fiber ribbon with connectors comprising:

at least an elongated substantially parallelepipedal connector made of rigid material having two adjacent inner surfaces forming a re-entrant right connector dihedral and two adjacent outer surfaces forming a projecting right connector dihedral and a third surface formed with at least a longitudinal groove, said groove being relatively wide and deep so that a sheathed fiber can be inserted therein with clearance;

a template having a first and a second adjacent surfaces forming a re-entrant right template dihedral, said surfaces intersecting along a template reference direction;

at least two transverse members secured to the first surface of said template dihedral and perpendicular to the second surface thereof, said transverse members having upper surfaces lying in one and the same plane parallel to said first template dihedral surface, being spaced apart by a length exactly equal to that of an elongated connector and defining a connector recess;

a first groove formed in one of said at least two transverse members receiving the sheathed part of the end portion of said optical fiber and a second groove aligned with said first groove and formed in the second of said at least two transverse members receiving the stripped part of the end portion of said optical fiber, the optical fiber guided in said grooves being parallel to said template reference direction;

means for inserting an elongated connector into said connector recess with the projecting connector dihedral accommodating the re-entrant template dihedral, the optical fiber being guided, when passing in the longitudinal connector groove, through aligned first and second grooves on each side of said connector, whereby it can be bonded to said connector in predefined position.

4,160,581

**POSITIONING SYSTEM OF THE OPTICAL AXES OF AN OBSERVATION DEVICE FOR COUPLED IMAGES, AND THE OBSERVATION DEVICE FOR SUCH A SYSTEM**

Alain Weissler, Boussy-Saint Antoine, France, assignor to Louis Peretz, La Celle Saint-Cloud, France

Filed Sep. 9, 1977, Ser. No. 831,912

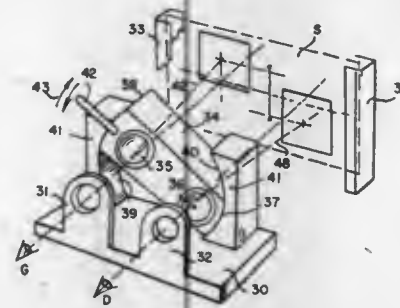
Int. Cl.<sup>2</sup> G02B 27/22

U.S. Cl. 350—133

8 Claims

1. A device for viewing two coupled images simultaneously comprising a stand, two convergent optical units connected side by side in said stand, said units being mounted in a single block with their parallel optical axes in front of said coupled

images to provide enlarged images for observation and means for rotating both of said units with respect to said stand, each



of said units having lateral, cylindrical surfaces with axes parallel to said optical axes for adjusting that unit.

4,160,582

**ELECTROSTATIC DISPLAY ASSEMBLY**

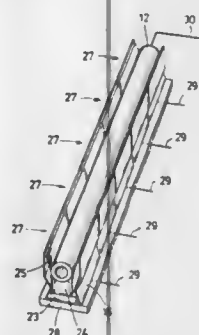
Sasaki Yasuo, Kobe, Japan, assignor to Displaytek Corporation and Daiwa Shinku Corporation, both of Japan

Filed Mar. 28, 1978, Ser. No. 891,114

Claims priority, application Japan, Apr. 1, 1977, 52-41448[U]  
Int. Cl.<sup>2</sup> G02F 1/00

U.S. Cl. 350—269

3 Claims



1. An electrostatic display assembly comprising:

a base of insulating material;

a plurality of channel shaped casings fixed to the base into a line, each casing having a pair of side walls opposite to each other;

a pair of supporting plates laid one on the other within each casing;

a fixed electrode with a cylindrical surface extending throughout the length of the plurality of casings within the same;

a resilient sheet electrode interposed between the supporting plates in each casing so that each side of the resilient sheet electrode is upturned and extends upwards adjacent to the fixed electrode along the inner surface of the side wall of the casing;

a layer of insulating material disposed between the fixed electrode and the resilient sheet electrodes; and

a means for applying a voltage between the fixed electrode and each of the resilient sheet electrodes which are electrically independent of each other, the outer surface of the fixed electrode and the inner surfaces of the resilient sheet electrodes being different in appearance from each other, whereby upon the application of a voltage between the fixed electrode and at least one of the resilient sheet electrodes independently of the others, the at least one of the resilient sheet electrodes are attracted to the surface of the fixed electrode and cover the same, causing a distinct change in the appearance of the assembly.

4,160,583

**ELECTROSTATIC DISPLAY DEVICE**

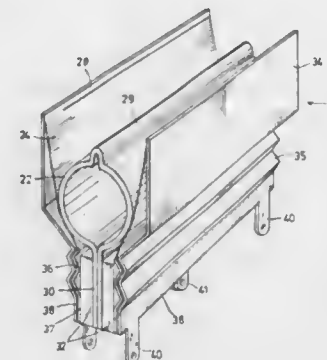
Hirotsada Ueda, Kobe, Japan, assignor to Displaytek Corporation and Daiwa Shinku Corporation, both of Japan  
Filed Mar. 28, 1978, Ser. No. 891,115

Claims priority, application Japan, Apr. 1, 1977, 52/41452[U];  
Oct. 8, 1977, 52/135345[U]

Int. Cl.<sup>2</sup> G02F 1/00

U.S. Cl. 350—269

4 Claims



1. An electrostatic display device comprising:

a casing having at least one side wall;

a fixed electrode having a cylindrical surface;

at least one resilient sheet electrode supported by a pair of supporting panels opposite to each other, each of the panels having at least one lateral projection on the inner surface thereof, the panels being disposed in such a manner that the projection on one of the panels is alternate to that of the other, so that the resilient sheet electrode is forced into contact with at least one projection on each panel;

a layer of insulating material disposed between the electrodes; and

means for applying electrical power to the fixed and resilient electrodes, whereby upon the application of voltage to the electrodes, the resilient sheet electrode is attracted to the cylindrical surface of the fixed electrode and covers the same, changing the appearance of the device.

3. An electrostatic display device comprising:

a casing having at least one side wall;

a fixed electrode having a cylindrical surface and an axial ridge at the uppermost portion of the cylindrical surface;

at least one resilient sheet electrode standing adjacent to the fixed electrode along the inner surface of the side wall;

a layer of insulating material disposed between the electrodes; and

means for applying a voltage between the fixed electrode and the resilient sheet electrode, whereby upon the application of voltage between the electrodes, the resilient sheet electrode is attracted to the cylindrical surface of the fixed electrode and covers the same, changing the appearance of the device.

4,160,584

**TRANSPARENT METALLIC COATING AND A GLASS OVERCOATING ON A PLASTIC SUBSTRATE PRODUCE A CHROMATIC EFFECT**

Charles L. Giles, Wilmington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 686,787, May 17, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,481

Int. Cl.<sup>2</sup> G02C 7/12; G02B 1/10, 1/24

U.S. Cl. 351—49

7 Claims

1. A spectacle lens for spectacles comprising a pair of lens rims connected by a bridge portion for supporting right and left spectacle lenses, each of said rims retaining a spectacle lens, said spectacle lens comprising in order:

(a) a transparent light polarizer substrate;

(b) a transparent continuous layer of a metal coated on one surface of said substrate; and

(c) a transparent continuous layer of a dielectric material coated over said metallic layer, the dielectric material



being an odd multiple of one-quarter wavelength in thickness with respect to a reference color of the spectrum, said layer of dielectric material being positioned on the side of said lens opposed to the eye of the wearer.

4,160,585

**SPECIAL EFFECTS DEVICE**

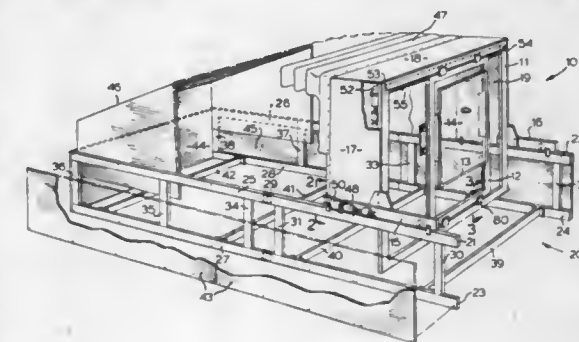
Warren Keillor, 201-3 Centre St., Markham, Ontario, Canada (L3P 3P9)

Filed Sep. 19, 1977, Ser. No. 834,434

Int. Cl.<sup>2</sup> G03B 21/32

U.S. Cl. 352—87

11 Claims



1. A special effects device for use in motion pictures, television and the like comprising of an outer frame, a middle frame and an inner frame; said middle frame mounted on said outer frame in a manner for translational movement relative to said outer frame and said inner frame mounted on said middle frame in a manner for translational movement relative to said middle frame; means for imparting translational movement to said middle frame; means for imparting translational movement to said inner frame; means for coordinating said translational movements; means for supporting an object within the perimeter of said inner frame; the arrangement of said frames being such that by coordinating the movements of said inner and middle frames translational movement is imparted to said object; said outer frame is mounted on a stand for movement in a direction perpendicular to the plane of movement of said middle and inner frames and means for imparting such movement to said outer frame.

# 4,160,586 BACKLASHLESS PHOTOTYPESETTER CARRIAGE BRAKE

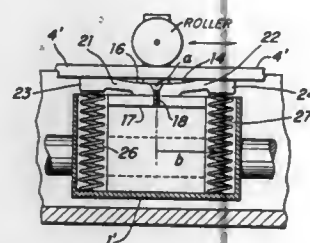
Peter R. Ebner, South Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Dec. 27, 1977, Ser. No. 864,308

Int. Cl.<sup>2</sup> B41B 13/00

U.S. Cl. 354—5

4 Claims



1. In a phototypesetter having a movable lens carriage, a backlashless carriage brake for applying a constant force in opposition to the bilateral motion of said carriage comprising:
  - a. an elongated way member positioned along the path of motion of said carriage;
  - b. a brake shoe member having a central portion rigidly affixed to said movable carriage and having a first bowed flexible arm member having an outer portion thereof together with a second bowed flexible arm member having an outer portion thereof;
  - c. first spring means separate from said flexible arm member for urging the outer portion of said first flexible arm member against said way member;
  - d. second spring means separate from said flexible arm member for urging the outer portion of said second flexible arm member against said way member; and
  - e. said brake shoe member having a shallow configuration, i.e., the ratio of the perpendicular distance from said rigidly fixed central portion to the elongated way to the perpendicular distance from said rigidly fixed central portion to the respective spring means is less than 1/10.

# 4,160,587 CAMERA EQUIPPED WITH RANGE FINDER FOR MANUAL OR AUTOMATIC FOCUSING

Wilfred Heiniger; Claude Krelenbuehl, and Manuel Millan, all of Yverdon, Switzerland, assignors to Bolex International S.A., Ste-Croix, Switzerland

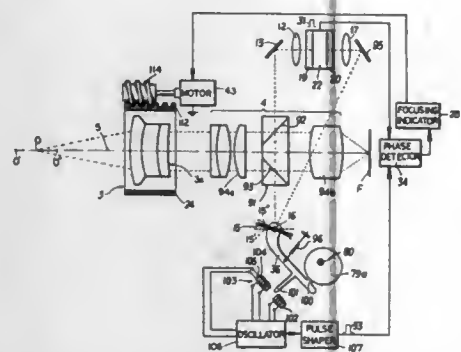
Continuation-in-part of Ser. No. 787,497, Apr. 14, 1977, abandoned, and Ser. No. 789,250, Apr. 20, 1977, abandoned. This application Sep. 30, 1977, Ser. No. 838,377

Claims priority, application Switzerland, Oct. 1, 1976, 012428/76

U.S. Cl. 354—25

Int. Cl.<sup>2</sup> G03B 7/08

23 Claims



1. In a camera having an objective provided with setting

means for varying the position of an axially shiftable lens member thereof to focus the objective upon an object along its axis, said objective further having components between which the incident light rays from an object have predetermined orientations in a position of said shiftable lens member in which the objective is focused upon such object,

the combination therewith of:  
a pair of ancillary projection systems intercepting incident light rays from an object in line with said objective, at least one of said projection systems including adjustable light-guiding means for varying the relative position of the intercepted light rays, said light-guiding means comprising an oscillatable element mechanically independent of said setting means, said projection systems including a pair of stationary light reflectors between said components respectively directing intercepted light rays toward said oscillatable element and toward a companion element in the other of said projection systems;  
photoelectric comparison means illuminable by the intercepted light rays from said projection systems for emitting a coincidence signal whenever two images respectively produced thereby register with each other to indicate that said projection systems are trained on the same object;  
sensing means responsive to the positions of said setting means and of said element for generating a correlation signal upon detecting an agreement between said positions;  
scanning means coupled with said element for periodically displacing same in a succession of sweeps whereby said correlation and coincidence signals appear in the form of short pulses during each sweep; and  
phase-detecting means connected to said comparison means and to said sensing means for determining the relative time position of said pulses.

# 4,160,588

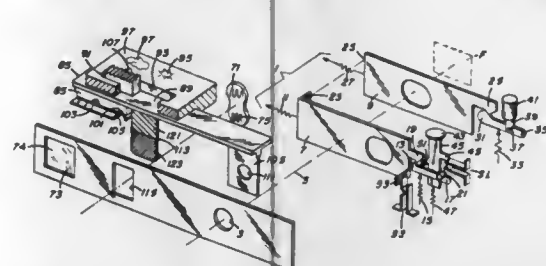
EXPOSURE CONTROL APPARATUS  
David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,775

Int. Cl.<sup>2</sup> G03B 7/00

U.S. Cl. 354—31

8 Claims



1. In an exposure control apparatus for a photographic camera, the combination comprising:
  - a. means for selecting any one of a plurality of various size exposure apertures;
  - b. means for providing a plurality of exposure times;
  - c. a signal emitting source for producing a signal to indicate that the level of light received from a scene to be photographed is too low for a proper film exposure at the selected aperture; and
  - d. means operatively associated with said aperture selecting means and said exposure time providing means for changing the level of scene light and the exposure time at which said low light signal is produced in accordance with a change of the selected aperture.

# 4,160,589 COMBINED SOLENOID AND TIMING SYSTEM FOR SLR CAMERA APPARATUS

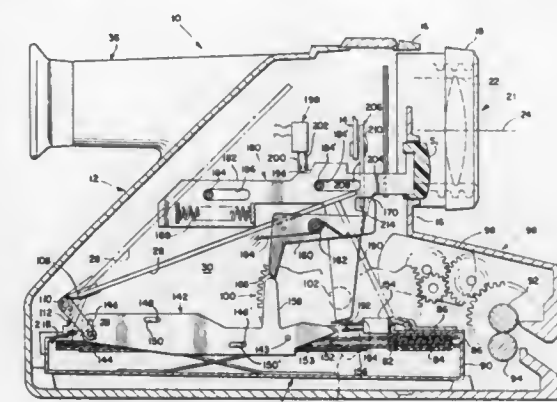
Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1978, Ser. No. 883,186

Int. Cl.<sup>2</sup> G03B 17/50

U.S. Cl. 354—86

14 Claims



1. A photographic camera having means for mounting photographic film material of the self-developing type at a given focal plane and for receiving a source of electrical energy, said camera comprising:
  - a. a manually actuable member mounted for reciprocal movement between an initial position and a second position;
  - b. a shutter blade mechanism;
  - c. means for mounting said shutter blade mechanism for displacement between an initial scene light unblocking arrangement and a scene light blocking arrangement;
  - d. selectively actuable drive means for displacing said shutter blade mechanism between its said scene light blocking and unblocking arrangements, said drive means including an electrically energizable component for displacing said shutter blade mechanism towards its said scene light blocking arrangement and a resilient biasing element for yieldably urging said shutter blade mechanism towards its said initial scene light unblocking arrangement;
  - e. a mirror assembly;
  - f. means for mounting said mirror assembly for displacement between an initial position wherein it precludes scene light passing through said shutter blade mechanism from impinging upon the focal plane and another position wherein it redirects scene light passing through said shutter blade mechanism towards the focal plane;
  - g. spring means for urging said mirror assembly from its said initial position towards its said other position;
  - h. a film processing and advancing roller;
  - i. a motor;
  - j. an energizable scene light detecting and integrating device;
  - k. a normally non-conducting first switch coupled to the source of electrical energy and arranged to be rendered conductive when said manually actuable member is displaced from its initial position to its said second position and again non-conductive when said manually actuable member is returned to its said initial position;
  - l. a normally non-conductive second switch coupled between the source of electrical energy and said motor;
  - m. means for rendering said second switch conductive and for sequentially utilizing said energized motor to drive said roller and thus effect the return of said mirror assembly to its said initial position when said manually actuable member is returned to its said initial position and said mirror assembly is in its said other position and for rendering said second switch again non-conductive when said mirror

assembly is subsequently returned to its said initial position;  
means responsive to rendering said first switch conductive for actuating said drive means to effect the displacement of said shutter blade mechanism into its said light blocking arrangement under the influence of said energizable component, for then effecting the displacement of said mirror assembly into its said scene light redirecting position under the influence of said spring means, for then actuating said drive means to effect the displacement of said shutter blade mechanism to its said scene light unblocking arrangement under the influence of said resilient urging element and for energizing said scene light detecting and integrating device, for then actuating said drive means to return said shutter blade mechanism back to its said scene light blocking arrangement under the influence of its said energizable component when said scene light detecting and integrating device has determined that the proper amount of scene light has impinged upon a film unit disposed at the focal plane, for then effecting the return of said manually actuable member to its said initial position whereby said first switch is rendered non-conductive and said second switch is rendered conductive to energize said motor to sequentially drive said film processing and advancing roller and effect the return of said mirror assembly to its said initial position thus rendering said second switch non-conductive and for then actuating said drive means to effect the return of said shutter blade mechanism to its said initial scene light unblocking arrangement.

# 4,160,590 REMOVABLE (LENS POSITION LIMITING) STOP FOR AUTO-MANUAL FOCUSING CAMERAS

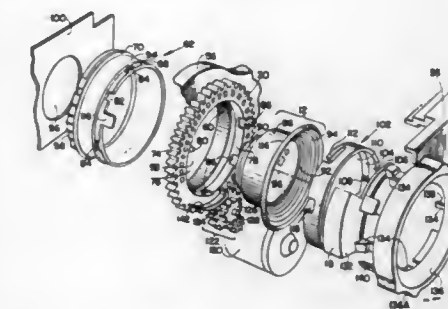
John M. Reynard, Framlingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 17, 1978, Ser. No. 896,713

Int. Cl.<sup>2</sup> G03B 3/00

U.S. Cl. 354—195

21 Claims



1. A photographic camera operative in either a manual or an automatic focusing mode, said camera comprising:
  - a. means for defining an image plane;
  - b. means for directing scene light along a given optical path to said image plane, said directing means including a lens assembly having a lens mounted for displacement over a focusing range wherein various positions thereof respectively serve to focus an image at said image plane of subjects positioned in various locations within a predetermined range of subject distances, and for further displacement from its said focusing range into a second range wherein it does not serve to focus images at said image plane of subjects positioned within said predetermined subject distance range;
  - c. means for selectively coupling said camera to a source of electrical energy;
  - d. ranging and focusing means for producing a signal indicative of the position of a particular subject selected to be photographed and for effecting movement of said lens from its said second range to a position in said focusing range in



accordance to said signal where said lens serves to focus an image of said particular subject at said image plane; means for unblocking and blocking said optical path to produce an exposure interval; and manually actuatable means for selecting the manual focusing mode of said camera, said manually actuatable means including means for limiting the manual displacement of said lens to within its said focusing range when said manual focusing mode is selected.

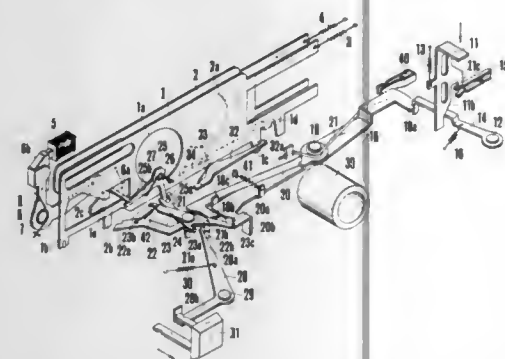
#### 4,160,591 CAMERA HAVING AN ELECTRICALLY TIMED SHUTTER

Toyotoshi Suzuki, Tokyo, and Kazunari Matsuzaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,747  
Claims priority, application Japan, Feb. 23, 1977, 52/18966  
Int. Cl.<sup>2</sup> G03B 9/08, 9/40

U.S. Cl. 354—235

2 Claims



1. A camera including a housing and having an electrically timed shutter comprising:

- (a) a shutter opening member;
- (b) a shutter closing member;
- (c) mechanical release actuating means for actuating said shutter opening member to initiate exposure;
- (d) an exposure control circuit including a battery for electrical power supply and an electromagnet and controlling the period of actuation of the shutter;
- (e) first releasable latch means for said closing member movable, in response to the energized state of said electromagnet, between a position where said shutter closing member is latched and a position where said shutter closing member is released;
- (f) means causing said first latch means to be displaced to a position where said shutter opening member is locked in response to operation of said actuating means when said electromagnet is not supplied with sufficient electrical energy;
- (g) a battery chamber and a cover detachable from said chamber in said housing;
- (h) changeover means responsive to the detachment of the cover for releasing said shutter opening member from the locked position;
- (i) a second releasable latch means for latching said shutter closing member in response to said changeover means; and
- (j) means arranged upon movement of said shutter opening member to be displaced so that said closing member is released from said second latch means.

#### 4,160,592 CAMERAS

Rolf Noack, and Karl Kromer, both of Dresden, German Democratic Rep., assignors to Veb Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.

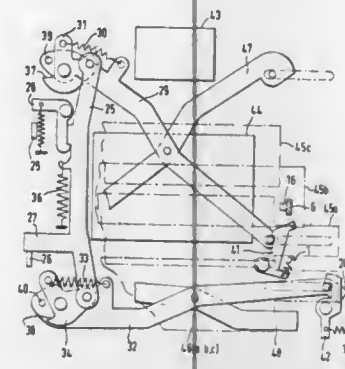
Filed Sep. 8, 1977, Ser. No. 831,652

Claims priority, application German Democratic Rep., Sep. 24, 1976, 194968

Int. Cl.<sup>2</sup> G03B 9/40, 19/12

U.S. Cl. 354—246

3 Claims



1. A lamellar focal-plane shutter for monocular mirror reflex cameras having a swivelling viewfinder mirror and shutter blades which return automatically to their starting positions after each exposure operation, comprising

- (a) a first rotatably mounted tensioning plate,
- (b) a shutter opening lever,
- (c) an opening spring connected between said first tensioning plate and said shutter opening lever,
- (d) a second rotatably mounted tensioning plate,
- (e) a shutter closing lever,
- (f) a closing spring connected between said second tensioning plate and said closing lever,
- (g) a coupling rod connected between said first and second tensioning plates,
- (h) a spring attached to said rod for tensioning upon the cocking of the camera,
- (i) a detent lever for holding the rod in a tensioned position and
- (j) a release arm for actuating said detent lever for the release of the coupling rod, said release arm returning to the start position when the viewfinder mirror returns to its viewing position.

#### 4,160,593

APPARATUS FOR DEVELOPING LATENT IMAGES  
Norman J. Rosenburgh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 763,443, Jan. 28, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,970

Int. Cl.<sup>2</sup> G03D 5/00; G03G 15/10

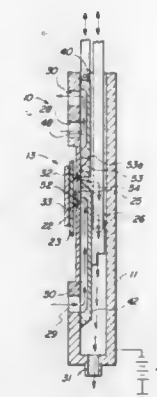
U.S. Cl. 354—317

23 Claims

1. Apparatus for developing a latent image on an image-bearing support, said apparatus comprising:

- (a) a housing which defines a chamber, said housing having means defining an opening therein against which the image-bearing support can be positioned for communication with the chamber;
- (b) first conduit means connectable to a source of development liquid under pressure;
- (c) second conduit means connectable to a source of drying gas under pressure;
- (d) valve means having a first operational state placing said chamber in fluid communication with said first conduit and a second operational state placing said chamber in fluid communication with said second conduit;
- (e) a member having a surface which is movable along a path between (1) a developing position proximate said opening

to form, with a positioned image-bearing support, a flow passage for development liquid and (2) a retracted position out of fluid communication with said chamber; and (f) control means for coordinating the operation of said



valve means with the movement of said surface so that said surface is in its developing position when said valve means is in its first operational state, and so that said surface is in its retracted position when said valve means is in its second operational state.

#### 4,160,594 METHOD AND ARRANGEMENT FOR THE DEVELOPMENT OF LATENT IMAGES PARTICULARLY LATENT PHOTOGRAPHIC IMAGES

Erwin Geyken, and Peter Dawidowitsch, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

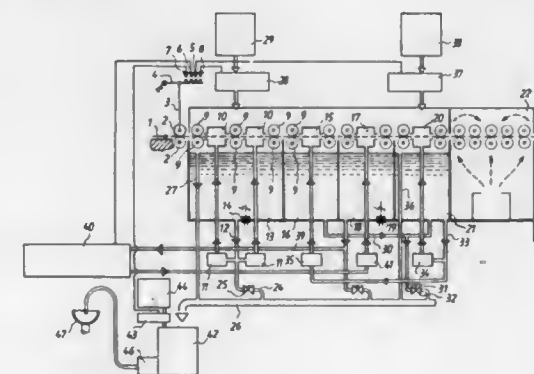
Continuation of Ser. No. 530,049, Dec. 5, 1974, Pat. No. 4,081,816. This application Sep. 22, 1977, Ser. No. 835,527  
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1973, 2361151

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> G03D 3/02

U.S. Cl. 354—324

9 Claims



1. In an apparatus for the development of photographic film, in combination, transport means for transporting photographic film along a predetermined transport path; a developing station provided with means for applying developer fluid to photographic film at a predetermined location along said path; a fixing station provided with means for applying fixer fluid to photographic film at a location along said path downstream of said developing station; a waste line for receiving and sewerage spent photographic film-processing fluids; means operative during operation of the apparatus for con-

tinually supplying fresh developer fluid to said developing station and continually withdrawing spent developer fluid from said developing station and transmitting the withdrawn spent developer fluid to said waste line along a predetermined developer-fluid withdrawal path; fixer-fluid desilvering means operative for removing silver from spent fixer fluid; means operative during operation of the apparatus for continually withdrawing spent fixer fluid from said fixing station and transmitting the withdrawn spent fixer fluid to said fixer-fluid desilvering means; neutralizing means operative during operation of the apparatus for chemically neutralizing the withdrawn spent developer fluid separate from the withdrawn spent developer fluid reaches said waste line by continually adding a chemical oxidizing agent to the withdrawn spent developer fluid at a location along said developer-fluid withdrawal path at which withdrawn spent developer fluid is separate from and unmixed with withdrawn spent fixer fluid; and intermediate-washing means operative for subjecting film transported from said developing station to said fixing station to an intermediate washing to thoroughly remove from the film any developer fluid clinging thereto, whereby to prevent developer fluid from reaching said fixing station and from there finding its way into said fixer-fluid desilvering means.

#### 4,160,595 COPYING MACHINE EQUIPPED WITH A FLASH TYPE FIXING APPARATUS

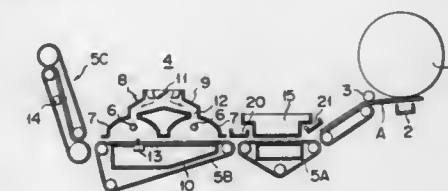
Kenzo Ito, Kodaira, and Yoshiharu Abe, Tokyo, both of Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1978, Ser. No. 919,719

Int. Cl.<sup>2</sup> G03G 15/00; G03B 27/76; F27B 9/28

U.S. Cl. 355—3 FU

8 Claims



1. A copying machine equipped with a flash type fixing apparatus, comprising a photosensitive layer, a flash type fixing apparatus for fixing a toner powder image transferred from the photosensitive layer onto a copying paper, light shielding shutter means disposed between the fixing apparatus and the photosensitive layer, and control means for closing said light shielding shutter means during the flashing of said fixing apparatus to prevent an illumination resulting from the flashing of the fixing means from reaching the photosensitive layer.

#### 4,160,596 DOCUMENT REPRODUCTION ILLUMINATION/EXPOSURE CONTROL SYSTEM

Robert E. Joseph, Dumfries, Va., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 18, 1977, Ser. No. 843,293

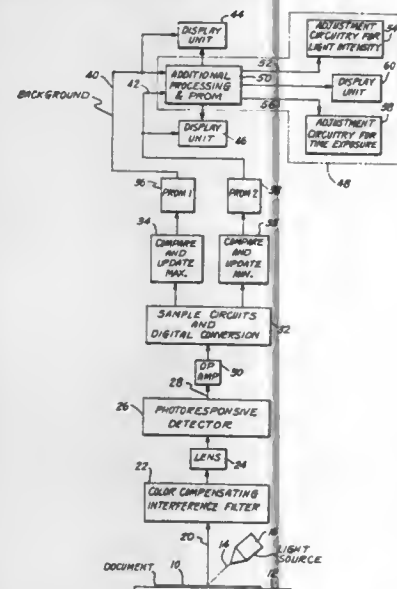
Int. Cl.<sup>2</sup> G03B 27/78

U.S. Cl. 355—68

9 Claims

1. A document reproduction illumination/exposure control system for ascertaining the photometric qualities of a document to be photographically reproduced on an image recording medium and providing responsive control signals for illumination and exposure parameters for a document reproduction apparatus, comprising, in combination:

- (a) variable illumination means for projecting radiation on a document to be reproduced;
- (b) detecting means for receiving radiation incident from said document and generating a radiation-detected signal proportional thereto, said detecting means comprising a linear array of photoelectric elements for scanning a linear area of said document;
- (c) clock signal generating means for sequentially enabling elements of said photoelectric array to scan said linear area;
- (d) means for measuring radiation-detection signals for each element of said array;
- (e) means for deriving from said measured radiation-detection signals first extremum signals corresponding to a background light intensity value of said document and second extremum signals corresponding to a line density light intensity value of said document;



- (f) first memory storage means for storing background/spectral response information for the image recording medium, and for providing a first illumination/exposure control signal;
- (g) second memory storage means for storing line density/spectral response information for the image recording medium, and for providing a second illumination/exposure control signal;
- (h) means for feeding said first extremum signals to said first memory storage means for obtaining said first illumination/exposure control signal;
- (i) means for feeding said second extremum signal to said second memory storage means for obtaining said second illumination/exposure control signal; and
- (j) illumination/exposure control means for receiving said first and second control signals whereby illumination and/or exposure parameters are correlated between the spectral characteristics of said document and said image recording medium.

#### 4,160,597 PHOTOGRAPHIC EASEL

Jerry S. Damm, and William R. Damm, both of 560 Sixth St., Hollister, Calif. 95023

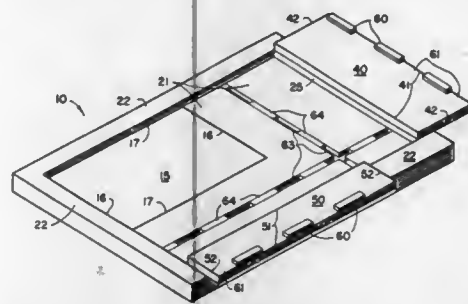
Filed Apr. 24, 1978, Ser. No. 899,064  
Int. Cl.<sup>2</sup> G03B 27/58

U.S. Cl. 355-74

4 Claims

1. In a photographic easel having a flat panel, and a wall integral with the panel defining a side of a test paper receiving area and along which wall a test paper can be adjustably positioned to bring subdivisions thereof successively into a predetermined target area within the receiving area; a substantially rectangular spacer flap fitted against the wall; and hinge means

mounting the flap on the wall for pivotal movement between a position flatly against the panel and a position retracted therefrom, said flap having an edge substantially parallel to the wall



disposed for adjustable positioning of the paper therealong when the flap is flatly against the panel and exposing said wall for adjustable positioning of the paper therealong when the flap is retracted.

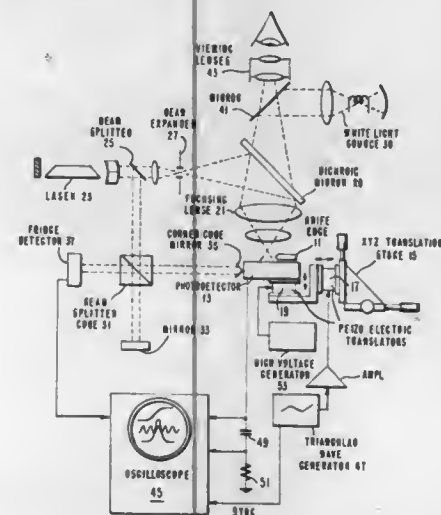
#### 4,160,598 APPARATUS FOR THE DETERMINATION OF FOCUSED SPOT SIZE AND STRUCTURE

Arthur H. Firester, Skillman, and Macy E. Heller, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1977, Ser. No. 827,254  
Int. Cl.<sup>2</sup> G01J 1/00

U.S. Cl. 356-121

4 Claims



1. Apparatus, for measuring the intensity profile of a cross section of a light beam provided by a light source of known wavelength, comprising:

a knife-edge;  
means for establishing relative motion between the knife-edge and the light beam in a manner causing repeated transverse scanings by the knife-edge of the light beam;  
means, abutting said knife-edge, for detecting the beam light power not occluded by the knife-edge during said repeated scanings, said detecting means having a light sensitive surface and means, overlying said light sensitive surface, for effecting an alteration in the apparent optical properties of said light sensitive surface such that the apparent optical properties of said light sensitive surface substantially correspond to the optical properties of the light sensitive surface of an information record blank;  
means for differentiating the output of said detecting means; interferometer means for measuring said relative motion; and  
means for simultaneously displaying the output of said dif-

ferentiating means and the output of said measuring means.

4,160,599

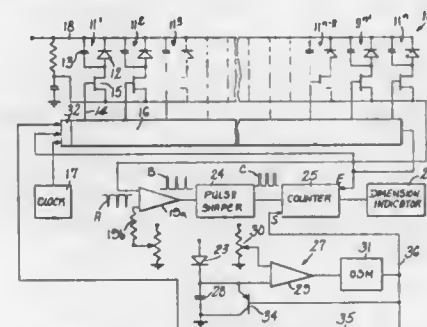
#### OPTICAL GAGING SYSTEM

Joseph L. Sperrazza, New Haven, Conn., assignor to Universal Technology, Inc., Woodbridge, Conn.

Filed Dec. 8, 1977, Ser. No. 858,822  
Int. Cl.<sup>2</sup> G01B 11/06

U.S. Cl. 356-381

6 Claims



1. In an apparatus for gating the thickness of strip material comprising a linear array of back-biased photo-sensitive electrically conductive elements, means for imaging the strip across said array, each of said elements having a capacitance which may discharge through the element at a rate dependent on the light intensity incident thereon and a switch in circuit with each element for completing a circuit therethrough, means for sequentially closing and then opening said switches to recharge said capacitances in a cycle of operation, means for counting the charging pulses during a cycle of operation; separate photo-sensitive means for sensing the light from one of said strip and the background, means responsive to said separate means for generating pulses at a repetition rate proportional to the intensity of light from said one of said strip and the background, and means for utilizing said pulses to commence a cycle of operation of sequentially closing said switches, whereby the time between cycles of operation is regulated as a function of the light intensity sensed by said separate means.

4,160,600

#### PRESSURE-RESPONSIVE APPARATUS

Douglas V. Luke, Farnham Common, England, assignor to Smiths Industries Limited, London, England

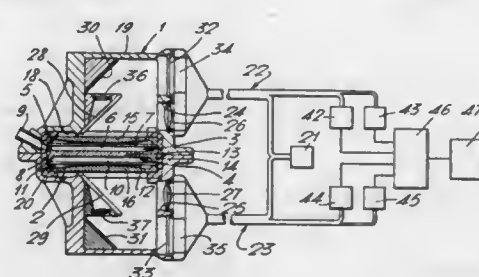
Filed Sep. 12, 1977, Ser. No. 832,706

Claims priority, application United Kingdom, Sep. 23, 1976, 39575/76; Jun. 22, 1977, 26122/77

Int. Cl.<sup>2</sup> G01B 9/02

U.S. Cl. 356-352

12 Claims



3. A temperature compensated pressure-responsive apparatus including a capsule divided into first and second cells each of which defines a first and second chamber, each of said first chambers having a curved reflective surface, each said cell including a diaphragm having a reflective surface and means

mounting said diaphragm to divide the said first and second chambers of said cell from one another, said capsule having a passageway communicating with one chamber of said first cell for supply thereto of a pressure to be sensed, and said second cell being sealed whereby its interior pressure is a function of ambient temperature, a light source for providing illumination of the said first chamber of both the said first and second cells to produce first and second patterns of fringes respectively caused by interference between light reflected by each said curved reflective surface and the reflective surface of each said respective diaphragm; sensing means for sensing displacement of the said first and second patterns of fringes; and means for providing an indication of the change in pressure of said first cell with respect to said second cell in accordance with the difference between the displacement of said first and second patterns of fringes, thereby to provide an indication of the pressure being sensed, compensated for changes in temperature of the capsule.

4,160,601

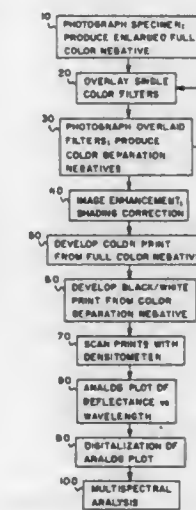
#### BIOCONTAMINATION AND PARTICULATE DETECTION SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Jacqueline M. Jacobs, Pasadena, Calif.

Filed Feb. 24, 1978, Ser. No. 880,727  
Int. Cl.<sup>2</sup> G01N 21/32; G01J 3/48

U.S. Cl. 356-404

7 Claims



1. A method of determining the characteristics of an unknown microscopic contaminant existing on a surface, comprising the steps of  
photographing said surface to produce an enlarged full-color photographic negative,  
overlaying said full-color negative one at a time with a plurality of individually different single-color filters, and consecutively photographing the image produced by each overlaid filter on said full color negative to create an equal number of color separation negatives,  
image-enhancing said full-color negative and each of said color separation negatives to produce respectively a clarified image-enhanced full-color negative and a plurality of clarified image-enhanced color separation negatives,  
developing a color print from said image-enhanced full-color negative,  
developing a single monochromatic print from each of said image-enhanced color separation negatives,  
scanning said color print and each of said monochromatic prints separately to produce profiles of reflectance as a function of optical wavelength, and  
comparing said reflectance profiles of contaminants with previously stored profiles of known contaminants produced in the same way, said previously stored profiles



describing a known spectral signature characteristic of a known contaminant, said comparing being accomplished by matching profiles of said unknown contaminants with said stored profiles, each matching profile thus identifying an unknown microscopic contaminant.

4,160,602

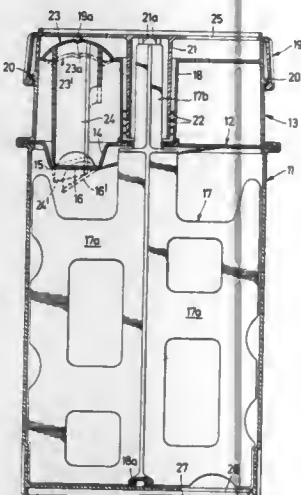
**MULTI-CHAMBER PACK**

Maurice E. Benz, Riehen, and Peter Bühler, Seltisberg, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland  
Filed Aug. 15, 1977, Ser. No. 824,666

Claims priority, application Switzerland, Aug. 18, 1976, 10513/76; Feb. 7, 1977, 1452/77

Int. Cl.<sup>2</sup> G05D 11/00; B65D 25/08; B01F 7/20  
U.S. Cl. 366—162

16 Claims



1. A multi-chamber pack comprising a first and at least one further chamber, a frangible partition separating said chambers, means operable externally of said chambers for breaking the partition within said pack, an agitator disposed rotatably in said first chamber, and mounted on said pack an actuator element coupled to the agitator so as to rotate the latter.

4,160,603

**IMMERSION CLEANER**

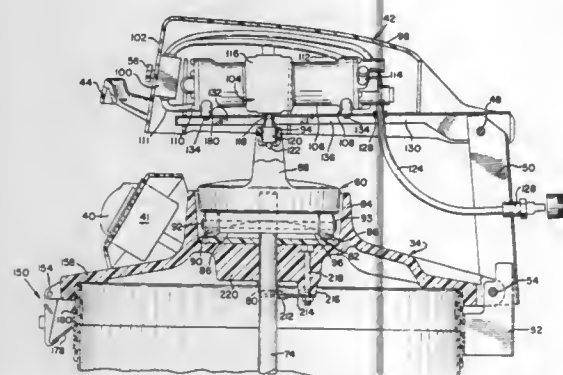
Karl G. Otzen, Brookfield, Wis., assignor to Safety-Kleen Corp., Elgin, Ill.

Division of Ser. No. 808,169, Jun. 20, 1977, Pat. No. 4,096,873.

This application Jun. 26, 1978, Ser. No. 919,361

Int. Cl.<sup>2</sup> B08B 3/04; B01F 7/32  
U.S. Cl. 366—219

6 Claims



1. A driving element and support assembly therefore, comprising, in combination, a clamp for encircling a liquid receiving container, a generally vertically extending head support element, including upper and lower end portions thereof, means in a part of said lower end portion pivotally attaching said lower end to a portion of said clamp, a head assembly

including a frame element adapted, in a position of use, to extend generally horizontally, means for forming a pivotable connection between one end of said frame element and said upper end of said vertical member, a motor attached to said frame element, a drive shaft extending generally downwardly from said motor, a driving element disposed on said drive shaft and adapted for removable reception into a drive element receiving recess in an associated driven member, said pivotal attachment of said lower end of said vertical member to said clamp permitting said upper end of said vertical member to pivot radially inwardly and outwardly with respect to said container, and said pivotal connection between said upper end and said frame permitting said head to oscillate vertically, said clamp and said vertical member and said frame member providing a reaction member for absorbing the driving torque of said motor, whereby in use, said drive head may be associated in use with a driven member undergoing both radial and axial oscillation, may remain in driving contact with said member at all times during said drive cycles and may be freely removable therefrom by pivoting said head assembly upwardly about said second pivot point.

4,160,604

**TUNA AND EGG-SALAD MIXER**

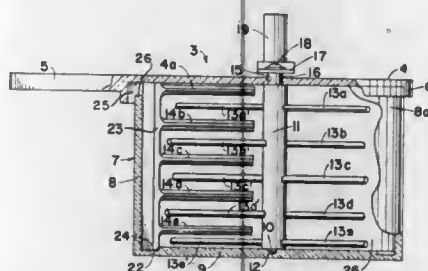
Anthony DiBona, Jr., 74-16 220th St., New York, N.Y. 11364

Filed May 5, 1978, Ser. No. 903,198

Int. Cl.<sup>2</sup> B01F 7/20

U.S. Cl. 366—247

8 Claims



1. A salad mixing device comprising in combination: an open-top vessel having a continuous circumscribing inner wall integral with a base therefor forming an enclosure with an open-top and having first rod-like elements extending from said inner wall inwardly into central space of the enclosure structure; the first rod-like elements being located at different elevations on the inner wall; and a lid fastenable onto and substantially sealable of the open-to-top, said continuous circumscribing inner wall having an inner surface carrying a male member, and a shaft mounted through the lid, said shaft carrying a cranking handle on an upper end thereof adapted to turn said shaft, said lid having a circumscribing downwardly-extending flange extending from an outer circumscribing edge of the lid, and said circumscribing downwardly-extending flange having a diameter between inner wall surfaces thereof adapted such that inner wall surfaces thereof fit wedgingly onto and around upper outer wall surfaces of said open-top vessel's said continuous circumscribing inner wall, and a lid slot being formed in said downwardly-extending flange of a size mateable with said male member when said lid is wedged-mounted onto the open-top vessel, such that said lid anchored against shifting rotatably on said open-top vessel when said cranking handle is cranked; and said shaft carrying fixedly-mounted outwardly-extending second rod-like elements on a lower portion of said shaft located beneath the lid, said second rod-like elements being located at elevations different from the elevations of the first rod-like elements and being movable laterally between said first rod-like elements to mesh with and move past said first rod-like elements when said cranking handle is cranked to turn said shaft when the lid is fastened onto said open-top vessel.

4,160,605

**INK RIBBON BOX**

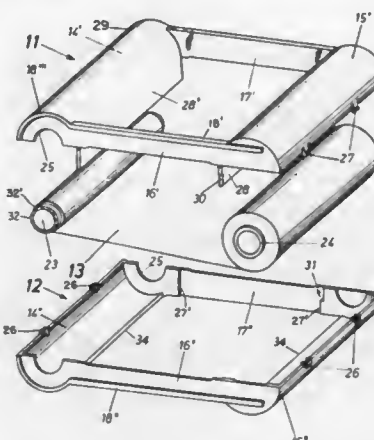
August E. Neubaum, Heppenheim, Fed. Rep. of Germany, assignor to Pitney Bowes Deutschland GmbH, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,367

Int. Cl.<sup>2</sup> B41J 33/14

U.S. Cl. 400—208

12 Claims



1. An ink ribbon box for use in a small printer, comprising: two cylindrical members oppositely spaced, parallel to one another, a pair of bridging flanges connected to the opposed ends of said two cylindrical members, each of said cylindrical members having an end to end extending opening, means within each of said cylindrical members for receiving an ink ribbon roll, the outer sides of said bridging flanges each having outwardly projecting guide fins which define guide channels thereon, one of said guide channels having a width which is different from the width of the other of said guide channels.

4,160,606

**PAPER FEED MECHANISM FOR MULTIPLE COPY PRINTER**

Santo Caenazzo, Rho, Italy, assignor to Honeywell Information Systems Italia, Italy

Continuation of Ser. No. 610,362, Sep. 4, 1975, abandoned. This

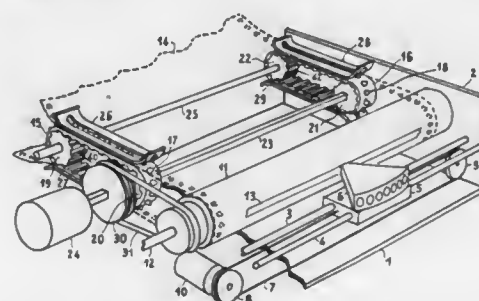
application Mar. 14, 1977, Ser. No. 777,985

Claims priority, application Italy, Sep. 27, 1974, 27802 A/74

Int. Cl.<sup>2</sup> B41J 15/20

U.S. Cl. 400—616.2

6 Claims



3. A mechanism for advancing a continuous print-receiving web through a printer, comprising: a rotatable cylindrical platen; web drive means for engaging said web in zones both upstream and downstream of said platen when said web is partially wound about said platen, said web drive means urging said web toward said platen with a first speed in said upstream zone and pulling said web away from said platen with said first speed in said downstream zone; and a coupling member for coupling together said web drive

means and said platen to provide a peripheral speed for said platen greater than said first speed.

4,160,607

**HINGE JOINTS FOR ELONGATED COLLAPSIBLE MEMBERS SUCH AS A FISHING ROD**

James R. Reichow, 2912 82nd Cir. North, Brooklyn Park, Minn. 55444

Filed Oct. 17, 1977, Ser. No. 842,492

Int. Cl.<sup>2</sup> F16B 7/10

U.S. Cl. 403—286

11 Claims



1. In a collapsible elongated member having at least two segments, each of the segments having at least one receiving end, the receiving end having an opening confined entirely therein, an improved hinge joint comprising: retention means for holding two segments in a substantially contiguous, linear relationship to each other so as to form an assembled member with a receiving end from one of the segments abutting a receiving end from the other segment; a unitary, nonelastic, flexible hinge formed from an environmentally stable material, the hinge having an elongated central portion between two ends; and hinge end means integrally formed as part of the hinge ends, the hinge end means securing each end of the hinge to a receiving end of each of the two segments and being freely movable within that portion of the segment adjacent the receiving ends.

4,160,608

**PRELOADING NUT FOR WEDGE SLEEVE**

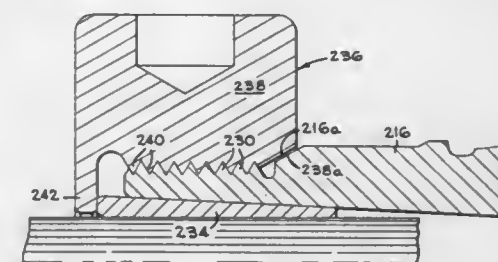
William J. Derner, and Connor E. Price, both of Indianapolis, Ind., assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 3, 1978, Ser. No. 874,962

Int. Cl.<sup>2</sup> F16B 2/14

U.S. Cl. 403—370

3 Claims



1. In apparatus to mount a tubular member on a shaft comprising a wedge sleeve received between said tubular member and said shaft, a nut received on said tubular member and in threaded engagement therewith, said nut having a radially inwardly extending resilient member rigidly connected thereto to engage the outer end of the wedge sleeve as the nut is advanced and to advance the wedge sleeve between the tubular member and the shaft, the improvement wherein said tubu-

lar member has a tapered surface facing said nut and said nut has a complementary tapered surface to engage and overlay the tapered surface on the tubular member when the nut is tightened on the tubular member to impose a positive limit to expansion of the tubular member by the wedge sleeve.

4,160,609

## CONNECTOR FOR BOLTED JOINTS

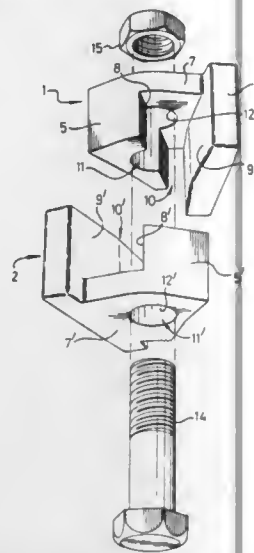
David B. Jackson, Rampton, and Keith T. Sisson, Mansfield, both of England, assignors to Hollybank Engineering Company Limited, Aylesbury, England

Filed Jan. 27, 1978, Ser. No. 872,755

Int. Cl.<sup>2</sup> B25G 3/00; F16D 1/00; F16G 11/00

U.S. Cl. 403—407

7 Claims



1. A connector for a bolted joint adapted to be mounted on a member to be connected to another member, the connector comprising:

a base portion, an intermediate portion and a key portion; opposed faces of said base and key portion being inclined and defining a channel which tapers convergently towards its base, which is provided by said intermediate portion, said opposing faces of said base and key portion also being disposed at an angle to each other so that the channel tapers along its length, said key portion being of complementary shape to said channel so that said connector can be clamped to another similar connector with each of said key portions received in the channel of the other connector, and wherein said connector has a bore therein for receiving a bolt extending through the connector and positioned to register with a bore of a similar connector when the connectors are clamped together by said bolt.

4,160,610

## COUPLING DEVICE FOR FURNITURE PARTS

P. Austen-Brown, Barnet; D. Youde, Aintree, and R. F. Pond, Chingford, all of England, assignors to Uermer Greenman Berger Limited, London, England

Filed Mar. 16, 1978, Ser. No. 887,113

Claims priority, application United Kingdom, Mar. 16, 1977, 11154/77; Aug. 15, 1977, 34099/77

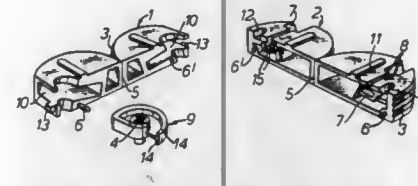
Int. Cl.<sup>2</sup> B25G 3/00; F16D 1/00; F16B 5/00

U.S. Cl. 403—407

11 Claims

1. An improved device for securing together at right angles two panels of an article of furniture, the device having first and second parts adapted to be received and retained in apertures formed in respective furniture sections to be joined, one part having a rotatable member with a camming surface which engages a part of the other member to secure the two parts together, the improvement being characterised by each part being of cylindrical form with a number of peripheral projec-

tions which serve to retain the part within a circular bore provided in the face of a respective panel, the first part having a flat side which locates against the face of the second part with the axes of said first and second parts at right angles, the first part having a rotatable plate which may be turned and caused to project from the flat side, the plate having a rim



defining by an inward face thereof, an inwardly developing camming surface along its length, the second part having a recess in the face defining a channel into which the plate member of the first part may move, with the camming surface engaging a surface in the channel so that the face of the second part is pulled into firm contact with the flat side of the first part.

4,160,611

## SYSTEMS FOR LAUNCHING OR HAULING UP SMALL BOATS

Arne Hveding, Borsaa, Norway, assignor to Lade Metall A/S, Trondheim, Norway

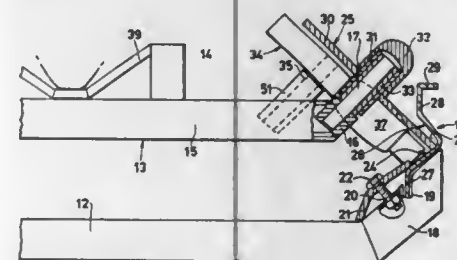
Filed Jan. 18, 1978, Ser. No. 870,334

Claims priority, application Norway, Jan. 17, 1977, 770127

Int. Cl.<sup>2</sup> B63C 3/12

U.S. Cl. 405—2

10 Claims



1. System for launching or hauling up pleasure and like small boats which comprises a pair of rails joined together by sleepers and a carriage supported by at least two pairs of carriage wheels to run along the rails, the rails being designed so that each of them forms a first track which is obliquely disposed in a lateral direction relative to a horizontal plane and a second track adjacent said first track and forming an angle in a lateral direction relative to the first track, said first track forming an abutment for the supporting surface of the wheels and the latter having axes obliquely disposed relative to a horizontal plane.

4,160,612

## TUBE CLOSURE

Fred G. Britton, Bedford; Robert J. Von Bose, and Cecil T. Keller, both of Arlington, all of Tex., assignors to Oil States Rubber Co., Arlington, Tex.

Filed May 1, 1978, Ser. No. 901,488

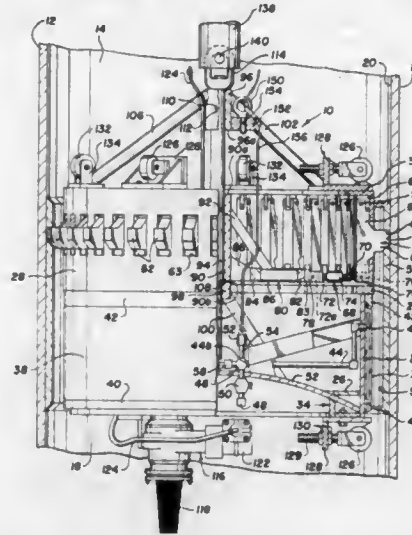
Int. Cl.<sup>2</sup> E02B 17/04

U.S. Cl. 405—227

8 Claims

1. In an offshore drilling platform support structure having hollow tubular legs and tubular members slideably disposed through tubular piling guides to secure the platform support structure in place, the tubular members having sealed ends for transporting to the drilling site and a central tube closure, the improvement comprising: a locking ring secured to the inner wall of the tubular member; a support casing; a bulkhead se-

cured to said support casing; seal means on said support casing sealing with the inner wall of the tubular member; connector means moveable between an extended position engaging the locking ring and a retracted position away from said locking ring; retraction means operably secured to said connector



means, said retraction means being arranged to move said connector means from the extended position to the retracted position to permit removal of the central tube closure from the tubular member; and means to equalize pressure on each side of the bulkhead to permit selective flooding of said tubular members.

4,160,613

## PILE ANCHOR FOR MOORINGS

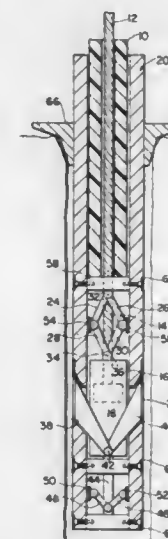
Tad Stanwick, 1735 K St. NW., Washington, D.C. 20006

Filed Jun. 23, 1978, Ser. No. 918,616

Int. Cl.<sup>2</sup> E02D 5/74, 27/50

U.S. Cl. 405—244

11 Claims



1. A pile anchor for moorings comprising:

A. A flexible elongated housing;

B. An anchor stock reciprocally positioned within the bottom of said housing and including:

i. a pair of flukes pivoted at their inner ends to said stock and extending outwardly through apertures in said housing, so that their outer ends are engagable with the surrounding seabed;

C. An anchor cable extending axially within said housing and embedded at its lower end within said anchor stock;

D. A bellis expander assembly pivoted at its top within said housing and said bellis at its bottom being pivoted to said anchor stock, so that two pairs of free ends engage the walls of said housing as expanders during longitudinal reciprocation of said cable and said anchor stock.

4,160,614

## EXPANSION SHELL ASSEMBLY AND METHOD FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

Stephen F. Koval, Portage, Pa., assignor to Jennmar Corporation, Cresson, Pa.

Filed Mar. 23, 1978, Ser. No. 889,409

Int. Cl.<sup>2</sup> E21D 21/00

U.S. Cl. 405—259

13 Claims



1. An expansion shell assembly for anchoring a bolt in a bore hole containing adhesive material comprising, a camming plug threadably engaged to the end of the bolt for axial movement thereon, an expandable shell having a plurality of longitudinally extending fingers spaced from one another by longitudinal slots, said fingers each having an inner surface abutting said camming plug and an outer surface adapted to engage the wall of the bore hole, releasable means securing said camming plug to the bolt for rotating the bolt in a first direction to facilitate mixing of the adhesive material in the bore hole, and said releasable means being operable upon rotation of the bolt in a second direction to permit rotation of the bolt relative to said camming plug and effect advancement of said camming plug on the bolt to exert an outward force upon said inner surfaces of said fingers to expand said fingers in the bore hole and thereby tension the bolt.

4,160,615

## CABLE ROCK ANCHOR

Stanley L. Baldwin, Winnipeg, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,191

Int. Cl.<sup>2</sup> E21D 21/00

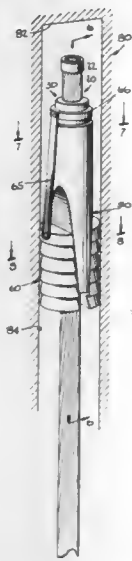
U.S. Cl. 405—259

7 Claims

1. An anchor assembly adapted to anchor a cable disposed within a hole comprising, in combination, cable gripping means for gripping said cable while said cable and said anchor assembly are being advanced within said hole, and expandable hole gripping means in contact with said cable gripping means, said cable gripping means comprising a set of conical wedges having toothed faces in contact with said cable and smooth frustoconical outer faces engaging a cooperating smooth frustoconical face communicating with said hole gripping means, said expandable hole gripping means having outer hole-engaging toothed faces and smooth wedge shaped inner faces in contact with smooth wedge faces communicating with said cable gripping means to expand said hole-engaging toothed

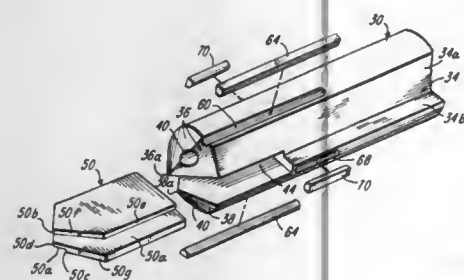


faces outwards in response to tension applied to said cable, whereby tension applied to said cable causes said cable grip-



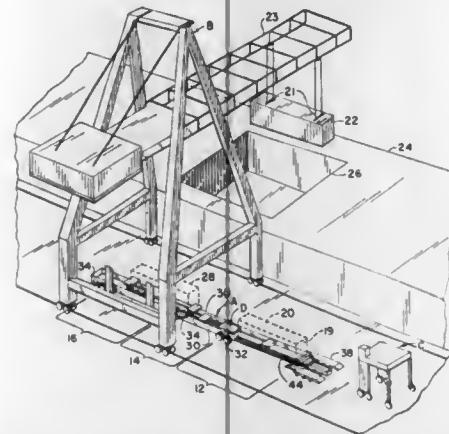
ping means to grip said cable ever more tightly and said hole gripping means to engage the face of said hole ever more tightly as said tension is increased.

**4,160,616**  
**DRILL CONTAINING MINIMUM CUTTING MATERIAL**  
Michael E. Winblad, 835 N. Hyatt St., Tipp City, Ohio 45371  
Filed Oct. 3, 1977, Ser. No. 838,802  
Int. Cl.<sup>2</sup> B23B 51/00  
U.S. Cl. 408—144 7 Claims



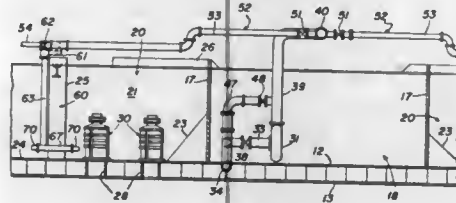
1. A drill of the type having an elongate shank of tool steel material and having a maximum diameter dimension, the shank having a tip part provided with a pair of spaced-apart tapered portions, the improvement comprising a cutting element of cutting material having a hardness greater than said tool steel material and positioned between the tapered portions and attached to the shank, the cutting element having at least four parallel transversely extending surfaces within a total transverse dimension, each of these surfaces having a transverse dimension substantially equal to one-half the maximum diameter dimension of the shank, there being a pair of opposed parallel surfaces which are spaced-apart by a given dimension, the cutting element also having a pair of intermediate opposed parallel surfaces which are spaced-apart less than the given dimension to form a cutting web which has a dimension less than the given dimension each of the transversely extending surfaces having a transverse dimension substantially less than the total transverse dimension of the cutting element.

**4,160,617**  
**CONTAINER CONVEYOR APPARATUS AND METHOD FOR VESSEL LOADING CRANE-YARD INTERFACE**  
Murray M. Montgomery, Oakland; William F. Gilger, Concord, and William W. Stelner, San Francisco, all of Calif., assignors to Matson Navigation Company, San Francisco, Calif.  
Filed Aug. 1, 1977, Ser. No. 821,010  
The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> B65G 67/00  
U.S. Cl. 414—139 16 Claims



1. Apparatus for conveying containers between a vessel crane for loading and unloading containers of at least a first or a second predetermined length from a vessel and the yard classification equipment for distributing containers to and from a container handling yard, the apparatus comprising:  
a pair of elongate support members extending along a single file conveyance path including a first work station underlying said vessel loading crane, a second work station at the remote end of said support member and an intermediate support for the support of at least one container between said work stations;  
vehicle means underlying the support members and any containers resting thereon for running reversibly along said support members between the work stations, the vehicle means including lifting means for raising said containers from a support position on said support members; and  
means for moving the vehicle means between said work stations along said single file conveyance path for the movement of said containers on said path over said support members, including first circuit means for determining movement on said path as a function of the length of the container being conveyed.

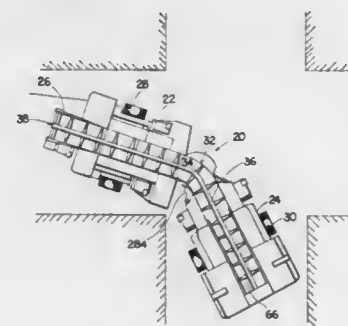
**4,160,618**  
**LIQUID AGITATOR FOR HOPPER**  
Ezra Sensibar, Chicago, Ill., assignor to David Sensibar Irrevocable Trust, Chicago, Ill.  
Filed Feb. 13, 1978, Ser. No. 877,102  
Int. Cl.<sup>2</sup> B65G 3/12  
U.S. Cl. 414—142 16 Claims



1. In a hopper dredge vessel having a hopper for containing

liquid and solid material with the solid material tending to agglomerate at the bottom of the hopper and having a discharge port, agitation apparatus comprising a fluid discharge nozzle disposed closely adjacent to the bottom of the hopper and directed toward areas where solid material tends to agglomerate and toward the discharge port, said fluid discharge nozzle having an input end and a discharge end, the axis of said discharge end being disposed closer to the bottom of the hopper than is the axis of said input end, conduit means connecting said discharge nozzle to a source of fluid for carrying fluid from the source to said nozzle, and pump means coupled to said conduit means for delivering fluid to said nozzle under a high pressure such that the fluid is ejected therefrom in a stream having a velocity and volume sufficient to break up agglomerations of solids and carry them toward the discharge port and prevent the formation of agglomerations at the bottom of the hopper.

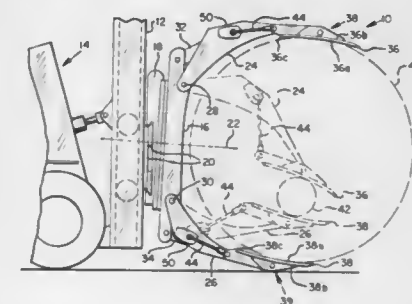
**4,160,619**  
**HORIZONTALLY ARTICULATED SHUTTLE CAR**  
Robert C. Nelson, Bluefield, W. Va., assignor to New River Manufacturing Company, Inc., Glen Lyn, Va.  
Filed Nov. 4, 1977, Ser. No. 848,761  
Int. Cl.<sup>2</sup> B60P 1/38  
U.S. Cl. 414—501 9 Claims



1. A mine haulage vehicle comprising:  
an elongated body having a front body section and a rear body section which are interconnected by a pivot section to enable said body sections to swing horizontally relative to each other about a vertical pivot axis;  
a pair of ground engaging wheels on each of said body sections;  
steering means including power means for swinging said body sections relative to one another about said vertical pivot axis;  
said front body section having a front floor plate and a pair of front sidewalls defining a front material-carrying conveyor trough;  
said rear body section having a rear floor plate and a pair of rear sidewalls defining a rear material-storing load compartment;  
said pivot section comprising -  
(a) an upper pair of overlapping plates connected respectively to said body sections, a top one of said plates being coplanar with said front floor plate;  
(b) a lower pair of overlapping plates connected respectively to said body sections and spaced below said upper pair of overlapping plates;  
(c) each of said pairs of overlapping plates being pivotally interconnected about said vertical pivot axis;  
(d) a pair of flexible sidewalls extending freely across said top one of said upper pair of overlapping plates connected between said pairs of front and rear sidewalls providing a flexible conveyor trough for guiding material across said pivot section throughout a range of horizontally swung positions of said front and rear body sections;  
a center strand conveyor trained for orbital movement about reversing means at the front and rear ends of said front and

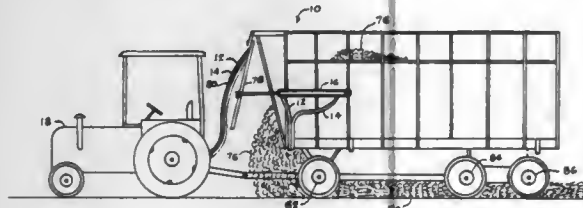
rear body sections respectively, said conveyor having an upper, conveying run movable along the rear floor plate, along the flexible conveyor trough, and along the front floor plate for loading material into the load compartment and for discharging material therefrom, said conveyor having a lower, return run movable from the front to the rear body sections across said lower pair of overlapping plates, said conveyor being horizontally flexible to follow a curved path through the flexible conveyor trough when the front and rear body sections are swung throughout their said range of horizontally swung positions.

**4,160,620**  
**LIFT TRUCK PAPER ROLL CLAMP HAVING IMPROVED CONTACT PAD RESTRAINT AND HINGE STRUCTURE**  
Stanley E. Farmer, Troutdale, and Harry F. Weinert, Portland, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.  
Filed Sep. 1, 1977, Ser. No. 829,631  
Int. Cl.<sup>2</sup> B66F 9/18  
U.S. Cl. 414—621 11 Claims



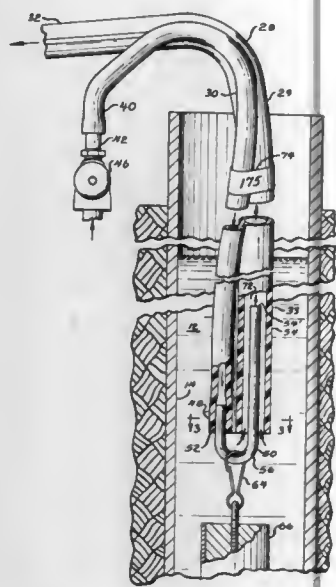
1. A load-handling clamp adapted to be mounted upon the lifting apparatus at the forward end of a lift truck for engaging a roll of paper comprising:  
(a) a frame adapted to be mounted upon said lifting apparatus so as to be selectively movable vertically by said lifting apparatus;  
(b) a pair of selectively openable and closeable opposing clamp arms mounted upon said frame projecting longitudinally therefrom in a forward direction, said clamp arms each having longitudinal edges extending longitudinally along opposite sides thereof;  
(c) power means mounted upon said frame for selectively opening and closing said clamp arms;  
(d) contact pad means hingedly connected to a forward end of a respective one of said pair of clamp arms for pivoting with respect to the respective clamp arm about an axis transverse to said forward direction; and  
(e) a pair of restraint means for limiting the pivotal movement of said contact pad means with respect to its respective clamp arm, each of said pair of restraint means comprising a forwardly extending elongate member pivotally connected at its forward end to the respective contact pad means and connecting means for slidably connecting the rearward end of said elongate member to the respective clamp arm and limiting the sliding movement of said member with respect to said clamp arm in a forward direction, the elongate member and connecting means of each of said pair of restraint means being located along a respective one of the opposite longitudinal edges of said clamp arm and positioned exterior of the respective edge.

4,160,621  
**TOTAL HYDRAULIC SILAGE WAGON**  
 Raymond Bishop, Rte. 4, Lawrenceburg, Tenn. 38464  
 Filed Nov. 4, 1977, Ser. No. 848,500  
 Int. Cl.<sup>2</sup> B60P 1/38  
 U.S. Cl. 414—786



1. A process for unloading silage which comprises setting a lever on a tractor so as to pump hydraulic fluid from an hydraulic fluid tank on said tractor to a pair of hydraulic cylinders, one located on each side of a top-hinged front gate of a wagon being pulled by said tractor, thereby opening said gate, and, substantially at the same time, by pumping hydraulic fluid from the same hydraulic tank, starting an hydraulic motor located on the wagon in juxtaposition with gears to cause said gears to turn an endless chain-type conveyor in the bottom of the wagon and thereby discharge silage from the wagon into a trench silo as said tractor moves therethrough, levelling the silage with axles of the wagon as they move over it, and, after discharging silage, resetting the lever so as to cause the hydraulic fluid to reverse cylinder action and close said door and at substantially the same time cause the motor to stop turning of the conveyor.

4,160,622  
**PORTABLE WATER SAMPLING APPARATUS**  
 Edward N. Colburn, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.  
 Filed Jul. 14, 1977, Ser. No. 815,874  
 Int. Cl.<sup>2</sup> F04F 5/44  
 U.S. Cl. 417—181



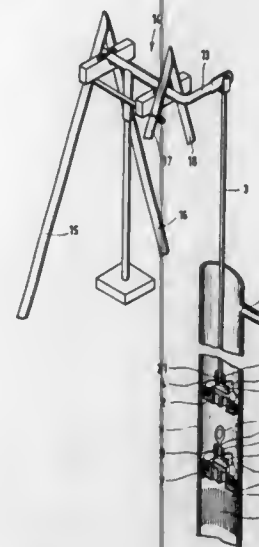
1. A portable water pumping apparatus for sampling water from a well comprising a wound coil of elongated, flexible tubing which is normally stored on a hose reel mounted for rotation on a wheeled cart, said flexible tubing being made of a plastic which has a memory and which has been extruded straight and maintained straight for at least several days prior to coiling, said tubing consisting of a pair of parallel arranged small and large diameter tubing portions integrally joined by a web portion; connector means insertable in the upper end of

1 Claim

said small diameter tubing portion and having a threaded portion adapted to engage the threaded portion of a cylinder of pressurized gas; a J-shaped connector formed of a short length of hollow tubing and having its shorter leg inserted in frictional engagement with the inside of said small diameter tubing portion at the lower end thereof, the longer leg having a length of at least 4 inches positioned in the adjacent lower end of said large diameter tubing portion but annularly spaced from the inner walls thereof; a weight member removably suspended from said J-shaped connector; the upper end of said large diameter tubing portion comprising a discharge opening means for discharging water forced up through said annular space and said large diameter tubing portion by gas passing down through the small diameter tubing portion and J-shaped connector from said cylinder when at least a portion of said coil of tubing is unwound and the lower end portion of each tubing portion and the top of the J-shaped connector is submerged beneath the water in a well.

4,160,623  
**DEEP WELL PUMP**  
 William K. Journey, Greenwood, Miss., assignor to Preussag Aktiengesellschaft, Hanover and Berlin, Fed. Rep. of Germany  
 Filed May 26, 1976, Ser. No. 690,012  
 Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530504; Jul. 9, 1975, 2530576  
 Int. Cl.<sup>2</sup> F04B 21/04, 21/06  
 U.S. Cl. 417—238

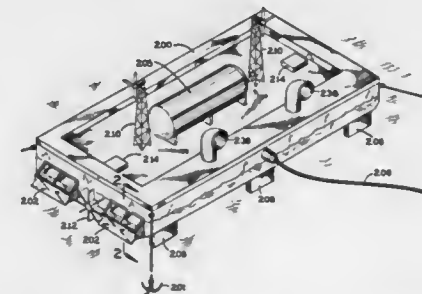
13 Claims



1. A deep well pump comprising a pump cylinder, adapted to be positioned in the ground, a foot valve structure having a foot valve and coupling means thereon, a valved piston movable in said cylinder over a given range of movement and also having coupling means thereon substantially identical to said first mentioned coupling means, and piston actuating means connected to said piston by said coupling means on said piston and having a length such that the actuating means is adapted to extend above the ground, said cylinder having a length such that it extends for a substantial length beyond said range of movement of the piston and also extends above the ground when the cylinder is positioned in the ground in said deep well and having a substantially constant diameter over its length, said substantially constant diameter cylinder also extending beneath said range of movement of said piston and including filter slits therein, and wherein said foot valve structure and said valved piston are substantially identical to and interchangeable with each other and said valved piston is movable during operation relative to said foot valve structure.

4,160,624  
**WATER VEHICLE-ACTUATED AIR COMPRESSOR AND SYSTEM THEREFOR**  
 Roland L. Smith, Homestead, Fla., assignor to Nu Watt, Inc., Palm Harbor, Fla.  
 Division of Ser. No. 814,685, Jul. 11, 1977, Pat. No. 4,115,034.  
 This application Jan. 16, 1978, Ser. No. 870,032  
 Int. Cl.<sup>2</sup> F04B 35/00  
 U.S. Cl. 417—330

3 Claims



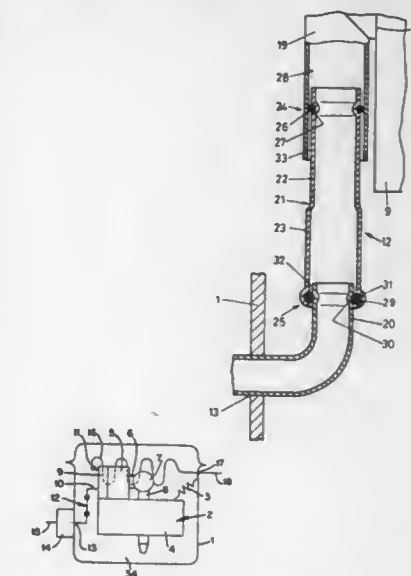
1. A water wave actuated system for compressing air and thereby generating electrical energy comprising:  
 an electricity generator operated by compressed air to generate electricity;  
 air storage means operatively connected to said generator to supply compressed air to said generator for operating the same;  
 underwater actuator means for actuation in response to waves in a body of water;  
 a plurality of cylinders;  
 a plurality of pistons having forward and reverse strokes respectively in said cylinders and movable in response to actuation of said actuator means by waves for compressing air in said cylinders;  
 vent means for each said cylinder communicating with one side of said piston therein for introducing air at atmospheric pressure into said cylinder behind said piston during a forward stroke of said piston;  
 valve-controlled vent means for each said cylinder communicating with the other side of said piston therein for introducing air at atmospheric pressure into said cylinder on the side of said piston during a reverse stroke thereof;  
 outlet means communicating with said other side of each said piston for supplying air compressed by said piston during a forward stroke thereof to said air storage means enroute to said electricity generator;  
 said actuator means comprising a plurality of first paddles totally submerged in the water and horizontally pivoted less than 45 degrees from the horizontal position for up and down movement by waves in the water and operatively coupled to certain of said pistons for reciprocating the latter in the corresponding cylinders;  
 and said actuator means further comprising a plurality of second paddles totally submerged in the water and horizontally pivoted less than 45 degrees from the vertical position for horizontal back and forth movement by waves in the water and operatively coupled to the remaining pistons for reciprocating the latter in the corresponding cylinders.

4,160,625  
**ENCAPSULATED REFRIGERATOR**  
 Jan Dyhr, Sonderborg, and Ole J. Nissen, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark  
 Filed Nov. 7, 1977, Ser. No. 849,308  
 Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650937  
 Int. Cl.<sup>2</sup> F04B 17/00, 35/00; F16L 39/04  
 U.S. Cl. 417—363

2 Claims

1. An encapsulated refrigerator assembly, comprising, a capsule, an integrated motor and compressor unit resiliently

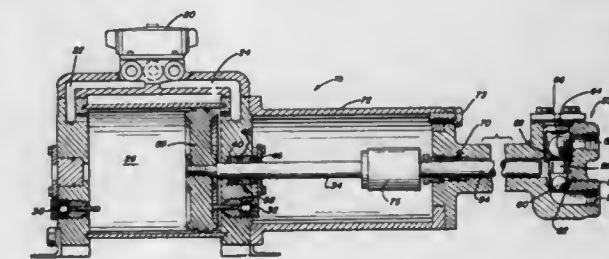
mounted in said capsule with said motor unit having a generally vertically extending axis, a compressor inlet port, an inlet port in said capsule, in circumferential alignment with said compressor port but axially and radially offset therefrom relative to the said motor axis, L-shaped pipe fittings for said ports having their free ends in coaxial and axially offset relation to each other, a connecting pipe between said fittings with its end in axially overlapping relation thereto, said connecting pipe having each end with a different diameter than the adjacent



one of said fittings and in radially spaced relation thereto to allow for relative lateral movement of said pipe relative to said fittings, said connecting pipe forming upper and lower articulated joints with said fittings, one of said articulated joints comprising mutually facing annular recesses in said connecting pipe and the corresponding one of said fitting with a resilient O-ring between said recesses, the other of said articulated joints forming a telescopic joint with an annular recess is only one member of said joint to allow telescopic action.

4,160,626  
**DRIVE ROD COUPLING FOR POSITIVE DISPLACEMENT PUMP**  
 Robert R. Bell, Houston, Tex., assignor to Vapor Corporation, Chicago, Ill.  
 Continuation of Ser. No. 661,308, Feb. 25, 1978, abandoned.  
 This application Sep. 19, 1977, Ser. No. 834,797  
 Int. Cl.<sup>2</sup> F04B 17/00  
 U.S. Cl. 417—403

3 Claims



1. In a reciprocating pump of the type including a pair of coaxial reciprocating and rectilinearly moving elements for pumping incompressible fluids, one reciprocating element being a piston rod driven by a pressure operated piston and the other being an incompressible fluid plunger slideably mounted in a plunger cylinder for pumping fluid, the improvement comprising:



a coupling device for connecting said rod and said plunger, including

a retainer on one of said members, said retainer comprising a body including a first open end and a second closed end and a side wall defined therebetween, said side wall and said second end defining a chamber within said body, a head on the other of said members,

a plurality of Belleville washer means for resiliently maintaining said head in said retainer to prevent separation of said head and said retainer through the entire stroke of said rod and said plunger, and

a bearing positioned within said chamber between said second end of said body and said head, said bearing being of substantially the same cross-sectional configuration and transverse dimension as said chamber, said bearing including a planar first end abutting a complementary portion of said second end of said retainer, said bearing also including a second end abutting a face of said head, said abutting relationships being the sole means supporting said bearing, said face being of a substantially hemispherical configuration and said second end of said bearing having a face of a complementary configuration to said face of said head, said bearing face and said head face held in abutting relationship throughout said stroke by said resilient means.

4,160,627

### HYDRAULICALLY POWERED TRIPLEX PUMP AND CONTROL SYSTEM THEREFOR

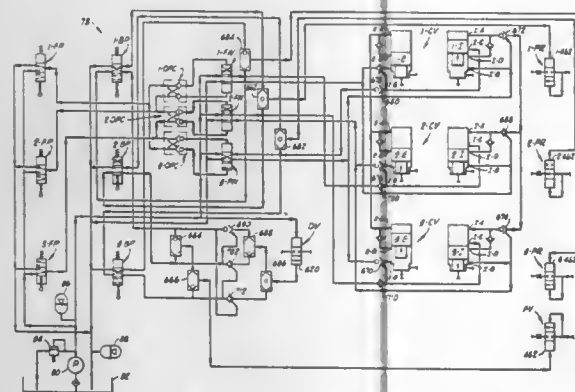
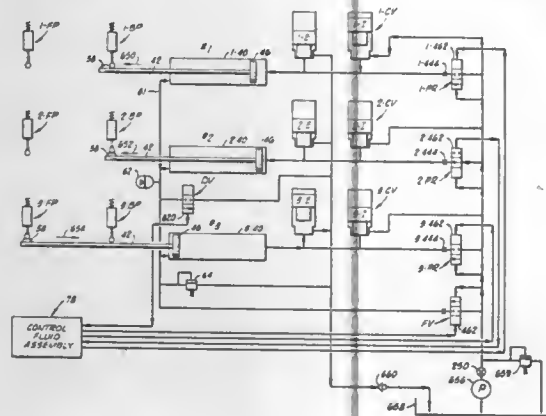
Clinton W. Cole, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 612,510, Sep. 11, 1975, abandoned, which is a division of Ser. No. 489,763, Jul. 18, 1974, abandoned, which is a division of Ser. No. 406,967, Oct. 16, 1973, Pat. No. 3,847,511. This application Apr. 6, 1977, Ser. No. 785,307

Int. Cl.<sup>2</sup> F04B 17/00, 35/04

U.S. Cl. 417-403

4 Claims



1. A hydraulically operated control valve assembly for use in controlling the application of pressurized power fluid to a piston and cylinder pump having a power cylinder on one end

and a fluid cylinder on the opposite end and a common piston rod assembly longitudinally movably received in the power cylinder and the fluid cylinder, the control valve assembly being of the type which includes:

a power fluid inlet valve body having power fluid entry and exit passages;

a power fluid exhaust valve body having power fluid entry and exit passages;

power fluid inlet sleeve valve means carried by said power fluid inlet valve body for providing selective communication between the power fluid entry passage and the power fluid exit passage of said power fluid inlet valve body;

power fluid exhaust sleeve valve means carried by said power fluid exhaust valve body for providing selective communication between the power fluid entry passage and the power fluid exit passage of said power fluid exhaust valve body;

the entry passage of said power fluid inlet valve body being in continuous communication with a source of pressurized power fluids;

the exit passage of said power fluid exhaust valve body being in continuous communication with a power fluid reservoir;

a common chamber in continuous communication with the power fluid entry passage of said power fluid exhaust valve body and the power fluid exit passage of said power fluid inlet valve body, said common chamber communicating with the power cylinder; and

precompression valve means having a power fluid entry passage, a power fluid exit passage in continuous communication with said common chamber through power fluid flow reducing means, and the entry passage being in continuous communication with the source of pressurized power fluid and being in selected communication with said common chamber through the exit passage and the power fluid flow reducing means, for producing a limited precompression of power fluid in the power cylinder,

in combination with the improvement comprising:

hydraulic control circuit means for providing hydraulic control of said precompression valve means independently of the power fluid, said hydraulic control circuit means including:

a source of pressurized hydraulic control fluid; said precompression valve means including a

hydraulically operated valve member; and further including a hydraulic fluid control entry passage therein, said valve member selectively placing pressurized power fluid in communication with said common chamber and, alternately, for blocking such communication in response to the absence or presence of pressurized hydraulic control fluid at the hydraulic control fluid entry passage, respectively; and

control valve means interposed between and in selective hydraulic communication with said source of pressurized hydraulic control fluid and the control fluid entry passage of said hydraulically operated precompression valve means for alternately blocking and passing pressurized hydraulic control fluid there-through in response to the position of the common piston and rod assembly of the piston and cylinder pump; and

said hydraulic control fluid entry passage of said precompression valve means being continuously isolated from said source of pressurized power fluid and isolated from the power fluid exit passage of said precompression valve means.

4,160,628

### POSITIVE DISPLACEMENT MACHINE

Manfred Ruoff, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

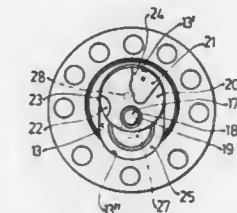
Filed Feb. 23, 1978, Ser. No. 880,892

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709174

Int. Cl.<sup>2</sup> F04B 19/02, 29/00

U.S. Cl. 417-465

20 Claims



1. A positive displacement machine, comprising a housing bounding an elongated interior compartment; a flat displaceable part-circular element received in said compartment and subdividing the same into a pressure chamber and a suction chamber having a pressure port and a suction port, respectively, said element having a periphery extending over more than 180° of arc and a diameter corresponding to the width of said interior compartment in a direction transverse to the elongation thereof, said displaceable element having in said periphery thereof a recess bounded by two edges which are spaced circumferentially of said periphery; and means for imparting to said element a translatable displacement and for superposing on said translatable displacement an angular movement such that during displacement of said element between two opposite dead center positions said pressure and suction chambers are temporarily placed in communication by said recess so as to permit displacement of a fluid from one to the other chamber.

4,160,629

### LIQUID IMMERSIBLE SCROLL PUMP

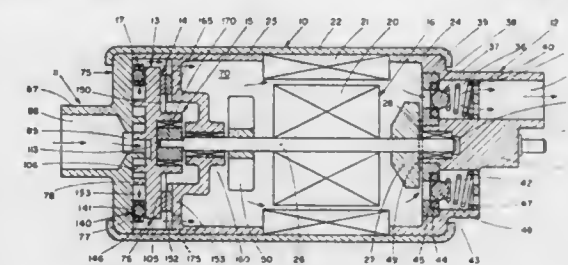
William P. Hidden, Wenham, and John E. McCullough, Carlisle, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Jun. 17, 1977, Ser. No. 807,414

Int. Cl.<sup>2</sup> F04C 1/02

U.S. Cl. 418-55

53 Claims



1. A liquid immersible self-lubricating and self-cooling pump, comprising in combination

(a) housing means with liquid inlet and discharge means on opposite ends thereof;

(b) scroll pump means comprising an orbiting scroll member with an end plate and an involute wrap and a stationary scroll member with an end plate and an involute wrap, said scroll pump means being positioned within said housing to receive liquid through said inlet means into a central scroll pump zone and discharge it at a predetermined pressure into a peripheral scroll pump discharge zone, said inlet means comprising a central liquid port in said end plate of said stationary scroll member, the configuration of said central port being defined along one principal bound-

ary by a partial tracing of the edge of said wrap of said orbiting scroll member and along another principal boundary by a line coinciding with a straight line drawn as a tangent to the generating radius of said wrap of said stationary scroll member;

(c) driving means within said housing arranged to drive said orbiting scroll member to experience orbiting motion with respect to said stationary scroll member; and

(d) coupling means to maintain a predetermined angular relationship between said scroll members; the flow of liquid through said scroll pump and said housing means around said driving means and into said liquid discharge means being such as to effect (1) tangential sealing between said involute wraps making moving line contact as said orbiting scroll member is driven, and (2) axial sealing to prevent radial leakage between said end plates and said involute wraps of said scroll members, whereby said scroll pump means is essentially self-sealing.

4,160,630

### GEAR PUMPS WITH LOW PRESSURE SHAFT LUBRICATION

Barry Wynn, Tarrant Gunville, England, assignor to General Signal Corporation, Stamford, Conn.

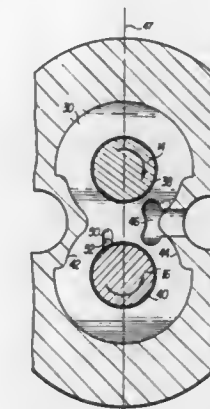
Filed Jan. 30, 1978, Ser. No. 873,650

Claims priority, application United Kingdom, Feb. 1, 1977, 3999/77

Int. Cl.<sup>2</sup> F04C 15/00

U.S. Cl. 418-102

5 Claims



1. An improved rotary gear pump comprising:

a housing having an inlet and an outlet chamber;

a pair of shafts mounted for rotation in said housing on bearings supported by said housing;

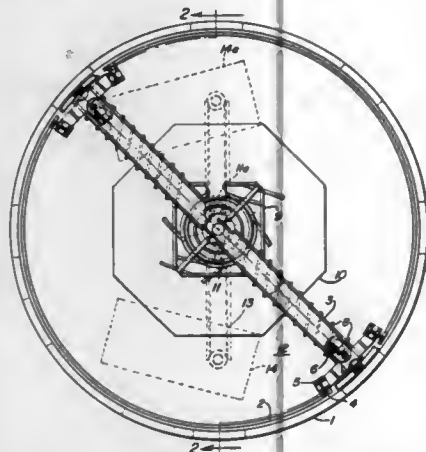
a pair of gears, one mounted on each of said shafts, said gears having gear teeth intermeshing at a zone located between said inlet chamber and said outlet chamber; said gear teeth sequentially enclosing volumes of fluid therebetween as said gears intermesh in said zone;

at least one seal plate located between said bearings and said gears with said shafts extending through said seal plate; channel means in said seal plate, originating adjacent to said zone at a location in which said channel means is open to receive fluid from said volumes between said intermeshing teeth only while said volumes are increasing, for directing fluid from said zone through one of the bearings adjacent said seal plate;

means for receiving fluid from said one bearing and directing it through the other bearing on the adjacent shaft; and means for receiving fluid from said other bearing and returning it to said inlet chamber.

4,160,631  
**PRILL TOWER RAKE**  
 Robert M. Stewart, and Robert W. Schwartz, both of Memphis, Tenn., assignors to W. R. Grace & Co., New York, N.Y.  
 Filed Sep. 13, 1977, Ser. No. 832,933  
 Int. Cl.<sup>2</sup> B29C 23/00

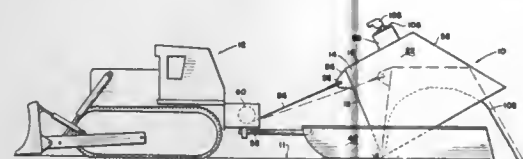
U.S. Cl. 425—10



1. Prill cooling and collecting apparatus including means for dropping prills through a prilling tower onto a screen, said screen being positioned over an air plenum having an air source; wherein the improvement comprises (a) at least one central opening in said screen for exit of said prills, (b) a rake positioned over said screen, said rake having arms pivoting over the screen center, said arms carrying rake beams, and (c) rake drive means for the rake beams to rake the prills toward said central opening in said screen.

4,160,632  
**APPARATUS TO DISPOSE OF FLY ASH**  
 William F. Scriminger, and William H. Ricketts, both of Muskogee, Okla., assignors to Muskogee Environmental Conservation Co., Muskogee, Okla.  
 Continuation-in-part of Ser. No. 776,115, Mar. 10, 1977, abandoned. This application Apr. 10, 1978, Ser. No. 894,915  
 Int. Cl.<sup>2</sup> B29C 5/02

U.S. Cl. 425—62



1. A fly ash disposal system comprising:  
 (a) a container enclosed by side walls and an upper closed top member, the bottom thereof being open, the said sidewalls being tapered upwardly and inwardly to the closed top member;  
 (b) fly ash inlet provided in the upper portion of the container for receiving air blown fly ash therethrough;  
 (c) liquid spray means carried by the container and disposed within the upper portion of the container for settling and caking the incoming fly ash;  
 (d) exhaust filter means carried by the upper portion of the container and in communication with the interior thereof;  
 (e) means attached to said container for assisting the removal of said container, and  
 (f) removal means associated with said attached means for removing the container without disturbing the caked fly ash;  
 whereby fly ash is blown into the container through the fly ash inlet and is settled to the bottom thereof by liquid spray from

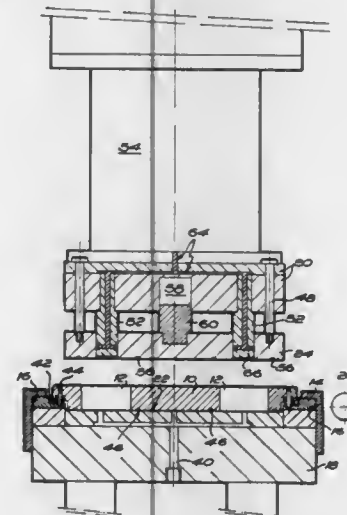
the liquid spray means for ultimately hardening the fly ash into a fly ash cake, the resultant air being removed by expulsion through the filter means.

9 Claims

4,160,633  
**APPARATUS FOR Moulding COMPONENTS IN COMPACTABLE MATERIALS**  
 Kenneth H. Strawson, and Gerald Spencer, both of Sheffield, England, assignors to National Research Development Corporation, London, England  
 Filed May 31, 1978, Ser. No. 911,155  
 Claims priority, application United Kingdom, Jun. 15, 1977, 25137/77

Int. Cl.<sup>2</sup> B30B 4/28  
 U.S. Cl. 425—85

9 Claims



1. In apparatus for moulding components in compactable materials, a die plate having at least one die cavity, a filter assembly adapted to form a closure member for said at least one die cavity at one side of said die plate, and means for injecting a slurry material into the at least one die cavity and for maintaining a slurry pressure within the mould cavity sufficient to achieve a required density of finished compact, the filter assembly being constituted by a filter block with a grooved surface and a filter pad in abutment with said grooved surface.

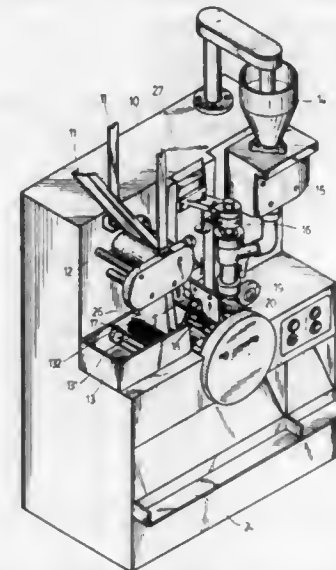
4,160,634  
**AUTOMATIC DUMPLING MAKING MACHINE**  
 Te-Hslu Huang, 79 Lane 225, Sec. 1, Chung-Hua Rd., Taichung, Taiwan  
 Filed Aug. 19, 1977, Ser. No. 826,210  
 Int. Cl.<sup>2</sup> A21C 9/06, 9/08

U.S. Cl. 425—112

10 Claims

1. An automatic dumpling making machine substantially comprising a dough sheet holder for holding dough sheets to be used; a transmission mechanism for transmitting the dough sheets; a flour container for containing flour to be applied over the sheets; a stuffing hopper for storing stuffings; a stuffing control device for controlling the amount of stuffings to be fed into a sheet; a stuffing feeding device for feeding stuffings into a sheet; a hitting device for hitting the central part of the sheet to form a dent for receiving stuffings; two polygon-shaped rotating wheels; a plurality of dumpling forming devices mounted on the peripheral surfaces of said two polygon-shaped rotating wheels for folding up the dough sheet to form a dumpling; a pushing rod for pushing the finished dumplings out of the forming device; a fixed and a movable brush means for cleaning the dumpling forming device; and a dumpling collector and a dough sheet collector for collecting the finished dumplings and remaining dough sheets respectively,

wherein each dough sheet is transmitted by the transmission mechanism to one of the dumpling forming devices where the sheet is hit by the hitting device to form a central dent and stuffings are fed into the dent from the hopper through the stuffing controller, and the forming device then folds up the dough sheet and cuts the same into a desirable shape and size, said movable brush comprising a brush part and a handle

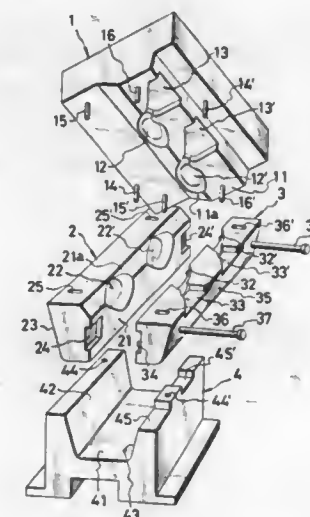


whose one end is formed into a ring groove for receiving one head of a fork, and the other end of the fork being secured to a seat, the fork having an arm with a wheel mounted thereon for engaging with a cam having a lobe so that when said cam lobe comes into contact with the wheel the fork is forced to rotate with respect to the fixed fork head and pull the brush backward, the brush being thereafter spring means pushed forward again.

4,160,635  
**APPARATUS FOR PRODUCING WOODEN HEADS OF GOLF CLUBS**  
 Yosaku Ikeda, 7229, Fukumitsu-cho, Nishitonami-gun, Toyama-ken, Japan  
 Filed Aug. 8, 1977, Ser. No. 822,832  
 Claims priority, application Japan, Aug. 10, 1976, 51-106682  
 Int. Cl.<sup>2</sup> B29C 6/00, 17/00

U.S. Cl. 425—128

7 Claims



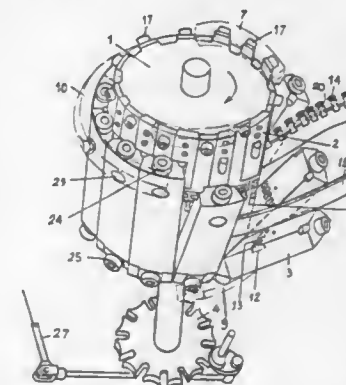
1. A molding apparatus for producing wooden heads of golf clubs including:  
 an upper mold member and a pair of lower mold members,

said upper mold member and lower mold members forming cavities for receiving resin-impregnated wooden head materials to be subjected to compression molding;  
 a bed having a receiving groove for receiving said lower mold members, said receiving groove having inclined inside walls for pressing said lower mold members together by wedge action;  
 said lower mold members having facing sides facing toward each other; a protruding member having one portion between said facing sides and having a second portion protruding beyond one end of said facing sides of said lower mold member;  
 wherein said protruding member is comprises of relatively hard resilient materials which are interposed between said pair of lower mold members, means formed in at least one of said facing sides for receiving said protruding member therein and this said means and said protruding member being so shaped that upon said lower members being pressed together by said inclined inside walls, said protruding member is compressed and upon said lower mold members being released from being pressed by said inclined walls, said protruding member resiliently urges said lower mold members apart;  
 an upper hot plate carrying said upper mold member, and a lower hot plate carrying said bed thereon.

4,160,636  
**INJECTION MOLDING APPARATUS FOR THE MANUFACTURE OF ZIPPERS**  
 Dino Magherini, Via Osservatorio 36, Florence, Italy  
 Filed Sep. 27, 1977, Ser. No. 837,149  
 Claims priority, application Italy, Sep. 30, 1976, 9607 A/76;  
 Sep. 20, 1977, 9573 A/77  
 Int. Cl.<sup>2</sup> B29D 5/00; B29F 1/00

U.S. Cl. 425—129 R

9 Claims



1. Apparatus for the manufacture of zippers comprising a rotor having a vertical axis, means for intermittently rotating said rotor around said vertical axis, a plurality of molds carried by said rotor, each mold including two mold sections one being fixed and the other movable to open and close the mold, and an injection station adjacent said rotor including means for injecting material into the molds as they successively pass the injection station, said fixed mold section being secured to the rotor, said movable mold section including a hinge connection with said rotor at the lower end of the movable mold section.



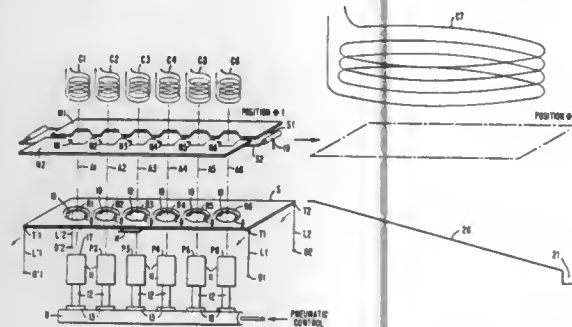
**4,160,637**  
**APPARATUS FOR TREATING A SPINNERET PLATE TO BE REUSED INTO THE MANUFACTURE OF SYNTHETIC FIBERS**

Theodore M. Jordan, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 12, 1978, Ser. No. 869,072

Int. Cl.<sup>2</sup> D01D 3/00

U.S. Cl. 425—225



1. An apparatus for treating by induction heating a spinneret pack including an outer ring surrounding a combined spinneret plate and filter assembly, said filter assembly, spinneret plate and outer ring being united by unprocessed polymer material fed for extrusion through said filter assembly and through holes in said spinneret plate during the manufacturing of synthetic fibers; the apparatus comprising:

first heating coil means having a plurality of individual coils; second induction heating coil means;  
 a tray having a plurality of receptacles for receiving in a one to one relationship a like plurality of spinneret packs when in a loading position;  
 said first coil means including a like plurality of individual heating coils each associated to a spinneret pack;  
 said tray being movable from said loading position into a rest position for which said receptacles are aligned with the respective said individual coils;  
 each receptacle having a bottom surface defining an opening, with each said bottom surface being adapted to receive one of said packs with the spinneret plate face down;  
 a like plurality of pedestal members movable along the common axes of said individual coils and said openings when said tray is in the rest position, said pedestal members being movable from a retracted position to a fully-extended position and back to a partially-extended position intermediate between said fully-extended position and said rest position;  
 each of said pedestal members being adapted to pass through a corresponding one of said openings of said tray when the tray is in said rest position, said rest position being located between said retracted and said partially-extended positions of the pedestal members;  
 whereby said packs are lifted from said tray in the rest position by the respective said pedestal members through said openings and brought into a heating position corresponding to said pedestal members in said fully-extended position, with said first heating coil means preheating said pack during a first time period sufficient to detach by gravity each of said outer rings from the respective said packs onto a corresponding receptacle of said tray;  
 with means operative on each combined filter assembly and spinneret plate, when said pedestal members are retracted to said partially-extended position, for transferring said filter assembly and spinneret plate as a unit into an operative position relative to said second induction heating coil means;

said second coil means being operable upon each said combined filter assembly and spinneret plate during a second time period sufficient to carbonize the material accumulated during extrusion in the holes of any of said spinneret

plates and to detach each of said spinneret plates from the associated filter assembly by gravity; and means for collecting the detached spinneret plates.

**4,160,638**  
**APPARATUS FOR FORMING SHEETS OF FOAMED SYNTHETIC PLASTICS MATERIAL**

Klaus-Dieter Kolosow, Hamburen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover Kleefeld, Fed. Rep. of Germany

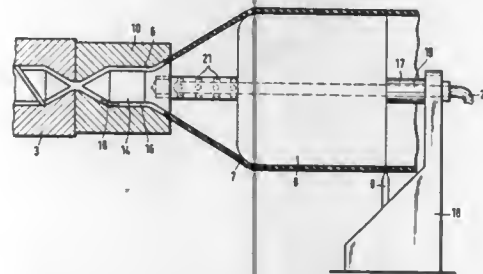
Filed Jan. 26, 1978, Ser. No. 872,637

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704231

Int. Cl.<sup>2</sup> B29D 27/00

U.S. Cl. 425—302.1

1 Claim



1. Apparatus for forming sheets of foamed synthetic plastics material, comprising a screw extruder, a nozzle head having an extrusion passage therein and a nozzle core positioned in the extrusion passage so as to form an annular nozzle, a cooled calibrating mandrel of a diameter larger than that of the annular nozzle, disposed downstream of the screw extruder having regard to the direction of extrusion and mounted on a stand, blowing means operatively associated with said annular nozzle for applying internal pressure to an extruded tube between the annular nozzle and the calibrating mandrel to increase the diameter of the tube, cutting apparatus for cutting open the increased-diameter cooled foamed plastics tube, and apparatus downstream of the cutting apparatus for laying out flat the cut-open tube, wherein the nozzle core is rigidly connected to the stand of the calibrating mandrel and is connected to the inner wall of the extrusion passage by a single web located within the nozzle head at a position at which the tube is eventually cut open by the cutting apparatus.

**4,160,639**  
**MANUFACTURING PROCESS AND STRAIGHTENING JIG FOR HOLLOW TAPERED RODS**

Toyoji Umeda, c/o Daiwa Seiko Kabushiki Kaisha, 14-16, 3-chome, Maesawa, Higashi Kurume-shi, Tokyo, Japan

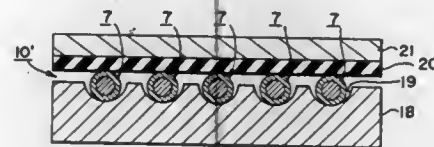
Filed Jun. 6, 1978, Ser. No. 913,173

Claims priority, application Japan, Dec. 29, 1977, 52-158171

Int. Cl.<sup>2</sup> B29C 17/02, 25/00

U.S. Cl. 425—383

9 Claims



1. A straightening jig for curing a plurality of wound semi-cured fiber-reinforced resin-impregnated sheets comprising a body having a surface with a plurality of grooves formed therein, the grooves being shaped so as partially to receive the wound sheets with a portion of each of the wound sheets protruding above the groove in which the wound sheet is partially received, and securing means for securing the wound

sheets in the grooves said securing means including an elastomeric layer for pressing against said wound sheets.

**4,160,640**  
**METHOD OF FUEL BURNING IN COMBUSTION CHAMBERS AND ANNULAR COMBUSTION CHAMBER FOR CARRYING SAME INTO EFFECT**

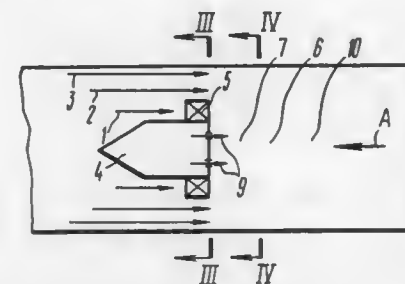
Vladimir A. Maev, ulitsa Granitnaya, 36, kv. 46; Andrei L. Kuznetsov, ulitsa S. Kovalevskoi, 16/4, kv. 141; Jury A. Lamm, ulitsa S. Kovalevskoi, 16, kv. 79; Viktor V. Ivakhnenko, Tovarishchesky prospekt, 4, kv. 373; Anatoly V. Sudarev, ulitsa Georgievskaya, 2, kv. 57, and Nikolai N. Prokushenkov, ulitsa Babushkina, 8, kv. 177, all of Leningrad, U.S.S.R.

Filed Aug. 30, 1977, Ser. No. 829,152

Int. Cl.<sup>2</sup> F23M 3/00

U.S. Cl. 431—9

5 Claims



1. A method of burning fuel in an annular combustion chamber, comprising predividing primary and secondary air into discrete coaxial annular streams;  
 swirling of said coaxial annular streams of primary air tangentially about a longitudinal axis of streams;  
 adjacent coaxial annular streams of primary air being swirled in opposite directions;  
 admitting the swirled coaxial annular streams of primary air and a portion of said coaxial annular streams of secondary air into a burning zone of an annular combustion chamber;  
 injecting fuel into said burning zone simultaneously with admission of said swirled coaxial annular streams of primary air and of said portion of the coaxial annular streams of secondary air to produce a recirculation flow of the fuel-air mixture; and  
 admitting the remaining portion of said coaxial annular streams of secondary air to a mixing zone of said combust-

tion chamber wherein products of combustion and secondary air are mixed;  
 whereby streamlines of said recirculation flow of the fuel-air mixture are developed transversely in said combustion chamber, thus developing a reduced temperature in said burning zone.

**4,160,641**  
**CONTINUOUS FURNACE**

Gabor Miskolczy, Carlisle, Mass.; Leonard G. Nowak, Ypsilanti, and Paul K. Shefsiek, Farmington, both of Mich., assignors to Holcroft & Company, Livonia, Mich.

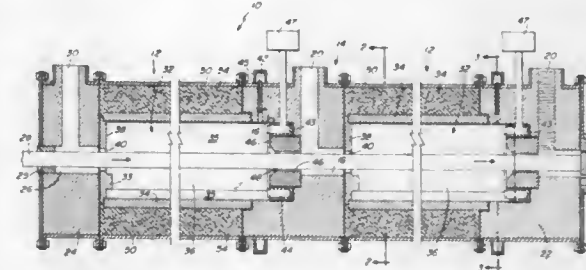
Filed Mar. 21, 1978, Ser. No. 888,714

Claims priority, application Canada, Sep. 15, 1977, 286780

Int. Cl.<sup>2</sup> F27B 9/28

U.S. Cl. 432—59

13 Claims



1. A furnace comprising:  
 (a) elongated furnace chamber means defining a central workpiece path therethrough and an inner surface surrounding said path;  
 (b) first means surrounding said path at one end of said chamber means for directing into said chamber means one component for a combustible mixture as a stream substantially parallel to and surrounding said path; and  
 (c) a second means surrounding said path at said one end of said chamber means for directing radially into said chamber means another component for a combustible mixture as a stream surrounding said path which flows substantially normal to said path, said first and second means being arranged for directing said streams into intersection with each other for producing a uniform combustible mixture in a ring around said path, whereby, upon combustion a uniform flame ring surrounds said path for heating workpieces thereon and for heating said inner surface.

# CHEMICAL

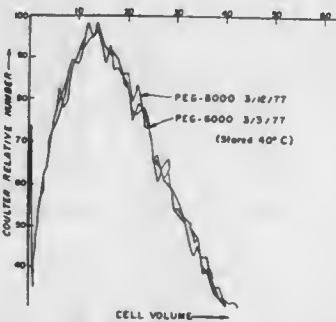
**4,160,642**  
**METHOD FOR PREPARING DYE SOLUTIONS**  
 Fred A. Deslerio, Cornwells Heights, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.  
 Division of Ser. No. 379,530, Jul. 16, 1973, Pat. No. 3,954,397.  
 This application Sep. 17, 1975, Ser. No. 614,120  
 Int. Cl.<sup>2</sup> D06P 3/32

U.S. Cl. 8—12 19 Claims  
 1. A process for increasing the solubility of a hydroxyazo metal chelate dye in an effective solvent substantially free from active hydrogen atoms as determined by the Zerewitinoff Method which comprises treating said dye with a copolymer of oxazolidinylethyl methacrylate and one or more monomers copolymerizable therewith.

**4,160,643**  
**WATER SOLUBLE CATIONIC AZO DYESTUFFS CONTAINING A CYCLAMMONIUM GROUP**  
 Peter Gregory, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England  
 Filed Dec. 27, 1976, Ser. No. 757,913  
 Claims priority, application United Kingdom, Jan. 27, 1976, 3067/76  
 Int. Cl.<sup>2</sup> C09B 27/00, 46/00; D06P 1/10, 3/70

U.S. Cl. 8—26 1 Claim  
 1. A mixture of water soluble cationic azo dyestuffs devoid of carboxylic acid or sulphonic acid groups, each dyestuff in said mixture containing at least one cyclammonium group and said dyestuffs differing only in the constitution of the said cyclammonium group, said cyclammonium group being a gamma-picolinium group in one dyestuff and a beta-picolinium group in another dyestuff in said mixture, the water-solubility of said mixture being superior to that of the individual dyestuffs.

**4,160,644**  
**PLATELET REFERENCE CONTROL AND METHOD OF PREPARATION**  
 Wayne L. Ryan, Omaha, Nebr., assignor to Streck Laboratories, Inc., Omaha, Nebr.  
 Filed Jun. 13, 1977, Ser. No. 805,810  
 Int. Cl.<sup>2</sup> G01N 33/16  
 U.S. Cl. 23—230 B 5 Claims

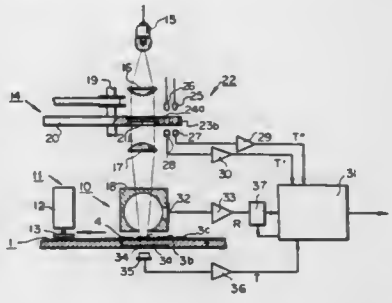


1. A method of preparing a fixed platelet reference control comprising the steps of stabilizing a fixed platelet reference control against false counts due to container adsorption by adding a solid polyethylene glycol as a stabilizing agent to one member selected from the two member class consisting of an aldehyde fixed platelet suspension member and an isotonic diluent member for a platelet suspension, and thereafter adding the other member to the mixture resulting from the first adding step whereby a control is achieved that is substantially time and agitation stable.

**4,160,645**  
**CATALYST MEDIATED COMPETITIVE PROTEIN BINDING ASSAY**  
 Edwin F. Ullman, Atherton, Calif., assignor to Syva Company, Palo Alto, Calif.  
 Filed Jul. 14, 1977, Ser. No. 815,636  
 Int. Cl.<sup>2</sup> G01N 33/16, 31/10, 21/22

U.S. Cl. 23—230 B 27 Claims  
 1. A method for measuring an analyte suspected of being present in an unknown, wherein said analyte is a member of an immunological pair consisting of ligand and antiligand, wherein three reactants are employed;  
 (1) conjugated label, wherein said label is conjugated either directly or indirectly to ligand analog to form labeled ligand, wherein ligand analog is capable of competing with ligand for antiligand and said label is capable of reacting by both one and two electron transfers;  
 (2) a redox reactant, R<sup>1</sup>, which reacts by one electron transfer and is capable of reacting with said label; and  
 (3) a redox reactant, R<sup>2</sup>, which reacts by two electron transfer and is capable of reacting with said label, wherein the rate of the label mediated reaction between R<sup>1</sup> and R<sup>2</sup> is substantially greater than the rate of the direct reaction between R<sup>1</sup> and R<sup>2</sup> and wherein either one or the product of one of R<sup>1</sup> and R<sup>2</sup> provides a detectable signal;  
 said method comprising;  
 (a) combining in an aqueous assay solution:  
 (i) said unknown;  
 (ii) conjugated label;  
 (iii) R<sup>1</sup>;  
 (iv) R<sup>2</sup>; and  
 (v) antiligand when said analyte is ligand; and  
 (b) determining the rate of reaction between R<sup>1</sup> and R<sup>2</sup> as compared to said rate in an assay solution having a known amount of analyte.

**4,160,646**  
**METHOD OF ANALYZING LIQUID SAMPLES AND SYSTEM FOR CONTINUOUSLY AUTOMATICALLY ANALYZING SAME**  
 Yoshikazu Furutani, and Shinichi Kishimoto, both of Kyoto, Japan, assignors to Kabushiki Kaisha Kyoto Daiichi Kagaku, Kyoto, Japan  
 Filed Nov. 21, 1977, Ser. No. 853,137  
 Claims priority, application Japan, Jan. 20, 1977, 52-5508  
 Int. Cl.<sup>2</sup> G01N 21/30, 21/48, 31/22, 33/16  
 U.S. Cl. 23—230 R 16 Claims



1. A method of analyzing a liquid sample comprising the steps of applying the sample to a composite test medium formed of a strip having thereon a reflectivity reference piece and at least one color reaction test piece feeding the test medium to spectral reflectivity measuring means, irradiating each of the pieces with energy of a plurality of predetermined different wavelengths, and obtaining corrected reflectivities of each of the test pieces as the relative values with respect to the reflectivity of said reflectivity reference piece from the amounts of reflected energy at at least some of the different wavelengths to measure the concentration of an abnormal substance contained in the test sample.



4,160,647

## CONTINUOUS OPERATION EXTRACTOR

Stoyan H. Sendov, Sofia; Stoyan I. Evtimov, Vidin; Ivan A. Nikolov, Vidin; Ivan A. Kuklin, Vidin; Mircho G. Mirchev, Vidin, and Nicolas S. Dimov, Vidin; all of Bulgaria, assignors to Chirkombinat, Vidin, Bulgaria

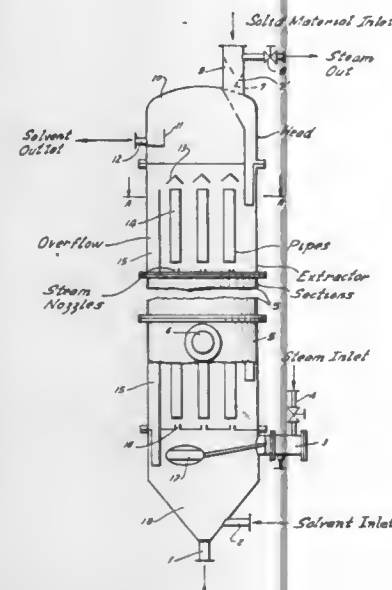
Continuation of Ser. No. 710,633, Aug. 2, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,152

Claims priority, application Bulgaria, Aug. 2, 1975, 30713

Int. Cl.<sup>2</sup> B01D 11/02

U.S. Cl. 422-106

3 Claims



1. A continuous-operation extractor for the solvent extraction of solids, comprising:

- a column formed with a discharge chamber at its bottom, a plurality of extractor sections disposed one above another above said chamber, and a head formed above the uppermost section;
- a solids inlet pipe above said head and communicating therewith, formed internally with a plurality of downwardly and inwardly inclined perforated surfaces over which solids can pass into said head, said inlet pipe being further formed above said surfaces with a steam outlet provided with a throttle valve;
- a plurality of spaced-apart mutually parallel upright pipes in each of said sections, each of said sections being formed with respective nozzles opening below each of said pipes and of inverted V-cross section whereby jets emerging from said nozzles induce a circulation of solids, solvent and gas upwardly through said pipes and around between said pipes of each section;
- a solvent outlet in said head;
- respective overflows connecting each upper section with the next lower section and the lowermost section with said chamber;
- a solids outlet formed in the bottom of said chamber;
- a solvent inlet opening into said chamber; and
- a steam inlet opening into a float-controlled valve connected to said chamber for controlling the level of material therein to maintain a steam-gas layer in said chamber below the nozzles of said lowermost section.

4,160,648

## FUEL COMPOSITIONS CONTAINING DEPOSIT CONTROL ADDITIVES

Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 730,495, Oct. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 700,922, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 698,243, Jun. 21, 1976, abandoned. This application May 27, 1977, Ser. No. 801,441

Int. Cl.<sup>2</sup> C10L 1/22; C07C 125/06; C07D 295/14

U.S. Cl. 44-63

22 Claims

1. A fuel composition comprising a major portion of hydrocarbons boiling in the gasoline range and from 30 to 2000 ppm of a poly(oxyalkylene) carbamate having at least one C<sub>1</sub>-C<sub>30</sub> hydrocarboxy-terminated poly(oxyalkylene) chain of 2 to 5 carbon oxyalkylene units bonded through an oxycarbonyl group to a nitrogen atom of a polyamine; said polyamine having from 2 to 10 amine nitrogens and from 2 to 40 carbon atoms, said carbamate having a molecular weight of from about 500 to 10,000.

4,160,649

## SUBSTITUTED NATURAL GAS VIA STEAM REFORMING OF KEROSENE

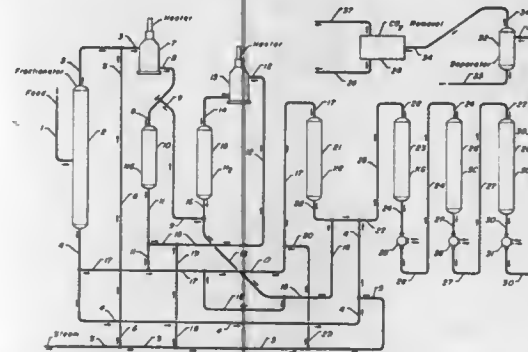
Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1978, Ser. No. 936,957

Int. Cl.<sup>2</sup> C10G 11/28; C10K 3/06

U.S. Cl. 48-214 A

10 Claims



1. A multiple-stage, steam reforming process for producing a methane-rich substitute natural gas from a kerosene charge stock, containing hydrocarbons boiling above a temperature of 450° F., which comprises the sequential steps of:

- (a) reacting a hydrocarbon mixture boiling below the kerosene boiling range and steam, in a first catalytic reaction zone, a steam reforming conditions including a temperature in the range of about 800° F. to about 1025° F.;
- (b) reacting a first portion of the resulting first zone effluent, in a second catalytic reaction zone, at hydrogen-producing conditions including a temperature in the range of about 1200° F. to about 1600° F.;
- (c) recycling at least a portion of the resulting second zone effluent to said first reaction zone;
- (d) reacting a second portion of said first zone effluent and a first portion of said kerosene charge stock, in a third catalytic reaction zone, at steam reforming conditions including (i) a minimum catalyst bed inlet temperature of about 840° F. and, (ii) a maximum catalyst bed outlet temperature of about 1,000° F.;
- (e) reacting at least a portion of the resulting third zone effluent and a second portion of said kerosene charge stock, in a fourth catalytic reaction zone, at steam reforming conditions including (i) a minimum catalyst bed inlet temperature of about 840° F. and, (ii) a maximum catalyst bed outlet temperature of about 1000° F.; and,

(f) recovering said methane-rich substitute natural gas from the resulting fourth reaction zone product effluent.

4,160,650

## SAND CORE CLEANING APPARATUS WITH DOUBLE ROLLER DELIVERY OF CLEANING MATERIAL

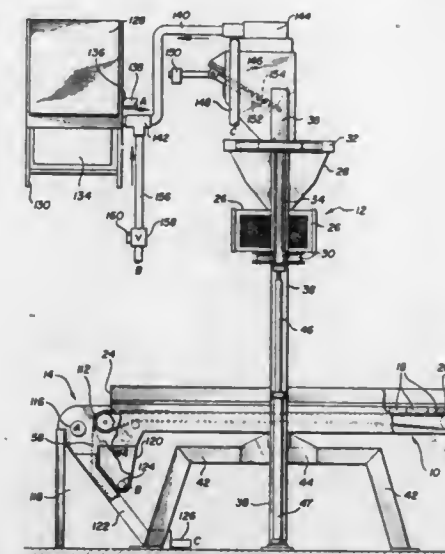
Brian J. Jensen, Franksville, Wis., assignor to NFE International, Ltd., Palatine, Ill.

Filed Apr. 20, 1978, Ser. No. 898,201

Int. Cl.<sup>2</sup> B24B 31/00; B24C 3/10

U.S. Cl. 51-16

11 Claims



1. Apparatus for removing fins from sand cores using a core cleaning material comprising:

- a frame;
- a core conveyor mounted to said frame for transporting said sand cores during removal of said fins;
- counter-rotating roller means mounted to said frame above said core conveyor for delivering a falling curtain of said core cleaning material onto said cores for removal of said fins, including,
- a pair of rotatably engaging rollers mounted to transversely extend substantially across said core conveyor and defining a contact surface junction;
- means for feeding said core cleaning material above said contact surface junction; and
- means for rotating said rollers in opposite rotational directions, enabling said core cleaning material to be withdrawn from said contact surface junction and deposited as a falling curtain of core cleaning material onto said cores to substantially remove said fins.

4,160,651

## METHODS OF TREATING A GASEOUS MIXTURE OF ADSORPTION

Claude Pivard, Paris, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

Filed Aug. 29, 1977, Ser. No. 828,546

Claims priority, application France, Sep. 7, 1976, 76 26868

Int. Cl.<sup>2</sup> B01D 53/04

U.S. Cl. 55-26

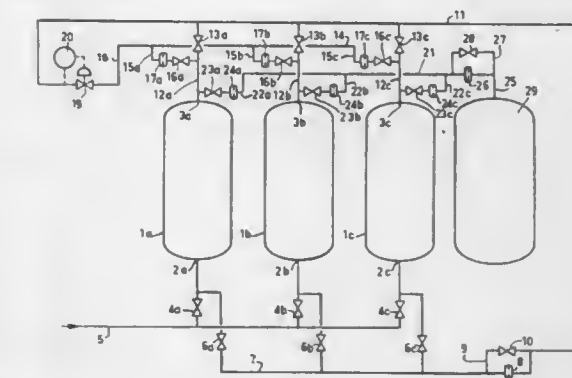
3 Claims

1. A method of treating a gaseous mixture by adsorption which employs the selective arrest of at least one component of said gaseous mixture, using three adsorbent beds and a buffer container, comprising performing sequentially the following cycle relating to a first bed of said beds:

- (a) a high pressure phase extending over a first third of said cycle, during which a treated gas is withdrawn which results from passing the said mixture through a first adsor-

bent bed in a direction termed the production direction at virtually constant high production pressure,

(b) a regeneration phase of said first adsorbent bed extending over a second third of said cycle consisting firstly of a de-pressurization phase from the high production pressure to a low regeneration pressure, said de-pressurization phase including two successive balancing operations firstly between said first adsorbent bed and a second adsorbent bed and secondly between said first adsorbent bed and said buffer chamber each of said balancing operations being effected with outfeed in the production direction and infeed in the opposite direction and a continuous removal of gas in the opposite direction from the production direction during the whole duration of said de-pressurization phase on one hand and finally of a cleaning phase at said low regeneration pressure which is performed by passing gas from said buffer chamber through said first adsorbent bed in the opposite direction from the direction of production,



(c) a re-pressurization phase extending over a third of said cycle, consisting of a balancing between said first adsorbent bed and a third adsorbent bed which is at the beginning of its regeneration phase, in the opposite direction from the direction of production, and a continuous introducing of treated gas in the direction opposite the direction of production, extending over the whole duration of said re-pressurization phase,

repeating said cycle for each of said three adsorbent beds in sequence with a stagger of a third of a cycle, introducing said mixture into said beds in sequence at a constant rate and pressure throughout said cycle, removing said treated gas from said beds in sequence at a substantially constant rate and pressure throughout said cycle, and removing from said beds in sequence, at a rate and pressure that are substantially constant throughout said cycle, gas that has passed through said beds in said opposite direction from the production direction.

4,160,652

## METHOD AND APPARATUS FOR HANDLING THE FLUIDS IN A TWO-PHASE FLOW PIPELINE SYSTEM

Robert E. Martin, Spring, and Ernest P. Hagan, Jr., Houston, both of Tex., assignors to Texas Eastern Engineering, Ltd., Houston, Tex.

Filed Aug. 26, 1977, Ser. No. 828,191

Int. Cl.<sup>2</sup> B01D 19/00

U.S. Cl. 55-46

14 Claims

1. In a two-phase flow pipeline adapted to transport both gas and liquid, a method of handling such flow including the steps of:

- supplying the gas and liquid flow stream of the pipeline into a separator and separating the incoming flow stream into gas and liquid;
- withdrawing from the upper portion of the separator the gas separated by the separator;



within the parameters of the system, continuously withdrawing from the lower portion of the separator the separated liquid, whereby when the incoming flow contains both liquid and gas the liquid is being withdrawn from the lower portion of the separator at the same time as the gas is being withdrawn from the upper portion of the separator;

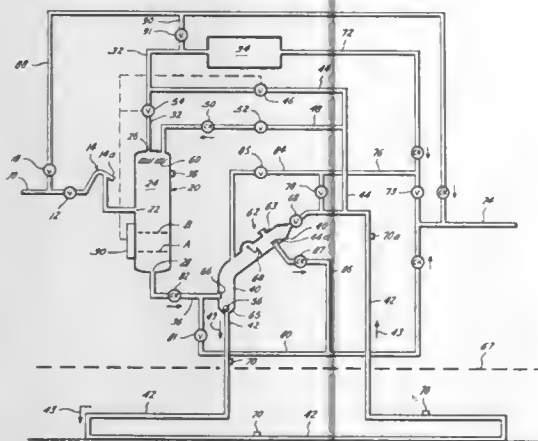
supplying the separated liquid into an elongated accumulator means and against a movable piston positioned in such accumulator means, said accumulator means being in fluid communication at its upstream end with the liquid outlet of the separator and in fluid communication at its downstream end with the gas outlet of the separator;

said accumulator means being positioned with respect to said separator whereby the hydraulic head of the separated liquids above the movable piston causes the accumulating liquids to move downstream into the elongated accumulator means; and

after a selected quantity of liquid has been accumulated in the accumulator means, supplying gas under pressure into the accumulator means to force the liquid stored therein out of the accumulator means.

11. In a two-phase flow pipeline adapted to transport both gas and liquid, an apparatus for handling such flow, including: a separator means for receiving the incoming gas and liquid flow and separating the gas and the liquid;

a first outlet at the upper portion of the separator through which the separated gas may be withdrawn;



a throttling control valve connected to the first outlet for controlling the flow of the gas from the separator;

a second outlet at the lower portion of the separator from which the separated liquids may be withdrawn;

elongated accumulator means in fluid communication with the second outlet of the separator for receiving and temporarily storing the separated liquids;

a movable free piston means positioned in the elongated accumulator means;

means with a second control valve therein providing fluid communication between the downstream side of the elongated accumulator means and the output of the throttling control valve;

said elongated accumulator means being positioned with respect to the separator such that the hydraulic head of the separated liquids above the movable free piston causes accumulating liquids to undergo some movement downstream into the elongated accumulator means;

means for controlling the operation of the throttling control valve and the second control valve whereby a selected pressure differential may be established across the level of the liquid in the separator and the downstream side of the movable free piston to cause the accumulating liquids and the free piston to move downstream into the accumulator means; and

means for supplying gas under pressure into the accumulator means to force the liquid stored therein out of the accumu-

lator means after a selected quantity of liquid has been accumulated in the accumulator means.

#### 4,160,653 FLUID BED SEPARATOR APPARATUS FOR PROCESSING WASTE MATERIAL TO RECOVER BURNABLES

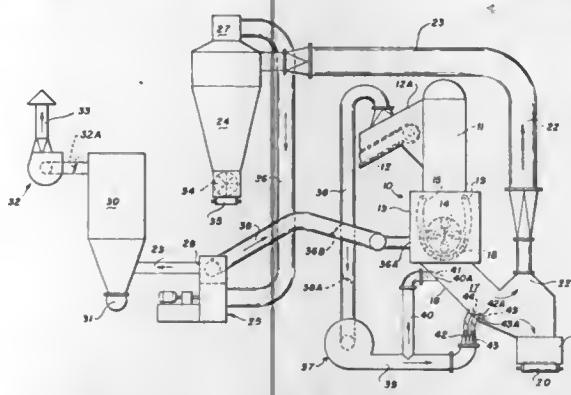
Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124

Filed Mar. 27, 1978, Ser. No. 890,042

Int. Cl.<sup>2</sup> C02C 1/18

U.S. Cl. 55—315

8 Claims



1. Fluid bed separator apparatus for processing waste material to recover burnables comprising: a hammer mill having a feed hopper forming an inlet and an elutriating chamber forming an outlet; an air lift column having an inlet connected into said elutriating chamber; a cyclone separator having an inlet connected to said air lift column; a blower having an inlet connected to said cyclone separator and a delivery outlet; conduit means connected between said blower delivery outlet and said hammer mill; a bag house having an inlet connected to said blower delivery outlet; and a fan connected to said bag house to exhaust air to atmosphere and maintain a pressure in said elutriating chamber less than ambient pressure, said blower creating an air flow through said hammer mill and in by-pass of said hammer mill, whereby said material in said hammer mill and elutriating chamber is subject to air movement flowing from said feed hopper to said air lift column.

#### 4,160,654 METHOD FOR MAKING SILVER-CONTAINING GLASSES EXHIBITING THERMOPLASTIC PROPERTIES AND PHOTSENSITIVITY

Roger F. Bartholomew, Painted Post; Joseph F. Mach, Corning, and Che-Kuang Wu, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,783

Int. Cl.<sup>2</sup> C03C 15/00, 21/00

U.S. Cl. 65—30 E

22 Claims

1. A method for making a transparent, essentially colorless glass body exhibiting thermoplastic properties wherein at least a surface portion thereof contains Ag<sup>+</sup> ions which comprises melting a batch for an anhydrous glass body consisting essentially, in mole percent on the oxide bases, of about 3–25% Na<sub>2</sub>O and/or K<sub>2</sub>O, 50–95% SiO<sub>2</sub>, up to 25% of at least one oxide selected from the group of BaO, B<sub>2</sub>O<sub>3</sub>, CaO, PbO, and ZnO, up to 35% MgO, up to 20% Al<sub>2</sub>O<sub>3</sub>, and up to 10% Li<sub>2</sub>O, and then contacting said anhydrous glass body in thickness dimensions no greater than about 5 mm. with an aqueous solution environment containing Ag<sup>+</sup> ions having a pH less than about 4, the oxidation state of the glass being controlled in both the batch composition and in said aqueous solution environment, said oxidation state of said aqueous solution environment being controlled by including an oxidizing agent therein, this contact being made at a temperature in excess of 100° C. and at a pressure in excess of 20 psig for a period of time

sufficient to hydrate at least a surface portion on said glass body having an amount of H<sub>2</sub>O absorbed therein effective to impart thermoplastic properties thereto and to cause the replacement of Na<sup>+</sup> and/or K<sup>+</sup> ions with Ag<sup>+</sup> ions in said hydrated glass, the proportion of Na<sup>+</sup> and/or K<sup>+</sup> ions in said hydrated glass being less with a corresponding increase in Ag<sup>+</sup> ions.

7. A method for making a transparent, essentially colorless glass body wherein at least a surface portion thereof exhibits thermoplastic properties and wherein at least said surface portion thereof contains Ag<sup>+</sup> ions which comprises the steps of:

(a) melting a batch for an anhydrous glass body consisting essentially, in mole percent on the oxide basis, of about 3–25% Na<sub>2</sub>O and/or K<sub>2</sub>O, 50–95% SiO<sub>2</sub>, up to 25% of at least one oxide selected from the group of BaO, B<sub>2</sub>O<sub>3</sub>, CaO, PbO, and ZnO, up to 35% MgO, up to 20% Al<sub>2</sub>O<sub>3</sub>, and up to 10% Li<sub>2</sub>O;

(b) hydrating said anhydrous glass body by exposing said body to a H<sub>2</sub>O-containing gaseous atmosphere having a relative humidity of at least about 75% at a temperature of at least about 100° C. for a period of time sufficient to develop at least a surface portion which is essentially saturated with H<sub>2</sub>O;

(c) dehydrating said body through contact thereof with a gaseous environment wherein the relative humidity is less than about 90% of that employed in said hydration step for a period of time sufficient to reduce the water content at least within said surface portion but leaving an amount therein effective to impart thermoplastic properties thereto; and then

(d) contacting said hydrated glass body with an aqueous solution environment containing Ag<sup>+</sup> ions having a pH less than about 5, this contact being made at a temperature in excess of 100° C. for a period of time sufficient to cause the replacement of Na<sup>+</sup> and/or K<sup>+</sup> ions in said hydrated glass with Ag<sup>+</sup> ions, the proportion of Na<sup>+</sup> and/or K<sup>+</sup> ions in said hydrated glass being less with a corresponding increase in Ag<sup>+</sup> ions, the oxidation state of the glass being controlled in both the batch composition and in said aqueous solution environment, said oxidation state of said aqueous solution being controlled by including an oxidizing agent thereof.

#### 4,160,655 PROCESS FOR MAKING GRADIENT PHOTOCROMIC GLASS ARTICLES

Paul I. Kingsbury, Jr., Elmira, and Thomas P. Seward, III, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,962

Int. Cl.<sup>2</sup> C03K 15/00; C03B 31/00

U.S. Cl. 65—30 R

4 Claims

1. A process for producing a gradient photochromic glass article by the selective over-nucleation of a limited portion of the glass article which essentially comprises the steps of:

(a) subjecting a selected limited portion of a potentially photochromic glass article containing silver and a halogen selected from the group consisting of chlorine, bromine and iodine to a nucleation heat treatment at a temperature above the minimum temperature necessary for the development of nuclei for silver halide growth in the glass but below the minimum temperature required for the growth of photochromic silver halide particles in the glass, for a time at least sufficient to reduce the photochromic development potential of said selected limited portion, in order to obtain the selective over-nucleation of said portion, while maintaining the remainder of the glass article at a temperature below the minimum temperature necessary for the development of nuclei for silver halide growth therein; and

(b) subjecting the entire potentially photochromic glass article to a photochromic development heat treatment at a temperature above the minimum temperature sufficient to

permit the growth of silver halide crystallites in the glass for a time at least sufficient to develop photochromic properties in the remaining portion of the glass article not subjected to selective over-nucleation.

#### 4,160,656 PROCESS FOR DEODORIZING LIQUID MANURE AND REMOVING HARMFUL GASES

Helmut Junkermann, Frankfurt, Fed. Rep. of Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Rosessler, Frankfurt, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,111

Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723753

Int. Cl.<sup>2</sup> C05F 3/00; C05C 9/00; C02B 1/34

U.S. Cl. 71—21

15 Claims

1. A process for deodorizing liquid manure and removing harmful gases therefrom comprising applying to the liquid manure formaldehyde and a peroxy compound in the weight ratio of formaldehyde (100 weight % basis) and peroxy compound (100 weight % basis) of 1:3 to 3:1.

#### 4,160,657 PREPARATION OF MONOCALCIUM PHOSPHATE AND PHOSPHORIC ACID

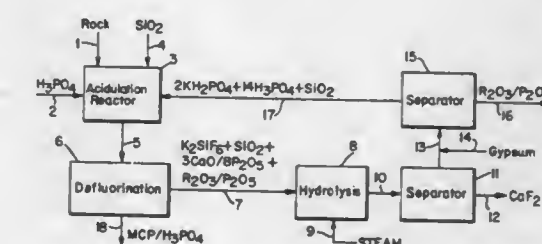
Erhart K. Drechsel, Houston, Tex., assignor to Pennzoil Company, Shreveport, La.

Continuation-in-part of Ser. No. 870,814, Jan. 19, 1978, which is a division of Ser. No. 608,973, Aug. 29, 1975, Pat. No. 4,086,322, which is a continuation-in-part of Ser. No. 512,877, Oct. 7, 1974, abandoned. This application Aug. 2, 1978, Ser. No. 930,147

Int. Cl.<sup>2</sup> C05B 11/10

U.S. Cl. 71—41

15 Claims



1. A process for the production of monocalcium phosphate and phosphoric acid which comprises acidulating phosphate rock with an excess of phosphoric acid in the presence of added silicon dioxide and potassium ion to produce a first slurry of insoluble potassium fluosilicate in a solution of monocalcium phosphate in phosphoric acid; subjecting this mixture to separation to produce a clarified solution of monocalcium phosphate in phosphoric acid and a second slurry comprising monocalcium phosphate in phosphoric acid which contains insoluble potassium fluosilicate; subjecting said second slurry to hydrolysis at an elevated temperature to regenerate a KH<sub>2</sub>PO<sub>4</sub>/H<sub>3</sub>PO<sub>4</sub> solution and produce calcium fluoride and silicon dioxide; recovering the calcium fluoride and silicon dioxide and recycling the KH<sub>2</sub>PO<sub>4</sub>/H<sub>3</sub>PO<sub>4</sub> solution to the acidulation reaction.

#### 4,160,658 SUBSTITUTED BENZOTHAZOLINES AND THEIR USE AS PLANT GROWTH REGULANTS

John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 735,658, Oct. 26, 1976, Pat. No. 4,075,216. This application Oct. 6, 1977, Ser. No. 839,875

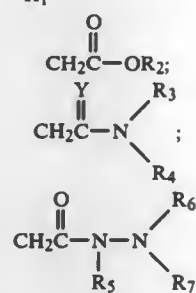
Int. Cl.<sup>2</sup> A01N 5/00


U.S. Cl. 71—90


39 Claims

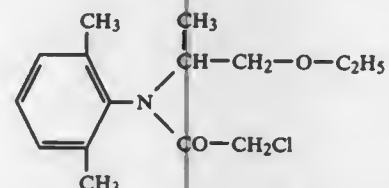
1. A composition for regulating the growth of soybean



O=C1NC2=CC=CC=C2S1
$$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}-\text{C}-\text{halogen;} \\ | \\ \text{R}_1 \end{array}$$


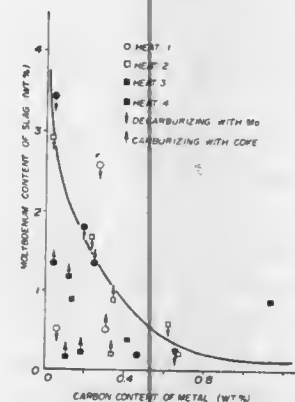
(II)   $\text{CH}_3$

(III)   $\text{CH}_3$   
 $\text{CH}-\text{CH}_2-\text{O}-\text{C}_2\text{H}_5$



(IV)

U.S. Cl. 75-12 11 Claims



(2) a herbicidally effective amount of 2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranyl methanesulfonate, in a weight ratio of (1) to (2) of 0.1-8:1.

U.S. Cl. 75—24 10 Claims

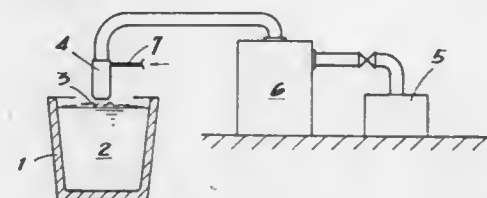


Diagram illustrating a three-stage gasification process:

- Stage A:** Iron oxide pellets, carbonaceous fuel, and limestone feed enter the top of a reactor.  $\text{CO}_2$  gas seal is present.  $\text{H}_2\text{O}$  and  $\text{N}_2$  enter from the top. Regenerated top gas exits.
- Stage B:** Preheated boiler feed water enters a heat exchanger (16).  $\text{CO}_2$ ,  $\text{H}_2\text{O}$ , and  $\text{N}_2$  enter the reactor (17). Exhaust goes to a heat exchanger (15) where steam is produced at  $1500-1700^\circ\text{C}$ .
- Stage C:** Hot steam and  $\text{CO}_2$  enter the reactor (18).  $\text{CO}_2$  gas seal is present. Steam is separated from air (22) and sent to a separating cyclone (20) which produces  $\text{H}_2$ ,  $\text{CH}_4$ , reduced  $\text{N}_2$ , and hot gas. The remaining cooled, dry reducing gas ( $\text{CO}_2$ ) is recycled back to the top of stage A.

1. A process for producing an ultra-low carbon stainless steel which comprises preparing a molten metal melt of low carbon stainless steel by top-blowing an oxidizing gas onto the surface of said molten metal contained in a vessel under reduced pressure, and while maintaining said molten metal under reduced pressure, blowing a mixed gas of an oxidizing gas and an inert gas into the low carbon stainless steel molten metal through a lance immersed in the melt.

4,160,665

## NICKEL-BASE ALLOY

Kuzma I. Terekhov, Maly Pionersky pereulok, 5, kv. 44; Alexei T. Tumanov, B. Gruzinskaya ulitsa, 36, kv. 58; Ljudmila S. Markina, ulitsa Krasna Kazanets, 19, korpus 1, kv. 119; Klavdia A. Okolelova, Krasnoprudnaya ulitsa, 7/9 kv. 181; Alexandr F. Belov, Leninsky prospekt, 66, kv. 114; Nikolai D. Bobovnikov, Savvinskaya naberezhnaya, 3 kv. 170; Fedor V. Tulyankin, ulitsa Zaporozhskaya, 2, kv. 49; Petr A. Zasetsky, ulitsa 26 Bakinskikh Komissarov, 7, korpus 3, kv. 24, all of Moscow; Vladimir N. Zhuchlin, ulitsa Koresheva, 10 kv. 10; Mikhail Y. Dzugutov, ulitsa Mira, 4, kv. 37, both of Elektrostal; Mikhail S. Podolsky, Profsojuznaya ulitsa, 52 korpus 2, kv. 35, Moscow, and Valentin V. Topilin, ulitsa Mira, 6, kv. 29, Elektrostal, all of U.S.S.R.

Continuation of Ser. No. 347,492, Apr. 3, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 817,531  
Int. Cl.<sup>2</sup> C22C 19/05

U.S. Cl. 75—171

3 Claims

1. A nickel-base alloy consisting of the following components in weight percent: 0.04–0.08 carbon; 13–16 chromium; 2.3–3.0 titanium; 1.8–3.0 aluminum; 2.2–6.0 niobium; 6–12 cobalt; 4–8 molybdenum; 0.001–0.1 lanthanum; 0.001–0.01 boron; 0.001–0.03 cerium and the balance-nickel.

4,160,666

## POLYMERIC CHEMICAL SENSITIZERS FOR ORGANIC PHOTOCONDUCTIVE COMPOSITIONS

John M. McCabe, and William E. Yoerger, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Filed May 25, 1977, Ser. No. 800,594  
Int. Cl.<sup>2</sup> G03G 5/06, 5/09

U.S. Cl. 96—1 PC

38 Claims

1. A photoconductive insulating composition comprising an organic photoconductor chemically sensitized with a polymer comprising repeating units to which are appended a monovalent chloredate radical.

4,160,667

## ALUMINUM CHELATES AS ACCEPTOR TYPE SENSITIZERS AND PLASTICIZERS FOR PHOTOCONDUCTIVE POLYMERS

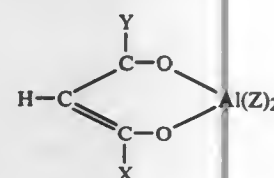
James M. Halm, Lombard, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Jun. 22, 1977, Ser. No. 808,858  
Int. Cl.<sup>2</sup> G03G 5/09, 5/04

U.S. Cl. 96—1.5 R

9 Claims

1. An electrophotographic recording element comprising a conductive base support coated with a layer comprising an organic photoconductive polymer of the electron donor type and a sensitizer of the formula:



where X and Y each independently is a member selected from the group consisting of alkyl, aryl, electron withdrawing alkyl and electron withdrawing aryl and Z is a member selected from the group consisting of fluoro and phenyl.

4,160,668

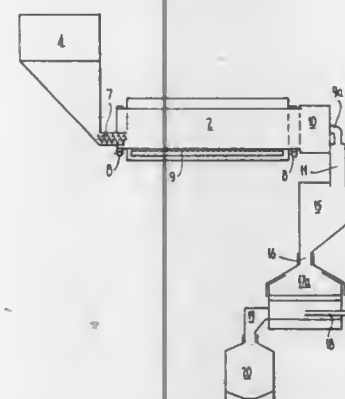
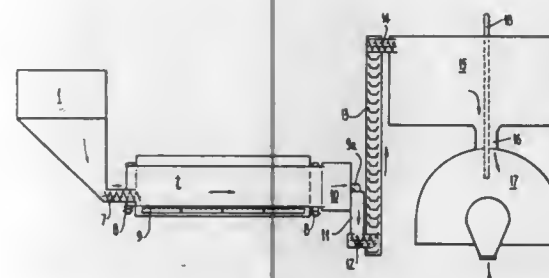
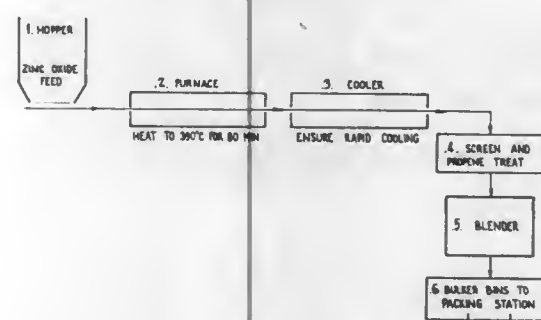
## ELECTROPHOTOGRAPHIC GRADE ZINC OXIDE

Paul J. Christesen, Annandale, and Geoffrey R. Sanders, Rowville, both of Australia, assignors to The Broken Hill Proprietary Company Limited and The Lysaght Durham Chemical Company Proprietary Limited, both of Victoria, Australia  
Continuation of Ser. No. 674,724, Apr. 6, 1976, abandoned. This application Aug. 11, 1977, Ser. No. 823,847

Claims priority, application Australia, Apr. 11, 1975, 1202/75  
Int. Cl.<sup>2</sup> G03G 5/08; H01C 13/00; G01G 9/02

U.S. Cl. 96—1.8

23 Claims



1. A process for the production of electrophotographic grade zinc oxide which comprises heating zinc oxide to a temperature of between 150° C. and 800° C., cooling the zinc oxide to a temperature below 100° C., and then treating the heat treated, cooled zinc oxide with an organic compound in the gaseous phase by contacting the gas with the zinc oxide at a temperature not exceeding 100° C., said organic compound being selected from the group consisting of propene, butene, pentene and isoprene.

4,160,669

## ARGON LASER FLASH EXPOSURE OF SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC MATERIAL

Teiji Haba, 3-31-8, Higashi, Kunitachi-shi, Tokyo; Tomio Nakajima, 3-12-4, Shin-machi, Setagaya-ku, Tokyo; Eiichi Sakamoto, 5-12, Hon-cho, Hanno-shi, Saitama-ken; Noboru Fujimori, 729, Misawa, Hino-shi, Tokyo, and Kiyomitsu Mine, 7775, Hino, Hino-shi, Tokyo, all of Japan  
Continuation of Ser. No. 666,455, Mar. 12, 1976, abandoned.

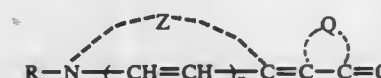
This application Feb. 9, 1978, Ser. No. 876,560

Claims priority, application Japan, Mar. 17, 1975, 50-32004  
Int. Cl.<sup>2</sup> G03C 5/04

U.S. Cl. 96—27 E

9 Claims

1. A process for forming an image by use of a silver halide photographic material comprising a silver halide photographic emulsion layer to be used for argon laser beam exposure which process comprises imagewise exposing the photographic material to argon laser beam light for 10<sup>-5</sup> to 10<sup>-7</sup> second, and developing said material said photographic emulsion layer comprising at least one sensitizing dye represented by the following formula:



wherein Z, when taken together with the atoms to which it is attached, form a heterocyclic nucleus selected from the group consisting of a pyridine nucleus, a pyrrole nucleus, an oxazole nucleus, a thiazole nucleus and a selenazole nucleus, said nuclei having a substituent or substituents selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and aryl or said nuclei are fused with a benzene or naphthalene ring which ring can have a substituent or substituents selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and halogen; Q, when taken together with the atoms to which it is attached, form a heterocyclic nucleus selected from the group consisting of a rhodanine nucleus, a thiohydantoin nucleus, a thioxazolidinedione nucleus and a thioselenazolidinedione nucleus, said nuclei having a substituent or substituents selected from the group consisting of lower alkyl, lower alkoxy, sulfoalkyl, carboxyalkyl, hydroxyalkyl, allyl and aryl; R is selected from the group consisting of alkyl, alkenyl, aryl, substituted alkyl wherein said substituent is selected from the group consisting of β-hydroxyethyl and β-carboxyethyl; and n is an integer of 0 or —1.

4,160,670

## LITHOGRAPHIC PRINTING PLATE MATERIAL

Yasuo Tsubai; Shigeru Iguchi; Shigeyoshi Suzuki, and Tamotsu Iwata, all of Nagakakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 5, 1977, Ser. No. 822,191

Claims priority, application Japan, Aug. 10, 1976, 51-95276  
Int. Cl.<sup>2</sup> G03C 5/54, 1/48; B44D 1/09; C03C 17/06

U.S. Cl. 96—119 R

22 Claims

1. A lithographic printing plate element using silver complex diffusion transfer process, characterized in that at least one of a layer which contains nuclei for physical development comprising a heavy metal or a sulfide thereof and a layer adjacent to said layer contain a polyfunctional synthetic polymer containing 1 to 20 mole % of functional groups having an affinity to said nuclei and being characterized by having affinity for colloidal heavy metal or a sulfide thereof and 5 to 99 mole % of functional groups providing hydrophilic properties.

4,160,671

## PHOTOSENSITIVE COMPOSITION

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

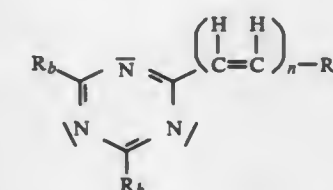
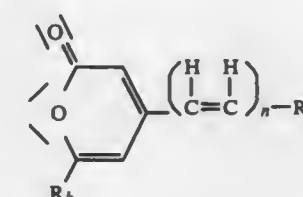
Filed Sep. 9, 1977, Ser. No. 831,935

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641100

Int. Cl.<sup>2</sup> G03C 1/52

6 Claims

1. A photosensitive composition comprising an ester or an amide of an o-naphthoquinone diazide sulfonic or carboxylic acid and, based on the amount of this compound, about 1 to 50 percent by weight of an organic dye capable of salt formation and selected from the group consisting of triphenylmethane, azine or anthraquinone dyes, and about 5 to 75 percent by weight of a photosensitive halogen-containing compound which releases acid upon exposure to light and having one of the general formulae I or II



in which

R<sub>a</sub> is an aryl group or a heterocyclic group which may be substituted,

R<sub>b</sub> is a trihaloalkyl group or a trihaloalkenyl group having from 1 to 3 carbon atoms and  
n is 1, 2 or 3.

4,160,672

GLASS-CERAMICS FOR SEMICONDUCTOR DOPING  
James E. Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 535,170, Dec. 23, 1974, Pat. No. 3,961,969, which is a continuation-in-part of Ser. No. 431,212, Jan. 7, 1974, Pat. No. 3,907,618. This application Feb. 18, 1976, Ser. No. 658,970

The portion of the term of this patent subsequent to Sep. 23, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C03C 3/22

2 Claims

1. A glass-ceramic body resulting from the in situ thermal crystallization of a thermally crystallizable substantially alkali metal oxide free glass having a composition in mole percent consisting essentially of SiO<sub>2</sub> 15–40, Al<sub>2</sub>O<sub>3</sub> 15–30, B<sub>2</sub>O<sub>3</sub> 20–60, RO 5–25, La<sub>2</sub>O<sub>3</sub> 0–5, Nb<sub>2</sub>O<sub>5</sub> 0–5 and Ta<sub>2</sub>O<sub>5</sub> 0–5, wherein RO is one or more of MgO, CaO, SrO and BaO in the following mole percentages:

MgO:0–15

CaO:0–10

SrO:0–10

BaO:0–15 and

wherein the ratio Al<sub>2</sub>O<sub>3</sub>/RO is 1.5–4.



4,160,673

**LOW TEMPERATURE CALCINED PORCELAIN AND PROCESS FOR PREPARATION THEREOF**

Toshio Fujita, Nagoya, and Hironaga Teratani, Owariasahi, both of Japan, assignors to Nippon Kowatsu Electric Co., Japan

Filed Dec. 30, 1977, Ser. No. 865,947

Claims priority, application Japan, Jan. 13, 1977, 52-2706; Oct. 5, 1977, 52-119767

Int. Cl.<sup>2</sup> C04B 33/24, 33/26

U.S. Cl. 106—45

10 Claims

1. A low temperature calcined porcelain consisting essentially of (a) about 40 to about 60% weight of pulverized waste glass, (b) about 10 to about 30% weight of aluminum oxide, (c) about 10 to about 25% weight of a fine alumina-silicate substance having a high plasticity, and (d) about 5 to about 15% weight of phosphoric acid and/or phosphate, and further, optionally, up to about 5% weight of a metal oxide as a coloring agent, the calcining temperature being in the range of from about 650° to 750° C.

4,160,674

**EARLY HIGH-STRENGTH PORTLAND CEMENT AND METHOD OF MANUFACTURE**

James L. Sawyer, Friendswood, Tex., assignor to Lone Star Industries, Houston, Tex.

Filed Jan. 30, 1978, Ser. No. 873,308

Int. Cl.<sup>2</sup> C04B 7/02

U.S. Cl. 106—89

12 Claims

1. An early high-strength cement having substantially all of its particles of a size of 20 microns and smaller, the cement having setting and volume change characteristics normal for and typical of portland cement.

4,160,675

**PROCESS FOR PURIFYING AN AQUEOUS SOLUTION**

Wilhelmus Pannekeet, Haarlem, and Robert Smakman, Nigtevecht, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Sep. 12, 1977, Ser. No. 832,126

Claims priority, application Netherlands, Sep. 17, 1976, 7610396

Int. Cl.<sup>2</sup> C13D 3/12, 3/14

U.S. Cl. 127—46 A

14 Claims

1. A process for removing an organic impurity from an aqueous solution consisting essentially of sequentially contacting the aqueous solution with an acid cation exchanger and subsequently with a polymer or polycondensate, which contains sulfur in the form of thiol groups bonded to carbon atoms.

4,160,676

**METHOD OF FORMING A COMPOSITE ROD**

Walter I. Waldrop, P.O. Box 19042, Houston, Tex. 77024; Roy Waldrop, and Cyrus Paul, both of Houston, Tex., assignors to Walter I. Waldrop, Houston, Tex.

Filed Aug. 17, 1978, Ser. No. 934,393

Int. Cl.<sup>2</sup> B22D 23/06, 19/02; B08B 7/00

U.S. Cl. 134—6

14 Claims

1. A method of forming a composite rod having a matrix bonding tungsten carbide particles comprising the steps of:

- washing the tungsten carbide particles;
- placing a quantity of the carbide particles in a graphite mold;
- heating the mold and particles to a range of about 300° to about 500° F. and pouring a water solution of flux in the mold while maintaining the temperature in the range of about 300° to about 500° F. whereby the water boils off and the flux coats the surfaces of the carbide particles;
- placing a matrix in the mold; and
- applying multi-flames to the mold and carbide particles while stirring the particles in the mold with a graphite rod to assist in intimate contact and commingling of the car-

bide particles and matrix to effect bonding of the matrix with the carbide particles to form the composite rod.

4,160,677

**METHOD OF PROCESSING ALLOY STEEL STRIP**

Frederick S. Lukac, New Kensington, and William P. Zbryski, Tarentum, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

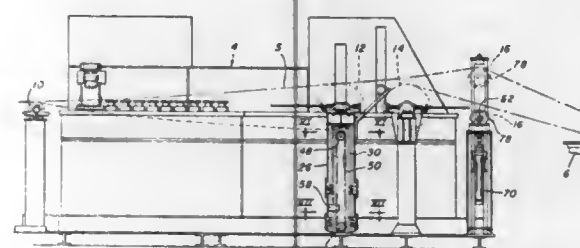
Division of Ser. No. 769,497, Feb. 17, 1977, Pat. No. 4,119,109.

This application Feb. 27, 1978, Ser. No. 881,967

Int. Cl.<sup>2</sup> B08B 7/04

U.S. Cl. 134—9

1 Claim



1. The method of processing alloy steel strip of various types which comprises passing one length of alloy steel strip of a first type continuously through a heat treating line, then through a molten salt bath in a tank with said length passing through the molten salt bath beneath and contacting a driven sink roll positioned in said tank, then above and in spaced apart relationship with a guide roll, covering said guide roll while said strip leaving the salt bath is passing over said guide roll, then passing said length through a rinse tank, then through a pickling bath, fastening the trailing end of said one length of alloy steel strip to the leading end of another length of alloy steel strip, continuing the above steps until a last length of alloy steel of the first type is being processed and an alloy steel strip of a second type which is not to be subject to the salt bath is to be processed, then fastening the leading end of a length of the second type of alloy steel strip to the trailing end of the last length of the first type of alloy steel strip, then raising said sink roll and its drive above said salt bath so that the second type of alloy steel strip will bypass the salt bath, uncovering said guide roll and raising said guide roll to contact said second type of alloy steel strip bypassing said molten salt bath, and continuing said processing with the sink roll being in raised or lowered position according to the type of alloy steel being treated; and with said guide roll being raised and uncovered or lowered and covered according to the type of alloy steel being treated.

4,160,678

**HETEROJUNCTION SOLAR CELL**

Faquir C. Jain, 16 Northwood Apartments, Storrs, Conn. 06268, and Mahmoud A. Melehy, P.O. Box 409, R.F.D. #1, Baltic, Conn. 06330

Continuation of Ser. No. 717,158, Aug. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 537,416, Dec. 30, 1974, abandoned. This application Apr. 6, 1978, Ser. No. 893,967

Int. Cl.<sup>2</sup> H01L 31/06

U.S. Cl. 136—89 SJ

3 Claims

1. A semiconductor solar cell comprising a window region of a semiconductor material of one conductivity type and having a given energy gap, a collector region of a different semiconductor material of a narrower energy gap and of an opposite conductivity type to said window region, said collector region forming a p-n heterojunction at its interface with said window region, the impurity concentration of an inner region of said window region adjacent to said heterojunction being less than half that of the portion of said collector region

4,160,680

**VACUUM CARBURIZING**

Russell F. Novy, Northbrook; Gerald L. Scott, Glenview, and Thomas O. Zurfluh, Chicago, all of Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

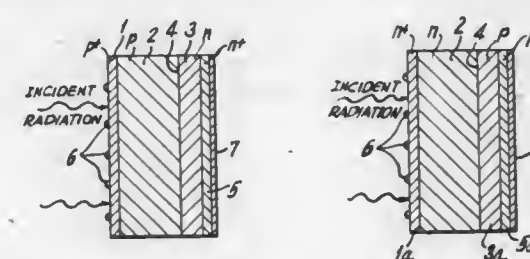
Continuation of Ser. No. 739,105, Nov. 5, 1976, abandoned, which is a continuation of Ser. No. 553,594, Feb. 27, 1975, abandoned. This application Apr. 18, 1978, Ser. No. 897,414

Int. Cl.<sup>2</sup> C21D 1/06

U.S. Cl. 148—16.5

11 Claims

1. The method of subatmospheric gaseous carburizing or carbonitriding workpieces in a load chamber within a vacuum furnace comprising the steps of placing a load of the workpieces to be carburized in the load chamber, sealing said furnace and evacuating said chamber to a first subatmospheric pressure for removing most of the air and adsorbed gases and surface contaminants from the workpieces, then bringing said workpieces up to treatment temperature in the range of 1500° F. to 1900° F., holding said workpieces for a sufficient time period at said treatment temperature and at said first subatmospheric pressure for temperature stabilization throughout the load, back filling carburizing gaseous treatment material into said furnace until the pressure in said chamber has been raised to a second subatmospheric pressure greater than said first subatmospheric pressure while maintaining said treatment temperature within said chamber, said treatment temperature being that temperature within the range of 1500° F. to 1900° F. at which the carburizing gaseous treatment material will carburize the workpieces, positively uniformly circulating said gaseous treatment material through the load of workpieces in the load chamber by a hot circulating fan within said furnace, said second subatmospheric pressure being at least 300 torr absolute for enabling the hot circulating fan to effectively circulate said gaseous treatment material in said furnace throughout said load of workpieces in said load chamber, at said second subatmospheric pressure providing an input flow of the gaseous treatment material into said furnace at a predetermined constant flow rate and adjusting the output pumping from said furnace for holding the pressure in said chamber at said second subatmospheric pressure which is at least 300 torr absolute, continuously circulating the gaseous treatment material through the load by the hot circulating fan, and continuing for the desired carburizing time said treatment temperature, said input flow, said output pumping, and said uniform circulating by the hot circulating fan.



tion and being of a greater conductivity than that of said inner window region.

4,160,679

**MIGRATION OF FINE LIQUID WIRES BY THERMAL GRADIENT ZONE MELTING THROUGH DOPED SURFACES**

Douglas E. Houston, Ballston Lake; Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,904

Int. Cl.<sup>2</sup> H01L 21/225

U.S. Cl. 148—1.5

9 Claims

1. In the method of moving a melt of metal-rich semiconductor material through a solid body of semiconductor material by thermal gradient zone melting processing comprising the step of

- selecting a body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one of two major opposed surfaces having a preferred planar crystal structure orientation which is one selected from the group consisting of (100), (110) and (111), the vertical axis of the body being substantially aligned with a first axis of the crystal structure, the surface having the preferred planar crystal structure orientation to accommodate one or more physical configurations of a layer of metal thereon;
- depositing a layer of metal on the selected surface of the body of semiconductor material;
- heating the body and the layer of metal to a temperature sufficient to form a melt of metal-rich material on the surface of the body;
- establishing a temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure, and
- migrating the metal-rich melt through the body parallel to the vertical axis of the body to form within the body at least one region of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one dopant impurity material therein to impart a second type conductivity and a selected level of resistivity thereto;

the improvement in the method of processing which includes prior to depositing the layer of metal on the selected surface the additional process step of forming a region in the body to increase the emissivity of the radiant energy in that portion of the body including the region, and to maintain the unidirectional thermal gradient to be established in the body normal to the selected surface in that region of the body, including the selected surface thereof on which the layer of metal is to be deposited, the region extending a predetermined depth into the body from the selected surface to provide a minimum thickness thereto and having a predetermined level of concentration of a dopant impurity material therein.

4,160,681

**SILICON STEEL AND PROCESSING THEREFOR**

Clarence L. Miller, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 27, 1977, Ser. No. 864,363

Int. Cl.<sup>2</sup> H01F 1/04

U.S. Cl. 148—111

14 Claims

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of: preparing a melt of silicon steel containing from 0.02 to 0.06% carbon, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, no more than 0.008% aluminum and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel; applying a refractory oxide coating to said steel; and final texture annealing said steel; the improvement comprising the steps of coating the surface of said steel with a refractory oxide coating consisting essentially of:

- 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;
- up to 100 parts, by weight of at least one other substance from the group consisting of boron and compounds thereof, said coating containing at least 0.1%, by weight, of boron;
- from 0.5 to 50 parts, by weight, of manganese sulfate;

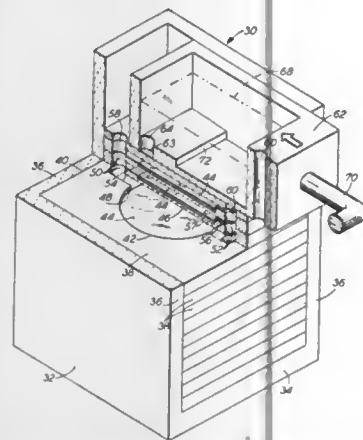


(d) up to 50 parts, by weight, of oxides less stable than  $\text{SiO}_2$  at temperatures up to  $2150^\circ\text{F}$ ., said oxides being of elements other than boron;  
 (e) up to 40 parts, by weight, of  $\text{SiO}_2$ ;  
 (f) up to 20 parts, by weight, of inhibiting substances; and  
 (g) up to 10 parts, by weight, of fluxing agent;  
 and final texture annealing said steel with said coating thereon; said steel having a permeability of at least 1870 ( $\text{G}/\text{O}_2$ ) at 10 oersteds and a core loss of no more than 0.720 watts per pound at 17 kilogauss-60 Hz.

13. Primary recrystallized steel from a melt consisting essentially of, by weight, 0.02 to 0.06% carbon, 0.015 to 0.15% manganese, 0.01 to 0.05% of material from the group consisting of sulfur and selenium, 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, 2.5 to 4.0% silicon, up to 1.0% copper, no more than 0.008% aluminum, balance iron; and having adhered thereto, a coating consisting essentially of:

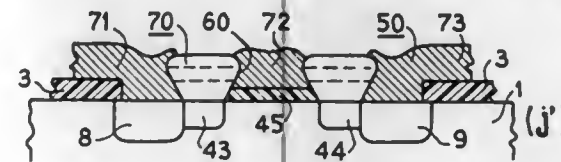
- 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;
- up to 100 parts, by weight, of at least one other substance from the group consisting of boron and compounds thereof, said coating containing at least 0.1%, by weight, of boron; and
- from 0.5 to 50 parts, by weight, of manganese sulfate.

4,160,682  
**DEPOSITING MATERIALS ON STACKED SEMICONDUCTOR WAFERS**  
 Werner F. Esseluhn, Wyomissing, Pa., assignor to Western Electric Co., Inc., New York, N.Y.  
 Filed Mar. 30, 1978, Ser. No. 891,867  
 Int. Cl.<sup>2</sup> H01L 21/208  
 U.S. Cl. 148—171 10 Claims



1. A method of depositing epitaxial melt material onto a plurality of semiconductor wafers, comprising:  
 placing the wafers in a stacked relationship in communication with a common passageway;  
 filling a reservoir with the material while an aperture in the reservoir is out of alignment with the passageway to prevent the flow of the material out of the reservoir; and  
 moving the reservoir to align the aperture with the passageway to flow the material through the passageway and onto the stacked wafers.

4,160,683  
**METHOD OF MANUFACTURING FIELD EFFECT TRANSISTORS OF THE MOS-TYPE**  
 Marcel Roche, Paris, France, assignor to Thomson-CSF, Paris, France  
 Filed Apr. 17, 1978, Ser. No. 897,169  
 Claims priority, application France, Apr. 20, 1977, 77 11912  
 Int. Cl.<sup>2</sup> H01L 21/225  
 U.S. Cl. 148—187 5 Claims



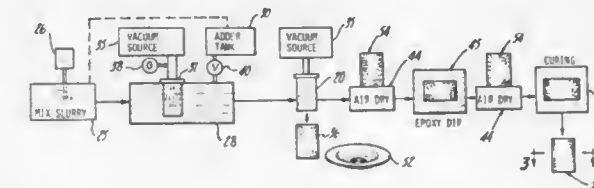
1. A method of manufacturing field-effect transistor of the MOS-type in one principal surface of a substrate of monocrystalline semiconductor material having a first conductivity type, comprising on the one hand two regions having a second conductivity type opposite to the first, namely a source region and a drain region, respectively, terminating at said surface and separated from one another by an intermediate channel region of the substrate and, on the other hand, a control gate of an electrically conductive material extending above said intermediate region, from which it is insulated by a layer of dielectric material, said method comprising the following steps:

- forming a masking layer of silica on the principal surface of the substrate (1) and forming two openings to expose two zones;
- diffusing impurities having the second conductivity type through these openings to form a source region (8) and a drain region (9);
- removing that portion of the masking silica layer which is present on said intermediate region (12) and forming, by successive deposits over the entire principal surface, a layer (70) of doped silica containing a doping impurity of the second conductivity type, the doping level decreasing with each successive deposit;
- removing said layer of doped silica by chemical etching except for two portions situated on the intermediate region respectively adjacent the source and drain regions, said portions decreasing in section in the direction toward said substrate to form a pit;
- diffusing impurities into the substrate from said two portions by heating to a temperature of from  $950^\circ\text{C}$ . to  $1150^\circ\text{C}$ . to form therein two regions (43) and (44) defining the ends of the channel;
- forming a layer of dielectric material (45) on the exposed zones of the principal surface during or after this diffusion;
- forming a layer (50) of conductive metal over the entire principal surface, said layer having reductions in thickness around said portions; and
- removing those portions of said metal layer which are situated above the portions of the layer of doped silica present on said two defining regions (43) and (44) by chemical etching to form source, gate and drain contacts (71), (72), and (73), respectively.

4,160,684  
**METHOD OF MANUFACTURING A COALESCING DEMISTER**  
 L. Joseph Berger, Jr., and Denis D. Gueguerre, both of Birmingham, Mich., assignors to Finite Filter Company, Madison Heights, Mich.  
 Continuation-in-part of Ser. No. 593,831, Jul. 7, 1975, Pat. No. 4,078,965. This application Jul. 23, 1976, Ser. No. 708,226  
 Int. Cl.<sup>2</sup> B32B 31/00  
 U.S. Cl. 156—69 32 Claims

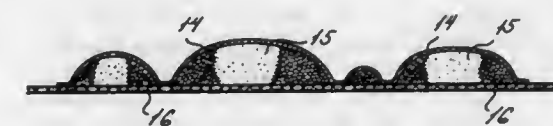
1. A method of manufacturing an out-to-in Coalescing Demister including the steps of providing a coalescing subassem-

bly, providing a prefilter-precoalescer subassembly, providing an upper end cap and a lower end cap and potting said coalescing and said prefilter-precoalescer subassemblies concentrically in said upper and said lower end caps with a continuous physical air gap between said subassemblies, providing for a complete separation of said coalescing and said prefilter-precoalescer subassemblies to allow no mechanical transfer of oil between said prefilter-precoalescer and said coalescing subassemblies, and also providing a continuous air flow barrier between said subassemblies, wherein the providing of a coalescer subassembly includes the steps of providing a forming fixture having a removable end cap, placing a perforated inner retainer on said forming fixture and securing it in place with said removable end cap, wrapping said inner retainer with at least one layer of a suitable synthetic cloth to form a lateral channeling filter layer, providing a suitable forming tank with



a suitable glass fiber slurry mix placed therein, providing a suitable vacuum source operatively connected to said forming fixture, lowering said forming fixture into said forming tank and applying a vacuum to the forming fixture in a predetermined manner until a desired thickness of glass fibers are formed over said anti-channeling filter layer, withdrawing said forming fixture from said forming tank, allowing the assembly manufactured thus far to air dry under vacuum for a predetermined period of time, installing an outer perforated retainer tube while said assembly is air drying, shutting off said vacuum, removing said retaining member from said forming fixture and removing said coalescer assembly therefrom, placing said coalescing portion of said coalescing subassembly to air dry, dipping said portion assembly in an epoxy dip after said air drying has taken place, removing said assembly from the epoxy dip and again placing it to air dry, and curing said assembly after the second drying operation has taken place.

4,160,685  
**METHOD OF MAKING AN APPLIQUE ARTICLE**  
 Minoru Kuroda, Amagasaki, Japan, assignor to Nishizawa Shoji Ltd., Osaka, Japan and The Dimension Weld International Corporation, Stamford, Conn.  
 Continuation-in-part of Ser. No. 393,791, Sep. 4, 1973, which is a continuation of Ser. No. 113,088, Feb. 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 662,962, Aug. 24, 1967, abandoned, and a continuation-in-part of Ser. No. 112,403, Feb. 3, 1971, abandoned, which is a continuation of Ser. No. 792,719, Jan. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 662,962, Aug. 24, 1967, abandoned. This application Jan. 7, 1976, Ser. No. 646,960  
 Claims priority, application Japan, Dec. 19, 1966, 41-83085; Dec. 19, 1966, 41-115532; Dec. 19, 1966, 41-115533; Dec. 19, 1966, 41-115535  
 The portion of the term of this patent subsequent to Dec. 21, 1988, has been disclaimed.  
 Int. Cl.<sup>2</sup> B32B 31/00  
 U.S. Cl. 156—219 8 Claims



1. A method of making an adhesive applique article, com-

prising the steps of providing a base layer of sheet material; providing an adhesive backing on only one surface of said base layer; providing a release layer; providing a cover layer of sheet material having a design surface with an outer contour line, a narrow outer bonding zone along said outer contour line and at least one inner bonding zone spaced inwardly from said outer bonding zone; further providing an intermediate layer of resiliently compressible latently adhesive material having spaces filled with a gaseous medium; forming a sandwich composed of said release layer, said base layer superimposed on said release layer with said adhesive backing thereof in contact with said release layer; said intermediate layer superimposed with one surface thereof on the other surface of said base layer and said cover layer superimposed on the other surface of said intermediate layer; and pressing said cover layer within said outer and inner bonding zones against said intermediate layer and said base layer while activating only said latently adhesive material and thereby bonding said cover layer by said latently adhesive material to said other surface of said base layer in said outer and inner bonding zones, and severing said cover layer and intermediate layer along said outer contour line, the presence of said intermediate layer resulting in formation of a cushion between said base layer and said cover layer in the area surrounded by said outer bonding zone upon bonding of said cover layer to said base layer.

4,160,686  
**METHOD OF REVERSE COATING TEXTILE SHEETS WITH POLYURETHENE**  
 Georg Niederdelmann, Dormagen; Bernd Quiring, and Wilhelm Thoma, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
 Filed Oct. 3, 1977, Ser. No. 838,683  
 Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644923  
 Int. Cl.<sup>2</sup> C09J 5/00  
 U.S. Cl. 156—331 11 Claims

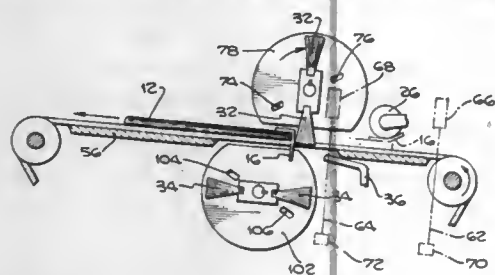
1. In a method of coating textile sheets by the reversal process with polyurethanes which are stable in storage as solutions according to which the solution of a polyurethane which is substantially free from reactive end groups is applied as top coat to a separating substrate in a first stage of the process, the top coat is dried and in a second stage an adhesive coat solution is applied to the top coat and the textile sheet is laminated thereto, the solvent in the adhesive coat is evaporated off in a second drying operation and the coated textile is subsequently lifted from the separating substrate, the improvement comprising the use of a polyurethane in at least one of the top coat and adhesive coat which has been prepared by the reaction of  
 (a) at least one dihydroxyl compound having a molecular weight of between about 500 and 5000,  
 (b) at least one diisocyanate and  
 (c) a mixture of about 95-35 mol % of at least one diol having a molecular weight of between about 62 and 450 and about 5-65 mol %  
 of at least one monoalkanolamine having a molecular weight of about 61 to 200, the molar ratio of components (a) to (c) being between about 1:1 and 1:6 thereby giving a coating with improved pressure deformation resistance under heat.

4,160,687  
**MAGAZINE PAGE LABELING APPARATUS**  
 Phillip L. Spear, Santa Ana, Calif., assignor to Avery International Corporation, San Marino, Calif.  
 Filed Jun. 26, 1978, Ser. No. 918,728  
 Int. Cl.<sup>2</sup> B32B 3/24  
 U.S. Cl. 156—444 8 Claims

8. An apparatus for applying labels over the rear and the two sides of a high speed moving object comprising:  
 means for dispensing a label and sticking it onto the back



edge of one side of said object to extend beyond the rear of said object;  
means for brushing said label across the rear of said object;  
means for directing a jet of air in the direction of travel of



said objects to deflect said label forward over the other side of said object; and  
means for brushing said label forward in the direction of movement of said object and for firmly applying said label to the other side of said object.

4,160,688

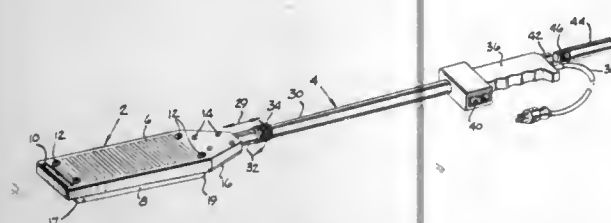
**LOW PROFILE HEAT SEALING IRON**  
Ray G. Brooks, Irving, Tex., and Harvell M. Smlth, Conifer, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 3, 1977, Ser. No. 765,140

Int. Cl.<sup>2</sup> B30B 15/34; D06F 75/08

U.S. Cl. 156—574

6 Claims



1. A low profile heat sealing iron adapted to be moved along a generally planar surface where access is limited comprising:

(a) a low profile head having a longitudinal axis comprising a cap member having generally planar first and second faces, heating plate means attached to said second face and having a head end and a foot end for heating a thermally activatable strip fed to the head end of said heating plate means for pressing said strip against said generally planar surface as said head is slid along over the length of said strip, and guide means comprising a rectangular slot passing through said cap member from said first face to said second face adjacent the head end of said heating plate means for guiding and feeding said strip to the head end of said heating plate means, and

(b) handle means connected to said low profile head for moving said head along said generally planar surface, said handle means also being of low profile, and said handle means having a longitudinal axis lying substantially in the same plane as said head longitudinal axis.

4,160,689

**SHEET SEALING SHOE ASSEMBLY**

Willy Altermatt, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Rheinfall, Switzerland

Filed Oct. 26, 1977, Ser. No. 845,614

Claims priority, application Switzerland, Nov. 23, 1976, 14727/76

Int. Cl.<sup>2</sup> B30B 15/34

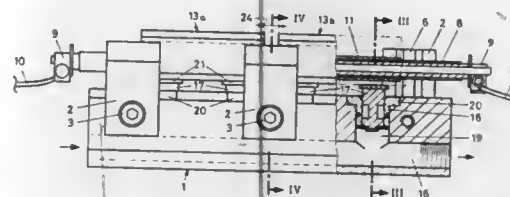
U.S. Cl. 156—583.1

12 Claims

1. In a sealing shoe assembly for forming a seam, by application of heat and pressure, on face-to-face arranged sheets dis-

posed between a backup support and the sealing shoe assembly cooperating with the backup support; the assembly including an elongated carrier and a sealing shoe supported on the carrier; the improvement wherein said sealing shoe is formed of at least two sealing shoe parts arranged on said carrier in longitudinal alignment with respect to one another; each said sealing shoe part having a U-shaped cross section formed of opposite legs and a web portion; each leg of each said sealing shoe part having a longitudinal first projection protruding in the length dimension of the respective sealing shoe part beyond the outline thereof; the improvement further comprising

(a) piston means individually and resiliently movably securing each said sealing shoe part to said carrier; said piston means comprising pistons being in engagement with each said sealing shoe part and being axially slidably supported in said carrier;



(b) means within said carrier for admitting a pressurized medium simultaneously to each said piston for urging each said sealing shoe part towards said backup support;

(c) a plurality of holders attached in a spaced relationship to said carrier; said holders being arranged at the opposite ends of each said sealing shoe part; each holder having a second projection disposed in the path of travel of a respective first projection for limiting the motion of each said sealing part away from said carrier;

(d) a longitudinal heater bar arranged on said carrier in the length dimension thereof and being held by said holders; and

(e) an elongated heat transmitting member surrounding said heater bar and being slidable with respect thereto; each said sealing shoe part straddling said heat transmitting member with said legs.

4,160,690

**GAS ETCHING METHOD AND APPARATUS**

Masahiro Shibagaki, Hiratsuka; Yasuhiro Horiike, Tokyo, and Takashi Yamazaki, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

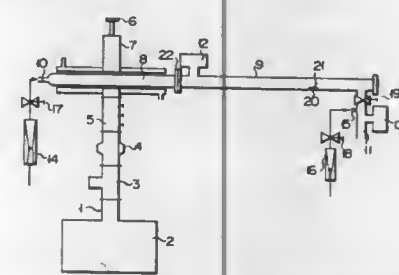
Filed Mar. 31, 1978, Ser. No. 892,330

Claims priority, application Japan, Mar. 31, 1977, 52-35448

Int. Cl.<sup>2</sup> C23F 1/02; C23C 15/00; B01K 1/00

U.S. Cl. 156—643

12 Claims



1. A gas etching apparatus comprising an etching gas-producing chamber; means for introducing into said chamber a mixture of a gas containing fluorine atoms and a gas containing oxygen atoms; means for activating the gas mixture received in the etching gas-producing chamber; an etching chamber provided in a region located apart from the etching gas-producing chamber and free from an electric field produced by the activating means; means for exhausting the etching gas from the etching chamber; and an etching gas-conducting means pro-

viding communication between the etching gas-producing chamber and the etching chamber and having conductance conforming to the formula:

$$10^{-1}Se \leq C_T \leq 5 \times 10^2 Se$$

where:

$C_T$  = conductance (l/min) of the etching gas-conducting means;

$Se$  = effective exhaust speed (l/min) in the etching chamber.

2. The gas etching apparatus according to claim 1, wherein the means for activating the gas mixture is high frequency discharging means.

3. The gas etching apparatus according to claim 2, wherein the high frequency discharging means is microwave discharging means.

10. A gas etching process which comprises the steps of introducing a mixture of a gas containing fluorine atoms and a gas containing oxygen atoms into an etching gas-producing chamber; activating the gas mixture; introducing the activated gas mixture through an etching gas-conducting means into an etching chamber provided in a region located apart from the etching gas-producing chamber and free from an electric field produced by activating the gas mixture; exhausting the gas mixture from the etching chamber; and etching a nongaseous material received in the etching chamber by the activated gas mixture, wherein the activated gas mixture is conducted into the etching chamber to satisfy the formula:

$$10^{-1}Se \leq C_T \leq 5 \times 10^2 Se$$

where:

$C_T$  = conductance (l/min) of the etching gas-conducting means;

$Se$  = effective exhaust speed (l/min) in the etching chamber.

4,160,691

**ETCH PROCESS FOR CHROMIUM**

Oscar R. Abolafia, Endwell, and John Rasile, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,073

Int. Cl.<sup>2</sup> C23F 1/00

U.S. Cl. 156—664

10 Claims

1. A process for etching chromium comprising contacting the chromium with a mixture comprising from about 5 to 20% by volume of concentrated HCl, from about 65 to 95% by volume of a water miscible organic solvent and from about 0 to 30% by volume water at a temperature of from about 50° to 95° C.

4,160,692

**WIPED FILM EVAPORATORS**

James Mitchell, and Thomas N. Pye, both of Leven, Scotland, assignors to Henry Balfour & Company Limited, Fife, Scotland

Filed Jul. 18, 1977, Ser. No. 817,003

Claims priority, application United Kingdom, Dec. 10, 1976, 51576/76

Int. Cl.<sup>2</sup> B01D 1/22

U.S. Cl. 159—6 W

16 Claims

1. A wiped-film evaporator for corrosive liquids, said wiped-film evaporator comprising,

(i) a vertically oriented cylindrical vessel, having a substantially smooth contoured inner surface, and having a corrosion resistant glass lining on said inner surface;

(ii) rotary shaft means within the vessel supported in bearing means and connectible to a drive, said rotary shaft means having a corrosion resistant lining on the external surface thereof;

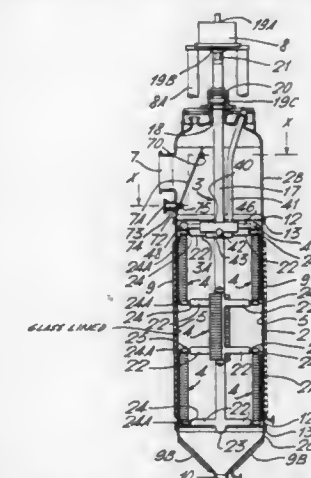
(iii) an inlet for delivery of liquid to be evaporated into the cylindrical vessel;

(iv) an outlet for vapour;

(v) corrosion resistant wiping means for wiping the internal

surface of the cylindrical vessel for the formation of a liquid film on the internal surface, said wiping means including a plurality of wiping units each wiping unit including a series of vertically stacked side-by-side wiping elements each of relatively small vertical extent and each pivotally mounted on a vertical spindle so as to adopt in use a trailing configuration relative to a radius of the vessel passing through the centre line of the spindle; and

(vi) A plurality of wiper support means carried by the rotary shaft means, each wiper support means comprising a pair



of axially-spaced radially-extending support members, mounting means being provided on the support members for support of one of said wiping units between the support members, said mounting means including socket devices receiving said vertical spindle of the wiping unit; (vii) each wiping element engaging the internal surface of the vessel to wipe a narrow annular strip on said internal surface and each element being individually pivotal whereby each wiping unit can cater for irregularities in the roundness and straightness of the portion of said internal surface wiped by the wiping unit.

4,160,693

**PROCESS FOR THE BLEACHING OF CELLULOSE PULP**

Jonas A. I. Lindahl, Domsjö; Ernst B. Tiberg, Ornskoldsvik, and Sten L. Haggstrom, Overhorns, all of Sweden, assignors to Mo och Domsjö Aktiebolag, Ornskoldsvik, Sweden

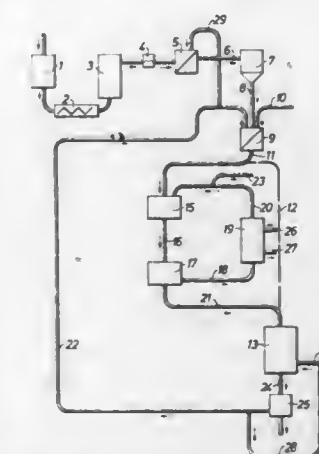
Filed Apr. 17, 1978, Ser. No. 896,649

Claims priority, application Sweden, Apr. 18, 1977, 7704404

Int. Cl.<sup>2</sup> D21C 9/10, 9/12, 9/16, 9/18

U.S. Cl. 162—24

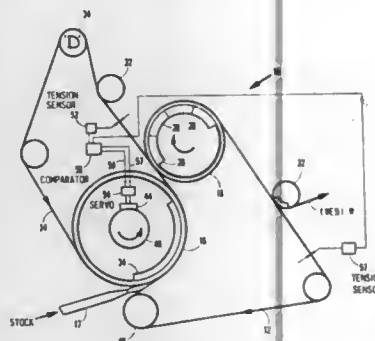
12 Claims



1. A process for the bleaching of lignocellulosic material, which comprises forming a pulp suspension of lignocellulosic

material having a consistency within the range from about 18% to about 55%; mixing the suspension in a mixing zone with a bleaching agent while adjusting the consistency of the pulp suspension to within the range from about 2% to about 15% and the temperature of the pulp suspension to within the range from about +10° C. to about -10° C. of a temperature within the range from about 40° to about 95° C. at which bleaching is to be carried out; quickly dewatering the pulp suspension to a pulp consistency within the range from about 18 to about 50%, equal to or at most 5% less than the initial pulp consistency of the pulp suspension charged to the mixing zone; passing the dewatered pulp suspension to the bleaching zone before its temperature can change substantially from the adjusted temperature; carrying out the bleaching with a bleaching agent at the selected bleaching temperature within the range from about 40° to about 95° C.; and recycling the bleaching liquor recovered from the dewatering to the mixing zone while maintaining a temperature in the recycled liquor to bring the pulp suspension to within said range of the bleaching temperature during the mixing with bleaching agent.

**4,160,694**  
**TWIN WIRE WEB FORMING WITH WIRE TENSION CONTROL**  
Ralph J. Futcher, Beaconsfield, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada  
Filed Dec. 23, 1977, Ser. No. 863,945  
Int. Cl.<sup>2</sup> D21F 1/40, 7/02  
U.S. Cl. 162—256



1. In a twin-wire web forming machine having a first endless forming belt and a second endless forming belt arranged in converging relation therewith; headbox means to feed stock in sandwiched relation between the converging belts; a first roll located within the loop of the first belt to receive the first and second belts in tensioned pressing relation about a portion of the periphery of the roll to provide an initial web formation zone; a second roll located within the loop of the second belt, to guide the second belt in diverging relation from the first belt, said second roll having a suction compartment therein adjacent the point of divergence of said belts to assist retention of said web on said second belt, belt drive means within said first loop to draw said first belt in tensioned relation from said first roll, brake means operating on said first roll in load applying relation, and brake control means to provide a predetermined value of tension to said first belt.

**4,160,695**  
**PROCESS FOR THE PRODUCTION OF GLUCOSE FROM CELLULOSE-CONTAINING VEGETABLE RAW MATERIALS**

Hans-Hermann Dietrichs, Reinbek; Michael Sinner, Dassen-dorf; Fritz Opderbek, München, and Karl-Heinz Brachthäuser, Ratingen, all of Fed. Rep. of Germany, assignors to Projektierung Chemische Verfahrenstechnik Gesellschaft mit beschränkter Haftung, Düsseldorf, Fed. Rep. of Germany  
Filed Jul. 18, 1977, Ser. No. 816,463  
Claims priority, application Austria, Jul. 20, 1976, 5345/76  
Int. Cl.<sup>2</sup> C12D 13/02; C13K 1/02  
U.S. Cl. 435—101

6 Claims  
1. A process for the production of glucose from cellulose-containing vegetable raw material which can be disintegrated by steam pressure treatment and defibrination consisting essentially of the steps of  
(a) treating cellulose-containing vegetable raw material with saturated steam at temperatures of from about 160° to 230° C. for a period of from about 2 minutes to about 4 hours to disintegrate the raw material,  
(b) lixiviating the disintegrated raw material with an aqueous solution of alkali to leave a fibrous residue, and  
(c) subjecting the fibrous residue to acid or enzymatic hydrolysis under conditions to produce glucose.

**4,160,696**  
**ASCORBIC ACID DETERMINATION**  
Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.  
Filed Aug. 23, 1976, Ser. No. 716,921  
Int. Cl.<sup>2</sup> G01N 31/14  
U.S. Cl. 435—25

19 Claims  
1. A composition for the detection of ascorbic acid comprising a dry mixture of sufficient ascorbic acid oxidase, coupling substance and buffer as to provide upon addition of water an aqueous composition buffered to a pH of between about 5.7 and about 8.7 and comprising at least about 10 µg/ml of ascorbic acid oxidase, and from about 5×10<sup>-3</sup> to about 10<sup>-2</sup> M coupling substance which interacts with dehydroascorbic acid to produce a detectable product.

**4,160,697**  
**METHOD FOR PURIFICATION OF CRUDE UROKINASE**  
Ichiro Chibata, Suita; Toshio Kakimoto, Minamikawachi; Yoshiaki Kakie, Takatsuki; Takeji Shibatani, Kobe, and Noriyuki Nishimura, Nara, all of Japan, assignors to Tanabe Selyaku Co., Ltd., Osaka, Japan  
Filed Mar. 23, 1978, Ser. No. 889,385  
Claims priority, application Japan, Apr. 9, 1977, 52-40683; Apr. 28, 1977, 52-49634; Sep. 30, 1977, 52-118321  
Int. Cl.<sup>2</sup> C07G 7/026  
U.S. Cl. 435—194

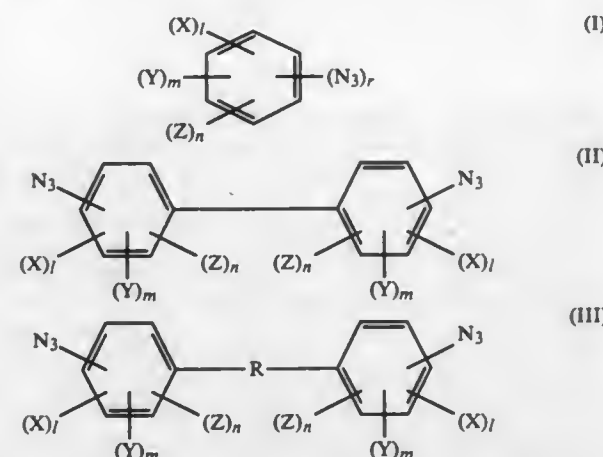
32 Claims  
1. A method of purifying crude urokinase which comprises contacting an aqueous urokinase solution with a water-insoluble, hydrophilic polysaccharide having a group of the formula:



wherein R is sulfothio, sulfo or p-sulfohenylamino, to have urokinase adsorbed thereon, and eluting the adsorbed urokinase from said polysaccharide to recover urokinase.

**4,160,698**  
**ENZYME IMMOBILIZATION WITH AZIDO COMPOUNDS**  
Sachio Miyairi, Chigasaki; Hideaki Tanaka, Hiratsuka; Akira Yabe, Fujisawa, and Koichi Honda, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan  
Filed Sep. 8, 1977, Ser. No. 831,649  
Claims priority, application Japan, Sep. 9, 1976, 51/108154  
Int. Cl.<sup>2</sup> C07G 7/02  
U.S. Cl. 435—173

11 Claims  
1. A method for the immobilization of an enzyme comprising the steps of:  
mixing about 1 to about 20% by weight enzyme with an aromatic group-containing azido compound and a water-soluble high molecular weight compound, wherein said aromatic group containing azido compound is represented by formulae selected from the group consisting of I, II and III

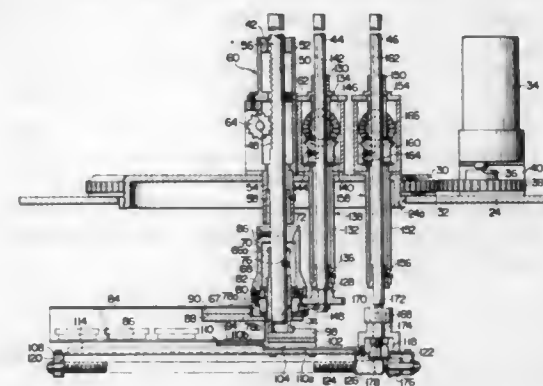


wherein X, Y and Z each represent one member selected from the group consisting of halogen atoms, alkyl, alkoxy and hydroxyl groups and salts thereof, sulfonic acid group and salts thereof; l, m and n each represent an integer having the value of from 0 to 4, and r represents an integer having the value of from 2 to 5; wherein R represents  $-(\text{CH}_2)_p-$   $-(\text{CH}=\text{CH})_q-$  wherein p and q represent an integer having the value of from 1 to 3, an oxygen atom, a sulfur atom,  $\text{SO}_2$  group or  $\text{NH}$  group; forming the resultant mixture into a desired shape; drying said shaped mixture; and exposing the dried mixture to light to cause the water soluble high molecular weight compound to be bound to one azido group of said azido compound and the enzyme to be bound to another azido group of said azido compound, whereby the enzyme becomes bound to said water soluble high molecular weight compound.

**4,160,699**  
**DRIVE SYSTEM FOR AUTOMATIC CULTURE APPARATUS**  
Shinroku Sogi, Makoto Yoshinaga, both of Hachioji; Toshio Shinohara, Chofu; Takayuki Aihara, and Ikuo Tawara, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Nov. 1, 1977, Ser. No. 847,553  
Claims priority, application Japan, Nov. 9, 1976, 51-133695  
Int. Cl.<sup>2</sup> C12K 1/10  
U.S. Cl. 435—287

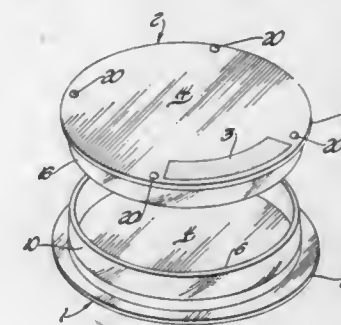
5 Claims  
1. A drive system for an automatic culture apparatus of the type which includes an air tight housing having a culture vessel platform, a culture progress observation platform and a separation/distribution work platform disposed therein, said platforms being vertically displaced from each other, said drive system comprising:

- A) a through-opening centrally formed in each of said platforms;  
B) a culture vessel carrier movable between said platforms through said openings;  
C) a transfer arm for transferring a culture vessel between said vessel carrier and said vessel platform, said vessel carrier and said observation platform, and said vessel carrier and said work platform; and  
D) drive mechanism means for:  
(1) moving said vessel carrier and said transfer arm in the



vertical direction such that said vessel carrier and said transfer arm may be moved between first, second and third positions adjacent said vessel platform, said observation platform and said work platform, respectively; and  
(2) moving said transfer arm in both the horizontal and vertical direction after said vessel carrier and transfer arm are placed in one of said first, second or third positions in such a manner that said transfer arm moves a culture vessel between said vessel carrier and the platform said transfer arm is adjacent.

**4,160,700**  
**PETRI DISH**  
Mary Boomus, Chelsea; Bernard Sobin, and John Schweitzer, both of Ann Arbor, all of Mich., assignors to Gelman Instrument Company, Ann Arbor, Mich.  
Filed Feb. 14, 1977, Ser. No. 768,311  
Int. Cl.<sup>2</sup> C12B 1/00  
U.S. Cl. 435—298



2 Claims  
1. A petri dish comprising:  
a molded, unitary organic resin container having a substantially flat, round bottom wall and a substantially cylindrical side wall extending perpendicularly upwardly from said bottom wall, said side wall having a height of from about 1/4 to 1/2 inch and having an outer cylindrical surface with a diameter of from about one to four inches, said container having a circular flange extending radially outwardly from and substantially coplanar with said bottom wall, said flange having an outer diameter about 1/4 to 1/2



inch greater than the diameter of the outer surface of said side wall;  
and a molded, unitary, transparent organic resin lid for said container having a round top wall and a substantially cylindrical side wall extending perpendicularly downwardly from said top wall, said downwardly extending side wall of said lid having an inner cylindrical surface with a diameter about the same as the diameter of the outer surface of said upwardly extending side wall of said container such that said inner cylindrical surface of said downwardly extending side wall of said lid fits snugly against said outer cylindrical surface of said upwardly extending side wall of said container to assure against the entrance of contaminants into said container, said lid having a circular flange extending radially outwardly from and substantially coplanar with said top wall, said flange on said lid having an outer diameter less than the outer diameter of said flange on said container;  
at least one of said cylindrical surfaces being tapered adjacent the extremity thereof thereby to enable said lid to be easily fitted onto said container.

4,160,701

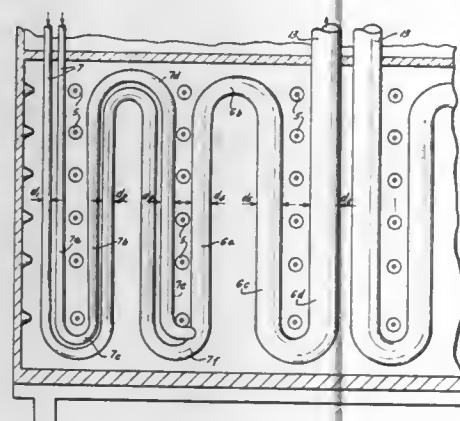
## TUBE FURNACE FOR THE CRACKING OF ORGANIC FEED STOCK

Armin Dorner, and Walter Kreuter, both of Munich, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 463,103, Apr. 22, 1974, Pat. No. 4,014,749. This application Dec. 28, 1976, Ser. No. 754,955  
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1973, 2320872

The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> C10G 9/20; F22B 21/24, 37/12  
U.S. Cl. 196—116

7 Claims



1. In a tube furnace for thermal cracking of a hydrocarbon, comprising a combustion chamber, and a plurality of duct systems traversing said chamber for conducting a hydrocarbon therethrough, said duct systems each having an inlet side and an outlet side, the improvement wherein said duct system comprises at said inlet sides at least two undulating tubes of said chamber, each tube having a plurality of loops in mutually parallel vertical planes for conducting said hydrocarbon in parallel and, at said outlet side, a common pipe in said chamber of undulating configuration with a plurality of loops in a vertical plane parallel to the vertical planes of said tubes and communicating with said tubes, said tubes opening into and being connected to said pipe and forming a junction therewith, the undulations of said pipes and tubes having upper and lower bends separated by a substantially vertical distance, said pipe having a flow cross section at least equal to that of said tubes at their junction with said pipe, the pitch of the undulations of

said tubes being less than the pitch of the undulations of said pipe.

4,160,702

## ELECTROCHEMICAL MEASUREMENT OF FATIGUE DAMAGE

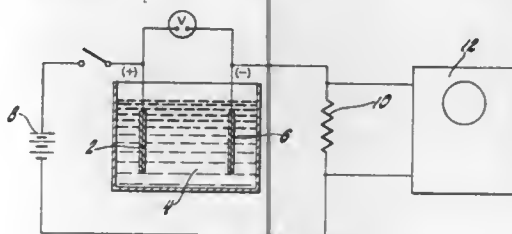
William J. Baxter, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1978, Ser. No. 898,614

Int. Cl.<sup>2</sup> G01N 27/42, 3/08

U.S. Cl. 204—1 T

2 Claims



1. A testing method for the early detection and assessment of the accumulation of fatigue damage in metal parts prior to the formation of detectable fatigue cracks therein comprising the steps of:

anodizing the surface of said part in an appropriate electrolyte to form a current-limiting oxide coating thereon said anodizing proceeding to a predetermined cut-off current at a predetermined anodizing potential;  
fatigue testing the parts according to a prescribed regimen for a sufficient amount to induce the formation of microcracks in said coating at the situs of deformations induced on said surface by said testing which deformations are precursors of said fatigue cracks;  
anodizing said part in said electrolyte at a potential of about said predetermined anodizing potential or less until the reanodization current falls off to about said predetermined cut-off current to anodically heal said microcracks; and  
determining the transient charge required to heal said microcracks as an indicator of the extent of fatigue accumulated in the part by said fatigue testing.

4,160,703

## NONPLATING CATHODE AND METHOD FOR PRODUCING SAME

Richard A. Bird, and Lowell W. Austin, both of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 830,834, Sep. 6, 1977. This application Jul. 3, 1978, Ser. No. 921,674

Int. Cl.<sup>2</sup> C25D 5/02, 7/06; C25F 5/00

U.S. Cl. 204—15

7 Claims

1. A method for producing metal strip material having a zinc coating only on one side comprising,

(a) conditioning a lead cathode means so as to immunize it against plating zinc on its surface during an electrolytic operation, said conditioning including immersing the lead cathode means in a zinc ion-containing electrolytic bath, electrolytically causing a light zinc coating to form on the surface of the cathode means, and electrolytically or chemically removing said zinc coating from the cathode means,

(b) immersing a zinc coated metal strip in said electrolytic bath and passing it through the electrolyte solution between anode means and the conditioned lead cathode means, and

(c) electrolytically treating the strip so as to remove the zinc coating from the side of the strip facing the conditioned cathode means while simultaneously depositing a substantially equivalent amount of zinc on the opposite side of the strip.

4,160,704

## IN SITU REDUCTION OF ELECTRODE OVERVOLTAGE

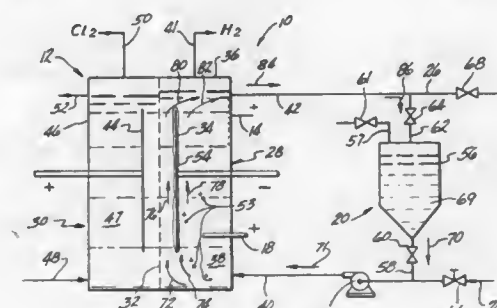
Han C. Kuo; Byung K. Ahn; Ronald L. Dotson, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 792,389, Apr. 29, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,360

Int. Cl.<sup>2</sup> C25B 11/04, 11/08; C25D 5/02, 5/34

U.S. Cl. 204—32 R

29 Claims



1. A method for reduction of the cathodic hydrogen overvoltage potential of a membrane type chlor-alkali electrolytic cell, having a cathodic chamber, a catholyte solution, a clean, hydrogen-evolving cathode, and an anode, which method comprises the steps of:

(a) introducing low overvoltage metal ions into the catholyte solution; and  
b. plating said low overvoltage metal ions, in metallic form, on the cathode in situ by passing an electric current from the anode to the cathode.

4,160,705

## SILICON-IRON PRODUCTION AND COMPOSITION AND PROCESS THEREFOR

Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

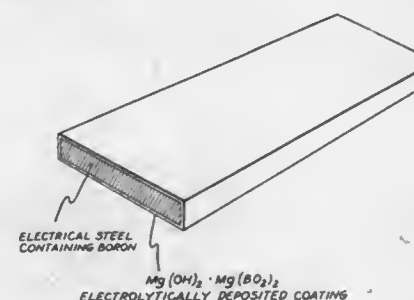
Filed Apr. 24, 1978, Ser. No. 899,487

The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C25D 5/50; H01F 1/04

U.S. Cl. 204—37 R

8 Claims



1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of providing a fine-grained, primary-recrystallized silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three and 50 parts per million boron, and between about 15 and 95 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, electrolyzing an aqueous solution consisting essentially of magnesium formate and magnesium metaborate and containing magnesia with the silicon-iron sheet being arranged as the cathode in said solution and the said solution being at a temperature of at least about 65° C. and thereby covering the sheet with a boron-containing adherent electrically-insulating coating of Mg(OH)<sub>2</sub>, and subjecting the coated sheet to a final heat

treatment to develop (110) [001] secondary recrystallization texture in the silicon-iron sheet.

4,160,706

## COATED SILICON-IRON PRODUCT AND PROCESS THEREFOR USING MAGNESIUM FORMATE AND METABORATE

Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

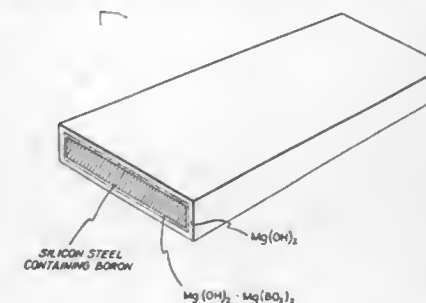
Filed Apr. 24, 1978, Ser. No. 899,488

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C25D 5/50; H01F 1/04

U.S. Cl. 204—37 R

8 Claims



1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of (a) providing a fine-grained primary-recrystallized silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three and 50 parts per million boron, and between about 15 and 95 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, (b) electrolyzing a solid MgO-buffered aqueous electrolytic formate-metaborate solution consisting essentially of magnesium formate and magnesium metaborate and containing magnesia with said silicon-iron sheet being arranged as the cathode in said solution and said solution being at a temperature of at least about 65° C. and thereby covering the sheet with a boron-containing adherent electrically insulating but relatively thin coating of Mg(OH)<sub>2</sub> to form a primary coated sheet, (c) electrolyzing a solid MgO-buffered electrolytic formate solution consisting essentially of magnesium formate with said primary coated sheet arranged as the cathode in said magnesium formate solution and thereby covering the boron-containing Mg(OH)<sub>2</sub> coating with a substantially thicker electrically insulating secondary coating of Mg(OH)<sub>2</sub> to form a double-coated sheet, and (d) thereafter subjecting said double-coated sheet to a final heat treatment to develop (110) secondary recrystallization texture in the silicon-iron sheet.

4,160,707

## PROCESS FOR APPLYING COATINGS CONTAINING BOTH A METAL AND A SYNTHETIC RESIN

Kees Helle, Bennekom, and Andries Kamp, Zevenaar, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 22, 1977, Ser. No. 780,051

Claims priority, application Netherlands, Apr. 26, 1976, 7604399

Int. Cl.<sup>2</sup> C25D 3/02, 5/10, 5/50

U.S. Cl. 204—37 R

17 Claims

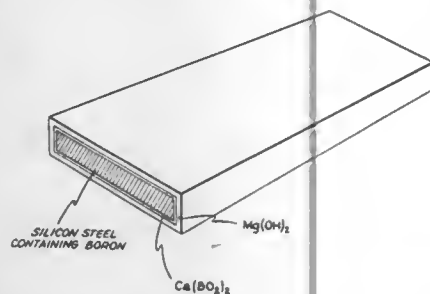
1. A process for coating a substrate which comprises codepositing on a substrate serving as a cathode a metal and resin particles having an average particle size of less than about 10 μm from an electroplating bath containing the said resin particles in a concentration of about 3 to 250 g per liter of bath liquid in the presence of both a cationic and a nonionic surface active compound for wetting said resin particles in a molar ratio between 100:1 and 2:1 and in an amount which is at least 4 × 10<sup>-3</sup> mmoles per m<sup>2</sup> of the surface area of the particles, said

surface active compounds containing no completely fluorinated carbon atoms, and thereafter drying the coating, said resin particles being other than a polyfluorocarbon compound.

**4,160,708**  
**COATED SILICON-IRON PRODUCT AND PROCESS THEREFOR USING CALCIUM FORMATE**

Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,490  
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> C25D 5/50; H01F 1/04  
U.S. Cl. 204—37 R



1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of (a) providing a fine grained primary-recrystallized silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three and 50 parts per million boron, and between about 15 and 95 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, (b) electrolyzing an aqueous electrolytic solution consisting essentially of calcium formate and boric acid buffered with solid  $\text{Ca}(\text{BO}_2)_2$  with said silicon-iron sheet being arranged as the cathode in said solution, thereby covering the sheet with an adherent electrically insulating coating of  $\text{Ca}(\text{BO}_2)_2$  to form a  $\text{Ca}(\text{BO}_2)_2$ -coated sheet, said solution being maintained at a temperature of at least about 65° C. throughout its period of electrolytic deposition, (c) electrolyzing an aqueous electrolytic solution consisting essentially of solid magnesium-buffered magnesium formate with said  $\text{Ca}(\text{BO}_2)_2$ -coated sheet arranged as the cathode in said magnesium formate solution, thereby covering the  $\text{Ca}(\text{BO}_2)_2$  coating with a substantially thicker electrically insulating coating of  $\text{Mg}(\text{OH})_2$  to form a double-coated sheet, said magnesium formate solution being maintained at a temperature of at least 65° C. throughout its period of electrolytic deposition and (d) thereafter subjecting said double-coated sheet to a final heat treatment to develop (110)[001] secondary recrystallization texture in the silicon-iron sheet.

**4,160,709**  
**PROCESS FOR THE GALVANIC DEPOSITION OF NICKEL FROM A NICKEL BATH**

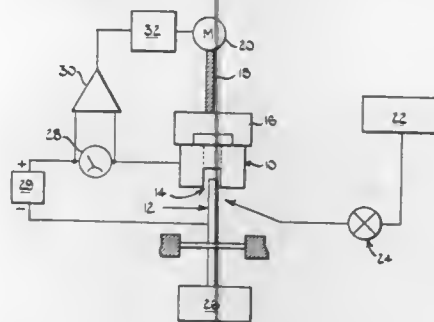
Otto Tuscher, Munich; Karl Butter, Ottobrunn, and Kuno Knauer, Jakobneuharting, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany  
Continuation of Ser. No. 750,688, Dec. 15, 1976, abandoned.  
This application May 10, 1978, Ser. No. 904,492  
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558423

Int. Cl.<sup>2</sup> C25D 3/12  
U.S. Cl. 204—49  
1. In a method for the galvanic deposition of nickel from an electrolyte containing nickel sulfamate and nickel chloride using nickel anodes in bags, the improvement which comprises reducing the formation of oxidation products from the nickel sulfamate and reducing the amount of sulfur in the deposited

nickel to less than 15 ppm by precleaning the electrolyte and using a nickel chloride concentration of from 15 to 20 g/l and a cathode current density of at least 3 amp/dm<sup>2</sup>, and preventing the escape of anode sludge into the electrolyte by enveloping the anodes in closed mesh bags prior to covering with the anode bags and suctioning the electrolyte from the anode bags and cycling the electrolyte through a selecting bath to the working bath whereby a weldable nickel is produced.

**4,160,710**  
**METHOD OF ELECTROLYTIC MACHINING**  
Stanley W. Greenwood, Colne, England, assignor to Rolls-Royce Limited, London, England  
Filed May 3, 1978, Ser. No. 902,747  
Claims priority, application United Kingdom, May 6, 1977, 19008/77

Int. Cl.<sup>2</sup> B23P 1/00, 1/04, 1/14  
U.S. Cl. 204—129.25  
6 Claims

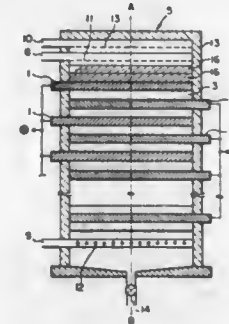


1. A method of electrolytically machining a workpiece with an electrode, including the steps of applying a first pulsed voltage across the workpiece and electrode so as to effect a corresponding pulsed, machining current flow, providing a second, parallel pulsed voltage of identical frequency and which alternates with said first pulsed voltage and providing a further, parallel pulsed voltage, each pulse of which is of sufficient duration to embrace the time taken to put out several of said first and second voltage pulses and, if the outputs of said first, second and further pulses coincide, developing from said coincident outputs a further pulse with which to bring about de-activation of the electrode traverse motor means, to stop forward movement of the electrode, but meanwhile maintaining machining current flow and a continuous delivery of electrolyte to the workpiece to wash sludge from between the workpiece and electrode.

**4,160,711**  
**ASSEMBLY OF ELECTRODES**  
Kazuo Nishizawa; Ken Higashitsuji, and Yugi Mori, all of Kyoto, Japan, assignors to Marubishi Yuka Kogyo Kabushiki Kaisha, Osaka, Japan  
Division of Ser. No. 578,981, May 19, 1975, Pat. No. 4,061,557.  
This application Mar. 29, 1977, Ser. No. 782,441  
Claims priority, application Japan, May 24, 1974, 49-057927; Oct. 19, 1974, 49-119888

Int. Cl.<sup>2</sup> C02B 1/82; C02C 5/12  
U.S. Cl. 204—152  
2 Claims  
1. A continuous process for the removal of solutes from an aqueous solution containing the same dissolved therein, said solutes being capable of forming insoluble materials depending upon the pH of the solution, which process comprises the steps of causing said aqueous solution to flow gravitationally downwards in the form of thin films over a vertical fabric of non-conductive material in which a plurality of elongated conductive elements are incorporated so as to be substantially horizontal parallel and spaced apart from each other and applying a potential to said conductive elements so as to produce a

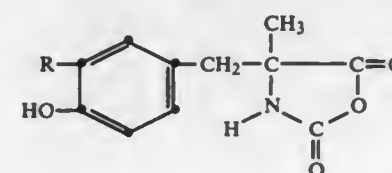
suitably steady pH distribution in the thin films of the solution flowing downwards over the fabric, whereby said solutes are



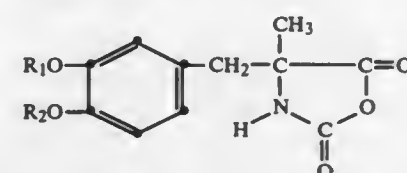
insolubilized and deposited on predetermined zones of said fabric irrespective of any anodic and cathodic reactions.

**4,160,712**  
**PROCESS FOR PREPARING NOVEL N-CARBOXYL-α-AMINO ACID ANHYDRIDES**  
Walfred S. Saari, and Joel R. Huff, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.  
Division of Ser. No. 773,258, Mar. 1, 1977, Pat. No. 4,120,971.  
This application Apr. 13, 1978, Ser. No. 895,846  
Int. Cl.<sup>2</sup> B01J 1/10; C07D 263/02  
U.S. Cl. 204—158 R  
8 Claims

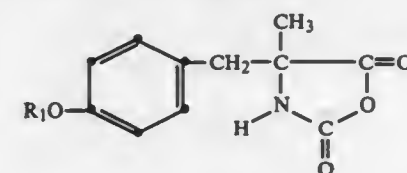
1. A process for preparing compounds having the formula:



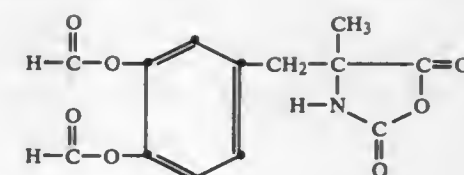
wherein R is hydrogen or hydroxy which comprises (A) catalytic hydrogenation in a non-aqueous system of (a) a compound having the formula



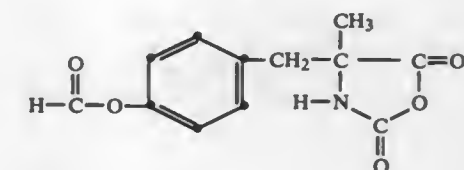
wherein R<sub>1</sub> and R<sub>2</sub> are separate or joined and comprise blocking groups susceptible to removal by said hydrogenation, when R in formula I is —OH or (b) a compound having the formula



wherein R<sub>1</sub> is a blocking group susceptible to removal by said hydrogenation, when R in formula I is hydrogen. or (B) photolysis in a non-aqueous system of a compound having the formula



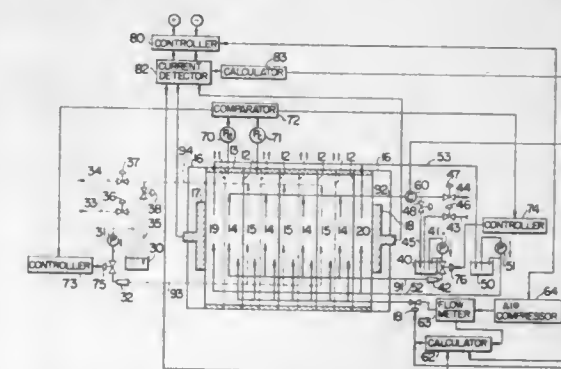
Id



Ic

**4,160,713**  
**PROCESS FOR ELECTRO-DIALYSIS**  
Harumi Matsuzaki; Sankichi Takahashi, and Osamu Kuroda, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of Japan  
Filed Jan. 30, 1978, Ser. No. 873,680  
Claims priority, application Japan, Jan. 31, 1977, 52-8665; Jan. 31, 1977, 52-8666

Int. Cl.<sup>2</sup> B01D 13/02  
U.S. Cl. 204—180 P  
19 Claims



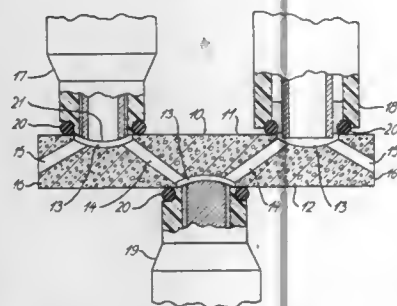
1. In a process for electro-dialyzing an electrolyte solution in an electro-dialysis apparatus, comprising the steps of: providing a plurality of alternately counterposed cation exchange membranes and anion exchange membranes; providing a plurality of frames interposed between the ion exchange membranes, thereby forming dilution chambers and concentration chambers alternately between the counterposed ion exchange membranes; providing supply and discharge passageways for the electrolyte solution, through the frames, through which the electrolyte solution is introduced to and discharged from the respective dilution chambers and concentration chambers; providing supply and discharge passageways for air bubbles, formed through the frames, through which air bubbles are introduced to lower parts and discharged from upper parts of the dilution chambers; applying an electric potential to a pair of electrodes respectively at both ends of the plurality of the dilution chambers and the concentration chambers, thereby diluting the electrolyte solution in the dilution chambers and concentrating the electrolyte solution in the concentration chambers by migration of ions due to electrophoresis of ions in the electrolyte solution and selective ion permeability of the ion exchange membranes; passing electrolyte solution diluted in the dilution chambers and electrolyte solution concentrated in the concentration



chambers through their respective chambers and passageways;  
 passing air through the air passageways so as to introduce air bubbles to the lower portions of the dilution chambers and discharge the air from the upper portions of the dilution chambers;  
 measuring the limiting current density ( $i_0$ ) without air bubbles in the chambers;  
 monitoring the limiting current density ( $i$ ) during operation when the air bubbles are introduced in the chambers;  
 determining the ratio of  $i/i_0$ ;  
 measuring the electrical resistance between the electrodes ( $R_0$ ) without air bubbles in the chambers;  
 monitoring the electrical resistance ( $R$ ) between the electrodes during operation when the air bubbles are introduced in the chambers;  
 determining the ratio  $R/R_0$ ; and  
 controlling the superficial velocity of air bubbles ( $V_a$ ) through the dilution chambers during operation so that  $V_a$  is maintained within the range of superficial air velocity that maintains  $R/R_0$  less than one and  $i/i_0$  constant and  $V_a$  optimum with respect to both conductivity of electrolyte and resistance between electrodes, whereby the thickness of the diffusion layers formed by concentration polarization near the ion exchange membranes in the dilution chambers are maintained smaller than when no air bubbles are introduced thereto.

#### 4,160,714 MEASURING CHAMBER UNIT

Jørgen Andersen, and Ole Nielsen, both of Herlev, Denmark, assignors to Radiometer A/S, Denmark  
 Continuation-in-part of Ser. No. 732,340, Oct. 14, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,933  
 Claims priority, application Denmark, Oct. 15, 1975, 4645/75  
 Int. Cl.<sup>2</sup> G01N 27/28  
 U.S. Cl. 204—195 R



1. A block-shaped measuring chamber unit, especially for use in electrochemical measuring apparatus, comprising differently orientated surface parts and a plurality of separate, shallow chamber-forming depressions formed in said surface parts, at least one of said depressions being formed in each of said surface parts, respectively, each of said depressions having a fluid inlet and a separate fluid outlet, said fluid inlets and outlets being formed solely as straight passages in said unit, and comprising straight passages each interconnecting two of said depressions and being oblique to the surface parts in which said two depressions are formed.

13. An electrochemical measuring apparatus comprising a block-shaped measuring chamber unit having differently orientated surface parts and a plurality of separate, shallow chamber-forming depressions formed in said surface parts, at least one of said depressions being formed in each of said surface parts, respectively, each of said depressions having a fluid inlet and a separate fluid outlet, said fluid inlets and outlets being formed solely as straight passages in said unit, and comprising straight passages each interconnecting two of said depressions and being oblique to the surface parts in which said two depressions are formed, and measuring instruments sealed to said

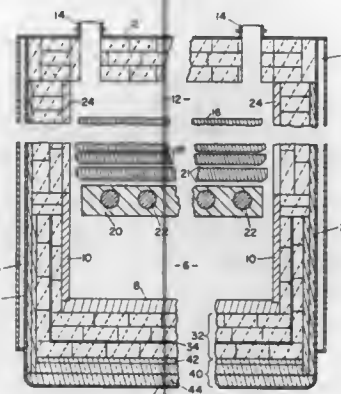
unit and closing said depressions respectively to form chambers.

#### 4,160,715 ELECTROLYTIC FURNACE LINING

Donald L. Kinosz, Arnold, Pa., and William R. Allen, Maryville, Tenn., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 28, 1978, Ser. No. 919,771  
 Int. Cl.<sup>2</sup> C25C 3/08, 3/06  
 U.S. Cl. 204—243 R

11 Claims



GRAPHITE  
 HIGH FIRED REFRACTORY  
 GLASS REFRACTORY

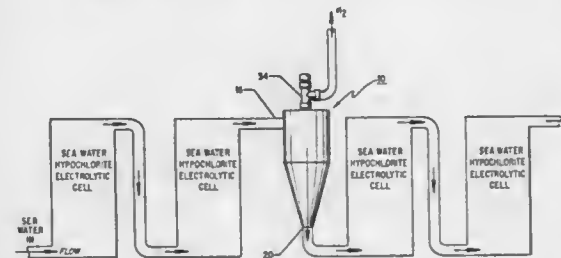
1. In a cell for producing aluminum by the electrolysis of aluminum chloride in a bath of aluminum chloride dissolved in at least one molten salt of higher electrodecomposition potential than aluminum chloride, said cell including at least two opposed electrodes having interelectrode space therebetween, a cell lining comprising:

- a perimetric metal shell around the cell;
- a continuous, electrically insulative coating on the inside surfaces of the shell, said coating having an upper temperature limit at which said coating is impenetrable by said molten salt from said bath and eutectics formed therefrom;
- a thermal lining within the coated shell of sufficient thickness that heat flow therethrough is uniformly maintained such that the insulative coating is not exposed to temperatures above said upper temperatures limit, comprising:
  - (1) an inner layer of high-fired refractory, penetrable by said molten salt, and resistant to chemical corrosion by said penetration, said inner layer of sufficient thickness that a substantially uniform salt freeze line is located therein,
  - (2) intermediate said inner layer and outside said freeze line, a layer of material impenetrable by molten aluminum,
  - (3) around and adjacent said inner layer, at least one layer of insulative glass refractory; and
  - (4) a perimetric carbonaceous lining along the lower, interior portions of the cell, adjacent the inner layer of high-fired refractory, for containing the produced molten aluminum therein.

#### 4,160,716 METHOD FOR REMOVING AN ENTRAINED GAS FROM A LIQUID MEDIUM

Russell M. Wiseman, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio  
 Division of Ser. No. 718,833, Aug. 3, 1976, Pat. No. 4,097,358.  
 This application Mar. 30, 1978, Ser. No. 891,692  
 Int. Cl.<sup>2</sup> C25B 1/34, 15/08; B01D 47/00  
 U.S. Cl. 204—270

1 Claim



1. A method for removing gaseous substances from the electrolyte flowing through a series of electrolytic cells comprising the steps of: introducing the electrolyte into a group of electrolytic cells numbering in the range of one to three connected in a series; introducing the output of the series of electrolytic cells into the top cylindrical section of a cyclone horizontally tangent to the interior surface so as to form a vortex aided by the form of the conical bottom section of the cyclone; allowing the gaseous substances to escape through an orifice in the top of the cyclone while severely restricting the flow of the electrolyte therethrough and into an exhaust system; arresting the circular flow of the electrolyte as it nears the bottom of the cyclone by means of a planar baffle attached to the interior wall of the outlet of the cyclone so as to protrude slightly into the conical bottom section; allowing the electrolyte to exit through the bottom of the cyclone with a slight back pressure to enhance separation of the gaseous substances from the electrolyte; and introducing the electrolyte with gaseous substances removed into a group of electrolytic cells numbering in the range of one to three connected in a series for further electrochemical production.

#### 4,160,717 ELECTRIC CONTACT POST FOR ELECTROCHEMICAL MACHINE

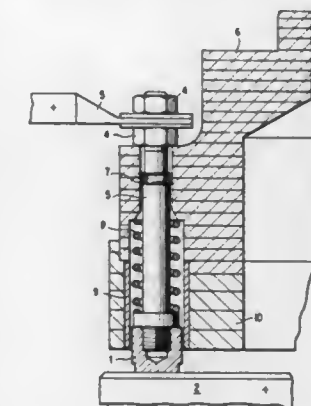
Gérard Navaro, Cleon Sud; Jean-Pierre Maillard, Fontenay aux Roses, and Serge Lacroix, Saint Gratien, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 1, 1978, Ser. No. 882,325  
 Claims priority, application France, Mar. 2, 1977, 77 06046  
 Int. Cl.<sup>2</sup> C25F 7/00; B23P 1/02  
 U.S. Cl. 204—279

5 Claims

1. In an electrochemical tool for machining a workpiece, an electric contact post comprising:  
 a support of nonconducting material having a through hole;  
 a current conducting guide rod slidable without play in said hole of said support;

a sleeve of heat and corrosion resistant material disposed in one end of said hole of said support;



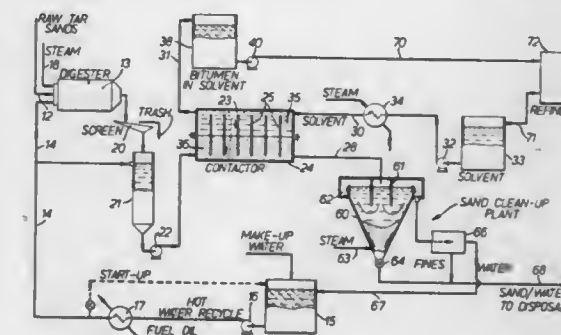
a tip fixed to one end of said guide rod and slidable with sufficient play to avoid jamming in said sleeve; and  
 a spring arranged to press said tip against said workpiece.

#### 4,160,718 SOLVENT EXTRACTION PROCESS

John S. Rendall, Stanford-le-Hope, England, assignor to Rohrtill S. A., Lugano, Switzerland

Filed Aug. 3, 1977, Ser. No. 821,497  
 Claims priority, application United Kingdom, Aug. 7, 1976, 32989/76; Jan. 25, 1977, 2939/77  
 Int. Cl.<sup>2</sup> C10G 1/04  
 U.S. Cl. 208—11 LE

26 Claims

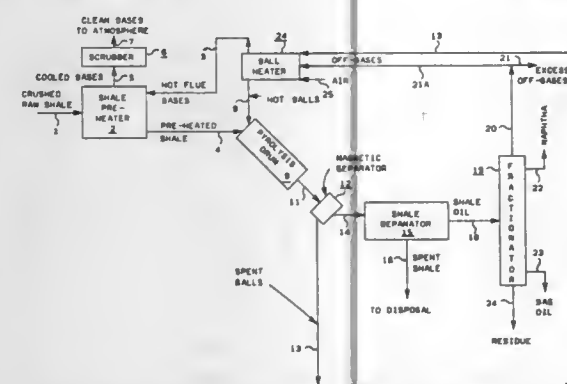


1. A continuous process for the solvent extraction of bitumen oils from tar-sand, comprising the steps of:

- supplying tar-sand at a supply point to a contactor and passing said tar-sand from said supply point towards a discharge point from said contactor;
- passing a stream of solvent through said contactor, said solvent being of lesser density than, and substantially immiscible with, water;
- supplying water to and withdrawing water from said contactor;
- said solvent stream and said water providing a solvent phase and a water phase in said contactor substantially distinct from each other, and said contactor being substantially filled by said solvent phase, said water phase and solids of said tar-sand with a barrier layer formed by said water phase between said solvent phase and solids;
- repeatedly showering solids of said tar-sand through said liquid phases in said contactor as the tar-sand passes through the contactor towards said discharge point, whereby said solids are contacted with said solvent phase and bitumen oils are progressively dissolved in said solvent phase;
- removing a bitumen oils-containing solvent phase from said contactor; and

(g) removing a discard stream at said discharge point, said discard stream comprising said withdrawn water and sand which is substantially free of bitumen oils and solvent.

**4,160,719**  
**IRON-CONTAINING REFRACTORY BALLS FOR RETORTING OIL SHALE**  
 Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
 Filed Sep. 28, 1977, Ser. No. 837,130  
 Int. Cl.<sup>2</sup> C10G 1/02  
 U.S. Cl. 208—11 R 10 Claims



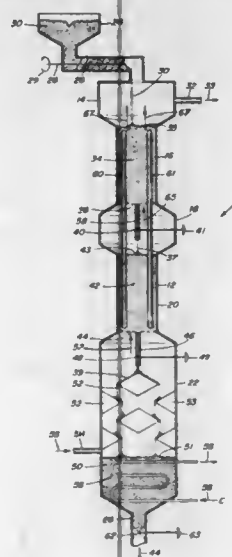
1. A process of retorting oil shale which comprises
  - a. preheating crushed raw oil shale employing hot flue gases hereinafter recited,
  - b. pyrolyzing said preheated crushed oil shale with hot iron-containing ceramic balls under conditions of temperature, pressure, and for a time sufficient to substantially convert said oil shale to produce a pyrolyzed admixture of shale oil, spent hot shale, and spent carbonaceous iron-containing ceramic balls, wherein said iron-containing ceramic balls contain about 10 to 90 weight percent iron in a sufficient state as to permit magnetic separation from said spent shale,
  - c. magnetically separating from said pyrolyzed admixture said hot spent carbonaceous iron-containing ceramic balls employing magnetic separation means,
  - d. separating said shale oil from said spent shale,
  - e. fractionating said shale oil to obtain light ends as off-gases,
  - f. contacting said carbonaceous iron-containing spent ceramic balls with at least a portion of said off-gases and air, thereby substantially burning off said carbonaceous residue and producing reheated hot magnetic ceramic balls and a stream of hot flue gases,
  - g. cycling said hot flue gases to said step (a) thereby preheating said crushed oil shale,
  - h. recycling said hot reheated iron-containing ceramic balls to said contacting step (b), and
  - i. wherein said separated spent hot shale is at least in part brought into indirect heat exchange with said incoming crushed raw oil shale prior to said preheating step (a), thus recovering heat from said hot spent oil shale and at least partially cooling the hot spent oil shale prior to disposal thereof.

**4,160,720**  
**PROCESS AND APPARATUS TO PRODUCE SYNTHETIC CRUDE OIL FROM TAR SANDS**  
 Junior D. Seader, and Kirshnakumar M. Jayakar, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah  
 Filed Dec. 15, 1977, Ser. No. 851,226  
 Int. Cl.<sup>2</sup> C10G 1/00; C10B 49/10, 49/00  
 U.S. Cl. 208—11 R 19 Claims

1. An apparatus for processing bitumen-bearing tar sands for the recovery of bitumen therefrom comprising:
  - means for maintaining a first fluidized bed for the bitumen-

bearing tar sands, the first fluidized bed serving as a pyrolysis zone for bitumen of the bitumen-bearing tar sands, the pyrolysis zone cracking a substantial portion of the bitumen and thereby volatilizing the same while leaving a carbon residue in the form of coke on the tar sands; means for introducing a comminuted, bitumen-bearing tar sand into the first fluidized bed; means for introducing coked tar sands from the first fluidized bed into a second fluidized bed; means for maintaining the second fluidized bed for the coked tar sands from the first fluidized bed, the second fluidized bed serving as a combustion zone for the coke on the coked tar sands to thereby develop thermal energy in the second fluidized bed; and heat transfer means comprising heat pipe means for conducting the thermal energy from the second fluidized bed to the first fluidized bed.

19. A single-pass process for producing synthetic crude oil from tar sand comprising:
  - vertically orienting an enclosed vessel;
  - segregating the vessel into an upper, pyrolysis zone and a lower, combustion zone;
  - introducing a comminuted tar sand into the pyrolysis zone thereby producing vapors of synthetic crude oil and a coked sand comprising a coke residue on particles of sand from the tar sand;



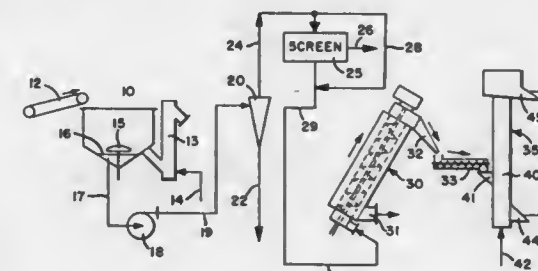
- feeding coked sand downwardly under the force of gravity from the pyrolysis zone to the combustion zone; generating thermal energy in the combustion zone by burning the coke residue on the coked sand while producing flue gases and burnt sand; removing burnt sand downwardly from the combustion zone under the force of gravity; injecting combustion air into the vessel below the combustion zone, the combustion air absorbing thermal energy from the burnt sand and fluidizing at least a portion of the coked sand in the combustion zone while supporting combustion of the coke residue, the combustion air becoming flue gases in combination with gaseous combustion products from the combustion zone; fluidizing at least a portion of the comminuted tar sand in the pyrolysis zone with the flue gases from the combustion zone, the flue gases commingling with and carrying away the vapors of synthetic crude oil from the pyrolysis zone; removing the commingled flue gases and vapors of synthetic crude oil from the upper end of the vessel; withdrawing the burnt sand from the lower end of the vessel; and transferring a substantial portion of the thermal energy not contained in the flue gases but generated in the combustion zone from the combustion zone to the pyrolysis zone by

tion zone from the combustion zone to the pyrolysis zone by embedding a first end of a heat pipe means in the combustion zone and a second end of the heat pipe means in the pyrolysis zone, the thermal energy pyrolyzing the tar sand thereby producing vapors of synthetic crude oil.

**4,160,721**  
**DE-SULFURIZATION OF PETROLEUM RESIDUES USING MELT OF ALKALI METAL SULFIDE HYDRATES OR HYDROXIDE HYDRATES**  
 Rollan Swanson, 220 California Ave., Santa Monica, Calif. 90403  
 Filed Apr. 20, 1978, Ser. No. 898,206  
 Int. Cl.<sup>2</sup> C10G 34/00, 29/10, 19/00  
 U.S. Cl. 208—230 11 Claims

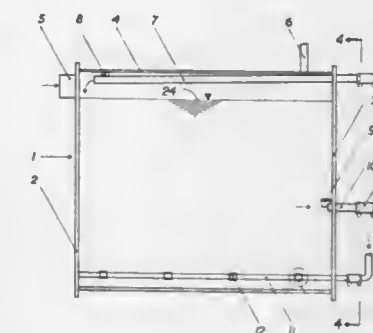
1. A process for reducing the elemental and organic sulfur content of petroleum residues, comprising contacting said residues with at least 0.25 volume thereof of a melt selected from the group consisting of alkali metal sulfide hydrates, alkali metal hydroxide hydrates or mixtures thereof at a process temperature range of between 120 degrees C. to 325 degrees C. for from about 3 to 60 minutes; separating said residues now having a reduced sulfur content from said melt; passing steam through said separated residues to separate said hydrates from said residues, and recovering said residues from separated water containing said hydrates.

**4,160,722**  
**RECOVERY OF PLASTIC FROM MUNICIPAL WASTE**  
 Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim, Inc., New York, N.Y.  
 Continuation-in-part of Ser. No. 675,133, Apr. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 490,568, Jul. 22, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,095  
 Int. Cl.<sup>2</sup> B03B 1/00; B07B 4/02  
 U.S. Cl. 209—4 11 Claims



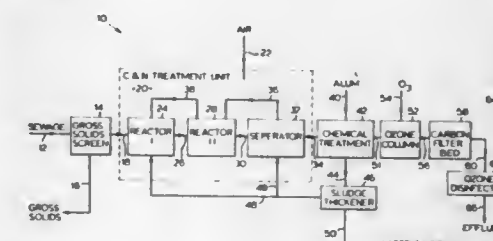
1. The process of recovering sheet plastic material from a mixture thereof with other solid waste materials including water absorbent fibrous material such as waste paper, comprising:
  - (a) converting said mixture to a particulate mass of a predetermined maximum particle size wherein the liquid content is at least approximately equal to the fibrous constituents thereof to impart soggy but readily crumbly characteristics to said mass, and
  - (b) subjecting said soggy but crumbly particulate mass to an air separation treatment causing the pieces of sheet plastic to be blown free of the remainder thereof.

**4,160,723**  
**METHOD AND APPARATUS FOR REMOVAL OF POLLUTANTS FROM WASTE WATER**  
 Andrew J. Kovacs, 157 Lardintown Rd., Sarver, Pa. 16055  
 Filed May 10, 1976, Ser. No. 685,005  
 Int. Cl.<sup>2</sup> C02C 1/08, 1/12  
 U.S. Cl. 210—7 13 Claims



1. Apparatus for removing pollutants from waste water, comprising:
  - an aeration tank including means of entry into which waste water is fed, said tank being horizontally disposed and having curved side walls;
  - an oxygen diffusing system within said aeration tank including means for diffusing oxygen at spaced intervals substantially along said tank, said diffused oxygen causing sludge in said tank to circulate in at least one rolling path;
  - a clarifier tank to be used in combination with said aeration tank for the purpose of separating said sludge from clarified liquid;
  - transfer means for transferring contents from said aeration tank to said clarifier tank;
  - means to return said sludge from said clarifier tank to said aeration tank, said return means being designed and positioned to direct said sludge to the proximity of incoming waste water, with said oxygen diffusing system being positioned to provide oxygen to the proximity of said incoming sludge and said incoming waste water and to further provide oxygen, at said spaced intervals throughout said aeration tank, whereby conducive conditions are provided for aerobic decomposition of waste matter; and,
  - means to expel the clarified liquid from said clarifier tank at more than one level, an upper level providing a faster flow rate than a lower level.

**4,160,724**  
**WASTE WATER TREATMENT**  
 Richard V. Loughton, Milton, Canada, assignor to Ontario Research Foundation, Sheridan Park, Canada  
 Continuation-in-part of Ser. No. 741,221, Nov. 12, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,868  
 Int. Cl.<sup>2</sup> C02C 1/06  
 U.S. Cl. 210—7 7 Claims

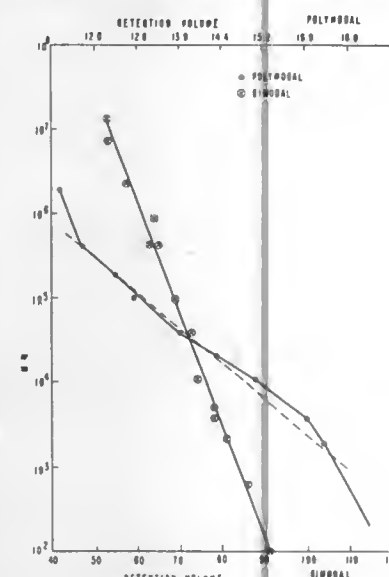


1. A method for the treatment of waste water containing contaminants including dissolved biodegradable carbonaceous material and nitrogenous material mainly in non-nitrate and/or





distribution, the average pore size for each mode being such that the linear portions of the molecular weight calibration



curve for each pore size in the bimodal distribution are substantially nonoverlapping and the pore volume of each mode being such that said linear portions are substantially parallel.

4,160,729

# METHOD FOR SEPARATING OILS FROM WATER

Ralph S. Wilcox, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 23, 1974, Ser. No. 508,114

Int. Cl.<sup>2</sup> C02B 9/02

U.S. Cl. 210—40

7 Claims

1. A method for improving oil-contaminated water which comprises:

- (1) contacting the water with porous petroleum asphalt bottom, said porous asphalt having been prepared by steps including (a) substantially saturating said asphalt at a temperature above its softening temperature, with an extractable oil, (b) cooling the resulting mixture to a temperature at least 20° C. below its initial ring-and-ball softening temperature, and (c) removing the extractable oil by solvent extracting said mixture at a temperature below said initial softening temperature; and
- (2) separating the resulting oil-containing bottoms from the water.

4,160,730

# PROCESS FOR MERCURY REMOVAL

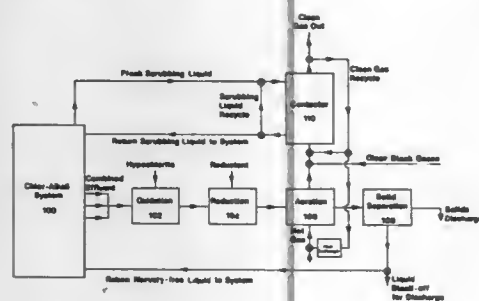
Xuan T. Nguyen, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Aug. 22, 1977, Ser. No. 826,524

Int. Cl.<sup>2</sup> C22B 43/00; C02B 1/36

U.S. Cl. 210—48

7 Claims



1. A process for the removal and recovery of mercury from

an aqueous medium containing solids having mercury associated therewith, substantially all of said mercury being in the form of inorganic ionic mercury, comprising the steps of: treating said medium with hypochlorite in a molar amount comprising at least 20 times the molar amount of said mercury in said medium thereby to dissociate said ionic mercury from said solids, adding a reducing agent to said hypochlorite treated medium to ensure conversion of substantially all said ionic mercury in said medium to elemental mercury, passing an entraining gas through said medium to entrain said elemental mercury, separating said entrained mercury from said gas thereby to recover said mercury.

4,160,731

# PROCESS FOR DEWATERING SEWAGE SLUDGES DISINFECTED WITH LIME

Carlos L. Doyle, Franklin, Ind., assignor to American Cyanamid Company, Stamford, Conn.

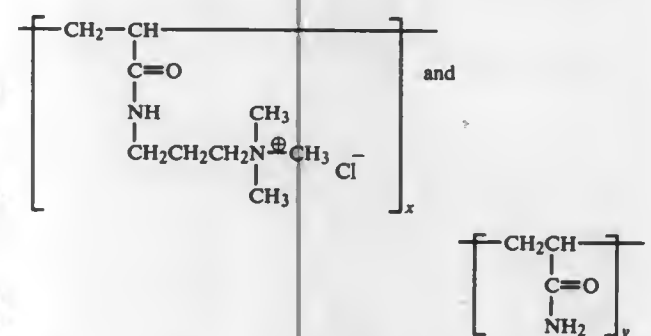
Filed Apr. 18, 1978, Ser. No. 897,474

Int. Cl.<sup>2</sup> C02C 3/00

U.S. Cl. 210—50

5 Claims

1. A process for recovering disinfected solids suitable for use as landfill from sewage sludge which process comprises treating said sewage sludge with an amount of lime sufficient to provide a pH of at least 12.0, adding to the thus treated sludge an effective amount of a copolymer containing repeating units of



wherein x represents a mole percent in the range of about 3–60 and y, correspondingly, a mole percent in the range of about 97–40, said copolymer having a standard viscosity of at least about 1.5 cps., filtering the resulting sludge to remove water therefrom, and disposing of the disinfected solids thus obtained as landfill.

4,160,732

# MECHANICAL DEWATERING PROCESS

Vere Maffet, West Chester, Pa., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 813,577, Jul. 7, 1977, Pat. No. 4,098,006, which is a continuation-in-part of Ser. No. 775,673, Mar. 8, 1977, Pat. No. 4,128,946. This application Mar. 29, 1978, Ser. No. 891,437

Int. Cl.<sup>2</sup> B01D 37/02

U.S. Cl. 210—75

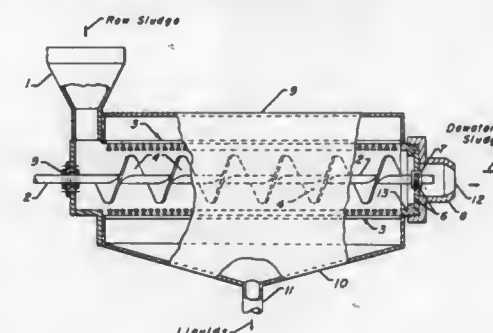
13 Claims

1. A process for dewatering fibrous organic waste which comprises the steps of:

- (a) passing a feed stream comprising organic waste and which comprises at least 50 wt.% water and at least 5 wt.% fibers on a dry basis into a first end of a first dewatering zone comprising a cylindrical chamber having a cylindrical porous wall formed by parallel windings which are spaced apart by a distance of about 0.0075 to about 0.013 cm.;
- (b) pressurizing the feed stream within the first dewatering zone to a superatmospheric pressure by rotating a screw conveyor having a helical blade which begins at the first

end of the first dewatering zone and which is centrally mounted within the cylindrical chamber while constricting the opening available at a second end of the first dewatering zone to less than the available cross-sectional area of the cylindrical chamber, the blade of the screw conveyor having a helical outer edge which is separated from the inner surface of the porous wall by a distance of from about 0.08 to 5.0 cm. along the length of the porous wall, and with the screw conveyor having a length to diameter ratio above 2:1;

- (c) maintaining a substantially continuous and unagitated cylindrical layer of filter media comprising fibers derived from the feed stream in an annular space located between



the inner surface of the porous wall of the cylindrical chamber and the helical outer edge of the screw conveyor, and simultaneously transferring the organic waste located between the grooves of the helical blade of the screw conveyor and surrounded by said cylindrical layer of filter media from the first end of the first dewatering zone to the second end of the first dewatering zone;

- (d) withdrawing water radially from the first dewatering zone through the porous wall and through said cylindrical layer of filter media; and,
- (e) withdrawing a first dewatering zone solids stream having a higher organic waste solids content than the feed stream from the second end of the first dewatering zone.

4,160,733

# MARINE ENGINE COOLING WATER FILTER CLEANING SYSTEM

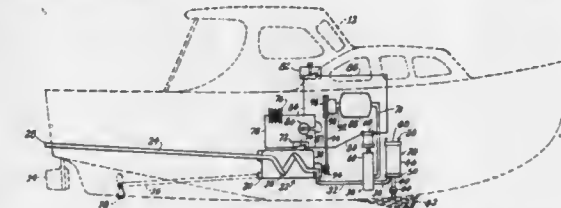
Duane A. Nelson, 1313 Maple St., Neenah, Wis. 54956

Filed Feb. 6, 1978, Ser. No. 875,443

Int. Cl.<sup>2</sup> B01D 35/14, 35/16, 29/38

U.S. Cl. 210—85

5 Claims



1. A water intake system for supplying an engine having a water pump with marine cooling water comprising, in combination,

- a water conduit leading from a source of marine water to said pump for normal water flow from said water source to said pump,
- a strainer disposed at the end of said conduit at said marine water source,
- a filter in said water conduit in fluid flow relation between said strainer and said pump,
- a valve means disposed between said filter and said pump, and,
- a compressed air source and an air conduit leading from said air source to said valve means at an air inlet, said valve means including means to close and open said

water conduit to said pump and to open and close said air inlet,

said valve means being operative to close said water conduit to said pump when said engine is overheated due to a clogged condition in said filter and/or said strainer and to open said air inlet to said water conduit and said filter so as to admit compressed air to said water conduit and said filter for a short predetermined time to blow back the clogging material out of said filter and strainer to said water source and further being operative to open said water conduit and close said air inlet after said predetermined time.

4,160,734

# CATCH BASIN PROCESSING APPARATUS

Lauren P. Taylor, Swarthmore, and Alex Petroski, Springfield, Pa., assignors to LRS Research Limited, Broomall, Pa.

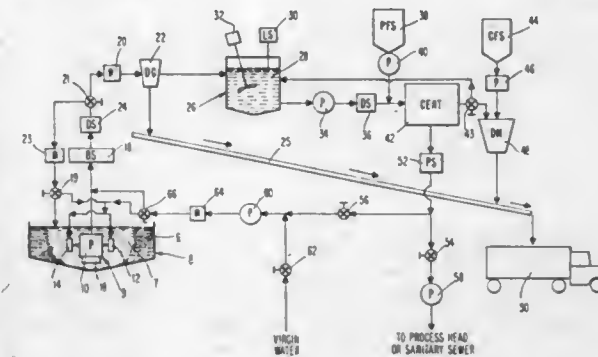
Continuation of Ser. No. 709,566, Jul. 26, 1976, Pat. No. 4,040,960. This application Jul. 5, 1977, Ser. No. 812,483

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> B01D 21/00

U.S. Cl. 210—96.1

28 Claims



1. A catch basin cleaning system for removing liquid, solid and semi-solid wastes from catch basins comprising:

- (a) pumping means for injecting liquid under pressure into said catch basin to combine with and suspend wastes therein, including means for removing waste containing liquids therefrom, said pumping means further comprising shunt means for selectively returning waste containing liquids directly to said catch basin;
- (b) equalization means for receiving waste containing liquids from at least said pumping means and temporarily holding said waste containing liquids;
- (c) dewatering means for receiving said waste containing liquids from said equalization means and for removing liquid from said waste containing liquids to produce at least a liquid and a thickened portion; and
- (d) water supply means for supplying liquid at least to said pumping means and for receiving said liquid portion from said dewatering means.

4,160,735

# FLUID FILTER BYPASS VALVE ASSEMBLY

Edmund Gregg, Willowick, and Charles E. Pillarczyk, Bedford Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Aug. 5, 1977, Ser. No. 822,168

Int. Cl.<sup>2</sup> B01D 27/10, 35/14

U.S. Cl. 210—130

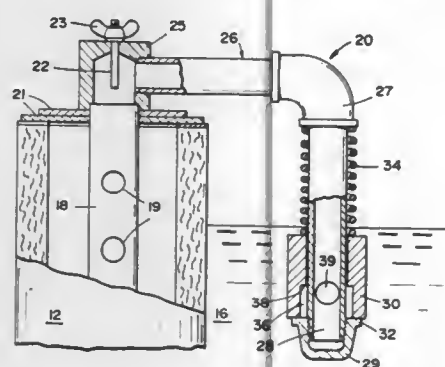
7 Claims

1. In a fluid filter assembly comprising a filter element, means for supplying fluid under pressure to one side of said filter element, reservoir means for receiving filtered fluid from the other side of said filter element and a normally closed bypass valve means adapted to open and provide communica-



tion between said one side and said other side of said filter element when the fluid pressure at said one side of said filter element exceeds the fluid pressure at the other side of said filter element by a given amount; the improvement wherein said bypass valve means comprises:

- (a) an elongated conduit having one end in communication with said one side of said filter element and extending to a free end located below the minimum normal level of fluid in said reservoir means, said conduit having an opening through the sidewall thereof spaced from said free end thereof;
- (b) plug means closing said free end of said conduit;
- (c) outwardly extending flange means about said free end of said conduit;
- (d) a fluid impervious sleeve closely surrounding a portion of said free end of said conduit in slidable engagement with the external surface thereof and with one end of said



sleeve adapted to seat against said outwardly extending flange means at said free end of said conduit, said sleeve having a portion of enlarged internal dimension at said one end thereof providing an internal surface extending transversely of the axis of said sleeve intermediate the ends thereof with said end portion of enlarged internal dimension of said sleeve together with the external surface of said free end portion of said conduit defining a chamber in communication with said opening through said sidewall of said conduit, said chamber being open at one end of said sleeve and closed at the other end of said sleeve; and,

(c) means for resiliently urging said one end of said sleeve into compressive seating engagement with said outwardly extending flange means, the area of compressive seating engagement between said one end of said sleeve and said flange means being equal to at least a substantial portion of the cross-sectional area of said chamber.

#### 4,160,736 ROTATING TRICKLING FILTER

David G. Prosser, Mequon, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.

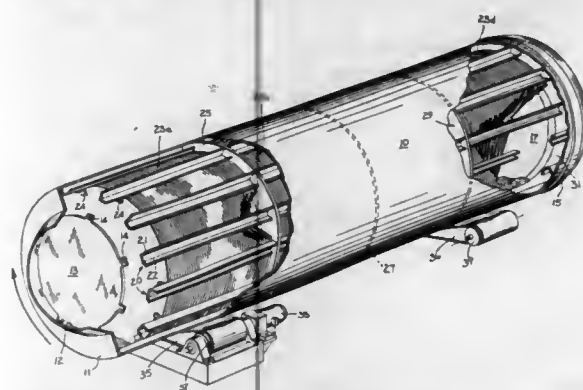
Filed Oct. 11, 1977, Ser. No. 840,532  
Int. Cl.<sup>2</sup> C02C 1/04

U.S. Cl. 210—150

9 Claims

1. A rotating trickling filter comprising: a hollow, elongated, imperforate, circular cylindrical shell; a wastewater inlet at one end of said shell; a treated water outlet at the opposite end of said shell; means for rotating said shell; longitudinally extending wastewater lifting means disposed adjacent the inner surface of said shell; fixed film contactor media mounted within said shell between the inlet and outlet means; and means for maintaining a low level of wastewater in said shell

so that a shallow pool of wastewater is formed at the bottom of said shell and through which said lifting means



sweeps to pick up and subsequently discharge wastewater over said media as the shell is rotated.

4,160,737  
FLOTATION AND PLATE SEPARATION DEVICE  
Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands  
Continuation of Ser. No. 665,930, Mar. 11, 1976, abandoned, which is a continuation of Ser. No. 532,329, Dec. 13, 1974, abandoned. This application Sep. 21, 1977, Ser. No. 835,336  
Claims priority, application Netherlands, Dec. 22, 1973, 7317649

Int. Cl.<sup>2</sup> B01D 21/10

U.S. Cl. 210—202

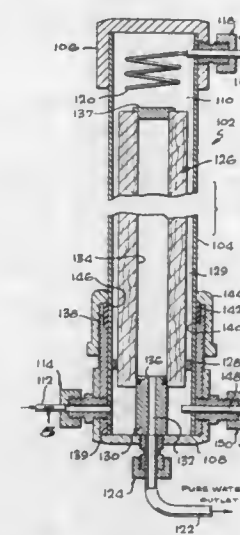
14 Claims

1. A purification device for treating a liquid material including a carrier liquid having particles therein to effect separation of the particles from said carrier liquid, comprising: means forming a tank including a supply chamber for said liquid material and a discharge chamber for the carrier liquid and a portion of said particles, plate separation means positioned within said tank to receive flow of the liquid material therein and communicating at one end with said supply chamber and at the other end with said discharge chamber, said plate separation means having an upper surface extending laterally from a wall of said supply chamber and beneath the surface of the liquid material in said supply chamber to form a corner within said supply chamber, said corner defining a space widening laterally upwardly to progressively reduce the flow velocity through said supply chamber, means forming a supply duct for said liquid material and including an opening communicating with said corner of said supply chamber, means for removing floating particles from the surface of the liquid material in said supply chamber, means forming a source of pressurized gas in a liquid and including a pump to pressurize said liquid and gas and a pressure reducing valve connected to receive flow from said pump, and injection nozzle means connected to receive flow from said valve and positioned in said corner of said supply chamber, the pressurized gas and liquid being depressurized upon flow through the valve to form a mixture of gas bubbles in the liquid for admixture with the liquid material in said supply chamber to remove a portion of said particles by flotation prior to flow of the liquid material through said plate separator.

4,160,738  
WATER PURIFICATION DEVICE AND SYSTEM  
Gerald A. Guter, 215 Via Socorro, San Clemente, Calif. 92672  
Filed May 16, 1977, Ser. No. 796,852  
Int. Cl.<sup>2</sup> B01D 27/08

U.S. Cl. 210—232

16 Claims



1. A water purification device which comprises at least two cooperating structural elements forming a housing containing an enclosed chamber, sealing means positioned between said structural elements, a cap compressing said sealing means and holding said at least two elements together, a fluid inlet to said chamber, a waste fluid outlet and a product fluid outlet from said chamber, at least one filter means positioned in said chamber, at least one additional mechanical connection maintaining said at least two structural elements in secure sealed engagement during operation under high internal fluid pressures, said at least one filter means being a tubular reverse osmosis filter, said filter constructed and arranged within said housing to provide an annulus between the outer surface of said reverse osmosis filter and the inner surface of said housing, a second sealing means within said annulus and preventing flow of inlet water through said annulus and past said second sealing means, said filter having one edge disposed in said chamber so that inlet water entering said chamber and said one edge of said filter passes through said filter and is treated therein, and pure water is discharged interiorly through said filter and waste water is discharged exteriorly of said filter in said annulus on the other side of said second sealing means from said inlet water, and forming a waste water chamber, and means closing one end of the bore of said tubular reverse osmosis filter to provide a pure water chamber separate from the inlet water introduced for purification, said product fluid outlet communicating with the other end of said bore and said pure water chamber therein, said waste fluid outlet communicating with said waste water chamber in the annulus exteriorly of said filter.

#### 4,160,739 POLYOLEFINIC COPOLYMER ADDITIVES FOR LUBRICANTS AND FUELS

Robert L. Stambaugh, Hatboro, and Richard A. Galluccio, Perkasie, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 5, 1977, Ser. No. 857,079

Int. Cl.<sup>2</sup> C10M 1/32, 3/26; C10L 1/14; C08L 23/00

U.S. Cl. 252—34

26 Claims

1. A composition comprising a major amount of a lubricating oil and a minor detergent amount of a graft copolymer comprising an oil soluble, substantially linear, substantially saturated, rubbery, olefinic hydrocarbon backbone polymer and graft polymerized thereon, copolymerized units of a monomer system comprising maleic acid or maleic anhydride and

one or more other monomers copolymerizable with maleic acid or maleic anhydride, said copolymerized units being post-reacted with a polyamino compound having one reactive primary or secondary amino group.

#### 4,160,740 INHIBITED AQUEOUS, METHOXYPROPANOL COOLANT ADJUSTED TO A pH BETWEEN ABOUT 6 AND 9

Forest H. Sweet, III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1977, Ser. No. 842,651

Int. Cl.<sup>2</sup> C09K 5/00

U.S. Cl. 252—75

13 Claims

1. An aqueous, methoxypropanol based coolant composition inhibited against corrosion of metals and against degradation of fluoroelastomers, which composition comprises the reaction product of:

- (A) about 1-70 parts by weight of one of 1-methoxy-2-propanol, 2-methoxy-1-propanol, or mixtures thereof;
- (B) about 30-98 parts by weight of water;
- (C) about 0.01-30 parts by weight of a phosphoric acid;
- (D) about 0.01-30 parts by weight of sodium hydroxide, potassium hydroxide or mixtures thereof;

wherein the pH of the composition is adjusted to between about 6 and about 9 by balancing the relative amounts of components (C) and (D) to attain said pH.

#### 4,160,741 BENZOTHIADIAZOLE ACCELERATORS STABILIZED WITH OXIRANE COMPOUNDS

Curtis A. Franz, Piscataway, N.J., assignor to American Cyanamid Company, Stamford, Conn.

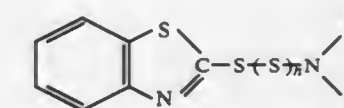
Filed Jul. 11, 1977, Ser. No. 814,601

Int. Cl.<sup>2</sup> C08C 4/00; C07D 277/78, 277/80; C08K 5/47

U.S. Cl. 252—182

6 Claims

1. A stabilized accelerator composition for rubber comprising (1) a benzothiazole having the formula



wherein R and R<sup>1</sup> are, individually, hydrogen alkyl of 1-8 carbon atoms, inclusive, cycloalkyl of 5-6 carbon atoms, inclusive, or, taken with the nitrogen, combine to form a morpholine, piperidine or pyrrolidine heterocyclic ring, and n is 0 or 1 and (2) an effective stabilizing amount of a solid or liquid oxirane compound having a molecular weight greater than 60 which is free of interfering functional groups.

#### 4,160,742 METHOD OF RESOLVING OIL-IN-WATER EMULSIONS

Manjeri S. Raman, Houston, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 15, 1978, Ser. No. 916,034

Int. Cl.<sup>2</sup> B01D 17/04

U.S. Cl. 252—344

5 Claims

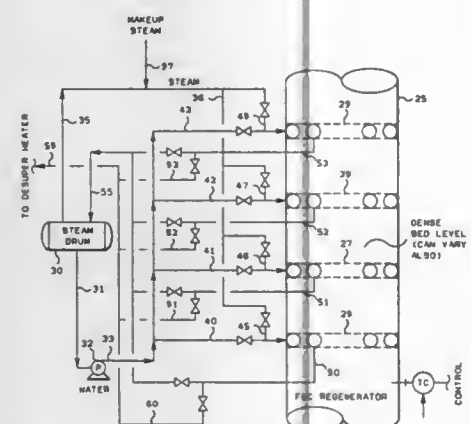
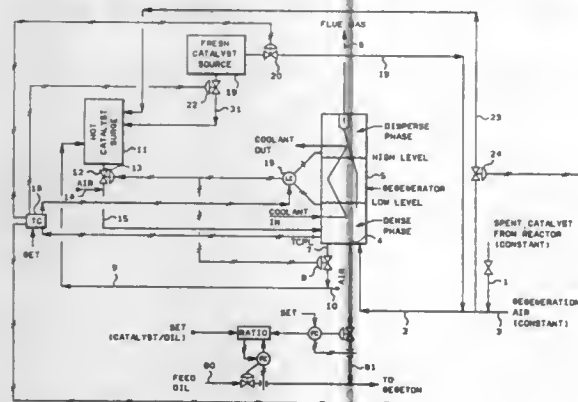
1. A method of breaking oil-in-water emulsions which comprises the steps of treating the emulsion with at least a de-emulsifying amount of a copolymer of acrylamide and methacrylamidopropyl trimethylammonium chloride where said copolymer is at least 50% by weight acrylamide.



**4,160,743**  
**CONTROLLING A REGENERATION OF FLUIDIZED PARTICLES OR CATALYSTS**  
 Carl S. Kelley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 30, 1978, Ser. No. 873,580  
 Int. Cl.<sup>2</sup> B01J 21/20, 29/38; C10G 13/18, 35/14  
 U.S. Cl. 252-411 R

7 Claims



1. A method for controlling the temperature of a regeneration at an elevated temperature of a mass of particles maintained in a dense phase of a fluidized bed in a generation zone, which comprises providing an auxiliary or surge zone, maintaining in said surge zone a dense phase of a mass of said particles, continuously and simultaneously circulating a portion of said mass of particles from within each of said beds, in said regeneration zone and in said surge zone, to within the bed of the other zone, and controlling the temperature within the bed of said mass of said particles in said fluidized bed in said regeneration zone, by increasing the level of the bed in said regeneration zone when the temperature therein is tending to rise by adjusting the circulation of particles between said zones to build up the level in the regeneration zone, and vice versa.

**4,160,744**  
**CATALYST FOR REDUCTION OF NITROGEN OXIDES AND METHOD FOR MANUFACTURE THEREOF**  
 Akira Watanabe; Tetsuya Sugimoto, both of Okayama, and Yasuhiro Makino, Bizen, all of Japan, assignors to Kyushu Refractories Co., Ltd., Bizen, Japan

Filed Mar. 6, 1978, Ser. No. 883,842  
 Claims priority, application Japan, Jun. 10, 1977, 52-67781  
 Int. Cl.<sup>2</sup> B01J 21/02, 23/74, 27/02  
 U.S. Cl. 252-440

11 Claims

1. A catalyst for use in the reduction of nitrogen oxides; which comprises (1) at least one iron-containing substance selected from the group consisting of iron hydroxides, ores having iron hydroxide as their principal component and products obtained by calcining said hydroxides and ores at a tem-

perature not exceeding 700° C. and (2) a material composed mainly of aluminum sulfate, the surface of said iron-containing substance being coated with said material, and said catalyst having an iron content of from 25 to 80% by weight as Fe<sub>2</sub>O<sub>3</sub>.

**4,160,745**  
**METHOD OF PREPARING HIGHLY ACTIVE NICKEL CATALYSTS AND CATALYSTS PREPARED BY SAID METHOD**  
 Lawrence L. Murrell, Elizabeth, and David J. C. Yates, West Millington, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 1, 1977, Ser. No. 856,262  
 Int. Cl.<sup>2</sup> B01J 21/04, 21/08, 21/12, 23/74  
 U.S. Cl. 252-466 J

24 Claims

1. A process for the preparation of a supported nickel catalyst comprising the following steps:

- (a) depositing nickel nitrate on an inert inorganic refractory oxide support or carbon;
- (b) decomposing the nickel nitrate on the support to nickel oxide at a temperature of from 100° to 270° C. in a flowing gaseous atmosphere which gaseous atmosphere is characterized as not decomposing at the temperature utilized and does not contain hydrogen, said nickel nitrate decomposition being conducted essentially to completion as indicated by the cessation of the evolution of nitrogen oxides;
- (c) reducing the nickel oxide on the support of step (b) to nickel metal on the support under a reducing atmosphere at a temperature of from 230° to 350° C.

**4,160,746**  
**CATALYST FOR HYDROGENATION OF ACETOPHENONE**  
 Jay A. Rashkin, Piscataway, N.J., assignor to Malcon Research & Development Corporation, New York, N.Y.

Filed May 23, 1978, Ser. No. 908,610  
 Int. Cl.<sup>2</sup> B01J 23/02, 23/06, 23/26, 23/72  
 U.S. Cl. 252-468

9 Claims

1. A method of preparing a catalyst for the liquid phase hydrogenation of acetophenone to phenyl methyl carbinol comprising:

- (a) blending a barium-copper chromite powder produced by the calcination of a barium-copper ammonium chromate powder with predetermined amounts of MgCrO<sub>4</sub> and a zinc compound and sufficient water to form a paste;
- (b) drying the paste of (a) at a temperature in the range of about 50°-200° C. in air, followed by calcination of said dried paste at a temperature in the range of about 200°-400° C. in air.

**4,160,747**  
**ELECTRODE AND MANUFACTURING METHOD THEREFOR**  
 Gerhard Schneider; Werner Riedl, and Hans-Martin Lippold, all of Ellwangen, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 410,282, Oct. 26, 1973, abandoned.  
 This application Jan. 27, 1978, Ser. No. 872,917  
 Int. Cl.<sup>2</sup> H01B 1/08

8 Claims

1. A method of manufacturing a positive electrode body for a primary cell with alkaline electrolyte comprising the steps of forming a first mixture of manganese dioxide, and graphite in proportions of active mass and conductive material for the mass, respectively; forming a dispersion in water only of polyisobutylene; forming a second mixture of the first mixture and the dispersion; and molding the second mixture into the positive electrode body.

**4,160,748**  
**NON-LINEAR RESISTOR**  
 Masatada Yodogawa; Susumu Miyabayashi; Yoshinari Yamashita; Takashi Yamamoto; Kohji Hayashi, and Hisayoshi Ueoka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1977, Ser. No. 863,922  
 Claims priority, application Japan, Jan. 6, 1977, 52/495  
 Int. Cl.<sup>2</sup> H01B 1/08

U.S. Cl. 252-518

6 Claims

1. A non-linear resistor devoid of bismuth oxide and having a high value and high load life stability comprising a sintered body of a ceramic composition, which comprises: 99.93 to 50 mole % of zinc oxide as ZnO; 0.01 to 10 mole % of a specific rare earth oxide selected from the group consisting of oxides of lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium as R<sub>2</sub>O<sub>3</sub>; 0.01 to 10 mole % of an alkaline earth oxide selected from the group consisting of oxides of calcium, strontium and barium as MO; 0.05 to 30 mole % of cobalt oxide as CoO and 0.01 to 1 mole % of a specific tetravalent element oxide M'O<sub>2</sub> selected from the group consisting of oxides of silicon, germanium, tin, titanium, zirconium, hafnium and cerium.

**4,160,749**  
**PROCESS FOR DISSOCIATING POLYURETHANE RESINS**  
 Gottfried Schneider; Kuno Wagner, both of Leverkusen, and Werner Dietrich, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,536  
 Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711145

Int. Cl.<sup>2</sup> B29H 19/00

U.S. Cl. 260-2.3

12 Claims

1. In a process for dissociating cellular and noncellular polyurethane resins into re-usable starting products for the isocyanate polyaddition process, wherein the polyurethane is reacted with associates of lactams and adductformers having at least two Zerewitinoff-active hydrogen atoms at from 150 to 250° C., optionally at elevated pressure, the improvement wherein from 35 to 1000 parts, by weight, based on 100 parts, by weight, of the polyurethane, of an associated mixture of:

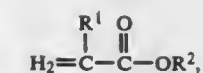
- (a) from 4 to 50 parts, by weight, of a lactam or azalactam, based on 100 parts, by weight, of polyurethane; and a mixture of:
- (b) water and/or compound having a molecular weight of from 62 to 200 having at least two Zerewitinoff-active hydrogen atoms; and
- (c) a polyhydroxyl compound having a molecular weight of from 300 to 6000; is used, and the proportion by weight of components (b) to (c) is from 1:10 to 10:1, and wherein said component (a) is used in a quantity such that said 35 to 1000 parts comprises from 4 to 50 parts of component (a).

**4,160,750**  
**AQUEOUS ACRYLIC CONTACT CEMENT**  
 Peter S. Columbus, Whitestone, and John Anderson, Brooklyn, both of N.Y., assignors to Borden, Inc., Columbus, Ohio  
 Filed Feb. 22, 1977, Ser. No. 770,517  
 Int. Cl.<sup>2</sup> C08L 1/00

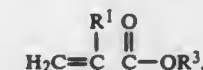
U.S. Cl. 260-17.4 ST

10 Claims

1. Contact cement for adhering like and unlike surfaces which is prepared from the ingredients comprising acrylic ester polymer selected from soft monomers having the following formula:



hard monomers having the following formula



and mixtures thereof, where R<sup>1</sup> is H or an alkyl group of 1 to 4 carbon atoms, R<sup>2</sup> is alkyl group containing from 1 to 14 carbon atoms and R<sup>3</sup> is an alkyl group containing 1 to 20 carbon atoms; about 0.002 to 0.5% of epoxy silane; about 0.0008 to 0.2% of a material selected from the group consisting essentially of glyoxal, formaldehyde paraformaldehyde and mixtures thereof; and sufficient amount of a thickener to give the desired consistency; amounts herein being based on 100 dry parts of the acrylic polymer.

8. Contact cement prepared from 98 to 99.75% of Rhoplex CA-12 acrylic emulsion which contains about 52% solids, 0.25 to 2% of a 3% aqueous solution of a thickener, 0.002 to 0.01% of a 40% aqueous solution of glyoxal and 0.002 to 0.01% of an epoxy silane, where the silane and glyoxal synergistically improve water resistance and adhesion of the cement without interfering with shelf stability and freeze/thaw property thereof.

**4,160,751**  
**LOW PRESSURE INJECTION MOLDABLE COMPOSITIONS**  
 Jan Bock, Houston, Tex.; Robert D. Lundberg, Bridgewater, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,765  
 Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260-23.5 A

27 Claims

1. An elastomeric composition having a viscosity at 0.73 sec<sup>-1</sup> at 200° C. of less than about 8×10<sup>4</sup>, and greater than 5×10<sup>3</sup> poises, said composition injection moldable into an elastomeric article, which consists essentially of:

- (a) a neutralized sulfonated elastomeric polymer having a viscosity at 0.73 sec<sup>-1</sup> at 200° C. of about 3×10<sup>5</sup> poises to about 5×10<sup>6</sup> poises and about 15 to about 50 meq. neutralized metal sulfonate groups per 100 grams of said neutralized sulfonated elastomeric polymer;
- (b) about 25 to about 150 parts by weight of a non-polar process oil per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said non-polar process oil having less than about 2 wt. % polar type compounds therein;
- (c) about 25 to about 300 parts by weight of an inorganic filler per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said inorganic filler being selected from the group consisting of clay, talc, and calcium carbonate and mixtures thereof, a ratio of said inorganic filler to said non-polar process oil being about 0.6 to about 1.25, and
- (d) at least 8 parts by weight of a preferential ionic plasticizer per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said preferential plasticizer having a melting point of at least 25° C. and is selected from the group consisting of carboxylic acids having about 5 to about 30 carbon atoms and salts of said carboxylic acids and mixtures thereof, an ion of said salt being selected from the group consisting of aluminum, ammonium, lead, Cd, Hg, and Groups IA, IIA and IB of the Periodic Table of Elements.



4,160,752

# PROCESS FOR MAKING CLOSURE SEALING COMPOUNDS AND OTHER LATEX BASED PREPARATIONS

Robert H. Akiyama, Scituate, and Leo B. Towle, Bedford, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.  
Filed Nov. 8, 1976, Ser. No. 739,462

Int. Cl.<sup>2</sup> C08J 3/20

U.S. Cl. 260—27 BB

6 Claims

1. A process for preparing a polymer composition for use as water based film-forming compositions or as a water-based closure sealing composition comprising a resin component, particulate non-plastic materials and a natural or synthetic diene rubber latex, said process consisting of the sequential steps of

- liquifying the resin component by heating to a temperature between about 150° to 210° F.,
- mixing the particulate non-plastic materials into the resin at high shear rates while maintaining the resin in the liquified state whereby the particulate non-plastic materials is substantially totally incased in the resin,
- dispersing the mixture from step (b) with an aqueous medium, to form an emulsion, and
- blending the natural or synthetic diene rubber latex in the aqueous emulsion to form a water-based closure sealing composition.

4,160,753

# PROCESS FOR THE PRODUCTION OF POLYAMIDE-POLYUREAS AND DISPERSIONS THEREOF IN WATER

Otto Lorenz, Roetgen-Rott, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Continuation of Ser. No. 592,589, Jul. 2, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 848,970

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1974, 2436017

Int. Cl.<sup>2</sup> C08G 18/32, 18/30; C08J 3/02

U.S. Cl. 260—29.2 TN

11 Claims

1. A process for the production of linear, segmented, polyamide ureas having carboxyl groups which are situated directly on the main chain and which are non-statistically arranged comprising reacting polyisocyanates with primary and/or secondary polyamines in the presence of tetracarboxylic acid dianhydrides at a temperature of from 10° to 100° C., the reactants being selected in such a way that from 0.05 to 0.6 acid anhydride groups and from 0.4 to 4 NCO-groups are used per amino group.

8. A process for the production of aqueous dispersions of linear, segmented, polyamide ureas having carboxyl groups which are situated directly on the main chain and which are non-statistically arranged, said polyamide ureas produced by reacting polyisocyanates with primary and/or secondary polyamines in the presence of tetracarboxylic acid dianhydrides at a temperature of from 10° to 100° C., the reactants being selected in such a way that from 0.05 to 0.6 acid anhydride groups and from 0.4 to 4 NCO-groups are used per amino group, said process comprising converting the carboxyl groups of the polyadduct into carboxylate groups by at least partial neutralization, and dispersing the resulting polyadduct, containing ionic groups, in water.

4,160,754

# STABLE POLYMER GELS

Dietmar Schäpel, Cologne; Kuno Wagner, Leverkusen; Hanns P. Müller, Leverkusen, and Manfred Dahm, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Mar. 13, 1978, Ser. No. 886,316

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713198

Int. Cl.<sup>2</sup> C08L 61/24

U.S. Cl. 260—29.4 R

12 Claims

1. Gels which are stable in storage, comprising a polymer matrix, a liquid dispersing agent embedded therein and optionally fillers or additives, characterized in that said polymer matrix is a polycondensation product from aldehydes and aminoplast-formers, at least 30% by weight of the aminoplast-formers having a molecular weight of between 200 and 10,000 and containing at least one functional group selected from the group consisting of ether, thioether, acetal, ester, urethane and carbonate groups.

4,160,755

# PROCESS FOR PRODUCING ANISOTROPIC DOPES AND ARTICLES THEREOF FROM BENZOIC ACID DERIVATIVE POLYMERS

Eul W. Choe, Randolph; Marshall Tan, Ridgefield Park, both of N.J., and Robert M. Minnani, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

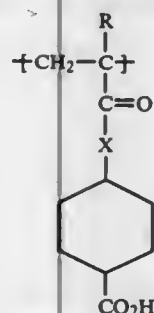
Filed Jan. 23, 1978, Ser. No. 871,281

Int. Cl.<sup>2</sup> C08L 33/08, 33/10

U.S. Cl. 260—29.6 H

11 Claims

1. A process for preparing an anisotropic dope which is useful in the production of fibers and films comprising: dissolving a polymer having recurring units of the formula



wherein R is hydrogen or methyl and X is oxygen or —NH, in an aqueous solution of at least one of the members of the group consisting of Group I metal compounds and compounds containing a protonated amine group.

4,160,756

# USE OF METAL COMPOUND IN AN AUTODEPOSITION COATING COMPOSITION

Takao Nishida, and Kiyoshi Tonolke, both of Osaka, Japan, assignors to Amchem Products, Inc., New York, N.Y.

Division of Ser. No. 720,033, Sep. 2, 1976, Pat. No. 4,103,049, which is a continuation of Ser. No. 446,032, Feb. 26, 1974, abandoned. This application May 5, 1978, Ser. No. 903,047

Claims priority, application Japan, Mar. 2, 1973, 48-25469

Int. Cl.<sup>2</sup> B05D 1/18; C23F 7/00

U.S. Cl. 260—29.6 M

17 Claims

1. An acidic aqueous coating composition comprising about 5 to about 550 g/l of solid resin particles, and of pH within the range of about 1.6 to about 5 and prepared from hydrofluoric acid, and about 0.025 to about 50 g/l of a metal-containing compound which is soluble in said composition, the metal of said compound selected from the group consisting of silver, iron in its divalent state, copper in its divalent state, cobalt in its divalent state, chromium in its trivalent state, cadmium, tin in

4,160,760

# PROCESS FOR PREPARING POLYACRYLONITRILE DOPED WITH PRUSSION BLUE

Stephen H. Carr, and Samuel I. Stupp, both of Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Filed Aug. 22, 1977, Ser. No. 826,419

Int. Cl.<sup>2</sup> C08K 3/02, 5/16; D06P 1/00, 3/70

U.S. Cl. 260—42.21

6 Claims

1. A method for reacting color agents selected from the group consisting of hydrated metal cyanide complexes, and iodine with polyacrylonitrile homopolymers and copolymers to provide a polymer solid exhibiting enhanced electrical properties and color characteristics, said method comprising the steps of:

- preparing a polymer solution of acrylonitrile polymer in a solvent selected from the group consisting of dimethyl formamide and dimethyl sulfoxide at a concentration below 20 weight-percent polymer,
- preparing an aqueous dispersion of an additive selected from the group consisting of hydrated metal cyanide complexes, iodine and mixtures thereof at a concentration below 0.1 Molar,
- agitating said polymer solution while slowly adding thereto said aqueous dispersion to provide a substantially homogeneous fluid system,
- evaporating said fluid system to remove said solvent and water therefrom, to provide a homogeneous, colored solid comprising an acrylonitrile polymer containing the additive distributed therethrough as an essentially molecularly dispersed phase.

4,160,761

# PLASTIC ARTICLES

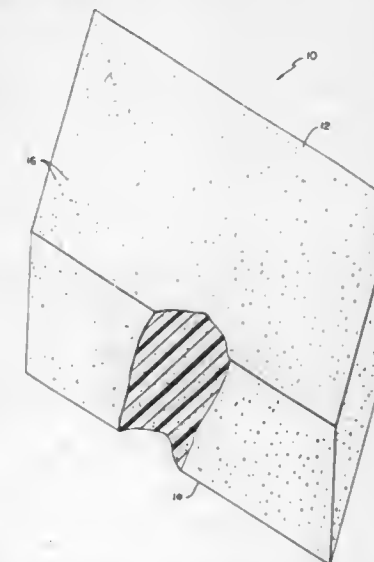
Richard C. Prusinski, and Jan R. Prusinski, both of Dearborn, Mich., assignors to Architectural Research Corporation, Livonia, Mich.

Filed May 4, 1978, Ser. No. 902,668

Int. Cl.<sup>2</sup> C08J 5/00

U.S. Cl. 260—42.47

3 Claims



1. A plastic article comprising fabricated of a filled thermoplastic resinous material, said filled thermoplastic resinous material comprising recycled thermoplastic resinous material intermixed with solid waste particles, said thermoplastic resinous material having as one component acrylonitrile-butadiene-styrene in an amount of 40% to 60%, by weight, based on the weight of the resinous material, and as a second component vinyl plastic in an amount of from 40% to 60%, by weight, based on the weight of the resinous material, said resinous material having mixed therein solid waste particles and additional amounts of silica sand, said fill material, including both

4,160,757

# ADHESIVE COMPOSITION

Toshio Honda, Akiyama; Yukio Fukuura, Kodaira; Shoji Tanaka, Higashi-Yamato; Itsuo Tanuma, Tokorozawa; Yoshikatsu Suzuki, Higashi-Murayama, and Hikaru Ishikawa, Kokubunji, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1977, Ser. No. 772,882

Claims priority, application Japan, Feb. 28, 1976, 51-21363  
Int. Cl.<sup>2</sup> C08K 5/09; C08L 9/00, 27/00, 63/00

U.S. Cl. 260—31.2 N

13 Claims

1. An adhesive composition prepared by mixing  
(a) an acrylonitrile-containing copolymer having carbon-to-carbon double bond  
(b) a phenol-polysulfide resin  
(c) a metal oxide, and  
(d) a polyfunctional electrophilic reactive compound containing at least two electrophilic reactive groups and containing at least one radical selected from the class consisting of isocyanate group, epoxy group, carbonyl halide group and sulfonyl halide group.

12. An adhesive composition as claimed in claim 1, in which the adhesive composition is prepared by compounding a) component, b) component and c) component at first to form a rubber composition by dissolving the composition in a solvent and by reacting the solution with d) component.

4,160,758

# METHOD OF MANUFACTURE OF ELASTOMER POLYESTER MOLDING COMPOUNDS

Irwin J. Gardner, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 30, 1978, Ser. No. 873,102

Int. Cl.<sup>2</sup> C08G 63/52; C08J 3/20

U.S. Cl. 260—40 R

10 Claims

1. A method for preparing an elastomer modified thermosetting unsaturated polyester molding compound having improved surface appearance, toughness and impact strength comprising preparing a first paste component comprising a mixture of an unsaturated polyester component, a free radical polymerizable monomer component, and an inorganic particulate filler component, preparing a second paste component comprising a mixture of a conjugated diene butyl elastomer copolymer component, a free radical polymerizable monomer component and an inorganic particulate filler component, and combining said first and second paste components.

4,160,759

# ELASTOMER MODIFIED POLYESTER MOLDING COMPOUND

Irwin J. Gardner, Scotch Plains, N.J., and Francis P. Baldwin, Coupleville, Wash., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 30, 1978, Ser. No. 873,103

Int. Cl.<sup>2</sup> C08L 67/06

U.S. Cl. 260—40 R

12 Claims

1. An elastomer modified thermosetting unsaturated polyester molding compound having improved surface appearance, toughness and impact strength comprising an unsaturated polyester component, a conjugated diene butyl elastomer copolymer component said copolymer consisting of from 85 to 99.5% by weight of a C<sub>4</sub>-C<sub>7</sub> isooolefin combined with 15 to 0.5% by weight of a C<sub>4</sub>-C<sub>14</sub> conjugated diolefin and said copolymer containing randomly distributed sites of conjugated diene unsaturation, a free radical polymerizable monomer component, and an inorganic particulate filler component.

the solid waste particles and silica sand, being present in an amount from 40% to 60%, by weight, based upon the weight of the resinous material.

**4,160,762**  
**HALOGEN-CONTAINING RESIN STABILIZER**  
**COMPRISING AN ALKOXYCARBONYLALKYLENETIN**  
**SULFIDE**

Motonobu Minagawa, Koshigaya, and Tetsuo Sekiguchi, Hasuda, both of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,528  
Claims priority, application Japan, Jun. 14, 1976, 51-69456  
Int. Cl.<sup>2</sup> C08K 5/58

U.S. Cl. 260—45.75 S 18 Claims

1. A stabilizer composition for enhancing the resistance to deterioration upon heating of a halogen-containing resin comprising (A) at least one sulfide compound of four-valent tin having linked to a tin atom at least one sulfide group and through carbon from one to two alkoxy-carbonylalkylene groups having from 1 to 8 carbon atoms in the alkoxy group and from 2 to 3 carbon atoms in the alkylene group and represented by the formula



and (B) at least one tin mercaptoalkylenecarboxylic acid ester having linked to a tin atom through sulfur from 2 to 3 mercaptoalkylenecarboxylic acid alkyl ester groups and 4 to 18 carbon atoms in the alkyl ester group, and through carbon from 1 to 2 alkoxy-carbonylalkylene groups having from 1 to 8 carbon atoms in the alkoxy group and from 2 to 3 carbon atoms in the alkylene group and represented by the formula



in which formulae R is an alkyl group having from 1 to 8 carbon atoms, R' is an alkyl group having from 4 to 18 carbon atoms, R'' is  $-C_6H_2bCO_2R$  or  $-SC_6H_2bCO_2R'$ , a is an integer from 1 to 4, b is 1 or 2, c is 0 or 1, d is 1 or 2, e is 2 or 3, n is from 1 to about 100, provided that when d is 2 a is at least 3, the stabilizer composition containing at least 5% by weight of the sulfide compound (A).

**4,160,763**  
**IMMUNOGLOBULIN HAVING A REDUCED**  
**COMPLEMENT FIXATION, A PROCESS FOR ITS**  
**PREPARATION AND AGENTS CONTAINING THIS**  
**IMMUNOGLOBULIN**

Hans Müller, Dautphetal-Buchneau, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,668  
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658334

Int. Cl.<sup>2</sup> A23J 1/06; A61K 37/04  
U.S. Cl. 260—112 B 17 Claims

1. A method for making an immunoglobulin preparation having reduced complement activity, which method comprises treating an immunoglobulin fraction with at least one member selected from the group consisting of (1) sulfolytic agents and (2) phosphates which are sparingly soluble in water, said treatment with a sulfolytic agent proceeding for 5 to 90 hours at a temperature not substantially higher than about 50° C. and at a concentration of said sulfolytic agent which is less than  $5(10^{-2})$  mole/liter, and said treatment with a phosphate being at a concentration of phosphate from 0.005 mole/liter to 0.15 mole/liter.

**4,160,764**  
**WATER-INSOLUBLE MONOAZO-DYESTUFFS FOR**  
**SYNTHETIC FIBROUS MATERIALS**

Peter Mischke, Nenenhain; Erwin Fleckenstein, Hofheim, and Reinhard Mohr, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 692,728, Jun. 4, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 894,177

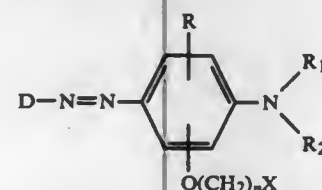
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1975, 2525557

Int. Cl.<sup>2</sup> C09B 29/26, 31/08

U.S. Cl. 260—206

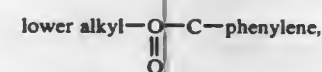
5 Claims

1. Azo-dyestuff of the formula



in which

D represents nitrophenylene,



dinitro-phenylene, nitro-cyano-phenylene, nitro-chloro-phenylene, nitro-bromo-phenylene, trichloro-phenylene, nitro-dichloro-phenylene, dinitro-chloro-phenylene, dinitro-cyano-phenylene, nitro-bromo-cyano-phenylene and dinitro-bromo-phenylene,

R represents hydrogen, chlorine, lower alkyl, lower alkoxy,  $-\text{O}-\text{CH}_2-\text{CN}$ ,  $-\text{NH}-\text{CO}-\text{lower alkyl}$ ,  $-\text{NH}-\text{COO}$  lower alkyl or



n stands for the integer 1 or 2, X represents cyano,  $-\text{CO}-\text{NH}_2$  or  $-\text{COO}-\text{lower alkyl}$ , R1 represents hydrogen, lower alkyl, lower alkylene-OH, lower alkylene-CN, lower alkylene-OCO-lower alkyl or lower alkenyl, and R2 represents lower alkyl, lower alkylene-O-CO-lower alkyl or lower alkylene-COO-lower alkyl.

**4,160,765**  
**METHOD FOR 6-BROMINATION OF**  
**1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE**  
**COMPOUNDS**

Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 17, 1976, Ser. No. 742,965

Int. Cl.<sup>2</sup> C07D 223/16

U.S. Cl. 260—239 BB

1 Claim

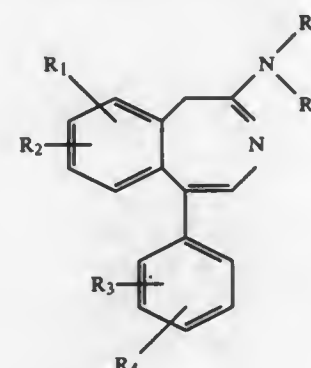
1. The method of preparing a 6-bromo-7,8-dimethoxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine hydrobromide comprising the step of reacting a 6-hydrogen-7,8-dimethoxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine with about two mole equivalents of bromine in acetic acid at ambient temperature.

**4,160,766**  
**AMINO CONTAINING BENZAZEPINES**  
John B. Bream, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed May 17, 1978, Ser. No. 906,838  
Claims priority, application United Kingdom, May 23, 1977, 21619/77

Int. Cl.<sup>2</sup> C07D 223/16; A61K 31/55; C07D 413/04  
U.S. Cl. 260—243.3 19 Claims

1. A compound of formula I,



wherein either

R1 is hydrogen, halogen, trifluoromethyl or lower alkyl or alkoxy, and

R2 is hydrogen or lower alkoxy, or

R1 and R2 together are methylenedioxy,

R3 is hydrogen, halogen, trifluoromethyl, or lower alkyl or alkoxy or alkylsulphonyl,

R4 is hydrogen, halogen, or lower alkyl or alkoxy, and

either

(i) R5 is hydrogen, lower alkyl or hydroxyalkyl, lower alkyl mono-substituted by cycloalkyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, lower alkenyl or alkenyl, wherein the multiple bond is in other than the  $\alpha,\beta$ -position, or phenylalkyl of 7 to 10 carbon atoms, and R6 is hydrogen, lower alkyl or hydroxyalkyl, or

(ii) R5 and R6 together with the nitrogen atom to which they are bound are 1-piperidinyl, 1-pyrrolidinyl, 1-morpholinyl, 1-piperazinyl or 1-(4-lower alkyl)-piperazinyl,

in free base form or in pharmaceutically acceptable acid addition salt form.

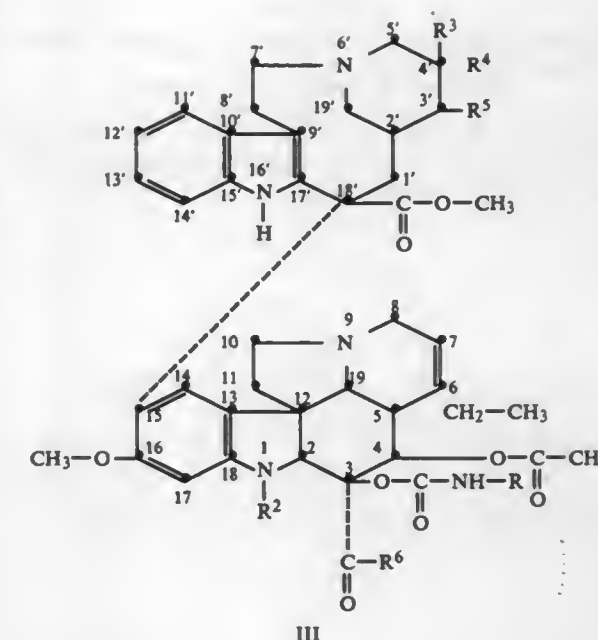
**4,160,767**  
**VINCA ALKALOID INTERMEDIATES**  
Jean C. Miller, and Gerald E. Gutowski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.  
Division of Ser. No. 869,546, Jan. 16, 1978, abandoned, which is a division of Ser. No. 747,575, Dec. 6, 1976, Pat. No. 4,096,148.  
This application Aug. 21, 1978, Ser. No. 935,431

Int. Cl.<sup>2</sup> C07D 519/04

U.S. Cl. 260—244.4

1 Claim

1. A compound of the formula



wherein R is C1-C4 alkyl, C3-C4 alkenyl,  $\text{CH}_2-\text{CHX}-\text{CH}_3$  or  $\text{CH}_2-\text{CH}_2\text{X}$  wherein X is Cl or Br;  
R2 is H, CH3 or CHO;  
one of R3 and R4, when taken singly, is H or OH and the other is ethyl;

R5, when taken singly, is H;

R4 and R5 taken together form an epoxide ring; and

R6 is OCH3 or NH2.

**4,160,768**  
**ANTI-INFLAMMATORY 3-BENZOFURANYL**  
**IMIDAZOTHIAZOLE**  
Robert E. Moser, Mentor; Larry J. Powers, Madison, and Zaven S. Ariyan, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio  
Division of Ser. No. 755,276, Dec. 29, 1976, Pat. No. 4,110,451, which is a division of Ser. No. 650,318, Jan. 19, 1976, Pat. No. 4,041,167. This application Mar. 2, 1978, Ser. No. 882,573

Int. Cl.<sup>2</sup> C07D 277/08

U.S. Cl. 260—306.7 T

1 Claim

1. 3-(2-Benzofuranyl)-5,6-dihydro-4H-imidazo-[2,1-b] thiazole.

**4,160,769**  
**OXIDATION OF KETONES TO ESTERS**  
David P. Higley, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,924

Int. Cl.<sup>2</sup> C07D 313/04, 309/08

U.S. Cl. 260—343

12 Claims

1. Method for the preparation of cycloaliphatic lactones which comprises oxidizing a cycloaliphatic ketone, having from about 5 to about 7 carbon atoms inclusive, with hydrogen peroxide and a catalytic amount of a selenium compound, having a valence of +4, selected from the group consisting of selenium dioxide, selenious acid, alkali metal salts of selenious acid, selenium halides, selenium oxyhalides, and dialkyl selenites having 1 to about 10 carbon atoms in each alkyl moiety, in the presence of at least 0.1 equivalent weights, per equivalent weight of selenium compound, of a base having a conjugate acid with a dissociation constant in the range of about  $5 \times 10^{-8}$  to about  $8 \times 10^{-2}$ , in an inert solvent whereby the oxidation by +6 valence selenium of said aliphatic ketone is inhibited, at a temperature of about 20° C. to about 200° C.



4,160,770  
LACTONES

Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

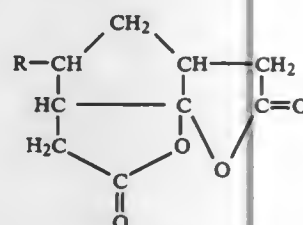
Filed Feb. 13, 1975, Ser. No. 549,612

Int. Cl.<sup>2</sup> C07C 493/04

U.S. Cl. 260—343.3 P

1 Claim

1. Spirodilactones from alkenyl or alkyl bis(succinic anhydride) having the formula



in which R is alkyl or alkenyl of 2 to 28 carbon atoms.

## 4,160,771

## SYNTHESIS OF TETRAHYDROFURAN

Paul D. Taylor, Clinton, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 632,343, Nov. 17, 1975, Pat. No. 4,105,678.

This application Nov. 3, 1977, Ser. No. 848,122

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 307/08

U.S. Cl. 260—346.11

3 Claims

1. A process which comprises hydrogenating 4-hydroxybutanal in an aqueous reaction medium maintained at a pH between about 0.2 and 3 to yield tetrahydrofuran.

## 4,160,772

STEROIDAL[16 $\alpha$ ,17-D]CYCLOHEXENE-21-CARBOXYLIC ACID ESTERS

Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb &amp; Sons, Inc., Princeton, N.J.

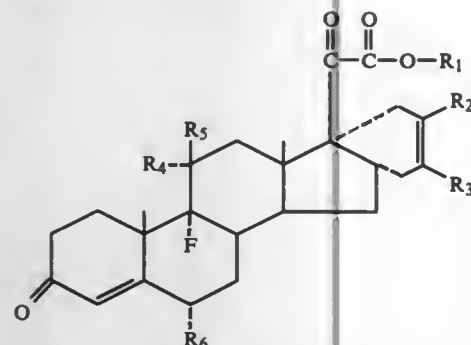
Filed Jun. 26, 1978, Ser. No. 919,006

Int. Cl.<sup>2</sup> C07J 5/00

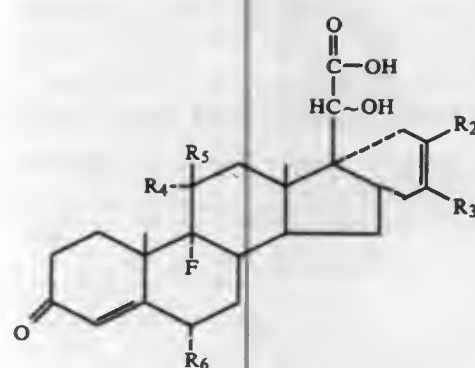
U.S. Cl. 260—397.1

16 Claims

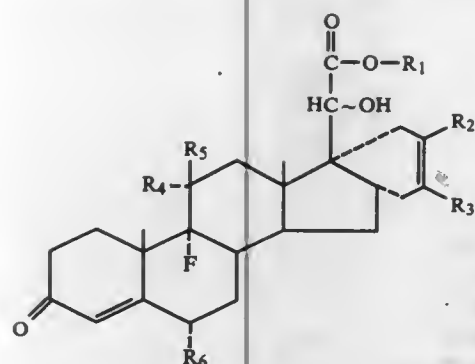
1. A steroid having the formula

or the 1,2-dehydro derivative thereof, wherein R<sub>1</sub> is alkyl of 1 to 10 carbon atoms, aryl or arylalkyl; R<sub>2</sub> and R<sub>3</sub> are the same or different and are hydrogen, alkyl or aryl; R<sub>4</sub> is hydrogen and R<sub>5</sub> is hydroxy or together R<sub>4</sub> and R<sub>5</sub> are =O; and R<sub>6</sub> is hydrogen, methyl or fluorine.

16. A steroid having the formula



or

or the 1,2-dehydro derivative thereof, wherein R<sub>1</sub> is alkyl of 1 to 10 carbon atoms, aryl or arylalkyl; R<sub>2</sub> and R<sub>3</sub> are the same or different and are hydrogen, alkyl or aryl; R<sub>4</sub> is hydrogen and R<sub>5</sub> is hydroxy or together R<sub>4</sub> and R<sub>5</sub> are =O; and R<sub>6</sub> is hydrogen, methyl or fluorine.

## 4,160,773

## SYNTHETIC ALKYL ESTERS OF PHOSPHOLIPID ACID, STRUCTURAL ANALOGS THEREOF AND A PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Hansjörg Elbl, Bovenand; Walter Diembeck, Göttingen, and Stephan Kovatchev, Göttingen-Röringen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 602,030, Aug. 5, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,735

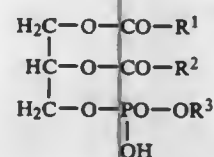
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1974, 2437833

Int. Cl.<sup>2</sup> A23J 7/00; C07F 9/02; C11C 3/00

U.S. Cl. 260—403

3 Claims

1. An alkyl ester of a phospholipid acid of the formula

wherein R<sup>1</sup> and R<sup>2</sup> are the same or different and each stands for a substituted or unsubstituted alkyl of 5 to 25 carbon atoms or haloalkyl of 6 to 25 carbon atoms and R<sup>3</sup> is alkyl of 6 to 18 carbon atoms.

3. The compound sn-1,2-dimyristoyl glycerol-3-phosphoric acid hexyl ester.

## 4,160,774

PROCESS OF DEGUMMING FATTY GLYCERIDES USING SODIUM ACETATE AND ACETIC ACID BUFFER  
Raghuram D. Shenoy, and Ananthram Ganapathy, both of Bombay, India, assignors to Cadbury India Limited, Bombay, India

Filed Jan. 25, 1978, Ser. No. 872,183

Int. Cl.<sup>2</sup> C11B 3/04

U.S. Cl. 260—424

4 Claims

1. A process for degumming fatty glycerides which comprises the steps of:

(a) adding sodium acetate and acetic acid buffer to molten crude vegetable sal fat containing the fatty glycerides wherein said sodium acetate-acetic acid buffer is in the pH range of 3 to 5; and

(b) removing the fatty glycerides degummed during step (a) from the sodium acetate-acetic acid buffer solution.

## 4,160,775

## PROCESS FOR THE PREPARATION OF NOVEL ORGANOSILOXANES

Curtis L. Schilling, Jr., Croton-on-Hudson, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,970

Int. Cl.<sup>2</sup> C07F 7/08

U.S. Cl. 260—448.2 E

27 Claims

1. Process of making an organofunctional siloxane having bonded to silicon at least one monovalent group of the formula

wherein R' is a monovalent hydrocarbon group, X is a hydrocarbonoxy group, a cyanohydrocarbonoxy group, an acyloxy group, a halogen atom, a hydroxy group, a cyano group or a group having the formula  $-\text{OC}(\text{O})\text{NR}_2$  wherein R is a monovalent nitrogen-free organic radical, a divalent hydrocarbon group when both R's are taken together or hydrogen and may be the same or different throughout the same group or molecule, when X is halogen, hydroxy, cyano or a group of the formula  $-\text{OC}(\text{O})\text{NR}_2$ , m is an integer of 1 and, when X is hydrocarbonoxy, cyanohydrocarbonoxy or acyloxy, m is 1 or 2, comprising subjecting a substituted allyl compound having the formula:

wherein X and m are as defined above and an organosiloxane having at least one silicon-bonded hydrogen to addition reaction conditions under which said silicon-bonded hydrogen and the silicon to which it is bonded become bonded respectively to the vicinal carbon atoms comprising the unsaturation of said substituted allyl compound, said organosiloxane and said substituted allyl compound having no groups that would interfere with said addition reaction and no groups, other than substituted allyl groups of said substituted allyl compound and silicon bonded hydrogen, that react under said addition reaction conditions, with the proviso that, when X is halogen, hydroxyl or cyano, the substituted allyl compound is added incrementally to said organosiloxane which is maintained at said addition reaction conditions.

## 4,160,776

## ALKOXY-BIS (TRIALKOXYSILOXY)-SILANE SURFACTANTS

Michael Scardera, Hamden, and David F. Gavin, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

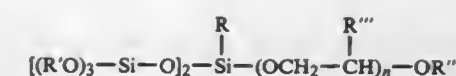
Filed Jun. 29, 1978, Ser. No. 920,579

Int. Cl.<sup>2</sup> C07F 7/18

U.S. Cl. 260—448.8 R

17 Claims

1. A surfactant composition having the formula:



wherein n is an integer of about 5 to about 50; R is selected from hydrogen, alkyl, alkenyl, aryl, and aralkyl; R' is independently selected from the same group as R with the proviso that at least a majority of the R' groups on each Si atom are sterically hindered alkyl groups having at least 3 carbon atoms; R'' is alkyl or alkenyl having about 1 to about 20 carbon atoms; and each R''' is independently selected from hydrogen and methyl.

## 4,160,777

## FLUORO-CHEMICAL COMPOUND USEFUL FOR TEXTILE TREATMENT

Basil L. Loudas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

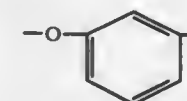
Division of Ser. No. 446,003, Feb. 26, 1974, Pat. No. 4,043,923. This application Jan. 14, 1977, Ser. No. 759,467

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> C07C 143/68, 143/74, 101/04

U.S. Cl. 260—456 F

4 Claims

1. A fluorochemical compound having the formula  $(\text{R}_f\text{Q})_x(\text{XCO})_m\text{A}(\text{COOM})_p$  where R<sub>f</sub> is fluorinated aliphatic radical having from three to twenty carbon atoms and containing about 40–78 weight percent carbon-bonded fluorine, "Q" is a divalent linking radical selected from the group consisting of  $-(\text{CH}_2)_n-$ ,  $-\text{SO}_2\text{NR}_1(\text{CH}_2)_n-$ ,  $-(\text{CH}_2)_n\text{COOCH}_2\text{CH}_2-$ ,  $-\text{SO}_2\text{NR}_1(\text{CH}_2\text{CH}_2\text{O})_n\text{CH}_2\text{CH}_2-$ ,  $-\text{SO}_2(\text{C}_2\text{H}_5)_2\text{C}_2\text{H}_4\text{NHC}_2\text{H}_4-$  and  $-\text{SO}_2$ wherein "R<sub>f</sub>" is hydrogen or a lower alkyl group having from about 1 to 14 carbon atoms and "n" is an integer from about 1 to 15, "M" is a cation selected from NH<sub>4</sub><sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>, Li<sup>+</sup>, H<sup>+</sup> or is a protonated alkyl amine having from 1–6 carbon atoms in the alkyl group, "A" is a polyvalent organic radical having a valency of m + p and is the residue obtained by eliminating the carboxyl groups of a polybasic organic acid or an organic anhydride and is selected from the group consisting of maleic, succinic, phthalic, tetrachlorophthalic, chlorendic, tetrabromophthalic, 3-nitrophthalic, 4-nitrophthalic, cis 1,2-cyclohexane dicarboxylic, 5-norbornene-2,3-dicarboxylic, 1,8-naphthalene dicarboxylic and benzophenone tetracarboxylic and pyromellitic, "X" is NR (wherein R is hydrogen or an alkyl group of from 1 to 14 carbon atoms), or N and "e", "p" and "m" are integers of 1 or 2.

## 4,160,778

## EPOXIDATION

Anthony M. Hildon, Tattenhall; Thomas D. Manly, Rancorn, and Alan J. Jagers, Rainhill, all of England, assignors to Propylox a Society Anonyme, Brussels, Belgium

Filed Jan. 30, 1978, Ser. No. 873,523

Claims priority, application United Kingdom, Feb. 26, 1977, 8246/77

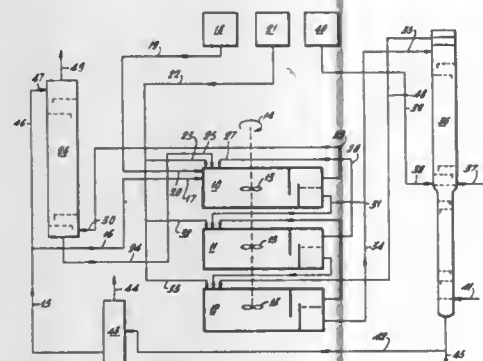
Int. Cl.<sup>2</sup> C07C 179/10

U.S. Cl. 260—502 R

9 Claims

1. In a continuous process for the preparation of a peracid which comprises reacting, in a reaction zone, hydrogen peroxide with an unsubstituted monocarboxylic acid having from 2 to 6 carbon atoms in an aqueous medium containing sulfuric acid to form a percarboxylic acid, and extracting the percarboxylic acid thus formed into an organic phase comprising an

organic solvent, thereby to produce an aqueous solution comprising sulphuric acid and water and an organic solution comprising percarboxylic acid and organic solvent, the improve-



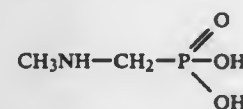
ment wherein the hydrogen peroxide is added to the reaction mixture at a plurality of locations in the reaction zone, thereby to limit the concentration of hydrogen peroxide at any location in the reaction zone.

**4,160,779**  
**PROCESS FOR THE PRODUCTION OF METHYLAMINOMETHYLPHOSPHONIC ACID AND ITS SALTS**

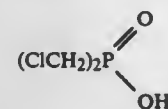
Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Gelby Corporation, Ardsley, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,829  
Claims priority, application Switzerland, Oct. 12, 1977, 12455/77

Int. Cl.<sup>2</sup> C07F 9/38  
U.S. Cl. 260—502.5  
1. A process for the production of methylaminomethylphosphonic acid of the formula



and the salts thereof, which comprises reacting bis-(chloromethyl) phosphinic acid



in water or an aqueous medium, with ammonia at 100°–200° C. and under autogenous pressure, and isolating the methylaminomethylphosphonic acid from the reaction mixture in the form of the free acid or of a salt.

**4,160,780**  
**2-KETOPENTAFLUOROPROPANESULFONIC ACID AND RELATED ACIDS**

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1975, Ser. No. 602,756  
Int. Cl.<sup>2</sup> C07C 143/08

U.S. Cl. 260—513 F  
1. A ketopolyfluorosulfonic acid of the formula



where  $\text{R}^1$  and  $\text{R}^2$ , alike or different, are F or perfluoroalkyl of up to 4 carbons.

**4,160,781**  
**4-BENZYLOXY-3-(CHLOROCARBONYL)-PHENYLACETYL CHLORIDE**

Arthur R. McFadden, East Brunswick; Richard C. Allen, Flemington, and Thomas B. K. Lee, Whitehouse Station, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 843,482, Oct. 19, 1977, Pat. No. 4,118,401.  
This application Sep. 5, 1978, Ser. No. 939,263

Int. Cl.<sup>2</sup> C07C 63/00  
U.S. Cl. 260—544 D  
1. 4-benzyloxy-3-(chlorocarbonyl)phenylacetyl chloride.

**4,160,782**  
**PROCESS FOR TREATING UREA BODIES**

Willy Henri P. Van Hiffte, Asenede, and Rafael Arsene J. Goethals, Ertvelde, both of Belgium, assignors to Compagnie Neerlandaise de l'Azote, Brussels, Belgium

Continuation of Ser. No. 168,754, Aug. 3, 1971, abandoned. This application Jan. 9, 1978, Ser. No. 868,183

Claims priority, application United Kingdom, Aug. 6, 1970, 38046/70

Int. Cl.<sup>2</sup> C07C 126/00  
U.S. Cl. 260—555 C  
22 Claims

1. A process for treating urea pellets, prills and like urea bodies to reduce their tendency to cake, which comprises treating said urea bodies with an aqueous solution containing an effective amount of trimethylol urea, which solution contains about 2 to about 5 mol of bonded and free formaldehyde per mol of urea.

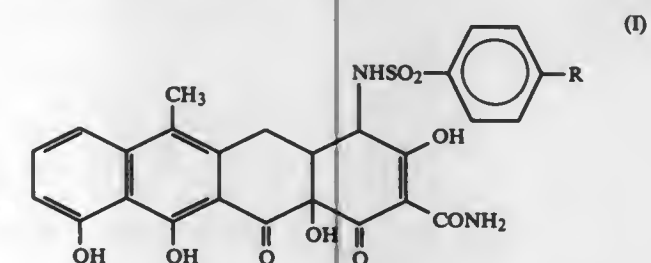
**4,160,783**  
**4-DEDIMETHYLAMINO-4-ARYLSULFONAMIDO-5A,6-ANHYDROTETRACYCLINES**

Marica Čakara; Slobodan Djokić, and Zrinka Tamburasev, all of Zagreb, Yugoslavia, assignors to PLIVA Pharmaceutical and Chemical Works, Yugoslavia

Filed Nov. 28, 1977, Ser. No. 855,496  
Claims priority, application Yugoslavia, Nov. 26, 1976, 2901/76

Int. Cl.<sup>2</sup> C07C 143/79; A61K 31/18  
U.S. Cl. 260—556 AR  
10 Claims

1. A 4-dedimethylamino-4-arylsulfonamido-5a,6-anhydrotetracycline of the formula I



wherein R stands for  $\text{C}_1$ – $\text{C}_3$ -alkyl, halogen or  $-\text{NHCOR}^1$ , and  $\text{R}^1$  being  $\text{C}_1$ – $\text{C}_3$ -alkyl.

**4,160,784**  
**PROCESS FOR THE PRODUCTION OF o-AMINOPHENYL KETONE DERIVATIVES**

Tsutomu Sugawara, Kobe; Tatsuo Toyoda, Osaka; Makoto Adachi, Izumi, and Kazuyuki Sasakura, Oumibachiman, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Feb. 18, 1977, Ser. No. 770,037  
Claims priority, application Japan, Feb. 18, 1976, 51-16677

Int. Cl.<sup>2</sup> C07C 85/18  
U.S. Cl. 260—570 AB  
7 Claims

1. Process for the production of o-aminophenyl ketone derivatives which comprises reacting an aniline unsubstituted in at least one ortho position with a nitrile in the presence of boron trihalogenide to introduce a substituted iminomethyl into the ortho position of said aniline and hydrolyzing the resulting iminomethyl compound.

**4,160,785**  
**REDUCTION OF DIIMINO COMPOUNDS TO DIAMINO COMPOUNDS**

Jimmy L. Webb, Ballston Lake, N.Y., and John E. Corn, Mt. Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

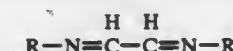
Continuation-in-part of Ser. No. 544,139, Jan. 27, 1975, abandoned. This application Jul. 1, 1976, Ser. No. 701,517

Int. Cl.<sup>2</sup> C07C 85/08  
U.S. Cl. 260—583 P  
4 Claims

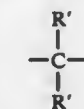
1. The process for making diamino compounds of the formula



which consists essentially of (1) hydrogenating a preformed imino compound of the formula



in a methanol solvent and in the added presence of a tertiary alkyl mono-amine of the formula  $\text{R}-\text{NH}_2$  which is used to increase the yield of the diamino compound, the tertiary alkyl mono-amine being present in a molar ratio of from 0.2 to 4.0 mols of the latter per mol of the imino compound, where R in the diimino compound and in the mono-amine is the same and is a monovalent alkyl hydrocarbon of from 4 to 10 carbon atoms containing a tertiary



group connected directly to the nitrogen atoms of the mono-amine or the imino compound, and where  $\text{R}'$  is a member of the class consisting of the methyl radical, the ethyl radical, and mixtures thereof, thereby to form the aforesaid diamino compound, and (2) recovering the above-described diamino compound from the reaction mixture.

**4,160,786**  
**PROCESS FOR ISOMERIZING CYCLOALKENOL TO CYCLOALKANONE**

William J. Ehmann, Orange Park, Fla., assignor to SCM Corporation, New York, N.Y.

Filed Aug. 11, 1978, Ser. No. 933,058  
Int. Cl.<sup>2</sup> C07C 45/00, 45/16

U.S. Cl. 260—586 P  
12 Claims

1. A process for isomerizing a beta-, gamma-unsaturated cycloalkenol to a cycloalkanone, wherein said cycloalkenol is

contaminated with an acid-forming moiety capable of causing dehydration of said cycloalkenol, which comprises:

forming a reaction mixture of said cycloalkenol, a catalytic amount of copper chromite catalyst, and between about 0.01% and 10% by weight of said cycloalkenol of a base which has a solubility in said reaction mixture not substantially above about 5 millimoles per gram of said catalyst, said base rendering said moiety substantially incapable of causing said dehydration, heating said reaction mixture at about 150° to 300° C. until said cycloalkanone is formed; and recovering said cycloalkanone from said reaction mixture.

**4,160,787**  
**PROCESS FOR EXTRACTING BITTER FLAVORING PRINCIPLES FROM HOPS**

Manfred Moll; Roland Flayeux, both of Vandoeuvre; Pierre Dicesare, Frouard, and Bernard Gross, Villers les Nancy, all of France, assignors to G.I.E. Tepral, France

Filed Mar. 31, 1976, Ser. No. 672,461  
Claims priority, application France, Apr. 2, 1975, 75 11278; Dec. 16, 1975, 75 39611

Int. Cl.<sup>2</sup> C07C 45/00, 45/16, 45/24  
U.S. Cl. 260—586 D  
8 Claims

1. A process of treating hops for the preparation of bitter flavoring extracts for food products and fermented beverages which comprises the steps of

- subjecting a purified hop extract containing alpha and beta-acids to a direct isomerization treatment of the alpha-acids by mixture thereof with magnesium ethoxide suspended in anhydrous ethanol, said mixture being shielded from light and refluxed under nitrogen, with agitation, at a temperature of the order of 80° C. and atmospheric pressure to form iso-alpha-acids;
- effecting a separation of the iso-alpha acids from the beta-acids in a pulsed column wherein the isomerized alpha-acids and the beta-acids are intermixed in an organic liquid phase containing the acids and are contacted in a pulsed column with an inorganic aqueous liquid phase comprising alkali metal carbonates or phosphates in solution, said pulsed column effecting the separation by internal dispersion of the two phases, the iso-alpha acids transferring into the aqueous liquid phase and the beta acids remaining in the organic liquid phase;
- isolating the resultant iso-alpha acids;
- transforming the separated beta-acids into alpha-acids by ultraviolet radiation at 3500–3600 Å, at a temperature between 10° and 50° C. to form a desoxy-alpha-acid and then oxidation of said desoxy-alpha-acid by a per-acid in a basic medium at a pH of 10–12, at a temperature of less than 25° C., said per-acid being selected from the group consisting of mono-persulfuric acid, p-nitro-perbenzoic acid and peracetic acid;
- then treating the alpha acid from (d) in another magnesium ethoxide isomerization (as in a) to obtain iso-alpha acids in free form in the form of the magnesium salt of said iso-alpha-acids.

**4,160,788**  
**DISPROPORTIONATION OF TOLUENE**

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,457  
Int. Cl.<sup>2</sup> C07C 3/62

U.S. Cl. 585—475  
6 Claims

1. A process for effecting disproportionation of toluene to produce benzene and xylenes in which the preparation of para-xylene isomer is in excess of its normal equilibrium concentration which comprises contacting toluene under conditions effective for accomplishing said disproportionation in the presence of a catalyst comprising the crystalline aluminosilicate zeolite ZSM-23.



4,160,789

**BLOCK COPOLYMERS**

Pierino Radici, Turate; Gaudenzio Bianchi, Fagnano Olona, and Paolo Colombo, Saronno, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

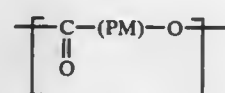
Filed Oct. 22, 1976, Ser. No. 734,932

Claims priority, application Italy, Oct. 30, 1975, 28810 A/75  
Int. Cl.<sup>2</sup> C48G 2/38

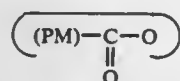
U.S. Cl. 525—411

5 Claims

1. A block copolymer of the structure A-B wherein:  
A is a polylactone block consisting of a chain of recurring units:



obtained from one or more lactone monomers of the formula:



wherein PM is a linear polymethylene chain having from 2 to 13 carbon atoms, non substituted or substituted by having at least one hydrogen atom replaced by a radical selected from the group consisting of the alkyl, aryl, aralkyl, cycloalkyl and alkylenyl radicals,

B is a polyoxymethylene block consisting of recurring units  $-\text{CH}_2\text{O}-$ , the said block B being present in the copolymer in an amount of at least 2% by weight and the said block A being present in the copolymer in an amount of at least 0.1% by weight.

4,160,790

**HIGH IMPACT NYLON MOLDING COMPOSITIONS**

Charles D. Mason, Chatham Township, Morris County, and Paul W. Flood, Lake Hopatcong, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 3, 1977, Ser. No. 821,380

Int. Cl.<sup>2</sup> C08L 77/00

U.S. Cl. 525—179

4 Claims

1. In a melt-blended composition of nylon-6 or nylon 66, as 60-98 percent by weight of the composition, blended with a copolymer of ethylene containing from 1-20 mol percent in the copolymer of randomly distributed units of acrylic acid or ethyl ester thereof: the improvement which comprises such blend containing both a copolymer of ethylene with such acid and a copolymer of ethylene with such ester at weight proportions, between the acid and ester copolymers, from 2 parts of acid copolymer: 12 parts ester copolymer up to 16 parts of acid copolymer: 5 parts ester copolymer by weight, whereby the notched Izod impact resistance of the composition is higher than for a like composition in which either one of the copolymers is substituted for the said blend of both copolymers.

4,160,791

**POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF**

Willard S. Higley, Glendora; Paul A. Cantor, Los Angeles, and Bruce S. Fisher, Covina, all of Calif., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 636,062, Nov. 28, 1975, Pat. No. 4,075,108, which is a continuation-in-part of Ser. No. 454,939, Mar. 26, 1974, abandoned. This application Jan. 30, 1978, Ser. No. 873,168

Int. Cl.<sup>2</sup> C08L 69/00

U.S. Cl. 525—469

9 Claims

1. A process for producing a polyether-polycarbonate block copolymer having a molecular weight within the range of from about 50,000 to about 750,000 as determined by the intrinsic viscosity measurement and containing from about 5 to about 35 percent by weight of repeating alkylene ether units and correspondingly from about 95 to about 65 percent by weight of repeating bisphenol A-carbonate units for use in forming membranes comprising:

dissolving a polyether glycol compound, bisphenol A, and pyridine in a solvent to give a total solids content of about 5 percent to about 16 percent, by weight, reacting the dissolved bisphenol A, polyether glycol compound, and pyridine with phosgene by adding phosgene, at an initial feed rate, to said solution with vigorous stirring while maintaining the solution in the temperature range of about 20° C. to about 43° C. until crystals of pyridine hydrochloride begin to form;

thereafter adding a chain terminator to the reacted solution and reducing the phosgene feed rate to about one-fiftieth of initial phosgene rate until the reaction solution undergoes a permanent color change, thereafter precipitating said polyether-polycarbonate block copolymer by mixing the reaction solution with an acidified liquid chosen from the group consisting of isopropyl alcohol, hexane and a 80:20 by volume mixture of acetone and water, and separating the precipitated polymer from the liquid.

4,160,792

**THERMOPLASTIC MOLDING COMPOSITION COMPRISING STYRENE-MALEIMIDE AND POLYCARBONATE**

Ronald A. Fava, Monroeville, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 794,496, May 6, 1977, Pat. No. 4,122,130. This application Oct. 10, 1978, Ser. No. 949,604

The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C08L 67/06

U.S. Cl. 525—148

5 Claims

1. A thermoplastic molding composition which comprises:  
A. from about 10% to about 90% by weight of a polycarbonate;  
B. from about 10% to about 90% by weight of a copolymer of maleimide and styrene containing from about 5% to about 35% maleimide and from about 65% to about 95% styrene.

4,160,793

**FIRE RETARDANT BLEND OF INTERPOLYMER COMPOSITION, CHLORINATED VINYL CHLORIDE POLYMER AND VINYL CHLORIDE POLYMER**

Paul Kraft, South Spring Valley, and Joseph Silberberg, Brooklyn, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 28, 1978, Ser. No. 937,230

Int. Cl.<sup>2</sup> C08L 33/20

U.S. Cl. 525—230

6 Claims

1. A fire retardant blend having good impact resistance and a high heat deflection temperature comprising:

- (1) a predominant amount of an interpolymer comprising: (a) crosslinked acrylate or methacrylate; (b) crosslinked styrene-acrylonitrile; and (c) uncrosslinked styrene-acrylonitrile components, said interpolymer being prepared by polymerizing styrene and acrylonitrile in the presence of a cross-linked alkyl acrylate or methacrylate polymer in two steps with at least one cross-linking agent being present in only one of the two steps;  
(2) a chlorinated vinyl chloride polymer; and  
(3) a vinyl chloride polymer.

4,160,794

**1-OXO-2,2-[DIALKYLPHOSPHONO(ALKYL)ALKYL-OXY]-1,2-DIPHENYLETHANE**

Andreas Schmidt, Reinach, and Rudolf Kirchmayr, Munchenstein, both of Switzerland, assignors to Ciba-Gelby Corporation, Ardsley, N.Y.

Division of Ser. No. 642,230, Dec. 19, 1975, Pat. No. 4,082,821.

This application Jan. 9, 1978, Ser. No. 867,992

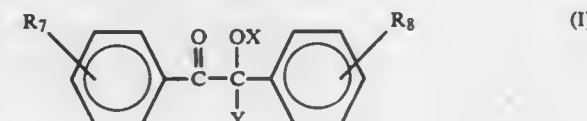
Claims priority, application Switzerland, Dec. 24, 1974, 017285/74; Dec. 26, 1975, 015304/75

Int. Cl.<sup>2</sup> C07F 9/40

U.S. Cl. 260—927 R

9 Claims

1. A compound of formula I



wherein

x represents a phosphonoalkyl group of formula



Y represents a phosphonoalkyl group of the formula



or a phosphonoalkoxy group of formula



each of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> independently represents alkyl of 1 to 4 carbon atoms, haloalkyl of 2 to 3 carbon atoms, alkoxyalkyl of 3 to 8 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, aralkyl of 7 to 8 carbon atoms, phenyl, halogeneophenyl, alkylphenyl or alkoxyphenyl, or R<sub>1</sub> and R<sub>2</sub> together, or R<sub>3</sub> and R<sub>4</sub> together, represent a branched or unbranched alkylene of 2 to 7 carbon atoms;  
each of R<sub>5</sub> and R<sub>6</sub> independently represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl;  
each of R<sub>7</sub> and R<sub>8</sub> independently represents hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or phenyl; and  
n is 2 or 3.

4,160,795

**DURABLE FLAME RETARDANT FOR POLYESTER TEXTILE MATERIALS**

James A. Albright, and Richard R. Nicholson, both of Ann Arbor, Mich., assignors to Veliscol Chemical Corporation, Chicago, Ill.

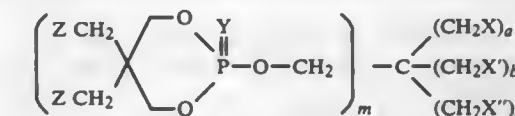
Filed Jan. 13, 1978, Ser. No. 869,084

Int. Cl.<sup>2</sup> C07F 9/165, 9/08

U.S. Cl. 260—937

11 Claims

1. A compound of the formula



wherein each Z is independently selected from the group consisting of hydrogen and halogen; Y is oxygen or sulfur; n is an integer of from 1 to 3; a, b, and c are integers of from 0 to 1; n+a+b+c=4; and wherein X, X', X'' are independently selected from the group consisting of hydrogen, halogen, alkyl of 1 to about 8 carbon atoms and  $\text{---OC(O)R}$ , provided that at least one of said X, X', X'' substituents is  $\text{---OC(O)R}$ , and R is independently selected from the group consisting of alkyl of 1 to about 18 carbon atoms, haloalkyl of 1 to about 18 carbon atoms, alkoxyalkyl of from 1 to about 18 carbon atoms, aryl of from 6 to about 18 carbon atoms, and haloaryl of from about 6 to about 18 carbon atoms.

4,160,796

**MELTING FURNACE CONSTRUCTIONS**

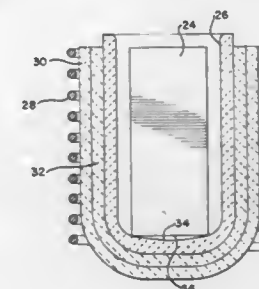
Nick G. Lirones, North Muskegon, Mich., assignor to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Oct. 31, 1977, Ser. No. 847,262

Int. Cl.<sup>2</sup> C04B 33/34

U.S. Cl. 264—60

7 Claims



1. A method for producing a crucible for use in melting a charge in a melting furnace, said furnace having heating means surrounding the crucible for melting the charge, and insulating means separating the crucible from the heating means, the insulating means including a ceramic liner adjacent said heating means, said method comprising forming said crucible by applying isostatic pressure to ceramic particles surrounding a core whereby the crucible may define an irregular exterior surface, casting a ceramic capsule around said crucible whereby the interior surfaces of the capsule closely conform to and are in contact with the exterior surfaces of said crucible, the casting of the ceramic capsule including the steps of providing a mold having interior dimensions corresponding with the interior dimensions of said liner, locating said crucible in said mold and casting ceramic particles in the mold for thereby forming said capsule around said crucible, the exterior dimensions of said capsule thereby being controlled by the mold configuration with the exterior dimensions of said capsule conforming with the interior dimensions of said liner whereby the capsule and crucible combination is snugly receivable

within said liner, and whereby the combination of said capsule and liner provide strong support for said crucible.

**4,160,797**  
**PROCESS FOR THE DEPOSITION OF**  
**POLYCRYSTALLINE SILICON FROM THE GAS PHASE**  
**ON HEATED CARRIERS**

Alois Göppinger; Rudolf Griesshammer; Helmut Hamster, all of Burghausen, and Franz Köppl, Altötting, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,223

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618293

Int. Cl.<sup>2</sup> B29C 13/00, 1/02

U.S. Cl. 264—81

7 Claims



1. An improved process for the deposition of polycrystalline silicon from the gaseous phase on heated carrier bodies of graphite, by heating said bodies to deposition temperature while contacting them with a gaseous mixture containing a decomposable silicon compound and separating the deposited silicon from the carrier body after termination of the deposition process, wherein the improvement comprises: assembling the carrier bodies from thin flexible graphite foils having a thickness of between 0.1–2 mm.

**4,160,798**  
**RELEASE COATINGS**

Lawrence Price, 63 Portland Ave., Old Orchard Beach, Me. 04064, and Mose A. Russo, Anderson Rd., Sebago, Me. 04075  
Filed May 9, 1977, Ser. No. 796,714

Int. Cl.<sup>2</sup> B29D 7/02

U.S. Cl. 264—213

4 Claims

1. In a method of forming a film of resinous material which includes the step of casting the film of resinous material in a flowable state onto a piece of paper having an easy release surface, drying the resinous film material and stripping it from the release surface, the improvement which comprises casting the film of resinous material onto a piece of paper having a release coating comprising a copolymer of an aliphatic 1-olefin having from 6 to 50 carbon atoms per molecule and maleic anhydride hydrolyzed with potassium hydroxide.

**4,160,799**  
**MAINTAINING PLANARITY IN POLYESTER FILM**  
**DURING UNIFORM TEMPERATURE HEAT**  
**RELAXATION**

Mark M. Locey, and William F. Gottermeler, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Continuation-in-part of Ser. No. 727,745, Sep. 29, 1976, abandoned. This application Apr. 19, 1978, Ser. No. 897,826

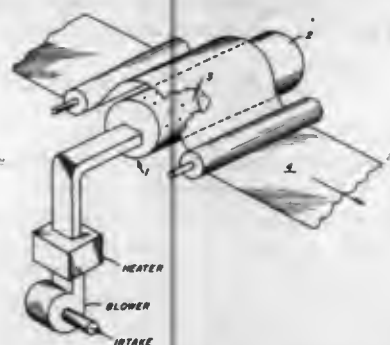
Int. Cl.<sup>2</sup> B29C 25/00

U.S. Cl. 264—342 R

8 Claims

1. A method of heat relaxing a biaxially-oriented heatset polyester film having a thickness from about 1 mil to about 7 mils, said method comprising heating said film at a uniform temperature sufficient to heat relax the film, while simulta-

neously subjecting the film to low tension in its longitudinal dimension and impinging gas on the film so as to buoy the film in a curved configuration free of straight segments along said



longitudinal dimension, said curved configuration having at least one curved segment defined by a radius of curvature within the range from about 1 inch to about 8 inches subtending an arc of no less than 40 degrees.

**4,160,800**  
**METHOD OF FORMING A COMPOSITE ROD**  
Kenneth E. Branen, Hudson, N.H., assignor to Avco Corporation, Wilmington, Mass.

Filed Aug. 5, 1977, Ser. No. 822,234

Int. Cl.<sup>2</sup> B29C 25/00

U.S. Cl. 264—345

6 Claims

1. A method of forming a round composite rod from a flat composite strip comprising:  
vertically suspending a flat composite strip containing longitudinally aligned monofilaments within a matrix that softens when heated;  
raising the temperature of a substantial length of the composite strip to its transition temperature and maintaining the composite strip at said temperature until the cross section of the composite assumes a substantially round configuration; and  
fully solidifying said composite.

**4,160,801**  
**HEAT EXCHANGER-BLOOD OXYGENATOR**  
**COMBINATION**  
Anthony Badolato, Willingboro, and Joseph S. Farrell, Piscataway, both of N.J., assignors to Surgikos, New Brunswick, N.J.  
Filed Oct. 19, 1977, Ser. No. 843,626

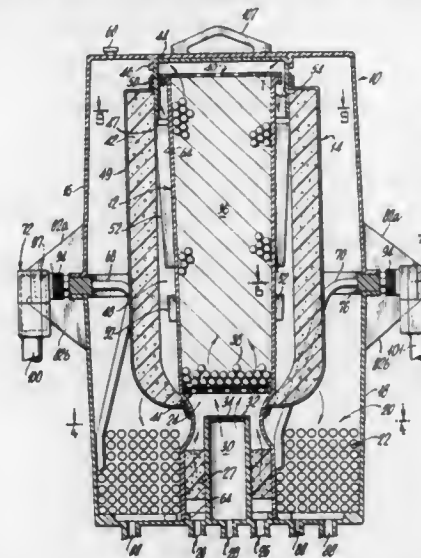
Int. Cl.<sup>2</sup> A61M 1/03

U.S. Cl. 422—46

10 Claims

1. A blood treatment apparatus comprising: an upper housing; a lower housing; a substantially cylindrical central housing supported at one end on the bottom wall of said lower housing and defining a blood oxygenation chamber therewithin; blood inlet means in said bottom wall for feeding blood to said central housing; oxygen inlet means in said bottom wall for feeding oxygen to said central housing; a blood reservoir in the lower portion of said lower housing surrounding said central housing for receiving oxygenated blood from said oxygenation chamber; blood outlet means in said bottom wall external of said central housing in communication with said blood reservoir for feeding oxygenated blood from said reservoir; a plurality of closely spaced heat-exchange coils located in said blood reser-

voir for regulating the temperature of said oxygenated blood; and an annular gasket separating said upper and lower hous-



ings and forming a seal therebetween; said coils having inlet and outlet ends extending through openings in said gasket.

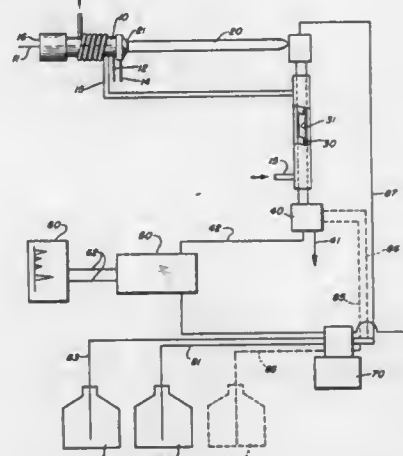
**4,160,802**  
**INSTRUMENT FOR THE AUTOMATED**  
**DETERMINATION OF ORGANIC HALOGENS**  
Robert H. White, Houston, Tex., and Lowell P. Hager, Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Feb. 23, 1978, Ser. No. 880,372

Int. Cl.<sup>2</sup> G01N 31/06, 31/12, 31/22

U.S. Cl. 422—68

5 Claims



1. An instrument for the automated determination of organic halogen content comprising in series arrangement:

- (a) an elongated combustion chamber, having an inlet end and an outlet end, for burning an organic halogen-containing sample in an oxygen-hydrogen flame;
- (b) a burner, affixed via a seal to the inlet end of the combustion chamber, having means for introducing and atomizing the sample in a rapid flow of hydrogen gas, and means for supplying oxygen to the atomized sample for combustion;
- (c) absorption means, affixed to the outlet end of the combustion chamber, including means for forming a supported moving film for absorbing the halogen-containing combustion gases, said film comprising a colorimetric reagent solution;
- (d) means for collecting the halogen-containing reagent

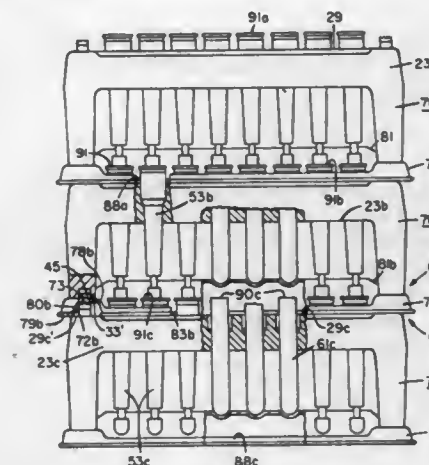
solution and venting therefrom inert, water-insoluble gases;  
(e) colorimeter means, connected to the collection means, for receiving and monitoring the halogen content of the vented reagent solution; and  
(f) pump means for transferring the reagent solution from storage vessels and establishing the moving liquid film.

**4,160,803**  
**SELF PACKAGED TEST KIT**  
Robert S. Potts, Sherborn, Mass., assignor to Corning Glass Works, Corning, N.Y.  
Filed Mar. 23, 1978, Ser. No. 889,218

Int. Cl.<sup>2</sup> B01L 9/00

U.S. Cl. 422—101

22 Claims



1. A self-packaged structure for use as a test kit comprising: collection tubes and fraction columns supported in said structure in an array including: a plurality of racks each adapted for supporting the fraction columns and collection tubes and a tray adapted to receive a plurality of said racks therein in a vertical orientation and to securely support one rack adjacent to another in tandem to form a modular package; each of said racks comprising: a modular integral monolith including: dependent legs, and a horizontal support member joining upper portions of the legs, the support member having a plurality of through holes therein aligned adjacent one another between the legs, each hole having a shaped interior wall adapted to receive a selected one of the fraction columns and collection tubes in substantially upright fashion, upstanding lugs disposed on an upper surface of the support member and aligned with a lower horizontal support surface of the legs, the legs having complementary recesses therein shaped for frictionally receiving the lugs of another of said racks to facilitate stacking of one rack over another, each tray including first means adapted for receiving at least one rack securing fraction columns therein and second means adapted for receiving at least one rack securing collection tubes therein, portions of the first and second means being spaced in said tray to mate with the lower horizontal support surface of the legs and further including, respective first and second surfaces aligned in selected spaced relation with the support member for the respective rack for supporting the fraction columns and collection tubes.

**4,160,804**  
**DEVICE FOR ASSAYING GOLD AND OTHER METALS**  
Thomas J. Victory, 25167 Harcourt, Farmington, Mich. 48024  
Filed Aug. 2, 1978, Ser. No. 930,416

Int. Cl.<sup>2</sup> B01L 9/00; G01N 31/00

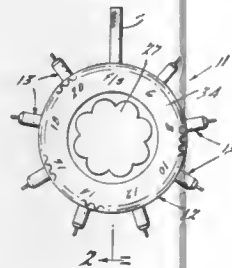
U.S. Cl. 422—104

7 Claims

1. A gold assaying device comprising a clam shell type of holder having facing halves mating at their peripheral edges, a plurality of radially extending apertured portions formed by



said mating edges, a plurality of needle supports, each support having a head within said peripheral edges and a body portion extending from one of said apertured portions, a bore in each



support holding a test needle, the needles in said supports being gold of different known karats, and indicia means on said holder identifying said known karats.

4,160,805

## BOILER CONTAINING DENITRATOR

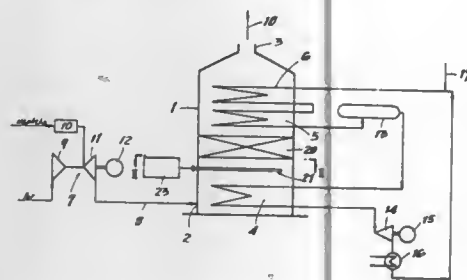
Hideya Inaba; Toshio Tatsumi, and Chihito Iwai, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co. Ltd., Osaka, Japan

Filed Jul. 14, 1977, Ser. No. 815,539

Int. Cl.<sup>2</sup> B01J 8/02; C01B 21/00

U.S. Cl. 422-180

7 Claims



1. In a waste heat boiler having a superheater, an evaporator and an economizer disposed in a combustion gas channel formed therein, the improvement comprising, a denitration catalyst layer disposed between said superheater and said evaporator, said catalyst layer being constituted by a number of plate-like denitration catalyst bodies disposed with their plate surfaces extending along the direction of flow of combustion gas, and reductant feeding means for adding a reductant to the combustion gas provided between said catalyst layer and said superheater.

4,160,806

## MOBILE CATALYST TREATMENT UNIT

Warner D. Long, 9112 Tiverton Way, Louisville, Ky. 40223; Charles C. Hager, Rt. 1, Box C F80, Crestwood, Ky. 40014, and George T. Hemenstall, 11104 Berwick Pl., Middletown, Ky. 40243

Filed May 9, 1977, Ser. No. 795,121

Int. Cl.<sup>2</sup> B01J 8/02, 37/12; F25D 15/00

U.S. Cl. 422-223

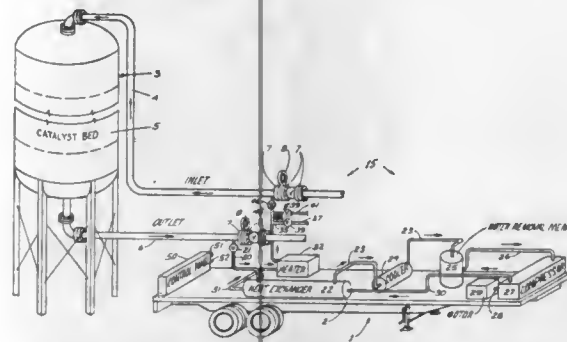
11 Claims

1. A catalytic gas treatment system which comprises in combination:

- a catalytic reactor containing a stationary catalyst bed and having an inlet and an outlet means connected to other gas treatment units, and
- a cutoff means in operative relation with said inlet means for isolating the catalytic reactor from the other gas treatment units,
- a cutoff means in operative relation with said outlet means

for isolating the catalytic reactor from the other gas treatment units,

- an auxiliary mobile catalyst treatment unit comprising:
- a gas processing loop supported on a mobile carrier and which is in open communication with said inlet and outlet means so as to form a flow passage through said loop and through said reactor, which loop comprises:
  - temperature changing means mounted on said mobile carrier and serially connected in said gas loop for conditioning the fluid passing through said gas loop, and
  - an auxiliary inlet means for addition of a carrier gas to said gas processing loop, and
  - flow means mounted on said mobile carrier and serially connected in said gas loop, and



- a first conduit at one end of said loop, detachably connected to said inlet means at a point between said cutoff means and said isolated catalytic reactor,
- a second conduit at the other end of said loop, detachably connected to said outlet means at a point between said isolated catalytic reactor and said cutoff means,
- whereby means are provided for establishing and recirculating a flow of carrier gas from said gas loop to said inlet means and thence through said catalytic reactor, and through said stationary catalyst bed in said reactor and thence through said outlet means back to said gas loop, said recirculation continuing until the carrier gas in said catalytic reactor is properly conditioned.

4,160,807

## SULFONAMIDO OXIMES, METAL COMPLEXES THEREOF, AND SOLUTIONS CONTAINING SUCH COMPOUNDS FOR USE IN EXTRACTION OF METAL VALUES

Michael J. Virnig, Fridley, and Kenneth D. MacKay, Circle Pines, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

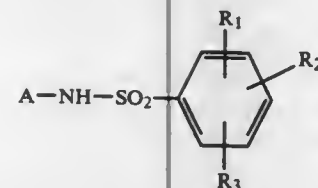
Filed May 24, 1978, Ser. No. 909,226

Int. Cl.<sup>2</sup> C07C 143/78, 143/79; B01D 11/04

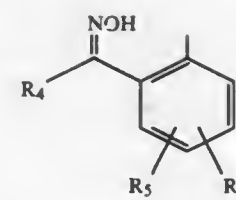
U.S. Cl. 423-24

83 Claims

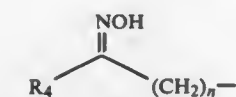
1. Compounds of the structure



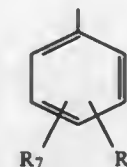
wherein A is a radical selected from the group consisting of



and



in which R4 is a member selected from the group consisting of hydrogen, linear and branched chain alkyl containing from 1 to 20 carbon atoms and a radical of the structure



in which R7 and R8, which may be the same or different, are selected from the group consisting of hydrogen, linear and branched chain alkyl containing from 1 to 20 carbon atoms, halogen, nitro, nitrile, lower alkoxy and trifluoromethyl; R5 and R6, which may be the same or different, are selected from the group consisting of hydrogen, linear and branched chain alkyl containing from 1 to 20 carbon atoms, halogen, nitro, nitrile, lower alkoxy and trifluoromethyl; n is an integer of 1 or 2; and, R1, R2 and R3, which may be the same or different, are selected from the group consisting of hydrogen and linear and branched chain alkyl containing from 1 to 20 carbon atoms; said compounds being further characterized as having solubilities of at least 2% by weight in essentially water-immiscible, liquid hydrocarbon solvents.

49. A process of recovering metal values selected from the group consisting of Cu<sup>++</sup>, Ni<sup>++</sup>, Zn<sup>++</sup>, Co<sup>++</sup> and Co<sup>+++</sup>, from aqueous solutions thereof which comprises contacting the said aqueous solutions with a solution of a sulfonamido oxime in an essentially water-immiscible, liquid hydrocarbon solvent to extract at least a portion of the metal values into the organic phase, separating the loaded organic phase from the aqueous phase and stripping at least a portion of the metal value from the organic phase into an aqueous stripping medium, said process being further characterized in that said sulfonamido oxime and the metal complex thereof formed during the extraction step have solubilities of at least 2% by weight in the essentially water-immiscible, liquid hydrocarbon solvent and the starting aqueous solution is of composition and pH for each metal value such as to allow at least a portion of the said metal value to be extracted by the sulfonamido oxime.

4,160,808

## PYROHYDROLYSIS PROCESS FOR SPENT ALUMINUM REDUCTION CELL LININGS

John N. Andersen, Moraga, and Norman Bell, Livermore, both of Calif.

Filed May 30, 1978, Ser. No. 910,416

Int. Cl.<sup>2</sup> C01F 7/04; C01B 7/19

U.S. Cl. 423-119

5 Claims

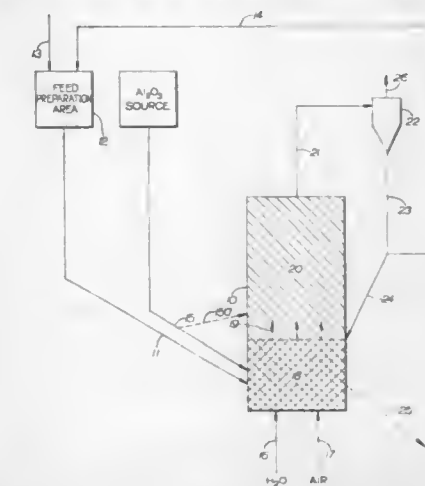
1. In the process of recovering fluoridic values from spent and waste materials generated in electrolytic aluminum reduction systems by subjecting the materials to pyrohydrolysis in a fluidized bed reactor at a temperature of at least about 1100° C., the reactor having a bed of fluidized spent and waste materials and a freeboard area extending from the surface of the bed to the top of the reactor, the improvement which comprises:

- charging a relatively coarse charge of spent and waste

materials to the fluidized bed, the charge having a particle size in the range of from about 2.0 mm to about 15.0 mm and a controlled Na to Al mole ratio of not less than about 0.7 and up to about 1.0;

(b) fluidizing and pyrohydrolyzing the coarse charge to generate an offgas containing volatilized fluoridic values including Na-containing vapors;

(c) establishing an extended reaction zone in the freeboard area of the reactor by charging a finely divided source of Al<sub>2</sub>O<sub>3</sub> to the reactor to contact the offgases and in a manner so as to obtain an excess of Al in the Na:Al mole ratio in the freeboard area whereby essentially all of the Na-



containing vapors are converted to HF and Na<sub>2</sub>O.xAl<sub>2</sub>O<sub>3</sub>, the relatively finely divided source of Al<sub>2</sub>O<sub>3</sub> being characterized by an Al<sub>2</sub>O<sub>3</sub> content of at least about 25% by weight and a particle size in the range of about 40 to about 500 microns and at least a portion of the finely divided source of Al<sub>2</sub>O<sub>3</sub> being charged to the freeboard area;

(d) recovering an offgas stream from the reactor containing entrained solids, separating the solids from the gas and recycling at least a portion of the solids to the fluidized bed reactor; and

(e) recovering a solid clinker from the reactor having a controlled Na to Al mole ratio.

4,160,809

## MODIFIED PYROHYDROLYSIS PROCESS FOR SPENT ALUMINUM REDUCTION CELL LININGS

John N. Andersen, Moraga, and Norman Bell, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jul. 24, 1978, Ser. No. 927,084

Int. Cl.<sup>2</sup> C01F 7/04; C01B 7/19

U.S. Cl. 423-119

7 Claims

1. In the process of recovering valuable components from carbon and fluoride-containing aluminous spent and waste materials generated in electrolytic aluminum reduction systems by subjecting the spent and waste materials to pyrohydrolysis in the presence of steam in a fluidized bed reactor having a fluidized bed and a freeboard area above the bed at a temperature within the range of about 900° C. to about 1300° C., the improvement comprising the combination of steps of

(a) combusting the carbon content of the spent and waste materials in the fluidized bed with an O<sub>2</sub>-containing stream having an O<sub>2</sub> content of at least about 90% by volume thus generating a hot offgas substantially free of nitrogen and containing HF and vaporized Na-containing compounds;

(b) establishing an extended reaction zone in the freeboard area of the reactor by contacting the hot offgas with a relatively finely divided source of Al<sub>2</sub>O<sub>3</sub> having a particle size within the range of about 40 to about 500 microns

1. A process for the manufacture of aluminum sulfate by the



reaction of reactants consisting essentially of sulfuric acid and alumina which comprises:

- forming a slurry of alumina solids in water;
- continuously mixing said slurry and sulfuric acid in substantially stoichiometric proportions in a tubular mixing zone, preheating the reactants therein to reaction temperature, and diverting said reactants into helical flow and repeatedly reversing the direction of rotation of helical flow during passage of said reactants through said tubular mixing zone;
- continuously passing the reacting mixture of alumina solids and acid from said tubular zone into a retention zone partially filled with a liquid phase of said mixture and a vapor phase;
- retaining said reacting mixture in said retention zone for sufficient time to achieve from 78 to 100 percent complete reaction;
- maintaining the reacting mixture under said vapor phase in said retention zone maintained at autogenic pressure from 15 to about 150 psig, and at a temperature from 225° to about 260° F. by indirect heat exchange cooling of said reactants and said vapor phase with cooling water; and
- continuously withdrawing aluminum sulfate product from said liquid phase in said zone.

**4,160,816**  
**PROCESS FOR STORING SOLAR ENERGY IN THE FORM OF AN ELECTROCHEMICALLY GENERATED COMPOUND**

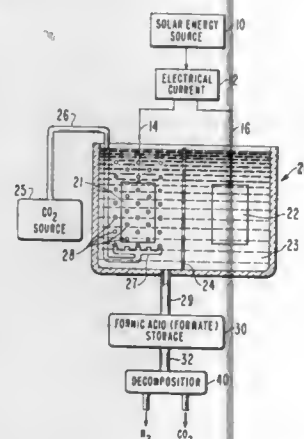
Richard Williams, Princeton, and Allen Bloom, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,758

Int. Cl.<sup>2</sup> C01B 1/13; C25B 3/04

U.S. Cl. 423—648 R

6 Claims



1. A process for storing solar energy in the form of an electrochemically generated material and retrieving the stored energy as hydrogen fuel comprising:

- converting solar radiation directly into electric current;
- applying said electric current to an anode and a cathode immersed in an electrolyte solution, wherein the voltage at said cathode is at least about 1.50 volts, said cathode comprising a material with a hydrogen overvoltage greater than about 0.5 volt to inhibit the production of hydrogen gas and increases the production of formic acid and the pH of said electrolyte solution is adjusted to from about pH 6 to about pH 9 to inhibit the formation of hydrogen and increase the formation of formic acid;
- diffusing CO<sub>2</sub> gas over said cathode to form formic acid;
- storing said formic acid; and
- retrieving said stored solar energy from said formic acid as H<sub>2</sub> fuel.

**4,160,817**  
**APPLICATION OF PROTEIN-PROTEIN INTERACTION AS AN ASSAY FOR THE DETECTION OF CANCER**

Edsel T. Bucovaz, John C. Morrison, both of Memphis; William C. Morrison, Germantown, and Walter D. Whybrew, Memphis, all of Tenn., assignors to Research Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,633

Int. Cl.<sup>2</sup> A61K 43/00; G01N 33/16

U.S. Cl. 424—1

61 Claims

1. A reagent use in detecting the presence of cancer in humans which comprises Coenzyme A-synthesizing protein complex Bakers' yeast extract and amounts of substrates for said extract effective to interact with said extract to produce a binding protein which binds to protein in the blood serum of said human to form a serum-protein-binding protein complex.

**4,160,818**  
**FLUORIMETRIC IMMUNOASSAY FOR DIPHENYLHYDANTOIN**

David S. Smith, and Adrienne R. McGregor, both of London, England, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

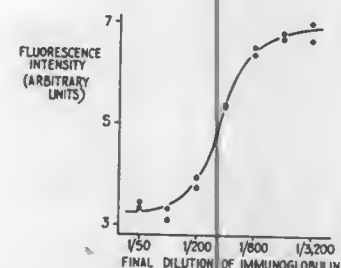
Filed Apr. 12, 1977, Ser. No. 787,232

Claims priority, application United Kingdom, Apr. 15, 1976, 15737/76; May 17, 1976, 20323/76

Int. Cl.<sup>2</sup> G01N 33/16, 21/52

U.S. Cl. 424—8

10 Claims



1. A method of assaying a biological fluid sample for a hydantoin or a closely related hydantoin structured compound, said method comprising the steps of:

- forming a mixture of said biological fluid sample containing said compound to-be-assayed with: (1) anti-compound antibodies, and (2) a fluorescent-labelled substituted compound, said substituted compound generally having little or no resemblance to said compound to-be-assayed prior to labelling but, having sufficient similarity to said compound to-be-assayed after labelling, so as to be bindable with said anti-compound antibodies, said anti-compound antibodies binding both with said compound to-be-assayed and said fluorescent-labelled substituted compound; and
- determining the amount of said compound in the fluid sample by measuring the fluorescence of said fluorescent-labelled substituted compound.

**4,160,819**  
**METHOD OF INHIBITING SKIN IRRITATION**

Sharon G. Willer, Loveland; Paul R. Yust, and Ralph Kelly, both of Cincinnati, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. No. 319,030, Dec. 27, 1972, Pat. No. 4,076,799. This application Jan. 20, 1978, Ser. No. 871,010

Int. Cl.<sup>2</sup> A61L 9/04; A61K 31/74, 31/13, 31/135

U.S. Cl. 424—45

12 Claims

1. A method for preventing or reducing irritation of the skin caused by contact with a skin irritating allergenic agent which comprises applying to the skin of a subject sensitized to said allergenic agent, prior to contact with said skin irritating aller-

genic agent, a protective agent containing at least two polar groups separated by a chain of at least 15 atoms, the majority of which are carbon atoms; wherein said protective agent is the condensation products of an alkylene oxide having 2 to 4 carbon atoms and a polyamine having 2 to 4 amino groups and containing 2 to 8 carbon atoms in an aliphatic, cycloaliphatic or aromatic group.

**4,160,820**

**PLAQUE INHIBITING COMPOSITION AND METHOD**  
Austin C. Wagenknecht, deceased, late of Hennepin County, Minn. (by Don A. Wagenknecht, personal representative); George V. Daravingas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 28, 1977, Ser. No. 855,527

Int. Cl.<sup>2</sup> A61K 9/68

U.S. Cl. 424—48

10 Claims

- A chewing gum containing:
  - from about 0.005% to about 10% by weight of butylated hydroxyanisole; and,
  - from about 0.001% to about 15% by weight of monocaprylin;
  - from about 0.001% to about 5% by weight of a zinc compound; and,
  - from about 0.05% to about 10% by weight of a plaque inhibiting flavor selected from the group consisting of cinnamon oil, peppermint oil, and spearmint oil and mixtures thereof; and,
  - from about 10% by about 95% by weight of a gum base.

**4,160,821**

**TREATMENT FOR GINGIVITIS**

Tibor Sipos, Lebanon, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1978, Ser. No. 881,207

Int. Cl.<sup>2</sup> A61K 7/16, 7/24, 31/315, 33/30

U.S. Cl. 424—49

10 Claims

1. A method for treating gingivitis which comprises topically applying to the gums of a patient in need of such treatment an effective amount for treating gingivitis of a composition which consists essentially of at least about 50% by weight of glycerol and from about 0.5 to 8% by weight of a pharmaceutically acceptable zinc salt that is soluble in said glycerol.

**4,160,822**

**DENTIFRICES**

Shigeru Hashimoto, Omihachiman, and Kenji Inoue, Takatsuki, both of Japan, assignors to Sunstar Hamigaki Kabushiki Kaisha, Takatsuki, Japan

Filed Sep. 28, 1977, Ser. No. 837,101

Claims priority, application Japan, Oct. 25, 1976, 51-129013; Mar. 29, 1977, 52-35998

Int. Cl.<sup>2</sup> A61K 7/18

U.S. Cl. 424—52

16 Claims

1. A dentifrice comprising a foaming agent in admixture with other conventional ingredients for dentifrice, said foaming agent comprising a sucrose fatty acid ester, an N-acylamino acid or a salt thereof and sodium monofluorophosphate.

**4,160,823**

**TRANSPARENT HAIR RINSING COMPOSITION**

Hiroshi Watanabe; Toshihiro Shiroye, both of Funabashi, and Eiji Iijima, Sakura, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,257

Claims priority, application Japan, Mar. 29, 1976, 51-34764

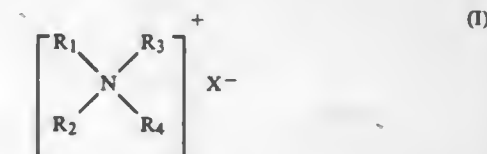
Int. Cl.<sup>2</sup> A61K 7/06, 7/09; C11D 1/62

U.S. Cl. 424—70

7 Claims

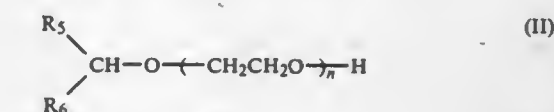
1. A transparent liquid hair rinsing composition consisting essentially of

(A) from 0.1 to 10% by weight of one or a mixture of quaternary ammonium salts having the formula (I):

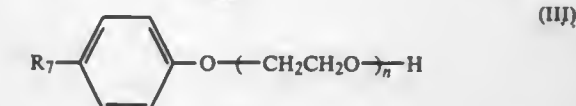


wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> each is alkyl, hydroxyalkyl or benzyl, with the proviso that one or two of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> is long-chain alkyl or hydroxyalkyl having 8 to 20 carbon atoms and the remaining groups are selected from alkyl and hydroxyalkyl having 1 to 3 carbon atoms and benzyl, and X is halogen or alkyl sulfate having 1 or 2 carbon atoms,

(B) from 0.1 to 10% by weight of non-ionic surface active agent having the formulas (II) or (III):



and



and mixtures thereof, wherein R<sub>5</sub> is an alkyl or alkenyl having 7 to 10 carbon atoms and R<sub>6</sub> is hydrogen or alkyl or alkenyl having 1 to 10 carbon atoms, with the proviso that the sum of the numbers of carbon atoms of the groups R<sub>5</sub> plus R<sub>6</sub> is in the range of from 7 to 19, R<sub>7</sub> is linear or branched alkyl having 6 to 12 carbon atoms, and n is the average value of the number of moles of added ethylene oxide units and is in the range of from 1 to 7, with the further proviso that the content of compound in which n is zero is lower than 3% based on the total weight of ingredient B,

- 5 to 30% by weight of a solvent selected from the group consisting of lower monohydric alcohols, polyhydric alcohols and glycols, and
- the balance is essentially water.

**4,160,824**

**INSECT ATTRACTIVE COMPOSITIONS**

Shinichi Inazuka, Yokohama; Shigekatsu Tsuchiya, Yokosuka; Katsumi Suzuki, Tokyo, and Toshiaki Mfyanishi, Yokosuka, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 714,126, Aug. 13, 1976, abandoned.

This application Apr. 5, 1978, Ser. No. 893,815

Claims priority, application Japan, Aug. 16, 1975, 50/99077

Int. Cl.<sup>2</sup> A01N 17/14, 9/36, 23/00

U.S. Cl. 424—84

11 Claims

1. In an insect attractive and killing composition which comprises a vegetable protein hydrolysate and an insecticide, the improvement wherein said protein hydrolysate is an acid-hydrolyzed defatted vegetable protein having a protein hydrolysis percent  $\geq 70\%$ , which has been neutralized to a pH of 5-9.

4,160,825

## ANTIBODY-ACTIVE PROTEIN COMPOSITION

Dennis Sikes, 316 Beechwood Dr., Athens, Ga. 30601  
Continuation of Ser. No. 609,101, Aug. 29, 1975, abandoned,  
which is a continuation of Ser. No. 412,224, Nov. 2, 1973,  
abandoned. This application Oct. 5, 1977, Ser. No. 839,713  
Int. Cl.<sup>2</sup> A61K 39/00

U.S. Cl. 424—85

9 Claims

1. A method for producing an antibody-active protein composition which comprises administering a spleen cell preparation from a heterologous warm blooded species to a pregnant mare to hyperimmunize the mare, removing blood from the hyperimmunized mare, separating the clear serum from the blood, and fractionating said serum by a physical-chemical procedure to separate therefrom said antibody-active protein fraction.

4,160,826

## INHIBITOR PREPARATION FOR THE ABSORPTION OF LIPIDS, BASED ON

## DIETHYLAMINOETHYLDEXTRAN

Ignazio Fischetti, Rome, Italy, assignor to Laboratory Biochimici Fargal-Pharmasint S.p.A., Pomezia, Italy  
Filed Nov. 19, 1976, Ser. No. 743,425

Claims priority, application Italy, Dec. 12, 1975, 52661 A/75  
Int. Cl.<sup>2</sup> A61K 31/73; C08B 37/02

U.S. Cl. 424—180

5 Claims

1. A process of treating subjects having excess weight for obtaining both antisteatogenous action and a reduction in weight which comprises administering a pharmacological preparation consisting essentially of diethylaminoethyl dextran as active agent and a pharmaceutical carrier wherein the diethylaminoethyl dextran is administered in doses of 1 to 2 grams twice a day for a total of 2 to 4 grams per day.

4,160,827

## METRONIDAZOLE PHOSPHATE AND SALTS

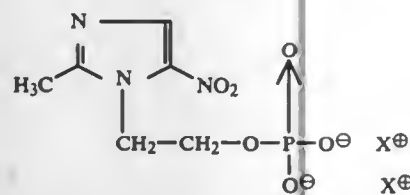
Moo J. Cho, and John J. Biermacher, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.  
Filed Feb. 6, 1978, Ser. No. 875,393

Int. Cl.<sup>2</sup> A61K 31/675, 31/685; C07F 9/58, 9/65

U.S. Cl. 424—199

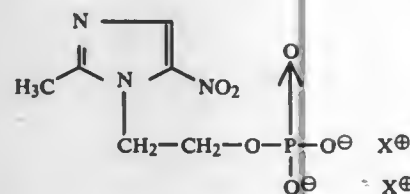
7 Claims

1. A compound of the formula:



wherein  $X^{\oplus}$  is a pharmacologically acceptable cation.

5. A process of antibiotic treatment comprising the administration to a subject of a therapeutic amount of a compound of the formula:



wherein  $X^{\oplus}$  is a pharmacologically acceptable cation, in association with a pharmaceutical carrier.

## ANALGESIC PHOSPHINYL COMPOUNDS AND COMPOSITIONS

Alfons Söder, Frankfurt-Schwanheim, and Klaus Perrey, Bonn-Bad, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

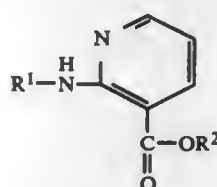
Division of Ser. No. 702,604, Jul. 6, 1976, Pat. No. 4,091,095.  
This application Feb. 10, 1978, Ser. No. 876,984

Int. Cl.<sup>2</sup> A61K 31/075; C07F 9/58, 9/60

U.S. Cl. 424—200

8 Claims

1. A member selected from the group consisting of  
(a) a compound of the formula



wherein

$R^1$  is phenyl, substituted phenyl, quinolyl or substituted quinolyl, substituted phenyl and substituted quinolyl comprising at least one substituent selected from the group consisting of a halo, a trifluoromethyl and from 1 to 3 alkyl radicals having a total of up to 4 carbon atoms; and  $R^2$  is a member having from 3 to 7 carbon atoms and selected from the group consisting of dialkylphosphinylalkyl and dialkylphosphinylhydroxyalkyl; and (b) an acid-addition salt of (a).

8. A pharmaceutical preparation having analgesic activity and containing an effective dose of a member as claimed in claim 1 in combination with at least one solid or fluid carrier or additive.

4,160,829

## ANTIBACTERIAL 1,2,4-OXADIAZOLYLACETAMIDO CEPHALOSPORINS

Robert Heijboer, Waddinxveen; Antoon van Harrewijn, Delft, and Peter W. Henniger, Leiden, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

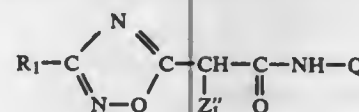
Continuation of Ser. No. 571,203, Apr. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 425,798, Dec. 18, 1973, abandoned. This application May 9, 1977, Ser. No. 795,024  
Claims priority, application United Kingdom, Dec. 22, 1972, 59524/72

Int. Cl.<sup>2</sup> A61K 31/545; C07D 501/56, 499/46, 271/06

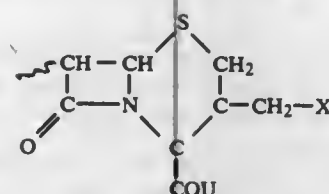
U.S. Cl. 424—246

6 Claims

1. A cephalosporanic acid derivative of the formula

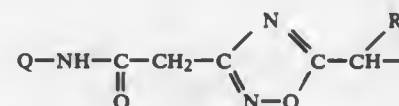


wherein Q is selected from the group consisting of



wherein U is a group OE', wherein E' is selected from the group consisting of hydrogen, a non-toxic, pharmaceutically acceptable salt forming cation and a non-toxic, pharmaceuti-

cally acceptable lower alkyl optionally substituted with lower alkanoyloxy, X is selected from the group consisting of acetoxy and S-Q', wherein Q' is selected from the group consisting of a tetrazolyl, triazolyl, imidazolyl or thiazolyl optionally substituted with alkyl of 1 to 6 carbon atoms,  $R_1$  is carboxyl methyl optionally transformed into a non-toxic, pharmaceutically acceptable ester or salt and  $Z_1''$  is selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms and



wherein Q is as defined above and  $R_2$  is selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms.

3. A method of killing bacteria comprising contacting bacteria with a bactericidal amount of at least one compound of claim 1.

5. A method of combatting bacterial infections in warm-blooded animals comprising administering to warm-blooded animals a bactericidally effective amount of at least one compound of claim 1.

4,160,830

## CEPHALOSPORINS

Shiro Morimoto, Kobe; Hiroaki Nomura, Takatsuki; Takeshi Fugono, Kawanishi, and Isao Minami, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan  
Division of Ser. No. 719,704, Sep. 2, 1976, Pat. No. 4,065,619, which is a continuation of Ser. No. 552,752, Feb. 25, 1975, abandoned, which is a continuation of Ser. No. 272,637, Jul. 17, 1972, abandoned. This application Oct. 14, 1977, Ser. No. 842,153

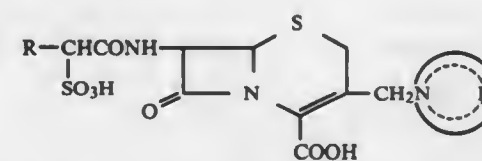
Claims priority, application Japan, Jul. 17, 1971, 46/53466; Oct. 22, 1971, 46/84130

Int. Cl.<sup>2</sup> A61K 31/54

U.S. Cl. 424—246

14 Claims

1. A method for combatting bacterial infections which comprises administering by injection to a patient infected with the pathogenic bacteria an antibacterially effective amount of a compound of the formula:



wherein R is phenyl or thienyl, and  $R'$  is a group which constitutes together with the adjacent nitrogen atom a pyridinium group, said pyridinium group being unsubstituted or substituted by carbamoyl, or a 4'-methyl-5'-(β-hydroxyethyl)-thiazolium or a pharmaceutically acceptable salt thereof.

4,160,831

## NOVEL INSECTICIDES

Verena Laanio, Arisdorf; Hans U. Brechbühler, Basel, and Dagmar Berrer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

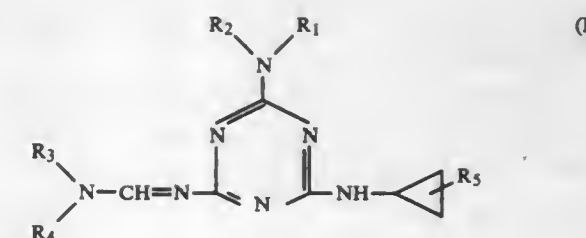
Continuation-in-part of Ser. No. 824,670, Aug. 15, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,988  
Claims priority, application Switzerland, Aug. 19, 1976, 10560/76; Mar. 4, 1977, 2720/77

Int. Cl.<sup>2</sup> C07D 251/70, 295/02; A61K 31/53, 31/535

U.S. Cl. 424—248.56

13 Claims

1. A compound of the formula



wherein

$R_1$  represents hydrogen,  $C_1$ - $C_4$ -alkyl which is unsubstituted or substituted by lower alkoxy; or represents  $C_3$ - $C_4$ -alkenyl,  $C_3$ - $C_4$ -alkynyl, cyclopropyl, hydroxyl, methoxy or ethoxy,

$R_2$  represents hydrogen, methyl or ethyl, or

$R_1$  and  $R_2$  together with the nitrogen atom to which they are attached represent a 5- or 6-membered heterocyclic ring which can contain a further nitrogen atom or an oxygen atom,

$R_3$  represents methyl or ethyl,

$R_4$  represents methyl or ethyl, and

$R_5$  represents hydrogen or methyl.

9. A pesticidal composition which comprises an effective pesticidal amount of a compound of claim 1 together with a suitable carrier or additive or mixtures thereof.

4,160,832

## NOVEL INSECTICIDES

Verena Laanio, Arisdorf; Hans U. Brechbühler, Basel, and Dagmar Berrer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

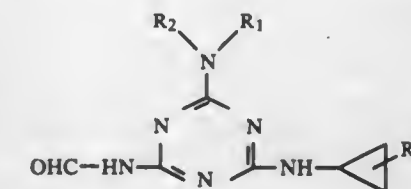
Continuation-in-part of Ser. No. 824,669, Aug. 15, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,989  
Claims priority, application Switzerland, Aug. 19, 1976, 10559/76; Mar. 4, 1977, 2719/77

Int. Cl.<sup>2</sup> C07D 251/70, 295/02; A61K 31/53, 31/535

U.S. Cl. 424—248.56

13 Claims

1. A compound of the formula



wherein

$R_1$  represents hydrogen,  $C_1$ - $C_4$ -alkyl which is unsubstituted or substituted by lower alkoxy, or represents  $C_3$ - $C_4$ -alkenyl,  $C_3$ - $C_4$ -alkynyl, cyclopropyl, hydroxy, methoxy or ethoxy,

$R_2$  represents hydrogen, methyl or ethyl, or

$R_1$  and  $R_2$  together with the nitrogen atom to which they are attached represent a 5- or 6-membered heterocyclic ring which can contain a further nitrogen atom or an oxygen atom, and

$R_3$  represents hydrogen or methyl,

and the acid addition salts thereof.

9. A pesticidal composition which comprises an effective pesticidal amount of a compound of claim 1 together with a suitable carrier or additive or mixtures thereof.



4,160,833

1,2,4-BENZOTRIAZINE-1,4-DI-N-OXIDE DERIVATIVES  
Peter J. Diel, Muttentz, Switzerland, assignor to Ciba-Gelgy Corporation, Ardsley, N.Y.

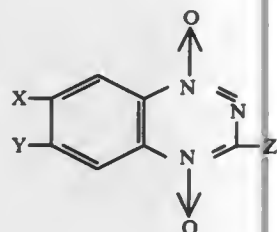
Continuation-in-part of Ser. No. 437,415, Jan. 28, 1974, abandoned. This application Oct. 19, 1977, Ser. No. 843,473  
Claims priority, application Switzerland, Feb. 2, 1973, 1555/73; Sep. 5, 1973, 12733/73

Int. Cl.<sup>2</sup> C07D 253/08; A61K 31/53

U.S. Cl. 424-249

8 Claims

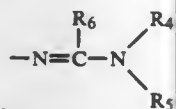
1. A 1,2,4-benzotriazine-1,4-di-N-oxide derivative of the formula I



wherein

X and Y each independently represents hydrogen, alkyl or alkoxy having 1 to 4 carbon atoms, phenoxy, or halogen, and

Z stands for the group of the formula



wherein R4 and R5 each independently represents hydrogen or alkyl having 1 to 4 carbon atoms and R6 represents hydrogen or methyl.

3. A composition for the control of pathogenic microorganisms, which composition contains as active substance an effective amount of a compound according to claim 1.

4,160,834

1-(SUBSTITUTED BENZOYL)-3-SUBSTITUTED  
PYRAZINYLUREAS

John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

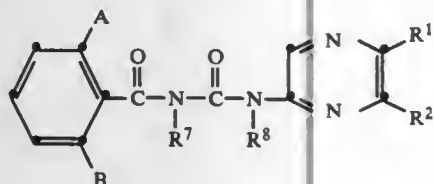
Continuation-in-part of Ser. No. 775,813, Mar. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 595,904, Jul. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 507,492, Sep. 19, 1974, abandoned. This application Dec. 19, 1977, Ser. No. 861,733

Int. Cl.<sup>2</sup> A61K 31/495; C07D 241/20

U.S. Cl. 424-250

40 Claims

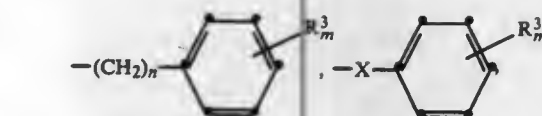
1. A compound of the formula



wherein

A and B are the same or different, and are halo, methyl, or trifluoromethyl;

R1, when taken separately, is hydrogen, halo, C1-C6 alkyl, C3-C6 cycloalkyl, halo(C1-C4)alkyl, nitro, cyano



or naphthyl;

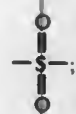
R2, when taken separately, is hydrogen, halo, methyl, ethyl, cyano, or halo(C1-C2)alkyl; with the limitation that R1 and R2 may not both be hydrogen at the same time;

R3 is halo, halo(C1-C4)alkyl, C1-C6 alkyl, C1-C4 alkoxy, C1-C4 alkylthio, C1-C4 alkylsulfonyl, nitro, cyano, or phenyl;

m is 0, 1, 2, or 3;

n is 0 or 1;

X is -O-, -S-, or



and

R7 and R8, when taken separately, are the same or different, and are hydrogen, C1-C4 alkanoyl, or C1-C3 alkoxy-carbonyl.

22. A method of controlling insects of an order selected from the group consisting of Coleoptera, Diptera, Lepidoptera, and Orthoptera, which comprises applying to the locus of the insects an insecticidal amount of a compound of claim 1.

4,160,835

ANTIHYPERTENSIVE COMPOSITIONS CONTAINING  
AN ARYLSUBSTITUTED ALANINE AND A PHENYL  
HYDRAZINOPROPIONIC ACID

Clement A. Stone, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 743,369, Nov. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 657,822, Feb. 13, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,755

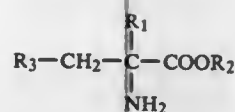
Int. Cl.<sup>2</sup> A61K 31/44, 31/445

U.S. Cl. 424-263

12 Claims

1. A pharmaceutical antihypertensive composition comprising

(A) a compound having the formula:

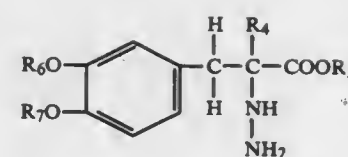


and pharmaceutically acceptable salts thereof, wherein R1 and R2 may be hydrogen or alkyl of from 1 to 4 carbon atoms, and R3 is a substituted or unsubstituted heterocyclic ring having the formula:



in which the heterocyclic ring is selected from the group consisting of 2-hydroxypyrid-4-yl, 2-aminopyrid-4-yl, 2-carboxypyrid-4-yl and tetrazol-[1,5-a]pyrid-6-yl, and pharmaceutically acceptable salts thereof, and tetrazol-[1,5-a]pyrid-6-yl, and pharmaceutically acceptable salts thereof, and

(B) a decarboxylase inhibitor having the formula:



wherein R4, R5, R6 and R7 are independently selected from the group consisting of hydrogen and C1-C4 alkyl, and pharmaceutically acceptable salts thereof.

4,160,836

ANTIEMETIC  
1-(BENZOTHAZOLYLALKYL)PIPERIDINE  
DERIVATIVES

Jan Vandenberg, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van Der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

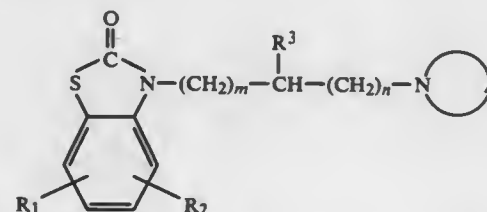
Division of Ser. No. 687,139, May 17, 1976, Pat. No. 4,066,772, which is a continuation-in-part of Ser. No. 597,793, Jul. 21, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,395

Int. Cl.<sup>2</sup> A61K 31/445; C07D 417/06, 417/14

U.S. Cl. 424-267

10 Claims

1. A chemical compound selected from the group consisting of a 1-(benzothiazolylalkyl)piperidine derivative having the formula:

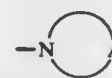


and the pharmaceutically acceptable acid addition salts thereof, wherein:

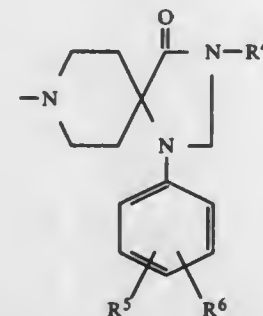
R1 and R2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

R3 is a member selected from the group consisting of hydrogen and methyl;

m and n are each an integer of from 1 to 2 inclusive; and the radical

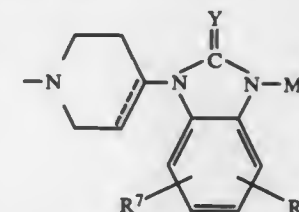


is a member selected from the group consisting of:  
(a) a radical having the formula:



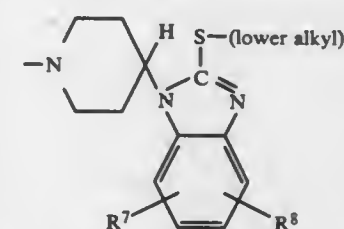
wherein R4 is a member selected from the group consisting of hydrogen and lower alkyl; and R5 and R6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

(b) a radical having the formula:



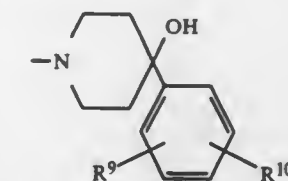
wherein R7 and R8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;

(c) a radical having the formula:



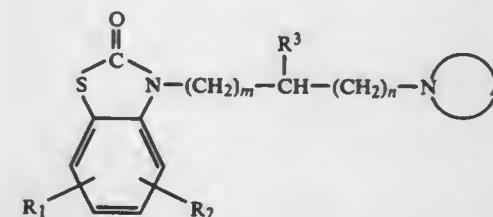
wherein R7 and R8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

(d) a radical having the formula:



wherein R9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R10 is selected from the group consisting of hydrogen and halo.

9. A method of inhibiting emesis which comprises the systemic administration in warm-blooded animals of an effective antiemetic amount of a compound selected from the group consisting of a 1-(benzothiazolylalkyl)piperidine derivative having the formula:



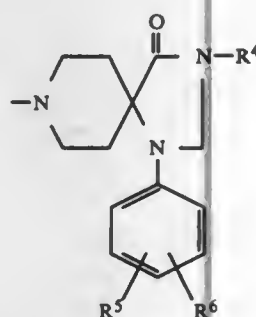
and the pharmaceutically acceptable acid addition salts thereof, wherein:

R1 and R2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

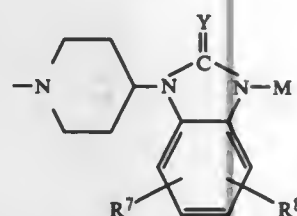
$R^3$  is a member selected from the group consisting of hydrogen and methyl;  
m and n are each an integer of from 1 to 2 inclusive; and  
the radical



is a member selected from the group consisting of:  
(a) a radical having the formula:

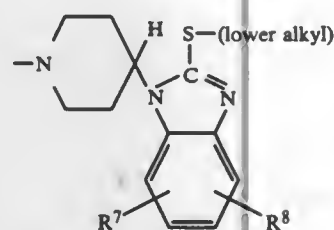


wherein  $R^4$  is a member selected from the group consisting of hydrogen and lower alkyl; and  $R^5$  and  $R^6$  are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;  
(b) a radical having the formula:

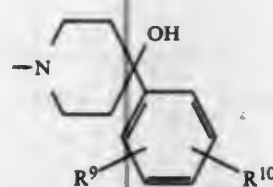


wherein  $R^7$  and  $R^8$  are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;

(c) a radical having the formula:



wherein  $R^7$  and  $R^8$  are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and  
(d) a radical having the formula:



wherein  $R^9$  is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and  $R^{10}$  is selected from the group consisting of hydrogen and halo;  
in admixture with a pharmaceutical carrier.

4,160,837

**DERIVATIVES OF PERHYDRO-AZA-HETEROCYCLES**  
Romeo Paioni, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

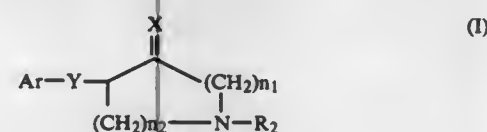
Filed Aug. 24, 1977, Ser. No. 827,274

Claims priority, application Luxembourg, Sep. 1, 1976, 75701  
Int. Cl.<sup>2</sup> C07D 211/46; A61K 31/445

U.S. Cl. 424-267

15 Claims

1. A compound of the formula



wherein X is hydrogen and  $OR_1$  in which  $R_1$  is hydrogen, lower alkyl having up to 4 carbon atoms or an acyl group  $-C(=D)R$ , in which R is lower alkyl having up to 4 carbon atoms,  $R_2$  is hydrogen, lower alkyl having up to 4 carbon atoms or propargyl, Ar is phenyl, naphthyl or 5,6,7,8-tetrahydronaphthyl, which are unsubstituted or mono- or disubstituted in an aromatic ring, at most two substituents being selected from lower alkyl and lower alkoxy, both having at most 4 carbon atoms, or halogen, and at most one substituent being selected from trifluoromethyl, carbamoyl, nitro and cyano, Y is oxygen,  $n_1$  is one and  $n_2$  is two or n is two and n is one, and the acid addition salts thereof.

15. A method for the treatment of mental depression in a warm-blooded animal comprising enteral or parenteral administration to said animal of a therapeutically effective amount of a compound according to claim 1 having the formula 1 defined in claim 1, or of a pharmaceutically acceptable acid addition salt thereof.

4,160,838

**ANTIMICROBIAL AND PLANT-GROWTH-REGULATING TRIAZOLE DERIVATIVES**

Gustaaf Van Reet, Tessenderlo; Jan Heeres, Vosselaar, and Lourens Wals, Turnhout, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

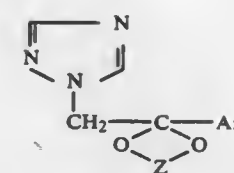
Continuation-in-part of Ser. No. 802,702, Jun. 2, 1977, abandoned, which is a division of Ser. No. 620,989, Oct. 9, 1975, Pat. No. 4,079,062, which is a continuation-in-part of Ser. No. 524,587, Nov. 18, 1974, abandoned. This application Jan. 3, 1978, Ser. No. 866,317

Int. Cl.<sup>2</sup> A01N 9/22; C07D 405/06

U.S. Cl. 424-269

7 Claims

1. A composition for combatting a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective amount of a chemical compound selected from the group consisting of a 1-( $\beta$ -aryl)ethyl-1H-1,2,4-triazole ketal of the formula:



and the therapeutically active acid addition salts thereof, wherein:

Z is an alkylene selected from the group consisting of  $-CH_2-CH_2-$ ,  $-CH_2-CH_2-CH_2-$ ,  $-CH(CH_3)-CH_2-$ ,  $-CH(CH_3)-CH_2-$ , and  $-CH_2-CH(alkyl)-$ , wherein said alkyl has from 1 to 10 carbon atoms; and

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, 5-chloro-2-thienyl, naphthyl, fluorenyl, and wherein "substituted phenyl" has the meaning of a phenyl radical having thereon from 1 to 3 substituents selected independently from the group consisting of halo, lower alkyl, lower alkyloxy, cyano and nitro.

4,160,839

**CARBAMYLTRIAZOLE INSECTICIDES**

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1976, Ser. No. 662,496

Int. Cl.<sup>2</sup> A01N 9/12; C07D 249/12

U.S. Cl. 424-269

10 Claims

1. The method of killing aphids in the presence of living plants comprising applying to the locus of the aphids an aphidicidal effective but substantially non-phytotoxic amount of 1-(N,N-dimethylcarbamyl)-3-cyclopropyl-5-(2-propynylthio)-1H-1,2,4-triazole.

4,160,840

**DERIVATIVES OF IMIDAZOINDOLE AND IMIDAZOTHIAZOLE**

Parimal K. Adhikary, 510 Basswood Dr., Apt. No. 6, Nashville, Tenn. 37209

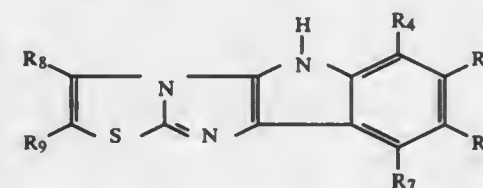
Continuation of Ser. No. 726,390, Sep. 24, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,854

Int. Cl.<sup>2</sup> C07D 277/60

U.S. Cl. 424-270

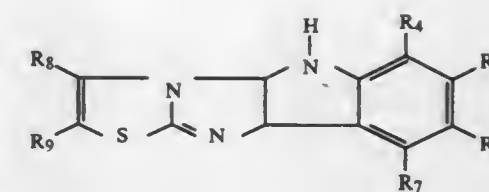
9 Claims

1. Compounds having the formula



and pharmaceutically acceptable acid addition salts thereof wherein  $R_4$ ,  $R_5$ ,  $R_6$ , and  $R_7$  are selected from the group consisting of hydrogen, halogen and lower-alkyl of from one to four carbon atoms, inclusive, with the proviso that when taken together they constitute the following substituents on the tetracyclic ring, 9-halo, 8-halo, 7-halo, 6-halo, 9-lower-alkyl, 8-lower-alkyl, 7-lower-alkyl, 6-lower-alkyl, 7,9-dihalo, 7,8-dihalo, 6,8-dihalo, 6,7-dihalo, 7,9-di-lower-alkyl, 7,8-di-lower-alkyl, and 4,6-di-lower-alkyl,  $R_8$  is selected from the group consisting of hydrogen, lower-alkyl of from one to four carbon atoms, inclusive, and  $R_9$  is selected from the group consisting of hydrogen and halo.

7. A method of treating hypertension in mammals which comprises administering by injection to mammals a hypertension lowering amount of a compound having the formula



and pharmaceutically acceptable acid addition salts thereof wherein  $R_4$ ,  $R_5$ ,  $R_6$ , and  $R_7$  are selected from the group consisting of hydrogen, halogen and lower-alkyl of from one to four carbon atoms, inclusive; with the proviso that when taken together they constitute the following substituents on the tetracyclic ring, 9-halo, 8-halo, 7-halo, 6-halo, 9-lower-alkyl, 8-lower-alkyl, 7-lower-alkyl, 6-lower-alkyl, 7,9-dihalo, 7,8-dihalo, 6,8-dihalo, 6,7-dihalo, 7,9-di-lower-alkyl, 7,8-di-lower-alkyl, and 4,6-di-lower-alkyl,  $R_8$  is selected from the group consisting of hydrogen, lower-alkyl of from one to four carbon atoms, inclusive, and  $R_9$  is selected from the group consisting of hydrogen and halo.

4,160,841

**HETEROCYCLIC DERIVATIVES OF****1-(1,3-DIOXOLAN-2-YLMETHYL)-1H-IMIDAZOLES**

Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

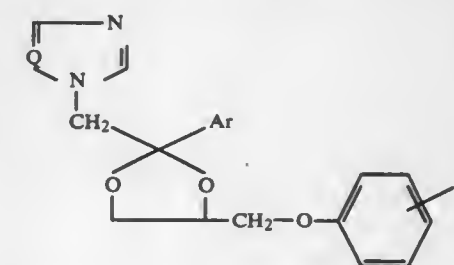
Continuation-in-part of Ser. No. 764,265, Jan. 31, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,726

Int. Cl.<sup>2</sup> A61K 31/415; C07D 405/14

U.S. Cl. 424-273 R

5 Claims

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



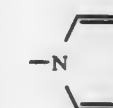
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of:

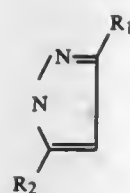
a 1H-pyrrol-1-yl radical of the formula



(a);

a 1H-pyrazol-1-yl radical of the formula

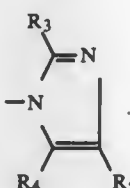




wherein

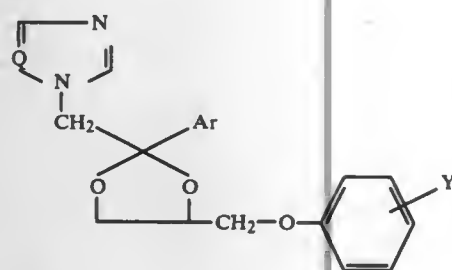
R<sub>1</sub> is selected from the group consisting of hydrogen, lower alkyl, lower alkylthio and phenyl, and, R<sub>2</sub> is selected from the group consisting of hydrogen, lower alkyl and phenyl; and

a 1H-imidazol-1-yl radical of the formula



wherein R<sub>3</sub> is selected from the group consisting of hydrogen, lower alkyl, phenyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, R<sub>4</sub> is selected from the group consisting of hydrogen, lower alkyl and phenyl, and, R<sub>5</sub> is selected from the group consisting of hydrogen and phenyl.

5. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective amount of a compound selected from the group consisting of an azole derivative having the formula:



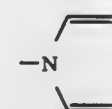
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkoxy; and

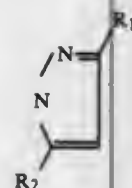
the radical Y is a member selected from the group consisting of:

a 1H-pyrazol-1-yl radical of the formula



a 1H-pyrazol-1-yl radical of the formula

(b)

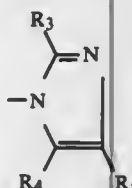


(b)

wherein

R<sub>1</sub> is selected from the group consisting of hydrogen, lower alkyl, lower alkylthio and phenyl, and, R<sub>2</sub> is selected from the group consisting of hydrogen, lower alkyl and phenyl; and

a 1H-imidazol-1-yl radical of the formula



(c)

wherein

R<sub>3</sub> is selected from the group consisting of hydrogen, lower alkyl, phenyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, R<sub>4</sub> is selected from the group consisting of hydrogen, lower alkyl and phenyl, and, R<sub>5</sub> is selected from the group consisting of hydrogen and phenyl.

4,160,842

INSECTICIDAL

[β-(SUBSTITUTED-PHENYL)VINYL]CYCLO-PROPANECARBOXYLATES

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

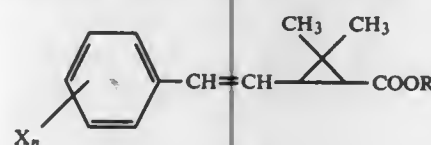
Filed Aug. 27, 1976, Ser. No. 718,253

Int. Cl.<sup>2</sup> C07C 69/76, 121/64; A01N 9/24

U.S. Cl. 424-274

10 Claims

1. An insecticidal compound of the formula:

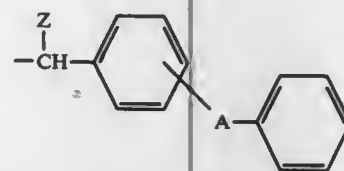


in which

X is halogen, cyano, nitro, aryl, aralkyl, aryloxy, arylthio, alkyl of C<sub>1</sub>-C<sub>4</sub>, alkoxy of C<sub>1</sub>-C<sub>4</sub>, alkylthio of C<sub>1</sub>-C<sub>4</sub>, haloalkyl of C<sub>1</sub>-C<sub>2</sub>, dialkylamino in which alkyls are C<sub>1</sub>-C<sub>2</sub>, or methylenedioxy; n is 1, 2, or 3; and

R is an alcohol residue selected from the group consisting of:

(a) a benzyl- or phenoxy-substituted benzyl group of the formula:



(a);

wherein Z is hydrogen, methyl, cyano, ethynyl, or phenyl, and A is —O— or —CH<sub>2</sub>—;

(b) a benzyl- or phenoxy-substituted furylmethyl group;

(c) an imidomethyl group selected from the group consisting

of maleimidomethyl, phthalimidomethyl, and tetrahydrophthalimidomethyl; and,

(d) a benzyl group substituted in at least two ring positions with chloro, methyl, or methylenedioxy groups.

8. An insecticidal composition comprising an insecticidally effective amount of a compound of claim 1 in admixture with an agriculturally acceptable extender.

10. A method of controlling insects which comprises applying to the locus where control is desired an insecticidally effective amount of a compound of claim 1.

4,160,843

NOVEL AMIDINES

Henry Szczepanski, Reinach, Switzerland, assignor to Ciba-Gelgy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,347

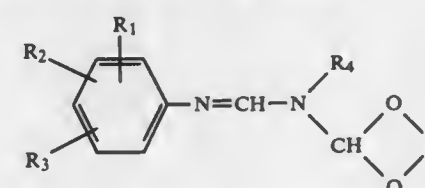
Claims priority, application Switzerland, Dec. 16, 1976, 15824/76; Aug. 9, 1977, 9738/77; Nov. 9, 1977, 13662/77

Int. Cl.<sup>2</sup> C07D 317/32, 319/06

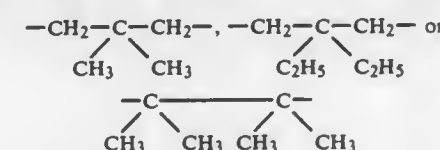
U.S. Cl. 424-278

9 Claims

1. A phenylformamidine of the formula



wherein each of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> represents hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, halogen or trifluoromethyl, R<sub>4</sub> represents C<sub>1</sub>-C<sub>4</sub>alkyl and A represents —CH<sub>2</sub>—CH<sub>2</sub>—, —CH<sub>2</sub>—CH<sub>2</sub>—, —CH<sub>2</sub>—CH<sub>2</sub>—,



4,160,844

COMPOSITION FOR TREATING SKIN MAST CELLS AND/OR DELAYED CELLULAR HYPERSENSITIVITY REACTIONS

Thomas S. C. Orr, Melton Mowbray, and Raymond W. Keogh, East Gosport, both of England, assignors to Fisons Limited, London, England

Filed May 5, 1977, Ser. No. 794,030

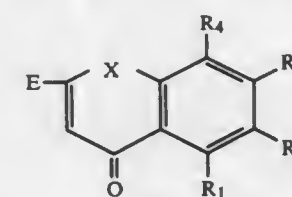
Claims priority, application United Kingdom, May 21, 1976, 20986/76

Int. Cl.<sup>2</sup> A61K 31/35, 31/41, 47/00

U.S. Cl. 424-283

13 Claims

1. A pharmaceutical composition suitable for application to the skin for treatment of a condition in a mammal involving skin mast cells and/or delayed cellular hypersensitivity reaction, said composition comprising a pharmaceutical carrier acceptable on the skin of said mammal and, as active ingredient, an effective amount of a compound having the formula



in which

R<sub>1</sub> represents hydroxy, an adjacent pair of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> form a —(CH<sub>2</sub>)<sub>4</sub>— chain,

984 O.G. 17

and the remaining substituent R<sub>2</sub> or R<sub>4</sub> represents alkyl C<sub>1</sub> to 9,

E represents a —COOH group, and

X represents oxygen,

or a pharmaceutically acceptable salt, ester or amide thereof.

12. A method for the treatment of a condition in a mammal, which condition involves skin mast cells and/or a delayed (cellular) hypersensitivity reaction, which method comprises administering an effective amount of a composition of claim 1 to a mammal having such a condition.

4,160,845

FUNGICIDAL

N-(HALOALIPHATICTHIO)HALOVINYLSULFONAMIDES

Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

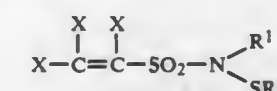
Filed Jan. 2, 1976, Ser. No. 646,134

Int. Cl.<sup>2</sup> A01A 9/00; C07C 143/822

U.S. Cl. 424-298

9 Claims

1. A compound of the formula



wherein X groups are chloro and bromo, R<sup>1</sup> is alkyl of 1 to 3 carbon atoms, and R<sup>2</sup> is polyhaloalkyl of 1 to 2 carbon atoms and 2 to 5 of the same or different halogen selected from chloro or bromo.

4,160,846

METHOD FOR CONTROLLING INSECTS WITH TETRASUBSTITUTED ORGANOTIN COMPOUNDS

Richard J. Strunk, Cheshire; Winchester L. Hubbard, Woodbridge, and Robert E. Grahame, Jr., Cheshire, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

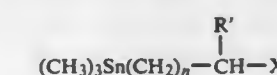
Continuation-in-part of Ser. No. 536,678, Dec. 26, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,983

Int. Cl.<sup>2</sup> A01N 9/12, 9/14

U.S. Cl. 424-288

14 Claims

1. A method for controlling insects or insect pests comprising applying to a locus subject to attack by insects or insect pests an effective amount for controlling insects or insect pests of an organotin compound having the structural formula



wherein:

R' is hydrogen, hydroxyl, alkoxy or a straight chain or branched alkyl group having 1 to 5 carbon atoms;

X is (a) —SO<sub>2</sub>R<sub>1</sub>, R' being hydrogen, and wherein R<sub>1</sub> is piperidinoethylmethiodide;

(b) —OR<sub>7</sub>, wherein R<sub>7</sub> is epoxyalkylene having 2 to 4 carbon atoms, and tetrahydro-1,1-dioxo-3-thienyl;

(c) —SR<sub>10</sub>, R' being hydrogen, and wherein R<sub>10</sub> is piperidinoethylmethiodide;

(d) 2-pyridyl;

(e) 4-pyridyl;

(f) 2-alkyl-5-pyridyl;

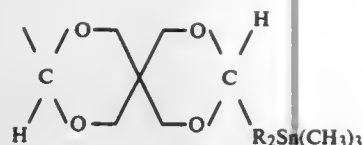
(g) 9-carbazolyl;

(h) 1-imidazolyl;

(i) N-2-oxopyrrolidinyl;

(j) —OCOR<sub>17</sub>, wherein R<sub>17</sub> is —NHR<sub>18</sub>, wherein R<sub>18</sub> is 2-furyl;

(k) tetrahydro-1,1-dioxo-2-thienyl;



wherein

$R_2$  is polymethylene having 2 to 11 carbon atoms; and  $n$  is an integer from 1 to 10.

4,160,847

# PROCESS OF IMPROVING THE FREEZE-THAW STABILITY OF FISH BAIT

George O. Orth, Jr., 10612 Riviera Pl. NE., Seattle, Wash. 98125

Filed Mar. 10, 1977, Ser. No. 776,139  
Int. Cl.<sup>2</sup> A23B 4/00

U.S. Cl. 426—1

3 Claims

1. A process for the preparation of a fish bait and improving the freeze-thaw stability of fish bait without substantial dehydration thereof consisting essentially of:

immersing the fish bait in a water solution containing 20% to 60% by volume of a water soluble, non-toxic glycol selected from the group consisting of triethylene glycol, diethylene glycol, tetraethylene glycol, propylene glycol, dipropylene glycol and glycerine;

applying a vacuum up to 28 inches mercury to the water solution containing the fish bait for a period of time ranging from 3 to 30 minutes;

then applying pressure to the water solution containing the fish bait of from 40 to 100 psi for a period of time ranging from 1 to 10 minutes; and

removing the fish from the water solution for packing and freezing.

4,160,848

ANTISTALING AGENT FOR BAKERY PRODUCTS  
Frederick D. Vidal, Englewood Cliffs, and Albert B. Gerrity, Holmdel, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 18, 1977, Ser. No. 788,193  
Int. Cl.<sup>2</sup> A21D 2/16

U.S. Cl. 426—24

12 Claims

1. A compositions of matter consisting essentially of (1) a glycerol ester of a  $C_{10}$ - $C_{24}$  saturated aliphatic fatty acid wherein at least 10 weight percent of said ester is a monoester, and (2) for each part by weight of said ester, from about 0.25 to about 1.0 part of a component selected from the group consisting of a free  $C_{14}$ - $C_{20}$  saturated aliphatic fatty acid, sodium and magnesium salts of said free acid, pentaerythritol monoester of said free acid and mixtures of said components.

4,160,849

# FOODS CONTAINING POTATO PULP

Michel Huchette, and Guy Bussiere, both of Lestrem, France, assignors to Roquette Freres, Lestrem, France

Filed Nov. 15, 1976, Ser. No. 742,001

Claims priority, application France, Nov. 17, 1975, 75 35016  
Int. Cl.<sup>2</sup> A23L 1/195

U.S. Cl. 426—94

25 Claims

1. A food selected from the group consisting of a fruit compote, a marmalade, a tomato-based sauce, a fruit juice, a fruit based drink, a confectionery comprising fruit and a pastry comprising fruit or coconut, said food containing an amount of neutral flavored dried potato pulp,

wherein said dried potato pulp is in powder form and comprises less than 70 weight percent starch, 5 to 25 weight percent humidity, 1 to 7 weight percent proteins ( $N \times 6.25$ ), 0.5 to 5 weight percent minerals, 0.1 to 1.5 weight percent oily materials, 5 to 25 weight percent cellulosic

material and 10 to 55 weight percent, by difference, of other structural polysaccharides, wherein the amount of said neutral flavored dried potato pulp is effective to render said food pulpy in texture.

4,160,850

# SHELF-STABLE MIX FOR A SPREADABLE BUTTER-SUBSTITUTE

Curtis H. Hallstrom, Anoka; Ali R. Toubia, Mound; Brian E. Glass, Plymouth; John V. Luck, and George V. Daravingas, both of Edina, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 605,478, Aug. 25, 1975, abandoned.  
This application Apr. 18, 1977, Ser. No. 788,566

Int. Cl.<sup>2</sup> A23D 3/00, 5/00

U.S. Cl. 426—601

20 Claims

1. A packaged shelf-stable mix suitable for the consumer preparation of a spreadable butter-substitute product upon the addition of water or water and an oil, such butter-substitute product having an oil content of from about 20% to about 80% by weight and a water content of from about 10% to about 80% by weight, said mix comprising:

(a) from about 0.01% to about 80% by weight of an emulsifier capable of forming a water-in-oil emulsion;

(b) from about 2% to about 99% by weight of a hard fat having a melting point of from about 29° C. to about 66° C. such that the solid fat index in the butter-substitute product prepared from said mix is from about 2% to 35% at 10° C., from about 1% to about 20% at 21° C., from about 0.9% to 15% at 27° C., from about 0% to 8% at 33° C. and from about 0% to 5% at 37.8° C.; and

(c) from 0% to about 97% by weight of an oil with the proviso that when the oil is present in an amount of about 5% to about 97% by weight, the emulsifier is present in an amount of from about 0.1% to about 30% by weight and the hard fat is present in an amount of about 2% to about 80% by weight.

4,160,851

# PROCESS FOR THE PRODUCTION OF PLASTICS/METAL COMPOSITES

Hans-Jürgen Lienert, Cologne; Helmut Kleimann, Leverkusen; Dieter Dieterich, Leverkusen; Wulf von Bonin, Leverkusen; Klaus Friederich, Leverkusen, all of Fed. Rep. of Germany, and Peter Markusch, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jul. 21, 1977, Ser. No. 817,880

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633764

Int. Cl.<sup>2</sup> B05D 1/38, 7/14, 3/02

U.S. Cl. 427—379

14 Claims

1. In a process for producing composite materials comprising applying an adhesion promoter to a metal surface, allowing said adhesion promoter to dry, applying a polyisocyanate reaction mixture to the thus treated metal surface and allowing said reaction mixture to fully react, the improvement wherein said adhesion promoter comprises an aqueous polyurethane dispersion.

4,160,852

# PRODUCTION OF STERILE PACKAGES

Roland M. Torterotot, "Le Petit Chaillot", 78730 Rochefort-en-Yvelines, and Jean R. L. Nasica, 19, avenue Emile Deschanel, 75007 Paris, both of France

Filed Sep. 29, 1977, Ser. No. 837,750

Claims priority, application France, Oct. 6, 1976, 76 30144; Jun. 1, 1977, 77 16772

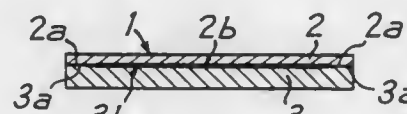
Int. Cl.<sup>2</sup> B32B 3/02

U.S. Cl. 428—192

18 Claims

1. A composite packaging laminate which is internally sterile and which is intended for the sterile packing of products, preferably in liquid and/or paste form, but which is without

such products therein, said composite packaging laminate comprising at least two individual strips, one of which comprises a thermoplastic material, said strips being adhered together in a sealing manner at least at their edges whereby the adjacent surfaces of the strips lie in opposed, facing relationship, said adjacent surfaces being sterile and having been sterilized by the time they are adhered together, said adjacent



surfaces also being readily separable each from the other under the action of pulling forces applied to the individual strips in divergent directions at a temperature which is at most equal to the softening temperature of the thermoplastic material, the thermoplastic material being such that after the separation of the two individual strips, the said one strip can be heat sealed to part of itself or to another individual strip with the application of heat and pressure to the thermoplastic material.

4,160,853

# CATALYST FOR MAKING POLYCARBONATE DIOLS FOR USE IN POLYCARBONATE URETHANES

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 681,012, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 385,019, Aug. 2, 1973, abandoned. This application Nov. 29, 1977, Ser. No. 855,585

Int. Cl.<sup>2</sup> B32B 27/40; C08G 18/42, 63/62

U.S. Cl. 428—425

22 Claims

1. A polyurethane which is the reaction product of:

a. a polycarbonate diol having a molecular weight between 500 and 5000 prepared by the reaction of a hydroxy-terminated aliphatic diol with a dialkyl carbonate in the presence of a titanium catalyst, said catalyst being a titanium compound which is substantially free from alkali metal; and

b. an organic diisocyanate.

15. A safety glass laminate comprising:

a. a ply of glass; and

b. laminated to said ply of glass a ply of transparent, energy-absorbing polycarbonate urethane which is the reaction product of

(1) a polycarbonate diol having a molecular weight between 500 and 5000 prepared by the reaction of a hydroxy-terminated aliphatic diol and a dialkyl carbonate in the presence of a titanium catalyst said catalyst being a titanium compound which is substantially free from alkali metal; and

(2) an organic diisocyanate.

18. A safety glass laminate comprising:

a. a ply of glass; and

b. laminated to said ply of glass, a ply of transparent, energy-absorbing polycarbonate urethane which is the reaction product of:

(1) a polycarbonate diol having a molecular weight between 500 and 5000 prepared by the reaction of a hydroxy-terminated aliphatic diol and a dialkyl carbonate in the presence of a titanium catalyst, said catalyst being a titanium compound which is substantially free from alkali metal;

(2) an organic diisocyanate; and

(3) an organic compound which contains at least two isocyanate-reactive hydrogens and has a molecular weight less than about 250.

4,160,854

# DUCTILE BRAZING FOIL FOR CAST SUPERALLOYS

Thomas L. D'Silva, Belmont, Calif., assignor to Western Gold & Platinum Co., Belmont, Calif.

Filed Jul. 19, 1978, Ser. No. 925,907

Int. Cl.<sup>2</sup> F16B 5/08

U.S. Cl. 428—607

3 Claims

1. A brazing foil consisting essentially of a substrate having the formula  $P_x Q_y R_z$  wherein P is an element selected from the group consisting of iron, nickel, chromium, cobalt and mixtures thereof, Q is a refractory element selected from the group consisting of molybdenum, tungsten, tantalum and mixtures thereof, R is a reactive element selected from the group consisting of aluminum, titanium, columbium and mixtures thereof, x is from about 65 to about 95 atomic percent, y is from about 1 to about 10 atomic percent, z is from about 1 to about 18 atomic percent, said substrate containing an effective amount of an amorphous phase and a micro-crystalline, metastable single phase to render said substrate ductile and on the external surfaces a coating of nickel, iron or cobalt boride as a melting point depressant, said foil having a thickness of from about 0.0005 to about 0.005 inches.

4,160,855

# ELECTRICAL CONTACT ELEMENT AND METHOD OF PRODUCING THE SAME

Dieter Stöckel, Birkenfeld, and Hans-Jürgen Oberg, Kelterndieblingen, both of Fed. Rep. of Germany, assignors to G. Rau, Pforzheim, Fed. Rep. of Germany

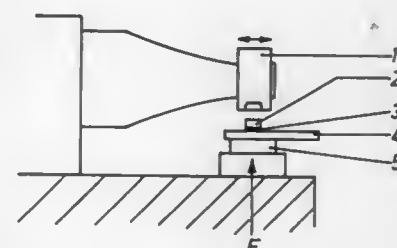
Filed Aug. 19, 1977, Ser. No. 826,194

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642323

Int. Cl.<sup>2</sup> B23K 21/02

U.S. Cl. 428—621

3 Claims



1. In an electrical element of the type including at least one contact piece joined to a carrier by means of ultrasonic welding, and an intermediate layer of readily cold-weldable metallic material which is inserted between each contact piece and the carrier prior to ultrasonic welding, the improvement wherein said intermediate layer consists of a metal powder shaped by the ultrasonic welding operation into said intermediate layer simultaneously with the joining of said carrier and each contact piece by the ultrasonic welding operation, and wherein the thickness of the metal powder prior to the ultrasonic welding operation is less than 100 μm.

4,160,856

# NOVEL FUEL CELL CONTAINING NOVEL MEANS FOR REMOVAL OF CARBONATES

Bernard Warszawski, Paris, France, assignor to Societe Generale de Constructions Electriques et Mecaniques "Alstom et Cie, Paris, France

Division of Ser. No. 541,996, Jan. 17, 1975, Pat. No. 4,002,493.

This application Dec. 16, 1976, Ser. No. 751,213

Claims priority, application France, Jan. 25, 1974, 74 02516

Int. Cl.<sup>2</sup> H01M 8/06

U.S. Cl. 429—14

26 Claims

1. Fuel cell having a plurality of elements (1) arranged in electrical contact with one another, each element comprising



a compartment (5) containing a pervious catalytic cathode electrode (2) and a pervious catalytic anode electrode (3) in spaced relationship to each other on opposed sides of said compartment (5) forming a space therebetween, said anode electrode (3) being a composite anode comprising (i) a catalyst component, and (ii) a fixing agent component for fixing carbonate ions;

means for charging an aqueous alkaline electrolyte (6) to fill the space between the electrodes in said compartment (5) and means for discharging said electrolyte from said space during the decarbonation phase;

a porous separating membrane (12) saturated with said electrolyte located in the space filled by the electrolyte and



alternately contacting each of said cathode and said anode in a plurality of positions;

wherein during operation of said fuel cell a combustible gas contacts the cathode electrode (2) and a gaseous fuel contacts the anode electrode (3), thereby forming water vapor, and generating carbonate ions at the anode electrode which are fixed by said fixing agent; and

means for converting said carbonate ions to carbon dioxide and means for removing said carbon dioxide when said electrolyte is discharged; and

condenser exchanger (7) in fluid communication with said compartment (5) for receiving said water vapor, then condensing it to water which is returned to the electrolyte in said compartment (5).

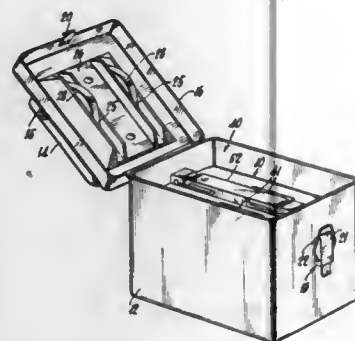
#### 4,160,857 CANISTER AND REMOVABLE BATTERY PACK UNIT THEREFOR

Paul C. Nardella, North Easton; Joseph D. Feeney, Carver; Thomas A. Wrublewski, Braintree, and Anthony W. Gon-salves, Randolph, all of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Feb. 16, 1978, Ser. No. 878,493

Int. Cl.<sup>2</sup> H01M 2/10

U.S. Cl. 429-97



1. In combination, a canister and a removable battery pack unit, said canister comprising a receptacle into which said battery pack unit is positioned; a cover enclosing said battery pack unit in said receptacle; a pair of electrical spring contacts located on the inside of said cover projecting downwardly for contact with said battery pack unit; an electrical connector in

said cover electrically connected to said electrical spring contacts, said connector providing means on the outside of said cover for an electrical connection in order to derive voltage from said battery pack unit; and said pack unit comprising a plurality of batteries electrically connected to each other, said batteries enclosed in a housing which includes two pairs of metallic strips serving as electrical contacts, both pairs of strips electrically connected to said batteries so that one of said strips in each pair is a negative terminal and the other of said strips in each pair is a positive terminal, one pair of metallic strips located in a side portion of said housing and not making electrical contacts with said receptacle, the other pair of metallic strips located in the upper portion of said housing and adapted to be contacted by said spring contacts when said cover is closed to thereby provide a means of deriving energy from said pack unit.

#### 4,160,858 SOLVENTLESS SILICONE RESINS

George F. Roedel, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 31, 1978, Ser. No. 873,802

Int. Cl.<sup>2</sup> C08F 11/04

U.S. Cl. 528-14

15 Claims

1. A process for producing a solventless silicone resin having a viscosity at 100% solids varying from 200 to 5,000 centipoise at 25° C. comprising (a) adding to organo chlorosilanes of the formula,



where R is selected from the class consisting of alkyl radicals, cycloalkyl radicals, alkenyl radicals, aryl radicals and fluoroalkyl radicals all having up to 8 carbon atoms and mixtures thereof where a is 1 or 2, from 0.05 to 0.2 part of water and from 0.1 to 1 part of an aliphatic alcohol of up to 3 carbon atoms per part of organochlorosilane to form a silicone alkoxy-late; (b) heating the alkoxy-late to reflux (c) inserting additional amounts of said aliphatic alcohol to said alkoxy-late and removing said alcohol until the acid-content of said alkoxy-late is below 1000 parts per million; (d) adding an alkali metal hydroxide to said alkoxy-late until its acid content does not exceed 100 parts per million (e) adding water to said alkoxy-late such that the amount of water that is added is from 0.2 to 0.8 moles of water per mole of hydrocarbonoxy radicals in said alkoxy-late; and (f) heating said alkoxy-late so as to effect the hydrolysis reaction with the additional water to obtain the desired resin product.

#### 4,160,859 CURABLE MIXTURES BASED ON MALEIMIDES AND ACETONE-ANIL

Alfred Renner, Münchenstein, and Abdul-Cader Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,571

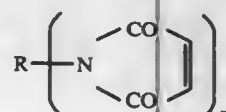
Claims priority, application Switzerland, Apr. 8, 1976, 4441/76

Int. Cl.<sup>2</sup> C08G 69/26, 73/10

U.S. Cl. 528-322

5 Claims

1. A curable composition which consists essentially of (a) a maleimide of the general formula I



wherein R denotes an n-valent aliphatic or aromatic radical, and n denotes the number 2; and (b) 2,2,4-trimethyl-1,2-dihydroquinoline, in such ratio that for 1 imido group

equivalent there is present 0.05 to 1 mole of 2,2,4-trimethyl-1,2-dihydroquinoline.

#### 4,160,860 ACTIVE PLANT EXTRACTS OF HYPOXIDACEAE AND THEIR USE

Karl H. Pegel, Durban, South Africa, assignor to Roecar Holdings (Netherlands Antilles) N.V., Netherlands Antilles

Filed Dec. 1, 1977, Ser. No. 856,507

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659465

Int. Cl.<sup>2</sup> C07G 3/00; C07J 17/00; A61K 31/705, 35/78

U.S. Cl. 536-5

16 Claims

1. In a process of preparing an extract of the family Hypoxidaceae comprising the steps of heating the plant material to a temperature sufficient to deactivate the sterol specific degradative enzymes and then extracting or concentrating the improvement to obtain an extract which contains only traces of sterolins and sterol compounds wherein the plant material is heated to at least 60° C. and thereafter extracted at 0° to 30° C. with an aqueous alcohol containing 30-75 volume percent ethanol for 1-15 days.

7. A process according to claim 1 comprising heating plant material of the plant *Hypoxis rooperi* to at least 60° C. immediately following comminution until the enzymes present are deactivated and then extracting the material at 0°-30° C. with aqueous alcohol containing 30-75 volume percent ethanol for 1-15 days.

9. An extract of a plant of the family Hypoxidaceae which has been prepared by the process of claim 1.

#### 4,160,861 METHOD FOR THE SEPARATION OF ANTIBIOTIC MACROLIDES

Douglas L. Cole, Roselle Park, and Robert T. Goegelman, Linden, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

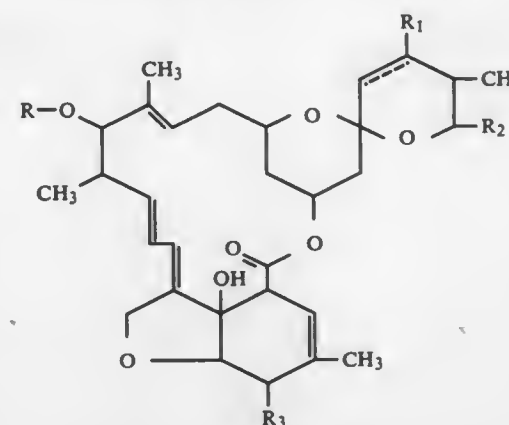
Filed Oct. 3, 1977, Ser. No. 839,138

Int. Cl.<sup>2</sup> C07H 17/08

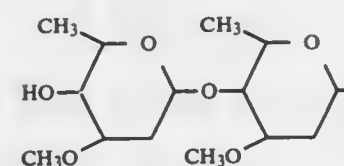
U.S. Cl. 536-17 A

8 Claims

1. A method for the separation of C-076 components wherein said C-076 components have the formula:



wherein R is:



and wherein the broken line indicates a single or a double bond;

R<sub>1</sub> is hydroxy and is present only when said broken line indicates a single bond.

R<sub>2</sub> is propyl or butyl; and

R<sub>3</sub> is methoxy or hydroxy, from a solution or broth containing a mixture of C-076 components obtained from the fermentation of a C-076 producing strain of *Streptomyces avermitilis*, wherein said solution or broth is chromatographed on a reverse phase high pressure liquid chromatography column and wherein the elution solvent is methanol:water.

#### 4,160,862 1-ACYL-3-(AMINO-LOWER-ALKYL)INDOLES

Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 261,739, Jun. 12, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,279

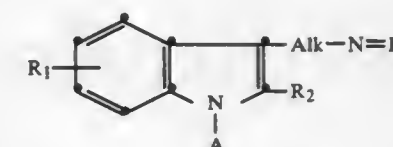
Claims priority, application United Kingdom, Apr. 25, 1973, 19624/73

Int. Cl.<sup>2</sup> C07D 401/06, 209/14

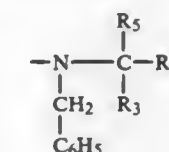
U.S. Cl. 542-439

8 Claims

1. A compound having the formula

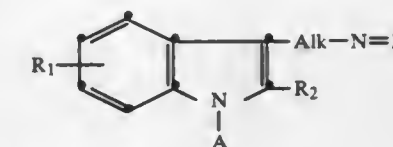


where Alk is lower-alkylene containing from two to seven carbon atoms; R<sub>1</sub> is hydrogen or from one to two members of the group consisting of lower-alkoxy and halogen; R<sub>2</sub> is hydrogen or lower-alkyl; A is benzoyl cinnamoyl, 2-thenoyl or 2-furoyl; and N=B is the group

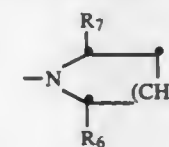


where R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> are each lower-alkyl, and wherein the phenyl ring of A when benzoyl can be substituted by from one to two members of the group consisting of lower-alkyl, lower-alkoxy or halogen; or a pharmaceutically acceptable acid-addition salt thereof.

5. A compound having the formula



where Alk is lower-alkylene containing from two to seven carbon atoms; R<sub>1</sub> is hydrogen or from one to two members of the group consisting of lower-alkoxy and halogen; R<sub>2</sub> is lower-alkyl; A is cinnamoyl; N=B is the group



where R<sub>6</sub> is cycloalkyl or cycloalkyl-lower-alkyl having from

three to seven ring carbon atoms in the cycloalkyl moiety and from one to five carbon atoms in the lower-alkyl moiety; R<sub>7</sub> is hydrogen; and n is one of the integers 1 and 2, and wherein the phenyl ring of A can be substituted by from one to two members of the group consisting of lower-alkyl, lower-alkoxy or halogen; or a pharmaceutically acceptable acid-addition salt thereof.

4,160,863

**PROCESS FOR THE PREPARATION OF THE CRYSTALLINE MONOHYDRATE OF 7-[D-α-AMINO-α-(p-HYDROXYPHENYL)ACETAMIDO]-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACID**

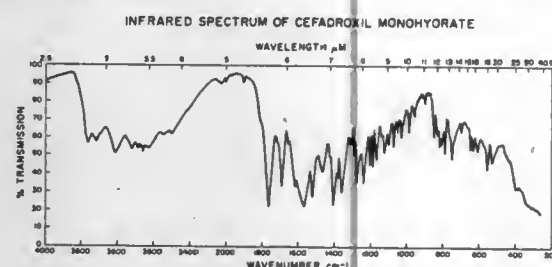
Daniel Bouzard, Franconville; Abraham Weber, and Jacques Stemer, both of Paris, all of France, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 785,392, Apr. 7, 1977, abandoned. This application Feb. 2, 1978, Ser. No. 874,457

Int. Cl.<sup>2</sup> C07D 501/22, 501/12

U.S. Cl. 544—30

19 Claims



1. A process for the preparation of crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid monohydrate exhibiting essentially the following x-ray diffraction properties:

Line	Spacing d(Å)	Relative Intensity
1	8.84	100
2	7.88	40
3	7.27	42
4	6.89	15
5	6.08	70
6	5.56	5
7	5.35	63
8	4.98	38
9	4.73	26
10	4.43	18
11	4.10	61
12	3.95	5
13	3.79	70
14	3.66	5
15	3.55	12
16	3.45	74
17	3.30	11
18	3.18	14
19	3.09	16
20	3.03	29
21	2.93	8
22	2.85	26
23	2.76	19
24	2.67	9
25	2.59	28
26	2.51	12
27	2.46	13
28	2.41	2
29	2.35	12
30	2.30	2
31	2.20	15
32	2.17	11
33	2.12	7
34	2.05	4
35	1.99	4
36	1.95	14

-continued

Line	Spacing d(Å)	Relative Intensity
37	1.90	10

which process comprises

- silylating 7-aminodesacetoxycephalosporanic acid in an inert substantially anhydrous aprotic solvent;
- acylating the so-produced silylated 7-aminodesacetoxycephalosporanic acid with D(-)-α-amino-α-(p-hydroxyphenyl)acetyl chloride hydrochloride in an inert substantially anhydrous aprotic solvent in the presence of an acid acceptor;
- cleaving any silyl groups of the acylation product by hydrolysis or alcoholysis; and
- forming the desired monohydrate product by a method selected from
  - upwardly adjusting the pH of the solution from step (c) in the presence of excess dimethylformamide to form the dimethylformamide solvate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid; dissolving said dimethylformamide solvate in acidified water or a mixture of acidified water and acetonitrile, and upwardly adjusting the pH of said acidified solution to precipitate the desired crystalline monohydrate;
  - upwardly adjusting the pH of the solution from step (c) in the presence of excess dimethylformamide to form the dimethylformamide solvate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid and contacting said dimethylformamide solvate with water or a partially aqueous medium to precipitate the desired crystalline monohydrate.

4,160,864

**ADHESIVE COMPOSITIONS COMPRISING METHYL ALLYL METHYLENEMALONATE**

Ignazio S. Ponticello, Rochester, N.Y., and John M. McIntire, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

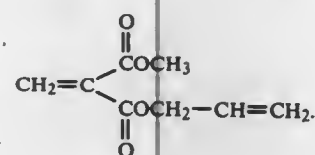
Filed Sep. 7, 1976, Ser. No. 721,148

Int. Cl.<sup>2</sup> C07C 69/38

U.S. Cl. 560—2

5 Claims

1. An adhesive composition which comprises a monomeric ester having the formula



4,160,865

**ASYMMETRIC SYNTHESIS**

Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J. Division of Ser. No. 723,401, Sep. 15, 1976, which is a division of Ser. No. 544,153, Jan. 27, 1975. This application May 16, 1977, Ser. No. 797,153

Int. Cl.<sup>2</sup> C07C 79/46

U.S. Cl. 560—22

2 Claims

1. The compound 6R, 10-dimethyl-undecan-2-yn-4(R)-ol 3,5-dinitrobenzoate.

2. The compound 6(R),10-dimethyl-undecan-2-yn-4(S)-ol-3,5-dinitrobenzoate.

4,160,866

**CARBAMATES**

R<sub>1</sub>—O.CO.NHO.CO.X.CO.OHN.CO.O—R<sub>1</sub>

(1)

John L. Brooks; Richard Budziarek, and David J. Harper, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 767,331, Feb. 10, 1977, abandoned. This application Nov. 23, 1977, Ser. No. 854,252 Claims priority, application United Kingdom, Apr. 30, 1976, 17704/76

Int. Cl.<sup>2</sup> C07C 125/06

U.S. Cl. 560—25

4 Claims

1. A carbamate compound of the formula:

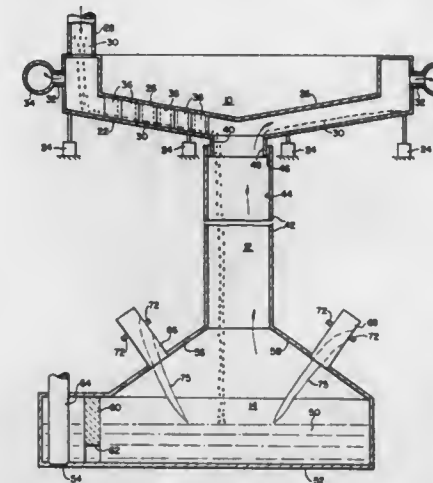
in which X is a member of the group consisting of a direct link, C<sub>1</sub> to C<sub>4</sub> alkylene groups, C<sub>2</sub> to C<sub>3</sub> alkenylene, o-phenylene and p-phenylene and R<sub>1</sub> is a member of the group consisting of C<sub>1</sub> to C<sub>18</sub> alkyl, phenyl, chlorophenyl, nitrophenyl, cyclohexyl and benzyl.



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# ELECTRICAL

4,160,867  
METHOD AND APPARATUS FOR MELTING  
MACHINING CHIPS  
Maurice G. Fey, Plum Borough, and Francis J. Harvey, II,  
Murrysville, both of Pa., assignors to Westinghouse Electric  
Corp., Pittsburgh, Pa.  
Filed May 17, 1977, Ser. No. 797,893  
Int. Cl.<sup>2</sup> H05B 7/00; F27D 3/00  
U.S. Cl. 13—2 P 5 Claims

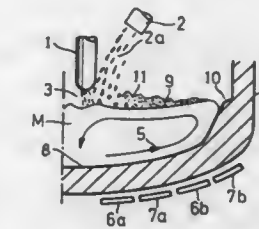


1. Apparatus for melting metal chips comprising:
  - (a) a preheating chamber comprising a hearth having a substantially planar surface and being rotatable about a central vertical axis, inlet means for metal chip stock adjacent to one surface portion of the hearth, outlet means for preheated metal chip stock adjacent to another surface portion of the hearth, means for moving the metal chip stock from the inlet means to the outlet means,
  - (b) a pre-reducing chamber communicating with said outlet means,
  - (c) a melting chamber communicating with the preheating chamber,
  - (d) an arc heater having axially spaced, generally hollow, cylindrical electrodes forming an arc chamber communicating with the melting chamber,
  - (e) electric means for striking an electric arc in an axial gap between the electrodes,
  - (f) means for rotating the arc within the arc chamber,
  - (g) means for blowing non-oxidizing gas through the gap to form an elongated arc stream comprising the non-oxidizing gas and the arc, and
  - (h) the non-oxidizing gas flowing through the melting chamber, the pre-reducing chamber and the preheating chamber in countercurrent to the movement of metal chips through said chamber.

4,160,868  
APPARATUS AND METHOD FOR MELTING FERROUS  
PELLETS  
Jan Marchner, and Yngve Sundberg, both of Vesteras, Sweden,  
assignors to ASEA Aktiebolag, Vesteras, Sweden  
Filed Nov. 23, 1976, Ser. No. 744,424  
Claims priority, application Sweden, Nov. 28, 1975, 7513411  
Int. Cl.<sup>2</sup> H05B 7/18 3 Claims

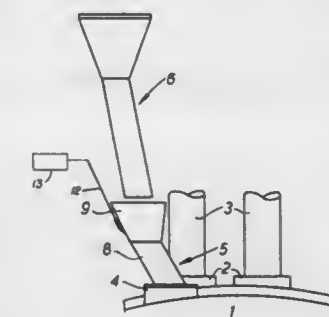
1. An arc furnace for melting ferrous pellets which float on a ferrous melt, said furnace comprising a non-magnetic hearth for containing said melt, at least one arcing electrode positioned to form an arc on a central portion of said melt, feeding means for feeding said pellets substantially to said central portion, stirrer means formed by at least two substantially concentric radially inner and outer coils positioned adjacently below said hearth and substantially parallel therewith and substantially symmetrical with said central portion, and power

means for feeding said coils with multiphase current having a phase sequence inductively propelling the bottom portion of said melt radially outwardly from below said central portion so



that the upper portion of the melt is caused to flow radially towards said central portion and float towards said central portion any of said pellets inadvertently floating on the melt remotely from the central portion thereof.

4,160,869  
CONTINUOUS CHARGING APPARATUS  
Andrew D. Robertson, Rotherham, England, assignor to British  
Steel Corporation, London, England  
Filed Dec. 1, 1977, Ser. No. 856,222  
Claims priority, application United Kingdom, Dec. 2, 1976,  
50306/76 Int. Cl.<sup>2</sup> F27D 3/16 16 Claims

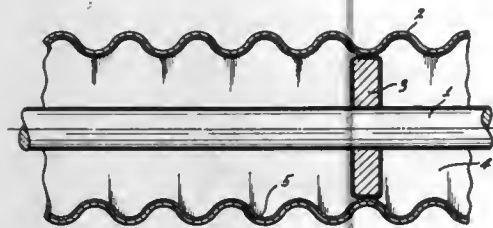


1. Apparatus for continuously charging particulate feedstock into an electric arc furnace normally containing furnace gases under positive pressure, comprising a furnace housing, a gravity feed chute for the feedstock secured to the furnace housing to form a closed fluid flow path and communicating with the furnace interior, and means for supplying steam or other gases in said feed chute at a mass flow rate and velocity sufficient to create a momentum flux in the chute exceeding the blowout force in the chute of the furnace gases.

4,160,870  
HIGH VOLTAGE DEVICE WITH GAS INSULATION  
Jan Artbauer, Langenhagen, Fed. Rep. of Germany, assignor to  
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesell-  
schaft, Hannover, Fed. Rep. of Germany  
Filed Apr. 26, 1973, Ser. No. 354,475  
Claims priority, application Fed. Rep. of Germany, May 5,  
1972, 2222681 Int. Cl.<sup>2</sup> H01B 9/06 1 Claim

1. In a high voltage cable having concentric inner and outer conductors provided for conducting different voltage potentials and being separated by an insulative gas, the improvement comprising:
  - an adhesive layer deposited on the inner surface of the outer conductor only, and including pigmentation for enhancement of the radiation emission and absorption relative to the respective conductor surface portion, said surface having lower local electric field strength than the field

strength adjacent to the surface of the inner conductor when said different potentials are being applied to the inner and outer conductors, the layer being sticky and



exposed to the gas for gathering dust and dirt, particularly before said potentials are applied to the conductors, the surface of the inner conductor being free from such adhesive layer.

4,160,871

### CONNECTING DEVICE FOR ACHIEVING THE ELECTRICAL JUNCTION AND MECHANICAL ASSEMBLY OF AT LEAST TWO CONDUCTORS

Jacques Lacroix, 94 Elysee II, La Celle Saint Cloud, France 78170

Filed Feb. 9, 1977, Ser. No. 766,904

Claims priority, application France, Feb. 17, 1976, 76 04300

Int. Cl.<sup>2</sup> H01R 5/10

U.S. Cl. 174—84 R

21 Claims



1. A connecting device in combination with and achieving an electrical junction and a mechanical assembly of two conductors, each conductor having at least one strand of wire and a bared wire end portion, said device comprising in combination an elongate electrically conductive connecting member substantially in the shape of a strip which defines two opposed side surfaces and a peripheral edge and two throughway orifices which are spaced apart from each other longitudinally of the strip, the bared end portions of the two conductors being respectively combined with the two orifices in contact zones between the strip and the bared end portions, each bared end portion comprising in the corresponding contact zone an extremity part extending substantially longitudinally alongside and adjoining a first of said surfaces of the strip, a second part extending substantially longitudinally alongside and adjoining a second of said surfaces of the strip and a third part interconnecting said extremity part and said second part and transversely extending through the respective orifice of said two orifices and imparting a labyrinth shape to the bared end portion, two tubular insulating terminals surrounding opposite end portions of the strip and covering said contact zones, each terminal defining with said first surface a first cavity receiving said extremity part of the bared end portion of the corresponding conductor and defining with said second surface a second cavity receiving said second part of the bared end portion of the corresponding conductor, means interposed between the terminals and the strip for slidably mounting the terminals longitudinally on the strip, retaining means interposed between the terminals and the strip for retaining the terminals on the strip, longitudinally extending support means in said first cavity of each terminal in supporting contact with said extremity part of the bared end portion of the corresponding conductor, one of two elements consisting of the strip and the support means of each terminal being resiliently yieldable and in a condition in which it is resiliently stressed transversely of said first cavity in a direction away from the other of said elements by the extremity part of the bared end portion of the corresponding conductor for maintaining electrical contact between the strip and the corresponding bared end portion.

### 4,160,872 SELF-FLOATING CABLE FOR MARINE OPERATIONS

Bo E. O. Lundberg, Sundbyberg, and Victor Seuka, Upplands-Bälånge, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

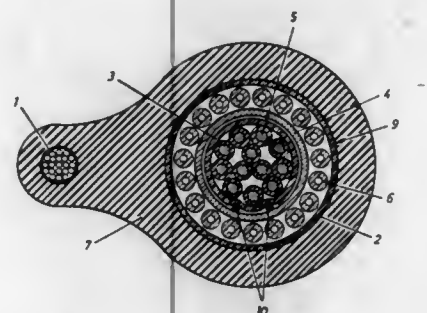
Filed Aug. 10, 1977, Ser. No. 823,288

Claims priority, application Sweden, Aug. 24, 1976, 7609347

Int. Cl.<sup>2</sup> H01B 7/12, 7/18; G02B 5/14

U.S. Cl. 174—101.5

1 Claim



1. Self-floating cable with high flexibility, comprising two separate conductor systems, one of said systems transferring electric energy and the other system resisting mechanical loads applied longitudinally and transversely to the cable; a common cable mantle surrounding said two systems, said one system including an inner friction layer of plastic material having a low friction coefficient when contacting its own surface and surrounding inner conductors of the electric conductor system, said inner friction layer being wound about itself to form overlapped and overlapping portions; a metallic layer covering said friction layer, said metallic layer also being wound about itself to form overlapped and overlapping portions; a number of hollow cords of soft plastic material disposed in parallel and surrounding said metallic layer, said cords extending with a pitch along the longitudinal direction of the cable; and an outer friction layer of plastic material with a low friction coefficient when contacting its own surface, said outer friction layer covering said cords and being surrounded by the cable mantle and being wound about itself to form overlapped and overlapping portions, the low friction coefficient of said outer friction layer being such as to enable longitudinal movement of the said one system relative to said cable mantle, the low friction coefficient of said inner friction layer enabling relative longitudinal movement of the inner conductors and the remainder of the said one system.

4,160,873

### LEVEL CONTROL CIRCUITRY FOR TWO WAY COMMUNICATION SYSTEM

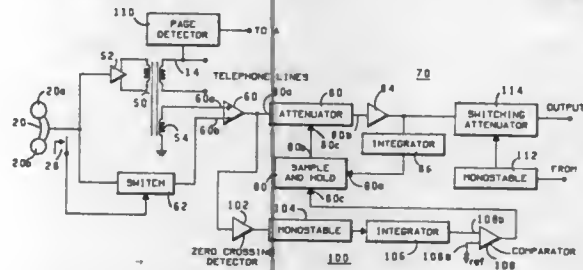
Kermit Beseke, Schaumburg, and Ronald Kopecki, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1977, Ser. No. 846,747

Int. Cl.<sup>2</sup> H04L 5/14

U.S. Cl. 178—58 R

7 Claims



1. In a two-way communication system of the type wherein first and second stations generate first and second signals, A

and B, respectively, said signals being duplexed on a transmission medium coupled between the stations, the transmission medium exhibiting losses such that the amplitude of the signal B received at the first station is significantly less than the signal A generated by said station, the improvement for balancing the levels of said signals in the station A comprising:

differential amplifier means, having first and second inputs and an output, for amplifying the difference between signals appearing at its input by a predetermined factor and producing said amplified difference signals at the output;

first coupling means for coupling the transmission medium signal A + B to said first differential amplifier input; and second coupling means for coupling the first station generated signal A in unmodified form to said second differential amplifier input,

such that the signal produced at the output of the differential amplifier means is said signal B amplified by said predetermined factor to thereby establish balance between the levels of said signals.

4,160,874

### PROCESS FOR SIGNALING AN INTERRUPTION IN THE STATE OF READINESS FOR THE RECEPTION IN DATA TERMINAL DEVICES IN WHICH DATA ARE EXCHANGED

Max Öllinger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,455

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1976, 2639063

Int. Cl.<sup>2</sup> H04N 1/32; H04L 25/02

U.S. Cl. 178—69 G

7 Claims

1. In a data transmission process in which each subscriber station is connected by way of a line to a telegraphic exchange and in which a calling station can selectively dial and establish a connection to a called station via a telegraphic transmission network, the connection being established between a calling station telegraphic data terminal device and a called station telegraphic data terminal device, in which permanent conditions cannot be transmitted by way of the telegraphic exchanges, and in which the calling station data terminal device requests that the called station data terminal device transmit a station identification code character, and in which data transmission begins after the called station data terminal device transmits and the calling station data terminal device receives the called station identification code characters, the improvement therein comprising the steps of:

monitoring for the presence or absence in the called station of a malfunction or disabling condition to determine the state of readiness of the called station data terminal device to receive data;

blocking the identification code character of the called station data terminal device to prevent transmission of the called station identification code character in response to interruption in the state of readiness to receive data; and then, automatically clearing the established connection between the calling and called stations.

4,160,875

### SECURITY SYSTEM

Leonard R. Kahn, 70 N. Grove St., Freeport, N.Y. 11520

Filed May 12, 1977, Ser. No. 796,123

Int. Cl.<sup>2</sup> H04K 1/00

U.S. Cl. 179—1.5 M

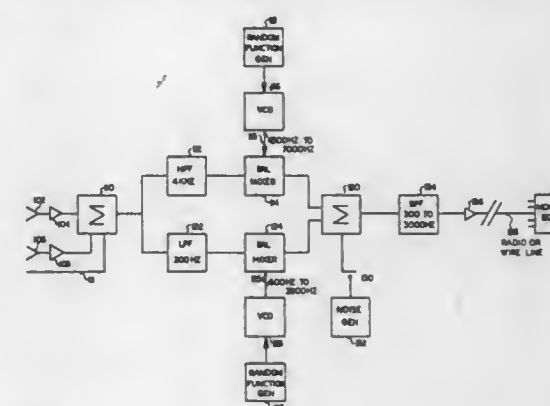
20 Claims

1. The method of providing security for individuals without violating the privacy of their conversations, comprising:

(a) converting sound waves, including voice waves present at a location to be protected, to electrical waves,

(b) processing said electrical waves so as to substantially reduce the information borne by normal conversation speech waves while not substantially degrading the intelli-

gibility borne by certain other waves outside the intelligible speech band which carry signals indicating emergency conditions, said waves being available for detection by monitoring personnel, and



(c) transmitting the waves processed by step (b) to a remote location.

4,160,876

### MODULAR MULTIPLEX/DEMULTIPLEX APPARATUS

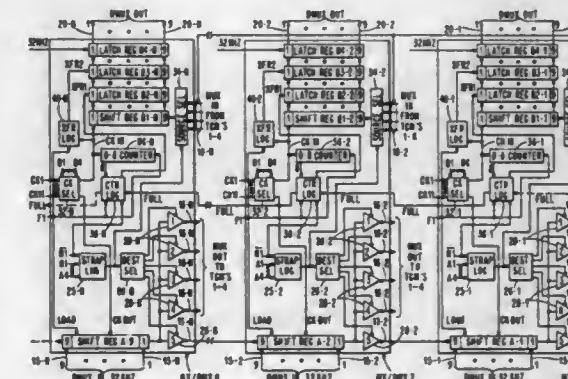
Robert J. Bojanek, Newton, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 1, 1978, Ser. No. 901,390

Int. Cl.<sup>2</sup> H04J 3/02

U.S. Cl. 179—15 AT

11 Claims



1. A modular multiplex/demultiplex apparatus, comprising: a plurality of multiplex/demultiplex module units, each comprising:

a plurality of demultiplex input lines for receiving demultiplexed data thereon, the data on each line being in a serial bit format;

shift register means having a plurality of stages connected in series and each coupled to a different one of the plurality of demultiplex input lines, a series input for receiving data in a multiplexed format, and an output, said shift register means being operative to shift data applied to the plurality of stages thereof or to the series input thereof serially to the output thereof in a multiplexed format;

a plurality of multiplex output lines, one of said multiplex output lines representing a module interconnection line and being connected to the series input of the shift register means of an adjacent module unit;

a plurality of gating means each connected to a different one of the plurality of multiplex output lines and connected to the output of the shift register means, each of said gating means having a first operating state during which multiplexed data at the output of the shift register



means may pass therethrough to its corresponding multiplex output line and a second operating state during which multiplexed data at the output of the shift register means is inhibited from passing therethrough to its corresponding multiplex output line; and selection means operative to enable a selected one of the gating means to operate in its first state to allow multiplexed data at the output of the shift register means to pass therethrough to its associated multiplex output line, whereby if the selection means selects the gating means connected to the multiplex output line connected to the series input of the shift register means of the adjacent module unit the data at the output of the shift register means passes through the selected gating means to its associated multiplex output line to the series input of the shift register means of the adjacent module unit, and whereby if the selection means selects one of the other gating means the data at the output of the shift register means passes through the selected gating means to its associated multiplex output line.

4,160,877

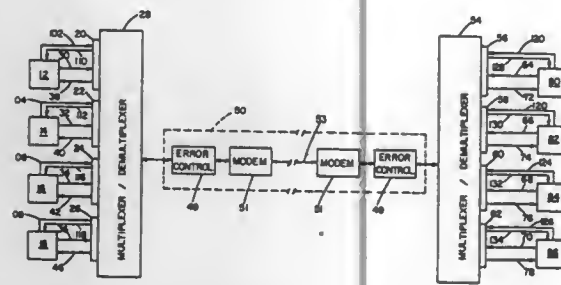
**MULTIPLEXING OF BYTES OF NON-UNIFORM LENGTH WITH END OF TIME SLOT INDICATOR**  
James E. Vander Mey, Newtonville, Mass., assignor to Codex Corporation, Newton, Mass.

Continuation of Ser. No. 702,921, Jul. 6, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 775,419

Int. Cl.<sup>2</sup> H04J 3/16

U.S. Cl. 179—15 BA

16 Claims



1. For use in a data transmission system wherein data in a plurality of constituent streams are received at a multiplexer, processed to form a single composite stream comprising time slots each carrying data from one constituent stream, transmitted in said composite stream over a communication link, and demultiplexed in a demultiplexer receiving said composite stream to recover the original plurality of constituent streams in separate form, the improvement comprising the combination of

a plurality of queues in said multiplexer, each associated with one of said constituent streams and arranged and connected to receive and store data therefrom, protocol-defining apparatus in said multiplexer defining a service sequence for said queues, each queue appearing at least once in said sequence, and a codeword set, the elements thereof being bit sequences of non-uniform length, said set being uniquely parsable and including a terminator codeword used to designate the end of a slot, framing means in said multiplexer, communicating with said protocol-defining apparatus therein, and arranged and connected to emit a bit stream in a sequence of time slots corresponding to said defined service sequence, the data in any one slot being derived from its associated queue, and in the form of codewords from said codeword set, said framing means emitting terminator codewords to mark the ends of at least some slots, said bit stream being suitable for transmission over the link to a demultiplexer parsing and decoding and composite stream of bits re-

ceived from said link, and emitting in separate form the original plurality of constituent data streams.

4,160,878

**CONFERENCE CIRCUIT WITH DIGITAL-ANALOG AND ANALOG-DIGITAL CONVERSION**

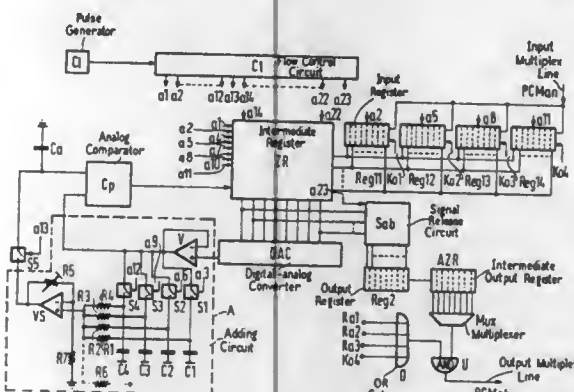
Peter Hirschmann, Puchheim, and Ernst Hoefer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Jul. 19, 1978, Ser. No. 926,197

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732603; Aug. 5, 1977, 2735401

Int. Cl.<sup>2</sup> H04M 3/56

U.S. Cl. 179—18 BC

6 Claims



1. A telecommunication conference circuit arrangement for use with a given maximum number  $n$  of conference subscribers each originating a digital signal on a multiplex input line, comprising:

- a signal acceptance means connected to the input line for accepting digital signals for conversion into analog signals;
- an intermediate register means connected to the signal acceptance means;
- a digital-analog converter connected to an output of the intermediate register means;
- an analog store means for storing an analog summation signal;
- an analog comparator means for comparing analog signals from the digital-analog converter with the analog summation signal stored in the analog store;
- signal allocation output device means connected to the output of the digital-analog converter;
- said signal acceptance means comprising  $n$  input registers, each input register being allocable to one of the conference subscribers and reading in corresponding digital signals from the subscriber;
- adding device means connected to an output of the digital-analog converter for forming the analog summation signal which is stored in the analog store from individual analog signals corresponding to each of the individual subscriber digital signals;
- said signal allocation output device means including an intermediate and output register means for transmitting the digital summation signal in respective time slots for the respective conference subscriber stations;
- clocked flow control means for creating a succession of clocked actuating signals for actuating in a given flow pattern the signal acceptance means, intermediate register means, digital-analog converter, adding device means, analog store means, analog comparator means, and signal allocation output device means; and
- said analog store, analog comparator, intermediate register, flow control means and digital-analog converter forming an analog-digital transducer means operating by iteration to digitalize the analog summation signal and store it in the intermediate register.

4,160,879

**TELEPHONE DISPLAY ACCESSORY**

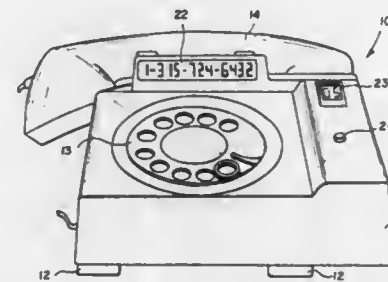
Ronald L. Sullivan, and Ronald R. Cosentino, both of Seneca Falls, N.Y., assignors to M E P & I Corporation, Seneca Falls, N.Y.

Filed Dec. 8, 1977, Ser. No. 858,710

Int. Cl.<sup>2</sup> H04M 1/56

U.S. Cl. 179—90 AN

14 Claims



1. An accessory for a telephone having a body, a dial, a handset, and a line switch, said accessory comprising:

- a housing shaped to fit over an outside surface of said telephone body;
- a main switch disposed in the region of said line switch for actuating said accessory in response to movement of said handset;
- a rotatable element arranged within said housing to encircle and be concentric with said dial;
- means for releasably connecting said rotatable element to said dial for rotating with said dial;
- a dialing switch arranged within said housing to be responsive to said rotatable element to produce pulses as a function of rotation of said element;
- a dialed number display device; and
- electronic logic circuitry arranged within said housing and responsive to said pulses from said dialing switch for:
  - displaying a dialed number digit-by-digit as said dialed number is dialed; and
  - spacing said displayed digits to separate said displayed digits into groups conforming to telephone number digit groupings for local calls, long distance calls within area, and long distance calls outside of area as said dialed number is dialed.

4,160,880

**MODULAR TERMINATION SYSTEM FOR COMMUNICATION LINES**

William A. Brey, Schaumburg, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Jun. 2, 1978, Ser. No. 911,874

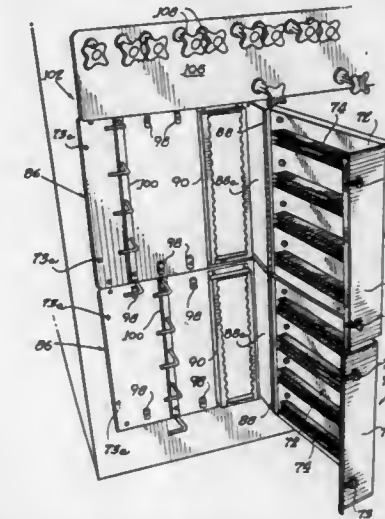
Int. Cl.<sup>2</sup> H04Q 1/14

U.S. Cl. 179—98

10 Claims

1. An arrangement terminating telephone and like communication lines comprising a first field, said first field comprising a first plurality of dielectric connector blocks each having electrically conductive terminals thereon, the terminals having front and back sides that are respectively at opposite sides of the associated connector block, a panel-support upon which said blocks are mounted, and connectors having conductors extending therefrom and which are terminated at the back sides of said terminals and adapted for connections to telephone lines, a second field comprising a second plurality of dielectric connector blocks each having electrically conductive terminals thereon, the terminals of the second plurality of blocks also having front and back sides that are respectively at opposite sides of the associated connector block, means forming a support for said second plurality of terminal blocks, base

means, a hinge connecting said last-mentioned support to the base means, additional connectors fixed relative to said base and having wires extending therefrom and to the back sides of the terminals of said second plurality of terminal blocks, a cable extending from each additional connector, each cable being a conductive extension of a plurality of said wires and



adapted for connections to further telephone lines, a plurality of cable guides receiving said cables and being offset from each other for locating the cables side-by-side as they run in a direction away from said first field, the cable guides being presented to said back sides of the second terminals, and means for routing jumper wires from the front sides of the terminals of one field to the front sides of terminals of the other field.

4,160,881

**ELECTRET TRANSDUCERS: ACOUSTICALLY TRANSPARENT BACKPLATE OF SINTERED CONDUCTIVE SPHERES AND A THIN ELECTRET COATING; MESHLIKE DIAPHRAGM SPACING SCREEN OVERLAYS APERTURED ELECTRET BACKPLATE WITH SCREEN JUNCTIONS OVERLAYING THE APERTURES**

Adrianus J. Smulders, Hoogland, Netherlands, assignor to Microtel B.V., Netherlands

Filed Dec. 28, 1977, Ser. No. 865,138

Int. Cl.<sup>2</sup> H04R 19/00

U.S. Cl. 179—111 E

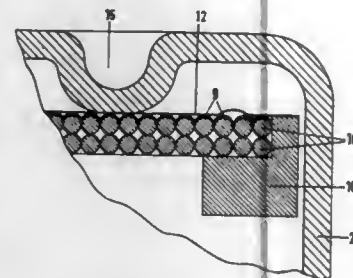
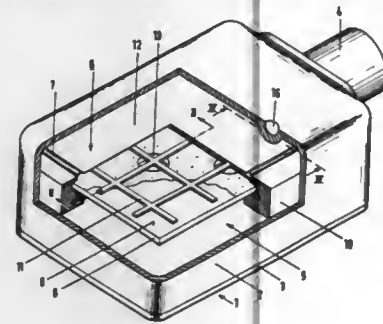
7 Claims

1. A motor assembly for an electret transducer comprising a diaphragm plate, a composite backplate including a plate-like body constituted by substantially spherical conductive particles sintered together and a thin coating of electret material disposed on the spherical particle surfaces of said plate-like body, thereby forming an acoustically transparent backplate having substantially spherical shaped protrusions constituted by said electret material opposite to said diaphragm plate, which rests on said protrusions along a substantially flat plane substantially tangent to the contours of said protrusions, and a mounting rim supporting said composite backplate and having a peripheral portion to which the outer edge portion of said composite diaphragm is attached, said diaphragm plate having a compliant surround at its periphery.

3. An electret transducer comprising in combination a casing and a motor assembly, said motor assembly comprising a diaphragm plate having a compliant surround at its periphery, a backplate, a plurality of apertures provided in said backplate, an electret foil disposed on said backplate, a meshlike spacing screen disposed on said electret foil opposite to said diaphragm plate, said diaphragm plate resting on said screen, the diaphragm plate supporting junctions of said screen overlying predetermined ones of said apertures, and a mounting rim



supporting said backplate along the periphery thereof, the outer edge portion of said diaphragm plate being attached to the peripheral portion of said rim substantially co-planar relative to said diaphragm, said mounting rim having an external



peripheral wall portion extending substantially perpendicular to the plane of said diaphragm plate said peripheral wall portion being acoustically sealed and attached to the opposite wall portion of said casing.

4,160,882

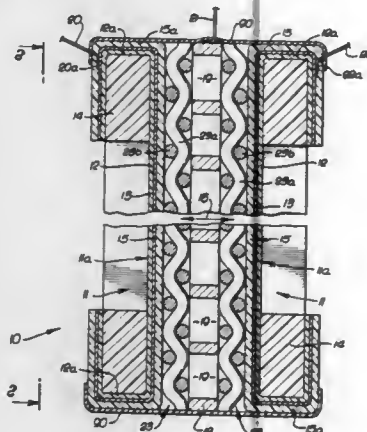
# DOUBLE DIAPHRAGM ELECTROSTATIC TRANSDUCER EACH DIAPHRAGM COMPRISING TWO PLASTIC SHEETS HAVING DIFFERENT CHARGE CARRYING CHARACTERISTICS

Michael L. Driver, 3658 N. Fair Oaks Ave., Altadena, Calif. 91001

Filed Mar. 13, 1978, Ser. No. 885,642  
Int. Cl.<sup>2</sup> H04R 19/02

U.S. Cl. 179—111 R

11 Claims



1. In an electrostatic loudspeaker, the combination comprising

- (a) a pair of spaced, generally parallel diaphragms each of which includes a first sheet of plastic material and an electrically conductive layer adherent to said sheet,
- (b) a pair of frames respectively peripherally mounting said diaphragms, the frames extending in parallel, spaced apart relation,

- (c) a perforate, electrically conductive sheet sandwiched between said diaphragms, and
- (d) foraminous sheets of dielectric material sandwiched between said perforate sheet and said diaphragms,
- (e) whereby said diaphragms remain acoustically coupled through said foraminous dielectric sheets and through said perforate, electrically conductive sheet for simultaneous vibratory excursions when an AC signal is applied across said electrically conductive layers and said perforate sheet is connected to a common potential,
- (f) each diaphragm also including a second sheet of plastic material sandwiched between the electrically conductive layer and one of said foraminous sheets of dielectric material, said second sheet having the capacity to carry a larger permanent static charge than said first sheet, said first and second sheets consisting of different plastic materials.

4,160,883

# ACOUSTIC TRANSDUCER AND METHOD OF MAKING SAME

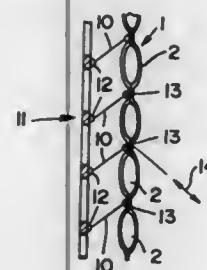
Oskar Hell, 1775 Parrott Dr., San Mateo, Calif. 94402

Filed Mar. 31, 1978, Ser. No. 892,416

Int. Cl.<sup>2</sup> H04R 7/00, 7/16, 31/00

U.S. Cl. 179—114 M

46 Claims



1. The method of making an acoustic transducer comprising the steps of:

- (a) fabricating a light weight diaphragm;
- (b) fabricating a heavy weight, structurally rigid base defining a supporting surface coextensive with said diaphragm and positioning said diaphragm in parallel relation to said supporting surface of said base;
- (c) mechanically connecting said diaphragm to said base by dynamically rigid means defining with said diaphragm and said base a plurality of similar parallelograms with flexible corners, and
- (d) mechanically connecting a drive means to said diaphragm.

7. An acoustic transducer comprising:

- (a) light weight diaphragm means;
- (b) heavy weight, structurally rigid base means defining a supporting surface parallel to and coextensive with said diaphragm;
- (c) dynamically rigid means mechanically connecting said diaphragm to said base to define with said diaphragm and said base a plurality of similar parallelograms with flexible corners; and
- (d) drive means mechanically connected to said diaphragm means.

4,160,884

# POWER REGULATION SYSTEM FOR REPEATED TELEPHONE TRANSMISSION LINES

Larry D. Bishop, Colleyville, Tex., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Feb. 6, 1978, Ser. No. 875,330

Int. Cl.<sup>2</sup> H04B 3/44

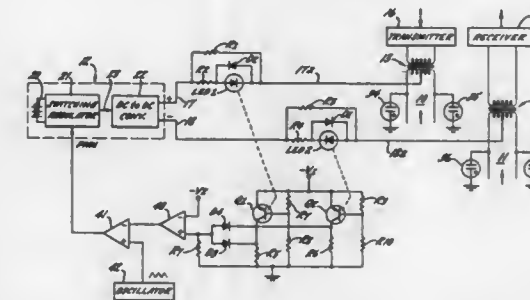
U.S. Cl. 179—170 J

6 Claims

1. In a telephone transmission system having repeaters spaced along both the transmit and receive legs of the transmis-

sion line, a power supply for the repeaters including a current regulator, positive and negative supply lines connecting said power supply to the two legs of the transmission line, and current surge protectors connected from the two legs of said transmission line to ground,

a pair of current sensors responsive to the current levels in said positive and negative supply lines, between said power supply and the current surge protectors closest to said power supply, for producing output signals representative of the respective current levels,



control signal generating means receiving the output signals from said current sensors for producing a control signal in response to a deviation of the higher current in said supply lines from a preselected reference level, said control signal generating means including means for selecting the larger of the output signals from said current sensors, and means for producing said control signal in accordance with the deviation of the selected larger signal from said preselected reference level,

and means for supplying said control signal to said current regulator to maintain the higher current level in said supply lines at said preselected reference level.

4,160,885

# ELECTRICAL SWITCH AND METHOD OF OPERATION

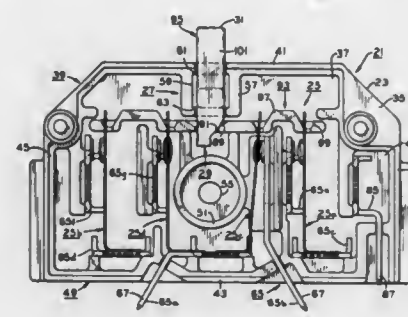
Harold B. Ellicott, Morrison, and James P. Frank, Rock Falls, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jan. 17, 1977, Ser. No. 759,875

Int. Cl.<sup>2</sup> H01H 9/00

U.S. Cl. 200—1 R

15 Claims



1. An electrical switch comprising:

- (a) a housing having wall means defining a chamber in said housing, said walls means including at least a pair of generally opposite sidewalls, and another wall extending between said sidewalls and integrally formed therewith;
- (b) an opening in said housing and extending through one of said sidewalls;
- (c) a plurality of switch means in said chamber, each of said switch means of said switch means plurality including a pair of switch members at least one of which is movable, said at least one switch member being operable generally between a making position engaged with the other of said

switch members and a breaking position disengaged therefrom, respectively;

- (d) a plurality of switch means supporting terminals mounted with said housing so as to extend through said wall means with each of said terminals of said switch means supporting terminal plurality respectively including a supporting section within said chamber for supporting one of said at least one switch member and said other switch member, and an electrical connector section exteriorly of said chamber and disposed generally adjacent said wall means, only one pair of said terminals of said switch means supporting terminal plurality extending through the other of said sidewalls with said supporting section of one of said terminals of said only one terminal pair supporting at least one of said at least one switch member and with said supporting section of the other of said terminals of said only one terminal pair supporting said other switch member, and all of the others of said terminals of said switch means supporting terminal plurality extending through said another wall; and

- (e) means movable in said chamber for engaging and actuating each of said at least one switch member to effect the operation thereof from one of the making and breaking positions toward the other of the making and breaking positions thereof, respectively, said engaging and actuating means including means in said chamber for camming at least two of said at least one switch members from the one of the making and breaking positions toward the other of the making and breaking positions thereof prior to the operation of the other of said switch members from the one of the making and breaking positions to the other of the making and breaking positions thereof, respectively, and means integral with at least a part of said engaging and actuating means and extending through said opening exteriorly of said chamber for receiving a force to effect the movement of said engaging and actuating means so as to operate said each of said at least one switch members.

4,160,886

# KEYBOARDS AND METHODS OF MAKING KEYBOARDS

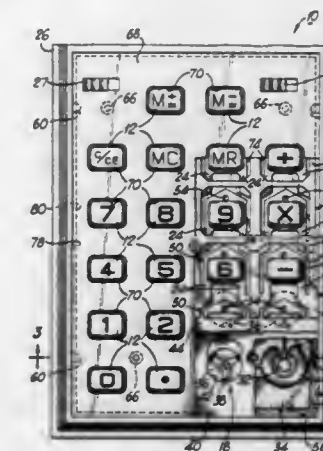
Duane H. Wright, deceased, late of Coeur d'Alene, Id. (by Greta B. Wright, personal representative), and Stephen F. Meyer, Hayden Lake, Id., assignors to Clare-Pendar Co., Post Falls, Id.

Filed Jul. 21, 1977, Ser. No. 817,550

Int. Cl.<sup>2</sup> H01H 13/70

U.S. Cl. 200—5 A

9 Claims



1. A keyboard assembly comprising:

- support means;
- a switching assembly mounted on said support means and including a plurality of pressure actuated switch means;
- and a key array overlying said switching assembly for selective actuation of said switching means;



said key array including a sheet of plastic of uniform thickness having been formed while in a pliant state into a generally flat base portion and a plurality of projecting keys each corresponding with one switching means; apertures in said plastic sheet partially surrounding each of said keys and freeing said keys for movement relative to said base portion; integral hinge portions of said plastic sheet interconnecting said base portion with said keys; and a switch actuating means on each key and aligned with one of said switch means.

8. A key array for operating a switching assembly in a data entry keyboard, said key array comprising:

- a one-piece, integral body formed from thermoplastic sheet material of uniform thickness by sequential sheet forming and cutting operations;
- said body including a generally planar base portion;
- a plurality of keys extending upwardly from said base portion;
- apertures in said body partially separating said keys from said base portion; and
- integral hinges connecting said keys to said base portion.

4,160,887

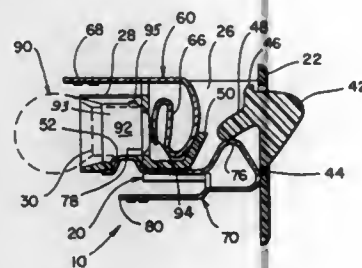
## CLOSURE ACTIVATED SWITCH

Harold S. van Buren, Jr., Lexington, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 8, 1977, Ser. No. 822,461

Int. Cl.<sup>2</sup> H01H 3/16

U.S. Cl. 200—61.62



1. A switch for mounting relative to a compartment having an access opening closable by a closure lid, said switch being activated to energize and de-energize a lamp bulb for illuminating the compartment in response to the opening and closing, respectively, of the closure lid, said switch comprising:
  - A. a housing for mounting relative to the compartment and including
    - i. a lamp bulb receiving portion for receiving and retaining the bulb, and
    - ii. a hinge member formed as an integral part of said housing and disposed so as to be engaged by the closure lid and pivoted from a first position to a second position in response to the closing of the lid;
  - B. a first contact member mounted to said housing and including
    - i. a first end portion for connection into an electrical circuit, and
    - ii. a second end portion for connecting to the bulb, and
  - C. a second contact member mounted to said housing, electrically isolated from said first contact member and including
    - i. a first end portion for connection into the electrical circuit,
    - ii. a second end portion for contacting the bulb when said hinge member is in its first position thereby to complete the electrical circuit through the bulb and energize the bulb,
    - iii. said second end portion being movable away from the bulb when said hinge member is pivoted to its second position thereby to open the electrical circuit and de-energize the bulb.

4,160,888  
**PUFFER-TYPE GAS-BLAST CIRCUIT BREAKER**  
 Ken-ichi Natsui; Kunio Hirasawa; Yoshio Yoshio, and Hiroshi Chida, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

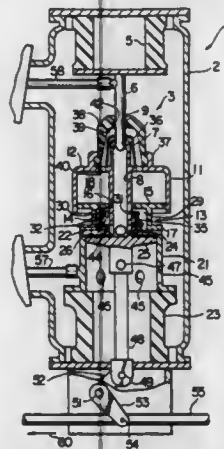
Filed Jun. 2, 1977, Ser. No. 802,940

Claims priority, application Japan, Jun. 10, 1976, 51/67987; Jun. 10, 1976, 51/67989

Int. Cl.<sup>2</sup> H01H 33/70, 33/88

U.S. Cl. 200—148 A

16 Claims



1. A puffer type gas-blast circuit breaker including at least one interrupting unit mounted in a vessel filled with an arc extinguishing gas of an unitary pressure, said interrupting unit comprising:
  - a pair of contacts positioned in alignment with but in opposed relation to each other, and movable toward and away from each other respectively, at least one of said pair of contacts having therein an axial hollow portion, said axial hollow portion having an opening in that axial free end face of said one contact, which is opposed to the other contact, whereby an arc is established between said pair of contacts, upon disengagement of said pair of contacts from each other;
  - a first cylinder and a first piston within said first cylinder to define a compression chamber filled with an arc extinguishing gas, said first cylinder and piston being movable relative to each other in association with the relative movement of said pair of contacts;
  - an insulating nozzle encompassing a free end portion of said one contact and having a throat portion in alignment with said pair of contacts, said throat portion being capable of being substantially blocked by the other contact, said insulating nozzle having an inner peripheral surface to define a guide passage by the cooperation of the free end portion of said one contact, and said guide passage bringing said compression chamber into communication with said axial hollow portion through said opening, when said pair of contacts are disengaged from each other;
  - a second cylinder and a second piston within said cylinder to define a suction chamber, said second cylinder and piston being movable relative to each other in association with the relative movement of said pair of contacts;
  - a first communicating means for bringing said axial hollow portion in communication with said suction chamber, whereby when said pair of contacts are relatively moved away from each other, an arc extinguishing gas in said compression chamber is compressed, and a volume of said suction chamber is enlarged, and when said pair of contacts are disengaged from each other, a pressure difference between said compression chamber and said suction chamber causes said arc extinguishing gas to be directed from said compression chamber via said guide passage, said axial hollow portion and said first communicating means, into said suction chamber, thereby to be blown against an arc produced between said pair of contacts; and

gas bleeding means for bleeding an arc extinguishing gas from said suction chamber into a space in said vessel by bringing said suction chamber into an open condition to or communication with a space in said vessel, when said pair of contacts are moved a given distance in the directions away from each other.

4,160,889

## ELECTRICAL TERMINAL BLOCK

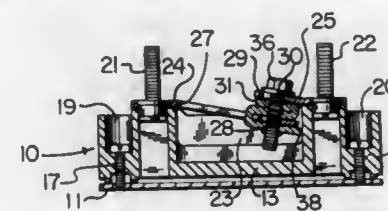
Jere W. Tognazzini, 7301 Lakewood Blvd., Dallas, Tex. 75214, and Kenneth R. Humphreys, 5737 McComas, Apt. 208, Dallas, Tex. 75206

Filed Dec. 15, 1977, Ser. No. 860,683

Int. Cl.<sup>2</sup> H01H 1/38, 1/42

U.S. Cl. 200—163

7 Claims



1. In an electrical terminal block of the kind having an insulative base; a pair of spaced posts on said base; a pair of parallel fixed links connected to said posts and extending toward each other, one of said fixed links being relatively long, and the other being relatively short; and a movable link slidingly mounted on said long link for movement between a connected position in which it engages both fixed links, and a disconnected position in which it engages only said one link; the improvement which comprises:
  - said one link being formed of flat electrically conductive material and having an elongated closed-ended slot formed therein axially of the link, the end of said slot adjacent its associated post being squared off, and the other end of said slot being rounded;
  - said other link being formed of flat electrically conductive material and having a slot therein, the end of said slot adjacent its associated post being rounded and aligned with the rounded end of the slot of said first link, and the other end of said slot being open;
  - said movable link being formed of three layers of electrically conductive material, two of said layers being proportioned and arranged to lie on top of said one link and fit under said other link in the connected position and the third of said layers being proportioned and arranged to lie under said one layer and being connected to one of said first layers by a substantially flat tab passing through the slot in said one link;
  - said movable link being provided with a locking screw passing through all three layers of the movable link, through the slot in said one link, and, when the movable link is in the connected position, through the slot in said other link;
  - said parts being proportioned so that when said movable link is in the connected position said locking screw is abutted against the aligned rounded ends of said slots and the third layer of said movable link is abutted against a surface of said insulative base, and when said movable link is in the disconnected position, said substantially flat tab is abutted against the squared-off end of the slot in said one link.

4,160,890

## APPARATUS FOR INDICATING THE POSITION OF ROTATING MECHANICAL ELEMENTS

Gerald L. P. Chard, Taunusstein; Joachim Haupt, Wiesbaden, and Werner Zuber, Hemsbach, all of Fed. Rep. of Germany, assignors to Motorola, Inc., Schaumburg, Ill.

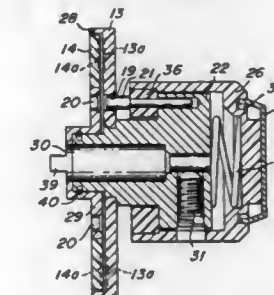
Filed Apr. 15, 1977, Ser. No. 788,050

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618114

Int. Cl.<sup>2</sup> H01H 9/00

U.S. Cl. 200—308

6 Claims



1. A switching apparatus for positioning indicating dials, comprises:
  - a first rotatable shaft,
  - a first dial skirt having a first array of indication symbols disposed thereon on a plane transverse to the axis of said first rotatable shaft,
  - means for coupling said first dial skirt to said first rotatable shaft so that said first dial skirt can be rotated by said first rotatable shaft about the axis thereof,
  - a second rotatable shaft co-axially disposed with said first rotatable shaft,
  - a second dial skirt having a second array of indication symbols disposed thereon on a plane transverse to the axis of said first rotatable shaft, said second dial skirt fixedly mounted on said second rotatable shaft,
  - a rotatable knob for rotating said first rotatable shaft to rotate said first dial skirt while said knob is held in a first position, and
  - means for coupling said first rotatable shaft to said second rotatable shaft so that they can be rotated in synchronism about the axis of said first rotatable shaft by said knob while said knob is pressed in the axial direction into and held in a second position.

4,160,891

## FURNACE FOR THE INDUCTIVE HEATING OF METALLIC WORKPIECES

Friedrich Scheffler, Remscheid, Fed. Rep. of Germany, assignor to AEG-Eltherm, G.m.b.H., Remscheid, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,096

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642099

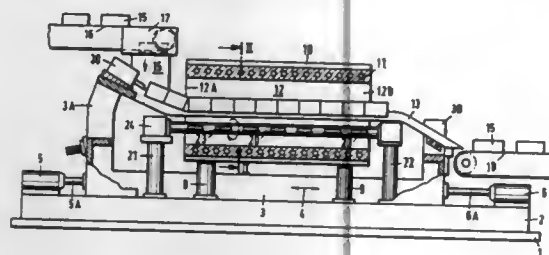
Int. Cl.<sup>2</sup> H05B 5/16

U.S. Cl. 219—10.69

4 Claims

1. A furnace for the inductive heating of metallic workpieces comprising:
  - an induction coil body encompassing the furnace space;
  - a workpiece receiver for receiving workpieces and transporting said workpieces through such furnace space in a longitudinal direction, said receiver including a pair of hollow tubes extending through such space in parallel;
  - driving means outside said coil body for causing reciprocating forward and backward movement of said receiver in said longitudinal direction; and
  - means within said furnace for lifting said workpieces from said receiver during backward movement of said receiver so that said workpieces remain longitudinally stationary

during said backward movement of said receiver, said workpieces advancing through said furnace space during said forward movement of said receiver, said lifting means including a pair of rotatable bars extending through said



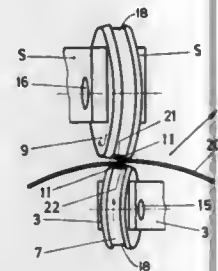
space below said tubes, said bars having cam surfaces thereon and means for rotating said bars so that said cam surfaces engage said workpieces to lift said workpieces from said tubes.

#### 4,160,892 METHOD AND APPARATUS FOR SEAM WELDING OVERLAPPED EDGES

Paul Opprecht, Im hinteren Bernold, Bergdietikon, Switzerland 8962, and Martin Kaul, Bellikon, Switzerland, assignors to Paul Opprecht, Bergdietikon, Switzerland  
Filed Mar. 18, 1976, Ser. No. 668,312  
Claims priority, application Switzerland, Mar. 19, 1975, 3483/75; Jul. 21, 1975, 9488/75

Int. Cl.<sup>2</sup> B23K 11/06  
U.S. Cl. 219—83

18 Claims



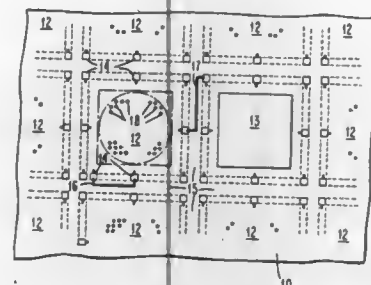
1. A method for longitudinally seam welding two overlapping metal sheet edges which comprises feeding two sheet edges of similar thickness to a welding station having opposed rollers on opposite sides of said overlapped sheets, guiding said edges along rigid guide means and biasing said edges toward said rigid guide means by resilient means, other than the metal sheet, which engages said sheet to cause said sheet edges to be in accurate overlapping relationship at said welding station, said overlapped being no more than 6 times the thickness of the edges, continuously feeding a pair of flat wire electrodes to the welding station between the rollers at the same rate as the overlapped edges and passing the overlapped edges in a longitudinal direction between said pair of electrodes so that the electrodes are located on opposite sides of the overlapped seam, said electrodes having a width of from 2 to 3 times that of the overlap, compressing the overlapped edges together between said electrodes at the welding station and simultaneously energizing the electrodes to thereby longitudinally seam weld the overlapped edges whereby the edges are welded with a continuously renewable electrode surface and the seam extends beyond the overlapped region into adjacent portions of the non-overlapped regions of the sheet edges, whereby the outer sheet edges are welded to the adjacent sheet to prevent each outer sheet edge from bending away from the adjacent sheet.

#### 4,160,893 INDIVIDUAL CHIP JOINING MACHINE

Robert H. Meyen, Salt Point; Karl J. Puttlitz; Karl Schink, both of Wappingers Falls, and Herbert Wenskus, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,768  
Int. Cl.<sup>2</sup> B23K 1/00, 1/04  
U.S. Cl. 219—85 BA

14 Claims



1. In soldering apparatus for multichip modules each having a substrate provided with a plurality of chip sites on one face thereof, and wherein the elevation of each chip site within a module may vary and the thickness of different substrates may vary, a combined chip handling and heating tool comprising: a selectively energizable infrared radiant heat source, a reflector surrounding said heat source and having a first opening therein, a quartz plate covering said first opening, and a shield covering said plate and having a second opening therein thru which said radiant energy passes, said reflector being operative to direct radiant energy through said plate and said first and second openings and concentrate such energy in a focal plane over an area of substantially the same size as a chip, said plane being external to said tool and located a fixed distance therefrom; said shield being operative to limit said radiant energy to only the chip being worked on by said tool, said shield having a conical tip extending from said plate and terminating in an edge surrounding said second opening, said edge being adapted to engage a chip; first means adapted to selectively connect said tool to a vacuum source for selectively holding a chip against said edge; said tip and plate defining a chamber communicating with said first means whereby the lower pressure is said chamber due to connection to the vacuum source allows a chip to be held against said edge due to atmospheric pressure; and second means for producing relative movement between said tool and a chip site to locate a chip thereon and to locate said tool so that solder on the chip is in said focal plane of said radiant energy.

#### 4,160,894 METHOD AND APPARATUS FOR THE FOCAL FORM CUTTING OF A MOVING WEB OF MATERIAL BY A LASER BEAM

Kurt Stemmler, Neuwied; Peter Langenbeck, Frickingen, and Günter Ehlscheld, Neuwied, all of Fed. Rep. of Germany, assignors to Winkler & Dunnebler Maschinenfabrik und Eisengiesserei KG, Neuwied am Rhein, Fed. Rep. of Germany Division of Ser. No. 685,601, May 12, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,569  
Claims priority, application Fed. Rep. of Germany, May 14, 1975, 2521530

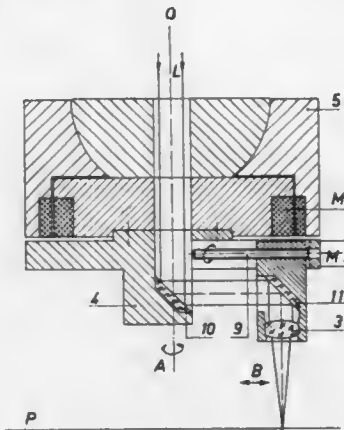
Int. Cl.<sup>2</sup> B23K 9/00  
U.S. Cl. 219—121 L

6 Claims

1. An apparatus for focal form cutting of a two-dimensional pattern on a moving web of material by means of a laser beam, wherein the focal lens of the laser beam is moved only in a

plane parallel to the web in a circular path with further components of movement being superimposed thereon, and wherein all components of movement are variable in speed and controlled independently of one another, said apparatus including:

- a laser beam source,
- a lens focussing the laser beam on said web, the improvement comprising:
- a rotatable lens carrier,
- means for attaching said lens eccentrically to the axis of rotation of said rotatable lens carrier on said lens carrier such that the optical axis of the lens is substantially parallel to the axis of rotation of said rotatable lens carrier,
- means for passing the laser beam through the axis of rotation of the lens carrier,



surface mirrors carried by said rotatable lens carrier for passing said laser beam from said rotatable lens carrier axis of rotation of said lens axis, a bearing element for said lens carrier and arranged on a rotatable carrier whose axis of rotation is parallel to the axis of rotation of the lens carrier and is spaced radially therefrom, and means for independently driving said rotatable lens carrier about its axis of rotation and for driving said bearing element about its axis of rotation; whereby, a two-dimensional pattern form cutting of the moving web is achieved whose greatest radius is determined by the eccentricity of the lens in relation to the lens carrier axis of rotation and the distance between the axis of rotation of said lens carrier and said bearing element.

#### 4,160,895 WELDING MACHINE FOR VALVE HOUSINGS

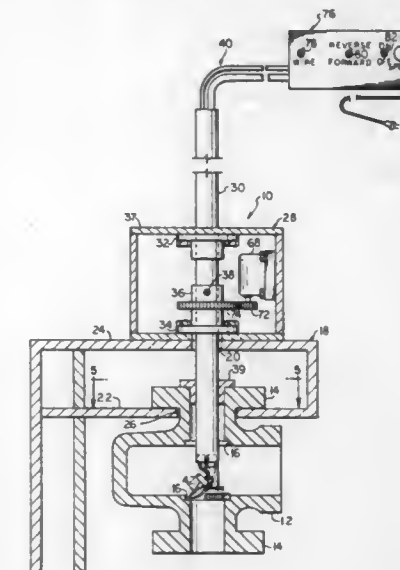
Troy K. Hopper, 5943 Nunn, Houston, Tex. 77086  
Filed Feb. 9, 1977, Ser. No. 766,912  
Int. Cl.<sup>2</sup> B23K 9/04

U.S. Cl. 219—125.1

11 Claims

1. Apparatus used in the rebuilding of the body of a valve, comprising: electrical welding means for adding material inside the valve body having an electrode to provide an arc; first support means having a first portion including an opening for detachably supporting the valve body, the first portion being aligned with a hole in a second portion of the support means, second support means for rotably supporting the electrode of said welding means in a relatively fixed relationship to the valve body having an elongate tubular member extending through the hole in said first support means sec-

ond portion and through the opening in the first portion; and



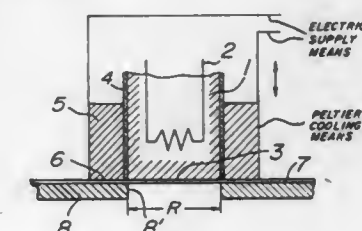
driving means for rotating the tubular member and electrode about the elongate axis of the tubular member for adding the material to a desired location in the valve body.

#### 4,160,896 HEAT DEVELOPING DEVICE FOR LOCALLY HEAT DEVELOPING A DRY PHOTOSENSITIVE FILM

Ryo Fujimori, and Hiromi Ito, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Oct. 18, 1977, Ser. No. 843,348  
Claims priority, application Japan, Oct. 21, 1976, 51-125458  
Int. Cl.<sup>2</sup> H05B 1/00

U.S. Cl. 219—216

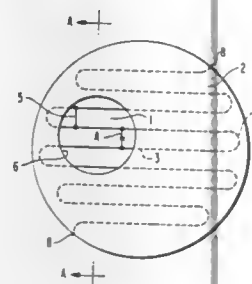
3 Claims



1. A heat developing device for a photo-sensitive film having at least one portion to be heat-developed, said device comprising a supporting means for supporting said photosensitive film and having an opening which is equal in configuration to said portion to be heat developed, a heating means provided at its lower side with a heating surface brought into contact with said portion of said photosensitive film and locally heating and heat-developing said portion only, and a cooling means surrounding said heating means and placed in contact with the periphery of said portion to be heat-developed, said cooling means including means for forcedly cooling the periphery of said portion thereby preventing heat transfer thereto.

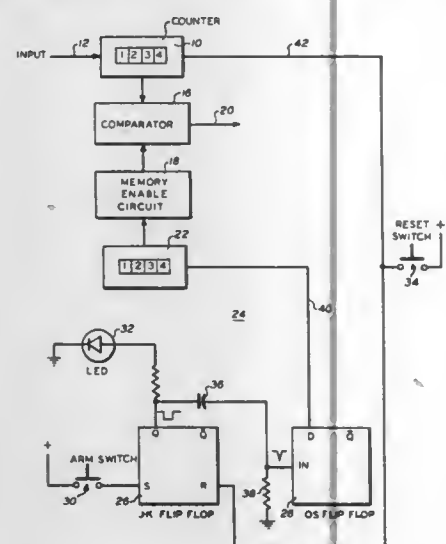


**4,160,897**  
**CERAMIC HEATING ELEMENT WITH RESTIVITY ADJUSTED TO A CERTAIN VALUE**  
 Yoichi Makino, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan  
 Filed Jun. 13, 1978, Ser. No. 915,099  
 Claims priority, application Japan, Jun. 14, 1977, 52-69450  
 Int. Cl.<sup>2</sup> H05B 3/16  
 U.S. Cl. 219—543



1. In a ceramic heating element comprising a ceramic substrate having on a surface thereof a resistor pattern of an electrically conductive material and a ceramic electrically insulating layer disposed on the surface of the ceramic substrate with the resistor pattern thereon, the improvement wherein the ceramic electrically insulating layer includes an opening through which a part of the resistor pattern is exposed, the effective length of the resistor pattern being changed through said opening, whereby the resistivity of the resistor pattern is adjusted to within a particular range, and a heat resistant electrically insulating coating filling the opening in the ceramic electrically insulating layer.

**4,160,898**  
**SAFETY CIRCUIT TO PREVENT THE OBTAINING OF A FALSE COUNT FROM PRESETTABLE COUNTERS**  
 Joseph Gaon, 64-50 229th St., Bayside, N.Y. 11364  
 Filed Nov. 25, 1977, Ser. No. 854,520  
 Int. Cl.<sup>2</sup> G06M 3/02; H03K 21/36  
 U.S. Cl. 235—92 PE



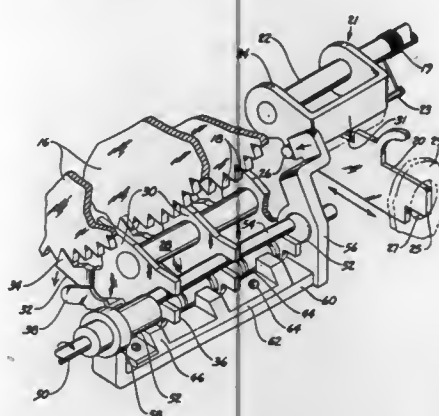
1. In a counting device having a load register for registering a count characteristic of units to be counted, a memory enable circuit adapted for storing a number characteristic of the required number of units to be counted, a comparator coupled to both said load register and said memory enable circuit for providing an output when the load register reaches a count equal to the number stored in said memory enable circuit, an

9 Claims

**4,160,899**  
**DETENT REMOVER FOR A POSTAGE METER**  
 James G. Montagnino, Monroe, Conn., and Frederick J. Staudinger, North Salem, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 27, 1977, Ser. No. 864,207  
 Int. Cl.<sup>2</sup> G07G 1/00  
 U.S. Cl. 235—101

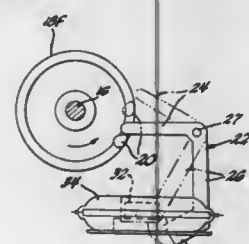
8 Claims



1. In a postage meter of the type having a housing containing a plurality of selector gears in operative engagement with print wheels for changing the setting of the print wheels upon actuation of the selector gears, the combination comprising: eccentric means rotatably received with the housing, detent means rotatably supported within the housing having a first portion in engagement with a selector gear and a second portion engageable with said eccentric means whereby upon rotation of said eccentric means said detent means rotate out of engagement with said selector gear.

**4,160,900**  
**MILEAGE SWITCH AND LATCH MEANS**  
 John A. Carol, Jr., Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.  
 Filed Jan. 11, 1978, Ser. No. 868,608  
 Int. Cl.<sup>2</sup> G01C 22/00; G06M 3/00  
 U.S. Cl. 235—132 E

3 Claims



1. In a vehicular odometer having an array of cylindrical coaxial number wheels interconnected to rotate stepwise in digital counting action and in sequence to indicate numerically

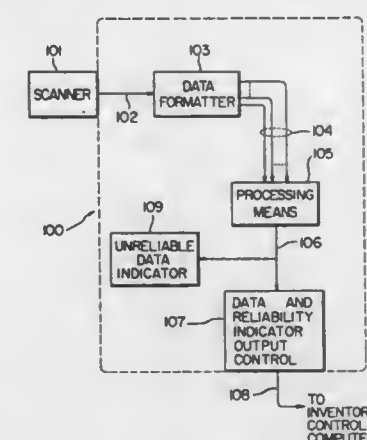
adjustable display device coupled with said memory enable circuit and adapted to transfer thereto of different numbers, and a safety switch circuit having a first flip-flop responsive to said load register completing its count, a second flip-flop coupled with said first flip-flop, and reset means coupled with said first flip-flop, said first flip-flop being responsive to said reset means upon activation thereof for triggering of said second flip-flop, means coupling the output of said second flip-flop with said display device for transferring the number in said display device to said memory enable circuit upon triggering of said second flip-flop.

the cumulative vehicle travel, for use with a device to be controlled upon attainment by the vehicle of a predetermined cumulative travel, the improvement comprising magnetically actuated switch means operatively connected to the device to be controlled for selectively controlling same, a permanent magnet positioned adjacent the magnetically actuated switch means so as to direct its lines of flux through a predetermined space toward the magnetically actuated switch means for magnetically actuating the switch means, magnetic shunt means pivotally mounted adjacent a predetermined one of the number wheels and positioned so as to be selectively pivotable into the space between the permanent magnet and the magnetically actuated switch means to provide a shunted magnetic path for the lines of flux away from the magnetically actuated switch means, and actuating means formed at a predetermined location on the predetermined one of the number wheels indicative of the predetermined cumulative vehicle travel for selectively pivoting the magnetic shunt means from a first position out of the path of the lines of flux to a second position in the path of the lines of flux upon movement of the actuating means by the predetermined one of the number wheels into an operative relationship with the magnetic shunt means.

**4,160,901**  
**COINCIDENCE TESTING METHOD FOR ENHANCING THE RELIABILITY OF OUTPUT DATA FROM A LABEL READER**

Sadao Nakanishi; Kazuhiro Suzuki; Nobufumi Tokura, and Shinichiro Endo, all of Ise, Japan, assignors to Shioko Electric Co., Ltd., Tokyo, Japan  
 Filed Mar. 29, 1978, Ser. No. 891,218  
 Claims priority, application Japan, Apr. 22, 1977, 52-46990  
 Int. Cl.<sup>2</sup> G06K 5/00, 7/14; G08C 9/06  
 U.S. Cl. 235—437

2 Claims



1. A coincidence testing method for enhancing the reliability of the output data from a label reader having a scanner and adapted to read a bar code consisting of a plurality of bars comprising the steps of:

obtaining a set of at least three binary signals, each signal in said set being representative of a particular different point along a particular bar as scanned by the scanner;  
 ordering said binary signals in said set in a sequence corresponding to the ordering of the particular different points along the particular bar;  
 testing successive adjacent pairs of said ordered binary signals for coincidence;  
 providing a binary output decision for the particular bar if predetermined coincidence tests are met; and  
 determining that a reliable output decision cannot be made for the particular bar if predetermined coincidence tests are not met.

**4,160,902**  
**OPTICAL READING HEAD**

Hans van Wijngaarden, Leidschendam, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

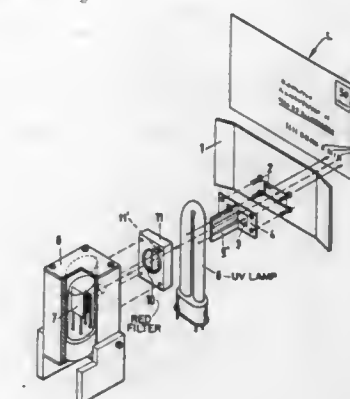
Filed Dec. 14, 1977, Ser. No. 860,627

Claims priority, application Netherlands, Dec. 23, 1976, 7614338

Int. Cl.<sup>2</sup> G01N 21/38

U.S. Cl. 250—461 R

3 Claims

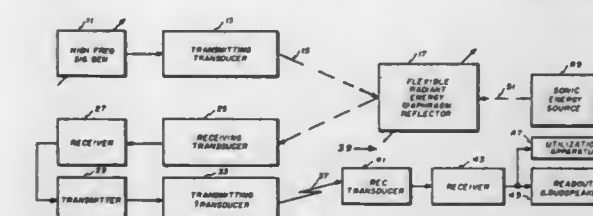


1. Optical reading head, particularly for reading luminescent code bars on documents and the like, which reading head comprises: a source of light for irradiating the bars, a detector for collecting the rays emitted by the bars, a filter material transmitting ultraviolet radiation at least adjacent the documents, and a hollow tubular optical guide for the filtered rays to said detector.

**4,160,903**  
**ELECTRO-OPTICAL RADIO SYSTEM**  
 John C. McKechnie, and Herbert Berke, both of Maitland, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Filed Oct. 7, 1977, Ser. No. 840,201  
 Int. Cl.<sup>2</sup> H04B 9/00

U.S. Cl. 250—199

30 Claims



1. A communication system, comprising in combination: means for generating a first electrical signal having a predetermined frequency greater than zero Hertz;  
 means connected to the output of said first electrical signal generating means for transducing the first electrical signal generated thereby into a first radiant energy signal having a frequency identical thereto and for effecting the broadcast thereof along a first path;  
 means spatially disposed along said first path from said transducing means for receiving said first radiant energy signal therefrom and for effecting the timely reflection thereof as a second radiant energy signal along a second path that is different from the aforesaid first path, said first radiant energy signal receiving and reflection effecting means being sufficiently flexible to be vibration responsive to a

predetermined third radiant energy signal received from along a third path;  
means spatially disposed along said second path for receiving said second radiant energy signal after the reflection thereof by the aforesaid receiving and reflection effecting means and for transducing it into a second electrical signal proportional thereto; and  
means connected to the output of said second radiant energy signal transducing means for effectively broadcasting a fourth signal that is proportional to said second electrical signal throughout a predetermined ambient environmental medium.

#### 4,160,904 DIGITAL CONTINUOUS FOCUS PROPORTIONAL CONTROLLER

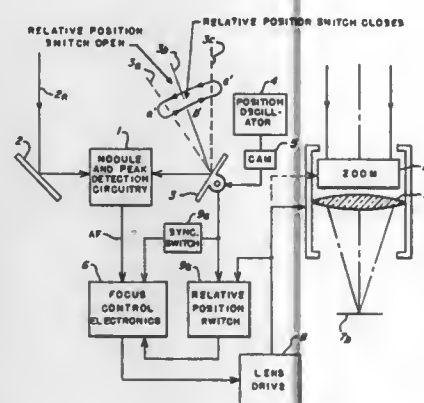
Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 19, 1977, Ser. No. 834,852

Int. Cl.<sup>2</sup> G01J 1/20

U.S. Cl. 250—201

10 Claims



1. Apparatus for use with an autofocus system which includes an optical element to be positioned proximate the desired focus position, the system producing first, second and third output signals, each of which may alternate between first and second states during operation of the system, comprising:  
a first counter having a reset input and an output;  
a first latch having a load input, a second input and an output;

means connecting the reset input of said first counter to the system so that said first counter is reset to its base whenever the first output signal changes from its first state to its second state and so that, prior to a change in the second output signal from its second state to its first state, said first counter begins counting whenever the third output signal changes from its first state to its second state but is reset again whenever the third output signal changes from its second state back to its first state and, subsequent to a change in the second output signal from its second state to its first state, said first counter is reset to its base and starts counting without being again reset until at least the first output signal changes from its second state back to its first state;

means connecting the second input of said first latch to the system and connecting the load input of said latch to the output of said first counter so that prior to a change in the second output signal from its second state to its first state, said first latch is loaded from and follows the count of said first counter but when there is a change in the second signal from its second state to its first state, said first latch holds its count until either (i) the third output signal changes to its first state, in which case said first latch is again loaded from and follows said first counter until there is a subsequent change in the third output signal to its second state, at which time said first latch again holds its

count or (ii) a change in the first signal from its second state to its first state; and  
motive means connected to the output of said first latch and to the optical element and operable to move the optical element in accordance with the count in said first latch when the first signal changes from its second state to its first state.

#### 4,160,905 ELECTRON MICROSCOPES

Julian P. Davey, Manchester, England, assignor to Kratos Limited, England

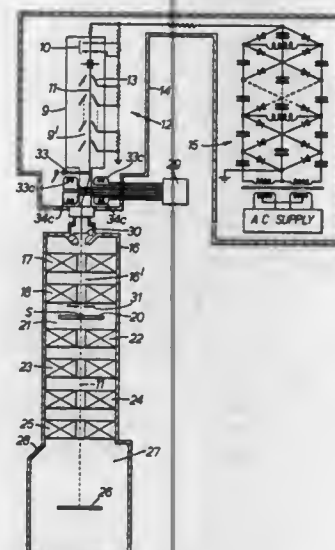
Filed Nov. 18, 1977, Ser. No. 852,717

Claims priority, application United Kingdom, Nov. 27, 1976, 49581/76

Int. Cl.<sup>2</sup> G01N 23/00

U.S. Cl. 250—311

5 Claims



1. An electron microscope comprising  
an evacuable housing,  
a microscope column, forming part of said housing,  
an electron gun in said housing,  
an accelerator in said housing for receiving electrons from the gun and directing a beam of the electrons into the microscope column,  
means in the column for locating a specimen in a specimen position therein,  
two members in said housing and spaced apart on the axis of the column, each member having an aperture therein, the apertures being aligned to allow the electron beam to pass therethrough,  
an ion-stopping member in said housing disposed with respect to said members to block the straight line paths along which any ions could otherwise pass through said apertures to said specimen position and  
electron guide means for constraining said beam of electrons travelling from the electron gun to the specimen position to follow a path which avoids the ion-stopping member.

#### 4,160,906 ANATOMICALLY COORDINATED USER DOMINATED PROGRAMMER FOR DIAGNOSTIC X-RAY APPARATUS

Herbert E. Daniels, Brown Deer; Paul M. Stivender, Waukesha; Paul C. Schanen, Wauwatosa; and Robert V. King, Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,218

Int. Cl.<sup>2</sup> A61B 6/00; H05G 1/46

U.S. Cl. 250—322

14 Claims

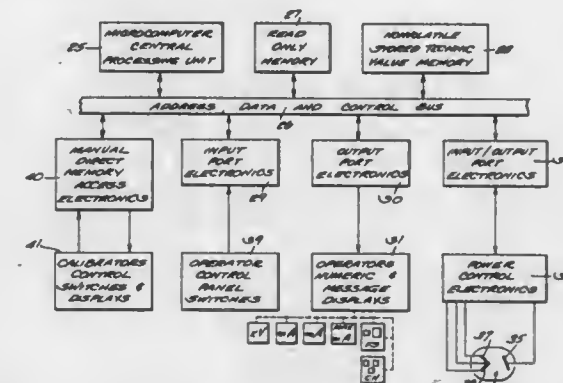
1. An anatomically based programmed diagnostic x-ray

system for conducting diagnostic technics comprising an x-ray tube and power control means coupled with said x-ray tube for controlling its power,

central processor means having input and output means and including memory means for storing data corresponding with parameters including the x-ray tube current (mA), x-ray tube kilovoltage (kV), exposure time (S), current-exposure time product (mAs), use and nonuse of automatic exposure control (AEC), x-ray field area sensor means and x-ray tube focal spot size for various x-ray technics and for storing programs to control said processor means,

automatic exposure control means included in said power control means,

a plurality of manually operable switch means having active and inactive states including technic selector switch means related, respectively, to anatomical areas composing the entire human body and user dominating switch means operable to select kV, mA and mAs independently at the option of the user,



said technic selector switch means being operable, respectively, to active states for selecting programs which determine the parameters for a predetermined priority x-ray technic for the anatomical area related to the technic selector switch means which has been operated and in which technics said AEC means is activated,  
means for coupling said switch means to said input means to enable said processor means to scan the states of said switch means, said processor means responding to switch means in active states by executing a program which results in providing output data corresponding with parameters for the selected technic, said x-ray tube power control means being responsive to said output data,  
said technics for anatomical areas, which have such x-ray transmissive properties as to be incompatible with use of AEC, being programmed to determine a fixed exposure time for the selected technic and to deactivate said automatic exposure control means simultaneously.

#### 4,160,907 THERMO-OPTICAL FAR INFRARED SYSTEM

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 8, 1978, Ser. No. 875,969

Int. Cl.<sup>2</sup> H01J 31/49

U.S. Cl. 250—330

4 Claims

1. An infrared imaging device including a thin-film thermal-optical transducer having an image side and an other side; means for projecting an infrared image on said image side of said transducer;  
a chopper interposed between said means and said transducer;  
radiation producing means for projecting a read radiation on said image side of said transducer;

scanning image detecting means adjacent said transducer on said other side; and

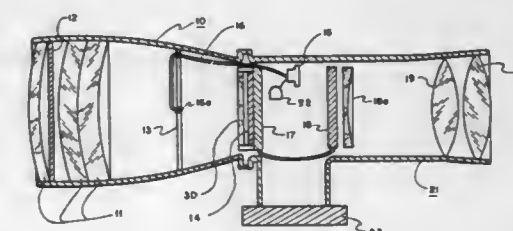


image display means connected to said image detecting means.

#### 4,160,908 PARTICULATE ENHANCEMENT FOR GENERATOR CONDITION MONITORS

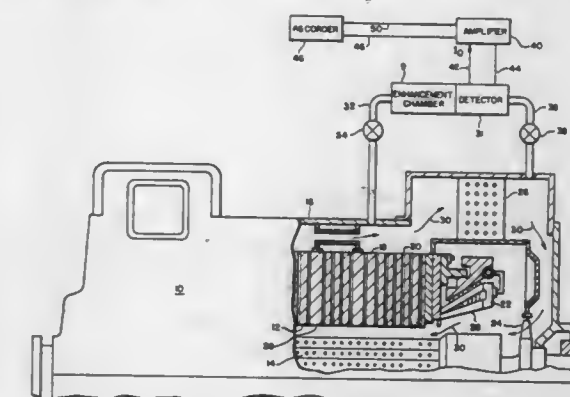
D. Colln Phillips, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1978, Ser. No. 873,341

Int. Cl.<sup>2</sup> G01T 1/18

U.S. Cl. 250—381

11 Claims



1. An apparatus for detecting submicron particulates in a gaseous carrier, said apparatus comprising:  
a particulate enhancement section which includes a platinum surface for said gaseous carrier to flow over whereby the number of submicron particulates in said gaseous carrier increases;  
a mixing and gas ionizing section, operably joined to said particulate enhancing section to receive said gaseous carrier and enhanced particulates therefrom, said mixing and gas ionizing section including means defining a delay volume for receiving the particulate bearing gas; and which also includes a source of radiation to effect ionization of the gaseous carrier; and  
a detector section operably joined to said mixing and gas ionizing section to receive the ionized gas and entrained particulates therefrom, said detector section including spaced electrodes having an applied voltage and between which current flow occurs by means of the ionized gas to produce a variable signal the magnitude of which is proportional to the amount of entrained particulates.

#### 4,160,909 X-RAY TUBE ARRANGEMENTS

Robert J. Froggatt, Southall, England, assignor to EMI Limited, Hayes, England

Filed Jul. 27, 1977, Ser. No. 819,578

Claims priority, application United Kingdom, Aug. 12, 1976, 76 33555

Int. Cl.<sup>2</sup> H05G 1/30

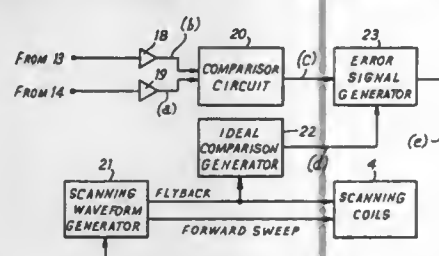
U.S. Cl. 250—402

5 Claims

1. An arrangement for monitoring repetitive movement of a



source of X-radiation along an elongated, X-ray emissive anode/target member, included in an X-ray tube, as a result of repetitive deflection of a beam of electrons, generated in said tubes, to and fro along said member, wherein the deflection is effected by deflection means associated with the tube and supplied with repetitively occurring deflection waveforms, the arrangement including detector means having a plurality of detector devices disposed to receive said radiation through a common aperture dimensioned to cause the radiation to shift



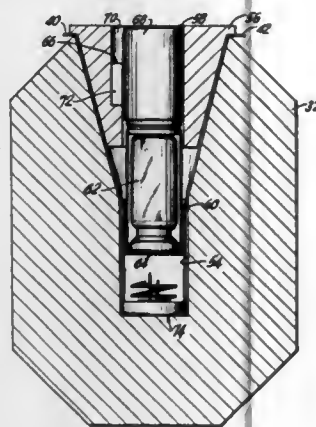
across said devices as said movement occurs, said devices producing electrical output signals indicative of the actual progress of said movement, means for generating datum electrical signals indicative of the desired progress of said movement, means for comparing said electrical output signals with said datum electrical signals to produce error signals indicative of discrepancy between said actual progress and said desired progress, and means utilizing said error signals to modify said deflection waveforms in a sense tending to reduce such discrepancy.

#### 4,160,910 RECHARGEABLE 99MO/99MTC GENERATOR SYSTEM

Alfred K. Thornton, New Hampton, and Frank E. Cerone, New Windsor, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,332  
Int. Cl.<sup>2</sup> G01N 21/24; G01T 1/00  
U.S. Cl. 250—432 PD

10 Claims



1. A rechargeable, radioisotope, generator system, comprised of, in combination:

(1) a case assembly having contained therein:

- (a) a portable shipping shield, comprised of, in combination:
  - (i) a main shield having an inner chamber communicating to the exterior of said main shield, said chamber having a tapered portion thereof terminating with a greater diameter at the exterior surface of said main shield,
  - (ii) a closure shield tapered to engage said main shield to provide a radiological safe seal and yet provide conduit means for ingress and egress of liquids, said closure shield having an inner bore traversing its center in alignment with the axis of and about the same diameter of said chamber,
  - (iii) a plug which is slidably mounted within said inner

bore and which can be retained in a fixed position therein by a lip on its upper surface which engages a retaining shelf on at least one portion of said closure shield; said plug being retained in place by removable retaining means which when said plug is disengaged from said shelf it can slidably move through at least a portion of said bore and into said inner chamber,

(iv) a vial for radioisotopes contained within and in alignment with said chamber and having a pierceable septum on at least one end thereof, and

(v) conduit and piercing means contained within said chamber for piercing said septum and permitting ingress of eluant from the exterior of said shipping shield and egress of radioisotope from said vial to the exterior of said shipping shield;

(b) a shielded generator having means for absorbing and retaining a parent radioisotope from which a daughter radioisotope can be eluted,

(c) a reservoir of eluant disposed in said assembly and in close proximity to said shielded generator and shipping shield, and having disposed thereon a sterile, one-way-check valve communicating to the atmosphere,

(d) first conduit means communicating from said reservoir to said shipping shield, second conduit means communicating from said shipping shield to said shielded generator, and third conduit means communicating from said shielded generator to the exterior of said assembly;

(2) a shelf traversing the front exterior of said assembly, a portion of which is shielded by exterior shielding means,

(3) a shielded elution vial into which said eluate is dispensed, and

(4) filter means disposed at a point between said vial and said third conduit means.

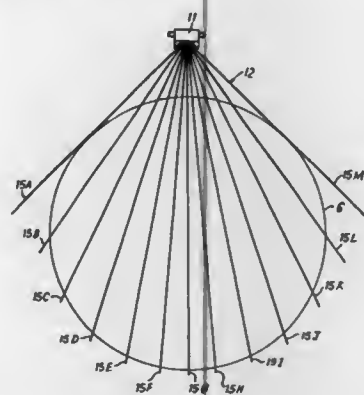
#### 4,160,911 FAN BEAM CT APPARATUS THE INTERBEAM ANGLE OF WHICH VARIES WITH POSITION ACROSS THE FAN

Godfrey N. Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Filed Mar. 17, 1977, Ser. No. 778,578  
Claims priority, application United Kingdom, Mar. 18, 1976, 11026/76

Int. Cl.<sup>2</sup> A61B 6/02  
U.S. Cl. 250—445 T

5 Claims



1. Computerised tomographic apparatus including a source of a fan-shaped distribution of penetrating radiation, such as X-radiation, support means supporting said source so that said radiation propagates across a location at which a desired cross-sectional slice of a patient's body can be disposed, detector means, including a plurality of detector devices, supported by said support means and disposed to receive radiation, propagated along respective beams within said distribution after it has traversed said location, scanning means for causing said support means, and with it said source and said detector means, to move angularly around said location causing, on the one

hand, said source to irradiate said location from a plurality of angularly spaced positions therearound and, on the other hand, the detector means to receive radiation traversing said location from each of said positions, and wherein the angle between adjacent ones of said beams varies across said distribution to cause substantially uniform spacing of beams which are substantially parallel to each other.

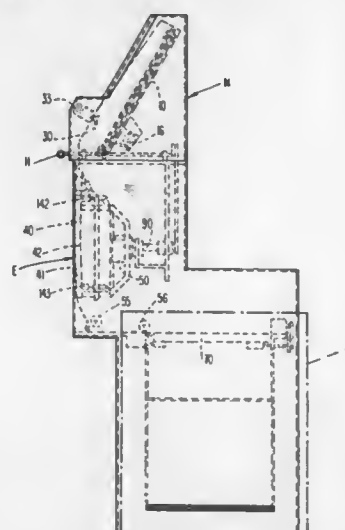
#### 4,160,912 AUTOMATIC CHEST X-RAY MACHINE

William J. Hogan, Medco Company, P.O. Box 236, Bally, Berks County, Pa. 19503

Filed Nov. 9, 1977, Ser. No. 849,939  
Int. Cl.<sup>2</sup> G11B 1/00

U.S. Cl. 250—468

12 Claims



1. A chest X-ray machine having supporting frame members and also comprising:

- a. a film-exposure station, said station including a vertically-disposed film-receiving holder having a pocket closed at its lower edge and opened at its top, said holder having a vertically-disposed front X-ray-transmissive plate and a vertically-disposed rear movable pressure plate;
- b. a film guide chute above the open top of said holder;
- c. a magazine located above the film-exposure station having a tray for containing a supply of cut-sheet unexposed film, said magazine being inclined relative to the vertical;
- d. means, including vacuum cup means, for lifting a topmost sheet of film from the film supply by an upward sliding motion and for carrying it to a position above said guide chute such that upon release of suction the released film sheet will drop through said guide chute into the pocket of said holder;
- e. means for moving said rearward pressure plate forwardly against the film sheet in said holder pocket, said moving means moving the lower part of said pressure plate forwardly against the lower part of said film sheet before the upper part of said pressure plate is moved forwardly against the upper part of said film sheet, thereby to force air upwardly out of said holder pocket;
- f. a horizontally-disposed stub pivot shaft journaled in at least one of the frame members and located on the center axis of, and rearward of, said exposure station;
- g. support means mounting said exposure station vertically on said stub shaft for angular movement therewith;
- h. means for opening the closed bottom of said film holder pocket; and
- i. film transport means for transporting a film sheet which drops through the open bottom of said holder pocket at said exposure station toward film processor means.

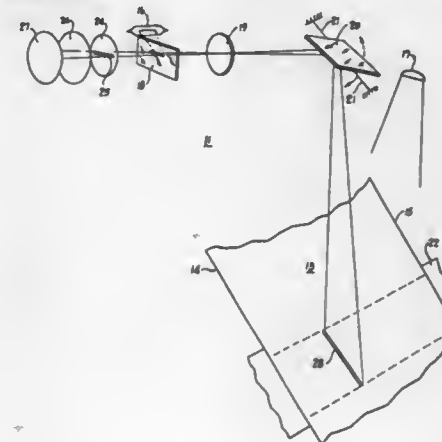
#### 4,160,913 WEB SCANNING APPARATUS

Irving R. Brenholdt, Stratford, Conn., assignor to St. Regis Paper Company, New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,064  
Int. Cl.<sup>2</sup> G01N 21/32

U.S. Cl. 250—563

16 Claims



1. A web scanning apparatus for a web movable along a path, comprising, in combination, a radiation detector, scanning means to establish a flying spot scanning path to periodically scan transversely of the moving web from a point preceding one side of the web and across the web to a point beyond the other side of the web to thus also scan a dark background on either side of the web, means to irradiate at least the flying spot scanned portion of the web, means to transmit to said detector the image of the flying spot scanned portion of the web, a differentiator connected to differentiate the output of said detector, and an output characterization circuit connected to the output of said differentiator to characterize between increasing and decreasing signals relative to a normal output from said detector during scan of the web signalling a wrinkle and a hole, respectively, in the web.

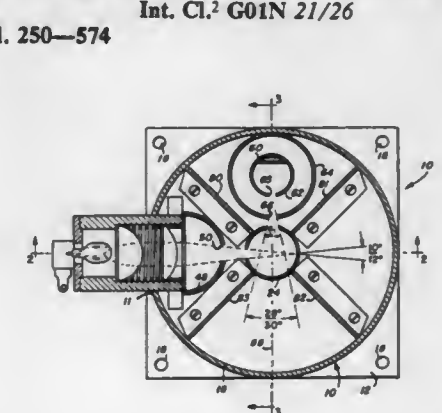
#### 4,160,914 APPARATUS FOR MEASURING OF PARTICULATE SCATTERING IN FLUIDS

William H. Wynn, Hillsborough, Calif., assignor to Monitek, Inc., Redwood City, Calif.

Filed Dec. 16, 1977, Ser. No. 861,218  
Int. Cl.<sup>2</sup> G01N 21/26

U.S. Cl. 250—574

17 Claims



1. An optical apparatus for the measurement of light scattered by a particulate within a fluid in the direction of a scattering axis, comprising: a housing;

a tubular enclosure confining the fluid with the particulate, having at least an optically transparent portion, disposed in said housing;

a light source for emitting light in the direction of an illumination axis into said housing and through said optically transparent portion;

a light sensitive detector having an active area which is disposed within said housing at right angles to and centrally with the scattering axis;

a first baffle surrounding said detector, said first baffle having a first aperture centered about said scattering axis;

a second baffle, identical in shape to but larger than said first baffle, surrounding said first baffle and being equidistantly spaced therefrom, said second baffle having a second aperture centered about said scattering axis;

the shape and size of said first and second apertures and the lateral extent of said active area being selected so that a line generatrix touching the wall of said second aperture and passing through said first aperture and intersecting said active area generates a solid surface defining a predetermined solid angle of acceptance within which light will reach said detector.

4,160,915

Patent Not Issued For This Number

4,160,916

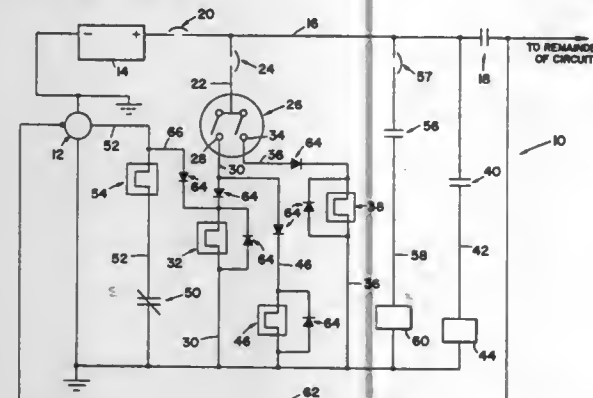
**ENGINE STOP-START ELECTRICAL CIRCUIT**  
Stamos I. Papisideris, Bristol, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 12, 1977, Ser. No. 832,252

Int. Cl.<sup>2</sup> H02G 3/00

U.S. Cl. 307—10 R

9 Claims



1. An electrical circuit for controlling an engine, comprising:
  - (a) electrical power source means for starting and turning off the engine;
  - (b) an engine shut-off solenoid being energizable only after turning off the engine; and
  - (c) means for generating current on start-up of the engine and after turning off the engine and for energizing said shut-off solenoid with said current that is generated after the turning off the engine.

4,160,917

**ENERGY CONSERVING TRANSFORMER POWER SUPPLY SYSTEM**

Herman Wald, 97-11 Horace Harding Expressway, Queens, N.Y. 11368

Filed Jan. 4, 1978, Ser. No. 866,935

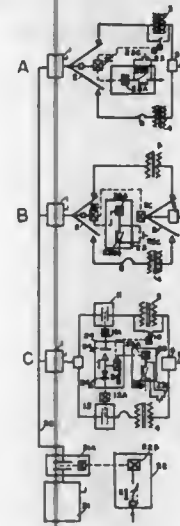
Int. Cl.<sup>2</sup> H02J 9/06

U.S. Cl. 307—64

9 Claims

1. An energy conserving transformer power supply system having a plurality of power transformer groups at various remote locations, a common power feeder, a common power switching means, a master program timer switching means, said common power feeder supplying said power transformer groups, said master program timer switching means opera-

tively connected to said power switching means controlling the power flow through said common power feeder, each of said transformer groups comprising: a main transformer of large capacity, an auxiliary transformer of relatively small capacity, a common load, a transfer switching means, a relay control means, said transfer switching means adapted to alternately transfer power to said common load through said main transformer or said auxiliary transformer, each of said relay control means operatively connected to said common feeder,



4,160,918

**INTEGRATED LOGIC CIRCUIT**

Artashes R. Nazarian, ploschad Junosti, 3, kv. 16; Vyacheslav Y. Kremlev, korpus 423, kv. 81; Vilyam N. Kokin, korpus 441, kv. 115, and Nikolai M. Manzha, korpus 401, kv. 49, all of Moscow, U.S.S.R.

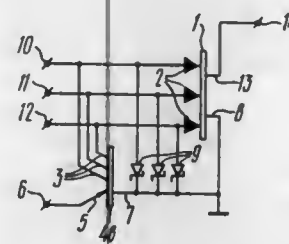
Filed Dec. 29, 1977, Ser. No. 865,362

Claims priority, application U.S.S.R., Jan. 6, 1977, 2438345

Int. Cl.<sup>2</sup> H03K 19/08, 19/12, 19/34

U.S. Cl. 307—205

8 Claims



1. An integrated injection logic circuit comprising:
  - a switching element having a unipolar FET with a plurality of gates, a source and a drain, said gates serving as inputs of said logic circuit and said drain serving as an output of said circuit;
  - a load transistor having a plurality of collectors, an emitter and a base area, said transistor having its collectors connected to respective gates of said unipolar FET and said base area combined with said source of said unipolar FET and grounded;

a power supply connected to said emitter of said load transistor;

a plurality of double-pole gating elements connected to said gates of said unipolar FET and to said base area of said load transistor, the conduction voltage of said gating elements being lower than that across p-n junctions of respective gates of said unipolar FET.

4,160,919

**EXCLUSIVE-OR CIRCUIT**

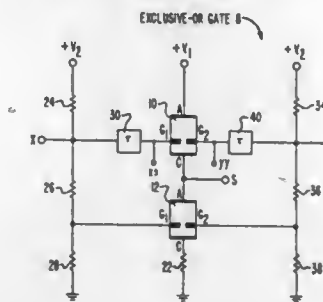
Walter R. Curtice, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,482

Int. Cl.<sup>2</sup> H03K 19/32, 19/08

U.S. Cl. 307—216

4 Claims



1. A circuit having first and second input terminals, each adapted to receive a stream of logic 1 signals and logic 0 signals, comprising:

a first transferred electron logic device (TELD), having first and second Schottky-barrier gates equidistant from the anode thereof, said anode adapted to connection to a positive terminal of a bias voltage source;

a second TELD having first and second Schottky-barrier gates equidistant from the anode thereof, said anode thereof being connected at an output junction to the cathode of said first device, the cathode of said second device being adapted to connection to the negative terminal of said bias voltage source;

delay means connected to said input terminals for respectively coupling said signals from said first and second input terminals to said gates of said first device, said first device forming a domain in response to one of said signals being a logic 1, thereby causing a logic 1 signal to be provided at said output junction; and

divider means connected to said input terminals and said gates of said second device for respectively coupling a fraction of said input signals from said first and second input terminals to said gates of said second device, said second device forming a domain in response to both of said second signals being a logic 1, whereby a signal representative of a logic 0 is provided at said output junction.

4,160,920

**BISTABLE ELEMENT AND A SWITCH CIRCUIT COMPRISING SUCH A BISTABLE ELEMENT**

Henri Courier de Méré, Paris, France, assignor to Blicosa Société de Recherches, France

Filed Jul. 15, 1977, Ser. No. 816,256

Claims priority, application France, Jul. 21, 1976, 76 22294

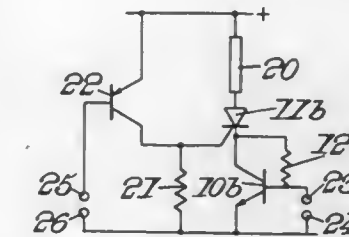
Int. Cl.<sup>2</sup> H03K 17/72

U.S. Cl. 307—252 C

8 Claims

1. A bistable device having a first state control input and a second state control input and exhibiting a first stable state of conductivity after a pulse has been applied to its first state control input, and exhibiting a second state of conductivity, different from the first, after a pulse has been applied to its second state control input, said device comprising: an element of the thyristor type having anode, cathode and gate electrodes and an element of the transistor type having emitter, collector

and base electrodes; a first control input connected to said gate electrode of the thyristor type element for determining a first stable state of conductivity of the device; a second control input connected to said base electrode of the transistor type element for determining a second stable state of conductivity, different from the first, of the device; said first and second control inputs comprising on and off control inputs of the device and each comprising a first conducting contact, a second conducting contact associated with said first conducting contact, and means connecting the second contacts to a prede-



termined potential point; means connecting the emitter-collector path of said transistor type element in relation to the anode-cathode path of said thyristor type element so that one of the two stable conductivity states of said transistor type element causes the intensity of current flowing through said thyristor type element to be cancelled, said second stable state of conductivity corresponding to the disabled state of said thyristor type element; and an amplifier element connected between said first control input and said gate electrode of said thyristor type element.

4,160,921

**THYRISTOR CONTROL**

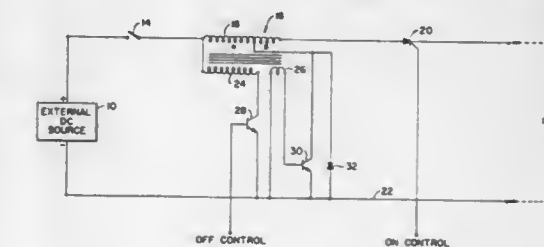
Charles W. Burrell, deceased, late of Los Altos, Calif., by Mildred G. Burrell, executrix, 226 Verano Dr., Los Altos, Calif. 94022

Filed Jun. 5, 1978, Ser. No. 912,539

Int. Cl.<sup>2</sup> H03K 3/36; H03B 7/06

U.S. Cl. 307—252 M

14 Claims



4. A control circuit for interrupting the supply of direct current (D.C.) power from an external source to a load, the control circuit comprising

a common lead;

a reverse blocking triode thyristor having separate anode, cathode and gate leads;

a transformer having a saturable core, a tapped primary winding, a first secondary winding and a second secondary winding, the first secondary winding being wound in opposition to the primary winding;

first switching means;

electronic, second switching means having a pair of switching terminals and a control terminal; and wherein the D.C. power supply, the primary winding, the thyristor, the load, and the common lead are connected together in series;

the first secondary winding is connected in series with the



first switching means between the common lead and the D.C. power supply;  
 the second secondary winding is connected between the common lead and the control terminal of the second switching means;  
 one of the switching contacts of the second switching means is connected to the common lead and the other is connected to the tap of the transformer's primary winding;  
 gate trigger means for applying a gate signal to the thyristor gate lead to cause the thyristor to become conductive and thereby cause electrical current to flow through the primary winding and the load whereby a magnetic field is generated in the primary winding and transformer core;  
 switch trigger means for causing the first switching means to become conductive for a time period sufficient to saturate the transformer core and generate a magnetic field in the core which is of a magnitude and polarity to enable it to oppose and cancel the magnetic field in the core, produced by the primary winding, and then to open circuit the first switching means;  
 whereby a current is momentarily generated in the primary winding which opposes and cancels the current produced therein by the D.C. power supply and a voltage is also generated in the second secondary winding which biases the second switching means to become conductive and shunt the primary winding tap to the common lead, to sustain this condition and to hold the potential of the anode of the thyristor below the negative potential of the D.C. supply so that the thyristor is positively turned off.

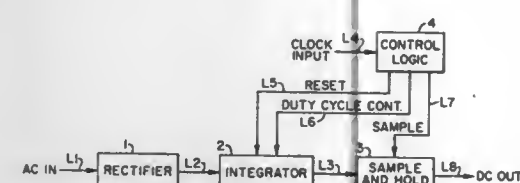
#### 4,160,922 METHOD OF GENERATING A DIRECT CURRENT CONTROL SIGNAL FROM A NOISY ALTERNATING CURRENT SIGNAL

James E. Rickenbacker, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Aug. 2, 1977, Ser. No. 821,120  
 Int. Cl.<sup>2</sup> H03K 5/00

U.S. Cl. 307—261

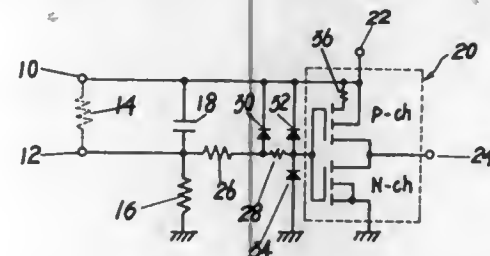
2 Claims



1. Apparatus for generating a direct current output signal proportional to the amplitude of an alternating current signal comprising:

- a rectifier, said rectifier being responsive to said alternating current signal for generating a rectified output signal related to said alternating current signal;
- integrator means for integrating the rectified output signal from said rectifier for a selected number of half cycles of said alternating current signal, said integrator means including means responsive to a variable control signal for varying the integrating time constant of said integrator means; and
- means for sampling the output level of said integrator means and for holding the sampled output level for a selected time.

4,160,923  
**TOUCH SENSITIVE ELECTRONIC SWITCHING  
 CIRCUIT FOR ELECTRONIC WRISTWATCHES**  
 Hidetoshi Maeda, and Toshihiro Ohba, both of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan  
 Continuation of Ser. No. 655,213, Feb. 4, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,087  
 Claims priority, application Japan, Feb. 5, 1975, 50-15727  
 Int. Cl.<sup>2</sup> H03K 3/353; H02H 9/04; G04B 19/00; H03K 17/60  
 U.S. Cl. 307—308 4 Claims



1. A touch sensitive electronic switching circuit for electronic wristwatches including a C-MOS inverter having a P-channel MOS field effect transistor and an N-channel field effect transistor, the gates of the respective transistors being coupled together and the drains of said transistors being coupled together, first and second input terminals for said C-MOS inverter across which an operator's body completes an electrical circuit to initiate switching of said C-MOS inverter from one state to another, a bias voltage source of a first level coupled to the source electrode of said P-channel transistor, a bias voltage source of a second level coupled to the source electrode of said N-channel transistor, said first level being higher than said second level, a pull-down resistor connecting said second input terminal with said bias voltage source of said second level, means connecting said first input terminal to said bias voltage source of said first level, and means connecting said second input terminal to a common gate terminal of the P and N channels of the C-MOS inverter, the improvement comprising:

resistor means of a high resistive value connected between said bias voltage source of said first level and the source electrode of said P-channel transistor, the ratio of the resistance of said resistor means to the resistance of said pull-down resistor being within a predetermined range.

#### 4,160,924 CRYOGENIC TEMPERATURE OPERATED MAGNETIC RECIPROCATING MOTOR SYSTEM

Elton M. Botts, Mattoon, Ill., assignor to Energy 76, Inc., Mattoon, Ill.

Filed Jul. 7, 1977, Ser. No. 813,761  
 Int. Cl.<sup>2</sup> H02K 33/00

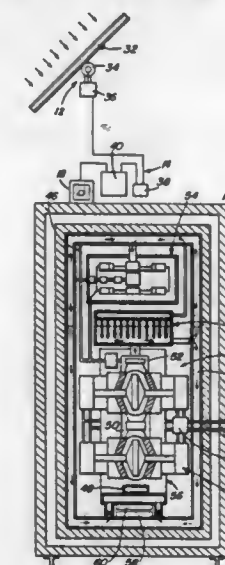
U.S. Cl. 310—17

9 Claims

1. In combination with a source of cryogenic cooling medium and a source of electrical energy, a power generating plant incorporating at least one converter means, said converter means including an insulated housing enclosing an elongated motor chamber, a pair of axially spaced electromagnetic coil assemblies mounted within the chamber and substantially extending across approximately its ends, an armature movably mounted within the housing chamber between the coil assemblies and disposed for reciprocal movement therebetween, means connected to said source of electrical energy for controlling the supply and polarity of the electrical energy conducted to the coil assemblies to effect the said movement of the armature, a power shaft connected to the said armature and disposed for sealed extension through the said coil assemblies

and housing and out of the chamber, and insulated conduit means connecting with the housing for simultaneously con-

ducting frequency power being derived from said secondary winding.



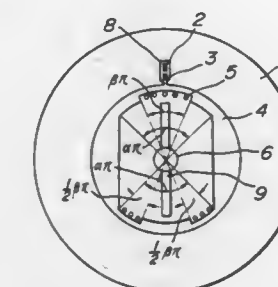
#### 4,160,925 QUADRUPLE FREQUENCY CONVERTER

Fujio Ishikawa, Yokohama, Japan, assignor to Toyo Denki Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1977, Ser. No. 820,458  
 Claims priority, application Japan, Aug. 18, 1976, 51-97794  
 Int. Cl.<sup>2</sup> H02K 47/18

U.S. Cl. 310—160

4 Claims



1. A frequency converter of a synchronous rotating machine type, comprising:

- (a) a stator having a polyphase primary winding and a polyphase secondary winding, said primary winding and said secondary winding having a number of poles in the ration of 1 to 4; and
- (b) a freely rotating rotor having a number of salient poles which is the same number as said poles of said primary winding, said salient poles each having center and outer portions and being divided into first and second groups, in which one salient pole of said first group has a center portion providing a narrower air gap between said rotor and said stator than said outer portions of said one salient pole and another salient pole of said second group has a center portion providing a wider air gap between said rotor and said stator than said outer portions of said another salient pole, said rotor further including small poles of said first group which are narrower in width than said one salient pole and located within  $\pm\pi/2$  from the center of said one salient pole, whereby said primary winding is connectable to an ac source to operate the converter as a synchronous motor and power output machine of quadruple frequency of the source frequency, the quadruple

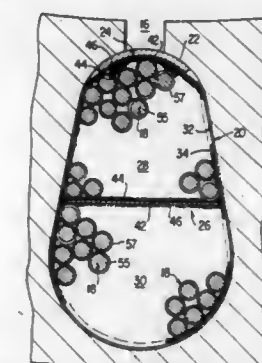
#### 4,160,926 MATERIALS AND IMPREGNATING COMPOSITIONS FOR INSULATING ELECTRIC MACHINES

Lloyd S. Cope, Villa Park, and Ladislav J. Rejda, Arcadia, both of Calif., assignors to The Epoxylite Corporation, Anaheim, Calif.

Filed Jun. 20, 1975, Ser. No. 588,847  
 Int. Cl.<sup>2</sup> H02K 3/36

U.S. Cl. 310—215

18 Claims



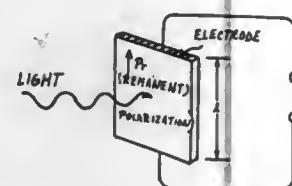
1. A random wound electric machine having a stator impregnated with a cured impregnating material comprising:

- (a) a plurality of slots contained in said stator, each slot having a wall which defines a channel into which electrical coils are inserted through an opening in the stator;
- (b) a plurality of windings contained in each of said slots;
- (c) a layer of material disposed within each of the slots which encircles the windings within each slot and bridges the opening of each slot, the layer of material comprising a layer of insulative material disposed in contact with the wall of the slot and a first layer of fabric in contact with the layer of insulative material which is wettable, impregnable and compressible, having a free surface energy greater than the surface tension of the impregnating material used for its impregnation and having capillary sized interstices disposed within the fabric which retain the impregnating material to produce a substantially void free fill of impregnating material between the fabric and the windings, the fabric being compressed by contact with the windings to substantially fill voids disposed between the wall and the windings with the fabric;
- (d) the layer of material disposed within each of the slots comprising a slot liner and a reinforcing layer which bridges the opening in the stator for each slot, the slot liner and reinforcing layer each including the first fabric layer compressed by the windings, the reinforcing layer also including a second fabric layer compressed by contact with the first fabric layer of the slot liner, and having capillary sized interstices which retain the impregnating material to produce a substantially void free fill of impregnating material between reinforcing material and the windings; and
- (e) the fabric layer being wetted by the impregnating material prior to curing and impregnated with cured impregnating material by retention of the impregnating material within the capillary sized interstices.

4,160,927  
**FERROELECTRIC CERAMIC DEVICES**  
 Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
 Division of Ser. No. 533,365, Dec. 16, 1974, Pat. No. 4,051,465, which is a continuation-in-part of Ser. No. 411,853, Nov. 1, 1973, Pat. No. 3,855,004. This application Apr. 5, 1977, Ser. No. 784,761

Int. Cl.<sup>2</sup> G21D 7/00  
 U.S. Cl. 310—302

2 Claims



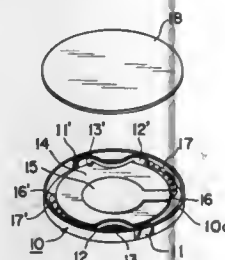
1. An electrical battery apparatus comprising, a substrate of a radioactively ionized polycrystalline ferroelectric ceramic material disposed between two conductive electrodes, and electrical means for remanently polarizing said substrate in a predetermined direction.

4,160,928  
**CASE ASSEMBLY FOR PIEZOELECTRIC RESONATOR**  
 Toshihiko Nakayama, and Kenji Takei, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Continuation of Ser. No. 685,257, May 11, 1976, which is a continuation of Ser. No. 523,924, Nov. 14, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,140

Claims priority, application Japan, Nov. 20, 1973, 48-130515  
 Int. Cl.<sup>2</sup> H01L 41/10  
 U.S. Cl. 310—353

6 Claims



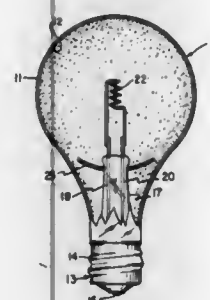
1. An oscillator case assembly comprising a thickness shear oscillator element having two surfaces, an energizing electrode attached onto each surface of the oscillator element and fine electrical lead means having members connected electrically at ends of each of said electrodes for energizing said electrodes, said case assembly further comprising a case element shaped into a shell and made of a solid insulating material, preferably glass or ceramic material, a pair of thin layer conductive elements, each extending from an inside surface through a peripheral surface to an outer surface of said case element and serving as part of lead-in or lead-out means for energizing said electrodes, and a pair of conductive retainer members arranged in diametrically opposite arrangement to each other, each retainer member being formed from a rectangular metal strip and having a shaped portion adapted for receiving and supporting a portion of the periphery of said oscillator element, each of said retainer members being electrically connected between one of said members of said lead means and one of said pair of conductive elements.

4,160,929  
**INCANDESCENT LIGHT SOURCE WITH TRANSPARENT HEAT MIRROR**  
 Luke Thorington, Easton, Pa.; Peter Walsh, Stirling, N.J.; Ronald Koo, Upper Montclair, N.J., and Wolfgang Thourer, Verona, N.J., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Mar. 25, 1977, Ser. No. 781,355  
 Int. Cl.<sup>2</sup> H01K 1/14, 1/32

U.S. Cl. 313—112

33 Claims



1. An incandescent electric lamp comprising: an envelope, incandescent filament means within said envelope for producing upon incandescence energy in the visible and infrared range upon the application of electrical current thereto, means electrically connected to said filament means adapted for supplying electrical current thereto, said filament means being located with respect to the interior of the envelope and the major portion of said envelope being shaped with a curved surface such that infrared energy produced by said filament means upon incandescence and reaching the envelope can be reflected back toward said filament means, and a transparent heat mirror coating on a major portion of said envelope curved surface said envelope formed by a layer of a high conductivity metal which is thick enough to reflect infrared energy and thin enough to transmit visible energy and at least one layer of a dielectric material thereon whose index of refraction of the energy in the visible range substantially matches the index of absorption of the metal in the visible range, said coating for reflecting back towards the filament at least an average in excess of about 60% of the energy over the infrared range produced by said filament means and for transmitting therethrough an average in excess of about 60% of the energy over the visible range produced by said filament means which reaches said coating said dielectric material providing phase matching to the visible energy for the metal.

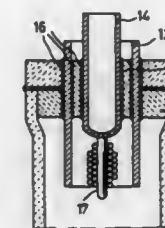
29. An incandescent electric lamp comprising a spherical shaped envelope with an elongated neck portion, an incandescent filament within said envelope for producing upon incandescence energy in the visible and infrared range upon application of electrical current thereto, means electrically connected to said filament adapted for supplying electrical current thereto, a coating on the spherical portion of the envelope for reflecting back to the filament at least a part of the infrared energy produced by said filament and for transmitting therethrough a substantial portion of the visible range energy produced by said filament, said reflector means adjacent said neck portion having substantially the same radius of curvature as the spherical portion of said envelope and located with respect to said envelope spherical portion to conform to its contour.

4,160,930  
**ELECTRIC DISCHARGE LAMP WITH ANNULAR CURRENT CONDUCTOR**  
 Antonius J. G. C. Driessen, and Hendricus E. M. C. Vos, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 16, 1976, Ser. No. 723,743  
 Claims priority, application Netherlands, Sep. 29, 1975, 7511415

Int. Cl.<sup>2</sup> H01J 17/04, 61/06  
 U.S. Cl. 313—217

1 Claim



1. An electric discharge lamp which comprises a cylindrical ceramic lamp vessel provided with end seals which mainly consist of ceramic, each of said end seals including a cylindrical current leadthrough for a main electrode and, in at least one of the seals, a current leadthrough for an auxiliary electrode, said current leadthrough for the auxiliary electrode being a cylindrical tube which surrounds the current leadthrough for the main electrode concentrically and is separated therefrom by a ceramic ring, said cylindrical tube which forms the current leadthrough of the auxiliary electrode projecting at least 2 mm into said lamp vessel, said main electrode having a tip which extends axially further into said lamp vessel than said auxiliary electrode disposed in the same end of said lamp vessel, said cylindrical tube consisting of a material selected from the group consisting of tungsten, molybdenum, rhenium and alloys thereof.

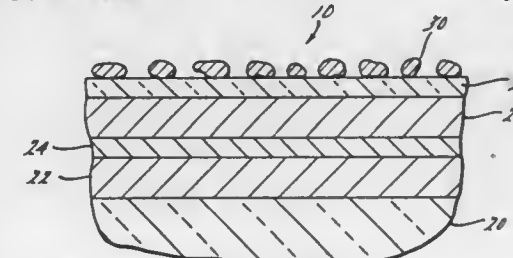
4,160,931  
**SOLID STATE SOURCE OF RADIANT ENERGY HAVING A CONTROLLABLE FREQUENCY SPECTRA CHARACTERISTIC**

John J. Lambe, Birmingham, and Shaun L. McCarthy, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 836,624, Sep. 26, 1977. This application Apr. 14, 1978, Ser. No. 896,408

Int. Cl.<sup>2</sup> H01L 33/00; H05B 33/02  
 U.S. Cl. 313—498

6 Claims

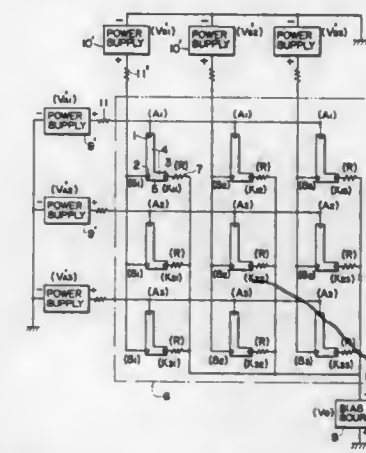


1. An improved solid state source of visible radiant energy comprising: a first electrode element; an insulating layer overlying said first electrode element; and a counter-electrode overlying said insulating layer to form a tunnel junction which generates surface plasmon modes in response to voltage applied between said first electrode and said counter-electrode; wherein said improvement includes means external to said junction for providing optical output coupling of said

surface plasmon modes in a visible light spectra having a high frequency cutoff  $\nu_{co} = |eV|/h$ , wherein  $h$  is the Planck constant,  $e$  is the electron charge and  $V$  is the value of the applied voltage.

4,160,932  
**METHOD OF DRIVING FLAT DISCHARGE PANEL**  
 Shigeo Mikoshiba, Tokyo, and Shinichi Shinada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan  
 Filed Apr. 8, 1977, Ser. No. 785,849  
 Claims priority, application Japan, Apr. 9, 1976, 51-39350  
 Int. Cl.<sup>2</sup> H05B 37/00, 39/00, 41/00  
 U.S. Cl. 315—169.4

8 Claims



1. A method of driving a flat discharge panel disposed in matrix type, said matrix composing: a plurality of first electrodes, said first electrodes being laterally disposed and commonly connected in each lateral line, a plurality of second electrodes, said second electrode being longitudinally disposed and commonly connected in each longitudinal line, a plurality of third electrodes, said respective third electrodes forming a plurality of first discharge spaces together with said respective first electrodes and forming a plurality of second discharge spaces together with said respective second electrodes, and said respective second discharge spaces being formed in common as part of said respective first discharge spaces, resistors connected in series with said respective third electrodes, said third electrodes commonly connected all via said resistors, discharging gas filled in said first and second discharge spaces, said method comprising the steps of: applying predetermined applied voltages  $V_A$  and  $V_S$  for the first and second discharge spaces in advance between said first and third electrodes, and between said second and third electrodes, respectively, where said voltages  $V_A$  and  $V_S$  satisfy the relation,

$$V_A < V_A(on) = V_S + (V_{Abd} - V_{Sm})$$

where  $V_A(on)$  is the applied voltage for the first discharge required for shifting the discharge from the second to the first discharge spaces,  $V_{Abd}$  is the first break down voltage when the second discharge space is discharged, and  $V_{Sm}$  is the second discharge maintenance voltage establishing self-supporting discharge in either of the first and second discharge spaces, varying at least one of  $V_A$  and  $V_S$  so that the values of said

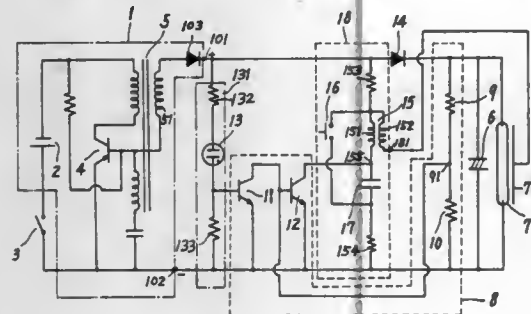


$V_A$  and  $V_S$  of the electrodes of the discharge spaces to be selected and presenting the self-supporting discharge in the second discharge space satisfies  $V_A > V_{A(on)}$ , varying at least one of said  $V_A$  and  $V_S$  so that the values of said  $V_A$  and  $V_S$  between the electrodes in half-selection mode satisfy,

$$V_A < V_{A(on)}$$

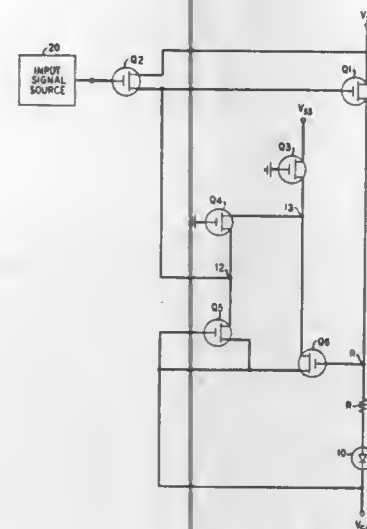
thereby shifting or maintaining the self-supporting discharge in the first and second discharge spaces in the discharge spaces to be selected.

**4,160,933**  
**ACCIDENTAL FLASH PREVENTION IN A PHOTOGRAPHIC FLASH DEVICE**  
Kazuo Tanaka, Neyagawa, Japan, assignor to West Electric Company, Ltd., Osaka, Japan  
Filed Sep. 8, 1977, Ser. No. 831,525  
Claims priority, application Japan, Sep. 30, 1976, 51-118132  
Int. Cl.<sup>2</sup> H05B 41/32  
U.S. Cl. 315-241 P 13 Claims



1. A photographic flash device comprising:
  - a flash discharge tube having discharging and triggering electrodes,
  - a main capacitor connected across discharging electrodes of said flash discharge tube,
  - triggering circuit means including a triggering capacitor connected with a synchronous switch and a triggering transformer for providing a triggering pulse to said triggering electrode for flashing said flash discharge tube upon closing said switch,
  - a voltage indicator for indicating the reaching of a specified level of the voltage of said main capacitor,
  - a DC power source having a power switch for feeding to said indicator and main capacitor in that order a high voltage DC current when said power switch is closed,
  - backward current preventing means connected between one end of said main capacitor and one end of said voltage indicator for allowing said DC current to flow forwardly from said source to said main capacitor while said power switch is closed and for preventing discharge current of said main capacitor from flowing backwardly from said main capacitor to said voltage indicator while said power switch is closed or open, and
  - a safety circuit having a switching means with a control terminal which is connected to said voltage indicator for controlling the charge and discharge of said triggering capacitor respectively when the indicator indicates and stops indication of said specified voltage level.

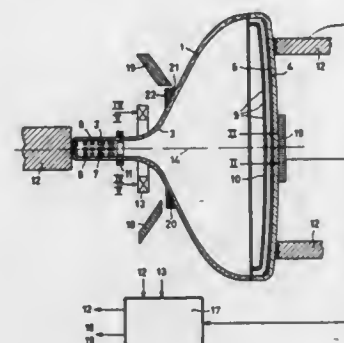
**4,160,934**  
**CURRENT CONTROL CIRCUIT FOR LIGHT EMITTING DIODE**  
Howard C. Kirsch, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Aug. 11, 1977, Ser. No. 823,729  
Int. Cl.<sup>2</sup> G05F 1/56; H05B 43/00  
U.S. Cl. 315-307 12 Claims



7. Semiconductor apparatus comprising:

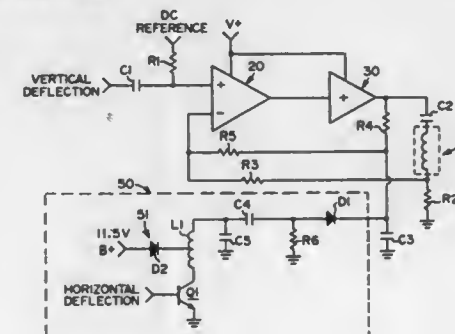
- (a) a first transistor having a low current carrying terminal and a pair of high current carrying terminals, one of said high current carrying terminals being connected to an output terminal to which is connected a light emitting diode in series with a ballast resistor;
- (b) a second transistor having a low current carrying terminal for connection thereto of an input signal source and having a pair of high current carrying terminals, one of the said high current carrying terminals of the second transistor being connected to the said low current carrying terminal of the first transistor;
- (c) third, fourth, and sixth transistors each having a low current carrying terminal and a pair of high current carrying terminals;
- (d) means for connecting mutually together one of the high current carrying terminals of each of the third, fourth, and sixth transistors;
- (e) a fifth unidirectional current inhibiting transistor device connected between the other high current carrying terminals of the fourth and sixth transistors; and
- (f) means for connecting the said other high current carrying terminal of the fourth transistor to said one of the high current carrying terminals of the second transistor; said first, second, third, fourth, fifth, and sixth transistors being MOS transistors characterized in that the transconductance of the fifth transistor is less than that of the third transistor, the transconductance of the third transistor is less than those of both the fourth and the sixth transistors, and the transconductances of both the fourth and sixth transistors are less than that of the second transistor.

**4,160,935**  
**METHOD AND APPARATUS FOR PROVIDING REFERENCE POINTS FOR MOUNTING THE MAGNETIC DEFLECTION UNIT OF A COLOR DISPLAY TUBE**  
Theodorus C. Groot; Pieter Huijter, and Johannes G. van Lent, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.  
Filed Sep. 7, 1977, Ser. No. 831,334  
Claims priority, application Netherlands, Sep. 17, 1976, 7610353  
Int. Cl.<sup>2</sup> H01J 29/56  
U.S. Cl. 315-379 9 Claims



5. A method of determining the position of the axis of an electron beam in a display tube having an envelope, an electron gun for generating the electron beam and a display screen located in the path of the beam, said method comprising the steps of energizing said gun to thereby generate said electron beam, producing, in the path of the beam, a dynamic multipole magnetic field in a plane normal to the longitudinal axis of said tube, moving one of said tube and the field relative to the other until said beam produces a dot on said screen, and locating the position of said dot with respect to the center of said field to thereby determine the position of the beam axis which is coincident with a line passing through the center of said field and said dot.

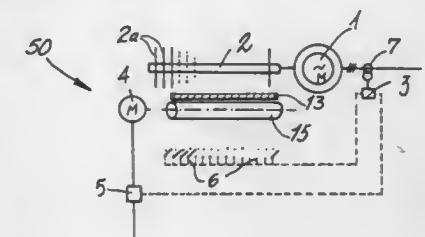
**4,160,936**  
**FAST-START VERTICAL CURRENT FEEDBACK CIRCUIT**  
Tex K. Monroe, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.  
Filed Dec. 14, 1977, Ser. No. 860,148  
Int. Cl.<sup>2</sup> H01J 29/70, 29/72  
U.S. Cl. 315-388 8 Claims



1. In a vertical deflection amplifier including a preamplifier having an input at which is applied a substantially DC feedback signal for the stabilization of the amplifier's DC output, the feedback signal being derived from the amplifier's output and applied to the input from a sampling network character-

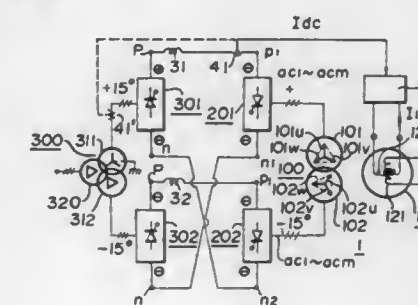
ized by a time-constant substantially longer than the period of the amplifier's AC input signal, the improvement comprising: a fast-start circuit for superimposing a transient voltage on the feedback signal so that the DC output of the amplifier reaches a predetermined quiescent level within a length of time substantially shorter than the sampling network time-constant.

**4,160,937**  
**PROCESS FOR THE CONTROL OF THE FORWARD SPEED OF WORK-PIECES**  
Antonio Florini, Via Olive, 33, Montorio Veronese, Verona, Italy  
Filed Jul. 15, 1977, Ser. No. 816,176  
Claims priority, application Italy, Aug. 25, 1976, 26515 A/76  
Int. Cl.<sup>2</sup> B23Q 5/10, 5/28  
U.S. Cl. 318-39 11 Claims



1. A method for automatically controlling the feed speed of a motor comprising, advancing a work-piece in a feed path at a feed speed, providing a tooling device having a tool member movable in the feed path with a portion engageable with a work-piece for tooling the work-piece and for receiving a negative load from the advancing work-piece which is proportional to the size of the portion of the tool member engaged with the work-piece, sensing the size of the portion of the tool member engageable with the work piece which corresponds with a maximum load admissible on the tooling device, and reducing the feed speed of the work-piece in the feed path when the maximum load determined by the sensing of the portion of the tool member engaged with the work-piece is exceeded.

**4,160,938**  
**MOTOR DRIVE APPARATUS**  
Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Sep. 8, 1977, Ser. No. 831,650  
Claims priority, application Japan, Sep. 29, 1976, 51-117508  
Int. Cl.<sup>2</sup> H02P 5/28  
U.S. Cl. 318-82 8 Claims



1. A motor drive apparatus comprising: an AC motor having G groups ( $G \geq 2$ ) of m-phase AC windings of which each group includes m-phase AC windings with a number M of AC input terminals ( $M \geq 2$ ); G groups of m-phase inverter units of which each unit has a plurality of solid-state switch elements, a pair of DC input

terminals and a number M of AC output terminals respectively connected to the M AC input terminals of each group of the G groups of m-phase AC windings; and each of the solid-state switch elements is connected between one of the DC input terminals and each of the AC output terminals;

G groups of DC power sources of which each group has a pair of DC output terminals;

a closed loop of DC line connecting the pairs of the DC output terminals of the G groups of DC power sources and the pairs of the DC input terminals of the G groups of m-phase inverter units with the DC power sources and the inverter units being alternately arranged in the connection.

4,160,939

## MOTOR SPEED CONTROL SYSTEM

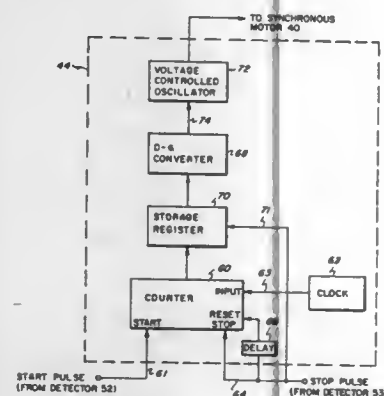
David E. Damouth, Rochester, N.Y., and William F. Gunning, Los Altos Hills, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1977, Ser. No. 832,776

Int. Cl.<sup>2</sup> H02P 5/34

U.S. Cl. 318—723

10 Claims



1. In an apparatus having a motor driven rotating multifaceted polygon for scanning a beam of radiation across a medium in successive scans, a motor speed control system comprising: scan signal means for generating a start of scan signal for each facet;

a counter having the capability of being started and stopped by signals applied thereto;

a clock coupled to said counter for supplying pulses to be counted thereby, said start of scan signal starting said counter;

means for stopping said counter, the number of counts in said stopped counter representing the speed of said multifaceted polygon, the output count being in digital format;

means for converting said digital format signal to an analog signal; and

a voltage controlled oscillator having a nominal frequency output which corresponds to the desired polygon speed, the frequency of said voltage controlled oscillator being changed in response to said analog signal if the actual speed of said polygon is different than said nominal speed, and means for coupling the output of said voltage controlled oscillator to said motor.

# 4,160,940

## METHOD OF AND SYSTEM FOR OPERATING AN INDUCTION MOTOR

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

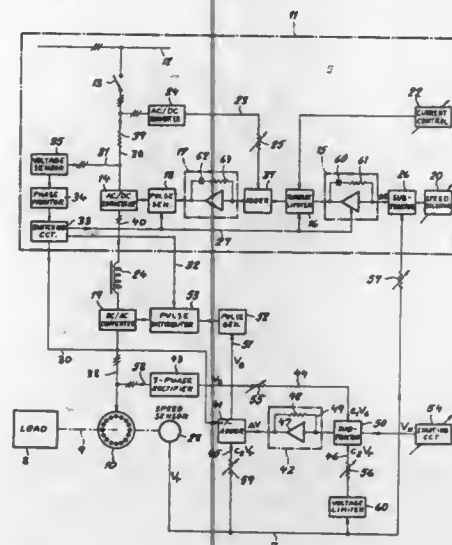
Filed Oct. 3, 1977, Ser. No. 838,942

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 2644748

Int. Cl.<sup>2</sup> H02P 5/34

U.S. Cl. 318—803

13 Claims



1. A method of operating an induction motor having a stator with multiple phase windings and a rotor coupled with a load, comprising the steps of:

energizing said phase windings with a polyphase input current of variable frequency to generate a rotating stator field entraining said rotor with a slip frequency depending on the load and on the magnitude of said input current; maintaining the rotor speed substantially at a selected level by making compensatory adjustments in said magnitude upon deviations of said speed from said level, said compensatory adjustments taking effect with an inherent time lag;

continuously monitoring a stator voltage developed across said phase windings; and

automatically varying the frequency of said input current, in response to changes of said stator voltage due to variations in said slip frequency, in a sense temporarily counteracting such variations within said time lag and at a rate substantially faster than the compensatory adjustment of said magnitude in response to a speed deviation.

4,160,941

## MULTI-PURPOSE BATTERY CHARGER

James A. Bennett, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Dec. 1, 1977, Ser. No. 856,751

Int. Cl.<sup>2</sup> H02J 7/04

U.S. Cl. 320—56

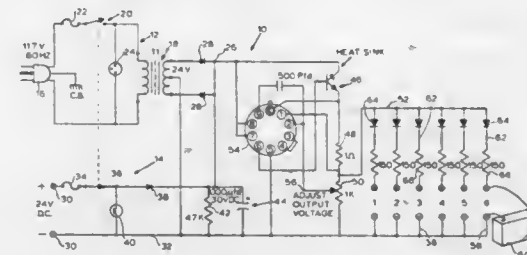
11 Claims

1. A battery charger for simultaneously charging multiple batteries comprising:

(a) a power supply adapted to be connected to either a source of a.c. power or a source of d.c. power, having a first output and a second output supplying a voltage with reference to one another equal to the charging voltage to be applied to the batteries, having a total amperage output capacity to provide fully charging capability to all the batteries simultaneously, and including means for preventing interaction between the sources of power or damage to the charger if connected to both simultaneously;

(b) a plurality of first connectors connected to said first output on one end and adapted to be connected to one terminal of a battery on the other end; and,

(c) a plurality of second connectors connected to said second output on one end and adapted to be connected to the other terminal of a battery on the other end, said second



connectors each including diode means for allowing charging current to pass through a battery connected in proper polarity between one of said first connectors and one of said second connectors while preventing current from the battery from flowing to said power supply or the other batteries being charged simultaneously.

4,160,942

## GOLF BALL TRAJECTORY PRESENTATION SYSTEM

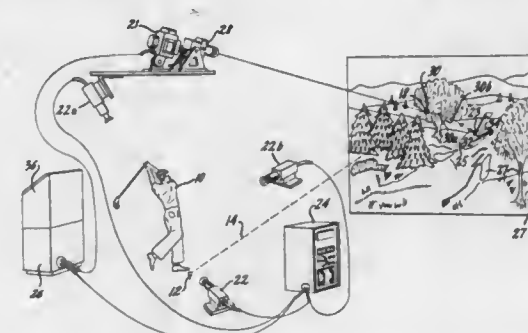
Francis deS. Lynch, Mattapoisett; William Gobush, North Dartmouth; Paul F. Sullivan; Randall W. Moore, both of Acushnet; Steven L. Haas, Marion; Norman O. Fonteneau, Acushnet, and John W. Jepson, Marion, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Sep. 12, 1977, Ser. No. 832,379

Int. Cl.<sup>2</sup> G03B 21/56; A63B 69/36

U.S. Cl. 350—120

5 Claims



1. A golf ball trajectory presentation system comprising:

(a) a plurality of electro-optical sensors for simultaneously monitoring the initial values of velocity, launch angle and spin velocity of said golf ball;

(b) means for calculating at least a major portion of the remainder of the trajectory of said golf ball based on said monitored initial values;

(c) a projection screen;

(d) means for forming an image on said projection screen adapted to substitution for said golf ball; and

(e) means for positioning said image according to the calculated trajectory of said golf ball.

4,160,943

## SWITCHED CURRENT REGULATOR

Daniel F. Hopta, Bridgewater, N.J., and Howard R. Beelitz, Gillett, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 15, 1978, Ser. No. 906,006

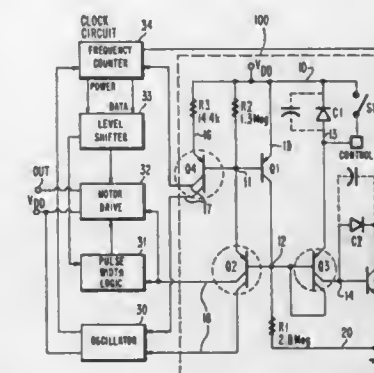
Int. Cl.<sup>2</sup> G05F 3/08; G04C 23/12

U.S. Cl. 323—4

10 Claims

1. In combination with a current regulator of the type in-

cluding first and second terminals for applying an energizing source therebetween; first and second transistors of a first conductivity type having base and emitter and collector electrodes; means connecting the base and emitter electrodes of said second transistor to the collector and base electrodes of said first transistor respectively; means connecting the emitter electrode of said first transistor to said first terminal; first collector load means having substantial direct current impedance connected between the collector electrode of said first transistor and said second terminal; means connected to the collector electrode of said second transistor for conditioning said transistor to conduct current between its collector and emitter electrodes, the foregoing connections forming means tending to regulate the potential between the emitter electrode of said second transistor and said first terminal; and means connected between said first terminal and the emitter electrode of said second transistor for determining the amplitude of the output current from said regulator; means for disabling the



operation of said current regulator and providing a concurrent reset pulse which means comprises:

a third transistor of said first conductivity type having base and emitter and collector electrodes, with said base electrode connected to the base electrode of said second transistor;

a third terminal for supplying reset pulses to which a first collector of said third transistor is connected; and switching means having relatively low impedance when closed and relatively high impedance when open for selectively connecting the emitter electrode of said third transistor to said first terminal, said switching means when closed conditioning the emitter-base junction of said third transistor for clamping the potential between said first terminal and the base electrode of said second transistor at a potential insufficiently large to support current flow between the emitter and collector electrodes of said second transistor.

4,160,944

## CURRENT AMPLIFIER CAPABLE OF SELECTIVELY PROVIDING CURRENT GAIN

Adel A. A. Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,564

Int. Cl.<sup>2</sup> G05F 3/08

U.S. Cl. 323—4

5 Claims

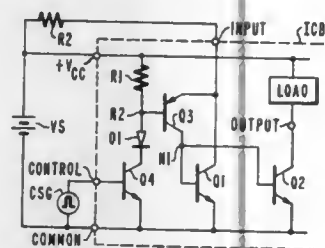
1. A current amplifier comprising: input, common, and output terminals; a first and second transistors of a first conductivity type and a third transistor of a second conductivity type, each of said transistors having a first electrode, and having second and third electrodes at the ends of its principal conduction path, the conductivity of which is controlled responsive to the extent potential between its first and second electrodes exceeds a respective threshold value, the threshold values required for conduction of said first and second transistors



being substantially alike, respective means connecting the first electrodes of said first and second transistors to the third electrode of said third transistor, the second electrodes of said first and second transistors being connected to said common terminal, the third electrode of said first transistor and the second electrode of said third transistor being connected to said input terminal, the third electrode of said second transistor being connected to said output terminal;

a resistance connecting the first electrode of said third transistor to a source of reverse bias potential;

a fourth transistor of said first conductivity type having a first electrode and having second and third electrodes at the ends of its principal conduction path, the conductivity of which is controlled responsive to the extent potential



between its first and second electrodes exceeds a respective threshold value;

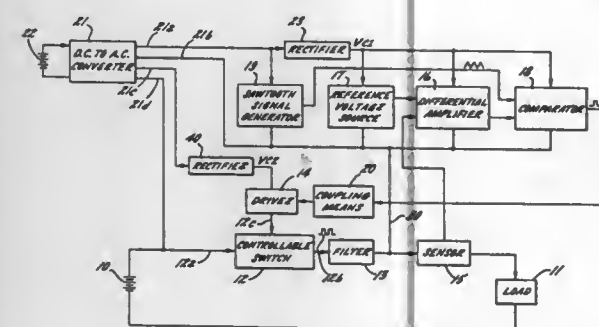
means for selectively applying forward bias signal between the first and second electrodes of said fourth transistor for biasing it into full conduction, and clamping its second and third electrodes close together in potential; and

potential offsetting means connected in series with the principal conduction path of said fourth transistor between the first electrode of said third transistor and said common terminal, said fourth transistor oriented in said series connection so its second and third electrodes are closer, respectively, to said common terminal and to the first electrode of said third transistor, said potential offsetting means providing sufficient potential offset to assure said third transistor adequate potential between its second and third electrodes to function in the normal transistor mode.

**4,160,945**  
**HIGH EFFICIENCY SWITCHING REGULATOR**  
Ian A. Schorr, Chicago, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Sep. 16, 1977, Ser. No. 833,765  
Int. Cl.<sup>2</sup> G05F 1/56  
U.S. Cl. 323—17

15 Claims



1. In a switching regulator for generating controllable pulses from a primary d-c. voltage source and then smoothing said pulses to form a d-c. output that varies according to the changes in said pulses, the improvement comprising a reference voltage source for establishing a d-c. reference signal that varies in magnitude with any variations in the magnitude of the d-c. output but with a substantially

constant differential in magnitude between the reference signal and the d-c. output,

sensing means for generating a signal that varies in accordance with changes in the voltage or current level of the d-c. output,

control means for detecting the difference between said reference signal and the signal from said sensing means and producing a control signal that varies in accordance with changes in said difference,

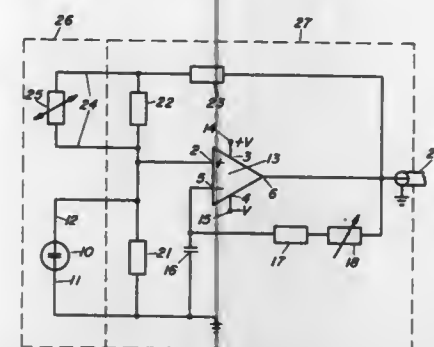
and means responsive to said control signal for adjusting the pulses that are generated and smoothed to form said d-c. output so as to maintain said output at a regulated voltage or current level,

said reference voltage source and said control means including an auxiliary internal power supply and means for returning the current flow through said reference voltage source and control means to said auxiliary internal power supply to minimize power losses in said reference voltage source and control means.

**4,160,946**  
**DEVICE FOR MEASURING CONDUCTIVITY OF A SOLUTION**  
Giovanni Frigato, Medolla, Italy, assignor to Sandoz Ltd., Basel, Switzerland

Filed Oct. 13, 1976, Ser. No. 731,668  
Claims priority, application Italy, Oct. 14, 1975, 69553 A/75  
Int. Cl.<sup>2</sup> G01N 27/42  
U.S. Cl. 324—30 R

3 Claims

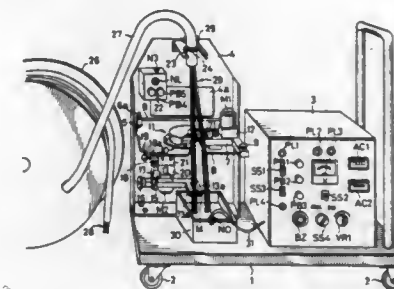


1. A device for measuring the conductivity of a solution, comprising a single elongated probe having at least two electrodes of opposite polarity exposed at its free end for immersion in the solution, and converter means comprising one single difference amplifier operating as an oscillator for converting the output from the electrodes which is proportional to the conductivity of the solution into an output having a frequency which is proportional to said conductivity, the amplifier having two supply inputs, a noninverting input, an inverting input and an output, the output from the one electrode being connected to the non-inverting input of the amplifier and the other electrode being earthed, the output for measurement being that taken from the output of the amplifier, and first and second feedback networks provided between the output of the difference amplifier and the two inputs, in which a variable resistor for adjusting the frequency of the output from the amplifier is included in the first of said networks.

**4,160,947**  
**APPARATUS AND METHOD FOR ELECTRICALLY TESTING MULTI-CORE CABLE**  
Shogo Tanno, Nishinomiya, and Masateru Hirose, Takarazuka, both of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Oct. 25, 1977, Ser. No. 845,363  
Claims priority, application Japan, Oct. 26, 1976, 51-128947  
Int. Cl.<sup>2</sup> G01R 31/12, 31/02  
U.S. Cl. 324—54

25 Claims



1. An apparatus for electrically testing a multi-core cable having a first end and a second end and including a plurality of insulated cores, each core comprising a conductor wire and an insulation covering said conductor wire, comprising: holding means for collectively holding said insulated cores of said multi-core cable at said first end, collective conductor means for collectively rendering conductive the conductor wires of all the cores of said multi-core cable at said first end, the cores of said multi-core cable being isolated from each other at said second end, core pick-up means operatively coupled to said core holding means for picking up said cores on a one by one basis at said first end, said core pick-up means transferring said picked up core along a predetermined path of travel, core separating means provided along said path of travel of said core pick-up means for electrically separating a core picked up by said core pick-up means from said collective conductor means, measuring electrode means provided at said first end along said path of travel of said core pick-up means and adapted to be in contact with the conductor of said picked up and electrically separated core, voltage source means coupled between said measuring electrode means and said collective conductor means at said first end for supplying a voltage therebetween, and means for measuring the electrical conduction characteristic between said electrically separated core in contact with said measuring electrode means at said first end and the remaining cores in contact with said collective conductor means at said first end.

**4,160,948**  
**MONITORING EFFECTS OF A LIQUID ON METALLIC INSTALLATIONS**  
Daniel Tytgat, Brussels, and Albert Degols, Berg, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

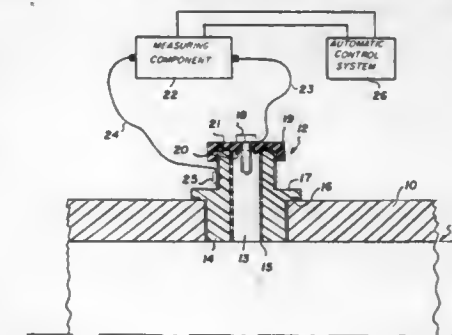
Filed Nov. 28, 1977, Ser. No. 855,388  
Claims priority, application France, Nov. 26, 1976, 76 35990  
Int. Cl.<sup>2</sup> G01R 27/26

U.S. Cl. 324—61 P

18 Claims

1. Process for monitoring the corrosive, erosive and/or encrusting nature of a liquid with respect to a metallic installation, comprising: immersing a metallic probe into the liquid whereby a double layer is created at the interface between the probe and the liquid; immersing an auxiliary electrode into the liquid near the probe so that the auxiliary electrode is electri-

cally insulated from the probe and measuring the differential capacitance of the double layer and the electrical resistance

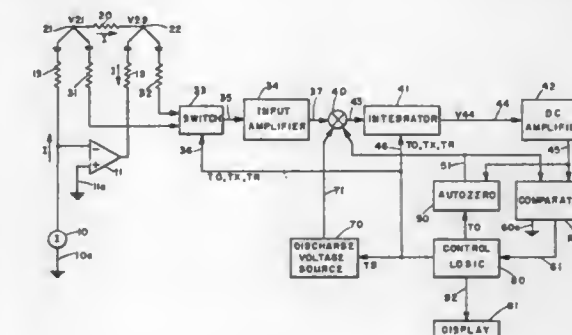


between the probe and the auxiliary electrode, which are representative of the surface condition of the probe.

**4,160,949**  
**AUTO-ZEROED OHMMETER**  
Dennis G. McFayden, San Diego, Calif., assignor to California Instruments Corporation, San Diego, Calif.  
Filed Mar. 6, 1978, Ser. No. 883,711  
Int. Cl.<sup>2</sup> G01R 27/02

U.S. Cl. 324—62

8 Claims



1. An ohmmeter comprised of: current circuit means having first and second leads for connection to respective terminals of an unknown resistor to supply current thereto for generation of first and second voltages at said terminals;

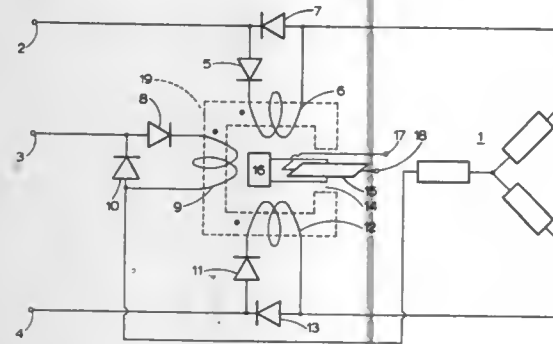
sensing circuit means having third and fourth leads for connection to said terminals of said unknown resistor for sensing and scaling said first and second voltage to third and fourth voltages respectively;

reference point voltage generator means for producing during a time period of predetermined duration, a ramp voltage with a slope proportional to the difference between said fourth voltage and a multiple of said third voltage to thereby generate a reference point voltage at the end of said time period;

means for reducing said reference point voltage at a predetermined rate and for measuring the time interval required to reduce said reference point voltage to said multiple of said third voltage; and

means for multiplying said time interval by a predetermined constant to thereby compute the resistance of said unknown resistor.

4,160,950  
**CURRENT MEASURING APPARATUS**  
 John A. Houldsworth, Croydon, England, assignor to U.S. Philips Corporation, New York, N.Y.  
 Filed May 6, 1977, Ser. No. 794,404  
 Claims priority, application United Kingdom, May 10, 1976, 19111/76  
 Int. Cl.<sup>2</sup> G01R 19/00, 33/00, 19/22  
 U.S. Cl. 324—107 4 Claims



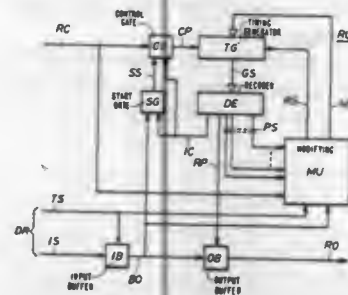
1. Apparatus for producing a signal whose average value is representative of the sum of the currents flowing in the conductors of a polyphase electrical supply to a load, comprising a plurality of line conductors coupling the polyphase electric supply to the load, a core forming a magnetic circuit in which is positioned a Hall-effect magnetosensitive device, an individual energizing conductor magnetically coupled to the core of the magnetic circuit corresponding to each said line conductor of the polyphase supply, and a rectifier means in series with each of the line conductors, said rectifier means comprising a first rectifier element in series with a corresponding energizing conductor and a second rectifier element in parallel with the resulting series combination of the first rectifier element and the energizing conductor, the second rectifier element being oppositely poled to the corresponding first rectifier element, said rectifier means supplying each said energizing conductor with a unidirectional current which is a measure of the current flowing in the corresponding line conductor of the supply in a given direction relative to the load, which given direction is the same for all said line conductors of the polyphase supply, said unidirectional currents having polarities with respect to the corresponding energizing conductors such that the magnetic fields which are produced in the magnetic circuit will all have the same sense.

4,160,951  
**METHOD OF REGENERATING ASYNCHRONOUS DATA SIGNALS AND APPARATUS FOR PERFORMING THE METHOD**

Per-Olov Thyselius, Tyreso, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden  
 Filed Aug. 31, 1977, Ser. No. 829,481  
 Claims priority, application Sweden, Sep. 15, 1976, 7610212  
 Int. Cl.<sup>2</sup> H04L 25/20 7 Claims

1. A method for regenerating asynchronous data characters of a given character structure containing data element which arrive on a transmission line time-distorted and at an incoming signalling rate which deviates from a nominal signalling rate, the characters after detection being supplied, at a character rate determined by the arriving elements, to a regeneration device which retransmits the characters to the transmission line at an outgoing signalling rate determined by a clock controlling the regeneration device, said regenerating method comprising the steps of temporarily storing at least one element of each of the supplied characters while the retransmission of the previous character progresses, establishing the time difference between the starting time of

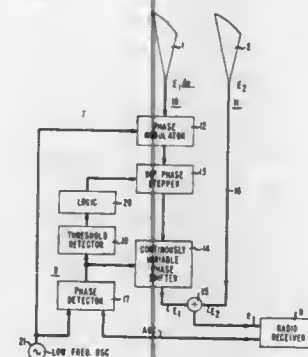
each supplied character and the expected completion time for the character retransmitted at the respective starting time, and



utilizing the established time difference at a certain instant to shorten the character being retransmitted at said certain instant, the extent of the shortening depending on the magnitude of the time difference in comparison with a given limit value.

4,160,952  
**SPACE DIVERSITY RECEIVER WITH COMBINED STEP AND CONTINUOUS PHASE CONTROL**  
 Kurt L. Seastrand, Jr., Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed May 12, 1978, Ser. No. 905,156  
 Int. Cl.<sup>2</sup> H04B 7/04 5 Claims

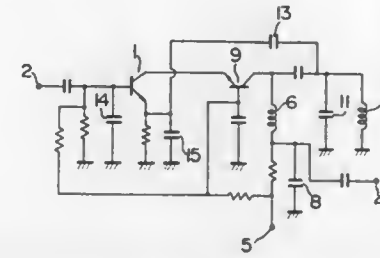
U.S. Cl. 325—369



1. In a space diversity system, a receiver including: first and second antenna circuits (10, 11); means (12, 21) for phase modulating the signal in one of said antenna circuits (10); means (15) for combining the signals in said antenna circuits (10, 11); and means (8, 17, 21) for detecting the amplitude modulation produced in said combined signals by said phase modulation; characterized in that: said one antenna circuit (10) includes a 90 degree phase stepper (13) and a continuously variable phase shifter (14); and in that said receiver further includes a control circuit (9) for controlling the combined phase shift produced by the phase stepper (13) and the variable phase shifter (14) in response to the detected amplitude modulation.

4,160,953  
**SELF-OSCILLATION MIXER CIRCUITS**  
 Shigeo Matsuura; Toshio Nagashima, both of Yokohama, and Mitsuhsa Shinagawa, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Mar. 13, 1978, Ser. No. 885,978  
 Claims priority, application Japan, Mar. 11, 1977, 52-25952; Mar. 11, 1977, 52-25953  
 Int. Cl.<sup>2</sup> H04B 1/28 13 Claims

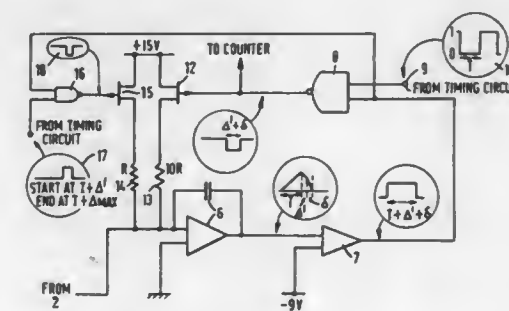
U.S. Cl. 325—440



1. A self-oscillation mixer circuit comprising:  
 (a) a cascade amplifier circuit including a first transistor of a common emitter connection and a second transistor of a common base connection having the emitter connected in cascade to the collector of said first transistor, said cascade amplifier circuit having an input circuitry including the base and the emitter of said first transistor;  
 (b) means for supplying a high frequency signal to be converted in frequency to said input circuitry;  
 (c) means connected to the collector of said second transistor for deriving an intermediate frequency signal produced through frequency conversion of said high frequency input signal;  
 (d) a resonance circuitry coupled to the collector of said second transistor for determining a local oscillation frequency, and  
 (e) feedback means connected between said input circuitry and said resonance circuitry to feedback the output from said resonance circuitry to said input circuitry.

4,160,954  
**MULTIPLE RATE DISCHARGE CIRCUIT FOR INTEGRATOR, ESPECIALLY FOR USE IN COMPUTERIZED AXIAL TOMOGRAPHY**  
 Godfrey N. Hounsfield, Newark, and Richard G. Gillard, Uxbridge, both of England, assignors to EMI Limited, Hayes, England  
 Filed Oct. 19, 1977, Ser. No. 843,515  
 Claims priority, application United Kingdom, Nov. 12, 1976, 47143/76  
 Int. Cl.<sup>2</sup> H03K 4/50, 5/12 6 Claims

U.S. Cl. 328—127



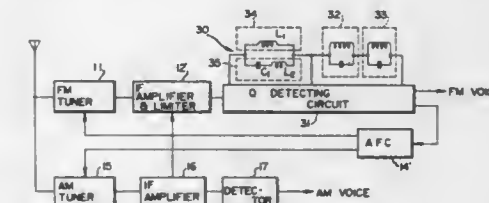
1. An electrical signal measuring arrangement comprising:  
 (a) an integrator circuit connected to receive the signals to be measured,

(b) means for applying said signals to said integrator circuit for a predetermined charge period (T)  
 (c) means, effective from the expiry of said period (T), to cause said integrator to discharge at a first rate, and including an electrically resistive discharge path connected to said integrator circuit by way of a switchable means for enabling or disabling said path, and control means for generating a control signal for controlling said switchable means, the control means including:  
 (i) a comparing means for comparing the instantaneous output of said integrator circuit with a reference value and providing an output signal when said instantaneous output exceeds said reference value,  
 (ii) an AND gate connected to receive the output signal from said comparing means and an electrical waveform defining charge and discharge periods for said integrator circuit and generating said control signal, and  
 (iii) means for applying said control signal to said switchable means to enable said path only when the output of said integrator circuit exceeds said reference value during said discharge periods, and  
 (d) means effective from the expiry of a predetermined time  $\Delta'$  following the expiry of the charge period (T) to cause said integrator circuit to discharge at a second rate, faster than the first-mentioned rate;  
 wherein said means effective to cause said integrator circuit to discharge at said second rate includes said resistive discharge path, said switchable means and said control means and, in addition, a further electrically resistive discharge path, of lower resistance than said first-mentioned path and connected in parallel therewith, a further switchable means, for enabling or disabling said further path, and a further control means for generating a further control signal for controlling said further switchable means.

4,160,955  
**COMPATIBLE AM-FM FREQUENCY DISCRIMINATOR**  
 Takeo Sato, Kobe, Japan, assignor to Fujitsu Ten Limited, Japan

Filed Dec. 5, 1977, Ser. No. 857,445  
 Claims priority, application Japan, Dec. 11, 1976, 51/149104  
 Int. Cl.<sup>2</sup> H03D 5/00 20 Claims

U.S. Cl. 329—2



8. A compatible AM-FM frequency discriminator, comprising:  
 a quadrature detecting circuit having means for applying AM and FM intermediate frequency signals and first, second, and third means for connecting a phase shifter group; and  
 a phase shifter group, said phase shifter group including fourth means for providing abrupt phase variations at both the AM and FM intermediate frequencies electrically connected to said first and second means, and fifth means for providing 90° phase shifts at both the AM and FM intermediate frequencies electrically connected to said second and third means.



4,160,956

## NUCLEAR-PUMPED URANYL SALT LASER

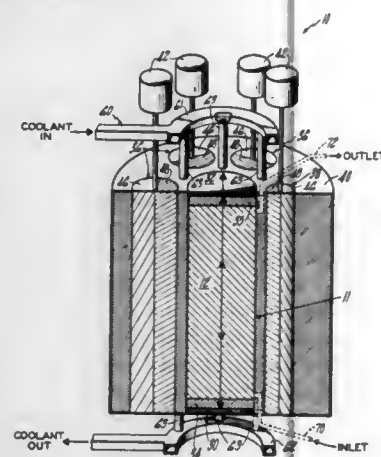
Walter J. Fader, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 26, 1976, Ser. No. 708,366

Int. Cl.<sup>2</sup> H01S 3/09

U.S. Cl. 331-94.5 P

7 Claims



5. A nuclear-pumped laser comprising an elongated laser cavity with a core of a combined lasing and fissionable composition consisting essentially of a uranyl salt with a  $\text{UO}_2^{++}$  uranyl ion enriched in the  $\text{U}^{235}$  isotope sufficient to sustain a fission chain reaction, the uranyl ion providing a lasing medium adapted to be nuclear radiation pumped by the direct excitation thereof with the products of a fission chain reaction and secondary electrons of the core to provide a lasing transition between a low-lying vibrational level of the first triplet electronic state and an upper vibrational level of the singlet ground state of the uranyl ion; longitudinally spaced parallel reflecting mirror means, fully and partially reflective respectively, at opposite longitudinal ends of the laser cavity for extracting a longitudinally transmitted laser pulse from the core, and fission control means encircling the core selectively operable for causing an above-prompt critical power transient of the core for nuclear radiation pumping of the uranyl ion for generating a laser pulse.

4,160,957

## SIGNAL RE-GENERATION APPARATUS

David W. Jesinger, Romsey, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jan. 3, 1978, Ser. No. 866,712

Claims priority, application United Kingdom, Jan. 4, 1977, 00008/77

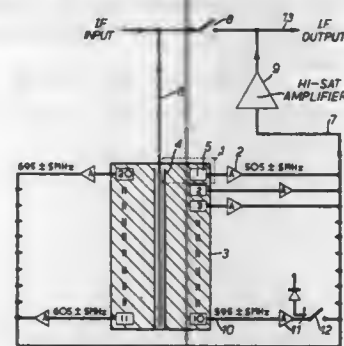
Int. Cl.<sup>2</sup> H03B 5/30

U.S. Cl. 331-107 A

5 Claims

1. Signal re-generation apparatus comprising an input terminal means for receiving a signal to be re-generated; a plurality of surface acoustic wave filters connected to said terminal, each said filter having a different pass band; a plurality of threshold amplifier means connected respectively to said filters, one for each said filter, for passing only those signals which are above a predetermined threshold level; an amplifier connected to said threshold amplifier means and having an output coupled to said filters in parallel thereby to define an oscillatory feedback loop; and switch means operatively associated with the loop and effective upon operation to quench oscillation, wherein when a signal to be re-generated is within the pass band of one of the filters and above the predetermined threshold level of the threshold amplifier means and is applied to the input terminal, the threshold amplifier means associated

with that filter passes the signal applied thereto so that oscillation takes place around the loop thereby to re-generate the said



signal until such time as the said switch means is operated to quench oscillation.

4,160,958

## SAMPLING LINEARIZER UTILIZING A PHASE SHIFTER

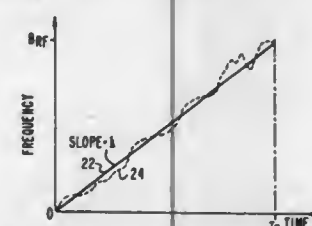
James H. Mims, Hanover, and Francis W. Hopwood, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1978, Ser. No. 935,240

Int. Cl.<sup>2</sup> H03B 23/00

U.S. Cl. 331-178

15 Claims



1. A FM waveform generation system including a sampling linearizer for improving the accuracy of a generated FM waveform signal with respect to a desired frequency rate of change, said sampling linearizer comprising an oscillator for generating a signal at a predetermined reference frequency; a mixer governed by said FM waveform signal and another signal to generate a first signal representative of said generated FM waveform signal; a sampler for sampling said first signal at predetermined sampling times to generate a second signal representative of the inaccuracies in said generated FM waveform with respect to said desired frequency rate of change; a linearizing servo controller governed by said second signal to reduce said inaccuracies in said FM waveform generation; and a phase shifter disposed between said oscillator and said mixer and responsive to the predetermined reference frequency signal of said oscillator to generate said another signal, said phase shifter being operative to shift the phase of said another signal with respect to said predetermined reference frequency signal as governed by a sequence of control signals representative of predetermined phase shift values.

4,160,959

## R.F. MODULATOR FOR USE IN T.V. GAMES

Stephen G. T. Malne, Ft. Salonga, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed Mar. 23, 1978, Ser. No. 889,973

Int. Cl.<sup>2</sup> H03C 1/36

U.S. Cl. 332-31 T

19 Claims

1. Apparatus for modulating a signal in accordance with an input signal, said apparatus comprising: a voltage source; dual

4,160,961

## PRINTED WIRING BOARD MOUNTING AND INTERCONNECTION OF COAXIAL CABLE TRANSFORMERS AND THE LIKE

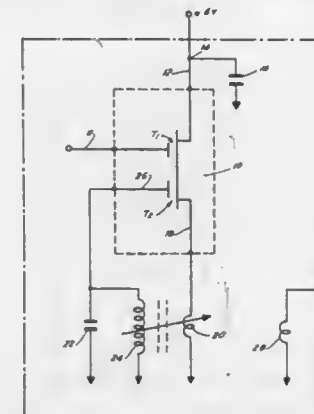
Richard A. Bory, and Alexander F. Hogg, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 22, 1977, Ser. No. 818,049

Int. Cl.<sup>2</sup> H01P 5/10, 3/06; H05K 1/18, 1/10

U.S. Cl. 333-27

2 Claims



inductively coupled to said resonant frequency means; said output circuit and said inductance means being operatively connected between said source and ground; and an output means operatively connected to said resonant frequency means.

4,160,960

## POWER-DIVIDING AND MODULATING ARRANGEMENT

Pieter Bikker, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

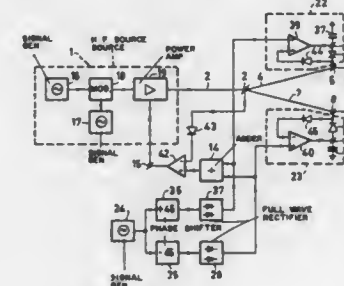
Filed Mar. 30, 1977, Ser. No. 782,929

Claims priority, application Netherlands, Apr. 8, 1976, 7603687

Int. Cl.<sup>2</sup> H03C 1/08; G01S 1/38

U.S. Cl. 332-40

3 Claims



1. A power divider and modulator circuit comprising means for generating a HF carrier signal having an output connected to a common terminal, said carrier signal generating means including modulator means for modulating said carrier signal, at least two variable impedances, a separate quarter wavelength transformer connecting each of said variable impedances to said common terminal, first and second means each coupled to one of said variable impedances for producing a modulating signal for controlling the impedance value of the associated variable impedance, adder means having an output and a first and second input coupled to said first and second means, respectively, for producing an output signal proportional to the sum of said modulating signals and means for coupling said output of said adder means to a control input of said modulator means so that the amplitude of said carrier signal is modulated by a signal proportional to the sum of said modulation signals.

4,160,962

## DUAL SECTION DISTRIBUTED PARAMETER DELAY-LINE

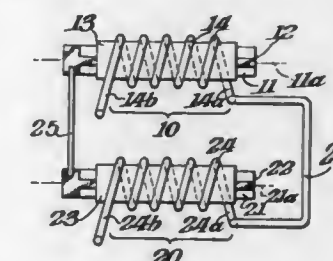
Andre de Keyser, Ronse, and Laurent Seynaeve, St. Eloois-Vijve, both of Belgium, assignors to Sprague Electric Company, North Adams, Mass.

Filed Nov. 4, 1977, Ser. No. 848,541

Int. Cl.<sup>2</sup> H03H 7/30; H01P 1/18, 9/00; H04N 9/535; 333 29; 31 R; 31 C

U.S. Cl. 333-141

6 Claims



1. An electromagnetic delay-line for delaying the luminance signal in a color television receiver is comprised of exactly two essentially identical delay-line sections, each of said sections comprising an elongated mandrel with surface portions thereof being electrically conductive and a continuous wire coil being wound about and being insulated from said mandrel, said con-

ductive surface portions of said two mandrels being electrically interconnected, said mandrels having parallel axes and being positioned side by side, a coil end of one and a coil end of the other of said sections being electrically interconnected, said interconnected coil ends being two laterally adjacent ends and the winding direction of one of said coils being the same as that of the other with respect to one axial direction so that a uniform unidirectional magnetic field of slowly varying magnitude having flux lines parallel to said axes will produce no net voltage between the free ends of said interconnected coils.

4,160,963

# PLURAL SUPPLY PATH ACOUSTIC SURFACE WAVE DEVICE

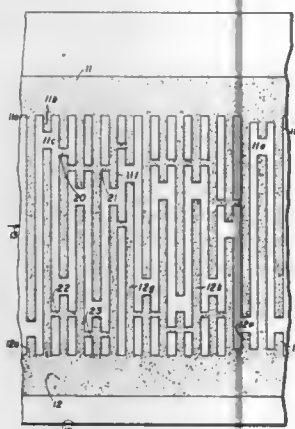
Ronald M. Hays, Jr., Walnut Creek, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 21, 1977, Ser. No. 817,757

Int. Cl.<sup>2</sup> H03H 9/04, 9/30, 9/32; H01L 41/10

U.S. Cl. 333—151

3 Claims



1. In an acoustic surface wave device having a substrate provided with at least a surface of piezoelectric material, an interdigital transducer comprising:

a plurality of bus bars disposed on the piezoelectric surface of said substrate in spaced substantially parallel relation with respect to each other and adapted to be excited by respective electrical signals of different phase,

plural sets of elongated electrodes corresponding in number to said plurality of bus bars, each of said electrodes in a corresponding one of said electrode sets extending transversely from a respective bus bar toward another bus bar but terminating in spaced relation thereto,

said plural electrode sets being arranged in interdigitated relation to define successive groups of individual electrodes from each of said plural electrode sets in a continuing series,

shorting bars electrically interconnecting respective electrodes of the same electrode set at locations spaced from the bus bar from which the set extends to provide alternate current paths for the electrodes so interconnected, an insulation layer on the piezoelectric surface of said substrate and covering said plural electrode sets, and

each of said shorting bars which electrically interconnect respective electrodes of one of said plural electrode sets being electrically isolated by said insulation layer from said shorting bars which electrically interconnect respective electrodes of another of said plural electrode sets.

4,160,964

# HIGH FREQUENCY WIDE BAND RESONANT CIRCUIT

Fumio Ishikawa, Isehara, and Yukio Tsuda, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

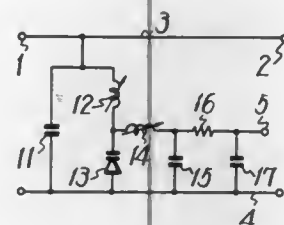
Filed Jul. 15, 1977, Ser. No. 816,200

Claims priority, application Japan, Jul. 22, 1976, 51/87518

Int. Cl.<sup>2</sup> H03J 3/18

U.S. Cl. 334—15

1 Claim



1. A high frequency wide band resonant circuit comprising: a first capacitive element;

a first series circuit including a first inductive element and a voltage controlled variable capacitance element and being connected in parallel to said first capacitive element;

a second series circuit including a second inductive element and a second capacitive element, said second series circuit being connected in parallel to said variable capacitance element with an end of said second inductive element connected to said first series circuit between said first inductive element and said variable capacitance element and an end of said second capacitive element being connected to a junction of said variable capacitance element with said first capacitive element;

means for supplying a control voltage for said variable capacitance element across said second capacitive element; a resistor having one end connected between the junction of said second inductive element with said second capacitive element, and the other end of said resistor being connected to said means for supplying a control voltage; and

a third capacitive element connected in series with said resistor across said second capacitive element for forming a  $\pi$ -type-circuit in cooperation with said resistor and said capacitive element and thereby raising the apparent impedance of said second inductive element in a frequency band likely to contain undesirable parasitic resonance and thereby reduce said parasitic resonance.

4,160,965

# POLARIZED MINIATURE RELAY

Ulrich Kobler, and Horst Tamm, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 14, 1977, Ser. No. 815,829

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632126

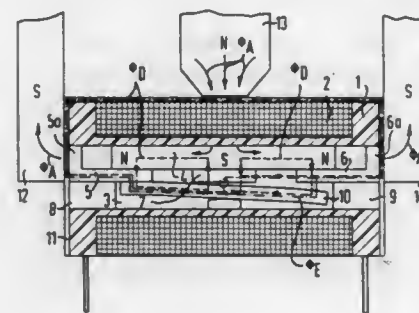
Int. Cl.<sup>2</sup> H01H 51/22

U.S. Cl. 335—79

20 Claims

1. In a polarized miniature relay having a switching space positioned interior of the body of a coil winding with a movable armature in the switching space adapted to operate at least one contact spring unit, the improvement of a bar permanent magnet positioned in the switching interior of the coil winding space parallel with the coil axis and extending longitudinally thereof, the bar magnet being insertable into the switching

space axially of the coil, the bar magnet forming a rigid nonrotating member to which at least one contact carrier is affixed,



and the armature being operatively carried by the bar magnet and rotatable relative thereto.

4,160,966

# STABILIZED REACTOR

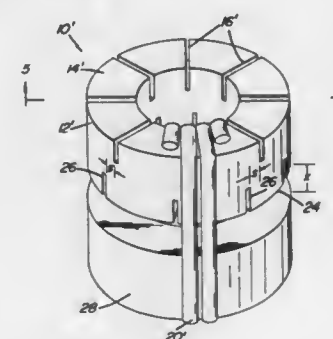
Theodore R. Kennedy, Willingboro, N.J., assignor to Inductotherm Corp., Rancocas, N.J.

Filed Sep. 6, 1977, Ser. No. 830,733

Int. Cl.<sup>2</sup> H01F 21/08

U.S. Cl. 336—155

8 Claims



1. A stabilized saturated reactor, comprising:

a core of magnetic material having an inner peripheral surface and an outer peripheral surface, a slotted end surface intermediate said inner and outer peripheral surfaces, and an unslotted end surface intermediate said inner and outer peripheral surfaces, said slotted end surface being provided with plural spaced slots,

each of said slots being open along said slotted end surface from said inner peripheral surface to said outer peripheral surface,

each of said slots extending from said slotted end surface along the axial dimension of the core to a depth less than one-half the axial dimension of the core,

each of said slots having a width substantially less than the cross-sectional dimensions of said core,

a winding connectable to an AC source, said winding surrounding said peripheral surfaces and said end surfaces, the cross-section of said winding being greater than said width of each of said slots,

whereby said winding when connected to said AC source establishes an unsaturated magnetic field through the volume of said core between said slotted end surface and approximately the depth of said slots and a saturated magnetic field through the volume of said core between said unslotted end surface and approximately the depth of said slots.

4,160,967

# ELECTRICAL COIL ASSEMBLY

Kelth J. W. Beech, Walsall, England, assignor to Lucas Industries Limited, Birmingham, England

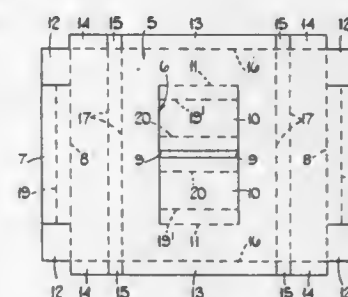
Filed Jul. 28, 1977, Ser. No. 819,671

Claims priority, application United Kingdom, Aug. 21, 1976, 34933/76

Int. Cl.<sup>2</sup> H01F 27/30

U.S. Cl. 336—209

10 Claims



1. An electrical coil assembly comprising an annular electric coil which has a rectangular aperture therethrough and has inner and outer peripheries and front and rear faces, and a covering over said coil, said covering being formed of a flexible, electrically insulating sheet which, when folded, is shaped to completely cover said inner and outer peripheries and said front and rear faces of said coil to provide a substantially dustproof seal for the coil when secured in position, said sheet having a rectangular aperture therethrough and including flaps which extend along opposite sides of said sheet, engage in said rectangular aperture in said sheet so as to overlies one pair of opposite side edges of the inner periphery of said coil, and are wider than the corresponding dimension of said rectangular aperture in said sheet.

4,160,968

# NORMALLY OPEN, THERMAL SENSITIVE ELECTRICAL SWITCHING DEVICE

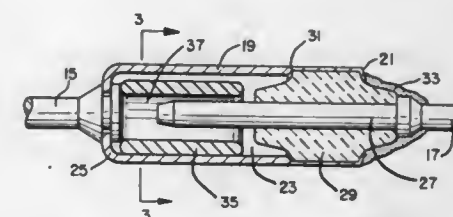
Sarmukh S. Saini, Dayton, Ohio, assignor to Emerson Electric Co., Dayton, Ohio

Filed May 31, 1977, Ser. No. 801,746

Int. Cl.<sup>2</sup> H01H 37/76

U.S. Cl. 337—404

4 Claims



1. A temperature-sensitive electrical switching device, having first and second current carrying electrical leads, for completing an electrically conductive circuit between the first and second electrical leads when the temperature of the switching device exceeds a predetermined temperature level, comprising: a hollow cylindrical electrically conductive case, having a first end defining an opening into a central cylindrical cavity and a second end which is closed, said case being electrically connected to the first electrical lead,

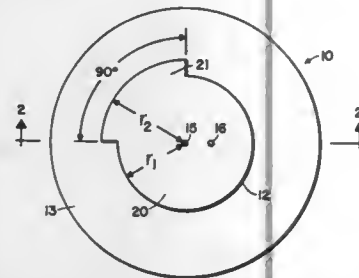
an electrically conductive member electrically connected to the second electrical lead, nonconductive means for mounting said conductive member such that it extends into said cylindrical cavity substantially along the central axis of said cavity, said nonconductive means sealing said opening into said cavity, and



3. In a system for measuring the angle of orientation of a beam of radiation relative to a phased array antenna, said system providing a sum channel signal and a difference channel signal, a correction circuit comprising:

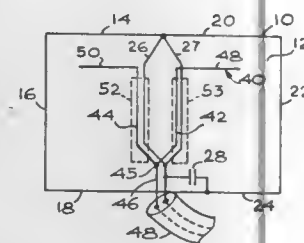
means for differentiating said sum channel signal to provide a derivative thereof;  
 means for multiplying said derivative by a factor representing the orientation of said beam and by a factor representing the magnitude of the boresight error slope of said phased array antenna to provide said weighted derivative; and  
 means for subtracting said weighted derivative from said difference signal to provide a corrected difference signal.

**4,160,976**  
**BROADBAND MICROSTRIP DISC ANTENNA**  
 Peter J. Conroy, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.  
 Filed Dec. 12, 1977, Ser. No. 859,370  
 Int. Cl.<sup>2</sup> H01Q 1/38  
 U.S. Cl. 343—700 MS  
 11 Claims



1. A broadband microstrip disc antenna comprising:
  - (a) a ground plane formed of conductive material and providing a smooth surface;
  - (b) a conductive disc positioned parallel to the smooth surface of said ground plane and spaced therefrom a predetermined distance;
  - (c) dielectric material positioned between said ground plane and said conductive disc;
  - (d) said conductive disc being electrically connected to said ground plane at approximately the center of said disc;
  - (e) a sector greater than one-half of said disc having a first radius;
  - (f) the remaining sector of said disc having a second radius different than said first radius; and
  - (g) a feed point on said conductive disc.

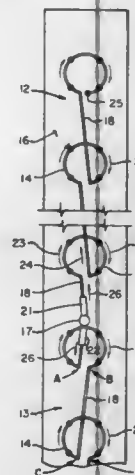
**4,160,977**  
**AUTOMOBILE ANTENNA**  
 Ross A. Davis, 95-461 Kaulia Pl., Mililani Town, Hi. 96789  
 Filed Feb. 23, 1978, Ser. No. 880,716  
 Int. Cl.<sup>2</sup> H01Q 1/32  
 U.S. Cl. 343—713  
 10 Claims



1. A vehicle antenna system responsive to both electrostatic and electromagnetic components of a radio signal and presenting an optimum impedance to associated radio circuits, including:
  - an electrically conductive vehicle body having at least one window opening therein to form a conductive edge;
  - a first conductor series connected with a first condenser to form a first tuning combination, said first tuning combination

tion being electrically coupled between oppositely disposed points along said conductive edge, said condenser having a magnitude of capacitance sufficient to produce in the medium wavelength radio band electrical resonance of a body loop including at least a portion of said conductive edge;  
 a plurality of intercoupled, electrically conductive members serially disposed on said window to form at least one antenna element primarily responsive to the electrostatic component of an impinging radio wave;  
 at least one of said plurality of intercoupled, electrically conductive members being physically closely proximate to said first conductor and parallel thereto but conductively isolated therefrom, whereby capacitive and inductive coupling of radio signals between said first conductor and said at least one of said plurality of intercoupled, electrically conductive members, occurs;  
 and an output conductor coupled to one of said at least one of a plurality of intercoupled, electrically conductive members proximate to said first conductor.

**4,160,978**  
**CIRCULARLY POLARIZED LOOP AND HELIX PANEL ANTENNAS**  
 Raymond H. DuHamel, 12001 Rhus Ridge Rd., Los Altos Hills, Calif. 94022  
 Filed Aug. 10, 1977, Ser. No. 823,218  
 Int. Cl.<sup>2</sup> H01Q 9/16, 9/30  
 U.S. Cl. 343—742  
 34 Claims



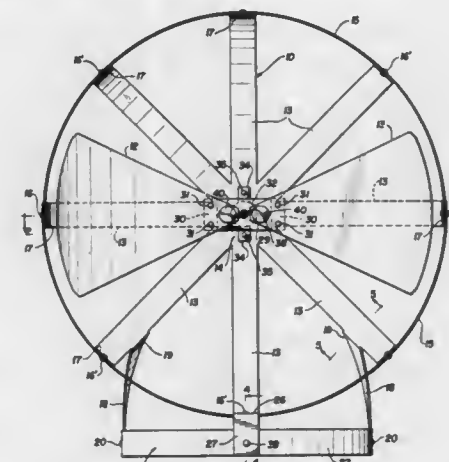
1. A circularly polarized antenna assembly comprising a conductive plane, a plurality of adjacent radiating elements each comprising at least one open radiating loop all portions which lie substantially in a plane, means for supporting each of said radiating elements above said conducting plane in line next to one another with the plane of said at least one loop being substantially parallel to the conducting plane, transmission line means connecting said radiating elements in series from one opened end of the loop to an adjacent loop and means for feeding one end of said series of radiating elements, the impedance of said transmission lines and radiating elements selected so that the radiating elements each support a traveling electrical wave equivalent to a traveling wave on a ring to produce circularly polarized radiation.

**4,160,979**  
**HELICAL RADIO ANTENNAE**  
 Robert J. Drewett, Swindon, England, assignor to National Research Development Corporation, London, England  
 Filed Jun. 20, 1977, Ser. No. 808,384  
 Claims priority, application United Kingdom, Jun. 21, 1976, 25727/76; Apr. 1, 1977, 13928/77  
 Int. Cl.<sup>2</sup> H01Q 1/36  
 U.S. Cl. 343—788  
 1 Claim



1. An end fed radio antenna comprising a flux-concentrating rod and an extended conductor having an electrical length of one quarter of the design wavelength, said conductor forming a series of insulated coaxial, helical windings of plural turns about said rod, said windings being separated from each other along the length of said rod, adjacent windings reversing the direction of winding and having opposite sense, each winding having the same given number of turns with the turns separated from each other.

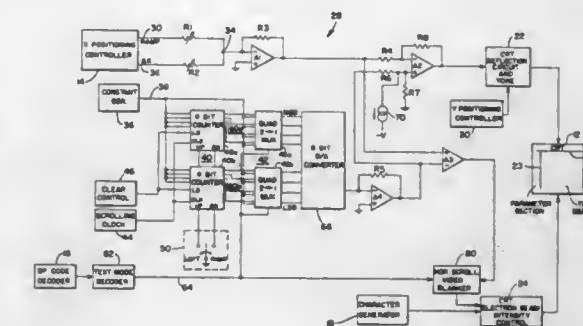
**4,160,980**  
**DIPOLE ANTENNA WITH PARABOLIC REFLECTOR**  
 James G. Murray, P.O. Box 442, White Rock, S.C. 29177  
 Filed Oct. 11, 1977, Ser. No. 840,729  
 Int. Cl.<sup>2</sup> H01L 21/26  
 U.S. Cl. 343—795  
 3 Claims



1. A unitized substantially all sheet metal television antenna comprising a substantially parabolically curved horizontal axis frontally open dish reflector, said reflector having a body formed by a plurality of circumferentially equidistantly spaced radial arms integrally joined near the axial center of the reflector and being formed of substantially equal width strips of

sheet metal, the zones between said arms being open and unobstructed, an axial annular rim formed of sheet metal joined to the outer ends of the radial arms and forming therewith an integrated reflector structure, the sheet metal rim being formed of a strip having substantially the thickness and width of said radial arms, said rim being coaxial with said reflector axis, a bow tie dipole spaced forwardly of the parabolically curved body of the reflector and spanning the major portion of the diameter of the reflector and being curved longitudinally in general parallelism to the body of the reflector, an axial spacer sleeve anchored to the center portion of the reflector body and projecting forwardly thereof, an insulating plate secured to the forward end of the spacer sleeve, said bow tie dipole being attached to and supported by the insulating plate, an electrical cable having terminals electrically connected to said dipole, said cable extending rearwardly through said spacer sleeve and beyond the rear of said dish reflector for connection with antenna terminals of a television receiver, a supporting base for the antenna including a vertical axis ring formed of sheet metal of substantially the same width and thickness employed for said rim and arms and being positioned somewhat below the bottom of said rim, and plural braces formed of sheet metal having substantially the same thickness and width as the sheet metal forming said ring and interconnecting said ring at plural circumferentially spaced points thereon with a corresponding number of spaced points on the body of said reflector.

**4,160,981**  
**CRT VIDEO TEXT LAYOUT SYSTEM HAVING HORIZONTAL SCROLLING**  
 Meredith T. Raney, Jr., Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio  
 Filed Jun. 6, 1977, Ser. No. 803,842  
 Int. Cl.<sup>2</sup> G06K 15/20  
 U.S. Cl. 340—721  
 13 Claims



1. In a video layout system of the type having a CRT display screen for viewing parameter information on a first section and text information on a second section, character generating means and vertical and horizontal positioning control means, the horizontal positioning control means including means for generating a ramp signal for controlling the horizontal sweep of an electron beam across the display screen of the CRT, an improvement comprising:
  - (a) means for selectively offsetting the start of the ramp signal so that any desired portion of text material having a pica format in excess of the width of the portion of the display screen for text material may be viewed to effect a horizontal scrolling of the text material; and
  - (b) disabling means for selectively blanking the electron beam to prohibit text information from being displayed on the parameter section of the display screen.



# 4,160,982 ANTI-DISPERSION ACCUMULATOR FOR INK JET PRINTING SYSTEM

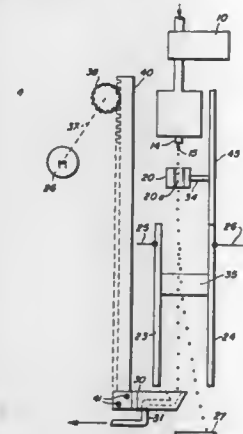
Robert I. Keur, Niles, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Mar. 24, 1978, Ser. No. 889,900

Int. Cl.<sup>2</sup> G01D 15/16

U.S. Cl. 346—75

8 Claims



1. A system for printing by directing ink along a path toward a record medium, comprising:  
an ink ejection head defining an orifice for directing ink toward the record medium;  
means for characterizing the ink for controlling its path for deposition at predetermined positions on the record medium;  
an accumulator normally positioned adjacent the record medium for catching ink directed away from the record medium; and  
means, operative upon start-up of the system and shut-down of the system for moving said accumulator between a pair of positions, one position adjacent said ejection head and the other position disposed a predetermined distance away from said ejection head, said accumulator while moving between said positions being oriented to intercept ink projected from said ejection head.

# 4,160,983 ELECTROMAGNETIC RELEASE MECHANISM FOR PHOTOGRAPHIC CAMERAS

Tetsuhiko Inagaki, and Keisuke Maeda, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

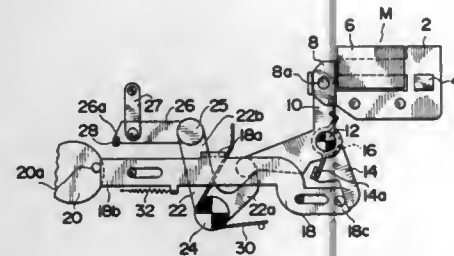
Filed Dec. 27, 1977, Ser. No. 864,434

Claims priority, application Japan, Dec. 29, 1976, 51-159831

Int. Cl.<sup>2</sup> G03B 9/08, 17/38

U.S. Cl. 354—234

7 Claims



1. An electromagnetic release mechanism for a camera comprising:  
a release member for initiating a camera shutter operation, said release member being movable between an inoperative position and an operating position for the initiation of said camera shutter operation;

permanent magnet means for retaining said release member in the inoperative position thereof;  
electromagnetic means energizable for counteracting said permanent magnet to allow the movement of said release member from said inoperative to said operating position;  
charge means including a charging member movable with and relative to said release member, and a biasing spring intercoupling said charging member and said release member and tensioned by the charging member;  
a movable member movable, in response to a camera cocking operation, from a first to a second position to move said charging member relative to said release member and charge said spring to bias said release member toward the operating position thereof when said release member is retained at the inoperative position thereof;  
an elastic member for driving said release member from the operating to inoperative position thereof, said movable member being engageable, at the second position thereof, with said elastic member to maintain the latter inoperative; and  
means for retaining said movable member at the second position thereof at least from the energization of said electromagnet to the initiation of the camera shutter operation, said movable member being releasable from said second position by means responsive to the camera shutter operation to actuate said elastic member.

# 4,160,984 SCHOTTKY-GATE FIELD-EFFECT TRANSISTOR AND FABRICATION PROCESS THEREFOR

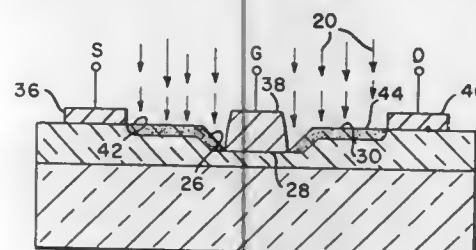
Glenn O. Ladd, Jr., Rancho Palos Verdes, and Frederick W. Cleary, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 14, 1977, Ser. No. 851,224

Int. Cl.<sup>2</sup> H01L 29/80

U.S. Cl. 357—22

3 Claims



1. A Schottky-gate field-effect transistor which comprises a III-V compound semiconductor crystal having spaced apart source, gate and drain electrodes thereof defining active current path regions of said device and further including thin inert ion implanted and lattice damaged high resistivity or semi-insulating regions extending only between and laterally coextensive with the spacing between said gate and source and said gate and drain electrodes, respectively, of said device and into said crystal to a depth of 1,000 angstroms or less to thereby minimize device drift, time constants and noise.

# 4,160,985 PHOTOSENSING ARRAYS WITH IMPROVED SPATIAL RESOLUTION

Theodore I. Kamins, Mountain View, and Godfrey T. Fong, Belmont, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 25, 1977, Ser. No. 854,938

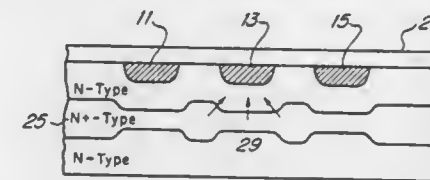
Int. Cl.<sup>2</sup> H01L 27/14

U.S. Cl. 357—30

4 Claims

1. A photosensing device comprising:  
a semiconductor substrate of a first conductivity type;  
an intermediate semiconductor layer on said substrate, said

intermediate layer being of the first conductivity type but of higher conductivity than said substrate;  
a surface semiconductor layer on said intermediate layer, said surface layer being of the first conductivity type, but of lower conductivity than said intermediate layer;  
an array of photosensing elements on said surface layer for detecting charge carriers photogenerated in said surface



layer and said intermediate layer by optical radiation incident on said device;  
whereby charge carriers created above the region of maximum conductivity will be accelerated toward the nearest of said photosensing elements and charge carriers created below the region of maximum conductivity will be accelerated away from said photosensing elements into said substrate.

# 4,160,986 BIPOLAR TRANSISTORS HAVING FIXED GAIN CHARACTERISTICS

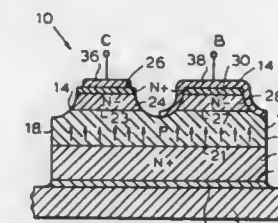
David M. Johnson, 5509 Harvard, Lubbock, Tex. 79415

Filed Aug. 2, 1976, Ser. No. 710,727

Int. Cl.<sup>2</sup> H01L 29/72

U.S. Cl. 357—36

8 Claims



1. A bipolar transistor comprising:  
a semiconductor body having first and second opposed surfaces with opposing edge surfaces therebetween;  
an emitter region, a base region and a first collector region in said semiconductor body with an emitter-base junction between said emitter and base regions and a base-collector junction between said base and first collector regions;  
said emitter region extending to said first surface and said emitter-base junction extending across said semiconductor body and terminating at said edge surfaces such that injection across said emitter-base junction is substantially uniform across said semiconductor body;  
said first collector region extending to said second surface;  
means for making a low ohmic collector contact to said first collector region at said second surface;  
a highly conductive substrate supporting said semiconductor body;  
means making a low ohmic emitter contact between said substrate and said first surface of said semiconductor body;  
said base region extending to said second surface;  
a second collector region in said semiconductor body and independent of said first collector region, said second collector region extending to said second surface; and  
means for making a low ohmic base contact to both said base region and said second collector region at said second surface.

# 4,160,987 FIELD EFFECT TRANSISTORS WITH POLYCRYSTALLINE SILICON GATE SELF-ALIGNED TO BOTH CONDUCTIVE AND NON-CONDUCTIVE REGIONS AND FABRICATION OF INTEGRATED CIRCUITS CONTAINING THE TRANSISTORS

Robert H. Dennard, Croton-on-Hudson, and Vincent L. Rideout, Mohegan Lake, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

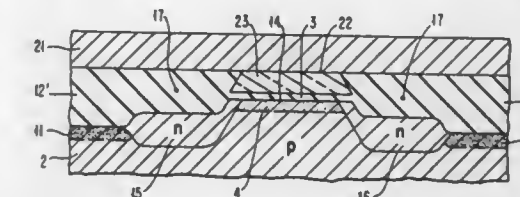
Continuation of Ser. No. 686,969, May 14, 1976, abandoned.

This application Jun. 6, 1977, Ser. No. 804,200

Int. Cl.<sup>2</sup> H01L 27/02

U.S. Cl. 357—41

44 Claims



1. A method for fabricating an integrated circuit containing an array of FETs having recessed field oxide isolation between FETs, and associated FET circuits peripheral to the array of FETs but on the same semiconductive substrate, and wherein FETs of the array have a channel region; a gate insulator; a doped polycrystalline silicon gate self-aligned to the field oxide isolation on the sides of the gate in the width direction, the gate neither overlapping nor underlapping the field oxide isolation; source and drain regions being self-aligned to the ends of the gate in the length direction; insulation over the source and drain but not over the gate; metallic-type high electrical conductivity interconnection line; and self-registering electrical connection between the gate and the interconnection line which comprises:

- (A) providing a semiconductive substrate of a first conductivity type containing active impurities of a first conductivity type;
- (B) providing an insulator layer on said substrate, which insulator layer is to be subsequently delineated to provide the gate insulator;
- (C) depositing a layer of polycrystalline silicon above the insulator layer;
- (D) depositing an oxidation barrier layer above said polycrystalline silicon layer;
- (E) delineating by masking and etching first predetermined polycrystalline silicon regions to provide the device area;
- (F) growing in the etched regions isolation oxide recessed into the substrate to provide insulating field oxide regions between FETs of the array;
- (G) delineating by masking and etching second predetermined polycrystalline silicon regions to provide polycrystalline silicon gate regions of the FETs;
- (H) thermally diffusing or ion implanting active impurities of a second and opposite type into preselected regions of the semiconductive substrate to provide FET source and drain regions;
- (I) thermally growing a silicon dioxide insulating layer over regions of the structure but not over the polycrystalline silicon FET gates which are still protected by an oxidation barrier layer;
- (J) removing existing oxidation barrier layer from over the FET gates by use of an etchant;
- (K) delineating contact holes to provide vias for achieving electrical connection between metallic interconnection lines and FET source and drain regions;
- (L) depositing and delineating a metallic-type high conductivity electrical interconnection pattern that makes electrical connection to the polycrystalline silicon FET gates; and to FET source and drains; and
- (M) providing electrical connection to said semiconductive substrate.

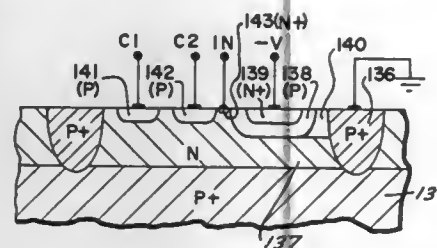
26. An integrated circuit prepared by the method of claim 1.

**4,160,988**  
**INTEGRATED INJECTION LOGIC (I-SQUARED L) WITH DOUBLE-DIFFUSED TYPE INJECTOR**  
Lewis K. Russell, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 454,789, Mar. 26, 1974, abandoned.  
This application Jun. 24, 1977, Ser. No. 809,615  
Int. Cl.<sup>2</sup> H01L 27/04

U.S. Cl. 357—44

21 Claims



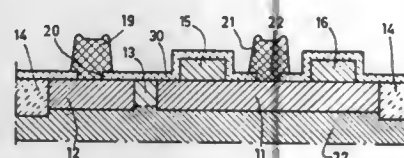
18. In a semiconductor structure, a semiconductor body having a planar surface comprising a body portion of one conductivity type, a first region of opposite conductivity type formed in said body and extending to said surface, spaced second and third collector regions in rectifying contact with said first region and extending to said surface, said second and third collector regions being spaced from said body portion, source means for providing current connected to said first region, said source means comprising a source transistor which has a base region of said one conductivity type and emitter and collector regions of the opposite conductivity type, said source transistor regions extending in the semiconductor body, said collector region of the source transistor extending to said surface and being connected to said first region, lead means for coupling said regions and said body portion to other circuitry and wherein said source transistor base region and said body portion are interconnected by structural means integrated with the semiconductor body for providing a voltage difference between said base region and said body portion, said structural means constituting the sole connection to the base region of said source transistor.

**4,160,989**  
**INTEGRATED CIRCUIT HAVING COMPLEMENTARY BIPOLAR TRANSISTORS**  
Michel de Brebisson, Caen; Jean-Michel Decrouen, Argences, both of France; Wolfgang F. J. Edlinger, Eindhoven, Netherlands, and Jean-Pierre H. Biet, Bleville-Beuville, France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 753,271, Dec. 22, 1976, abandoned.  
This application Mar. 17, 1978, Ser. No. 887,646  
Claims priority, application France, Dec. 29, 1975, 75 39964  
Int. Cl.<sup>2</sup> H01L 27/02

U.S. Cl. 357—44

5 Claims



1. An integrated circuit comprising:  
a semiconductor substrate portion of a first conductivity type;  
a plurality of regions of semiconductor material of a second conductivity type on said substrate portion;

regions of first insulating material adjoining said semiconductor regions, and extending at least partially thereover;  
a semiconducting layer of first type conductivity extending partially over said regions of insulating material forming a connection track and partially over said semiconductor regions, said semiconducting layer comprising a monocrystalline portion and a polycrystalline portion;  
a first bipolar npn transistor having first, second and third vertically arranged successive zones, said first zone being located in said substrate region, said second zone forming the base of the first transistor and located in one of said second type semiconductor regions, and said third zone located in said monocrystalline portion of said semiconductor layer and located on said one semiconductor region, said second zone separating said third zone from said substrate region.

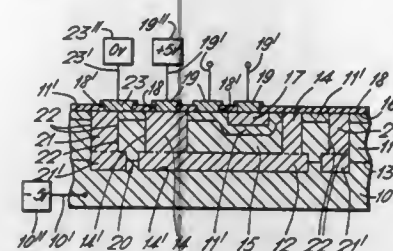
**4,160,990**  
**SEMICONDUCTOR DEVICES AND CIRCUIT ARRANGEMENTS INCLUDING SUCH DEVICES**  
Jeffrey Kane, Hulme, England, assignor to Ferranti Limited, Hollinwood, England

Filed Nov. 28, 1977, Ser. No. 855,256  
Claims priority, application United Kingdom, Nov. 27, 1976, 49577/76

Int. Cl.<sup>2</sup> H01L 27/04

U.S. Cl. 357—48

28 Claims



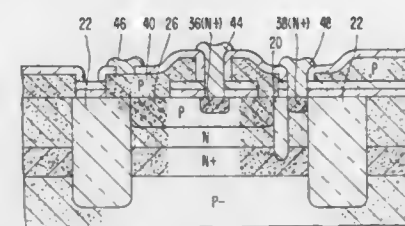
1. A semiconductor device formed in a semiconductor body comprising a substrate of one conductivity type, a thin layer initially wholly of said one conductivity type disposed on said substrate of the same conductivity type, said device having a plurality of constituent components, at least one of the components including a combination of regions comprising a buried layer of said opposite conductivity type at a portion of the interface between the thin layer and the substrate, and an isolation barrier for the component of said opposite conductivity type, the isolation barrier extending through the thin layer to the buried layer, regions of the device and of said one conductivity type extending beyond said at least one component, but contiguous with said at least one component, and said at least one component including at least one outer annular region of said opposite conductivity type, said annular region being disposed adjacent to the surface of the thin layer remote from the substrate, and being uniformly spaced from the combination of regions of said at least one component, and a significant resistance region between said at least one outer annular region and the combination of regions of said at least one component, said significant resistance region being a part of the component.

**4,160,991**  
**HIGH PERFORMANCE BIPOLAR DEVICE AND METHOD FOR MAKING SAME**  
Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia, Wappingers Falls, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,769  
Int. Cl.<sup>2</sup> H01L 27/12

U.S. Cl. 357—49

8 Claims



1. A high performance semiconductor device with small emitter-base spacing comprising:  
a silicon semiconductor body having regions of monocrystalline silicon isolated from one another by isolating regions;  
a subcollector region within at least one of said regions of monocrystalline silicon;  
first and second insulator layers over portions of said monocrystalline silicon;  
a doped polycrystalline silicon layer over said second insulator layer with openings in said polycrystalline silicon layer to said monocrystalline surface only where an emitter contact and a collector reach-through are to be made;  
a third insulator layer over said polycrystalline silicon layer;  
a collector reach-through connecting the surface of said at least one regions of monocrystalline silicon with said subcollector region;  
a base region spaced from said collector reach-through extending into said body from the surface of said body;  
an emitter region within said base region extending from the surface of said body into said base region;  
an emitter ohmic contact to said emitter region through said opening in said polycrystalline silicon layer;  
a base ohmic contact composed of said doped polycrystalline silicon to said base region through openings in said first and second insulator layers;  
said base contact being dielectrically isolated from and surrounding said emitter contact by said third insulator layer; and  
a collector ohmic contact to said collector reach-through.

**4,160,992**  
**PLURAL SEMICONDUCTOR DEVICES MOUNTED BETWEEN PLURAL HEAT SINKS**  
Michael G. Adlerstein, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

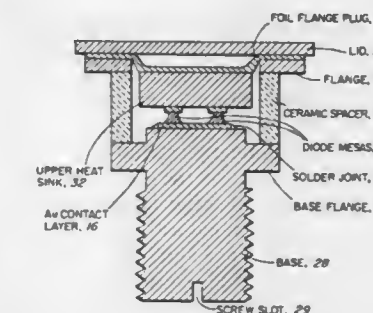
Filed Sep. 14, 1977, Ser. No. 833,322  
Int. Cl.<sup>2</sup> H01L 23/02, 29/48, 29/56

U.S. Cl. 357—81

5 Claims

1. A microwave diode device comprising in combination:  
a metal base, said base having a lower threaded portion, an upper planar surface, and a flanged portion between said upper planar surface and said lower threaded portion;  
a layer of electrically and thermally conductive metal disposed upon said upper planar surface of said base;  
a plurality of diode device bodies having a first surface in electrical and thermal contact with said first layer of electrically and thermally conductive metal;  
a second layer of electrically and thermally conductive metal disposed upon a second surface of said plurality of diode device bodies;  
a body of metal electrically and thermally in contact with a

second surface of said plurality of diode device bodies, said body of metal having a larger volume than the volume of said plurality of diode device bodies;  
an insulating spacer having a hollow cylindrical shape, one end of said spacer coupled to said flanged portion of said base;



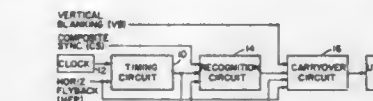
a conducting annularly shaped flange coupled to the end of said spacer opposite said flanged portion;  
a flexible metal layer, center portions of said flexible metal layer being coupled thermally to said body of metal and outer portions of said flexible metal layer being coupled to said flange; and  
a disc-shaped lid positioned over said flexible metal layer.

**4,160,993**  
**VIR LINE RECOGNITION SYSTEM**  
Richard G. Merrell, Darien, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 12, 1977, Ser. No. 859,631  
Int. Cl.<sup>2</sup> H04N 9/12

U.S. Cl. 358—21 V

19 Claims



11. In a television receiver of the type having a line recognition system for identifying a predetermined horizontal scanning line of a transmitted television signal by counting horizontal scanning lines occurring subsequently of a reference point defined by the composite sync component of said television signal, the improvement comprising:  
means for sampling preselected logical characteristics of said composite sync component at predetermined time intervals during each horizontal scanning line of said television signal; and  
means responsive to said means for sampling for determining said reference point according to the logical characteristics of said sampled composite sync component.

**4,160,994**  
**LUMINANCE KEY AMPLIFIER**  
James A. Mendrala, San Fernando, Calif., assignor to Sonex International Corp., Burbank, Calif.

Continuation of Ser. No. 584,744, Jun. 7, 1975, abandoned, which is a continuation of Ser. No. 443,388, Feb. 19, 1974, abandoned. This application Aug. 26, 1977, Ser. No. 827,880  
Int. Cl.<sup>2</sup> H04N 9/535

U.S. Cl. 358—22

22 Claims

1. An arrangement for keying video signals comprising:  
a first video signal source for providing a first video signal having a plurality of color components and which compo-



nents of said first video signal are present in various proportions relating to the presence of colors in the first video signal source and which represent a first visual image; a second video signal source for providing a second video signal representing a second visual image; and keying means coupling together substantially equal proportions of the components of said first video signal source to the extent that the components of said first video signal are present and providing a signal representative of the average of the components of the first video signal, means to receive the coupled components of the first video signal for comparing the average intensity of the coupled components of the first video signal with a reference, said means for comparing being operative to pass the first video signal to an output to the exclusion of the second video signal when the average intensity of the coupled components of the first signal assumes a first relationship with respect to the reference and to pass the second video signal to the output to the exclusion of the first video signal when the average intensity of the coupled components of the first video signal assume a second relationship with respect to the reference.

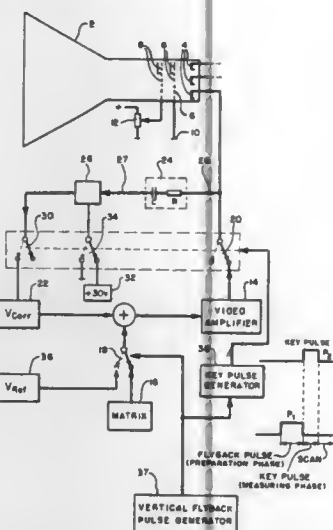
4,160,995

## BIAS SETTING APPARATUS FOR USE WITH TELEVISION RECEIVERS

Erik A. Jensen, Baunehøj 22, 7600 Struer, Denmark  
Filed Jan. 25, 1977, Ser. No. 762,368

Int. Cl.<sup>2</sup> H04N 9/20, 9/535

U.S. Cl. 358—29



1. In a color television receiver having a display tube with a plurality of electron guns and a source of video signals for providing the proper signals to be applied to each of the electron guns, the improvement comprising:

- timing means for defining selectively repeatable cathode voltage correction periods, each of said correction periods having a preparation phase followed by measuring and adjustment phase;
- means individual to each electron gun for producing a respective correction voltage level;
- means for producing a reference voltage level;
- cathode voltage control means individual to each electron gun for selectively applying a composite test signal based on the sum of said respective correcting voltage level and said reference voltage level to the respective cathode during said preparation phase, said cathode voltage control means including reference switching means for applying a composite video signal based on the sum of said correcting voltage level and the signal from the source of video signals to the respective cathode between the occurrences of said preparation phase;
- storage means individual to each electron gun and coupled

to the respective cathode for sensing the voltage level of the respective cathode at the end of said preparation phase, during said preparation phase said cathode voltage control means is applying said composite test signal, and said storage means storing the sensed voltage subsequent to said preparation phase during said measuring and adjustment phase;

video switching means individual to each electron gun for disconnecting said cathode voltage control means from the respective cathode during said measuring and adjusting phase, thereby allowing the application of a biasing voltage to the respective cathode which is determined by the stored voltage sensed at the end of the immediately prior preparation phase; and

current sensing means individual to each electron gun for sensing the current of the respective cathode during said measuring and adjusting phase and for adjusting the correction voltage level of said correction voltage producing means as a function of the sensed current, such that the adjusted correction voltage applied to the respective cathode during normal operation subsequent to said measuring and adjustment phase corresponds to the cutoff bias of the respective electron gun.

4,160,996

## SWITCHABLE HIGH VOLTAGE GENERATOR FOR PENETRATION-TYPE COLOR CRT

Jacques Nigra, Velizy Villacoublay, and Guy Vanthuyne, Arpa-jon, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

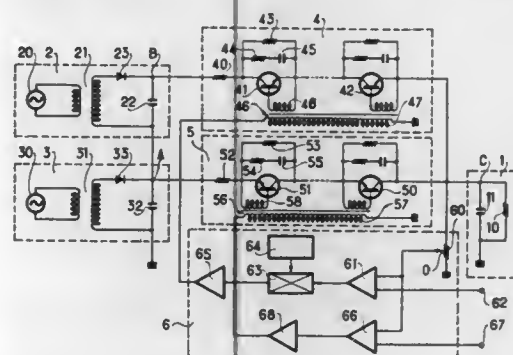
Filed Sep. 26, 1977, Ser. No. 836,392

Claims priority, application France, Oct. 1, 1976, 76 29692

Int. Cl.<sup>2</sup> H04N 9/27; G05F 1/56; H02J 1/00; H01J 29/80

U.S. Cl. 358—73

3 Claims



1. Very high voltage DC generator which can be switched between  $n$  levels for feeding a capacitive load, comprising a very high voltage power source capable of delivering at least two extreme levels of voltage straddling in the  $n$  DC voltage levels, at least two series assemblies of power transistors each connected to the power source via a current limiting resistor and to the load and defining respectively two opposite directions of conduction between the source and the load and a control circuit having a transistor control channel for each series assembly of transistors, means in each transistor control channel for elaborating an image signal of the error voltage between the voltage value at the terminals of the load and the required level, which causes, as a function of the direction of conduction of said assemblies, the transistors of one of the series assemblies to operate in the saturated state as a switching circuit, at least one of the control channels further comprising a modulator receiving the signal of an oscillator and ensuring the modulation thereof by said image signal to control the transistors of the corresponding series assembly in the saturated state and then in the non-saturated state, as a function of the value of said error voltage signal image, for ensuring opera-

tion of this assembly as a switching circuit and as a regulation circuit connected in series with the load.

4,160,997

## INTRAORAL FLUOROSCOPE

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J. 07065

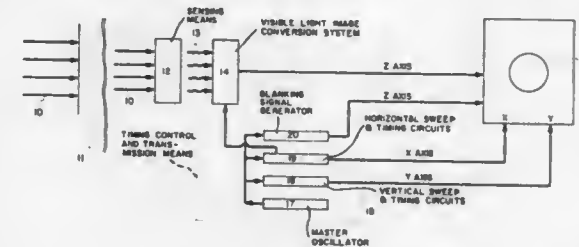
Continuation-in-part of Ser. No. 469,655, May 14, 1974,

abandoned. This application May 12, 1976, Ser. No. 685,457

Int. Cl.<sup>2</sup> H04N 7/18, 5/32

U.S. Cl. 358—93

5 Claims



1. An intraoral fluoroscope adapted for use with an electronic video display system comprising:

- (a) sensing means for converting an invisible radiant energy image to a visible light image;
- (b) a light image conversion system for converting a visible light image to an electrical video signal output comprising at least one charge coupled image sensor, said image conversion system being in visible light communication with said sensing means and said light image conversion system and sensing means adapted for insertion into the human mouth; and
- (c) timing, control and transmission means electrically connecting said conversion system and said video display system and adapted to receive and transmit said video signal output from said conversion system to said video display system.

4,160,998

## TELEVISION-BASED ALARM SYSTEM

Gerhard Kamin, Traisa, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Fed. Rep. of Germany

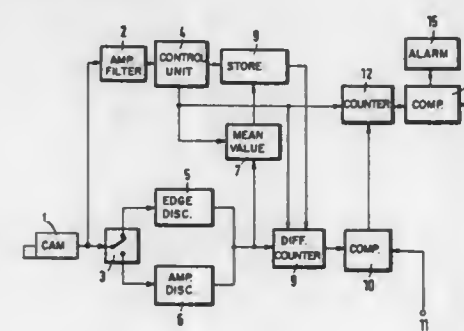
Filed Apr. 15, 1977, Ser. No. 787,957

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617111

Int. Cl.<sup>2</sup> H04N 7/18

U.S. Cl. 358—105

10 Claims



1. An alarm system for detecting a movement or change in the field of view supervised by a television camera, the system comprising a discriminator responsive to the video signal produced by the camera and adapted to produce a signal upon the occurrence of a predetermined characteristic in the picture content of the video signal, means for providing a succession of reference values each derived by adding the number of signals produced by the discriminator during a plurality of equal time intervals of predetermined duration and dividing the sum so formed by the number of time intervals over which the addi-

tion is performed, difference value means for generating difference values between the number of signals produced by the discriminator during each of a succession of time intervals, each time interval equal to the said predetermined duration, and the currently provided reference value, comparing means for comparing the difference values with a preselected first value to produce an event signal, and evaluating the event signal according to a predetermined criterion to produce an alarm with the criterion is satisfied.

4,160,999

## MOUNTING ARRANGEMENT FOR A TELEVISION MONITORING CAMERA

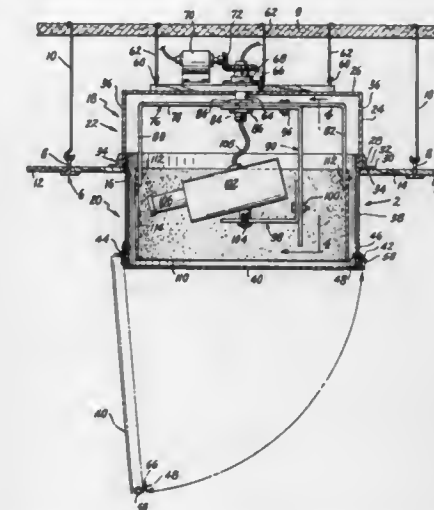
Joseph H. Claggett, 1017 E. Fourth Ave., Mitchell, S. Dak. 57301

Filed Apr. 5, 1978, Ser. No. 893,580

Int. Cl.<sup>2</sup> H04N 7/18; G03B 17/56, 29/00

U.S. Cl. 358—108

10 Claims



1. An arrangement for mounting a monitoring camera on a ceiling, including:

- a housing including upper and lower portions, said lower housing portion including a partially transparent, cylindrical sidewall;
- means for mounting said housing on said ceiling, with at least said lower housing portion extending downwardly from said ceiling;
- a rotatable drive shaft mounted to extend into said housing from the upper end thereof;
- motor means connected with said drive shaft for effecting rotational movement thereof;
- bracket means mounted on the lower end of said drive shaft, within said housing;
- an opaque cylinder carried by said bracket means and received within said partially transparent cylindrical sidewall of said lower housing portion, said opaque cylinder having a window therein; and
- said bracket means being adaptable to mount a monitoring camera within said opaque cylinder, with its lens aimed through said window,
- said bracket means, said opaque cylinder and said camera being movable as a unit upon rotation of said drive shaft by said motor means, and said partially transparent lower cylindrical sidewall and said opaque cylinder concealing said camera from view.

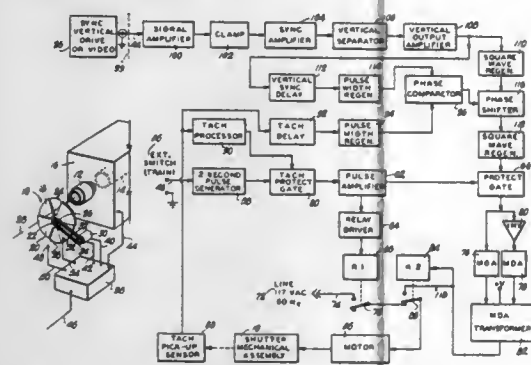
# 4,161,000 HIGH SPEED TELEVISION CAMERA CONTROL SYSTEM

Robert R. Cleveland, Kansas City, Mo., assignor to Video Systems Research, Inc., Kansas City, Mo.

Filed Oct. 28, 1977, Ser. No. 846,433  
Int. Cl.<sup>2</sup> H04N 5/30, 7/18

U.S. Cl. 358—225

19 Claims



18. An electrical circuit for controlling the operation of an electrical motor device in accordance with timing signals of the type produced by a sync-pulse generator used in a conventional television system for controlling picture image scanning, including:

detection circuit means adapted to be operably coupled with a source of said timing signals for receiving said timing signals from the latter, and operative to detect at least certain periodically recurring ones of said received timing signals comprising a train of picture synchronizing pulses each respectively associated with the commencement of scanning of a picture field by said television system, said detection circuit means including filter circuit means for selectively filtering said timing signals to detect said train of synchronizing pulses;

amplifying means adapted to be operably coupled with said motor device and operably coupled with said detection circuit means,

said amplifying means being operative to receive said train of synchronizing pulses and including amplification circuit means for amplifying each of the latter to produce synchronized power signals for delivery to said motor device for energizing the latter to operate,

the operating condition of said motor device being controlled in accordance with the frequency of said train of synchronizing pulses,

sensing means operably associated with said motor device for sensing said operating condition of the latter, and for producing control signals corresponding to said sensed condition;

actuable pulse generation means having an output and being operative upon actuation thereof for generating an electrical pulse having a prescribed duration at said output thereof; and

digital logic circuit means having inputs thereto operably coupled with said sensing means, with said pulse generation means output, and with said detection circuit means, and having a gated output operably coupled with said amplifying means,

said logic circuit means being responsive to the receipt of said pulse from said pulse generation means upon actuation of the latter for coupling said detection circuit means with said amplifying means for said pulse duration to allow delivery of said synchronizing pulse train to the latter for energizing said motor device,

said logic circuit means functioning to maintain said coupling between said detection circuit means and said amplifying means after said pulse duration only so long as said control signals are being produced by said sensing means, said logic circuit means functioning to uncouple said detection circuit means from said amplifying means upon failure

of said sensing means to produce said control signals after said pulse duration.

# 4,161,001 VIDEO SIGNAL REPRODUCING APPARATUS WITH A MANUALLY CONTROLLED TRACK SEARCHING ARRANGEMENT

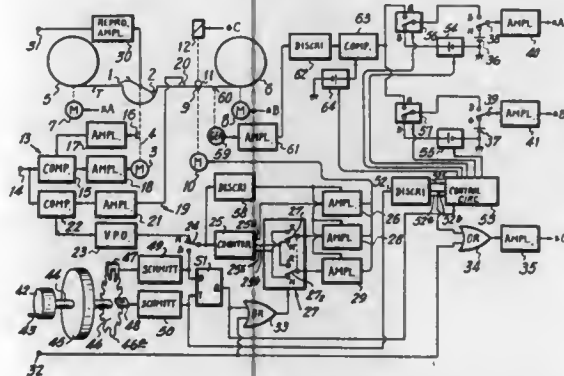
Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 810,862

Claims priority, application Japan, Jul. 5, 1976, 51-79705  
Int. Cl.<sup>2</sup> H04N 5/78; G11B 27/02, 15/46

U.S. Cl. 360—10

15 Claims



1. Apparatus for reproducing video signals recorded in successive parallel tracks on a magnetic tape, said tracks being disposed at an angle with respect to the direction of advancement of the tape, comprising:

magnetic signal sensing means for reproducing the video signals recorded in each of said tracks upon positioning of said tape for scanning of the respective track by said sensing means;

tape transport means for transporting said tape relative to said sensing means and thereby causing the latter to scan said tracks in succession for reproducing the video signals respectively recorded therein at a rate dependent on the speed at which the tape is transported; and

track searching means including a manually rotatable wheel, and control means sensing changes in the rotational position of said wheel and providing signals in response to such changes for regulating the speed at which the tape is transported by said tape transport means in dependence on the speed of rotation of said manually rotatable wheel.

# 4,161,002 POWER CONSERVING MOTOR CONTROL CIRCUIT FOR A VIDEO TAPE RECORDER

Isao Saito, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,034

Claims priority, application Japan, Jan. 8, 1977, 52-497[U]; Jan. 8, 1977, 52-499[U]

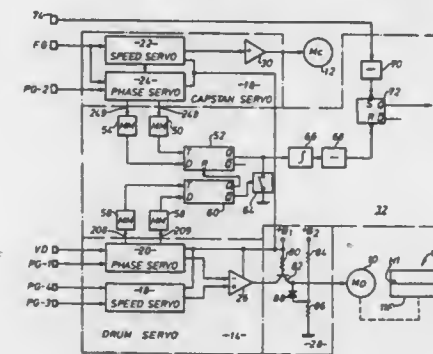
Int. Cl.<sup>2</sup> G11B 21/02

U.S. Cl. 360—75

13 Claims

5. A video tape recorder comprising:  
a rotary magnetic head;  
a motor for rotating said rotary magnetic head;  
servo means for controlling said motor and thereby said rotary magnetic head to rotate at a predetermined speed;  
non-servo control means for controlling said motor and

thereby said rotary magnetic head to rotate at an uncontrolled speed slower than said predetermined speed; and



means for selectively connecting one of said servo means and said non-servo control means to said motor.

# 4,161,003 DEVICE FOR HOLDING A ROTATABLE RECORD DISC

Yutaka Ichihayashi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

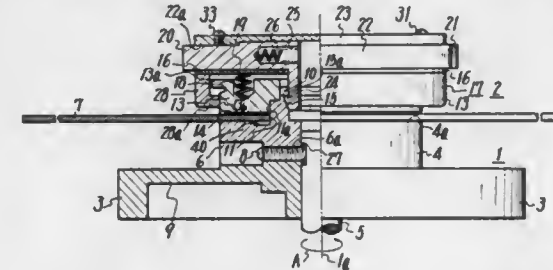
Filed Apr. 18, 1978, Ser. No. 897,425

Claims priority, application Japan, Apr. 20, 1977, 52-49707[U]

Int. Cl.<sup>2</sup> G11B 19/00, 5/82

U.S. Cl. 360—99

11 Claims



1. A device for holding a rotatable record disc having a central opening therethrough, comprising:

a support base rotatable about a central axis and including means defining a supporting surface normal to said axis and against which one side of the record disc may engage, means engageable in said central opening of the disc, when the latter engages said supporting surface, for concentrically aligning the disc with said axis, and first locking means; and

clamp means including a clamp housing adapted to be disposed at the other side of the record disc when one side of the latter engages said supporting surface, a plurality of locking elements which are slidably mounted in said clamp housing so as to be movable relative to the latter in directions radially with respect to said axis, locking claws extending from inner ends of said locking elements and being engageable with said first locking means upon outwardly radial movement of said locking elements, biasing means for urging said locking elements in outwardly radial directions with respect to said axis for maintaining engagement of said claws with said first locking means and thereby securing said clamp housing against movement away from said base with said clamp housing disposed at said other side of the record disc, said locking elements having outer portions exposed at diametrically opposite sides of said clamp housing for allowing simultaneous manual urging thereof toward each other to provide release of said locking claws from said first locking means and thereby permit removal of said clamp means from said base, a clamp base extending from said clamp

housing for engaging against said other side of the record disc and being movable relative to said clamp housing in the direction of said axis, and resilient means urging said clamp base relative to said clamp housing in the direction of said axis toward said other side of the record disc for clamping the latter between said clamp base and said supporting surface.

# 4,161,004 HEAD POSITIONING MECHANISM FOR RECORDING/PLAYBACK MACHINE

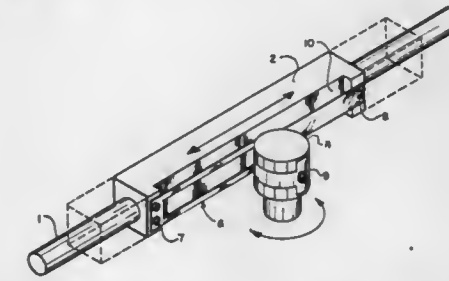
Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.

Filed Apr. 5, 1977, Ser. No. 784,905

Int. Cl.<sup>2</sup> G11B 5/56

U.S. Cl. 360—106

21 Claims



1. A positioning mechanism for a read/write head of a recording/playback machine of the type utilizing discs upon which information is magnetically stored, said positioning mechanism comprising:

a rotary drive motor having an armature shaft;  
a capstan affixed to the armature shaft of said rotary drive motor for rotation therewith when the motor is actuated;  
a carriage means adapted to carry a magnetic read/write head;

a guide means connected to said carriage means to define a path of movement therefor, said path being parallel to a line generally tangent to said capstan;

a flexible, nonstretchable band means having opposite ends, said band means being wound about said capstan and fixed thereto with the opposite end portions of said band extending from said capstan substantially along said line tangent; and

attachment means for attaching respective ends of said band means to spaced-apart locations on said carriage means, said attachment means including resilient means for attaching one end of said band to said carriage and for applying a biasing force thereto which tends to maintain a predetermined tension in said band whereby upon an incremental angular rotation of said armature shaft, one end portion of said band is wound off of said capstan and the opposite end portion of said band is simultaneously wound onto said capstan, thereby causing said carriage means to move along said path.

# 4,161,005 MAGNETIC HEADS AND FIXING MATERIAL WITH AN ADDITIONAL FILLER OF MOS<sub>2</sub>

Hiroaki Kato, Machida, and Junji Hamana, Chichibu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,637

Claims priority, application Japan, Nov. 1, 1976, 51-131507; Feb. 21, 1977, 52-17900

Int. Cl.<sup>2</sup> G11B 5/105

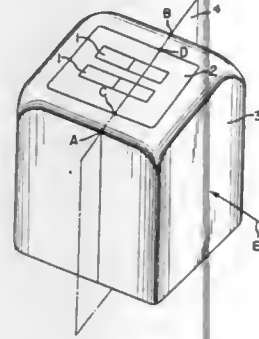
U.S. Cl. 360—129

9 Claims

1. A magnetic head comprising:  
a magnetic core having a sliding surface on which a magnetic tape moves;  
a casing for enclosing said magnetic core; and  
a fixing material used to secure said magnetic core within



said casing, said fixing material comprising not less than 19.5% by weight of a resin having adhesiveness, 40-80%

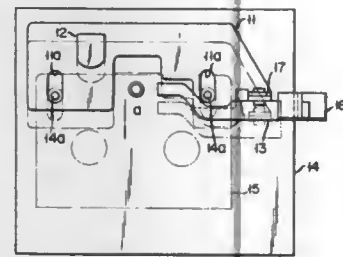


by weight of a fine powder of  $\text{SiO}_2$  as a filler and 0.5-50% by weight of a fine powder of  $\text{MoS}_2$  as another filler.

#### 4,161,006 TAPE CASSETTE-EJECTING INHIBITING DEVICE FOR A MAGNETIC TAPE APPARATUS

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Feb. 1, 1978, Ser. No. 874,058  
Claims priority, application Japan, Feb. 14, 1977, 52/16425[U]

Int. Cl.<sup>2</sup> G11B 15/00, 23/00  
U.S. Cl. 360-137



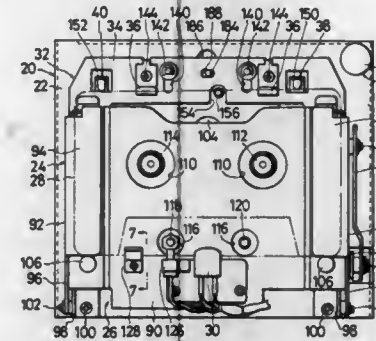
1. A tape cassette-ejecting device for a magnetic tape apparatus utilizing a cassette having a magnetic tape received therein, said device comprising a substrate; a magnetic head-supporting plate extending over the substrate and slidable between first and second positions; a magnetic head mounted on the magnetic head-supporting plate for joint movement therewith, said magnetic head being removed from the magnetic tape in the cassette when said supporting plate is in said first position and being in contact with the magnetic tape when said supporting plate is in said second position; an eject lever mounted on the magnetic head-supporting plate below the cassette for joint movement with said plate and being rotatable in a direction perpendicular to that in which the magnetic head-supporting plate is slidable; and an eject control button for rotating said eject lever movable in a direction perpendicular to that in which the magnetic tape-supporting plate is slidable, said eject control button being located such that when the magnetic head-supporting plate is in said first position movement of the eject control button will cause it to contact one end of the eject lever and rotate same so that the other end of said eject lever will push up the cassette, and when the magnetic head-supporting plate is in said second position movement of the eject control button will not cause it to contact said one end of the eject lever.

#### 4,161,007 MAGNETIC TAPE CASSETTE APPARATUS

Tamotsu Haraguchi, Musashino, Japan, assignor to TEAC Corporation, Musashino, Japan  
Filed Aug. 2, 1977, Ser. No. 821,094  
Claims priority, application Japan, Aug. 16, 1976, 51-97530; Aug. 16, 1976, 51-97531

Int. Cl.<sup>2</sup> G11B 23/04  
U.S. Cl. 360-137

10 Claims



1. In a magnetic tape cassette apparatus of the type having a cassette cradle pivoted at one end for movement between a first position for loading and unloading a tape cassette into and from the cradle through the other end thereof and a second position for running the tape within the tape cassette with respect to a magnetic head fixedly mounted on the cradle at said one end thereof, the improvement comprising: a carriage adapted for movement between a third position remote from said other end of said cradle in said second position and a fourth position adjacent to said other end of said cradle in said second position; electrical switch means mounted on said carriage so as to be actuated by the tape cassette carried by said cradle when the latter is moved from said first to said second position and when said carriage is moved from said third to said fourth position; carriage shift means actuable manually for moving said carriage from said fourth to said third position; and ejector means responsive to the actuation of said carriage shift means for moving said cradle from said second to said first position, the motion from said second to said first position being delayed until at least after said carriage has begun to move from said fourth to said third position; said carriage shift means and said ejector means being operatively associated with each other so that upon movement of said cradle from said first to said second position by direct manual actuation thereof, said carriage is moved from said third to said fourth position, said cradle reaching said second position before said carriage reaches said fourth position.

#### 4,161,008 PROTECTION CIRCUITRY FOR CABLE TRANSMISSION SYSTEM

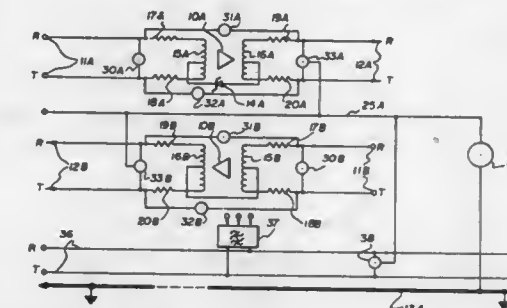
Detlef Zimmermann, Sayman F. Demircioglu, and Jindrich Kugler, all of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada  
Filed Apr. 26, 1978, Ser. No. 900,264

Int. Cl.<sup>2</sup> H02H 9/04  
U.S. Cl. 361-56

10 Claims

1. In a cable transmission system comprising: a multipaired cable which includes a core having a plurality of cable pairs, and a conductive sheath surrounding said core; a plurality of line powered amplifiers at discrete locations along the system, each connected in series with an individual cable pair through a pair of input and output terminals; a plurality of negative impedance switching devices connecting each of said terminals to a common bus;

characterized by a further negative impedance switching device having a switching voltage greater than that of said



plurality of devices, connected between the common bus and the conductive sheath.

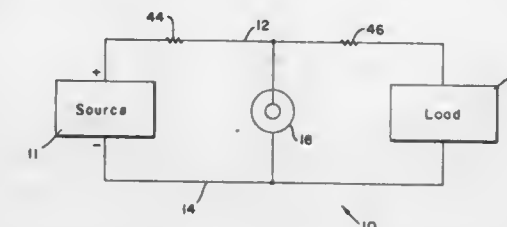
#### 4,161,009 AUTOMATIC CROWBAR AND ARC QUENCHING SYSTEM

Robin J. Harvey, Thousand Oaks, and Michael A. Lutz, Mountain View, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 13, 1978, Ser. No. 896,076  
Int. Cl.<sup>2</sup> H02H 3/24

U.S. Cl. 361-56

7 Claims



1. An automatic arc quenching system comprising: a source of voltage connected to first and second buses; a device connected to both said first and second buses, said device having first and second conductors therein respectively connected to said first and second buses, said device being such that arcing may occur between said first and second conductors; and a crossed-field switch device connected between said first and second buses, said crossed-field switch device being conditioned so that it is nonconductive at normal bus voltage and is conductive when an arc occurs between said conductors in said device so that when an arc occurs between said conductors in said device, said crossed-field switch device provides a parallel current path to the arc so that arc energy is reduced.

#### 4,161,010 COMMUTATION SENSOR CIRCUIT FOR A DC-TO-DC SILICON CONTROLLED RECTIFIER (SCR) CHOPPER CIRCUIT

Stanley L. Mann, New Berlin, and Charles E. Rettig, Brookfield, both of Wis., assignors to Litton Industrial Products, Inc., Milwaukee, Wis.

Filed Sep. 15, 1977, Ser. No. 833,537  
Int. Cl.<sup>2</sup> H02H 3/28

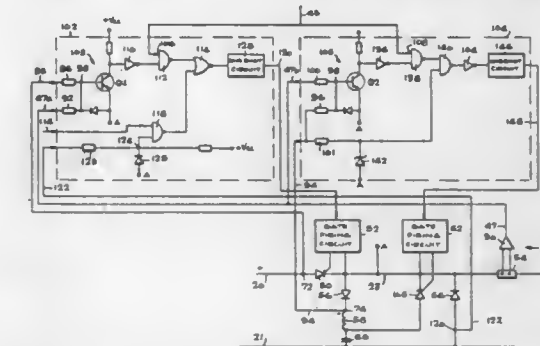
U.S. Cl. 361-79

10 Claims

1. A commutation sensor circuit for a DC-to-DC chopper circuit connected between a source of applied DC voltage and regulated output where the chopper circuit receives a command signal representative of a desired regulated output and where the chopper circuit includes a controller that compares

the command signal to the actual regulated output, the commutation sensor circuit comprising:

- a circuit common providing a circuit reference of known electrical potential,
- first sensor means referenced to said circuit common sensing the applied DC voltage as the available commutation voltage,
- first control means comparing said available commutation voltage to the actual regulated output and enabling the chopper circuit when said available commutation voltage is sufficient to commutate the chopper circuit,



- second sensor means referenced to said circuit common sensing the commutation voltage in the chopper circuit after said first control means enables the chopper circuit and the controller initiates the chopper cycle, and
- second control means comparing said chopper circuit commutation voltage to the actual output current and initiating commutation by the chopper circuit at least when said output current equals the maximum commutating ability of the chopper circuit thereby overriding the controller of the chopper circuit.

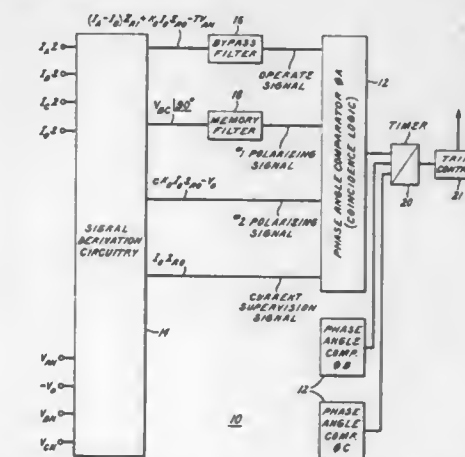
#### 4,161,011 GROUND DISTANCE RELAY EMPLOYING PHASE COMPARATOR MEASUREMENT

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 21, 1978, Ser. No. 879,653  
Int. Cl.<sup>2</sup> H02H 3/26, 7/26

U.S. Cl. 361-80

18 Claims



9. In a ground distance protective relay for a transmission line in an a-c power system, the relay circuit including phase angle comparator operation wherein AND circuit means is responsive to phase coincidence of a plurality of input signals thereto, one input signal being an operating signal and another input signal being a first polarizing signal, the operating signal being related to the sum of (1) the product of transmission line current and a replica impedance of the transmission line and (2) transmission line voltage, the polarizing signal being related to

transmission line voltage, TIMER circuit means responsive to an output signal of the AND circuit means for producing a TIMER output signal when the phase coincidence of the plurality of signals is of a predetermined duration, wherein the improvement comprises:

- means for providing a second polarizing signal, said second polarizing signal being related to the zero sequence voltage of the transmission line at the relay; and
- wherein the AND circuit means is responsive to the phase coincidence of: (1) the operating signal, (2) the first polarizing signal, and (3) the second polarizing signal, the TIMER circuit means producing said TIMER output signal when the phase coincidence of the three input signals is of a predetermined duration.

4,161,012

## HIGH VOLTAGE PROTECTION APPARATUS

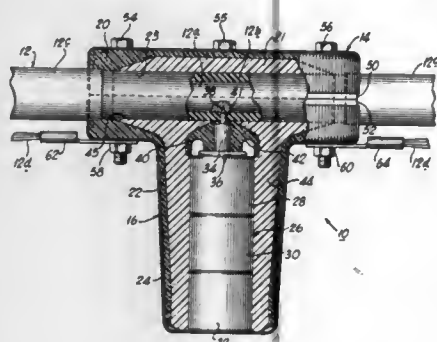
Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Mar. 2, 1977, Ser. No. 773,511

Int. Cl.<sup>2</sup> H02H 3/22

U.S. Cl. 361—128

57 Claims



1. A surge arrester for connecting to a component of an electrical power circuit comprising arrester components including a valve element formed by one or more valve blocks, a formed dielectric body for housing said arrester components, said dielectric body comprising means for forming a substantially air-free interface encircling said arrester components when said arrester components are inserted into said dielectric body and said dielectric body being fabricated from an elastomeric material to define a central bore which is of a smaller diameter than said arrester components, said bore being dilatable about said arrester components, and a cover of conductive material encircling at least a portion of said dielectric body.

4,161,013

## ELECTROMECHANOCHEMICAL DEVICE

Alan J. Grodzinsky, Watertown, Mass., and Norman A. Shoenfeld, Brooklyn, N.Y., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 23, 1977, Ser. No. 799,486

Int. Cl.<sup>2</sup> H01G 9/00; B01D 13/00

U.S. Cl. 361—433

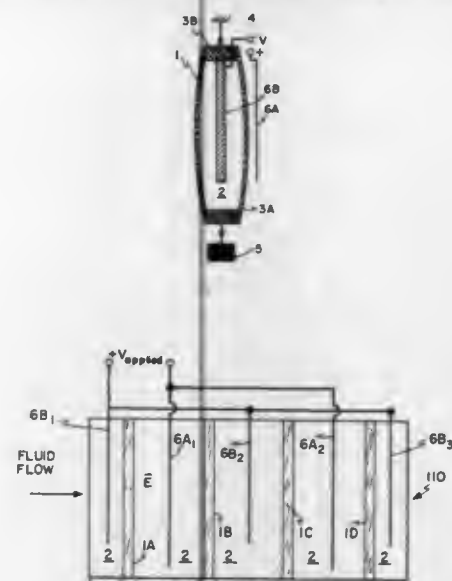
37 Claims

1. An electromechanochemical transductive coupler for use in connection with an aqueous electrolyte containing mobile ions that comprises, in combination:

a deformable polyelectrolyte film comprising fixed charge molecular groups, which film, when immersed in an aqueous electrolyte containing mobile ions which enter into the film, is operable to provide a force that is a function of the structural configuration of the matrix of the film, said structural configuration being a function of the internal concentration profile of mobile ions inside the polyelectrolyte film, which internal concentration profile is a

function of an electric field applied across the thickness dimension thereof; means to apply an electric field across the thickness dimension of the film to actively control the internal concentration profile of mobile ions inside the polyelectrolyte film and thus control the force generated by the film; and means connected to the film to couple said force therefrom.

25. An electromechanochemical device having, in combination: porous polyelectrolyte fibrous film means comprising



fixed charge molecular groups; an aqueous electrolyte comprising mobile ions, said film being immersed in said aqueous electrolyte, the spacing of the fibers of the film and hence the pore size thereof being a function of an electric field in the region occupied by the film and having a component directed across the thickness dimension of the film; and electrical means to apply an electric field across the thickness dimension of the film to actively control in a smooth, variable fashion, the spacing of the fibers of the film.

4,161,014

## LUMINAIRE HAVING A CONFIGURED INTERFERENCE MIRROR AND REFLECTOR

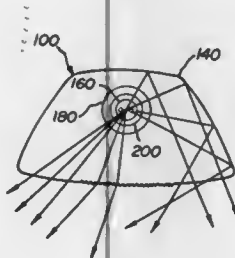
Thomas W. Dey, Rochester, N.Y.; James D. Howe, St. Louis, Mo., and Eugene C. Letter, Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 786,710, Apr. 11, 1977, abandoned, and a continuation-in-part of Ser. No. 716,415, Aug. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 821,044

Int. Cl.<sup>2</sup> F21L 00/00; F21M 3/04

U.S. Cl. 362—263

38 Claims



1. A luminaire fixture of high illumination efficiency structured to house a monochromatic light source and capable to control the direction of light emittable from such light source

to illuminate a task area in a controlled intensified light pattern, comprising:

- receptacle means for defining a designated lamp space and capable to receive a monochromatic light source to occupy the designated lamp space;
- reflector means including a reflective surface disposed about the designated lamp space for reflecting light from the reflective surface toward the task area; and
- multilayer interference mirror means geometrically configured to define an interference film surface the cross section and profile of which is nonlinear between points defining the extremities of the interference film surface, the interference film surface being disposed about the designated lamp space and supporting a multilayer interference film for receiving light emittable from a monochromatic light source to occupy the designated lamp space, and light to be reflected by the reflector means receivable directly from a monochromatic light source to occupy the designated lamp space and light reflected from the multilayer interference film, for passage through the geometrically configured multilayer interference mirror means, of that light received at predetermined angles of incidence into controlled angular directions and to reflect the light received at other than the predetermined angles of incidence to thereby illuminate the task area in a controlled intensified light pattern.

4,161,015

## LUMINAIRE USING A MULTILAYER INTERFERENCE MIRROR

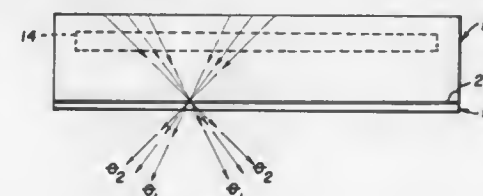
Thomas W. Dey, and Eugene C. Letter, both of Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 716,409, Aug. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 821,129

Int. Cl.<sup>2</sup> F21V 9/00; G02B 5/28

U.S. Cl. 362—263

6 Claims



1. A luminaire assembly of high illumination efficiency for controlling the direction of light to illuminate a task area in a controlled intensified light pattern, comprising:

reflector means; light source means disposed within said reflector means for emitting monochromatic light; and multilayer interference mirror means disposed on a supporting substrate for receiving light emitted directly from said light source means and light reflected from said reflector means for passing therethrough light received at predetermined angles of incidence and for reflecting other light emitted from the light source means and reflected from the reflector means which other light is thereafter again received by the multilayer interference mirror means after being reflected by said reflector means for passage through the multilayer interference mirror means at the predetermined angles of incidence for said multilayer interference mirror means to intensify by controlling the angular direction of light passing therethrough for passage of said light into a control range to illuminate the task area in a controlled intensified light pattern.

4,161,016

## SEMICONDUCTOR AND HEAT SINK ASSEMBLY

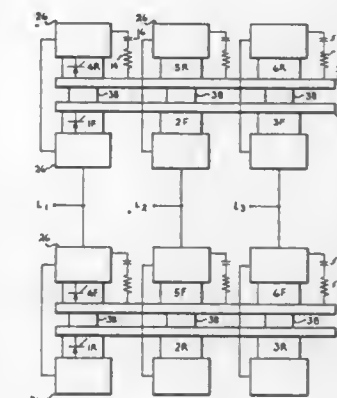
Norman E. Born, and Martin A. Halttunen, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 12, 1977, Ser. No. 859,837

Int. Cl.<sup>2</sup> H05K 7/20

U.S. Cl. 361—388

4 Claims



1. A semiconductor and heat sink assembly having first and second groups of semiconductors, each semiconductor having an anode terminal and a cathode terminal, said first group being active and said second group being inactive in a first mode of circuit operation and said second group being active with said first group being inactive in a second mode of circuit operation, said assembly comprising:

(a) a first electrically conductive heat sink unit joining the anode terminals of a first portion of the semiconductors of said first group and the cathode terminals of a first portion of the semiconductors of said second group;

(b) a second electrically conductive heat sink unit joining the cathode terminals of a second portion of the semiconductors of said first group and the anode terminals of a second portion of the semiconductors of said second group; and

(c) a plurality of additional heat sink members one of which is connected to the free electrode terminals of each of the semiconductors of said first and second groups.

4,161,017

## METHOD AND APPARATUS FOR MOUNTING PRINTED CIRCUIT BOARDS

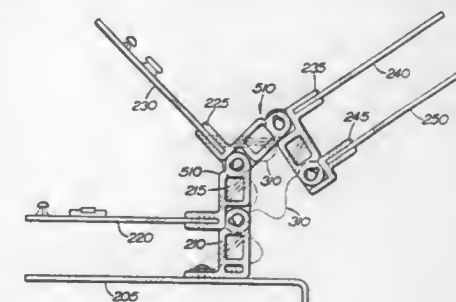
Perry H. Pierce, and Dan L. Prendergast, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 622,792, Oct. 15, 1975. This application Aug. 8, 1977, Ser. No. 822,860

Int. Cl.<sup>2</sup> H02B 1/02

U.S. Cl. 361—412

6 Claims



1. An interlocking hinge comprising: a body; a projection extending perpendicular to the longitudinal axis and adjacent to a first longitudinal end of said body, said



projection having one or more eccentric portions with respect to the central axis thereof; engaging means adjacent to a second longitudinal end of said body for freely engaging an object of a shape corresponding to that of said projection in one relative position and for locking together therewith in a second relative position; and attachment means connected to the body of said hinge for attaching an external member thereto, said attachment means comprising two lateral extensions from said body, said lateral extensions having force-fitting means interposed therebetween for force-fitting into an opening in said external member.

4,161,018

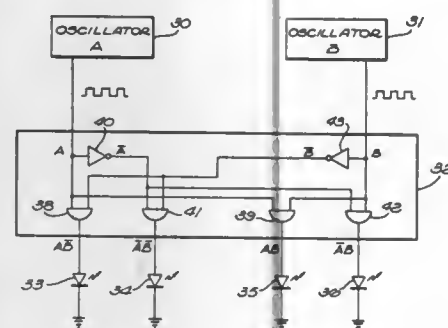
## LIGHTED ORNAMENTAL DEVICES

James B. Briggs, 1722 La Barranca, La Canada, Calif. 91011, and Flake M. Wakefield, 2852 Burkshire Ave., Los Angeles, Calif. 90064

Filed Apr. 13, 1977, Ser. No. 787,289  
Int. Cl.<sup>2</sup> F21V 33/00

U.S. Cl. 362-104

13 Claims



1. An ornamental device having a plurality of light sources illuminated in a random or substantially random fashion, the improvement comprising plural light sources disposed in a pattern on the face of the device, and circuit means mounted on the device forming a self-contained ornamental/circuit assembly for automatically controlling energization of the light sources one at a time by internal electrical generation of energizing signals, said circuit means comprising oscillator means and means connecting the oscillator means with logic means, said logic means comprising shift register means having feedback from a plurality of stages thereof to its data input through Exclusive Or means for generating said energizing signals in a random or substantially random manner, and having a plurality of outputs connected to decoding means, said oscillator means being connected to another input of said shift register means and said sources being connected to said logic means.

4,161,019

## LIGHTING FIXTURE

Gerard E. Mulvey, 57 Mobile Dr., Toronto, Ontario, Canada  
Filed May 2, 1977, Ser. No. 793,132

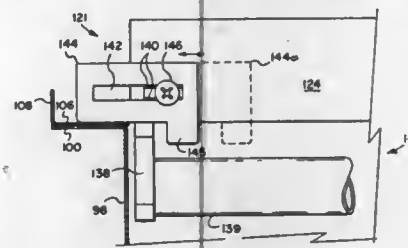
Claims priority, application Canada, Feb. 25, 1977, 272726  
Int. Cl.<sup>2</sup> F21V 21/34, 21/14

U.S. Cl. 362-147

13 Claims

1. A lighting fixture for a ceiling structure including mutually parallel and spaced apart ceiling members having upwardly facing surfaces defining an opening and wherein a said lighting fixture may be removably positioned between said ceiling members and supported in such position, said lighting fixture comprising a generally rectangular housing having mutually spaced apart side walls, and a bottom wall releaseably attached thereto; arms retractably mounted on said side walls for movement

between extended positions for disposition on said upwardly facing surfaces of said ceiling members and retracted positions so that said lighting fixture can be moved vertically between said ceiling members, and,



a handle portion projecting downwardly from each said arm and extending below said bottom wall.

4,161,020

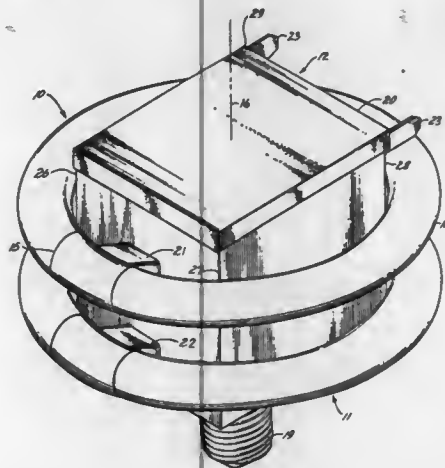
## FLUORESCENT LAMPHOLDER ASSEMBLY FOR CIRCLINE LAMP

Jack V. Miller, Sierra Madre, Calif., assignor to Killerwatt Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 770,753, Feb. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 734,263, Oct. 20, 1976, abandoned, and Ser. No. 734,264, Oct. 20, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,317  
Int. Cl.<sup>2</sup> F21S 5/00

U.S. Cl. 362-216

37 Claims



1. A fluorescent lampholder assembly for receiving a circline lamp comprising:  
a block-shaped housing having a smaller cross section than the circline lamp, the housing having four edges parallel to the axis of the circline lamp when installed, the diagonal distance between the edges being almost as large as the diameter of the circline lamp;  
a lampholder-socket having a first portion lying inside the housing, a second portion lying outside the housing, and terminals extending through the first and second portions, the terminals being adapted to engage the plug pins of the circline lamp outside the housing when the circline lamp surrounds the housing and being adapted to receive connecting wires of components inside the housing; and means extending from the housing in spaced relationship from the lampholder-socket for supporting the circline lamp together with the lampholder-socket when the pins of the circline lamp engage the terminals.

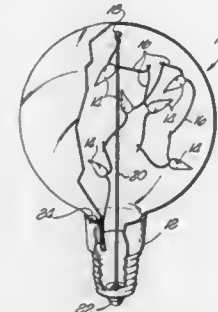
4,161,021

## LOW ENERGY DECORATIVE LIGHT BULB DISPLAYS

Benjamin B. George, Jr., 12751 Browning, Santa Ana, Calif. 92705  
Filed Aug. 29, 1977, Ser. No. 828,403  
Int. Cl.<sup>2</sup> F21P 1/00

U.S. Cl. 362-252

7 Claims



1. A decorative light bulb assembly comprising:  
a transparent bulb with surrounding interior reflective surfaces and a narrow base opening at one end;  
a base structure adapted to be permanently affixed to said bulb at said base opening and containing opposing base terminals for supplying electrical power from a lamp socket;  
a lamp string consisting of a plurality of unbased miniature lamps with elongated flexible wire leads connected end-to-end in series, said lamp string having a length substantially longer than the distance between said base terminals and the opposite end of said bulb and having its two ends electrically coupled to the opposing base terminals with one end affixed to the base; and, twisting means for supporting a portion of said lamp string near said opposite end of said bulb at a point remote from the base for imparting a rotary spring-like tension that opens folds in said lamp string to distribute said lamps within said bulb at locations substantially displaced from the central axis and inner reflecting bulb surfaces, thereby producing myriad reflective images of said lamps within said bulb.

4,161,022

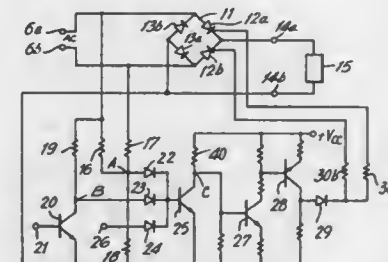
## CONTROLLABLE RECTIFIER CIRCUIT FOR A POWER SUPPLY

Kenichi Kanazawa, Atsugi, and Nobuyuki Takahashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Aug. 7, 1978, Ser. No. 931,765

Claims priority, application Japan, Aug. 9, 1977, 52-95231  
Int. Cl.<sup>2</sup> H02M 7/155

U.S. Cl. 363-88

10 Claims



1. A controllable rectifier circuit for selectively producing a half-wave or a full-wave rectified signal, comprising:  
a pair of input terminals adapted to be supplied with an AC signal;  
a bridge rectifier coupled to said pair of input terminals and including a pair of output terminals across which a rectified AC signal is produced, said bridge rectifier compris-

ing a first current path including a switchable rectifier for conducting positive half cycles of said AC signal and a second current path including a switchable rectifier for conducting negative half cycles of said AC signal;  
means coupled to said pair of input terminals for receiving, in sequence, reduced amplitude versions of said positive and negative half cycles of said AC signal to produce an output pulse when the reduced amplitude of a respective one of said positive and negative half cycles is less than a predetermined level;  
means for selectively supplying one of said half cycles of said AC signal to said last-mentioned pulse producing means to prevent said pulse producing means from producing an output pulse during said one half cycle, and thereby produce an output pulse during the beginning and ending portions of each of said other half cycle; and means for supplying the output pulses produced by said pulse producing means to each of said switchable rectifiers, whereby said bridge rectifier rectifies both half cycles of said AC signal when said one half cycle is not supplied to said pulse producing means, and said bridge rectifier rectifies only said other half cycle of said AC signal when said one half cycle is supplied to said pulse producing means.

4,161,023

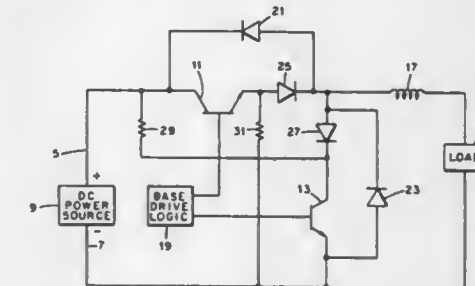
## UP-AND-DOWN CHOPPER CIRCUIT

Jacques R. Goffeau, Hermosa Beach, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 7, 1977, Ser. No. 831,302  
Int. Cl.<sup>2</sup> H02M 7/00

U.S. Cl. 363-124

3 Claims



1. In a Darlington transistor type "up-and-down" chopper for regulating a DC voltage from a source supplying energy to an energy storing load in a "down" operating mode and alternately transferring energy stored in said load to said source in an "up" operating mode including first and second Darlington transistors connected in a series-shunt relationship, respectively, between said source and said load, an inductor connected in immediate series with said load for smoothing the chopped current flowing through said load, a base drive logic circuit means for supplying base drive signals to the base electrodes of said first and second transistors to switch said first transistor "on" and "off" at a selected rate when said chopper is operating in said down mode and switching said second transistor "on" and "off" at a selected rate when said chopper is operating in said up mode, a first free-wheeling diode connected in parallel with the series connected inductor and load for maintaining conduction of current through said load in the down mode during the time said first transistor is switched "off" and a second free-wheeling diode connected between said source and said series connected inductor and load for conducting current from said load to said source in said up mode during the time said second transistor is switched "off", the improvement comprising:  
a first charging circuit means for applying the DC source voltage between the collector and emitter electrodes of said second transistor to charge the inter-electrode capaci-

tance of said second transistor to prevent conduction through said second transistor when said first transistor is turned "on", and  
a second charging circuit means for applying the DC source voltage between the collector and emitter electrodes of said first transistor to charge the inter-electrode capacitance of said first transistor to prevent conduction through said first transistor when said second transistor is turned "on".

4,161,024

# PRIVATE CACHE-TO-CPU INTERFACE IN A BUS ORIENTED DATA PROCESSING SYSTEM

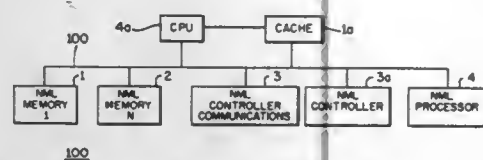
Thomas F. Joyce, Burlington, and Thomas O. Holtey, Newton Lower Falls, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1977, Ser. No. 863,097

Int. Cl.<sup>2</sup> G06F 13/00

U.S. Cl. 364-200

3 Claims



1. A data processing system comprising:  
a system bus;  
a plurality of system units including a main memory, a cache memory, a central processing unit (CPU), and a communications controller all connected in parallel to said system bus, said controller operating to supervise interconnection between said units via said bus to transfer data therebetween and said CPU including memory request means for generating data requests;  
said cache memory including:  
private interface means connecting said cache memory directly to said CPU for permitting direct transmission of data requests from said CPU to said cache memory and direct transmission of requested data from said cache memory to said CPU;  
cache directory and data buffer means for evaluating said data requests and generating a first predetermined output when the requested data is not present in said cache memory; and  
system bus interface means connecting said cache memory to said system bus for obtaining CPU requested data not found in said cache memory from said main memory via said system bus in response to said first predetermined output from said cache directory and data buffer means.

4,161,025

# INFORMATION PROCESSING SYSTEM

Jean-Jacques Dahy, Aubergenville, and Maurice Hubert, Versailles, both of France, assignors to Compagnie Internationale pour l'Informatique, Louveciennes, France

Continuation of Ser. No. 525,638, Nov. 20, 1974, abandoned.

This application Apr. 12, 1977, Ser. No. 786,895

Claims priority, application France, Dec. 4, 1973, 73 43137

Int. Cl.<sup>2</sup> G06F 3/04

U.S. Cl. 364-200

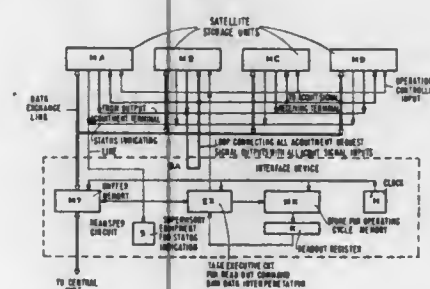
3 Claims

1. An interface device for controlling data exchanges through a data exchange link comprising a data exchange transfer circuit between a central processor unit and a plurality of individually selectable satellite units each of which operates according to an operative cycle of its own for execution of an exchange,

each operative cycle of a satellite unit comprising a fixed plurality of sequential steps, each step being executed according to an internal chronometry of the satellite unit and the initiation of each successive step of the sequence

being authorized from the reception after request of an acquit signal of the execution of the preceding step of the sequence by the satellite unit,  
each satellite unit having an input/output data connection to the said data exchange transfer circuit, an operative cycle control input controlling each time it is activated the execution of a corresponding step of the operative cycle of the satellite unit, an acquit signal requesting output activated each time an operative step of the cycle has been executed in the satellite unit and an acquit signal receiving input the activation of which authorizes the satellite unit to proceed to the execution of the next step of its operative cycle,

said interface device comprising the combination of:  
means storing at locations thereof addressable from the central processor unit sequences of data, each sequence describing a step by step record of the operative cycle of a particular one of the satellite units and each data of the sequence describing the nature of the step to be executed by the satellite unit and the time instant at which the execution of this step may occur in the satellite unit,



- read-out data register means coupled to the said storage means to successively store the data words read out from said storage means,  
data read-out command and read-out data decoder means having a storage means address input activable by the central processor unit, a data input connected to the said read-out data register means, a satellite control signal delivering output connected to the operative cycle control inputs of the satellite units, and having a further output activated concurrently to the said satellite control signal and connected to an unblocking input of the said data exchange transfer circuit said data read-out command and read-out data decoder means further having a clock input,  
local clock means having an output connected to said clock input of the said data read-out command and data decoder means for defining the time instants at which the said satellite control signals are applied to the said satellite control signal delivering output and at which data are read-out from the said storing means, and,  
conductor means permanently connecting all acquit signal requesting outputs of the satellite units to all acquit signal receiving inputs of the said satellite units.

4,161,026

# HARDWARE CONTROLLED TRANSFERS TO MICROPROGRAM CONTROL APPARATUS AND RETURN VIA MICROINSTRUCTION RESTART CODES

John E. Wilhite, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 22, 1977, Ser. No. 853,981

Int. Cl.<sup>2</sup> G06F 9/14, 9/20, 9/19, 13/08

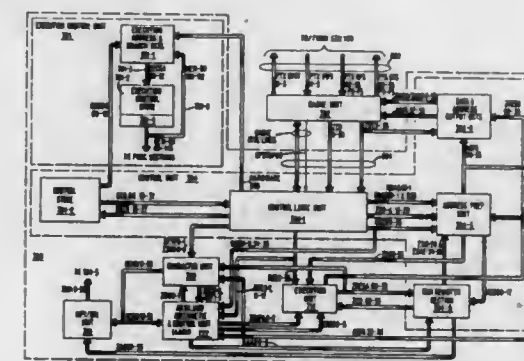
U.S. Cl. 364-200

26 Claims

1. A data processing system including a microprogrammable data processing unit for performing data manipulations under the control of instructions wherein the processing of instructions proceed in a pipelined fashion wherein each instruction is

processed in a number of different phases of operation to completion, said data processing unit comprising:

- a plurality of registers for storing instructions to be processed, each instruction including a multibit operation code;
- a first addressable control store coupled to a first one of said plurality of registers for receiving signals corresponding to said multibit operation code of an instruction to be processed, said first control store including a plurality of locations, each for storing a word including at least a multibit control sequence code having less bits than said operation code and an address, said control sequence code specifying one of a number of hardwired control sequences and said address identifying a first microinstruction of a different one of a plurality of execution sequences;
- a cycled addressable second control store including a plurality of locations for storing at least one microinstruction of a different one of said plurality of execution sequences;
- an address register connected to receive said address from said first control store and connected to said second control store for read out of the microinstruction contents of a location during a cycle of operation;
- an output register connected to said second control store for temporarily storing said microinstruction contents read out during said cycle of operation;
- hardwired control state sequencing means coupled to said first control store including sequence decoder circuit



- means for decoding said control sequence codes, said hardwired control sequencing means for generating different sequences of control signals for defining the different operations to be performed during a first one of said phases of operation for each instruction, said hardwired control sequencing means, being conditioned by each control sequence code within a certain class read out in response to the operation code of an instruction being processed, for generating a predetermined one of said different sequences of control signals, for performing said operations during said first one of said phases of said instruction, for transferring said address into said address register, for continued processing of said instruction under the control of the specified one of said plurality of execution sequences, and for placing said sequencing means in a predetermined state, said specified execution sequence including a microinstruction containing a restart code bit pattern; and,  
decoder circuit means coupled to said hardwired control state sequencing means and to said output register, said decoder circuit means being operative upon the read out of said microinstruction restart code pattern from said second control store into said output register to generate signals for switching said hardwired control state sequencing means from said predetermined state to another state to continue instruction processing in said pipelined fashion.

4,161,027

# DIGITAL PROTECTION SYSTEM FOR TRANSMISSION LINES AND ASSOCIATED POWER EQUIPMENT

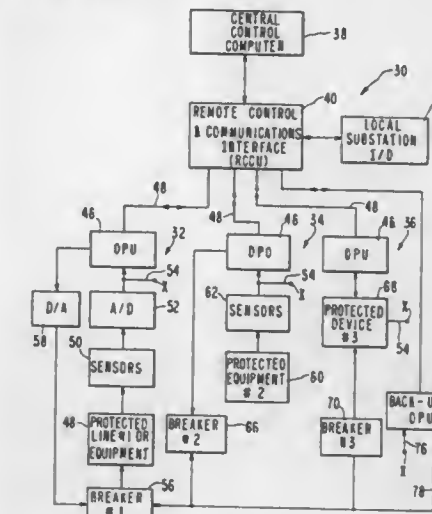
Billy D. Russell, Bryan, Tex., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 4, 1976, Ser. No. 729,558

Int. Cl.<sup>2</sup> G05B 9/02; H02H 7/00

U.S. Cl. 364-492

13 Claims



1. A method of monitoring and controlling the respective operating conditions of a plurality of electrical power transmission structures at a corresponding plurality of locations remote from each other comprising: sensing the operating condition of the power transmission structure at each of the locations; digitizing the information corresponding to the sensed operating condition from each location; communicating the digitized information to a microprocessing station at each location; processing the digitized information with a predetermined algorithm to cause the generation of signals corresponding to the operating condition of the corresponding power transmission structure; communicating the signals from each microprocessing station to a central processing region independently of the communication of the signals from the microprocessing stations of the other locations; and changing the operating conditions of the transmission structure at a location corresponding to a predetermined operating condition detected by the receipt of digitized information at the corresponding microprocessing station.

4,161,028

# ELECTRIC DEMAND CONTROL SYSTEM

Frederick B. Davis, 3rd, Drexel Hill, and Charles W. Ross, Hatboro, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed May 30, 1978, Ser. No. 910,320

Int. Cl.<sup>2</sup> A02J 13/00; G06G 7/62

U.S. Cl. 364-492

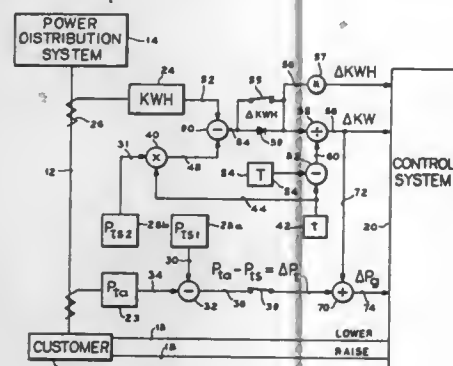
11 Claims

1. A control system for controlling the consumption of power by a customer over a tie line connected to transfer power between a distribution system and said customer without the consumption exceeding a predetermined energy demand limit during a predetermined demand period, comprising:

means for determining the power transfer deviation as the change in generation or load required by the customer under existing conditions to make the energy transferred to the customer over the whole demand period correspond to the demand limit;  
means for determining the energy transfer deviation as the deviation between the amount of energy actually transferred during the elapsed portion of the existing demand period and the desired energy transfer for that portion;



means for controlling said generation or load in response to said power transfer deviation to tend to reduce that deviation toward zero; and



means for modifying the response of said control means in response to a quantity which is a joint function of said energy transfer deviation and the unelapsed time in the demand period.

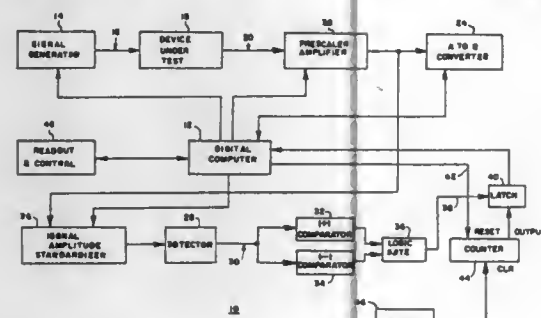
#### 4,161,029 AUTOMATIC TRANSIENT RESPONSE ANALYZER SYSTEM

George J. Frye, 12175 SW. Douglas St., Portland, Oreg. 97225, and Leonardus J. Geerling, Rte. 2, Box 124D, Hillsboro, Oreg. 97123

Filed Sep. 19, 1977, Ser. No. 834,799  
Int. Cl.<sup>2</sup> G01R 15/12

U.S. Cl. 364—579

5 Claims



1. Automatic transient response analyzer system comprising: digital computer means; signal generator means under control of said digital computer means for generating measurement signals to device under test; prescaler amplifier means for receiving signals from said device under test and being under control of said digital computer means; analog to digital converter means receiving signals from said prescaler amplifier means and under control of said digital computer means; signal amplitude standardizer means receiving signals from said analog to digital converter means and being under control of said digital computer means; detector means receiving signals from said signal amplitude standardizer means; comparator means receiving signals from said detector means and for providing level-crossing output signals; clock-driven counter means under control of said digital computer means; latch means receiving signals from said counter means and said comparator means and for supplying signals to said digital computer means; and readout and control means for sending and receiving signals

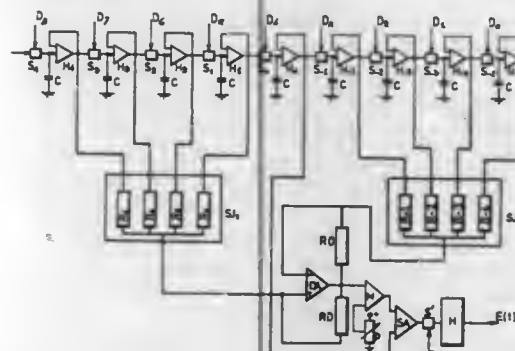
from said digital computer means for providing output information.

#### 4,161,030 REGENERATING A DEGENERATED CURVE

Eduard B. M. de Jong, Tilburg, Netherlands, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.  
Filed Jul. 14, 1977, Ser. No. 815,641  
Claims priority, application Netherlands, Jul. 19, 1976, 7607956

Int. Cl.<sup>2</sup> G01N 21/26  
U.S. Cl. 364—581

7 Claims

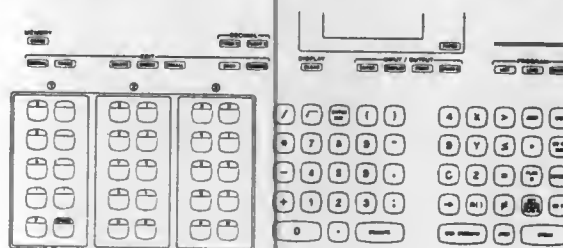


1. Apparatus for regenerating a degenerated curve, which curve is approximately degenerated exponentially, comprising a sampling means for sampling in a real time sense the degenerated curve, a memory for storing the samples and an arithmetic means arranged to determine each point of the regenerated curve from the sum of a central sample value, the weighted value of at least one sample preceding the central sample and the weighted value of at least one sample following the central sample.

#### 4,161,031 PROGRAMMABLE CALCULATOR INCLUDING BOOLEAN FLAG VARIABLE MEANS

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.  
Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,293  
Int. Cl.<sup>2</sup> G06F 15/06, 3/02  
U.S. Cl. 364—709

6 Claims



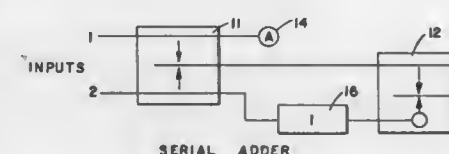
1. An electronic calculator comprising: keyboard input means for entering alphanumeric information, including lines of algebraic statements, into the calculator; memory means for storing a program of lines of algebraic statements previously entered into the calculator; processing means, coupled to said keyboard input means and memory means, for processing lines of algebraic state-

ments entered into the calculator and stored in said memory means to perform selected functions; and output means, coupled to said processing means, for providing a visual indication of selected functions performed by said processing means; said keyboard input means including a plurality of keys for specifying one of a plurality of boolean flag variables to be entered as part of an algebraic statement, and a plurality of flag variable control keys for entering flag statements, each flag statement specifying one of a clearing, setting, and testing function in connection with a designated one of said plurality of boolean flag variables, said keyboard means including a display control key operative in combination with selected ones of said plurality of keys specifying one of said plurality of boolean flag variables for entering a flag display statement to initiate visual display on said output means of the state of the specified boolean flag variable.

#### 4,161,032 SERIAL ARITHMETIC FUNCTIONS WITH MAGNETIC BUBBLE LOGIC ELEMENTS

Richard P. Williams, Columbia, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.  
Filed Feb. 16, 1978, Ser. No. 878,207  
Int. Cl.<sup>2</sup> G06F 7/48; G11C 11/14  
U.S. Cl. 364—714

18 Claims

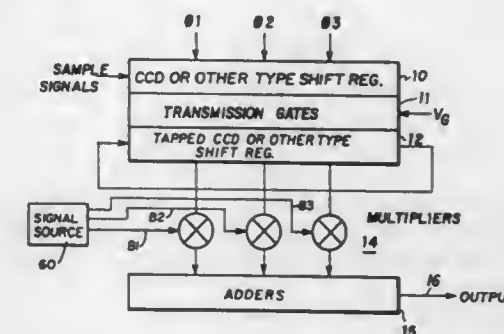


1. A magnetic bubble device for performing an arithmetic operation on magnetic bubble streams representative of binary numbers, comprising: input means for two or more magnetic bubble streams representative of binary numbers; output means for at least one bubble stream representative of the result of the arithmetic operation; and a magnetic bubble arithmetic unit connected between said input and output means, said arithmetic unit comprising: a plurality of magnetic bubble elements, said plurality including a first two-input AND-EXCLUSIVE OR bubble logic gate, said gate having first and second continuous, uninterrupted paths extending from the input to the output of said gate for the passage of bubbles therethrough, the outputs of said paths representative of the logical AND operation performed on bubbles input to said paths, and a third output path disposed between said first and second paths for providing an output representative of the EXCLUSIVE OR operation performed on bubbles input to said first and second paths, said gate further having a pair of preferred transition paths from said first and second paths to said third path such that a bubble entering on either of said first or second paths, in the absence of a bubble entering on the other path, exits the gate on said third path, said plurality of magnetic bubble elements interconnected in a fixed logical pipeline configuration within said unit for performing a predetermined arithmetic operation, said configuration characterized by an absence of bubble feedback paths internal to said unit.

#### 4,161,033 CORRELATOR/CONVOLVER USING A SECOND SHIFT REGISTER TO ROTATE SAMPLE VALUES

Lloyd W. Martinson, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.  
Filed Dec. 22, 1977, Ser. No. 863,233  
Int. Cl.<sup>2</sup> G06F 15/34  
U.S. Cl. 364—728

2 Claims



1. A digital convolver/correlator comprising, in combination: input means for supplying first input signals at a predetermined rate; signal source means for supplying first shift signals at said predetermined rate; serial in and parallel out first shift register means having a plurality of at least n first stages for receiving the first input signals and serially shifting said first input signals from stage to stage in response to said first shift signals; transfer signal means for producing a transfer signal each time said first shift register means has received n input signals; serial and parallel in and parallel out second shift register means having a plurality of n second stages with the signal output terminal of its final stage coupled to the signal input terminal of its first stage for enabling rotation of said first input signals through said second stages thereof; transmission means responsive to said transfer signal for transferring the said first input signals in parallel manner from the stages of said first shift register means to corresponding stages of said second shift register means; said signal source means constructed to supply to said second shift register means second shift signals for rotating the input signals from stage to stage therein at a rate not less than approximately said predetermined rate; means providing a plurality of second input signals; a plurality of multiplier means, each coupled to receive as a first input operand the first input signal from a different stage of said second shift register means and as a second input operand one of said second input signals to produce a product signal representative of the value of the first input signal applied thereto times the value of the second input signal applied thereto; and summing means responsive to the product signals from said plurality of multiplier means for producing output signals.

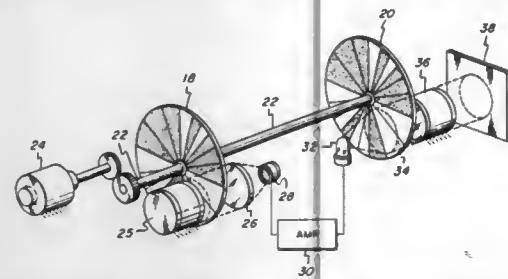
#### 4,161,034 CORRELATION APPARATUS

Edward W. Stark, Garden City, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.  
Filed Dec. 7, 1962, Ser. No. 243,163  
Int. Cl.<sup>2</sup> G06G 7/19  
U.S. Cl. 364—822

9 Claims

1. Signal handling apparatus comprising summing means adapted to receive simultaneously signals representing a function taken at one or more different phases of time, means providing simultaneously a plurality of signals representing said function taken at various phases of time, a plurality of multiplying means each of which receives the output signal from said

summing means and one of the simultaneously provided function signals, and a plurality of integrating means simultaneously receiving the product output signals from respective multiplying means, whereby peak output signals from said

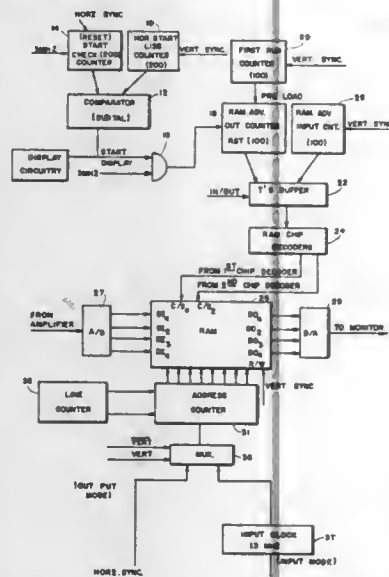


integrating means is indicative of which respective multiplying means receive simultaneously provided signals having the same phases as the phases of the input signals to said summing means.

**4,161,035**  
**CIRCUITRY FOR DISPLAYING A CONSTANTLY CHANGING M-MODE OUTPUT ON A RASTER SCAN DISPLAY**  
Yair Toor, Rehovot; Haim Rousso, Tel-Aviv, and Ben-Zion Kopilavitz, Petach Tikva, all of Israel, assignors to Israel Electro-Optical Industry Ltd., Rehovot, Israel  
Filed Oct. 31, 1977, Ser. No. 847,021  
Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 364—900

2 Claims



1. Circuitry for displaying a constantly changing M-mode transducer scan output on a raster scan display associated with synchronization circuitry, said scan output being in the form of a first multiplicity of data lines each containing a second multiplicity of data words and each representing a scan of the transducer output at a particular closely spaced scanning time and such that the data line representing the oldest scan is periodically erased and a data line representing the newest scan is displayed, said circuitry comprising:

means for receiving data representing sequential scans of an M-mode ultrasound transducer output;  
random access memory means, comprising a first multiplicity of memory elements, each for storing one of said first multiplicity of data lines representing a sample of the M-mode ultrasound transducer output;  
horizontal start line counter means receiving a vertical synchronization signal from the synchronization circuitry and

providing a first output indicating the relative horizontal position at which an information display sequence begins;  
start check counter means receiving a horizontal synchronization signal and a clock signal from the synchronization circuitry for producing a second output indicating the horizontal position at which the raster beam of the display is currently located;

comparator means receiving said first and second outputs and providing a start display signal when said first and second outputs indicate the same horizontal position;  
first random access counter memory means providing a third output;

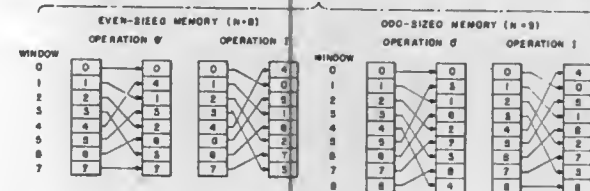
random access memory advance output counter means receiving said start display signal from said comparator means and operative in response thereto to provide a fourth output representing instructions to said random access memory means, sequentially to read out, one data word from each data line during each raster scan beginning at a data word contained in a data line indicated by said third output; and

random access memory input counter means receiving said vertical synchronization signal from said synchronization circuitry and providing a fifth output operative to load a data line representing the newest scan into said random access memory means at a memory element determined by said third output, such that upon receipt of every vertical synchronization signal a line of data is stored in sequential ones of said first multiplicity of memory elements.

**4,161,036**  
**METHOD AND APPARATUS FOR RANDOM AND SEQUENTIAL ACCESSING IN DYNAMIC MEMORIES**  
S. Brent Morris, Columbia; Arthur Valliere, III, Arnold, and Richard A. Wisniewski, Severna Park, all of Md., assignors to United States of America, Director National Security Agency, Washington, D.C.  
Filed Nov. 8, 1977, Ser. No. 849,561  
Int. Cl.<sup>2</sup> G06F 7/00

U.S. Cl. 364—900

21 Claims



1. A memory system comprising:

a dynamic memory having  $N$  locations,  $0, \dots, N-1$ , for the storage of data, wherein  $N$  is any odd number or any integer power of 2;

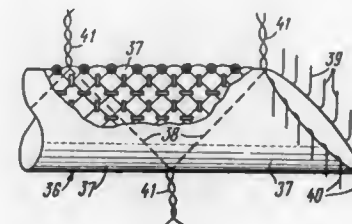
first and second interconnections among said storage locations such that the data in said memory may be rearranged in accordance with first and second shuffle operations, wherein said first shuffle operation is an In Shuffle and said second shuffle is an Out Shuffle; and

control means connected to said first and second interconnections and responsive to the input address of a desired datum for generating control signals defining a sequence of said shuffle operations, said control signals enabling said first and second interconnections such that said dynamic memory is reconfigured in accordance with said shuffle operations to access said datum to a preselected memory location.

**4,161,037**  
**FERRITE CORE MEMORY**  
Jury E. Seleznev; Jury A. Burkin, and Sergei V. Kuzmin, all of Novosibirsk, U.S.S.R., assignors to Vychislitelny Tsent Sibirskogo Otdelenia Akademii Nauk SSSR, U.S.S.R.  
Continuation of Ser. No. 516,131, Oct. 18, 1974, abandoned, which is a division of Ser. No. 319,053, Dec. 27, 1972, Pat. No. 3,858,310. This application Jan. 17, 1977, Ser. No. 759,872  
Int. Cl.<sup>2</sup> G11C 5/08

U.S. Cl. 365—51

1 Claim

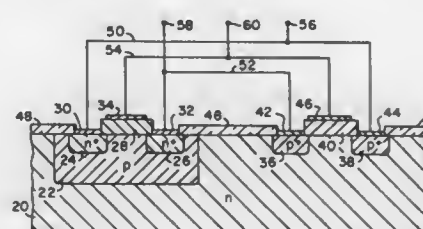


1. A ferrite core memory in the form of a cylindrical hollow plait, comprising: a plurality of matrices comprising ferrite cores threaded with mutually perpendicular coordinate wires and wires forming readout and inhibition windings; the matrices being connected edge to edge and helically wound to form the cylindrical surface of the plait, with a helical junction between adjacent matrices the coordinate wires forming opposed helices lying on the cylindrical surface of the plait; and outgoing leads of the readout and inhibition windings being distributed longitudinally of the plait along said junction.

**4,161,038**  
**COMPLEMENTARY METAL-FERROELECTRIC SEMICONDUCTOR TRANSISTOR STRUCTURE AND A MATRIX OF SUCH TRANSISTOR STRUCTURE FOR PERFORMING A COMPARISON**  
Shu-Yau Wu, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Sep. 20, 1977, Ser. No. 834,941  
Int. Cl.<sup>2</sup> G11C 11/40; G06G 7/00

U.S. Cl. 365—145

13 Claims



1. A complementary metal-ferroelectric-semiconductor device that provides a controllable minimum current in response to selected voltages, said semiconductor device comprising:

a first semiconductor material having a first type of dopant impurity;  
a semiconductor material located in the first semiconductor material, said complementary semiconductor material comprised of a second type of dopant impurity;  
a first source region in said complementary semiconductor material, said first source region having a concentration of the first type of dopant impurity that is higher than the concentration of said first type of dopant impurity in the semiconductor substrate;  
a first drain region in said complementary semiconductor material, said first drain region having a higher concentration of the first type of dopant impurity than the first semiconductor material, said first drain region being displaced from said first source region by a predetermined

lateral distance across the surface of the complementary semiconductor material;

a first ferroelectric film adjoining the complementary semiconductor material along the predetermined lateral distance between said first source region and said first drain region;

first source and drain electrodes covering the surface of the first source and first drain regions respectively and a first gate electrode covering the surface of said ferroelectric film that is oppositely disposed from the surface of the ferroelectric film adjoining the complementary semiconductor material;

a second source region in said first semiconductor material, said second source region having a higher concentration of the second type dopant impurity than the concentration of said complementary semiconductor material;

a second drain region in said first semiconductor material, said second drain region having a higher concentration of the second type of dopant impurity than the concentration of said complementary semiconductor, said second drain region being disposed from said source region by a predetermined lateral distance across the surface of the first semiconductor material;

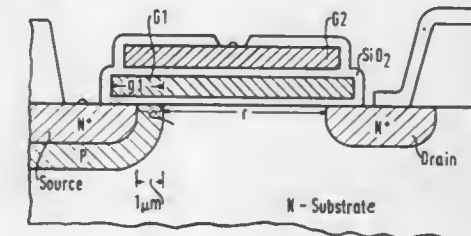
a second ferroelectric film adjoining the first semiconductor material along the predetermined lateral distance between said second source region and said second drain region; and

second source and drain electrodes covering the surface of the second source and the second drain regions respectively, and a second gate electrode covering the surface of said second ferroelectric film that is oppositely disposed from the surface of the ferroelectric film adjoining the first semiconductor material, the first drain and source electrodes being respectively connected to the second source and drain electrodes, and the first gate electrode being connected to the second gate electrode such that the first and second electrodes are connected in complementary fashion.

**4,161,039**  
**N-CHANNEL STORAGE FET**  
Bernward Rössler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 750,860, Dec. 15, 1976, Pat. No. 4,087,795. This application Feb. 6, 1978, Ser. No. 875,700  
Int. Cl.<sup>2</sup> G11C 11/40

U.S. Cl. 365—185

11 Claims



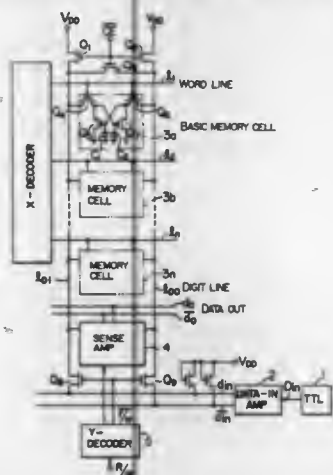
1. In an n-channel storage field effect transistor (FET) having:

a source, a channel, and a drain;  
at least one gate which is a floating storage gate surrounded on all sides by an insulator including means for recharging of the storage gate by channel injection wherein electrons on account of their heating and through an electric field acting in a source-drain direction overcome an energy threshold to a conductivity band of the insulator and thus reach the storage gate;  
said channel injection being employed for programming by charging of the storage gate;



said storage gate, due to its charge and by influencing the source-drain current, exerting a restrictive influence upon a source-drain path;  
in an unprogrammed state said channel being of a depletion type;  
an additional, controllable control gate being provided which has a terminal and in capacitive interaction with the storage gate;  
wherein the improvement comprises:  
a length of said channel being determined by a thickness of a P doped P layer segment formed in an N-doped substrate directly beside a diffused N+doped N+layer segment as a source;  
said N+layer segment being located directly beside said P layer segment;  
an N+doped N+layer segment as a drain being arranged at an interval from the P layer segment which forms a drift path, said interval being at least approximately equal to a thickness of said P layer segment between the source and the drift path;  
the storage gate and the control gate being arranged in insulated fashion above a surface of the substrate at a predetermined distance for influencing the channel path; and  
means for erasure by irradiation with ultraviolet light, said means comprising the storage gate projecting beyond the control gate by which it is otherwise covered.

said data-in amplifier comprises means for holding the output of said data-in amplifier at a precharge potential level of said



data line except in the write mode in response to said read-and-write command signal.

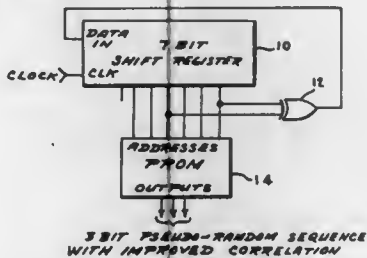
**4,161,041  
PSEUDO RANDOM NUMBER GENERATOR  
APPARATUS**

Eric W. Butler, Severna Park, and Clinton W. Moulds, III, Millersville, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,190  
Int. Cl.<sup>2</sup> G11C 13/00

U.S. Cl. 365-244

7 Claims



1. A pseudo random number generator apparatus comprising in combination:

- a shift register having a predetermined bit length, said shift register having a clock input and a data input, said shift register having a plurality of output states, said shift register receiving a clock signal and a data signal, said shift register shifting said data signals to said plurality of output states,
- an exclusive or gate having a predetermined number of input lines and an output line, said output line being connected to said data input of said shift register, each line of said predetermined number of input lines being randomly connected to a single line of said plurality of output states of said shift register, and,
- a programmable read only memory connected to (n-1) of said plurality of output states of said shift register wherein n is equal to number of said predetermined bit length, said programmable read only memory have a plurality of output lines, said programmable read only memory assigning addresses to each integer appearing on said plurality of output lines, said programmable read only memory providing a random number on said plurality of output lines.

**4,161,040  
DATA-IN AMPLIFIER FOR AN MISFET MEMORY  
DEVICE HAVING A CLAMPED OUTPUT EXCEPT  
DURING THE WRITE OPERATION**  
Takashi Satoh, Kodaira, Japan, assignor to Hitachi, Ltd., Japan  
Filed May 20, 1977, Ser. No. 798,865  
Claims priority, application Japan, May 24, 1976, 51-59117  
Int. Cl.<sup>2</sup> G11C 7/02

U.S. Cl. 365-203

20 Claims

19. A dynamic type MIS memory device having memory cells, data lines coupled to said cells, a data-in amplifier for writing information into said cells, and a transfer gate coupled between said data line and said data-in amplifier and being operative under a read-and-write command signal, wherein

**DESIGN PATENTS**

**GRANTED JUL. 10, 1979**

**ERRATA**

For CLASS	See PATENT NO.
021-030 .....	252,343
021-022 .....	252,344
021-120 .....	252,345
021-227 .....	252,346
021-227 .....	252,347
021-134 .....	252,348
015-124 .....	252,349
017-022 .....	252,353
003-030 .....	252,354
003-048 .....	252,355

# DESIGNS

JULY 10, 1979

252,296

## SHOE PROTECTOR OR SIMILAR ARTICLE

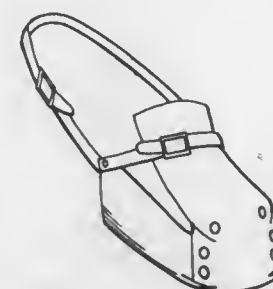
Richard S. Alegria, 912 Arguello St., Apt. 3, Redwood City, Calif. 94063

Filed Mar. 28, 1977, Ser. No. 781,923

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-277



252,298

## COMBINED BRUSH HANDLE AND BACK

Maurice C. Baudon, Beauvais, France, assignor to S.A. Ets Lardenois, Hermes, France

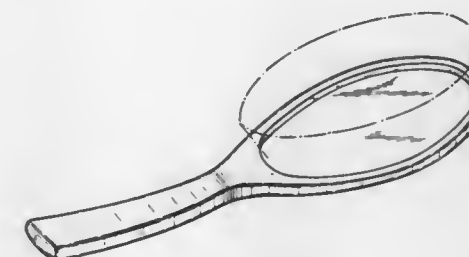
Filed Nov. 24, 1975, Ser. No. 634,329

Claims priority, application France, Jun. 6, 1975, 267

Term of patent 14 years

Int. Cl. D4-02

U.S. Cl. D4-35



252,297

## SLIPPER

Lorenzo C. Vinas, Banolas, Spain, assignor to Comercial Exportadora Banolense S.A., Banolas, Spain

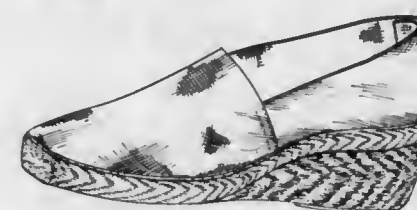
Filed Jul. 16, 1976, Ser. No. 705,857

Claims priority, application Spain, Feb. 4, 1976, 86190

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-300



252,299

## DISPLAY RACK

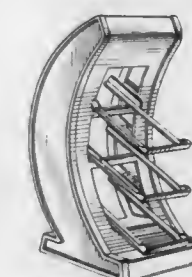
Simeon Marshall, Chicago, Ill., assignor to Rachengold-Werk Adolf Speck, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,986

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-23





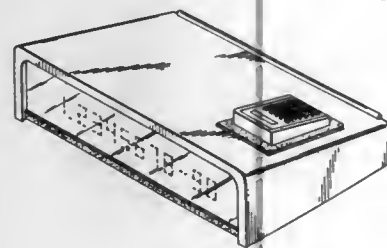
252,300  
MOBILE INTRAVENOUS STAND  
John W. Pryor, 420 N. Cedros, Solana Beach, Calif. 92075  
Filed May 11, 1977, Ser. No. 795,794  
Term of patent 14 years  
Int. Cl. D6-99

U.S. Cl. D6-28



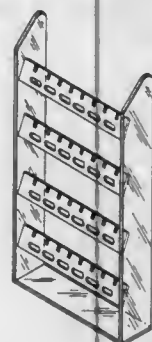
252,301  
COMBINED LECTERN AND DISPLAY CALCULATOR  
George S. McCarty, Laguna Beach, Calif., assignor to Educational Calculator Devices, Inc.  
Filed Feb. 23, 1977, Ser. No. 771,391  
Term of patent 14 years  
Int. Cl. D6-06; D18-01

U.S. Cl. D6-155



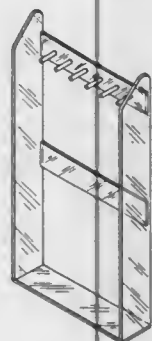
252,302  
JEWELRY CADDY  
Warren E. Persky, Dallas, Tex., assignor to Item House, Inc., Dallas, Tex.  
Filed May 3, 1978, Ser. No. 902,768  
Term of patent 14 years  
Int. Cl. D6-04

U.S. Cl. D6-157



252,303  
JEWELRY CADDY  
Warren E. Persky, Dallas, Tex., assignor to Item House, Inc., Dallas, Tex.  
Filed May 3, 1978, Ser. No. 902,769  
Term of patent 14 years  
Int. Cl. D6-04

U.S. Cl. D6-157



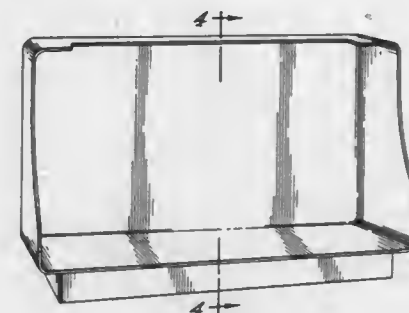
252,304  
SEWING MACHINE WORK TABLE OR SIMILAR ARTICLE  
Wayne A. Current, 17 Mabern Dr., Holmdel, N.J. 07733  
Filed Oct. 8, 1976, Ser. No. 731,067  
Term of patent 14 years  
Int. Cl. D6-03

U.S. Cl. D6-179



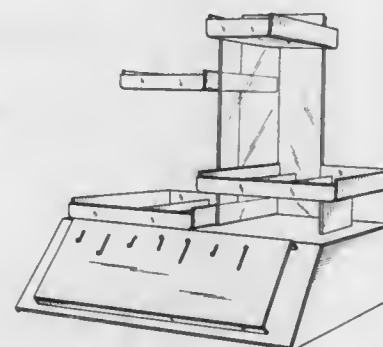
252,305  
DISPLAY UNIT  
Phillip A. Waters, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
Filed Apr. 7, 1978, Ser. No. 894,573  
Term of patent 14 years  
Int. Cl. D20-02

U.S. Cl. D6-181



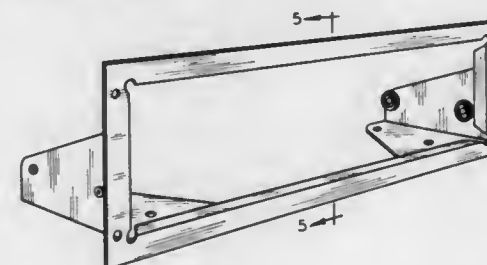
252,306  
COMBINED DISPLAY RACK AND SELECTION CONSOLE  
Myron L. Denhoff, 435 E. 85th St., New York, N.Y. 10028  
Filed May 18, 1978, Ser. No. 901,748  
Term of patent 3½ years  
Int. Cl. D20-02

U.S. Cl. D6-188



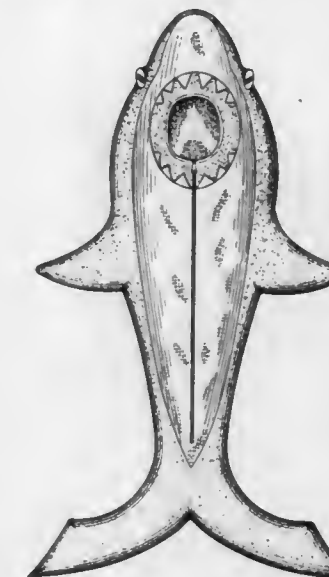
252,307  
DRAWER SUSPENSION FRAME  
Max E. Hosmer, Charlevoix, Mich., assignor to Freedman Aircraft Engineering Corp., Charlevoix, Mich.  
Filed May 12, 1977, Ser. No. 796,469  
Term of patent 14 years  
Int. Cl. D6-06

U.S. Cl. D6-191



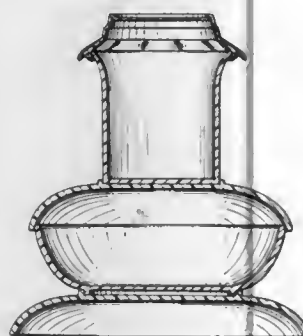
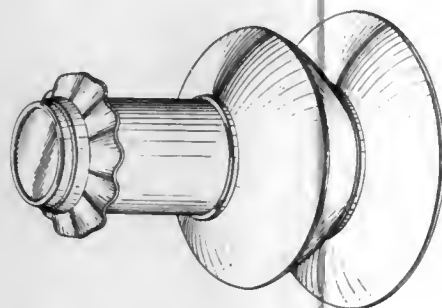
252,308  
SLEEPING BAG  
Robert J. Ochwat, 13215 Mackinaw, Chicago, Ill. 60633  
Filed Mar. 21, 1977, Ser. No. 779,298  
Term of patent 14 years  
Int. Cl. D6-13

U.S. Cl. D6-268



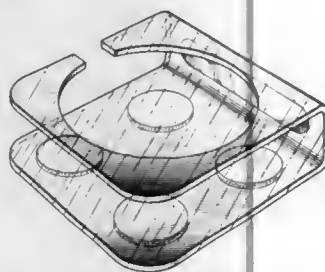
**252,309**  
**DINNERWARE SET**  
 Michel Schwartz, Great Neck, N.Y., assignor to Miramar of California, Los Angeles, Calif.  
 Filed Oct. 20, 1976, Ser. No. 734,057  
 Term of patent 14 years  
 Int. Cl. D7-01

U.S. Cl. D7-3



**252,310**  
**PLASTIC CUP HOLDER**  
 Marvin B. Shannon, 1413 Grand Ave., Fort Worth, Tex. 76106  
 Filed Nov. 14, 1977, Ser. No. 851,541  
 Term of patent 14 years  
 Int. Cl. D7-06

U.S. Cl. D7-70



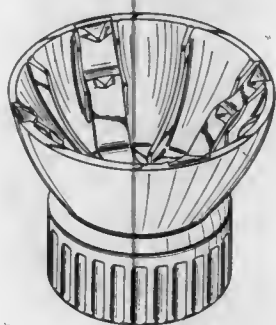
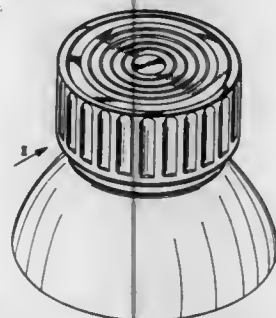
**252,311**  
**DECORATED COOKING POT OR SIMILAR ARTICLE**  
 Graziano Prussi, Florence, Italy, assignor to Moneta S.p.A., Milan, Italy  
 Filed Dec. 14, 1977, Ser. No. 860,739  
 Claims priority, application Italy, Jun. 17, 1977, 21562 B/77  
 Term of patent 3½ years  
 Int. Cl. D7-02

U.S. Cl. D7-97



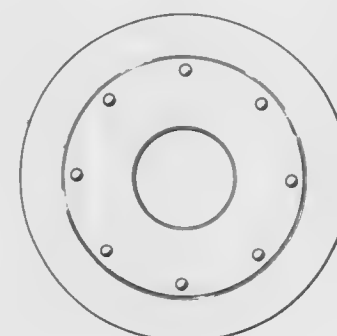
**252,312**  
**FRUIT HOLDER**  
 Peter Ackeret, Küsnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland  
 Filed Feb. 2, 1977, Ser. No. 764,154  
 Claims priority, application Italy, Feb. 2, 1977, 52883 B/77  
 Term of patent 14 years  
 Int. Cl. D7-04

U.S. Cl. D7-99



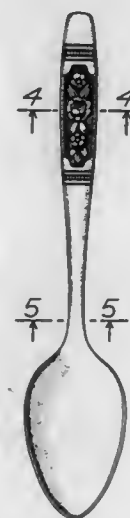
**252,313**  
**HEAT STORAGE BASE FOR DINNERWARE**  
 Thomas J. Landry, Old Saybrook, Conn., assignor to AMF Incorporated, White Plains, N.Y.  
 Filed Oct. 11, 1977, Ser. No. 840,697  
 Term of patent 14 years  
 Int. Cl. D7-01

U.S. Cl. D7-130



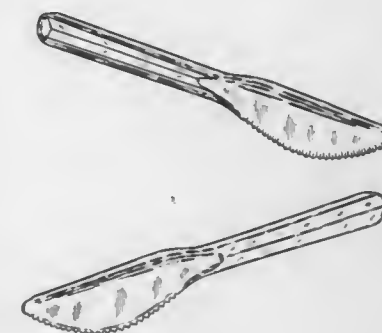
**252,314**  
**SPOON OR SIMILAR ARTICLE**  
 Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.  
 Filed Oct. 31, 1977, Ser. No. 847,116  
 Term of patent 14 years  
 Int. Cl. D7-03

U.S. Cl. D7-137



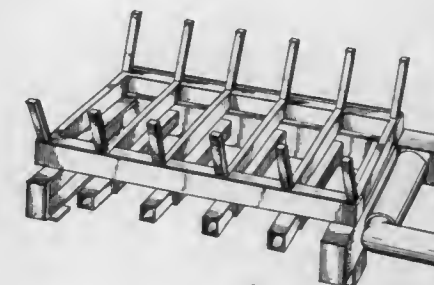
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**KNIFE**  
 William A. Dart, Mason, Mich., assignor to Dart Container Corporation, Mason, Mich.  
 Filed Dec. 13, 1976, Ser. No. 749,718  
 Term of patent 14 years  
 Int. Cl. D7-03

U.S. Cl. D7-138



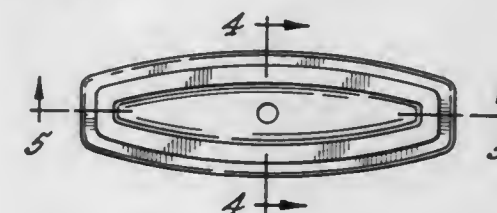
**252,316**  
**COMBINED FIREPLACE GRATE AND HEATER**  
 Donald D. Cagle, 2500 S. U St., Fort Smith, Ark. 72901  
 Filed Dec. 23, 1977, Ser. No. 863,810  
 Term of patent 14 years  
 Int. Cl. D7-08; D23-03

U.S. Cl. D7-207



**252,317**  
**ESCUTCHEON**  
 LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
 Filed Jun. 19, 1978, Ser. No. 916,342  
 Term of patent 14 years  
 Int. Cl. D8-09

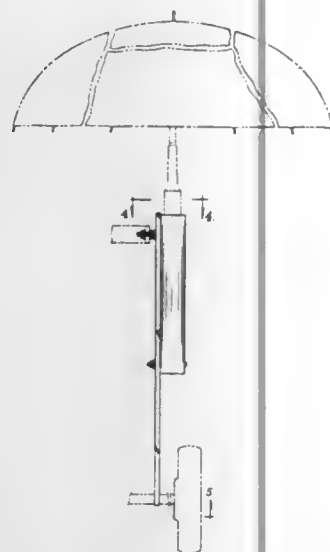
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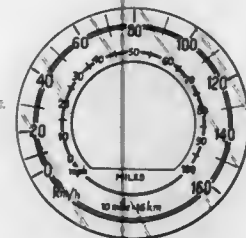
**252,318**  
**GOLF CART CARRIED OPEN UMBRELLA HOLDER**  
 George W. Kriegner, 13908 Rossini, Detroit, Mich. 48205  
 Filed Nov. 10, 1976, Ser. No. 740,414  
 Term of patent 14 years  
 Int. Cl. D8—99

U.S. Cl. D8—373



**252,320**  
**VEHICLE SPEEDOMETER METRIC CONVERSION LABEL**  
 Harry Chojna, 1 Dallas Ct., Hughesdale, Victoria 3166, Australia  
 Filed Sep. 15, 1976, Ser. No. 723,436  
 Term of patent 14 years  
 Int. Cl. D10—07

U.S. Cl. D10—103



**252,321**  
**VEHICLE SPEEDOMETER METRIC CONVERSION LABEL**  
 Harry Chojna, 1 Dallas Ct., Hughesdale, Victoria 3166, Australia  
 Filed Sep. 15, 1976, Ser. No. 723,438  
 Term of patent 14 years  
 Int. Cl. D10—07

U.S. Cl. D10—103



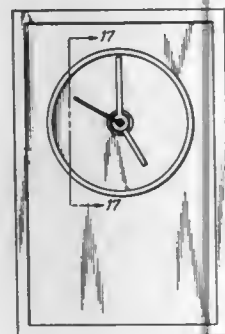
**252,322**  
**FINGER RING**  
 Russell C. Johnson, 4625 Red Bank Rd., Cincinnati, Ohio 45227  
 Filed Sep. 5, 1975, Ser. No. 610,683  
 Term of patent 14 years  
 Int. Cl. D11—01

U.S. Cl. D11—31



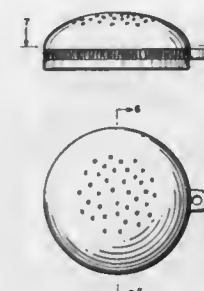
**252,319**  
**CLOCK**  
 Paul S. Kopel, 55 Oakdale Dr., Rochester, N.Y. 14618  
 Filed Jan. 27, 1977, Ser. No. 762,850  
 Term of patent 14 years  
 Int. Cl. D10—01

U.S. Cl. D10—25



**252,323**  
**KEY CHAIN FOB**  
 Lester V. Molenaar, P.O. Box 777 W. Hwy. 40, Willmar, Minn. 56201  
 Filed Oct. 25, 1977, Ser. No. 844,704  
 Term of patent 14 years  
 Int. Cl. D3—01

U.S. Cl. D11—81



**252,325**  
**MOTORCYCLE**  
 Makoto Hori, 5-8-204, Nishiyamato-danchi, Wako-shi, Saitama-ken, and Hiroshi Nakano, 2-1-5, Kamiigusa, Suginami-ku, Tokyo, both of Japan  
 Filed Dec. 28, 1977, Ser. No. 865,341  
 Claims priority, application Japan, Jun. 30, 1977, 52-25697  
 Term of patent 14 years  
 Int. Cl. D12—11

U.S. Cl. D12—110



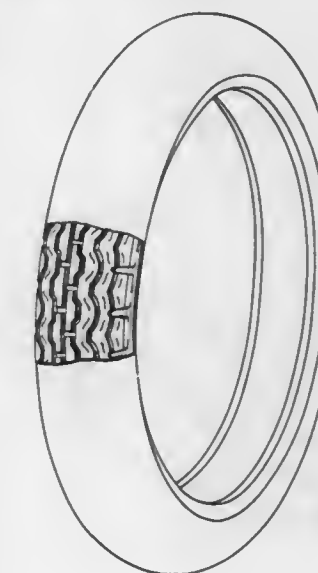
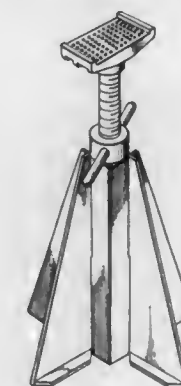
**252,326**  
**TIRE**  
 Barrington S. Gill, and Claude A. Hart, both of Sutton Coldfield, England, assignors to Dunlop Limited, United Kingdom  
 Filed Sep. 14, 1977, Ser. No. 833,388  
 Claims priority, application United Kingdom, Mar. 16, 1977, 979287/77

Term of patent 14 years  
 Int. Cl. D12—15

U.S. Cl. D12—141

**252,324**  
**STABILIZER JACK**  
 Julius F. John, Gardena, Calif., assignor to Norco Industries, Inc., Gardena, Calif.  
 Filed Jul. 1, 1977, Ser. No. 812,398  
 Term of patent 14 years  
 Int. Cl. D12—05

U.S. Cl. D12—55

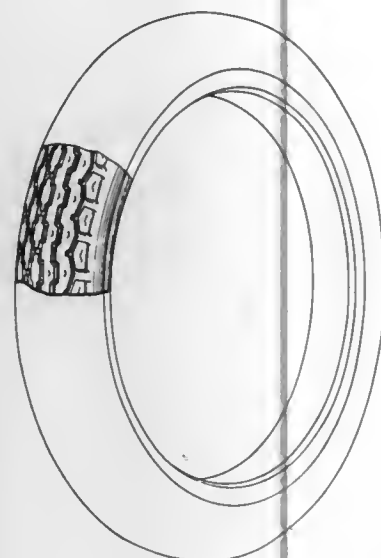


252,327  
TIRE

Hisashi Shirashoji, Kobe, Japan, assignor to Dunlop Limited, England

Filed Nov. 7, 1977, Ser. No. 849,334  
Claims priority, application Japan, May 30, 1977, 52-20838  
Term of patent 14 years  
Int. Cl. D12-15

U.S. Cl. D12-142



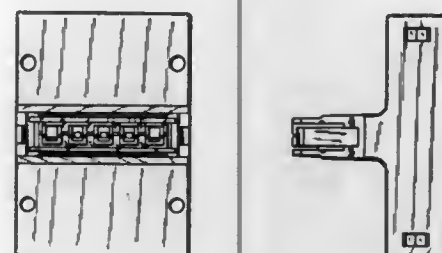
252,329

CIRCUIT CONNECTOR MODULE

Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Sep. 29, 1977, Ser. No. 837,756  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-24



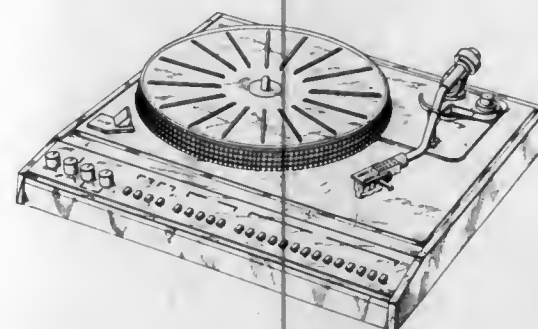
252,330

RECORD PLAYER

Leslie A. Leech, Frewchle, Scotland, assignor to BSR Limited, Warley, England

Filed Aug. 18, 1976, Ser. No. 715,642  
Claims priority, application United Kingdom, Feb. 28, 1976, 974702Term of patent 14 years  
Int. Cl. D14-07

U.S. Cl. D14-17



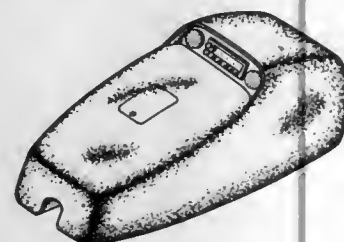
252,328

COMBINED MOTORCYCLE GAS TANK, RADIO AND TAPE DECK

James T. Moore, Sr., 191 Corona St., San Francisco, Calif. 94127

Filed Jul. 27, 1977, Ser. No. 819,591  
Term of patent 14 years  
Int. Cl. D12-17

U.S. Cl. D12-155



252,331

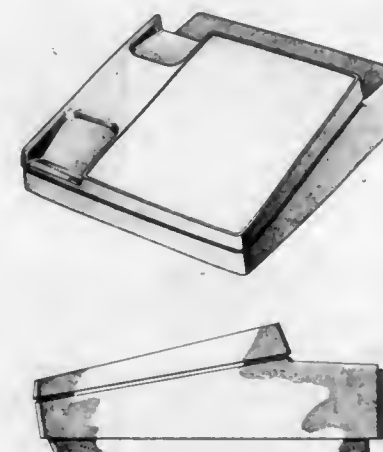
TELEPHONE STAND

Andrew J. Baase, Beach Grove; John G. Engstrom, Indianapolis, both of Ind.; Donald M. Genaro, Hawthorn, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 614,510, Sep. 18, 1975, Pat. No. Des. 246,584. This application Aug. 15, 1977, Ser. No. 824,417

Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-60



252,333

FELT TIP PEN

Takaji Funahashi, No. 1, 2-chome, Kitatakascho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan

Filed Aug. 31, 1977, Ser. No. 829,325  
Claims priority, application Japan, Mar. 11, 1977, 52-8979  
Term of patent 14 years  
Int. Cl. D19-06

U.S. Cl. D19-47



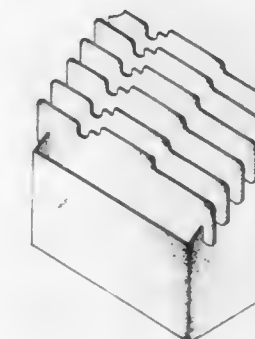
252,334

DESK TOP FILE

Donald I. Small, 60 Woodward Rd., West Springfield, Mass. 01089

Filed Sep. 16, 1977, Ser. No. 834,139  
Term of patent 14 years  
Int. Cl. D19-02

U.S. Cl. D19-90



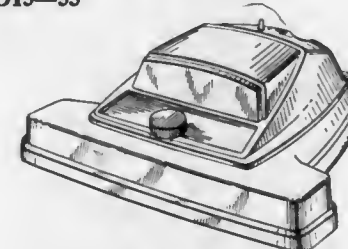
252,332

WIDE TRACK VACUUM CLEANER HOUSING

Harold W. Schaefer, Bloomington, Ill., assignor to National Union Electric Corporation

Filed Apr. 6, 1977, Ser. No. 785,057  
Term of patent 14 years  
Int. Cl. D15-05

U.S. Cl. D15-53



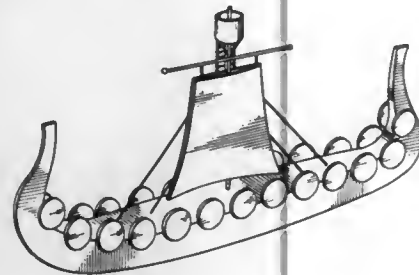


252,335  
TOY SHIP

Leon Goldpaint, 11702 Dunning St., Santa Fe Springs, Calif. 90670

Filed Jan. 3, 1977, Ser. No. 756,343  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-130



252,336

FISH HOOK AND LEADER HOLDER

Vincent Grippi, Jr., 4955 Desmond, Oakland, Calif. 94618

Filed Sep. 1, 1977, Ser. No. 829,873  
Term of patent 7 years  
Int. Cl. D22-05

U.S. Cl. D22-23



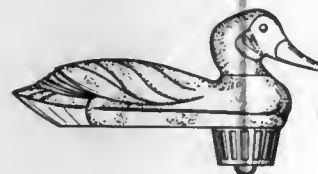
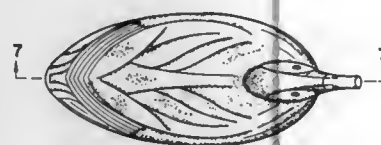
252,337

CHLORINATOR FOR SWIMMING POOLS

James M. Hehnen, 3881 W. 160th St., Cleveland, Ohio 44111

Filed Jul. 26, 1977, Ser. No. 819,070  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-3



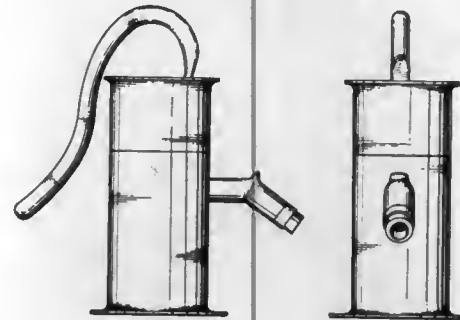
252,338

KITCHEN FAUCET

Clifton D. Skinner, R.F.D. #1, Box 96, Dexter, Me. 04930

Continuation-in-part of Ser. No. 713,853, Aug. 11, 1976. This application Nov. 2, 1978, Ser. No. 957,242  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-23



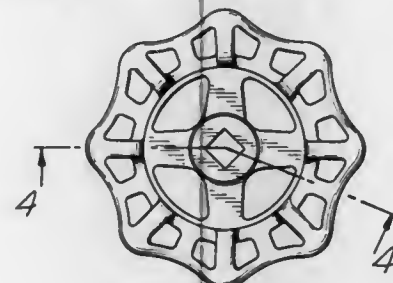
252,339

VALVE HANDLE

Masao Okano, Suwa, Japan, assignor to Toyo Valve Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,375  
Claims priority, application Japan, Jan. 28, 1976, 51-2218  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-30



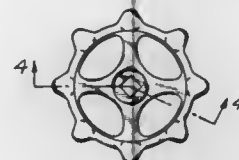
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VALVE HANDLE

Masao Okano, Suwa, Japan, assignor to Toyo Valve Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,377  
Claims priority, application Japan, Jan. 28, 1976, 51-2219  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-30



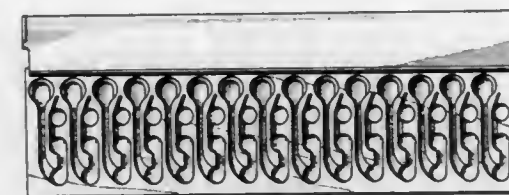
252,341

TESTING TRAY

Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Barrington, Ill.

Filed May 12, 1977, Ser. No. 796,394  
Term of patent 14 years  
Int. Cl. D24-02

U.S. Cl. D24-29



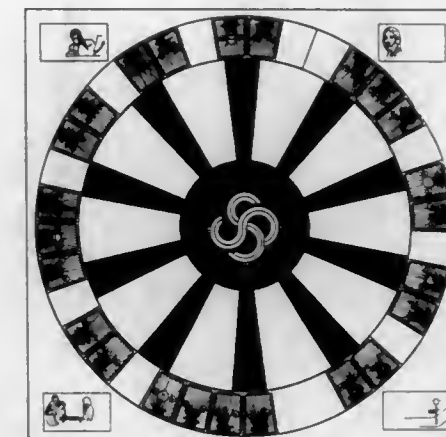
252,342

GAME BOARD

John Ilich, 1885 Spaulding, SE., Grand Rapids, Mich. 49506

Filed Feb. 2, 1977, Ser. No. 764,808  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-30



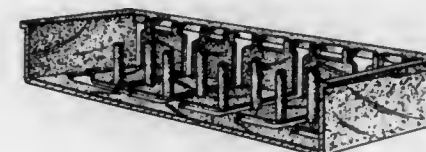
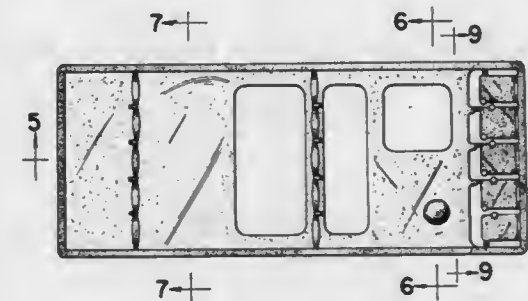
252,342

TAMPER PROOF TRAY FOR HYPODERMIC SYRINGES

Joseph E. Brady, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,915  
Term of patent 14 years  
Int. Cl. D24-04

U.S. Cl. D24-31



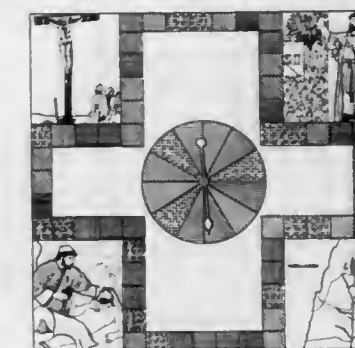
252,344

BIBLICAL GAME BOARD

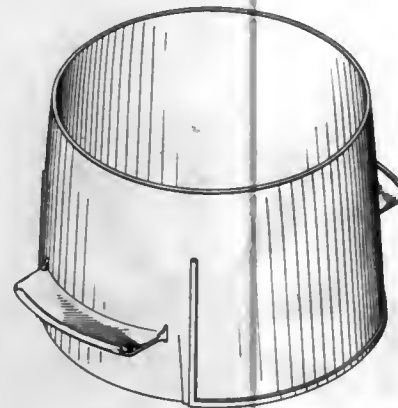
William E. Parker, P.O. Box 284, McDonald, Tenn. 37353; William E. Parker, Jr., 1507 Lee St., and Larry D. Hawkins, 2807 Bo St., both of Cleveland, Tenn. 37311

Filed May 27, 1977, Ser. No. 801,256  
Term of patent 14 years  
Int. Cl. D21-01

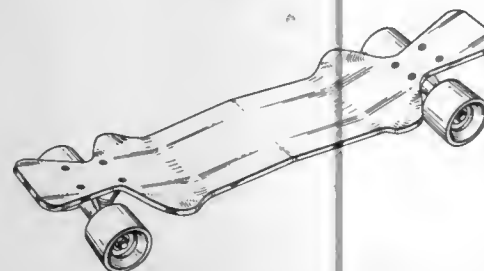
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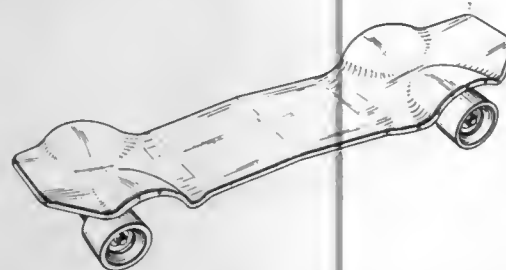
**252,345**  
**TOY MOLD**  
 Frederick W. Bassinger, Edina, Minn., assignor to K-tel International, Inc.  
 Filed Feb. 7, 1977, Ser. No. 765,910  
 Term of patent 14 years  
 Int. Cl. D21-01  
 U.S. Cl. D21-120



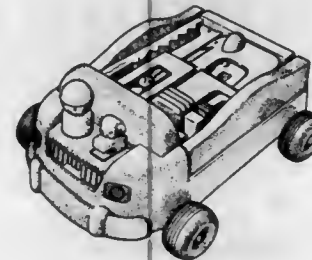
**252,346**  
**SKATEBOARD**  
 John S. Solheim, 529 W. Wakona La., Phoenix, Ariz. 85023  
 Filed Sep. 28, 1977, Ser. No. 837,457  
 Term of patent 14 years  
 Int. Cl. D21-01  
 U.S. Cl. D21-227



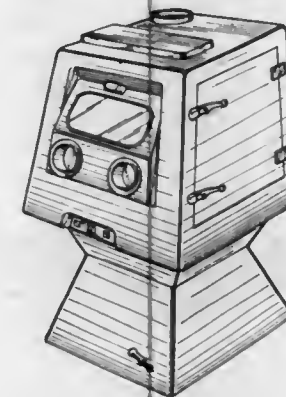
**252,347**  
**SKATEBOARD**  
 John S. Solheim, 529 W. Wakona La., Phoenix, Ariz. 85023  
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 Term of patent 14 years  
 Int. Cl. D21-01  
 U.S. Cl. D21-227



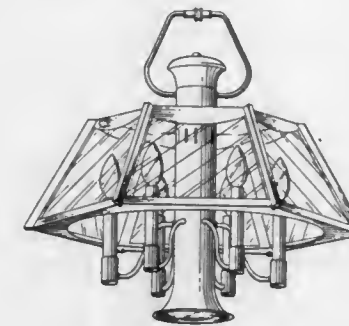
**252,348**  
**COMBINED TOY VEHICLE AND REMOVABLE FIGURES THEREFOR**  
 Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combl Co., Ltd., Tokyo, Japan  
 Continuation-in-part of Ser. No. 657,327, Feb. 11, 1976. This application Oct. 28, 1977, Ser. No. 846,476  
 Claims priority, application Japan, Sep. 10, 1975, 50-36870  
 Term of patent 14 years  
 Int. Cl. D21-01  
 U.S. Cl. D21-134



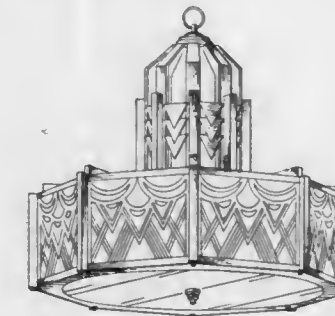
**252,349**  
**ABRADING MACHINE CABINET**  
 Stewart I. Ashworth, Guernsey, Channel Islands, assignor to Abrasives International, Limited  
 Filed Sep. 18, 1975, Ser. No. 614,542  
 Claims priority, application United Kingdom, Apr. 26, 1975, 970881/75  
 Term of patent 14 years  
 Int. Cl. D15-09  
 U.S. Cl. D15-124



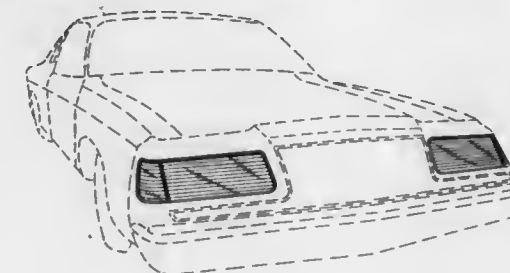
**252,350**  
**LIGHT FIXTURE**  
 Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605  
 Filed Jun. 2, 1977, Ser. No. 802,975  
 Term of patent 14 years  
 Int. Cl. D26-05  
 U.S. Cl. D48-3



**252,351**  
**LIGHT FIXTURE**  
 Fredrick G. Glassman, 9170 La Alba, Whittier, Calif. 90605  
 Filed Jun. 2, 1977, Ser. No. 802,990  
 Term of patent 14 years  
 Int. Cl. D26-05  
 U.S. Cl. D48-23 R



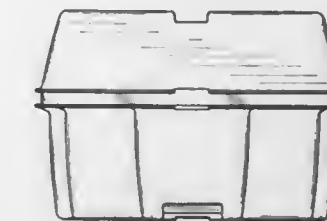
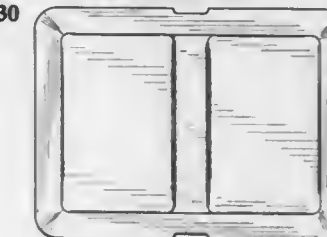
**252,352**  
**PAIR OF AUTOMOBILE HEADLAMP LENSES**  
 Carl A. Cameron, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.  
 Filed Jan. 27, 1977, Ser. No. 763,163  
 Term of patent 14 years  
 Int. Cl. D26-06  
 U.S. Cl. D48-32 A



**252,353**  
**DRUM LUG**  
 Daniel S. Mikosz, Arlington Heights, Ill., assignor to Ludwig Industries, Chicago, Ill.  
 Filed Jul. 16, 1976, Ser. No. 705,906  
 Term of patent 14 years  
 Int. Cl. D17-04  
 U.S. Cl. D17-22



**252,354**  
**BATTERY BOX**  
 Tim M. Uyeda, South San Gabriel, Calif., assignor to Flambeau Products Corporation  
 Filed May 24, 1977, Ser. No. 800,090  
 Term of patent 14 years  
 Int. Cl. D3-02  
 U.S. Cl. D3-30



**\* 252,355**  
**GAMING POUCH FOR KENO OR THE LIKE**  
 Robert N. Uber, 4132 W. Cavalier Dr., Phoenix, Ariz. 85019  
 Filed Sep. 3, 1976, Ser. No. 720,221  
 Term of patent 14 years  
 Int. Cl. D3-01  
 U.S. Cl. D3-48





# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. B. Dick Company: See—  
Keur, Robert I., 4,160,982, Cl. 346-75.000.
- A-T-O Inc.: See—  
Asper, Wayne E., 4,160,354, Cl. 53-497.000.  
Mais, James W.; Bianchi, David L.; and Barker, Theodore L., 4,160,351, Cl. 53-76.000.
- Abbott Laboratories: See—  
Chittenden, Richard M., 4,160,451, Cl. 128-214.400.
- Abcor, Inc.: See—  
Barrington, James E., 4,160,446, Cl. 128-1.00R.  
DelPico, Joseph, 4,160,726, Cl. 210-23.00F.
- Abe, Yoshiharu: See—  
Ito, Kenzo; and Abe, Yoshiharu, 4,160,595, Cl. 355-3.0FU.
- Abolafia, Oscar R.; and Rasile, John, to International Business Machines Corporation. Etch process for chromium. 4,160,691, Cl. 156-664.000.
- ACF Industries, Incorporated: See—  
Kemp, Willard E., 4,160,460, Cl. 137-72.000.
- Acushnet Company: See—  
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.
- Adachi, Makoto: See—  
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.
- ADCO Venetian Blind Company: See—  
La Moll, Kenneth; and Schneider, Gerry, 4,160,972, Cl. 340-541.000.
- Adelberger, Donald L.; and Pangos, William, to NCR Corporation. Connector housing. 4,160,572, Cl. 339-14.00P.
- Adhikary, Parimal K. Derivatives of imidazoindole and imidazothiazole. 4,160,840, Cl. 424-270.000.
- Adlerstein, Michael G., to Raytheon Company. Plural semiconductor devices mounted between plural heat sinks. 4,160,992, Cl. 357-81.000.
- Aebi, Rudolf: See—  
Vogel, Christian; and Aebi, Rudolf, 4,160,660, Cl. 71-118.000.
- AEG-Elotherm, G.m.b.H.: See—  
Scheffler, Friedrich, 4,160,891, Cl. 219-10.690.
- Agency of Industrial Science & Technology, Ministry of International Trade & Industry: See—  
Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, 4,160,698, Cl. 435-173.000.
- AGFA-Gevaert, A.G.: See—  
Geyken, Erwin; and Dawidowitsch, Peter, 4,160,594, Cl. 354-324.000.
- Ahmed, Adel A. A., to RCA Corporation. Current amplifier capable of selectively providing current gain. 4,160,944, Cl. 323-4.000.
- Ahn, Byung K.: See—  
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,160,704, Cl. 204-32.00R.
- Aihara, Takayuki: See—  
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,160,699, Cl. 435-287.000.
- Ajinomoto Co., Inc.: See—  
Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyamishi, Toshiaki, 4,160,824, Cl. 424-84.000.
- Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Motor drive apparatus. 4,160,938, Cl. 318-82.000.
- Akiyama, Robert H.; and Towle, Leo B., to W. R. Grace & Co. Process for making closure sealing compounds and other latex based preparations. 4,160,752, Cl. 260-27.0BB.
- Akkerman, Neil H.; Foster, Stephen R.; and Goans, Kip B., to Baker CAC, Inc. Flow line monitor pilot valve assembly. 4,160,463, Cl. 137-596.180.
- Aktiebolaget Electrolux: See—  
Reistad, Bengt R., 4,160,366, Cl. 62-476.000.
- Aktiebolaget Partner: See—  
Kalberg, Tommy K.; and Rangert, Bo, 4,160,321, Cl. 30-383.000.
- Akzo N.V.: See—  
Helle, Kees; and Kamp, Andries, 4,160,707, Cl. 204-37.00R.
- Akzona Incorporated: See—  
Pannekeet, Wilhelmus; and Smakman, Robert, 4,160,675, Cl. 127-46.00A.
- Aladdin Industries, Incorporated: See—  
Bridges, John A., 4,160,570, Cl. 312-245.000.
- Albright, James A.; and Nicholson, Richard R., to Velsicol Chemical Corporation. Durable flame retardant for polyester textile materials. 4,160,795, Cl. 260-937.000.
- Allegheny Ludlum Industries, Inc.: See—  
Lukac, Frederick S.; and Zbryski, William P., 4,160,677, Cl. 134-9.000.
- Miller, Clarence L., Jr., 4,160,681, Cl. 148-111.000.
- Allen, Richard C.: See—  
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,160,781, Cl. 260-544.00D.
- Allen, Theodore L., Jr.: See—  
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.
- Allen, William R.: See—  
Kinosz, Donald L.; and Allen, William R., 4,160,715, Cl. 204-243.00R.
- Allied Chemical Corporation: See—  
Mason, Charles D.; and Flood, Paul W., 4,160,790, Cl. 525-179.000.
- Altermatt, Willy, to SIG Schweizerische Industrie-Gesellschaft. Sheet sealing shoe assembly. 4,160,689, Cl. 156-583.100.
- Aluminum Company of America: See—  
Kinosz, Donald L.; and Allen, William R., 4,160,715, Cl. 204-243.00R.
- Alza Corporation: See—  
Theeuwes, Felix, 4,160,452, Cl. 128-260.000.
- AM International, Inc.: See—  
Halm, James M., 4,160,667, Cl. 96-1.50R.
- Ambac Industries, Inc.: See—  
Daborowski, Ignace J.; and Galis, Leon A., 4,160,434, Cl. 123-140.0FG.
- Amchem Products, Inc.: See—  
Nishida, Takao; and Tonoike, Kiyoshi, 4,160,756, Cl. 260-29.60M.
- American Cyanamid Company: See—  
Doyle, Carlos L., 4,160,731, Cl. 210-50.000.
- Franz, Curtis A., 4,160,741, Cl. 252-182.000.
- American Hoechst Corporation: See—  
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,160,781, Cl. 260-544.00D.
- American Optical Corporation: See—  
Gottlieb, Nathan; and Sussman, Milton H., 4,160,578, Cl. 350-89.000.
- Grolman, Bernard, 4,160,330, Cl. 33-200.000.
- American Safety Equipment Corporation: See—  
Bennett, James A., 4,160,941, Cl. 320-56.000.
- American Standard Inc.: See—  
Niemann, James E., 4,160,293, Cl. 4-295.000.
- Ammons, Vernon G., to PPG Industries, Inc. Catalyst for making polycarbonate diols for use in polycarbonate urethanes. 4,160,853, Cl. 428-425.000.
- AMP Incorporated: See—  
Sergeant, Ronald G., 4,160,317, Cl. 29-749.000.
- Weisenburger, Lawrence P., 4,160,573, Cl. 339-99.00R.
- Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., to International Business Machines Corporation. High performance bipolar device and method for making same. 4,160,991, Cl. 357-49.000.
- Andersen, John N.; and Bell, Norman. Pyrohydrolysis process for spent aluminum reduction cell linings. 4,160,808, Cl. 423-119.000.
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- Andersen, Jorgen; and Nielsen, Ole, to Radiometer A/S. Measuring chamber unit. 4,160,714, Cl. 204-195.00R.
- Anderson, John: See—  
Columbus, Peter S.; and Anderson, John, 4,160,750, Cl. 260-17.4ST.
- Anthony, Thomas R.: See—  
Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., 4,160,679, Cl. 148-1.500.
- Antioch Bookplate Company: See—  
Neff, Elias, 4,160,352, Cl. 53-137.000.
- Aoki, Eiichiro: See—  
Yamada, Shigeru; and Aoki, Eiichiro, 4,160,404, Cl. 84-1.260.
- Apollo Spinner, Inc.: See—  
Cooney, Robert M., 4,160,554, Cl. 280-87.04A.
- Appleton Machine Company: See—  
Plach, Edward F., 4,160,530, Cl. 242-68.200.
- Applied Power, Inc.: See—  
Severson, Larry A., 4,160,537, Cl. 254-50.300.
- Architectural Research Corporation: See—  
Prusinski, Richard C.; and Prusinski, Jan R., 4,160,761, Cl. 260-42.470.
- Arco Polymers, Inc.: See—  
Fava, Ronald A., 4,160,792, Cl. 525-148.000.
- Arendt, Ronald H.; and Curran, Matthew J., to General Electric Company. Silicon-iron production and composition and process therefor. 4,160,705, Cl. 204-37.00R.

- Arendt, Ronald H.; and Curran, Matthew J., to General Electric Company. Coated silicon-iron product and process therefor using magnesium formate and metaborate. 4,160,706, Cl. 204-37.00R.
- Arendt, Ronald H.; and Curran, Matthew J., to General Electric Company. Coated silicon-iron product and process therefor using calcium formate. 4,160,708, Cl. 204-37.00R.
- Argus Chemical Corporation: See—  
Minagawa, Motonobu; and Sekiguchi, Tetsuo, 4,160,762, Cl. 260-45.75S.
- Ariyan, Zaven S.: See—  
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,160,768, Cl. 260-306.70T.
- Armagast, David W.: See—  
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,160,443, Cl. 126-270.000.
- Armstrong, James E., to Pool Company. Leg structure for jack-up platform with single point jacking. 4,160,538, Cl. 254-89.00R.
- Arnold Industries, Inc.: See—  
Blackstone, George H., 4,160,472, Cl. 144-194.000.
- Artbauer, Jan, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. High voltage device with gas insulation. 4,160,870, Cl. 174-14.00R.
- Arthur D. Little, Inc.: See—  
Hidden, William P.; and McCullough, John E., 4,160,629, Cl. 418-55.000.
- ASEA Aktiebolag: See—  
Marchner, Jan; and Sundberg, Yngve, 4,160,868, Cl. 13-11.000.
- Ashion, Larry J.; and Block, Leo, to Raypak, Inc. Securement of heat exchanger surfaces to tubes by lock seaming and method of fabrication. 4,160,476, Cl. 165-171.000.
- Asper, Wayne E., to A-T-O Inc. Packing head fill safety device. 4,160,354, Cl. 53-497.000.
- Aurifex Limited: See—  
East, Harvey J., 4,160,361, Cl. 59-82.000.
- Austin-Brown, P.; Youde, D.; and Pond, R. F., to Unerman Greenman Berger Limited. Coupling device for furniture parts. 4,160,610, Cl. 403-407.000.
- Austin, Lowell W.: See—  
Bird, Richard A.; and Austin, Lowell W., 4,160,703, Cl. 204-15.000.
- Autotrol Corporation: See—  
Prosser, David G., 4,160,736, Cl. 210-150.000.
- Avco Corporation: See—  
Blake, Nathan L.; and Stelzer, Robert A., 4,160,355, Cl. 56-98.000.
- Brannen, Kenneth E., 4,160,800, Cl. 264-345.000.
- Avery International Corporation: See—  
Spear, Phillip L., 4,160,687, Cl. 156-444.000.
- Ayler, Steven E.; and Holtrop, John W., to United States of America, Navy. Liquid propellant gun, positive displacement single valve. 4,160,405, Cl. 89-7.000.
- Baba, Masanao, to Nippon Cable System Inc. Two-lever control unit. 4,160,499, Cl. 192-0.098.
- Bach-Simpson Limited: See—  
Carriere, Victor, 4,160,388, Cl. 73-646.000.
- Backx, Leo J. J.: See—  
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,160,841, Cl. 424-273.00R.
- Badolato, Anthony; and Farrell, Joseph S., to Surgikos. Heat exchanger-blood oxygenator combination. 4,160,801, Cl. 422-46.000.
- Bahler, Peter: See—  
Benz, Maurice E.; and Bahler, Peter, 4,160,602, Cl. 366-162.000.
- Baker CAC, Inc.: See—  
Akkerman, Neil H.; Foster, Stephen R.; and Goans, Kip B., 4,160,463, Cl. 137-596.180.
- Baldwin, Francis P.: See—  
Gardner, Irwin J.; and Baldwin, Francis P., 4,160,759, Cl. 260-40.00R.
- Baldwin, Stanley L., to International Nickel Company, Inc., The. Cable rock anchor. 4,160,615, Cl. 405-259.000.
- Ballinger, Hugh A., to United Kingdom Atomic Energy Authority. Sealing members. 4,160,464, Cl. 138-93.000.
- Baracz, Andrew J., to United States of America, Army. Programmed self-destruct system for a munition. 4,160,416, Cl. 102-215.000.
- Barber, Warren A.; and Seesselberg, Henry A., to Singer Company, The. Programmable sewing system with auxiliary memory. 4,160,422, Cl. 112-121.110.
- Barker, Theodore L.: See—  
Mais, James W.; Bianchi, David L.; and Barker, Theodore L., 4,160,351, Cl. 53-76.000.
- Barnickel, Andrew. Heat exchanger. 4,160,440, Cl. 126-110.00R.
- Barrett, Donald R. Golf putting frame game device. 4,160,550, Cl. 273-176.00F.
- Barrington, James E., to Abcor, Inc. Apparatus for and method of sterilization by the delivery of tubal-occluding polymer. 4,160,446, Cl. 128-1.00R.
- Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, to Corning Glass Works. Method for making silver-containing glasses exhibiting thermoplastic properties and photosensitivity. 4,160,654, Cl. 65-30.00E.
- Barton, Peter; and Lamb, Philip W. J., to Xerox Corporation. Document handling apparatus. 4,160,547, Cl. 271-275.000.
- Bausch & Lomb Incorporated: See—  
Dey, Thomas W.; Howe, James D.; and Letter, Eugene C., 4,161,014, Cl. 362-263.000.
- Dey, Thomas W.; and Letter, Eugene C., 4,161,015, Cl. 362-263.000.
- Baxter Travenol Laboratories, Inc.: See—  
Winchell, David A., 4,160,473, Cl. 150-0.500.
- Baxter, William J., to General Motors Corporation. Electrochemical measurement of fatigue damage. 4,160,702, Cl. 204-1.00T.
- Bayer Aktiengesellschaft: See—  
Lienert, Hans-Jürgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.
- Lorenz, Otto, 4,160,753, Cl. 260-29.2TN.
- Niederdelmann, Georg; Quring, Bernd; and Thoma, Wilhelm, 4,160,686, Cl. 156-331.000.
- Schapel, Dietmar; Wagner, Kuno; Muller, Hanns P.; and Dahm, Manfred, 4,160,754, Cl. 260-29.40R.
- Schneider, Gottfried; Wagner, Kuno; and Dietrich, Werner, 4,160,749, Cl. 260-2.300.
- Beach, David E., to Eastman Kodak Company. Exposure control apparatus. 4,160,588, Cl. 354-31.000.
- Beech, Keith J. W., to Lucas Industries Limited. Electrical coil assembly. 4,160,967, Cl. 336-209.000.
- Beelitz, Howard R.: See—  
Hopta, Daniel F.; and Beelitz, Howard R., 4,160,943, Cl. 323-4.000.
- Behringwerke Aktiengesellschaft: See—  
Muller, Hans, 4,160,763, Cl. 260-112.00B.
- Bell, John L. Stratified charge internal combustion engine. 4,160,430, Cl. 123-75.00B.
- Bell, Michael. Outer shoe with gripping surface. 4,160,331, Cl. 36-59.00B.
- Bell, Norman: See—  
Andersen, John N.; and Bell, Norman, 4,160,808, Cl. 423-119.000.
- Andersen, John N.; and Bell, Norman, 4,160,809, Cl. 423-119.000.
- Bell, Robert R., to Vapor Corporation. Drive rod coupling for positive displacement pump. 4,160,626, Cl. 417-403.000.
- Bell Telephone Laboratories, Incorporated: See—  
Duyin, Arthur, 4,160,407, Cl. 98-115.00R.
- Kirsch, Howard C., 4,160,934, Cl. 315-307.000.
- Seastrand, Kurt L., Jr., 4,160,952, Cl. 325-369.000.
- Belov, Alexandr F.: See—  
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
- Benfield Corporation: See—  
Benson, Homer E.; and McCrea, Donald H., 4,160,810, Cl. 423-220.000.
- Bennett, James A., to American Safety Equipment Corporation. Multipurpose battery charger. 4,160,941, Cl. 320-56.000.
- Benson, Homer E.; and McCrea, Donald H., to Benfield Corporation. Removal of acid gases from hot gas mixtures. 4,160,810, Cl. 423-220.000.
- Benz, Maurice E.; and Bahler, Peter, to Ciba-Geigy AG. Multi-chamber pack. 4,160,602, Cl. 366-162.000.
- Berg, Charles A., to Pyreflex Corporation. Heat recuperator. 4,160,577, Cl. 350-1.100.
- Berger, Kurt: See—  
Kudlich, Walter; Herrmann, Hans; Lechner, Gunther; and Berger, Kurt, 4,160,504, Cl. 206-334.000.
- Berger, L. Joseph, Jr.; and Guequierre, Denis D., to Finite Filter Company. Method of manufacturing a coalescing demister. 4,160,684, Cl. 156-69.000.
- Bergman, Roland H.; Meyer, Richard J.; and Fortman, Richard F., to Minster Machine Company, The. Transfer press having quick change die sets. 4,160,372, Cl. 72-404.000.
- Berke, Herbert: See—  
McKechnie, John C.; and Berke, Herbert, 4,160,903, Cl. 250-199.000.
- Berkshire Paper Company: See—  
Wallsten, Thomas S., 4,160,535, Cl. 248-94.000.
- Berlin, Edwin P., Jr., to Massachusetts Institute of Technology. Three-dimensional display. 4,160,973, Cl. 340-718.000.
- Berrerr, Dagmar: See—  
Laanio, Verena; Brechbuhler, Hans U.; and Berrerr, Dagmar, 4,160,831, Cl. 424-248.560.
- Laanio, Verena; Brechbuhler, Hans U.; and Berrerr, Dagmar, 4,160,832, Cl. 424-248.560.
- Bertini, Milo. Saw blade construction and method of making same. 4,160,397, Cl. 83-661.000.
- Beseke, Kermit; and Kopecki, Ronald, to Motorola, Inc. Level control circuitry for two way communication system. 4,160,873, Cl. 178-58.00R.
- Best & Donovan: See—  
Wikoff, Mark W., 4,160,320, Cl. 30-380.000.
- Bettix Limited: See—  
Jackman, Anthony D., 4,160,381, Cl. 73-322.500.
- Bexten, Eugen; Logue, Robert W.; and Wiebe, Ken J., to International Harvester Company. Auxiliary steering system. 4,160,490, Cl. 180-133.000.
- Bhatia, Harsaran S.: See—  
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,160,991, Cl. 357-49.000.
- Bianchi, David L.: See—  
Mais, James W.; Bianchi, David L.; and Barker, Theodore L., 4,160,351, Cl. 53-76.000.
- Bianchi, Gaudenzio: See—  
Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, 4,160,789, Cl. 525-411.000.

- Bichot, Bernard H.; and Gest, Rene, to Saint-Gobain Industries. Method and apparatus for manufacture of insulating sleeves. 4,160,398, Cl. 83-865.000.
- Bicosa Societe de Recherches: See—  
Courier de Mere, Henri, 4,160,920, Cl. 307-252.00C.
- Biermacher, John J.: See—  
Cho, Moo J.; and Biermacher, John J., 4,160,827, Cl. 424-199.000.
- Biet, Jean-Pierre H.: See—  
de Brebisson, Michel; Decrouen, Jean-Michel; Edlinger, Wolfgang F. J.; and Biet, Jean-Pierre H., 4,160,989, Cl. 357-44.000.
- Bigotti, Alberto. Shoe cabinet. 4,160,571, Cl. 312-327.000.
- Bikker, Pieter, to U.S. Philips Corporation. Power-dividing and modulating arrangement. 4,160,960, Cl. 332-40.000.
- Bird, Richard A.; and Austin, Lowell W., to National Steel Corporation. Nonplating cathode and method for producing same. 4,160,703, Cl. 204-15.000.
- Bishop, Larry D., to Wescom, Inc. Power regulation system for repeated telephone transmission lines. 4,160,884, Cl. 179-170.00J.
- Bishop, Raymond. Total hydraulic silage wagon. 4,160,621, Cl. 414-786.000.
- Black Clawson Fibreclaim, Inc.: See—  
Marsh, Paul G., 4,160,722, Cl. 209-4.000.
- Blackstone, George H., to Arnold Industries, Inc. Apparatus for splitting wood. 4,160,472, Cl. 144-194.000.
- Blake, Nathan L.; and Stelzer, Robert A., to Avco Corporation. Forage harvester and row crop attachment therefor. 4,160,355, Cl. 56-98.000.
- Blakeslee, Thomas R., to Logisticon, Inc. Extended width sensor. 4,160,488, Cl. 180-168.000.
- Block, Leo: See—  
Ashton, Larry J.; and Block, Leo, 4,160,476, Cl. 165-171.000.
- Bloom, Allen: See—  
Williams, Richard; and Bloom, Allen, 4,160,816, Cl. 423-648.00R.
- Bly, Vincent T., to United States of America, Army. Thermo-optical far infrared system. 4,160,907, Cl. 250-330.000.
- Bobovnikov, Nikolai D.: See—  
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
- Bock, Jan; Lundberg, Robert D.; and Makowski, Henry S., to Exxon Research & Engineering Co. Low pressure injection moldable compositions. 4,160,751, Cl. 260-23.50A.
- Boeing Company, The: See—  
White, Thomas H., 4,160,534, Cl. 244-135.00A.
- Boginsky, Vladimir P.: See—  
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.
- Bojanek, Robert J.; and Mason, Marvin S., to GTE Sylvania Incorporated. Modular multiplex/demultiplex apparatus. 4,160,876, Cl. 179-150AT.
- Bolex International S.A.: See—  
Heiniger, Wilfried; Kreienbuehl, Claude; and Millan, Manuel, 4,160,587, Cl. 354-25.000.
- Bondarev, German G.: See—  
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.
- Boonius, Mary; Sobin, Bernard; and Schweitzer, John, to Gelman Instrument Company. Petri dish. 4,160,700, Cl. 435-298.000.
- Borden, Inc.: See—  
Columbus, Peter S.; and Anderson, John, 4,160,750, Cl. 260-174ST.
- Borkan, William N. Method and device for estimating fuel consumption. 4,160,376, Cl. 73-113.000.
- Born, Norman E.; and Haltunen, Martin A., to General Electric Company. Semiconductor and heat sink assembly. 4,161,016, Cl. 361-388.000.
- Bory, Richard A.; and Hogg, Alexander F., to Motorola, Inc. Printed wiring board mounting and interconnection of coaxial cable transformers and the like. 4,160,961, Cl. 333-27.000.
- Botalam: See—  
Joannic, Jean V., 4,160,469, Cl. 140-115.000.
- Botts, Elton M., to Energy 76, Inc. Cryogenic temperature operated magnetic reciprocating motor system. 4,160,924, Cl. 310-17.000.
- Bouyard, Daniel; Weber, Abraham; and Stemer, Jacques, to Bristol-Myers Company. Process for the preparation of the crystalline monohydrate of 7-[D- $\alpha$ -amino- $\alpha$ -(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid. 4,160,863, Cl. 544-30.000.
- Bozeman, Hoyt W., Jr.: See—  
Lindsey, Keith E.; and Bozeman, Hoyt W., Jr., 4,160,540, Cl. 254-134.3PA.
- Brachthausen, Karl-Heinz: See—  
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbek, Fritz; and Brachthausen, Karl-Heinz, 4,160,695, Cl. 435-101.000.
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- Brannen, Kenneth E., to Avco Corporation. Method of forming a composite rod. 4,160,800, Cl. 264-345.000.
- Bream, John B., to Sandoz Ltd. Amino containing benzazepines. 4,160,766, Cl. 260-243.300.
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- Brech, Kilian H., deceased: See—  
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- Brechbuhler, Hans U.: See—  
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- Bredero Price, B.V.: See—  
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- Brenholdt, Irving R., to St. Regis Paper Company. Web scanning apparatus. 4,160,913, Cl. 250-563.000.
- Brent Chemicals International Limited: See—  
Brittain, Philip I.; and Lyons, Michael R. J., 4,160,375, Cl. 73-104.000.
- Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Action game apparatus. 4,160,548, Cl. 273-1.00M.
- Brey, William A., to Reliable Electric Company. Modular termination system for communication lines. 4,160,880, Cl. 179-98.000.
- Brice, Robert D. Platform attachment. 4,160,493, Cl. 182-122.000.
- Bridges, John A., to Aladdin Industries, Incorporated. Wall mounted modules for packaging, merchandising and storage. 4,160,570, Cl. 312-245.000.
- Bridgestone Tire Co., Ltd.: See—  
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- Briggs, James B.; and Wakefield, Flake M. Lighted ornamental devices. 4,161,018, Cl. 362-104.000.
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- Bristol-Myers Company: See—  
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- Brittain, Philip I.; and Lyons, Michael R. J., to Brent Chemicals International Limited. Indicator compositions. 4,160,375, Cl. 73-104.000.
- Britton, Fred G.; Von Bose, Robert J.; and Keller, Cecil T., to Oil States Rubber Co. Tube closure. 4,160,612, Cl. 405-227.000.
- Brody, Philip S., to United States of America, Army. Ferroelectric ceramic devices. 4,160,927, Cl. 310-302.000.
- Broken Hill Proprietary Company Limited, The: See—  
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- Brooks, John L.; Budziarek, Richard; and Harper, David J., to Imperial Chemical Industries Limited. Carbamates. 4,160,866, Cl. 560-25.000.
- Brooks, Ray G.; and Smith, Harvell M., to Johns-Manville Corporation. Low profile heat sealing iron. 4,160,688, Cl. 156-574.000.
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Portmann, August T., 4,160,409, Cl. 100-257.000.
- Brugman, Johannes A. H., to Hunter Douglas International N.V. Suspension device for a support. 4,160,344, Cl. 52-39.000.
- Brunswick Corporation: See—  
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- Buckley, Dieter: See—  
Weber, Adolf; Munster, Erhard; and Buckley, Dieter, 4,160,411, Cl. 102-7.000.
- Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., to Research Corporation. Application of protein-protein interaction as an assay for the detection of cancer. 4,160,817, Cl. 424-1.000.
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Seleznev, Jury E.; Burkin, Jury A.; and Kuzmin, Sergei V., 4,161,037, Cl. 365-51.000.
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- Burrell, Mildred G., executrix: See—  
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- Burroughs Corporation: See—  
McMillan, Andrew H.; and Wisner, Daniel A., 4,160,546, Cl. 271-263.000.
- Bussiere, Gny: See—  
Huchette, Michel; and Bussiere, Guy, 4,160,849, Cl. 426-94.000.
- Butler, Eric W.; and Moulds, Clinton W., III, to United States of America, Air Force. Pseudo random number generator apparatus. 4,161,041, Cl. 365-244.000.



- Butter, Karl: See—  
Tuscher, Otto; Butter, Karl; and Knauer, Kuno, 4,160,709, Cl. 204-49.000.
- Cadbury India Limited: See—  
Shenoy, Raghuram D.; and Ganapathy, Ananthram, 4,160,774, Cl. 260-424.000.
- Caenazzo, Santo, to Honeywell Information Systems Italia. Paper feed mechanism for multiple copy printer, 4,160,606, Cl. 400-616.200.
- Cakara, Marica; Djokic, Slobodan; and Tamburasev, Zrinka, to PLIVA Pharmaceutical and Chemical Works. 4-Dedimethylamino-4-arylsulfonamido-5a,6-anhydrotetracyclines, 4,160,783, Cl. 260-556.0AR.
- Calgon Corporation: See—  
Raman, Manjeri S., 4,160,742, Cl. 252-344.000.
- Calhoun, Michael B.; and Fredd, John V., to Otis Engineering Corporation. Well tools, 4,160,478, Cl. 166-55.100.
- California Instruments Corporation: See—  
McFayden, Dennis G., 4,160,949, Cl. 324-62.000.
- Camco, Incorporated: See—  
Watkins, Fred E., 4,160,484, Cl. 166-317.000.
- Camprubi, Anselmo B., to Incotex S.A. Weft selector mechanism, 4,160,468, Cl. 139-453.000.
- Canaird Sales Ltd.: See—  
Dryer, Grant M., 4,160,342, Cl. 47-80.000.
- Canfield, Sheldon A.: See—  
Carvalho, Robert L.; Canfield, Sheldon A.; and Steinbaugh, Gary, 4,160,360, Cl. 57-81.000.
- Canon Kabushiki Kaisha: See—  
Kato, Hiroaki; and Hamana, Junji, 4,161,005, Cl. 360-129.000.  
Suzuki, Toyotoshi; and Matsuzaki, Kazunari, 4,160,591, Cl. 354-235.000.
- Canon, Inc.: See—  
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- Cantor, Paul A.: See—  
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- Carl Schenck AG: See—  
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- Carol, John A., Jr., to General Motors Corporation. Mileage switch and latch means, 4,160,900, Cl. 235-132.00E.
- Carr, Stephen H.; and Stupp, Samuel L., to Northwestern University. Process for preparing polyacrylonitrile doped with Prussian blue, 4,160,760, Cl. 260-42.210.
- Carriere, Victor, to Bach-Simpson Limited. Power measuring apparatus for ultrasonic transducers, 4,160,388, Cl. 73-646.000.
- Caruso, Patsy. Circular to chain saw conversion apparatus, 4,160,319, Cl. 30-122.000.
- Carvalho, Robert L.; Canfield, Sheldon A.; and Steinbaugh, Gary, to Owens-Corning Fiberglass Corporation. Optical strand sensor for detecting a filament being wound and twisted on a spool, 4,160,360, Cl. 57-81.000.
- Cascade Corporation: See—  
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- Caterpillar Tractor Co.: See—  
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- Celanese Corporation: See—  
Choe, Eui W.; Tan, Marshall; and Mininni, Robert M., 4,160,755, Cl. 260-29.60H.
- Taylor, Paul D., 4,160,771, Cl. 260-346.110.
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Josis, Christian; and Hans, Andre, 4,160,725, Cl. 210-21.000.
- Cerone, Frank E.: See—  
Thornton, Alfred K.; and Cerone, Frank E., 4,160,910, Cl. 250-432.0PD.
- Cervin, Steve A.: See—  
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.
- Champion International Corporation: See—  
Gorham, Jack C., 4,160,519, Cl. 229-37.00R.
- Roccaforte, Harry I., 4,160,502, Cl. 206-45.140.
- Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Asymmetric synthesis, 4,160,865, Cl. 560-22.000.
- Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., to Minnesota Mining and Manufacturing Company. Interior storm window construction, 4,160,348, Cl. 52-202.000.
- Chard, Gerald L. P.; Haupt, Joachim; and Zuber, Werner, to Motorola, Inc. Apparatus for indicating the position of rotating mechanical elements, 4,160,890, Cl. 200-308.000.
- Chevron Research Company: See—  
Edwards, Laroy H., 4,160,845, Cl. 424-298.000.
- Lavigne, Joe B., 4,160,770, Cl. 260-343.30P.
- Lewis, Robert A.; and Honnen, Lewis R., 4,160,648, Cl. 44-63.000.
- Soutar, David, Jr.; Feffer, Philip C.; and Guenther, Lloyd M., 4,160,307, Cl. 28-220.000.
- Wilcox, Ralph S., 4,160,729, Cl. 210-40.000.
- Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibata, Takeji; and Nishimura, Noriyuki, to Tanabe Seiyaku Co., Ltd. Method for purification of crude urokinase, 4,160,697, Cl. 435-194.000.
- Chida, Hiroshi: See—  
Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, 4,160,888, Cl. 200-148.00A.
- Chimkombinat: See—  
Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, Nikola S., 4,160,647, Cl. 422-106.000.
- Chittenden, Richard M., to Abbott Laboratories. Unidirectional catheter placement unit, 4,160,451, Cl. 128-214.400.
- Cho, Moo J.; and Biernacher, John J., to Upjohn Company. The Metronidazole phosphate and salts, 4,160,827, Cl. 424-199.000.
- Choe, Eui W.; Tan, Marshall; and Mininni, Robert M., to Celanese Corporation. Process for producing anisotropic dopes and articles thereof from benzoic acid derivative polymers, 4,160,755, Cl. 260-29.60H.
- Christesen, Paul J.; and Sanders, Geoffrey R., to Broken Hill Proprietary Company Limited. The; and Lysaght Durham Chemical Company Proprietary Limited, The. Electrophotographic grade zinc oxide, 4,160,668, Cl. 96-1.800.
- Chrysler Corporation: See—  
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- Knupp, Dwight A., 4,160,379, Cl. 73-229.000.
- Chushin Gakki Seizo Kabushiki Kaisha: See—  
Tomioka, Michiaki, 4,160,401, Cl. 84-1.160.
- Ciba-Geigy AG: See—  
Benz, Maurice E.; and Bahler, Peter, 4,160,602, Cl. 366-162.000.
- Ciba-Geigy Corporation: See—  
Diel, Peter J., 4,160,833, Cl. 424-249.000.
- Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, 4,160,831, Cl. 424-248.560.
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- Maier, Ludwig, 4,160,779, Cl. 260-502.500.
- Paioni, Romeo, 4,160,837, Cl. 424-267.000.
- Renner, Alfred; and Zahir, Abdul-Cader, 4,160,859, Cl. 528-322.000.
- Schmidt, Andreas; and Kirchmayr, Rudolf, 4,160,794, Cl. 260-927.00R.
- Szczepanski, Henry, 4,160,843, Cl. 424-278.000.
- Vogel, Christian; and Aebi, Rudolf, 4,160,660, Cl. 71-118.000.
- Cincinnati Milacron, Inc.: See—  
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,160,819, Cl. 424-45.000.
- Cist, John D.: See—  
Gromlich, Roy J.; Brech, Kilian H., deceased; and Cist, John D., 4,160,385, Cl. 73-622.000.
- Citizen Watch Company Limited: See—  
Nakayama, Toshihiko; and Takei, Kenji, 4,160,928, Cl. 310-353.000.
- Claggett, Joseph H. Mounting arrangement for a television monitoring camera, 4,160,999, Cl. 358-108.000.
- Clare-Pendar Co.: See—  
Wright, Duane H., deceased; and Meyer, Stephen F., 4,160,886, Cl. 200-5.00A.
- Classic Products Corporation: See—  
Fogel, Isaac, 4,160,296, Cl. 5285.000.
- Cleary, Frederick W.: See—  
Ladd, Glenn O., Jr.; and Cleary, Frederick W., 4,160,984, Cl. 357-22.000.
- Cleland, Robert K. Liquid metering and blending means, 4,160,512, Cl. 222-56.000.
- Cleveland, Robert R., to Video Systems Research, Inc. High speed television camera control system, 4,161,000, Cl. 358-225.000.
- Cline, Harvey E.: See—  
Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., 4,160,679, Cl. 148-1.500.
- Cluthe, George J., to Geo. Cluthe Manufacturing Co. Limited, The. Rural mail box, 4,160,520, Cl. 232-17.000.
- Coal Industry (Patents) Limited: See—  
Monks, Harry, 4,160,391, Cl. 74-661.000.
- Cockerham, Terry L. Toothpaste dispenser, 4,160,513, Cl. 222-181.000.
- Codex Corporation: See—  
Vander Mey, James E., 4,160,877, Cl. 179-15.0BA.
- Codman & Shurtleff, Inc.: See—  
Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.
- Colburn, Edward N., to UOP Inc. Portable water sampling apparatus, 4,160,622, Cl. 417-181.000.
- Cole, Clinton W., to Halliburton Company. Hydraulically powered triplex pump and control system therefor, 4,160,627, Cl. 417-403.000.
- Cole, Douglas L.; and Goegelman, Robert T., to Merck & Co., Inc. Method for the separation of antibiotic macrolides, 4,160,861, Cl. 536-17.00A.
- Cole, Lewis C., to United States of America, Army. Target activated projectile, 4,160,415, Cl. 102-214.000.
- Colombo, Paolo: See—  
Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, 4,160,789, Cl. 525-411.000.
- Columbus, Peter S.; and Anderson, John, to Borden, Inc. Aqueous acrylic contact cement, 4,160,750, Cl. 260-17.4ST.
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Nigra, Jacques; and Vanthuyne, Guy, 4,160,996, Cl. 358-73.000.
- Compagnie Internationale pour l'Informatique: See—  
Dahy, Jean-Jacques; and Hubert, Maurice, 4,161,025, Cl. 364-200.000.
- Compagnie Neerlandaise de l'Azote: See—  
Van Hijfte, Willy Henri P.; and Goethals, Rafael Arsene J., 4,160,782, Cl. 260-555.00C.

- Comstock, Theodore R.: See—  
Smith, Gordon S.; and Comstock, Theodore R., 4,160,304, Cl. 16-49.000.
- Conard, Donald D. Suitcase with transporting rims, 4,160,495, Cl. 190-18.00A.
- Conroy, Edward H.; and Gloster, Arthur, to Texasgulf Inc. Multi-stage crystallization of sodium carbonate, 4,160,812, Cl. 423-421.000.
- Conroy, Peter J., to Motorola, Inc. Broadband microstrip disc antenna, 4,160,976, Cl. 343-700.0MS.
- Cooke, Claude E., Jr.: See—  
Erbstoesser, Steven R.; Muecke, Thomas W.; and Cooke, Claude E., Jr., 4,160,482, Cl. 166-284.000.
- Cooney, Robert M., to Apollo Spinner, Inc. Skateboard accessory, 4,160,554, Cl. 280-87.04A.
- Cope, Lloyd S.; and Rejda, Ladislav J., to Epoxylite Corporation, The. Materials and impregnating compositions for insulating electric machines, 4,160,926, Cl. 310-215.000.
- Copper Co., Ltd.: See—  
Ito, Kenzo; and Abe, Yoshiharu, 4,160,595, Cl. 355-3.0FU.
- Corn, John E.: See—  
Webb, Jimmy L.; and Corn, John E., 4,160,785, Cl. 260-583.00P.
- Corning Glass Works: See—  
Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, 4,160,654, Cl. 65-30.00E.
- Kingsbury, Paul I., Jr.; and Seward, Thomas P., III, 4,160,655, Cl. 65-30.00R.
- Potts, Robert S., 4,160,803, Cl. 422-101.000.
- Cosentino, Ronald R.: See—  
Sullivan, Ronald L.; and Cosentino, Ronald R., 4,160,879, Cl. 179-90.0AN.
- Courier de Mere, Henri, to Bicos Societe de Recherches. Bistable element and a switch circuit comprising such a bistable element, 4,160,920, Cl. 307-252.00C.
- Courtney, Thomas; and Lumba, Vijay K., to Fairchild Camera and Instrument Corporation. Optically coupled isolator device and method of making same, 4,160,308, Cl. 29-588.000.
- Covington, Wayne F.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Weninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.
- CPC Engineering Corporation: See—  
Reid, Robert A., 4,160,569, Cl. 308-203.000.
- Craib, Rupert G. Floor joist plate, 4,160,350, Cl. 52-696.000.
- Crestetto, Giovanni. Automotive bumper, 4,160,562, Cl. 293-120.000.
- Cri-Dan: See—  
Mulot, Georges C., 4,160,395, Cl. 82-5.000.
- Cross, Thomas A.: See—  
Fastina, Anthony J.; and Cross, Thomas A., 4,160,373, Cl. 73-23.000.
- Crumbly, John T. Two-stage flush mechanism for toilets, 4,160,294, Cl. 4-324.000.
- Crump, Janet M.: See—  
Crump, Terence J.; and Crump, Janet M., 4,160,374, Cl. 73-76.000.
- Crump, Terence J.; and Crump, Janet M. Apparatus for measuring the diffusive resistance of plant stomata, 4,160,374, Cl. 73-76.000.
- Crumpacker, William H. Wrench, 4,160,394, Cl. 81-64.000.
- Cunningham, Francis V., to Joslyn Mfg. and Supply Co. High voltage protection apparatus, 4,161,012, Cl. 361-128.000.
- Curran, Matthew J.: See—  
Arendt, Ronald H.; and Curran, Matthew J., 4,160,705, Cl. 204-37.00R.
- Arendt, Ronald H.; and Curran, Matthew J., 4,160,706, Cl. 204-37.00R.
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- Curtice, Walter R., to RCA Corporation. Exclusive-OR circuit, 4,160,919, Cl. 307-216.000.
- Curtis, Robert S. Fuel system for aquatic craft, 4,160,425, Cl. 115-6.100.
- Daborowski, Ignace J.; and Galis, Leon A., to Ambac Industries, Inc. Excess fuel starting device for fuel injection engines, 4,160,434, Cl. 123-140.0FG.
- Dahm, Manfred: See—  
Schapel, Dietmar; Wagner, Kuno; Muller, Hanns P.; and Dahm, Manfred, 4,160,754, Cl. 260-29.40R.
- Dahy, Jean-Jacques; and Hubert, Maurice, to Compagnie Internationale pour l'Informatique. Information processing system, 4,161,025, Cl. 364-200.000.
- Dainichi-Nippon Cables, Ltd.: See—  
Tanno, Shogo; and Hirose, Masateru, 4,160,947, Cl. 324-54.000.
- Daiwa Shinku Corporation: See—  
Ueda, Hirotada, 4,160,583, Cl. 350-269.000.
- Yasuo, Sasaki, 4,160,582, Cl. 350-269.000.
- Dalziel, Warren L., to Shugart Associates. Head positioning mechanism for recording/playback machine, 4,161,004, Cl. 360-106.000.
- D'Amico, John J., to Monsanto Company. Substituted benzothiazolines and their use as plant growth regulants, 4,160,658, Cl. 71-90.000.
- Damm, Jerry S.; and Damm, William R. Photographic easel, 4,160,597, Cl. 355-74.000.
- Damm, William R.: See—  
Damm, Jerry S.; and Damm, William R., 4,160,597, Cl. 355-74.000.
- Damouth, David E.; and Gunning, William F., to Xerox Corporation. Motor speed control system, 4,160,939, Cl. 318-723.000.
- Dan River Incorporated: See—  
Newell, Robert C.; and Kinning, Robert F., 4,160,424, Cl. 112-275.000.
- Danfoss A/S: See—  
Dyhr, Jan; and Nissen, Ole J., 4,160,625, Cl. 417-363.000.
- Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., to General Electric Company. Anatomically coordinated user dominated programmer for diagnostic x-ray apparatus, 4,160,906, Cl. 250-322.000.
- Dankman, Scott; Levy, Richard C.; and McCoy, Bryan. Toy flying vehicle including sound effect generator, 4,160,339, Cl. 46-232.000.
- Daravinas, George V.: See—  
Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravinas, George V., 4,160,850, Cl. 426-601.000.
- Wagenknecht, Austin C., deceased; Daravinas, George V.; and Koski, William E., 4,160,820, Cl. 424-48.000.
- Davey, Julian P., to Kratos Limited. Electron microscopes, 4,160,905, Cl. 250-311.000.
- David Sensibar Irrevocable Trust: See—  
Sensibar, Ezra, 4,160,618, Cl. 414-142.000.
- Davis, Frederick B., 3rd; and Ross, Charles W., to Leeds & Northrup Company. Electric demand control system, 4,161,028, Cl. 364-492.000.
- Davis, Ross A. Automobile antenna, 4,160,977, Cl. 343-713.000.
- Davis, Steven S., to Envirotech Corporation. Pulp washer, 4,160,297, Cl. 8-156.000.
- Dawidowitsch, Peter: See—  
Geyken, Erwin; and Dawidowitsch, Peter, 4,160,594, Cl. 354-324.000.
- De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posten, Telegrafie en Telefonie: See—  
van Wijngaarden, Hans, 4,160,902, Cl. 250-461.00R.
- de Breisson, Michel; Decrouen, Jean-Michel; Edlinger, Wolfgang F. J.; and Biet, Jean-Pierre H., to U.S. Philips Corporation. Integrated circuit having complementary bipolar transistors, 4,160,989, Cl. 357-44.000.
- Decrouen, Jean-Michel: See—  
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- Degols, Albert: See—  
Tytgat, Daniel; and Degols, Albert, 4,160,948, Cl. 324-61.00P.
- de Jong, Eduard B. M., to Technicon Instruments Corporation. Regenerating a degenerated curve, 4,161,030, Cl. 364-581.000.
- de Keyser, Andre; and Seynaeve, Laurent, to Sprague Electric Company. Dual section distributed parameter delay-line, 4,160,962, Cl. 333-141.000.
- DePico, Joseph, to Abcor, Inc. Ultrafiltration process for the concentration of polymeric latices, 4,160,726, Cl. 210-23.00F.
- Demircioglu, Sayman F.: See—  
Zimmermann, Detlef; Demircioglu, Sayman F.; and Kugler, Jindrich, 4,161,008, Cl. 361-56.000.
- Demuth, Hans; and Stumpff, Walter, to Sulzer Brothers, Ltd. Knot hole beam, 4,160,532, Cl. 242-125.100.
- DeNicola, Joseph P., to Instron Corporation. Extensometer, 4,160,325, Cl. 33-148.00D.
- Denison, Early B.: See—  
Dickson, Leon L., Jr.; and Denison, Early B., 4,160,457, Cl. 134-167.00C.
- Dennard, Robert H.; and Rideout, Vincent L., to International Business Machines Corporation. Field effect transistors with polycrystalline silicon gate self-aligned to both conductive and non-conductive regions and fabrication of integrated circuits containing the transistors, 4,160,987, Cl. 357-41.000.
- Derner, William J.; and Price, Connor E., to FMC Corporation. Pre-loading nut for wedge sleeve, 4,160,608, Cl. 403-370.000.
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- DeSchutter, Camiel R. Insulating modular panel units, 4,160,349, Cl. 52-481.000.
- DeShano, Al. Capsule for a life saving line and float, 4,160,298, Cl. 9-14.000.
- Desiderio, Fred A., to Rohm and Haas Company. Method for preparing dye solutions, 4,160,642, Cl. 8-12.000.
- Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Automatic sequence generator for a polyphonic tone synthesizer, 4,160,399, Cl. 84-1.030.
- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: See—  
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- Wiseman, Russell M., 4,160,716, Cl. 204-270.000.
- DiBona, Anthony, Jr. Tuna and egg-salad mixer, 4,160,604, Cl. 366-247.000.
- Dicesare, Pierre: See—  
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- Dickson, Leon L., Jr.; and Denison, Early B., to Shell Oil Company. Tool joint cleaner, 4,160,457, Cl. 134-167.00C.
- Diehl: See—  
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- Diel, Peter J., to Ciba-Geigy Corporation. 1,2,4-Benzotriazine-1,4-di-N-oxide derivatives. 4,160,833, Cl. 424-249.000.
- Diembeck, Walter: See—  
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- Dieterich, Dieter: See—  
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- Dietrich, Werner: See—  
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- Dieterichs, Hans-Hermann; Sinner, Michael; Oderbek, Fritz; and Brachthausen, Karl-Heinz, to Projektierung Chemische Verfahrenstechnik Gesellschaft mit beschränkter Haftung. Process for the production of glucose from cellulose-containing vegetable raw materials. 4,160,695, Cl. 435-101.000.
- Dikinis, Daumantas V. Automatic car identification system. 4,160,522, Cl. 235-454.000.
- Dill, Herbert C.; and Wisler, Allen E., to Hughes Tool Company. Heat treatment of welds. 4,160,543, Cl. 266-252.000.
- Dimension Weld International Corporation, The: See—  
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- Dimov, Nikola S.: See—  
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Ueda, Hirotsada, 4,160,583, Cl. 350-269.000.
- Yasuo, Sasaki, 4,160,582, Cl. 350-269.000.
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- Dr. Johannes Heidenhain GmbH: See—  
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- Doherty, George O. Outside-the-needle catheter device with needle housing. 4,160,450, Cl. 128-214.400.
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- Domtar Inc.: See—  
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- Nguyen, Xuan T., 4,160,730, Cl. 210-48.000.
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- Dow Chemical Company, The: See—  
Sweet, Forest H., III, 4,160,740, Cl. 252-75.000.
- Thomas, Ronnie L.; and Suhy, Frederick A., 4,160,483, Cl. 166-307.000.
- Doyle, Carlos L., to American Cyanamid Company. Process for dewatering sewage sludges disinfected with lime. 4,160,731, Cl. 210-50.000.
- Drake, James A. Garden canopy. 4,160,341, Cl. 47-28.00R.
- Drayer, T. Gary: See—  
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- Drechsel, Erhart K., to Pennzoil Company. Preparation of monocalcium phosphate and phosphoric acid. 4,160,657, Cl. 71-41.000.
- Drewett, Robert J., to National Research Development Corporation. Helical radio antennae. 4,160,979, Cl. 343-788.000.
- Driessen, Antonius J. G. C.; and Vos, Hendricus E. M. C., to U.S. Philips Corporation. Electric discharge lamp with annular current conductor. 4,160,930, Cl. 313-217.000.
- Driver, Michael L. Double diaphragm electrostatic transducer each diaphragm comprising two plastic sheets having different charge carrying characteristics. 4,160,882, Cl. 179-111.00R.
- Dryer, Grant M., to Canaird Sales Ltd. Pots for growing plants. 4,160,342, Cl. 47-80.000.
- D'Silva, Thomas L., to Western Gold & Platinum Co. Ductile brazing foil for cast superalloys. 4,160,854, Cl. 428-607.000.
- DuHamel, Raymond H. Circularly polarized loop and helix panel antennas. 4,160,978, Cl. 343-742.000.
- Dunn, Cecil C. Tool for layout of baseball diamonds (Du-Ber). 4,160,324, Cl. 33-137.00R.
- Dunne, Carroll J., Jr.; and Scott, Ian J. C., to Chrysler Corporation. Pump enclosed fluid flowmeter. 4,160,380, Cl. 73-229.000.
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- Kirkland, Joseph J.; and Yau, Wallace W., 4,160,728, Cl. 210-31.00C.
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- Duro-Test Corporation: See—  
Thorington, Luke; Walsh, Peter; Koo, Ronald; and Thourer, Wolfgang, 4,160,929, Cl. 313-112.000.
- Duthie, Anthony J.: See—  
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- Duym, Arthur, to Bell Telephone Laboratories, Incorporated. Ventilating system. 4,160,407, Cl. 98-115.00R.
- Dyhr, Jan; and Nissen, Ole J., to Danfoss A/S. Encapsulated refrigerator. 4,160,625, Cl. 417-363.000.
- Dzugutov, Mikhail Y.: See—  
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- E.M.F., Inc.: See—  
Griesbach, Melbourne L., 4,160,326, Cl. 33-174.00R.
- E M I Limited: See—  
Froggatt, Robert J., 4,160,909, Cl. 250-402.000.
- Hounsfield, Godfrey N., 4,160,911, Cl. 250-445.00T.
- Hounsfield, Godfrey N.; and Gillard, Richard G., 4,160,954, Cl. 328-127.000.
- E. R. Squibb & Sons, Inc.: See—  
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- E. & U. Gertsch AG: See—  
Gertsch, Ulrich, 4,160,556, Cl. 280-618.000.
- East, Harvey J., to Aurifex Limited. Jewelry bracelets. 4,160,361, Cl. 59-82.000.
- Eastman Kodak Company: See—  
Beach, David E., 4,160,588, Cl. 354-311.000.
- Locey, Mark M.; and Göttermeier, William F., 4,160,799, Cl. 264-342.00R.
- McCabe, John M.; and Yoerger, William E., 4,160,666, Cl. 96-1.0PC.
- Ponticello, Ignazio S.; and McIntire, John M., 4,160,864, Cl. 560-2.000.
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- Wu, Tai-Wing, 4,160,696, Cl. 435-25.000.
- Ebner, Peter R., to Itek Corporation. Backlashless phototypesetter carriage brake. 4,160,586, Cl. 354-5.000.
- Edgell, Thomas A.: See—  
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- Edlinger, Wolfgang F. J.: See—  
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- Edwards, Laroy H., to Chevron Research Company. Fungicidal N-(haloaliphaticthio)halovinylsulfonamides. 4,160,845, Cl. 424-298.000.
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- Ehmann, William J., to SCM Corporation. Process for isomerizing cycloalkenol to cycloalkanone. 4,160,786, Cl. 260-586.00P.
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- Electric Power Research Institute, Inc.: See—  
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- Eli Lilly and Company: See—  
Miesel, John L., 4,160,834, Cl. 424-250.000.
- Miller, Jean C.; and Gutowski, Gerald E., 4,160,767, Cl. 260-244.400.
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Saini, Sarmukh S., 4,160,968, Cl. 337-404.000.
- Endo, Isamu: See—  
Mori, Haruo; Ueda, Tadashige; and Endo, Isamu, 4,160,364, Cl. 60-293.000.
- Endo, Shinichiro: See—  
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.
- Energy 76, Inc.: See—  
Botts, Elton M., 4,160,924, Cl. 310-17.000.
- Engel, John F., to FMC Corporation. Insecticidal [β-(substituted-phenyl)vinyl]cyclopropanecarboxylates. 4,160,842, Cl. 424-274.000.
- Engineering Enterprises, Inc.: See—  
Nixon, Jeddy D.; and Fox, Fred K., 4,160,551, Cl. 277-124.000.
- English, William D.: See—  
Neff, Joseph A.; and English, William D., 4,160,811, Cl. 423-276.000.
- Envirotech Corporation: See—  
Davis, Steven S., 4,160,297, Cl. 8-156.000.
- Epoxylite Corporation, The: See—  
Cope, Lloyd S.; and Rejda, Ladislav J., 4,160,926, Cl. 310-215.000.
- Erbstoesser, Steven R.; Muecke, Thomas W.; and Cooke, Claude E., Jr., to Exxon Production Research Company. Ball sealer diversion of matrix rate treatments of a well. 4,160,482, Cl. 166-284.000.
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- Esseluhn, Werner F., to Western Electric Co., Inc. Depositing materials on stacked semiconductor wafers. 4,160,682, Cl. 148-171.000.
- Etablissements Francois Salomon et Fils: See—  
Salomon, Georges P. J., 4,160,332, Cl. 36-119.000.
- Etudes et Recherches Avances: See—  
Galicher, Georges, 4,160,497, Cl. 192-4.00A.
- Etudes Techniques et Représentations Industrielles E.T.R.I.: See—  
Vettori, Claude, 4,160,576, Cl. 339-119.00R.
- Evtimov, Stoyan I.: See—  
Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, Nikola S., 4,160,647, Cl. 422-106.000.
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Bock, Jan; Lundberg, Robert D.; and Makowski, Henry S., 4,160,751, Cl. 260-23.50A.
- Gardner, Irwin J., 4,160,758, Cl. 260-40.00R.
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- Murrell, Lawrence L.; and Yates, David J. C., 4,160,745, Cl. 252-466.001.
- F. A. Malone & Son, Inc.: See—  
Malone, Fermer A., Sr.; and Malone, Fermer A., Jr., 4,160,528, Cl. 242-56.00R.
- F. D. Farnam Co.: See—  
Farnam, Robert G.; and Lomik, Alexander, 4,160,561, Cl. 293-1.000.
- Fader, Walter J., to United Technologies Corporation. Nuclear-pumped uranyl salt laser. 4,160,956, Cl. 331-94.50P.
- Fairchild Camera and Instrument Corporation: See—  
Courtney, Thomas; and Lumba, Vijay K., 4,160,308, Cl. 29-588.000.
- Farmer, Stanley E.; and Weinert, Harry F., to Cascade Corporation. Lift truck paper roll clamp having improved contact pad restraint and hinge structure. 4,160,620, Cl. 414-621.000.
- Farnam, Robert G.; and Lomik, Alexander, to F. D. Farnam Co. Vehicle bumper shim and method. 4,160,561, Cl. 293-1.000.
- Farrell, Joseph S.: See—  
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- Fastia, Anthony J.; and Cross, Thomas A., to United Technologies Corporation. Vehicle exhaust gas analysis system with gas blockage interlock. 4,160,373, Cl. 73-23.000.
- Fava, Ronald A., to Arco Polymers, Inc. Thermoplastic molding composition comprising styrene-maleimide and polycarbonate. 4,160,792, Cl. 525-148.000.
- Federal Paper Board Company, Inc.: See—  
Ganz, Robert H., 4,160,353, Cl. 53-393.000.
- Feeney, Joseph D.: See—  
Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.
- Feffer, Philip C.: See—  
Soutar, David, Jr.; Feffer, Philip C.; and Guenther, Lloyd M., 4,160,307, Cl. 28-220.000.
- Felix Stiegler Maschinenfabrik: See—  
Matzner, Peter; and Schulze, Ehrhart, 4,160,396, Cl. 83-100.000.
- Ferranti Limited: See—  
Kane, Jeffrey, 4,160,990, Cl. 357-48.000.
- Law, James T., 4,160,455, Cl. 128-400.000.
- Fey, Maurice G.; and Harvey, Francis J., II, to Westinghouse Electric Corp. Method and apparatus for melting machining chips. 4,160,867, Cl. 13-2.00P.
- Fiber Mechanics AB: See—  
Lindgren, Mats, 4,160,521, Cl. 233-27.000.
- Fichter, Robert, to Norwood Marking & Equipment Co. Marking device utilizing dual rod power cylinder. 4,160,410, Cl. 101-41.000.
- Finite Filter Company: See—  
Berger, L. Joseph, Jr.; and Guequierre, Denis D., 4,160,684, Cl. 156-69.000.
- Finsterwalder, Lorenz; Zeh, Horst; and Schaarschmidt, Ulrich, to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH. Sample taking device for toxic and/or radioactive substances. 4,160,382, Cl. 73-422.00R.
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- Firester, Arthur H.; and Heller, Macy E., to RCA Corporation. Apparatus for the determination of focused spot size and structure. 4,160,598, Cl. 356-121.000.
- Fischer, Artur. Hollow structural element for assembling a structure. 4,160,337, Cl. 46-26.000.
- Fischetti, Ignazio, to Laboratorio Biochimici Fargal-Pharmasint S.p.A. Inhibitor preparation for the absorption of lipids, based on diethylaminoethyl dextran. 4,160,826, Cl. 424-180.000.
- Fisher, Bruce S.: See—  
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,160,791, Cl. 525-469.000.
- Fisons Limited: See—  
Orr, Thomas S. C.; and Keogh, Raymond W., 4,160,844, Cl. 424-283.000.
- Flach, Wayne T.: See—  
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.
- Flanagan, Paul, to Flynn Burner Corporation. Liquid fuel atomizing nozzle. 4,160,526, Cl. 239-427.000.
- Flayeux, Roland: See—  
Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, 4,160,787, Cl. 260-586.00D.
- Fleckenstein, Erwin: See—  
Mischke, Peter; Fleckenstein, Erwin; and Mohr, Reinhard, 4,160,764, Cl. 260-206.000.
- Fleischer, Henry. Child holding device and joint therefor. 4,160,553, Cl. 280-87.02W.
- Fletcher, James D. Archery bow string release device. 4,160,437, Cl. 124-35.00A.
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Mason, Charles D.; and Flood, Paul W., 4,160,790, Cl. 525-179.000.
- Flower, Ralph F. J. Rotary valves. 4,160,436, Cl. 123-190.00B.
- Flynn Burner Corporation: See—  
Flanagan, Paul, 4,160,526, Cl. 239-427.000.
- FMC Corporation: See—  
Derner, William J.; and Price, Connor E., 4,160,608, Cl. 403-370.000.
- Engel, John F., 4,160,842, Cl. 424-274.000.
- Fogel, Isaac, to Classic Products Corporation. Waterbed headboard bracket. 4,160,296, Cl. 5-285.000.
- Fong, Godfrey T.: See—  
Kamins, Theodore I.; and Fong, Godfrey T., 4,160,985, Cl. 357-30.000.
- Fonteneau, Norman O.: See—  
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.
- Ford Motor Company: See—  
Lambe, John J.; and McCarthy, Shaun L., 4,160,931, Cl. 313-498.000.
- McLean, Douglas H., 4,160,485, Cl. 172-9.000.
- Foremost-McKesson, Inc.: See—  
Harris, Robert M., Jr., 4,160,727, Cl. 210-23.00H.
- Fortman, Richard F.: See—  
Bergman, Roland H.; Meyer, Richard J.; and Fortman, Richard F., 4,160,372, Cl. 72-404.000.
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- Foux, Amnon, to University of Utah. Implantable catheter system. 4,160,454, Cl. 128-348.000.
- Fowler, John S.: See—  
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- Fowler, Ronald J., to United States of America, Navy. Arming-safing system for airborne weapons. 4,160,417, Cl. 102-221.000.
- Fox, Charles T.; and Graham, Edward P., to United States Stove Company. Fireplace cover. 4,160,442, Cl. 126-140.000.
- Fox, Fred K.: See—  
Nixon, Jeddy D.; and Fox, Fred K., 4,160,551, Cl. 277-124.000.
- Frank, James P.: See—  
Ellicott, Harold B.; and Frank, James P., 4,160,885, Cl. 200-1.00R.
- Franz, Curtis A., to American Cyanamid Company. Benzothiazole accelerators stabilized with oxirane compounds. 4,160,741, Cl. 252-182.000.
- Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: See—  
Theurer, Josef, 4,160,418, Cl. 104-2.000.
- Frazier, Paul D. Method of constructing an orthodontic appliance. 4,160,322, Cl. 32-14.00C.
- Fredd, John V.: See—  
Calhoun, Michael B.; and Fredd, John V., 4,160,478, Cl. 166-55.100.
- Frei, Ernst. Clothes hanger. 4,160,515, Cl. 223-96.000.
- Frentress, Zane, to Milliken Research Corporation. Random signal generator for the manufacture of slub open end spun yarn. 4,160,359, Cl. 57-58.890.
- Friddy, Levi G., to United States of America, Navy. Degreasing, a three step process to obtain propellant samples from case bonded motors. 4,160,314, Cl. 29-558.000.
- Friederich, Klaus: See—  
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.
- Frigato, Giovanni, to Sandoz Ltd. Device for measuring conductivity of a solution. 4,160,946, Cl. 324-30.00R.
- Fritsch, Robert A., to Harnischfeger Corporation. Carrier frame for mobile crane. 4,160,558, Cl. 280-797.000.
- Froggatt, Robert J., to E M I Limited. X-ray tube arrangements. 4,160,909, Cl. 250-402.000.
- Frye, George J.; and Geerling, Leonardus J. Automatic transient response analyzer system. 4,161,029, Cl. 364-579.000.
- Fugono, Takeshi: See—  
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,160,830, Cl. 424-246.000.
- Fuji Jukogyo Kabushiki Kaisha: See—  
Mori, Haruo; Ueda, Tadashige; and Endo, Isamu, 4,160,364, Cl. 60-293.000.
- Fujimori, Noboru: See—  
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,160,669, Cl. 96-27.00E.
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- Fujita, Michio, to Toyota-Koki Kabushiki-Kaisha. Profiling apparatus for a disk-like article having a cylindrical face and rounded corners. 4,160,438, Cl. 125-11.0TP.
- Fujita, Toshio; and Teratani, Hironaga, to Nippon Kouatsu Electric Co. Low temperature calcined porcelain and process for preparation thereof. 4,160,673, Cl. 106-45.000.
- Fujitsu Ten Limited: See—  
Sato, Takeo, 4,160,955, Cl. 329-2.000.
- Fukui, Seiji, to Shimano Industrial Company Limited. Multiple-speed hub for bicycles. 4,160,393, Cl. 74-750.00B.
- Fukuura, Yukio: See—  
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
- Fuller, Frank M. Fireplace utensil. 4,160,441, Cl. 126-127.000.
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Futcher, Ralph J., to Dominion Engineering Works Limited. Twin wire web forming with wire tension control. 4,160,694, Cl. 162-256.000.

G.I.E. Tepral: See—

Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, 4,160,787, Cl. 260-586.00D.

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Stockel, Dieter; and Oberg, Hans-Jurgen, 4,160,855, Cl. 428-621.000.

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VerMehren, Hubert R., 4,160,500, Cl. 198-457.000.

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Shenoy, Raghuram D.; and Ganapathy, Ananthram, 4,160,774, Cl. 260-424.000.

Ganz, Robert H., to Federal Paper Board Company, Inc. Bottle packaging machine. 4,160,353, Cl. 53-393.000.

Gaon, Joseph. Safety circuit to prevent the obtaining of a false count from presettable counters. 4,160,898, Cl. 235-92.0PE.

Gardner, Irwin J., to Exxon Research & Engineering Co. Method of manufacture of elastomer polyester molding compounds. 4,160,758, Cl. 260-40.00R.

Gardner, Irwin J.; and Baldwin, Francis P., to Exxon Research & Engineering Co. Elastomer modified polyester molding compound. 4,160,759, Cl. 260-40.00R.

Garner, Andrew: See—

Brigham, Robert J.; Sirianni, Guy V.; and Garner, Andrew, 4,160,661, Cl. 75-12.000.

Garrett Corporation, The: See—

Holmes, Edward S. B., 4,160,969, Cl. 338-23.000.

Gavin, David F.: See—

Scardera, Michael; and Gavin, David F., 4,160,776, Cl. 260-448.80R.

Gebr. Hofmann G.m.b.H. & Co., KG, Maschinenfabrik: See—

Himmeler, Gunther, 4,160,378, Cl. 73-146.000.

Geerling, Leonardus J.: See—

Frye, George J.; and Geerling, Leonardus J., 4,161,029, Cl. 364-579.000.

Gelman Instrument Company: See—

Boomus, Mary; Sobin, Bernard; and Schweitzer, John, 4,160,700, Cl. 435-298.000.

General Electric Company: See—

Arendt, Ronald H.; and Curran, Matthew J., 4,160,705, Cl. 204-37.00R.

Arendt, Ronald H.; and Curran, Matthew J., 4,160,706, Cl. 204-37.00R.

Arendt, Ronald H.; and Curran, Matthew J., 4,160,708, Cl. 204-37.00R.

Born, Norman E.; and Halttunen, Martin A., 4,161,016, Cl. 361-388.000.

Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., 4,160,906, Cl. 250-322.000.

Ellicott, Harold B.; and Frank, James P., 4,160,885, Cl. 200-1.00R.

Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., 4,160,679, Cl. 148-1.500.

Kindig, Alan L., 4,160,316, Cl. 29-734.000.

Roedel, George F., 4,160,858, Cl. 528-14.000.

Webb, Jimmy L.; and Corn, John E., 4,160,785, Cl. 260-583.00P.

Wilkinson, Stanley B., 4,161,011, Cl. 361-80.000.

General Instrument Corporation: See—

Maine, Stephen G. T., 4,160,959, Cl. 332-31.00T.

General Mills, Inc.: See—

Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.

Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,820, Cl. 424-48.000.

General Motors Corporation: See—

Baxter, William J., 4,160,702, Cl. 204-1.00T.

Carol, John A., Jr., 4,160,900, Cl. 235-132.00E.

Vona, Nick, Jr., 4,160,367, Cl. 68-17.00R.

General Signal Corporation: See—

Wynn, Barry, 4,160,630, Cl. 418-102.000.

George, Benjamin B., Jr. Low energy decorative light bulb displays. 4,161,021, Cl. 362-252.000.

Geo. Cluthe Manufacturing Co. Limited, The: See—

Cluthe, George J., 4,160,520, Cl. 232-17.000.

Gerrity, Albert B.: See—

Vidal, Frederick D.; and Gerrity, Albert B., 4,160,848, Cl. 426-24.000.

Gertsch, Ulrich, to E. & U. Gertsch A.G. Heel or sole holder for a sole plate of a safety ski binding and sole plate equipped with such holder. 4,160,556, Cl. 280-618.000.

Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH: See—

Finstenwalder, Lorenz; Zeh, Horst; and Schaarschmidt, Ulrich, 4,160,382, Cl. 73-422.00R.

Gest, Rene: See—

Bichot, Bernard H.; and Gest, Rene, 4,160,398, Cl. 83-865.000.

Geyken, Erwin; and Dawidowitsch, Peter, to AGFA-Gevaert, A.G. Method and arrangement for the development of latent images particularly latent photographic images. 4,160,594, Cl. 354-324.000.

Giles, Charles L., to Polaroid Corporation. Transparent metallic coating and a glass overcoating on a plastic substrate produce a chromatic effect. 4,160,584, Cl. 351-49.000.

Gilger, William F.: See—

Montgomery, Murray M.; Gilger, William F.; and Steiner, William W., 4,160,617, Cl. 414-109.000.

Gillard, Richard G.: See—

Hounsfield, Godfrey N.; and Gillard, Richard G., 4,160,954, Cl. 328-127.000.

Gist-Brocades N.V.: See—

Heijboer, Robert; van Harrewijn, Antoon; and Henniger, Peter W., 4,160,829, Cl. 424-246.000.

Glass, Brian E.: See—

Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.

Global Coatings Limited: See—

Kaufmann, John H., 4,160,346, Cl. 52-96.000.

Gloster, Arthur: See—

Conroy, Edward H.; and Gloster, Arthur, 4,160,812, Cl. 423-421.000.

Goans, Kip B.: See—

Akkerman, Neil H.; Foster, Stephen R.; and Goans, Kip B., 4,160,463, Cl. 137-596.180.

Gobush, William: See—

Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.

Goegelman, Robert T.: See—

Cole, Douglas L.; and Goegelman, Robert T., 4,160,861, Cl. 536-17.00A.

Goethals, Rafael Arsene J.: See—

Van Hijfte, Willy Henri P.; and Goethals, Rafael Arsene J., 4,160,782, Cl. 260-555.00C.

Goffeau, Jacques R., to United States of America, Energy. Up-and-down chopper circuit. 4,161,023, Cl. 363-124.000.

Goldberger, W. M.: See—

Markel, Richard F.; and Goldberger, W. M., 4,160,813, Cl. 423-448.000.

Gonsalves, Anthony W.: See—

Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.

Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, to Wacker-Chemtronik Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the deposition of polycrystalline silicon from the gas phase on heated carriers. 4,160,797, Cl. 264-81.000.

Gorham, Jack C., to Champion International Corporation. Paperboard bulk bin. 4,160,519, Cl. 229-37.00R.

Gottermeier, William F.: See—

Locey, Mark M.; and Gottermeier, William F., 4,160,799, Cl. 264-342.00R.

Gottlieb, Nathan; and Sussman, Milton H., to American Optical Corporation. Annular reflector for microscope objective. 4,160,578, Cl. 350-89.000.

Graham, Edward P.: See—

Fox, Charles T.; and Graham, Edward P., 4,160,442, Cl. 126-140.000.

Grahame, Robert E., Jr.: See—

Strunk, Richard J.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., 4,160,846, Cl. 424-288.000.

Graphite Synthesis Company: See—

Markel, Richard F.; and Goldberger, W. M., 4,160,813, Cl. 423-448.000.

Great Lakes Carbon Corporation: See—

Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., 4,160,814, Cl. 423-461.000.

Greenwood, Stanley W., to Rolls-Royce Limited. Method of electrolytic machining. 4,160,710, Cl. 204-129.250.

Gregg, Edmund; and Pilarczyk, Charles E., to Towmotor Corporation. Fluid filter bypass valve assembly. 4,160,735, Cl. 210-130.000.

Gregory, Peter, to Imperial Chemical Industries Limited. Water soluble cationic azo dyestuffs containing a cyclammonium group. 4,160,643, Cl. 8-26.000.

Griesbach, Melbourne L., to E.M.F., Inc. Thickness responsive blank gauge. 4,160,326, Cl. 33-174.00R.

Griesshammer, Rudolf: See—

Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, 4,160,797, Cl. 264-81.000.

Grindstaff, Lloyd I.: See—

Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., 4,160,814, Cl. 423-461.000.

Grodzinsky, Alan J.; and Shoenfeld, Norman A., to Massachusetts Institute of Technology. Electromechanical device. 4,161,013, Cl. 361-433.000.

Grolman, Bernard, to American Optical Corporation. Apparatus and method for making ophthalmic measurements. 4,160,330, Cl. 33-200.000.

Gromlich, Roy J.; Brech, Kilian H., deceased (by Brech, Avis, executrix); and Cist, John D., to Du Pont de Nemours, E. I., and Company; and Sonic Instruments, Inc. Pipe quality monitoring mechanism. 4,160,385, Cl. 73-622.000.

Groot, Theodor C.; Huijter, Pieter; and van Lent, Johannes G., to U.S. Philips Corporation. Method and apparatus for providing reference points for mounting the magnetic deflection unit of a color display tube. 4,160,935, Cl. 315-370.000.

Gross, Bernard: See—

Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, 4,160,787, Cl. 260-586.00D.

GTE Sylvania Incorporated: See—

Bojanek, Robert J.; and Mason, Marvin S., 4,160,876, Cl. 179-15.0AT.

Monroe, Tex K., 4,160,936, Cl. 315-388.000.

Guenther, Lloyd M.: See—

Soutar, David, Jr.; Feffer, Philip C.; and Guenther, Lloyd M., 4,160,307, Cl. 28-220.000.

Guequierre, Denis D.: See—

Berger, L. Joseph, Jr.; and Guequierre, Denis D., 4,160,684, Cl. 156-69.000.

Guffey, Dean H.: See—

Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., 4,160,814, Cl. 423-461.000.

Gulf Oil Corporation: See—

Kirkpatrick, Joel L., 4,160,839, Cl. 424-269.000.

Gunning, William F.: See—

Damouth, David E.; and Gunning, William F., 4,160,939, Cl. 318-723.000.

Gurkov, Konstantin S.: See—

Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.

Guter, Gerald A. Water purification device and system. 4,160,738, Cl. 210-232.000.

Gutowski, Gerald E.: See—

Miller, Jean C.; and Gutowski, Gerald E., 4,160,767, Cl. 260-244.000.

Guyot, Volker; Maus, Otfried; and Muller, Martin, to Carl Schenck AG. Process for the turning-in of a part to be balanced affected by imbalance. 4,160,384, Cl. 73-462.000.

Haas, Steven L.: See—

Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.

Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu. Argon laser flash exposure of spectrally sensitized silver halide photographic material. 4,160,669, Cl. 96-27.00E.

Hacias, Kenneth J., to Oxy Metal Industries Corporation. Water emulsifiable lubricant and coolant. 4,160,370, Cl. 72-42.000.

Hackbarth, Richard W.; Puariea, Douglas A.; and Kramlinger, Philip J., to Maxson Corporation, The. Articulated schnabel Car. 4,160,420, Cl. 105-367.000.

Hagan, Ernest P., Jr.: See—

Martin, Robert E.; and Hagan, Ernest P., Jr., 4,160,652, Cl. 55-46.000.

Hager, Charles C.: See—

Long, Warner D.; Hager, Charles C.; and Hempenstall, George T., 4,160,806, Cl. 422-223.000.

Hager, Lowell P.: See—

White, Robert H.; and Hager, Lowell P., 4,160,802, Cl. 422-68.000.

Haggstrom, Sten L.: See—

Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., 4,160,693, Cl. 162-24.000.

Hairegenics, Inc.: See—

Miller, Paul W., 4,160,453, Cl. 128-330.000.

Halliburton Company: See—

Cole, Clinton W., 4,160,627, Cl. 417-403.000.

Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., to General Mills, Inc. Shelf-stable mix for a spreadable butter-substitute. 4,160,850, Cl. 426-601.000.

Halm, James M., to AM International, Inc. Aluminum chelates as acceptor type sensitizers and plasticizers for photoconductive polymers. 4,160,667, Cl. 96-1.50R.

Halttunen, Martin A.: See—

Born, Norman E.; and Halttunen, Martin A., 4,161,016, Cl. 361-388.000.

Hamana, Junji: See—

Kato, Hiroaki; and Hamana, Junji, 4,161,005, Cl. 360-129.000.

Hamilton, Ralph A. Omnidirectional heat pipe. 4,160,444, Cl. 126-271.000.

Hamster, Helmut: See—

Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, 4,160,797, Cl. 264-81.000.

Hans, Andre: See—

Josis, Christian; and Hans, Andre, 4,160,725, Cl. 210-21.000.

Haraguchi, Tamotsu, to TEAC Corporation. Magnetic tape cassette apparatus. 4,161,007, Cl. 360-137.000.

Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., to Great Lakes Carbon Corporation. Thermal desulfurization and calcination of petroleum coke. 4,160,814, Cl. 423-461.000.

Harken, Peter O.; and Lawson, William E., to Vanguard, Inc. Swivel base. 4,160,541, Cl. 254-192.000.

Harnischfeger Corporation: See—

Fritsch, Robert A., 4,160,558, Cl. 280-797.000.

Harper, David J.: See—

Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,866, Cl. 560-25.000.

Harris Corporation: See—

Raney, Meredith T., Jr., 4,160,981, Cl. 340-721.000.

Harris, Robert M., Jr., to Foremost-McKesson, Inc. Method and apparatus utilizing staged reverse osmosis units for purifying and dispensing water. 4,160,727, Cl. 210-23.00H.

Harvey, Francis J., II: See—

Fey, Maurice G.; and Harvey, Francis J., II, 4,160,867, Cl. 13-2.00P.

Harvey, Robin J.; and Lutz, Michael A., to Hughes Aircraft Company. Automatic crowbar and arc quenching system. 4,161,009, Cl. 361-56.000.

Hasenpath, Helmut; and Rohde, Hergen. Mechanical sweepers. 4,160,303, Cl. 15-349.000.

Hashimoto, Shigeru; and Inoue, Kenji, to Sunstar Hamigaki Kabushiki Kaisha. Dentifrices. 4,160,822, Cl. 424-52.000.

Hauber, Peter F. Sliding door lock assembly. 4,160,560, Cl. 292-101.000.

Haupt, Joachim: See—

Chard, Gerald L. P.; Haupt, Joachim; and Zuber, Werner, 4,160,890, Cl. 200-308.000.

Hawkins, Robert W.; Togami, Paul G.; and Drayer, T. Gary, to International Harvester Company. 2-Speed rotor gear case. 4,160,456, Cl. 130-27.00T.

Hayashi, Kohji: See—

Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.

Hays, Ronald M., Jr., to Texas Instruments Incorporated. Plural supply path acoustic surface wave device. 4,160,963, Cl. 333-151.000.

Heeres, Jan; Backs, Leo J. J.; and Mostmans, Joseph H., to Janssen Pharmaceutica, N.V. Heterocyclic derivatives of 1-(1,3-dioxolan-2-ylmethyl)-1H-imidazoles. 4,160,841, Cl. 424-273.00R.

Heeres, Jan: See—

Van Reet, Gustaaf; Heeres, Jan; and Wals, Lourens, 4,160,838, Cl. 424-269.000.

Heijboer, Robert; van Harrewijn, Antoon; and Henniger, Peter W., to Gist-Brocades N.V. Antibacterial 1,2,4-oxadiazolylacetamido cephalosporins. 4,160,829, Cl. 424-246.000.

Heil, Oskar. Acoustic transducer and method of making same. 4,160,883, Cl. 179-114.00M.

Heinen, Hans D., to Intellectual Trade Cy S.A. Fire door assembly. 4,160,421, Cl. 110-173.00R.

Henniger, Wilfried; Kreienbuehl, Claude; and Millan, Manuel, to Bolex International S.A. Camera equipped with range finder for manual or automatic focusing. 4,160,587, Cl. 354-25.000.

Helle, Kees; and Kamp, Andries, to Akzo N.V. Process for applying coatings containing both a metal and a synthetic resin. 4,160,707, Cl. 204-37.00R.

Heller, Macy E.: See—

Firester, Arthur H.; and Heller, Macy E., 4,160,598, Cl. 356-121.000.

Hempenstall, George T.: See—

Long, Warner D.; Hager, Charles C.; and Hempenstall, George T., 4,160,806, Cl. 422-223.000.

Henkel Corporation: See—

Virmig, Michael J.; and MacKay, Kenneth D., 4,160,807, Cl. 423-24.000.

Henniger, Peter W.: See—

Heijboer, Robert; van Harrewijn, Antoon; and Henniger, Peter W., 4,160,829, Cl. 424-246.000.

Henry Balfour & Company Limited: See—

Mitchell, James; and Pye, Thomas N., 4,160,692, Cl. 159-6.00W.

Herculite Protective Fabrics Corporation: See—

Von Kohorn, Henry; and Kydonieus, Agis F., 4,160,335, Cl. 43-131.000.

Hermann Berstorff Maschinebau GmbH: See—

Kolossow, Klaus-Dieter, 4,160,638, Cl. 425-302.100.

Herrmann, Hans: See—

Kudlich, Walter; Herrmann, Hans; Lechner, Gunther; and Berger, Kurt, 4,160,504, Cl. 206-334.000.

Hewlett-Packard Company: See—

Kamins, Theodore I.; and Fong, Godfrey T., 4,160,985, Cl. 357-30.000.

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.

Pierce, Perry H.; and Prendergast, Dan L., 4,161,017, Cl. 361-412.000.

Hidden, William P.; and McCullough, John E., to Arthur D. Little, Inc. Liquid immersible scroll pump. 4,160,629, Cl. 418-55.000.

Higashitsuji, Ken: See—

Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yugi, 4,160,711, Cl. 204-152.000.

Higgins, Larry, to Leggett & Platt, Incorporated. Small diameter, single cone coil spring for use in a box spring assembly. 4,160,544, Cl. 267-166.000.

Higley, David P., to Union Carbide Corporation. Oxidation of ketones to esters. 4,160,769, Cl. 260-343.000.

Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., to United States of America, Health, Education and Welfare. Polycarbonate membranes and production thereof. 4,160,791, Cl. 525-469.000.

Hilbert, Tom, to Melcher Manufacturing Co., Inc. Unitary seat for inner tube float. 4,160,299, Cl. 9-347.000.

Hildon, Anthony M.; Manly, Thomas D.; and Jagers, Alan J., to Propylox a Society Anonyme. Epoxidation. 4,160,778, Cl. 260-502.00R.

Himmeler, Gunther, to Gebr. Hofmann G.m.b.H. & Co., KG, Maschinenfabrik. Tire testing machine. 4,160,378, Cl. 73-146.000.



- Hirasawa, Kunio: See—  
Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, 4,160,888, Cl. 200-148.00A.
- Hirose, Masateru: See—  
Tanno, Shogo; and Hirose, Masateru, 4,160,947, Cl. 324-54.000.
- Hirschmann, Peter; and Hofer, Ernst, to Siemens Aktiengesellschaft. Conference circuit with digital-analog and analog-digital conversion. 4,160,878, Cl. 179-18.0BC.
- Hirst, Peter B.; and Duthie, Anthony J., to Johnston Brothers (Engineering) Limited. Refuse collecting vehicles. 4,160,302, Cl. 15-340.000.
- Hitachi, Ltd.: See—  
Matsuura, Shigeo; Nagashima, Toshio; and Shinagawa, Mitsuhsa, 4,160,953, Cl. 325-440.000.
- Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, 4,160,713, Cl. 204-180.00P.
- Mikoshiba, Shigeo; and Shinada, Shinichi, 4,160,932, Cl. 315-169.400.
- Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, 4,160,888, Cl. 200-148.00A.
- Satoh, Takashi, 4,161,040, Cl. 365-203.000.
- Hitachi Plant Engineering and Construction Co., Ltd.: See—  
Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, 4,160,713, Cl. 204-180.00P.
- Hitachi Shipbuilding & Engineering Co., Ltd.: See—  
Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, 4,160,805, Cl. 422-180.000.
- Hoechst Aktiengesellschaft: See—  
Mischke, Peter; Fleckenstein, Erwin; and Mohr, Reinhard, 4,160,764, Cl. 260-206.000.
- Soder, Alfons; and Perrey, Klaus, 4,160,828, Cl. 424-200.000.
- Stahlhofen, Paul, 4,160,671, Cl. 96-91.00D.
- Hofer, Ernst: See—  
Hirschmann, Peter; and Hofer, Ernst, 4,160,878, Cl. 179-18.0BC.
- Hoffmann-La Roche Inc.: See—  
Chan, Ka-Kong; and Saucy, Gabriel, 4,160,865, Cl. 560-22.000.
- Hogan, William J., to Spectrum X-ray Corporation. Automatic chest X-ray machine. 4,160,912, Cl. 250-468.000.
- Hogg, Alexander F.: See—  
Bory, Richard A.; and Hogg, Alexander F., 4,160,961, Cl. 333-27.000.
- Holbrook, Arthur J., to Rolf C. Hagen (USA) Corp. Aquarium waterfall. 4,160,427, Cl. 119-5.000.
- Holcroft & Company: See—  
Miskolczy, Gabor; Nowak, Leonard G.; and Shefsiek, Paul K., 4,160,641, Cl. 432-59.000.
- Hollybank Engineering Company Limited: See—  
Jackson, David B.; and Sisson, Keith T., 4,160,609, Cl. 403-407.000.
- Holmes, Edward S. B., to Garrett Corporation. The Transducer and method of making. 4,160,969, Cl. 338-23.000.
- Holtey, Thomas O.: See—  
Joyce, Thomas F.; and Holtey, Thomas O., 4,161,024, Cl. 364-200.000.
- Holtrop, John W.: See—  
Ayler, Steven E.; and Holtrop, John W., 4,160,405, Cl. 89-7.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Matsumoto, Katsuhiko, 4,160,565, Cl. 297-483.000.
- Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,160,431, Cl. 123-75.00B.
- Honda, Koichi: See—  
Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, 4,160,698, Cl. 435-173.000.
- Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, to Bridgestone Tire Co., Ltd. Adhesive composition. 4,160,757, Cl. 260-31.20N.
- Honeywell Inc.: See—  
Wilwerding, Dennis J., 4,160,904, Cl. 250-201.000.
- Honeywell Information Systems Inc.: See—  
Joyce, Thomas F.; and Holtey, Thomas O., 4,161,024, Cl. 364-200.000.
- Wilhite, John E., 4,161,026, Cl. 364-200.000.
- Honeywell Information Systems Italia: See—  
Caenazzo, Santo, 4,160,606, Cl. 400-616.200.
- Honnen, Lewis R.: See—  
Lewis, Robert A.; and Honnen, Lewis R., 4,160,648, Cl. 44-63.000.
- HOP Corporation, The: See—  
Turk, L. Jan; and Kehle, Ralph O., 4,160,481, Cl. 166-272.000.
- Hopper, Troy K. Welding machine for valve housings. 4,160,895, Cl. 219-125.100.
- Hopta, Daniel F.; and Beelitz, Howard R., to RCA Corporation. Switched current regulator. 4,160,943, Cl. 323-4.000.
- Hopwood, Francis W.: See—  
Mims, James H.; and Hopwood, Francis W., 4,160,958, Cl. 331-178.000.
- Horiike, Yasuhiro: See—  
Shibagaki, Masahiro; Horiike, Yasuhiro; and Yamazaki, Takashi, 4,160,690, Cl. 156-643.000.
- Houldsworth, John A., to U.S. Philips Corporation. Current measuring apparatus. 4,160,950, Cl. 324-107.000.
- Hounsfield, Godfrey N., to EMI Limited. Fan beam CT apparatus the interbeam angle of which varies with position across the fan. 4,160,911, Cl. 250-445.00T.
- Hounsfield, Godfrey N.; and Gillard, Richard G., to EMI Limited. Multiple rate discharge circuit for integrator, especially for use in computerized axial tomography. 4,160,954, Cl. 328-127.000.
- Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Migration of fine liquid wires by thermal gradient zone melting through doped surfaces. 4,160,679, Cl. 148-1.500.
- Howe, James D.: See—  
Dey, Thomas W.; Howe, James D.; and Letter, Eugene C., 4,161,014, Cl. 362-263.000.
- Howmet Turbine Components Corporation: See—  
Lirones, Nick G., 4,160,796, Cl. 264-60.000.
- Hsieh, Jack. Method for the direct reduction of iron ore. 4,160,663, Cl. 75-35.000.
- Hsu, Charles J. Emergency water leak plug. 4,160,465, Cl. 138-97.000.
- Huang, John C. P.: See—  
Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., 4,160,348, Cl. 52-202.000.
- Huang, Te-Hsiu. Automatic dimpling making machine. 4,160,634, Cl. 425-112.000.
- Hubbard, Junius P. Window shutter and mounting therefor. 4,160,343, Cl. 49-90.000.
- Hubbard, Winchester L.: See—  
Strunk, Richard J.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., 4,160,846, Cl. 424-288.000.
- Hubert, Maurice: See—  
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- Huchette, Michel; and Bussiere, Guy, to Roquette Freres. Foods containing potato pulp. 4,160,849, Cl. 426-94.000.
- Huckabay, Durward A., to Imperial West Chemical Company. Aluminum sulfate manufacturing process. 4,160,815, Cl. 423-556.000.
- Huff, Joel R.: See—  
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- Hughes Aircraft Company: See—  
Harvey, Robin J.; and Lutz, Michael A., 4,161,009, Cl. 361-56.000.
- Ladd, Glenn O., Jr.; and Cleary, Frederick W., 4,160,984, Cl. 357-22.000.
- Hughes Tool Company: See—  
Dill, Herbert C.; and Wisler, Allen E., 4,160,543, Cl. 266-252.000.
- Huijter, Pieter: See—  
Groot, Theodorus C.; Huijter, Pieter; and van Lent, Johannes G., 4,160,935, Cl. 315-370.000.
- Hukuta, Masakazu; and Kobayashi, Hirotsugi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Device for capping supplying opening of fuel-tank. 4,160,511, Cl. 220-210.000.
- Humphreys, Kenneth R.: See—  
Tognazzini, Jere W.; and Humphreys, Kenneth R., 4,160,889, Cl. 200-163.000.
- Hunter Douglas International N.V.: See—  
Brugman, Johannes A. H., 4,160,344, Cl. 52-39.000.
- Hutzenlaub, Armin S. P.; and Pack, Klaus. Roller winding machine for the formation of single reels. 4,160,529, Cl. 242-56.600.
- Hveding, Arne, to Lade Metall A/S. Systems for launching or hauling up small boats. 4,160,611, Cl. 405-2.000.
- Ichiyanagi, Yutaka, to Sony Corporation. Device for holding a rotatable record disc. 4,161,003, Cl. 360-99.000.
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- Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, to Sumitomo Electric Industries, Ltd. Method and apparatus for detecting internal cavities in casting bars. 4,160,387, Cl. 73-639.000.
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- Iijima, Eiji: See—  
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,160,823, Cl. 424-70.000.
- Ikeda, Yosaku. Apparatus for producing wooden heads of golf clubs. 4,160,635, Cl. 425-128.000.
- IMC Magnetics Corp.: See—  
Smith, Gordon S.; and Comstock, Theodore R., 4,160,304, Cl. 16-49.000.
- Imperial Chemical Industries Limited: See—  
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,866, Cl. 560-25.000.
- Gregory, Peter, 4,160,643, Cl. 8-26.000.
- Ridgeway, John J., 4,160,413, Cl. 102-24.0HC.
- Imperial West Chemical Company: See—  
Huckabay, Durward A., 4,160,815, Cl. 423-556.000.
- Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, to Hitachi Shipbuilding & Engineering Co., Ltd. Boiler containing denitrator. 4,160,805, Cl. 422-180.000.
- Inagaki, Tetsuhiko; and Maeda, Keisuke, to Minolta Camera Kabushiki Kaisha. Electromagnetic release mechanism for photographic cameras. 4,160,983, Cl. 354-234.000.
- Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyani-shi, Toshiaki, to Ajinomoto Co., Inc. Insect attractive compositions. 4,160,824, Cl. 424-84.000.
- Incotex S.A.: See—  
Camprubi, Anselmo B., 4,160,468, Cl. 139-453.000.
- Indelicato, Alphonse. Signal tube. 4,160,333, Cl. 40-322.000.
- Inductotherm Corp.: See—  
Kennedy, Theodore R., 4,160,966, Cl. 336-155.000.
- Ingle, James E.: See—  
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,160,566, Cl. 299-30.000.

- Inoue, Kenji: See—  
Hashimoto, Shigeru; and Inoue, Kenji, 4,160,822, Cl. 424-52.000.
- Inoue, Yoshihiro: See—  
Nagasaki, Katsumi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; Yano, Akifumi; and Momose, Tetsuo, 4,160,662, Cl. 75-24.000.
- Instron Corporation: See—  
DeNicola, Joseph F., 4,160,325, Cl. 33-148.00D.
- Intellectual Trade Cy S.A.: See—  
Heinen, Hans D., 4,160,421, Cl. 110-173.00R.
- Interbrev S.A.: See—  
Pizzoccaro, Luigi, 4,160,306, Cl. 24-205.00R.
- International Business Machines Corporation: See—  
Abolafia, Oscar R.; and Rasile, John, 4,160,691, Cl. 156-664.000.
- Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,160,991, Cl. 357-49.000.
- Dennard, Robert H.; and Rideout, Vincent L., 4,160,987, Cl. 357-41.000.
- Meyen, Robert H.; Puttlitz, Karl J.; Schink, Karl; and Wenskus, Herbert, 4,160,893, Cl. 219-85.0BA.
- International Harvester Company: See—  
Bexten, Eugen; Logue, Robert W.; and Wiebe, Ken J., 4,160,490, Cl. 180-133.000.
- Hawkins, Robert W.; Togami, Paul G.; and Drayer, T. Gary, 4,160,456, Cl. 130-27.00T.
- International Nickel Company, Inc.: See—  
Baldwin, Stanley L., 4,160,615, Cl. 405-259.000.
- International Paper Company: See—  
Nowacki, Ulrich G., 4,160,406, Cl. 93-36.300.
- Iog Industrie-Ofenbau GmbH: See—  
Wilkening, Hermann; and Loges, Hans-Joachim, 4,160,371, Cl. 72-147.000.
- Ishikawa, Fujio, to Toyo Denki Seizo Kabushiki Kaisha. Quadruple frequency converter. 4,160,925, Cl. 310-160.000.
- Ishikawa, Fujio; and Tsuda, Yukio, to Sony Corporation. High frequency wide band resonant circuit. 4,160,964, Cl. 334-15.000.
- Ishikawa, Hikaru: See—  
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
- Ishimaru, Wataru: See—  
Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, 4,160,392, Cl. 74-732.000.
- Israel Electro-Optical Industry Ltd.: See—  
Toor, Yair; Rouso, Haim; and Kopilavitz, Ben-Zion, 4,161,035, Cl. 364-900.000.
- Itek Corporation: See—  
Ebner, Peter R., 4,160,586, Cl. 354-5.000.
- Ito, Hiromi: See—  
Fujimori, Ryo; and Ito, Hiromi, 4,160,896, Cl. 219-216.000.
- Ito, Kenzo; and Abe, Yoshiharu, to Copyer Co., Ltd. Copying machine equipped with a flash type fixing apparatus. 4,160,595, Cl. 355-3.0FU.
- Ivakhnenko, Viktor V.: See—  
Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.
- Iwai, Chihiro: See—  
Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, 4,160,805, Cl. 422-180.000.
- Iwata, Tamotsu: See—  
Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, 4,160,670, Cl. 96-119.00R.
- Jac. Jacobsen A/S: See—  
Krogsrud, Jens C., 4,160,536, Cl. 248-280.100.
- Jackman, Anthony D., to Bettix Limited. Floats and method for making same. 4,160,381, Cl. 73-322.500.
- Jackson, David B.; and Sisson, Keith T., to Hollybank Engineering Company Limited. Connector for bolted joints. 4,160,609, Cl. 403-407.000.
- Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., to Southwest Research Institute. Ultrasonic inspection system including apparatus and method for tracking and recording the location of an inspection probe. 4,160,386, Cl. 73-625.000.
- Jackson, Richard R. Blood pressure measuring catheter. 4,160,448, Cl. 128-673.000.
- Jacobs, Jacqueline M.: See—  
United States of America, National Aeronautics and Space Administration; and Jacobs, Jacqueline M., 4,160,601, Cl. 356-404.000.
- Jagers, Alan J.: See—  
Hildon, Anthony M.; Manly, Thomas D.; and Jagers, Alan J., 4,160,778, Cl. 260-502.00R.
- Jain, Faquir C.; and Melehy, Mahmoud A. Heterojunction solar cell. 4,160,678, Cl. 136-89.05J.
- James, Rex L.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Weninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.
- Janssen Pharmaceutica, N.V.: See—  
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,160,841, Cl. 424-273.00R.
- Vandenberk, Jan; Kennis, Ludo E. J.; Van Der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,160,836, Cl. 424-267.000.
- Van Reet, Gustaaf; Heeres, Jan; and Wals, Lourens, 4,160,838, Cl. 424-269.000.
- Jaworski, Eugene: See—  
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,160,548, Cl. 273-1.00M.
- Jayakar, Kirshnakumar M.: See—  
Seader, Junior D.; and Jayakar, Kirshnakumar M., 4,160,720, Cl. 208-11.00R.
- Jennmar Corporation: See—  
Koval, Stephen F., 4,160,614, Cl. 405-259.000.
- Jensen, Brian J., to NFE International, Ltd. Sand core cleaning apparatus with double roller delivery of cleaning material. 4,160,650, Cl. 51-16.000.
- Jensen, Erik A. Bias setting apparatus for use with television receivers. 4,160,995, Cl. 358-29.000.
- Jepson, John W.: See—  
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.
- Jesinger, David W., to Plessey Handel und Investments AG. Signal re-generation apparatus. 4,160,957, Cl. 331-107.00A.
- Joannic, Jean V., to Botalam. Twisting device for a machine for binding packages with wire. 4,160,469, Cl. 140-115.000.
- Johannsen, Thoril J. Side-fold conveyor. 4,160,501, Cl. 198-632.000.
- Johns-Manville Corporation: See—  
Brooks, Ray G.; and Smith, Harvell M., 4,160,688, Cl. 156-574.000.
- Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Combined solenoid and timing system for SLR camera apparatus. 4,160,589, Cl. 354-86.000.
- Johnson, David M. Bipolar transistors having fixed gain characteristics. 4,160,986, Cl. 357-36.000.
- Johnson, Harold R. Hand operated jack for a multipurpose jig apparatus of the type including a length of pipe and a plurality of releasable, pipe-gripping tail stops. 4,160,539, Cl. 254-106.000.
- Johnson & Johnson: See—  
Sipos, Tibor, 4,160,821, Cl. 424-49.000.
- Johnston Brothers (Engineering) Limited: See—  
Hirst, Peter B.; and Duthie, Anthony J., 4,160,302, Cl. 15-340.000.
- Johnston, Roger L., to Simon-Krause, Inc. Control system for mobile self-propelled aerial lift. 4,160,492, Cl. 182-2.000.
- Jolly, William D.: See—  
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.
- Jones, Barry E.; and Smith, John A., to National Research Development Corporation. Transponders. 4,160,971, Cl. 340-152.00T.
- Jordan, Theodore M., to Westinghouse Electric Corp. Apparatus for treating a spinneret plate to be reused into the manufacture of synthetic fibers. 4,160,637, Cl. 425-225.000.
- Josef Wagner GmbH, Firma: See—  
Wagner, Josef, 4,160,525, Cl. 239-332.000.
- Joseph, Robert E., to United States of America, Commerce. Document reproduction illumination/exposure control system. 4,160,596, Cl. 355-68.000.
- Josis, Christian; and Hans, Andre, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie; and Siderurgiemaritime-Maritime Staalnijverheid. Waste water purification processes. 4,160,725, Cl. 210-21.000.
- Joslyn Mfg. and Supply Co.: See—  
Cunningham, Francis V., 4,161,012, Cl. 361-128.000.
- Journey, William K., to Preussag Aktiengesellschaft. Deep well pump. 4,160,623, Cl. 417-238.000.
- Jousson, Pierre J., to Les Produits Associates LPA SA. Flexible multi-conduit tube and its manufacture. 4,160,466, Cl. 138-115.000.
- Joyce, Thomas F.; and Holtey, Thomas O., to Honeywell Information Systems Inc. Private cache-to-CPU interface in a bus oriented data processing system. 4,161,024, Cl. 364-200.000.
- Junkermann, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for deodorizing liquid manure and removing harmful gases. 4,160,656, Cl. 71-21.000.
- Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: See—  
Artbauer, Jan, 4,160,870, Cl. 174-14.00R.
- Lambelet, Percy, 4,160,426, Cl. 118-323.000.
- Kabushiki Kaisha Kyoto Daiichi Kagaku: See—  
Furutani, Yoshikazu; and Kishimoto, Shinichi, 4,160,646, Cl. 23-230.00R.
- Kabushiki Kaisha Tokai Rika Denki Seisakusho: See—  
Hukuta, Masakazu; and Kobayashi, Hirotsugi, 4,160,511, Cl. 220-210.000.
- Kahn, Leonard R. Security system. 4,160,875, Cl. 179-1.50M.
- Kaiser Aluminum & Chemical Corporation: See—  
Andersen, John N.; and Bell, Norman, 4,160,809, Cl. 423-119.000.
- Kakie, Yoshiaki: See—  
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.
- Kakimoto, Toshio: See—  
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- Kallberg, Tommy K.; and Rangert, Bo, to Aktiebolaget Partner. Portable gas-motor-driven cutting implement. 4,160,321, Cl. 30-383.000.
- Kamin, Gerhard, to Robert Bosch GmbH. Television-based alarm system. 4,160,998, Cl. 358-105.000.
- Kamins, Theodore I.; and Fong, Godfrey T., to Hewlett-Packard Company. Photosensing arrays with improved spatial resolution. 4,160,985, Cl. 357-30.000.
- Kamp, Andries: See—  
Helle, Kees; and Kamp, Andries, 4,160,707, Cl. 204-37.00R.



- Kanazawa, Kenichi; and Takahashi, Nobuyuki, to Sony Corporation. Controllable rectifier circuit for a power supply. 4,161,022, Cl. 363-88.000.
- Kane, Jeffrey, to Ferranti Limited. Semiconductor devices and circuit arrangements including such devices. 4,160,990, Cl. 357-48.000.
- Kao Soap Co., Ltd.: See—  
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,160,823, Cl. 424-70.000.
- Karikh, Nikolai B.: See—  
Pechuk, Vasily I.; Pompeev, Vladimir M.; and Karikh, Nikolai B., 4,160,377, Cl. 73-141.00A.
- Kato, Hiroaki; and Hamana, Junji, to Canon Kabushiki Kaisha. Magnetic heads and fixing material with an additional filler of MoS<sub>2</sub>. 4,161,005, Cl. 360-129.000.
- Kaufmann, John H., to Global Coatings Limited. Roof coating composition and construction. 4,160,346, Cl. 52-96.000.
- Kaul, Martin: See—  
Opprecht, Paul; and Kaul, Martin, 4,160,892, Cl. 219-83.000.
- Kawai, Hisasi: See—  
Morino, Seiji; and Kawai, Hisasi, 4,160,429, Cl. 123-32.0EB.
- Kawai Musical Instrument Mfg. Co. Ltd.: See—  
Deutsch, Ralph, 4,160,399, Cl. 84-1.030.
- Kehle, Ralph O.: See—  
Turk, L. Jan; and Kehle, Ralph O., 4,160,481, Cl. 166-272.000.
- Keillor, Warren. Special effects device. 4,160,585, Cl. 352-87.000.
- Keller, Cecil T.: See—  
Britton, Fred G.; Von Bose, Robert J.; and Keller, Cecil T., 4,160,612, Cl. 405-227.000.
- Kelley, Carl S., to Phillips Petroleum Company. Controlling a regeneration of fluidized particles or catalysts. 4,160,743, Cl. 252-411.00R.
- Kelly, Ralph: See—  
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,160,819, Cl. 424-45.000.
- Kemp, Willard E., to ACF Industries, Incorporated. Fire-safe valve structure. 4,160,460, Cl. 137-72.000.
- Kennedy, Theodore R., to Inductotherm Corp. Stabilized reactor. 4,160,966, Cl. 336-155.000.
- Kennis, Ludo E. J.: See—  
Vandenberk, Jan; Kennis, Ludo E. J.; Van Der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,160,836, Cl. 424-267.000.
- Keogh, Raymond W.: See—  
Orr, Thomas S. C.; and Keogh, Raymond W., 4,160,844, Cl. 424-283.000.
- Kerr-McGee Corporation: See—  
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,160,566, Cl. 299-30.000.
- Keur, Robert I., to A. B. Dick Company. Anti-dispersion accumulator for ink jet printing system. 4,160,982, Cl. 346-75.000.
- Kievsky Institut Avtomatiki Imeni XXV Siezda KPSS: See—  
Pechuk, Vasily I.; Pompeev, Vladimir M.; and Karikh, Nikolai B., 4,160,377, Cl. 73-141.00A.
- Killerwatt Corporation: See—  
Miller, Jack V., 4,161,020, Cl. 362-216.000.
- Kindig, Alan L., to General Electric Company. Apparatus for positioning insulating members in magnetic core slots. 4,160,316, Cl. 29-734.000.
- King, Robert V.: See—  
Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., 4,160,906, Cl. 250-322.000.
- Kingsbury, Paul I., Jr.; and Seward, Thomas P., III, to Corning Glass Works. Process for making gradient photochromic glass articles. 4,160,655, Cl. 65-30.00R.
- Kinzing, Robert F.: See—  
Newell, Robert C.; and Kinzing, Robert F., 4,160,424, Cl. 112-275.000.
- Kinosz, Donald L.; and Allen, William R., to Aluminum Company of America. Electrolytic furnace lining. 4,160,715, Cl. 204-243.00R.
- Kirchmayr, Rudolf: See—  
Schmidt, Andreas; and Kirchmayr, Rudolf, 4,160,794, Cl. 260-927.00R.
- Kirkland, Joseph J.; and Yau, Wallace W., to Du Pont de Nemours, E. I., and Company. Bimodal chromatographic resolving zone. 4,160,728, Cl. 210-31.00C.
- Kirkpatrick, Joel L., to Gulf Oil Corporation. Carbamyltriazole insecticides. 4,160,839, Cl. 424-269.000.
- Kirsch, Howard C., to Bell Telephone Laboratories, Incorporated. Current control circuit for light emitting diode. 4,160,934, Cl. 315-307.000.
- Kiser, Dennis D.: See—  
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,160,443, Cl. 126-270.000.
- Kishimoto, Shinichi: See—  
Furutani, Yoshikazu; and Kishimoto, Shinichi, 4,160,646, Cl. 23-230.00R.
- Kleimann, Helmut: See—  
Lienert, Hans-Jürgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.
- Klimashko, Vladimir V.: See—  
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.
- Knauer, Kuno: See—  
Tuscher, Otto; Butter, Karl; and Knauer, Kuno, 4,160,709, Cl. 204-49.000.
- Knight, Kenneth R. Foldable hand baggage. 4,160,496, Cl. 190-43.000.
- Knupp, Dwight A., to Chrysler Corporation. Composite fluid flowmeter with slotted arcuate axial exhaust. 4,160,379, Cl. 73-229.000.
- Kobayashi, Hirotosugi: See—  
Hukuta, Masakazu; and Kobayashi, Hirotosugi, 4,160,511, Cl. 220-210.000.
- Kobayashi, Yoshio: See—  
Maruhashi, Shigeaki; and Kobayashi, Yoshio, 4,160,664, Cl. 75-49.000.
- Kobler, Ulrich; and Tamm, Horst, to Siemens Aktiengesellschaft. Polarized miniature relay. 4,160,965, Cl. 335-79.000.
- Kochs Adler AG: See—  
Scholl, Hans; and Tiemann, Helmut, 4,160,423, Cl. 112-121.120.
- Kogure, Hiroshi: See—  
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,160,431, Cl. 123-75.00B.
- Kokin, Vilyam N.: See—  
Nazarian, Artashes R.; Kremlev, Vyacheslav Y.; Kokin, Vilyam N.; and Manzhala, Nikolai M., 4,160,918, Cl. 307-205.000.
- Kolossow, Klaus-Dieter, to Hermann Berstorff Maschinbau GmbH. Apparatus for forming sheets of foamed synthetic plastics material. 4,160,638, Cl. 425-302.100.
- Kondo, Kazuo: See—  
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
- Kondo, Yoshikazu: See—  
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
- Koo, Ronald: See—  
Thorington, Luke; Walsh, Peter; Koo, Ronald; and Thoutret, Wolfgang, 4,160,929, Cl. 313-112.000.
- Kopecki, Ronald: See—  
Beske, Kermit; and Kopecki, Ronald, 4,160,873, Cl. 178-58.00R.
- Kopilavitz, Ben-Zion: See—  
Toor, Yair; Rouso, Haim; and Kopilavitz, Ben-Zion, 4,161,035, Cl. 364-900.000.
- Koppl, Franz: See—  
Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, 4,160,797, Cl. 264-81.000.
- Koski, William E.: See—  
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,820, Cl. 424-48.000.
- Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V. Pneumatic impact mechanism. 4,160,486, Cl. 173-135.000.
- Kosyak, Anatoly F.: See—  
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.
- Kotzur, Frank W.; and Zajac, Ronald E., to Windings, Inc. Container with octagonal insert and corner payout. 4,160,533, Cl. 242-137.100.
- Kovacs, Andrew J. Method and apparatus for removal of pollutants from waste water. 4,160,723, Cl. 210-7.000.
- Koval, Stephen F., to Jennmar Corporation. Expansion shell assembly and method for combining resin bonding and mechanical anchoring of a bolt in a rock formation. 4,160,614, Cl. 405-259.000.
- Kovalevsky, Evgeny S.: See—  
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.
- Kovatchev, Stephan: See—  
Eibl, Hansjörg; Diembeck, Walter; and Kovatchev, Stephan, 4,160,773, Cl. 260-403.000.
- Kraft, Paul; and Silberberg, Joseph, to Stauffer Chemical Company. Fire retardant blend of interpolymers composition, chlorinated vinyl chloride polymer and vinyl chloride polymer. 4,160,793, Cl. 525-230.000.
- Kramlinger, Philip J.: See—  
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- Kratos Limited: See—  
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- Kreienbuehl, Claude: See—  
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- Krogsrud, Jens C., to Jac. Jacobsen A/S. Counterbalanced arm. 4,160,536, Cl. 248-280.100.
- Kromer, Karl: See—  
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- Kubota, Ltd.: See—  
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- Kuether, Christian L.; and Kuether, Edith L. Bath chair. 4,160,292, Cl. 4-146.000.
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- Kugler, Jindrich: See—  
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- Kunze, Dieter; Leonhardt, Ernst; and Noack, Christian, to VEB Kombinat Fortschritt Landmaschinen. Engine cooling system for an agricultural vehicle. 4,160,487, Cl. 180-68.00R.
- Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., to Olin Corporation. In situ reduction of electrode overvoltage. 4,160,704, Cl. 204-32.00R.
- Kupka, Rudolph J. Ski scooter. 4,160,552, Cl. 280-21.00R.
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- Kuroda, Osamu: See—  
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- Kuzmin, Sergei V.: See—  
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- Kuznetsov, Andrei L.: See—  
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- Kyle, Gordon L. Convertible chair. 4,160,564, Cl. 297-131.000.
- Kyushu Refractories Co., Ltd.: See—  
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- Lacroix, Serge: See—  
Navarro, Gerard; Maillard, Jean-Pierre; and Lacroix, Serge, 4,160,717, Cl. 204-279.000.
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- Lade Metall A/S: See—  
Hveding, Arne, 4,160,611, Cl. 405-2.000.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—  
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McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,160,566, Cl. 299-30.000.
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- Larson, Ivar W.: See—  
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- Laughton, Richard V., to Ontario Research Foundation. Waste water treatment. 4,160,724, Cl. 210-7.000.
- Lavigne, Joe B., to Chevron Research Company. Lactones. 4,160,770, Cl. 260-343.30P.
- Law, James T., to Ferranti Limited. Heater for beating fluid in a body cavity. 4,160,455, Cl. 128-400.000.
- Lawson, William E.: See—  
Harken, Peter O.; and Lawson, William E., 4,160,541, Cl. 254-192.000.
- Lechner, Gunther: See—  
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- Lee, Thomas B. K.: See—  
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Davis, Frederick B., 3rd; and Ross, Charles W., 4,161,028, Cl. 364-492.000.
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Higgins, Larry, 4,160,544, Cl. 267-166.000.
- Le Noane, Georges E.; and Mathern, Andre M. Device for terminating the fibers of an optical fiber ribbon with connectors. 4,160,580, Cl. 350-96.210.
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- Letter, Eugene C.: See—  
Dey, Thomas W.; Howe, James D.; and Letter, Eugene C., 4,161,014, Cl. 362-263.000.
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- Levett, Albert M. Plant protection device. 4,160,340, Cl. 47-27.000.
- Levy, Richard C.: See—  
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- Lewis, Robert A.; and Nonnen, Lewis R., to Chevron Research Company. Fuel compositions containing deposit control additives. 4,160,648, Cl. 44-63.000.
- Lienert, Hans-Jürgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, to Bayer Aktiengesellschaft. Process for the production of plastics/metal composites. 4,160,851, Cl. 427-379.000.
- Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., to Mo och Domsjö Aktiebolag. Process for the bleaching of cellulose pulp. 4,160,693, Cl. 162-24.000.
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- Lindgren, Mats, to Fiber Mechanics AB. Fibre-reinforced rotor. 4,160,521, Cl. 233-27.000.
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Lindsey, Keith E.; and Bozeman, Hoyt W., Jr., 4,160,540, Cl. 254-134.3PA.
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Schneider, Gerhard; Riedl, Werner; and Lippold, Hans-Martin, 4,160,747, Cl. 252-506.000.
- Lirones, Nick G., to Howmet Turbine Components Corporation. Melting furnace constructions. 4,160,796, Cl. 264-60.000.
- Liton Industrial Products, Inc.: See—  
Mann, Stanley L.; and Rettig, Charles E., 4,161,010, Cl. 361-79.000.
- Liton Systems, Inc.: See—  
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- Locey, Mark M.; and Gottermeier, William F., to Eastman Kodak Company. Maintaining planarity in polyester film during uniform temperature heat relaxation. 4,160,799, Cl. 264-342.00R.
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Wilkening, Hermann; and Loges, Hans-Joachim, 4,160,371, Cl. 72-147.000.
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Blakeslee, Thomas R., 4,160,488, Cl. 180-168.000.
- Logsdon, Duane D., to Logsdon Foundation. The Roof flashing structure. 4,160,347, Cl. 52-199.000.
- Logsdon Foundation, The: See—  
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- Logue, Robert W.: See—  
Bexten, Eugen; Logue, Robert W.; and Wiebe, Ken J., 4,160,490, Cl. 180-133.000.
- Lomik, Alexander: See—  
Farnam, Robert G.; and Lomik, Alexander, 4,160,561, Cl. 293-1.000.
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- Lorenz, Otto, to Bayer Aktiengesellschaft. Process for the production of polyamide-polyureas and dispersions thereof in water. 4,160,753, Cl. 260-29.21N.
- Loudas, Basil L., to Minnesota Mining and Manufacturing Company. Fluorochemical compound useful for textile treatment. 4,160,777, Cl. 260-456.00F.
- LRS Research Limited: See—  
Taylor, Lauren P.; and Petroski, Alex, 4,160,734, Cl. 210-96.100.



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Beech, Keith J. W., 4,160,967, Cl. 336-209.000.  
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Hallstrom, Curtis H.; Toubia, Ali R.; Glass, Brian E.; Luck, John V.; and Daravinas, George V., 4,160,850, Cl. 426-601.000.  
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Luke, Douglas V., to Smiths Industries Limited. Pressure-responsive apparatus. 4,160,600, Cl. 356-352.000.  
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Lundberg, Robert D.: See—  
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Lutz, Michael A.: See—  
Harvey, Robin J.; and Lutz, Michael A., 4,161,009, Cl. 361-56.000.  
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Lynch, Patrick J.: See—  
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Lyons, Michael R. J.: See—  
Brittain, Philip I.; and Lyons, Michael R. J., 4,160,375, Cl. 73-104.000.  
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Christesen, Paul J.; and Sanders, Geoffrey R., 4,160,668, Cl. 96-1.800.  
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Sullivan, Ronald L.; and Cosentino, Ronald R., 4,160,879, Cl. 179-90.0A.  
Mach, Joseph F.: See—  
Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, 4,160,654, Cl. 65-30.00E.  
MacKay, Kenneth D.: See—  
Virnig, Michael J.; and MacKay, Kenneth D., 4,160,807, Cl. 423-24.000.  
Maeda, Hidetoshi; and Ohba, Toshihiro, to Sharp Kabushiki Kaisha. Touch sensitive electronic switching circuit for electronic wrist-watches. 4,160,923, Cl. 307-308.000.  
Maeda, Keisuke: See—  
Inagaki, Tetsuhiko; and Maeda, Keisuke, 4,160,983, Cl. 354-234.000.  
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Maier, Ludwig, to Ciba-Geigy Corporation. Process for the production of methylaminomethylphosphonic acid and its salts. 4,160,779, Cl. 260-502.500.  
Maillard, Jean-Pierre: See—  
Navaro, Gerard; Maillard, Jean-Pierre; and Lacroix, Serge, 4,160,717, Cl. 204-279.000.  
Maine, Stephen G. T., to General Instrument Corporation. R.F. modulator for use in T.V. games. 4,160,959, Cl. 332-31.00T.  
Mais, James W.; Bianchi, David L.; and Barker, Theodore L., to A-T-O Inc. Front flap opener. 4,160,351, Cl. 53-76.000.  
Makino, Yasuhiro: See—  
Watanabe, Akira; Sugimoto, Tetsuya; and Makino, Yasuhiro, 4,160,744, Cl. 252-440.000.  
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Makowski, Henry S.: See—  
Bock, Jan; Lundberg, Robert D.; and Makowski, Henry S., 4,160,751, Cl. 260-23.50A.  
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Rashkin, Jay A., 4,160,746, Cl. 252-468.000.  
Malone, Fermer A., Jr.: See—  
Malone, Fermer A., Sr.; and Malone, Fermer A., Jr., 4,160,528, Cl. 242-56.00R.  
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Manly, Thomas D.: See—  
Hildon, Anthony M.; Manly, Thomas D.; and Jagers, Alan J., 4,160,778, Cl. 260-502.00R.  
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Manns, William G., to Texas Instruments Incorporated. Metal-dielectric electron beam scanning stack. 4,160,310, Cl. 29-25.140.  
Manzha, Nikolai M.: See—  
Nazarian, Artashes R.; Kremlev, Vyacheslav Y.; Kokin, Vilyam N.; and Manzha, Nikolai M., 4,160,918, Cl. 307-205.000.

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Marchner, Jan; and Sundberg, Yngve, to ASEA Aktiebolag. Apparatus and method for melting ferrous pellets. 4,160,868, Cl. 13-11.000.  
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Markusch, Peter: See—  
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.  
Marmon Company: See—  
Schrecongost, Ray B., 4,160,400, Cl. 84-1.130.  
Marquess, Richard D., to Syston-Donner Corporation. Stable preload shock mounted bearing assembly. 4,160,568, Cl. 308-159.000.  
Marroquin, Emilio R., to Litton Systems, Inc. Hammer for forming an undercut fastener driving slot. 4,160,300, Cl. 10-7.000.  
Marsh, Paul G., to Black Clawson Fibreclaim, Inc. Recovery of plastic from municipal waste. 4,160,722, Cl. 209-4.000.  
Martens, Alan; Radkevich, Thomas J.; and Smith, Jack R., to Westinghouse Electric Corp. Gas turbine and combined cycle power plant having reduced emission of nitrogen oxide and improved coolant injection flow control system therefor. 4,160,362, Cl. 60-39.18B.  
Martin, Robert E.; and Hagan, Ernest P., Jr., to Texas Eastern Engineering, Ltd. Method and apparatus for handling the fluids in a two-phase flow pipeline system. 4,160,652, Cl. 55-46.000.  
Martin, Rodger L.; and Nadwodny, Donald P. Racquet grip fitter system. 4,160,327, Cl. 33-174.00D.  
Martinson, Lloyd W., to RCA Corporation. Correlator/convolver using a second shift register to rotate sample values. 4,161,033, Cl. 364-728.000.  
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Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yugi, 4,160,711, Cl. 204-152.000.  
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Marvin Glass & Associates: See—  
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,160,548, Cl. 273-1.00M.  
Mason, Charles D.; and Flood, Paul W., to Allied Chemical Corporation. High impact nylon molding compositions. 4,160,790, Cl. 525-179.000.  
Mason, Marvin S.: See—  
Bojanek, Robert J.; and Mason, Marvin S., 4,160,876, Cl. 179-15.0AT.  
Massachusetts Institute of Technology: See—  
Berlin, Edwin P., Jr., 4,160,973, Cl. 340-718.000.  
Grodzinsky, Alan J.; and Shoenfeld, Norman A., 4,161,013, Cl. 361-433.000.  
Mathern, Andre M.: See—  
Le Noane, Georges E.; and Mathern, Andre M., 4,160,580, Cl. 350-96.210.  
Mathews, Bernard C. Drive for mower. 4,160,356, Cl. 56-192.000.  
Matson Navigation Company: See—  
Montgomery, Murray M.; Gilger, William F.; and Steiner, William W., 4,160,617, Cl. 414-139.000.  
Matsudaira, Nobufumi: See—  
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.  
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Matsuoka, Saburo: See—  
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,160,431, Cl. 123-75.00B.  
Matsuura, Shigeo; Nagashima, Toshio; and Shinagawa, Mitsuha, to Hitachi, Ltd. Self-oscillation mixer circuits. 4,160,953, Cl. 325-440.000.  
Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, to Hitachi, Ltd.; and Hitachi Plant Engineering and Construction Co., Ltd. Process for electro-dialysis. 4,160,713, Cl. 204-180.00P.  
Matsuzaki, Kazunari: See—  
Suzuki, Toyotoshi; and Matsuzaki, Kazunari, 4,160,591, Cl. 354-235.000.  
Matzner, Peter; and Schulze, Ehrhart, to Felix Stiegler Maschinenfabrik. Apparatus for the perforation of tracks of goods. 4,160,396, Cl. 83-100.000.  
Maus, Otfried: See—  
Guyot, Volker; Maus, Otfried; and Muller, Martin, 4,160,384, Cl. 73-462.000.  
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Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephan, 4,160,773, Cl. 260-403.000.

Maxson Corporation, The: See—  
Hackbarth, Richard W.; Puarica, Douglas A.; and Kramlinger, Philip J., 4,160,420, Cl. 105-367.000.  
McCabe, John M.; and Yoerger, William E., to Eastman Kodak Company. Polymeric chemical sensitizers for organic photoconductive compositions. 4,160,666, Cl. 96-1.0PC.  
McCambridge, Joseph. Fluid-dynamic emergency brakes. 4,160,494, Cl. 188-270.000.  
McCarthy, Shaun L.: See—  
Lambe, John J.; and McCarthy, Shaun L., 4,160,931, Cl. 313-498.000.  
McCoy, Bryan: See—  
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan, 4,160,339, Cl. 46-232.000.  
McCrea, Donald H.: See—  
Benson, Homer E.; and McCrea, Donald H., 4,160,810, Cl. 423-220.000.  
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Hidden, William P.; and McCullough, John E., 4,160,629, Cl. 418-55.000.  
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., to American Hoechst Corporation. 4-Benzoyloxy-3-(chlorocarbonyl)-phenylacetyl chloride. 4,160,781, Cl. 260-544.00D.  
McFayden, Dennis G., to California Instruments Corporation. Auto-zeroed ohmmeter. 4,160,949, Cl. 324-62.000.  
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McGregor, Adrienne R.: See—  
Smith, David S.; and McGregor, Adrienne R., 4,160,818, Cl. 424-8.000.  
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Ponticello, Ignazio S.; and McIntire, John M., 4,160,864, Cl. 560-2.000.  
McKechnie, John C.; and Berke, Herbert, to United States of America, Navy. Electro-optical radio system. 4,160,903, Cl. 250-199.000.  
McLean, Douglas H., to Ford Motor Company. Tractor with draft load control system. 4,160,485, Cl. 172-9.000.  
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Melcher Manufacturing Co., Inc.: See—  
Hilbert, Tom, 4,160,299, Cl. 9-347.000.  
Melehy, Mahmoud A.: See—  
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Mendrala, James A., to Sonex International Corp. Luminance key amplifier. 4,160,994, Cl. 358-22.000.  
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Merrell, Richard G., to Zenith Radio Corporation. VIR line recognition system. 4,160,993, Cl. 358-21.00V.  
Merz, Walter, to Swiss Aluminium Ltd. Pneumatic unloading device. 4,160,567, Cl. 406-98.000.  
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Tuscher, Otto; Butter, Karl; and Knauer, Kuno, 4,160,709, Cl. 204-49.000.  
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Miesel, John L., to Eli Lilly and Company. 1-(Substituted benzoyl)-3-(substituted pyrazinyl)ureas. 4,160,834, Cl. 424-250.000.  
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Heiniger, Wilfried; Kreienbuehl, Claude; and Millan, Manuel, 4,160,587, Cl. 354-25.000.  
Miller, Clarence L., Jr., to Allegheny Ludlum Industries, Inc. Silicon steel and processing therefore. 4,160,681, Cl. 148-111.000.  
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Frentress, Zane, 4,160,359, Cl. 57-58.890.  
Milton, A. Fenner, to United States of America, Navy. Tapered velocity electro-optical waveguide switch. 4,160,579, Cl. 350-96.140.  
Mims, James H.; and Hopwood, Francis W., to Westinghouse Electric Corp. Sampling linearizer utilizing a phase shifter. 4,160,958, Cl. 331-178.000.

Minagawa, Motonobu; and Sekiguchi, Tetsuo, to Argus Chemical Corporation. Halogen-containing resin stabilizer comprising an alkoxycarbonylalkylenetin sulfide. 4,160,762, Cl. 260-45.75S.  
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Mine, Kiyomitsu: See—  
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,160,669, Cl. 96-27.00E.  
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Choe, Eui W.; Tan, Marshall; and Mininni, Robert M., 4,160,755, Cl. 260-29.60H.  
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Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., 4,160,348, Cl. 52-202.000.  
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Mitchell, James; and Pye, Thomas N., to Henry Balfour & Company Limited. Wiped film evaporators. 4,160,692, Cl. 159-6.00W.  
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Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., 4,160,693, Cl. 162-24.000.  
Mobil Oil Corporation: See—  
Young, Lewis B., 4,160,788, Cl. 585-475.000.  
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Monks, Harry, to Coal Industry (Patents) Limited. Auxiliary drive mechanism. 4,160,391, Cl. 74-661.000.  
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Monroe, Tex K., to GTE Sylvania Incorporated. Fast-start vertical current feedback circuit. 4,160,936, Cl. 315-388.000.  
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Tandon, Sirjang L.; and Moon, John P., 4,160,315, Cl. 29-603.000.  
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Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.  
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- Morrison, John C.: See—  
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- Moser, Robert E.; Powers, Larry J.; and Arlyan, Zaven S., to Diamond Shamrock Corporation. Anti-inflammatory 3-benzofuranyl imidazothiazole, 4,160,768, Cl. 260-306.70T.
- Mostmans, Joseph H.: See—  
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- Motorola, Inc.: See—  
Besek, Kermit; and Kopecki, Ronald, 4,160,873, Cl. 178-58.00R.  
Bory, Richard A.; and Hogg, Alexander F., 4,160,961, Cl. 333-27.000.  
Chard, Gerald L. P.; Haupt, Joachim; and Zuber, Werner, 4,160,890, Cl. 200-308.000.  
Conroy, Peter J., 4,160,976, Cl. 343-700.0MS.
- Moulds, Clinton W., III: See—  
Butler, Eric W.; and Moulds, Clinton W., III, 4,161,041, Cl. 365-244.000.
- Muecke, Thomas W.: See—  
Ernstosser, Steven R.; Muecke, Thomas W.; and Cooke, Claude E., Jr., 4,160,482, Cl. 166-284.000.
- Muller, Hanns P.: See—  
Schapel, Dietmar; Wagner, Kuno; Muller, Hanns P.; and Dahm, Manfred, 4,160,754, Cl. 260-29.40R.
- Muller, Hans, to Behringwerke Aktiengesellschaft. Immunoglobulin having a reduced complement fixation, a process for its preparation and agents containing this immunoglobulin, 4,160,763, Cl. 260-112.00B.
- Muller, Martin: See—  
Guyot, Volker; Maus, Otfried; and Muller, Martin, 4,160,384, Cl. 73-462.000.
- Mullins, Wayne L. Combination lift turn-over/push-off block transfer apparatus, 4,160,507, Cl. 414-749.000.
- Mulot, Georges C., to Cri-Dan. Thread-cutting machine, 4,160,395, Cl. 82-5.000.
- Mulvey, Gerard E. Lighting fixture, 4,161,019, Cl. 362-147.000.
- Munster, Erhard: See—  
Weber, Adolf; Munster, Erhard; and Buckley, Dieter, 4,160,411, Cl. 102-7.000.
- Murray, James G. Dipole antenna with parabolic reflector, 4,160,980, Cl. 343-795.000.
- Murrell, Lawrence L.; and Yates, David J. C., to Exxon Research & Engineering Co. Method of preparing highly active nickel catalysts and catalysts prepared by said method, 4,160,745, Cl. 252-466.00J.
- Muskogee Environmental Conservation Co.: See—  
Scriminger, William F.; and Ricketts, William H., 4,160,632, Cl. 425-62.000.
- Nadwodny, Donald P.: See—  
Martin, Rodger L.; and Nadwodny, Donald P., 4,160,327, Cl. 33-174.00D.
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- Nagashima, Toshio: See—  
Matsura, Shigeo; Nagashima, Toshio; and Shinagawa, Mitsuhsa, 4,160,953, Cl. 325-440.000.
- Nakajima, Tomio: See—  
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- Nakayama, Toshihiko; and Takei, Kenji, to Citizen Watch Company Limited. Case assembly for piezoelectric resonator, 4,160,928, Cl. 310-353.000.
- Nalick, David L. Dome structure and method of construction, 4,160,345, Cl. 52-81.000.
- Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., to Codman & Shurtleff, Inc. Canister and removable battery pack unit therefor, 4,160,857, Cl. 429-97.000.
- Nasica, Jean R. L.: See—  
Tortoriot, Roland M.; and Nasica, Jean R. L., 4,160,852, Cl. 428-192.000.
- National Research Development Corporation: See—  
Drewett, Robert J., 4,160,979, Cl. 343-788.000.  
Jones, Barry E.; and Smith, John A., 4,160,971, Cl. 340-152.00T.  
Strawson, Kenneth H.; and Spencer, Gerald, 4,160,633, Cl. 425-85.000.
- National Steel Corporation: See—  
Bird, Richard A.; and Austin, Lowell W., 4,160,703, Cl. 204-15.000.
- Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, to Hitachi, Ltd. Buffer-type gas-blast circuit breaker, 4,160,888, Cl. 200-148.00A.
- Navaro, Gerard; Maillard, Jean-Pierre; and Lacroix, Serge, to Regie Nationale des Usines Renault. Electric contact post for electrochemical machine, 4,160,717, Cl. 204-279.000.
- Nazarian, Artashes R.; Kremlev, Vyacheslav Y.; Kokin, Vilyam N.; and Manzha, Nikolai M. Integrated logic circuit, 4,160,918, Cl. 307-205.000.
- NCR Corporation: See—  
Adelberger, Donald L.; and Pangos, William, 4,160,572, Cl. 339-14.00P.
- Ned Strongin Associates, Inc.: See—  
Lyons, Paul; Zant, Fred; and Resnick, Charles, 4,160,338, Cl. 46-44.000.
- Neff, Elias, to Antioch Bookplate Company. Packaging method and apparatus, 4,160,352, Cl. 53-137.000.
- Neff, Joseph A.; and English, William D., to TRW Inc. Production of tetrafluorammonium bifluoride and tetrafluorammonium tetrafluoroborate, 4,160,811, Cl. 423-276.000.
- Nelson, Duane A. Marine engine cooling water filter cleaning system, 4,160,733, Cl. 210-85.000.
- Nelson, Robert C., to New River Manufacturing Company, Inc. Horizontally articulated shuttle car, 4,160,619, Cl. 414-501.000.
- Neubauer, August E., to Pitney Bowes Deutschland GmbH. Ink ribbon box, 4,160,605, Cl. 400-208.000.
- New River Manufacturing Company, Inc.: See—  
Nelson, Robert C., 4,160,619, Cl. 414-501.000.
- Newell, Robert C.; and Kinning, Robert F., to Dan River Incorporated. Stitch counter for a sewing machine, 4,160,424, Cl. 112-275.000.
- Newton, Paul P.; and Olsen, Robert A., to Warner Electric Brake & Clutch Company. Electromagnetic coupling, 4,160,498, Cl. 192-84.00C.
- NFE International, Ltd.: See—  
Jensen, Brian J., 4,160,650, Cl. 51-16.000.
- NGK Spark Plug Co., Ltd.: See—  
Makino, Yoichi, 4,160,897, Cl. 219-543.000.
- Nguyen, Xuan T., to Domtar Inc. Process for mercury removal, 4,160,730, Cl. 210-48.000.
- Nicholson, Richard R.: See—  
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- Nickels, Joseph J., Jr., to Van-Packer Co. Reinforce tee section for chimney, 4,160,559, Cl. 285-156.000.
- Nicolson, Alexander M., to Sperry Rand Corporation. Electromagnetic wave telemetry system for transmitting downhole parameters to locations thereabove, 4,160,970, Cl. 340-18.0LD.
- Niederellmann, Georg; Quiring, Bernd; and Thoma, Wilhelm, to Bayer Aktiengesellschaft. Method of reverse coating textile sheets with polyurethane, 4,160,686, Cl. 156-331.000.
- Nielsen, Ole: See—  
Andersen, Jorgen; and Nielsen, Ole, 4,160,714, Cl. 204-195.00R.
- Niemann, James E., to American Standard Inc. Drain valve assembly, 4,160,293, Cl. 4-295.000.
- Nigra, Jacques; and Vanthuyne, Guy, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Switchable high voltage generator for penetration-type color CRT, 4,160,996, Cl. 358-73.000.
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Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, Nikolaas, 4,160,647, Cl. 422-106.000.
- Nippon Cable System Inc.: See—  
Baba, Masanao, 4,160,499, Cl. 192-0.098.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Yamada, Shigeru; and Aoki, Eiichiro, 4,160,404, Cl. 84-1.260.
- Nippon Kowatsu Electric Co.: See—  
Fujita, Toshio; and Teratani, Hironaga, 4,160,673, Cl. 106-45.000.
- Nippon Soken, Inc.: See—  
Morino, Seiji; and Kawai, Hisasi, 4,160,429, Cl. 123-32.0EB.
- Nishida, Takao; and Tonoike, Kiyoshi, to Amchem Products, Inc. Use of metal compound in an autodeposition coating composition, 4,160,756, Cl. 260-29.60M.
- Nishimura, Noriyuki: See—  
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibata, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.
- Nishiumi, Hideo: See—  
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.
- Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yugi, to Marubishi Yuka Kogyo Kabushiki Kaisha. Assembly of electrodes, 4,160,711, Cl. 204-152.000.
- Nishizawa Shoji Ltd.: See—  
Kuroda, Minoru, 4,160,685, Cl. 156-219.000.
- Nissan Motor Company, Limited: See—  
Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, 4,160,392, Cl. 74-732.000.
- Tsutsumi, Saburo, 4,160,432, Cl. 123-75.00B.
- Nissen, Ole J.: See—  
Dyhr, Jan; and Nissen, Ole J., 4,160,625, Cl. 417-363.000.
- Nisshin Steel Co. Ltd.: See—  
Maruhashi, Shigeaki; and Kobayashi, Yoshio, 4,160,664, Cl. 75-49.000.
- Nixon, Jeddy D.; and Fox, Fred K., to Engineering Enterprises, Inc. Seal assembly, 4,160,551, Cl. 277-124.000.

- Noack, Christian: See—  
Kunze, Dieter; Leonhardt, Ernst; and Noack, Christian, 4,160,487, Cl. 180-68.00R.
- Noack, Rolf; and Kromer, Karl, to Veb Pentacon Dresden Kamera und Kinowerke. Cameras, 4,160,592, Cl. 354-246.000.
- Nomura, Hiroaki: See—  
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- Nordblad, Sven S.; and Svensson, Karl-Erik, to Telefonaktiebolaget L M Ericsson. Apparatus for replacement of a cable drum or similar object on a shaft with another cable drum, 4,160,527, Cl. 242-47.000.
- Northern Telecom Limited: See—  
Zimmermann, Detlef; Demircioglu, Sayman F.; and Kugler, Jindrich, 4,161,008, Cl. 361-56.000.
- Northwestern University: See—  
Carr, Stephen H.; and Stupp, Samuel I., 4,160,760, Cl. 260-42.210.
- Norwood Marking & Equipment Co.: See—  
Fichter, Robert, 4,160,410, Cl. 101-41.000.
- Novy, Russell F.; Scott, Gerald L.; and Zurluh, Thomas O., to Sola Basic Industries, Inc. Vacuum carburizing, 4,160,680, Cl. 148-16.500.
- Nowacki, Ulrich G., to International Paper Company. Method and apparatus for erecting a carton, 4,160,406, Cl. 93-36.300.
- Nowak, Leonard G.: See—  
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- Nu Watt, Inc.: See—  
Smith, Roland L., 4,160,624, Cl. 417-330.000.
- Nyssen, James. Method and apparatus for making multi-layer spiral pipe, 4,160,312, Cl. 29-429.000.
- Oberg, Hans-Jurgen: See—  
Stockel, Dieter; and Oberg, Hans-Jurgen, 4,160,855, Cl. 428-621.000.
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Maeda, Hidetoshi; and Ohba, Toshihiro, 4,160,923, Cl. 307-308.000.
- Ohlbach, Ralph C. Shipping container for printed circuit boards and other items, 4,160,503, Cl. 206-328.000.
- Ohtsuka, Kunio: See—  
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- Oil States Rubber Co.: See—  
Britton, Fred G.; Von Bose, Robert J.; and Keller, Cecil T., 4,160,612, Cl. 405-227.000.
- Okolelova, Klavdia A.: See—  
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zassetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
- Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including boolean flag variable means, 4,161,031, Cl. 364-709.000.
- Olin Corporation: See—  
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,160,704, Cl. 204-32.00R.
- Pryor, Michael J.; and Tyler, Derek E., 4,160,474, Cl. 164-73.000.
- Scardera, Michael; and Gavin, David F., 4,160,776, Cl. 260-448.80R.
- Ollinger, Max, to Siemens Aktiengesellschaft. Process for signaling an interruption in the state of readiness for the reception in data terminal devices in which data are exchanged, 4,160,874, Cl. 178-69.00G.
- Olsen, Robert A.: See—  
Newton, Paul P.; and Olsen, Robert A., 4,160,498, Cl. 192-84.00C.
- Olson, Donel R., to Olson Engineering Inc. Modulating air control valve, 4,160,433, Cl. 123-124.00R.
- Olson Engineering Inc.: See—  
Olson, Donel R., 4,160,433, Cl. 123-124.00R.
- Olympus Optical Co., Ltd.: See—  
Fujimori, Ryo; and Ito, Hiromi, 4,160,896, Cl. 219-216.000.
- Osana, Akira, 4,161,006, Cl. 360-137.000.
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- Onizaki, Yasushi: See—  
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
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- Orr, Thomas S. C.; and Keogh, Raymond W., to Fisons Limited. Method, 4,160,844, Cl. 424-283.000.
- Orth, George O., Jr. Process of improving the freeze-thaw stability of fish bait, 4,160,847, Cl. 426-1.000.
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Calhoun, Michael B.; and Fredd, John V., 4,160,478, Cl. 166-55.100.
- Otzen, Karl G., to Safety-Kleen Corp. Immersion cleaner, 4,160,603, Cl. 366-219.000.
- Owens-Corning Fiberglass Corporation: See—  
Carvalho, Robert L.; Canfield, Sheldon A.; and Steinbaugh, Gary, 4,160,360, Cl. 57-81.000.
- Owens-Illinois, Inc.: See—  
Rapp, James E., 4,160,672, Cl. 106-39.600.
- Oxy Metal Industries Corporation: See—  
Hacias, Kenneth J., 4,160,370, Cl. 72-42.000.
- Pack, Klaus: See—  
Hutzenlaub, Armin S. P.; and Pack, Klaus, 4,160,529, Cl. 242-56.600.
- Paioni, Romeo, to Ciba-Geigy Corporation. Derivatives of perhydroaza-heterocycles, 4,160,837, Cl. 424-267.000.
- Pangos, William: See—  
Adelberger, Donald L.; and Pangos, William, 4,160,572, Cl. 339-14.00P.
- Pannekeet, Wilhelmus; and Smakman, Robert, to Akzona Incorporated. Process for purifying an aqueous solution, 4,160,675, Cl. 127-46.00A.
- Papadideris, Stamos I., to Caterpillar Tractor Co. Engine stop-start electrical circuit, 4,160,916, Cl. 307-10.00R.
- Park, Jack H.: See—  
Schievelbein, Vernon H.; and Park, Jack H., 4,160,480, Cl. 166-269.000.
- Paul, Cyrus: See—  
Waldrop, Walter I.; Waldrop, Roy; and Paul, Cyrus, 4,160,676, Cl. 134-6.000.
- Pearson, John S. Combined key holder and security device, 4,160,369, Cl. 70-456.00R.
- Pechuk, Vasily I.; Pompeev, Vladimir M.; and Karikh, Nikolai B., to Kievsky Institut Avtomatiki Imeni XXV Siezda KPSS. Load cell, 4,160,377, Cl. 73-141.00A.
- Pegel, Karl H., to Roecar Holdings (Netherlands Antilles) N.V. Active plant extracts of hypoxidaceae and their use, 4,160,860, Cl. 536-5.000.
- Pennwalt Corporation: See—  
Vidal, Frederick D.; and Gerrity, Albert B., 4,160,848, Cl. 426-24.000.
- Pennzoil Company: See—  
Drechsel, Erhart K., 4,160,657, Cl. 71-41.000.
- Peretz, Louis: See—  
Weissler, Alain, 4,160,581, Cl. 350-133.000.
- Perrey, Klaus: See—  
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- Peterson, Donald L.; and Monroe, Gordon E., to United States of America, Agriculture. Catching surface seal and rotating trunk for a continuous tree chop harvester, 4,160,357, Cl. 56-329.000.
- Petroski, Alex: See—  
Taylor, Lauren P.; and Petroski, Alex, 4,160,734, Cl. 210-96.100.
- Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., to Tsentrai Nauchno-Issledovatel'skiy Dizeiny Institut. Compression ignition engine regulation system, 4,160,365, Cl. 60-606.000.
- Phillips, D. Colin, to Westinghouse Electric Corp. Particulate enhancement for generator condition monitors, 4,160,908, Cl. 250-381.000.
- Phillips Petroleum Company: See—  
Kelley, Carl S., 4,160,743, Cl. 252-411.00R.
- Pollock, Lyle W., 4,160,719, Cl. 208-11.00R.
- Piat, Jean, to Sotarem S.A. Cutting-off machine for hard bodies, 4,160,439, Cl. 125-16.00R.
- Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Flotation and plate separation device, 4,160,737, Cl. 210-202.000.
- Pielkenrood-Vinitex B.V.: See—  
Pielkenrood, Jacob, 4,160,737, Cl. 210-202.000.
- Pierce, Perry H.; and Prendergast, Dan L., to Hewlett-Packard Company. Method and apparatus for mounting printed circuit boards, 4,161,017, Cl. 361-412.000.
- Pilarczyk, Charles E.: See—  
Gregg, Edmund; and Pilarczyk, Charles E., 4,160,735, Cl. 210-130.000.
- Pitney Bowes Deutschland GmbH: See—  
Neubauer, August E., 4,160,605, Cl. 400-208.000.
- Pitney-Bowes, Inc.: See—  
Montagnino, James G.; and Staudinger, Frederick J., 4,160,899, Cl. 235-101.000.
- Pivard, Claude, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude. Methods of treating a gaseous mixture of adsorption, 4,160,651, Cl. 55-26.000.
- Pizzoccaro, Luigi, to Interbrev S.A. Method and an apparatus for indicating length on a zip fastener, 4,160,306, Cl. 24-205.00R.
- Placer Development Limited: See—  
Brigham, Robert J.; Sirianni, Guy V.; and Garner, Andrew, 4,160,661, Cl. 75-12.000.
- Plach, Edward F., to Appleton Machine Company. Core chuck, 4,160,530, Cl. 242-68.200.
- Plessey Handel und Investments AG: See—  
Jesinger, David W., 4,160,957, Cl. 331-107.00A.
- PLIVA Pharmaceutical and Chemical Works: See—  
Cakara, Marica; Djokic, Slobodan; and Tamburasev, Zrinka, 4,160,783, Cl. 260-556.00AR.
- Podolsky, Mikhail S.: See—  
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zassetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.



## Polaroid Corporation: See—

Giles, Charles L., 4,160,584, Cl. 351-49.000.  
Johnson, Bruce K.; and Whiteside, George D., 4,160,589, Cl. 354-86.000.

Reynard, John M., 4,160,590, Cl. 354-195.000.

Pollock, Lyle W., to Phillips Petroleum Company. Iron-containing refractory balls for retorting oil shale. 4,160,719, Cl. 208-11.00R.

Pompeev, Vladimir M.: See—  
Pechuk, Vasily I.; Pompeev, Vladimir M.; and Karikh, Nikolai B., 4,160,377, Cl. 73-141.00A.

Pond, R. F.: See—  
Austin-Brown, P.; Youde, D.; and Pond, R. F., 4,160,610, Cl. 403-407.000.

Ponticello, Ignazio S.; and McIntire, John M., to Eastman Kodak Company. Adhesive compositions comprising methyl allyl methacrylate. 4,160,864, Cl. 560-2.000.

Pool Company: See—

Armstrong, James E., 4,160,538, Cl. 254-89.00R.

Portmann, August T., to Bruderer AG. Drive for the movable work component, such as the ram of a press, stamping machine or the like. 4,160,409, Cl. 100-257.000.

Potts, Robert S., to Corning Glass Works. Self packaged test kit. 4,160,803, Cl. 422-101.000.

Powers, Larry J.: See—  
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,160,768, Cl. 260-306.70T.

PPG Industries, Inc.: See—

Ammons, Vernon G., 4,160,853, Cl. 428-425.000.

Prendergast, Dan L.: See—  
Pierce, Perry H.; and Prendergast, Dan L., 4,161,017, Cl. 361-412.000.

Prestige Group Limited, The: See—

Rossi-Ashton, Alan G., 4,160,462, Cl. 137-529.000.

Preussag Aktiengesellschaft: See—

Journey, William K., 4,160,623, Cl. 417-238.000.

Price, Connor E.: See—  
Derner, William J.; and Price, Connor E., 4,160,608, Cl. 403-370.000.

Price, Lawrence; and Russo, Mose A. Release coatings. 4,160,798, Cl. 264-213.000.

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Dietrichs, Hans-Hermann; Sinner, Michael; Opperbek, Fritz; and Brachthausen, Karl-Heinz, 4,160,695, Cl. 435-101.000.

Prokushenkov, Nikolai N.: See—  
Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.

Propylox a Society Anonyme: See—  
Hildon, Anthony M.; Manly, Thomas D.; and Jagers, Alan J., 4,160,778, Cl. 260-502.00R.

Prosser, David G., to Autotrol Corporation. Rotating trickling filter. 4,160,736, Cl. 210-150.000.

Prusinski, Jan R.: See—  
Prusinski, Richard C.; and Prusinski, Jan R., 4,160,761, Cl. 260-42.470.

Prusinski, Richard C.; and Prusinski, Jan R., to Architectural Research Corporation. Plastic articles. 4,160,761, Cl. 260-42.470.

Pryor, Michael J.; and Tyler, Derek E., to Olin Corporation. Lubrication in DC casting of copper base alloys. 4,160,474, Cl. 164-73.000.

Puariea, Douglas A.: See—  
Hackbarth, Richard W.; Puariea, Douglas A.; and Kramlinger, Philip J., 4,160,420, Cl. 105-367.000.

Puttlitz, Karl J.: See—  
Meyen, Robert H.; Puttlitz, Karl J.; Schink, Karl; and Wenskus, Herbert, 4,160,893, Cl. 219-85.0BA.

Putyra, Donald J. Toilet shroud. 4,160,295, Cl. 4-420.000.

Pye, Thomas N.: See—  
Mitchell, James; and Pye, Thomas N., 4,160,692, Cl. 159-6.00W.

Pyreflex Corporation: See—

Berg, Charles A., 4,160,577, Cl. 350-1.100.

Query, Grady W.; and Query, O. Grady. Method for treating fireants. 4,160,336, Cl. 43-132.00A.

Query, O. Grady: See—  
Query, Grady W.; and Query, O. Grady, 4,160,336, Cl. 43-132.00A.

Quiring, Bernd: See—  
Niederellmann, Georg; Quiring, Bernd; and Thoma, Wilhelm, 4,160,686, Cl. 156-331.000.

Radford, William H., to Rolls-Royce Limited. Method of making a wax pattern for a shell mould. 4,160,313, Cl. 29-525.000.

Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, to Societa' Italiana Resine S.I.R. S.p.A. Block copolymers. 4,160,789, Cl. 525-411.000.

Radiometer A/S: See—

Andersen, Jorgen; and Nielsen, Ole, 4,160,714, Cl. 204-195.00R.

Radkevich, Thomas J.: See—  
Martens, Alan; Radkevich, Thomas J.; and Smith, Jack R., 4,160,362, Cl. 60-39.18B.

Raman, Manjeri S., to Calgon Corporation. Method of resolving oil-in-water emulsions. 4,160,742, Cl. 252-344.000.

Raney, Meredith T., Jr., to Harris Corporation. CRT video text layout system having horizontal scrolling. 4,160,981, Cl. 340-721.000.

Rangert, Bo: See—  
Kallberg, Tommy K.; and Rangert, Bo, 4,160,321, Cl. 30-383.000.

Rapp, James E., to Owens-Illinois, Inc. Glass-ceramics for semiconductor doping. 4,160,672, Cl. 106-39.600.

Rashkin, Jay A., to Malcon Research & Development Corporation. Catalyst for hydrogenation of acetophenone. 4,160,746, Cl. 252-468.000.

Rasile, John: See—

Abolafia, Oscar R.; and Rasile, John, 4,160,691, Cl. 156-664.000.

Rauschenberger, Richard A., to Will Ross Inc. Unitary sample-vent valve assembly. 4,160,383, Cl. 73-422.00R.

Rauschenberger, Richard A., to Will Ross Inc. Catheterization tray. 4,160,505, Cl. 206-571.000.

Raypak, Inc.: See—

Ashton, Larry J.; and Block, Leo, 4,160,476, Cl. 165-171.000.

Raytheon Company: See—

Adlerstein, Michael G., 4,160,992, Cl. 357-81.000.

Studel, Fritz, 4,160,975, Cl. 343-16.00M.

RCA Corporation: See—

Ahmed, Adel A. A., 4,160,944, Cl. 323-4.000.

Curtice, Walter R., 4,160,919, Cl. 307-216.000.

Firester, Arthur H.; and Heller, Macy E., 4,160,598, Cl. 356-121.000.

Hopta, Daniel F.; and Beelitz, Howard R., 4,160,943, Cl. 323-4.000.

Martinson, Lloyd W., 4,161,033, Cl. 364-728.000.

Wardell, Myron H., Jr., 4,160,510, Cl. 220-2.10A.

Williams, Richard; and Bloom, Allen, 4,160,816, Cl. 423-648.00R.

Regie Nationale des Usines Renault: See—

Navaro, Gerard; Maillard, Jean-Pierre; and Lacroix, Serge, 4,160,717, Cl. 204-279.000.

Reichow, James R. Hinge joints for elongated collapsible members such as a fishing rod. 4,160,607, Cl. 403-286.000.

Reid, Robert A., to CPC Engineering Corporation. Bearing support for a lift pump. 4,160,569, Cl. 308-203.000.

Reistad, Bengt R., to Aktiebolaget Electrolux. Absorption refrigerating apparatus. 4,160,366, Cl. 62-476.000.

Rejda, Ladislav J.: See—

Cope, Lloyd S.; and Rejda, Ladislav J., 4,160,926, Cl. 310-215.000.

Reliable Electric Company: See—

Brey, William A., 4,160,880, Cl. 179-98.000.

Rendall, John S., to Rohrlit S. A. Solvent extraction process. 4,160,718, Cl. 208-11.0LE.

Renner, Alfred; and Zaher, Abdul-Cader, to Ciba-Geigy Corporation. Curable mixtures based on maleimides and acetone-anil. 4,160,859, Cl. 528-322.000.

Research Corporation: See—

Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,160,817, Cl. 424-1.000.

Resnick, Charles: See—

Lyons, Paul; Zant, Fred; and Resnick, Charles, 4,160,338, Cl. 46-44.000.

Rettig, Charles E.: See—

Mann, Stanley L.; and Rettig, Charles E., 4,161,010, Cl. 361-79.000.

Reynard, John M., to Polaroid Corporation. Removable (lens position limiting) stop for auto-manual focusing cameras. 4,160,590, Cl. 354-195.000.

Rice, Marjorie L. Garment hanger construction. 4,160,516, Cl. 223-98.000.

Richardson, Reginald D.; and Shannon, Robert H. Heavy oil recovery process. 4,160,479, Cl. 166-267.000.

Rickenbacker, James E., to Exxon Production Research Company. Method of generating a direct current control signal from a noisy alternating current signal. 4,160,922, Cl. 307-261.000.

Ricketts, William H.: See—

Schriminger, William F.; and Ricketts, William H., 4,160,632, Cl. 425-62.000.

Rideout, Vincent L.: See—

Dennard, Robert H.; and Rideout, Vincent L., 4,160,987, Cl. 357-41.000.

Ridgeway, John J., to Imperial Chemical Industries Limited. Shaped explosive charge device for under water use. 4,160,413, Cl. 102-24.0HC.

Riedl, Werner: See—

Schneider, Gerhard; Riedl, Werner; and Lippold, Hans-Martin, 4,160,747, Cl. 252-506.000.

Robert Bosch GmbH: See—

Kamin, Gerhard, 4,160,998, Cl. 358-105.000.

Ruoff, Manfred, 4,160,628, Cl. 417-465.000.

Robertson, Andrew D., to British Steel Corporation. Continuous charging apparatus. 4,160,869, Cl. 13-33.000.

Roccaforte, Harry I., to Champion International Corporation. Platform carton. 4,160,502, Cl. 206-45.140.

Roche, Marcel, to Thomson-CSF. Method of manufacturing field effect transistors of the MOS-type. 4,160,683, Cl. 148-187.000.

Rockford Servo Corporation: See—

Buisker, Raymond A., 4,160,517, Cl. 226-19.000.

Rodebush, James E.; and Thiele, Gerald H., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,160,659, Cl. 71-95.000.

Roecar Holdings (Netherlands Antilles) N.V.: See—

Pegel, Karl H., 4,160,860, Cl. 536-5.000.

Roedel, George F., to General Electric Company. Solventless silicone resins. 4,160,858, Cl. 528-14.000.

Roffler, Josua, to Sulzer Brothers, Ltd. Spacer grid for parallel cylindrical tubes. 4,160,477, Cl. 165-172.000.

Rohde, Hergen: See—

Hasenpath, Helmut; and Rohde, Hergen, 4,160,303, Cl. 15-349.000.

Rohm and Haas Company: See—

Desiderio, Fred A., 4,160,642, Cl. 8-12.000.

Stambaugh, Robert L.; and Galluccio, Richard A., 4,160,739, Cl. 252-34.000.

Rohrlit S. A.: See—

Rendall, John S., 4,160,718, Cl. 208-11.0LE.

Rolf C. Hagen (USA) Corp.: See—

Holbrook, Arthur J., 4,160,427, Cl. 119-5.000.

Rolls-Royce Limited: See—

Greenwood, Stanley W., 4,160,710, Cl. 204-129.250.

Radford, William H., 4,160,313, Cl. 29-525.000.

Ronde, Hubertus J.; and Van Loosdregt, Peter C., to U.S. Philips Corporation. Method of manufacturing a cathode ray tube for displaying colored pictures. 4,160,311, Cl. 29-25.150.

Roquette Freres: See—

Huchette, Michel; and Bussiere, Guy, 4,160,849, Cl. 426-94.000.

Rosenburgh, Norman J., to Eastman Kodak Company. Apparatus for developing latent images. 4,160,593, Cl. 354-317.000.

Ross, Charles W.: See—

Davis, Frederick B., 3rd; and Ross, Charles W., 4,161,028, Cl. 364-492.000.

Rossi-Ashton, Alan G., to Prestige Group Limited, The. Adjustable relief valves and pressure cookers incorporating such valves. 4,160,462, Cl. 137-529.000.

Rossler, Bernhard, to Siemens Aktiengesellschaft. N-Channel storage FET. 4,161,039, Cl. 365-185.000.

Rousso, Haim: See—

Toor, Yair; Rousso, Haim; and Kopilavitz, Ben-Zion, 4,161,035, Cl. 364-900.000.

Ruoff, Manfred, to Robert Bosch GmbH. Positive displacement machine. 4,160,628, Cl. 417-465.000.

Russell, Billy D., to Electric Power Research Institute, Inc. Digital protection system for transmission lines and associated power equipment. 4,161,027, Cl. 364-492.000.

Russell, Homer C.: See—

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.

Russell, Lewis K., to Signetics Corporation. Integrated injection logic (I-squared L) with double-diffused type injector. 4,160,988, Cl. 357-44.000.

Russo, Mose A.: See—

Price, Lawrence; and Russo, Mose A., 4,160,798, Cl. 264-213.000.

Ryan, Wayne L., to Streck Laboratories, Inc. Platelet reference control and method of preparation. 4,160,644, Cl. 23-230.00B.

Saari, Walfrid S.; and Huff, Joel R., to Merck & Co., Inc. Process for preparing novel N-carboxyl- $\alpha$ -amino acid anhydrides. 4,160,712, Cl. 204-158.00R.

Safety-Kleen Corp.: See—

Otzen, Karl G., 4,160,603, Cl. 366-219.000.

Saini, Sarmukh S., to Emerson Electric Co. Normally open, thermal sensitive electrical switching device. 4,160,968, Cl. 337-404.000.

Saint-Gobain Industries: See—

Bichot, Bernard H.; and Gest, Rene, 4,160,398, Cl. 83-865.000.

St. Regis Paper Company: See—

Brenholdt, Irving R., 4,160,913, Cl. 250-563.000.

Saito, Isao, to Sony Corporation. Power conserving motor control circuit for a video tape recorder. 4,161,002, Cl. 360-75.000.

Sakamoto, Eiichi: See—

Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,160,669, Cl. 96-27.00E.

Sakamoto, Hitoshi, to Sony Corporation. Video signal reproducing apparatus with a manually controlled track searching arrangement. 4,161,001, Cl. 360-10.000.

Sakamoto, Susumu: See—

Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.

Salisbury, John K., Jr.: See—

United States of America, National Aeronautics and Space Administration; and Salisbury, John K., Jr., 4,160,508, Cl. 414-4.000.

Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Ski boot. 4,160,332, Cl. 36-119.000.

Salomon, Georges P. J., to S.A. des Ets Francois Salomon & Fils. Safety bindings for skis. 4,160,555, Cl. 280-612.000.

Sanders, Geoffrey R.: See—

Christesen, Paul J.; and Sanders, Geoffrey R., 4,160,668, Cl. 96-1.800.

Sandoz Ltd.: See—

Bream, John B., 4,160,766, Cl. 260-243.300.

Frigato, Giovanni, 4,160,946, Cl. 324-30.00R.

Sasakura, Kazuyuki: See—

Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.

Sato, Takeo, to Fujitsu Ten Limited. Compatible AM-FM frequency discriminator. 4,160,955, Cl. 329-2.000.

Satoh, Takashi, to Hitachi, Ltd. Data-in amplifier for an MISFET memory device having a clamped output except during the write operation. 4,161,040, Cl. 365-203.000.

Saucy, Gabriel: See—

Chan, Ka-Kong; and Saucy, Gabriel, 4,160,865, Cl. 560-22.000.

Sawyer, James L., to Lone Star Industries. Early high-strength Portland cement and method of manufacture. 4,160,674, Cl. 106-89.000.

Scardera, Michael; and Gavin, David F., to Olin Corporation. Alkoxy-bis (trialkoxysiloxy)-silane surfactants. 4,160,776, Cl. 260-448.80R.

Schaarschmidt, Ulrich: See—

Finsterwalder, Lorenz; Zeh, Horst; and Schaarschmidt, Ulrich, 4,160,382, Cl. 73-422.00R.

Schanen, Paul C.: See—



- Severson, Larry A., to Applied Power, Inc. Tire spreading and inspecting machine. 4,160,537, Cl. 254-50.300.
- Seward, Thomas P., III: See—  
Kingsbury, Paul I., Jr.; and Seward, Thomas P., III, 4,160,655, Cl. 65-30.00R.
- Seynaeve, Laurent: See—  
de Keyser, Andre; and Seynaeve, Laurent, 4,160,962, Cl. 333-141.000.
- Shanfelt, Donald Y.: See—  
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,160,443, Cl. 126-270.000.
- Shannon, Robert H.: See—  
Richardson, Reginald D.; and Shannon, Robert H., 4,160,479, Cl. 166-267.000.
- Sharp Kabushiki Kaisha: See—  
Maeda, Hidetoshi; and Ohba, Toshihiro, 4,160,923, Cl. 307-308.000.
- Shefski, Paul K.: See—  
Miskolczy, Gabor; Nowak, Leonard G.; and Shefski, Paul K., 4,160,641, Cl. 432-59.000.
- Shell Oil Company: See—  
Dickson, Leon L., Jr.; and Denison, Early B., 4,160,457, Cl. 134-167.000.
- Shenoy, Raghuram D.; and Ganapathy, Ananthram, to Cadbury India Limited. Process of degumming fatty glycerides using sodium acetate and acetic acid buffer. 4,160,774, Cl. 260-424.000.
- Shibagaki, Masahiro; Horiike, Yasuhiro; and Yamazaki, Takashi, to Tokyo Shibaura Electric Co., Ltd. Gas etching method and apparatus. 4,160,690, Cl. 156-643.000.
- Shibatani, Takeji: See—  
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.
- Shibuya, Toshio: See—  
Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, 4,160,392, Cl. 74-732.000.
- Shimano Industrial Company Limited: See—  
Fukui, Seiji, 4,160,393, Cl. 74-750.00B.
- Shinada, Shinichi: See—  
Mikoshiba, Shigeo; and Shinada, Shinichi, 4,160,932, Cl. 315-169.400.
- Shinagawa, Mitsuhsa: See—  
Matsuura, Shigeo; Nagashima, Toshio; and Shinagawa, Mitsuhsa, 4,160,953, Cl. 325-440.000.
- Shinko Electric Co., Ltd.: See—  
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.
- Shinohara, Toshio: See—  
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,160,699, Cl. 435-287.000.
- Shionogi & Co., Ltd.: See—  
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.
- Shirose, Toshihiro: See—  
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,160,823, Cl. 424-70.000.
- Shoenfeld, Norman A.: See—  
Grodzinsky, Alan J.; and Shoenfeld, Norman A., 4,161,013, Cl. 361-433.000.
- Shugart Associates: See—  
Dalziel, Warren L., 4,161,004, Cl. 360-106.000.
- Siderurgiemaritime-Maritime Staalnijverheid: See—  
Josis, Christian; and Hans, Andre, 4,160,725, Cl. 210-21.000.
- Siemens Aktiengesellschaft: See—  
Hirschmann, Peter; and Hofer, Ernst, 4,160,878, Cl. 179-18.0BC.
- Kobler, Ulrich; and Tamm, Horst, 4,160,965, Cl. 335-79.000.
- Ollinger, Max, 4,160,874, Cl. 178-69.00G.
- Rossler, Bernhard, 4,161,039, Cl. 365-185.000.
- STG Schweizerische Industrie-Gesellschaft: See—  
Altermatt, Willy, 4,160,689, Cl. 156-583.100.
- Sigmund, Richard W., to Timbren, Ltd. Log shearing and splitting device. 4,160,470, Cl. 144-3.00B.
- Signetics Corporation: See—  
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- Sikes, Dennis. Antibody-active protein composition. 4,160,825, Cl. 424-85.000.
- Silberberg, Joseph: See—  
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- Simon-Krause, Inc.: See—  
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- Simpson, John P. Tennis serve training and practice device. 4,160,549, Cl. 273-29.00A.
- Singer Company, The: See—  
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- Stavis, Gus, 4,160,974, Cl. 343-16.00M.
- Sinner, Michael: See—  
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- Sipos, Tibor, to Johnson & Johnson. Treatment for gingivitis. 4,160,821, Cl. 424-49.000.
- Sirianni, Guy V.: See—  
Brigham, Robert J.; Sirianni, Guy V.; and Garner, Andrew, 4,160,661, Cl. 75-12.000.
- Sisson, Keith T.: See—  
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- Sleder, Richard L., to Brunswick Corporation. Alternator driven CD ignition with auxiliary power. 4,160,435, Cl. 123-148.00C.
- Smakman, Robert: See—  
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- Smith, David S.; and McGregor, Adrienne R., to Technicon Instruments Corporation. Fluorimetric immunoassay for diphenylhydantoin. 4,160,818, Cl. 424-8.000.
- Smith, Gordon S.; and Comstock, Theodore R., to IMC Magnetics Corp. Hold-open accessory for a door closer. 4,160,304, Cl. 16-49.000.
- Smith, Harvell M.: See—  
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- Smith, Jack R.: See—  
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- Smith, John A.: See—  
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- Smith, Roland L., to Nu Watt, Inc. Water vehicle-actuated air compressor and system therefor. 4,160,424, Cl. 417-330.000.
- SmithKline Corporation: See—  
Weinstock, Joseph, 4,160,765, Cl. 260-239.0BB.
- Smiths Industries Limited: See—  
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- Smolyanitsky, Boris N.: See—  
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.
- Smulders, Adrianus J., to Microtel B.V. Electret transducers: acoustically transparent backplate of sintered conductive spheres and a thin electret coating; meshlike diaphragm spacing screen overlays apertured electret backplate with screen junctions overlaying the apertures. 4,160,881, Cl. 179-111.00E.
- Snyder, William H.; Williams, Ralph E.; and Wisotski, John, to Edgell, Thomas A.; and Tillinghast, Roberta K. Earth fracturing apparatus. 4,160,412, Cl. 102-20.000.
- Sobin, Bernard: See—  
Boomus, Mary; Sobin, Bernard; and Schweitzer, John, 4,160,700, Cl. 435-298.000.
- Societa' Italiana Resine S.I.R. S.p.A.: See—  
Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, 4,160,789, Cl. 525-411.000.
- S.A. des Ets Francois Salomon & Fils: See—  
Salomon, Georges P. J., 4,160,555, Cl. 280-612.000.
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- Soder, Alfons; and Perrey, Klaus, to Hoechst Aktiengesellschaft. Analgesic phosphinyl compounds and compositions. 4,160,828, Cl. 424-200.000.
- Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, to Olympus Optical Co., Ltd. Drive system for automatic culture apparatus. 4,160,699, Cl. 435-287.000.
- Sola Basic Industries, Inc.: See—  
Novy, Russell F.; Scott, Gerald L.; and Zurluh, Thomas O., 4,160,680, Cl. 148-16.500.
- Solow, Joseph E. Automobile trunk lock guard. 4,160,368, Cl. 70-417.000.
- Solvay & Cie.: See—  
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- Sonex International Corp.: See—  
Mendrala, James A., 4,160,994, Cl. 358-22.000.
- Sonic Instruments, Inc.: See—  
Gromlich, Roy J.; Brech, Kilian H., deceased; and Cist, John D., 4,160,385, Cl. 73-622.000.
- Sony Corporation: See—  
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- Ishikawa, Fumio; and Tsuda, Yukio, 4,160,964, Cl. 334-15.000.
- Kanazawa, Kenichi; and Takahashi, Nobuyuki, 4,161,022, Cl. 363-88.000.
- Saito, Isao, 4,161,002, Cl. 360-75.000.
- Sakamoto, Hitoshi, 4,161,001, Cl. 360-10.000.
- Sotarem S.A.: See—  
Piat, Jean, 4,160,439, Cl. 125-16.00R.
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- Southwest Research Institute: See—  
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- Spaetgens, Theodore W. Tuned torsional vibration damper. 4,160,390, Cl. 74-574.000.
- Spear, Phillip L., to Avery International Corporation. Magazine page labeling apparatus. 4,160,687, Cl. 156-444.000.
- Spectrum X-ray Corporation: See—  
Hogan, William J., 4,160,912, Cl. 250-468.000.
- Spence-Bate, Harry A. H. Film handling apparatus. 4,160,545, Cl. 271-106.000.
- Spencer, Gerald: See—  
Strawson, Kenneth H.; and Spencer, Gerald, 4,160,633, Cl. 425-85.000.
- Sperrazza, Joseph L., to Universal Technology, Inc. Optical gaging system. 4,160,599, Cl. 356-381.000.
- Sperry Rand Corporation: See—  
Nicolson, Alexander M., 4,160,970, Cl. 340-18.0LD.
- Stark, Edward W., 4,161,034, Cl. 364-822.000.

- Sprague Electric Company: See—  
de Keyser, Andre; and Seynaeve, Laurent, 4,160,962, Cl. 333-141.000.
- Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Photosensitive composition. 4,160,671, Cl. 96-91.00D.
- Stambaugh, Robert L.; and Galluccio, Richard A., to Rohm and Haas Company. Polyolefinic copolymer additives for lubricants and fuels. 4,160,739, Cl. 252-34.000.
- Stanley Electric Co., Ltd.: See—  
Teshima, Toru; and Uchiyama, Yoshinori, 4,160,447, Cl. 128-735.000.
- Stanwick, Tad. Pile anchor for moorings. 4,160,613, Cl. 405-244.000.
- Stark, Edward W., to Sperry Rand Corporation. Correlation apparatus. 4,161,034, Cl. 364-822.000.
- Staudinger, Frederick J.: See—  
Montagnino, James G.; and Staudinger, Frederick J., 4,160,899, Cl. 235-101.000.
- Stauffer Chemical Company: See—  
Kraft, Paul; and Silberberg, Joseph, 4,160,793, Cl. 525-230.000.
- Rodebush, James E.; and Thiele, Gerald H., 4,160,659, Cl. 71-95.000.
- Stavis, Gus, to Singer Company. The. Target sensing and homing system. 4,160,974, Cl. 343-16.00M.
- Steinbaugh, Gary: See—  
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- Steiner, William W.: See—  
Montgomery, Murray M.; Gilger, William F.; and Steiner, William W., 4,160,617, Cl. 414-139.000.
- Stelzer, Robert A.: See—  
Blake, Nathan L.; and Stelzer, Robert A., 4,160,355, Cl. 56-98.000.
- Stemer, Jacques: See—  
Bouvard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,160,863, Cl. 544-30.000.
- Stemmler, Kurt; Langenbeck, Peter; and Ehlscheid, Gunter, to Winkler & Dunnebler Maschinenfabrik und Eisengiesserei KG. Method and apparatus for the focal form cutting of a moving web of material by a laser beam. 4,160,894, Cl. 219-121.00L.
- Sterling Drug Inc.: See—  
Zenitz, Bernard L., 4,160,862, Cl. 542-439.000.
- Steucl, Fritz, to Raytheon Company. Correction circuit for wide bandwidth antenna. 4,160,975, Cl. 343-16.00M.
- Stevens, Graham A. Air structure. 4,160,523, Cl. 237-1.00A.
- Stewart, John K., to Canon, Inc. Tamping tool. 4,160,419, Cl. 104-10.000.
- Stewart, Robert M.; and Schwartz, Robert W., to W. R. Grace & Co. Prill tower rake. 4,160,631, Cl. 425-10.000.
- Stiber, Clifford W. Circulating fireplace with adjustable controls for selectively heating one or more rooms. 4,160,524, Cl. 237-51.000.
- Stivender, Paul M.: See—  
Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., 4,160,906, Cl. 250-322.000.
- Stockel, Dieter; and Oberg, Hans-Jurgen, to G. Rau. Electrical contact element and method of producing the same. 4,160,855, Cl. 428-621.000.
- Stockman, Leon: See—  
Stockman, Suzanne; and Stockman, Leon, 4,160,414, Cl. 102-65.200.
- Stockman, Suzanne; and Stockman, Leon. Projectile having a delay-action firing mechanism. 4,160,414, Cl. 102-65.200.
- Stone, Clement A., to Merck & Co., Inc. Antihypertensive compositions containing an arylsubstituted alanine and a phenyl hydrazinopropionic acid. 4,160,835, Cl. 424-263.000.
- Strawson, Kenneth H.; and Spencer, Gerald, to National Research Development Corporation. Apparatus for moulding components in compactable materials. 4,160,633, Cl. 425-85.000.
- Streck Laboratories, Inc.: See—  
Ryan, Wayne L., 4,160,644, Cl. 23-230.00B.
- Strunk, Richard J.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., to Uniroyal, Inc. Method for controlling insects with tetrasubstituted organotin compounds. 4,160,846, Cl. 424-288.000.
- Stumpp, Walter: See—  
Demuth, Hans; and Stumpp, Walter, 4,160,532, Cl. 242-125.100.
- Stupp, Samuel I.: See—  
Carr, Stephen H.; and Stupp, Samuel I., 4,160,760, Cl. 260-42.210.
- Sudarev, Anatoly V.: See—  
Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.
- Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, to Shionogi & Co., Ltd. Process for the production of o-aminophenyl ketone derivatives. 4,160,784, Cl. 260-570.0AB.
- Sugimoto, Tetsuya: See—  
Watanabe, Akira; Sugimoto, Tetsuya; and Makino, Yasuhiro, 4,160,744, Cl. 252-440.000.
- Suhy, Frederick A.: See—  
Thomas, Ronnie L.; and Suhy, Frederick A., 4,160,483, Cl. 166-307.000.
- Sullivan, Paul F.: See—  
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.
- Sullivan, Ronald L.; and Cosentino, Ronald R., to M E P & I Corporation. Telephone display accessory. 4,160,879, Cl. 179-90.0AN.
- Sulzer Brothers, Ltd.: See—  
Demuth, Hans; and Stumpp, Walter, 4,160,532, Cl. 242-125.100.
- Roffler, Josua, 4,160,477, Cl. 165-172.000.
- Sumitomo Electric Industries, Ltd.: See—  
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.
- Sundberg, Yngve: See—  
Marchner, Jan; and Sundberg, Yngve, 4,160,868, Cl. 13-11.000.
- Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, to Nissan Motor Company, Limited. Automatic power transmission with direct-drive clutch. 4,160,392, Cl. 74-732.000.
- Sunstar Hamigaki Kabushiki Kaisha: See—  
Hashimoto, Shigeru; and Inoue, Kenji, 4,160,822, Cl. 424-52.000.
- Surgikos: See—  
Badolato, Anthony; and Farrell, Joseph S., 4,160,801, Cl. 422-46.000.
- Sussman, Milton H.: See—  
Gottlieb, Nathan; and Sussman, Milton H., 4,160,578, Cl. 350-89.000.
- Suzuki, Katsumi: See—  
Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyamishi, Toshiaki, 4,160,824, Cl. 424-84.000.
- Suzuki, Kazuhiro: See—  
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.
- Suzuki, Shigeyoshi: See—  
Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, 4,160,670, Cl. 96-119.00R.
- Suzuki, Shosuke: See—  
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
- Suzuki, Takanobu: See—  
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.
- Suzuki, Toyotoshi; and Matsuzaki, Kazunari, to Canon Kabushiki Kaisha. Camera having an electrically timed shutter. 4,160,591, Cl. 354-235.000.
- Suzuki, Yoshikatsu: See—  
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
- Svensson, Karl-Erik: See—  
Nordblad, Sven S.; and Svensson, Karl-Erik, 4,160,527, Cl. 242-47.000.
- Swanson, Rollan. De-sulfurization of petroleum residues using melt of alkali metal sulfide hydrates or hydroxide hydrates. 4,160,721, Cl. 208-230.000.
- Sweeney, William M., to Texaco Inc. Low pour crude oil compositions. 4,160,459, Cl. 137-13.000.
- Sweet, Forest H., III, to Dow Chemical Company. The. Inhibited aqueous, methoxypropanol coolant adjusted to a pH between about 6 and 9. 4,160,740, Cl. 252-75.000.
- Swiss Aluminium Ltd.: See—  
Merz, Walter, 4,160,567, Cl. 406-98.000.
- Switzer, Ralph V. Freight car door opener. 4,160,509, Cl. 414-607.000.
- Symot Limited: See—  
Willis, Gordon, 4,160,334, Cl. 40-531.000.
- Systron-Donner Corporation: See—  
Marquess, Richard D., 4,160,568, Cl. 308-159.000.
- Syva Company: See—  
Ullman, Edwin F., 4,160,645, Cl. 23-230.00B.
- Szczepanski, Henry, to Ciba-Geigy Corporation. Novel amidines. 4,160,843, Cl. 424-278.000.
- Takagi, Kinzo. Variable delivery hydraulic equipment. 4,160,403, Cl. 91-483.000.
- Takahashi, Nobuyuki: See—  
Kanazawa, Kenichi; and Takahashi, Nobuyuki, 4,161,022, Cl. 363-88.000.
- Takahashi, Sankichi: See—  
Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, 4,160,713, Cl. 204-180.00P.
- Takeda Chemical Industries, Ltd.: See—  
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,160,830, Cl. 424-246.000.
- Takei, Kenji: See—  
Nakayama, Toshihiko; and Takei, Kenji, 4,160,928, Cl. 310-353.000.
- Tamburasev, Zrinka: See—  
Cakara, Marica; Djokic, Slobodan; and Tamburasev, Zrinka, 4,160,783, Cl. 260-556.0AR.
- Tamm, Horst: See—  
Kobler, Ulrich; and Tamm, Horst, 4,160,965, Cl. 335-79.000.
- Tan, Marshall: See—  
Choe, Eui W.; Tan, Marshall; and Mininni, Robert M., 4,160,755, Cl. 260-29.60H.
- Tanabe Seiyaku Co., Ltd.: See—  
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.
- Tanaka, Hideaki: See—  
Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, 4,160,698, Cl. 435-173.000.
- Tanaka Instrument Company Limited: See—  
Kubono, Takashi, 4,160,389, Cl. 74-89.180.
- Tanaka, Kazuo, to West Electric Company, Ltd. Accidental flash prevention in a photographic flash device. 4,160,933, Cl. 315-241.00P.



- Tanaka, Shoji: See—  
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
- Tandon Magnetics Corporation: See—  
Tandon, Sirjang L.; and Moon, John P., 4,160,315, Cl. 29-603.000.
- Tandon, Sirjang L.; and Moon, John P., to Tandon Magnetics Corporation. Method of making a magnetic head assembly. 4,160,315, Cl. 29-603.000.
- Tanno, Shogo; and Hirose, Masateru, to Dainichi-Nippon Cables, Ltd. Apparatus and method for electrically testing multi-core cable. 4,160,947, Cl. 324-54.000.
- Tanuma, Itsuo: See—  
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
- Tatsumi, Toshio: See—  
Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, 4,160,805, Cl. 422-180.000.
- Taupin, Jean-Paul. Device for fluidizing and discharging divided material. 4,160,514, Cl. 222-228.000.
- Tawara, Ikuo: See—  
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,160,699, Cl. 435-287.000.
- Taylor, Lauren P.; and Petroski, Alex, to LRS Research Limited. Catch basin processing apparatus. 4,160,734, Cl. 210-96.100.
- Taylor, Paul D., to Celanese Corporation. Synthesis of tetrahydrofuran. 4,160,771, Cl. 260-346.110.
- Taylor, Richard E. Collapsible refuse bag cart. 4,160,557, Cl. 280-652.000.
- TDK Electronics Co., Ltd.: See—  
Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.
- TEAC Corporation: See—  
Haraguchi, Tamotsu, 4,161,007, Cl. 360-137.000.
- Technicon Instruments Corporation: See—  
de Jong, Eduard B. M., 4,161,030, Cl. 364-581.000.
- Smith, David S.; and McGregor, Adrienne R., 4,160,818, Cl. 424-8.000.
- Telefonaktiebolaget L M Ericsson: See—  
Lundberg, Bo E. O.; and Scuka, Victor, 4,160,872, Cl. 174-101.500.
- Nordblad, Sven S.; and Svensson, Karl-Erik, 4,160,527, Cl. 242-47.000.
- Thyselius, Per-Olov, to Telefonaktiebolaget L M Ericsson. Method of regenerating asynchronous data signals and apparatus for performing the method. 4,160,951, Cl. 325-13.000.
- Tiberg, Ernst B.: See—  
Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., 4,160,693, Cl. 162-24.000.
- Tiemann, Helmut: See—  
Scholl, Hans; and Tiemann, Helmut, 4,160,423, Cl. 112-121.120.
- Tillinghast, Roberta K.: See—  
Snyer, William H.; Williams, Ralph E.; and Wisotski, John, 4,160,412, Cl. 102-20.000.
- Timbern, Ltd.: See—  
Sigmund, Richard W., 4,160,470, Cl. 144-3.00B.
- Togami, Paul G.: See—  
Hawkins, Robert W.; Togami, Paul G.; and Drayer, T. Gary, 4,160,456, Cl. 130-27.00T.
- Tognazzini, Jere W.; and Humphreys, Kenneth R. Electrical terminal block. 4,160,889, Cl. 200-163.000.
- Tokura, Nobufumi: See—  
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.
- Tokyo Shibaura Electric Co., Ltd.: See—  
Shibagaki, Masahiro; Horike, Yasuhiro; and Yamazaki, Takashi, 4,160,690, Cl. 156-643.000.
- Tomioka, Michiaki, to Chushin Gakki Seizo Kabushiki Kaisha. String vibration transducer bridge for electric stringed instruments. 4,160,401, Cl. 84-1.160.
- Tonoike, Kiyoshi: See—  
Nishida, Takao; and Tonoike, Kiyoshi, 4,160,756, Cl. 260-29.60M.
- Toor, Yair; Rousso, Haim; and Kppilavitz, Ben-Zion, to Israel Electro-Optical Industry Ltd. Circuitry for displaying a constantly changing M-mode output on a raster scan display. 4,161,035, Cl. 364-900.000.
- Topilin, Valentin V.: See—  
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
- Torterotot, Roland M.; and Nasica, Jean R. L. Production of sterile packages. 4,160,852, Cl. 428-192.000.
- Touba, Ali R.: See—  
Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.
- Towle, Leo B.: See—  
Akiyama, Robert H.; and Towle, Leo B., 4,160,752, Cl. 260-27.0BB.
- Towmotor Corporation: See—  
Gregg, Edmund; and Pilarczyk, Charles E., 4,160,735, Cl. 210-130.000.
- Toyo Denki Seizo Kabushiki Kaisha: See—  
Ishikawa, Fujio, 4,160,925, Cl. 310-160.000.
- Toyo Kogyo Company Limited: See—  
Kubono, Takashi, 4,160,389, Cl. 74-89.180.
- Toyoda-Koki Kabushiki-Kaisha: See—  
Fujita, Michio, 4,160,438, Cl. 125-11.0TP.
- Toyoda, Tatsuo: See—  
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Furukubo, Tatsumi, 4,160,363, Cl. 60-290.000.
- Tracy, Ronald J. Portable dental cabinet. 4,160,323, Cl. 32-22.000.
- TRW Inc.: See—  
Neff, Joseph A.; and English, William D., 4,160,811, Cl. 423-276.000.
- van Buren, Harold S., Jr., 4,160,887, Cl. 200-61.620.
- Tsentrainy Nauchno-Issledovatel'skiy Dizeiny Institut: See—  
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.
- Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, to Mitsubishi Paper Mills, Ltd. Lithographic printing plate material. 4,160,670, Cl. 96-119.00R.
- Tsuchiya, Shigekatsu: See—  
Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyamishi, Toshiaki, 4,160,824, Cl. 424-84.000.
- Tsuda, Yukio: See—  
Ishikawa, Fumio; and Tsuda, Yukio, 4,160,964, Cl. 334-15.000.
- Tsutsumi, Saburo, to Nissan Motor Company, Limited. Internal combustion engine having main and auxiliary combustion chambers. 4,160,432, Cl. 123-75.00B.
- Tulyankin, Fedor V.: See—  
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- Tumanov, Alexei T.: See—  
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Teshima, Toru; and Uchiyama, Yoshinori, 4,160,447, Cl. 128-735.000.
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Higley, David P., 4,160,769, Cl. 260-343.000.
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Strunk, Richard J.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., 4,160,846, Cl. 424-288.000.
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Agriculture: See—  
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Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,160,791, Cl. 525-469.000.
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Jacobs, Jacqueline M. Bioccontamination and particulate detection system. 4,160,601, Cl. 356-404.000.
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Williams, Richard P., 4,161,032, Cl. 364-714.000.
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Ayler, Steven E.; and Holtrop, John W., 4,160,405, Cl. 89-7.000.
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- Milton, A. Fenner, 4,160,579, Cl. 350-96.140.
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Bikker, Pieter, 4,160,960, Cl. 332-40.000.
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- United States Stove Company: See—  
Fox, Charles T.; and Graham, Edward P., 4,160,442, Cl. 126-140.000.
- United Technologies Corporation: See—  
Fader, Walter J., 4,160,956, Cl. 331-94.50P.
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Sperrazza, Joseph L., 4,160,599, Cl. 356-381.000.
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White, Robert H.; and Hager, Lowell P., 4,160,802, Cl. 422-68.000.
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Foux, Amnon, 4,160,454, Cl. 128-348.000.
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Colburn, Edward N., 4,160,622, Cl. 417-181.000.
- Maffet, Vere, 4,160,732, Cl. 210-75.000.
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- Upjohn Company, The: See—  
Cho, Moo J.; and Biermacher, John J., 4,160,827, Cl. 424-199.000.
- Valliere, Arthur, III: See—  
Morris, S. Brent; Valliere, Arthur, III; and Wisniewski, Richard A., 4,161,036, Cl. 364-900.000.
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Nickels, Joseph J., Jr., 4,160,559, Cl. 285-156.000.
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Vandenberk, Jan; Kennis, Ludo E. J.; Van Der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,160,836, Cl. 424-267.000.
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Harken, Peter O.; and Lawson, William E., 4,160,541, Cl. 254-192.000.
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Groot, Theodorus C.; Huijter, Pieter; and van Lent, Johannes G., 4,160,935, Cl. 315-370.000.
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Ronde, Hubertus J.; and Van Loosdregt, Peter C., 4,160,311, Cl. 29-25.150.
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Nigra, Jacques; and Vanthuyne, Guy, 4,160,996, Cl. 358-73.000.
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- Vapor Corporation: See—  
Bell, Robert R., 4,160,626, Cl. 417-403.000.
- Vari-Tronics Co.: See—  
Schraut, Eugene H., 4,160,575, Cl. 339-103.00M.
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Schneider, Gerhard; Riedl, Werner; and Lippold, Hans-Martin, 4,160,747, Cl. 252-506.000.
- Vataru, Marcel; Miller, Leo; and Schwesinger, Dennis W. Water and energy conservation system. 4,160,461, Cl. 137-337.000.
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Kunze, Dieter; Leonhardt, Ernst; and Noack, Christian, 4,160,487, Cl. 180-68.00R.
- Veb Pentacon Dresden Kamera und Kinowerke: See—  
Noack, Rolf; and Kromer, Karl, 4,160,592, Cl. 354-246.000.
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Albright, James A.; and Nicholson, Richard R., 4,160,795, Cl. 260-937.000.
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- Victory, Thomas J. Device for assaying gold and other metals. 4,160,804, Cl. 422-104.000.
- Vidal, Frederick D.; and Gerrity, Albert B., to Pennwalt Corporation. Antistaling agent for bakery products. 4,160,848, Cl. 426-24.000.
- Video Systems Research, Inc.: See—  
Cleveland, Robert R., 4,161,000, Cl. 358-225.000.
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Vona, Nick, Jr., to General Motors Corporation. Dual container additive dispenser for appliance. 4,160,367, Cl. 68-17.00R.  
 von Bonin, Wulf: See—  
 Lienert, Hans-Jürgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friedrich, Klaus; and Markus, Peter, 4,160,851, Cl. 427-379.000.  
 Von Bose, Robert J.: See—  
 Britton, Fred G.; Von Bose, Robert J.; and Keller, Cecil T., 4,160,612, Cl. 405-227.000.  
 Von Kohorn, Henry; and Kydonieus, Agis F., to Hercules Protective Fabrics Corporation. Dispensers for the controlled release of pest-controlling agents and methods for combatting pests therewith. 4,160,335, Cl. 43-131.000.  
 Vos, Hendricus E. M. C.: See—  
 Driessen, Antonius J. G. C.; and Vos, Hendricus E. M. C., 4,160,930, Cl. 313-217.000.  
 Vychislitelny Tsentr Sibirskogo Otdelenia Akademii Nauk SSSR: See—  
 Seleznev, Yuri E.; Burkin, Yuri A.; and Kuzmin, Sergei V., 4,161,037, Cl. 365-51.000.  
 W. R. Grace & Co.: See—  
 Akiyama, Robert H.; and Towle, Leo B., 4,160,752, Cl. 260-27.00B.  
 Stewart, Robert M.; and Schwartz, Robert W., 4,160,631, Cl. 425-10.000.  
 Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH: See—  
 Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, 4,160,797, Cl. 264-81.000.  
 Kudlich, Walter; Herrmann, Hans; Lechner, Gunther; and Berger, Kurt, 4,160,504, Cl. 206-334.000.  
 Wade, Kenneth L. Earplug. 4,160,449, Cl. 128-152.000.  
 Wagenknecht, Austin C., deceased (by Wagenknecht, Don A., personal representative); Daravingas, George V.; and Koski, William E., to General Mills, Inc. Plaque inhibiting composition and method. 4,160,820, Cl. 424-48.000.  
 Wagenknecht, Don A., personal representative: See—  
 Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,820, Cl. 424-48.000.  
 Wagner, Josef, to Josef Wagner GmbH, Firma. Spray gun construction. 4,160,525, Cl. 239-332.000.  
 Wagner, Kuno: See—  
 Schapel, Dietmar; Wagner, Kuno; Müller, Hanns P.; and Dahm, Manfred, 4,160,754, Cl. 260-29.40R.  
 Schneider, Gottfried; Wagner, Kuno; and Dietrich, Werner, 4,160,749, Cl. 260-2.300.  
 Wakefield, Flake M.: See—  
 Briggs, James B.; and Wakefield, Flake M., 4,161,018, Cl. 362-104.000.  
 Wald, Herman. Energy conserving transformer power supply system. 4,160,917, Cl. 307-64.000.  
 Walden, Jack M.: See—  
 Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.  
 Waldrop, Roy: See—  
 Waldrop, Walter I.; Waldrop, Roy; and Paul, Cyrus, 4,160,676, Cl. 134-6.000.  
 Waldrop, Walter I.; Waldrop, Roy; and Paul, Cyrus, to Waldrop, Walter I. Method of forming a composite rod. 4,160,676, Cl. 134-6.000.  
 Wallsten, Thomas S., to Berkshire Paper Company. Conical filter holder. 4,160,535, Cl. 248-94.000.  
 Wals, Lourens: See—  
 Van Reet, Gustaaf; Heeres, Jan; and Wals, Lourens, 4,160,838, Cl. 424-269.000.  
 Walsh, James L.: See—  
 Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,160,991, Cl. 357-49.000.  
 Walsh, Peter: See—  
 Thorington, Luke; Walsh, Peter; Koo, Ronald; and Thourer, Wolfgang, 4,160,929, Cl. 313-112.000.  
 Ward, Dennis J., to UOP Inc. Substituted natural gas via steam reforming of kerosene. 4,160,649, Cl. 48-214.00A.  
 Wardell, Myron H., Jr., to RCA Corporation. CRT with tension band adapted for pusher-type tensioning and method for producing same. 4,160,510, Cl. 220-2.10A.  
 Warner Electric Brake & Clutch Company: See—  
 Newton, Paul P.; and Olsen, Robert A., 4,160,498, Cl. 192-84.00C.  
 Warszawski, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie. Novel fuel cell containing novel means for removal of carbonates. 4,160,856, Cl. 429-14.000.  
 Watanabe, Akira; Sugimoto, Tetsuya; and Makino, Yasuhiro, to Kyushu Refractories Co., Ltd. Catalyst for reduction of nitrogen oxides and method for manufacture thereof. 4,160,744, Cl. 252-440.000.  
 Watanabe, Haruo: See—  
 Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.  
 Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, to Kao Soap Co., Ltd. Transparent hair rinsing composition. 4,160,823, Cl. 424-70.000.  
 Watkins, Fred E., to Camco, Incorporated. Surface control well safety valve. 4,160,484, Cl. 166-317.000.  
 Watson, Robert E.: See—  
 Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Fran-

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 Webb, Jimmy L.; and Corn, John E., to General Electric Company. Reduction of diimino compounds to diamino compounds. 4,160,785, Cl. 260-583.00P.  
 Weber, Abraham: See—  
 Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,160,863, Cl. 544-30.000.  
 Weber, Adolf; Munster, Erhard; and Buckley, Dieter, to Diehl. Sound signal body for generating underwater sound signals. 4,160,411, Cl. 102-7.000.  
 Weinert, Harry F.: See—  
 Farmer, Stanley E.; and Weinert, Harry F., 4,160,620, Cl. 414-621.000.  
 Weinstock, Joseph, to SmithKline Corporation. Method for 6-bromination of 1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine compounds. 4,160,765, Cl. 260-239.00B.  
 Weisenburger, Lawrence P., to AMP Incorporated. Flat cable connector. 4,160,573, Cl. 339-99.00R.  
 Weissler, Alain, to Peretz, Louis. Positioning system of the optical axes of an observation device for coupled images, and the observation device for such a system. 4,160,581, Cl. 350-133.000.  
 Wenninger, Fred, Jr.: See—  
 Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.  
 Wenskus, Herbert: See—  
 Meyen, Robert H.; Puttlitz, Karl J.; Schink, Karl; and Wenskus, Herbert, 4,160,893, Cl. 219-85.00A.  
 Wescom, Inc.: See—  
 Bishop, Larry D., 4,160,884, Cl. 179-170.00J.  
 Schorr, Ian A., 4,160,945, Cl. 323-17.000.  
 West Electric Company, Ltd.: See—  
 Tanaka, Kazuo, 4,160,933, Cl. 315-241.00P.  
 Western Electric Co., Inc.: See—  
 Esseluhn, Werner F., 4,160,642, Cl. 148-171.000.  
 Western Gold & Platinum Co.: See—  
 D'Silva, Thomas L., 4,160,854, Cl. 428-607.000.  
 Westinghouse Electric Corp.: See—  
 Fey, Maurice G.; and Harvey, Francis J., II, 4,160,867, Cl. 13-2.00P.  
 Jordan, Theodore M., 4,160,687, Cl. 425-225.000.  
 Martens, Alan; Radkevich, Thomas J.; and Smith, Jack R., 4,160,362, Cl. 60-39.18B.  
 Mims, James H.; and Hopwood, Francis W., 4,160,958, Cl. 331-178.000.  
 Phillips, D. Colin, 4,160,908, Cl. 250-381.000.  
 Wu, Shu-Yau, 4,161,038, Cl. 365-145.000.  
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 White, Thomas H., to Boeing Company, The. Operating station for aircraft refueling boom. 4,160,534, Cl. 244-135.00A.  
 Whiteside, George D.: See—  
 Johnson, Bruce K.; and Whiteside, George D., 4,160,589, Cl. 354-86.000.  
 Whitney, Donald S. Pick-up tool. 4,160,563, Cl. 294-19.00R.  
 Whybrew, Walter D.: See—  
 Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,160,817, Cl. 424-1.000.  
 Wiebe, Ken J.: See—  
 Bexten, Eugen; Logue, Robert W.; and Wiebe, Ken J., 4,160,490, Cl. 180-133.000.  
 Wikoff, Mark W., to Best & Donovan. Hand held band saw. 4,160,320, Cl. 30-380.000.  
 Wilbs, Thomas. Warm water heater. 4,160,475, Cl. 165-55.000.  
 Wilcox, Ralph S., to Chevron Research Company. Method for separating oils from water. 4,160,729, Cl. 210-40.000.  
 Wilhite, John E., to Honeywell Information Systems Inc. Hardware controlled transfers to microprogram control apparatus and return via microinstruction restart codes. 4,161,026, Cl. 364-200.000.  
 Wilkening, Hermann; and Loges, Hans-Joachim, to Iog Industrie-Offenbau GmbH. Apparatus for making a spiral coil having spaced turns. 4,160,371, Cl. 72-147.000.  
 Wilkinson, Stanley B., to General Electric Company. Ground distance relay employing phase comparator measurement. 4,161,011, Cl. 361-80.000.  
 Wilkinson, Victor E. Racing muzzle for dogs. 4,160,428, Cl. 119-133.000.  
 Will Ross Inc.: See—  
 Rauschenberger, Richard A., 4,160,383, Cl. 73-422.00R.  
 Rauschenberger, Richard A., 4,160,505, Cl. 206-571.000.  
 Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, to Cincinnati Milacron, Inc. Method of inhibiting skin irritation. 4,160,819, Cl. 424-45.000.  
 Williams, Ralph E.: See—  
 Snyder, William H.; Williams, Ralph E.; and Wisotski, John, 4,160,412, Cl. 102-20.000.  
 Williams, Richard; and Bloom, Allen, to RCA Corporation. Process for storing solar energy in the form of an electrochemically generated compound. 4,160,816, Cl. 423-648.00R.  
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Williams, Robert M. Fluid bed separator apparatus for processing waste material to recover burnables. 4,160,653, Cl. 55-315.000.  
 Willis, Gordon, to Symot Limited. Reversible page turner. 4,160,334, Cl. 40-531.000.  
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 Winblad, Michael E. Drill containing minimum cutting material. 4,160,616, Cl. 408-144.000.  
 Winchell, David A., to Baxter Travenol Laboratories, Inc. Plastic container with auxiliary tube retention means. 4,160,473, Cl. 150-0.500.  
 Windings, Inc.: See—  
 Kotzur, Frank W.; and Zajac, Ronald E., 4,160,533, Cl. 242-137.100.  
 Winkler & Dunneber Maschinenfabrik und Eisengiesserei KG: See—  
 Stemmler, Kurt; Langenbeck, Peter; and Ehscheid, Gunter, 4,160,894, Cl. 219-121.00L.  
 Winters, Donald R. Post and rail interconnection. 4,160,542, Cl. 256-70.000.  
 Wiseman, Russell M., to Diamond Shamrock Corporation. Method for removing an entrained gas from a liquid medium. 4,160,716, Cl. 204-270.000.  
 Wisler, Allen E.: See—  
 Dill, Herbert C.; and Wisler, Allen E., 4,160,543, Cl. 266-252.000.  
 Wisner, Daniel A.: See—  
 McMillan, Andrew H.; and Wisner, Daniel A., 4,160,546, Cl. 271-263.000.  
 Wisniewski, Richard A.: See—  
 Morris, S. Brent; Valliere, Arthur, III; and Wisniewski, Richard A., 4,161,036, Cl. 364-900.000.  
 Wisotski, John: See—  
 Snyder, William H.; Williams, Ralph E.; and Wisotski, John, 4,160,412, Cl. 102-20.000.  
 Wolf, Horst, to Zinser Textilmaschinen GmbH. Method of and system for operating an induction motor. 4,160,940, Cl. 318-803.000.  
 Woodard, Kenneth E., Jr.: See—  
 Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,160,704, Cl. 204-32.00R.  
 Woodruff, Jed R. Hand loom having rotary heddle assembly. 4,160,467, Cl. 139-33.000.  
 Woolley, George C. Combined holder and sole accessory. 4,160,301, Cl. 12-120.500.  
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 Wright, Greta B., personal representative: See—  
 Wright, Duane H., deceased; and Meyer, Stephen F., 4,160,886, Cl. 200-5.00A.  
 Wrublewski, Thomas A.: See—  
 Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.  
 Wu, Che-Kuang: See—  
 Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, 4,160,654, Cl. 65-30.00E.  
 Wu, Shu-Yau, to Westinghouse Electric Corp. Complementary metal-ferroelectric semiconductor transistor structure and a matrix of such transistor structure for performing a comparison. 4,161,038, Cl. 365-145.000.  
 Wu, Tai-Wing, to Eastman Kodak Company. Ascorbic acid determination. 4,160,696, Cl. 435-25.000.  
 Wynn, Barry, to General Signal Corporation. Gear pumps with low pressure shaft lubrication. 4,160,630, Cl. 418-102.000.  
 Wynn, William H., to Monitek, Inc. Apparatus for measuring of particulate scattering in fluids. 4,160,914, Cl. 250-574.000.  
 Xerox Corporation: See—  
 Barton, Peter; and Lamb, Philip W. J., 4,160,547, Cl. 271-275.000.  
 Damouth, David E.; and Gunning, William F., 4,160,939, Cl. 318-723.000.  
 Yabe, Akira: See—  
 Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, 4,160,698, Cl. 435-173.000.  
 Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, to Honda Giken Kogyo Kabushiki Kaisha. Insert liner for divided auxiliary combustion chamber of engine. 4,160,431, Cl. 123-75.00B.  
 Yamada, Shigeru; and Aoki, Eiichi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,160,404, Cl. 84-1.260.  
 Yamamori, Takahiro: See—  
 Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, 4,160,392, Cl. 74-732.000.  
 Yamamoto, Takashi: See—  
 Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.  
 Yamashita, Yoshinari: See—  
 Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.

Yamazaki, Hiroyuki: See—  
 Nagasaki, Katsumi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; Yano, Akifumi; and Momose, Tetsuo, 4,160,662, Cl. 75-24.000.  
 Yamazaki, Takashi: See—  
 Shibagaki, Masahiro; Horiike, Yasuhiro; and Yamazaki, Takashi, 4,160,690, Cl. 156-643.000.  
 Yano, Akifumi: See—  
 Nagasaki, Katsumi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; Yano, Akifumi; and Momose, Tetsuo, 4,160,662, Cl. 75-24.000.  
 Yasuo, Sasaki, to Displaytek Corporation; and Daiwa Shinku Corporation. Electrostatic display assembly. 4,160,582, Cl. 350-269.000.  
 Yates, David J. C.: See—  
 Murrell, Lawrence L.; and Yates, David J. C., 4,160,745, Cl. 252-466.00J.  
 Yau, Wallace W.: See—  
 Kirkland, Joseph J.; and Yau, Wallace W., 4,160,728, Cl. 210-31.00C.  
 Yockey, Francis J.: See—  
 Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.  
 Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, to TDK Electronics Co., Ltd. Non-linear resistor. 4,160,748, Cl. 252-518.000.  
 Yoerger, William E.: See—  
 McCabe, John M.; and Yoerger, William E., 4,160,666, Cl. 96-1.00C.  
 Yoshimoto, Hiroyuki: See—  
 Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.  
 Yoshinaga, Makoto: See—  
 Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,160,699, Cl. 435-287.000.  
 Yoshioka, Yoshio: See—  
 Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, 4,160,888, Cl. 200-148.00A.  
 Youde, D.: See—  
 Austin-Brown, P.; Youde, D.; and Pond, R. F., 4,160,610, Cl. 403-407.000.  
 Young, Bruce, Jr. Shelf-supporting standards. 4,160,506, Cl. 211-86.000.  
 Young, Lewis B., to Mobil Oil Corporation. Disproportionation of toluene. 4,160,788, Cl. 585-475.000.  
 Yust, Paul R.: See—  
 Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,160,819, Cl. 424-45.000.  
 Zahir, Abdul-Cader: See—  
 Renner, Alfred; and Zahir, Abdul-Cader, 4,160,859, Cl. 528-322.000.  
 Zajac, Ronald E.: See—  
 Kotzur, Frank W.; and Zajac, Ronald E., 4,160,533, Cl. 242-137.100.  
 Zant, Fred: See—  
 Lyons, Paul; Zant, Fred; and Resnick, Charles, 4,160,338, Cl. 46-44.000.  
 Zasetsky, Petr A.: See—  
 Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.  
 Zbryski, William P.: See—  
 Lukac, Frederick S.; and Zbryski, William P., 4,160,677, Cl. 134-9.000.  
 Zeh, Horst: See—  
 Finsterwalder, Lorenz; Zeh, Horst; and Schaarschmidt, Ulrich, 4,160,382, Cl. 73-422.00R.  
 Zenith Radio Corporation: See—  
 Merrell, Richard G., 4,160,993, Cl. 358-21.00V.  
 Zenitz, Bernard L., to Sterling Drug Inc. 1-Acyl-3-(amino-lower-alkyl)-indoles. 4,160,862, Cl. 542-439.000.  
 Zhuchin, Vladimir N.: See—  
 Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.  
 Zimmermann, Detlef; Demircioglu, Sayman F.; and Kugler, Jindrich, to Northern Telecom Limited. Protection circuitry for cable transmission system. 4,161,008, Cl. 361-56.000.  
 Zinser Textilmaschinen GmbH: See—  
 Wolf, Horst, 4,160,940, Cl. 318-803.000.  
 Zuber, Werner: See—  
 Chard, Gerald L. P.; Haupt, Joachim; and Zuber, Werner, 4,160,890, Cl. 200-308.000.  
 Zurfluh, Thomas O.: See—  
 Novy, Russell F.; Scott, Gerald L.; and Zurfluh, Thomas O., 4,160,680, Cl. 148-16.500.

# LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Donaldson Company, Inc.: See—

Hiemstra, John R.; and Wagner, Wayne M., Re. 30,042, Cl. 285-419.000.

Hiemstra, John R.; and Wagner, Wayne M., to Donaldson Company, Inc. Exhaust system connector seal. Re. 30,042, Cl. 285-419.000.  
Wagner, Wayne M.: See—  
Hiemstra, John R.; and Wagner, Wayne M., Re. 30,042, Cl. 285-419.000.

# LIST OF PLANT PATENTEEES

Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree (43-G-587). 4,435, 7-10-79, Cl. 41.000.  
Gesellschaftsvertrag über die Erfindergemeinschaft "OPTIMARA": See—  
Holtkamp, Reinhold, 4,433, Cl. 69.000.  
Holtkamp, Reinhold, to Gesellschaftsvertrag über die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,433, 7-10-79, Cl. 69.000.

Hrebeniuk, Alexander. Poinsettia plant. 4,434, 7-10-79, Cl. 86.000.  
Marionnet, Andre, to Marionnet-Rabier, Jeanne. Strawberry plant. 4,432, 7-10-79, Cl. 49.000.  
Marionnet-Rabier, Jeanne: See—  
Marionnet, Andre, 4,432, Cl. 49.000.  
Nies, Marvin L. Cherry tree. 4,436, 7-10-79, Cl. 37.000.  
Reedley Nursery, Inc.: See—  
Anderson, Frederic W., 4,435, Cl. 41.000.

# LIST OF DESIGN PATENTEEES

Abrasives International, Limited: See—  
Ashworth, Stewart I., 252,349, Cl. D15-124.000.  
Akeret, Peter, to Zyliss Zysset AG. Fruit holder. 252,312, 7-10-79, Cl. D7-99.000.  
Alegria, Richard S. Shoe protector or similar article. 252,296, 7-10-79, Cl. D2-277.000.  
American Home Products Corporation: See—  
Brady, Joseph E., 252,342, Cl. D24-31.000.  
Amerock Corporation: See—  
Clayton, LaVerne E., 252,317, Cl. D8-350.000.  
Waters, Phillip A., 252,305, Cl. D6-181.000.  
AMF Incorporated: See—  
Landry, Thomas J., 252,313, Cl. D7-130.000.  
Ashworth, Stewart I., to Abrasives International, Limited. Abrading machine cabinet. 252,349, 7-10-79, Cl. D15-124.000.  
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., to Bell Telephone Laboratories, Incorporated. Telephone stand. 252,331, 7-10-79, Cl. D14-60.000.  
Bassinger, Frederick W., to K-tel International, Inc. Toy mold. 252,345, 7-10-79, Cl. D21-120.000.  
Baudon, Maurice C., to S.A. Ets Lardenois. Combined brush handle and back. 252,298, 7-10-79, Cl. D4-35.000.  
Bell Telephone Laboratories, Incorporated: See—  
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.  
Brady, Joseph E., to American Home Products Corporation. Tamper proof tray for hypodermic syringes. 252,342, 7-10-79, Cl. D24-31.000.  
BSR Limited: See—  
Leech, Leslie A., 252,330, Cl. D14-17.000.  
Cagle, Donald D. Combined fireplace grate and heater. 252,316, 7-10-79, Cl. D7-207.000.  
Cameron, Carl A., to Chrysler Corporation. Pair of automobile headlamp lenses. 252,352, 7-10-79, Cl. D48-32.00A.  
Chojna, Harry. Vehicle speedometer metric conversion label design. 252,320, 7-10-79, Cl. D10-103.000.  
Chojna, Harry. Vehicle speedometer metric conversion label. 252,321, 7-10-79, Cl. D10-103.000.  
Chrysler Corporation: See—  
Cameron, Carl A., 252,352, Cl. D48-32.00A.  
Clayton, LaVerne E., to Amerock Corporation. Escutcheon. 252,317, 7-10-79, Cl. D8-350.000.  
Combi Co., Ltd.: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 252,348, Cl. D21-134.000.  
Comercial Exportadora Banolense S.A.: See—  
Vinas, Lorenzo C., 252,297, Cl. D2-300.000.  
Current, Wayne A. Sewing machine work table or similar article. 252,304, 7-10-79, Cl. D6-179.000.

Dart Container Corporation: See—  
Dart, William A., 252,315, Cl. D7-138.000.  
Dart, William A., to Dart Container Corporation. Knife. 252,315, 7-10-79, Cl. D7-138.000.  
Denhoff, Myron L. Combined display rack and selection console. 252,306, 7-10-79, Cl. D6-188.000.  
Dunlop Limited: See—  
Gill, Barrington S.; and Hart, Claude A., 252,326, Cl. D12-141.000.  
Shirashoji, Hisashi, 252,327, Cl. D12-142.000.  
Educational Calculator Devices, Inc.: See—  
McCarty, George S., 252,301, Cl. D6-155.000.  
Engstrom, John G.: See—  
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.  
Flambeau Products Corporation: See—  
Uyeda, Tim M., 252,354, Cl. D3-30.000.  
Freedman Aircraft Engineering Corp.: See—  
Hosmer, Max E., 252,307, Cl. D6-191.000.  
Funahashi, Takaji. Felt tip pen. 252,333, 7-10-79, Cl. D19-47.000.  
Genaro, Donald M.: See—  
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.  
Gill, Barrington S.; and Hart, Claude A., to Dunlop Limited. Tire. 252,326, 7-10-79, Cl. D12-141.000.  
Glassman, Fredrick G. Light fixture. 252,351, 7-10-79, Cl. D48-23.00R.  
Glassman, Fredrick R. Light fixture. 252,350, 7-10-79, Cl. D48-3.000.  
Goldpaint, Leon. Toy ship. 252,335, 7-10-79, Cl. D21-130.000.  
Grippi, Vincent, Jr. Fish hook and leader holder. 252,336, 7-10-79, Cl. D22-23.000.  
Hart, Claude A.: See—  
Gill, Barrington S.; and Hart, Claude A., 252,326, Cl. D12-141.000.  
Hawkins, Larry D.: See—  
Parker, William E.; Parker, William E., Jr.; and Hawkins, Larry D., 252,344, Cl. D21-22.000.  
Hehnen, James M. Chlorinator for swimming pools. 252,337, 7-10-79, Cl. D23-3.000.  
Hori, Makoto; and Nakano, Hiroshi. Motorcycle. 252,325, 7-10-79, Cl. D12-110.000.  
Hosmer, Max E., to Freedman Aircraft Engineering Corp. Drawer suspension frame. 252,307, 7-10-79, Cl. D6-191.000.  
Ilich, John. Game board. 252,343, 7-10-79, Cl. D21-30.000.  
Ishii, Yoshiyasu: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 252,348, Cl. D21-134.000.  
Item House, Inc.: See—  
Persky, Warren E., 252,302, Cl. D6-157.000.  
Persky, Warren E., 252,303, Cl. D6-157.000.  
John, Julius F., to Norco Industries, Inc. Stabilizer jack. 252,324, 7-10-79, Cl. D12-55.000.

# LIST OF DESIGN PATENTEEES

PI 27

Johnson, Russell C. Finger ring. 252,322, 7-10-79, Cl. D11-31.000.  
Jonsson, Nils G., to National Service Industries, Inc. Circuit connector module. 252,329, 7-10-79, Cl. D13-24.000.  
K-tel International, Inc.: See—  
Bassinger, Frederick W., 252,345, Cl. D21-120.000.  
Kopel, Paul S. Clock. 252,319, 7-10-79, Cl. D10-25.000.  
Kriegner, George W. Golf cart carried open umbrella holder. 252,318, 7-10-79, Cl. D8-373.000.  
Landry, Thomas J., to AMF Incorporated. Heat storage base for dinnerware. 252,313, 7-10-79, Cl. D7-130.000.  
Leech, Leslie A., to BSR Limited. Record player. 252,330, 7-10-79, Cl. D14-17.000.  
Ludwig Industries: See—  
Mikosz, Daniel S., 252,353, Cl. D17-22.000.  
Marshall, Simeon, to Rachengold-Werk Adolf Speck. Display rack. 252,299, 7-10-79, Cl. D6-23.000.  
Matsuda, Hiroaki: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 252,348, Cl. D21-134.000.  
McCarty, George S., to Educational Calculator Devices, Inc. Combined lectern and display calculator. 252,301, 7-10-79, Cl. D6-155.000.  
McGarvey, John N.: See—  
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.  
Mikosz, Daniel S., to Ludwig Industries. Drum lug. 252,353, 7-10-79, Cl. D17-22.000.  
Miramar of California: See—  
Schwartz, Michel, 252,309, Cl. D7-3.000.  
Molenaar, Lester V. Key chain fob. 252,323, 7-10-79, Cl. D11-81.000.  
Moneta S.p.A.: See—  
Prussi, Graziano, 252,311, Cl. D7-97.000.  
Moore, James T., Sr. Combined motorcycle gas tank, radio and tape deck. 252,328, 7-10-79, Cl. D12-155.000.  
Nakano, Hiroshi: See—  
Hori, Makoto; and Nakano, Hiroshi, 252,325, Cl. D12-110.000.  
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Combined toy vehicle and removable figures therefor. 252,348, 7-10-79, Cl. D21-134.000.  
National Service Industries, Inc.: See—  
Jonsson, Nils G., 252,329, Cl. D13-24.000.  
National Union Electric Corporation: See—  
Schaefer, Harold W., 252,332, Cl. D15-53.000.  
Norco Industries, Inc.: See—  
John, Julius F., 252,324, Cl. D12-55.000.  
Ochwat, Robert J. Sleeping bag. 252,308, 7-10-79, Cl. D6-268.000.  
Okano, Masao, to Toyo Valve Co., Ltd. Valve handle. 252,339, 7-10-79, Cl. D23-30.000.  
Okano, Masao, to Toyo Valve Co., Ltd. Valve handle. 252,340, 7-10-79, Cl. D23-30.000.

Oneida Ltd.: See—  
Richmond, Colin B., II, 252,314, Cl. D7-37.000.  
Parker, William E.; Parker, William E., Jr.; and Hawkins, Larry D. Biblical game board. 252,344, 7-10-79, Cl. D21-22.000.  
Parker, William E., Jr.: See—  
Parker, William E.; Parker, William E., Jr.; and Hawkins, Larry D., 252,344, Cl. D21-22.000.  
Persky, Warren E., to Item House, Inc. Jewelry caddy. 252,302, 7-10-79, Cl. D6-157.000.  
Persky, Warren E., to Item House, Inc. Jewelry caddy. 252,303, 7-10-79, Cl. D6-157.000.  
Prussi, Graziano, to Moneta S.p.A. Decorated cooking pot or similar article. 252,311, 7-10-79, Cl. D7-97.000.  
Pryor, John W. Mobile intravenous stand. 252,300, 7-10-79, Cl. D6-28.000.  
Rachengold-Werk Adolf Speck: See—  
Marshall, Simeon, 252,299, Cl. D6-23.000.  
Richmond, Colin B., II, to Oneida Ltd. Spoon or similar article. 252,314, 7-10-79, Cl. D7-37.000.  
Ryder International Corporation: See—  
Thomas, Michael D., 252,341, Cl. D24-29.000.  
Schaefer, Harold W., to National Union Electric Corporation. Wide track vacuum cleaner housing. 252,332, 7-10-79, Cl. D15-53.000.  
Schwartz, Michel, to Miramar of California. Dinnerware set. 252,309, 7-10-79, Cl. D7-3.000.  
Shannon, Marvin B. Plastic cup holder. 252,310, 7-10-79, Cl. D7-70.000.  
Shirashoji, Hisashi, to Dunlop Limited. Tire. 252,327, 7-10-79, Cl. D12-142.000.  
Skinner, Clifton D. Kitchen faucet. 252,338, 7-10-79, Cl. D23-23.000.  
Small, Donald I. Desk top file. 252,334, 7-10-79, Cl. D19-90.000.  
S.A. Ets Lardenois: See—  
Baudon, Maurice C., 252,298, Cl. D4-35.000.  
Solheim, John S. Skateboard. 252,346, 7-10-79, Cl. D21-227.000.  
Solheim, John S. Skateboard. 252,347, 7-10-79, Cl. D21-227.000.  
Thomas, Michael D., to Ryder International Corporation. Testing tray. 252,341, 7-10-79, Cl. D24-29.000.  
Toyo Valve Co., Ltd.: See—  
Okano, Masao, 252,339, Cl. D23-30.000.  
Okano, Masao, 252,340, Cl. D23-30.000.  
Uber, Robert N. Gaming pouch for Keno or the like. 252,355, 7-10-79, Cl. D3-48.000.  
Uyeda, Tim M., to Flambeau Products Corporation. Battery box. 252,354, 7-10-79, Cl. D3-30.000.  
Vinas, Lorenzo C., to Comercial Exportadora Banolense S.A. Slipper. 252,297, 7-10-79, Cl. D2-300.000.  
Waters, Phillip A., to Amerock Corporation. Display unit. 252,305, 7-10-79, Cl. D6-181.000.  
Zyliss Zysset AG: See—  
Akeret, Peter, 252,312, Cl. D7-99.000.



# CLASSIFICATION OF PATENTS

ISSUED JULY 10, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 4	CLASS 46	4,160,383	275	4,160,424	187	4,160,683	632	4,160,501
146 4,160,292	26 4,160,337	462 4,160,384	CLASS 115	CLASS 150	CLASS 200			
295 4,160,293	44 4,160,338	622 4,160,385	6.1 4,160,425	0.5 4,160,473	1 R 4,160,885			
324 4,160,294	232 4,160,339	625 4,160,386	CLASS 118	CLASS 156	5 A 4,160,886			
420 4,160,295	CLASS 47	639 4,160,387	323 4,160,426	69 4,160,684	61.62 4,160,887			
	27 4,160,340	646 4,160,388	CLASS 119	219 4,160,685	148 A 4,160,888			
285 4,160,296	28 R 4,160,341	89.18 4,160,389	5 4,160,427	331 4,160,686	163 4,160,889			
	80 4,160,342	574 4,160,390	133 4,160,428	444 4,160,687	308 4,160,890			
CLASS 8	CLASS 48	661 4,160,391	CLASS 123	574 4,160,688	CLASS 204			
12 4,160,642	214 A 4,160,649	732 4,160,392	32 EB 4,160,429	583.1 4,160,689	1 T 4,160,702			
26 4,160,643	CLASS 49	750 B 4,160,393	75 B 4,160,430	643 4,160,690	15 4,160,703			
156 4,160,297	90 4,160,343	CLASS 75	4,160,431	664 4,160,691	32 R 4,160,704			
	CLASS 51	12 4,160,661	4,160,432	CLASS 159	37 R 4,160,705			
14 4,160,298	16 4,160,650	24 4,160,662	4,160,433	6 W 4,160,692	4,160,706			
347 4,160,299	CLASS 52	35 4,160,663	4,160,434	CLASS 162	4,160,707			
	39 4,160,344	49 4,160,664	140 FG 4,160,435	24 4,160,693	4,160,708			
CLASS 12	81 4,160,345	171 4,160,665	148 CC 4,160,436	256 4,160,694	4,160,709			
120.5 4,160,301	96 4,160,346	CLASS 81	190 B 4,160,436	CLASS 164	4,160,710			
CLASS 13	199 4,160,347	64 4,160,394	CLASS 124	73 4,160,474	4,160,711			
2 P 4,160,867	202 4,160,348	5 4,160,395	35 A 4,160,437	CLASS 165	4,160,712			
11 4,160,868	481 4,160,349	CLASS 83	11 TP 4,160,438	55 4,160,475	4,160,713			
33 4,160,869	696 4,160,350	100 4,160,396	16 R 4,160,439	171 4,160,476	4,160,714			
CLASS 15	CLASS 53	661 4,160,397	CLASS 126	172 4,160,477	4,160,715			
340 4,160,302	76 4,160,351	865 4,160,398	110 R 4,160,440	CLASS 166	4,160,716			
349 4,160,303	137 4,160,352	CLASS 84	127 4,160,441	55.1 4,160,478	4,160,502			
CLASS 16	497 4,160,353	1.03 4,160,399	140 4,160,442	267 4,160,479	4,160,503			
49 4,160,304	4,160,354	1.13 4,160,400	270 4,160,443	269 4,160,480	4,160,504			
CLASS 17	CLASS 55	1.16 4,160,401	271 4,160,444	272 4,160,481	4,160,505			
4,160,305	26 4,160,651	1.24 4,160,402	369.1 4,160,445	284 4,160,482	CLASS 208			
CLASS 23	46 4,160,652	1.26 4,160,404	CLASS 127	307 4,160,483	11 LE 4,160,718			
230 B 4,160,644	315 4,160,653	CLASS 89	46 A 4,160,675	317 4,160,484	11 R 4,160,719			
230 R 4,160,646	CLASS 56	7 4,160,405	CLASS 128	CLASS 172	4,160,720			
CLASS 24	98 4,160,355	CLASS 91	1 R 4,160,446	9 4,160,485	4,160,721			
205 R 4,160,306	192 4,160,356	483 4,160,403	152 4,160,449	CLASS 173	4,160,722			
CLASS 28	329 4,160,357	CLASS 93	214.4 4,160,450	135 4,160,486	CLASS 210			
220 4,160,307	344 4,160,358	36.3 4,160,406	4,160,451	CLASS 174	4,160,723			
CLASS 29	CLASS 57	CLASS 96	260 4,160,452	14 R 4,160,870	4,160,724			
2 4,160,309	58.89 4,160,359	1 PC 4,160,666	330 4,160,453	84 R 4,160,871	4,160,725			
25.14 4,160,310	81 4,160,360	1.5 R 4,160,667	348 4,160,454	101.5 4,160,872	4,160,726			
25.15 4,160,311	CLASS 59	1.8 4,160,668	400 4,160,455	CLASS 178	4,160,727			
429 4,160,312	82 4,160,361	27 E 4,160,669	673 4,160,448	58 R 4,160,873	4,160,728			
525 4,160,313	39.18 B 4,160,362	91 D 4,160,671	735 4,160,447	69 G 4,160,874	4,160,729			
558 4,160,314	290 4,160,363	119 R 4,160,670	CLASS 130	CLASS 179	4,160,730			
588 4,160,308	293 4,160,364	CLASS 98	27 T 4,160,456	1.5 M 4,160,875	4,160,731			
603 4,160,315	606 4,160,365	115 R 4,160,407	6 4,160,676	15 AT 4,160,876	4,160,732			
734 4,160,316	CLASS 62	CLASS 99	9 4,160,677	15 BA 4,160,877	4,160,733			
749 4,160,317	476 4,160,366	348 4,160,408	167 C 4,160,457	18 BC 4,160,878	4,160,734			
CLASS 30	CLASS 65	CLASS 100	CLASS 135	90 AN 4,160,879	4,160,735			
113 4,160,318	30 E 4,160,654	257 4,160,409	5 AT 4,160,458	98 4,160,880	4,160,736			
122 4,160,319	30 R 4,160,655	CLASS 101	CLASS 136	111 E 4,160,881	4,160,737			
380 4,160,320	CLASS 68	41 4,160,410	89 SJ 4,160,678	111 R 4,160,882	4,160,738			
383 4,160,321	17 R 4,160,367	CLASS 102	CLASS 137	114 M 4,160,883	CLASS 211			
CLASS 32	CLASS 70	7 4,160,411	13 4,160,459	170 J 4,160,884	4,160,506			
14 C 4,160,322	417 4,160,368	20 4,160,412	72 4,160,460	CLASS 180	4,160,891			
22 4,160,323	456 R 4,160,369	24 HC 4,160,413	337 4,160,461	68 R 4,160,487	4,160,892			
CLASS 33	CLASS 71	65.2 4,160,414	529 4,160,462	133 4,160,490	4,160,893			
125 R 4,160,328	21 4,160,656	214 4,160,415	596.18 4,160,463	168 4,160,488	4,160,894			
137 R 4,160,324	41 4,160,657	215 4,160,416	CLASS 138	282 4,160,489	4,160,895			
148 D 4,160,325	90 4,160,658	221 4,160,417	93 4,160,464	CLASS 181	4,160,896			
174 D 4,160,327	95 4,160,659	CLASS 104	97 4,160,465	284 4,160,491	4,160,897			
174 R 4,160,326	118 4,160,660	2 4,160,418	115 4,160,466	CLASS 182	4,160,510			
178 D 4,160,329	CLASS 72	10 4,160,419	CLASS 139	2 4,160,492	4,160,511			
200 4,160,330	42 4,160,370	CLASS 105	33 4,160,467	122 4,160,493	4,160,512			
CLASS 36	147 4,160,371	367 4,160,420	453 4,160,468	CLASS 188	4,160,513			
59 B 4,160,331	404 4,160,372	CLASS 106	CLASS 140	270 4,160,494	4,160,514			
119 4,160,332	CLASS 73	39.6 4,160,672	115 4,160,469	18 A 4,160,495	4,160,515			
CLASS 40	23 4,160,373	45 4,160,673	CLASS 144	43 4,160,496	4,160,516			
322 4,160,333	76 4,160,374	89 4,160,674	3 B 4,160,470	CLASS 190	4,160,517			
531 4,160,334	104 4,160,375	CLASS 110	176 4,160,471	0.098 4,160,499	4,160,518			
CLASS 43	113 4,160,376	173 R 4,160,421	194 4,160,472	84 C 4,160,498	4,160,519			
131 4,160,335	141 A 4,160,377	CLASS 112	CLASS 148	CLASS 196	4,160,520			
132 A 4,160,336	146 4,160,378	121.11 4,160,422	1.5 4,160,679	116 4,160,701				
CLASS 44	229 4,160,379	121.12 4,160,423	16.5 4,160,680	CLASS 198				
63 4,160,648	322.5 4,160,380		171 4,160,682	457 4,160,500				
	422 R 4,160,382							

CLASS 233	403	4,160,773	327	4,160,571	CLASS 346	492	4,161,026	52	4,160,822	
27	4,160,521	424	4,160,774	CLASS 313	75	4,160,982	492	4,161,027	70	4,160,823
CLASS 235	448.2 E	4,160,775	112	4,160,929	CLASS 350	579	4,161,028	84	4,160,824	
92 PE	4,160,898	456 F	4,160,776	217	4,160,930	581	4,161,029	85	4,160,825	
101	4,160,899	502 R	4,160,777	498	4,160,931	709	4,161,030	180	4,160,826	
132 E	4,160,900	502.5	4,160,778	CLASS 315	89	4,160,577	4,161,031	199	4,160,827	
437	4,160,901	513 F	4,160,779	169.4	4,160,932	96.14	4,160,578	714	4,161,032	
454	4,160,922	544 D	4,160,780	241 P	4,160,933	96.21	4,160,579	728	4,161,033	
CLASS 237	555 C	4,160,781	169.4	4,160,934	120	4,160,580	822	4,161,034	246	4,160,829
1 A	4,160,523	556 AR	307	4,160,935	133	4,160,581	900	4,161,035	248.56	4,160,830
51	4,160,524	570 AB	370	4,160,936	269	4,160,582	4,161,036	249	4,160,831	
CLASS 239	583 P	4,160,784	388	4,160,937	CLASS 351	51	4,161,037	250	4,160,832	
332	4,160,525	586 D	39	4,160,938	49	4,160,584	4,161,038	253	4,160,833	
427	4,160,526	937 R	82	4,160,939	CLASS 352	145	4,161,039	267	4,160,835	
CLASS 242	586 D	4,160,786	723	4,160,940	87	4,160,585	203	4,161,040	269	4,160,837
47	4,160,527	803	803	4,160,940	CLASS 353	244	4,161,041	270	4,160,839	
56 R	4,160,528	CLASS 264	CLASS 320	5	4,160,586	CLASS 365	249	4,160,841	270	4,160,840
56.6	4,160,529	60	4,160,796	25	4,160,587	CLASS 366	250	4,160,842	273 R	4,160,842
68.2	4,160,530	81	4,160,797	31	4,160,588	CLASS 400	253	4,160,843	274	4,160,843
78.1	4,160,531	213	4,160,798	86	4,160,589	CLASS 403	256	4,160,844	278	4,160,844
125.1	4,160,532	342 R	4,160,799	195	4,160,590	CLASS 405	257	4,160,845	283	4,160,846
137.1	4,160,533	345	4,160,800	234	4,160,591	CLASS 406	258	4,160,846	288	4,160,846
CLASS 244	135 A	252	4,160,543	235	4,160,592	CLASS 407	259	4,160,847	298	4,160,845
CLASS 248	94	166	4,160,544	246	4,160,593	CLASS 408	260	4,160,848	CLASS 425	
280.1	4,160,536	CLASS 266	CLASS 267	317	4,160,594	CLASS 409	261	4,160,849	10	4,160,631
CLASS 250	106	166	4,160,545	324	4,160,595	CLASS 410	262	4,160,850	62	4,160,632
199	4,160,903	CLASS 271	CLASS 272	324	4,160,596	CLASS 411	263	4,160,851	85	4,160,633
201	4,160,904	106	4,160,546	324	4,160,597	CLASS 412	264	4,160,852	112	4,160,634
311	4,160,905	263	4,160,547	324	4,160,598	CLASS 413	265	4,160,853	128	4,160,635
322	4,160,906	275	4,160,548	324	4,160,599	CLASS 414	266	4,160,854	129 R	4,160,636
330	4,160,907	CLASS 273	CLASS 274	324	4,160,600	CLASS 415	267	4,160,855	302.1	4,160,638
381	4,160,908	1 M	4,160,549	324	4,160,601	CLASS 416	268	4,160,856	383	4,160,639
402	4,160,909	29 A	4,160,550	324	4,160,602	CLASS 417	269	4,160,857	CLASS 426	
432 PD	4,160,910	176 F	4,160,551	324	4,160,603	CLASS 418	270	4,160,858	1	4,160,847
445 T	4,160,911	124	4,160,552	324	4,160,604	CLASS 419	271	4,160,859	24	4,160,848
461 R	4,160,912	CLASS 280	CLASS 281	324	4,160,605	CLASS 420	272	4,160,860	94	4,160,849
468	4,160,913	21 R	4,160,553	324	4,160,606	CLASS 421	273	4,160,861	601	4,160,850
563	4,160,914	87.02 W	4,160,554	324	4,160,607	CLASS 422	274	4,160,862	CLASS 427	
574	4,160,915	87.04 A	4,160,555	324	4,160,608	CLASS 423	275	4,160,863	379	4,160,851
CLASS 252	612	612	4,160,556	324	4,160,609	CLASS 424	276	4,160,864	CLASS 428	
34	4,160,739	618	4,160,557	324	4,160,610	CLASS 425	277	4,160,865	192	4,160,852
75	4,160,740	652	4,160,558	324	4,160,611	CLASS 426	278	4,160,866	405	4,160,853
182	4,160,741	797	4,160,559	324	4,160,612	CLASS 427	279	4,160,867	627	4,160,854
344	4,160,742	CLASS 285	CLASS 286	324	4,160,613	CLASS 428	280	4,160,868	621	4,160,855
411 R	4,160,743	156	4,160,559	324	4,160,614	CLASS 429	281	4,160,869	CLASS 429	
440	4,160,744	419	Re.30,042	324	4,160,615	CLASS 430	282	4,160,870	14	4,160,856
466 J	4,160,745	CLASS 292	CLASS 293	324	4,160,616	CLASS 431	283	4,160,871	97	4,160,857
468	4,160,746	101	4,160,560	324	4,160,617	CLASS 432	284	4,160,872	CLASS 431	
506	4,160,747	CLASS 293	CLASS 294	324	4,160,618	CLASS 433	285	4,160,873	9	4,160,640
518	4,160,748	1	4,160,561	324	4,160,619	CLASS 434	286	4,160,874	CLASS 432	
CLASS 254	50.3	120	4,160,562	324	4,160,620	CLASS 435	287	4,160,875	59	4,160,641
89 R	4,160,537	CLASS 294	CLASS 295	324	4,160,621	CLASS 436	288	4,160,876	CLASS 435	
106	4,160,538	19 R	4,160,563	324	4,160,622	CLASS 437	289	4,160,877	25	4,160,696
134.3 PA	4,160,539	CLASS 297	CLASS 298	324	4,160,623	CLASS 438	290	4,160,878	101	4,160,695
192	4,160,541	131	4,160,564	324	4,160,624	CLASS 439	291	4,160,879	173	4,160,698
CLASS 256	483	483	4,160,565	324	4,160,625	CLASS 440	292	4,160,880	194	4,160,697
70	4,160,542	CLASS 299	CLASS 300	324	4,160,626	CLASS 441	293	4,160,881	287	4,160,699
CLASS 260	2.3	30	4,160,566	324	4,160,627	CLASS 442	294	4,160,882	298	4,160,700
17.4 ST	4,160,750	CLASS 307	CLASS 308	324	4,160,628	CLASS 443	295	4,160,883	CLASS 525	
23.5 A	4,160,751	10 R	4,160,916	324	4,160,629	CLASS 444	296	4,160,884	148	4,160,792
27 BB	4,160,752	64	4,160,917	324	4,160,630	CLASS 445	297	4,160,885	179	4,160,790
29.2 TN	4,160,753	205	4,160,918	324	4,160,631	CLASS 446	298	4,160,886	230	4,160,793
29.4 R	4,160,754	216	4,160,919	324	4,160,632	CLASS 447	299	4,160,887	409	4,160,789
29.6 H	4,160,755	252 C	4,160,920	324	4,160,633	CLASS 448	300	4,160,888	CLASS 528	
29.6 M	4,160,756	252 M	4,160,921	324	4,160,634	CLASS 449	301	4,160,889	14	4,160,858
31.2 N	4,160,757	261	4,160,922	324	4,160,635	CLASS 450	302	4,160,890	322	4,160,859
40 R	4,160,758	308	4,160,923	324	4,160,636	CLASS 451	303	4,160,891	CLASS 536	
42.21	4,160,759	CLASS 308	CLASS 309	324	4,160,637	CLASS 452	304	4,160,892	5	4,160,860
42.47	4,160,760	159	4,160,568	324	4,160,638	CLASS 453	305	4,160,893	17 A	4,160,861
45.75 S	4,160,761	203	4,160,569	324	4,160,639	CLASS 454	306	4,160,894	439	4,160,862
112 B	4,160,762	CLASS 310	CLASS 311	324	4,160,640	CLASS 455	307	4,160,895	CLASS 544	
206	4,160,763	17	4,160,924	324	4,160,641	CLASS 456	308	4,160,896	30	4,160,863
239 BB	4,160,764	160	4,160,925	324	4,160,642	CLASS 457	309	4,160,897	CLASS 560	
243.3	4,160,765	215	4,160,926	324	4,160,643	CLASS 458	310	4,160,898	2	4,160,864
244.4	4,160,766	302	4,160,927	324	4,160,644	CLASS 459	311	4,160,899	22	4,160,865
306.7 T	4,160,767	353	4,160,928	324	4,160,645	CLASS 460	312	4,160,900	25	4,160,866
343	4,160,768	CLASS 312	CLASS 313	324	4,160,646	CLASS 461	313	4,160,901	CLASS 585	
343.3 P	4,160,769	245	4,160,570	324	4,160,647	CLASS 462	314	4,160,902	475	4,160,788
346.11	4,160,771	CLASS 313	CLASS 314	324	4,160,648	CLASS 463	315	4,160,903	2	4,160,822
397.1	4,160,772	112	4,160,929	75	4,160,982	CLASS 464	316	4,160,904	70	4,160,823
		217	4,160,930	112	4,160,929	CLASS 465	317	4,160,905	84	4,160,824
		498	4,160,931	217	4,160,930	CLASS 466	318	4,160,906	85	4,160,825
				498	4,160,931	CLASS 467	319	4,160,907	180	4,160,826
						CLASS 468	320	4,160,908	199	4,160,827
						CLASS 469	321	4,160,909	200	4,160,828
						CLASS 470	322	4,160,910	246	4,160,829
						CLASS 471	323	4,160,911	248.56	4,160,830
						CLASS 472	324	4,160,912	249	4,160,831
						CLASS 473	325	4,160,913	250	4,160,832
						CLASS 474	326	4,160,914	253	4,160,833
						CLASS 475	327	4,160,915	263	4,160,835
						CLASS 476	328	4,160,916	267	4,160,837
						CLASS 477	329	4,160,917	269	4,160,838
						CLASS 478	330	4,160,918	270	4,160,839
						CLASS 479	331	4,160,919	270	4,160,840
						CLASS 480	332	4,160,920	273 R	4,160,842
						CLASS 481	333	4,160,921	274	4,160,842
						CLASS 482	334	4,160,922	278	4,160,843
						CLASS 483	335	4,160,923	283	4,160,844
						CLASS 484	336	4,160,924	288	4,160,846
						CLASS 485	337	4,160,925	298	4,160,845
						CLASS 486	338	4,160,926	CLASS 425	
						CLASS 487	339	4,160,927	10	4,160,631
						CLASS 488	340	4,160,928	62	4,160,632
						CLASS 489	341	4,160,929	85	4,160,633
						CLASS 490	342	4,160,930	112	4,160,634
						CLASS 491	343	4,160,931	128	4,160,635
						CLASS 492	344	4,160,932	129 R	4,160,636
						CLASS 493	345	4,160,933	302.1	4,160,638
						CLASS 494	346	4,160,934	383	4,160,639
						CLASS 495	347	4,160,935	CLASS 426	
						CLASS 496	348	4,160,936	1	4,160,847
						CLASS 497	349	4,		

D2—	277	252,296	179	252,304	130	252,313	D12—	55	252,324	D17—	22	252,353	D22—	23	252,336
	300	252,297	181	252,305	138	252,315		110	252,325	D19—	47	252,333	D23—	3	252,337
D3—	30	252,354	188	252,306	207	252,316		141	252,326		90	252,334	D24—	23	252,338
	48	252,355	191	252,307	350	252,317	D8—	142	252,327	D21—	22	252,344	D25—	30	252,339
D4—	35	252,298	268	252,308	373	252,318		155	252,328		30	252,343		30	252,340
D6—	23	252,299		3	252,309	D10—	25	252,319	D13—	24	252,329		D24—	29	252,341
	28	252,300	D7—	37	252,314		103	252,320	D14—	17	252,330			31	252,342
	155	252,301		70	252,310			252,321		60	252,331		D48—	29	252,343
	157	252,302		97	252,311	D11—	31	252,322	D15—	53	252,332			23 R	252,350
		252,303		99	252,312		81	252,323		124	252,349			32 A	252,351
															252,352

P.—	37	4,436	41	4,435	49	4,432	69	4,433	86	4,434
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# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

4 : 4,160,961	4,160,811	4,160,356	4,160,927	4,160,348	4,160,997
4,160,976	4,160,815	4,160,400	4,160,958	4,160,420	4,161,033
4,161,026	4,160,845	4,160,410	4,161,032	4,160,607	4,161,034
6 : 4,160,347	4,160,854	4,160,451	4,161,036	4,160,622	4,160,368
4,160,476	4,160,882	4,160,456	4,161,041	4,160,777	4,160,402
4,160,512	4,160,883	4,160,502	4,160,318	4,160,807	4,160,425
4,160,522	4,160,921	4,160,503	4,160,325	4,160,820	4,160,449
4,160,540	4,160,926	4,160,509	4,160,330	4,160,850	4,160,459
4,160,645	4,160,941	4,160,517	4,160,427	4,160,623	4,160,465
4,160,727	4,160,949	4,160,548	4,160,434	4,160,500	4,160,494
4,160,808	4,160,978	4,160,552	4,160,446	4,160,544	4,160,533
4,160,914	4,160,985	4,160,574	4,160,448	4,160,653	4,160,549
4,160,963	4,160,988	4,160,618	4,160,569	4,160,658	4,160,578
4,160,984	4,160,994	4,160,649	4,160,584	4,161,000	4,160,588
8 : 4,160,324	4,161,004	4,160,667	4,160,589	4,160,333	4,160,593
4,160,412	4,161,009	4,160,680	4,160,590	4,160,450	4,160,604
9 : 4,160,518	4,161,018	4,160,760	4,160,629	4,160,659	4,160,634
4,160,776	4,161,020	4,160,873	4,160,641	4,160,644	4,160,655
4,160,846	4,161,021	4,160,880	4,160,726	4,160,304	4,160,666
4,160,828	4,161,023	4,160,885	4,160,752	4,160,586	4,160,679
04 : 4,160,507	4,160,904	4,160,916	4,160,803	4,160,800	4,160,691
4,160,295	4,161,017	4,160,924	4,160,857	4,160,353	4,160,696
06 : 4,160,300	4,161,031	4,160,945	4,160,876	4,160,385	4,160,705
4,160,308	4,160,335	4,160,982	4,160,877	4,160,407	4,160,706
4,160,309	4,160,373	4,160,993	4,160,887	4,160,415	4,160,708
4,160,315	4,160,397	4,161,012	4,160,942	4,160,416	4,160,750
4,160,345	4,160,443	4,160,493	4,160,952	4,160,422	4,160,755
4,160,399	4,160,474	4,160,513	4,160,970	4,160,424	4,160,769
4,160,405	4,160,564	4,160,531	4,160,975	4,160,526	4,160,775
4,160,433	4,160,599	4,160,608	4,160,992	4,160,553	4,160,785
4,160,437	4,160,678	4,160,731	4,161,013	4,160,598	4,160,793
4,160,444	4,160,767	4,161,024	4,161,024	4,160,741	4,160,842
4,160,452	4,160,834	4,160,316	4,160,316	4,160,745	4,160,858
4,160,461	4,160,956	4,160,326	4,160,326	4,160,746	4,160,862
4,160,488	4,160,958	4,160,349	4,160,349	4,160,758	4,160,864
4,160,495	4,160,728	4,160,350	4,160,350	4,160,759	4,160,875
4,160,508	4,160,780	4,160,357	4,160,357	4,160,771	4,160,879
4,160,554	4,160,579	4,160,370	4,160,370	4,160,772	4,160,893
4,160,560	4,160,340	4,160,458	4,160,379	4,160,781	4,160,898
4,160,568	4,160,376	4,160,516	4,160,483	4,160,788	4,160,910
4,160,568	4,160,406	4,160,839	4,160,546	4,160,790	4,160,917
4,160,571	4,160,624	4,160,293	4,160,559	4,160,801	4,160,936
4,160,575	4,160,786	4,160,806	4,160,684	4,160,816	4,160,939
4,160,597	4,160,903	4,160,463	4,160,700	4,160,821	4,160,959
4,160,601	4,160,981	4,160,577	4,160,702	4,160,848	4,160,973
4,160,617	4,160,986	4,160,798	4,160,761	4,160,861	4,160,987
4,160,648	4,160,354	4,160,296	4,160,795	4,160,865	4,160,991
4,160,687	4,160,359	4,160,307	4,160,796	4,160,919	4,161,014
4,160,721	4,160,453	4,160,314	4,160,804	4,160,943	4,161,015
4,160,729	4,160,524	4,160,322	4,160,827	4,160,944	4,160,317
4,160,738	4,160,825	4,160,327	4,160,900	4,160,966	4,160,336
4,160,778	4,160,977	4,160,339	4,160,931	4,160,972	4,160,535
4,160,791	4,160,770	4,160,886	4,160,430	4,160,974	4,160,573
4,160,809	4,160,809	4,160,809	4,160,637	Re.30,042	
	17 : 4,160,305				

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

38 : 4,160,537	4,160,627	4,160,792	4,160,631	4,160,612	4,160,534
39 : 4,160,298	4,160,719	4,160,810	4,160,704	4,160,626	4,160,542
4,160,320	4,160,743	4,160,835	4,160,814	4,160,652	4,160,563
4,160,351	4,160,557	4,160,853	4,160,817	4,160,657	4,160,567
4,160,352	4,160,620	4,160,867	4,160,840	4,160,674	4,160,603
4,160,355	4,161,029	4,160,908	4,160,292	4,160,676	4,160,619
4,160,360	4,160,319	4,160,912	4,160,310	4,160,688	4,160,703
4,160,367	4,160,331	4,160,929	4,160,341	4,160,740	4,160,383
4,160,372	4,160,362	4,160,934	4,160,342	4,160,751	4,160,435
4,160,380	4,160,510	4,161,011	4,160,343	4,160,802	4,160,470
4,160,417	4,160,614	4,161,016	4,160,386	4,160,884	4,160,473
4,160,440	4,160,642	4,161,028	4,160,441	4,160,889	4,160,492
4,160,472	4,160,677	4,161,038	4,160,457	4,160,895	4,160,498
4,160,572	4,160,681	4,160,677	4,160,460	4,160,922	4,160,505
4,160,616	4,160,682	4,160,550	4,160,478	4,161,027	4,160,530
4,160,672	4,160,712	4,160,813	4,160,481	4,160,297	4,160,541
4,160,716	4,160,715	4,160,980	4,160,482	4,160,467	4,160,561
4,160,735	4,160,723	4,160,999	4,160,484	4,160,480	4,160,560
4,160,768	4,160,736	4,160,294	4,160,528	4,160,596	4,160,733
4,160,819	4,160,739	4,160,442	4,160,538	4,160,907	4,160,736
4,160,968	4,160,742	4,160,506	4,160,538	4,160,299	4,160,906
40 : 4,160,483	4,160,742	4,160,570	4,160,543	4,160,323	4,161,010
4,160,566	4,160,765	4,160,621	4,160,551	4,160,394	4,160,812
					56 : 4,160,812

## DESIGN PATENTS

4 : 252,346	252,324	09 : 252,313	23 : 252,338	27 : 252,323	39 : 252,322
01 : 252,341	252,328	17 : 252,299	25 : 252,329	34 : 252,345	42 : 252,337
04 : 252,347	252,335	252,305	252,334	36 : 252,306	47 : 252,342
05 : 252,316	252,336	252,308	26 : 252,307	48 : 252,302	
06 : 252,296	252,350	252,317	252,315	252,314	252,303
252,300	252,351	252,353	252,318	252,319	252,310
252,301	252,354	252,331	252,352		

## PLANT PATENTS

6 : 4,435	06 : 4,436	42 : 4,434			
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OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE

July 17, 1979

Volume 984

Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	984 OG 20
Patent Suits . . . . .	984 OG 20
Reissue Applications Filed . . . . .	984 OG 21
Patent Notices	
Certificates of Correction for the Week of July 17, 1979 . . . . .	984 OG 22
Disclaimers . . . . .	984 OG 22
Patents Available for Licensing or Sale . . . . .	984 OG 22
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	984 OG 23
Condition of Patent Applications . . . . .	984 OG 24
Reissue Patents Granted (30,043) . . . . .	529
Plant Patents Granted (4,437) . . . . .	531
Patents Granted	
General and Mechanical (4,161,042) . . . . .	533
Chemical (4,161,392) . . . . .	651
Electrical (4,161,617) . . . . .	715
Design Patents Granted (252,356) . . . . .	777
Index of Patentees . . . . .	PI 1
Indices of Reissues, Plants and Designs . . . . .	PI 26
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Plants . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Plants . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) - Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,  
Nov. 7, 1978. Commissioner of Patents and Trademarks.

## Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,535,844, Emanuel M. Glaros, STRUCTURAL PANELS, filed May 3, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1803, Emanuel M. Glaros v. H. H. Robertson Co. et al.

3,546,396, American Telecommunication Corporation, ENCLOSED TELEPHONE HAVING A RACEWAY FOR ITS CORD; D. 210,378, same, TELEPHONE HANDSET; D. 210,379, same, FRENCH CRADLE TELEPHONE; D. 211,645, same, COMBINED TELEPHONE AND ENCLOSURE THEREFOR, filed Sept. 14, 1972, D.C. Conn. (Bridgeport), Doc. B-594, United States Telephone Company v. American Telecommunications Corp. Judgment entered for plaintiff on Apr. 11, 1979.

3,771,829, Truckweld Equipment Company, DUMP TRAILER, filed Jan. 19, 1979, D.C., W.D. Wash. (Seattle), Doc. C79-100M, Reliance Truck & Equipment, Ltd. v. Truckweld Equipment Company.

3,780,246, The Black & Decker Manufacturing Company, HAND-OPERATED TOOL WITH SWITCH ACTUATOR HAVING THREE-POSITION LOCK-OFF ASSEMBLY, filed Aug. 11, 1976, D.C. Del. (Wilmington), Doc. 76-263, Black & Decker Manufacturing Company v. Dieston, Inc. Stipulation and order dismissing case with prejudice filed on Aug. 30, 1979.

3,788,734, Martin Long, UNDERWATER ELECTRONIC FLASH ACTUATOR, filed Apr. 10, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79-0824-LHB, Martin Long v. O. H. Brigham.

3,807,069, Robert Daley, INDEXING DEVICE, filed May 16, 1979, Court of Appeals, 1st Circuit, Mass. (Boston), Doc. 79-1195, Robert Daley et al. v. Grafton Printing Co. Inc.

3,829,933, William R. Lambert, METHOD AND APPARATUS FOR EVISCERATING SCALLOPS, filed May 11, 1979, D.C., M.D. Fla. (Orlando), Doc. 79-239-ORL-CR, William R. Lambert, doing business as Southern Seafood Company v. Canaveral Seafood, Inc. et al.

3,834,668, John W. Casey, PIPE PUSHING APPARATUS, filed Apr. 24, 1979, D.C., W.D. Mich. (Grand Rapids), Doc. G79-255-CA1, John W. Casey v. Utility Contracting Company.

3,841,413, William M. Applewhite, TRACTOR ATTACHMENT BAR ASSEMBLY WITH RETRACTABLE PORTIONS, filed Apr. 20, 1979, D.C., N.D. Miss. (Clarksdale), Doc. DC79-49-S-P, William M. Applewhite v. Forrest City Machine Works, Inc.

3,843,051, Structural Rubber Products Co., HIGHWAY RAILWAY CROSSINGS; 4,117,977, same, filed Mar. 27, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1223, Structural Rubber Products Co. v. Park Rubber Co. et al.

3,844,523, Martin J. Wilhelm, MOLD HAVING A BREATHABLE RELEASE SHEET ACROSS THE TOP, filed June 23, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75-351, Unisource Corporation v. Adrosil Corporation. Patent No. 3,844,523 granted on Oct. 29, 1974 in the name of Martin J. Wilhelm is declared to be invalid. Entered May 11, 1979.

3,849,833, William Doyle Watt, Jr., COMPOSITE DRAWER HANDLE, filed Feb. 13, 1978, D.C., M.D.N.C. (Greensboro), Doc. C-78-59-WS, Keeler Corporation, doing business as Keeler Brass Co. v. Stewart-Warner Corp. Stipulation of dismissal of action without prejudice filed on Mar. 29, 1979.

3,850,087, John A. Landblom et al, CREPE GRIDDLE FOR MAKING THIN UNIFORM CREPES, filed Mar. 21, 1978, D.C. Colo. (Denver), Doc. 78-W-291, Creative Cookware, Inc. v. General Electric Company. Stipulation dismissing action, complaint and counterclaim with prejudice filed on Mar. 12, 1979.

3,852,830, Leonard Marmor, KNEE PROSTHESIS, filed May 25, 1976, D.C., W.D. Tenn. (Memphis), Doc. C-76-238, Harry T. Treace et al. v. Leonard Marmor, Plaintiffs ordered to remit to defendant 5% of net sales of knee prostheses sold since Oct. 1, 1974, and covered by Patent No. 3,852,830, plus accrued interest. Judgment dated Apr. 24, 1979.

3,857,566, Jerome H. Lemelson, ADHESIVE SURFACE DART AND SHOCK ABSORBING TARGET; 3,917,271, same, BALL FOR TARGET GAMES, filed Nov. 24, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4371, Centsable Prod., et al. v. Jerome H. Lemelson et al. Cause dismissed with leave to reinstate should settlement negotiations not be consummated. Order dated Apr. 27, 1979.

3,867,806, Lantech, Inc., PROCESS OF MAKING A STRETCHED-WRAPPED PACKAGE, filed Apr. 17, 1979, D.C., S.D. Fla. (Miami), Doc. 79-1841-C-JE, Lantech Inc. v. International Packaging Machines Inc.

3,868,670, Joseph O'Nory, CUSTOMER SERVICE DISPLAY; Reg. No. 1,073,403 (TELE-O-MATIC AND DESIGN), Joseph O'Nory, doing business as Advance Electro Systems, filed Apr. 24, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79-1489-MRP (Sx), Joseph O'Nory v. Patricia Properties, Ltd.

3,908,704, Penntube Plastics Co., CORRUGATED TUBING, filed Oct. 16, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3442, Penntube Plastics Co. et al. v. Union Carbide Corporation. Cause dismissed with leave to reinstate. Nov. 29, 1978.

3,917,271. (See 3,857,566.)

3,939,545, Assembly Machines, Inc., ASSEMBLY MACHINE ACTUATOR, filed Apr. 9, 1979, D.C. Pa. (Erie), Doc. 79-48 Erie, Assembly Machines, Inc. v. Swanson-Erie Corp.

3,943,294, Ameron, Inc., IMPACT-PROTECTIVE COATING FOR PLASTIC PIPE, filed Feb. 21, 1978, D.C.N.J. (Newark), Doc. 78-320, The Thompson Tool Co., Inc. v. Colonial Tool Company, Inc. et al. Dismissal of action filed May 17, 1979.

3,964,373, Christen, Inc., PAPER LOG ROLLER, filed Mar. 2, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-128, Christen, Inc. v. Amron Corporation. Consent judgment filed Mar. 13, 1979.

3,968,256, Edmond L. Sing, PREPARATION OF COTTAGE CHEESE, filed Apr. 4, 1977, D.C., E.D. Mo. (St. Louis), Doc. 77-360C(4), Edmond L. Sing v. Culture Products, Inc. Defendants are enjoined from infringing plaintiff's patent. May 15, 1979.

3,973,513, Maurice K. Huwe, DROP MARKER, filed Mar. 14, 1979, D.C., E.D. Wash. (Spokane), Doc. C-79-69, Tru Marks, Inc. v. E-Z Way, Inc. and Maurice K. Huwe. Notice of dismissal filed Apr. 25, 1979.

3,983,960, Bert J. Sikil, SCISSORS LIFT; 4,113,065, same, filed Mar. 30, 1979, D.C., N.D. Calif. (San Francisco), Doc. C-79-0703-CFP, Mark Industries v. Up-Right, Inc.

4,027,315, Dunn Instruments, Inc., MULTIPLE IMAGE CAMERA, filed Nov. 16, 1978, D.C., N.D. Calif. (San Francisco), Doc. C-78-2670-CBR, Dunn Instruments, Inc. v. Ohio Nuclear, Inc. Action dismissed without prejudice to the right, upon good cause shown, to reopen the action if settlement is not consummated. Filed Apr. 18, 1979.

4,030,895, Robert A. Caughey, APPARATUS FOR PRODUCING COMBUSTIBLE GASES FROM CARBONACEOUS MATERIALS, filed Apr. 20, 1979, D.C., W.D. Tenn. (Memphis), Doc. 79-2295-M, Forest Fuels v. Vernon Plass and Scotch Kilns of Tenn.

4,036,205, Hayes-Te Equipment Corporation, FIREPLACE STOVE, filed Mar. 10, 1978, D.C. Conn. (Hartford), Doc. H-78-126, C & D Distributors, Inc. v. Hayes-Te Equipment Corporation et al. Stipulation for dismissal filed Apr. 12, 1979.

JULY 17, 1979

U. S. PATENT AND TRADEMARK OFFICE

984 OG 21

4,044,521, Larry J. Fischer et al., ROOF INSULATION SUPPORT SYSTEM, filed Apr. 25, 1979, D.C. Minn. (Minneapolis), Doc. 4-79-173, Larry J. Fischer v. Johns-Manville Corporation.

4,050,381, Robert W. Helnemann, LOW DENSITY INDIRECT FIRE MUNITION SYSTEM (U), filed May 15, 1979, U.S. Court of Claims (D.C.), Doc. 202-79-C, Robert D. Heinemann v. The United States.

4,070,710, NuGraphics Inc., RASTER SCAN DISPLAY APPARATUS FOR DYNAMICALLY VIEWING IMAGE ELEMENTS STORED IN A RANDOM ACCESS MEMORY ARRAY, filed May 15, 1979, D.C., N.D. Calif. (San Francisco), Doc. C-79-1155-SW, Hewlett-Packard Co. v. NuGraphics Inc.

4,080,950, Jo Paul Industries, Inc., BALL THROWING DEVICE, filed May 17, 1979, D.C. Ind. (Terre Haute), Doc. TH-79-83-C, Jo Paul Industries, Inc. v. Ken's Tool and Design, Inc. et al.

4,087,945, Peter Berntsen and Phillip R. Peterson, DRIVEN-TYPE SURVEY MONUMENT, filed May 11, 1979, D.C. Ariz. (Phoenix), Doc. C-79-350, Berntsen Cast Products, Inc. v. Allied Manufacturing Co., Inc.

4,103,187, Sidney Ellner, ULTRAVIOLET LIQUID PURIFICATION SYSTEM, filed Apr. 10, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79-1327, Aquafine Corporation v. Sidney Ellner and Ultraviolet Purification Systems, Inc.

4,107,292, Akzona Incorporated, STABLE WATER DISPERSIONS OF ENCAPSULATED PARATHION, filed Mar. 26, 1979, D.C. Del. (Wilmington), Doc. 79-157, Pennwalt Corporation v. Akzona Incorporated et al.

4,113,065. (See 3,983,960.)

4,117,977. (See 3,843,051.)

4,127,975, Thomas E. Judkins, CONCEALED FASTENERS FOR WALL PANELS, filed May 1, 1979, D.C., N.D.N.Y. (Utica), Doc. 79-CV-294, Thomas E. Judkins v. Roger Neil Weiner et al.

D. 210,378. (See 3,546,396.)

D. 210,379. (See 3,546,396.)

D. 211,645. (See 3,546,396.)

D. 230,853, Formica Corporation, SLIDING DOOR UNIT FOR SHOWER STALLS OR THE LIKE, filed Apr. 20, 1979, D.C., S.D. Ohio (Cincinnati), Doc. C-1-79-251, Powers Flat Corporation v. Basco Co. et al.

D. 243,893, Trend Line Furniture Corporation, SOFA, filed May 1, 1979, D.C., W.D.N.C. (Statesville), Doc. ST-C-79-15, Trend Line Furniture Corporation v. Stylecraft Furniture, Inc.

D. 249,890, Roger A. Chinn et al., WOOD BURNING STOVE WITH SCREEN, filed Apr. 3, 1979, D.C. Oreg. (Portland), Doc. C-79-321, Woodcutters Manufacturing, Inc. v. John E. Blaser et al.

D. 250,618, Galaxy Office Furniture Limited, EXECUTIVE CHAIR, filed Apr. 30, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79-1566-R, Galaxy Office Furniture Limited v. Chair World, Inc. et al.

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,334,067, Re. S.N. 035,255, Filed May 2, 1979, Cl. 528/17, METHOD OF MAKING ONE COMPONENT ROOM TEMPERATURE CURING SILOXANE RUBBERS, Donald R. Weyenberg, Owner of Record: Dow Corning Corporation, Midland, Mich., Attorney or Agent: William E. Dominick, et al., Ex. Gp.: 144

4,020,649, Re. S.N. 034,903, Filed May 1, 1979, Cl. 63/32, BRILLIANTIZED STEP CUT DIAMOND, Henry Grossbard, Owner of Record: The Radiant Cut Diamond Corp., New York, N.Y., Attorney or Agent: Camil P. Spicens, et al., Ex. Gp.: 333

4,020,987, Re. S.N. 002,325, Filed Jan. 10, 1979, Cl. 228/56, SOLDER PREFORM, Norman Hascoe, Owner of Record: Semi-Alloys, Inc., Mount Vernon, N.Y., Attorney or Agent: Laurence B. Dodds, Ex. Gp.: 321

4,025,838, Re. S.N. 033,482, Filed Apr. 26, 1979, Cl. 318/568, SIGNAL MODIFICATION DEVICE FOR MEMORY CONTROLLED MANIPULATOR APPARATUS, Takehiko Watanabe, Owner of Record: Kawasaki Heavy Industries, Ltd., Kobe-Shi, Hyogo-Ken, Japan, Attorney or Agent: Richard D. Mason, et al., Ex. Gp.: 217

4,065,549, Re. S.N. 037,665, Filed May 10, 1979, Cl. 423/447.4, PROCESS FOR PRODUCING A HIGH TENSILE STRENGTH, HIGH YOUNG'S MODULUS CARBON FIBER HAVING EXCELLENT INTERNAL STRUCTURE HOMOGENEITY, Yoshiro Kinoshita, Owner of Record: Toray Industries, Inc., Tokyo, Japan, Attorney or Agent: Austin R. Miller, et al., Ex. Gp.: 113

4,067,224, Re. S.N. 035,572, Filed May 3, 1979, Cl. 72/416, SWAGING DIES, Cedric Gwilliam Birks, Owner of Record: C.C.L. Systems Limited, Surrey, England, Attorney or Agent: Cedric G. Birks, Ex. Gp.: 321

4,122,814, Re. S.N. 016,369, Filed Mar. 1, 1979, Cl. 123/148 E, OPTO-ELECTRONIC IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES, Eric Harold Ford, Owner of Record: Lumenition Limited, London, England, Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 342

4,128,732, Re. S.N. 33,992, Filed Apr. 27, 1979, Cl. 136/89 PC, SOLAR CELL, Roy Kaplow, et al., Owner of Record: Massachusetts Institute of Technology, Cambridge, Mass., Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 114

# PATENT NOTICES

## Certificates of Correction for the Week of July 17, 1979

Re. 29,872	4,110,952	4,135,409	4,147,254
D. 249,118	4,111,507	4,136,180	4,147,286
3,944,810	4,111,580	4,136,251	4,147,799
3,947,890	4,111,911	4,136,505	4,148,111
3,954,009	4,112,258	4,136,563	4,148,163
3,957,761	4,112,284	4,137,257	4,148,360
4,016,295	4,112,274	4,137,500	4,148,372
4,017,696	4,112,376	4,137,537	4,148,507
4,021,345	4,112,500	4,137,948	4,148,544
4,030,821	4,114,607	4,138,065	4,148,610
4,055,392	4,116,376	4,138,452	4,148,638
4,058,512	4,116,551	4,139,526	4,148,986
4,059,583	4,116,623	4,140,599	4,149,158
4,062,625	4,116,868	4,141,080	4,149,212
4,064,334	4,116,944	4,141,239	4,149,253
4,066,772	4,118,711	4,141,701	4,149,266
4,088,704	4,121,295	4,141,734	4,150,210
4,090,230	4,121,763	4,142,495	4,150,352
4,090,783	4,122,468	4,142,808	4,150,357
4,091,841	4,122,506	4,143,108	4,150,475
4,092,706	4,122,554	4,143,119	4,150,603
4,093,131	4,122,744	4,143,143	4,150,642
4,094,875	4,123,335	4,143,278	4,151,014
4,095,374	4,123,664	4,143,313	4,151,110
4,097,071	4,123,957	4,143,393	4,151,189
4,097,935	4,124,932	4,143,572	4,151,259
4,098,346	4,125,302	4,143,737	4,151,364
4,099,240	4,125,499	4,144,212	4,151,606
4,099,242	4,125,507	4,144,289	4,151,697
4,099,832	4,125,651	4,144,787	4,151,825
4,102,186	4,126,422	4,144,924	4,151,877
4,104,769	4,126,677	4,144,960	4,151,904
4,105,882	4,128,684	4,145,351	4,152,276
4,106,167	4,128,712	4,145,575	4,152,360
4,107,322	4,129,937	4,145,969	4,152,396
4,107,612	4,131,003	4,146,080	4,152,472
4,108,562	4,131,614	4,146,291	4,152,473
4,108,715	4,131,648	4,146,534	4,153,377
4,108,989	4,131,649	4,146,584	4,153,443
4,109,513	4,133,868	4,146,687	4,153,732
4,109,595	4,133,966	4,146,833	
4,110,038	4,134,421	4,147,035	
4,110,679	4,134,978	4,147,116	

## Disclaimers

3,784,635.—Robert J. Thiessen, Westfield, N.J. SUBSTITUTED PHENOXYBENZOIC ACID AND ESTERS THEREOF. Patent dated Jan. 8, 1974. Disclaimer filed Feb. 9, 1979, by the assignee, Mobil Oil Corporation.

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,934,059.—Murray Arthur Polinsky, Somerville, N.J. METHOD OF VAPOR DEPOSITION. Patent dated Jan. 20, 1976. Disclaimer filed Mar. 29, 1979, by the assignee, RCA Corporation.

Hereby enters this disclaimer to claim 1 of said patent.

3,983,168.—Robert J. Thiessen, Westfield, N.J. HALO-PHENOXY BENZOIC ACID SALTS. Patent dated Sept.

28, 1976. Disclaimer filed Feb. 9, 1979, by the assignee, Mobil Oil Corporation.

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

4,002,862.—Robert J. Thiessen, Westfield, N.J. 2-NITRO-5-(CYANO-TRIFLUOROMETHYL-PHENOXY) BENZOIC ACIDS AND ESTERS. Patent dated Jan. 11, 1977. Disclaimer filed Feb. 9, 1979, by the assignee, Mobil Oil Corporation.

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

4,026,601.—John L. Dill, III, Mansfield, and Othar P. Kennedy, Jr., Mount Vernon, Ohio. AIR SUSPENSION SEAT ASSEMBLY. Patent dated May 31, 1977. Disclaimer filed May 11, 1979, by the assignee, National Seating Company.

Hereby enters this disclaimer to claims 1, 2, 12 and 13 of said patent.

4,042,421.—Jaak Stefaan Van Den Sype, Mount Klaco, William Alphonse Kilinskas, Cortlandt, N.Y. Richard Benedict Mazzarella, Indianapolis, Ind., and John Bernard Lightstone, White Plains, N.Y. METHOD FOR PROVIDING STRONG TOUGH METAL ALLOYS. Patent dated Aug. 16, 1977. Disclaimer filed May 29, 1979, by the assignee, Union Carbide Corporation.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 11, 12, 13 and 14 of said patent.

4,097,791.—Ward L. Bivens, Painesville, and Richard A. Schwehr, Mentor, Ohio. DELAYED TURN-ON AND TURN-OFF CONTROL CIRCUIT. Patent dated June 27, 1978. Disclaimer filed May 3, 1979, by the assignee, Tecumotor Corporation.

Hereby enters this disclaimer to all claims of said patent.

4,128,737.—Mark V. Dorate, Detroit, Mich. VOICE SYNTHESIZER. Patent dated Dec. 5, 1978. Disclaimer filed May 29, 1979, by the assignee, Federal Screw Works.

Hereby enters this disclaimer to claims 11-16 and 21-23, of said patent.

## Patents Available for Licensing or Sale

3,314,080. HUMIDIFYING SYSTEM. John Shilling, Jr., 16126 Spinning Ave., Torrance, Calif. 90504.

3,858,612. FLOOR DRAIN STOPPER. Arthur Van Steenburg, RR. Box 9484, Spirit Lake, Iowa 51360.

3,991,700. RUBBER ATTACHMENT FOR OUTBOARD MOTORS. William T. Cleary, 209 Fisher St. and Paul A. Bourgeois, 130 W. Baraga Ave., Marquette, Mich. 49855.

4,021,872. MATERNITY MATTRESS. Lee Powell, 4534 White Pine, Memphis, Tenn. 38108.

4,089,267. APPARATUS FOR MIXING GRANULAR FERTILIZER AND/OR LAWN TREATMENT LIQUID IN WATER. William J. Flynn, 915 Middle River Drive, Fort Lauderdale, Fla. 33304.

4,108,409. GOLF BAG ACCESSORY. Joseph X. Rombach. Correspondence to: Louis H. Rombach, 201 North Pembrey Drive, Wilmington, Del. 19803.

4,143,761. SAFETY MATCH BOOK. Francis P. Brand, 11 Curley St., Long Beach, N.Y. 11561.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table follow-

ing, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
	Denver Public Library	(303) 573-5152 Ext. 223
Colorado	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Georgia	Chicago Public Library	(312) 269-2814
Illinois	Boston Public Library	(617) 536-5400 Ext. 265
Massachusetts	Detroit Public Library	(313) 833-1458
Michigan	Kansas City: Linda Hall Library	(816) 363-4600
Missouri	St. Louis Public Library	(314) 241-2288 Ext. 214
	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
Nebraska	Newark Public Library	(201) 733-7740
New Jersey	Albany: New York State Library	(518) 474-5125
New York	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
North Carolina	Cincinnati & Hamilton County Public Library	(513) 369-6969
Ohio	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
	Dallas Public Library	(214) 748-9071
Texas	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.



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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Hologry; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	5-17-77
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents.....	Numbers 3,027,553 to 3,031,668, inclusive
Plant Patents.....	Numbers 2,135 to 2,142, inclusive

REISSUES

JULY 17, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,043  
VORTICAL FLOW AEROTHERMODYNAMIC  
FIREPLACE UNIT

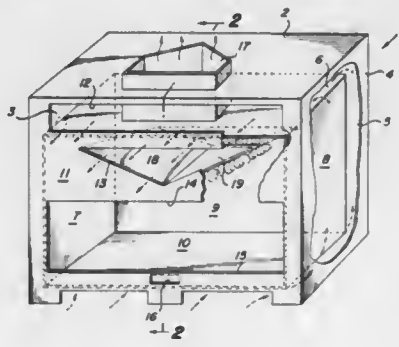
Alexander J. Moncrieff-Yeates, 8924 Rhyme Ct., Annandale, Va. 22003

Original No. 4,056,091, dated Nov. 1, 1977, Ser. No. 570,798, Apr. 23, 1975. Application for reissue Jun. 8, 1978, Ser. No. 913,849

Int. Cl.<sup>2</sup> F24B 7/00

U.S. Cl. 126—121

21 Claims



1. A heat exchange structure for use [in a fireplace] with a firebox of the type including an enclosure for a fire producing a hot thermally donative gas, said enclosure comprising side walls, a back wall, and a top wall, a flue opening in said top wall for exhausting said donative gas, an outer enclosure comprising walls spaced outwardly from said fire enclosure walls and defining therebetween passages for a thermally recipient air, a front wall extending downwardly from a front portion of said top wall and including a fire enclosure opening therein, means communicating air from said thermally recipient air passages through said front wall, said means comprising a duct extending between junctures with said back and front walls through a central portion of said fire enclosure, said structure further characterized in that said duct has a bottom surface comprising a flame plate for exposure to said donative gas in said enclosure, said flame plate being slanted upwardly toward one of said junctures to define throughout the extent of said one juncture a laterally extensive thermally donative air vorticity area throughout which the donative air is induced to whirl in a stable vortex proximate to and in heat exchange relationship to said flame plate and said wall structure.

Re. 30,044  
VERTICAL ARCH SHELTER

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Company, Pleasant Ridge, Mich.

Original No. 4,036,244, dated Jul. 19, 1977, Ser. No. 576,101, Jun. 12, 1975. Continuation-in-part of Ser. No. 339,333, May 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 93,293, Nov. 27, 1970, abandoned. Application for reissue May 22, 1978, Ser. No. 908,518

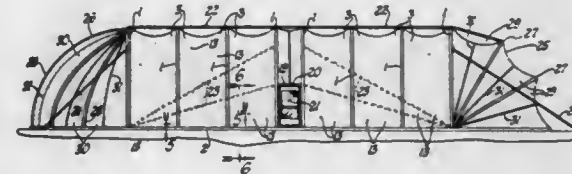
Int. Cl.<sup>2</sup> A45F 1/16; E04B 1/32

U.S. Cl. 135—4 R

15 Claims

1. A vaulted membrane shelter comprising at least two substantially vertical arches with curved bights mounted on a base face to face but spaced apart with means to fix said arches in space to form a vaulted framework; a tensioned flexible membrane extending between and being operatively attached

to said arches by means that permits membrane tensioning movement downward along arch circumference; said membrane [being fabricated to form] having an inward concave curvature between the bights of said arches, [having a maximum depression of] with a curvature depth at its lowest point



that is at least 5% of the distance between said arches, producing double curvature in said membrane between said bights; and means for maintaining tension in said membrane acting between the lower portion of said membrane and said base to diminish membrane vibration and increase rigidity of said shelter.

Re. 30,045  
VACUUM X-RAY ENVELOPE

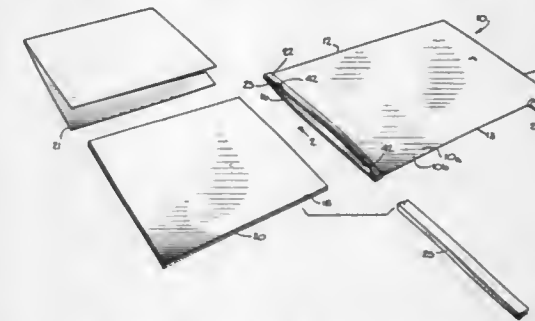
Franklin R. Greene, Flushing, N.Y., assignor to E-Z-EM Company, Inc., Westbury, N.Y.

Original No. 3,958,693, dated May 25, 1976, Ser. No. 542,256, Jan. 20, 1975. Continuation-in-part of Ser. No. 438,033, Jan. 30, 1974, abandoned. Application for reissue Dec. 22, 1976, Ser. No. 753,545

Int. Cl.<sup>2</sup> B65D 81/20; B03B 41/18

U.S. Cl. 206—455

18 Claims



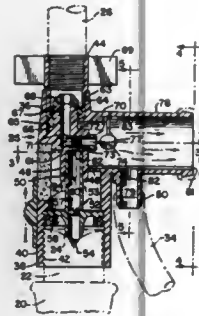
1. A reusable envelope for an X-ray cassette having X-ray film and intensifier screen comprising: first and second collapsible sheets sealed to one another along first, second and third sealed edges forming an envelope having an open edge, a sealing zone extending across said open edge between said first and second sealed edges, said sheets having polished facing interior surfaces in said sealing zone, said interior surfaces in said sealing zone being flush against each other at the line of the seal at said first and second sealed edges, the seal at said first and second sealed edges being beadless in said sealing zone, and a valve sealed to one of said sealed edges permitting communication between the interior of said envelope and the outside, said valve being positioned away from said sealing zone.

Re. 30,046  
NEBULIZER

Edward van Amerongen, Wilmette, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.  
Original No. 3,771,721, dated Nov. 13, 1973, Ser. No. 286,692, Sep. 6, 1972. Application for reissue Feb. 26, 1975, Ser. No. 553,081

Int. Cl.<sup>2</sup> A61M 11/02  
U.S. Cl. 239—338

10 Claims



1. A nebulizer adapted to be screwed onto a receptacle having an upwardly facing threaded portion adapted to receive the nebulizer, the receptacle being closed at said threaded portion by a breachable membrane, said nebulizer comprising a body having a hollow portion and downwardly facing socket, said socket being threaded whereby the nebulizer may be screwed onto the threaded portion of said receptacle, said socket having concentrically a breaching tubular means adapted for one end to breach said membrane, said body having a venturi means positioned in the hollow portion, the other end of said breaching tubular means being in fluid communication with a conduit terminating at the venturi transverse with the venturi means, a second socket means adapted to receive a connection means from a source of pressurized fluid, said second socket means being in fluid communication with the upstream portion of said venturi means, said body having a chamber means, the downstream portion of said venturi means terminating in said chamber means, said chamber means having a ball means disposed downstream of said venturi and displaced therefrom, whereby fluid emanating from said venturi impinges on said ball, said chamber means having an outlet at the bottom thereof for draining liquid, said chamber means having at the bottom an elongated axially disposed ridge, said hollow portion being at one side in fluid communication with said chamber means, and said body having an opening at substantially the other side thereof in communication with said hollow portion.

Re. 30,047  
ROAD SURFACING MATERIALS

Geoffrey Lees, Stratford upon Avon, and Arthur R. Williams, Birmingham, both of England, assignors to Dunlop Limited, Great Britain

Original No. 3,957,525, dated May 18, 1976, Ser. No. 449,759, Mar. 11, 1974. Continuation of Ser. No. 245,159, Apr. 18, 1972, abandoned. Application for reissue May 2, 1978, Ser. No. 902,767

Claims priority, application United Kingdom, Apr. 24, 1971, 11237/71; Nov. 16, 1971, 53096/71

Int. Cl.<sup>2</sup> C08H 17/04

U.S. Cl. 106—288 B

5 Claims

1. A road surfacing material comprising a blend of at least two aggregates of graded sizes up to not more than  $1\frac{1}{2}$  inches disposed in a binder matrix and having different rates of wear as judged by the aggregate test BS 812 1967, the particles of each of said two aggregates exposed to the surface falling within different size ranges, the slower wearing aggregate comprising one portion of particles of larger size and another portion of particles of smaller size than any of the particles of the faster wearing aggregate, and each of said two aggregates having a surface micro-texture defined by asperity heights in the range of 5 to 500 microns.

Re. 30,048  
CHARACTER RECORDING SYSTEM

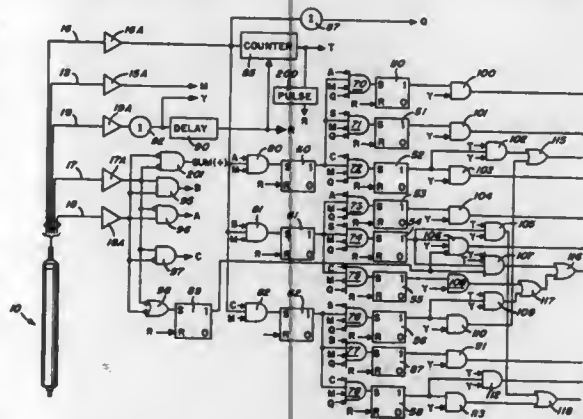
David Moss, Berkley, Calif., assignor to Creative Ventures, Inc., Dayton, Ohio

Original No. 3,903,502, dated Sep. 2, 1975, Ser. No. 392,782, Aug. 29, 1973. Application for reissue Jun. 22, 1977, Ser. No. 808,800

Int. Cl.<sup>2</sup> G06K 9/00

U.S. Cl. 340—146.3 SY

25 Claims



22. Apparatus for translating motion of a scribe member into signals defining a complete set of characters, comprising means defining a cell within which a character is traced, sensing means operating to sense the beginning and the end of each scribing stroke of the scribe member, means for generating at least one unique signal identifying the position of the scribe member during one or more scribing strokes by which a character is traced in said cell, and logic circuit means responsive both to said signal generating means and to said sensing means and constructed to translate said signals only at the beginning and the end of a scribing stroke into a further signal identifying a unique character.

# PLANT PATENTS

GRANTED JULY 17, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,437  
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Jun. 29, 1978, Ser. No. 920,361  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—12

1 Claim

1. A new and distinct variety of rose plant of the grandiflora class, substantially as shown and described herein, characterized particularly as to novelty by the unique combination of its upright, vigorous growth with many blooms borne in long-stemmed clusters, its cherry and white bicolored flowers with no fragrance, its heavy long, abundant thorns and its dark brown new foliage.

4,439  
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Mar. 27, 1978, Ser. No. 890,866  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—17

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, upright habit of growth; its tendency to bloom in clusters of several blooms during Spring and early Summer; its bud and flower color of Wilson's Chinese Coral; its very light fragrance.

4,438  
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Mar. 31, 1978, Ser. No. 892,482  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—15

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its heavily branched plant, Chrome Yellow color of buds and blooms, good resistance to rose powdery mildew, lack of fragrance and stems with numerous, long straight prickles.

4,440  
ROSE PLANT—ETERNA

Georges A. Delbard, Paris, France, assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Dec. 12, 1977, Ser. No. 859,995  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—18

1 Claim

1. A new and distinct cultivar of rose of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its uniform color of French Rose from bud to well-developed open flower; its vigorous plant, straight and relatively heavy stems.



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PATENTS

GRANTED JUL. 17, 1979

ERRATA

For CLASS	See PATENT NO.
414-025 .....	4,161,253
206-504 .....	4,161,254
414-323 .....	4,161,255
414-620 .....	4,161,256
400-175 .....	4,161,373
401-116 .....	4,161,374
403-169 .....	4,161,375
405-196 .....	4,161,376
435-199 .....	4,161,424
435-011 .....	4,161,425
435-313 .....	4,161,426
525-004 .....	4,161,472
585-004 .....	4,161,495
585-836 .....	4,161,496
585-714 .....	4,161,497
525-439 .....	4,161,498
428-213 .....	4,161,547
428-539 .....	4,161,551
428-654 .....	4,161,553
526-090 .....	4,161,571
525-444 .....	4,161,579
525-411 .....	4,161,581

# PATENTS

GRANTED JULY 17, 1979

## GENERAL AND MECHANICAL

4,161,042

### ADJUSTABLE PROSTHETIC LIMB

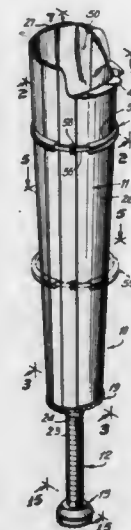
Hugh V. Cottingham, Upper Montclair, and Joseph Scrocco, West Orange, both of N.J., assignors to BHN, Inc., Upper Montclair, N.J.

Filed Oct. 25, 1977, Ser. No. 845,185

Int. Cl.<sup>2</sup> A61F 1/08

U.S. Cl. 3—17 R

31 Claims



1. A prosthetic appliance for supporting a person having a residual lower limb comprising a socket means including a base plate, and a plurality of struts, each of said struts being secured in said base plate in overlapping relationship with respect to each other to define a selectively adjustable sleeve for receiving and securing a residual lower limb therein, said adjustable sleeve including an ischial bearing means for supporting a person's weight so that said selectively adjustable sleeve is adapted to be diametrically varied to receive a residual lower limb and to radially apply pressure to said residual lower limb and thereby stabilize the position of said ischial bearing means with respect to said person, and an elongated support means with respect to said person, and an elongated support means adjustably secured to said socket means for selectively adjusting the length of said prosthetic appliance.

4,161,043

### SEALING MECHANISM FOR A LIQUID FLOOR DRAIN

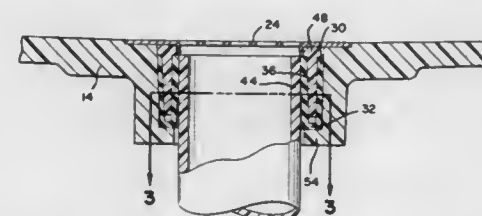
Raymond Flores, P.O. Box 226, Union City, Calif. 94587

Filed Mar. 13, 1978, Ser. No. 885,653

Int. Cl.<sup>2</sup> E03C 1/26; E03F 5/06; F16L 17/02

U.S. Cl. 4—292

8 Claims



1. A sealing mechanism for a liquid floor drain having a floor opening including side portions in the vicinity of a liquid drain conduit comprising:

- a connecting conduit adapted for communicating with the liquid drain conduit and extending therefrom within the floor opening to the vicinity of the surface of the floor;
- first gasket member adapted for placement within the

floor opening and for placement circumferentially with respect to said connecting conduit, said first gasket member having a first wall adjacent said connecting conduit, said first gasket member also having a second wall circumferentially positioned with respect to said connecting conduit and adjacent first wall, said first and second walls of said first gasket member each having edge portions oriented toward the floor, said first and second walls forming a cavity therebetween;

c. second gasket member being circumferentially placed with respect to said first gasket member, said second gasket member including wedging means for forcing said first wall of said first gasket member against the side portions of said drain opening, and for forcing said second wall of said first gasket member against said connecting conduit, said second gasket member effecting sealing between said connecting conduit and the side portions of said drain opening; and

d. means for overlapping said edge portions of said first and second walls and for sealing said cavity formed therebetween.

4,161,044

### COVER SECURE CONTOUR BED SHEETS

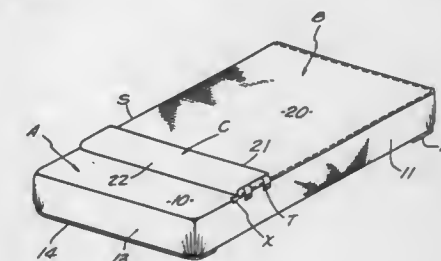
Gladys D. Bogle, 1650 Loganrita Ave., Arcadia, Calif. 91006

Filed Apr. 5, 1978, Ser. No. 893,767

Int. Cl.<sup>2</sup> A47G 9/00

U.S. Cl. 5—494

8 Claims



1. Bedding for ensuring the covered confinement of a sleeping person, and including in combination; a contoured bottom sheet comprised of a panel to coextensively overlie a mattress and having depending panels form-fitted to embrace said mattress, and a top sheet to substantially overlie the bottom sheet and permanently secured to the bottom sheet along one side thereof and releasably secured to the foot and other side thereof and having a flap turned back from its head portion and fitted to and retaining loose bed coverings.

4,161,045

### MATTRESS

John J. Regan, 2316 N. Harlem Ave., Elmwood Park, Ill. 60635

Filed Dec. 19, 1977, Ser. No. 861,961

Int. Cl.<sup>2</sup> A47C 23/00, 27/00

U.S. Cl. 5—464

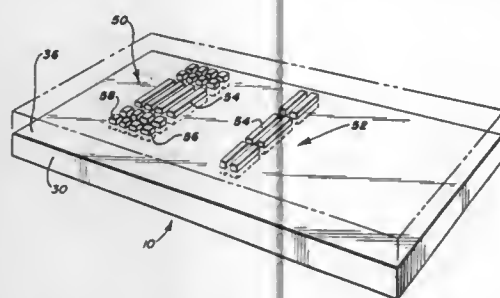
23 Claims

1. In a mattress comprising a single layer of a resilient material and having a generally planar body-supporting top surface and a generally planar support-engaging bottom surface, the improvement which comprises:

first and second pluralities of individual ribs of less compressibility than the material of said mattress extending transversely through said mattress, the ribs of each plurality being spaced apart laterally of each other in the longitudinal direction of the mattress whereby each said individual rib is independently compressible, said first and second pluralities being spaced apart longitudinally of the



mattress and positioned to support only the shoulders and buttocks of one lying on the mattress, the lesser resilience

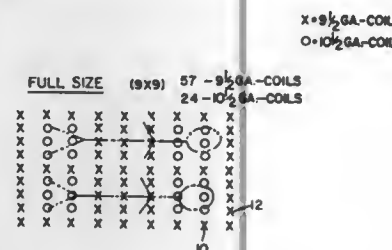


of the ribs complementing the greater resilience of the mattress material to support the body lying on the mattress in a generally straight attitude.

**4,161,046**  
**COIL SPRING ASSEMBLY**  
Gerald A. Golembeck, Lake Elmo, Minn., assignor to The United States Bedding Company, St. Paul, Minn.  
Filed May 10, 1978, Ser. No. 904,396  
Int. Cl.<sup>2</sup> A47C 23/04

U.S. Cl. 5—248

1 Claim



1. A coil spring assembly for mattresses and box springs characterized by improved comfort and support in which the coil spring assembly is formed of coil springs arranged in a plurality of lengthwise and crosswise extending rows and in which the coil springs consist of two sets of coil springs in which the coil springs of both sets are of the same size but in which the coil springs of one set are of lower gauge and greater stiffness than the coil springs of the other set with the outermost coil springs in each of the lengthwise and crosswise extending rows and in the middle rows extending lengthwise and crosswise of the spring assembly being of the one set while the coil springs remaining in the rows adjacent the outermost lengthwise rows being of the other set with the number of lengthwise rows of coil springs of the one set comprising at least half of the lengthwise rows of coil springs in the spring assembly.

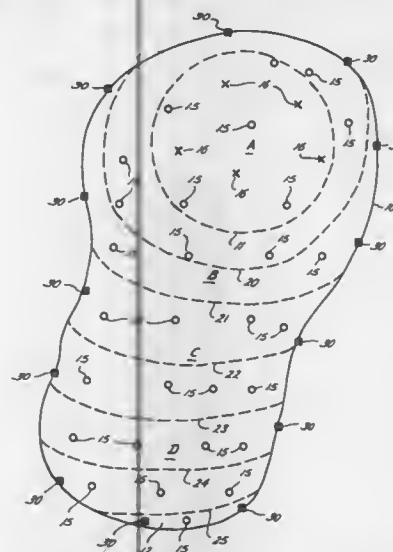
**4,161,047**  
**PROCESS FOR RECOVERY OF HYDROCARBONS**  
Edwin A. Riley, 901 Ridgeway Ter., Arlington, Tex. 76012  
Filed Oct. 19, 1977, Ser. No. 843,567  
Int. Cl.<sup>2</sup> E21B 43/16, 43/18

U.S. Cl. 166—266

12 Claims

10. A process for the recovery of hydrocarbons from a partially depleted oil formation reservoir that has been subjected to at least primary recovery operations and which reservoir is unsuited for other secondary recovery processes due to adverse properties of the formation, comprising the steps of: injecting dry natural gas into one well of an oil-bearing reservoir having a plurality of wells previously drilled therein, wherein the production of oil from said wells was theretofore discontinued; continuing said injecting until the bottom-hole pressure of an adjacent well is increased sufficiently to enable produc-

tion of oil therefrom to be effected by enriching said gas by vaporization of the light ends of the oil in the reservoir; producing oil and some enriched gas from the adjacent well in the formation; separating oil and other hydrocarbon liquids from the natu-

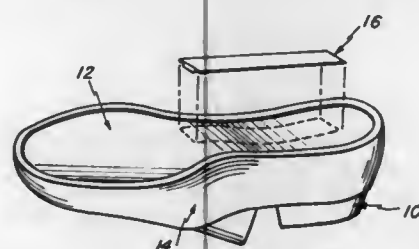


ral gas to provide a stripped natural gas which is essentially entirely methane; and recycling the stripped dry natural gas back into the formation a plurality of times to repeat the foregoing steps for maximum recovery of the oil from the reservoir while storing the natural gas for subsequent use.

**4,161,048**  
**METHOD AND APPARATUS FOR STIFFENING SHOE INSOLES**  
Leo F. Stanton, Newburyport, Mass., assignor to Bush Universal, Inc., Woburn, Mass.  
Filed Oct. 3, 1977, Ser. No. 838,670  
Int. Cl.<sup>2</sup> A43D 21/00, 31/00, 3/00

U.S. Cl. 12—146 S

25 Claims



1. An apparatus for applying a strip of activatable material to the bottom of an insole of a shoe assembly to form a shank in situ on the bottom of the insole, said strip including an activatable matrix surrounded by a sleeve, said apparatus comprising: a frame; shoe support means mounted to the frame for firmly supporting the shoe assembly; strip retaining means on the frame and having strip engaging portions spaced from the shoe support means; positioning means for locating a strip in a predetermined position between and in alignment with the strip retaining means and shoe support means; said shoe support means being mounted for movement toward and away from the strip retaining means between a first, remote position and a second, operative position in

which the insole may be urged against the strip engaging portions of the strip engaging means; said shoe support and strip retaining means being constructed and arranged so that as the shoe support means moves from its first to its second position, the insole of a supported shoe assembly will engage the positioned strip and continued movement of the shoe support means will carry and urge the strip and insole bottom against the strip engaging portions of the strip retaining means to hold the strip against the insole; and means for activating the matrix while the strip is held against the insole bottom.

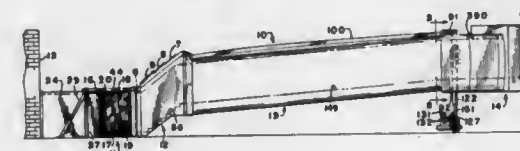
21. A method for forming and applying a shank stiffener to the bottom of a shoe insole, said stiffener initially being in the form of an elongate flexible sleeve containing a flexible matrix of externally activatable thermosetting resin, said method comprising:

supporting a shoe assembly in a predetermined position, the shoe assembly having a last and an insole at its bottom; aligning a strip engaging means with the insole bottom but in spaced relation thereto; locating said stiffener between the strip engaging means and the insole of the supported shoe assembly, in alignment with but in spaced relation to the insole and strip retaining means; thereafter effecting relative movement of the shoe assembly and the strip engaging means toward each other to cause the stiffener to be urged firmly toward the insole bottom by the strip engaging means; and activating the stiffener while it is maintained in engagement with the insole bottom.

**4,161,049**  
**PASSENGER LOADING BRIDGE**  
Robert L. Saunders, Ogden, and George D. Hone, Roy, both of Utah, assignors to Abex Corporation, New York, N.Y.  
Continuation of Ser. No. 847,638, Nov. 1, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,692  
Int. Cl.<sup>2</sup> E01D 1/00

U.S. Cl. 14—71.5

21 Claims



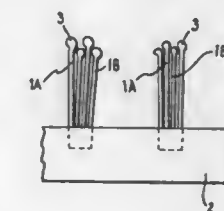
4. A passenger loading bridge for interconnecting an aircraft with the ground level of an airport terminal building including: a. a rotunda connected to the building substantially at ground level; b. a tunnel support vertically pivotally connected at its inner end to the rotunda to enable horizontal swinging movement of the tunnel support; c. a tunnel horizontally pivotally connected at its inner end to the tunnel support; d. an aircraft engaging cab assembly connected to the outer end of the tunnel; and e. a drive assembly mounting the outer end of the tunnel for swinging the tunnel about the rotunda and including elevating means for elevating the tunnel and cab assembly; characterized by f. the tunnel having a floor support extending longitudinally of the tunnel and bearing all normal structural loads and the side walls and roof being of non-structural curtain wall construction subject only to wind and roof loads.

**4,161,050**  
**HAIR BRUSH**  
Tetsuo Sasaki, Sakura, and Yoshimi Tsuchiya, Yachiyo, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan  
Filed Jun. 26, 1978, Ser. No. 919,423  
Claims priority, application Japan, Jul. 1, 1977, 52-87229[U]; Jan. 30, 1978, 53-9894[U]

Int. Cl.<sup>2</sup> A46B 9/02

U.S. Cl. 15—159 A

4 Claims

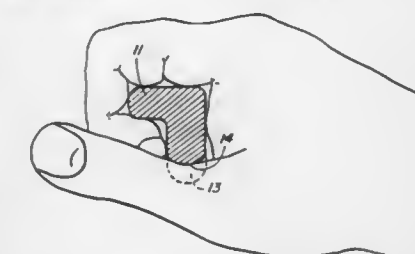


1. A hair brush comprising: a brush body; a plurality of discrete, spaced-apart, tufts of bristles whose inner ends are secured to said brush body and which project away from said brush body, said tufts being arranged on said brush body so that the total number of bristles per unit area of the brushing surface is from 8 to 30 bristles/cm<sup>2</sup>, each tuft consisting essentially of approximately equal numbers of long bristles of substantially equal length and short bristles, said long and short bristles being substantially uniformly distributed in each tuft, each tuft containing a total of from 2 to 6 bristles, each bristle having a diameter of from 0.45 to 0.70 mm and projecting from the brush body a distance of from 15 to 30 mm, said short bristles projecting from said brush body a distance which is from 1 to 10 mm shorter than the distance said long bristles project from said brush body so that the outer ends of said long bristles are located inwardly from the outer ends of said short bristles, said long bristles having enlarged substantially spherical outer ends wherein the diameters of said outer ends are from 1.2 to 2.5 times larger than the diameters of the remainders of said bristles.

**4,161,051**  
**CONTOURED HANDLE**  
Bernard Brodwin, 5 Barone Rd., West Orange, N.J. 07052  
Filed Apr. 19, 1977, Ser. No. 788,821  
Int. Cl.<sup>2</sup> B25G 1/10

U.S. Cl. 16—110 R

7 Claims



1. A contoured handle having an elongated body having a length at least equal to the width of the palm of a human hand, said body having two protruding portions extending along the length of the body and said portions protrude in different directions from the longitudinal axis of the body, the direction of one portion is at substantially a right angle with respect to the direction of the other of said portions, one of said portions having a first recessed channel adapted to receive the thumb of a human hand, and the other of said portions having a convexly curved surface adapted to occupy the partially enclosed space by curled fingers of the same human hand.

4,161,052

**METHOD AND APPARATUS FOR MAKING A UNIFORM, CONTINUOUS SLIVER**

Ludwig Erben, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

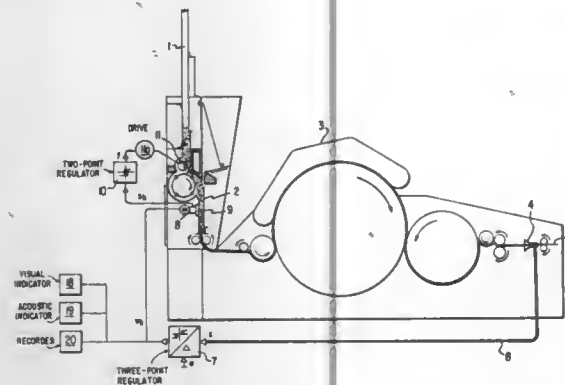
Filed Dec. 21, 1977, Ser. No. 862,690

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658044

Int. Cl.<sup>2</sup> D01H 5/38

U.S. Cl. 19—240

14 Claims



1. An apparatus for regulating the sliver output of a carding machine supplied with a tuft column by a card feeder having a tuft shaft and feeding means for introducing tuft into the tuft shaft; comprising in combination:

- (a) a sliver sensor for continuously sensing the throughput quantity of the sliver and generating a continuous main regulating signal as a function of the throughput quantity;
- (b) a regulator connected to said sliver sensor for receiving said main regulating signal from said sliver sensor and generating a reference signal as a function of said main regulating signal;
- (c) a tuft column sensor connected to said tuft shaft for sensing a variable of the tuft column advancing in said tuft shaft; said tuft column sensor having
  - (1) signal generating means for emitting an auxiliary regulating signal as a function of the sensed variable of the tuft column;
  - (2) a desired value setting means being connected to said regulator for receiving said reference signal from said regulator and further being connected to said signal generating means of said tuft column sensor for varying said auxiliary regulating signal as a function of said reference signal; and
- (d) tuft column altering means being connected to said signal generating means of said tuft column sensor for receiving said auxiliary regulating signal and further being connected to said card feeder for altering the tuft column as a function of said auxiliary regulating signal.

4,161,053

**AUTOMATIC-LOCK SLIDER FOR SLIDE FASTENER**

Wolfgang Ruhrmann, Stuttgart, Fed. Rep. of Germany, assignor to Gundel Ruhrman, Stuttgart, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,597

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620682

Int. Cl.<sup>2</sup> A44B 19/30

U.S. Cl. 24—205.14 R

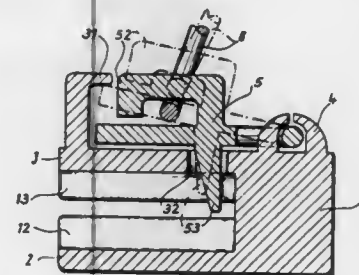
7 Claims

1. An automatically locking slider for a slide fastener consisting essentially of:

- (a) a slider body of rigid material including a top plate, a bottom plate, and a wedge fixedly connecting said plates,
  - (1) said plates defining therebetween a path for passage of a slide fastener stringer through said slider body in a predetermined direction, said wedge dividing a terminal

portion of said path into two branches, and at least one of said plates including flange means bounding said path transversely to said direction,

- (2) said top plate being formed with an aperture communicating with said path;
- (b) a latch of rigid material secured to said top plate outside said path for free pivoting movement about an axis transverse to said direction,
  - (1) said latch including a detent passing through said aperture and having two opposite faces transverse to said direction, a first one of said faces being directed away from said wedge, and the second face being directed toward said wedge,
  - (2) said faces converging inward of said path toward a free end of said detent,
  - (3) respective integral abutment portions of said top plate and of said latch engaging each other for limiting said pivoting movement to an unlocking position and a locking position,



- (4) in said unlocking position of said latch, said first face being approximately perpendicular to said direction, and said free end projecting from said aperture into said path and toward said bottom plate,
- (5) in said locking position of the latch, said free end farther projecting into said path and being nearer said bottom plate and said wedge than in said unlocking position,
- (6) whereby said free end frictionally engages said stringer during movement of said stringer in said path in a direction away from said wedge without preventing such movement when said latch is in the unlocking position, the latch is pivoted by the engaged stringer from the unlocking position into the locking position when the stringer moves in said path toward the wedge and thereafter prevents further stringer movement toward said wedge; and
- (c) a pull member secured to said latch.

4,161,054

**METHOD FOR CONTINUOUSLY FULLING AND WORKING TEXTILE MATERIAL IN ROPE FORM**

Jose M. Serracant Clermont, Calie Virgen de Gracia, 52 Sabadell, Spain

Continuation of Ser. No. 677,846, Apr. 16, 1976, abandoned.

This application Nov. 30, 1977, Ser. No. 856,159

Claims priority, application Spain, Apr. 17, 1975, 436,895

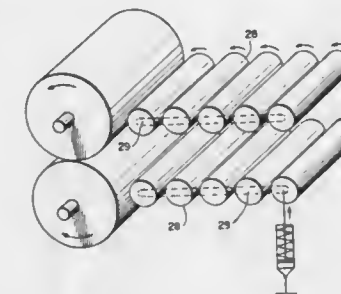
Int. Cl.<sup>2</sup> D06C 17/00

U.S. Cl. 26—21

6 Claims

1. A method for continuously pleating, compressing and fulling textile material in rope form, said method comprising: providing an elongated enclosure having at least two opposite walls thereof defined by movable members, with each of said movable members comprising a plurality of separate surfaces spaced from each other longitudinally of said enclosure;

continuously introducing textile material in endless rope form into a first end of said enclosure at a first speed; driving all of said separate surfaces of each of said movable members at a second speed slower than said first speed, thereby forming said textile material into folds, and continuously and positively contacting said folds with all of said separate surfaces of each of said movable members which move in the same direction as said folds, thereby continuously guiding and carrying said folds through said enclosure at said second speed; simultaneously urging all of said separate surfaces of at least one of said movable members toward said folds in a direc-



tion transverse to the direction of movement of said folds through said enclosure, thereby compressing said folds; continuously discharging said folds at a uniform rate from a second end of said enclosure; and repeatedly passing said textile material through said enclosure, thereby repeatedly folding and compressing said textile material.

4,161,055

**METHOD OF MAKING SELF ALIGNING SPHERICAL BEARING**

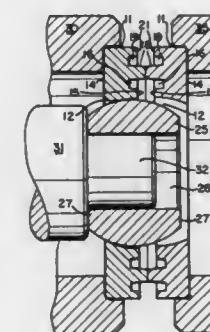
Mykola Weremijenko, Yardley, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed May 17, 1978, Ser. No. 906,474

Int. Cl.<sup>2</sup> B21D 53/10

U.S. Cl. 29—149.5 B

4 Claims



1. A method of making a self aligning spherical bearing comprising the steps of placing an outer bearing race component in a holding fixture, placing an inner spherical bearing race in a holding fixture adjacent said outer bearing race component,

placing a second outer bearing race component in a rotatable bearing fixture in contact with said outer bearing race component, rotating said second outer bearing race component relative to said first bearing race component while applying axial pressure thereto for fusion welding, directing the flash weld material into a space in at least one of said outer bearing race components, stopping rotation of said second outer bearing race component at a predetermined axial location, applying axial pressure on said second outer bearing race component until stop faces on said outer bearing race components are in contact and removing the completed bearing from said holding fixture.

4,161,056

**METHOD AND DEVICE FOR REPAIRING DAMAGED SCREW PROPELLERS**

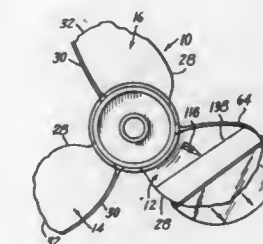
Philip N. Dunham, Biddeford, Me., assignor to P.R.K., Inc., Orlando, Fla.

Filed Aug. 5, 1977, Ser. No. 822,250

Int. Cl.<sup>2</sup> B23P 7/00

U.S. Cl. 29—402

12 Claims



11. A method of repairing a damaged screw propeller comprising the steps of:

- (a) surrounding the damaged portion of a propeller blade with a hollow envelope having external surfaces corresponding in configuration to a portion of the blade before said portion received its damage to substantially duplicate the configuration of said portion of said blade before said portion received its damage; and
- (b) securing said envelope in the position determined by said surrounding step and filling any internal voids due to blade damage between the envelope and the damaged blade with an adhesive.

4,161,057

Patent Not Issued For This Number

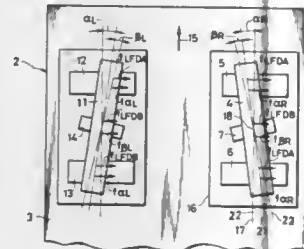


4,161,058

**METHOD FOR ATTACHING STEERING WHEEL**  
 Shinichi Sasaki, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan  
 Filed Feb. 16, 1978, Ser. No. 878,430  
 Claims priority, application Japan, Aug. 25, 1977, 52-101125  
 Int. Cl.<sup>2</sup> B23P 11/00

U.S. Cl. 29—428

2 Claims



1. A method for attaching a steering wheel having a linear axis of symmetry to the steering column of a motor vehicle, said method comprising the steps of:

placing said vehicle on the stage of a toe-in tester including drive rollers so as to mount the front wheels of said vehicle on said drive rollers, said stage defining an axis thereof; moving said drive rollers in a manner that the axes of said drive rollers are perpendicular to the axis of said stage as well as to the planes of rotation of said front wheels; detecting thereby slide-slipping angles  $\alpha_R$ ,  $\alpha_L$  of right and left front wheels of said vehicle relative to said drive rollers;

also detecting camber angles  $C_{NR}$ ,  $C_{NL}$  of said right and left front wheels so as to determine a compensating angle  $\gamma$ ; and

attaching said steering wheel to said steering column with the axis of symmetry of said steering wheel being angularly biased through said compensating angle  $\gamma$  relative to the forward direction of travel of said vehicle when the direction of said vehicle is stabilized on said stage of said toe-in tester;

said compensating angle  $\gamma$  being determined by the equation

$$\gamma = a(\alpha_R + \alpha_L) + (C_{NR} - C_{NL}) + C$$

wherein a, b, c are constants dependent upon the type of vehicle involved.

4,161,059

**METHOD OF FASTENING TO A BELT**  
 Edgar Francois, Bethel, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,357

Int. Cl.<sup>2</sup> B23P 11/00

U.S. Cl. 29—432

4 Claims

1. The method of fastening together flexible belts having reinforcing cords therein comprising:

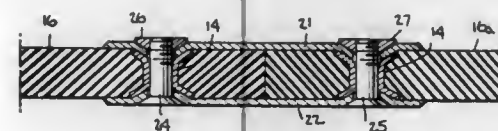
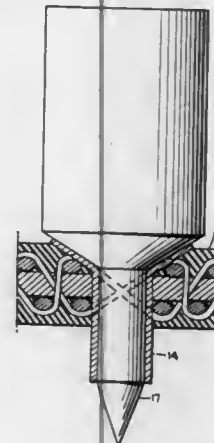
piercing each belt with a piercing tool having a sleeve thereon to form an aperture in each belt, thereby positioning a sleeve in each of said apertures formed in said belts,

said piercing tool being effective to minimize breaking of said reinforcing cords; terminating the ends of each of said sleeves substantially at the surfaces of each belt;

positioning reinforcing plate means having apertures aligned with said apertures of said belts on each side of said belts; and

joining said belts by bolting together said plate means and said belts with bolts extending through said sleeves.

3. The method of fastening together a rigid plate having an aperture therein and a flexible belt having reinforcing cords therein comprising:



piercing said belt with a piercing tool having a sleeve thereon to form an aperture in said belt; thereby positioning the sleeve in said aperture formed in said belt, said piercing tool being effective to minimize breaking of said reinforcing cords;

terminating the ends of said sleeve substantially at the surface of the belt;

determining the relative positions of said rigid plate and said belt to align said aperture of said rigid plate and said aperture of said belt;

and fastening together said plate and said belt with a bolt extending through said aperture of said plate and through said sleeve.

4,161,060

**PROCESS FOR THE PRODUCTION OF A MOULD FOR MOULDING A SPECTACLE FRAME FRONT**

William Lenne, Gagny; Jean F. Bourdot, Paris, and Guy Roland, Vincennes, all of France, assignors to Essilor International (Cie Generale d'Optique), Joinville le Pont, France

Filed Dec. 1, 1977, Ser. No. 856,581

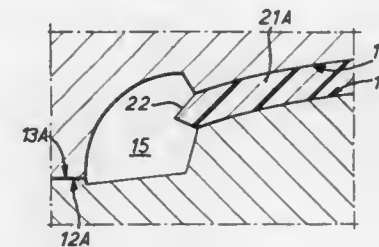
Claims priority, application France, Dec. 17, 1976, 76 38040  
 Int. Cl.<sup>2</sup> B22D 11/126; B21D 33/00; B29C 1/02; B29N 9/00  
 U.S. Cl. 29—527.1

5 Claims

1. A process for the production of a mould for moulding a spectacle frame front from a prototype pattern, comprising:

producing from a prototype two metallic half-moulds having complementary abutting mould faces, the moulding surface of each half mould being formed with a bridge cavity, two annular rim depressions one on each side of the bridge cavity and support surfaces bounded by the rim depressions for supporting false lenses;

employing the half-moulds, in a first phase, for moulding at least one webbed frame front; cutting a pair of false lenses out of the webbed frame front; and



setting back the abutting mould faces in a second phase by a total depth at least equal to the moulding shrinkage of the false lenses so that the false lenses can be gripped between the support surfaces when the mould faces abut.

4,161,061

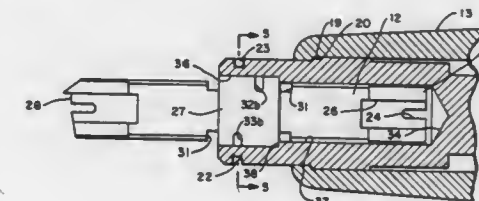
**TERMINATION TOOL BLADE AND SLIDE APPARATUS**  
 John R. Mason, Thousand Oaks, and Donald L. Gregson, Paradise, both of Calif., assignors to Dracon Industries, Chatsworth, Calif.

Filed Jun. 17, 1977, Ser. No. 807,441

Int. Cl.<sup>2</sup> H01R 43/00

U.S. Cl. 29—566.4

6 Claims



1. A tool for terminating electrical conductors at a termination clip, comprising:

a manually engageable handle, a slide in said handle mounted for sliding lengthwise movement therein,

means mounted in said handle for yieldably urging said slide outwardly therefrom, for limiting outward movement of said slide, and for impacting said slide,

a termination blade, a termination end on said blade adapted to contact the termination clip,

means disposed between said slide and said termination blade for removably interlocking said blade in one position with said slide, so that when the electrical conductor is positioned adjacent to the terminal clip and said termination end is forced thereagainst, the conductor is seated therein by the impact on said slide,

said means for removably interlocking said blade to said slide including a cam follower member mounted on said slide being yieldably urged toward said termination blade, a cam surface on said termination blade aligned with said cam follower member, so that when said cam surface is forced past said cam follower member in one direction said termination blade is interlocked with said slide, and when said cam surface is forced in the opposite direction it is removable therefrom,

a bore on the outward end of said slide formed to accept said termination blade,

a cylindrical collar on said termination blade disposed to fit within said bore, said collar having an L-shaped groove on the surface thereof formed to accept said cam follower member, said L-shaped groove having one segment aligned with the collar cylindrical axis, and the other

segment aligned circumferentially thereon, said cam surface being in the bottom of said circumferentially aligned groove segment, whereby an inward and rotary motion sequence of said blade in said slide with said cam follower member aligned with said one segment interlocks said blade and slide.

4,161,062

**METHOD FOR PRODUCING HOLLOW SUPERCONDUCTING CABLES**

Ko Agatsuma, Akishima; Kenichi Koyama, Tokorozawa; Itaru Todoriki, Tanashi; Tetsuo Yamaguchi, Yokohama; Osamu Kohno, Chiba, and Takashi Saito, Yokohama, all of Japan, assignors to Agency of Industrial Science and Technology and The Fujikura Cable Works, Ltd., both of Tokyo, Japan

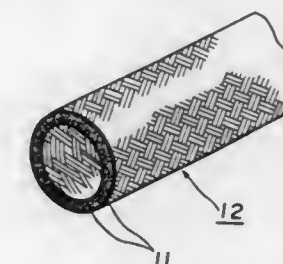
Filed Oct. 26, 1977, Ser. No. 845,770

Claims priority, application Japan, Nov. 2, 1976, 51-131264; Nov. 2, 1976, 51-131265

Int. Cl.<sup>2</sup> H01V 11/00

U.S. Cl. 29—599

10 Claims



1. In a method of producing hollow superconducting cables, comprising taking an elongated hollow conductor of normally conducting material, the periphery of which is provided in its lengthwise direction with at least one groove penetrating part-way towards the longitudinal axis of the hollow conductor, and locating within said groove a multifilament superconductor extending along the length of said groove, the improvement wherein the multifilament superconductor to be located in said groove is made beforehand by the steps of:

(a) forming a multiplicity of composite wires, each composite wire containing at least two metallic elements that are mutually diffusible upon diffusion heat treatment to become a superconducting intermetallic compound;

(b) braiding respective pluralities of said composite wires together to form a braided sleeve;

(c) deforming said braided sleeve to provide it with the cross-sectional profile of said groove; and

(d) subjecting said at least two metallic elements of the composite wires in the deformed braided sleeve to diffusion heat treatment causing said elements mutually to diffuse and become said superconducting intermetallic compound, thereby transforming said deformed braided sleeve into the multifilament superconductor to be located in said groove.

4,161,063

**METHOD OF MAKING A CATHODE FOR AN ELECTROCHEMICAL CELL**

Franz Goebel, Ashland, and Nikola Marincic, Winchester, both of Mass., assignors to GTE Laboratories Incorporated, Stamford, Conn.

Division of Ser. No. 763,845, Jan. 31, 1977, Pat. No. 4,086,397.  
 This application Dec. 15, 1977, Ser. No. 860,699

Int. Cl.<sup>2</sup> H01M 4/88, 4/96

U.S. Cl. 29—623.5

7 Claims

1. A method for constructing a large, highly active cathode electrode for use in an electrochemical cell comprising the steps of:

forming a porous, semi-rigid dough of cathode material; drying the dough; breaking up the dried dough to form a mass of discrete porous conglomerates; and



pressing a quantity of the conglomerates onto a rigid electrically conductive screen-like member so that the conglomerates substantially fill the interstices therein and are structurally supported by the interstice-defining members of the screen-like member.

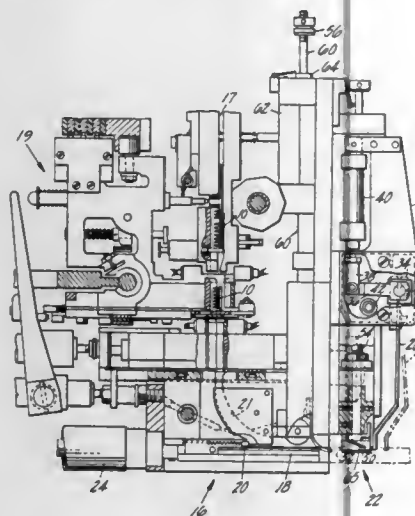
#### 4,161,064 MACHINES FOR BOARD MOUNTING AND SOCKET MOUNTING COMPONENTS

Daniel W. Woodman, Jr., Beverly, and Henry L. Wright, Ipswich, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Aug. 18, 1977, Ser. No. 825,824  
Int. Cl.<sup>2</sup> H05K 3/30

U.S. Cl. 29—741

7 Claims



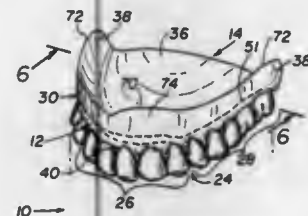
1. In a machine for separately inserting in circuit boards both successive electronic components and sockets for mounting said components, the components and sockets respectively having a body and dual in-line leads extending in parallel therefrom and the sockets having portions shaped to receive the component leads endwise, said machine having an inserting means and a means for releasably supporting each socket or component above a board and in alignment with the inserting means, first mechanism operative to mount a component in a socket preinserted by the machine, said mechanism comprising a device movable into and out of cooperative relation with the supporting means to align leads of the component with the lead receiving portions of the pre-inserted socket, said device comprising a member having one portion formed to engage and position a face of the socket when on the supporting means and another portion formed to engage and position end leads of the component when on the supporting means in predetermined

offset relation to said positioned face of the socket, and other mechanism for operating said member in time relation to said inserting means.

#### 4,161,065 METHOD FOR MAKING READILY RESHAPABLE DENTURES

John Gigante, 600 Hilltop Ter., Cliffside Park, N.J. 07010  
Filed Oct. 7, 1977, Ser. No. 840,154

Int. Cl.<sup>2</sup> A61C 13/04, 13/10; B29C 5/04; B29D 3/00  
U.S. Cl. 32—2 67 Claims



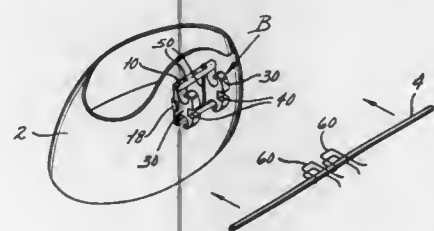
1. A method for manufacturing an article used to produce an artificial denture comprising the steps of:

- placing a set of artificial teeth including anterior and posterior teeth in a mold having a cavity along the base portion of the teeth;
- filling a limited portion of said cavity with a first composition comprising a curable mixture of a first polyacrylic powder and a liquid acrylic monomer;
- filling at least an anterior portion of said cavity with a second composition comprising a heat-curable mixture of a second polyacrylic powder and a plasticized liquid acrylic monomer, said plasticized liquid acrylic monomer comprising from 30% to 90% by weight of liquid acrylic monomer and from 70% to 10% by weight of a plasticizer mixture so as to embed certain of said anterior teeth in said second composition; and
- curing said first and second compositions in said cavity to integrally join same together and to obtain a rigid frame structure from which said teeth depend, whereby in producing said artificial denture said second composition containing certain of said anterior teeth is remoldable and said anterior teeth are adjustable with finger pressure to closely conform to desired portions of an oral cavity and said frame portion comprised of said first composition concurrently remaining rigid.

#### 4,161,066 ORTHODONTIC BRACKET

Jim B. Morrow, 10701 Meath Dr., St. Louis County, Mo. 63123, and Peter G. Sotiropoulos, 100 S. Fairway Dr., Belleville, Ill. 62223

Filed Jun. 20, 1977, Ser. No. 808,189  
Int. Cl.<sup>2</sup> A61C 7/00  
U.S. Cl. 32—14 A 17 Claims



2. In combination with an arch wire which is adapted to extend along a row of teeth, an improved orthodontic bracket for connecting the tooth with the arch wire, said bracket com-

prising: a base attached to the tooth or to a band that fits around the tooth, the base having at least one slide way that extends along it in a generally horizontal direction; at least one insert engaged with the slide way and being configured such that it is free to slide horizontally along the way, but cannot be withdrawn outwardly from the way or moved vertically with respect to the way, the insert further having an outwardly presented portion that is configured to receive the arch wire extended along the row of teeth, and securing means for fastening the insert to the base in any one of a plurality of fixed positions to which it may be moved along the slide way, said means providing a positive stop to movement of the insert in either direction horizontally along the way.

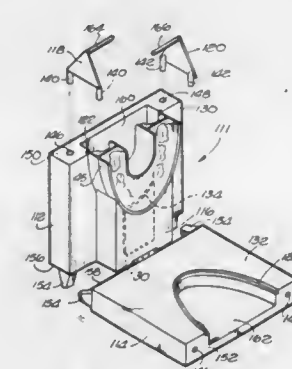
#### 4,161,067 METHOD FOR CONSTRUCTING REGISTERED TEETH CASTINGS

Ivan Bekey, 517 Erskine Dr., Pacific Palisades, 90272, and Roger S. Wolk, 28 Malibu Colony Dr., Malibu, both of Calif. 90265

Filed Nov. 29, 1976, Ser. No. 745,712  
Int. Cl.<sup>2</sup> A61C 9/00

U.S. Cl. 32—17

5 Claims



1. A method for obtaining castings of registered upper and lower dental impressions separated by at least one non-porous, bite-deformable septum, comprising:

- simultaneously obtaining registered dental impressions of a patient's upper and lower teeth by simultaneously biting into impression material that is separated by said septum and deforming said septum with said upper and lower teeth;
- transferring said dental impressions to a mold without disturbing their registration;
- forming two registered mold cavities separated by said non-porous, bite-deformed septum, one of which incorporates the upper dental impression and one of which incorporates the lower dental impression;
- casting an impression of each mold cavity while maintaining registration of the mold cavities; and,
- removing the separate upper and lower dental castings from the mold.

#### 4,161,068 APPARATUS AND METHOD FOR ALIGNING SHAFTS

Thomas M. McMaster, 1490 Donnelly Rd., Mt. Vernon, Wash. 98273

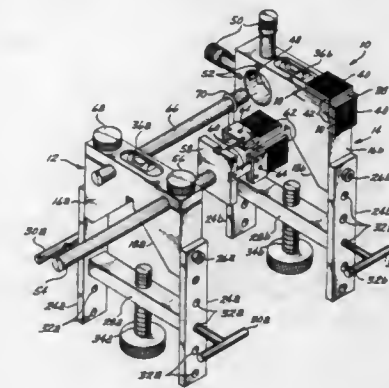
Filed Nov. 30, 1977, Ser. No. 855,752  
Int. Cl.<sup>2</sup> G01B 5/24

U.S. Cl. 33—412

30 Claims

5. An apparatus for aligning a pair of shafts comprising: a pair of blocks having means for aligning and leveling a separate block on each of a pair of shafts to be aligned, cooperating ronchi ruling means extending between the two blocks for

indicating angular misalignment by exhibiting a Moire fringe pattern, and a second cooperating means extending between

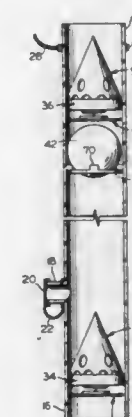


the two blocks for measuring parallel misalignment between the shafts.

#### 4,161,069 ELONGATED FLEXIBLE LEVEL FOR USE AS TRANSIT

Angelo Cubeta, Maple Ave., Higganum, Conn. 06441

Filed Nov. 21, 1977, Ser. No. 853,025  
Int. Cl.<sup>2</sup> G01C 5/04, 9/22  
U.S. Cl. 33—367 14 Claims



1. An elongated flexible level assembly for use as a transit and the like comprising:

- a pair of float assemblies each comprising:
  - (1) a housing providing a chamber therewithin with a flow passage thereto adjacent its lower end;
  - (2) a first valve seat in said chamber adjacent to said flow passage and between said flow passage and the upper end of said chamber defining a first valve opening;
  - (3) a first valve member reciprocable in said chamber relative to said first valve seat to effect sealing of said first valve opening upon seating on said first valve seat;
  - (4) a second valve seat in said chamber spaced from said first valve seat towards said upper end of said chamber and defining a second valve opening;
  - (5) a second valve member reciprocable in said chamber relative to said second valve seat to effect sealing of said second valve opening upon seating upon said second valve seat;
  - (6) indicator means on said housing intermediate said first and second valve seats, said housing being transparent at least about said indicator means;
  - (7) float means movable in said chamber in response to fluid level above said indicator means to move said second valve member into seating engagement with said second valve seat and thereby prevent passage of liquid and air therethrough;



(8) valve member actuating means above at least said second valve seat, said actuating means comprising a member having its center of gravity spaced upwardly of its midpoint to provide instability whereby tilting of said float assembly will cause said actuating means to tip over; and

(9) means coupling said actuating means with each of said valve members and operable to move said valve members into engagement with said valve seats upon substantial deviation of said housing from the vertical, said valve members actuating means permitting flow of air and liquid thereby, said actuating means moving said valve members to seal said valve openings upon substantial tilting of a float assembly from the vertical, said coupling means being movable relative to said actuating means upon movement of said second valve member by said float means to permit movement of said second valve member independently of said actuating means; and

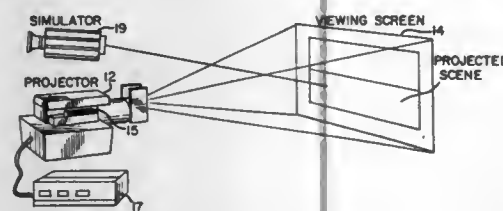
B. an elongated flexible conduit connected at its ends to said float assemblies to provide flow therethrough of associated liquid into said flow passages of said float assemblies, whereby, when both of said float assemblies are at the same height, the liquid level in said housings will register with said indicator means thereof and, when they are at different heights, the liquid level may rise in the lower thereof until said float means seals said second valve seat opening to prevent flow of air and liquid therethrough.

**4,161,070**  
**LASER RANGEFINDER TRAINER**  
Herman I. Pardes, Wanamassa, and Frederick B. Sherburne, Oceanport, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 20, 1978, Ser. No. 917,223  
Int. Cl.<sup>2</sup> F41G 3/26

U.S. Cl. 35—25

6 Claims

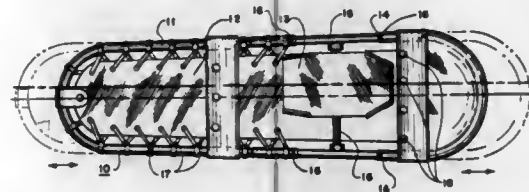


1. An electro-optical rangefinder training system comprising a means for simulating a rangefinder operation including means for ranging onto a target and setting a range indication, a picture projector and viewing screen, each picture including a scene portion and a target designating portion and having data encoded thereon to indicate the range of targets on the picture, laser means associated with said ranging means to trigger a laser beam upon actuating said rangefinder, said projector including optic means for projecting a picture onto said screen, said screen reflecting the visual light and laser beam impinging thereon; and said projector optic means providing from each picture a scene portion and target visible to the eye and a target aperture, corresponding to the target, superimposed thereon and invisible to the eye but susceptible to a laser beam impinging thereon; and laser beam detection means, said projector optic means directing the laser beam reflected from said target to said detection means when said laser beam has hit the target, and means for receiving encoded data from said picture corresponding to the range of the target which has been hit whereby the setting on the ranging means may be compared with the actual range to the target.

**4,161,071**  
**SNOWSHOE**  
Fritz Maul, 3768 S. 189th Pl., Seattle, Wash. 98188  
Filed Sep. 9, 1977, Ser. No. 831,802  
Int. Cl.<sup>2</sup> A43B 5/04

U.S. Cl. 36—125

6 Claims

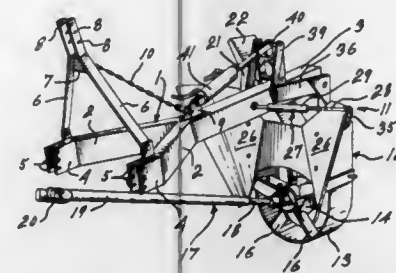


1. In a snowshoe having a frame defining the outer perimeter configuration of said snowshoe, a webbing mounted to said frame and suitably covering the interior area defined by said frame, and a binding mounted to said frame, the improvement of: mounting said binding asymmetrically with respect to the rectilinear centerline of said frame.

**4,161,072**  
**DITCH DIGGER WITH ADJUSTABLE SIDE WINGS**  
Normand Pronovost, 256 Rte. 159, St. Tite, Canada  
Filed Oct. 11, 1977, Ser. No. 840,640  
Int. Cl.<sup>2</sup> E02F 5/08

U.S. Cl. 37—93

4 Claims

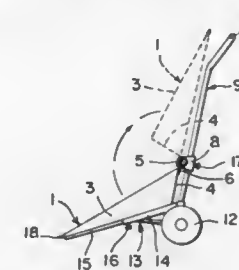


1. A ditch digger comprising a frame defining a longitudinal direction and a pair of opposite ends in said longitudinal direction, said frame comprising a boom having a Y shape planar configuration and including a pair of front branches forwardly diverging from each other and a rear projection, connection means operatively connecting said frame to a tractor vehicle, said connection means including the outer end of said branches being constructed and arranged for pivotal connection to lower hitch arms of a tractor, a pair of arms pivotally connected to said front branches respectively and to an upper hitch point of a tractor, and an adjustable link angularly suspending said boom relative to said pair of arms, a digging rotor unit carried by said rear projection and including a stator structure and a digging rotor, the latter being rotatively carried by said stator structure for transverse rotation about an axis extending in said longitudinal direction, and having a lower half radially sinkable in operatively axial digging engagement with the ground, and a pair of grading blades laterally projecting on the opposite sides respectively of the stator structure and angularly adjustable laterally outward relative to said lower half for selective transverse sloping of the sides of the ditch, said digging rotor unit being pivotally suspended at the end of said rear projection, a linkage system and an actuator connected to said digging rotor unit and to said frame and operatively articulating the same vertically relative to each other constructed and arranged to maintain said digging rotor in relatively the same upright attitude irrespective of the depth setting of said digging rotor unit.

**4,161,073**  
**SNOW SCOOP**  
William Oakes, 104 State St., Newburyport, Mass. 01950  
Filed Nov. 4, 1977, Ser. No. 848,395  
Int. Cl.<sup>2</sup> E01H 5/02

U.S. Cl. 37—130

4 Claims



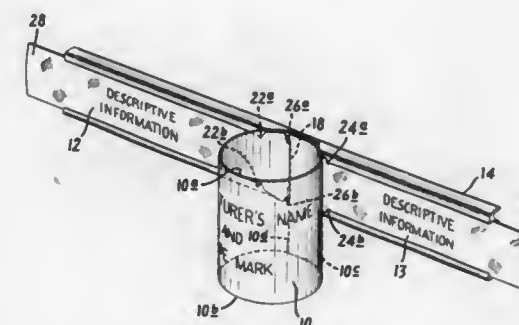
1. A snow scoop attachment comprising:

- (a) a scoop;
- (b) means for rotatably attaching said scoop to a frame; and
- (c) means for slideably attaching said scoop to said frame, and wherein said rotatable attaching means comprises: a plurality of strap hinges attached to said scoop; a bar rotatably received by said hinges; and a plurality of brackets adapted for receiving a frame and rotatably receiving said bar.

**4,161,074**  
**THREE-DIMENSIONAL PRODUCT MARKER**  
George L. DePinna, Forest Hills, N.Y., assignor to Goodren Products Corp., Englewood, N.J.  
Filed Mar. 22, 1977, Ser. No. 780,166  
Int. Cl.<sup>2</sup> G09F 1/00

U.S. Cl. 40—124.1

6 Claims

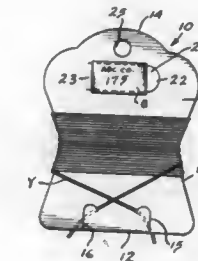


1. A three-dimensional product marker comprising a flat flexible sheet having an information-bearing front surface and having upper, lower and side edges, and first and second support panels extending outwardly from side edges of the flat sheet, said panels having front and rear surfaces, and said flat sheet having a vertical slit formed in the sheet adjacent the first support panel, said vertical slit spaced from said upper and lower edges and sized to receive the second support panel and thereby permit the first and second support panels to be pulled across and away from each other behind the flat sheet to impart a three-dimensional shape to the flat sheet and place on the same side the information-bearing surface of the flat sheet and the rear surfaces of the support panels.

**4,161,075**  
**THREAD AND YARN ORGANIZER**  
Ann S. Eubanks, 6737 Moss Lake Dr., Chattanooga, Tenn. 37343, and Celeste M. Steinkraus, 204 E. Lake Shore Ter., Chattanooga, Tenn. 37415  
Filed Feb. 21, 1978, Ser. No. 879,664  
Int. Cl.<sup>2</sup> B65H 75/06, 75/28; G09F 3/08

U.S. Cl. 40—309

3 Claims

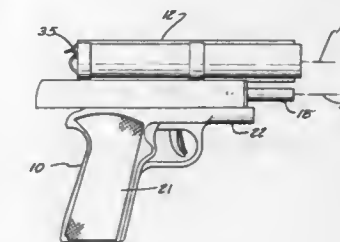


1. Apparatus for holding a flexible strand of yarn of indeterminate length, comprising a thin, substantially flat body of flexible thermoplastic material, said body including first and second end walls connected by side walls, said side walls tapering inwardly from said first and second end walls and defining a reduced waist about which a strand of yarn may be wound, said first end wall being substantially straight from side to side of said body and generally normal to the longitudinal axis thereof, a pair of oppositely facing substantially "J" shaped slits extending inwardly from said first end wall for receiving and frictionally retaining opposite ends of said yarn, each of said "J" shaped slits having a relatively straight portion and a hook portion, said straight portions being generally parallel to the longitudinal axis of said body, a tongue cut from said body between said reduced waist and said second end wall, said tongue having substantially parallel sides which are generally parallel to said first end portion and having a free end, the base of said tongue being integrally connected to said body so that a portion of said tongue may be displaced out of the plane of said body to removably receive an indicia bearing member, said portion of said tongue being repositionable in the plane of said body to assist in frictionally retaining said member thereon, and said body having an opening located adjacent to said second end wall for hanging said body from a support member.

**4,161,076**  
**AIMING SYSTEM FOR WEAPONS**  
Wesley L. Snyder, 1103 Forest Home Dr., Houston, Tex. 77094  
Filed Oct. 31, 1977, Ser. No. 846,691  
Int. Cl.<sup>2</sup> F41G 1/34

U.S. Cl. 42—1 A

34 Claims



1. An aiming system for attachment to a weapon having an elongate barrel which comprises:

- a dust-proof housing member attached to said weapon;
- a laser enclosed within said housing member for projecting a coherent beam of light onto a target; and
- a buffer interposed between said housing member and said laser, said buffer cushioning said laser from shock upon recoil of the weapon.

4,161,077

## RADIO CONTROLLED FISHING APPARATUS

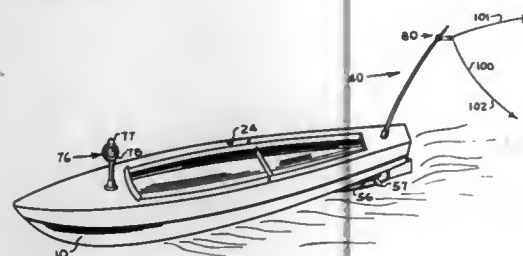
Charles J. Ciacio, 4060 Byron Ave., Titusville, Fla. 32780, and Harry A. Rinehart, Titusville, Fla., assignors to Charles J. Ciacio, Titusville, Fla.

Filed May 8, 1978, Ser. No. 903,732

Int. Cl.<sup>2</sup> A01K 97/00; A63H 23/02

U.S. Cl. 43—26.1

10 Claims



1. A combination fishing apparatus and toy vessel for controllably towing a section of fishing line intermediate a baited end and the angler, said fishing apparatus comprising in combination:

a floating body;

radio receiver means having an antenna coupled thereto for receiving radio control signals from a distant command transmitter, with said radio receiver means having first demodulator means for reconstructing a first signal from said radio control signals;

power means operably coupled to said radio receiver means for propelling said floating body over the surface of a body of water responsive to said first signal; and

line release means coupled to said antenna adjacent a distended end thereof for receiving therethrough and controllably releasing the intermediate section of the fishing line responsive to the tension on the fishing line exceeding a predetermined limit.

4,161,078

## FISHING LINE SUBMERGING DEVICE

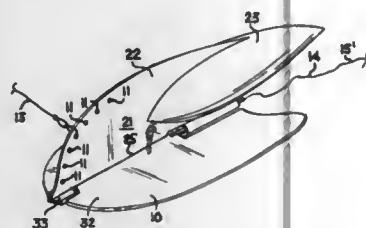
George B. Pagani, 733 Melva Ave., Oakdale, Calif. 95361

Continuation-in-part of Ser. No. 740,222, Nov. 9, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,058

Int. Cl.<sup>2</sup> A01K 95/00

U.S. Cl. 43—43.13

4 Claims



1. A fish-line submerging device for submerging a fishing line and leader to a predetermined depth comprising, a vertical fin having a substantially flat lower edge, a forward tip and an upper edge, means for causing the vertical fin to assume a substantially vertical attitude in water, the horizontal fin having a forward point and a rearward edge with said forward point rotatively affixed to said forward tip of the vertical fin, a detent member affixed to the rearward portion of said flat lower edge of the vertical fin, means for urging said detent member into locking contact with the rearward edge of the horizontal fin, means for attaching the leader to said detent member at an attaching position, a series of means for attaching the fishing line at a predetermined attaching point at said upper surface of the vertical fin, whereby upon a predetermined tension in said leader line, the detent mechanism releases the

horizontal fin and the fin thereby rotates freely about the vertical fin at its forward tip.

4,161,079

## INSTANT MOUSE TRAP

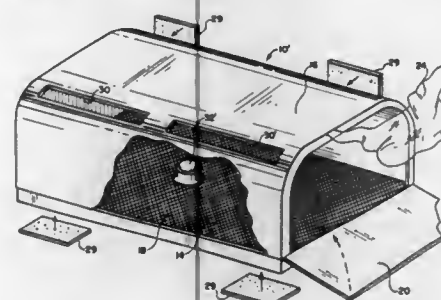
Isaac Hill, 6340 S. Honore St., Chicago, Ill. 60636

Filed Dec. 27, 1977, Ser. No. 864,534

Int. Cl.<sup>2</sup> A01M 23/00

U.S. Cl. 43—58

10 Claims



1. A trap for rodents or like pests comprising: an enclosure for the pest to enter;

means for ensnaring the pest in the enclosure;

a charge of separately covered bait material mounted to the enclosure;

means for uncovering said covered bait material within the enclosure, said means for uncovering being operable externally of said enclosure, whereby covered bait material may be stored for a long period of time and yet easily released when desired.

4,161,080

## ADJUSTABLE ANIMAL TRAP

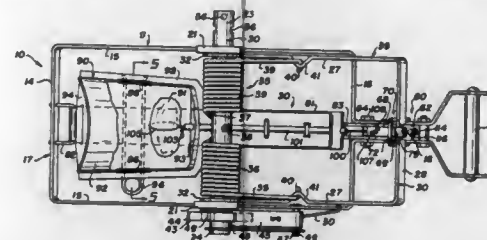
William Gabry, Box 10, Vavenby, Canada

Filed Apr. 17, 1978, Ser. No. 896,845

Int. Cl.<sup>2</sup> A01M 23/30

U.S. Cl. 43—82

10 Claims



1. An adjustable animal trap comprising a base frame having a fixed jaw, a winding shaft journaled across the base frame spaced from the fixed jaw, an upper frame swingingly mounted at one end on the winding shaft and having a striker jaw at the opposite end thereof, spring means operatively connecting the winding shaft to the upper frame, control means normally permitting rotation of the winding shaft in one direction only, a trigger assembly for releasably securing the upper frame to the base frame with the trap in a set position, lever means for rotating the winding shaft in said one direction whereby to tension the spring means and apply a selected spring pressure biasing the trap towards a shut position, bait support means carried by the base frame and including a bait holder near the fixed jaw, and a release member operatively connecting the trigger assembly to the bait holder whereby the upper frame is released and the trap is allowed to snap shut only when a pulling force is exerted on said bait holder.

4,161,081

## AMUSEMENT SET

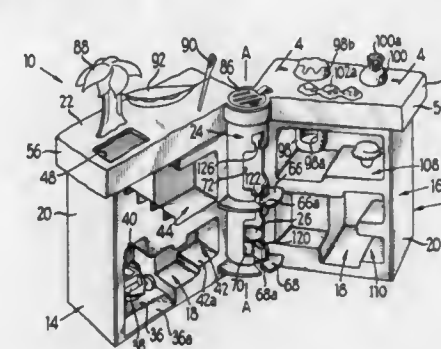
Allison W. Katzman, Chicago; Palmer J. Schoenfeld, Evanston, and Burton C. Meyer, Downers Grove, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,401

Int. Cl.<sup>2</sup> A63H 33/00

U.S. Cl. 46—11

23 Claims



1. An amusement set (for use particularly by children), comprising:

a carrying case including a pair of mating hollow housing members pivotally connected along one edge to open and close along a peripheral seam line around each member, each of said hollow housing members including internal wall means therein defining a plurality of rooms at different levels when said housings are rested on a bottom wall in an open position;

a hollow, elevator shaft in coaxial alignment with the axis of pivotal interconnection between said housing members extending between said different levels, said shaft having openings at said different levels exposed between said housing members when in an open condition; and an elevator manually movable in said shaft between said different levels.

4,161,082

## FIGURE TOY LIMB WITH TWIRLING HAND UNIT

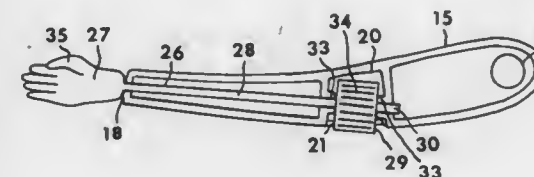
Brian S. Alexander, 907-1 Austin, Evanston, Ill. 60202

Filed Nov. 28, 1977, Ser. No. 855,160

Int. Cl.<sup>2</sup> A63H 7/00, 3/46

U.S. Cl. 46—119

3 Claims



1. A figure toy limb comprising, in combination, an arm having a hollow portion, multiple supporting standards within said hollow portion, an outer chamber opening in the wall of said hollow portion, a twirling hand unit held by said arm portion, said twirling hand unit including an axle mounted on said standards and easily rotatable thereon, a figure toy hand non-rotatably attached at one end of said axle and a cylindrical turning wheel non-rotatably attached near or at the other end of said axle, part of the said cylindrical turning wheel being accessible through the said outer chamber opening so that rotating the said cylindrical turning wheel (by finger) will impart a twirling motion to the said figure toy hand.

4,161,083

## METHOD FOR VESSEL CULTIVATION OF LENTINUS EDODES

Noriyoshi Fuzisawa, Sakura, and Kenichi Hattori, Musashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

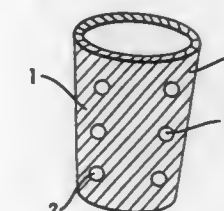
Filed May 30, 1978, Ser. No. 910,953

Claims priority, application Japan, Jul. 29, 1977, 52-91012

Int. Cl.<sup>2</sup> A01G 1/04

U.S. Cl. 47—1.1

9 Claims



1. A method for the vessel cultivation of *Lentinus edodes* comprising inoculating seed fungi of *Lentinus edodes* into a culture medium in a vessel, subjecting the inoculated culture medium to radiation, taking out the culture medium from the vessel after hyphae have been sufficiently developed in the culture medium and subjecting the culture medium to a fruiting body-producing treatment, said method being characterized in that a vessel comprising mainly light-impermeable portions but including localized light-permeable portions is used as the cultivation vessel.

4,161,084

## METHOD FOR REDUCING TEMPERATURE AT WHICH PLANTS FREEZE

Deane C. Arny, Madison, Wis., and Steven E. Lindow, Berkeley, Calif., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 3, 1978, Ser. No. 921,800

The portion of the term of this patent subsequent to Sep. 6, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> A01G 1/00

U.S. Cl. 47—2

11 Claims

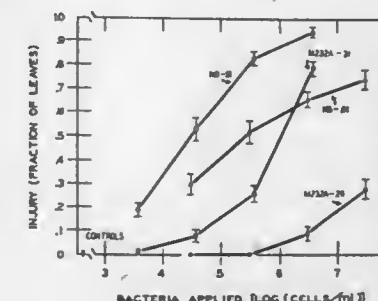


Figure 1. Frost damage to B232A protected corn seedlings challenged with different cell densities of *E. hericicola* or *E. stramineus*. Corn seedlings were sprayed 3 days prior to freezing at -4.3°C with  $5 \times 10^8$  cells/ml B232A in nutrient broth (4 and 5) or with nutrient broth alone (6 and 7) and were placed in a mist chamber. Two days prior to freezing plants were sprayed with different cell densities (shown on the abscissa) of *E. stramineus* isolate P21 (2 and 3) or *E. hericicola* isolate P26 (4 and 5) to phosphate buffer and were returned to the mist chamber. Vertical bars represent the standard error of the determination of the mean.

1. The method for protecting plants against frost injury comprising treating the plants by the application of non-ice nucleating bacteria in an amount sufficient to increase the population prior to the onset of freezing temperature to increase the proportion of non-ice nucleating bacteria to ice nucleating bacteria from that normally present on the plants thereby to reduce the temperature at which frost injury occurs.

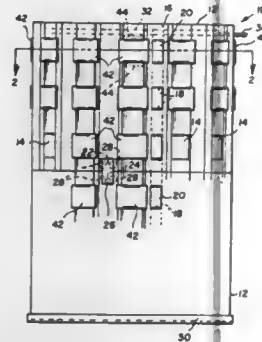


**4,161,085**  
**GARDEN DEVICE AND METHOD OF PRODUCING SAME**  
 F. Wesley Moffett, Jr., 944 Allens Creek Rd., Rochester, N.Y. 14618

Filed Mar. 20, 1978, Ser. No. 888,350  
 Int. Cl.<sup>2</sup> A01G 9/021

U.S. Cl. 47—82

18 Claims



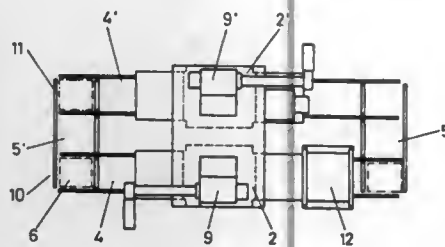
1. A garden device for producing a vertically oriented garden comprising:  
 a first vertically extending endless wall enclosure for receiving a quantity of growing medium, said first wall enclosure comprising a vertically oriented flexible sheet having vertically spaced plant openings extending therethrough; and  
 a flexible cover slip for releasably covering each plant opening, each of said cover slips having means for releasably attaching said slip to said sheet for covering one of said plant openings to prevent the escape of the growing medium and moisture contained therein from said enclosure, and detaching said slip from said sheet to permit access to the growing medium through said one plant opening whereby a seed or plant may be embedded in the growing medium for growth through said one plant opening.

**4,161,086**  
**CONTINUOUS SHOT-BLASTING MACHINE**  
 Sergej Toedtli, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland  
 Filed Jul. 11, 1977, Ser. No. 814,847  
 Claims priority, application Switzerland, Jul. 13, 1976, 8995/76

Int. Cl.<sup>2</sup> B24C 3/10

U.S. Cl. 51—418

14 Claims



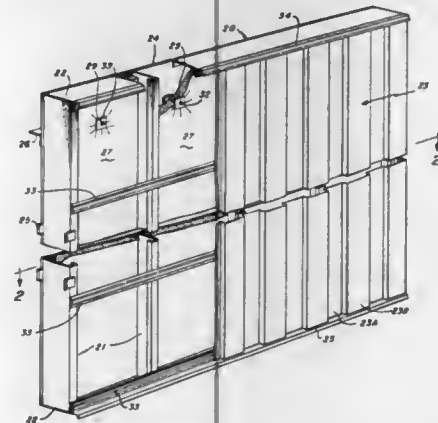
1. A continuous shot-blasting machine for surface treating batches of workpieces comprising at least one blasting chamber for shot-blasting the workpieces, first and second supporting racks for carrying the workpieces through said chamber, conveyor means for transporting said supporting racks with the workpieces through said chamber, at least one turn-over device for rotating one of said first and second supporting racks with workpieces thereon through 180 degrees about a substantially horizontal axis, and means for temporarily securing the workpieces to said supporting rack being rotated during

rotation of said supporting rack and for releasing the workpieces from said supporting rack to deposit the turned-over workpieces onto the other one of said first and second supporting racks so that untreated surfaces of the workpieces are being exposed for shot-blasting treatment.

**4,161,087**  
**PANELS FOR USE IN CONSTRUCTING BUILDING WALL AND BUILDING WALLS INCLUDING SUCH PANELS**  
 Clarence N. Levesque, Westford, Mass. 01886

Filed May 11, 1978, Ser. No. 904,936  
 Int. Cl.<sup>2</sup> E04F 13/12, 19/04; E06B 1/04; E04B 2/02  
 U.S. Cl. 52—62

17 Claims



1. A modular panel for use in constructing the wall of a building, said panel including at least two channel members whose lengths do not exceed a predetermined maximum determined by transportation limitations, and a series of stud members welded to said channel members to provide a rigid framework dimensioned to provide a predetermined lengthwise and vertical portion of a wall of a building, finish sheet material secured to the inside of said framework to provide an inner panel wall, sections of insulation for at least some of the rectangular spaces established by said framework, said sections shaped and dimensioned to be a press fit in said spaces and fitted therein and frictionally held by said framework, a vapor barrier backed by said inner wall, said insulation sections lodged against said barrier, a plurality of vertically spaced sub-girts for the outer side of the framework and including one for each channel member and secured thereto and others secured to said stud members, corrugated metal panelling providing a series of spaced, vertical channels and outwardly disposed ribs, the channels secured to said sub-girts to provide an outer panel wall, said insulating sections of a thickness to provide a dead air space between said sections and said outer wall, and flashing anchored to said panel in back of said panelling by sub-girts and extending outwardly under the bottom edges of said panelling.

**4,161,088**  
**PIPE-AND-BALL TRUSS ARRAY**  
 Paul F. Gugliotta, 39 E. 20th St., New York, N.Y. 10003, and David Hoffmann, 117 N. Jefferson St., Milwaukee, Wis. 53202

Filed Nov. 11, 1977, Ser. No. 850,646

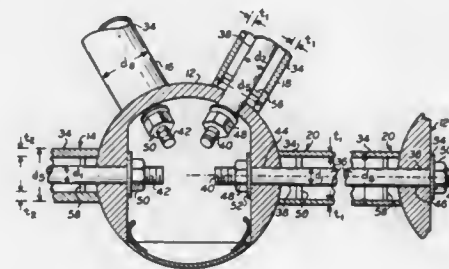
Int. Cl.<sup>2</sup> E04B 1/56

U.S. Cl. 52—223 R

27 Claims

1. In a pipe-and-ball truss array for supporting a deck surface thereon in a predetermined plane, said truss array comprising a plurality of truss members, at least one of said plurality of truss members comprising an outer chord of said truss array, at least a first hollow substantially ball-like member portion common to said plurality of truss members and first means for joining

said plurality of truss members to said first substantially ball-like member portion, each of said truss members comprising an outer hollow pipe element having a longitudinal axis and first and second ends with an inner rod element extending through said outer hollow pipe element, said inner rod element having first and second ends, said outer hollow pipe element having an outer surface, said first substantially ball-like member portion having a plurality of spaced apart apertures extending from the exterior surface thereof to the interior thereof, each of said inner rod element first ends having threads thereon and extending beyond said outer hollow pipe element first end and through an associated one of said first substantially ball-like member portion apertures, each of said outer hollow pipe element first ends bearing against said first substantially ball-like member portion exterior surface, said first joining means comprising first threadable nut means threadably mounted in said first substantially ball-like member portion interior on said inner rod element threaded first ends and bearing against the interior surface of said first substantially ball-like member portion for simultaneously placing said inner rod element of said truss member in tension and said outer hollow pipe element of the same truss member in compression for enabling applied tensile, compressive and axial forces to be transferrable between said joined truss members through said first substantially ball-like member for maintaining a force resistant three-dimensional prestressed truss array; the improvement comprising a structural tee element extending radially outward from



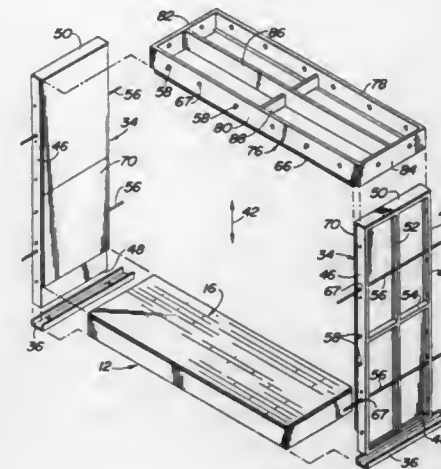
the outer surface of at least one of said outer chord outer hollow pipe elements in a plane normal to the plane in which the deck surface is to be supported on said truss array, said outer chord having a configuration comprising said structural tee element, said structural tee element being structurally integral with said outer chord outer hollow pipe element outer surface and comprising a radially extending portion and a first planar extending portion normal thereto, said first planar extending portion extending in a plane parallel to said deck surface supporting said deck surface thereon above said structurally integral outer chord outer hollow pipe element outer surface in a single layered support system, said outer chord inner rod element and first joining means being disposed in said outer chord configuration for eccentrically prestressing said outer chord configuration, said other outer hollow pipe elements without said structural tee element having said inner rod element and said first joining means associated therewith disposed for axially prestressing said other outer hollow pipe elements, said eccentrically prestressed outer chord outer hollow pipe element having said structurally integrated radially extending structural tee element being structurally stronger in bending in said force resistant three-dimensional truss array than said other outer hollow pipe elements without said structural tee, whereby said deck surface is structurally supported in said force resistant three-dimensional truss array on said structural tee element bearing pipe elements in said single layered support system.

**4,161,089**  
**MODULAR BUILDING STRUCTURE SYSTEM**  
 Martin B. Omansky, 10702 Green Mountain Cir., Columbia, Md. 21044

Filed Dec. 14, 1977, Ser. No. 860,386  
 Int. Cl.<sup>2</sup> E04C 3/10

U.S. Cl. 52—227

22 Claims



1. A modular building structure comprising:  
 (a) a foundation member having an upper surface defining a base plane;  
 (b) at least one channel member formed in one piece formation secured to said foundation member;  
 (c) a plurality of wall panel members slidably insertable within said channel member, said wall panel members extending in a plane substantially orthogonal said base plane, each of said wall panel members being positionally located in abutting relation to a next successive wall panel member, said wall panel members having a wall panel frame member including a pair of opposing side wall panel frame members extending in a substantially orthogonal direction to said base plane, said opposing side wall panel frame members defining a first side wall panel member having at least one conically tapered slip pin member fixedly secured thereto extending in a direction substantially parallel said base plane and a second side wall panel member having at least one correspondingly conically tapered opening formed therethrough, said conically tapered opening being alignable with said conical slip pin member formed on said first side wall panel member of a next successive wall panel frame member for frictional engagement between said slip pin member and said conical opening; and,  
 (d) a plurality of ceiling panel members secured to said wall panel members, said ceiling panel members extending substantially in a plane parallel said base plane.

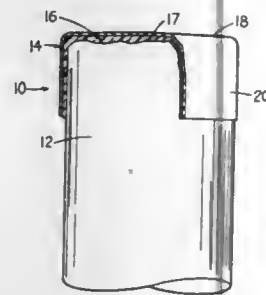
**4,161,090**  
**POST ASSEMBLY AND METHOD**  
 Ridley Watts, Jr., 34000 Cedar Rd., Gates Mills, Ohio 44040  
 Filed Feb. 3, 1978, Ser. No. 874,875  
 Int. Cl.<sup>2</sup> E04H 12/00

U.S. Cl. 52—301

16 Claims

1. A post assembly comprising:  
 a post with a solid or closed end,  
 a cover extending across said end and about side portions of

the post adjacent said end, said cover being spaced from said end, and



a foamed, semi-rigid, energy-absorptive, adhesive completely filling the space between said cover and said end and adhering the cover to the post.

4,161,091

# APPARATUS FOR MAKING A CONNECTED SERIES OF STUFFED SEALED ENVELOPE ASSEMBLIES

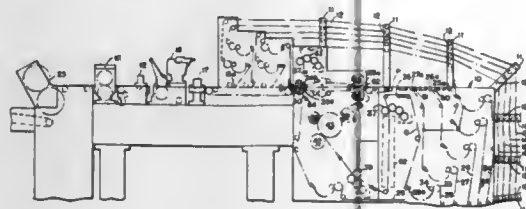
Richard E. Hartnig, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Mar. 8, 1978, Ser. No. 884,691

Int. Cl.<sup>2</sup> B65B 11/48

U.S. Cl. 53—206

5 Claims



1. Apparatus for making a connected series of stuffed sealed envelope assemblies, each having at least one insert ply and one return envelope therein comprising a frame, means on said frame for advancing an elongated insert ply web along a first path, means for advancing a series of return envelopes along a second path toward said first path and at a lineal speed faster than the speed of advance of said insert ply web, knife roll means on said frame in said second path for controlling the advance of each return envelope and for directing each return envelope into said first path while transversely severing said insert ply web into segments, and means on said frame for enveloping said return envelopes and insert ply segments between continuous webs.

5. The apparatus of claim 1 in which said frame includes means for advancing an elongated return envelope web along said second path, means on said frame in said second path for applying adhesive to said return envelope ply web along longitudinally spaced apart, transversely extending bands, means on said frame in said second path for applying adhesive to said return envelope ply web along interrupted, longitudinally extending lines, means on said frame in said second path for transversely severing said return envelope ply web adjacent each of said transversely extending bands to define discrete return envelope plies, each having a specified length between the ends thereof and a transversely extending band of adhesive adjacent one end thereof, said interrupted lines of adhesive terminating adjacent the other end of each discrete return envelope ply, means on said frame in said second path for first folding each discrete return envelope ply on itself along a transverse line positioned between the ends thereof and closer to said other end than said one end to provide front and back panels with said back panel being shorter than said front panel, said folding step bringing said back panel into adhesive union

with a portion of said front panel, the remainder of said front panel other than said portion constituting an envelope flap, and means on said frame in said second path for second folding each first folded return envelope ply on itself along a transverse line and develop said envelope flap.

4,161,092

# FLAT ARTICLE HANDLING SYSTEM

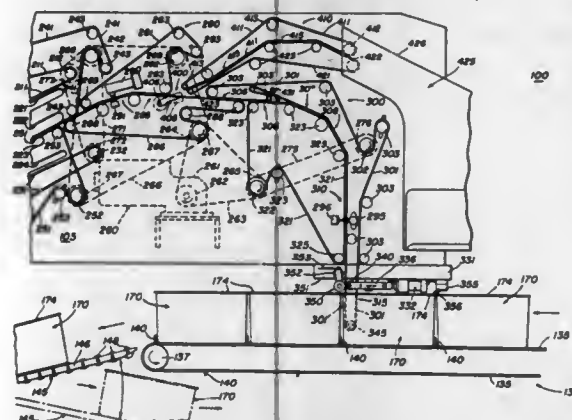
John M. Buday, Des Plaines, Lawrence B. Holmes, Evanston, both of Ill.; Veljko Milenkovic, Birmingham, Mich., and Bernard Stevens, Skokie, Ill., assignors to Gard, Inc., Niles, Ill.

Continuation-in-part of Ser. No. 659,029, Feb. 18, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,108

Int. Cl.<sup>2</sup> B65B 5/08, 5/10

U.S. Cl. 53—244

47 Claims



1. A system for stacking flat articles into containers with the flat articles disposed essentially normal to the bottoms of the containers, said system comprising a stacking conveyor including cooperating pinch belts for conveying the flat articles in a shingled stream, said stacking conveyor having an input end for receiving flat articles from a source thereof and a delivery end for feeding the shingled stream of flat articles from said stacking conveyor, means for moving a continuous line of containers and the delivery end of said stacking conveyor with respect to each other in a continuous manner, said delivery end being oriented essentially normal to the bottom of a container on said container conveyor, mechanism for shifting said delivery end and the containers with respect to each other following the filling of a container to place said delivery end at the front of the next empty container, stack support structure associated with said delivery end including one of said pinch belts extending into the associated container and terminating a short distance from the bottom thereof to support the forming stack of flat articles therein, and a following roller engaging the side of the shingled stream disposed away from said one pinch belt and resiliently urging the shingled stream against said one pinch belt during the relative shifting of the delivery end and the container, whereby said delivery end serves to feed the shingled stream of flat articles into successive containers to stack the flat articles therein without interruption.

4,161,093

# METHOD AND APPARATUS FOR WRAPPING GROUPS OF CIGARETTES

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,069

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632967

Int. Cl.<sup>2</sup> B65B 11/08

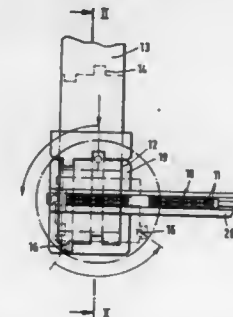
U.S. Cl. 53—228

2 Claims

1. In an apparatus for wrapping a stack (10) of a plurality of

cigarette packs (11) in a carton blank (12), said blank being separable from a web of material (13) fed to the apparatus in a vertical plane wherein the longitudinal axis of said web is rotationally displaced from the longitudinal horizontal axis of said stack, the improvements characterized by:

- a cutting means including a blade member (24) movable in a direction perpendicular to said vertical plane for severing a carton blank from said web,
- a vertically oriented blank holder (15) disposed adjacent said blade member but spaced therefrom in the direction of cutting movement thereof, said blank holder comprising a disc rotatable about its own median transverse axis perpendicular to said vertical plane,



- a plurality of suction holders (16) associated with said blank holder for retaining a severed carton blank thereon delivered thereto by the cutting movement of said blade member,
- means for rotating said blank holder and retained carton blank about said axis to align the axes of said blank with the horizontal axes of said stack, and
- a separate mouthpiece axially displaceable with respect to said blank and defining an opening through which said stack may be pushed, said mouthpiece including an upper edge comprising said blade member, and wherein said cutting means further comprises a stationary counter blade disposed on the opposite side of the web from said blade member which cooperates with the blade member of the mouthpiece to sever the blank from the web.

4,161,094

# APPARATUS FOR PROCESSING BISCUITS OR THE LIKE

Otto Biddig, Geesthacht; Gerhard Tolasch, Wentorf, and Dietrich Bardenhagen, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

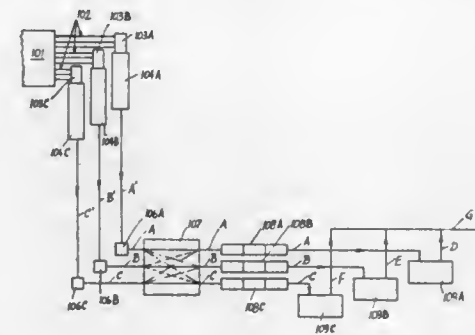
Filed Feb. 27, 1978, Ser. No. 881,822

Claims priority, application United Kingdom, Mar. 16, 1977, 11043/77; Fed. Rep. of Germany, Jan. 7, 1978, 2800570

Int. Cl.<sup>2</sup> B65B 57/00

U.S. Cl. 53—493

26 Claims



1. Apparatus for processing biscuits which issue from an oven, comprising a plurality of conveyor means for transport-

ing discrete rows of biscuits from the oven along a plurality of separate paths; means for accumulating the biscuits into a series of blocks in a first portion of each of said paths; a plurality of variable-output packing machines, one of each of said accumulating means and each disposed in a second portion of the respective path, said machines including devices for confining blocks of the respective series in containers; means for prating the blocks of said series in third portions of said paths intermediate said first and second portions, including means for transferring equal numbers of blocks from one of said paths into each of the other paths in response to a reduction of the output of the machine in the second portion of said one path; and control means including means for increasing the output of the machines in the second portions of said other paths in response to transfer of blocks from said one path into said other paths.

4,161,095

# FLAT ARTICLE STACKING SYSTEM

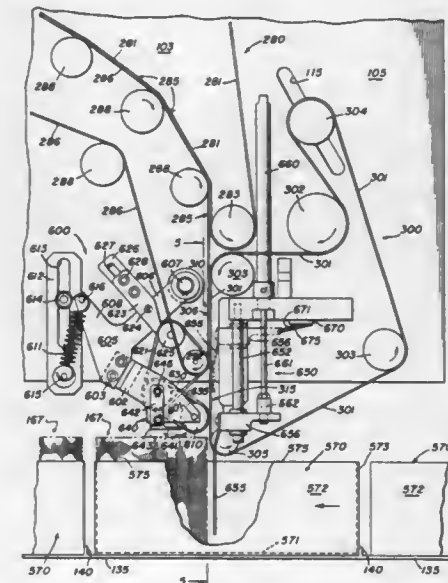
John M. Buday, Des Plaines, Ill., assignor to Gard, Inc., Niles, Ill.

Filed Nov. 8, 1977, Ser. No. 849,702

Int. Cl.<sup>2</sup> B65B 5/08, 5/10

U.S. Cl. 53—527

20 Claims



1. A system for stacking flat articles into containers with the flat articles disposed essentially normal to the bottoms of the containers, said system comprising a stacking conveyor including cooperating pinch belts for conveying the flat articles in a shingled stream, said stacking conveyor having an input end for receiving flat articles from a source thereof in a shingled stream, one of said pinch belts at the other end of said stacking conveyor terminating before the other pinch belt, the other end of said other pinch belt providing a delivery end for feeding the shingled stream of flat articles from said stacking conveyor, means for moving a continuous line of containers and the delivery end of said stacking conveyor with respect to each other in a continuous manner, said delivery end being oriented essentially normal to the bottom of a container on said container conveyor for feeding the shingled stream of flat articles thereto, means for generating a gap in the shingled stream of flat articles that arrives at said delivery end at the completion of the filling of one container and ends when the next empty container is in position to receive the shingled stream, a following roller disposed adjacent to said delivery end and urging the shingled stream thereagainst to guide the shingled stream into the associated container, and drive mechanism for said following roller to drive said following roller in a direction to impart



an impetus to the flat articles in the shingled stream to feed them into the associated container.

4,161,096

# **BLADE ARRANGEMENT FOR A MOTOR DRIVEN SICKLE OR ROTARY MOWING MACHINES, AND SUCH MACHINES**

Hans Biberger, Landshuter Strasse 4, 8301 Ergolding-Landshut, Fed. Rep. of Germany

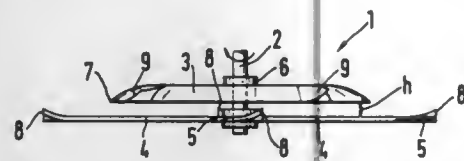
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1976, 2635807

Filed Nov. 22, 1976, Ser. No. 744,047

Int. Cl.<sup>2</sup> A01D 55/18

U.S. Cl. 56—12.9

11 Claims



1. A blade arrangement for a motor driven sickle or rotary mowing machine adapted for ejection of cut grass into a grass collecting container, comprising a rotatable blade shaft, a substantially circular plate fixed on said shaft, blade arms extending radially of said shaft, said blade arms being spaced along said shaft a selected distance from said circular plate, said circular plate having a concave surface facing along said shaft in the direction of said blade arms, said selected distance and said concave surface being such that the noise produced by the operation of said blade arrangement is reduced, said blade arms extending radially of said shaft, said blade arms having blade cutting edges thereon spaced from said shaft and extending radially outwardly of the periphery of said substantially circular plate, a plurality of air deflecting members on said blade arms and on said plate distributed substantially uniformly peripherally relative to said shaft each said air deflecting member on each said blade arm being disposed radially outwardly of said periphery of said circular plate.

4,161,097

# **KNOTTER WITH IMPROVED BILLHOOK AND ACTUATION MECHANISM**

Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Rand Corporation, New Holland, Pa.

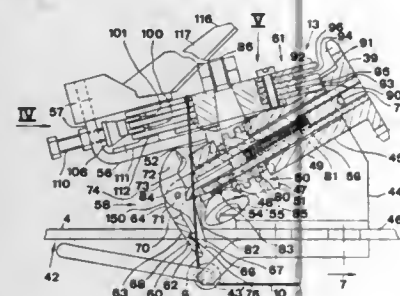
Filed Jun. 16, 1978, Ser. No. 916,371

Claims priority, application United Kingdom, Jun. 21, 1977, 25939/77

Int. Cl.<sup>2</sup> A01D 39/00

U.S. Cl. 56—343

4 Claims



1. In a crop baling machine having an elongate bale case, a pickup and infeed mechanism for delivering crop material into said bale case, a packing mechanism at least partially within said bale case for compressing the crop material therein into a compact mass and forcing it through said bale case, a twine dispensing mechanism including at least one twine carrying needle movable through said bale case, and a knot tying mechanism on said bale case for cyclically receiving twine from said needle and tying a knot in primary and secondary portions

thereof to provide separate discrete packages of crop material, said knot tying mechanism including a support frame, means mounted on said frame for holding the primary and secondary portions of the twine in a substantially side-by-side relationship extending along a predetermined path, said means for holding including a rotatable means, said path movable with the rotation of said rotatable means between at least first and second positions, a billhook including an elongate shaft rotatably mounted on said frame adjacent said twine holding means, an actuation means also mounted on said frame adjacent said billhook to open and close same at selected locations along its rotary path, and means for rotating said rotatable means and said billhook in timed relation, the improvement wherein:

said actuation comprises a rotatable cam mounted on a fixed spindle, said spindle being fixed relative to the rotation of said billhook; and  
said billhook includes a fixed jaw and a movable jaw pivotally mounted on said fixed jaw, said movable jaw further including a cam follower for contacting said rotatable cam and opening and closing said billhook in response to the surface variations of said cam.

4,161,098

# **CLOCK HAVING A LINEAR SCALE**

Kurt Ingendahl, Seefeldstrasse 152, Zurich, Switzerland

Filed Mar. 1, 1976, Ser. No. 662,895

Claims priority, application Switzerland, Mar. 3, 1975, 2650/75; Dec. 12, 1975, 16161/75

Int. Cl.<sup>2</sup> G04B 45/00, 19/06

U.S. Cl. 58—2

32 Claims



1. A clock comprising at least one indicator device, said indicator device including an indicator, a substantially linear scale subdivided into time units, drive means for moving said indicator along the scale, said indicator being driven in accordance with the passage of time in its path of travel along said scale, said scale being one-dimensional, and said indicator being provided with an indicator mark indicating its direction of movement and being movable to-and-fro along said scale between both of its end points, said scale including a rod with scale markers arranged thereat, and an endless band for carrying the indicator, said rod being provided at its ends with drive and bearing means for rollers driving and deflecting the band.

4,161,099

# **DAY AND DATE INDICATOR FOR CLOCKS**

Erwin Storz, Bad Durrheim, Fed. Rep. of Germany, assignor to Kelnzle Uhrenfabriken GmbH, Schwenningen, Fed. Rep. of Germany

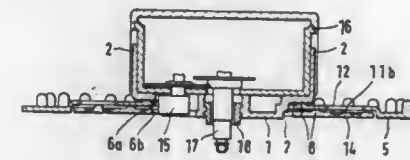
Filed Nov. 23, 1977, Ser. No. 854,310

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 7707132[U]

Int. Cl.<sup>2</sup> G04B 19/24; G09D 3/08

U.S. Cl. 58—4 R

9 Claims



1. A day and date indicator for clocks, comprising a carrier structure adapted to be attached to said clock adjacent the clockwork mechanism of said clock, said clockwork mechanism having at least one indicator shaft extending outwardly from said mechanism toward the face of said clock for moving the hands of said clock, a flat annular date disc extending parallel to the face of said clock and supported by said carrier structure for rotation about said indicator shaft, said date disc having an outer surface bearing date indicia thereon, a flat annular day disc supported by said carrier structure for rotation about the axis of said indicator shaft in a plane parallel to the plane of said date disc, said day disc having a flat surface bearing indicia thereon indicating the days of the week, the inner peripheral edge of said annular date disc being disposed closely adjacent to and having substantially the same diameter as the inner peripheral edge of said annular day disc, said two inner peripheral edges of said discs each having a plurality of gear teeth adapted to cooperate with a rotatable cam driven by said clockwork mechanism, said cam being located radially inward of the gear teeth of both said discs when said carrier structure is attached to said clock and including an eccentric portion shaped to periodically engage gear teeth of both of said discs for simultaneously advancing both of said discs in periodic step-by-step motion in the same direction of rotation about said indicator shaft, the side of each of said discs opposite to the indicia bearing side thereof including a plurality of outwardly projecting pins disposed in a circular locus for use in selectively setting the disc to a desired indicating position, said date disc including slots therein to provide access through said date disc to the outwardly projecting pins of said day disc for purposes of setting said day disc, and detent means extending from said carrier structure adjacent the inner peripheral edges of said day and date discs in angularly spaced relation to said cam, said detent means resiliently engaging said day and date discs respectively to hold said discs in their respective set positions when said discs are not being advanced by said cam.

4,161,100

# **ATTACHMENT DEVICE FOR SECURING STRUCTURAL PARTS TO A CHAIN**

Hans H. Dalferth, Haydenstrasse 21, 708 Aalen-Wasseraffingen, and Dieter A. G. Mauer, Stammesackerstrasse 93, 741 Reutlingen, both of Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,570

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2710550

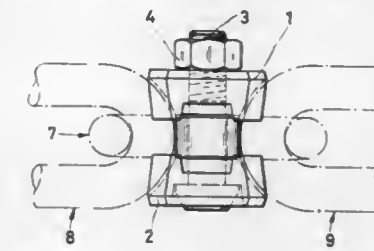
Int. Cl.<sup>2</sup> F16G 15/00

U.S. Cl. 59—93

7 Claims

1. An attachment device for securing structural parts to a chain, in which two flanges are clamped across the two arms of a chain link by a bolt which penetrates through the link, the wings of the flanges clamping the arms of the link between them, the bolt also serving for attaching the structural part to the chain, characterized in that between the two flanges the bolt supports a replaceable centering piece which has end

walls which are in contact with the curved ends of two adjacent chain links which engage with the chain link carrying the



attachment device, the adjacent chain links being spaced apart by the centering piece.

4,161,101

# **CONTROL SYSTEM FOR AND METHOD OF ZERO ERROR AUTOMATIC CALIBRATION OF GAS TURBINE TEMPERATURE CONTROL PARAMETERS**

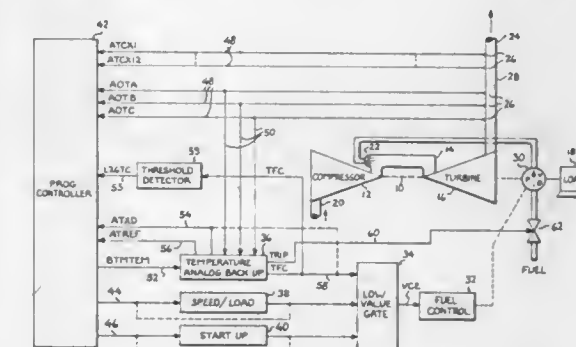
Thane M. Drummond, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Sep. 9, 1976, Ser. No. 722,066

Int. Cl.<sup>2</sup> F02C 9/04

U.S. Cl. 60—39.03

8 Claims



1. In a control system of the type including a controller for providing a fuel control signal to a gas turbine for controlling fuel flow thereto to control the temperature of said turbine, said fuel control signal having a value derived as a function of the average of the values of temperature signals provided to the controller from sensors in the turbine, the improvement in said control system comprising:

- (a) means for specifying to said controller a reference having a value proportional to a desired turbine operating temperature;
- (b) means in said controller for deriving a difference value proportional to the difference in magnitude between said reference and the value derived from the average of the temperature signals;
- (c) means in said controller for developing a first adjustment value which varies at a rate specified by a vernier constant when said difference value exceeds a predetermined magnitude;
- (d) means in said controller for developing a second adjustment value, said second adjustment value having a magnitude proportional to the difference in the value of a mid-value signal and the value derived from the average values of the temperature signals;
- (e) means in said controller responsive to said first adjustment value and to said second adjustment value for developing a temperature trim signal proportional to the difference therebetween; and
- (f) means for providing said fuel control signal to said turbine including,
  - (1) means responsive to specified ones of the temperature

signals for generating said mid-value signal, said mid-value signal having a magnitude intermediate the individual values of the temperature signals provided by said specified ones, and  
(2) means for combining said mid-value signal and said temperature trim signal to thereby provide said fuel control signal.

4,161,102

## TURBINE ENGINE STARTING SYSTEM

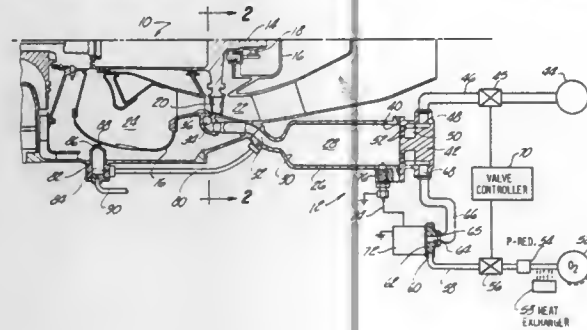
Gytis B. Jasas, Toledo, Ohio; Richard L. Trauth, Lambertville, Mich., and Raymond Smith, Monclova, Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 5, 1977, Ser. No. 839,624

Int. Cl.<sup>2</sup> F02C 7/26

U.S. Cl. 60—39.14 M

7 Claims



1. A starting system for a turbine engine having a support housing, a main combustion chamber housing within the support housing, a turbine shaft, and turbine blades mounted on said shaft, said starting system comprising:  
an auxiliary combustion chamber housing defining an auxiliary combustion chamber,  
a source of combustible fuel and pressurized oxidizer fluidly connected to said auxiliary combustion chamber,  
means for igniting said fuel in said auxiliary combustion chamber, said igniting means further comprising an electrically powered igniter coupled to said auxiliary combustion chamber housing and adapted to ignite said combustible fuel in said auxiliary combustion chamber, and electrical energy generating means connected to said igniter, said electrical energy generating means comprising an electrical generator and a turbine connected to and adapted to rotatably drive said generator, said turbine being fluidly disposed in a fluid line connecting said oxidizer source to said combustion chamber, and  
fluid passage means having one end open to said auxiliary combustion chamber and having its other end open to said turbine blades on said shaft whereby combustion gases flow from said auxiliary combustion chamber through said fluid passage means and impinge upon said turbine blades to thereby rotatably drive said turbine shaft.

4,161,103

## CENTRIFUGAL COMBUSTOR WITH FLUIDIZED BED AND CONSTRUCTION THEREOF

John J. Horgan, Wethersfield, and Francis H. Morrison, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,034

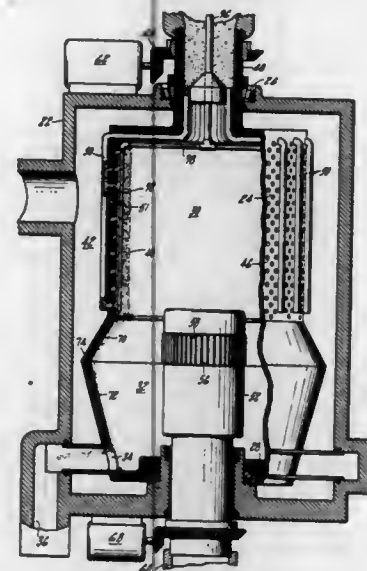
Int. Cl.<sup>2</sup> F02C 3/26; F23D 19/00

U.S. Cl. 60—39.35

4 Claims

1. A coal-fired combustor having a rotary drum supported vertically with respect to the earth's horizon, including a cylindrically shaped wall defining a combustion chamber, means for fluidizing the coal to form a fluidized coal bed adjacent the inner surface of said wall, said wall including louver-like elements extending vertically in said chamber attached to the adjacent louver-like element, each louver having a lip portion

overlapping said next adjacent louver element, means for admitting coal internally of said wall through the outer surface of said louver element through openings formed in said louver element adjacent said lip so that said coal is admitted therein radially and is directed toward the axis of rotation of said



drum, air admitted internally through openings in said louver element flowing toward said axis of rotation fluidizing the bed, means communicating with said chamber for leading products of combustion out of said combustor and means for imparting rotary motion to said wall.

4,161,104

## IGNITION OF HYDRAZINE-TYPE MONOPROPELLANTS

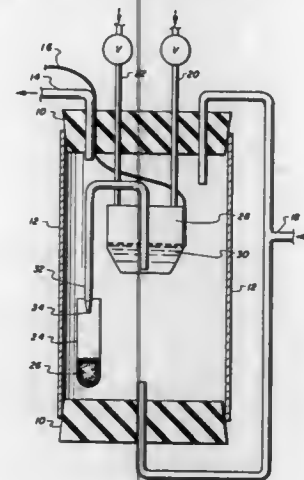
Michael Ladacki, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 16, 1968, Ser. No. 785,062

Int. Cl.<sup>2</sup> C06D 5/04

U.S. Cl. 60—218

10 Claims



1. A process for producing gaseous hydrazine fuel reaction products comprising intimately contacting a hydrazine fuel with an ignition composition comprising silver nitrate and copper chromite and thereby igniting and decomposing said hydrazine fuel to produce said gaseous hydrazine fuel reaction products.

4,161,105

## TANDEM MASTER CYLINDER

Yutaka Hagiwara, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Japan

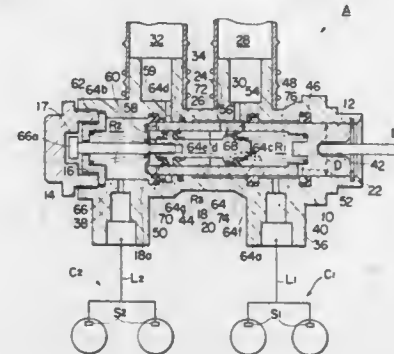
Filed Aug. 4, 1977, Ser. No. 821,813

Claims priority, application Japan, Aug. 9, 1976, 51/94624

Int. Cl.<sup>2</sup> B60T 11/06, 11/24

U.S. Cl. 60—561

1 Claim



1. In a tandem master cylinder for a split brake system including:

- a housing having a main bore;
  - a primary piston slidably disposed in said main bore and having a secondary bore coaxial with said main bore;
  - a secondary piston slidably disposed in said secondary bore and cooperative with said secondary bore to form a first pressure chamber situated on one axial side of said secondary piston and also cooperative with said main bore and a part of said secondary bore to form a second pressure chamber situated on the other axial side of said secondary piston, said secondary piston being responsive to the pressure difference between said first and second pressure chambers and movable to reduce said pressure difference;
  - a spring disposed within said first pressure chamber for urging said secondary piston to a set position;
  - a return spring disposed within said second pressure chamber for urging said primary piston to a rest position;
  - first conduit means for selectively hydraulically connecting said first and second chambers to two independent hydraulic sources respectively in accordance with the position of said primary piston;
  - second conduit means for separately discharging there-through the hydraulic pressures developed in said first and second pressure chambers; and
  - limiting means for limiting the movement of said secondary piston away from said set position thereof within a predetermined range;
- the improvement comprising:  
said secondary piston being in the form of a spool to have an annular recess intermediate between the axial ends thereof; and  
said first conduit means including first and second passageway arrangements which respectively establish communication between said hydraulic sources and said first and second pressure chambers upon quick return of said primary piston to said rest position;  
said first passageway arrangement including a first port inlet formed in said housing and constantly in hydraulic communication with one of said hydraulic sources, an annular chamber defined between said secondary bore and said annular recess formed in said secondary piston and constantly in hydraulic communication with said first port inlet, a plurality of apertures formed in said secondary piston for selectively providing communication between said annular chamber and said first pressure chamber, and an annular seal mounted on said secondary piston and operatively connected to said apertures, said annular seal being adapted to regulate selective communication from said annular chamber to said first pressure chamber

through said apertures in response to the pressure difference between said annular chamber and said first pressure chamber; and

said second passageway arrangement including a second port inlet formed in said housing and constantly in hydraulic communication with the other of said hydraulic sources, a plurality of openings formed in said housing for selectively providing communication between said second port inlet and said second pressure chamber, and an annular seal mounted on said housing and operatively connected to said openings, said second named annular seal being adapted to regulate selective communication from said second port inlet to said second pressure chamber through said openings in response to the pressure difference between said second port inlet and said second pressure chamber.

4,161,106

## APPARATUS AND METHOD FOR DETERMINING ENERGY WASTE IN REFRIGERATION UNITS

Robert H. Savage, Downey, and Cecil G. Young, La Canada, both of Calif., assignors to Water Chemists, Inc., Los Angeles, Calif.

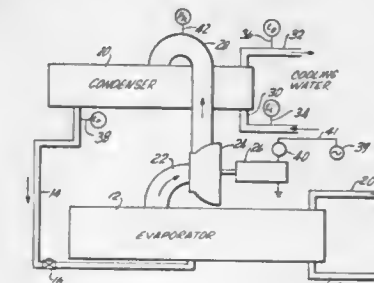
Continuation of Ser. No. 772,439, Feb. 28, 1977, abandoned.

This application Jun. 22, 1978, Ser. No. 917,895

Int. Cl.<sup>2</sup> F25B 49/00

U.S. Cl. 62—115

7 Claims



1. In a refrigeration unit of the type having a condenser with a refrigerant fluid inlet and a refrigerant fluid outlet, an evaporator with refrigerant fluid inlet and a refrigerant fluid outlet, a compressor with a refrigerant fluid inlet and a refrigerant fluid outlet, the outlet of the condenser being in series fluid circuit with the inlet of the evaporator, the outlet of the evaporator being in series fluid circuit with the inlet of the compressor, and the outlet of the compressor being in series fluid circuit with the inlet of the condenser, motor means to drive the compressor, coolant fluid circuit means for cooling the refrigerant in the condenser, the coolant fluid circuit means having an inlet to the condenser and an outlet from the condenser, and refrigeration load circuit means for being cooled by refrigerant in the evaporator, an improvement to sense performance of the refrigeration unit comprising:

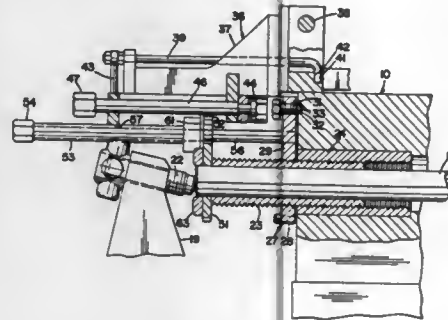
- (a) means to sense the load on the compressor motor;
- (b) means to determine an optimum value of the condenser head pressure within the condenser from the load sensed by the sensing means;
- (c) means to sense the actual condenser head pressure; and
- (d) means to compare the two head pressures to determine deviations from optimum performance.





**4,161,113**  
**KNOCKOUT ADJUSTMENT MECHANISM FOR FORGING MACHINES**  
 Gaylen O. Kline, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio  
 Filed Apr. 11, 1978, Ser. No. 895,363  
 Int. Cl.<sup>2</sup> B21D 45/00  
 U.S. Cl. 72-344

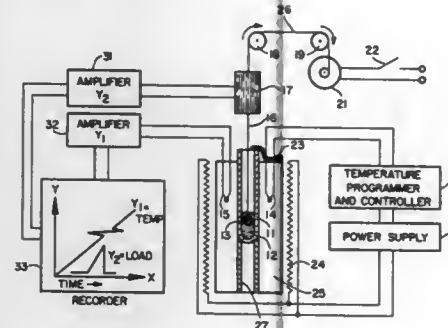
17 Claims



1. A forging machine comprising a frame, a die on said frame in which blanks are shaped by a tool movable on said frame, and an adjustable knockout assembly on said frame, said knockout assembly including a knockout pin slidable in said frame between a first position occupied during the forming of blanks in said die and an operative position to which it moves to eject a blank from said die, knockout pin stop means threaded into said frame for axial adjustment with the position of said stop means adjustably determining said first position of said knockout pin, said stop means providing a driven gear portion, a drive gear engageable with said driven gear journaled for rotation to cause adjusting rotation of said stop means and movable axially with said stop means as said stop means is axially adjusted, the position of said drive and driven gears providing a visual indication of said first position of said knockout pin during adjustment of said stop means.

**4,161,114**  
**METHOD AND APPARATUS FOR MEASURING ADHESION OF PARTICULATE MATERIALS**  
 Karl J. Kraeutle, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Filed Apr. 17, 1978, Ser. No. 897,237  
 Int. Cl.<sup>2</sup> G01N 25/00  
 U.S. Cl. 73-15.6

13 Claims

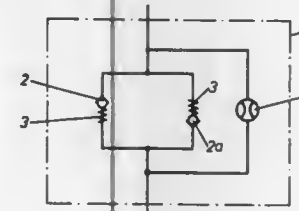


1. A method for measuring adhesion of particulate material comprising the steps of:  
 filling a container to a first predetermined level with said particulate material;  
 packing said particulate material in said container to a first predetermined density;  
 resting a geometric object upon said packed particulate material in said container;

adding more particulate material to said container to a second predetermined level;  
 compacting said more particulate material to a second predetermined density;  
 pulling the geometric object from said sample of particulate material by measurable force means; and  
 measuring the force required to pull said geometric object from said sample of particulate material.

**4,161,115**  
**APPARATUS FOR MONITORING HYDRAULIC PLANT FOR LEAKAGES**  
 Jakob Wetter, Düsseldorf, Fed. Rep. of Germany, assignor to Sack GmbH, Düsseldorf, Fed. Rep. of Germany  
 Filed Nov. 21, 1977, Ser. No. 853,588  
 Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2653020  
 Int. Cl.<sup>2</sup> G01M 3/08  
 U.S. Cl. 73-40.5 R

3 Claims

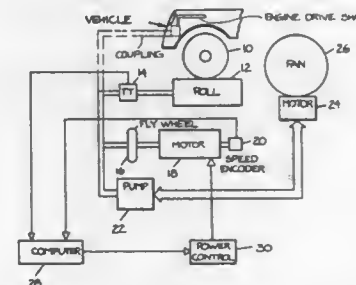


1. Apparatus for detecting leakages in hydraulic equipment, said apparatus being insertable into a conduit for supplying fluid under pressure to said hydraulic equipment and being arranged to detect leakage flows in either direction through said conduit, and including:

- (a) an inlet;
- (b) an outlet;
- (c) first and second conduit means connected and arranged to define alternate flow paths for pressurized fluid between said inlet and said outlet;
- (d) first and second pre-loaded one-way valve means connected in said first and said second conduit means, respectively, and arranged oppositely to each other so that each of said first and said second conduit means will accommodate flow in only one direction therethrough, the preload on said valve means being such that as pressure rises in either direction no fluid will flow until a threshold point is reached;
- (e) third conduit means located between said inlet and said outlet and connected to form a by-pass flow path around said first and said second conduit means; and
- (f) a restricted flow monitor connected in said third conduit means, constructed and arranged to detect fluid leakages in both directions of fluid flow through said apparatus, the flow through said third conduit and said monitor being such that as pressure rises the fluid flow will increase until the capacity of said third conduit and said monitor is reached;
- (g) whereby the apparatus will provide fluid flow at an increasing rate in either direction through said third conduit and said monitor as the pressure increases until the pressure increases to the point that one of said valves opens.

**4,161,116**  
**INERTIA AND ROAD LOAD SIMULATION FOR VEHICLE TESTING**  
 Clark E. Fegraus, and Severino D'Angelo, both of Laguna Beach, Calif., assignors to Automotive Environmental Systems, Inc., Westminster, Calif.  
 Continuation of Ser. No. 718,917, Aug. 30, 1976, abandoned.  
 This application Sep. 21, 1977, Ser. No. 835,225  
 Int. Cl.<sup>2</sup> G01M 17/00; G01L 3/22  
 U.S. Cl. 73-117

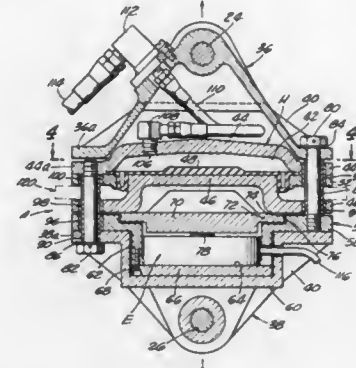
42 Claims



12. A method for simulating the inertia of and road load torque to a vehicle undergoing testing, comprising the steps: permitting a vehicle wheel to exert torque on a roll; measuring the torque exerted by the vehicle wheel; computing the vehicle wheel speed as a function of measured torque, road load torque and preselected simulated inertia; exerting torque on the roll to resist wheel speed changes initiated by the vehicle, the resisting torque being proportional to the preselected simulated inertia; and measuring the actual speed of the vehicle wheel, and comparing the actual vehicle wheel speed value with the computed wheel speed value and generating a resultant error signal to correct the exerting torque toward achieving a zero error signal.

**4,161,117**  
**HYDRAULIC-ELECTRONIC LOAD SENSING DEVICE FOR LOAD INDICATING APPARATUS**  
 Elmer L. Decker, Long Beach, and James Moon, Santa Ana, both of Calif., assignors to Decker Engineering Corporation, Long Beach, Calif.  
 Filed Dec. 5, 1977, Ser. No. 857,583  
 Int. Cl.<sup>2</sup> G01L 1/26  
 U.S. Cl. 73-141 R

9 Claims

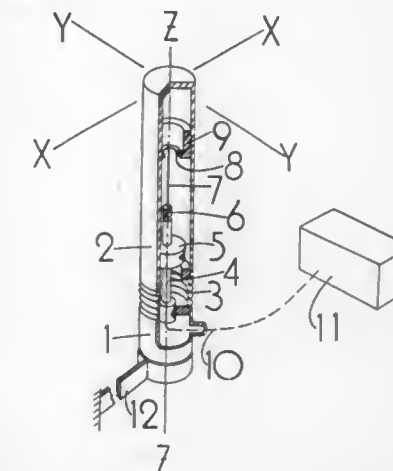


1. A load sensing device for load indicating means having a pair of spaced members supported for separating movement under applied tension load forces, comprising:  
 (a) a pair of force applying elements respectively connectable with said spaced members;  
 (b) a pair of load cells, one of the hydraulic type and the other of the electronic type, mechanically interconnected

in series operative relationship between said force applying elements and being operatively responsive to compression load forces;  
 (c) the hydraulic load cell comprising first and second opposed members interconnected by a diaphragm for relative movement and coacting to form a variable pressure hydraulic chamber adapted to contain a liquid, said first of the opposed members being positioned adjacent one of the force applying elements;  
 (d) a third member spaced from said second member and being positioned adjacent the other of said force applying elements;  
 (e) the electronic load cell having a load plunger and being positioned with one end connected with said third member;  
 (f) a force transmitting member interposed between said plunger and said second member;  
 (g) means interconnecting said force applying elements respectively with said first and third members so that upon movement of said force applying elements away from each other under tension load forces, said first and third members will be moved towards each other to apply concomitant compression load forces to said hydraulic load cell and said electronic load cell;  
 (h) said interconnecting means comprising tie members connecting said one force applying member with said third member and said other force applying member with said first member, and said second member having sliding guided relation with respect to said tie members.

**4,161,118**  
**FORCE DIRECTION TRANSDUCER**  
 Thomas J. Banwell, Claremont, and Thomas C. Banwell, both of 885 Atlanta Ct., Claremont, Calif. 91711  
 Filed Dec. 12, 1977, Ser. No. 859,605  
 Int. Cl.<sup>2</sup> G01F 1/28  
 U.S. Cl. 73-188

1 Claim



1. In apparatus of the character described for determining the direction of a force or forces resulting from two-dimensional hydrodynamic flow, the combination of a toroidal electrical resistance element and a thin electrical contact wire, a top section and a bottom section comprising surfaces of revolution, said sections placed in the path of flow at a fixed point, said sections flexibly coupled and having coincident axes of revolution, means disposed within the sections for mounting an electrically insulated contact wire and toroidal electrical resistor so that the slight tilting due to the applied force against the top section causes the said wire to make electrical contact against the inner side of said resistor which provides, by means of an electrical manipulating circuit, an electrical signal which is commensurate to the direction of the applied forces.



4,161,119

**PNEUMATIC FLOW MEASURING SYSTEM**

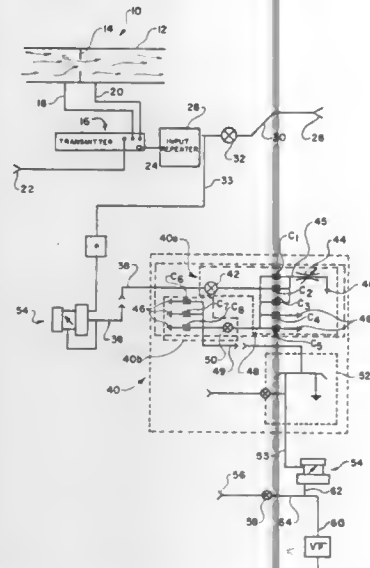
Robert O. Brandt, Jr., Garner, N.C., assignor to Brandt Industries, Inc., Fuquay-Varina, N.C.

Filed Mar. 6, 1978, Ser. No. 883,537

Int. Cl.<sup>2</sup> G01F 1/42; G06G 5/00

U.S. Cl. 73—205 R

13 Claims



1. A pneumatic instrument for measuring flow and effectively extracting the square root of a pneumatic input signal, comprising: input means for directing a pneumatic input signal to said instrument; a synthesizer network forming a part of said instrument and communicatively connected to said input means for directing a pneumatic input signal to said instrument such that pneumatic input signals to said instrument are directed to said synthesizer network; said synthesizer network including orifice and capillary means connected in series and communicatively connected to said input means such that pneumatic input signals directed through said input means to said synthesizer network are directed through said orifice and capillary means; means within said synthesizer network and associated with said orifice and capillary means for causing the pressure drop across a portion of said orifice and capillary means to be generally linear with flow therethrough; and output means operatively associated with said synthesizer network and communicatively connected to said capillary means for directing air from said synthesizer network such that the air moving therefrom becomes an output pneumatic signal that is linear with the flow being measured.

4,161,120

**EQUIPMENT FOR THE DETECTION OF ROTATION PARAMETERS IN PARTICULAR FOR A WHEEL-VELOCITY SENSOR**

Jean-Claude Cloarec, Livry Gargan, France, assignor to WABCO Westinghouse, Freinvill-Sevran, France

Filed May 8, 1978, Ser. No. 903,624

Int. Cl.<sup>2</sup> G01P 3/48, 1/00

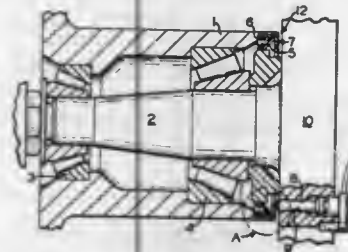
U.S. Cl. 73—494

5 Claims

1. For use with a vehicle wheel having a hub rotatably mounted on a spindle by bearing means and a bearing seal mounted in a bore of said hub, a wheel sensor device comprising:

- (a) a rotor with teeth on the periphery thereof;
- (b) a stator having a detecting head in proximity of said rotor teeth; and
- (c) an integrated assembly including said rotor and said

bearing seal mounted in said bore of said rotor for rotation therewith; wherein the improvement comprises,



(d) said seal having a cavity in which said rotor is housed so that the toothed portion of said rotor is encased by said seal.

4,161,121

**ULTRASONIC IMAGING SYSTEM**

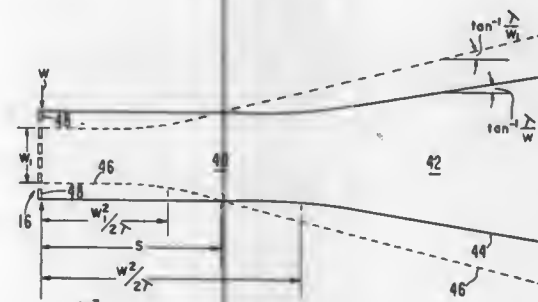
Louis T. Zitelli, Palo Alto, and William L. Beaver, Los Altos Hills, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 673,775, Apr. 5, 1976, abandoned. This application Jul. 20, 1977, Ser. No. 817,394

Int. Cl.<sup>2</sup> G01N 29/00

U.S. Cl. 73—626

20 Claims



1. A phased array acoustic beam scanning apparatus comprising:

- an array of transducer elements for interchanging energy with an acoustic beam, said elements being spaced side-by-side in a first direction;
- means for applying repetitive electric pulses to form said acoustic beam, said means including delay circuit means for sweeping said beam over a desired angular range in a plane transverse to said transducers and including said first direction; and
- means synchronized with said pulses for activating said elements to receive reflections of said beam and convert same to analogous electrical signals, said means de-energizing at least a symmetric outer pair of elements of said array to reduce the extent of the active elements of said array during the time period in which near field reflected acoustic information arrives at said array, whereby an effectively smaller array is presented during detection of said near field reflected information.

4,161,122

**APPARATUS FOR EXAMINING BODIES THROUGH SCANNING BY MEANS OF ULTRASOUND**

Klaus Buchner, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin &amp; Munich, Fed. Rep. of Germany

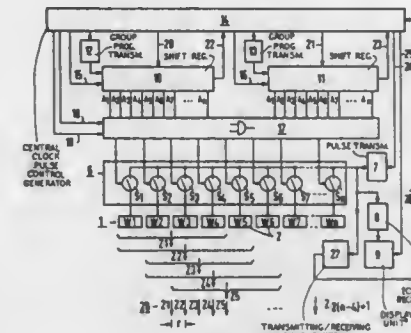
Filed Jun. 28, 1978, Ser. No. 919,826

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1977, 2733920

Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—626

8 Claims



1. Apparatus for examining bodies through scanning by means of ultrasound comprising an ultrasonic applicator comprising at least one row of adjacently arranged ultrasonic transducer elements and an actuating system for group-actuation of the transducer elements, whereby the actuating system for actuating the transducer elements of the ultrasonic applicator is constructed in such symmetrical configurations with an even-numbered and odd-numbered count of transducer elements that the symmetry axes of the configurations of simultaneously energized transducer elements, at one time, become placed in the gaps between the adjacent transducer elements, and, another time, in the centers of the transducer elements, whereby the actuation proceeds in such a manner that, during a scan cycle over the entire length of the applicator, the symmetry axes occupy, at least once, every possible position in the gaps between two transducer elements, or in the centers of the transducer elements, respectively, with the possible exception of only the transducer elements of the first half of the first, and the second half of the last transducer element group of the applicator, characterized in that, the actuating system (6; 10 through 25; 27, 28), in an interlaced transmitting/receiving clock pulse sequence activates groups with an even-numbered and groups with an odd-numbered count of transducer elements (W1 through Wn) in a chronologically interlaced fashion such that each connected even-numbered or odd-numbered group, in relation to the previously connected group, in a first clock pulse interval, acts first as a receiver for the echo signals of the transmitting beam of the preceding group, and in a following clock pulse interval, is switched over to transmission.

4,161,123

**PRESSURE GAUGE CONSTRUCTION**

David M. Carpenter, Berea, Ky., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 25, 1978, Ser. No. 936,972

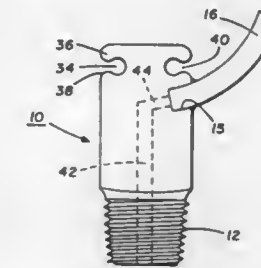
Int. Cl.<sup>2</sup> G01L 7/04

U.S. Cl. 73—741

10 Claims

6. In a pressure gauge comprising a dial plate having pressure graduations thereon, a pointer, a Bourdon tube operatively sensitive to pressure changes for effecting correlative displacement of said pointer about the graduations on said dial plate, an outer enclosure casing and a socket extending through said casing for communicating fluid pressure to be measured from a source to the inlet of said Bourdon tube, the improvement in which said socket comprises an extruded

metal formation including a first as-extruded slot in which to receive the open inlet end of said Bourdon tube and at least one



second as-extruded slot for receipt of a self-tapping screw by which said casing can be secured to said socket.

4,161,124

**APPARATUS FOR THE CONTROL BY A CABLE OF SPEED CHANGE DEVICES OF ARTICULATED PARALLELOGRAM TYPE FOR BICYCLES AND SIMILAR VEHICLES**

Lucien C. H. Juy, deceased, late of Dijon, France (by Henri Juy, heir), assignor to Le Simplex, Dijon, France

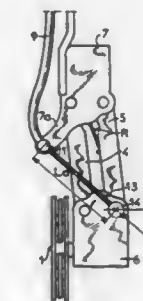
Filed Mar. 24, 1977, Ser. No. 780,993

Claims priority, application France, Mar. 24, 1976, 76 09406

Int. Cl.<sup>2</sup> F16H 7/10, 9/00, 11/08

U.S. Cl. 74—217 B

11 Claims



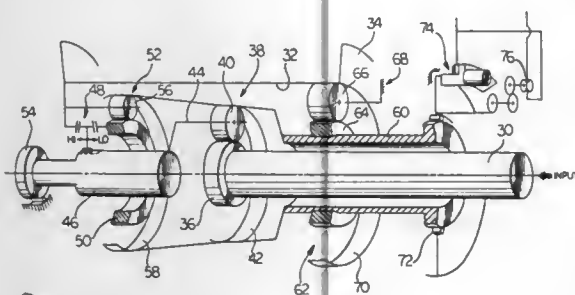
1. Apparatus for the control by a cable of a speed change device comprising an articulated parallelogram including a fixed upper support, a laterally movable lower support, two parallel levers pivotally connected to said support, a chain guide secured to said lower support and laterally movable therewith for derailing a chain on pinions of a free wheel cluster, elastic means acting on the parallelogram to deform the same in one direction, the cable acting on the parallelogram to deform the same in the other direction against the action of the elastic means, means securing said cable to said parallelogram at first and second spaced locations such that application of external force to said cable produces deformation of said parallelogram, and projection means on said parallelogram, carrying said means for securing said cable at said first location, said projection means offsetting said first location both laterally in the direction of the free wheel cluster and vertically in the direction of the lower support to reduce the angle of the cable connected at said first and second locations with respect to the direction of lateral movement of the chain guide.

**4,161,125**  
**AIRCRAFT CONTROL SYSTEM COMPONENT WITH IMPROVED BALLISTIC TOLERANCE**  
 William G. Degnan, Huntington, Conn., assignor to United Technologies Corporation, Hartford, Conn.  
 Filed Nov. 7, 1977, Ser. No. 848,953  
 Int. Cl.<sup>2</sup> G05G 1/04, 7/00; F41H 5/04  
 U.S. Cl. 74-469 25 Claims



14. An aircraft flight control system comprising:  
 (A) pilot actuated control input means,  
 (B) controlled means remote from said input means,  
 (C) means connecting said input means to said control means so that said input means is effectively interconnected to said controlled means to control same and including:  
 (1) a plurality of interlinked and coacting parts adapted to cooperate with and move relative to associated parts in performing the control function and having at least one component comprising:  
 (a) a first sideplate member,  
 (b) a second sideplate member,  
 (c) a spacer member positioned between and joined to said sideplate members to selectively space said sideplate members, and  
 (d) each of said sideplate members comprising three bonded laminates with the central laminate twice the thickness of the other laminates and with the outboard laminate of selected thickness and yield strength that the petals formed therein by a projectile impacting and passing therethrough are reasonably deformable by interference with associated parts following such ballistic damage so as to improve the ballistic damage tolerance of the component and permit its continued operation.

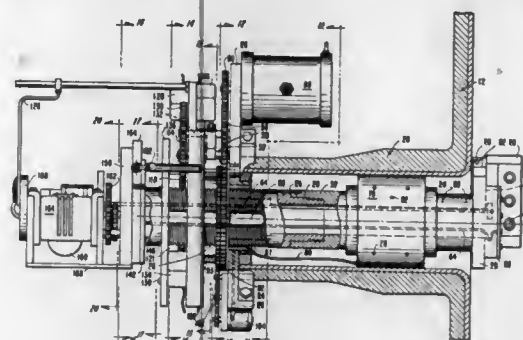
**4,161,126**  
**WINCH CONSTRUCTION HAVING AXIALLY SHIFTABLE FACE GEAR**  
 James E. Winzler, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.  
 Filed Feb. 9, 1977, Ser. No. 767,085  
 Int. Cl.<sup>2</sup> F16H 37/06  
 U.S. Cl. 74-674 19 Claims



1. A winch construction comprising:  
 a winch drum journaled for rotation and having a hollow hub;  
 a motor having a rotary output for driving said drum;  
 a transmission comprising at least two planetary gear sets disposed within said hollow hub for coupling said motor and said drum; and  
 means for selectively coupling said planetary gear sets to

said motor and said drum in at least two different gear ratios;  
 one of said planetary gear sets being coupled to said motor and the other of said planetary gear sets being coupled to said drum, and said selective coupling means comprising means for alternately serially coupling said sets together and for coupling said one planetary gear set directly to said drum.

**4,161,127**  
**REMOTELY OPERABLE PORTABLE BORING TOOL**  
 Patrick L. Tiffin, 3030 McMillan Rd., San Luis Obispo, Calif. 93401  
 Filed Apr. 8, 1977, Ser. No. 786,119  
 Int. Cl.<sup>2</sup> B23B 5/36, 3/26  
 U.S. Cl. 82-1.4 18 Claims

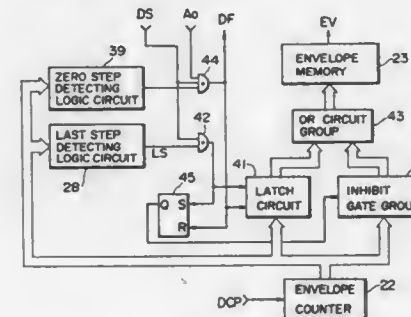


1. A boring bar apparatus for removing material from the interior of a rigid structure through a cylindrical opening therein, comprising:  
 a bar projecting into said cylindrical opening and mountable therein for rotation about the axis of that opening;  
 a cutting head adjustably mounted to said bar for rotation therewith, said cutting head holding a cutting element adapted to remove material located within the essentially circular path defined by said element as said bar rotates; means for altering the radial position of said cutting head relative to said bar as said bar rotates; and  
 means for altering the axial position of said cutting head relative to said opening as said bar rotates including a pair of radially oriented gears on said bar, one of said gears being a main drive gear keyed to said bar in a manner allowing it to slide axially therealong as it imparts rotational movement to that bar and the other of said gears being threaded thereon and clamped to said rigid structure to locate it axially relative to said structure, and a gear transmission engaging said gears to control the axial movement of said bar and hence said cutting head by controlling the rotational speed of said threaded gear relative to said main drive gear.

5. A boring bar apparatus for removing material from the interior of a rigid structure through a cylindrical opening therein, comprising:  
 a bar projecting into said cylindrical opening and mountable therein for rotation about the axis of that opening, said bar having an outer axially threaded surface portion;  
 a cutting head adjustably mounted to said bar for rotation therewith, said cutting head holding a cutting element adapted to remove material located within the essentially circular path defined by said element as said bar rotates; means for altering the radial position of said cutting head relative to said bar as said bar rotates comprising a rack and pinion mechanism including a rack carried by said cutting head and a pinion engageable therewith which is carried by and rotatable relative to said bar such that rotational movement of said pinion relative to said bar causes a corresponding radial movement of said cutting head, an axially directed shaft carried rotatably within said bar and connected at one end to said pinion for im-

parting rotational movement thereto, and a radial drive assembly carried by said bar for rotation therewith and operably connected to said shaft for imparting relative rotational movement thereto; and  
 means for altering the axial position of said cutting head relative to said opening as said bar rotates, including a radially oriented axial drive gear held against axial movement relative to said structure and having a threaded opening extending axially therethrough to engage said outer axially threaded surface portion of said bar, and gear transmission means operatively engaged with said axial drive gear and said bar for controlling the rotational speed of said nut relative to that of said bar to control the axial movement of said bar and hence said cutting head;  
 said means for altering the radial and axial positions of said cutting head being mutually independent in their operation and actuatable from outside said opening.

**4,161,128**  
**ELECTRONIC MUSICAL INSTRUMENT**  
 Shigeru Yamada, and Eiichiro Aoki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan  
 Filed Dec. 9, 1977, Ser. No. 859,042  
 Claims priority, application Japan, Dec. 13, 1976, 51-149945  
 Int. Cl.<sup>2</sup> G10H 1/02  
 U.S. Cl. 84-1.26 7 Claims

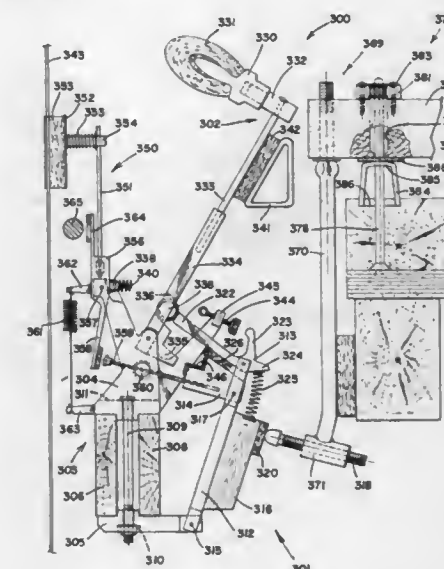


1. An electronic musical instrument having circuitry in which an envelope waveform varying stepwise is generated and utilized to modulate the amplitude of a musical tone waveform signal, which comprises:  
 (a) detecting means, responsive to the phase of said musical tone waveform signal, for detecting when the amplitude of said tone waveform signal becomes a zero level; and  
 (b) control means, cooperating with said detecting means and said circuitry, for bringing the amplitude of said stepwise generated envelope waveform to a zero level, and thereby ending generation of said envelope waveform, in synchronizator with said tone waveform signal becoming a zero level as detecting by said detecting means.

**4,161,129**  
**MODIFIED PIANO STRIKING MECHANISM**  
 Jorge L. Carbone, 1544 Gottschall Rd., Stow, Ohio 44224  
 Continuation-in-part of Ser. No. 581,026, May 27, 1975, Pat. No. 4,061,067. This application Dec. 5, 1977, Ser. No. 857,507  
 Int. Cl.<sup>2</sup> G10C 3/16  
 U.S. Cl. 84-253 9 Claims

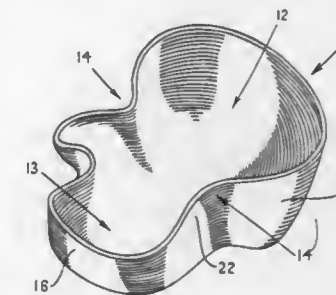
1. A striking mechanism for use in pianos and related instruments having at least one string to produce a musical note and at least one key to select the musical note comprising:  
 an escapement action actuated by said key;  
 at least one hammer assembly for striking a string including:  
 a hammer head;  
 a foot engageable with said escapement action; and,  
 a hammer shank carrying said hammer head and said foot at opposite ends;

means for supporting said hammer assembly and said escapement action;  
 wherein said escapement action includes:  
 an action arm;  
 a jack carried by said arm and engageable with said hammer shank; and,



a damping block carried by said arm below said jack and communicable with said foot while the key is totally depressed and partially released and free from said foot when the key is totally released and communicable with said jack when the key is totally released and free of said jack while the key is totally depressed.

**4,161,130**  
**BODY FOR BASS GUITAR**  
 Thomas G. Lieber, 9 E. Valley Stream Blvd., Valley Stream, N.Y. 11580  
 Filed Nov. 23, 1977, Ser. No. 854,273  
 Int. Cl.<sup>2</sup> G01D 1/08  
 U.S. Cl. 84-267 1 Claim

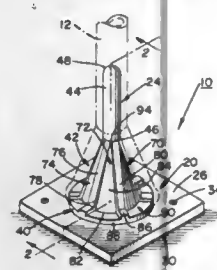


1. In a bass guitar, the improvement comprising a single piece bowl-shaped body constructed of graphite in a continuous layer of substantially uniform thickness, the body having a waist portion separating a smaller upper bowl portion from a larger lower bowl portion, the lower bowl portion having a circular bout and substantially greater depth than the upper bowl portion, with the sides of the body being perpendicular to the top along the front side and the waist area of the bass side, and with all other surfaces curving downwardly to meet the bottom in a continuously smooth surface.



**4,161,131**  
**MUSICAL INSTRUMENT SUPPORTING STAND**  
 Herbert S. Blayman, 195 Jefferson Ave., Tenafly, N.J. 07670  
 Filed Nov. 8, 1977, Ser. No. 849,558  
 Int. Cl.<sup>2</sup> G10D 9/00; G10G 5/00  
 U.S. Cl. 84-453

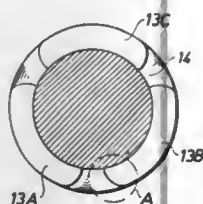
10 Claims



1. A device for holding musical instruments comprising: a pedestal;
- a stanchion mounted on said pedestal for supporting the musical instrument, said stanchion including an upright section and a base; and
- a plurality of air vents defined in said upright section and a plurality of air vents defined in said base with said base and upright section air vents being fluidly coupled together for conducting air into the instrument supported on the stanchion, said air vents each including a base surface and a pair of ribs, with each rib having a top surface and an edge surface intersecting said base surface so that said top surfaces are spaced from said base surface to define a channel, through which air passes, said air retarding moisture condensation in the instrument, the instrument contacting said rib top surfaces to be supported thereon with a bypass means being defined in said channels through which air moves into the instrument past the point of contact between the instrument and said stanchion when that instrument is supported on said stanchion.

**4,161,132**  
**SELF-TAPPING SCREW**  
 Ingvar A. Eklund, Hallstahammar, and Sixten H. Lejdegard, Ramnas, both of Sweden, assignors to Bulten-Kanthall Aktiebolag, Hallstahammar, Sweden  
 Continuation of Ser. No. 692,738, Jun. 4, 1976, abandoned. This application Dec. 6, 1977, Ser. No. 858,042  
 Claims priority, application Sweden, Jun. 5, 1975, 7506443  
 Int. Cl.<sup>2</sup> F16B 25/00, 33/02  
 U.S. Cl. 85-47

3 Claims

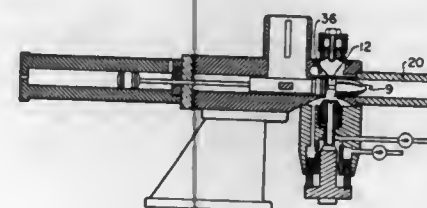


1. A self-tapping screw for use in pulverable materials consisting of bricks, concrete and rock, comprising:
  - (a) a core having a single cylindrical surface of uniform diameter with a head at one end and a tip at the opposite end, said head having a planar annular surface merging smoothly with said cylindrical surface; and
  - (b) a helical screw thread projecting radially from said cylindrical surface said thread comprising a plurality of circumferentially successive thread portions per revolution, each portion extending circumferentially at least 90 degrees and having a full radial height for a majority of such extent, between which portions there are voids of several degrees flush with said cylindrical surface, the leading and

trailing ends of each of said thread portions respectively beginning substantially radially and convexly at said cylindrical surface, and being smoothly rounded into the apex of said screw thread portion, portions of said single cylindrical surface surrounding each of said thread portions individually.

**4,161,133**  
**LIQUID PROPELLANT GUN**  
 William L. Black, China Lake; Robert A. Gould, Ridgecrest, and Stanley E. Wood, Inyokern, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Continuation-in-part of Ser. No. 774,366, Mar. 4, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,527  
 Int. Cl.<sup>2</sup> F41F 1/04  
 U.S. Cl. 89-7

12 Claims



1. A bulk-loaded liquid propellant gun utilizing a liquid propellant for firing a projectile from a barrel comprising: an elongated barrel;
- a bolt within said barrel movable between loading and firing positions to load said barrel and to seal the rear thereof;
- a projectile within said barrel forward of said bolt;
- a depression on the rear of said projectile to provide a void between said bolt and said projectile;
- a gas filling said void;
- an injection port in said barrel communicating to said void while said bolt is in loading position and sealed by said bolt while in firing position;
- ignition means in said barrel between said bolt and said projectile while said bolt is in firing position to ignite said liquid propellant; and
- compression means to place said liquid propellant and said gas at a pressure greater than atmospheric pressure.

**4,161,134**  
**FLUID PRESSURE CIRCUIT FOR PERIODIC OPERATION OF FLUID PRESSURE OPERABLE DRIVE MEANS**

Udo Stossberg, Gehrden; Josef Frania, Hanover; Hans F. Meyer, Gehrden, and Alfons Kneutinger, Munich, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany  
 Filed Aug. 1, 1977, Ser. No. 820,511  
 Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652902

Int. Cl.<sup>2</sup> F01L 25/06, 31/00

U.S. Cl. 91-219

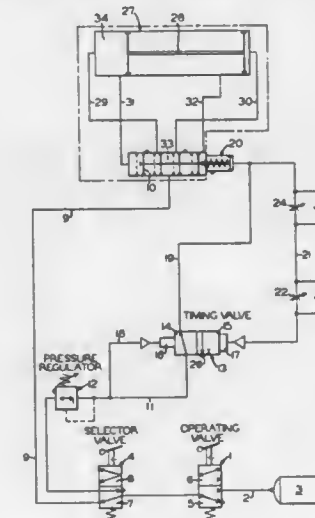
4 Claims

1. A fluid pressure control circuit for controlling operation of reciprocable motor means, such as a windshield wiper motor having double-acting piston means operable responsively to supply and release, alternately, of fluid pressure for effecting reciprocal operation of said operating piston means, said control circuit comprising:

- (a) a source of fluid under pressure;
- (b) stop cylinder means operably connected to said control valve means and effective, when subjected to fluid pressure, for holding said control valve means in a stationary

position until relieved of said fluid pressure acting thereon;

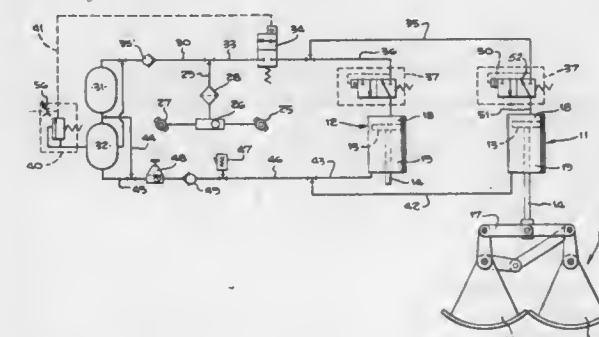
- (c) timing valve means including opposingly arranged actuating pistons having different pressure areas, a smaller of which is constantly subjected to actuating fluid pressure for biasing the timing valve means toward a supply position, in which said stop cylinder means is subjected to fluid pressure, and a larger of said pressure areas being alternately subjected to and relieved of actuating pressure for effecting alternate operation of said timing valve means between said supply position and a pressure release



- position in which said stop cylinder means is relieved of fluid pressure, according to predetermined rhythmical time intervals; and
- (d) throttling valve means comprising a pair of pre-set flow capacity chokes interposed in serial relation with each other between said stop cylinder means and the larger of said pressure areas, and a pair of one-way check valves arranged in parallel relation with said chokes, respectively, with the direction of flow of one of said check valves being toward said larger pressure areas and the direction of flow of the other check valve being opposite to said one.

**4,161,135**  
**FAIL SAFE FLUID POWER DEVICE**  
 Roland E. Garlinghouse, 2415 E. Washington Blvd., Los Angeles, Calif. 90021  
 Continuation-in-part of Ser. No. 628,154, Nov. 3, 1975, abandoned, and a continuation of Ser. No. 776,101, Mar. 10, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 876,991  
 Int. Cl.<sup>2</sup> F15B 15/17, 11/16  
 U.S. Cl. 91-417 R

9 Claims

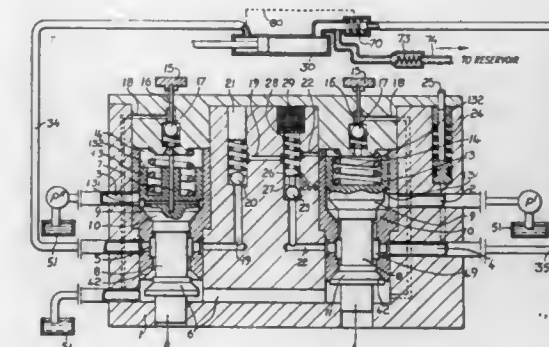


1. In a system for performing work by operation of a gas actuated ram comprising a cylinder and a piston therein form-

ing in said cylinder a forward chamber and a reverse chamber wherein said reverse chamber has a reverse exhaust means at a pressure exceeding ambient pressure, and wherein said piston is movable between full forward and reverse positions, said system comprising an outside pressure connection adapted to provide a source of gas at forward operating pressure and an exhaust, a gas storage container means of capacity at least equal to the capacity of the reverse chamber with the piston at said full reverse position, said container means including a first gas passage means forming a connection between said container means and said outside pressure connection, operating valve means including a pressure diverting portion and a pressure exchange portion, gas passage means interconnecting said operating valve means with said outside pressure connection and said container means, said operating valve means having one adjustment wherein said pressure diverting portion is in a position blocking gas under pressure from said outside pressure connection to said forward chamber, sequence valve means interconnected with said container means and with said operating valve means, said sequence valve means having a first automatic adjustment at pressures less than said forward operating pressure operative to set said operating valve means at said one adjustment whereby to inhibit passage of gas by said operating valve means to said forward chamber, said sequence valve means having a second automatic adjustment when said container means is at said forward operating pressure, said operating valve means having another adjustment in response to said second automatic adjustment of the sequence valve means wherein said pressure exchange portion is part of an interconnection from said forward chamber through said outside pressure connection to said source and wherein said reverse chamber has a connection to said reverse exhaust means, at least a part of said operating valve means upon disconnection of said source from said outside pressure connection serving as an exhaust passage from said forward chamber, a reverse gas connection between said container means and said reverse chamber, said reverse gas connection being operative to pass gas under pressure to said reverse chamber whereby to reverse action of said ram when at least said part of said operating valve means is serving as an exhaust passage.

**4,161,136**  
**HYDRAULIC JACK CONTROL DEVICE**  
 Karl Krieger, Wuppertal, Fed. Rep. of Germany, assignor to Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany  
 Filed Nov. 11, 1977, Ser. No. 850,560  
 Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651913; Jan. 17, 1977, 2701668; Mar. 11, 1977, 2710649  
 Int. Cl.<sup>2</sup> F15B 13/042  
 U.S. Cl. 91-461

10 Claims



1. A control device for controlling the supply of fluid to a double-acting jack for extending and retracting the jack, the control device comprising first and second valves, each valve comprising a housing and a valve member movable in the housing, each valve housing having an inlet passage, an outlet

passage, and a jack-supply passage, each valve member being movable in its said housing between a first position in which its jack-supply passage is connected to its outlet passage and a second position in which its jack-supply passage is connected to its inlet passage, each valve member having a piston portion, each piston portion having first and second faces disposed one on each side thereof, a pressure chamber being defined between the first face of each piston portion and its corresponding housing, each said first face of each valve member piston portion being subjected to fluid pressure in its corresponding pressure chamber to urge the valve member towards its first position, and each said second face being subjected to the pressure in the inlet passage to urge the valve member towards its second position, each said first face having an effective surface area larger than the effective surface area of its corresponding second face whereby to produce a resultant force urging each valve member towards its first position when pressures on the first and second face of each piston portion are equal, each pressure chamber having a bleed valve for bleeding fluid therefrom, each bleed valve having an operating member operable to open the bleed valve to relieve the pressure in its associated pressure chamber and allow its associated valve member to be moved to its second position by fluid pressure exerted on its said second face, the valve member of said first valve having a passage extending through its piston portion and placing its associated pressure chamber in communication with its inlet passage, the control unit further comprising a valve-connecting passage for placing the jack-supply passage of the first valve in communication with the pressure chamber of the second valve.

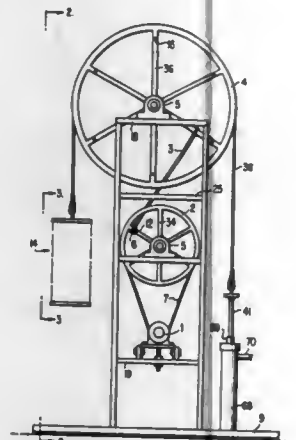
4,161,137

**ROCKER WHEEL JACK FOR AN OIL-WELL PUMP**  
Arthur K. Gaddy, 925 Gabaldon NW., Albuquerque, N. Mex. 87104

Filed Mar. 14, 1977, Ser. No. 777,466  
Int. Cl.<sup>2</sup> F01B 9/00

U.S. Cl. 92—13

2 Claims



1. A wheel jack comprising:  
a support frame,  
a drive motor,  
means supporting the drive motor on the frame,  
a rotating rocker drive,  
means supporting the rotating rocker drive on the frame,  
a rocker wheel,  
means supporting the rocker wheel for back-and-forth rocking movement on the frame,  
means connecting the motor to the rocker drive for moving the latter,  
means connecting the rocker drive to the wheel for rocking the latter back and forth, and  
cable means supported on the wheel so that back-and-forth movement of the wheel moves one end of the cable means to operate a sucker rod, for example,  
the rocker drive being supported on a first shaft and the

rocker wheel on a second shaft spaced from the first shaft, further comprising  
means to variably spaced the first and the second shafts relative to each other.

4,161,138

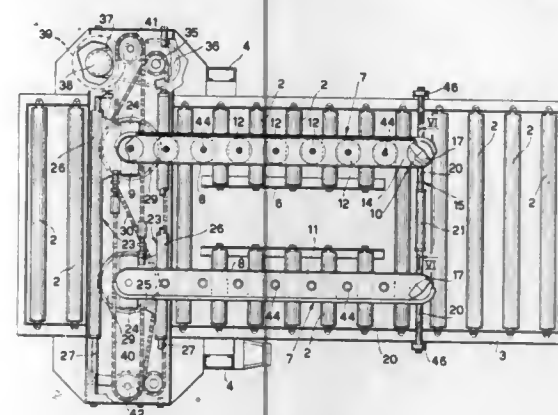
**MACHINE FOR SEALING PARALLELEPIPED BOXES**  
Augusto Marchetti, Piazza Stellia, 7, Milan, Italy

Filed Mar. 24, 1978, Ser. No. 889,717

Claims priority, application Italy, Apr. 1, 1977, 22013 A/77  
Int. Cl.<sup>2</sup> B31B 1/60; B65G 15/00

U.S. Cl. 93—36,9

4 Claims



1. A machine for sealing parallelepiped boxes composed of two vertical side walls, two vertical end walls, a group of upper closing flaps and a group of lower closing flaps, comprising a support surface for the boxes to be sealed, a pair of entraining elements including conveyor belts disposed in a transversely displaceable manner at the two sides of said support surface to engage with respective side walls of the boxes in order to feed them along said support surface, and at least one taping head disposed above said support surface to apply an adhesive sealing tape to the top of the boxes as they advance along said support surface, each conveyor belt extending as an endless loop about a respective succession of rollers with their axes parallel and spaced apart along the feed direction of the boxes, of which the most downstream roller is rotated by motor means, wherein said most downstream roller associated with each conveyor belt has a drive shaft rotatably supported by a slide which can be controllably spaced along a guide transverse to the feed direction of the boxes, on said shaft there being mounted a sprocket which cooperates with the analogous sprocket associated with the other conveyor belt, with a drive sprocket disposed in proximity to one side of said support surface and rotated by a motor, and with a chain tightening sprocket disposed in proximity to the other side of said support surface, by way of a chain which engages at its opposite ends with said sprockets associated with the conveyor belts.

4,161,139

**CONDITIONING APPARATUS**

Franciscus Van Deuren, Bostel, Netherlands, assignor to Simon-Heesen B.V., Bostel, Netherlands

Filed May 1, 1978, Ser. No. 901,824

Claims priority, application Netherlands, May 11, 1977, 7705234

Int. Cl.<sup>2</sup> A01J 11/04, 13/00

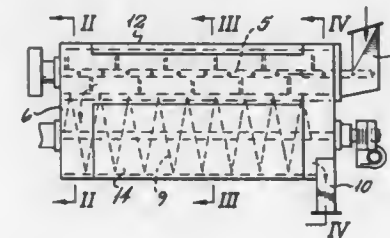
U.S. Cl. 99—467

7 Claims

1. Apparatus for the treatment of animal feedstuff prior to pelletising thereof comprising a conditioning vessel and at least one sterilisation vessel, each of which is in the form of a cylindrical drum, means for feeding the material to be treated through the conditioning vessel where steam or other additive can be applied, means for passing material from the condition-

ing vessel to the sterilisation vessel or vessels and means for discharging material from the sterilisation vessel or vessels after a required residence time therein, said conditioning vessel and said sterilisation vessel or vessels being arranged in spaced

relatively moving platen, said relief means lying out of the path of said relatively moving platen as first platen moves towards said second platen; and  
(F) control means for regulating the actuation of said moving means.



4,161,141

**TWO SIDE MULTI ROLLER TONER STATION FOR ELECTROGRAPHIC NON-IMPACT PRINTER**

Kishor M. Lakhanl, 5428 NW. 66th St., Oklahoma City, Okla. 73132

Filed Oct. 5, 1977, Ser. No. 839,692

Int. Cl.<sup>2</sup> G03G 13/00; B41F 35/00

U.S. Cl. 101—1

11 Claims

apart relationship and connected by walls to form an integral structure having a single chamber between said vessels through which a heating medium may be passed, thus to heat the contents of both the conditioning vessel and the or each sterilisation vessel.

4,161,140

**PROTECTED ROCKER-ARM SAFETY DEVICE FOR PRESSES**

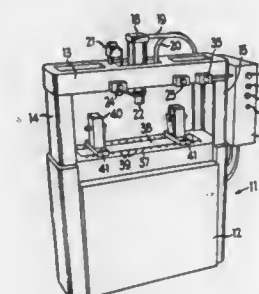
Paul C. Altman, 2821 Valley Forge Rd., Lisle, Ill. 60532

Filed Sep. 1, 1977, Ser. No. 829,591

Int. Cl.<sup>2</sup> B30B 1/08; F16P 7/00

U.S. Cl. 100—53

21 Claims



1. A safety device for a press of the type having two platens coupled to a framework with the first of said platens movable under an applied force toward the second of said platens, said safety device comprising:

- (A) a substantially rigid member capable of withstanding, along at least one dimension, the force of one of said platens moving towards the other of said platens;
- (B) a supporting structure including mounting means for allowing the affixing of said supporting structure to said press;
- (C) attaching means, coupled to said member and said structure, for rotationally coupling said member to said structure, said attaching means allowing rotation of said member about an axis passing through said member between first and second positions, said mounting means allowing the affixing of said structure to said press with said member, when in said first position, lying partly in the path of a platen moving relative to said member as said first platen moves towards said second platen and having an angular disposition relative to said path of said relatively moving platen, and, when in said second position, lying out of said path of said relatively moving platen;
- (D) moving means, coupled to said member, for rotating said member between said first and said second positions;
- (E) relief means, coupled to said structure, for, (1) with said structure affixed to said press, (2) said member in said first position, and (3) said member in contact with said relatively moving platen, relieving from said attaching means substantially all force imposed on said member by said

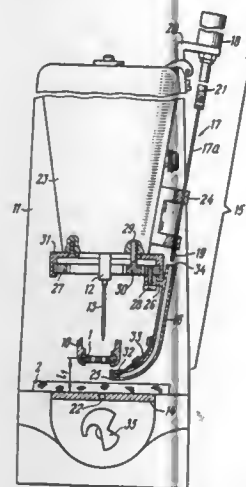
1. In an electrographic printing system of the type wherein a recording medium, comprised of a conductively treated paper base supporting a plastic dielectric coating on each of its sides and traveling along a path, has electrographic images formed thereon by selectively applying a high potential across the recording medium and wherein the latent images are subsequently made visible by applying a toner to the medium:

an electrode structure on each side of said recording medium, each electrode structure spaced adjacent the path of said recording medium and including a plurality of spaced rows of electrodes, with successive electrodes in each of said rows being spaced from each other, and with the electrodes of successive rows being staggered;  
first means for selectively energizing each of said electrodes, whereby latent electrographic images are selectively formed substantially simultaneously on each side of said recording medium; and,  
a two-sided toner applicator station for developing substantially simultaneously the latent images formed on each side of said recording medium by applying toner solution substantially simultaneously to two sides of the recording medium;  
said two-sided toner applicator station including a first set of development electrodes for developing the latent images formed on a first side of said recording medium, and a second set of development electrodes for developing the latent images formed on a second side of said recording medium, said first and second sets of development electrodes being operative for developing the latent images on each side of said recording medium; wherein said two-sided toner applicator station includes second means for effecting the level of the toner liquid below said first side of said recording medium whereby said first set of development electrodes are operative thereby effecting a one-sided toner applicator station.



1. In a semi-automatic machine for sewing a button on a stem of thread, comprising: a housing; a needle bar with a needle through which a needle thread passes; a throat plate located below the needle with an opening aligned with the needle for the passage of the needle with the needle thread therethrough; a button holder mounted at a predetermined spacing from said

throat plate and adapted to accommodate a button having holes which is to be sewn onto a cloth adapted to be accommodated between the button holder and the throat plate, by guiding the needle thread by the needle through the holes of the button and the cloth and forming a foot from this thread, an improvement including a device for forming a stem of the needle thread mounted on said housing, said device comprising: a trough rotatably mounted about said needle adapted to rotate during the process of sewing on the button and having one of its ends underlying said button holder; means for rotat-



ably mounting said trough with respect to said needle; means for engaging the needle thread and providing a reserve length thereof upon this thread having been guided through one hole of the button and through the cloth, said thread engaging means being mounted for travel through said trough to underlie said button holder to engage the needle thread and to exit from the trough prior to the trough being rotated and the reserve length of the needle thread having been provided; means for driving said needle thread-engaging means for the travel through said trough and retraction therefrom; and means for rotating said trough.

#### 4,161,149 CUTTING APPARATUS FOR FLATBED SEWING MACHINE

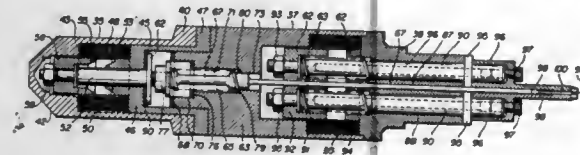
Miroslav Baran, Trenton, Canada, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed May 5, 1977, Ser. No. 794,252

Claims priority, application Canada, May 12, 1976, 252340  
Int. Cl.<sup>2</sup> D05B 37/04

U.S. Cl. 112—130

4 Claims



1. A cutting apparatus for cutting a strip of material connected to a component and extending beyond at least one edge thereof, the cutting being performed at said one edge, said apparatus comprising blade means for cutting the strip; tension means for tensioning the strip during cutting thereof; first plunger means engaging the tension means; second plunger means engaging the blade means; electromagnetic drive means for moving the first plunger means and tension means from a rest position to a tensioning position on each side of the blade means, and for moving said second plunger means and blade means from a rest position to a cutting position between the tensioning means; sensor means for actuating said drive means when the component and strip are properly located beneath

the blade means, said electromagnetic drive means including a core formed of magnetic material on each of said first and second plunger means; first and second coils around said first and second plunger means; and circuit means for energizing said first and second coils sequentially in response to signals from said sensor means, whereby the first plunger means and tension means are moved to the tensioning position before movement of the second plunger means and blade means to the cutting position; and means for returning the blade means, tension means, and first and second plunger means to the rest position.

#### 4,161,150 SIMPLIFIED ACTUATION OF TWO STEP BUTTONHOLE IN ELECTRONICALLY CONTROLLED SEWING MACHINE

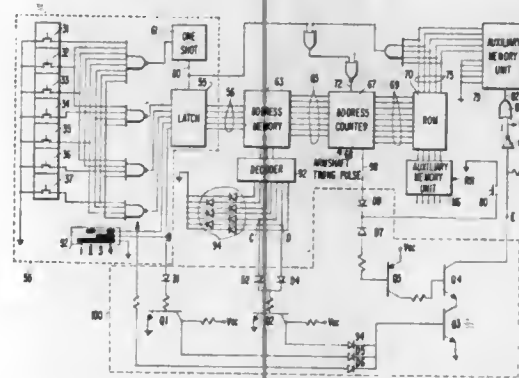
Jack Brown, Union, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,017

Int. Cl.<sup>2</sup> D05B 3/06, 3/02

U.S. Cl. 112—158 E

4 Claims



1. An electronically controlled sewing machine having stitching instrumentalities; actuators for positioning said stitching instrumentalities in the formation of a sequence of stitches; a first logic device including at least one memory device containing sequential stitch information for release to said actuators, including information for reverse stitching; a selector means for retrieving selected stitch information from said memory device, said selector means including means for selecting at least one form of a buttonhole and means for selecting reverse stitching; said first logic device being responsive to selection of said at least one form of a buttonhole to release sequential stitch information from said memory device to said actuator of a first step of said buttonhole beginning with a first end thereof and terminating in a series of inner and outer stitches of a first leg thereof, said first logic device being further responsive to an extraneous signal to terminate the release of stitch information of said inner and outer stitches of said first leg, and to initiate the release of sequential stitch information from said memory device to said actuators of the second step of said buttonhole beginning with a second end thereof and terminating in a series of inner and outer stitches of a second leg thereof; wherein the improvement comprises:

means for connecting said reverse selecting means to said first logic device as a generator of said extraneous signals and as a reverse stitch selector; and  
means responsive to selection of said means for selecting at least one form of a buttonhole for enabling operation of said reverse selecting means as a generator of said extraneous signal and responsive to non-selection of said buttonhole selecting means for enabling operation of said reverse selecting means to effect reverse straight stitching.

#### 4,161,151 SEWING MACHINE

Marcel Fresard, Petit-Lancy, and Antonio Jimenez, Meyrin, both of Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

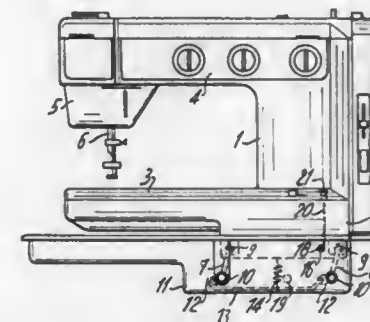
Filed Jan. 25, 1978, Ser. No. 872,034

Claims priority, application Switzerland, Feb. 8, 1977, 1475/77; Sep. 1, 1977, 10662/77

Int. Cl.<sup>2</sup> D05B 73/10

U.S. Cl. 112—217.1

6 Claims



1. In a sewing machine adapted to be mounted in a support member, comprising a column, a lower frame member on which said column is mounted, said lower frame member including a free arm portion extending therefrom, an upper arm on said column disposed generally parallel to said free arm portion and terminating in a head in which a drive mechanism of a needle carrying bar is provided, a casing, means pivotally connecting said lower frame member to said casing, said means comprising at least two support members pivoted at one of their ends to said frame member and pivoted at their other ends to said casing, the improvement wherein said support members connect said lower frame member to said casing in such a manner as to permit displacement of the machine with respect to the casing between a first position in which the lower frame member and the free arm are housed in said casing, with their upper faces being generally at the level of the upper edge of the casing, and a second position in which the free arm is on the elevated position above the casing, a connecting rod pivoted at its ends to two of said support members so as to ensure maintenance of their parallelism when the machine is displaced from its first position into its second position, said support members comprising links pivoted in pairs on two sides of said lower frame member and pivoted to the inside of said casing, at least one of each such pair of links provided with an extension at one of its pivotal ends and on which one of the ends of said connecting rod is pivoted thus connecting it to a link of the other pair, a bearing of non-circular transverse section on at least one end of said links to permit compensation for the manufacturing tolerances of the assembly of the pivots points of said links and of said connecting rods.

#### 4,161,152 PRETENSION THREADING DEVICE

William L. Herron, Elizabeth, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,654

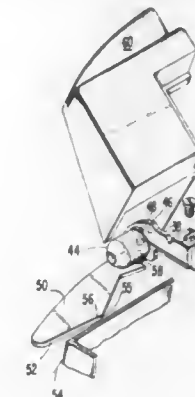
Int. Cl.<sup>2</sup> D05B 47/00

U.S. Cl. 112—254

1 Claim

1. A pretension threading device facilitating threading of a pretension device of a sewing machine having a base and a bracket arm with a rear surface and a rear corner at one extremity of said arm, said arm overhanging said base and supporting a thread supply for supplying thread to said pretension device, said pretension threading device comprising an elongated ear fastened to said bracket arm and extending away from said thread supply along the rear surface of said arm and having a segment projecting beyond the rear corner of said arm, said ear having said pretension device attached thereto and having a thread holding notch for engaging thread from

said thread supply against said pretension device, said ear also having an edge for guiding thread from said projecting segment to said thread holding notch, and a fin disposed in covering relation about said pretension device, said fin tapering away from said thread supply toward said rear corner of said



arm, and a lip depending from said fin, said lip tapering toward said rear corner of said arm to form an expansive slot between said fin and said ear at said rear corner, said lip guiding a length of thread drawn under said segment of said ear projecting beyond said rear corner and between said arm and said ear toward said thread holding notch and said pretension device.

#### 4,161,153 THREAD WINDING MECHANISM FOR SEWING MACHINE

Hideo Nawa, Chiryu, and Yujiro Takikawa, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Nov. 18, 1977, Ser. No. 852,749

Claims priority, application Japan, Nov. 18, 1976, 51/153867[U]

Int. Cl.<sup>2</sup> D05B 59/00; B65H 54/18

U.S. Cl. 112—279

4 Claims

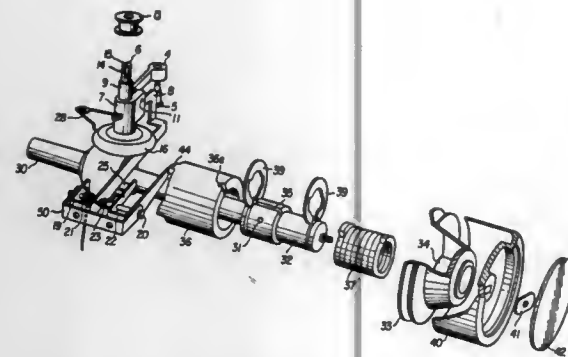
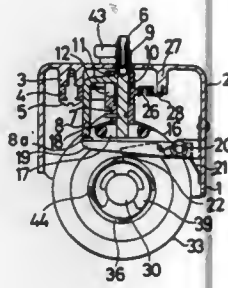
1. A thread winding mechanism for a sewing machine including a motor which comprises:

a thread winding shaft, provided in an arm of the sewing machine, an upper portion thereof being extended from said arm for inserting a bobbin thereon;  
a bearing member connected to said arm;  
rotatable guide means disposed within said arm and including a guide member rotatably supporting thereon said thread winding shaft with said bearing member being disposed between said thread winding shaft and said guide member and being vertically movable along said thread winding shaft during bobbin insertion on said thread winding shaft;

lever means pivotally mounted on said arm and operatively connected to said bearing member of said guide means, said lever means being rotatable in response to the vertical movement of said bearing member;  
a main shaft connected to said arm;  
a drive pulley transmitting rotational torque from said motor of the machine to said main shaft;  
clutch means normally engaging said main shaft with said drive pulley for unitary rotation therebetween; and  
a torque transmitting pulley secured to the lower end of said



thread winding shaft for transmitting torque from said drive pulley to said thread winding shaft when said thread



winding shaft is rotated about said drive means from an inoperative position to an operative position.

4,161,154

## STABILIZING DEVICE FOR SHIPS

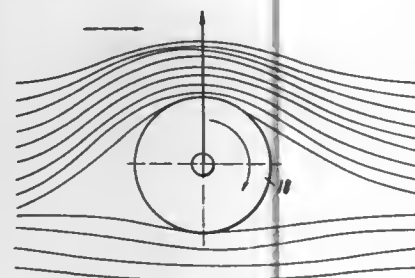
Walter M. Kollenberger, deceased, late of Hamburg, Fed. Rep. of Germany (by Kathe L. M. Kollenberger, administratrix), assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Fed. Rep. of Germany Continuation of Ser. No. 784,705, Apr. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 697,755, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 595,334, Jul. 14, 1975, abandoned. This application Jan. 30, 1978, Ser. No. 873,716

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1974, 2434257

Int. Cl.<sup>2</sup> B63B 39/00, 43/02

U.S. Cl. 114-122

3 Claims



1. A stabilizing apparatus for a body comprising inner and outer rotors arranged concentrically one within another and rotatable in opposite directions provided on each side of the body to be stabilized, means to move the outer rotors alternatively into and out of said body and means attachable to each side of said body to hold said inner rotors in a fixed relationship with said body.

4,161,155

## PATCH FOR SHIP HULLS

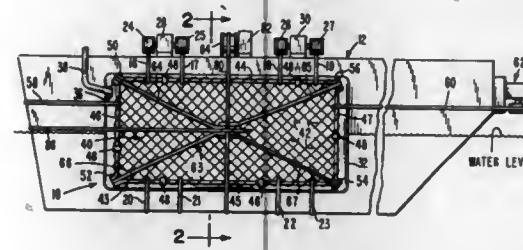
Charles C. Cloutier, P.O. Box 885, Morgan City, La. 70380

Filed Jun. 30, 1978, Ser. No. 921,025

Int. Cl.<sup>2</sup> B63B 43/16

U.S. Cl. 114-227

12 Claims



1. An inflatable, fluid filled patch for covering damaged areas of a vessel hull to prevent leakage of fluid material from the hull, comprising:  
an inflatable bladder;  
a peripheral frame;  
mesh means secured to said frame and covering said bladder for securing the bladder to a hull;  
securing cable means for positioning said bladder on the hull;  
bracket means having a plurality of legs secured at one end to said peripheral frame and extending thereabove and converging at the other end to a common apex; and  
tensioning cable means for applying pressure to the apex of said bracket means and thence to said peripheral frame to seal the edges of said bladder against the hull.

4,161,156

## POWER PROPELLED BOAT WITH IMPROVED ELECTRICAL CONNECTOR

Masato Sato, Akashi, and Keiichi Nakamizo, Himeji, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

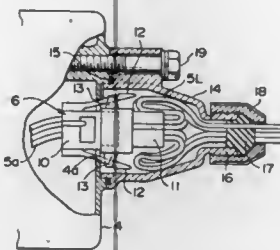
Filed Aug. 16, 1977, Ser. No. 825,032

Claims priority, application Japan, Aug. 19, 1976, 51-111513[U]

Int. Cl.<sup>2</sup> B63B 35/72

U.S. Cl. 115-76

6 Claims



1. Power propelled boat comprising a boat hull, an engine unit having engine body means mounted on the boat hull for providing propulsive force, and at least one electric component for the engine unit which is positioned in a water-tight casing mounted on the boat hull, said engine unit having at least one electric part which is functionally associated with said electric component and mounted on said engine body, wire means for connecting said electric part with said electric component, said wire means having one end connected with said electric part and the other end adapted to be connected with said electric component, removable connector means for connecting said other end with said electric component, said removable connector means including disconnectable jack and receptacle means for releasably connecting said other end with said electric component, water-tight cover means releasably secured to the casing for encircling said jack and receptacle means, resilient grommet means for supporting said wire means

passed therethrough, said grommet means being located on said cover means, and cap means adapted to be engaged with said cover means for compressing the grommet means so as to provide water-tight seal between the cover means, the grommet means, and the wire means, said wire means being formed with loop means in said cover means so that excess length of wire means is stored in said cover means.

4,161,157

## ANIMAL LITTER CONTAINER

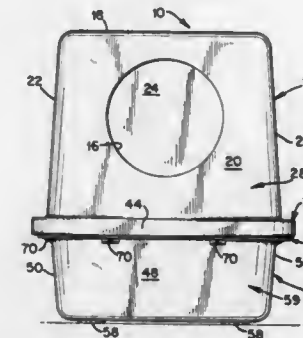
Donald J. Haugen, 709 W. Huron St., Ann Arbor, Mich. 48103

Filed May 13, 1977, Ser. No. 796,591

Int. Cl.<sup>2</sup> A01K 1/00

U.S. Cl. 119-1

17 Claims



1. An animal litter container comprising:  
(a) an upper enclosure portion defined by generally upstanding walls including a front wall, a rear wall, and a pair of side walls, and by a top wall extending between said generally upstanding walls;  
(b) a lower enclosure portion, said upper and lower enclosure portions defining an enclosed space when coupled together;  
(c) said upper enclosure portion including means for providing access for an animal to said enclosed space, said access means including an opening in one of said upstanding walls;  
(d) means between said upper and lower enclosure portions for coupling said enclosure portions together;  
(e) means for preventing liquid from collecting in said coupling means, said preventing means including a portion of said upper enclosure portion projecting into said enclosed space, said projecting portion extending substantially entirely around said upper enclosure portion and having a free extremity, said free extremity being spaced from said coupling means.

4,161,158

## PRESERVATION OF LIVE FISH BAIT

Frank A. Kartesz, 760 Somerset Ave., Rockwood, Pa. 15557

Filed Aug. 3, 1977, Ser. No. 821,615

Int. Cl.<sup>2</sup> A01K 67/00

U.S. Cl. 119-1

12 Claims

1. A method of preserving underground and surface dwelling fish bait comprising:  
packing the bait in a media containing nutrients, an antibiotic and a stress relieving drug; and,  
maintaining the temperature of said packed bait between 33 and 55 degrees Fahrenheit.

4,161,159

## INSTANTANEOUSLY EMPTIABLE EXTERNALLY MOUNTED ANIMAL FOOD TRAY

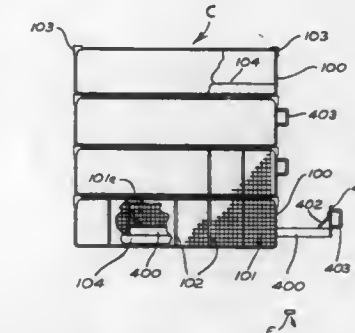
Basil K. J. Leong, Portage, Mich., assignor to International Research and Development Corp., Mattawan, Mich.

Filed Jul. 5, 1977, Ser. No. 812,639

Int. Cl.<sup>2</sup> A01K 1/02

U.S. Cl. 119-18

14 Claims



1. A readily emptiable animal food tray, for use in conjunction with a plurality of animal cages mounted side-by-side and having support means of approximately the same width as said food tray therebetween, whereby said animal cages are spaced from each other approximately the width of said animal food tray thereby forming a recess therebetween, comprising a bottom, vertically extending members at the ends of said tray which are adapted substantially to correspond to the cross-section of the recess between said adjacent animal cages immediately above said tray bottom, and gripping means on the vertically extending member at one end of said tray for pushing or pulling said tray into and out of the said opening between adjacent animal cages, said bottom of said tray being angled downwardly from a central longitudinal apex to its lower edges.

4,161,160

## FUEL ADDITIVE INJECTION SYSTEM FOR DIESEL ENGINES

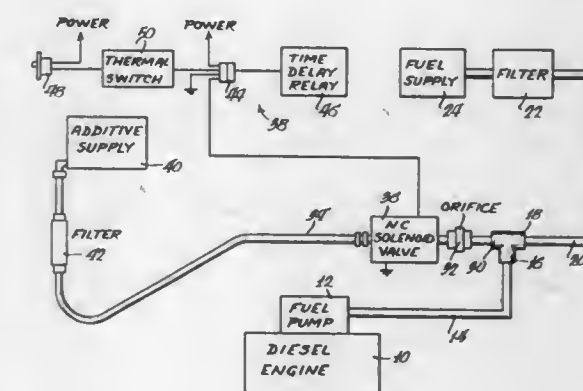
George E. Hicks; John W. Litherland, both of Peoria; Arlan G. Martin, Morton, and Lawrence Williams, Peoria Heights, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 31, 1977, Ser. No. 847,530

Int. Cl.<sup>2</sup> F02M 43/00

U.S. Cl. 123-1 A

7 Claims



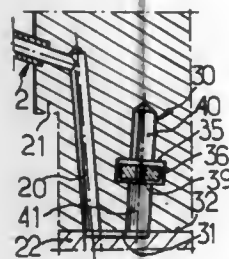
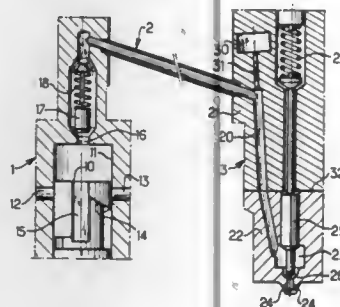
1. In a diesel fuel supply system, the combination of:  
a fuel pump for supplying fuel to a diesel engine;  
a fuel tank connected to said pump for delivering fuel to the pump;  
a fuel additive tank;  
a valve;

means connecting said additive tank to said pump through said valve in parallel relation to said fuel tank; and means for selectively operating said valve.

**4,161,161**  
**DEVICE FOR DAMPING PRESSURE WAVES IN AN INTERNAL COMBUSTION ENGINE FUEL INJECTION SYSTEM**

Dirk Bastenhof, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint Denis, France  
Filed Feb. 10, 1977, Ser. No. 767,485  
Claims priority, application France, Mar. 15, 1976, 76 07337  
Int. Cl.<sup>2</sup> F02M 55/02  
U.S. Cl. 123—32 JV

6 Claims



1. A device for injecting liquid fuel into an internal combustion engine, the device comprising an injection pump and an injector, the injector including an injector body, an injector nozzle having an injector valve seat and at least one fuel delivery orifice, an injection conduit having a portion extending through the injector body and connecting the pump to the fuel delivery orifice by way of the injector valve seat, an injector needle valve reciprocally mounted in the injector body, said device further comprising:

an accumulator chamber formed in the injector body and having a volume less than the total volume of the injection conduit and

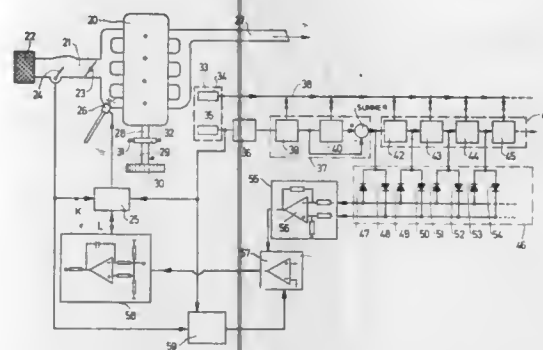
a narrow passage having a cross-section smaller than the cross-section of the injection conduit and connecting the accumulator chamber to the portion of the injection conduit which extends through the injector body, wherein the injector body has a flat junction surface, the nozzle has a flat junction surface sealingly mating with the junction surface of the injector body, the portion of the injection conduit that extends through the injector body crosses the plane of the junction surfaces into the injector nozzle, the accumulator chamber comprises a blind hole drilled into the injector body from the junction surface thereof at a location spaced from the intersection of the injection conduit with said junction surface, and the narrow passage comprises a slot in one of the junction surfaces of the injector body and the injector nozzle.

**4,161,162**  
**METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE**  
Reinhard Latsch, Vaihingen, and Valerio Bianchi, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Continuation of Ser. No. 564,073, Apr. 1, 1975, abandoned. This application Jul. 7, 1977, Ser. No. 815,383  
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1974, 2417187

Int. Cl.<sup>2</sup> F02B 3/00

U.S. Cl. 123—32 EA

24 Claims



1. An apparatus for controlling the operation of an internal combustion engine, which includes a crankshaft, comprising:

- (A) sensor means associated with the crankshaft, for sensing crankshaft rotation during a predetermined measurement-time interval and forming an electrical signal related to the crankshaft rotation, said measurement-time interval corresponding to an angular region of the crankshaft rotation related to at least one stroke of a piston of the engine;
- (B) actual value signal generator means including integration means, connected to said sensor means, for integrating sequential ones of the electrical signals generated by the sensor means generating during the predetermined measurement-time interval an electrical actual value signal related to the speed of rotation of the crankshaft, which signal is representative of the fluctuation in the average combustion chamber pressure in two sequential time intervals;
- (C) nominal value signal generator means, for generating an electrical nominal value signal from engine parameters;
- (D) first comparator means, for electrically comparing said actual value signal with said nominal value signal and for forming an electrical output signal; and
- (E) servo means, connected to the output of said first comparator means, for adjusting the composition of the fuel-air mixture of said internal combustion engine in response to the electrical output signal.

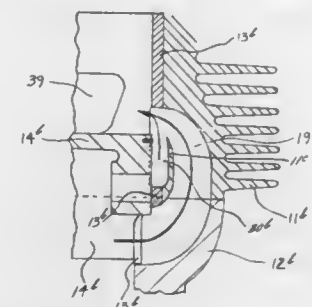
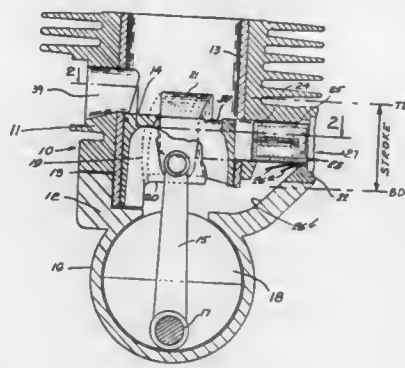
**4,161,163**  
**TWO CYCLE INTERNAL COMBUSTION ENGINE**  
Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.  
Continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, and a continuation-in-part of Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 361,407, May 18, 1973, abandoned, Ser. No. 416,231, Nov. 15, 1973, Pat. No. 4,000,723, and Ser. No. 416,215, Nov. 15, 1973, Pat. No. 3,905,341, each is a division of said Ser. No. 375,065  
This application Oct. 4, 1977, Ser. No. 839,180  
Int. Cl.<sup>2</sup> F02B 33/04

U.S. Cl. 123—73 A

7 Claims

6. A variable speed, two-cycle, crankcase compression internal combustion engine comprising a cylinder, a piston working

in the cylinder, a crankcase having a crank space below the cylinder, a combustion chamber above the piston and a fuel flow space immediately below the piston but above the crank space even in bottom dead center position of the piston, fuel intake porting and passage means for supplying fuel to the engine and including fuel intake porting in the cylinder wall confronting the bottom dead center position of the piston and being of sufficient axial dimension to supply fuel to said fuel space immediately below the piston throughout at least a substantial part of the upward stroke of the piston and further



including a fuel tract approaching the cylinder in the region of said intake porting above said fuel space, a fuel transfer system having transfer porting through the cylinder wall above the piston in bottom dead center position and comprising passage means providing uninterrupted intercommunication between said transfer porting and said tract, a passage providing uninterrupted intercommunication between said fuel space and said fuel tract throughout the cycle of the engine, and reed valve means in said fuel tract for controlling the fuel supply to the engine.

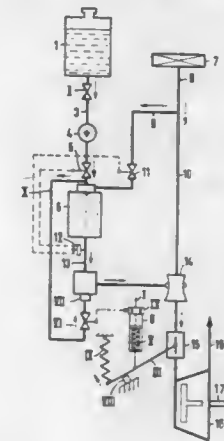
**4,161,164**  
**INTERNAL COMBUSTION ENGINE FUEL SUPPLY SYSTEM**  
Erhard Mühlberg, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Division of Ser. No. 378,234, Jul. 16, 1973, abandoned. This application May 30, 1975, Ser. No. 582,473  
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1972, 2235004  
Int. Cl.<sup>2</sup> F02M 31/00

U.S. Cl. 123—122 G

6 Claims

1. In a method of operating an internal combustion engine, said engine including a fuel supply tank for receiving a liquid hydrocarbon fuel, a fuel line coupled to said fuel supply tank, a gas intake line, a throttle valve coupled to said engine and to said gas intake line, a converter for converting said liquid hydrocarbon fuel to a soot-free gaseous fuel by means of partial combustion, a first branch line coupled to said gas intake line, a gas metering valve coupled to said first branch line and to said converter, a first fuel metering valve coupled to said fuel

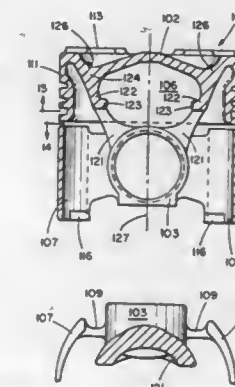
line and said converter, an injection device coupled to said converter, a second branch line coupled to said fuel line between said fuel metering valve and said converter, and a second fuel metering valve coupled to said second branch line and to said injection device, said method including the steps of converting said liquid hydrocarbon fuel to a soot-free gaseous fuel by means of partial combustion in said converter while supplying an oxygen-containing gas to said converter by means of said first branch line and said gas metering valve, supplying said gaseous fuel to said engine, and supplying combustion air to said engine by means of said throttle valve and said gas



intake line to support combustion of said gaseous fuel, the improvement comprising the step of admixing, by means of said second fuel metering valve, liquid hydrocarbon fuel from said fuel supply tank with said gaseous fuel produced by said converter, subsequent to said step of converting and prior to said steps of supplying said gaseous fuel to said engine and supplying said combustion air to said engine, said step of admixing further comprising admixing said liquid hydrocarbon fuel with said gaseous fuel by opening said second fuel metering valve to admix said liquid hydrocarbon fuel with said gaseous fuel when said throttle valve is fully opened.

**4,161,165**  
**PISTON FOR AN INTERNAL COMBUSTION ENGINE**  
Richard Belush, and James A. Wade, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.  
Continuation-in-part of Ser. No. 586,895, Jun. 16, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,109  
Int. Cl.<sup>2</sup> F02F 3/02; F16J 1/04  
U.S. Cl. 123—193 P

27 Claims



1. A piston for an internal combustion engine, comprising a circular dome, a ring band, a relatively thin flexible heat dam part connecting the outer periphery of said dome to said band, a support part connected to the underside of the dome and spaced radially inwardly from said band, said support part



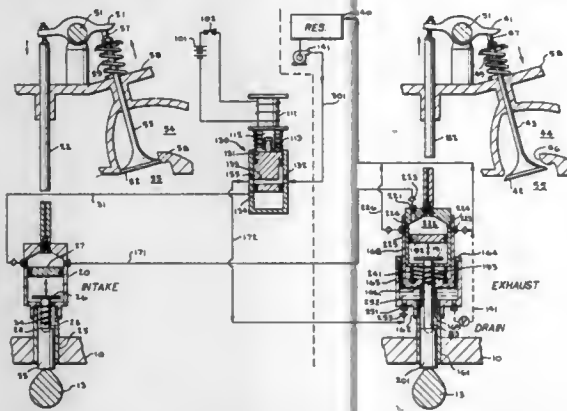
being annular in cross section, said dome, said band, said dam part, and said support part being coaxial and generally symmetrical about the axis of the piston, piston pin bosses, said support part also being connected to said bosses and thus supporting said dome on said bosses, arcuate thrust pads at the sides of the piston, a plurality of struts connecting said pads with said bosses, said pads being supported by said bosses, whereby said dome, said ring band and said pads are substantially structurally separated and structurally function substantially independently of each other.

**4,161,166**  
**DEVICE FOR SELECTIVELY CONTROLLING THE NUMBER OF OPERATIVE CYLINDERS IN MULTI-CYLINDER INTERNAL COMBUSTION ENGINES**

Frank B. Rožnovsky, 1911 Margaret, Houston, Tex. 77093  
Filed Dec. 9, 1977, Ser. No. 859,199  
Int. Cl.<sup>2</sup> F02D 13/06

U.S. Cl. 123—198 F

5 Claims



1. In an engine having a hydraulic system, a fuel system, cam-carrying cam shaft and multiple combustion cylinders, each cylinder having an intake valve, exhaust valve, and said engine having means for selectively removing and returning one or more cylinders from and to the power cycle, the improvement comprising:

control means for (1) selectively providing hydraulic fluid from said hydraulic system to permit the opening of the intake valve in selected combustion cylinders chosen to remain in said power cycle, and (2) selectively withholding hydraulic fluid from selected cylinders to bar the opening of the intake valve in such selected combustion cylinders chosen to be withdrawn from such power cycle; and

said control means further having combination means therein for 1 selectively providing hydraulic fluid to selected combustion cylinders to cause the reciprocation of an exhaust valve in said selected combustion cylinders chosen to remain in the power cycle, and 2 selectively providing said hydraulic fluid to such selected combustion cylinders to bar such reciprocation.

**4,161,167**  
**LAP CUTTING BLADES**  
Dieter Regler, and Alfred Moritz, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronk Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,837  
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722779

Int. Cl.<sup>2</sup> B28D 1/00, 1/08

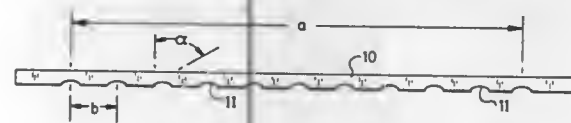
U.S. Cl. 125—18

12 Claims

1. A lap cutting blade usable for the multiple lap cutting of solid materials comprising:

an elongated lap cutting blade having a generally rectilinear

cutting edge, the length of which is 1-75 times the thickness of the blade, as measured at its cutting edge, said cutting edge having rectilinear edge portions separated by a plurality of notched edge portions which, in turn, define a plurality of recesses which encompass 5 to 25% of the total blade length and 5 to 40% of the effective operating



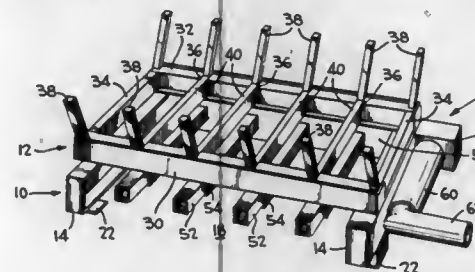
length of the blade and which each have a length between 10 to 20 times the blade thickness and wherein said notched blade edge portions define a notch angle of between 20 and 80 degrees, as measured between the tangent thereto at its point of intersection with said rectilinear cutting edge portion and a line perpendicular to said rectilinear cutting edge portion.

**4,161,168**  
**FIREPLACE GRATE**  
Donald D. Cagle, P.O. Box 3349, Station A, Fort Smith, Ark. 72913

Filed Jan. 27, 1978, Ser. No. 872,909  
Int. Cl.<sup>2</sup> F23H 13/00

U.S. Cl. 126—164

12 Claims



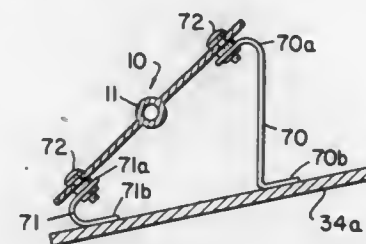
10. A fireplace grate comprising a lower supporting frame and a grill mounted thereon, said lower frame consisting of a transversely extending rear member and a pair of side members extending right-angulantly from the ends of the rear member and forming therewith a U-shaped structure the front of which is entirely open between the front ends of the side members, the lower frame rear member being a tubular manifold open at one end for air input and closed at its opposite end, a plurality of tubes extending forwardly in laterally spaced parallelism from removable connection of their rear ends to the manifold for receiving air therefrom and having their front ends open for discharge of said air, and said grill comprising transversely extending front and rear members connected at their ends to forwardly extending side members and forming therewith a rectangular structure the side members of which bear on the side members of the lower frame, brackets slidably hanging the front end portions of the tubes from the front member of the grill, and the rear member of the grill being hinged to the manifold, whereby the tubes secure the grill down in operative position on the lower frame and the tubes are slidable forwardly in the brackets for removal from the manifold, thereby freeing the grill to swinging to upwardly tilted inoperative position facilitating removal of ashes through the open front of the lower frame.

**4,161,169**  
**FOCUSSING FLAT PLATE SOLAR COLLECTOR DEVICE**  
Nathan E. Brussels, and Edwin S. Piasecki, both of Cherry Hill, N.J., assignors to Solar Energy Systems, Inc., Cherry Hill, N.J.

Continuation of Ser. No. 813,637, Jul. 7, 1977, abandoned. This application Jul. 14, 1977, Ser. No. 815,499  
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

17 Claims



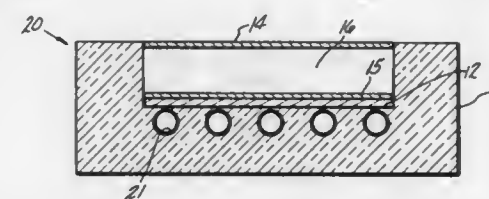
1. A solar energy collector comprising:  
a plurality of elongated fin/tube elements each of which includes an elongated tube and at least one fin extending radially outward from and integrally joined with said elongated tube;  
inlet and outlet manifold tubes arranged in spaced parallel fashion and having coupling sections extending outwardly from said manifold tubes at spaced intervals;  
a rotary hydraulic joint coupled between the ends of each of said elongated tubes and one of said coupling sections for rotatably joining each fin/tube element to said inlet and outlet manifold tubes while providing a leakproof joint; and  
solar tracking means for simultaneously rotating said fin/tube elements to properly orient said fin/tube elements with respect to said solar radiation, said solar tracking means comprising:  
eccentrically mounted cam means having a cam surface;  
means for rotating said cam means;  
a reciprocally mounted rod having a cam follower roller rollingly engaging said cam means;  
bias means normally urging said rod in a direction to urge said cam follower roller into engagement with said cam surface;  
a projection for each of said fin/tube elements, said projection extending radially outward from said tube; and  
coupling means for pivotally coupling the free end of each of said projections to said rod whereby linear movement of said rod simultaneously rotates said fin/tube elements.

**4,161,170**  
**SOLAR ENERGY COLLECTION SYSTEM**  
Bernard H. Nicolaisen, Houston, Tex., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 17, 1977, Ser. No. 852,255  
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

15 Claims



8. A solar energy collection apparatus comprising:  
(a) a heat insulative base;  
(b) an absorber plate overlying said heat insulative base; said absorber plate capable of absorbing solar radiation and

converting at least a portion of said solar radiation into thermal energy;

(c) at least one protective cover spaced above said absorber plate, said protective cover being capable of transmitting solar radiation through to said absorber plate and being impervious to the passage of gases;

(d) at least one gas space being positioned between said absorber plate and a protective cover, said gas space filled with an asymmetric gas which is capable of absorbing thermal re-radiation;

(e) passage means for circulating a heat transfer fluid located in close proximity to said absorber plate;

(f) means for removing said asymmetric gas from said gas space;

(g) means for removing absorbed thermal energy from said asymmetric gas; and

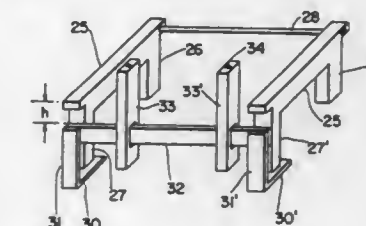
(h) means for returning said asymmetric gas back to said gas space (d) from means (g).

**4,161,171**  
**SLIDING FIREPLACE ANDIRONS**  
Alexander J. Moncrieff-Yeates, 8924 Rhyme Ct., Annandale, Va. 22003

Continuation-in-part of Ser. No. 729,955, Oct. 6, 1976, Pat. No. 4,096,849. This application Oct. 31, 1977, Ser. No. 847,106  
Int. Cl.<sup>2</sup> F24B 13/00

U.S. Cl. 126—298

10 Claims



1. In a heating unit of the type which includes a room air recirculating passageway and includes a fire enclosure defined in part by a bed plate, the improvement wherein the bed plate includes spaced stationary grates extending fore and aft of said bed plate and rigidly affixed thereto throughout their fore and aft dimensions to provide integral reinforcement for said bed plate and further including andirons, means mounting said andirons to said unit for side to side movement in a path across the front portion of the fire enclosure at the front of said bed plate, said mounting means comprises a horizontal rod which extends across at least a portion of the front of said enclosure in a position spaced above the bed plate, and said mounting means further comprises a guide rail which extends across at least a portion of the front of said bed plate at approximately the level thereof, and each said andiron includes means registering with said rod and with said guide track to permit movement therealong.

**4,161,172**  
**LIFE SUPPORT CHAMBER FOR INFANTS, METHOD AND SYSTEM**

Donald E. Pickering, Reno, Nev., assignor to Airborne Life Support Systems, Inc., Reno, Nev.

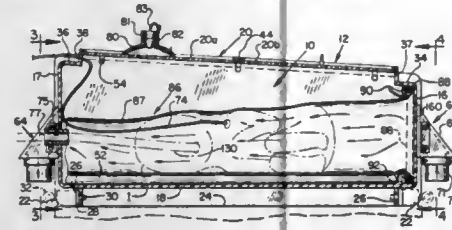
Continuation-in-part of Ser. No. 763,312, Jan. 28, 1977, Pat. No. 4,121,571. This application Nov. 23, 1977, Ser. No. 854,328  
Int. Cl.<sup>2</sup> A61G 11/00

U.S. Cl. 128—1 B

8 Claims

7. A device for maintaining high-risk infants and other medical patients in a controlled environment while at rest and during medical procedures comprising:  
a thin elongated flexible impervious transparent tubular membrane enclosure means adapted to closely enclose the

patient full length while recumbent and being open at its opposite ends, means for connecting one open end of said membrane enclosure means to a source of life-sustaining gas,



an infra-red heating means disposed adjacent but in spaced relation to said membrane and being directed toward said membrane so as to be operable to provide radiant heat energy to the interior of said membrane.

4,161,173

**BLOOD PRESSURE GAUGE**

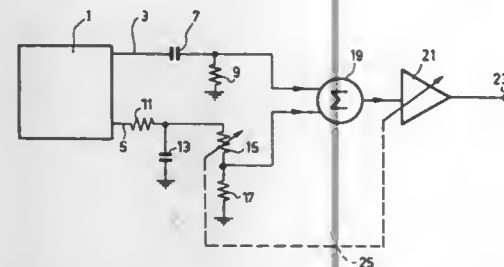
Hans Crestas, Regensdorf, and Edwin Zimmerman, Ostermundigen, both of Switzerland, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,338

Claims priority, application Netherlands, Oct. 17, 1975, 7512187

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—672



1. A device for measuring blood pressure comprising a measuring device for forming an electrical blood pressure signal dependent on the blood pressure value, said electrical blood pressure signal containing alternating current components and a direct current component having a given mutual ratio determined by the subject under test, a circuit arrangement coupled to the output of the measuring device and comprising two separate signal paths and an output terminal wherein the first signal path is designed to selectively pass alternating current in a substantially unvaried manner, the second signal path comprising means for selectively passing the direct current component of the blood pressure signal and an attenuator which attenuates by a given factor the signals guided through said second signal path, a common output for the two signal paths at which a sum signal is produced, and an amplifier responsive to the sum signal and designed to amplify the sum signal by the same factor and to couple same to the output terminal to derive an output signal, the amplifier amplifying the alternating current components of the blood pressure signal relative to the direct current component and passing on the direct current component in a substantially unvaried manner thereby to form at the output terminal an output signal having a different said mutual ratio of alternating to direct current components but the same value of the direct current components.

4,161,174

**BIOMEDICAL ELECTRODE ASSEMBLY**

Albert R. Mercuri, 502 South Ave., Weston, Mass. 02193

Continuation-in-part of Ser. No. 815,180, Jul. 13, 1977,

abandoned. This application Jul. 7, 1978, Ser. No. 922,723

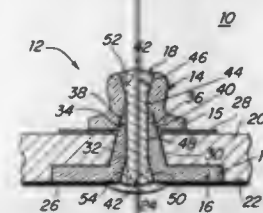
Int. Cl.<sup>2</sup> A61B 5/04

U.S. Cl. 128—641

7 Claims

1. In an electrode unit having an electrode assembly and a

contact pad with an opening in it for receiving the electrode assembly, an improved electrode assembly comprising: a first member disposed on one side of said pad with a stud portion extending axially through the opening in the pad, a first mating area on the stud portion and a first hole therein; a second member disposed on the other side of the pad and having an aperture with a second mating area engaging with said first



mating area of said stud portion and a second hole therein; a connector member extending axially through the opening in the pad and into the first and second holes and securing together said first and second members with pad between them; and conductive means extending through said members to provide a continuous electrical path through the electrode assembly.

4,161,175

**SURGICAL FINGER AND FENCE SPLINTS**

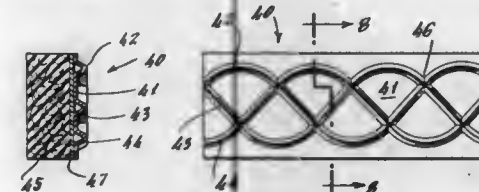
Max Bentele, Fairfield, Conn., assignor to Conco Medical Co., Inc., Bridgeport, Conn.

Filed Apr. 29, 1977, Ser. No. 792,311

Int. Cl.<sup>2</sup> A61F 5/04

U.S. Cl. 128—87 A

14 Claims



1. A surgical splint comprising a supportive base fabricated of bendable aluminum sheet material, the base having at least one integral stiffening rib comprising a corrugated portion of the bendable aluminum sheet material, the integral stiffening rib disposed in a preselected pattern extending across both the width and length of the base thereby increasing both the widthwise and longitudinal rigidity of the bendable aluminum sheet material, and a foam pad attached to the base on the side opposite the at least one corrugated stiffening rib.

4,161,176

**COLOR ADAPTABLE BANDAGE**

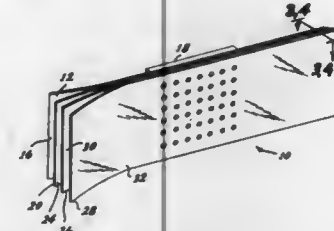
Frederick E. Harris, II, 944 Palisades Beach Rd., Santa Monica, Calif. 90403, and William H. Pavitt, Jr., Pacific Palisades, Calif., assignors to Frederick Earl Harris, II, Santa Monica, Calif.

Filed Apr. 5, 1977, Ser. No. 784,701

Int. Cl.<sup>2</sup> A61L 15/00

U.S. Cl. 128—155

8 Claims



1. A bandage comprising: a first patch of opaque film having an adhesive coating on a first side and being non-adhesive on its second side;

at least one additional opaque patch of film, large enough to cover the non-adhesive second side of said first patch of opaque film and removably attached to it, having a first side facing the second side of said first patch of film, and having a second side; the second sides of said first and additional opaque patches of film having different colors.

4,161,177

**CATHETER ATTACHMENT**

Heinz Fuchs, Melsungen, Fed. Rep. of Germany, assignor to Intermedicat GmbH, Emmenbrucke, Switzerland

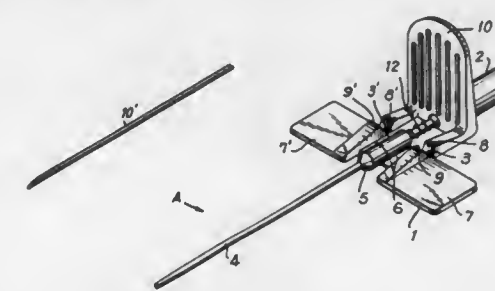
Filed Feb. 11, 1977, Ser. No. 769,335

Claims priority, application Switzerland, Feb. 12, 1976, 1725/76

Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—214.4

17 Claims



1. A catheter attachment for introducing a flexible catheter into a blood vessel, comprising front and rear attachment sections and means for pivotally connecting said sections, and a flexible catheter mounted in said attachment sections, said rear attachment section including means communicating with said catheter for providing communication between the catheter and a transfusion device, whereby the rear attachment section and the portion of the catheter therein may move with respect to the front attachment section without disturbing the remainder of the catheter in and extending from the front attachment section; and means for limiting angular movement of said attachment sections with respect to one another to about 90°.

4,161,178

**ADDITIVE TRANSFER DEVICE**

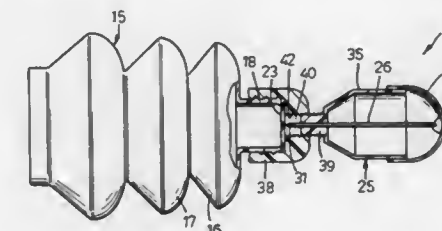
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 8, 1977, Ser. No. 858,493

Int. Cl.<sup>2</sup> A61J 1/00

U.S. Cl. 128—272.3

14 Claims



1. An additive transfer device for storing and transferring of a medicament to a solution container having a pierceable closure comprising:

- an additive container for storing the medicament to be transferred, said additive container having at least one collapsible wall and defining a neck portion with an opening therein;
- a pierceable diaphragm member sealing the opening in the container;
- a closure member secured to said neck portion and in contact with a portion of said diaphragm member, said closure member presenting a passage therethrough;
- a holder member;

a piercing member having a channel therethrough for the flow of said medicament and a piercing point on both ends thereof, an intermediate portion of said piercing member secured to said holder member; guide means defined by said holder member, said guide means positioned from said piercing member and terminating inwardly of one end of said piercing member; a cover member adapted to extend over said holder member and said one end of said piercing member extending beyond said guide means; and said holder member and said additive container being interconnected to permit movement of said holder member and said piercing member toward said additive container; so that upon movement of said holder, said piercing member will move in the direction of said pierceable diaphragm through said passage to effect penetration thereof and upon removal of said cover member and penetration of said solution container closure by the other piercing end of said piercing member, the contents of said additive container can be expelled into the solution container by collapsing said wall of said additive container.

4,161,179

**VACUUM BAG FOR WOUND DRAINAGE**

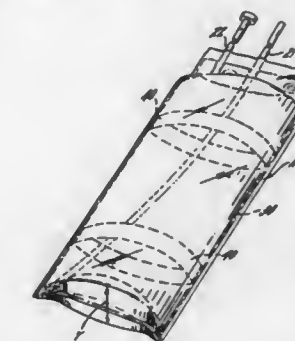
Harvey J. Abramson, New York, N.Y., assignor to Metatech Corporation, Northbrook, Ill.

Filed Aug. 8, 1977, Ser. No. 822,564

Int. Cl.<sup>2</sup> A61M 1/00

U.S. Cl. 128—278

8 Claims



1. A vacuum bag assembly for wound drainage comprising, in combination, an outer bag of thin flexible plastic in the form of an initially flat sealed envelope having opposed walls with parallel side edges defining a central axis as well as end edges, the edges being sealed, a sealed catheter connection providing communication to the space within the bag, the bag including first and second springs spaced along the axis, each spring being in the form of a pair of leaf spring elements lying back-to-back with their ends in register with one another and extending from one side edge of the bag to the other, the leaf spring elements being prestressed for bowing mutually outwardly in lenticular relation away from the central axis, the walls of the bag having reinforcement in the form of a flat sleeve formed of relatively stiff flexible sheets interposed between the springs and the walls of the bag so that upon bowing of the springs the walls of the bag are bowed outwardly uniformly over the major portion of the length thereof into a distended pillow of lenticular cross section for development of vacuum at the catheter connection.

4,161,180

**SUNTRAP SOLAR RADIATION COLLECTOR**

Howard L. Tiger, Eagle Ridge Way, West Orange, N.J. 07052

Filed Jun. 27, 1977, Ser. No. 810,400

Int. Cl.<sup>2</sup> A61H 33/06

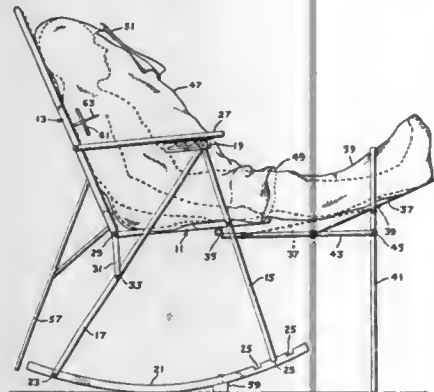
U.S. Cl. 128—372

11 Claims

1. A suntrap for exposing simultaneously the user to rays of the sun and shielding said user from wind, the suntrap comprising in combination:



body supporting means for sustaining weight of the user's body upwardly of his knees;  
 foot support means for sustaining the weight of said user's legs and feet;  
 upper enveloping means for enclosing said user's body substantially completely from his knee area to and including his head;  
 said upper enveloping means being provided with means for admitting the rays of the sun so as to impinge directly upon said user's body;

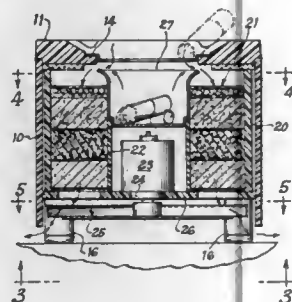


lower enveloping means adapted to enclose said user's feet and legs to approximately the knee area;  
 said lower enveloping means cooperating with said upper enveloping means to encase the user's entire body in loose fashion, while providing sufficient communication with ambient air to ensure an adequate supply of air for breathing;  
 said body support being in the form of a chair; and  
 said chair is a rocking chair with chocks and safety stops.

**4,161,181**  
**SMOKE FILTERING ASHTRAYS**  
 Robert W. Nicks, 2047 Cambridge, Cardiff-By-The-Sea, Calif. 92007, and Larry King, 1660 S. Amphlett Blvd., San Mateo, Calif. 94402

Filed Mar. 16, 1977, Ser. No. 778,119  
 Int. Cl.<sup>2</sup> A24F 19/00, 19/10  
 U.S. Cl. 131—231

19 Claims



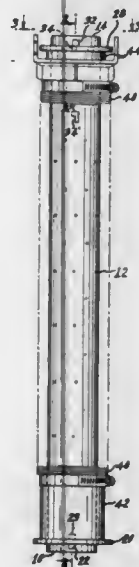
1. A combination ashtray and smoke filtering device comprising:
  - a. A molded ashtray top piece vertically supported by a housing body, said ashtray having depressions for supporting lighted cigarettes and a plurality of perforations through which smoke, ashes and butts may pass;
  - b. Cupped retaining means for collection of ashes and butts placed vertically below the supported cigarette;
  - c. A removable cartridge filter placed vertically beneath the ashtray top;
  - d. Inner and outer vertical walls which closely contain the filter cartridge and enclose the path of smoke and air, the inner wall enclosing a space concentric with the cartridge for containing motor drive means;
  - e. A horizontal plate enclosing the filter and motor compartment

- f. Direct current electric motor means, the shaft of the motor vertically aligned and connected to the hub of fan means;
- g. Horizontally aligned centrifugal fan means parallel to and closely placed to said perforated supporting plate, the central hub of the fan connected to the motor shaft;
- h. Exit vents adjacent to the outer perimeter of said centrifugal fan, whereby said fan driven by said motor will draw air and smoke through the pathway thus defined from the ashtray top through the filter enclosed by the vertical walls through the perforated horizontal plate, and discharge the filtered air at the exit vents;
- i. Voltage source providing D-C current to said motor means;
- j. Switch means to interrupt the flow of D-C current to said motor means.

**4,161,182**  
**SANITARY HOSE HOLDER**  
 Richard J. Burton, 906 Seminole Rd., Waycross, Ga. 31501  
 Filed Oct. 3, 1977, Ser. No. 838,660  
 Int. Cl.<sup>2</sup> B08B 9/02

U.S. Cl. 134—166 C

10 Claims



1. A holder for cleaning and storing an elongated sanitary hose extensible between an extended length and a contracted length, said device comprising:
  - a. an elongated hollow cylinder having opposite ends and being of a length greater than the contracted length of such sanitary hose and having an outside diameter less than the inside diameter of such sanitary hose;
  - b. a retaining member mounted to said cylinder adjacent one of said ends and extending radially outwardly from said cylinder a distance whereby the combined outside diameter of said cylinder and the distance of said retaining member is greater than the inside diameter of such sanitary hose; and
  - c. releasable means for locking such hose onto said cylinder adjacent the other of said ends of said cylinder.

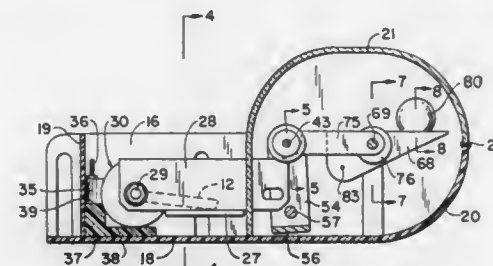
**4,161,183**  
**VIBRATION SENSITIVE VALVE OPERATING APPARATUS**  
 Edwin X. Berry, 6040 Verner Ave., Sacramento, Calif. 95841  
 Filed Aug. 4, 1977, Ser. No. 821,689  
 Int. Cl.<sup>2</sup> F16K 17/36

U.S. Cl. 137—39

54 Claims

1. A valve shut-off device for operating an associated valve

means in response to seismic vibrations of predetermined magnitude, said valve means having an externally operable movable valve mechanism, said device comprising:  
 a housing having a base and an opposed pair of side wall members;  
 spring bias means secured to said housing adjacent a first end thereof;  
 torque arm means adapted to be coupled to said movable valve mechanism and having a first portion coupled to said spring bias means and a free end;  
 said spring bias means providing a biasing force tending to rotate said torque arm means about a predetermined first axis in a predetermined angular direction;  
 latch means for normally preventing rotation of said torque arm means in said predetermined angular direction, said latch means being pivotally mounted to said housing for rotation about a second axis substantially parallel to said first axis and including first bearing means normally engaged with said free end of said torque arm means when said device is armed, and second bearing means; and

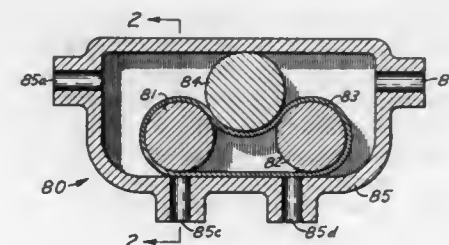


triggerable catch means for normally maintaining said latch means in contact with said torque arm means and for enabling said latch means to disengage said torque arm means in response to said seismic vibrations, said triggerable catch means including balance plate means pivotally mounted to said housing for rotation about a third axis substantially parallel to said second axis, trigger arm means coupled to said balance plate means and movable therewith, said trigger arm means having a portion normally engaged with said second bearing means when said device is armed, and trigger means for enabling said balance plate means to rotate said trigger arm means about said third axis to disengage said normally engaged portion of said trigger arm means from said second bearing means in response to said seismic vibrations so that said latch means disengages said torque arm means to enable said spring bias means to rotate said torque arm means in said predetermined angular direction.

**4,161,184**  
**LINEAR ROLLING CONTACT VALVES**  
 Earl W. Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811  
 Division of Ser. No. 710,797, Aug. 2, 1976, Pat. No. 4,056,292.  
 This application Aug. 5, 1977, Ser. No. 822,093  
 Int. Cl.<sup>2</sup> G05D 11/03

U.S. Cl. 137—98

2 Claims



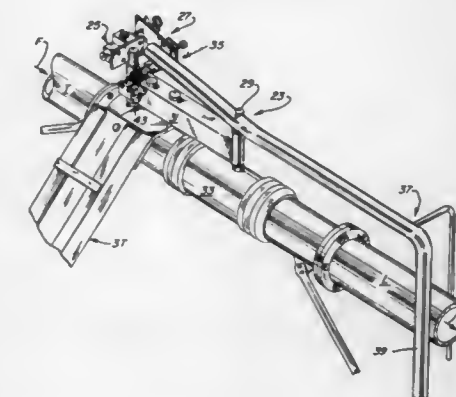
1. A linear rolling contact valve comprising:

a valve-body,  
 said valve-body having a rectangular internal cross section, two major rollers,  
 a circular retainer belt,  
 said retainer belt being in a surrounding relationship to said major rollers, in rolling contact with same, and serving to prevent said major rollers from moving away from each other,  
 said retainer belt being adjacent an inner side of said valve-body,  
 a separator roller,  
 said separator roller being in rolling contact with said retainer belt and with the inner side of said valve-body opposite the first named side,  
 said separator roller serving to depress said retainer belt between said major rollers to prevent same from moving towards each other,  
 said major rollers, said retainer belt and said separator roller comprising an assembly which can move inside said valve-body,  
 the other two inner sides of said valve-body being adjacent the axial ends of said assembly so as to prevent fluid leakage therepast,  
 two end walls,  
 said end walls serving to close the ends of said valve-body, an opening into at least one end portion of said valve body, flow of fluid through said opening causing linear movement of said assembly with respect to said valve-body.

**4,161,185**  
**ALIGNMENT CONTROL APPARATUS FOR A SELF-PROPELLED IRRIGATION SYSTEM**  
 James R. McConnell, Colorado Springs, Colo., assignor to Tumac Industries, Inc., Colorado Springs, Colo.  
 Filed May 12, 1978, Ser. No. 905,277  
 Int. Cl.<sup>2</sup> B05B 3/12

U.S. Cl. 137—344

18 Claims

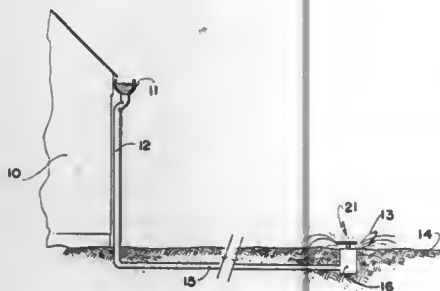


6. In a self-propelled irrigation system having a distribution pipe composed of at least first and second pipe segments movably mounted to each other in fluid communication and having at least one self-propelled tower supporting each pipe segment in a substantially horizontal position for movement relative to the other pipe segment, an alignment control apparatus for selectively operating at least one of said self-propelled support towers to maintain said first and second pipe segments in a predetermined alignment, said controlled apparatus comprising:

an elongated actuation arm having first and second end portions,  
 means for mounting said arm adjacent said first and second pipe segments with said first end portion overlapping part of said first pipe segment and said second end portion overlapping part of second pipe segment, said mounting means including a main support body, means for mounting said main body in a fixed position relative to said first pipe

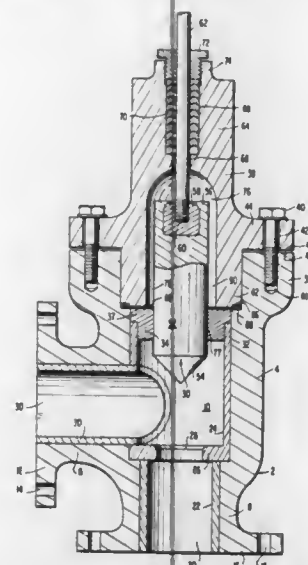
segment, and means for pivotably mounting said actuation arm to said main body between the end portions of said arm for movement about a substantially vertical, pivotal axis, said mounting means further including means operably connected between said arm and at least one of said first and second pipe segments for biasing a part of said second end portion of said arm against said second pipe segment in an abutting relationship whereby said second end portion of said arm moves with said second pipe segment to pivot said arm about said pivotal axis and move said first end portion of said arm relative to said first pipe segment, said second end portion being movable against the force of said biasing means away from said abutting relationship with said second pipe segment, valve means for controlling the movement of the self-propelled support tower for said first pipe segment, said valve means including a housing, means for mounting said housing adjacent at least one of said first and second pipe segments, a control member, and means for mounting said control member for movement relative to said valve housing, and, means operably connected between said one end portion of said arm and the control member of said valve means for moving said control member with said one end portion of said arm.

**4,161,186**  
**DOWNSPOUT RECEIVER AND WATER DISPENSING DEVICE**  
Charles L. Sitarz, Box 7, R.R. #2, Dugald, Canada  
Filed Oct. 5, 1977, Ser. No. 839,645  
Claims priority, application Canada, Oct. 18, 1976, 264003  
Int. Cl.<sup>2</sup> E04D 13/08  
U.S. Cl. 137—357 2 Claims



1. A downspout receiver and water dispensing device adapted to be used with a downspout having a lower discharge end and having connecting means between the downspout and said receiver; comprising in combination a rain water receiver operatively connected to the lower discharge end of a downspout, cover means for the upper end of said receiver, said cover means normally closing off said upper end of said receiver, and means mounting said cover means for water egress therepast whereby water pressure within said receiver opens said cover, said receiver being adapted to be buried underground remote from the associated downspout, said receiver consisting of a container having a closed lower end and an open upper end with the open upper end normally being located flush with the surface of the ground, and an aperture formed in the wall of said container adjacent said closed lower end to receive the associated connecting means from the downspout, said cover means comprising a disc normally engaging the open upper end of said receiver.

**4,161,187**  
**EROSION RESISTANT CONTROL VALVE**  
David N. Bauer, 8345 Pine Cir., Hobe Sound, Fla. 33455  
Filed Jan. 3, 1978, Ser. No. 866,715  
Int. Cl.<sup>2</sup> F16K 27/02  
U.S. Cl. 137—375 4 Claims

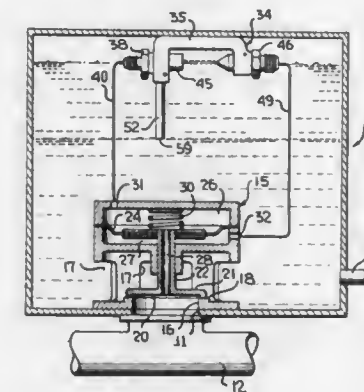


1. An erosion resistant control valve comprising a steel outer body having a cylindrical inlet, a cylindrical outlet whose longitudinal axis is perpendicular to the longitudinal axis of said inlet, a cylindrical central chamber of diameter greater than the diameter of said outlet joining said inlet to said outlet, a first tubular sleeve lining said inlet, a second tubular sleeve lining said outlet, a third tubular sleeve having a transverse portion defining a valve seat lining said central chamber with said valve seat interposed in the flow passage for erosive fluid through the valve defined by said first, second and third tubular sleeves, a bonnet bolted to said body member opposite to said outlet, an elongated valve plug having a conical end designed to sealingly engage said valve seat, a cylindrical cavity in said bonnet, an actuator rod fixed to said valve plug opposite to said conical end, said rod extending through a packed gland in said bonnet for reciprocation of said valve plug within said cavity into and out of engagement with said valve seat, said first, second and third tubular sleeves and said valve plug being formed entirely of carbide selected from the group consisting of chrome carbide and tungsten carbide, and said first, second and third tubular sleeves being locked in place in said outer body by compression from said outer body.

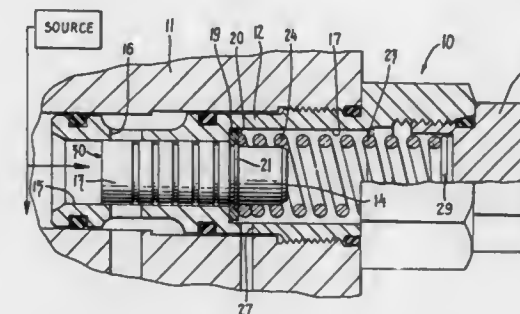
**4,161,188**  
**JET TYPE LIQUID LEVEL SENSOR AND SYSTEM**  
Richard G. Jorgensen, Santa Ana, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio  
Filed Dec. 2, 1977, Ser. No. 856,997  
Int. Cl. F15c 1/14  
U.S. Cl. 137—386 12 Claims

1. A jet liquid level sensor comprising a body having a nozzle and a receiver, the nozzle having an inlet and a discharge orifice, the receiver having an inlet orifice and an outlet, said orifices being aligned along a substantially horizontal axis and spaced apart, a shroud extending from the nozzle beyond said discharge orifice toward said receiver, said shroud being horizontally separated from said receiver by an unobstructed space, said shroud defining a shut off chamber axially adjacent said discharge orifice through which liquid issuing from the discharge orifice passes in a substantially horizontal direction as a jet stream that is received in said receiver inlet, means to introduce liquid vertically into said shut off chamber at a flow rate insufficient to divert said jet stream from said receiver inlet, said means including a pickup tube extending

from the sensor and having one end communicating laterally with said shut off chamber and having its other end radially spaced from said discharge orifice, and said shroud having

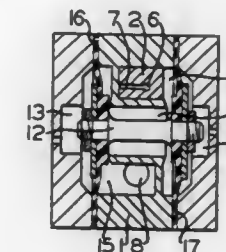


**4,161,189**  
**CONTROL VALVE**  
Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.  
Continuation of Ser. No. 714,419, Sep. 16, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,252  
Int. Cl.<sup>2</sup> F16K 15/06  
U.S. Cl. 137—514.7 4 Claims



1. A pressure control valve comprising in combination: a valve body having an inlet and outlet, a chamber having first and second end portions filled with hydraulic fluid, the valve body being further provided with passageway means one end of which is in communication with the chamber intermediate end portions thereof, the passageway means permitting hydraulic fluid to flow into and out of the chamber; a valve spool mounted within the valve body and shiftable against biasing means into the chamber from a normal closed position through a nominal design operating position to a full open position, the inlet being placed in communication with the outlet as the control member attains the nominal design operating position, the valve spool being provided with an enlarged portion; first fluid flow restriction means to greatly damp the movement of the valve spool, the restriction means becoming operational only as the valve spool attains the nominal design operating position, the first fluid flow restriction means being formed by the cooperation of the peripheral surface of the enlarged portion of the valve spool and the surface of the chamber immediately adjacent the passageway means.

**4,161,190**  
**INTEGRATED THROTTLE FOR THROTTLED AIR REMOVAL IN MULTIPLE-WAY VALVES**  
Rudolf Möller, Hanover, and Detlef Opel, Haste, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany  
Filed Sep. 12, 1977, Ser. No. 832,251  
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645448  
Int. Cl.<sup>2</sup> F15B 13/042  
U.S. Cl. 137—596.18 3 Claims



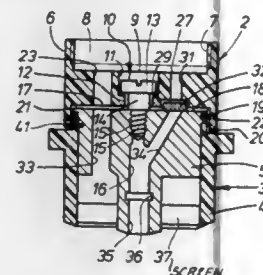
1. A multiple-diaphragm supply and exhaust valve having a throttle, comprising:  
(a) a valve casing having a cavity therein;  
(b) a support port, an exhaust port and a control port communicating with said cavity;  
(c) a pair of control pressure chambers;  
(d) means including a plurality of diaphragms operable in response to pressure in one of said pair of control pressure chambers to establish a first communication between said supply port and said control port and operable in response to pressure in the other of said pair of control pressure chambers to establish a second communication between said control port and said exhaust port;  
(e) an arcuately extending channel in said cavity, said channel having one side intersecting said exhaust port and having an adjacent side open to said control port when said second communication is established;  
(f) a throttle member disposed in said arcuate channel for sliding movement along said channel to open and close said communication between said exhaust port and said side of said channel;  
(g) threaded passage means in said casing communicating with said arcuate channel intersecting said exhaust port; and  
(h) screw means threadedly received in said passage means and having one end connected to said throttle member to slide said throttle member along said channel to open or close said exhaust passage depending upon the direction of axial adjustment of said screw.

**4,161,191**  
**ADAPTOR FOR CONNECTION TO A FAUCET**  
Anton Ranger, Bruckmühl, and Alexander Uebel, Gauting, both of Fed. Rep. of Germany, assignors to Knorr-Bremse-Bowles-Fluidics GmbH, Munich, Fed. Rep. of Germany  
Filed Nov. 1, 1976, Ser. No. 737,477  
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1975, 2549872; Aug. 2, 1976, 2634721  
Int. Cl.<sup>2</sup> F16K 11/06  
U.S. Cl. 137—625.46 14 Claims

1. An adapter for connection to an outflow end of a liquid faucet, comprising a central axis, an inlet part and an outlet part disposed in axial alignment with said inlet part relative to said central axis, valve means operatively disposed between said inlet part and said outlet part for rotation about said central axis, said inlet part comprising at one side thereof means for connection to said outflow end of the liquid faucet, said inlet part further comprising at the other side thereof a first plane end face (17) and a plurality of first flow channel means (23) to



27) extending through said inlet part from said one side to said other side of said inlet part, said outlet part comprising a second plane end face (18) facing said first plane end face (17) of said inlet part, and exit port means substantially opposite said second plane end face, said outlet part further comprising a plurality of second flow channel means extending from said second plane end face to said exit port means, means operatively connecting said inlet part and said outlet part to each other for rotating the outlet part relative to the inlet part, said valve means further comprising valve sealing body means



operatively located between said inlet part and said outlet part, said valve sealing body means being subject to the liquid pressure from said faucet through at least one of said first flow channel means whereby said valve sealing body means control the size of the cross-sectional flow area between said at least one first flow channel means and a respective one of said second flow channel means in response to rotation of said outlet part relative to said inlet part, while simultaneously providing the necessary sealing and whereby the ratio of open cross-sectional flow area to closed cross-sectional area is continuously adjustable by said rotation.

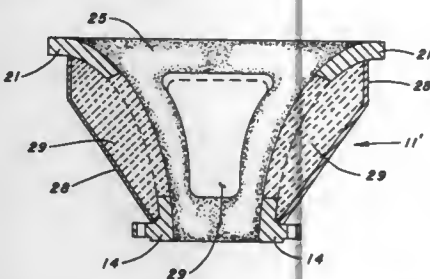
4,161,192

## TRANSFER LINE EXCHANGER INLET CONE

Chester D. Porter, Baton Rouge, La., assignor to Allied Chemical Corporation, Morristown, N.J.  
Division of Ser. No. 598,107, Jul. 22, 1975, Pat. No. 4,078,292.  
This application Dec. 19, 1977, Ser. No. 861,799  
Int. Cl.<sup>2</sup> F15D 1/02

U.S. Cl. 138—44

4 Claims



1. An inlet cone for passing gases from the outlet side of a hydrocarbon cracking heater to the tube side of a heat exchanger, said inlet cone comprising:

- A. a generally conical metal wall connectable around the periphery of its larger end to said heat exchanger and connectable around the periphery of its smaller end to said cracking heater, said generally conical wall having an aperture between its said larger end and its said smaller end;
- B. a pressure resistant exterior wall of metal, said pressure resistant exterior wall being spaced from said generally conical wall and having its ends connected to said generally conical wall at points above and below, respectively said smaller end and said larger end of said generally conical wall; and
- C. a castable refractory fill, said refractory fill occupying the gap between said pressure resistant exterior wall and said generally conical wall and extending inwardly to form a filled aperture, said refractory fill in said filled aperture

being approximately flush with the interior of said generally conical wall.

4,161,193

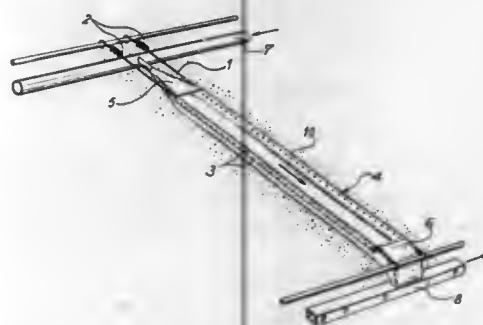
## OPEN DUCTS DESIGNED FOR READY DISASSEMBLY AND RE-USE

Aimé Freychet, Grenoble, and André Gouzy, St-Ismier, both of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Continuation of Ser. No. 545,565, Jan. 30, 1975, abandoned. This application Sep. 23, 1976, Ser. No. 725,856  
Int. Cl.<sup>2</sup> F16L 11/12

U.S. Cl. 138—103

4 Claims



1. An open duct for heating the surface under said duct by circulation of a liquid through the duct, said duct comprising a length of heat transfer material, flexible enough to be rolled and unrolled and incapable of supporting itself, the duct including two end portions having a top, bottom and sides formed of said material, means for introducing fluid into the duct through one end portion, means for receiving fluid flowing from the duct through the other end portion, the duct further including an open portion between said end portions having a bottom and sides formed of said material, the bottom engaging the surface being heated and being flattened by the weight of the fluid, the open portion including means for holding and supporting the sides of said open portion above the surface to be heated along the full length thereof to prevent liquid flowing through said duct from spilling over the sides of the open portion.

4,161,194

## REINFORCED SMOOTH FLOW PIPE

James Nyssen, 10045 Kenswood Dr., Chilliwack, British Columbia, Canada

Filed Mar. 13, 1978, Ser. No. 885,659  
Int. Cl.<sup>2</sup> F16L 9/16, 9/06

U.S. Cl. 138—154

7 Claims



1. A reinforced, spirally wound pipe having a generally smooth inner wall, comprising
  - a. an elongated sheet of ductile material formed into joined, adjacent helical convolutions,
  - b. at least one helical impression forming an integral rib protruding outwardly from the wall of the pipe, said impression having a helical aperture forming a mouth of said impression, said impression further having a divergent depression in the inner wall of the pipe, which has a greater inner cross-sectional dimension than the width of said aperture,
  - c. a flat, smooth helical portion of the wall of the pipe lo-

cated between adjacent ones of said helical impressions, and

- d. a helical reinforcement element lodged in each of said impressions, said element generally conforming to the internal shape of said impression and having a first portion of approximately the same width as said aperture, said first portion being located generally parallel to the inner wall of the pipe, and a second portion extending into the impression.

4,161,195

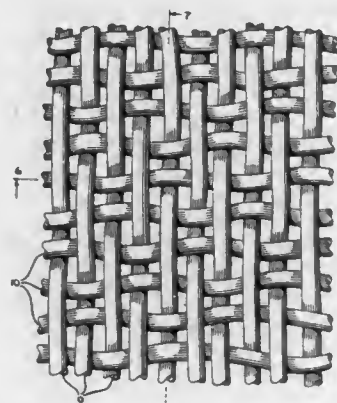
## NON-TWILL PAPERFORMING FABRIC

Mir I. A. Khan, Appleton, Wis., assignor to Albany International Corp., Albany, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,317  
Int. Cl.<sup>2</sup> D03D 15/00; D21F 1/10

U.S. Cl. 139—383 A

16 Claims



1. In a papermaking fabric having machine direction and cross machine direction thread systems that interlace with one another, the combination of:

- a weave repeat pattern of at least five crossovers for each thread system to form thread knuckles in each thread system on opposite sides of the fabric;
- threads in both the machine direction and cross machine direction having interlacings in each weave repeat to be even sided;
- thread knuckles of the machine and cross machine directions not exceeding more than three crossovers in length; and
- the thread knuckles of both the machine and cross machine direction thread systems having a non-regular twill pattern.

4,161,196

## METHOD AND APPARATUS FOR MAKING SPIRAL BINDER NOTE BOOKS

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Woma-Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

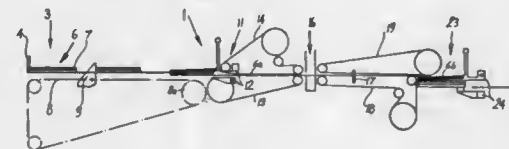
Filed Nov. 25, 1977, Ser. No. 854,818

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653527; Jul. 27, 1977, 2733820

Int. Cl.<sup>2</sup> B21F 15/00

U.S. Cl. 140—92.4

15 Claims



1. In a method of assembling and converting elongated spirals and elongated sheets into pads whose leaves are held

together by binders each of which constitutes a portion of a spiral, the steps of

- establishing an elongated path between two substantially parallel planes;
- assembling a series of successive first stacks, each consisting of said elongated sheets, in a first portion of said path, including positioning said sheets transversely of the longitudinal direction of said path;
- breaking up said first stacks into smaller second stacks in a second portion of said path;
- applying a row of perforations to a longitudinally extending edge portion of each second stack in a third portion of said path, said rows of perforations extending substantially at right angles to said planes;
- collecting several successive second stacks into larger third stacks in a fourth portion of said path;
- subdividing successive third stacks into groups of registering pads in a fifth portion of said path, including severing each third stack in at least one plane which is parallel to said first mentioned planes;
- aligning the perforations of successive groups of pads in at least one additional portion of said path;
- introducing spirals into the aligned perforations of successive groups of pads in a further portion of said path;
- maintaining said rows of perforations substantially at right angles to said first mentioned planes in the course of said collecting, subdividing, aligning and introducing steps; and
- severing successive spirals in still another portion of said path so that each spiral yields several discrete binders, one for each pad of the respective group.

4,161,197

## APPARATUS FOR MEASURING AND DISPENSING CHEMICAL

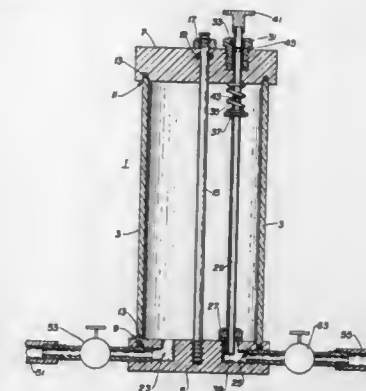
James S. Stevenson, Oakland, Calif., assignor to Terminator Products, Inc., Oakland, Calif.

Filed Dec. 2, 1977, Ser. No. 856,783

Int. Cl.<sup>2</sup> B65B 3/04, 31/00

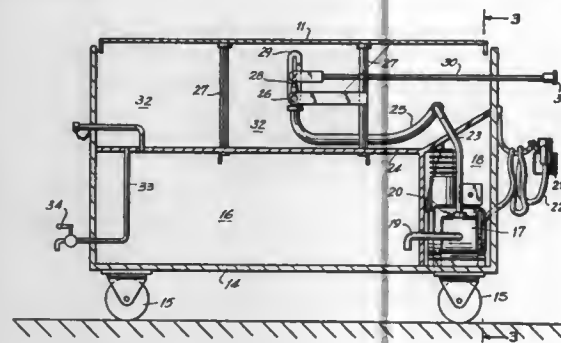
U.S. Cl. 141—18

10 Claims



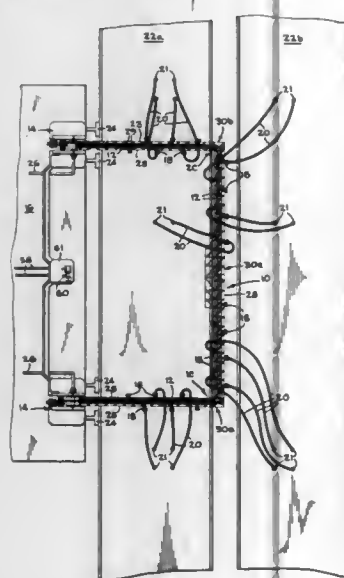
1. Apparatus for use in measuring and dispensing chemicals in a closed system for the preparation of a chemical mixture, comprising a measuring container, means for indicating the quantity of contents of such container, an input passageway to said container and a discharge passageway from said container, means for normally closing said discharge passageway to the discharge of contents from said container while exposing said discharge passageway to the upper region of said container, whereby development of a reduced pressure in said discharge passageway will cause a reduction of pressure in said container to enable intake of liquid via said intake passageway, and means for opening said discharge passageway from its normally closed condition while exposing said upper region to atmospheric pressure to enable withdrawal of contents from said container via said discharge passageway.

**4,161,198**  
**APPARATUS FOR HANDLING WASTES FROM SMALL ANIMAL CAGES**  
 Nickolas J. Sojka, Charlottesville, Va., assignor to University of Virginia Alumni Patents Foundation, Charlottesville, Va.  
 Division of Ser. No. 587,306, Jun. 16, 1975, Pat. No. 4,009,685.  
 This application Nov. 18, 1976, Ser. No. 743,090  
 Int. Cl.<sup>2</sup> B67C 7/00; B65B 3/04  
 U.S. Cl. 141—92



1. In a machine for washing rectangular trays of the type in which spray nozzles direct a spray of water upwardly against an inverted tray, the spray water and refuse being collected in a first compartment in the machine, the improvement which comprises  
 a second compartment in the machine for a supply of spray water,  
 pump means connected between the second compartment and the spray nozzles,  
 a third compartment in the machine for a supply of liquid foam composition, and  
 foam generating means connected to the third compartment for filling the cleaned rectangular trays with foam.

**4,161,199**  
**VAPOR RECOVERY FRAME**  
 Frank P. Haley, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.  
 Filed Jul. 28, 1977, Ser. No. 819,740  
 Int. Cl.<sup>2</sup> B65B 3/18  
 U.S. Cl. 141—387

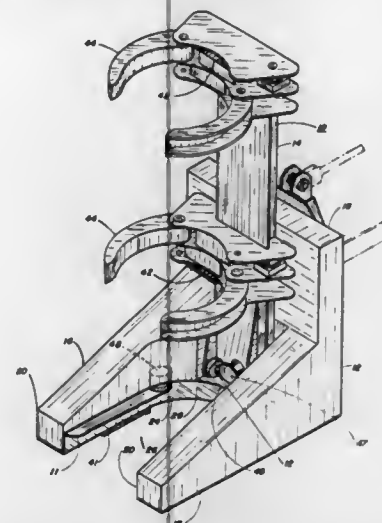


1. Apparatus for collecting vapors from a plurality of vapor ducts of a marine tanker and routing said vapors to a central recovery container, wherein said apparatus is mounted on a

dock alongside a tanker mooring area, said apparatus comprising:

a generally U-shaped rigid supporting frame including spaced substantially parallel side sections and an elongated central section extending between one pair of ends of said side sections,  
 a generally U-shaped conduit member mounted to said frame member and having a plurality of openings along the length thereof adjacent said frame side and central sections,  
 longitudinally spaced support means for said frame and conduit member,  
 means for pivotally connecting said support means to the other pair of ends of said U-shaped frame side sections for swinging movement thereof about a horizontal axis,  
 means for pivotally lowering said frame about said axis to a position with said conduit openings in proximity with the vapor ducts of a moored marine tanker,  
 means for respectively connecting each of said vapor ducts to an adjacent opening in said conduit member,  
 means adjacent said support means for connecting said conduit member to said central recovery container, and  
 means for pivotally raising said frame and said conduit member mounted thereon into a stored position on said dock when said apparatus is not in use.

**4,161,200**  
**TREE HARVESTER AND BUNCHER**  
 Alva Z. Albright, 6407 Masonic Dr., Alexandria, La. 71301  
 Filed Jun. 2, 1977, Ser. No. 802,708  
 Int. Cl.<sup>2</sup> A01G 23/08  
 U.S. Cl. 144—34 R

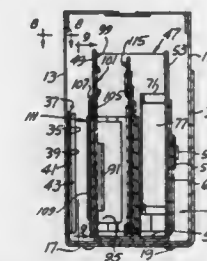


1. In an improved tree harvester and buncher, having a base structure, with ball-bearing side-tilting means mounted on the back thereof and with a tree-receiving center recess mounted on the front, said base structure being horizontally articulated to an upper structure, and adapted for use with a power train having an auxiliary power supply, said upper structure mounting vertically spaced pairs of tree grapples, and said base structure mounting tree cutting means, controlled power means with sensing and signal means comprising:

- (a) four hydraulic cylinders mounted between said upper structure and said tree grapples for opening and closing the respective arms of said grapples;
- (b) a fifth hydraulic cylinder mounted between said base structure and the tree cutting means for actuating it in cutting operation with sensing and signalling means mounted on said fifth hydraulic cylinder for sensing and signalling the position of said tree cutting means in its cutting operation;
- (c) a sixth hydraulic cylinder mounted between said ball-

bearing side-tilting means and responsive to the closing of said tree grapples to "float" and permit said tree harvester and buncher to conform to the position of an engaged tree;  
 (d) a seventh hydraulic cylinder mounted in said upper structure adjacent said base structure and with rod end forward for its rod to project into said center recess and engage a tree therein, and responsive to said sensing and signalling means to freeze in position at the beginning of said tree cutting means cutting operation to hold the butt of said tree in its original position when cut; and  
 (e) an eighth hydraulic cylinder mounted between the upper structure and the base structure for pivoting said structures relative to each other, and responsive to said sensing and signalling means to pivot said upper structure rearwardly relatively to said base structure toward the end of said tree cutting means cutting operation.

**4,161,201**  
**COMBINATION CARRYING CASE AND ARTICLE ORGANIZER ASSEMBLY**  
 Bess Carp, Detroit, Mich., assignor to Joseph Carp, Detroit, Mich., a part interest  
 Filed Jun. 28, 1978, Ser. No. 919,819  
 Int. Cl.<sup>2</sup> A45C 13/02  
 U.S. Cl. 150—35

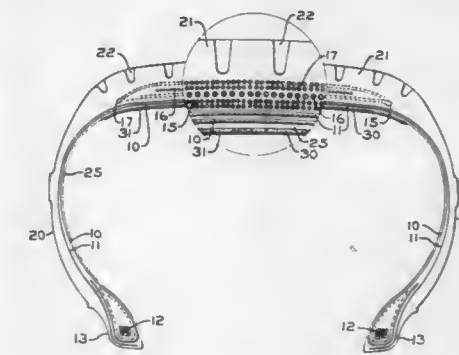


1. In combination with a carrying case having a chamber; an article organizer assembly removably enclosed within said chamber;  
 said assembly comprising an upright first side wall;  
 a bottom wall along one edge hinged thereto as an extension thereof;  
 an upright second side wall hinged to the other edge of the bottom wall as an extension thereof;  
 upright end walls on one side hinged to opposite ends of said first side wall as extensions thereof;  
 a foldable flap extending from the other side of each end wall adapted to overly said second side wall;  
 snap fasteners on each flap removably secured to a corresponding fastener upon said second side wall;  
 and a series of article storage pockets upon the interiors of each of said side walls and one end wall and a pocket upon the other end wall, said side, end and bottom walls adapted to lie in a single plane to facilitate selective filling of said pockets.

**4,161,202**  
**PUNCTURE SEALING TIRE**  
 Joe A. Powell, Norton; James W. Messerly, Stow, and Ronald L. Shippy, Brunswick, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio  
 Filed Jun. 18, 1973, Ser. No. 370,656  
 Int. Cl.<sup>2</sup> B60C 19/12  
 U.S. Cl. 152—347

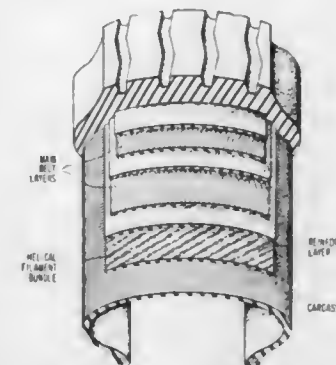
1. A puncture sealing tubeless tire having a carcass with a tread over the road-engaging portion of the carcass and an air impervious liner bonded to the inner face of the carcass, characterized by additional presence of a thin sheet of closed cell cellular rubber with its cells filled with a gas under pressure which is mainly nitrogen, which sheet is bonded to the inner

face of the liner over at least the portion opposite to the tread, and wherein the cellular rubber is coated with a solid fluent



material capable of flowing into punctures under operating conditions.

**4,161,203**  
**PNEUMATIC RADIAL TIRE**  
 Yasuo Suzuki, Akiyawa; Masaru Abe, Sayama, and Toshiro Tezuka, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan  
 Filed Apr. 26, 1977, Ser. No. 791,072  
 Claims priority, application Japan, Apr. 28, 1976, 51/47728  
 Int. Cl.<sup>2</sup> B60C 9/22, 9/12  
 U.S. Cl. 152—361 R



1. In a pneumatic radial tire comprising a carcass composed of cords arranged substantially parallel with a vertical center section through the rotational axis of the tire and a belt interposed between a tread and said carcass and composed of at least two main cord layers whose cords are formed of an inextensible material such as a steel cord and arranged along different directions crossed at a small angle with respect to the circumferential direction of the tire, the improvement comprising at least one rubberized reinforcing layer interposed between said belt and said carcass and containing reinforcing elements spaced apart from each other and embedded therein, said reinforcing element being formed of at least a helically formed filament, said helically formed filament being formed of material having a tensile breaking strength of at least 140 kg/mm<sup>2</sup> and elongation at tensile breaking strength which is at least 1.2 times the smallest elongation at tensile breaking strength of said main cord layers of said belt, and said rubberized reinforcing layer as a whole being extensible and compressible.



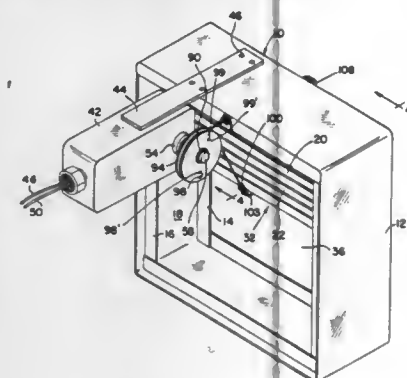
4,161,204

**MOTORIZED SMOKE AND FIRE DAMPER**

John C. Kurz, 200 Red Lion Rd., Philadelphia, Pa. 19115  
Continuation of Ser. No. 833,160, Sep. 14, 1977. This application  
Feb. 6, 1978, Ser. No. 875,390  
Int. Cl.<sup>2</sup> E05F 15/20

U.S. Cl. 160—1

8 Claims



1. In a smoke and fire damper mounted within an air duct of the type including a frame and a blade assembly movable from an open position to define a damper opening within the frame to a closed position, wherein the damper opening is closed, the combination of

- a cable tensioning means positioned adjacent the frame to tension a cable,
- said cable tensioning means functioning from a first position to a second position,
- the said cable tensioning means being positioned exteriorly of the air duct and above the frame,
- said cable tensioning means comprising a motor affixed to the frame and adapted to rotate a spindle,
- said spindle including a step portion and an engagement for engaging a first spring,
- a cable winding pulley rotatable about the spindle and including a hub abutting the spindle step portion,
- a bushing loosely overfitting the pulley hub and the spindle step portion, said bushing being provided with a second engagement and being adapted to rotate freely of the hub and the said step portion,
- a first coil spring interposed between the spindle and the bushing and having a first end engaged with the spindle engagement and a second end engaged with the second engagement, and
- frictional means to retard rotation of the bushing when the spindle is rotated whereby the first coil spring is tensioned sufficiently to continuously engage the spindle step portion and the hub upon operation of the motor to continuously tend to rotate the pulley,
- the pulley being adapted to rotate freely of the spindle and the bushing upon deactivation of the motor.

4,161,205

**METHOD AND APPARATUS FOR PLYBONDING CONTROL**

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 8, 1977, Ser. No. 804,516  
Int. Cl.<sup>2</sup> D21F 1/06, 1/08, 11/08

U.S. Cl. 162—133

5 Claims

1. A mechanism for making a multilayered fibrous web comprising in combination:
- a felt for carrying a first web layer on its lower surface to a bonding station;
  - a perforate web forming cylinder forming a second web layer on the surface with said felt wrapping a portion of

the upper surface of the cylinder for laying the first layer on the second layer at said bonding station;

means delivering a slurry of stock to the cylinder on the uprunning side for forming a web thereon;

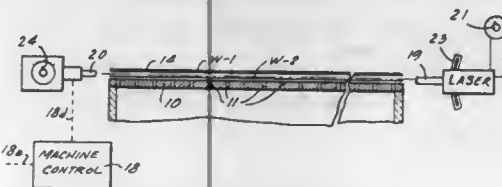
means forming a vacuum within the cylinder for dewatering the web layer formed on the cylinder and aiding in bonding the web layers;

means for forming a water bead to a nip between layers at said bonding station where the first layer joins the second;

a power beam generator projecting a beam into the nip to detect said water bead;

a beam receiver sensing the energy of the beam passing through the nip and emitting an output signal as a function of the size of the water bead depending on the receiver output signal; and

control means connected to the mechanism to vary an operating factor of the mechanism for changing the size of said bead, and said control means connected to said receiver and receiving the output signal thereof and connected to the mechanism for changing the size of said bead to main-



tain the bead at a predetermined size for obtaining optimum bonding between said layers.

5. The method of forming a multilayered fibrous web comprising the steps of laying a first web layer on the lower surface of a felt and carrying it to a bonding station, forming a second web layer on the surface of a perforate web forming cylinder with said felt wrapping a portion of the upper surface of the cylinder for laying the first layer on the second layer at said bonding station; delivering a slurry of stock to the cylinder on the uprunning side for forming a web thereon, forming a vacuum within the cylinder for dewatering the web layer formed on the cylinder and aiding in bonding the web layers, forming a water bead at a nip between layers at said bonding station where the first layer joins the second layer, projecting a beam from a power beam generator into the nip to detect said water bead, sensing the energy of the beam passing through the nip with a beam receiver which emits an output signal which varies as a function of the size of the water bead and controlling the operating conditions of the bonding station depending upon the receiver output signal to maintain the bead at a predetermined size for optimum bonding between said layers.

4,161,206

**ELECTROMAGNETIC CASTING APPARATUS AND PROCESS**

John C. Yarwood, Madison; Ik Y. Yun, Orange; Derek E. Tyler, Cheshire, and Peter J. Kindlmann, Northford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 15, 1978, Ser. No. 905,889  
Int. Cl.<sup>2</sup> B22D 11/01, 27/02

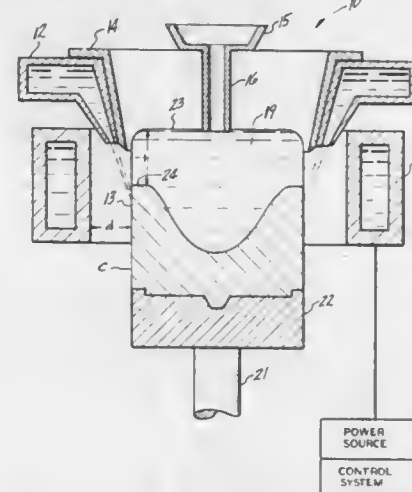
U.S. Cl. 164—49

18 Claims

1. In a process for casting metals comprising:
- electromagnetically containing and forming molten metal into a desired shape, said electromagnetic containing and forming including the steps of providing an inductor for applying a magnetic field to said molten metal; applying an alternating current to said inductor to generate said magnetic field, said inductor in operation being spaced from said molten metal by a gap extending from the surface of the molten metal to the opposing surface of the inductor; and minimizing variations in said gap during said casting process by electrically sensing variations in said gap and responsive thereto controlling the magnitude of

said current applied to said inductor so as to minimize said gap variations; the improvement wherein said step of electrically sensing variations in said gap comprises:

- determining an electrical parameter corresponding about to the reactance or inductance of said inductor which varies with the magnitude of said gap and responsive to the determining of said electrical parameter, generating an



error signal the magnitude of which is a function of the difference between the value of said determined electrical parameter and a predetermined value thereof; and wherein said step of controlling the magnitude of said current comprises:

controlling the current applied to said inductor in response to said error signal so as to drive said error signal towards zero.

4,161,207

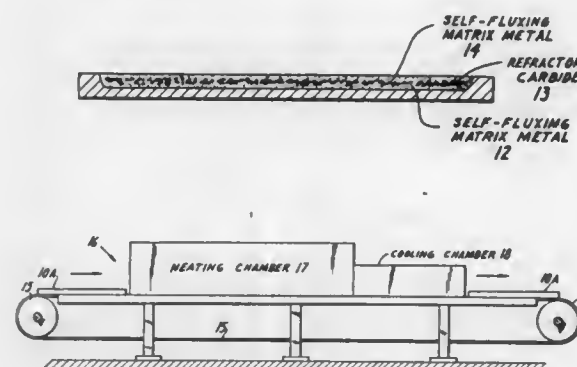
**PRODUCTION OF CARBIDE LADEN CONSUMABLES IN A GRAPHITE MOLD**

Jean L. Fluckiger, Sao Paulo, Brazil, and René Wasserman, Echichens, Switzerland, assignors to Eutectic Corporation, Flushing, N.Y.

Continuation of Ser. No. 690,921, May 28, 1976, abandoned.  
This application Jan. 19, 1978, Ser. No. 870,767  
Int. Cl.<sup>2</sup> B22D 23/06, 25/00

U.S. Cl. 164—80

7 Claims



1. A method of producing a carbide laden consumable in the form of a composite rod which comprises,
- providing a graphite mold having at least one elongated U-shaped groove therein,
  - said at least one groove containing a charge of fusible ingredients comprising a first layer of powdered self-fluxing matrix metal alloy at the bottom of said groove, a second layer of particulate refractory metal carbide on top of said first layer and a third layer of said matrix

metal alloy on top of said second layer, said first layer of said powdered matrix metal constituting about 25% to 50% of the total combined first and third layers, with the third layer making up the balance of the total combined first and third layers.

- the composition of said matrix metal alloy and said refractory carbide together in said mold ranging by weight from about 80% to 30% of said matrix metal alloy and the balance consisting essentially of about 20% to 70% of said refractory metal carbide,
- said self-fluxing matrix metal alloy being selected from the group consisting of Ni-base, Ni-Cu-base, Fe-base and Co-base alloys containing by weight at least one element selected from the group consisting of about 0.1% to 6% of silicon and about 0.1% to 5% boron and having a melting point ranging up to about 1370° C.,
- said refractory metal carbide being selected from the group consisting of carbides of W, Mo, Cr, Zr, Ti, Hf, Nb, Ta, V, B and Si and mixtures of at least two of said carbides,
- passing said graphite mold through a furnace having a heating zone maintained at a temperature above the melting point of said matrix alloy,
- said furnace having a cooling zone immediately after said heating zone, the atmosphere in said furnace being reducing,
- causing said matrix alloy to melt and infiltrate the interstices in said carbide layer,
- and passing said graphite mold into said cooling zone immediately after said heating zone to solidify said matrix alloy and inhibit segregation of said refractory carbide to thereby produce a composite rod characterized by improved quality and improved strength.

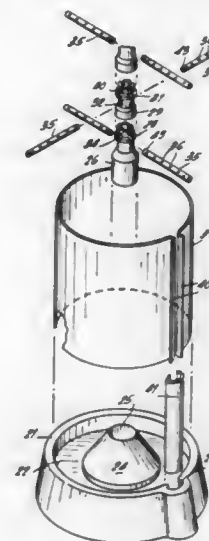
4,161,208

**INVESTMENT CASTING APPARATUS**

Abraham J. Cooper, 348 Country Club La., Pomona, N.Y. 10970  
Filed Dec. 5, 1977, Ser. No. 857,113  
Int. Cl.<sup>2</sup> B22C 7/02

U.S. Cl. 164—244

5 Claims



1. A casting assembly comprising a resilient base, a first recess in the top of said base, a second recess in the base laterally disposed with respect to the first recess and in communication therewith, a sprue forming structure of heat liquifying plastic releasably carried at one end within the base recess and extending upwardly therefrom, said sprue forming structure comprising, coupled, axially bored, plug and socket members and outwardly extending hollow tubes of heat liquifying plastic carried by the plug and socket members in communication with the axial bore, said tubes having openings therein in communication with the interior of the tubes, means to connect

heat liquifying models to the tubes, an elongated split ring having outwardly disposed flanged portions on the free ends of the ring, said flanged portions being receivable within said second recess when said ring is received within said first recess at one end said ring extending upwardly from said base around the sprue forming structure and spaced therefrom, and an elongated split pin adapted to be slipped over said flanged portions and within said second recess

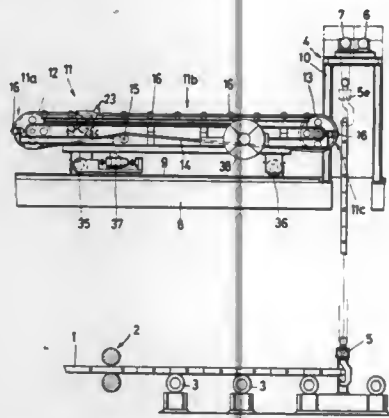
**4,161,209**  
**APPARATUS FOR HANDLING THE STARTING STRAND OF A METAL STRAND CASTING PLANT**

Siegfried Dangeleit, Krefeld, and Dieter Kothe, Moers, both of Fed. Rep. of Germany, assignors to DEMAG Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Aug. 18, 1977, Ser. No. 825,534

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637824

Int. Cl.<sup>2</sup> B22D 11/08  
U.S. Cl. 164—446

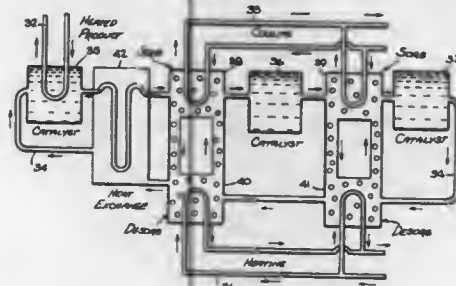


1. A dolly for supporting, guiding and positioning a starting strand of a metal casting plant, comprising
  - (a) a dolly body;
  - (b) guide pulley means positioned at each end of said body;
  - (c) traction belt means extending over said guide pulley means;
  - (d) power means connected to said pulley means for driving said pulley means; the improvement characterized by
  - (e) a plurality of pairs of support rollers spaced along the top surface and the front and rear edges of said body;
  - (f) said pairs of said support rollers forming parallel rows longitudinally of said body;
  - (g) a retractable carrier connected to said traction belt means, said carrier in extended position engaging a starting strand on said dolly; and
  - (h) forwardly and rearwardly facing bearing surfaces on said retractable carrier;
  - (i) said bearing surfaces supporting and guiding a starting strand on said dolly upwardly onto said dolly, and over and downwardly into a casting strand path.

**4,161,210**  
**TEMPERATURE INCREASE SYSTEM**  
Allen F. Reid, 10 Melody La., Geneseo, N.Y. 14454, and Albert H. Half, 3636 Lemmon Ave., Dallas, Tex. 75219  
Filed Jan. 10, 1975, Ser. No. 540,214  
Int. Cl.<sup>2</sup> F28D 15/00

- U.S. Cl. 165—1      10 Claims
1. The method of increasing the temperature of heat content of a first fluid or solid by accumulating heat in an endothermic chemical reaction from a second fluid or solid at lower temperatures  $T_1$  and releasing the heat at temperatures  $T_2$  higher than temperatures  $T_1$  in the reverse exothermic chemical reaction to heat the first fluid or solid and thereby increase its temperature

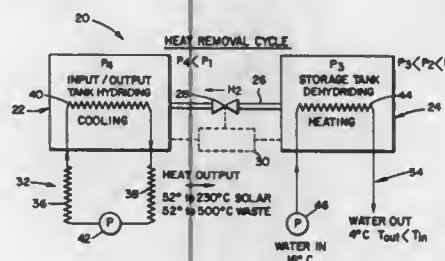
or heat content, there being a partial separation of reactants from products of the chemical reaction providing one fraction with a concentration of reactants significantly greater than the equilibrium concentration of reactants thereby enabling the



chemical reaction to proceed with absorption of heat, and there being a second fraction with a concentration of products significantly greater than the equilibrium concentration of products thereby enabling the reverse chemical reaction to proceed with release of heat.

**4,161,211**  
**METHODS OF AND APPARATUS FOR ENERGY STORAGE AND UTILIZATION**  
Thomas E. Duffy, and David A. Roby, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.  
Continuation-in-part of Ser. No. 591,831, Jun. 30, 1975. This application Dec. 23, 1976, Ser. No. 753,821  
Int. Cl.<sup>2</sup> F28D 15/00

U.S. Cl. 165—1      20 Claims



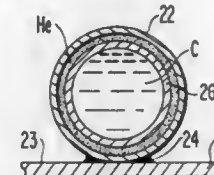
1. Thermal energy utilization apparatus comprising:
  - (a) an input-output tank containing a first hydride former and a storage tank containing a second hydride former, the first hydride former being an intermetallic compound or alloy having the nominal formula, by atomic ratio, of:  $Mg_{0.8-0.9}Ni_{0.1}Mo_{0.1}$  where M is an element from periodic table groups I-B, III-A, or IV-A or a mixture thereof and the second hydride former being an intermetallic compound or alloy having the nominal formula, by atomic ratio, of:  $Fe_{0.1-1.0}Ti_{1.0}Ni_{0.9}$  where N is an element from periodic table groups IV-B, V-B, VI-B, VII-B or VIII or a mixture thereof;
  - (b) flow means communicating between and with the interiors of the input-output tank and the storage tank;
  - (c) means for heating said first hydride former to liberate hydrogen therefrom and effect a flow of said hydrogen from said input-output tank through said flow means to said storage tank;
  - (d) means for removing heat from said second hydride former to effect the association of said hydrogen therewith;
  - (e) means for heating the second hydride former to effect a dissociation of hydrogen therefrom, a flow of said hydrogen from said storage tank to said input-output tank, and an exothermic, heat producing association of said hydrogen with the hydride former in said input-output tank; and
  - (f) means for recovering and utilizing heat liberated by the association of the hydrogen with the first hydride former.
6. A method of utilizing energy which comprises the steps

of: effecting a flow of hydrogen into contact with a hydridable metallic material having the nominal formula, by atomic ratio, of  $Mg_{0.8-0.9}Ni_{0.1}Mo_{0.1}$  where M is an element from periodic table groups I-B, III-A, or IV-A or a mixture thereof or the nominal formula, by atomic ratio, of:  $Fe_{0.1-1.0}Ti_{1.0}Ni_{0.9}$  where N is an element from periodic table groups IV-B, V-B, VII-B, or VIII or a mixture thereof to form a hydride by the association of said hydrogen and said metallic material; circulating a fluid heat transfer medium into heat transfer relationship with the hydrided metallic material to desorb hydrogen therefrom while concomitantly cooling said fluid; and thereafter utilizing said fluid as a cooling medium for refrigeration and/or space air conditioning.

**4,161,212**  
**PNEUMATICALLY CONTROLLED WIDE HEAT LOAD SPACE RADIATOR**

Stanley J. Hightower, Lakewood, Colo., assignor to Martin Marietta Corporation, Rockville, Md.  
Filed Jan. 28, 1977, Ser. No. 764,564  
Int. Cl.<sup>2</sup> F28F 13/00, 1/22

U.S. Cl. 165—96      7 Claims

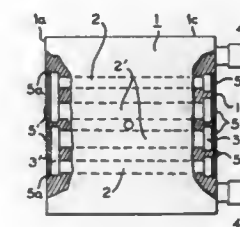


1. A pneumatically controlled, wide heat load, space radiator assembly for a spacecraft, earth satellite, or the like, said radiator assembly comprising in combination:
  - a heat radiator mounted to the spacecraft for thermal radiation to space, said heat radiator having a face,
  - at least one tube array mounted to the face of the heat radiator in thermal conducting fashion, said array comprising concentric, radially spaced, longitudinally extending inner and outer heat conductive tubes,
  - means defining a sealed annular gap between said tubes of a given longitudinal extent thereof,
  - a coolant media within said inner heat conductive tube in thermal contact with said inner heat conductive tube and constituting the waste heat load for said space radiator assembly, and
  - means for selectively supplying a gas under pressure to said sealed annular gap between said concentric tubes or for venting said annular gap to space to vary the thermal impedance between said inner and outer heat conductive tubes and modulate the waste heat rejection rate of said spacecraft radiator assembly.

**4,161,213**  
**COOLING CAPSULE FOR A THYRISTOR**  
Wilfried Heide, Altenberg; Friedrich Muller; Klaus Otto, both of Nuremberg, and Tibor Salanki, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Filed Apr. 18, 1977, Ser. No. 788,595  
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617776

- Int. Cl.<sup>2</sup> F28F 9/22      2 Claims
- U.S. Cl. 165—168
1. A cooling capsule for a thyristor comprising:
    - a core of metal having first and second opposing surfaces formed as heat transfer surfaces and third and fourth opposing surfaces transverse to said first and second surfaces, said metal core having a flow path running through and an inlet opening and outlet opening connected to the flow path, said flow path comprising: first

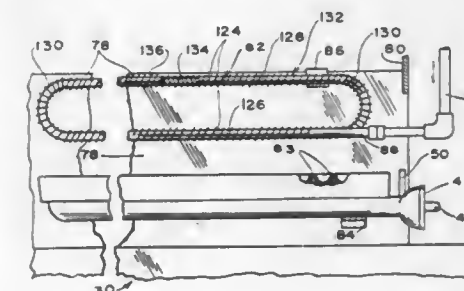
and second pluralities of bores, said first plurality of bores extending through said core adjacent said first surface and between said third and fourth surfaces, said second plurality of bores extending through said core adjacent said second surface and between said third and fourth surfaces, and said first plurality of bores being spaced from said second plurality of bores; and first and second pluralities of recesses in said third and fourth surfaces each of said



first plurality of recesses connecting a pair of bores each of which is from the same plurality of bores and each of said second plurality of recesses connecting a pair of bores each of which is from a different plurality of bores; and plate-shaped metallic members, each member arranged to cover in a coolant-tight manner one of said recesses and each member being joined to its associated recess by means of an electron-beam weld.

**4,161,214**  
**LAUNDRY HOT WATER SUPPLY COIL ASSEMBLY**  
Ion L. Wendel, St. Petersburg, Fla., assignor to James L. Lowe, St. Petersburg, Fla.  
Continuation of Ser. No. 740,301, Nov. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 660,323, Feb. 23, 1976, and Ser. No. 732,488, Oct. 14, 1976. This application Aug. 10, 1978, Ser. No. 932,435  
Int. Cl.<sup>2</sup> F28F 1/42

U.S. Cl. 165—172      5 Claims



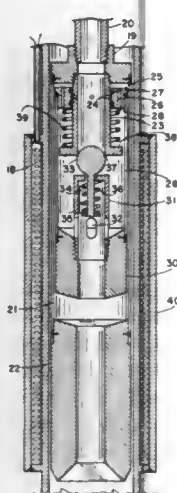
1. For use in a laundry dryer and clothes washer combination; a coil for liquid such as water to be inserted in the heating unit of a dryer to derive heat therefrom to heat water flowing through the coil; the coil comprising, fluid inlet and outlet ports interconnected by a plurality of generally straight and spaced apart runs, each run having opposite ends interconnected by returns connecting said runs in series with each other between said inlet and said outlet ports, said runs including upper and lower sets of runs, the runs of each set lying generally in a common plane with the other runs of the set and the planes of the two sets of runs being generally parallel and spaced from each other; said runs having formed internally throughout the length thereof a continuous spiral groove for conveying liquid such as water through the coil, and wherein said runs are formed from metallic tubing and wherein the outer surface of the runs are configured in a shape as a spiral protrusion complementary to the spiral groove of the runs and extending coextensively and continuously with the spiral groove in the same direction as the spiral groove.



**4,161,215**  
**SOLENOID OPERATED TUBING SAFETY VALVE**  
 Henry A. Bourne, Jr., Ponca City, Okla.; Louis M. Ayers, Houston, Tex., and Minor R. Wiseman, Newkirk, Okla., assignors to Continental Oil Company, Ponca City, Okla.  
 Continuation of Ser. No. 617,116, Sep. 26, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 848,800  
 Int. Cl.<sup>2</sup> E21B 43/12

U.S. Cl. 166—65 M

15 Claims



11. A safety valve for a tubing string comprising:  
 (a) a tubing sub adapted to be used as a part of said tubing string;  
 (b) a solenoid coil wound around a portion of said tubing sub;  
 (c) a mandrel adapted for attachment to said tubing string and having main valve seat means thereon;  
 (d) a solenoid plunger movable from a lower to an upper position in response to operation of said solenoid coil;  
 (e) main valve means responsive to movement of said solenoid plunger; and  
 (f) pressure equalizing valve means adapted to allow flow of fluid into said tubing string above said safety valve when said main valve is closed and said solenoid plunger is in a lower position relative to said mandrel.

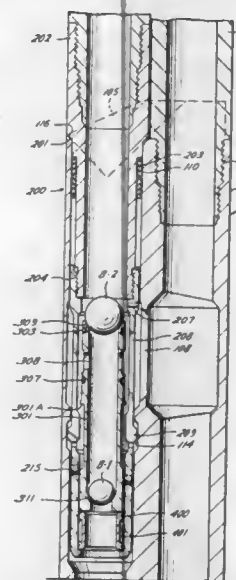
**4,161,216**  
**MECHANICAL LATCH WITH HYDRAULIC LOCKING MECHANISM**  
 Amaswar Amancharla, League City, Tex., assignor to Baker International Corporation, Orange, Calif.  
 Filed Sep. 27, 1978, Ser. No. 946,235  
 Int. Cl.<sup>2</sup> E21B 23/00

U.S. Cl. 166—193

68 Claims

1. An apparatus for selective mechanically activated latching and hydraulically activated locking and unlocking of one end of a tubular string within an anchor assembly in a subterranean bore, said anchor assembly defining first co-engaging means thereon for selective latching and locking of said tubular string with said anchor assembly, said apparatus comprising: a housing; second co-engaging means for complimentary operation with said first co-engaging means; longitudinally shiftable sleeve means initially secured interior of and to at least one of said housing and said second co-engaging means, said sleeve means initially being positioned with respect to said second co-engaging means whereby said second co-engaging means may be selectively and repeatedly latched with respect to said first co-engaging means; first seat means for sealing receipt of a first sealing element whereby said sleeve means is converted to an hydraulically responsive piston to longitudinally shift one of said sleeve means and said second co-engaging means relative to the other of said sleeve means and said second co-engaging means to a first position whereby said first relative shifting to said first position locks said second co-engaging

means with said first co-engaging means; and second seat means for sealing receipt of a second sealing element whereby said sleeve means is converted to a piston to longitudinally shift one of said sleeve means and said second co-engaging



means relative to the other of said sleeve means and said second co-engaging means to a second position whereby said second relative shifting to said second position unlocks said first and said second co-engaging means.

**4,161,217**  
**HOT WATER FOAM OIL PRODUCTION PROCESS**  
 Richard E. Dilgren, Houston, and Kenneth B. Owens, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.  
 Filed May 8, 1978, Ser. No. 903,469  
 Int. Cl.<sup>2</sup> E21B 43/24

U.S. Cl. 166—252

16 Claims



1. An oil recovery process which comprises:  
 arranging well conduits for injecting and producing fluid at horizontally separated locations within a subterranean interval which contains at least one oil-bearing layer which, at the reservoir temperature, has an absolute permeability of at least about 0.5 darcy and contains an oil having a viscosity of at least about 100 centipoises,  
 flowing a relatively non-viscous fluid through the reservoir interval and heating at least subsequently inflow portions of that fluid hot enough to significantly increase the mobility of the reservoir oil,  
 controlling the rates of heating and injecting the relatively non-viscous fluid and the rate of producing fluid from the reservoir interval so that (a) a heated channel of preferential permeability is formed within or near the oil-bearing layer and (b) the pressure gradient required for flowing the heated, relatively non-viscous fluid through the preferential permeable channel is reduced or kept low by the thermal mobilization of any reservoir fluid encountered within that channel,  
 changing the composition of the fluid being flowed through the reservoir interval by including as at least a mobility-

controlling proportion of that fluid a relatively viscous hot water foam that consists essentially of aqueous liquid, noncondensable gas and surfactant and is hot enough to significantly increase the mobility of the reservoir oil, controlling the composition of the hot water foam being injected so that, in contact with the reservoir rocks and fluids within the reservoir, the foam has a mobility low enough so that flowing it through the heated, preferential permeable channel requires a pressure gradient exceeding that required to cause an equivalent rate of flow of the heated relatively non-viscous fluid through that channel without requiring an injection pressure that exceeds the fracturing pressure of the reservoir, and recovering oil from fluid produced from the reservoir interval while adjusting the composition and temperature of the total amount of fluid being flowed through the reservoir interval so that the produced fluid contains heated oil and a significant portion of fluid flows through portions of the reservoir interval other than those within the channel of preferential permeability.

**4,161,218**  
**HIGH CONFORMANCE ENHANCED OIL RECOVERY PROCESS**

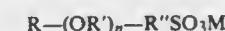
James E. Varnon; Vernon H. Schievelbein; Mohan V. Kudchadker, all of Houston, and Lawrence E. Whittington, Katy, all of Tex., assignors to Texaco Inc., White Plains, N.Y.  
 Filed Dec. 22, 1977, Ser. No. 863,504  
 Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 166—269

18 Claims

1. A method of recovering petroleum from a subterranean, petroleum-containing formation, said formation containing water having a salinity of from 5000 to 150,000 parts per million total dissolved solids, said formation containing at least two distinct petroleum-containing strata, the permeability of at least one of said strata being at least 50 percent greater than the permeability of the other stratum, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with substantially all of the strata and said formation, comprising

- (a) injecting a first aqueous oil-displacing fluid into the formation via the injection well, said fluid passing through at least one of the more permeable strata of said formation and displacing oil therein toward the production well, from which it is recovered to the surface of the earth;  
 (b) after said first aqueous oil displacing fluid has passed through at least one of said more permeable strata to the production well, discontinuing injecting said fluid and injecting into said stratum an aqueous fluid containing an emulsifying surfactant mixture comprising (1) from about 0.5 to about 4.0 percent by weight of an alkylpolyalkoxyalkylene sulfonate or alkylarylpolyoxyalkylene sulfonate having the following formula:



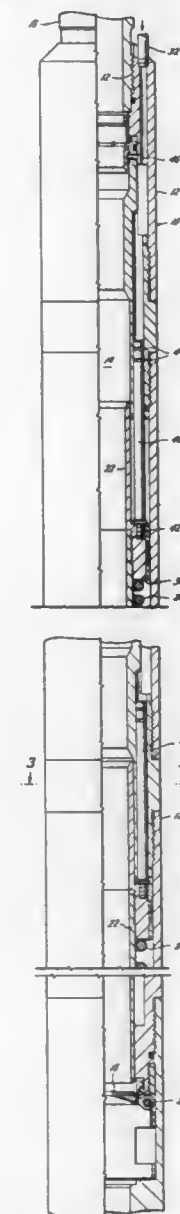
wherein R is an alkyl group, linear or branched, having from 9 to 25 carbon atoms or an alkylaryl group selected from the group consisting of benzene, toluene or xylene having attached thereto at least one alkyl group, linear or branched, said alkyl group containing from 9 to 15 carbon atoms; R' is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher molecular weight alkylene; n is a number from 2 to 10; R'' is ethylene, propylene, hydroxy propylene, or butylene and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium, and (2) from 0.01 to 10.0 percent by weight of an organic sulfonate which is at least partially water soluble, selected from the group consisting of alkyl sulfonates containing from 8 to 20 carbon atoms, alkylaryl sulfonates containing from 8 to 20 carbon atoms in the alkyl chain, petroleum sulfonate having average equivalent weight from 300 to 500, said emulsifying surfactants forming a

macro-emulsion in the flow channels of the most permeable strata of the formation, thereby reducing the permeability of the strata invaded by the emulsifying fluid; and (c) thereafter injecting a second aqueous oil displacing fluid into the formation, said oil displacing fluid invading at least one strata not invaded by the oil displacing fluid of step (a) above, displacing petroleum therein toward the production well where it is recovered to the surface of the earth.

**4,161,219**  
**PISTON ACTUATED WELL SAFETY VALVE**  
 Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.  
 Filed Feb. 27, 1978, Ser. No. 881,484  
 Int. Cl.<sup>2</sup> E21B 43/12

U.S. Cl. 166—324

5 Claims



1. In a well safety valve for controlling the fluid flow through a well conduit and including a tubular housing and a valve closure member moving between open and closed positions, a longitudinally tubular member telescopically movable in the housing for controlling the movement of the valve closure member, means for biasing the tubular member in a first direction for causing the valve closure member to move to the closed position, the improvement in means for moving the

tubular member in a second direction for opening the valve closure member comprising,

at least one piston telescopically movable within and having its longitudinal axis within the wall of the housing and outside of the tubular member, said piston contacting said tubular member, one side of the piston being in communication with hydraulic fluid extending to the well surface for actuating said member in the second direction to open said valve closure member, the second side of the piston being exposed to fluid pressure in the valve housing tending to move the piston in the first direction, and said piston having a cross-sectional width less than the thickness of the housing for reducing the hydrostatic force of the hydraulic fluid acting on the one side of the piston whereby the valve may be used at greater depths in the well.

4,161,220

#### METHOD AND APPARATUS FOR PRETENSIONING SCREW JOINTS

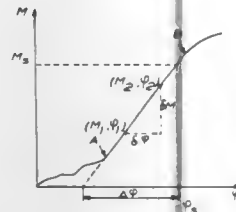
Carl-Gustaf Carlin, Tyresö, and Stefan M. B. Skyllermark, Nacka, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 17, 1977, Ser. No. 852,600

Claims priority, application Sweden, Nov. 22, 1976, 7613005 Int. Cl.<sup>2</sup> B23Q 19/06

U.S. Cl. 173—1

4 Claims



1. Method for pretensioning a screw joint to a predetermined axial load ( $F_p$ ), the axial load/rotation relationship ( $F/\phi$ ) for the screw joint being known, comprising the steps of: measuring the instantaneous magnitude of the applied torque and the angle of rotation within the linear elastic deformation range of the joint, calculating the torque/rotation gradient ( $dM/d\phi$ ), applying a tightening torque to the screw joint, sensing when the screw joint has been tightened to a torque level ( $M_s$ ) which, according to the calculated torque/rotation gradient ( $dM/d\phi$ ) and the previously known axial load/rotation relationship ( $F/\phi$ ), corresponds to said predetermined axial load ( $F_p$ ), and discontinuing said applied tightening torque responsive to said sensing when the screw joint has been tightened to said torque level ( $M_s$ ).

4,161,221

#### METHOD AND APPARATUS FOR PRETENSIONING SCREW JOINTS

Carl-Gustaf Carlin, Tyresö, and Stefan M. B. Skyllermark, Nacka, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 17, 1977, Ser. No. 852,286

Claims priority, application Sweden, Nov. 22, 1976, 7613006 Int. Cl.<sup>2</sup> B23Q 19/06

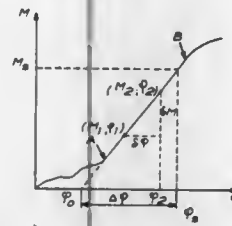
U.S. Cl. 173—1

10 Claims

1. Method for pretensioning a screw joint to a predetermined axial load ( $F_p$ ), the tension/rotation relationship

$$\left(\frac{F}{\phi}\right)$$

of the screw joint being known, comprising the steps of: determining the torque/rotation relationship  $M(\phi)$  during the linear, elastic deformation sequence of the tightening process, calculating by extrapolation of said torque/rotation relationship  $M(\phi)$  a theoretical, tensionless angular position ( $\phi_0$ ) of the screw joint,



applying a tightening torque to the screw joint, sensing when the screw joint has been rotated with relation to said theoretical, tensionless angular position ( $\phi_0$ ) an angular interval ( $\Delta\phi$ ) which according to said known tension/rotation relationship

$$\left(\frac{F}{\phi}\right)$$

corresponds to said predetermined axial load ( $F_p$ ), and then discontinuing said tightening torque application responsive to said sensing when the screw joint has been rotated through said angular interval ( $\Delta\phi$ ).

4,161,222

#### METHOD FOR REDUCING CONTAMINANT EMISSIONS IN GAS DRILLING OPERATIONS

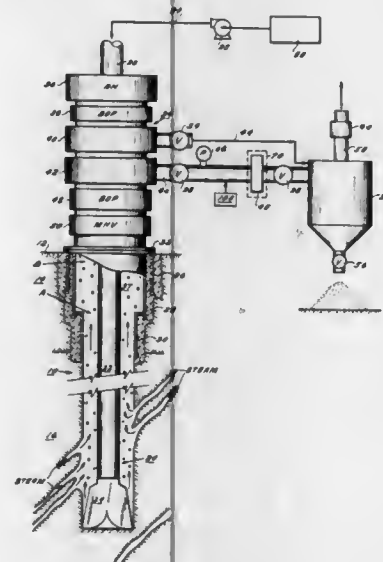
David S. Pye, Brea, Calif., assignor to Unlon Oil Company of California, Brea, Calif.

Filed Jun. 1, 1978, Ser. No. 911,423

Int. Cl.<sup>2</sup> E21B 21/00

U.S. Cl. 175—66

17 Claims



1. A method for drilling a borehole through a steam-bearing subterranean formation, comprising the steps of:

- rotating a drill bit in engagement with the bottom of said borehole thereby drilling said borehole and producing particulate drilling cuttings;
- flowing a gaseous drilling fluid from the earth surface downwardly through a first fluid pathway to said drill bit;

4,161,224

#### FLUID DUMP MECHANISM

Kai R. Hostrup, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 10, 1978, Ser. No. 676,592

Int. Cl.<sup>2</sup> E21B 1/10

U.S. Cl. 175—297

5 Claims

- flowing from the bottom of said borehole upwardly through a second fluid pathway to the earth surface a contaminant-bearing gas comprised of said gaseous drilling fluid, said drilling cuttings and steam produced from the steam-bearing formation being penetrated, said second fluid pathway having a minimum velocity point at a first location wherein the velocity of said contaminant-bearing gas is a minimum and a maximum velocity point at a second location above said first location wherein the velocity of said contaminant-bearing gas is a maximum;
- imposing a preselected surface back pressure on said contaminant-bearing gas, said surface back pressure being an amount effective to reduce the velocity of said contaminant-bearing gas at said maximum velocity point to a value less than the velocity at which substantial erosion of well hardware and substantial diminution of the drilling cuttings occurs and to control the velocity of said contaminant-bearing gas at said minimum velocity point at a value sufficient to transport said drilling cuttings through said borehole, whereby the erosion of said well hardware is reduced and said drilling cuttings arrive at the earth surface as relatively large, easily separated particles; and
- venting at least a portion of said contaminant-bearing gas to the atmosphere.



4,161,223

#### PRESSURE RELIEF VALVE FOR ROCK BITS

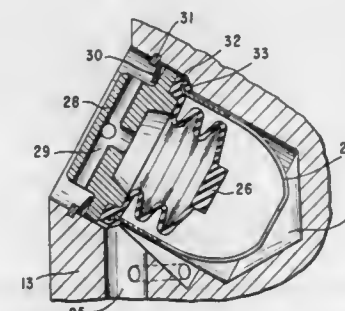
Erwin S. Oelke, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 13, 1978, Ser. No. 885,892

Int. Cl.<sup>2</sup> E21B 9/08

U.S. Cl. 175—228

6 Claims



- A sealed lubricated rotary rock bit comprising;
  - a bit body having at least one leg extending downwardly therefrom, said leg having a journal pin for rotatively supporting a rolling cutter, a seal between said rolling cutter and said journal pin;
  - a lubricant reservoir disposed in said bit body communicating with the bearing area between said rolling cutter and said journal pin, said reservoir further having a pressure compensator disposed therein, said pressure compensator comprising a resilient membrane separating the reservoir into a lubricant region and a drilling fluid region; and means for relieving excess lubricant pressure around said membrane to the exterior of said bit body, said pressure relief means comprising an annular seat formed in the wall of said reservoir, a valve face formed on the outer circumference of said membrane, and means for biasing said valve face against said valve seat to prevent flow of lubricant from within said reservoir to the exterior thereof until the excess lubricant pressure exceeds a pre-selected value.

5. In an apparatus for use in an oil well having:

- an outer tubular member;
- an inner tubular member longitudinally slidable within said outer tubular member and arranged to have an oil filled chamber between said members;
- a metering piston on one of said tubular member in said oil chamber and having a metering means therethrough for controlling longitudinal sliding movement between said tubular members;
- dump valve means in one of said members having an open position for bypassing said metering means, and a closed position arranged such that when said dump valve means is in the closed position, slidable movement is controlled by oil flow through said metering means; and
- dump valve operating means arranged for moving said dump valve means from its closed position to its open position after a predetermined amount of movement between said members, the improvement comprising;
- attachment means releasably attaching said dump valve operating means to the member other than the one having said dump valve means, and subsequent to the opening of said dump valve means, for releasing and sliding longitudinally with the movement of said tubular members while said dump valve means is in the open position.

4,161,225

#### SKEWED INSERTS FOR AN EARTH BORING CUTTER

Howard E. Mitchell, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 858,236, Dec. 7, 1977, abandoned. This application Aug. 2, 1978, Ser. No. 930,254

Int. Cl.<sup>2</sup> E21B 9/08

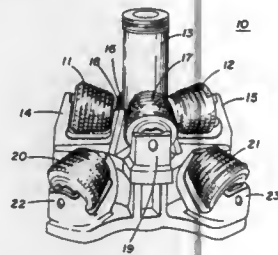
U.S. Cl. 175—374

2 Claims

1. An earth boring bit with a cutter having a rotational axis and individual cutting inserts and being adapted to be moved along earth formations causing the inserts to engage the formations and the cutter to rotate in a rotational direction, thereby imposing a radial force from said formations onto said inserts acting perpendicular to said rotational axis of said cutter and a shear force from said formations onto said inserts acting at an angle to said radial force, said radial force and shear force

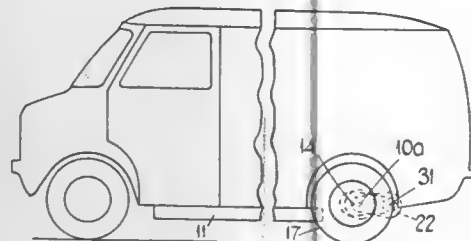


producing a maximum force that imposes a maximum load on said inserts, comprising:  
 an earth boring bit body;  
 a cutter body rotatably mounted on said earth boring bit body, said cutter body containing said rotational axis; and  
 at least one annular row of inserts projecting from said cutter body for engaging the earth formations, each of said in-



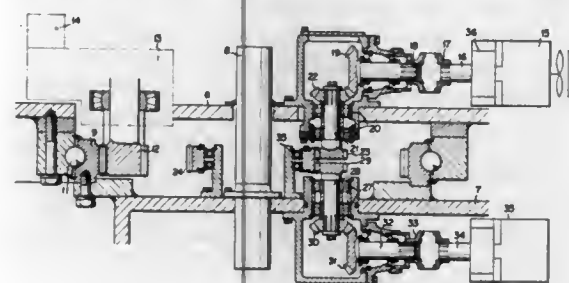
serts having a central axis that is angularly offset from the rotational axis of the cutter, said inserts being angularly offset in a direction opposite to said rotational direction of the cutter so that said central axis of each of said inserts is substantially aligned with said maximum force when the insert has penetrated the earth formations and is at its maximum load just prior to spalling or chipping of the formations.

**4,161,226**  
**VEHICLE DRIVE SYSTEMS**  
 Peter S. Warner, Henlow, and John R. Bicht, Hemel Hempstead, both of England, assignors to Lucas Industries Limited, Birmingham, England  
 Filed Apr. 29, 1977, Ser. No. 792,167  
 Claims priority, application United Kingdom, May 8, 1976, 19033/76  
 Int. Cl.<sup>2</sup> B60K 1/00  
 U.S. Cl. 180—65 E 3 Claims



1. An electric drive apparatus for an electrically driven vehicle having a body, first and second ground engaging elements at opposite respective sides of the vehicle body, and spring means connecting the ground engaging elements to the vehicle body, the drive apparatus comprising an electric motor mounted on a chassis of the vehicle, the motor having an output to a transmission including a first stage incorporating a differential mechanism, the differential mechanism having two output shaft connected to respective second stages of the transmission, to which the ground engaging elements of the vehicle are connected respectively, the second stages being mounted as unsprung weight of the vehicle and being housed in casings mounted on the vehicle in the manner of radius arms, and the transmission mechanism incorporating joints whereby relative movements between the first and second stages thereof can take place.

**4,161,227**  
**TRANSMISSION GEAR FOR A VEHICLE OF THE TYPE HAVING A SWIVELLING UPPER STRUCTURE WITH RESPECT TO AN UNDERCARRIAGE**  
 Takayasu Inui, Osaka, and Satoru Nishimura, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Saisakusho, Tokyo, Japan  
 Continuation of Ser. No. 645,349, Dec. 30, 1975, abandoned.  
 This application Sep. 26, 1977, Ser. No. 836,707  
 Claims priority, application Japan, Jun. 30, 1975, 50/91397; Jun. 30, 1975, 50/91398  
 Int. Cl.<sup>2</sup> B60K 17/02; B62D 11/02  
 U.S. Cl. 180—70 R 2 Claims

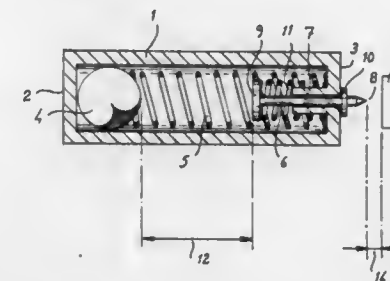


1. In a construction vehicle of the type having an undercarriage with an endless track and a swivelling upper structure pivotally mounted through thrust bearing means on said undercarriage, the combination of:  
 an engine for use in moving the vehicle mounted on said upper structure and connected through transmission gear means to said endless track, said transmission gear means comprising an input gear rotatably mounted through a bearing on said upper structure, eccentrically from the swivelling axis of the upper structure, an output gear rotatably mounted through a bearing on said undercarriage eccentrically from said swivelling axis and an idler gear mounted in a manner such as to be free to rotate with respect to said undercarriage by the interposition of a bearing on said undercarriage coaxially with said swivelling axis and arranged between said undercarriage and said upper structure wherein said input and output gears are rotatably engaged with each other by the interposition of said idler gear;  
 an annular internal gear fixedly secured to said undercarriage in a manner such as to be concentric with said swivelling axis and on the outer peripheral surface of which is mounted said thrust bearing means;  
 a swing means mounted on said upper structure and comprising a swing pinion rotatably engaged with said annular internal gear; and  
 a motor for use in swivelling said upper structure with respect to said undercarriage mounted on said upper structure and connected to said swing pinion of the swing means whereby the travelling operation of the vehicle and the swivelling operation of the upper structure are independent of, and separate from, each other, while being simultaneously and synchronously performed.

**4,161,228**  
**VEHICLE CRASH DETECTOR**  
 Lars G. Svensson, Upsala; Gustav Karlstedt, Sollentuna; Claes Tisell, Strangnas, and Yngve Thorstensson, Sollentuna, all of Sweden, assignors to Forenade Fabriksverken, Sweden  
 Filed Dec. 28, 1977, Ser. No. 865,216  
 Claims priority, application Sweden, Jan. 13, 1977, 7700327  
 Int. Cl.<sup>2</sup> G05G 15/00, 15/02, 15/04  
 U.S. Cl. 180—282 13 Claims

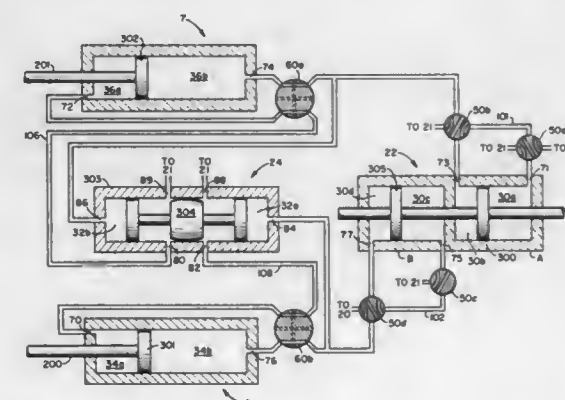
1. Crash detector for actuating an actuator of an operating system of a movable vehicle when a deceleration force acting on the vehicle exceeds a predetermined magnitude, the vehicle being movable in a predetermined direction of movement and

having leading and trailing ends, said crash detector comprising:  
 a longitudinally extending housing adapted to be mounted on the vehicle and defining a bore having leading and trailing ends facing in the same direction as the leading and trailing ends of the vehicle;  
 a mass body positioned in the rear end of the bore of said housing for axial movement towards the leading end in response to deceleration forces acting on the vehicle;  
 a first spring having a predetermined spring constant and exerting a force on said mass body urging the mass body towards said trailing end;  
 a firing pin axially movable in said bore and positioned in said bore between said mass body and said leading end of said bore and having a portion thereof adapted to actuate



said actuator, said portion being spaced a predetermined distance from the actuator; and  
 a second spring having a predetermined spring constant greater than the predetermined spring constant of the first spring and exerting a force on the firing pin urging the firing pin towards said trailing end, said mass body and said firing pin and said first and second springs being interrelated in such manner that when a deceleration force acting on the vehicle exceeds the predetermined magnitude, said mass body moves towards the leading end of the bore against the force of said first spring and contacts said firing pin and thereafter moves against the force of said first and second springs, said firing pin being moved said predetermined axial distance by said mass body and the deceleration force.

**4,161,229**  
**HYDRAULIC SYNCHRONIZING SYSTEM FOR COORDINATING MOVEMENT OF THE VIBRATOR GUIDE RODS**  
 Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.  
 Filed May 31, 1977, Ser. No. 802,150  
 Int. Cl.<sup>2</sup> G01V 1/14; F01B 25/14  
 U.S. Cl. 181—114 3 Claims

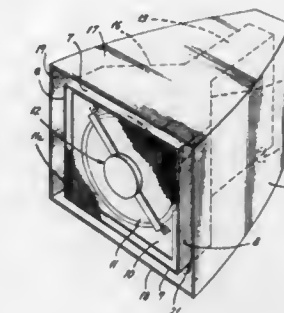


1. In a vibratory seismic energy source adapted to be transported on a vehicle, including a baseplate which couples seis-

mic energy to the ground, a supporting means positioned above said baseplate for supporting the weight of the vehicle applied to said baseplate, vertically disposed column means on opposite sides of said vibratory source connected to said supporting means and secured in sliding relation to said vehicle, and a pair of lift cylinder assemblies connected to said supporting means on opposite sides of said vibratory source in parallel relation with said column means for raising and lowering said column means relative to said vehicle and for raising and lowering said vehicle as to said column means, said lift cylinder assemblies containing pistons which define said cylinders into working and non-working chambers, the improvement comprising:

hydraulic synchronizing means interconnecting said lift cylinder assemblies for coordinating vertical movement of said column means, including dual piston and cylinder means for simultaneously supplying the working chambers of said lift cylinder assemblies with substantially equal volumes of hydraulic fluid, and a valve means in fluid communication with said working chambers and responsive to pressure differentials existing between the working chambers of said lift cylinder assemblies which adjusts the flow of hydraulic fluid out of the non-working chambers of said lift cylinder assemblies so as to maintain substantially equal pressure in the working chambers of said lift cylinder assemblies.

**4,161,230**  
**LOUDSPEAKER EQUIPMENT**  
 Warren Ripple, 3345 Marko St., Sarasota, Fla. 33580  
 Continuation of Ser. No. 687,353, May 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,364, Sep. 22, 1975, abandoned. This application Mar. 16, 1978, Ser. No. 886,991  
 Int. Cl.<sup>2</sup> H05K 5/00  
 U.S. Cl. 181—148 5 Claims

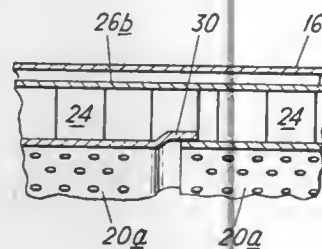


1. Loudspeaker equipment comprising a speaker, a speaker enclosure having enclosure walls defining a speaker chamber having front and rear intercommunicating compartments, the front compartment being generally rectangular and having a rectangular front wall with an opening therein with the speaker mounted thereon and exposed through the opening, the side walls of the front compartment defining a generally rectangular compartment space, the rear compartment having one dimension equal to one dimension of said front wall and having a dimension perpendicular to the first dimension substantially smaller than the first dimension, two of said side walls having rearward extensions of smaller width than said side walls and serving as side walls of the rear compartment, and the rear compartment having additional walls of the same dimension as said side walls cooperating with said extensions in defining a generally rectangular rear compartment space, one transverse dimension of which is substantially smaller than the corresponding dimension of the front compartment and the other transverse dimension of which is substantially equal to the corresponding dimension of the front compartment, the enclosure walls being at least in large part formed of thin sheet

material capable of excitation and consequent sound vibration under the influence of the speaker at least at frequencies in the lower portion of the audio range, and a reflector in which the speaker and its enclosure are positioned, the reflector having an opening at the front through which the speaker is exposed, said opening being larger than the front compartment of the speaker enclosure to provide clearance at all sides of the speaker enclosure, the reflector having rearwardly converging side walls enclosing the speaker enclosure with clearance at the four lateral sides of both the front and rear compartments of the speaker enclosure.

**4,161,231**  
**METAL CAVITATED SANDWICH STRUCTURES**  
Wilfred H. Wilkinson, Turnditch, England, assignor to Rolls-Royce Limited, London, England  
Continuation of Ser. No. 518,964, Oct. 29, 1974, abandoned.  
This application Nov. 29, 1977, Ser. No. 855,720  
Claims priority, application United Kingdom, Oct. 31, 1973, 50690/73

Int. Cl.<sup>2</sup> F01N 1/24  
U.S. Cl. 181—292



1. An improved sound absorbing sandwich structure for use in environments where a temperature differential across the structure thickness causes differential expansion and movement of the layers with respect to each other, the structure comprising: a first sheet metal layer, a second sheet metal layer having perforations therein, a rigid honeycomb cellular interlayer disposed between said first and second layers, and means rigidly attaching said interlayer by welding to each of said first layer and said second layer to provide a substantially rigid sandwich structure, the improvement being that one of the layers of sheet metal consists of a plurality of sheet pieces each of which has a small surface area relative to the other layer of sheet metal and each of which is disposed with each of its edges adjacent to respective edges of the adjacent sheet pieces such that there can be independent expansion or contraction of each sheet piece and the edges of each sheet piece can move without interference with respect to the adjacent edges of adjacent sheet pieces when the layers of the structure are subjected to a temperature differential and expand or contract differentially whereby overall shear stress across the sandwich structure is minimized and thereby prevents the second perforated sheet metal layer from cracking.

**4,161,232**  
**SAFETY DECK MOUNTING STRUCTURE**  
Leopold Bustin, Emmans Rd., Flanders, N.J. 07836  
Filed Feb. 15, 1978, Ser. No. 877,970  
Int. Cl.<sup>2</sup> B60R 3/00

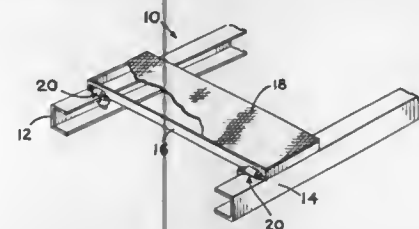
U.S. Cl. 182—92

1. Safety deck for vehicles comprising:  
a deck structure including a frame element and a grating section;  
means for securing said deck structure to the frame of a vehicle, said frame including at least a pair of support structural elements, said means for securing said deck structure comprising at least two cylindrical elements secured outside said frame element whereby said frame element is adapted to be received on said support element,

each of said cylindrical elements for receiving a J-bolt therethrough, at least one J-bolt for engaging one of said support structural elements of said frame, another of said J-bolts for engaging another of said support structural elements of said frame;

each of said J-bolts including a base, a short arm and a long arm, said long arm being provided with threads and sized to extend through said cylindrical element;

nut means for threadedly engaging said long arm of said



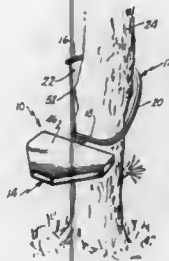
J-bolts, said nut means being of a diameter larger than said cylindrical elements such as to be precluded from passing therethrough;

said J-bolts being disposed through said cylindrical elements such as to be positioned in opposing configuration whereby positioning of the basis of said J-bolts on said support structural elements and tightening said nut means creates opposing forces in said frame element; and means disposed on each said J-bolt for resiliently engaging said support structural elements.

**4,161,233**  
**PORTABLE TREE SEAT**  
James A. Wirtz, 1531 Shettler Rd., Muskegon, Mich. 49444  
Filed Dec. 9, 1977, Ser. No. 858,963  
Int. Cl.<sup>2</sup> A47C 9/10

U.S. Cl. 182—187

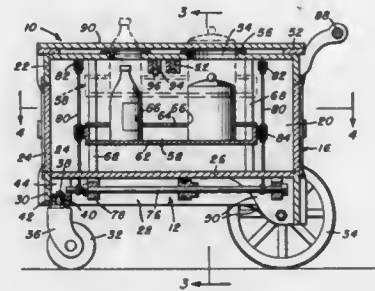
10 Claims



1. A portable seat adapted for use with a tree or like generally vertically extending member, said seat comprising:  
a mounting member having a first tree engaging portion and a spaced second tree engaging portion, said member dimensioned to at least partially encircle a tree with the first and second tree engaging portions abutting the tree on opposite sides thereof;  
a seat support arm extending outwardly from one of said portions;  
a seat member; and  
pivot and biasing means for pivotally securing said seat member to said seat support arm whereby said mounting member may be positioned around a tree with said first and second portions engaging opposite sides of the tree and the seat member may pivot relative to said seat support and assume a horizontal position relative to the ground.

**4,161,234**  
**SERVING CART**  
Clyde Munn, 203 Huckleberry Dr., Cheraw, S.C. 29520  
Filed Mar. 13, 1978, Ser. No. 885,981  
Int. Cl.<sup>2</sup> E04H 3/04  
U.S. Cl. 186—1 R

2 Claims

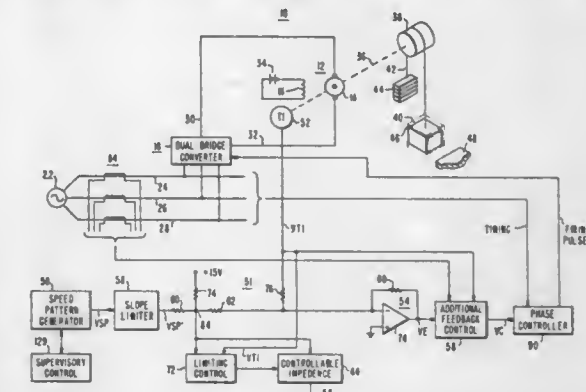


1. A serving cart comprising a serving top, a base including wheel means, vertical supports extending between said base and said top, a carrying shelf for bottles and containers positioned between said base and said top, and means for vertically adjusting said shelf relative to said top, said top having a plurality of separate openings defined therethrough for selective projection of the bottles and containers through said openings for direct access thereto when the shelf is vertically adjusted upward toward said top, said shelf including interconnected parallel upper and lower panels, said lower panel comprising a support surface for the bottles and containers, said upper panel having a series of openings therein receiving, positioning, and stabilizing the bottles and containers supported on the lower panel and projecting upwardly through the upper panel openings, said means for vertically adjusting said shelf comprising self-contained power means, including a battery powered motor, mounted on said base, and a control system extending from said power means to said shelf for a selective vertical movement of the shelf in response to activation of the power means, said control system includes an elongated shaft rotatably mounted on said base and driven by said motor, said shaft extending centrally and longitudinally of said base, said shaft having opposed end portions, a pair of flexible members affixed to each end portion of the shaft, each pair of flexible members, outward of the corresponding end of the carrying shelf, extending vertically to and about a series of pulley members affixed respectively to the undersurface of the serving top and the corresponding end of the carrying shelf, whereby rotation of the elongated shaft in a first direction will effect a winding of the flexible members thereon and a corresponding elevation of the carrying shelf, a rotation of the shaft in the opposite direction will effect an unwinding of the flexible members therefrom and a gravitational lowering of the carrying shelf, said serving cart further including an extension leaf hingedly mounted along each edge of the serving top and selectively moveable between a first position overlying the serving top, and a second position pivoted upward and outward so as to generally parallel the serving top, and means for releasably supporting each leaf in its outwardly swung position comprising a support bar, and a track mounted beneath the serving top and receiving said bar for a selective extension thereof outward so as to at least partially underlie the outwardly positioned leaf.

**4,161,235**  
**ELEVATOR SYSTEM**  
William R. Caputo, Wyckoff, and Alan L. Husson, Hacketts-town, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed May 19, 1978, Ser. No. 907,523  
Int. Cl.<sup>2</sup> B66B 1/30

U.S. Cl. 187—29 R  
1. An elevator system, comprising:  
an elevator car,

motive means for said elevator car,  
speed pattern means providing a speed pattern signal indicative of the desired speed of said elevator car,  
means providing a velocity signal responsive to the actual speed of said elevator car,  
controllable impedance means,  
control means providing a first control signal responsive to at least one predetermined parameter of said speed pattern signal, said control means including reference means providing a first reference signal relative to said at least one

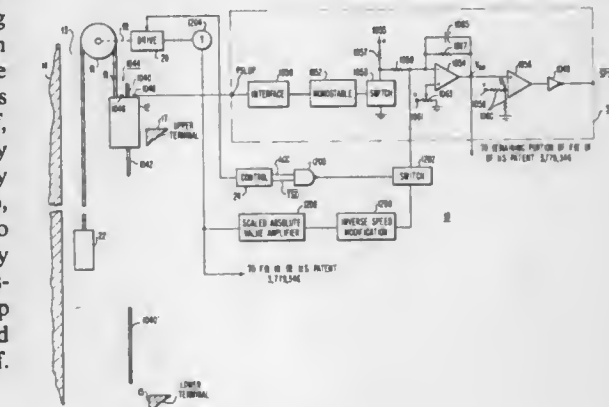


predetermined parameter, said control means modifying the impedance of said controllable impedance means in response to a predetermined relationship between said first control signal and said first reference signal, and error signal means providing an error signal for controlling said motive means in response to said velocity signal and said speed pattern signal, said controllable impedance means being connected to modify the affect of said speed pattern signal on said error signal means, at least when its impedance is modified by said control means.

**4,161,236**  
**ELEVATOR SYSTEM**  
Alan L. Husson, Hacketts-town, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Jun. 1, 1978, Ser. No. 911,575  
Int. Cl.<sup>2</sup> B66B 5/04

U.S. Cl. 187—29 R

5 Claims



1. An elevator system, comprising:  
a building having a hoistway and terminal floors,  
an elevator car mounted for guided movement in said hoistway,  
velocity means providing a velocity signal responsive to the speed of said elevator car,  
detector means providing a speed versus position signal as said elevator car approaches a terminal floor,  
overspeed means responsive to said speed versus position



signal for providing an overspeed signal when a predetermined overspeed condition is detected, control means providing a control signal having a first condition when said elevator car is set to decelerate and stop at a terminal floor, and a second condition when it is not so set, and modification means operative when said control means is in its second condition and said detector means is providing the speed versus position signal, to change a parameter upon which the issuance of the overspeed signal by said overspeed means is based, with said change causing the issuance of the overspeed signal to be advanced in time, compared with the time at which it would otherwise be provided, with the magnitude of the advancement being inversely proportional to the magnitude of said velocity signal.

4,161,237

**VIBRATION ABSORBER FOR ROTATING BODY**

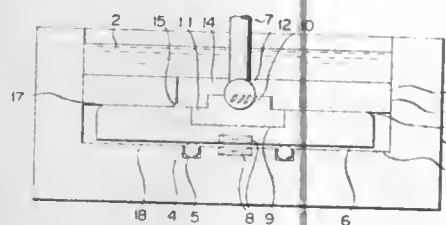
Norio Uchida, and Nakaba Komiya, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 15, 1978, Ser. No. 886,888

Claims priority, application Japan, Mar. 22, 1977, 52-31401  
Int. Cl.<sup>2</sup> F16F 15/16

U.S. Cl. 188—1 B

8 Claims



1. A vibration absorber for a rotating body comprising a tank including at least side and bottom portions and containing a viscous liquid substantially filling said tank, a spherical surface formed at one end of a vertically extending pivot, a first member located adjacent the bottom of said tank and having a partially spherical surface to fit on said spherical surface of the pivot and capable of moving in the horizontal direction, a hollow second member placed on top of said first member and capable of moving in the vertical direction independently of the horizontal movement of said first member, and a centripetal means for locating the center of said first member on the central axis of said pivot upon moving said first member in the horizontal direction, all of said members and means being disposed within said tank.

4,161,238

**SELF ENERGIZING BRAKE ASSEMBLY**

Jean J. Lasoen, Villepreux, France, and Paul R. Chervenak, Warren, Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Jun. 9, 1977, Ser. No. 805,052

Claims priority, application Canada, Aug. 6, 1976, 258614  
Int. Cl.<sup>2</sup> F16D 49/20

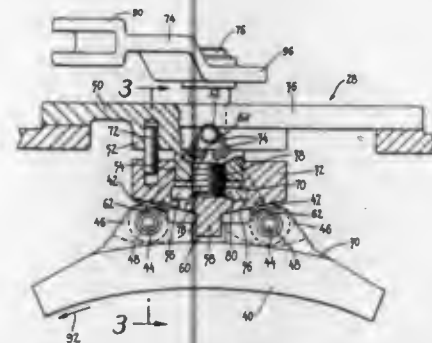
U.S. Cl. 188—74

2 Claims

1. A self-energizing brake assembly adapted to contact the surface of a rotatable member to hold it from rotation and in combination with a radially spaced away support member, said brake assembly comprising:

a laterally shiftable brake shoe disposed between the support member and the rotatable member and having opposed sides, one side being adapted to frictionally contact the surface of the rotatable member, and the other side being provided with a pair of rollers laterally spaced apart in the direction of rotation of the surface of the rotatable member; wedge block means mounted on the support for movement

towards and away from said rotatable member, said wedge block means being provided with a pair of laterally spaced apart opposed inclined converging ramp surfaces; spring means operable to maintain each of said opposed ramp surfaces in rolling contact with an associated one of said pair of rollers; and



4,161,239

**DISC BRAKE**

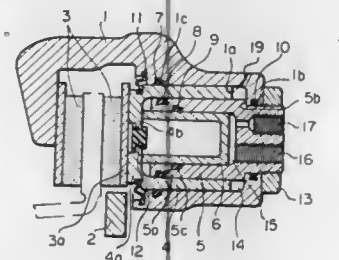
Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Dec. 16, 1977, Ser. No. 861,448

Claims priority, application Japan, Dec. 29, 1976, 51/160385  
Int. Cl.<sup>2</sup> F16D 65/20

U.S. Cl. 188—106 P

8 Claims



1. A brake cylinder comprising:

- a cylinder body;
- a first piston slidably received in said cylinder body, said first piston having an outer periphery in liquid-tight relationship with said cylinder body;
- an inner cylinder having an outer end fixedly secured to said cylinder body, an open inner end, and an outer periphery in liquid-tight sliding relationship with an inner periphery of said first piston;
- said outer periphery of said inner cylinder, said first piston, and said cylinder body together defining a first hydraulic chamber;
- a second piston slidably received in said inner cylinder, said second piston having an outer periphery in liquid-tight relationship with an inner periphery of said inner cylinder;
- said second piston having an outer end cooperating with said outer end of said inner cylinder to define a second hydraulic chamber;
- said cylinder body having therein a first annular recess receiving a first annular seal member slidably contacting said outer periphery of said first piston and forming a liquid-tight slidably seal between said cylinder body and said outer periphery of said first piston;
- said outer periphery of said inner cylinder having therein a

second annular recess receiving a second annular seal member slidably contacting said inner periphery of said first piston and forming a liquid-tight slidably seal between said inner periphery of said first piston and said outer periphery of said inner cylinder;

said inner periphery of said inner cylinder having therein a third annular recess receiving a third annular seal member slidably contacting said outer periphery of said second piston and forming a liquid-tight slidably seal between said inner periphery of said inner cylinder and said outer periphery of said second piston;

said first and second pistons being axially slidably movable in a first direction from respective initial positions thereof to respective braking positions thereof by liquid pressure supplied into said first and second hydraulic chambers, respectively; and

said seal members and the respective said recesses thereof having a configuration such that said seal members comprise means for storing therein restoring forces for, upon the release of said liquid pressure, returning said first and second pistons from said respective braking positions thereof to said respective initial positions thereof.

4,161,240

**RATCHET ACTION SLACK ADJUSTER**

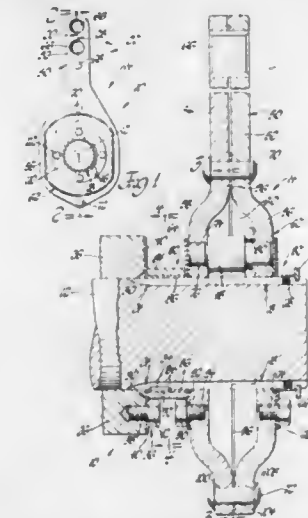
William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1978, Ser. No. 870,331

Int. Cl.<sup>2</sup> F16D 65/54

U.S. Cl. 188—196 BA

18 Claims



1. A ratchet action slack adjuster assembly comprising; a rotatable actuating shaft displaceable from a rest position for actuating a braking means and having ratchet teeth extending axially along a portion of said shaft, actuator means having an initial position and brake-applied positions mounted on said actuating shaft and coacting with said ratchet teeth for providing input to said rotatable actuating shaft by arcuate movement of said actuator means, adjustment means extending about said shaft and being axially spaced along said shaft from said actuator means for mounting independently of said actuator means on a support means for rotary motion relative to said actuator means and relative to said actuating shaft and coacting with said ratchet teeth at a position spaced axially along said shaft for preventing return rotation of said actuating shaft after said actuating shaft has rotated a predetermined amount corresponding to a desired amount of play in a braking means.

4,161,241

**DASHPOT APPARATUS INCLUDING A FLEXIBLE DIAPHRAGM PISTON**

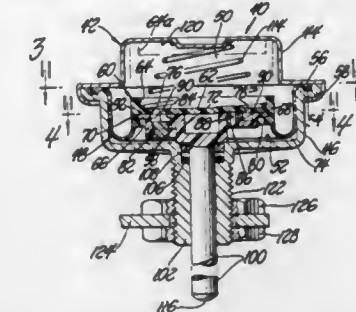
William C. Larson, Rochester, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,880

Int. Cl.<sup>2</sup> F16F 9/04

U.S. Cl. 188—298

2 Claims



1. A dashpot assembly, comprising housing means including first and second housing sections, moveable wall means situated within and cooperating with said housing means to define at least first and second distinct and variable chamber means at either side of said moveable wall means and internally of said housing means, said moveable wall means comprising a relatively flexible diaphragm peripherally retained generally between and by said first and second housing sections and having a relatively rigid diaphragm-engaging body, said diaphragm being generally juxtaposed to said diaphragm-engaging body so as to be situated on generally the first chamber side of the diaphragm-engaging body, said diaphragm-engaging body being situated as to be on generally the said second chamber side of said diaphragm, said diaphragm comprising a generally relatively thick diaphragm body portion positioned in juxtaposed relationship to said diaphragm-engaging body, said diaphragm body portion comprising recess-like means formed generally on said second chamber side thereof, said diaphragm-engaging body comprising a flange means, said flange means being received in said recess-like means for operatively connecting said diaphragm to said diaphragm-engaging body, motion transmitting means operatively carried by said moveable wall means and being effective when actuated to move said moveable wall means in a direction toward said first chamber, said motion transmitting means being operatively connected to said diaphragm-engaging body, conduit means carried by said moveable wall means for completing communication between said first and second chambers, said conduit means including sintered gas permeable metering means having the capability of permitting a preselected volume rate of flow of air therethrough at a corresponding air pressure differential thereacross, said conduit means comprising first passage means formed in said diaphragm-engaging body and containing said gas permeable metering means and second passage means formed through said diaphragm body portion and communicating with said first passage means, said second passage means comprising a first conduit section and a second conduit section each formed through said diaphragm and spaced from each other, said diaphragm-engaging body having annular passage means formed in the face thereof juxtaposed to said diaphragm in a manner to inter-connect said first passage means with said second passage means, and third passage means formed through said diaphragm-engaging body, said third passage means being effectively closed to flow therethrough by said diaphragm when said diaphragm and said diaphragm-engaging body are being moved in said direction toward said first chamber, said diaphragm being operative to open said third passage means to flow therethrough from said second chamber to said first chamber when said diaphragm and said diaphragm-engaging body are being moved in a sec-

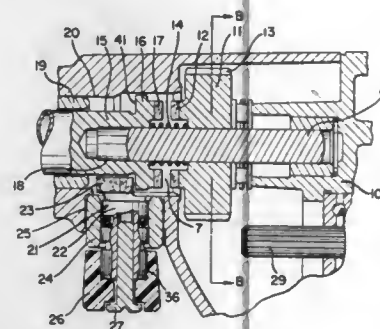


ond direction opposite to said first direction and toward said second chamber.

**4,161,242**  
**POWER-DRIVEN DRILL AND SCREWDRIVER**  
Robert G. Moores, Jr., Reisterstown, and Charles E. Hopkins, Sr., Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 15, 1977, Ser. No. 806,907  
Int. Cl.<sup>2</sup> B23B 21/00; F16D 11/00  
U.S. Cl. 192—34

25 Claims

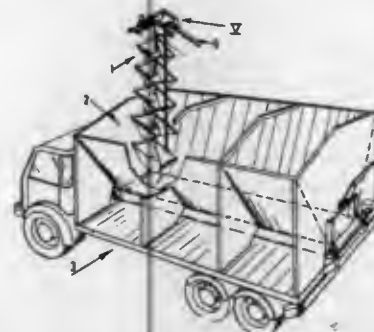


1. A power-driven drill and screwdriver comprising:  
a housing having a longitudinal axis;  
a drive motor mounted in said housing;  
a case attached to said housing;  
a first clutch member rotatably mounted in said case and operatively connected to said drive motor;  
a second clutch member rotatably mounted in said case and slideably movable relative to said first clutch member between a first location whereat said second clutch member firmly engages said first clutch member and a second location whereat said second clutch member is disengaged from said first clutch member;  
means biasing said second clutch member into said second location;  
cam means being mounted on said case so as to be rotatably adjustable about an axis transverse to said longitudinal axis from one position on said case corresponding to the screwdriving mode of the tool to another position on said case corresponding to the drill mode of the tool;  
said cam means being arranged in said case with respect to said second clutch to counteract the urging force of said biasing means and to displace said second clutch member into said first location when said cam means is adjusted from said one position to said other position;  
manually-adjustable means for adjusting said cam means between said two positions;  
first limit means and second limit means coacting with said manually-adjustable means for defining said positions, respectively; and,  
connection means for connecting said manually-actuable means to said cam means so as to cause said first limit means to correspond to one of said positions and said second limit means to correspond to the other one of said positions.

**4,161,243**  
**FALL BRAKE**  
Marius Grisnich, No. 9, Punterstraat, Emmeloord, Netherlands  
Filed Aug. 4, 1977, Ser. No. 821,915  
Claims priority, application Netherlands, Aug. 25, 1976, 7609467

Int. Cl.<sup>2</sup> B65G 11/08  
U.S. Cl. 193—27  
1. A fall brake for material comprising a plurality of frames, suspension means for suspending said frames one beneath the other, each frame having a material guide directed downwards in a sense opposite that of the overlying material guide,

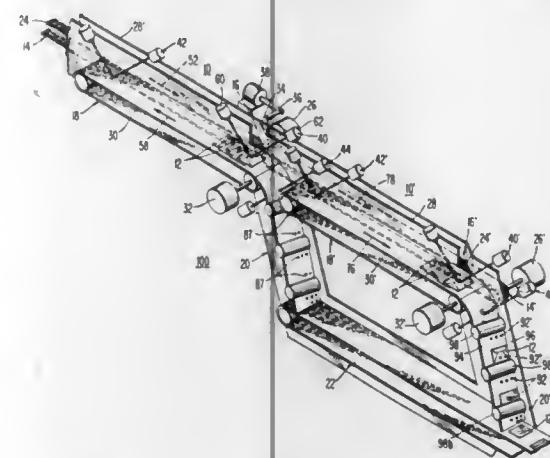
wherein the frames are pivotally interconnected in staggered positions and said suspension means includes at least one flexible member extending from a lifting mechanism and connected at least to the lowermost frame, characterized in that the lowermost operative frame can be upwardly pivoted from its operative position into an inoperative position in which the



frame is mainly parallel to the overlying frame and in that each frame has suspended to it a material guide extending downwardly at an angle to said frame,  
said suspension means including a belt having holes for suspending said frames at intervals along its length and wherein in order to regulate the angle of inclination of the material guide the belt has a plurality of suspension holes.

**4,161,244**  
**MAIL BUFFER FEEDER SYSTEM**  
James R. Hunter, Chadds Ford; Sebastian J. Lazzarotti, and Robert S. Bradshaw, both of Broomall, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.  
Filed Mar. 31, 1978, Ser. No. 892,190  
Int. Cl.<sup>2</sup> B65G 47/30  
U.S. Cl. 198—347

15 Claims

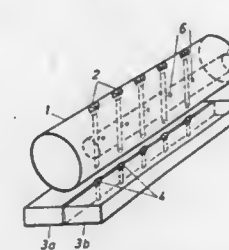


1. A buffer feeder system for processing mail pieces comprising:  
at least a first and a second subsystem having transport means for conveying said mail pieces thereto, said first and second subsystem having respective first and second buffer feeder conveyor means positioned in operative relationship with said transport means, first and second gating means associated respectively with said first and second subsystem and being operatively positioned with respect to said transport means for selectively directing said mail pieces onto said first and second buffer feeder conveyor means, at least first and second mail sensing means positioned at substantially the opposite extremities of the buffer feeder conveyor means of each subsystem, master control means coupled to both subsystems for initiating concurrently a buffer mode in one subsystem and a

feeder mode in the other subsystem, said master control means causing at a predetermined time said first subsystem to assume a buffer mode and said second subsystem to assume a feeder mode wherein said first gating means assumes a physical orientation which causes all of the mail pieces being conveyed by said transport means to be directed onto said first buffer feeder conveyor means, said master control means conditioning said first buffer feeder conveyor means for motion in a direction to receive and buffer said mail pieces,  
said first mail sensing means of said first subsystem being positioned in proximity to said first gating means and being coupled to said first buffer feeder conveyor means, said first mail sensing means being responsive to the presence of each mail piece deposited upon the latter conveyor means for incrementing the conveyor motion in a fixed step to produce a shingled batch of mail pieces, said second mail sensing means of said first subsystem being coupled to said master control means and providing an electrical signal thereto indicative of a full condition in said first buffer feeder conveyor means,  
said master control means conditioning said second buffer feeder conveyor means at said predetermined time for motion in a direction to feed out the shingled batch of mail pieces previously stored on the last mentioned conveyor means.

**4,161,245**  
**PROCESS AND APPARATUS FOR FEEDING ELONGATED ARTICLES IN ORIENTED POSITIONS**  
Stig G. Baggeström, Tullinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden  
Filed Dec. 29, 1977, Ser. No. 865,533  
Claims priority, application Sweden, Jan. 26, 1977, 7700788  
Int. Cl.<sup>2</sup> B65G 47/24  
U.S. Cl. 198—399

13 Claims



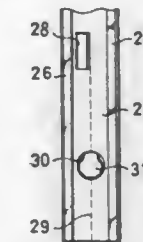
1. A method of feeding elongated articles having enlarged heads at one end, said method comprising depositing a plurality of elongated articles into a correspond plurality of bores in a turnable member in random orientation in which the elongated articles may be introduced in some bores head-first and in other bores tail-first, passing the articles through the bores in which they are introduced tail-first, holding the articles in the bores in which they are introduced head-first, turning the turnable member 180° while continuing to hold the articles introduced head-first into the bores so that said articles are now inverted and releasing the now inverted articles for passage through the bores.

**4,161,246**  
**PACKAGED SLIDE FASTENER**  
Taruo Tanaka, 3551 Niederwalgen, Marburg am der Neuen Schule 14, Fed. Rep. of Germany, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 748,952, Dec. 9, 1976, abandoned. This application Jun. 7, 1978, Ser. No. 913,442  
Claims priority, application Japan, Dec. 29, 1975, 50/177587  
Int. Cl.<sup>2</sup> B65D 85/18, 75/36  
U.S. Cl. 206—45.31

4 Claims

1. A packaged slide fastener comprising: an elongated base plate; a slide fastener placed on one surface of said base plate,

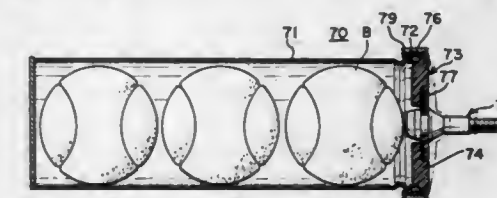
said base plate being substantially coextensive in width to said slide fastener and having a length greater than that of said slide fastener; and an elongated plastic film having substantially the same length as said base plate and having a width greater than that of said base plate, said plastic film covering said base plate and said slide fastener thereon and having side margins folded back over the side edges of said base plate, the folded margins



of said plastic film being adhered to the other surface of the base plate, said base plate having a portion of said one surface covered directly with an adhered to said plastic film, and there being a cutout recess in said portion, said base plate having an inspection opening, a perforation extending between said inspection opening and one end of said base plate, and an aperture receiving therein the bottom wing of the slider of said slide fastener.

**4,161,247**  
**METHOD OF AND MEANS FOR PRESERVING TENNIS BALLS OR THE LIKE**  
Robert S. Feinberg, 81 Edgemont Pl., Teaneck, N.J. 07666, and David A. Selick, 76 Le Roy St., Tenafly, N.J. 07670  
Continuation of Ser. No. 564,347, Apr. 2, 1975, abandoned, which is a division of Ser. No. 347,080, Apr. 4, 1973, Pat. No. 3,889,807. This application Dec. 13, 1977, Ser. No. 859,999  
The portion of the term of this patent subsequent to Jun. 17, 1992, has been disclaimed.  
Int. Cl.<sup>2</sup> B65D 45/32, 85/00  
U.S. Cl. 206—315 B

2 Claims



1. A cap for closing the open end of a cylindrical container to form a storage receptacle capable of maintaining pressure therein comprising a closure member formed of an elastomeric material including relatively thick central portion releasably engaging the open end of said container and a relatively thin annular border, a locking collar slidably engaging said annular border and holding it in compressed engagement with the outer face of said container said open end, and an inflation valve mounted on said closure member and providing communication between opposite sides thereof.

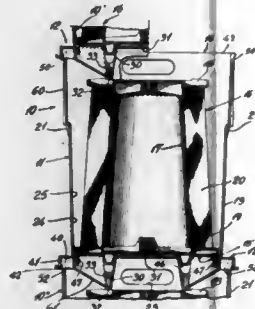
**4,161,248**  
**CONTAINER FOR WIRE SPOOL**  
Martin Kalmanovitch, Montreal, Canada, assignor to Universal Wire & Cable Co. Ltd., Montreal, Canada  
Filed Oct. 11, 1977, Ser. No. 840,787  
Int. Cl.<sup>2</sup> B65D 85/04, 85/66, 21/02, 51/02  
U.S. Cl. 206—389

7 Claims

1. The combination of a spool for metal wire and the like and a container for said spool; said spool having a core and upper and lower flanges at the opposite ends thereof; said container

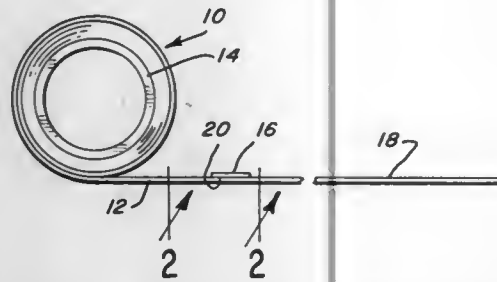


comprising a housing and a removable cover; said housing having a side wall, a bottom wall and an open top end; said spool being disposed entirely within said housing with said lower flange being seated on said bottom wall, said upper flange being recessed below the housing top end; said cover closing said housing open top end and including a depending wall having a portion in sealing sliding engagement with the



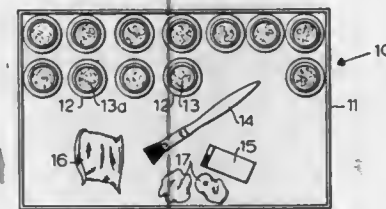
exterior of said housing side wall defining a floating joint between said cover and said housing permitting vertical displacement of said cover relative to said housing while frictionally engaging said housing to accommodate spools of different heights; and said cover having load transfer means depending into said housing and being directly seated on said upper flange with said spool directly transferring loads between said cover and said bottom wall independently of said housing side wall.

**4,161,249**  
**WEB PRODUCT WITH MARKER AND METHOD OF MANUFACTURE**  
Russell N. Dashow, Glencoe, Ill., assignor to RND Company  
Filed Apr. 13, 1978, Ser. No. 895,992  
Int. Cl.<sup>2</sup> B65D 85/67; G01D 13/00  
U.S. Cl. 206—459



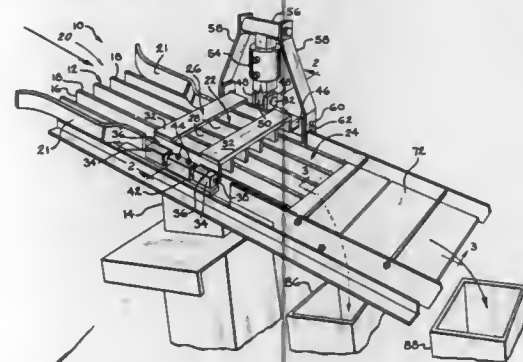
1. A web product which is marked at predetermined locations to aid a user dispensing said product, comprising: an integral web having a predetermined length and a predetermined width between the longitudinal edges of said web, said web being wound into a roll having said width, said web having an inside surface of a first color; and marking means secured to said inside surface of said web along at least one predetermined location intermediate the ends of said web, said marking means extending transversely across said web and being disposed between said longitudinal edges of said web, said marking means having a first surface overlying said web and an opposing exposed surface of a second color; whereby said web can be unwound to expose said marking means which signifies to a user that a predetermined portion of the length of said web has been unwound.

**4,161,250**  
**KIT FOR DECORATING BORDER PANEL OF PICTURE MATS**  
Donald C. Pierce, 59 Repos Vista, Novato, Calif. 94947  
Continuation of Ser. No. 760,263, Jan. 18, 1977, abandoned, which is a division of Ser. No. 588,965, Jun. 20, 1975, Pat. No. 4,025,666. This application Apr. 27, 1978, Ser. No. 900,432  
Int. Cl.<sup>2</sup> B05C 17/10  
U.S. Cl. 206—575



1. A kit for dry-powder coloring of cardboard picture mats or portions thereof, comprising:  
a receptacle containing a plurality of elements which include at least one cardboard picture mat, a dry cleaning eraser pad of an open knit cloth bag containing eraser particles for dry cleansing of a dry mat surface and preparing it for dry application of powder and for evenly removing powder from the surface to lighten it,  
at least one container containing a mixture of pigmented fine dry inorganic powder including one of a dominant color and a hue-lightener,  
a wide-end applicator for dry application of said powder to the cleaned dry mat, and  
a soft pencil type of eraser for removal of unwanted areas of applied powder from said mat,  
the particle size of the major portion of the powder being in the range of 0.1-5 microns for the powder of dominant hue and 1-10 microns for the hue-lightener.

**4,161,251**  
**INSPECTION FIXTURE**  
William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607  
Filed Dec. 16, 1976, Ser. No. 751,449  
Int. Cl.<sup>2</sup> B07C 5/08  
U.S. Cl. 209—604



1. An inspection fixture comprising a lower object support having an entrance portion, an intermediate portion, and a discharge portion, said intermediate portion of said lower object support being of conductive material, an upper conducting member, means for movably supporting said upper conducting member in a first position above said intermediate portion of said lower object support, fluid-operated means for moving said conducting member from the first position to a second position further spaced from said intermediate portion, means for supporting said lower object support at an angle to the horizontal whereby an object placed on said entrance

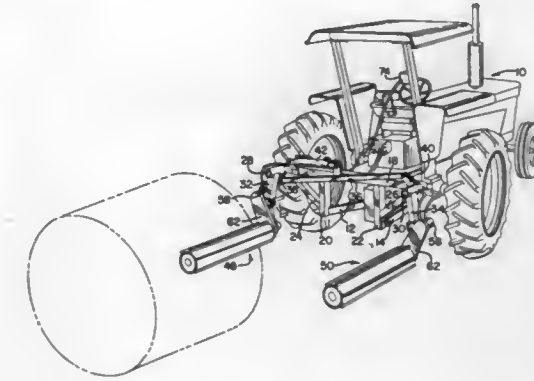
portion will move by gravity past said intermediate and said discharge portions, a source of electrical power connected between the said conducting member and said intermediate portion of said lower object support, valve means in series with said source of power for actuating said fluid-operated means to move said conducting member from the first position to the second position when an object contacts both said conducting member and said intermediate portion of said lower object support to complete a circuit between said valve means and said power source, means forming an opening associated with said discharge portion, a diverter plate, and means operated by said valve means for moving said diverter plate from a first position covering said opening whereby objects passing over said discharge portion can pass over said opening, and a second position spaced from said opening whereby objects passing over said discharge portion will drop through said opening.

**4,161,252**  
**SET OF SORTING-STACKING BINS**  
John N. M. Howells, Kittery, Me., assignor to Recycling & Conservation, Inc., Kittery, Me.  
Filed Nov. 16, 1977, Ser. No. 852,073  
Int. Cl.<sup>2</sup> A47F 3/14  
U.S. Cl. 211—126



1. A vertical stack of removable bins:  
each bin comprising a container having an integral bottom wall, a front wall, a rear wall and a pair of opposite side walls, all formed of self supporting, water-resistant, sheet material,  
and each bin having a separable enlarged base underlying, and removably affixed to the said bottom wall thereof, said base having downwardly depending flanges along the side and rear edges thereof adapted to closely fit the corresponding upper edges of the rear and side walls of the next lowermost said container to seat thereon  
the front wall of each said container being inclined downwardly and inwardly from proximate the upper edge thereof to proximate the lower edge thereof to thereby define a top front opening into the next lowermost said container,  
each said base having a front edge, spaced from the front edge of said top front opening, to define the rear edge of said opening,  
and each said base being joinably separate from its respective container so that a plurality of said containers may be shipped nested and the bases thereof shipped separately.

**4,161,253**  
**CARRIER AND DISPENSER FOR CYLINDRICAL BALES**  
Horace E. Ralston, Millington; Edward L. Robinson, Jr., Memphis, both of Tenn., and William K. Ralston, deceased, late of Cordova, Tenn. (by Louise Ralston, executor), assignors to International Harvester Company, Chicago, Ill.  
Filed Aug. 16, 1977, Ser. No. 825,009  
Int. Cl.<sup>2</sup> B66F 9/19  
U.S. Cl. 414—25



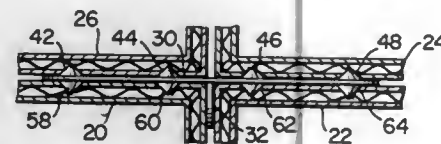
1. An apparatus adapted for mounting on a mobile unit for dispensing hay from a cylindrical bale, said apparatus comprising:  
a frame mountable on the unit and including a transverse main beam having a pair of spindles projecting at right angles therefrom at opposite ends of the beam;  
a pair of arms journaled respectively on said pair of spindles and extending generally downwardly therefrom;  
a pair of elongated rollers journaled on said arms and projecting at right angles therefrom in spaced parallel relation for releasably holding a cylindrical bale with its longitudinal axis parallel to the rollers;  
an elongated bar pivotally and directly interconnecting said arms for moving said arms toward and away from each other in response to moving said bar in one direction and the opposite direction respectively;  
a double acting hydraulic cylinder connected between said main beam and said bar for selectively moving said bar in said directions to move said arms toward and away from each other;  
a hydraulic motor mounted on each of said arms for driving the respective rollers to rotate a bale thereon about its longitudinal axis; and  
control means for driving said motors at varying speeds relative to each other whereby a shredding or tearing action may be imparted by the rollers to the bale thereon to enhance dispensing of hay from the bale.

**4,161,254**  
**ANCHOR MEMBER FOR UNITIZING A PLURALITY OF CONTAINERS**  
Charles F. Taylor, 150 E. Industry, La Habra, Calif. 90631  
Continuation-in-part of Ser. No. 808,297, Jun. 20, 1977, abandoned, and a continuation-in-part of Ser. No. 679,090, Apr. 21, 1976, Pat. No. 4,069,927. This application Oct. 6, 1977, Ser. No. 839,892  
The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> B65G 1/14

U.S. Cl. 206—504  
1. An anchor member for unitizing a plurality of corrugated containers having inner and outer layers, said anchor member including:  
(a) a flat, rigid body of substantially rectangular shape for placement at the junction between laterally adjacent corrugated cardboard containers having flat surfaces dis-

posed in substantially the same plane, one face of said flat body being engaged with a portion of the flat surface of adjacent containers

- (b) a single rectilinear wall extending outwardly from said one face of said flat body for engagement with portions of adjacent containers proximate the flat surfaces engaged by said flat body, said wall being proximate the midpoint of one dimension of the flat body and extending transversely for the majority of another dimension, and



- (c) a plurality of spaced pins projecting outwardly from said one face of said flat body on both sides of said single wall, and from said other face of said flat body, for engaging portions of the flat surfaces of the adjacent containers to prevent relative movement thereof
- (d) said spaced pins being of predetermined uniform height to pierce the outer layer of the corrugated cardboard containers but not the inner layer thereof, thereby preserving the contents of the containers from contamination.

4,161,255

#### DEVICE FOR DISCHARGING MATERIALS LYING UPON A STORAGE AREA

Claude P. Ropert, 1 Cite du Parc, Boite Postale 46, 28240 La Loupe, France

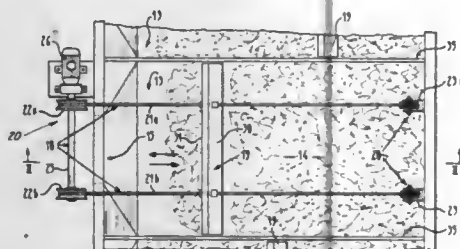
Filed Dec. 1, 1977, Ser. No. 857,351

Claims priority, application France, Dec. 2, 1976, 76 36324

Int. Cl.<sup>2</sup> B65G 25/08

U.S. Cl. 414—323

6 Claims



1. In a device for handling and more particularly for discharging materials or products lying in a pile upon a horizontal or slightly sloped storage area, comprising a movable scraping element, a reversible winch system comprising at least one hauling cable and sheaves and a motor for said winch system, means for reversing the movement of said winch system for driving said scraping element in a back-and-forth movement on said storage area and discharging means contiguous to said storage area; the improvement comprising means for measuring the resisting force exerted on said scraping element while said element is moved into said pile of material, means for setting a predetermined value of resisting force, control means for generating a controlling signal when said resisting force reaches said predetermined value, and means for connecting said reversing means to said control means upon said controlling signal being transmitted for reversing the direction of movement of said winch system and consequently of said scraping element for discharging material from said pile of material.

#### 4,161,256 FLUID POWER SYSTEM HAVING MULTIPLE, SEPARATELY CONTROLLABLE DOUBLE-ACTING FLUID MOTORS AND REDUCED NUMBER OF FLUID CONDUITS

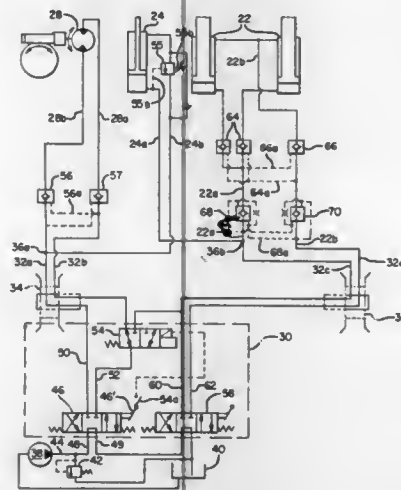
Richard D. Seaberg, Vancouver, Wash., assignor to Cascade Corporation, Portland, Oreg.

Filed Oct. 4, 1977, Ser. No. 839,179

Int. Cl.<sup>2</sup> B66F 9/18

U.S. Cl. 414—620

17 Claims



1. A fluid power system having a source of pressurized fluid and multiple, separately controllable double-acting fluid motors each for selectively performing a different function, said system comprising:

- (a) at least three of said separately controllable double-acting fluid motors, each of said three motors having a respective fluid line means for connecting the respective motor to said source, each of said respective line means comprising a pair of fluid lines operatively connected separately to the respective motor;
- (b) selectively operable fluid control valve means operatively connected between said source and said respective fluid line means for receiving fluid from said source and delivering said fluid selectively to said fluid lines;
- (c) each of two of said motors having one of its fluid lines operatively connected to said valve means jointly with a fluid line of the third motor, and having the other of its fluid lines operatively connected to said valve means separately from the fluid lines of the other ones of said motors, the fluid lines of the third motor being operatively connected to said valve means separately from one another.

4,161,257

#### CLOSURE FOR VACUUM BOTTLES AND THE LIKE

Hermann Hauri, Lenzburg, Switzerland, assignor to Genossenschaft Vebo Solothurnische Eingliederungs-Stätte für Behinderte, Zuchwil, Switzerland

Filed May 24, 1977, Ser. No. 799,946

Claims priority, application Switzerland, May 25, 1976, 6758/76

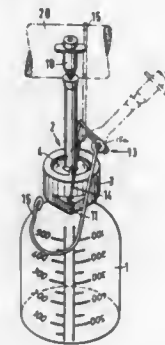
Int. Cl.<sup>2</sup> B65D 51/16

U.S. Cl. 215—260

10 Claims

1. The combination of a container including a neck portion having an open end and an inner surface with a detachable elastic closure comprising a substantially cylindrical portion surrounding said neck portion and having a first and a second end, and an end wall integral with said first end and extending across said open end, said end wall having a substantially centrally located opening and being readily deformable in response to establishment of a pressure differential between the interior and exterior of said container whereby the extent of

deformation of said end wall furnishes a visually detectable indication of said pressure differential, a conduit comprising a flexible hose sealingly connected with said end wall and communicating with the interior of said container via said opening, and a suspending device for said closure, said suspending de-



vice comprising a section having two legs connected to said cylindrical portion and a further portion defining a slit, said hose being insertable into said slit and the width of said slit being such that said further portion deforms and seals said hose when the latter is inserted into said slit.

4,161,258

#### STOPPER ARRANGEMENT FOR BOTTLES

Albert Obrist, Therwilstr. 12, Reinach BL, Switzerland (4153)

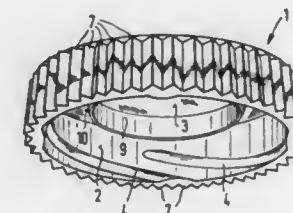
Filed Mar. 28, 1978, Ser. No. 890,939

Claims priority, application Switzerland, Mar. 29, 1977, 3926/77

Int. Cl.<sup>2</sup> B65D 41/04

U.S. Cl. 215—302

18 Claims



1. Stopper arrangement for bottles, comprising a bottle having an externally threaded neck which is closed by a synthetic plastic screw cap, the screw cap having an approximately cylindrical internally threaded wall part which is closed by an upper lid surface, the external threading of the bottle neck and the internal threading of the screw cap having at least two thread turn segments which rise at an angle less than 30°, the screw cap having on its circumference at least a section protruding sufficiently outwardly from the bottle neck for the application of the lifting portion of a crown cork opener, the distance of the protruding section from the upper lid surface of the screw cap being not greater than the clear internal width of a crown cork opener, and the cylindrical wall part being of such elastic formation that the stopper cap can be vertically lifted and opened by a crown cork opener without screwing movement.

4,161,259

#### STACKABLE CONTAINER FOR BOTTLES AND THE LIKE

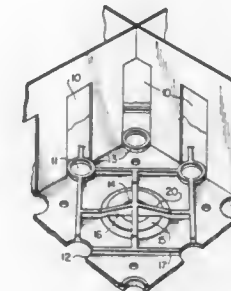
Federico V. Palafox, Naucapán de Juárez, Mexico, assignor to Procesos Plásticos, S.A., Mexico

Filed Oct. 17, 1977, Ser. No. 842,989

Int. Cl.<sup>2</sup> B65D 1/26, 25/06

U.S. Cl. 220—21

5 Claims



1. An improved container for holding and transporting bottles and the like comprising
- a unitarily formed parallelepiped container having pairs of rectangular side and end walls, a bottom wall and a plurality of longitudinally and transversely extending inner walls, said inner walls intersecting to divide said container into a plurality of cells adapted to receive bottles;
- means at the corner junctions of said side and end walls forming a double wall structure including spaced, parallel wall portions;
- said end walls including means extending between the upper portions of said corner junctions defining a handle;
- means in said inner and end walls defining spaced apart openings extending upwardly from said bottom wall, at least some of said openings being located at the intersections of said inner walls;
- means in said bottom wall defining a first plurality of generally circular holes, at least some of which are located below said openings;
- means in said bottom wall defining a second plurality of holes, each of the holes of said second plurality being substantially centrally located in said cells and being of a smaller diameter than the tops of bottles to be received in said cells;
- rib means integrally formed on said bottom wall for improving the rigidity thereof, said rib means including a first plurality of ribs extending across the inner surface of said bottom wall between the holes of said first plurality of holes;
- a plurality of annular flanges extending upwardly from the inner surface of said bottom wall surrounding each of said first plurality of holes and connected to said first plurality of ribs;
- a second plurality of ribs extending radially across and outwardly from the holes of said second plurality of holes, pairs of said second ribs extending diagonally across said cells perpendicular to each other and intersecting at the centers of said second plurality of holes, said second plurality of ribs being connected to said first plurality of ribs,
- said first plurality of ribs forming, in each cell, a square rotated 45° from the peripheral edges of the cell; and
- each of said second plurality of ribs being thicker at the center thereof than at either end, the upper surfaces thereof being tapered to engage a generally concave bottle bottom.



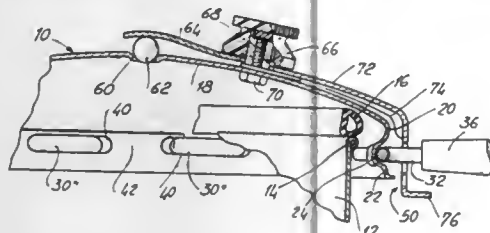
4,161,260

## COVER FOR PRESSURE POTS

Adriano Lagostina, Gravelona Toce, Italy, assignor to Stratoflat International Company, Schaan, Liechtenstein  
 Filed Jul. 20, 1978, Ser. No. 926,282  
 Claims priority, application Italy, Dec. 3, 1977, 30539 A/77  
 Int. Cl.<sup>2</sup> B65D 45/00

U.S. Cl. 220—316

9 Claims



1. A cover effective to be applied to pots, casseroles and like kitchen containers, of such size and structural characteristics as to allow for a use thereof as the "container" part of a "pressure pot" and comprising an outwardly projecting rim or edge at the mouth thereof, characterized in that it is formed by a structural component (generally made of metal and of cup-like shape) comprising a downwardly directed bent rim, of such a size as to be fitted with a reduced clearance about said container projecting rim, and in that it comprises an essentially annular component, located about said rim and effective to contract or shrink, from a condition of free passing about the projection of the container mouth, to a condition in which at least a part of the structure fitted about the rim of container engages abuttingly said projection, said cover further including means effective to provide for tightness, safety and shrinking of said annular component, the applying of said cover to said container and the abuttingly fixing of the cover to the rim of the container allowing for an efficient pressure pot to be obtained.

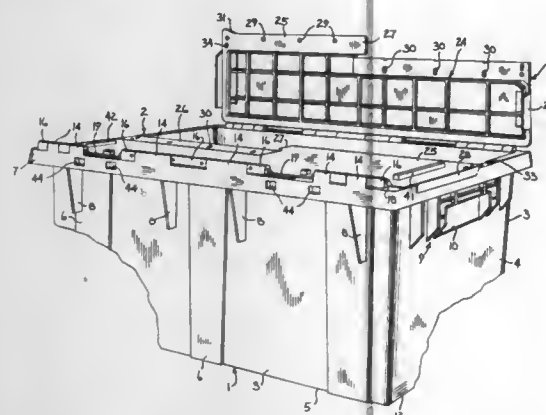
4,161,261

## SECURITY CONTAINER

James J. Frater, Watertown, Wis., assignor to Menasha Corporation, Neenah, Wis.  
 Filed May 5, 1978, Ser. No. 903,253  
 Int. Cl.<sup>2</sup> B65D 43/14, 51/04

U.S. Cl. 220—337

16 Claims



1. A container assembly, comprising an open-top container having a generally vertical wall and a bottom connected to the lower end of the wall, a pair of lid sections each having a first edge hinged to the upper edge of the vertical wall and having a second edge disposed opposite said first edge, said lid sections disposed to pivot from a downwardly hanging storage position to a generally horizontal closed position, a first flap member disposed on the second edge of each lid section and

projecting laterally of said second edge beyond the center line of the container and extending approximately one-half the longitudinal length of said second edge, a second flap member disposed on the second edge of each lid section and extending approximately one-half the length of said second edge, said second flap member being recessed relative to the outer surface of each lid section and said outer surface being substantially at the same level as the upper edge of the vertical wall when the lid section is in the closed position, the first flap member of one of the lid sections disposed to overlie the second flap member of the other lid section when the lid sections are in the closed position, whereby the closed lid sections provide a substantially flat upper supporting surface, and projection means extending upwardly from the upper surfaces of the closed lid sections for preventing displacement of an upper container stacked on said closed lid sections.

4,161,262

## MULTIPLE DOSING DEVICE

Reiner Habrich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
 Filed Sep. 14, 1977, Ser. No. 833,356  
 Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642652

Int. Cl.<sup>2</sup> G01F 11/28, 11/06

U.S. Cl. 222—1

12 Claims



10. A method of dosing liquid such as reaction resin compounds for casting comprising the steps of:

- interposing plate shaped dosing elements, each containing a dosing plunger, with a dosing liquid inlet, dosing liquid outlet and a dosing control inlet between a liquid connecting plate and control connecting plate with a sealing element interposed between each two adjacent plates;
- forming diaphragm valves from cooperating surfaces of said plates and said sealing elements, a first valve being formed for each dosing element at the dosing liquid inlet and a second valve being formed at the dosing liquid outlet;
- feeding the liquid to be dosed under pressure from said liquid connecting plate to the first diaphragm valve associated with each dosing element; and
- controlling said diaphragm valves such that:
  - the first diaphragm valves are opened to permit the dosing liquid, under pressure, to move the dosing plungers in one direction and fill cylinders;
  - said first diaphragm valves are closed and said second diaphragm valves opened; and
  - a fluid pressure medium is applied to the dosing control inlet to operate said dosing plungers in the opposite direction to simultaneously dispense dosing liquid from all of said dosing elements.

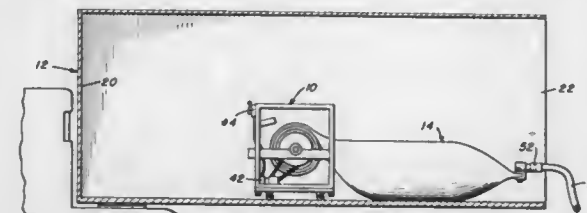
4,161,263

## HANDLING SYSTEM FOR FLEXIBLE SHIPPING CONTAINERS

Robert J. Wagner, Wernersville, Pa., assignor to Sonoco Products Company, Hartsville, S.C.  
 Filed Dec. 29, 1977, Ser. No. 865,495  
 Int. Cl.<sup>2</sup> B60P 3/22; B65D 35/28

U.S. Cl. 222—100

3 Claims



1. For use within a bulk freight shipping container having a support floor, an inner end, and an outer discharge end; a handling system comprising a collapsible fluent material shipping tank selectively positionable on and along the support floor, said system further comprising an independent handling and storage rack positionable on said support floor inward of the tank, said rack including means mounted thereon for supporting said rack on said support floor for free travel of the rack along said floor between the inner end and the outer discharge end both in conjunction with and relative to said tank, said tank having an inner end and an outer discharge end, means for selectively engaging said rack with the inner end of the tank, and power means on said rack for travel therewith both for a selective power drawing of said tank into a collapsed stored position on said rack in conjunction with a traveling of the rack toward said discharge end, and a selective discharge of said tank from said rack.

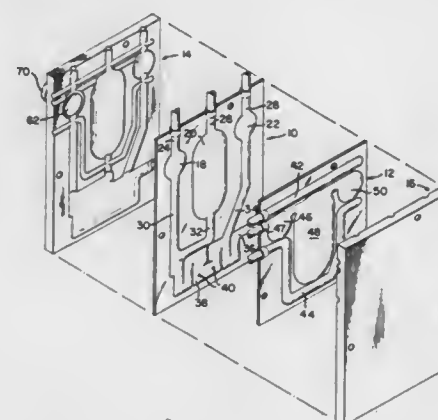
4,161,264

## FLUID METERING AND MIXING DEVICE HAVING INLET AND OUTLET VALVES

Arthur L. Malmgren, 386 NW. 112th St., Seattle, Wash. 98177, and Bryan E. Johnson, 21708 80th W., Edmonds, Wash. 98020  
 Filed Jun. 17, 1977, Ser. No. 807,425  
 Int. Cl.<sup>2</sup> B65D 37/00

U.S. Cl. 222—135

6 Claims



1. A device for metering a fluid at a predetermined flow rate, comprising:  
 a first fluid chamber having a predetermined volume;  
 a first set of flexible, elongated fluid inlet and outlet conduits communicating with said first fluid chamber;  
 a second fluid chamber having a predetermined volume;  
 a second set of flexible, elongated fluid inlet and outlet conduits communicating with said second fluid chamber;  
 a first flexible clamp tube having an externally accessible inlet end and a restricted terminating end, said first clamp

tube overlying the inlet conduit of said first set and the outlet conduit of said second set;

a second flexible clamp tube having an externally accessible inlet end and a restricted terminating end, said second clamp tube overlying the outlet conduit of said first set and the inlet conduit of said second set;

a first pair of rigid surfaces spaced apart by the overlying portions of said first clamp tube and said inlet and outlet conduits by a fixed distance selected such that pressurization of said first clamp tube collapses the walls of the inlet conduit of said first set and the outlet conduit of said second set thereby preventing fluid flow into said first fluid chamber and from said second fluid chamber;

a second pair of rigid surfaces spaced apart by the overlying portions of said second clamp tube and said inlet and outlet conduits by a fixed distance selected such that pressurization of said second clamp tube collapses the walls of the outlet conduit of said first set and the inlet conduit of said second set thereby preventing fluid flow out of said first fluid chamber and also preventing fluid flow into said second fluid chamber; and

control means alternating between first and second cycles, said control means pressurizing said first clamp tube while depressurizing said second clamp tube during said first cycle thereby allowing fluid to fill said first fluid chamber and allowing fluid to drain from said second fluid chamber, and said control means depressurizing said first clamp tube while pressurizing said second clamp tube during said second cycle thereby allowing fluid to drain from said first fluid chamber and allowing fluid to fill said second fluid chamber such that the flow rate of fluid from said metering device is a substantially constant predetermined value.

4,161,265

## DEVICE FOR DISPENSING POWDERED MATERIAL

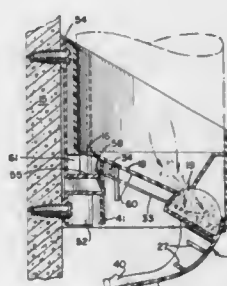
Stephen G. Hauser, Tarzana, and Keith S. Keith, Los Angeles, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Sep. 14, 1977, Ser. No. 833,184

Int. Cl.<sup>2</sup> G01F 11/24

U.S. Cl. 222—181

7 Claims



1. A two piece molded dispenser comprising a housing provided with an upstanding top portion having an upwardly extending wall for retaining an inverted container of particulate material to be dispensed, said housing having a funnel means terminating in an orifice, journalling means in said housing positioned below said funnel means, and stop means positioned below at least a portion of said funnel means; and an integrally formed dispensing means including horizontal stub means and at least one elongated leaf spring means, said dispensing means having a normally upwardly facing open trap chamber means and being in receiving relationship with said orifice, said dispensing means having a downwardly depending manually operated lever means, said trap chamber means of said dispensing means having said horizontal stub means positioned for rotatable mounting in said journalling means, said at least one elongated leaf spring means extending at one end from said stub means and the other end having a portion in

abutment with said stop means, said leaf spring being in a non-tension position when said trap chamber of said dispensing means is in a non-dispensing position, and said trap chamber means having a rear wall which cooperates with said orifice in the non-dispensing position of said trap chamber to prevent particulate material from spilling out of said trap chamber and to close said orifice in the dispensing position of said trap chamber.

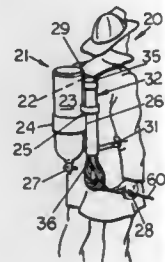
#### 4,161,266 LIFELINE CARRIER

William F. Howarth, Jr., 48 Ashland Ave., Methuen, Mass. 01844

Filed Nov. 4, 1976, Ser. No. 738,713  
Int. Cl.<sup>2</sup> A45C 11/00

U.S. Cl. 224—215

8 Claims



1. In combination with a back frame having a cylindrical air tank retained thereon by at least one strap partially encircling said tank midway of the height thereof;

a life line carrier for firemen said carrier comprising:

an elongated hollow container having a closed, upper end, an opposite open lower end and a side wall;

an end closure hinge pivoted to said container for closing said lower open end;

spring means, operably connected to said end closure and biasing said closure to open position;

first latch means, including a handle, on said container for retaining said spring biased end closure in closed position over said open end until manually unlatched;

an elongated line closely packed within said container, as a festoon coiled, elongated unitary package; said line being accessible proximate said open end and adapted to be slidably withdrawn as a unitary package endwise from said lower end of said container when said closure is opened;

a pig tail encircling the adjacent loops at the lower end of said festooned, close packed line proximate said open end and having a portion adapted to project from said container when said closure is opened for slidably withdrawing said package;

an elongated straight blade having one end fixed to the side wall of said container, proximate said closed upper end, said blade extending in substantial parallelism with said side wall at a spaced distance therefrom toward the open end thereof to a free terminal end and

second latching means on said side wall releasably connecting said free terminal end of said blade to said side wall, proximate said open lower end,

said straight blade being slidable downwardly between the tank strap and the air tank of a conventional back carried air tank to position said life line carrier alongside said tank and actuation of said handle springing open said closure to permit slidable withdrawal endwise of said closely packed line as a unitary package.

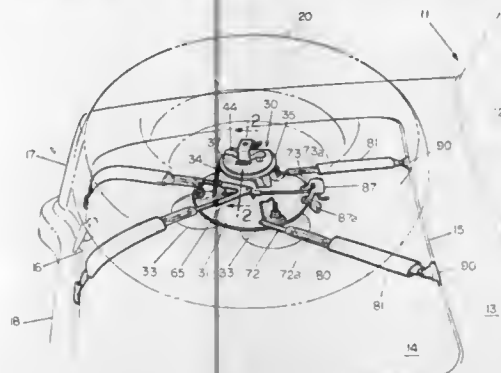
#### 4,161,267 TRUNK MOUNT SPARE WHEEL CARRIER DEVICE

Frederick D. Morrison, Jr., 5741 Acres Rd., Sylvania, Ohio 43560

Filed Jun. 6, 1977, Ser. No. 803,780  
Int. Cl.<sup>2</sup> B62D 43/02

U.S. Cl. 224—42,24

9 Claims



1. A spare wheel carrier for releasable securement to an automobile trunk lid having perimetric edges surrounding an upper surface, said wheel having an inner annular hub flange region, said carrier comprising:

a base member having depending means adapted to rest on the upper surface of said trunk lid,

an upstanding central support means, connected to said base member, having an upper horizontal face, adapted to flushly support said wheel on said inner annular hub flange region,

a lock plate adapted to rest on the other side of said annular hub flange region,

means for urging said support means face and lock plate together thereby compressingly secure said hub flange region therebetween,

a plurality of elongate flexible holding straps secured at one end to said base member, said straps extending without entanglement or interference with said spare wheel to releasably engage said perimetric edges.

a yoke to which two of said plurality of said straps are connected and

means for affecting movement of said yoke and consequent adjustment of the tension in said two straps.

#### 4,161,268 SKI STORING, PROTECTING, AND CARRYING APPARATUS

Charles W. Heil, 1629 Hickory La., Eagan, Minn. 55122  
Filed Aug. 5, 1976, Ser. No. 711,848

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

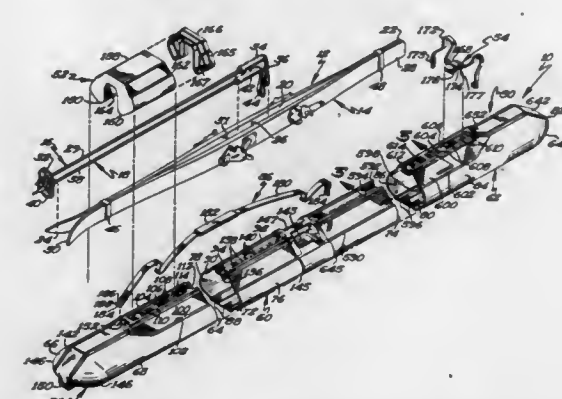
Int. Cl.<sup>2</sup> B65D 7/24; A63C 11/02

U.S. Cl. 224—45 S

27 Claims

1. Apparatus for storing, protecting, and carrying a first snow ski and a second snow ski with the first ski having a bottom surface, an end, two sides, and a tip formed on the forward portion of the snow ski and curved from the bottom surface and with the second ski having a bottom surface, an end, two sides, and a tip formed on the forward portion of the snow ski and curved from the bottom surface with the bottom surface of the first ski adjacent to and facing the bottom surface of the second ski, comprising, in combination: a rigid, hollow, thin-walled elongated container having a first closed end and a second closed end spaced from the first closed end, with the container also including at least a first portion and a second portion being in a telescopic relation; and means for telescopically capturing the first and second snow skis within the container when the second portion is telescoped with the first

portion to prevent longitudinal movement of the first and second snow skis within the container and for allowing the container to be used for several length of skis, comprising: first means for engaging and holding the end of the first snow ski; second means for engaging and holding the end of the second snow ski; and third means for retaining the tip of the first snow ski and the tip of the second snow ski to prevent latitudinal movement in a direction perpendicular to the longitudinal axis of the container and for centrally aligning the forward portions of the first and second snow skis within the container when the second portion is telescoped with the first portion comprising: fourth means for urging the tip of the first snow ski in a latitudinal direction perpendicular to the longitudinal axis of the container; fifth means for urging the tip of the second snow ski



in a latitudinal direction perpendicular to the longitudinal axis of the container; sixth means for limiting movement of the first snow ski in a direction opposite to the latitudinal direction which the first snow ski is urged by the fourth urging means; and seventh means for limiting movement of the second snow ski in a direction opposite to the latitudinal direction which the second snow ski is urged by the fifth urging means, with the sixth and seventh means comprising a limiting member formed integrally with the container against which one side of each of the first and second snow ski abut to thereby removably capture the first and second snow skis within the container when the second portion is telescoped with the first portion to prevent the skis from bouncing, rattling, or moving inside the container during transit.

#### 4,161,269 WEB CLAMP

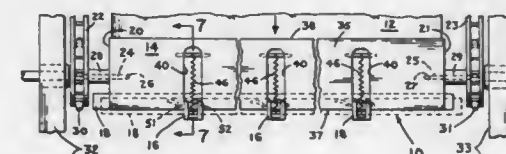
Alan D. Kirkpatrick, Sparta, N.J., assignor to Corrugated Development, Inc., Fairfield, N.J.

Filed Nov. 21, 1977, Ser. No. 853,240

Int. Cl.<sup>2</sup> B65H 29/04

U.S. Cl. 226—92

10 Claims



1. A clamp for carrying the edge of a web of material comprising:

a base bar;

at least one clamping element pivotally secured to said base bar said at least one clamping element being pivotable between clamping, release and loading positions;

spring means connected to said base bar and said clamping element, said spring means for urging said clamping element into said clamping position and also for urging said clamping element into said loading position; and

camming means slidably engaging said at least one clamping

element, said camming means for displacing said at least one clamping element from said clamping position to said release position against the force of said spring means.

#### 4,161,270

#### CONTINUOUS LOOP STUFFER CARTRIDGE HAVING IMPROVED MOEBIUS LOOP TENSIONING DEVICE

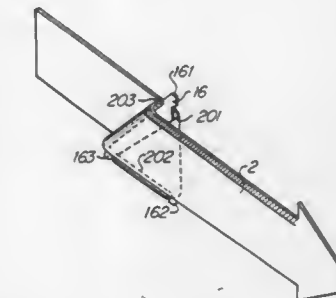
Ross H. Casey, Meridian, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 15, 1977, Ser. No. 815,976

Int. Cl.<sup>2</sup> B65H 17/50, 23/32

U.S. Cl. 226—118

9 Claims



1. Apparatus comprising:

a reservoir having a capacity for holding tape;

an output port coupled to the reservoir and having an orifice for dispensing tape;

an input port coupled to the reservoir, and having an orifice for receiving tape;

a triangular-shaped tensioning device positioned within the output port, the triangular-shaped tensioning device having three frictional edge surfaces comprising a first edge surface, a second edge surface and a third edge surface, each of the three edge surfaces being substantially disposed within a plane defined by the other two edge surfaces;

a continuous loop tape having a Moebius half twist therein disposed about the first edge surface, the second edge surface and the third edge surface of the triangular-shaped tensioning device and the tape having a portion within the reservoir and a portion extending from the output port to the input port; and

tape moving means positioned within the input port for creating a tensile force within the portion of the continuous loop tape disposed outside the reservoir and extending from the triangular-shaped tensioning device to the tape moving means and for injecting tape received by the input port into the reservoir.

#### 4,161,271 PINNING MACHINE

Charles B. Bussard, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 789,763, Apr. 22, 1977, abandoned, which is a continuation of Ser. No. 641,842, Dec. 18, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,552

Int. Cl.<sup>2</sup> B31F 7/00

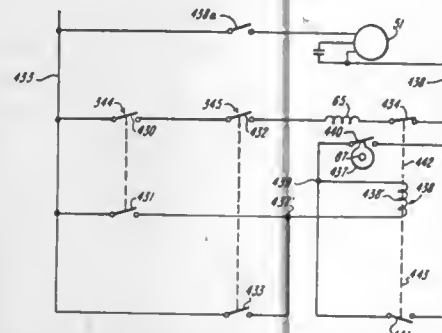
U.S. Cl. 227—8

4 Claims

1. Apparatus for pinning tags to merchandise, comprising: an anvil, a plunger cooperable with the anvil, means for feeding a tag along a path to a position between the anvil and the plunger, means for moving the plunger and the anvil relatively toward each other to hold the tag and the merchandise in a bent orientation at a pinning zone, means for driving a pin through the tag and the merchandise to pin the tag to the merchandise, a pair of independently movable actuators disposed on opposite sides of the pinning zone adjacent the anvil and the plunger, the means effective only when both actuators are simultaneously in their operated positions, for operating



the tag feeding means, the plunger and the pin driving means through an operating cycle, wherein the operating means includes a camshaft, a cam secured to the camshaft, and means



controlled by the cam for preventing the operation of the apparatus through more than one cycle until both actuators have been released.

4,161,272

## NAIL DRIVER CONSTRUCTION

Walter Brückl, Oberndorf-Aistalig a.N., Fed. Rep. of Germany, assignor to Mafell-Maschinenfabrik Rudolf Mey KG, Fed. Rep. of Germany

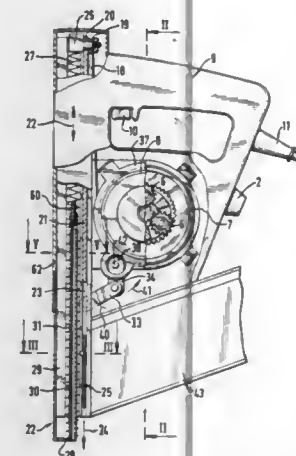
Filed Nov. 29, 1977, Ser. No. 855,731

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654521

Int. Cl.<sup>2</sup> B25C 7/06

U.S. Cl. 227—131

19 Claims

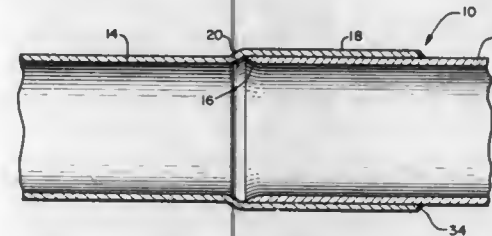


1. A nail driver, comprising a housing having a nail guide therein, a striking bar movable in said housing for driving the nail out of said nail guide, a motor in said housing, a coupling mechanism connected to said motor including a rotatable pulley driven by said motor, an intermediate member connected between said coupling mechanism and said striking bar for converting the rotary motion of the motor into an infeed movement of the striking bar including a flexible tape having one end secured to said striking bar and an opposite end connected to said pulley and being wound around said pulley for being driven thereby to move said striking bar, and a disconnecting mechanism connected to said coupling mechanism for disengaging the coupling mechanism after the stroke of said striking bar automatically.

4,161,273  
TUBE JOINT AND METHOD OF MAKING SAME  
Robert P. Jeffers, Kinsman, Ohio, assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio  
Filed Feb. 22, 1977, Ser. No. 770,679  
Int. Cl.<sup>2</sup> B23K 1/18

U.S. Cl. 228—154

3 Claims



1. The method of forming a tube joint comprising: chamfering the end outer diameter of a male tube and then flaring the end inner diameter of said male tube until the end outer diameter is substantially equivalent to the outer diameter of the remainder of said male tube; expanding one end of a second tube to receive said male end, thus forming a female end; and connecting said male and female ends.

4,161,274

## DOOR PANEL FOR MAIL BOX UNIT

Allan T. Bishop, Senneville, and Maurice Wytruk, La Salle, both of Canada, assignors to Accessories Manufacturers, Ltd., Montreal, Canada

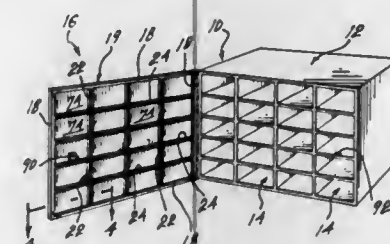
Filed Jan. 6, 1978, Ser. No. 867,460

Claims priority, application Canada, Oct. 24, 1977, 289377

Int. Cl.<sup>2</sup> B65D 91/00; F16B 12/00

U.S. Cl. 232—24

7 Claims



1. A door panel for covering the open face of a mail box having a series of individual mail receiving compartments, comprising, in combination: a peripheral frame adapted to be hingedly mounted to said mail box; a grid structure consisting of interlocked horizontal and vertical channel members, each member comprising a pair of transversely spaced walls connected along one edge thereof by and integral with a web; a first of said interlocked channel members having at least one opening through the web thereof and a pair of slots longitudinally spaced in each of said walls and contiguous with said opening to define oppositely disposed wall projecting portions extending toward said opening; a second of said channel members interlocked with said first channel member having a pair of longitudinally spaced slots in each of the walls thereof, said slots extending from the free edge of said walls to a distance thereon less than the overall width of each said wall to define a pair of oppositely disposed tongues, said tongues being deformingly bent inwardly in the channel of said first channel member thereby securing said first and second channel members together.

4,161,275

## CENTRIFUGAL LIQUID CLEANER

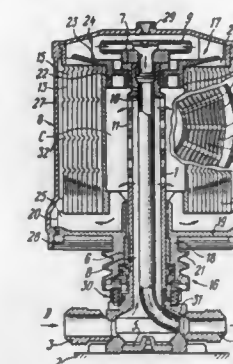
Viktor A. Berber, Shelkovichnaya ulitsa, 184, kv. 65; Vladimir I. Mozyakov, Shelkovichnaya ulitsa, 190, kv. 47, and Nikolai A. Khodosov, Oktyabrsky poselok, 6 linia, 36, all of Saratov, U.S.S.R.

Filed May 24, 1978, Ser. No. 909,294

Int. Cl.<sup>2</sup> B04B 11/02

U.S. Cl. 233—31

3 Claims



1. A centrifugal liquid cleaner comprising: a base; a hollow axle which is vertically arranged and fixedly secured to said base, said axle having an inlet for liquid to be cleaned and an outlet for cleaned liquid; a cylindrical rotor mounted on said hollow axle for rotation thereabout; a drive for rotating said cylindrical rotor; said cylindrical rotor having: an upper impeller and a lower impeller, a sleeve coaxial with said hollow axle mounted between said upper and lower impellers and connected thereto for combined rotation, a band of a height substantially equal to the sleeve height having one end fixed to said sleeve and wound thereon in the form of a spiral, spacers arranged in a succession in the radial direction between the turns of the spiral of said band in parallel with said hollow axle, apertures for the passage of cleaned liquid defined by said spacers and said band; ridges provided longitudinally on said band vertically spaced along its height and cambering towards said hollow axle, a casing connected to said upper and lower impellers to close said sleeve and band, and upper and lower impellers, spaces in said casing between the end faces of said sleeve and band and said upper and lower impellers, one of said spaces communicating with the inlet and the other with the outlet of said hollow axle, said spaces communicating with each other through said apertures; a pressurizing disk mounted in said casing on said hollow axle above the upper impeller.

4,161,276

## COMPLEX LOGICAL FAULT DETECTION APPARATUS AND METHOD

Eric Sacher, Phoenix, Ariz., and Thomas E. Trebelhorn, San Diego, Calif., assignors to NCR Corporation, Dayton, Ohio  
Filed Mar. 1, 1978, Ser. No. 882,518

Int. Cl.<sup>2</sup> G06F 11/00

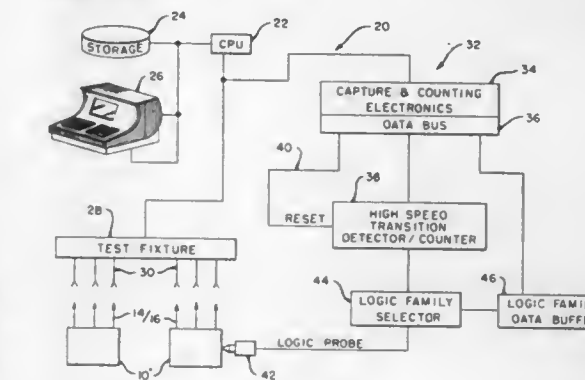
U.S. Cl. 235—302

8 Claims

1. The method of testing a logic circuit having a binary input thereto and a binary output therefrom for error producing malfunctions comprising the steps of:

- applying a plurality of preselected binary test patterns to the input of a first known good identical logic circuit according to a preselected sequence;
- counting the number of transitions in logic state of the output of the first known good identical logic circuit from the application of each binary test pattern until a stabilized output state is reached;
- saving the number of transitions counted and the logic state of the stabilized output for each binary test pattern of the first known good identical logic circuit;
- applying the plurality of preselected binary test patterns

of step (a) to the input of a second known good identical logic circuit according to the sequence of step (a);  
(e) counting the number of transitions in logic state of the output of the second known good identical logic circuit from the application of each binary test pattern until a stabilized output state is reached;  
(f) comparing the transitions counted and final logic state of the first known good identical logic circuit to those of the second known good identical logic circuit for each test pattern;  
(g) tagging as an indeterminate value each transition count and logic state saved in step (c) which does not compare identically with the respective transition count and logic state determined for the second known good identical logic circuit;



- applying the plurality of preselected binary test patterns used in step (a) to the input of the logic circuit to be tested according to the sequence of step (a);
- counting the number of transitions in logic state of the output of the logic circuit being tested from the application of each binary test pattern until a stabilized output state is reached;
- comparing the transitions counted and final logic states as saved in step (c) and tagged in step (g) to those of the logic circuit being tested for each test pattern; and,
- indicating an error condition if either the compared transitions count or final logic state associated with a test pattern is not identical.

4,161,277

## IMPROPER COPY RUN PROGRAM ENTRY CHECK FOR ELECTROSTATIC TYPE REPRODUCTION OR COPYING MACHINES

Edward L. Steiner, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,021

Int. Cl.<sup>2</sup> G06F 11/00

U.S. Cl. 235—304

4 Claims

1. In a reproduction machine for producing impressions of an original, the reproduction machine having a photosensitive member and a plurality of discrete operating components cooperable with one another and the photosensitive member to electrostatically produce the impressions on support material, the method of checking for an improper copy run instruction entry to the reproduction machine comprising the steps of:

- inputting instructions to the reproduction machine for a copy run to be accomplished by the photosensitive member and the plurality of discrete operating components, the instruction depending upon at least one predetermined operating condition of one of the machine operating components,
- checking said one operating component to determine the readiness of the operating condition,

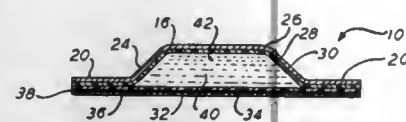
1. A nebulizer device capable of reducing a flowable liquid to an ultrafine dispersion of liquid particles in a propellant gas, comprising a mixing element comprising (a) a microporous member having a multiplicity of liquid passages therethrough, said passages having entrance orifices adapted to receive a supply of said flowable liquid and exit orifices sufficiently small that when filled with said liquid, the liquid is retained therein by capillary attraction and is prevented from flowing therefrom under ambient conditions except as liquid is supplied through said liquid passages to said exit orifices, (b) a filming surface communicating with said exit orifices and having some affinity for said liquid, and (c) a gas orifice comprising an edge of said filming surface spaced from said exit orifices and communicating with a gas conduit adapted to transmit a supply of gas through said gas orifice, whereby liquid which flows through said liquid passages is adapted to exit said exit orifices as thin liquid streams which adhere to said filming surface as a continuous thin liquid film which extends to the edge of said filming surface comprising said gas orifice where the thin liquid film is adapted to be drawn into the gas flowing through said gas passage, the drawing of said liquid film into said gas flow causing said film to be stretched across said filming surface as a very thin continuous film of said liquid for introduction into said gas flow to form said ultrafine dispersion.



37. Method for reducing a flowable liquid to an ultra-fine dispersion of liquid particles in a propellant gas comprising the steps of:

- (a) confining a flowable liquid within a microporous element comprising a multiplicity of microscopic liquid passages having entrances communicating with a supply of liquid and having as the only means for escape a multiplicity of exit orifices sufficiently small that when filled with liquid, the liquid is retained therein by capillary attraction and is prevented from flowing therefrom under ambient conditions except as liquid is supplied to said exit orifices,
- (b) causing said flowable liquid to flow into said entrances, through said liquid passages and out of said exit orifices onto a filming surface having some affinity for said liquid whereby said liquid forms a thin continuous liquid film having a thickness of about 0.01 inch or less on said filming surface extending from said exit orifices to an edge of said filming surface which is spaced from said exit orifices, and
- (c) causing a supply of gas to flow at sufficient velocity through a gas orifice which communicates with said edge of said filming surface and against said continuous liquid film which extends to said edge, thereby causing said continuous liquid film to become stretched as a very thin continuous film of said liquid on said filming surface and to be drawn into said gas flow to form said ultra-fine dispersion.

**4,161,283**  
**ARTICLE FOR THE DISPENSING OF VOLATILES**  
 Sy Hyman, 425 E. 58 St., New York, N.Y. 10022  
 Filed Jun. 3, 1977, Ser. No. 803,369  
 Int. Cl.<sup>2</sup> A61L 9/04  
 U.S. Cl. 239—55 19 Claims

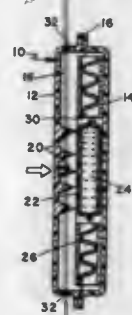


19. An article for the dispersion of a volatile substance to the surrounding atmosphere comprising a layer of a molecular diffusion polymer and a layer substantially impervious to molecular diffusion, said layers being heat bonded to each other along their respective peripheral portions to form a reservoir portion for containing a liquid volatilizable substance, another layer substantially impervious to molecular diffusion overlying said molecular diffusion layer, whereby the liquid volatilizable substance may diffuse through the first said layer to the surrounding atmosphere.

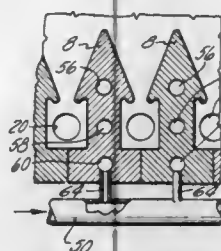
**4,161,284**  
**SLOW DIFFUSER-AIR SCENT**  
 Horace E. Rattan, P.O. Box 287, El Centro, Calif. 94423  
 Filed Feb. 9, 1978, Ser. No. 876,536  
 Int. Cl.<sup>2</sup> A24F 25/00  
 U.S. Cl. 239—43 4 Claims

1. A fragrance dispensing packet comprising:
  - (a) an outer container having a pair of semi-rigid walls spaced apart to define a space therebetween;
  - (b) a rupturable pod containing an evaporable fragrant substance disposed in said space;
  - (c) at least one of said walls being yieldable adjacent said space;
  - (d) at least one of said walls having an inwardly directed

spike adjacent said pod to rupture same upon said walls being compressed together; and



**4,161,285**  
**LASER NOZZLE CONSTRUCTION**  
 Paul Matheny, Tequesta, and Joe T. Akin, Jupiter, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.  
 Filed Dec. 22, 1977, Ser. No. 863,494  
 Int. Cl.<sup>2</sup> B05B 15/00  
 U.S. Cl. 239—132.3 6 Claims



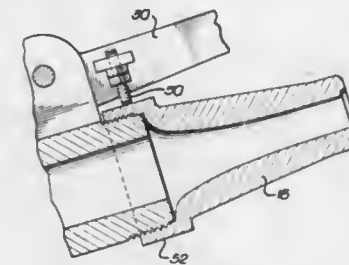
1. A laser nozzle comprising a plurality of stacked elongated nozzle members, each nozzle member having two elongated projections on each side thereof, a forward projection and a rearward projection, each rearward projection being formed having a flat outer surface, each forward projection being formed having a tapered outer surface, said tapered outer surface tapering inwardly as it extends to the forward end of the nozzle member, said nozzle members being placed adjacent each other so that in their stack the flat surfaces of the rear projections meet to form a solid wall and said forward projections are spaced, adjacent forward projections of adjacent nozzle members forming an elongated nozzle, a cavity being formed between each pair of meeting rearward projections and spaced forward projections of adjacent nozzle members, side plates enclosing the ends of the plurality of nozzle members, end plates being placed at each end enclosing the ends of the cooperating side plates and exposed surface of the end nozzle members, openings in said side plates being connected to the cavities formed by the projections for directing a lasing gas thereto.

**4,161,286**  
**SELF-COMPENSATING NOZZLE CONSTRUCTION**  
 John D. Beamer, West Covina, and William J. Wichman, Glendora, both of Calif., assignors to Rain Bird Sprinkler Manufacturing Corporation, Glendora, Calif.  
 Filed Oct. 25, 1977, Ser. No. 844,659  
 Int. Cl.<sup>2</sup> B05B 3/14  
 U.S. Cl. 239—230 3 Claims

1. In a part-circle water sprinkler having a sprinkler body, a replaceable nozzle from which a continuous stream of water is ejected, a forward drive arm to provide incremental angular

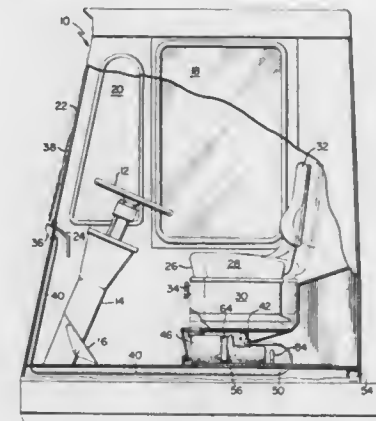
movement in a forward direction, and a reverse drive arm movable into the water stream to provide a reverse movement, the improvement comprising:

first means, located on said nozzle, to limit the extent of movement of said reverse drive arm into the water stream, to a degree dependent upon the nozzle size; and



second means, located on said reverse drive arm, to abut said first means and thereby determine the extent to which said reverse drive arm is moved into the water stream, whereby larger or smaller nozzle sizes and correspondingly larger or smaller stream diameters will not substantially affect the acceleration force provided by said reverse drive arm.

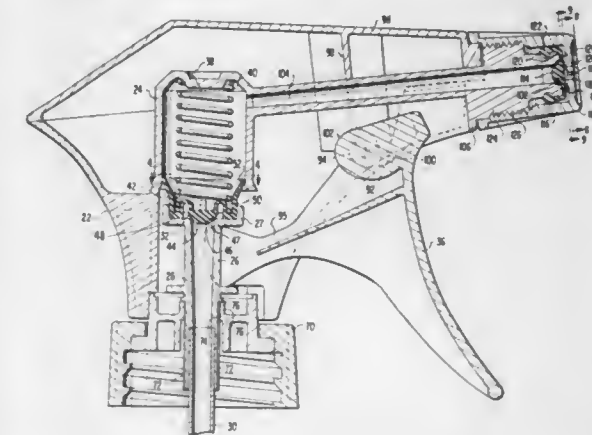
**4,161,287**  
**VEHICLE LIQUID WINDOW WASHER BOTTLE AND ENCLOSURE**  
 William J. Brown, Naperville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.  
 Filed Jul. 8, 1977, Ser. No. 814,236  
 Int. Cl.<sup>2</sup> B05B 3/18  
 U.S. Cl. 239—284 R 5 Claims



1. An enclosure for a bottle adapted to contain a liquid for dispensement therefrom, said enclosure including surrounding walls, an upper one of said walls having a hole there-through, a bottle mounted on a bottom said wall and being securely attached thereon, said bottle including a neck extending therefrom and intercommunicating with the interior of the bottle, said neck extending through said hole and having a filling opening at the end thereof, a dispensing tube connected to said bottle, said neck having a bead thereon intermediate said filling opening and the body of said bottle, a resilient sealing annulus disposed between said bead and the underside of said upper wall and sealing the interior of said enclosure from the exterior, a filling opening closure cap having a lower annular portion resiliently engaged and sealed in said filling opening, said cap having a flange thereon above said lower annular portion, said flange being engageable over said hole in said upper wall and being in sealing engagement with the upper surface of said upper wall, and effecting a continuous seal extending from the neck terminal end, over the upper wall hole and the upper surface of said upper wall, said cap lower portion and said flange additionally coacting with said enclosure

and said bottle neck to substantially eliminate movement of said bottle neck with respect to the upper wall hole in said enclosure.

**4,161,288**  
**FLUID DISPENSER METHOD AND APPARATUS**  
 James C. McKinney, Atlanta, Ga., assignor to Creative Dispensing Systems, Inc., Atlanta, Ga.  
 Filed Oct. 5, 1976, Ser. No. 729,798  
 Int. Cl.<sup>2</sup> B65D 47/34  
 U.S. Cl. 239—333 26 Claims



1. An apparatus for dispensing fluids from a container comprising:
 

- a housing;
- a trigger;
- means for pivotably mounting said trigger to said housing including a member configured in an open spiral on one of said housing and said trigger and a peg on the other one of said housing and said trigger configured for disposition within the interior space defined by said spiral shaped member;
- a pump chamber having a piston movable through a limited stroke responsive to said trigger for varying the volume of said pump chamber, whereby the limits of the piston stroke limit the pivoting movement of said trigger;
- an outlet valve having a valve member for blocking communication with said chamber responsive to the pressure in said chamber;
- a nozzle cap for adjustably contacting said outlet valve member to vary the discharge pattern of the fluid dispensed;
- inlet conduit means attached to said piston and communicating with the container, providing a venting passage for the container selectively blocked by mating surfaces on said conduit means and container responsive to movement of the piston; and
- a flexible member slidably contacting the wall of said pump chamber for blocking communication between said pump chamber and said inlet conduit means responsive to the pressure in said chamber.

**4,161,289**  
**AIRBRUSH**  
 Jerome I. Rebold, Timonium, Md., assignor to CBS Inc., New York, N.Y.  
 Filed Apr. 14, 1978, Ser. No. 896,252  
 Int. Cl.<sup>2</sup> B05B 7/30  
 U.S. Cl. 239—346 10 Claims

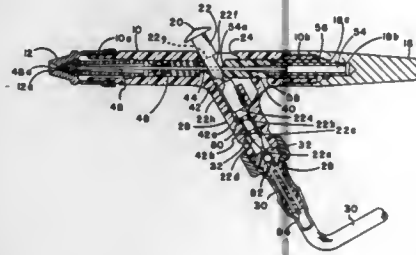
1. An airbrush of the double-action type, comprising:
 

- a unitary body including an elongated portion having forward and rearward ends and having an axial passage therein for a needle, and a cylindrical portion depending from an intermediate point of the elongated portion and

having a passage intersecting the axial passage in said elongated portion for receiving a finger-operated lever, an internally tapered air cap threadably secured to the forward end of the elongated portion of said body, a jet supported within and in fixed spatial relationship with said air cap,

a closure cap closing the rearward end of the elongated portion of said body adapted for longitudinal adjustment on said elongated portion and having an internal recess formed therein coaxially with said axial passage,

a needle having a tapered forward end supported in said axial passage for longitudinal movement therein, said needle being guided at a point forwardly of said intermediate point by paint-to-air sealing means disposed within said axial passage and secured at its other end to and guided by an elongated guide member a forward portion of the length of which is supported within said axial pas-

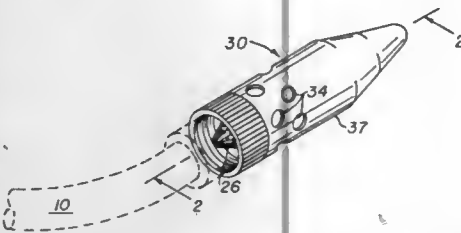


sage for longitudinal movement therein and a rearward portion of the length of which extends into the recess in said closure cap,

spring means cooperatively arranged with said closure cap and said guide member for normally biasing said needle to a position at which the tapered front end thereof is seated in said jet, and

a finger-operated lever supported in the passage in said depending cylindrical portion to engage the forward end of the forward portion of said guide member for moving the needle against the action of said spring means, the extent of movement being limited by engagement of the rearward end of the rearward portion of said guide member with the bottom of the recess in said closure cap, whereby the maximum opening of the airbrush is predetermined by the adjusted position of the closure cap on the elongated portion of said body.

**4,161,290**  
**WATERING DEVICE**  
J. Ernest Hill, 3114 Linkwood, Houston, Tex. 77025  
Continuation-in-part of Ser. No. 727,033, Sep. 27, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,551  
Int. Cl.<sup>2</sup> B05B 1/16  
U.S. Cl. 239—396 2 Claims



1. A device for controlling the flow of liquid, comprising: a connector portion including;

a threaded skirt portion adapted for engagement with a liquid source,

web portion separating said threaded portion from the interior of a nipple member,

an axial bore of at least three sided configuration adapted to receive a movable disc between the walls of said skirt

portion, and a lateral bore within said web portion in communication with said axial bore,

orifice means through said web portion in communication with said nipple member and said lateral bore,

movable disc member, correlative in diametrical configuration with said axial bore, having a said aperture being so spaced that only one may communicate with said lateral bore at one time, plurality of differently sized apertures therethrough, and

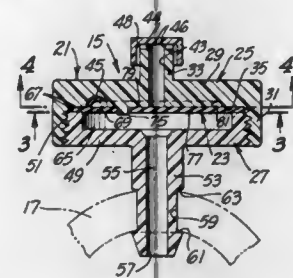
a nipple member adjacent said web portion opposite said connector skirt portion including;

deflector means at one end thereof,

at least one turbulence chamber adjacent said deflector means, and

aperture means through the wall of said nipple member.

**4,161,291**  
**EMITTER**  
Clarence Bentley, 9256 Stamps Ave., Downey, Calif. 90240  
Filed Nov. 1, 1978, Ser. No. 956,805  
Int. Cl.<sup>2</sup> B05B 15/00  
U.S. Cl. 239—542 10 Claims



1. An emitter for use in drip irrigation comprising: body means for defining an emitter chamber, said body means including a first surface defining at least a portion of said emitter chamber;

a resilient element having first and second opposite faces; means for mounting the resilient element in said emitter chamber with said first face confronting and closely adjacent said first surface;

said first surface and said first face cooperating to define a restricted fluid passage;

said body means including an inlet for supplying fluid under pressure to the emitter chamber and the second face of the resilient element;

said resilient element having aperture means providing communication between said second face of said resilient element and said restricted fluid passage;

said body means including an outlet leading from said restricted fluid passage whereby fluid under pressure can pass from the inlet through said aperture means and said restricted fluid passage to said outlet; and

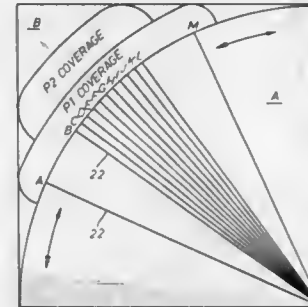
means on said resilient element at said aperture means for increasing the pressure drop across said resilient element whereby the pressure drop urges the resilient element against the first surface to maintain the integrity of the restricted fluid passage even at relatively low flow rates through the aperture means.

**4,161,292**  
**CENTER PIVOT IRRIGATION SYSTEM HAVING APPARATUS FOR IRRIGATING CORNERS**  
Huland L. Holloway, Melbeta, and Edward M. Norum, Jr., Gering, both of Nebr., assignors to Lockwood Corporation, Gering, Nebr.

Filed Mar. 17, 1977, Ser. No. 778,470  
Int. Cl.<sup>2</sup> B05B 3/12

U.S. Cl. 239—11

15 Claims



1. A center pivot irrigation system adapted to provide corner irrigation comprising:

- a main pipeline sprinkler rotatable about a center and having a plurality of main fluid discharge nozzles spaced therealong for controllably providing fluid to a central, generally circular area;
- a signal generator for producing a set of at least one control signal in response to and indicative of the rotational position of the main pipeline sprinkler;
- a drive mechanism for rotating the main pipeline sprinkler in response to the set of control signals, the drive mechanism rotating the main pipeline sprinkler at a substantially constant first rate for irrigating areas corresponding to non-corner orientations, and at an intermittent rate for irrigating areas corresponding to corner orientations, the intermittent rate defined in part by a zero rate period of predetermined duration during which the main pipeline sprinkler is not rotating; and
- an auxiliary sprinkler including at least first and second auxiliary nozzles disposed substantially at the end of the main pipeline sprinkler, the first auxiliary nozzle operated by the set of control signals for irrigating said corner areas only during said zero rate periods, and the second auxiliary nozzle being operated alternately of the first auxiliary nozzle by the set of control signals.

**4,161,293**  
**BLOWER BEATER MILL**  
Richard Beelmann, Mülheim; Johannes Kerstges, Oberhausen, and Paul Mertens, Mülheim, all of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,768

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658469

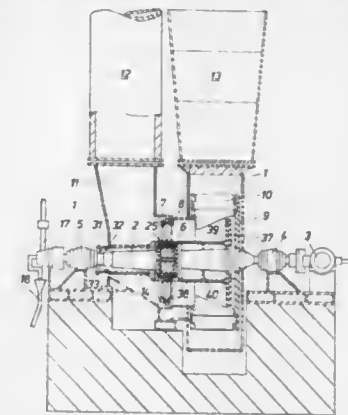
Int. Cl.<sup>2</sup> B02C 13/10

U.S. Cl. 241—56

7 Claims

1. A blower beater mill for grinding and drying, comprising: a mill shaft with hub rings; a rotor having a beater portion located on said mill shaft and having a fan impeller, said beater portion having beater arms; said beater arms of said beater portion being fastened in spaces between said hub rings of said mill shaft; said mill shaft being water-cooled along its longitu-

dinal axis; said hub rings having shaft cams; and an outside jacket enclosing said shaft cams at a spaced distance therefrom;



said outside jacket having cutouts for passage of said beater arms.

**4,161,294**  
**BLOWER BEATER MILL**  
Friedrich W. Lautenschläger, Gechingen, and Hermann Hennecke, Mülheim, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

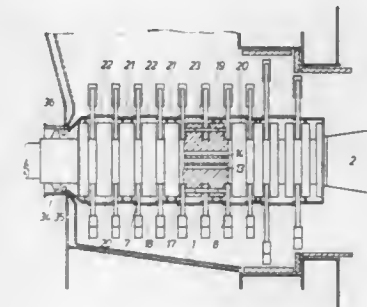
Filed Dec. 19, 1977, Ser. No. 861,540

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728750

Int. Cl.<sup>2</sup> B02C 13/10

U.S. Cl. 241—56

9 Claims



1. A blower beater mill for grinding and drying, comprising: a mill shaft water-cooled along its longitudinal axis and having hub rings; a rotor having a beater portion located on said mill shaft and having a fan impeller; beater arms of a beater portion being fastened between said hub rings of said mill shaft; said hub rings having shaft crests; jacket means enclosing said shaft crests at a spaced distance therefrom; said jacket means comprising individual rings, said beater arms passing through said individual rings.

**4,161,295**  
**BLOWER BEATER MILL**  
Hermann Hennecke; Paul Mertens, both of Mülheim, and Josef Krecher, Dorsten, all of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,763

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658467

Int. Cl.<sup>2</sup> B02C 13/10

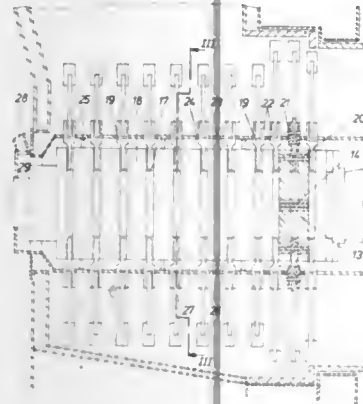
U.S. Cl. 241—66

10 Claims

1. A blower mill, comprising: a rotor with a beater portion having beater arms comprising three interconnected parts; one



of said three parts comprising an intermediate portion having at one end thereof a beater arm base connected thereto; a beater head connected to another opposite end of said intermediate portion; a shaft with hub rings; said hub rings having peripheral surfaces; two of said interconnected parts of said beater arms having fastening elements above said peripheral surfaces of the hub rings; cover elements located axially with



said rotor in a free space between beater arm bases and radially at a distance above said peripheral surfaces of said hub ring; said cover elements being located on a diameter between said peripheral surfaces of said hub rings and said fastening elements of the beater arm parts; said three parts comprising said intermediate portion, beater arm base and beater head with connections of said three parts being above said cover elements.

4,161,296

**GRANULATOR WITH FORCED FEED ASSEMBLY**

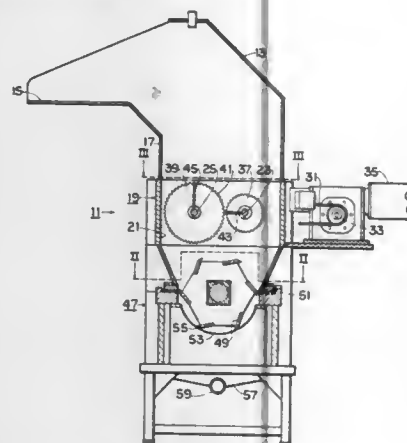
Frank Parker, and Leslie M. Parker, both of Old Brandon Rd., Hillsboro, Tex. 76645

Filed Jun. 9, 1978, Ser. No. 914,037

Int. Cl.<sup>2</sup> B02C 23/00

U.S. Cl. 241—152 A

15 Claims



1. In an apparatus for granulating articles into particles of the type having a chute with an entry for insertion of the articles to be granulated, and a grinder chamber in communication with the chute, the grinder chamber enclosing a plurality of rotor knives that are rotated past a stationary knife for cutting the articles and a perforated screen mounted below the rotor knives having apertures that allow the particles to pass through for collection, a force feeding means for urging the articles into the grinder chamber, comprising:

- a force feeding chamber located between the grinder chamber and the entry of the chute;
- a shaft extending across the force feeding chamber;

drive means for rotating the shaft; a pair of plates mounted on the shaft for rotating therewith and spaced apart a selected distance; each plate having a plurality of teeth formed on at least a portion of its edge for grabbing and tearing the articles; and a web mounted between the pair of plates for crushing and pushing the articles into the grinder chamber.

4,161,297

**YARN FEEDING DEVICE**

Sergio Vella, Via Trossi 10, 13051 Biella (Vercelli), Italy

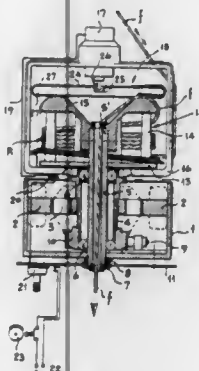
Filed Mar. 10, 1976, Ser. No. 665,568

Claims priority, application Italy, Mar. 10, 1975, 21079 A/75

Int. Cl.<sup>2</sup> B65H 51/20

U.S. Cl. 242—47.01

9 Claims



1. Yarn feeding device with constant adjustable tension, the yarn being fed from a yarn source to a yarn using device, particularly for use in weaving and knitting machines, of the type comprising: a fixed hollow body, around which the yarn coming from said source is wound into turns by an element rotating outwardly of said fixed body and coaxially thereto, to form thereon a yarn reserve from which the actual yarn is drawn, to be sent to said yarn using device, passing inside the fixed hollow body, adjustable brake means cooperating with said fixed body for braking the yarn with constant intensity, downstream of said yarn reserve; and means associated to the fixed hollow body, for adjusting and keeping even the amount of said yarn reserve; said yarn feeding device being characterized in that, the brake means comprise a round element, formed by a solid central part and by a peripheral part with radial blades, arranged between an electromagnet mounted on said rotary element for winding the yarn, and the outer edge of said hollow body onto which the yarn gets wound, said blades being elastically bent at their ends with which they engage said edge, and said electromagnet housing the end of its core into an appropriate seat provided at the centre of the solid part of said round element.

4,161,298

**WINDING MACHINE**

Daryl Davis, 3221 Tanglewood Trail, Fort Worth, Tex. 76109

Filed Apr. 11, 1978, Ser. No. 895,509

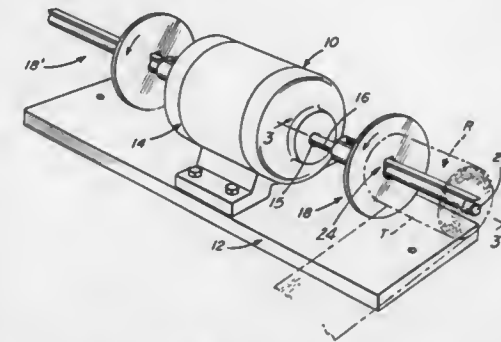
Int. Cl.<sup>2</sup> B65H 17/02

U.S. Cl. 242—67.1 R

8 Claims

1. A winding machine, comprising, in combination:
  - (a) a shaft;
  - (b) connector means attached to the shaft for coupling the shaft to an associated drive shaft for rotation by the drive shaft, and
  - (c) guide means engageable with a tape being wound for guiding the tape as the shaft is rotated and causing the tape to wind on the shaft, the connector means including a cylindrical collar provided with a through bore arranged for receiving the associated drive shaft, the shaft of the

winding machine being partially inserted into the bore as well, and clamp means provided on the collar and engage-



ing the shaft and engageable with the drive shaft for holding the shaft in the collar and the collar on the drive shaft.

4,161,299

**AIRCRAFT PERFORMANCE DATA QUALIFIER**

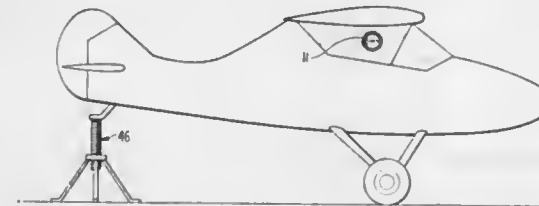
Leonard F. Smisson, 1607 W. Michigan, Midland, Tex. 79701

Filed Apr. 20, 1978, Ser. No. 898,166

Int. Cl.<sup>2</sup> B64D 43/00

U.S. Cl. 244—1 R

4 Claims



1. A calibrated apparatus to obtain performance data for maximum cruise economy on aircraft and wherein the apparatus is mounted on the aircraft for viewing by the crew thereof, said apparatus comprising, a plurality of relatively thin, round, flat discs mounted concentrically with one another about a center point, said discs being rotatable with respect to one another, said rotatable concentrically mounted discs comprising an upper disc, a middle disc and a base disc, the upper disc and base disc being fixed to one another with the middle disc being rotatable with respect to the upper and base discs, indicating means positioned on the upper disc and being movable across the surface of said upper disc, the indicating means having a proximal end and a distal end wherein the proximal end is pivotally engaged with the upper disc, leveling means integral with the indicating means wherein said leveling means comprising a leveling bubble, the upper disc having an elongated aperture therethrough at a fixed radius from the center point, indicia means located in juxtaposition with said elongated aperture, said indicia means indicating a first set of flight parameters of the aircraft, the middle disc having indicia means located thereupon in cooperative relationship with the elongated aperture of the upper disc for viewing through said elongated aperture at predetermined times when said elongated aperture is positioned in juxtaposition with the middle disc, indicia means imprinted on the middle disc at a fixed radius from the center point adapted for viewing through said elongated aperture, said indicia means indicating a second set of flight parameters, the indicating means movable with respect to the elongated aperture of the upper disc and adapted to point to various indicia of the upper and middle disc, whereby to obtain maximum cruise economy using the previously calibrated apparatus the crew climbs the aircraft to a designated altitude and enters the first set of flight parameters, then enters the second set of flight parameters, then adjusts the indicating means to a predetermined setting relative to the

second set of flight parameters, then adjusts power of the aircraft until the leveling bubble centers thereby indicating a condition of maximum cruise economy.

4. The method of obtaining performance data for maximum cruise economy on a aircraft utilizing a computer instrument mounted on an aircraft for viewing by the flight crew thereof, the instrument having three flat discs mounted concentrically about a center point and rotatable with respect to one another, an indicating means positioned on the first of said discs and being movable across the surface of said first disc, leveling bubble means integral with the indicating means, the first disc having an elongated aperture therethrough with indicia means located in juxtaposition with the elongated aperture indicating a first set of flight parameters of the aircraft, the second of said discs having indicia means located thereupon in cooperative relationship with the elongated aperture of the first disc for viewing through said elongated aperture at predetermined times, said indicia means indicating a second set of flight parameters, the indicating means movable with respect to the elongated aperture of the first disc and adapted to point to various indicia of the first and second discs, the method comprising the steps of, flying at a predetermined altitude with known relative wind and temperature, recording at selected air speeds of the aircraft the fuel flow and angle of attack, computing specific range against angle of attack, plotting air speed against specific range and angle of attack for each air speed point, determining from the plot the best air speed for maximum range of said aircraft, transferring the plotted points to the computer instrument, setting the first disc relative to the second disc to show current free air temperature and altitude, setting the indicating means to the effective relative wind, centering the bubble of the leveling means by power increases or reductions of the aircraft, thereby indicating maximum cruise economy.

4,161,300

**CANARD TYPE AIRCRAFT**

Hans Schwaerzler, Taufkirchen, and Werner Staudacher, Zorneding, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

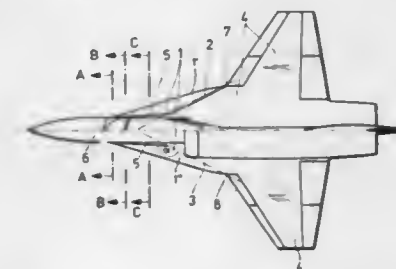
Filed Dec. 12, 1977, Ser. No. 859,685

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656692

Int. Cl.<sup>2</sup> B64C 5/04, 5/10

U.S. Cl. 244—45 A

7 Claims



1. A canard type aircraft comprising fuselage means (6) having a longitudinal axis, wing means (4) operatively secured to said fuselage means, steering means (1', 1'') operatively secured to said wing means so that said steering means are tiltable about a tilting axis extending at an acute angle relative to said longitudinal axis of said fuselage means (6), said steering means (1', 1'') each comprising a first edge (5) facing the aircraft fuselage means (6), and a second edge (2, 3) facing the respective wing means (4), said first and second edges (2, 5; 3, 5) including an obtuse angle ( $\alpha$ ), said second wing means facing edge (2, 3) substantially defining said tilting axis, said fuselage means (6) having surface areas facing the first edge (5) of the respective steering means (1', 1''), said first edge having a shape substantially conforming to the shape of the respective fuselage surface area facing said first edge, said first edge being



movable relative to said fuselage, whereby an effective sealing between said fuselage means and said first edge (5) facing said fuselage means (6) may be maintained substantially in all positions of said first edge relative to said fuselage means.

#### 4,161,301 DEPLOYMENT APPARATUS FOR STORES FROM VEHICLES

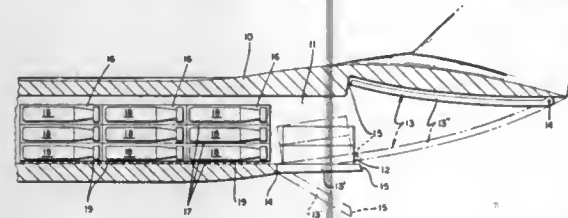
Richard G. Beardsley, Gainesville, and Norman S. Currey, Atlanta, both of Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed Feb. 27, 1978, Ser. No. 881,175

Int. Cl.<sup>2</sup> B64D 1/10

U.S. Cl. 244—137 R

10 Claims



1. A deployment apparatus for stores from a vehicle during movement comprising:
  - at least one carrier pallet formed by a plurality of parallel cradles each adapted to receive and secure one of said stores;
  - releasable lock elements on each said pallet complementary to, for coaction with, lock elements on adjacent stationary structure of the vehicle operable to immovably secure said at least one pallet on said vehicle against relative movement;
  - releasable connector elements carried by each said pallet to permit the interconnection of each said pallet with another similar pallet in vertical alignment;
  - a drive mechanism engageable between each said pallet and cradle and operative to move said cradle linearly relative to said pallet;
  - releasable coupling elements carried by each said drive mechanism whereby each said pallet is connectable to another said pallet with the cradles thereof disposed in fore and aft alignment;
  - a releasable mechanism operative to permit movement of each said store relative to its cradle; and
  - an actuator for the operation of said release mechanism at a predetermined location of said cradle in its movement by said drive mechanism.

#### 4,161,302 RETAINING STRUCTURE FOR GUTTER DOWNSPOUTS

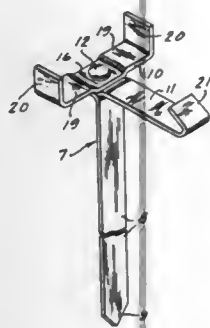
Frank A. Stuhlman, Rte. 3, Weller Dr., Plainfield, Ill. 60544

Filed Aug. 17, 1977, Ser. No. 825,221

Int. Cl.<sup>2</sup> B05B 15/06; E04D 13/08

U.S. Cl. 248—49

6 Claims



1. A supporting structure for a laterally extending terminal

portion of a gutter downspout, comprising an elongated supporting member adapted to be disposed in the ground and extend upwardly therefrom, said supporting member having its upper end terminating in a transversely extending flange, a downspout-receiving member having an intermediate portion thereof disposed at said flange and extending at substantially right angles to the supporting member to form a generally T-shaped structure, the free ends of said downspout-receiving member having upwardly extending portions spaced apart a sufficient distance to receive a downspout therebetween with said free ends disposed adjacent to the side walls of such a downspout for restricting lateral movement of the latter relative to said supporting member, and an elongated retaining member extending in the general plane of said downspout-receiving member at approximately right angles to the latter, adapted to be disposed adjacent the bottom wall of such a downspout, said supporting, receiving and retaining members comprising individual members formed from flat strip stock, said retaining member having one end thereof disposed adjacent said T-shaped structure at the juncture of said supporting and downspout-receiving members, said flange, the intermediate portion of said downspout-receiving member, and the adjacent end of said retaining member being disposed one upon the other and secured together thereat to form a unitary structure, the opposite free end of said retaining member extending upwardly and rearwardly, whereby the end edge of the bottom wall of such a downspout may be disposed between said free end and the adjacent intermediate portion of said retaining member for restricting upward movement of such a downspout relative to the supporting structure and restricting axial movement of the downspout in a forward direction toward such free end of said retaining member.

#### 4,161,303 KNOCKDOWN CONNECTOR AND GUIDEWAY ASSEMBLY

Pierre Bachand, 149 rue Maurice, Rosemere, Quebec, Canada

Filed Jan. 3, 1978, Ser. No. 866,772

Int. Cl.<sup>2</sup> A47G 29/02

U.S. Cl. 248—246

5 Claims



1. A knockdown connector and guideway assembly wherein the guideway is a box-shaped channel having a back wall, side walls and co-planar flanges extending from the outer edges of said side walls towards each other and separated by a slot, of uniform width, extending longitudinally of said channel, the inside face of said back wall and the inside faces of said flanges being uniformly spaced-apart longitudinally of the channel, but the inside faces of said flanges diverging transversely of the channel from said side walls towards said slot with respect to the inside face of said back wall, and wherein the connector includes an elongated base member having a central portion and opposite end portions, said opposite end portions being flat and co-planar with opposed substantially parallel main flat faces, said end portions having a uniform thickness of a value lying between the maximum and minimum distance between the inside face of each flange and of the back wall, said base member having a width less than the width of said slot and a length greater than the width of said slot, said base member being insertable within said channel through said slot and being rotatable in said channel about an axis of rotation passing through said central portion and substantially perpendicular to

the inside face of said back wall to a blocked position wherein said end portions become wedged between the inclined inside surfaces of said flanges and the inside surface of said back wall with the back flat surface of said connector in close contact with the inside surface of the back wall of said channel, and a holding member secured to said base member and extending through said slot.

#### 4,161,304 RUBBER ELASTIC ENGINE MOUNTS OR SUPPORTS WITH HYDRAULIC DAMPING, ESPECIALLY FOR ENGINE SUSPENSIONS IN MOTOR VEHICLES

Heinz Brenner, and Arno Hamaekers, both of Ahrweiler, Fed. Rep. of Germany, assignors to BOGE GmbH, Eltorf, Fed. Rep. of Germany

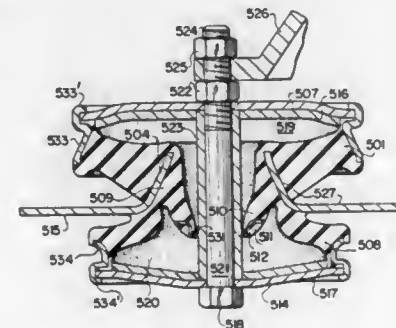
Filed Apr. 27, 1977, Ser. No. 791,309

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618333; Oct. 19, 1976, 2647105; Oct. 27, 1976, 2648526

Int. Cl.<sup>2</sup> F16F 15/04

U.S. Cl. 248—562

15 Claims



1. An elastic rubber engine mount with hydraulic damping, especially for engine suspensions in motor vehicles, comprising a first metallic end wall for connection to an engine casing, a second metallic end wall spaced axially from said first wall, a metallic supporting element for connection to an engine supporting frame, a first elastic rubber-like peripheral wall adheringly connected with said first end wall and with said supporting element, a partition formed at least in major part of a flexible elastic rubber-like material and connected with said supporting element so as to define with said first end wall and said first peripheral wall a liquid-filled main chamber of variable volume on one side of said partition, a second elastic rubber-like peripheral wall adheringly connected with said second end wall and with said supporting element so as to define an auxiliary liquid-filler chamber of variable volume on the other side of said partition, means defining a flow connection between said main and auxiliary chambers, and means rigidly connecting said first and second end walls together for joint movement relative to said supporting element, at least one of said end walls including a truncated conical surface extending about the central longitudinal axis of the mount, said supporting element also including a truncated conical surface disposed generally across from and facing, but axially displaced relative to, the conical surface of said one end wall such that the two conical surfaces define therebetween a truncated conical space having generally concentric inner and outer truncated conical surfaces inclined in the same sense toward the central longitudinal axis of the mount, and at least one of said rubber-like peripheral walls comprising a similar truncated conical body having inner and outer axially displaced, truncated conical surfaces adheringly connected to the corresponding inner and outer axially displaced, truncated conical surfaces of said one end wall and said supporting element such that the inner and outer adhering surface areas are axially displaced relative to each other.

#### 4,161,305 TILT CHAIR CONTROL MECHANISM

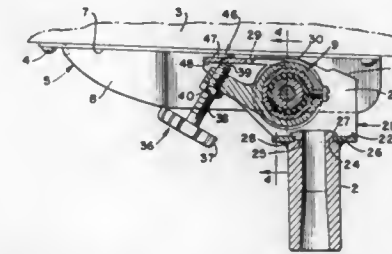
Philip J. Williams, Poland, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio

Filed Dec. 29, 1977, Ser. No. 866,166

Int. Cl.<sup>2</sup> A45D 19/04

U.S. Cl. 248—608

7 Claims



1. A control mechanism for a chair having a tiltable seat including, a relatively stationary control body having a pair of vertical spaced-apart side walls, a torsion unit provided with an outer sleeve having end portions journaled within openings in said side walls, said outer sleeve end portions normally angularly stationary relative to said control body side walls during tiltable displacement of said seat, an inner sleeve within said outer sleeve and joined thereto by an intermediate resilient element to provide a relative angular biasing action between said two sleeves, a spider assembly attached to said chair seat including a pair of depending side flanges respectively overlying the ends of said torsion unit inner sleeve, means locking said spider side flanges to said inner sleeve to preclude relative angular displacement therebetween, a tension lever having a collar surrounding said outer sleeve and a forwardly projecting arm constantly biased upwardly toward said seat, means locking said collar to said outer sleeve, a separate front stop member spanning and fixedly secured to the top forward portion of said control body side walls, said front stop member of case-hardened steel, adjustable tension regulating means carried by the distal portion of said tension lever arm and engageable with the undersurface of said front stop member whereby adjustment of said tension regulating means produces relative frictional motion between said regulating means and said front stop member, said case-hardened steel front stop member including a transverse plate engageable by said tension regulating means and a pair of rearwardly projecting arms each extending from said plate to a point overlying said outer sleeve, said arms spaced apart to define a central notch therebetween, at least a portion of said arms straddling the lateral limits of said tension lever collar, limit means on the upper surface of said front stop member abutting said spider assembly to define the forward tilt limit of said chair seat, and inclined stop ramps on the top of said control body side walls disposed rearwardly of said torsion unit and abutted by said spider assembly when tilted rearwardly.

#### 4,161,306 ELECTRO-MAGNETIC VALVE

Gerhard Brüne, Bamberg, and Manfred Lembke, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1976, Ser. No. 727,690

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1975, 2548774

Int. Cl.<sup>2</sup> F16K 31/06; H01F 5/00, 21/28

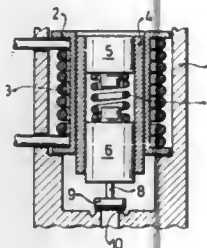
U.S. Cl. 251—129

2 Claims

1. An electro-magnetic valve which includes valve means, a valve housing, an iron core disposed along a principal axis within the valve housing, a plunger means coaxially oriented relative to the iron core and separated therefrom by an air gap, said plunger means being movable along the principal axis to open and close the valve means, a stationary magnetic winding means including a magnetic winding and a winding bobbin



disposed concentrically about the principal axis for moving the plunger toward the iron core, means for moving the plunger means away from the iron core, and a temperature compensating resistance connected to the magnetic winding means, the

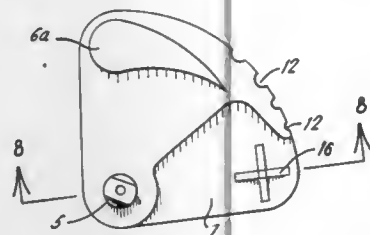


improvement wherein the magnetic winding is made of brass wire having a specific resistance greater than 20 milli-ohms per square millimeter of cross-section per meter length at a temperature of 20 degrees centigrade.

**4,161,307**  
**VALVES FOR VEHICLE HEATING SYSTEMS**  
Colin W. F. Clinch, Basingstoke; David N. Harley, Bournemouth, and John P. Palmer, Reading, all of England, assignors to ITW Limited, Basingstoke, England  
Filed Aug. 20, 1976, Ser. No. 716,060  
Claims priority, application United Kingdom, Aug. 23, 1975, 35112/75

Int. Cl.<sup>2</sup> F16K 5/10  
U.S. Cl. 251—206

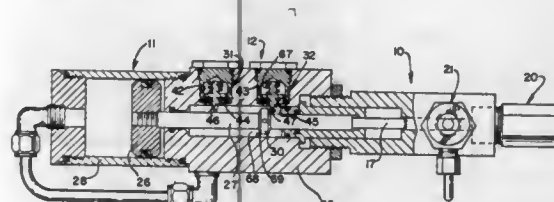
4 Claims



1. A plastic valve for a motor vehicle heater system, comprising a housing, inlet and outlet ports formed coaxially in said housing, and a substantially planar closure member mounted in said housing for pivotal movement between an open position and a closed position about an axis parallel to said axis of said ports, said closure member being substantially quadrantal and extending in a plane perpendicular to said axis of said ports and having an aperture which communicates between said inlet and said outlet ports when the closure member is in said open position, said closure member having a predetermined substantially rigid thickness through a substantial portion of its area including that portion carrying said axis and forming said aperture and a thinner more flexible portion which covers said outlet port when the closure member is in said closed position, said flexible portion of said closure member being stiffened locally in the area of said thin flexible portion which covers said outlet port when said closure member is in the closed position with said flexible portion permitting flexing movement of the closure along the axis of said ports to insure sealing at low pressures between said ports and said closure member further having notches in its periphery, said notches traversing said outlet port as said closure member pivots from said open position to said closed position, with said notches acting as pressure relief means between said open and closed positions.

**4,161,308**  
**SWITCHING VALVE ASSEMBLY FOR FLUID MOTOR-DRIVEN INJECTOR PUMP**  
Robert R. Bell, and William H. Alexander, both of Houston, Tex., assignors to Vapor Corporation, Chicago, Ill.  
Continuation-in-part of Ser. No. 666,920, Mar. 15, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,142  
Int. Cl.<sup>2</sup> F16K 1/16; F01L 25/02; F04B 17/00, 35/00  
U.S. Cl. 251—228

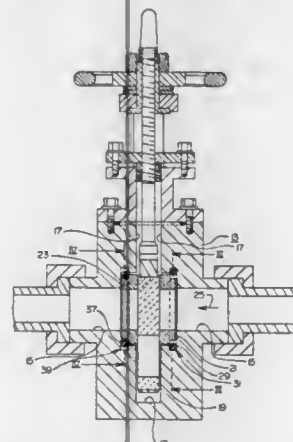
1 Claim



1. A dumping valve assembly for a switching valve device comprising a casing, a ring-shaped valve seat of resilient material supported by said casing and having a fluid passageway extending centrally therethrough, said seat having inlet and outlet sides at the opposite ends of the fluid passageway, and a valve closure member resiliently biased against the inlet side of the seat and having an actuating arm extending through the passageway and being tiltable relative to the seat for opening the valve assembly, said closure member including a disk-shaped central portion with the actuating arm extending from one side thereof, and a guide arm extending from the other side of said central portion, said arms being axially aligned along an axis extending through the center of the central portion and being conically shaped and identically formed whereby the closure member is symmetrical and weight balanced, whereby engagement and movement of the actuating arm causes the valve closure member to tilt and open the passageway.

**4,161,309**  
**FLUID BY-PASS/SEAL MEANS**  
Thomas A. Klyce, Memphis, Tenn., assignor to Mohawk Valve Company, Bartlett, Tenn.  
Filed Aug. 26, 1977, Ser. No. 828,199  
Int. Cl.<sup>2</sup> F16K 3/02  
U.S. Cl. 251—328

7 Claims

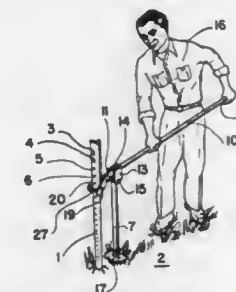


3. An improved gate valve of the type including a valve housing having a fluid passageway therethrough for allowing fluid to flow through said valve housing and having a gate-receiving chamber positioned substantially transverse to and in communication with said fluid passageway, including a gate member reciprocally mounted in said gate-receiving chamber of said valve housing for movement between a position in which fluid is allowed to freely flow through said valve housing and a position in which fluid is prevented from flowing through said valve housing, including an annular-shaped seat

member positioned in said valve housing intermediate said fluid passageway and said gate-receiving chamber on the upstream side of said gate-receiving chamber, said fluid passageway having an enlarged portion for receiving said seat member, and including a seal member positioned between said seat member and said valve housing, wherein the improvement comprises: a pocket means formed in said valve housing adjacent said seal member for allowing said seal member to move thereto when fluid is flowing into or attempting to flow into said fluid passageway in a forward direction so that the fluid can by-pass said seal member and flow between said seat member and said valve housing, said valve housing having an annular groove therein adjacent said seal member for defining said pocket means.

**4,161,310**  
**METAL FENCE POST PULLER**  
Merrill D. Parker, Box 46, Rufus, Ore. 97050  
Filed Jun. 22, 1978, Ser. No. 918,036  
Int. Cl.<sup>2</sup> E21B 19/00  
U.S. Cl. 254—30

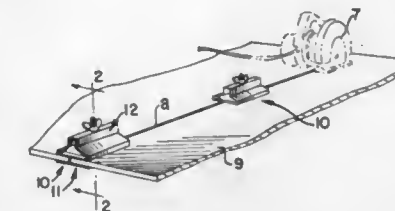
1 Claim



1. A metal fence post puller for pulling a metal fence post from the ground, the fence post having projections extending therefrom, said metal fence post puller comprising a shaft-like support member having spaced opposite first and second ends; an elongated bar having spaced opposite first and second ends having a pair of bracket members affixed thereto in the area of the first end thereof in spaced parallel diametrically opposed relation, said bracket members being pivotally affixed to the first end of the support member whereby said bar is rotatable in the plane of said bar and said support member in directions toward and away from said support member when manually gripped at the second end of said bar; a base plate affixed to the second end of the support member and extending perpendicularly thereto for supporting said support member in upright position adjacent a metal fence post; a rod-like cross member affixed to said bar at the first end thereof and extending perpendicularly therefrom; and coupling means for coupling said bar to the fence post, said coupling means comprising a pair of flat bar members each having spaced opposite first and second ends and a bottom edge extending between and joining said ends with a downwardly opening slot formed therein in the area of the first end and extending from the bottom edge at an acute angle therewith and a rod-like connecting member affixed to said flat bar members in the area of the second ends thereof and maintaining said flat bar members in spaced parallel relation whereby when said flat bar members are positioned astraddle the fence post with the connecting member under a projection of said fence post and with the cross member of said elongated bar in said slots, manual force applied downward in the area of the second end of said elongated bar exerts a much greater force upward on said fence post.

**4,161,311**  
**KERF CLAMP**  
Daniel V. Holman, Chicago, Ill., assignor to Adjustable Clamp Company, Chicago, Ill.  
Filed Jun. 1, 1978, Ser. No. 911,462  
Int. Cl.<sup>2</sup> B25B 5/14  
U.S. Cl. 269—49

7 Claims



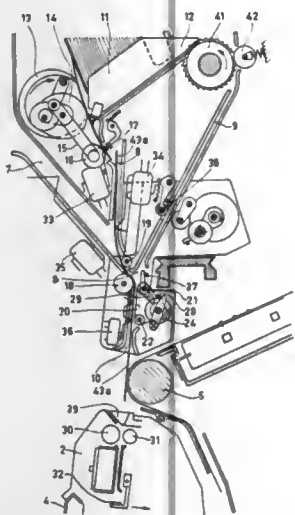
1. In a kerf clamp of the type including a clamp base having an upper horizontal work piece engaging surface, a rigid kerf blade projecting perpendicularly upwardly from said base horizontal surface, male fastener means mounted on the upper distal end of said blade, female fastener means adapted for mating engagement with said male fastener means, and a clamp pressure member having a lower horizontal work piece engaging surface and having a slot opening therein adapted for receiving said kerf blade and male fastener means therethrough and an additional opening through the top surface of said clamp pressure member which is aligned with said slot opening for receiving said male fastener means, said kerf blade and said vertical slot providing means to align said clamp base and pressure member with each other and with a kerf; the improvement wherein said clamp base includes a pair of elongate strengthening ribs or deformations extending substantially across said base in a direction transverse to the plane of said kerf blade for providing added structural rigidity to said base, and said pressure member is a generally tubular structure including a relatively large flat bottom wall defining said lower work piece engaging surface, and a narrow upper gripping portion, said structure having opposed sloping shoulder walls between said upper gripping portion and said flat base for providing added strength in compression to said pressure member.

**4,161,312**  
**CARD FEEDING MECHANISM**  
Friedhelm Eckhardt, Eiserfeld-Niederschelden; Wolfgang Raffenberg, Kirchen-Wehbach, and Axel Klein, Eiserfeld-Eisern, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.  
Filed Dec. 7, 1977, Ser. No. 858,267  
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655789  
Int. Cl.<sup>2</sup> B65H 29/00  
U.S. Cl. 271—3

8 Claims

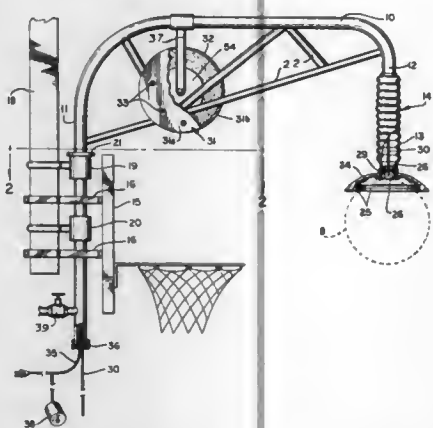
1. A card handling mechanism for feeding cards to and receiving cards in a reverse direction from a processing station, comprising:  
a supply magazine for storing cards to be processed;  
a guide channel, and first means for feeding a card from the supply magazine to and through the guide channel;  
a forked channel portion having first, second and third legs;  
an input channel extending from said forked channel portion third leg disposed for receiving a card fed through the first leg;  
an ejection channel having an input end disposed for receiving a card ejected from the input channel through the forked channel out the second leg;  
second means for feeding a card in the input channel in a feed direction for processing, and for ejecting a card in the input channel in a direction opposite said feed direction; and

a buffer channel arranged to permit manual insertion of a card through the buffer channel, into said first leg, for feeding into the input channel; wherein said guide channel opens into the buffer channel in front of said first leg; said mechanism includes a deflector, and means for mounting and moving said deflector at least between a first position in which a card being ejected from said input channel follows an undeflected path from said third leg to



said second leg, and a second position in which the card being ejected from said input channel is deflected so as to follow a path out said first leg; and said channels and forked channel portion are so arranged that a card being fed through said guide channel and said first leg while another card is being ejected along said undeflected path will contact said another card at an acute angle and be guided along said another card and through said input channel for processing.

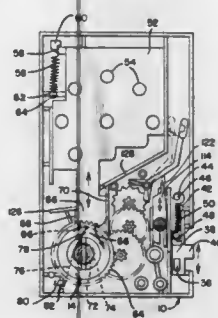
**4,161,313**  
**PRACTICE DEVICE FOR BASKETBALL**  
Russell F. Dickey, 3618 Lakeshore Dr., Smyrna, Ga. 30080  
Filed Dec. 12, 1977, Ser. No. 859,399  
Int. Cl.<sup>2</sup> A63B 69/00  
U.S. Cl. 273-1.5 A 4 Claims



4. A basketball practice device, wherein at least one player can practice techniques for handling a basketball relatively to a backboard and a goal, said practice device comprising holding means for releasably holding said basketball adjacent to said backboard and said goal, said holding means being so constructed and arranged that said basketball is removable from said holding means by a player through the use of a predetermined amount of force, support means for supporting

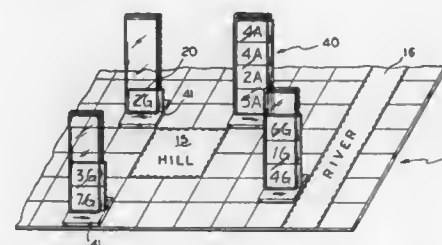
said holding means, said support means being movable with respect to said backboard, said support means including extendible means carrying said holding means, said extendible means providing for selected movement of said holding means in a vertical plane, said holding means including a cap, and attaching means for releasably attaching said basketball to said cap, said attaching means including means for evacuating said cap, and sealing means for sealing between said basketball and said cap when said basketball has said cap received thereon, said means for evacuating said cap including a source of vacuum in communication with said cap, and means for varying said source of vacuum, said support means comprising a boom pivotally mounted above said backboard, said extendible means being carried by one end of said boom and placed in the vicinity of said goal, said extendible means including a tubular member fixed to said cap, said boom having an opening there-through in communication with the opening in said tubular member, a vacuum pump carried by said boom, the low pressure side of said vacuum pump being connected to said opening through said boom, a motor connected to said vacuum pump for driving said vacuum pump, and a housing surrounding said vacuum pump and said motor, and a cable connected to said cap and extending through said tubular member and said opening through said boom.

**4,161,314**  
**AMUSEMENT DEVICE WITH APERTURES AND TIMED BALL RELEASE**  
Takashi Kaga, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan  
Filed Nov. 2, 1976, Ser. No. 738,329  
Claims priority, application Japan, May 26, 1976, 51/67981[U]  
Int. Cl.<sup>2</sup> A63D 13/00; A63B 71/04  
U.S. Cl. 273-121 R 3 Claims



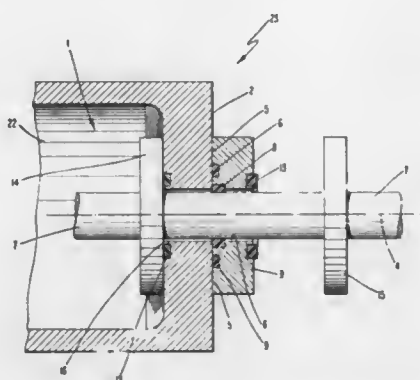
1. An amusement device, comprising a housing provided with a playing surface having first openings and a path leading toward said openings, a plate below said playing surface provided with second openings and mounted to move between first and second positions wherein said first and second openings are aligned and non-aligned, respectively, means biasing said plate toward said second position, a plurality of playing pieces each capable of passing through said openings, means for propelling said playing pieces along said path toward said first openings, and means automatically moving said plate to said first position after an interval of time, wherein said means automatically moving said plate comprises a knob mounted to said housing for rotation, said knob being provided with abutment means, and spring means for rotating said knob in one direction after said knob has been rotated manually in the opposite direction until said abutment means engages said plate urging said plate to its said first position.

**4,161,315**  
**STACKER FOR GAME COUNTERS**  
Jimmy W. Walton, 201 North St., Cascade, Wis. 53011  
Filed Nov. 14, 1977, Ser. No. 850,960  
Int. Cl.<sup>2</sup> A63F 3/00, 9/00  
U.S. Cl. 273-262 7 Claims



3. In combination:  
a game board divided into a plurality of playing spaces; playing pieces comprising thin, generally square pieces of material; and  
stackers for holding and displaying a plurality of said pieces comprising a flat base having a size selected to fit within a single one of said playing spaces and means perpendicularly mounted to said base for holding and displaying said plurality of pieces in a position whereby said pieces are oriented perpendicularly with respect to said base.

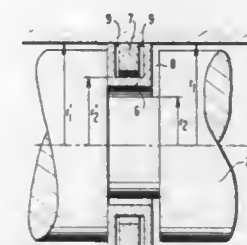
**4,161,316**  
**GASTIGHT PENETRATION**  
Helmut Nowack, Fislisbach, and Adelbert Rappange, Kleindöttingen, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland  
Filed Sep. 14, 1977, Ser. No. 833,361  
Claims priority, application Switzerland, Aug. 18, 1977, 10142/77  
Int. Cl.<sup>2</sup> F16J 15/06  
U.S. Cl. 277-9 6 Claims



1. In a gastight penetration through a wall of a gas-filled enclosure of the type having an opening in said wall and an actuating rod extending through said opening and movable in an axial direction, the improvement comprising:  
(a) a pair of flanges secured on said actuating rod on opposite sides of said wall and spaced apart a distance greater than the thickness of said wall,  
(b) flange seal means secured on the interior and exterior of said wall in position to be engaged by said flanges upon axial movement thereof relative to said wall,  
(c) rod seal means in said wall for preventing leakage of gas through said opening around said rod, said rod seal means being positioned between said flange seal means, and said wall including a removable plate on the exterior side for retaining said rod seal means, whereby said rod seal means

and said exterior flange seal means may be replaced without leakage of gas through said opening.

**4,161,317**  
**SEAL RING FOR ROTARY SHAFT**  
Hiroshi Sakamaki, Utsunomiya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 524,187, Nov. 15, 1974, abandoned.  
This application Jan. 23, 1976, Ser. No. 651,870  
Claims priority, application Japan, Nov. 17, 1973, 48-132260[U]  
Int. Cl.<sup>2</sup> F16J 9/00  
U.S. Cl. 277-25 2 Claims



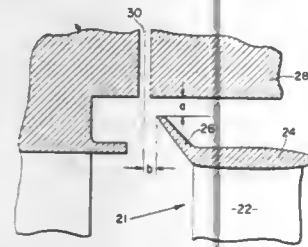
1. A composite seal ring structure in combination with a cylindrical ring carrier having a first peripheral slot therein, a cylindrical chamber containing liquid, said carrier being positioned within the chamber so that the liquid is on only one side of the ring structure, a shaft fixed to the ring carrier for rotating said carrier and ring structure, the outside diameter of said carrier being smaller than the inside diameter of said chamber, said ring structure preventing the liquid from leaking past said ring structure to the other side of said ring structure, said composite seal ring structure comprising:  
a first radially expandable split seal ring having a gap and disposed in said first slot so that the outer periphery of said first ring engages the inner peripheral surface of said chamber, the axial width of said first ring being less than that of said first slot to form in said slot a first clearance space which is open to said one side of said chamber so that said space is filled with said liquid; and  
a second radially expandable split seal ring having a gap and disposed within a second peripheral slot formed in said first ring and having an axial width less than that of said second slot to form second and third clearance spaces between the adjacent sides of said second ring and said second slot for containing liquid in said spaces, the outer periphery of said second ring also engaging the inner peripheral surface of said chamber;  
the gaps in said first and second split rings being radially misaligned;  
whereby, upon rotation of said shaft, the first and second rings, and the liquid in said first, second and third clearance spaces, also rotate so that the liquid packing effect produced by centrifugal force prevents the liquid from leaking past said composite seal ring structure.

**4,161,318**  
**SEALING SYSTEM FOR ROTORS**  
Alan R. Stuart, Sketchley Manor, and Brian S. Stratford, Littleover, both of England, assignors to Rolls-Royce Limited, London, England  
Filed Mar. 14, 1978, Ser. No. 886,605  
Claims priority, application United Kingdom, Mar. 26, 1977, 12841/77  
Int. Cl.<sup>2</sup> F01D 11/04; F16J 15/40  
U.S. Cl. 277-53 5 Claims

1. A sealing system for a turbine of a gas turbine engine comprising:  
a rotor arranged to be supplied with hot gases, a turbine casing defined by a stationary member surrounding said



rotor, an annulus mounted on the periphery of said rotor, an annular clearance between said annulus and said stationary member, and means in said stationary member positioned just upstream of said annular clearance for injecting a high pressure cooling fluid transversely across



a flow path of the hot gases in an area upstream of the annular clearance, said means providing a curtain of high pressure cooling fluid which blocks at least a portion of the hot gases from passing through said annular clearance to thereby increase the proportion of hot gases used to do useful work on said rotor.

#### 4,161,319 EXPANSION PACKER

Arnold G. Stocking, 1132 Marcombe Crescent NE., Calgary, Alberta, Canada

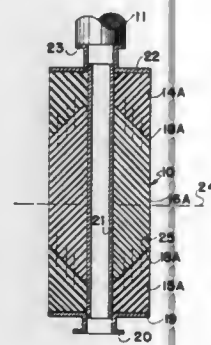
Filed Jul. 10, 1978, Ser. No. 923,179

Claims priority, application Canada, Jul. 14, 1977, 282701

Int. Cl.<sup>2</sup> F16J 15/10; E21B 33/128

U.S. Cl. 277—116.6

4 Claims



1. An expansion packer for oil well drillings comprising in combination a mandrel having upper and lower connections and a central axially extending tubular portion therebetween, a resilient packing element surrounding said tubular portion and extending between said upper and lower connections, said packing element including upper and lower tubular sections and a center section, all formed from a resilient elastomeric material, bonded junctions between each of said upper and lower sections and the respective ends of said center section, the durometer reading of said upper and lower sections being greater than the durometer reading of said center section, said junctions inclining at an angle and extending outwardly from said tubular portion of said mandrel and towards the transverse axis of said center section thereby forming a substantial conical junction.

#### 4,161,320 RESILIENT PACKING

Charles G. Stucke, Clarence, N.Y., assignor to Chemprene, Inc., Alden, N.Y.

Continuation of Ser. No. 357,966, May 7, 1973, abandoned. This application Jun. 24, 1977, Ser. No. 809,869

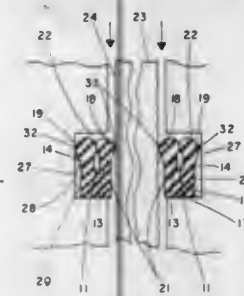
Int. Cl.<sup>2</sup> F16J 15/32

U.S. Cl. 277—205

5 Claims

1. A resilient packing having a unitary body of a generally ring configuration about an axis, said body including a cavity

of a generally U-shaped cross-sectional contour extending annularly on and inwardly from an outer surface of the packing and defined by upwardly and outwardly extending leg portions, which each terminate in enlarged lip sections which mate upon radial compression of the packing to preserve the generally U-shaped cross-sectional contour of the cavity and to create an outwardly, expansive force on the lip sections by virtue of such compression which insures a positive sealing force for such ring wherein each enlarged lip section has a projecting portion extending inwardly, said projecting portions of each lip section having a curved surface which in cross-section forms the arc of a circle the radius of which is such that upon compression of the mating lip sections, the projecting portions are each com-



pressed inwardly, a distance equal to from about 8 to about 30 percent of such radius, said lip sections including a convex portion extending outwardly and forming the contact sealing surfaces for the packing, said convex portion in cross-section being conical and terminating in an apex which forms a circumferential ridge constituting the sealing contact surface for the lip section, said apex being generally radially in line with said inwardly extending projecting portion of each enlarged lip section, whereby said circumferential ridge is in direct compression loading with the curved surfaces of said lip sections, said direct compression loading including compression along a generally radial straight line between an approximate midpoint of said curved surface and said circumferential ridge.

#### 4,161,321

PISTON RING AND METHOD OF MANUFACTURE  
John L. Hendrixon, Shelby, and Robert R. Rositch, Spring Lake, both of Mich., assignors to Sealed Power Corporation, Muskegon, Mich.

Filed Jan. 25, 1978, Ser. No. 872,157

Int. Cl.<sup>2</sup> F16J 9/14

U.S. Cl. 277—215

6 Claims



1. For use in a piston oil ring assembly in a reciprocating piston engine, a parted annular sealing ring of generally uniform material composition adapted to be disposed in a piston ring groove and including a radially inwardly directed ring surface of substantially constant diameter adapted to be engaged by an expander-spring disposed in said groove for expanding said ring into sealing engagement with a cylinder wall, said sealing ring comprising first ring portions at respective ring tips and a second ring portion of the same said material composition as said first portion extending between said first ring portions integrally therewith, segments of said ring surface integral with said first portions being substantially hardened as compared with said ring surface in said second portion

to prevent wear and embedment of an expander-spring into said first portions.

#### 4,161,322 VEHICLES HAVING REDUCED TILTING OF THE SUPERSTRUCTURE THEREOF RELATIVE TO THE WHEEL AXLE SUPPORT THEREFOR

Bo-Gunnar Ekeborg, and Stig-Gunnar Lofgren, both of Jarved, Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

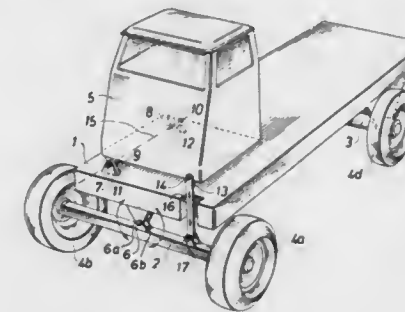
Filed Oct. 17, 1977, Ser. No. 844,091

Claims priority, application Sweden, Oct. 22, 1976, 7611772

Int. Cl.<sup>2</sup> B62D 37/00

U.S. Cl. 280—6 R

12 Claims



1. A vehicle having a superstructure characterized by a low sideways tilt relative to a tilting axle, comprising, in combination, a chassis; at least first and second wheel axles supporting the chassis, at least one of which is pivotably mounted on the chassis so as to be tiltable sideways about the pivot mounting in a plane substantially parallel to the sideways tilting plane of the vehicle; a superstructure pivotably mounted on the chassis for tilting about its pivot mounting in a plane parallel to the axle tilting plane; and means on the other side of the pivot mounting for the tiltable axle, linking the superstructure to the tiltable axle, and pivotably attached to the superstructure on one side of the chassis and to the tiltable axle on the other side of the chassis, the spacing between the pivot mounting of the superstructure and the pivot attachment of the linking means thereto, to tilt the superstructure less about its pivot mounting when the tiltable wheel axle is tilted sideways.

#### 4,161,323

##### SNOW SKI BOARD APPARATUS

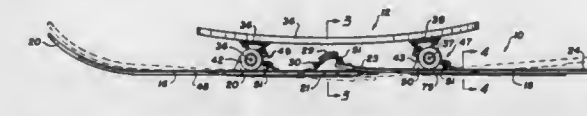
Maxwell T. Wetteland, 5225 Empire Dr., North Burnaby, British Columbia, Canada (V5B 1N1)

Filed Oct. 3, 1977, Ser. No. 838,597

Int. Cl.<sup>2</sup> A63C 17/18; B62B 13/04, 19/02

U.S. Cl. 280—7.12

10 Claims



1. Snow ski apparatus comprising a fore ski section having a front end curved upwardly and a back end, said fore ski section being formed with a lower or running surface with a slight central protuberance of substantially shallow V-cross section extending longitudinally near the back end thereof, a rear ski section having a front end curved upwardly and a back end, said rear section being formed with a lower or running surface with a slight central protuberance of substantially shallow V-cross section extending longitudinally near the front end thereof, and being immediately behind and in longitudinal

alignment with the fore ski section, the front end of the rear ski section overlapping the back end of the front ski section, a flexible connector connecting the front end of the rear section to the back end of the fore section, first mounting means on the fore section between the ends thereof adapted to clamp said fore section to the front rollers of a roller skate board, and second mounting means on the rear section between its ends adapted to clamping said rear section to the rear rollers of the skate board, said connector allowing limited relative vertical and horizontal movement between the fore ski section and the rear ski section.

#### 4,161,324

##### SKI BOARD

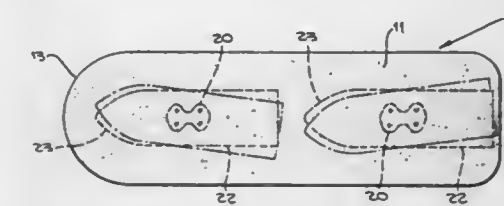
Christopher R. Colvin, 201 Calle Conchita, San Clemente, Calif. 92672

Filed Jan. 3, 1978, Ser. No. 866,274

Int. Cl.<sup>2</sup> B62M 27/02

U.S. Cl. 280—21 A

6 Claims



1. A ski board for use as a sport vehicle to accommodate the feet of a rider comprising a relatively flat wide foot board having an upper face for the feet intermediate opposite ends and a lower face, a pair of respective forward and rearward runners of substantially equal length, said length being less than one-half the length of the board, and a mounting interconnecting each runner to the board at the lower face so that the runners are in force and aft alignment and one runner behind the other, the runners being at locations spaced from each other with the front of the forward runner no further forward than the front end of the board and the rear of the rearward runner no further rearward than the rear end of the board, each mounting comprising a saddle and a yoke, the saddle having a fore and an aft end, there being a boss with a post thereon adjacent one end and a universal joint (socket) adjacent the other end, the saddle of one of said mountings having an attachment to the lower face of the board with the fore end forward and the saddle and the other mounting having an attachment to the lower face of the board with the fore end rearward, each said yoke comprising a column having a movable end in thrust engagement in said socket and an anchored end is fixed engagement with the respective runner intermediate opposite ends of the runner, said column having a transversely extending steering arm, and a yieldable connection between the steering arm and said post whereby pressure on one side or the other of the board effects a lateral shift of the steering arm and a corresponding change in direction of the runner relative to the board.

#### 4,161,325

##### SUPPLEMENTARY SUPPORT FOR VEHICLES

Herbert Schneider, Haimhausen, Fed. Rep. of Germany, assignor to SUD-Chemie AG, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,910

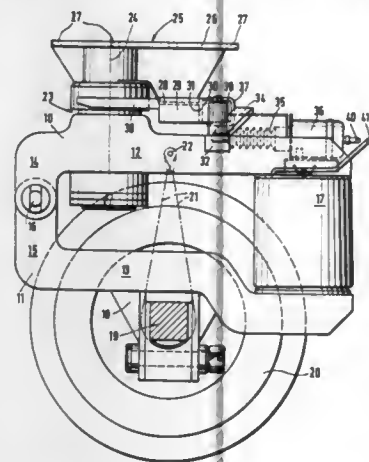
Int. Cl.<sup>2</sup> B60G 17/00; B60B 11/00

U.S. Cl. 280—81 R

6 Claims

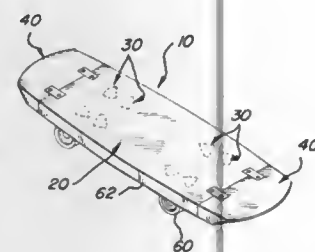
1. A removable mobile frame for reduction of axle loads of a heavy vehicle comprising first and second horizontal lever arms pivotally interconnected at one end, biasing means interposed between free ends of said lever arms, a supporting member connected to said first lever arm and adapted to be attached to said vehicle, the connection between said supporting member and said first lever arm including a shaft defining a vertical

rotatable pivot axis between said first lever arm and said supporting member, means normally maintaining said supporting member and said first lever arm in a predetermined position and accommodating rotation from said predetermined posi-



tion, said last means including a cam track on said supporting member and a cam on said first lever arm biased into engagement with said cam track with said cam track defining said predetermined position, and at least one axle and one rotor wheel on said axle connected to said second lever arm.

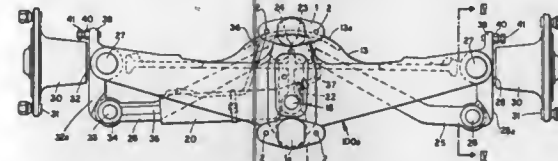
**4,161,326**  
**SKATEBOARD**  
Steven L. Gaber, 12208 Wallingstone La., Austin, Tex. 78759  
Filed Feb. 4, 1977, Ser. No. 765,656  
Int. Cl.<sup>2</sup> A63C 17/14  
U.S. Cl. 280—87.04 A 5 Claims



1. In a skateboard having wheels, and an integral board having upper and lower horizontal surfaces extending over said wheels, an improvement to said board comprising: at least one cavity formed in the lower surface of said board oriented over each of said wheels, said cavity extending from said lower horizontal surface of said board to a region below the upper horizontal surface of said board, said cavity being substantially triangular in shape at the intersection of said cavity with said lower horizontal surface, the shape of said cavity corresponding in shape to the surface of a cone segment, said cavity being oriented on said lower surface wherein a line drawn through the apex of said triangular shape on said lower horizontal surface nearest the longitudinal centerline of said board bifurcates said cavity and said line further intersects said longitudinal centerline at an angle between 45° and 75°.

**4,161,327**  
**STEERING ASSEMBLY FOR A VEHICLE, ESPECIALLY FOR AN INDUSTRIAL FLOOR VEHICLE, SUCH AS A FORKLIFT TRUCK**  
Günter Honecker, Klein-Welzheim, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany  
Filed Sep. 26, 1977, Ser. No. 836,849  
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642903

Int. Cl.<sup>2</sup> B60G 1/00 7 Claims  
U.S. Cl. 280—95 R



1. A wheel assembly for a vehicle, especially a floor vehicle such as a forklift truck, which comprises:  
an elongated axle housing;  
a respective axle carrier pivotally mounted at each end of said housing for steering displacement of a wheel carried on the respective carrier;  
a pivot pin mounted in said housing centrally of said ends;  
a steering knuckle swingably mounted on said pin; and  
a pair of flat, coplanar tie bars individually pivoted to said knuckle and respectively articulated to said carriers, said tie bars being angularly bent in their common plane and having a substantially rectangular cross section progressively narrowing from their bends in the direction of said knuckle.

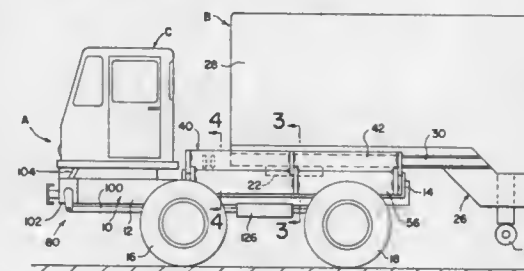
**4,161,328**  
**BICYCLE**  
Boris Efros, 920 N. Stanley Ave., Los Angeles, Calif. 90046  
Filed Mar. 4, 1977, Ser. No. 774,620  
Int. Cl.<sup>2</sup> B62J 1/00 15 Claims  
U.S. Cl. 280—290



1. A restraint mechanism for a bicycle rider comprising:  
(a) means for engaging the body of the rider;  
(b) first and second coupling means for selectively joining said body engaging means to preselected portions of said bicycle;  
(c) a first engaging means having spring means for selectively retaining said first coupling means in a first preselected position;  
(d) a second engaging means having spring means for selectively retaining said second coupling means in a first preselected position;  
said first and second engaging means each including means

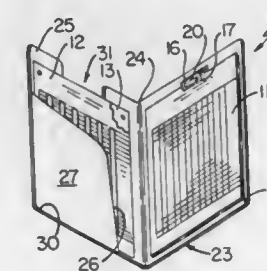
for releasing the associated spring means from the associated coupling means thereby permitting adjustment of said body engaging means, said releasing means configured such that upon actuation, the associated coupling means is movable into a second preselected position, and upon deactuation, the associated coupling means is retained in said second position.

**4,161,329**  
**TRACTOR TO TRAILER CONNECT SYSTEM**  
Gilbert B. Pilz, Milford, Mich., and George H. Young, Ottawa, Kans., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.  
Filed Feb. 6, 1978, Ser. No. 875,570  
Int. Cl.<sup>2</sup> B60D 7/02 17 Claims  
U.S. Cl. 280—474



1. A wheel supported draft vehicle comprising a chassis frame including a motive power carrying front portion and a load carrying rear portion, said chassis frame having front and rear pairs of wheels mounted thereon, and selectively operable connecting means on the said rear portion of said chassis frame for making articulated and non-articulated draft connections with a vehicular trailer, said selectively operable connecting means including coupling means on said rear portion of said chassis frame interengagable with kingpin means on a vehicular trailer to provide an articulated connection between said trailer and draft vehicle, and said selectively operable connecting means further including plate means mounted on said rear portion of said chassis frame for movement between a first position engaging laterally opposite sides of said trailer and a second position out of engagement with said trailer, said plate means in said first position interengaging said draft vehicle and trailer against relative pivotal movement.

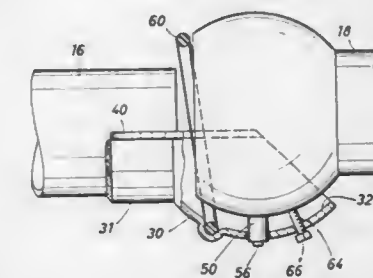
**4,161,330**  
**INVENTORY COMPARISON SYSTEM**  
Donald E. Ross, Centerville, Ohio, assignor to Dayco Corporation, Dayton, Ohio  
Filed Oct. 10, 1978, Ser. No. 949,609  
Int. Cl.<sup>2</sup> B42D 15/00 20 Claims  
U.S. Cl. 283—55



1. In an apparatus for comparing an inventory of a competitor's products with a supplier's suggested inventory, the improvement comprising, a competitor's part numbers sheet having a first arrangement of said competitor's part numbers thereon with a vacancy on said sheet adjacent each part number for marking the available quantity of each part number to define said inventory of competitor's products, a supplier's part

numbers sheet having a second arrangement of said supplier's part numbers thereon which is identical to said first arrangement, opening means in said supplier's sheet adjacent the part numbers thereon, first sheet aligning means comprising said competitor's sheet and second sheet aligning means comprising said supplier's sheet, and means supporting and aligning said competitor's sheet and said supplier's sheet in aligned relation employing said first and second sheet aligning means so that said supplier's sheet blocks from view said first arrangement of part numbers and each quantity of a competitor's part number is viewable through said opening means opposite a corresponding supplier's part number, each supplier's part number and its viewable quantity comprising said supplier's suggested inventory for said inventory of said competitor's products.

**4,161,331**  
**SPHERICAL IRRIGATION PIPE COUPLING WITH REPLACEABLE SEAL**  
James E. Hansen, Spokane, Wash., assignor to Gifford-Hill & Company, Inc., Spokane, Wash.  
Filed May 23, 1977, Ser. No. 799,140  
Int. Cl.<sup>2</sup> B05B 15/00; F16L 27/02, 27/06, 55/00 14 Claims  
U.S. Cl. 285—5



6. A universally movable coupling for irrigation pipes having a replaceable sealing element, said coupling comprising:  
a first pipe section;  
an internal connection element extending from said first pipe section and having a flow passage defined therein for allowing fluid flow therethrough, said internal connection element defining a generally spherical external surface;  
a pivot pin extending from the lower portion of said internal connection element;  
a second pipe section;  
external connector means extending from said second pipe section and defining a generally spherical internal surface that is adapted for mating engagement with at least a portion of the generally spherical external surface of said internal connection element and defining a concave supporting receptacle for supporting said internal connection element and one extremity of said first pipe section, said concave supporting receptacle defining a pivot aperture releasably receiving said pivot pin to retain said coupling against longitudinal separation;  
external locking means being connectable to said external connector means and being formed to define a partially spherical internal surface that is adapted for mating engagement with at least a portion of the spherical external surface of said internal connection element;  
said external connector means and said external locking means each being formed to define internal seal groove segments that are disposed in registry upon assembly of said external locking means to said external connector means to define an annular seal groove;  
an annular sealing element being receivable with said annular seal groove and establishing a movable seal between said internal connection element and said external connector and said external locking means; and  
separation means being provided on one of said internal connection element and said external connection means,



said separation means being movable to accomplish sufficient separation of said internal connection element and external connection means to facilitate removal and replacement of said sealing element.

14. A universally movable coupling for irrigation pipes having a replaceable sealing element, said coupling comprising:

- a first pipe section;
- an internal connection element extending from said first pipe section and having a flow passage defined therein for allowing fluid flow therethrough said internal connection element defining a generally spherical external surface and having a pivot pin depending therefrom;
- a second pipe section;
- external connector means defining a generally semicylindrical portion that is weldable to said second pipe section said external connector means defines a generally spherical internal surface that is adapted for mating engagement with at least a portion of the spherical external surface of said internal connection element and defines a concave supporting receptacle for supporting said internal connection element and one extremity of said first pipe section, said concave supporting receptacle defining an aperture for receiving said pivot pin and establishing a mechanical connection between said internal connection element and external connector means;
- external locking means being connectable to said external connector means and being formed to define a partially spherical internal surface that is adapted for mating engagement with at least a portion of the spherical external surface of said internal connection element;
- an annular sealing element being receivable in movable sealed engagement between said internal connection element and said external connector means and between said internal connection element and said external locking means;
- means for limiting the amount of compression of said annular sealing element;
- a drain passage being defined in said pivot pin means and communicating said flow passage of said coupling with the atmosphere when said drain passage is open; and closure means is provided for said drain passage and may be selectively opened and closed as desired for draining fluid from said pipe sections and coupling.

4,161,332

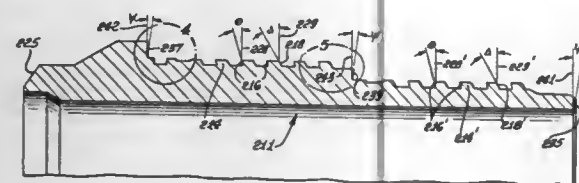
**DOVETAIL CONNECTION FOR PIN AND BOX JOINTS**  
Thomas L. Blose, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 679,476, Apr. 22, 1976, abandoned.  
This application Jun. 9, 1978, Ser. No. 914,162

Int. Cl.<sup>2</sup> F16L 25/00

U.S. Cl. 285—334

15 Claims



1. In a pipe joint including pin and box members defining an axis,

- (a) first and second pairs of interengaged threads on the respective members, the first pair of threads axially spaced from the second pair of threads; and
- (b) a first pair of general frusto-conical shoulders on the members located axially between said first and second pairs of threads, said shoulders having semi-dovetail interfit on make-up of the joint,
- (c) said threads of said first and second pairs having semi-dovetail interengaged flanks which are negatively angled

in axial radial planes, and relative to planes normal to said axis, said flanks on the pin member facing away from the end of the pin member, and said frusto-conical shoulders being positively angled in axial radial planes, and relative to planes normal to said axis,

- (d) said joint including a second pair of annular shoulders on the respective members which extend in substantially parallel, face-to-face, proximate but spaced relation on normal make-up of the joint, said second pair of shoulders having semi-dovetail interfit in the event of sufficient coining of the shoulders of the first pair on joint make-up, said interfit being positively angled in axial radial planes and relative to planes normal to said axis.

4,161,333

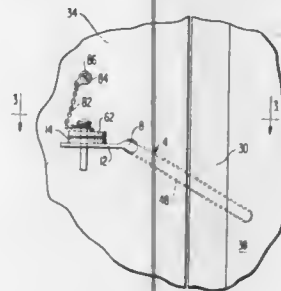
**PROTECTIVE MEANS AGAINST UNAUTHORIZED ENTRY FOR A DOORWAY**

Milton Guttman, 1719 Miami Gardens Dr., North Miami Beach, Fla. 33162

Continuation-in-part of Ser. No. 663,129, Mar. 2, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 872,829  
Int. Cl.<sup>2</sup> E05C 19/18, 1/04

U.S. Cl. 292—288

2 Claims



1. Protective means against unauthorized entry for a doorway which comprises:

- a sliding bolt having a major longitudinal body portion and a minor angled leg portion,
- a doorway defined in part by a jamb backed by a stud,
- a door having inner and outer faces hinged at one side closing said doorway,
- a hole drilled in said door, jamb and stud at an angle downward, said hole being at least as long as said bolt body portion and slightly larger in diameter than the diameter of said bolt, said bolt being inserted in said hole,
- a first annular member fastened to said inner face of said door normal thereto and adjacent said hole in the door, said annular member comprising a central hole large enough to receive the body portion of said bolt and a smaller lateral hole,
- a second annular member fixed upon said angled leg portion having a hole therein corresponding to said lateral hole of said first annular member whereby said second annular member may be juxtaposed parallel to said first annular member when said bolt is fully inserted in said door hole with said lateral hole and second annular member hole aligned, and
- a pin extending through said lateral hole and said second annular member hole.

4,161,334

**PROTECTIVE APPENDAGE FOR A STEERING COLUMN**

Richard A. Sukup, 7456 Meadowcrest, Fort Worth, Tex. 76112  
Filed May 4, 1978, Ser. No. 902,973

Int. Cl.<sup>2</sup> B62D 25/08

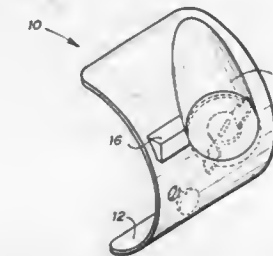
U.S. Cl. 296—1 R

8 Claims

- 1. A protective appendage for the steering column of an

automobile, with the column having thereon a lock assembly for the ignition key, comprising:

- (a) a base member comprising a sheet of material which is formed in the arc of a circle so as to be categorized as cylindrical, and the radius of said formed member being approximately 2 inches, such that the base member may surround a portion of the steering column adjacent the lock assembly, and the included angle of the cylindrical portion being within the range of about 110°–180°, and the length of said base member (as measured in a direction parallel to the longitudinal axis of the steering column) being about 3 inches; and



- (b) a cylindrical shell of semi-flexible material attached to and extending outwardly from the base member, and said shell having a length which is sufficient to enclose the lock assembly and having a diameter which is less than the length between the two extreme portions of the protruding arms of the lock assembly, and the cylindrical shell being sufficiently flexible so that it may be temporarily squeezed to an elongated cross section which is long enough to pass over said two arms, and said shell being sufficient resilient so as to return to its original cylindrical shape after passing over the arms, whereby said shell may be held in place by the lock assembly arms after the shell has been passed over said arms.

4,161,335

**TRUCK BED LINER**

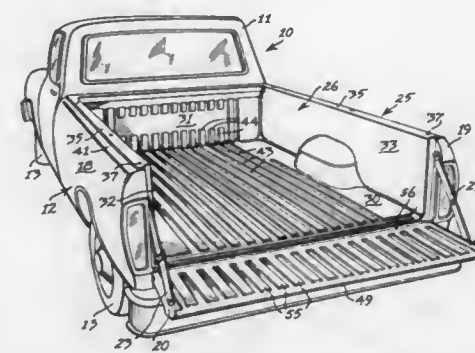
Edwin L. Nix, 733 Tahlena Ave., and Bobby E. Davenport, 317 Beckley Dr., both of Madison, Tenn. 37115

Continuation of Ser. No. 769,580, Feb. 17, 1977, Pat. No. 4,111,481. This application Jul. 31, 1978, Ser. No. 929,739

Int. Cl.<sup>2</sup> B62D 33/02

U.S. Cl. 296—39 R

6 Claims



1. A protective liner for a truck bed having a bottom wall, a front wall, and opposed side walls, said side walls having longitudinally extending top ledges, comprising:

- (a) a bottom liner wall and opposed side liner walls adapted to fit against the interior surfaces of the corresponding bottom wall and opposed side walls in the truck bed,
- (b) each of said side liner walls having upper edge portions terminating in laterally outboard extending top flanges adapted to cover the corresponding ledges of the side walls of the truck bed,

(c) at least one opening extending through each of the top ledges,

- (d) the width of each ridge member being greater than the width of the corresponding longitudinally aligned rib member to provide longitudinal ventilating spaces between said ridge member and the bottom wall of said truck bed.

4,161,336

**DUAL-OPENING SUN ROOF**

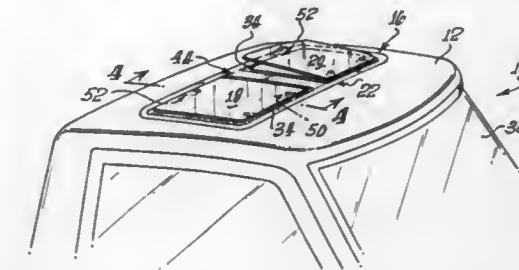
Eugene B. LeVan, Whittier, and John Lehne, Hacienda Heights, both of Calif., assignors to LeVan Specialty Co. Inc., City of Industry, Calif.

Filed Jan. 23, 1978, Ser. No. 871,383

Int. Cl.<sup>2</sup> B60J 9/08

U.S. Cl. 296—137 B

10 Claims



1. A dual-opening, sun roof mounting in an aperture formed in an automobile roof wherein the improvement of said sun roof comprises:

- a main, peripheral frame structure having a substantially rectangular configuration including front, rear and side portions;
- a central strut member secured between said front and rear portions of said frame structure;
- a compartment defined by said central strut member;
- a pair of framed openings defined by said main frame and said central strut member;
- a sealing means supported within the perimeter of each framed opening;
- a pair of panel members hingedly mounted in respective openings;
- means for latching said panels along said rear portion of said frame structure; and
- means for releasably hinging said panels along said front portion of said frame structure, whereby each of said panels is individually operated.

4,161,337

**PORTABLE FOLDING ORTHOPEDIC CHAIR**

Albert Ross, Palm Springs; Richard H. Garrett, Berkeley; Hayden S. Gordon, Orinda, and Evan R. Flavell, Albany, all of Calif., assignors to Albert Ross, Palm Springs, Calif.

Filed Dec. 15, 1977, Ser. No. 860,985

Int. Cl.<sup>2</sup> A47C 7/40

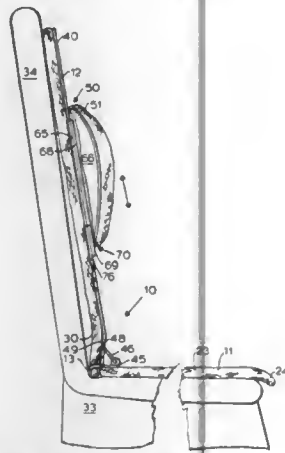
U.S. Cl. 297—230

5 Claims

1. A portable folding orthopedic seat unit for use on a chair, automobile seat, and the like, including in combination:

- a seat member,
- a back member,
- a hinge connecting said back and seat members together so that they can be collapsed together to a generally flat position and opened to a seating position,
- said back member including vertical rigid support means extending from the bottom to the top of the back member,
- a carrying handle attached to said rigid support means near said hinge, and
- a movable back-support assembly supported slidably on said support means and comprising:
- two separate, padded, generally elliptically-shaped, back-

support members, spaced apart from each other, a substantially vertically rigid and horizontal flexing connecting member joining them together, each said back-support member comprising a rigid rear portion attached to said connecting member and extending in a plane tilted outwardly at an angle to the plane of said back member, a forward resilient portion supported on said rear portion,



and cover means enclosing said resilient portion and said rear portion, and means for holding said connecting member at a desired adjustable vertical position on said rigid support means, whereby the back of the person sitting in said portable seat unit is supported solely by said two separate back-support members.

4,161,338

## PICKUP TRUCK HOIST ATTACHMENT

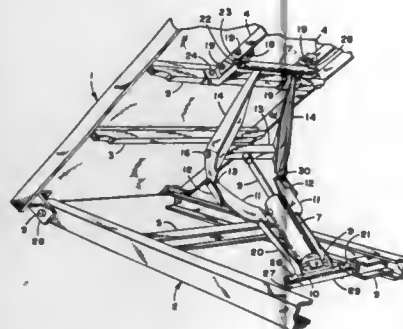
Henry C. Brown, Dallas, Tex., assignor to The Uni Corporation, Dallas, Tex.

Filed Nov. 3, 1977, Ser. No. 848,110

Int. Cl.<sup>2</sup> B60P 1/16

U.S. Cl. 298—22 J

5 Claims



1. A scissor hoist attachment for converting a fixed bed truck with a passenger cab and hauling bed supported on a frame to a tilting bed truck where the truck bed may be rotated from a horizontal to a tilt position, such attachment permitting the truck cab and bed, when the bed is in the horizontal position, to assume the same relative relationship as before the conversion, comprising:

at least two hinges fixedly attached between the underside of the hauling bed and the rear of the truck frame to permit relative rotation between the hauling bed and frame,

a generally tapered bottom frame including a pair of elongate longitudinally extending side plates tapered toward each other at one end and means connected to the side plates at such end for pivotally connecting the side plates to the truck frame and a generally U-shaped element connected between each longitudinally extending side plate at their other end where they are tapered away from each other, said U-shaped element being wider at the

bottom of the U and narrower towards the ends of the prongs,

a generally tapered top frame including a pair of elongate longitudinally extending side plates tapered toward each other at one end and means connected to the side plates at such end for pivotally connecting the side plates to the truck hauling bed and means for pivotally connecting the top frame side plates at their other ends where they are tapered away from each other to the ends of the prongs of the U-shaped element of the bottom frame,

a yoke pivotally connected between the top frame side plates,

a variable length actuator means interconnected between the yoke and the means for pivotally connecting the bottom frame side plates to the truck frame, said variable length actuator means exerting a lifting force between the truck frame and the yoke when said actuator means is extended so that said truck bed is tilted rearwardly and said variable length actuator means retracting the truck bed when said actuator means is retracted.

4,161,339

## CONTROL VALVE FOR USE IN AUTOMOTIVE BRAKE SYSTEM FOR CONTROLLING BRAKE FLUID PRESSURE

Hiroshi Kawaguchi, Mishima, and Yoshihisa Nomura, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

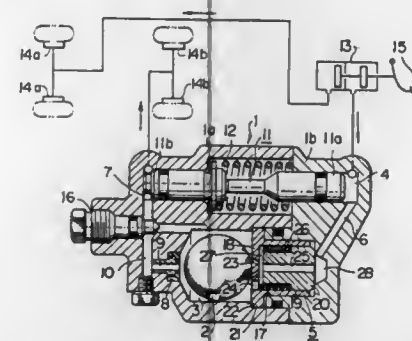
Filed Jul. 27, 1977, Ser. No. 819,345

Claims priority, application Japan, Feb. 4, 1977, 52-12326[U]

Int. Cl.<sup>2</sup> B60T 8/14

U.S. Cl. 303—24 F

7 Claims



1. In a control valve for use in an automotive hydraulic brake system for controlling the pressure of brake fluid transmitted to rear wheel cylinders, said control valve comprising: a valve chamber communicated with a master cylinder and communicated through a valve port with the rear wheel cylinders,

a ball valve floatingly disposed in said valve chamber and adapted to move forward by its own inertia to close said valve port when the deceleration of an automotive vehicle reaches a predetermined value,

an improvement comprising variable restriction means disposed in the line communicating said master cylinder through said valve chamber with said rear wheel cylinders and including a control member responsive to the flow rate of brake fluid through said line for controlling said flow rate and adapted to move from a first position at which the restriction of said flow rate is minimum toward a second position at which the restriction of said flow rate is maximum when said flow rate exceeds a predetermined value and a spring for urging said control member toward said first position;

said variable restriction means comprising at least two passages which are arranged in parallel relation with each other so as to divide the flow of brake fluid through said line into at least two flows, and a valve member respon-

sive to the predetermined flow rate of brake fluid through said line for closing at least one of said parallel passages.

4,161,341

## ACTUATING DEVICE FOR PRESSURE MEDIUM BRAKE SYSTEMS

Erich Reinecke, Beinhorn; Helmut Ulrich, Springe; Arnold Haas, Sehnde, and Willi Kolnitz, Coppenbrügge, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 833,800

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642041

Int. Cl.<sup>2</sup> B60T 15/06

U.S. Cl. 303—52

4 Claims

4,161,340

## POPPET VALVE TYPE BRAKE CONTROL VALVE DEVICE

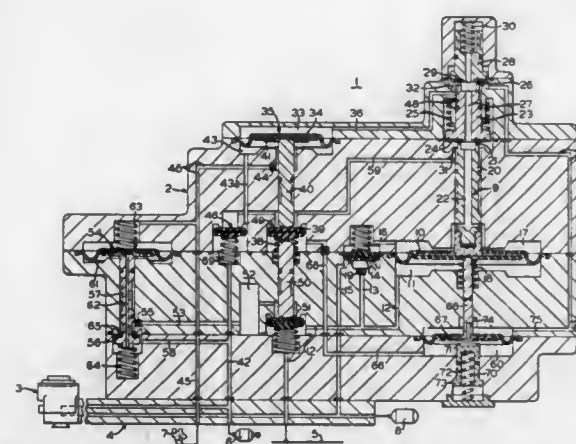
James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 22, 1978, Ser. No. 908,484

Int. Cl.<sup>2</sup> B60T 15/22

U.S. Cl. 303—33

12 Claims



10. For use in a railway car brake system having a brake pipe, a reservoir normally charged to the pressure carried in the brake pipe and a brake cylinder device, there is provided a brake control valve device comprising:

(a) a brake cylinder delivery passage to which said brake cylinder device is connected;

(b) a first exhaust passage via which said brake cylinder delivery passage is connected to atmosphere;

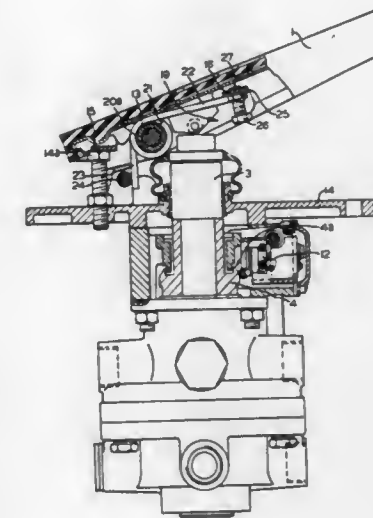
(c) a supply passage via which said brake cylinder delivery passage is connected to said reservoir;

(d) an exhaust control piston valve device in said first exhaust passage operative in a first position thereof to establish fluid pressure communication between said brake cylinder delivery passage and atmosphere and having a control chamber associated therewith, pressurization of said control chamber effecting operation of said piston valve device to a second position in which said communication is interrupted; and

(e) a service valve assembly operatively disposed in said supply passage comprising:

(i) a movable piston abutment subject opposingly to the pressure carried in said brake pipe and in said reservoir; and

(ii) valve means engageable with said piston abutment for movement therewith to a brake release position in response to a predominance of brake pipe fluid pressure relative to said reservoir fluid pressure and movable from said brake release position to a brake application position in response to a reduction of said brake pipe fluid pressure relative to said reservoir fluid pressure for establishing fluid pressure communication between said reservoir and said brake cylinder device and between said reservoir and said control chamber.



1. An actuating device for controlling the operation of vehicle brake systems, comprising:

(a) a support;

(b) an actuating lever pivotally attached to said support;

(c) a push rod disposed on said support for axial movement relative thereto;

(d) means on said actuating lever engageable with said push rod to axially move said push rod in a first direction by an amount dependent upon the amount of pivotal movement of said actuating lever in said first direction;

(e) means axially biasing said push rod in a second direction opposite said first direction;

(f) an auxiliary actuating lever pivotally attached to said support and underlying said actuating lever so that pivotal movement of said actuating lever in said one direction effects engagement of said actuating lever with said auxiliary actuating lever;

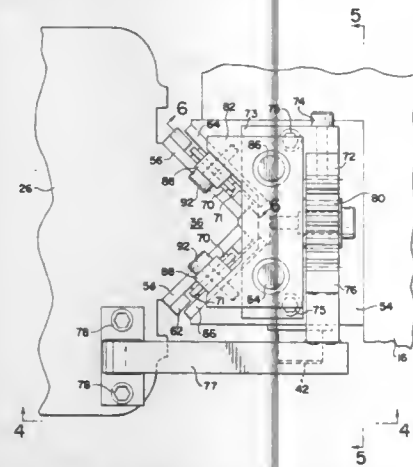
(g) means biasing said auxiliary actuating lever around said pivot in said second direction;

(h) first stop means on said support engageable by said auxiliary actuating lever to limit pivotal movement of said auxiliary actuating lever in said second direction;

(i) second stop means on said support engageable by said actuating lever to limit pivotal movement of said actuating lever in said second direction and so disposed as to provide a predetermined distance for movement of said actuating lever away from said second stop means in said first direction before engagement with said auxiliary actuating lever, and means on said push rod for actuating braking mechanism in accordance with the axial position of said push rod.

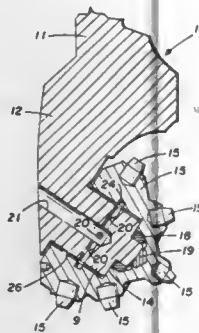


**4,161,342**  
**ANTI-FRICTION GIBS FOR PRESSES**  
 Roger J. Nelsen, Hastings, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.  
 Filed Dec. 5, 1977, Ser. No. 857,121  
 Int. Cl.<sup>2</sup> F16C 29/04  
 U.S. Cl. 308—6 R 11 Claims



1. In a mechanical press having a frame including a pair of side members and a press slide mounted therebetween, the improvement in anti-friction gib means comprising: a flat steel race secured to a vertical surface on each side of said press slide adjacent a side member; flat steel races positioned opposite each of said press slide races and secured to vertical surfaces of each of said press side members and parallel to said press slide races; rollers positioned between said opposed races; roller retaining means to retain said rollers between said races; and means to reciprocate said roller retaining means responsive to the movement of said slide.

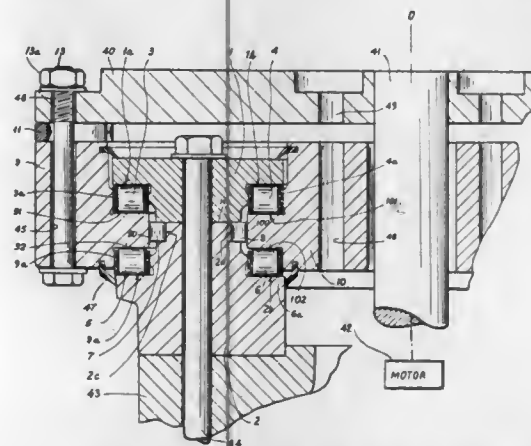
**4,161,343**  
**CONE RETAINER FOR A ROTARY ROCK BIT**  
 Homer J. Brashear, De Soto, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.  
 Filed Jul. 21, 1978, Ser. No. 926,768  
 Int. Cl.<sup>2</sup> F16C 19/00  
 U.S. Cl. 308—8.2 3 Claims



1. A method of rotatably locking a rock boring cutter assembly upon a bearing pin, comprising the steps of: providing a cantilever bearing pin with radial and axial passages; providing a rock boring cutter assembly with an annular inner surface that can be positioned over said bearing pin and an inner annular groove in said annular inner surface; providing a retainer assembly, said retainer assembly comprising a multiplicity of locking rods; positioning said locking rods in said radial passages in said bearing pin;

positioning said rock boring cutter assembly on said bearing pin; and positioning an expander rod in said axial passage in said bearing pin to contact and cause said locking rods to move radially outward in said radial passages and bridge between said bearing pin and said groove in said rock boring cutter assembly to rotatably lock said rock boring cutter assembly on said bearing pin.

**4,161,344**  
**METHOD OF AND MEANS FOR ROTATABLY SUPPORTING A LOAD**  
 Aimé Delarbre, Chatillon, France; Joachim Boesner, Velbert, and Michael Blank, Wuppertal, both of Fed. Rep. of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Fed. Rep. of Germany  
 Continuation-in-part of Ser. No. 820,356, Jul. 29, 1977, abandoned. This application Oct. 14, 1977, Ser. No. 842,360  
 Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634776  
 Int. Cl.<sup>2</sup> F16C 19/00  
 U.S. Cl. 308—222 9 Claims

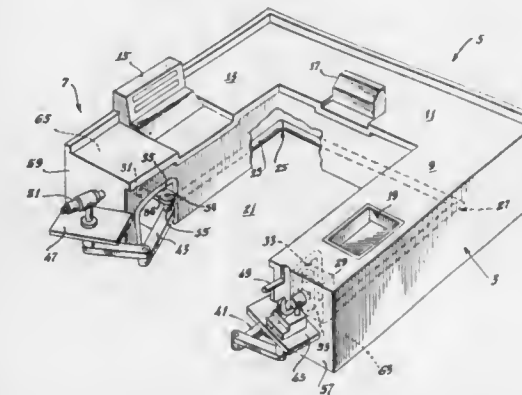


1. A mounting for a load to be at least partly rotated about a vertical axis, comprising: stationary support means including an annular member centered on said axis and provided with inner and outer peripheral guide tracks; rotatable support means including a first and a second annular carrier coaxial with said annular member, said first carrier engaging said outer guide track, said second carrier engaging said inner guide track; a load-carrying platform spacedly overlying said carriers and said member; and fastening means for selectively connecting said platform with either of said carriers while leaving the respectively other carrier separated therefrom, said fastening means including spacing means interposable between said platform and said other carrier for holding said platform out of contact with the carrier previously connected therewith.

**4,161,345**  
**SUPPORTING FRAME FOR FURNITURE**  
 James A. Begun, Montpelier, Vt., assignor to Howard W. Martin, Montpelier, Vt., a part interest  
 Filed Apr. 18, 1978, Ser. No. 897,337  
 Int. Cl.<sup>2</sup> A47B 91/08  
 U.S. Cl. 312—253 12 Claims

1. A frame for defining a configuration for arranging and supporting furniture thereon, said frame including a plurality of rod-like members joined together to define a configuration corresponding to a desired arrangement of furniture,

said configuration of said joined rod-like members having first and second end portions, said configuration of said joined rod-like members being carried by a supporting floor, first and second furniture supporting stanchions affixed to said first and second end portions, respectively, said first and second furniture supporting stanchions being of sufficient height relative to the height of said furniture such that said furniture rests upon the top of said supporting stanchions when said furniture is positioned above said plurality of joined rod-like members comprising said frame, wherein said supporting stanchions support said furniture mounted thereon,

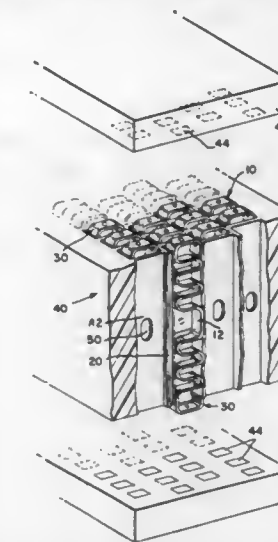


said furniture concealing said plurality of joined rod-like members when said furniture is positioned thereabove, armature means for supporting additional equipment, said armature means being pivotably mounted to at least one of said furniture supporting stanchions such that said additional equipment can be pivoted into and out of predetermined positions, said furniture supported by said supporting stanchions and said supporting stanchions defining at least one compartment therebetween for storing said additional equipment, said armature means and said additional equipment carried thereon being pivotable into and out of said defined compartment.

**4,161,346**  
**CONNECTING ELEMENT FOR SURFACE TO SURFACE CONNECTORS**  
 Gabriel B. Cherian, York, and William S. Scheingold, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.  
 Filed Aug. 22, 1978, Ser. No. 935,839  
 Int. Cl.<sup>2</sup> H05K 1/12  
 U.S. Cl. 339—17 M 8 Claims

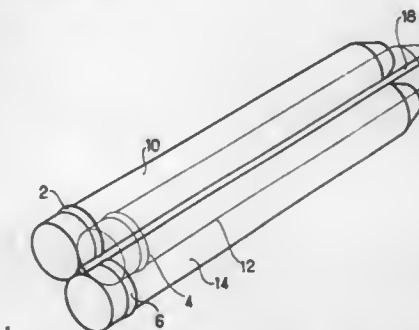
1. A connecting element for interconnecting electrical circuits on two devices having identically arranged circuit pad patterns, which comprises:  
 a. a body portion having multiple, S-shaped spring sections on both sides of a center section;  
 b. contacts at the free ends of the spring sections; and

c. a resilient shorting beam attached to the center section and spaced from the body portion, said beam extending to the



contacts at the ends of the spring section and adapted to be biased thereagainst.

**4,161,347**  
**CONNECTOR FOR AN OPTICAL FIBRE LINK**  
 André Tardy, St. Germain les Arpajon, France, assignor to Compagnie Generale d'Electricite, Paris, France  
 Filed Oct. 20, 1977, Ser. No. 843,920  
 Claims priority, application France, Nov. 9, 1976, 76 33753  
 Int. Cl.<sup>2</sup> G01B 5/14  
 U.S. Cl. 350—96.21 8 Claims



1. Connector for an optical fibre link comprising: at least one flexible optical fibre constituting a light guide; three holding rods which are cylinders of revolution; clamping means for holding said holding rods parallel to one another and in contact in pairs by their lateral surfaces along three rectilinear contact lines and forming between them a holding channel delimited by the facing parts of the lateral surfaces of said rods; an end section of the fibre being disposed in said holding channel; and guide means pressing on the lateral outside surface of the assembly formed by the three holding rods for guiding the end section of the fibre with precision and without risk of damage up to a portion ensuring its optical connection with another optical element, the improvement comprising: said three holding rods having the same diameter, said rods comprising grooves cut respectively at a constant depth in said holding rods, around said rods at a common distance from the end of the holding channel and resilient means comprising three identical resilient rings disposed respectively in said grooves, with

said rings projecting from the lateral surfaces of the rods with projecting portions of said rings being reduced locally by compression and resilient deformation under action of the clamping means on contact lines between said holding rods.

4,161,348

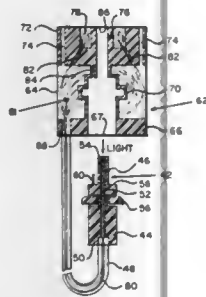
**PREASSEMBLED FIBER OPTIC SECURITY SEAL**  
Reinhard R. Ulrich, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1977, Ser. No. 823,077

Int. Cl.<sup>2</sup> G02B 5/16

U.S. Cl. 350—96.20

10 Claims



1. A preassembled fiber optic seal comprising: a fiber optic bundle; a first connector for securing the outward ends of the bundle together, whereby individual fibers of the bundle are randomly positioned within the connector; a second connector having an intermediate length of individual fibers wrapped therearound; means for permanently securing the first connector to the second connector; an opening formed in the second connector, the opening positioned in registry with the ends of the bundle when the connectors are secured together; wherein light passage through the fiber optic bundle creates a unique fingerprint at the second connector opening, which will be altered if the seal is broken.

4,161,349

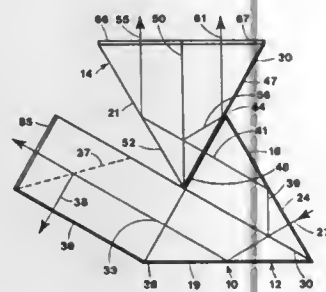
**BEAM SEPARATING PRISM SYSTEM**  
John B. Norman, Irving, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Mar. 13, 1978, Ser. No. 885,707

Int. Cl.<sup>2</sup> G02B 27/14

U.S. Cl. 350—173

16 Claims



1. A beam separating prism system for an imaging system comprising two pairs of prisms, each pair having a partially reflecting region located between parallel adjacent surfaces of the prisms, one pair of prisms located adjacent to said other pair and having an air gap there between, a first prism of said one pair of prisms positioned to receive light along an entry axis through a nonreflecting entry surface, the region of said

one pair intercepting said entry axis at an angle of approximately 60 degrees and reflecting a second and third light component and transmitting a first light component, a second prism of said one pair having a totally reflecting surface intercepting said entry axis at an angle of approximately 30 degrees to reflect the first light component from said entry axis along a first exit axis parallel to the parallel faces of said one pair of prisms, said first prism having a total reflecting surface located on the rear of said entrance surface to reflect said second and third light components along a second axis parallel to said first exit axis, the region of the other prism pair intercepting said second axis at an angle of approximately 60 degrees reflecting the third light component and transmitting the second light component, said other prism pair comprising a third and fourth prisms, said third prism located adjacent said first prism having a totally reflecting surface located on the rear of the surface intercepting said second axis to intercept the third light component at an angle of approximately 30 degrees for reflecting the third light component along a third exit axis in a certain direction, said fourth prism having a totally reflecting surface intercepting said second axis at an angle of approximately 30 degrees to reflect the second light component along a second exit axis parallel to said third exit axis in said certain direction and at an angle of approximately 60 degrees to said first exit axis.

4,161,350

**TELESCOPIC PHOTOGRAPHING LENS SYSTEM**  
Yasunori Arai, Asaka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

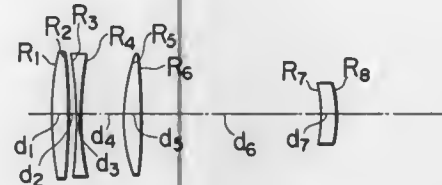
Filed Jul. 11, 1978, Ser. No. 923,750

Claims priority, application Japan, Jul. 11, 1977, 52-82659

Int. Cl.<sup>2</sup> G02B 9/34

U.S. Cl. 350—220

2 Claims



1. A telephoto lens system comprising four lenses grouped into four components wherein a first lens is a positive lens having a stronger curvature surface directed to the object, a second lens is negative lens having a stronger curvature surface directed to the object, a third lens is a positive lens having a stronger curvature surface directed to the object and a fourth lens is a negative meniscus lens having a concave surface directed to the object, the distances between the first and second lenses the second and third lenses the third and fourth lenses being progressively greater, said lens system satisfying the following conditions:

$$\frac{N_1 + N_3}{2} < \frac{N_2 + N_4}{2}, N_1 < N_3 \quad (1)$$

$$\frac{v_1 + v_3}{2} - v_2 > 25, v_4 > 55 \quad (2)$$

- (3)  $0.55f < -f_2 < 0.75f$
- (4)  $0.85 < f_1/f_3 < 1.15$
- (5)  $0.08f < d_4 < 0.15f$
- (6)  $0.35f < d_6 < 0.5f$
- (7)  $f < -R_2 < 1.5f$
- (8)  $0.65f < -R_3 < 0.95f$
- (9)  $0.35f < R_5 < 0.45f$
- (10)  $0.1f < -R_7 < 0.2f$

where:  $N_i$  is the refractive index of the  $i$ -th lens on  $d$ -line;  
 $v_i$  is the Abbe's number of the  $i$ -th lens;

$f$  is the overall focal length;  
 $f_i$  is the focal distance of the  $i$ -th lens  
 $d_k$  is the distance between the  $k$ -th and  $(k+1)$ th lens surfaces;  
and  
 $R_k$  is the radius of curvature of the  $k$ -th lens surface and further defined by:  
 $f=100 F=1:3.5 f_B=27.68 K=0.94 -f_2=62.3 f_1/f_3=1.03$

lens surface	R	d	n	v
1	49.692	4.026	1.51633	64.1
2	-111.380	2.226		
3	-74.103	1.282	1.68893	31.1
4	102.736	10.031		
5	41.067	3.569	1.62230	53.2
6	-2355.821	43.231		
7	-17.489	2.308	1.51633	64.1
8	-34.694			

where

F=aperture ratio

K=telescopic ratio

 $f_B$ =back focal length

4,161,351

**ALL-REFLECTIVE OPTICAL TARGET ILLUMINATION SYSTEM WITH HIGH NUMERICAL APERTURE**

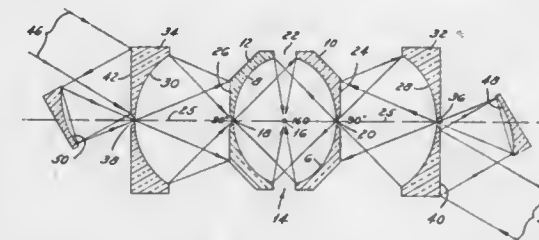
Carlton E. Thomas; Robert D. Sgler, both of Ann Arbor, Mich., and John G. Hoeger, Newport, Calif., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,095

Int. Cl.<sup>2</sup> G02B 5/10

U.S. Cl. 350—294

10 Claims



1. In an optical system for providing illumination of a target region at high numerical aperture from a pair of generally confluent collimated beams of electromagnetic energy, and comprising a pair of opposed first ellipsoidal reflectors disposed to define a target cavity and having respective first openings on a system axis, a pair of plane reflectors disposed and directed outwardly of said target chamber normal to said system axis, and a pair of second ellipsoidal reflectors disposed and directed oppositely of respective plane reflectors and having respective second openings on said system axis, the improvement comprising first and second eccentric pupil paraboloidal reflectors respectively disposed on said system axis outwardly of a second ellipsoidal reflector to intercept and focus one of said collimated beams into the opening of the associated second ellipsoidal reflector.

4,161,352

**VEHICLE MOUNTED SURVEILLANCE APPARATUS**

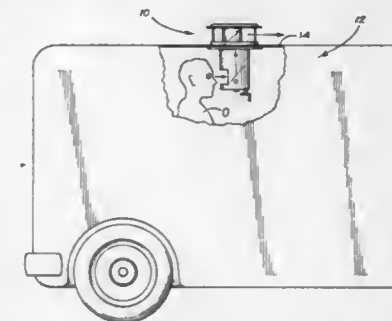
Larry L. Felix, 1250 Manzanita, Canby, Ore. 97013, and Norman P. Fandrel, 3822 SE. Spaulding, Milwaukie, Ore. 97222

Filed Mar. 14, 1977, Ser. No. 777,062

Int. Cl.<sup>2</sup> G02B 23/08

U.S. Cl. 350—301

7 Claims



1. Apparatus for use in surveillance from a vehicle comprising:

adapter means having an aperture mounted adjacent to a wall opening in the vehicle;

casing means rotatably mounted on said adapter means operable for revolving about its longitudinal axis within the vehicle;

scope means mounted within said casing means including an assembly operable for selectively shifting said scope means in the direction of said longitudinal axis through the wall opening, said assembly including an elongate, threaded shaft rotatably connected to said scope means and a nut means rigidly secured to said casing means for receiving said shaft so that rotation of said shaft imparts longitudinal shifting to said scope means, said scope means further including an elongate slot formed in a wall portion thereof for receiving said nut means, a portion of said slot contacting said nut means during revolution of said casing means so that revolution of said casing means imparts simultaneous revolution to said scope means; and a pair of opposed, reflecting means mounted on said scope means for reflecting images from outside the vehicle to the inside.

4,161,353

**SECONDARY IMAGE REPRODUCTION DEVICE**

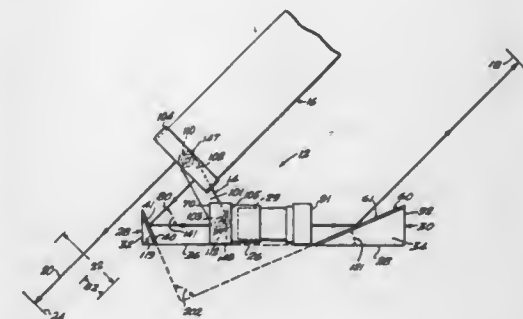
Herman Centner, 8730 SW. 21 Terr., Miami, Fla. 33165

Filed Jul. 22, 1977, Ser. No. 818,054

Int. Cl.<sup>2</sup> A61B 3/02; G03B 21/26, 21/28

U.S. Cl. 351—30

15 Claims



1. For attachment to a projector having a beam opening for passage of a primary beam of emergent light rays to project a primary image on a main surface and wherein the projector includes a main lens system;

a device to simultaneously produce a duplicate image of the



primary image on a second surface, said device comprising:

- a member including a first end zone portion and a second end zone portion and an intermediate portion between the end zone portions, and said member having a longitudinal axis through the portions and defining a secondary light beam path,
- a first plane mirror having a reflective surface on the first end zone with the reflective surface facing toward said second end zone and at a first angle with respect to the longitudinal axis of the member;
- a second plane mirror having a reflective face on the second end zone with the reflective surface facing toward said first end zone and at a second angle with respect to the longitudinal axis of the member,
- the sum of said first and said second angles being substantially 90 degrees,
- said first end zone having an opening between the intermediate portion and the first plane mirror such that a line of sight through said first opening and toward the reflective surface of said first plane mirror reflects light rays entering the first opening which impinge upon the first plane mirror parallel to said axis along said secondary light beam path towards the second plane mirror; and
- said second end zone having an opening between the intermediate portion and the second plane mirror so that light rays traveling along the light beam path are reflected through said second opening,
- means to mount the device to a projector oriented so that (a) the first plane mirror and (b) the first opening in the first end zone are in the peripheral portion of the primary beam of emergent light rays projecting the primary image on the main surface to reflect a portion of said primary beam from the first mirror parallel to the axis of the member to be reflected by the second mirror to simultaneously project and produce a secondary image on a second surface which is a duplication of the primary image;
- an auxiliary lens means in the path on the intermediate portion with a lens axis parallel to the axis of the member to focus the light rays reflected from the first mirror to the second mirror on the second surface; and
- means connecting the second end zone portion to the intermediate portion including adjustment means to rotate the second mirror about the axis of the member and relative to the first mirror through 180 degrees of rotation.

4,161,354

#### TOP SHUTTER CURTAIN RELEASE MECHANISM FOR AN AUTOMATIC APERTURE VALUE CONTROL CAMERA

Hiroshi Kurei, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1977, Ser. No. 828,117

Claims priority, application Japan, Aug. 27, 1976, 51-102413

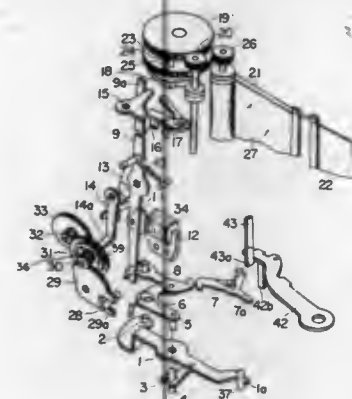
Int. Cl.<sup>2</sup> G03B 7/08, 9/02

U.S. Cl. 354—36

2 Claims

1. In an automatic camera of the aperture control type wherein the lens stopping operation is carried out by detecting the variation in light quantity due to the lens stopping operation with a finder viewing mirror in its raised position, said camera including a shutter having top and bottom curtains and means for cocking said top and bottom curtains, light measuring means for detecting when the light quantity is equal to a predetermined value, and means for terminating the lens stopping operation including a magnet connected to said light measuring means, said magnet being de-energized when the detected light quantity is equal to said predetermined value, the improvement comprising an operating member carrying an armature for contacting said magnet when energized, said operating member being biased to move said armature away from said magnet upon de-energization of said magnet, lens operation terminating means operatively connected with said operating member and cooperating therewith for terminating the lens stopping operation when said operating member is

released by said magnet to move away from said magnet, said lens operation terminating means including a plurality of intermeshed gears having at least first and second gears, said first gear being engagable by a control lever operatively associated with said operating member, a unidirectional clutch means operatively coupling at least two of said gears for permitting rotation of some of said gears in the return direction even when said control lever engages and stops rotation of said first gear



4,161,355

#### PHOTOGRAPHIC CAMERA CONTROL CIRCUITRY

Masayoshi Sahara, Sannan, and Masaaki Nakai, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

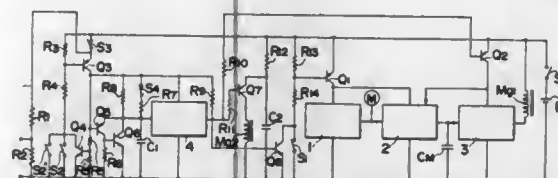
Filed Feb. 3, 1978, Ser. No. 875,074

Claims priority, application Japan, Feb. 14, 1977, 52/15299

Int. Cl.<sup>2</sup> G03B 7/08, 9/64

U.S. Cl. 354—51

6 Claims



1. A photographic camera control circuitry comprising:
  - a light measuring circuit for generating a light representative signal, said light measuring circuit including a photocell receiving light of the scene to be photographed, through a camera objective and a diaphragm aperture;
  - storing means for storing said light representative signal;
  - storage switch means for connecting and disconnecting said storing means to or from said light measuring circuit;
  - exposure time control means for initiating shutter closing at a time commensurate with the signal stored in said storing means;
  - a first control circuit for energizing said light measuring circuit and actuating said storage switch means to connect said storing means to said light measuring circuit;
  - a second control circuit for energizing said exposure time control means and for deactuating said storage switch means to disconnect said storing means from said light measuring circuit;

delay means for generating an output after a lapse of a given time period from the actuation thereof;

electromagnetic means for actuating a camera mechanism to initiate an exposure sequence;

a third control circuit for energizing said electromagnetic means;

a first switch means for actuating said first control circuit; and

second switch means for actuating said first control circuit and said delay means, said delay means being connected with said second and third control circuits so that both said circuits are actuated in response to the output of said delay means.

4,161,356

#### APPARATUS FOR IN-SITU PROCESSING OF PHOTOPLATES

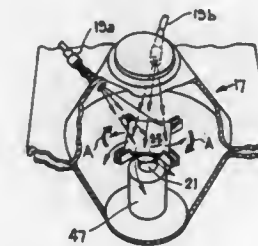
James W. Giffin, 4653 Columbia River Ct., San Jose, Calif. 95136; Michael A. De Santis, 3116 Penetencia Creek Rd., San Jose, Calif. 95132, and John S. Burchard, 630 Dorrance Rd., Boulder Creek, Calif. 95006

Division of Ser. No. 761,135, Jan. 21, 1977, abandoned. This application Jun. 20, 1977, Ser. No. 807,884

Int. Cl.<sup>2</sup> G03D 3/02; B08B 3/02

U.S. Cl. 354—323

4 Claims



1. An apparatus for in-situ processing of photoplates comprising:
  - a lower frusto-conical bowl-shaped member having sloping side walls and a first rim and an upper frusto-conical bowl-shaped member having sloping side walls and a second rim, said first and second rims disposed adjacent to each other such that the sloping side walls of said lower and upper bowls define most of a closed chamber therebetween,
  - a motor-driven spinner chuck projecting into the chamber, said chuck having means for rotating a photoplate in a horizontal plane,
  - spray means flush mounted to the inside walls of said upper bowl at locations where dripping from said spray means will avoid the horizontally rotating photoplate in the spinner chuck, said spray means for directing photoplate processing fluids onto said photoplate.

4,161,357

#### PHOTORECEPTOR HEATING APPARATUS

John L. Herman, Penfield, and John Stavisky, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1977, Ser. No. 830,258

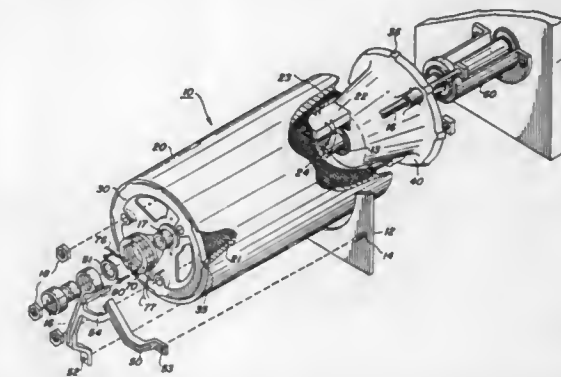
Int. Cl.<sup>2</sup> G03G 15/00; G03B 27/52

U.S. Cl. 355—3 DR

4 Claims

1. A copier having a substantially cylindrical photoreceptor, a shaft journaled to said copier, endbells adapted for mounting said photoreceptor to said shaft, said photoreceptor including energy receptor means on a first surface thereof, and heater/controller means adapted for connection to said energy receptor means for controlling temperature variations of a second surface of the photoreceptor, the improvement comprising:
  - power transmission means adapted to be mounted over said shaft, said power transmission means including a slip ring assembly that comprises three concentric annular mem-

bers, one of said members being stationary, and support means adapted to fit over said shaft and against said power transmission means wherein said one of said annular mem-



bers has projection means thereon for mating with said support means and preventing said one of said annular members from rotating relative to said shaft.

4,161,358

#### SHEET SUPPORTING DRUM DURING DEVELOPMENT IN MACHINES FOR ELECTROSTATICALLY PREPARING PRINTING MATRICES

Vittorino Boschet, Milan, Italy, assignor to Grafosol, S.p.A., Milan, Italy

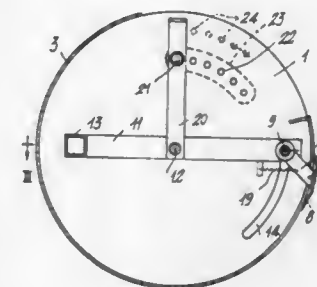
Filed Jan. 26, 1978, Ser. No. 872,487

Claims priority, application Italy, Feb. 1, 1977, 20545/77[U]

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355—3 DR

3 Claims



1. A sheet supporting drum for use during development of a latent image in machines for electrostatically preparing printing matrices, provided with front and rear grippers, for retaining said sheet in its proper position on the drum surface of which the rear gripper is angularly displaceable over the drum surface, wherein said rear gripper comprises a fillet carried by arms passing through slots in the drum shell and mounted on a rotatable common shaft carried by bearing means, said common shaft being adapted to be angularly displaced about an axis coincident with the drum axis of rotation.

4,161,359

#### APPARATUS FOR SYNCHRONIZING MOVEMENT BETWEEN AN OPTICAL SCANNING SYSTEM AND AN IMAGING MEMBER

Roger D. Masham, Newport Pagnell, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1977, Ser. No. 844,991

Claims priority, application United Kingdom, Dec. 17, 1976, 52776/76

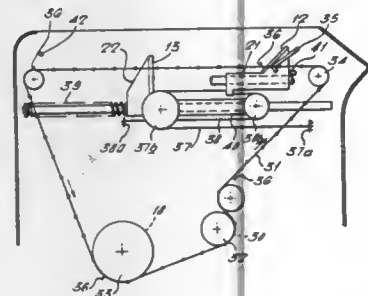
Int. Cl.<sup>2</sup> G03G 21/00

U.S. Cl. 355—8

6 Claims

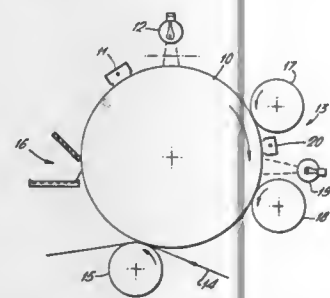
1. A photocopier including a rotatable drum having a photo-

sensitive surface thereon, an optical system for scanning successive portions of an object plane and directing light reflected from said object plane onto successive portions of said photosensitive surface, said optical system comprising a reciprocable



scanning carriage and an endless drive transmission member which continuously, drivingly engages said drum and which discontinuously, drivingly engages the carriage by means of detents spaced along said member by a distance equal to the circumference of said drum.

**4,161,360**  
**LIQUID DEVELOPMENT APPARATUS**  
Kenneth W. Smith, Welwyn Garden City, England, assignor to Xerox Corporation, Stamford, Conn.  
Filed Sep. 28, 1977, Ser. No. 837,137  
Claims priority, application United Kingdom, Dec. 31, 1976, 54465/76  
Int. Cl.<sup>2</sup> G03G 15/00  
U.S. Cl. 355—10 7 Claims

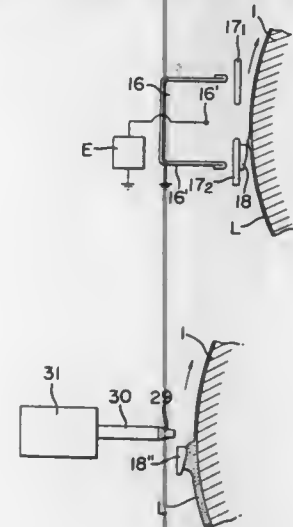


1. Electrostatographic imaging apparatus including a development apparatus for the liquid development of electrostatic latent images on an imaging surface, the development apparatus comprising first and second developer applicators arranged for successive application of developer liquid to the surface, the first and second applicators having retaining recesses for developer liquid, and the recesses of the first and second applicators being of relatively high and low frequencies, respectively, for enhanced developed image quality.

**4,161,361**  
**WET TYPE ELECTROPHOTOGRAPHIC APPARATUS**  
Ikuro Soma, Yokohama, and Yusaku Takada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 23, 1977, Ser. No. 827,021  
Claims priority, application Japan, Dec. 3, 1976, 51-145460  
Int. Cl.<sup>2</sup> G03G 15/10  
U.S. Cl. 355—10 28 Claims

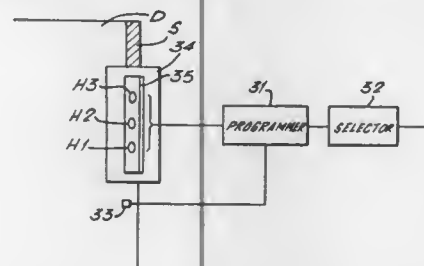
1. An electrophotographic apparatus comprising:  
a movable photosensitive medium which at least moves upwardly along its path of movement;  
means for forming an electrostatic latent image on said photosensitive medium;  
developing means for supplying developing liquid to the

surface of said photosensitive medium to develop the electrostatic latent image thereon into a toner image; squeeze power forming means disposed downstream of said developing means with respect to the path of movement of said photosensitive medium, and opposed to said photosensitive medium at a position where said photosensitive medium moves upwardly, said squeeze power forming means being spaced from the layer of developing liquid formed on said photosensitive medium;  
a liquid thickness evening member disposed to contact the developing liquid dammed up and bulged by the action of said squeeze power forming means to make uniform the



thickness of the layer of developing liquid squeezed by said squeeze power forming means and which then flows down said photosensitive medium, said liquid thickness evening member being provided with a liquid-contacting surface having a planar surface region which is substantially parallel to the surface of said photosensitive medium, and a contiguous sloped surface region which extends downwardly from said planar surface region, wherein the clearance between said sloped surface region and the surface of said photosensitive medium continuously increases in the direction opposite to the direction of movement of said photosensitive medium.

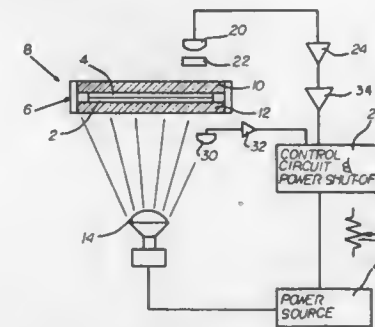
**4,161,362**  
**DOCUMENT CODING**  
Neil B. Blake, Harpenden, England, assignor to Rank Xerox Limited, London, England  
Filed Sep. 12, 1977, Ser. No. 832,314  
Claims priority, application United Kingdom, Sep. 17, 1976, 38622/76  
Int. Cl.<sup>2</sup> G03B 27/52  
U.S. Cl. 355—40 13 Claims



1. Apparatus for color-coding documents including means

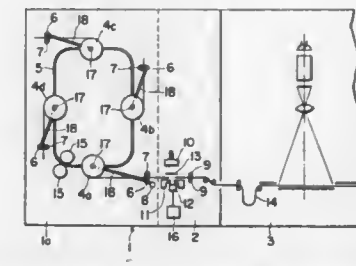
for automatically marking successive documents serially presented thereto with mutually different colors in a preselected sequence, wherein said marking means includes a plurality of marking devices operable in the preselected sequence, wherein each said device is loaded with a different color marking material, said marking devices to be operated singly and in combination to produce a range of colors.

**4,161,363**  
**INSTANTANEOUS EXPOSURE CONTROL FOR FILM**  
Rolf D. Kahle, Saratoga, Calif., assignor to Quantor Corporation, Mountain View, Calif.  
Filed Aug. 4, 1975, Ser. No. 601,756  
Int. Cl.<sup>2</sup> G03B 27/74, 27/78  
U.S. Cl. 355—68 20 Claims



8. A system for controlling the exposure of light sensitive film so that the relative light density of images on the film remains constant irrespective of variations in the quality or quantity of light to which the film is exposed or variations in the relative light transmissivity of a light sensitive substance of the film, the substance substantially instantaneously changing its light transmissivity as a function of its exposure to light, the system comprising: a light source; means for positioning the film so that light from the source exposes the film; a light sensor positioned on the side of the film opposite from the light source for sensing the intensity of light being transmitted by the film; and means operatively coupled with the sensor for terminating the exposure of the film to light from the source after and in response to a predetermined change in the sensed light intensity and, thereby, in the light transmissivity of the film; whereby the exposure of the film is carried out, controlled and terminated as a function of the change in the light transmissivity of the film induced by light from the source.

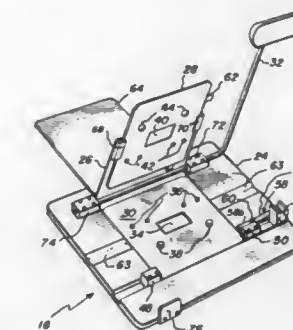
**4,161,364**  
**PICTURE PRINTING APPARATUS**  
Yoshimitsu Hanai; Makio Hirata, and Mikio Kogane, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
Filed Nov. 3, 1977, Ser. No. 848,426  
Claims priority, application Japan, Nov. 4, 1976, 51-132933  
Int. Cl.<sup>2</sup> G03B 27/58; B65H 19/18  
U.S. Cl. 355—72 4 Claims



1. In a picture printing apparatus for processing a roll of negative film, of the type including an exposure section fed with printing paper from a supply section, the improvement

wherein said supply section comprises means for supporting and successively conveying a plurality of roll papers to be fed to said exposure section, and means for successively connecting the ends of said roll papers as they are fed to said exposure section, whereby the length of the roll paper is substantially infinite and the printing process can be performed continuously for the entire length of each roll of negative film.

**4,161,365**  
**NEG HOLD ASSEMBLY FOR PHOTOGRAPHIC PRINTER**  
Richard D. Anderson, Maple Grove, and John A. Wedel, Crystal, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.  
Filed Jan. 9, 1978, Ser. No. 868,080  
Int. Cl.<sup>2</sup> G03B 27/62  
U.S. Cl. 355—75 27 Claims



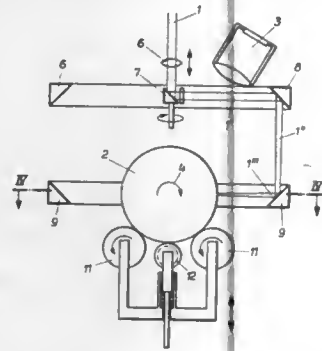
1. A neghold assembly for use in a photographic printer, the neghold assembly comprising:  
first and second insert plates having mating light transmitting portions;  
a transport base for holding the first insert plate;  
top insert holder means for holding the second insert plate;  
handle means operably connected to the top insert holder means for selectively pivoting the top insert holder means to a clamping position in which the first and second aperture insert plates are clamped together to hold photographic film and to open positions in which the first and second insert plates are separated; and  
insert lift lever means operably engaging the handle means and the second insert plate for lifting the second insert plate to release clamping of the first and second insert plates when the handle means is depressed beyond the clamping position, thereby permitting adjustment of film position without pivoting the second insert plate to an open position.

**4,161,366**  
**PROCESS AND APPARATUS FOR THE AUTOMATIC EXAMINATION OF EGGS FOR CRACKS OR PLACES OF FRACTURE IN THEIR SHELL**  
Johannes Bol, Heppenheim, and Hans-Ulrich Freund, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Battelle-Institute e.V., Frankfurt am Main, Fed. Rep. of Germany  
Filed Feb. 14, 1977, Ser. No. 768,601  
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605721  
Int. Cl.<sup>2</sup> G01N 33/08, 21/32; G02B 27/17  
U.S. Cl. 356—56 11 Claims

1. A process for detecting cracks or fractures in an egg shell comprising the steps of:  
(a) rotating the egg about its longitudinal axis;  
(b) focussing at least one beam of light from a light source;  
(c) directing the focussed light beam onto a rotatable mirror;  
(d) rotating the rotatable mirror such that the light beam

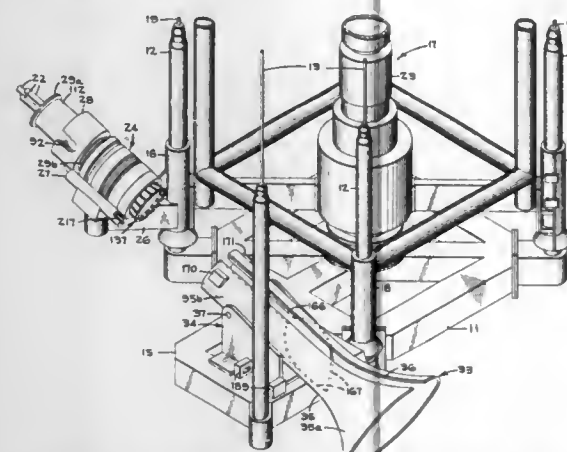


scans the egg shell along circumferential paths including both ends of the egg; and  
(e) detecting and measuring the intensity of light emanating



from the egg such that cracks or fractures can be located, the light emanating from the egg at a higher intensity when the light beam enters the egg through a crack or fracture.

**4,161,367**  
**METHOD AND APPARATUS FOR COMPLETING DIVERLESS SUBSEA FLOWLINE CONNECTIONS**  
Glen H. Cuiper, Spring, and Thomas J. Ames, Houston, both of Tex., assignors to FMC Corporation, San Jose, Calif.  
Filed Feb. 15, 1978, Ser. No. 877,924  
Int. Cl.<sup>2</sup> E21B 43/01; F16L 1/00  
U.S. Cl. 405-169



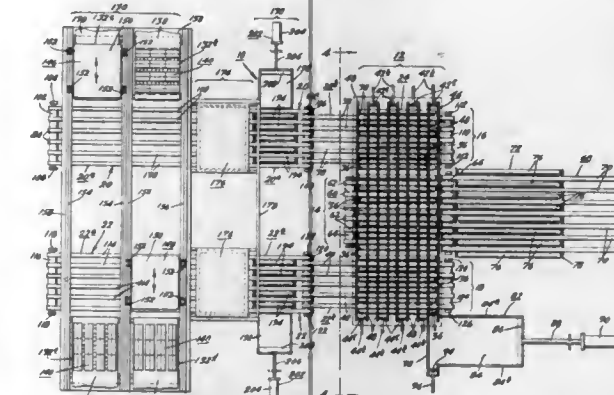
1. Remote-controlled apparatus for connecting a first connector, mounted on one end of a first flowline with a second connector mounted on one end of a second flowline and for securing the ends of the connectors in precise axial alignment without damage to seals used to interconnect the connectors, in a fluid-tight arrangement, said apparatus comprising:

- a pull-in cable;
- means for connecting said pull-in cable to the geometric center of the free end of said first connector;
- means for moving said pull-in cable and said first connector into axial alignment with said second connector;
- an annular seal;
- means for mounting said seal adjacent the free end of one of said first and second connectors;
- means for securing the ends of said first and said second connectors in precise axial alignment without pressing the ends of said connectors against said seal; and
- means for pressing the ends of said first and said second connectors against said seal in a fluid-tight relationship after the connectors are secured in precise axial alignment.

**4,161,368**  
**BRICK BLENDING APPARATUS**  
Alfred Batzdorff, Langhorne, Pa., assignor to The Keller Corp., Hatfield, Pa.  
Filed Feb. 6, 1978, Ser. No. 875,304  
Int. Cl.<sup>2</sup> B65G 59/02

U.S. Cl. 414-114

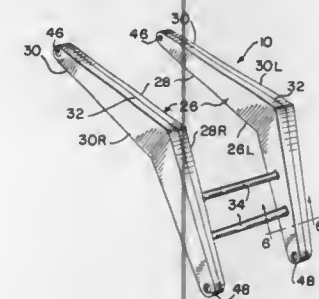
12 Claims



1. Apparatus for selectively blending rows of bricks, comprising a brick blending station, said blending station including a brick blending area, a first brick staging area on one side of said brick blending area, and a second brick staging area on the opposite side of said blending area from said first staging area, means for delivering a plurality of rows of bricks to said first staging area in a spaced parallel disposition, means for delivering a plurality of rows of bricks to said second staging area in a spaced parallel disposition parallel to the brick rows delivered to said first staging area, transfer means for selectively moving rows of bricks from said first staging area into said blending area, transfer means for selectively moving rows of bricks from said second staging area into said blending area to provide a blended array of brick rows, guide means in said blending station for guiding said brick rows into said blending area, said guide means comprising a plurality of parallel fence elements and means for selectively raising or lowering said fence elements into an operative position within said blending station, and conveyor means for removing the blended array of bricks from said blending area.

**4,161,369**  
**LOADER BOOM ASSEMBLY**  
Emil F. Moreno, Melrose Park, Ill., assignor to International Harvester Company, Chicago, Ill.  
Filed Feb. 2, 1977, Ser. No. 764,781  
Int. Cl.<sup>2</sup> E02F 3/81  
U.S. Cl. 414-722

2 Claims



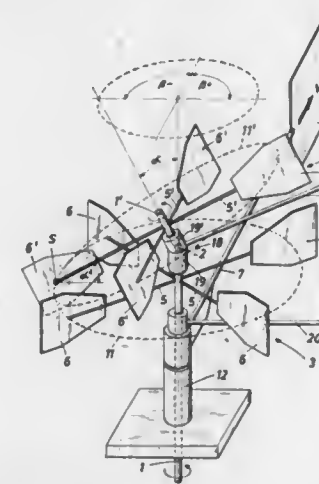
1. A boom assembly for a loader pivotally mounted on a tractor and movable supporting a material handling member, wherein the improvement comprises:  
a pair of boom arms having one end pivotally connected to said tractor and having a second end movably supporting said material handling member, said boom arms comprising:  
a pair of matched inner and outer C-channels having hori-

zontal and vertical surfaces welded at the contact edges of said horizontal and vertical surfaces welded at the contact edges of said horizontal surfaces to form a box boom arm, with only said inner C-channels having aligned cross tie apertures in said vertical surfaces forward of said tractor; a cross tie member passing through said apertures and welded to said vertical surface of said inner C-channel and to said vertical surface of said outer C-channel.

**4,161,370**  
**WINDMILL**  
Gottfried Oppolzer, Geylinggasse 15, A-1130 Vienna, Austria  
Filed Apr. 11, 1978, Ser. No. 895,447  
Claims priority, application Austria, Apr. 18, 1977, 2683/77; Feb. 1, 1978, 680/78  
Int. Cl.<sup>2</sup> F03D 3/02

U.S. Cl. 416-17

18 Claims



1. A windmill comprising shaft means defining a vertical axis, first and second windmill wheels mounted on and non-rotatably connected by shaft means, each of said windmill wheels having rigidly interconnected vanes, which are adapted to return opposite to the direction of the wind, said first and second windmill wheels defining respective axially outermost flight circle planes which intersect at an acute angle, the vanes of each of said windmill wheels being adapted to describe an orbital line, which is tangent to a corresponding orbital line described by the vanes of the other windmill wheel at an apex, which is disposed between said flight circle planes, and control means for moving said windmill wheels relative to each other so as to move said apex about said vertical axis and thus to vary said angle when measured in a vertical plane that is at right angles to the direction of the wind, said vanes of each of said windmill wheels interdigitating with those of the other windmill wheel adjacent to said apex so that said vanes shelter each other from the wind as they return when said apex lies in said vertical plane.

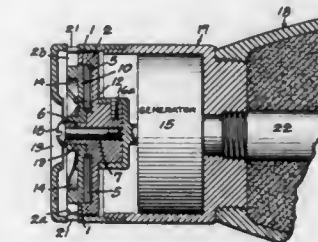
**4,161,371**  
**SELF-REGULATING TURBINE**  
Milton A. Sheppa, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Nov. 16, 1949, Ser. No. 127,612  
Int. Cl.<sup>2</sup> F03D 1/02; F42C 15/40

U.S. Cl. 416-43

1 Claim

1. A self-regulating turbine comprising an inner turbine rotor having outwardly extending vanes with air passages between them, an outer rotor member concentric with and extending radially beyond said inner rotor and having limited circumferential motion relative to said inner rotor, said outer rotor

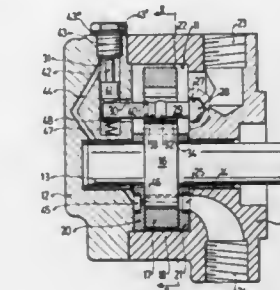
member coupled to a load, bosses on said outer member disposed to substantially obstruct the outward flow of air from said air passages in one extreme circumferential position of said outer member, but not in the other extreme circumferential position of said outer member, said bosses shaped as to constitute an extension of said vanes when in said other extreme circumferential position whereby to increase the effectiveness of the rotor at low operating speeds, biasing means acting on said inner turbine rotor thereby urging said outer rotor into



said last named position but opposed by air reaction on said vanes toward said first named position, said biasing means comprising a plurality of spring members circumferentially spaced in said outer rotor and directed inwardly thereof, a plurality of spaced studs affixed in said inner turbine rotor and projecting therefrom, said spring members arranged to engage successively said studs to secure non-linear biasing characteristics, and stop means preventing relative rotation of said outer rotor member beyond said other extreme position.

**4,161,372**  
**INTERNAL-GEAR FLUID-DISPLACEMENT MACHINE WITH MOVABLE SEPARATING BODY**  
Paul Bosch, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Oct. 28, 1977, Ser. No. 846,525  
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650908  
Int. Cl.<sup>2</sup> F01C 1/10, 19/00; F03C 3/00; F04C 1/06  
U.S. Cl. 418-126

13 Claims



1. An internal-gear fluid-displacement machine comprising, in combination, a housing having an internal chamber; an internal gear in said chamber; a spur gear located in said chamber and meshing with said internal gear at a meshing region which constitutes a high-pressure zone of the machine during operation, said gears bounding with each other an interspace which constitutes a low-pressure zone of the machine, and a separating region which narrows from said interspace toward said meshing region; an elongated separating body which fills said separating region thus separating said low-pressure and high-pressure zones from one another; an actuating element connected to said separating body for joint displacement substantially longitudinally of the latter, said actuating element being a lever having one end mounted on said housing for pivoting and another end; and means for subjecting said actuating element to a force which acts substantially longitudinally of said separating body and has a magnitude which depends on

the pressure of a fluid present at said high-pressure zone, said subjecting means including a bore in said housing, a piston mounted in said bore and having one end face bounding a pressure space in said bore and another end face facing said other end of said lever, and means for admitting the fluid from said high-pressure zone into said pressure space to act on said piston and press the same against said other end of said lever.

4,161,373

## TYPING DEVICE INCLUDING A TYPE DISC

Kurt Chvatilsky, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

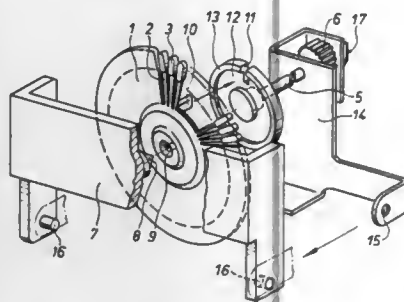
Filed Aug. 16, 1977, Ser. No. 825,541

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639872

Int. Cl.<sup>2</sup> B41J 1/04

U.S. Cl. 400—175

13 Claims



1. In a typing device including a frame; a drive shaft; support means for rotatably supporting the drive shaft in the frame; and a type disc arranged in the frame for being rotated by the drive shaft; the improvement comprising

- (a) a conically centering bearing assembly situated between one side of said type disc and a frame part; said centering bearing assembly being the sole means for the radial centering of said type disc with respect to said drive shaft;
- (b) means for coupling said type disc to said drive shaft; said means for coupling being arranged for transmitting solely rotary motions of said shaft to said type disc to thereby prevent radial excursions of said drive shaft from being transmitted to said type disc; and
- (c) a spring means axially urging said type disc against said frame part for a conical centering of said type disc on said frame part by said bearing assembly.

4,161,374

## TWIST RETRACTABLE WRITING IMPLEMENT

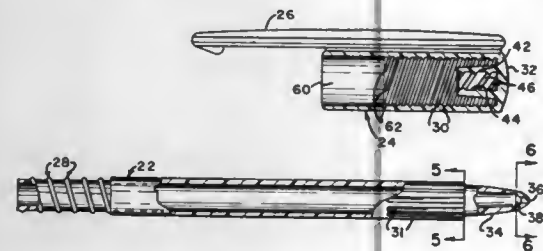
Harold E. Koeln, Kirkwood, and Walter W. Paige, Jr., Crestwood, both of Mo., assignors to Penn Corporation, Princeton, N.J.

Filed Apr. 1, 1977, Ser. No. 783,639

Int. Cl.<sup>2</sup> B43K 5/16, 7/12

U.S. Cl. 401—116

5 Claims



1. In a twist retractable writing implement having a barrel and a cap threadably received thereon, a scribe element carried by said cap, rotation of said cap longitudinally displacing said scribe element with reference to the barrel alternatively into

extended and retracted condition, wherein the cap and the barrel are tubular, said cap having a closed end and said barrel having a first open end and a second end which converges into an opening tip, said cap having an inside diameter substantially the same as the outside diameter of the barrel adjacent its open end, and wherein a socket is mounted on the closed end of the cap for receipt of the scribe element at its end opposite the writing tip, wherein the socket is an annular flange coaxial with the cap and depending from the closed end thereof, the improvement wherein the cap is cooperatively grooved spaced from its open end, said grooves having multiple leads and wherein the cap top abuts the open end of the barrel when the writing tip is fully extended.

4,161,375

## CONNECTOR FOR TUBES OF SQUARE CROSS-SECTION

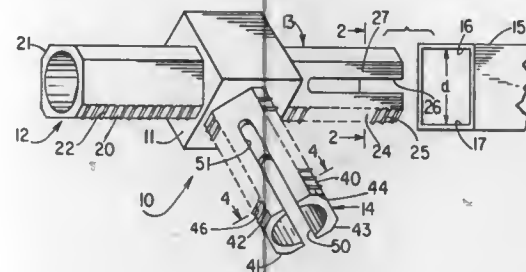
Pierce M. Murphy, 111 S. Second St., LaCrosse, Wis. 54601

Filed May 5, 1978, Ser. No. 903,251

Int. Cl.<sup>2</sup> F16D 1/00

U.S. Cl. 403—169

16 Claims



1. A connector for tubes of square cross-section comprising: an elongated hollow metallic member of such size and shape in external cross-section as to be insertable within an end length of a tube for connection therewith, said member having at least two external longitudinal surfaces of minor width on opposite sides thereof; spaced integral transverse teeth on at least one of said longitudinal surfaces; the transverse distance between the exterior of said teeth and said opposite longitudinal surface being greater than an internal transverse dimension of a tube to be connected to said member, whereby relative rotation between a tube and said member inserted therein causes said teeth to bite into an internal surface of the tube and thus establish secure connection.

4,161,376

## OFFSHORE FIXED PLATFORM AND METHOD OF ERECTING THE SAME

James E. Armstrong, Crosby, Tex., assignor to Pool Company, Dallas, Tex.

Continuation of Ser. No. 685,791, May 20, 1976, abandoned.

This application Oct. 28, 1977, Ser. No. 846,317

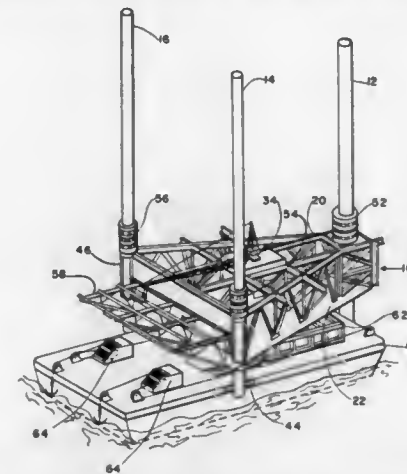
Int. Cl.<sup>2</sup> E02B 17/04

U.S. Cl. 405—196

6 Claims

1. A non-buoyant offshore fixed platform comprising: a lower deck having a floor for supporting equipment thereon, an upper deck having openings therein to permit the passage of equipment therethrough, a deck crane mounted on the upper deck, upper deck floor sections removably supported on said upper deck to close the openings in said upper deck thereby providing an upper deck surface, said upper deck floor sections being removable to permit access to the lower deck from the upper deck whereby the deck crane

can be used to move equipment between the upper and lower decks, truss members interconnected between said lower deck and said upper deck to support said upper deck from said lower deck, said truss members being spaced such that equipment moved through one of said openings may be



lowered onto the area underlying said opening and onto the area underlying openings adjacent thereto, support legs, elevating means for moving said upper and lower decks relative to said support legs, and means for fixing said legs relative to said upper and lower decks.

4,161,377

## MOULDING APPARATUS

Kenneth H. Strawson, Sheffield, and Joseph Ramsey, Mexborough, both of England, assignors to National Research Development Corporation, London, England

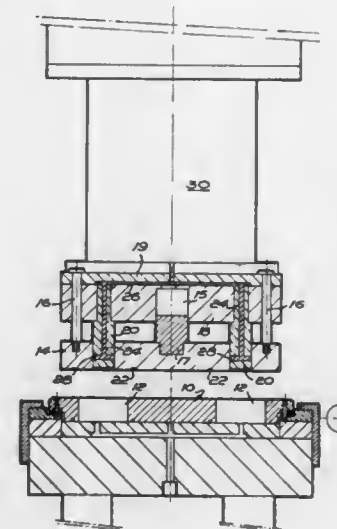
Filed May 31, 1978, Ser. No. 911,210

Claims priority, application United Kingdom, Jun. 15, 1977, 25138/77

Int. Cl.<sup>2</sup> B30B 9/28

U.S. Cl. 425—3

5 Claims



1. In moulding apparatus, a die having at least one die cavity, means constituted by a first piston and cylinder arrangement for opening and closing the die, and means constituted by a second piston and cylinder arrangement for injecting mouldable material into the die, the second annular piston and cylinder arrangement being disposed within the first piston and cylinder arrangement.

4,161,378

## PRODUCTION OF MOULDED COMPONENTS IN COMPACTABLE MATERIALS

Kenneth H. Strawson, and Gerald Spencer, both of Sheffield, England, assignors to National Research Development Corporation, London, England

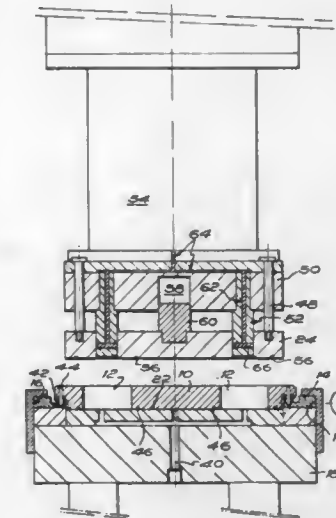
Filed May 31, 1978, Ser. No. 911,156

Claims priority, application United Kingdom, Jun. 15, 1977, 25136/77

Int. Cl.<sup>2</sup> B30B 9/28

U.S. Cl. 425—3

13 Claims



1. In a machine for the production of moulded components in a compactable material, a die plate having at least one cavity; a filter assembly forming a closure member for said at least one cavity at one side of said die plate; a die cover plate adapted to be brought into engagement with the opposite side of said die plate; and means for ducting a compactable slurry material to said at least one cavity and for maintaining a slurry pressure such that liquid is expelled through the filter assembly for producing a compact of the material in a required condition in the at least one die cavity.

4,161,379

## APPARATUS FOR PRODUCING REINFORCED HOSE

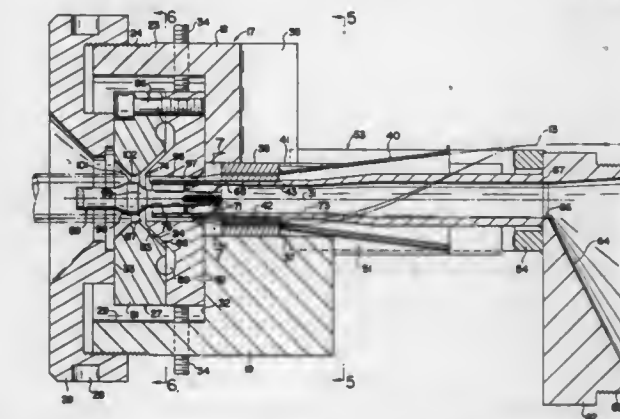
John R. Sudyk, Middlefield, Ohio, assignor to The Johnson Rubber Company, Middlefield, Ohio

Filed Jul. 21, 1977, Ser. No. 817,584

Int. Cl.<sup>2</sup> B29D 23/05

U.S. Cl. 425—112

21 Claims



1. An extrusion head for producing reinforced hose comprising a frame providing a mounting surface at one end, an outer annular nozzle assembly mounted on said mounting surface, means connected for adjusting the radial position of said outer nozzle assembly along said mounting surface, said frame including an bore open to said mounting surface, an annular



guide ring in said bore formed with a spiral groove there-through, said groove operating to guide an open reinforcing fabric strip as an overlapping spiral tube into said outer nozzle assembly, an elongated inner nozzle assembly extending through said guide ring providing an annular inner nozzle at its exit end within said fabric spiral tube, said inner nozzle assembly being axially adjustable relative to said outer nozzle assembly and having its exit end laterally supported by said guide ring, and frame extension laterally spaced from said inner nozzle assembly laterally supporting the other end of said inner nozzle assembly at a location spaced from said guide ring whereby a clearance zone is provided along which a strip of fabric travels to said guide ring, said inner and outer nozzles operating to extrude inner and outer layers of material respectively against the inner and outer sides of said fabric spiral tube.

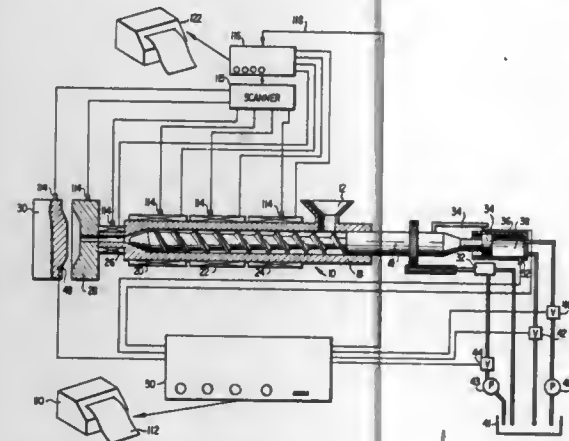
4,161,380

## INJECTION MOLDING PROCESS CONTROL

Thomas G. Bishop, Mt. Gilead, Ohio, assignor to HPM Corporation, Mt. Gilead, Ohio  
Division of Ser. No. 516,501, Dec. 21, 1974. This application  
Feb. 23, 1978, Ser. No. 880,453  
Int. Cl.<sup>2</sup> B29F 1/06

U.S. Cl. 425—145

12 Claims



1. In an automatically controlled injection molding apparatus having a process control means for producing uniform, high quality articles from synthetic resinous material, the improvement comprising:

material pressure sensing means for sensing the pressure of plasticized synthetic resinous material in the mold;  
injection pressure sensing means for sensing the pressure of hydraulic fluid during the injection portion of the molding cycle;  
integration means operable to integrate the work parameter of the injection molding apparatus during the injection portion of the molding cycle to obtain a work index;  
initiating means for starting the integration means approximately with the inception of the injection portion of the molding cycle; terminating means for stopping the integration means when the material pressure sensing means indicates a predetermined value; and

feedback means for making a compensatory adjustment in a viscosity-affecting parameter of the molding apparatus during subsequent molding cycles thereof and being activated by a signal from said process control means in response to the value of the work index.

5. Apparatus for cyclically controlling an injection molding machine during injection molding of uniform, high quality articles from synthetic resinous material, comprising:

first sensing means for generating a first signal representing pressure of synthetic resinous material in a mold;  
second sensing means for generating a second signal representing a work parameter;  
adjustment means for changing a viscosity-affecting parameter

of subsequent cycles in response to a command signal; and  
process control means for controlling a molding cycle having a plasticizing portion, an injection portion and a holding portion, the process control means including an integrator for generating a work index by integrating said second signal with respect to time during said injection portion until said first signal attains a predetermined value, a comparator for determining if the work index is within the predetermined allowable range, and means for generating an appropriate command signal to said adjustment means when the work index is outside the predetermined allowable range, whereby the failure of the work index to lie within the predetermined allowable range effects a variation in the plasticizing portion of subsequent cycles such that the work index of subsequent cycles will more likely fall within the predetermined allowable range.

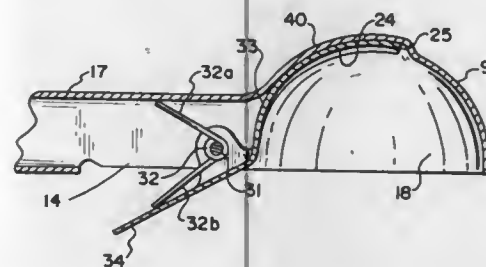
4,161,381

## ICE CREAM SCOOP

August M. Sciortino, 1919A Pickwick La., Glenview, Ill. 60025  
Filed Sep. 27, 1976, Ser. No. 726,434  
Int. Cl.<sup>2</sup> A23P 1/00

U.S. Cl. 425—286

3 Claims



1. In an ice cream scoop which comprises a generally hemispherical bowl and a hollow handle formed and stamped from an integral blank of sheet metal of uniform thickness, the handle being generally polygonal in cross section and connected to the bowl at a juncture but having a relatively short opening adjacent said juncture, an ejector pivotally mounted on the handle adjacent to the juncture and comprising an arcuate tongue projecting into the bowl past the juncture and having its outwardly facing surface generally conforming to the interior surface of the bowl and a short thumb lever arm formed on the ejector at the end opposite the tongue, the thumb lever arm, being disposed on the handle side of the juncture extending above the handle and available to be depressed by the thumb of the user into said short opening to rock the ejector and raise the tongue out of the bowl in a movement adapted to eject a ball of ice cream which may have been formed in the bowl by scooping, the ejector being spring biased to move the tongue into the bowl to bottom on the interior of the bowl, and the majority of the handle being available for gripping by the user's fist during scooping without using said ejector,

the invention herein which comprises:

the bowl having an exterior imperforate arcuate protrusion formed therein giving rise to a shallow interior arcuate recess, the recess and protrusion being located in the bottom of the bowl and in alignment with the ejector and arranged to receive the back surface of the tongue when the tongue is bottomed in the bowl, the recess being configured to mate with the tongue, the depth of the recess being such that the outwardly facing surface of the tongue forms a substantially hemispherical continuum of the interior surface of the bowl when the tongue is bottomed in the bowl within said recess and the recess extending along the bowl at least to the juncture of bowl and handle

whereby to provide stepped ribs adjacent the recess and connected to said handle.

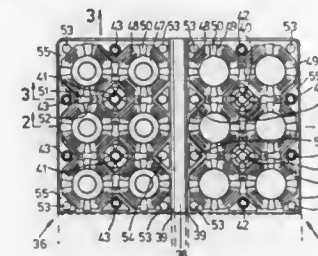
4,161,382

## APPARATUS FOR PRODUCING A CONTAINER MATRIX

Pietro Padovani, Verona, Italy, assignor to Industrie Specializzate Articoli Plastici S.p.A., Verona, Italy  
Filed Sep. 9, 1977, Ser. No. 831,822  
Claims priority, application Italy, Sep. 15, 1976, 84955 A/76  
Int. Cl.<sup>2</sup> B29C 17/14

U.S. Cl. 425—291

4 Claims



1. In a moulding apparatus comprising an upper mould member and a lower mould member for forming a plastics material container matrix having a pre-determined line of rupture between adjacent containers, said lower mould member having an upper surface for receiving said plastics material and a lower surface; said lower mould member defining a bore extending from said upper surface to said lower surface; die means slidably displaceable within said bore for deforming said plastics material, said die means having a plurality of faces; cutter means slidably displaceable within said bore for cutting said plastics material, said cutter means defining a plurality of faces; one of said faces of said die means being in a sliding abutment relationship with one of said faces of said cutter means, a longitudinal axis and at least one cutting edge, said at least one cutting edge extending obliquely to said longitudinal axis; said upper mould member having a pressure member displaceably mounted thereon; said pressure member having a lower surface; said lower surface defining a cavity aligned with said bore in said lower mould member; said cavity receiving at least a portion of said cutter member and said die member when said members are displaced, said cutter member extending into said cavity beyond said die member upon completion of such displacement; said portion of said die means displaceable into said cavity defining an inclined end face; said end face being so inclined that maximum deformation of said plastics material occurs along an extension of the line of abutment of said die means and said cutter means:

4,161,383

## MACHINE FOR CONTINUOUS PRODUCTION OF MOLDED ARTICLES

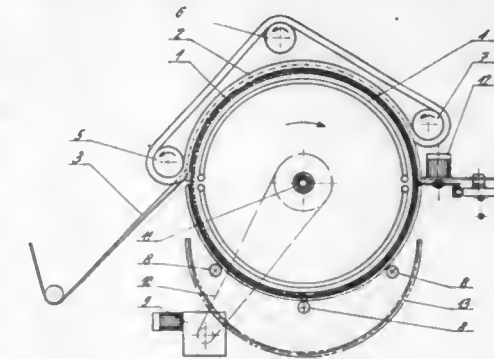
Carlo Gadani, Via A. Bonzagni 20, Milan, Italy (20149)  
Filed May 3, 1978, Ser. No. 902,742  
Claims priority, application Italy, May 25, 1977, 23983 A/77  
Int. Cl.<sup>2</sup> B29C 17/00, 23/00

U.S. Cl. 425—302.1

10 Claims

1. A machine for the continuous production of molded articles of reinforced thermosetting resins or thermoplastic laminates, characterized in that it comprises a rotatable male mold having in axial and cross-section a shape corresponding to that of the articles to be molded, a female mold formed of flexible elements in the form of endless belts or the like running over rollers, which belts mate along a length of their travel a

peripheral segment of the male mold and are moved by the latter together with the laminate to be molded which moves in between the male and female molds and is molded in accordance with the shape of the male mold, said laminate being in



the form of a band uncoiling from a stock roll and entering the machine in a plastic condition, means for hardening the laminate after it has been molded and a cutting device for severing the molded articles to a desired length.

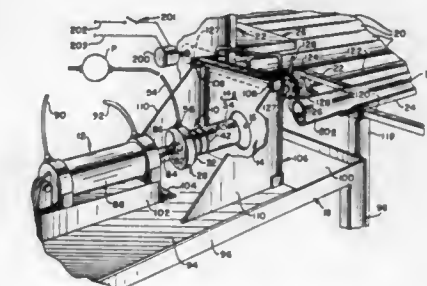
4,161,384

## APPARATUS TO FORM A BELL END IN A PLASTIC PIPE

Jimmie R. McGregor, Mineral Wells, Tex., assignor to Harsco Corporation, Camp Hill, Pa.  
Division of Ser. No. 769,736, Feb. 17, 1977, Pat. No. 4,134,949.  
This application Feb. 13, 1978, Ser. No. 877,362  
Int. Cl.<sup>2</sup> B29C 17/02

U.S. Cl. 425—388

8 Claims



1. In apparatus to form a bell end on a plastic pipe, the combination comprising: support means; a stripper plate having an aperture formed therethrough; means securing said stripper plate to said support means; actuating means secured relative to said support means; a mandrel base; means securing said mandrel base to said actuating means; a plurality of mandrel shell segments having an expander shoulder intermediate opposite ends thereof; means detachably securing said mandrel shell segments to said mandrel base; and a tapered shoulder adjacent said mandrel base, said tapered shoulder having a diameter at its enlarged end which is substantially equal to the diameter of the aperture through said stripper plate and greater than the diameter of the expander shoulder on the mandrel shell segments, said mandrel shell segments having a passage formed therein adjacent said expander shoulder through which air flows from space between the tapered shoulder and the expander shoulder.

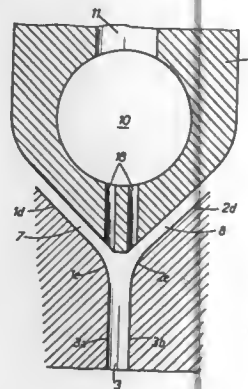
4,161,385

**EXTRUSION APPARATUS FOR PRODUCING COMPOSITE STRUCTURES**

Guy Goldstein, Colmar; Yves Roussin-Moynier, Wintzenheim, both of France, and Gerd Albrecht, Remscheid, Fed. Rep. of Germany, assignors to Beghin-Say, Thumeries, France  
Filed Mar. 10, 1977, Ser. No. 776,433  
Claims priority, application France, Mar. 10, 1976, 76 06803  
Int. Cl.<sup>2</sup> B29F 3/04

U.S. Cl. 425—462

7 Claims



1. A planar extrusion-die system for achieving a film or foil sheathing network of lengthwise threads or filaments substantially centrally disposed in said film or foil, said system comprising an extrusion slit fed upstream by two flows of polymeric materials, one of which issues from a plurality of flat conduits to form a film or foil and the other from a multitude of small holes drilled into a central component of which the vertical cross-section is in the shape of a punch located in the body of the die upstream of said slit to form threads or filaments, said holes being fashioned in the punch as two parallel rows staggered with respect to holes from one row to the other, said extrusion slit being joined by rounded surfaces to the flat conduits supplying the material forming the film or foil to provide a chamberlike area, said holes issuing immediately upstream of the issuing of said flat conduits into the extrusion slit toward said rounded surfaces and into said chamberlike area, said threads or filaments being engaged by the polymer flow of said flat conduits and brought into a row in the plane of symmetry of said extrusion slit.

4,161,386

**NOZZLE FOR INJECTION MOLDING MACHINES**

Jesus M. Osuna-Diaz, Rochester, Mich., assignor to Incoe Corporation, Troy, Mich.

Filed Dec. 19, 1977, Ser. No. 862,101  
Int. Cl.<sup>2</sup> B29F 1/00

U.S. Cl. 425—549

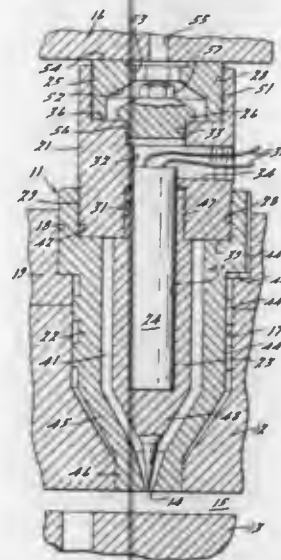
12 Claims

1. An internally heated injection molding nozzle comprising body means having an inlet for plastic material at one end, a seat for a plastic material supply member around said inlet, and a discharge orifice for said material at the other end of said body means;

a shank in said body means;  
a removable heater in said shank;  
means forming a passage extending from said heater laterally through said body means through which electrical leads connected to said heater extend;  
means in said body means forming an access opening forwardly of said inlet in a direction toward said discharge orifice through which the heater is removable from said one end of the body means;

means in said body means forming a passage for said plastic material extending from said inlet to said discharge orifice, a portion of said material passage extending around and being separate from said access opening and said lateral

passage and another portion thereof being annular in form and separating said shank from said body means;



and removable means associated with said access opening separating said plastic material passage from said heater.

4,161,387

**DETECTION DEVICES ESPECIALLY FOR THE DETECTION OF FLAMES**

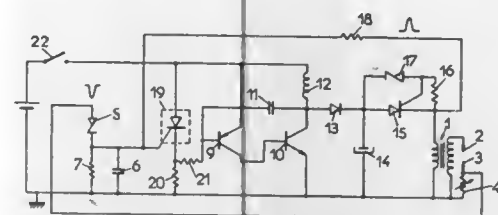
Henri E. Courier de Méré, Paris, France, assignor to BICOSA Societe de Recherches, Clichy, France

Filed Oct. 27, 1977, Ser. No. 846,080

Claims priority, application France, Apr. 19, 1977, 77 11712  
Int. Cl.<sup>2</sup> F23N 5/00

U.S. Cl. 431—74

7 Claims



1. A flame detecting apparatus comprising spark electrodes defining a spark-gap therebetween and connected to a source of voltage pulses of a predetermined polarity, said pulses having an amplitude greater than the breakdown voltage of the spark-gap so that each pulse produces a spark between said spark electrodes, further comprising a detection device responsive to high frequency noise signals generated at each spark, said detecting device comprising a diode having two electrodes, wherein one of said electrodes is coupled to one of said spark electrodes to be connected in inverse conduction relationship with respect to said predetermined polarity of said pulses.

4,161,388

**SIGNAL DEVICE HAVING PROLONGED ILLUMINATION MEANS**

Andre C. Bouchard, Peabody, and Lawrence R. Fraley, Ipswich, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 17, 1977, Ser. No. 778,395

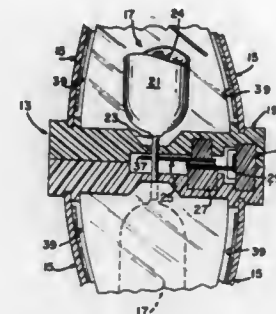
Int. Cl.<sup>2</sup> F21K 5/02; F21L 25/00; F21K 2/00

U.S. Cl. 431—359

13 Claims

1. In combination, a hand-operable distress signal device comprising:

a supportive structure;  
a plurality of percussively-ignitable flashlamps positioned within said supportive structure each for providing a highly intense light output upon actuation thereof, each of said flashlamps including a light-transmitting envelope and a primer tube projection therefrom;  
means for singularly actuating each of said flashlamps, said means including a resilient striking mechanism for striking each of said primer tubes to effect deformation thereof;  
a light-transmitting housing for covering said flashlamps, said housing positioned on said supportive structure and



including an interior surface adjacent each of said flashlamps; and  
a coating of a long decay photoluminescent material having an excitation range compatible with said high intense light output of said percussively-ignitable flashlamps and positioned on said interior surface of said housing adjacent each of said flashlamps in operative relationship thereto, said photoluminescent material directly receiving the highly intense light emitted from each of said flashlamps and providing a prolonged, visible illumination in response to said direct receipt of light.

4,161,389

**FLUIDIZED BED CALCINING SYSTEM**

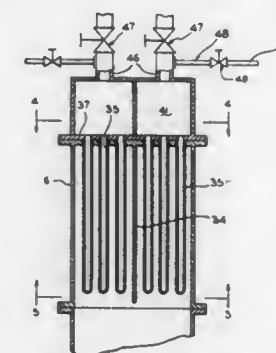
Herbert K. Staffin, and Robert Staffin, both of Colonia, N.J., assignors to Proceadyne, Inc., New Brunswick, N.J.

Filed Apr. 7, 1978, Ser. No. 894,240

Int. Cl.<sup>2</sup> F27B 15/00

U.S. Cl. 432—58

4 Claims



1. Filter apparatus for filtering the off-gas from the bed of a fluidized bed calcining system for heating granular solids comprising at least one fluidized bed reactor to receive a charge of solids, means to heat the solids, and means to force a gas through the solids, said filter apparatus comprising a plurality of gas-permeable filter elements interposed in the path of the stream of off-gas so arranged that some of the elements are in filtering phase while other elements are in blow-back phase for cleaning the elements, a station including means to blow back the filter elements, and means to intermittently skip the filter elements past the blow-back station to alternate the filter elements between filtration and blow back phase according to a

predetermined cycle to maintain continuous filtering performance.

4,161,390

**CALCINING KETTLE HAVING MULTI-PASS HEATING SYSTEM**

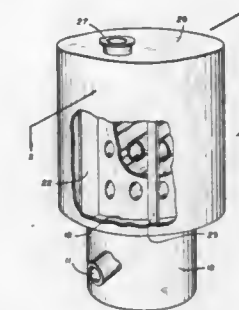
John Page, Harvard, and Francis R. Leding, Clarendon Hills, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jun. 16, 1977, Ser. No. 807,264

Int. Cl.<sup>2</sup> F27D 1/08; F27B 14/00

U.S. Cl. 432—102

12 Claims



1. A calcining apparatus comprising a calcining kettle of generally cylindrical form having side and bottom walls of heat conductive material and defining a unitary calcining chamber, a jacket surrounding said kettle and spaced therefrom to define an annular heating chamber for containment of a heating medium, at least two vertically oriented baffles arranged between and sealed to said kettle side wall and said jacket dividing said heating chamber into at least two heating chamber members extending along substantially the entire length of said jacket, one an entrance chamber member and the other an inter-pass chamber member, a plurality of substantially tubular first-pass flues horizontally positioned and disposed within said kettle each having one end connected to said entrance chamber and the other end connected to said inter-pass chamber, a plurality of second pass flues horizontally positioned and disposed within said kettle mounted each having one end connected to said inter-pass chamber, and means connected to the other ends of said second pass flues for exhausting the heating medium therefrom.

4,161,391

**MELTING APPARATUS**

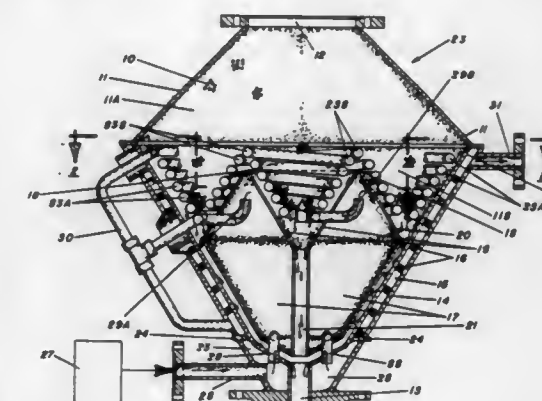
Herbert W. Parker, Chester, Va., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 14, 1978, Ser. No. 886,704

Int. Cl.<sup>2</sup> F27B 5/14; E01C 19/45

U.S. Cl. 432—209

10 Claims



4. Apparatus for melting solid particles of synthetic polymer comprising:



- (a) an enclosure;  
 (b) an inlet for introducing said solid particles of synthetic polymer to said enclosure;  
 (c) an outlet for withdrawal of said synthetic polymer in the molten state from said enclosure;  
 (d) at least one annular member, supported in the interior of said enclosure in spaced apart relationship therewith;  
 (e) a heating unit, disposed within said enclosure between

said annular member and said inlet, said heating unit having multiple zigzags in cross-section across said enclosure and having small spaces therethrough;  
 (f) jacket means substantially surrounding said enclosure at and downstream of a point corresponding to said heating unit, and  
 (g) means for heating said annular member, said heating unit, and said jacket means to above the melt temperature of said solid particles of synthetic polymer.

## CHEMICAL

4,161,392  
**NITROGEN CONTAINING POLYMERS PREPARED FROM METHACRYLIC ESTERS AS CARBURETOR DETERGENTS AND CORROSION INHIBITORS**  
 Carmen M. Cusano, Poughkeepsie; Isaac D. Rubin, Wappingers Falls; Ronald E. Jones, Glenham, and Paul F. Vartanian, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 1, 1977, Ser. No. 847,643

Int. Cl.<sup>2</sup> C10L 1/22

U.S. Cl. 44—62 14 Claims  
 1. A copolymer comprising the olefin polymerization product of:

- A. butyl methacrylate  
 B. a C<sub>8</sub>–C<sub>20</sub> saturated or unsaturated, substituted or unsubstituted, aliphatic or aromatic ester of an unsaturated mono-, di- or polyaliphatic carboxylic acid of chain length C<sub>1</sub> to C<sub>6</sub> in the amount of 5 to 81 percent by weight; and  
 C. an ethylenically unsaturated compound containing a basic nitrogen atom in the side chain selected from the group consisting of dimethyl amino ethyl methacrylic acid and 4-vinyl pyridine.

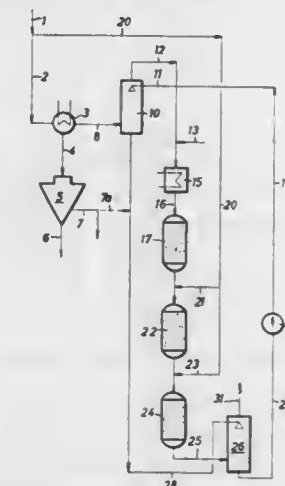
4,161,393  
**SHIFT CONVERSION OF RAW GAS FROM GASIFICATION OF COAL**  
 Paul Rudolph, Bad Homburg, and Uwe D. Marwig, Münster, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 1, 1978, Ser. No. 882,483

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1977, 2709768

Int. Cl.<sup>2</sup> C10J 3/00

U.S. Cl. 48—197 R 10 Claims



1. In a process for producing a fuel gas from a solid fuel which is gasified under a pressure of about 15–100 bars by a treatment with steam and a gas containing free oxygen, cooling the produced raw gas to a temperature of about 150°–200° C. and saturating it with water vapor, removing condensate which has formed so that the resultant raw gas contains hydrocarbons having a boiling range from about 20° to 400° C. in an amount of about 10–100 g per standard m<sup>3</sup> of dry gas and has a CO:H<sub>2</sub>O volume ratio of about 0.8–2, and subjecting the raw gas to a shift conversion, the improvement which comprises dividing the raw gas into first and second partial streams in a ratio of about 1:10 to 1:1, feeding the first partial stream with a surplus of water vapor to a first shift conversion stage at an inlet temperature of about 280°–450° C., and passing through at least one subsequent shift conversion stage a mixture of effluent gas from the preceding shift conversion stage and at least part of the second partial stream of raw gas, said second partial stream of raw gas containing the same hydrocarbons as said

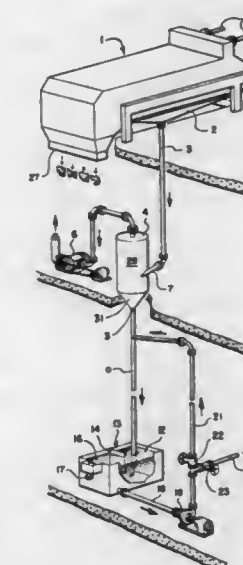
resultant raw gas, maintaining a pressure of about 15–100 bars in the shift conversion stages, the gas mixture entering each subsequent shift conversion stage being at a temperature of about 300°–500° C. and having a hydrogen content of about 25–35% by volume (related to the moist gas) and a hydrogen partial pressure above 5 bars, and removing fuel gas from the last shift conversion stage.

4,161,394  
**POLISHING SLURRY OF XANTHAN GUM AND A DISPERSING AGENT**  
 Glen B. Regan, 17370 Skyline Blvd., Woodside, Calif. 94062  
 Filed Jun. 19, 1978, Ser. No. 916,925  
 Int. Cl.<sup>2</sup> C09K 3/14

U.S. Cl. 51—302 4 Claims  
 1. A solution for use in suspending 0.05–15.0 micron abrasive particles to produce a slurry for use in polishing lenses and semi-conductor wafers comprising water containing in solution from 0.06 to 0.75 percent by weight of xanthan gum and from 0.5 to 5.0 percent by weight of a dispersing agent selected from the group consisting of the condensate of formaldehyde with naphthalene monosulfonic acid, polymethacrylic acid and their ammonium and alkali metal salts.

4,161,395  
**FOAM AND LIQUOR SEPARATOR**  
 Norris K. Brown, and James W. Foust, both of Salt Lake City, Utah, assignors to Envirotech Corporation, Menlo Park, Calif.  
 Filed Mar. 20, 1978, Ser. No. 890,644  
 Int. Cl.<sup>2</sup> B01D 19/02

U.S. Cl. 55—178 1 Claim



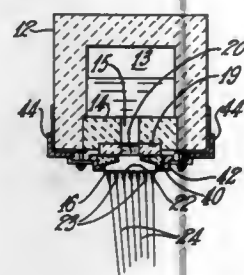
1. A system for removing entrained liquor from the air stream withdrawn from a vacuum filter, comprising a receiver that includes a cylindrical vessel having a top and an inverted cone-shaped bottom portion, a centrally located top outlet adapted to be connected to a source of reduced pressure and a bottom outlet at the apex of said cone, both of said outlets being directed axially of said receiver, an inlet conduit entering the sidewall of said receiver intermediate the top and bottom, said conduit being connected tangentially through said sidewall and directed downwardly toward said bottom whereby to impart a downward swirling path to liquid introduced into said receiver, at least one inwardly extending baffle on the inner wall of said conical section above said bottom outlet, a vertical standpipe connected to said bottom outlet to extend downwardly therefrom, a seal tank below said receiver adapted to receive a mixture of foam and liquor from said vertical standpipe and effect separation of foam from liquid and to retain a

minimal volume of separated liquid therein, the lower end of said vertical standpipe terminating in submergence in said liquid in said seal tank, a second conduit connecting the interior of said tank and said vertical standpipe at a location below said bottom outlet, and pump means for recycling a controlled volume of liquid from said tank into said vertical standpipe at a rate such that the density and weight of liquid in said vertical standpipe is sufficient to seal said bottom outlet of said cone thereby to enable application of vacuum to the interior of said receiver.

**4,161,396**  
**METHOD AND APPARATUS FOR PROCESSING HEAT-SOFTENED FIBER-FORMING MATERIAL**  
 Neil E. Greene, Granville; Seshadri Srinivasan, Pickerington, and Leonard A. Stenger, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio  
 Filed Mar. 17, 1978, Ser. No. 887,705  
 Int. Cl.<sup>2</sup> C03B 37/02

U.S. Cl. 65—1

25 Claims



1. The method of processing heat-softened mineral material including establishing a body of the material for delivery into a bushing having orifices through which material flows from the bushing, flowing material from the body through an opening in a flow block, thermally isolating the material in the bushing from the body of material by a bushing block, flowing the material from the bushing through the orifices as fine streams, and concomitantly flowing material from the opening in the flow block through a substantially cylindrical passage in the bushing block into the bushing wherein the flow capacity of the passage in the bushing block is substantially equal to but not less than the flow capacity of all of the orifices.

**4,161,397**  
**LIQUID COMBINATION SEED TREATMENT COMPOSITIONS**  
 Eugene M. Bellet, Stilwell, Kans., and Madan M. Joshi, Quincy, Ill., assignors to Kalo Laboratories, Inc., Kansas City, Mo.  
 Filed Aug. 8, 1977, Ser. No. 822,792  
 Int. Cl.<sup>2</sup> C05F 11/08

U.S. Cl. 71—7

15 Claims

1. A liquid seed treating composition which comprises a fluid suspension of microdried bacteria and a chemical substance toxic to the bacterium in a non-phytotoxic, non-bactericidal oil carrier.

**4,161,398**  
**METHOD FOR ELECTROSLAG REMELTING OF A COPPER-NICKEL ALLOY**  
 Joseph W. Tommaney, Sarver, Pa., and Claudia J. Burton, Clinton, N.Y., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.  
 Filed May 8, 1978, Ser. No. 904,166  
 Int. Cl.<sup>2</sup> C22B 4/06

U.S. Cl. 75—10 C

8 Claims

1. A method for the electroslag remelting of a copper-nickel alloy, which method comprises preparing a mixture consisting essentially of from about 35% to about 75% barium fluoride and from about 25% to about 65% calcium fluoride, by weight,

fusing said mixture at a temperature within the range of from about 350° F. below the melting point of the alloy to about 100° F. above said melting point to form a flux composition, placing said flux composition in an electroslag remelting mold, inserting said alloy into said flux composition, generating sufficient Joule heat in said flux composition to melt said alloy by passing electric current between said mold and said alloy so that the molten alloy falls through the flux, collecting said molten alloy and cooling it to a temperature below its melting point.

**4,161,399**  
**METHOD FOR ELECTROSLAG REMELTING OF A MANGANESE-COPPER-NICKEL ALLOY**  
 Joseph W. Tommaney, Sarver, Pa., and Claudia J. Burton, Clinton, N.Y., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.  
 Filed May 8, 1978, Ser. No. 904,165  
 Int. Cl.<sup>2</sup> C22B 4/06

U.S. Cl. 75—10 C

14 Claims

1. A method for the electroslag remelting of a manganese-copper-nickel alloy, which method comprises preparing a mixture consisting essentially of from about 50% to about 85% barium fluoride and from about 15% to about 50% calcium fluoride, by weight, fusing said mixture at a temperature within the range of from about 100° F. below the melting point of the alloy to about 100° F. above said melting point to form a flux composition, placing said flux composition in an electroslag remelting mold, inserting said alloy into said flux composition, generating sufficient Joule heat in said flux composition to melt said alloy by passing electric current between said mold and said alloy so that the molten alloy falls through the flux, collecting said molten alloy and cooling it to a temperature below its melting point.

**4,161,400**  
**METHODS OF DESULPHURIZING FLUID MATERIALS**  
 William G. Wilson, Pittsburgh, Pa., and D. Alan R. Kay, Hamilton, Canada, assignors to MolyCorp, Inc., Pittsburgh, Pa.  
 Continuation-in-part of Ser. No. 705,525, Jul. 15, 1976, Pat. No. 4,084,960. This application Oct. 3, 1977, Ser. No. 838,945  
 Int. Cl.<sup>2</sup> C21C 7/00

U.S. Cl. 75—58

9 Claims

1. A method of desulphurizing fluid materials comprising the steps of:  
 (a) reacting a member from the group consisting of rare earth oxides, rare earth fluorocarbonates and rare earth oxyfluorides with sulphur to be removed from the fluid material at a sufficiently low oxygen potential to form one of the group consisting of rare earth sulphides and rare earth oxysulphides and mixtures thereof until a substantial portion of the sulfur has been reached, and  
 (b) removing said oxysulphides and sulphides.

**4,161,401**  
**NICKEL-CALCIUM ALLOY FOR HYDROGEN STORAGE**  
 Gary D. Sandrock, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.  
 Division of Ser. No. 739,481, Nov. 8, 1976, Pat. No. 4,096,641. This application Nov. 2, 1977, Ser. No. 847,797  
 Int. Cl.<sup>2</sup> C22C 19/03

U.S. Cl. 75—170

1 Claim

1. An alloy for the storage of hydrogen at subatmospheric pressures consisting essentially of, in weight percent, about 18.5% Cu, about 10.6% Ca, and the balance essentially nickel.

**4,161,402**  
**NICKEL-MISCHMETAL-CALCIUM ALLOYS FOR HYDROGEN STORAGE**  
 Gary D. Sandrock, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.  
 Division of Ser. No. 739,483, Nov. 8, 1976, Pat. No. 4,096,639. This application Nov. 2, 1977, Ser. No. 847,695  
 Int. Cl.<sup>2</sup> C22C 19/03

U.S. Cl. 75—170

10 Claims

1. An alloy for hydrogen storage consisting essentially of, in weight percent, from about 4% to about 27% mischmetal, from about 2% to about 11% calcium, up to about 17.3% copper, and the balance essentially nickel.

**4,161,403**  
**COMPOSITE ELECTRICAL CONTACT MATERIAL OF Ag-ALLOY MATRIX AND INTERNALLY OXIDIZED DISPERSED PHASE**  
 Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Japan  
 Filed Mar. 22, 1978, Ser. No. 889,097  
 Int. Cl.<sup>2</sup> C22C 5/06

U.S. Cl. 75—173 A

4 Claims

1. A composite electrical contact material having dispersed therein alloys of silver and solute metal elements, said alloys including,

a primary alloy comprising a primary silver matrix, and 3 to 11% by weight of tin and 1 to 13% by weight of indium which are in solid solution with said primary silver matrix, and  
 a subsidiary alloy of a system different from the primary alloy and comprising another silver matrix and one or more metal elements, said elements being of such percentages that they are in solid solution with said other silver matrix, and being internally oxidized, and  
 said composite material comprising a plurality of said primary silver grain matrices containing the solute metal elements of the primary alloy, and a plurality of said other silver grain matrices containing solute metal elements of the subsidiary alloy and intercoalescing with each other and with said primary silver grain matrices, said solute metal elements having been precipitated in their parental matrices as oxides by internal oxidation of the alloys, said subsidiary alloy being selected from a group consisting of Ag alloy comprising Sn(3%–11% by weight) and Bi (0.01%–2% by weight), Ag alloy comprising Cd(0.01%–25% by weight), Ag alloy comprising Mn(0.01%–5% by weight), Ag alloy comprising Sb (0.01%–4% by weight), Ag alloy comprising Zn(0.01%–5% by weight), and Ag alloy comprising Pb(0.01%–10% by weight).

**4,161,404**  
**PHOTOSENSITIVE MATERIAL FOR USE IN ELECTROPHOTOGRAPHY WITH A POLY ALKYL OR BENZYL GLUTAMATE**  
 Takamichi Enomoto, and Seiti Sakuma, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan  
 Filed Oct. 7, 1977, Ser. No. 840,276  
 Claims priority, application Japan, Oct. 13, 1976, 51-122661  
 Int. Cl.<sup>2</sup> G03G 5/14

U.S. Cl. 96—1.5 R

11 Claims

1. In a photosensitive material for use in electrophotography comprising an electrically conductive support, a barrier layer on said support and a photosensitive layer on said barrier layer, the improvement which comprises: said barrier layer consists essentially of a polymer selected from the group consisting of film-forming poly-γ-alkyl glutamate and film-forming poly-γ-benzyl glutamate.

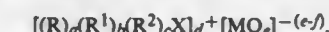
**4,161,405**  
**METHOD OF CATIONALLY POLYMERIZING OXIRANE FREE MATERIALS WITH GROUP VIA ONIUM SALTS**  
 James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
 Division of Ser. No. 638,981, Dec. 9, 1975, Pat. No. 4,058,400, which is a continuation of Ser. No. 466,373, May 2, 1974, abandoned. This application Aug. 5, 1977, Ser. No. 822,150  
 Int. Cl.<sup>2</sup> G03C 5/00, 1/94, 5/04; C08J 3/28

U.S. Cl. 96—35.1

2 Claims

1. A method for cationically polymerizing organic material free of oxirane oxygen consisting essentially of a monomeric or prepolymeric cationically polymerizable organic material free of oxirane oxygen selected from vinyl organic monomers, vinyl organic prepolymers, cyclic organic ethers, cyclic organic esters, cyclic organic sulfides, cyclic amines and organo-silicon cyclics which comprises,

(A) forming a mixture of such organic material and an effective amount of an aromatic onium salt of a Group VIa element having the formula,



(B) exposing said mixture of (A) to ultraviolet radiation, where R is a monovalent aromatic organic radical, R<sup>1</sup> is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, R<sup>2</sup> is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, X is a Group VIa element selected from sulfur, selenium and tellurium, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 3 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 or 1, where the sum of a+b+c is a value equal to 3 or the valence of X, d=e—f

f=valence of M and is an integer equal to from 2 to 7 inclusive  
 e is >f and is an integer having a value up to 8.

**4,161,406**  
**SOLUTION AND METHOD FOR PROCESSING HIGH SPEED VIDEO NEWS FILM**  
 David K. Bulloch, Hillsdale, N.J., assignor to Philip A. Hunt Chemical Corp., Palisades Park, N.J.  
 Filed Dec. 7, 1977, Ser. No. 858,193  
 Int. Cl.<sup>2</sup> G03C 7/00

U.S. Cl. 96—55

3 Claims

1. A bath for color development of imagewise exposed VNF high speed color reversal cine film the emulsion of which contains latent silver halide images and which incorporates color couplers, said film having been black and white developed and having thereafter been stopped, the color developing bath concurrently reducing contrast without flashing, which color developer bath includes water, a calcium sequestering agent, an anti-oxidant, a buffer, a restrainer, an alkalinizing agent and a color developing agent, that improvement comprising:

(A) the absence of benzyl alcohol from said color developer bath,

(B) the inclusion in said color developer bath of a competing coupler selected from the group consisting of 3–5 g./l. of citrazinic acid and 0.3–0.8 g./l. of 1-amino-8-naphthol-3, 6-disulfonic acid, 6–12 g./l. of the silver halide solvent ethylene diamine, 0–0.015 g./l. of the reversal and contrast control agent t-butylamine borane and 0.05–0.3 g./l. of a competing non-coupling developer selected from the group consisting of 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone, phenidone and phenidone derivatives,

(C) the pH of the color developer bath being about 11.7, (D) and which film after color development is stopped, bleached and fixed.



**4,161,407**  
**CROSSLINKABLE POLYMERS HAVING VINYL SULFONYL GROUPS OR STYRYLSULFONYL GROUPS AND THEIR USE AS HARDENERS FOR GELATIN**

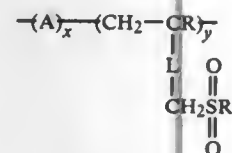
Gerald A. Campbell, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,880

Int. Cl.<sup>2</sup> G03C 1/72; C08L 89/00; C08F 28/00; C08G 75/00  
 U.S. Cl. 96—114

10 Claims

1. A polymer having repeating units having the formula:



where A is a polymerized  $\alpha,\beta$ -ethylenically unsaturated addition polymerizable monomer or a mixture of such polymerizable monomers, x is a molar unit of from 10 to 95, and y is a molar unit of from 5 to 90,

L is a linking group selected from the group consisting of alkylene, arylene, COZ and COZR<sup>3</sup>,

R<sup>3</sup> is selected from the group consisting of alkylene and arylene,

Z is O or NH,

R is hydrogen or alkyl having 1 to 6 carbon atoms, and R' is  $\text{---CH=CHR}^2$  or  $\text{---CH}_2\text{CH}_2\text{X}$  where X is a leaving group which can be displaced by a nucleophile or can be eliminated in the form of HX upon treatment with base and R<sup>2</sup> is hydrogen, alkyl or aryl.

**4,161,408**  
**METHOD FOR THE PREPARATION OF A PHOTOTHERMOGRAPHIC SYSTEM**

John M. Winslow, South St. Paul, and Ivan R. Maw, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 6, 1977, Ser. No. 803,549

Int. Cl.<sup>2</sup> G03C 1/02, 1/72

8 Claims

1. A method of forming a photothermographic emulsion which comprises adding light sensitive silver halide grains with agitation to a dispersion of a long chain fatty acid in water, with no alkali or ammonia salt of said acid present in the dispersion while the acid is maintained above its melting point but below its boiling point, then converting the acid to an ammonia salt or alkali metal salt of the acid, then cooling the dispersion, and thereafter converting the alkali metal or ammonia salt to a silver salt of the acid.

**4,161,409**  
**CORROSION INHIBITIVE PIGMENT**

Louis Schiffman, 1837 Merritt Rd., Abington, Pa. 19001

Filed Mar. 6, 1978, Ser. No. 883,507

Int. Cl.<sup>2</sup> C08K 3/10; C09C 1/34; C09D 5/08  
 U.S. Cl. 106—14.21

14 Claims

1. The method of preparing a corrosion-inhibiting pigment which comprises reacting a hexavalent chromium compound in aqueous solution with a water soluble oxidizable organic compound containing an active hydroxyl, aldehyde or carbonyl group at a temperature below 95° C. and under conditions to reduce 5 to 70% of the hexavalent chromium compound to lower valent state, evaporating the resulting aqueous reaction product to dryness at a temperature below 150° C., and pulverizing the dried product to pigment size range.

**4,161,410**  
**SETTABLE DENTAL COMPOSITIONS WITH POLYTERPENE BINDER**

Michael A. Pellico, Los Angeles, Calif., assignor to Denton Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 736,241, Oct. 27, 1976, abandoned. This application May 22, 1978, Ser. No. 908,241

Int. Cl.<sup>2</sup> C09K 3/00

U.S. Cl. 106—35

16 Claims

1. A method for preparing an oral, settable dental composition which comprises interacting:

component A containing:

(i) a polycarboxylic acid selected from the group consisting of C<sub>36</sub> dimer acid, C<sub>34</sub> trimer acid and mixtures thereof,

(ii) a reaction rate activator selected from the group consisting of lower aliphatic alcohols, lower aromatic alcohols, lower aliphatic organic acids, calcium, magnesium and zinc salts of said acids, and mixtures thereof, said reaction rate activator being present in an amount from about 1 to about 30 wt. % based on the weight of the polycarboxylic acid, provided however, that the upper weight limit of the lower aliphatic organic acids and the calcium, magnesium and zinc salts of said acids does not exceed about 10 wt. % based on the weight of the polycarboxylic acid, and

(iii) polyterpene resin in an amount from about 0.3 to about 1.3 parts by weight per 1.0 part by weight of polycarboxylic acid; and

component B containing a metallic base selected from the group consisting of oxides and hydroxides of zinc, magnesium, calcium, copper and mixtures thereof, said metallic base being present in an amount from about 0.1 to about 4.0 parts by weight per 1.0 part by weight of polycarboxylic acid.

**4,161,411**  
**CEMENT DUST BRIQUETTES AND PROCESS OF PRODUCTION THEREOF**

Nancy J. Sell, 3244 Peterson Rd., Green Bay, Wis. 54301, and June E. Doyen, 3240 Old Mill Rd., Northbrook, Ill. 60062

Filed Jun. 16, 1977, Ser. No. 807,161

Int. Cl.<sup>2</sup> C04B 7/40

U.S. Cl. 106—100

15 Claims

1. A process for producing kiln cement dust molded briquettes of high crushing strength and effective for use as a partial feed in cement making processes, comprising the steps of:

(a) applying a mineral oil to the inner surfaces of cavity molds;

(b) substantially filling said cavity molds with kiln cement dust collected from a cement kiln and being essentially free from extraneous binders; and

(c) compacting said kiln cement dust between said mold surfaces under a pressure of at least 20,000 psi to thereby form mineral oil coated kiln cement dust molded briquettes.

**4,161,412**  
**METHOD OF HEAT TREATING  $\gamma/\gamma'$ - $\alpha$  EUTECTIC NICKEL-BASE SUPERALLOY BODY**

Michael F. Henry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,975

Int. Cl.<sup>2</sup> C22F 1/10

U.S. Cl. 148—3

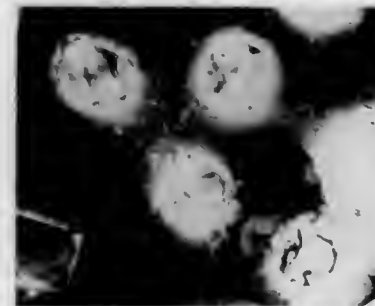
15 Claims

1. A method of improving the mechanical properties of a  $\gamma/\gamma'$ - $\alpha$  eutectic nickel-base superalloy body containing a  $\gamma$ -phase, a  $\gamma'$ -phase, and an aligned molybdenum fiber  $\alpha$ -phase which comprises the steps:

(a) heating said body to a temperature at which at least a portion of the  $\gamma'$ -phase will transform to a  $\gamma$ -phase,

(b) maintaining the heated body at said temperature to allow

transformation of at least a portion of said  $\gamma'$ -phase to a  $\gamma$ -phase, and



(c) cooling the transformed body to a temperature at which at least a portion of the  $\gamma$ -phase precipitates as a modified  $\gamma'$ -phase.

**4,161,413**  
**METHOD AND APPARATUS FOR PRODUCING A POST-MIXED, STABILIZED SCARFING PRE-HEATING FLAME**

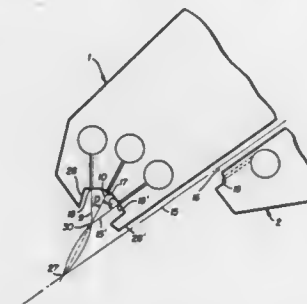
Ronald E. Fuhrhop, West Nyack, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 836,512, Sep. 26, 1977, Pat. No. 4,115,154. This application Jul. 3, 1978, Ser. No. 921,810

Int. Cl.<sup>2</sup> B23K 7/04, 7/08

U.S. Cl. 148—9.5

13 Claims



1. A process for thermochemically scarfing a metal workpiece comprising:

- (1) preheating a spot on the surface of the workpiece where the scarfing reaction is to begin by directing a post-mixed preheating flame at said spot, said preheating flame being formed by:
  - (a) discharging at least one stream of preheat oxidizing gas and at least one stream of preheat fuel gas from separate ports in such a manner that said streams impinge external to their discharge ports, above the work surface and in such manner that the axes of said streams form an acute included angle between them, and
  - (b) stabilizing said preheating flame by discharging a low-intensity stream of oxidizing gas, the direction of said stabilizing stream being in the same general direction as the direction of said flame and through the impingement of said preheat oxidizing gas and preheat fuel gas streams, and
  - (c) continuing steps (a) and (b) until said spot reaches its oxidizing gas ignition temperature, and thereafter
- (2) directing a stream of scarfing oxidizing gas at an acute angle to the work surface at said preheated spot, while simultaneously
- (3) causing relative movement between said scarfing oxidizing gas stream and said work surface, thereby producing a scarfing cut.

**4,161,414**  
**PROCESS FOR FABRICATING FLUID-CONTROL MEMBERS FOR INTERNAL-COMBUSTION ENGINES AND THE LIKE**

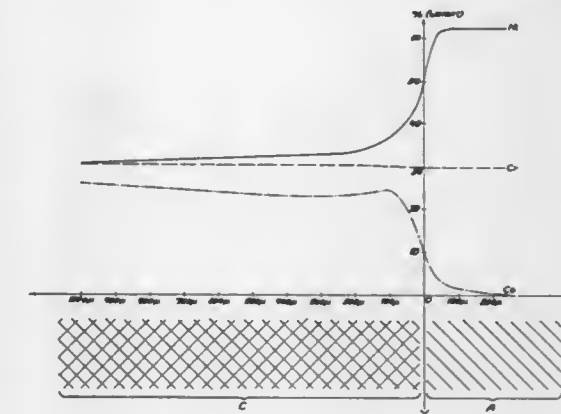
Robert Saint-Prix, 14 Rue Edouard Petit, St. Etienne (Loire), France

Continuation-in-part of Ser. No. 767,663, Feb. 10, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 930,818

Int. Cl.<sup>2</sup> C22F 1/10

U.S. Cl. 148—11.5 R

9 Claims



1. A process for manufacturing a fluid-control member coacting with a seat in a hot, corrosive environment, comprising the steps of:

- (a) forming a workpiece from a corrosion-resistant first alloy essentially composed of nonferrous metals including a preponderance of nickel and a lesser proportion of chromium;
- (b) applying to a seat-engaging zone of said workpiece a second corrosion-resistant alloy of nonferrous metals containing a predominant proportion of cobalt along with enough chromium to substantially equalize the excess of nickel over chromium in said first alloy, the application of said second alloy to said zone being carried out at a temperature high enough to cause interdiffusion of the constituents of said first and second alloys with resulting formation of a third alloy in said zone containing substantially equal proportions of nickel and chromium on the order of 30% each;
- (c) slowly cooling said workpiece;
- (d) subjecting the cooled workpiece to a homogenizing heat treatment; and
- (e) mechanically working said zone to effect a reduction in the granulometry thereof and a hardening of its structure.

**4,161,415**  
**METHOD FOR PROVIDING STRONG WIRE**

Jaak S. Van den Sype, Scarsdale, and Lanier Stambaugh, Briarcliff Manor, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 874,326, Feb. 1, 1978, abandoned. This application May 3, 1978, Ser. No. 902,567

Int. Cl.<sup>2</sup> C21D 6/04, 9/52

U.S. Cl. 148—12 B

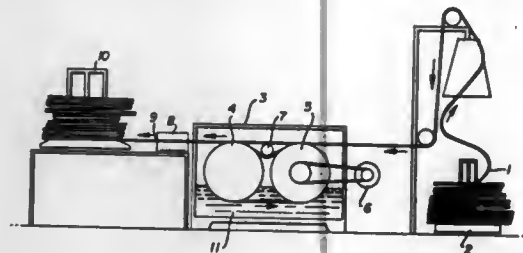
9 Claims

1. A process for improving the strength characteristics of a wire composed of an austenitic metal alloy selected from the group consisting of stainless steel alloys of the AISI 200 and 300 series and non-stainless steel alloys containing iron, manganese, chromium, and carbon, said alloy having an Md temperature of no higher than about 100° C. and an Ms temperature of no higher than about minus 100° C., comprising the following steps:

- (a) deforming the wire at a strain of at least about 10 percent and at a temperature in the range of about Md minus 50° C. to about Md plus 50° C., said Md temperature being

that of the alloy undergoing deformation, in such a manner that the wire has a martensite phase of no greater than about 10 percent by volume and an austenite phase of at least about 90 percent by volume and a yield strength in the range of about 130,000 psi to about 230,000 psi;

(b) cooling the wire to a temperature no higher than about minus 75° C.; and



(c) drawing the cooled wire through a die under back-tension (i) wherein the back-tension on said wire just prior to the entry of the wire into the die is at least about 75,000 psi; and (ii) whereby the cross-sectional area of the wire is reduced by a percentage in the range of about 7 percent to about 25 percent;

in such a manner that the wire has a martensite phase of at least about 50 percent by volume and an austenite phase of at least about 10 percent by volume.

4,161,416

## PRODUCTION OF ALUMINUM WIRE

William T. Walton, III, Decatur, Ga., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed May 26, 1978, Ser. No. 909,935

Int. Cl.<sup>2</sup> C22F 1/04

U.S. Cl. 148—12.7 A

14 Claims

1. In a process for producing wire from rod of an aluminum alloy having a composition for precipitating at least one constituent upon artificial aging to enhance desired alloy properties, including the step of working the rod into wire with a predetermined extent of area reduction, the improvement which comprises:

- performing said working step under conditions for imparting to the wire a finish working temperature in a preselected elevated range, and
- passively retarding the rate of temperature decay of the wire from said finish working temperature for a period of time sufficient to effect substantial precipitation of said one constituent,
- said elevated range being such that said retarding step, performed on wire that has been worked with said predetermined extent of area reduction, effects artificial aging of the wire.

4,161,417

## METHOD OF MAKING CMOS STRUCTURE WITH RETARDED ELECTRIC FIELD FOR MINIMUM LATCH-UP

Ernest W. Yim, Sunnyvale, and Paul G. G. VanLoon, San Jose, both of Calif., assignors to Siliconix Corporation, Santa Clara, Calif.

Division of Ser. No. 631,729, Nov. 13, 1975. This application Oct. 17, 1977, Ser. No. 842,683

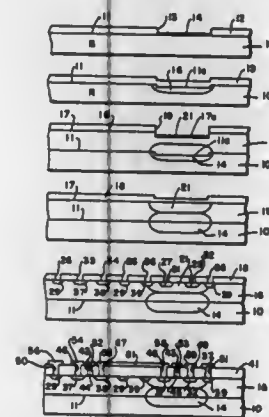
Int. Cl.<sup>2</sup> H01L 21/225, 21/74

U.S. Cl. 148—175

2 Claims

1. A method of fabricating a CMOS structure which is substantially free of parasitic SCR action notwithstanding the presence of a vertical parasitic transistor formed by the source or drain region of one MOS device, the well in which the source and drain regions are formed and the body of the structure and a lateral parasitic transistor formed by the source or drain region of the other MOS device, the body and the well, said method comprising the steps of: providing a generally

planar substrate of the first conductivity type, applying a layer of material of the second conductivity type to a predetermined region of the surface of the substrate, diffusing the material of the second conductivity type into the substrate, forming an epitaxial layer of the first conductivity type on the surface of the substrate, applying material of the second conductivity type to a region of the epitaxial layer overlying the predeter-



mined region of the substrate, heating the substrate to diffuse the material of the second conductivity type until the regions in the substrate and epitaxial layer meet to form an overlapping well and buried layer, forming source and drain regions of the first conductivity type in the well for the one MOS device, and forming source and drain regions of the second conductivity type in the body outside the well for the other MOS device.

4,161,418

## IONIZED-CLUSTER-BEAM DEPOSITION PROCESS FOR FABRICATING P-N JUNCTION SEMICONDUCTOR LAYERS

Kiyoshi Morimoto; Yukihiko Utamura, both of Mobara, and Toshinori Takagi, Nagakakyō, all of Japan, assignors to Futaba Denshi Kogyo K. K., Chiba, Japan

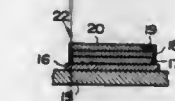
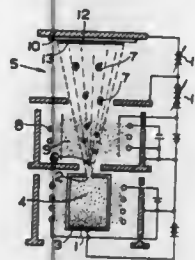
Division of Ser. No. 695,645, Jun. 14, 1976, abandoned. This application May 23, 1978, Ser. No. 908,748

Claims priority, application Japan, Jun. 27, 1975, 50-079414; Jul. 18, 1975, 50-087257; Nov. 22, 1975, 50-139479

Int. Cl.<sup>2</sup> H01L 21/203; C23C 15/00

U.S. Cl. 148—175

5 Claims



1. A method of producing a p-n junction type solid-state element comprising the steps of: providing a substrate made of semiconductor material of a first conductivity type;

evaporating semiconductor material of a second conductivity type to form a vapor;

injecting the vapor into a vacuum region of  $10^{-2}$  Torr at most to form clusters of atoms;

bombarding the clusters with electrons to ionize at least a part of the clusters, thereby forming ionized clusters; and

accelerating the ionized clusters by an electric field to let the ionized clusters collide with the substrate, thereby coating the substrate with a layer of semiconductor material of the second conductivity type to form a p-n junction therewith.

4,161,419

## PRODUCTION OF COATED ELECTRICAL CONDUCTOR CABLE

Dominic A. Alia, Williamsport, Pa., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

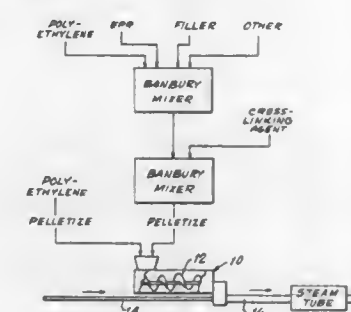
Continuation of Ser. No. 666,744, Mar. 15, 1976, abandoned.

This application Dec. 1, 1977, Ser. No. 856,483

Int. Cl.<sup>2</sup> H01B 13/14

U.S. Cl. 156—51

10 Claims



1. In a method of producing, on electrical conductor cable, a cured, electrically insulating coating of filled polyethylene comprising the steps of,

- extruding, from an extruder having a feed screw, onto a conductor cable, a curable coating composition comprising polyethylene and inert particulate filler material and containing at least about 50% by weight polyethylene, and
- curing the extruded coating in the presence of a cross-linking agent to produce said cured, electrically insulating coating on the cable,

the improvement which comprises:

admixing, at the extruder screw, at least a major portion of the polyethylene and a pre-established substantially homogeneous mixture of the filler material and an amount of an ethylene propylene rubber, effective to enable substantially homogeneous dispersion of the filler material in the polyethylene by the action of the extruder screw, said rubber having an ethylene content above 50%, the ratio of said filler material to said rubber, in parts by weight, being between about 1:1 and 5:1.

4,161,420

## ULTRASONIC METHOD FOR MANUFACTURING BRASSIERE TAPES

Robert A. Clarke, White Plains; Peter J. Kuhl, Jackson Heights, and Richard H. Paschke, Medford, all of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Division of Ser. No. 736,786, Oct. 29, 1976, Pat. No. 4,045,271.

This application Jun. 14, 1977, Ser. No. 806,427

Int. Cl.<sup>2</sup> A41F 1/00; B29C 27/08

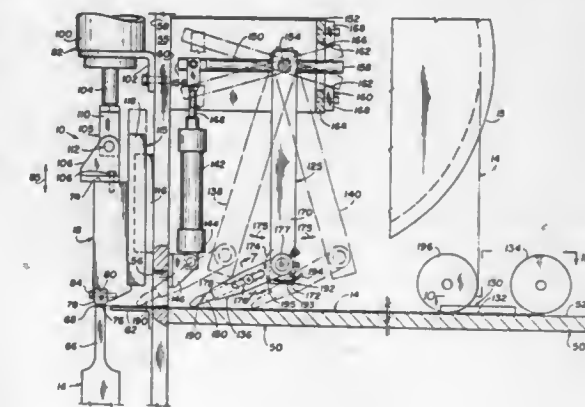
U.S. Cl. 156—73.3

25 Claims

1. The method of fabricating an article from an elongated continuous strip of material formed of flexible layers capable of being ultrasonically welded and having elements longitudinally spaced along an outer one of said layers, said article

having a body portion and a pair of overlapping tabs extending therefrom, the method comprising the steps of:

- interposing between the portion of said layers forming said tabs an insulation element capable of transmitting therethrough ultrasonic vibratory energy for permitting individual layers of material in each of said tabs to be simultaneously welded together, while preventing said tabs from being welded together,
- retaining in an open position a horn and an anvil for receiving the full width of said strip therebetween, said horn having a forward end engaging one side of said strip and said anvil having a surface opposing and cooperating with said forward end and engaging the opposite side of said strip for simultaneously severing and welding said



strip across the width thereof when brought into operative relationship with each other,

- advancing said strip between said horn and anvil when in said open position a distance predetermined by the longitudinal space between a selected number of said elements,
- moving said horn and anvil into said operative position in which they engage said opposite sides of said strip and,
- vibrating said horn ultrasonically at least when in said operative position for severing and welding together of the layers of said strip transversely across the entire width thereof while said insulation element prevents said tabs from being welded together, whereby the trailing end of one article and the leading end of the next article are formed.

4,161,421

## METHOD AND APPARATUS FOR CONTINUOUS OXYGEN BLEACHING OF CELLULOSIC PULP

Michael I. Sherman, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Sep. 13, 1977, Ser. No. 832,875

Int. Cl.<sup>2</sup> D21C 7/04, 7/06, 9/10

U.S. Cl. 162—18

22 Claims

1. A method of oxygen-bleaching cellulosic pulp at super atmospheric pressure and temperature utilizing a first pressurized chamber, a plurality of discrete pressurized tubular members disposed in a circle and in fluid communication and physical contact with said first chamber at one end thereof, and a second pressurized chamber, at least some of the hollow members in fluid communication and physical contact with the second chamber at the other ends thereof, the cross-sectional areas of all of the tubular members being less than the cross-sectional area of the first chamber or the second chamber; and a circular plate having at least one aperture formed therein of substantially the same cross-sectional area and shape of each of the tubular members;

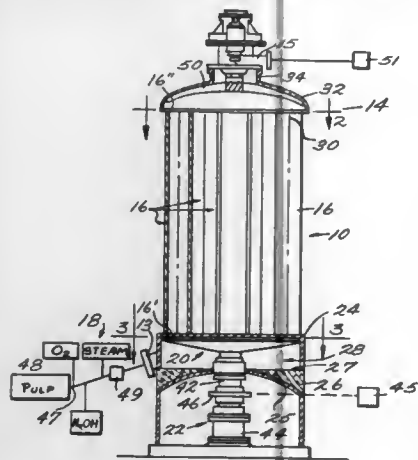
intimately mixing oxygen-bearing fluid with digested cellulosic pulp, continuously feeding the pulp under pressure to the first chamber,



selectively providing communication between the first and second chambers through at least one of the members to allow pulp passage from the first chamber through the member to displace pulp from the member to the second chamber, while blocking passage between others of the members and the second chamber.

progressively changing the at least one member through which pulp passes to the second chamber and the members through which passage is blocked, so that pulp remains within each member sufficient time to allow oxygen-bleaching thereof without degradation, and passes through the members without channelling, by rotating the apertured circular plate to return the at least one aperture in the circular plate to each member to allow plugs of pulp to successively travel through each member as new plugs are introduced into each member, and continuously discharging the oxygen-bleached pulp from the second chamber as it is displaced therefrom by pulp slugs from the members.

5. Oxygen bleaching apparatus comprising a pressurized first chamber adapted to receive digested cellulosic pulp, and including an inlet for digested cellulosic pulp, means for adding oxygen bearing fluid to the digested cellulosic pulp, and means for mixing the oxygen with the pulp, a plurality of discrete pressurized tubular members each having first and second ends, and each in fluid communi-



cation and physical contact at the first end thereof with the first chamber, and extending therefrom, said members disposed in a circle,

a pressurized second chamber adapted to receive pulp therein, said second chamber being in fluid communication and physical contact with at least some of said members at the second ends thereof, said second chamber including an outlet for oxygen bleached pulp, the cross-sectional areas of all of the tubular members being less than the cross-sectional area of the first chamber or the second chamber,

means distinct from said first chamber inlet for selectively providing passage of digested cellulosic pulp mixed with oxygen through at least one of said members from said at least one member to said second chamber while blocking passage of pulp between others of said plurality of members and said second chamber said passage providing and blocking means comprising a generally circular plate having at least one aperture formed therein of substantially the same cross-sectional area and shape of each of said members, and means for rotating said passage providing and blocking means so that it allows pulp passage from said first chamber through each member in turn to displace pulp from each member in turn to said second chamber, and so that pulp remains within each member sufficient time to allow oxygen-bleaching thereof without degradation, said rotating means returning as at least one aperture in said circular plate to each member to allow

plugs of pulp to successively travel through each member as new plugs are introduced into each member.

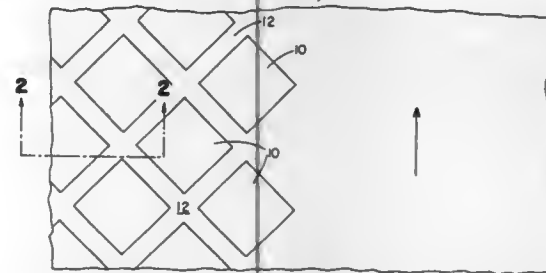
4,161,422

**FILTER PAPER AND METHOD OF MAKING SAME**  
Grover C. Lawson, and James C. Wilson, both of Greenwich, N.Y., assignors to Hollingsworth & Vose Company, East Walpole, Mass.

Division of Ser. No. 813,953, Jul. 8, 1977, Pat. No. 4,119,543, which is a continuation-in-part of Ser. No. 691,420, Jun. 1, 1976, abandoned. This application May 10, 1978, Ser. No. 904,318 Int. Cl.<sup>2</sup> D21F 11/00

U.S. Cl. 162—135

7 Claims



1. The method of making a filter medium which comprises providing a water-laid web of fibers including at least 70% by weight of cellulose fibers, said web having a ream weight of 35 to 180 lb.,

impregnating said web with resin by contacting the wire side of said web in a pattern with a liquid composition containing a resin and a vehicle to cause penetration of said composition into said web to a depth of 15 to 45% of the total thickness of the web, said pattern having first zones free from said resin and other zones impregnated with said resin, at least one surface dimension of each of the first said zones being from 0.1 to 4 mm., the total area of the first said zones being from 35 to 60% of the total surface area of the wire side, and

heating said web to remove said vehicle and leave said resin in an amount from 9 to 15% by weight of the web in said pattern to provide an impregnated web having an air porosity from 1 to 200 CFM per sq. ft. at a pressure drop of 0.5 inch on a Frazier Porosity Tester.

4,161,423

**USE OF A DISSOLVED CELLULOSE AS A DRY STRENGTH AGENT AND DRAINAGE AID FOR PAPER**  
Richard B. Wasser, Norwalk, and John A. Sedlak, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 680,266, Apr. 26, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,207 Int. Cl.<sup>2</sup> D21H 3/20, 3/18

U.S. Cl. 162—163

9 Claims

1. A process for providing a cellulosic paper of improved dry strength which comprises forming an aqueous suspension of paper-making cellulosic fibers; adding to said suspension about 0.05 to 1 weight percent based on the dry weight of said fibers of a cellulose dissolved in a solvent selected from the group consisting of paraformaldehyde-dimethylsulfoxide, nitrogen dioxide-dimethyl formamide and cadmium oxide-ethylenediamine so as to provide a precipitated cellulose; maintaining the suspension under agitation until association of the precipitated cellulose and said paper-making cellulosic fibers occurs; forming a web of said paper-making fibers and the associated precipitated cellulose; and drying the resulting web.

4,161,424

**NOVEL ENDONUCLEASE AND PROCESS FOR PRODUCTION THEREOF**

Tadahiko Ando, Tokyo; Takehiko Shibata; Shukuko Ikawa, both of Wako, and Cholung Kim, Tokyo, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed Jul. 18, 1977, Ser. No. 816,541

Claims priority, application Japan, Jul. 23, 1976, 51-87883 Int. Cl.<sup>2</sup> C07G 7/026; C12D 13/06

U.S. Cl. 435—199

23 Claims

1. Endonuclease capable of selectively recognizing specific nucleic acids and cleaving the phospho-diester bond in the nucleic acids to produce nucleic acid fragments having discrete molecular weight, said enzyme being obtained from a cell-free extract of a species of genus *Bacillus*, which endonuclease is a member selected from the group consisting of:

- (1) R. BsuM obtained from ATCC 6051
- (2) R. Bsu6633 obtained from ATCC 6633
- (3) R. Bsu1193 obtained from IAM 1193
- (4) R. Bsu1231 obtained from IAM 1231
- (5) R. Bsu1192 obtained from IAM 1192
- (6) R. Bsu1145 obtained from IAM 1145
- (7) R. Bsu1076 obtained from IAM 1076
- (8) R. Bsu1114 obtained from IAM 1114
- (9) R. Bsu1259 obtained from IAM 1259
- (10) R. Bce14579 obtained from ATCC 14579
- (11) R. BceR obtained from ATCC 31293
- (12) R. Bce170 obtained from ATCC 31292
- (13) R. Bsu1247 obtained from IAM 1247
- (14) R. Bce1229 obtained from IAM 1229
- (15) R. Bme205 obtained from ATCC 31294
- (16) R. Bpu1387 obtained from AHU 1387
- (17) R. Bme899 obtained from IAM 1030 and
- (18) R. Bsp1286 obtained from IAM 1286.

4,161,425

**ENZYMATIC REAGENT SYSTEM FOR TOTAL CHOLESTEROL ASSAY USING OXYGEN-RATE METHOD**

Andrew W. Perry, Anaheim, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 701,919, Jul. 1, 1976, abandoned. This application Mar. 18, 1977, Ser. No. 778,919 Int. Cl.<sup>2</sup> G01N 31/14

U.S. Cl. 435—11

27 Claims

1. A cholesterol assay enzymatic reagent for rate determination of cholesterol in a sample to be assayed of the type comprising cholesterol oxidase, and a buffering agent in an amount to produce a solution having a pH of between about 5.5 and about 8, characterized in that said reagent further comprises means for neutralizing substantially all oxygen consumption inhibiting effects of inhibiting effects present in said sample to be assayed, said means consisting of alkyl dimethylbenzylammonium salt in an amount sufficient to neutralize substantially all oxygen consumption inhibiting effects of inhibiting agents present in said sample to be assayed.

8. In a cholesterol assay enzymatic reagent kit capable of being employed for rate determination of cholesterol in a sample to be assayed of the type comprising:

- (a) a first reagent comprising:
  - (i) cholesterol esterase and
  - (ii) cholesterol oxidase; and
- (b) a second reagent comprising:
  - (i) a buffer solution having a pH of between about 5.5 to about 8;

said reagents adapted to be employed together; the improvement being that said second reagent further comprises means for neutralizing substantially all oxygen consumption inhibiting effects of inhibiting agents present in said sample to be assayed, said means consisting of an alkyl dimethylbenzylammonium salt in an amount sufficient to neutralize substantially all oxygen consumption inhibiting effects of inhibiting agents present in said sample to be assayed.

12. In a rate method for determining the cholesterol concen-

tration in a cholesterol containing sample comprising the steps of:

- (a) oxidizing the cholesterol present in the sample in an oxygen saturated aqueous solution by means of a cholesterol assay enzymatic reagent of the type comprising:
  - (i) cholesterol oxidase and;
  - (ii) a buffering agent in an amount to produce a solution having a pH of between 5.5 and about 8; in the presence of a sensor which serves to monitor a property or characteristic of oxygen in said solution related to the oxygen concentration thereof;
- (b) generating a first electrical signal related to said oxygen concentration;
- (c) differentiating said first electrical signal to produce an output signal proportional to the instantaneous time rate of change of oxygen concentration; and
- (d) measuring said output signal to determine said cholesterol concentration; the improvement comprising neutralizing substantially all oxygen consumption inhibiting effects of inhibiting agents in said sample to be assayed by including in said cholesterol assay enzymatic reagent a cationic surfactant in an amount sufficient to neutralize substantially all oxygen consumption inhibiting effects of inhibiting agents present in said sample to be assayed.

4,161,426

**APPARATUS FOR REMOVING GASEOUS IMPURITIES**  
Franz X. Kneer, Hanau-Mittelbuchen, Fed. Rep. of Germany, assignor to Gebrüder Weiss KG, Frohnhausen, Fed. Rep. of Germany

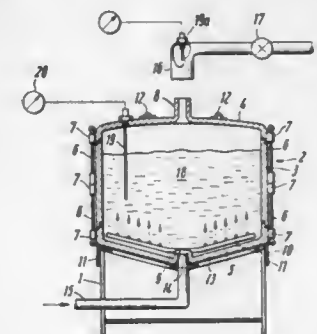
Filed Dec. 17, 1976, Ser. No. 751,945

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558256

Int. Cl.<sup>2</sup> C12B 1/00, 1/16

U.S. Cl. 435—313

5 Claims



1. An apparatus for removing gaseous organic impurities from waste gases by contacting the waste gas with an absorbent, comprising a closed container having an inlet at its base and an outlet at its top; a supporting stand for receiving and holding said container, said stand having quick disconnect-means adapted for registration and gas-tight connection of said inlet on placement of the container on the stand with a source of waste gas and said container having means in the bottom thereof for distributing the waste gas entering the inlet over the entire area of the container and means for measuring the biological activity of absorbent in the container.

4,161,427  
**CONTROL SYSTEM FOR A FURFURAL REFINING UNIT RECEIVING MEDIUM SWEET CHARGE OIL**

Avilino Sequeira, Jr.; John D. Begnaud, and Frank L. Barger, all of Port Arthur, Tex., assignors to Texaco Inc., New York, N.Y.

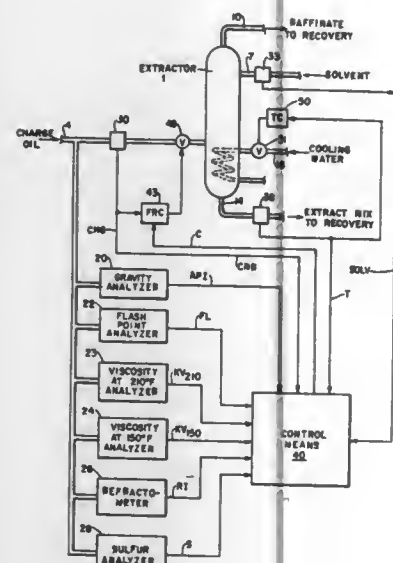
Continuation of Ser. No. 851,995, Nov. 16, 1977, abandoned.

This application Jun. 5, 1978, Ser. No. 912,913

Int. Cl.<sup>2</sup> C10G 21/00; C06G 7/58

U.S. Cl. 196—14.52

10 Claims



1. A control system for a furfural refining unit receiving medium sweet charge oil and furfural, one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control system, treats the received charge oil with the received furfural to yield extract mix and raffinate, comprising gravity analyzer means for sampling the medium sweet charge oil and providing a signal API corresponding to the API gravity of the medium sweet charge oil, flash point analyzer means for sampling the medium sweet charge oil and providing a signal FL corresponding to the flash point temperature of the charge oil, viscosity analyzer means for sampling the medium sweet charge oil and providing signals KV<sub>150</sub> and KV<sub>210</sub> corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, sulfur analyzer means for sampling the medium sweet charge oil and providing a signal S corresponding to the sulfur content of the medium sweet charge oil, a refractometer samples the medium sweet charge oil and provides a signal RI corresponding to the refractive index of the medium sweet charge oil, flow rate sensing means for sensing the flow rates of the medium sweet charge oil and of the furfural and providing signals CHG and SOLV, corresponding to the medium sweet charge oil flow rate and the furfural flow rate, respectively, means for sensing the temperature of the extract mix and providing a corresponding signal T, and control means connected to all of the analyzer means, the refractometer, and to all the sensing means for controlling the other flow rate of the charge oil and the furfural flow rates in accordance with signals API, FL, KV<sub>150</sub>, S, RI, CHG, T and SOLV.

4,161,428  
**DEVICE FOR RECOVERING OIL PRODUCTS FROM OIL SANDS**

Herbert Gottschlich, Uehfeld; Christian Koch, Erlangen, and Konrad Künstle, Röttelnbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

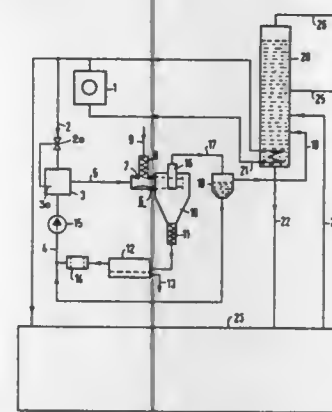
Filed Sep. 28, 1977, Ser. No. 837,388

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2645137

Int. Cl.<sup>2</sup> C10G 1/04; B01D 11/02

U.S. Cl. 196—14.52

4 Claims



1. Apparatus for recovering oil products from oil sands comprising

- a separate enclosed pressure vessel for mixing steam and water in the absence of oil sands under high atmospheric pressure,
- a first inlet in said enclosed pressure vessel for the introduction of water under high superatmospheric pressure,
- a nuclear reactor,
- superheated steam under high superatmospheric pressure from said nuclear reactor,
- a second inlet in said enclosed pressure vessel for the introduction of said superheated steam under high superatmospheric pressure to heat said water entering said vessel,
- a hot water outlet in said pressure vessel for the discharge of heated water,
- an elongated tubular reaction chamber having a constriction at a point intermediate its ends,
- a hot water conduit for conducting said heated water from said hot water outlet to one end of said elongated tubular reaction chamber, upstream said constriction,
- an input screw conveyor extending from an opening at the constriction in said elongated tubular reaction chamber perpendicularly to the axis of said elongated tubular reaction chamber for feeding oil sands from an external source into said reaction chamber in direct contact with said hot water to effect entrainment of the oil sands and release of oil from the sands,
- a hydrocyclone for separating solids from liquids, said other end of said elongated tubular reaction chamber extending to and opening into said hydrocyclone for discharge of hot water and reaction products consisting primarily of oil and sand,
- an output screw conveyor extending from the bottom of said hydrocyclone for the discharge of sand together with some water separated therein,
- an enlarged settling tank for receiving said sand and water from said output screw conveyor to permit said sand to settle at the bottom of the tank with clarified water above the sand,
- a water filter connected to the settling tank for the flow of clarified water through the water filter to remove suspended solid matter in the water,

- a crude oil separator chamber connected to said hydrocyclone for receiving from said hydrocyclone separated oil together with some water and wherein said oil and water separate in layers in said crude oil separator,
- an oil discharge in said separator chamber for the discharge of the oil layer,
- a water discharge in said separator chamber for the withdrawal of said water layer, and
- a water feed pump for returning said water from said water filter and said water from said crude oil separator under high superatmospheric pressure to said enclosed pressure vessel.

4,161,429

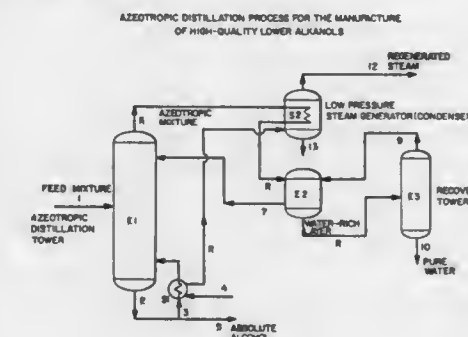
**HIGH-PRESSURE AZEOTROPIC DISTILLATION FOR THE MANUFACTURE OF ANHYDROUS ALCOHOLS**  
 James J. Baiel, Morris Plains, and Constantine Tsionopoulos, Parsippany, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 22, 1976, Ser. No. 734,953

Int. Cl.<sup>2</sup> B01D 3/36; C07C 29/28, 31/08, 31/10

U.S. Cl. 203—18

7 Claims



1. A process for the manufacture of a substantially anhydrous C<sub>2</sub>-C<sub>5</sub> alcohol from an aqueous mixture thereof by employing a distillation column with the simultaneous generation of a useable steam at the overhead section of the distillation column which comprises conducting the separation of said alcohol from said aqueous mixture in the distillation column at a column pressure ranging from about 50 psig. to about 300 psig. in the presence of cyclohexane and in the presence of oxygen in an amount less than about 6.6 wppm within the distillation column.

4,161,430

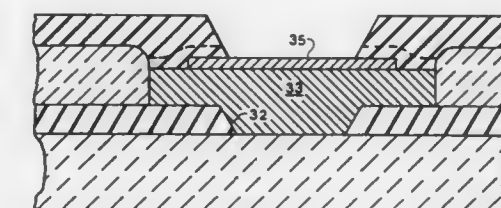
**METHOD OF FORMING INTEGRATED CIRCUIT METAL INTERCONNECT STRUCTURE EMPLOYING MOLYBDENUM ON ALUMINUM**  
 Marilyn R. Sogo, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 4, 1978, Ser. No. 966,325

Int. Cl.<sup>2</sup> C25D 5/02; H01L 23/48

U.S. Cl. 204—15

10 Claims



1. A method of forming an interconnect structure on a semi-conductor substrate, said method comprising:  
 depositing an aluminum layer on said substrate;

depositing a layer of molybdenum on said aluminum layer; forming a photoresist pattern defining an interconnect structure having a width more narrow than the desired width of the interconnect structure; etching portions of said molybdenum layer exposed by a said photoresist pattern; removing said photoresist pattern; depositing a first dielectric layer over said molybdenum pattern with a width greater than the width of said molybdenum pattern so as to completely cover said molybdenum pattern; and anodizing said exposed aluminum layer to form said interconnect structure.

4,161,431

**PROCESS FOR PRODUCING THIN FILM RESISTOR**  
 Takehiko Matsunaga; Saburo Umeda, both of Yokohama, and Tsuneaki Kamel, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

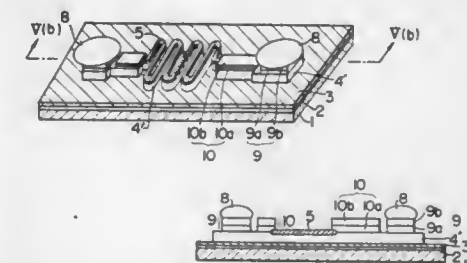
Filed Dec. 14, 1977, Ser. No. 860,618

Claims priority, application Japan, Dec. 17, 1976, 51-150951

Int. Cl.<sup>2</sup> C25D 5/02, 11/02; H01C 17/06

U.S. Cl. 204—15

10 Claims



1. A process for producing a thin film resistor, which comprises a first step of forming a tantalum nitride film on an alumina substrate by sputtering, a second step of removing part of the tantalum nitride film formed in the first step by photo etching, thereby forming a pattern, and anodically oxidizing part of the pattern destined to be the resistor, thereby forming a tantalum pentoxide film, a third step of forming a first electrode layer of one metal selected from chromium, titanium, and Nichrome by vacuum vapor deposition on the pattern, so that the tantalum pentoxide formed in the second step is directly connected to a conductor part and the electrode layer is apart from the conductor part, and forming a nickel film as a second electrode layer on the first electrode layer likewise by vacuum vapor deposition, whereby an electrode part is formed apart from said conductor part, a fourth step of heat treating the article obtained in the third step in an atmosphere of a gas selected from argon gas, nitrogen gas and argon-nitrogen gas mixture, and a fifth step of forming a solder bump at the electrode part treated in the fourth step.

4,161,432

**ELECTROPLATING CHROMIUM AND ITS ALLOYS**  
 Donald J. Barclay, Winchester, and William M. Morgan, Chandler's Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 913,639, Jun. 8, 1978, which is a continuation-in-part of Ser. No. 833,634, Sep. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 637,483, Dec. 3, 1975, Pat. No. 4,062,737. This application Jun. 8, 1978, Ser. No. 913,973

Claims priority, application United Kingdom, Jun. 14, 1977, 24734/77

Int. Cl.<sup>2</sup> C25D 3/06

U.S. Cl. 204—51

32 Claims

1. In a solution for electroplating chromium in which the source of chromium ions is an aqueous equilibrated solution of



chromium(III) thiocyanate complex, the improvement which comprises,

a buffer material in the solution, which buffer material provides one of the ligands for the complex, said buffer material being selected from the group consisting of amino acids, peptides, formates, acetates and hypophosphites.

4,161,433

**DECOMPOSITION OF ALKALI METAL AMALGAMS**  
Oronzio De Nora, Milan, Italy; Antonio Nidola, and Placido M. Spaziante, both of Lugano, Switzerland, assignors to Oronzio De Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Feb. 17, 1978, Ser. No. 878,905

Claims priority, application Italy, Dec. 5, 1977, 30381 A/77  
Int. Cl.<sup>2</sup> C25B 1/16; C25C 7/00; H01B 1/04, 1/06

U.S. Cl. 204—98

18 Claims

1. A polyphase packing material for alkali metal mercury amalgam denuders comprising a sintered mixture of at least one powdered valve metal boride and at least one valve metal carbide and also containing at least one member of the group consisting of 0.5 to 10% by weight of at least one metal of group VIII of the Periodic Table and 1 to 30% by weight of graphite.

4,161,434

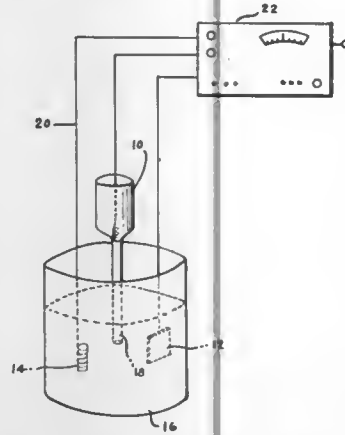
**METHOD FOR SEPARATING TRIALUMINUM NICKELIDE FIBERS FROM AN ALUMINUM MATRIX**  
Kenneth P. Quinlan, Newton, and Joseph J. Hutta, Groton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 12, 1978, Ser. No. 950,658

Int. Cl.<sup>2</sup> C25F 5/00, 3/00, 3/04

U.S. Cl. 204—146

3 Claims



1. An electrolytic process for separating aluminum nickelide fibers from a solid, two-phased, composite matrix of aluminum and trialuminum nickelide filaments which comprises the steps of passing an electric current between

- (A) a cathode composed of an inert material; and
- (B) an anode composed of a two-phased composite matrix of aluminum and trialuminum nickelide filaments; while
- (C) both anode and cathode are immersed in a one molar solution of potassium hydroxide to effectively remove said aluminum nickelide filaments from said matrix without adversely affecting said nickelide filaments.

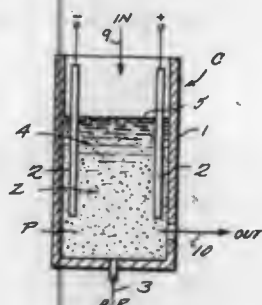
4,161,435  
**PROCESS AND APPARATUS FOR REDUCING THE LEVEL OF CONTAMINANTS IN AQUEOUS ELECTROLYTES CONTAINING THE SAME**  
Karl Moeglich, Dunedin, Fla., assignor to Innova, Inc., Clearwater, Fla.

Filed Oct. 13, 1977, Ser. No. 841,925

Int. Cl.<sup>2</sup> C02C 5/12; C02B 1/82

U.S. Cl. 204—152

17 Claims



1. An electrochemical process for reducing the level of contaminants from an aqueous electrolyte containing the contaminants comprising: suspending particles in the electrolyte in a reaction zone defined by a pair of electrodes to obtain a nonfluidized suspension containing from 1 to 40% by volume of the particles, establishing high turbulence corresponding to a Reynolds number between about 10,000 and about 50,000 and sufficient to maintain the particles in a state of violent agitation, applying D.C. current between the electrodes at a current density in amperes per unit area of electrode surface which does not exceed 1.0 amp/cm<sup>2</sup> and continuing the application of the D.C. current and the high turbulence at least until the contaminants are oxidized or reduced or coagulated.

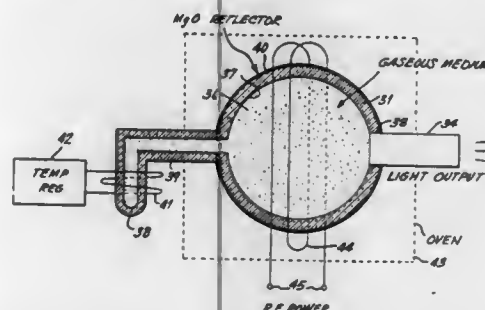
4,161,436

**METHOD OF ENERGIZING A MATERIAL**  
Gordon Gould, 1200 N. Nash Ave., Arlington, Va. 22209  
Division of Ser. No. 498,065, Aug. 16, 1974, Pat. No. 4,053,845, which is a continuation of Ser. No. 644,035, Mar. 6, 1967, abandoned, and Ser. No. 804,540, Apr. 6, 1959, abandoned, said Ser. No. 644,035 is a division of said Ser. No. 804,540, and a continuation-in-part of Ser. No. 804,539, Apr. 6, 1959, abandoned. This application Oct. 6, 1977, Ser. No. 840,050

Int. Cl.<sup>2</sup> B01J 1/10

U.S. Cl. 204—157.1 R

3 Claims



1. A method of energizing a material including the steps of: (a) providing a substance in a bounded volume, the atoms, ions or molecules of which have at least a pair of energy states which differ in energy by an amount corresponding to light frequencies; (b) exciting atoms, ions or molecules of said substance within said bounded volume to produce a greater population of atoms, ions or molecules of said substance in a higher of said energy states; (c) directing substantially collimated stimulating light along

a path through said bounded volume which enables the stimulating light to selectively stimulate emission of substantially collimated light; and (d) shining said emitted substantially collimated light onto said material which includes a mixture of reactable chemicals whereby said emitted substantially collimated light promotes reaction between said chemicals.

4,161,438

ELECTROLYSIS CELL

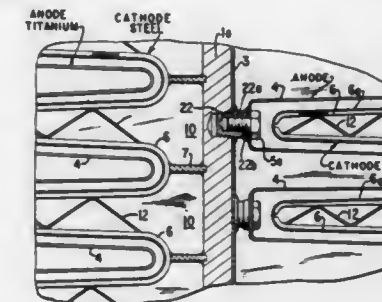
Oronzio De Nora, Milan, Italy, and Vittorio De Nora, Nassau, The Bahamas, assignors to Oronzio De Nora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation of Ser. No. 571,378, Apr. 24, 1975, and a continuation of Ser. No. 51,162, Jun. 30, 1970, U.S. Pat. No. 3,930,980

Claims priority, application Italy, Apr. 23, 1970, 23757 A/70  
Int. Cl.<sup>2</sup> C25B 11/03, 11/10, 13/00

U.S. Cl. 204—266

1 Claim



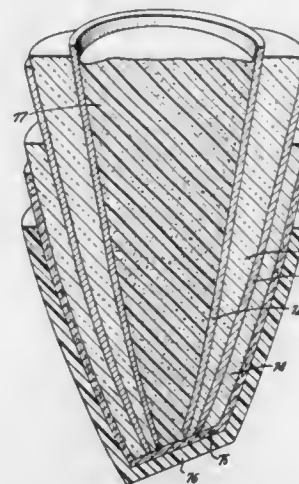
4,161,437  
**MEASURING PROBE FOR THE POLAROGRAPHIC DETERMINATION OF PARTIAL GAS PRESSURES**  
Wolfgang Fleckenstein, Kiel, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 648,944. This application Nov. 21, 1977, Ser. No. 853,582

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1975, 2501399

Int. Cl.<sup>2</sup> G01N 27/46

U.S. Cl. 204—195 P

4 Claims



1. In a measuring probe for polarographic determination of partial gas pressures, particularly partial pressures of oxygen in aqueous solutions, particularly in biological media, of the type having an indicator electrode which, except for a very small effective surface, is insulated all around, and a diaphragm protecting the effective surface against poisoning, and which probe has a reference electrode, the improvement comprising, in combination, insulating support means; said indicator electrode being constituted by a thin film of metal, having the properties of a noble metal, deposited on said insulating support means; a thin film insulating layer deposited on and covering said indicator electrode film; said effective surface being an exposed edge surface of said indicator electrode film forming part of a measuring surface of said probe, which measuring surface lies in a plane substantially perpendicular to the plane of said indicator electrode; a shielding layer, in the form of a thin film deposited on and covering the thin film insulating layer which insulates said indicator electrode; said shielding layer extending to at least adjacent said measuring surface; and means insulating said shielding layer from the exterior of said probe and from said measuring surface.

4,161,439

**APPARATUS FOR APPLICATION OF ELECTROSTATIC FIELDS TO MIXING AND SEPARATING FLUIDS**

Kenneth W. Warren, and Floyd L. Prestridge, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 3, 1978, Ser. No. 892,612

Int. Cl.<sup>2</sup> B03C 5/00, 5/02

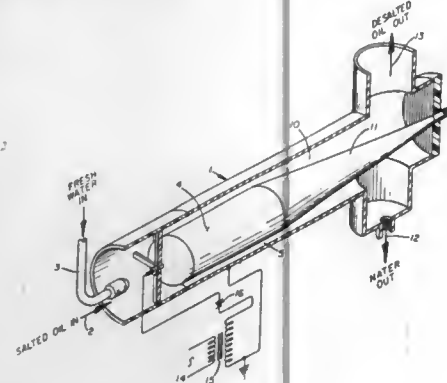
U.S. Cl. 204—306

4 Claims

1. Apparatus for mixing a plurality of fluids and subsequently separating the fluids, including,

- a vessel,
- inlets to the vessel for a plurality of fluids to be mixed and subsequently separated,
- a common flow path in the vessel for the fluids to be mixed and subsequently separated,
- first means electrically energized as electrodes to generate an electrostatic field in the flow path of an intensity which will move drops of the more polar of the fluids fast enough to be sheared by the other fluids into smaller sizes which will distribute throughout the less polar of the fluids in a mixing operation,

second means electrically energized as electrodes to generate an electrostatic field in the flow path downstream of the first field and of an intensity which will move the drops of the dispersed fluid into collision with each other and coalesce into sizes large enough to gravitate from the remaining fluid,



a volume provided in the vessel downstream of the mixing and separating electrodes in which the coalesced fluid separates from the remaining fluid, and outlet conduits connected to the vessel to withdraw the separated fluids.

#### 4,161,440 LIQUEFACTION OF CALCIUM-CONTAINING SUBBITUMINOUS COALS AND COALS OF LOWER RANK

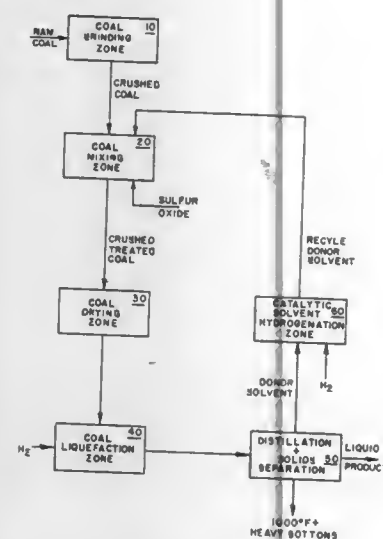
Roy J. Brunson, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 21, 1977, Ser. No. 853,301

Int. Cl.<sup>2</sup> C10G 1/00, 1/06

U.S. Cl. 208—8 R

12 Claims



1. A process for liquefying a calcium-containing subbituminous coal and coals of lower rank comprising:

- contacting said coal with a sulfur oxide, maintained in the liquid phase, to form within the pores of said coal a water-insoluble, thermally stable calcium compound; and
  - liquefying the treated coal at a temperature within the range from about 700° F. to about 950° F. and at a pressure within the range from about 300 psia to about 3000 psia.
5. The process of claim 1 wherein the sulfur oxide is dissolved in a solvent, and maintained under pressure.

9. The process of claim 1 wherein the liquefaction is accomplished in the presence of a solvent which comprises a hydrogen-donor compound.

12. The process of claim 9 wherein the coal is initially con-

tacted with a first solvent which contains sulfur oxide, the coal is thereafter dried, and then contacted and liquified with a second solvent indigenous to the process.

#### 4,161,441 PROCESS FOR THE PRODUCTION OF DISTILLATE FUELS FROM OIL SHALES AND BY-PRODUCT THEREFROM

Jacque C. Morrell, 4501 Conn. Ave. NW., Washington, D.C. 20008

Continuation of Ser. No. 679,315, Apr. 23, 1976, abandoned.

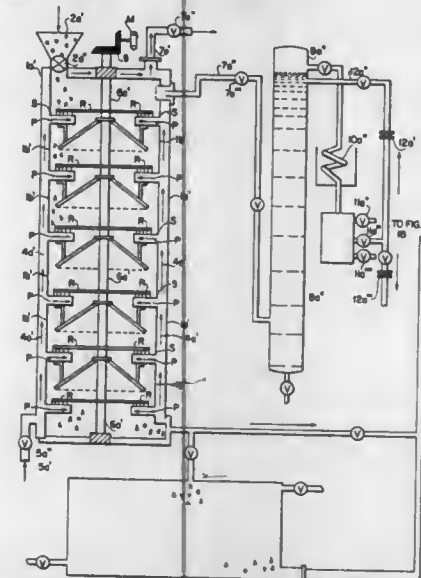
This application Oct. 31, 1977, Ser. No. 847,832

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C10G 1/02

U.S. Cl. 208—11 R

4 Claims



1. A continuous process for removing a substantial amount of the water present in oil shale prior to retorting the same to facilitate the rate of recovery of the oil therefrom in the retorting step of the process and to substantially increase the capacity of the retorting step in the process and improve the overall efficiency thereof; which comprises subjecting the said oil shale in subdivided form to indirect heat treatment in a partial dehydration step conducted at a temperature of up to 650° F., said partial dehydration step being conducted by passing said oil shale into a vertical retort equipped with hollow shelves opening into said vertical retort through which hollow shelves hot combustion gases are passed to partially dehydrate said oil shale, moving said oil shale progressively downward onto and over said shelves wherein it is indirectly heated by said hot gases passing there through, said partial dehydration being conducted for a sufficient time to remove substantial to major amounts of free and combined water from the oil shale and considerable amounts of oil distillate and thereafter passing the heated partially dehydrated oil shale to a retorting step for further heat treatment at a temperature of about 850° F. to about 1,000° F., fractionating the vapors from the retorting step wherein there is removed a light overhead product comprising vapors of low boiling hydrocarbons, water, hydrocarbon gases and ammonia and wherein heavier conversion oil product from the oil shale are condensed and separated as a liquid for further treatment and use.

#### 4,161,442 PROCESSING OF TAR SANDS

Costandi A. Andeh, Princeton, and Nai Y. Chen, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.  
Filed Jan. 5, 1978, Ser. No. 867,061  
Int. Cl.<sup>2</sup> C10G 1/00; C10J 3/06

U.S. Cl. 208—11 R

12 Claims

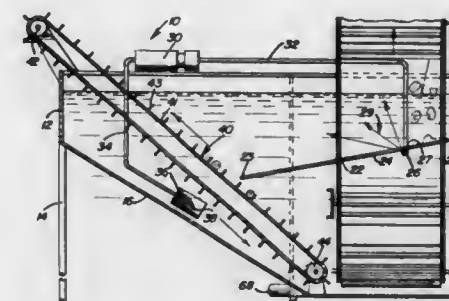
1. A method for upgrading tar sands which comprises: mixing the equivalent of 1 part of tar sands with up to about 5 parts of spent hot sand obtained as defined below to form a mixture therein in a distillation zone at a temperature within the range of 600° to 850° F., stripping petroliferous material from said hot mixture in said distillation zone with steam under conditions avoiding significant cracking to produce an oil distillate product, recovering said oil distillate product, passing sand particles comprising hydrocarbonaceous deposits obtained from said distillation zone to a fuel gas generation zone, contacting said sand particles comprising hydrocarbonaceous deposits in said fuel gas generation zone with a mixture of steam and oxygen containing gas at a temperature within the range of 1500° to 2200° F. and recovering a fuel gas product therefrom, and passing hot sand particles recovered from said fuel gas generation zone at an elevated temperature to said distillation zone for admixture with tar sands as above identified.

#### 4,161,443 POTATO AND ROCK SORTER

Tony L. Glover, R.R. 1, Tigerton, Wis. 54486  
Filed May 2, 1978, Ser. No. 902,090  
Int. Cl.<sup>2</sup> B03B 5/66

U.S. Cl. 209—157

3 Claims



1. An apparatus for separating heavier components from lighter components mixed therewith comprising: container means having a liquid disposed therein, said liquid having a surface disposed at a predetermined height within said container means; mixed component delivery means having a discharge end spaced above said liquid surface for depositing mixed components into said liquid; baffle means disposed below said liquid surface, said baffle means having a receiving end disposed vertically below said discharge end for receiving said mixed components after they have been deposited by said delivery means and fallen through said liquid, said baffle means being substantially planar and being positioned within said container means inclining downwardly from said receiving end to a lower end, the mixed components moving downwardly along said baffle means incline; an aperture formed in said baffle means and spaced from said receiving end along said incline for allowing the heavier mixed components to fall therethrough under the influence of gravity after having moved downwardly from said receiving end; nozzle means disposed below said aperture for causing an upward flow of liquid through said aperture to deflect the lighter components away from said aperture thereby al-

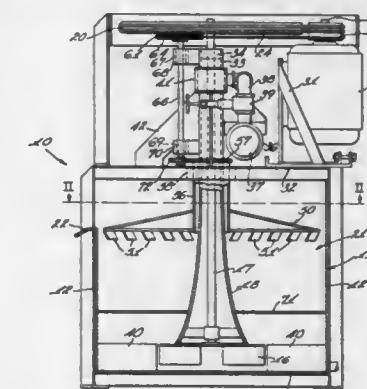
lowing only the heavier components to fall through said aperture; pump means connected to said nozzle means for providing a continuous pressurized supply of liquid to said nozzle means; first conveyor means having one end thereof disposed vertically below said aperture for receiving said heavier components and removing them from the body of liquid; and second conveyor means having one end thereof disposed vertically below said lower end of said baffle means for receiving said lighter components and removing them from said liquid.

#### 4,161,444 MECHANICAL MEANS FOR INCREASING THE GRADE OF A FLOTATION CELL CONCENTRATE

Donald C. Moore, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.  
Filed Nov. 25, 1977, Ser. No. 854,900  
Int. Cl.<sup>2</sup> B03D 1/20

U.S. Cl. 209—169

1 Claim



1. In a flotation cell for treating coal slurry which contains unwanted refuse particles: a tank in which the coal slurry is contained; air supply means arranged to deliver air to the bottom of the tank to infuse fine air bubbles into the slurry; a power driven agitating means carried by the tank and operatively arranged to disperse the fine air bubbles through the slurry; and, a mechanical power driven froth agitator carried by the tank, said froth agitator comprising a rake having a plurality of spaced-apart depending teeth which are disposed radially with respect to the axis of rotation of the rake and at an angle with respect to a horizontal line that passes through the axis about which the rake rotates, said teeth slanting inwardly towards the axis of rake rotation, said rake being disposed in position to impart a rolling mechanical motion to the froth layer so that the froth is rolled back into the low solid pulp below the froth layer so as to dislodge unwanted refuse particles mechanically trapped between air bubbles.

#### 4,161,445 PROCESS FOR THE DESALINATION OF SALT CONTAINING WATER

Dadley W. Coillet, 12 Ross Rd., Belmont, Mass. 02178  
Filed Nov. 23, 1977, Ser. No. 854,405  
Int. Cl.<sup>2</sup> B01D 13/00

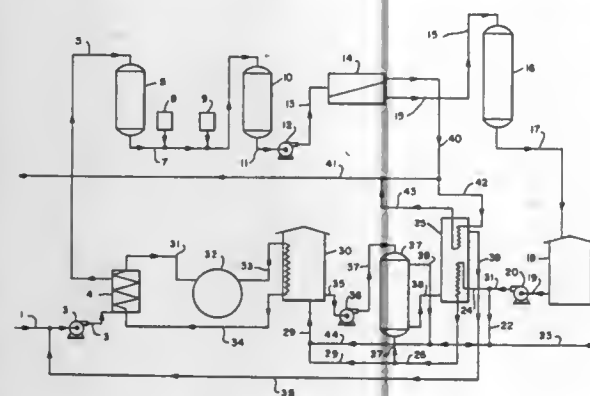
U.S. Cl. 210—23 H

3 Claims

1. A process for forming potable water from a salt-containing water source comprising the steps of (a) passing water from said water source in a stream through a heat exchange zone, wherein it is cooled, (b) passing said cooled water stream through a reverse osmosis membrane zone to form a permeate water stream,

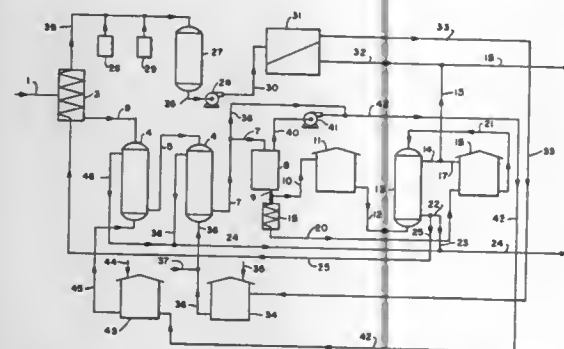


- (c) passing said permeate stream through a thermal ion exchange desalination resin bed to form a potable water stream,  
 (d) preheating a regenerant water stream by heat generated



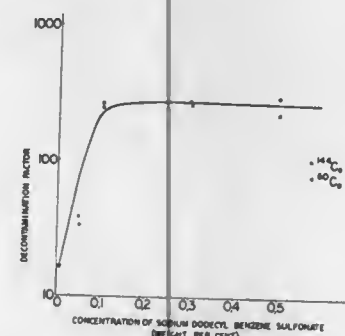
- during cooling of said water source stream in said heat exchange zone, and  
 (e) periodically thermally regenerating said desalination resin by passing said preheated regenerated stream through said resin bed.

**4,161,446**  
**PROCESS FOR THE TREATMENT OF GROUND WATER**  
 Dudley W. Coillet, 12 Ross Rd., Belmont, Mass. 02178  
 Filed Nov. 23, 1977, Ser. No. 854,406  
 Int. Cl.<sup>2</sup> B01D 13/00  
 U.S. Cl. 210—23 H 3 Claims



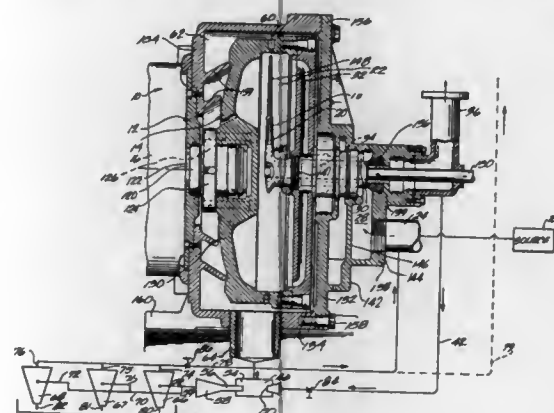
1. A process for forming potable water from a salt-containing water source comprising the steps of  
 (a) passing water from said water source as a stream through a bed of thermal ion exchange desalination resin to form a potable water stream,  
 (b) periodically thermally regenerating said desalination resin by passing a preheated regenerant stream of higher temperature than said water source through said resin bed,  
 (c) passing said water source stream prior to step (a) and the regenerant water stream resultant from step (b) through a heat exchange zone in which said regenerant water stream is cooled and said water source is heated, and  
 (d) passing said cooled regenerant water stream through a reverse osmosis membrane zone to form a permeate for use as potable water.

**4,161,447**  
**PROCESS FOR TREATING WASTE WATER CONTAINING RADIOACTIVE SUBSTANCES**  
 Katumi Kojima, Ohimachi, Japan, assignor to Daicel Ltd., Osaka and Mitsui Shipbuilding & Engineering Co., Ltd., Tokyo, both of Japan  
 Filed Nov. 18, 1974, Ser. No. 524,976  
 Claims priority, application Japan, Jun. 13, 1974, 49-67520  
 Int. Cl.<sup>2</sup> B01D 13/00  
 U.S. Cl. 210—23 H 8 Claims



1. In a reverse osmosis process for purifying waste water from atomic energy installations containing radioactive substances, in which the waste water is flowed under pressure in contact with a semipermeable membrane and the radioactive substances are preferentially retained on one side of the membrane and purified water is recovered from the other side of the membrane, the improvement which comprises said waste water flowed past said membrane contains from 0.1 to 1.0 weight percent of at least one water-soluble organic surfactant effective to retain more than about 99 percent of the radioactive substances in said waste water on said one side of said membrane, and wherein the concentration of said organic surfactant in said waste water is at least twice as much as the critical concentration of micelle formation of said surfactant in said waste water.

**4,161,448**  
**COMBINED SEPARATOR AND PUMP WITH DIRTY PHASE CONCENTRATOR**  
 John W. Erickson, Huntington Beach, and Peter A. Soriano, Rowland Heights, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.  
 Filed Feb. 21, 1978, Ser. No. 879,811  
 Int. Cl.<sup>2</sup> B01D 43/00  
 U.S. Cl. 210—258 15 Claims



1. An improvement in the means for separating waste from a dirty fluid to generate a cleansed fluid stream, the improvement comprising:  
 (a) centrifugal separator means for separating waste from a

- dirty fluid stream by centrifugal force and creating separated waste in a fluid carrier and a first cleansed fluid stream;  
 (b) at least one secondary separator;  
 (c) means communicating the separated waste and fluid carrier from the centrifugal separator to the secondary separator for the concentration of the waste and the formation by the secondary separator of a second cleansed fluid stream from the fluid carrier and a waste stream;  
 (d) means using at least a portion of the first cleansed fluid and at least a portion of the head imparted to such first cleansed fluid by the centrifugal separator means to pump the separated solid waste and fluid carrier to the secondary separator through the communicating means; and  
 (e) means for receiving the waste stream.

**4,161,449**  
**POWDERED CARPET COMPOSITION**  
 James A. Smith, Old Tappan, N.J., and James H. McLaughlin, Chatham, Mass., assignors to Airwick Industries, Inc., Carlstadt, N.J.  
 Filed Sep. 2, 1977, Ser. No. 830,238  
 Int. Cl.<sup>2</sup> D06M 11/04  
 U.S. Cl. 252—8.6 10 Claims

1. A powdered carpet-treating composition comprising a blend of from about 40.0–98.99%, by weight, of an inorganic salt carrier selected from the group consisting of sulfates, chlorides, carbonates, bicarbonates, borates, citrates, phosphates, nitrates and blends thereof, substantially all of the particles of said carrier being between 0.06–0.25 millimeters; from about 1.0–25.0%, by weight, of an agglomerating agent selected from the group consisting of starch, silica powders, grain flour, wood flours, talc, pumice, clays and calcium phosphate; from about 0.01–20.0%, by weight, of a volatile odorous agent and up to about 15%, by weight, of an antistatic agent.

**4,161,450**  
**DRYING COMPOSITIONS**  
 Jean-Claude Vitat, Antony; Jean-Pierre Rémond, Massy, and Jean-Robert Thebault, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France  
 Filed Mar. 15, 1977, Ser. No. 777,849  
 Claims priority, application France, Jun. 4, 1976, 76 16961  
 Int. Cl.<sup>2</sup> C09K 3/00

1. A composition comprising from 90 to 99.95% by weight of an organic solvent containing at least 50% by weight of 1,1,2-trichloro-1,2,2-trifluoro-ethane, 0.04% to 8% by weight of a hydrophobic surface active agent substantially insoluble in water, and 0.01% to 2% by weight of an organic acid which voids the formation of stable emulsions, said acid being selected from the group consisting of saturated aliphatic mono- or diacids having a C<sub>5</sub>–C<sub>10</sub> chain and which are linear, branched or cyclic and substituted or unsubstituted; aliphatic unsaturated mono- or diacids which have a C<sub>5</sub>–C<sub>30</sub> chain and are linear or branched and substituted or unsubstituted; and aromatic acids having a C<sub>7</sub>–C<sub>9</sub> saturated or unsaturated chain, which are unsubstituted or mono- or polysubstituted by at least one amino, nitro, hydroxy or methoxy group.

**4,161,451**  
**LUBRICATING OIL ADDITIVE COMPOSITION**  
 Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
 Continuation-in-part of Ser. No. 672,805. This application Mar. 27, 1978, Ser. No. 890,879  
 The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.  
 Int. Cl.<sup>2</sup> C10M 1/48, 3/42, 5/24, 7/46  
 U.S. Cl. 252—32.7 E 14 Claims

1. An additive composition for use in crankcase lubricating oils comprising:  
 (1) an oil-soluble antioxidant selected from aromatic and

- alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized ester-olefins, and  
 (2) an oil-soluble secondary amine of the formula:



wherein R and R' are aliphatic radicals.

2. The composition of claim 1 wherein the weight ratio of the antioxidant to the secondary amine is 1:0.001–21, and R and R' each contain from 6 to 30 carbon atoms.

4. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and an antioxidant amount of the composition of claim 2.

5. The composition of claim 4 comprising an oil of lubricating viscosity, from 0.25 to 10% weight of said antioxidant, and from 0.001 to 5% weight of said secondary amine.

6. The composition of claim 5 which contains an antioxidant-antiwear amount of an oil-soluble zinc dihydrocarbyldithiophosphate salt, and wherein the antioxidant is a wax sulfide or polysulfide.

**4,161,452**  
**POLYOLEFINIC COPOLYMER ADDITIVES FOR LUBRICANTS AND FUELS**  
 Robert L. Stambaugh, Hatboro, and Richard A. Galluccio, Perkasie, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 763,756, Jan. 28, 1977, abandoned. This application Dec. 5, 1977, Ser. No. 857,078  
 Int. Cl.<sup>2</sup> C10M 1/32, 3/26, 1/24; C08L 23/00

U.S. Cl. 252—34 24 Claims

1. A composition comprising a major amount of a lubricating oil and a minor detergent amount of a graft copolymer prepared by intimately admixing (a) an oil soluble, substantially linear, substantially saturated, rubbery, olefinic hydrocarbon backbone polymer, (b) an addition copolymerizable graft monomer system comprising an unsaturated polycarboxylic acid or anhydride and at least one other monomer copolymerizable therewith, and (c) a free radical initiator capable of hydrogen abstraction, the temperature during admixing in the presence of the initiator being below the decomposition temperature of the initiator, and thereafter increasing the temperature of the mixture to or above the decomposition temperature of the initiator.

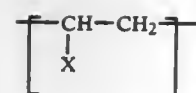
6. A composition as in claim 1 wherein the graft copolymer is post-reacted with an alcohol or amino alcohol.

**4,161,453**  
**ELECTROPHORETIC DEVELOPERS**  
 Yvan K. Gilliams, Hever, and Noel J. De Volder, Edegem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

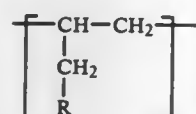
Filed Jul. 20, 1977, Ser. No. 817,264  
 Claims priority, application United Kingdom, Jul. 23, 1976, 30920/76

Int. Cl.<sup>2</sup> G03G 9/12 13 Claims

1. A liquid developer composition suitable for use in developing electrostatic charge patterns, which composition contains in an electrically insulating non-polar carrier liquid a dispersed particulate colouring substance, one or more charge control substances, a copolymer (I) pre-coating for said colouring substance particles in a weight ratio of copolymer (I) to colouring substance wherein 1:1 and 9:1 and a copolymer (II) in said carrier liquid in a weight ratio of copolymer (II) to colouring substance between 0.5:1 and 5:1, said copolymer (I) being a copolymer consisting of 50 to 90 mole % of recurring units of the following formula (A)



wherein X is phenyl or alkylphenyl, and from 10 to 50 mole % of recurring units of the following formula (B)



wherein R is a hydroxyl group or is a group resulting from the esterification of hydroxyl with a C<sub>12</sub>-C<sub>20</sub> aliphatic acid with the proviso that the copolymer (I) contains at least 0.5% by weight of free hydroxyl groups, and said copolymer (II) being a copolymer selected from the group consisting of

- a copolymer of at least one C<sub>12</sub>-C<sub>20</sub> alkyl ester of methacrylic acid (X) and the n-butyl or isobutyl ester of methacrylic acid (Y)
- a copolymer of X, Y and up to 70% by weight of styrene or a styrene homologue, and
- a copolymer of X, Y and up to 0.4% by weight of methacrylic acid,

the weight ratio of X to Y in these copolymers being comprised between 15:85 and 50:50.

4,161,454

## COATING MAGNETITE WITH POLYACID

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,604

Int. Cl.<sup>2</sup> G03G 9/08; B32B 5/16, 15/08

U.S. Cl. 252-62.1 P

17 Claims

8. A method of toner formation comprising forming an aqueous dispersion of magnetic particles in a solution of a water soluble salt of a polyanhydride in water, converting the soluble salt of the polyanhydride to the polyacid by adding acid to said aqueous dispersion to precipitate the polyacid onto said magnetic particles, separating the coated magnetic particles from the aqueous dispersion, mixing said coated particles into a solution of a solvent and resin to form a slurry and spray drying said slurry to form toner.

4,161,455

## NOVEL PRECIPITATED SILICEOUS PRODUCTS AND METHODS FOR THEIR USE AND PRODUCTION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 796,913, is a division of Ser. No. 557,707, Mar. 12, 1975, abandoned. This application May 30, 1978, Ser. No. 911,003

Int. Cl.<sup>2</sup> C11D 3/08

U.S. Cl. 252-174.25

1 Claim

1. A detergent composition, including as an agent to improve flow properties, a finely divided, amorphous, precipitated silicon dioxide having:

- (a) a wet cake moisture content of from between about 77.9 to 83.5% where it is about 77.9 to 83.2% in the presence of a metal cation and between about 79.8 to 83.5% in the absence of said metal cation;
- (b) a structure index of from between about 350 to 505 where it is between about 350 to 495 in the presence of said metal cation and between about 395 to 505 in the absence of said metal cation;
- (c) an oil absorption of from between about 190 to 212 cc/100 grams where it is between about 193 to 212 cc/100 grams in the presence of said metal cation and between

- about 190 to 202 cc/100 grams in the absence of said metal cation;
  - (d) a void volume of from between about 3.19 to 4.44 cc Hg/g SiO<sub>2</sub> where it is between about 3.19 to 4.44 cc Hg/g SiO<sub>2</sub> in the presence of said metal cation and between about 3.55 to 4.14 cc Hg/g SiO<sub>2</sub> in the absence of said metal cation;
  - (e) a BET surface area of from between about 120 to 220 m<sup>2</sup>/g where it is between about 153 to 220 m<sup>2</sup>/g in the presence of said metal cation and between about 120 to 153 m<sup>2</sup>/g in the absence of said metal cation; and
  - (f) a percent friability of from between about 20 to 98% where it is between about 28 to 93% in the presence of said metal cation and between about 20 to 98% in the absence of said metal cation;
- wherein said silicon dioxide comprises at least 90% SiO<sub>2</sub> and said metal cation is selected from the group consisting of aluminum, magnesium, zinc and calcium.

4,161,456

## BASE MATERIAL FOR ARTIFICIAL LEATHER

Gustav Sinn, Leverkusen; Martin Matner, Odenthal, and Hermann J. Bross, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 822,000, Aug. 5, 1977, which is a continuation of Ser. No. 650,532, Jan. 19, 1976, abandoned. This application Feb. 24, 1978, Ser. No. 880,899

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1975, 2502654; Jan. 23, 1975, 2502644

Int. Cl.<sup>2</sup> B32B 7/14

U.S. Cl. 252-182

1 Claim

1. A vulcanization paste comprising 0.5 to 10.0 parts by weight of zinc oxide, 0.2 to 10.0 parts by weight of sulphur, 0.2 to 3.0 parts by weight of a water soluble accelerator, 0.2 to 3.0 parts by weight of a water insoluble accelerator, 2.0 to 15.0 parts by weight of titanium dioxide, 0.1 to 5.0 parts by weight of a dispersing agent and 10.0 to 50.0 parts by weight of water.

4,161,457

## PROCESS FOR PREPARING A DIVALENT EUROPIUM ACTIVATED ALKALINE EARTH METAL ALUMINATE PHOSPHOR

Kōichi Takahashi, Odawara; Kinichiro Narita, Chigasaki; Akiyasu Kagami, Ninomiya; Takashi Hase, Fujisawa; Yoshiyuki Mimura, Chigasaki; Junro Koike, Machida; Ryuya Toyonaga, Ebina, and Takehiro Kojima, Kawasaki, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka and Nippon Hōsō Kyōkai, Tokyo, both of Japan

Filed Mar. 15, 1977, Ser. No. 777,692

Int. Cl.<sup>2</sup> C09K 11/46

U.S. Cl. 252-301.4 R

4 Claims

1. A process for preparing a divalent europium activated alkaline earth metal aluminate phosphor comprising: mixing magnesium oxide or a magnesium compound convertible to magnesium oxide at the firing temperature used in said process, a barium halide or a mixture of a barium halide and barium oxide or a barium compound decomposable to barium oxide at said firing temperature containing barium halide at such a rate that the amount of barium contained in the barium halide is not less than 70% by weight of the total amount of barium in said mixture, an aluminum compound convertible to aluminum oxide at said firing temperature, and Eu<sub>2</sub>O<sub>3</sub> or a europium compound convertible to Eu<sub>2</sub>O<sub>3</sub> at said firing temperature at a mixing ratio which satisfies the composition formula



wherein, a, b, c and d are numbers satisfying the conditions

$$a+b+c+d=10, \text{ and}$$

$0 < a \leq 2.00$ ,  $0.25 \leq b \leq 2.00$ ,  $6.0 \leq c \leq 8.5$ ,  $0.05 \leq d \leq 0.30$ ; firing the mixture in air at a temperature of 1200° C. to 1600° C; and

then firing the fired mixture in a reducing atmosphere at a temperature of 1000° C. to 1600° C.

4,161,458

## STABLE AQUEOUS AEROSOL SYSTEM WITH CARBON DIOXIDE PROPELLANT

Gary G. Kolleth, Lakewood, Colo., assignor to Scott's Liquid Gold Incorporated, Denver, Colo.

Filed Aug. 29, 1977, Ser. No. 828,974

Int. Cl.<sup>2</sup> C09K 3/30

U.S. Cl. 252-305

3 Claims

1. An aqueous aerosol system suitable for use in a pressurized aerosol container having a compressed gas propellant, comprising a gaseous carbon dioxide propellant phase and an aqueous liquid phase which liquid phase contains diethylamine, which undergoes a reversible reaction with carbon dioxide or carbonic acid, the amount of said diethylamine being sufficient to impart a neutral or nearly neutral pH to the liquid phase of the system at equilibrium after pressurization with the carbon dioxide.

4,161,459

## COMPOSITION FOR CHEMICALLY PEELING FRUITS AND VEGETABLES

Shigeru Otsuka, Toyonaka; Zenichi Mori, Wakayama; Tetsuhiko Tominaga, Takarazuka; Junichi Tamura, Wakayama; Yoshio Shimoda, Ikeda; Takashi Takeuchi, Wakayama; Masakazu Oku, Kawabe, and Kan Mori, Wakayama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd. and Kao Soap Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 822,705, Aug. 8, 1977, Pat. No. 4,130,668, which is a continuation of Ser. No. 679,018, Apr. 21, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,209

Claims priority, application Japan, Apr. 30, 1975, 50-52192

Int. Cl.<sup>2</sup> B01F 17/00; A23L 1/212

U.S. Cl. 252-352

9 Claims

1. An aqueous alkaline solution for peeling fruits or vegetables consisting essentially of

- I. from 0.1 to 1.5 weight percent of alkali,
  - II. from 0.005 to 1.0 weight percent of a mixture of
    - (a) polyoxyethylene (3-60) sorbitan fatty acid (C<sub>8</sub>-C<sub>18</sub>) ester having an HLB value higher than 9, and
    - (b) glycerin fatty acid (C<sub>8</sub>-C<sub>18</sub>) ester having an HLB value not higher than 9, said mixture containing from one to 5 parts by weight of component (a) and from one to 5 parts by weight of component (b) and,
  - III. the balance being essentially water.
4. An aqueous alkaline solution for peeling fruits or vegetables consisting essentially of

- I. from 0.1 to 1.5 weight percent of alkali,
- II. from 0.005 to 1.0 weight percent of a mixture of
  - (a) polyoxyethylene (3-60) sorbitan fatty acid (C<sub>8</sub>-C<sub>18</sub>) ester having an HLB value higher than 9, and
  - (b) sorbitan fatty acid (C<sub>8</sub>-C<sub>18</sub>) ester having an HLB value not higher than 9, said mixture containing from one to 5 parts by weight of component (a) and from one to 5 parts by weight of component (b) and,
- III. the balance being essentially water.

7. An aqueous alkaline solution for peeling fruits or vegetables consisting essentially of

- I. from 0.1 to 1.5 weight percent of alkali,
- II. from 0.005 to 1.0 weight percent of a mixture of
  - (a) polyoxyethylene (3-60) sorbitan fatty acid (C<sub>8</sub>-C<sub>18</sub>) ester having an HLB value higher than 9, and
  - (b) propylene glycol fatty acid (C<sub>8</sub>-C<sub>18</sub>) ester having an HLB value not higher than 9, said mixture containing from one to 5 parts by weight of component (a) and from one to 5 parts by weight of component (b) and,
- III. the balance being essentially water.

4,161,460  
METHOD OF ENHANCING OLEOPHILIC AND HYDROPHOBIC PROPERTIES OF ABSORBENT MATERIAL

Vincent N. R. Sewell, Victoria, Canada, assignor to R. B. Cybernetris (1970) Ltd., Canada

Continuation of Ser. No. 522,260, Nov. 8, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,157

Int. Cl.<sup>2</sup> B01J 31/02

U.S. Cl. 252-426

2 Claims

1. A process for rendering open-cell elastomeric polyurethane foam material preferentially oleophilic in the presence of water to improve the oil absorption and the oil immobilization capacity of said foam material, comprising the steps of coating the surfaces of said foam material with a coating material consisting essentially of paraffin wax dissolved in an organic solvent, removing an excess of the dissolved wax and organic solvent by draining the excess from the foam material and by squeezing the foam material to remove excess wax solution from within said foam material and drying the resulting foam material to remove said solvent and to obtain a porous foam sorbent material impregnated with from about 1/4 percent to 10 percent by weight of said wax whereby the foam material obtained is suitable for picking up oil spills from water surfaces.

4,161,461

## TREATMENT OF TRANSITION METAL COMPOUND

Anthony D. Caunt, Welwyn Garden City, and Ian G. Williams, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 7, 1977, Ser. No. 849,357

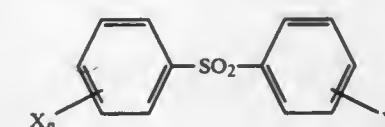
Claims priority, application United Kingdom, Nov. 15, 1976, 47449/76

Int. Cl.<sup>2</sup> C08F 4/64

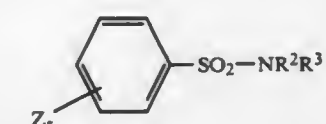
U.S. Cl. 252-429 B

16 Claims

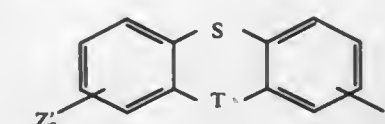
1. In a process of treating a transition metal halide in which a solid halide of a transition metal of Groups IVA to VIA of the Periodic Table is subjected to grinding in the presence of a Lewis Acid compound and at least one organic sulphur-containing compound of one of the formulae (A), (B) or (C), and the ground product is washed with a liquid medium, wherein formula (A) is



formula (B) is



and  
formula (C) is



where  
X, or each X, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a



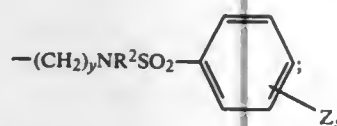
group  $-NR^1R^2$ , or two groups X can together form an unsaturated hydrocarbon ring;  
 Y, or each Y, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group  $-NR^1R^2$ , or two groups Y can together form an unsaturated hydrocarbon ring; or a group X and a group Y may be replaced by a link between the two phenyl groups attached to the  $-SO_2-$  group, the linkage being either direct or through a group  $-O-$ ,  $-CH_2-$ ,  $-NR^1-$ ,  $-S-$ , or  $-CO-$ ;

$R^1$  is a hydrogen atom or a hydrocarbyl group;

$R^2$  is a hydrocarbyl group;

p and q are each, independently, an integer from 0 up to 5; Z, or each Z, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group  $-NR^1R^2$ , or two groups Z can together form an unsaturated hydrocarbon ring;

$R^3$  is a hydrocarbyl group or a group



s is an integer from 0 up to 5;

y is a positive integer;

T is  $-S-$ ,  $-O-$ ,  $-NR^2-$ , or  $-CO-$ ; and

Z', or each Z', is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio or arylthio group, or a group  $-NR^1R^2$ , the improvement which comprises adding up to 2.50 moles of aluminum chloride to the solid halide of the transition metal for each gramme atom of the transition metal which is present in the solid halide of the transition metal, grinding the mixture of aluminum chloride and the solid halide of the transition metal, adding to the ground mixture from 0.01 up to 0.50 moles of titanium tetrachloride, and from 0.10 up to 2.50 moles of the organo-sulphur containing compound, for each gramme atom of the transition metal which is present in the solid halide of the transition metal, grinding the mixture thereby obtained and washing the ground product with a liquid medium capable of dissolving the at least one organic sulphur-containing compound and at least one of aluminum chloride or titanium tetrachloride.

4,161,462

#### CATALYST FOR (CO) POLYMERIZATION OF ETHYLENE, ALPHA-OLEFINS, CONJUGATED AND NON-CONJUGATED DIENES, A METHOD OF PREPARING SAME

Jury N. Bocharov, ulitsa Dokukina, 3, korpus 1, kv. 13; Viktor A. Kabanov, Lomonosovsky prospekt, 3, korpus 1, kv. 3; Marina A. Martynova, ulitsa Stasovoi, 4, kv. 34, all of Moscow; Valery G. Popov, ulitsa 1, 17/1, kv. 3, Moskovskaya oblast poselok chernogolooka; Vladimir I. Smetanjuk, ulitsa Stasovoi, 4, kv. 34, and Viktor V. Fedorov, 3 Samotechny Pereulok, 23, kv. 88, both of Moscow, all of U.S.S.R.

Continuation of Ser. No. 490,992, Jul. 23, 1974, abandoned. This application Oct. 29, 1976, Ser. No. 737,108

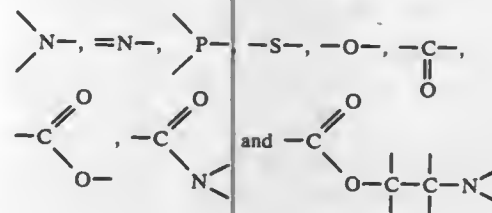
Claims priority, application U.S.S.R., Jul. 24, 1973, 1950384 Int. Cl.<sup>2</sup> B01J 31/02, 31/12

U.S. Cl. 252-429 B

17 Claims

1. A catalyst for the polymerization and copolymerization  $\alpha$ -olefines and conjugated and non-conjugated dienes comprising 0.1 to 50 wt.% of a compound of a transition metal from Groups IV-VIII of the periodic system selected from the group consisting of titanium, vanadium, chromium and nickel, said compound being chemically combined and distributed over the surface and within the volume of a rubbery polymeric

carrier selected from the group consisting of natural rubber, synthetic rubber based on conjugated dienes, synthetic rubber based on ternary copolymers of ethylene, propylene and polyenes, synthetic rubber based on ternary copolymers of ethylene, propylene and acetylenes and synthetic siloxane rubber containing unsaturated bonds, said polymeric carrier, containing from 1 to 50 wt.% of a moiety selected from the group consisting of



and mixtures thereof and a co-catalyst of an organometallic compound of a metal selected from the group consisting of magnesium and aluminum at a molar ratio of the co-catalyst to the compound of the transition metal ranging from 1 to 500, with said catalyst being in the form of a gel which is swellable but insoluble in the reaction medium.

4,161,463

#### OLEFIN DISPROPORTIONATION OVER SILICA-RARE EARTH METAL OXIDE CATALYSTS

John W. Myers, and Jesse R. Harris, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla. Division of Ser. No. 739,765, Nov. 8, 1976, Pat. No. 4,102,939.

This application May 23, 1978, Ser. No. 908,606

Int. Cl.<sup>2</sup> B01J 29/06, 23/10

U.S. Cl. 252-455 R

20 Claims

1. A catalyst composition consisting essentially of at least one rare earth metal oxide in an effective amount supported on silica, wherein said rare earth metal oxide is the oxide of yttrium, lanthanum, cerium, praseodymium, dysprosium, or mixture thereof, activated by

(a) treatment in hydrogen, nitrogen, or mixture at elevated temperatures, or

(b) by treatment in a molecular oxygen containing gas at elevated temperatures followed by step (a).

8. A catalyst composition consisting essentially of a rare earth metal oxide supported on silica, calcined in a molecular-oxygen-containing atmosphere, followed by activation treatment with hydrogen, nitrogen, or admixture at elevated temperatures, wherein said rare earth metal oxide is selected from the group consisting of the oxides of yttrium, lanthanum, cerium, praseodymium, dysprosium, and mixtures, and wherein said catalyst contains about 0.05 to 20 weight percent of the rare earth oxide expressed as the metal based on the total weight of catalyst including silica support.

4,161,464

#### DEVULCANIZED RUBBER COMPOSITION AND PROCESS FOR PREPARING SAME

Paul P. Nicholas, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 24, 1978, Ser. No. 889,999

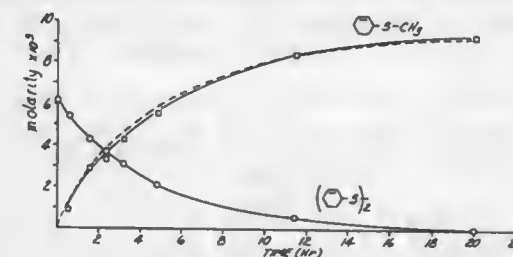
Int. Cl.<sup>2</sup> B29H 19/00; C08C 2/06

U.S. Cl. 260-2.3

19 Claims

1. A process for devulcanization of scrap rubber comprising, (a) comminuting said scrap rubber to obtain vulcanizate particles small enough to be adequately devulcanized within a predetermined period of time, and, (b) contacting said vulcanizate particles with (i) an organic solvent having dissolved therein a predetermined concentration of an onium salt of an element, selected from the group consisting of nitrogen, phosphorus, and sulfur, and (ii) an aqueous solution containing a

sufficient concentration of  $OH^-$  ions to selectively disrupt enough polysulfide crosslinks to produce devulcanized rubber



particles which contain less than about one-half the crosslink density of said scrap rubber from which said devulcanized rubber particles are derived.

4,161,465

#### PVC RED-MUD COMPOSITIONS

Paul L. C. Hao; Horng S. Tang, and Wei W. Hsu, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Jul. 18, 1977, Ser. No. 816,668

Int. Cl.<sup>2</sup> C08K 3/22; C08L 27/06

U.S. Cl. 260-2.3

10 Claims

1. A polyvinylchloride composition having good tensile strength and retention of elasticity which comprises 20 to 85 weight percent polyvinylchloride and 5 to 80 weight percent red-mud.

4,161,466

#### SMOKE RETARDED POLYMER COMPOSITIONS CONTAINING AMINE MOLYBDATES

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 841,182, Oct. 11, 1977, Pat. No. 4,129,540, which is a continuation-in-part of Ser. No. 770,168, Feb. 14, 1977, Pat. No. 4,053,455. This application Sep. 22, 1978, Ser. No. 944,948

Int. Cl.<sup>2</sup> C08K 5/31, 5/34, 5/18

U.S. Cl. 260-28 R

14 Claims

1. A smoke retarded composition comprising (A) a smoke retardant amount of at least one amine molybdate, the amine used in preparing said amine molybdate containing from 1 to 40 carbon atoms and from 1 to 10 primary, secondary or tertiary amine groups or a mixture thereof, and (B) at least one polymer selected from the group consisting of polyamides, poly(phenylene oxides), polysulfones, and epihalohydrin polymers.

4,161,467

#### REACTIVE CATALYST FOR AMINO RESINS

Andrew C. Markessini, Thessaloniki, Greece, assignor to Teukros A.G., Basel, Switzerland

Filed Oct. 4, 1977, Ser. No. 839,248

Claims priority, application Greece, Oct. 12, 1976, 10988/51908; Apr. 27, 1977, 53301

Int. Cl.<sup>2</sup> C08L 61/24

U.S. Cl. 260-29.4 R

7 Claims

1. A material for bonding together water-penetrable cellulosic particles which comprises: an amino resin, and 1 to 30% by weight of a catalyst system, calculated as 100% solids and based on the weight of the amino resin, to effect polycondensation of the amino resin, said catalyst system comprising an aqueous solution of an organic component and an inorganic component wherein the organic component is formaldehyde and urea or a nonresinous condensation product of formaldehyde and urea and the inorganic component is a water-soluble alkali metal halide.

#### 4,161,468 PROCESS FOR THE PREPARATION OF GRAFT POLYMER DISPERSIONS EMPLOYING LIQUID FREE RADICAL CATALYSTS

John E. Davis, Woodhaven, and Pauls Davis, Gibraltar, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

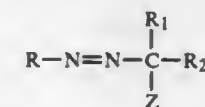
Continuation-in-part of Ser. No. 846,034, Oct. 27, 1977, abandoned. This application Jun. 7, 1978, Ser. No. 913,911

Int. Cl.<sup>2</sup> C08F 2/06, 4/04, 20/44; C08L 67/06

U.S. Cl. 260-30.4 R

7 Claims

1. In a process for the preparation of graft polymer dispersions by the in situ polymerization in the presence of a free radical catalyst of an ethylenically unsaturated monomer or mixture of monomers in a liquid polyol, the improvement which comprises employing as the free radical catalyst an unsymmetrically-substituted azo compound having a melting point less than 30° C. and a ten hour half-life between 55° C. and 100° C. and represented by the following formula



wherein

R is a lower alkyl of 1-6 carbon atoms and

$R_1$  is selected from alkyl of 1-20 carbon atoms, phenalkyl of 7-12 carbon atoms, cycloalkyl of 3-12 carbon atoms, a heterocyclo radical wherein the hetero atoms is O, S or N and together with  $R_2$  can form an alkylene biradical of from 2 to 16 carbon atoms, and can be substituted by Z,  $R_2$  is R, or phenyl and Z is H, CN,  $S-R_2$  or  $O-R_2$ .

4,161,469

#### POLYALKYLENE TEREPHTHALATE AND ORGANOPOLYSILOXANE-POLYCARBONATE BLOCK COPOLYMER BLENDS

Donald G. LeGrand, Burnt Hills, and Albert F. Yee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,023

Int. Cl.<sup>2</sup> C08L 67/02, 69/00, 83/06

U.S. Cl. 260-40 R

10 Claims

1. A polymer blend comprising a polyalkylene terephthalate resin and an organopolysiloxane-polycarbonate block copolymer having impact values greater than the impact value of the polyalkylene terephthalate resin component of the blend.

4,161,470

#### POLYESTER OF 6-HYDROXY-2-NAPHTHOIC ACID AND PARA-HYDROXY BENZOIC ACID CAPABLE OF READILY UNDERGOING MELT PROCESSING

Gordon W. Calundann, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

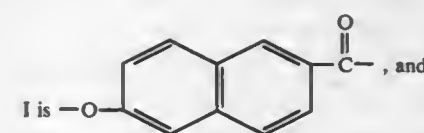
Filed Oct. 20, 1977, Ser. No. 843,993

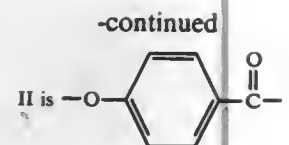
Int. Cl.<sup>2</sup> C08G 63/06

U.S. Cl. 260-40 P

42 Claims

1. A melt processable wholly aromatic polyester capable of forming a thermotropic melt phase at a temperature below approximately 350° C. consisting essentially of the recurring moieties I and II which may include substitution of at least some of the hydrogen atoms present upon an aromatic ring wherein:





with said optional substitution if present being selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, and mixtures of the foregoing, and wherein said polyester comprises approximately 10 to 90 mole percent of moiety I, and approximately 10 to 90 mole percent of moiety II.

**4,161,471**  
**ELASTOMER MODIFIED UNSATURATED MOLDING COMPOSITIONS**

Robert J. Kassal, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 13, 1978, Ser. No. 896,043

Int. Cl.<sup>2</sup> C08K 3/06; C08L 11/00, 19/00, 67/06

U.S. Cl. 260—40 R **8 Claims**

1. A filled, unsaturated ester molding composition comprising:

- (a) 10–60 weight percent of an  $\alpha,\beta$ -ethylenically unsaturated ester polymerizable molding resin, the unsaturation number of said resin being between about 150 and 250,
- (b) 39–89 weight percent of a polymerizable monomer, and
- (c) 1–30 weight percent of an elastomeric modifier selected from the group consisting of chloroprene polymers and hydrocarbon polymers, wherein the chloroprene polymer is selected from the group consisting of homopolymers of chloroprene, copolymers of chloroprene with sulfur, copolymers of chloroprene with at least one copolymerizable organic monomer, and copolymers of chloroprene with sulfur and at least one copolymerizable organic monomer, wherein chloroprene constitutes at least 50 weight percent of the organic monomer make-up of the copolymer, and wherein the hydrocarbon polymer is selected from the group consisting of ethylene/propylene copolymers and copolymers of ethylene, propylene and at least one nonconjugated diene.

**4,161,472**  
**IMPACT MODIFIED VINYL CHLORIDE POLYMER COMPOSITION**

Marvin H. Lehr, Bath, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 23, 1978, Ser. No. 871,665

Int. Cl.<sup>2</sup> C08L 51/04, 53/02

U.S. Cl. 525—4 **15 Claims**

1. A normally rigid thermoplastic composition comprising (a) a matrix comprising a vinyl chloride resin, (b) an impact modifier or co-modifier in said matrix for reducing the brittle temperature of said vinyl chloride resin, said impact modifier being present in an amount in the range from about 3 percent to about 25 percent by weight based on total resinous components, so as to produce at least a 20 percent improvement in Izod impact strength of non-impact-modified vinyl chloride resin, and (c) a block copolymer ultra-modifier consisting essentially of a block copolymer of a vinyl aromatic compound (S) and a conjugated diene (D), wherein said vinyl aromatic compound (S) is selected from the group consisting of styrene,  $\alpha$ -methyl styrene, vinyl toluene, vinyl xylene, and vinyl naphthalene, said conjugated diene (D) is selected from the group consisting of butadiene, isoprene, 1,3-pentadiene, and 2,3-dimethyl-butadiene, wherein said ultra-modifier is present in an amount in the range from about 1 percent to about 15 percent by weight, based on the total resinous components of said composition, and said co-modifier and said ultra-modifier are each present as distinguishable impact modifier particles dispersed in said vinyl chloride resin.

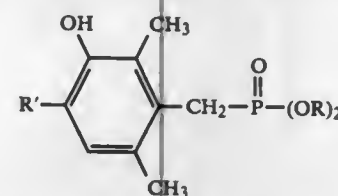
**4,161,473**  
**2,4,6-TRIALKYL-3-HYDROXYPHENYLALKANE PHOSPHONATE AND PHOSPHINATE STABILIZERS**  
John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 491,074, Jul. 22, 1974, Pat. No. 3,962,376, which is a continuation-in-part of Ser. No. 400,602, Sep. 25, 1973, abandoned. This application Mar. 19, 1976, Ser. No. 668,358

Int. Cl.<sup>2</sup> C08L 5/53

U.S. Cl. 260—45.85 S **15 Claims**

8. A composition comprising a polyolefin containing a stabilizing quantity of (a) a compound of the formula:



wherein R is an alkyl group of 12 to 24 carbon atoms and R' is a branched-chain alkyl of 3 to 8 carbon atoms and (b) a secondary stabilizer selected from the group consisting of distearyl thiodipropionate and dilauryl thiodipropionate.

**4,161,474**  
**BIS-(ALKYLAMINOPHENOXY)ALKANES AS ANTIDEGRADANTS FOR RUBBER**

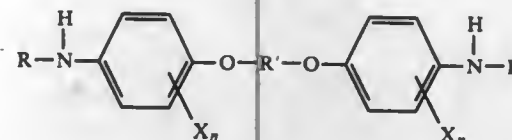
Robert H. Campbell, Akron, and Gene R. Wilder, Medina, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 25, 1977, Ser. No. 854,671

Int. Cl.<sup>2</sup> C08K 5/18

U.S. Cl. 260—45.9 QA **7 Claims**

1. Vulcanizable diene rubber having incorporated therein a stabilizing amount of a compound according to the formula



wherein the Rs are the same or different secondary alkyl radicals, including cyclic alkyls, of from 3 to 8 carbons, R' is a divalent straight or branched chain alkyl radical of from 1 to 6 carbon atoms, X is lower alkyl or halogen, and n is an integer of 0 to 4.

**4,161,475**  
**SULFURIZED MANNICH CONDENSATION PRODUCTS AND LUBRICANTS CONTAINING SAME**

Kirk E. Davis, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

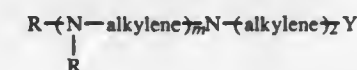
Continuation-in-part of Ser. No. 656,228, Feb. 9, 1976, Pat. No. 4,090,854, which is a continuation-in-part of Ser. No. 528,189, Nov. 29, 1974, abandoned. This application Sep. 19, 1977, Ser. No. 834,618

Int. Cl.<sup>2</sup> C07G 17/00

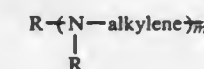
U.S. Cl. 260—132 **14 Claims**

1. A sulfurized Mannich condensation product containing about 0.1 to about 20% sulfur by weight, based on the total weight of the product, said sulfur having been introduced into the product by sulfurizing with elemental sulfur a nitrogen-containing Mannich condensation product made from a phenol bearing a substantially hydrocarbyl substituent of about 6 to about 400 carbon atoms, formaldehyde, a formaldehyde precursor or a C<sub>2-7</sub> aliphatic-based aldehyde and an amino com-

pound selected from the group consisting of (1) heterocyclic-substituted polyamines of the formula



wherein each R is independently a hydrogen atom or a C<sub>1-12</sub> substantially hydrocarbyl group with the proviso that at least one R is a hydrogen atom and alkylene is a C<sub>1-10</sub> alkylene group, m is a whole number of 1 to 10, and Y is an oxygen, divalent sulfur atom or —N—R\* and R\* is either a R or a



group and (2) aromatic amines selected from the group consisting of aniline, alkyl-substituted anilines, phenothiazine and aromatic polyamines of the general formula



wherein Ar is an aromatic nucleus of 6 to about 20 carbon atoms, each R is as defined hereinabove, and y is 2 to about 8.

**4,161,476**  
 **$\alpha$ -HALO-2-OXO-1-AZETIDINEMETHANE-CARBOXYLIC ACID COMPOUNDS**

Karl Heusler, Basel, Switzerland, and Robert B. Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

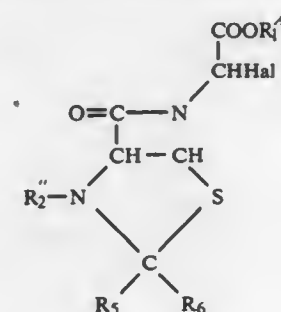
Division of Ser. No. 524,699, Nov. 18, 1974, Pat. No. 4,052,408, which is a continuation of Ser. No. 843,754, Jul. 22, 1969, abandoned. This application Jul. 11, 1977, Ser. No. 814,763

Claims priority, application Switzerland, Jul. 23, 1968, 10994/68; Dec. 11, 1968, 18502/68

Int. Cl.<sup>2</sup> C07D 277/62

U.S. Cl. 260—306.7 C **5 Claims**

1. A compound of the formula Ia



in which

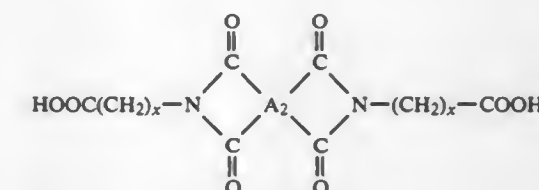
R<sup>4</sup><sub>1</sub> represents a member selected from the group consisting of lower alkyl of 1–4 carbon atoms, halogenolower alkyl of 1–4 carbon atoms, adamantyl, monocyclic cycloalkyl with 3 to 8 ring carbon atoms and phenyl-lower alkyl, R<sup>4</sup><sub>2</sub> is carbo lower alkoxy with up to 7 carbon atoms in the lower alkyl residue, carbovinyl, carbocycloalkoxy, wherein cycloalkyl is monocyclic cycloalkyl with 3 to 6 ring carbon atoms or adamantyl, carbobenzyloxy, carbodiphenylmethoxy or carbo( $\alpha$ -4-biphenyl)- $\alpha$ -methylethoxy, each of the substituents R<sub>5</sub> and R<sub>6</sub> represents a lower alkyl of from 1–4 carbon atoms and Hal represents a member selected from the group consisting of a chlorine and bromine atom.

**4,161,477**  
**POLYIMIDE RESIN-FORMING COMPOSITION**  
John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92021, and John Gagliani, San Diego, Calif., assignors to John V. Long, El Cajon, Calif., a part interest  
Filed Apr. 8, 1976, Ser. No. 674,762  
Int. Cl.<sup>2</sup> C07D 209/34

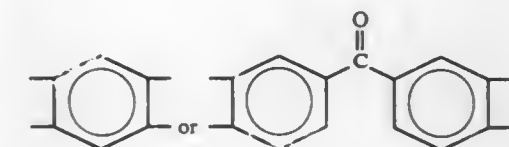
U.S. Cl. 260—326 C **6 Claims**

1. An imide-forming material consisting essentially of a stoichiometric adduct of:

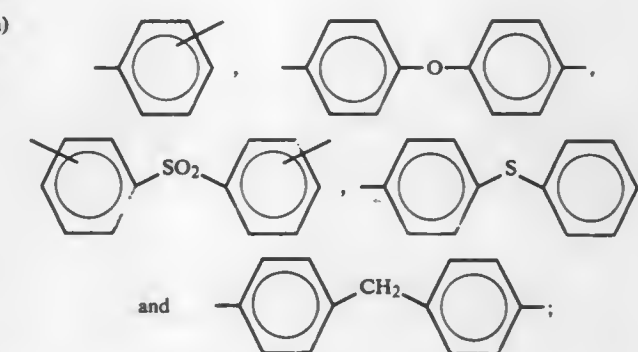
(a) an N-substituted cyclic bisimide of the formula



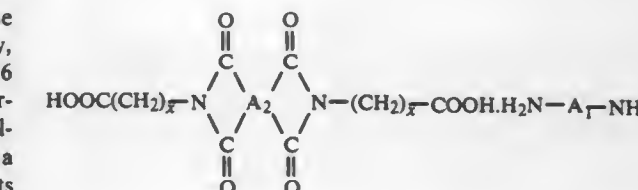
wherein x is 4 to 6 and A<sub>2</sub> is a tetravalent, aromatic radical of the formula



and (b) one or more aromatic diamines capable of forming a polyimide by an exchange reaction with the terminal carboxyl groups of said bisimide upon the application of heat to said mixture or adduct, said aromatic diamine having the formula H<sub>2</sub>N—A<sub>1</sub>—NH<sub>2</sub> in which A<sub>1</sub> is a divalent aromatic radical selected from the group consisting of



said adduct being of the formula:

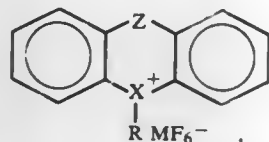


wherein A<sub>1</sub>, A<sub>2</sub> and x have the above-indicated values.

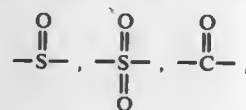


4,161,478  
PHOTOINITIATORS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Continuation-in-part of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Sep. 14, 1977, Ser. No. 833,146  
Int. Cl.<sup>2</sup> C07C 149/00, 14/30; C07D 335/10  
U.S. Cl. 260—327 B 11 Claims  
1. A photoinitiator having the formula,



where M is selected from P, As and Sb, X is a Group VIa element selected from sulfur and selenium, R is a monovalent organic aromatic radical having from 6–20 carbon atoms Z is a member selected from the class consisting of —S—,

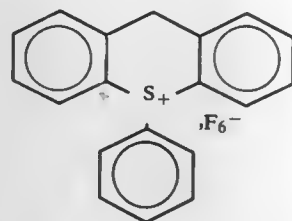


O, Se,



—CH<sub>2</sub>— and —C<sub>2</sub>H<sub>4</sub>—, and R<sup>4</sup> is selected from C<sub>(1-8)</sub> alkyl and C<sub>(6-13)</sub> aryl.

3. A photoinitiator in accordance with claim 1, having the formula,

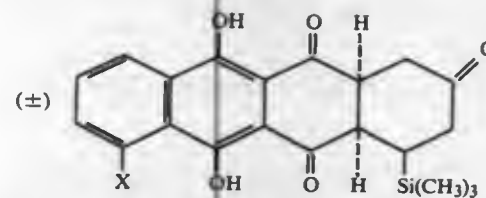


## 4,161,479

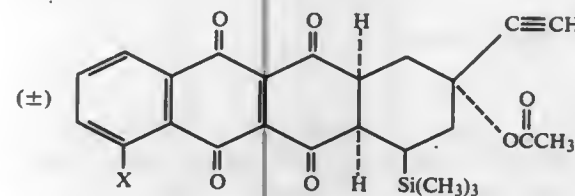
5-(4-CHLOROPHENYL)FURFURYLUREA  
Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.  
Filed Jul. 10, 1978, Ser. No. 922,860  
Int. Cl.<sup>2</sup> C07D 307/54  
U.S. Cl. 260—347.3 1 Claim  
1. The compound 5-(4-chlorophenyl)furfurylurea.

## 4,161,480

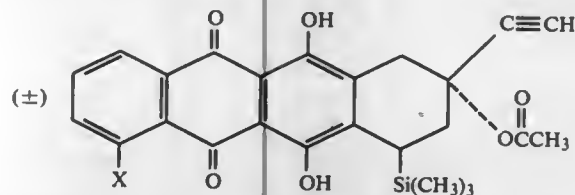
INTERMEDIATES FOR THE SYNTHESIS OF 4-DEMETHOXYDAUNORUBICIN  
Raphael Pappo, Skokie, and Robert B. Garland, Northbrook, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.  
Filed Jun. 5, 1978, Ser. No. 912,671  
Int. Cl.<sup>2</sup> C07C 49/66, 49/73, 63/44  
U.S. Cl. 260—365 9 Claims  
1. A compound of the formula



wherein X is hydrogen, methoxy, or hydroxy.  
4. A compound of the formula



wherein X is hydrogen, methoxy, or hydroxy.  
7. A compound of the formula



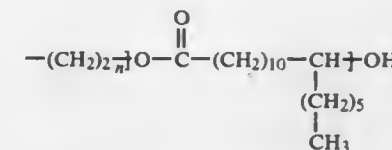
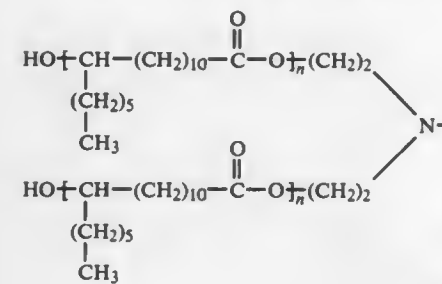
wherein X is hydrogen, methoxy, or hydroxy.

## 4,161,481

PROCESS FOR THE ISOLATION OF PURIFIED ANTHRAQUINONE  
Joachim Priemer, Odenthal; Georg Nicklas, and Nikolaus Schulz, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Nov. 16, 1977, Ser. No. 852,123  
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655103  
Int. Cl.<sup>2</sup> C07C 49/68 8 Claims  
1. Process for the isolation of purified anthraquinone from crude anthraquinone which has been obtained by oxidation of naphthalene to give naphthoquinone, reaction of the oxidation product with butadiene to give tetrahydroanthraquinone, oxydehydrogenation of the reaction product with molecular oxygen to give a crude anthraquinone and optionally removal of naphthalene, phthalic anhydride and low-boiling substances from this crude anthraquinone, which comprises treating said crude anthraquinone with an oxygen compound of the elements of the first and/or second main group of the Periodic System in solid, pulverulent form and in an amount of 0.1 to 20% by weight relative to said crude anthraquinone at an elevated temperature, optionally in the presence of an organic solvent, and then isolating purified anthraquinone by subliming the pretreated anthraquinone in the presence of said oxygen compound at a temperature of about 190° to about 290° C. and a pressure of about 1 to about 90 mm Hg and then desubliming it under the same pressure, or by vaporizing the pretreated anthraquinone at a temperature of about 290° to about 380° C. and a pressure of about 90 to about 760 mm Hg and condensing the vapour under a pressure of about 90 to about 760 mm Hg.

4,161,482  
PRODUCTION OF POLYOLS CONTAINING BASIC NITROGEN

Suresh K. Nema, Kerala, India, assignor to The Indian Space Research Organisation, Bangalore, India  
Filed Mar. 2, 1977, Ser. No. 773,543  
Int. Cl.<sup>2</sup> C09F 5/00; C11C 3/00  
U.S. Cl. 260—404 1 Claim  
1. Polyols containing basic nitrogen of the formula



wherein n denotes the degree of polymerization of a homopolymer of 12-hydroxy stearic acid which varies between 2 and 10.

## 4,161,483

## HYDROGENATION PROCESS

Raymond M. Caben, Brussels, Belgium, assignor to Labofina S.A., Brussels, Belgium  
Filed Jul. 31, 1978, Ser. No. 929,540  
Claims priority, application Luxembourg, Dec. 2, 1977, 78621  
Int. Cl.<sup>2</sup> C11C 3/12; B01J 31/12  
U.S. Cl. 260—409 8 Claims  
1. A process for partially and selectively hydrogenating a natural oil which comprises the step of treating said natural oil in the presence of a nickel catalyst and such an amount of an organic nitrogen-containing basic compound which is equivalent to form about 5 to about 40 atoms of nitrogen per 100 atoms of nickel with hydrogen at a hydrogen pressure and a reaction sufficient to obtain a substantially liquid hydrogenation product rich in monoenic compounds and with a low content in trans-isomers, conjugated dienic compounds and saturated compounds.

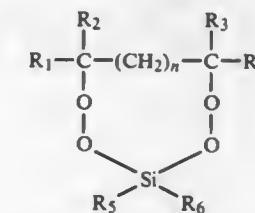
## 4,161,484

FRACTIONATION OF GLYCERIDE OILS BY COOLING AND UNDER HOMOGENEOUS AGITATION  
Hendrikus J. van den Berg, Terheyden, Netherlands, assignor to Lever Bros. Co., New York, N.Y.  
Continuation of Ser. No. 756,687, Jan. 4, 1977, abandoned. This application Mar. 28, 1978, Ser. No. 890,888  
Claims priority, application United Kingdom, Jan. 8, 1976, 651/76  
Int. Cl.<sup>2</sup> C09F 5/10; C11B 3/00  
U.S. Cl. 260—428.5 18 Claims  
1. A process for fractionating fatty material comprising cooling said fatty material from a wholly liquid condition, in a cooling zone defined between the inner walls of a chamber and a stirrer having a smooth profile mounted in said chamber, to a temperature at which partial crystallization of said fatty material takes place while agglomeration of crystals resulting from homogeneous agitation occurs in said cooling zone; and separating agglomerated fat crystals thus formed from the remaining liquid fatty material.

## 4,161,485

## CYCLIC SILYL PEROXIDES

Reidar Halle, Novato, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.  
Filed Jun. 12, 1978, Ser. No. 914,817  
Int. Cl.<sup>2</sup> C07F 7/08  
U.S. Cl. 260—448.2 R 21 Claims  
1. A cyclic silyl peroxide having the formula



wherein

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of lower alkyl having from 1 to 3 carbon atoms; R<sub>5</sub> and R<sub>6</sub> are each selected from the group consisting of alkyl, alkenyl and aryl; and n is an integer from 1 to 4.

## 4,161,486

## CLEAVAGE OF SILICON-TO-CARBON BONDS BY MEANS OF HYDROGEN HALIDE

Hans-Joachim Köttsch; Rüdiger Draese, and Hans-Joachim Vahlensieck, all of Rheinfelden, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany  
Filed Feb. 24, 1978, Ser. No. 880,903  
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708406  
Int. Cl.<sup>2</sup> C07F 7/12  
U.S. Cl. 260—448.2 E 6 Claims  
1. In a process for preparing a halogen alkyl silane by contacting an alkyl silane of the formula



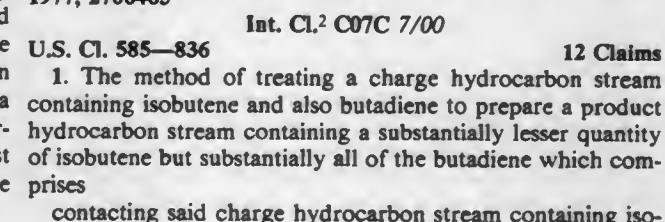
where

R represents a substituted or unsubstituted alkyl group or an alkenyl group,  
R' represents an alkyl group, and  
n represents 0, 1, or 2  
with a hydrogen halide in the presence of a catalyst, the improvement which comprises employing as the catalyst aluminum oxide or an aluminum oxide-containing composition.

## 4,161,487

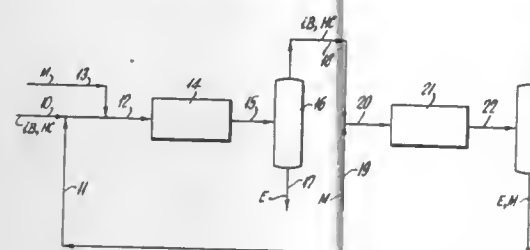
## PROCESS FOR THE HYDROLYSIS AND CONDENSATION OF ALKYL/ARYL-TRICHLOROSILANES

Dieter Börner; Götz Koerner, both of Essen, and Gerd Rossmay, Haltern, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany  
Filed Oct. 18, 1977, Ser. No. 843,219  
Claims priority, application United Kingdom, Oct. 26, 1976, 44490/76  
Int. Cl.<sup>2</sup> C07F 7/08  
U.S. Cl. 260—448.2 R 10 Claims  
1. A process for the hydrolysis and condensation of alkyl/aryl-trichlorosilanes containing up to 40 mole % of dialkyl, diaryl, or alkylaryldichlorosilanes comprising dissolving the chlorosilanes in liquid hydrogen chloride and carrying out the hydrolysis at a pressure of 15 to 80 atmospheres and a temperature of —17° to +47° C. with water in an amount of 0.165 to 0.465 moles per chlorine atom attached to a silicon atom, and





butene with a deficiency of a lower alkanol in a first reaction zone containing acid ion-exchange resin etherification first catalyst thereby forming a first product stream containing the tertiary butyl ether of said lower alkanol plus hydrocarbon and unreacted isobutene; separating said first product stream, in a first separation zone, into (i) a bottoms containing the tertiary butyl ether of said lower alkanol and (ii) an overhead containing unreacted hydrocarbons and unreacted isobutene; contacting said overhead containing said unreacted hydrocarbons and unreacted isobutene with excess lower alkanol, in molar amount greater than the molar amount of unreacted isobutene, in a second reaction zone containing acid ion-exchange resin etherification second catalyst, characterized by a lower hydrogen ion activity than the



M - METHANOL  
E - ETHYL TERTIARY BUTYL ETHER  
L - LOWER ALKANOL  
HC - OTHER HYDROCARBONS

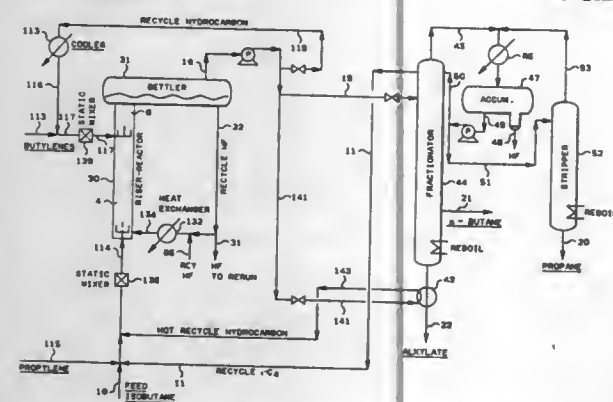
hydrogen ion activity of said first catalyst, thereby forming a second product stream containing the tertiary butyl ether of said lower alkanol, plus unreacted hydrocarbons and unreacted lower alkanol; separating said second product stream, in a second separation zone, into (i) a second overhead stream containing unreacted hydrocarbons and unreacted isobutene and (ii) a second bottoms stream containing the tertiary butyl ether of said lower alkanol, plus unreacted lower alkanol; recovering said second overhead stream containing unreacted hydrocarbons and unreacted isobutene; recycling said second bottoms stream, containing the tertiary butyl ether of said lower alkanol plus unreacted methanol, to said first reaction zone; and recovering said tertiary butyl ether of said lower alkanol from said bottoms from said first separation zone.

**4,161,497**  
**HF ALKYLATION INTRODUCING SEPARATE OLEFINS IN VERTICALLY EXTENDED REACTOR**  
Donald J. Makovec, and Thomas Hutson, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 7, 1977, Ser. No. 840,424  
Int. Cl.<sup>2</sup> C07C 3/54

U.S. Cl. 585-714

6 Claims



1. A process for alkylating an isoparaffin with a lighter and

a heavier olefin in the presence of HF acid in a vertically extended reactor comprising:

- introducing a liquid mixture comprising an isoparaffin, said lighter olefin, and said catalyst into the lower end portion of said reactor to pass said mixture upwardly through said reactor;
- introducing said heavier olefin into said reactor at an intermediate section in said reactor substantially downstream of the place of introduction of said olefin in (a);
- passing said mixture of (b) through said reactor at suitable conditions of temperature, pressure, and residence time to form alkylate;
- passing the reaction effluent containing alkylate from step (c) upwardly into a settling zone to separate an HF acid phase and a hydrocarbon phase containing said alkylate product; and
- recycling a portion of said separated hydrocarbon phase to each point of introduction of said olefin in step (a) and step (b) so that the recycle hydrocarbon phase can function as a reaction heat removal liquid when the alkylation reaction is occurring.

**4,161,498**  
**BLENDS OF LOW MOLECULAR WEIGHT POLYALKYLENE TEREPHTHALATE RESINS AND ORGANOPOLYSILOXANE-POLYCARBONATE BLOCK COPOLYMERS**

Richard C. Bopp, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,021

Int. Cl.<sup>2</sup> C08L 67/02, 69/00, 83/06

U.S. Cl. 525-439

10 Claims

1. An improved high impact nonreinforced blend comprising a low molecular weight polyalkylene terephthalate resin having an intrinsic viscosity range of from about 0.2 to about 1.0 dl./g. and an organopolysiloxane-polycarbonate block copolymer, subject to the proviso that the blend has an impact value greater than the impact value of the polyalkylene terephthalate resin component of the blend.

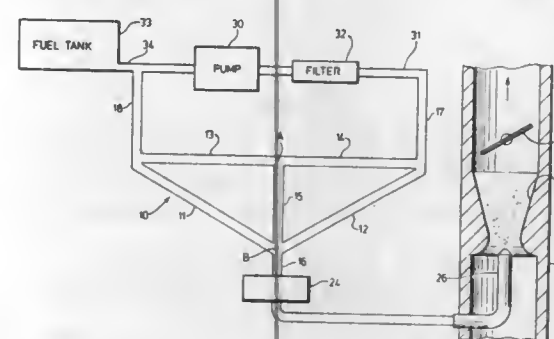
**4,161,499**  
**FUEL METERING DEVICE FOR INTERNAL COMBUSTION ENGINE**  
Peter Floroff, 20 Nealon Ave., Toronto, Ontario, Canada (M4K 1Y9)

Continuation-in-part of Ser. No. 737,861, Nov. 2, 1976, abandoned. This application Apr. 11, 1978, Ser. No. 895,171

Int. Cl.<sup>2</sup> F02M 7/10

U.S. Cl. 261-36 A

4 Claims



1. A fuel metering device for an internal combustion engine comprising a fuel flow regulating means having a plurality of tubular passage elements forming a configuration of a generally isosceles triangle including a median, said triangle having a first side, and second and third sides extending from opposite ends of said first side to a vertex, and said median extending from the mid-point of said first side to said vertex, an input conduit connected to the junction of said first and second sides

for supplying fuel under pressure to said regulating means, an output conduit connected to the junction of said first and third sides, and an extension passage element connected to said vertex, said extension passage element being connectible to a fuel nozzle adjacent a venturi in an air supply passage of an internal combustion engine whereby said regulating means is responsive to air pressure in the venturi to provide required fuel flow to said air supply passage.

**4,161,500**  
**PROCESS FOR LOW ATTENUATION METHACRYLATE OPTICAL FIBER**

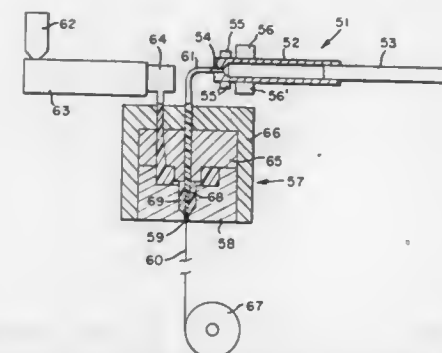
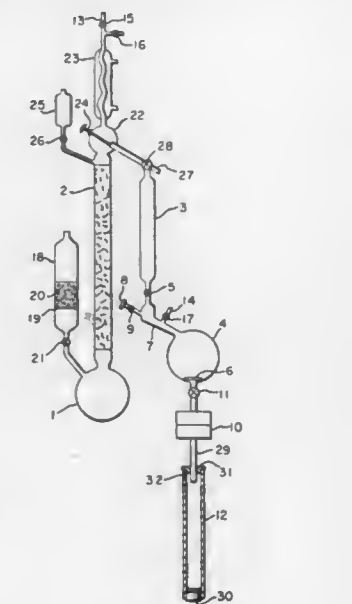
Henry M. Schleinitz, Kennett Square, and Paul G. Stephan, Landenberg, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 14, 1977, Ser. No. 842,166

Int. Cl.<sup>2</sup> D02G 3/00; B32B 27/00

U.S. Cl. 264-1

28 Claims



1. An improved process for making an optical fiber which consists essentially of organic high polymers, said fiber consisting of a core and cladding, said core being fabricated of a first polymer which contains a major proportion of methyl methacrylate units, which comprises the steps

- (a) mixing in a sealed system vinyl monomers of which at least 60 mol % is methyl methacrylate, said monomers containing 0 to 10 ppm biacetyl and 0-500 ppb of transition metal ions and being substantially free of particulate matter, with a free radical polymerization initiator and a chain transfer agent;
- (b) transferring said mixture in a sealed system to a polymerization vessel, and closing said vessel;
- (c) maintaining said mixture without a free liquid surface in said vessel under a pressure of 7 to 25 kg/cm<sup>2</sup>, while simultaneously: maintaining the temperature of said mixture below about 70° C. until conversion to polymer is at

least 60% complete dilatometrically, raising the temperature at a rate to reach a temperature of 90° to 100° C. at the time that conversion to polymer is at least 95% complete dilatometrically, and continuing to raise the temperature at about the same rate to a temperature in the range of 115° to 140° C., holding the temperature in said range for at least a half hour and cooling to form a solid preform of said first polymer;

- (3) (a) transferring said solid preform of said first polymer to the barrel of a ram extruder adapted to receive it;
- (b) advancing said solid preform through said barrel with a ram into a heated zone, whereby said preform is softened only at its forward end, and extruding said core of said fiber, and
- (c) applying to said core a second polymer which is substantially amorphous and which has an index of refraction below that of said first polymer, to form said cladding of said fiber.

**4,161,501**  
**METHOD OF PRODUCING MECHANICALLY STRONG METAL OXIDE PELLETS**

Hans Skretting, Vagsbygd, Norway, assignor to Elkem-Spigerværket A/S, Oslo, Norway

Continuation of Ser. No. 614,343, Sep. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 458,717, Apr. 8, 1974. This application Dec. 23, 1976, Ser. No. 753,872

Int. Cl.<sup>2</sup> C04B 33/32

U.S. Cl. 264-66

6 Claims

1. In a method of producing mechanically strong pellets useful for introduction into a smelting furnace during its operation which are for consumption in smelting furnaces at furnace temperatures of from 1250° to 1550° C. from metal oxide containing material by sintering in a shaft furnace at sintering temperatures of from above 1000° to about 1500° C. comprising admixing metal oxide containing material consumably utilizable in smelting furnaces with water and binder material said water and binder being present in sufficient amount to form raw pellets which will hold their shape and forming pellets therefrom, the improvement comprising: drying the formed pellets before sintering in a shaft furnace in a drying apparatus separate from the shaft furnace at temperatures of from about 150° to about 300° C. until the moisture content of the pellets is from about 0.2% to about 1.5% whereby the tendency of the pellets to burst and pulverize or ball together into lumps during the subsequent sintering operation is substantially reduced.

**4,161,502**  
**PROCESS FOR FORMING PLASTIC ARTICLES**  
Ritchie A. Wessling, and Edward F. Gurnee, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 704,261, Jul. 12, 1976, abandoned, which is a continuation of Ser. No. 545,662, Jan. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 347,172, Apr. 2, 1973, abandoned. This application Apr. 2, 1977, Ser. No. 789,385

Int. Cl.<sup>2</sup> B29C 3/00

U.S. Cl. 264-119

5 Claims

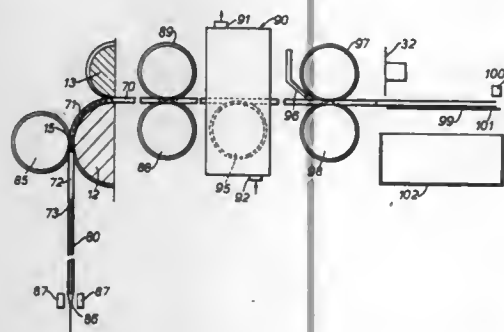
1. A process of forming decomposition-free, substantially fused, clear, flexible plastic shaped articles comprising the sequential steps of (1) compressing in a compressing device a resinous powder having lamellar crystalline nonspherulitic morphology into a substantially unoriented briquette having green strength, (2) removing said briquette from the compressing device and placing said briquette in a forging press wherein lubrication is provided between the contacting surfaces of the briquette and said forging press to effect plug flow, and (3) forging said briquette into a shaped article while maintaining said briquette at a temperature between the alpha-transition temperature and the melting point of said resinous powder.

**4,161,503**  
**METHOD OF MAKING MULTITUBULAR SHEATHS**  
 Stanley C. Foulkes, Deane; Robert Moore, Whitfield; James Ratcliffe, Bolton, and James M. Stephenson, Urmston, all of England, assignors to Chloride Group Limited, London, England

Filed Mar. 3, 1977, Ser. No. 774,201  
 Claims priority, application United Kingdom, Mar. 4, 1976, 8762/76; Aug. 20, 1976, 34902/76  
 Int. Cl.<sup>2</sup> B29C 5/00

U.S. Cl. 264—136

6 Claims



1. A method of making a multitubular sheath having at least five tubes comprising:

providing a porous multitubular heated fabric impregnated with 15% to 35% by weight of polymer, the polymer of the composite being a thermoplastic polymer having a melting point at least 20° C. below the temperature at which the material of the fabric melts or chars; continuously feeding the heated fabric onto an array of parallel metal rods, one of said at least five tubes to each rod, the rods having curved inlet portions and straight sizing portions, while holding the rods in a fixed position, the rods having substantially the same cross sectional area over the whole of their length; floatingly registering a mandrel in each of said at least five tubes such that each mandrel abuttingly engages the inlet end of its associated rod so as to assist the continuous feeding of the fabric onto the rods, cooling the heated fabric as it is continuously fed onto said rods so that the fabric at least immediately prior to the sizing portions is substantially at ambient temperature heating the fabric on the straight sizing portions so as to permit the fabric to conform to the rod; thereafter cooling the fabric on the rods to a temperature so as to permit the thermoplastic polymer to solidify and the tubes to become self supporting and feeding the fabric off the ends of the rods; and, cutting it to the required length.

**4,161,504**  
**PROCESS OF MAKING A FILTER ELEMENT FOR USE IN INTRAVENOUS INFUSIONS**  
 Luciano Baldini, Grosotto, Italy, assignor to Bieffe S.p.A., Grosotto, Italy

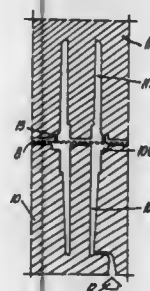
Filed Mar. 28, 1977, Ser. No. 782,054  
 Claims priority, application Italy, Aug. 10, 1976, 26186 A/76  
 Int. Cl.<sup>2</sup> B29D 23/02

U.S. Cl. 264—163

1 Claim

1. A process for making a filter which comprises an upper tubular portion and a lower tubular portion with filter fabric disposed in an intermediate enlargement, comprising providing two half molds each of which is so shaped internally as to produce one of said tubular portions, providing a plurality of cutting means projecting into the interior of a said half mold at a series of peripherally spaced points, positioning filter fabric between said two half molds, closing said two half molds together so that said cutting means penetrate and tear said fabric at said plurality of spaced points with said fabric unsupported at said plurality of spaced points, and then injecting

plastic material into one of said two half molds and about said cutting means so that said plastic flows on both sides of said



fabric, the tearing of the fabric allowing a more substantial flow of plastic through the fabric thereby to promote an improved bond between the plastic and the fabric.

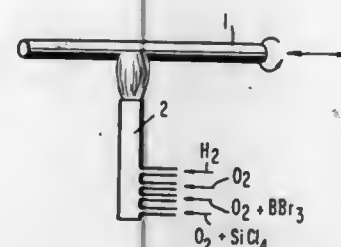
**4,161,505**  
**PROCESS FOR PRODUCING OPTICAL TRANSMISSION FIBER**  
 Satoshi Shiraishi; Kunio Fujiwara, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 419,011, Nov. 26, 1973, abandoned. This application Jan. 14, 1976, Ser. No. 648,997  
 Claims priority, application Japan, Nov. 25, 1972, 47-118345; Nov. 25, 1972, 47-118346

Int. Cl.<sup>2</sup> B05D 5/06

U.S. Cl. 264—171

40 Claims

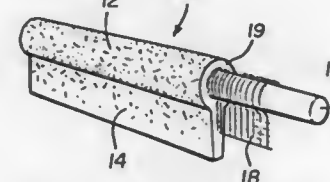


1. A process for producing an optical transmission fiber, comprising (A) oxidizing halides, hydrides or organic compounds of Si with OF<sub>2</sub> or oxygen containing a gaseous fluorine compound, or (B) by the oxidation of SiF<sub>4</sub> to form doped fused silica containing F and depositing said doped fused silica containing F as a layer on the outer surface of a rod or pipe or pure fused silica and melting and spinning said rod or pipe having said deposited layer into a fiber.

4. A process for producing an optical transmission fiber, comprising (A) oxidizing halides, hydrides or organic compounds of Si with OF<sub>2</sub> or oxygen containing a gaseous fluorine compound, or (B) by the oxidation of SiF<sub>4</sub> to form doped fused silica containing F and depositing said doped fused silica containing F as a layer on the outer surface of a pure fused silica rod or pipe and inserting said rod or pipe into a second pipe of a doped fused silica containing F and then melting and spinning said second pipe having said rod or said first pipe therein into a fiber.

**4,161,506**  
**METHOD OF FORMING FINISHING WELTS**  
 Edward M. Danko, Detroit, Mich., assignor to Color Custom Compounding, Inc., Warren, Mich.  
 Division of Ser. No. 724,815, Sep. 20, 1976, Pat. No. 4,093,773.  
 This application Nov. 9, 1977, Ser. No. 849,915  
 Int. Cl.<sup>2</sup> B29F 3/10; B29C 17/00  
 U.S. Cl. 264—174

5 Claims



1. The method of making a finishing welt, comprising the steps of:

feeding a composite preform through an essentially key-hole shaped guide passage in a core pin of a cross head extruder, the preform including (a) a flexible reinforcing rod fed through the enlarged head portion of the passage and (b) a fabric scrim surrounding the rod and extending into the smaller tail portion of the passage;

flowing heated plastic material over the composite preform as the preform exits from the core pin within the extruder cross head;

then extruding the plastic material around the preform through an essentially key-hole configured die orifice in general alignment with the core pin passage and thereby forming a welt having a generally cylindrical head and a depending flange, wherein the head includes the flexible reinforcing rod surrounded by a fabric scrim and encased within an outer plastic covering and wherein the scrim extends into the flange for reinforcement; and

embossing a pattern onto the outer surface of the welt head by (a) conveying the welt under tension, while the plastic material of the welt is still deformable by virtue of residual heat from extrusion, over the roughened surface of a first roller and embossing at least slightly more than half the outer circumference of the welt head, the welt being wrapped at least partially around the first roller as it comes into contact therewith and as a result being conveyed away from the first roller along an axis different from that along which the welt first engages the first roller, and then (b) conveying the welt under tension over the roughened surface of a second roller and embossing slightly more than half the outer circumference of the welt head, including the previously unembossed portion, and overlapping a portion of the embossment formed by the first roller with the embossment formed by the second roller.

**4,161,507**  
**STABILIZED DIAGNOSTIC TEST STRIP FOR THE DETECTION OF UROBILINOGEN**  
 Wolfgang Hirsch, Wunstorf, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,585

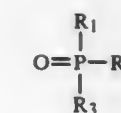
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728236

Int. Cl.<sup>2</sup> G01N 31/22, 33/16

U.S. Cl. 422—56

4 Claims

1. A stabilized diagnostic test strip for the detection of urobilinogen, preferably in biologic fluids, especially in urine, comprising an absorbent carrier containing a diazonium salt and an acid, and as a stabilizer at least one phosphoric acid triamide of the formula



in which R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub>, which may be the same or different, are radicals selected from the group of amino-, mono- and dialkylamino-, mono- and diarylamino-, aralkylamino-, N-methylanilide-, N-piperidide- and N-morpholine.

**4,161,508**  
**APPARATUS FOR APPLYING LIQUID SAMPLES TO SURFACES**  
 Dieter Jänchen, Muttentz, Switzerland, assignor to Camag Chemie-Erzeugnisse und Adsorptionstechnik AG, Muttentz, Switzerland

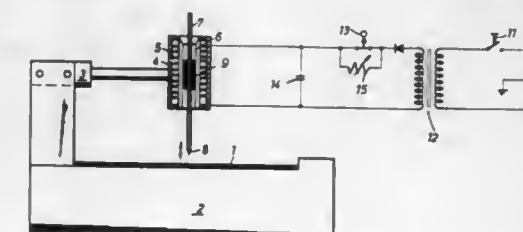
Filed Sep. 19, 1977, Ser. No. 834,290

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642777

Int. Cl.<sup>2</sup> B01L 3/02; G01N 1/12, 31/06, 31/08

U.S. Cl. 422—100

8 Claims



1. In an apparatus for applying at least one liquid sample to a separating surface comprising electromagnet means having a vertically disposed opening extending therethrough;

pipette means for containing said liquid sample and being located within said vertically disposed opening, said pipette means being responsive to said electromagnet means and being freely movable within said vertically disposed opening; and

energizing means for energizing said electromagnet means so that (a) said pipette means is suspended over said surface in response to the electromagnet means being energized, said suspension of the pipette means being effected only by said energizing means and (b) the pipette means falls under the influence of gravity to said surface in response to the energization of said electromagnet means being reduced so that said liquid sample is applied to said surface.

**4,161,509**  
**MONOLITHIC CONVERTER**  
 Hubert H. Nowak, Jackson, Mich., assignor to Tenneco, Inc., Racine, Wis.

Filed Apr. 14, 1975, Ser. No. 567,578

Int. Cl.<sup>2</sup> B01J 1/14; F01N 3/08, 3/15

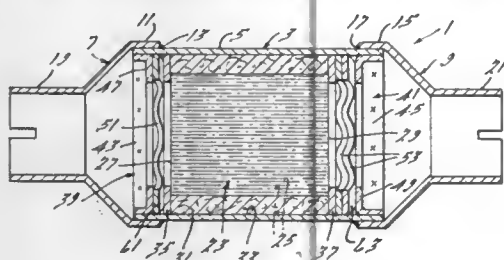
U.S. Cl. 422—179

11 Claims

1. A catalytic converter for combustion engine exhaust systems comprising a metal housing having a longitudinal axis and having an inlet for unpurified exhaust gas at one end and an outlet for relatively purified gas at the other end, a catalyst element in said housing comprising a gas pervious monolithic refractory substrate containing catalyst material and having support faces at opposite ends that are substantially parallel to each other and substantially normal to said axis, a resilient layer around said substrate and resiliently supporting it radially in said housing, said substrate having a gas inlet surface and a gas outlet surface each extending substantially normal to said longitudinal axis, inlet gas passage means providing a gas flow



passage between said housing inlet and said substrate inlet surface for unpurified gas, outlet gas passage means providing a gas flow passage between said substrate outlet surface and said housing outlet for relatively purified gas, support means contained inside of said housing serving to axially support said catalyst element in position between said inlet and outlet and including transverse partitions and at least one separate and individual relatively flat layer of spring metal washer means inside said housing and separable from and non-integral with



respect to all other parts of said converter and consisting of at least one axially compressed undulated wave spring washer reacting against said partitions and axially movable as a whole relative to at least one of the partitions and housing and applying continuous spring pressure to said substrate in a direction substantially parallel to said longitudinal axis and in longitudinal alignment with said support faces, said relatively flat layer of spring metal washer means constituting the only spring means applying continuous resilient pressure to said substrate in the direction of said longitudinal axis.

#### 4,161,510 REFORMING FURNACE HAVING CERAMIC-COATED TUBES

Alfred J. Edridge, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 537,503, Dec. 30, 1974, abandoned, which is a division of Ser. No. 391,081, Aug. 27, 1973, abandoned, which is a continuation of Ser. No. 240,856, Apr. 3, 1972, abandoned. This application Dec. 18, 1975, Ser. No. 641,791

Int. Cl.<sup>2</sup> B01J 8/06; F16L 9/14  
U.S. Cl. 422—197 1 Claim

1. Apparatus for steam reforming of light hydrocarbons which comprises in combination:  
a steam reforming furnace including tubes filled with steam reforming catalyst; and  
a coating of ceramic, heat reflective material painted on the outer surface of at least a portion of at least one of said tubes exposed to high temperatures during steam reforming, whereby the fissure creep rate in said portion of said tubes is reduced.

#### 4,161,511 PROCESS OF REFINING SODIUM HEXAFLUOROSILICATE

Yoshiro Shiraki, Yamaguchi; Hiroshi Haraoka, and Hiromichi Arai, both of Ube, all of Japan, assignors to Central Glass Company, Limited, Yamaguchi, Japan

Filed Jan. 31, 1978, Ser. No. 873,883  
Claims priority, application Japan, Feb. 1, 1977, 52-9284  
Int. Cl.<sup>2</sup> C01B 33/10

U.S. Cl. 423—341 8 Claims

1. A process of refining a crude sodium hexafluorosilicate containing gypsum as an impurity, comprising the steps of:  
(a) dispersing the crude sodium hexafluorosilicate in an aqueous solution of sodium chloride to form a first slurry and allow the gypsum to dissolve in said solution;  
(b) removing at least a portion of the liquid component of

said slurry thereby to accomplish the removal of a substantial amount of the dissolved gypsum;  
(c) reconstituting an aqueous second slurry of the solid component of said first slurry such that the concentration of Na in the liquid phase of said second slurry is not greater than 80 g/l;  
(d) adding a mineral acid to said second slurry so as to give an acid concentration of at least 0.1 N;  
(e) maintaining the acidified slurry at temperatures not lower than 80° C. with continued stirring to cause recrystallization of sodium hexafluorosilicate; and  
(f) recovering crystalline sodium hexafluorosilicate from the product of step (e).

#### 4,161,512 PROCESS FOR PREPARING TITANIUM CARBIDE

Alexandr G. Merzhanov, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 1, kv. 30; Inna P. Borovinskaya, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 17/1, kv. 9, both of Moskovskaya oblast; Gennady G. Karjuk, ulitsa D. Korotchenko, 17a, kv. 60, Kiev; Fedor I. Dubovitsky, Vorobievskoe shosse, 2b, kv. 12, Moscow; Valentina K. Prokudina, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 16, kv. 12; Viktor I. Ratnikov, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 24, kv. 63, both of Moskovskaya oblast; Anatoly V. Bochkov, ulitsa Sergema, 42, kv. 12, Kiev; Evgeny I. Moshkovsky, ulitsa Vyshgorodskaya, 76a, kv. 18, Kiev; Semen J. Sharivker, ulitsa Zhadanovskogo, 96, kv. 7, Keiv, and Sergei S. Krizhanovsky, pereulok Minsky, 28, Keiv, all of U.S.S.R.

Filed Jan. 11, 1978, Ser. No. 868,628  
Claims priority, application U.S.S.R., Jan. 21, 1977, 2444251  
Int. Cl.<sup>2</sup> C01B 31/30

U.S. Cl. 423—440 6 Claims

1. Method of producing titanium carbide, which comprises locally igniting a portion of a mixture consisting of 80-88% by weight of commercial titanium powder and 20-12% by weight of finely divided carbon, thus causing an exothermal reaction of said mixture whereby under the conditions of layer-by-layer combustion the entire mixture is heated to reaction with the formation of gaseous by-products, the process being carried out in an inert refractory porous casing having a porosity of 15-30%, thereby preventing said mixture from scattering upon an intensive cooling thereof and permitting removal of said gaseous products through said porous casing, thus forming titanium carbide of high purity with the combined carbon content approaching the stoichiometric value.

#### 4,161,513 METHOD OF PREPARING TITANATES SUITABLE AS ION-EXCHANGE MATERIAL

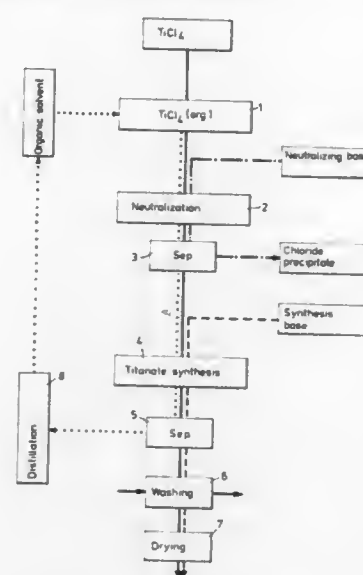
Sevald Forberg, Gillerbacken 15, S-124 42 Bandhagen, and Per-Inge Olsson, Mortgatan 11, 4tr, S-133 00 Saltsjobaden, both of Sweden

Filed Dec. 9, 1977, Ser. No. 859,141  
Claims priority, application Sweden, Dec. 15, 1976, 7614116  
Int. Cl.<sup>2</sup> C01G 23/00

U.S. Cl. 423—598 13 Claims

1. A method of preparing titanates suitable as cation exchange material which comprises dissolving titanium tetrachloride in a water-free or a substantially water-free organic solvent selected from the group consisting of water-free or substantially water-free forms of alcohols, ketone and mixtures thereof;  
partially neutralizing hydrochloric acid formed in the titanium tetrachloride solution and removing the chloride by reacting with a base which, in the used solvent, causes the precipitation of not-readily dissolved chloride; separating the precipitated chloride from the solution;

reacting a cation forming base with the neutralized solution to produce a titanate precipitate;



separating the precipitate from the residual solution and recovering the titanate.

#### 4,161,514 COMPOSITION AND METHOD FOR PREPARING SPECIMENS OF MICRO-ORGANISMS FOR MICROSCOPIC EXAMINATION

Dee O. Casey, 281 Maple St., Brevard, N.C. 28712  
Continuation-in-part of Ser. No. 655,385, Feb. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 277,909, Oct. 5, 1972, abandoned. This application Feb. 7, 1977, Ser. No. 766,229

Int. Cl.<sup>2</sup> C12K 1/04; G01N 1/00, 1/28, 1/30  
U.S. Cl. 424—3 15 Claims

1. A composition for staining micro-organisms to enable viewing by microscope and for immobilizing motile micro-organisms without damage to the structure thereof, which comprises an aqueous solution consisting essentially of water, from 0.025% to 0.125% by weight of hydrogen fluoride and a small amount of malachite green sufficient to provide a pleasing background color so that said micro-organisms stand out clearly.

10. A method for preparing a specimen containing a number of micro-organisms in aqueous suspension for viewing under a microscope which comprises placing one drop of said suspension on a viewing surface, placing in contact with said drop of said suspension one drop of an aqueous solution containing 0.025% to 0.125% by weight hydrogen fluoride and a small amount of malachite green sufficient to provide a pleasing color to said suspension and permitting said suspension and said solution to combine while quiescent, to stain said micro-organisms and to immobilize motile micro-organisms while maintaining their form and shape.

#### 4,161,515 DOUBLE RECEPTOR FLUORESCENT IMMUNOASSAY

Edwin F. Ullman, Atherton, Calif., assignor to Syva Company, Palo Alto, Calif.  
Continuation-in-part of Ser. No. 402,693, Oct. 2, 1973, Pat. No. 3,998,943. This application Dec. 17, 1976, Ser. No. 751,838  
The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> G01N 21/00, 31/00, 33/16

U.S. Cl. 424—8 6 Claims

1. A method for detecting the presence of an antigen in a sample comprising:

combining in an aqueous medium (1) said sample; (2) ligand analog-fluorescer, wherein said ligand analog is specifically recognizable by said antigen, and the ligand analog and fluorescer are linked sufficiently close by a linking group, so that the simultaneous binding of antigen and antibody to fluorescer is sterically inhibited; and (3) anti-fluorescer;  
determining at at least one wavelength the intensity of the fluorescence from said medium related to the emission of said fluorescer or said fluorescer bound to said anti-fluorescer as compared to a standard having a known amount of anti-ligand.

#### 4,161,516 COMPOSITION FOR TREATING AIRWAY DISEASE

John H. Bell, Loughborough, England, assignor to Fisons Limited, London, England  
Continuation-in-part of Ser. No. 599,071, Jul. 25, 1975, abandoned. This application Jan. 14, 1977, Ser. No. 759,469  
Claims priority, application United Kingdom, Jan. 23, 1976, 2606/76; Jan. 23, 1976, 2608/76

Int. Cl.<sup>2</sup> A61J 3/00; A61K 31/35

U.S. Cl. 424—14 16 Claims

1. A pharmaceutical composition adapted to be fluidized into a gas stream for inhalation treatment of airway disease, said composition being in the form of soft pellets or granules having a diameter of about 30 to 500 microns, said pellets or granules comprising a therapeutically effective proportion of a solid medicament useful for treating said disease, each of said pellets or granules being an agglomeration of individual particles of said medicament, at least 90% of said particles having a diameter less than 10 microns.

#### 4,161,517 PLAQUE INHIBITING COMPOSITION AND METHOD

Austin C. Wagenknecht, deceased, late of Hennepin County, Minn. (by Don A. Wagenknecht, personal representative); George V. Daravinas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 28, 1977, Ser. No. 855,511  
Int. Cl.<sup>2</sup> A61K 9/68

U.S. Cl. 424—48 18 Claims

1. A chewing gum comprising:  
(a) from about 10% to about 95% by weight of a gum base; and  
(b) from about 0.001% to about 25% by weight of a mixture of an alkyl sulfate salt and a member selected from the group consisting of a stearyl-2-lactylate salt and a di(2-ethylhexyl)sulfosuccinate salt and mixtures thereof in a weight ratio of from about 1,000:1 to about 1:1,000.

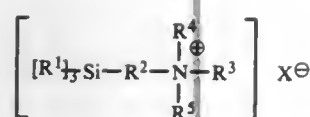
#### 4,161,518 COMPOSITIONS AND METHODS FOR INHIBITING PLAQUE FORMATION

Richard Y. Wen, New Brighton; Linda L. LaFleur, Oakdale; Michael R. Engel, White Bear Lake, and Anthony J. Lucas, Afton, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 29, 1977, Ser. No. 865,707  
Int. Cl.<sup>2</sup> A61K 7/18, 7/22

U.S. Cl. 424—52 15 Claims

1. A dentifrice composition which consists essentially of at least one ingredient selected from the group consisting of caries prophylactic agents, soaps, detergents, flavoring agents, sweetening agents and humectants and at least about 0.05% by weight of a quaternary ammonium organosiloxane having the formula



wherein R<sup>1</sup> is an alkoxy group having from 1 to 5 carbon atoms, R<sup>2</sup> is an alkylene group having from 1 to 25 carbon atoms, and R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are, individually, alkyl groups of from 1 to 25 carbon atoms, and X is an anion.

#### 4,161,519 PROCESS FOR PREPARING AN ANTIPREGNANCY VACCINE

Gursaran P. Talwar, New Delhi, India, assignor to All India Institute of Medical Sciences, New Delhi, India

Continuation of Ser. No. 544,677, Jan. 28, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,455

Int. Cl.<sup>2</sup> A61K 37/38, 39/00

U.S. Cl. 424—88 9 Claims

1. A process for preparing a vaccine for the prevention of pregnancy which comprises:

- obtaining chemically pure beta subunit of human chorionic gonadotropin;
- reacting said chemically pure beta subunit of human chorionic gonadotropin with rabbit anti-vine leuteinizing hormone immunosorbent to obtain a beta subunit of human chorionic gonadotropin preparation which is free of determinants capable of reacting with high affinity with anti leuteinizing hormone sera; and
- condensing the thus treated beta subunit of human chorionic gonadotropin preparation with a subject-compatible immunogenic carrier to obtain a vaccine.

#### 4,161,520 METHOD OF TREATING HYPERTENSION

Melville W. Osborne, Somerville, and Michael R. Cohen, West Orange, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 14, 1976, Ser. No. 731,979

Int. Cl.<sup>2</sup> A61K 35/06, 31/35, 31/34

U.S. Cl. 424—115 20 Claims

1. A method for treating hypertension in warm blooded animals with hypertension comprising the oral administration to such warm blooded animals of from less than 0.1 mg/kg/day to about 10 mg/kg/day of a polyether compound with ionophore activity.

14. A method of altering the hemodynamic profile of warm blooded animals suffering from angina to the normal state comprising orally administering to such warm blooded animals from less than 0.1 mg/kg/day to about 10 mg/kg/day of a polyether compound with ionophoric activity sufficient to revert the hemodynamic profile to the normal state.

#### 4,161,521 SOMATOSTATIN ANALOGS

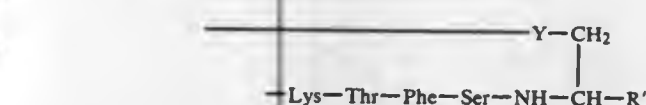
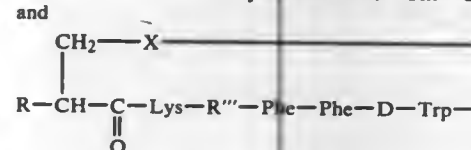
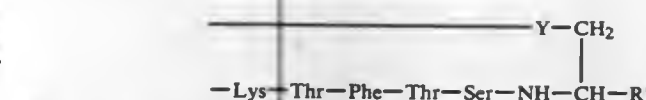
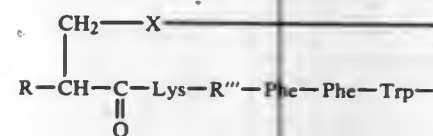
Daniel F. Veber, Ambler; Frederick W. Holly, Glenside; Robert G. Strachan, Warrington; William J. Paleveda, Lansdale; Ruth F. Nutt, Green Lane, and Ralph F. Hirschmann, Blue Bell, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 680,005, Apr. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 603,067, Aug. 8, 1975, abandoned. This application Jun. 14, 1976, Ser. No. 695,348

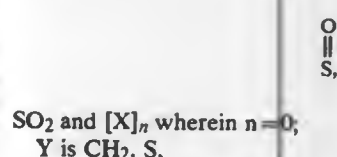
Int. Cl.<sup>2</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177 37 Claims

1. The peptides having the structure:



wherein:  
X is CH<sub>2</sub>, S,



SO<sub>2</sub> and [Y]<sub>n</sub> wherein n=0;  
R is H, NH<sub>2</sub> and R'NH and wherein  
R'' is Ala-Gly-, lower acyl containing 2 to 6 carbon atoms or  
aroyl containing 7 to 21 carbon atoms;  
R' is H and CO<sub>2</sub>H; wherein X and Y are not both heteroatoms and when R' is H, X and Y are not both —CH<sub>2</sub>—; and  
R''' is asparagine, alanine or α-aminobutyric acid.

#### 4,161,522 METHOD FOR BLOCKING ALLERGIC RESPONSES

Robert N. Hamburger, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 652,868, Jan. 27, 1976, which is a continuation-in-part of Ser. No. 565,425, Apr. 4, 1975, abandoned. This application Sep. 7, 1978, Ser. No. 940,323

Int. Cl.<sup>2</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177 17 Claims

1. A method for blocking the mammalian allergic reaction which method comprises administering to a host subject in an effective amount of a polypeptide comprising from 3–10 amino acids in sequence, said sequence selected from a portion of the amino acid sequence 265–537 of the Fc region of Immunoglobulin E, or the polypeptide Asp-Thr-Glu-Ala-Arg, or a pharmacologically acceptable salt or derivative thereof.

#### 4,161,523 ROSAMICIN ESTERS, ACID ADDITION SALTS AND METHODS FOR PRODUCTION THEREOF

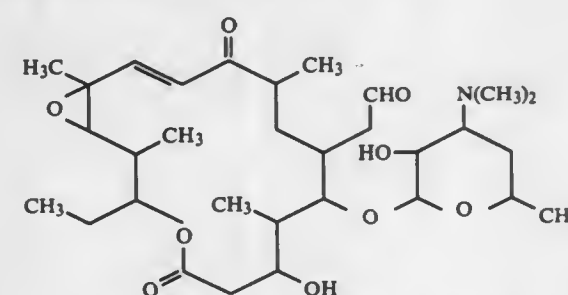
Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 303,883, Nov. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 4,916, Jan. 22, 1970, abandoned. This application Oct. 21, 1974, Ser. No. 516,338

Int. Cl.<sup>2</sup> A61K 31/71

U.S. Cl. 424—181 21 Claims

1. A compound selected from the group consisting of rosamicin and the non-toxic pharmaceutically acceptable acid addition salts thereof, said rosamicin being an organic substance having an infrared spectrum substantially as shown in FIG. 1, having a nuclear magnetic spectrum substantially as shown in FIG. 2, having an optical rotation at 25° measured by the D line of sodium of —33.4° (C=0.3% ethanol), having a molecular weight of 381 as measured by mass spectrometry, having an empirical formula C<sub>31</sub>H<sub>51</sub>NO<sub>9</sub> having an m.p. of 110–114° C., having an ultraviolet spectrum with an E<sub>1cm</sub><sup>1%</sup>=238 at 240 mμ, having an antibacterial spectrum substantially as shown in Table IX, and having a planar structural formula substantially as follows:



6. A method of eliciting an antibacterial response in a mammal having a bacterial infection which comprises administering to said mammal an antibacterially effective quantity of a compound of claim 1.

#### 4,161,524 O-ALKYL-S-N-PROPYL-N-SULFONYL-PHOSPHORIC ACID ESTER AMIDES

Shigeo Kishino; Junichi Saito, both of Tokyo; Akio Kudamatsu; Kozo Shikawa, both of Kanagawa, and Shinichi Tsuboi, Tokyo, all of Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 723,834, Sep. 16, 1976, Pat. No. 4,134,979.

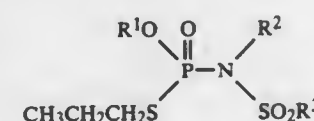
This application Jun. 21, 1978, Ser. No. 917,719

Claims priority, application Japan, Sep. 22, 1975, 50/113705

Int. Cl.<sup>2</sup> A01N 9/36; C07F 9/24

U.S. Cl. 424—215 9 Claims

1. An O-alkyl-S-n-propyl-N-sulfonylphosphoric acid ester amide of the formula



in which

- R<sup>1</sup> is methyl or ethyl,  
R<sup>2</sup> is C<sub>1</sub>–C<sub>6</sub> alkyl or alkenyl, C<sub>1</sub>–C<sub>6</sub> alkyl substituted by aryl, phenyl, C<sub>1</sub>–C<sub>6</sub> alkylphenyl, or halophenyl, and  
R<sup>3</sup> is C<sub>1</sub>–C<sub>6</sub> alkyl, C<sub>1</sub>–C<sub>6</sub> alkyl substituted by halogen, phenyl, C<sub>1</sub>–C<sub>6</sub> alkylphenyl, C<sub>1</sub>–C<sub>6</sub> alkoxyphenyl, halophenyl or nitrophenyl, with the proviso that both R<sup>2</sup> and R<sup>3</sup> are not simultaneously C<sub>1</sub>–C<sub>6</sub> alkyl.

2. A method of combating insects, acarids or nematodes,

which comprises applying to the insects, acarids, or nematodes, or to a habitat thereof an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1.

#### 4,161,525 PROCESS OF TREATING PROLIFERATIVE SKIN DISEASES WITH INDOLE DERIVATIVES

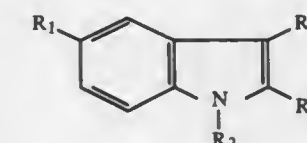
John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 808,447, Jun. 21, 1977, Pat. No. 4,107,306, which is a division of Ser. No. 643,633, Jan. 5, 1976, Pat. No. 4,034,087, which is a continuation-in-part of Ser. No. 425,065, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Apr. 17, 1978, Ser. No. 897,063

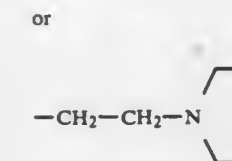
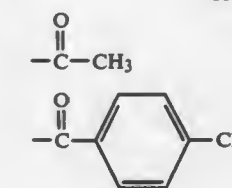
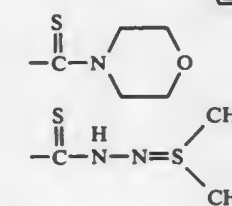
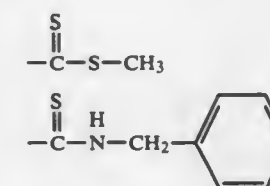
Int. Cl.<sup>2</sup> A61K 31/56, 31/535, 31/40, 31/405

U.S. Cl. 424—240 2 Claims

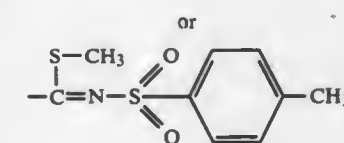
1. A process for alleviating proliferative skin diseases which comprise administering to the afflicted human or animal a composition containing as its active component at least one compound of the formula:



wherein R<sub>1</sub> is hydrogen or methoxy  
R<sub>2</sub> is —CH<sub>3</sub>

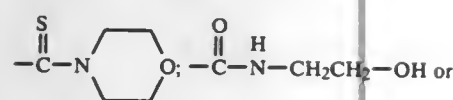


R<sub>3</sub> is hydrogen, methyl, phenyl





R<sub>4</sub> is hydrogen, hydroxy



said compounds being in association with a pharmaceutical carrier wherein said active component is present in an amount in the range of about 0.1 to about 15% w/v, which is effective to alleviate a proliferative skin disease.

2. A process in accordance with claim 1 wherein said active component is administered in conjunction with a permissive dosage of a glucocorticoid.

#### 4,161,526 ZINC SALT PREVENTION OR REMOVAL OF DISCOLORATION IN PYRITHIONE, PYRITHIONE SALT AND DIPYRITHIONE COMPOSITIONS

William G. Gorman, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,293

Int. Cl.<sup>2</sup> A61K 31/555, 31/44, 33/30

U.S. Cl. 424-245

6 Claims

1. A white to cream yellow pyrrithione, pyrrithione salt or dipyrithione composition for application to skin or hair containing from about 0.01 percent to about 1 percent of the zinc salt of an organic carboxylic or inorganic acid, zinc hydroxide or zinc oxide or a mixture thereof effective in preventing or removing discoloration caused by formation of a colored pyrrithione, pyrrithione salt or dipyrithione contaminant in said composition.

#### 4,161,527 ANTIBIOTIC COMPOSITIONS

Kenzo Ishizuka, Amagasaki; Hiroshi Fujisawa, Toyonaka, and Etsunosuke Noda, Yao, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Aug. 29, 1977, Ser. No. 828,841

Claims priority, application Japan, Aug. 31, 1976, 51-104582

Int. Cl.<sup>2</sup> A61K 31/54

U.S. Cl. 424-246

8 Claims

8. A solid antibiotic composition, which comprises 7β-[2-(2-imino-4-thiazolin-4-yl)acetamido]-3-[1-[2-(N,N-dimethylamino)ethyl]-1H-tetrazol-5-yl]thiomethyl-3-cephem-4-carboxylic acid dihydrochloride hydrate, of which the water content is substantially 1 to 4 mols per mol of 7β-[2-(2-imino-4-thiazolin-4-yl)acetamido]-3-[1-[2-(N,N-dimethylamino)ethyl]-1H-tetrazol-5-yl]thiomethyl-3-cephem-4-carboxylic acid dihydrochloride moiety, and sodium carbonate, the amount of sodium carbonate being substantially 1 to 2 mols per mol of said hydrate.

#### 4,161,528 1,3-DIPHENYL-2-TRICHLOROMETHYL-IMIDAZOLI- DINES

Klaus Thomas, Gau-Algesheim; Walter Ost, Bingen, and Jürgen Curtze, Geisenheim-Johannisberg, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG., Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 776,365, Mar. 10, 1977, abandoned, which is a continuation of Ser. No. 660,410, Feb. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 573,822, May 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 427,368, Dec. 21, 1973, abandoned. This application Feb. 17, 1978, Ser. No. 878,669

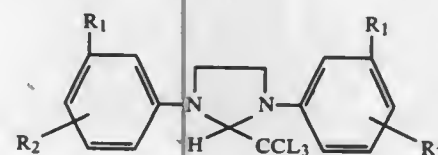
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1972, 2263239; Feb. 28, 1975, 2508715

Int. Cl.<sup>2</sup> C07D 233/10; A61K 31/395

U.S. Cl. 424-273 R

7 Claims

1. A compound of the formula



wherein

R<sub>1</sub> is halogen, lower alkyl or, when R<sub>2</sub> is 4-fluoro, 4-bromo, 4-iodo or 4-(lower alkyl of more than 1 carbon atom), also hydrogen; and  
R<sub>2</sub> is attached to the 4- or 5-position of the phenyl ring and is hydrogen, halogen or lower alkyl.

#### 4,161,529 PHENOXY PHENYL PYRROLIDINE COMPOUNDS, COMPOSITIONS AND METHODS OF USE

Laszlo Beregi, Boulogne; Pierre Hugon, Ruell-Malmalson; Jacques Duhault, Chatou, and Michèle Boulanger, Marly le Roi, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

Filed Feb. 14, 1978, Ser. No. 877,601

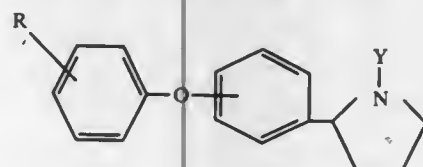
Claims priority, application United Kingdom, Feb. 25, 1977, 8096/77

Int. Cl.<sup>2</sup> A61K 31/40; C07D 207/06

U.S. Cl. 424-274

9 Claims

1. A compound having the formula:



wherein:

—R is selected from the group consisting of hydrogen, halogen, alkyl and alkoxy of 1 to 4 carbon atoms inclusive, and trifluoromethyl;  
—Y is selected from the group consisting of hydrogen, saturated and unsaturated hydrocarbon radical of from 1 to 4 carbon atoms inclusive, hydroxyethyl, hydroxypropyl and carboxymethyl; and physiologically tolerable acid addition salts thereof.

9. A method for treating a animal body afflicted with lipid-metabolism disorders comprising the steps of administering an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

#### 4,161,530 PHARMACEUTICAL COMBINATION PREPARATIONS AS HYPNOTICS

Werner P. Koella, Oberwill, Switzerland, assignor to Ciba-Geigy Corporation, Airdsley, N.Y.

Continuation of Ser. No. 641,318, Dec. 16, 1975, abandoned.

This application Mar. 17, 1978, Ser. No. 887,687

Claims priority, application Switzerland, Jan. 6, 1975, 72/75 Int. Cl.<sup>2</sup> A61K 31/40, 31/135, 31/165, 31/335

U.S. Cl. 424-274

15 Claims

1. A pharmaceutical preparation suitable as hypnotic for inducing and prolonging sleep which contains a mixture of pharmacological active compounds comprising (1) a beta-receptor blocking compound selected from the group consisting of 3-isopropylamino-1-(1-naphthyl)-2-propanol, 3-isopropylamino-1-(3-methyl-phenyl)-2-propanol, 1-(2-allyl-phenyl)-3-isopropylamino-2-propanol, 1-(4-acetylaminophenyl)-3-isopropylamino-2-propanol, 1-(4-indolyl)-3-isopropylamino-2-propanol, 3-isopropylamino-1-[4-(2-methoxyethyl)-phenyl]-2-propanol, 3-isopropylamino-1-[4-(2-methylthioethoxy)-phenyl]-2-propanol, 1-(9,10-ethano-9,10-dihydro-1-anthryl)-3-isopropylamino-2-propanol, 3-isopropylamino-1-[2-(1-pyrryl)-phenyl]-2-propanol, 1-[2-(3,4-dimethoxyphenyl)-ethyl]-3-(3-methyl-phenyl)-2-propanol, 1-isopropylamino-3-(1,2,3,4-tetrahydro-1,4-ethano-5-naphthyl)-2-propanol, 1-tert-butylamino-3-(1,2,3,4-tetrahydro-2,3-dihydroxy-5-naphthyl)-2-propanol, 1-(7-indenyl)-3-isopropylamino-2-propanol, 1-(7-indanyloxy)-3-isopropylamino-2-propanol, 1-(5-methyl-8-cumaryl)-3-isopropylamino-2-propanol, 4-(3-isopropylamino-2-hydroxy-1-propyloxy)-2-methylindole, 2-tert-butylamino-1-(7-ethyl-2-benzofuranyloxy)-ethanol and 1-(2-allyloxy-phenyl)-3-isopropylamino-2-propanol in the form of racemates, optically active antipodes or a non-toxic acid addition salt thereof, which can be used pharmaceutically, and (2) L-tryptophane or a non-toxic salt thereof which can be used pharmaceutically, wherein the ratio of the beta-receptor blocking compound to L-tryptophane, or a non-toxic salt thereof which can be used pharmaceutically is of about 1:5 to about 1:100 by weight and which contains from about 20% to about 100% of active compounds together with an excipient.

#### 4,161,531 DIURETIC AND SALURETIC 5-SULFAMOYL BENZOIC ACID DERIVATIVES CARRYING A HETEROCYCLIC SUBSTITUENT

Dieter Bormann, Kelkheim; Merkel Wulf, Neuenhain, and Roman Muschawek, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 740,741, Nov. 10, 1976, which is a division of Ser. No. 570,649, Apr. 23, 1975, Pat. No. 4,010,273. This application Jan. 5, 1978, Ser. No. 867,347

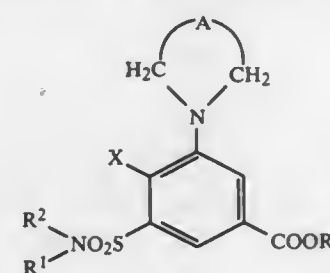
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1974, 2419970

Int. Cl.<sup>2</sup> A61K 31/40; C07D 207/04

U.S. Cl. 424-274

9 Claims

1. A 5-sulfamoylbenzoic acid compound of the formula



or a physiologically tolerated salt thereof, wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are hydrogen or alkyl of 1 to 4 carbon atoms, X is benzyl, phenylthio, or anilino, in each of which the phenyl ring may be

substituted by halogen, CF<sub>3</sub>, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms, and A is a —CH<sub>2</sub>—CH<sub>2</sub>—group which may be substituted by halogen or alkyl of 1 to 4 carbon atoms.

8. A diuretically and saluretically active composition containing 0.5 to 100 mg per dosage unit of a compound as defined in claim 1 and a pharmaceutically tolerable carrier therefor.

9. A method of treatment which comprises administering to a patient a diuretically or saluretically effective amount of compound as defined in claim 1.

#### 4,161,532 N-(1'-ETHYL-2'-OXO-5'-PYRROLIDINYL METHYL) BENZAMIDE COMPOUNDS AND DERIVATIVES, METHOD OF PREPARATION AND PHARMACEUTICAL PREPARATIONS

Gerard Bulteau, Paris; Jacques Acher, Itteville, and Jean C. Monier, Lardy, all of France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile de France, Paris, France

Filed Apr. 14, 1978, Ser. No. 896,126

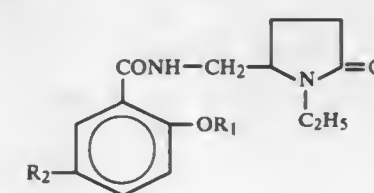
Claims priority, application France, Apr. 15, 1977, 77 11644

Int. Cl.<sup>2</sup> C07D 207/20; A61K 31/40

U.S. Cl. 424-274

10 Claims

1. A substituted N-(1'-ethyl-2'-pyrrolidinylmethyl) benzamide compound of the formula:

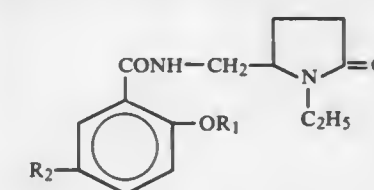


wherein:

R<sub>1</sub> is hydrogen or methyl and  
R<sub>2</sub> is hydrogen or sulfamoyl,  
a pharmacologically acceptable organic or inorganic acid addition salt, an alkyl ammonium salt, an N-oxide and an optical isomer thereof.

6. A pharmaceutical composition for the treatment of psychic disturbances, comprising

(a) a substituted N-(1'-ethyl-2'-oxo-5'-pyrrolidinylmethyl) benzamide compound of the formula:



wherein

R<sub>1</sub> is hydrogen or methyl and  
R<sub>2</sub> is hydrogen or sulfamoyl,  
a pharmacologically acceptable organic or inorganic acid addition salt, an alkyl quaternary ammonium salt, an optical isomer thereof; and

(b) a pharmaceutically acceptable support therefor;

(c) said benzamide compound being present in an amount sufficient for the effective treatment of said psychic disturbances.

4,161,533  
5-SULFAMOYL-ORTHANILIC ACIDS AND PROCESS  
FOR THEIR PREPARATION

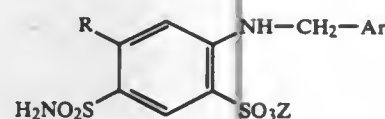
Karl Sturm, Heidesheim, and Roman Muschaweck, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,135

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718871

Int. Cl.<sup>2</sup> A61K 31/34, 31/38; C07D 307/52, 333/20  
U.S. Cl. 424—285

1. A compound of the formula



wherein

Ar is furyl;

R is phenoxy, phenylthio, or phenoxy or phenylthio substituted by a chlorine or bromine atom or by methyl or methoxy, and

Z is hydrogen or a physiologically acceptable metal ion, ammonium ion, or substituted ammonium ion.

4,161,534  
PROCESS FOR THE PRODUCTION OF NOVEL  
HYDROXYALKYL DITHIOCARBAMATES

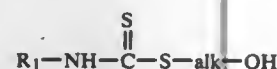
Ernst Schweizer, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,649

Claims priority, application Switzerland, Jan. 17, 1977, 528/77

Int. Cl.<sup>2</sup> A61K 31/27; C07C 155/08  
U.S. Cl. 424—300

1. A hydroxyalkyl dithiocarbamate of the formula



wherein R<sub>1</sub> represents a phenyloxyphenyl or phenylaminophenyl radical which is unsubstituted or substituted by lower alkyl, halogen, trifluoromethyl, nitro and/or cyano, and alk represents lower alkylidene or lower alkylene.

8. Method of treatment of helminthoses characterized in that a compound as claimed in claim 1 is administered to a warm-blooded being.

4,161,535  
PESTICIDAL 2-ISOPROPYL-4-PHENYL-3-BUTENOIC  
ACID BENZYL ESTERS

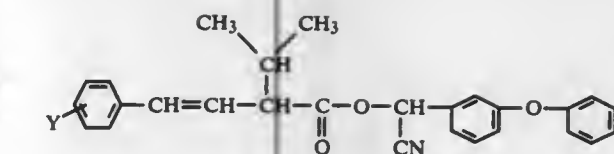
Willy Meyer, Riehen; Jozef Drabek, Oberwil; Saleem Farooq, Aesch; Laurenz Gsell, Fullinsdorf, and Odd Kristiansen, Möhlin, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,635

Claims priority, application Switzerland, Sep. 30, 1976, 12369/76; Mar. 11, 1977, 3095/77

Int. Cl.<sup>2</sup> A01N 9/20; A61K 31/275; C07C 121/75  
U.S. Cl. 424—304

1. A compound of the formula



wherein Y is hydrogen, halogen or methyl.

6. A method of combating animal and plant pests at a locus, which method comprises applying to the locus a pesticidally effective amount of a compound as claimed in claim 1.

4,161,536  
PESTICIDAL ALIPHATIC CARBOXYLATES

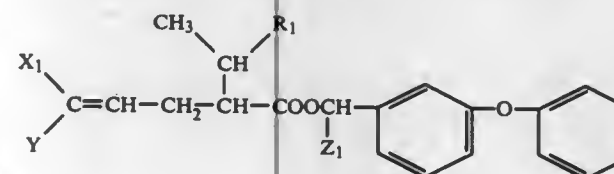
Jozef Drabek, Oberwil; Saleem Farooq, Aesch; Laurenz Gsell, Fullinsdorf; Odd Kristiansen, Möhlin, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,150

Claims priority, application Switzerland, Nov. 12, 1976, 14284/76; Sep. 29, 1977, 11910/77

Int. Cl.<sup>2</sup> A01N 9/20, 9/24; C07C 69/65, 121/75  
U.S. Cl. 424—304

1. An aliphatic carboxylic acid ester of the formula



wherein

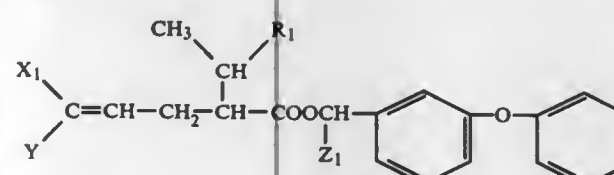
R<sub>1</sub> represents hydrogen or methyl,

X<sub>1</sub> represents halogen,

Y represents halogen or methyl, and

Z represents cyano or ethynyl.

8. A method for combating insects which comprises applying thereto an insecticidally effective amount of a compound of the formula



wherein

R<sub>1</sub> represents hydrogen or methyl,

X<sub>1</sub> represents halogen,

Y represents halogen or methyl, and

Z represents cyano or ethynyl.

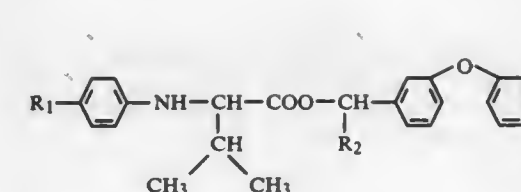
4,161,537  
INSECTICIDAL ISOVALERIC ACID ESTERS

Yoshio Katsuda, Nishinomiya; Minoru Nakajima, and Toshio Fujita, both of Kyoto, all of Japan, assignors to Dainippon Jochugiki Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1977, Ser. No. 856,207

Int. Cl.<sup>2</sup> A01N 9/20; C07C 101/00, 121/75  
U.S. Cl. 424—304

1. Isovaleric acid ester derivatives and the optical isomers thereof expressed by the general formula I:

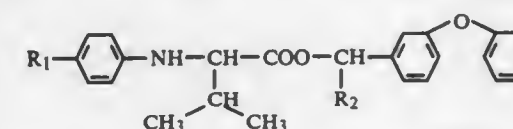


wherein,

R<sub>1</sub> represents hydrogen, methyl group or chlorine atom, and

R<sub>2</sub> represents hydrogen or cyano group.

11. An insecticidal composition comprising a carrier and as its essential ingredient an insecticidally effective amount of an isovaleric acid ester derivative of the general formula:



wherein,

R<sub>1</sub> represents hydrogen, a methyl group, or a chlorine atom

and

R<sub>2</sub> represents hydrogen or a cyano group.

4,161,538  
SUBSTITUTED PHENYLACETIC ACID DERIVATIVES  
AND PROCESS FOR THE PREPARATION THEREOF

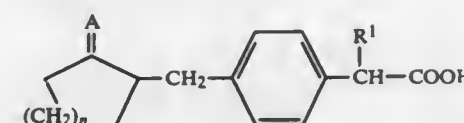
Atsuyuki Terada; Kazuyuki Wachi, and Eiichi Misaka, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Mar. 10, 1978, Ser. No. 885,527

Claims priority, application Japan, Apr. 5, 1977, 52-38906; Apr. 5, 1977, 52-38907; Jun. 10, 1977, 52-68468

Int. Cl.<sup>2</sup> A61K 31/19; C07C 65/20  
U.S. Cl. 424—317

1. A compound having the formula



wherein R<sub>1</sub> represents hydrogen atom or a lower alkyl group, A represents oxo group or hydroxyimino group, n is an integer from 1 to 3 and a nontoxic pharmaceutically acceptable salt thereof.

21. A pharmaceutical composition for treating inflammation in mammals comprising an inert pharmaceutically acceptable carrier and an anti-inflammatory effective amount of a compound of claim 1 or a non-toxic pharmaceutically acceptable salt of said compound.

4,161,539  
USE OF MALIC ACID AS A RUMINANT FEED ADDITIVE

Odie T. Stallcup, Fayetteville, Ark., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 786,315, Apr. 11, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,694

Int. Cl.<sup>2</sup> A61K 31/19

U.S. Cl. 424—317

1. A method of improving the growth response in ruminants

which comprises orally administering to the ruminant a growth-promoting amount of malic acid.

4,161,540  
ANTIANDROGENIC AGENTS AND METHODS FOR THE  
TREATMENT OF ANDROGEN DEPENDENT DISEASE  
STATES

Rudolph O. Neri, Hawthorne, and John G. Topliss, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

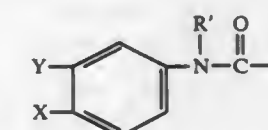
Continuation of Ser. No. 725,822, Sep. 23, 1976, which is a division of Ser. No. 505,116, Sep. 11, 1974, Pat. No. 3,995,060, which is a continuation-in-part of Ser. No. 265,655, Jun. 20, 1972, abandoned, which is a continuation-in-part of Ser. No.

146,461, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 876,999, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 734,854, Jun. 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 573,836, Aug. 22, 1966, abandoned. This application Oct. 3, 1977, Ser. No. 838,606

Int. Cl.<sup>2</sup> A61K 31/165

U.S. Cl. 424—324

1. A method for the treatment of acne which comprises administering to an animal having acne a therapeutically effective quantity for treating acne of a substituted anilide having the structural formula:



or the non-toxic pharmaceutically acceptable salts thereof, wherein X is a member selected from the group consisting of nitro, trifluoromethyl, chloro, bromo and iodo; Y is a member selected from the group consisting of hydrogen, halogen, nitro, lower alkyl, lower alkoxy, lower alkanoyl, polyfluoroloweralkoxy, polyfluoroloweralkyl, and trifluoromethylthio, with the proviso that when Y and R' are both hydrogen, X is other than iodo; R' is a member selected from the group consisting of hydrogen and alkyl having less than 5 carbon atoms, and R is cyclopropyl, cyclobutyl or branched chain alkyl having up to 8 carbon atoms.

4,161,541  
BENZHYDRYL GUANIDINES

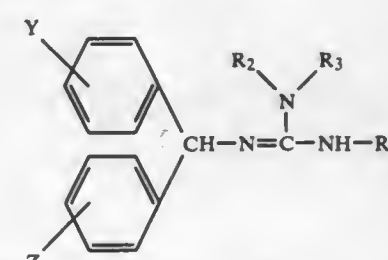
Chris R. Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Division of Ser. No. 828,694, Aug. 29, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,208

Int. Cl.<sup>2</sup> A61K 31/155; C07C 129/12

U.S. Cl. 424—326

1. A pharmaceutical composition in dosage unit form comprising an effective hypoglycemic amount of a member selected from the group consisting of a benzhydryl guanidine derivative having the formula:



wherein:

R<sub>1</sub> is a member selected from the group consisting of hydrogen and loweralkyl,

R<sub>2</sub> is a member selected from the group consisting of hydrogen and loweralkyl,



R<sub>3</sub> is a member selected from the group consisting of hydrogen, loweralkyl, and cyclopentyl and cyclohexyl, Y and Z are each a member selected from the group consisting of hydrogen, halo, loweralkyl, preferably methyl, and loweralkyloxy, preferably methoxy and ethoxy; and the pharmaceutically acceptable acid salts thereof in admixture with a pharmaceutical carrier.

4,161,542

## HEART ACTIVE COMPOUNDS

Enar I. Carlsson, Västra Frölunda; Gustav B. R. Samuelsson, Mölnlycke, and Bo T. Lundgren, Brillesläs, all of Sweden, assignors to Aktiebolaget Hassle, Göteborg, Sweden

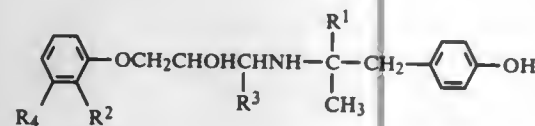
Continuation-in-part of Ser. No. 821,956, Aug. 4, 1977, abandoned, which is a continuation of Ser. No. 610,399, Sep. 4, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,514

Claims priority, application Sweden, Jun. 4, 1975, 7506348  
Int. Cl.<sup>2</sup> A61K 31/135; C07C 93/06, 87/29, 43/20

U.S. Cl. 424—330

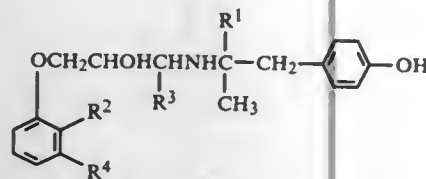
74 Claims

1. A compound of the formula I



wherein R<sup>1</sup> is selected from the group consisting of hydrogen and methyl and R<sup>2</sup> is selected from the group consisting of hydrogen, methyl, ethyl, propyl, allyl, methoxy and propargyloxy, R<sup>3</sup> is selected from the group consisting of hydrogen, methyl and ethyl, and R<sup>4</sup> is selected from the group consisting of hydrogen and methyl, provided that R<sup>2</sup> and R<sup>4</sup> are not both hydrogen, or a therapeutically acceptable salt of such a compound.

27. A method of treating cardiovascular disorders by blocking the  $\beta$ -receptors of the heart which comprises administering to mammals in need of said treatment, an amount effective to block said  $\beta$ -receptors of a compound of the general formula I



wherein R<sup>1</sup> is selected from the group consisting of hydrogen and methyl, and R<sup>2</sup> is selected from the group consisting of hydrogen, methyl, ethyl, propyl, allyl, methoxy, propargyloxy, R<sup>3</sup> is selected from the group consisting of hydrogen, methyl, and ethyl, and R<sup>4</sup> is selected from the group consisting of hydrogen and methyl, provided that R<sup>2</sup> and R<sup>4</sup> are not both hydrogen, or its therapeutically acceptable acid addition salt.

4,161,543

## FEEDING HERBIVOROUS ANIMALS

Elmer F. Glabe, Northbrook; Perry W. Anderson, Niles, and Stergios Laftsidis, Chicago, all of Ill., assignors to Food Technology Products, Chicago, Ill.

Continuation-in-part of Ser. No. 630,697, Nov. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 484,080, Jun. 28, 1974, Pat. No. 3,925,559, which is a continuation-in-part of Ser. No. 300,736, Oct. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,616, Jun. 30, 1971, abandoned. This application Dec. 8, 1977, Ser. No. 858,660. The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> A23K 1/00

U.S. Cl. 426—2

15 Claims

1. A process of feeding herbivorous animals from the group consisting of beef cattle, dairy cattle, sheep, goats, horses, hogs and fowl which comprises feeding such animals with feeds normally eaten by such animals and sodium diacetate in sufficient amounts to serve as an attractant to such animals for such feeds and to enhance the taste threshold.

4,161,544

## PROCESS FOR MAKING A POURABLE MATERIAL FOR CHEWING GUM

Dieter Kaul, Vosskuhlen 6, 2200 Elmshorn, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,878

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2710579

Int. Cl.<sup>2</sup> A23G 3/30

U.S. Cl. 426—5

11 Claims

1. A process for making a pourable material for chewing gum, which comprises the steps of:  
adding to a dry base of chewing gum heated to about 60° to 120° C. dry sugar materials, polysaccharides, natural gums and swelling agents;  
mixing and crushing the mass at this temperature for about 1–15 minutes;  
subsequently cooling the mixture to a temperature ranging from 30–minus 5° C., and continuing the mixing for about 1–15 minutes, so as to produce a pourable powder for making chewing gum, which will remain pourable at normal temperatures even after storage without forming agglomerates.

4,161,545

## HONEY COATED ROASTED NUT PRODUCT AND METHOD FOR MAKING SAME

William M. Green, Box 535, Robersonville, N.C. 27871, and Maurice W. Hoover, 920 Merwin Rd., Raleigh, N.C. 27606

Filed May 16, 1978, Ser. No. 906,663

Int. Cl.<sup>2</sup> A23L 1/36

U.S. Cl. 426—93

9 Claims

1. A process for providing a honey coated roasted nut comprising first coating raw nuts with a mixture comprising about 50–80% by weight of honey and from about 20–50% by weight of water, enrobing the honey coated nuts with a dry mixture containing about 84–92% by weight of sugar and about 8–16% by weight of starch, the particle size of the sugar and starch in said dry mixture being in the range of 0.002 inch to 0.02 inch, and thereafter roasting the nuts.

4,161,546

## PROCESS FOR TEXTURIZING PROTEINACEOUS MATERIALS

Cavit Akin, Warrenville, Ill., and Franklin D. Darrington, Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 3, 1977, Ser. No. 821,348

Int. Cl.<sup>2</sup> A23J 3/00

U.S. Cl. 426—104

9 Claims

1. A process for texturizing an aqueous slurry of single-cell protein materials comprising:

- adding to the aqueous slurry of single-cell protein materials a texturizing agent selected from the group consisting of protein isolates, protein concentrates, gelatin, or mixtures thereof, wherein the dry weight ratio of the single-cell protein material to the texturizing agent is in the range of from about 1:9 to about 9:1;
- heating the aqueous slurry to a temperature of from about 30° to about 130° C.;
- whipping the heated slurry to form a foam;
- freezing the foam;
- dehydrating the frozen foam; and
- heat treating the dehydrated foam at a temperature of from about 130° to about 230° C. for from about 3 to about 120 minutes to yield a water-stable textured product.

4,161,547

## METHOD OF PRODUCING ANTIREFLECTIVE COATINGS ON POLYDIETHYLENEGlyCOLDIALLYLCARBONATE, AN OPTICAL PRODUCT MADE BY THE METHOD, AND THE USE OF THE OPTICAL PRODUCT

Gerhard Kienel, Hanau, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

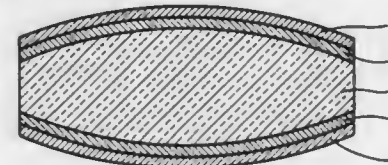
Filed Dec. 21, 1977, Ser. No. 862,874

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658417

Int. Cl.<sup>2</sup> G02B 5/28

U.S. Cl. 428—213

6 Claims



4. A three layer antireflective transparent optical body, consisting of a substrate of polydiethyleneglycoldiallylcarbonate to define the first layer; a first coat on the substrate of ZrO<sub>2</sub> having a content of 4 to 15 weight-percent of Al<sub>2</sub>O<sub>3</sub> and having a first refractive index to define the second layer; and a second coat of a borosilicate glass superposed on the first coating and containing less than 5 weight-percent of alkali metal oxides and having a second refractive index less than said first refractive index to define the third layer.

4,161,548

## MAKING LONG YOLK HARD COOKED EGGS

William Warren, 729 S. Main St., Centerville, Mass. 02632

Filed Jan. 26, 1978, Ser. No. 872,372

Int. Cl.<sup>2</sup> A23L 1/32

U.S. Cl. 426—299

6 Claims

1. The method of preparing a hard cooked avian egg having an elongated or ovoid yolk and white mixture extending substantially from end to end of the cooked egg, which comprises cooking an egg for a time sufficient to soft boil it such that a thin layer of hard cooked egg white is formed adjacent the shell,  
mixing the uncooked internal liquid in the egg,  
and completing the cooking of the entire egg.

4,161,549

## METHOD OF IMPROVING THE FLAVOR OF PREVIOUSLY DRIED GREEN COFFEE BEANS

Akira Ohno, Nagoya, Japan, assignor to Gallon & Company, Nagoya, Japan

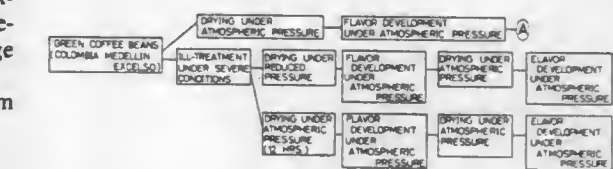
Continuation-in-part of Ser. No. 723,091, Sep. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 529,547, Dec. 4, 1974, abandoned. This application Dec. 29, 1977, Ser. No. 865,445

Claims priority, application Japan, Dec. 7, 1973, 48-137508; Jul. 19, 1974, 49-83364

Int. Cl.<sup>2</sup> A23F 1/02

U.S. Cl. 426—460

5 Claims



1. In the processing of green coffee beans wherein said beans are dried and thereafter roasted and said dried beans, which due to storage conditions have suffered marked damage and are no longer characterized by desirable flavor properties, the improvement which comprises treating the beans within a treatment chamber to improve the flavor properties in preparation for said roasting by the essential additional sequential steps of:

- tempering the previously dried green coffee beans in a first controlled atmosphere at atmospheric pressure at a first temperature range within a range of about 0 degrees C. to about 26 degrees C. and with a first humidity range within a range of about 45% to about 70% for not less than about 6 hours such that said tempering reduces the water content of the beans below that prior to said tempering;
  - heating and further humidifying the green beans tempered as in (a) in a second controlled atmosphere under atmospheric pressure for a period of at least 6 hours and not more than 24 hours such that flavor development is effected, at a second temperature higher than any temperature value in said first temperature range without substantially reducing said second temperature, wherein said second temperature ranges from about 10 degrees C. to about 30 degrees C. and a second humidity above any humidity value in said first humidity range without reduction below any humidity value in said first humidity range wherein said second humidity ranges from about 55% to about 90%; and
- said step (b) is carried forth in the presence of sufficient circulation of air through the treatment chamber to purge undesirable constituents evolved.

4,161,550

## MEAT AROMA PRECURSOR COMPOSITION

Christian A. Bernhardt, Fairfield, and Marvin J. Mohlenkamp, Jr., Colerain Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 21, 1977, Ser. No. 835,126

Int. Cl.<sup>2</sup> A23L 1/231

U.S. Cl. 426—533

14 Claims

1. A meat-like aroma precursor composition comprising:

- a hydrogen sulfide precursor;
- a dimethyl sulfide precursor; and
- an edible proteinaceous material wherein said hydrogen sulfide precursor, said dimethyl sulfide precursor, and said proteinaceous material are present in amounts effective to generate a meat-like aroma upon heating said precursor composition in an aqueous environment.





4,161,561

## MULTILAYER PLATE

Hans-Dietrich Krug, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,824  
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709644

Int. Cl.<sup>2</sup> B32B 3/26  
U.S. Cl. 428—213

5 Claims



1. A multilayer plate which is capable of being shaped comprising: a central foam sheet of a closed cell, cross-linked polyolefin, a sheet of metal capable of being shaped without wrinkling covering one surface of the polyolefin sheet, and a sheet of hard plastic capable of being shaped without wrinkling covering the other surface of the polyolefin sheet.
5. A multilayer plate as in claim 1, wherein the covering sheets are at least about 0.4 mm thick.

4,161,562

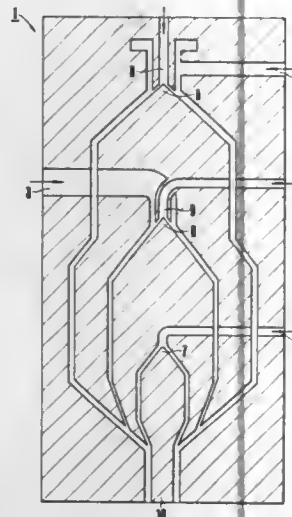
## BIAXIALLY STRETCHED FIVE-LAYER FILM FOR PACKAGING FOOD

Shinsuke Yoshikawa, Nobuyuki Hisazumi, and Masataka Yamamoto, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,135  
Claims priority, application Japan, Dec. 29, 1976, 51-159068  
Int. Cl.<sup>2</sup> B32B 7/02

U.S. Cl. 428—215

8 Claims



1. A biaxially stretched five-layer laminate film comprising: a first layer of an ionomer, an olefin homopolymer, an olefin copolymer or mixture of an olefin homopolymer with an olefin copolymer and having a thickness in the range of from 7 to 25μ; a fifth layer of an ionomer and having a thickness in the range of from 20 to 50μ; a second layer of an ethylene copolymer with a crystal-melting temperature 5° to 30° C. lower than that of the ionomer of said first or the ionomer of the fifth layer and having a thickness in the range of from 0.2 to 3μ; a third layer of a vinylidene chloride copolymer and having a thickness in the range of from 5 to 15μ; and a fourth layer of an ethylene copolymer with a crystal-melting point 5° to 30° C. lower than

that of the ionomer of said first or fifth layer and having a thickness in the range of from 0.2 to 3μ, the ratio of the thickness of said first layer to that of the fifth layer being in the range of from 0.4 to 0.6 and the total thickness of the film being in the range of from 35 to 90μ.

4,161,563

## PRINTED TEXTILE WEB MATERIAL

Gerhard Metzger, Halbach b. Aschaffenburg, Fed. Rep. of Germany, assignor to Transfertex Thermodruck-system GmbH, Kleinostheim, Fed. Rep. of Germany

Division of Ser. No. 779,301, Mar. 21, 1977. This application Mar. 20, 1978, Ser. No. 887,923

Int. Cl.<sup>2</sup> B32B 29/02

U.S. Cl. 428—233

6 Claims



1. A textile web material comprising a roll of textile, said textile having a heat-transfer printed face and an unprinted face, and a roll of a backing web, wherein said unprinted textile face is bonded by a heat-activatable adhesive to said backing web, whereby said material when unrolled provides a heat applied textile wall covering, and said textile can be peeled from said backing web with the covering applied to the wall.

4,161,564

## COATING FORMULATION, METHOD, AND COATED SUBSTRATE

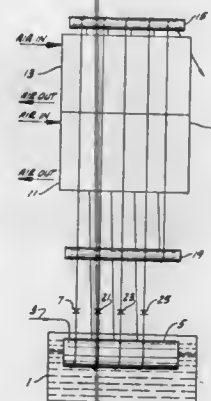
Thomas J. Legbandt, Long Beach, Calif., assignor to La Barge, Inc., St. Louis, Mo.

Division of Ser. No. 612,292, Sep. 11, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,854

Int. Cl.<sup>2</sup> H01B 7/18, 7/20

U.S. Cl. 428—381

4 Claims



1. An insulated conductor assembly comprising a conductor, a polyimide insulative cover surrounding said conductor, and over said cover a color coding topcoating comprising a poly(1,3-imidazolidine-2,4,5-trione) polymer, a coloring agent compatible with said imidazolidine-trione polymer, and a free radical scavenger in a proportion sufficient to inhibit cleavage and cross-linking of said imidazolidine-trione polymer by action of oxygen thereon.

4,161,565

## PLASTICIZER CONTAINING POLYVINYL BUTYRAL SHEETS HAVING A REDUCED ADHESION TO GLASS

Hans D. Hermann, Bad Soden am Taunus, and Joachim Ebigt, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,394  
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646280

Int. Cl.<sup>2</sup> C08K 5/17

U.S. Cl. 428—437

5 Claims

1. A glass laminate comprising at least two panes of glass adherent to a plastic interlayer, said interlayer being a plasticized polyvinylbutyral containing an adhesion-reducing amount of a betain.

4,161,566

## AQUEOUS DISPERSE COMPOSITIONS CONTAINING CLAY AND OLEAGINOUS FILM-FORMING MATERIALS

William A. Higgins, Gates Mills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 846,062, Oct. 27, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 918,008

Int. Cl.<sup>2</sup> C23F 11/16; C10M 7/38, 7/46

U.S. Cl. 428—454

54 Claims

1. An aqueous disperse composition, capable of irreversibly forming a coherent film, comprising (I) an internal phase comprising at least one film-forming, non-asphaltic, oleaginous material (A) and (II) an external phase comprising a clay-thickened water slurry (B-1) having a pH in the range of about 6 to about 9, said slurry containing, in addition to water and at least one clay (B-2), at least one flocculating agent (C).

42. A method for preparing an aqueous disperse composition, capable of irreversibly forming a coherent film, which comprises the steps of:

- I hydrating a thickening amount of at least one clay (B-2) to form an aqueous slurry (B-1);
- II treating the aqueous slurry (B-1) with at least one flocculating agent (C) to form a treated aqueous clay slurry or treated augmented aqueous clay slurry;
- III reacting at least one carboxylic acid (D) with at least one overbased salt of an organic acid (E) to form a film-forming oleaginous material (A); and
- IV combining the oleaginous material with the aqueous clay slurry (B-1) to form a disperse composition having the oleaginous material (A) or material (F) comprising the internal phase and the aqueous clay slurry (B-1) comprising the external phase.

4,161,567

## PANELS FOR INDUSTRIAL DRYERS AND OTHER HEATED ENCLOSURES HAVING STAINLESS STEEL END STRUCTURAL SHEET ELEMENTS

Lloyd F. Sturgeon, Orelana, Pa., assignor to Proctor & Schwartz, Inc., Philadelphia, Pa.

Filed Sep. 12, 1977, Ser. No. 832,423

Int. Cl.<sup>2</sup> B32B 15/18; E04C 2/08

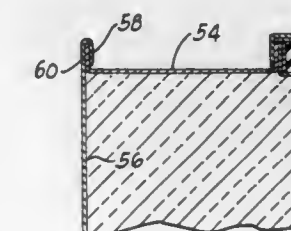
U.S. Cl. 428—594

8 Claims

1. A structural heat-insulation panel for high temperature industrial dryers and such other heated enclosures comprising inner and outer opposed metallic sheets in generally parallel, spaced-apart planes, one of said sheets being exposed to higher temperature than the other sheet, said sheets defining a space therebetween; insulation means in said space; end structural sheet elements connecting said inner and outer sheets together and enclosing said space; said end sheet elements having sufficient strength to act as load bearing members between the inner and outer sheets;

said end sheet elements being of low heat conductivity stainless steel.

3. A structural heat-insulation panel for high temperature industrial dryers and such other heated enclosures comprising inner and outer opposed metallic sheets in generally parallel, spaced-apart planes, one of said sheets being exposed to higher temperature than the other sheet, said sheets defining a space therebetween; insulation means in said space; end structural sheet elements connecting said inner and outer sheets together along lines of connection and enclosing said space; said end sheet elements having sufficient strength to act as load bearing members between the inner and outer sheets and being of low heat conductivity stainless steel; said end sheet elements or panels or both being embossed



along said lines of connection to reduce the heat flow between the inner and outer panels.

5. A structural heat-insulation panel for high temperature industrial dryers and such other heated enclosures comprising inner and outer opposed metallic sheets in generally parallel, spaced-apart planes, one of said sheets being exposed to higher temperature than the other sheet, said sheets defining a space therebetween; insulation means in said space; end structural sheet elements connecting said inner and outer sheets together along lines of connection and enclosing said space; said end sheet elements having sufficient strength to act as load bearing members between the inner and outer sheets and being of low heat conductivity stainless steel; said outer sheet being painted on its outer surface with a heat emissive paint.

4,161,568

## BATTERY HOLDER

John Lund, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Jan. 11, 1978, Ser. No. 868,721

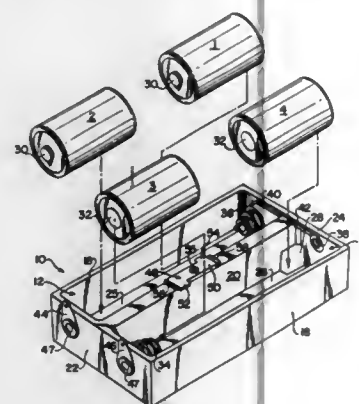
Int. Cl.<sup>2</sup> H01M 2/10

U.S. Cl. 429—99

2 Claims

1. A holder for batteries of the type having terminals of opposite polarity at opposite ends of the battery, said holder comprising a generally rectangular tray having a pair of parallel compartments, each with a bottom wall, a pair of parallel side walls, a pair of parallel end walls, and an open top, one of said side walls separating said compartments and being common to both compartments, each compartment being dimensioned to receive a pair of said batteries in a series between its end walls and having contact means inside its end walls for engaging adjacent battery terminals, the contact means at one end wall of one compartment and the opposite end wall of the other compartment being spring biased to urge the batteries of each compartment into engagement with one another, means interconnecting the contact means at one end of one compartment with the contact means at the same end of the other compartment so that all of said batteries may be connected in a series circuit, each compartment being dimensioned to permit the batteries therein to move somewhat under mechanical shock forces while being held in engagement with one another

by the bias of the associated spring biased contact means, and retainer means projecting from said common side wall laterally over one of said batteries in each compartment that engages the spring biased contact means of the compartment, but not over an adjacent battery of that compartment, whereby said one battery in each compartment, but not the adjacent battery in that compartment, is held against removal from its normal position in that compartment through the open top of that compartment, and whereby said one battery in each compart-



ment can be shifted in its compartment to the normal position of the adjacent battery in that compartment for removal from that compartment after the adjacent battery therein has been removed, said retainer means comprising a single piece that is substantially Z-shaped in the plane of the open tops of the compartments and that has a stem centrally mounted on said common side wall and a pair of branches projecting oppositely over said one battery in each of said compartments, respectively.

4,161,569

# COMPOSITE ELECTRODE FOR STORAGE BATTERIES, ACCUMULATORS AND THE LIKE

Peter Faber, Karlstein, Fed. Rep. of Germany, assignor to Rhenisch-Westfälisches Elektrizitätswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,184

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710907

Int. Cl.<sup>2</sup> H01M 4/72

U.S. Cl. 429—234

9 Claims



1. A composite electrode for storage batteries and the like, comprising:
  - a metal support provided with a multiplicity of through-going openings, respective synthetic-resin layers consti-

tuted as openwork sheets and flanking said support, said synthetic-resin layers bending toward one another into said openings and being directly fused together through the openings in said support and at points within said openings, an active mass received in the openwork of at least one of said synthetic-resin layers.

4,161,570

# PROCESS FOR THE PRODUCTION OF RADIATION CURABLE COATING COMPOSITIONS CONTAINING MICROCAPSULES

Yu-Sun Lee, Parma, Ohio, and Dale R. Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 29, 1977, Ser. No. 792,326

Int. Cl.<sup>2</sup> C08J 9/32

U.S. Cl. 521—53

14 Claims

1. A process for the preparation of a radiation curable coating composition for use in the manufacture of carbonless copy paper, said coating composition being capable of being set to a solid without the application of heat, said radiation curable coating composition containing microcapsules comprising the steps of:

- (a) providing a dispersion of substantially discrete microcapsules in a continuous phase, said continuous phase comprising a liquid volatile solvent, said microcapsules containing a solution of chromogenic material, said microcapsules being impermeable to said solution of chromogenic material;
- (b) providing a liquid radiation curable suspending medium, said liquid radiation curable suspending medium comprising one or more ethylenically unsaturated organic compounds having at least one terminal ethylenic group per molecule, said radiation curable suspending medium being polymerizable by ultraviolet or ionizing radiation to a solid resin;
- (c) mixing said dispersion of substantially discrete microcapsules in said continuous phase and said liquid radiation curable suspending medium with turbulent agitation to form an intimate mixture of said dispersion of microcapsules and said liquid radiation curable suspending medium said mixing taking place without displacement of said solution of chromogenic material from said microcapsules; and
- (d) applying heat and vacuum to said mixture, while maintaining said agitation, until said liquid volatile solvent is substantially removed from said mixture to form a dispersion of substantially discrete microcapsules in said liquid radiation curable suspending medium, said heat and vacuum being applied without displacement of said solution of chromogenic material from said microcapsules, said heat being applied to maintain said mixture at a temperature above the boiling point of said volatile solvent at said vacuum.

4,161,571

# PROCESS FOR PRODUCTION OF THE MALEIC ANHYDRIDE ADDUCT OF A LIQUID POLYMER

Seimei Yasui, Takarazuka, and Takao Oshima, Sonelgashi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 733,914, Oct. 19, 1976, Pat. No. 4,080,493.

This application Oct. 18, 1977, Ser. No. 843,311

Int. Cl.<sup>2</sup> C08F 8/46

U.S. Cl. 526—90

16 Claims

1. A process for the production of the maleic anhydride adducts of a liquid polymer having a maleic anhydride addition amount of 2 to 70% by weight, which comprises reacting a liquid polymer having a molecular weight of 150 to 5,000 and a viscosity of 2 to 50,000 centipoise at 30° C., said liquid polymer being selected from the group consisting of liquid polybutadienes, liquid polyisoprenes and liquid copolymers comprising units of butadiene or isoprene and units of at least one

compound selected from the group consisting of other diolefins, olefins and aromatic vinyl compounds, with maleic anhydride in the presence of at least one compound, as a gelatin inhibitor, selected from the group consisting of:

- (a) organic salts of iron, organic complexes of iron, chelate compounds of iron and inorganic compounds of iron;
- (b) chlorides, bromides and iodides of the elements belonging to Groups (III), (IV), (V) or (VI) of the Periodic Table, and ether complexes, ester complexes and aldehyde complexes thereof; and
- (c) alkyl metal halides of the formula:



wherein M' is a metal belonging to Group (III) or (IV) of the Periodic Table, R is alkyl having 1 to 8 carbon atoms, Y is chlorine, bromine or iodine, m is an atomic valence of the metal M', and n is a positive integer smaller than m.

4,161,572

# CURABLE DIALLYL PHTHALATE COMPOUNDS AND PROCESS FOR PRODUCING SAME

Kazuya Yonezawa, Hisao Furukawa, and Masaaki Azuma, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1978, Ser. No. 936,378

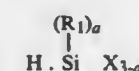
Claims priority, application Japan, Aug. 29, 1977, 52-103902

Int. Cl.<sup>2</sup> C08F 8/18, 8/32, 8/34, 8/00

U.S. Cl. 525—100

1 Claim

1. A process for producing curable diallyl phthalate compound wherein diallyl phthalate monomer or diallyl phthalate prepolymer having a molecular weight of 20,000 or less, is reacted with a hydrosilane compound represented by the formula:



wherein R<sub>1</sub> is a monovalent hydrocarbon group having 1 to 10 carbon atoms; X is a group selected from the group consisting of halogen, alkoxy, acyloxy, aminoxy, phenoxy, thioalkoxy and amino groups; and "a" is an integer 0, 1 or 2; at a temperature of between 50° and 150° C.

4,161,573

# PROCESS FOR MAKING POLYSTYRENE

Jeffrey A. Gunsher, Midland; Joseph L. Garner, Sanford, both of Mich., and Conrad O. M. Miller, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 715,585, Aug. 18, 1976, abandoned.

This application Jul. 25, 1977, Ser. No. 818,686

Int. Cl.<sup>2</sup> C08F 112/08

U.S. Cl. 526—64

21 Claims

1. A continuous process for making a polystyrene having a  $M_w$  between about 1,000 and about 50,000 and a  $M_w/M_n$  ratio of less than about 8 comprising staged contacting of a solution of styrene monomer in a first inert organic diluent with a cation generator, in 2 or more stages, under substantially isothermal conditions in each stage, at a temperature between about 0° C. and about 120° C. in a manner such that said styrene monomer, prior to the final contact stage, is always present in said staged contacting in greater than a stoichiometric amount with respect to said cation generator.

4,161,574

# PROPYLENE-TERPOLYMERS

Helmut Strametz, and Kurt Rust, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,711

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637990

Int. Cl.<sup>2</sup> C08F 4/64, 210/08

U.S. Cl. 526—159

1 Claim

1. A process for the preparation of a propylene terpolymer consisting by weight of 93.2 to 99.0% propylene units, 0.5 to 1.9% ethylene units and 0.5 to 4.9% butene-(1) units which comprises copolymerizing propylene, ethylene and butene-(1) in an inert diluent, liquid propylene or in the gaseous phase in the presence of a mixed catalyst consisting of a TiCl<sub>3</sub>-containing compound and an activator, and maintaining the weight ratio of ethylene to butene-(1) smaller than 1:1 to obtain said terpolymer.

4,161,575

# CATALYST FOR EPOXY POWDER COATINGS

John P. Seymour, Marcus Hook; Rocco L. Mascioli, Media; Burton D. Belchman, Springfield, and Phillip J. Zaluska, Schnecksville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 12, 1978, Ser. No. 950,907

Int. Cl.<sup>2</sup> C08G 59/68

U.S. Cl. 528—90

3 Claims

1. In a process for curing a finely divided 1-2-epoxy resin having a lower softening point of not less than 40° C. by heating said epoxy resin to an elevated temperature in the presence of a catalyst, the improvement which comprises heating said epoxy resin in the presence of a triethylene diamine salt of thiocyanic acid.

4,161,576

# CONTROL OF PROCEDURES FOR FORMATION OF WATER-IMMISCIBLE THERMOSETTING PHENOL-FORMALDEHYDE RESINS

Ramesh C. Vasisht, Delta, Canada, assignor to Cor Tech Research Ltd., Richmond, Canada

Division of Ser. No. 779,621, Mar. 21, 1977. This application

Nov. 29, 1977, Ser. No. 855,738

Int. Cl.<sup>2</sup> C08G 8/10

U.S. Cl. 528—139

7 Claims

1. A process for the production of a water-immiscible thermosetting phenol-formaldehyde resin characterized by a large proportion of the linkages between benzene rings being benzyl ether linkages located ortho to the phenolic hydroxyl group, by reaction of formaldehyde with phenol at a mole ratio of at least 1:1 in an essentially aqueous reaction medium containing at least one water-soluble metal carboxylate catalyst for the reaction, said catalyst having the formula  $(C_nH_{2n+1}COO)_xM$  where n is an integer from 0 to 10, x is greater than 1 and M is a metal having an atomic number of from 21 to 30, which comprises conducting exothermic methylation of phenol by formaldehyde at an elevated temperature in excess of about 60° C., thereafter conducting polymerization of the methylolated phenol by heating the reaction medium resulting from the methylation reaction at a temperature in excess of about 90° C. for a time insufficient to cause separation of a water-immiscible resin phase from the aqueous phase at that temperature, cooling the reaction medium to cause separation of a low viscosity water-immiscible resin phase from the aqueous phase, said low viscosity resin phase being characterized by a large proportion of the linkages between benzene rings being benzyl ether linkages located ortho to the phenolic hydroxyl groups, recovering the low viscosity resin phase from the aqueous phase, heating said recovered low viscosity resin at a temperature below its thermosetting temperature for a sufficient time to increase the viscosity thereof to a desired higher value, and



recovering the higher viscosity thermosetting phenolformaldehyde resin so formed.

4,161,577

## CATIONIC DYEABLE COPOLYESTERS

John A. Price, Swarthmore, Pa., and Hugo Stange, Princeton, N.J., assignors to Avtex Fibers Inc., Valley Forge, Pa.

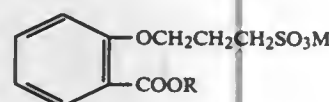
Continuation-in-part of Ser. No. 43,600, Jun. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 855,033, Sep. 3, 1969, abandoned. This application Nov. 24, 1972, Ser. No. 309,274

Int. Cl.<sup>2</sup> C08G 63/66, 63/68

U.S. Cl. 528—173

3 Claims

1. A fiber-forming copolyester resin comprising the condensation polymerization product of terephthalic acid or its lower dialkyl ester, an aliphatic glycol and a substituted aromatic acid ester represented by the



where R is a lower alkyl radical having 1 to 4 carbon atoms and M is an alkali metal selected from the group consisting of sodium, potassium and lithium and the carboxylate group is in the ortho position with respect to the metal propoxy sulfonate group, said substituted aromatic acid ester being present in an amount sufficient to improve the basic dyeability of the copolyester resin.

4,161,578

## PROCESS FOR SOLID PHASE POLYMERIZATION OF POLYESTER

Dale J. Herron, Minneapolis, Minn., assignor to Bepex Corporation, Santa Rosa, Calif.

Filed May 12, 1978, Ser. No. 905,226

Int. Cl.<sup>2</sup> C08G 63/18

U.S. Cl. 528—272

8 Claims

1. A process for continuous production of high molecular weight polyethylene terephthalate by polycondensation in the solid phase from a dried granulated polyethylene terephthalate having a beginning intrinsic viscosity of at least 0.4 without occurrence of stickiness of the granulate, which process comprises:

- crystallizing the polymer by heating at a temperature in the range of about 180° to 220° C. under forced motion and under an inert gas atmosphere for a residence time less than about 1.5 hours;
- discharging the crystallized product at a temperature of at least 180° C., a density of at least 1.385 grams per cubic centimeter, and a moisture content of less than 0.02 percent by weight;
- continuously introducing the crystallized granulate to a continuous fixed bed reactor and polycondensing in contact with an inert gas at a temperature in the range of about 210° to 235° C. to achieve a reaction temperature within the range of about 200° to 230° C. and higher than the crystallization temperature, whereby polycondensation takes place and sticking of the granulate is avoided; and
- continuously removing the polycondensed granulate flowing from the reaction zone.

4,161,579  
EXTRUSION GRADE POLYETHYLENE  
TEREPHTHALATE

Robert Edelman, Staten Island, N.Y.; Frank M. Berardinelli, Millington, and Kurt F. Wissbrun, Short Hills, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,674

Int. Cl.<sup>2</sup> C08G 63/76, 63/70

U.S. Cl. 525—444

15 Claims

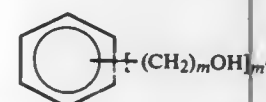
1. A high melt-strength, gel-free, branched polyethylene terephthalate polymer, suitable for extrusion blow molding applications, comprising polyethylene terephthalate which has been modified by the incorporation of: (a) from about 0.025 to about 1.5 mol percent of chain branching agent selected from one or more members of the group consisting of pentaerythritol; compounds having the formula:



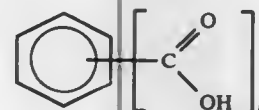
wherein R<sup>1</sup> is a saturated aliphatic hydrocarbon radical containing from 3 to 6 carbon atoms and k is an integer from 3 to 6; compounds having the formula:



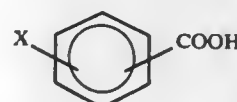
wherein R<sup>2</sup> is a saturated aliphatic hydrocarbon radical containing from 1 to 6 carbon atoms and wherein l is an integer from 3 to 6; compounds having the formula:



where m is an integer from 1 to 6 and m' is an integer from 3 to 6; and compounds having the formula:



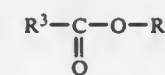
wherein n is an integer from 3 to 4; and (b) from about 0.25 to about 10 equivalents based on the number of moles of (a) of a chain terminating agent, the chain terminating agent having a boiling point of above about 200° C. and being stable at temperatures of up to about 305° C. and selected from one or more members of the group consisting of aromatic monocarboxylic acids having the formula:



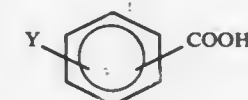
wherein X is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen, and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:



where p is an integer from 1 to 3; substituted and unsubstituted, saturated and unsaturated aliphatic monocarboxylic acids having from 6 to 30 carbon atoms; substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; monofunctional esters having the formula:



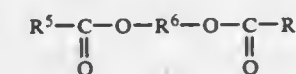
wherein R<sup>3</sup> is an organic radical derived from a member selected from the group consisting of aromatic monocarboxylic acids having the formula:



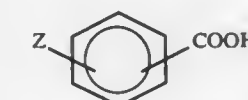
wherein Y is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:



where q is an integer from 1 to 3; substituted and unsubstituted aliphatic monocarboxylic acids having from 6 to 30 carbon atoms; and substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; and wherein R<sup>4</sup> is a member selected from the group consisting of benzyl radicals and aliphatic radicals having from 1 to 18 carbon atoms; and which are the reaction product of an alcohol and a monocarboxylic acid; and difunctional esters having the formula



wherein R<sup>5</sup> is an organic radical derived from a member selected from the group consisting of aromatic monocarboxylic acids having the formula:



wherein Z is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen, and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:



where r is an integer from 1 to 3; substituted and unsubstituted, saturated and unsaturated aliphatic monocarboxylic acids having from 1 to 30 carbon atoms; and substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; and wherein R<sup>6</sup> is a member selected from the group consisting of saturated aliphatic radicals having from 2 to 18 carbon atoms and saturated alicyclic radicals having from 5 to 18 carbon atoms; and which are the reaction product of a diol and a monocarboxylic acid; the modified polyethylene terephthalate having a zero shear rate melt viscosity at a temperature in the range of from about 265° C. to about 300° C. of from about 10<sup>5</sup> to about 10<sup>6</sup> poise and a melt viscosity at a shear rate of about 10<sup>3</sup> seconds<sup>-1</sup> and at a temperature in the range of

from about 265° C. to about 300° C. of from about 10<sup>3</sup> to about 10<sup>4</sup> poise.

4,161,580

THERMOSETTING MIXTURES OF POLYIMIDE  
BETA-AMINO CROTONIC ACID DERIVATIVE AND  
POLYAMINE WHICH ARE STABLE ON STORAGE

Theobald Haug, Frenkendorf; Jürg Keifer, Reinach; Peter Ruf, Binningen, all of Switzerland, and Andre Schmittler, Hegenheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 588,529, Jun. 19, 1975, Pat. No. 4,089,845.

This application Feb. 21, 1978, Ser. No. 879,283

Claims priority, application Switzerland, Jul. 2, 1974, 9050/74

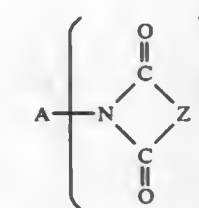
Int. Cl.<sup>2</sup> C08G 69/08

U.S. Cl. 528—322

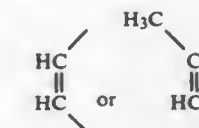
12 Claims

1. A storage-stable, heat-curable, thermosetting composition of matter which consists essentially of

(a) a polyimide of a saturated dicarboxylic acid of formula I

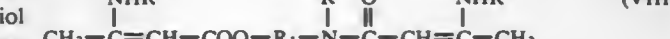
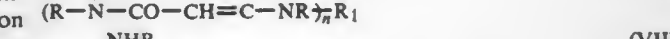
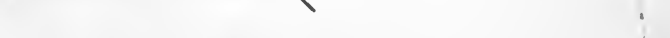
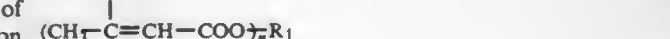
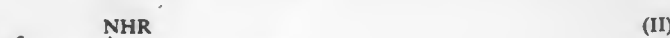


wherein A denotes a x-valent organic radical of at least 2 and at most 30 carbon atoms, Z denotes a radical of the formula



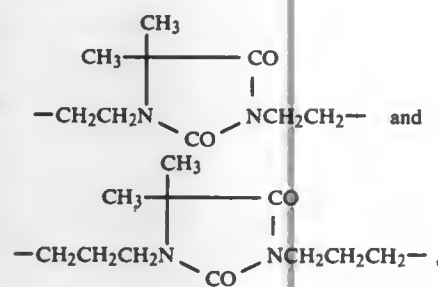
and x denotes the number 2 or 3, or a mixture of said polyimides;

(b) a beta-aminocrotonic acid derivative or mixture of said derivatives selected from the group consisting of those of the formulae II to VIII

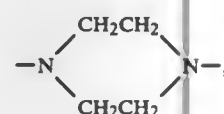


wherein each of R and R<sub>2</sub> denotes a hydrogen atom, a linear, branched or cyclic hydrocarbon radical having up to 9 carbon atoms, R<sub>1</sub> denotes a n-valent linear, branched

or cyclic hydrocarbon radical having up to 20 carbon atoms or a heterocyclic radical selected from the group consisting of

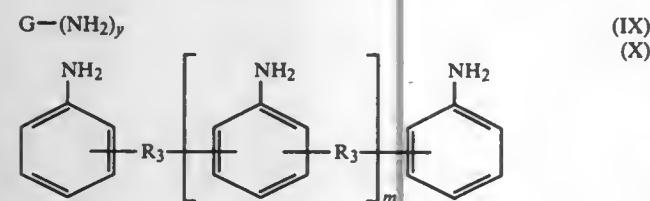


T together with both nitrogen atoms denotes



x denotes an oxygen atom or the —NH— group, E denotes the allyl or furfuryl radical which is suitable to undergo polymerization reactions, and n is a number from 2 to 4; and

(c) a polyamine or a mixture of polyamines selected from the group consisting of those of formulae IX and X



wherein G denotes a y-valent organic radical with 2 to 40 carbon atoms, y is an integer from 2 to 4, R<sub>3</sub> each denote a divalent hydrocarbon radical of an aldehyde or ketone with 1 to 8 carbon atoms resulting from removal of the oxygen atom, and m is a number from 0.1 to 2; and wherein said composition contains 0.25 to 1.0 equivalent of the sum of beta-aminocrotonyl group (b) equivalents plus primary amino group (c) equivalents per each 1.0 equivalent of imide groups (a), the content of primary amino group equivalents, referred to the sum of the equivalents of beta-aminocrotonyl groups plus primary amino groups, being at most 90% of the sum.

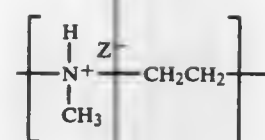
**4,161,581**  
**POLY-[(DIALKYL AND HYDROXY-DIALKYL-IMINO)ETHYLENE HALIDES] AND PROCESS**  
Arthur F. Wagner, Princeton; Nathaniel Grier, Englewood, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.  
Continuation-in-part of Ser. No. 462,263, Apr. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,042, Jun. 11, 1973, abandoned. This application Sep. 29, 1977, Ser. No. 837,980  
Int. Cl.<sup>2</sup> C08G 73/02

U.S. Cl. 525—411

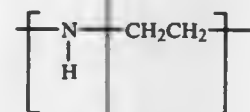
4 Claims

1. A method of preparing a linear unbranched non-cross-linked polymer comprising repeating units of the formula

wherein R<sub>4</sub> is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo and nitro and



where Z<sup>-</sup> is a counteranion, which comprises admixing a polymer comprising repeating units of the formula



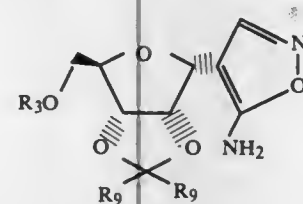
with an excess of aqueous formaldehyde and formic acid, and heating the resulting admixture to a temperature of from 30° to 100° C. for up to 100 hours wherein a mixture of 97 to 100% formic acid and aqueous formaldehyde is employed and, following the heating of said admixture, there is then added to the reaction mixture an aqueous mineral acid HZ, and the aqueous acidic mixture is subjected to distillation under reduced pressure thereby removing reagents and by-products.

**4,161,582**  
**PROCESS TO PRODUCE OXAZINOMYCIN**  
Manfred Welgele, North Caldwell, and Silvano DeBernardo, Upper Montclair, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.  
Division of Ser. No. 743,887, Nov. 22, 1976, Pat. No. 4,096,321.  
This application Mar. 20, 1978, Ser. No. 890,550  
Int. Cl.<sup>2</sup> C07G 3/00

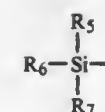
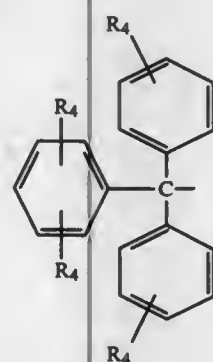
U.S. Cl. 536—1

1. A compound of the formula

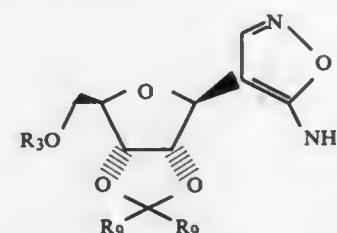
4 Claims



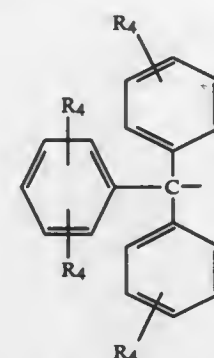
wherein R<sub>9</sub> is hydrogen or lower alkyl and R<sub>3</sub> is selected from the group consisting of



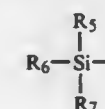
wherein R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> are lower alkyl.  
2. A compound of the formula



wherein R<sub>9</sub> is hydrogen or lower alkyl and R<sub>3</sub> is selected from the group consisting of



wherein R<sub>4</sub> is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo and nitro, and



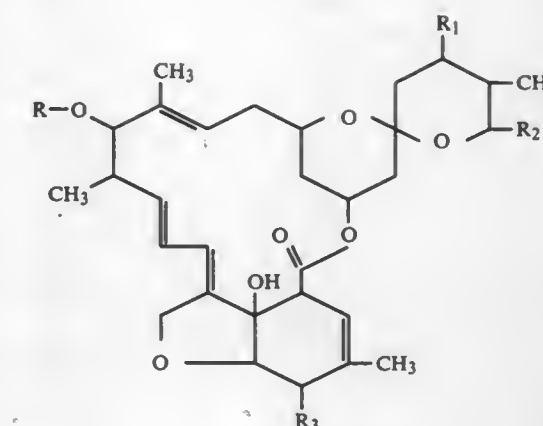
wherein R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> are lower alkyl.

**4,161,583**  
**METHOD FOR THE SEPARATION AND PURIFICATION OF ANTIBIOTIC MACROLIDES**  
Kenneth E. Wilson, Woodbridge, and Thomas W. Miller, Carteret, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.  
Filed Oct. 3, 1977, Ser. No. 839,094  
Int. Cl.<sup>2</sup> C07H 17/08

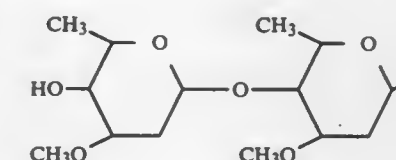
U.S. Cl. 536—17 A

7 Claims

1. A method for purifying crude C-076 extract solutions obtained from the fermentation of a C-076 producing strain of *Streptomyces avermitilis*, wherein the C-076 compounds have the structure:



wherein R is:



and wherein

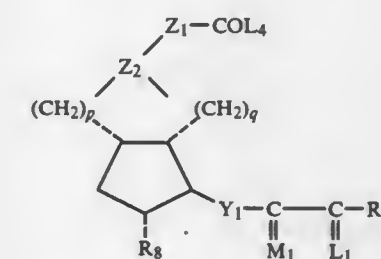
the broken line indicates a single or a double bond;  
R<sub>1</sub> is hydroxy and is present only when said broken line indicates a single bond;  
R<sub>2</sub> is propyl or butyl; and  
R<sub>3</sub> is methoxy or hydroxy, which comprises:  
(a) dissolving said crude extract solution into a low boiling hydrocarbon solvent;  
(b) extracting said low boiling hydrocarbon solution with ethylene glycol;  
(c) extracting the ethylene glycol extract with an organic solvent selected from ethyl ether, ethyl acetate, chloroform, or benzene;  
(d) recovering the purified C-076.

**4,161,584**  
**CYCLOAMIDES OF NITRILOPROSTACYCLINS**  
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
Continuation-in-part of Ser. No. 807,514, Jun. 17, 1977, Pat. No. 4,097,489. This application Apr. 5, 1978, Ser. No. 893,586  
Int. Cl.<sup>2</sup> C07D 221/16

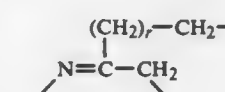
U.S. Cl. 542—421

49 Claims

1. A prostacyclin analog of the formula



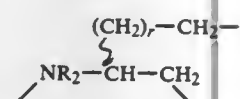
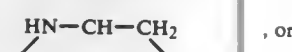
wherein R<sub>8</sub> is hydrogen, hydroxy, or hydroxymethyl  
wherein Z<sub>2</sub> is



(1)



-continued  
(CH<sub>2</sub>)<sub>r</sub>-CH<sub>2</sub>-



wherein R<sub>2</sub> is alkyl of one to 4 carbon atoms, inclusive, or alkylcarbonyl of one to 4 carbon atoms, inclusive;  
wherein one of p, q, and r is the integer one and the other two are the integer zero;

wherein Z<sub>1</sub> is

- (1) -(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-CH<sub>2</sub>-,
- (2) -(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-CF<sub>2</sub>-, or
- (3) trans-(CH<sub>2</sub>)<sub>g</sub>-CH=CH-

wherein g is the integer zero, one, or 2;

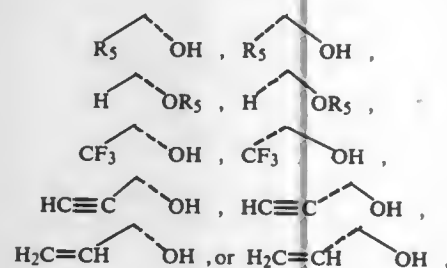
wherein R<sub>4</sub> is hydrogen, hydroxy, or hydroxymethyl;

wherein Y<sub>1</sub> is

- (1) trans-CH=CH-,
- (2) cis-CH=CH-,
- (3) -CH<sub>2</sub>CH<sub>2</sub>-,
- (4) trans-CH=C(Hal)-, or
- (5) -C≡C-

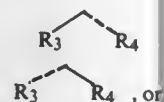
wherein Hal is chloro or bromo;

wherein M<sub>1</sub> is

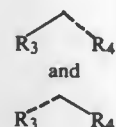


wherein R<sub>5</sub> is hydrogen or alkyl with one to 4 carbon atoms, inclusive

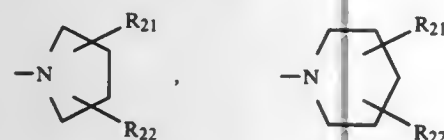
wherein L<sub>1</sub> is



a mixture of

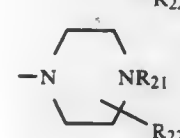
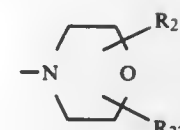


wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro; wherein L<sub>4</sub> is cycloamino selected from the group consisting of

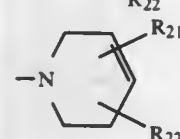
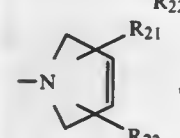
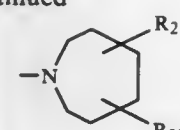


(2)

(3)



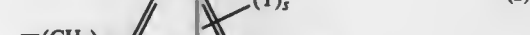
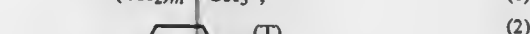
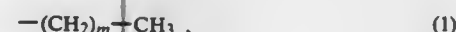
or



wherein R<sub>21</sub> and R<sub>22</sub> are

- (i) hydrogen;
- (ii) alkyl of one to 12 carbon atoms, inclusive;
- (iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
- (iv) aralkyl of 7 to 12 carbon atoms, inclusive;
- (v) phenyl;
- (vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxy, carbonyl of one to 4 carbon atoms, inclusive, or nitro;
- (vii) carboxyalkyl of one to four carbon atoms, inclusive;
- (viii) carbamoylalkyl of one to four carbon atoms, inclusive;
- (ix) cyanoalkyl of one to four carbon atoms, inclusive;
- (x) acetylalkyl of one to four carbon atoms, inclusive;
- (xi) benzoylalkyl of one to four carbon atoms, inclusive;
- (xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxy, carbonyl of one to four carbon atoms, inclusive, or nitro;
- (xiii) pyridyl;
- (xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; or alkoxy of one to 3 carbon atoms, inclusive;
- (xv) pyridylalkyl of one to 4 carbon atoms, inclusive;
- (xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms;
- (xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
- (xviii) dihydroxyalkyl of one to 4 carbon atoms, and
- (xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R<sub>21</sub> and R<sub>22</sub> is other than hydrogen or alkyl;

wherein R<sub>7</sub> is



wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when R<sub>2</sub> is not alkylcarbonyl.

4,161,585

### 5-HYDROXY-PGI<sub>1</sub>, 3,4-DIDEHYDROPIPERIDYLAMIDES

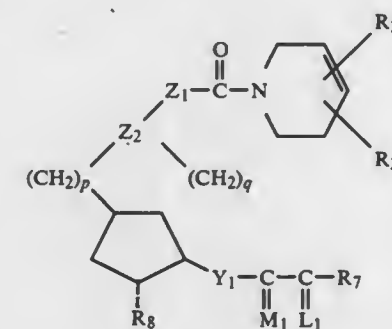
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.  
Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,204

Int. Cl.<sup>2</sup> C07D 405/02

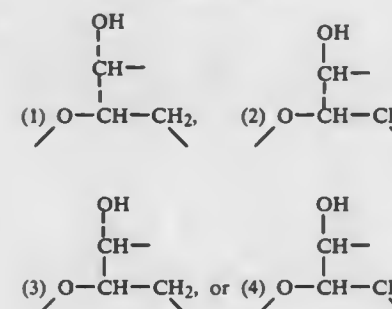
U.S. Cl. 542-426

47 Claims

1. A prostacyclin analog of the formula



wherein Z<sub>2</sub> is



wherein one of p or q is the integer zero or one and the other is the integer zero;

wherein Z<sub>1</sub> is

- (1) -(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-CH<sub>2</sub>-,
- (2) -(CH<sub>2</sub>)<sub>g</sub>-CH<sub>2</sub>-CF<sub>2</sub>-, or
- (3) trans-(CH<sub>2</sub>)<sub>g</sub>-CH=CH-

wherein g is the integer one, 2, or 3 when q is zero and zero, one, or 2 when q is one;

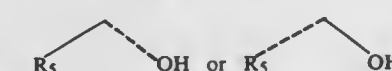
wherein R<sub>8</sub> is hydrogen, hydroxy, or hydroxymethyl;

wherein Y<sub>1</sub> is

- (1) trans-CH=CH-,
- (2) cis-CH=CH-,
- (3) -CH<sub>2</sub>CH<sub>2</sub>-,
- (4) trans-CH=C(Hal)-, or
- (5) -C≡C-

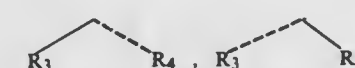
wherein Hal is chloro or bromo;

wherein M<sub>1</sub> is



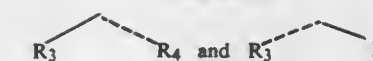
wherein R<sub>5</sub> is hydrogen or alkyl with one to 4 carbon atoms, inclusive;

wherein L<sub>1</sub> is



or a mixture of

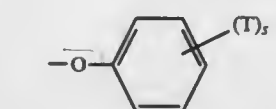
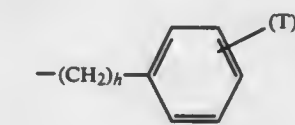
-continued



wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro; wherein R<sub>21</sub> and R<sub>22</sub> are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxy, carbonyl of one to 4 carbon atoms, inclusive; and

wherein R<sub>7</sub> is

- (1) -(CH<sub>2</sub>)<sub>3</sub>-CH<sub>3</sub>,



wherein h is the integer zero or one; s is the integer zero, one, 2, or 3; and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl.

4,161,586

### 5-HYDROXY-PGI<sub>1</sub> PIPERAZINYLAMIDES

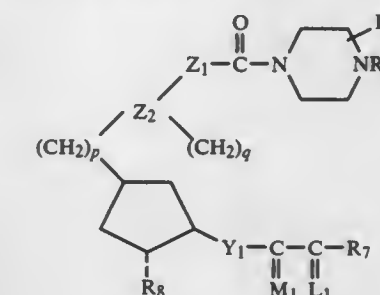
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.  
Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,202

Int. Cl.<sup>2</sup> C07D 405/06

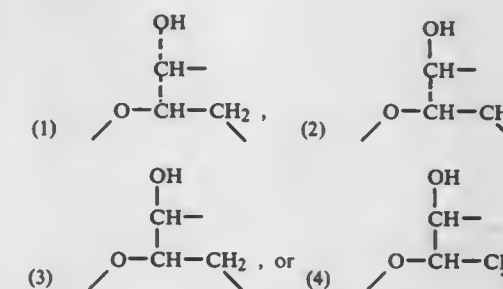
U.S. Cl. 542-426

47 Claims

1. A prostacyclin analog of the formula



wherein Z<sub>2</sub> is



wherein one of p or q is the integer zero or one and the other is the integer zero;

R<sup>1</sup> is alkyl of 1 to 16 carbon atoms or is phenyl which is unsubstituted or substituted by alkyl of 1 to 4 carbon



atoms, alkoxy of 1 to 4 carbon atoms, chlorine or bromine, or is phenalkyl of 7 to 10 carbon atoms and  $R^2$  is hydrogen, or  $R^1$  and  $R^2$  together are a trimethylene bridge which is unsubstituted or in which one, two or three H atoms are replaced by alkyl of 1 to 12 carbon atoms, and B is N-morpholinyl, which is unsubstituted or substituted by one or two methyl, or is N-thiomorpholinyl-S-dioxide, N-(N'-alkyl)-piperazinyl (where alkyl is of 1 to 4 carbon atoms) or N-isindolinyl.

#### 4,161,590 FLUORINATED AMPHOTERIC AND CATIONIC SURFACTANTS

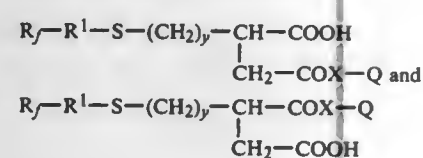
Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 538,432, Jan. 3, 1975, Pat. No. 4,069,244. This application Jan. 12, 1978, Ser. No. 868,771

Int. Cl.<sup>2</sup> C07D 295/14

U.S. Cl. 544—159

1. Compounds of the formulae



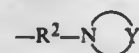
wherein

$R_7$  is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;

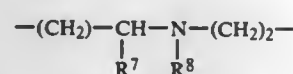
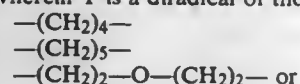
$R^1$  is branched or straight chain alkylene of 1 to 12 carbon atoms, alkyleneethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms or alkyleneiminoalkylene of 2 to 12 carbon atoms where the nitrogen atom contains as a third substituent, hydrogen or alkyl of 1 to 6 carbon atoms;

$y$  is 1 or zero;

$X$  is  $-NR-$ , wherein  $R$  is hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms; and  $Q$  is a cyclic amino group selected from



wherein  $Y$  is a diradical of the formulae



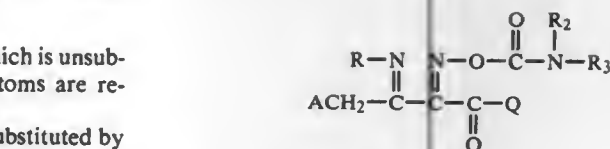
$R^2$  is a linear or branched alkylene of 2 to 12 carbon atoms, oxygen or sulfur interrupted linear or branched alkylene of up to 60 carbon atoms or hydroxyl substituted alkylene.  $R^7$  and  $R^8$  are independently hydrogen, a lower alkyl or hydroxy-lower alkyl group of 1 to 6 carbon atoms.

4,161,591  
BUTYRAMIDES AND BUTYRATES  
Russell F. Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Division of Ser. No. 463,987, Apr. 25, 1974, Pat. No. 4,059,623, which is a continuation-in-part of Ser. No. 369,606, Jun. 13, 1973, abandoned. This application Oct. 25, 1977, Ser. No. 845,053

Int. Cl.<sup>2</sup> C07C 103/22; C07D 295/12, 295/22

U.S. Cl. 544—164

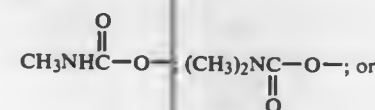
1. A compound of the formula



, when  $Q$  is  $-OR_4$ .

$A$  is hydrogen or methyl;

$R$  is  $C_1$ - $C_{18}$  alkyl;  $C_3$ - $C_4$  alkenyl;  $C_5$ - $C_7$  cycloalkyl optionally substituted with methoxy or with 1 or 2 methyl groups;  $C_6$ - $C_8$  cycloalkylalkyl;  $C_1$ - $C_3$  alkoxy; alkoxyalkyl with a total of 3-6 carbon atoms; benzyl; phenethyl;  $(CH_3)_2N-$ ;  $(CH_3)_2CH_2N-$ ;  $(C_2H_5)_2N-$ ; 1-(4-methylpiperazinyl); N-morpholino;



wherein:

$R_1$  is hydrogen, methyl, methoxy,

$(CH_3)_2N-$ ,  $CH_3S-$ , or fluorine;

$R_2$  is hydrogen, methyl, or ethyl;

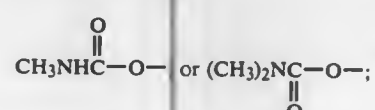
$R_3$  is methyl, ethyl, or allyl;

$R_4$  is  $C_1$ - $C_2$  alkyl;

and when  $Q$  is  $-NR_5R_6$ ,

$A$  is hydrogen or methyl;

$R$  is  $(CH_3)_2N-$ ;  $(CH_3)_2CH_2N-$ ;  $(C_2H_5)_2N-$ ; 1-(4-methylpiperazinyl); N-morpholino;



$R_2$  is hydrogen, methyl, or ethyl;

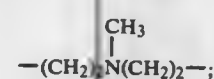
$R_3$  is methyl, ethyl, or allyl;

$R_5$  is methoxy,  $C_1$ - $C_4$  alkyl or allyl;

$R_6$  is hydrogen, methyl, or ethyl; and

$R_5$  and  $R_6$  can be taken together to form a ring and are

$-(CH_2)_2O(CH_2)_2-$ ;

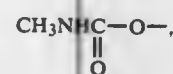


or  $-(CH_2)_n-$ ; and

$n$  is 4-6; with the proviso that

(i) the total carbon content of,  $R_2$ ,  $R_3$  and  $R_4$  is not greater than 8C;

(ii) when  $R$  is



$R_2$  is hydrogen and  $R_3$  is  $CH_3$ ;

(iii) when  $R$  is



$R_2$  and  $R_3$  are both methyl; and

(iv) the total carbon content of  $R_2$ ,  $R_3$ ,  $R_5$  and  $R_6$  is not greater than 8C.

6. Compound of claim 1: N,N-dimethyl-2-[(methylcarbamyl)oxyimino]-3-(N-morpholine)iminobutyramide.

#### 4,161,592 PIPERIDINYL-S-TRIAZINES

Samuel Evans, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,294

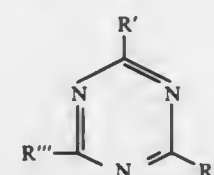
Claims priority, application Switzerland, Jul. 8, 1976, 8774/76

Int. Cl.<sup>2</sup> C07D 251/46, 251/52, 251/70

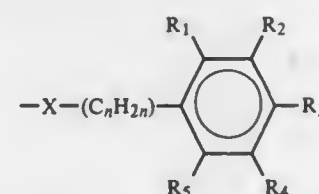
U.S. Cl. 544—198

9 Claims

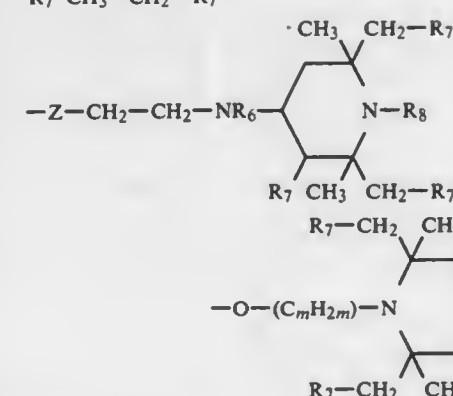
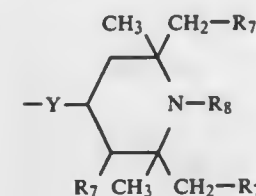
1. A member selected from the group consisting of a compound of the formula I



and an addition salt thereof, in which one of the radicals  $R'$ ,  $R''$  and  $R'''$  is a group of the formula II:

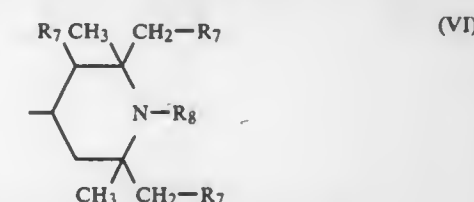


wherein one of  $R_1$  and  $R_3$  is  $-OH$  and the other is hydrogen,  $R_2$  is  $C_1$ - $C_{12}$  alkyl,  $C_5$ - $C_7$  cycloalkyl,  $C_6$ - $C_{10}$  aryl or  $C_7$ - $C_9$  aralkyl,  $R_4$  and  $R_5$  are hydrogen,  $C_1$ - $C_{12}$  alkyl,  $C_5$ - $C_7$  cycloalkyl,  $C_6$ - $C_{10}$  aryl or  $C_7$ - $C_9$  aralkyl,  $n$  is an integer of 0 to 12 and  $X$  is  $-O-$ ,  $-S-$  or  $-NR_6-$  wherein  $R_6$  is hydrogen or  $C_1$ - $C_{12}$  alkyl, and one of the radicals  $R'$ ,  $R''$  and  $R'''$  is one of the groups



in which  $Y$  is  $-O-$  or  $-NR_6-$  wherein  $R_6$  has the meaning defined above,  $Z$  is  $-O-$  or  $-S-$ ,  $m$  is 1 to 6,  $R_7$  is hydrogen or  $C_1$ - $C_8$  alkyl and  $R_8$  is hydrogen, oxygen,  $C_1$ - $C_{12}$  alkyl,  $C_3$ - $C_6$  alkenyl,  $C_3$ - $C_4$  alkenyl,  $C_2$ - $C_{21}$  alkoxyalkyl,  $C_7$ - $C_8$  aralkyl, 2,3-epoxypropyl, an aliphatic acyl group with 1-4 C

atoms or one of the groups  $-CH_2COOR_9$ ,  $-CH_2-CH(R_{10})-OR_{11}$ ,  $-COOR_{12}$  or  $-CONHR_{12}$ , wherein  $R_9$  is  $C_1$ - $C_{12}$  alkyl,  $C_3$ - $C_6$  alkenyl, phenyl,  $C_7$ - $C_8$  aralkyl or cyclohexyl,  $R_{10}$  is hydrogen, methyl or phenyl,  $R_{11}$  is hydrogen, an aliphatic, aromatic, araliphatic or alicyclic acyl group with 1-8 C atoms, wherein the aromatic part is unsubstituted or is substituted by chlorine,  $C_1$ - $C_4$  alkyl,  $C_1$ - $C_8$  alkoxy or by hydroxyl, and  $R_{12}$  is  $C_1$ - $C_{12}$  alkyl, cyclohexyl, phenyl or benzyl, and  $R_{13}$  is hydrogen,  $-OH$  or one of the groups  $-O-CO-R_{14}$  or  $-NR_{12}-CO-R_{14}$ , wherein  $R_{14}$  is  $C_1$ - $C_{12}$  alkyl or phenyl, and one of the radicals  $R'$ ,  $R''$  and  $R'''$  independently of the others is an identical or different group of the formula II, or is an identical or different group III, IV or V, or is  $-N_3$ , or one of the groups  $-S-R_{15}$ ,  $-OR_{17}$ ,  $-P(O)-(OR_{17})_2$  or  $-NR_{18}R_{10}$ , wherein  $R_{15}$  is hydrogen,  $C_1$ - $C_{18}$  alkyl,  $C_5$ - $C_7$  cycloalkyl,  $C_6$ - $C_{10}$  aryl,  $C_7$ - $C_9$  aralkyl or the group  $-(C_6H_5)_p-CO-OR_{16}$  wherein  $R_{16}$  is  $C_1$ - $C_{18}$  alkyl, and  $p$  is 1 to 6,  $R_{17}$  is  $C_1$ - $C_{18}$  alkyl,  $C_6$ - $C_{10}$  aryl or  $C_7$ - $C_9$  aralkyl and  $R_{18}$  and  $R_{19}$  independently of one another are hydrogen,  $C_1$ - $C_{18}$  alkyl,  $C_5$ - $C_7$  cycloalkyl,  $C_6$ - $C_{10}$  aryl,  $C_7$ - $C_9$  aralkyl or the group



in which  $R_7$  and  $R_8$  have the meaning defined above.

#### 4,161,593 PROCESS FOR THE PREPARATION OF TRIAZINES CONTAINING A MIXTURE OF CHLORINE AND FLUORINE SUBSTITUENTS, AND OF CYANURIC FLUORIDE

Erich Klauke, Odenthal; Ernst Kysela, Bergisch-Gladbach, and Alfons Dorlars, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,601

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702625

Int. Cl.<sup>2</sup> C07D 251/28

U.S. Cl. 544—217

5 Claims

1. Process for the preparation of triazines containing a mixture of chlorine and fluorine substituents, characterized in that cyanuric chloride is heated with cyanuric fluoride to temperatures from 30°-300° C. in the presence of suitable catalysts.

4,161,594  
DIALCOHOLS  
Hans Batzer, Arlesheim; Jürgen Habermeier, Pöfingen, and Daniel Porret, Fresens, NE, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland  
Continuation-in-part of Ser. No. 82,074, Oct. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 870,547, Nov. 4, 1969, Pat. No. 3,629,263. This application Jan. 17, 1975, Ser. No. 541,911

Claims priority, application Switzerland, Nov. 11, 1968, 16803/68

The portion of the term of this patent subsequent to Dec. 21, 1988, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 239/54, 239/62, 233/72

U.S. Cl. 544—302

10 Claims

1. A compound which is 1,3-di-(β-hydroxyethyl)-5-phenyl-5-ethylbarbituric acid.  
2. A compound which is 1,3-di-(β-hydroxy-n-propyl)-5,5-diethylbarbituric acid.  
3. A compound which is 1,3-di-(β-hydroxyethoxyethyl)-5,5-dimethylhydantoin.

7. A compound which is 1,3-di-( $\beta$ -hydroxyethyl)-5,5-dimethyl-6-isopropyl-5,6-dihydrouracil.

9. 1,3-di-( $\beta$ -hydroxy-n-propyl)-5,5-dimethylhydantoin which is a crystalline solid.

4,161,595

## LEVULINIC ACID SALT

Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,678

Int. Cl.<sup>2</sup> C07D 239/95

U.S. Cl. 544—284

2 Claims

1. A levulinic acid addition salt of 4-amino-6,7-dimethoxy-2[4-(5-methylthio-1,3,4-oxadiazole-2-carbonyl)piperazin-1-yl]-quinazoline wherein the base to acid ratio comprises one mole equivalent of said base to from 1.25 to 1.35 mole equivalents of said acid.

4,161,596

## PROCESS FOR PREPARING CARBAMOYLOXY ACRYLATES

Frank G. Cowherd, III, and Louis F. Theiling, Jr., both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 755,063, Dec. 28, 1976, Pat. No. 4,126,747.

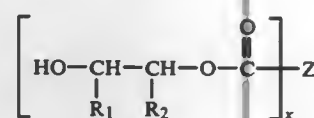
This application Aug. 25, 1978, Ser. No. 936,819

Int. Cl.<sup>2</sup> C07D 295/18

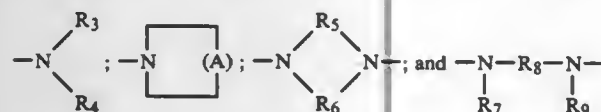
U.S. Cl. 544—388

11 Claims

1. A process for producing a carbamoyloxy acrylate which comprises esterifying an hydroxyalkyl carbamate of the structure



wherein x is 1 or 2; R<sub>1</sub> and R<sub>2</sub> are each hydrogen or alkyl of up to 10 carbon atoms and Z is chosen from the group consisting of



wherein R<sub>3</sub> is hydrogen, alkyl of up to 10 carbon atoms, or cycloalkyl of up to 10 carbon atoms; R<sub>4</sub> is alkyl of up to 10 carbon atoms, cycloalkyl of up to 10 carbon atoms, hydroxyalkyl of up to 3 carbon atoms or aralkyl having up to 10 carbon atoms in the alkyl segment; R<sub>5</sub>, R<sub>6</sub>, and R<sub>8</sub> are each methylene, ethylene, or 1,2-propylene; R<sub>7</sub> and R<sub>9</sub> are each hydrogen or alkyl of up to 10 carbon atoms; and A is a divalent alkylene chain having up to 10 carbon atoms completing a 3-6 membered ring structure, by reacting said hydroxyalkyl carbamate with acrylic or methacrylic acid at a temperature of from 40° C. to 80° C. in contact with an esterification catalyst and from 50 ppm to 5,000 ppm, based on the weight of the acrylic or methacrylic acid, of a polymerization inhibitor chosen from the group consisting of lower alkoxy-substituted phenolic and alkylated alkoxyphenolic polymerization inhibitors having up to 10 carbon atoms in the alkyl and alkoxy segments.

4,161,597

## N-ALKYL-14-HYDROXYMORPHINANS AND DERIVATIVES

Roy A. Olofson, State College, Pa., and Joseph P. Pepe, Rochester, N.Y., assignors to Research Corporation, New York, N.Y.

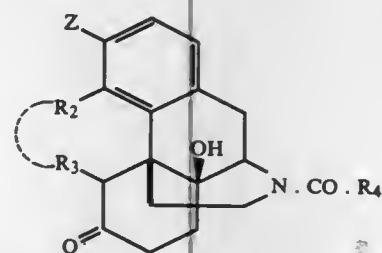
Filed Dec. 20, 1976, Ser. No. 751,571

Int. Cl.<sup>2</sup> C07D 489/08, 221/28

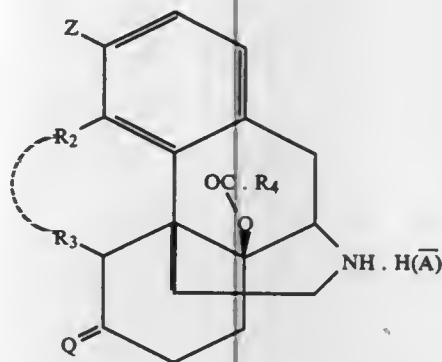
U.S. Cl. 546—15

17 Claims

1. A process of preparing a morphinan of formula



the corresponding optical isomer thereof and mixtures of said optical isomers which comprises adding to an acid addition salt selected from the group having the formula



the corresponding optical isomer thereof or admixtures of said optical isomers,

an amount of base sufficient to neutralize said acid salt wherein H(A) is a hydrogen acid capable of forming a salt with a secondary amine, wherein Z is R<sub>1</sub>O,

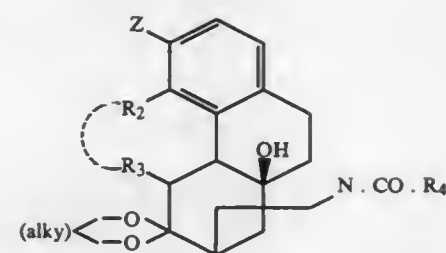
R<sub>1</sub> is lower alkyl or phenyl lower alkyl wherein the alkyl moiety contains 1 to 5 carbon atoms, straight or branch chain lower alkanoyl having 1 to 5 carbon atoms in the alkyl moiety thereof, or cycloalkylcarbonyl and substituted cycloalkylcarbonyl having 3 to 6 carbon atoms in the cyclic moiety thereof, benzoyl, substituted benzoyl, or phenylalkanoyl or substituted phenylalkanoyl of 1 to 6 carbon atoms in the alkanoyl moiety wherein the substituents are loweralkyl of 1-5 carbon atoms,

R<sub>2</sub> and R<sub>3</sub> are hydrogen or when taken together R<sub>2</sub> and R<sub>3</sub> are oxa,

Q is two hydrogen atoms or oxo,

R<sub>4</sub> is hydrogen, straight or branch chain lower alkyl having 1 to 5 carbon atoms in the alkyl moiety thereof, cycloalkyl or substituted cycloalkyl having 3 to 6 carbon atoms in the cyclic moiety, phenyl, substituted phenyl, phenylalkyl or substituted phenylalkyl of 1 to 5 carbon atoms in the alkyl moiety, wherein the substituents are loweralkyl of 1-5 carbon atoms in the loweralkyl moiety thereof.

9. The adduct of a compound having the formula



the corresponding optical isomer, and mixtures of said optical isomers, wherein Z, R<sub>1</sub> and R<sub>4</sub> are as defined in claim 1, provided R<sub>1</sub> is other than alkanoyl,

R<sub>2</sub> with R<sub>3</sub> is oxa,

and (alkyl) is alkylene of 2 to 5 carbon atoms in the alkylene moiety, with a member selected from the group consisting of benzene, loweralkyl and polyloweralkyl substituted benzenes, tetrahydrofuran and polyloweralkyl substituted tetrahydrofurans wherein the substituted benzene nucleus carries 1-6 substituents and the substituted furan nucleus carries 1-4 substituents and lower alkyl contains 1-5 carbon atoms.

4,161,598

## 1-OXYGENATED-2,6-METHANO-3-BENZAZOCINES

Noel F. Albertson, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 406,199, Oct. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 257,343,

May 26, 1972, Pat. No. 3,823,149, which is a continuation-in-part of Ser. No. 43,556, Jun. 4, 1970, abandoned.

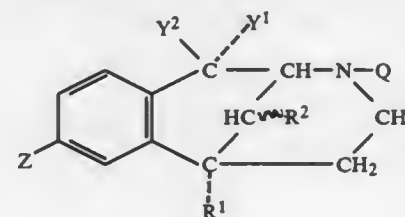
This application Jul. 8, 1977, Ser. No. 813,813

Int. Cl.<sup>2</sup> C07D 221/26

U.S. Cl. 546—97

18 Claims

1. 3-Q-6-R<sup>1</sup>-11-R<sup>2</sup>-1-Y<sup>1</sup>-1-Y<sup>2</sup>-8-Z-1,2,3,4,5,6-Hexahydro-2,6-methano-3-benzazocine having the structural formula



wherein:

Q is cyclopropylmethyl, cyclobutylmethyl, propyl, allyl or 2-phenylethyl;

R<sup>1</sup> is methyl, ethyl or propyl;

R<sup>2</sup> is hydrogen, methyl or ethyl;

Y<sup>1</sup> taken alone is hydrogen;

Y<sup>2</sup> taken alone is hydroxy; or

Y<sup>1</sup> and Y<sup>2</sup> taken together are oxo; and

Z is hydroxy; and when Y<sup>1</sup> and Y<sup>2</sup> taken together are oxo, Z is also acyloxy selected from the group consisting of acetoxy, propionyloxy, butyryloxy, pivalyloxy, isobutyryloxy, isovaleryloxy, 3,3-dimethylbutyryloxy, benzoyloxy, p-anisoyloxy, m-anisoyloxy, p-toluyloxy and p-trifluoromethylbenzyloxy;

or an acid-addition salt thereof.

4,161,599

## PROCESS FOR THE PREPARATION OF THIENO(2,3-c)-AND THIENO(3,2-c)PYRIDINES

Jean P. Maffrand, Toulouse, France, assignor to PARCOR, Paris, France

Filed May 23, 1978, Ser. No. 908,957

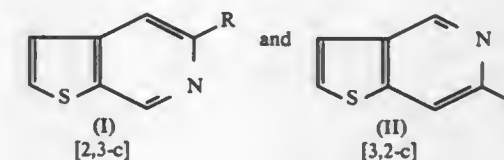
Claims priority, application France, Jun. 21, 1977, 77 18991

Int. Cl.<sup>2</sup> C09S 495/04

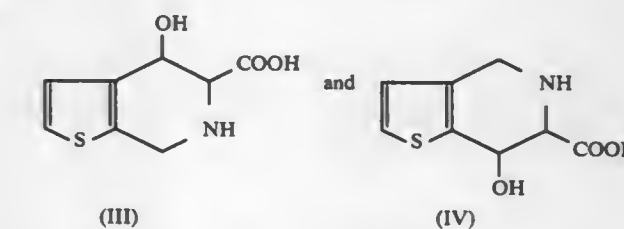
U.S. Cl. 546—114

1 Claim

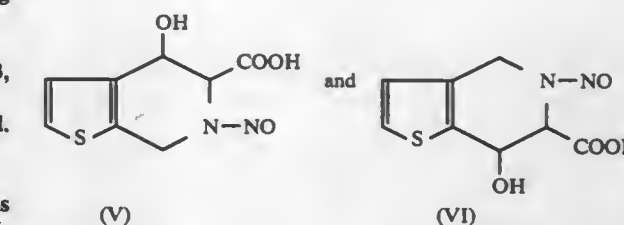
1. Process for the preparation of a compound selected from the compounds having the formulae



wherein R is selected from hydrogen and carboxy, comprising adding an aqueous solution of an alkali metal nitrite to an acidic solution of a compound selected from the compounds having the formulae



to give, respectively, a compound of formulae



and then reacting a compound of formula (V) or (VI) respectively with an acid selected from hydrochloric acid, hydrobromic acid, sulfuric acid and trifluoroacetic acid and making the reaction mixture basic with an alkali metal hydroxide, to give the derivatives of formula (I) and (II) respectively, in which R is hydrogen, or reacting said compound (V) or (VI) with an alkali metal hydroxide in aqueous solution at the reflux temperature and subsequent neutralization, to give the derivatives of the formula (I) and (II), respectively, in which R is carboxy.

4,161,600

## LEVO-6-OXO-2-PIPERIDINECARBOXYLIC ACID QUININE SALTS

Stewart M. Miller, Watchung, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1976, Ser. No. 753,242

Int. Cl.<sup>2</sup> C07D 453/04

U.S. Cl. 546—135

2 Claims

1. l-6-oxo-2-piperidinecarboxylic acid quinine salt.

2. d-6-oxo-2-piperidinecarboxylic acid quinine salt.

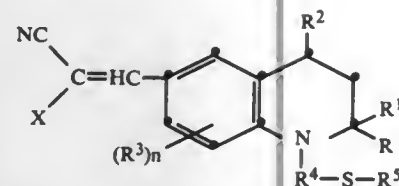


**4,161,601**  
**METHINE DYES FROM**  
**1-[2-(2-BENZOTHAZOLYL)THIO]ALKYL]-1,2,3,4-TETRAHYDRO-2,2,4,7-TETRAMETHYLQUINOLINE COMPOUNDS**  
 Clarence A. Coates, Jr., and Max A. Weaver, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1977, Ser. No. 802,090  
 Int. Cl.<sup>2</sup> C07D 417/14

U.S. Cl. 546—176

1. Compounds of the formula:

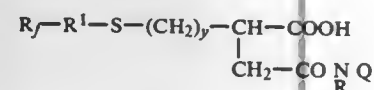


wherein X is selected from cyano, carbamoyl, lower alkyl carbamoyl, lower alkoxy carbonyl, lower alkylsulfonyl and arylsulfonyl; R, R<sup>1</sup>, and R<sup>2</sup> are independently selected from hydrogen and lower alkyl; R<sup>3</sup> is selected from hydrogen, lower alkyl, lower alkoxy and halogen and n is 0, 1 or 2; R<sup>4</sup> is lower alkylene; R<sup>5</sup> is benzothiazolyl which may be substituted with up to two groups independently selected from Cl, Br, NO<sub>2</sub>, lower alkyl, lower alkylamino, lower alkanoylamino, lower alkoxy, hydroxy, cyano, and -SCN.

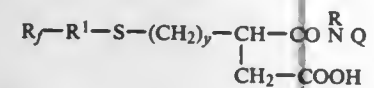
**4,161,602**  
**FLUORINATED AMPHOTERIC AND CATIONIC SURFACTANTS CONTAINING A PYRIDINIUM MOIETY**  
 Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.  
 Division of Ser. No. 538,432, Jan. 3, 1975, Pat. No. 4,069,244.  
 This application Jan. 12, 1978, Ser. No. 868,773  
 Int. Cl.<sup>2</sup> C07D 213/56

U.S. Cl. 546—335

1. A compound of the formula

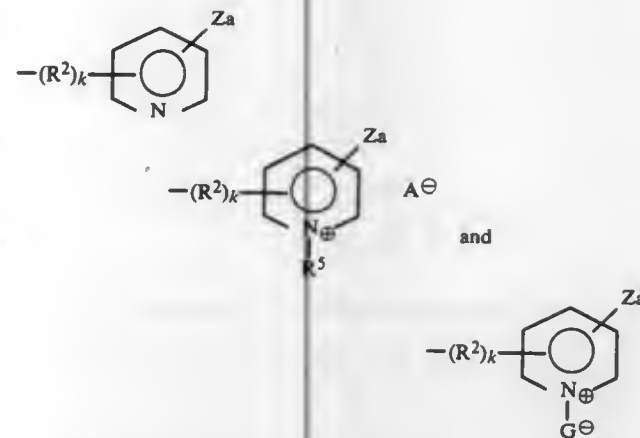


or its amphoteric tautomer or of the formula



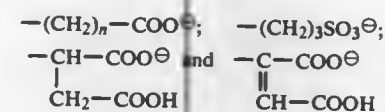
or its amphoteric tautomer or a mixture thereof wherein

R<sub>1</sub> is straight or branched chain perfluoroalkyl of 6 to 12 carbon atoms or a perfluoroalkyl of 2 to 6 carbon atoms substituted by heptafluoroisopropoxy on the terminal carbon atom;  
 R is hydrogen, alkyl of 1 to 6 carbon atoms, or hydroxyalkyl of 1 to 6 carbon atoms;  
 R<sup>1</sup> is branched or straight chain alkylene of 1 to 12 carbon atoms;  
 Y is 1 or zero;  
 Q is a nitrogen containing group selected from aromatic amino groups selected from



wherein

R<sup>2</sup> is a linear or branched alkylene of 2 to 12 carbon atoms, or  
 R<sup>2</sup> is hydrogen, an alkyl group or hydroxyalkyl group;  
 A<sup>⊖</sup> is an anion which forms an ammonium salt of the formula NH<sub>4</sub><sup>⊕</sup>A<sup>⊖</sup>;  
 G<sup>⊖</sup> is selected from the groups



where n is 1 to 5;  
 Z is halogen or methyl,  
 a is an integer from 0 to 3.

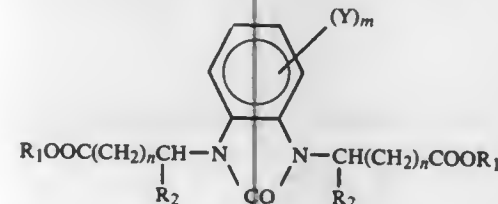
**4,161,603**  
**DICARBOXYLIC ACIDS AND DICARBOXYLIC ACID ESTERS CONTAINING A BENZIMIDAZOLONE RADICAL**  
 Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1977, Ser. No. 794,694  
 Claims priority, application Switzerland, May 12, 1976, 5932/76

Int. Cl.<sup>2</sup> C07D 235/26

U.S. Cl. 548—305

1. A benzimidazolone compound of the formula



in which

the two R<sub>1</sub> independently of one another each denote hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,  
 the two R<sub>2</sub> independently of one another each denote hydrogen or alkyl with 1 to 10 carbon atoms,  
 the two n represent identical or different numbers from 2 to 12,  
 Y represents bromo or chloro, and  
 m equals zero or denotes a number from 1 to 4.

**4,161,604**  
**PROCESS FOR MAKING**  
**1-HYDROXYETHYL-2-UNDECYL-2-IMIDAZOLINE**  
 Charles H. Elster, River Vale, N.J., and Gabriel J. Gibbs, Pearl River, N.Y., assignors to Lonza Inc., Bergen, N.J.  
 Filed Jan. 10, 1978, Ser. No. 868,350  
 Int. Cl.<sup>2</sup> C07D 233/64

U.S. Cl. 548—352

12 Claims

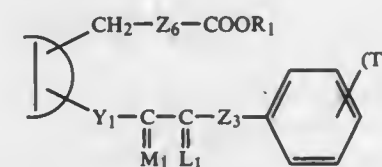
1. A process for producing a high purity imidazoline comprising the following steps:

- reacting a carboxylic acid and at least a 5% molar excess of a diamine in the liquid phase in a reactor under vacuum, thereby forming the imidazoline and water of reaction vapor;
  - passing at least some of the vaporized water into a first distillation zone having vapor-liquid contact means;
  - removing water substantially free of the diamine as the distillate from the first distillation zone;
  - continuing steps (a), (b), and (c) until substantially all of the water of reaction formed has been removed;
  - thereafter vaporizing and feeding the unreacted diamine into a second distillation zone substantially devoid of any vapor-liquid contact means, thereby obtaining a high purity imidazoline product as the residue in said reaction zone;
- said carboxylic acid having a formula of R<sup>1</sup>COOH where R<sup>1</sup> is a hydrocarbyl radical of from 3 to 40 carbon atoms and said diamine having a formula of NH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NHR<sup>2</sup> where R<sup>2</sup> is hydrogen or an optionally-substituted alkyl or alkaryl group having from 1 to 15 carbon atoms.

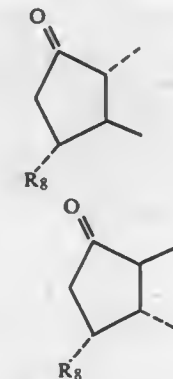
**4,161,605**  
**ω-ARYL-CIS-13-PGE COMPOUNDS**  
 Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
 Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909.  
 This application Mar. 3, 1977, Ser. No. 774,186  
 Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 560—53

1. A prostaglandin analog of the formula:



wherein D is



wherein R<sub>8</sub> is hydrogen or hydroxy  
 wherein Y is cis—CH=CH—  
 wherein Z<sub>6</sub> is

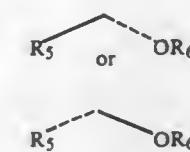
- cis—CH=CH—CH<sub>2</sub>—(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—,
- cis—CH=CH—CH<sub>2</sub>—(CH<sub>2</sub>)<sub>g</sub>—CF<sub>2</sub>—,
- cis—CH<sub>2</sub>—CH=CH—(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—,

- (CH<sub>2</sub>)<sub>3</sub>—(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—, or
- (CH<sub>2</sub>)<sub>3</sub>—(CH<sub>2</sub>)<sub>g</sub>—CF<sub>2</sub>—,

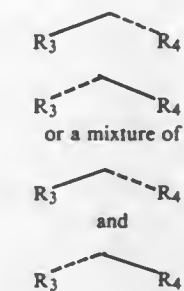
wherein g is one, 2, or 3;

wherein Z<sub>3</sub> is oxa or methylene;

wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that Z<sub>3</sub> is oxa only when R<sub>3</sub> and R<sub>4</sub> are hydrogen or methyl, being the same or different;  
 wherein M<sub>1</sub> is



wherein R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen;  
 wherein L<sub>1</sub> is



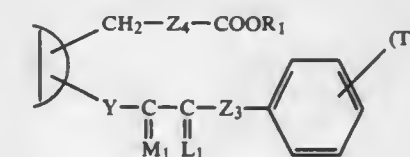
wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro and wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

**4,161,606**  
**ω-ARYL-CIS-13-INTER-OXA-PGA COMPOUNDS**  
 Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
 Division of Ser. No. 774,186, Mar. 3, 1972, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,183  
 Int. Cl.<sup>2</sup> C07C 177/00

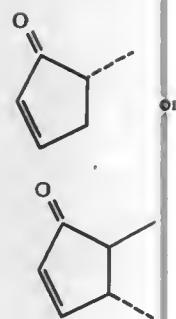
U.S. Cl. 560—53

37 Claims

1. A prostaglandin analog of the formula:



wherein D is



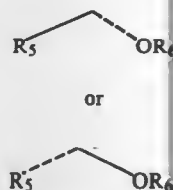
wherein Y is  $\text{cis-CH=CH-}$ ,  
wherein Z<sub>4</sub> is

- (1)  $\text{—CH}_2\text{—O—CH}_2\text{—(CH}_2\text{)}_g\text{—CH}_2\text{—}$ ,  
(2)  $\text{—(CH}_2\text{)}_2\text{—O—(CH}_2\text{)}_g\text{—CH}_2\text{—}$ , or  
(3)  $\text{—(CH}_2\text{)}_3\text{—O—(CH}_2\text{)}_g\text{—}$ ,  
wherein g is one, 2, or 3;

wherein Z<sub>3</sub> is oxa or methylene;

wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl,

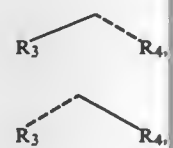
wherein M<sub>1</sub> is



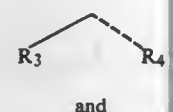
or

wherein R<sub>5</sub> and R<sub>6</sub> are hydrogen or methyl, with the proviso that one of R<sub>5</sub> and R<sub>6</sub> is methyl only when the other is hydrogen;

wherein L<sub>1</sub> is



or a mixture of



and



and

wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro and Z<sub>3</sub> is methylene; and

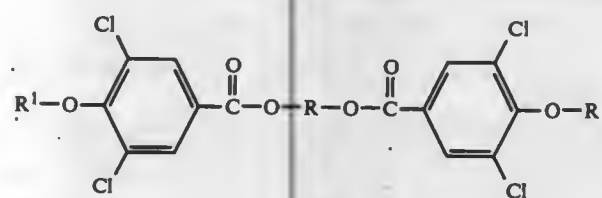
wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,161,607  
**THERMALLY STABLE, RIGID BISPHENOLS**  
August H. Frazer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Division of Ser. No. 751,088, Dec. 16, 1976, Pat. No. 4,065,432.  
This application Oct. 5, 1977, Ser. No. 839,709  
Int. Cl.<sup>2</sup> C07C 69/88, 69/90

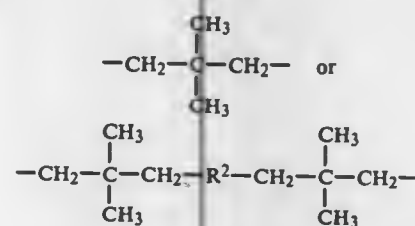
U.S. Cl. 560—65

4 Claims

1. The thermally stable, rigid bisphenols of the formula



where R is



where

R<sup>2</sup> is an arylene selected from the group consisting of 1,4-phenylenes, 4,4'-biphenylenes and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl, and

R<sup>1</sup> is hydrogen or



where R<sup>3</sup> is a hydrocarbon of 1 to 10 carbons selected from the group consisting of alkyl, aryl, aralkyl and alkaryl.

4,161,608  
**11-HYDROXY METHYL 11-DEOXYPROSTAGLANDIN E<sub>1</sub>**  
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to Ayerst, McKenna and Harrison Limited, Montreal, Canada

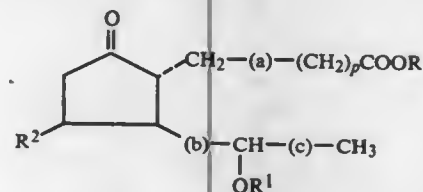
Division of Ser. No. 741,077, Nov. 11, 1976, Pat. No. 4,089,898, which is a division of Ser. No. 489,856, Jul. 19, 1974, Pat. No. 4,006,136, which is a division of Ser. No. 238,650, Mar. 27, 1972, Pat. No. 3,849,474. This application Jan. 27, 1978, Ser. No. 872,972

Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 560—121

3 Claims

1. A compound of the formula



in which (a) is  $\text{CH}_2\text{CH}_2$ , p is an integer from 2 to 4, (b) is  $\text{trans-CH=CH}$ , (c) is  $\text{(CH}_2\text{)}_q$  wherein q is an integer from 1 to 6, R is hydrogen or lower alkyl, R<sup>1</sup> is hydrogen and R<sup>2</sup> is  $\text{CH}_2\text{OH}$ .

4,161,609  
**SYNTHESIS OF CARBOXYLIC ACID ESTERS**  
Richard D. Cramer, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Filed Sep. 14, 1977, Ser. No. 833,371  
Int. Cl.<sup>2</sup> C07C 67/20

U.S. Cl. 560—215

26 Claims

1. A process for the preparation of carboxylic acid esters having the formula  $\text{RCOOR}_3$  from carboxylic acid amides having the formula  $\text{RCOONR}_1\text{R}_2$  and hydroxyl compounds having the formula  $\text{R}_3\text{OH}$ , which comprises contacting at least one mole of said hydroxyl compound with each mole of said amide in the vapor phase at temperatures of from 100° C. to 400° C. and at pressures of from 0.01 to 100 atmospheres in the presence of a solid catalyst having a surface area of 10 to 1000 m<sup>2</sup>/g for a contact time of 0.1 to 20 seconds, thereby forming the ester and  $\text{HNR}_1\text{R}_2$ , recovering the ester by condensation of the exit vapors by cooling, and separating  $\text{HNR}_1\text{R}_2$  from the uncondensed portion of the exit vapors, wherein

R is selected from the class consisting of H; an alkyl group having from 1 to 10 carbon atoms; an alkenyl group having from 2 to 10 carbon atoms; an alkynyl group having from 2 to 10 carbon atoms; phenyl; and a phenyl group substituted by a methyl, chloro or methoxy group;

R<sub>1</sub> taken separately is selected from the class consisting of H and alkyl groups having from 1 to 10 carbon atoms;

R<sub>2</sub> taken separately is selected from the class consisting of H and alkyl groups having from 1 to 10 carbon atoms;

R<sub>3</sub> is selected from the class consisting of primary or secondary alkyl group having from 1 to 10 carbon atoms;

primary or secondary alkyl group having from 2 to 10 carbon atoms substituted by a hydroxy group, alkoxy group having from 1 to 4 carbon atoms or an acetoxy group;

phenyl; and phenyl substituted by 1 or 2 alkyl groups having 1 to 10 carbon atoms, 1 or 2 fluorine atoms, 1 or 2 chlorine atoms, 1 or 2 bromine atoms, a methoxy group or a methoxycarbonyl group;

and the catalyst is selected from the class consisting of titanium dioxide, alumina, zirconium oxide, molybdena, cerium (IV) oxide, mixtures of from 10 to 100% alumina and 90 to 0% silica, mixtures of from 0 to 100% titanium dioxide and 100 to 0% alumina, and supported catalyst compositions comprising 5 to 25% vanadium pentoxide, nickel oxide, or tungsten oxide on alumina, alumina-silica mixtures, or copper (II) oxide and chromium (III) oxide mixtures.

4,161,610  
**PROCESS FOR PREPARING VINYL ESTERS**  
Donald L. Klass, Barrington, Ill., assignor to Union Oil Company of California, Brea, Calif.  
Filed Sep. 29, 1961, Ser. No. 141,832  
Int. Cl.<sup>2</sup> C07C 67/05

U.S. Cl. 560—243

8 Claims

1. The process of preparing vinyl esters which comprises reacting an olefinic hydrocarbon having 2 to 10 carbon atoms per molecule with a carboxylic acid of the formula



wherein R<sup>1</sup> is a hydrocarbon radical of 1 to 20 carbon atoms and m is an integer of 1 to 5, under substantially anhydrous liquid phase conditions in the presence of a catalytic amount of a member selected from the group consisting of (a) an alkaline earth metal salt of a carboxylic acid within the above-defined group in combination with a noble metal compound selected from the group consisting of palladium, iridium, ruthenium, rhodium, and platinum; and (b) an alkali metal or alkaline earth metal salt of carboxylic acids within the above defined group in combination with a noble metal compound selected from platinum, iridium, ruthenium and rhodium compounds, and a

regenerative oxidant capable of maintaining said noble metal in oxidized form.

4,161,611  
**PROCESS FOR THE PRODUCTION OF 2-METHOXY-3,6-DICHLOROBENZOIC ACID**  
Dong-Whae Kim, Deerfield, Ill., assignor to Veeco Chemical Corporation, Chicago, Ill.  
Continuation of Ser. No. 654,249, Feb. 23, 1976, abandoned.  
This application Jan. 9, 1978, Ser. No. 868,091  
Int. Cl.<sup>2</sup> C07C 65/08

U.S. Cl. 562—474

12 Claims

1. A process for the production of 2-methoxy-3,6-dichlorobenzoic acid which comprises reacting 2-amino-3,6-dichlorobenzoic acid with a minimum of one mole of nitrous acid for each mole of the 2-amino-3,6-dichlorobenzoic acid to form the corresponding diazonium salt, hydrolyzing the diazonium salt, hydrolyzing the diazonium salt to form 2-hydroxy-3,6-dichlorobenzoic acid and methylating said hydroxy acid.

4,161,612  
**PROCESS FOR PREPARING THIODIGLYCOLIC ACID**  
Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
Filed Mar. 31, 1978, Ser. No. 892,246  
Int. Cl.<sup>2</sup> C07C 149/20

U.S. Cl. 562—594

9 Claims

1. A process for preparing thiodiglycolic acid which comprises contacting glycolic acid, diglycolic acid or bromoacetic acid and hydrogen sulfide in the presence of aqueous hydrogen bromide at a temperature of from about 90° C. to about 220° C. and a pressure of from about 0.1 atmosphere to about 100 atmospheres.

4,161,613  
**RECOVERY OF ACRYLIC ACID FROM QUENCH BOTTOMS BY THE ADDITION OF ALUMINUM CHLORIDE**  
Stephen C. Paspek, Jr., Cleveland, and William A. Every, Twinsburg, both of Ohio, assignors to Standard Oil Company (Ohio), Cleveland, Ohio  
Filed Dec. 14, 1977, Ser. No. 860,516  
Int. Cl.<sup>2</sup> C07C 51/42, 57/04

U.S. Cl. 562—600

12 Claims

1. A process for the separation of acrylic acid from an aqueous mixture of acrylic acid and water comprising adding a Group III A metal halide salt to said aqueous mixture in an amount sufficient to form an organic phase containing acrylic acid, and an aqueous phase, and separating the organic phase from the aqueous phase.

4,161,614  
**PROCESS FOR THE PREPARATION OF CYCLOHEXANE DIONE-(1,4)-TETRAMETHYL DIKETAL**  
Elmar Konz, Bad Soden am Taunus, and Rudolf Pistorius, Ober-Mörlen, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Jan. 24, 1978, Ser. No. 871,921  
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703077

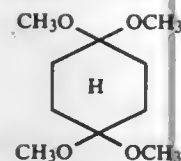
Int. Cl.<sup>2</sup> C07C 41/00

U.S. Cl. 568—670

5 Claims

1. A process for the preparation of cyclohexanedione-(1,4)-tetramethyl diketal of the formula





which comprises reducing p-benzoquinone tetramethyl diketal with hydrogen in the presence of a hydrogenation catalyst, in a basic medium, at a temperature of from about  $-10^{\circ}$  to  $+150^{\circ}$  C.

#### 4,161,615 DEHYDROGENATION OF CYCLIC KETONES TO BETA-NAPHTHOLS

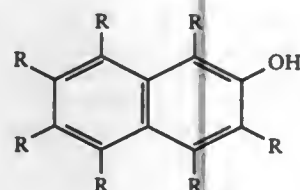
Werner H. Müller, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 649,496, Jan. 15, 1976, abandoned. This application May 26, 1977, Ser. No. 800,915

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1975, 2501770

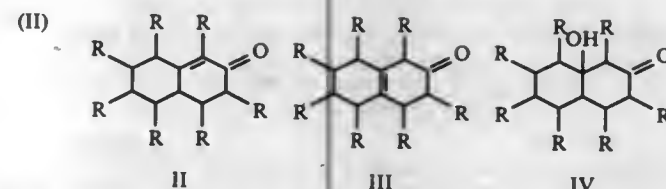
U.S. Cl. 568—740 Int. Cl.<sup>2</sup> C07C 39/14

1. A process for the preparation of 2-hydroxy-naphthalenes of the formula



wherein the radicals R are selected from:

- hydrogen,
- straight chain, branched chain and cyclic alkyl radicals and
- phenyl and naphthyl, and adjacent aliphatic radicals R may together form an alicyclic 5- or 6-membered ring, and the R substituents taken together do not contain more than 24 carbon atoms, which comprises heating a cycloalkene or hydroxycycloalkanone of the formulae II to IV



wherein the radicals R are as defined above, in the liquid phase at a temperature of  $140^{\circ}$  to  $350^{\circ}$  C. and a pressure of up to 20 atmospheres in a solvent which is a polyglycol dialkyl ether having alkyl groups of up to 6 carbon atoms and a noble metal catalyst of the 8th subgroup of the Periodic System.

#### 4,161,616 ACROLEIN CONVERSION TO BUTANEDIOL

Paul D. Taylor, Corpus Christi, Tex.; Thomas H. Vanderspurt, Gillette, and Anthony B. Conclatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

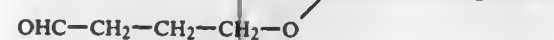
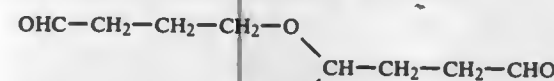
Filed Apr. 24, 1978, Ser. No. 899,052

Int. Cl.<sup>2</sup> C07C 31/18

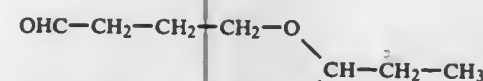
U.S. Cl. 568—862

14 Claims

1. A process for converting acrolein into 1,4-butanediol which comprises (1) selectively hydrogenating acrolein to a product mixture consisting of at least two moles of allyl alcohol per mole of acrolein and propionaldehyde, (2) subjecting the product mixture to acidic conditions to produce acrolein diallyl acetal and propionaldehyde diallyl acetal, (3) selectively hydroformylating the acetals to form a hydroformylation product mixture of



and



and (4) subjecting the hydroformylation product mixture to substantially neutral aqueous hydrolysis/hydrogenation conditions to yield 1,4-butanediol.

## ELECTRICAL

#### 4,161,617 METHOD AND APPARATUS FOR ELECTRICALLY MELTING GLASS

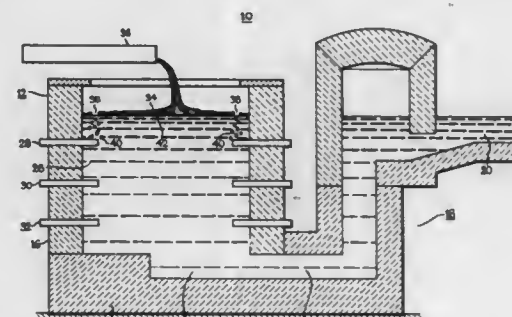
Kenneth S. Hrycik, Eastlake; John H. Leonhardt, Euclid, and William J. Prentice, Jr., South Euclid, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 1, 1978, Ser. No. 901,315

Int. Cl.<sup>2</sup> C03B 5/02

U.S. Cl. 13—6

12 Claims



1. A process for continuously melting a glass batch by heating said glass batch in a furnace having plurality of electrodes disposed in a vertically oriented melting chamber to feed said glass batch at the top level of the chamber and withdraw molten glass at the bottom level of the chamber and further including one set of electrodes located adjacent the top level of the chamber with at least one other set of electrodes located at a lower level of the chamber which comprises:

- feeding said glass batch continuously at the top level of the chamber to form a blanket resting on the molten glass,
- supplying electrical energy to said lower level electrodes at a rate sufficient to supply molten glass continuously at the bottom level of the chamber, and
- supplying electrical energy to said top level electrodes at a rate sufficient to maintain the batch blanket at relatively constant thickness while generating localized hot spots in the molten glass adjacent said electrodes and causing a flow of gas bubbles upwardly through the glass at said hot spot locations for escape through the batch blanket.

#### 4,161,618 DC ARC FURNACE OPERATION INDICATING SYSTEM

Sven-Einar Stenkvist, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

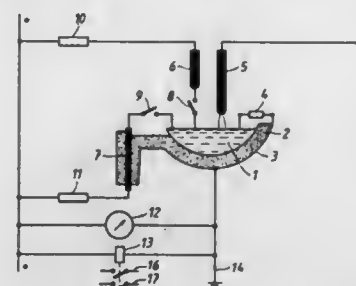
Filed Feb. 22, 1978, Ser. No. 880,149

Claims priority, application Sweden, Feb. 22, 1977, 7701913

Int. Cl.<sup>2</sup> H05B 7/148

U.S. Cl. 13—12

4 Claims



1. A DC arc furnace comprising a hearth having an outside and an inside adapted to contain pieces of solid metal and a melt formed therefrom, at least one arcing electrode adapted to form an arc with said pieces and said melt, at least one melt electrode adapted for melt contact by said melt, a starting electrode adapted to be moved into contact with said pieces to form said melt to a degree effecting said melt contact and to

thereafter be moved away from said contact with the pieces, and positive and negative power lines of which the positive line connects with said melt and starting electrodes and the negative line connects with said arcing electrode, whereby a voltage differential is formed between the hearth's said outside and said positive line and which differential is dependent in value on the degree said starting and/or melt contact electrodes form good electric connections with said pieces and said melt respectively, and means for measuring said value.

#### 4,161,619 ELECTRODE SOCKET DESIGN

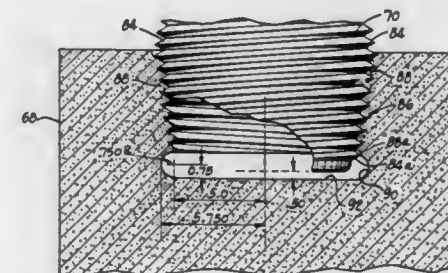
Kegham M. Markarian, University Heights; Richard D. Matty, Marshallville, and Fred E. Svekric, Euclid, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Nov. 11, 1977, Ser. No. 850,709

Int. Cl.<sup>2</sup> H05B 7/14

U.S. Cl. 13—18 C

12 Claims



1. An electric-arc furnace electrodes comprising an elongate, carbonaceous electrode section having a socket adjacent one end, the socket extending longitudinally from an opening in an end surface of the electrode to a base, the socket having a threaded portion, the socket being adapted when in use to receive a threaded pin, the socket having a base portion between the base and the threaded portion when the electrode is in use such that the pin extends through the length of the threaded portion into the base portion and terminates at a location spaced from the base, the base portion comprising a circumferentially extending fillet having at least one circumferential, radiused surface intermediate the lowermost socket thread and the base of the socket, the base including a transversely extending surface which is as compared with the radiused surfaces relatively flat.

#### 4,161,620 ELECTRIC ARC FURNACE FOR STEEL MAKING, WITH NO REFRACTORY BRICKS AT THE FURNACE WALL

Syoji Nakamura, Osaka, Japan, assignor to Kyoei Seiko Kabushiki Kaisha, Osaka, Japan

Filed Oct. 31, 1977, Ser. No. 847,472

Claims priority, application Japan, Nov. 17, 1976, 51-138684

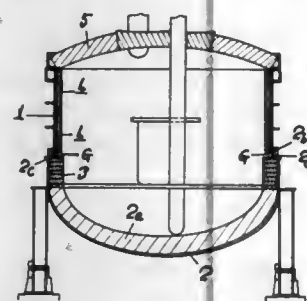
Int. Cl.<sup>2</sup> F27D 1/12

U.S. Cl. 13—32

3 Claims

1. An electric arc furnace for use in the manufacture of steel, said furnace comprising:  
a furnace bed portion lined with refractory material;  
a solid metal shell portion made separately from said bed portion and having an outer diameter which is less than the outer diameter of said bed portion, said shell portion being joined to the top of said bed portion and extending upwardly therefrom; and  
a plurality of hollow metal water-cooling boxes arranged in plural layers and attached to and covering the entire inner

surface of said shell portion above the slag line of the furnace, said metal boxes forming the inner furnace wall



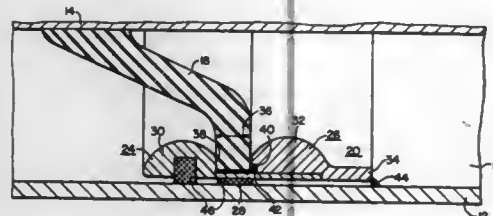
and being directly exposed to the heat in the furnace during use thereof.

#### 4,161,621 SPACER MOUNT FOR A GAS INSULATED TRANSMISSION LINE

Philip C. Bolin, Westborough; Robert J. Lapen, Marlboro, and Alan H. Cookson, Southborough, all of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Jun. 29, 1977, Ser. No. 811,231  
Int. Cl.<sup>2</sup> H01B 9/04

U.S. Cl. 174-14 R

8 Claims



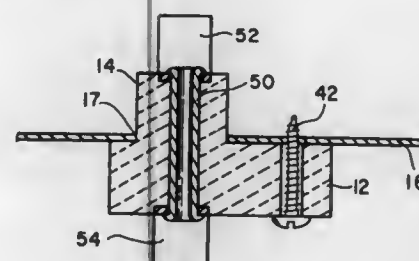
1. A gas-insulated transmission line comprising:  
an elongated, cylindrical outer sheath;  
an elongated inner conductor disposed within said outer sheath;  
an insulating gas disposed within said outer sheath an electrically insulating said inner conductor from said outer sheath;  
an insulating spacer having a longitudinal width disposed within said outer sheath and insulatably supporting said inner conductor within said outer sheath; and  
a metallic spacer mount for mounting said spacer within said outer sheath comprising:  
an annular first member having a longitudinally extending section and a radially-inwardly extending nub; and  
an annular second member having a radially-inwardly extending nub, said second member being secured to said first member at said first member longitudinal section, said first and second member nubs being spaced-apart a distance substantially the same as said spacer width, said first member nub, said second member nub, and said first member longitudinal section forming an annular space therebetween, said spacer being disposed within said annular space, said spaced mount being secured to said outer sheath.

#### 4,161,622 INSULATOR ASSEMBLY HAVING NOVEL FEEDTHROUGH PORTION

Sanford A. Drayer, 1270 Village Way, Orlando, Fla. 32807, and Gordon D. Wampler, 11411 NW. 30th St., Sunrise, Fla. 33323  
Filed Dec. 22, 1976, Ser. No. 753,211  
Int. Cl.<sup>2</sup> H01B 17/26

U.S. Cl. 174-152 R

1 Claim



1. A pre-assembled pass-through bushing unit for conducting electricity from one side to the other of an electrically conducting partition having an opening therein comprising:  
an insulator device having a main body and an integral feedthrough portion extending outwardly of said main body, said portion being sized to fit through the opening in the partition;  
means defining a bore extending completely through said main body and feedthrough portion;  
connector means positioned at each end of said bore and having openings aligned therewith;  
locking means on said insulator device adjacent opposite ends of said bore cooperating with said connector means to prevent rotation of said connector means with respect to each other and said device;  
a hollow conductor snugly received within said bore and said connector openings and having its opposite ends deformed over said connector means to form a rigid unitary assembly; and  
means for rigidly removably attaching said device to the partition.

#### 4,161,623 CODE GENERATOR FOR TEXT TRANSMISSION DEVICES

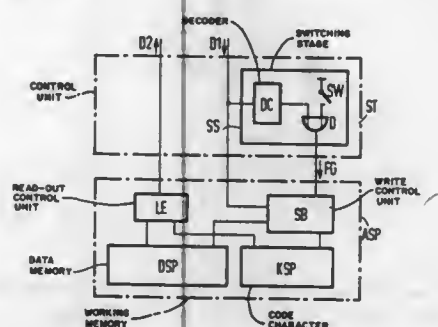
Jürgen Heltmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,639  
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708333

U.S. Cl. 178-79

Int. Cl.<sup>2</sup> H04L 15/00

6 Claims



1. In a code generator for text transmission devices of the type which, in order to allow a subscriber to be recognized, emits code characters assigned to the subscriber over a trunk

line, the code characters being stored in a memory which comprises electrically operable storage elements whose content remains unchanged upon a loss of operating voltage, a write-in control unit being connected to the memory for writing-in code characters, and a read-out control unit being connected to the memory for reading the code characters, the improvement therein comprising:

a line matching unit connecting the write-in control unit to the trunk line for inputting code characters from a central position to the memory via the trunk line over which normal text transmission occurs.

#### 4,161,624 HANDS-FREE TELEPHONE WITH CASCADED ATTENUATORS

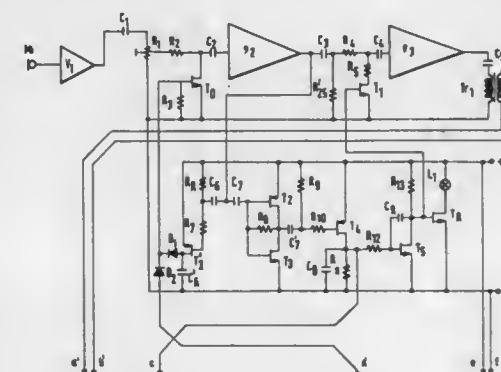
Jürgen Brosow, Elsenwang, Austria, assignor to Dasy Inter S.A., Genf, Switzerland

Filed Aug. 25, 1977, Ser. No. 827,752  
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638286

U.S. Cl. 179-1 HF

Int. Cl.<sup>2</sup> H04M 1/60

11 Claims



1. In a hands free telephone set including a transmit channel connected to a microphone, a receive channel connected to a loudspeaker and a control circuit connected between said channels to determine the transmission direction of said set by voice controlled switching, each of said channels comprising a first or preamplifier and a second or final amplifier; the improvement wherein each said channel also comprises a first attenuator inserted before the respective said first amplifier and a second attenuator inserted before the respective said second amplifier, said control circuit comprising a separate first delay circuit for each of said transmit and receive channels, the input of said first delay circuits being fed with the preamplified voice signal of the respective channel, the output signal of each said first delay circuit being coupled as an attenuating-signal to the first attenuator of the respective other channel and to a separate second delay circuit, the output signals of said second delay circuits being applied as attenuating signals to the second attenuator of the respective channel.

#### 4,161,625 METHOD FOR DETERMINING THE FUNDAMENTAL FREQUENCY OF A VOICE SIGNAL

Harald Katterfeldt, Ulm, and Helmut Mangold, Aufheim, both of Fed. Rep. of Germany, assignors to Licentia, Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,144  
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715411

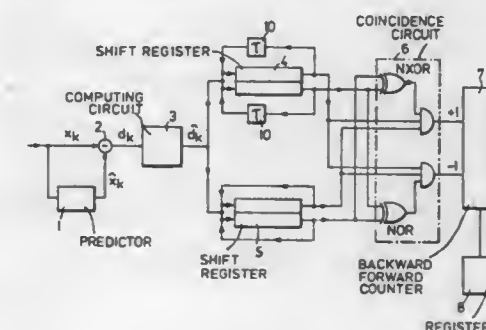
U.S. Cl. 179-1 SC

Int. Cl.<sup>2</sup> G10L 1/02

7 Claims

1. A method of determining the fundamental frequency of a voice signal comprising:  
feeding the original voice signal to a predictor to form an estimated voice signal; subtracting said estimated voice

signal from said original voice signal to form a difference signal; auto correlating only the significant characteristic



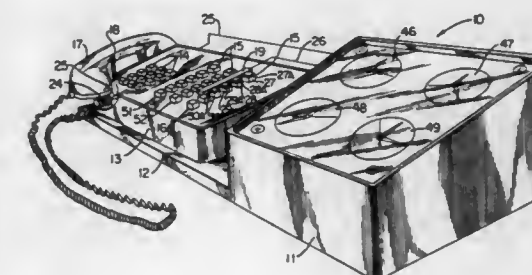
of said difference signal; and determining the maxima of the correlation coefficients as a measure of the fundamental frequency.

#### 4,161,626 TELEPHONE TIME RECORDER

Tim R. Waldo, 6542 Blain, Fremont, Mich. 49412  
Filed Jan. 25, 1978, Ser. No. 872,012  
Int. Cl.<sup>2</sup> H04M 15/18

U.S. Cl. 179-7.1 R

10 Claims



1. In a telephone having a receiver, a receiver retainer, and a plurality of push buttons connected to a plurality of telephone call lines with a disconnect switch connected to the telephone call lines so as to be responsive to displacement of said receiver from said retainer to transmit a call when closed and to terminate the call when opened, a telephone call monitoring device for measuring the elapsed time of usage of selected ones of said telephone call lines for calls initiating from said telephone comprising a monitoring circuit including a plurality of timers electrically connected in parallel to one another in said monitoring circuit, a stop switch and means electrically connecting said stop switch in series with each of said timers, said stop switch switchable between conductive and non-conductive electrical states, start switch means associated with each said timer including a plurality of start switches mounted in an elongated strip, said strip positioned adjacent a set of said buttons, each said start switch being a reed switch mounted adjacent a respective one of said push buttons and switchable between conductive and non-conductive electrical states, activating members including magnetic means associated with each button of said set and its associated start switch, said activating members operative to switch an associated one of said start switches when its associated button is moved transversely of said strip, each of said timers in said monitoring circuit having an associated said start switch and being energized when its associated start switch and said stop switch are in conductive states and being deenergized when one of its associated start switch and said stop switch is in a non-conductive state, and accumulating means associated with each of said timers for cumulatively storing and displaying the aggregate



time lapse resulting from a series of calls as measured by the time duration that its respective timer is energized.

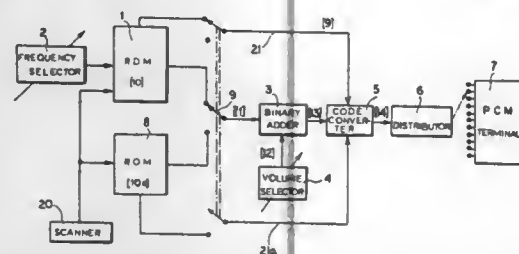
#### 4,161,627 METHOD OF AND SYSTEM FOR GENERATING DIGITAL TEST SIGNALS

Bertram Amann, Enningen u.A., Fed. Rep. of Germany, assignor to Wandel & Goltermann, Enningen u.A., Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,501  
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659512

Int. Cl.<sup>2</sup> H04J 3/14; H04L 3/00  
U.S. Cl. 179—15 BF

10 Claims



1. A method of generating digital test signals simulating an oscillation of pseudo-logarithmically compressed selectable amplitude, comprising the steps of: establishing a set of numerical values representative of successive amplitude samples of a cycle of an oscillation to be simulated; quantizing said numerical values in conformity with a pseudo-logarithmic compression characteristic to form a series of basic multibit code words; generating a supplemental multibit code word representing a quantized multiplication factor; algebraically adding said supplemental code word to each of said basic code words to form a sequence of resulting multibit code words; and transmitting said sequence to a load to be tested.

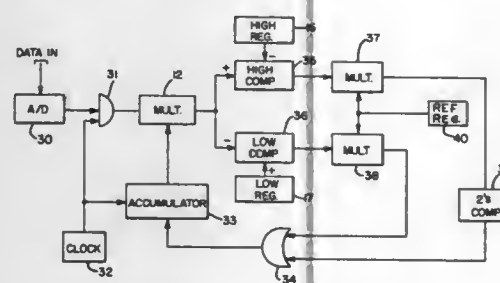
#### 4,161,628 TECHNIQUE FOR TRACKING AMPLITUDE FADES FOR MULTI-AMPLITUDE SIGNALLING

Daniel D. McRae, West Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 31, 1978, Ser. No. 873,834  
Int. Cl.<sup>2</sup> H04J 3/04; H04B 1/10

U.S. Cl. 179—15 BL

11 Claims



1. In a data communication system wherein transmitted data signals may occupy amplitude levels at and between upper and lower values of the same polarity, a method of adjusting the amplitudes of received data signals comprising the steps of: multiplying the amplitude of each received data signal by an adjustable gain coefficient to obtain a gain product signal; comparing said gain product signal with first and second reference values representative of gain products corresponding to said upper and lower values of the amplitude

levels capable of being occupied by transmitted data signals; and adjusting the value of said gain coefficient so as to make the percentage of time that said first reference value is exceeded by gain product signals equal to the percentage of time that said second reference value exceeds gain product signals.

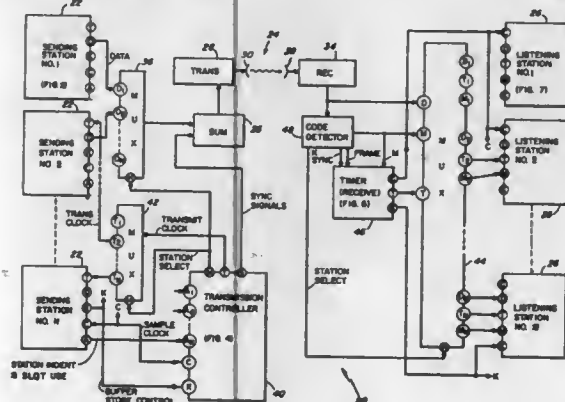
#### 4,161,629 COMMUNICATION SYSTEM WITH SELECTABLE DATA STORAGE

Arent H. Kits van Heyningen, Newport, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 6, 1978, Ser. No. 875,702  
Int. Cl.<sup>2</sup> H04J 3/16

U.S. Cl. 179—15 BA

7 Claims



1. A communication system for selectively transmitting data from a set of sending stations over a common communication link to a set of listening stations, the system comprising: a register means located in each of said sending stations for the storage of samples of data to be transmitted by said system; each of said register means having slots serially connected for the storage of data, there being terminals coupled to respective ones of the slots; each of said sending stations further comprising switching means coupled to said register means for selecting a pair of terminals of said register means, one of said terminals being a data input terminal and the other of said terminals being a data output terminal, the slots coupled between said input and said output terminals being designated for data storage, all data of said sending stations being coupled via said output data terminal to said common communication link; and wherein each of said listening stations comprises a corresponding register means and a corresponding switching means coupling said register means to said communication link.

#### 4,161,630 CIRCUIT ARRANGEMENT FOR USE IN TELEPHONE SYSTEMS

James P. Bennett, Duffield, and David C. Harms, Beeston, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Nov. 29, 1977, Ser. No. 855,564  
Claims priority, application United Kingdom, Dec. 3, 1976, 50451/76

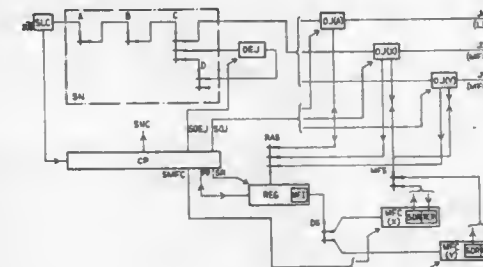
Int. Cl.<sup>2</sup> H04M 7/06

U.S. Cl. 179—18 EB

8 Claims

1. An automatic telephone exchange employing registers for the setting-up of connections over junctors of at least one group of outgoing junctions which employ forward and backward multi-frequency code signalling, wherein said junctors are accessible from a group of multi-frequency control equip-

ments each having a sender and receiver compatible with said multi-frequency code signalling characterised in that a cross-point switching means is provided for establishing selective two-way signalling connections between said registers and the multi-frequency control equipments of at least said group, in which circuit arrangements are provided at each register and at each said control equipment and said circuit arrangements comprise signal transmitting and receiving means whereby any



2-out-of-N signal presented locally in parallel-marking form to the transmitting means of the register or the multi-frequency control equipment effects generation of a corresponding signal in serial form which is transmitted as an N-bit sequence over a single bi-directional wire of the particular selective connection and is operative in the receiving means of the multi-frequency control equipment or register respectively to effect reproduction of the signal in parallel-marking form.

#### 4,161,631 PICKUP CARTRIDGE

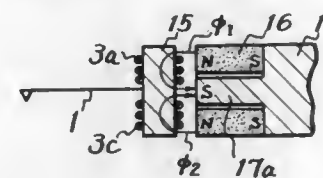
Hitoshi Matsuda, Tokyo, Japan, assignor to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Continuation of Ser. No. 639,189, Dec. 9, 1975, abandoned. This application Jul. 13, 1978, Ser. No. 924,354

Claims priority, application Japan, Dec. 13, 1974, 49-143218  
Int. Cl.<sup>2</sup> H04R 9/16

U.S. Cl. 179—100.41 D

2 Claims



1. A pickup cartridge comprising: a cantilever, a cross-shaped armature with four legs attached to said cantilever, a damper attached to said armature, a suspension wire means for supporting said cantilever and said armature and extending through said damper, holding means disposed at the rear of said damper and including at least a magnet with north and south poles, said suspension wire means being attached thereto, and electromagnetic pickup means including axially aligned first and second coils of the same number of turns connected in series mounted on first and second axially aligned legs of said armature, third and fourth coils of the same number of turns connected in series mounted on third and fourth axially aligned ledges of said armature, said first and second coils aligned at 90 degrees to said third and fourth coils, said armature being disposed such that magnetic flux generated by said magnet and passing through said armature is varied when the distance between the four legs of said armature and said magnet is changed so as to induce a voltage in said first, second, third and fourth coils wound on said armature, said magnetic flux which passes through said coils passing in the direction of the axes of said coils and being not parallel to the direction deter-

mined by a line between the north and south poles of said magnet and said first coil moving toward said magnet when said second coil moves away from said magnet and said third coil moving toward said magnet when said fourth coil moves toward said magnet to produce a linear push-pull output.

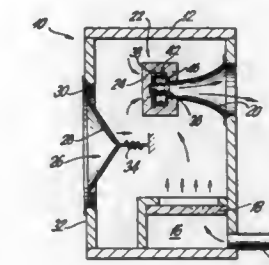
#### 4,161,632 PNEUMATIC ACOUSTIC TRANSDUCER WITH FERROMAGNETIC FLUID VALVE

Dan Sibalis, 90 Gold St., New York, N.Y. 10038

Filed Jul. 5, 1978, Ser. No. 922,067  
Int. Cl.<sup>2</sup> H04R 23/00

U.S. Cl. 179—113

7 Claims



1. An acoustic transducer for modulating a stream of flowing fluid in accordance with an audio signal comprising, a variable magnetic field, ferromagnetic fluid disposed across said magnetic field in said stream, and means for varying said magnetic field in accordance with said audio signal to thereby vary the flow resistance of said ferromagnetic fluid to modulate said stream.

#### 4,161,633 SUBSCRIBER LINE/TRUNK CIRCUIT

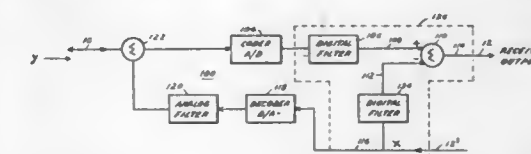
Robert Treiber, Centerport, N.Y., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Continuation of Ser. No. 773,713, Mar. 2, 1977, abandoned. This application May 8, 1978, Ser. No. 903,458

Int. Cl.<sup>2</sup> H04B 3/20; H04M 9/08

U.S. Cl. 179—170.2

37 Claims



1. A line circuit for providing an interface between at least a subscriber line carrying bidirectional analog communication signals and a digital circuit, said line circuit being subject to undesired line signal return from a two-wire to four-wire conversion means provided therein, comprising: analog-to-digital coder means for converting said analog communication signals to digital signals; digital signal processing means for selectively attenuating said digital signals coupled thereto from said analog-to-digital coder and for subtracting from said attenuated digital signals said undesired line signal return present in

said line circuit to provide a composite digital output signal representative of said analog communication signals substantially without the presence therein of said undesired line signal return; and means for coupling said composite digital output signal to said digital circuit.

4,161,634

## COUNT-DOWN ADDRESSING SYSTEM

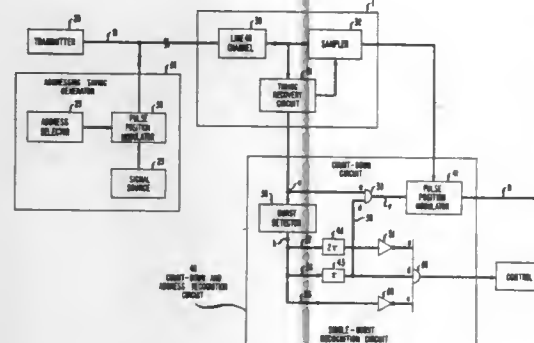
Jules A. Bellisio, Wall Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 31, 1978, Ser. No. 929,431

Int. Cl.<sup>2</sup> H04B 3/46

U.S. Cl. 179—175.31 R

8 Claims



1. Apparatus for addressing one of a plurality of  $n$  remote stations distributed along a system capable of transmitting electromagnetic wave energy characterized in that said apparatus includes:

an addressing signal generator (22) coupled to said system (20, 21, i) for generating an addressing signal comprising a series of  $m$  signal bursts, where  $m$  is an integer between one and  $n$ , and designates the station to be addressed; means (33, 34, 41, 43) at each of said stations for deleting one burst from said series and for retransmitting a series of bursts having one less than the number received; and further means (34, 38, 43, 44, 50, 51) for recognizing that only a single addressing burst is received.

4,161,635

## ADDRESS VERIFICATION SYSTEM

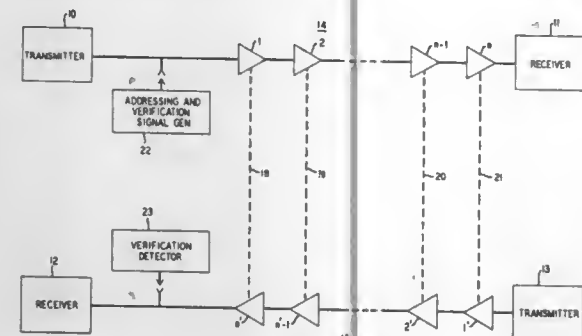
Dan H. Wolaver, Edison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 31, 1978, Ser. No. 929,435

Int. Cl.<sup>2</sup> H04B 3/46

U.S. Cl. 179—175.31 R

5 Claims



1. An address verification system for use in a communication system including a first wavepath (14) having a plurality of  $n$  remote addressable stations (1, 2, . . .  $n$ ) distributed therealong for transmitting signals in a first direction, and a second wavepath 15 having a second plurality of  $n'$  remote addressable

stations (1', 2', . . .  $n'$ ) distributed therealong for transmitting signals in a second direction opposite to said first direction; generating means (22), coupled to said first wavepath at a point therealong, for generating a series of  $i$  addressing signal bursts for addressing the  $i$ th addressable station therefrom, where  $i$  is an integer between one and  $n$ ; first means (43, 44, 45, 46, 47) at each of said stations for deleting one burst from said series and for retransmitting a series of bursts having one less than the number received; second means (43, 48, 49, 50, 51, 52, 53, 54, 55) for recognizing when only a single burst is received and for coupling (32) between said first and second wavepaths (14, 15) to form a loop-back circuit; characterized in that said system includes a verification detector (23) coupled to said loop-back circuit at a point along said second wavepath (15); and in that said generating means (22) includes selector means (70) for generating a second series of  $p+1$  signal bursts, where  $p$  is equal to the number of addressable stations in the loop-back circuit between said generating means (22) and said verification detector (23).

4,161,636

## ARC EXTINGUISHING ARRANGEMENT FOR GAS BLAST TYPE CIRCUIT BREAKER

Heribert Maier, Dietikon, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

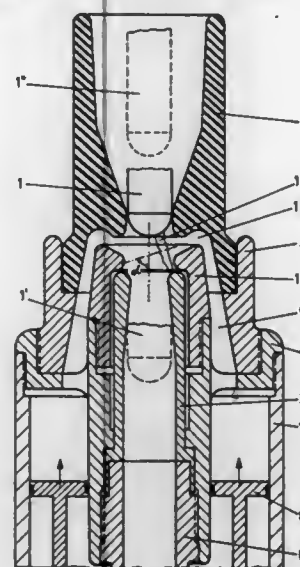
Filed Apr. 27, 1976, Ser. No. 680,800

Claims priority, application Switzerland, Jun. 18, 1975, 7905/75

Int. Cl.<sup>2</sup> H01H 33/88

U.S. Cl. 200—148 A

9 Claims



1. In an electrical circuit breaker of the gas blast type comprising a pair of contact members disposed within an arc quenching zone of a chambered part at which separation of the contact members takes place and an arc is established therebetween, the improvement wherein an annular blast gas in-flow duct surrounds said arc quenching zone and through which the gas is forced by piston action in the direction of said quenching zone, and the discharge end of said in-flow duct includes a gas deflection zone constituted by a fixed ring-shaped duct which lies at an acute angle to the axis of the quenching zone, said angle being in the range of from 45° to 60° for preventing blow-back of hot arc extinction gases formed in the quenching zone through said in-flow duct in the opposite direction.

4,161,637

## PUSHBUTTON SWITCH

Wolfgang Priesemuth, Wendelbornweg 12, D-2210 Itzehoe-Nordoe, Fed. Rep. of Germany

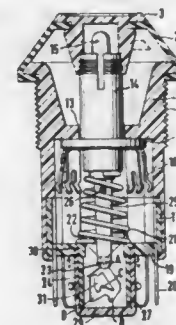
Filed Feb. 22, 1977, Ser. No. 770,827

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606551

Int. Cl.<sup>2</sup> H01H 3/00

U.S. Cl. 200—153 J

8 Claims



1. A pushbutton switch which includes in combination: a housing, a reciprocable actuating member arranged coaxially within said housing and movable from a first position representing its inactive position to a second position representing its active position, and vice versa, movable switch contacts supported by said actuating member so as to be movable therewith, a locking device associated with said actuating member and comprising a connecting link guide and guiding pin means in engagement with and very accurately guided by said connecting link guide, single spring means operatively connected coaxially to said actuating member and continuously urging the same to said first position, stationary switch contacts arranged on said switch housing, said locking device being operable in response to said actuating member reaching said second position to lock said actuating member in said second position, in which said movable and stationary switch contacts electrically contact each other, said actuating member also being movable out of said second position to allow said spring means to return said actuating member to said first position without any danger of tilting and binding, a link member having one end freely movably linked to said reciprocable member, said housing having a bottom having said contacting link guide fixedly connected thereto, said guiding pin means being connected to the other end of said link member, a divided housing extension extending outwardly from said bottom and arranged inwardly of said stationary switch contacts, one section of said divided housing extension containing said connecting link guide and forming a part of said bottom, and the other section of said extension forming a detachable cover.

4,161,638

## VACUUM INTERRUPTER LATCH RELEASE MECHANISM

Robert H. Ettinger, Pittsfield, Mass., assignor to General Electric Company, N.Y.

Filed May 12, 1978, Ser. No. 905,168

Int. Cl.<sup>2</sup> H01H 3/30

U.S. Cl. 200—153 SC

9 Claims

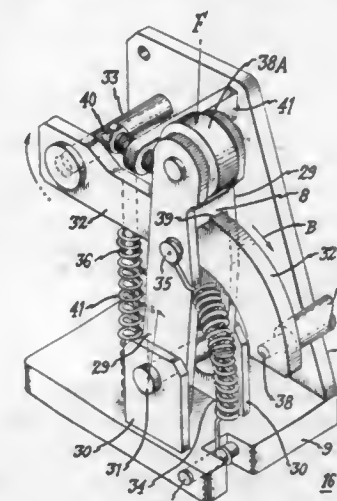
1. A latch release mechanism for operating a moveable electrical terminal comprising:

support means for carrying the latch release mechanism in operational relationship with the terminal;

a trigger action arm pivotally mounted upon the support for retaining electrical contacts in a closed position against a driving force when the trigger action arm is in a first position and for allowing the electrical contacts to open when the trigger action arm is in a second position;

a support arm assembly pivotally connected to a base portion of the support by means of a pair of upright plates at one end and having means on the other end for opposing

the force and keeping the electrical contacts in the closed position and for releasing the force to open the electrical contacts in cooperation with said trigger action arm; a catch means on the trigger action arm for engaging with a stop means on the support arm assembly; and



a first spring pivotally attached at one end to the support arm assembly proximate the stop means and pivotally attached at the other end to the base support.

4,161,639

## HANDLE SAFETY SWITCH

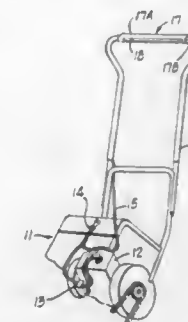
Thomas J. Nofel, Brookpark, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Jul. 1, 1977, Ser. No. 812,178

Int. Cl.<sup>2</sup> H01H 9/06, 13/08

U.S. Cl. 200—157

6 Claims



1. A safety switch for controlling the operation of a motor of an appliance having a handle held by the operator of the appliance while walking behind the appliance, the combination of a hollow hand grasping member removably mounted on the handle in a position to be grasped by the operator, said hand grasping member having a slot along substantially the length thereof and a bar extending longitudinally therealong and protruding into said slot in said hand grasping member, a single serpentine resilient means carried by the hand grasping member in said slot along the length thereof and positioned to resiliently urge the said bar outwardly of the hand grasping member substantially equally along the length of the bar to permit the bar to move bodily relative to the hand grasping member and to permit the bar to tilt relative to the hand grasping member, electric contact members carried by the hand grasping member adjacent the opposite ends thereof, said electric contact members being electrically connected to said motor for the control of the operation of the motor, an electric conducting member within said bar and extending outwardly



at each end of said bar to move therewith, said electric conducting member electrically engaging said contact members under the bias of said resilient means, the said bar urged outwardly of said hand grasping member under the bias of said resilient means holding said engaging portions of the electric conducting member in electric contact with both said electric contact members to close the circuit between said contact members, the movement of the said bar bodily inwardly of the hand grasping member along the length of the hand grasping member by the hand of the operator grasping the bar in opposition to the bias of said resilient means breaking the contact of both the engaging members with the contact members, respectively, to open the circuit between said contact members, and the tilting of the bar relative to the hand grasping member by the hand of the operator grasping the bar in opposition to the bias of said resilient means breaking the contact of at least one of the engaging members with a contact member to open the circuit between said contact members.

4,161,640

## ORBITAL WELDING TORCH

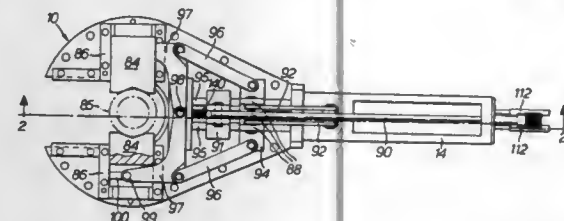
Robert A. C. Bromwich, Marlow; William G. Hill, Beckenham, and Charles M. Lawrence, Horsham, all of England, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.  
Filed Jun. 6, 1977, Ser. No. 804,198

Claims priority, application United Kingdom, Jun. 4, 1976, 23252/76

Int. Cl.<sup>2</sup> B23K 37/02

U.S. Cl. 219—60 A

16 Claims



1. An orbital welding torch for butt welding tubes comprising:

- a horse-shoe shaped body having an open mouth to enable said body to engage partially around the tubes to be butt welded when inserted from one side of the tubes,
- a crescent shaped table having an open mouth rotatably carried by said body,
- a welding head mounted on said table,
- means for rotating said table relative to said body so as to orbit said head around the region of the weld, said open mouth of said body and said table being capable of alignment to enable said body to be inserted from one side of the tube to engage partially around the tube,
- a pair of clamping blocks arranged to move in a direction which is substantially diametric relative to the tubes when the torch is in position to make a weld and is substantially transverse to the direction of insertion of the body whereby, once the torch has been inserted from one side of the tubes so that the body extends partially around the tubes, and
- clamping means for moving said clamping blocks, comprising two cranks, each of said cranks being pivoted at one end to one of said clamping blocks and at the other end to the other of said cranks, a slideable block movable with respect to said body, a pair of crank links, each of said crank links being pivoted at one end to said block and at the other end to one of said cranks at a point between the ends of said one crank, a fixed block immovable with respect to said body, a lever pivoted at one end to said fixed block, and a lever link pivoted at one end to said slideable block and at the other end to said lever whereby moving said lever toward the plane of the body will cause said slideable block to move toward said tubes so that said crank links rotate said cranks to move said clamping

blocks against said tubes to hold said torch in place during the making of a weld.

4,161,641

## EDM PROCESS AND APPARATUS FOR OVERCUT MACHINING OF A WORKPIECE BY AN ELECTRODE TOOL

Benno Bonga, Crans, Switzerland, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland

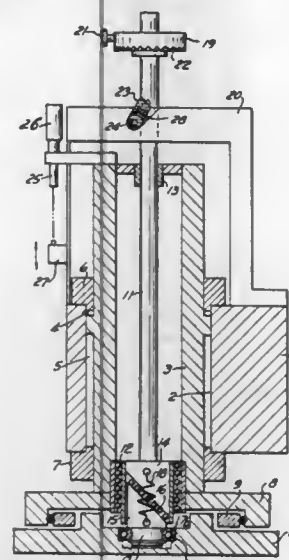
Filed Dec. 9, 1977, Ser. No. 859,219

Claims priority, application Switzerland, Dec. 14, 1976, 15688/76

Int. Cl.<sup>2</sup> B23K 9/16

U.S. Cl. 219—69 M

30 Claims



1. In a process for EDM machining an electrode workpiece by means of an electrode tool wherein said electrodes are displaced one relative to another from an initial relative position simultaneously along an axis of penetration of the electrode tool within the electrode workpiece and in a direction perpendicular to said axis, such relative displacement being controlled from the start of a machining operation such as to maintain a predetermined machining gap between the electrode tool and the electrode workpiece, the improvement comprising monitoring the moment at which a predetermined machining dimension is achieved, retracting the electrode tool at such moment, following said retraction by a further advance of said electrode tool, and progressively changing the radial direction of translation motion between the beginning of said retraction and the end of said advance.

4,161,642

## CUTTING AND GOUGING HEAD FOR WELDING EQUIPMENT

Walter Arnason, 807 2nd Avenue, Castlegar, British Columbia, Canada (V1N 1L2)

Filed Nov. 18, 1977, Ser. No. 852,857

Claims priority, application Canada, Nov. 29, 1976, 266772

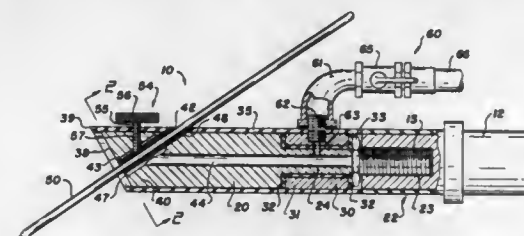
Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—70

6 Claims

1. A cutting and gouging head for an electrode holder of an electric arc welder comprising an electrically conductive body having a longitudinal passage extending between inner and outer ends of said body, couplings means for electrically connecting the inner end to the holder, insulating means electrically isolating exterior portions of the body; said outer end having an end face, a bore, and a counterbore connected to the longitudinal passage and open to said end face; a tubular member mounted in the bore to extend longitudinally of the counterbore, said tubular member having an outer surface spaced

from an inner surface of the counterbore to define therewith an annular jet nozzle of a constant volume, clamping means on the outer end adapted to secure an electrode rod within the tubular member with one end of said electrode rod projecting beyond



the end face, and air supply means mounted on the body for supplying pressurized air to the longitudinal passage whereby air is discharged from the annular jet nozzle to flow longitudinally of the electrode rod as a substantially annular stream.

4,161,643

## WELDING HANDLE ASSEMBLY

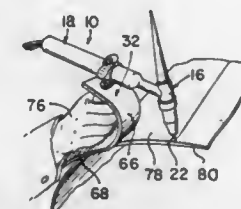
Timothy J. Martin, Jr., 1328 Pangborn Rd., Lynden, Wash. 98264, and David C. Waschke, 7017 Mission Rd., Everson, Wash. 98247

Filed Oct. 28, 1977, Ser. No. 846,440

Int. Cl.<sup>2</sup> B23K 9/32

U.S. Cl. 219—70

28 Claims



1. A welding apparatus adapted to form a weld on a work piece having a weld location at which said weld is to be made, and an exposed surface area spaced from said weld location, said apparatus comprising in combination:

- a welding probe having a first lengthwise axis and having an operating end adapted to be placed in proximity to said weld location of said work piece to form a weld at said weld location,
- a main handle having a forward end to which said probe is mounted, said main handle having a second lengthwise axis extending laterally from said first lengthwise axis,
- an auxiliary handle assembly connected to said main handle, said auxiliary handle assembly comprising:
  - a handle portion pivotally connected to said main handle and having a third lengthwise axis extending laterally from said second lengthwise axis, said handle portion having a forward portion and a rearward portion, a length dimension and width dimension such that it can be grasped in the palm of a person's hand, with fingers of the hand spaced along the lengthwise axis of the handle portion, said handle portion having an upper end by which it is attached to said main handle, and also a lower end, the lengthwise dimension of the handle being such that the lower end thereof extends at least to a heel portion of the hand grasping the handle portion,
- insulating means mounted to said handle portion comprising:
  - a first insulating portion mounted to said handle portion and having a protective surface spaced forward of said handle a sufficient distance to be positioned forward of the hand grasping the handle portion, said protective surface having lengthwise and a width dimensions sufficient to provide protection

from radiant heat emitted from the location of the operating end of the probe at the weld location, and b. a second insulating portion spaced rearward of said handle portion at said lower end of said handle portion, said second insulating portion having an upper surface adapted to engage the heel of the hand grasping the handle portion, and lower surface adapted to be positioned against the exposed surface of the work piece, to provide protection from conducted heat in said work piece,

whereby a person is able to operate said apparatus by grasping the handle portion and resting the heel of the hand on the exposed surface of the work piece with the second insulating portion positioned therebetween, and with the operating end of the probe being positioned in proximity to the weld location.

4,161,644

## ELECTROPHOTOGRAPHIC APPARATUS COMPRISING IMPROVED THERMAL FIXING MEANS

Nobuyuki Yanagawa; Tsutomu Watanabe, and Kazuaki Tagawa, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

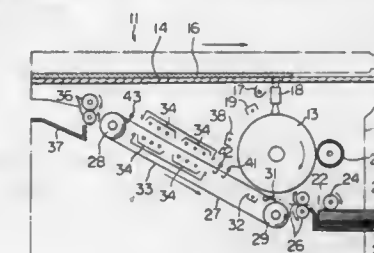
Filed Sep. 20, 1977, Ser. No. 834,983

Claims priority, application Japan, Sep. 24, 1976, 51/114493

Int. Cl.<sup>2</sup> H05B 1/00; G03G 15/20

U.S. Cl. 219—216

7 Claims



1. An electrophotographic apparatus comprising: electric heater means for thermally fixing a toner image to a copy sheet; power source means operative to supply full electric power and partial electric power to the heater means; and switch means connected to the power source means and the heater means for controlling the power source means to normally supply partial power to the heater means and to supply full power to the heater means for a predetermined length of time as the copy sheet passes through the heater means; the switch means being constructed to sense passage of the copy sheet through the heater means; the switch means comprising a first switch provided at an inlet of the heater means which is actuated by engagement with the copy sheet and a second switch provided at an outlet of the heater means which is actuated by engagement with the copy sheet; the first switch controlling the power source means to switch from partial power to full power and the second switch controlling the power source means to switch from full power to partial power; the switch means further comprising a third switch provided between the inlet of the heater means and the first switch which is actuated by engagement with the copy sheet and means for selectively enabling the first and third switches during a single copy operation and a multiple copy operation respectively.

4,161,645

## ARC WELDING APPARATUS AND METHOD

Wataru Shimada, and Seigo Hiramoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 534,186, Dec. 19, 1974, abandoned.

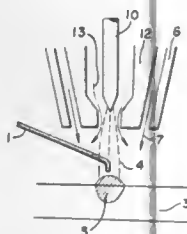
This application Aug. 10, 1976, Ser. No. 713,032

Claims priority, application Japan, Dec. 19, 1973, 48/143176

Int. Cl.<sup>2</sup> B23K 9/16

U.S. Cl. 219—137 R

8 Claims



5. An arc welding method comprising the steps of: disposing a non-consumable electrode within a guide nozzle such that said electrode is axially recessed within said nozzle; creating an arc between said non-consumable electrode and a base metal; continuously surrounding said non-consumable electrode with an inert gas fed from said guide nozzle; shielding said arc and restricting the radial extent thereof by feeding a shielding gas having carbon dioxide therein outside the periphery of said arc and said inert gas; and laterally feeding a deoxidizer in the vicinity of the arc for causing a deoxidizing reaction for the melted metal, generated from said base metal, and shielding gas.

4,161,646

## METHOD OF WELDING TUBULAR MEMBERS

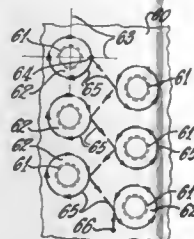
Ronald O. McCormick, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 8, 1977, Ser. No. 813,997

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—121 EM

5 Claims



1. In a method of welding wherein a group of tubular members are welded to a plate, the improvement comprising: directing a welding beam along a continuous path extending peripherally of the tubular members and between the tubular members.

4,161,647

## ELECTRICALLY HEATED SPIGOT FOR CONNECTING AN ELECTROMAGNETIC SUPPLYING PUMP TO THE INLET OF A LOW PRESSURE CASTING MOULD

Henri Carbonnel, 11 avenue Beausejour, 92160 Antony, France

Filed Nov. 29, 1977, Ser. No. 856,770

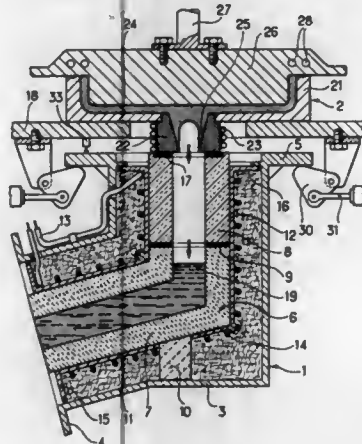
Int. Cl.<sup>2</sup> F24H 1/18

U.S. Cl. 219—301

12 Claims

1. A spigot for connecting the inlet of a low pressure casting mould to a pipeline connected to an electromagnetic pump for supplying the mould with molten metal, said spigot being

adapted to be clamped by clamping means against the inlet to the mould, said spigot comprising: an inner refractory supply conduit; an external metal jacket surrounding said conduit; and thermally insulating means surrounding said conduit and thermally separating said conduit from said jacket; wherein that end of said conduit for connection to the mould inlet includes a removable sleeve of thermally insulating refractory material resistant to the corrosive action of the molten metal and pro-



vided, at its inner end, with a first gasket through which said sleeve bears on a part of said conduit and, at its outer end, with a second gasket through which, in use, the mould inlet will bear on said sleeve, said sleeve being held in place in said spigot by the effect of the clamping means which in use clamp said spigot to said mould inlet and a sleeve housing bounding said insulating refractory material adapted to enable release of said sleeve from said spigot.

4,161,648

## ELECTRICAL RADIATION HEATER FOR A GLASS CERAMIC PLATE

Gerhard Göessler, Oberderdingen, Fed. Rep. of Germany, assignor to E. G. O. Elektro-Geräte Blanc und Fischer, Fed. Rep. of Germany

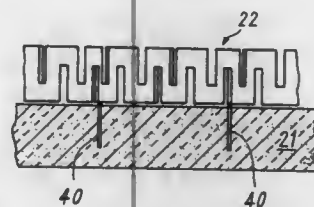
Filed Nov. 3, 1976, Ser. No. 738,517

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551137

Int. Cl.<sup>2</sup> H05B 3/68

U.S. Cl. 219—464

22 Claims



1. An electrical radiation heater for a glass ceramic plate, which forms a cooking plate, comprising: support means for said glass ceramic plate; a lining made from highly thermally insulating, temperature-resistant material disposed in said support means; a thin sheet, having a substantially flat upper surface consisting of high temperature-resistant insulating material, said sheet comprising a fibrous material and an inorganic binding agent, said sheet being disposed beneath said ceramic plate, disposed on said lining; a heating conductor strip disposed on said sheet, insulating and temperature resistant ring means located in said support means and engaging over the outer periphery of said sheet to hold the latter down on said lining at its outer

4,161,650

## SELF-POWERED FIBER OPTIC INTERCONNECT SYSTEM

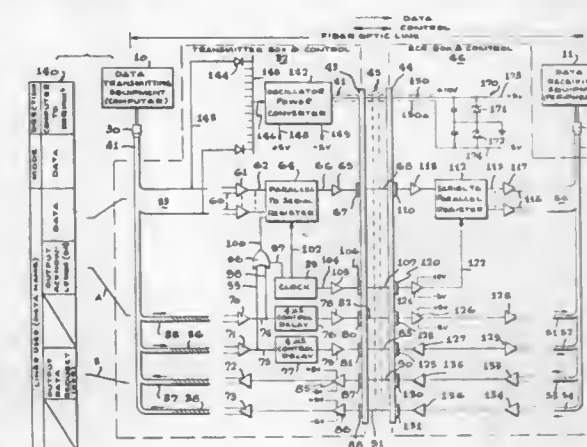
Kenneth O. Caouette, Valencia; George H. Fortescue, Granada Hills; Mohammad K. Zaman, Northridge, and Donald J. Oda, Palmdale, all of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Apr. 6, 1978, Ser. No. 894,161

Int. Cl.<sup>2</sup> H04B 9/00; H02M 3/24; G02B 5/14

U.S. Cl. 250—199

8 Claims



1. A self-powered fiber optic interconnect system for interconnecting a data transmitting device and a data receiving device comprising: means included in said data transmitting device for producing an electrical data signal; a transmitter converter comprising means for receiving and converting said electrical data signal to an optical data signal; a fiber optic line for receiving said optical signal at one end thereof for transmission therethrough; a receiver unit at the other end of said fiber optic line comprising means for receiving and reconverting said optical signal to an output electrical data signal; and means for producing power from said electrical data signal in said data transmitter device for operating said transmitter converter and said receiver unit.

4,161,651

## SIMULTANEOUSLY SAMPLED REMOTE DATA READING AND TRANSMISSION SYSTEM USING OPTICAL FIBERS

Yoshihiro Sano; Tomio Chiba, both of Katsuta; Hiroyuki Kudou, and Yoshiteru Miki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 2, 1978, Ser. No. 882,909

Claims priority, application Japan, Mar. 16, 1977, 52-27907

Int. Cl.<sup>2</sup> H04B 9/00; G01R 19/26

U.S. Cl. 250—199

8 Claims

1. A system for reading and transmitting data from a plurality of remote terminal equipments installed at respective measuring locations distributed in a system to be controlled in protection and control operations through simultaneous sampling, comprising at least one optical fiber, means for generating a synchronizing signal to be transmitted through said optical fiber to each of said terminal equipments and means for receiving data at said measuring locations from each of said terminal equipments through said optical fiber, wherein each of said terminal equipments comprises: first means for receiving said synchronizing signal to initiate measurement of a quantity to be measured at the associated measuring location in synchronism with said synchronizing signal; second means for sampling the measured quantity and con-

periphery, said sheet and said ring means having greater mechanical strength and lower thermal insulating characteristics than said lining; said heating conductor strip being relatively thick and having slits extending alternately from opposite edges thereof to define a zig-zag shape in said strip, said heating conductor strip furthermore having a back and forth curvature to define a serpentine form and being in edge-on engagement with said upper surface;

a plurality of anchoring tab means formed integrally with said conductor strip, said tab means projecting from said sheet engaging edge at spaced intervals and being at least partially pierced through said insulating sheet; and, electrical terminal connection means for said conductor strip.

4,161,649

## MULTIMODE ELECTRONIC BRAKE MONITOR SYSTEM

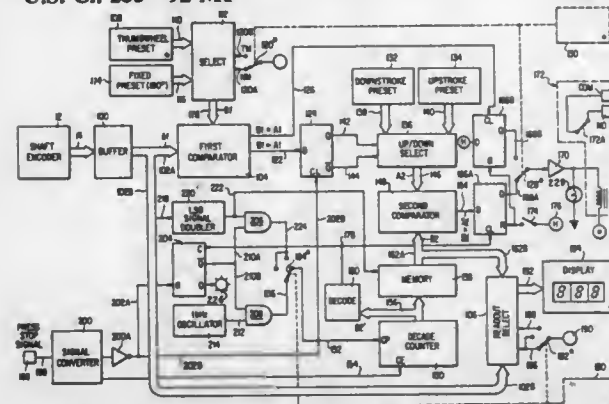
Ted Klos, Greenfield, and Herman J. Tiedt, Brookfield, both of Wis., assignors to American Motors Corporation, Southfield, Mich.

Filed Dec. 21, 1977, Ser. No. 863,045

Int. Cl.<sup>2</sup> G06M 3/02; G07C 3/00

U.S. Cl. 235—92 MP

12 Claims

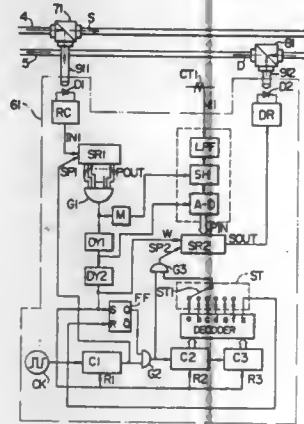


1. An electronic brake monitor for determining when the braking time of a machine having a reciprocating member and means for braking said member and means for initiating said braking means exceeds at least one of a plurality of preset braking times, comprising:

- an encoder means coupled to said member for providing an output corresponding to the absolute position of said member;
- a generator for producing clock pulses;
- a digital counter connected to said generator and enabled to accumulate clock pulses in response to said initiating means;
- preset means responsive to said encoder output and said initiating means for establishing at least a first and second mutually independent preset braking times, and for selection of a first preset braking time when said member is moving in an upstroke direction and for selection of a second preset braking time when said member is moving in a downstroke direction;
- memory means connected to said counter and responsive to changes in said encoder output for accepting the accumulated contents of said counter;
- comparator means connected to said preset means and to said memory means for producing an alert condition when the contents of said memory means exceeds said selected preset braking time.



verting an analog data corresponding to the sampled quantity into corresponding digital data; and third means for sending out said digital data output from said second means to said receiving means through said optical



fiber during a time slot specifically allotted to said terminal equipment, discriminately from other time slots each being allotted specifically to each of the other terminal equipments.

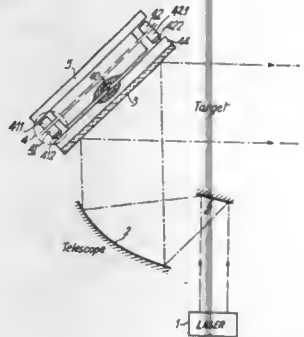
#### 4,161,652 SYSTEM FOR OPTICALLY AIMING A LASER BEAM ON TO A TARGET

Bernard G. A. Moreau, Bagneux, and René J. J. Jalin, Chatillon, both of France, assignors to Office National d'Etudes et de Recherches Aérospatiales, Chatillon, France

Filed Dec. 22, 1977, Ser. No. 863,234  
Claims priority, application France, Dec. 24, 1976, 76 39052; Dec. 15, 1977, 77 37912

Int. Cl.<sup>2</sup> G01B 11/26; G01J 1/20  
U.S. Cl. 250—203 R

6 Claims



2. A system for optically aiming a laser beam on to a target comprising:

- a mirror which reflects the laser beam towards the target;
- a pivot for said mirror;
- first and second vibrating control members for determining with the pivot a first mirror rotation axis and a second mirror rotation axis perpendicular to the first axis and controlling the angular position of the mirror around said axes;
- means for generating a first reference signal having a first predetermined frequency;
- means for generating a second reference signal having a second predetermined frequency, different from said first frequency;
- a laser radiation detector receiving the laser radiation reflected by the target and producing a reception signal;
- two pass band filters respectively tuned to said first and second frequency and both filtering said reception signal

for respectively delivering a first and a second re-aiming signal components; and means for operating said first and second vibrating control members by respectively the sum of the first reference signal and the first re-aiming signal component and the sum of the second reference signal and the second re-aiming signal component.

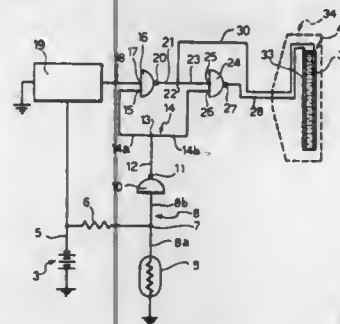
#### 4,161,653 CONTROL CIRCUIT FOR REAR VIEW MIRRORS PROVIDED WITH A LIQUID CRYSTAL CELL

Remo Bedini, Pisa, and Danilo De Rossi, S. Giuliano Terme, both of Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed Feb. 24, 1978, Ser. No. 880,743  
Claims priority, application Italy, Feb. 25, 1977, 45207 A/77  
Int. Cl.<sup>2</sup> H01J 39/12

U.S. Cl. 250—215

1 Claim



1. Control circuit for controlling the potential difference applied to conductive layers of a liquid crystal cell forming part of a rear view mirror for motor vehicles, said circuit being adapted to be supplied from a direct current low voltage source, and comprising, in combination:

- resistive potential divider means, connectible to said source and including a resistance and a photoresistor;
  - a logic inverter, connected in parallel with the photoresistor, to invert the voltage across the photoresistor;
  - oscillator means connectible to said source for generating a square wave;
  - a first logic NAND gate having a first input connected to the oscillator, a second input connected to the output of the logic inverter and an output;
  - a second logic NAND gate, having a first input connected to the output of the first NAND gate, a second input connected to the output of the logic inverter and an output;
  - conductor means connecting the output of the second logic NAND gate to one of the conductive layers of the liquid crystal cell; and
  - further conductor means connecting the output of said first logic NAND gate to the other conductive layer of the liquid crystal cell,
- whereby, when the photoresistor is activated, in use of the circuit, by incident light in excess of a predetermined threshold intensity, the voltage between the conductive layers of the liquid crystal cell has a peak-to-peak amplitude double the amplitude of the square wave generated by the oscillator means.

#### 4,161,654 CAROUSEL-TYPE COMPONENT DISPENSER WITH PHOTOELECTRIC CONTROL MEANS

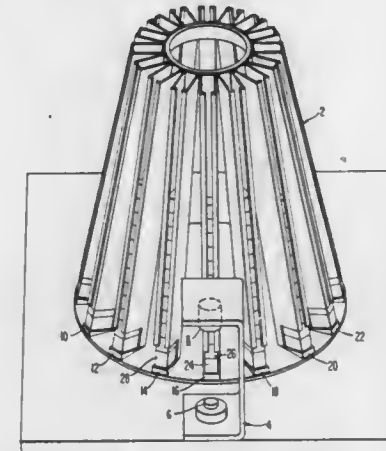
Thomas D. Szarewicz, East Lansdowne, and John H. Drinkard, Jr., Exton, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 20, 1977, Ser. No. 862,659

Int. Cl.<sup>2</sup> G01D 21/04

U.S. Cl. 250—221

7 Claims



1. An apparatus for dispensing components in the order required for the assembly of a work piece, comprising: a rotatable carousel for storing sequentially prearranged components; means for indexing said carousel to the next desired position of rotation, said position corresponding to the location on said carousel of the next component required for the assembly of said work piece; means for rotating said carousel to the position specified by said indexing means; means for providing a detectable energy beam; means for detecting the presence of said energy beam, said detecting means switching from a first state to a second state in response to the non-detection of said energy beam; a source of electrical power; means responsive to the application of said source of electrical power for activating said indexing means, said activation means further responsive to the removal of said source of electrical power for activating said rotating means; and means connected to said detecting means, said source of electrical power and said activation means, for applying said source of electrical power to said activation means when said detecting means is in the second state and for removing said source of electrical power to said activation means when said detecting means is in the first state.

#### 4,161,655 MULTI-CELL DETECTOR USING PRINTED CIRCUIT BOARD

Dennis J. Cotic, David M. Hoffman, both of Milwaukee; Peter S. Shelley, Brookfield, and Laurel J. Zech, Milwaukee, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

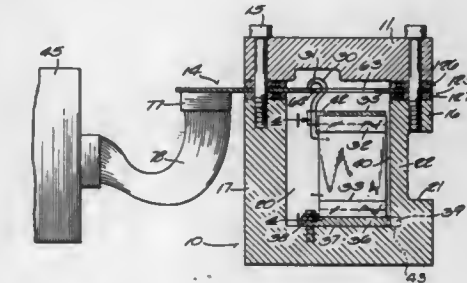
Filed Nov. 28, 1977, Ser. No. 855,532  
Int. Cl.<sup>2</sup> G01T 1/18

U.S. Cl. 250—385

8 Claims

1. A radiation detector comprising a housing for being occupied by ionizable gas at a pressure of several atmospheres and having a closed bottom, wall means defining a chamber having a top opening, and a radiation transmissive window in said housing, an array of detector elements disposed in said chamber and a fine signal wire extending from a plurality of the ele-

ments, respectively, said wires being arranged for being accessible through said top opening, a cover for being disposed on said wall means to close said opening and means for pressing said cover toward said wall means with sufficient force to maintain said gas pressure, improved means for establishing electric circuits between the outside of said chamber and said wires inside of said chamber, comprising: a circuit board including an insulating base layer having an opening for being disposed over the top opening of said chamber to enable said wires to extend through said opening and be accessible from the side of said board which is opposite from a side that is presented toward said chamber, at least one margin of said board surrounding its



- opening extending over the opening in said chamber and areas of said board around said opening being superimposed over the top of said wall means, a first plurality of conductive strips adhered to said base layer, said strips having corresponding ends terminating outside of said chamber and opposite corresponding ends terminating inside said chamber on said one margin of the opening and having holes and aligned holes in said board for said wires to pass through said board from said chamber to make electric contact with said strips, an insulating layer superimposed over said strips and adhered to said board, and gasket means disposed between said board and wall means and between said board and cover to effectively seal said chamber when said cover is pressed toward said wall means.

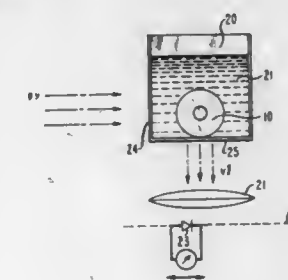
#### 4,161,656 METHODS FOR MEASURING DOPANT CONCENTRATIONS IN OPTICAL FIBERS AND PREFORMS

Dietrich Marcuse, Lincroft, and Herman M. Presby, Highland Park, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1978, Ser. No. 890,869  
Int. Cl.<sup>2</sup> G01T 1/10; G01N 21/38

U.S. Cl. 250—459

5 Claims



1. A method of determining the dopant concentrations in optical fibers and fiber preforms CHARACTERIZED BY THE STEPS OF:

illuminating a length of a fiber/preform with a source of ultraviolet radiation;  
determining, along a direction transverse to the longitudinal axis of said fiber/preform, the intensity distribution of radiant energy derived from said fiber/preform; and  
determining from said intensity distribution, the concentration of dopant as a function of distance from the center of the fiber/preform.

## 2. The method according to claim 1 CHARACTERIZED IN THAT:

the radiant energy measured is the fluorescent light produced by the dopant whose concentration is to be determined.

4,161,657

## HYDROGEN SUPPLY AND UTILITY SYSTEMS AND COMPONENTS THEREOF

Marlin R. Shaffer, Jr., 1957 Hubbard Ave., Salt Lake City, Utah 84108

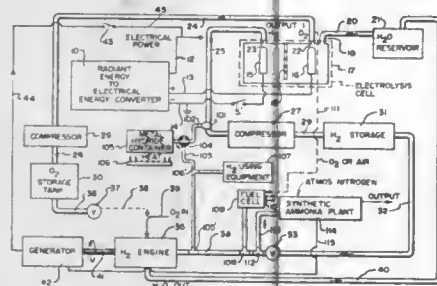
Continuation of Ser. No. 551,763, Feb. 21, 1975, abandoned.

This application Mar. 13, 1978, Ser. No. 885,584

Int. Cl.<sup>2</sup> F03G 7/02

U.S. Cl. 290—1 R

5 Claims



1. An electrical power system including, in combination: first structural means directly responsive to impingement thereon of the sun's rays for converting the sun's radiant energy in said rays as so received into electrical energy, said first means including a pair of opposite-polarity, electrolysis, electrical connectors; second electrolysis means having water incorporating a salt-type electrolyte for generating hydrogen at a lower pressure and also oxygen, said second means having a pair of separated electrodes respectively coupled to said electrical connectors, a water inlet, and hydrogen and oxygen gas outlet ports respectively disposed cooperably with said electrodes; third means coupled to said hydrogen port and utilizing the hydrogen therefrom for producing a useful result; hydrogen storage means, including an electrically operated compressor, interposed between said second and third means, for storing hydrogen at a higher pressure, said hydrogen storage means being provided with means for regulating hydrogen flow from said hydrogen storage means to said third means for essentially uniform flow.

4,161,658

## WIND TURBINE GENERATOR HAVING INTEGRATOR TRACKING

John P. Patrick, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 15, 1978, Ser. No. 916,320

Int. Cl.<sup>2</sup> F03D 9/00

U.S. Cl. 290—44

2 Claims

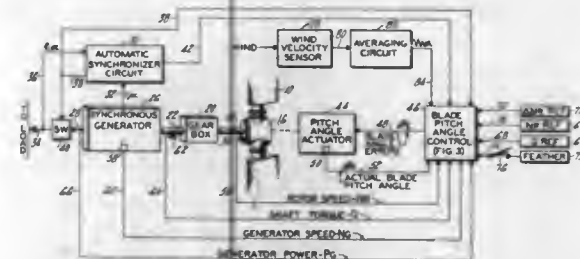
1. In a power generating system including a wind turbine driven generator, said wind turbine having a wind driven rotor with a plurality of variable pitch angle blades:

first control means responsive to a first condition of operation of said system for producing as a function thereof a first blade angle reference signal indicative of a desired blade pitch angle,

second control means responsive to a second condition of

operation of said system for producing as a function thereof a second blade angle reference signal indicative of a desired blade pitch angle, said second control means including integrator means producing an integral blade angle control signal,

means for selecting one of said first and second blade angle reference signals,



actuator means responsive to the selected one of said first and second blade angle reference signals for varying the pitch angle of said blades in response thereto, and feedback means responsive to the selected one of said first and second blade angle reference signals for maintaining the integral blade angle control signal produced by said integrator means at a value within a preselected range relative to said selected one of said blade angle reference signals.

4,161,659

## SOLID STATE PROXIMITY SWITCH

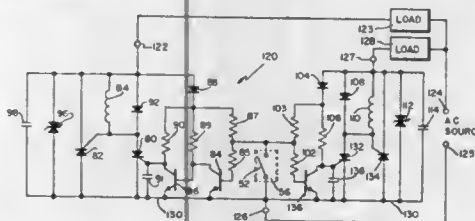
Keith Jacob, Ann Arbor, Mich., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Continuation-in-part of Ser. No. 857,584, Dec. 5, 1977. This application Jun. 9, 1978, Ser. No. 914,133

Int. Cl.<sup>2</sup> H01H 35/38; G05D 7/06

U.S. Cl. 307—39

9 Claims



1. A proximity detector and control comprising:  
a normally closed terminal, a normally open terminal and a common terminal adapted to be coupled between an AC source and a pair of alternately actuated loads;  
a proximity detector providing first and second signals representative of the absence or presence, respectively, of an object to be detected;  
a first solid state switching circuit coupled between said normally closed and said common terminals and having a control terminal coupled to said proximity detector and responsive to said first signal therefrom to provide a conduction path between said normally closed terminal and said common terminal; and  
a second solid state switching circuit coupled between said normally open and said common terminals and having a control terminal coupled to said proximity detector and responsive to said second signal therefrom to provide a conduction path between said normally open terminal and said common terminal, wherein said first and second solid state switching circuits each includes a pair of controlled unidirectional conductive devices coupled to conduct current between said normally closed and normally open terminals and said common terminal in opposite directions.

4,161,660

## APPARATUS FOR PRODUCING A TIME-PROPORTIONED CONTROL SIGNAL ELECTRONICALLY

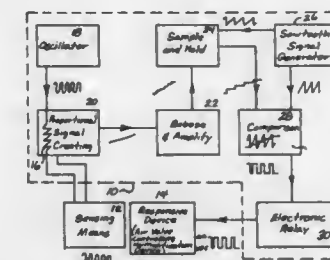
Donald A. Gallant, Charlotte, N.C., assignor to Longwood Machine Works, Inc., Woodside, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,487

Int. Cl.<sup>2</sup> H01H 35/42

U.S. Cl. 307—118

23 Claims



1. An apparatus for producing a timed control signal for actuation of a responsive device for changing a condition to a predetermined desired condition, said apparatus comprising  
(a) electronic means for sensing the condition;  
(b) means for creating electronic signals proportional to the measure of said condition being sensed by said electronic means within a sensitivity range and cyclic electronic ramp signals rising uniformly to a maximum amplitude representing said sensitivity range;  
(c) electronic means for processing said proportional signals to create therefrom a series of timed control signals by comparison of said proportional signals and said rising cyclic ramp signals at each cycle thereof and creating one of said timed control signals for the remaining duration of each cycle at the time that each ramp signal rises above each proportional signal.

4,161,661

## SYSTEM FOR AUTOMATICALLY SWITCHING TRANSFORMER COUPLED LINES

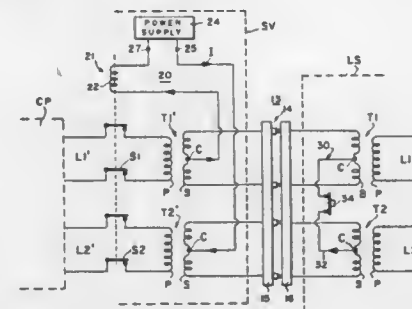
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of William S. Dwinell, Santa Ana, Calif.

Filed Mar. 9, 1978, Ser. No. 885,067

Int. Cl.<sup>2</sup> H01H 31/16

U.S. Cl. 307—119

6 Claims



1. A system for automatically operating switching means in transformer-coupled AC lines interconnected by a two-plug connector, comprising:  
four transformers, each transformer having a primary winding and a center-tapped secondary winding;  
a switching circuit connected to the center taps of the secondary windings of a first and second transformer, the secondary windings of the first and second transformers being connected to one plug of the connector,

the secondary windings of the third and fourth transformers being connected to the other plug of the connector;  
an electric line connected to each primary winding, a switching means in the lines connected to the first and second transformers,  
said switching circuit including a switch controller for operating the switching means;  
an impedance connected between the center taps of the secondary windings of the third and fourth transformers, said switching circuit having continuity through said impedance whereby said switch controller maintains said switching means in one state when said connector plugs are mated, and  
said switching circuit having discontinuity through said impedance whereby said controller maintains said switching means in another state when said plugs are unmated.

4,161,662

## STANDARDIZED DIGITAL LOGIC CHIP

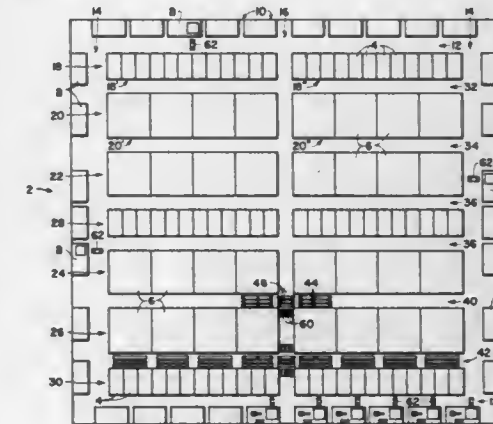
Robert B. Malcolm, Scottsdale, Ariz., and Clarence E. McDaniel, Wichita Falls, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 651,494, Jan. 22, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,047

Int. Cl.<sup>2</sup> H01L 27/04

U.S. Cl. 307—213

3 Claims



1. A semiconductor chip including a plurality of logic cell means and a plurality of bonding pad means, comprising in combination:  
a plurality of first roadway means for providing space for placeable electrical conductors between at least two of the plurality of logic cell means, each of said plurality of first roadway means having a longer and a shorter dimension;  
a plurality of second roadway means for providing space for placeable electrical conductors between at least one of the plurality of logic cell means and at least one of the plurality of bonding pad means, said second roadway means having a longer and a shorter dimension;  
first cross-under means for bypassing said placeable electrical conductors, said first cross-under means being disposed adjacent to each of the plurality of logic cell means in said first roadway means, said first cross-under means having a longer dimension and a shorter dimension, said longer dimension of said first cross-under means being parallel to said longer dimension of said first roadway means;  
second cross-under means for bypassing said placeable electrical conductors, said second cross-under means being disposed adjacent each of the plurality of bonding pad means in said second roadway means, said second cross-under means having a longer dimension and a shorter dimension, said longer dimension of said second cross-under means being perpendicular to said longer dimension of said second roadway means; and



wherein the logic cell means further comprises:  
a plurality of logic gates; and  
a plurality of flip-flops, said plurality of logic gates being a multiple of said plurality of logic flip-flops, said multiple being in the range of from 2.0 to 2.5.

4,161,663

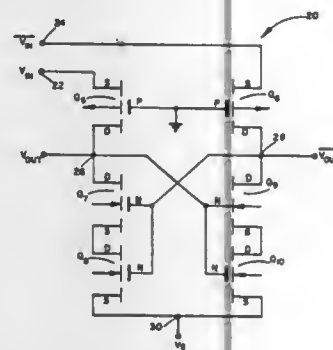
**HIGH VOLTAGE CMOS LEVEL SHIFTER**

Miguel A. Martinez, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 10, 1978, Ser. No. 885,248

Int. Cl.<sup>2</sup> H03K 5/02, 3/353, 17/10, 17/60

U.S. Cl. 307—264



1. A voltage level shifter comprising:  
first and second sources of supply voltage,  
first and second transistor devices having respective conduction paths and control electrodes,  
first and second pairs of series connected transistor devices having respective conduction paths and control electrodes,  
first and second input terminals to receive respective input voltage signals, and  
first and second output terminals to provide output voltage signals having a wide output voltage swing,  
said first transistor device connected between said first input terminal and said first output terminal,  
said second transistor device connected between said second input terminal and said second output terminal,  
the respective control electrodes of said first and second transistor devices connected together and to said first source of supply voltage,  
said first pair of series connected transistor devices connected between said first output terminal and said second source of supply voltage,  
said second pair of series connected transistor devices connected between said second output terminal and said second source of supply voltage,  
the respective control electrodes of each of the first pair of transistor devices connected together and to said second output terminal,  
the respective control electrodes of each of the second pair of transistor devices connected together and to said first output terminal.

4,161,664

**INPUT CIRCUIT**

Hiroto Kawagoe, Kodaira, and Kosei Nomiya, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan  
Continuation of Ser. No. 643,771, Dec. 23, 1975, abandoned.

This application Feb. 21, 1978, Ser. No. 879,756

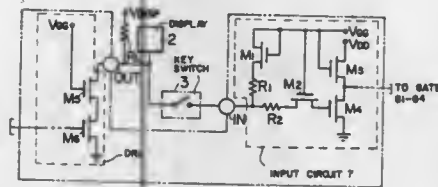
Claims priority, application Japan, Jan. 6, 1975, 50/000103  
Int. Cl.<sup>2</sup> H03K 3/353, 17/08

U.S. Cl. 307—304

6 Claims

1. In an input circuit for a MISFET integrated circuit, including at least an input terminal to which an input signal is applied, said input circuit comprising:  
a first field effect transistor having a conduction path be-

tween its source and drain coupled between said input terminal and a power supply terminal to which a voltage lower in absolute value than a high voltage potential of said input signal is applied, and having a gate to which is applied a voltage causing said first field effect transistor to cut off when said input signal is at said high voltage potential; and



a second field effect transistor having a conduction path between its source and the drain coupled between said input terminal and a gate of a third field effect transistor and having a gate to which is applied a voltage lower in absolute value than said high voltage potential, to prevent said high voltage potential from being applied to the gate of said third field effect transistor.

4,161,665

**MAGNETOSTRICTIVE ENGINE DETONATION SENSOR**

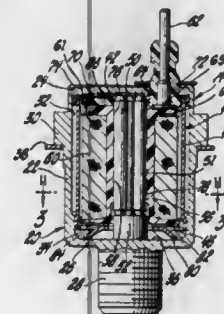
Charles E. Buck, James M. Johnson, and Paul A. Joseph, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,209

Int. Cl.<sup>2</sup> H01L 41/06

U.S. Cl. 310—26

3 Claims



1. A vibration sensor adapted for use with a spark ignited internal combustion engine to detect ringing vibrations of a predetermined frequency due to engine knock, comprising, in combination:

a generally cylindrical housing having opposing axial ends, one of said axial ends having means adapted for attachment to the engine for axial vibration therewith, the housing forming a first resonant assembly having a first resonant frequency slightly higher than the predetermined frequency;  
an elongated magnetostrictive element compressed longitudinally and aligned axially between the axial ends of the housing, the magnetostrictive element including a source of permanent magnetic flux defining a flux path in longitudinal orientation therethrough and characterized by a reluctance which varies in response to vibration induced variations in magnetostrictive element compression;  
a pickup assembly comprising a spool and a pickup coil wound on the spool, the spool having a surface defining an axial opening therethrough and being disposed in the housing with the magnetostrictive element extending through the axial opening, whereby the pickup coil is adapted to sense the vibration-induced reluctance changes in the magnetostrictive element and generate an output

electrical signal, the spool further engaging the magnetostrictive element along said surface in a force fit characterized by at least a predetermined push-out force, the pickup assembly thereby being physically coupled to the magnetostrictive element to form a second resonant assembly having a second resonant frequency slightly lower than the predetermined frequency, the first and second resonant assemblies, in combination, being effective to establish a single resonant peak at substantially the predetermined frequency in the sensor electrical output signal characteristic.

4,161,667

**FLEXIBLE MOUNTING OF ELECTRIC MOTORS**

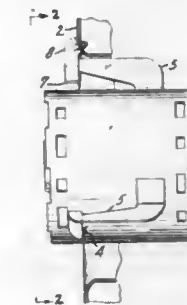
John B. Buckman, and Robert E. Lykes, both of Troy, Ohio, assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Nov. 16, 1977, Ser. No. 851,962

Int. Cl.<sup>2</sup> H02K 5/24

U.S. Cl. 310—51

3 Claims



4,161,666

**IMBALANCE DETERMINING APPARATUS**

Thomas J. Bacsanyi, Novi, and Edward J. Harmon, Wixom, both of Mich., assignors to Ransburg Corporation, Indianapolis, Ind.

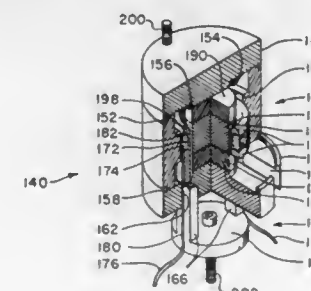
Division of Ser. No. 733,433, Oct. 18, 1976, Pat. No. 4,060,003.

This application Jun. 6, 1977, Ser. No. 803,463

Int. Cl.<sup>2</sup> H02K 33/18

U.S. Cl. 310—27

5 Claims



1. A force coil comprising a housing, first and second magnets for generating a magnetic field within the housing, the housing including an inner wall defining the interior thereof and means for providing return paths for the magnetic flux, at least one turn of an electrical conductor for conducting current, the first and second magnets being aligned generally axially of one another, one pair of like poles of the first and second magnets being directed oppositely in the housing and the other pair of like poles facing one another to provide a substantially uniform magnetic field which extends radially of the alignment axis of the magnets and which extends to the return path providing means of the housing, and means for conducting flux disposed between and in contact with the facing poles of the magnets, the return path providing means of the housing including a flux conducting region of the inner wall which projects radially inwardly into closely spaced apart relation with the flux conducting means to provide an air gap therebetween through which flux is directed radially, means for supporting the conductor in the air gap for movement therein in response to force due to current flow in the conductor, the housing inner wall comprising a generally cylindrical portion disposed about an axis, the flux conducting means comprising a generally cylindrical spacer which is generally coaxial with the housing inner wall, the spacer including an end wall in contact with each of the facing like poles of the first and second magnets, the spacer end walls and facing like poles being generally equal in size and shape, the flux conducting region of the inner wall comprising an axially and radially inwardly extending annular portion of the inner wall.

4,161,668

**EXCITER COOLING ARRANGEMENT FOR DYNAMOELECTRIC MACHINES**

James S. Schmohe, and Ronald C. Van Kessel, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 635,499, Nov. 26, 1975, abandoned.

This application Jul. 5, 1977, Ser. No. 813,016

Int. Cl.<sup>2</sup> H02K 11/00

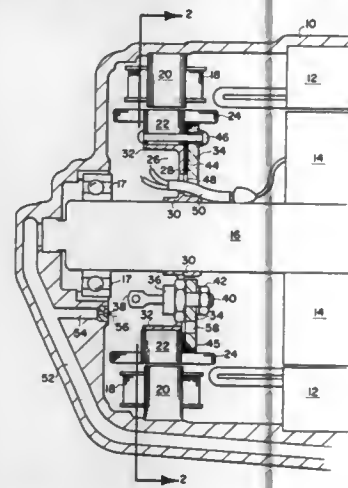
U.S. Cl. 310—68 D

4 Claims

1. A rectifier support structure for dynamoelectric machines having rectifiers secured to a rotating shaft within a housing wherein an oil coolant is sprayed from a source at one end of the housing directly on the rectifiers, comprising:

a hub structure including at least one support member secured to and rotatable with the shaft and a circular rim member secured to said support member and concentric with the shaft;  
at least one plate secured to said hub structure wherein the plane of said plate is perpendicular to the axis of the shaft and configured with apertures suitable to receive the rectifiers;  
insulating means interposed between said hub structure and said plate for electrically insulating said plate from said hub; and  
a plurality of coolant apertures configured in said plate effective to permit at least a portion of the coolant to flow in a direction parallel to the axis of the shaft through said plates wherein each of said coolant apertures is located in axial alignment with the circular rim member and with a

portion of the aperture disposed radially inwardly relative to the circular rim member and a portion of the aperture disposed radially further away from the center line of the



rotating shaft than said circular rim member thereby being effective to reduce sludge build-up on said circular member.

#### 4,161,669 INSULATING ASSEMBLY FOR STATOR SLOTS OF ELECTRICAL MOTORS

Michele Aimar, Turin, Italy, assignor to ITW Fastex Italia, Turin, Italy

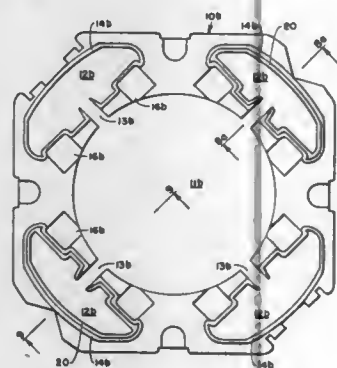
Filed Jun. 10, 1977, Ser. No. 805,253

Claims priority, application Italy, Jun. 16, 1976, 24359 A/76; Aug. 24, 1976, 26483 A/76

Int. Cl.<sup>2</sup> H02K 3/00

U.S. Cl. 310-194

6 Claims



1. An insulating assembly for use with a slotted stator in an electrical motor, including a pair of identical end plates of insulating material each having a center opening for receiving a rotor of said motor and a plurality of cutouts symmetrically spaced around said opening and having a complimentary shape to the said stator slots of said electrical motor, each of said cutouts having along the periphery thereof a flange extending from said end plate, one half the total number of said flanges of each end plate of said pair being provided at the free ends thereof with an extended stepped-down edge complimentary to and acceptable within the corresponding other half of the flanges of the other plate of said pair, one of said pair of end plates adapted to be positioned on each end of said stator with corresponding mating flanges inserted in one of said stator slots so as to form an insulating interlocked partition between the inner wall of said slots and a stator winding extending between adjacent slots, as well as substantially insulating the opposite end surfaces of said stator.

#### 4,161,670 CIRCUIT ARRANGEMENT FOR DRIVING PIEZOELECTRIC INK JET PRINTERS

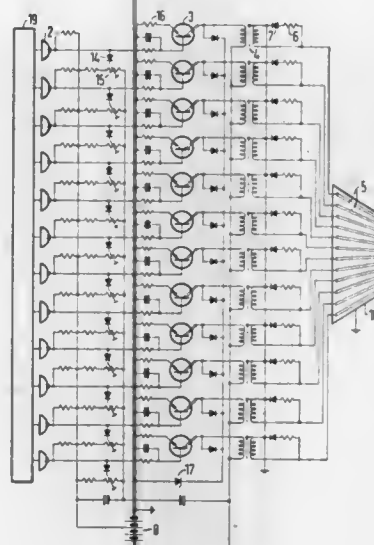
Hans Kern, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Sep. 10, 1976, Ser. No. 721,951

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548691

Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310-317

13 Claims



1. In a circuit arrangement for driving at least one printing jet in mosaic printers, in the form of a tubular drive element of polarized ceramic, which contains printing liquid and whose diameter reduces with the application of a voltage in the direction of the polarizing voltage and increases with the application of a voltage in opposition to the polarizing voltage, the combination of means operatively connected to said ceramic for supplying thereto a voltage pulse comprising two directly following half cycles of opposite polarity, the second half cycle of which is of a polarity to polarize said ceramic and the first half cycle of which is of opposite polarity, and means, responsive upon selection of such printing jet, to trigger said pulse-supplying means, whereby the first half cycle of the supplied pulse is operable to initially effect expansion of said drive element from its normal rest condition, for effecting an ink flow into said drive element to fill the latter in its expanded state, and the second half of the supplied pulse is operable to effect an immediately following contraction of said drive element beyond its normal rest condition to apply pressure upon the ink in the expanded drive element, which pressure is reactive on the incoming ink flow produced by the initial expansion of the drive element, with the effective working stroke being derived from both half cycles and thus comprising the difference between such expanded and contracted conditions.

#### 4,161,671 X-RAY TUBE

Gerardus F. Klinkert, Waddinxveen, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands

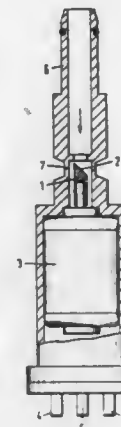
Filed Mar. 14, 1978, Ser. No. 886,444

Claims priority, application Netherlands, Mar. 14, 1977, 7702720

Int. Cl.<sup>2</sup> H01J 35/10

U.S. Cl. 313-60

1 Claim



1. An X-ray tube comprising a cathode serving as a source of electron rays and a rotatable anode, characterized in that the anode is bevelled so that a rotating X-ray beam can be obtained by rotation of the anode.

#### 4,161,672 HIGH PRESSURE METAL VAPOR DISCHARGE LAMPS OF IMPROVED EFFICACY

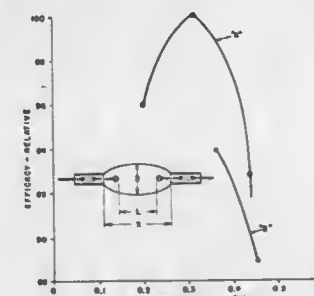
Daniel M. Cap, Kirtland, and William H. Lake, Novelty, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 812,479, Jul. 5, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,628

Int. Cl.<sup>2</sup> H01J 61/30

U.S. Cl. 313-220

6 Claims



1. A high pressure metal vapor arc discharge lamp for general illuminating purposes and rated for a power input of not more than 250 watts, said lamp comprising an arc chamber having a shape selected from the group of shapes consisting essentially of ellipsoids and spheroids and approximations thereof, said arc chamber being defined within an envelope made of light-transmitting material and having a wall thickness not exceeding 1.5 millimeters, a fill of mercury and metal halide contained within said chamber and adapted to be vaporized during operation of the lamp, said arc chamber having a wall area of such value as to effect a wall loading in the range of from about 10 to 35 watts/cm<sup>2</sup> when the lamp is operated at rated wattage, said arc chamber having a length-to-diameter ratio (X/D) in the range of from about 0.9 to 2.5, a pair of electrodes supported within said arc chamber on inleads extending through said envelope, said electrodes having opposing tips spaced from one another by a distance L of such value

as to effect an arc loading in the range of from about 60 to 150 watts/cm when the lamp is operated at rated wattage, the insertion factor Y of said electrodes being in the range of from about 0.1 to 0.6, where Y is equal to the quantity (X-L)/X, and neck seals hermetically bonding said inleads to said envelope, said neck seals and any heat-conserving devices associated therewith collectively subtending less than 10 percent of the solid angle at the center of said arc chamber.

#### 4,161,673 ARC SUPPRESSION AND STATIC ELIMINATION SYSTEM FOR A TELEVISION CRT

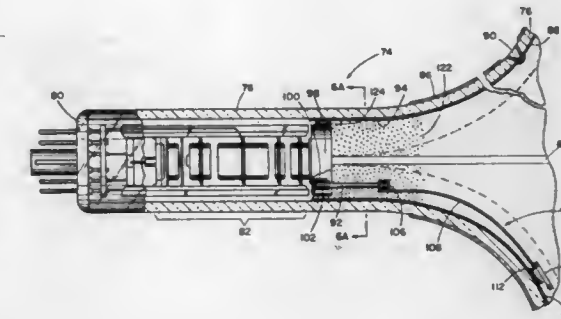
Robert M. Gregg, Chicago, and Phillip C. Miller, Northbrook, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 30, 1977, Ser. No. 811,494

Int. Cl.<sup>2</sup> H01J 29/02, 29/84

U.S. Cl. 313-481

9 Claims



1. An electron gun for generating at least one electron beam, said gun being characterized by having an elongated discrete arc suppression resistor having length-to-width ratio is about 8:1 to 20:1 mounted on an anode electrode of the gun in cantilever fashion at a point spaced from said beam so as not to interfere therewith, said resistor extending substantially axially and supporting on the distal end a getter strap to which it is electrically connected, said getter strap in turn supporting a getter pan assembly containing a vaporizable getter material.

#### 4,161,674 OVERVOLTAGE PROTECTED FLUORESCENT TUBE SUPPLY CIRCUIT

Paul Maurer, CH-8902 Urdorf, Switzerland

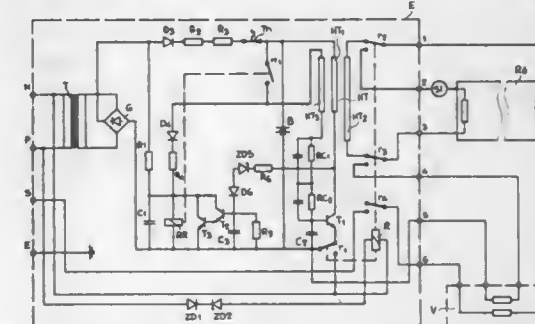
Filed Jan. 27, 1978, Ser. No. 872,920

Claims priority, application Switzerland, Feb. 3, 1977, 1224/77

Int. Cl.<sup>2</sup> H05B 37/00, 41/14

U.S. Cl. 315-86

9 Claims



1. Overvoltage protected fluorescent tube supply circuit to supply a fluorescent tube (Ro) from a d-c voltage source (B) and to protect the circuit upon removal of the fluorescent tube having



a transformer (HT) having a secondary (HT<sub>2</sub>) connected to the electrodes of the fluorescent tube (Ro);  
 a primary winding (HT<sub>1</sub>) and a feedback winding (HT<sub>3</sub>);  
 an oscillatory supply circuit for the transformer including a controlled semiconductor switching element (T<sub>1</sub>) having a control electrode (base) and a main current carrying path (emitter-collector), said main current carrying path being connected serially between the primary winding (HT<sub>1</sub>) and said voltage source (B);  
 and a timing circuit (RC<sub>1</sub> RC<sub>2</sub>) connected to the feedback winding, to said source, and to the control electrode of said controlled switching element (T<sub>1</sub>) to control, respectively, conduction, and non-conduction, in periodic oscillatory cycles, of said semiconductor switching element in accordance with induction of voltage in said feedback winding upon change of current flow through the primary winding due to change of said semiconductor switching element between conductive and nonconductive state, change of current flow through said primary winding inducing a high voltage in the secondary (HT<sub>2</sub>) thereof to operate the fluorescent tube,  
 and comprising  
 a safety circuit to disconnect current supply from said source to said transformer upon removal of the fluorescent tube (Ro) from connection to the secondary (HT<sub>2</sub>) of said transformer including  
 a relay (RR, rr) having a control portion (RR) and normally open switching terminals (rr), the control portion of the relay being connected in series with one of the windings (HT<sub>3</sub>) of the transformer (HT), and the switching terminals (rr) being connected between the voltage source (B) and said one of the windings (HT<sub>3</sub>) of the transformer;  
 a voltage detector (R<sub>6</sub>, ZD5, D6) connected to sense voltages occurring at the primary winding (HT<sub>1</sub>) of the transformer upon disconnection of the tube (Ro) from the secondary (HT<sub>2</sub>);  
 and controlled switching means (T<sub>2</sub>, T<sub>3</sub>) connected to and controlled by the voltage detector responsive to a sensed voltage at said primary winding in excess of a predetermined level to remove supply of power from said source (B) to said transformer (HT) comprising a transistor switch (T<sub>2</sub>, T<sub>3</sub>) connected to the relay to deenergize the relay when the transistor switch becomes conductive upon sensing of voltage at said primary winding in excess of said predetermined level and thus disconnecting the source (B) from the transformer.

4,161,675

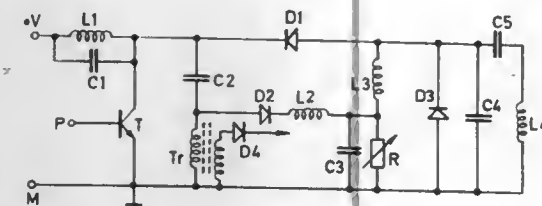
## LINE OUTPUT STAGE

Giuseppe Zappala, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Turin, Italy  
 Filed Nov. 28, 1977, Ser. No. 855,308

Claims priority, application Italy, Nov. 26, 1976, 69821 A/76  
 Int. Cl.<sup>2</sup> H01J 29/56

U.S. Cl. 315—371

7 Claims



1. A line output stage for providing a cyclic line saw tooth signal comprising a first parallel resonant circuit including a horizontal deflection coil and a first capacitor, one side of the first parallel resonant circuit being connected to ground and the other side of the first parallel resonant circuit being returned to ground by way of a first diode and a controllable semiconductor switch which controls the cycle of said cyclic

line saw tooth signal; a second diode connector in parallel with the first parallel resonant circuit, a second parallel resonant circuit comprising a second capacitor and a second coil having one side for connection to a D.C. power supply and the other side returned to ground by way of the controllable semiconductor switch; and an energy transfer circuit coupled to the second parallel resonant circuit for transferring energy during each saw tooth cycle from the second parallel resonant circuit to the first parallel resonant circuit, the energy transfer circuit including a third diode and means for modulating at vertical frequency the power transferred which is capable of adjusting said power transferred during each horizontal saw tooth cycle.

4,161,676

## DEVICE FOR DISPLAYING VARIABLE QUANTITIES

Slobodan Alisic, Eindhoven; René H. Hamer, Rotterdam, and Ludovicus A. H. Fleskens, St. Oedenrode, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

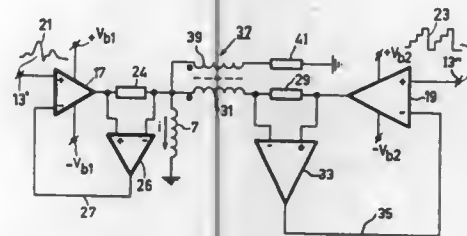
Filed Jan. 5, 1978, Ser. No. 867,162

Claims priority, application Netherlands, Jan. 17, 1977, 7700418

Int. Cl.<sup>2</sup> H01J 29/70, 29/72

U.S. Cl. 315—395

5 Claims



1. A device for displaying variable quantities on a display screen of a cathode ray tube comprising, a deflection unit including deflection coils for deflecting an electron beam produced in the cathode ray tube and at least two deflection amplifiers, at least one deflection amplifier having an input adapted to receive a signal voltage which corresponds to the quantity to be displayed and an output connected to a set of deflection coils, power supply means including a plurality of terminals for supplying operating voltages ranging from a highest supply voltage value to a lowest supply voltage value, means coupling at least two of said deflection amplifiers to respective voltage supply terminals of the power supply means so that said deflection amplifiers are powered with supply voltages of different magnitude, means connecting each of the deflection amplifiers which are coupled to a supply voltage other than the highest supply voltage to the deflection coils via a coupling element which is adapted to transfer signals from the deflection amplifier in the direction of the deflection coils substantially without distortion and to substantially block signals in the opposite direction, the deflection amplifier with the highest supply voltage being adapted to amplify signal components with the highest frequencies and the deflection amplifier with the lowest supply voltage being adapted to amplify signal components with the lowest frequencies.

4,161,677

## MATERIAL FLOW STOPPAGE DETECTOR DEVICE

Terry A. Dill, Keota, Iowa, assignor to The Jefferson Industries Company, Fairfield, Iowa

Filed May 12, 1978, Ser. No. 905,275

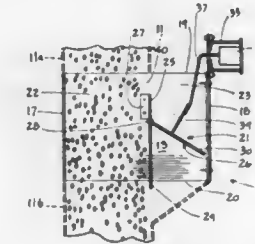
Int. Cl.<sup>2</sup> G05D 7/00

U.S. Cl. 318—482

10 Claims

1. A flow stoppage detector device for a particulate material supply line comprising:  
 (a) a housing having:  
 (1) first and second adjacent upright conduit sections,  
 (2) a pivoted partition means in said housing comprising a

first leg member movable to a first position to form a common side wall for said conduit sections and a second leg member arranged in a position to obstruct flow of material in one of said conduit sections when the first leg member is in the first moved position therefor, and  
 (b) switch means on said housing having a switch actuator movable to a first position and a second position, said



actuator, in one of the positions therefor, being adjacent the second leg member in the obstructing position therefor,

(c) said particulate material, when the flow thereof through said first conduit section is obstructed, overflowing said common side wall into said second conduit section, to move said switch actuator from one position to the other position therefor.

4,161,678

## SERVO-SYSTEM

Nobuo Kaleda; Kenji Kawakami; Yoshihiro Okano, and Hiroshi Ohtsu, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

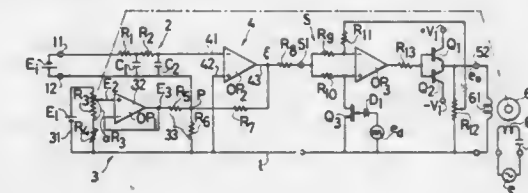
Filed Nov. 4, 1976, Ser. No. 738,736

Claims priority, application Japan, Nov. 13, 1975, 50-154456[U]; Nov. 13, 1975, 50-154458[U]; Nov. 13, 1975, 50-154459[U]

Int. Cl.<sup>2</sup> G05D 23/00

U.S. Cl. 318—641

7 Claims



1. A servo-system for self-balancing use using an ac servo-motor with no capacitor coupling comprising:

input circuit means including means to receive an input signal and means to receive a compared signal, said input circuit means including a direct-coupled dc amplifier capable of comparing and amplifying input and compared signals and further including feed-back signal adjustment means;

a servo amplifier having a differential direct-coupling amplifier with an inverting input terminal and a noninverting input terminal, said two input terminals being supplied with the output of said input circuit means through individual resistors, and a switch connected between said noninverting input terminal and a common line, said switch being turned on and off in synchronism with an ac power supply;

amplifier means comprising a pair of complementary transistor connected in series with their emitters in common and their bases driven by the output of said servo amplifier; a resistive dividing feedback circuit coupling the common connection of said transistor emitters directly to said inverting input terminal of said servo amplifier, said feedback circuit serving to make the potential at the inverting

input terminal become equal to that at the non-inverting input terminal;

an ac servo motor supplied by said ac power supply, said servomotor being driven by the output of said amplifier means; and

means for causing said ac servo motor to control said feedback signal adjustment means to bring the compared value into balance with said input signal.

4,161,679

## CAM PROGRAM CONTROLLER SYSTEMS

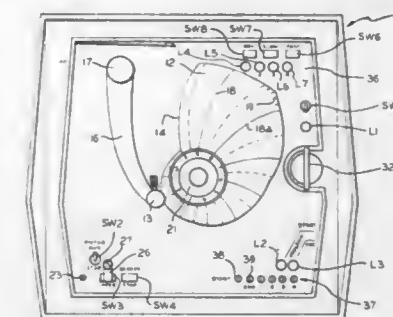
Mitchell I. Kohn, Skokie, and Abdor H. Alton, Lake Zurich, both of Ill., assignors to Love Controls Corporation, Chicago, Ill.

Filed Mar. 24, 1976, Ser. No. 669,815

Int. Cl.<sup>2</sup> G05B 19/40

U.S. Cl. 318—685

36 Claims



1. An improved cam program controller system for controlling processes by providing set point signals representing time function relationships,

said system including a cam having a contour representing a program of set point signals,

stepping motor means for rotating said cam independently of line frequency,

cam angular position indicating means independent of the cam contour, whereby the time position of the cam program is indicated,

cam follower means juxtaposed to said cam contour for moving responsive to variations in the distance of the contour of the cam,

means responsive to the movement of said cam follower means as said cam rotates for providing said set point signals, and

control means for using said set point signals to control a process.

4,161,680

## AC ROTARY MACHINE APPARATUS

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,436

Claims priority, application Japan, Nov. 2, 1976, 51-131906

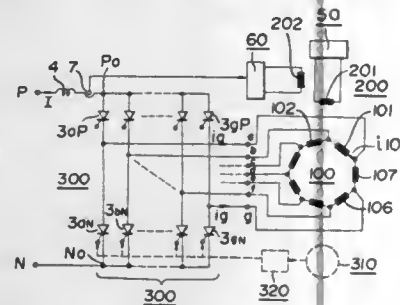
Int. Cl.<sup>2</sup> H02P 5/40

U.S. Cl. 318—722

20 Claims

1. In an AC rotary machine apparatus comprising an AC

rotary machine having AC windings and an AC feeder having solid state switches which feeds AC power to the AC wind-



ings, an improvement which comprises the AC windings forming seven phases.

#### 4,161,681 PRIME MOVER, METHOD OF OPERATING SUCH AND CIRCUIT

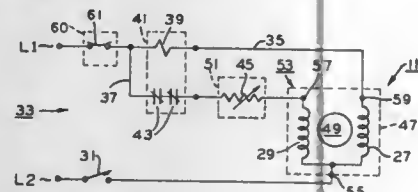
William C. Rathje, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 17, 1977, Ser. No. 778,335

Int. Cl.<sup>2</sup> H02P 1/44

U.S. Cl. 318—783

46 Claims



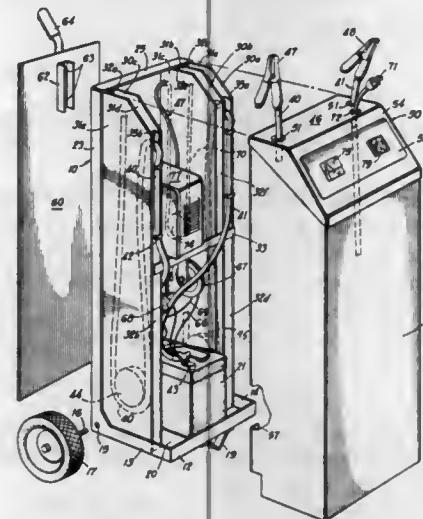
1. In a prime mover adapted for energization across a power source and having a stationary assembly, the stationary assembly including main winding means adapted for excitation upon the energization of the prime mover, auxiliary winding means arranged in parallel circuit relation with the main winding means and adapted for excitation upon the energization of the prime mover, and one of a pair of opposite terminal end portions of each of the main winding means and the auxiliary winding means being connected together and adapted for connection with the power source, a rotatable assembly associated with the stationary assembly and adapted for rotation at a preselected speed in response to magnetic coupling relation of the rotatable assembly with the main winding means and the auxiliary winding means upon the excitation thereof; the improvement comprising a current relay device including contact means connected in series circuit relation with the other of the opposite terminal end portions of the auxiliary winding means and adapted for movement between an open position and a closed position, and a coil connected in series circuit relation with the other of the opposite terminal end portions of the main winding means and operable generally for effecting the movement of said contact means to the closed position thereof upon the energization of the prime mover across the power source, and a PTCT connected in series circuit relation with said contact means and the other opposite terminal end portion of the auxiliary winding means and adapted for energization in response to the closure of said contact means when the prime mover is energized across the power source, said PTCT being initially operable upon its energization when said contact means is closed to pass current to the auxiliary winding means to effect the excitation thereof and said PTCT also being operable to inhibit the passage of the current therethrough to the auxiliary winding means generally when the rotatable assembly attains its preselected speed so that the continued excitation of at least the main winding means thereafter effects the rotation of the rotatable member at the preselected speed thereof when the prime mover is ener-

gized across the power source, said coil being responsive to the occurrence of a reduction in the current flow to the main winding means when the rotatable member is rotated at its preselected speed in response to the continued excitation of at least the main winding means so as to effect the movement of said contact means to the open position thereof in order to deenergize said PTCT.

#### 4,161,682 PORTABLE BATTERY CHARGER

William B. Corvett, Rte. #2 Hinton Rd., Covington, Ga. 30209  
Filed Apr. 29, 1977, Ser. No. 792,470  
Int. Cl.<sup>2</sup> H02J 7/00; H01M 2/10  
U.S. Cl. 320—2

11 Claims



1. A portable battery charger comprising:
  - (a) a housing having a plurality of parallel partitions defining parallel compartments, said housing being provided with a pair of spaced openings aligned respectively with said two of said compartments therein;
  - (b) a battery disposed within a remaining compartment;
  - (c) a battery charger disposed within remaining compartment and electrically connected to said battery;
  - (d) battery charging cables having proximal ends directly electrically connected to said battery and said battery charger, intermediate portions of said cables being respectively received as U shaped loops in respective other of said compartments; the distal ends of said cables being slideably received in and extending outwardly respectively through said opening in said housing;
  - (e) battery terminal clamps electrically connected to the ends of said cables, and being larger than said holes for arresting inwardly movement of said cables through said holes externally of said housing; and
  - (f) means for yieldably urging said intermediate portions of said cables into said compartments sufficiently to yieldably hold said terminal clamps adjacent to their respective holes and in spaced apart condition.

#### 4,161,683 ALTERNATOR FOR A REGENERATIVE FEED-BACK SYSTEM

Lebern W. Stroud, 4620 Biscayne, Fort Worth, Tex. 76117, and Jerry W. Lemons, 7533 Terry Dr., Fort Worth, Tex. 76118  
Continuation of Ser. No. 614,904, Sep. 19, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,475  
Int. Cl.<sup>2</sup> H02P 11/00

U.S. Cl. 322—87

15 Claims

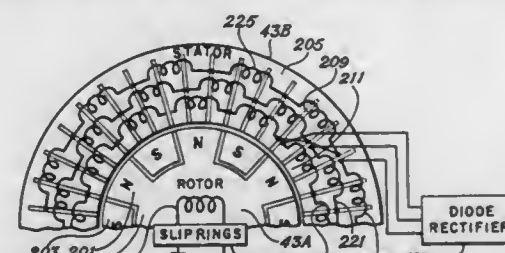
1. In a regenerative feed-back system of the type having the output of a multi-phase alternator coupled to its rotary field to

self-excite the alternator, an improved alternator of the type having a stationary stator with a rotor concentrically located therein, comprising:

- an annular structure formed of ferro-magnetic material defining an annular stator core having a plurality of segments separated by slots which extend in a direction parallel to the axis of said stator core; and
- a multi-phase stator winding having for each phase a plurality of coils extending around the stator core on the inside thereof, each of the coils being of 13 A.W.G. electrically conductive wire and enclosing a selected number of segments three turns, whereby each slot has six wires passing through it.

7. A system adapted to be coupled to a multi-phase rectified rotary field system to increase the power and current through regenerative feedback, comprising:

- a DC power supply for normally exciting the rotary field of said multi-phase system,
- output means coupled to the output of said multi-phase system for applying power to a load upon demand,



means responsive to current flow from the output of said multi-phase system to a load for coupling the output of the multi-phase system to its rotary field to self-excite the multi-phase system, and means for electrically disconnecting the output of said DC power supply from said rotary field when the output of said multi-phase system is applied to said rotary field, said multi-phase rectified rotary field system including an alternator of the type having a stationary stator with a rotor concentrically located therein and comprising: an annular structure formed of ferro-magnetic material defining an annular stator core having a plurality of segments separated by slots which extend in a direction parallel to the axis of said stator core; and a multi-phase stator winding having for each phase a plurality of coils extending around the stator core on the inside thereof, each of the coils being of 13 A.W.G. electrically conductive wire and enclosing a selected number of segments three turns, whereby each slot has six wires passing through it.

#### 4,161,684 DUAL VOLTAGE AUTOMOTIVE ON-BOARD ELECTRICAL NETWORK SYSTEM

István Ragály, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Oct. 3, 1977, Ser. No. 838,636  
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648372

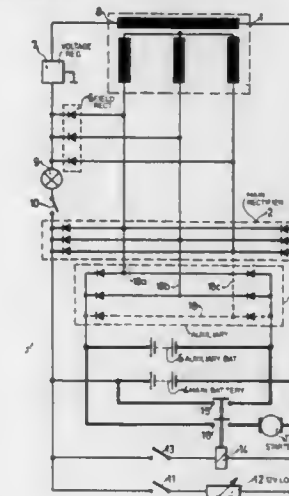
Int. Cl.<sup>2</sup> H02J 7/14

U.S. Cl. 322—90

12 Claims

1. Dual voltage automotive on-board electrical network system having
  - a three-phase alternator (1);
  - a main battery (4);
  - a main three-phase bridge rectifier (2) connected to the alternator (1) and supplying charging current from the alternator to the main battery;
  - an auxiliary battery (5);

an auxiliary two-phase bridge rectifier (3) supplying charging current from the alternator to the auxiliary battery (5); means (18a, 18b, 18c) connecting the output of the alternator (1) to the input of the main rectifier (2) and to the input of the input of the auxiliary rectifier (3) to supply power from the alternator to both said rectifiers; a main load (12); main switch means (11) selectively connecting said main load to main battery (4);



an auxiliary load (17) having a voltage rating which is the sum of the nominal battery voltages of both said batteries (4, 5); and auxiliary switch means (13, 14, 16) connected for energization of said auxiliary load (17); said auxiliary switch means (13, 14, 16) including a switching connection (15) serially connecting said batteries (4, 5) upon connection of said auxiliary load (17) for energization by said batteries (4, 5) in series.

#### 4,161,685 SOLID STATE PROXIMITY SWITCH

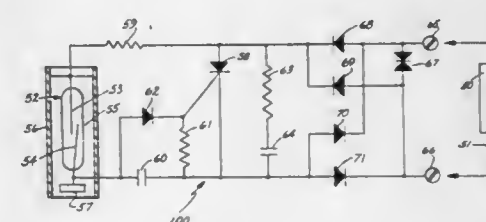
Keith Jacob, Ann Arbor, Mich., assignor to Ibec Industries, Inc., New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,584

Int. Cl.<sup>2</sup> H01H 35/38; G05D 7/06

U.S. Cl. 323—19

13 Claims



1. A magnetic proximity apparatus comprising:
  - a base means for supporting said apparatus;
  - a gated switch means for selectively completing an electrical circuit coupling an electrical source to an electrical load responsive to the position of a ferro-magnetic object, said gated switch means having a control gate for receiving a signal causing said switch means to complete the electrical circuit;
  - an elongated magnetic actuator means for selectively conditioning said gated switch means between a conductive and nonconductive condition, said actuator means being electrically coupled to said control gate of said gated switch means such that the presence of a ferro-magnetic object axially adjacent an end of said actuator means causes said



actuator means to apply an electrical signal to said control gate making said gated switch means conductive; and said magnetic actuator means comprising a hollow cylindrical permanent magnet and a reed switch positioned within said permanent magnet and wherein the length of said cylindrical permanent magnet is greater than the length of said reed switch so as to enclose said reed switch within said permanent magnet whereby increasing the proximity of a ferro-magnetic object to an end of said permanent magnet and said reed switch increases the magnetic flux from said permanent magnet through said reed switch sufficiently to close said reed switch.

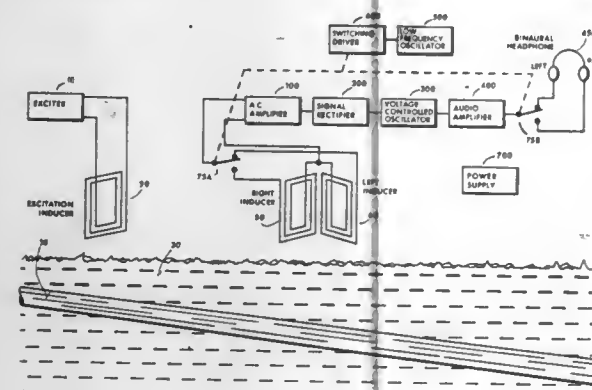
**4,161,686**  
**CONCEALED STRUCTURE TRACING TRANSLATOR**  
**APPARATUS INCLUDING POSITION SENSITIVE**  
**BITONIC INDICATION MEANS**

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770  
Filed Jan. 24, 1977, Ser. No. 762,028

Int. Cl.<sup>2</sup> G01V 3/00

U.S. Cl. 324—3

12 Claims



1. Translator means for providing improved directional acuity and at least the sense of relative, say right or left hand, positional perceptibility as to the lay of concealed conductive structurement through the use of a plurality of separate acting inducer means operative to provide plural sensory indication to an operator, said translator including in operative combination:

- Plural inducer means for the interception of various magnitudes of first frequency electromagnetic field lines, said field lines having been produced sympathetically in the concealed structurement by separate exciter means, said plural inducer means including at least two separate acting electromagnetic field receptor means arranged in responsive offset positions therefrom operative to provide second frequency minute alternating current signals the individual levels of which are uniquely proportional to the relative signal strength of said first frequency electromagnetic field lines accordingly intercepted at each of the said receptor means said offset positions;
- A.C. amplifier means, coupled to said inducer means, operative to increase the magnitude of said second frequency said minute alternating current signal levels produced by each of the said plural electromagnetic field receptor means and thereby produce effectively separate second frequency signal levels of proportionately greater amplitude at the output of said amplifier means;
- Signal rectifier means, coupled to said A.C. amplifier means, operative to recover the relative amplitude of the said second frequency said alternating current signal levels as effectively separate direct current control signal voltage levels proportional to each said second frequency alternating current signal level;
- Voltage controlled oscillator means, coupled to said signal rectifier means, operative to provide source means for

variable third frequency signal rates proportional to said direct current control voltage levels;

- Third frequency amplifier means coupled to said voltage controlled oscillator means;
- Plural sensory indication means, coupled to said third frequency amplifier means, responsive to said third frequency thereby being operative to provide at least, say left and right hand, bi-positional sensory indication;
- Plural control means, including a source of fourth signal, wherein said control means is:
  - coupled to said inducer means and said A.C. amplifier means, operative to act with said fourth frequency signal so as to provide at least a distinctly separate, say left and right hand, second frequency response amplification, albeit multiplexed, for each of at least two said second frequency said minute alternating current signal levels; and,
  - coupled to said third frequency amplifier means as coupled to said plural sensory indication means, operative to act with said fourth frequency signal so as to provide at least two distinctly separate, albeit demultiplexed, say left and right hand, third frequency signal outputs therefrom wherein the consequent periodicity of each said signal output third frequency rate is effectuated by a correlative said second frequency signal level; and,
- D.C. power source means for energizing the active elements of the said translator means.

**4,161,687**  
**METHOD FOR LOCATING UNDERGROUND**  
**ANOMALIES BY DIFFRACTION OF**  
**ELECTROMAGNETIC WAVES PASSING BETWEEN**  
**SPACED BOREHOLES**

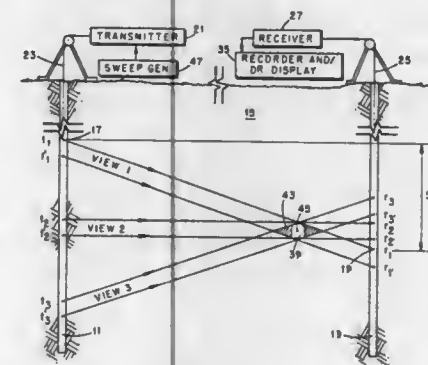
R. Jeffrey Lytle; Darrel L. Lager, both of Livermore; Edwin F. Laine, Alamo, and Donald T. Davis, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 12, 1977, Ser. No. 832,490

Int. Cl.<sup>2</sup> G01V 3/12, 3/18

U.S. Cl. 324—6

9 Claims



- A method for locating an anomaly of high electrical contrast within a medium by diffraction of electromagnetic waves at the edges of said anomaly, including the steps of: drilling first and second boreholes, with the medium to be surveyed for anomalies situated between the boreholes; lowering an electromagnetic wave transmitting antenna down the first borehole first and second times; driving said transmitting antenna to transmit electromagnetic waves during said first and second lowerings, the frequency of said electromagnetic waves being within the range of 15-120 MHz; lowering a receiving antenna down said second borehole first and second times in unison with said first and second lowerings of said transmitting antenna, said receiving antenna having a first vertical separation from the transmitting antenna during said first lowering and a second

vertical separation from the transmitting antenna during said second lowering; detecting variations of the waves at the receiving antenna during each of said lowerings, said variations being undulatory over a wide range of depth during said lowerings as the antennas approach an anomaly, said undulations being distinctly different when the anomaly is in a direct path between the antennas due to diffraction of said waves away from said receiving antenna due to diffraction of said waves away from said receiving antenna; recording the depth of said transmitting and receiving antennas upon reception at the receiving antenna of a distinctive variation in the undulations of the waves during each of said lowerings; and triangulating the lines defined by the positions of said receiving and transmitting antennas upon reception of said distinctive wave variations at the receiving antenna, to thereby locate the anomaly.

**4,161,688**  
**CABLE FAULT LOCATING APPARATUS HAVING AN**  
**EARTH CURRENT CANCELLER**

Tadaharu Nakayama, Tokyo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

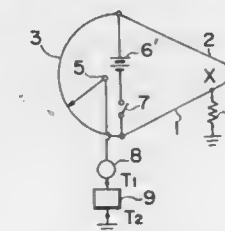
Filed Nov. 14, 1977, Ser. No. 851,564

Claims priority, application Japan, Nov. 13, 1976, 51-137080; Jun. 27, 1977, 52-76410; Jul. 8, 1977, 52-81775; Aug. 25, 1977, 52-102011; Sep. 21, 1977, 52-113545

Int. Cl.<sup>2</sup> G01R 31/08

U.S. Cl. 324—52

13 Claims



1. In a cable fault locating apparatus of the type which comprises a bridge circuit made up of a ratio arm having a movable tap output terminal and connected to open ends of a faulty cable and a sound return cable which are connected to form a loop circuit, a bridge power source connected through a switch to both ends of said ratio arm for providing electrical power to said bridge circuit, and a galvanometer connected between the output terminal of said ratio arm and the ground, the improvement comprising an earth current canceller means having first and second output terminals and connected to said galvanometer so as to cancel a stray earth current which may be produced by moisture or the like entering the faulty point to thereby form a local cell with the metallic part of the faulty cable, the soil, and the grounding metallic material.

**4,161,689**  
**METHOD AND APPARATUS FOR REPAIRING**  
**PROTECTIVELY LINED REACTOR VESSELS**

Seymour Schlosberg, East Brunswick, and Michael J. Lerman, Carteret, both of N.J., assignors to DeDietrich (USA), Inc., Union, N.J.

Continuation of Ser. No. 820,918, Aug. 1, 1977, Pat. No. 4,112,572, which is a division of Ser. No. 663,113, Mar. 2, 1976, Pat. No. 4,078,697. This application Apr. 26, 1978, Ser. No. 900,124

Int. Cl.<sup>2</sup> G01R 31/12

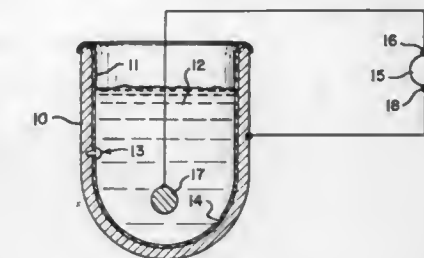
U.S. Cl. 324—54

2 Claims

- In combination: a protectively lined reactor vessel for containing conductive liquid of the type comprising a conductive metal support

wall and an insulating protective inner liner having at least one break therein;

a repair plug disposed in the wall of said vessel, said repair plug comprising a first metal exposed to said conductive fluid and comprising, (a) an insulating anchor stud anchored into the portion of said metal support wall underlying said break, (b) a sealing gasket disposed on the portion of said protective lining surrounding said break and clamped onto said protective lining throughout a path



surrounding said break, (c) a washer disposed upon said sealing gasket, (d) clamping means mechanically coupling said washer and said gasket onto said protective lining, and (e) means for insulating said anchor stud from the metal support wall; and

break detection means comprising means for detecting a reduction in the electrical resistance between the conductive liquid contained in the interior of the vessel and the conductive metal support wall.

**4,161,690**  
**METHOD AND APPARATUS FOR PARTICLE ANALYSIS**  
Markus Feier, Regensdorf, Switzerland, assignor to Contraves AG, Zurich, Switzerland

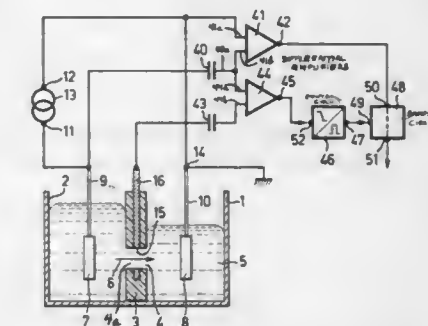
Filed Jun. 5, 1978, Ser. No. 912,927

Claims priority, application Switzerland, Jun. 27, 1977, 7842/77

Int. Cl.<sup>2</sup> G01N 27/00

U.S. Cl. 324—71 CP

12 Claims



1. In a method of analyzing particles suspended in a liquid by means of two vessels for the liquid containing the therein suspended particles and which vessels are separated from one another by an electrically insulating wall which has a through-passing elongate channel, two supply electrodes each of which contacts the liquid in a respective one of the vessels and each supply electrode being connected with a terminal of an electrical power supply, at least one auxiliary electrode contacting the liquid in the channel, the dimension of the auxiliary electrode in a direction essentially parallel to the lengthwise direction of the channel being small in relation to the length of the channel, and at least two feeler means, one of which is operatively associated with a pair of electrodes for determining the timewise course of the potential difference between such electrodes, the improvement which comprises:

forming an auxiliary value correlated to the timewise course



of the potential difference between a predetermined auxiliary electrode and one of the other electrodes; forming a measuring value correlated to the timewise course of the potential difference between two of the other electrodes; and sampling the measuring value for obtaining a sampling value corresponding to a particle and as a function of the auxiliary value.

9. An apparatus for analyzing particles suspended in a liquid, especially blood cells, comprising:  
a pair of vessels for the liquid containing the particles suspended therein;  
an electrically insulating wall separating the vessels from one another;  
said wall having an elongate channel means piercingly extending therethrough for flow communicating said pair of vessels with one another;  
an electrical power supply having a pair of terminals;  
a respective supply electrode arranged in each of the vessels and contacting the liquid contained therein;  
each supply electrode being operatively connected with a respective terminal of the electrical power supply;  
at least one auxiliary electrode contacting the liquid in the channel means;  
said auxiliary electrode having a dimension extending essentially parallel to the lengthwise direction of the channel which is small in relation to the length of the channel means;  
at least two feeler means having input means and output means;  
each of said feeler means being operatively connected to a respective pair of said electrodes for detecting the changes as a function of time of the potential difference between such electrodes;  
an auxiliary value being formed by the timewise course of the potential difference between said auxiliary electrode and one of the supply electrodes;  
a measuring value being formed by the timewise course of the potential difference between the two supply electrodes;  
a sampling circuit for sampling the measuring value as a function of a sampling signal for forming a sampling value;  
a control circuit having an input and output for forming the sampling signal as a function of the auxiliary value;  
said control circuit comprising a series circuit of a Schmitt-trigger having hysteresis and a monostable multivibrator;  
said control circuit having an input connected with the output means of one of said feeler means operatively associated with the auxiliary electrode;  
said sampling circuit having a control input and a signal input and an output;  
said output of the control circuit being connected with the control input of the sampling circuit;  
said signal input of the sampling circuit being connected with the output means of the other feeler means; and  
the sampling value appearing at the output of the sampling circuit.

4,161,691

**MULTI-PURPOSE DIGITAL MEASURING APPARATUS**  
Stanley L. Vermeers, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

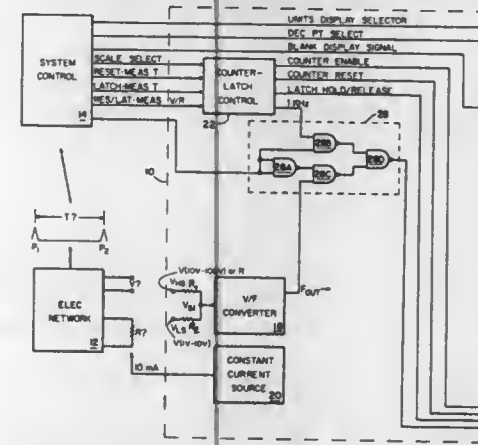
Filed Mar. 6, 1978, Ser. No. 883,543  
Int. Cl.<sup>2</sup> G01R 19/26, 27/02; G04F 8/00

U.S. Cl. 324—120

12 Claims

1. Apparatus for selectively measuring voltage and time durations of events, said quantities being associated with an electrical network, said apparatus comprising:  
first means for generating a first train of digital pulses when a voltage is measured by said apparatus, the frequency of said first train of digital pulses varying according to the value of voltage measured by said apparatus;

second means for generating a second train of digital pulses of selected constant frequency;  
means responsive to a first select signal for selecting said first digital pulse train when voltage is measured by said apparatus, and responsive to a second select signal for selecting said second digital pulse train when the time duration of an event is measured by said apparatus;  
counting means receiving said selected digital pulse train for providing a digital output signal which represents the number of pulses of said selected digital pulse train which



are received by said counting means when said counting means is enabled;  
control means responsive to a plurality of binary instructions for coupling said first and second select signals to said selecting means, for enabling said counting means to count received pulses during a succession of time periods of equal time duration when said apparatus is measuring voltage, and for enabling said counting means to count received pulses during a single time period when said apparatus is measuring the time duration of an event.

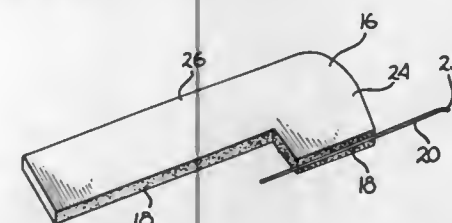
4,161,692

**PROBE DEVICE FOR INTEGRATED CIRCUIT WAFERS**  
John W. Tarzwell, Phoenix, Ariz., assignor to Cerprobe Corporation, Tempe, Ariz.

Filed Jul. 18, 1977, Ser. No. 816,337  
Int. Cl.<sup>2</sup> G01R 1/06, 31/02

U.S. Cl. 324—158 P

12 Claims



1. A probe device for testing integrated circuit wafers, said device comprising:

- a support member having an aperture;
- a plurality of ceramic holding members, each said holding member having relatively broad, generally parallel surfaces and relatively narrow edges, at least a portion of one said edge having an electrically conductive path disposed thereon, said holding members coupled to said support member, via one said narrow edge, such that said relatively broad surfaces are generally perpendicular to said support member and such that said holding members extend into said aperture; and
- a plurality of probe members, each said probe member coupled to said electrically conductive path on said narrow edge of each said holding member and extending into

said aperture, one or more of said probe members being configured to electrically contact a circuit wafer placed within said aperture.

4,161,693

**CLAMPED INPUT COMMON MODE REJECTION AMPLIFIER**

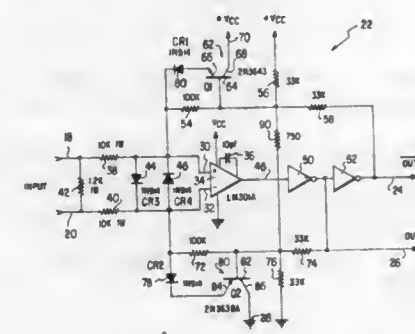
Peter J. Carlson, Fort Lauderdale, Fla., assignor to Airpax Electronics, Inc., Fort Lauderdale, Fla.

Filed Mar. 9, 1977, Ser. No. 775,957

Int. Cl.<sup>2</sup> H03F 3/45; G01P 3/48

U.S. Cl. 324—173

16 Claims



1. An operational amplifier having positive and negative differential inputs and an output, a positive power supply terminal, first solid state clamping means coupling said positive input to said positive power supply terminal, a negative power supply terminal, and second solid state clamping means coupling said negative input to said negative power supply terminal whereby excessive common mode voltage input excursions are clamped to avoid false switching of said output, wherein said clamping devices each includes a transistor and a diode.

4,161,694

**RADIO RELAY CHANNEL BRANCH CASCADE EXHIBITING UNIFORM TRANSIT-TIME-AND-ATTENUATION-CHARACTERISTICS OF ALL CHANNELS**

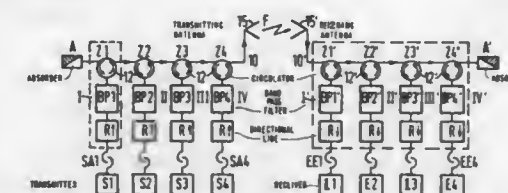
Hans-Werner Weber, Darmstadt, and Hermann Vollhardt, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Jun. 24, 1977, Ser. No. 809,807

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1976, 2628906

Int. Cl.<sup>2</sup> H04B 7/14

U.S. Cl. 325—1

2 Claims



1. A multi-channel radio relay system in which a plurality of high-frequency channels are provided in a link between a transmitting and a receiving station, said channels being combined at the transmitting station to form a common high-frequency group over a cascade circuit comprising channel branch elements, each of which contains a circulator and a band-pass filter, and separated at the receiving station over a similar cascade circuit, the allocation of frequencies being such that each channel passes over an equal number of circulators in said link, the edge channel of highest frequency being allotted to the circulator, of one of said cascades, most remote from the antenna associated therewith, and with the circulator, of the other cascade, closest to the antenna associated therewith, the

edge channel of lowest frequency being allocated to the circulator of each cascade at the opposite end to that allotted to the highest frequency, all of said circulators being similarly arranged in their respective cascades, the band-pass filter of each cascade connected to the circulator most remote from the associated antenna being detuned by an amount  $\Delta f$ , from its middle channel frequency in the direction of the middle frequency of the channel adjacent in frequency position, and the remaining band-pass filters being tuned to the middle frequency of the channel involved.

4,161,695

**TRANSMISSION AND RECEPTION CONTROL CIRCUIT FOR A TRANSCEIVER**

Takao Kakigi, Inagi, Japan, assignor to Cybernet Electronic Corporation, Kanagawa, Japan

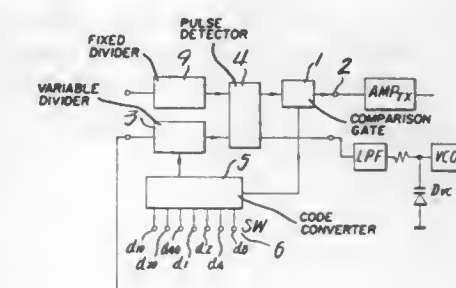
Filed May 12, 1977, Ser. No. 796,423

Claims priority, application Japan, May 14, 1976, 51/55174; Jul. 10, 1976, 51/82423

Int. Cl.<sup>2</sup> H04B 1/40

U.S. Cl. 325—17

8 Claims



1. In a transceiver having transmitting and receiving stages, a transmission and reception control circuit comprising:  
a voltage-controlled oscillator;  
a variable frequency divider connected to the voltage-controlled oscillator for providing a variable output frequency;  
changing means for changing the output frequency of the variable frequency divider;  
a fixed frequency divider;  
means for connecting the fixed frequency divider to a reference frequency source;  
a phase detector connected between the frequency dividers and the voltage-controlled oscillator for comparing the output frequencies of the frequency dividers to produce an output to automatically control the voltage-controlled oscillator; and  
gate means responsive to the output of the phase detector and an output of the changing means indicative of a prohibited channel for inhibiting the operation of the transmitting and receiving stages.

4,161,696

**PULSE TRANSMITTER REFERENCE NETWORKS SUPPLYING ECD CAPABILITY**

Milton Dishal, Clifton, and James P. Van Etten, Nutley, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation-in-part of Ser. No. 767,427, Feb. 10, 1977, abandoned, which is a continuation-in-part of Ser. No. 634,308, Nov. 21, 1975, abandoned. This application Feb. 21, 1978, Ser. No. 879,326

Int. Cl.<sup>2</sup> H04B 1/04; G01S 1/20; H03K 5/00, 3/04

U.S. Cl. 325—163

10 Claims

1. A method of varying the phase of RF cycles inside a pulse envelope while maintaining said pulse envelope stationary, said pulse envelope being the pulse shape obtained by connecting



- a boule with a pair of opposed bases normal to a longitudinal axis, prepared from a first semiconductor material having a first type conductivity and an impurity for rendering the first material a second and opposite type conductivity;
- a plurality of layers alternately of the first and the second type conductivity defining junction planes normal to the axis;
- a reflective coating on all cylindrical surfaces of the boule between the bases;
- voltage means of sufficient amplitude to cause an injection

current to flow through the boule, coupled across the bases; and,  
field means for applying a uniform magnetic field along the axis between the bases.

4,161,703

**SCHMITT TRIGGER SQUARE WAVE OSCILLATOR**  
Karl-Diether Nutz, Oedheim, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

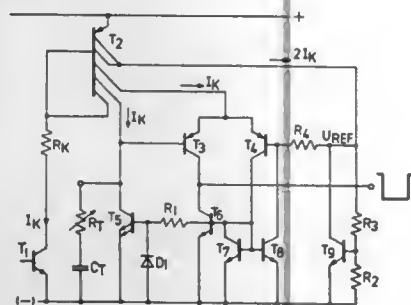
Filed Mar. 14, 1978, Ser. No. 886,395

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712369

Int. Cl.<sup>2</sup> H03K 3/295, 3/35

U.S. Cl. 331-111

7 Claims



1. In an oscillator for producing a square wave output signal and including a Schmitt trigger circuit, a capacitor connected for controlling the operation of the Schmitt trigger circuit, a constant current source connected to supply the capacitor with charging current, and current control means connected for causing the discharge current from the capacitor to be consistent with the charging current thereto, the improvement wherein: said oscillator further comprises a variable resistor connected in series with said capacitor to form a series RC element therewith; and a current-driven reference voltage source connected to supply said Schmitt trigger circuit with a reference voltage which determines the switching voltage of said Schmitt trigger circuit; said constant current source comprises a first current mirror circuit connected for simultaneously supplying a constant charging current to said capacitor, a constant current to said Schmitt trigger circuit and a constant current to said reference voltage source; and said current control means comprise a second current mirror circuit including a transistor connected in parallel with said series RC element, said transistor being switchable into a conductive state in which it conducts a current in a direction to discharge said capacitor and having twice the amplitude of the constant charging current supplied to said capacitor by said first current mirror circuit, whereby superposition of the current conducted by said transistor and the constant charging current supplied to said capacitor by said first current mirror circuit results in a discharging current through said capacitor equal in amplitude to the charging current supplied to said capacitor by said first current mirror circuit.

4,161,704

**COAXIAL CABLE AND METHOD OF MAKING THE SAME**

Robert H. Schafer, Perkasi, Pa., assignor to Uniform Tubes, Inc., Collegeville, Pa.

Filed Jan. 21, 1977, Ser. No. 760,878

Int. Cl.<sup>2</sup> H01P 3/06, 1/20, 11/00, 1/30

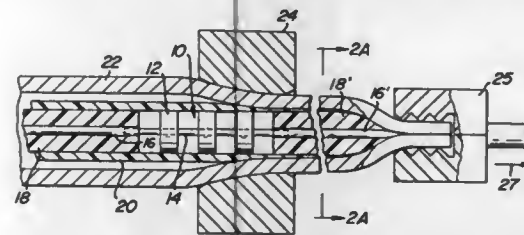
U.S. Cl. 333-33

14 Claims

1. A coaxial cable comprising:  
(a) at least one center conductor,  
(b) at least one circuit component electrically associated with said center conductor and coaxial therewith,  
(c) a tubular layer of dielectric material surrounding said

circuit component and said center conductor respectively, and

(d) a monolithic jacket of electrically conductive material surrounding said tubular layer and exerting radially in-



wardly directed compressive force on the entire circumference of said tubular layer of dielectric material, said jacket extending along the length of and being coaxial with said circuit component and said center conductor.

4,161,705

**LOW LEVEL CONTROLLABLE RADIO FREQUENCY PHASE SHIFTER**

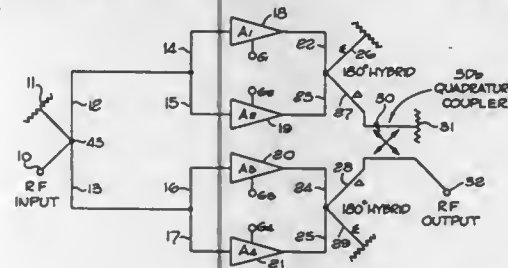
Jeffrey T. Nemit, Canoga Park, and Ronald I. Wolfson, Northridge, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,524

Int. Cl.<sup>2</sup> H03H 7/20, 7/22; H01P 1/18

U.S. Cl. 333-156

10 Claims



1. A signal controlled radio frequency phase shifter comprising:

first means responsive to an RF signal input for in-phase division of said RF signal into two branches substantially equally;

second means comprising first, second, third and fourth circuits each having an RF input terminal and an amplitude control terminal and each providing an RF output at a corresponding output terminal at an amplitude which is a function of a parameter of said control signal applied to the corresponding control terminal, said first and second circuits having their RF input terminals connected in parallel to one of said first means branches, said third and fourth circuits having their inputs connected in parallel to the other of said first means branches, said control signals being applied differentially in a first control signal pair to said first and second circuits and differentially in a second control signal pair to said third and fourth circuits;

third means comprising first and second 180° hybrids each having four ports including a pair of input ports and sum and difference output ports, said input ports of said first hybrid being discretely connected to said first and second circuit outputs of said second means and said input ports of said second hybrid being discretely connected to said third and fourth circuit outputs of said second means;

and fourth means comprising a quadrature coupler having at least three terminals including an output terminal and first and second quadrature related terminals, said coupler first quadrature terminal being connected to the difference output port of said first hybrid coupler and said coupler second quadrature terminal being connected to the difference output port of said second hybrid coupler, said cou-

pler output terminal providing an RF signal having a phase with respect to said first means RF input which is a function of said control signals applied to said second means amplitude control terminals.

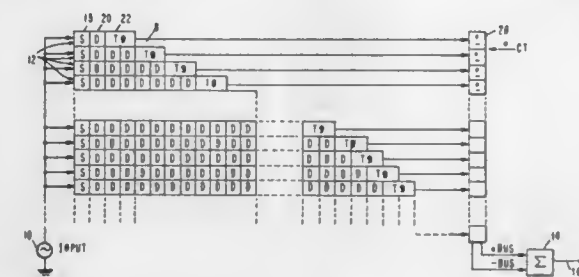
4,161,706

**UNIVERSAL TRANSVERSAL FILTER CHIP**  
James F. Dubil, Warrenton, Va.; Alain M. Falcoz, St-Jeannet; Rene J. Glaise, St. Paul de Vence; Christian A. Jacquart, Gattiere, all of France; Howard N. Leighton, Rockville, Md.; Vladimir Riso, Nice, France, and Raymond J. Wilfinger, LaGrangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1978, Ser. No. 869,069

Int. Cl.<sup>2</sup> H03H 9/28, 7/30; G11C 19/28; H03K 5/156  
U.S. Cl. 333-165

5 Claims



1. A transversal filter comprising:

a plurality of channels,  
means for feeding a signal into all the channels of the plurality of channels in parallel,

analog shift register delay means in each of the channels for delaying said signal a different amount in each channel, said analog shift register means having at least three parallel shift register segments,

signal splitting means in each channel for placing a portion of said signal on each of the shift register segments to provide each channel with at least three parallel paths, each path carrying a portion of the whole signal transmitted through the channel, and

differential summing means for summing all of the paths in all of the channels together and providing either a positive or negative output signal which is some desired function of the input signal, said summing means having gain setting means in each channel for selecting whether the output of any path in any channel forms a positive or negative increment in the summation to determine the gain of that channel and thereby determine said desired function.

4,161,707

**PUSHBUTTON TUNER HAVING LINKAGE OPERATED TUNING SLIDER**

Takao Kanai, and Yujiro Mori, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1977, Ser. No. 831,699

Claims priority, application Japan, Sep. 20, 1976, 51-111748

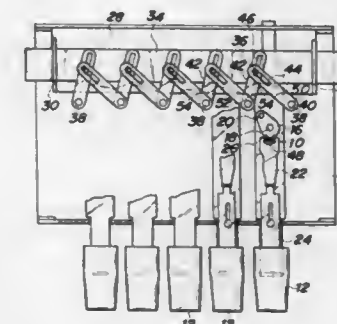
Int. Cl.<sup>2</sup> H03J 5/08

U.S. Cl. 334-7

5 Claims

1. In a pushbutton tuner including support means, a plurality of operative means each having a pushbutton connected thereto and positioned on said support means with the associated operative means for similar movement from an inoperative position to an operative position upon depression of the pushbutton, and tuning means positioned on said support means for movement in a direction transverse to the direction of movement of the operative means, the improvement comprising: linkage means responsive to the depression of any selected one of said pushbuttons for moving said tuning means in said transverse direction a distance which varies with the particular pushbutton which is depressed, said linkage means

comprising a pair of links associated with each operative means, each pair of links being supported for pivotal movement about parallel pivot axes spaced apart in a direction parallel to said transverse direction, the free end portions of each pair of links overlapping one another and each having elongated slots receiving a projection extending from said tuning means so that as each pair of links assumes different relative angular positions with respect to the associated pivot points the tuning means has a different corresponding position, and there is associated with each of said operative means adjustable tuning control means for engaging at least one of the



confronting edges of the associated pair of links when the associated pushbutton is fully depressed, each of said adjustable control means being lockably adjustable in position in a direction parallel to said transverse direction of movement of said tuning means and so that upon full depression of the associated pushbutton the tuning control means will first engage at least one confronting link edge to pivot the associated links when the pushbutton is partially depressed and upon further depression of the associated pushbutton will slide along the latter edge until it reaches the point of intersection between said confronting edges where further pivotal movement of the links is terminated.

4,161,708

**ELECTRONIC TUNING SYSTEM WITH DIGITAL BAND SELECTION**

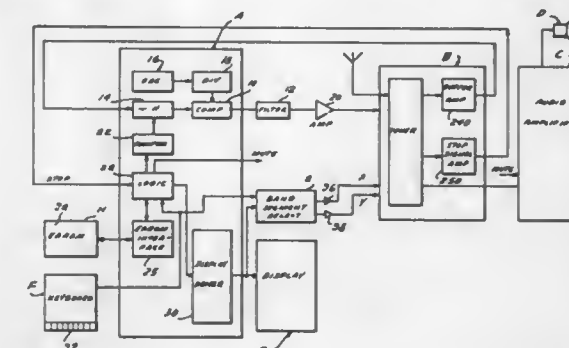
Vincent P. Friberg, Longmeadow, and Chester R. Kruczek, East Longmeadow, both of Mass., assignors to General Instrument Corporation, Clifton, N.J.

Filed Feb. 1, 1978, Ser. No. 874,262

Int. Cl.<sup>2</sup> H03H 5/12; H04B 1/06

U.S. Cl. 334-15

18 Claims



1. An electronic tuning system or the like comprising: a tuner having a varactor tuned resonant circuit comprising a plurality of series connected inductors and band switching means operably connected to said inductors to operably delete selected ones of said inductors from said resonant circuit in accordance with band segment selection signals; a station selector generating station selection signals in accordance with the actuation thereof; control circuitry operably connected to said station selector and comprising means for generating a



varactor control signal in accordance with said station selection signals and means for generating a display code representative of the frequency selected; means for displaying indicia corresponding to said display code; and digital means for generating band segment selection signals, said digital means comprising means for converting said display code into a decimal number and means for decoding said decimal number to form said band segment selection signals.

4,161,709

## MICROFORM CAMERA

Harry A. H. Spence-Bate, 1 Cheam Pl., Morley, Western Australia, Australia (6062)

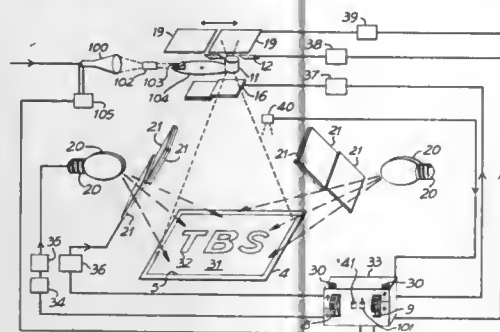
Filed Dec. 20, 1977, Ser. No. 862,566

Claims priority, application United Kingdom, Dec. 22, 1976, 53544/76

Int. Cl.<sup>2</sup> G03B 27/76, 27/78, 27/32

U.S. Cl. 355—38

15 Claims



1. A microform camera for photographically copying a record comprising:

- a camera lens,
- a shutter associated with said lens,
- a film holder adapted to move microform film through the back focal plane of said lens for recording successive images on said film,
- at least one lens filter mounted to a filter moving means for moving the filter between said lens and the front focal plane of the lens,
- shutter timing means for timing the opening of said shutter,
- first colour indicating means settable to correspond to the colour of the background of the record to be copied,
- second colour indicating means settable to correspond to the predominant colour of the record, and
- control means controlled by said first and second colour indicating means which is arranged to set said shutter timing means to a correct exposure for said predominant colour and to actuate said filter moving means to insert the said filter between said lens and the front focal plane of the lens.

4,161,710

## LOADING COIL FOR ANTENNA

Tadao Kakurai, 39-28, 3-chome, Chluo, Nakano-ku, Tokyo, Japan

Filed Jan. 6, 1978, Ser. No. 867,313

Int. Cl.<sup>2</sup> H01F 27/30; H01Q 9/22

U.S. Cl. 336—192

1 Claim

1. A loading coil for antenna comprising in combination a coil bobbin consisting of a densely wire-winding portion around which the coil wire is wound densely and a sparsely wire-winding portion provided below and in continuance to said densely winding portion and provided with a spiral groove along which the coil wire is wound sparsely, said sparsely winding portion having formed at its upper end a hole extending horizontally in registration with the topmost end of said spiral groove and also having formed centrally thereof a through-hole extending vertically along the length thereof, an upper snap-in base secured to the top end of said coil bobbin

and having connected thereto the upper end of the coil wire, a connector pin inserted into said through-hole in said coil bobbin and positioned such that a hole formed toward the upper end of said pin is in registration with said horizontal hole in said coil bobbin, said connector pin having formed at its lower end a slitted hole, a ring secured to the bottom end of said coil bobbin and having connected thereto the lower end of the coil wire, a cotter pin inserted into and fixed in said horizontal hole in the coil bobbin, said cotter pin having an internally threaded



and slitted inner wall adapted to hold and electrically connect the coil wire, a screw inserted into said horizontal hole in the coil bobbin from the opposite end thereof and threadedly engaged with said cotter pin, said cotter pin being spread out by said screw and thereby electrically connected to the connector pin, a lower snap-in base secured to said ring, said base having provided centrally in its upper portion a hole and also having provided centrally in its lower portion an internally threaded hole, and a coil sleeve securely interposed between said upper and lower snap-in bases.

4,161,711

## CIRCUIT INTERRUPTING DEVICE

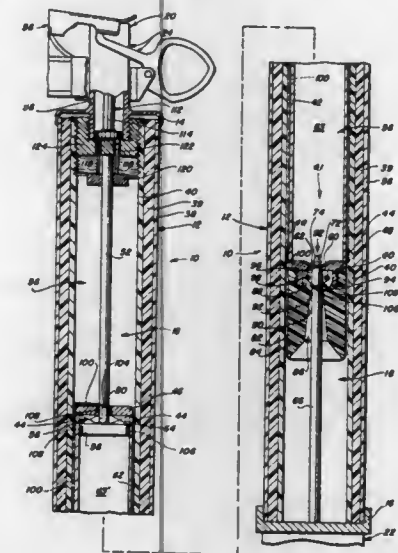
Otto Meister, Arlington Heights, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed May 24, 1978, Ser. No. 909,146

Int. Cl.<sup>2</sup> H01H 85/38

U.S. Cl. 337—273

60 Claims



60. An improved circuit interrupting device of the type having a reservoir of pressurized dielectric fluid with a port for directing the fluid at an arc, and a pair of relatively movable contacts which receive respective ends of, and elongate, the arc as they move apart, wherein the improvement comprises: a diaphragm normally closing the port; means for tearing the diaphragm to open the port as the contacts move apart; and

means for forcing the pressurized fluid from the port at a rate higher than that achievable by the fluid pressure alone as the contacts move apart.

4,161,712

## CURRENT LIMITING FUSE FOR CAPACITOR

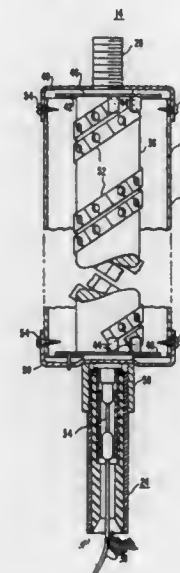
Peter H. Thiel, Bloomington, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1977, Ser. No. 787,134

Int. Cl.<sup>2</sup> H01H 85/04

U.S. Cl. 337—159

22 Claims



1. A current limiting fusible protective device comprising: a current limiting fuse section adapted for interruption of high fault currents and comprising a fusible ribbon of conductive material having a cross section with major and minor dimensions, and a fusible conductive wire having a substantially circular cross section; and a low current expulsion fuse section adapted for interruption of relatively low fault currents and comprising a replaceable fusible conductive link; said fusible ribbon, said fusible wire, and said fusible link being electrically connected in series circuit relationship.

4,161,713

## FUSIBLE ELEMENT FOR ELECTRIC FUSES HAVING A RELATIVELY HIGH VOLTAGE RATING AND A RELATIVELY HIGH CYCLING PERFORMANCE

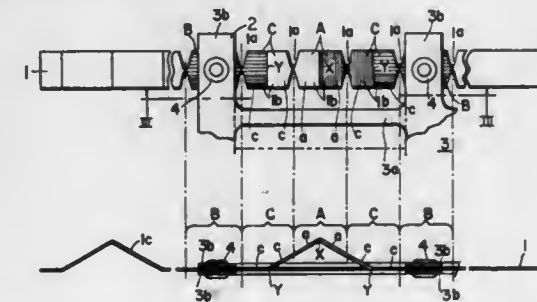
Philip C. Jacobs, Jr., Newtonville, Mass., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Mar. 13, 1978, Ser. No. 886,034

Int. Cl.<sup>2</sup> H01H 85/12

U.S. Cl. 337—161

6 Claims



1. A fusible element for electric fuses having a relatively

high voltage rating and a relatively high cycling capability comprising in combination

- (a) a narrow ribbon of sheet metal subdivided by equidistant points of equally reduced cross-section into a plurality of serially connected fusible element sections;
- (b) said plurality of fusible element sections including first fusible element sections angularly bent in the center thereof to form fusible element half-sections separated by non-perforated edges;
- (c) said plurality of fusible element sections further including second fusible element sections being planar and arranged in spaced relation from one of said plurality of first fusible element sections;
- (d) a fusible element support of electric insulating material extending in a direction longitudinally of said ribbon and having transverse arms arranged in registry with said plurality of second fusible element sections;
- (e) fastener means projecting transversely through said arms and said second fusible element sections and firmly affixing said second fusible element sections to said arms; and
- (f) said plurality of fusible element sections further including third fusible element sections conductively interconnecting said first fusible element sections and said second fusible element sections, said third fusible element sections being angularly bent in the center thereof to form half-sections separated by non-perforated edges, each of said half-sections of said third fusible element sections having one end co-planar with said second fusible element sections and another end co-planar with one of said half-sections of one of said first fusible element sections.

4,161,714

## ELECTRIC FUSE

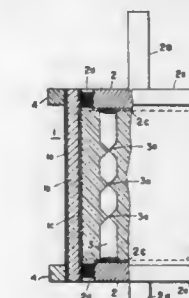
Philip C. Jacobs, Jr., Newtonville, Mass., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Oct. 25, 1977, Ser. No. 844,720

Int. Cl.<sup>2</sup> H01H 85/16

U.S. Cl. 337—253

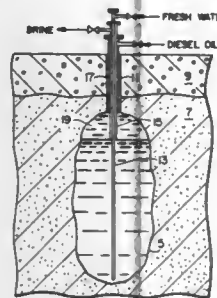
6 Claims



1. An electric fuse including

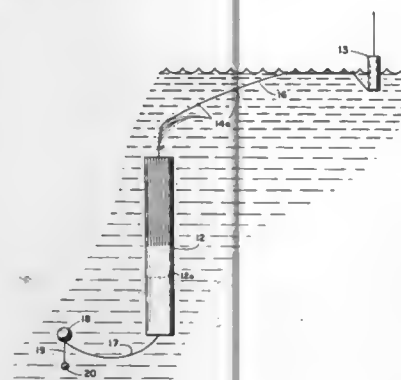
- (a) a fusible element immersed in a pulverulent arc-quenching filler;
- (b) a tubular fuse casing of a relatively elastic and relatively soft reinforced synthetic resin having the same cross-section along the entire length thereof housing said fusible element and said filler;
- (c) a pair of circular terminal plugs having end surfaces of substantially equal area press-fitted into the ends of said casing and conductively interconnected by said fusible element, said pair of terminal plugs having knurled lateral walls; and
- (d) a pair of annular fasteners exposing the axially outer end surfaces of said pair of terminal plugs mounted on said casing each adjacent one of the ends thereof and pressing the wall of said casing radially inwardly into firm engagement with said knurled lateral walls of said pair of terminal plugs.

**4,161,715**  
**METHOD AND APPARATUS FOR MEASURING THE INTERIOR DIMENSIONS OF A HOLLOW BODY**  
 Lawrence A. Harris, Schenectady, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.  
 Filed Sep. 2, 1977, Ser. No. 830,210  
 Int. Cl.<sup>2</sup> G01S 1/70; G01F 17/00; G01S 1/72  
 U.S. Cl. 340—16 R



1. An apparatus for measuring the interior dimensions of the walls of a hollow body, said walls radiate acoustic waves when illuminated by electromagnetic energy, comprising:
  - (a) means for transmitting a beam of electromagnetic energy toward a location on an interior wall of a hollow body;
  - (b) means for receiving acoustic waves propagated from said wall location in response to the electromagnetic energy; and
  - (c) timing means for determining the elapsed time between transmission of the electromagnetic energy and reception of the acoustic waves so that a measurement of the dimension between the apparatus and the wall location is obtained.

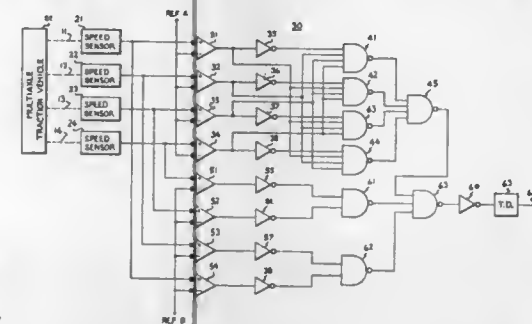
**4,161,716**  
**VERY LOW FREQUENCY SONOBUOY (VLF SONOBUOY)**  
 Thomas E. Stixrud, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Filed Dec. 16, 1977, Ser. No. 861,156  
 Int. Cl.<sup>2</sup> B63B 21/52; H04R 1/44  
 U.S. Cl. 340—2



1. An apparatus for hydromechanically decoupling a hydrophone arrangement disposed in a water medium from the effects of current, wind and surface wave action comprising:
  - means extending through the water-air interface for transmitting signals representative of impinging acoustic energy on the hydrophone arrangement;
  - means configured to lie at and below the water-air interface for buoyantly supporting the hydrophone arrangement;
  - means coupled between the transmitting means and the

buoyantly supporting means for permitting the separation thereof;  
 means connected to the buoyantly supporting means and the hydrophone arrangement for suspending the hydrophone arrangement below the water-air interface;  
 means carried on the suspending means near the hydrophone arrangement for damping the effects of wind and surface wave action therefrom;  
 means mounted on the suspending means for forming a catenary thereof;  
 means connected to the suspending means for ensuring the deployment of the aforesaid means; and the suspending means including a weak link portion connected to the deployment ensuring means to allow the separation thereof and the subsequent creation of a catenary in the suspending means by the catenary forming means.

**4,161,717**  
**LOCKED AXLE DETECTOR FOR A MULTI-AXLE TRACTION VEHICLE**  
 James W. Hoover; James Long, both of North East, and Edward S. Matulevich, Erie, all of Pa., assignors to General Electric Company, Erie, Pa.  
 Filed Mar. 13, 1978, Ser. No. 885,708  
 Int. Cl.<sup>2</sup> G08B 21/00; B60T 8/04  
 U.S. Cl. 340—62

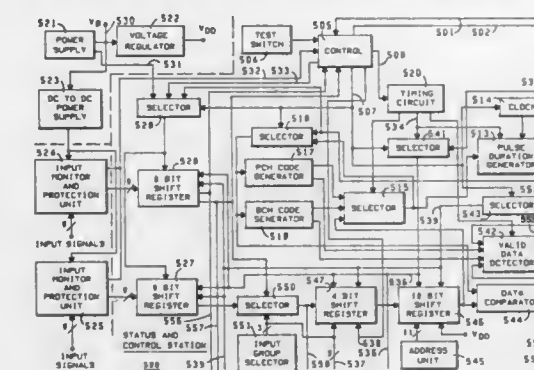


1. In a traction vehicle of the type having a plurality of axle carrying trucks and a plurality of axles on each of the trucks, an improved locked axle detector comprising:
  - (a) speed sensing means associated with each of said axles for providing a plurality of speed signals, each of said speed signals being representative of the rotational velocity of a corresponding one of said axles;
  - (b) first means connected for receiving said speed signals and for generating a locked axle signal when one and only one of said speed signals is representative of an axle rotational velocity lower than a predetermined first threshold level; and
  - (c) second means connected for receiving said speed signals and for inhibiting said first means except when said speed signals are indicative of at least one axle on each of the trucks rotating at a velocity greater than a predetermined second threshold level.

**4,161,718**  
**SUPERVISORY CONTROL SYSTEM**  
 Yitzhak Cohen, Yahud; Yigal Brandman, Ramat Hasharon, both of Israel, and Zvi Eckstein, Highland Park, Ill., assignors to Motorola Israel Ltd., Tel-Aviv, Israel  
 Filed Jun. 20, 1977, Ser. No. 807,850  
 Int. Cl.<sup>2</sup> G06F 11/00  
 U.S. Cl. 340—146.1 BA

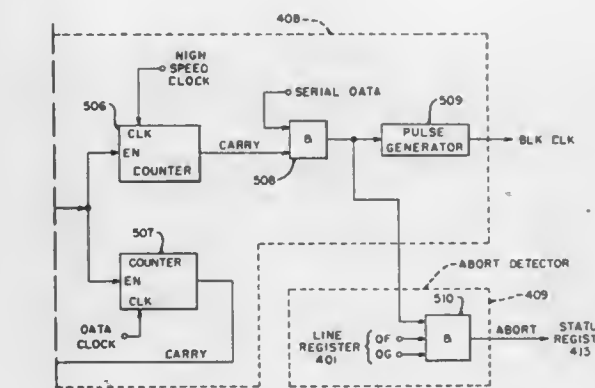
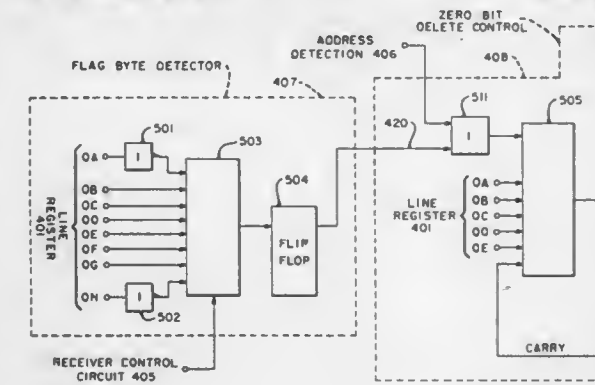
1. A method for receiving successive signals comprising the steps of:
  - receiving a first signal;
  - receiving a second signal;
  - providing a first output signal for the first received signal;

momentarily applying the first output signal to an output signal utilization means;  
 sensing the status of the output signal utilization means during the application of the first output signal;



comparing the sensed status of the output signal utilization means with the second received signal and providing a second output signal when the sensed status and second received signal are identical;  
 applying the second output signal to the output signal utilization means.

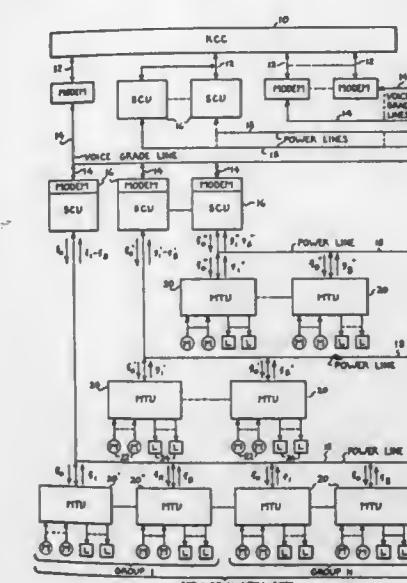
**4,161,719**  
**SYSTEM FOR CONTROLLING SYNCHRONIZATION IN A DIGITAL COMMUNICATION SYSTEM**  
 Bipin D. Parikh; Hareesh C. Patnaik; Bhagubhai K. Patel, all of Cambridge, Ohio; Prabodh M. Dharja, Des Plaines, Ill.; John J. Kurtz, Cambridge, Ohio; Alfred D. Jenkins, Cambridge, Ohio, and Prakash Y. Mahajan, Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio  
 Filed Oct. 4, 1977, Ser. No. 839,481  
 Int. Cl.<sup>2</sup> H04Q 9/00  
 U.S. Cl. 340—147 SY



8. In a communication system for transmitting a frame of data from a transmitting terminal over a serial communication link to a receiving terminal, a control system for controlling

the synchronization of said frame so that a frame of data assembled at, and transmitted from, the transmitting terminal may be properly disassembled at the receiving terminal comprising:  
 at said transmitting terminal,  
 first means for generating a prescribed flag character made up of a series of bits unique to said flag character,  
 second means, coupled to said first means, for transmitting said flag character as the initial and terminating characters of which a frame is comprised,  
 third means, coupled to said first and second means, for selectively inserting into the frame prescribed dummy bits to prevent the transmitted frame from containing a series of bits unique to said flag character except at those portions in the frame where the occurrence of a flag character is intended,  
 fourth means, coupled to said second and third means, for selectively generating a prescribed abort character made up of a series of bits unique to said abort character in response to a prescribed transmission condition and causing said second means to transmit said abort character while inhibiting the insertion of dummy bits into the abort character by said third means,  
 at said receiving terminal,  
 fifth means, coupled to said serial communication link, for monitoring said link for a frame beginning flag character,  
 sixth means, coupled to said fifth means, for controllably causing the disassembly of a frame of data until the detection of a frame-terminating flag character, and  
 seventh means, coupled to said fifth and sixth means, for removing dummy bits inserted during the transmission of the frame.

**4,161,720**  
**METER TERMINAL UNIT FOR USE IN AUTOMATIC REMOTE METER READING AND CONTROL SYSTEM**  
 Anthony P. Bogacki, Chester, N.H., assignor to General Electric Company, Somersworth, N.H.  
 Filed May 23, 1977, Ser. No. 799,550  
 Int. Cl.<sup>2</sup> H04Q 11/00; H04M 11/04  
 U.S. Cl. 340—150

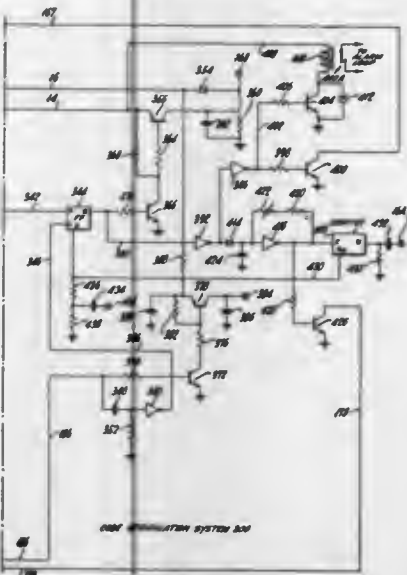
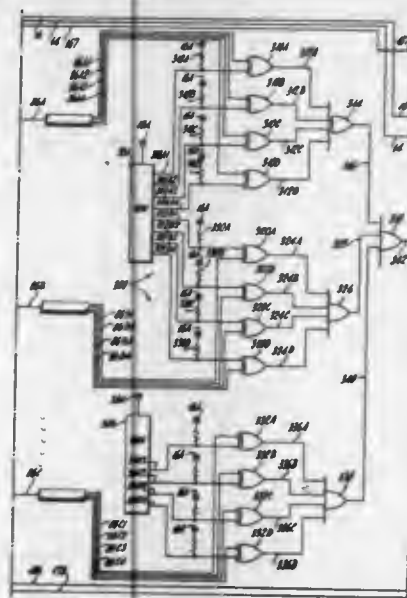


1. In a remote automatic utility meter reading system of the type including a control center for receiving measurement data in response to commands transmitted by said control center, each of said commands having first and second address portions and a function code portion, and further including a plurality of section control units for communicating commands and data between said control center and a plurality of meter terminal units associated with each section control unit, an improved meter terminal unit comprising:



- (a) register means for receiving commands communicated by an associated section control unit;
- (b) a meter including an encoder, said encoder capable of generating data signals representative of a commodity reading measured by said meter;
- (c) a plurality of addressable storage means for receiving the data signals from said encoder and storing a commodity reading represented thereby; and
- (d) means including first and second address recognition means, said first address recognition means corresponding to the first address portion of said commands and recognizing a specified meter terminal unit address and said second address recognition means corresponding to the second address portion of said commands and recognizing a specified address corresponding to an associated section control unit and further including function code decode means responsive to the contents of the function code portion of a first command received by said register means to selectively effect the transfer of data signals from said encoder into an identified one of said addressable storage means as specified by the function code portion of said first command when the address specified by the first and second address portions of said first command are recognized by said first and second address recognition means, and further responsive to a second command received by said register means to selectively effect the transfer of a commodity reading from a one of said storage means to an associated section control unit as specified by the function code portion of said second command when the addresses specified by the first and second address portions of said second command are recognized by said first and second address recognition means.

lected code and for generating an inhibit signal when said codes are different; and,



(c) inhibit means responsive to said inhibit signal for inhibiting transmission of the contents of said register means.

#### 4,161,721 ALARM DEVICE HAVING CODE VERIFICATION SYSTEM

Robert M. Conklin, Chappaqua, N.Y., and Arthur T. Human, Norwalk, Conn., assignors to Holmes Protection, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 667,786, Mar. 17, 1976, Pat. No. 4,048,621. This application Aug. 25, 1977, Ser. No. 827,528

Int. Cl.<sup>2</sup> H04Q 9/00; G08B 21/00  
U.S. Cl. 340—168 B

9 Claims

1. An alarm device for registering and transmitting a preselected code to a receiving station comprising:

- (a) register means under control of an operator for registering a code entered therein;
- (b) transmitting means responsive to a transmit signal for transmitting the contents of said register means to the receiving station;
- (c) transmit signal generating means for generating said transmit signal;
- (d) a comparator comprising storage means for storing said preselected code, and comparing means connected with said storage and register means for comparing the code registered in said register means with said stored preselected code.

4,161,722  
SIGNAL DECODING SYSTEM  
Martin S. Tatch, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1967, Ser. No. 687,963

Int. Cl.<sup>2</sup> H04B 7/00

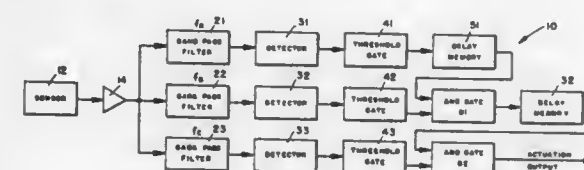
U.S. Cl. 340—171 R  
1. A decoding logic receiver for an electronic control device comprising:

- first circuit means, responsive to a correct sequence of transmitted tones of selected frequencies, for producing an output pulse;
- second circuit means, responsive to either receipt of two or more simultaneously transmitted tones or receipt of tones transmitted in incorrect sequence, to provide a primary inhibit output pulse;
- third circuit means, responsive to the absence of a signal

3 Claims

during selected time intervals, for producing a secondary inhibit output pulse;

actuating means, responsive to receipt of an output pulse from said first circuit means, for producing an actuation output; and



means responsive to either a primary inhibit output pulse or a secondary inhibit output pulse for preventing operation of said actuating means.

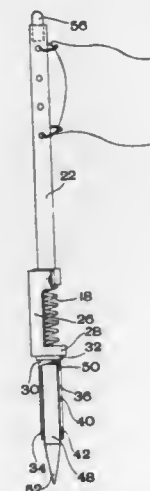
4,161,723  
FLAGPOLE PARTICULARLY FOR INDICATING GOALS IN SKIING COMPETITIONS  
Glanfranco De Vittori, via al Fiume 1a, Viganello, Switzerland  
Filed Apr. 7, 1978, Ser. No. 894,343

Claims priority, application Switzerland, Apr. 28, 1977, 5418/77; Jun. 22, 1977, 7684/77

Int. Cl.<sup>2</sup> E04H 12/32

U.S. Cl. 340—323 R

4 Claims



1. A flagpole, for indicating goals in skiing competitions, comprising an upper flag carrying portion and a lower pointed portion for insertion in the ground, a helical spring rigidly secured at its ends to said upper and lower portions of said flagpole in coaxial relationship therewith, a semicylindrical shell embracing substantially half of the periphery of the helical spring and extending over its entire length arranged on one side of said helical spring to form an abutment for said upper portion, a bushing integral with said shell embracing said lower pointed portion, said bushing having a snug frictional fit permitting said abutment to be angularly rotated relative to said lower pointed portion.

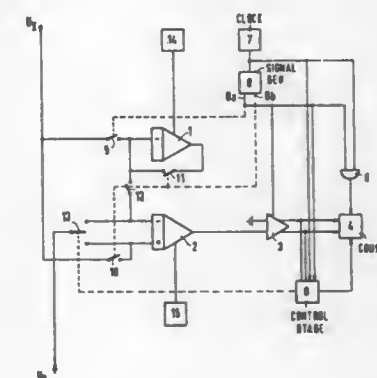
4,161,724  
METHOD AND CIRCUIT ARRANGEMENT FOR CONVERTING AN ANALOG QUANTITY INTO A DIGITAL QUANTITY USING A PAIR OF INTEGRATORS  
Kurt Smutny, Neunkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Filed May 6, 1977, Ser. No. 794,372

Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2621087

Int. Cl.<sup>2</sup> H03K 13/02

U.S. Cl. 340—347 NT

7 Claims



1. In a method for converting an analog quantity into a digital quantity, in which the analog quantity is temporarily connected during a conversion period and in which, further, pulses delivered by a pulse generator are fed to a counter during a time when the reference quantity is connected to the integrating circuit, the improvement comprising repetitively carrying out the following steps:

- (a) feeding the analog quantity to a first integrator during the first phase of a conversion period;
- (b) feeding the analog quantity to a second integrator during a second phase of the conversion period immediately following the first phase;
- (c) feeding the output signal of the first integrator to the second integrator in addition to the analog quantity and bringing the input of the first integrator to 0 by negative feedback of its output signal during said second phase of the conversion period;
- (d) connecting the reference quantity to the second integrator only during the first phase of the conversion period for a time period sufficient to bring said second integrator to zero during said first phase; and
- (e) counting the pulses in a counter over said time when said reference quantity is connected to said second integrator, whereby during the second phase of the conversion period the second integrator will at the same time integrate the output signal and have transferred to it the signal integrated by the first integrator during the first conversion period, so that, after the second repetition of the first phase of the conversion period, the output obtained by connecting the reference quantity to the second integrator and counting pulses in a counter will be a true representation of the analog quantity.

4,161,725  
ANALOG-FIBONACCI p-CODE CONVERTER  
Alexei P. Stakhov, ulitsa Chekhova, 49, kv. 16, Taganrog, U.S.S.R.

Filed Nov. 9, 1977, Ser. No. 849,984

Int. Cl.<sup>2</sup> H03K 13/02

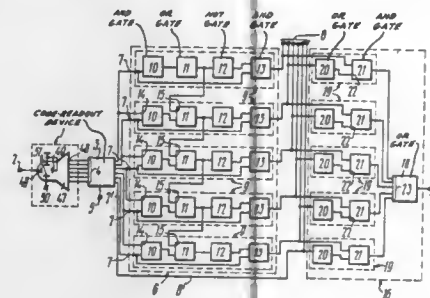
U.S. Cl. 340—347 AD

6 Claims

1. An analog-Fibonacci p-code converter comprising: a device for realization of a Fibonacci p-code table comprising an ordered sequence of n-place combinations of binary signals corresponding to minimal forms the Fibonacci

p-code of numbers from zero to  $\phi_p(n)-1$ , wherein  $\phi_p(n)$  is the Fibonacci p-number, and two combinations of binary signals corresponding to a quantized analog value with the serial number N are located between combinations of binary signals corresponding to minimal forms of the Fibonacci p-code of numbers N-1 and N differing in more than one place, the first combination differing from the combination of binary signals corresponding to a minimal form of the Fibonacci p-code of the number N-1 in the high order place of non-coincident digits of the combinations of binary signals corresponding to minimal forms of the Fibonacci p-codes of the numbers N-1 and N, and the second combination differing from the combination of binary signals corresponding to a minimal form of the Fibonacci p-code of the number N in the low order place nearest to the high order place of non-coincident places of the combinations of binary signals corresponding to minimal forms of the Fibonacci p-codes of the numbers N-1 and N, the device having an input receiving the analog value being converted, and a plurality of message outputs whose number is equal to the number of places in the Fibonacci p-code;

a code readout device having a first control input, a plurality of message inputs and a plurality of message outputs corresponding to places of the Fibonacci p-code; a first control input of said code readout device receiving a code readout pulse; a plurality of message inputs of said code readout device being coupled to said device for realization of the Fibonacci p-code table; the message outputs corresponding to places of the Fibonacci p-code from 0



(p-1)th of said plurality of message outputs of said code readout device being message outputs of said analog-Fibonacci p-code converter corresponding to places of the Fibonacci p-code from 0 to (P-1)th;

a device for conversion of a binary code corresponding to the quantized analogue value into a minimal form of the Fibonacci p-code of the serial number of the quantized analogue value having a plurality of inputs and a plurality of outputs which are message outputs of said analog-Fibonacci p-code converter corresponding to places of the Fibonacci p-code beginning with the pth place; the plurality of inputs of said device for conversion of binary code being connected to the outputs of the code readout device corresponding to places of the Fibonacci p-code, beginning with the pth place; a plurality of similar functional stages for identification of a pair of neighboring unity places in the selected combination of binary signals, whose number is equal to the number of places of the Fibonacci p-code, beginning with the pth place; a functional stage corresponding to an ith place of said plurality of the functional stages; a first AND gate of said functional stage having a first input, a second input and an output connected with the first input to the ith output of said code readout device, beginning with  $i=p$ ; an OR gate of said functional stage corresponding to the ith place having a first input, a second input and an output, the first input being connected to the output of said first AND gate and the output being connected to the second output of the OR gate of

the functional stage corresponding to the (i-1)th place; a NOT gate of said functional stage having an input and an output, the input being connected to the output of said OR gate; a second AND gate of said functional stage corresponding to the ith place having a first input, a second input and an output which is the ith message output of said analog-Fibonacci p-code converter, beginning with  $i=p$ , the first input being connected to the output of said NOT gate, the second input being connected to the first input of said first AND gate;

a device for checking the converted code combination of binary signals corresponding to a minimal form of the Fibonacci p-code having a plurality of inputs and an output which is a check output of said analog Fibonacci p-code converter, the inputs being connected to the outputs of said code readout device and to the outputs of said device for conversion of binary code into a minimal form of the Fibonacci p-code; a first OR gate of said checking device having an input and an output which is the check output of said analog-Fibonacci p-code converter; a plurality of similar functional stages of said checking device corresponding to predetermined places of the Fibonacci p-code, beginning with the pth place; the functional stage of said plurality of functional stages corresponding to an ith place of the Fibonacci p-code; a second OR gate of said functional stage corresponding to the ith place of the Fibonacci p-code having p inputs which are the inputs of said checking device corresponding to places of the Fibonacci p-code from the (i-1)th to the (i-p)th place; an AND gate of said functional stage corresponding to the ith place of the Fibonacci p-code having a first input, a second input and an output, the first input being connected to the output of said second OR gate of the ith functional stage of said device for conversion of the readout combination of binary signals which corresponds to the quantized analogue value into a minimal form of the Fibonacci p-code of the serial number of said quantized analogue value, the second being connected to the output of said second OR gate of the functional stage corresponding to the ith place of the Fibonacci p-code, and the output being connected to a respective input of said first OR gate of the checking device.

4,161,726

## DIGITAL JOYSTICK CONTROL

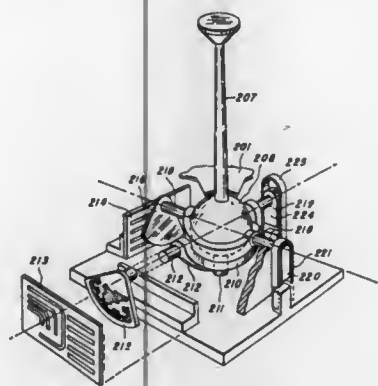
David C. Burson, Garland, and Harold D. Larson, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 6, 1977, Ser. No. 785,144

Int. Cl.<sup>2</sup> G06F 3/02

U.S. Cl. 340-365 R

7 Claims



5. A digital joystick control comprising:

- a platform having a centrally-located circular opening provided therein;
- a base member depending from said platform and having

respective pairs of side and end support members defining a chamber in registration with the circular opening in said platform;

- a joystick including an elongated shaft having a spherical ball on one end thereof, the elongated shaft of said joystick being disposed outwardly of said platform with said spherical ball being partially received within said chamber, and protruding outwardly of the circular opening in said platform;
- first and second socket members mounted within said chamber, said first socket member comprising a cup-shaped member in which said ball is seated, said cup-shaped member having an elongated slot disposed substantially perpendicular to the side support members and being pivotably connected to said side support members for movement about an axis perpendicular thereto, said second socket member comprising an arcuate strap extending about said cup-shaped member in traverse relationship thereto, said arcuate strap having an elongated groove disposed substantially perpendicular to the end support members and being pivotably connected to said end support members for movement about an axis perpendicular thereto;
- said ball having a pin member extending through the slot in said first socket member and into the groove in said second socket member thereby interconnecting said first and second members with said joystick to provide a swivel joint between said ball and said first and second socket members to enable movement of said shaft about said ball in any direction with respect to said platform;
- first and second circuit boards mounted in fixed relation to said base member, each of said circuit boards including a plurality of conductive wiper arms extending outwardly thereof; and
- first and second plate members fixably connected to said first and second socket members, respectively, for pivotal movement therewith, each of said plate members having a patterned surface presenting conductive and non-conductive regions in opposing relation to said circuit board with said wiper arms engaging the patterned surfaces of said plate members, the locations of the conductive and non-conductive regions of the patterned surface of said plate members with respect to said wiper arms being changeable in response to movement of the shaft member of said joystick.

4,161,727

## PROCESS FOR GENERATING AND TRANSMITTING DIFFERENT ANALOG MEASURED VALUES TO A CENTRAL CONTROL FROM A PLURALITY OF FIRE ALARM CIRCUITS WHICH ARE ARRANGED IN THE FORM OF A CHAIN IN AN ALARM LOOP

Peer Thilo, and Otto W. Moser, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 4, 1977, Ser. No. 821,840

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641489

Int. Cl.<sup>2</sup> G08B 23/00

U.S. Cl. 340-518

6 Claims



1. In a process of transmitting analog measuring value signals to a central control from a plurality of alarm circuits which are connected in the form of a chain in an alarm line and which are interrogated to produce analog measuring signals, and during which process a first voltage is applied to the alarm

line to charge capacitors in the alarm circuits and then the alarm line is disconnected prior to an interrogation and fire detectors of the alarm circuits remain powered by their respective capacitors, and during which process a second voltage is applied to the alarm line so that a switching device in each alarm circuit operates to connect the following alarm circuit in the chain to the alarm line with a delay representing the measuring value of the connecting alarm circuit, and in which process the respective alarm circuit address is read from the number of preceding increases in alarm line current and the associated measuring value is derived from the length of the respective switching delay, the improvement therein comprising the steps of:

applying the first voltage to the alarm line as a full line voltage for a time sufficient to charge the capacitors and then removing the first voltage from the alarm line for an interval which is longer, at least by a multiple, than the sum of the charging and interrogation times permitting the capacitors to power the detectors; and applying a second voltage to the alarm line to cause the alarm circuits to cause the switching devices of each alarm circuit to sequentially connect the next following alarm circuit to the alarm line to place its analog measuring value on the alarm line.

4,161,728

## ELECTRONIC DISPLAY APPARATUS

Edward F. Insam, Harrow, England, assignor to The General Electric Company Limited, London, England

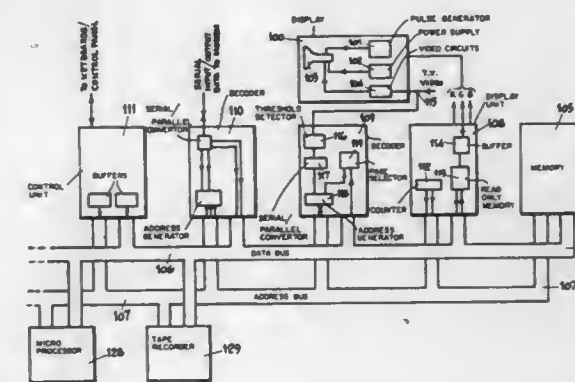
Filed Sep. 1, 1977, Ser. No. 829,710

Claims priority, application United Kingdom, Sep. 6, 1976, 36842/76

Int. Cl.<sup>2</sup> G06K 15/20

U.S. Cl. 340-750

5 Claims



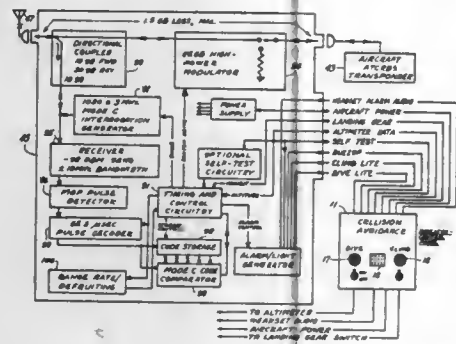
1. Apparatus for the display of information comprising a television-type display, character generator means for generating video signal elements for said display in response to data signals representing characters and symbols to be displayed, at least one receiver means for receiving and decoding coded signals including coded data signals, data storage means, a multiconductor bus arrangement over which data signals are transferred in parallel mode between said receiver means, said storage means and said character generator means, and a multiconductor address bus arrangement to which address signals are applied in parallel mode to control the transfer of said data signals on said data bus to the required destination.



**4,161,729**  
**BEACON ADD-ON SUBSYSTEM FOR COLLISION AVOIDANCE SYSTEM**  
 Bernard A. Schneider, 8984 Bellefontaine Rd., Dayton, Ohio 45424

Filed Feb. 9, 1978, Ser. No. 876,443  
 Int. Cl.<sup>2</sup> G01S 9/56  
 U.S. Cl. 343—6.5 R

4 Claims



1. In an air traffic control radar beacon system (ATCRBS), having an air traffic control (ATC) transponder with ATCRBS mode C altitude information signal reply, cooperating with an antenna, the improvement, a beacon add-on subsystem for collision avoidance system (BASCAS), for providing collision avoidance indication, said improvement comprising:
  - a. means cooperating with the said ATC transponder and the said antenna for storing said mode C altitude information;
  - b. means for radiating said mode C altitude information with an added determined first modulation frequency;
  - c. means cooperating with the said antenna for receiving a mode C altitude information signal having an added determined first modulation frequency and receiving a mode C altitude information signal reply having an added determined second modulation frequency;
  - d. means for comparing the said stored altitude information with the received altitude information from said signal reply having said second modulation frequency and providing an indication responsive to the said comparison; and
  - e. said means for radiating cooperating with the said antenna, said ATC transponder, and said means for receiving mode C altitude information signals having the said added determined first modulation frequency to radiate mode C altitude information signals having the said determined second modulation frequency.

**4,161,730**  
**RADIO DETERMINATION USING SATELLITES TRANSMITTING TIMING SIGNALS WITH CORRECTION BY ACTIVE RANGE MEASUREMENT**  
 Roy E. Anderson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,402  
 Int. Cl.<sup>2</sup> G01S 5/12

U.S. Cl. 343—6.5 R

15 Claims

1. A method of radio determination using a plurality of earth satellites having known locations and including satellites that simultaneously transmit timing signals at precisely known intervals, comprising the steps of:
  - a. receiving at an object being located the timing signals transmitted by first and second satellites and measuring the time-of-arrival of each timing signal with respect to a clock to derive the one-way ranging times and therefore the ranges from said first and second satellites to the object;
  - b. computing the approximate position fix of the object from the known locations of said first and second satellites and the ranges, and also computing from the satellite locations a hyperbolic line of position for the object extending

through the approximate position fix and along which the approximate position fix is displaced by clock error, independently determining a line of position of the object by performing a two-way active range measurement made through an earth satellite,



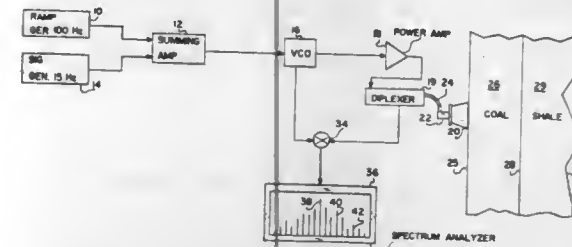
determining the true position fix of the object at the intersection of said hyperbolic line of position and independently determined line of position, and resetting said clock to correct for the clock error which is dependent upon the distance between the approximate and true position fixes.

**4,161,731**  
**THICKNESS MEASUREMENT SYSTEM**  
 Thomas A. Barr, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 31, 1977, Ser. No. 847,277  
 Int. Cl.<sup>2</sup> G01S 9/24

U.S. Cl. 343—14

4 Claims



1. A frequency modulated CW radar thickness measurement system comprising:
  - a. a frequency modulated oscillator;
  - b. first signal generating means for generating a generally triangular-shaped electrical waveform signal of a frequency of 70 to 200 Hz;
  - c. second signal generating means for generating an electrical signal of a frequency of 3 to 30 Hz;
  - d. signal combining means responsive to said first and second signal generating means for providing a modulating signal to said modulated oscillator which corresponds to the output of said first generating means modulated by the output of said second generating means;
  - e. a horn-type antenna having a solid interior of non-conductive material;
  - f. transmitting means responsive to said modulated oscillator for coupling a replica of the output of said modulated oscillator to said antenna means, whereby a signal is transmitted from said antenna;
  - g. receiving means coupled to said antenna and said frequency modulated oscillator for providing a difference signal; and

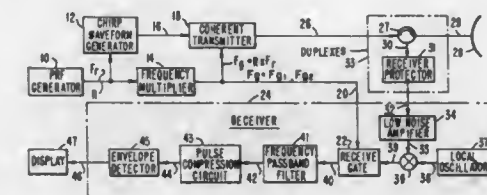
frequency indicating means responsive to the output of said receiving means for indicating difference frequencies, which frequencies are representative of range of a reflection from said antenna, whereby the difference in distance between reflections is representative of opposite surfaces, and thus indicative of the distance between said surfaces and thereby the thickness of said body.

**4,161,732**  
**GATED PULSE COMPRESSION RADAR**  
 R. Noel Longuemare, Jr., Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1976, Ser. No. 741,439  
 Int. Cl.<sup>2</sup> G01S 9/233

U.S. Cl. 343—17.2 PC

18 Claims



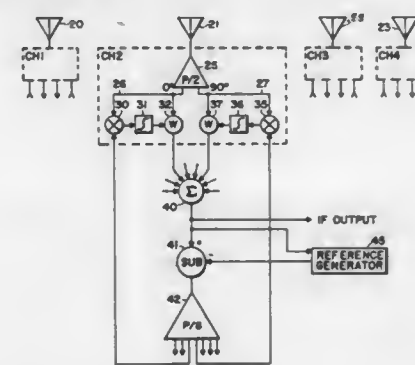
1. A method of operating a pulse compression coherent radar for obtaining target information comprising the steps of:
  - a. generating a plurality of sequences of spaced apart pulses, each said sequence having a predetermined duration and frequency bandwidth amenable to pulse compression, said spaced apart pulses in each of said sequences having a constant pulsewidth and pulse spacing to provide a fixed repetition rate for each of said sequences which is greater than said frequency bandwidth of said respective sequence of pulses;
  - b. transmitting said plurality of sequences of spaced apart pulses;
  - c. receiving a constant pulsewidth portion of each target reflected pulse of a sequence of pulses during time gated intervals of constant duration less than said pulse spacing and at said fixed repetition rate between transmitting each spaced apart pulse of a sequence and after transmitting a sequence to provide a uniform receive duty cycle to the entire length of a received sequence of pulses;
  - d. compressing an entire length of a received sequence of target reflected pulses to generate target information.

**4,161,733**  
**NULL STEERING APPARATUS INCLUDING WEIGHT OSCILLATION ELIMINATING MEANS**  
 Gregory H. Piesinger, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1977, Ser. No. 834,592  
 Int. Cl.<sup>2</sup> H01Q 3/26

U.S. Cl. 343—100 SA

8 Claims



1. In a multiple antenna array including null steering apparatus of the type utilizing reference signal generating means for

preventing a null on a desired signal, weight oscillation eliminating means comprising:

- (a) feedback means associated with each antenna in the array for adjusting the amplitude and phase of signals therein so that unwanted signals from the array are cancelled;
- (b) reference signal producing means including a closed circuit coupled to said feedback means with means for selectively picking off at least a portion of a desired signal and circuitry utilizing the picked off portion to generate a reference signal, which reference signal is applied to said feedback means to prevent said feedback means from forming a null on the desired signal; and
- (c) phase shifting means coupled into the closed circuit of said reference signal producing means for adjusting the phase of the reference signal to compensate for phase shifts between the desired signal and the reference signal.

**4,161,734**  
**POSITION SURVEILLANCE USING ONE ACTIVE RANGING SATELLITE AND TIME OF ARRIVAL OF A SIGNAL FROM AN INDEPENDENT SATELLITE**  
 Roy E. Anderson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,401  
 Int. Cl.<sup>2</sup> G01S 1/20

U.S. Cl. 343—100 ST

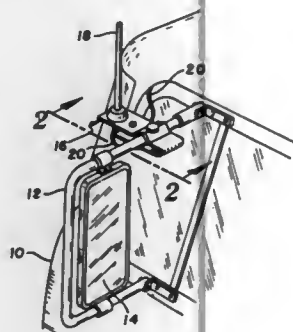
12 Claims



1. A method of position surveillance using a plurality of satellites having known locations and including a first satellite that transmits timing signals, comprising the steps of:
  - a. receiving at an object to be located and at a fixed earth station the timing signal transmitted by said first satellite;
  - b. performing a two-way active range measurement after reception of said first satellite timing signal at the earth station by transmitting an active ranging signal from the earth station through a second satellite to the object and back, to thereby derive the ranging time between said second satellite and object;
  - c. measuring the time of arrival of said first satellite timing signal at the object relative to reception of said active ranging signal at the object and deriving the elapsed time interval therebetween, and transmitting said elapsed time interval to the earth station;
  - d. computing at the earth station the position fix of said object from the known locations of said first and second satellites and earth station, the elapsed time interval measured at the object, and the ranging time between said second satellite and object, and displaying the position fix so obtained.

**4,161,735**  
**DETACHABLE ANTENNA MOUNT**  
 Norbert R. Zylla, 15253 Yakima St. NW., Anoka, Minn. 55305  
 Filed May 22, 1978, Ser. No. 908,126  
 Int. Cl.<sup>2</sup> H01Q 1/32  
 U.S. Cl. 343—713

11 Claims



1. A detachable antenna mount for mounting an antenna to a projecting metal member on a vehicle, permitting connection of the antenna to an antenna connection cable, and providing an electrical ground connection for the antenna connection cable, the detachable antenna mount comprising:

first and second plates having clamping portions for holding the projecting member therebetween, at least the first plate being of an electrically conductive material, the first plate further having a receiving portion at which the antenna and antenna connection cable may be connected together with an electrical ground conductor of the antenna connection cable being in electrical contact with the first plate;

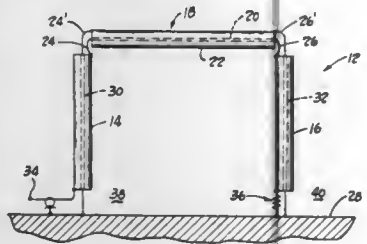
hinge means for connecting the first and second plates together at one end;

clamping screw means for clamping the first and second plates together; and

an electrically conductive pointed member connected to one of the plates for engaging the projecting member when the plates are clamped together and providing an electrical connection between the plates and the metal of the projecting member; whereby an electrical ground connection between the electrical ground conductor of the cable and the metal of the projecting member is provided by at least the first plate and the pointed member.

**4,161,736**  
**DIRECTION FINDING ANTENNA AND SYSTEM**  
 David J. Goodman, 3305 DeSota Ave., Cleveland Heights, Ohio 44118  
 Continuation-in-part of Ser. No. 758,591, Jan. 12, 1977, Pat. No. 4,115,780. This application Sep. 18, 1978, Ser. No. 943,331  
 Int. Cl.<sup>2</sup> H01Q 1/48, 21/08  
 U.S. Cl. 343—739

8 Claims



1. An antenna comprising two spaced-apart tubular monopoles extending linearly from a ground plane perpendicular to the ground plane; a coaxial transmission line extending linearly between said

monopoles, said transmission line being a dielectric line section comprising inner and outer conductors; means to top-connect the inner conductor of said transmission line to said monopoles; and ground means grounding the outer conductor to ground, said ground means comprising at least one ground lead extending within one of said monopoles.

**4,161,737**  
**HELICAL ANTENNA**  
 Eugene A. Albright, 1742 W. Rose, Phoenix, Ariz. 85015  
 Filed Oct. 3, 1977, Ser. No. 838,484  
 Int. Cl.<sup>2</sup> H01Q 1/36  
 U.S. Cl. 343—749

8 Claims



1. An antenna including in combination: an elongated support member for supporting an antenna coil thereon;

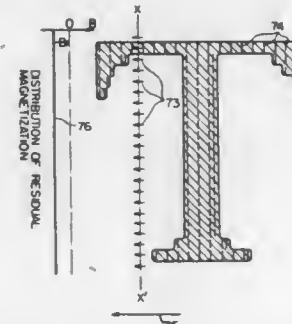
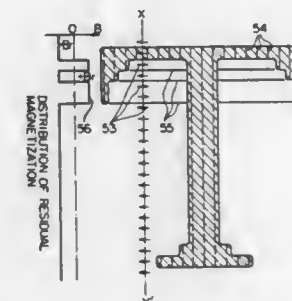
a helical stepped, tapered conductive antenna winding on said support member comprising at least first, second and third conductively interconnected winding sections each having a different pitch in a stepped progression from the first to the third section, and first and second tightly wound loading coils located respectively, between the first and second sections, and the second and third sections of said winding, said first and second loading coils comprising stepped, tapered windings, respectively.

**4,161,738**  
**METHOD AND APPARATUS FOR RECORDING LATENT IMAGES FOR MAGNETOGRAPHY**  
 Norio Kokaji, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan  
 Filed Feb. 3, 1978, Ser. No. 875,010  
 Claims priority, application Japan, Feb. 10, 1977, 52-13957  
 Int. Cl.<sup>2</sup> G03G 19/00; G11B 5/09  
 U.S. Cl. 346—74.1

4 Claims

1. A method of recording magnetic latent images in a magnetic recording medium for Magnetography in response to picture signals, said recording medium being receptive to imposition of a multiplicity of generally parallel, polarized magnetizing tracks by a magnetic recording head, said method comprising a step of applying a periodically reversing magnetizing field to said medium in response to a picture signal of black color in order to generate a track thereon having a periodically reversing magnetic polarity, and a step of applying a saturation magnetizing field of uniform predetermined

polarity to said medium in response to a white color picture signal in order to generate tracks of uniform polarity in regions

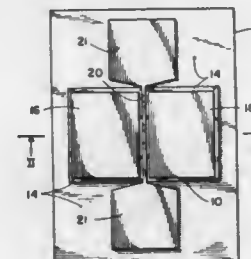


of said recording medium representing white color regions of the recorded picture.

**4,161,739**  
**MICROWAVE InP/SiO<sub>2</sub> INSULATED GATE FIELD EFFECT TRANSISTOR**  
 Louis J. Messick, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Filed Oct. 27, 1977, Ser. No. 846,070  
 Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357—23

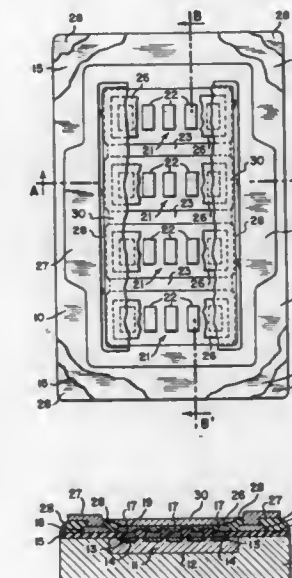
4 Claims



1. An insulated gate field effect transistor comprising: a semi-insulating InP substrate; semiconducting n-type InP material disposed on said substrate; a source contact and a drain contact spaced apart and disposed on said semiconducting InP material; a layer of silicon dioxide disposed over said semiconducting InP material in the space between said source and drain contacts; and a gate electrode disposed on said layer of silicon dioxide.

**4,161,740**  
**HIGH FREQUENCY POWER TRANSISTOR HAVING REDUCED INTERCONNECTION INDUCTANCE AND THERMAL RESISTANCE**  
 Richard H. Frey, Hampton, N.J., assignor to Microwave Semiconductor Corp., Somerset, N.J.  
 Filed Nov. 7, 1977, Ser. No. 849,302  
 Int. Cl.<sup>2</sup> H01L 29/72  
 U.S. Cl. 357—36

4 Claims



1. In a microwave power transistor of the type comprising a base pocket active area capable of generating heat to be removed, a plurality of spaced emitter rows within the boundaries of said base pocket and a plurality of discrete base areas closely spaced between successive spaced emitter rows, an improved electrical contact structure comprising:

bonding pad means on two sides of said base pocket active area;

a finger electrode structure for making electrical contact with said discrete base areas, said fingers extending across said base pocket active area for making electrical contact with said bonding pad means;

an insulating layer overlying said finger electrode structure in the region overlying said base pocket active area; and emitter bonding plate means for making electrical contact with said emitter rows, said emitter bonding plate means overlying at least a portion of said base pocket active area and being insulated from said finger electrode structure by said insulating layer.

**4,161,741**  
**SEMICONDUCTOR MEMORY DEVICE**  
 Marnix G. Collet, Eindhoven, Netherlands; Roelof H. W. Salters, and Joannes J. M. Koomen, both of Sunnyvale, Calif., assignors to U.S. Philips Corporation, New York, N.Y.  
 Filed Jul. 11, 1977, Ser. No. 814,650  
 Claims priority, application Netherlands, Feb. 4, 1977, 7701172

Int. Cl.<sup>2</sup> H01L 27/02

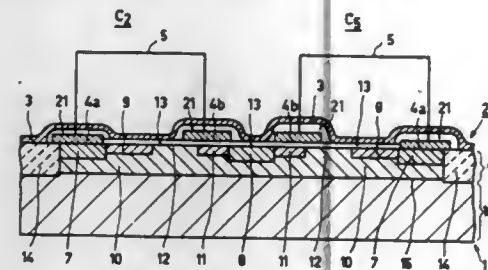
U.S. Cl. 357—41

25 Claims

1. A semiconductor device having a semiconductor memory element in particular suitable for use in a random access memory, comprising a semiconductor body having a surface-adjointing surface region of mainly one conductivity type and having a first field effect transistor, which comprises two main electrode regions of one conductivity type having therebetween a channel region of said one conductivity type and a surface situated gate region of opposite conductivity type forming a part of the semiconductor body, by means of which gate region a depletion region extending at least into the chan-



nel region can be induced in the semiconductor body, said gate region forming a charge storage region in which information can be stored in the form of electrical charge, which information can be read out non-destructively by determining the conductivity in the channel region between the main electrode regions, characterized in that the memory element comprises a second field effect transistor, which is of the insulated gate variety, and which comprises two main electrode regions one of which is formed by said charge storage region and the other

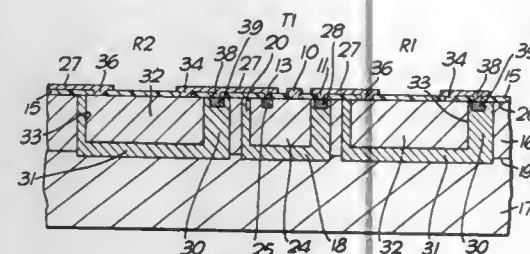


main electrode region is formed by a second surface region of the same conductivity type as said charge storage region, and both main electrode regions of said second field effect transistor being located between the two main electrode regions of said first field effect transistor, the second field effect transistor comprising at least a gate electrode which is insulated from the surface of the semiconductor body and which is coupled electrically to one of the main electrode regions of the first field effect transistor.

**4,161,742**  
**SEMICONDUCTOR DEVICES WITH MATCHED RESISTOR PORTIONS**  
Jeffrey Kane, Cheadle Hulme, England, assignor to Ferranti Limited, Hollinwood, England  
Continuation of Ser. No. 710,746, Aug. 2, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,137  
Claims priority, application United Kingdom, Aug. 2, 1975, 32401/75

Int. Cl.<sup>2</sup> H01L 27/04, 27/02, 29/72  
U.S. Cl. 357—48

12 Claims



1. A semiconductor device in a semiconductor body comprising:

- (a) first and second resistors, said first resistor having a greater impedance than said second resistor;
- (b) said first resistor including at least first and second substantially-matched resistor portions, and means for electrically connecting said first and second resistor portions to form said first resistor;
- (c) said second resistor including at least a third resistor portion, each of said first, second and third resistor regions being matched to each other to have substantially similar electrical characteristics and to provide said first and second resistors of accurately determinable impedances; and
- (d) each of said first, second and third resistor portions isolated individually within said semiconductor body by an isolating P-N junction and an associated surrounding

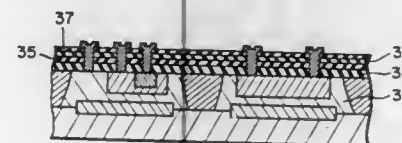
diffused region, said associated surrounding regions being isolated from each other within said semiconductor body, each of said isolating P-N junctions being disposed between a resistor region and its surrounding region, said associated surrounding regions being made substantially wholly of a material having a lower resistivity than that of each of said first, second and third resistor portions.

**4,161,743**  
**SEMICONDUCTOR DEVICE WITH SILICON CARBIDE-GLASS-SILICON CARBIDE PASSIVATING OVERCOAT**

Toshio Yonezawa, Yokosuka; Takashi Ajima, Tokyo, and Masato Uchida, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan  
Continuation of Ser. No. 782,224, Mar. 28, 1977, abandoned. This application Jun. 14, 1978, Ser. No. 915,541

Int. Cl.<sup>2</sup> H01L 29/34  
U.S. Cl. 357—54

22 Claims

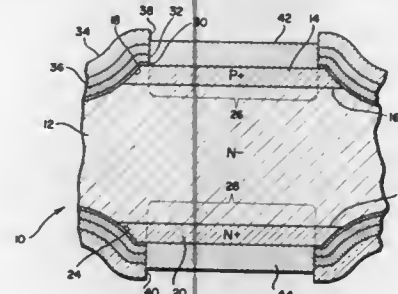


1. A semiconductor device comprising a semiconductor substrate including an exposed surface having a plurality of P-N junctions disposed thereon, and an insulative and protective film, said film including a first silicon carbide layer adhered to and substantially covering said surface; a layer of a silicate glass adhered to and substantially covering said first silicon carbide layer, said silicate glass being selected from the group consisting of P-SG, P-As-SG, and P-Sb-SG where "SG" means "silicate glass"; and a second silicon carbide layer adhered to and substantially covering said silicate glass layer.

**4,161,744**  
**PASSIVATED SEMICONDUCTOR DEVICE AND METHOD OF MAKING SAME**  
Theodore A. Blaske, Plano, and Ho Y. Yu, Richardson, both of Tex., assignors to Varo Semiconductor, Inc., Garland, Tex.  
Filed May 23, 1977, Ser. No. 799,467

Int. Cl.<sup>2</sup> H01L 29/04  
U.S. Cl. 357—59

5 Claims



1. A passivated semiconductor device comprising: a semiconductor body of monocrystalline silicon substrate material including a surface region having dopant material incorporated therein to form a diffusion layer, the boundary region between said layer and the parent substrate material defining a semiconductor junction; and a passivation film on selected portions of the semiconductor body and bridging over said junction to reside on adjacent surfaces of said layer and said parent substrate material, said film including a first, comparatively thin base coat of substantially undoped polycrystalline silicon material intimately contacting said semiconductor

body, and a second coat disposed on said base coat, including a layer of said polycrystalline silicon material doped with oxygen.

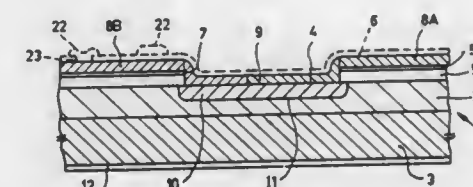
**4,161,745**  
**SEMICONDUCTOR DEVICE HAVING NON-METALLIC CONNECTION ZONES**

Arie Slob, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1977, Ser. No. 837,032  
Claims priority, application Netherlands, Nov. 19, 1976, 7612883

Int. Cl.<sup>2</sup> H01L 29/04, 23/48, 29/44  
U.S. Cl. 357—59

14 Claims

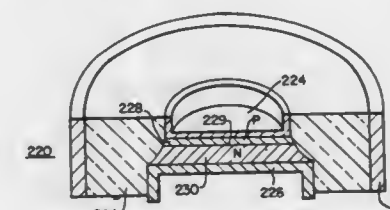


1. A semiconductor device having a semiconductor body of monocrystalline silicon, which device comprises at least one semiconductor circuit element having at least first and second active zones of opposite type conductivities, an electrically insulating layer provided on the surface of said semiconductor body and having at least one window, and a silicon layer which extends on the insulating layer and on the silicon surface within the window and which comprises a first layer part of a first type conductivity and a second layer part of a second type conductivity opposite to that of the first and adjoining said first layer part at least within the window, the first layer part of the silicon layer within the window forming an electrode and the first layer part outside the window on the insulating layer forming a connection conductor of said first active zone of the first type conductivity, and the second layer part of the silicon layer within the window forming an electrode and the second layer part outside the window on the insulating layer forming a connection conductor of said second active zone of the second type conductivity.

**4,161,746**  
**GLASS SEALED DIODE**  
Joseph E. Johnson, Churchill; John A. Ostop, Greensburg, and David L. Moore, Jeannette, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Mar. 28, 1978, Ser. No. 891,090

Int. Cl.<sup>2</sup> H01L 23/02  
U.S. Cl. 357—73

18 Claims



1. A semiconductor diode, comprising:  
(a) a body of semiconductor material having opposed substantially flat parallel top and bottom surfaces with an edge portion extending between said top and bottom surfaces, said body of semiconductor material including at least two regions of opposite conductivity type respectively extending to said substantially flat top and bottom surfaces, with the interface of said at least two regions forming a PN junction therebetween, said PN junction

extending across said body of semiconductor material and terminating at said edge portions;

- (b) first and second electrodes respectively affixed to said top and bottom surfaces of said body of semiconductor material; and
- (c) a first ring-shaped member encircling said body of semiconductor material and spaced therefrom by a ring-shaped glass member, said ring-shaped glass member having an inner surface which is fused to said edge portion of said body of semiconductor material.

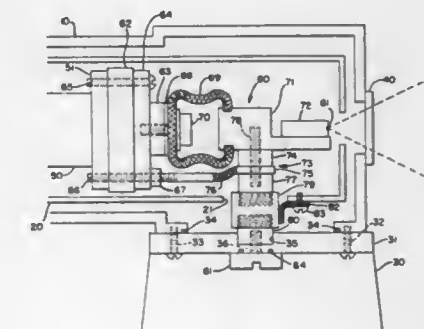
**4,161,747**  
**SHOCK ISOLATOR FOR OPERATING A DIODE LASER ON A CLOSED-CYCLE REFRIGERATOR**

Robert A. Frosh, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Donald E. Jennings, Berwyn Heights, Md.

Filed Feb. 24, 1978, Ser. No. 880,838  
Int. Cl.<sup>2</sup> H01L 25/04, 23/02, 23/42

U.S. Cl. 357—82

10 Claims



1. Apparatus for maintaining a component at a substantially constant temperature and substantially isolated from vibration in a closed-cycle refrigerator, comprising:

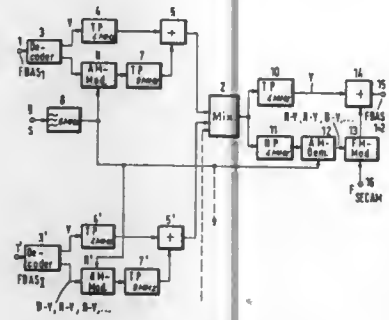
- housing means;
- radiation shield means within said housing means for reducing radiation heat from said housing means;
- thermal damper means surrounded by said radiation shield means and coupled to a cold tip of said refrigerator; and
- means for mounting said component within said radiation shield means, including:
- thermal contact means spaced from said thermal damper means for mounting said component thereon,
- flexible and thermally conductive strap means coupled between said thermal contact means and said thermal damper means for isolating said component from vibrations of said refrigerator and for thermally connecting said component to said cold tip,
- first thermal insulator means connected to said thermal contact means for thermally insulating said component,
- thermal conduction means connected to said first thermal insulator means and flexibly and thermally coupled to said thermal damper means for isolating said component from vibrations of said refrigerator and for maintaining said thermal conduction means at substantially said cold tip temperature,
- second thermal insulator means connected to said thermal conduction means for thermally insulating said thermal conduction means,
- another thermal conduction means connected to said second insulator means and flexibly and thermally coupled to said radiation shield means for isolating said component from vibrations of said radiation shield means and for maintaining said another thermal conduction means at substantially said radiation shield temperature, and
- third thermal insulator means connected to said another thermal conduction means for thermally insulating said another thermal conduction means.



**4,161,748**  
**MIXING OF SECAM COLOR-T.V. SIGNALS**  
 Bodo Heyl, Welterstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Dec. 22, 1977, Ser. No. 863,303  
 Int. Cl.<sup>2</sup> H04N 9/535

U.S. Cl. 358—22

13 Claims



1. A method of mixing a plurality of SECAM color-T.V. signals, comprising, in combination, these steps:  
 for each SECAM color-T.V. signal, separating the frequency-modulated color component thereof from the luminance component, frequency-demodulating the color component to yield a video-frequency color component, amplitude-modulating the video-frequency color component to yield an amplitude-modulated color component, and then superimposing the amplitude-modulated color component onto the luminance component to form a frequency-multiplex signal corresponding to the original SECAM color-T.V. signal;  
 mixing these frequency-multiplex signals using a single mixing channel to yield a frequency-multiplex mix signal which is comprised of a luminance mix component and a color mix component;  
 separating the color mix component from the luminance mix component on the basis of frequency;  
 amplitude-demodulating the color mix component to yield a video-frequency mix of the color components of the original SECAM color-T.V. signals;  
 frequency-modulating the video-frequency color-component mix to yield a frequency-modulated mixed color component for a SECAM color-T.V. signal; and  
 superimposing the frequency-modulated mixed color component onto the luminance mix component to yield a SECAM color-T.V. signal which constitutes a mix of the original SECAM color-T.V. signals.

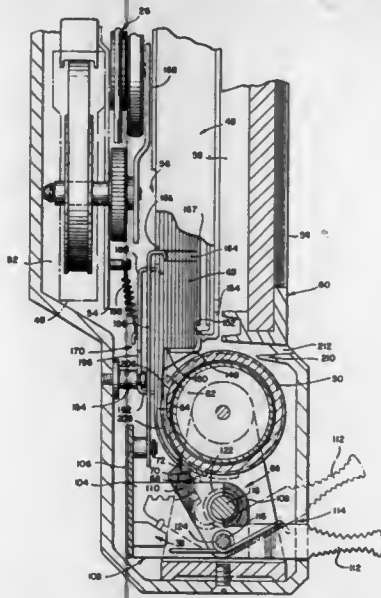
**4,161,749**  
**PRINTER FOR PRODUCING PRINT OF AN ELECTRONICALLY RECORDED IMAGE**  
 Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.  
 Filed Mar. 30, 1978, Ser. No. 891,704  
 Int. Cl.<sup>2</sup> H04N 1/46, 1/46; G01D 9/28  
 U.S. Cl. 358—75

11 Claims

1. A printer for use with electronic image recording apparatus for providing a color print of an electronically recorded image of a scene on an image receiving sheet, the apparatus being of the type including means for providing a plurality of distinct electronic image signals that collectively represent a color record of an optical image of the scene in electronic data form and individually represent different color components of the optical image, the apparatus also including means for holding a plurality of image receiving sheets and a transfer sheet including thereon a number of sequentially arranged sets of a plurality of adjacent parallel stripes of different colored printing mediums for selective transfer to an image receiving sheet, in accordance with a corresponding electronic image signal, to

provide a color print of the recorded image thereon, said printer comprising:

a frame;  
 a cylindrical drum having an axis and being mounted on said frame for rotation about the axis, said drum also including a support surface on which an image receiving sheet is adapted to be located for support and rotation with said drum and means for releasably receiving and securing one end of an image receiving sheet to said drum such that the image receiving sheet is wrapped onto said support surface in response to an initial revolution of said drum;  
 means being operative for advancing an image receiving sheet relative to the apparatus holding means such that one end thereof is brought into operative engagement with said receiving and securing means on said drum and for advancing the transfer sheet relative to the apparatus holding means to present a set of stripes of the different colored printing mediums at a fixed position adjacent said support surface of said drum with the stripes extending along the length of said drum in parallel relation to the axis and in proximate facing relation to an image receiving sheet wrapped on said support surface in response to an initial revolution of said drum;  
 a printing head including a plurality of printing transducers mounted thereon, each of said printing transducers being



adapted to have a different one of the plurality of distinct electronic image signals applied thereto for converting the signal into a printing signal in a form of energy which when applied to a corresponding one of the different colored printing medium stripes is effective to cause the selective transfer of the colored printing medium from the one stripe to the image receiving sheet on said drum support surface;

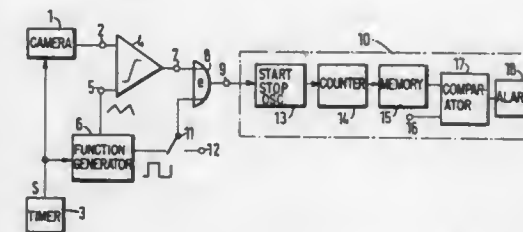
means for mounting said printing head on said frame for linear movement along the length of said drum in a direction parallel to the drum axis between first and second positions such that each of said printing transducers is located in operative alignment with a corresponding one of the plurality of colored printing medium stripes located at said fixed position so as to track along the corresponding stripe as said printing head is advanced from said first position to said second position; and  
 drive means for rotatably driving said drum and simultaneously linearly driving said printing head from said first position to said second position in coordinated relation with the rotation of said drum while the plurality of distinct electronic image signals are applied simultaneously to corresponding ones of said plurality of printing transducers to effect the selective transfer of the different colored mediums to the image receiving sheet, wrapped

**4,161,750**  
**VIDEO ALARM SYSTEMS**  
 Gerhard R. Kamin, Traisa, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Mar. 10, 1978, Ser. No. 885,455  
 Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710883

U.S. Cl. 358—105

Int. Cl.<sup>2</sup> H04N 7/18

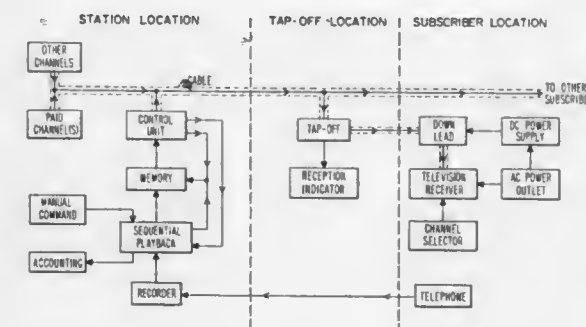
10 Claims



1. An alarm system of the kind wherein an analog video signal produced by a television camera is discriminated to detect a movement or change in the field of view monitored by the television camera, the system comprising means for generating a threshold-value signal, means for converting the video signal provided by the camera into a binary signal whose value depends upon whether or not the level of the threshold-value signal is exceeded by the video signal, and means for evaluating the binary signal according to a predetermined criterion to determine whether or not to raise an alarm, wherein the threshold-value signal is an alternating signal whose frequency is related in predetermined manner to the horizontal frequency of the video signal, and whose level swings at least between the white and black values of the video signal at least once during each line period of the latter.

**4,161,751**  
**HIGH-SECURITY CABLE TELEVISION ACCESS SYSTEM**  
 Clarence S. Ost, 7905 Bayshore Dr., Margate City, N.J. 08402  
 Filed May 19, 1977, Ser. No. 798,409  
 Int. Cl.<sup>2</sup> H04N 7/16  
 U.S. Cl. 358—114

8 Claims



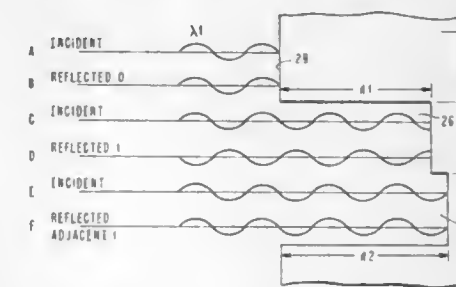
1. Method of providing, to requesting cable television subscribers, access to requested program signals transmitted over the cable and via interconnections including tap offs and down leads to the subscribers' television receivers, comprising generating a string of clocking pulses corresponding to serial numbering of all the subscribers, combining program command pulses with the clocking pulses corresponding to the respective requesting subscribers in the clocking string and thereby producing a program command signal string, wherein the string of clocking pulses is generated by providing a square wave of

onto said support surface during the initial revolution of said drum, to provide a color print of the recorded image on the image receiving sheet.

certain repetition frequency, and the program command signal string is generated by gating a narrower square wave thereto at the time of each requesting subscriber's clocking pulse and combining the gated portion thereof with the string of clocking pulses, transmitting the program command signal string via the cable to each of the respective requesting subscribers' tap offs, and at each requesting subscriber's tap off separating the command pulses from the clocking pulse string, and utilizing the requesting subscriber's command pulse to gate the requested program signals to that television receiver.

**4,161,752**  
**HIGH DENSITY VIDEO DISK HAVING TWO PIT DEPTHS**  
 Albert R. Basilico, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
 Filed Jun. 28, 1977, Ser. No. 810,702  
 Int. Cl.<sup>2</sup> H04N 5/76; G11B 23/18, 7/24  
 U.S. Cl. 358—128

6 Claims



1. A video disk of the type that is optically readable according to interference or the absence of interference occurring in light from a point being read on a track of the record when the record is illuminated with light of an appropriate wavelength, said disk comprising,  
 first and second sets of track revolutions located on the disk with each track revolution being separated from track revolutions of the same set by a single track revolution of the other set,  
 pits of a depth designated  $d_1$  along track revolutions of the first set for producing interference in light of a wavelength designated  $\lambda_1$  but not in light of a wavelength designated  $\lambda_2$ ,  
 pits of a depth designated  $d_2$  along track revolutions of the second set for producing interference in light of wavelength  $\lambda_2$  but not in light of wavelength  $\lambda_1$ , whereby a read operation on track revolutions of the first set with light of wavelength  $\lambda_1$  and on track revolutions of the second set with light of wavelength  $\lambda_2$  is independent of the data content of an adjacent track revolution.

**4,161,753**  
**VIDEO RECORDING DISK WITH INTERLACING OF DATA FOR FRAMES ON THE SAME TRACK**  
 Jack H. Bailey, Millbrook, and Gerald H. Ottaway, Pleasant Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
 Filed Jul. 8, 1977, Ser. No. 814,017  
 Int. Cl.<sup>2</sup> H04N 5/76

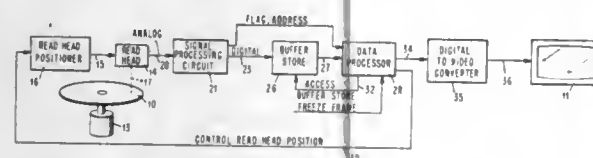
U.S. Cl. 358—128

7 Claims

1. A video recording disk of the type having a succession of track revolutions, comprising,  
 a recording disk, and a plurality of frames representing a sequence to be presented to a television set recorded on each of said succession of track revolutions, said frames each being divided into successive data units each comprising a predetermined number of horizontal lines of a



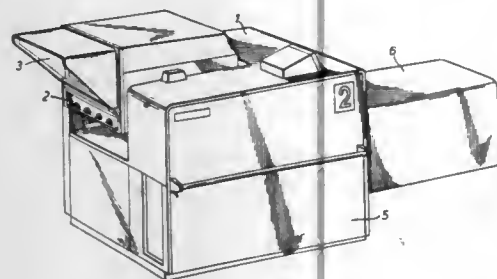
television frame and each of said data units of the same frame being spaced apart in sequence substantially equally around the track revolution and interlaced with data units



of other frames of the same track revolution, each of said data units having a header containing an address identifying the sequence of the data unit within a frame and identifying the frame within a sequence of frames.

**4,161,754**  
**TELEVISION CAMERA USABLE AS STUDIO OR PORTABLE UNIT**  
Stanley J. Leeson, Wickham Bishops, Near Witham, and Norman A. Porter, Chelmsford, both of England, assignors to The Marconi Company Limited, Chelmsford, England  
Filed Oct. 21, 1977, Ser. No. 844,182  
Claims priority, application United Kingdom, Nov. 6, 1976, 46278/76

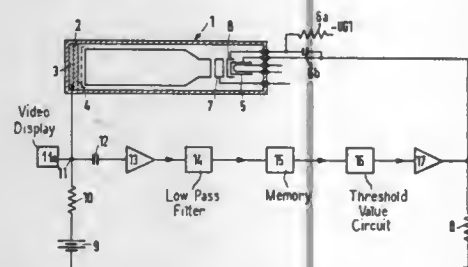
Int. Cl.<sup>2</sup> H04N 5/26  
U.S. Cl. 358—185 5 Claims



1. A television camera of the studio or outside broadcast type comprising a television camera tube and associated control and processing circuitry and a housing therefor and wherein said television camera tube is provided in a separable unit which may be removed from said housing and utilised, with circuitry remaining within said housing, as a portable camera.

**4,161,755**  
**TELEVISION PICK-UP SYSTEM**  
Joerg Haendle, Erlangen; Heinz Horbaschek, Frauenaurach, and Hartmut Sklebitz, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Jan. 19, 1978, Ser. No. 870,754  
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703836

Int. Cl.<sup>2</sup> H04N 5/197  
U.S. Cl. 358—219 3 Claims

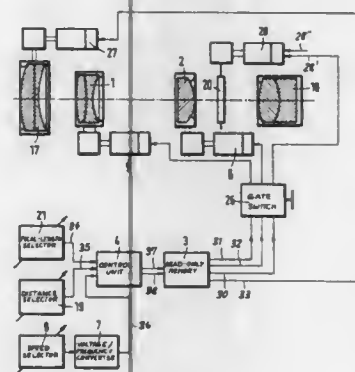


1. An image pick-up system comprising a television camera having a television camera tube including a cathode, a grid,

and a signal plate having a photosensitive layer with a free surface, said camera tube being operable for producing an electron beam, and for deflecting and focusing the electron beam onto the signal plate, comprising means for adjusting the cathode potential of the television camera tube, and comprising an installation for processing the video signal tapped off from the signal plate, and a circuit arrangement comprising a memory (15) and a low pass filter (14) connected in series to form a series circuit connected to the signal plate (3), and the output of the circuit arrangement (14, 15) being connected with the means (17) for adjusting the cathode potential of the television camera tube (1) such that the grid and cathode potentials are more positive the brighter the image location corresponding to the respective output signal of the circuit arrangement (14, 15), the memory (15) comprising means for storing a television image and means for reading out the stored television image synchronously with the deflection of the electron beam of the camera tube (1), said memory (15) being operable for picking up one television field and subsequent to storage of the television field, being operable synchronously with the movement of the beam of the camera tube (1) with the series circuit (14, 15) supplying an output signal synchronous with the deflection of the beam of the camera tube and representing a blurred video image conforming to the low frequency components of the video signal tapped off from the signal plate.

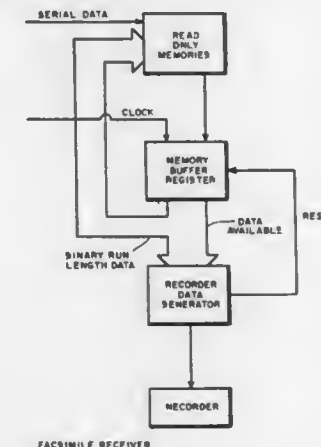
**4,161,756**  
**CONTROL SYSTEM FOR VARIFOCA OBJECTIVE**  
Otto Thomas, Bad Kreuznach, Fed. Rep. of Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 778,933, Mar. 18, 1977, abandoned. This application May 26, 1977, Ser. No. 801,017  
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611639

Int. Cl.<sup>2</sup> G02B 7/11, 15/14  
U.S. Cl. 358—225 10 Claims



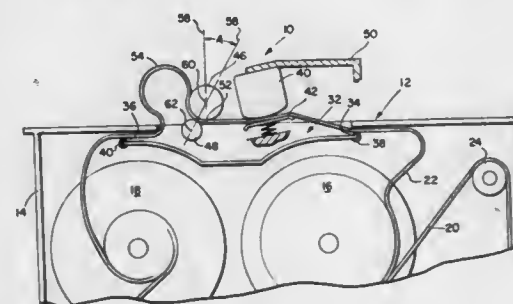
1. In an optical zooming system wherein a varifocal objective has a plurality of components including an axially shiftable variator for changing its focal length and an axially shiftable compensator for maintaining a constant image plane, the combination therewith of:  
first drive means for axially shifting said variator;  
second drive means for axially shifting said compensator;  
memory means storing correlated positional data for said variator and said compensator;  
a source of zooming signals; and  
control means connected to said memory means and to said source for concurrently reading out respective sequences of said correlated positional data to said first and second drive means in response to said zooming signals whereby said variator and said compensator are axially shifted between different positions in a zoom range.

**4,161,757**  
**FACSIMILE SYSTEM**  
David R. Spencer, Melville, N.Y., and Larry K. Baxter, Lexington, Mass., assignors to Litton Systems, Inc., Melville, N.Y.  
Filed Jun. 1, 1977, Ser. No. 802,344  
Int. Cl.<sup>2</sup> H04L 3/00; H04N 1/00  
U.S. Cl. 358—261 4 Claims



2. A system for decoding a comma free code, such as a Huffman code, comprising:  
read only memory means for receiving serial data to partially address the read only memory with the incoming data bit and a memory buffer register for supplying said read only memory with a vectored address from said memory to complete the address of the read only memory, said vectored address having been supplied to the memory buffer register from the read only memory when the previous data bit was received, said vectored address comprising the decoded loop.

**4,161,758**  
**LOOP FORMING AUDIO DRIVE**  
William R. Wray, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.  
Filed Apr. 25, 1978, Ser. No. 899,864  
Int. Cl.<sup>2</sup> G03B 23/12, 31/02  
U.S. Cl. 360—90 3 Claims

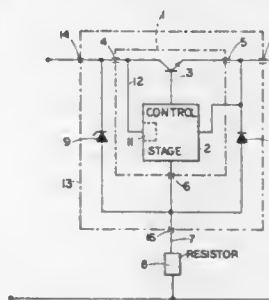


1. A tape drive mechanism having a capstan and pinch roller arrangement for drawing an audio tape in a given direction across an audio transducer and then into a free loop in a audio-visual system, the system including means for retarding the feeding of the tape after it advances from the capstan, the capstan being located in a downstream relation to the transducer, as viewed in the given direction of tape advancement, and arranged with respect to the transducer such that the tape lies in a given plane as it approaches the capstan, the improvement wherein the pinch roller is mounted in a downstream relation to the initial point of tangency of the tape with the capstan so that the tape is carried partially around the capstan and thereby displaced from the given plane as it emerges from contact with the roller and capstan to thereby form a loop in the emerging tape portion the pinch roller being mounted in

relation to the capstan so that a plane passed through the center of said capstan and the initial point of tangency between the given tape plane and the capstan is at an angle greater than 10 degrees to a plane passed through the center of the capstan and the center of the pinch roller, and thereby maintain said loop in the emerging tape portion throughout operation of said tape drive mechanism.

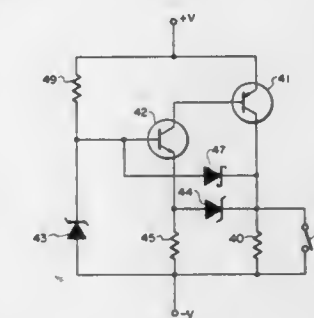
**4,161,759**  
**PROTECTION CIRCUIT FOR A VOLTAGE REGULATOR**  
Manfred Stein, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany  
Filed Oct. 5, 1977, Ser. No. 839,634  
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715330

Int. Cl.<sup>2</sup> H02H 9/04  
U.S. Cl. 361—18 7 Claims



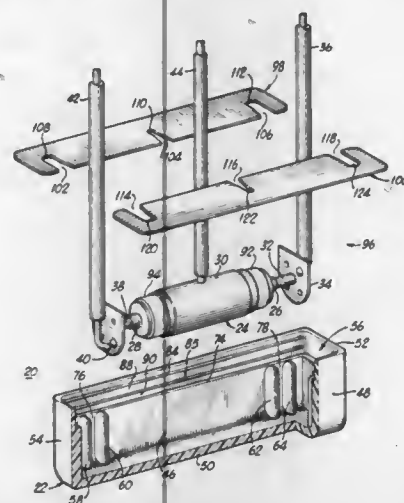
1. A protection circuit for a voltage regulator in integrated construction, particularly for motor vehicles, comprising a voltage regulator having a ground connection line, an input and an output, a resistor connected in the ground connection line of said voltage regulator, and a diode path connected between a voltage regulator sided end of said resistor and said input of the voltage regulator, whereby said resistor having such a value that the potential difference occurring on said resistor is limited to a very small value in comparison to the output voltage.

**4,161,760**  
**SHORT CIRCUIT PROTECTION OF REGULATED POWER SUPPLIES**  
William R. Valentine, Andover, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed May 22, 1978, Ser. No. 907,648  
Int. Cl.<sup>2</sup> H02H 3/24  
U.S. Cl. 361—18 6 Claims



1. An overload protection circuit for a voltage regulator connected between a power source and a load; wherein the voltage regulator comprises a series pass ampli-

4,161,762  
**GAS TUBE ARRESTER PROTECTOR AND METHOD OF ASSEMBLING THE PROTECTOR**  
 Eric A. Scheithauer, Chicago, Ill., assignor to Cook Electric Company, Morton Grove, Ill.  
 Continuation-in-part of Ser. No. 637,713, Dec. 4, 1975, Pat. No. 4,051,546. This application Sep. 21, 1977, Ser. No. 835,411  
 Int. Cl.<sup>2</sup> H02H 3/22  
 U.S. Cl. 361—124 19 Claims

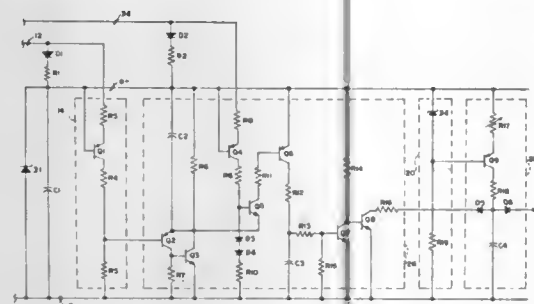


1. An overvoltage arrester protector for protecting telephone lines from high voltage and surge currents comprising: a generally hollow elongated housing having one side substantially open for access into said housing and having retaining means on the inside walls of said housing; a gas tube overvoltage arrester having at least first and second electrodes; lead means to be coupled to said telephone lines; fusible means coupled to each of said first and second electrodes; contact means attached to said fusible means and said lead means and disposed in said retaining means such that said gas tube overvoltage arrester is positioned within said housing; and spacer means having slots therein to receive said lead means, said spacer means being positioned through the open side of said housing to further retain said gas tube overvoltage arrester in said housing and to substantially close said open side of said housing.

4,161,763  
**COMPACT VOLTAGE SURGE ARRESTER DEVICE**  
 Earl W. Stetson, Pittsfield, Mass., assignor to General Electric Company, New York, N.Y.  
 Filed Mar. 27, 1978, Ser. No. 890,254  
 Int. Cl.<sup>2</sup> H02H 9/06  
 U.S. Cl. 361—128 1 Claim

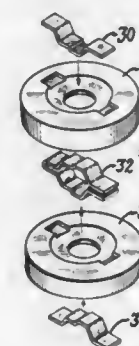
1. A compact surge arrester comprising in combination: a single electrode having a flat projection surface thereon for defining an extended arcing surface and a pair of flat contact surfaces thereon, one of said contact surfaces including high-electrical resistive means for limiting current flow to said one surface; a double electrode structure having a first pair of opposing flat contact surfaces on one side and a second pair of flat opposing contact surfaces on another side thereof, a pair of flat projected surfaces for defining arcing surfaces, said first pair of contact surfaces being electrically coupled together; a disc of electrically insulating material separating said single electrode structure and said double electrode structure and providing arc quenching means therebetween said electrodes; and

4,161,761  
**PROPORTIONAL GROUND CURRENT RELAY**  
 Richard J. Moran, Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.  
 Filed Sep. 6, 1977, Ser. No. 830,653  
 Int. Cl.<sup>2</sup> H02H 3/08  
 U.S. Cl. 361—94 17 Claims



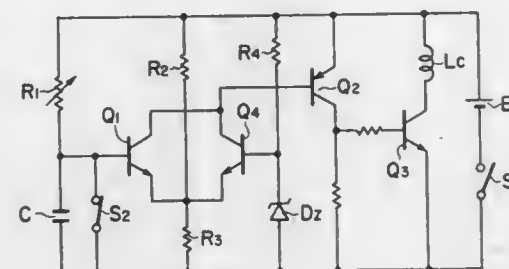
1. A median phase current detection circuit for a three phase alternating electric power system, which comprises: power supply means, having a positive terminal and a negative terminal, for supplying a constant direct voltage between said positive and negative terminals; phase current sensing means, which is coupled to the three phase power system and includes a positive output and a negative output, for producing between its two outputs a direct voltage first signal which is proportional to the instantaneous sum of a single polarity portion of the phase and ground currents flowing in said power system; and reference signal means, connected to receive said constant direct voltage supplied by said power supply means and said first signal produced by said phase current sensing means, for storing a direct voltage reference signal for at least a half cycle, which follows and approximates in magnitude successive minimum, instantaneous magnitudes of said first signal occurring at least once every half cycle; whereby said reference signal is proportional to the median phase current of the three phase power system.

a plurality of zinc oxide varistors of the type consisting of a zinc oxide disc having metal electrodes at opposing ends and a ceramic collar around the periphery, wherein one of



the gap electrodes is electrically coupled with line and one of the zinc oxide electrodes is electrically coupled with ground.

4,161,764  
**EXPOSURE CONTROLLING CIRCUIT FOR ELECTRIC SHUTTERS**  
 Yasuo Ishiguro, Kenji Wakazono, and Toshihisa Saito, all of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan  
 Filed May 8, 1978, Ser. No. 903,401  
 Claims priority, application Japan, May 10, 1977, 52-52584  
 Int. Cl.<sup>2</sup> G03B 7/00, 9/58  
 U.S. Cl. 361—187 3 Claims

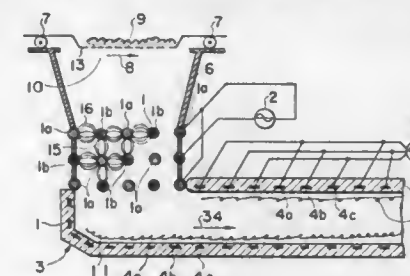


1. An exposure controlling circuit for electric shutters comprising a current source, a current source switch connected to said current source, a first switching means connected to said current source through said current source switch, a first coil connected to said current source through said current source switch and first switching means to control the shutter closing operation, and a voltage drop detecting circuit connected to said first switching means and capable of detecting the voltage drop of said current source, said first switching means being operated by a signal issued from said voltage drop detecting circuit to energize said first coil with said current source and to thereby close the shutter when the voltage of said current source drops to be below a predetermined value while the shutter is opened.

4,161,765  
**POWDER MATERIAL PROCESSING APPARATUS**  
 Tsutomu Itoh, Tokyo; Munekazu Sakurai, Kitamoto; Masahiro Yamamoto, Chiba, and Yasunari Okamoto, Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Onoda, Japan  
 Filed Jan. 4, 1977, Ser. No. 756,910  
 Int. Cl.<sup>2</sup> H05B 5/02  
 U.S. Cl. 361—226 13 Claims

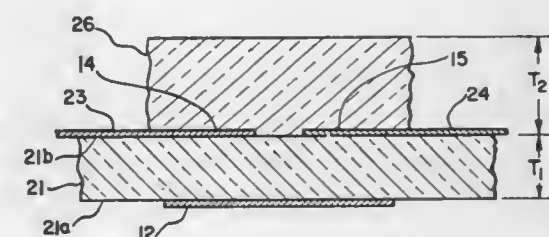
1. A powder material processing apparatus comprising:

a charging zone defined by at least one wall including a passageway adjacent thereto; an array of elongated conductors extending in parallel relationship to and spaced from one another, said conductors extending transversely with respect to said passageway; an A.C. power supply coupled to said electrodes with alter-



nate electrodes coupled to opposite polarity terminals of said A.C. power supply to apply an A.C. voltage to said conductors of a magnitude to apply a bi-polar charge to powder by generating a silent A.C. discharge between said conductors; and means for passing powder material through the region where said silent discharge is generated.

4,161,766  
**LAMINATED CAPACITIVE TOUCH-PAD**  
 Donald E. Castleberry, Schenectady, and Wesley K. Waldron, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
 Filed May 23, 1977, Ser. No. 799,298  
 Int. Cl.<sup>2</sup> H01G 7/00  
 U.S. Cl. 361—280 9 Claims



1. A capacitive touch-pad comprising: a first layer of dielectric material having first and second surfaces, said first surface being outwardly facing and exposed to an external environment; a first electrode fabricated upon said first surface to be exposed to said external environment and responsive to contact with a human body member; a pair of spatially separated second and third electrodes fabricated upon said second surface substantially within the boundaries of said first electrode; and a second layer of rigid dielectric material laminated to said second surface in abutment with said second and third electrodes; said first layer having a thickness predeterminedly selected to cause an electrical capacitance between each of said second and third electrodes and said first electrode to be greater than the parasitic capacitance between said first and second electrodes.

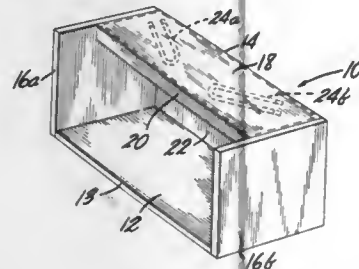


**4,161,767**  
**TASK LIGHTING SYSTEM WITH**  
**ANGULARLY-DISPLACED FLUORESCENT TUBES**  
 Roger Benasutti, St. Paul, and Thomas A. Koenig, Stillwater,  
 both of Minn., assignors to Conwed Corporation, St. Paul,  
 Minn.

Filed Oct. 3, 1977, Ser. No. 838,764  
 Int. Cl.<sup>2</sup> A61G 13/00

U.S. Cl. 362—33

3 Claims



1. A task lighting system for illuminating a work surface comprising:

- a substantially horizontal hood having a front edge;
- said hood having a width of from about 60 to about 90 inches and depth of from about 15 to about 24 inches;
- a front lip on the front edge of said hood of from about 4 to about 6 inches;
- means for holding said hood from about 16 to about 26 inches above said work surface;
- first and second parallel fluorescent tubes in the left half of said hood behind said lip;
- the axes of said first and second substantially parallel fluorescent tubes being substantially in a horizontal plane and making an angle of from about 9 to about 80 degrees with respect to said front edge;
- third and fourth substantially parallel fluorescent tubes in the right half of said hood behind said lip;
- the axes of said third and fourth substantially parallel fluorescent tubes being substantially in a horizontal plane and making the same angle between 9 and 80 degrees with respect to said front edge as the axes of said first and second substantially parallel fluorescent tubes in left-right symmetry about a line normal to the center of said front edge.

**4,161,768**  
**ARTIFICIAL CHRISTMAS TREE**  
 Ray J. Gauthier, 2931 Lloyd Georg St., and Fred G. Caverzan,  
 3415 Mark Ave., both of Windsor, Ont., Canada (N9E 2X3)  
 Filed Jun. 14, 1978, Ser. No. 915,576

Int. Cl.<sup>2</sup> A47G 33/06

U.S. Cl. 362—123

2 Claims

1. An artificial Christmas tree which is produced in knock-down components for assembly by the user, comprising in combination a central stalk made of a wooden tube containing therein electrical conductors which are concentric with and run the full length of said central stalk; spaced holes located around the stalk for inserting therein branches of said tree, said holes leading from the surface of the stalk in a downward angle to its center; a plurality of main branches to which are attached secondary branches, made of two intertwined, stiff, and insulated electrical wires, said secondary branches being electrically connected to their main branch by jump wires, and each of the main branches terminating at its top with a cap, and at its stalk insertion end with a plug which makes electrical contact with the said electrical conductors within the stalk; tufts of artificial pine needles covering the said main and secondary branches; spaced, colored, ornamental electric lights attached to said main and secondary branches; a cap on the top of the central stalk provided with a central extension for attaching an

ornament thereto; in combination with an electric cord leading from the said conductors within the central stalk and at the



bottom thereof for attaching the tree to a power source; and a pedestal to which the central stalk can be attached.

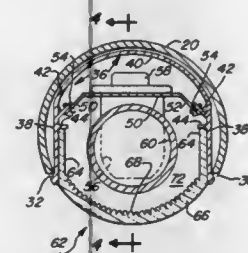
**4,161,769**  
**ILLUMINATED HAND RAIL**  
 Billy N. Elliott, Golden, Colo., assignor to Zimmerman Metals,  
 Inc., Denver, Colo.

Filed Jul. 11, 1977, Ser. No. 814,496

Int. Cl.<sup>2</sup> F21V 33/00, 21/00

U.S. Cl. 362—146

9 Claims



1. In an illuminating hand rail arranged to be mounted adjacent a walkway for projecting light downwardly thereon, comprising:

- an opaque tube forming said hand rail having an elongated opening of uniform width in the lower portion of the wall thereof, the maximum cross section of said opening defining a reference rectangle of a width and length through which a unitary lighting fixture containing an elongated illuminating bulb may be inserted, said fixture comprising:
- an elongated U-shaped housing of uniform cross section having an arcuate bight portion adapted to abut the inner wall of the tube and longitudinal parallel spaced walls of a width substantially that of the width of the rectangle, the outer edges of said parallel spaced walls being arranged to abut the longitudinal edges of the rectangular opening in said tube whereby the interior of said tube is substantially sealed;
- an elongated continuous reflector plate secured to the housing along the length thereof forming a first open ended chamber therebetween at one side thereof for receiving electrical wires, and a second chamber at the other side thereof for receiving an illuminating bulb, said second chamber being disposed nearest the outer edges of said parallel spaced walls of said housing;
- an illuminating bulb socket secured to the reflector plate

and disposed in said second chamber for supporting the bulb,

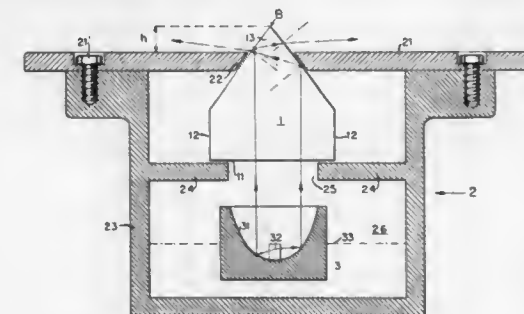
- a window closing said second chamber along the length thereof, said window being removable from the housing to provide access to the second chamber for replacing the bulb, said window including longitudinal parallel walls adapted to be inserted and closely fit between the parallel walls of the housing to substantially seal the interior of the housing and having an arcuate portion between said parallel walls said arcuate portion forming a continuation of the tube outer surface across the rectangular opening when said housing and window are inserted into said tube, and
- removable clip means provided at each end of the window and attached to said tube to permit easy removal of the window from the housing for replacement of said bulb.

**4,161,770**  
**GUIDE SIGNAL DEVICES**  
 Urs Maurer, Dietlikon, Switzerland, assignor to Erni & Co.,  
 Elektroindustrie, Zurich, Switzerland  
 Filed Sep. 19, 1977, Ser. No. 834,841  
 Claims priority, application Switzerland, Sep. 17, 1976,  
 011784/76

U.S. Cl. 362—309

Int. Cl.<sup>2</sup> F21V 7/00

10 Claims



1. A guide signal device suitable for mounting in airport runways or taxiways comprising a covered housing situated beneath ground level of the runway or taxiway having its cover substantially flush with the ground containing a light source and a prism, said light source being located below the prism and a portion of said prism projecting above the cover of said housing, said projecting portion of the prism having a cross-sectional profile of an isosceles triangle which includes two planar surfaces converging together to form an apex of the triangle, a portion of said surfaces projecting above the cover plate of the housing wherein light emerging from the light source is both transmitted through and internally reflected from one of the said planar surfaces, the planes forming an apex angle such that the reflected light from the one surface is internally reflected towards the other surface where the light is transmitted through the prism in a desired direction.

**4,161,771**  
**INVERTER RIPPLE REGULATOR**  
 James W. Bates, Palos Verdes Estates, Calif., assignor to Gulton  
 Industries, Inc., Metuchen, N.J.  
 Filed Jul. 25, 1977, Ser. No. 818,350

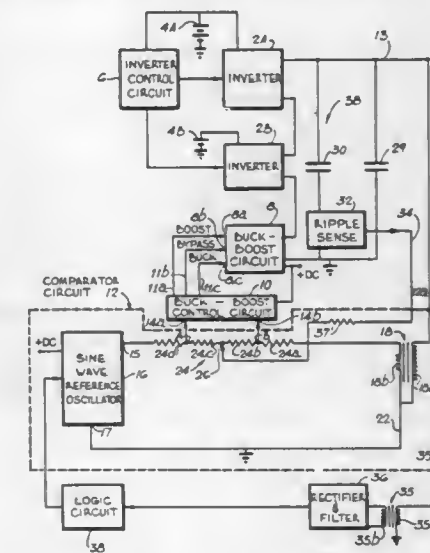
Int. Cl.<sup>2</sup> H02M 1/12

U.S. Cl. 363—43

17 Claims

1. A converter circuit for providing a regulated sinusoidal-like output voltage under varying load current conditions from DC, said converter circuit comprising, in combination: DC voltage source means; a source of a reference signal having the desired sinusoidal-like waveform; inverter circuit means energized by said DC voltage source means for providing an output which at least roughly approximates a desired sinusoidal-like output, a buck-boost circuit having a first output condition

where the output thereof is a first finite signal of one polarity which is a fraction of the maximum amplitude of said output, a second output condition where the output thereof is a second finite signal of the same amplitude but opposite polarity to said first finite signal, and a third output condition where the output thereof is zero; means for adding the output of said buck-boost circuit to the output of said inverter circuit means to produce an overall combined output; comparator means for comparing



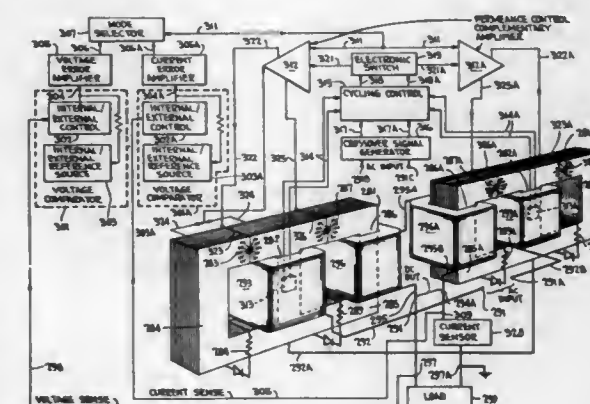
the output of said reference signal source and at least a part of said overall combined output of said inverter circuit and buck-boost circuits which has an amplitude comparable to said reference signal; and control means responsive repeatedly over each half cycle to said comparator means for operating said buck-boost circuit into one of said output conditions for a desired period which brings said overall resultant output toward the instantaneous level of the desired sinusoidal output.

**4,161,772**  
**CONVERSION AND CONTROL OF ELECTRICAL**  
**ENERGY BY ELECTROMAGNETIC INDUCTION**  
 Nathan A. Moerman, 7310 Maple Ave., Chevy Chase, Md.  
 20015  
 Division of Ser. No. 762,896, Jan. 26, 1977, which is a division of  
 Ser. No. 635,007, Nov. 25, 1975, Pat. No. 4,020,440. This  
 application Nov. 7, 1977, Ser. No. 849,379

Int. Cl.<sup>2</sup> H02M 7/02

U.S. Cl. 363—44

2 Claims



1. In an electromagnetic induction means for converting alternating current power into direct current power,

a first and second identical electric power pulse transformer means,  
each of said identical means having an input path means, an output path means, a bypass means, an input winding means on said input path means, an output winding means on said output path means, a first electromagnetically coupled variable permeance control means between said input path means and said output path means, a second electromagnetically coupled variable permeance control means between said input path means and said bypass path means,

a pair of alternating current source terminal means,  
a means connecting said first and second input winding means in series with said pair of alternating current source terminal means,

a load current sensing means,

a first and a second direct current output terminal means,  
a means connecting said first output terminal means, said first and second output winding means said load current sensing means and said second terminal output means in series aiding configuration,

a first, second, third and fourth reverse transient suppression means, each having a winding means and a unidirectional current flow and energy absorbing means,  
said first suppression means surrounding said bypass path means of said first identical means,

said second suppression means surrounding said output path means of said first identical means,

said third suppression means surrounding said bypass path means of said second identical means,

said fourth suppression means surrounding said output path means of said second identical means,

a first voltage comparator means having a direct current reference voltage means and an output voltage setting means producing a voltage error output signal,

a voltage feedback means connecting said first voltage comparator means and said first output terminal means,

a second voltage comparator means having a direct current reference voltage means and an output direct current setting means producing a current error output signal,

a current feedback means connecting said current sensing means to said second voltage comparator means,

an operating mode selector means,

means connecting the voltage error signal output of said first voltage comparator means as a first input to said operating mode selector means,

means connecting the current error signal output of said second voltage comparator means as a second input to said operating mode selector means,

a first and a second complementary control amplifier means for alternating a minimum magnetic permeance state and a variable permeance state,

means connecting the output of said operating mode selector means as the first input to both of said amplifier means,

means connecting the complementary control outputs of said first amplifier means to said first and second variable permeance control means in said first identical means,

means connecting the complementary control outputs of said second amplifier means to said first and second variable permeance control means in said second identical means,

a first flux density sensing means magnetically coupled to said input path means of said first identical means,

a second flux density sensing means magnetically coupled to said input path means of said second identical means,

a crossover signal generator means,

a cycling control means,

means connecting said pair of alternating current source terminal means to said crossover signal generator means,

means connecting the crossover signal outputs of said crossover signal generator means to said cycling control means,

means connecting the output of said first flux density sensing means as the first input to said cycling control means,

means connecting the output of said second flux density

sensing means as the second input to said cycling control means,

an electronic switch means having a first and a second alternating signal output means,

means connecting said first output of said electronic switch means to said first complementary control amplifier means as the second input thereto,

means connecting said second output of said electronic switch means to said second complementary control amplifier means as the second input thereto,

whereby an alternating current input applied to said crossover signal generator produces a crossover pulse to establishing a pulsing frequency control for said cycling control and said electronic switch in conjunction with the alternating output signals from said first and second flux density sensing means,

whereby said operating mode selector provides the amplitude control for said complementary control amplifier means in response to voltage and current error signals received thereby,

whereby said identical electrical power pulse transformer means produce a pulsed direct current output in response to the variation of permeance in said permeance control means, said variation being provided by said complementary amplifier means.

4,161,773

PUSH-PULL INVERTER INCLUDING STARTER CIRCUIT

Bronislaw T. Szpakowski, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 10, 1978, Ser. No. 922,973

Int. Cl.<sup>2</sup> H02M 7/515

U.S. Cl. 363—49

10 Claims



1. An inverter for transforming direct current from a source of direct current into alternating current, said inverter including a transformer having a first winding for receiving a train of rectangular pulses from a switching means whereby said switching means selectively interrupts a flow of current from said source of direct current to said first winding, said transformer having a second winding for connection to an AC load, said inverter characterized by a control circuit means for controlling the operation of said switching means such that, upon start-up of said inverter, the first pulse applied to said first winding has one half the duration of the subsequent pulses in said train of rectangular pulses, and the subsequent pulses in said train, after said first pulse, are all of the same duration.

4,161,774  
REGENERABLE ELECTRIC WOUND CAPACITOR  
WHICH IS DIVIDED INTO A PLURALITY OF  
SUB-CAPACITANCES

Reinhard Behn, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

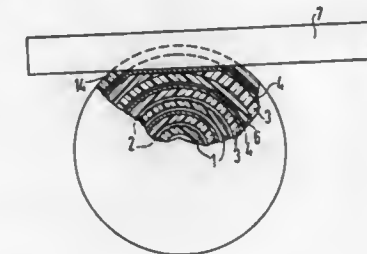
Filed Sep. 12, 1977, Ser. No. 832,344

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641182

Int. Cl.<sup>2</sup> H02M 3/18

U.S. Cl. 363—59

12 Claims



1. An electrical regenerative wound capacitor which is divided into a plurality of series connected sub-capacitances for use in voltage multiplier cascades, comprising:

(a) a first dielectric film having a plurality of spaced strips of first regenerably thin metalization coatings attached thereto, insulating means being positioned between the spaced strips;

(b) a second dielectric film over the first dielectric film and thin metalization coatings, a plurality of spaced strips of second metal coatings separated by insulating means, at least one strip of the second coatings laterally positioned to overlap at least two side-by-side strips of the first coatings to form a series arrangement of coatings as series connected subcapacitances;

(c) said first and second dielectric films and associated first and second coatings being wound to form a capacitive region of the wound capacitor;

(d) at least two outermost turns of the second dielectric film and second coatings wherein said second coating has a relatively higher surface conductivity than that of said first regenerably thin metalization coatings, no first coatings being arranged between the two outermost turns of the second coatings and dielectric film;

(e) at least one outer connection wire fused into at least one of said outermost turns of second dielectric and second coatings of high surface conductivity, said connection wire lying external to the capacitive region and being positioned to project from a periphery between end side-walls of the wound capacitor; and

(f) said first regenerative thin coatings not being electrically connected to any outer connection wires.

4,161,775  
RECTIFIER UNIT FOR PROVISION IN AN  
ALTERNATOR

Herbert Franz, Stuttgart; Reinhold Wamsler, Schwieberdingen, and Georg Binder, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,708

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649418

Int. Cl.<sup>2</sup> H02M 1/00; H02K 11/00

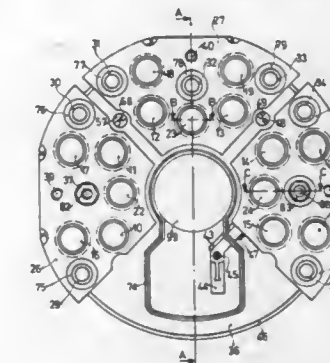
U.S. Cl. 363—145

14 Claims

1. Rectifier unit for a 3-phase alternator having three formed metal cooling plates each connected to a different one of the alternating current terminals of said alternator, on which plates diodes are mounted and to which the diodes mounted thereon have one of their terminals connected, and also an insulating plate on which conductor paths for connecting up the diodes

are provided and including the improvement, according to the invention, wherein:

there are thermally and electrically connected to each said cooling plate, one exciter field circuit diode, at least one



positive side diode and at least one negative side diode, and each of said cooling plates (26,27,28) has the form of a circular sector disk with a claw-like extension at right angles thereto at its outer edge.

4,161,776

FLYBACK TRANSFORMER WITH HIGH TENSION  
CONNECTOR

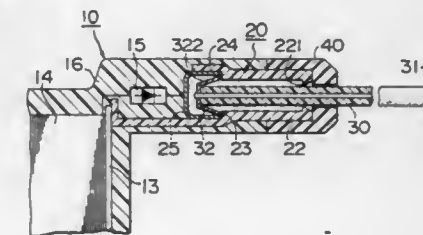
Shoji Onoue, Musashino, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1977, Ser. No. 815,456

Int. Cl.<sup>2</sup> H02M 7/00

U.S. Cl. 363—146

5 Claims



1. A flyback transformer for a television receiver including a core, a coil assembly mounted on the core and including a low tension and a high tension coil and also including a rectifier connected with the high tension coil for rectifying a high tension output therefrom, the coil assembly being contained in an enclosure of an electrically insulating material together with the rectifier, a high tension lead wire having an insulating coating, and fastener means for providing an electrical connection between the high tension lead wire and the rectifier; characterized in that the fastener means comprises a tubular connector body formed of an electrically insulating material and having one end of a greater inner diameter than that of the other end, with a step between the both ends, the connector body being supported by the enclosure and having said other end opening outside the enclosure said other end being formed with a plurality of substantially axially extending slits with a plurality of inwardly extending lips at the ends thereof, a conductive cap fitted into the space at said one end of the connector body and positioned against the step and electrically connected with the rectifier, and a fastener of an electrically conductive material firmly mounted on and electrically connected with the high tension lead wire and adapted to engage the conductive cap and to be locked by the step at the end of the high tension lead wire is inserted into the connector body said fastener means including a resilient insulating cap fitted on the end of the high tension lead wire and which is adapted to be



fitted over said other end of the connector body to resiliently urge the lips inwardly to firmly grip the high tension lead wire.

#### 4,161,777 VISUAL OUTPUT MEANS FOR A DATA PROCESSING SYSTEM

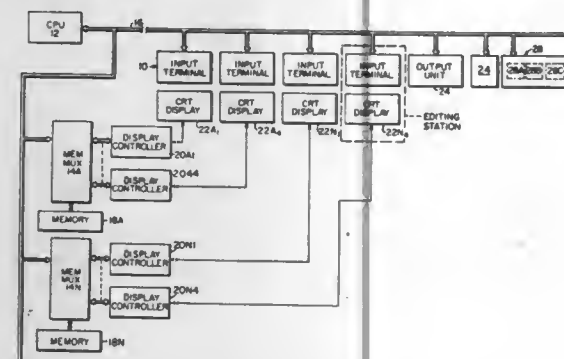
Charles W. Ying, Andover, Mass., assignor to AteX, Incorporated, Bedford, Mass.

Division of Ser. No. 710,220, Jul. 30, 1976, which is a continuation of Ser. No. 508,358, Sep. 23, 1974, abandoned. This application Apr. 3, 1978, Ser. No. 892,979

Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 364—200

6 Claims



1. Visual display assembly means for use with a digital data processing system that includes a bus and means for a generating onto the bus system address and system transfer control signals to produce a transfer of system data signals over the bus, said display assembly means comprising:

A. a memory for storing data signals at identified storage locations therein, said memory producing a transfer of data with a said storage location therein in response to memory address signals that identify that said storage location uniquely in the data processing system and memory transfer control signals;

B. a plurality of visual display means for producing visual images corresponding to data stored in said memory, each said visual display mean including a display data connection for receiving data signals, display address means for generating display address signals and display transfer means for generating display transfer control signals thereby to initiate a data transfer with said corresponding visual display means;

C. multiplexing means connected to said memory and said plurality of visual display means, said multiplexing means including:

i. bus connection means connectible to the bus for coupling the system address signals, the system transfer control signals and the system data signals between the bus and said multiplexing means;

ii. priority arbitration means connected to said bus connection means and to said display transfer means in each said visual display means for responding to the transfer control signals from said connection means and each said visual display means thereby to designate whether a transfer of data signals with said memory will occur through the said bus connection means or with one of said visual display means;

iii. transfer control means connected to said bus connection means and to said display transfer control means and responsive to the system address and system transfer control signals from said bus connection means and to the display transfer control signals from said visual display means for generating the memory transfer control signals that initiate a data transfer operation by said memory; iv. address path switching means connected to said memory, said bus connection means, said display address means and said priority arbitration means and

responsive to said priority arbitration means for coupling, to said memory, memory address signals corresponding to the selected ones of the system signals and the display address signals; and

v. data path switching means connected to said bus connection means and to said display data connections for each of said visual display means for transferring data signals between said memory and the one of said visual display means and said bus connection means that is selected by said priority arbitration means.

#### 4,161,778 SYNCHRONIZATION CONTROL SYSTEM FOR FIRMWARE ACCESS OF HIGH DATA RATE TRANSFER BUS

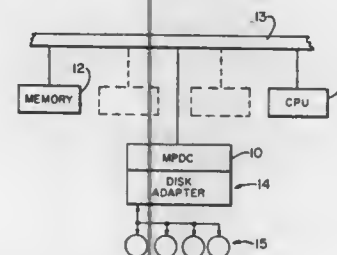
Edward F. Getson, Jr., Lynn, Mass.; John H. Kelley, Nashua, N.H.; Donald J. Rathbun, Andover, Mass., and Albert T. McLaughlin, Hudson, N.H., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jul. 19, 1977, Ser. No. 816,985

Int. Cl.<sup>2</sup> G06F 3/06

U.S. Cl. 364—200

5 Claims



1. A data transfer control system for signalling the occurrence of a time period during which an asynchronous common communication bus may be accessed by a firmware control system during a data transfer between a main memory and a mass storage device without compromising the data transfer rate or incurring data errors, said bus electrically linking said main memory, said firmware control system, and a mass storage control unit in electrical communication with a disk adapter controlling the operation of said mass storage device, which includes:

(a) memory means in electrical communication with said disk adapter and said control unit for transferring data asynchronously therebetween and indicating both the presence of input data and the occurrence of a filled condition in said memory means;

(b) logic gate means responsive to the indications from said memory means and control signals from said control unit for providing data strobes to synchronize the flow of data between said memory means and said control unit; and

(c) logic timing means in electrical communication with said control unit and said logic gate means for issuing a control signal to said firmware control system indicating the occurrence of said time period.

#### 4,161,779 DYNAMIC PRIORITY SYSTEM FOR CONTROLLING THE ACCESS OF STATIONS TO A SHARED DEVICE

David H. Spencer, Lebanon, and Edward A. Becker, Somerset, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 30, 1977, Ser. No. 855,855

Int. Cl.<sup>2</sup> G06F 3/04

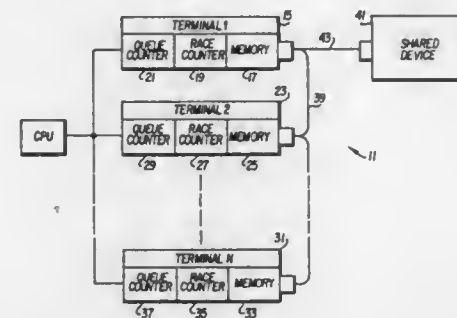
U.S. Cl. 364—200

19 Claims

1. A dynamic priority system for controlling the access of a plurality of requesting stations to a shared device serially interconnected to the stations comprising:

access priority storage means within each station for storing a first priority value when its associated station initially

requests access to the shared device and successively incremented priority values whenever another station subsequently requests access to the shared device; data storage means within each station for storing informational data to be transferred to said shared device; shared device monitoring means within each station for signaling when the shared device is in a busy state or an accessible state;



access allocating means within each station receiving the priority value stored in its associated priority storage means in response to a shared device accessible signal from its associated monitoring means for continuously incrementing said received value until the value in one of the access allocating means of one of said requesting stations exceeds a preselected value whereby the requesting station exceeding this value is allocated access to said shared device and the remaining stations are inhibited from accessing said shared device.

#### 4,161,780 SPIN RATE TIMING SYSTEM

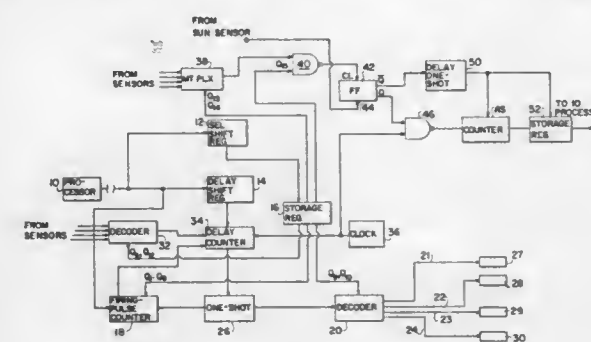
Louis R. Rudolph, Annandale, Va., and Woodrow W. Ewen, II, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1978, Ser. No. 918,256

Int. Cl.<sup>2</sup> G06F 15/20; B64G 1/20

U.S. Cl. 364—434

2 Claims



1. Apparatus for use in controlling the attitude of a spinning spacecraft, said apparatus receiving serial data words from an external processor and pulse inputs from sensors disposed on the spacecraft and transmitting data to said processor and signals to control thruster jets on said spacecraft, said apparatus comprising:

a select shift register having its input coupled to said processor for receiving a select data word;

a delay shift register having its input coupled to said processor for receiving a delay data word;

a storage register having its data input coupled to the data output of said selected shift register for storing said select data word;

a delay counter having its input coupled to the data output of said delay shift register;

a clock coupled to said delay counter for stepping down the count in said counter;

a first decoder coupled to the data output of said storage register, said first decoder receiving at least two data bits from said storage register to direct a signal received at its input to one of a plurality of outputs, said outputs controlling said thruster jets;

a firing pulse counter coupled to the data output of said storage register, said firing pulse counter receiving a plurality of data bits from said storage register to enter an initial count in said counter, the delay data word loading the data in said counter;

a second decoder coupled to the data output of said storage register, said second decoder receiving at least two data bits from said storage register to select one of a plurality of sensor inputs as the output of said decoder; said output being coupled to said delay counter to load the delay word in said delay shift register into said delay counter; and

a one-shot multivibrator coupled to said delay counter, said multivibrator being triggered when the count in said delay counter reaches zero, the output of said multivibrator being coupled to said firing-pulse counter and being coupled to the input of said first decoder.

#### 4,161,781 DIGITAL TAPE RULE

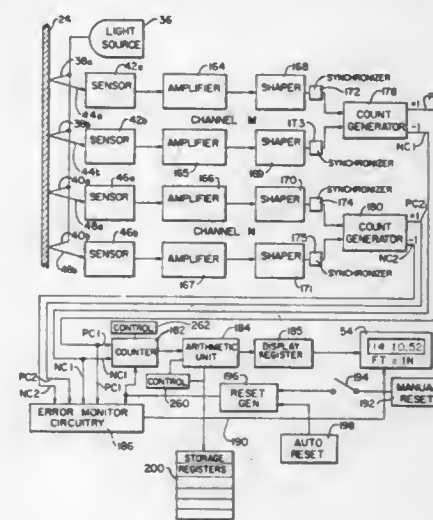
William J. Hildebrandt, Simsbury, and Robert F. West, West Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Nov. 25, 1977, Ser. No. 854,670

Int. Cl.<sup>2</sup> G06M 1/272; G01B 3/08

U.S. Cl. 364—562

43 Claims



1. In a measuring device comprising a housing and an elongated coilable tape blade measuring element biased in a coiled condition in said housing with one end fixed to said housing and a free end adapted to be moved toward and away from said housing to traverse a distance to be measured:

(a) a series of optical markings at constant intervals along said blade for indicating the passage of distance when said markings are irradiated and said blade is moved relative to said housing;

(b) photoelectric sensing means carried by said housing and operatively associated with said markings on said blade for providing output signals at constant increments of distance during movement of said blade; and

(c) readout means operatively connected to said sensing

means for converting said signals to an indication of the distance traversed by said blade.

**4,161,782**  
**MICROPROCESSOR COMPUTERIZED**  
**PRESSURE/TEMPERATURE/TIME DOWN-HOLE**  
**RECORDER**

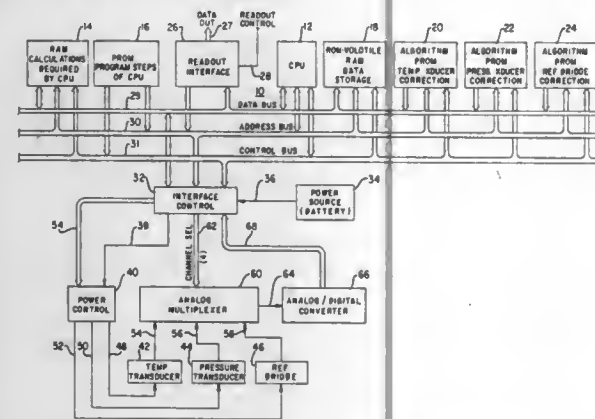
Oliver W. McCracken, Pauls Valley, Okla., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 23, 1977, Ser. No. 863,678

Int. Cl.<sup>2</sup> E21B 47/06; G06F 15/20

U.S. Cl. 364—571

21 Claims



1. The method of storing data versus time down-hole in a well bore from a self-contained tool comprising temperature and pressure transducers, a pressure transducer reference bridge, a power source, and an associated microprocessor computer; comprising the steps of:

- (1) initiating a preselected program-defined initial time-out period,
- (2) upon completion of said preselected initial time-out period, initiating via said microprocessor, a time-multiplexed analog read-out sample of each of said transducers and reference bridge,
- (3) converting each said analog output sample to a digital format and storing same in a register of said microprocessor,
- (4) determining the differential between each instant stored sample and the next preceding like sample and storing those instant samples effecting a differential with absolute value exceeding a least count value in RAM storage means,
- (5) storing a time tag associated with each sample stored in step (4),
- (6) computing the data rate of change from successive pairs of samples,
- (7) adjusting a next successive time-out period as an inverse function of each next preceding data rate of change computation; and
- (8) repeating steps (2) through (7), above.

**4,161,783**  
**CHARGE-COUPLED MULTIPLYING**  
**DIGITAL-TO-ANALOG CONVERTER**  
Edwin H. Wrench, Jr., San Diego, Calif., and Jerome J. Tiemann, Schenectady, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1978, Ser. No. 892,580

Int. Cl.<sup>2</sup> G06J 1/00; H03K 13/02

U.S. Cl. 364—606

1 Claim

1. A multiplying digital-to-analog converter comprising: a substrate, capable of being implemented with charge-coupled devices (CCDs) on its surface;

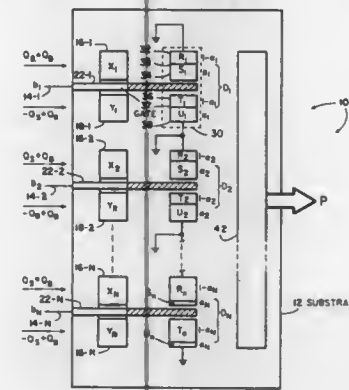
a first plurality of N means, disposed on the surface of the substrate, for receiving a digital word  $b_1b_2b_3 \dots b_N$ ,

where N is the word length, each means receiving only one of the digits  $b_i$ ,  $1 \leq i \leq N$ ;

a second plurality of N means, implemented on the substrate as potential wells  $X_i$ , for receiving a positive charge  $Q_S + Q_B$ , which results from the addition of a bipolar signal voltage S to a voltage bias B,  $B \leq |S|$ ;

a third plurality of N means, implemented on the substrate as potential wells  $Y_i$  in apposition to the potential wells  $X_i$ , for receiving a positive charge  $-Q_S + Q_B$ , which results from the subtraction of the signal voltage S from the voltage bias B;

a fourth plurality of N means, implemented on the substrate



Charge-Coupled Multiplying Digital-to-Analog Converter

between the potential wells  $X_i$  and  $Y_i$ , for gating equilibrated charges which are in apposition, equilibration occurring only if the digit  $b_i$  equals 0;

a fifth plurality of N pairs of means, implemented upon the substrate and having channel stops diffused into them, for receiving the equilibrated charges, the charge on one portion of each of the N pairs of wells being dumped to ground; and

a sixth means implemented on the substrate as a larger potential well, which accepts the undumped charges from the fifth means, the means for receiving the equilibrated charges, for forming a product having the factors  $Q_S$  and the two's complement number  $b_Nb_{N-1} \dots b_2b_1$ .

**4,161,784**  
**MICROPROGRAMMABLE FLOATING POINT**  
**ARITHMETIC UNIT CAPABLE OF PERFORMING**  
**ARITHMETIC OPERATIONS ON LONG AND SHORT**  
**OPERANDS**

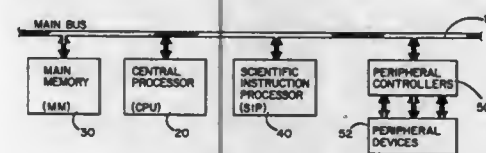
David E. Cushing, Chelmsford, and Steven A. Tague, Billerica, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 5, 1978, Ser. No. 867,242

Int. Cl.<sup>2</sup> G06F 7/48, 9/00

U.S. Cl. 364—748

40 Claims



1. A microprogrammable arithmetic processing unit for performing an arithmetic operation upon a pair of operands, said processing unit comprising:

a microprogrammed control section including:

a cycled addressable control store including a plurality of storage locations for storing a corresponding number of microinstruction words, each including a control field coded to indicate a physical organizational characteristic of said unit; and,

output register means coupled to said control store for storing a microinstruction word read out during an operative cycle of said control store;

addressing means coupled to control store for applying an address for referencing one of said plurality of storage locations during said operative cycle;

an arithmetic and logic unit including a plurality of groups of multibit microprocessor chips, each group including a predetermined number of said chips connected to operate in tandem, each chip being coupled to said output register means and including:

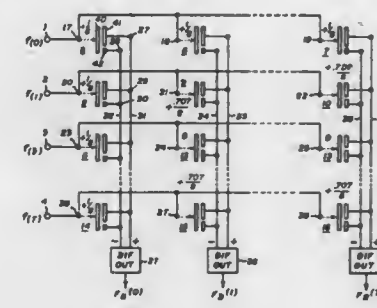
an arithmetic logic unit section; and,

a multibit addressable random access memory section connected to said arithmetic logic unit section, each said memory section having a plurality of multibit storage locations and a multibit random access memory shift register and multiplexer section coupled to said random access memory section; and

control circuit means coupled to a predetermined one of said chips included within each of said groups, said control circuit means being coupled to said output register and operative in response to each microinstruction word read out from said control store during each operative cycle to selectively interconnect said groups of chips for operation as two independent sections and as a single section in accordance with coding of said control field as required for performing said arithmetic operation upon said pair of operands.

**4,161,785**  
**MATRIX MULTIPLIER**  
Emery P. Gasperek, Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.  
Filed Nov. 17, 1977, Ser. No. 852,501  
Int. Cl.<sup>2</sup> G06G 7/19, 7/16; H03K 5/159  
U.S. Cl. 364—827

7 Claims



1. A matrix multiplier comprising:

(a) electrical input terminal means for simultaneous application of a plurality (X) of ordered analog input voltage quantities, where

$$X = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_j \\ \vdots \\ x_m \end{bmatrix}$$

(b) a plurality of electrical circuit elements arranged in a two dimensional array having rows and columns, each circuit element having:

(1) capacitive storage means whose capacity establishes a weight corresponding to a respective fixed coefficient of a two dimensional matrix (A) of fixed coefficients where

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1m} \\ a_{21} & a_{22} & & \\ & & a_{ij} & \\ & & & a_{nm} \end{bmatrix} \text{ and}$$

(2) terminal means for applying an input and for deriving an output,

(c) means for interconnecting the terminal means of the circuit elements in each row to said electrical input terminal means for applying a common input quantity ( $x_j$ ) to each element in said row, each circuit element producing a product ( $a_{ij}x_j$ ) proportional to the weight of the fixed coefficient ( $a_{ij}$ ) of said electrical circuit element and to the applied analog input quantity ( $x_j$ ), said products representing analog quantities of electrical charge,

(d) means for interconnecting the terminal means of said circuit elements in each column for deriving an output ( $y_i$ ) equal to the sum of products in each column of circuit elements, where

$$y_i = \sum_{j=1}^m a_{ij}x_j = a_{i1}x_1 + a_{i2}x_2 + \dots + a_{ij}x_j + \dots + a_{im}x_m \text{ and}$$

(e) a plurality of output circuit means, each coupled to a respective column interconnecting means for deriving an ordered analog output voltage quantity (Y), where

$$Y = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_i \\ \vdots \\ y_n \end{bmatrix} = A X$$

corresponding to the multiplication of said two dimensional matrix (A) of fixed coefficients by said plurality (X) of ordered analog input quantities.



4,161,786

## DIGITAL BUS COMMUNICATIONS SYSTEM

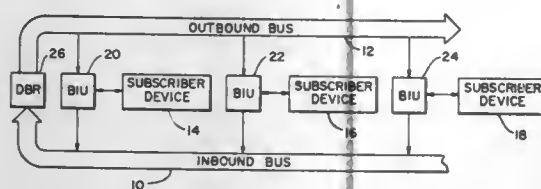
Gregory T. Hopkins, Chelmsford; Ashraf M. Dahod, Reading; Victor A. Demarines, Chelmsford; Norman B. Meisner, Newton Centre, and David G. Willard, Carlisle, all of Mass., assignors to The Mitre Corporation, Bedford, Mass.

Filed Feb. 27, 1978, Ser. No. 881,704

Int. Cl.<sup>2</sup> G06F 3/00; H04J 3/04

U.S. Cl. 364-900

46 Claims



1. A time division multiple access communications system comprising:

a common signal path and a set of terminals coupled to said path, said set including means for establishing one or more communication links over said path between one or more of said terminals, and means for transferring digital signals between linked terminals in one or more time slots associated with said links, said time slots being in a repetitive framed sequence, each of said terminals having an associated address and including means to identify and receive correspondingly addressed digital signals on said path, wherein at least one terminal further includes means for transmitting an addressed primary slot allocation signal on said signal path in at least one of said time slots, said primary slot allocation signal being addressed to one or more other terminals and including data representative of the identity of an allocated one or more of said time slots in which said other terminals may transmit addressed signals on said path.

4,161,787

## PROGRAMMABLE TIMER MODULE COUPLED TO MICROPROCESSOR SYSTEM

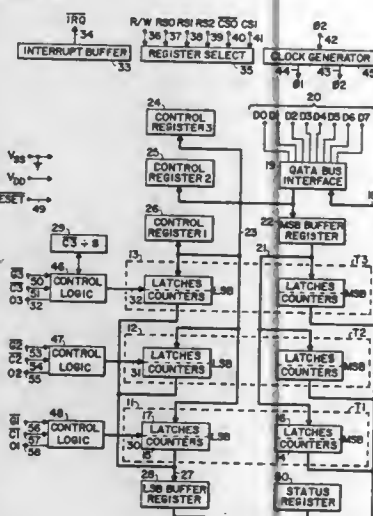
Stanley E. Groves, Round Rock; Gene A. Schriber; Brian M. Spinks, both of Austin, all of Tex.; Richard M. Baker, Phoenix, Ariz.; Thomas C. Daly, Dallas, Tex., and Rodney J. Means, Manassas, Va., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1977, Ser. No. 848,558

Int. Cl.<sup>2</sup> G06F 9/18

U.S. Cl. 364-900

9 Claims



1. A programmable timer device for use within a digital

processing system and coupleable to a data bus of said system and responsive to a clock signal, comprising:

latch means responsive to signals on said data bus for receiving and storing a first binary number from said data bus; counter means responsive to said clock signal coupled to said latch means and to said data bus for counting at a rate determined by said clock signal;

first means coupled to said latch means and said counter means for generating a signal for interrupting the operation of the system in response to a matching between the contents of said counter means and said first binary number;

status storage means responsive to said first means coupled to said data bus for storing information indicative of the occurrence of said interrupt signal; for receiving selection signals;

selection means responsive to said selection signals coupled to said latch mean, said counter means, and said status storage means for selectively and operatively coupling a one of said latch means, said status storage means, and said counter means to said data bus.

4,161,788

## BUBBLE MEMORY CONTROLLER WITH MULTIPAGE DATA HANDLING

Robert J. Rosenblum, Brighton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 21, 1977, Ser. No. 789,390

Int. Cl.<sup>2</sup> G06F 13/08; G11C 11/02

U.S. Cl. 364-900

8 Claims

1. A controller device for functionally operating a magnetic bubble memory device which includes a plurality of data storage loops wherein each loop has a plurality of bit positions for the storage of data as represented by a magnetic domain or a void, said controller device comprising:

interface control means for communicating memory command information from an external processor;

sequencing means operably connected to said interface control means for receiving command information therefrom and synchronizing the transition from one functional state to another in the magnetic bubble memory device;

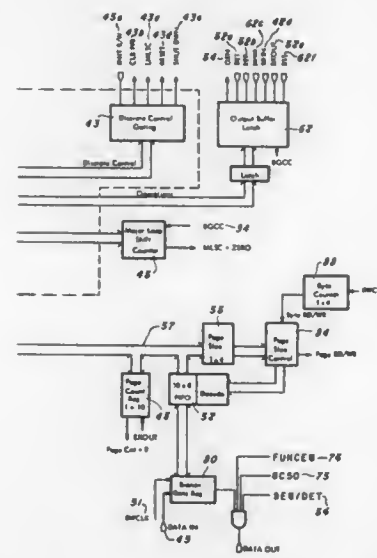
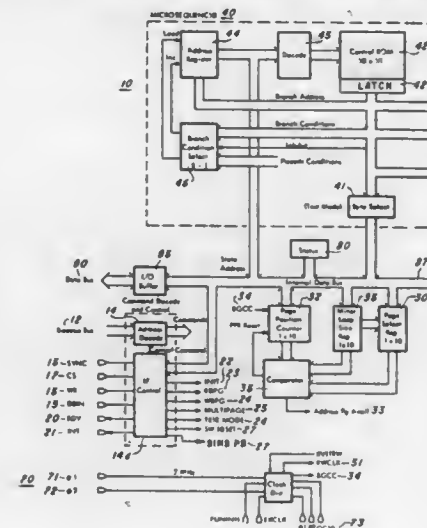
page position means operably connected between said interface control means and said sequencing means for determining the accessibility of a page of data as defined by a plurality of bit positions extending across the plurality of storage loops and made up of a single bit position from each of the plurality of storage loops and disposed in the same virtual bit position therein common to each of the storage loops in the magnetic bubble memory device;

counter means operably connected to said sequencing means and having bubble propagation period information indicative of movement of data as represented by a magnetic domain or a void from one bubble-affecting functional event to another in the magnetic bubble memory device; data buffer means operably connected to said interface control means, said sequencing means, and said page position means for interchanging data between the magnetic bubble memory device and the external processor in the form of plural bit words; and

output buffer means operably connected to said sequencing means for delivering bubble function-enabling commands to the magnetic bubble memory device;

said sequencing means being conditioned by said page position means identifying which page of data from said magnetic bubble memory device is being presently accessed or written and by said counter means reaching a predetermined count indicative of the movement of a specific data bit from one bubble-affecting functional event to another in the magnetic bubble memory device for potentially

effecting a change in the functional state of the magnetic bubble memory device and for directing said output buffer



means to deliver a bubble function-enabling command thereto.

4,161,789

## CROSS-TAIL SENSOR FOR CROSS-TIE MEMORY

Ernest J. Torok, St. Paul; Maynard C. Paul, Bloomington, and David S. Lo, Burnsville, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

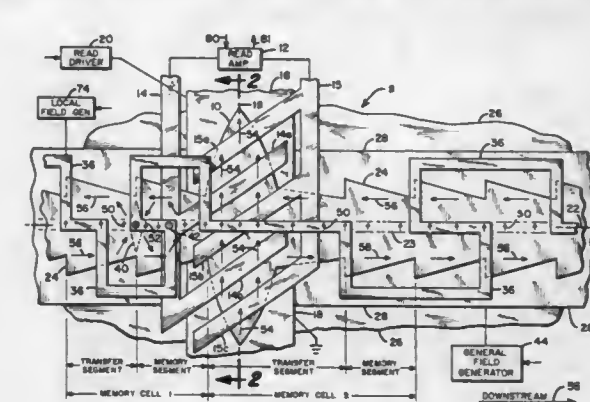
Filed Jul. 3, 1978, Ser. No. 921,695

Int. Cl.<sup>2</sup> G11C 19/08

U.S. Cl. 365-87

3 Claims

1. In a magnetic memory system in which binary data are stored as magnetic vector orientations about the geometric centerline of a magnetic strip, the improvement wherein a portion of said strip is configured into a sharp film whose longitudinal axis is transverse the geometric centerline of said strip and whose transverse axis is along the geometric centerline of said strip, said sharp film extending beyond the two opposing edges of said strip for forming an open flux path film possessing the characteristic of shape anisotropy and providing a magnetic easy axis generally oriented along said longitudinal axis and along which the sharp film's remanent magnetization resides wherein for all points on the sharp film's edge the angle  $\beta'$  between the sharp film's edge and the sharp film's longitudinal axis is equal to or greater than  $0^\circ$  and less than  $45^\circ$ , and means associated with said sharp film for reading out the orientation of said sharp film's remanent magnetization along said longitudinal axis.



tation of said sharp film's remanent magnetization along said longitudinal axis.

4,161,790

## PROGRAMMABLE MODULAR ELECTRONIC REGISTER AND METHOD OF IMPLEMENTING SAME

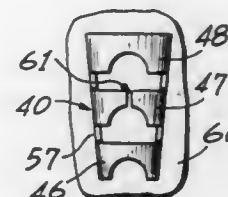
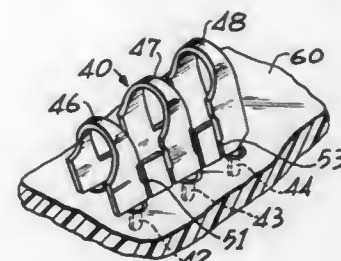
Eric Winston, Melrose Park, Pa., assignor to Jerrold Electronics Corporation, Hatboro, Pa.

Filed Mar. 24, 1978, Ser. No. 889,953

Int. Cl.<sup>2</sup> G11C 17/00, 17/06, 5/04

U.S. Cl. 365-94

6 Claims

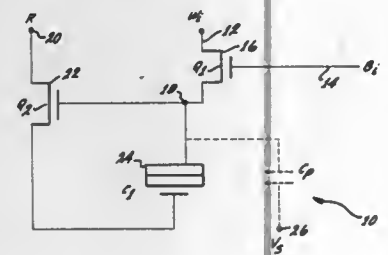


4. The method of forming a programmable binary word in an electronic substrate having a plurality of apertures therein, comprising the steps of forming at least one conductive module blank having continuous conducting first and second legs, plural cross links joining said legs, and plural tabs, at least one of said tabs extending from said second leg and a plurality of said tabs extending from said first leg about the area of the intersections of said first leg and said cross links, bending said module blank and inserting said tabs in said substrate apertures, fixedly attaching said module and said substrate, and removing each portion of said first leg intermediate said cross links.

4,161,791  
**AUTOMATIC REFRESH MEMORY CELL**  
 George S. Leach, Phoenix, Ariz., assignor to Electronic Mem-  
 ories & Magnetics Corporation, Encino, Calif.  
 Filed Aug. 28, 1978, Ser. No. 937,180  
 Int. Cl.<sup>2</sup> G11C 11/40

U.S. Cl. 365-222

10 Claims



1. An integrated circuit, three element, stored charge, re-  
 freshed, semiconductor memory cell, comprising in combina-  
 tion:

(a) a first actuable device adapted to couple a first selection

line to a storage junction, and adapted to be controlled by  
 a second selection line;

(b) an integrated circuit field effect capacitor having an  
 insulated gate electrode and a second electrode exhibiting  
 substantial capacitance between said gate electrode and  
 said second electrode, said second electrode being con-  
 nected to said first actuable device at the storage junction  
 and capable of charge pumping from one electrode to the  
 other electrode thereof;

(c) a second actuable device for receiving applied refresh  
 signals and selectively coupling such refresh signals to  
 said gate electrode of said capacitor, said second actuable  
 device having a control electrode coupled to said storage  
 junction and being responsive to the storage of a first  
 valued signal at said storage junction to admit refresh  
 signals to said capacitor gate electrode, and operable in  
 response to the storage of a second valued signal to block  
 application of refresh signals to said capacitor gate elec-  
 trode;

whereby refresh signals can pump charge through said ca-  
 pacitor to maintain the voltage at said storage junction  
 representing the presence of a first valued signal.

## DESIGN PATENTS

GRANTED JUL. 17, 1979

### ERRATA

For CLASS	See PATENT NO.
D20-043 .....	252,377
D03-039 .....	252,409
D21-052 .....	252,411
D21-006 .....	252,412
D21-246 .....	252,413
D21-041 .....	252,414
D21-076 .....	252,415



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## DESIGNS

JULY 17, 1979

252,356

### KEY HOLDER

Secundino Garcia, 90 Schermerhorn St. Apt. 1-L., Brooklyn,  
N.Y. 11201

Filed Sep. 22, 1977, Ser. No. 835,675  
Term of patent 14 years  
Int. Cl. D3—01

U.S. Cl. D3—61



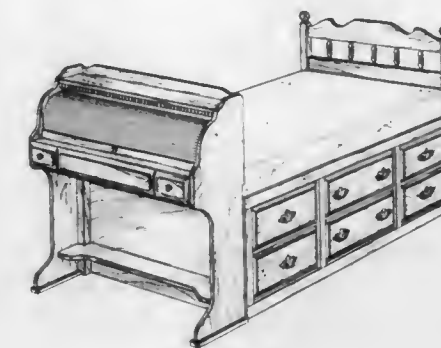
252,358

### COMBINED BEDSTEAD, MATTRESS AND STORAGE UNIT

Norman H. Fowler, Morristown, Tenn., assignor to Ludlow  
Corporation, Needham Heights, Mass.

Filed Jan. 6, 1977, Ser. No. 757,399  
Term of patent 14 years  
Int. Cl. D6—01

U.S. Cl. D6—80



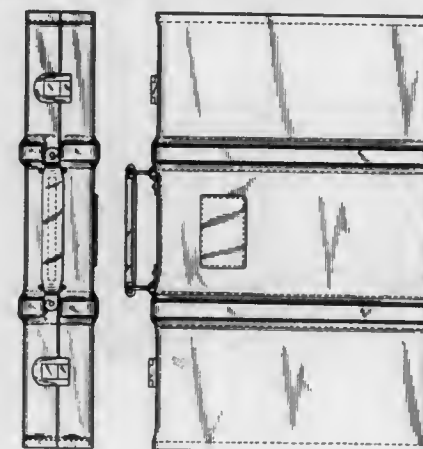
252,357

### ATTACHE CASE OR SIMILAR ARTICLE

Abraham I. Tawil, New York, N.Y., assignor to H.I.T. Industries Ltd., Avenel, N.J.

Filed Oct. 13, 1977, Ser. No. 841,748  
Term of patent 14 years  
Int. Cl. D3—01

U.S. Cl. D3—76



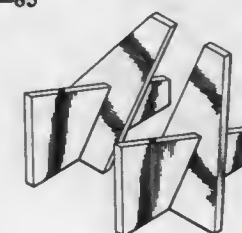
252,359

### SUPPORT STAND FOR A LOUDSPEAKER

Steve J. Cohen, 175 Maribean Sq., Atlanta, Ga. 30327, and Cory  
W. Hillebrand, 1562 Beechcliff Dr., Atlanta, Ga. 30329

Filed Jun. 30, 1977, Ser. No. 812,007  
Term of patent 14 years  
Int. Cl. D6—99

U.S. Cl. D6—85

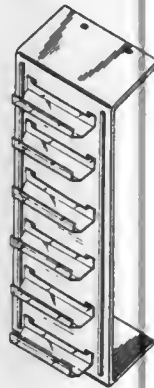


252,360

## EYEGGLASS CASE DISPLAY UNIT

Richard S. Dunchock, Farmington Hills, Mich., assignor to Optarac Corporation, Southfield, Mich.  
Filed Apr. 5, 1978, Ser. No. 893,697  
Term of patent 14 years  
Int. Cl. D20-02

U.S. Cl. D6-85



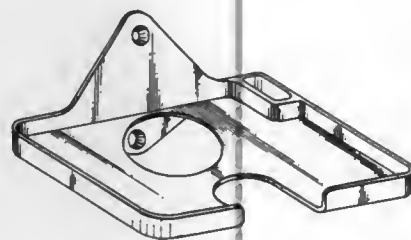
252,361

## HOLDER FOR AN ELECTRIC SHAVER

Siegfried Pape, 3281 Capricorn Crescent, Mississauga, Ontario, Canada

Filed Jan. 5, 1977, Ser. No. 756,747  
Term of patent 14 years  
Int. Cl. D6-04; D23-02

U.S. Cl. D6-88

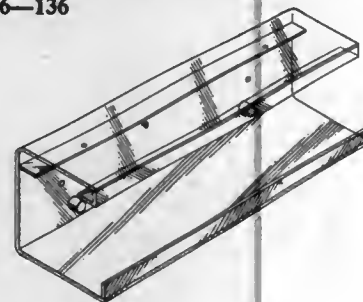


252,362

## IMPLEMENT RACK

Stephen C. Mayes, Quarter Mile Rd., Stratton, Vt. 05155, and Frederik G. R. von Roth, II, P.O. Box 33, Peru, Vt. 05152  
Filed Apr. 19, 1977, Ser. No. 788,913  
Term of patent 14 years  
Int. Cl. D6-04

U.S. Cl. D6-136

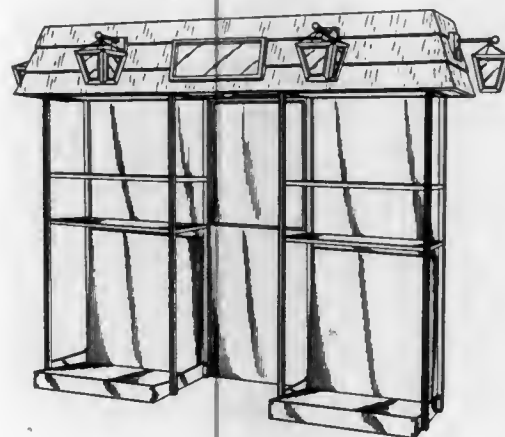


252,363

## COMBINED DISPLAY RACK AND LIGHT FIXTURES THEREFOR

Lawrence G. Kern; Charles L. Davis, both of Atlanta; Rafael T. Bustos, Clarkston, and William B. Taylor, Chamblee, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.  
Filed Feb. 16, 1977, Ser. No. 769,370  
Term of patent 14 years  
Int. Cl. D20-02

U.S. Cl. D6-153

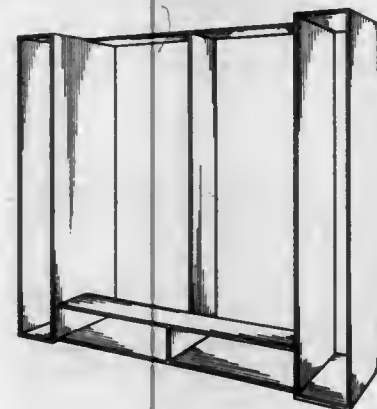


252,364

## WALL MOUNTED FRAME FOR A WARDROBE CABINET

Margareta Gavel, and Peter Gavel, both of Stockholm, Sweden, assignors to BPA Byggproduktion AB, Stockholm, Sweden  
Filed Apr. 27, 1976, Ser. No. 680,804  
Claims priority, application Sweden, Nov. 14, 1975, 75002279  
The portion of the term of this patent subsequent to Jun. 19, 1993, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6-06

U.S. Cl. D6-191

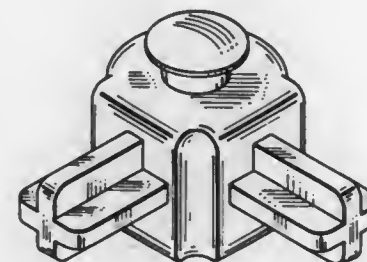


252,365

## CORNER CONNECTOR FOR KNOCK-DOWN FURNITURE

William S. Durham, III, 2660 La Salle Dr., Mountain View, Calif. 94040  
Filed May 23, 1977, Ser. No. 799,206  
Term of patent 14 years  
Int. Cl. D6-99

U.S. Cl. D6-191

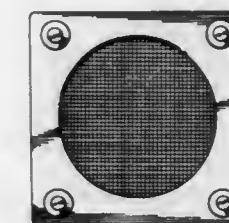


252,367

## FLOUR SIFTER OR THE LIKE

Mark H. Freedman, Box 9348, Albuquerque, N. Mex. 87119; Theodore M. Freedman, 901 Dartmouth NE., Albuquerque, N. Mex. 87106, and Charles O. Weldman, Alameda, N. Mex., assignors to Mark H. Freedman and Theodore M. Freedman, both of Albuquerque, N. Mex.  
Filed Dec. 17, 1976, Ser. No. 751,662  
Term of patent 14 years  
Int. Cl. D7-04

U.S. Cl. D7-47



252,368

## MEASURING-DISPENSING SPOON OR THE LIKE

Arthur C. Folli, 8 Old Smalleytown Rd., Warren, N.J. 07060  
Filed Oct. 20, 1977, Ser. No. 843,957  
Term of patent 14 years  
Int. Cl. D7-03

U.S. Cl. D7-50

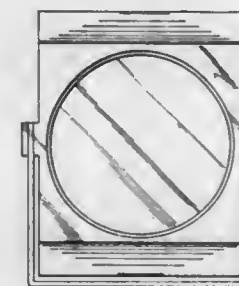


252,366

## MIRROR

Elihu Cohen, New York, N.Y., assignor to Trina, Inc.  
Filed Jun. 6, 1977, Ser. No. 804,089  
Term of patent 14 years  
Int. Cl. D6-07

U.S. Cl. D6-237

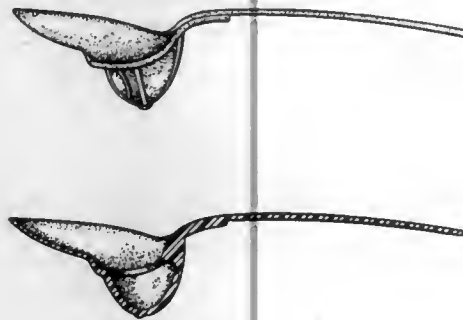




252,369

**MEASURING-DISPENSING SPOON OR THE LIKE**  
 Arthur C. Folli, 8 Old Smalleytown Rd., Warren, N.J. 07060  
 Filed Oct. 20, 1977, Ser. No. 843,958  
 Term of patent 14 years  
 Int. Cl. D7-03

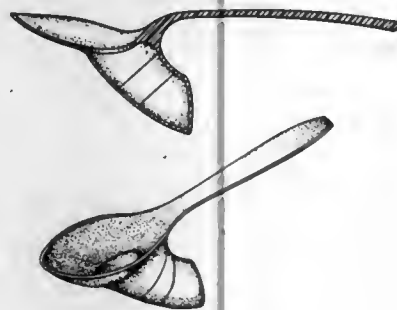
U.S. Cl. D7-50



252,370

**MEASURING-DISPENSING SPOON OR THE LIKE**  
 Arthur C. Folli, 8 Old Smalleytown Rd., Warren, N.J. 07060  
 Filed Oct. 20, 1977, Ser. No. 843,959  
 Term of patent 14 years  
 Int. Cl. D7-03

U.S. Cl. D7-50



252,371

**MEASURING-DISPENSING SPOON OR THE LIKE**  
 Arthur C. Folli, 8 Old Smalleytown Rd., Warren, N.J. 07060  
 Filed Oct. 20, 1977, Ser. No. 843,960  
 Term of patent 14 years  
 Int. Cl. D7-03

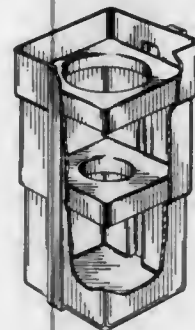
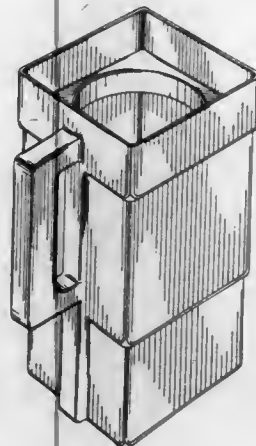
U.S. Cl. D7-50



252,372

**BOTTLE DRAINER**  
 Thomas N. Macaulay, 2432 E. South Mountain Ave., Phoenix, Ariz. 85040  
 Filed Feb. 16, 1977, Ser. No. 769,208  
 Term of patent 14 years  
 Int. Cl. D7-99

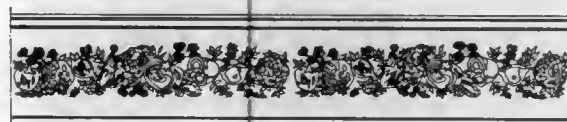
U.S. Cl. D7-70



252,373

**COOKING POT**  
 Richard B. Eisenrod, Los Angeles, Calif., assignor to Household Manufacturing Company, Los Angeles, Calif.  
 Filed Aug. 29, 1977, Ser. No. 828,774  
 Term of patent 14 years  
 Int. Cl. D7-01, 02

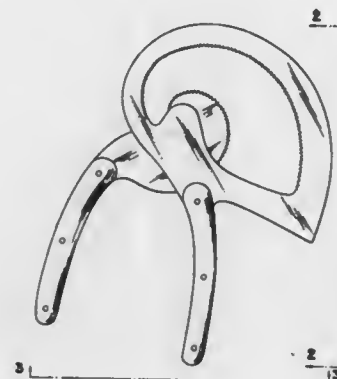
U.S. Cl. D7-85



252,374

**NUTCRACKER**  
 Paul Matisse, Cambridge, Mass., assignor to Kalliroscope Corporation, Cambridge, Mass.  
 Filed Jan. 23, 1977, Ser. No. 809,477  
 Term of patent 14 years  
 Int. Cl. D7-06

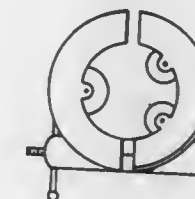
U.S. Cl. D7-98



252,376

**TUBING CUTTER**  
 John J. Dobias, 1212 Sumach Dr., Windsor, Ontario, Canada (N8S 2S4)  
 Filed Jul. 25, 1977, Ser. No. 818,620  
 Term of patent 14 years  
 Int. Cl. D8-05

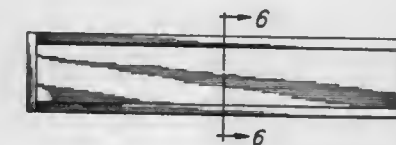
U.S. Cl. D8-60



252,377

**HOLDER FOR BUMPER STICKERS**  
 Robert L. Mallory, and Sheilah A. Mallory, both of 3160A N. Truckee La., Sparks, Nev. 89431  
 Filed Aug. 1, 1977, Ser. No. 820,950  
 Term of patent 14 years  
 Int. Cl. D8-8; D12-16

U.S. Cl. D20-43



252,375

**SPOON OR SIMILAR ARTICLE**  
 Ellen B. Manderfield, Syracuse, N.Y., assignor to Onelda Ltd., Onelda, N.Y.  
 Filed Aug. 15, 1977, Ser. No. 824,411  
 Term of patent 14 years  
 Int. Cl. D7-03

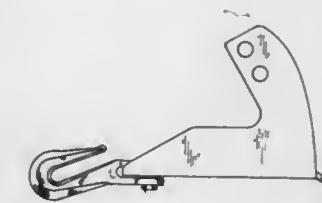
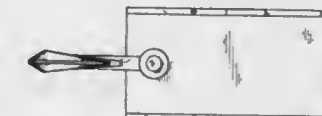
U.S. Cl. D7-137



252,378

**COMBINED HOOK AND SUPPORTING FRAME**  
 William J. Mels, 6 Valley Dr., Crescent, Iowa 51526  
 Filed Apr. 28, 1977, Ser. No. 791,803  
 Term of patent 14 years  
 Int. Cl. D8-05; D12-16

U.S. Cl. D8-367



252,379  
BOTTLE

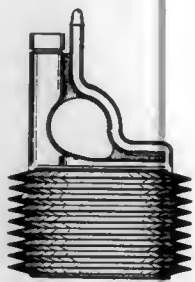
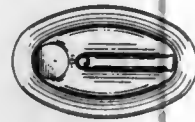
Philip F. Hartung, Dean Bldg. 655 Main St., East Greenwich, R.I. 02818

Filed Aug. 30, 1977, Ser. No. 829,121

Term of patent 7 years

Int. Cl. D9-07

U.S. Cl. D9-48

252,381  
SPRING PRESSURE GAUGE OR SIMILAR ARTICLE

Thoburn T. Mosier, 3878 Chiselmur Pl., Columbus, Ohio 43220

Filed Oct. 6, 1977, Ser. No. 840,060

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-83

252,380  
PANTOGRAPH PACKAGE

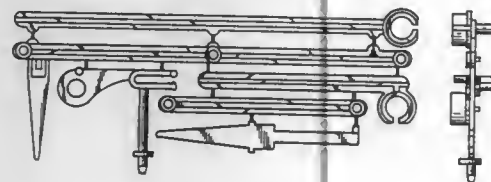
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed Apr. 25, 1977, Ser. No. 790,489

Term of patent 14 years

Int. Cl. D9-99

U.S. Cl. D9-193

252,382  
FLOATING MARKER

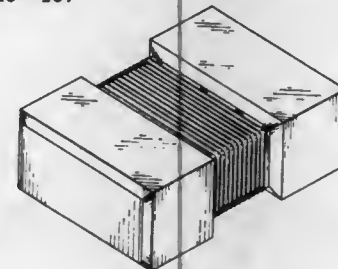
Frank C. Hutmacher, Box 73, Mead, Nebr. 68041

Filed May 16, 1977, Ser. No. 796,938

Term of patent 14 years

Int. Cl. D10-06

U.S. Cl. D10-107

252,383  
COMBINED RUNWAY LOCATOR AND WIND  
DIRECTION INDICATOR

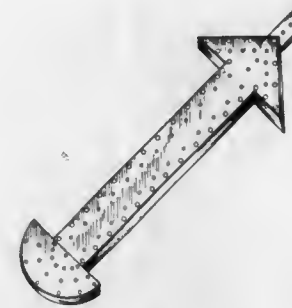
Theodore Jackson, P.O. Box 407, and Ken Johnson, P.O. Box 303, both of Council, Id. 83612

Filed Jul. 21, 1978, Ser. No. 926,709

Term of patent 14 years

Int. Cl. D10-06

U.S. Cl. D10-109

252,385  
CHRISTMAS TREE ORNAMENT

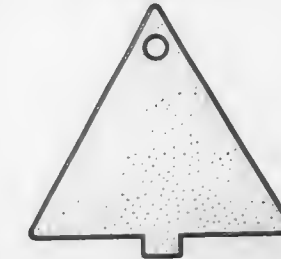
Jerome J. Wieselmann, 5261 Sir Bors, St. Louis, Mo. 63129

Filed Apr. 14, 1977, Ser. No. 787,343

Term of patent 14 years

Int. Cl. D11-05

U.S. Cl. D11-125

252,386  
ADULT PACIFICATION NOVELTY

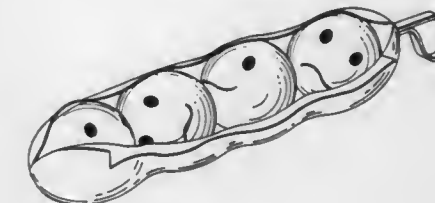
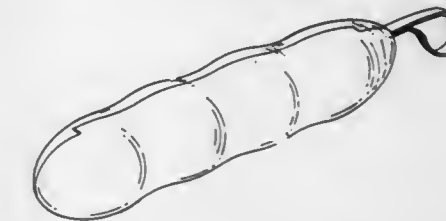
Judith A. Onderdonk, 2285 W. Henrietta Rd., Rochester, N.Y. 14623

Filed Jun. 24, 1976, Ser. No. 699,455

Term of patent 7 years

Int. Cl. D11-04

U.S. Cl. D11-157

252,384  
FINGER RING

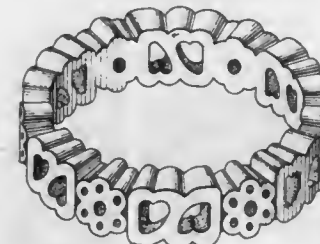
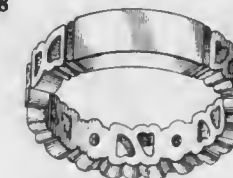
James K. Arakaki, 607 S. Hill St., Los Angeles, Calif. 90014

Filed Dec. 8, 1977, Ser. No. 858,886

Term of patent 14 years

Int. Cl. D11-07

U.S. Cl. D11-38

252,387  
NAME PLATE OR THE LIKE

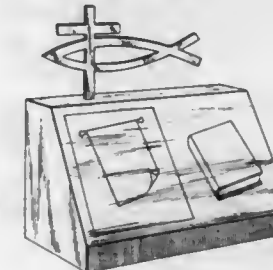
Gordon H. Lawrence, 14000 E. Linvale Pl., Aurora, Colo. 80014

Filed Apr. 11, 1977, Ser. No. 786,378

Term of patent 14 years

Int. Cl. D11-02

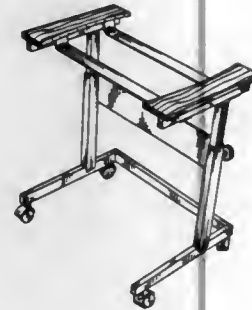
U.S. Cl. D11-131





**252,388**  
**MOBILE STAND FOR SUPPORTING A TABLE TOP FOR OFFICE MACHINE**  
 Kim Fjells-Jensen, No. 4 Bellevue, Rudkøbing, Denmark (5900)  
 Filed Mar. 3, 1978, Ser. No. 883,333  
 Claims priority, application Denmark, Sep. 6, 1977, 682/77  
 Term of patent 14 years  
 Int. Cl. D12—02

U.S. Cl. D12—25



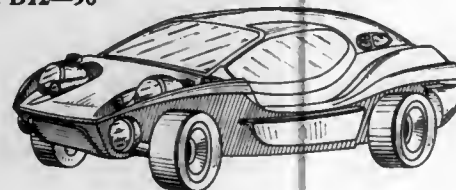
**252,390**  
**FIXED PITCH PROPELLER FOR AIRCRAFT**  
 Walter B. Voisard, Beaver Creek Township, Greene County, Ohio, assignor to The Cessna Aircraft Company  
 Filed Apr. 11, 1977, Ser. No. 786,605  
 Term of patent 14 years  
 Int. Cl. D12—07

U.S. Cl. D12—214



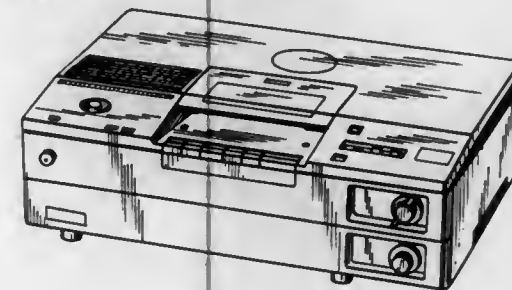
**252,389**  
**AUTOMOBILE**  
 Eric A. Dedeken, Keizerin Maria Theresiastraat 62, 9000 Gent, Belgium  
 Filed Feb. 24, 1978, Ser. No. 882,026  
 Claims priority, application Benelux, Sep. 1, 1977, 01073-00  
 Term of patent 14 years  
 Int. Cl. D12—08

U.S. Cl. D12—90



**252,391**  
**VIDEO TAPE RECORDER**  
 Toshio Ohya, Omiya, and Noriaki Kozuka, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed May 6, 1977, Ser. No. 794,675  
 Term of patent 14 years  
 Int. Cl. D14—01

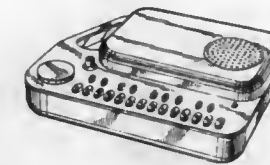
U.S. Cl. D14—2



**252,392**  
**RECORD PLAYER**  
 Hoi T. Vong, 179/810 Connaught Rd. West, Cheung Ka Industrial Bldg., 19th Floor, Block A, West Point, Hong Kong  
 Filed Mar. 29, 1978, Ser. No. 891,483  
 Claims priority, application United Kingdom, Feb. 28, 1978, 983529/78

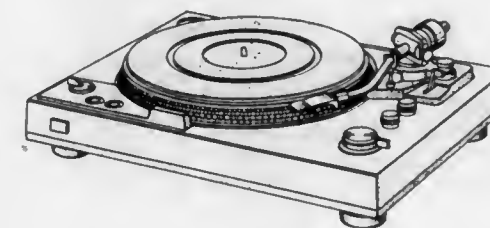
Term of patent 14 years  
 Int. Cl. D14—03

U.S. Cl. D14—14



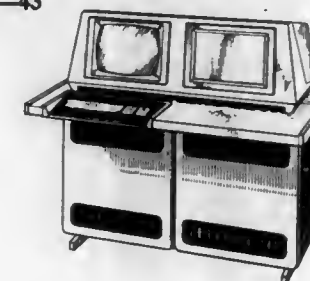
**252,393**  
**RECORD PLAYER**  
 Takashi Kashidaira, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan  
 Filed Apr. 5, 1977, Ser. No. 784,868  
 Claims priority, application Japan, Nov. 19, 1976, 51-45730  
 Term of patent 14 years  
 Int. Cl. D14—01

U.S. Cl. D14—17



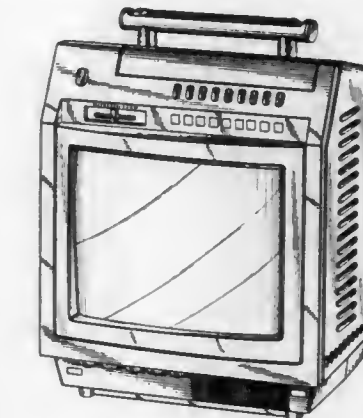
**252,394**  
**CONTROL AND DISPLAY CONSOLE**  
 Richard J. Schick, Park Ridge, Ill., assignor to Honeywell Inc., Minneapolis, Minn.  
 Filed Dec. 14, 1977, Ser. No. 860,536  
 Term of patent 14 years  
 Int. Cl. D14—02

U.S. Cl. D14—43



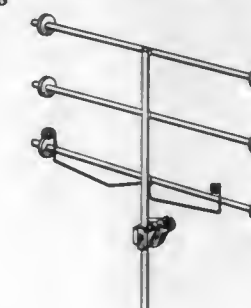
**252,395**  
**TELEVISION RECEIVER**  
 Toshio Ohya, Omiya, Japan, assignor to Sony Corporation, Tokyo, Japan  
 Filed Jul. 15, 1977, Ser. No. 816,161  
 Claims priority, application Japan, Jan. 18, 1977, 52-1103  
 Term of patent 14 years  
 Int. Cl. D14—03

U.S. Cl. D14—80



**252,396**  
**THREAD TREE**  
 Shirley A. Gros, 12026 Thistle Brae Ter., Lakeside, Calif. 92040  
 Filed May 23, 1977, Ser. No. 799,197  
 Term of patent 14 years  
 Int. Cl. D15—06

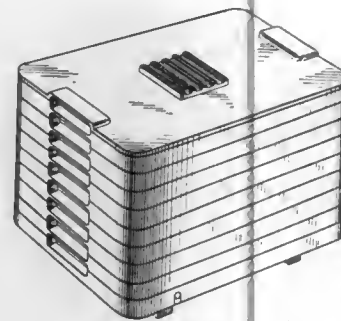
U.S. Cl. D15—78



252,397  
**FOOD DEHYDRATOR**  
 Michael A. Cousins, 8 Jayne Ave., Huntington Station, N.Y. 11746, and Morison S. Cousins, 229 E. 29 St., New York, N.Y. 10016

Filed Apr. 1, 1977, Ser. No. 783,809  
 Term of patent 14 years  
 Int. Cl. D15—08

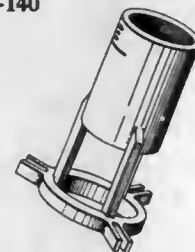
U.S. Cl. D15—110



252,398  
**BORING BAR HOUSING**  
 Ernest E. Grimsley, 4533 Wake Forest Rd., Portsmouth, Va. 23703

Filed Feb. 23, 1977, Ser. No. 775,282  
 Term of patent 14 years  
 Int. Cl. D15—99

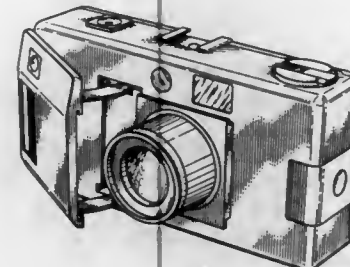
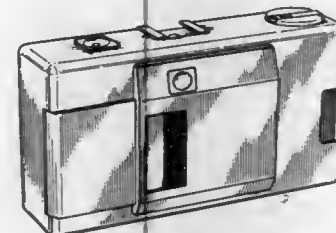
U.S. Cl. D15—140



252,399  
**PHOTOGRAPHIC CAMERA**  
 Heinz Waaske, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Oct. 6, 1977, Ser. No. 840,115  
 Claims priority, application Fed. Rep. of Germany, May 20, 1977, 1128

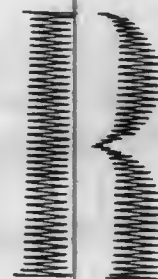
Term of patent 14 years  
 Int. Cl. D16—01  
 U.S. Cl. D16—05



252,400  
**MONOGRAM**  
 Lars G. Rosenblad, Huskvarna, Sweden, assignor to Huskvarna AB, Huskvarna, Sweden

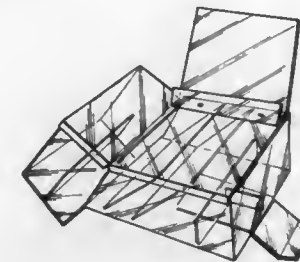
Filed Apr. 28, 1977, Ser. No. 792,039  
 Term of patent 14 years  
 Int. Cl. D18—03

U.S. Cl. D18—24



252,401  
**DESK FILE**  
 Clifford P. Heintz, 33-33 Lakeside Dr., Bristol, Conn. 06010  
 Filed Jul. 11, 1977, Ser. No. 814,403  
 Term of patent 14 years  
 Int. Cl. D19—02

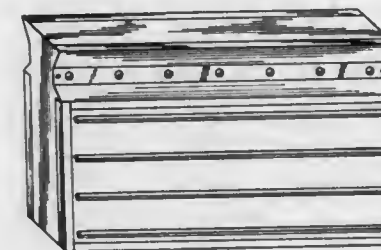
U.S. Cl. D19—90



252,402  
**ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES**  
 Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211

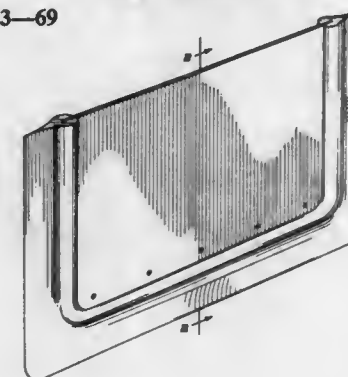
Filed Oct. 6, 1977, Ser. No. 840,053  
 Term of patent 14 years  
 Int. Cl. D20—03

U.S. Cl. D20—10



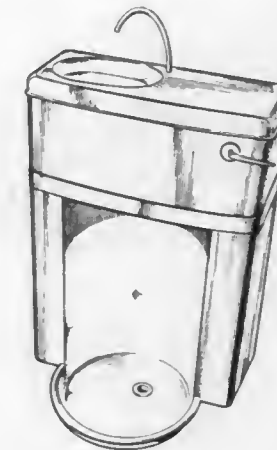
252,403  
**WATER DAM FOR A FLUSH TANK**  
 Richard E. Baron, 14439 N. 73rd St., Scottsdale, Ariz. 85260  
 Filed May 13, 1977, Ser. No. 796,762  
 Term of patent 14 years  
 Int. Cl. D23—02

U.S. Cl. D23—69



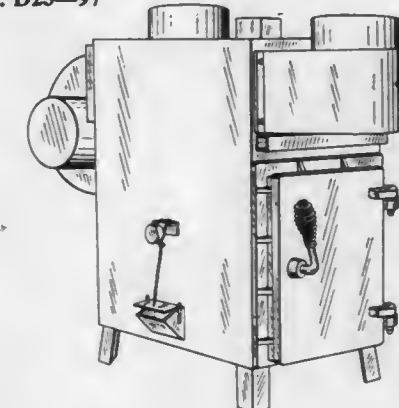
252,404  
**COMBINED BASIN AND URINAL**  
 Ernest P. Basterfield, 22 High Rd. Eastleigh, Edenvale, Transvaal, South Africa  
 Filed Dec. 7, 1977, Ser. No. 858,461  
 Term of patent 17 years  
 Int. Cl. D23—02

U.S. Cl. D23—49



252,405  
**HOME HEATER**  
 Friedrich W. Heine, 577 Garfield, P.O. Box 10924, Eugene, Oreg. 97401  
 Filed Oct. 25, 1977, Ser. No. 845,152  
 Term of patent 14 years  
 Int. Cl. D23—03

U.S. Cl. D23—97



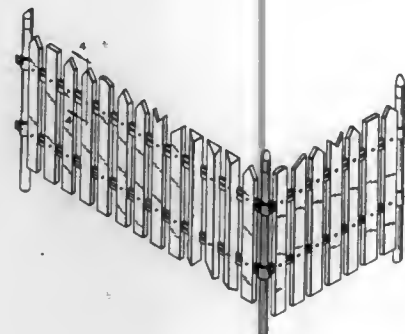


252,406  
FENCE

John J. Dobias, 1212 Sumach Dr., Windsor, Ontario, Canada  
N8S 2S4

Filed Feb. 22, 1977, Ser. No. 770,928  
Term of patent 14 years  
Int. Cl. D25-02

U.S. Cl. D25-38

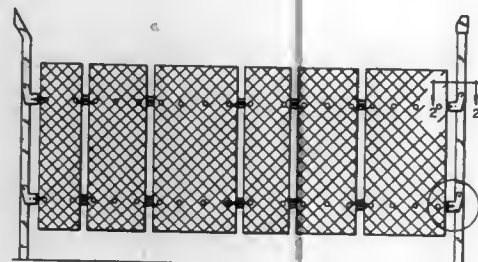


252,407  
FENCE

John J. Dobias, 1212 Sumach Dr., Windsor, Ontario, Canada  
N8S 2S4

Filed Feb. 22, 1977, Ser. No. 770,929  
Term of patent 14 years  
Int. Cl. D25-02

U.S. Cl. D25-38



252,408  
ADJUSTABLE AND COLLAPSIBLE SCAFFOLD  
Engene F. Dempewolf, Box 80, Hoxie, Kans. 67740  
Filed Jul. 22, 1977, Ser. No. 818,114  
Term of patent 14 years  
Int. Cl. D25-99

U.S. Cl. D25-66

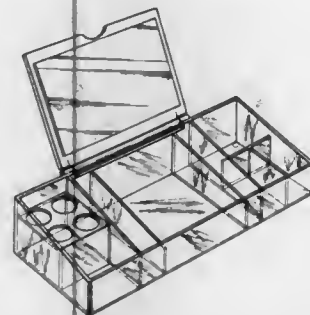


252,409  
COSMETIC ORGANIZER

Arnold Rose, Providence, R.I., and Elihu Cohen, New York,  
N.Y., assignors to Trina, Inc.

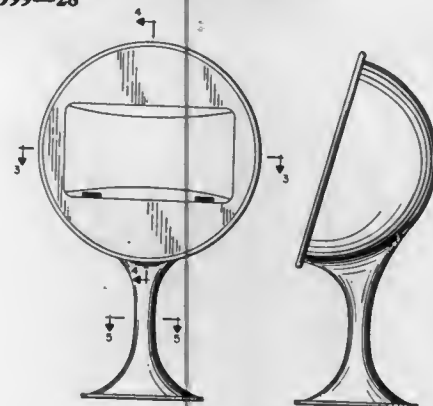
Filed Aug. 29, 1977, Ser. No. 828,953  
Term of patent 14 years  
Int. Cl. D28-03

U.S. Cl. D3-39



252,410  
FINANCIAL TRANSACTION KIOSK  
Clarence F. Graser, Columbus, Ohio, assignor to The City Na-  
tional Bank & Trust Company, Columbus, Ohio  
Filed Jun. 30, 1977, Ser. No. 811,771  
Term of patent 14 years  
Int. Cl. D31-00

U.S. Cl. D99-28



252,411  
QUEEN CHESS PIECE

Robert R. Hollendonner, 1830 "T" St., Washington, D.C. 20009  
Division of Ser. No. 301,098, Oct. 26, 1972. This application  
Feb. 26, 1976, Ser. No. 658,654

Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-52

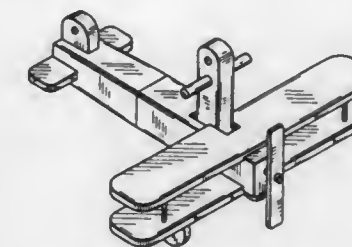


252,413  
AIRPLANE SWING SEAT

Jane C. Knight, 316 Ralston Ave., and Robert M. Norman, 370  
Panoramic Way, both of Mill Valley, Calif. 94941

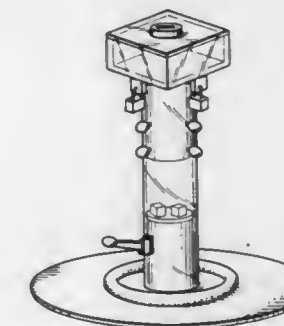
Filed Aug. 8, 1977, Ser. No. 822,935  
Term of patent 14 years  
Int. Cl. D21-03

U.S. Cl. D21-246



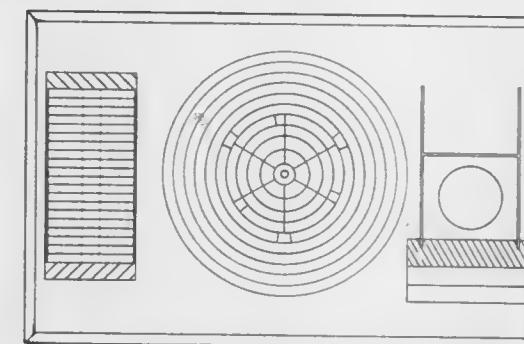
252,414  
DICE GAME APPARATUS  
Manuel Camara, 600 Jennings St., Vallejo, Calif. 94590  
Filed Aug. 8, 1977, Ser. No. 822,938  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-41



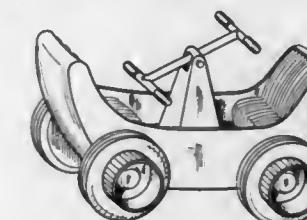
252,412  
DART GAME BOARD OR THE LIKE  
Earl L. Barker, P.O. Box 2573, Sanford, N.C. 27330  
Filed May 19, 1977, Ser. No. 798,440  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-6



252,415  
TOY VEHICLE  
Jerry L. Ellis, 6520 Shadowlawn, Dearborn Heights, Mich.  
48127  
Filed Aug. 24, 1976, Ser. No. 717,469  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-76



# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. O. Smith Corporation: *See—*  
Buckman, John B.; and Lykes, Robert E., 4,161,667, Cl. 310-51.000.
- Abbott Laboratories: *See—*  
Genese, Joseph N., 4,161,178, Cl. 128-272.300.  
Plattner, Jacob J.; Voss, Houston F.; and Magic, Susan E., 4,161,488, Cl. 260-455.00R.
- Abe, Masaru: *See—*  
Suzuki, Yasuo; Abe, Masaru; and Tezuka, Toshiro, 4,161,203, Cl. 152-361.00R.
- Abex Corporation: *See—*  
Saunders, Robert L.; and Hone, George D., 4,161,049, Cl. 14-71.500.
- Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna and Harrison Limited, 11 Hydroxy methyl 11-deoxyprostaglandin E<sub>2</sub>, 4,161,608, Cl. 560-121.000.
- Abramson, Harvey J., to Metatech Corporation. Vacuum bag for wound drainage, 4,161,179, Cl. 128-278.000.
- Accessories Manufacturers, Ltd.: *See—*  
Bishop, Allan T.; and Wytruk, Maurice, 4,161,274, Cl. 232-24.000.
- Acher, Jacques: *See—*  
Bulteau, Gerard; Acher, Jacques; and Monier, Jean C., 4,161,532, Cl. 424-274.000.
- Adjustable Clamp Company: *See—*  
Holman, Daniel V., 4,161,311, Cl. 269-49.000.
- Agatsuma, Ko; Koyama, Kenichi; Todoriki, Itaru; Yamaguchi, Tetsuo; Kohno, Osamu; and Saito, Takashi, to Agency of Industrial Science and Technology; and Fujikura Cable Works, Ltd., The Method for producing hollow superconducting cables, 4,161,062, Cl. 29-599.000.
- Agence Nationale de Valorisation de la Recherche: *See—*  
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,161,494, Cl. 260-665.00R.
- Agency of Industrial Science and Technology: *See—*  
Agatsuma, Ko; Koyama, Kenichi; Todoriki, Itaru; Yamaguchi, Tetsuo; Kohno, Osamu; and Saito, Takashi, 4,161,062, Cl. 29-599.000.
- AGFA-GEVAERT N.V.: *See—*  
Gilliams, Yvan K.; and De Volder, Noel J., 4,161,453, Cl. 252-62.10L.
- Aimar, Michele, to ITW Fastex Italia. Insulating assembly for stator-slots of electrical motors, 4,161,669, Cl. 310-194.000.
- Air Products and Chemicals, Inc.: *See—*  
Seymour, John P.; Mascioli, Rocco L.; Beitchman, Burton D.; and Zaluska, Philip J., 4,161,575, Cl. 528-90.000.
- Airborne Life Support Systems, Inc.: *See—*  
Pickering, Donald E., 4,161,172, Cl. 128-1.00B.
- Airpax Electronics, Inc.: *See—*  
Carlson, Peter J., 4,161,693, Cl. 324-173.000.
- Airwick Industries, Inc.: *See—*  
Smith, James A.; and McLaughlin, James H., 4,161,449, Cl. 252-8.600.
- Aisin Seiki Kabushiki Kaisha: *See—*  
Nawa, Hideo; and Takikawa, Yujiro, 4,161,153, Cl. 112-279.000.
- Ajima, Takashi: *See—*  
Yonezawa, Toshio; Ajima, Takashi; and Uchida, Masato, 4,161,743, Cl. 357-54.000.
- Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. AC rotary machine apparatus, 4,161,680, Cl. 318-722.000.
- Akin, Cavit; and Darrington, Franklin D., to Standard Oil Company (Indiana). Process for texturizing proteinaceous materials, 4,161,546, Cl. 426-104.000.
- Akin, Joe T.: *See—*  
Matheny, Paul; and Akin, Joe T., 4,161,285, Cl. 239-132.300.
- Aktiebolaget Hassle: *See—*  
Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Lundgren, Bo T., 4,161,542, Cl. 424-330.000.
- Albany International Corp.: *See—*  
Khan, Mir I. A., 4,161,195, Cl. 139-383.00A.
- Albertson, Noel F., to Sterling Drug Inc. 1-Oxygenated-2,6-methano-3-benzazocines, 4,161,598, Cl. 546-97.000.
- Albrecht, Gerd: *See—*  
Goldstein, Guy; Roussin-Moynier, Yves; and Albrecht, Gerd, 4,161,385, Cl. 425-462.000.
- Albright, Alva Z. Tree harvester and buncher, 4,161,200, Cl. 144-34.00R.
- Albright, Eugene A. Helical antenna, 4,161,737, Cl. 343-749.000.
- Alcan Aluminum Corporation: *See—*  
Alia, Dominic A., 4,161,419, Cl. 156-51.000.  
Walton, William T., III, 4,161,416, Cl. 148-12.70A.
- Alexander, Brian S. Figure toy limb with twirling hand unit, 4,161,082, Cl. 46-119.000.
- Alexander, William H.: *See—*  
Bell, Robert R.; and Alexander, William H., 4,161,308, Cl. 251-228.000.
- Alia, Dominic A., to Alcan Aluminum Corporation. Production of coated electrical conductor cable, 4,161,419, Cl. 156-51.000.
- Alisic, Slobodan; Hamer, Rene H.; and Fleskens, Ludovicus A. H., to U.S. Philips Corporation. Device for displaying variable quantities, 4,161,676, Cl. 315-395.000.
- All India Institute of Medical Sciences: *See—*  
Talwar, Gursaran P., 4,161,519, Cl. 424-88.000.
- Allegheny Ludlum Industries, Inc.: *See—*  
Tommaney, Joseph W.; and Burton, Claudia J., 4,161,398, Cl. 75-10.00C.  
Tommaney, Joseph W.; and Burton, Claudia J., 4,161,399, Cl. 75-10.00C.
- Allied Chemical Corporation: *See—*  
Parker, Herbert W., 4,161,391, Cl. 432-209.000.  
Porter, Chester D., 4,161,192, Cl. 138-44.000.
- Allis-Chalmers Corporation: *See—*  
Moore, Donald C., 4,161,444, Cl. 209-169.000.
- Altman, Paul C. Protected rocker-arm safety device for presses, 4,161,140, Cl. 100-53.000.
- Alton, Ahdor H.: *See—*  
Kohn, Mitchell I.; and Alton, Ahdor H., 4,161,679, Cl. 318-685.000.
- Aluminum Company of America: *See—*  
Vernam, William D.; and Evancho, Joseph W., 4,161,553, Cl. 428-654.000.
- Amancharla, Amareswar, to Baker International Corporation. Mechanical latch with hydraulic locking mechanism, 4,161,216, Cl. 166-193.000.
- Amann, Bertram, to Wandel & Goltermann. Method of and system for generating digital test signals, 4,161,627, Cl. 179-15.0BF.
- American Cyanamid Company: *See—*  
Wasser, Richard B.; and Sedlak, John A., 4,161,423, Cl. 162-163.000.
- American Motors Corporation: *See—*  
Klos, Ted; and Tiedt, Herman J., 4,161,649, Cl. 235-92.0MP.
- Ames, Thomas J.: *See—*  
Cuiper, Glen H.; and Ames, Thomas J., 4,161,367, Cl. 405-169.000.
- AMP Incorporated: *See—*  
Cherian, Gabriel B.; and Scheingold, William S., 4,161,346, Cl. 339-17.00M.
- Anderson, Perry W.: *See—*  
Glabbe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 4,161,543, Cl. 426-2.000.
- Anderson, Richard D.; and Wedel, John A., to Pako Corporation. Neghold assembly for photographic printer, 4,161,365, Cl. 355-75.000.
- Anderson, Roy E., to General Electric Company. Radio determination using satellites transmitting timing signals with correction by active range measurement, 4,161,730, Cl. 343-6.50R.
- Anderson, Roy E., to General Electric Company. Position surveillance using one active ranging satellite and time of arrival of a signal from an independent satellite, 4,161,734, Cl. 343-100.0ST.
- Ando, Tadahiko; Shibata, Takehiko; Ikawa, Shukuko; and Kim, Cholung, to Rikagaku Kenkyusho. Novel endonuclease and process for production thereof, 4,161,424, Cl. 435-199.000.
- Aoki, Eiichiro: *See—*  
Yamada, Shigeru; and Aoki, Eiichiro, 4,161,128, Cl. 84-1.260.
- Appleman, Theodore C., to Eastside Machine & Welding, Inc. Flame spraying process for materials requiring fusion, 4,161,555, Cl. 427-333.000.
- Arai, Hiromichi: *See—*  
Shiraki, Yoshiro; Haraoka, Hiroshi; and Arai, Hiromichi, 4,161,511, Cl. 423-341.000.
- Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Telescopic photographing lens system, 4,161,350, Cl. 350-220.000.
- Argus Chemical Corporation: *See—*  
Halle, Reidar; and Bock, Lawrence A., 4,161,485, Cl. 260-448.20R.
- Armstrong, James E., to Pool Company. Offshore fixed platform and method of erecting the same, 4,161,376, Cl. 405-196.000.
- Arnason, Walter. Cutting and gouging head for welding equipment, 4,161,642, Cl. 219-70.000.
- Army, Deane C.; and Lindow, Steven E., to Wisconsin Alumni Research Foundation. Method for reducing temperature at which plants freeze, 4,161,084, Cl. 47-2.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*  
Arai, Yasunori, 4,161,350, Cl. 350-220.000.  
Kurei, Hiroshi, 4,161,354, Cl. 354-36.000.
- ASEA Aktiebolag: *See—*  
Stenkvis, Sven-Einar, 4,161,618, Cl. 13-12.000.



- Ateliers des Charmilles, S.A.: See—  
Bonga, Benno, 4,161,641, Cl. 219-69.00M.  
Atex, Incorporated: See—  
Ying, Charles W., 4,161,777, Cl. 364-200.000.  
Atlas Copco Aktiebolag: See—  
Carlin, Carl-Gustaf; and Skyllermark, Stefan M. B., 4,161,220, Cl. 173-1.000.  
Carlin, Carl-Gustaf; and Skyllermark, Stefan M. B., 4,161,221, Cl. 173-1.000.  
Audeh, Costandi A.; and Chen, Nai Y., to Mobil Oil Corporation. Processing of tar sands. 4,161,442, Cl. 208-11.00R.  
Automotive Environmental Systems, Inc.: See—  
Fegraus, Clark E.; and D'Angelo, Severino, 4,161,116, Cl. 73-117.000.  
Avedko B.V.: See—  
Kooiman, Pieter L., 4,161,146, Cl. 108-136.000.  
Avtex Fibers Inc.: See—  
Price, John A.; and Stange, Hugo, 4,161,577, Cl. 528-173.000.  
Ayers, Louis M.: See—  
Bourne, Henry A., Jr.; Ayers, Louis M.; and Wiseman, Minor R., 4,161,215, Cl. 166-65.00M.  
Ayerst, McKenna and Harrison Limited: See—  
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,161,608, Cl. 560-121.000.  
Azuma, Masaaki: See—  
Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, 4,161,572, Cl. 525-100.000.  
B. F. Goodrich Company, The: See—  
Kroenke, William J., 4,161,466, Cl. 260-28.00R.  
Lehr, Marvin H., 4,161,472, Cl. 525-4.000.  
Nicholas, Paul P., 4,161,464, Cl. 260-2.300.  
Powell, Joe A.; Messerly, James W.; and Shippy, Ronald L., 4,161,202, Cl. 152-347.000.  
Babcock & Wilcox Company, The: See—  
Stump, Paul E., 4,161,112, Cl. 72-283.000.  
Bachand, Pierre. Knockdown connector and guideway assembly. 4,161,303, Cl. 248-246.000.  
Bacsanyi, Thomas J.; and Harmon, Edward J., to Ransburg Corporation. Imbalance determining apparatus. 4,161,666, Cl. 310-27.000.  
Baggstrom, Stig G., to Telefonaktiebolaget L M Ericsson. Process and apparatus for feeding elongated articles in oriented positions. 4,161,245, Cl. 198-399.000.  
Bagli, Jehan F.: See—  
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,161,608, Cl. 560-121.000.  
Baile, James J.; and Tsonopoulos, Constantine, to Exxon Research & Engineering Co. High-pressure azotropic distillation for the manufacture of anhydrous alcohols. 4,161,429, Cl. 203-18.000.  
Bailey, Jack H.; and Ottaway, Gerald H., to International Business Machines Corporation. Video recording disk with interlacing of data for frames on the same track. 4,161,753, Cl. 358-128.000.  
Baker International Corporation: See—  
Amancharla, Amarendra, 4,161,216, Cl. 166-193.000.  
Baker, Richard M.: See—  
Groves, Stanley E.; Schriber, Gene A.; Spinks, Brian M.; Baker, Richard M.; Daly, Thomas C.; and Means, Rodney J., 4,161,787, Cl. 364-900.000.  
Bakhalov, Vladimir I.; Volvenkov, Gennady V.; Polukhin, Valentin P.; Starokadomsky, Vadim S.; and Ter-Bogdasarov, Arkady V., to Vsesojuzny Nauchno-Issledovatel'skiy Institut Legkogo i Textilnogo Mashinostroenia. Method of sewing a button on a thread stem and semi-automatic machine for performing same. 4,161,148, Cl. 112-110.000.  
Baldini, Luciano, to Bieffe S.p.A. Process of making a filter element for use in intravenous infusions. 4,161,504, Cl. 264-163.000.  
Banwell, Thomas C.: See—  
Banwell, Thomas J.; and Banwell, Thomas C., 4,161,118, Cl. 73-188.000.  
Banwell, Thomas J.; and Banwell, Thomas C. Force direction transducer. 4,161,118, Cl. 73-188.000.  
Baran, Miroslav, to Bata Shoe Company, Inc. Cutting apparatus for flatbed sewing machine. 4,161,149, Cl. 112-130.000.  
Barclay, Donald J.; and Morgan, William M., to International Business Machines Corporation. Electroplating chromium and its alloys. 4,161,432, Cl. 204-51.000.  
Bardenhagen, Dietrich: See—  
Bildung, Otto; Tolasch, Gerhard; and Bardenhagen, Dietrich, 4,161,094, Cl. 53-493.000.  
Barger, Frank L.: See—  
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,161,427, Cl. 196-14.520.  
Barouh, Victor; Rottmann, George; and DeSimone, Salvatore, to Eaton Allen Corp. Adhesively correctable transfer medium with delayed alteration resistance characteristics. 4,161,551, Cl. 428-539.000.  
Barr, Thomas A., to United States of America, National Aeronautics and Space Administration. Thickness measurement system. 4,161,731, Cl. 343-14.000.  
Barraut, Joel; Guisnet, Michel; Lucien, Jacques; and Maurel, Raymond, to Societe Nationale Elf Aquitaine (Production). Process for the production of mercaptans. 4,161,493, Cl. 260-609.00R.  
BASF Aktiengesellschaft: See—  
Baumann, Hans; and Oberlinner, Andreas, 4,161,589, Cl. 544-70.000.  
BASF Wyandotte Corporation: See—  
Davis, John E.; and Davis, Pauls, 4,161,468, Cl. 260-30.40R.
- Basilico, Albert R., to International Business Machines Corporation. High density video disk having two pit depths. 4,161,752, Cl. 358-128.000.  
Bastenhof, Dirk, to Societe d'Etudes de Machines Thermiques S.E.M.T. Device for damping pressure waves in an internal combustion engine fuel injection system. 4,161,161, Cl. 123-32.0JV.  
Bata Shoe Company, Inc.: See—  
Baran, Miroslav, 4,161,149, Cl. 112-130.000.  
Bates, James W., to Gulton Industries, Inc. Inverter ripple regulator. 4,161,771, Cl. 363-43.000.  
Battelle-Institute e.V.: See—  
Bol, Johannes; and Freund, Hans-Ulrich, 4,161,366, Cl. 356-56.000.  
Batzdorff, Alfred, to Keller Corp., The. Brick blending apparatus. 4,161,368, Cl. 414-114.000.  
Batzer, Hans; Habermeyer, Jurgen; and Porret, Daniel, to Ciba-Geigy AG. Dialcohols. 4,161,594, Cl. 544-302.000.  
Bauer, David N. Erosion resistant control valve. 4,161,187, Cl. 137-375.000.  
Baumann, Hans; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Spirodipyrans. 4,161,589, Cl. 544-70.000.  
Baxter, Larry K.: See—  
Spencer, David R.; and Baxter, Larry K., 4,161,757, Cl. 358-261.000.  
Bayer Aktiengesellschaft: See—  
Kishino, Shigeo; Saito, Junichi; Kudamatsu, Akio; Shiokawa, Kojo; and Tsuboi, Shinichi, 4,161,524, Cl. 424-215.000.  
Klaue, Erich; Kysela, Ernst; and Dorlars, Alfons, 4,161,593, Cl. 544-217.000.  
Priemer, Joachim; Nicklas, Georg; and Schulz, Nikolaus, 4,161,481, Cl. 260-369.000.  
Sinn, Gustav; Matner, Martin; and Bross, Hermann J., 4,161,456, Cl. 525-182.000.  
Weissel, Oskar, 4,161,492, Cl. 260-563.00R.  
BBC Brown, Boveri & Company Limited: See—  
Maier, Heribert, 4,161,636, Cl. 200-148.00A.  
Nowack, Helmut; and Rappange, Adelbert, 4,161,316, Cl. 277-9.000.  
Beamer, John D.; and Wichman, William J., to Rain Bird Sprinkler Manufacturing Corporation. Self-compensating nozzle construction. 4,161,286, Cl. 239-230.000.  
Beardsley, Richard G.; and Currey, Norman S., to Lockheed Corporation. Deployment apparatus for stores from vehicles. 4,161,301, Cl. 244-137.00R.  
Beaver, William L.: See—  
Zitelli, Louis T.; and Beaver, William L., 4,161,121, Cl. 73-626.000.  
Becker, Edward A.: See—  
Spencer, David H.; and Becker, Edward A., 4,161,779, Cl. 364-200.000.  
Beckman Instruments, Inc.: See—  
Perry, Andrew W., 4,161,423, Cl. 435-11.000.  
Bedini, Remo; and De Rossi, Danilo, to FIAT Societa per Azioni. Control circuit for rear view mirrors provided with a liquid crystal cell. 4,161,653, Cl. 250-215.000.  
Beelmann, Richard; Kerstges, Johannes; and Mertens, Paul, to Deutsche Babcock Aktiengesellschaft. Blower beater mill. 4,161,293, Cl. 241-56.000.  
Beghin-Say: See—  
Goldstein, Guy; Roussin-Moynier, Yves; and Albrecht, Gerd, 4,161,385, Cl. 425-462.000.  
Begnaud, John D.: See—  
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,161,427, Cl. 196-14.520.  
Begun, James A., to Martin, Howard W., a part interest. Supporting frame for furniture. 4,161,345, Cl. 312-253.000.  
Behn, Reinhard, to Siemens Aktiengesellschaft. Regenerable electric wound capacitor which is divided into a plurality of sub-capacitances. 4,161,774, Cl. 363-59.000.  
Behringwerke Aktiengesellschaft: See—  
Hirsch, Wolfgang, 4,161,507, Cl. 422-56.000.  
Beitchman, Burton D.: See—  
Seymour, John P.; Mascioli, Rocco L.; Beitchman, Burton D.; and Zaluska, Philip J., 4,161,575, Cl. 528-90.000.  
Bekey, Ivan; and Wolk, Roger S. Method for constructing registered teeth castings. 4,161,067, Cl. 32-17.000.  
Bell, John H., to Fisons Limited. Composition for treating airway disease. 4,161,516, Cl. 424-14.000.  
Bell, Robert R.; and Alexander, William H., to Vapor Corporation. Switching valve assembly for fluid motor-driven injector pump. 4,161,308, Cl. 251-228.000.  
Bell Telephone Laboratories, Incorporated: See—  
Bellisio, Jules A., 4,161,634, Cl. 179-175.31R.  
Marcuse, Dietrich; and Presby, Herman M., 4,161,656, Cl. 250-459.000.  
Wolaver, Dan H., 4,161,635, Cl. 179-175.31R.  
Bellet, Eugene M.; and Joshi, Madan M., to Kalo Laboratories, Inc. Liquid combination seed treatment compositions. 4,161,397, Cl. 71-7.000.  
Bellina, Russell F., to Du Pont de Nemours, E. I., and Company. Butyramides and butyrates. 4,161,591, Cl. 544-164.000.  
Bellisio, Jules A., to Bell Telephone Laboratories, Incorporated. Count-down addressing system. 4,161,634, Cl. 179-175.31R.  
Beloit Corporation: See—  
Justus, Edgar J., 4,161,205, Cl. 162-133.000.  
Belush, Richard; and Wade, James A., to Cummins Engine Company, Inc. Piston for an internal combustion engine. 4,161,165, Cl. 123-193.00P.

- Benasutti, Roger; and Koenig, Thomas A., to Conwed Corporation. Task lighting system with angularly-displaced fluorescent tubes. 4,161,767, Cl. 362-33.000.  
Bennett, James P.; and Harms, David C., to Plessey Handel und Investments AG. Circuit arrangement for use in telephone systems. 4,161,630, Cl. 179-18.0EB.  
Bentele, Max, to Conco Medical Co., Inc. Surgical finger and fence splints. 4,161,175, Cl. 128-87.00A.  
Bentley, Clarence. Emitter. 4,161,291, Cl. 239-542.000.  
Bepex Corporation: See—  
Herron, Dale J., 4,161,578, Cl. 528-272.000.  
Berardinelli, Frank M.: See—  
Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., 4,161,579, Cl. 525-444.000.  
Berber, Viktor A.; Mozyakov, Vladimir I.; and Khodosov, Nikolai A. Centrifugal liquid cleaner. 4,161,275, Cl. 233-31.000.  
Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, to Science Union et Cie, Societe Francaise de Recherche Medicale. Phenoxy phenyl pyrrolidine compounds, compositions and methods of use. 4,161,529, Cl. 424-274.000.  
Bernhardt, Christian A.; and Mohlenkamp, Marvin J., Jr., to Procter & Gamble Company, The. Meat aroma precursor composition. 4,161,550, Cl. 426-533.000.  
Berry, Edwin X. Vibration sensitive valve operating apparatus. 4,161,183, Cl. 137-39.000.  
BHN, Inc.: See—  
Cottingham, Hugh V.; and Scrocco, Joseph, 4,161,042, Cl. 3-17.00R.  
Bianchi, Valerio: See—  
Latsch, Reinhard; and Bianchi, Valerio, 4,161,162, Cl. 123-32.0EA.  
Biberger, Hans. Blade arrangement for a motor driven sickle or rotary mowing machines, and such machines. 4,161,096, Cl. 56-12.900.  
Bicht, John R.: See—  
Warner, Peter S.; and Bicht, John R., 4,161,226, Cl. 180-65.00E.  
BICOSA Societe de Recherches: See—  
Courier de Mere, Henri E., 4,161,387, Cl. 431-74.000.  
Bieffe S.p.A.: See—  
Baldini, Luciano, 4,161,504, Cl. 264-163.000.  
Binder, Georg: See—  
Franz, Herbert; Wamsler, Reinhold; and Binder, Georg, 4,161,775, Cl. 363-145.000.  
Bishop, Allan T.; and Wytruk, Maurice, to Accessories Manufacturers, Ltd. Door panel for mail box unit. 4,161,274, Cl. 232-24.000.  
Bishop, Thomas G., to HPM Corporation. Injection molding process control. 4,161,380, Cl. 425-145.000.  
Black & Decker Inc.: See—  
Moore, Robert G., Jr.; and Hopkins, Charles E., Sr., 4,161,242, Cl. 192-34.000.  
Black, William L.; Gould, Robert A.; and Wood, Stanley E., to United States of America, Navy. Liquid propellant gun. 4,161,133, Cl. 89-7.000.  
Blake, Neil B., to Rank Xerox Limited. Document coding. 4,161,362, Cl. 353-40.000.  
Blank, Michael: See—  
Delarbre, Aime; Boesner, Joachim; and Blank, Michael, 4,161,344, Cl. 308-222.000.  
Blaske, Theodore A.; and Yu, Ho Y., to Varo Semiconductor, Inc. Passivated semiconductor device and method of making same. 4,161,744, Cl. 357-59.000.  
Blayman, Herbert S. Musical instrument supporting stand. 4,161,131, Cl. 84-453.000.  
Bildung, Otto; Tolasch, Gerhard; and Bardenhagen, Dietrich, to Hauni-Werke Korber & Co. KG. Apparatus for processing biscuits or the like. 4,161,094, Cl. 53-493.000.  
Blöse, Thomas L., to Hydriil Company. Dovetail connection for pin and box joints. 4,161,332, Cl. 285-334.000.  
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V. Catalyst for (co) polymerization of ethylene, alpha-olefines, conjugated and non-conjugated dienes, a method of preparing same. 4,161,462, Cl. 252-429.00B.  
Bochko, Anatoly V.: See—  
Merzhanov, Alexandr G.; Borovinskaya, Inna P.; Karjuk, Gennady G.; Dubovitsky, Fedor I.; Prokudina, Valentina K.; Ratnikov, Viktor I.; Bochko, Anatoly V.; Moshkovsky, Evgeny I.; Sharivker, Semen J.; and Krizhanovsky, Sergei S., 4,161,512, Cl. 423-440.000.  
Bock, Lawrence A.: See—  
Halle, Reidar; and Bock, Lawrence A., 4,161,485, Cl. 260-448.20R.  
Boesner, Joachim: See—  
Delarbre, Aime; Boesner, Joachim; and Blank, Michael, 4,161,344, Cl. 308-222.000.  
Bogacki, Anthony P., to General Electric Company. Meter terminal unit for use in automatic remote meter reading and control system. 4,161,720, Cl. 340-150.000.  
BOGE GmbH: See—  
Brenner, Heinz; and Hamaekers, Arno, 4,161,304, Cl. 248-562.000.  
Bogle, Gladys D. Cover secure contour bed sheets. 4,161,044, Cl. 5-494.000.  
Bogri, Tibor: See—  
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,161,608, Cl. 560-121.000.  
Bol, Johannes; and Freund, Hans-Ulrich, to Battelle-Institute e.V. Process and apparatus for the automatic examination of eggs for cracks or places of fracture in their shell. 4,161,366, Cl. 356-56.000.
- Bolin, Philip C.; Lapen, Robert J.; and Cookson, Alan H., to Westinghouse Electric Corp. Spacer mount for a gas insulated transmission line. 4,161,621, Cl. 174-14.00R.  
Bonga, Benno, to Ateliers des Charmilles, S.A. EDM Process and apparatus for overcut machining of a workpiece by an electrode tool. 4,161,641, Cl. 219-69.00M.  
Bopp, Richard C., to General Electric Company. Blends of low molecular weight polyalkylene terephthalate resins and organopolysiloxane-polycarbonate block copolymers. 4,161,498, Cl. 525-439.000.  
Bormann, Dieter; Merkel Wulf; and Muschawek, Roman, to Hoechst Aktiengesellschaft. Diuretic and saluretic 5-sulfamoylbenzoic acid derivatives carrying a heterocyclic substituent. 4,161,531, Cl. 424-274.000.  
Borner, Dieter; Koerner, Gotz; and Rossmay, Gerd, to Th. Goldschmidt AG. Process for the hydrolysis and condensation of alkyl/aryl-trichlorosilanes. 4,161,487, Cl. 260-448.20R.  
Borovinskaya, Inna P.: See—  
Merzhanov, Alexandr G.; Borovinskaya, Inna P.; Karjuk, Gennady G.; Dubovitsky, Fedor I.; Prokudina, Valentina K.; Ratnikov, Viktor I.; Bochko, Anatoly V.; Moshkovsky, Evgeny I.; Sharivker, Semen J.; and Krizhanovsky, Sergei S., 4,161,512, Cl. 423-440.000.  
Bosch, Paul, to Robert Bosch GmbH. Internal-gear fluid-displacement machine with movable separating body. 4,161,372, Cl. 418-126.000.  
Boschet, Vittorino, to Grafosol, S.p.A. Sheet supporting drum during development in machines for electrostatically preparing printing matrices. 4,161,358, Cl. 355-3.0DR.  
Bosse, Frank, to Windmoller & Holscher. Reinforced webs of film. 4,161,559, Cl. 428-110.000.  
Bouchard, Andre C.; and Fraley, Lawrence R., to GTE Sylvania Incorporated. Signal device having prolonged illumination means. 4,161,388, Cl. 431-359.000.  
Boulanger, Michelle: See—  
Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, 4,161,529, Cl. 424-274.000.  
Bourdout, Jean F.: See—  
Lenne, William; Bourdout, Jean F.; and Rolland, Guy, 4,161,060, Cl. 29-527.100.  
Bourne, Henry A., Jr.; Ayers, Louis M.; and Wiseman, Minor R., to Continental Oil Company. Solenoid operated tubing safety valve. 4,161,215, Cl. 166-65.00M.  
Boyesen, Eyvind, to Performance Industries, Inc. Two cycle internal combustion engine. 4,161,163, Cl. 123-73.00A.  
Bradshaw, Robert S.: See—  
Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., 4,161,244, Cl. 198-347.000.  
Brandman, Yigal: See—  
Cohen, Yitzhak; Brandman, Yigal; and Eckstien, Zvi, 4,161,718, Cl. 340-146.1BA.  
Brandt Industries, Inc.: See—  
Brandt, Robert O., Jr., 4,161,119, Cl. 73-205.00R.  
Brandt, Robert O., Jr., to Brandt Industries, Inc. Pneumatic flow measuring system. 4,161,119, Cl. 73-205.00R.  
Brashear, Homer J., to Dresser Industries, Inc. Cone retainer for a rotary rock bit. 4,161,343, Cl. 308-8.200.  
Brenner, Heinz; and Hamaekers, Arno, to BOGE GmbH. Rubber elastic engine mounts or supports with hydraulic damping, especially for engine suspensions in motor vehicles. 4,161,304, Cl. 248-562.000.  
Bridgestone Tire Company Limited: See—  
Suzuki, Yasuo; Abe, Masaru; and Tezuka, Toshiro, 4,161,203, Cl. 152-361.00R.  
Bristol-Myers Company: See—  
Kaplan, Murray A.; and Granatek, Alphonse P., 4,161,595, Cl. 544-284.000.  
Brockl, Walter, to Mafell-Maschinenfabrik Rudolf Mey KG. Nail driver construction. 4,161,272, Cl. 227-131.000.  
Brodwin, Bernard. Contoured handle. 4,161,051, Cl. 16-110.00R.  
Bromwich, Robert A. C.; Hill, William G.; and Lawrence, Charles M., to Foster Wheeler Energy Corporation. Orbital welding torch. 4,161,640, Cl. 219-60.00A.  
Brosow, Jorgen, to Dasy Inter S.A. Hands-free telephone with cascaded attenuators. 4,161,624, Cl. 179-1.0HF.  
Bross, Hermann J.: See—  
Sinn, Gustav; Matner, Martin; and Bross, Hermann J., 4,161,456, Cl. 525-182.000.  
Brown, Henry C., to Uni Corporation, The. Pickup truck hoist attachment. 4,161,338, Cl. 298-22.00J.  
Brown, Jack, to Singer Company, The. Simplified actuation of two step buttonhole in electronically controlled sewing machine. 4,161,150, Cl. 112-158.00E.  
Brown, Norris K.; and Foust, James W., to Envirotech Corporation. Foam and liquor separator. 4,161,395, Cl. 55-178.000.  
Brown, William J., to Caterpillar Tractor Co. Vehicle liquid window washer bottle and enclosure. 4,161,287, Cl. 239-284.00R.  
Brune, Gerhard; and Lembke, Manfred, to Robert Bosch GmbH. Electro-magnetic valve. 4,161,306, Cl. 251-129.000.  
Brunson, Roy J., to Exxon Research & Engineering Co. Liquefaction of calcium-containing subbituminous coals and coals of lower rank. 4,161,440, Cl. 208-8.00R.  
Brussels, Nathan E.; and Piasecki, Edwin S., to Solar Energy Systems, Inc. Focussing flat plate solar collector device. 4,161,169, Cl. 126-271.000.  
Buchner, Klaus, to Siemens Aktiengesellschaft. Apparatus for examining bodies through scanning by means of ultrasound. 4,161,122, Cl. 73-626.000.



Buck, Charles E.; Johnson, James M.; and Joseph, Paul A., to General Motors Corporation. Magnetostrictive engine detonation sensor. 4,161,665, Cl. 310-26.000.

Buckman, John B.; and Lykes, Robert E., to A. O. Smith Corporation. Flexible mounting of electric motors. 4,161,667, Cl. 310-51.000.

Buday, John M.; Holmes, Lawrence B.; Milenkovic, Veljko; and Stevens, Bernard, to Gard, Inc. Flat article handling system. 4,161,092, Cl. 53-244.000.

Buday, John M., to Gard, Inc. Flat article stacking system. 4,161,095, Cl. 53-527.000.

Bulloch, David K., to Philip A. Hunt Chemical Corp. Solution and method for processing high speed video news film. 4,161,406, Cl. 96-55.000.

Bulteau, Gerard; Acher, Jacques; and Monier, Jean C., to Societe d'Etudes Scientifiques et Industrielles de l'ile de France. N-(1'-ethyl-2'-oxo-5'-pyrrolidinylmethyl) benzamide compounds and derivatives, method of preparation and pharmaceutical preparations. 4,161,532, Cl. 424-274.000.

Bulten-Kanthall Aktiebolag: See—

Eklund, Ingvar A.; and Lejdegard, Sixten H., 4,161,132, Cl. 85-47.000.

Bundy, Gordon L., to Upjohn Company. The Cycloamides of nitriloprostacyclins. 4,161,584, Cl. 542-421.000.

Burchard, John S.: See—

Giffin, James W.; De Santis, Michael A.; and Burchard, John S., 4,161,356, Cl. 354-323.000.

Burke, James R.: See—

Kessler, Bernard V.; Hoff, Gerald F.; and Burke, James R., 4,161,702, Cl. 331-94.50H.

Burroughs Corporation: See—

Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., 4,161,244, Cl. 198-347.000.

Sogo, Marilyn R., 4,161,430, Cl. 204-15.000.

Spencer, David H.; and Becker, Edward A., 4,161,779, Cl. 364-200.000.

Szarewicz, Thomas D.; and Drinkard, John H., Jr., 4,161,654, Cl. 250-221.000.

Burson, David C.; and Larson, Harold D., to Texas Instruments Incorporated. Digital joystick control. 4,161,726, Cl. 340-365.00R.

Burton, Claudia J.: See—

Tommaney, Joseph W.; and Burton, Claudia J., 4,161,398, Cl. 75-10.00C.

Tommaney, Joseph W.; and Burton, Claudia J., 4,161,399, Cl. 75-10.00C.

Burton, Richard J. Sanitary hose holder. 4,161,182, Cl. 134-166.00C.

Bush Universal, Inc.: See—

Stanton, Leo F., 4,161,048, Cl. 12-146.00S.

Bussard, Charles B., to Monarch Marking Systems, Inc. Pinning machine. 4,161,271, Cl. 227-8.000.

Bustin, Leopold. Safety deck mounting structure. 4,161,232, Cl. 182-92.000.

B.V. Neratoom: See—

Klinkert, Gerardus F., 4,161,671, Cl. 313-60.000.

Cagle, Donald D. Fireplace grate. 4,161,168, Cl. 126-164.000.

Cahen, Raymond M., to Labofina S.A. Hydrogenation process. 4,161,483, Cl. 260-409.000.

Calundann, Gordon W., to Celanese Corporation. Polyester of 6-hydroxy-2-naphthoic acid and para-hydroxy benzoic acid capable of readily undergoing melt processing. 4,161,470, Cl. 260-40.00P.

Camag Chemie-Erzeugnisse und Adsorptionstechnik AG: See—

Janchen, Dieter, 4,161,508, Cl. 422-100.000.

Camco, Incorporated: See—

Pringle, Ronald E., 4,161,219, Cl. 166-324.000.

Campbell, Gerald A., to Eastman Kodak Company. Crosslinkable polymers having vinylsulfonyl groups or styrylsulfonyl groups and their use as hardeners for gelatin. 4,161,407, Cl. 96-114.000.

Campbell, Robert H.; and Wilder, Gene R., to Monsanto Company. Bis-(alkylaminophenoxy)alkanes as antidegradants for rubber. 4,161,474, Cl. 260-45.90A.

Canon Kabushiki Kaisha: See—

Soma, Ikuo; and Takada, Yusaku, 4,161,361, Cl. 355-10.000.

Caouette, Kenneth O.; Fortescue, George H.; Zaman, Mohammad K.; and Oda, Donald J., to Lockheed Aircraft Corporation. Self-powered fiber optic interconnect system. 4,161,650, Cl. 250-199.000.

Cap, Daniel M.; and Lake, William H., to General Electric Company. High pressure metal vapor discharge lamps of improved efficacy. 4,161,672, Cl. 313-220.000.

Caputo, William R.; and Husson, Alan L., to Westinghouse Electric Corp. Elevator system. 4,161,235, Cl. 187-29.00R.

Carbone, Jorge L. Modified piano striking mechanism. 4,161,129, Cl. 84-253.000.

Carbonnel, Henri. Electrically heated spigot for connecting an electromagnetic supplying pump to the inlet of a low pressure casting mould. 4,161,647, Cl. 219-301.000.

Carl Freudenberg, Firma: See—

Krug, Hans-Dietrich, 4,161,561, Cl. 428-213.000.

Carlin, Carl-Gustaf; and Skillermark, Stefan M. B., to Atlas Copco Aktiebolag. Method and apparatus for pretensioning screw joints. 4,161,220, Cl. 173-1.000.

Carlin, Carl-Gustaf; and Skillermark, Stefan M. B., to Atlas Copco Aktiebolag. Method and apparatus for pretensioning screw joints. 4,161,221, Cl. 173-1.000.

Carlson, Peter J., to Airpax Electronics, Inc. Clamped input common mode rejection amplifier. 4,161,693, Cl. 324-173.000.

Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Lundgren, Bo T., to Aktiebolaget Hassle. Heart active compounds. 4,161,542, Cl. 424-330.000.

Carp, Bess, to Carp, Joseph, a part interest. Combination carrying case and article organizer assembly. 4,161,201, Cl. 150-35.000.

Carp, Joseph: See—

Carp, Bess, 4,161,201, Cl. 150-35.000.

Carpenter, David M., to Dresser Industries, Inc. Pressure gauge construction. 4,161,123, Cl. 73-741.000.

Cascade Corporation: See—

Seaberg, Richard D., 4,161,256, Cl. 414-620.000.

Casey, Dee O. Composition and method for preparing specimens of micro-organisms for microscopic examination. 4,161,514, Cl. 424-3.000.

Casey, Ross H., to Hewlett-Packard Company. Continuous loop stuffer cartridge having improved Moebius loop tensioning device. 4,161,270, Cl. 226-118.000.

Castleberry, Donald E.; and Waldron, Wesley K., to General Electric Company. Laminated capacitive touch-pad. 4,161,766, Cl. 361-280.000.

Caterpillar Tractor Co.: See—

Brown, William J., 4,161,287, Cl. 239-284.00R.

Hicks, George E.; Litherland, John W.; Martin, Arlan G.; and Williams, Lawrence, 4,161,160, Cl. 123-1.00A.

Winzler, James E., 4,161,126, Cl. 74-674.000.

Caudel, Edward R.: See—

Cochran, Michael J.; and Caudel, Edward R., 4,161,697, Cl. 325-330.000.

Caunt, Anthony D.; and Williams, Ian G., to Imperial Chemical Industries Limited. Treatment of transition metal compound. 4,161,461, Cl. 252-429.00B.

Caverzan, Fred G.: See—

Gauthier, Ray J.; and Caverzan, Fred G., 4,161,768, Cl. 362-123.000.

Cavitron Corporation: See—

Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,161,420, Cl. 156-73.300.

CBS Inc.: See—

Rebold, Jerome I., 4,161,289, Cl. 239-346.000.

Celamerck GmbH & Co. KG: See—

Thomas, Klaus; Ost, Walter; and Curtze, Jürgen, 4,161,528, Cl. 424-273.00R.

Celanese Corporation: See—

Calundann, Gordon W., 4,161,470, Cl. 260-40.00P.

Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., 4,161,579, Cl. 525-444.000.

Taylor, Paul D.; Vanderspurt, Thomas H.; and Conciatori, Anthony B., 4,161,616, Cl. 568-862.000.

Centner, Herman. Secondary image reproduction device. 4,161,353, Cl. 351-30.000.

Central Glass Company, Limited: See—

Shiraki, Yoshiro; Haraoka, Hiroshi; and Arai, Hiromichi, 4,161,511, Cl. 423-341.000.

Cerprobe Corporation: See—

Tarzwel, John W., 4,161,692, Cl. 324-158.00P.

Chang, Clarence D., to Mobil Oil Corporation. Conversion of mixtures of carbon oxides and hydrogen. 4,161,489, Cl. 260-449.00R.

Chemprene, Inc.: See—

Stucke, Charles G., 4,161,320, Cl. 277-205.000.

Chen, Nai Y.: See—

Audeh, Costandi A.; and Chen, Nai Y., 4,161,442, Cl. 208-11.00R.

Cherian, Gabriel B.; and Scheingold, William S., to AMP Incorporated. Connecting element for surface to surface connectors. 4,161,346, Cl. 339-17.00M.

Chernyshev, Boris A.: See—

Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stolper, Leonid M.; and Chernyshev, Boris A., 4,161,107, Cl. 62-117.000.

Chervenak, Paul R.: See—

Lasoen, Jean J.; and Chervenak, Paul R., 4,161,238, Cl. 188-74.000.

Chevron Research Company: See—

Edridge, Alfred J., 4,161,510, Cl. 422-197.000.

Lowe, Warren, 4,161,451, Cl. 252-32.70E.

Suzuki, Shigeto, 4,161,612, Cl. 562-594.000.

Chiba, Tomio: See—

Sano, Yoshihiro; Chiba, Tomio; Kudou, Hiroyuki; and Miki, Yoshiteru, 4,161,651, Cl. 250-199.000.

Chinone, Naoki: See—

Takeda, Yutaka; Nakamura, Satoshi; Chinone, Naoki; Nakashima, Hisao; and Kurata, Kazuhiro, 4,161,701, Cl. 331-94.50H.

Chloride Group Limited: See—

Foulkes, Stanley C.; Moore, Robert; Ratcliffe, James; and Stephenson, James M., 4,161,503, Cl. 264-136.000.

Chugai Denki Kogyo Kabushiki-Kaisha: See—

Shibata, Akira, 4,161,403, Cl. 75-173.00A.

Chvatilsky, Kurt, to Olympia Werke AG. Typing device including a type disc. 4,161,373, Cl. 400-175.000.

Ciacchio, Charles J.; and Rinehart, Harry A., to Ciacchio, Charles J. Radio controlled fishing apparatus. 4,161,077, Cl. 43-26.100.

Ciba-Geigy AG: See—

Batzler, Hans; Habermeyer, Jürgen; and Porret, Daniel, 4,161,594, Cl. 344-302.000.

Ciba-Geigy Corporation: See—

Drabek, Josef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,161,536, Cl. 424-304.000.

Evans, Samuel; and Rasberger, Michael, 4,161,592, Cl. 544-198.000.

Green, George E.; and Losert, Ewald, 4,161,588, Cl. 542-432.000.

Habermeyer, Jürgen, 4,161,603, Cl. 548-305.000.

Haug, Theobald; Keifer, Jürg; Ruf, Peter; and Schmitter, Andre, 4,161,580, Cl. 528-322.000.

Heusler, Karl; and Woodward, Robert B., 4,161,476, Cl. 260-306.70C.

Koella, Werner P., 4,161,530, Cl. 424-274.000.

Meyer, Willy; Drabek, Josef; Farooq, Saleem; Gsell, Laurenz; and Kristiansen, Odd, 4,161,535, Cl. 424-304.000.

Mueller, Karl F., 4,161,590, Cl. 544-159.000.

Mueller, Karl F., 4,161,602, Cl. 546-335.000.

Schweizer, Ernst, 4,161,534, Cl. 424-300.000.

Spivack, John D.; and Dexter, Martin, 4,161,473, Cl. 260-45.85S.

Clarion Co., Ltd.: See—

Kanai, Takao; and Mori, Yujiro, 4,161,707, Cl. 334-7.000.

Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., to Cavitron Corporation. Ultrasonic method for manufacturing brassiere tapes. 4,161,420, Cl. 156-73.300.

Clinch, Colin W. F.; Harley, David N.; and Palmer, John P., to ITW Limited. Valves for vehicle heating systems. 4,161,307, Cl. 251-206.000.

Cloarec, Jean-Claude, to WABCO Westinghouse. Equipment for the detection of rotation parameters in particular for a wheel-velocity sensor. 4,161,120, Cl. 73-494.000.

Cloutier, Charles C. Patch for ship hulls. 4,161,155, Cl. 114-227.000.

Coates, Clarence A., Jr.; and Weaver, Max A., to Eastman Kodak Company. Methine dyes from 1-[2-[(2-benzothiazolyl)thio]alkyl]-1,2,3,4-tetrahydro-2,2,4,7-tetramethylquinoline compounds. 4,161,601, Cl. 546-176.000.

Cochran, Michael J.; and Caudel, Edward R., to Texas Instruments Incorporated. Automatically clarifying radio receiver. 4,161,697, Cl. 325-330.000.

Cohen, Michael R.: See—

Osborne, Melville W.; and Cohen, Michael R., 4,161,520, Cl. 424-115.000.

Cohen, Yitzhak; Brandman, Yigal; and Eckstien, Zvi, to Motorola Israel Ltd. Supervisory control system. 4,161,718, Cl. 340-146.1BA.

Coillet, Dudley W. Process for the desalination of salt containing water. 4,161,445, Cl. 210-23.00H.

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Collet, Marnix G.; Salters, Roelof H. W.; and Koomen, Joannes J. M., to U.S. Philips Corporation. Semiconductor memory device. 4,161,741, Cl. 357-41.000.

Color Custom Compounding, Inc.: See—

Danko, Edward M., 4,161,506, Cl. 264-174.000.

Colt Industries Operating Corp.: See—

Larson, William C., 4,161,241, Cl. 188-298.000.

Colvin, Christopher R. Ski board. 4,161,324, Cl. 280-21.00A.

Combustion Engineering, Inc.: See—

Warren, Kenneth W.; and Prestridge, Floyd L., 4,161,439, Cl. 204-306.000.

Commissariat à l'Energie Atomique: See—

Freyhet, Aime; and Gouzy, Andre, 4,161,193, Cl. 138-103.000.

Compagnie Generale d'Electricite: See—

Tardy, Andre, 4,161,347, Cl. 350-96.210.

Conciatori, Anthony B.: See—

Taylor, Paul D.; Vanderspurt, Thomas H.; and Conciatori, Anthony B., 4,161,616, Cl. 568-862.000.

Conco Medical Co., Inc.: See—

Bentley, Max, 4,161,175, Cl. 128-87.00A.

Conklin, Robert M.; and Human, Arthur T., to Holmes Protection, Inc. Alarm device having code verification system. 4,161,721, Cl. 340-168.00B.

Continental Oil Company: See—

Bourne, Henry A., Jr.; Ayers, Louis M.; and Wiseman, Minor R., 4,161,215, Cl. 166-65.00M.

Contraves AG: See—

Feier, Markus, 4,161,690, Cl. 324-71.0CP.

Conwed Corporation: See—

Benasutti, Roger; and Koenig, Thomas A., 4,161,767, Cl. 362-33.000.

Cook Electric Company: See—

Scheithauer, Eric A., 4,161,762, Cl. 361-124.000.

Cookson, Alan H.: See—

Bolin, Philip C.; Lapen, Robert J.; and Cookson, Alan H., 4,161,621, Cl. 174-14.00R.

Cooper, Abraham J. Investment casting apparatus. 4,161,208, Cl. 164-244.000.

Copal Company Limited: See—

Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, 4,161,764, Cl. 361-187.000.

Cope, Louis T., to H&T Enterprises, Inc. Method and apparatus for reducing the temperature of a fluid. 4,161,108, Cl. 62-306.000.

Cor Tech Research Ltd.: See—

Vasishth, Ramesh C., 4,161,576, Cl. 528-139.000.

Corrugated Development, Inc.: See—

Kirkpatrick, Alan D., 4,161,269, Cl. 226-92.000.

Corvette, William B. Portable battery charger. 4,161,682, Cl. 320-2.000.

Cotic, Dennis J.; Hoffman, David M.; Shelley, Peter S.; and Zech, Laurel J., to General Electric Company. Multi-cell detector using printed circuit board. 4,161,655, Cl. 250-385.000.

Cottingham, Hugh V.; and Scrocco, Joseph, to BHN, Inc. Adjustable prosthetic limb. 4,161,042, Cl. 3-17.00R.

Courier de Mere, Henri E., to BICOSA Societe de Recherches. Detection devices especially for the detection of flames. 4,161,387, Cl. 431-74.000.

Cowherd, Frank G., III; and Theiling, Louis F., Jr., to Union Carbide Corporation. Process for preparing carbamoyloxy acrylates. 4,161,596, Cl. 544-388.000.

Cramer, Richard D., to Du Pont de Nemours, E. I., and Company. Synthesis of carboxylic acid esters. 4,161,609, Cl. 560-215.000.

Creative Dispensing Systems, Inc.: See—

McKinney, James C., 4,161,288, Cl. 239-333.000.

Crestas, Hans; and Zimmerman, Edwin, to U.S. Philips Corporation. Blood pressure gauge. 4,161,173, Cl. 128-672.000.

Crivello, James V., to General Electric Company. Method of cationally polymerizing oxirane free materials with group VIa onium salts. 4,161,405, Cl. 96-35.100.

Crivello, James V., to General Electric Company. Photoinitiators. 4,161,478, Cl. 260-327.00B.

Cross, Eric, to William Cotton Limited. Latchguards. 4,161,109, Cl. 66-88.000.

Cubeta, Angelo. Elongated flexible level for use as transit. 4,161,069, Cl. 33-367.000.

Cuiper, Glen H.; and Ames, Thomas J., to FMC Corporation. Method and apparatus for completing diverless subsea flowline connections. 4,161,367, Cl. 405-169.000.

Cummins Engine Company, Inc.: See—

Belush, Richard; and Wade, James A., 4,161,165, Cl. 123-193.00P.

Currey, Norman S.: See—

Beardsley, Richard G.; and Currey, Norman S., 4,161,301, Cl. 244-137.00R.

Curtze, Jürgen: See—

Thomas, Klaus; Ost, Walter; and Curtze, Jürgen, 4,161,528, Cl. 424-273.00R.

Cusano, Carmen M.; Rubin, Isaac D.; Jones, Ronald E.; and Vartanian, Paul F., to Texaco Inc. Nitrogen containing polymers prepared from methacrylic esters as carburetor detergents and corrosion inhibitors. 4,161,392, Cl. 44-62.000.

Cushing, David E.; and Tague, Steven A., to Honeywell Information Systems, Inc. Microprogrammable floating point arithmetic unit capable of performing arithmetic operations on long and short operands. 4,161,784, Cl. 364-748.000.

Cybernet Electronic Corporation: See—

Kakigi, Takao, 4,161,695, Cl. 325-17.000.

Dahod, Ashraf M.: See—

Hopkins, Gregory T.; Dahod, Ashraf M.; Demarines, Victor A.; Meisner, Norman B.; and Willard, David G., 4,161,786, Cl. 364-900.000.

Dai Nippon Toray Co., Ltd.: See—

Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,161,457, Cl. 252-301.40R.

Daiel Ltd.: See—

Kojima, Katumi, 4,161,447, Cl. 210-23.00H.

Dainippon Jochugiki Kabushiki Kaisha: See—

Katsuda, Yoshio; Nakajima, Minoru; and Fujita, Toshio, 4,161,537, Cl. 424-304.000.

Dalferth, Hans H.; and Mauer, Dieter A. G. Attachment device for securing structural parts to a chain. 4,161,100, Cl. 59-93.000.

Daly, Thomas C.: See—

Groves, Stanley E.; Schriber, Gene A.; Spinks, Brian M.; Baker, Richard M.; Daly, Thomas C.; and Means, Rodney J., 4,161,787, Cl. 364-900.000.

Dangeleit, Siegfried; and Kothe, Dieter, to DEMAG Aktiengesellschaft. Apparatus for handling the starting strand of a metal strand casting plant. 4,161,209, Cl. 164-446.000.

D'Angelo, Severino: See—

Fegraus, Clark E.; and D'Angelo, Severino, 4,161,116, Cl. 73-117.000.

Danko, Edward M., to Color Custom Compounding, Inc. Method of forming finishing welts. 4,161,506, Cl. 264-174.000.

Daravinas, George V.: See—

Wagenknecht, Austin C.; deceased; Daravinas, George V.; and Koski, William E., 4,161,517, Cl. 424-48.000.

Darrington, Franklin D.: See—

Akin, Cavit; and Darrington, Franklin D., 4,161,546, Cl. 426-104.000.

Dashow, Russell N., to RND Company. Web product with marker and method of manufacture. 4,161,249, Cl. 206-459.000.

Dasy Inter S.A.: See—

Brosow, Jorgen, 4,161,624, Cl. 179-1.0HF.

Davenport, Bobby E.: See—

Nix, Edwin L.; and Davenport, Bobby E., 4,161,335, Cl. 296-39.00R.

Davis, Daryl. Winding machine. 4,161,298, Cl. 242-67.10R.

Davis, Donald T.: See—

Lytle, R. Jeffrey; Lager, Darrel L.; Laine, Edwin F.; and Davis, Donald T., 4,161,687, Cl. 324-6.000.

Davis, John E.; and Davis, Pauls, to BASF Wyandotte Corporation. Process for the preparation of graft polymer dispersions employing liquid free radical catalysts. 4,161,468, Cl. 260-30.40R.

Davis, Kirk E., to Lubrizol Corporation. The Sulfurized Mannich condensation products and lubricants containing same. 4,161,475, Cl. 260-132.000.

Davis, Pauls: See—

Davis, John E.; and Davis, Pauls, 4,161,468, Cl. 260-30.40R.



- Davison, Thomas W.: See—  
Suzuki, Fred K.; and Davison, Thomas W., 4,161,557, Cl. 428-1.000.
- Dayco Corporation: See—  
Ross, Donald E., 4,161,330, Cl. 283-55.000.
- DeBernardo, Silvano: See—  
Weigle, Manfred; and DeBernardo, Silvano, 4,161,582, Cl. 536-1.000.
- Decker, Elmer L.; and Moon, James, to Decker Engineering Corporation. Hydraulic-electronic load sensing device for load indicating apparatus. 4,161,117, Cl. 73-141.00R.
- Decker Engineering Corporation: See—  
Decker, Elmer L.; and Moon, James, 4,161,117, Cl. 73-141.00R.
- DeDietrich (USA), Inc.: See—  
Schlosberg, Seymour; and Lerman, Michael J., 4,161,689, Cl. 324-54.000.
- Degnan, William G., to United Technologies Corporation. Aircraft control system component with improved ballistic tolerance. 4,161,125, Cl. 74-469.000.
- Delarbre, Aime; Boesner, Joachim; and Blank, Michael, to Kugelfischer Georg Schafer & Co. Method of and means for rotatably supporting a load. 4,161,344, Cl. 308-222.000.
- DEMAG Aktiengesellschaft: See—  
Dangeleit, Siegfried; and Kothe, Dieter, 4,161,209, Cl. 164-446.000.
- Demarines, Victor A.: See—  
Hopkins, Gregory T.; Dahod, Ashraf M.; Demarines, Victor A.; Meisner, Norman B.; and Willard, David G., 4,161,786, Cl. 364-900.000.
- Denki Onkyo Co., Ltd.: See—  
Onoue, Shoji, 4,161,776, Cl. 363-146.000.
- De Nora, Oronzio; Nidola, Antonio; and Spaziante, Placido M., to Oronzio De Nora Impianti Elettrochimici S.p.A. Decomposition of alkali metal amalgams. 4,161,433, Cl. 204-98.000.
- De Nora, Oronzio; and De Nora, Vittorio, to Oronzio De Nora Impianti Elettrochimici S.p.A. Electrolysis cell. 4,161,438, Cl. 204-266.000.
- De Nora, Vittorio: See—  
De Nora, Oronzio; and De Nora, Vittorio, 4,161,438, Cl. 204-266.000.
- Denton Industries, Inc.: See—  
Pellico, Michael A., 4,161,410, Cl. 106-35.000.
- DePinna, George L., to Goodren Products Corp. Three-dimensional product marker. 4,161,074, Cl. 40-124.100.
- De Rossi, Danilo: See—  
Bedini, Remo; and De Rossi, Danilo, 4,161,653, Cl. 250-215.000.
- De Santis, Michael A.: See—  
Giffin, James W.; De Santis, Michael A.; and Burchard, John S., 4,161,356, Cl. 354-323.000.
- DeSimone, Salvatore: See—  
Barouh, Victor; Rottmann, George; and DeSimone, Salvatore, 4,161,551, Cl. 428-539.000.
- Detz, Clifford M., to Union Carbide Corporation. Method for stabilizing acetylene. 4,161,495, Cl. 585-4.000.
- Deutsche Babcock Aktiengesellschaft: See—  
Beelmann, Richard; Kerstges, Johannes; and Mertens, Paul, 4,161,293, Cl. 241-56.000.
- Hennecke, Hermann; Mertens, Paul; and Krecher, Josef, 4,161,295, Cl. 241-66.000.
- Lautenschlager, Friedrich W.; and Hennecke, Hermann, 4,161,294, Cl. 241-56.000.
- Deutsche Gold- und Silber-Scheideanstalt vormals Roesler: See—  
Kleemann, Axel; Klenk, Herbert; and Schwarze, Werner, 4,161,491, Cl. 260-557.00R.
- Deutsche Texaco Aktiengesellschaft: See—  
Humbert, Heiko; and Wegner, Hans-Georg, 4,161,496, Cl. 585-836.000.
- De Vittori, Gianfranco. Flagpole particularly for indicating goals in skiing competitions. 4,161,723, Cl. 340-323.00R.
- De Volder, Noel J.: See—  
Gilliams, Yvan K.; and De Volder, Noel J., 4,161,453, Cl. 252-62.10L.
- Dewey, Craig D.: See—  
Raugulis, Indulis E.; Dewey, Craig D.; and Gundrum, Richard H., 4,161,144, Cl. 105-163.00R.
- Dexter, Martin: See—  
Spivack, John D.; and Dexter, Martin, 4,161,473, Cl. 260-45.85S.
- Dharia, Prabodh M.: See—  
Parikh, Bipin D.; Patnaik, Hareesh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; Kurtz, John J.; Jenkins, Alfred D.; and Mahajan, Prakash Y., 4,161,719, Cl. 340-147.05Y.
- Dickey, Russell F. Practice device for basketball. 4,161,313, Cl. 273-1.50A.
- Dilgren, Richard E.; and Owens, Kenneth B., to Shell Oil Company. Hot water foam oil production process. 4,161,217, Cl. 166-252.000.
- Dill, Terry A., to Jefferson Industries Company. The. Material flow stoppage detector device. 4,161,677, Cl. 318-482.000.
- Dishal, Milton; and Van Etten, James P., to International Telephone and Telegraph Corporation. Pulse transmitter reference networks supplying ECD capability. 4,161,696, Cl. 325-163.000.
- Dorlars, Alfons: See—  
Klaue, Erich; Kysela, Ernst; and Dorlars, Alfons, 4,161,593, Cl. 544-217.000.
- Dow Chemical Company, The: See—  
Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., 4,161,573, Cl. 526-64.000.
- Stallcup, Odie T., 4,161,539, Cl. 424-317.000.
- Ward, John K.; and Gardner, Johnny B., 4,161,554, Cl. 427-239.000.
- Wessling, Ritchie A.; and Gurnee, Edward F., 4,161,502, Cl. 264-119.000.
- Doyen, June E.: See—  
Sell, Nancy J.; and Doyen, June E., 4,161,411, Cl. 106-100.000.
- Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, to Ciba-Geigy Corporation. Pesticidal aliphatic carboxylates. 4,161,536, Cl. 424-304.000.
- Drabek, Jozef: See—  
Meyer, Willy; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; and Kristiansen, Odd, 4,161,535, Cl. 424-304.000.
- Dracon Industries: See—  
Mason, John R.; and Gregson, Donald L., 4,161,061, Cl. 29-566.400.
- Draese, Rudiger: See—  
Kotzsch, Hans-Joachim; Draese, Rudiger; and Vahlensieck, Hans-Joachim, 4,161,486, Cl. 260-448.20E.
- Dragerwerk Aktiengesellschaft: See—  
Fleckenstein, Wolfgang, 4,161,437, Cl. 204-195.00P.
- Drayer, Sanford A.; and Wampler, Gordon D. Insulator assembly having novel feedthrough portion. 4,161,622, Cl. 174-152.00R.
- Dresser Industries, Inc.: See—  
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- Carpenter, David M., 4,161,123, Cl. 73-741.000.
- Mitchell, Howard E., 4,161,225, Cl. 175-374.000.
- Drinkard, John H., Jr.: See—  
Szarewicz, Thomas D.; and Drinkard, John H., Jr., 4,161,654, Cl. 250-221.000.
- Drummond, Thane M., to General Electric Company. Control system for and method of zero error automatic calibration of gas turbine temperature control parameters. 4,161,101, Cl. 60-39.030.
- Dubil, James F.; Falcoz, Alain M.; Glaise, Rene J.; Jacquart, Christian A.; Leighton, Howard N.; Riso, Vladimir; and Wilfinger, Raymond J., to International Business Machines Corporation. Universal transverse filter chip. 4,161,706, Cl. 333-165.000.
- Dubovitsky, Fedor I.: See—  
Merzhanov, Alexandr G.; Borovinskaya, Inna P.; Karjuk, Gennady G.; Dubovitsky, Fedor I.; Prokudina, Valentina K.; Ratnikov, Viktor I.; Bochkov, Anatoly V.; Moshkovsky, Evgeny I.; Sharivker, Semen J.; and Krizhanovsky, Sergei S., 4,161,512, Cl. 423-440.000.
- Duffy, Thomas E.; and Rohy, David A., to International Harvester Company. Methods of and apparatus for energy storage and utilization. 4,161,211, Cl. 165-1.000.
- Duhault, Jacques: See—  
Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, 4,161,529, Cl. 424-274.000.
- Dunham, Philip N., to P.R.K., Inc. Method and device for repairing damaged screw propellers. 4,161,056, Cl. 29-402.000.
- Du Pont de Nemours, E. I., and Company: See—  
Bellina, Russell F., 4,161,591, Cl. 544-164.000.
- Cramer, Richard D., 4,161,609, Cl. 560-215.000.
- Frazer, August H., 4,161,607, Cl. 560-65.000.
- Kassal, Robert J., 4,161,471, Cl. 260-40.00R.
- Schleimitz, Henry M.; and Stephan, Paul G., 4,161,500, Cl. 264-1.000.
- Dwinell, William S.: See—  
Frosch, Robert A.; and Dwinell, William S., 4,161,661, Cl. 307-119.000.
- Dynamit Nobel Aktiengesellschaft: See—  
Kotzsch, Hans-Joachim; Draese, Rudiger; and Vahlensieck, Hans-Joachim, 4,161,486, Cl. 260-448.20E.
- E. G. O. Elektro-Geraete Bland und Fischer: See—  
Goessler, Gerhard, 4,161,648, Cl. 219-464.000.
- Eastman Kodak Company: See—  
Campbell, Gerald A., 4,161,407, Cl. 96-114.000.
- Coates, Clarence A., Jr.; and Weaver, Max A., 4,161,601, Cl. 546-176.000.
- Eastside Machine & Welding, Inc.: See—  
Appleman, Theodore C., 4,161,555, Cl. 427-333.000.
- Eaton Allen Corp.: See—  
Barouh, Victor; Rottmann, George; and DeSimone, Salvatore, 4,161,551, Cl. 428-539.000.
- Ebibt, Joachim: See—  
Hermann, Hans D.; and Ebibt, Joachim, 4,161,565, Cl. 428-437.000.
- Eckhardt, Friedrich; Raffenberg, Wolfgang; and Klein, Axel, to U.S. Philips Corporation. Card feeding mechanism. 4,161,312, Cl. 271-3.000.
- Eckstien, Zvi: See—  
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- Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., to Celanese Corporation. Extrusion grade polyethylene terephthalate. 4,161,579, Cl. 525-444.000.
- Edgar Pickering (Blackburn) Limited: See—  
Lund, Kenneth, 4,161,147, Cl. 112-79.00R.
- Edridge, Alfred J., to Chevron Research Company. Reforming furnace having ceramic-coated tubes. 4,161,510, Cl. 422-197.000.
- Edwards, Donald W.; and Wells, Luther R., Jr., to Southern Explosives Corporation. Blasting booster and methods. 4,161,142, Cl. 102-23.000.
- Efros, Boris. Bicycle. 4,161,328, Cl. 280-290.000.
- Ekeborg, Bo-Gunnar; and Lofgren, Stig-Gunnar, to Mo och Domsjo Aktiebolag. Vehicles having reduced tilting of the superstructure thereof relative to the wheel axle support therefor. 4,161,322, Cl. 280-6.00R.

- Eklund, Ingvar A.; and Lejdegard, Sixten H., to Bulten-Kanthall Aktiebolag. Self-tapping screw. 4,161,132, Cl. 85-47.000.
- Electric Power Research Institute, Inc.: See—  
Harris, Lawrence A., 4,161,715, Cl. 340-16.00R.
- Electronic Memories & Magnetics Corporation: See—  
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- Elkem-Spigerverket A/S: See—  
Skretting, Hans, 4,161,501, Cl. 264-66.000.
- Elliott, Billy N., to Zimmermann Metals, Inc. Illuminated hand rail. 4,161,769, Cl. 362-146.000.
- Elster, Charles H.; and Gibbs, Gabriel J., to Lonza Inc. Process for making 1-hydroxyethyl-2-undecyl-2-imidazoline. 4,161,604, Cl. 548-352.000.
- Engel, Michael R.: See—  
Wen, Richard Y.; LaFleur, Linda L.; Engel, Michael R.; and Lucas, Anthony J., 4,161,518, Cl. 424-52.000.
- Enomoto, Takamichi; and Sakuma, Seiti, to Ricoh Co., Ltd. Photosensitive material for use in electrophotography with a poly alkyl or benzyl glutamate. 4,161,404, Cl. 96-1.50R.
- Envirotech Corporation: See—  
Brown, Norris K.; and Foust, James W., 4,161,395, Cl. 55-178.000.
- Erb, Elisha W.; and Resch, Darrel R. Pneumatic nebulizer and method. 4,161,281, Cl. 239-8.000.
- Erb, Elisha W.; and Resch, Darrel R. Microcapillary nebulizer and method. 4,161,282, Cl. 239-8.000.
- Erben, Ludwig, to Trutzschler GmbH & Co. KG. Method and apparatus for making a uniform, continuous sliver. 4,161,052, Cl. 19-240.000.
- Erickson, John W.; and Soriano, Peter A., to Kobe, Inc. Combined separator and pump with dirty phase concentrator. 4,161,448, Cl. 210-258.000.
- Erlichman, Irving, to Polaroid Corporation. Printer for producing print of an electronically recorded image. 4,161,749, Cl. 358-75.000.
- Erni & Co., Elektroindustrie: See—  
Maurer, Urs, 4,161,770, Cl. 362-309.000.
- Essilor International (Cie Generale d'Optique): See—  
Lenne, William; Bourdot, Jean F.; and Rolland, Guy, 4,161,060, Cl. 29-527.100.
- Ettinger, Robert H., to General Electric Company. Vacuum interrupter latch release mechanism. 4,161,638, Cl. 200-153.05C.
- Eubanks, Ann S.; and Steinkraus, Celeste M. Thread and yarn organizer. 4,161,075, Cl. 40-309.000.
- Eutectic Corporation: See—  
Fluckiger, Jean L.; and Wasserman, Rene, 4,161,207, Cl. 164-80.000.
- Evancho, Joseph W.: See—  
Vernam, William D.; and Evancho, Joseph W., 4,161,553, Cl. 428-654.000.
- Evans, Samuel; and Rasberger, Michael, to Ciba-Geigy Corporation. Piperidinyl-s-triazines. 4,161,592, Cl. 544-198.000.
- Every, William A.: See—  
Paspek, Stephen C., Jr.; and Every, William A., 4,161,613, Cl. 562-600.000.
- EVG Entwicklungs- und Verwertungs-Gesellschaft mbH.: See—  
Ritter, Klaus; Ritter, Gerhard; Ritter, Josef; Pohacker, Josef; and Jahrbacher, Gert, 4,161,110, Cl. 72-7.000.
- Ewen, Woodrow W., II: See—  
Rudolph, Louis R.; and Ewen, Woodrow W., II, 4,161,780, Cl. 364-434.000.
- Exxon Production Research Company: See—  
Mifsud, Joseph F., 4,161,229, Cl. 181-114.000.
- Exxon Research & Engineering Co.: See—  
Baiel, James J.; and Tsouopoulos, Constantine, 4,161,429, Cl. 203-18.000.
- Brunson, Roy J., 4,161,440, Cl. 208-8.00R.
- Faber, Peter, to Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft. Composite electrode for storage batteries, accumulators and the like. 4,161,569, Cl. 429-234.000.
- Fabrig, Paul, to Womako-Maschinenkonstruktionen GmbH. Method and apparatus for making spiral binder note books. 4,161,196, Cl. 140-92.400.
- Falcoz, Alain M.: See—  
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- Fandrei, Norman P.: See—  
Felix, Larry L.; and Fandrei, Norman P., 4,161,352, Cl. 350-301.000.
- Farooq, Saleem: See—  
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- Fedorov, Viktor V.: See—  
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- Fegraus, Clark E.; and D'Angelo, Severino, to Automotive Environmental Systems, Inc. Inertia and road load simulation for vehicle testing. 4,161,116, Cl. 73-117.000.
- Feier, Markus, to Contraves AG. Method and apparatus for particle analysis. 4,161,690, Cl. 324-71.00CP.
- Feinberg, Robert S.; and Selick, David A. Method of and means for preserving tennis balls or the like. 4,161,247, Cl. 206-315.00B.
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- Ferranti Limited: See—  
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- FIAT Societa per Azioni: See—  
Bedini, Remo; and De Rossi, Danilo, 4,161,653, Cl. 250-215.000.
- Fisons Limited: See—  
Bell, John H., 4,161,516, Cl. 424-14.000.
- Flavell, Evan R.: See—  
Ross, Albert; Garrett, Richard H.; Gordon, Hayden S.; and Flavell, Evan R., 4,161,337, Cl. 297-230.000.
- Fleckenstein, Wolfgang, to Dragerwerk Aktiengesellschaft. Measuring probe for the polarographic determination of partial gas pressures. 4,161,437, Cl. 204-195.00P.
- Fleskens, Ludovicus A. H.: See—  
Alisic, Slobodan; Hamer, Rene H.; and Fleskens, Ludovicus A. H., 4,161,676, Cl. 315-395.000.
- Flores, Raymond. Sealing mechanism for a liquid floor drain. 4,161,043, Cl. 4-292.000.
- Floroff, Peter. Fuel metering device for internal combustion engine. 4,161,499, Cl. 261-36.00A.
- Fluckiger, Jean L.; and Wasserman, Rene, to Eutectic Corporation. Production of carbide laden consumables in a graphite mold. 4,161,207, Cl. 164-80.000.
- FMC Corporation: See—  
Cuiper, Glen H.; and Ames, Thomas J., 4,161,367, Cl. 405-169.000.
- Haley, Frank P., 4,161,199, Cl. 141-387.000.
- Focke, Heinz, to Focke & Pfuhl. Method and apparatus for wrapping groups of cigarettes. 4,161,093, Cl. 53-228.000.
- Focke & Pfuhl: See—  
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- Fontanille, Michel: See—  
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,161,494, Cl. 260-665.00R.
- Food Technology Products: See—  
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 4,161,543, Cl. 426-2.000.
- Forberg, Sevald; and Olsson, Per-Inge. Method of preparing titanates suitable as ion-exchange material. 4,161,513, Cl. 423-598.000.
- Forenade Fabriksverken: See—  
Svensson, Lars G.; Karlstedt, Gustav; Tisell, Claes; and Thorstensson, Yngve, 4,161,228, Cl. 180-282.000.
- Fortescue, George H.: See—  
Caouette, Kenneth O.; Fortescue, George H.; Zaman, Mohammad K.; and Oda, Donald J., 4,161,650, Cl. 250-199.000.
- Foster Wheeler Energy Corporation: See—  
Bromwich, Robert A. C.; Hill, William G.; and Lawrence, Charles M., 4,161,640, Cl. 219-60.00A.
- Foulkes, Stanley C.; Moore, Robert; Ratcliffe, James; and Stephenson, James M., to Chloride Group Limited. Method of making multitubular sheaths. 4,161,503, Cl. 264-136.000.
- Foust, James W.: See—  
Brown, Norris K.; and Foust, James W., 4,161,395, Cl. 55-178.000.
- Fraley, Lawrence R.: See—  
Bouchard, Andre C.; and Fraley, Lawrence R., 4,161,388, Cl. 431-359.000.
- Francois, Edgar, to Uniroyal, Inc. Method of fastening to a belt. 4,161,059, Cl. 29-432.000.
- Francia, Josef: See—  
Stossberg, Udo; Francia, Josef; Meyer, Hans F.; and Kneuttinger, Alfons, 4,161,134, Cl. 91-219.000.
- Franz, Herbert; Wamsler, Reinhold; and Binder, Georg, to Robert Bosch GmbH. Rectifier unit for provision in an alternator. 4,161,775, Cl. 363-145.000.
- Frater, James J., to Menasha Corporation. Security container. 4,161,261, Cl. 220-337.000.
- Frazer, August H., to Du Pont de Nemours, E. I., and Company. Thermally stable, rigid bisphenols. 4,161,607, Cl. 560-65.000.
- Fresard, Marcel; and Jimenez, Antonio, to Mefina S.A. Sewing machine. 4,161,151, Cl. 112-217.100.
- Freund, Hans-Ulrich: See—  
Bol, Johannes; and Freund, Hans-Ulrich, 4,161,366, Cl. 356-56.000.
- Frey, Richard H., to Microwave Semiconductor Corp. High frequency power transistor having reduced interconnection inductance and thermal resistance. 4,161,740, Cl. 357-36.000.
- Freychet, Aime; and Gouzy, Andre, to Commissariat a l'Energie Atomique. Open ducts designed for ready disassembly and re-use. 4,161,193, Cl. 138-103.000.
- Friberg, Vincent P.; and Kruczek, Chester R., to General Instrument Corporation. Electronic tuning system with digital band selection. 4,161,708, Cl. 334-15.000.
- Frosch, Robert A.; and Dwinell, William S. System for automatically switching transformer coupled lines. 4,161,661, Cl. 307-119.000.
- Fuchs, Heinz, to Intermedicat GmbH. Catheter attachment. 4,161,177, Cl. 128-214.400.
- Fuhrhop, Ronald E., to Union Carbide Corporation. Method and apparatus for producing a post-mixed, stabilized scarfing pre-heating flame. 4,161,413, Cl. 148-9.500.
- Fuji Photo Film Co., Ltd.: See—  
Hanai, Yoshimitsu; Hirata, Makio; and Kogane, Mikio, 4,161,364, Cl. 355-72.000.
- Fujikata, Kenji; Yokozawa, Norio; and Shibayama, Akinori, to Hitachi, Ltd.; and Nippon Telegraph and Telephone Public Corporation. Analog comparator. 4,161,700, Cl. 328-147.000.



Fujikura Cable Works, Ltd., The: See—  
Agatsuma, Ko; Koyama, Kenichi; Todoriki, Itaru; Yamaguchi, Tetsuo; Kohno, Osamu; and Saito, Takashi, 4,161,062, Cl. 29-599.000.

Fujisawa, Hiroshi: See—  
Ishizuka, Kenzo; Fujisawa, Hiroshi; and Noda, Etsunosuke, 4,161,527, Cl. 424-246.000.

Fujita, Toshio: See—  
Katsuda, Yoshio; Nakajima, Minoru; and Fujita, Toshio, 4,161,537, Cl. 424-304.000.

Fujiwara, Kunio: See—  
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,161,505, Cl. 264-171.000.

Furukawa, Hisao: See—  
Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, 4,161,572, Cl. 525-100.000.

Futaba Denshi Kogyo K. K.: See—  
Morimoto, Kiyoshi; Utamura, Yukihiko; and Takagi, Toshinori, 4,161,418, Cl. 148-175.000.

Fuzisawa, Noriyoshi; and Hattori, Kenichi, to Kao Soap Co., Ltd. Method for vessel cultivation of *Lentinus edodes*, 4,161,083, Cl. 47-1.100.

G. D. Searle & Co.: See—  
Pappo, Raphael; and Garland, Robert B., 4,161,480, Cl. 260-365.000.

Gaber, Steven L. Skateboard, 4,161,326, Cl. 280-87.04A.

Gabry, William. Adjustable animal trap, 4,161,080, Cl. 43-82.000.

Gadani, Carlo. Machine for continuous production of molded articles, 4,161,383, Cl. 425-302.100.

Gaddy, Arthur K. Rocker wheel jack for an oil-well pump, 4,161,137, Cl. 92-13.000.

Gagliani, John: See—  
Long, John V.; and Gagliani, John, 4,161,477, Cl. 260-326.00C.

Gallant, Donald A., to Longwood Machine Works, Inc. Apparatus for producing a time-proportioned control signal electronically, 4,161,660, Cl. 307-118.000.

Gallon & Company: See—  
Ohno, Akira, 4,161,549, Cl. 426-460.000.

Galluccio, Richard A.: See—  
Stambaugh, Robert L.; and Galluccio, Richard A., 4,161,452, Cl. 252-34.000.

Gard, Inc.: See—  
Buday, John M.; Holmes, Lawrence B.; Milenkovic, Veljko; and Stevens, Bernard, 4,161,092, Cl. 53-244.000.

Buday, John M., 4,161,095, Cl. 53-527.000.

Gardner, Johnny B.: See—  
Ward, John K.; and Gardner, Johnny B., 4,161,554, Cl. 427-239.000.

Garland, Robert B.: See—  
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Garlinghouse, Roland E. Fail safe fluid power device, 4,161,135, Cl. 91-417.00R.

Garner, Joseph L.: See—  
Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., 4,161,573, Cl. 526-64.000.

Garrett, Richard H.: See—  
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Gaspark, Emery P., to General Electric Company. Matrix multiplier, 4,161,785, Cl. 364-827.000.

Gauthier, Ray J.; and Caverzan, Fred G. Artificial Christmas tree, 4,161,768, Cl. 362-123.000.

Gebruder Weiss KG: See—  
Kneer, Franz X., 4,161,426, Cl. 435-313.000.

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Anderson, Roy E., 4,161,730, Cl. 343-6.50R.

Anderson, Roy E., 4,161,734, Cl. 343-100.0ST.

Bogacki, Anthony P., 4,161,720, Cl. 340-150.000.

Bopp, Richard C., 4,161,498, Cl. 525-439.000.

Cap, Daniel M.; and Lake, William H., 4,161,672, Cl. 313-220.000.

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Cotic, Dennis J.; Hoffman, David M.; Shelley, Peter S.; and Zech, Laurel J., 4,161,655, Cl. 250-385.000.

Crivello, James V., 4,161,405, Cl. 96-35.100.

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Drummond, Thane M., 4,161,101, Cl. 60-39.030.

Ettinger, Robert H., 4,161,638, Cl. 200-153.0SC.

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Henry, Michael F., 4,161,412, Cl. 148-3.000.

Hoover, James W.; Long, James; and Matulevich, Edward S., 4,161,717, Cl. 340-62.000.

Hryciak, Kenneth S.; Leonhardt, John H.; and Prentice, William J., Jr., 4,161,617, Cl. 13-6.000.

LeGrand, Donald G.; and Yee, Albert F., 4,161,469, Cl. 260-40.00R.

Rathje, William C., 4,161,681, Cl. 318-783.000.

Stetson, Earl W., 4,161,763, Cl. 361-128.000.

General Electric Company Limited, The: See—  
Insam, Edward F., 4,161,728, Cl. 340-750.000.

General Instrument Corporation: See—  
Frieberg, Vincent P.; and Kruczek, Chester R., 4,161,708, Cl. 334-15.000.

General Mills, Inc.: See—  
Wagenknecht, Austin C.; deceased; Daravingas, George V.; and Koski, William E., 4,161,517, Cl. 424-48.000.

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Buck, Charles E.; Johnson, James M.; and Joseph, Paul A., 4,161,665, Cl. 310-26.000.

Genese, Joseph N., to Abbott Laboratories. Additive transfer device, 4,161,178, Cl. 128-272.300.

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Hauri, Hermann, 4,161,257, Cl. 215-260.000.

Georg Fischer Aktiengesellschaft: See—  
Toedtli, Sergej, 4,161,086, Cl. 51-418.000.

GESTRA-KSB Vertriebsgesellschaft mbH & Co.: See—  
Klann, Holm; and Lingnau, Josef, 4,161,278, Cl. 236-56.000.

Getson, Edward F., Jr.; Kelley, John H.; Rathbun, Donald J.; and McLaughlin, Albert T., to Honeywell Information Systems, Inc. Synchronization control system for firmware access of high data rate transfer bus, 4,161,778, Cl. 364-200.000.

GF Business Equipment, Inc.: See—  
Williams, Philip J., 4,161,305, Cl. 248-608.000.

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Elster, Charles H.; and Gibs, Gabriel J., 4,161,604, Cl. 548-352.000.

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Hansen, James E., 4,161,331, Cl. 285-5.000.

Gigante, John. Method for making readily reshaping dentures, 4,161,065, Cl. 32-2.000.

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Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, to Food Technology Products. Feeding herbivorous animals, 4,161,543, Cl. 426-2.000.

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Giesmann, Herbert C.: See—  
Fasse, Mark E.; and Giesmann, Herbert C., 4,161,143, Cl. 104-244.100.

Glover, Tony L. Potato and rock sorter, 4,161,443, Cl. 209-157.000.

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Goldstein, Guy; Roussin-Moynier, Yves; and Albrecht, Gerd, to Beghin-Say. Extrusion apparatus for producing composite structures, 4,161,385, Cl. 425-462.000.

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Goodman, David J. Direction finding antenna and system, 4,161,736, Cl. 343-739.000.

Goodren Products Corp.: See—  
DePinna, George L., 4,161,074, Cl. 40-124.100.

Gordon, Hayden S.: See—  
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Gorman, William G., to Sterling Drug Inc. Zinc salt prevention or removal of discoloration in pyrrhione, pyrrhione salt and dipyrhione compositions, 4,161,526, Cl. 424-245.000.

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Gould, Inc.: See—  
Jacobs, Philip C., Jr., 4,161,713, Cl. 337-161.000.

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Gould, Robert A.: See—  
Black, William L.; Gould, Robert A.; and Wood, Stanley E., 4,161,133, Cl. 89-7.000.

Gouzy, Andre: See—  
Freychet, Aime; and Gouzy, Andre, 4,161,193, Cl. 138-103.000.

Grafosol, S.p.A.: See—  
Boschet, Vittorino, 4,161,358, Cl. 355-3.0DR.

Granatek, Alphonse P.: See—  
Kaplan, Murray A.; and Granatek, Alphonse P., 4,161,595, Cl. 544-284.000.

Grapes, Eugene F.: See—  
Patterson, William W., III; and Grapes, Eugene F., 4,161,145, Cl. 105-376.000.

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Green, William M.; and Hoover, Maurice W. Honey coated roasted nut product and method for making same, 4,161,545, Cl. 426-93.000.

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Gregg, Robert M.; and Miller, Philip C., to Zenith Radio Corporation. Arc suppression and static elimination system for a television CRT, 4,161,673, Cl. 313-481.000.

Gregson, Donald L.: See—  
Mason, John R.; and Gregson, Donald L., 4,161,061, Cl. 29-566.400.

Grier, Nathaniel: See—  
Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ying, 4,161,581, Cl. 525-411.000.

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Groves, Stanley E.; Schriber, Gene A.; Spinks, Brian M.; Baker, Richard M.; Daly, Thomas C.; and Means, Rodney J., to Motorola, Inc. Programmable timer module coupled to microprocessor system, 4,161,787, Cl. 364-900.000.

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Drabek, Josef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,161,536, Cl. 424-304.000.

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Goebel, Franz; and Marincic, Nikola, 4,161,063, Cl. 29-623.500.

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Bouchard, Andre C.; and Fraley, Lawrence R., 4,161,388, Cl. 431-359.000.

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Guisnet, Michel: See—  
Barrault, Joel; Guisnet, Michel; Lucien, Jacques; and Maurel, Raymond, 4,161,493, Cl. 260-609.00R.

Gulf & Western Manufacturing Company: See—  
Nelsen, Roger J., 4,161,342, Cl. 308-6.00R.

Pilz, Gilbert B.; and Young, George H., 4,161,329, Cl. 280-474.000.

Gulton Industries, Inc.: See—  
Bates, James W., 4,161,771, Cl. 363-43.000.

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Raugulis, Indulis E.; Dewey, Craig D.; and Gundrum, Richard H., 4,161,144, Cl. 105-163.00R.

Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., to Dow Chemical Company. The. Process for making polystyrene, 4,161,573, Cl. 526-64.000.

Gurnee, Edward F.: See—  
Wessling, Ritchie A.; and Gurnee, Edward F., 4,161,502, Cl. 264-119.000.

Guttman, Milton. Protective means against unauthorized entry for a doorway, 4,161,333, Cl. 292-288.000.

Guyot, Patrick: See—  
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,161,494, Cl. 260-665.00R.

H&T Enterprises, Inc.: See—  
Cope, Louis T., 4,161,108, Cl. 62-306.000.

Haas, Arnold: See—  
Reinecke, Erich; Ulrich, Helmut; Haas, Arnold; and Kolmitz, Willi, 4,161,341, Cl. 303-52.000.

Habermeier, Jürgen, to Ciba-Geigy Corporation. Dicarboxylic acids and dicarboxylic acid esters containing a benzimidazolone radical, 4,161,603, Cl. 548-305.000.

Habermeier, Jürgen: See—  
Batzer, Hans; Habermeier, Jürgen; and Porret, Daniel, 4,161,594, Cl. 544-302.000.

Habrich, Reiner, to Siemens Aktiengesellschaft. Multiple dosing device, 4,161,262, Cl. 222-1.000.

Haendle, Joerg; Horbaschek, Heinz; and Sklebitz, Hartmut, to Siemens Aktiengesellschaft. Television pick-up system, 4,161,755, Cl. 358-219.000.

Hagiwara, Yutaka, to Nissan Motor Company, Limited. Tandem master cylinder, 4,161,105, Cl. 60-561.000.

Haley, Frank P., to FMC Corporation. Vapor recovery frame, 4,161,199, Cl. 141-387.000.

Halff, Albert H.: See—  
Reid, Allen F.; and Halff, Albert H., 4,161,210, Cl. 165-1.000.

Halford, Wayne R., to Mattel, Inc. Curved track section for toy vehicle, 4,161,279, Cl. 238-10.00F.

Halle, Reidar; and Bock, Lawrence A., to Argus Chemical Corporation. Cyclic silyl peroxides, 4,161,485, Cl. 260-448.20R.

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Hostrup, Kai R., 4,161,224, Cl. 175-297.000.

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Brenner, Heinz; and Hamaekers, Arno, 4,161,304, Cl. 248-562.000.

Hamburger, Robert N., to University of California, The Regents of the. Method for blocking allergic responses, 4,161,522, Cl. 424-177.000.

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Alisic, Slobodan; Hamer, Rene H.; and Fleskens, Ludovicus A. H., 4,161,676, Cl. 315-395.000.

Hampl, Edward F., Jr., to Minnesota Mining and Manufacturing Company. Hydrostatically extruded thermoelectric legs, 4,161,111, Cl. 72-60.000.

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Hansen, James E., to Gifford-Hill & Company, Inc. Spherical irrigation pipe coupling with replaceable seal, 4,161,331, Cl. 285-5.000.

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Shiraki, Yoshiro; Haraoka, Hiroshi; and Arai, Hiromichi, 4,161,511, Cl. 423-341.000.

Harley, David N.: See—  
Cinch, Colin W. F.; Harley, David N.; and Palmer, John P., 4,161,307, Cl. 251-206.000.

Harmon, Edward J.: See—  
Bacsanyi, Thomas J.; and Harmon, Edward J., 4,161,666, Cl. 310-27.000.

Harms, David C.: See—  
Bennett, James P.; and Harms, David C., 4,161,630, Cl. 179-18.0EB.

Harnischfeger Corporation: See—  
Raugulis, Indulis E.; Dewey, Craig D.; and Gundrum, Richard H., 4,161,144, Cl. 105-163.00R.

Harris Corporation: See—  
McRae, Daniel D., 4,161,628, Cl. 179-15.0BL.

Harris, Frederick E., II; and Pavitt, William H., Jr., to Harris, Frederick Earl, II. Color adaptable bandage, 4,161,176, Cl. 128-155.000.

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Harris, Jesse R.: See—  
Myers, John W.; and Harris, Jesse R., 4,161,463, Cl. 252-455.00R.

Harris, Lawrence A., to Electric Power Research Institute, Inc. Method and apparatus for measuring the interior dimensions of a hollow body, 4,161,715, Cl. 340-16.00R.

Harsco Corporation: See—  
McGregor, Jimmie R., 4,161,384, Cl. 425-388.000.

Hart, James E., to Westinghouse Air Brake Company. Poppet valve type brake control valve device, 4,161,340, Cl. 303-33.000.

Hartnig, Richard E., to Paper Converting Machine Company. Apparatus for making a connected series of stuffed sealed envelope assemblies, 4,161,091, Cl. 53-206.000.

Hase, Takashi: See—  
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,161,457, Cl. 252-301.40R.

Hattori, Kenichi: See—  
Fuzisawa, Noriyoshi; and Hattori, Kenichi, 4,161,083, Cl. 47-1.100.

Haug, Theobald; Keifer, Jurg; Ruf, Peter; and Schmitter, Andre, to Ciba-Geigy Corporation. Thermosetting mixtures of polyimide beta-amino crotonic acid derivative and polyamine which are stable on storage, 4,161,580, Cl. 528-322.000.

Haugen, Donald J. Animal litter container, 4,161,157, Cl. 119-1.000.

Hauni-Werke Korber & Co. KG.: See—  
Blidung, Otto; Tolasch, Gerhard; and Bardenhagen, Dietrich, 4,161,094, Cl. 53-493.000.

Hauri, Hermann, to Genossenschaft Vebo Solothurnische Eingliederungs-Stätte für Behinderte. Closure for vacuum bottles and the like, 4,161,257, Cl. 215-260.000.

Hauser, Stephen G.; and Keith, Keith S., to United States Borax & Chemical Corporation. Device for dispensing powdered material, 4,161,265, Cl. 222-181.000.

Heide, Wilfried; Muller, Friedrich; Otto, Klaus; and Salanki, Tibor, to Siemens Aktiengesellschaft. Cooling capsule for a thyristor, 4,161,213, Cl. 165-168.000.

Heil, Charles W. Ski storing, protecting, and carrying apparatus, 4,161,268, Cl. 224-45.00S.

Heilmann, Juergen, to Siemens Aktiengesellschaft. Code generator for text transmission devices, 4,161,623, Cl. 178-79.000.

Hendrixon, John L.; and Rositch, Robert R., to Sealed Power Corporation. Piston ring and method of manufacture, 4,161,321, Cl. 277-216.000.

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Hennecke, Hermann: See—  
Lautenschlager, Friedrich W.; and Hennecke, Hermann, 4,161,294, Cl. 241-56.000.

Henry, Michael F., to General Electric Company. Method of heat treating  $\gamma/\gamma'$ -a eutectic nickel-base superalloy body, 4,161,412, Cl. 148-3.000.

Herman, John L.; and Stavisky, John, to Xerox Corporation. Photoreceptor heating apparatus, 4,161,357, Cl. 355-3.0DR.

Hermann, Hans D.; and Ebgt, Joachim, to Hoechst Aktiengesellschaft. Plasticizer containing polyvinylbutyral sheets having a reduced adhesion to glass, 4,161,565, Cl. 428-437.000.

Herron, Dale J., to Bepex Corporation. Process for solid phase polymerization of polyester, 4,161,578, Cl. 528-272.000.

Herron, William L., to Singer Company, The. Pretension threading device, 4,161,152, Cl. 112-254.000.

Heusler, Karl; and Woodward, Robert B., to Ciba-Geigy Corporation.  $\alpha$ -Halo-2-oxo-1-azetidinemethane-carboxylic acid compounds, 4,161,476, Cl. 260-306.70C.

Hewlett-Packard Company: See—  
Casey, Ross H., 4,161,270, Cl. 226-118.000.

Heyl, Bodo, to Robert Bosch GmbH. Mixing of SECAM color-T.V. signals, 4,161,748, Cl. 358-22.000.

Hicks, George E.; Litherland, John W.; Martin, Arlan G.; and Williams, Lawrence, to Caterpillar Tractor Co. Fuel additive injection system for diesel engines, 4,161,160, Cl. 123-1.00A.

Higgins, William A., to Lubrizol Corporation. The. Aqueous disperse compositions containing clay and oleaginous film-forming materials, 4,161,566, Cl. 428-454.000.

Hightower, Stanley J., to Martin Marietta Corporation. Pneumatically controlled wide heat load space radiator, 4,161,212, Cl. 165-96.000.

Hildebrandt, William J.; and West, Robert F., to Stanley Works, The. Digital tape rule, 4,161,781, Cl. 364-562.000.

Hill, Isaac. Instant mouse trap, 4,161,079, Cl. 43-58.000.

Hill, J. Ernest. Watering device, 4,161,290, Cl. 239-396.000.



Hill, William G.: See—  
Bromwich, Robert A. C.; Hill, William G.; and Lawrence, Charles M., 4,161,640, Cl. 219-60.00A.

Hiramoto, Seigo: See—  
Shimada, Wataru; and Hiramoto, Seigo, 4,161,645, Cl. 219-137.00R.

Hirata, Makio: See—  
Hanai, Yoshimitsu; Hirata, Makio; and Kogane, Mikio, 4,161,364, Cl. 355-72.000.

Hirsch, Wolfgang, to Behringwerke Aktiengesellschaft. Stabilized diagnostic test strip for the detection of urobilinogen, 4,161,507, Cl. 422-56.000.

Hirschmann, Ralph F.: See—  
Veber, Daniel F.; Holly, Frederick W.; Strachan, Robert G.; Paleveda, William J.; Nutt, Ruth F.; and Hirschmann, Ralph F., 4,161,521, Cl. 424-177.000.

Hisazumi, Nobuyuki: See—  
Yoshikawa, Shinsuke; Hisazumi, Nobuyuki; and Yamamoto, Masataka, 4,161,562, Cl. 428-215.000.

Hitachi, Ltd.: See—  
Fujikata, Kenji; Yokozawa, Norio; and Shibayama, Akinori, 4,161,700, Cl. 328-147.000.  
Kawagoe, Hiroto; and Nomiya, Kosei, 4,161,664, Cl. 307-304.000.  
Matsunaga, Takehiko; Umeda, Saburo; and Kamei, Tsuneaki, 4,161,431, Cl. 204-15.000.  
Sano, Yoshihiro; Chiba, Tomio; Kudou, Hiroyuki; and Miki, Yoshiteru, 4,161,651, Cl. 250-199.000.  
Takeda, Yutaka; Nakamura, Satoshi; Chinone, Naoki; Nakashima, Hisao; and Kurata, Kazuhiro, 4,161,701, Cl. 331-94.50H.

Hoechst Aktiengesellschaft: See—  
Bormann, Dieter; Merkel Wulf; and Muschaweck, Roman, 4,161,531, Cl. 424-274.000.  
Hermann, Hans D.; and Ebigt, Joachim, 4,161,565, Cl. 428-437.000.  
Konz, Elmar; and Pistorius, Rudolf, 4,161,614, Cl. 568-670.000.  
Muller, Werner H., 4,161,615, Cl. 568-740.000.  
Strametz, Helmut; and Rust, Kurt, 4,161,574, Cl. 526-159.000.  
Sturm, Karl; and Muschaweck, Roman, 4,161,533, Cl. 424-285.000.

Hoeger, John G.: See—  
Thomas, Carlton E.; Sigler, Robert D.; and Hoeger, John G., 4,161,351, Cl. 350-294.000.

Hoff, Gerald F.: See—  
Kessler, Bernard V.; Hoff, Gerald F.; and Burke, James R., 4,161,702, Cl. 331-94.50H.

Hoffman, David M.: See—  
Cotic, Dennis J.; Hoffman, David M.; Shelley, Peter S.; and Zech, Laurel J., 4,161,655, Cl. 250-385.000.

Hoffmann-La Roche Inc.: See—  
Weigle, Manfred; and DeBernardo, Silvano, 4,161,582, Cl. 536-1.000.

Hoffmann, David: See—  
Gugliotta, Paul F.; and Hoffmann, David, 4,161,088, Cl. 52-223.00R.

Hoffmann-La Roche Inc.: See—  
Osborne, Melville W.; and Cohen, Michael R., 4,161,520, Cl. 424-115.000.

Hollingsworth & Vose Company: See—  
Lawson, Grover C.; and Wilson, James C., 4,161,422, Cl. 162-135.000.

Holloway, Huland L.; and Norum, Edward M., Jr., to Lockwood Corporation. Center pivot irrigation system having apparatus for irrigating corners, 4,161,292, Cl. 239-11.000.

Holly, Frederick W.: See—  
Veber, Daniel F.; Holly, Frederick W.; Strachan, Robert G.; Paleveda, William J.; Nutt, Ruth F.; and Hirschmann, Ralph F., 4,161,521, Cl. 424-177.000.

Holman, Daniel V., to Adjustable Clamp Company. Kerf clamp, 4,161,311, Cl. 269-49.000.

Holmes, Lawrence B.: See—  
Buday, John M.; Holmes, Lawrence B.; Milenkovic, Veljko; and Stevens, Bernard, 4,161,092, Cl. 53-244.000.

Holmes Protection, Inc.: See—  
Conklin, Robert M.; and Human, Arthur T., 4,161,721, Cl. 340-168.00B.

Hone, George D.: See—  
Saunders, Robert L.; and Hone, George D., 4,161,049, Cl. 14-71.500.

Honecker, Gunter, to Linde Aktiengesellschaft. Steering assembly for a vehicle, especially for an industrial floor vehicle, such as a forklift truck, 4,161,327, Cl. 280-95.00R.

Honeywell Information Systems, Inc.: See—  
Cushing, David E.; and Tague, Steven A., 4,161,784, Cl. 364-748.000.

Getson, Edward F., Jr.; Kelley, John H.; Rathbun, Donald J.; and McLaughlin, Albert T., 4,161,778, Cl. 364-200.000.

Hoover, James W.; Long, James; and Matulevich, Edward S., to General Electric Company. Locked axle detector for a multi-axle traction vehicle, 4,161,717, Cl. 340-62.000.

Hoover, Maurice W.: See—  
Green, William M.; and Hoover, Maurice W., 4,161,545, Cl. 426-93.000.

Hopkins, Charles E., Sr.: See—  
Moores, Robert G., Jr.; and Hopkins, Charles E., Sr., 4,161,242, Cl. 192-34.000.

Hopkins, Gregory T.; Dahod, Ashraf M.; Demarines, Victor A.; Meisner, Norman B.; and Willard, David G., to Mitre Corporation. The Digital bus communications system, 4,161,786, Cl. 364-900.000.

Horbaschek, Heinz: See—  
Haendle, Joerg; Horbaschek, Heinz; and Sklebitz, Hartmut, 4,161,755, Cl. 358-219.000.

Horgan, John J.; and Morrison, Francis H., to United Technologies Corporation. Centrifugal combustor with fluidized bed and construction thereof, 4,161,103, Cl. 60-39.350.

Hostrup, Kai R., to Halliburton Company. Fluid dump mechanism, 4,161,224, Cl. 175-297.000.

Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: See—  
Kollenberger, Walter M., deceased, 4,161,154, Cl. 114-122.000.

Howarth, William F., Jr. Lifeline carrier, 4,161,266, Cl. 224-215.000.

Howells, John N. M., to Recycling & Conservation, Inc. Set of sorting-stacking bins, 4,161,252, Cl. 211-126.000.

HPM Corporation: See—  
Bishop, Thomas G., 4,161,380, Cl. 425-145.000.

Hryciak, Kenneth S.; Leonhardt, John H.; and Prentice, William J., Jr., to General Electric Company. Method and apparatus for electrically melting glass, 4,161,617, Cl. 13-6.000.

Hsu, Wei W.: See—  
Hao, Paul L. C.; Tang, Hong S.; and Hsu, Wei W., 4,161,465, Cl. 260-2.300.

Hugon, Pierre: See—  
Beregi, Laszlo; Hugon, Pierre; Duhaute, Jacques; and Boulanger, Michelle, 4,161,529, Cl. 424-274.000.

Human, Arthur T.: See—  
Conklin, Robert M.; and Human, Arthur T., 4,161,721, Cl. 340-168.00B.

Humbert, Heiko; and Wegner, Hans-Georg, to Deutsche Texaco Aktiengesellschaft. Novel method of treating a charge hydrocarbon stream containing isobutene and also butadiene, 4,161,496, Cl. 585-836.000.

Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., to Burroughs Corporation. Mail buffer feeder system, 4,161,244, Cl. 198-347.000.

Husson, Alan L., to Westinghouse Electric Corp. Elevator system, 4,161,236, Cl. 187-29.00R.

Husson, Alan L.: See—  
Caputo, William R.; and Husson, Alan L., 4,161,235, Cl. 187-29.00R.

Hutson, Thomas, Jr.: See—  
Makovec, Donald J.; and Hutson, Thomas, Jr., 4,161,497, Cl. 585-714.000.

Hutta, Joseph J.: See—  
Quinlan, Kenneth P.; and Hutta, Joseph J., 4,161,434, Cl. 204-146.000.

Hydriol Company: See—  
Blöse, Thomas L., 4,161,332, Cl. 285-334.000.

Hyman, Sy. Article for the dispensing of volatiles, 4,161,283, Cl. 239-55.000.

Ibec Industries, Inc.: See—  
Jacob, Keith, 4,161,685, Cl. 323-19.000.

Ikawa, Shukuko: See—  
Ando, Tadahiko; Shibata, Takehiko; Ikawa, Shukuko; and Kim, Cholung, 4,161,424, Cl. 435-199.000.

Imperial Chemical Industries Limited: See—  
Caunt, Anthony D.; and Williams, Ian G., 4,161,461, Cl. 252-429.00B.

Incoe Corporation: See—  
Osuna-Diaz, Jesus M., 4,161,386, Cl. 425-549.000.

Indesit Industria Elettrodomestici Italiana S.p.A.: See—  
Zappala, Giuseppe, 4,161,675, Cl. 315-371.000.

Indian Space Research Organisation, The: See—  
Nema, Suresh K., 4,161,482, Cl. 260-404.000.

Industrial Technology Research Institute: See—  
Hao, Paul L. C.; Tang, Hong S.; and Hsu, Wei W., 4,161,465, Cl. 260-2.300.

Industrie Specializzate Articolli Plastici S.p.A.: See—  
Padovani, Pietro, 4,161,382, Cl. 425-291.000.

Ingendahl, Kurt. Clock having a linear scale, 4,161,098, Cl. 58-2.000.

Innova, Inc.: See—  
Moeglich, Karl, 4,161,435, Cl. 204-152.000.

Insam, Edward F., to General Electric Company Limited, The. Electronic display apparatus, 4,161,728, Cl. 340-750.000.

Intermedicat GmbH: See—  
Fuchs, Heinz, 4,161,177, Cl. 128-214.400.

International Business Machines Corporation: See—  
Bailey, Jack H.; and Ottaway, Gerald H., 4,161,753, Cl. 358-128.000.

Barclay, Donald J.; and Morgan, William M., 4,161,432, Cl. 204-51.000.

Basilico, Albert R., 4,161,752, Cl. 358-128.000.

Dubil, James F.; Falcoz, Alain M.; Glaise, Rene J.; Jacquart, Christian A.; Leighton, Howard N.; Riso, Vladimir; and Wilfinger, Raymond J., 4,161,706, Cl. 333-165.000.

International Harvester Company: See—  
Duffy, Thomas E.; and Rohy, David A., 4,161,211, Cl. 165-1.000.

Moreno, Emil F., 4,161,369, Cl. 414-722.000.

Ralston, Horace E.; Robinson, Edward L., Jr.; and Ralston, William K., deceased, 4,161,253, Cl. 414-25.000.

International Nickel Company, Inc., The: See—  
Sandrock, Gary D., 4,161,401, Cl. 75-170.000.

Sandrock, Gary D., 4,161,402, Cl. 75-170.000.

International Research and Development Corp.: See—  
Leong, Basil K. J., 4,161,159, Cl. 119-18.000.

International Telephone and Telegraph Corporation: See—  
Dishal, Milton; and Van Eiten, James P., 4,161,696, Cl. 325-163.000.

Nemitt, Jeffrey T.; and Wolfson, Ronald I., 4,161,705, Cl. 333-156.000.

Treiber, Robert, 4,161,633, Cl. 179-170.200.

Inui, Takayasu; and Nishimura, Satoru, to Kabushiki Kaisha Komatsu Seisakusho. Transmission gear for a vehicle of the type having a swivelling upper structure with respect to an undercarriage, 4,161,227, Cl. 180-70.00R.

Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, to Copal Company Limited. Exposure controlling circuit for electric shutters, 4,161,764, Cl. 361-187.000.

Ishizuka, Kenzo; Fujisawa, Hiroshi; and Noda, Etsunosuke, to Takeda Chemical Industries, Ltd. Antibiotic compositions, 4,161,527, Cl. 424-246.000.

Itoh, Tsutomu; Sakurai, Munekazu; Yamamoto, Masahiro; and Okamoto, Yasunari, to Onoda Cement Co., Ltd. Powder material processing apparatus, 4,161,765, Cl. 361-226.000.

ITW Fastex Italia: See—  
Aimar, Michele, 4,161,669, Cl. 310-194.000.

ITW Limited: See—  
Clinch, Colin W. F.; Harley, David N.; and Palmer, John P., 4,161,307, Cl. 251-206.000.

Iwatsu Electric Co., Ltd.: See—  
Kokaji, Norio, 4,161,738, Cl. 346-74.100.

J. M. Huber Corporation: See—  
Wason, Satish K., 4,161,455, Cl. 252-174.250.

Jacob, Keith, to Scovill Manufacturing Company. Solid state proximity switch, 4,161,659, Cl. 307-39.000.

Jacob, Keith, to Ibec Industries, Inc. Solid state proximity switch, 4,161,685, Cl. 323-19.000.

Jacobs, Philip C., Jr., to Gould, Inc. Fusible element for electric fuses having a relatively high voltage rating and a relatively high cycling performance, 4,161,713, Cl. 337-161.000.

Jacobs, Philip C., Jr., to Gould, Inc. Electric fuse, 4,161,714, Cl. 337-253.000.

Jacquart, Christian A.: See—  
Dubil, James F.; Falcoz, Alain M.; Glaise, Rene J.; Jacquart, Christian A.; Leighton, Howard N.; Riso, Vladimir; and Wilfinger, Raymond J., 4,161,706, Cl. 333-165.000.

Jahrbacher, Gert: See—  
Ritter, Klaus; Ritter, Gerhard; Ritter, Josef; Pohacker, Josef; and Jahrbacher, Gert, 4,161,110, Cl. 72-7.000.

Jalin, Rene J.: See—  
Moreau, Bernard G. A.; and Jalin, Rene J., 4,161,652, Cl. 250-203.00R.

Janchen, Dieter, to Camag Chemie-Erzeugnisse und Adsorptionstechnik AG. Apparatus for applying liquid samples to surfaces, 4,161,508, Cl. 422-100.000.

Jasas, Gytis B.; Trauth, Richard L.; and Smith, Raymond, to Teledyne Industries, Inc. Turbine engine starting system, 4,161,102, Cl. 60-39.14M.

Jeffers, Robert P., to Youngstown Sheet and Tube Company. Tube joint and method of making same, 4,161,273, Cl. 228-154.000.

Jefferson Industries Company, The: See—  
Dill, Terry A., 4,161,677, Cl. 318-482.000.

Jenkins, Alfred D.: See—  
Parikh, Bipin D.; Patnaik, Haresh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; Kurtz, John J.; Jenkins, Alfred D.; and Mahajan, Prakash Y., 4,161,719, Cl. 340-147.05Y.

Jennings, Donald E.: See—  
United States of America, National Aeronautics and Space Administration; and Jennings, Donald E., 4,161,747, Cl. 357-82.000.

Jerrold Electronics Corporation: See—  
Winston, Eric, 4,161,790, Cl. 365-94.000.

Jimenez, Antonio: See—  
Fresard, Marcel; and Jimenez, Antonio, 4,161,151, Cl. 112-217.100.

Johnson, Bryan E.: See—  
Malmgren, Arthur L.; and Johnson, Bryan E., 4,161,264, Cl. 222-135.000.

Johnson, James M.: See—  
Buck, Charles E.; Johnson, James M.; and Joseph, Paul A., 4,161,665, Cl. 310-26.000.

Johnson, Joseph E.; Ostop, John A.; and Moore, David L., to Westinghouse Electric Corp. Glass sealed diode, 4,161,746, Cl. 357-73.000.

Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PG1, 3,4-didehydropiperidylamides, 4,161,585, Cl. 542-426.000.

Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PG1, hexamethyliminomides, 4,161,587, Cl. 542-426.000.

Johnson Rubber Company, The: See—  
Sudyk, John R., 4,161,379, Cl. 425-112.000.

Jones, Ronald E.: See—  
Cusano, Carmen M.; Rubin, Isaac D.; Jones, Ronald E.; and Vartanian, Paul F., 4,161,392, Cl. 44-62.000.

Jorgensen, Richard G., to Parker-Hannifin Corporation. Jet type liquid level sensor and system, 4,161,188, Cl. 137-386.000.

Joseph, Paul A.: See—  
Buck, Charles E.; Johnson, James M.; and Joseph, Paul A., 4,161,665, Cl. 310-26.000.

Jos. Schneider & Co. Optische Werke: See—  
Thomas, Otto, 4,161,756, Cl. 358-225.000.

Joshi, Madan M.: See—  
Bellet, Eugene M.; and Joshi, Madan M., 4,161,397, Cl. 71-7.000.

Justus, Edgar J., to Beloit Corporation. Method and apparatus for plybonding control, 4,161,205, Cl. 162-133.000.

Juy, Henri, heir: See—  
Juy, Lucien C. H., deceased, 4,161,124, Cl. 74-217.00B.

Juy, Lucien C. H., deceased (by Juy, Henri, heir), to Le Simplex. Apparatus for the control by a cable of speed change devices of articulated parallelogram type for bicycles and similar vehicles, 4,161,124, Cl. 74-217.00B.

Kabanov, Viktor A.: See—  
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V., 4,161,462, Cl. 252-429.00B.

Kabushiki Kaisha Komatsu Seisakusho: See—  
Inui, Takayasu; and Nishimura, Satoru, 4,161,227, Cl. 180-70.00R.

Kaga, Takashi, to Tomy Kogyo Co., Inc. Amusement device with apertures and timed ball release, 4,161,314, Cl. 273-121.00R.

Kagami, Akiyasu: See—  
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Kolke, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,161,457, Cl. 252-301.40R.

Kahle, Rolf D., to Quantor Corporation. Instantaneous exposure control for film, 4,161,363, Cl. 355-68.000.

Kaieda, Nobuo; Kawakami, Kenji; Okano, Yoshihiro; and Ohtsu, Hiroshi, to Yokogawa Electric Works, Ltd. Servo-system, 4,161,678, Cl. 318-641.000.

Kakigi, Takao, to Cybernet Electronic Corporation. Transmission and reception control circuit for a transceiver, 4,161,695, Cl. 325-17.000.

Kakurai, Tadao. Loading coil for antenna, 4,161,710, Cl. 336-192.000.

Kalmanovich, Martin, to Universal Wire & Cable Co. Ltd. Container for wire spool, 4,161,248, Cl. 206-389.000.

Kalo Laboratories, Inc.: See—  
Bellet, Eugene M.; and Joshi, Madan M., 4,161,397, Cl. 71-7.000.

Kamei, Tsuneaki: See—  
Matsunaga, Takehiko; Umeda, Saburo; and Kamei, Tsuneaki, 4,161,431, Cl. 204-15.000.

Kamin, Gerhard R., to Robert Bosch GmbH. Video alarm systems, 4,161,750, Cl. 358-105.000.

Kamyr, Inc.: See—  
Sherman, Michael I., 4,161,421, Cl. 162-18.000.

Kanai, Takao; and Mori, Yujiro, to Clarion Co., Ltd. Pushbutton tuner having linkage operated tuning slider, 4,161,707, Cl. 334-7.000.

Kane, Jeffrey, to Ferranti Limited. Semiconductor devices with matched resistor portions, 4,161,742, Cl. 357-48.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—  
Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, 4,161,572, Cl. 525-100.000.

Kao Soap Co., Ltd.: See—  
Fuzisawa, Noriyoshi; and Hattori, Kenichi, 4,161,083, Cl. 47-1.100.

Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,161,459, Cl. 252-352.000.

Sasaki, Tetsuo; and Tsuchiya, Yoshimi, 4,161,050, Cl. 15-159.00A.

Kaplan, Murray A.; and Granatek, Alphonse P., to Bristol-Myers Company. Levulinic acid salt, 4,161,595, Cl. 544-284.000.

Karasudani, Yasuo, to Tokico Ltd. Disc brake, 4,161,239, Cl. 188-106.00P.

Karjuk, Gennady G.: See—  
Merzhanov, Alexandr G.; Borovinskaya, Inna P.; Karjuk, Gennady G.; Dubovitsky, Fedor I.; Prokudina, Valentina K.; Ratnikov, Viktor I.; Bochkov, Anatoly V.; Moshkovsky, Evgeny I.; Sharivker, Semen J.; and Krizhanovsky, Sergei S., 4,161,512, Cl. 423-440.000.

Karlstedt, Gustav: See—  
Svensson, Lars G.; Karlstedt, Gustav; Tisell, Claes; and Thorstensson, Yngve, 4,161,228, Cl. 180-282.000.

Kartesz, Frank A. Preservation of live fish bait, 4,161,158, Cl. 119-1.000.

Kasinskas, Michael M., to State of Connecticut; and United States of America, America, part interest to each. Method and apparatus for dispensing a deicer liquid, 4,161,280, Cl. 239-1.000.

Kassal, Robert J., to Du Pont de Nemours, E. I., and Company. Elastomer modified unsaturated molding compositions, 4,161,471, Cl. 260-40.00R.

Katsuda, Yoshio; Nakajima, Minoru; and Fujita, Toshio, to Dainippon Jochugiki Kabushiki Kaisha. Insecticidal isovaleric acid esters, 4,161,537, Cl. 424-304.000.

Katterfeldt, Harald; and Mangold, Helmut, to Licentia. Patent-Verwaltungs-G.m.b.H. Method for determining the fundamental frequency of a voice signal, 4,161,625, Cl. 179-1.05C.

Katzman, Allison W.; Schoenfeld, Palmer J.; and Meyer, Burton C., to Marvin Glass & Associates. Amusement set, 4,161,081, Cl. 46-11.000.

Kaul, Dieter. Process for making a pourable material for chewing gum, 4,161,544, Cl. 426-5.000.

Kawagoe, Hiroto; and Nomiya, Kosei, to Hitachi, Ltd. Input circuit, 4,161,664, Cl. 307-304.000.

Kawaguchi, Hiroshi; and Nomura, Yoshihisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control valve for use in automotive brake system for controlling brake fluid pressure, 4,161,339, Cl. 303-24.00F.

Kawakami, Kenji: See—  
Kaieda, Nobuo; Kawakami, Kenji; Okano, Yoshihiro; and Ohtsu, Hiroshi, 4,161,678, Cl. 318-641.000.

Kawasaki Jukogyo Kabushiki Kaisha: See—  
Sato, Masato; and Nakamizo, Keiichi, 4,161,156, Cl. 115-76.000.



Kay, D. Alan R.: See—  
Wilson, William G.; and Kay, D. Alan R., 4,161,400, Cl. 75-58.000.  
Keifer, Jurg: See—  
Haug, Theobald; Keifer, Jurg; Ruf, Peter; and Schmitter, Andre, 4,161,580, Cl. 528-322.000.  
Keinzle Uhrenfabriken GmbH: See—  
Storz, Erwin, 4,161,099, Cl. 58-4.00R.  
Keith, Keith S.: See—  
Hauser, Stephen G.; and Keith, Keith S., 4,161,265, Cl. 222-181.000.  
Keller Corp., The: See—  
Batzdorff, Alfred, 4,161,368, Cl. 414-114.000.  
Kelley, John H.: See—  
Getson, Edward F., Jr.; Kelley, John H.; Rathbun, Donald J.; and McLaughlin, Albert T., 4,161,778, Cl. 364-200.000.  
Kern, Hans, to Siemens Aktiengesellschaft. Circuit arrangement for driving piezoelectric ink jet printers. 4,161,670, Cl. 310-317.000.  
Kerstges, Johannes: See—  
Beelmann, Richard; Kerstges, Johannes; and Mertens, Paul, 4,161,293, Cl. 241-56.000.  
Kessler, Bernard V.; Hoff, Gerald F.; and Burke, James R., to United States of America, Navy. Distributed feedback filter and laser. 4,161,702, Cl. 331-94.50H.  
Khan, Mir I. A., to Albany International Corp. Non-twill paperforming fabric. 4,161,195, Cl. 139-383.00A.  
Khodosov, Nikolai A.: See—  
Berber, Viktor A.; Mozyakov, Vladimir I.; and Khodosov, Nikolai A., 4,161,275, Cl. 233-31.000.  
Kienel, Gerhard, to Leybold-Heraeus GmbH & Co. KG. Method of producing antireflective coatings on polydiethyleneglycoldiallylcarbonate, an optical product made by the method, and the use of the optical product. 4,161,547, Cl. 428-213.000.  
Kienel, Gerhard, to Leybold-Heraeus GmbH & Co. KG. Method of producing antireflective coatings on acrylic glasses, optical bodies produced by this method and the use of such optical bodies. 4,161,560, Cl. 428-213.000.  
Kim, Cholung: See—  
Ando, Tadahiko; Shibata, Takehiko; Ikawa, Shukuko; and Kim, Cholung, 4,161,424, Cl. 435-199.000.  
Kim, Dong-Whee, to Vesicol Chemical Corporation. Process for the production of 2-methoxy-3,6-dichlorobenzoic acid. 4,161,611, Cl. 562-474.000.  
Kindlmann, Peter J.: See—  
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,161,206, Cl. 164-49.000.  
King, Larry: See—  
Nicks, Robert W.; and King, Larry, 4,161,181, Cl. 131-231.000.  
Kirkpatrick, Alan D., to Corrugated Development, Inc. Web clamp. 4,161,269, Cl. 226-92.000.  
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Uchida, Norio; and Komiya, Nakaba, 4,161,237, Cl. 188-1.00B.  
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Delarbre, Aime; Boesner, Joachim; and Blank, Michael, 4,161,344, Cl. 308-222.000.  
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Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,161,420, Cl. 156-73.300.  
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Gottschlich, Herbert; Koch, Christian; and Kunstle, Konrad, 4,161,428, Cl. 196-14.520.  
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Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,161,505, Cl. 264-171.000.  
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Legbandt, Thomas J., 4,161,564, Cl. 428-381.000.  
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Cahen, Raymond M., 4,161,483, Cl. 260-409.000.  
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Wen, Richard Y.; LaFleur, Linda L.; Engel, Michael R.; and Lucas, Anthony J., 4,161,518, Cl. 424-52.000.  
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Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 4,161,543, Cl. 426-2.000.  
Lager, Darrel L.: See—  
Lytle, R. Jeffrey; Lager, Darrel L.; Laine, Edwin F.; and Davis, Donald T., 4,161,687, Cl. 324-6.000.  
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Burson, David C.; and Larson, Harold D., 4,161,726, Cl. 340-365.00R.  
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Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., 4,161,244, Cl. 198-347.000.  
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Juy, Lucien C. H., deceased, 4,161,124, Cl. 74-217.00B.  
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LeVan, Eugene B.; and Lehne, John, 4,161,336, Cl. 296-137.00B.  
Lehr, Marvin H., to B. F. Goodrich Company, The. Impact modified vinyl chloride polymer composition. 4,161,472, Cl. 525-4.000.  
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Dubil, James F.; Falcoz, Alain M.; Glaize, Rene J.; Jacquart, Christian A.; Leighton, Howard N.; Riso, Vladimir; and Wilfinger, Raymond J., 4,161,706, Cl. 333-165.000.  
Lejdegard, Sixten H.: See—  
Eklund, Ingvar A.; and Lejdegard, Sixten H., 4,161,132, Cl. 85-47.000.  
Lembke, Manfred: See—  
Brune, Gerhard; and Lembke, Manfred, 4,161,306, Cl. 251-129.000.  
Lemons, Jerry W.: See—  
Stroud, Lebern W.; and Lemons, Jerry W., 4,161,683, Cl. 322-87.000.  
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Hryciak, Kenneth S.; Leonhardt, John H.; and Prentice, William J., Jr., 4,161,617, Cl. 13-6.000.  
Lerman, Michael J.: See—  
Schlossberg, Seymour; and Lerman, Michael J., 4,161,689, Cl. 324-54.000.  
LeVan, Eugene B.; and Lehne, John, to LeVan Specialty Co. Inc. Dual-opening sun roof. 4,161,336, Cl. 296-137.00B.  
LeVan Specialty Co. Inc.: See—  
LeVan, Eugene B.; and Lehne, John, 4,161,336, Cl. 296-137.00B.  
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van den Berg, Hendrikus J., 4,161,484, Cl. 260-428.500.  
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Kienel, Gerhard, 4,161,547, Cl. 428-213.000.  
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Honecker, Gunter, 4,161,327, Cl. 280-95.00R.  
Lindow, Steven E.: See—  
Army, Deane C.; and Lindow, Steven E., 4,161,084, Cl. 47-2.000.  
Lingnau, Josef: See—  
Klann, Holm; and Lingnau, Josef, 4,161,278, Cl. 236-56.000.  
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Suzuki, Fred K.; and Davison, Thomas W., 4,161,557, Cl. 428-1.000.  
Litherland, John W.: See—  
Hicks, George E.; Litherland, John W.; Martin, Arlan G.; and Williams, Lawrence, 4,161,160, Cl. 123-1.00A.  
Litton Systems, Inc.: See—  
Spencer, David R.; and Baxter, Larry K., 4,161,757, Cl. 358-261.000.  
Lo, David S.: See—  
Torok, Ernest J.; Paul, Maynard C.; and Lo, David S., 4,161,789, Cl. 365-87.000.  
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Caouette, Kenneth O.; Fortescue, George H.; Zaman, Mohammad K.; and Oda, Donald J., 4,161,650, Cl. 250-199.000.



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Beardsley, Richard G.; and Currey, Norman S., 4,161,301, Cl. 244-137.00R.
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Holloway, Huland L.; and Norum, Edward M., Jr., 4,161,292, Cl. 239-11.000.
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Ekeborg, Bo-Gunnar; and Lofgren, Stig-Gunnar, 4,161,322, Cl. 280-6.00R.
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Hoover, James W.; Long, James; and Matulevich, Edward S., 4,161,717, Cl. 340-62.000.
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Gallant, Donald A., 4,161,660, Cl. 307-118.000.
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Elster, Charles H.; and Gibs, Gabriel J., 4,161,604, Cl. 548-352.000.
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Green, George E.; and Losert, Ewald, 4,161,588, Cl. 542-432.000.
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Kohn, Mitchell I.; and Alton, Ahdor H., 4,161,679, Cl. 318-685.000.
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Wendel, Ion L., 4,161,214, Cl. 165-172.000.
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Davis, Kirk E., 4,161,475, Cl. 260-132.000.
- Higgins, William A., 4,161,566, Cl. 428-454.000.
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Wen, Richard Y.; LaFleur, Linda L.; Engel, Michael R.; and Lucas, Anthony J., 4,161,518, Cl. 424-52.000.
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Warner, Peter S.; and Bicht, John R., 4,161,226, Cl. 180-65.00E.
- Lucien, Jacques: See—  
Barraut, Joel; Guisnet, Michel; Lucien, Jacques; and Maurel, Raymond, 4,161,493, Cl. 260-609.00R.
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- Lund, Kenneth, to Edgar Pickering (Blackburn) Limited. Looper mechanism for a tufting machine. 4,161,147, Cl. 112-79.00R.
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Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Lundgren, Bo T., 4,161,542, Cl. 424-330.000.
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Buckman, John B.; and Lykes, Robert E., 4,161,667, Cl. 310-51.000.
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Brockl, Walter, 4,161,272, Cl. 227-131.000.
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Plattner, Jacob J.; Voss, Houston F.; and Magic, Susan E., 4,161,488, Cl. 260-455.00R.
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Parikh, Bipin D.; Patnaik, Hareh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; Kurtz, John J.; Jenkins, Alfred D.; and Mahajan, Prakash Y., 4,161,719, Cl. 340-147.05Y.
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Katterfeldt, Harald; and Mangold, Helmut, 4,161,625, Cl. 179-1.05C.
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Leeson, Stanley J.; and Porter, Norman A., 4,161,754, Cl. 358-185.000.
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Goebel, Franz; and Marincic, Nikola, 4,161,063, Cl. 29-623.500.
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Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,161,523, Cl. 424-181.000.
- Martin, Arlan G.: See—  
Hicks, George E.; Litherland, John W.; Martin, Arlan G.; and Williams, Lawrence, 4,161,160, Cl. 123-1.00A.
- Martin, Howard W.: See—  
Begun, James A., 4,161,345, Cl. 312-253.000.
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Hightower, Stanley J., 4,161,212, Cl. 165-96.000.
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- Marvin Glass & Associates: See—  
Katzman, Allison W.; Schoenfeld, Palmer J.; and Meyer, Burton C., 4,161,081, Cl. 46-11.000.
- Marwig, Uwe D.: See—  
Rudolph, Paul; and Marwig, Uwe D., 4,161,393, Cl. 48-197.00R.
- Maschinenfabrik GmbH & Co.: See—  
Krieger, Karl, 4,161,136, Cl. 91-461.000.
- Mascioli, Rocco L.: See—  
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Halford, Wayne R., 4,161,279, Cl. 238-10.00F.
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Markarian, Kegang M.; Matty, Richard D.; and Svekrick, Fred E., 4,161,619, Cl. 13-18.00C.
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Hoover, James W.; Long, James; and Matulevich, Edward S., 4,161,717, Cl. 340-62.000.
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Malcolm, Robert B.; and McDaniel, Clarence E., 4,161,662, Cl. 307-213.000.
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Moran, Richard J., 4,161,761, Cl. 361-94.000.
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- McKinney, James C., to Creative Dispensing Systems, Inc. Fluid dispenser method and apparatus. 4,161,288, Cl. 239-333.000.
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Smith, James A.; and McLaughlin, James H., 4,161,449, Cl. 252-8.600.
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Lee, Yu-Sun; and Shackle, Dale R., 4,161,570, Cl. 521-53.000.
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Groves, Stanley E.; Schriber, Gene A.; Spinks, Brian M.; Baker, Richard M.; Daly, Thomas C.; and Means, Rodney J., 4,161,787, Cl. 364-900.000.
- Mefina S.A.: See—  
Fresard, Marcel; and Jimenez, Antonio, 4,161,151, Cl. 112-217.100.
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Hopkins, Gregory T.; Dahod, Ashraf M.; Demarines, Victor A.; Meisner, Norman B.; and Willard, David G., 4,161,786, Cl. 364-900.000.
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Frater, James J., 4,161,261, Cl. 220-337.000.
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Miller, Stewart M., 4,161,600, Cl. 546-135.000.
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Bormann, Dieter; Merkel Wulf; and Muschaweck, Roman, 4,161,531, Cl. 424-274.000.
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Beilmann, Richard; Kerstges, Johannes; and Mertens, Paul, 4,161,293, Cl. 241-56.000.
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Powell, Joe A.; Messery, James W.; and Shippy, Ronald L., 4,161,202, Cl. 152-347.000.
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Schwaerzler, Hans; and Staudacher, Werner, 4,161,300, Cl. 244-45.00A.
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Abramson, Harvey J., 4,161,179, Cl. 128-278.000.
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Katzman, Allison W.; Schoenfeld, Palmer J.; and Meyer, Burton C., 4,161,081, Cl. 46-11.000.
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Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,161,536, Cl. 424-304.000.
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Frey, Richard H., 4,161,740, Cl. 357-36.000.
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- Miki, Yoshiteru: See—  
Sano, Yoshihiro; Chiba, Tomio; Kudou, Hiroyuki; and Miki, Yoshiteru, 4,161,651, Cl. 250-199.000.
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Buday, John M.; Holmes, Lawrence B.; Milenkovic, Veljko; and Stevens, Bernard, 4,161,092, Cl. 53-244.000.
- Miller, Conrad O. M.: See—  
Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., 4,161,573, Cl. 526-64.000.
- Miller, Philip C.: See—  
Gregg, Robert M.; and Miller, Philip C., 4,161,673, Cl. 313-481.000.
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Wilson, Kenneth E.; and Miller, Thomas W., 4,161,583, Cl. 536-17.00A.
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Takashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,161,457, Cl. 252-301.40R.
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Hampl, Edward F., Jr., 4,161,111, Cl. 72-60.000.
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Sahara, Masayoshi; and Nakai, Masaaki, 4,161,355, Cl. 354-51.000.
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Terada, Atsuke; Wachi, Kazuyuki; and Misaka, Eiichi, 4,161,538, Cl. 424-317.000.
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Hopkins, Gregory T.; Dahod, Ashraf M.; Demarines, Victor A.; Meisner, Norman B.; and Willard, David G., 4,161,786, Cl. 364-900.000.
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Akamatsu, Masahiko, 4,161,680, Cl. 318-722.000.
- Shimada, Wataru; and Hiramoto, Seigo, 4,161,645, Cl. 219-137.00R.
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Kojima, Katumi, 4,161,447, Cl. 210-23.00H.
- Mo och Domsjo Aktiebolag: See—  
Ekeborg, Bo-Gunnar; and Lofgren, Stig-Gunnar, 4,161,322, Cl. 280-6.00R.
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Audeh, Costandi A.; and Chen, Nai Y., 4,161,442, Cl. 208-11.00R.
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Klyce, Thomas A., 4,161,309, Cl. 251-328.000.
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Bernhardt, Christian A.; and Mohlenkamp, Marvin J., Jr., 4,161,550, Cl. 426-533.000.
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Wilson, William G.; and Kay, D. Alan R., 4,161,400, Cl. 75-58.000.
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Bussard, Charles B., 4,161,271, Cl. 227-8.000.
- Moncrieff-Yeates, Alexander J. Sliding fireplace andirons. 4,161,171, Cl. 126-298.000.
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Bulteau, Gerard; Acher, Jacques; and Monier, Jean C., 4,161,532, Cl. 424-274.000.
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Campbell, Robert H.; and Wilder, Gene R., 4,161,474, Cl. 260-45.9QA.
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Decker, Elmer L.; and Moon, James, 4,161,117, Cl. 73-141.00R.
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Johnson, Joseph E.; Ostop, John A.; and Moore, David L., 4,161,746, Cl. 357-73.000.
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Foulkes, Stanley C.; Moore, Robert; Ratcliffe, James; and Stephenson, James M., 4,161,503, Cl. 264-136.000.
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Barclay, Donald J.; and Morgan, William M., 4,161,432, Cl. 204-51.000.
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Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,161,459, Cl. 252-352.000.
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Kanai, Takao; and Mori, Yujiro, 4,161,707, Cl. 334-7.000.
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Regler, Dieter; and Moritz, Alfred, 4,161,167, Cl. 125-18.000.
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Horgan, John J.; and Morrison, Francis H., 4,161,103, Cl. 60-39.350.
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Pelosi, Stanford S., Jr., 4,161,479, Cl. 260-347.300.
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Thilo, Peer; and Moser, Otto W., 4,161,727, Cl. 340-518.000.
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Merzhanov, Alexandr G.; Borovinskaya, Inna P.; Karjuk, Gennady G.; Dubovitsky, Fedor I.; Prokudina, Valentina K.; Ratnikov, Viktor I.; Bochko, Anatoly V.; Moshkovsky, Evgeny I.; Sharvker, Semen J.; and Krizhanovsky, Sergei S., 4,161,512, Cl. 423-440.000.
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Groves, Stanley E.; Schriber, Gene A.; Spinks, Brian M.; Baker, Richard M.; Daly, Thomas C.; and Means, Rodney J., 4,161,787, Cl. 364-900.000.
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Cohen, Yitzhak; Brandman, Yigal; and Eekstien, Zvi, 4,161,718, Cl. 340-146.1BA.
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Berber, Viktor A.; Mozyakov, Vladimir I.; and Khodosov, Nikolai A., 4,161,275, Cl. 233-31.000.
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Nofel, Thomas J., 4,161,639, Cl. 200-157.000.
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Heide, Wilfried; Muller, Friedrich; Otto, Klaus; and Salanki, Tibor, 4,161,213, Cl. 165-168.000.
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- Murphy, Pierce M. Connector for tubes of square cross-section. 4,161,375, Cl. 403-169.000.
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Bormann, Dieter; Merkel Wulf; and Muschaweck, Roman, 4,161,531, Cl. 424-274.000.
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Sahara, Masayoshi; and Nakai, Masaaki, 4,161,355, Cl. 354-51.000.
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Katsuda, Yoshio; Nakajima, Minoru; and Fujita, Toshio, 4,161,537, Cl. 424-304.000.
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Sato, Masato; and Nakamizo, Keiichi, 4,161,156, Cl. 115-76.000.
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Takeda, Yutaka; Nakamura, Satoshi; Chinone, Naoki; Nakashima, Hisao; and Kurata, Kazuhiro, 4,161,701, Cl. 331-94.50H.
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Takeda, Yutaka; Nakamura, Satoshi; Chinone, Naoki; Nakashima, Hisao; and Kurata, Kazuhiro, 4,161,701, Cl. 331-94.50H.
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Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,161,457, Cl. 252-301.40R.
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Kline, Gaylen O., 4,161,113, Cl. 72-344.000.
- National Research Development Corporation: See—  
Strawson, Kenneth H.; and Ramsey, Joseph, 4,161,377, Cl. 425-3.000.
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Parikh, Bipin D.; Patnaik, Hareesh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; Kurtz, John J.; Jenkins, Alfred D.; and Mahajan, Prakash Y., 4,161,719, Cl. 340-147.05Y.
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Priemer, Joachim; Nicklas, Georg; and Schulz, Nikolaus, 4,161,481, Cl. 260-369.000.
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De Nora, Oronzio; Nidola, Antonio; and Spaziante, Placido M., 4,161,433, Cl. 204-98.000.
- Nikitkin, Vasily D.: See—  
Korsakov-Bogatkov, Sergei M.; Kravovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stolper, Leonid M.; and Chernyshev, Boris A., 4,161,107, Cl. 62-117.000.
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Matsuda, Hitoshi, 4,161,631, Cl. 179-100.41D.
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Yamada, Shigeru; and Aoki, Eiichiro, 4,161,128, Cl. 84-1.260.
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Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,161,457, Cl. 252-301.40R.
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Sakamaki, Hiroshi, 4,161,317, Cl. 277-25.000.
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Fujikata, Kenji; Yokozawa, Norio; and Shibayama, Akinori, 4,161,700, Cl. 328-147.000.
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Inui, Takayasu; and Nishimura, Satoru, 4,161,227, Cl. 180-70.00R.
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Hagiwara, Yutaka, 4,161,105, Cl. 60-561.000.
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Ishizuka, Kenzo; Fujisawa, Hiroshi; and Noda, Etsunosuke, 4,161,527, Cl. 424-246.000.
- Nofel, Thomas J., to MTD Products Inc. Handle safety switch. 4,161,639, Cl. 200-157.000.
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Kawaguchi, Hiroto; and Nomiya, Kosei, 4,161,664, Cl. 307-304.000.
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Kawaguchi, Hiroshi; and Nomura, Yoshihisa, 4,161,339, Cl. 303-24.00F.
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Szpakowski, Bronislaw T., 4,161,773, Cl. 363-49.000.
- Norum, Edward M., Jr.: See—  
Holloway, Huland L.; and Norum, Edward M., Jr., 4,161,292, Cl. 239-11.000.
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- Obrist, Albert. Stopper arrangement for bottles. 4,161,258, Cl. 215-302.000.
- Oda, Donald J.: See—  
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Kaieda, Nobuo; Kawakami, Kenji; Okano, Yoshihiro; and Ohtsu, Hiroshi, 4,161,678, Cl. 318-641.000.
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- Okano, Yoshihiro: See—  
Kaieda, Nobuo; Kawakami, Kenji; Okano, Yoshihiro; and Ohtsu, Hiroshi, 4,161,678, Cl. 318-641.000.
- Oku, Masakazu: See—  
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- Olin Corporation: See—  
Nicolaisen, Bernard H., 4,161,170, Cl. 126-271.000.
- Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,161,206, Cl. 164-49.000.
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- Olsson, Per-Inge: See—  
Forberg, Sevald; and Olsson, Per-Inge, 4,161,513, Cl. 423-598.000.
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Chvatilsky, Kurt, 4,161,373, Cl. 400-175.000.
- Omansky, Martin B. Modular building structure system. 4,161,089, Cl. 52-227.000.
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- Onosovsky, Evgeny V.: See—  
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Thomas, Klaus; Ost, Walter; and Curtze, Jurgen, 4,161,528, Cl. 424-273.000.
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Johnson, Joseph E.; Ostop, John A.; and Moore, David L., 4,161,746, Cl. 357-73.000.
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Bailey, Jack H.; and Ottaway, Gerald H., 4,161,753, Cl. 358-128.000.
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Heide, Wilfried; Muller, Friedrich; Otto, Klaus; and Salanki, Tibor, 4,161,213, Cl. 165-168.000.
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Greene, Neil E.; Srinivasan, Seshadri; and Stenger, Leonard A., 4,161,396, Cl. 65-1.000.
- McCormick, Ronald O., 4,161,646, Cl. 219-121.0EM.
- Owens-Illinois, Inc.: See—  
Lenard, William M.; and Taylor, Lynn J., 4,161,556, Cl. 427-385.00A.
- Owens, Kenneth B.: See—  
Dilgren, Richard E.; and Owens, Kenneth B., 4,161,217, Cl. 166-252.000.
- P.R.K., Inc.: See—  
Dunham, Philip N., 4,161,056, Cl. 29-402.000.
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- Pagani, George B. Fishing line submerging device. 4,161,078, Cl. 43-43.130.
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Koeln, Harold E.; and Paige, Walter W., Jr., 4,161,374, Cl. 401-116.000.
- Pako Corporation: See—  
Anderson, Richard D.; and Wedel, John A., 4,161,365, Cl. 355-75.000.
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- Paleveda, William J.: See—  
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- Palmer, John P.: See—  
Cinch, Colin W. F.; Harley, David N.; and Palmer, John P., 4,161,307, Cl. 251-206.000.
- Paper Converting Machine Company: See—  
Hartnig, Richard E., 4,161,091, Cl. 53-206.000.
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- Parker, Frank; and Parker, Leslie M. Granulator with forced feed assembly. 4,161,296, Cl. 241-152.00A.
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- Parker, Herbert W., to Allied Chemical Corporation. Melting apparatus. 4,161,391, Cl. 432-209.000.
- Parker, Leslie M.: See—  
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- Parker, Merrill D. Metal fence post puller. 4,161,310, Cl. 254-30.000.
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Parikh, Bipin D.; Patnaik, Hareesh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; Kurtz, John J.; Jenkins, Alfred D.; and Mahajan, Prakash Y., 4,161,719, Cl. 340-147.05Y.
- Patnaik, Hareesh C.: See—  
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- Patrick, John P., to United Technologies Corporation. Wind turbine generator having integrator tracking. 4,161,658, Cl. 290-44.000.
- Patterson, William W., III; and Grapes, Eugene F. Adjustable bulkhead assembly. 4,161,145, Cl. 105-376.000.
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Torok, Ernest J.; Paul, Maynard C.; and Lo, David S., 4,161,789, Cl. 365-87.000.
- Paul, William A. Inspection fixture. 4,161,251, Cl. 209-604.000.
- Pavitt, William H., Jr.: See—  
Harris, Frederick E., II; and Pavitt, William H., Jr., 4,161,176, Cl. 128-155.000.
- Pellico, Michael A., to Denton Industries, Inc. Settable dental compositions with polyterpene binder. 4,161,410, Cl. 106-35.000.
- Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 5-(4-Chlorophenyl)furfurylurea. 4,161,479, Cl. 260-347.300.
- Penn Corporation: See—  
Koeln, Harold E.; and Paige, Walter W., Jr., 4,161,374, Cl. 401-116.000.
- Pepe, Joseph P.: See—  
Olofson, Roy A.; and Pepe, Joseph P., 4,161,597, Cl. 546-15.000.
- Performance Industries, Inc.: See—  
Boyesen, Eyvind, 4,161,163, Cl. 123-73.00A.
- Perry, Andrew W., to Beckman Instruments, Inc. Enzymatic reagent system for total cholesterol assay using oxygen-rate method. 4,161,425, Cl. 435-11.000.
- Philip A. Hunt Chemical Corp.: See—  
Bullock, David K., 4,161,406, Cl. 96-55.000.
- Phillips Petroleum Company: See—  
Makovec, Donald J.; and Hutson, Thomas, Jr., 4,161,497, Cl. 585-714.000.
- Myers, John W.; and Harris, Jesse R., 4,161,463, Cl. 252-455.00R.
- Piasecki, Edwin S.: See—  
Brussels, Nathan E.; and Piasecki, Edwin S., 4,161,169, Cl. 126-271.000.
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- Pierce, Donald C. Kit for decorating border panel of picture mats. 4,161,250, Cl. 206-575.000.
- Piesinger, Gregory H., to Motorola, Inc. Null steering apparatus including weight oscillation eliminating means. 4,161,733, Cl. 343-100.05A.
- Pilz, Gilbert B.; and Young, George H., to Gulf & Western Manufacturing Company. Tractor to trailer connect system. 4,161,329, Cl. 280-474.000.
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Konz, Elmar; and Pistorius, Rudolf, 4,161,614, Cl. 568-670.000.
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Plessey Handel und Investments AG: See—  
Bennett, James P.; and Harms, David C., 4,161,630, Cl. 179-18.0EB.  
Pohacker, Josef: See—  
Ritter, Klaus; Ritter, Gerhard; Ritter, Josef; Pohacker, Josef; and Jahrbacher, Gert, 4,161,110, Cl. 72-7.000.  
Polaroid Corporation: See—  
Ertichman, Irving, 4,161,749, Cl. 358-75.000.  
Wray, William R., 4,161,758, Cl. 360-90.000.  
Polukhin, Valentin P.: See—  
Bakhalov, Vladimir I.; Volvenkov, Gennady V.; Polukhin, Valentin P.; Starokadomsky, Vadim S.; and Ter-Bogdassarov, Arkady V., 4,161,148, Cl. 112-110.000.  
Pool Company: See—  
Armstrong, James E., 4,161,376, Cl. 405-196.000.  
Popov, Valery G.: See—  
Bocharov, Yuri N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V., 4,161,462, Cl. 252-429.00B.  
Porret, Daniel: See—  
Baltzer, Hans; Habermeyer, Jürgen; and Porret, Daniel, 4,161,594, Cl. 544-302.000.  
Porter, Chester D., to Allied Chemical Corporation. Transfer line exchanger inlet cone, 4,161,192, Cl. 138-44.000.  
Porter, Norman A.: See—  
Leeson, Stanley J.; and Porter, Norman A., 4,161,754, Cl. 358-185.000.  
Powell, Joe A.; Messerly, James W.; and Shipley, Ronald L., to B. F. Goodrich Company. The. Puncture sealing tire, 4,161,202, Cl. 152-347.000.  
Prentice, William J., Jr.: See—  
Hryciak, Kenneth S.; Leonhardt, John H.; and Prentice, William J., Jr., 4,161,617, Cl. 13-6.000.  
Presby, Herman M.: See—  
Marcuse, Dietrich; and Presby, Herman M., 4,161,656, Cl. 250-459.000.  
Prestridge, Floyd L.: See—  
Warren, Kenneth W.; and Prestridge, Floyd L., 4,161,439, Cl. 204-306.000.  
Price, John A.; and Stange, Hugo, to Avtex Fibers Inc. Cationic dyeable copolyesters, 4,161,577, Cl. 528-173.000.  
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Priesemuth, Wolfgang. Pushbutton switch, 4,161,637, Cl. 200-153.00J.  
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Pringle, William L., to United States Steel Corporation. Ratchet action slack adjuster, 4,161,240, Cl. 188-196.0BA.  
Procedyne, Inc.: See—  
Staffin, Herbert K.; and Staffin, Robert, 4,161,389, Cl. 432-58.000.  
Procesos Plasticos, S.A.: See—  
Palafox, Federico V., 4,161,259, Cl. 220-21.000.  
Procter & Gamble Company: See—  
Bernhardt, Christian A.; and Mohlenkamp, Marvin J., Jr., 4,161,550, Cl. 426-533.000.  
Proctor & Schwartz, Inc.: See—  
Sturgeon, Lloyd F., 4,161,567, Cl. 428-594.000.  
Prokudina, Valentina K.: See—  
Merzhanov, Alexandr G.; Borovinskaya, Inna P.; Karjuk, Gennady G.; Dubovitsky, Fedor I.; Prokudina, Valentina K.; Ratnikov, Viktor I.; Bochkov, Anatoly V.; Moshkovsky, Evgeny I.; Sharvker, Semen J.; and Krizhanovsky, Sergei S., 4,161,512, Cl. 423-440.000.  
Pronko, Vladimir G.: See—  
Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovskiy, Evgeny V.; Pronko, Vladimir G.; Stolper, Leonid M.; and Chernyshev, Boris A., 4,161,107, Cl. 62-117.000.  
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Pye, David S., to Union Oil Company of California. Method for reducing contaminant emissions in gas drilling operations, 4,161,222, Cl. 175-66.000.  
Quantor Corporation: See—  
Kahle, Rolf D., 4,161,363, Cl. 355-68.000.  
Quinlan, Kenneth P.; and Hutta, Joseph J., to United States of America, Air Force. Method for separating trialuminum nickelide fibers from an aluminum matrix, 4,161,434, Cl. 204-146.000.  
R. B. Cybernetris (1970) Ltd.: See—  
Sewell, Vincent N. R., 4,161,460, Cl. 252-426.000.  
Raffenberg, Wolfgang: See—  
Eckhardt, Friedhelm; Raffenberg, Wolfgang; and Klein, Axel, 4,161,312, Cl. 271-3.000.  
Ragaly, Istvan, to Robert Bosch GmbH. Dual voltage automotive on-board electrical network system, 4,161,684, Cl. 322-90.000.  
Rain Bird Sprinkler Manufacturing Corporation: See—  
Beamer, John D.; and Wichman, William J., 4,161,286, Cl. 239-230.000.  
Ralston, Horace E.; Robinson, Edward L., Jr.; and Ralston, William K., deceased (by Ralston, Louise, executor), to International Harvester Company. Carrier and dispenser for cylindrical bales, 4,161,253, Cl. 414-25.000.  
Ralston, Louise, executor: See—  
Ralston, Horace E.; Robinson, Edward L., Jr.; and Ralston, William K., deceased, 4,161,253, Cl. 414-25.000.

Ralston, William K., deceased: See—  
Ralston, Horace E.; Robinson, Edward L., Jr.; and Ralston, William K., deceased, 4,161,253, Cl. 414-25.000.  
Ramsey, Joseph: See—  
Strawson, Kenneth H.; and Ramsey, Joseph, 4,161,377, Cl. 425-3.000.  
Ranger, Anton; and Uebel, Alexander, to Knorr-Bremse-Bowles-Fluidics GmbH. Adaptor for connection to a faucet, 4,161,191, Cl. 137-625.460.  
Rank Xerox Limited: See—  
Blake, Neil B., 4,161,362, Cl. 355-40.000.  
Ransburg Corporation: See—  
Bacsanyi, Thomas J.; and Harmon, Edward J., 4,161,666, Cl. 310-27.000.  
Rappange, Adelbert: See—  
Nowack, Helmut; and Rappange, Adelbert, 4,161,316, Cl. 277-9.000.  
Rasberger, Michael: See—  
Evans, Samuel; and Rasberger, Michael, 4,161,592, Cl. 544-198.000.  
Rasmussen, Chris R., to McNeil Laboratories, Inc. Benzhydryl guanidines, 4,161,541, Cl. 424-326.000.  
Ratcliffe, James: See—  
Foulkes, Stanley C.; Moore, Robert; Ratcliffe, James; and Stephenson, James M., 4,161,503, Cl. 264-136.000.  
Rathbun, Donald J.: See—  
Getson, Edward F., Jr.; Kelley, John H.; Rathbun, Donald J.; and McLaughlin, Albert T., 4,161,778, Cl. 364-200.000.  
Rathje, William C., to General Electric Company. Prime mover, method of operating same and circuit, 4,161,681, Cl. 318-783.000.  
Ratnikov, Viktor I.: See—  
Merzhanov, Alexandr G.; Borovinskaya, Inna P.; Karjuk, Gennady G.; Dubovitsky, Fedor I.; Prokudina, Valentina K.; Ratnikov, Viktor I.; Bochkov, Anatoly V.; Moshkovsky, Evgeny I.; Sharvker, Semen J.; and Krizhanovsky, Sergei S., 4,161,512, Cl. 423-440.000.  
Rattan, Horace E. Slow diffuser-air scent, 4,161,284, Cl. 239-43.000.  
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Raytheon Company: See—  
Kits van Heyningen, Arent H., 4,161,629, Cl. 179-15.0BA.  
Rebold, Jerome I., to CBS Inc. Airbrush, 4,161,289, Cl. 239-346.000.  
Recognition Equipment Incorporated: See—  
Norman, John B., 4,161,349, Cl. 350-173.000.  
Recycling & Conservation, Inc.: See—  
Howells, John N. M., 4,161,252, Cl. 211-126.000.  
Regan, Glen B. Polishing slurry of xanthan gum and a dispersing agent, 4,161,394, Cl. 51-302.000.  
Regan, John J. Mattress, 4,161,045, Cl. 5-464.000.  
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Reid, Allen F.; and Half, Albert H. Temperature increase system, 4,161,210, Cl. 165-1.000.  
Reinecke, Erich; Ulrich, Helmut; Haas, Arnold; and Kolnitz, Willi, to WABCO Westinghouse GmbH. Actuating device for pressure medium brake systems, 4,161,341, Cl. 303-52.000.  
Remond, Jean-Pierre: See—  
Vitat, Jean-Claude; Remond, Jean-Pierre; and Thebault, Jean-Robert, 4,161,450, Cl. 252-194.000.  
Republic Steel Corporation: See—  
Markarian, Khegan M.; Matty, Richard D.; and Svekric, Fred E., 4,161,619, Cl. 13-18.00C.  
Resch, Darrel R.: See—  
Erb, Elisha W.; and Resch, Darrel R., 4,161,281, Cl. 239-8.000.  
Erb, Elisha W.; and Resch, Darrel R., 4,161,282, Cl. 239-8.000.  
Research Corporation: See—  
Olofson, Roy A.; and Pepe, Joseph P., 4,161,597, Cl. 546-15.000.  
Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft: See—  
Faber, Peter, 4,161,569, Cl. 429-234.000.  
Rhône-Poulenc Industries: See—  
Vitat, Jean-Claude; Remond, Jean-Pierre; and Thebault, Jean-Robert, 4,161,450, Cl. 252-194.000.  
Ricoh Co., Ltd.: See—  
Enomoto, Takamichi; and Sakuma, Seiti, 4,161,404, Cl. 96-1.50R.  
Yanagawa, Nobuyuki; Watanabe, Tsutomu; and Tagawa, Kazuaki, 4,161,644, Cl. 219-216.000.  
Rikagaku Kenkyusho: See—  
Ando, Tadahiko; Shibata, Takehiko; Ikawa, Shukuko; and Kim, Cholung, 4,161,424, Cl. 435-199.000.  
Riley, Edwin A. Process for recovery of hydrocarbons, 4,161,047, Cl. 166-266.000.  
Rinehart, Harry A.: See—  
Ciaccio, Charles J.; and Rinehart, Harry A., 4,161,077, Cl. 43-26.100.  
Ripple, Warren. Loudspeaker equipment, 4,161,230, Cl. 181-148.000.  
Riso, Vladimir: See—  
Dubil, James F.; Falcoz, Alain M.; Glaise, René J.; Jacquart, Christian A.; Leighton, Howard N.; Riso, Vladimir; and Wilfinger, Raymond J., 4,161,706, Cl. 333-165.000.  
Ritter, Gerhard: See—  
Ritter, Klaus; Ritter, Gerhard; Ritter, Josef; Pohacker, Josef; and Jahrbacher, Gert, 4,161,110, Cl. 72-7.000.  
Ritter, Josef: See—  
Ritter, Klaus; Ritter, Gerhard; Ritter, Josef; Pohacker, Josef; and Jahrbacher, Gert, 4,161,110, Cl. 72-7.000.

Ritter, Klaus; Ritter, Gerhard; Ritter, Josef; Pohacker, Josef; and Jahrbacher, Gert, to EVG Entwicklungs- und Verwertungs-Gesellschaft mbH. Automatic control device for a bending machine, 4,161,110, Cl. 72-7.000.  
RND Company: See—  
Dashow, Russell N., 4,161,249, Cl. 206-459.000.  
Robert Bosch GmbH: See—  
Bosch, Paul, 4,161,372, Cl. 418-126.000.  
Brune, Gerhard; and Lembke, Manfred, 4,161,306, Cl. 251-129.000.  
Franz, Herbert; Wamsler, Reinhold; and Binder, Georg, 4,161,775, Cl. 363-145.000.  
Heyl, Bodo, 4,161,748, Cl. 358-22.000.  
Kamin, Gerhard R., 4,161,750, Cl. 358-105.000.  
Latsch, Reinhard; and Bianchi, Valerio, 4,161,162, Cl. 123-32.0EA.  
Ragaly, Istvan, 4,161,684, Cl. 322-90.000.  
Robinson, Edward L., Jr.: See—  
Ralston, Horace E.; Robinson, Edward L., Jr.; and Ralston, William K., deceased, 4,161,253, Cl. 414-25.000.  
Rockwell International Corporation: See—  
Ladacki, Michael, 4,161,104, Cl. 60-218.000.  
Martinez, Miguel A., 4,161,663, Cl. 307-264.000.  
Rohm and Haas Company: See—  
Stambaugh, Robert L.; and Galluccio, Richard A., 4,161,452, Cl. 252-34.000.  
Rohy, David A.: See—  
Duffy, Thomas E.; and Rohy, David A., 4,161,211, Cl. 165-1.000.  
Rolland, Guy: See—  
Lenne, William; Bourdot, Jean F.; and Rolland, Guy, 4,161,060, Cl. 29-527.100.  
Roller Bearing Company of America: See—  
Weremijenko, Mykola, 4,161,055, Cl. 29-149.50B.  
Rolls-Royce Limited: See—  
Stuart, Alan R.; and Stratford, Brian S., 4,161,318, Cl. 277-53.000.  
Wilkinson, Wilfred H., 4,161,231, Cl. 181-292.000.  
Ropert, Claude P. Device for discharging materials lying upon a storage area, 4,161,255, Cl. 414-323.000.  
Rosenblum, Robert J., to Texas Instruments Incorporated. Bubble memory controller with multipage data handling, 4,161,788, Cl. 364-900.000.  
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- Shaffer, Marlin R., Jr. Hydrogen supply and utility systems and components thereof. 4,161,657, Cl. 290-1.00R.
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- Sherman, Michael L., to Kamy, Inc. Method and apparatus for continuous oxygen bleaching of cellulosic pulp. 4,161,421, Cl. 162-18.000.
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- Heide, Wilfried; Muller, Friedrich; Otto, Klaus; and Salanki, Tibor, 4,161,213, Cl. 165-168.000.
- Heitmann, Juergen, 4,161,623, Cl. 178-79.000.
- Kern, Hans, 4,161,670, Cl. 310-317.000.
- Muhlberg, Erhard, 4,161,164, Cl. 123-122.00G.
- Smutny, Kurt, 4,161,724, Cl. 340-347.0NT.
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- Weber, Hans-Werner; and Vollhardt, Hermann, 4,161,694, Cl. 325-1.000.
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- Herron, William L., 4,161,152, Cl. 112-254.000.
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- Skyllemark, Stefan M. B.: See—Carlin, Carl-Gustaf; and Skyllemark, Stefan M. B., 4,161,220, Cl. 173-1.000.
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- Smisson, Leonard F. Aircraft performance data qualifier. 4,161,299, Cl. 244-1.00R.
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- Sonoco Products Company: See—Wagner, Robert J., 4,161,263, Cl. 222-100.000.

- Soriano, Peter A.: See—Erickson, John W.; and Soriano, Peter A., 4,161,448, Cl. 210-258.000.
- Sotiriopoulos, Peter G.: See—Morrow, Jim B.; and Sotiriopoulos, Peter G., 4,161,066, Cl. 32-14.00A.
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- Spencer, David R.; and Baxter, Larry K., to Litton Systems, Inc. Facsimile system. 4,161,757, Cl. 358-261.000.
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- Vansteelandt, Marc G., 4,161,097, Cl. 56-343.000.
- Spinks, Brian M.: See—Groves, Stanley E.; Schriber, Gene A.; Spinks, Brian M.; Baker, Richard M.; Daly, Thomas C.; and Means, Rodney J., 4,161,787, Cl. 364-900.000.
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- Stambaugh, Lanier: See—Van den Sype, Jaak S.; and Stambaugh, Lanier, 4,161,415, Cl. 148-12.00B.
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- Steinkraus, Celeste M.: See—Eubanks, Ann S.; and Steinkraus, Celeste M., 4,161,075, Cl. 40-309.000.
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- Stephan, Paul G.: See—Schleinitz, Henry M.; and Stephan, Paul G., 4,161,500, Cl. 264-1.000.
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- Stetson, Earl W., to General Electric Company. Compact voltage surge arrester device. 4,161,763, Cl. 361-128.000.
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- Sumitomo Electric Industries, Ltd.: See—Nakayama, Tadaharu, 4,161,688, Cl. 324-52.000.
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- Suzuki, Shigeto, to Chevron Research Company. Process for preparing thiodiglycolic acid. 4,161,612, Cl. 562-594.000.
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- Cochran, Michael J.; and Caudel, Edward R., 4,161,697, Cl. 325-330.000.
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Borner, Dieter; Koerner, Gotz; and Rossmly, Gerd, 4,161,487, Cl. 260-448.20R.
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Vitat, Jean-Claude; Remond, Jean-Pierre; and Thebault, Jean-Robert, 4,161,450, Cl. 252-194.000.
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Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,161,596, Cl. 544-388.000.
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Karasudani, Yasuo, 4,161,239, Cl. 188-106.00P.
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Uchida, Norio; and Komiya, Nakaba, 4,161,237, Cl. 188-1.00B.
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Kaga, Takashi, 4,161,314, Cl. 273-121.00R.
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Neri, Rudolph O.; and Topliss, John G., 4,161,540, Cl. 424-324.000.
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Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,161,457, Cl. 252-301.40R.
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Kawaguchi, Hiroshi; and Nomura, Yoshihisa, 4,161,339, Cl. 303-24.00F.
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Jasas, Gytis B.; Trauth, Richard L.; and Smith, Raymond, 4,161,102, Cl. 60-39.14M.
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Sacher, Eric; and Trebelhorn, Thomas E., 4,161,276, Cl. 235-302.000.
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Erben, Ludwig, 4,161,052, Cl. 19-240.000.
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Baiel, James J.; and Tsonopoulos, Constantine, 4,161,429, Cl. 203-18.000.
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Sasaki, Tetsuo; and Tsuchiya, Yoshimi, 4,161,050, Cl. 15-159.00A.
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McConnell, James R., 4,161,185, Cl. 137-344.000.
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Ranger, Anton; and Uebel, Alexander, 4,161,191, Cl. 137-625.460.
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Matsunaga, Takehiko; Umeda, Saburo; and Kamei, Tsuneaki, 4,161,431, Cl. 204-15.000.
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Brown, Henry C., 4,161,338, Cl. 298-22.00J.
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Schafer, Robert H., 4,161,704, Cl. 333-33.000.
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Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,161,596, Cl. 544-388.000.
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Klass, Donald L., 4,161,610, Cl. 560-243.000.
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Francois, Edgar, 4,161,059, Cl. 29-432.000.
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Golembeck, Gerald A., 4,161,046, Cl. 5-248.000.
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Hauser, Stephen G.; and Keith, Keith S., 4,161,265, Cl. 222-181.000.
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Page, John; and Leding, Francis R., 4,161,390, Cl. 432-102.000.
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Quinlan, Kenneth P.; and Hutta, Joseph J., 4,161,434, Cl. 204-146.000.
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Kasinkas, Michael M., 4,161,280, Cl. 239-1.000.
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Pardes, Herman I.; and Sherburne, Frederick B., 4,161,070, Cl. 35-25.000.
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Alisic, Slobodan; Hamer, Rene H.; and Fleskens, Ludovicus A. H., 4,161,676, Cl. 315-395.000.
- Collet, Marnix G.; Salters, Roelof H. W.; and Koomen, Joannes J. M., 4,161,741, Cl. 357-41.000.
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Pringle, William L., 4,161,240, Cl. 188-196.0BA.
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Degnan, William G., 4,161,125, Cl. 74-469.000.
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Kalmanovitch, Martin, 4,161,248, Cl. 206-389.000.
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Hamburger, Robert N., 4,161,522, Cl. 424-177.000.
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Voorhees, John J., 4,161,525, Cl. 424-240.000.
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Sojka, Nickolas J., 4,161,198, Cl. 141-92.000.
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Bundy, Gordon L., 4,161,584, Cl. 542-421.000.
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Woodman, Daniel W., Jr.; and Wright, Henry L., 4,161,064, Cl. 29-741.000.
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Morimoto, Kiyoshi; Utamura, Yukihiko; and Takagi, Toshinori, 4,161,418, Cl. 148-175.000.
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Kotzsch, Hans-Joachim; Draese, Rudiger; and Vahlensieck, Hans-Joachim, 4,161,486, Cl. 260-448.20E.
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Schmohe, James S.; and Van Kessel, Ronald C., 4,161,668, Cl. 310-68.00D.
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Yim, Ernest W.; and VanLoon, Paul G. G., 4,161,417, Cl. 148-175.000.
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Bell, Robert R.; and Alexander, William H., 4,161,308, Cl. 251-228.000.
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Zitelli, Louis T.; and Beaver, William L., 4,161,121, Cl. 73-626.000.
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Blaske, Theodore A.; and Yu, Ho Y., 4,161,744, Cl. 357-59.000.
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Stein, Manfred, 4,161,759, Cl. 361-18.000.
- Veber, Daniel F.; Holly, Frederick W.; Strachan, Robert G.; Paleveda, William J.; Nutt, Ruth F.; and Hirschmann, Ralph F., to Merck & Co., Inc. Somatostatin analogs. 4,161,521, Cl. 424-177.000.
- Veissel Chemical Corporation: See—  
Kim, Dong-Whee, 4,161,611, Cl. 562-474.000.
- Vella, Sergio. Yarn feeding device. 4,161,297, Cl. 242-47.010.
- Vermeers, Stanley L., to United States of America, Navy. Multi-purpose digital measuring apparatus. 4,161,691, Cl. 324-120.000.
- Vernam, William D.; and Evancho, Joseph W., to Aluminum Company of America. Aluminum brazing sheet. 4,161,553, Cl. 428-654.000.
- Vitat, Jean-Claude; Remond, Jean-Pierre; and Thebault, Jean-Robert, to Rhone-Poulenc Industries. Drying compositions. 4,161,450, Cl. 252-194.000.
- Vollhardt, Hermann: See—  
Weber, Hans-Werner; and Vollhardt, Hermann, 4,161,694, Cl. 325-1.000.
- Volvenkov, Gennady V.: See—  
Bakhalov, Vladimir I.; Volvenkov, Gennady V.; Polykhin, Valentin P.; Starokadomsky, Vadim S.; and Ter-Bogdarsarov, Arkady V., 4,161,148, Cl. 112-110.000.
- Voorhees, John J., to University of Michigan, The Regents of the. Process of treating proliferative skin diseases with indole derivatives. 4,161,525, Cl. 424-240.000.
- Voss, Houston F.: See—  
Plattner, Jacob J.; Voss, Houston F.; and Magic, Susan E., 4,161,488, Cl. 260-455.00R.



- Vsesojuzny Nauchno-Issledovatel'skiy Institut Legkogo i Textilnogo Mashinostroyeniya: See—  
Bakhalov, Vladimir I.; Volvenkov, Gennady V.; Polukhin, Valentin P.; Starokadomsky, Vadim S.; and Ter-Bogdassarov, Arkady V., 4,161,148, Cl. 112-110.000.
- WABCO Westinghouse: See—  
Cloarec, Jean-Claude, 4,161,120, Cl. 73-494.000.
- WABCO Westinghouse GmbH: See—  
Moller, Rudolf; and Opel, Detlef, 4,161,190, Cl. 137-596.180.  
Reinecke, Erich; Ulrich, Helmut; Haas, Arnold; and Kolnitz, Willi, 4,161,341, Cl. 303-52.000.  
Stossberg, Udo; Frania, Josef; Meyer, Hans F.; and Kneutinger, Alfons, 4,161,134, Cl. 91-219.000.
- Wachi, Kazuyuki: See—  
Terada, Atsuyuki; Wachi, Kazuyuki; and Misaka, Eiichi, 4,161,538, Cl. 424-317.000.
- Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH: See—  
Regler, Dieter; and Moritz, Alfred, 4,161,167, Cl. 125-18.000.
- Wade, James A.: See—  
Belush, Richard; and Wade, James A., 4,161,165, Cl. 123-193.00P.
- Wagenknecht, Austin C., deceased (by Wagenknecht, Don A., personal representative); Daravingas, George V.; and Koski, William E., to General Mills, Inc. Plaque inhibiting composition and method, 4,161,517, Cl. 424-48.000.
- Wagenknecht, Don A., personal representative: See—  
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,161,517, Cl. 424-48.000.
- Wagman, Gerald H.: See—  
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,161,523, Cl. 424-181.000.
- Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ying, to Merck & Co., Inc. Poly-[dialkyl] and hydroxy-dialkyl-imino)ethylene halides] and process, 4,161,581, Cl. 525-411.000.
- Wagner, Robert J., to Sonoco Products Company. Handling system for flexible shipping containers, 4,161,263, Cl. 222-100.000.
- Wakazono, Kenji: See—  
Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, 4,161,764, Cl. 361-187.000.
- Waldo, Tim R. Telephone time recorder, 4,161,626, Cl. 179-7.10R.
- Waldron, Wesley K.: See—  
Castleberry, Donald E.; and Waldron, Wesley K., 4,161,766, Cl. 361-280.000.
- Walton, Jimmy W. Stacker for game counters, 4,161,315, Cl. 273-262.000.
- Walton, William T., III, to Alcan Aluminum Corporation. Production of aluminum wire, 4,161,416, Cl. 148-12.70A.
- Wampler, Gordon D.: See—  
Drayer, Sanford A.; and Wampler, Gordon D., 4,161,622, Cl. 174-152.00R.
- Wamsler, Reinhold: See—  
Franz, Herbert; Wamsler, Reinhold; and Binder, Georg, 4,161,775, Cl. 363-145.000.
- Wandel & Goltermann: See—  
Amann, Bertram, 4,161,627, Cl. 179-15.0BF.
- Ward, John K.; and Gardiner, Johnny B., to Dow Chemical Company. The Method for preventing polymers formation in styrene storage containers, 4,161,554, Cl. 427-239.000.
- Warner, Peter S.; and Bicht, John R., to Lucas Industries Limited. Vehicle drive systems, 4,161,226, Cl. 180-65.00E.
- Warren, Kenneth W.; and Prestridge, Floyd L., to Combustion Engineering, Inc. Apparatus for application of electrostatic fields to mixing and separating fluids, 4,161,439, Cl. 204-306.000.
- Warren, William. Making long yolk hard cooked eggs, 4,161,548, Cl. 426-299.000.
- Waschke, David C.: See—  
Martin, Timothy J., Jr.; and Waschke, David C., 4,161,643, Cl. 219-70.000.
- Wason, Satish K., to J. M. Huber Corporation. Novel precipitated siliceous products and methods for their use and production, 4,161,455, Cl. 252-174.250.
- Wasser, Richard B.; and Sedlak, John A., to American Cyanamid Company. Use of a dissolved cellulose as a dry strength agent and drainage aid for paper, 4,161,423, Cl. 162-163.000.
- Wasserman, Rene: See—  
Fluckiger, Jean L.; and Wasserman, Rene, 4,161,207, Cl. 164-80.000.
- Watanabe, Tsutomu: See—  
Yanagawa, Nobuyuki; Watanabe, Tsutomu; and Tagawa, Kazuaki, 4,161,644, Cl. 219-216.000.
- Water Chemists, Inc.: See—  
Savage, Robert H.; and Young, Cecil G., 4,161,106, Cl. 62-115.000.
- Watts, Ridley, Jr. Post assembly and method, 4,161,090, Cl. 52-301.000.
- Weaver, Max A.: See—  
Costes, Clarence A., Jr.; and Weaver, Max A., 4,161,601, Cl. 546-176.000.
- Weber, Hans-Werner; and Vollhardt, Hermann, to Siemens Aktiengesellschaft. Radio relay channel branch cascade exhibiting uniform transit-time-and-attenuation-characteristics of all channels, 4,161,694, Cl. 325-1.000.
- Weber, Harold J. Concealed structure tracing translator apparatus including position sensitive bitonic indication means, 4,161,686, Cl. 324-3.000.
- Wedel, John A.: See—  
Anderson, Richard D.; and Wedel, John A., 4,161,365, Cl. 355-75.000.
- Wegner, Hans-Georg: See—  
Humbert, Heiko; and Wegner, Hans-Georg, 4,161,496, Cl. 585-836.000.
- Weigle, Manfred; and DeBernardo, Silvano, to Hoffman-La Roche Inc. Process to produce oxazinomycin, 4,161,582, Cl. 536-1.000.
- Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., to Schering Corporation. Rosamicin esters, acid addition salts and methods for production thereof, 4,161,523, Cl. 424-181.000.
- Weissel, Oskar, to Bayer Aktiengesellschaft. Cycloaliphatic amines and process for preparing same, 4,161,492, Cl. 260-563.00R.
- Wells, Luther R., Jr.: See—  
Edwards, Donald W.; and Wells, Luther R., Jr., 4,161,142, Cl. 102-23.000.
- Wen, Richard Y.; LaFleur, Linda L.; Engel, Michael R.; and Lucas, Anthony J., to Minnesota Mining and Manufacturing Company. Compositions and methods for inhibiting plaque formation, 4,161,518, Cl. 424-52.000.
- Wendel, Ion L., to Lowe, James L. Laundry hot water supply coil assembly, 4,161,214, Cl. 165-172.000.
- Weremijenko, Mykola, to Roller Bearing Company of America. Method of making self aligning spherical bearing, 4,161,055, Cl. 29-149.50B.
- Westling, Ritchie A.; and Gurnee, Edward F., to Dow Chemical Company. The Process for forming plastic articles, 4,161,502, Cl. 264-119.000.
- West, Robert F.: See—  
Hildebrandt, William J.; and West, Robert F., 4,161,781, Cl. 364-562.000.
- Westinghouse Air Brake Company: See—  
Hart, James E., 4,161,340, Cl. 303-33.000.
- Westinghouse Electric Corp.: See—  
Bolin, Philip C.; Lapen, Robert J.; and Cookson, Alan H., 4,161,621, Cl. 174-14.00R.
- Caputo, William R.; and Husson, Alan L., 4,161,235, Cl. 187-29.00R.
- Husson, Alan L., 4,161,236, Cl. 187-29.00R.
- Johnson, Joseph E.; Ostrop, John A.; and Moore, David L., 4,161,746, Cl. 357-73.000.
- Longuemare, R. Noel, Jr., 4,161,732, Cl. 343-17.2PC.
- Thiel, Peter H., 4,161,712, Cl. 337-159.000.
- Wetteland, Maxwell T. Snow ski board apparatus, 4,161,323, Cl. 280-7.120.
- Weiter, Jakob, to Sack GmbH. Apparatus for monitoring hydraulic plant for leakages, 4,161,115, Cl. 73-40.50R.
- Whittington, Lawrence E.: See—  
Varnon, James E.; Schievelbein, Vernon H.; Kudchadker, Mohan V.; and Whittington, Lawrence E., 4,161,218, Cl. 166-269.000.
- Wichman, William J.: See—  
Beamer, John D.; and Wichman, William J., 4,161,286, Cl. 239-230.000.
- Wilder, Gene R.: See—  
Campbell, Robert H.; and Wilder, Gene R., 4,161,474, Cl. 260-45.9QA.
- Wilfinger, Raymond J.: See—  
Dubil, James F.; Falcoz, Alain M.; Glaise, Rene J.; Jacquart, Christian A.; Leighton, Howard N.; Riso, Vladimir; and Wilfinger, Raymond J., 4,161,706, Cl. 333-165.000.
- Wilkinson, Wilfred H., to Rolls-Royce Limited. Metal cavitated sandwich structures, 4,161,231, Cl. 181-292.000.
- Willard, David G.: See—  
Hopkins, Gregory T.; Dahod, Ashraf M.; Demarines, Victor A.; Meisner, Norman B.; and Willard, David G., 4,161,786, Cl. 364-900.000.
- William Cotton Limited: See—  
Cross, Eric, 4,161,109, Cl. 66-88.000.
- Williams, Ian G.: See—  
Caunt, Anthony D.; and Williams, Ian G., 4,161,461, Cl. 252-429.00B.
- Williams, Lawrence: See—  
Hicks, George E.; Litherland, John W.; Martin, Arlan G.; and Williams, Lawrence, 4,161,160, Cl. 123-1.00A.
- Williams, Philip J., to GF Business Equipment, Inc. Tilt chair control mechanism, 4,161,305, Cl. 248-608.000.
- Wilson, James C.: See—  
Lawson, Grover C.; and Wilson, James C., 4,161,422, Cl. 162-135.000.
- Wilson, Kenneth E.; and Miller, Thomas W., to Merck & Co., Inc. Method for the separation and purification of antibiotic macrolides, 4,161,583, Cl. 536-17.00A.
- Wilson, William G.; and Kay, D. Alan R., to MolyCorp, Inc. Methods of desulphurizing fluid materials, 4,161,400, Cl. 75-58.000.
- Windmoller & Holscher: See—  
Bosse, Frank, 4,161,559, Cl. 428-110.000.
- Winslow, John M.; and Maw, Ivan R., to Minnesota Mining and Manufacturing Company. Method for the preparation of a photothermographic system, 4,161,408, Cl. 96-114.100.
- Winston, Eric, to Jerrold Electronics Corporation. Programmable modular electronic register and method of implementing same, 4,161,790, Cl. 365-94.000.
- Winzeler, James E., to Caterpillar Tractor Co. Winch construction having axially shiftable face gear, 4,161,126, Cl. 74-674.000.
- Wirtz, James A. Portable tree seat, 4,161,233, Cl. 182-187.000.
- Wisconsin Alumni Research Foundation: See—  
Army, Deane C.; and Lindow, Steven E., 4,161,084, Cl. 47-2.000.

- Wiseman, Minor R.: See—  
Bourne, Henry A., Jr.; Ayers, Louis M.; and Wiseman, Minor R., 4,161,215, Cl. 166-65.00M.
- Wissbrun, Kurt F.: See—  
Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., 4,161,579, Cl. 525-444.000.
- Wolaver, Dan H., to Bell Telephone Laboratories, Incorporated. Address verification system, 4,161,635, Cl. 179-175.31R.
- Wolfson, Ronald I.: See—  
Nemit, Jeffrey T.; and Wolfson, Ronald I., 4,161,705, Cl. 333-156.000.
- Wolk, Roger S.: See—  
Bekey, Ivan; and Wolk, Roger S., 4,161,067, Cl. 32-17.000.
- Womako-Maschinenkonstruktionen GmbH: See—  
Fabrig, Paul, 4,161,196, Cl. 140-92.400.
- Wood, Stanley E.: See—  
Black, William L.; Gould, Robert A.; and Wood, Stanley E., 4,161,133, Cl. 89-7.000.
- Woodman, Daniel W., Jr.; and Wright, Henry L., to USM Corporation. Machines for board mounting and socket mounting components, 4,161,064, Cl. 29-741.000.
- Woodward, Robert B.: See—  
Heusler, Karl; and Woodward, Robert B., 4,161,476, Cl. 260-306.70C.
- Wray, William R., to Polaroid Corporation. Loop forming audio drive, 4,161,758, Cl. 360-90.000.
- Wrench, Edwin H., Jr.; and Tiemann, Jerome J., to United States of America, Navy. Charge-coupled multiplying digital-to-analog converter, 4,161,783, Cl. 364-606.000.
- Wright, Henry L.: See—  
Woodman, Daniel W., Jr.; and Wright, Henry L., 4,161,064, Cl. 29-741.000.
- Wytruk, Maurice: See—  
Bishop, Allan T.; and Wytruk, Maurice, 4,161,274, Cl. 232-24.000.
- Xerox Corporation: See—  
Herman, John L.; and Stavisky, John, 4,161,357, Cl. 355-3.0DR.
- Lu, Chin H., 4,161,454, Cl. 252-62.10P.
- Masham, Roger D., 4,161,359, Cl. 355-8.000.
- Smith, Kenneth W., 4,161,360, Cl. 355-10.000.
- Steiner, Edward L., 4,161,277, Cl. 235-304.000.
- Turner, Sam R., 4,161,490, Cl. 260-465.00D.
- Yamada, Shigeru; and Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument, 4,161,128, Cl. 84-1.260.
- Yamaguchi, Tetsuo: See—  
Agatsuma, Ko; Koyama, Kenichi; Todoriki, Itaru; Yamaguchi, Tetsuo; Kohno, Osamu; and Saito, Takashi, 4,161,062, Cl. 29-599.000.
- Yamamoto, Masahiro: See—  
Itoh, Tsutomu; Sakurai, Munekazu; Yamamoto, Masahiro; and Okamoto, Yasunari, 4,161,765, Cl. 361-226.000.
- Yamamoto, Masataka: See—  
Yoshikawa, Shinsuke; Hisazumi, Nobuyuki; and Yamamoto, Masataka, 4,161,562, Cl. 428-215.000.
- Yanagawa, Nobuyuki; Watanabe, Tsutomu; and Tagawa, Kazuaki, to Ricoh Co., Ltd. Electrophotographic apparatus comprising improved thermal fixing means, 4,161,644, Cl. 219-216.000.
- Yankee, Ernest W., to Upjohn Company, The.  $\omega$ -Aryl-cis-13-PGE compounds, 4,161,605, Cl. 560-53.000.
- Yankee, Ernest W., to Upjohn Company, The.  $\omega$ -Aryl-cis-13-inter-oxa-PGA compounds, 4,161,606, Cl. 560-53.000.
- Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., to Olin Corporation. Electromagnetic casting apparatus and process, 4,161,206, Cl. 164-49.000.
- Yasui, Seimei; and Oshima, Takao, to Sumitomo Chemical Company, Limited. Process for production of the maleic anhydride adduct of a liquid polymer, 4,161,571, Cl. 526-90.000.
- Yee, Albert F.: See—  
LeGrand, Donald G.; and Yee, Albert F., 4,161,469, Cl. 260-40.00R.
- Yim, Ernest W.; and VanLoon, Paul G. G., to Siliconix Corporation. Method of making CMOS structure with retarded electric field for minimum latch-up, 4,161,417, Cl. 148-175.000.
- Ying, Charles W., to Atex, Incorporated. Visual output means for a data processing system, 4,161,777, Cl. 364-200.000.
- Yokogawa Electric Works, Ltd.: See—  
Kaieda, Nobuo; Kawakami, Kenji; Okano, Yoshihiro; and Ohtsu, Hiroshi, 4,161,678, Cl. 318-641.000.
- Yokozawa, Norio: See—  
Fujikata, Kenji; Yokozawa, Norio; and Shibayama, Akinori, 4,161,700, Cl. 328-147.000.
- Yonezawa, Kazuya; Furukawa, Hisao; and Azuma, Masaaki, to Kanagafuchi Kagaku Kogyo Kabushiki Kaisha. Curable diallyl phthalate compounds and process for producing same, 4,161,572, Cl. 525-100.000.
- Yonezawa, Toshio; Ajima, Takashi; and Uchida, Masato, to Tokyo Shibaura Electric Co., Ltd. Semiconductor device with silicon carbide-glass-silicon carbide passivating overcoat, 4,161,743, Cl. 357-54.000.
- Yoshida Kogyo Kabushiki Kaisha: See—  
Tanaka, Taruo, 4,161,246, Cl. 206-45.310.
- Yoshikawa, Shinsuke; Hisazumi, Nobuyuki; and Yamamoto, Masataka, to Kureha Kagaku Kogyo Kabushiki Kaisha. Biaxially stretched five-layer film for packaging food, 4,161,562, Cl. 428-215.000.
- Young, Cecil G.: See—  
Savage, Robert H.; and Young, Cecil G., 4,161,106, Cl. 62-115.000.
- Young, George H.: See—  
Pliz, Gilbert B.; and Young, George H., 4,161,329, Cl. 280-474.000.
- Youngstown Sheet and Tube Company: See—  
Jeffers, Robert P., 4,161,273, Cl. 228-154.000.
- Yu, Ho Y.: See—  
Blaske, Theodore A.; and Yu, Ho Y., 4,161,744, Cl. 357-59.000.
- Yun, Ik Y.: See—  
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,161,206, Cl. 164-49.000.
- Zaluska, Philip J.: See—  
Seymour, John P.; Mascioli, Rocco L.; Beitchman, Burton D.; and Zaluska, Philip J., 4,161,575, Cl. 528-90.000.
- Zaman, Mohammad K.: See—  
Caouette, Kenneth O.; Fortescue, George H.; Zaman, Mohammad K.; and Oda, Donald J., 4,161,650, Cl. 250-199.000.
- Zappala, Giuseppe, to Indesit Industria Elettrodomestici Italiana S.p.A. Line output stage, 4,161,675, Cl. 315-371.000.
- Zech, Laurel J.: See—  
Cotic, Dennis J.; Hoffman, David M.; Shelley, Peter S.; and Zech, Laurel J., 4,161,655, Cl. 250-385.000.
- Zenith Radio Corporation: See—  
Gregg, Robert M.; and Miller, Philip C., 4,161,673, Cl. 313-481.000.
- Tanaka, Akio, 4,161,699, Cl. 325-464.000.
- Zimmerman, Edwin: See—  
Crestas, Hans; and Zimmerman, Edwin, 4,161,173, Cl. 128-672.000.
- Zimmerman Metals, Inc.: See—  
Elliott, Billy N., 4,161,769, Cl. 362-146.000.
- Zitelli, Louis T.; and Beaver, William L., to Varian Associates, Inc. Ultrasonic imaging system, 4,161,121, Cl. 73-626.000.
- Zylla, Norbert R. Detachable antenna mount, 4,161,735, Cl. 343-713.000.



## LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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| Creative Ventures, Inc.: See—  | Moncrieff-Yeates, Alexander J. Vortical flow aerothermodynamic fireplace unit. Re. 30,043, Cl. 126-121.000. |
| Moss, David, Re. 30,048, Cl. 340-146.3SY.  | Moss, David, to Creative Ventures, Inc. Character recording system. Re. 30,048, Cl. 340-146.3SY.            |
| Dunlop Limited: See—   | Respiratory Care, Inc.: See—  |
| Lees, Geoffrey; and Williams, Arthur R., Re. 30,047, Cl. 106-288.00B.  | van Amerongen, Edward, Re. 30,046, Cl. 239-338.000.   |
| E-Z-EM Company, Inc.: See—   | Tension Structures Company: See—  |
| Greene, Franklin R., Re. 30,045, Cl. 206-455.000.  | Huddle, Carl F., Re. 30,044, Cl. 135-4.00R.   |
| Greene, Franklin R., to E-Z-EM Company, Inc. Vacuum X-ray envelope. Re. 30,045, Cl. 206-455.000.                   | van Amerongen, Edward, to Respiratory Care, Inc. Nebulizer. Re. 30,046, Cl. 239-338.000.                    |
| Huddle, Carl F., to Tension Structures Company. Vertical arch shelter. Re. 30,044, Cl. 135-4.00R.                  | Williams, Arthur R.: See—   |
| Lees, Geoffrey; and Williams, Arthur R., to Dunlop Limited. Road surfacing materials. Re. 30,047, Cl. 106-288.00B. | Lees, Geoffrey; and Williams, Arthur R., Re. 30,047, Cl. 106-288.00B.                                       |

## LIST OF PLANT PATENTEES

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|--|--|
| Delbard, Georges A., to Jackson & Perkins Co. Rose plant—Eterna. 4,440, 7-17-79, Cl. 18.000. | Warriner, William A., 4,439, Cl. 17.000.   |
| Jackson & Perkins Co.: See—  | Warriner, William A., to Jackson & Perkins Co. Rose plant. 4,437, 7-17-79, Cl. 12.000. |
| Delbard, Georges A., 4,440, Cl. 18.000.  | Warriner, William A., to Jackson & Perkins Co. Rose plant. 4,438, 7-17-79, Cl. 15.000. |
| Warriner, William A., 4,437, Cl. 12.000.   | Warriner, William A., to Jackson & Perkins Co. Rose plant. 4,439, 7-17-79, Cl. 17.000. |
| Warriner, William A., 4,438, Cl. 15.000.   |  |

## LIST OF DESIGN PATENTEES

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|--|---|
| Arakaki, James K. Finger ring. 252,384, 7-17-79, Cl. D11-38.000.   | Durham, William S., III. Corner connector for knock-down furniture. 252,365, 7-17-79, Cl. D6-191.000.   |
| Barker, Earl L. Dart game board or the like. 252,412, 7-17-79, Cl. D21-6.000.                              | Eisenrod, Richard B., to Household Manufacturing Company. Cooking pot. 252,373, 7-17-79, Cl. D7-85.000.   |
| Baron, Richard E. Water dam for a flush tank. 252,403, 7-17-79, Cl. D23-69.000.                            | Ellis, Jerry L. Toy vehicle. 252,415, 7-17-79, Cl. D21-76.000.  |
| Basterfield, Ernest P. Combined basin and urinal. 252,404, 7-17-79, Cl. D23-49.000.                        | Fjello-Jensen, Kim. Mobile stand for supporting a table top for office machine. 252,388, 7-17-79, Cl. D12-25.000.   |
| BPA Byggproduktion AB: See—  | Folli, Arthur C. Measuring-dispensing spoon or the like. 252,368, 7-17-79, Cl. D7-50.000.   |
| Gavel, Margareta; and Gavel, Peter, 252,364, Cl. D6-191.000.   | Folli, Arthur C. Measuring-dispensing spoon or the like. 252,369, 7-17-79, Cl. D7-50.000.   |
| Bustos, Rafael T.: See—  | Folli, Arthur C. Measuring-dispensing spoon or the like. 252,370, 7-17-79, Cl. D7-50.000.   |
| Kern, Lawrence G.; Davis, Charles L.; Bustos, Rafael T.; and Taylor, William B., 252,363, Cl. D6-153.000.  | Folli, Arthur C. Measuring-dispensing spoon or the like. 252,371, 7-17-79, Cl. D7-50.000.   |
| Camara, Manuel. Dice game apparatus. 252,414, 7-17-79, Cl. D21-41.000.                                     | Fowler, Norman H., to Ludlow Corporation. Combined bedstead, mattress and storage unit. 252,358, 7-17-79, Cl. D6-80.000.  |
| Cessna Aircraft Company, The: See—   | Freedman, Mark H.; Freedman, Theodore M.; and Weidman, Charles O., to Freedman, Mark H.; and Freedman, Theodore M. Flour sifter or the like. 252,367, 7-17-79, Cl. D7-47.000. |
| Voisard, Walter B., 252,390, Cl. D12-214.000.  | Freedman, Theodore M.: See—   |
| City National Bank & Trust Company, The: See—  | Freedman, Mark H.; Freedman, Theodore M.; and Weidman, Charles O., 252,367, Cl. D7-47.000.  |
| Graser, Clarence F., 252,410, Cl. D99-28.000.  | Garcia, Secundino. Key holder. 252,356, 7-17-79, Cl. D3-61.000.   |
| Coca-Cola Company, The: See—   | Gavel, Margareta; and Gavel, Peter, to BPA Byggproduktion AB. Wall mounted frame for a wardrobe cabinet. 252,364, 7-17-79, Cl. D6-191.000.                                    |
| Kern, Lawrence G.; Davis, Charles L.; Bustos, Rafael T.; and Taylor, William B., 252,363, Cl. D6-153.000.  | Gavel, Peter: See—  |
| Cohen, Elihu, to Trina, Inc. Mirror. 252,366, 7-17-79, Cl. D6-237.000.                                     | Gavel, Margareta; and Gavel, Peter, 252,364, Cl. D6-191.000.  |
| Cohen, Elihu: See—   | Graser, Clarence F., to City National Bank & Trust Company, The. Financial transaction Kiosk. 252,410, 7-17-79, Cl. D99-28.000.   |
| Rose, Arnold; and Cohen, Elihu, 252,409, Cl. D3-39.000.  | Grimsley, Ernest E. Boring bar housing. 252,398, 7-17-79, Cl. D15-140.000.  |
| Cohen, Steve J.; and Hillebrand, Cory W. Support stand for a loudspeaker. 252,359, 7-17-79, Cl. D6-85.000. | Gros, Shirley A. Thread tree. 252,396, 7-17-79, Cl. D15-78.000.   |
| Cousins, Michael A.; and Cousins, Morison S. Food dehydrator. 252,397, 7-17-79, Cl. D15-110.000.           | H.I.T. Industries Ltd.: See—  |
| Cousins, Morison S.: See—  | Tawil, Abraham I., 252,357, Cl. D3-76.000.  |
| Cousins, Michael A.; and Cousins, Morison S., 252,397, Cl. D15-110.000.                                    | Hartung, Philip F. Bottle. 252,379, 7-17-79, Cl. D9-48.000.   |
| Davis, Charles L.: See—  | Heine, Friedrich W. Home heater. 252,405, 7-17-79, Cl. D23-97.000.  |
| Kern, Lawrence G.; Davis, Charles L.; Bustos, Rafael T.; and Taylor, William B., 252,363, Cl. D6-153.000.  | Heintz, Clifford P. Desk file. 252,401, 7-17-79, Cl. D19-90.000.  |
| Dedeken, Eric A. Automobile. 252,389, 7-17-79, Cl. D12-90.000.   | Hillebrand, Cory W.: See—   |
| Dempewolf, Eugene F. Adjustable and collapsible scaffold. 252,408, 7-17-79, Cl. D25-66.000.                | Cohen, Steve J.; and Hillebrand, Cory W., 252,359, Cl. D6-85.000.   |
| Dobias, John J. Tubing cutter. 252,376, 7-17-79, Cl. D8-60.000.  |   |
| Dobias, John J. Fence. 252,406, 7-17-79, Cl. D25-38.000.   |   |
| Dobias, John J. Fence. 252,407, 7-17-79, Cl. D25-38.000.   |   |
| Dunchock, Richard S., to Optarac Corporation. Eyeglass case display unit. 252,360, 7-17-79, Cl. D6-85.000. |   |

## LIST OF DESIGN PATENTEES

PI 27

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| Hollendonner, Robert R. Queen chess piece. 252,411, 7-17-79, Cl. D21-52.000.   | Mosier, Thoburn T. Spring pressure gauge or similar article. 252,381, 7-17-79, Cl. D10-83.000.                              |
| Honeywell Inc.: See—   | Norman, Robert M.: See—   |
| Schick, Richard J., 252,394, Cl. D14-43.000.   | Knight, Jane C.; and Norman, Robert M., 252,413, Cl. D21-246.000.   |
| Household Manufacturing Company: See—  | Ohya, Toshio; and Kozuka, Noriaki, to Sony Corporation. Video tape recorder. 252,391, 7-17-79, Cl. D14-2.000.               |
| Eisenrod, Richard B., 252,373, Cl. D7-85.000.  | Ohya, Toshio, to Sony Corporation. Television receiver. 252,395, 7-17-79, Cl. D14-80.000.                                   |
| Husqvarna AB: See—   | Onderdonk, Judith A. Adult pacification novelty. 252,386, 7-17-79, Cl. D11-157.000.   |
| Rosenblad, Lars G., 252,400, Cl. D18-24.000.   | Oneida Ltd.: See—   |
| Hutmacher, Frank C. Floating marker. 252,382, 7-17-79, Cl. D10-107.000.  | Manderfield, Ellen B., 252,375, Cl. D7-137.000.   |
| Jackson, Theodore; and Johnson, Ken. Combined runway locator and wind direction indicator. 252,383, 7-17-79, Cl. D10-109.000.  | Optarac Corporation: See—   |
| Johnson, Ken: See—   | Dunchock, Richard S., 252,360, Cl. D6-85.000.   |
| Jackson, Theodore; and Johnson, Ken, 252,383, Cl. D10-109.000.   | Pape, Siegfried. Holder for an electric shaver. 252,361, 7-17-79, Cl. D6-88.000.  |
| Kalliroscope Corporation: See—   | RB Toy Development Co.: See—  |
| Matisse, Paul, 252,374, Cl. D7-98.000.   | Kupperman, Sam; and Kupperman, Dennis, 252,380, Cl. D9-193.000.   |
| Kashidaira, Takashi, to Sansui Electric Co., Ltd. Record player. 252,393, 7-17-79, Cl. D14-17.000.   | Rollei-Werke Franke & Heidecke: See—  |
| Kern, Lawrence G.; Davis, Charles L.; Bustos, Rafael T.; and Taylor, William B., to Coca-Cola Company, The. Combined display rack and light fixtures therefor. 252,363, 7-17-79, Cl. D6-153.000. | Waaske, Heinz, 252,399, Cl. D16-05.000.   |
| Knight, Jane C.; and Norman, Robert M. Airplane swing seat. 252,413, 7-17-79, Cl. D21-246.000.   | Rose, Arnold; and Cohen, Elihu, to Trina, Inc. Cosmetic organizer. 252,409, 7-17-79, Cl. D3-39.000.                         |
| Kozuka, Noriaki: See—  | Rosenblad, Lars G., to Husqvarna AB. Monogram. 252,400, 7-17-79, Cl. D18-24.000.  |
| Ohya, Toshio; and Kozuka, Noriaki, 252,391, Cl. D14-2.000.   | Sansui Electric Co., Ltd.: See—   |
| Kupperman, Dennis: See—  | Kashidaira, Takashi, 252,393, Cl. D14-17.000.   |
| Kupperman, Sam; and Kupperman, Dennis, 252,380, Cl. D9-193.000.  | Schick, Richard J., to Honeywell Inc. Control and display console. 252,394, 7-17-79, Cl. D14-43.000.                        |
| Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Pantograph package. 252,380, 7-17-79, Cl. D9-193.000.   | Sony Corporation: See—  |
| Kutschmende, Ralph. Illuminated sign with channels for moveable character plates. 252,402, 7-17-79, Cl. D20-10.000.  | Ohya, Toshio; and Kozuka, Noriaki, 252,391, Cl. D14-2.000.  |
| Lawrence, Gordon H. Name plate or the like. 252,387, 7-17-79, Cl. D11-131.000.   | Ohya, Toshio, 252,395, Cl. D14-80.000.  |
| Ludlow Corporation: See—   | Tawil, Abraham I., to H.I.T. Industries Ltd. Attache case or similar article. 252,357, 7-17-79, Cl. D3-76.000.              |
| Fowler, Norman H., 252,358, Cl. D6-80.000.   | Taylor, William B.: See—  |
| Macaulay, Thomas N. Bottle drainer. 252,372, 7-17-79, Cl. D7-70.000.   | Kern, Lawrence G.; Davis, Charles L.; Bustos, Rafael T.; and Taylor, William B., 252,363, Cl. D6-153.000.                   |
| Mallory, Robert L.; and Mallory, Sheila A. Holder for bumper stickers. 252,377, 7-17-79, Cl. D20-43.000.   | Trina, Inc.: See—   |
| Mallory, Sheila A.: See—   | Cohen, Elihu, 252,366, Cl. D6-237.000.  |
| Mallory, Robert L.; and Mallory, Sheila A., 252,377, Cl. D20-43.000.   | Rose, Arnold; and Cohen, Elihu, 252,409, Cl. D3-39.000.   |
| Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 252,375, 7-17-79, Cl. D7-137.000.  | Voisard, Walter B., to Cessna Aircraft Company, The. Fixed pitch propeller for aircraft. 252,390, 7-17-79, Cl. D12-214.000. |
| Matisse, Paul, to Kalliroscope Corporation. Nutcracker. 252,374, 7-17-79, Cl. D7-98.000.   | Vong, Hoi T. Record player. 252,392, 7-17-79, Cl. D14-14.000.   |
| Mayes, Stephen C.; and von Roth, Frederik G. R., II. Implement back. 252,362, 7-17-79, Cl. D6-136.000.   | von Roth, Frederik G. R., II: See—  |
| Meis, William J. Combined hook and supporting frame. 252,378, 7-17-79, Cl. D8-367.000.   | Mayes, Stephen C.; and von Roth, Frederik G. R., II, 252,362, Cl. D6-136.000.   |
|  | Waaske, Heinz, to Rollei-Werke Franke & Heidecke. Photographic camera. 252,399, 7-17-79, Cl. D16-05.000.                    |
|  | Weidman, Charles O.: See—   |
|  | Freedman, Mark H.; Freedman, Theodore M.; and Weidman, Charles O., 252,367, Cl. D7-47.000.                                  |
|  | Wieselmann, Jerome J. Christmas tree ornament. 252,385, 7-17-79, Cl. D11-125.000.   |

# CLASSIFICATION OF PATENTS

ISSUED JULY 17, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3	CLASS 48	CLASS 85	214.4	4,161,177	CLASS 173	315 B	4,161,247
17 R	4,161,042	47	272.3	4,161,178	1	389	4,161,248
CLASS 4	CLASS 51	CLASS 89	278	4,161,179	4,161,220	455	Re.30,045
292	4,161,043	7	372	4,161,180	4,161,221	459	4,161,249
CLASS 5	CLASS 52	CLASS 91	641	4,161,174	CLASS 174	504	4,161,254
248	4,161,046	219	672	4,161,173	14 R	575	4,161,250
464	4,161,045	417 R	CLASS 131	4,161,181	152 R	CLASS 208	
494	4,161,044	461	231	4,161,182	66	8 R	4,161,440
CLASS 12	CLASS 53	CLASS 92	166 C	4,161,182	228	11 R	4,161,441
146 S	4,161,048	13	CLASS 135	4,161,182	297	CLASS 209	
CLASS 13	CLASS 54	CLASS 93	4 R	Re.30,044	374	157	4,161,443
6	4,161,617	36.9	CLASS 137	4,161,182	79	169	4,161,444
12	4,161,618	CLASS 96	39	4,161,183	CLASS 179	604	4,161,251
18 C	4,161,619	1.5 R	98	4,161,184	1 HF	CLASS 210	
32	4,161,620	35.1	344	4,161,185	1 SC	23 H	4,161,445
CLASS 14	CLASS 55	55	357	4,161,186	7.1 R		4,161,446
71.5	4,161,049	114	375	4,161,187	15 BA	258	4,161,447
CLASS 15	CLASS 56	114.1	386	4,161,188	15 BF		4,161,448
159 A	4,161,050	CLASS 99	514.7	4,161,189	15 BL	CLASS 211	
CLASS 16	CLASS 57	467	596.18	4,161,190	18 EB	126	4,161,252
110 R	4,161,051	CLASS 100	625.46	4,161,191	100.41 D	CLASS 215	
CLASS 19	CLASS 58	53	CLASS 138	4,161,192	113	260	4,161,257
240	4,161,052	CLASS 101	44	4,161,192	170.2	302	4,161,258
CLASS 24	CLASS 59	1	103	4,161,193	175.31 R	CLASS 219	
205.14 R	4,161,053	CLASS 102	154	4,161,194	CLASS 180	60 A	4,161,640
CLASS 26	CLASS 60	23	CLASS 139	4,161,195	65 E	69 M	4,161,641
21	4,161,054	CLASS 104	92.4	4,161,196	70 R	70	4,161,642
CLASS 29	CLASS 61	244.1	CLASS 140	4,161,196	282	121 EM	4,161,643
149.5 B	4,161,055	CLASS 105	18	4,161,197	114	137 R	4,161,645
402	4,161,056	163 R	92	4,161,198	148	216	4,161,644
428	4,161,058	376	387	4,161,199	292	301	4,161,647
432	4,161,059	CLASS 106	CLASS 144	4,161,199	CLASS 182	464	4,161,648
527.1	4,161,060	14.21	34 R	4,161,200	92	CLASS 220	
566.4	4,161,061	35	CLASS 148	4,161,200	187	21	4,161,259
599	4,161,062	100	3	4,161,412	CLASS 186	316	4,161,260
623.5	4,161,063	288 B	9.5	4,161,413	1 R	337	4,161,261
741	4,161,064	CLASS 108	11.5 R	4,161,414	CLASS 187		4,161,262
CLASS 32	CLASS 62	136	12 B	4,161,415	29 R	100	4,161,263
2	4,161,065	CLASS 112	12.7 A	4,161,416	CLASS 188	135	4,161,264
14 A	4,161,066	79 R	175	4,161,417	1 B	181	4,161,265
17	4,161,067	110	CLASS 150	4,161,418	74	CLASS 224	
CLASS 33	CLASS 63	130	35	4,161,201	106 P	42.24	4,161,267
367	4,161,069	158 E	CLASS 152	4,161,202	196 BA	45 S	4,161,268
412	4,161,068	217.1	347	4,161,202	298	215	4,161,266
CLASS 35	CLASS 64	254	361 R	4,161,203	CLASS 192		4,161,269
25	4,161,070	279	CLASS 156	4,161,203	34	92	4,161,270
CLASS 36	CLASS 65	122	51	4,161,419	CLASS 193	118	4,161,271
125	4,161,071	227	73.3	4,161,420	27	8	4,161,272
CLASS 37	CLASS 66	76	CLASS 160	4,161,204	CLASS 196	131	4,161,273
93	4,161,072	CLASS 119	1	4,161,204	14.52	154	4,161,274
130	4,161,073	1	CLASS 162	4,161,205	CLASS 198	CLASS 228	
CLASS 40	CLASS 67	18	18	4,161,421	347	CLASS 232	
124.1	4,161,074	CLASS 123	133	4,161,205	399	24	4,161,274
309	4,161,075	1 A	135	4,161,422	CLASS 200	CLASS 233	
CLASS 42	CLASS 68	32 EA	163	4,161,423	148 A	31	4,161,275
1 A	4,161,076	32 JV	CLASS 164	4,161,206	153 J	CLASS 235	
CLASS 43	CLASS 69	73 A	49	4,161,207	153 SC	92 MP	4,161,649
26.1	4,161,077	122 G	80	4,161,207	157	302	4,161,276
43.13	4,161,078	193 P	244	4,161,208	CLASS 203	304	4,161,277
58	4,161,079	198 F	446	4,161,209	18	CLASS 236	
82	4,161,080	CLASS 125	CLASS 165	4,161,210	CLASS 204	56	4,161,278
CLASS 44	CLASS 70	18	1	4,161,211	15	CLASS 238	
62	4,161,392	CLASS 126	96	4,161,212	51	10 F	4,161,279
CLASS 46	CLASS 71	121	168	4,161,213	98	CLASS 239	
11	4,161,081	164	172	4,161,214	146	1	4,161,280
119	4,161,082	271	CLASS 166	4,161,215	152	8	4,161,281
CLASS 47	CLASS 72	298	65 M	4,161,216	157.1 R		4,161,282
1.1	4,161,083	CLASS 128	252	4,161,217	195 P	11	4,161,283
2	4,161,084	1 B	266	4,161,217	266	43	4,161,284
82	4,161,085	87 A	269	4,161,218	306	55	4,161,285
		155	324	4,161,219	CLASS 206	132.3	4,161,286
					45.31	230	4,161,286



## CLASSIFICATION OF PATENTS

284 R	4,161,287	66	4,161,501	641	4,161,678	CLASS 351	381	4,161,564			
333	4,161,288	119	4,161,502	685	4,161,679	30	4,161,353	169	4,161,375	437	4,161,565
338	Re.30,046	136	4,161,503	722	4,161,680	CLASS 354	CLASS 405	539	4,161,551	454	4,161,566
346	4,161,289	163	4,161,504	783	4,161,681	36	4,161,354	594	4,161,567	594	4,161,567
396	4,161,290	171	4,161,505	2	4,161,682	51	4,161,355	654	4,161,553	654	4,161,553
542	4,161,291	174	4,161,506	CLASS 320	36	4,161,356	196	CLASS 414	99	4,161,568	
CLASS 241	4,161,293	49	4,161,311	CLASS 322	87	4,161,683	25	4,161,253	234	4,161,569	
56	4,161,294	CLASS 271	90	4,161,684	3 DR	4,161,357	114	4,161,368	CLASS 431	4,161,387	
66	4,161,295	3	4,161,312	CLASS 323	8	4,161,358	323	4,161,255	74	4,161,388	
152 A	4,161,296	CLASS 273	19	4,161,685	10	4,161,359	722	4,161,256	359	4,161,388	
CLASS 242	47.01	1.5 A	4,161,313	CLASS 324	38	4,161,361	CLASS 416	CLASS 432	58	4,161,389	
67.1 R	4,161,298	121 R	4,161,314	3	4,161,686	40	4,161,362	102	4,161,390		
CLASS 244	45 A	262	4,161,315	6	4,161,687	68	4,161,363	209	4,161,391		
1 R	4,161,299	9	4,161,316	52	4,161,688	72	4,161,364	CLASS 418	126	4,161,372	
45 A	4,161,300	25	4,161,317	54	4,161,689	75	4,161,365	CLASS 422	11	4,161,425	
137 R	4,161,301	53	4,161,318	71 CP	4,161,690	56	4,161,366	199	4,161,424		
CLASS 248	49	116.6	4,161,319	120	4,161,691	100	4,161,367	313	4,161,426		
246	4,161,302	205	4,161,320	158 P	4,161,692	179	4,161,368	CLASS 521	53	4,161,570	
562	4,161,303	216	4,161,321	173	4,161,693	197	4,161,369	CLASS 525	4	4,161,472	
608	4,161,304	CLASS 280	1	4,161,694	23	4,161,370	CLASS 423	100	4,161,572		
CLASS 250	199	6 R	4,161,322	17	4,161,695	36	4,161,371	411	4,161,581		
4,161,650	203 R	7.12	4,161,323	163	4,161,696	41	4,161,372	439	4,161,498		
4,161,651	215	21 A	4,161,324	330	4,161,697	48	4,161,373	444	4,161,579		
4,161,652	221	81 R	4,161,325	464	4,161,698	54	4,161,374	CLASS 526	64	4,161,573	
4,161,653	385	87.04 A	4,161,326	468	4,161,699	59	4,161,375	90	4,161,571		
4,161,654	459	95 R	4,161,327	CLASS 328	73	4,161,746	CLASS 424	159	4,161,574		
4,161,655	CLASS 251	290	4,161,328	147	4,161,700	82	4,161,514	90	4,161,575		
4,161,656	129	474	4,161,329	CLASS 283	55	4,161,330	4,161,515	139	4,161,576		
CLASS 252	206	CLASS 285	5	4,161,331	CLASS 285	5	4,161,516	173	4,161,577		
32.7 E	228	4,161,332	334	4,161,332	111	4,161,703	4,161,517	272	4,161,578		
34	328	CLASS 290	33	4,161,704	CLASS 333	128	4,161,518	322	4,161,580		
62.1 L	8.6	1 R	4,161,657	156	4,161,705	185	4,161,519	CLASS 536	1	4,161,582	
62.1 P	32.7 E	44	4,161,658	165	4,161,706	219	4,161,520	17 A	4,161,583		
174.25	34	CLASS 292	288	4,161,333	CLASS 334	7	4,161,521	421	4,161,584		
182	62.1 L	CLASS 296	1 R	4,161,334	CLASS 336	192	4,161,522	426	4,161,585		
194	62.1 P	1 R	4,161,335	137 B	159	4,161,712	4,161,523	432	4,161,586		
301.4 R	174.25	39 R	4,161,336	CLASS 297	161	4,161,713	4,161,524	70	4,161,589		
305	182	137 B	4,161,336	230	253	4,161,714	4,161,525	159	4,161,590		
352	194	CLASS 298	22 J	4,161,338	CLASS 339	17 M	4,161,526	164	4,161,591		
426	301.4 R	CLASS 303	24 F	4,161,339	CLASS 340	2	4,161,527	198	4,161,592		
429 B	305	CLASS 307	33	4,161,340	16 R	4,161,716	4,161,528	217	4,161,593		
455 R	352	4,161,341	52	4,161,341	62	4,161,717	4,161,529	284	4,161,595		
CLASS 254	426	39	4,161,659	CLASS 308	146.1 BA	4,161,718	4,161,530	302	4,161,596		
30	429 B	118	4,161,660	6 R	146.3 SY	Re.30,048	4,161,531	388	4,161,596		
CLASS 260	455 R	119	4,161,661	8.2	147 SY	4,161,719	4,161,532	CLASS 546	15	4,161,597	
2.3	455 R	213	4,161,662	CLASS 310	150	4,161,720	4,161,533	97	4,161,598		
4,161,464	455 R	264	4,161,663	26	168 B	4,161,721	4,161,534	114	4,161,599		
4,161,465	455 R	304	4,161,664	27	171 R	4,161,722	4,161,535	135	4,161,600		
4,161,466	455 R	CLASS 308	6 R	4,161,342	323 R	4,161,723	4,161,536	176	4,161,601		
4,161,467	455 R	CLASS 312	8.2	4,161,343	347 AD	4,161,725	4,161,537	335	4,161,602		
4,161,468	455 R	CLASS 313	222	4,161,344	347 NT	4,161,724	4,161,538	CLASS 548	305	4,161,603	
4,161,469	455 R	CLASS 315	26	4,161,665	365 R	4,161,726	4,161,539	352	4,161,604		
4,161,470	455 R	CLASS 318	51	4,161,666	518	4,161,727	4,161,540	CLASS 560	53	4,161,605	
4,161,471	455 R	86	4,161,674	CLASS 343	750	4,161,728	4,161,541	65	4,161,607		
4,161,472	455 R	6.5 R	4,161,729	14	4,161,731	4,161,732	4,161,542	121	4,161,608		
4,161,473	455 R	17.2 PC	4,161,732	100 SA	4,161,733	4,161,734	4,161,543	215	4,161,609		
4,161,474	455 R	100 ST	4,161,735	713	4,161,736	4,161,737	4,161,544	243	4,161,610		
4,161,475	455 R	739	4,161,736	749	4,161,737	CLASS 346	4,161,545	CLASS 562	474	4,161,611	
4,161,476	455 R	74.1	4,161,738	CLASS 350	96.20	4,161,348	4,161,546	594	4,161,612		
4,161,477	455 R	96.21	4,161,347	CLASS 351	173	4,161,349	4,161,547	600	4,161,613		
4,161,478	455 R	220	4,161,350	CLASS 400	222	4,161,373	4,161,548	CLASS 568	670	4,161,614	
4,161,479	455 R	294	4,161,351	CLASS 401	215	4,161,374	4,161,549	CLASS 585	714	4,161,495	
4,161,480	455 R	301	4,161,352	CLASS 402	233	4,161,375	4,161,550	836	4,161,496		
4,161,481	455 R	CLASS 351	30	4,161,353	CLASS 403	381	4,161,564				
4,161,482	455 R	CLASS 354	36	4,161,354	CLASS 405	539	4,161,551				
4,161,483	455 R	CLASS 355	8	4,161,355	CLASS 414	99	4,161,568				
4,161,484	455 R	CLASS 356	56	4,161,366	CLASS 422	11	4,161,425				
4,161,485	455 R	CLASS 357	100	4,161,367	CLASS 423	100	4,161,572				
4,161,486	455 R	CLASS 358	14	4,161,516	CLASS 424	444	4,161,579				
4,161,487	455 R	CLASS 359	179	4,161,509	CLASS 425	3	4,161,377				
4,161,488	455 R	CLASS 360	90	4,161,758	CLASS 361	18	4,161,759				
4,161,489	455 R	CLASS 361	285	4,161,759	CLASS 362	324	4,161,540				
4,161,490	455 R	CLASS 362	326	4,161,541	CLASS 363	112	4,161,379				
4,161,491	455 R	CLASS 363	145	4,161,380	CLASS 364	200	4,161,777				
4,161,492	455 R	CLASS 364	2	4,161,543	CLASS 365	87	4,161,789				
4,161,493	455 R	CLASS 365	94	4,161,790	CLASS 366	222	4,161,791				
4,161,494	455 R	CLASS 366	175	4,161,373	CLASS 367	175	4,161,373				
4,161,495	455 R	CLASS 368	215	4,161,374	CLASS 369	215	4,161,374				
4,161,496	455 R	CLASS 369	233	4,161,375	CLASS 370	233	4,161,375				
4,161,497	455 R	CLASS 371	233	4,161,375	CLASS 372	233	4,161,375				
4,161,498	455 R	CLASS 373	233	4,161,375	CLASS 374	233	4,161,375				
4,161,499	455 R	CLASS 375	233	4,161,375	CLASS 376	233	4,161,375				
4,161,500	455 R	CLASS 377	233	4,161,375	CLASS 378	233	4,161,375				
4,161,501	455 R	CLASS 379	233	4,161,375	CLASS 380	233	4,161,375				
4,161,502	455 R	CLASS 381	233	4,161,375	CLASS 382	233	4,161,375				
4,161,503	455 R	CLASS 383	233	4,161,375	CLASS 384	233	4,161,375				
4,161,504	455 R	CLASS 385	233	4,161,375	CLASS 386	233	4,161,375				
4,161,505	455 R	CLASS 387	233	4,161,375	CLASS 388	233	4,161,375				
4,161,506	455 R	CLASS 389	233	4,161,375	CLASS 390	233	4,161,375				
4,161,507	455 R	CLASS 391	233	4,161,375	CLASS 392	233	4,161,375				
4,161,508	455 R	CLASS 393	233	4,161,375	CLASS 394	233	4,161,375				
4,161,509	455 R	CLASS 395	233	4,161,375	CLASS 396	233	4,161,375				
4,161,510	455 R	CLASS 397	233	4,161,375	CLASS 398	233	4,161,375				
4,161,511	455 R	CLASS 399	233	4,161,375	CLASS 400	233	4,161,375				
4,161,512	455 R	CLASS 401	233	4,161,375	CLASS 402	233	4,161,375				
4,161,513	455 R	CLASS 403	233	4,161,375	CLASS 404	233	4,161,375				
4,161,514	455 R	CLASS 405	233	4,161,375	CLASS 406	233	4,161,375				
4,161,515	455 R	CLASS 407	233	4,161,375	CLASS 408	233	4,161,375				
4,161,516	455 R	CLASS 409	233	4,161,375	CLASS 410	233	4,161,375				
4,161,517	455 R	CLASS 411	233	4,161,375	CLASS 412	233	4,161,375				
4,161,518	455 R	CLASS 413	233	4,161,375	CLASS 414	233	4,161,375				
4,161,519	455 R	CLASS 415	233	4,161,375	CLASS 416	233	4,161,375				
4,161,520	455 R	CLASS 417	233	4,161,375	CLASS 418	233	4,161,375				
4,161,521	455 R	CLASS 419	233	4,161,375	CLASS 420	233	4,161,375				
4,161,522	455 R	CLASS 421	233	4,161,375	CLASS 422	233	4,161,375				
4,161,523	455 R	CLASS 423	233	4,161,375	CLASS 424	233	4,161,375				
4,161,524	455 R	CLASS 425	233	4,161,375	CLASS 426	233	4,161,375				
4,161,525	455 R	CLASS 427	233	4,161,375	CLASS 428	233	4,161,375				
4,161,526	455 R	CLASS 429	233	4,161,375	CLASS 430	233	4,161,375				

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

4 : 4,161,737	4,161,291	4,161,288	4,161,455	4,161,573	4,161,582
6 : 4,161,043	4,161,324	4,161,301	4,161,702	4,161,584	4,161,583
4,161,118	4,161,328	4,161,313	4,161,732	4,161,586	4,161,600
4,161,121	4,161,336	4,161,416	4,161,747	4,161,587	4,161,604
4,161,127	4,161,337	4,161,682	4,161,772	4,161,605	4,161,634
4,161,133	4,161,356	4,161,270	4,161,048	4,161,606	4,161,635
4,161,135	4,161,417	Re.30,046	4,161,063	4,161,659	4,161,656
4,161,176	4,161,425	4,161,045	4,161,064	4,161,666	4,161,689
4,161,181	4,161,430	4,161,079	4,161,073	4,161,685	4,161,696
4,161,222	4,161,448	4,161,081	4,161,087	4,161,046	4,161,740
4,161,363	4,161,515	4,161,082	4,161,174	4,161,111	4,161,751
4,161,394	4,161,522	4,161,092	4,161,266	4,161,268	4,161,779
4,161,410	4,161,564	4,161,095	4,161,281	4,161,365	35 : 4,161,137
4,161,451	4,161,650	4,161,126	4,161,282	4,161,408	36 : Re.30,045
4,161,477	4,161,661	4,161,140	4,161,388	4,161,517	4,161,074
4,161,485	4,161,663	4,161,160	4,161,434	4,161,518	4,161,085
4,161,510	4,161,687	4,161,178	4,161,445	4,161,578	4,161,088
4,161,612	4,161,691	4,161,249	4,161,446	4,161,735	4,161,130
4,161,745	4,161,705	4,161,287	4,161,548	4,161,767	4,161,179
4,161,771	4,161,716	4,161,302	4,161,621	4,161,789	4,161,208
8 : 4,161,185	4,161,722	4,161,311	4,161,638	4,161,585	4,161,210
4,161,769	4,161,739	4,161,369	4,161,686	4,161,066	4,161,283
01 : 4,161,423	4,161,783	4,161,381	4,161,708	4,161,374	4,161,320
04 : 4,161,731	08 : 4,161,212	4,161,390	4,161,713	4,161,143	4,161,357
4,161,276	4,161,458	4,161,480	4,161,714	4,161,292	4,161,392
4,161,662	4,161,626	4,161,488	4,161,749	4,161,172	4,161,405
4,161,692	4,161,059	4,161,543	4,161,758	4,161,720	4,161,406
4,161,733	4,161,069	4,161,546	4,161,760	4,161,042	4,161,407
4,161,791	4,161,103	4,161,557	4,161,763	4,161,051	4,161,412
05 : 4,161,168	4,161,125	4,161,557	4,161,777	4,161,065	4,161,413
4,161,539	4,161,175	4,161,610	4,161,778	4,161,070	4,161,415
06 : Re.30,048	4,161,206	4,161,611	4,161,786	4,161,131	4,161,420
4,161,044	4,161,280	4,161,668	4,161,788	4,161,150	4,161,421
4,161,061	4,161,658	4,161,673	4,161,788	4,161,152	4,161,422
4,161,067	4,161,679	4,161,699	4,161,788	4,161,169	4,161,454
4,161,078	4,161,781	4,161,711	4,161,788	4,161,180	4,161,469
4,161,104	4,161,471	4,161,762	4,161,157	4,161,232	4,161,478
4,161,106	4,161,591	4,161,765	4,161,159	4,161,235	4,161,479
4,161,114	4,161,607	4,161,665	4,161,189	4,161,236	4,161,490
4,161,116	4,161,607	4,161,712	4,161,201	4,161,247	4,161,495
4,161,117	4,161,077	4,161,712	4,161,233	4,161,269	4,161,498
4,161,183	4,161,184	4,161,677	4,161,240	4,161,289	4,161,526
4,161,188	4,161,187	4,161,681	4,161,241	4,161,389	4,161,551
4,161,197	4,161,214	4,161,397	4,161,321	4,161,401	4,161,552
4,161,199	4,161,230	4,161,123	4,161,329	4,161,429	4,161,579
4,161,211	4,161,285	4,161,155	4,161,342	4,161,442	4,161,590
4,161,223	4,161,333	4,161,192	4,161,351	4,161,449	4,161,595
4,161,250	4,161,353	4,161,200	4,161,386	4,161,470	4,161,598
4,161,254	4,161,435	4,161,036	4,161,468	4,161,489	4,161,602
4,161,265	4,161,622	4,161,252	4,161,502	4,161,520	4,161,632
4,161,279	4,161,628	4,161,089	4,161,506	4,161,523	4,161,633
4,161,284	4,161,693	4,161,242	4,161,509	4,161,540	
4,161,286	13 : 4,161,108	4,161,289	4,161,525	4,161,581	
	4,161,182	4,161,348	4,161,556		

PI 32

PI 32

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 33

4,161,715	4,161,464	42 : 4,161,352	4,161,609	4,161,308	4,161,371
4,161,721	4,161,466	4,161,055	4,161,654	4,161,326	4,161,391
4,161,730	4,161,472	4,161,112	4,161,704	4,161,332	4,161,436
4,161,734	4,161,474	4,161,142	4,161,717	4,161,334	4,161,568
4,161,752	4,161,475	4,161,145	4,161,746	4,161,338	4,161,706
4,161,753	4,161,550	4,161,158	4,161,790	4,161,343	4,161,780
4,161,757	4,161,555	4,161,163	4,161,629	4,161,349	4,161,068
4,161,766	4,161,566	4,161,204	4,161,234	4,161,367	4,161,071
4,161,785	4,161,570	4,161,244	4,161,253	4,161,376	4,161,256
37 : 4,161,119	4,161,613	4,161,263	4,161,309	4,161,384	4,161,264
4,161,514	4,161,617	4,161,340	4,161,335	4,161,427	4,161,331
4,161,545	4,161,619	4,161,346	4,161,601	4,161,440	4,161,643
4,161,660	4,161,639	4,161,368	4,161,047	4,161,554	54 : 4,161,596
39 : 4,161,090	4,161,646	4,161,398	4,161,076	4,161,616	55 : 4,161,084
4,161,102	4,161,667	4,161,399	4,161,166	4,161,683	4,161,091
4,161,113	4,161,672	4,161,400	4,161,170	4,161,697	4,161,144
4,161,129	4,161,719	4,161,409	4,161,216	4,161,726	4,161,195
4,161,202	4,161,729	4,161,419	4,161,217	4,161,744	4,161,205
4,161,251	4,161,736	4,161,452	4,161,218	4,161,787	4,161,261
4,161,267	4,161,141	4,161,500	4,161,219	4,161,049	4,161,315
4,161,271	4,161,215	4,161,521	4,161,225	4,161,395	4,161,375
4,161,273	4,161,224	4,161,541	4,161,229	4,161,657	4,161,411
4,161,305	4,161,439	4,161,553	4,161,290	50 : 4,161,345	4,161,443
4,161,330	4,161,463	4,161,567	4,161,296	51 : Re.30,043	4,161,444
4,161,379	4,161,497	4,161,575	4,161,298	4,161,101	4,161,649
4,161,380	4,161,782	4,161,577	4,161,299	4,161,171	4,161,655
4,161,396	41 : 4,161,310	4,161,597	4,161,299	4,161,198	4,161,761

## DESIGN PATENTS

6 : 252,384	08 : 252,387	20 : 252,408	252,369	252,375	252,410
01 : 252,403	09 : 252,401	25 : 252,374	252,370	252,386	41 : 252,405
04 : 252,372	13 : 252,359	26 : 252,360	252,371	252,397	44 : 252,379
06 : 252,365	16 : 252,363	29 : 252,415	252,411	252,402	252,409
252,373	17 : 252,380	31 : 252,382	35 : 252,367	37 : 252,412	47 : 252,358
252,396	32 : 252,394	32 : 252,377	36 : 252,356	39 : 252,381	50 : 252,362
252,413	19 : 252,378	34 : 252,368	252,366	252,390	51 : 252,398

## PLANT PATENTS

06 : 4,437	4,438	4,439		
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**OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE**

July 24, 1979

Volume 984

Number 4

**CONTENTS**

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	984 OG 26
Trademark Rules of Practice . . . . .	984 OG 26
Regulations for the Use of the Facilities of the Patent and Trademark Office . . . . .	984 OG 26
Registration to Practice . . . . .	984 OG 27
Patent and Trademark Office Board of Appeals . . . . .	984 OG 29
Patent Suits . . . . .	984 OG 29
Reissue Applications Filed . . . . .	984 OG 31
Patent Notices	
Certificates of Correction for the Week of July 24, 1979 . . . . .	984 OG 32
Disclaimers . . . . .	984 OG 32
Dedications . . . . .	984 OG 32
National Technical Information Service . . . . .	984 OG 32
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	984 OG 34
Condition of Patent Applications . . . . .	984 OG 35
Reissue Patents Granted (30,049) . . . . .	791
Plant Patents Granted (4,441) . . . . .	795
Patents Granted	
General and Mechanical (4,161,792) . . . . .	797
Chemical (4,162,142) . . . . .	915
Electrical (4,162,367) . . . . .	975
Design Patents Granted (252,416) . . . . .	1039
Index of Patentees . . . . .	PI 1
Indices of Reissues, Plants and Designs . . . . .	PI 27
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Plants . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Plants . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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## PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of Information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979. Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	\$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,  
Acting Commissioner of  
Patents and Trademarks.  
July 3, 1979.

## Trademark Rules of Practice

Revision 1 to the ninth edition of the Trademark Rules of Practice, dated May, 1979, is now available, and has been mailed to current subscribers.

The Rules are in looseleaf form so as to accommodate revisions. New subscriptions may be ordered from:

Superintendent of Documents  
United States Government Printing Office  
Washington, D.C. 20402

The charge is \$10.00 for domestic mailing and \$12.50 for foreign mailing.

The Rules booklet is available only by subscription. When revisions are issued, they are a part of the subscription and are mailed automatically. Revisions are announced in the OFFICIAL GAZETTE of the Patent and Trademark Office.

SIDNEY A. DIAMOND,  
Assistant Commissioner for Trademarks.  
June 15, 1979.

## Regulations for the Use of the Facilities of the Patent and Trademark Office

## Revision of Regulations

AGENCY: Patent and Trademark Office, Commerce.  
ACTION: Notice.

SUMMARY: The Patent and Trademark Office gives notice of a revision of its "Regulations for the Public Use of Records in the Public Search Room for Patents of the Patent and Trademark Office," published in the Federal Register of July 14, 1976, 41 FR 29009. The regulations published in the Federal Register of July 14, 1976, are limited to the use of the Public Search Room for Patents. The revision is intended to allow public use of other Patent and Trademark Office record facilities with minimum risk to the security of Patent and Trademark Office personnel and government property.

EFFECTIVE DATE: June 26, 1979.

FOR FURTHER INFORMATION CONTACT: Bradford R. Huther, Deputy Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, 703-557-2290.

SUPPLEMENTARY INFORMATION: This revision is an extension of the present regulations, published in the Federal Register of July 14, 1976, 41 FR 29009, to allow public use of Patent Examining Group Facilities and the Scientific Library under conditions which are as nearly as possible the same as those which apply to the Public Search Room for Patents.

All persons seeking use of the Public Search Room for Patents and/or the Patent Examining Group Facilities must obtain a User Pass. The guards at the entrances to the Public Search Room for Patents can direct prospective users to the pass issuance desk. User Passes will be issued to persons not

under prohibition from using the facilities who agree to abide by the regulations of the Public Search Room for Patents and the Patent Examining Group Facilities.

The use of the Group facilities for search purposes by members of the public is strictly limited to the search of materials not available in the Public Search Room for Patents or the Scientific Library and when it does not conflict with the regular business of Patent and Trademark personnel and only between the hours of 8:45 a.m. and 4:45 p.m. on regular business days.

The Public Search Room for Patents is open 8:00 a.m.-8:00 p.m., Monday through Friday except on legal holidays. The hours of the Record Room are 8:00 a.m.-5:00 p.m. on the days the Public Search Room for Patents is open.

The revised regulations appear below:

## REGULATIONS

Regulations for members of the public using the facilities of the U.S. Patent and Trademark Office, including but not limited to the Public Search Room for Patents.

The Public Search Room for Patents is defined as that area comprising the foyers of the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices; Microfilm Center; restrooms and telephone areas off these foyers; the stacks; Record Room public reception area; study and copier areas between the foyers; and the Mezzanine.

The facilities of the Patent Examining Groups are defined as those areas in Buildings 3, 34 and 4 of Crystal Plaza designating Examining Groups.

With the respect to the Group Facilities, authorized personnel under these Regulations, include Supervisory Patent Examiners and Examining Group Directors.

The Scientific Library is located on the second floor of Building 34 of Crystal Plaza.

To maintain and protect the patents and related records located in the Public Search Room for Patents and the Patent Examining Group Facilities, it is necessary to establish and to enforce certain rules and regulations pertaining to the use thereof. Under applicable statutes and regulations, including 40 U.S.C. 486(c); 41 CFR Subpart 101-20.3; and appropriate Sections of Department Organization Orders 30-3A and 30-3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Patent and Trademark Office.

These regulations supersede all previous regulations on the subject.

1. All persons using the facilities of the Patent and Trademark Office are subject to the regulations governing conduct on property under the charge and control of the General Services Administration which appear in 41 CFR Subpart 101-20.3 [41 CFR §§ 101-20.300 through 101-20.314].
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. No food or beverages in any form are to be consumed except in designated areas.
5. Loud talking, use of radios, and any other form of activity which may disturb other members of the public and/or Patent and Trademark Office personnel are forbidden.
6. Children brought into the Patent and Trademark Office must not be allowed to disturb others.
7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.

8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.

9. Patent records and any other property of the Patent and Trademark Office shall not be removed from their normal location without permission from an authorized official; nor shall such records or property be mutilated. Authorization will not be given to remove from any Group Facility, U.S. patents or any other material readily available through the Scientific Library.

10. The use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission from an authorized official. Relative to the Public Search Room, the use of dictation equipment is prohibited except in designated areas. Whenever permission is obtained, the use of such equipment must not conflict with Regulation 5.

11. In the Public Search Room for Patents, library trucks or carts are to be used for transporting bundles only. The trucks or carts are not to be used for storage while making searches.

12. In the Public Search Room for Patents, patents temporarily removed from bundles for any purpose must be returned to the proper place in the appropriate bundle.

13. In the Public Search Room for Patents, all bundles of patents must be promptly and properly replaced in the stacks by the user.

14. The reserving of seats and/or working areas is prohibited.

15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Public Search Room for Patents after 5:00 p.m.

16. The front portion of the Public Search Room for Patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling shall not be occupied by users after 6:00 p.m.

17. A valid User Pass must be worn and visible at all times when Patent and Trademark Office facilities are being used. In addition, all persons holding User Passes must register with the designated representative in each Examining Group where they search and must sign a log (sign-in, sign-out sheet) indicating time-in, time-out, name, User Pass number, class(es) and subclass(es) users after 6:00 p.m.

18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark personnel upon request for cause.

19. Packages, briefcases or other personal effects brought into the Public Search Room for Patents or the Group Facilities are subject to search by authorized Patent and Trademark Office personnel upon request.

20. All packages, briefcases or other personal effects brought into the Group Search Rooms must be removed when leaving the Group Search Room areas.

21. Patents and other documents must not be removed from the Group patent shoes for any reason other than for cursory study thereof while kept in close proximity with the shoe and must not be moved out of their normal sequence.

22. All patent shoes must be promptly replaced in their proper location in the shoe cases.

23. All textbooks, journals and the like must be returned to their proper location.

24. All persons using the facilities of the Patent and Trademark Office are to refrain from engaging in any conduct which (1) is criminal in nature or (2) which causes or appears to cause an employee of the Patent and Trademark Office to violate the conflicts of interest regulations of the Department of Commerce [15 CFR §§ 0.735-1 through 0.735-41].

25. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents and the Group Facilities, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

These regulations will be enforced in accordance with the

Procedures for Enforcement published in the Federal Register of May 17, 1978, 43 FR 21345 (970 O.G. 114, published May 30, 1978).

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents and the Patent Examining Group Facilities and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

These Regulations have been instituted in order to maintain high quality and completeness of patent files and to provide an orderly environment for exploring, or studying in depth, the wealth of scientific and technological information contained in United States Patents. Although the Regulations may cause some inconvenience, the understanding and cooperation of users will insure that, for future users, the knowledge contained in United States Patents will be available in an environment conducive to study in the Public Search Room for Patents and the Patent Examining Group Facilities.

DONALD W. BANNER,  
Commissioner of Patents  
and Trademarks.  
June 20, 1979.

## Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before August 24, 1979.

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### Patent and Trademark Office Board of Appeals

In accordance with the provisions of 35 U.S.C. 7, vacancies on the Board of Appeals are filled by appointment of examiners-in-chief under the classified civil service. These appointments will be made at a salary of \$47,500 per annum maximum. There will be two positions to be filled through this announcement.

Persons interested in being considered for the vacancies are invited to submit their applications to the address given below, on or before August 17, 1979. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

**Duties:** Serves as a member of the Board of Appeals of the Patent and Trademark Office. As an examiner-in-chief, participates in its appellate and administrative responsibilities and exercises independent judgment on all matters before him or her on appeal subject to administrative and policy direction of the Commissioner. Appeals filed in accordance with 35 U.S.C. 134 and 37 CFR 1.101 through 1.198 of the Rules of Practice of the United States Patent and Trademark Office in Patent Cases involve complex legal and technical questions. The Board of Appeals has the sole power to hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patent and for reissue of patents. Final decisions of the Board, if unfavorable to an applicant, may be appealed to the United States Court of

Customs and Patent Appeals or civil action may be taken in accordance with 35 U.S.C. 145.

**Qualifications:** Candidates must possess (1) a minimum of five years of patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office; (2) a law degree or be a member in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the constitution; (3) a high degree of demonstrated competence in mechanical technology; (4) ability to write clearly and logically; (5) comprehensive experience in patent prosecution, examination or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

**Factors Which Will be Considered in Evaluating Qualified Candidates:** Candidates will be evaluated on the basis of education, training, awards and supervisory appraisals. **Note:** The qualifications of the proposed incumbent will have to be reviewed and approved by the Department of Commerce before an appointment can be made effective.

Employees of the Department of Commerce may apply by submitting a completed Merit Promotion Interest Statement, Form CD 261, and a completed SF 171, Personal Qualifications Statement, if one is not already on file at the address given below. Persons who are not employees of the Department of Commerce should submit a completed SF 171. Copies of Form SF 171 may be obtained at local post offices. The completed forms should be sent to:

U.S. Patent and Trademark Office  
 Office of Personnel  
 Building 2, Room 9C05  
 Crystal Plaza  
 Arlington, Virginia 22202

Questions concerning this notice should be directed to Ms. Donna Waters, Office of Personnel, Room 2-9C05, Telephone (703) 557-3831.

LUTRELLE F. PARKER,  
 Acting Commissioner of  
 Patents and Trademarks.

### Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,876,985, Fischer & Porter Company, ROTARY VALVES FOR LABORATORY GLASSWARE AND THE LIKE, filed Mar. 20, 1975, D.C.N.J. (Camden), Doc. C75-0472, Fischer & Porter Company v. Lurco Manufacturing Co. Inc. Order dismissed without costs and without prejudice to the right, upon good cause shown within 60 days, to reopen action if settlement not consummated, filed Mar. 18, 1977.

2,906,875, Edward T. Molinaro and Anthony P. Catanzaro, STATION SAMPLING RADIO, filed Mar. 27, 1979, D.C. Del. (Wilmington), Doc. 79-159, Anthony P. Catanzaro v. Motorola, Inc.

3,009,149, Ramsey McDonald, AUTOMATIC DIAL RADIO TELEPHONE SYSTEM, filed Apr. 17, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3-79-0478-H, Ramsey McDonald v. Communications Industries, Inc.

3,102,374, Multifold-International, Inc., PACKING MACHINE, filed Mar. 27, 1979, D.C., S.D. Ohio (Cincinnati), Doc. C-1-79-103, Multifold-International, Inc. v. Jagenberg-Werke Aktiengesellschaft.

3,172,571, American Can Company, COLLAPSIBLE DISPENSING TUBE; 3,260,410, same, COLLAPSIBLE CONTAINER STRUCTURE; 3,295,725, same, COLLAPSIBLE DISPENSING CONTAINER WITH AN IMPERMEABLE BARRIER BOTH IN ITS LAMINATED WALL AND IN ITS HEADPIECE; 3,347,419, same, COLLAPSIBLE DISPENSING TUBE, filed Mar. 2, 1979, D.C., N.D. Ill. (Chicago), Doc. 79CS31, American Can Company v. Dart Industries, Inc.

3,185,364, Ampex Corporation, DRIVE SYSTEM FOR TAPE TRANSPORT SYSTEM; 3,318,545, same, WEB TRANSPORT SYSTEM; 3,383,578, same, CONTINUOUS MODE MOTOR SPEED CONTROL SYSTEM, filed Sept. 21, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-3531-R, Ampex Corp. v. National Cash Register Co. et al.



3,225,799, Ernest A. Hayden & John S. Tanner, LUMBER SAWING ATTACHMENT FOR PORTABLE CHAIN SAW; 3,366,150, William Malloff, SAW CHAIN, filed Oct. 6, 1977, D.C.N.J. (Newark), Doc. 77-2090, Grandberg Industries, Inc. v. Robert Sperber and Sperber Tool Works, Inc. Judgment in favor of plaintiff, filed Mar. 29, 1979.

3,260,410. (See 3,172,571.)

3,260,411. (See 3,172,571.)

3,268,119, Rudd-Melikian, Inc., VENDING MACHINE EQUIPMENT, filed Apr. 24, 1979, D.C.N.J. (Newark), Doc. 79-1251, Refreshment Machinery Incorporated v. Flaggstaff Corporation.

3,270,852, Robert Fondiller, TYPEWRITER ERASURE MECHANISM, filed Mar. 23, 1979, D.C. S.D.N.Y., Doc. 79-1556 NEL, Robert Fondiller v. International Business Machines Corp.

3,295,725. (See 3,172,571.)

3,308,323, High Voltage Engineering Corporation, INCLINED-FIELD HIGH-VOLTAGE VACUUM TUBES, filed Mar. 14, 1979, D.C. Mass. (Boston), Doc. 79-510-G, High Voltage Engineering Corporation v. Dowish Developments Limited.

3,318,545. (See 3,185,364.)

3,318,545, Ampex Corporation, WEB TRANSPORT SYSTEM; 3,370,948, same, TAPE TRANSPORT DRIVE SYSTEM, filed Apr. 12, 1978, D.C. N.D. Calif. (San Francisco), Doc. C78-0797WWS, Ampex Corporation v. Data General Corp. Order of dismissal filed Apr. 5, 1979.

3,347,419. (See 3,172,571.)

3,366,150. (See 3,225,799.)

3,370,948. (See 3,318,545.)

3,383,578. (See 3,185,364.)

3,429,142, S. A. Zuccolo Rochet & Cie, WATCH BAND ADJUSTABLE CLASP, filed Mar. 30, 1979, D.C. S.D.N.Y., Doc. 79-C-1668 (WK), S. A. Zuccolo Rochet & Cie. v. Westerman Mfg. Co., Inc.

3,453,970, Ideal Toy Corporation, STEERABLE TOY VEHICLE; 4,078,799, same, TOY VEHICLE AND TOY VEHICLE GAME; 4,141,552, same, TOY DRONE CAR GAME; 4,141,553, same, TOY VEHICLE GAME, filed Sept. 11, 1978, D.C. Del. (Wilmington), Doc. 78-388, Ideal Toy Corporation v. Tyco Industries, Inc. Pat. Nos. 3,453,970, 4,141,552 and 4,141,553 included by supplemental complaint, filed Mar. 23, 1979.

3,499,380, Nelson L. Gongwer, AUTOMATIC FOOD COOKING MACHINE, filed Aug. 2, 1978, D.C. N.D. Ind. (South Bend), Doc. S78-0166, Nelson L. Gongwer v. Mark Stitt. Pursuant to joint stipulation, action dismissed without prejudice with parties bearing their own costs, filed Mar. 29, 1979.

3,515,619, Dimensional Plastics Corp., RESINOUS PLASTIC SHEETS, SHAPES, PANELS AND SLABS SIMULATING OBSIDIAN AND QUARTZ, filed Nov. 30, 1978, D.C. S.D. Tex. (Houston), Doc. CA H-78-2308, Dimensional Plastics Corp. v. Frank Lazarus Calfgas. Plaintiff's motion to dismiss without prejudice is granted, filed Mar. 26, 1979.

3,581,798, Josef Malamed, VENETIAN BLIND CONSTRUCTION, filed Apr. 26, 1979, D.C. S.D.N.Y., Doc. 79-C-2192LBS, Josef Malamed and Continental Workroom Inc. v. Venetianaire Corp. of America.

3,606,258, Fibco, Inc., ENERGY ABSORBING DECELERATION BARRIERS, filed Jan. 27, 1975, D.C. N.D. Ill. (Chicago), Doc. 75c277, Fibco, Inc. v. Energy Absorption Systems, Inc. Cause dismissed with prejudice and without costs, filed Sept. 15, 1976.

3,608,210, California Automotive Research, TRAFFIC HAZARD SIMULATOR, filed Mar. 30, 1979, D.C. S.D. Calif. (San Diego), Doc. 79-0336, California Automotive Research v. Applied Personal Dynamics and Doug Kessler.

3,624,205, Burroughs Wellcome & Co. (U.S.A.) Inc., TREATMENT OF HYPERURICEMIA IN HUMANS, filed Mar. 21, 1979, D.C. S.D. Fla. (Miami), Doc. 79-6167-C-SMA, Burroughs Wellcome Co. Etc. v. Genetix Drug Corp. Etc. Same, filed Mar. 21, 1979, D.C.N.J. (Newark), Doc. C79-790, Burroughs Wellcome Co. v. Pharmadyne Laboratories, Inc. Order of dismissal of action, filed June 5, 1979.

3,625,793, Mallinckrodt, Inc., BALLOON-TYPE CATHETERS AND METHOD OF MANUFACTURE, filed May 16,

1977, D.C. Del. (Wilmington), Doc. 77-178, Mallinckrodt, Inc. v. Brunswick Corp. et al. Stipulation and order dismissing case with prejudice, with each party bearing own costs, filed Mar. 30, 1979.

3,644,164, Wesley S. C. Chia, PLASTIC GREENERY STRIPS FOR DECORATIVE PURPOSES, filed Jan. 10, 1979, D.C. C.D. Calif. (Los Angeles), Doc. 79-0131-IH, Wesley S. C. Chia et al. v. Keene Corporation.

3,652,974, Milross Controls, Inc., INTEGRATED CIRCUIT CARRIER, filed Mar. 13, 1979, D.C. N.D. Ind. (South Bend), Doc. S79-0058, Milross Controls, Inc. v. Wells Electronics, Inc.

3,661,144, Jensen and Jensen, SUCTION APPARATUS FOR BODY CAVITIES, filed Feb. 23, 1978, D.C. N.D. Calif. (San Francisco), Doc. C78-0409 CFP, A/S Ferrosan v. Berkeley Bio-Medical Inc. Defendants are permanently enjoined from making, using, selling etc. the body cavity aspiration devices of U.S. Patent 3,661,144, filed Mar. 23, 1979.

3,668,653, Sundstrand Corporation, CONTROL SYSTEM, filed Mar. 23, 1979, D.C. E.D. Mich. (Detroit), Doc. 79-70826, White Consolidated Industries, Inc. v. Vega Servo-Control, Inc.

3,670,072, Cambridge Chemical Products, Inc., HEMATOLOGICAL STAIN SYSTEM, filed Mar. 22, 1979, D.C. S.D. Fla. (Miami), Doc. 79-6172-C-JLK, Cambridge Chemical Products, Inc. v. MC/B Manufacturing Chemists, Inc. et al.

3,679,977, Bell Telephone Laboratories, PRECODED TERNARY DATA TRANSMISSION, filed Jan. 11, 1979, D.C. S.D. Fla. (Miami), Doc. 79-118-C-JAG, Recal-Milgo, Inc. v. American Telephone and Telegraph Company et al.

3,708,388, Air Products and Chemicals, Inc., PROCESS OF LAMINATING USING VINYL ACETATE-ETHYLENE COPOLYMER LATEX ADHESIVE COMPOSITION, filed May 2, 1979, D.C.S.C. (Greenville), Doc. 79-826, Air Products and Chemicals, Inc. v. Chas. S. Tanner Co.

3,710,082, Edwin A. Sloane and Charles L. Helzman, SYSTEM FOR DIGITALLY CONTROLLING A VIBRATION TESTING ENVIRONMENT OR APPARATUS, filed May 17, 1979, D.C. S.D. Calif. (San Diego), Doc. 79-0658-N, Genrad, Inc. v. Spectral Dynamics Corporation.

3,715,535, Ray M. Johnson, CIRCULAR WAVEGUIDE MICROWAVE APPLICATOR, filed Mar. 28, 1979, D.C. N.D. Calif. (San Francisco), Doc. C-79-671-SW, Ray M. Johnson v. Microdry Corp.

3,715,982, Spectral Data Corporation, SPECTRAL-ZONAL COLOR RECONNAISSANCE SYSTEM; Re. 29,085, same, filed Apr. 23, 1979, U.S. Court of Claims (Washington, D.C.), Doc. 150-79, Spectral Data Corporation v. The United States.

3,738,217, Omark Industries, Inc., INSULATION HANGER, filed Apr. 30, 1979, D.C.N.J. (Camden), Doc. C79-1350, KSM Division of Omark Industries, Inc. v. H. S. Jones Company Incorporated.

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3,826,068, Weed Eaters, Inc., ROTARY CUTTING ASSEMBLY; 3,850,776, same, filed May 26, 1977, D.C. W.D. Wis. (Madison), Doc. 77-C-204, Weed Eater, Inc. v. The Toro Company and Toro Sales Company, Inc. Plaintiff's motion to dismiss granted on Sept. 5, 1978.

3,850,776. (See 3,826,068.)

3,899,654, Wahl Clipper Corp., SOLDERING IRON TIP ASSEMBLY AND CORDLESS SOLDERING IRON EMBODYING SAME, filed June 6, 1979, D.C. N.D. Ill. (Chicago), Doc. 79c2312, Wahl Clipper Corporation v. Tandy Corp. et al.

3,928,993, Takeji Owamoto, HOLDING TOY, filed Dec. 5, 1978, D.C. N.D. Calif. (San Francisco), Doc. C78-2805, ITI Hawaii v. So-Young America etc. Same, filed May 3, 1979, D.C. N.D. Calif. (San Francisco), Doc. C-79-1066 CBR, ITI Hawaii, Inc. v. Golden Crown Enterprises, Inc.

4,028,167, Gerber Garment Technology, Inc., LABEL APPLICATOR FOR AUTOMATICALLY CONTROLLED CUTTING MACHINE; 4,137,804, same, FLUID CUTTING JET RECEIVER, filed Feb. 5, 1979, D.C. N.D. Tex. (Dallas), Doc.

CA3-79-135-F, Camaco, Inc. v. Gerber Scientific, Inc. Order dismissing case without prejudice to reopening within sixty days if settlement not consummated, filed Mar. 6, 1979.

4,086,468, C & H Manufacturing Company, STOP MEANS FOR MAT BOARD CUTTER, filed May 18, 1979, D.C. S.D. Miss. (Jackson), Doc. J79-0261(N), C & H Manufacturing Company v. Keeton Products International, Inc.

4,077,335, Umberto Lazzaroli et al., EXTENSIBLE TABLE, filed Apr. 24, 1979, D.C. M.D.N.C. (Greensboro), Doc. C-79-272-S, Cicci Enterprises, Inc. v. Bassett Mirror Co., Inc.

4,078,799. (See 3,453,970.)

4,092,451, Howard Sernaker, EMBROIDERY TRANSFER; 4,140,563, same, METHOD OF MAKING EMBROIDERY TRANSFER, filed Apr. 16, 1979, D.C.N.J. (Newark), Doc. C79-1095, Virginitie Patents, Inc. v. Swiss Maid Emblems et al.

4,096,523, Armand Belmares-Barabla, Stanley J. Chayka and Robert M. Lund, COLOR CORRECTION SYSTEM, filed June 9, 1978, D.C. S.D.N.Y., Doc. 78-C-2652 WCC, Video Corporation of America v. Stanley J. Chayka.

4,099,478, Brunswick Corporation, HIGH THRUST TROLLING MOTOR, filed May 18, 1979, D.C. W.D. Wis. (Milwaukee), Doc. 79-342, Brunswick Corporation v. Minn Kota, Inc. et al.

4,100,711, Transco, Inc., PREFABRICATED INSULATING PANEL, filed Apr. 25, 1979, D.C. N.D. Ill. (Chicago), Doc. 79c1678, Transco, Inc. v. Lisco Incorporated and Raymond Urban.

4,101,703, Schwarzkopf Development Corporation, COATED CEMENTED CARBIDE ELEMENTS, filed Apr. 24, 1979, D.C. W.D. Pa. (Pittsburgh), Doc. 79-546, Kennametal Inc. v. Schwarzkopf Development Corporation.

4,104,356, Deutsch and Jones, TILT-UP PANEL BRACKET, filed May 11, 1979, D.C. C.D. Calif. (Los Angeles), Doc. 79-1711 LEW (Sx), J. A. Deutsch & Co., Inc. v. Ramon Navarro et al.

4,112,138, The Mead Corporation, MANIFOLD CARBON-LESS FORM AND PROCESS FOR THE PRODUCTION THEREOF, filed May 21, 1979, D.C. E.D. Wis. (Milwaukee), Doc. 79-344, The Mead Corporation v. Shade Information Systems, Inc.

4,137,804. (See 4,028,167.)

4,140,563. (See 4,092,451.)

4,141,552. (See 3,453,970.)

4,141,553. (See 3,453,970.)

4,145,780, Classic Products Corporation, WATERBED ASSEMBLY, filed May 1, 1979, D.C. C.D. Calif. (Los Angeles), Doc. 79-1571-F (Kx), Marina Marine, Inc. et al. v. Classic Products Corporation.

4,146,602, Becton, Dickinson and Company, SIMULTANEOUS RADIOASSAY OF FOLATE AND VITAMIN B12, filed May 9, 1979, D.C. Mass. (Boston), Doc. C.A. 79-924-K, Becton, Dickinson and Company v. Ria Products, Inc.

Re. 29,085. (See 3,715,982.)

D. 207,718, Anchor Hocking Glass Corporation, TUMBLER OR SIMILAR ARTICLE, filed July 6, 1977, D.C. W.D. Okla. (Oklahoma City), Doc. C77-0657-T, Anchor Hocking Corporation et al. v. Continental Plastics Company. The claims of plaintiffs asserted in complaint and counterclaims of defendants in amended answer and counterclaim are dismissed with prejudice.

#### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,017,557, Re. S.N. 969,935, Filed Dec. 15, 1978, Cl. 260/857 G, NOVEL ELASTOMERIC GRAFT COPOLYMERS, Clarence Frederick Hammer, et al., Owner of Record: E. I. Du Pont de Nemours and Company, Wilmington, Del., Attorney or Agent: Paul R. Steyermark, Ex. Gp.: 142

4,023,014, Re. S.N. 37,945, Filed May 19, 1979, Cl. 235/61.7 B, CREDIT CARD VERIFIER, Kenneth N. Goldberg, Owner of Record: Inventor, Attorney or Agent: Robert C. Schmertz, Jr., Ex. Gp.: 235

4,058,348, Re. S.N. 038,591, Filed May 14, 1979, Cl. 303/35, BRAKE APPARATUS WITH A COMBINED BRAKE CYLINDER AND RESERVOIR, James E. Hart, Owner of Record: Westinghouse Air Brake Company, Wilmerding, Pa., Attorney or Agent: R. W. McIntire, Jr., Ex. Gp.: 315

4,129,458, Re. S.N. 033,991, Filed Apr. 27, 1979, Cl. 136/89 PC, SOLAR-CELL ARRAY, Roy Kaplow, et al., Owner of Record: Massachusetts Institute of Technology, Cambridge, Mass., Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 114



# PATENT NOTICES

## Certificates of Correction for the Week of July 24, 1979

Re. 29,957	4,102,650	4,136,166	4,145,188
3,918,940	4,102,839	4,137,105	4,145,217
3,988,879	4,106,345	4,137,242	4,145,260
3,991,108	4,107,749	4,137,485	4,145,385
4,001,073	4,108,963	4,137,623	4,145,597
4,019,393	4,109,297	4,139,257	4,145,958
4,022,513	4,110,293	4,139,460	4,147,450
4,025,163	4,110,804	4,140,372	4,147,518
4,025,533	4,111,226	4,140,459	4,147,813
4,037,030	4,111,799	4,140,573	4,148,132
4,043,976	4,111,883	4,140,754	4,148,157
4,051,106	4,115,308	4,141,466	4,148,243
4,055,393	4,115,538	4,141,787	4,148,453
4,058,203	4,116,606	4,141,903	4,148,841
4,058,580	4,117,439	4,142,241	4,148,975
4,060,551	4,117,830	4,142,487	4,149,235
4,063,009	4,119,554	4,142,499	4,149,676
4,080,507	4,120,562	4,142,794	4,149,744
4,082,142	4,120,818	4,142,040	4,149,754
4,086,441	4,122,281	4,143,210	4,149,927
4,087,368	4,122,964	4,143,212	4,150,632
4,088,421	4,123,388	4,143,787	4,151,080
4,088,695	4,125,067	4,144,040	4,151,101
4,088,768	4,127,932	4,144,179	4,152,218
4,089,600	4,129,416	4,144,225	4,152,900
4,091,087	4,131,730	4,144,390	4,153,055
4,091,173	4,132,887	4,144,613	4,153,671
4,094,719	4,133,979	4,144,617	4,153,694
4,097,278	4,134,068	4,144,702	4,153,783
4,097,458	4,134,141	4,144,880	4,153,873
4,098,976	4,136,095	4,144,939	4,154,608
4,100,217	4,136,109	4,145,173	4,156,453
4,102,107	4,136,115	4,145,176	

## Disclaimers

3,882,313.—*Dan H. Siemens, Jr.*, Richland, Wash. CONCENTRIC ANNULAR TANKS. Patent dated May 6, 1975. Disclaimer filed Apr. 17, 1979, by the assignee, *Westinghouse Electric Corporation*.

Hereby enters this disclaimer to claims, 1, 7 and 8 of said patent.

4,022,973.—*Bül L. Stackhouse and Theodore E. Taylor*, Lynchburg, Va. APPARATUS FOR INDICATING SYNCHRONIZATION AND OUT-OF-SYNCHRONIZATION CONDITION. Patent dated May 10, 1977. Disclaimer filed Apr. 30, 1979, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,153,692.—*Wolfgang Krümer, Karl Heinz Büchel and Manfred Piempel*, Wuppertal, Germany. ACYLATED IMIDAZOLYL-O,N-ACETALS, THEIR PHARMACEUTICALLY ACCEPTABLE SALTS AND METAL COMPLEXES. Patent dated May 8, 1979. Disclaimer filed June 4, 1979, by the assignee, *Boyer Aktiengesellschaft*.

The term of this patent subsequent to Jan. 16, 1996 has been disclaimed.

## Dedication

4,035,770.—*Susan Little Sarte*, Chatham, N.J. SWITCHING SYSTEM FOR USE WITH COMPUTER DATA LOOP TERMINALS AND METHOD OF OPERATING SAME. Patent dated July 12, 1977. Dedication filed Apr. 6, 1979, by the assignee, *International Business Machines Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

## National Technical Information Service

### GOVERNMENT-OWNED INVENTIONS

#### Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for \$5.00 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for \$4.00 (\$8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,  
Patent Program Coordinator,  
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE  
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324  
Patent application 929,614. Latch Mechanism. Filed July 31, 1978.

Patent application 956,305. Cooling Apparatus for an Exhaust Nozzle of a Gas Turbine Engine. Filed Oct. 30, 1978.  
Patent application 956,704. A Combined Receiver Protector, AGC Attenuator and Sensitivity Time Control Device. Filed Nov. 1, 1978.

Patent application 958,929. Indicator for Detection of SO<sub>2</sub> Leakage. Filed Nov. 8, 1978.  
Patent application 959,048. System for Releasably Connecting Blades to Rotor. Filed Nov. 9, 1978.

Patent application 959,050. Optical Protractor. Filed Nov. 9, 1978.  
Patent application 960,207. Multiplexing of Multiple Loop Sidelobe Cancellers. Filed Nov. 13, 1978.

Patent application 962,411. Interferogram Synthesisization Method and Apparatus. Filed Nov. 20, 1978.  
Patent application 962,741. Line-of-Sight Stabilization Reflector Assembly. Filed Nov. 21, 1978.

U.S. DEPARTMENT OF AGRICULTURE  
Research Agreements & Patent Branch, General Service Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent application 897,811. Sequential Velocity Disk Refiner. Filed Apr. 19, 1978.  
Patent 4,125,708. Chitosan Modified With Anionic Agent and Glutaraldehyde. Filed Feb. 15, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,133,784. Biodegradable Film Compositions Prepared From Starch and Copolymers of Ethylene and Acrylic Acid. Filed Sept. 28, 1977. Patented Jan. 9, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY  
Assistant General Counsel for Patents  
Washington, D.C. 20545

Patent application 841,087. Interferometric Correction System for a Numerically Controlled Machine. Filed Oct. 11, 1977.  
Patent application 843,182. Acoustic Imaging System. Filed Oct. 18, 1977.

Patent 4,082,607. Fuel Subassembly Leak Test Chamber for a Nuclear Reactor. Filed Sept. 30, 1976. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,087,323. Pipe Connector. Filed Dec. 9, 1976. Patented May 2, 1978. Not available NTIS.  
Patent 4,087,324. Pipe Construction. Filed Oct. 30, 1951. Patented May 2, 1978. Not available NTIS.

Patent 4,088,182. Temperature Control System for a J-Module Heat Exchanger. Filed May 29, 1974. Patented May 9, 1978. Not available NTIS.

JULY 24, 1979

U. S. PATENT AND TRADEMARK OFFICE

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Patent 4,088,533. Radionuclide Trap. Filed Jan. 18, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,089,535. Dual-Shank Attachment Design for Omega Seals. Filed Jan. 25, 1977. Patented May 16, 1978. Not available NTIS.

Patent 4,089,743. Flow Duct for Nuclear Reactors. Filed Jan. 21, 1977. Patented May 16, 1978. Not available NTIS.

Patent 4,091,288. Threshold Self-Powered Gamma Detector for Use as a Monitor of Power in a Nuclear Reactor. Filed Apr. 4, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,092,498. Neutronic Reactor. Filed Aug. 29, 1952. Patented May 30, 1978. Not available NTIS.

Patent 4,092,542. High-Resolution Radiography by Means of a Hodoscope. Filed Jan. 27, 1977. Patented May 30, 1978. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
National Institutes of Health, Chief, Patent Branch  
Westwood Building, Bethesda, Md. 20250

Patent 4,110,461. Effect of Dinhenylhydantoin and Related Compounds on Glaucoma. Filed Mar. 10, 1973. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,115,418. 1,2-Diaminocyclohexane Platinum (II) Complexes Having Antineoplastic Activity. Filed Sept. 2, 1976. Patented Sept. 19, 1978. Not available NTIS.

Patent 4,138,089. Slide Valve. Filed Aug. 9, 1977. Patented Feb. 6, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR  
Branch of Patents, 18th and C Sts., NW.,  
Washington, D.C. 20240

Patent application 942,846. Removal of Asbestos Fibers From Water. Filed Sept. 15, 1978.  
Patent 4,089,812. Massive Catalyst. Filed May 13, 1977. Patented May 16, 1978. Not available NTIS.

Patent 4,094,955. Acid Process for Recovery of Alumina From Clay. Filed June 24, 1977. Patented June 13, 1978. Not available NTIS.

Patent 4,096,944. Cartridge for Grouting an Anchor Element in a Hole of a Support Structure. Filed Nov. 21, 1977. Patented June 27, 1978. Not available NTIS.

Patent 4,097,854. Sensing Mechanism for Mine Roof Bolting Apparatus. Filed Mar. 4, 1977. Patented June 27, 1978. Not available NTIS.

Patent 4,102,816. Adsorbent for Polynuclear Aromatic Compounds. Filed Oct. 18, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,105,328. Method of and Apparatus for Manipulating Line Weight in an Image. Filed June 29, 1976. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,110,344. Adsorbent for Polynuclear Aromatic Compounds. Filed Oct. 18, 1977. Patented Aug. 29, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY  
Assistant Chief for Patents, Office of Naval Research  
Code 302, Arlington, Va. 22217

Patent application 947,810. A Mixture Suitable for an Aero-stat. Filed Oct. 2, 1978.  
Patent application 970,414. Safe-Arm Device for Directed Warhead. Filed Dec. 18, 1978.

Patent application 972,124. An Acoustical Dereverberator. Filed Dec. 19, 1978.

Patent application 972,538. An AC Initiation System. Filed Dec. 18, 1978.

Patent 4,104,970. Electronic Ignition System for Liquid Explosive. Filed Feb. 10, 1977. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,106,906. Method for Suppressing Water Evaporation Using a Polybutadiene Film. Filed Jan. 31, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,108,025. Aircraft Head-Up Display Unit Mount Adjustment Tool. Filed May 27, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,108,604. Analytical Method for TNT in Water. Filed July 18, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,216. Microwave Generator. Filed May 31, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,232. Correction and Transmission System for Directional Target Information. Filed June 6, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,998. Optical Slippings. Filed Feb. 28, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,111,728. Gas Generator Propellants. Filed Feb. 11, 1977. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,118,930. Filter-Cooler. Filed Nov. 3, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,119,917. Sequentially Triggering Two or More Hydrogen Thyristors With Precision Timing. Filed Nov. 3, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,121,496. Gun Pod Stationary Blast Diffuser. Filed May 2, 1977. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,122,754. Dependent Sway Bracing Weapon Restraints. Filed Aug. 5, 1977. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,122,912. Dry Cooled Jet Aircraft Runup Noise Suppression System. Filed Mar. 23, 1977. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,122,927. Disconnect Linkage for Force Transmission System. Filed May 13, 1977. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,123,939. Thermal Standard. Filed Apr. 19, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,127,033. Ultrasonic Scanner System for Cast Explosive Billets. Filed Aug. 23, 1976. Patented Nov. 28, 1978. Not available NTIS.

## TENNESSEE VALLEY AUTHORITY

Division of Law, Muscle Shoals, Ala. 35660

Patent 4,066,432. Production of Suspension Fertilizers From Wet-Process Orthophosphoric Acids. Filed Jan. 28, 1977. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,113,842. Preparation of Dicalcium Phosphate From Phosphate Rock by the Use of Sulfur Dioxide, Water, and Carbonyl Compounds. Filed Mar. 18, 1977. Patented Sept. 12, 1978. Not available NTIS.

## U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts.  
Washington, D.C. 20240

Patent 4,090,935. Process for Recovering Silver, Copper and Stainless Steel From Silver Braided Stainless Steel Sections. Filed July 12, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,094,158. Loading Gate for Mine Roof Bolter Apparatus. Filed May 27, 1977. Patented June 13, 1978. Not available NTIS.

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**PATENT EXAMINING CORPS**  
**RENE D. TEGTMEYER, Assistant Commissioner**  
**WILLIAM FELDMAN, Deputy Assistant Commissioner**

## PATENT EXAMINING GROUPS

**Actual  
Filing Date  
of Oldest  
New Case  
Awaiting  
Action**

<b>GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAJIARNA, Director.....</b>	<b>8-11-78</b>
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
<b>GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....</b>	<b>5-2-78</b>
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
<b>HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....</b>	<b>7-6-78</b>
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
<b>COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....</b>	<b>3-20-78</b>
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
<b>SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—II. S. VINCENT, Director.....</b>	<b>12-1-77</b>
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrate Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	

<b>INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director.....</b>	<b>11-2-77</b>
Generation and Utilization of Physical Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Hologory; Acoustics; Recorders; Weighing Scales.	
<b>SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....</b>	<b>2-3-78</b>
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	
<b>INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director.....</b>	<b>6-1-78</b>
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
<b>RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director.....</b>	<b>8-25-78</b>
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
<b>ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....</b>	<b>8-25-77</b>
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
<b>DESIGNS, GROUP 290—C. D. QUARFORTH, Director.....</b>	<b>5-17-77</b>
Industrial Arts; Household, Personal and Fine Arts.	

<b>HAANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director.....</b> Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Extruding; Sprinkling; Extruding; Extruders; Coin Handling; Check Counters; Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicle and Apparatuses; Brakes; Railways and Railroad Equipment.	2-22-78
<b>MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....</b> Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Work; Drawing; Metal Spinning; Bonding; Metal Foundry; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
<b>AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—E. R. GRAY, Director.....</b> Amusement; Exercising Devices; Proctors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
<b>HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director.....</b> Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
<b>GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director.....</b> Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Patents.....	Numbers 3,027,558 to 3,031,668, inclusive
Plant Patents.....	Numbers 2,135 to 2,142, inclusive

984 OG 35

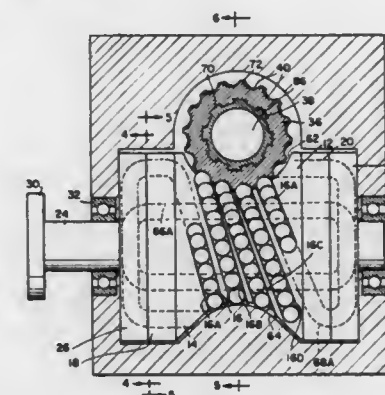


# REISSUES

JULY 24, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,049  
**POWER TRANSFER**  
 Ewald Schutz, Lancaster, Pa., assignor to Power Transfer Corporation, Lancaster, Pa.  
 Original No. 4,023,433, dated May 17, 1977, Ser. No. 481,993, Jun. 24, 1974. Application for reissue May 19, 1978, Ser. No. 907,808  
 Int. Cl.<sup>2</sup> F16H 1/16, 55/06, 55/04, 55/22  
 U.S. Cl. 74—425 **30 Claims**



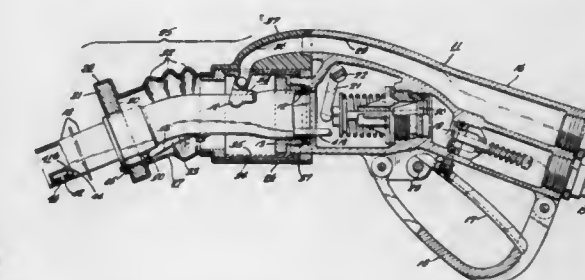
1. A power transfer unit of the type including a housing, a drive gear shaft rotatable within the housing and a pinion gear shaft rotatable within the housing comprising
  - A. a drive gear associated with the drive gear shaft,
    1. said drive gear being provided with a plurality of continuous power transfer material flow paths,
    2. said drive gear terminating laterally in a pair of spaced heads,
    3. at least some of the flow paths of the drive gear extending longitudinally the entire length of the drive gear and terminating at each head of the drive gear;
  - B. a rotatively mounted pinion gear disposed adjacent to said drive gear,
    1. said pinion gear including a plurality of grooves in its outer surface, portions of the flow paths in the drive gear being adapted to overlie portions of the grooves of the pinion gear in a power transfer area; and
  - C. power transfer material in moving engagement with the overlying portions of the flow paths of the drive gear and the grooves of the pinion gear in the power transfer area for transferring rotative power between said drive gear and pinion gear.

Re. 30,050  
**INTERLOCK SYSTEM FOR A GASOLINE DISPENSING NOZZLE**  
 William B. Hansel, Media, Pa., assignor to Suntech, Inc., Philadelphia, Pa.  
 Original No. 4,011,897, dated Mar. 15, 1977, Ser. No. 635,189, Nov. 25, 1975. Application for reissue Jun. 23, 1978, Ser. No. 918,620  
 Int. Cl.<sup>2</sup> B65B 57/06 **5 Claims**

1. A nozzle for dispensing fluid which is designed to permit operation of the nozzle only when the discharge spout of the nozzle is properly inserted into the fillpipe inlet of the tank being filled, with the discharge spout being inserted in the fillpipe a predetermined distance and the lower side of the discharge [spout] spout being urged toward the inside of the fillpipe inlet, so that in the event the nozzle falls from the

fillpipe, dispensing of fluid is immediately terminated, said nozzle comprising:

- a. a nozzle housing;
- b. a discharge spout, connected to the nozzle housing, for insertion into the fillpipe of the tank to be filled;
- c. a main nozzle valve in the nozzle housing;
- d. means for controlling the position of the nozzle valve for regulating the dispensing of fluid through the nozzle housing and discharge spout, said controlling means having an enabling position wherein the position of the main nozzle valve can be regulated and a disabling position wherein the main nozzle valve remains in or obtains a closed position; [and]
- e. *an automatic shut-off system which acts in response to the liquid level in the tank being filled reaching the discharge end of the discharge spout, to place the nozzle valve controlling*



*means in its disabling position by means of a vacuum deactivating the main nozzle valve, said vacuum being created by the closing of a vent line within said nozzle extending from the end of the discharge spout to the main nozzle valve; and*

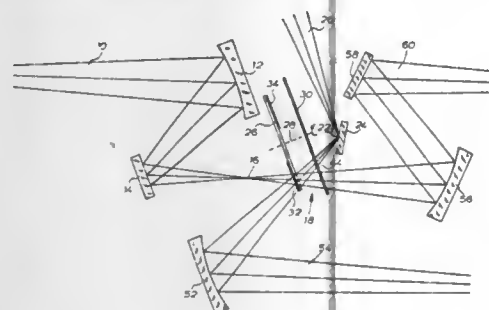
- [e.] f. interlock means, responsive to the discharge spout being inserted into the fillpipe a predetermined distance and the lower side of the discharge spout being urged toward the inside of the fillpipe inlet, for maintaining the controlling means in a disabled condition at all times by closing said vent line except when the discharge spout is inserted in the fillpipe inlet the predetermined distance and the lower side of the discharge spout is urged toward the inside of the fillpipe inlet, thereby assuring that the nozzle cannot be operated [operate] except when it is properly inserted in the fillpipe of the tank being filled and that its operation will be immediately terminated should the nozzle fall from the fillpipe.

Re. 30,051  
**CHOPPER ARRANGEMENT FOR ATOMIC ABSORPTION SPECTROPHOTOMETER**  
 Werner K. Lahmann, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany  
 Original No. 3,901,601, dated Aug. 26, 1975, Ser. No. 435,338, Jan. 21, 1974. Application for reissue Jul. 27, 1977, Ser. No. 819,365  
 Claims priority, application Fed. Rep. of Germany, Jan. 25, 1973, 2303533  
 Int. Cl.<sup>2</sup> G01J 3/42, 3/08 **11 Claims**

9. *In a double-beam spectrophotometer optical testing system having a sample beam path passing through a sample substance and a reference beam path, including a line-emitting first light source which emits a resonance line of an element of interest desired to be measured and a second light source emitting a continuous spectrum, a monochromator for selecting a limited spectral range containing the resonance line from the entire continuous*

spectrum, a detector impinged upon by the sample and reference beams of light and a signal analyzer circuit connected to generate an output signal from the detector corrected with respect to the background absorption,

a chopper arrangement by which, in a predetermined cyclical sequence of four successive intervals, light from the line emitting first light source is directed to the sample and reference paths and light from the continuous spectrum light source is similarly directed to the sample and reference paths, said chopper arrangement comprising:



two disc-like elements having a common axis and being mounted in offset relationship along their common axis and being rotatable coaxially and conjointly, each of said disc-like elements being mounted so as to be rotatable through each of said beam paths;

one of said elements having a light transmissive portion and a reflecting portion positioned to periodically, alternately pass and reflect said beams of light;

the other of said elements having a light transmissive portion and a light blocking portion positioned to periodically, alternately pass and block one of said beams of light.

Re. 30,052

**ELECTRICAL CONTACT MATERIAL AND PROCESS**  
Terrence A. Davies, Encino, Calif., and David J. Pedder, Oxford, England, assignors to Square D Company, Park Ridge, Ill.

Original No. 4,011,053, dated Mar. 8, 1977, Ser. No. 622,786, Oct. 15, 1975. Continuation-in-part of Ser. No. 387,884, Aug. 13, 1973, abandoned, and a continuation-in-part of Ser. No. 340,440, Mar. 12, 1973, abandoned. Application for reissue Dec. 23, 1977, Ser. No. 863,542

Claims priority, application United Kingdom, Mar. 15, 1972, 12189/72; Aug. 18, 1972, 38568/72; Aug. 25, 1972, 39667/72

Int. Cl.<sup>2</sup> B22F 3/00; C22C 29/00

U.S. Cl. 75-234

61 Claims

1. A material for use in making electrical contacts for power level applications consisting essentially of a first metal selected from a group consisting of silver and copper, an oxide of a second metal selected from a group consisting of cadmium, tin, and zinc added in an amount from a minimum effective amount up to a maximum equal to the limit of solubility of the second metal in the first metal, and an oxide of a third metal selected from a group consisting of metals in group IA and IIA of a periodic table with the oxides of the second and the third metals uniformly distributed throughout the material.

33. An electrical contact for electrical power applications comprising a first metal selected from a group consisting of silver and copper, an oxide of a second metal selected from a group consisting of cadmium, tin and zinc added in an amount from a minimum effective amount up to a maximum equal to the limit of solubility of the second metal in the first metal, and an oxide of a third metal selected from a group consisting of the metals in groups IA and IIA of a periodic table with the oxides of the second and the third metals uniformly distributed throughout the material.

Re. 30,053

**PG-TYPE, 1,9-LACTONES**

Gordon L. Bundy, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

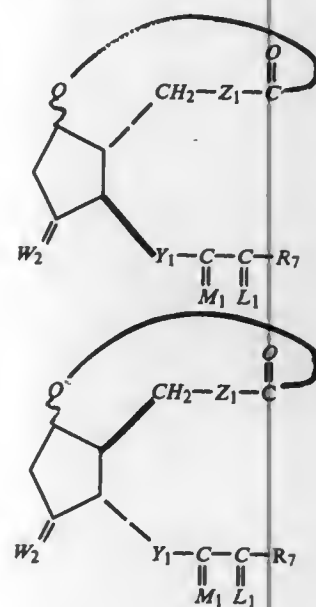
Original No. 4,049,648, dated Sep. 20, 1977, Ser. No. 670,522, Mar. 29, 1976. Continuation-in-part of Ser. No. 589,724, Jun. 23, 1975, abandoned. Application for reissue Jan. 16, 1978, Ser. No. 869,900

Int. Cl.<sup>2</sup> C07D 313/00

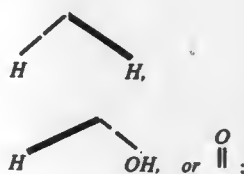
U.S. Cl. 542-426

113 Claims

91. A prostaglandin-type, 1,9-lactone of the formula



wherein W<sub>2</sub> is



wherein L<sub>1</sub> is



or a mixture of



and

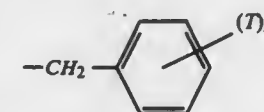


wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same

or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro, only when the other is hydrogen or fluoro; wherein M<sub>1</sub> is



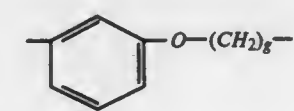
wherein R<sub>5</sub> is hydrogen or methyl; wherein R<sub>7</sub> is  $-(CH_2)_m-CH_3$ , wherein m is one to 5, inclusive,  $cis-CH=CH-CH_2-CH_3$ , or



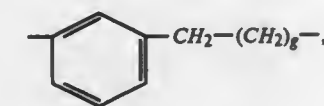
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl;

wherein Y<sub>1</sub> is  $trans-CH=CH-$ ,  $-CH_2CH_2-$ ,  $cis-CH=CH-$ , or  $-C=C-$ ; and wherein Z<sub>1</sub> is

- (1)  $cis-CH=CH-CH_2-(CH_2)_g-CH_2-$ ,
- (2)  $cis-CH=CH-CH_2-(CH_2)_g-CF_2-$ ,
- (3)  $cis-CH_2-CH=CH-(CH_2)_g-CH_2-$ ,
- (4)  $-CH_2-(CH_2)_g-CH_2-$ ,
- (5)  $-(CH_2)_3-(CH_2)_g-CF_2-$ ,
- (6)  $-CH_2-O-CH_2-(CH_2)_g-CH_2-$ ,



or



wherein g is one to 3 inclusive.

Re. 30,054

**CONTROL DEVICE**

Kian K. Ong, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Original No. 3,980,955, dated Sep. 14, 1976, Ser. No. 564,790, Apr. 3, 1975. Application for reissue Feb. 24, 1977, Ser. No. 771,696

Claims priority, application Netherlands, Apr. 19, 1974, 7405304

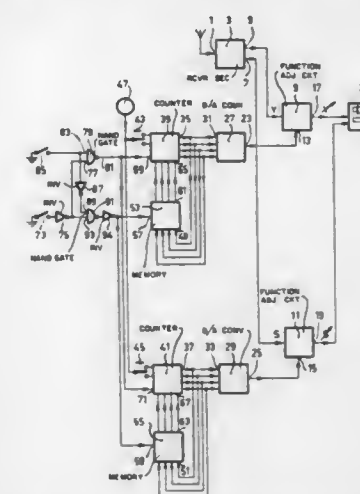
Int. Cl.<sup>2</sup> H03K 25/00

U.S. Cl. 325-390

3 Claims

1. Control device for adjusting at least one gain factor of a function, which device comprises a counter having a plurality of outputs, a digital-to-analog converter coupled to said outputs of the counter and having an output, a function adjustment circuit having an adjusting signal input coupled to said converter output, a control correction member means for immediately setting said counter into a selected state, a mem-

ory means coupled to said counter outputs for supplying the digital setting for said [desired] selected state to said counter,



and a write-in control member means for providing that information from said counter outputs is written into said memory.

Re. 30,055

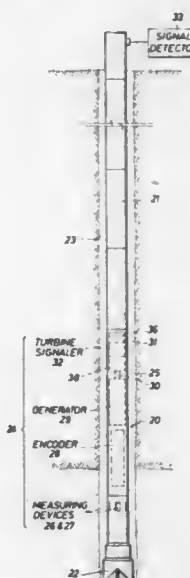
**APPARATUS FOR TRANSMITTING WELL BORE DATA**  
Jackson R. Claycomb, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Original No. 3,949,354, dated Apr. 6, 1976, Ser. No. 470,081, May 15, 1974. Application for reissue Apr. 5, 1978, Ser. No. 893,569

Int. Cl.<sup>2</sup> G01V 1/40

U.S. Cl. 340-18 LD

38 Claims



1. Apparatus adapted for producing signals at the surface representative of at least one downhole condition occurring while drilling a borehole and comprising:

a body adapted to be tandemly coupled into a tubular drill string and defining a fluid passage for carrying drilling fluids being circulated to a borehole-drilling device dependently coupled therebelow;

data-signaling means on said body and including circuit means for producing digitally-encoded electrical data signals;

power-supply means on said body and including an electrical generator adapted to be rotatively driven for producing electrical power for said circuit means; and



impeller means coupled to said generator and cooperatively arranged in fluid passage for rotatively driving said generator upon flow of drilling fluids through said fluid passage and said impeller means; [and] said impeller means including signal-producing means [cooperatively arranged on said impeller means and] adapted for at least partially

obstructing the flow of drilling fluids through said [impeller means] fluid passage in response to said electrical data signals to selectively produce correspondingly-encoded acoustic signals in drilling fluids circulating through said body.

## PLANT PATENTS

GRANTED JULY 24, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,441

## ROSE PLANT

H. A. Conklin, P.O. Box 365, McFarland, Calif. 93250

Filed Jul. 21, 1978, Ser. No. 927,615

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—2

1 Claim

1. A new and distinct variety of rose plant of the climbing hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by its general similarity to its parent variety, Patchwork (U.S. Plant Pat. No. 4,012), but different therefrom by its pronounced climbing growth habit.

4,442

## FUCHSIA PLANT

James R. Shawver, 281 S. Job St., Virginia, Ill. 62691

Filed Jul. 5, 1978, Ser. No. 921,461

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—84

1 Claim

1. The new and distinct variety of fuchsia plant herein de-

scribed and illustrated, characterized by the rose red sepals in combination with the lavender petals marked with rose red veins.

4,443

## AFRICAN VIOLET NAMED BRILLIANT EVA

Maximilian J. Epp, Huttonville, Canada, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Aug. 30, 1978, Ser. No. 938,116

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—69

1 Claim

1. A new and distinct cultivar of *Saintpaulia ionantha* substantially as herein shown and described, characterized by its medium violet-blue color when compared with its parent Eva.

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# PATENTS

GRANTED JUL. 24, 1979

## ERRATA

For CLASS	See PATENT NO.
414-085 .....	4,162,016
414-313 .....	4,162,017
414-786 .....	4,162,018
414-412 .....	4,162,019
406-185 .....	4,162,106
260-326.2 .....	4,162,142
435-239 .....	4,162,192
435-121 .....	4,162,193
435-015 .....	4,162,194
435-310 .....	4,162,195
435-313 .....	4,162,196
585-471 .....	4,162,214
546-201 .....	4,162,252
585-274 .....	4,162,271
062-024 .....	4,162,272
585-854 .....	4,162,273
528-075 .....	4,162,274
525-428 .....	4,162,275
525-002 .....	4,162,276
525-146 .....	4,162,277
525-002 .....	4,162,278
200-61.88 .....	4,162,384
200-153 SC .....	4,162,385
200-239 .....	4,162,386
307-362 .....	4,162,416
354-155 .....	4,162,498
364-200 .....	4,162,519
364-200 .....	4,162,520



# PATENTS

GRANTED JULY 24, 1979

## GENERAL AND MECHANICAL

4,161,792

### WASTE DISPOSAL SYSTEM AND METHOD

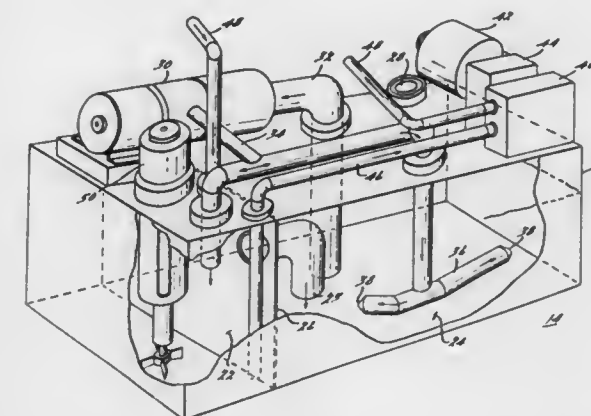
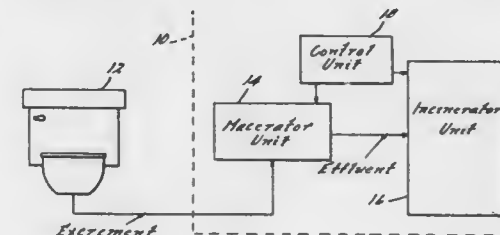
John A. Dallen, Port Clinton, Ohio, and Harry W. Green, Sarasota, Fla., assignors to The Standard Products Company, Cleveland, Ohio

Filed Nov. 3, 1976, Ser. No. 738,531

Int. Cl.<sup>2</sup> A47K 11/02

U.S. Cl. 4-111.1

54 Claims



1. A portable system for disposing of human excrement comprising a maceration unit for converting the excrement to a liquified effluent and an incineration unit for incinerating said effluent; said maceration unit including a first storage means for storing said excrement, macerating means for macerating said excrement into a substantially liquified effluent, second storage means for storing said effluent, said first pumping means for drawing effluent from said second storage means and pumping said effluent through a circulation line to said incineration unit and back to said maceration unit; said incineration unit including a combustion chamber, a crucible disposed within said combustion chamber, a burner for introducing a high temperature flame into said combustion chamber, and controlled means for drawing from said circulation line a portion of the effluent circulating in said line and feeding said effluent into the crucible within said combustion chamber.

4,161,793

### COMBINATION BATHROOM STOOL AND TOILET

Mercedes A. Merchan, 6846 Edgemoor, Houston, Tex. 77074, assignor to Mercedes Merchan, Houston, Tex.

Continuation-in-part of Ser. No. 621,023, Nov. 3, 1975, abandoned. This application Mar. 15, 1978, Ser. No. 886,784

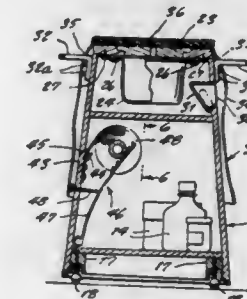
Int. Cl.<sup>2</sup> A47K 11/02; A61G 7/02

U.S. Cl. 4-134

5 Claims

1. A combination bathroom stool and toilet device, comprising a hollow upwardly tapered body consisting of a frustoconical side wall, a circular top wall and a circular bottom wall, non-skid means upon an underside of said bottom wall for stationarily maintaining said device, caster means on an underside of said bottom wall for moving said device across a floor, a horizontal intermediate wall between said top and said bot-

tom walls defining an upper and a lower chamber within said body, said top wall having a central, circular opening, so as to serve as a toilet seat, a pair of spaced apart channels on an underside of said top wall, a pot below said top wall opening having sidewardly extending ears slideably supported on said channels, an upper doorway on said side wall providing access into said upper chamber for sliding said pot outwardly of said



body, said doorway being closeable by a hinged door, a pair of U-shaped handle grips upon opposite sides of said body, an opening in said side wall fitted with an inwardly hollowed soap dish for holding soap, and a removable cushion placed upon said top wall, said cushion being integral with a skirt draped downwardly all around said body and enclosing a major portion of said body from view.

4,161,794

### INFLATABLE CUSHION

Kristina E. Darnfors, Askim, Sweden, assignor to Bengt Petersson New Products Investment AB, Goteborg, Sweden

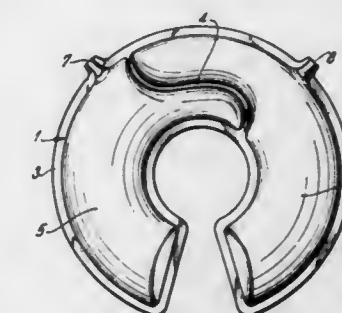
Filed Jun. 7, 1976, Ser. No. 693,180

Claims priority, application Sweden, Jun. 9, 1975, 7506543

Int. Cl.<sup>2</sup> A47G 9/00; A47C 27/10

U.S. Cl. 5-441

2 Claims



1. A substantially annular inflatable resting cushion having two ends and a middle section and comprising two sheets of a flexible material joined together along defining border lines which define the shape of the cushion, said cushion being divided into two separate inflatable compartments by a curved defining line in the middle section, each of said compartments having a reduced portion in overlapping relationship with the other of said compartments in said middle portion such that a radius passing through the middle section will pass through the reduced portion of each of the compartments.

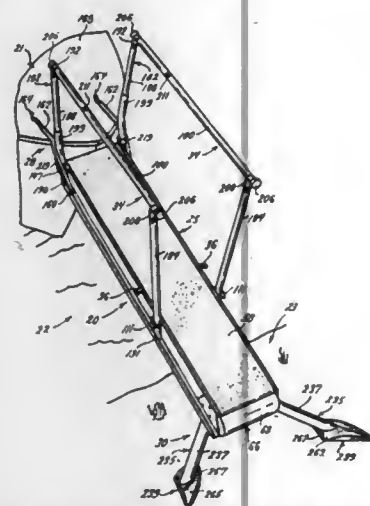
4,161,795

## BOAT RAMP

Roland G. Quest, 50 Woodcrest Dr., St. Louis, Mo. 63124  
Filed Sep. 2, 1977, Ser. No. 830,094  
Int. Cl.<sup>2</sup> E04C 3/02

U.S. Cl. 9—1.6

17 Claims



1. A ramp for allowing egress and ingress to and from a landing base and a boat having a deck comprising:

- (a) a plank having a rear end to be supported near the boat and a front end to be supported near the base; and
- (b) a foldable hand rail assembly comprising a pair of hand rails mounted on opposite sides of the plank, each rail mounted by a rear end brace bent so as to have an off-set lower segment, each lower rear brace segment being pivotally mounted to opposite sides of the plank, the tops of the rear braces being pivotally engaged near the rear ends of their respective hand rails, and each rail mounted by a front end brace pivotally mounted on opposite sides of the plank, each front brace being pivotally engaged to each rail near the front end of the rail, the braces being mounted to the plank at an angle so that when the braces pivot from a lowered position to an upright position they are tilted at an angle outwardly away from the sides of the plank to provide a passageway between the hand rails of greater width than the plank width; and
- (c) means to adjustably mount the rear plank end to the boat comprising link chains having their lower ends secured to the plank near the rear end of the plank and their upper ends secured to the boat to allow the rear end of the plank to be supported a selected position beneath the level of the boat deck;
- (d) means to latch the hand rail braces when they are in an upright position; and
- (e) foldable legs pivotally mounted near the front end of the plank and extendable outwardly from the sides of the plank to support the front end of the plank on the landing base.

4,161,796

## MONOLITHIC POLYMER FOAM SAILBOAT HULL

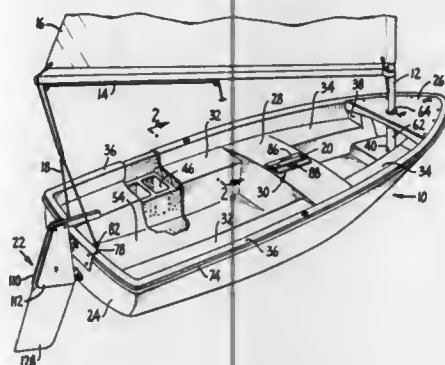
Andrew T. Kostanecki, Darien, Conn., assignor to Kramco Manufacturing, Inc., South San Francisco, Calif.  
Filed Jun. 7, 1977, Ser. No. 804,321  
Int. Cl.<sup>2</sup> B63B 3/00

U.S. Cl. 9—6 P

13 Claims

1. A sailboat hull comprising a monolithic structure of low-density polymer foam, said hull having integrally formed therewith a structural reinforcement core in the form of an internal H-shaped structure defining a cross member extending transversely across the hull and seat members extending along and disposed inwardly of the sides of the hull, said seat members terminating short of the bow of the hull, said cross member merging with the bottom and opposite sides of the hull and

having a centerboard trunk formed therein, said seat members defining leg space therebetween and extending forwardly and rearwardly of the cross member and merging with the cross member and the sides and transom of the hull and said hull



having integrally formed therewith, in front and in merging relationship with the seats and the bottom of the hull, deck supports extending to a level in close proximity to the gunwale line of the hull.

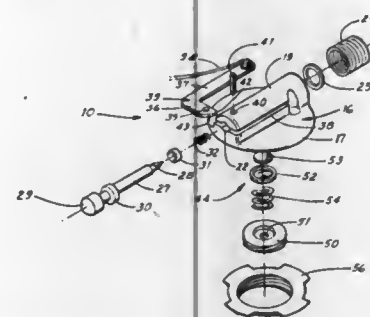
4,161,797

## DETONATOR ASSEMBLY

Harry G. Ruscigno, P. O. Box 164, Orange, Calif. 92669  
Filed Mar. 15, 1976, Ser. No. 667,187  
Int. Cl.<sup>2</sup> B63C 9/16, 9/24

U.S. Cl. 9—316

5 Claims



1. In a detonator assembly for mating a gas cartridge to an expandable chamber, said cartridge having a sealing diaphragm across one end thereof and said chamber having a wall, said detonator assembly being of the type including a body having first and second intersecting passageways therein, one end of said second passageway being adapted to receive said one end of said cartridge, a firing pin positioned for axial movement in said second passageway and having a diaphragm puncturing element at one end thereof positioned in facing relationship with said one end of said cartridge, means positioned within said body for biasing said firing pin with said one end thereof spaced from said one end of said cartridge, and manually operable means for moving said firing pin axially to puncture said sealing diaphragm of said cartridge, the improvement wherein:

said body has a planar flange on one side thereof and a threaded collar extending perpendicularly from one side of said flange, said collar being adapted to extend through a hole in said chamber wall, said first passageway extending through said collar for providing a fluid passageway into said chamber;

a nut positionable in said chamber for engaging said collar and sandwiching said chamber wall between said nut and said flange to connect said body to said chamber wall and

to provide a fluid-tight seal between said chamber and said first passageway in said body; and

one-way valve means positioned within said first passageway in said body for permitting flow of the gas in said cartridge from said cartridge to said chamber via said first and second passageways and preventing escape of said gas from said chamber.

4,161,798

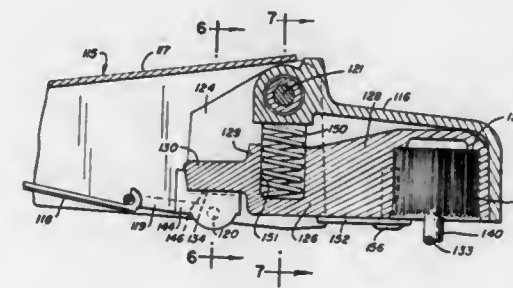
## FINER ADJUSTMENT WINDSHIELD ARM MOUNTING HEAD

Michael G. Mohnach; William H. Harbison, both of Valparaiso, and Robert O. Wittwer, Portage, all of Ind., assignors to The Anderson Company, Gary, Ind.

Filed Apr. 1, 1977, Ser. No. 783,939  
Int. Cl.<sup>2</sup> B60S 1/08, 1/26

U.S. Cl. 15—250.13

11 Claims



11. A wiper arm having a mounting head with a longitudinal axis, said mounting head having mounting means and fine adjustment means disposed therein, said mounting means and fine adjustment means having a longitudinal axis, a drive shaft having a drumhead mounted on one end portion, said drumhead having vertical fluting adapted to coact with said mounting means, spring means engaging said mounting head and said fine adjustment means for urging said head and said fine adjustment means into interlocking engagement, and means for positioning said mounting means and fine adjustment means relative to said drumhead and mounting head to orient said longitudinal axis of the mounting means and fine adjustment means relative to said longitudinal axis of the arm.

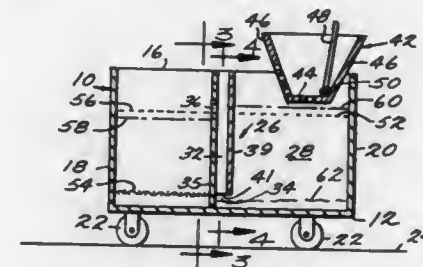
4,161,799

## MOP CLEANING DEVICE

Weldon B. Sorrells, 830 Leigh Mill Rd., Great Falls, Va. 22066  
Continuation-in-part of Ser. No. 462,076, Apr. 18, 1974, abandoned. This application Sep. 8, 1975, Ser. No. 611,244  
Int. Cl.<sup>2</sup> A47L 13/14

U.S. Cl. 15—260

5 Claims



1. A mop cleaning device comprising: an open-top container having a bottom and an enclosing side wall; and vertical partition means within the container for dividing the interior of the bucket into first and second compartments, and for maintaining a predetermined liquid level in the first compartment and for permitting displacement of liquid from the lower end of the first compartment to the upper end of the second compartment when liquid is added to the upper end of the first compartment by wringing of a mop thereinto, said means forming a laterally

enclosed upwardly extending passage communicating at its lower end with the first compartment only near the lower end portion thereof and communicating at its upper end with the second compartment near the upper end thereof, whereby liquid wrung from a mop into the first compartment displaces an equal amount of liquid upwardly from the lower end of the first compartment into the second compartment; and a mop wringer associated with said first compartment at a position in which liquid wrung from a mop drops into said first compartment, said wringer being located above the level of the upper end of said passage and being supported by said container, whereby wringing of a mop does not agitate the liquid in said first compartment.

4,161,800

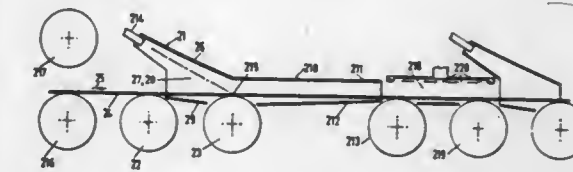
## APPARATUS FOR IMPROVING THE QUALITY OF STEEL SECTIONS

Mario Economopoulos, Liege; Yves J. Respen, Herstal, and Stephane H. Wilmette, Liege, all of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Division of Ser. No. 619,022, Oct. 2, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,327  
Claims priority, application Belgium, Oct. 4, 1974, 820750  
Int. Cl.<sup>2</sup> C21D 9/54

U.S. Cl. 15—302

1 Claim



1. An apparatus for improving the quality of a steel section at the outlet of a section rolling mill, the apparatus comprising: a container forming a reservoir of a cooling fluid and having one wall perforated by orifices for atomizing and directing the cooling fluid onto a flat surface of a rolled section being displaced past the perforated wall; and means for supplying the cooling fluid connected to the container; said container comprising, arranged one after the other:

- (a) a first enclosure comprising means for water-cooling the rolled sections, and
  - (b) an air-drying enclosure comprising means for removing from the section water applied to it while passing through the first enclosure;
- said first enclosure comprising a case having two distinct portions, a first portion on the inlet side of the section, said first portion having a height decreasing down to a root of said case which is directly above the upper generatrix of a roller, the upper part of this roller being located inside the case owing to the presence of an opening in its bottom wall, a second portion having a roof substantially horizontal with respect to the plane taken taken as a reference plane for the section going through the case, the bottom walls of the two portions of the case, one being arranged before the roller and the other after the roller, being slightly inclined towards the roller without touching it; and on the inlet side of the section said means for water cooling comprises a device arranged to eject water onto the upper part of the section substantially in the direction of the zone where the section, assumed to be plane, contacts the roller, the roller carrying the section and conveying the section towards the outlet of the container.



4,161,801

**FLUID STRIPPING APPARATUS**

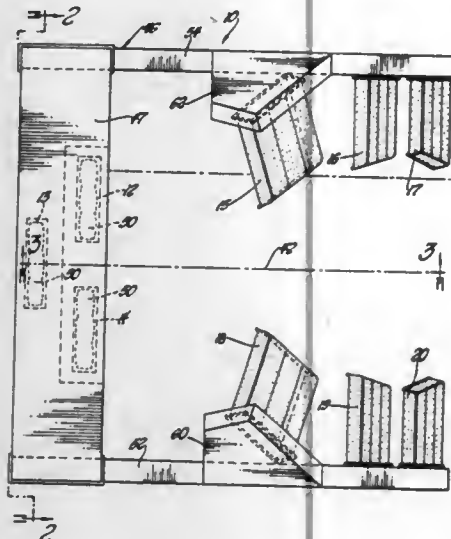
David R. Day, 637 Princeton Rd., Berkely, Mich. 48072, and  
Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich.  
48455

Filed Mar. 16, 1978, Ser. No. 887,040

Int. Cl.<sup>2</sup> B60S 3/04

U.S. Cl. 15—316 R

14 Claims



1. An apparatus for stripping fluids from the surface of an object comprising: a flexible, inflatable bag of generally rectangular transverse cross section including an elongated inlet for introducing air under pressure into said bag and an elongated opening at one end of said bag defining a nozzle of smaller area than said inlet for emitting a stream of air while maintaining the bag in a nonflailing orientation and rigidly inflated; means for effecting relative motion between said bag and the object to be stripped; and support means for supporting said rigidly inflated bag so that it extends toward the object and wherein the nozzle end of said bag lies in the path of motion of the object as said bag is rigidly inflated to cause physical engagement between the nozzle end of said bag and the object to bring the stream of air emitted from said nozzle opening into close spacial relationship with the surface of the object, said nozzle being orientated to direct the stream of air in a direction to strip the object as the bag is rigidly inflated.

4,161,802

**DRAPERY AND DRAPERY PLEAT CLEANING TOOL HEAD**

Arlen M. Knight, 1141 N. Patterson, and William R. Hacht-  
mann, 5072 Walnut Park Dr., both of Santa Barbara, Calif.  
93111

Filed Apr. 10, 1978, Ser. No. 894,703

Int. Cl.<sup>2</sup> A47L 9/02

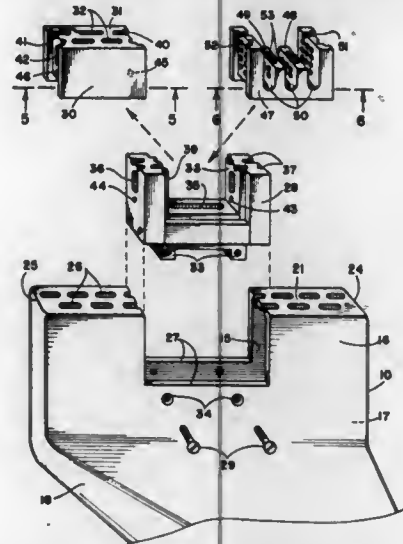
U.S. Cl. 15—331

6 Claims

1. A drapery and drapery pleat cleaning tool head assembly for connection to a vacuum hose extending from a cleaning machine, said tool head assembly including, in combination:

(a) a housing comprised of wide front ended top and bottom walls spaced relatively close together with left and right side walls converging towards each other in a rearward direction to merge with narrowed rear end portions of said top and bottom walls into a cylindrical portion having a rear end opening for connection to said vacuum hose, and an elongated front wall extending between the front ends of the top, bottom, left and right side walls, said front wall having a plurality of openings communicating with the interior of the housing to provide a front suction surface for engaging drapery material, a portion of said elongated front wall and corresponding extending por-

tions of said top and bottom walls intermediate the front ends of said side walls defining a cut-out; and  
(b) insert receiving means secured in said cut-out for mounting in operative position different inserts whereby a first insert can be received in said insert receiving means, with a front wall portion flush with said elongated front wall on either side of said cut-out and with openings positioned to provide continuity with the openings in said front wall to define a continuous suction surface between the front ends of the left and right side walls for efficient cleaning of depending drapery material; or whereby a second insert



can be received in said insert receiving means with an undulating front wall portion defining transverse fins with channels therebetween, the side walls and front tips of the fins, and floors of the channels having openings connecting with the interior of the housing, so that pleated portions of drapes may be received in said channels between the fins and end channel walls to enable the pleat surfaces and inner folds of the pleats to be subject to suction and thereby cleaned while portions of the drapes on either side of the pleated material are cleaned by the portions of the elongated front wall on either side of said cut-out.

4,161,803

**CASTER**

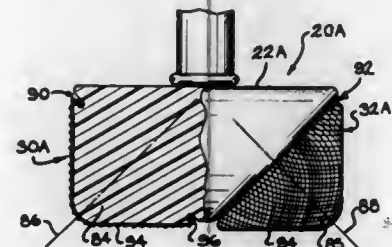
Robert L. Propst, 2347 Londonderry, and Paul L. Propst, 2490  
Laurelwood, both of Ann Arbor, Mich. 48104

Filed Dec. 12, 1977, Ser. No. 859,319

Int. Cl.<sup>2</sup> B60B 33/00

U.S. Cl. 16—18 A

3 Claims



1. A low profile caster particularly adapted for rolling support on a carpet having carpet fibers, said caster comprising a body having an upright spindle, a pair of extension members formed on said body on opposite sides of said spindle, rollers rotatably mounted on said extension members, each of said rollers comprising a flexible boot fitted over one of said extension members and slidably engaged therewith, each of said boots slidably rotating on one of said extension members about

an axis of rotation inclined with respect to said spindle in response to movement of said caster on said carpet, each of said boots having an outer surface engageable with said carpet and diverging away from said axis, bottom portions of said surfaces of said boots being positioned on opposite sides of and equidistant from said spindle so as to be centered therewith.

4,161,804

**HEAT-ACTUATED DOOR LATCH**

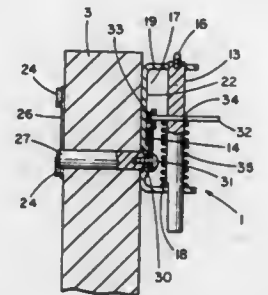
Richard E. D'Hooge, Wood Dale, and Frank S. Pasek, West-  
chester, both of Ill., assignors to Rixson-Firemark, Inc.,  
Franklin Park, Ill.

Filed Dec. 21, 1977, Ser. No. 862,723

Int. Cl.<sup>2</sup> E05F 15/20

U.S. Cl. 16—48.5

6 Claims



1. A heat-actuated door latch adapted for mounting on or near a door to latch the door closed, comprising: an integral fusible element separable when subjected to intense heat, a heat conducting element fixed to a first portion of the fusible element and shaped to extend completely through a door, latching means, supporting means carrying the latching means for latching movement, means coupling a second portion of the fusible element to the latching means to retain the latching means in an unlatched position, and latch force means exerting a latching force upon the latching means which releases the latching means to effect a latch in response to the separation of the fusible element.

4,161,805

**PROCESS AND APPARATUS FOR CARDING FIBERS**

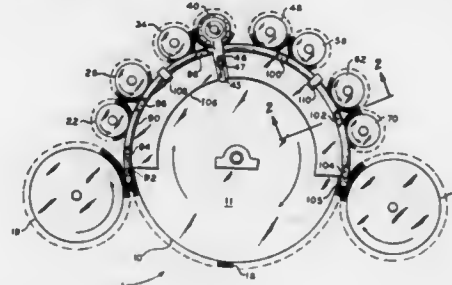
Nathan T. Worley, Seneca, S.C., assignor to Phillips Petroleum  
Company, Bartlesville, Okla.

Filed Feb. 15, 1978, Ser. No. 878,098

Int. Cl.<sup>2</sup> D01G 15/02

U.S. Cl. 19—98

21 Claims



1. A method comprising:  
carding staple fibers on a carding machine comprising a main cylinder roll having a cylindrical surface and a first end and a second end wherein said staple fibers form a web on the main cylinder roll, said web having a first edge positioned adjacent the first end and a second edge positioned adjacent the second end, and  
forming at least one gaseous barrier near at least said first end by directing a pressurized gas primarily toward said

cylindrical surface adjacent said first end at a pressure sufficient to maintain the first edge of the web a distance from the first end of the main cylinder roll.

4,161,806

**SNAP FASTENER**

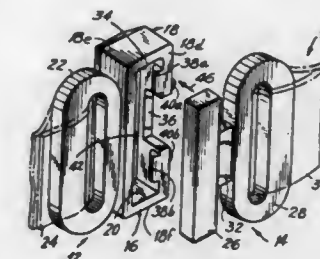
Bonnie C. Hennisse, Miami, Fla., and Synde Cousins, New  
York, N.Y., assignors to Bonnie Enterprises, Inc., New York,  
N.Y.

Filed Mar. 24, 1977, Ser. No. 780,593

Int. Cl.<sup>2</sup> A44B 17/00

U.S. Cl. 24—201 A

38 Claims



1. A fastener for releasably joining two associated parts to each other, comprising a female member having a first connecting means for connecting said female member to one of the associated parts, and having a socket portion; a male member having a second connecting means for connecting said male member to the other one of the associated parts and having an insert portion, said insert portion being dimensioned and configured to be removably receivable within said socket portion with little relative clearance, said first and second connecting means being securely attached to the respective ones of said portions and being adapted to be gripped to disengage said portions without applying excessive stresses to the associated parts, said socket portion forming a substantially hollow housing having an aperture in a side wall and having fenestration means in a face wall of said housing for exposing the interior thereof, and said insert portion comprising a tab dimensioned and configured to substantially correspond to the configuration and dimension of the interior of said hollow housing so as to be receivable therein by passage through said fenestration means, at least one of said portions being provided with retaining means in the form of a plurality of protuberances, some of which are on one side of said side wall projecting inwardly of said fenestration means and on the other side of said side wall projecting in a direction away from said fenestration means and in a direction of said second connecting means, so that said retaining means releasably retaining the other of said portions during engagement therebetween of said socket and insert portions, said insert portion being snappingly receivable into said socket portion by deforming at least one of said portions and said retaining means.

4,161,807

**APPARATUS AND METHOD FOR LOCKING LOAD SUPPORTING STRUCTURES TOGETHER**

William J. Swenson, Houston, Tex., assignor to Raymond Inter-  
national, Inc., Houston, Tex.

Filed Sep. 28, 1977, Ser. No. 837,623

Int. Cl.<sup>2</sup> A44B 21/00

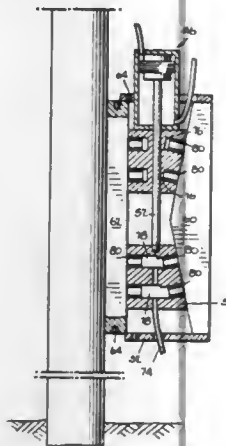
U.S. Cl. 24—263 SW

23 Claims

23. Apparatus for locking two load supporting members together comprising: a surface on one of said members converging relative to a facing surface on the other of said members, wedge means between said members and having a first surface facing said converging surface, means adapted to move said wedge means along said converging surface in a converging direction, gripping means movable toward said other of said members upon movement of said wedge means said wedge means having a second surface facing a surface of said gripping



means, recesses being formed between a surface of said wedge means and said converging surface and between a surface of said wedge means and a surface of said gripping means, sleeve means telescopically disposed in each recess and having an end engaging the respective surface facing said recesses, and pressure means for establishing a positive fluid pressure substan-



tially in excess of ambient pressure in said recesses when said wedge means move along said converging surface, said sleeve means being so arranged relative to said recesses and said converging surface and gripping surface as to retard the escape of said pressurized fluid between said wedge means and the respective surfaces facing said recesses.

#### 4,161,808 MACHINE FOR CUTTING CONTINUOUS SHEET MATERIAL

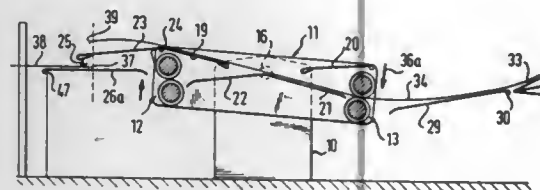
Gerhard Wittstock, Pinneberg, Fed. Rep. of Germany, assignor to Werner H.K. Peters Maschinenfabrik G.m.b.H., Hamburg, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,357

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722233

Int. Cl.<sup>2</sup> B23P 23/00; B23D 19/00  
U.S. Cl. 29—33 R

26 Claims



1. A machine for longitudinally cutting and grooving continuous sheet material, said machine including a first longitudinal cutting and grooving station, a second longitudinal cutting and grooving station, means for cutting and grooving said sheet material at each of said stations, means for feeding sheet material in a predetermined direction through said machine, means mounting said stations spaced apart in said predetermined direction, whereby, in operation, said sheet material first passes said first station and then passes said second station, means for moving said stations upwardly and downwardly between working and inoperative positions, a device for cutting said continuous sheet material transversely into sections, said working positions of said first station and said second station lying in a common plane and said feed means being operative to feed said sheet material along said common plane, a first guide device for guiding said sheet material associated with said first station, another first guide device for guiding said sheet material associated with said second station, said first guide devices of both said stations being disposed on one side of said common plane when said station with which said guide device is associated is in the working position thereof, a second guide device,

means mounting said second guide device between said first station and said second station, said second guide device being directed towards said cutting and grooving means of said second station both when said second station is in said working position thereof and in said inoperative position thereof, a third guide device and means mounting said third guide device between said first station and said second station, said third guide device being directed towards said cutting and grooving means of said first station both when said first station is in the working position thereof and in the inoperative position thereof.

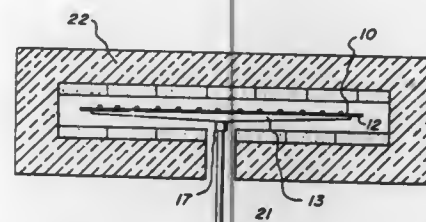
#### 4,161,809 METHOD OF FABRICATING A SOLAR ABSORBER PANEL

Asbjorn M. Severson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 26, 1977, Ser. No. 836,804

Int. Cl.<sup>2</sup> B23P 15/26  
U.S. Cl. 29—157.3 D

6 Claims



1. A method of fabricating a solar flat plate absorber panel comprising the steps of:  
providing a pair of sheets of structural metal including a first sheet having a plurality of juxtaposed elongated grooves formed therein and a second sheet provided with a pair of substantially parallel grooves across the end portions thereof and having openings therein for the provision of inlet and outlet accesses thereto such that when the pair of sheets is assembled in a superimposed fashion the grooves form a distinct fluid passage system consisting of manifold passages joined by a plurality of connecting passages;  
placing suitable metallic sealant material in the grooves of said sheets, said sealing material having a melting point lower than that of the sheets;  
assembling said pair of sheets in superimposed configuration to create said fluid passage system and seam welding the periphery of said assembled pair of sheets to produce a fluid tight envelope having a hollow internal passage network;  
purging said internal passage system of air by flowing a non-oxidizing gas therethrough; and  
partially evacuating said internal volume of said envelope while heating said envelope thereby maintaining said non-oxidizing gas therein at reduced pressure in a manner which causes said sealant to melt and fill the peripheral junctures of said passages.

#### 4,161,810 METHOD OF WITHDRAWING ELONGATE TUBULAR MEMBERS

James H. Beard, Cyril Lea, and Bernard W. Ludwig, all of Melton Mowbray, England, assignors to The Production Engineering Research Association of Great Britain, Melton Mowbray, England

Division of Ser. No. 651,811, Jan. 23, 1976, Pat. No. 4,106,177.

This application Jan. 17, 1978, Ser. No. 870,212

Claims priority, application United Kingdom, Jan. 24, 1975, 3106/75; Jan. 24, 1975, 3107/75; Aug. 22, 1975, 34891/75; Aug. 23, 1975, 35110/75

Int. Cl.<sup>2</sup> B23P 19/02

U.S. Cl. 29—427

9 Claims



1. A method of withdrawing an elongated tubular member from a bore in a support member and simultaneously re-shaping said bore for receiving a replacement tubular member, comprising the steps of fixing at a leading end of said tubular member a hollow adapter means constituting when so fixed an extension of said tubular member, inserting through the tubular member and the hollow adapter means a rod having an overall length greater than the combined length of the tubular member and the adapter means, securing said rod to the adapter means in the region of the leading end of the tubular member, securing a broach to the rod at the region of a trailing end of the tubular member, pulling the tubular member in an axial direction by suitable gripping means operating at least initially on said adapter means to withdraw the tubular member from the bore and thereby drawing the broach through the bore to re-shape it.

#### 4,161,811 METHOD AND APPARATUS FOR THE MANUFACTURE OF REINFORCED SMOOTH FLOW PIPE

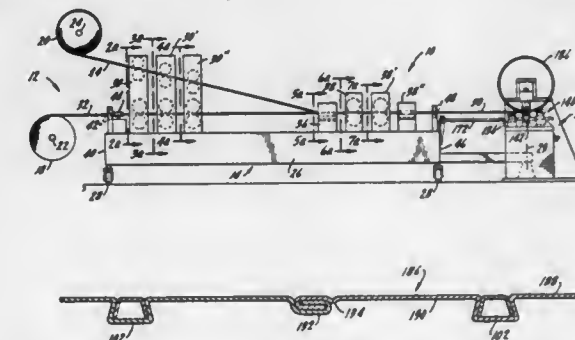
James Nyssen, 10045 Kenswood Dr., Chilliwack, British Columbia, Canada

Filed Mar. 13, 1978, Ser. No. 885,662

Int. Cl.<sup>2</sup> B23P 19/00, 19/04

U.S. Cl. 29—429

13 Claims



1. Apparatus for manufacturing reinforced, spirally wound pipe having a generally smooth inner wall from an elongated flat sheet of ductile material and one or more narrow strips of ductile material, comprising  
a. rolling means for continuously forming one longitudinal, generally trapezoidal reinforced impression in the elongated flat sheet corresponding to each of the narrow strips, said rolling means having an entry end for acceptance of said flat sheet and an exit end for issuing the reinforced sheet, and consisting essentially of  
i. means to form one longitudinal, generally rectangular

channel in the sheet corresponding to each of said narrow strips,

- ii. means to shape each narrow strip into a reinforcement element having a first continuous portion of a lesser width than the width of said rectangular channels and a second continuous portion comprising a pair of splayed legs extending from the outer edges of said first portion,
  - iii. means to insert each of said strips into a corresponding one of said rectangular channels, and
  - iv. means to close the walls of each of said channels about said strips to form said trapezoidal impressions,
- b. a forming device proximate said exit end for continuously curling said reinforced sheet into adjacent, helical convolutions, and
- c. means to join said adjacent convolutions.

10. A method of manufacturing reinforced, spirally wound pipe with a generally smooth inner wall from an elongated continuous sheet of ductile material and at least one continuous, narrow strip of ductile material, comprising the successive steps of

- a. forming one longitudinal, rectangular channel in said sheet corresponding to each of said strips of ductile material,
- b. shaping each of said strips into reinforcement elements having a first continuous portion of a lesser width than the width of said channel and a second continuous portion comprising a pair of splayed legs extending from the outer edges of the first portion, the height of each of said shaped strips being no greater than the depth of said channels,
- c. inserting each reinforcement element into a corresponding one of said rectangular channels,
- d. closing each of said channels about said elements to form longitudinal, reinforced impressions in the elongated sheet which have a trapezoidal cross-section, and
- e. curling said sheet into convolutions having said impressions forming ribs in the exterior wall of said convolutions.

#### 4,161,812 METHODS OF SECURING TORSIONALLY FLEXIBLE MOTOR MOUNTING ARRANGEMENTS TO SUPPORTS THEREFOR

Ernest W. Litch, III, Ft. Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

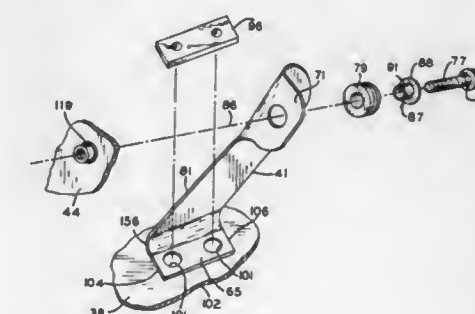
Division of Ser. No. 636,547, Dec. 1, 1975, Pat. No. 4,063,060.

This application Sep. 1, 1977, Ser. No. 829,662

Int. Cl.<sup>2</sup> B23P 11/02

U.S. Cl. 29—446

12 Claims



1. A method of mounting a motor to a motor support so that the motor will be torsionally flexible relative to the support, and wherein the motor is inflexibly interconnected with a first end of at least two torsionally flexible leaf spring mounting arms that are self-supporting unitary structural members, each having at least one mounting hole at a second end thereof remote from the motor; said method comprising aligning a mounting hole at the second end of a first one of the torsionally flexing mounting arms with a first mounting location on the motor support, and tightening a first fastener at the first mounting location while the fastener is accommodated in the mounting hole in the arm; flexing at least one other torsionally flexi-

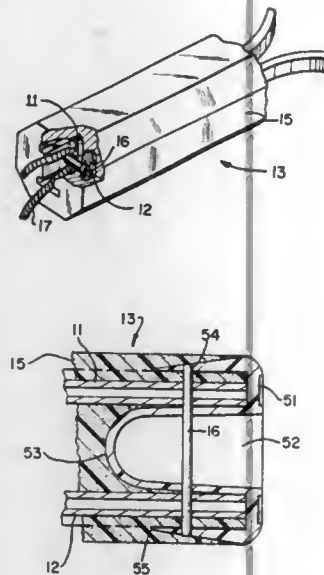


ble mounting arm to align the mounting hole therein with another mounting location on the motor support; and tightening another fastener at the another mounting location while the another fastener is accommodated in the mounting hole in the other torsionally flexible mounting arm.

#### 4,161,813 METHOD OF STRING ATTACHING TO GAME RACKET HANDLE

Mark L. Robinson, Andover, Mass., assignor to Acro, Inc., Stoneham, Mass.  
Continuation-in-part of Ser. No. 800,660, May 26, 1977, abandoned. This application Feb. 15, 1978, Ser. No. 878,087  
Int. Cl.<sup>2</sup> B23P 3/00, 19/04  
U.S. Cl. 29—460

7 Claims



1. A method of making the game racket handle of a game racket having a frame with a handle portion comprising opposed legs, pin means connected between said opposed legs in said handle portion near the end thereof for accommodating a handle string looped thereover, said handle portion comprising additional material between and around said opposed legs and formed with a cavity extending from the end of said handle portion to slightly beyond said pin means for accommodating said handle string, which method includes the steps of, inserting said pin means through said opposed legs near the end of said end portion, and inserting initially flowable material between said opposed legs leaving a cavity extending between said legs from the end of the handle portion to slightly beyond the pin means for accommodating a handle string in said handle portion.

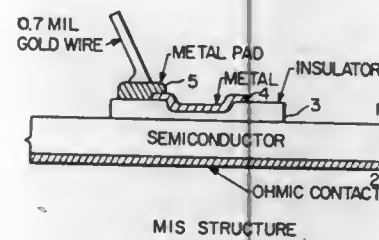
6. A method of making the game racket handle of a game racket having a frame with a handle portion comprising opposed legs, pin means connected between said opposed legs in said handle portion near the end thereof for accommodating a handle looped thereover, said handle portion comprising additional material between and around said opposed legs and formed with a cavity extending from the end of said portion to slightly beyond said pin means for accommodating said handle string, which method includes the steps of, inserting a cap means formed with a protrusion in said cavity open at the end of said handle portion, inserting initially flowable material between said opposed legs and said cap means leaving a cavity extending between said legs from the end of the handle portion to slightly beyond the pin means for accommodating a handle string,

and inserting said pin means through said cap means and said opposed legs near the end of said handle portion.

#### 4,161,814 TUNNEL INJECTION OF MINORITY CARRIERS IN SEMI-CONDUCTORS

Joseph M. Ballantyne, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.  
Division of Ser. No. 638,406, Dec. 8, 1975, Pat. No. 4,065,780.  
This application Oct. 24, 1977, Ser. No. 846,490  
Int. Cl.<sup>2</sup> B01J 17/00  
U.S. Cl. 29—580

12 Claims



1. A method of fabricating a multilayer thin film device having adjacent insulator and semiconductor layers to produce an energy-band configuration which provides improved tunnel-injection of minority carriers through the semiconductor-insulator interface of said device, comprising:  
forming a semiconductor substrate having an upper and a lower surface;  
chemically etching said semiconductor substrate;  
cleaning the upper surface of said semiconductor substrate in an oil-free, ion-pumped vacuum to free said upper surface of oxides and contaminants; and  
depositing an insulator material on said cleaned upper surface while maintaining said vacuum to produce a thin insulator region adjacent the semiconductor-insulator interface, the cleaning of said upper surface and the subsequent deposition of an insulator material thereon creating an electric charge close to the semiconductor-insulator interface, such electric charge producing and maintaining a depletion region in said semiconductor substrate adjacent said semiconductor-insulator interface to substantially suppress tunneling of majority carriers and to enhance tunneling of minority carriers.

#### 4,161,815 METHODS FOR MAKING ELECTRICAL CELLS AND BATTERIES

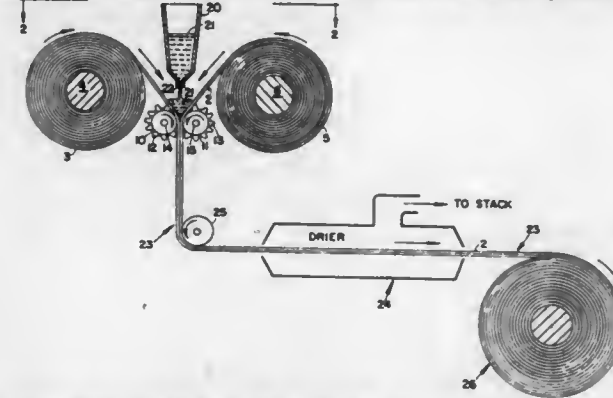
Edwin H. Land, Cambridge, and Gordon F. Kinsman, Billerica, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.  
Division of Ser. No. 811,472, Jun. 30, 1977, Pat. No. 4,124,742.  
This application Dec. 8, 1977, Ser. No. 858,685  
Int. Cl.<sup>2</sup> H01M 6/00  
U.S. Cl. 29—623.4

8 Claims

1. The method of making a subassembly useful in the manufacture of laminar batteries from a conductive plastic sheet to which electrode patches have been adhered, comprising the steps of passing said plastic sheet with said electrode patches adhered thereto and a sheet of cellophane together through a pair of nip rolls under pressure with said patches confronting said sheet of cellophane while supplying an aqueous composition containing a bonding agent to said sheets in the nip between said rolls, and drying the laminate so produced.

4. The method of making a laminate useful in the manufacture of batteries from a sheet of cellophane and a sheet of conductive plastic on one side of which there are electrode patches, comprising providing a sheet of conductive plastic

with electrode patches and a sheet of cellophane and feeding said sheets together between a pair of nip rolls under pressure

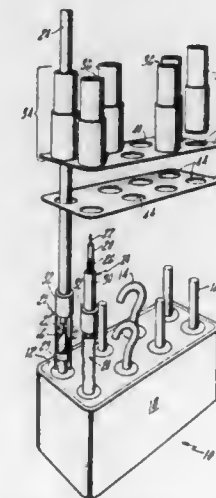


while supplying an aqueous composition containing a bonding agent to the nip between said rolls.

#### 4,161,816 METHOD OF MAKING RELAY AND RF ADAPTOR ASSEMBLY

Paul A. Frano, Windsor Locks; Robert W. Bowman, Enfield; Donald F. Drapeau, Windsor, and Marino Kain, Bloomfield, all of Conn., assignors to HI-G, Incorporated, Windsor Locks, Conn.  
Division of Ser. No. 631,874, Nov. 14, 1975, Pat. No. 4,109,222.  
This application Dec. 27, 1977, Ser. No. 864,833  
Int. Cl.<sup>2</sup> H01R 43/00  
U.S. Cl. 29—628

6 Claims

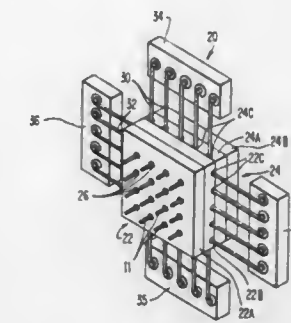


1. A method of making a miniature radio frequency relay assembly comprising the steps of mounting a plurality of radio frequency signal-carrying pins in a predetermined layout on an electrically conductive relay header with each pin projecting externally from the header for connection to a coaxial cable, forming a radio frequency adaptor as a one-piece component separate from the header by interconnecting tubular shells providing at least as many openings as there are radio frequency signal-carrying pins with the openings formed in a pattern corresponding to the RF signal-carrying pin layout on the header, and securing the one-piece RF adaptor as an integral unit in electrically conductive relation to the relay header with each header pin received within the opening of a complementary shell, whereby the shells of the adaptor unit are made common with electrical ground and serve as radio frequency shields.

#### 4,161,817 METHOD AND APPARATUS FOR MAKING A SEMICONDUCTOR DEVICE MOUNTING ELEMENT EMBODYING AN EMBEDDED FAN-OUT WIRE ARRANGEMENT

Edward T. Bernardo, Endicott; Louis H. Faure; Alfred H. Johnson, both of Poughkeepsie, and Donald G. Pittwood, Owego, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Mar. 31, 1978, Ser. No. 892,048  
Int. Cl.<sup>2</sup> H01R 9/00  
U.S. Cl. 29—630 B

11 Claims



1. A method of fabricating a semiconductor device mounting element for providing a fan-out I/O terminal attachment comprising,  
supporting a plurality of insulated wires in a spatial parallel arrangement of columns and rows between two spaced apertured flat die elements,  
engaging said wires at a first location between said die elements and uniformly reducing the spacing in a first direction between the wires at only a first location maintaining the arrangement of columns and rows,  
compacting said wires in a direction transverse to said first direction at a second location adjacent the said first location while maintaining an arrangement of columns and rows,  
forming an enclosure about the wire portions positioned between one of said die elements and said second location, injecting an organic hardenable resin material into said enclosure thereby encapsulating the wires positioned within, severing the wires adjacent said second location, and severing the wires adjacent said die element, and removing the die.

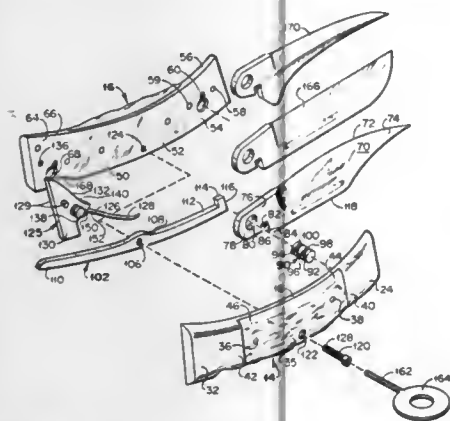
#### 4,161,818 FOLDING POCKET KNIFE HAVING REPLACEABLE BLADES

Paul S. Phelps, Maryville, Tenn., assignor to Star Sales Company, Knoxville, Tenn.  
Filed Feb. 6, 1978, Ser. No. 875,579  
Int. Cl.<sup>2</sup> B26B 1/04, 5/00  
U.S. Cl. 30—157

7 Claims

1. A pocket knife which can be readily disassembled for purposes of cleaning and substituting blades comprising:  
a case including first and further cooperating members which are releasably secured to each other,  
a blade pivotally mounted at one of its end in said case between said first and further cooperating members,  
a first spring member, said first spring member being elongated and defining a first end portion and a further end portion, said first spring member defining an opening therethrough between said first and further end portions for pivotally mounting said first spring member between said first and further case members; and  
a spring mount carried by said case and serving to secure said first and further case members together, said spring mount carrying a further spring member, said further spring member engaging said further end portion of said

first elongated spring member, and said first end portion of said elongated spring member engaging said end portion



of said blade proximate said opening to assist in maintaining said blade in its opened and closed positions upon movement of said blade to such positions by an operator.

4,161,819

# GLASS CUTTER

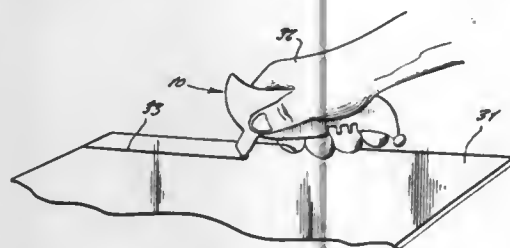
Frank Pietrantonio, 2215 Gunther Ave., Pelham Gardens, N.Y. 10469

Filed Mar. 3, 1978, Ser. No. 882,980

Int. Cl.<sup>2</sup> B26B 25/00; C03B 33/10

U.S. Cl. 30—164.95

4 Claims



1. A glass cutter comprising an S-shaped handle having in its working position an upturned front end and a downturned back end to define concave gripping surfaces respectively on its top edge adjacent the front end and on its bottom edge adjacent the back end, a carrier foot extending downwardly from the lower edge of the handle at a point rearwardly of the front end and substantially beneath the concave upper gripping surface, and a cutting wheel disposed at the lower end of the depending carrier foot.

4,161,820

# APPARATUS FOR CUTTING VEGETATION

James L. Moore, Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Filed Oct. 28, 1977, Ser. No. 846,288

Int. Cl.<sup>2</sup> A01D 55/18; A01G 3/06

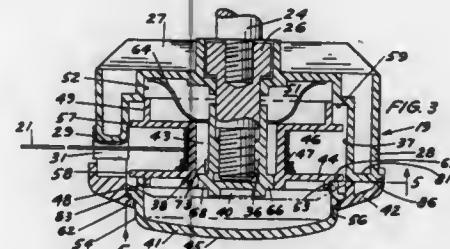
U.S. Cl. 30—276

16 Claims

1. An apparatus for cutting vegetation, comprising:  
(a) a head rotatable about an axis of rotation with an integral drive connection carried on a first face and a second face having a smooth surface free of projections and recesses capable of trapping appreciable vegetation, and said head having an open-ended cavity with a smooth cylindrical wall coaxial to the rotational axis;  
(b) a spool mounted in said cavity and having spaced-apart flanges defining a storage zone for cutting line, said flanges provided with two circular peripheries adapted to

be journaled snugly within said cylindrical wall, and said spool having an axial opening;

(c) at least one flexible, non-metallic cutting line coiled in said storage zone of said spool and having a free end extending outwardly from said head into a cutting plane;  
(d) a circular button member carried on said head and mounted for manually-induced axial movement from an outward station into said head to an inward station;  
(e) a cover removably secured to said head to contain said button member and spool member and biasing means for urging said button member and spool towards the outward station;



(f) said cover, button member and spool having interestered cylindrical bearing surfaces spaced intermediate of said axial opening and said cylindrical wall, said bearing surfaces forming low-friction journal means for common rotation relative to one another and said rotational axis; and  
(g) locking means on said head and received within said central axial opening of said spool, said locking means adapted to be activated by said button member in the inward station for releasing said spool for rotation within said head through a predetermined angular displacement for extending a certain length of cutting line from said head into said cutting plane whereat said locking means secure said spool against rotation relative to said head.

4,161,821

# SCRIBING TOOL FOR MARKING WALL PANELS FOR CUTTING TO FIT THE CONTOUR OF A WALL CORNER

Charles W. Miller, 814 N. 8th St., Springfield, Ill. 62702

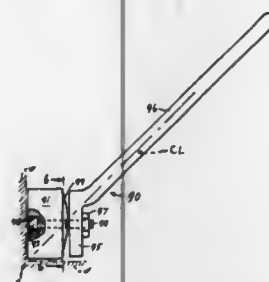
Continuation-in-part of Ser. No. 680,468, Apr. 26, 1976,

abandoned. This application Oct. 13, 1977, Ser. No. 841,739

Int. Cl.<sup>2</sup> B43L 13/02

U.S. Cl. 33—41 R

6 Claims



1. A scribing tool for marking a being-installed wall panel for cutting said panel to fit the contour of a wall corner, said tool comprising: a roller disc having a cylindrical peripheral surface and having a flat surface perpendicular to the axis of said cylindrical surface, a shaft journaled in an axial bore in said disc and carrying a scribing point protruding axially at least slightly beyond said flat surface for marking a cut-guiding line on a panel held flatwise against one wall with said panel's edge close to the corner defined by said one wall and by another intersecting wall at right angle thereto when said flat face of said disc is pressed against said one wall and said cylindrical surface is rolled against said another wall, and a manipulating

handle fixed to said shaft at an angle of approximately 45 degrees to the axis of said shaft and with its center line oriented during a scribing operation to pass close to the intersection line of said walls for firm-pressure engagement therewith.

4,161,822

# SKATE BLADE ANALYZER

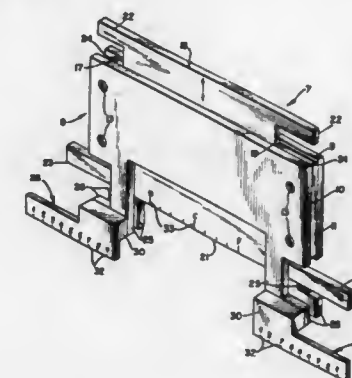
Norman R. Ayyazian, 1 Patriots Cir., Woburn, Mass. 01801

Filed May 30, 1978, Ser. No. 910,848

Int. Cl.<sup>2</sup> G01B 5/00, 3/14

U.S. Cl. 33—174 R

6 Claims



1. An ice skate blade analyzer comprising a support having foot members provided with coplanar bottom surfaces adapted to rest on an inverted ice skate blade holder and to straddle a part of the blade extending upwardly from the holder, said support having a slot disposed above and between the foot member, a slide member mounted in said slot and disposed substantially parallel to the blade for movement toward and away from the blade edge, said slide having a bottom edge disposed substantially parallel to the bottom surfaces of said foot members, means carried by said foot members for indicating when said support is centered relative to the blade holder supports, and means carried by said slide, adjacent to its bottom edge, for indicating the location of the tangent or high point of the blade edge which contacts said bottom edge of the slide member.

4,161,823

# CIRCUMFERENCE MEASURING GAUGE

Terrence Collins, Whitburn, England, assignor to American Filtrona Corporation, Richmond, Va.

Filed Jan. 6, 1978, Ser. No. 867,448

Claims priority, application United Kingdom, Jan. 7, 1977, 596/77

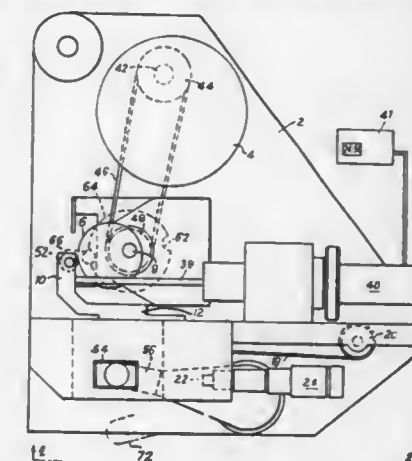
Int. Cl.<sup>2</sup> G01B 3/10, 5/08

U.S. Cl. 33—179

9 Claims

1. A measuring gauge comprising, in combination:  
a tape including an intermediate portion forming means defining a closed loop with its two end portions extending away from the loop in opposite directions;  
two mounting members, one fixed relative to each end portion of said tape, one mounting member being fixed and the other being mounted for movement towards and away from the said one member to increase or decrease the loop circumference;  
means responsive to the distance apart of two datum points, one fixed relative to each mounting member, to indicate the size of said loop;  
means resiliently biasing said other mounting member away from said one mounting member to tighten said loop;  
cam means having a cam surface;  
a cam follower attached to said other mounting member in operative relationship with said cam surface;  
means mounting said cam means for rotation with said cam surface and cam follower in engagement successively and alternately to move said other mounting member towards

said one mounting member against said resilient bias to relax said loop for acceptance or release of a test rod and then to permit said resilient bias to move said other mounting member away from said one mounting member to tighten said loop around a test rod disposed therethrough; motor means operatively associated with said cam means to effect said rotation of said cam means, and control means operable to actuate and deactivate said motor means in a measuring cycle, said control means comprising first sensing and actuating means operative to sense insertion of a test rod through said loop when relaxed and thereupon to actuate said motor means to rotate said cam means from a start position in which said cam surface



engages said cam follower to maintain said loop relaxed against said resilient bias to an intermediate position in which said loop is tightened around said test rod under said resilient bias, second sensing and actuating means operative to sense said cam means in said intermediate position and thereupon to deactivate said motor and actuate a timing means, said timing means being operative after a predetermined measuring interval to reactuate said motor means to rotate said cam means directly to said start position, to relax said loop and release said test rod, and third sensing and deactuating means operative to sense the release of said rod and thereupon to deactivate said motor with said cam means in said start position.

4,161,824

# GAP SETTING MEANS

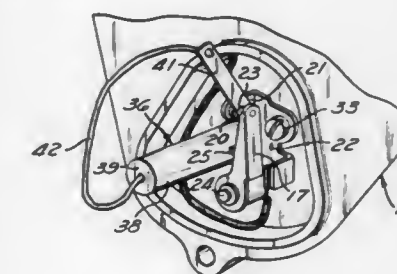
Jerry Riha, Mentor, Ohio, assignor to Robert K. Elder, Twinsburg, Ohio

Filed Sep. 8, 1977, Ser. No. 831,359

Int. Cl.<sup>2</sup> G01B 3/30

U.S. Cl. 33—180 AT

1 Claim



1. A method of adjusting the gap of a set of ignition breaker contact points on an internal combustion engine in a BMW motorcycle having a combined mechanical timing advance mechanism and tubular breaker point cam both removably mounted on a driving shaft, comprising the steps of removing



both the mechanical advance mechanism and breaker point cam from the shaft, providing a first cylindrical, tubular gauge having a cylindrical bore of 0.355 inch (9.00 mm.) nominal diameter and an outer cylindrical surface concentric with said bore and of 0.470 inch (11.8 mm.) nominal diameter resulting in a gauge wall thickness equal to the maximum wall thickness of the tubular-breaker point cam, disposing the first gauge on the shaft such that the cam follower is displaced from the shaft a distance corresponding to the maximum lift produced by said cam, providing a second gauge having a thickness corresponding to a desired gap between the breaker points, disposing the second gauge between the points while the first gauge is disposed on the shaft, adjusting one of the breaker points relative to the other to develop a gap substantially equal to the thickness of said second gauge, locking said one breaker point in the position determined by said second gauge, thereafter removing said first and second gauges and replacing said tubular breaker point cam and mechanical timing advance mechanism on said shaft.

4,161,825

## PLASTICIZED ORGANIC WASTE

Vere Maffet, West Chester, Pa., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 813,578, Jul. 7, 1977, Pat. No. 4,099,336, and a continuation-in-part of Ser. No. 813,577, Jul. 7, 1977, Pat. No. 4,098,006, each is a continuation-in-part of Ser. No. 775,673, Mar. 8, 1977. This application Dec. 8, 1977, Ser. No. 858,879

Int. Cl.<sup>2</sup> F26B 7/00

U.S. Cl. 34—12

13 Claims

1. A plasticized composition comprising sewage sludge dried to less than 15 wt.% water and plasticized at a temperature of at least about 100° C. and a pressure of at least about 300 psig.

4,161,826

## METHOD OF DEAGGLOMERATION OF ALUMINUM POWDER

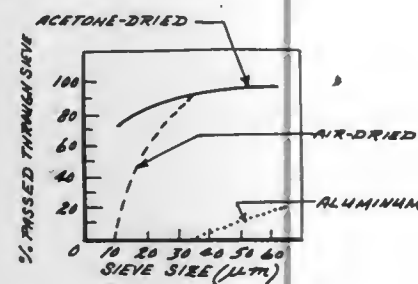
Joseph J. Hutta, Groton, and Kenneth P. Quinlan, Newton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1978, Ser. No. 884,881

Int. Cl.<sup>2</sup> F26B 7/00

U.S. Cl. 34—12

2 Claims



1. A method for the deagglomeration of micrometer-sized aluminum metal powders which comprises the steps of  
(1) admixing said powders with water;  
(2) allowing said powders to remain in contact with said water at room temperature for a period of time of about 30 hours; and  
(3) air-drying the resulting water-treated aluminum powder.

4,161,827

## ARTICLES OF FOOTWEAR

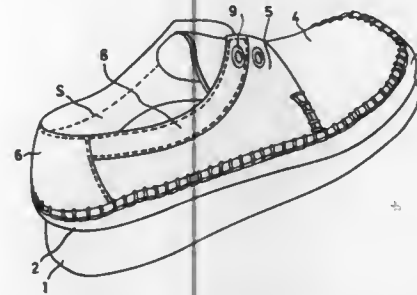
Patrick J. Roberts; Kevin P. Hogan, and Thomas Kealy, all of Kilkenny, Ireland, assignors to Padmore & Barnes International Limited, Kilkenny, Ireland

Filed Oct. 25, 1977, Ser. No. 845,115

Claims priority, application Ireland, Oct. 27, 1976, 2381/76 Int. Cl.<sup>2</sup> A43B 3/14

U.S. Cl. 36—11

6 Claims



1. An article of footwear having an outer sole of resilient material, an under-vamp of soft leather extending over the whole area of the outer sole, the edge of the under-vamp being turned up to form a continuous unseamed rim around the article of footwear, and an upper vamp, a pair of quarters and a counter all of soft leather hand-stitched to the rim to form an upper.

4,161,828

## OUTER SOLE FOR SHOE ESPECIALLY SPORT SHOES AS WELL AS SHOES PROVIDED WITH SUCH OUTER SOLE

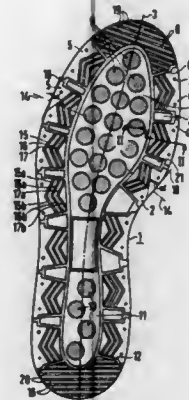
Hans Benseler, Harkenbleck-Hannover, and Horst Schaefer, Bad Windsheim, both of Fed. Rep. of Germany, assignors to Puma-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Division of Ser. No. 693,956, Jun. 8, 1976, Pat. No. 4,083,125. This application Dec. 22, 1977, Ser. No. 863,088

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1975, 2525613; Jun. 9, 1975, 2525615; Jun. 9, 1975, 2525665 Int. Cl.<sup>2</sup> A43B 13/04, 23/28

U.S. Cl. 36—32 R

20 Claims



1. A shoe with an inner sole and an outer sole constructed from a material having rubber-elastic properties, the outer sole including profiled projection means arranged along lateral sole edges, characterized in that the profiled projection means laterally delimit a tread surface of the outer sole, each of the profiled projection means are provided with at least two V-shaped slots extending obliquely to a tangential plane at outer boundary surfaces of the individual profiled projection means substantially in a bisecting plane thereof, said at least two

V-shaped slots are nested one within the other, in that the outer sole is provided with inner profiled projections having hollow spaces open in the direction toward the inner sole within an area of a front sole, which hollow spaces are surrounded by the profiled projection means, in that the inner profiled projections project in an unloaded condition of the outer sole with respect to the tread surface formed by the edge profiling, and in that an inner sole covering the hollow spaces of the profiled projections is air-permeable.

4,161,829

## SHOES INTENDED FOR PLAYING GOLF

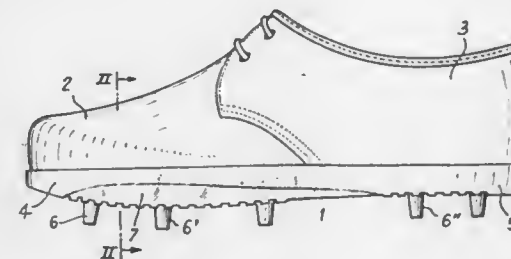
Alain Wayser, 21 rue du Bac, 75007-Paris, France

Filed Jun. 12, 1978, Ser. No. 914,725

Int. Cl.<sup>2</sup> A43B 5/00, 13/04

U.S. Cl. 36—127

7 Claims



1. A pair of golf shoes, wherein each of the shoes of said pair comprises a bottom extending from one end to the other, substantially on the same plane, forming a sole and a heel, without change in level of the heel with respect to the sole, the bottom comprising a thickness slightly smaller at the level of the heel with respect to the sole, the bottom comprising a thickness slightly smaller at the level of the heel with respect to the sole, this bottom further comprising projections, such as metal studs, the inner part of the shoe comprising a convex portion for supporting the plantar arch, the sole comprising further over limited portions of the edges of said sole, recesses forming bevels, preferably curved, allowing the movement of pivoting of the shoe with respect to the ground.

4,161,830

## DEVICE FOR IDENTIFYING INGOTS OR CASTINGS

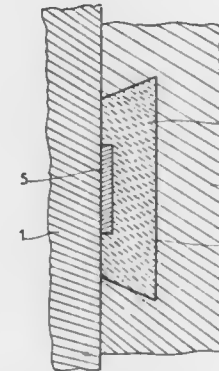
Patrick R. Gentil, Saint-Cloud, France, assignor to Calider, Saint-Chamond, France

Filed Dec. 12, 1977, Ser. No. 859,953

Claims priority, application France, Dec. 30, 1976, 76 39669 Int. Cl.<sup>2</sup> G09F 3/02

U.S. Cl. 40—2.2

4 Claims



1. A device for use in marking an ingot or casting made in an ingot mould or a metal mould, comprising a body of a refractory material, said body having a low thickness and a characteristic shape, said body having a "dovetail" cross-section so

that said body has one face having a smaller surface area than the opposite face, and a magnet incorporated in said refractory body and located in said one face having said smaller surface area.

4,161,831

## PICTURE MOUNTING AND DISPLAY

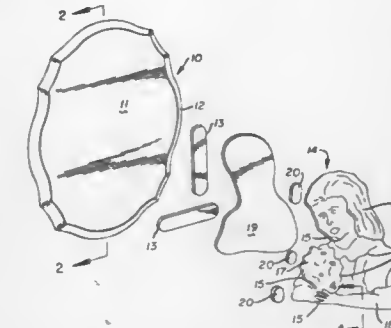
Donald J. Restle, 168 Melrose Ave., Youngstown, Ohio 44512

Filed Sep. 28, 1977, Ser. No. 837,162

Int. Cl.<sup>2</sup> G09F 1/12

U.S. Cl. 40—160

1 Claim



1. A picture mounting and display comprising a base, a photograph having portions thereof partially cut away from other portions thereof, parts of said partially cut away portions being bowed vertically and horizontally, some of said partially cut away portions being spaced outwardly and some of said partially cut away portions being spaced inwardly, both in a different degree with respect to parts of said other portions so as to form shaped interconnecting parts of said photograph, a flat backing member adjacent said photograph engaging parts of said other portions and at least one spacing member positioned between said backing member and said base.

4,161,832

## SEVEN-SEGMENTED ELECTROMECHANICAL DIGITAL INDICATOR

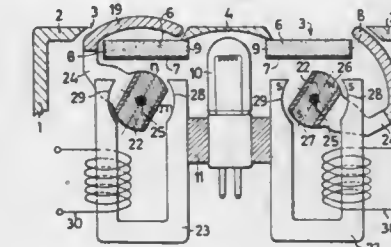
Giorgio Bergamini, Bari, Italy, assignor to Nuovo Pignone S.p.A., Italy

Filed Jan. 18, 1978, Ser. No. 870,325

Claims priority, application Italy, Feb. 1, 1977, 19834 A/77 Int. Cl.<sup>2</sup> G09F 13/28

U.S. Cl. 40—451

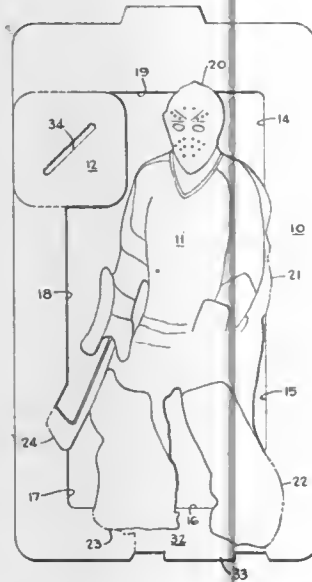
6 Claims



1. An electromechanical digital indicator, comprising a box on the top plate of which are formed seven slits or windows arranged in the fashion of a figure-of-eight as the sides of two superposed parallelograms, in correspondence of which there can be caused to appear or disappear seven angularly movable segments, the angular displacement of each movable segment from a stable position corresponding to an inactive or out-of-view segment to another stable position corresponding to an active or in-view segment, or vice versa being obtained by the agency of a driving electromagnetic circuitry composed by a permanent magnet which, hinged in the inside of such a box and integral with said movable segment, magnetically cooper-

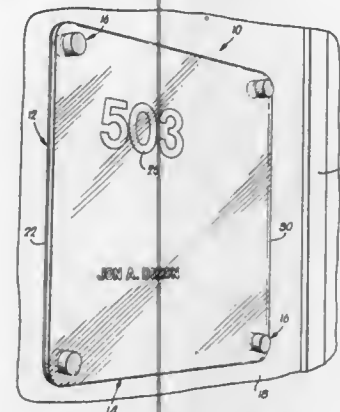
ates with an electromagnet also contained in said box, characterized in that said permanent magnets of the driving magnetic circuits of the angular displacements of said movable segments to which they are solidly fastened, are centrally hinged with respect to their central axes, each between the two pole shoes of an electromagnet which has substantially the shape of a "U," which shoes confront respectively the two magnetized front ends of said permanent magnet and encompass them along the entire arc of circle described by the angular displacement of the movable segment integral with the permanent magnet.

**4,161,833**  
**CUTOUT DISPLAY DEVICE**  
Kenneth E. Wagner, Williamsville, N.Y., assignor to Carton-Craft Corp., Buffalo, N.Y.  
Continuation of Ser. No. 687,525, May 18, 1976, abandoned.  
This application Sep. 30, 1977, Ser. No. 838,067  
Int. Cl.<sup>2</sup> G09F 1/08  
U.S. Cl. 40—539



1. A display device comprising a rigid inflexible panel having an irregularly shaped display figure or object depicted thereon, a series of die-cuts in said panel providing open areas surrounding a major portion of the outline of said display figure or object, and score lines outlining the remaining portions of the outline of said figure or object and connecting between said die-cuts, whereby the surrounding portion of said panel may be broken away from said display figure without flexing or bending of said figure to effect complete separation of said display figure from said panel, said panel being fabricated by die-cutting and scoring a plurality of identical chip-board laminations in corresponding identical locations thereon and adhesively securing them to each other in laminated form to form a die-cut panel of substantial thickness and rigidity, said figure has a tab formation at the lower end thereof and said surrounding portion of said panel includes a base member having a slot therein for receiving said tab formation to support said figure in an upright position, said panel further includes a score line extending from an outer edge thereof inward to said display figure to facilitate the beginning of the separation of the surrounding panel from the display figure.

**4,161,834**  
**THEFT PROOF MODULAR SIGN**  
Howard K. Hendricks, Jr., 4030 W. 97th Ter., Overland Park, Kans. 66207  
Filed Aug. 2, 1977, Ser. No. 821,320  
Int. Cl.<sup>2</sup> G09F 15/00  
U.S. Cl. 40—606 5 Claims

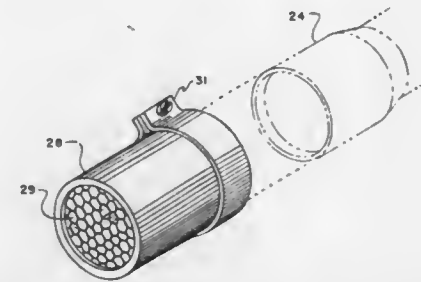


1. A theft-proof wall-mounted sign including:  
a rigid base plate having indicia superimposed on one face thereof;  
a transparent overlay plate in juxtaposition with said base plate and protectively covering said indicia;  
at least one elongate threaded member having one end rigidly secured to said wall and an opposed end projecting outwardly therefrom, said member engaging said plates intermediate said ends to mount the latter in a substantially upright position on said wall with said indicia facing outwardly therefrom;  
a solid retainer threadably coupled with said opposed end and having a side wall portion and an end section disposed in enveloping relation to said opposed end for holding said plates juxtaposed and maintaining the latter in engagement with said member, said retainer being provided with an inner flat surface in complementary abutting relationship to said overlay plate,  
said retainer having a transverse cross-sectional area greater than that of said member to create an illusory appearance of support for said sign which is more substantial than that actually presented by the threaded member;  
a spacer supported on said threaded member between the wall and said base sheet, said spacer having opposed flat faces, one of which abuts the base sheet and the other being adapted to abut the wall, said spacer being provided with a transverse cross-section identical to that of said retainer whereby the illusory appearance of increased support is further enhanced; and  
set screw locking means extending transversely through the side wall of the retainer and releasably engaging said member for preventing unauthorized rotation and thereby removal of the retainer from the member whereby the sign is rendered substantially tamper-proof.

**4,161,835**  
**SCATTER SHIELD FOR WEAPON AIMING LIGHT**  
Lewis E. Lough, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Dec. 16, 1977, Ser. No. 861,138  
Int. Cl.<sup>2</sup> F41G 1/36  
U.S. Cl. 42—1 A 1 Claim

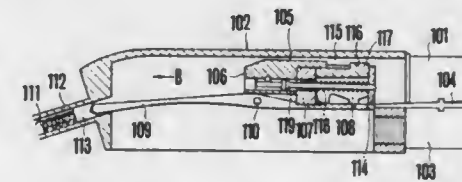
1. A scatter shield assembly attached at the output end of an infrared aiming light for reducing the easily detectable wide angle scattered infrared light accompanying a narrow infrared aiming light beam emanated from said infrared aiming light yet

readily allowing transmission of said infrared aiming light beam therethrough, the assembly comprising:  
a scatter shield comprised of a cluster of thin walled aluminum honeycomb, adjacent hexagonally shaped tubular sections that are evenly hollow throughout their entire length for allowing easy light transmission therethrough and having a length to diameter ratio of 10:1 with the diameter being measured across the flat sides of the hexagonal



onal shape with said tubular sections being surrounded by a rigid outer shell wherein said scatter shield is finished with a dull flat black, non-reflective coating; and  
a screw threadably attachment means for attaching said scatter shield at said output end of said infrared aiming light wherein screw threads on the outside of said rigid outer shell mesh with screw threads on the inside of an extension of said output end of said infrared aiming light.

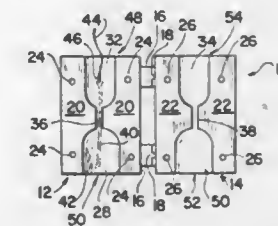
**4,161,836**  
**BREECHBLOCK ASSEMBLY AND AN OPERATING MECHANISM FOR A FIRE-ARM AUTOMATIC LOADING**  
Hisao Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Kawaguchiya Hayashi Juko Kayaku-ten, Tokyo, Japan  
Filed Nov. 15, 1977, Ser. No. 851,736  
Claims priority, application Japan, Nov. 25, 1976, 51-141399; Dec. 22, 1976, 51-154703; Dec. 22, 1976, 51-172181[U]  
Int. Cl.<sup>2</sup> F41C 11/06  
U.S. Cl. 42—16 6 Claims



1. In a breechblock assembly of an automatic gun the improvement comprises in combination a receiver, an axially extending gunbarrel fixed at one end to and extending axially from said receiver and having a breech face at the one end thereof, a breechblock slider having a substantially C-shaped or partly cylindrical embracing portion with its front end opened and housed in said receiver so as to be movable therein forwardly and backwardly, a substantially stem-shaped breechblock in slidable engagement with said embracing portion of said breechblock so as to be moved relatively to said breechblock slider by a predetermined distance in the axial direction thereof thereby permitting the breech face of said gunbarrel to be tightly closed, a locking block housed in a radial throughhole formed in said breechblock, said locking block having a projection formed in the upper portion of the front end of said locking block and said projection being engaged in a recess formed in an extended portion of the gunbarrel so as to restrict the backward movement of said breechblock and the rear end portion of said locking block being arrested by said embracing portion of said breechblock slider so as to prevent the withdrawal of said locking block, and means for swinging said locking block so as to protrude said

projection of said locking block through said throughhole when the span between said breechblock and said breechblock slider is contracted while said projection is retracted into said throughhole when said span is extended.

**4,161,837**  
**FISHING HOOK BAIT MOLD**  
Gerald M. Johnston, 954 Tiger Tail Rd., Vista, Calif. 92083  
Filed Dec. 16, 1977, Ser. No. 861,121  
Int. Cl.<sup>2</sup> A01K 97/00  
U.S. Cl. 43—4 7 Claims



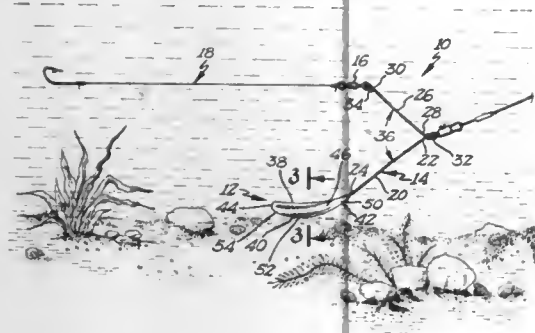
1. A fishing hook bait mold comprising a first half body and a second half body, means to hingeably secure said half bodies together, each of said bodies having a lateral surface, means to have each of said half bodies dispose each lateral surface in touching engagement with each other, each said lateral surface having a first cavity and a second cavity, each said lateral surface having a passageway therein communicating to the interior of said first cavity and said second cavity, a first semispherical cavity and a second semispherical cavity being formed when said first half body and said second half body are pivoted into a closed condition wherein said lateral surfaces are juxtaposed, said first semispherical cavity having an open mouth portion, said second semispherical cavity having an open mouth portion, said open mouth portion of said first semispherical cavity being disposed opposite to said open mouth portion of said semispherical cavity, said first cavity of each of said half bodies forming said first semispherical cavity when said body halves are disposed in said closed condition, said second cavity of each of said half bodies forming said second semispherical cavity when said body halves are disposed in said closed condition, said passageway in each said lateral surface being disposed in juxtaposed relationship and extending transverse to said open mouth portions of said first semispherical cavity and said second semispherical cavity when said body halves are disposed in said closed condition, wherein a fishing hook having a line receiving eye end and a barbed carrying end and a shank portion therebetween, may have a portion of said shank portion carried within said passageway and may have said line receiving eye end and said barb carrying end selectively disposed within said first and said second semispherical cavities when said body halves are disposed in said closed condition.

**4,161,838**  
**FISHING IMPLEMENT**  
Daniel D. Gapen, Rte. 1, Big Lake, Minn. 55309  
Filed Jul. 5, 1977, Ser. No. 812,803  
Int. Cl.<sup>2</sup> A01K 85/00  
U.S. Cl. 43—42.11 2 Claims

1. Fishing implement arranged for attachment to a reel-line and for attaching a fishing hook assembly for working the fishing hook assembly on the water bottom, for trolling the fishing hook assembly in a manner preventing twisting of the fishing hook assembly, for elevating the fishing hook assembly, or for properly presenting the fishing hook assembly while trolling, drifting, river fishing, or still fishing, comprising, in combination: an L-shaped spring wire having a first wire leg including a first end and a second end and a second wire leg



including a first end and a second end, with the first ends of the first and second legs being joined by a twist forming a reel-line attachment loop at their junction; a loop formed on the second end of the second leg for attaching the fishing hook assembly to the fishing implement; and a sinker attached to the second end of the first leg, with the sinker being of a substantially snagless shape and including: a top surface, a bottom surface, a first end, a second end opposite to the first end, and first and second sides, with the bottom surface including: a first, generally straight portion, a second, generally rounded portion, and a third, generally raised end portion, with the first portion and the first leg extending in a generally tangential manner from the second portion for presenting an advancement plane which is generally straight and having no edges for snagging or catching on obstructions, with the top surface being generally flat for allowing the fishing implement to run at a constant depth

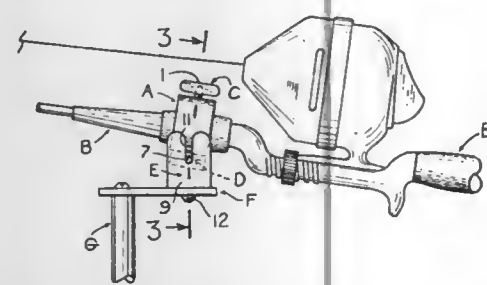


and for aiding the fishing implement to maintain a vertical orientation, with the first end having a tear drop shape formed from the tapering together of the top surface, the bottom surface, and the first and second sides, with the second end being rounded and slightly dished up and formed from the top surface, the bottom surface, and the first and second sides rounding and dishing up together, with the first and second sides flowing from the first end and following through with the contour of the first end, for minimizing the water flow disturbance around the sinker and for presenting no edges for snagging or catching obstructions, and with the attachment loop being formed forward and above the sinker and the attaching loop being located above the attachment loop and the sinker for allowing the sinker to rock to a secondary position having a greater vertical orientation such that the fishing implement is able to raise itself over obstructions.

**4,161,839**  
**SWIVEL DEVICE FOR SUPPORTING A BALANCED OR SEMI-BALANCED FISHING ROD AND INDICATING WHEN A FISH STRIKES**  
Russell L. Ward, 1258 Esser Ave., San Leandro, Calif. 94579  
Filed Feb. 21, 1978, Ser. No. 879,615  
Int. Cl.<sup>2</sup> A01K 97/12

U.S. Cl. 43-17

1 Claim



1. A swivel device for supporting a fishing rod at or near the center of gravity of the rod and in which the rod is free to swing about a vertical and horizontal axis and can be freely

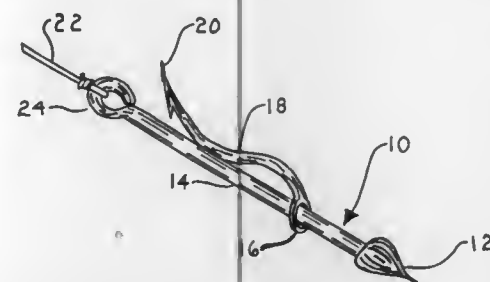
lifted in a vertical direction off from the swivel device and comprising:

- a clevis shaped support having vertically extending and spaced apart side walls integral with a web portion of the clevis, the planes of the side walls paralleling each other and each side wall having a vertical slot extending downwardly from its upper edge, the bottom of each slot lying in the same horizontal plane;
- a trunnion bearing having a base with diametrically extending trunnions projecting beyond said base and rockably receivable in said slots so that when the trunnions are supported by the bottoms of said slots, the aligned axes of said trunnions will lie in said horizontal plane;
- a fishing pole clamping member permanently and pivotally connected to the top of the base member of said trunnion bearing and freely swingable about said pivotal connection, the axis of said pivotal connection being normal to and intersecting the common axis of said trunnions; and
- whereby said clamping member is free to swing about the pivotal connection between the clamping member and the trunnion bearing base as the fishing pole may be swung laterally, said trunnion bearing base being free to swing about the common axis of said trunnions to permit the fishing pole to likewise freely swing in a plane normal to said same horizontal plane, and the pole and said clamping member with its attached trunnion bearing being moved when a fish strikes to attract the fisherman, and permitting him to grasp the pole and freely lift it in a vertical direction to free the trunnions from the slots in said clevis side walls so that the fisherman can play the fish immediately and capture it.

**4,161,840**  
**FISH HOOK**  
David B. Kidd, 5820 Hillsboro Rd., Nashville, Tenn. 37215  
Filed May 9, 1977, Ser. No. 794,717  
Int. Cl.<sup>2</sup> A01K 83/00

U.S. Cl. 43-43.4

6 Claims

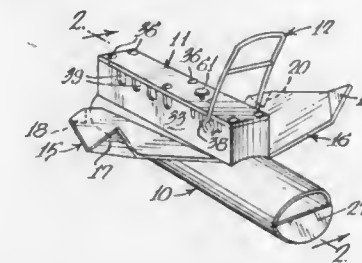


1. A fish hook comprising at least one S-shaped hook member with a barb at one end thereof and an other end, a linear shaft having a first end and a second end, said second end having means thereat for attachment to a fishing line, said hook member being attached to said shaft such that said barb rests against said shaft and the other end of said hook member being sufficiently loosely fitted around said shaft for the hook member to lift up and be forced out into a fish's mouth when the fish bites, said S-shaped hook member extending generally along the length of said shaft and with the barb pointing outward but generally toward the second end of said shaft hook member and said shaft, and said hook member and said shaft being completely concealable inside a worm lure.

**4,161,841**  
**FISHING DEVICE**  
Frederick W. Holstein, 1331 Howe St., Racine, Wis. 53403  
Filed Jan. 26, 1978, Ser. No. 872,552  
Int. Cl.<sup>2</sup> A01K 95/00

U.S. Cl. 43-43.13

18 Claims

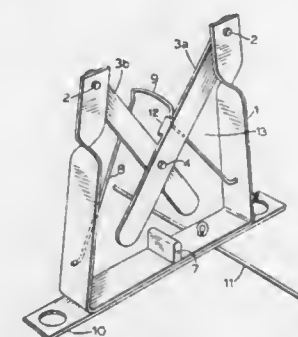


1. A fishing device having a body, a bail pivotally connected to said body intermediate the ends thereof for connection to a tow line, a pair of wings extending outwardly one from each side of the body and angled relative thereto to provide thrust surfaces for controlling the attitude of the body while moving in water, and front and rear deflectors associated with each wing in fixed relation thereto with the front deflector turned up from the plane of the wing and the rear deflector turned down from the plane of the wing for causing alternate rising and diving of the device as the angle of the bail to the body changes at different levels in the water because of the tow line connection.

**4,161,842**  
**TRAPS FOR ANIMALS**  
Armand Jacob, R.R. 5, Tilbury, Ontario, Canada  
Filed May 2, 1977, Ser. No. 792,533  
Int. Cl.<sup>2</sup> A01M 23/24

U.S. Cl. 43-85

5 Claims

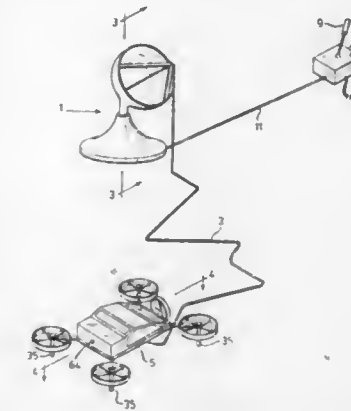


1. A trap for animals comprising a peripheral frame defining an opening, and having a gap therein above the opening, portions of the frame to either side of the gap being spring urged towards one another, a pair of strike arms for delivering a killing blow to an animal entering the trap, said arms being pivotally connected to the frame one arm to each side of the gap, the arms being pivotally connected to one another to form a toggle linkage collapsible downwardly into a sprung condition within the frame opening under the spring urging of the frame, the assembly of frame and strike arms having an alternative set condition with the toggle linkage at least partially straightened and the frame portions to either side of the gap drawn apart, latch means to hold the assembly of frame and strike arms in said set condition, and trigger means to release the latch means upon an animal reaching a predetermined position with its neck in the opening beneath the strike arms.

**4,161,843**  
**ELECTRICALLY POWERED TOY AIRCRAFT**  
Danny C. T. Hui, 15 Trudy Rd., Willowdale, Ontario, Canada (M2J 2Y7)  
Filed Sep. 1, 1978, Ser. No. 938,840  
Int. Cl.<sup>2</sup> A63H 27/04

U.S. Cl. 46-75

10 Claims

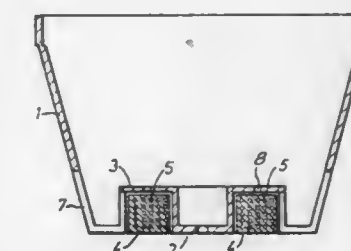


1. An electrically powered toy including a stand having a rotatable portion, a flying body adapted to fly above said stand, and a flexible cable interconnecting the flying body and rotatable portion of the stand, the flying body being provided with four identical propellers rotatable in the horizontal plane and arranged in a rectangular pattern, a drive motor located centrally of the four propellers, gear means driven by the motor for rotating said four identical propellers at the same speed, and a fifth smaller propeller rotatable by the motor in the vertical plane.

**4,161,844**  
**HYDROCULTURE PLANT POT WITH AN INSERTED CONTAINER FOR RECEIVING A HYDROCULTURE FERTILIZER**  
Claus Hentschel; Karl Martin, both of Cologne, Fed. Rep. of Germany, and Leonard Volckaert, Merelbeke, Belgium, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Dec. 12, 1975, Ser. No. 640,311  
Int. Cl.<sup>2</sup> A01G 27/00

U.S. Cl. 47-62

2 Claims



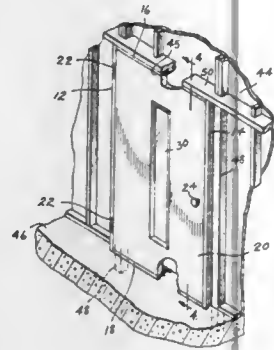
1. A hydroculture plant pot with an inserted container for receiving a hydroculture ion exchange fertilizer, means for insuring that said container will always be surrounded by water as long as any water remains in said plant pot, including an annular compartment projecting from the bottom of said plant pot and surrounding a portion of said bottom, said annular portion being surrounded by an additional portion of said bottom, means to enable water passage between said compartment and the remainder of said plant pot, said container being positioned in said compartment and being provided with apertures to permit the passage of water, the dimensions of said

apertures being less than the size of the particles of the hydroculture fertilizer.

**4,161,845**  
**INVERTIBLE PREFABRICATED DOOR**  
Donald B. Naylor, 1013 N. Michigan St., Plymouth, Ind. 46563  
Filed Aug. 22, 1975, Ser. No. 607,028  
Int. Cl.<sup>2</sup> E06B 3/32

U.S. Cl. 49—380

1 Claim

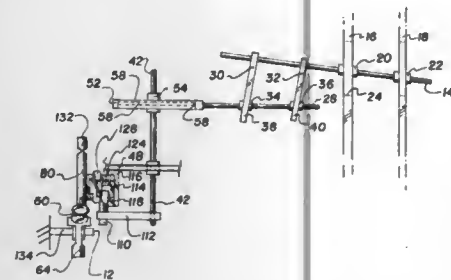


1. An invertible prefabricated door assembly for mounting within a wall opening defined by a foundation and overhead support, said door assembly comprising a panel, first and second jambs, a first combined header and threshold means, a second combined header and threshold means, said jambs and both combined header and threshold means forming a four-sided enclosed frame, said panel fitting within said frame and having opposite vertical side edges, hinge means pivotally connecting said panel at one side edge to said first jamb, each of said first and second combined header and threshold means for mounting either to the foundation or the overhead support of a said wall opening depending upon the desired location of said hinge means, each combined header and threshold means including a first part which said panel overlaps when closed and a second part extending substantially forwardly of said first part to define a grooved panel, said first part being offset from said second part and separated therefrom by a shoulder constituting a portion of each combined header and threshold means, said panel having upper and lower marginal edges, said upper panel marginal edge overlying the shoulder of said first combined header and threshold means and said lower marginal panel edge overlying the shoulder of said second combined header and threshold means when said panel is closed.

**4,161,846**  
**CENTER OF CURVATURE**  
Uoo S. Whang, 750 Arlington Dr., Waco, Tex. 76710  
Filed Apr. 4, 1977, Ser. No. 783,964  
Int. Cl.<sup>2</sup> B24B 13/00, 17/02

U.S. Cl. 51—33 W

3 Claims



1. An apparatus for performing an operation in the shape of a given curve on a workpiece comprising, in combination:

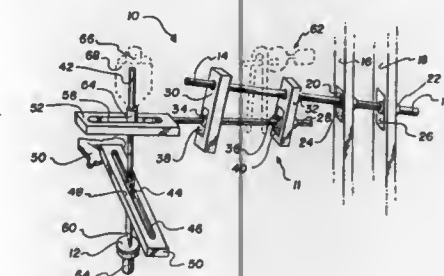
a working interface;  
a tool holder for positioning the working interface;  
a means for positioning a subcenter about which to rotate the tool holder;  
a curve tracer for tracing the given curve;  
a means for detecting a change in vertical position of the traced curve;  
a means for obtaining a length by multiplying a change detected by the means for detecting a change in vertical position by a constant;  
a means for changing the position of the means for positioning a subcenter by the length obtained from the multiplying means;  
a virtual tool holder responsive to the curve tracer rotatable about the subcenter positioned by the subcenter positioning means; and  
a means for connecting the tool holder in a fixed relationship to the virtual tool holder whereby the working interface positioned by the tool holder maintains substantially single point contact with the workpiece.

**4,161,847**  
**APPARATUS AND METHOD FOR PERFORMING ASPHERICAL OPERATIONS ON A WORKPIECE**  
Uoo S. Whang, Waco, Tex., assignor to New Asian Corporation, Waco, Tex.

Filed Apr. 4, 1977, Ser. No. 783,969  
Int. Cl.<sup>2</sup> B24B 13/00, 17/02

U.S. Cl. 51—33 W

12 Claims



1. An apparatus for performing conic sectional operations on a workpiece comprising, in combination;  
a conic surface generator for describing a cone;  
a cutting plane generator for describing a plane;  
a conic section follower connected to the conic surface generator and connected to the cutting plane generator whereby the follower follows the intersection of the cutting plane and the cone as the cone is generated;  
a working interface for working on a workpiece; and  
means for connecting the working interface to the conic section follower whereby the working interface traces the conic section generated by the intersection of the cone and the plane.

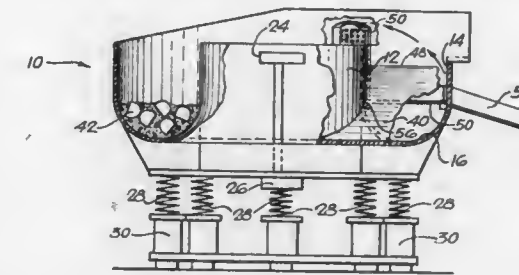
**4,161,848**  
**VIBRATORY FINISHING DEVICE**  
George F. Jones, Mishawaka, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.  
Continuation of Ser. No. 748,953, Dec. 9, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,758  
Int. Cl.<sup>2</sup> B24B 31/12

U.S. Cl. 51—163.2

7 Claims

1. The combination with a finishing mill having a substantially annular trough adapted to contain a charge of treating media and parts, and means for vibrating said trough to cause the media and parts to travel about the trough in an orbital path, a means for separation of parts from the media for removal of the parts while the media is retained in the trough comprising a barrier extending crosswise of the trough, said

barrier having a surface rising gradually to an apex at a level above the bottom of the trough whereby the depth of the parts and media immediately in advance of the barrier builds up to a level above the apex for clearance thereof, said barrier tapering off abruptly from the apex whereby the level of parts and media immediately beyond the barrier falls to a level below the apex to closely adjacent the bottom of the trough, and a separator screen immediately beyond and adjacent the barrier at a



level below the apex of the barrier but above the bottom of the trough for receiving the parts and media overflowing the barrier and to separate the parts on the surface thereof while the media passes through into the underlying portions of the trough, and a discharge means for receiving the parts separated on the surface of the separator screen, said separator screen being dimensioned to have a length to extend a short distance beyond the barrier.

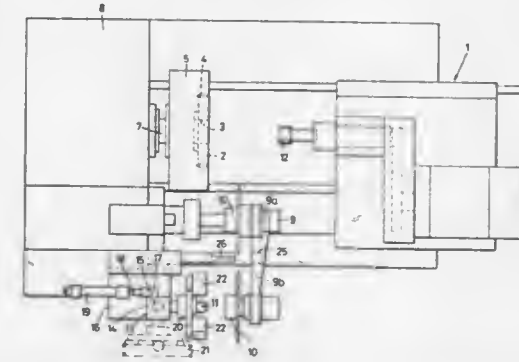
**4,161,849**  
**AUXILIARY WORKPIECE-LOADING AND UNLOADING APPARATUS**  
Hugues Voumard, and Roger Sauvain, both of La Chaux-de-Fonds, Switzerland, assignors to Voumard Machines Co., Switzerland

Filed Dec. 21, 1977, Ser. No. 862,931  
Claims priority, application Switzerland, Dec. 22, 1976, 16193/76

Int. Cl.<sup>2</sup> B24B 5/10

U.S. Cl. 51—215 CP

2 Claims



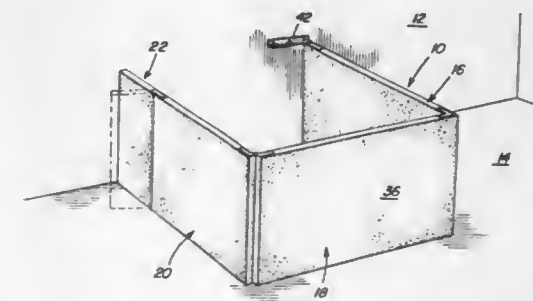
1. Auxiliary workpiece loading and unloading apparatus for use with a machine tool comprised of a workpiece supply location, a horizontal axis headstock having a machining station, and transport means having one or more rotary or pendular arms for causing workpieces to be moved from said supply location to said machining station without said workpieces undergoing a change of orientation, said apparatus comprising: a workpiece holder pivotable about a substantially vertical axis, capable of effecting alternating rotary movements about said vertical axis in a sequence synchronized with the movements of said transport means; means for causing said workpiece holder to carry out said alternating rotary movements correlatively to the movements of said rotary or pendular arm; workpiece support means for receiving each of said workpieces at a side of said machine tool and for subsequently presenting each of said workpieces in proper orientation to said

transport means, said workpiece support means including two lower shoes and a hydraulically or pneumatically controlled upper jack for pressing said workpieces vertically against said shoes in order to hold said workpieces firmly in place during said movements of said workpiece holder, said shoes being adjustable in height so that when said workpiece holder is facing in the direction of the longitudinal axis of said machine tool, an unmachined workpiece will be correctly positioned at said supply location to be picked up by said rotary or pendular arm, and said workpiece support means will be correctly positioned at a location to receive a machined workpiece from said rotary or pendular arm.

**4,161,850**  
**ROOM DIVIDER**  
Lyle R. Peterson, 429 E. 1700S, Bountiful, Utah 84010, and Brent A. Peterson, Rte. #3, Rexburg, Id. 83440  
Filed Feb. 1, 1978, Ser. No. 874,313  
Int. Cl.<sup>2</sup> E04B 2/82

U.S. Cl. 52—65

9 Claims



1. A room divider comprising a plurality of vertically disposed, rigid panels, means pivotally connecting adjacent end edges of adjacent panels together, means pivotally supporting only the free end edge portion of one of the endmost of said panels from a building structure to enable swinging movement about a substantially vertical axis, means along the lower edge of said panels for rolling engagement with a supporting floor surface, the end of the other endmost panel remote from the point of attachment with the building structure including a pivotal access door, and means pivotally connecting the access door to the adjacent panel, said means connecting the end edge portion of one panel to a building structure including a supporting plate rigidly connected to the building structure adjacent a vertical support and including an upstanding pivot pin pivotally engaging the bottom edge of the end portion of the panel, a bracket attached to the vertical support in vertically spaced relation to the mounting bracket and including a depending pivot pin engaging a longitudinal slot in a plate in the top edge of the end portion of the panel to enable inward and outward movement of the top edge portion of the panel connected to the building structure to compensate for unevenness and irregularity in the floor surface supporting the panels.

**4,161,851**  
**MOTOR VEHICLE WINDOW ASSEMBLY**  
Hiroshi Inamoto, and Yoshinori Morita, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan  
Filed Feb. 3, 1978, Ser. No. 875,105  
Claims priority, application Japan, Feb. 4, 1977, 52-13068[U]  
Int. Cl.<sup>2</sup> E06B 1/36

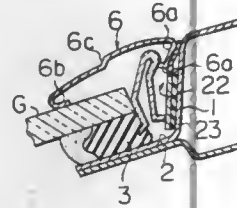
U.S. Cl. 52—208

12 Claims

1. A motor vehicle window assembly comprising: painted body panels having a side wall defining a window opening and a bottom wall projecting into said window opening;  
a glass pane for closing said window opening and when



mounted therein having a space between the edge of said glass pane and said side wall;  
 adhesive means for mounting said glass pane to said bottom wall;  
 a spacer adhesively attached to and extending continuously along all of the length of said side wall; and  
 molding having a depending flange portion engaging said spacer, an end portion engaging the perimeter on the outer

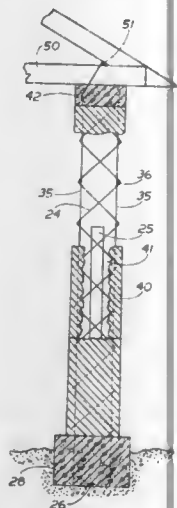


side of said glass pane and a trim portion extending between said depending flange portion and said end portion to bridge said space;  
 said spacer having a portion extending between said side wall and said molding to prevent contact and mutual abrasion between said molding and said side wall and to prevent accumulation of abrasive particles between said side wall and said molding.

**4,161,852**  
**ADOBE WALL CONSTRUCTION**  
 Karl V. Schultz, 18322 Carlwyn Dr., Castro Valley, Calif. 94546  
 Filed Oct. 17, 1977, Ser. No. 842,674  
 Int. Cl.<sup>2</sup> E04B 1/00

U.S. Cl. 52-250

7 Claims



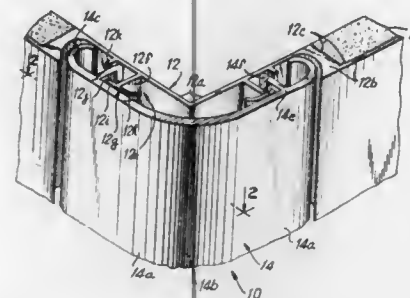
1. An integral reinforcing means for a unitary foundation-reinforced solid adobe wall-roofing beam construction having:
  - (a) a foundation;
  - (b) a reinforced adobe wall extending upwardly from said foundation; and
  - (c) a roofing beam resting upon the top of said wall; said integral reinforcing means comprising:
    - (1) a plurality of readily bendable upright wire trusses, the lower ends of which are embedded within said foundation and the upper ends of which are provided with a respective loop through which the roofing beam extends;
    - (2) a pair of spaced flexible wire mesh extending the length of said wall and loosely pinned to opposite sides of said wire trusses; and wherein the adobe wall is formed around said wire trusses and wire mesh.

**4,161,853**  
**RESILIENT WALL PROTECTOR**  
 Kenneth Weiss, Plainview, and Martin Fieder, Scarsdale, both of N.Y., assignors to A. R. Nelson Co., Inc., Long Island City, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,805  
 Int. Cl.<sup>2</sup> E04B 5/00

U.S. Cl. 52-288

12 Claims



1. A resilient wall protector comprising a retainer member adapted to be connected to a wall surface to be protected and having at least one locking portion generally projecting outwardly from a wall portion of said retainer member; a resilient member configured to substantially cover said retainer member when mounted thereon, said resilient member having at least one engaging portion projecting towards said retainer member and adapted to snappingly engage said locking portion and generally maintain said retainer and resilient members spaced from each other at a predetermined distance, application of inward pressures on said resilient member towards said retainer member causing said resilient member to at least partially deform and causing said locking and engaging portions to separate from each other along the direction of said wall portion while still maintaining locking engagement between said portions and said members; and an end limit rib or stop projecting from said wall portion and spaced from said locking portion to prevent excessive relative movement between said engaging and locking portions and limit such relative movement to a predetermined or desired amount.

**4,161,854**  
**MOUNTING DISK FOR THE FIXATION OF LOOSELY INSTALLED SEALING SHEETS**

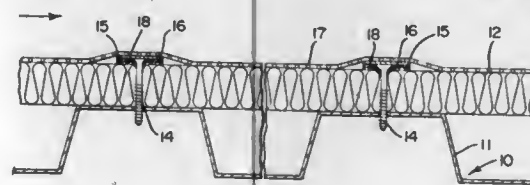
Harry Stelzer, Troisdorf-Sieglar, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Fed. Rep. of Germany  
 Filed Feb. 7, 1977, Ser. No. 766,502

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1976, 7603185

Int. Cl.<sup>2</sup> B32B 7/08

U.S. Cl. 52-309.1

10 Claims



10. Mounting disk arrangement for the fixation of loosely installed sealing sheets of a synthetic resin, wherein the mounting disk can be attached to a substructure by means of a screw passed through the mounting disk; said mounting disk arrangement including:
  - a mounting disk,
  - a screw passed through the mounting disk for connecting the same to a substrate,
  - and a blocking means attached to the mounting disk to

prevent the unturning of the screw passed through the mounting disk and connected to the substrate,  
 said mounting disk, said screw, and said blocking means being arranged whereby said sealing sheets of a synthetic resin can be affixed to the arrangement of the mounting disk, the screw and the blocking means,  
 said mounting disk arrangement having sealing sheets of a synthetic resin affixed to the arrangement of the mounting disk, screw and blocking means.

**4,161,855**  
**THERMAL INSULATION MATERIAL AND PROCESS FOR MAKING THE SAME**

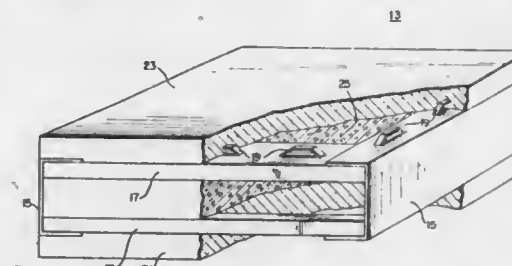
Robert F. Mulvey, Malvern, and Charles E. Crepeau, Centre Square, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 678,842, Apr. 21, 1976, abandoned. This application Feb. 2, 1978, Ser. No. 874,452

Int. Cl.<sup>2</sup> E04B 2/00, 5/00

U.S. Cl. 52-612

5 Claims



1. A thermally insulating composite assembly comprising generally at least one structural surface element and a low density cellular gypsum material positioned adjacent to said surface element, said cellular gypsum material comprising a gypsum matrix having minute cavities homogeneously distributed therein, said gypsum material having a dry density in the range of about 3 to about 6 pounds per cubic foot and a thermal coefficient of less than about 0.36.

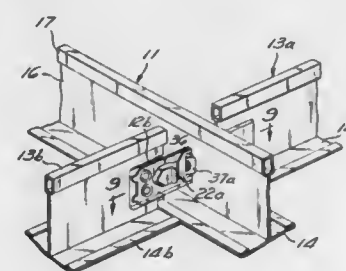
**4,161,856**  
**SUSPENSION CEILING SYSTEM**  
 Donald A. Brown, Westlake, and Paul D. LaLonde, Avon Lake, both of Ohio, assignors to Donn Products, Inc., Westlake, Ohio

Filed Nov. 15, 1976, Ser. No. 741,738

Int. Cl.<sup>2</sup> E04C 2/42

U.S. Cl. 52-667

11 Claims



1. A suspension ceiling system or the like adapted to be assembled to form a grid defining panel openings comprising main tee members each having a face flange, first end connectors at each end and lateral openings intermediate its ends, and cross tee members each having a face flange, second end connectors at its ends and lateral openings intermediate its ends, said first end connectors and said second end connectors being endwise connectible to provide main runs having alternate main tee and cross tee members, said second end connectors being endwise connectible at said lateral openings to provide cross runs extending perpendicular to said main runs, said cross tee members having a length corresponding to a dimension of

said panel openings minus the width of a flange, said main tee members having a length corresponding to a panel opening dimension plus the width of a flange whereby when said main tees and cross tees are endwise interconnected to form main runs and said cross tees are connected between said main runs the panel opening dimensions are maintained.

**4,161,857**  
**FREEZE DRYING CONTAINER WITH MANUAL STOPPERING**

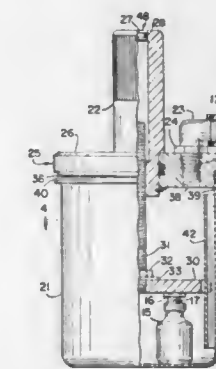
Douglas S. Fraser, New Paltz, N.Y., assignor to FTS Systems, Inc., Stone Ridge, N.Y.

Filed May 12, 1978, Ser. No. 905,427

Int. Cl.<sup>2</sup> B65B 31/02

U.S. Cl. 53-97

9 Claims



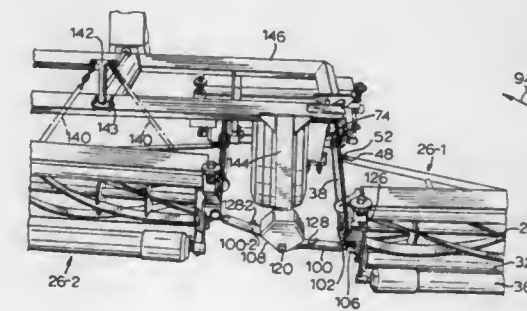
1. A stoppering container for the stoppering of sample vials under vacuum comprising a cover assembly, a stoppering plate and a container body, said cover assembly including a cover plate having an opening therein, a handle rotatably secured in said opening, a shaft, said shaft being fixedly attached at a lower end to said stoppering plate and threadedly attached on an upper portion to said rotatable handle, said container body having means for guiding said stoppering plate for vertical movement in a substantially fixed circumferential orientation, whereby upon rotation of said handle, said shaft and said stoppering plate may be controllably vertically moved within said container body to force stoppering plugs into sample vials.

**4,161,858**  
**GANG MOWER**  
 Theodorus P. H. Gerrits, Wychen, Netherlands, assignor to Brouwer Turf Equipment Limited, Keswick, Canada  
 Filed Jan. 9, 1978, Ser. No. 867,867

Int. Cl.<sup>2</sup> A01D 75/30

U.S. Cl. 56-7

6 Claims



1. A mower having
  - (1) a wheel supported main frame for movement along a path of travel,
  - (2) a mower unit having a mower reel for cutting grass, said mower unit having a mower frame having an inner side

- located adjacent said main frame and an outer side located remote from said main frame,
- (3) a first pulley mounted on said mower frame at the inner side thereof for driving said reel,
- (4) a second pulley mounted on said main frame for driving said first pulley, said second pulley being spaced along said path of travel from said first pulley, and a flexible belt extending between said pulleys, said belt having upper and lower flights,
- (5) means for driving said second pulley so that said upper flight moves from said first pulley toward said second pulley,
- (6) a telescopic connecting arm extending along the longitudinal axis of said belt between the flights thereof, said connecting member having an outer tubular member having first and second ends, said first end being rigidly connected to said mower frame, said arm also having an inner tubular member having a first end telescopically mounted within said second end of said outer member and having a second end pivotally connected to said main frame at a first pivotal connection, the axis of said first pivotal connection being at right angles to said path of travel for movement of said mower unit in an arc about said first pivotal connection,
- (7) said inner member being rotatable about its axis within said outer member for rotation of said mower unit about the axis of said inner member,
- (8) spring means connected between said inner and outer tubular members and biasing said inner and outer tubular members apart, and means retaining said inner tubular member within said outer tubular member,
- (9) a support strut connected to said outer side of said mower frame and extending to and connected with said outer tubular member at a location adjacent said second end of said outer tubular member,
- (10) a rear support arm pivotally connected at a second pivotal connection to said inner side of said mower frame and pivotally connected at a third pivotal connection to said main frame, the axes of said second and third pivotal connections both being parallel to said path of travel, whereby to permit up and down movement of the inner side of said mower frame,
- (11) and a rear bias spring connected to said main frame and extending over said rear support arm and biasing said rear support arm downwardly to hold said inner side of said mower frame downwardly against the lifting torque of said belt.

4,161,859

## CROP PICKUP DEVICE

Donald P. Storm, Hinsdale, and George W. Ridge, La Grange, both of Ill., assignors to International Harvester Company, Chicago, Ill.

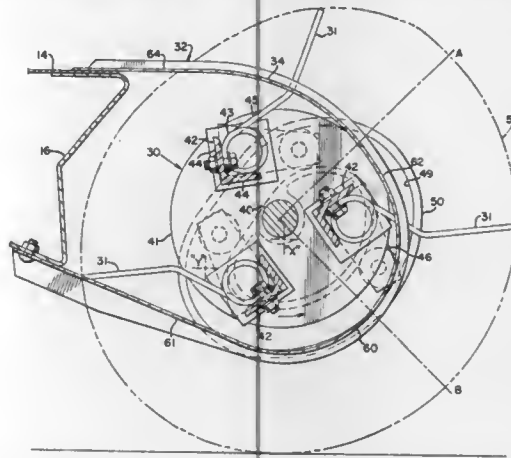
Filed Jun. 9, 1977, Ser. No. 804,969  
Int. Cl.<sup>2</sup> A01D 89/00

U.S. Cl. 56—364

3 Claims

1. A crop pickup mechanism comprising a frame, a tine reel having forward upper and lower quadrants rotatably mounted on the frame and including a plurality of axially spaced sets of tines projecting outwardly from said reel, a plurality of laterally spaced material supporting strippers fixed to the frame and defining fore-and-aft extending slots therebetween for the projection of said tines therethrough, each of said strippers being disposed about said reel and having a forward lower portion disposed at a uniform radius about an axis substantially below the axis of rotation of said tine reel and a forward upper portion having a substantially larger radius of curvature than said forward lower portion, said upper portion terminating in a generally horizontal straight trailing portion for attachment

to said pickup frame, the projection of said tines beyond said strippers being substantially greater along a line bisecting the



forward upper quadrant of said pickup mechanism than along a line bisecting the forward lower quadrant thereof.

4,161,860

## HAYMAKING MACHINE

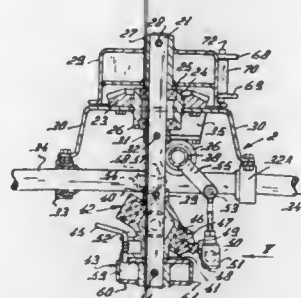
Cornelis van der Lely, 7, Brüschennrain, Zug, Switzerland  
Filed Apr. 8, 1977, Ser. No. 786,030

Claims priority, application Netherlands, Apr. 8, 1976, 7603684

Int. Cl.<sup>2</sup> A01D 81/00

U.S. Cl. 56—370

43 Claims



1. A haymaking machine comprising a frame and at least one rake member that is rotatable about a substantially upwardly extending axis, driving means connected to rotate said rake member about said upwardly extending axis, said rake member having turnable tines that define an outer working circumference and a steering mechanism associated with said tines, said steering mechanism being structured to turn said tines during about one-half of a complete rotation of said rake member to crop depositing positions and during the remaining about one-half of said rotation from crop gathering positions, said steering mechanism including a circular swash plate ring means and at least two elongated tine carriers that are universally pivoted to said swash plate ring means, said tine carriers each comprising an uninterrupted beam continuously extending across the diameter of said rake member and being oppositely positioned to cross one another.

4,161,861

## METHOD AND APPARATUS FOR FORMING AN EYE IN CORDAGE

Russell F. Storm, 115 Walnut, Windsor, Ill. 61957  
Filed Jun. 14, 1978, Ser. No. 915,502

Int. Cl.<sup>2</sup> D01H 15/00

U.S. Cl. 57—22

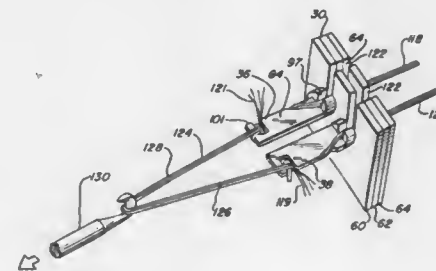
35 Claims

1. Apparatus for making an eye in a string having a plurality

of strands, said strands capable of forming at least two bundles, including

a pair of first retaining means for releasably retaining and longitudinally twisting at least two of said bundles of said strands of said string;

a second retaining means spaced from said first retaining means for gripping and retaining a portion of said string at any of a plurality of positions along said string, said second retaining means spaced from said first retaining means; and



means for rotating both of said first retaining means in the same direction, either clockwise or counterclockwise, whereby said bundles retained by said first retaining means may be twisted longitudinally in one direction thereby to provide a pretwist in said bundles and, after said bundles being laid over each other at the distal ends thereof, may be twisted longitudinally in an opposite direction to form said eye.

4,161,862

## DRAW ROLL DRIVE ARRANGEMENT

Max Hartmannsgruber, Kirchheim; Gunter Schulz; Konrad Klein, both of Ebersbach, and Horst Wolf, Albershausen, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

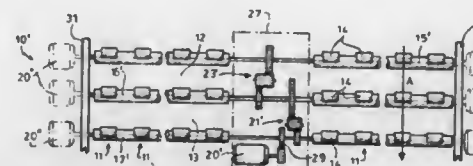
Filed Sep. 12, 1977, Ser. No. 832,701

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641434

Int. Cl.<sup>2</sup> D01H 1/22

U.S. Cl. 57—92

21 Claims



1. A long spinning machine, preferably a ring spinning machine having at least one drive motor with a plurality of drawing means which serve to draw the fiber strands that are arranged next to each other at least on one side of the machine, with the driving lower rollers of each drawing means being formed by long roller lines, each of which roller lines extends along all of the drawing means of the long side of said machine, and further that the roller lines arranged on said long side of the machine are positively connected to each other at one point along the roller lines by drive gear transmissions thereby correlating the rpm relationships of the roller lines, the further improvement in which at least some of the roller lines of the drawing system that are arranged on the long side of the machine are positively connected with each other at least at one additional point spaced from said one point along the roller lines by additional drive gear transmissions and wherein all of said drive gear transmissions connected to the same roller lines have the same gear ratios and wherein the roller lines associated with the drawing fields having the greatest draft are

connected with each other by a plurality of said drive gear transmissions.

4,161,863

## ROTARY RING FOR SPINNING AND TWISTING RING MACHINES

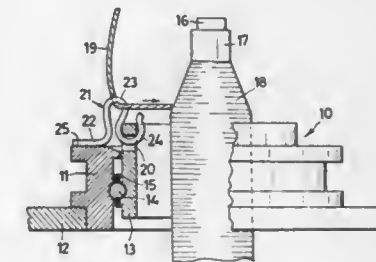
Angelo Marzoli, Palazzolo Sull'Oglio, Italy, assignor to F.lli Marzoli & C. S.p.A., Palazzolo Sull'Oglio, Italy  
Filed Mar. 2, 1978, Ser. No. 882,692

Claims priority, application Italy, Mar. 2, 1977, 20838 A/77; Jan. 27, 1978, 19716 A/78

Int. Cl.<sup>2</sup> D01H 7/56

U.S. Cl. 57—124

15 Claims



1. A rotary ring for spinning and twisting frames of the ring class, comprising a spindle-carrying carriage on the frame, an annular stator body fastened to said spindle-carrying carriage, an annular rotor body concentrically connected for rotation to said stator body, characterized by a rider having substantially the shape of a small ring which is hooked to said rotor body and has a portion intended for sliding on a surface of said stator body and a portion spaced apart from said sliding portion and so shaped as to permit the passage of the yarn being processed.

4,161,864

## ELECTRONIC WATCH, PARTICULARLY A QUARTZ-CONTROLLED WRISTWATCH

Wolfgang Ganter, Schramberg, Fed. Rep. of Germany, assignor to Gebrüder Junghans GmbH, Schramberg, Fed. Rep. of Germany

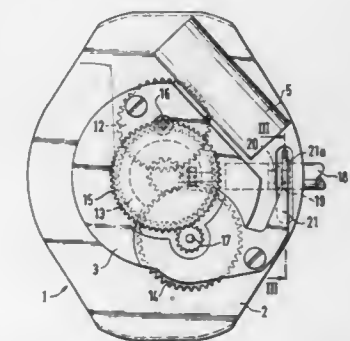
Filed Oct. 27, 1977, Ser. No. 846,120

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653081

Int. Cl.<sup>2</sup> G04C 3/00

U.S. Cl. 58—23 R

9 Claims



1. In an electronic watch, particularly a quartz-controlled wristwatch; an indicator-hand arrangement; an electronic circuit for controlling said indicator-hand arrangement; hand setting means including a setting shaft adapted to be arrested in different positions thereof; and a support plate, the improvement comprising: arresting means on said setting shaft; and an arresting spring operatively associated with said arresting means, said spring concurrently comprising a switch element through which at least one current path within said electronic circuit is selectively closed and interrupted.



4,161,865

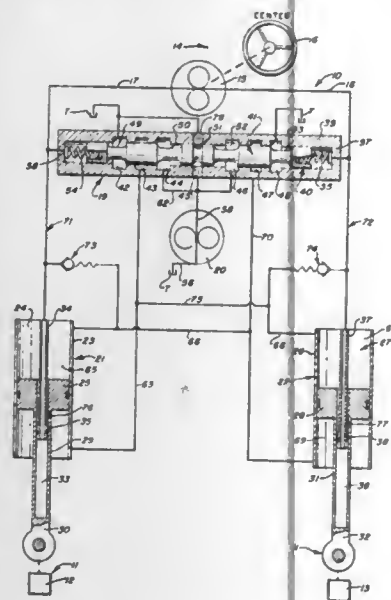
**STEERING CONTROL WITH HYDRAULIC FOLLOW-UP**  
Ralph R. Day, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 27, 1978, Ser. No. 872,977

Int. Cl.<sup>2</sup> F15B 9/02, 13/06

U.S. Cl. 60—385

22 Claims



1. In a hydraulically operable steering mechanism having a manually operable steering element, a steering cylinder including wall means defining a piston chamber and a piston movable in said chamber, connecting means for connecting the piston to the device to be steered, pump means for providing pressurized hydraulic steering fluid, and a control valve having a movable valve member for controlling the delivery of pressurized fluid from the pump means to the piston chamber selectively to opposite sides of the piston therein to urge the connecting means selectively in opposite directions for effecting a steering movement of the device to be steered, the improvement comprising:

- means for biasing said valve member to a nonsteering disposition;
- hydraulic means for moving said movable valve member, as an incident of selective disposition of said steering element, from said nonsteering disposition to cause delivery of pressurized hydraulic fluid to said piston chamber selectively to effect a corresponding steering movement of the device to be steered; and
- restoring means responsive to movement of the device to be steered to hydraulically move said valve member back to the nonsteering disposition as a result of the device being disposed in the steering disposition corresponding to the selected steering disposition of the steering element.

4,161,866

**STIRLING CYCLE MACHINE**

Shuichi Kamiyama, Tokyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1977, Ser. No. 838,370

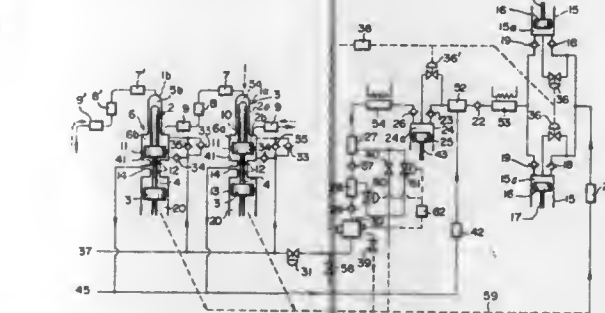
Int. Cl.<sup>2</sup> F02G 1/04

U.S. Cl. 60—517

12 Claims

1. A Stirling cycle machine comprising a rotatable shaft, a plurality of cylinders disposed around said shaft, a plurality of pistons respectively disposed in said cylinders for reciprocating movements so as to define working chambers for a Stirling cycle operation, means for connecting said pistons with said shaft so that the reciprocating movements of the pistons are interrelated with rotation of the shaft, a plurality of compressor means disposed adjacent to said shaft for collecting working fluid which has leaked from the working chambers past said pistons, a portion of said leaked working fluid being at a

higher pressure than the remaining lower pressure portion, said plurality of compressor means adapted to be driven by said connected pistons and shaft, fluid refining means connected



with said compressor means to receive the working fluid collected thereby and refine it, and means for returning the working fluid under pressure to the working chambers.

4,161,867

**HYDRAULIC BRAKE BOOSTER**

Yoshiharu Adachi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

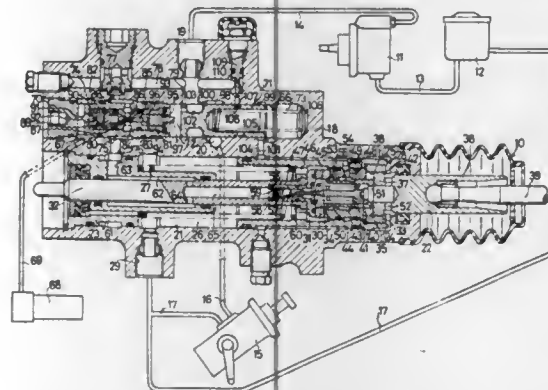
Continuation of Ser. No. 628,547, Nov. 3, 1975, abandoned. This application Feb. 13, 1978, Ser. No. 877,520

Claims priority, application Japan, Nov. 12, 1974, 49/130224

Int. Cl.<sup>2</sup> B60T 13/14

U.S. Cl. 60—547 A

8 Claims



1. A hydraulic brake booster mechanism for use with a circulating fluid pressure system including a source of continuously circulating fluid pressure, a power steering mechanism, and a passage means for connecting said source and said power steering mechanism, comprising:

- a housing disposed within said passage means and having an inlet port for receiving said fluid pressure from said source and an outlet port communicating with said power steering mechanism;
- an input piston means slidably disposed within said housing and operatively associated with a brake pedal;
- a power piston means slidably disposed within said housing for energizing a master brake cylinder;
- a control chamber interposed between said input and power piston means for actuating said power piston means;
- a control valve means actuated by said input piston means and movable between a first position wherein said control chamber receives the fluid pressure from said source and a second position wherein the fluid pressure within said control chamber is drained from said control chamber to a reservoir;
- a spool valve means slidably disposed within said housing and including a variable orifice means for controlling said

passage means and a biasing means for biasing said spool valve means in a direction in which said orifice means is throttled, said spool valve means further comprising a first pressure receiving area which is subjected to the fluid pressure modulated by said control valve means for biasing said spool valve means in said direction, and a second oppositely disposed pressure receiving area which is subjected to the fluid pressure from said source; an accumulator means for accumulating an emergency supply of fluid pressure; and a change-over valve means, disposed within said housing so as to be operable independent of operation of said input piston means and said brake pedal and be actuated solely by said spool valve means which is displaced by said biasing means upon a failure of said source, for delivering said emergency fluid pressure to said control chamber upon actuation of said control valve means.

4,161,868

**REFRIGERATOR WITH FRONT ACCESS MEANS**

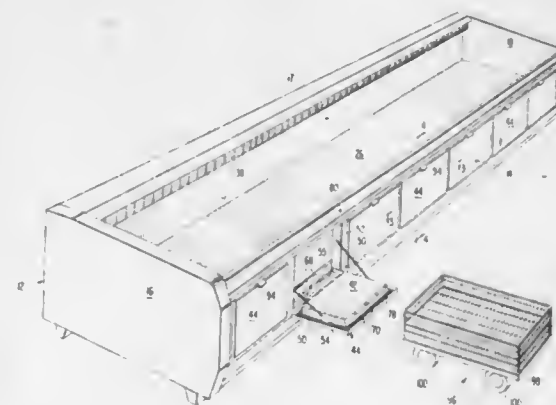
Thomas E. Kennedy, Niles, Mich., and Thomas H. Thompson, Mishawaka, Ind., assignors to Tyler Refrigeration Corp., Niles, Mich.

Filed Dec. 21, 1977, Ser. No. 862,932

Int. Cl.<sup>2</sup> A47F 3/04

U.S. Cl. 62—256

15 Claims



1. A refrigerator case for supporting items therein for display and self-service to customers comprising:

- (a) a well portion enclosed by a bottom portion, a front wall, a rear wall, and a top portion, said top portion providing access to items contained in said well portion of the case;
- (b) said case including means for refrigerating items contained in said well portion;
- (c) said front wall having access means for providing access through said front wall to said well portion to expose said well portion for loading and unloading goods for display, said access means including a panel member hingedly secured to said front wall for movement between an open position for exposing at least a part of said well portion for loading and unloading goods through said front wall and a closed position for closing said front wall, wherein said panel member is generally rectangular in configuration, having a top edge, a bottom edge, a first side edge, and a second side edge, said panel member being hinged along said bottom edge to said front wall for pivotal movement of said panel member downwardly away from said front wall, said panel member further including securing means adjacent said top edge, said front wall having complementary securing means to cooperate with said securing means on said panel member for maintaining said panel member in a closed position and releasing said panel member from said front wall for pivoting said panel member to said open position; and
- (d) means for restraining the movement of the panel member

beyond a predetermined position when said panel member is moved to said open position; wherein said well portion includes a bottom well wall, a front well wall and a rear well wall, said bottom well wall being generally planar in configuration, said panel member defining an inner surface and an outer surface, said inner surface defining a substantially planar configuration and said restraining means co-operating with a part of said front wall and said panel member to maintain the inner surface of said panel member when in said open position substantially coplanar with the well bottom wall for allowing items to be readily moved on a substantially coplanar surface along the inner surface of said panel into said well portion of the case.

4,161,869

**WHEEL COVER LOCK**

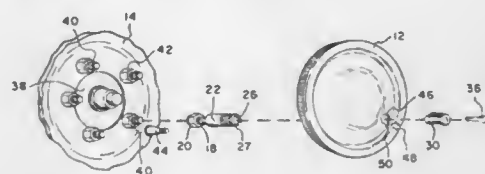
James R. Dixon, 591 N. 30th St., Apt. Q 12, Camden, N.J. 08105

Filed Mar. 8, 1978, Ser. No. 884,585

Int. Cl.<sup>2</sup> B65D 55/14

U.S. Cl. 70—166

1 Claim



1. A wheel cover lock comprising:

- an elongated cylindrically shaped bolt having a nut coaxially and fixedly secured to one end thereof such that said bolt and said nut will always move in unison with each other, said nut being adapted to be secured to one of the wheel lugs of a vehicle;
- a substantially cylindrically shaped tumbler housing coaxially threaded onto the other end of said bolt such that the distance between said nut and said tumbler housing is adjustable by rotating said tumbler housing relative to said bolt, the free end of said tumbler housing having an annularly shaped end wall, a slot formed in said end wall and extending across the entire diameter thereof, said slot being adapted to receive the tip of a screw driver;
- a tumbler member adapted to cooperate with said tumbler housing, said tumbler member including a first portion adapted to pass through a hole in a wheel cover so as to cooperate with said tumbler housing and a second larger portion which is incapable of passing through said hole, said tumbler member including a means extending therefrom adjacent said second larger portion which is adapted to cooperate with said wheel cover to prevent rotation of said wheel cover relative to said wheel cover.

4,161,870

**MOBILE CARGO-CONTAINER LOCK**

Robert W. Barnes, Levittown, Pa., assignor to Lavelle Aircraft Company, Newtown, Pa.

Filed Jan. 12, 1978, Ser. No. 868,881

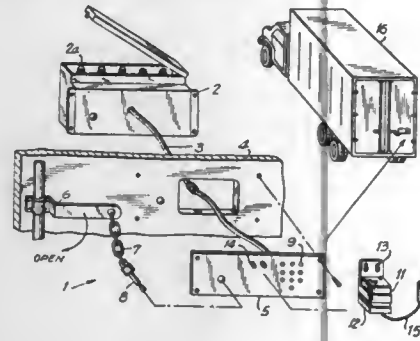
Int. Cl.<sup>2</sup> E05B 49/00

U.S. Cl. 70—278

12 Claims

1. A method of locking and unlocking a mobile cargo-container door, having a mechanical latching arrangement operated by a lever-type door handle on the exterior side of said door, said method comprising: for the locking operation, the step of mechanically restraining said handle in the closed position utilizing a de-energized electro-mechanical locking mechanism located on the interior of the cargo container, thereby locking said door latching arrangement in the closed position; and for the unlocking operation, which utilizes an electric power source, the step of operating a signal generating source on the exterior of said container to actuate electronic circuits in

a pre-selected sequence causing the operation of said electro-mechanical locking mechanism to the unlocked position,



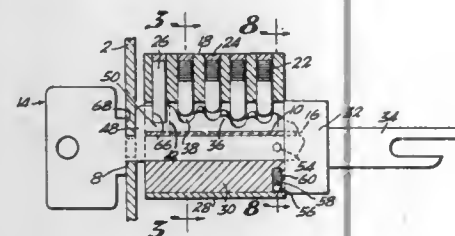
thereby releasing said mechanical restraint on said door handle.

**4,161,871**  
**LOCKING MECHANISM**  
Kurt Ziegler, Park West Villa #77, 11244 SW. 169th St., Miami, Fla. 33157

Filed Jul. 17, 1978, Ser. No. 925,047  
Int. Cl.<sup>2</sup> E05B 17/14, 19/06, 27/04

U.S. Cl. 70—356

22 Claims



1. A locking mechanism for use with locks having an outer cylinder with pin box retaining a plurality of movable resiliently urged pins, and bolt with actuating linkage, comprising: a face plate fixedly attached to an object sought to be locked, and having therein a fixed slot in angular disorientation to a plane of the movable resiliently urged pins; an inner cylinder in rotationally movable internal concentric relationship to the outer cylinder, having a key slot, and having a pin bar substantially adjacent and parallel to a plane of the key slot, said pin bar having a plurality of biased grooves forming inclined planes of random height; and means connecting the inner cylinder to the bolt actuating linkage.

**4,161,872**  
**ROLLING MILLS**  
John C. Ashton, Gamston, near Retford, England, assignor to Ashlow Steel & Engineering Company, Limited, Sheffield, England

Filed Jan. 3, 1978, Ser. No. 866,614  
Claims priority, application United Kingdom, Jan. 7, 1977, 597/77

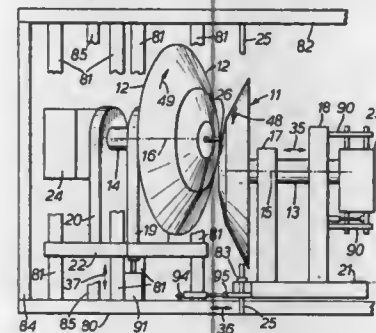
U.S. Cl. 72—95

Int. Cl.<sup>2</sup> B21B 19/02

1 Claim

1. A rolling mill comprising: a pair of generally disc shaped rolling heads each having an axis of rotation and affording opposed rolling surfaces, each said rolling surfaces being inclined at a substantial angle to its said axis of rotation, said axes of rotation lying in spaced parallel planes and said axes of rotation being inclined to one another about a third axis perpendicular to said planes;

means for varying the spacing between said spaced parallel planes;  
means for varying the angle of inclination of said rolling heads about said third axis;  
means for varying the separation of said rolling heads; and



drive means for said rolling heads, said drive means adapted to be capable of rotating said rolling surfaces of said heads in opposite senses relative to each other and at different speeds.

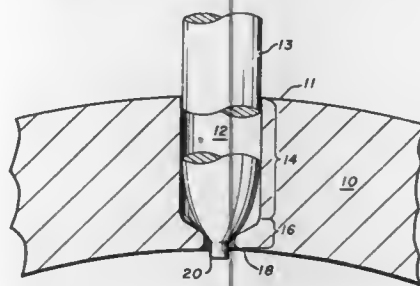
**4,161,873**  
**INTERNAL AND EXTERNAL EXTRUDED NIPPLES OR NOZZLES IN PIPE HEADERS OR BOILER DRUMS**  
Thomas L. Mabery, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 26, 1978, Ser. No. 872,534

Int. Cl.<sup>2</sup> B21D 28/28

U.S. Cl. 72—324

10 Claims



1. A method of forming a hole in a metal part and extruding a nipple on a first surface of a metal part around the hole, the hole extending through the part from the first surface to a second surface on the part, and having a desired diameter, comprising the steps of:

- forming an initial cylindrical hole in the part, the initial hole having the desired diameter along a first portion extending a major part of the way through the hole from the second surface, the hole having a smaller diameter along a minor second portion extending part of the way into the hole from the first surface; and
- forcing a mandrel through the initial hole from the second surface to the first surface, the mandrel having a diameter at its widest point equal to the desired diameter, thereby extruding material forming the smaller portion of the hole into a nipple on the first surface of the part.

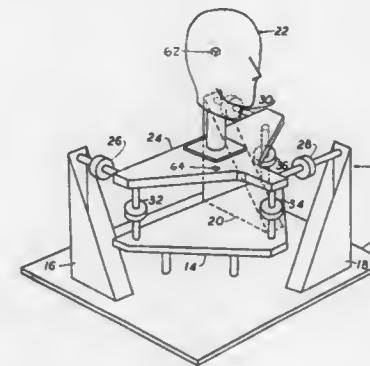
**4,161,874**  
**HEAD AND NECK IMPACT MEASUREMENT SYSTEM**  
Lawrence J. Specker, Dayton, Ohio; Aubin M. Higgins, Earlington, Ky., and James W. Brinkley, Kettering, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 8, 1978, Ser. No. 932,071

Int. Cl.<sup>2</sup> G01M 7/00; G01P 15/00

U.S. Cl. 73—12

2 Claims



1. A system for measuring head and neck impact forces in a simulated bird-aircraft collision test system, comprising: a movable support member; an anthropometric dummy head and neck member secured to said movable support member; a first fixed support member vertically spaced from said movable support member; a first force measuring load cell connected between the movable support member and said first fixed support member; said first load cell having an active axis passing vertically through the movable support member and the fixed support member a predetermined first distance on one side of the head and neck member; a second fixed support member; a second force measuring load cell connected between the movable support member and said second fixed support member; said second load cell having an active axis passing horizontally through the movable support member and the second fixed support member and intersecting the active axis of said first load cell at a first point of intersection within the movable support member; a third force measuring load cell connected between the movable support member and said first fixed support member; said third load cell having an active axis passing vertically through the movable support member and said first fixed support member a predetermined second distance equal to said first distance on the side of the head and neck member remote from said first point of intersection; a third fixed support member; a fourth force measuring load cell connected between the movable support member and said third fixed support member; said fourth load cell having an active axis passing horizontally through the movable support member and the third fixed support member and intersecting the active axis of said third load cell at a second point of intersection within the movable support member; a fifth force measuring load cell connected between said movable support member and said first fixed support member; said fifth load cell having an active axis passing vertically through the movable support member and said first fixed support member a predetermined third distance forward of said head and neck member; a fourth fixed support member; a sixth force measuring load cell connected between said movable support member and said fourth fixed support member; said sixth load cell having an active axis passing horizontally through the movable support member and the fourth fixed support member parallel to a line passing through the first and second points of intersection in said movable member and intersecting the active axis of said fifth load cell at a third point of intersection within the movable member.

**4,161,875**  
**APPARATUS FOR MEASURING THE ALCOHOL PERCENTAGE IN THE BREATH OF AN EXAMINEE**  
Cornelis C. Stuitje, Zeist, Netherlands, assignor to Detecta-Kraan B.V., Zeist, Netherlands

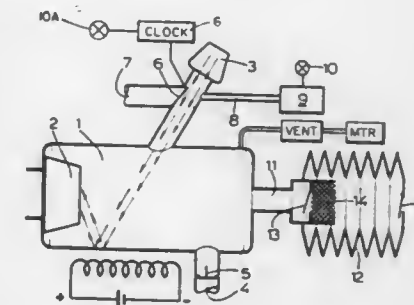
Filed Jan. 6, 1978, Ser. No. 867,514

Claims priority, application Netherlands, Jan. 20, 1977, 770054

Int. Cl.<sup>2</sup> G01N 31/00

U.S. Cl. 73—23

13 Claims



1. Apparatus for measuring the alcohol percentage in the breath of an examinee, comprising an air-tight chamber, inlet and outlet openings in the chamber, an air inlet channel connected with said inlet opening for blowing the breath into the same, an air outlet channel connected with said outlet opening, a check valve arranged in said air outlet channel, a gas detector enclosed by said chamber of which the electric resistance is influenced by alcohol vapor and means responsive to the electric resistance of said gas detector for indicating the alcohol percentage, said gas detector being positioned in the chamber and exposed at all times to the interior of the chamber, the air inlet channel and opening being positioned so that breath blown into the chamber will deflect off of at least one of the inner walls of the chamber before coming in contact with the gas detector.

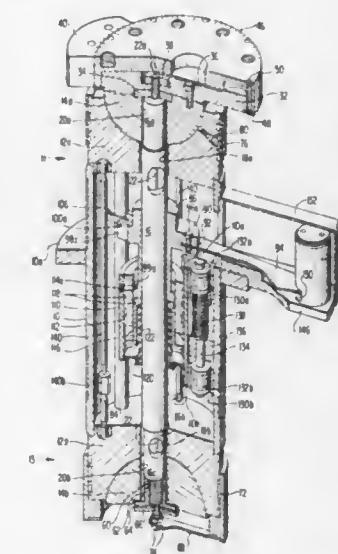
**4,161,876**  
**MASS PROPERTIES MEASUREMENT SYSTEM**  
David A. Carpenter, Parkton, Md., assignor to MRC Corporation, Hunt Valley, Md.

Filed Mar. 17, 1978, Ser. No. 887,606

Int. Cl.<sup>2</sup> G01M 1/12

U.S. Cl. 73—65

52 Claims



1. A mass properties measurement apparatus, comprising: first and second opposed bearing assemblies, each comprising:



ing a fixed bearing and a journal seated in and movable relative to the bearing, the journals of said bearing assemblies being generally part spherically shaped with a generally planar face, the surfaces of the fixed bearings complementing the shape of the associated journals;

rigid connecting means coupled to said first and second journals for substantially securing said journals against movement relative to each other, said connecting means and journals being located relative to said fixed bearings to permit substantially only rotational movement of the journals and connecting means relative to the fixed bearings about a rotational axis, said connecting means including a hollow shaft rigidly secured to the first bearing assembly journal, and a journal preload spring fixed to the second bearing assembly journal, said hollow shaft extending through a central axial bore in said second journal and being secured to said journal preload spring at a location substantially coincident with the radial center of said second journal, whereby said journal preload spring exerts a preloading force between said first and second journals through said hollow shaft;

a support table coupled to said first journal for rotational movement therewith, the plane of the surface of said support table being substantially perpendicular to said rotational axis;

torsion wire means extending substantially along said rotational axis and having an end portion coupled to said support table for rotational movement therewith and its other end portion fixed with one of said bearings against movement relative thereto and against movement with said support table, said torsion wire means controlling oscillatory movement of said support table, said journals, and said connecting means about said rotational axis; means for limiting the maximum angle through which said support table is rotatable in oscillatory movement; and means for measuring successive periods of oscillation of said support table to determine mass properties of a test object mounted on said support table.

4,161,877

#### METHOD FOR THE DETERMINATION OF THE AXIAL THRUST OF ROLLER BEARINGS

Heinrich F. Bauer, Eichenau; Gerhard Helbling, Munich, and Florian Hildebrandt, Günding, all of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union München GmbH, Munich, Fed. Rep. of Germany

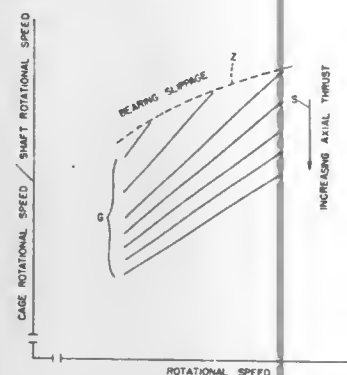
Filed Sep. 12, 1977, Ser. No. 832,291

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642080

Int. Cl.<sup>2</sup> G01L 5/12

U.S. Cl. 73—140

3 Claims



1. A method for the determination of the axial thrust of roller bearings adapted therefor under extreme operating conditions, comprising obtaining the cage rotational speed from the frequency of the dynamic deflection at a weak point in the side of a stationary component of said roller bearing during operation thereof during roll body over-roll, determining the

variation in the bearing cage rotational speed with the shaft rotational speed, and utilizing this value as the measuring magnitude for the axial thrust

4,161,878

#### PRESSURE FLUCTUATION FLOWMETER

Theodore J. Fussell, Jr., Bridgewater, N.J., assignor to Neptune Eastech, Inc., Edison, N.J.

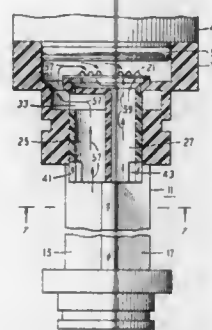
Continuation-in-part of Ser. No. 558,155, Mar. 13, 1975,

abandoned. This application Sep. 7, 1976, Ser. No. 721,070

Int. Cl.<sup>2</sup> G01F 1/32

U.S. Cl. 73—194 VS

40 Claims



1. A pressure fluctuation flowmeter comprising a bluff body having a base surface facing fluid flow, a pair of converging surfaces extending downstream from said base surface and an orifice adjacent each downstream surface, means defining a hollow interior, means bifurcating said orifice and said interior to define a pair of channels in said interior in non-fluid communication with one another, a substantially planar vibratory sensor having first and second opposite surfaces, said channels having port means at a same end of said interior for admitting and withdrawing pressure fluctuations into said channels from said bifurcated orifice for communication in a same longitudinal direction toward said sensor, and means vibratorily mounting said sensor with said first and second surfaces normal to said longitudinal direction and with said first surface communicating with a first one of said pair of channels and said second surface separately communicating with a second one of said pair of channels and thereby to cause said sensor to vibrate in response to pressure fluctuations in said channels.

4,161,879

#### COMPOSITE TANGENTIAL AND AXIAL EXHAUST FLUID FLOWMETER

Carroll J. Dunne, Jr., Toledo, Ohio, assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 3, 1978, Ser. No. 892,616

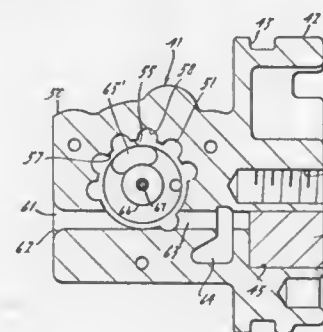
Int. Cl.<sup>2</sup> G01F 1/06

U.S. Cl. 73—229

28 Claims

1. A composite tangential exhaust and axial exhaust fluid flowmeter comprising, in combination, housing means having a substantially cylindrical cavity for receiving a rotor element therein, a common fluid inlet port means in direct communication with said cylindrical rotor cavity and directing all of the fluid entering the flowmeter into said rotor receiving cavity, a plurality of fluid exhaust outlet port means each coupled in series fluidic relation with said fluid inlet port means and in parallel fluid relation to each other, one of said fluid exhaust outlet port means extending generally longitudinally of said housing means and formed generally tangen-

tially of said cavity to exhaust fluid tangentially therefrom and another of said fluid exhaust outlet port means extending transversely of said housing means and formed parallel to the central axis of said cavity to exhaust fluid in a direction axially transversely of said cavity, and a rotor



element rotatable in the cavity by all of the fluid entering said housing through said inlet port means and exhausting from said cavity through any of said fluid exhaust outlet port means communicating with said rotor receiving cavity.

4,161,880

#### LINEARIZED DIGITAL THERMOMETER

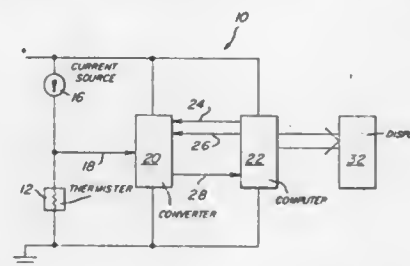
Howard S. Prosky, Denver, Colo., assignor to Electromedics, Inc., Denver, Colo.

Filed Jan. 5, 1978, Ser. No. 867,127

Int. Cl.<sup>2</sup> G01N 7/20

U.S. Cl. 73—342

10 Claims



1. An electronic thermometer, comprising: a thermistor having a predetermined non-linear temperature and resistance relationship characteristic; a source operatively connected for directing a constant current through the thermistor to thereby create an analog voltage across said thermistor related to thermistor temperature by the predetermined temperature and resistance relationship; visual display means operatively connected in said electronic thermometer for visually displaying an indication of a calculated equivalent temperature as sensed by said thermistor; converter means operatively connected for receiving the analog voltage across said thermistor and for supplying a digital signal directly related to the analog voltage; computer means operatively connected for controlling said converter means to supply the digital signal, for calculating an equivalent temperature from the digital signal applied from said converter means, and for operatively controlling said display means to display a visual indication of the calculated equivalent temperature; said computer means including a solid state preprogrammed read only memory containing information in a lookup table defining a predetermined piecewise linearized approximation of the predetermined non-linear temperature and resistance characteristic of said thermistor, the information in said lookup table including slope and constant

information for each segment of the piecewise linearized approximation;

said computer means calculating the equivalent temperature for each individual digital signal supplied by said converter means by relating each digital signal from said converter means to the piecewise linearized approximation recorded in the lookup table, by obtaining slope and constant information for each digital output signal from said lookup table, and by digitally performing a first order algebraic calculation with each digital signal and with the slope and constant information obtained for that digital signal, the result of the calculation being the equivalent temperature; and

said computer means conducting a signal representative of the equivalent temperature to said display means and controlling said display means to visually display an indication of the equivalent temperature.

4,161,881

#### HAND SHOWER AND TEMPERATURE INDICATING UNIT

Zeev Raz, 17 Keren Hayessod Str., Beer-Sheva, Israel

Continuation-in-part of Ser. No. 726,099, Sep. 24, 1976,

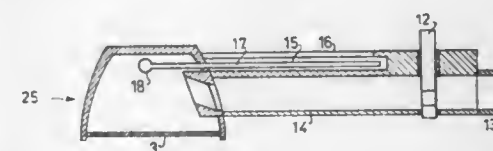
abandoned. This application Aug. 11, 1977, Ser. No. 823,558

Claims priority, application Israel, Oct. 27, 1975, 48730

Int. Cl.<sup>2</sup> G01K 13/02

U.S. Cl. 73—343 R

8 Claims



1. A hand shower and temperature indicating unit comprising: a shower head consisting of a water chamber having a perforated water outlet surface and a temperature sensitive means positioned inside the rear of the chamber in close proximity to the opposite back surface of said chamber; a rigid water conduit section serving as the handle for said unit and integrally attached at one end thereof to the side surface of said chamber at a position between said temperature sensitive means and said perforated water outlet surfaces, said conduit section having at said one end means adapted to direct a water flow towards said temperature sensitive means away from said perforated water outlet surface and having at the free end thereof means for attachment to a water supply line; and a temperature indicating means positioned within a recess provided in the outer surface of said unit opposite to said perforated water outlet surface and being operationally attached via a wall of said chamber to said temperature sensitive means to indicate the temperature of the water within the chamber.

4,161,882

#### TEMPERATURE-DEPENDENT ACTUATING MECHANISMS

Peter R. B. Golch, Gloucester, England, assignor to Splrax Sarco Limited, England

Filed Apr. 13, 1978, Ser. No. 896,053

Claims priority, application United Kingdom, Apr. 18, 1977, 16071/77

Int. Cl.<sup>2</sup> G01K 5/42, 5/44

U.S. Cl. 73—368.3

13 Claims

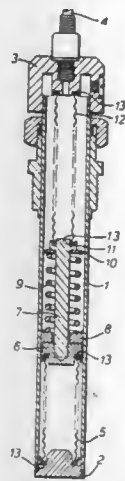
1. A temperature dependent actuating mechanism comprising a temperature responsive sensor and an actuator; the sensor including:

- a variable volume chamber,
- a temperature responsive means, and

a connection between said variable volume chamber and said temperature responsive means such that change in volume of said means brought about by rise in temperature increases the volume of the interior of said variable volume chamber;

the actuator including:

- a chamber,
- a variable volume member in this actuator chamber, and
- an operating member connected with said variable volume member to move in dependence upon changes in volume of the variable volume member; and



the mechanism further comprising a fluid flow path between the interior of said variable volume chamber of the sensor and said chamber of the actuator whereby increase in the volume of the interior of said variable volume chamber of the sensor permits fluid to flow out of said actuator chamber via said fluid flow path thereby to permit the volume of said variable volume member of the actuator to increase with resultant movement of the operating member of the actuator.

#### 4,161,883 CONDITIONING ASSEMBLY FOR CONTINUOUS STACK MONITORING

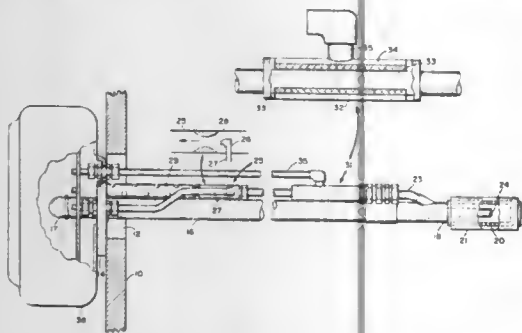
James C. Laird, Maxwellton, and Robert L. Tomlin, Lewisburg, both of W. Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 23, 1978, Ser. No. 908,868

Int. Cl.<sup>2</sup> G01N 1/24

U.S. Cl. 73-421.5 A

6 Claims



1. A probe for collecting samples of industrial gas, comprising

- a first tubular conduit having at least one open end;
- means supporting said first conduit within a stack containing a stream of industrial gases with the open end of said first conduit extending into said stream;
- a second tubular conduit open at both ends, said second conduit penetrating said first conduit so as to intercept at

one end of said second conduit flow within said first conduit;

an inertial filter interposed in said second conduit medially of the ends thereof, said inertial filter including a cylinder of porous material open at both ends connected said second conduit to receive and conduct axially through said cylinder gases flowing in said second conduit, said inertial filter further including a covering wall of gas impervious material surrounding the exterior of said cylinder in spaced relationship thereto so as to create a confined space surrounding the exterior of said cylinder;

a second filter of gas pervious material enclosing said open end of said first conduit, the porosity of said second filter being not less than about 100 microns;

means for establishing a relatively high velocity flow of gases from said stack through said second filter, said second conduit and said inertial filter;

means communicating with said confined space of said inertial filter for extracting sample gas at a relatively low velocity flow, the direction of said sample gas flow being substantially orthogonal to the direction of flow of stack gas through said inertial filter; and

means for periodically applying a blast of pressurized fluid to said first conduit for cleansing said second filter of material trapped therein.

#### 4,161,884 TURN RATE INDICATOR OF AIRCRAFT USING GYROSCOPE

Kouhei Shigenobu, Komae, Japan, assignor to Tokyo Aircraft Instrument Co., Ltd., Tokyo, Japan

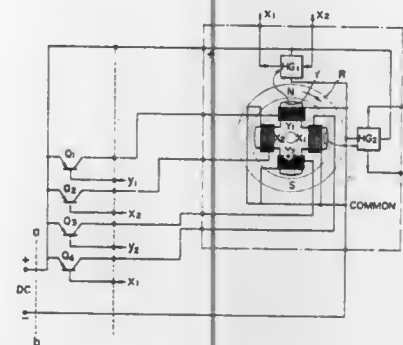
Filed Apr. 6, 1978, Ser. No. 894,151

Claims priority, application Japan, Feb. 28, 1978, 53-22542

Int. Cl.<sup>2</sup> G01P 9/02

U.S. Cl. 73-504

4 Claims



1. An aircraft turn rate indicator including a gyroscope having freedom of rotation around at least one axis, comprising:

- a housing including an annular member adapted to be secured to the body of said aircraft;
- a gimbal mounted within said housing and rotatable with respect to said annular member, said gimbal being returnable to a reference position;
- a motor stator having a central axle supported by said gimbal, said stator including a plurality of coils and Hall elements, the central axle of said motor stator being parallel to the pitch axis of said aircraft when said aircraft is not turning;
- an outer motor rotor rotatably supported by the central axle of said motor stator at the outer periphery of said stator;
- a Hall motor control circuit integrally supported by said gimbal, said control circuit including a plurality of semiconductor devices each thermally coupled to said gimbal and electrically connected to corresponding coils and Hall elements of said motor stator, said semiconductor devices

controlling the current through said stator coils in response to signals from said Hall elements;

a plurality of connecting lines for electrically connecting the coils and Hall elements of said stator to said control circuit;

power supply lines for connecting said control circuit to a power source terminal integrally mounted to said housing; and

a pointer driven by said gimbal in accordance with the angular displacement of said gimbal with respect to said annular member.

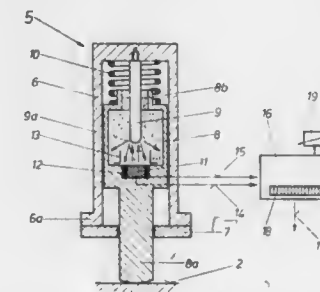
4,161,885  
MEASURING APPARATUS FOR MEASURING THE  
ROLL GAP IN GAUGE-CONTROLLED ROLL STANDS  
Ernst T. Sack, Ratingen-Hosel; Friedrich Nordmeyer, Dusseldorf, and Emil F. Kersting, Ratingen, all of Fed. Rep. of Germany, assignors to Sack GmbH, Dusseldorf-Rath, Fed. Rep. of Germany

Filed May 27, 1977, Ser. No. 801,346

Int. Cl.<sup>2</sup> G01N 9/24

U.S. Cl. 73-597

6 Claims



1. Roll gap measuring apparatus comprising two relatively movable components, a measuring surface on each component, wherein said two components engage one another in a telescoping manner, the inner component having a chamber part-filled with a fluid whose density is substantially constant during temperature changes, and being one of said measuring surfaces, and the outer component having a cup-shaped configuration with an annular cover at one end to permit an elongated projection of the inner component to project outwardly from said outer component, said outer component further including a rod attached to a closed end thereof, said rod being immersed in said fluid contained in said inner component and bearing the other of said two measuring surfaces, a pulsed ultrasonic signal transmitter and a sound receiver located on the same measuring surface, and measuring means for measuring the time taken for sound pulses to travel between said measuring surfaces, means for allowing said fluid to freely expand if the depth of penetration of said immersed rod increases to maintain said constant pressure of said fluid, said fluid container includes a base wall and said signal transmitter and sound receiver are located adjacent thereto, and said measuring surface on said immersed rod is constructed as a spherical reflector for pulses emitted by said transmitter.

4,161,886  
PRESSURE TRANSDUCER AND METHOD  
Robert W. Eshelman, Ann Arbor, and Frederick W. Crall, Farmington Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 19, 1978, Ser. No. 897,890

Int. Cl.<sup>2</sup> G01L 9/10, 9/14

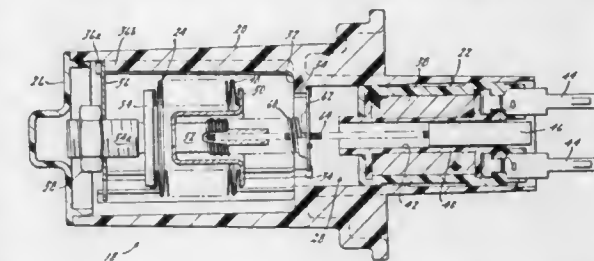
U.S. Cl. 73-722

6 Claims

1. In a pressure transducer having a housing within which is disposed a differential pressure sensing element whose axial length is a function of differential pressure applied to the element, the improvement comprising:

means positioning one axial end of the sensing element at a selected location on the housing;

means applying a spring force between the opposite axial end of the sensing element and another selected location on said housing such that axial expansion and contraction of the sensing element reacts with said spring force com-



prising a threaded fitting, a helical coil spring coaxial with said threaded fitting having one axial end threaded onto said threaded fitting; and

calibration means effective to selectively set the relative threaded engagement of the coil spring and the fitting comprising means for relatively rotating the fitting and spring.

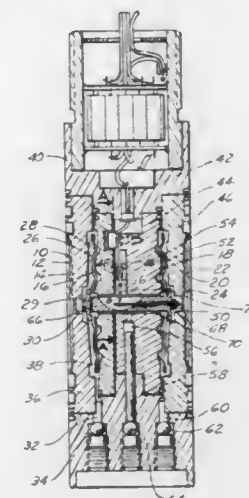
4,161,887  
MEDIA INDEPENDENT DIFFERENTIAL PRESSURE  
TRANSDUCER  
Vaughn L. Stone; Terence K. Rhind; Allen H. Andrews, all of Riverside, and John M. Hendrie, Ojai, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Sep. 2, 1977, Ser. No. 830,292

Int. Cl.<sup>2</sup> G01L 9/04

U.S. Cl. 73-720

7 Claims



1. A differential pressure transducer comprising

- a pressure capsule;
- a first isolator chamber means in said pressure capsule for linking external pressures to said capsule having pressure biasing means for maintaining elevated pressure in said first isolator chamber means, and
- first diaphragm means coupling said external pressures to said first isolator chamber means;
- a second isolator chamber means in said pressure capsule for linking external pressures to said capsule having pressure biasing means for maintaining elevated pressure in second isolator chamber means, and
- second diaphragm means coupling said external pressures to said second isolator chamber means;
- support means for providing mechanical support for said diaphragm means under conditions of overpressure;
- a first aneroid sensing means nested in said first isolator



chamber means connected to a moveable spacer tube means transforming external pressures on said capsule coupled by diaphragm means into linear displacements of said aneroid sensing element as a function of the magnitude of the external pressures;

a second aneroid sensing means nested in said first isolator chamber means connected to said moveable spacer tube means transforming external pressures on said capsule coupled by diaphragm means into linear displacements of said aneroid sensing element as a function of the magnitude of the external pressures;

pressure biasing means for maintaining elevated pressures in said aneroid sensing elements;

displacements sensing means connected to said spacer tube means for sensing said linear displacements; and

support ring means contoured to the said aneroid sensing elements and forming said isolator chamber means.

4,161,888

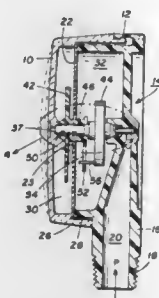
**PRESSURE GAUGE CONSTRUCTION**  
Robert D. Bissell, Orange, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 22, 1978, Ser. No. 908,482

Int. Cl.<sup>2</sup> G01L 19/02

U.S. Cl. 73—740

8 Claims



1. In a pressure gauge including a hollow casing at least partially defined by a transparent viewing crystal visibly exposing both a dial plate and a pointer displaceable relative to graduations on said dial plate for indicating values of pressure and a Bourdon tube having a fixed end adapted to communicate outward of said casing with a pressure source of value to be measured and a free end operably connected to said pointer for displacing said pointer in response to pressure changes received at said fixed end, zero adjustment calibration apparatus comprising in combination:

- (a) an arcuately displaceable shaft interior of said casing and rotatably engaged with said Bourdon tube at a location near the fixed end thereof, said shaft being adapted when arcuately displaced to effect concomitant arcuate displacement of said Bourdon tube and pointer connected thereto;
- (b) engagement means on said shaft comprising a tool engageable formation on the end of said shaft operable to effect arcuate displacement thereof; and
- (c) an aperture through said casing located opposite said shaft end engagement means to render said tool engageable formation operably accessible from the exterior of said casing for calibrationally positioning said pointer.

4,161,889

**GYROSCOPIC POWER TRANSMISSION SYSTEM**  
Virgil Hinds, 1950 Miller Rd., Ann Arbor, Mich. 48103

Filed Apr. 8, 1977, Ser. No. 785,943

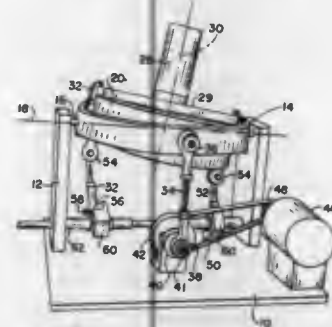
Int. Cl.<sup>2</sup> G01C 19/02; F16H 3/74, 33/10

U.S. Cl. 74—5 R

21 Claims

1. A power transmission system comprising a mass rotating about a first axis, said rotating mass being in a frame pivotably supported by a gimbal about a second axis at right angle to said first axis, pivot means pivotably supporting said gimbal about a

third axis at right angle to said second axis and at variable angle relative to said first axis, first power means oscillating said gimbal and said rotating mass frame about said third axis,



second power means reciprocable by said rotating mass frame when precessionally oscillating about said second axis and biasing means urging said first axis to a position wherein said first axis is orthogonal to said third axis.

4,161,890

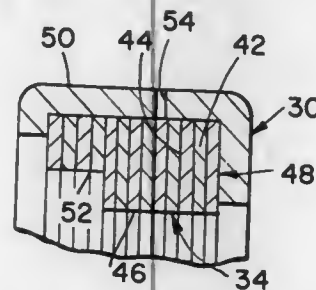
**FRICION DRIVE CONTACT ZONE**  
Alexander Goloff, East Peoria, and Ralph E. Denning, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 6, 1977, Ser. No. 830,542

Int. Cl.<sup>2</sup> F16H 55/32; F16D 69/00

U.S. Cl. 74—214

26 Claims



1. In a friction drive type power transmitting arrangement which comprises first and second substantially rigid members with respective contact portions of said members in frictional engagement at a longitudinally extending contact zone and means for causing a relative velocity of said members at a first end of said contact zone to be different than a relative velocity of said members at a second end of said contact zone, an improvement comprising:

- a plurality of generally parallel plates aligned surface to surface with a respective edge of each plate forming a continuous surface with a respective edge of an adjacent plate; and
- means for mounting said plates to a respective one of said first and second members with said edges of said plates forming a respective contact portion thereof.

**4,161,891**  
**OPERATING HANDLE ATTACHMENT**  
**ARRANGEMENT, PARTICULARLY WINDOW CRANK**  
**FOR AUTOMOTIVE VEHICLES**

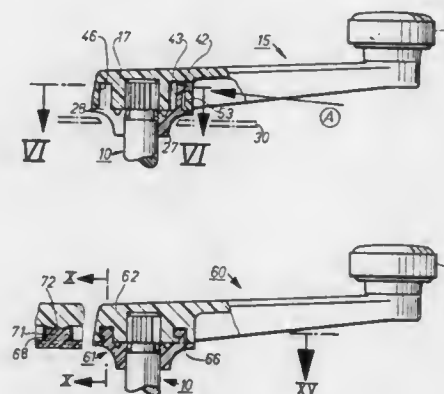
Walter Bossert, Gelsingen-Weiler, Fed. Rep. of Germany, assignor to Bossert AG, Gelsingen, Fed. Rep. of Germany  
Filed Apr. 21, 1977, Ser. No. 789,474

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617691

Int. Cl.<sup>2</sup> G05G 1/00

U.S. Cl. 74—548

45 Claims



1. Attachment arrangement to secure an operating handle (15, 60) to a shaft (10) to transmit torque, and rotary movement of the handle to the shaft while inhibiting undesired axial removal of the handle from the shaft while yet permitting controlled removal of the handle, comprising

a coupling element (61) to couple the shaft (10) to the operating handle (60), the coupling element being made of a unitary molding of yielding plastic material formed with an opening therein matching and receiving the shaft therethrough;

interengaging projection and recess means (35) formed on the shaft (10) and on the coupling element (61), respectively, and forming an axial lock to prevent removal of the coupling element from the shaft in axial direction when the projection and recess means are engaged including;

a groove (12) formed in the shaft (10) and an elastic engagement portion (35) formed on said coupling element (61) and projecting inwardly of the opening and fitting into said groove (12) on the shaft (10) to reliably attach said coupling element to the shaft and prevent axial removal therefrom,

the inwardly projecting portion (35) of the coupling element comprising an at least part circular bead which is radially subdivided into a plurality of inwardly projecting sections;

the operating handle (60) including a hub (62) surrounding the shaft and being formed with a recess to receive a portion of the coupling element (61); and

releasable locking means (49; 65, 66, 67, 68, 69; 76, 77) formed on the portion of the coupling element and the hub of the operating handle and engaging the coupling element to the handle when in locked position to connect the handle to the shaft.

4,161,892

**STEERING-WHEEL RIM**

Giovanni Conterno, Veduggio Olona, Italy, assignor to Personal S.p.A., Abbiate Gruzzano, Italy

Filed Jun. 29, 1977, Ser. No. 811,177

Claims priority, application Italy, Oct. 29, 1976, 22423 B/76

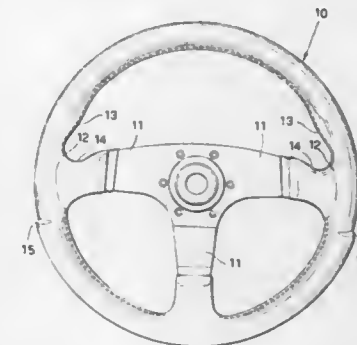
Int. Cl.<sup>2</sup> B62D 1/04; G05G 1/10

U.S. Cl. 74—552

5 Claims

1. A steering-wheel comprising a rim, a central hub, at least two diametrically opposite spokes connecting said rim to said

central hub and dividing said rim into upper and lower portions, and hand resting means arranged at the junctions of said two spokes with said rim, said hand resting means comprising a pair of thumb seats each associated with one of said spokes and formed by a projection on the inner side of the upper portion of the rim adjacent the intersection of the respective spoke with said rim and by an adjacent hollow space in the



inner side of said upper portion of the rim adjacent the intersection of the respective spoke with said rim and being positioned below said projection and continuing into the upper side of respective spoke, and a pair of rear hand-edge seats each associated with one of said spokes and formed by an upwardly facing shoulder in the outer side of the lower portion of the rim.

4,161,893

**ROTARY INDEXING MECHANISM**

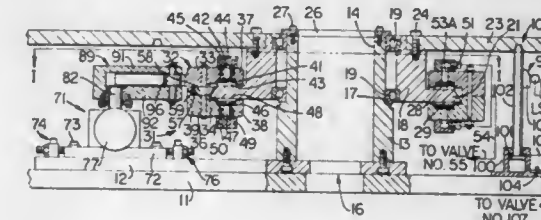
John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Filed Sep. 16, 1976, Ser. No. 723,925

Int. Cl.<sup>2</sup> B23Q 17/00

U.S. Cl. 74—813 R

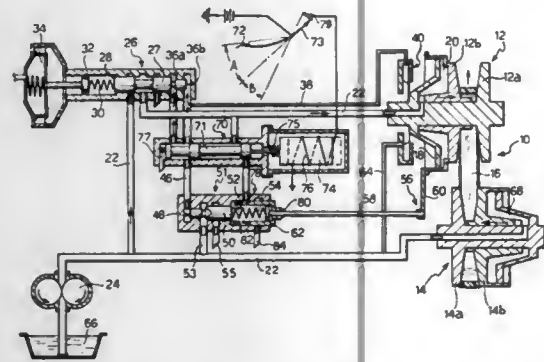
11 Claims



1. An indexing mechanism, comprising:

- base means;
- cyclical drive means mounted on said base means;
- driven means supported for movement relative to said base means and about an axis of rotation, said driven means having an annular radially extending flange the center of which coincides with said axis of rotation;
- connecting means including an annular ring supported on and for movement relative to said annular flange for connecting said cyclical drive means to said driven means, said connecting means including coupling means movable into and out of engagement with said driven means and centering means for maintaining the center of said annular ring concentric about said axis of rotation; and
- control means for effecting a simultaneous coupling by said coupling means of said drive means to said driven means and a driving of said driven means by said drive means in one direction and a simultaneous uncoupling of said coupling means to uncouple said drive means from said driven means and a driving of said drive means in an opposite direction relative to said driven means.

**4,161,894**  
**AUTOMATIC TRANSMISSION DEVICE, WITH BELT TRANSMISSION RATIO VARIATOR, PARTICULARLY FOR MOTOR VEHICLES**  
 Dante Giacosa, Turin, Italy, assignor to Sira Societa' Industriale Ricerche Automotoristiche, Turin, Italy  
 Filed Nov. 21, 1977, Ser. No. 853,593  
 Claims priority, application Italy, Nov. 24, 1976, 69792 A/76  
 Int. Cl.<sup>2</sup> F16H 55/52; B60K 41/12  
 U.S. Cl. 74—863



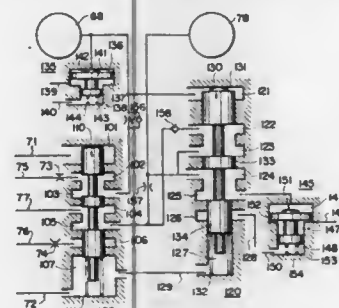
1. A transmission device for interposition between the engine and the drive wheels of a motor vehicle, including an automatic transmission ratio variator comprising a driving pulley and a driven pulley, each of which is expandable and formed by two half-pulleys, a transmission belt of trapezoidal cross section interconnecting the two pulleys, a pump which feeds hydraulic fluid under pressure through a delivery pipe to the pulleys so as to cause a variation of the distance between the two half-pulleys forming each of the two pulleys, a control valve interposed between the pump and the driving pulley and having a displaceable member with two opposite faces, means applying to one said face the vacuum in the engine induction manifold, means applying to the opposite said face a fluid pressure which varies in dependence upon the rotational speed of the driving pulley, a modulation valve having two opposite faces which modulates the pressure of the hydraulic fluid delivered by the pump, means applying to one face of the modulation valve the said fluid pressure and means applying to the opposite face of the modulation valve a pressure proportional to the separation of the half-pulleys of one of the said pulleys, wherein the improvement consists in: the division of the face of the displaceable member of the control valve which is subjected to the said fluid pressure effectively into two separate faces, a pressure transducer responsive to the rotational speed of the engine to provide a pressure signal which is applied directly to a first of the said faces of the control valve, and a selector valve controlling the application of said pressure signal to a second of said control valve faces.

**4,161,895**  
**HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION**  
 Fumihiro Ushijima, and Kagenori Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichiken, Japan  
 Filed Mar. 3, 1977, Ser. No. 774,118  
 Claims priority, application Japan, Sep. 13, 1976, 51-108728  
 Int. Cl.<sup>2</sup> B60K 21/00  
 U.S. Cl. 74—867

1. In an hydraulic control system for an automatic transmission including: at least first and second engaging members; a transmission for establishing at least two change gear ratios due to selective engagement of said first and second engaging members; a first servo-mechanism for controlling the engagement of said first engaging member for shifting to a high speed;

and a second servo-mechanism for controlling the engagement of said second engaging member for shifting to a low speed; said shifting to a high speed being established due to engagement of said first engaging member and release of said second engaging member, and said shifting to a low speed being established due to release of said first engaging member and engagement of said second engaging member; the improvement comprising accumulator means operatively associated with said second servo-mechanism, and a shift timing valve mounted between said accumulator means and said second servo-mechanism for controlling communication of said second servo-mechanism with said accumulator means in response to build-up of pressure to a given level in said first servo-mechanism, wherein said system comprises:

- (a) a transmission including first and second servo-chambers;  
 (b) a shift valve including first, second, third, fourth, fifth, sixth, seventh fluid chambers and a spool, said first fluid chamber being supplied a governor pressure, said seventh fluid chamber being supplied a throttle pressure, said second and sixth fluid chambers being connected to exhaust passages, respectively, said fourth fluid chamber being supplied a line pressure from a pressure regulator, said system operating such that in the upper position of said spool, said third fluid chamber is communicated with said second fluid chamber, a fluid pressure in said third fluid chamber is exhausted, said fifth fluid chamber is communicated with said fourth fluid chamber, and said fifth fluid chamber is supplied a line pressure, and such that in a lower position of said spool, said third fluid chamber is communicated with said fourth fluid chamber,

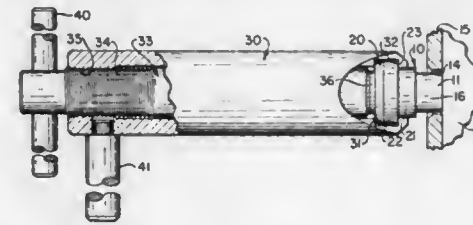


and supplied a line pressure, said fifth fluid chamber is communicated with said sixth fluid chamber, and a fluid pressure in said fifth fluid chamber is exhausted, said spool having first, second and third lands having the same diameter, said first land controlling the communication between said second and third fluid chambers, said second land controlling the communication between said third and fourth fluid chambers and the communication between said fourth and fifth fluid chambers, said third land controlling the communication between said fifth fluid chamber and said sixth fluid chamber;

- (c) a shift timing valve including first, second, third, fourth, fifth, sixth, seventh fluid chambers and a spool, fluid pressure in said first fluid chamber exerting a downward force to said spool, fluid pressure in said seventh fluid chamber exerting an upward force to said spool, said sixth fluid chamber being connected to an exhaust passage, said seventh fluid chamber being supplied a throttle pressure, said spool having first and second and third lands, the diameters of said first land and said second land being the same, the diameter of said third land being smaller than that of said first and second lands, said first land controlling the communication between said second and third fluid chambers, said second land controlling the communication between the third and fourth fluid chambers and the communication between the fourth and fifth fluid chambers and said third land controlling the communication between said fifth and sixth fluid chambers; and wherein said accumulator means comprise:  
 (d) a first accumulator for use with said first-servo-chamber,

said first accumulator including first, second, third fluid chambers and a spool, said second fluid chamber being supplied a line pressure exerting an upward force to said spool and a fluid pressure in said first fluid chamber exerting a downward force to said spool; and  
 (e) a second accumulator for use with said second servo-chamber, said second accumulator including first, second, third fluid chambers and a spool, said second fluid chamber being supplied a line pressure, said third fluid chamber being connected to an exhaust passage, fluid pressure in said second fluid chamber exerting an upward force to said spool, and fluid pressure in said first fluid chamber exerting a downward force to said spool;  
 said first servo-chamber being connected to (i) said first fluid chamber in said first accumulator, (ii) said first fluid chamber in said shift timing valve, and (iii) said third fluid chamber in said shift valve by way of an orifice, said second servo-chamber being connected to (i) said third and fourth fluid chambers in said shift timing valve, and (ii) said fifth fluid chamber in said shift valve by way of an orifice, said fifth fluid chamber in said shift valve being connected to said second fluid chamber in said shift timing valve by way of a check valve which allows only a flow of fluid to said second fluid chamber in said shift timing valve being connected to said first fluid chamber in said second accumulator.

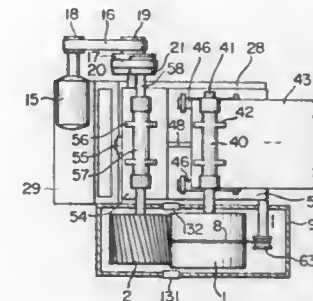
**4,161,896**  
**THEFT PREVENTION ASSEMBLY FOR USE WITH CAR WHEELS**  
 Clark E. Creed, Wethersfield, Conn., assignor to Monarch Machine Company, Inc., New Britain, Conn.  
 Filed Nov. 30, 1977, Ser. No. 856,002  
 Int. Cl.<sup>2</sup> B25B 13/06; F16B 23/00  
 U.S. Cl. 81—121 A



1. The combination of a theft prevention device adapted to be mounted on a wheel mounting stud and a special tool required for its attachment and removal wherein:

- A. the theft prevention device comprises:  
 a. an internally threaded sleeve having a radially expanded end portion, which is flared outwardly to form inner and outer frustoconical surfaces,  
 b. a ring loosely encircling said end portion and having a rear shoulder for engagement by the tool and an inner frustoconical surface complementary to and engageable with the outer frustoconical surface of the sleeve, and  
 B. the tool comprises:  
 a. an elongated tool body having relatively movable clamping members at one end for engagement behind the ring and with the end portion of the sleeve, and  
 b. means for moving said clamping members together to produce sufficient frictional force to enable the sleeve, ring, and tool to be rotated as a unit.

**4,161,897**  
**APPARATUS FOR MANUFACTURING A GLASS FIBER CHOPPED STRAND MAT**  
 Koji Nakazawa, Toshiaki Kikuchi, and Toshihito Fujita, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan  
 Filed Aug. 24, 1977, Ser. No. 827,272  
 Claims priority, application Japan, Aug. 25, 1976, 51/101293  
 Int. Cl.<sup>2</sup> D01G 1/04; B26D 5/00  
 U.S. Cl. 83—73



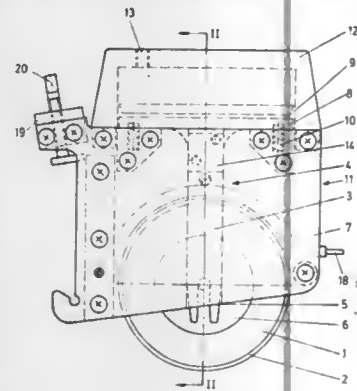
1. An apparatus for manufacturing a chopped strand mat having uniform thickness, comprising,  
 a frame structure,  
 a conveyer means disposed below said frame structure,  
 a cutter roller having a plurality of cutting edges embedded on a peripheral surface thereof,  
 a first means for rotatably supporting said cutter roller,  
 a driving means for rotating said cutter roller,  
 a feed roller for feeding a strand to a cutting position,  
 a second means having one end pivotably secured to said frame said first means being mounted on said second means,  
 a third means mounted on said second means for supporting said feed roller in parallel and in contact with said cutter roller to rotate said feed roller with rotation of said cutter roller,  
 a guide means disposed in a stationary position relative to said feed roller for guiding the strand over said feed roller into between said feed roller and said cutter roller, while reciprocating to move the strand axially of said feed roller,  
 a detecting means for detecting a deviation of dropping direction of chopped strands from a predetermined direction to provide a control signal indicative of a direction of the deviation,  
 a fourth means responsive to said control signal for pivoting said second means to change a relative position of said feed roller to said cutter roller and said frame so that the predetermined dropping direction is recovered.

**4,161,898**  
**HEATED CUTTING DEVICE**  
 Peter Wingen, Overath, Fed. Rep. of Germany, assignor to Dienes Werke GmbH & Co. K.G., Overath-Vilkerath, Fed. Rep. of Germany  
 Filed Mar. 3, 1978, Ser. No. 883,255  
 Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716703

- Int. Cl.<sup>2</sup> B26F 3/10  
 U.S. Cl. 83—171  
 1. A cutting device for use in roll slitting machines or the like comprising: carrier means for rotatably carrying a cutting disc, a cutting disc rotatably mounted on said carrier means and having a circular peripheral edge, arcuate electric heating



means for heating said peripheral edge during rotation of said cutting disc, and said heating means being mounted on said



**4,161,899**  
**PHOTOGRAPHIC PAPER CUTTER WITH AUTOMATIC PAPER FEED IN THE EVENT OF OCCASIONAL MISSING CUT MARKS**

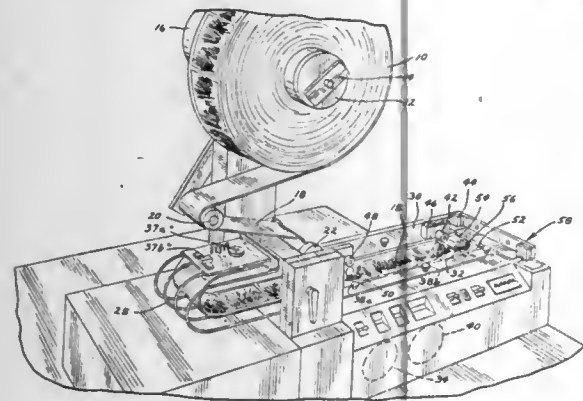
Gerald R. Strunc, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Continuation of Ser. No. 837,999, Sep. 29, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 937,250

Int. Cl.<sup>2</sup> B26D 5/34, 7/06

U.S. Cl. 83—371

25 Claims



1. In a photographic paper cutter for cutting photographic prints from a strip of photographic paper bearing cut indicia, the photographic paper cutter including paper feed drive means for driving the strip along a path, knife means for cutting the strip, and cut indicia sensing means for sensing the cut indicia, the improvement comprising:

storage means for storing a signal indicative of a total feed length for use if a cut indicium is not sensed within a predetermined portion of a paper feed-and-cut cycle, wherein the signal indicative of the total feed length is a function of the feed length of a previous cycle in which a cut indicium was sensed; and

control means for controlling the paper feed drive means during a paper feed-and-cut cycle, the control means causing the paper feed drive means to drive the strip the total feed length if a cut indicium has not been sensed within a predetermined portion of the paper feed-and-cut cycle.

**4,161,900**  
 **veneer edging jig for table saws**  
Jeffrey G. Mendelsohn, 11816 W. 99th Pl., Overland Park, Kans. 66214

Filed Feb. 3, 1978, Ser. No. 874,855

Int. Cl.<sup>2</sup> B27B 5/04

U.S. Cl. 83—409

4 Claims



1. For use in combination with a table saw having a horizontal planar table and a power driven circular saw blade disposed in a vertical plane with its upper portion projecting upwardly through and above a slot of said table, a veneer edging jig comprising:

- an elongated lower clamp plate adapted to rest slidably on said saw table,
- an elongated upper clamp plate disposed above and parallel to said lower plate,
- operating means operable to lower said upper plate forcibly toward said lower plate whereby to clamp veneer sheets therebetween with the portions of said sheets to be trimmed away projecting outwardly between a pair of matching longitudinal edges of said plates, the longitudinal edge portions of said plates, at said matching edges thereof, being formed of a material capable of being cut by said saw blade, and being detachably connected to the remaining portions of said plates, whereby they may be replaced when necessary, and
- guide means operable, as said lower plate is slidably moved over said table, to confine said movement to a line longitudinal to the plates and parallel to the to the plane of said saw blade, with said matching longitudinal plate edges closely adjacent the vertical plane of the adjacent surface of said saw blade.

**4,161,901**  
**DYNAMICALLY ADAPTIVE PLAYER PIANO ROLL TO MAGNETIC TAPE FORMATING SYSTEM AND PLAYBACK**

Henry V. Walker, Franklin, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 2, 1977, Ser. No. 792,847

Int. Cl.<sup>2</sup> G10F 5/00; G10G 3/04

U.S. Cl. 84—115

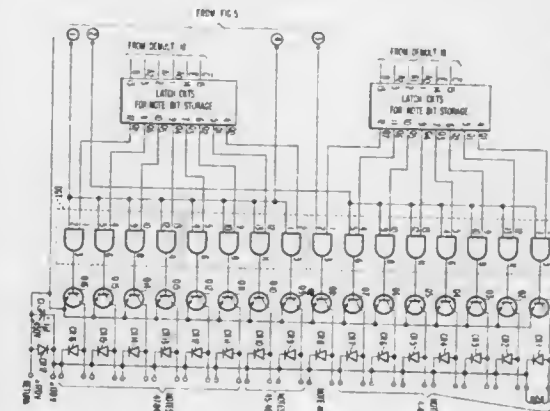
9 Claims

1. In a method of digitally recording musical data on magnetic tape for the recreation of musical performances by a plurality of electronically controlled musical note producing instruments, said musical performances having been previously recorded on player piano rolls as a plurality of parallel data streams in various formats and wherein the streams of parallel data are scanned in sequence for producing, for each data stream, an electrical signal corresponding to the presence or absence of a note to be played in the recreation of said musical performance along with a plurality of parallel data streams carrying expression data bits which vary according to said various formats, said scanning of said streams of parallel data and producing electrical signals being in a sequence to produce a serial musical data stream divided into multiplexed frames of musical data cells, there being at least one data cell in each frame for each one of said plurality of parallel data streams the improvement comprising

providing at least one further group of data cells in said serial data stream for carrying digital code words which identify the format of the musical data as recorded on said player piano roll,

generating a code word unique to each of said various for-

mats and inserting said code words into said data cells for carrying code words,



and magnetically recording said serial musical data streams divided into multiplexed frames of musical data cells on a single channel of a magnetic tape.

**4,161,902**  
**JEW'S HARP**

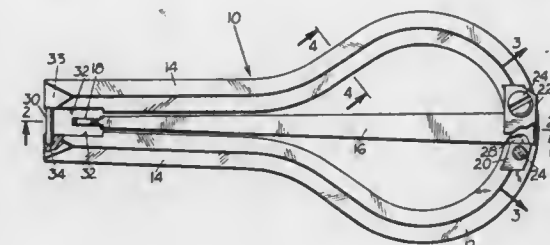
Harry E. Siverson, 4805 SE. 26th Ave., Portland, Oreg. 97202

Filed Jun. 16, 1978, Ser. No. 915,975

Int. Cl.<sup>2</sup> G10D 7/12

U.S. Cl. 84—375

13 Claims



- A Jew's-Harp comprising
- (a) a frame,
- (b) said frame having a closed looped end and a pair of arms extending longitudinally from such looped end in spaced relation,
- (c) said arms having free end portions opposite from said looped end,
- (d) a reed extending between said arms,
- (e) means at said looped end of the frame supporting said reed between said arms,
- (f) and spacer means having opposite ends removably engaged with respective arms,
- (g) said spacer means having lateral engagement with both of said arms to provide selected spacing of the arms and maintain them out of contact with said reed.

**4,161,903**  
**FILAMENT TENSIONING DEVICE FOR BOBBINS OF A BRAIDING MACHINE, OR THE LIKE**

Vincent Sokol, 93 Sunnyside Dr., Yonkers, N.Y. 10705

Filed Apr. 18, 1978, Ser. No. 897,386

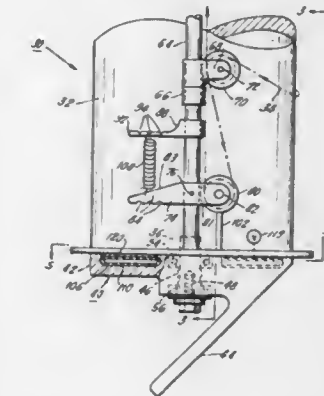
Int. Cl.<sup>2</sup> D04C 3/14

U.S. Cl. 87—57

23 Claims

1. A filament tension regulating device, comprising:  
a bobbin for holding filament that is to be unwound under tension; a support bracket for said bobbin with respect to

which said bobbin is rotatable as the filament on said bobbin is unwound under tension;  
brake means engageable with said bobbin for retarding the rotation of said bobbin with respect to said bracket as the filament is being unwound under tension; said brake means comprising a hydraulic fluid containing chamber; said chamber being connected with said bobbin such that increase in the hydraulic pressure in said chamber applies



greater braking force to said bobbin for retarding rotation thereof and a decrease in the hydraulic pressure in said chamber reduces the braking force applied to said bobbin correspondingly releasing said bobbin to rotate with respect to said bracket;  
means connecting the filament being unwound under tension with said chamber in a manner such that the pressure in said chamber varies inversely with the tension of the filament.

**4,161,904**  
**LIQUID PROPELLANT MODULAR GUN INCORPORATING HYDRAULIC PRESSURIZATION OF THE CASE**

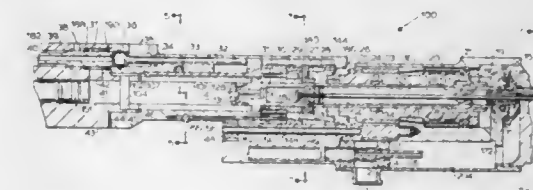
William Groen, San Jose, and Lester C. Elmore, Portola Valley, both of Calif., assignors to Pulsepower Systems, Incorporated, San Carlos, Calif.

Filed Jun. 6, 1977, Ser. No. 803,442

Int. Cl.<sup>2</sup> F41F 1/04

U.S. Cl. 89—7

32 Claims



29. A liquid propellant gun of the kind in which liquid propellant is burned in a combustion chamber to fire a projectile from the gun and comprising,

a bolt mounted for axial movement between a rearward, projectile loading position and a forward, projectile firing position,

liquid propellant injection means for injecting a liquid propellant into the combustion chamber, said liquid propellant injection means including a propellant control valve and bolt engaging means for moving the control valve to an open position when engaged by the bolt, and wherein the projectile sensor means are operatively associated with the bolt engaging means for the propellant control valve to open the propellant control valve only when a projectile has actually entered the gun.

4,161,905

## HYDRAULIC SERVOMECHANISM

Hiroshi Ota, Tokyo, Japan, assignor to Nisshin Sangyo Co., Ltd., Tokyo, Japan

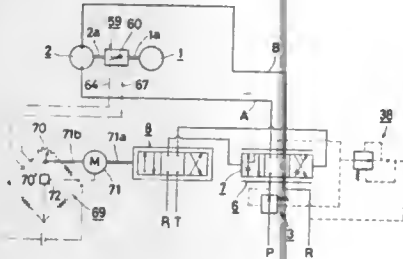
Filed Jun. 6, 1977, Ser. No. 803,516

Claims priority, application Japan, Jun. 10, 1976, 51/67068

Int. Cl.<sup>2</sup> F15B 9/03, 9/09, 9/12, 13/16

U.S. Cl. 91—363 R

9 Claims



1. A hydraulic servomechanism for synchronizing a motion of a driven element with a motion of a command element, which comprises, in combination, a phase difference detecting means for detecting a difference in the motions of the driven and command elements, a hydraulic fluid conduit means for actuating the driven element, a hydraulic fluid flow control valve having a valve body defining an interior bore, the conduit means being connected to the interior bore a hollow cylindrical spool reciprocally positioned in the interior valve body bore, a pilot spool reciprocally positioned in the hollow cylindrical spool, means for reciprocating the pilot spool in response to the difference in the motions detected by the phase difference detecting means, the hollow cylindrical spool being arranged to be reciprocated in response to the reciprocation of the pilot spool for controlling the hydraulic fluid flow rate, and a pressure compensation valve having a valve body defining an interior bore, in communication with the interior bore of the control valve and, having an inlet for the hydraulic fluid, a fluid path from the inlet to a lower portion of the interior bore of the pressure compensation valve, a spool reciprocally positioned in the interior bore of the pressure compensation valve body, and a spring biasing the spool of the pressure compensation valve in the direction of the lower portion, the reciprocation of the spool being controlled by the spring, by the hydraulic fluid flowing from the inlet into the lower portion and by the hydraulic fluid flowing from the interior bore of the control valve into the interior bore of the pressure compensation valve, and the reciprocation of the spool in the pressure compensation valve body adjusting the flow rate of the hydraulic fluid.

4,161,906

## RADIAL PISTON PUMP OR MOTOR HAVING IMPROVED PORTING

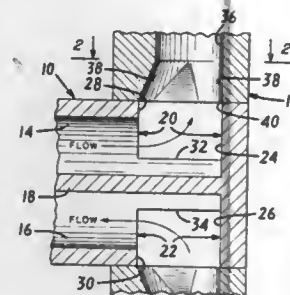
Jaromir Tobias, New York, N.Y., assignor to American Hydraulic Propulsion Systems, Inc., Englewood, N.J.

Filed Dec. 8, 1977, Ser. No. 858,561

Int. Cl.<sup>2</sup> F01B 13/06

U.S. Cl. 91—498

13 Claims



1. In a radial piston hydraulic pump or motor which includes

a pintle shaft having supply and return passages communicating from one end thereof with charge and discharge areas that open radially outwardly through charge and discharge ports in the pintle shaft and a cylinder block mounted for rotation about the axis of the pintle shaft, the cylinder block including a multiplicity of circumferentially spaced-apart radial cylinders each of which communicates in sequence with the charge and discharge ports of the pintle shaft by way of a transfer passage in the block which has a port adjacent the pintle shaft, the improvement wherein each transfer passage port is asymmetrical with respect to the centerline thereof in the axial direction, the area of the part of each transfer passage port which lies on the side of the axial centerline remote from the supply and return passages being substantially greater than the area of the remaining part of the port.

4,161,907

## CARTON FORMING MACHINE

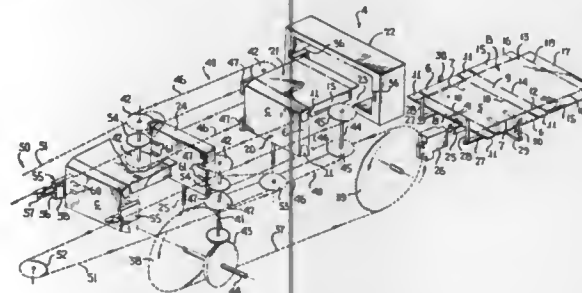
Robert H. Ganz, Saddle River, N.J., assignor to Ganz Brothers, Inc., Bergenfield, N.J.

Filed Jun. 20, 1977, Ser. No. 808,086

Int. Cl.<sup>2</sup> B31B 1/30, 1/44

U.S. Cl. 93—51.1

12 Claims



1. Apparatus for erecting cartons from flat carton blanks, said apparatus comprising a fixed forming well generally lying in a vertical plane, a plurality of forming heads each of a configuration for cooperating with said folding well for forming a carton blank into an erected carton during the passage of the carton blank through said forming well, first carrier means for moving said forming heads in spaced relation along a closed path including a generally horizontal straight line portion extending through said forming well, sealing means for sealing cartons erected in said forming well in their erected state, second carrier means for moving said sealing means along said path portion in cooperation with said forming heads, stripper members for removing erected and sealed cartons from said forming heads, and third carrier means for moving said stripper members along said path portion in timed relation to movement of said forming heads, and horizontally disposed hopper means for receiving cartons stripped from said forming heads.

4,161,908

## APPARATUS FOR THE PRODUCTION OF WRAPPED FOODS

Kingo Miyahara, Tokyo, Japan, assignor to Dowo Co. Ltd., Tokyo, Japan

Division of Ser. No. 694,680, Jun. 10, 1976, Pat. No. 4,089,982. This application Aug. 22, 1977, Ser. No. 826,930

Claims priority, application Japan, Jun. 12, 1975, 50-71233; Jun. 12, 1975, 50-71234; Mar. 24, 1976, 51-31454; Mar. 24, 1976, 51-31455

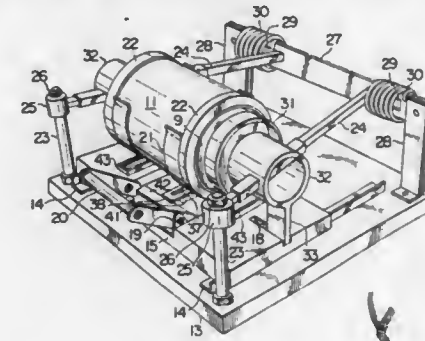
Int. Cl.<sup>2</sup> A23L 3/32

U.S. Cl. 99—349

6 Claims

1. Apparatus for the production of a wrapped food, comprising a base plate having front and rear portions, a carriage mounted on said plate for reciprocatory movement between the front and the rear portions of said base plate, a pair of

support members arranged on said carriage for detachably mounting an electrically insulated container, which container is adapted to receive therein a material foodstuff, a pair of movement guide members each disposed at either end of said container in spaced-apart relation and arranged above said base plate so as to converge from the front to the rear portions of the base plate, the guide members being engaged by the support members, and a pair of electrode plates each mounted on one of said pair of movement guide members and at either end



of the container, said electrode plates being in reciprocatory motion together with the reciprocatory movement of said carriage, whereby when the carriage moves from the front portion to the rear portion of the base plate, the pair of electrode plates move into the container so as to be brought into pressure engagement with opposite ends of the material foodstuff, and when the carriage moves from the rear portion to the front portion of the base plate, the pair of electrode plates move out of the container so as to be brought out of pressure engagement with the material foodstuff.

4,161,909

## ULTRAHIGH TEMPERATURE HEATING SYSTEM

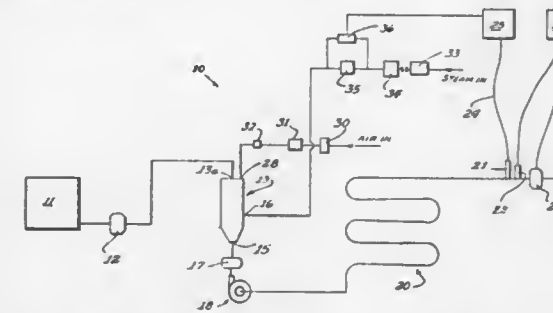
Alden H. Wakeman, Lake Mills, Wis., assignor to Crepaco, Inc., Lake Mills, Wis.

Filed Sep. 8, 1978, Ser. No. 940,718

Int. Cl.<sup>2</sup> A23C 3/02

U.S. Cl. 99—453

9 Claims



1. An ultrahigh temperature heating system for a liquid product of known specific gravity and specific heat, said system comprising a source of product at a predetermined first temperature; an upright chamber including a product inlet disposed adjacent the upper end portion thereof and communicating with said source for receiving at a predetermined first flow rate the product at the first temperature, an outlet disposed adjacent the lower end portion of said chamber, and a steam inlet disposed intermediate said inlet and outlet through which a controlled amount of steam at a first pressure and at a predetermined second temperature is adapted to flow into said chamber and intermix with the product descending within said chamber and heat same to the predetermined second temperature; first means connected to said chamber outlet for removing from said chamber the mixture of product and steam at a predetermined second flow rate whereby there is no accumulation of same in the chamber lower end portion; second means

for exerting a predetermined second pressure on the product and steam removed from said chamber whereby all of the steam is condensed and mixed with the product; and third means connected to said second means for retaining the mixture of the product and steam condensate for a predetermined time interval and at the second temperature and pressure.

4,161,910

## STRAP FEEDING AND TENSIONING ASSEMBLY

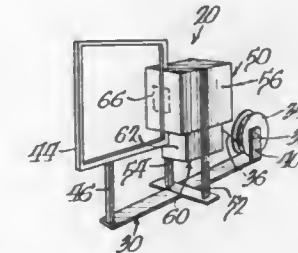
John H. Leslie, Winnetka, and George A. Crosby, Long Grove, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed May 19, 1978, Ser. No. 907,689

Int. Cl.<sup>2</sup> B65B 13/06

U.S. Cl. 100—26

13 Claims



1. A strap feeding and tensioning assembly for a strapping machine having a frame, strap chute and a strap end gripping and sealing unit, said feeding and tensioning assembly comprising:

- a strap guide arm pivotably connected on one end to said strapping machine frame;
- traction wheel means on said guide arm for feeding and withdrawing a length of strap into and out of said chute;
- a gripper means on said guide arm for gripping said strap;
- a high tension drive member rotatable on an axis which is fixed relative to, and movable with, said guide arm;
- a reversible, rotatable drive motor;
- a gear drive assembly means engaged with said motor for separately rotating (1) said traction wheel means to feed said strap and to withdraw said strap when one end is held by said strap end gripping and sealing unit and (2) said high tension drive member to apply a high tension to said strap; and
- a high tension reaction means connected to said strapping machine frame for engaging said high tension drive member and transferring the reaction force of said drive member to said strapping machine frame as said drive member is rotated in engagement with said reaction means, whereby said drive member moves along said reaction means causing said guide arm to (1) pivot, (2) actuate said gripper means to grip said strap, and (3) pull the gripped strap thereby drawing said high tension in said strap.

4,161,911

## PRESSES FOR BALING WASTE MATERIALS

Anton Schäfer, Langenfeld, and Karl Probst, Solingen, both of Fed. Rep. of Germany, assignors to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,678

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636742

Int. Cl.<sup>2</sup> B30B 15/30

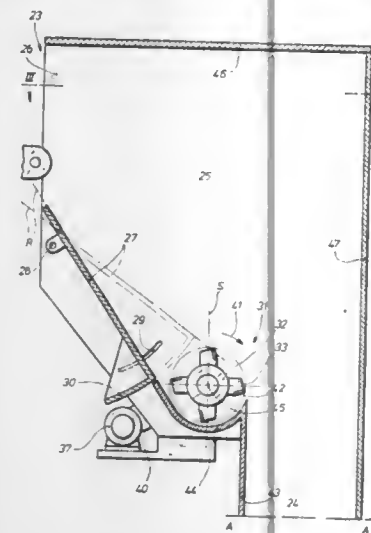
U.S. Cl. 100—96

10 Claims

1. A baling press for processing waste materials such as refuse into bales comprising: a pressing box; a filler shaft connected to said pressing box including a shaft portion for feeding waste material to be pressed from above into said box; a plunger slideably mounted in said box; a driving mechanism for moving said plunger to press waste in said box; an inclined material inlet chute located within said filler shaft through

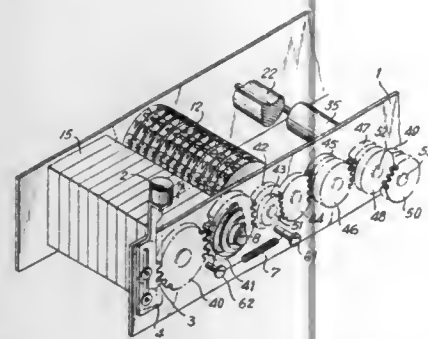


which waste material may be introduced into said baling press; and a material preparation device located to receive material introduced through said inclined inlet chute for treating said incoming material; said preparation device including a rotor, means mounting said rotor for rotation about a substantially horizontal axis extending across the bottom of said inclined chute, means on said rotor for engaging waste material from said chute and drive means for rotatively driving said rotor in



a given direction; said rotor being arranged at a location between the bottom of said inclined inlet chute and the inlet of said shaft portion, with said inclined inlet chute on one side of said rotor; said given direction of rotation of said rotor being such that as said rotor rotates said one side of said rotor on which said inlet chute is located travels in a generally upwardly directed rotary path to propel material incoming from said chute over and above said rotor before said material reaches said shaft portion.

**4,161,912**  
**MINIATURE PRINTER**  
Kiyofumi Usui, and Kozo Kodaira, both of Shiojiri, Japan, assignors to Shinshu Seiki Kabushiki Kaisha, Suwa and Kabushiki Kaisha Suwa Seikoshu, Tokyo, both of, Japan  
Filed Jun. 6, 1977, Ser. No. 804,047  
Claims priority, application Japan, Jun. 4, 1976, 51-65341  
Int. Cl.<sup>2</sup> B41J 1/44  
U.S. Cl. 101-99  
19 Claims



1. A miniature printer for printing a web of paper comprising energy storage means, means for supplying energy to said energy storage means, said energy supplying means being displaceable in a first direction to effect energy storage and being displaceable in a second direction opposite from said first direction during release of the energy stored in said energy storage means, paper feeding means, a plurality of rotatable character rings having a plurality of characters disposed about their periphery, means for selecting a single said character on

each of said character rings for printing on said paper, means operatively coupling said energy supplying means and said character selection means for at least in part powering said character selection means during the supply of energy to said energy storage means to effect character selection, means for effecting printing of said characters on said paper and means operatively coupling said energy storage means with said paper feeding means and said printing means to power said paper feeding means and printing means by the energy released from printing means when said energy supplying means is displaced in said second direction but not when said energy supplying means is displaced in said first direction.

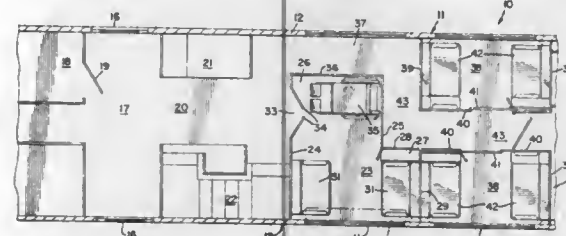
**4,161,913**  
**RAILWAY TRUCK FRAMES**  
Jean-Claude Guillaumin, L'Etang la Ville, France, assignor to Societe des Acieries de Paris et d'Outreau, Paris, France  
Filed Apr. 5, 1977, Ser. No. 784,915  
Claims priority, application France, Apr. 12, 1976, 76 010660  
Int. Cl.<sup>2</sup> B61F 5/00, 5/04, 5/14, 5/52  
U.S. Cl. 105-200  
5 Claims



1. In a rigid type bogie-truck for railway rolling stock, comprising a pair of longitudinal side-members and a cross-member connected by butt-welding to each of said side-members in a central area thereof, a connecting appendix rigid with a respective longitudinal side-member in said central area thereof and extending laterally therefrom, said connecting appendix comprising:

a cylindrical portion forming the shape of a connection between the appendix and the cross-member, an upper substantially flat face, a lower slightly convex face, said upper and said lower faces extending from said cylindrical portion and flaring out towards the respective longitudinal side-member, and four swells constituting two pairs of lateral swells, each one of said swells extending and gradually departing from said cylindrical portion towards a respective arm of the respective side-member.

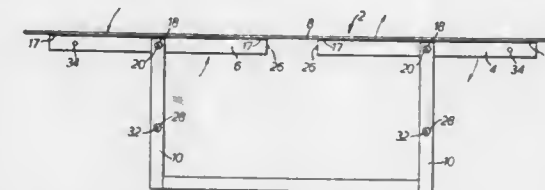
**4,161,914**  
**RAILWAY SLEEPING CAR COMPARTMENTAL ARRANGEMENT**  
Ronald W. Marsh, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.  
Filed Jun. 15, 1977, Ser. No. 806,792  
Int. Cl.<sup>2</sup> B60N 3/00  
U.S. Cl. 105-344  
9 Claims



1. In a passenger car including a car having first and second side walls, a roof and floor structure, a vestibule in said car, a first access and exit door in said side walls communicating directly with said vestibule, the improvement of an ar-

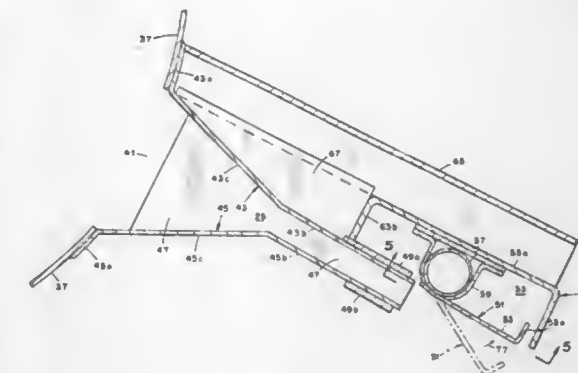
angement for accommodating a wheel chair for handicapped persons comprising, a first aisle of a width accommodating said wheel chair communicating directly with said vestibule, an enlarged passenger compartment accommodating a person confined to a wheel chair including a pair of longitudinally spaced walls extending laterally from said first side wall and terminating short of said second side wall, a longitudinally extending divider wall connecting said longitudinally spaced walls, a pair of seats within said compartment, a second access and exit door in one of said longitudinally spaced walls communicating directly with said first aisle and being generally longitudinally aligned therewith, said second door being of substantially the same width as said first aisle thereby accommodating passage therethrough of said wheel chair, a space within said compartment adjacent to said second access and exit door and being generally longitudinally aligned with said first aisle for accommodating said wheel chair, said longitudinal alignment of the above mentioned elements providing ease of access and use of said compartment and minimizing essential maneuvering of wheel chairs within the car, a second aisle of lesser width than said first aisle disposed between said divider wall and said second side wall and communicating with said first aisle, and additional compartments within said car of lesser size in area than said enlarged compartment disposed remotely from said vestibule and said first aisle, said additional compartments communicating with said second aisle and said second aisle providing a relative passenger boundary between said enlarged and additional compartments.

**4,161,915**  
**ADJUSTABLE TABLE**  
Milan J. Varmuza, London, England, assignor to Avalanche Limited, London, England  
Filed Jun. 19, 1978, Ser. No. 916,786  
Claims priority, application United Kingdom, Jul. 19, 1977, 30179/77  
Int. Cl.<sup>2</sup> A47B 9/00  
U.S. Cl. 108-144  
5 Claims



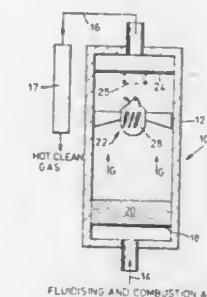
1. An adjustable table comprising a table top, a base frame positioned underneath the table top and having four fixed upstanding legs which are arranged in pairs at opposite end portions of the frame, and a support member pivotally attached to the upper end portions of each pair of legs such that it pivots between the legs, the support members being pivotable between their legs from a first position in which the support members support the table top at a first height to a second position in which the support members support the table top at a second and higher height, the support members being horizontal in their first position and vertical in their second position, the table top resting freely on the support members in an unsecured condition as the support members are moved between their first and their second positions whereby the table top remains the same way up when the support members are in their first and their second positions, and the adjustable table including locking means for locking the support members to the upstanding legs when the support members are in their second position.

**4,161,916**  
**INCINERATION APPARATUS WITH ADJUSTABLE AIR CURTAIN**  
Robert D. Applegate, P.O. Box 309, Attica, Ind. 47918  
Filed Sep. 19, 1977, Ser. No. 834,516  
Int. Cl.<sup>2</sup> F23G 3/02  
U.S. Cl. 110-203  
4 Claims



1. An apparatus for directing a curtain of air into a pit in which material is burning, including an air supply means, an elongated plenum member adapted to be positioned along one edge of the pit, said plenum member being in fluid communication with said air supply means for distributing air along the length thereof, a nozzle means attached to and extending along the length of said plenum and having an outlet for releasing the air from said plenum along its length in a stream moving generally at right angles to the length of said plenum, a vane located adjacent the outlet of said nozzle in proximity to said air stream, said vane being generally aligned with said nozzle, means to vary the position of said vane to change the path of said air stream and a protective member disposed above said vane to prevent falling objects from contacting said vane.

**4,161,917**  
**FLUIDIZED BED COMBUSTION APPARATUS**  
Albert Jubb, Kenilworth, England, assignor to Rolls-Royce Limited, London, England  
Continuation of Ser. No. 776,917, Mar. 11, 1977, abandoned.  
This application Sep. 21, 1978, Ser. No. 944,657  
Claims priority, application United Kingdom, Mar. 26, 1976, 12176/76  
Int. Cl.<sup>2</sup> F23D 19/00  
U.S. Cl. 110-263  
3 Claims



1. A fluidised bed combustion apparatus for burning a particulate combustible material fluidised in a particulate inert material to produce heated exhaust gases for use as power, said apparatus comprising: a vessel, a bed of fluidisable inert material and combustible material in said vessel, means for supporting said bed above the bottom of said vessel, said vessel having an inlet for a flow of fluidising and combustion gas positioned beneath and spaced from said bed, said vessel also having an outlet remote from said inlet and positioned above said bed for discharge from said vessel of a flow of the heated exhaust gases

and any entrained completely burnt particulate combustible material, particle separating means in series with and positioned downstream of the outlet of said vessel for separating the completely burnt particulate combustible material from the heated exhaust gases, gas-swirling means positioned in said vessel in spaced relationship above said bed and spaced relationship below said outlet, said gas-swirling means being arranged to impart a swirling motion to the heated exhaust gases, completely burnt particulate combustible material and partially burnt particulate material whereby dwell time of the partially burnt particulate material in the vessel is increased by the partially burnt particulate material being centrifuged towards the wall of said vessel to completely burn within the vessel or fall back to said bed through said swirling means, said gas-swirling means including a central hub and a plurality of static vanes extending between the wall of said vessel and said central hub, each of said vanes having an angle of less than 45° with a vertical axis of said vessel and said central hub and vanes having an axis substantially parallel to the flow direction of the heated exhaust gases rising from said bed towards said outlet of said vessel and coincident with the vertical axis of said vessel.

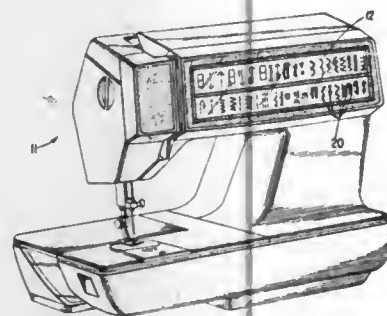
#### 4,161,918 ROLLOVER AND WIPE PROJECTIVE CIRCUIT FOR AN ELECTRICAL SWITCHING ARRAY

William H. Dunn, Branchville, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,006  
Int. Cl.<sup>2</sup> D05B 3/02

U.S. Cl. 112—158 E

5 Claims



4. In a sewing machine having a plurality of individually selectable operator influenced functions comprising: a touch panel associated with said sewing machine having individual areas thereon sensitive to an operator's touch for individually selecting said sewing machine functions, a plurality of touch pads arranged on said touch panel with a specifically different predetermined combination thereof operatively associated with each one of said touch sensitive areas, an input line from each of said touch pads directed to a protective circuit, means in said protective circuit to scan input signals from said touch pads for establishing and detecting prescribed conditions of operator influence of any of said predetermined combination of said touch pads, means for storing the values of said input signals for a predetermined number of scans and means for comparing these stored values to establish their identity for rendering any selected one of said operator influenced functions effective, zero input detecting means in said protective circuit responsive to a predetermined set of values of said input signals for generating a signal indicating the absence of operator influence on all of said plurality of inputs, and means in said protective circuit operative upon effectiveness of any operator influenced function by establishment of said prescribed conditions for preventing selection of another operator influenced function until a signal is received from said zero input detecting means.

#### 4,161,919 MOTOR CONTROL SYSTEM FOR SEWING MACHINE

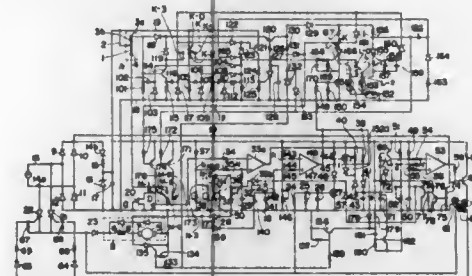
Koji Nishida, Nagoya; Taneichi Kawai, Anjo; Shigemitsu Hamajima, Anjo; Nobuyoshi Nagura, Anjo, and Tsuneo Hida, Anjo, all of Japan, assignors to Aisin Seiki Co., Ltd., Japan

Filed Jul. 7, 1977, Ser. No. 813,624  
Claims priority, application Japan, Jul. 23, 1976, 51-88542; Jul. 23, 1976, 51-88543

Int. Cl.<sup>2</sup> D05B 69/22

U.S. Cl. 112—275

19 Claims



1. A motor control system for a sewing machine having a foot controller with a stop position, a motor with an armature winding, and at least one motor drive thyristor serially connected to the motor, comprising:  
a shunt thyristor parallelly connected with the armature winding of the motor in the sewing machine;  
deceleration detector circuit means for detecting the fall of motor speed into a predetermined threshold level and generating a deceleration detection signal;  
means for producing a stop signal when the foot controller is moved to its stop position;  
brake command circuit means for receiving the deceleration detection signal from the deceleration detector circuit means and the stop signal, and generating a brake command signal to operate the shunt thyristor in a shunt mode; and  
trigger phase clamp circuit means for receiving the brake command signal and clamping the trigger phase of said at least one motor drive thyristors.

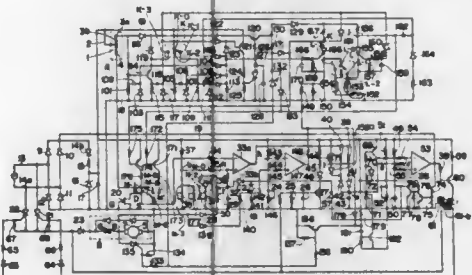
#### 4,161,920 MOTOR CONTROL SYSTEM FOR ONE STITCH SEWING CONTROL OF A SEWING MACHINE

Koji Nishida, Nagoya; Taneichi Kawai, Anjo; Shigemitsu Hamajima, Oobu; Nobuyoshi Nagura, and Tsuneo Hida, both of Anjo, all of Japan, assignors to Aisin Seiki Co., Ltd., Japan

Filed Jul. 7, 1977, Ser. No. 813,625  
Claims priority, application Japan, Jul. 23, 1977, 52-88546  
Int. Cl.<sup>2</sup> D05B 69/22

U.S. Cl. 112—275

19 Claims



1. A motor control system for one stitch sewing control of a sewing machine having motor drive thyristors, a trigger phase indication circuit means for controlling operation of the motor drive thyristors and a comparator circuit means for generating a trigger phase indication signal to accelerate or decelerate

motor speed into an indicated speed which corresponds to a down position of a foot controller, characterized in that the system further comprises:

- a start pulse generator circuit means for detecting the down position of the foot controller and generating a pulse;
- a first needle position detector means for detecting the arrival of the sewing needle at a first predetermined halt position;
- a second needle position detector means for detecting the arrival of the sewing needle at a second predetermined halt position;
- a first memory circuit which is energized by the pulse from the start pulse generator circuit means and which is deenergized by the first needle position detector means;
- a one stitch sewing speed indication signal generator means, which is energized by the energization of the first memory circuit, for supplying a one stitch sewing speed indication signal to the comparator circuit means;
- a second memory circuit which is energized at the time the first needle position detector means deenergizes the first memory circuit means and which is deenergized by the second needle position detector means; and
- a predetermined constant trigger phase command signal generator means, which is energized by the second memory circuit means, for supplying a predetermined constant trigger phase command signal to the comparator circuit means.

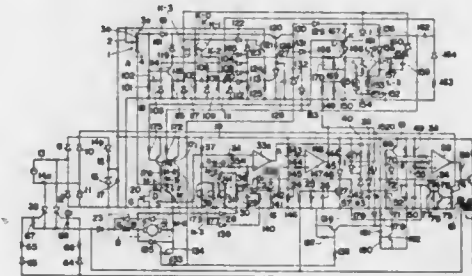
#### 4,161,921 MOTOR CONTROL SYSTEM FOR SEWING MACHINE

Koji Nishida, Nagoya; Taneichi Kawai, Anjo; Shigemitsu Hamajima, Oobu; Nobuyoshi Nagura, and Tsuneo Hida, both of Anjo, all of Japan, assignors to Aisin Seiki Co., Ltd., Japan

Filed Jul. 7, 1977, Ser. No. 813,626  
Claims priority, application Japan, Jul. 23, 1976, 51-88544  
Int. Cl.<sup>2</sup> D05B 69/22

U.S. Cl. 112—275

27 Claims



1. A motor control system for a sewing machine having motor drive thyristors, trigger phase indication circuit means for controlling operation of the motor drive thyristors, comparator circuit means for generating a trigger phase indication signal to accelerate or decelerate motor speed into an indicated speed which corresponds to the down position of a foot controller, means for generating a stop signal when the foot controller is moved to its stop position, and brake means for stopping the motor, wherein the improvement comprises:

- needle position detector means for detecting the arrival of the sewing needle at a predetermined stop position;
- predetermined constant trigger phase command circuit means, which is energized by the stop signal, for supplying a predetermined trigger phase indication signal to the comparator circuit means to decelerate motor speed; and
- brake command circuit means, which is energized by the stop signal, for supplying a brake command signal to a brake means when the needle position detector means detects the arrival of the sewing needle at the predetermined stop position.

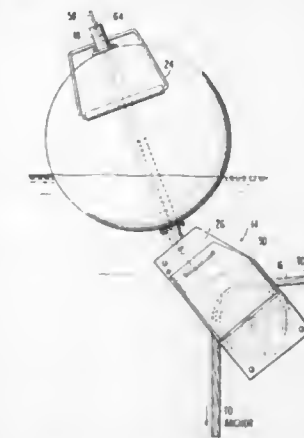
#### 4,161,922 ANCHOR CADDY

Francis Fogg, Scotia, N.Y., assignor to Fish-N-Mate Ltd., Gloversville, N.Y.

Filed Mar. 1, 1978, Ser. No. 882,402  
Int. Cl.<sup>2</sup> B63B 21/22

U.S. Cl. 114—297

10 Claims



1. An anchor caddy device for mounting on a boat anchor line between the boat and the anchor, said device comprising:  
a float having an upper and a lower portion, the upper portion normally riding out of the water when the float is disposed therein;  
a housing mounted adjacent the lower portion of said float, said housing defining a passage therethrough for an anchor line;  
releasable dogging means mounted in the passage through said housing for normally engaging an anchor line when the line extends therethrough to permit one way movement of the line, only, responsive to a force exerted thereon in the direction of the boat;  
latch means mounted on the upper portion of said float and coupled to said dogging means for selectively releasing said means so that when an anchor line extends through the passage, two way movement of the line therethrough will be permitted;  
deflector means carried by said housing and actuated by a force exerted thereon in the direction of the boat when an anchor line extends therethrough for restricting movement of said device responsive to said force.

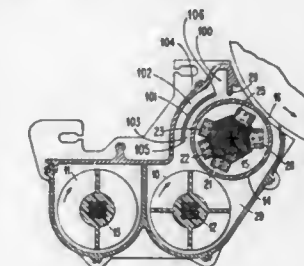
#### 4,161,923 ELECTROPHOTOGRAPHIC DEVELOPER WITH CARRIER OVERFLOW CONTROL

Jerry J. Abbott; William J. Bernardelli, both of Longmont; John A. Thompson, Boulder, and Allison H. Caudill, Lafayette, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,496  
Int. Cl.<sup>2</sup> G03G 13/09

U.S. Cl. 118—658

8 Claims



1. A magnetic-brush developer for use in an electrophotographic machine wherein a developer material comprising a



toner-coated magnetic carrier is supplied to a rotating magnetic-brush roll at a pickup zone to be transported by said roll to an elevated development zone, said developer comprising:

- a housing means for enclosing said roll and holding said developer material, said housing means being open at said development zone;
- said magnetic-brush roll comprising a rotating hollow roll with magnetic means disposed within said roll for creating a magnetic field in the path of the periphery of said roll;
- means to bring said developer material into contact with the roll surface at said pickup zone whereat the carrier is magnetically attracted to the roll surface and moved therewith;
- a doctoring blade located adjacent to the development zone opening in said housing means; and
- an overflow plate means mounted between said roll and the inner surface of said housing means and extending from an end adjacent to said pickup zone to an end spaced substantially apart from said doctoring blade to provide a first path between said overflow plate means and said roll through which said carrier is transported toward said doctoring blade and a second path between said overflow plate means and said inner surface of the housing means through which said carrier can fall back into said pickup zone when said carrier is accumulated in excess amounts behind said doctoring blade.

#### 4,161,924 SHELTER

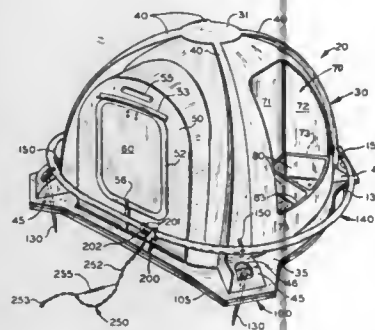
Scott D. Welker, 1359 Winnetta, Toledo, Ohio 43614

Filed May 9, 1977, Ser. No. 795,107

Int. Cl.<sup>2</sup> A01K 1/02

U.S. Cl. 119—19

45 Claims



1. A shelter comprising:

- (A) a housing having an opening for a door and an outside feeding stall, and
- (B) an endless track surrounding and near the base of said housing and outside said feeding stall,
- (C) a glide on said track, and
- (D) a tether attached to said glide.

15. A shelter for animals comprising:

- (A) a base having floor with a downwardly offset peripheral flange,
- (A) a cover for said base having a downwardly offset peripheral flange seating in said base peripheral flange, and an animal opening in said side of said cover,
- (C) a continuous rail track completely around the lower edge of said cover above said flanges,
- (D) a glide on and movable along said track,
- (E) a tether having one end attached to said glide, and
- (F) a plurality of spaced pin means penetrating said flanges for anchoring said cover and said base to their supporting surface.

#### 4,161,925 ELECTRONIC CONTROLS FOR AUTOMATICALLY OPERATING A CATTLE DIPPING VAT

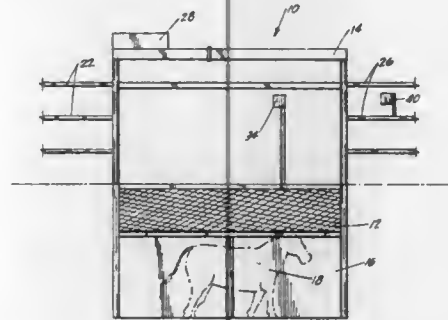
Donald W. Whitson, Scott City, Kans., assignor to All Phase Electronics, Inc., Scott City, Kans.

Filed Dec. 9, 1977, Ser. No. 859,233

Int. Cl.<sup>2</sup> A01K 13/00; A61D 11/00

U.S. Cl. 119—158

7 Claims



1. An electrical control device for automatically operating a cattle dipping vat, the vat having a tank containing sufficient dipping fluid to allow an animal to be immersed therein, a cage for receiving the animal therein and suspending the animal above the tank, the vat having a cage frame with a front door and a back door, the vat having hydraulic cylinders for lowering and raising the cage in the tank and opening and closing the front and back door, the device comprising:

- a first sensing means for determining the presence of an animal in the cage;
- a first hydraulic switch means connected to said first sensing means and the hydraulic cylinder, said first hydraulic switch means turned on when the animal is in the cage and closing the back door;
- a second sensing means for determining when the back door is closed connected to said first hydraulic switch means and turning off said first hydraulic switch means;
- a second hydraulic switch means connected to said second sensing means and the hydraulic cylinder, said second hydraulic switch means turned on for lowering the cage into the tank after the back door has been closed;
- a third sensing means for determining when the cage is at the bottom of its travel in the tank connected to said second hydraulic switch means and turning off said second hydraulic switch means;
- a third hydraulic switch means connected to said third sensing means and the hydraulic cylinder, said third hydraulic switch means turned on for raising the cage from the tank when the cage has reached the bottom of its travel;
- a fourth sensing means for determining when the cage is at the top of its travel when raised from the tank connected to said third hydraulic switch and turning off said third hydraulic switch means;
- a fourth hydraulic switch means connected to said fourth sensing means and the hydraulic cylinder, said fourth hydraulic switch means turned on for opening the front cage door when the cage is at the top of its travel;
- a fifth sensing means for determining when the front cage door is open connected to said fourth hydraulic means the turning off said fourth hydraulic switch means;
- a sixth sensing means connected to said first sensing means to determine when the animal has exited the cage and the cage is empty;
- a fifth hydraulic switch means connected to said sixth sensing means and to the hydraulic cylinder, said fifth hydraulic switch means turned on for closing the front cage door when the animal has exited the cage;
- a seventh sensing means for determining when the front cage door is closed, connected to said fifth hydraulic

switch means and turning off said fifth hydraulic switch means;

a sixth hydraulic switch means connected to said seventh sensing means and to the hydraulic cylinder activator, said sixth hydraulic switch means turned on for opening the back cage door when the front cage door is closed; and

an eighth sensing means for determining when the back cage door is open and connected to said sixth hydraulic switch means and turning off said sixth hydraulic switch means.

#### 4,161,926 ENGINE PARAMETER MODULATION

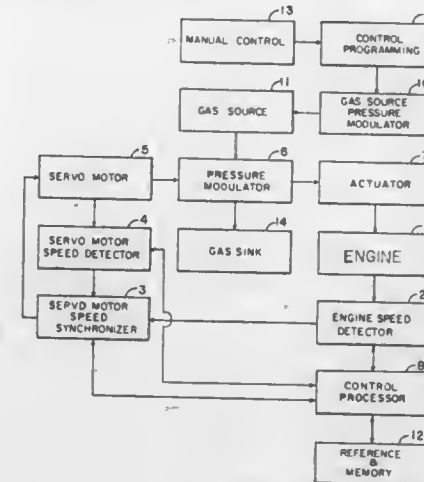
Uriel Vogel, P.O. Box 408, Huntington, N.Y. 11743

Filed Apr. 6, 1977, Ser. No. 785,103

Int. Cl.<sup>2</sup> F02B 33/00; F02M 7/12

U.S. Cl. 123—32 EA

14 Claims



1. Method for creating an engine parameter control signal to obtain an optimum operating point of said engine, comprising: creating a supply of pressurized gas flow, directing said gas flow to and through a chamber, modulating the gas flow through the chamber at a certain speed by means whereby pressure of said gas in said chamber is correspondingly modulated, leading said modulated gas pressure to a means responsive to gas pressure whereby an engine parameter is modified, measuring modulation of an output of said engine due to modulation of said parameter whereby the measured modulation of said output is a measure of deviation of an operating point of said engine from an optimum operation point, generating a control signal from said measure of deviation from said optimum operating point, controlling said supply of pressurized gas flow to said chamber according to said control signal, whereby the pressure of said supply is changed, detecting the speed of said engine and synchronizing the speed of said modulation of gas flow with said engine speed whereby any point of said modulation corresponds to a fixed phase of rotation of the engine regardless of speed of said engine, and isolating the modulation means from vibration and noise of said engine, whereby the operating point of said engine is shifted towards said optimum operating point.

#### 4,161,927 FUEL INJECTION FOR DIVIDED AUXILIARY CHAMBER OF ENGINE

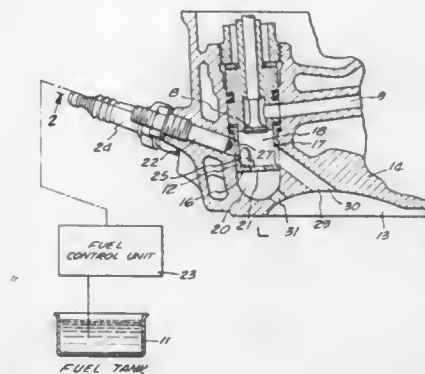
Shizuo Yagi, Asaka; Isao Fujii, Hasuda, and Hiroshi Kogure, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,513

Int. Cl.<sup>2</sup> F02B 19/18, 75/02

U.S. Cl. 123—75 B

4 Claims



1. In an internal combustion piston engine having a main combustion chamber, the combination of: means forming an auxiliary combustion chamber, means dividing said auxiliary combustion chamber into a primary cavity and a secondary cavity, an opening connecting said primary and secondary cavities, spark ignition means communicating with said primary cavity, means for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including a fresh air intake passage and an auxiliary intake valve for supplying fresh air to said primary cavity and into said secondary cavity, means including a fuel injector for supplying fuel during the intake stroke to mix with the fresh air to form relatively rich air-fuel mixtures in both of said cavities, a relatively long primary torch passage extending from said primary cavity to said main combustion chamber and having an outlet end positioned near the center of said main combustion chamber, and a relatively short secondary torch passage extending from said secondary cavity to said main combustion chamber and having an outlet end positioned adjacent a peripheral zone of said main combustion chamber.

#### 4,161,928

##### THROTTLE BODY ASSEMBLY

Kenneth W. Teague, Dayton, Ohio, and Kenneth A. Graham, Beverly Hills, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 719,021, Aug. 30, 1976. This application Jul. 17, 1978, Ser. No. 925,572

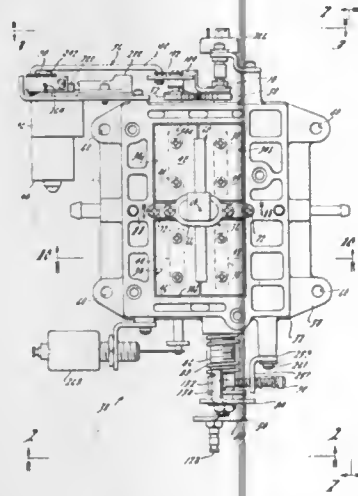
Int. Cl.<sup>2</sup> F02D 11/10

U.S. Cl. 123—102

3 Claims

1. In a throttle body assembly comprising a throttle body defining an induction passage, throttle shaft structure rotatably mounted on said throttle body, throttle blade structure disposed in said induction passage and operable by selective rotation of said throttle shaft structure to selectively throttle said induction passage, actuating means for rotating said throttle shaft structure and operating said throttle blade structure from a preset basic idle position over a range of positions, said actuating means including a first element affixed to said throttle shaft structure, a second element, and a lost motion connection coupling said first and said second elements which permits rotation of said throttle shaft structure within a limited initial increment of said range without imparting motion to said second element, means for both establishing the preset basic idle position and sensing when said second element is in a position which will allow said throttle blade structure to oc-

copy the preset basic idle position comprising an adjustment element disposed on said throttle body for abutment by said second element, means biasing said second element toward abutment with said adjustment element, said actuating means further including means for moving said second element against the bias of said biasing means to selectively rotate said throttle shaft structure and operate said throttle blade structure over said range, an electrically actuated prime mover, a rotary



output shaft driven by said prime mover, a crank arm affixed to said output shaft, means operatively coupling said throttle shaft structure and said crank arm for causing said throttle shaft structure to rotate when said output shaft is driven by said prime mover, and an electric circuit for operating said prime mover including a circuit connection which senses when said second element is in abutment with said adjustment element to permit operation of said prime mover only when such abutment occurs.

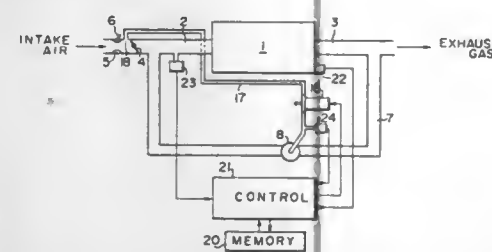
#### 4,161,929 EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Mishima; Kiyoshi Kobashi, Susono, and Jiro Nakano, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 1, 1977, Ser. No. 847,434  
Claims priority, application Japan, Aug. 30, 1977, 52-103953  
Int. Cl.<sup>2</sup> F02M 25/06

U.S. Cl. 123—119 A

9 Claims



1. An exhaust gas recirculation control system for an internal combustion engine, comprising a passage for conducting exhaust gases to be recirculated, a diaphragm type exhaust gas recirculation control valve having a diaphragm chamber and controlling said passage in accordance with the fluid pressure supplied to said diaphragm chamber, a pressure control valve for controlling said fluid pressure, a pressure sensor for detecting said fluid pressure, a memory means for retaining target values for said fluid pressure which provide the optimum exhaust gas recirculation in various operating conditions of the engine, said operating conditions of the engine being expressed

by the combination of two quantities selected from the rotational speed, amount of intake air, and intake manifold vacuum of the engine, means for detecting current values of said two selected quantities, and a control means which reads out a particular target value for said fluid pressure from said memory means in accordance with the current values of said two selected quantities, compares the read-out target value with the value of said fluid pressure detected by said pressure sensor, and controls said pressure control valve so as to accord said fluid pressure to the read-out target value.

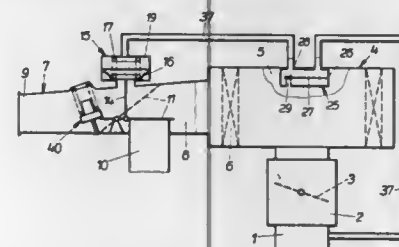
#### 4,161,930 DEVICE FOR REGULATING THE INTAKE AIR TEMPERATURE OF A CARBURETOR-EQUIPPED INTERNAL COMBUSTION ENGINE

Lothar Bendig, Ludwigsburg, and Rolf Flusser, Freiberg am Neckar, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,765  
Int. Cl.<sup>2</sup> F02M 31/00

U.S. Cl. 123—122 D

7 Claims



1. A device for regulating the intake air temperature of an internal combustion engine which is equipped with a carburetor in its air intake system, an air filter upstream of the carburetor, and, leading to the air filter, a cold air intake duct for raw air of ambient temperature, a warm air intake duct for preheated raw air coming from an exhaust stove or the like, and a duct junction through which the two intake ducts open into a raw air mixing duct which connects them to the air filter, the duct junction having associated therewith an air flow proportioning valve which, in a first end position, opens the cold air duct while closing the warm air duct and, in a second end position, closes the cold air duct, while opening the warm air duct, the air temperature regulating device comprising in combination:

- a pneumatic actuator operatively connected to the air flow proportioning valve in such a way that negative air pressure supplied to the actuator will move the valve in the direction towards said second end position, in opposition to a return spring biasing the valve towards said first end position;
- a vacuum line supplying negative air pressure to the pneumatic actuator from a point downstream of the carburetor;
- a temperature-controlled pressure relief valve arranged in the vacuum line, at a point at which a temperature-responsive element of the relief valve is exposed to the proportioned flow of raw air which moves from the duct junction to the carburetor, the relief valve being so adjusted that an increase in the temperature of the proportioned flow of raw air progressively increases the opening of a relief port in the vacuum line, thereby correspondingly reducing the negative pressure which is being supplied to the pneumatic actuator, with the result that the return spring will shift the air flow proportioning valve more towards said first end position;
- a position-adjustable stop cooperating with the air flow proportioning valve so as to block the return-spring-induced valve movement in the direction towards the first

end position, at varying distances from said end position; and  
temperature-responsive stop positioning means, including a temperature-responsive element which is exposed to raw air of ambient temperature.

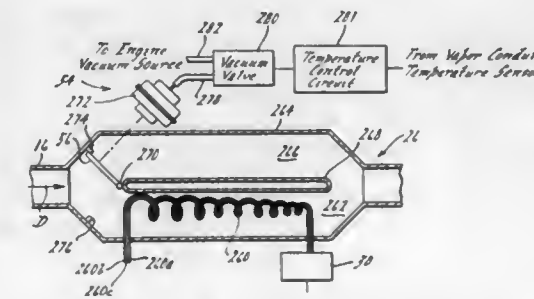
#### 4,161,931 VAPOR TEMPERATURE CONTROLLED EXHAUST GAS HEAT EXCHANGER

Dante S. Giardin, Dearborn Heights, and Douglas R. Hamburg, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 699,004, Jun. 21, 1976, Pat. No. 4,099,499.  
This application Mar. 7, 1978, Ser. No. 884,331

Int. Cl.<sup>2</sup> F02M 31/00  
U.S. Cl. 123—122 E

3 Claims



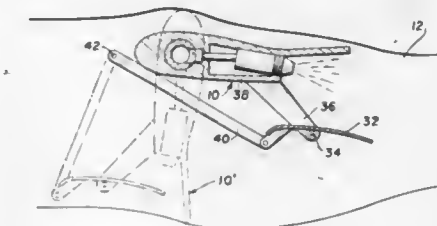
1. An exhaust gas heat exchanger for inclusion in the exhaust gas conduit system of an automotive internal combustion engine, comprising in combination:

- housing means having an exhaust gas inlet port and an exhaust gas outlet port;
- baffle means received within said housing means operative to partition the interior of said housing means into at least two chambers, said chambers being arranged for parallel exhaust flow communication between said inlet port and said outlet port;
- heat exchanger coil means received within one of said chambers and arranged for conveyance of a fluid;
- diverter valve means within said housing in proximity to said inlet port and operable to direct exhaust gas passing through said inlet port to flow to said outlet port substantially through a selected one of said chambers;
- valve control means for controlling the position of said diverter valve means;
- said heat exchanger coil means being arranged for conveyance of a fluid fuel which is a liquid under standard temperature and pressure conditions and which may be vaporized by heating and said valve control means including temperature responsive means arranged to be responsive to the fluid fuel temperature at a selected fluid fuel location for controlling the application of exhaust gas heat to said coil means, said selected liquid fuel location is downstream, in the fluid conveyance direction, from the heat exchanger coil means; and
- said valve control means further include vacuum motor means communicable to a vacuum source and communicating with said temperature responsive means operative to provide diverter valve means positioning.

4,161,932  
FUEL INJECTION SYSTEM  
Siegfried Holzbaur, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 562,859, Mar. 27, 1975, Pat. No. 4,079,718. This application Mar. 17, 1978, Ser. No. 888,084  
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1974, 2415182

Int. Cl.<sup>2</sup> F02M 39/00; F16K 15/03  
U.S. Cl. 123—139 AW

12 Claims



1. In combination, the assembly including: air measuring valve means; biasing means; and an air suction tube of an internal combustion engine, the suction tube defining an air flow cross section and the air measuring valve means providing a controlled flow of air through the flow cross section, the improvement wherein:

the air measuring valve means is mounted eccentrically within the air suction tube for pivotal displacement by the air flow drawn into the suction tube by the engine against the force exerted on the air measuring valve means by the biasing means, said air measuring valve means including a main valve and an auxiliary valve with the outer surface of both valves being shaped to produce a lift force, said auxiliary valve being disposed adjacent to and preferably in the flow direction in front of the main valve; and the main valve and the suction tube have their cooperating surfaces relatively dimensioned so that the flow cross section in the region of the air measuring valve is closed by the main valve under the force of the biasing means during periods when the air flow ceases, is gradually opened at one end of the main valve by an impedance induced force as a function of the pressure difference prevailing on both sides of the air measuring valve, and is further opened at the other end of the main valve as the air flow increases through the opening at said one end, and an air flow is established around the auxiliary valve.

#### 4,161,933 MIXTURE CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Gerhard Stumpp, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Jul. 18, 1977, Ser. No. 816,844

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639768

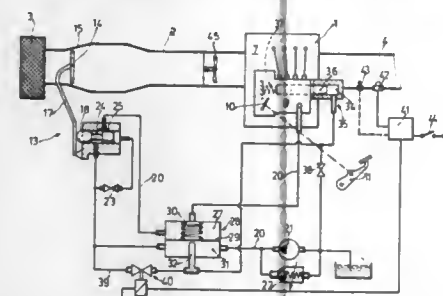
Int. Cl.<sup>2</sup> F02M 39/00  
U.S. Cl. 123—139 AW

21 Claims

1. An apparatus for regulating the fuel-air ratio of the combustible mixture for an internal combustion engine, said apparatus including: a main fuel metering system actuated by a control rod for providing metered amounts of fuel to the injection valves of the engine; an airflow metering device; a fuel flow valve having an adjustable flow cross section and serving to control the flow of fuel to said main fuel metering system; and a comparator for performing a comparison of the flow of fuel through said flow valve with the flow of fuel into said main fuel metering system, and wherein the improvement comprises: adjuster means; an arbitrarily settable control lever; a restoring spring for the control rod; and a relief line containing a throttle, wherein:



- (i) said fuel flow valve is actuated by said airflow metering device;
- (ii) said control rod is coupled to said arbitrarily settable control lever;
- (iii) said comparator is a differential pressure valve connected in parallel with said fuel flow valve, said differential pressure valve having two chambers, one of which is a pressure controlled chamber, with the pressure con-



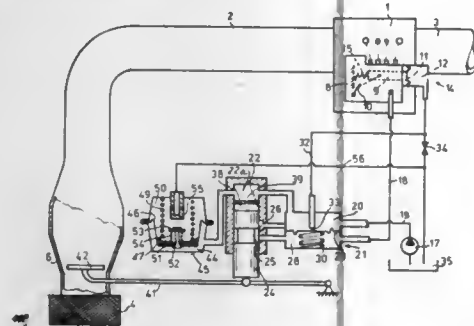
trolled chamber being connected through the relief line containing the throttle to the adjuster means; and

(iv) said adjuster means includes a final control element coupled to the control rod, whereby the control rod may be displaced in opposition to said restoring spring, said adjuster means being actuated by said differential pressure valve for causing a corrective displacement of the control rod in response to the results of the comparison performed by said differential pressure valve.

**4,161,934**  
**APPARATUS TO CONTROL THE COMPOSITION OF THE OPERATING MIXTURE OF AN INTERNAL COMBUSTION ENGINE**

Gerhard Stumpp, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Sep. 12, 1977, Ser. No. 832,704  
 Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641398

Int. Cl.<sup>2</sup> F02M 39/00  
 U.S. Cl. 123—139 AW 13 Claims



1. In a control apparatus for controlling the composition of the operating mixture of an internal combustion engine, and including: air metering means for metering the air quantity aspirated into the engine; fuel supply means; a fuel apportioning device including throttle means connected to and actuated by the air metering means; a fuel supply line leading from the fuel supply means to the fuel apportioning device, said fuel supply means supplying fuel through the fuel supply line to the fuel apportioning device at an essentially constant pressure; a differential pressure control valve connected to the fuel supply line between the fuel supply means and the fuel apportioning device, said differential pressure control valve having a controlled pressure chamber situated upstream of said throttle means and an uncontrolled pressure chamber situated downstream of said throttle means; a fuel injection pump; position-

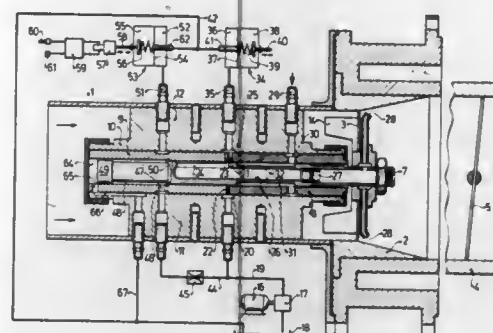
ing means for adjustment of the air fuel ratio of the operating mixture said positioning means having a working chamber; and a relief line containing throttle means, said relief line being connected to the controlled pressure chamber and to the working chamber upstream of its throttle means, the improvement comprising:

- (a) means defining a storage chamber having a displaceable wall, said fuel supply line being connected upstream of the throttle means of the fuel apportioning means to the storage chamber;
- (b) force applying means being connected to said displaceable wall, said displaceable wall being displaceable in opposition to an essentially constant force produced by the force applying means to a terminal position; and
- (c) a pressure control valve connected to the fuel supply line upstream of the throttle means of the fuel apportioning means.

**4,161,935**  
**FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE**

Konrad Eckert; Siegfried Holzbaur, both of Stuttgart; Wolf Wessel, Oberriexingen, and Hermann Grieshaber, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Sep. 23, 1977, Ser. No. 836,104  
 Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645215

Int. Cl.<sup>2</sup> F02M 9/08  
 U.S. Cl. 123—139 AW 19 Claims

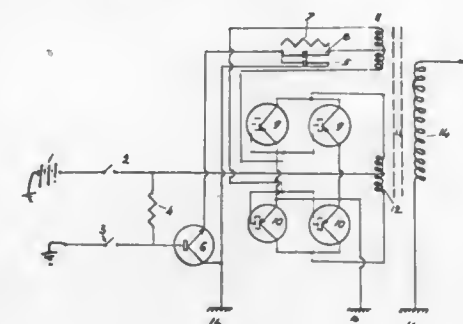


1. In a fuel injection system for an internal combustion engine, said system including an air flow rate measuring member located in the induction tube of said engine, and seriatim thereto an arbitrarily settable throttle valve, said air flow rate measuring member being disposed for axial displacement with respect to said induction tube under the influence of said air flow, and there being provided means to exert a restoring force on said member in opposition to said air flow, and wherein said system further includes fuel metering means including a movable valve member, said movable valve member being moved by said displacements of said air flow rate measuring member, the improvement comprising:

said air flow rate measuring member is a baffle plate disposed on a shaft, and said fuel metering means is provided by features of said shaft and further comprising a rotating member disposed to rotate about the axis of said shaft, and means responsive to the air flow for rotating the shaft about its axis, and yet further comprising conduit means for delivering metered fuel from said fuel metering means to the vicinity of the periphery of said baffle plate where the air flow velocity is near maximum.

**4,161,936**  
**AUDIO FREQUENCY IONIZATION IGNITION SYSTEM**  
 Bill V. Volsky, 430-11th Ave., SE., Calgary, Alberta, Canada  
 Continuation-in-part of Ser. No. 424,235, Jan. 24, 1974, abandoned. This application Apr. 19, 1977, Ser. No. 788,829  
 Int. Cl.<sup>2</sup> F02P 1/00

U.S. Cl. 123—148 E 3 Claims

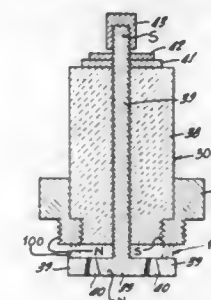


1. An ignition device for ignition systems of automobiles and the like which includes a source of low voltage D.C. electrical energy and a mechanically operated contact breaker assembly; comprising in combination a solid state high voltage generator, a sinusoidal wave push/pull oscillator circuit operatively connected to said generator and to said source of electrical energy, and a switching circuit operatively connected to said oscillator circuit for controlling the energization of said oscillator circuit, said generator including a high frequency secondary coil operatively connected to the associated ignition system, a triggering primary coil and a power primary coil, said power coil being operatively connected to said oscillator circuit and to the associated source of electrical energy, said switching circuit including said triggering primary coil and a single switching transistor operatively connected between said triggering primary coil, said source of electrical energy and said associated contact breaker assembly whereby the opening and closing of said contact breaker assembly activates said switching circuit and hence synchronizes the output of said power generator with the ignition system, said switching circuit including means to absorb surge energy in said oscillator circuit, said means including a resistor and capacitor in parallel with one another, one side of said resistor and capacitor being connected centrally to said triggering coil, the other side of said resistor and capacitor being connected to the emitter of said switching transistor, and a further capacitor being connected between said other side of said first mentioned resistor and capacitor and the collector of said switching transistor.

**4,161,937**  
**IGNITER WITH MAGNETIC ACTIVATION**  
 Martin E. Gerry, 13452 Winthrop St., Santa Ana, Calif. 92705  
 Continuation-in-part of Ser. No. 707,208, Jul. 21, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,547  
 Int. Cl.<sup>2</sup> F02P 1/00

U.S. Cl. 123—169 EL 5 Claims  
 1. An igniter having an electrical insulator, comprising the combination of:

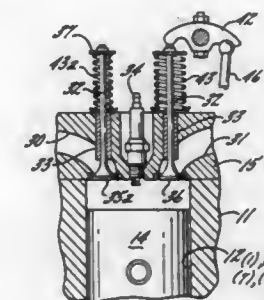
a magnetized base retaining said insulator, one end of said base being the firing end of said igniter; and



a magnetized elongated electrode having a lateral protrusion integral therewith at said firing end, said electrode being retained by the insulator.

**4,161,938**  
**INTERNAL COMBUSTION ENGINE WITH IMPROVED INTAKE VALVE CONTROL SYSTEM**  
 Charles L. King, 703 Rozanne Dr., Addison, Ill. 60101  
 Filed May 18, 1978, Ser. No. 907,002  
 Int. Cl.<sup>2</sup> F02D 13/06

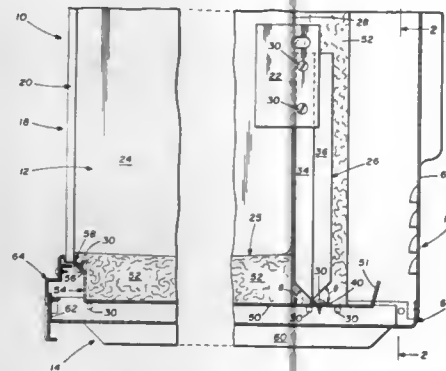
U.S. Cl. 123—198 F 6 Claims



1. An internal combustion engine for automobiles and the like comprising:  
 a cylinder block formed with a plurality of cylinders,  
 a piston mounted within each cylinder for reciprocating movement in a four stroke operating cycle comprising an intake stroke, a compression stroke, a power stroke and an exhaust stroke,  
 a crankshaft rotatably driven by reciprocating movement of said pistons,  
 an intake port communicating with each said cylinder, means for directing fuel into each said cylinder,  
 an intake valve for each intake port mounted for movement between an open position permitting gas flow into the respective cylinder and a closed position blocking gas flow into the cylinder,  
 an exhaust port leading from each said cylinder,  
 an exhaust valve for each exhaust port mounted for reciprocating movement between a position closing the outlet port from the respective cylinder and a position opening the outlet port,  
 cam means for opening and closing the intake valves for some of said cylinders during each cycle of operation in predetermined timed relation to said crankshaft rotation, spring means for controlling the opening and closing of the intake valves of the other cylinders, said spring means including a biasing spring for urging the intake valve of each said other cylinder to a normally closed position while permitting progressively greater opening of the respective intake valve on intake strokes during relatively high speed operation than during lower speed operation of the engine,

electrical means for igniting the fuel introduced into said cylinders in timed firing sequence, and means for opening and closing said exhaust valves in timed relation to said crankshaft rotation to permit exhaust of gases from said cylinders through said exhaust ports.

**4,161,939**  
**OVEN LINER SUSPENSION ASSEMBLY**  
 Richard M. Scherer, Oxford, Miss., assignor to Chambers Corporation, Oxford, Miss.  
 Filed Mar. 6, 1978, Ser. No. 883,748  
 Int. Cl.<sup>2</sup> F24C 15/16  
 U.S. Cl. 126—19 R 13 Claims

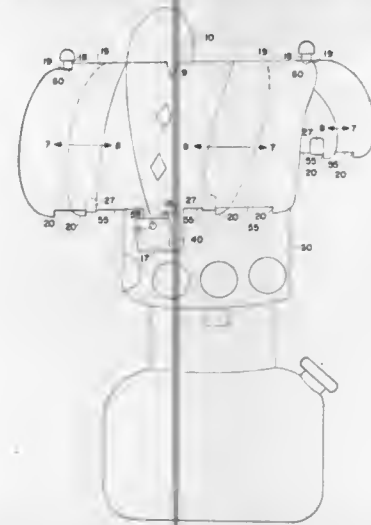


1. An oven liner suspension assembly for rigidly supporting an oven liner within the cabinet structure of an oven while allowing for expansion and contraction of the oven liner during operation, the oven liner being a box-like structure with an open front wall and having a top wall, rear wall, bottom wall and two side walls comprising:
  - at least one elongated anchor leg rigidly secured to the rear wall of the oven liner, said anchor leg extending a predetermined distance beyond the bottom wall of the oven liner;
  - a base plate member extending beneath the bottom wall of said oven liner and extending to an upwardly projecting edge;
  - said anchor leg extending to a flange member, said flange member being rigidly attached to said base plate member such that said anchor leg may bend with respect to said base plate member during expansion and contraction of the oven liner; and
  - a lip extending peripherally from the front of the oven liner, said lip being rigidly attached to said upwardly projecting edge such that the front of the oven liner is rigidly suspended upon said base plate member such that the oven liner may expand and contract during operation of the oven.

**4,161,940**  
**TELESCOPIC HEAT CONTROL DEFLECTOR**  
 Frances E. Reed, 11 N. Shore Trail, Sparta, N.J. 07871  
 Filed Mar. 3, 1977, Ser. No. 753,355  
 Int. Cl.<sup>2</sup> F24C 1/16  
 U.S. Cl. 126—59 10 Claims

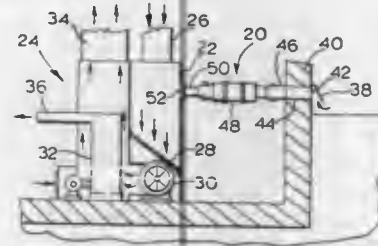
1. A heater heat-deflector comprising in combination: a sheet element having heater unit-mounting means located at each of two of first opposite side-edges thereof, the heater unit-mounting means being adapted for mounting one of the first opposite side edges onto one side portion of a heater unit, and for mounting a remaining one of the first opposite side edges on an opposite side of the heater unit, such that the sheet element extends above and a predetermined distance above the heater unit sufficiently to deflect rising heat; said sheet element having ventilation through-space extending upwardly through the sheet element at at least one point located substantially in alignment between said one and said remaining one of said first

opposite side edges at a point adapted to be over the heater unit and at least one telescopic deflector flange-sheet mounted



on and extendable from and retractable to at least one of said other second opposite edges, and being telescopic in to and fro directions.

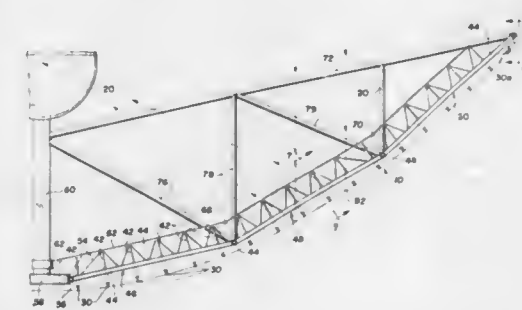
**4,161,941**  
**AIR INLET APPARATUS**  
 Samuel D. Bloxham, Scarborough, Canada, assignor to Donald B. Moffatt, Hamilton, Canada  
 Filed Oct. 27, 1977, Ser. No. 845,981  
 Int. Cl.<sup>2</sup> F24C 3/00  
 U.S. Cl. 126—85 B 8 Claims



8. In an oil or gas fired furnace system used in a building such as at home, and including a furnace, hot air ducts leading hot air from the furnace to parts of the building, a cold air return from said parts of the building back to the furnace and a furnace burner and flue system, the improvement in which a device is provided to permit the furnace to inspire colder air from outside the building into the cold air return for heating by the furnace, said device comprising:
  - a cylindrical inlet portion operatively coupled to the outside of the building for receiving said colder air from outside the building and having an upstream end towards the outside of the building and a downstream end;
  - means defining a chamber attached to the downstream end of the inlet portion and having an internal cross-section larger than that of the inlet portion;
  - a frusto-conical section coupled to the chamber remote from the inlet portion for carrying air from the chamber towards the furnace and converging towards the furnace;
  - a valve assembly comprising means defining a valve seat at the junction of the inlet portion on the chamber means, a conical element contained in the chamber and defining a conical surface engageable with the valve seat to restrict air flow, and carrier means coupled to the chamber and to the conical element to locate the element relative to the

valve seat and to permit adjustment of the element towards and away from the valve seat to thereby adjust air flow;  
 a baffle plate fixedly positioned at the junction of the chamber and the frusto-conical section to inhibit sudden flow changes caused by pressure fluctuations; and  
 means coupling the frusto-conical section to the furnace cold air return to complete the colder air path to the furnace.

**4,161,942**  
**SOLAR ENERGY COLLECTOR**  
 Robert J. Monk, 4640 Country Creek, Apt. 1255, Dallas, Tex. 75236  
 Filed Dec. 27, 1977, Ser. No. 864,617  
 Int. Cl.<sup>2</sup> F24J 3/02  
 U.S. Cl. 126—271 11 Claims

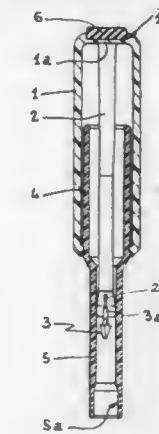


1. A solar energy collection device for heating a heat transfer media comprising: a plurality of concentrically arranged rings, said rings forming a circular paraboloid shaped frame; support means rotatably supporting said circular paraboloid frame; means adjustably supporting said rings to said support means; a plurality of strips of reflective film, said strips being positioned across said rings from the outer ring of said circular paraboloid frame to the opposite side of said ring through the center of the frame, said reflective film further arranged to form a mirror surface to reflect sun's incoming light rays to a focal point; means to adjust the tension of said reflective film strips; and a solar collector secured at the focal point of said mirror and adapted to transfer heat to a media flowing there-through.

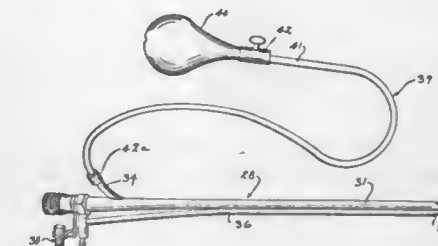
**4,161,943**  
**NEEDLE IMPLANTING APPARATUS**  
 Paul Nogier, 108 rue du Dr. Edouard Locard, Lyon, France (69005)  
 Filed May 10, 1977, Ser. No. 795,470  
 Claims priority, application France, May 19, 1976, 76 15861  
 Int. Cl.<sup>2</sup> A61B 17/52  
 U.S. Cl. 128—1.3 6 Claims

1. In an apparatus to introduce intra-dermal needles in the tissues, said apparatus including a body, supporting means carried by said body to support a needle made of a magnetizable material, and means to push said needle beyond said body to implant same into the tissues, the improvement in said appa-

ratus comprising a permanent magnet fixed to said apparatus on an exposed surface thereof by means of which the implanted



**4,161,944**  
**LASER SYSTEM AND METHOD AND LASER AMPLIFIER FOR USE THEREWITH**  
 Myron C. Muckerheide, 5510 Pine Park St., Schofield, Wis. 54476  
 Division of Ser. No. 724,119, Sep. 17, 1976, Pat. No. 4,120,293.  
 This application Aug. 22, 1978, Ser. No. 935,792  
 Int. Cl.<sup>2</sup> A61B 5/08  
 U.S. Cl. 128—654 6 Claims



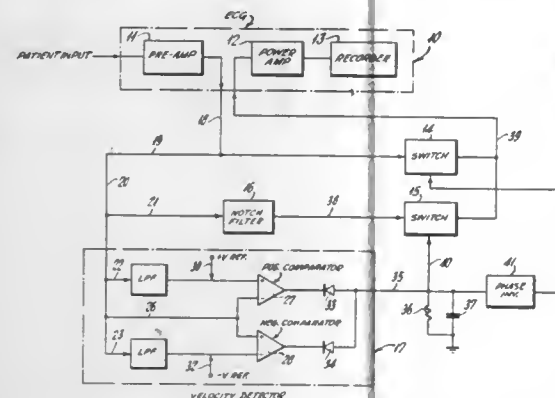
3. A system selectively conducting a laser beam to vaporize absorbing material located at an internal area of a living mammal, comprising means selectively supplying a laser beam having a predetermined wavelength, a laser amplifier adjacent to said supply means and having an input receiving said supply laser beam and an output supplying an amplified laser beam, means including an inlet mounted adjacent to said amplifier output and extending into said internal area of said living mammal for providing an outlet located adjacent said absorbing material for permitting passage of said amplified laser beam to said absorbing material, means injecting particles capable of emitting X-rays when energized by a photon onto said absorbing material, and means sensing the vaporization of said absorbing material and said particles in response to said amplified beam for diagnosis of a condition of said internal area.

**4,161,945**  
**SELECTIVE INTERFERENCE FILTER**  
 Hyman Grossman, Elmwood Park, N.J., assignor to Cambridge Instrument Company, Inc., Ossining, N.Y.  
 Filed Oct. 25, 1977, Ser. No. 844,896  
 Int. Cl.<sup>2</sup> A61B 5/04  
 U.S. Cl. 128—696 6 Claims

1. Filtering apparatus for electrical signals produced by biophysical recording apparatus such as an ECG comprising a notch filter having an input and output, means for feeding said signals to the input of said notch filter, a velocity detector

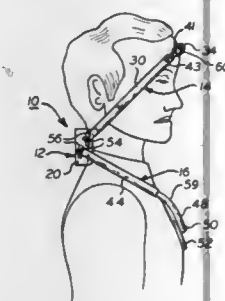


having an input connected to said notch filter and including means for producing control signals in response to the presence and absence of a rapid rate of change of first said electrical signal, switch means interconnected between the input and output of said notch filter and with said velocity detector



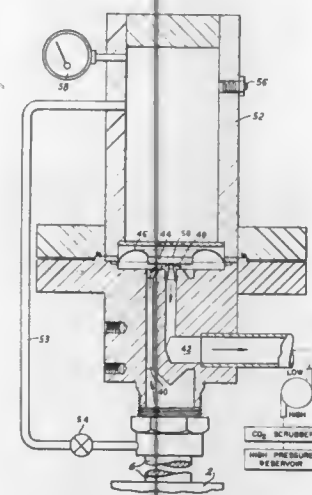
whereby one of said control signals will actuate said switch means to selectively feed said electrical signals through said notch filter and the other of said control signals will actuate the switch means to bypass said filter, and means for delaying reinsertion of said notch filter after it has been bypassed.

**4,161,946**  
**SUPPORT FOR MAINTAINING HEAD IN UPRIGHT POSITION**  
Lance E. Zuesse, New York, N.Y.  
Continuation of Ser. No. 752,138, Dec. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 675,929, Apr. 12, 1976, abandoned. This application Feb. 2, 1978, Ser. No. 874,580  
Int. Cl.<sup>2</sup> A61H 1/02  
U.S. Cl. 128—75



1. A head support, comprising:  
nape-engagement means for positioning in such manner as to engage the nape of the neck of the wearer;  
forehead-engagement means for positioning around the wearer's forehead; and  
chest-engagement means for placement on the wearer's chest,  
said nape-engagement means, said forehead-engagement means and said chest-engagement means being so interconnected that said nape-engagement means acts as a force-transmitting fulcrum through which the forward and downward pressure of the wearer's head applied to said forehead-engagement means is passed on to said chest-engagement means.

**4,161,947**  
**DIVERS EXHAUST VALVE**  
Alexander G. Copson, 52 High St., Yaddethorpe, Scunthorpe, Lincolnshire, England  
Filed Feb. 14, 1977, Ser. No. 768,459  
Claims priority, application United Kingdom, Feb. 16, 1976, 6042/76; Feb. 26, 1976, 7671/76; May 13, 1976, 19787/76  
Int. Cl.<sup>2</sup> B63C 11/18  
U.S. Cl. 128—142.3



1. A normally closed exhaust valve for divers' breathing apparatus comprising:  
a valve body;  
a chamber defined at least in part by said valve body;  
at least one inlet duct in said valve body including means for receiving gas to be exhausted from said diver's breathing apparatus, each said inlet duct being in communication at one end thereof with said chamber;  
at least one exhaust duct in said valve body for selectively receiving gas from said inlet ducts and for exhausting the gas, each said exhaust duct terminating at one end thereof in an orifice opening into said chamber;  
at least one diaphragm forming a wall portion of said chamber and each carrying a valve member thereon positioned adjacent each said exhaust duct orifice, each said valve member being normally urged into seating position relative to each said exhaust duct orifice to thereby prevent communication between the inlet and exhaust ducts, said diaphragm being exposed on the side thereof remote from its associated chamber solely to ambient external pressure and on the other side thereof solely to the combined pressure in said chamber and said exhaust duct;  
pressure control means connected to said exhaust duct for maintaining a predetermined pressure therein;  
a compressor having a low pressure inlet and a high pressure outlet;  
a high pressure gas reservoir;  
conduit means connected between said exhaust duct and an inlet of said pressure control means, between an outlet of said pressure control means and the inlet of said compressor and between the outlet of said compressor and said reservoir;  
and a carbon dioxide scrubber unit connected between said pressure control means and said reservoir;  
whereby each said valve member is movable in accordance with changes in the pressure acting on the opposed sides of said diaphragm between a first normally closed position in which its seats on the orifice at said one end of said exhaust duct to prevent communication between the inlet and exhaust ducts and a second open position in which the valve member is unseated from the said orifice and is spaced from same to permit communication between said

inlet and exhaust ducts for exhaustion of gas from the valve.

**4,161,948**  
**SYNTHETIC MEMBRANE FOR WOUND-DRESSINGS**  
Daniel Bichon, Gaillard, France, assignor to Battelle Memorial Institute, Carouge, Switzerland  
Filed Jan. 16, 1978, Ser. No. 869,688  
Claims priority, application Switzerland, Jan. 18, 1977, 576/77

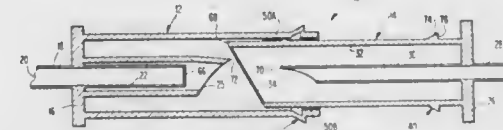
Int. Cl.<sup>2</sup> A61F 13/00

U.S. Cl. 128—156 20 Claims  
1. Synthetic membrane or skin containing poly-aminoacids usable for wound-dressings consisting of two integral layers of which at least one is resorbable by the body, the first internal layer being directly applied to the wound and the second layer constituting an external protection thereof, characterized by the fact that the second layer is formed from a porous semi-permeable membrane or film having an asymmetric structure, that is having pores of decreasing size when going from the inside layer to the outside one, which ensures the free penetration of air, water and low molecular weight substances but prevents the entrance of external pathogenic germs, and by the fact that the first layer is essentially formed of a hydrophilic, non-toxic, bio-degradable membrane or tissue consisting substantially of a pluri-cellular, spongy and fluid permeable material selected from polymers and copolymers of  $\alpha$ -aminoacids and esters thereof.

**4,161,949**  
**ASEPTIC CONNECTOR**  
Chandrakant B. Thanawalla, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.  
Filed Oct. 27, 1977, Ser. No. 846,227  
Int. Cl.<sup>2</sup> A61M 3/00

U.S. Cl. 128—247

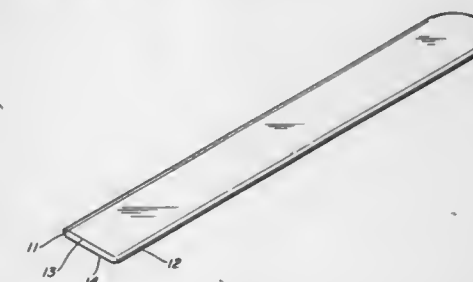
10 Claims



1. An aseptic connector for affecting aseptic juncture of two bodies, for fluid flow therebetween, through said connector, comprising:  
(a) a female element including:  
(i) a base;  
(ii) a first conduit passing through said base, a first end thereof communicating with said first body, a second end thereof extending distally from said base;  
(iii) a cylindrical sheath extending from said base a greater distance than said second end of said first conduit, concentrically spaced about said distally extending second end of said first conduit;  
(iv) an annular exterior wall extending from said base a greater distance than said sheath, concentrically spaced about said sheath, a distal end of said exterior wall defining a first orifice; and  
(v) first pellicular means for sealing said first orifice at said annular exterior wall distal end;  
(b) a male element, telescopically engageable with said female element, including:  
(i) a sole;  
(ii) a second conduit passing through said sole, a first end thereof communicating with said second body, a second end thereof extending distally from said sole, said second conduit telescopically insertable into said first conduit;  
(iii) tubular means extending from said sole a greater

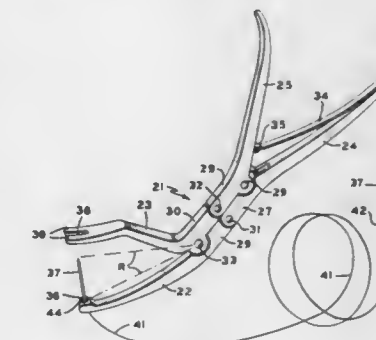
distance than said second conduit, concentrically spaced about said second conduit, having an outer diameter less than inner diameter of said annular wall, said tubular means telescopically insertable into said annular exterior wall; and  
(c) means for retaining said male and female elements in telescoping engagement, with said tubular means at least partially resident within said annular exterior wall and said second conduit at least partially resident within said first conduit.

**4,161,950**  
**ELECTROSURGICAL KNIFE**  
James D. Doss; Robert E. Cowan; Robert H. Newell, and Charles W. McCabe, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Aug. 1, 1975, Ser. No. 601,113  
Int. Cl.<sup>2</sup> A61N 3/04  
U.S. Cl. 128—303.14 7 Claims



5. A surgical implement adapted for use with a radiofrequency generator comprising:  
a blade of insulating material having a sharp cutting edge;  
a first conductive electrode secured on one side of said blade adjacent said cutting edge;  
a second conductive electrode secured on the other side of said blade adjacent said cutting edge, whereby said first and second electrodes are insulated from one another.

**4,161,951**  
**NEEDLE DRIVER**  
Dennis R. Scanlan, Jr., Boca Raton, Fla., assignor to Scanlan International, Inc., St. Paul, Minn.  
Filed Apr. 27, 1978, Ser. No. 900,719  
Int. Cl.<sup>2</sup> A61B 17/06  
U.S. Cl. 128—340 7 Claims



1. In a needle driver, to assist the surgeon in inserting sutures in tough tissue such as the sternum, for manipulation of sutures, particularly of the type having a straight needle at each end of the suture and in which the suture is fixed coaxially in the base of each needle and in which a disparity in diameters of the

needle and the suture establishes an annular foot at the base of the needle, the combination of the following elements:

- a lower jaw, being an elongate member;
- an upper jaw, being a similar elongate member, the two jaws being articulated at one end by means affording reciprocation of the free ends of the jaws;
- a cylindrical socket proximate to the free end of the lower jaw in its upper face, to receive the base of the needle and direct the needle point toward the free space within a fork at the end of the upper jaw;
- a cylindrical channel, coaxial with the socket but of lesser diameter, extending from the bottom of the socket to the lower face of the lower jaw, to accommodate the suture fixed coaxially in the base of the needle;
- an annular step at the bottom of the socket, arising from the difference in diameters of the socket and the channel, the annular step accommodating the annular foot at the base of the needle, serving as a platform, to impart thrust thereupon when the jaws are closed to drive the needle through tissue placed thereinbetween; and
- a kerf in the lower jaw, of width sufficient to accommodate the diameter of the suture but not that of the needle, the kerf extending to the common axis of the socket and channel, to permit loading of the needle into the socket by first sliding the suture sidewise into the kerf and then seating the needle into the socket by drawing the suture down through the channel.

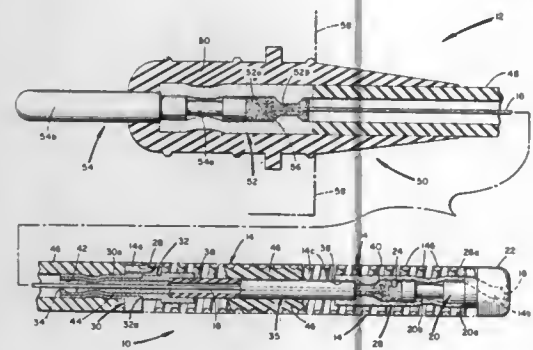
#### 4,161,952 WOUND WIRE CATHETER CARDIOVERTING ELECTRODE

Philip C. Kinney, Pittsburgh; Marlin S. Hellman, Gibsonia, and Alois A. Langer, Pittsburgh, all of Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Nov. 1, 1977, Ser. No. 847,443  
Int. Cl.<sup>2</sup> A61N 1/04

U.S. Cl. 128—786

36 Claims



1. A large surface area catheter electrode having a smooth outer surface and being of a uniform diameter throughout its discharge surface, for permanent implantation in a body and for cardioverting a malfunctioning heart, the electrode comprising:

- an electrically conductive resilient wire discharge electrode having an elongated coil wound section and proximal and distal ends said coil wound section being of a solid, single conductive material;
- an electrically conductive lead extending to said wound section of said resilient wire electrode and having proximal and distal ends, said proximal end being adapted for connection to a pulse generator;
- connector means for electrically connecting said lead to said resilient wire discharge electrode; and
- a filler material substantially filling said wound section of said resilient wire electrode so that only the outer periphery of said wound section is exposed to the body.

4,161,953

#### METHOD OF PUFFING TOBACCO TISSUE

Eugene Glock, Richmond, Va., assignor to American Brands, Inc., New York, N.Y.

Continuation of Ser. No. 744,042, Nov. 22, 1976, abandoned, which is a continuation of Ser. No. 628,912, Nov. 5, 1975, abandoned, which is a continuation of Ser. No. 40,726, May 27, 1970, abandoned. This application Jun. 6, 1978, Ser. No. 913,246  
Int. Cl.<sup>2</sup> A24B 3/18

U.S. Cl. 131—140 P

3 Claims

1. A method for puffing tobacco tissue which consists essentially of:

- (A) admixing tobacco tissue with hot water at a temperature of at least about 70° C. to the boiling point thereof, said hot water being added in an amount such that substantially all the hot water is absorbed by the tobacco tissue within a maximum period of five (5) minutes, said tobacco tissue being puffed by the absorbed hot water;
- (B) evaporatively freeze-drying the puffed tobacco tissue of step (A) under subatmospheric pressure; and
- (C) recovering tobacco tissue having a retained puffed condition free of an objectionable amount of tackiness caused by hygroscopic extractives on the surface of the tobacco tissue.

4,161,954

#### SMOKING APPARATUS

Bert F. Fornaciari, 179 Primrose, Palo Alto, Calif. 94303

Filed May 12, 1977, Ser. No. 796,177

Int. Cl.<sup>2</sup> A24F 1/14, 1/26

U.S. Cl. 131—173

13 Claims



1. In a smoking apparatus having a water container for containing water, a pipe bowl for holding burning smoking material, means for connecting said pipe bowl to the water container and means for drawing smoke from the pipe bowl through water in the water container before it is discharged from the apparatus, the improvement comprising:

- valve means located in the pipe bowl having a closed position for preventing smoking material in the pipe bowl from falling into the water container and an open position for dumping the residue and ash from smoking material burned in the pipe bowl into the water container, said valve means including an air passageway for permitting smoke to pass therethrough when said valve means is in its closed position.

4,161,955

#### COMBINATION MIRROR/HAIR DRYER

Robert Webb, 145 N. 410 W., St. George, Utah 84770

Filed Jun. 10, 1977, Ser. No. 805,531

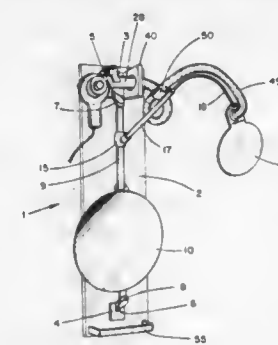
Int. Cl.<sup>2</sup> A45D 20/00

U.S. Cl. 132—9

10 Claims

1. Hair drying-mirror apparatus for use in combination with a pistol-grip portable hair dryer comprising a base, a mirror

mounted on the base, adjustment means for varying the vertical position of the mirror on the base, mounting means for



removably holding a pistol-grip portable hair dryer on the base, and adjustable direction means for adjustably directing the flow of air from the dryer to a desired location.

4,161,956

#### CLEANING ARRANGEMENTS FOR TUBES

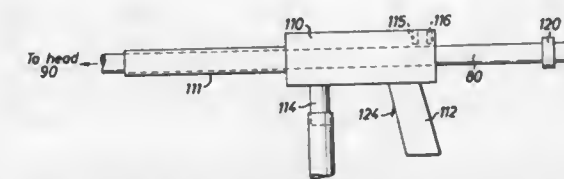
Jared Hadgkiss, 125 Fallowfield, Chesterton, Cambridge, England

Filed Sep. 16, 1977, Ser. No. 833,952

Int. Cl.<sup>2</sup> B08B 3/02, 9/04

U.S. Cl. 134—167 C

8 Claims



1. Cleaning apparatus for cleaning the interior of a tube or tubes, said apparatus comprising a hose having at one end thereof a jet producing head, a reel on which said hose is wound, drive means for rotating the reel to either unwind hose therefrom or wind hose onto the reel, a hand holdable housing having a barrel in which said head can be accommodated and from which the head can be ejected along a tube to be cleaned, the hose, when said head has been ejected, passing through said barrel, first and second switch means carried by said housing, actuation of said first switch means causing said drive means to rotate the reel in one direction and actuation of said second switch means causing said reel to rotate in the opposite direction, and means for supply water under pressure to said hose.

4,161,957

#### LEAKAGE PROTECTIVE APPARATUS FOR STORAGE CONTAINERS OR THE LIKE

Ernst H. Schoellkopf, Zumikon, Switzerland, assignor to Ironflex AG, Aarich, Switzerland

Filed Sep. 28, 1976, Ser. No. 727,614

Claims priority, application Switzerland, Oct. 6, 1975, 12946/75; Dec. 24, 1975, 16799/75; Fed. Rep. of Germany, Mar. 15, 1976, 2610769

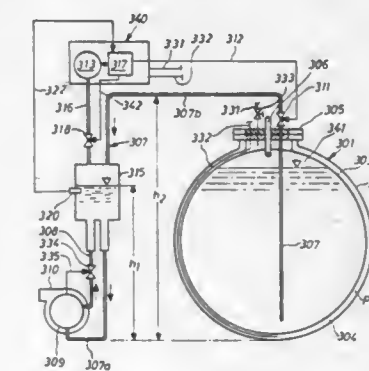
Int. Cl.<sup>2</sup> G01M 3/28

U.S. Cl. 137—205

13 Claims

1. A leakage protective apparatus for the outlet line of a storage container for flowable material, comprising a storage container, a consumer, a conduit arrangement connecting the storage container and consumer, the conduit arrangement including a pump for pumping the flowable material from the storage container to the consumer, the conduit arrangement further including an intermediate

container connected between the pump and storage container, a negative pressure source connected to the intermediate container, the conduit arrangement further including a shutoff valve,



means for detecting a predetermined minimum negative pressure in the conduit arrangement, and a switching device for closing the valve when the detecting means detects a pressure above the predetermined minimum negative pressure.

4,161,958

#### FIXTURE ASSEMBLY FOR REMOVING OPERATING ASSEMBLY FROM BOTTOM OPERABLE TANK CAR VALVE WHILE CLOSURE PORTION REMAINS IN CLOSED POSITION IN THE TANK

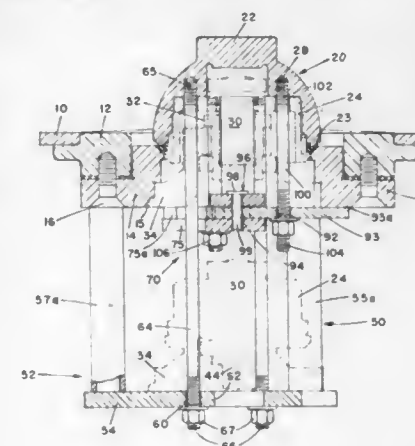
Gunter R. Behle, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,552

Int. Cl.<sup>2</sup> F16K 43/00, 51/00

U.S. Cl. 137—316

13 Claims



1. A fixture assembly for removing for repair and/or replacement some or all of an operating assembly of a bottom operable tank car valve while a valve closure portion of a valve assembly remains in closed position in engagement with a valve seat, preventing any lading from escaping from the tank while the damaged portion of the valve operating assembly including depending operator means is repaired and/or replaced, comprising:

- a first fixture having a first fixture plate and at least a pair of first fixture spacers which extend from said first fixture plate to a tank car bottom flange, said spacers maintaining the first fixture plate spaced from the tank bottom flange; said first fixture plate including first fixture openings which align with valve closure openings in a valve closure; closure fasteners holding the depending operator means attached to the valve closure; at least some of said



closure fasteners which align with said first fixture openings being removable and adapted to be replaced with first fixture studs extending through said first fixture openings openings in said depending operator means and into said valve closure openings from which said closure fasteners have been removed; first fixture stud fastening means attached to said first fixture studs secured against the lower surface of the first fixture plate to positively urge the valve closure into closed position into engagement with its seat; the remaining closure fasteners being removable from said valve closure openings to allow said depending operator means to descend to the upper surface of said first fixture plate; a second fixture including a second fixture plate inserted between said first fixture spacers and said first fixture studs and the tank bottom flange; said second fixture plate being generally V-shaped, including at least a pair of arms, with a portion of each arm engaging the tank bottom flange; second fixture studs inserted through second fixture openings provided in said second fixture arms, and being inserted into the remaining of said valve closure openings; second fixture fastening means attached to the lower ends of the second fixture studs to urge said second fixture into firm engagement with the tank bottom flange, and said valve closure into engagement with its seat; whereby said first stud fastening means may then be disconnected and the first fixture studs removed from said valve closure openings; and whereby said first fixture and said depending operator means may be removed from the tank bottom for repair or replacement of damaged valve operator parts, while said second fixture maintains the valve closure in closed position engagement with its seat, retaining the lading in the tank during repair or replacement of the valve operator parts which have been removed.

4,161,959

#### HIGH-TEMPERATURE SLIDE VALVE, ESPECIALLY HOT-BLAST SLIDE VALVE

Hermann Jansen, and Heinz Schneider, both of Düren, Fed. Rep. of Germany, assignors to Zimmermann & Jansen GmbH, Düren, Fed. Rep. of Germany

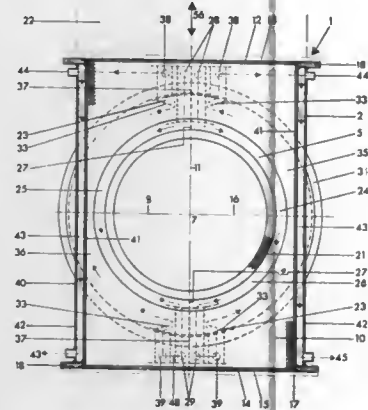
Filed Apr. 20, 1976, Ser. No. 678,672

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1975, 2518074; Aug. 28, 1975, 2538357

Int. Cl.<sup>2</sup> F16K 49/00

U.S. Cl. 137—340

4 Claims



1. A high-temperature slide valve, especially hot-blast slide valve, comprising:

- a water cooled valve casing having a flow cross-section with a longitudinal axis provided with a pair of end flanges, said casing including coolant passages;
- circular, hollow, tubular sealing strips positioned in the casing;
- said valve casing defining a chamber positioned transversely of the longitudinal axis of the flow cross-section of

the valve casing, said chamber having therein a slide valve plate for closing and opening said flow cross-section, said sealing strips having arcuate outer surfaces slideably and sealingly engaging the plate for sealing said casing to the plate;

- an actuating device controlling said valve plate position being removably attached to said casing at one end of said chamber;
- a center portion (60) of said valve casing enclosing said chamber (10) for said valve plate (9) with a rectangular configuration having side walls and upper and lower walls (17 and 18) for selective attachment of said actuating device, each of said upper and lower walls having an opening therethrough, one of said openings being open for positioning of the actuating device therethrough and the other of said openings being blocked by a closure means;
- refractory material lining the sidewalls (40) of said chamber (10);
- said coolant passages comprising first and second opposing, concentric, semi-circular sections (25 and 26) having first and second inlets (28) and first and second outlets (29), respectively, said first and second sections located around the flow cross-sections and formed within the hollow of said sealing strips (5);
- third and fourth opposing, concentric, semi-circular sections (35 and 36) having third and fourth inlets (39) and third and fourth outlets (38), respectively, said third and fourth sections being defined by said casing and disposed radially outward of and concentric with said first and second sections;
- a plurality of sidewall cooling sections formed by double wall sections of which said sidewalls form one wall thereof (43) having sidewall inlets (44) and sidewall outlets (45), said sidewall sections located between said end flanges and generally perpendicular to said semi-circular sections;
- said first and second outlets having means for selective normal connection to said third and fourth inlets; and
- said third and fourth outlets having means for selective normal connection to said sidewall inlets.

4,161,960

#### HIGH AND LOW TUBING PRESSURE ACTUATED WELL SAFETY VALVE

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Feb. 23, 1978, Ser. No. 880,532

Int. Cl.<sup>2</sup> F16K 17/00

U.S. Cl. 137—458

4 Claims



1. A well safety valve adapted to be positioned in a well

tubing and close on either a predetermined high tubing pressure or a predetermined low tubing pressure comprising,

- a body,
- a valve closure member in the body moving between open and closed positions,
- a tubular member longitudinally movable in the body for controlling the movement of the valve closure member, said tubular member including a first upper, a second middle, and a third lower telescoping section, said first section including a piston exposed to fluid pressure in the tubing acting to move the first section in response to the fluid pressure,
- means yieldably urging the first section in a direction to open the valve,
- means yieldably urging the second section in a direction to open the valve,
- first releasable locking means normally securing the first and second sections together,
- second releasable locking means normally securing the second and third sections together,
- means for moving the third section in a direction for allowing the closure of the valve member when the second locking means is released.

4,161,962

#### CIRCUIT FOR DETERMINING THE RESPONSE CURRENT OF MAGNETIC VALVES

Albert Maringer, and Michael Labinsky, both of Karlsruhe, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

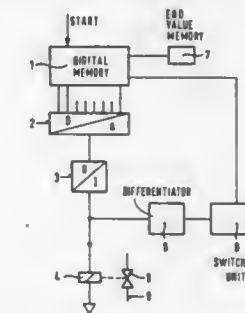
Filed Aug. 23, 1977, Ser. No. 827,025

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640900

Int. Cl.<sup>2</sup> F16K 31/06; G01R 33/00

U.S. Cl. 137—557

10 Claims



1. A circuit for determining the response current of magnetic valves comprising:

- a current source for delivering an impressed current rising as a ramp to a field coil of the magnetic valve;
- a differentiator coupled parallel to the field coil for the differentiating the voltage at the field coil;
- an electronic switching unit having as a control input the output of said differentiator;
- a program generator in control connection with the current source in such a manner that a sudden rise in the output voltage of the differentiator stops the program generator; and
- means for storing the program value, which is reached when the current rise is stopped and which determines the response current, coupled to the program generator.

4,161,961

#### DIAPHRAGM VALVE

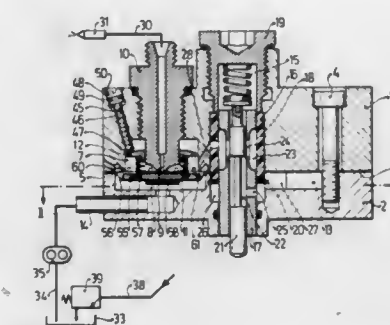
Heinrich Knapp, Leonberg; Max Greiner, Gerlingen; Klaus-Jürgen Peters, Affalterbach, and Günther Jäggle, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 9, 1977, Ser. No. 831,831

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648955

Int. Cl.<sup>2</sup> G05D 7/01

U.S. Cl. 137—501



1. In a diaphragm valve including: means defining a chamber; a flexible diaphragm forming a movable part of the valve, said diaphragm being clamped by the chamber defining means so as to extend across the chamber and divide same into two chambers through which pressurized liquid flows; and a valve carrier including a seat positioned in one of the chambers in operative proximity to the diaphragm, the improvement comprising:

- a valve plate disposed loosely in a pocket in the diaphragm and serving to operatively cooperate with the valve seat; and
- spring means encircling said valve carrier arranged to center said valve plate relative to said valve seat.

4,161,963

#### LIQUID TREATMENT APPARATUS

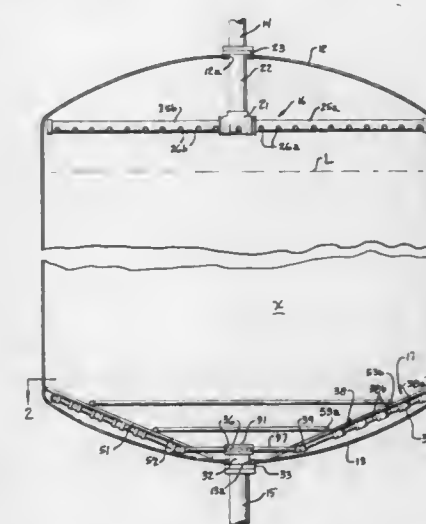
Walter J. Stevens, Belvidere, Ill., assignor to Techni-Chem, Inc., Cherry Valley, Ill.

Filed Sep. 22, 1975, Ser. No. 615,718

Int. Cl.<sup>2</sup> E03B 11/00

U.S. Cl. 137—592

6 Claims



2. In a liquid treatment apparatus including a tank having a side wall and an upwardly dished bottom wall and a central opening in the bottom wall, a lower liquid distributor having a

header mounted in said central opening in the bottom wall and a plurality of distributor conduits connected to the header and extending outwardly therefrom at generally uniform angularly spaced locations around the header, the improvement wherein said distributor conduits each include a first straight conduit section extending laterally outwardly from the header toward the side wall of the tank and a second straight conduit section connected to the outer end of the first conduit section by a pipe elbow having a fixed angle of substantially less than 90°, the pipe elbow in each distributor conduit extending oblique to a longitudinal plane defined by the axis of the respective first conduit section and the tank axis, and each second conduit section extending at an acute angle to the longitudinal plane through the respective first conduit section and at an acute angle to a plane perpendicular to the tank axis to provide a liquid distributor having a shallow upwardly dished configuration, and distributor support means for supporting the distributor on the tank bottom, said second conduit sections each having a plurality of T-fittings at spaced locations therealong and lateral conduit sections attached to each of said T-fittings and extending generally horizontally, said distributor support means including a plurality of arms corresponding in number to the number of distributor conduits and supported on said bottom wall to extend outwardly from adjacent the center of the tank at an acute angle to a plane perpendicular to the tank axis and crosswise of at least some of said lateral conduit sections, and means attaching the arms to at least some of said lateral conduit sections to support the same.

4,161,964

**RESERVOIR FOR FUEL INJECTION SYSTEM**

Max Greiner, Gerlingen, and Bernhard Temmen, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

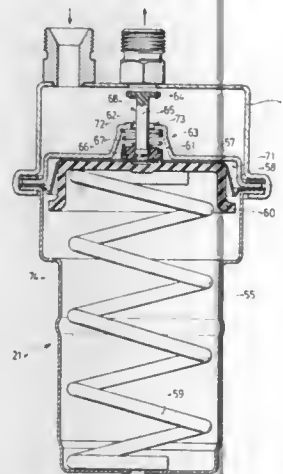
Filed Jan. 5, 1978, Ser. No. 867,069

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702133

Int. Cl.<sup>2</sup> F16L 55/04; F02M 69/00

U.S. Cl. 138—26

5 Claims



1. A fuel reservoir for a fuel injection system, comprising: a housing defining a chamber; an intermediate plate mounted to the housing within the chamber for dividing the chamber into two parts, said intermediate plate having a flow opening and a throttle opening formed therein; a yieldable reservoir member mounted to the housing within one of the chamber parts and dividing that chamber part into two portions; reservoir spring means mounted within the chamber portion facing away from the intermediate plate and engageable with one side of the yieldable reservoir member, wherein the yieldable reservoir member lies against the intermedi-

ate plate in its rest position under the influence of the reservoir spring means; and valve means operatively associated with the flow opening and throttle opening in the intermediate plate, said valve means comprising:

- a movable valve member; and a valve spring engageable with the movable valve member in the opening position of the valve means when the reservoir experiences a movement to decrease its volume, said movable valve member including:
  - (i) a shank member that projects through the flow opening and is displaceable by means of the yieldable reservoir member against the force of the valve spring; and
  - (ii) a valve plate.

4,161,965

**WATER-FLOW CONTROL DEVICE**

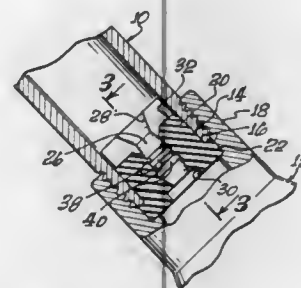
Thurman L. Merritt, 19114 E. Carroll, Glendora, Calif. 91740

Filed Feb. 25, 1977, Ser. No. 772,127

Int. Cl.<sup>2</sup> F16D 1/02

U.S. Cl. 138—45

2 Claims



1. A liquid flow-control device for positioning between a shower-supply pipe and a shower head, said device comprising:
  - a main annular body member formed of a resilient material having a central longitudinal bore disposed therethrough, an inlet orifice, an outlet orifice, flow-restrictive means integral with said body member, said flow restrictive means being controlled by exerted compressive forces of liquid flow, oppositely disposed, flexible body portions defined by a slot extending laterally across the inlet orifice to define the bifurcated portions adjacent the inlet orifice to restrict the opening of said orifice when said flexible wall members are forced inwardly by said compression forces applied against said inclined wall surfaces, each of said body portions including an inclined wall surface, said body member including an enlarged annular flange member formed on the end of the body member opposite the flexible body portions and wherein said outlet orifice being disposed therein, and aerating means formed within said bore comprising a plurality of ridges and corresponding grooves formed within said bore interposed between said inlet and outlet orifices.

4,161,966

**SPACER FOR COAXIAL TUBE SYSTEMS**

Ernst Scheffler, Friedrich Schatz, and Gerhard Ziemek, all of Langenhagen, Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 734,663, Oct. 12, 1976, abandoned.

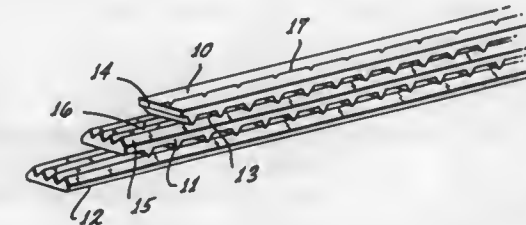
This application Oct. 31, 1977, Ser. No. 847,083

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1975, 2547423

Int. Cl.<sup>2</sup> F16L 9/18

U.S. Cl. 138—112

3 Claims



1. A coaxial tube system, including a helical spacer for spacing an inner tube of the system from another tube thereof in coaxial relation, there being a temperature gradient between the tubes such as, for example, in an electric cable operated in a superconducting state or in the inner tube of such a system for carrying fluid media, said helical spacer comprising:

a plurality of flat elongated, relatively narrow, superimposed elements of an insulating material, the elements being so disposed and at least some of them having a profiled surface established by notches separated by roof-like extremities, the notches of surfaces of respective two of the elements facing each other extending transversely to each other so that individual, adjacent elements will contact each other at spaced points on the respective roof-like extremities only, said elements being wound onto the inner tube in spaced-apart loops and being twisted, thereby holding the outer tube on the inner tube.

4,161,967

**THERMAL SLEEVE**

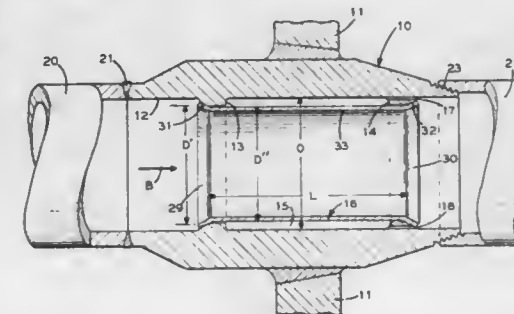
Theodore S. Sprague, Hudson, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Feb. 3, 1978, Ser. No. 875,023

Int. Cl.<sup>2</sup> F16L 9/10, 9/18

U.S. Cl. 138—113

4 Claims



1. A fluid flow nozzle having a bore extending therethrough, a pair of axially spaced rings of equal inner diameter being disposed within the bore, each ring having an inner peripheral end surface diverging outwardly at an angle whose tangent is equal to the ratio of the ring inner diameter to the axial length between the respective diverging end surfaces of the rings, and a thermal sleeve disposed within the bore, the sleeve having diverging end portions whose outer peripheral surfaces con-

form to and are in contact with the diverging end surfaces of said rings, whereby said thermal sleeve maintains sealing contact with component parts of the nozzle during thermal expansion and contraction without giving rise to stress causing restraints.

4,161,968

**FOOD CASING AND METHOD OF PREPARING SAME**  
Jerome J. M. Rasmussen, Burbank, Ill.; Richard C. Waldman, Glen Rock, Pa., and Richard L. Oliver, Schaumburg, Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 3, 1977, Ser. No. 848,065

Int. Cl.<sup>2</sup> F16L 11/02

U.S. Cl. 138—118.1

19 Claims

1. A cellulosic food casing including on the interior surface of said food casing a release coating comprising at least about 0.286% by weight of water soluble cellulose ether and at least about 0.029% by weight of a cationic thermosetting resin.

18. A cellulosic food casing including on the interior surface of said food casing a release coating comprising at least about 0.286% by weight of a water soluble cellulose ether and at least about 0.029% by weight of a water soluble protein having a molecular weight above about 10,000 and an isoelectric point in the range of from about pH<sub>2</sub> to pH<sub>6</sub>.

4,161,969

**METHOD TO CONNECT TWO STRING-LIKE MEMBERS**  
René Neyraud, Saint Cyr au Mont d'Or, France, assignor to Verdol, SA., Caluire, France

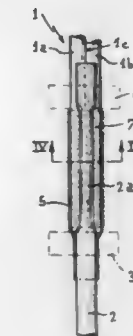
Filed Apr. 14, 1978, Ser. No. 896,529

Claims priority, application France, Apr. 18, 1977, 77 12475

Int. Cl.<sup>2</sup> D03C 3/44; B25G 3/36

U.S. Cl. 139—90

9 Claims



1. The method of connecting to a string-like member an elastically extensible member to provide a return-spring action when the extensible member is stretched within a predetermined stretch limit, the extensible member being of a type which reduces in diameter when stretched, including the steps of:

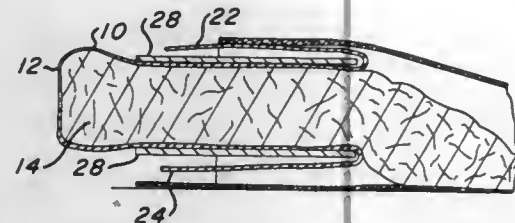
stretching a portion of said extensible member to reduce its diameter;  
disposing the stretched portion adjacent to a connecting portion of the string-like member;  
applying to said adjacent stretched and connecting portions of the members a settable substance to bond them together;  
disposing a covering material about said stretched and connecting portions to tightly confine said settable substance; setting said substance while confined;  
and releasing said stretched portion of said extensible member when said substance has been set.



**4,161,970**  
**METHOD AND APPARATUS FOR FILLING DOWN**  
**GARMENTS**

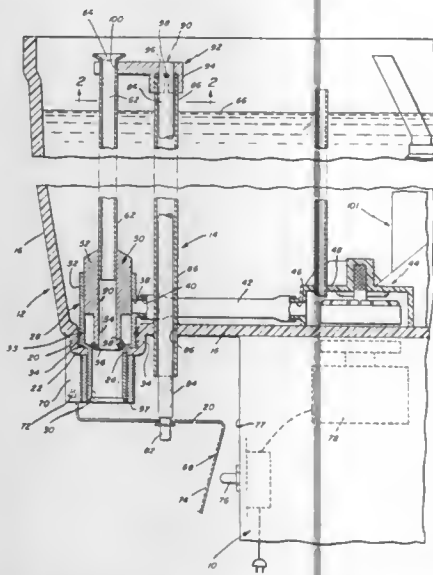
George D. Lamb, 802 S. Sherman St., Longmont, Colo. 80501  
Division of Ser. No. 810,523, Jun. 27, 1977, Pat. No. 4,094,126.  
This application Feb. 13, 1978, Ser. No. 877,169

Int. Cl.<sup>2</sup> B65B 3/16  
U.S. Cl. 141—114 3 Claims



1. The combination of a packet of down and an inserter/extruder tube for dispensing down from the packet comprising: (a) a flexible plastic film, tubular packet for down having one permanently sealed end and a releasable seal at the opposite end; (b) a pair of manipulating flaps depending from opposed sides of said packet extending beyond said releasable seal; and (c) an essentially rigid tube of approximately the diameter of said tubular packet and of a length of approximately  $\frac{1}{4}$  to 1 length of said packet, whereby said tubular packet may be freely inserted in said rigid tube and said tubular packet may be easily pulled by said flaps from the inside back along the outside of the rigid tube so as to be turned inside out and dispense the down from the tubular packet.

**4,161,971**  
**DISPENSER FOR PERISHABLE BEVERAGES**  
William Arzberger, Medfield, and Merle S. Brown, Cohasset, both of Mass., assignors to Jet Spray Corp., Waltham, Mass.  
Continuation-in-part of Ser. No. 697,923, Jun. 21, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 827,954  
Int. Cl.<sup>2</sup> B67D 5/02  
U.S. Cl. 141—362 16 Claims



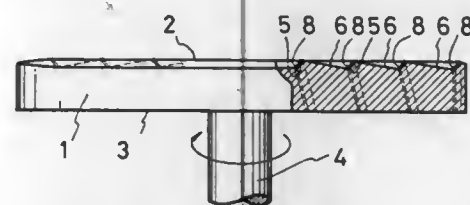
1. A refrigerated beverage dispenser comprising a base and a bowl on the base for storing refrigerated beverage, a first opening in the bottom of the bowl, an outlet tube mounted in the bowl and registering with the opening and with at least the major portion of its length being submerged in the refrigerated beverage when the

bowl is filled with beverage, said tube being made of a material having a high thermal conductivity so as to provide a good heat exchange relationship between the beverage and the tube, allowing the tube to achieve the temperature of the beverage, a valve movable in the outlet tube within the portion of the tube positioned to be submerged in the beverage in the bowl, a port in the major outlet tube portion through which beverage in the bowl is discharged into and through the tube, a valve seat in the outlet tube downstream of the port and cooperating with the valve to control the discharge of beverage from the bowl, and an actuator operatively connected to the valve for unseating it from the valve seat to permit discharge of beverage from the bowl.

**4,161,972**  
**APPARATUS FOR PRODUCING CHIPS FROM LOGS OF**  
**TIMBER**

Morimasa Hanaya, Kure, Japan, assignor to Toyo Pulp Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1975, Ser. No. 645,863  
Claims priority, application Japan, Jan. 8, 1975, 50-4479; Feb. 23, 1975, 50-75506; Feb. 28, 1975, 50-23847; May 15, 1975, 50-56751; Aug. 26, 1975, 50-102588  
Int. Cl.<sup>2</sup> B27C 1/02  
U.S. Cl. 144—176 20 Claims

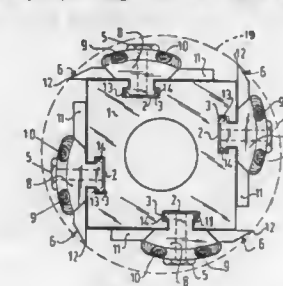


1. An apparatus for producing chips from logs of timber, comprising a disc-like member having a front face and a rear face, a rotating shaft connected coaxially to a central region of said rear face, said front face being provided with means defining at least one spiral working surface which consists of main and auxiliary oblique surface portions, said spiral working surface extending along a spiral path from adjacent the central region of said disc-like member to the peripheral edge thereof, said main and auxiliary surface portions being inclined relative to one another with a predetermined angle included therebetween, means defining a plurality of openings extending through said disc-like member and spaced from one another along said spiral working surface, cutting blade means disposed in said openings, each of said cutting blade means including a main cutting edge substantially parallel to said main oblique surface portion of said working surface and an auxiliary cutting edge substantially parallel to said auxiliary oblique surface portion of said working surface, said main oblique surface portion being parallel to the rotational axis of said disc-like member.

**4,161,973**  
**DEVICE FOR FASTENING A CHISEL TO A ROTATABLE**  
**CHISEL BLOCK OF A WOOD WORKING MACHINE**  
Leefert Klooster, De Wijk, Netherlands, assignor to L. Klooster & Zonen B.V., Zaandam, Netherlands  
Filed Nov. 7, 1977, Ser. No. 849,350  
Int. Cl.<sup>2</sup> B27G 13/04  
U.S. Cl. 144—224 5 Claims

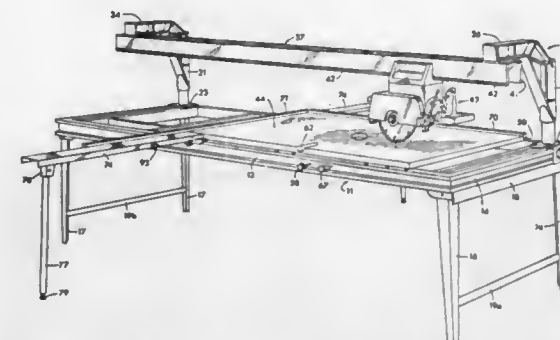
1. A fastening device for securing a wood working chisel to a rotatable chisel block having a fastening slot therein, which comprises a clamping plate adapted to sandwich the chisel

between it and the chisel block and having an opening, a bolt extending through said opening and a nut captive within said slot and engaged with said bolt, said clamping plate including a lateral extension projecting into said slot and provided with



cam portions engaged against the block within said slot, a set screw carried by said lateral extension and bottomed in said slot to force said cam portions against the block and fix said clamping plate relative to said block.

**4,161,974**  
**PORTABLE BENCH FRAME FOR POWER TOOLS**  
Lionel Patterson, P.O. Box 117, Markham, Ontario, Canada (L3P 3J5)  
Filed Dec. 23, 1977, Ser. No. 863,861  
Int. Cl.<sup>2</sup> B25H 1/02  
U.S. Cl. 144—287 17 Claims

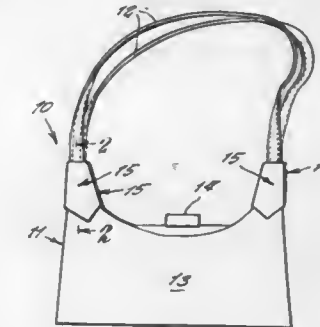


1. A bench frame suitable for precision woodworking comprising a bench having a substantially large rectangular frame body, two pairs of foldable support members provided at two ends of said frame body and operative to support said frame body in a horizontal manner, two spaced telescopic columns provided at two corners of one longitudinal edge portion of said frame body, said columns having two cantilever members provided thereon extending forwardly in a spaced manner above said frame body, an elongated traverse beam mounted to said cantilever members, said traverse beam being operative to receive selected tools to be slidably mounted thereon, and said columns being adjustable simultaneously for selectively raising or lowering said traverse beam with respect to said frame body.

**4,161,975**  
**HANDBAG CONSTRUCTION AND METHOD**  
**THEREFORE**  
Charles Stakofsky, 1660 E. New York Ave., Brooklyn, N.Y. 11212  
Filed Dec. 23, 1977, Ser. No. 863,742  
Int. Cl.<sup>2</sup> A45C 13/26  
U.S. Cl. 150—33 1 Claim

1. A handbag, comprising in combination a bag and at least one strap secured to said bag, said bag including a pair of opposite side panels peripherally stitched together except along an upper edge thereof fitted with interpivotable frames having a lock, and also being left unstitched at a terminal of a plurality of tapering portions, said tapering portions stitched

together along their side edges forming tubular portions receiving the ends of said straps, and said tubular portions being



each enclosed by a cuff draped around an outer side thereof providing an attractive appearance.

**4,161,976**  
**ANTI SKID CHAIN**  
Wilhelm Schmitt, Heppenheim-Erbach, and Herbert Schumacher, Gornhelmertal, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany  
Filed Jun. 6, 1977, Ser. No. 803,925  
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631147  
Int. Cl.<sup>2</sup> B60C 27/06  
U.S. Cl. 152—239 12 Claims

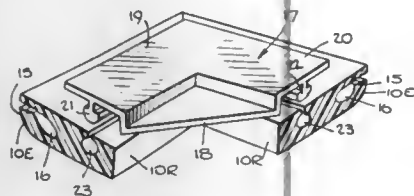


1. An antiskid tire chain comprising a network positionable during use in the region of the tire tread, including two parallel chains extendable along opposite sides of the tread, a plurality of rings interconnected into each chain for guiding same, a plurality of straps each interconnecting one ring from one chain with one ring from the other chain and each crossing over another strap, and at least one post connected to a strap in the region of each intersection, each post being composed of synthetic material and comprising a circular member having a T-shaped cross-section having the larger diameter portion comprising a planar surface contacting the surface of the tire during use and wherein the straps pass through the larger diameter portion entering and leaving same spaced from said planar surface.

**4,161,977**  
**FRAME ASSEMBLY FOR MOUNTING FABRIC SHEETS**  
Floyd Baslow, 100 Lafayette St., New Bethlehem, Pa. 16242  
Continuation-in-part of Ser. No. 728,285, Sep. 30, 1976, Pat. No. 4,053,008. This application Sep. 19, 1977, Ser. No. 834,472  
Int. Cl.<sup>2</sup> A47G 1/10  
U.S. Cl. 160—381 11 Claims

1. A frame assembly for mounting and displaying a sheet of decorative fabric material having predetermined dimensions, said assembly comprising a set of four mitered pieces, and coupling elements joining said pieces together at their mitered

corners at the rear to form a rectangular frame whose dimensions fall somewhat short of the sheet dimensions to an extent equal to the margins of the sheet, each frame piece having inlet jaws which lie adjacent the junction of the outer edge and the back thereof and communicate with an internal storage channel running the full length of the piece, each piece also having



a pressure-sensitive adhesive band on the front face running the full length thereof to secure the ends of the sheet to the frame, the margins of the sheet ends being insertable into the channels of said pieces through said inlet jaws which clamp onto said margins to maintain the sheet supported thereby in smooth condition.

#### 4,161,978 INGOT CASTING

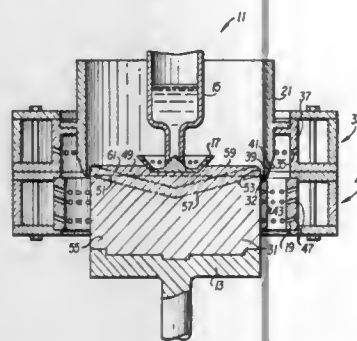
Carson L. Brooks; John W. Carson, and Garland T. Culbreth, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jul. 19, 1978, Ser. No. 926,118

Int. Cl.<sup>2</sup> B22D 11/12, 27/02

U.S. Cl. 164—49

14 Claims



1. A system for continuous casting an elongated ingot comprising:

- a molten metal supply means for continuously supplying molten metal to a first end of said ingot at a casting zone;
- a means for moving a second end of said ingot downwardly away from said supply means;
- a means for cooling said molten metal at said casting zone close to said supply means to solidify said molten metal with low-head casting and thereby form said ingot;
- an electromagnetic inductor positioned adjacent said casting zone, said electromagnetic inductor being energized by an alternating current source for producing an electromagnetic field at said ingot downstream of said casting zone;
- an alternating power source with a frequency higher than 2,200 Hz; and,
- a metallic shield means surrounding said casting zone at a location intermediate said casting station and said inductor for blocking out virtually all of said electromagnetic field above the lower end of said shield means at said casting zone but allowing said electromagnetic field to exist at said ingot immediately below said casting zone.

7. A method for continuously casting an elongated ingot comprising the steps of:

depositing molten metal at a first end of an ingot with a supply means;

moving a second end of said ingot downwardly away from said supply means;

cooling said molten metal at a casting zone close to said first end to solidify said molten metal with low-head casting to form said ingot;

creating an electromagnetic field about said ingot downstream of said casting zone; and,

virtually blocking out said electromagnetic field above the lower end of said shield means at said casting zone to allow said low-head casting to take place without virtually any influence from said electromagnetic field.

4,161,979

#### METHOD OF AND APPARATUS FOR FLUSHING AN AUTOMOBILE COOLING SYSTEM

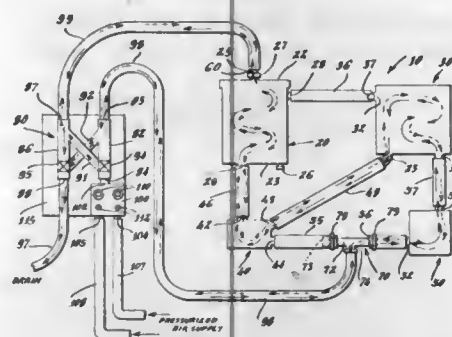
Earl J. Stearns, 62 Flushing Ave., Fairfield, Conn. 06432

Filed Apr. 25, 1977, Ser. No. 790,325

Int. Cl.<sup>2</sup> F28G 9/00

U.S. Cl. 165—95

14 Claims



1. An apparatus for flushing an automobile cooling system, said cooling system comprising a radiator having a radiator cap opening, a water pump, a heater and an engine block which are interconnected by a series of hoses, wherein the apparatus comprises a first flexible hose one end of which is removably connected to a heater opening normally receiving a hose between said water pump and said heater, means for connecting said first flexible hose to said heater, plugging means to prevent any fluid flow through said water pump to heater hose, a second flexible hose one end of which is removably connected to said radiator cap opening, means for connecting said second flexible hose to said radiator cap opening, a pressurized supply means for a flow of a cleaning fluid, and an "X" connector adapted to receive the ends of said first and second flexible hoses opposite said cooling system, said "X" connector being connected to said supply means, said "X" connector having a valve means whereby said flow of said cleaning fluid from said supply means is directed into said first flexible hose while at the same time the exiting flow of said cleaning fluid from said radiator cap opening is directed to an outlet of said "X" connector, said valve means also being capable of being selectively reset so as to redirect said flow of cleaning fluid into said second flexible hose while at the same time directing the exiting flow of said cleaning fluid from said heater through said first flexible hose to said outlet.

4,161,980

#### COOLING CAPSULE FOR THYRISTORS

Heribert Rüger, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,421

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2643072

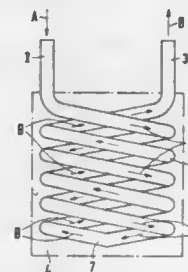
Int. Cl.<sup>2</sup> F28F 7/02; H01L 3/00

U.S. Cl. 165—168

8 Claims

1. In a cooling capsule for use with thyristors wherein the

capsule includes a core having first and second end faces adapted for heat-conducting connection to a thyristor and wherein a cooling coil is cast within said core for providing a flow path for liquid coolant therethrough, said cooling coil having first and second ends extending from said core to provide inlet and outlet openings and having subsections which are located in said core in respective spaced first and second planes which extend in the vicinity of and approximately parallel to said first and second end faces of said core, respectively, the improvement comprising:



said cooling coil being formed as a helix which extends from said first end to a region at which it turns around and extends to said second end in the manner of a bifilar winding, said subsections which carry coolant in opposite directions being alternately arranged adjacent one another; and

subsections of said helix being arranged to lie in said first and second planes and being formed so as to be at least partially straight.

4,161,981

#### METHOD FOR RECOVERING HYDROCARBONS

Jack H. Park, Houston, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,150

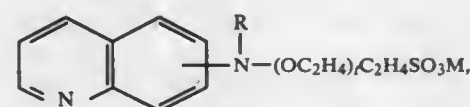
Int. Cl.<sup>2</sup> E21B 43/22, 43/24

U.S. Cl. 166—261

9 Claims

1. A method for recovering hydrocarbons from an underground reservoir penetrated by an injection well and a production well which comprises:

- (a) establishing a burning zone in said reservoir at the face of said injection well,
- (b) introducing a combustion-supporting gas into said reservoir via said injection well to propagate said zone toward said production well,
- (c) terminating the injection of the combustion-supporting gas into the reservoir,
- (d) injecting into the said reservoir via said injection well an aqueous drive fluid having dissolved therein a small amount of a sulfonated interfacial tension reducer,
- (e) recovering the displaced hydrocarbons via the said production well, and wherein the said sulfonated interfacial tension reducer has the formula:



wherein t is a number of from 3 to about 40, and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium, R is selected from the group consisting of hydrogen and  $-(\text{OC}_2\text{H}_4)_s\text{C}_2\text{H}_4\text{SO}_3\text{M}$ , where s is a number of from 3 to about 40 and M has the same meaning as previously described.

4,161,982

#### HIGH CONFORMANCE ENHANCED OIL RECOVERY PROCESS

Vernon H. Schlevelbein; Mohan V. Kudchadker; James E. Var-non, all of Houston, and Lawrence E. Whittington, Katy, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,502

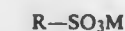
Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 166—269

25 Claims

1. A method of recovering petroleum from a subterranean, petroleum-containing formation, said formation containing water whose salinity is from 5,000 to 220,000 parts per million total dissolved solids, said formation containing at least two distinct petroleum-containing strata, the permeability of at least one of said strata being at least 50 percent greater than the permeability of the other stratum, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with substantially all of said formation, comprising

- (a) injecting a first aqueous oil-displacing fluid into the formation via the injection well, said fluid passing through at least one of the more permeable strata of said formation and displacing oil therein toward the production well, from which it is recovered to the surface of the earth;
- (b) after said first aqueous oil displacing fluid has passed through at least one of said more permeable strata to the production well, discontinuing injecting said fluid and injecting into said stratum at least one aqueous fluid containing an emulsifying surfactant mixture comprising
  - (1) from 0.2 to 5 percent by weight of an organic sulfonate comprising an alkyl or alkylaryl sulfonate having the following formula:



wherein R is an alkyl group containing from 6 to 20 carbon atoms, or an alkylaryl group selected from the group consisting of benzene, toluene or xylene having attached thereto at least one alkyl containing from 6 to 20 carbon atoms, and M is ammonium, sodium, potassium, or lithium, or a sodium, potassium, lithium, or ammonium salt of petroleum sulfonate which is at least partially water soluble and has a median equivalent weight in the range of 350 to 420;

- (2) from 0.01 to 5.0 percent by weight of a dialkylaryl-polyalkoxyalkylene sulfonate having the following formula:



wherein  $\text{R}_d$  is a dialkylaryl group selected from the group consisting of benzene and toluene having attached thereto at least two alkyl groups, each having from 3 to 14 carbon atoms,  $\text{R}_a'$  is ethylene or a mixture of ethylene and higher alkylene with relatively more ethylene than higher alkylene, na is a number from 2 to 10,  $\text{R}_a''$  is ethylene, propylene, hydroxypropylene or butylene, and  $\text{M}_a$  is ammonium, sodium, potassium or lithium; and

- (3) from about 0.01 to about 10.0 percent by weight of an alkylpolyalkoxyalkylene sulfonate or alkylarylpolyalkoxyalkylene sulfonate having the following formula:



wherein  $\text{R}_b$  is an alkyl group having from 9 to 25 carbon atoms or an alkylaryl group selected from the group consisting of benzene, toluene or xylene having attached thereto one alkyl group, having from 9 to 15 carbon atoms;  $\text{R}_b'$  is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher molecular weight alkylene; nb is a number from 2 to 10,  $\text{R}_b''$  is ethylene, propylene, hydroxy propylene, or butylene and  $\text{M}_b$  is a monovalent



cation selected from the group consisting of sodium, potassium lithium and ammonium, said emulsifying surfactant mixture forming a macro-emulsion in the flow channels of the most permeable strata of the formation, thereby reducing the permeability of the strata invaded by the emulsifying fluid; and

(c) thereafter injecting a second aqueous oil displacing fluid into the formation, said oil displacing fluid invading at least one stratum not invaded by the oil displacing fluid of step (a) above, displacing petroleum therein toward the production well where it is recovered to the surface of the earth.

**4,161,983**  
**HIGH CONFORMANCE OIL RECOVERY PROCESS**  
Vernon H. Schievelbein, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,503  
Int. Cl.<sup>2</sup> E21B 43/22

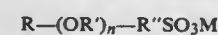
U.S. Cl. 166—269

19 Claims

1. A method of recovering petroleum from a subterranean, petroleum-containing formation, said formation containing at least two distinct petroleum-containing strata or layers, the permeability of at least one of said strata being at least 50 percent greater than the permeability of the other stratum, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with substantially all of said formation, comprising

(a) injecting a first aqueous oil-displacing fluid into the formation via the injection well, said fluid passing through at least one of the more permeable strata of said formation and displacing oil therein toward the production well, from which it is recovered to the surface of the earth;

(b) after said first aqueous oil displacing fluid has passed through at least one of said more permeable strata to the production well, discontinuing injecting said fluid and injecting into said stratum an aqueous fluid containing an emulsifying surfactant mixture comprising (1) from 0.01 to 10.0 percent by weight of an alkylpolyalkoxyalkylene sulfonate or alkarylpolyalkoxyalkylene sulfonate having the following formula:



wherein R is an alkyl group, linear or branched, having from 9 to 25 carbon atoms or an alkaryl group selected from the group consisting of benzene, toluene and xylene having attached thereto at least one alkyl group, linear or branched, having from 9 to 15 carbon atoms; R' is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher molecular weight alkylene; n is a number including fractional numbers, from 2 to 10; R'' is ethylene, propylene, hydroxy propylene, or butylene and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium, and (2) from about 0.1 to about 5.0 percent by weight of a water insoluble nonionic surfactant having the following formula:



wherein R''' is a branched or linear alkyl group having 9 to 25 carbon atoms, or an alkaryl group selected from the group consisting of benzene, toluene and xylene having attached thereto at least one alkyl group, linear or branched, containing from 9 to 15 carbon atoms, R''' is ethylene or a mixture of ethylene and propylene with relatively more ethylene than propylene; and n is a number from 2 to 10, said emulsifying surfactants forming a macro-emulsion in the flow channels of the most permeable strata of the formation, thereby reducing the permeability of the strata invaded by the emulsifying fluid; and

(c) thereafter injecting a second aqueous oil displacing fluid into the formation, said oil displacing fluid invading at

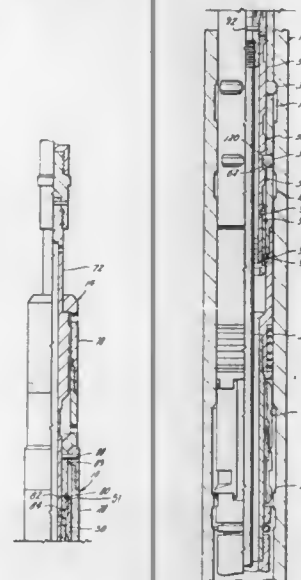
least one stratum not invaded by the oil displacing fluid of step (a) above, displacing petroleum therein toward the production well where it is recovered to the surface of the earth.

**4,161,984**  
**WELL LOCKING DEVICE AND METHOD**  
Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Sep. 11, 1978, Ser. No. 940,819  
Int. Cl.<sup>2</sup> E21B 23/02

U.S. Cl. 166—315

10 Claims



1. A well lock for locking in the bore of a tubing in a well, said tubing including first and second recesses comprising, a lock housing carrying first and second locking means, seal means positioned on the exterior of the housing and adapted to seal with the bore of the tubing, locator means on the housing for positioning the first and second locking means aligned with the first and second recesses in the tubing, a mandrel positioned for telescoping movement in the housing, means on the mandrel for locking the first locking means in the first recess on longitudinal movement of the mandrel, means on the mandrel for engaging said second locking means for preventing unlocking of the first locking means if pressure is applied to the seal to move the housing upwardly, and releasable locking means between the mandrel and the housing.

9. A method of locking a well lock having first and second locking means in a tubing nipple in a well having first and second recesses comprising, moving the well lock into the nipple and aligning the first and second locking means with the first and second recesses respectively, moving a mandrel having a shoulder relative to the first locking means to place the shoulder behind the first locking means thereby locking the first locking means in the first recess, if the well pressure below the well lock is sufficient to move the well lock upwardly, moving the second locking means inwardly into engagement with the mandrel thereby holding the shoulder in a locked position behind the first locking means.

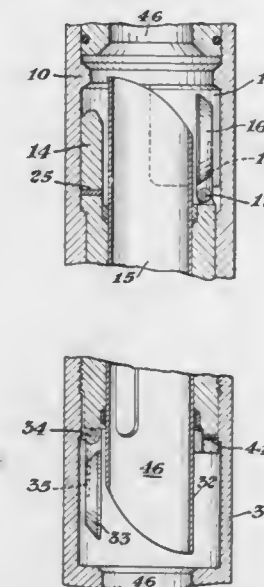
**4,161,985**  
**TOOL FOR REMOVING FLUIDS AND LOOSE MATERIAL FROM AN EARTH FORMATION**  
Onazip J. Fournier, and Wayne F. Nelson, both of Wichita Falls, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1978, Ser. No. 922,928

Int. Cl.<sup>2</sup> E21B 37/00, 41/00

U.S. Cl. 166—321

5 Claims



1. A tool for removing fluids and loose material from an earth formation, the tool comprising:

a first valve unit, which includes a first sleeve member having an upper and lower end, a hollow piston positioned inside the sleeve member, and slidable downwardly from a rest position to a latch position, and having an upper and lower end, a first hollow mandrel positioned inside the piston, and having an upper and lower end, a first flapper disk hingably mounted on the inside of the first sleeve member above the upper end of the first mandrel; the first disk being movable, by the upper end of the first mandrel, from a closed position to an open position, upon downward movement of the piston to the latch position; a first annulus being defined between the first sleeve member and the lower end of the piston, the first sleeve member having first intake ports therein which communicate with the first annulus;

a second valve unit, which includes a second sleeve member having an upper and lower end, a second hollow mandrel positioned inside the second sleeve member, and slidable downwardly from a rest position to a latch position, and having an upper and lower end, a second flapper disk hingably mounted on the inside of the second sleeve member below the lower end of the second mandrel; the second disk being movable, by the lower end of the second mandrel, from a closed position to an open position, upon downward movement of the second mandrel to the latch position;

a second annulus being defined between the second sleeve member and the second mandrel, the second sleeve member having second intake ports therein which communicate with the second annulus;

a surge chamber section which connects the lower end of the first sleeve member with the upper end of the second sleeve member;

the upper end of the first sleeve member being adapted for fastening into a first tubing string, and the lower end of the second sleeve member being adapted for fastening into a second tubing string; and

a central conduit being defined lengthwise through the first valve unit, the chamber section, and the second valve unit,

for enabling fluids and loose material to flow from the earth formation through the recited valve units and chamber section and into the tubing strings.

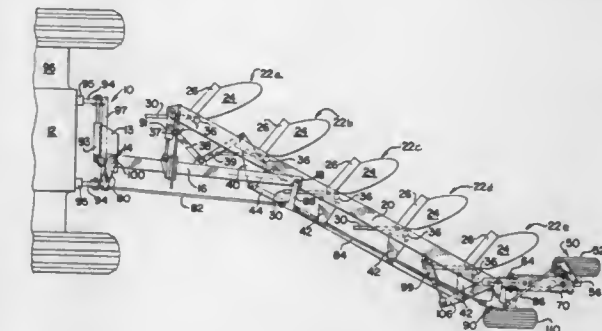
**4,161,986**  
**FLOW AND FLOW MOUNTING BRACKET THEREFOR**  
Gerald G. Ward, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sep. 19, 1977, Ser. No. 834,629

Int. Cl.<sup>2</sup> A01B 61/04, 69/08

U.S. Cl. 172—266

11 Claims



1. A plow of the type adapted to be pulled by a traction vehicle and including a main frame having a horizontal beam inclined relative to the direction of travel of said vehicle, said horizontal beam having upper and lower surfaces, and a plurality of plow bottoms supported by said horizontal beam wherein the improvement comprises:

for each of said plow bottoms;

a vertical bearing secured to said horizontal beam,

a plow bottom mounting bracket pivotally supported on said horizontal beam by said vertical bearing, said mounting bracket having flat upper and lower surfaces and a hub portion formed thereon and extending above and below said bracket surfaces, said surfaces extending laterally and forwardly of said hub portion, said bracket also having a horizontal plow pivotal mount located adjacent and rearward of said hub portion,

a vertical post having upper and lower ends, the lower end of said vertical post being positively connected to said hub portion for rotation therewith and extends upwardly therefrom terminating in a free upper end, such that when said free upper end of said vertical post is inserted through said vertical bearing the hub portion provides beam working support and said flat upper surface of the mounting bracket is in close proximity and parallel to the lower surface of said horizontal beam,

said mounting bracket further including a tool mounting section that extends upwardly from said flat upper surface, means retaining said vertical post in said vertical bearing such that pivotal movement therebetween is permitted, means for fixing said plow mounting bracket relative to said main frame at selected positions, and

trip linkage means connecting the plow bottom to said mounting section.

**4,161,987**  
**TRACTOR GRADER**  
Richard G. Tolmer, Norwood, Australia, assignor to Suzanne G. Tolmer, Norwood, Australia, a part interest

Filed Nov. 14, 1977, Ser. No. 850,962

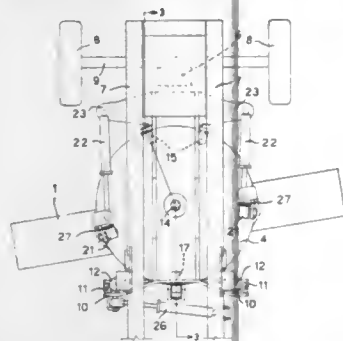
Claims priority, application Australia, Nov. 15, 1976, PC8146  
Int. Cl.<sup>2</sup> E02F 3/76

U.S. Cl. 172—791

3 Claims

1. A grader comprising a tractor with an elongated chassis, said grader including a grader blade on a turntable, characterized in that said turntable comprises a lower plate to which the blade is attached, and a co-operating upper plate, said lower

plate being supported by a plurality of spaced rollers engaging the lower surface of the lower plate, said rollers being mounted in brackets carried by said upper plate, said upper plate being supported by a frame universally mounted at its forward end to the forward portion of the tractor, and at its rearward end by a plurality of spaced lift rams acting between said turntable and support members fixed to said chassis, said frame at its forward end including a cross member, hydraulic rams for angling said



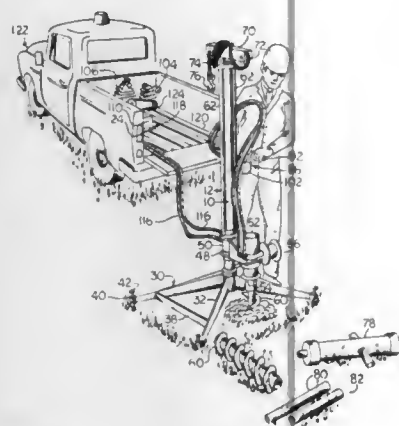
blade extending from said cross member to further brackets on said blade, said further brackets for said angling rams extending upwardly and carrying rollers engaging the top surface of said upper plate, whereby operation of the angling rams causes relative rotation of the lower plate relative to the upper plate, scrapers being provided to deflect spoil from the upper plate in the path of said rollers as said lower plate rotates relative to the upper plate.

**4,161,988**  
**PORTABLE EARTH CORE SAMPLING MACHINE**  
Ronald D. Hart, 1695 One Washington Plz., Tacoma, Wash. 98402

Filed Dec. 5, 1977, Ser. No. 857,391  
Int. Cl.<sup>2</sup> E21C 9/00

U.S. Cl. 173—32

10 Claims



1. A portable machine for drilling into the earth and taking earth core samples during soil testing operations, comprising:
  - (a) a fluid cylinder subassembly comprising in turn: a fluid cylinder, serving also as the principal stationary body portion of this portable machine, a piston rod, serving also as the principal extendable body portion of this portable machine; an elongated guide member firmly secured to the outside of the fluid cylinder, between fluid ports located at both the top and bottom of the fluid cylinder; a transverse header box having a sheave mounted at each of its ends and in turn mounted on the extending end of the piston rod; and a base secured to the fluid cylinder to position the fluid cylinder subassembly on the earth while taking earth core samples;
  - (b) a traveling support subassembly for a fluid power unit subassembly comprising, in turn, a partial sleeve to be

guided up and down the outside of the fluid cylinder and kept from turning by the elongated guide member; power transmitting tie rods secured between partial sleeve and the transverse header box, whereby the traveling support subassembly moves along the exterior of the fluid cylinder in direct relation to the movement of the piston rod in and out of the cylinder; and a guide for the tie rods secured to the fluid cylinder at its end, from which the transverse header box is raised and lowered upon movement of the piston rod;

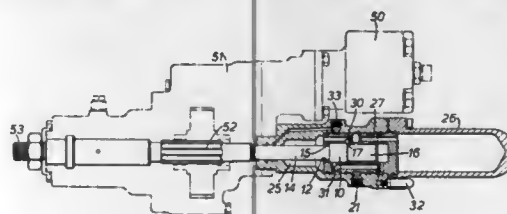
- (c) a fluid driving power unit subassembly, mounted on the traveling support subassembly, comprising in turn a driving fluid motor and its attachment accessories to secure and to rotate a hollow core digging auger, and to secure and to rotate, alternatively, a capstan, to receive and to power a rope passing over the sheaves of the transverse header box, when one end of the rope is attached to a calibrated hammer used in preparing a core sample, and the other end of the rope is guided by an operator to, around, and from the capstan;
- (d) a fluid control subassembly secured to the elongated guide member at an initially selected optional height to be conveniently manipulated by an operator, comprising in turn, a four way valve to alternatively direct the fluid to the fluid motor to rotate it in respective clockwise or counterclockwise directions, and to alternatively direct fluid to the fluid cylinder, to extend or retract the piston and therefore correspondingly move the transverse header box, and also correspondingly move, via the tie rods, the traveling support subassembly on which the fluid power unit subassembly is mounted; and a fluid control valve serving alternatively as a throttle to control the speed of the fluid motor rotating a hollow core digging auger, and as a throttle to control the speed of the extension and retraction of the piston and consequently, also the transverse header box, and the fluid power unit subassembly, via the tie rods and the traveling support subassembly; and
- (e) a fluid power source and distribution subassembly, comprising, in turn, a fluid pump; a motor to drive the fluid pump; a fluid tank; a housing to secure together the fluid pump, motor, and tank in a conveniently handled power pack; and fluid hoses and fittings to conduct fluid to and from the often remotely located power pack, during distribution of the fluid via the fluid control subassembly to the fluid cylinder subassembly and to the fluid driving power unit subassembly, when earth core samples are being taken during soil testing operations.

**4,161,989**  
**RECIPROCATING HYDRAULIC MOTORS**  
Antony D. Barber, Truro, England, assignor to CompAir Construction & Mining Limited, Camborne, England  
Filed Oct. 4, 1977, Ser. No. 839,190  
Claims priority, application United Kingdom, Aug. 10, 1976, 41967/76

Int. Cl.<sup>2</sup> B25D 9/00

U.S. Cl. 173—105

10 Claims



1. A reciprocating hydraulic motor including a cylinder, a piston mounted to reciprocate in the cylinder and having opposed faces exposed respectively to the pressure in a com-

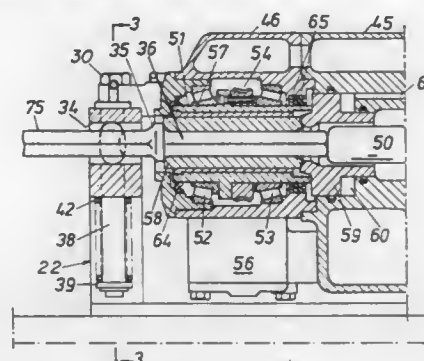
pression chamber and the pressure in a biasing chamber communicating permanently with a constant supply pressure so that reciprocation of the piston alternately increases the biasing chamber and vice versa, and means defining ports controlled by the piston to connect the compression chamber directly to a pressure supply throughout one end portion of a stroke, and to connect the compression chamber directly to exhaust throughout an opposite end portion of the stroke, and throughout a compression-expansion travel between these end portions to cut off the compression chamber from all external connection so that the liquid in it alternately expands over a higher range of pressure and is compressed over a lower range of pressure.

**4,161,990**  
**ROCK DRILLING APPARATUS**  
Bo E. Forsberg, Vällingby, and Carl G. B. Ekwall, Saltsjöbaden, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 31, 1977, Ser. No. 847,043  
Claims priority, application Sweden, Nov. 4, 1976, 7612275  
Int. Cl.<sup>2</sup> B25D 9/00

U.S. Cl. 173—105

12 Claims



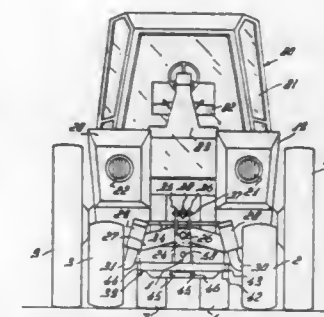
1. Rock drilling apparatus comprising:
  - a feed beam (11);
  - a slide (12) axially displaceable along said feed beam;
  - a motor (19) coupled to said slide for axially displacing said slide along said feed beam;
  - a hammer drill (13) mounted to said slide (12) for axial displacement along said feed beam (11), said drill (13) being pivotably mounted at its rear end on said slide (12) by means of a transverse hinge connection (20-25);
  - said drill (13) comprising a housing having a main portion (45) in which an impact motor (50) is located and a detachable front portion (46) including a motor and gearing unit, said front portion being detachable from said main portion; said motor and gearing unit of said front portion including bearings (52,53) and sealing rings (64, 65) in front of and at the rear of said bearings, said sealing rings protecting said bearings also when the motor and gearing unit is detached from the remainder of said drill, said front portion (46) having a front aperture therein for receiving the rear end (36) of a drill string (75), the drill string (75) being freely insertable in and retractable out of said front aperture; and
  - said slide (12) comprising retainer means (37, 38; 73) for preventing the drill string (75) from being pulled out of said drill.

**4,161,991**  
**TRACTORS**  
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland  
Continuation of Ser. No. 683,940, May 6, 1976, Pat. No. 4,131,170. This application Jun. 28, 1978, Ser. No. 919,854  
Claims priority, application Netherlands, May 12, 1975, 7505526

Int. Cl.<sup>2</sup> B60K 17/28, 5/08

U.S. Cl. 180—53 FE

10 Claims



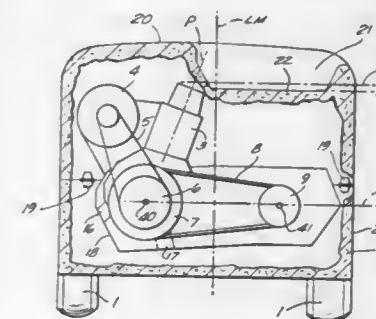
1. A tractor for agricultural purposes which comprises: a frame; a pair of front ground engaging wheels and a pair of rear ground engaging wheels mounted on said frame and providing support therefor; a lifting device mounted on the front of said frame and a further lifting device mounted on the rear of said frame; a driver's seat mounted on the same frame which is relatively remote from said front lifting device and proximate to said rear lifting device whereby an operator in said seat has a substantially unobstructed view of said rear lifting device; and a pair of engines operatively connected to said rear wheels, one of said engines mounted on each side of said frame whereby they are parallel to and spaced on either side of the longitudinal center line of the tractor, said engines being completely forward of said driver's seat and so positioned and spaced apart whereby an operator in said seat has a substantially unobstructed view of said front lifting device in a line-of-sight passing between said engines.

**4,161,992**  
**VEHICLE WITH INTERNAL-COMBUSTION ENGINE**  
Theodor Abels, and Bernhard Gütz, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany  
Filed Dec. 28, 1977, Ser. No. 865,299  
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659282

Int. Cl.<sup>2</sup> B60K 17/10

U.S. Cl. 180—306

8 Claims



1. A vehicle comprising:
  - a chassis having a vertical longitudinal median plane extending in the direction of travel of the vehicle;
  - a piston-type internal-combustion engine having a crankshaft extending parallel to said plane; and



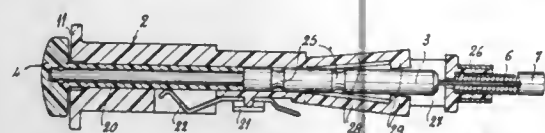
a hydrostatic transmission including a hydrostatic pump and at least one hydrostatic motor connected to a wheel of the vehicle for propelling same, said pump having a shaft extending parallel to said longitudinal median plane and connected to said crankshaft by a force transmission element, said crankshaft having a central plane disposed out of the longitudinal median plane and to one side thereof, said pump being disposed on the opposite side of said longitudinal median plane and directly alongside said engine.

**4,161,993**  
**SAFETY-TYPE DASHBOARD CONTROL FOR CHOKE OR THE LIKE**

Alain Pitrat, Mours Saint-Eusebe, France, assignor to Societe Anonyme des Equipements S.E.I.M., Romans, France  
Filed Oct. 3, 1977, Ser. No. 838,759  
Claims priority, application France, Oct. 1, 1976, 76 30655  
Int. Cl.<sup>2</sup> B60K 37/06

U.S. Cl. 180—90

10 Claims



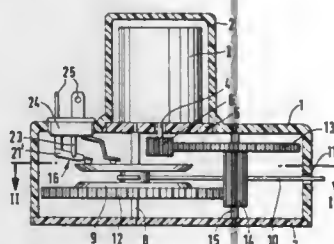
1. A control assembly for a controlled element displaceable longitudinally with respect to a support, said assembly comprising:

- a guide secured to said support and defining a longitudinally extending guide passage, said guide having a laterally elastically deflectable finger having an abutment portion normally lying in said passage but laterally elastically deflectable out of said passage;
- a longitudinally extending rod having a rear end connectable for joint longitudinal displacement with said controlled element and bearing longitudinally backwardly on said portion in an intermediate position and a front end, said rod being displaceable forwardly from said intermediate position away from said portion for adjustment of said controlled element and being displaceable backwardly from said intermediate position with lateral elastic deflection of said portion on forcible backward depression of said front end; and
- a control knob on said front end spaced from said support in said intermediate position of said rod.

**4,161,994**  
**SPEED REGULATING DEVICE FOR MOTOR VEHICLES**  
Harald Collonia, Königsteln, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany  
Filed Feb. 27, 1978, Ser. No. 881,679  
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709164

Int. Cl.<sup>2</sup> B60J 23/00  
U.S. Cl. 180—179

6 Claims



1. In a motor vehicle speed regulating device having an adjusting device with a movable setting element for connec-

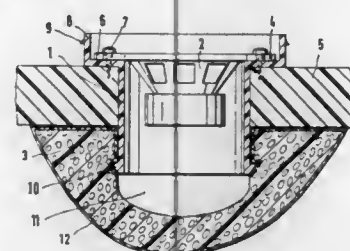
tion to a throttle valve of an engine to adjust the air/fuel mixture and thereby adjust the speed of the engine, and an electrical regulator for comparing a reference signal representative of a desired speed and a signal representative of actual speed and detecting a deviation therebetween and producing a control signal dependent on the deviation, and connected with the setting element to cause movement of the setting element in response to a detected deviation, the improvement comprising variable impedance means carried by the setting element and including movable electrical contact means for producing a changed impedance dependent upon a changed position of the setting element and conducting the changed impedance to the electrical regulator, said variable impedance means including a lost motion means whereby the setting element must move a predetermined extent before a changed impedance is produced, thereby avoiding oscillation or hunting of the speed regulating device.

**4,161,995**  
**LOUDSPEAKER HOUSING FORMING A CLOSED, DAMPED SYSTEM, PARTICULARLY FOR AUTOMOTIVE INSTALLATION**

Gottfried Pohlmann, Schellerten, and Egon Schneider, Hildesheim, both of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany  
Filed Aug. 8, 1977, Ser. No. 822,949  
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637487

Int. Cl.<sup>2</sup> H05K 5/00; G10K 10/00  
U.S. Cl. 181—150

19 Claims

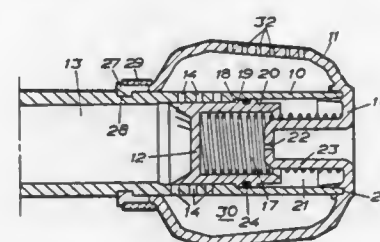


1. A vehicle loudspeaker housing for combination with and to receive and hold a loudspeaker, intended for installation on a panel, cover or the like formed with an opening therein comprising

- two separate, connectable housing elements,
- one element comprising a hollow open sleeve-like dimensionally and form stable essentially tubular element (1, 1') insertable and fitting in the opening of the panel (5, 5', 5'') having two open ends and dimensioned to laterally surround the loudspeaker,
- means located at one end of said tubular element extending laterally therefrom to overlap the panel;
- means to attach said tubular element to the panel;
- attachment means (4, 8', 18') for the loudspeaker (2, 2', 2''), formed on said tubular element at one end thereof, the loudspeaker, upon attachment, closing off said one end, and the second element comprising
- a housing body element (3, 3', 3'') having an essentially airtight covering and foamed plastic material located therein, engaged over the circumference of the outside of the hollow sleeve-like tubular element (1, 1', 1'') on the rear side of the panel (5, 5', 5'') at the other end thereof, said housing body element having a closed end section and forming a chamber (11, 11') behind said hollow sleeve-like body; and
- cooperating connecting means disposed at the rear side of the panel and towards the other end of the tubular element (1, 1', 1'') to firmly and essentially air-tightly secure the housing body element and the tubular element together to form a closed, damped system.

**4,161,996**  
**EXHAUST MUFFLER**  
Miroslav Dolejsi, Johanneshov, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden  
Filed Jan. 23, 1978, Ser. No. 871,393  
Claims priority, application Sweden, Jan. 21, 1977, 7700621  
Int. Cl.<sup>2</sup> F01N 1/20; F16K 17/00  
U.S. Cl. 181—230

16 Claims



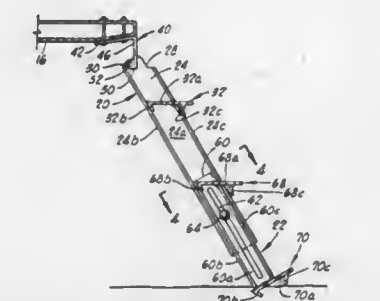
1. An exhaust muffler for pressure gas driven motors, comprising:

- exhaust gas receiving means adapted to be coupled to an exhaust outlet of a pressure gas driven motor;
- a variable flow restricting passage (14) coupled to said exhaust gas receiving means;
- a spring biased valve body (12) in communication with said exhaust gas receiving means and with said variable flow restricting passage (14) and responsive to the actual exhaust gas pressure to maintain a constant pressure drop across the exhaust muffler by continuously adapting the area of said variable flow restricting passage (14) to the actual exhaust pressure; and
- a vibration dampening means (21, 22) associated with said valve body (12) for preventing resonance oscillation of said valve body, said vibration dampening means comprising a chamber (21) partly defined by said valve body (12); and a restriction opening (22) connecting said chamber (21) to the atmosphere.

**4,161,997**  
**SELF-STORING STEP STRUCTURE FOR VEHICULAR MOUNTING**

Thomas W. Norman, 2817 NW. 64th St., Oklahoma City, Okla. 73112  
Division of Ser. No. 578,155, May 16, 1975, Pat. No. 4,021,071.  
This application Mar. 2, 1977, Ser. No. 773,522  
Int. Cl.<sup>2</sup> E06C 5/04  
U.S. Cl. 182—93

3 Claims



1. A self-storing step structure comprising:  
a first, upper step section including a pair of spaced rails of C-shaped cross-section;  
means for pivotally connecting said first step section to a vehicle for pivotation about a horizontal axis between an operative position and a storing position;  
an extensible, lower step section including a pair of spaced rails of C-shaped cross-section slidably registering with, and nesting within, the rails of said first step section, and having a step member extending between, and engaged

with, the rails of said extensible step section, said step member comprising:  
a step platform;  
a rear web secured to said step platform along one edge thereof;  
a forward web secured to said step platform along the second edge thereof and extending parallel to said rear web along the length of said step platform, said forward web being angled to the plane of said step platform and slidably resting upon the spaced rails of said first step section whereby weight imposed upon said step member is distributed in part to said first step section via said forward web and in part to said extensible step section via said step platform; and  
means for adjustably interlocking said first step section with said extensible step section.

**4,161,998**  
**FIRE ESCAPE DEVICE**  
Richard C. Trimble, 1600 Gateway East #175, Richmond, Va. 23229  
Filed Dec. 22, 1977, Ser. No. 863,422  
Int. Cl.<sup>2</sup> E06C 1/36, 1/56; A63B 7/04  
U.S. Cl. 182—190

9 Claims



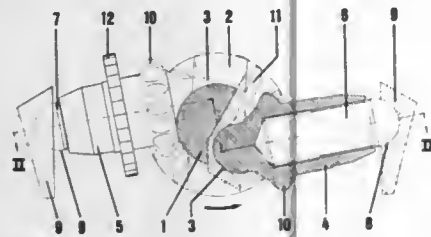
1. A fire escape device designed to depend vertically from a building comprising in combination a thin elongated flexible rope-like support of uniform diameter having a multiplicity of beads with holes bored therethrough, each about 4 to 5 inches in diameter spaced along substantially the entire length of said support, supporting each other, and freely movable thereon, horizontal rods having a length about two times the diameter of said beads attached to said rope-like support above and below said beads on said support, and grasping hook means attached to at least one end of said support for attachment of said fire escape device to a supporting means on a building.

**4,161,999**  
**AUTOMATIC SLACK ADJUSTER**  
Sven E. Camph, Malmo, Sweden, assignor to Camph Engineering Company AB, Malmo, Sweden  
Filed Dec. 12, 1977, Ser. No. 859,735  
Claims priority, application Sweden, Dec. 27, 1976, 7614550  
Int. Cl.<sup>2</sup> F16D 65/56  
U.S. Cl. 188—196 BA

3 Claims

1. An automatic slack adjuster for maintaining a predetermined slack in a brake force transmission comprising a key shaft carrying an angularly movable key flat arranged between two brake shoe engaging compression force transmitting elements adapted to be moved in the direction away from each other upon turning of said key flat during brake application, each of said compression force transmitting elements being designed as a key engaging sleeve part threaded on a brake shoe engaging bolt part, the parts of each element engaging said key being interconnected via a gear wheel journaled coaxially to said key shaft, a spring disc being provided to

engage a toothed surface on said sleeve to cause rotation of the interconnected parts of the said elements in case the angular movement of the key shaft exceeds a predetermined angle, characterised in that said spring engaged disc is designed as a spring mounted on the end surface of said key shaft adjacent to



said gear wheel, said spring carrying an axially protruding stop member adapted to resiliently engage said toothed surface and to slide on said toothed surface on one of said parts in case of relative angular displacement of the gear wheel and the force transmitting elements.

4,162,000

## SPRAG FOR ONE-WAY CLUTCHES

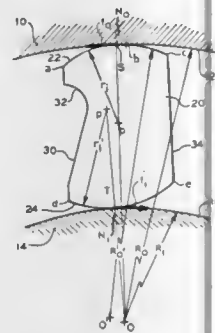
Thaddeus F. Zlotek, Warren, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed May 31, 1977, Ser. No. 801,816

Int. Cl.<sup>2</sup> F16D 41/07

U.S. Cl. 192—41 A

3 Claims



1. In a one-way clutch including an outer race having an inner surface and an inner race having an outer surface, the inner surface and the outer surface defining an annular space therebetween, a plurality of tiltable elements disposed circumferentially within the annular space adapted to connect the inner and outer races during relative rotation thereof in one direction and to permit relative rotation thereof in the opposite direction, said elements having camming surfaces being arcs having laterally spaced centers located within the profile of said elements and at least one of said camming surfaces having a portion formed on an arc of a radius with a center point outside the profile of said elements.

4,162,001

## FREE RING SYNCHRONIZER HAVING OPPOSITELY ACTING SPRING MEANS

Kenneth B. Yant, Oregon, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 16, 1977, Ser. No. 852,124

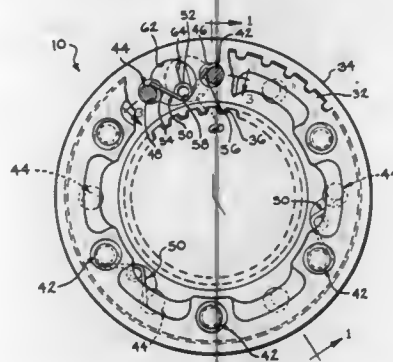
Int. Cl.<sup>2</sup> F16D 23/06

U.S. Cl. 192—53 E

6 Claims

1. A synchronizing device comprising: first and second axially spaced friction rings, an axially shiftable coupling collar disposed between said friction rings, said coupling collar having spaced first and second openings and guide means located between said openings, a pin fixed to and extending axially from each of said friction

rings, each of said pins passing through one of said first and second openings,



a torsion spring disposed in said guide means having a coiled center section and oppositely directed leg portions radially extending from each end of said coiled center section and yieldingly engaging said pins.

4,162,002

## FRICTION CLUTCH

Oswald Dubiel, and Dieter Pretzel, both of Buhl, Fed. Rep. of Germany, assignors to LuK Lammen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany

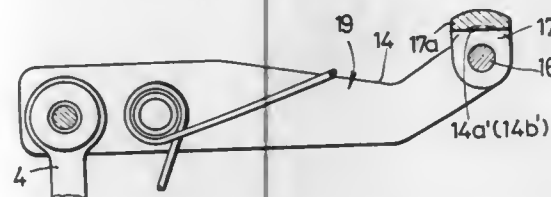
Filed Sep. 27, 1977, Ser. No. 836,974

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643863

Int. Cl.<sup>2</sup> F16D 23/00

U.S. Cl. 192—99 A

18 Claims



1. Friction clutch having a housing and levers mounted on the housing for actuating at least one pressure plate, the levers engaging the pressure plate through a connecting linkage, the levers being formed of at least two sheetmetal members and at least two connecting members firmly linking said sheetmetal members to one another, the levers being disposed radially to the housing and carrying, in vicinity of the inner radial end thereof and between said sheetmetal members thereat, a run-up member responsive to the action of an actuating member for actuating the pressure plate, said run-up member being of T-shaped construction including two beam parts overlapping end regions of said sheetmetal members.

4,162,003

## READY-FOR-USE RAPID TEST PACKAGE FOR SEROLOGICAL TESTS

Dezsö I. Bartos, Buchenweg, 5024 Pulheim, Fed. Rep. of Germany, and Jerzy Rybczynski, Kolding, Denmark, assignors to Dezsö Istvan Bartos, Pulheim, Fed. Rep. of Germany

Continuation of Ser. No. 793,653, May 4, 1977, abandoned,

which is a continuation of Ser. No. 693,801, Jun. 7, 1976, abandoned, which is a continuation of Ser. No. 483,659, Jun. 27, 1974, abandoned. This application Mar. 16, 1978, Ser. No. 888,041

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1973, 2333434

Int. Cl.<sup>2</sup> B65D 25/08; F26B 5/04, 5/06; G01N 31/00

U.S. Cl. 206—219

4 Claims

1. A disposable package comprising a chemically inert transparent reaction vessel for performing a serological complement fixation test which contains reactants for said test comprising an antigen or antibodies to the antigen to be detected, hemolytic amoceptor and complement, said reactants being preserved in said vessel in frozen or freeze-dried form, each having been deep frozen or freeze-dried to form a separate layer or having been deep frozen or freeze-dried in separate areas of said vessel.

4,162,004

## CARRYING CASE

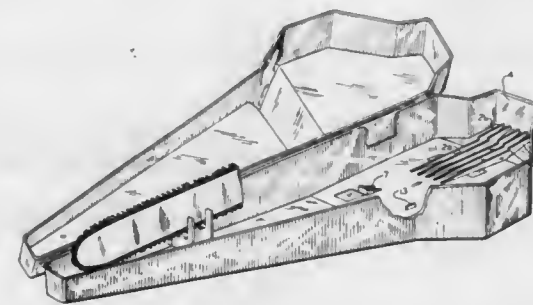
William E. Thomas, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 28, 1977, Ser. No. 865,142

Int. Cl.<sup>2</sup> B65D 85/54; A45C 11/26

U.S. Cl. 206—349

17 Claims



1. A case adapted to receive and to store an object within it in a fixed position, thus preventing undesirable motion of that object in said case, which comprises in said case a stop, lug or block protruding from a wall of said case into its interior so positioned and adapted as to coact with a portion of said object that motion of that object toward said block is arrested when said portion of said object is in contact with a portion of said block, and an inclined surface within the interior of said case removed from said stop to provide between said surface and said stop a space to receive at least a portion of said object, said surface facing said portion of said stop and being otherwise so positioned and adapted as to coact with another portion of said object to urge it by virtue of its weight upon said inclined surface toward said portion of said stop.

4,162,005

## ARTIST BRUSH BOX

Harrison K. Linger, 7412 Springvale Dr., Louisville, Ky. 40222

Filed Dec. 12, 1977, Ser. No. 859,444

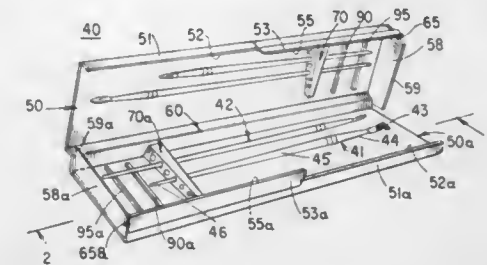
Int. Cl.<sup>2</sup> A46B 17/00; B65D 77/26

U.S. Cl. 206—362

10 Claims

1. A container for artist brushes having elongated tapered handles, said container comprising a pair of elongated panels hingedly interconnected along inner longitudinal edges thereof, two support members respectively disposed on said panels adjacent to opposite ends thereof and extending transversely thereof, each of said support members including two

inclined walls spaced apart longitudinally of the corresponding panel and disposed at predetermined angles with respect thereto, said inclined walls of each said support member respectively having like-sized holes therethrough forming a pair of holes having the centers thereof lying along a common axis extending longitudinally of the corresponding panel substantially parallel thereto, each said pair of holes being adapted to receive therethrough a brush handle of a predetermined size until the peripheral edges of the holes of said pair of holes engage the handle firmly to hold it in place with the handle tip disposed at a predetermined location between the corresponding support member and the adjacent end of the corresponding panel, each of said panels including a first rail disposed thereon between said predetermined location and the adjacent end of said panel substantially parallel to the corresponding support member and extending a short distance above the lower ends of the corresponding pair of holes, each of said panels including a second rail disposed thereon between the corresponding first rail and the adjacent end of said panel substantially parallel to said first rail and extending thereabove, each of said first and second rails of each panel being engageable with a brush han-



dle smaller than said predetermined size for elevating the handle and inclining it with respect to said axis to urge the handle into engagement with the peripheral edges of the corresponding pair of holes before the handle extends beyond the adjacent end of the corresponding panel, each of said panels having a side wall extending therefrom substantially normal thereto along the outer longitudinal edge thereof in the direction of the corresponding support member, each of said panels including an end wall extending therefrom substantially normal thereto adjacent to the end thereof nearest the corresponding support member in the direction of and above said side walls, said panels being hingedly movable between a substantially coplanar open configuration wherein associated brushes are insertable through the open ends of said panels and a closed configuration with one of said panels overlying the other substantially parallel thereto and cooperating with said side walls and said end walls to form a closed container, and latch means on said side walls for latching said panels in the closed configuration thereof, whereby different size handles can be held by each of said support members within the confines of said container.

4,162,006

## MAGNETIC DISKETTE MAGAZINE

David R. Wilson, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,435

Int. Cl.<sup>2</sup> B65D 85/30

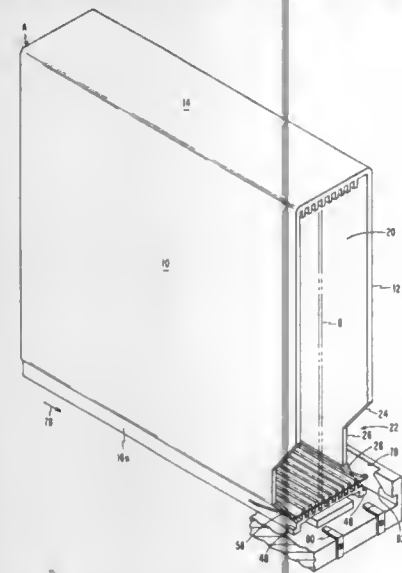
U.S. Cl. 206—444

2 Claims

1. A magazine for containing a series of thin, flat, rectangular articles of a type subject to warpage and disposed in the magazine in vertical, spaced disposition comprising: a magazine bottom, top panel and end panel effectively connected together and leaving the other end of the magazine open through which the articles may be withdrawn, and a series of vertically aligned ribs within said magazine bottom and top panel extending longitudinally of said bottom



and top panel and providing pairs of vertically aligned grooves having parallel root portions so that the grooves may receive said articles and hold them vertical and spaced with respect to each other, said grooves on said bottom being relatively narrow so as to accurately hold the bottom edges of said articles in spaced disposition so that a clothespin like picker device movable in a predetermined path close to and parallel with the bottom edges of said articles may reliably grip selected



ones of the articles prior to pulling them out of the magazine, said grooves within said magazine top panel being relatively wide in comparison with said grooves in said bottom and said end panel being plane, smooth and unribbed on its inside surface allowing warpage of said articles out of flatness with substantially no binding of said articles in the magazine to prevent their free movement out of the magazine through said open end of the magazine.

**4,162,007**  
**MAGAZINE-LID COMBINATION FOR JACKETED MAGNETIC DISKS**

Maynard E. Bothun; Curtis A. Larson; Gayland E. Lightner, and David R. Wilson, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,438

Int. Cl.<sup>2</sup> B65D 85/30, 43/12

U.S. Cl. 206—444

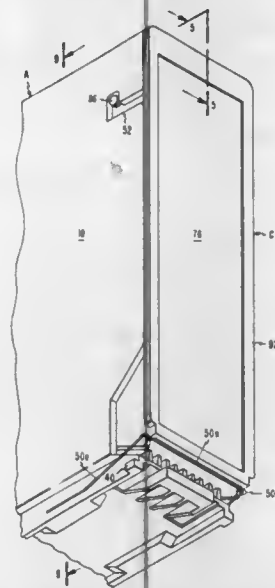
4 Claims

1. A container for disk assemblies each including a disk enclosed in a rectangular jacket, said container comprising:

- a bottom, a top panel, an end panel and a pair of side panels that connect said top and end panels and said bottom and providing the container with an opposite end that is open when unlidded,
- a lid for closing said open container end and completing the container when closing said open end,
- a plurality of spaced aligned ribs on the inside surface of said lid and said top panel and said bottom for holding the disk assemblies in the container in spaced relation with respect to each other, and

a pivotal connection of said lid on said container including a pair of aligned L-shaped notches formed in said side panels and a pair of pins provided on said lid, said L-shaped notches being disposed adjacent said top panel and remote from said bottom and including initial notch portions extending from said open end of the container and parallel with said bottom and toward said end panel and ultimate notch portions in communication with said initial notch portions and extending parallel with said end panel and toward said top panel, said pins being provided adjacent an end of said lid and entering said initial notch portions

with translatory movement of said lid to partially close said open end of the container with the ends of the ribs on the inside surface of said lid interleaving with translatory motion with said disk assemblies in the grooves between said ribs of said bottom and top panel and said lid swinging



shut on the open end of said container when said pins move upwardly in said ultimate notch portions so as to fully close said open container end and bring the ribs of the lid into full interleaving relationship with said disk assemblies.

**4,162,008**  
**SHIPPING AND DISPLAY CARTON FOR AN ELECTRIC LAMP OR SIMILAR ARTICLE, AND RESULTING PACKAGE**

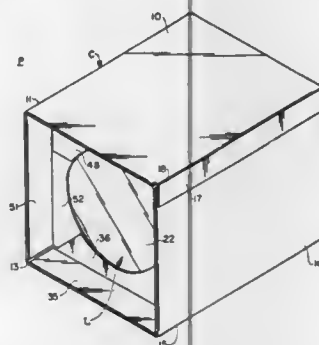
David McCalmont, Bloomfield, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1978, Ser. No. 900,944

Int. Cl.<sup>2</sup> B65D 5/50

U.S. Cl. 206—590

8 Claims



1. In a paperboard shipping and display carton for a fragile article of a type which has an end portion that is susceptible to damage by abrasion at regions where it contacts the carton, the combination comprising:

- a plurality of connected walls which define a collapsible tubular sleeve,
- a tabular member depending from each of the respective walls and held in intumed relationship with the carton by a segment which is secured to the inner surface of the associated wall, said tabular members being disposed at

the same end of the carton and each having an unattached end segment, and

means coupling the unattached end segments of adjacent tabular members in paired foldable relationship in a manner such that the end segments are automatically pulled into upstanding position by the respective walls when the collapsed carton is erected into tubular form and said end segments then constitute inwardly-projecting flanges which extend along the periphery of the carton and are adapted to engage the end portion of an article that is inserted into the carton and thus retain the article in place while exposing a part of it to view,

the unattached end segment of one of said tabular members being larger than the others and being so shaped and articulated that it constitutes an article-protective panel that lies flat within the carton, when the carton is in collapsed condition, and is pulled into upstanding position along with the unattached end segments of the other tabular members, when the carton is erected, and is thereby automatically positioned behind and in overlying relationship with each of the upstanding end segments of the other tabular members and thus constitutes a smooth continuous pad for the end face of an inserted article which shields the end face from the abrasive action of the laterally protruding end edges of said end segments of the tabular members.

**4,162,009**  
**MEANS AND METHOD FOR PACKAGING ENDLESS FABRICS**

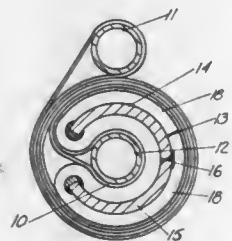
Peter Schouten, Grovedale, Australia, assignor to Huyck Corporation, Wake Forest, N.C.

Filed Apr. 10, 1978, Ser. No. 894,995

Int. Cl.<sup>2</sup> B65D 85/02, 85/672

U.S. Cl. 206—389

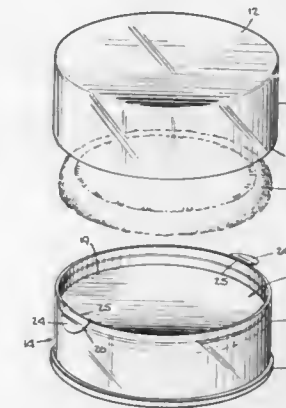
10 Claims



1. A package for endless papermaking fabrics, said package comprising an elongated endless fabric, a pair of inner cores inserted in said endless fabric at its opposite extremities, an outer core surrounding a first of said inner cores and the portion of the fabric extending around said inner core, said outer core comprising a pair of opposing semi-cylindrical sections, means hingedly connecting said sections together along a mating pair of their side edges, the opposite side edges of the sections being spaced apart to define a longitudinal slot through which the fabric projects, a layer of cushioning material interposed between the inner surface of said outer core and the fabric surrounding the first of said inner cores, the remainder of the fabric extending outwardly beyond said longitudinal slot being wound on said outer core, means extending along at least one edge of said slot acting to increase the angle of wrap of the fabric wound around said outer core, the other of said inner cores being juxtaposed to the rolled fabric, and means securing said cores together to form a package.

**4,162,010**  
**COSMETIC DUSTING POWDER CONTAINER**  
Charles J. Hovsepian, West Caldwell, N.J., assignor to Packaging Systems Corporation, Pearl River, N.Y.  
Filed Feb. 27, 1978, Ser. No. 881,539  
Int. Cl.<sup>2</sup> B65D 51/18, 11/20  
U.S. Cl. 206—823

9 Claims



1. A container of the type used for cosmetic dusting powder comprising a container body having an upstanding wall, and an insert for placement within said container body to prevent escape of the container contents, said container wall having at least one area of reduced wall thickness defining an inwardly opening recess at a lip of said wall providing a passage for the escape of air as said insert is positioned within said container body and an outwardly projecting rib extending substantially around the periphery of said insert for closing said at least one passage to seal said container when said insert is fully inserted.

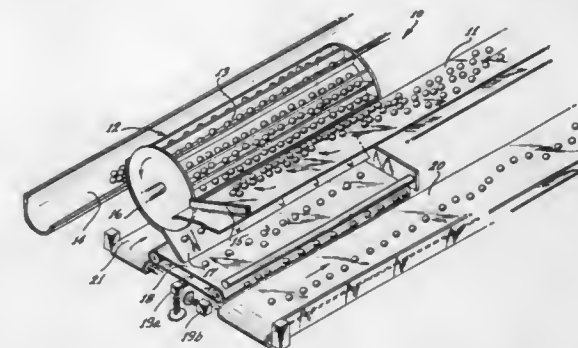
**4,162,011**  
**APPARATUS FOR SORTING FRUITS AND VEGETABLES**  
Richard L. Beach, Danville, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.

Filed Oct. 18, 1976, Ser. No. 733,397

Int. Cl.<sup>2</sup> B07C 5/00

U.S. Cl. 209—637

12 Claims



10. Apparatus for sorting firm whole specimens of fruit and vegetables from soft broken specimens comprising: means for amplifying rolling momentum and velocity of specimens to be sorted; generally horizontal conveyor means having a resilient surface for receiving specimens to which amplified rolling momentum and velocity is imparted; said means for amplifying rolling momentum and velocity of specimens being structured to deposit generally simultaneously a plurality of specimens to be sorted onto said resilient surface wherein specimens being sorted are cleared off the area of the resilient surface underlying a point of deposit of specimens before an additional plurality of specimens is deposited on said moving conveyor;

said resilient surface imparting a trampoline effect to firm specimens transported by said conveyor means; said trampoline effect imparted enabling sorting of firm whole specimens from soft broken specimens; and, means for separately collecting the sorted specimens.

**4,162,012**  
**DEVICE FOR ASSORTING INADEQUATELY WOUND COILS**

Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., München-Gladbach, Fed. Rep. of Germany

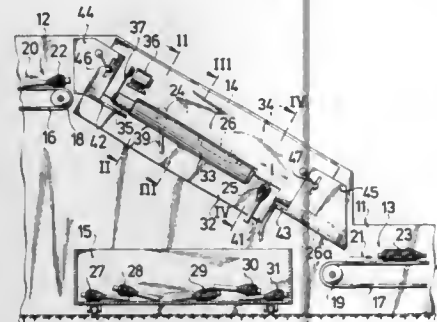
Filed Dec. 7, 1977, Ser. No. 858,385

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655561

Int. Cl.<sup>2</sup> B07C 5/12

U.S. Cl. 209—662

4 Claims



1. Device for separating-out inadequately wound coils from coils conveyed individually and serially by at least one of an horizontal and inclined conveyor in direction of the longitudinal axis of the coils comprising means defining at least one coil support surface for the coils disposed at a section of the conveyor, said support surface being formed with at least one sorting opening widening in conveyance direction of the conveyor, said sorting opening having a starting width greater than the diameter of the coil cores but smaller than the diameter of an adequately wound coil, said sorting opening in said conveyance direction widening to an opening section having a width greater than that of the coil diameter, said widened opening section of said sorting opening having a length shorter than the length of an adequately wound coil.

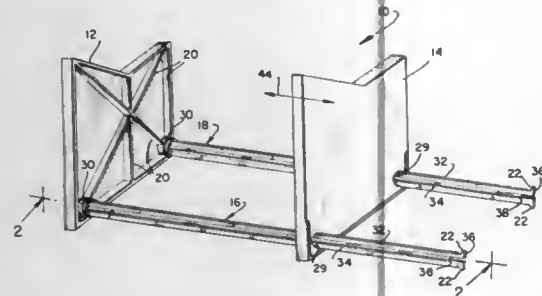
**4,162,013**  
**BOOK RACK**  
Larry H. Tucker, Engelwood Cliffs, N.J., assignor to Concepts For Children, Inc., Englewood Cliffs, N.J.

Filed Feb. 6, 1978, Ser. No. 875,340

Int. Cl.<sup>2</sup> A47B 65/00

U.S. Cl. 211—43

6 Claims



1. An adjustable rack assembly for books or like items comprising first and second supports alignable in parallel spaced relationship; and corresponding first and second end plaques removably mountable on first and second supports, respectively;

said first and second end plaques being mountable on each of said first and second supports each extending substantially normal to a plane through said first and second supports; each of said first and second end plaques comprising a substantially planar plastic web having first and second major planar surfaces, each in a plane substantially parallel to its respective web, and each web including corresponding first and second channel members having respective first and second channels therein, said first and second supports being introduceable into said channels for mounting each of said first and second end plaques on said first and second supports; said first and second supports including first means cooperable with said first and second channel members on said first and second end plaques for releasably engaging opposite ends of said first and second supports, respectively, to said first and second end plaques, said means comprising respective discrete pairs of resilient legs mounted on each end of each of said first and second supports, and corresponding pairs of feet emergent from said legs, said feet being aligned and emergent at relative normals to said legs, each of said discrete pairs of legs having a slot defined therebetween, said respective feet of each discrete pair having a distance therebetween which exceeds the height of each of said channels, said respective discrete pairs of legs having a flex characteristic under a linearly applied pressure for introduction of said discrete pairs of resilient legs through a respective channel in said end plaques, each of said feet having a cammed surface corresponding to a cam profile of said channel; and said first and second supports including second means cooperable with said first means for fixing the position of said first end plaque on said first and second supports, said second end plaque being slidable on said first and second supports and telescopic thereon relative to said first end plaque.

**4,162,014**  
**VERTICAL FILE CONSTRUCTION**  
Mitchell Bobrick, Los Angeles, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.

Filed May 16, 1977, Ser. No. 797,335

Int. Cl.<sup>2</sup> A47F 7/00

U.S. Cl. 211—50

7 Claims



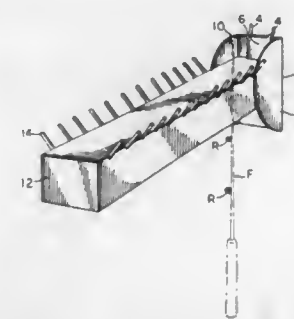
1. In a vertical letter file adapted to be mounted on a supporting surface, the combination of: a primary tray member having parallel sidewalls, a front wall and a bottom wall, support means on the uppermost extremity of said sidewalls for mounting said tray on said supporting surface, and detent means on said sidewalls; and a secondary tray member having parallel sidewalls, a front wall and a bottom wall connected to said sidewalls and detent means on said sidewalls engageable with the detent means on said primary tray member, said detent means on said sidewalls of said secondary tray member being displaceable by said primary tray member and engageable with the detent means thereof by springing into engagement therewith.

able with the detent means thereof by springing into engagement therewith.

**4,162,015**  
**DISPLAY FOR FISHING RODS**  
Bill J. Hodges, deceased, late of Atoka, Okla. (by Bernice G. Hodges, executrix), assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest  
Filed Jun. 22, 1977, Ser. No. 808,827  
Int. Cl.<sup>2</sup> A47F 5/00

U.S. Cl. 211—87

2 Claims



1. A display for fishing rods, said display comprising a mounting member, a plurality of support hook means extending upwardly from said mounting member rearwardly thereof and again upwardly to facilitate engagement with a pegboard, stabilizing hook means extending from said mounting member and adapted to engage said pegboard, a rigid base member extending outwardly from and substantially normal to said mounting member, said mounting member being provided with wing portions extending forwardly, one wing portion disposed on either side of said base member, said wing portions being in contact with said base member substantially the entire forwardly extending length of said wing portion, said base member comprising an elongated hollow box-like member, the sides of said box-like member being substantially parallel to the force of gravity, a first row of thin elongated projections extending outwardly and upwardly from a first upper corner of said box-like member, and a second row of thin elongated projections extending outwardly and upwardly from a second upper corner of said box-like member, said projections being adapted to slidably receive a fishing line guide ring of a fishing rod, said first and second rows of projections extending from opposite sides of said base member and extending in directions away from each other.

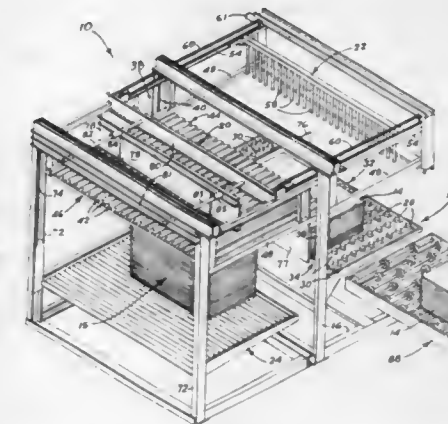
**4,162,016**  
**ARTICLE STACKER WITH OVERHEAD FINGER RAKE**  
Robert A. Schmitt, Vancouver, Wash., assignor to Columbia Machine, Inc., Vancouver, Wash.  
Filed Apr. 3, 1978, Ser. No. 893,004  
Int. Cl.<sup>2</sup> B65G 57/10

U.S. Cl. 414—85

5 Claims

1. Article stacking apparatus comprising a layer-arranging table, the upper surface of which is formed by a plurality of laterally-spaced article support members defining channels therebetween, a transfer carriage horizontally adjacent said layer-arranging table, the upper surface of said carriage being formed by a plurality of laterally-spaced elongate slats defining channels therebetween, and an overhead rake horizontally shiftable between a first position overlying said layer arranging table, and a second position overlying said transfer carriage, said rake including a plurality of laterally-spaced tines having downwardly projecting ends which are positioned to extend into said channels of said layer-arranging table and said

wardly projecting ends which are positioned to extend into said channels of said layer-arranging table and said

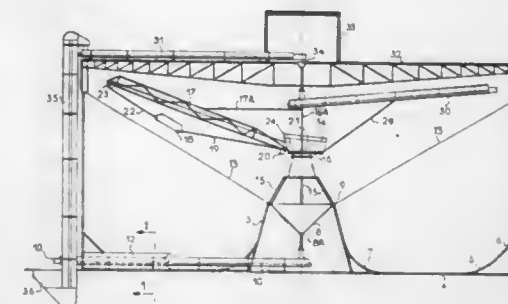


transfer carriage as said rake is shifted horizontally between its first and second positions.

**4,162,017**  
**GRANULAR OR PULVERULENT PRODUCT STORING AND HANDLING INSTALLATION**  
Gustave M. Noyon, Paris, France, assignor to Societe Internationale d'Investissements et de Participations par abreviation INTERPAR, Paris, France  
Filed Jan. 10, 1977, Ser. No. 760,769  
Claims priority, application France, Jan. 13, 1976, 76 00674  
Int. Cl.<sup>2</sup> B65G 47/00

U.S. Cl. 414—313

20 Claims



1. An installation for storing and handling a granular or pulverulent product, comprising a store, a vessel located within the store and for storing the product and comprising a floor and upwardly extending wall means joined to the floor for retaining said product inside the vessel, said wall means including a wall which is upwardly and outwardly inclined relative to the interior of the vessel and defines an upper edge, at least one handling apparatus for extracting the product from the vessel and comprising a movable frame located outside the vessel adjacent said inclined wall, a rigid boom which is mounted on the frame to be movable relative to the vessel so that an end of the boom remote from said frame is movable in a path which is adjacent a region of the vessel laterally remote from the inclined wall and is higher than said edge, a dragline including a raking scoop and movably mounted on the boom so that the scoop is movable between a first position in which the scoop is adjacent said edge of said inclined wall and a second position in which the scoop is adjacent said end of the boom remote from the frame, means for shifting the dragline and scoop in an active scooping direction from said second position to said first position of the scoop to cause said product to pour over said edge of the inclined wall for reception by product discharge means and means for shifting the dragline and scoop in a return direction from said first position to said second position.



second position, and means for pouring said product into the vessel and located in said region and positioned higher than said edge of the inclined wall and adjacent said path of said end of the boom whereby a heap of said product can be formed in the vessel which has a natural slope which is downwardly inclined from said region to said edge of the inclined wall.

**4,162,018**  
**METHOD FOR CONTAINER LOADING AND UNLOADING**

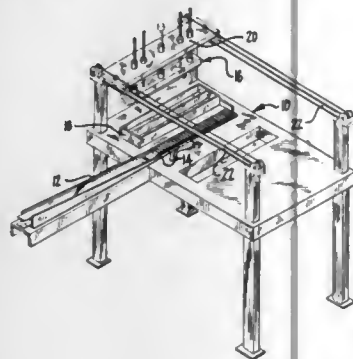
Satya P. Arya, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Continuation of Ser. No. 790,588, Apr. 25, 1977, abandoned, which is a continuation of Ser. No. 658,391, Feb. 17, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,438

Int. Cl.<sup>2</sup> B65G 47/91

U.S. Cl. 414—786

3 Claims



1. A method of loading or unloading elongated cylindrical radioactive nuclear fuel rods disposed in side-to-side relation to or from each of three separate locations, at least one of said locations having a container with four upstanding sidewalls, said method comprising the steps of:

supporting said container on a stationary surface for loading an array of cylindrical fuel rods into or unloading of an array of articles from said container,

supporting an array of cylindrical fuel rods on a stationary support surface at a second location in side-by-side relationship with their cylindrical surface being uppermost, shifting a bridge means horizontally and operating switch means when said hand is in alignment with each one of said three separate locations,

after operating a switch indicating alignment with said first location, lowering a transfer hand having a plurality of suction surfaces for holding the cylindrical surfaces of said fuel rods in an array and in side-by-side relation within an open space defined by said four upstanding walls of said container,

operating a switching means to stop further downward movement of said transfer hand when said transfer hand and array are located at the proper height in said container depending upon the number of layers in said container,

decreasing the vacuum in said transfer hand to release said nuclear fuel rods in said container when loading fuel rods in said container, providing a vacuum sufficient to grip cylindrical surfaces of array of said nuclear fuel rods in said container when unloading said container,

raising said transfer hand from said container and above said upstanding side walls of said container,

moving said bridge means in the reverse direction to a position associated with a further switch means associated with said second location,

lowering said transfer hand toward said support surface and decreasing said vacuum in said transfer hand means to deposit an array of side-by-side fuel rods at said support surface when depositing fuel rods at said second location, increasing said vacuum in said transfer hand to lift an

array of fuel rods from said support surface when removing fuel rods therefrom, shifting said bridge means to said third location to operate a third switch means indicating alignment of said bridge means with said third location, lowering said transfer hand and increasing said vacuum in said hand to remove an array of fuel rods at said third location, decreasing said vacuum to deposit an array fuel rods at said third location, and raising said transfer hand and moving said bridge means to either said first or second locations.

**4,162,019**  
**APPARATUS FOR RECOVERING FILLER FROM SANITARY PADS**

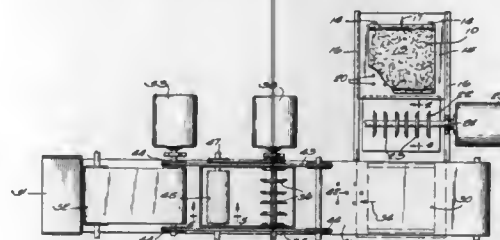
Curt G. Joa, P.O. Box 1121, Boynton, Fla. 33435

Filed Sep. 28, 1977, Ser. No. 837,125

Int. Cl.<sup>2</sup> B65G 65/04

U.S. Cl. 414—412

7 Claims



1. Apparatus for recovering filler from a sanitary pad having a film backing and a cover sheet, said apparatus comprising: a movable tray on which the pad can be laid out flat, a cutter to which the movable tray will advance the pad to cut open the cover sheet to expose the filler, means for sucking the filler and the cut cover sheet from the film backing for salvage, and means for disposing of the film backing.

**4,162,020**  
**ANTI-SPILL DEVICE**

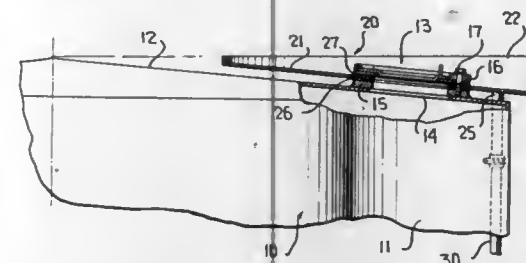
Edward O. Kirkland, Riverton, Wyo., assignor to Donald K. Smith, Sterling, Colo.

Filed Jun. 3, 1977, Ser. No. 803,277

Int. Cl.<sup>2</sup> B65D 25/20, 25/56

U.S. Cl. 220—1 B

6 Claims



1. A storage tank assembly comprising a storage tank having a roof and an upstanding wall, and a hatch with an openable cover carried by said roof adjacent an edge of said roof, said hatch and said roof having mating mounting flanges, and an anti-spill device associated with said hatch for collecting spillage through said hatch, said anti-spill device including a pan having a bottom wall interposed between said hatch mounting flange and said roof mounting flange, said bottom wall of said pan having an access opening therethrough aligned with said hatch and an upstanding peripheral wall, and drain means connected to said pan.

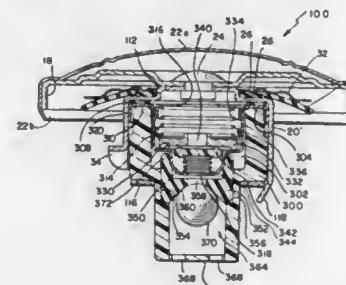
**4,162,021**  
**PRESSURE-VACUUM RELIEF FUEL TANK CAP WITH ROLL-OVER SAFETY VALVE FEATURE**  
Billy G. Crute, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 548,035, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 510,483, Sep. 30, 1974, Pat. No. 3,938,692. This application Sep. 26, 1975, Ser. No. 616,960

Int. Cl.<sup>2</sup> B65D 51/16

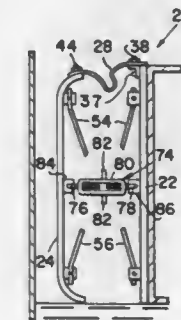
U.S. Cl. 220—202

5 Claims



4. A pressure-vacuum cap for a vehicle fuel tank having a normally upwardly extending filler neck formed with a peripherally and radially extending sealing surface concentric with the longitudinal axis of said neck, said cap comprising a cover, a valve body providing a centrally disposed passageway extending axially therethrough concentric with and in communication with said filler neck, means for connecting said valve body to said cover so that said valve body extends axially downwardly into said filler neck, said valve body and its passageway having an axially upper end portion and an axially lower end portion, pressure-vacuum valve means disposed in the upper end portion of said passageway for normalizing the pressure in such a tank, venting the tank to atmosphere when the pressure in the tank exceeds a predetermined superatmospheric level and when the pressure in the tank drops below a predetermined subatmospheric level, said valve means including an axially downwardly projecting, generally concentric shell portion having a central vent opening therein, in which the improvement comprises a rubber-like insert disposed in the lower portion of said passageway and sealably engaging said shell portion about said vent opening, said insert having a venting passageway extending axially therethrough in communication with said vent opening, said insert being formed to have an axially downwardly facing concentric valve seat about its said venting passageway, and a ball disposed in the lower portion of said valve body passageway to move into closing engagement with said valve seat.

means for providing a seal between the shoe and the bracket, said seal means being flexible;



means for selectively restricting the extension of the resilient mounting means for positioning the shoe relative to the bracket and out of contact with the tank.

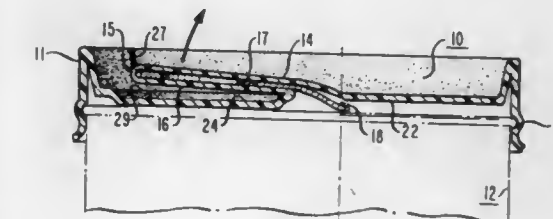
**4,162,023**  
**DUST COVER FOR FLIP TOP OPENING CONTAINERS**  
Heinz J. Faltermeier, 2236 Washington Valley Rd., Martinsville, N.J. 08836

Filed Oct. 23, 1978, Ser. No. 953,648

Int. Cl.<sup>2</sup> B65D 51/22

U.S. Cl. 220—258

7 Claims



1. A dust cover for flip-top opening containers having a pull-tab comprising a skirt member consisting of a substantially flat narrow band of plastic material joined at its end to form a ring; and a multi-layered substantially flat-top surface member having a first top layer contiguously joined along a majority of its edge to a top edge of said ring and forming free unconnected edge; a second layer contiguous with said top layer joined along said free edge and folded thereunder retaining between said top layer and said second layer said pull-tab to form a multi-layer retention member.

**4,162,024**  
**CONTAINER HAVING SLIDEABLE CLOSURE MEANS**  
John P. Shanley, 311 N. Dunton Ave., Arlington Heights, Ill. 60004

Filed May 25, 1978, Ser. No. 909,549

Int. Cl.<sup>2</sup> B65D 43/20

U.S. Cl. 220—350

15 Claims

1. A storage container comprising: an integrally formed tray portion having bottom, front and rear walls and opposed side walls; side panels attached to the side walls of said tray, said side panels having an inwardly extending horizontal flange means located generally intermediate the top and bottom thereof, said panels having generally vertical flanges located along the front and rear thereof, said horizontal flanges being located closely adjacent the top of the respective side walls of said tray and said vertical flanges being located closely adjacent said front and rear walls of said tray so that the sides of said tray fit within said horizontal vertical flanges;

**4,162,022**  
**CLOSURER AND METHOD FOR SEALING A FLOATING TANK ROOF**

William M. Fox, 5735 Alhambra Ave., Martinez, Calif. 94553

Filed Jun. 5, 1978, Ser. No. 912,259

Int. Cl.<sup>2</sup> B65D 87/18, 87/20

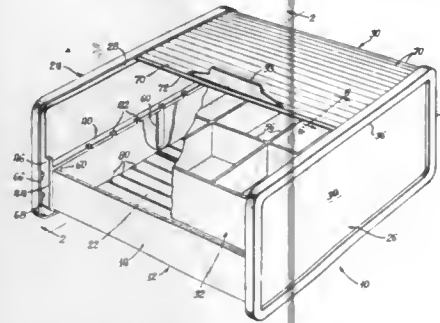
U.S. Cl. 220—224

8 Claims

1. A tank roof seal disposable about the periphery of a tank roof floating on a fluid contained in a tank comprising:

a bracket;  
means for securing the bracket to the tank roof;  
a shoe positionable against the tank;  
means for resiliently mounting the shoe to the bracket;

each of said side panels having a channel along a substantial portion of the periphery thereof, said channels being opposed to one another and adapted to receive a sliding closure member therebetween;  
a closure member fitting in the channel of said opposite side panels, said member being generally rigid in the direction



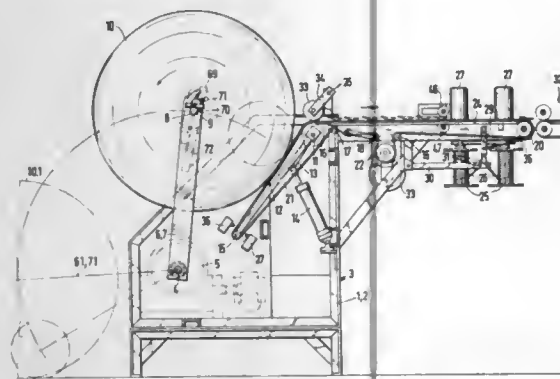
between said channels and flexible in the transverse direction so that said member is slideable in said channels and can be moved around the corners thereof to thereby open and close the container, said closure member being dimensioned so as to extend generally around approximately one half of the periphery of said container.

**4,162,025**  
**APPARATUS FOR UNREELING VALVED SACKS WHICH ARE REELED IN OVERLAPPING FORMATION**  
Fritz Achelpohl; Konrad Tetenborg, and Richard Feldkämper, all of Lengerich of Westphalia, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,633  
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658294

Int. Cl.<sup>2</sup> B65H 5/28  
U.S. Cl. 221-72

7 Claims



1. Apparatus for separating valved sacks stored in overlapping formation and held on reels by holding bands, the separated sacks being supplied to filling machines, said apparatus comprising a stand in which pivotable arms with bearings for receiving the reel are mounted, a frame which can be applied to the reel and carries at opposite ends rollers over which there pass driven endless belts pressing on the reel periphery to drive the reel, means for applying said frame to the reel, spools for coiling holding bands that are pulled off together with the unreeled overlapping sacks, conveyor means which are disposed downstream of the reel-driving belts, move at a higher speed and pull the sacks individually from the overlapping formation, roller means for pressing the overlapping sack formation against the endless belts and disposed at a spacing of no more than about one length of the sacks to be unreeled from the point where the overlapping sacks are just being lifted off

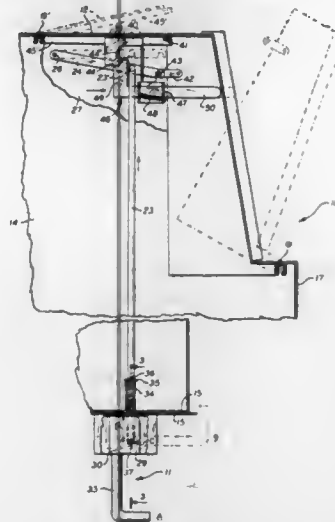
the reel, and limiting switches mounted on said stand on opposite sides of one end of the frame carrying the rollers, the switching positions of the limiting switches being disposed in planes which keep the applying motion of said means for applying said frame within close limits.

**4,162,026**  
**INTERLOCK MECHANISM**  
Philip F. Jacobs; Evelyn Friedman, and Peter Southall, all of Whitehall, N.Y., assignors to E. B. Metal & Rubber Industries, Inc., Whitehall, N.Y.

Filed Jun. 13, 1977, Ser. No. 806,308  
Int. Cl.<sup>2</sup> G07F 11/02

U.S. Cl. 221-92

18 Claims



1. A mechanism for use with first and second separate units each having a movable part movable between open and closed positions to respectively permit and prevent access to the interior of the units, said mechanism comprising elongate means supported at one of its ends in one of the units for movement between first and second positions and having an opposite end portion extending into the other unit, means in said other unit operatively connected to said opposite end portion of the elongate means for moving the latter between its first and second positions, said moving means including a manually operated element positioned wholly within the confines of the other unit upon moving the elongate means to one of its positions and extending exteriorly of said other unit upon moving the elongate means to its other position, said element, in one of its positions, preventing movement of the movable part of the other unit to its closed position until said elongate means is moved to its said one position thereof in which it is adapted to hold the movable part of said one of said units in locked position.

**4,162,027**  
**REMOTE READOUT DEVICE FOR A PUMP**  
Warren L. Howard, Mansfield, and Eugene E. Dorcas, Colleyville, both of Tex., assignors to Datacon, Inc., Arlington, Tex.

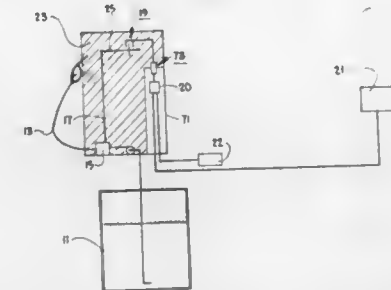
U.S. Cl. 222-23

8 Claims

1. In a pumping device for pumping flammable liquids, measuring the quantity of liquid transferred, and electrically relaying from within the explosive environment of the pumping device to a remote location information as to the quantity of liquid transferred, the improvement which comprises:

- a. a photo-emitter disposed within the explosive environment of the pumping device;
- b. a photo-receptor disposed within the explosive environ-

- ment in an orientation such that the emission from said photo-emitter is receivable by said photo-receptor;
- c. a blocking means for intermittently blocking the emission pathway between said photo-emitter and said photo-receptor, said blocking means being connected to mechanical parts of the pumping device such that each blockage of the emission pathway corresponds to a certain quantity of liquid having been pumped;
- d. a first pair of resistors, the left lead of one connected to the input of said photo-emitter and the left lead of the other connected to the output of said photo-receptor; each of said resistors having sufficient resistance to prevent a spark from occurring when a high potential is applied to the right lead of each resistor and the left leads are short circuited or grounded;
- e. a second pair of resistors, the left lead of one connected to the input of said photo-receptor and the left lead of the other connected to the output of said photo-receptor; each of said second pair of resistors having sufficient resistance to prevent a spark from occurring when a high potential is applied to the right lead of each resistor and the left leads are short circuited or grounded;



- f. a first power means for supplying a potential difference across the right leads of said first pair of resistors; said first power means being disposed outside of the explosive environment;
- g. a second power means for supplying a potential difference across the right leads of said second pair of resistors; said second power means being disposed outside of the explosive environment;
- h. container means for sealingly containing said first pair of resistors and said second pair of resistors; said container means being disposed across the periphery of the explosive environment such that the left leads of said first pair of resistors and said second pair of resistors extend from said container means into the explosive environment, and the right leads of said first pair of resistors and said second pair of resistors extend from said container means outside of the explosive environment; and
- i. means for transferring the pulses produced by said photo-receptor to the remote location, said transferring means being connected to the right leads of said second pair of resistors and disposed outside of the explosive environment of the pumping device.

**4,162,028**  
**BEVERAGE DISPENSING SYSTEM**  
Arthur M. Reichenberger, 1916 N. 21st Pl., Phoenix, Ariz. 85006

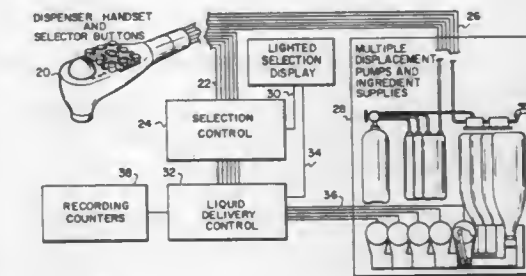
Filed Feb. 11, 1977, Ser. No. 767,772  
Int. Cl.<sup>2</sup> B67D 5/06

U.S. Cl. 222-129.4

11 Claims

1. A beverage dispenser comprising a movable dispenser handset; a plurality of flexible liquid delivery conduits coupled to said dispenser handset for delivering liquid beverage ingredients thereto; a plurality of liquid delivery means for displacing liquid under pressure, comprising a normal mode group of said liquid delivery means and at least one alternate mode group of said liquid delivery means, each of said liquid delivery means coupled respectively to said liquid delivery conduits; a

plurality of liquid ingredient supplies coupled respectively to said liquid delivery means; said dispenser handset having control switches and a plurality of selection switches; an electronic control means coupled in circuit with said control switches and said selection switches; said control means coupled in circuit with said liquid delivery means; said control means being responsive to the manual actuation of any one of said selection switches to energize a respective liquid delivery means from said normal mode group to cause the flow of liquid through respective conduits and said dispenser handset; a mode selector means in said control means for changing the functional con-

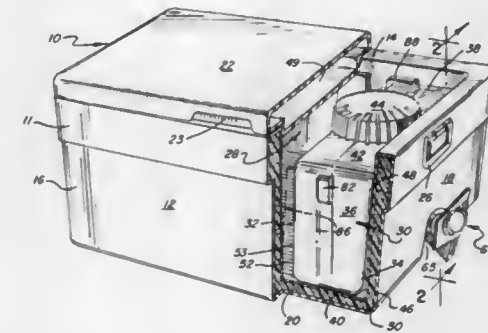


nections of said selection switches to the alternate mode group of said liquid delivery means when energized by actuation of one of said control switches; said control means having the functional connections of said selector switches changed to said alternate mode group, being responsive to manual actuation of any one of said selection switches to energize said respective liquid delivery means from said alternate mode group to cause the flow of liquid through respective conduits and said dispenser handset; said mode selector means being responsive to the manual actuation of any selection switch to change the functional connections of said selection switches back to the normal mode group of said liquid delivery means.

**4,162,029**  
**COOLER CHEST/LIQUID DISPENSER COMBINATION**  
Marten Gottsegen, 1212 Lake Shore Dr., Chicago, Ill. 60610, and Howard L. Esch, 6161 SW. 123 Ter., Miami, Fla. 33156  
Filed Aug. 3, 1977, Ser. No. 821,619  
Int. Cl.<sup>2</sup> B67D 5/62

U.S. Cl. 222-131

7 Claims



1. A cooler chest and beverage container combination comprising:

- (a) a main body portion having a pair of upstanding insulated side walls, a pair of upstanding insulated end walls, and an insulated bottom wall defining an interior chamber having interior wall surfaces;
- (b) a lid closure for the top of said body portion;
- (c) a removable liquid container disposed in said interior chamber, said liquid container comprising: a first and a second spaced apart end wall, a pair of spaced apart side walls joining said end walls, a bottom wall, and a top wall,



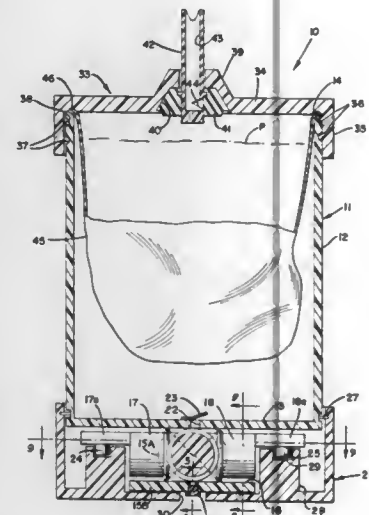
together defining in interior space, said top wall includes an opening of sufficient size to permit removal of said tap means;

- (d) said first one of said liquid container end walls being disposed in contact with at least portions of the inner surface of a first one of said upstanding insulated end walls of said main body portion;
- (e) an exterior tap means having an open shank portion extending through apertures in said first body portion end wall and said first liquid container end wall adjacent the bottom walls into said interior space of said liquid container to withdraw liquid therefrom upon actuation of said tap means from the exterior without removal of said liquid container or opening of said lid closure;
- (f) at least one lug disposed on each of said liquid container side walls;
- (g) shoulder means disposed on the interior wall surface each of said main body portion side walls;
- (h) said lugs and shoulder means cooperating to urge the first liquid container end wall into contact with said main body portion end wall and alignment of said tap means apertures;
- (i) said tap means includes means for removably securing said tap means in position comprising an exteriorly screw threaded end of said shank portion extending into said interior space, a nut threadable thereon, sealing means disposed around said liquid container aperture, and an exterior annular flange formed integral with said tap means, so that said nut sealingly compresses together said seal, said first liquid container end wall, and said first main body portion end wall; and
- (j) said insulated end walls of said main body portion comprise an outer shell spaced from an inner liner and having insulation means therebetween, and said outer shell is recessed in the area of said tap means so that said outer shell and said liner are in substantial contact in the area of said tap means annular flange.

**4,162,030**  
**DISPOSABLE PACKAGE DISPENSER HAVING A PRESSURE RELEASE CHANNEL**  
 Nicholas G. Capra, East Hanover, N.J., and Ronald L. Antenore, Coral Gables, Fla., assignors to J. Claybrook Lewis and Associates, Ltd.

Filed Apr. 20, 1977, Ser. No. 789,552  
 Int. Cl.<sup>2</sup> B05B 11/02  
 U.S. Cl. 222—321

14 Claims



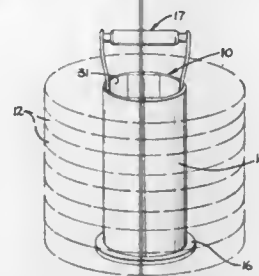
1. A reusable, pressurizable, dispensing container comprising: a housing having a side wall with an open end and a closed end and defining a pressurization chamber therewithin; expansible chamber means at the closed end and connected with the pressurization chamber to pressurize the chamber; manually

operable means connected with the expansible chamber means to operate the expansible chamber means; closure means on the open end of the container releasably attaching a dispensing package thereto having a collapsible product containing member received in the pressurization chamber of the container, whereby the contents of the collapsible member may be pressurized for dispensing as desired, said closure means having attaching means thereon cooperating with complementary attaching means on the housing to releasably secure the closure means to the housing open end, said closure means normally effecting an air-tight seal with said housing open end to prevent loss of pressure from the pressurization chamber; product discharge means on the package for selectively discharging product from the package under pressure when the interior of the housing is pressurized upon manipulation of the expansible chamber means; and a pressure release channel formed through and extending angularly across the attaching means and establishing fluid communication between the pressurization chamber and the atmosphere to release pressure from the pressurization chamber upon initial opening movement of the closure means, to prevent forcible displacement of the closure means from the housing by pressure in the pressurization chamber when the closure means is loosened for removal from the housing.

**4,162,031**  
**COMPUTER TAPE REEL HANDLING DEVICE**  
 E. John Summersby, 4580 W. 170th St., Lawndale, Calif. 90260  
 Filed Apr. 10, 1978, Ser. No. 894,927  
 Int. Cl.<sup>2</sup> B65D 71/00

U.S. Cl. 224—45 K

1 Claim



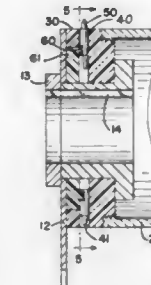
1. A handling device comprising: an upright cylindrical body for receiving items to be handled, said body having two substantially identical semi-cylindrical sections which form said body when connected, wherein each of said body sections includes an internally laterally extending projection stem for attaching said sections one to the other; said sections are joined along longitudinally extending edges wherein each section includes one longitudinal projection and one longitudinal groove; a flange at one end portion of said body for limiting movement of and providing support for said items; means at said other end portion of said body for cooperating with a handle whereby said body can be carried; a handle connected to said other end portion moveable between extended and retracted positions, said handle including two arms and a grip portion, wherein each of said arms includes at one end portion an elongated slot-like opening forming a boundary surface for guiding said arms relative to said body during movement between said extended and retracted positions, and at an opposite end portion a spring seat projection for engaging a biasing spring wherein the opposite end portions of said arms are biased outwardly when said arms are in said extended position; said body including internally extending pads which extend through said slot-like opening for sliding along said boundary surface and tabs mounted to said pads for entrapping said arms; and

said spring positioned in said grip portion for biasing said arms outwardly when in said extended position.

**4,162,032**  
**PINWHEEL ASSEMBLY HAVING IMPROVED PINS**  
 Frank J. Lockwood, 7011 W. Archer Ave., Chicago, Ill. 60638  
 Filed Aug. 7, 1978, Ser. No. 931,549  
 Int. Cl.<sup>2</sup> B65H 17/38

U.S. Cl. 226—81

9 Claims

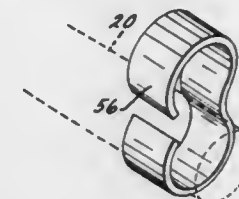


1. An improved pinwheel assembly for paper feeding and the like, rotatable about an axis, having a cylinder, a plurality of pins, each of said pins being movably mounted in a seat of a certain diameter in said cylinder and having a follower, said follower being engaged with a camming surface for reciprocal travel in said seat toward and away from said axis of rotation of said pinwheel, each of said pins having a body formed of a high lubricity plastic, said body having a steel tip, integrally mounted within said pin body, said plastic providing a substantially friction-free travel of said pin body in said seat and said steel tip providing an increased wear capability in the feeding of paper, thereby leading to an increased wear life of the entire pinwheel assembly.

**4,162,033**  
**POWDER ACTUATED TOOL**  
 Raymond V. Pomeroy, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.  
 Division of Ser. No. 817,386, Jul. 20, 1977, Pat. No. 4,114,792.  
 This application Mar. 8, 1978, Ser. No. 884,433  
 Int. Cl.<sup>2</sup> B25C 1/14

U.S. Cl. 227—10

1 Claim

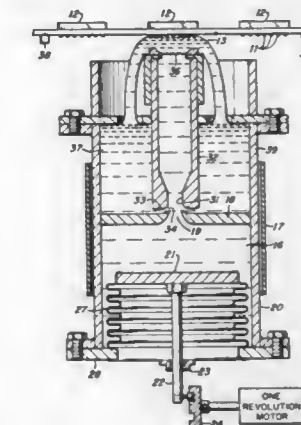


1. A tool for explosively driving elongated fasteners comprising a housing, a barrel mounted in the housing, a piston slideably carried in the barrel and adapted to be explosively driven from a ready-to-be-fired position at the rear of the barrel toward the forward end of the barrel, a barrel extension removably screwed into a main body portion of the barrel to be removed for replacement of the piston, and a resilient retaining clip in the barrel extension that frictionally engages the piston to prevent free sliding of the piston and to hold the piston in the ready-to-be-fired position, and said clip protruding out of a slot in the extension and into engagement with the main barrel portion to resist screwing of the barrel extension relative to the main barrel portion.

**4,162,034**  
**EJECTOR CONTROLLED SOLDERING DEVICE**  
 Emil P. Pavlas, Villa Park, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.  
 Filed May 3, 1978, Ser. No. 902,612  
 Int. Cl.<sup>2</sup> B23K 3/06

U.S. Cl. 228—37

10 Claims

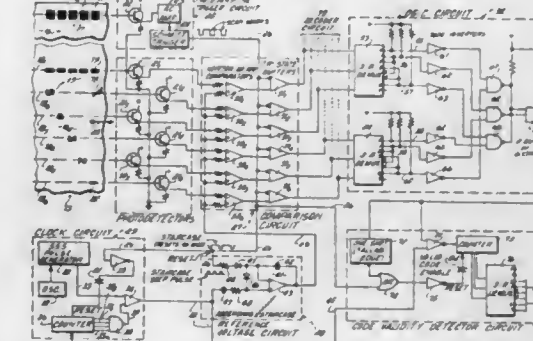


1. A solder fountain apparatus, which comprises: a flow well having a necked down throat at the lower end thereof; a plate having an opening aligned with and spaced from said throat; means for applying pressurized solder through said opening and said throat to flow through and out the upper end of said well; and means for collecting the overflowing solder about said space between said throat and plate so that portions of said overflow solder are drawn through said space and into said throat by the solder flowing through said throat.

**4,162,035**  
**HIGH RESOLUTION OPTICAL POSITION CODE DETECTOR FOR INFORMATION RECORDED ON RECORD CARRIER PARTIALLY IN HUMANLY INTELLIGIBLE FORM**  
 Robert K. Calzetta, Cincinnati, Ohio, assignor to General Signal Corporation, Stamford, Conn.  
 Filed Sep. 23, 1977, Ser. No. 835,920  
 Int. Cl.<sup>2</sup> G06K 7/14, 19/06; G08C 9/06

U.S. Cl. 235—456

13 Claims



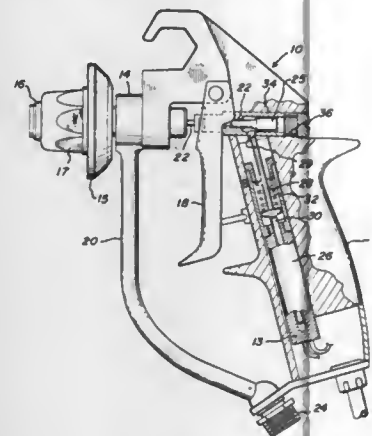
5. A system for detecting a position code representative of information encoded on a record carrier, comprising: a record carrier having a first predetermined light-reflective characteristic, said record carrier being divided into at least one track, said at least one track being subdivided into a plurality of channels, said channels having at least one data mark recorded therein to form a position code representative of recorded information, at least one of said data marks being recorded in humanly intelligible form as

1. A liquid sprinkling system employing connection sockets, each of said sockets comprising: a tubular connection portion for connection of a main pipe and at least one tubular connection for connection of a sub-pipe, said main pipe and said sub-pipe being connected between an associated connection socket; said tubular main pipe connection portion and tubular sub-pipe connection portion communicating with each other through an opening disposed proximate a central portion



thereof, said sub-pipe connection portion having a single opening for allowing liquid to flow only in one particular axial direction along an axis of said sub-pipe connection portion and an internal closure inside thereof, for preventing flow of liquid in an opposite axial direction of the sub-pipe connection portion; adjusting means for adjusting a flow rate of liquid passing through said opening proximate said central portion; each of said connection sockets being further defined by a cylindrical guide wall inside said sub-pipe connection portion extending at the peripheral edge of said opening up to an upper internal surface of the sub-pipe connection portion and said single opening in the sub-pipe connection portion being a hole provided at one of two diametrically opposing positions thereon in an axial direction of the sub-pipe connection portion, and said flow rate adjusting means being a plug rotatably received in a space defined by said guide wall and provided with a hole flush with said hole in the guide wall being in communication with said opening, said plug being accessible for flow rate control from the outside of said connection socket.

**4,162,042**  
**SPRAY GUN SAFETY SENSOR**  
Gordon V. Mommsen, Brooklyn Center, Dale R. Hemming, and Richard E. Hudrik, both of Fridley, all of Minn., assignors to Graco Inc., Minneapolis, Minn.  
Filed May 27, 1977, Ser. No. 801,935  
Int. Cl.<sup>2</sup> B05B 7/02  
U.S. Cl. 239—526

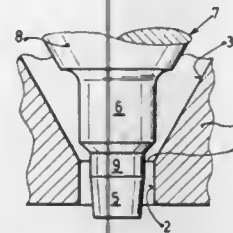


1. A proximity detector and spray disabling apparatus attachable to a spray gun body for detecting the proximate presence of a human body member and disabling the spray gun spray valve actuating mechanism, comprising:

- (a) an electrical sensor element attachable to said spray gun body, said sensor element adapted for providing electrical signals at an output terminal, which signals are indicative of the relative proximity of a human body member to said sensor element;
- (b) an electrical solenoid connected to said output terminal, said solenoid having an actuating member which moves in response to said signals;
- (c) a trigger actuator engageable in operable arrangement with said spray valve actuating mechanism; and
- (d) a slide bolt coupled to said solenoid actuating member and moveable to engage and disengage said trigger actuator with said valve actuating mechanism;

Whereby the relative proximity of a human body member to said sensor element causes said trigger actuator to become disengaged with said spray valve actuating mechanism.

**4,162,043**  
**FUEL INJECTION NOZZLE**  
Ewald Eblen, Stuttgart, and Karl Hofmann, Neckarrems, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Feb. 28, 1978, Ser. No. 881,931  
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709892  
Int. Cl.<sup>2</sup> F02M 61/04  
U.S. Cl. 239—533.3



1. In a fuel injection nozzle for internal combustion engines including a nozzle body and a needle valve, said nozzle body having a central, cylindrical surface defining an injection port and a conical surface serving as a valve seat, said central, cylindrical surface and said conical surface merging to form a dividing edge, said needle valve having a sealing cone portion, a cylindrical throttle pin portion downstream thereof and extending into said injection port when the needle is in the closed condition and a spray-forming pin portion downstream of said throttle pin portion, the diameter of said spray-forming pin portion being less than the diameter of said throttle pin portion, said needle valve being displaceable in the nozzle body by the fuel pressure in a direction opposite to the direction of fuel flow and against a closing force between a closed position where the sealing cone portion engages the conical surface and a fully opened position, the improvement in the needle valve, comprising:

a cylindrical section forming part of the spray-forming pin portion and situated immediately adjacent to and downstream of said throttle pin portion, and wherein the cylindrical section and the dividing edge are in opposition when the needle valve is in its fully opened position, and together define the narrowest flow cross section obtainable with the spray-forming pin portion.

**4,162,044**  
**PROCESS FOR GRINDING COAL OR ORES IN A LIQUID MEDIUM**

Willy Manfroy, Carmel, Ind., and Richard R. Klimpel, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 853,734, Nov. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 687,782, May 19, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,872

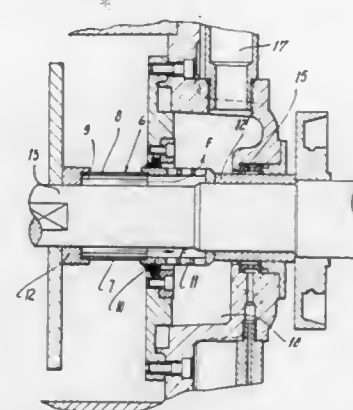
Int. Cl.<sup>2</sup> B02C 23/18  
U.S. Cl. 241—16

1. A process for grinding coal or ores containing metal values comprising carrying out said grinding in the presence of a liquid medium and a polyelectrolyte grinding aid comprising acrylic or methacrylic acid polymers or copolymers of the same with each other or with other ethylenically unsaturated monomers, said grinding aid being dispersible in said medium and being employed in an amount effective to provide increased grinding efficiency.

**4,162,045**  
**ORE GRINDING PROCESS**  
Melvin F. Katzer, Danville, Calif.; Richard R. Klimpel, Midland, Mich., and Willy Manfroy, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.  
Continuation-in-part of Ser. No. 853,735, Nov. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 687,795, May 19, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,884  
Int. Cl.<sup>2</sup> B02C 23/18

U.S. Cl. 241—16  
1. A process for grinding ores containing metal values or coal, which comprises carrying out said grinding in the presence of a liquid medium and a grinding aid system comprising (a) a polyelectrolyte comprising acrylic or methacrylic acid polymers or copolymers of the same together or with other ethylenically unsaturated monomers, and (b) an inorganic compound selected from the group consisting of alkali metal salts of carbonates and bicarbonates, said grinding aid system being dispersible in said medium and being employed in an amount effective to synergistically increase grinding efficiency.

**4,162,046**  
**HORIZONTAL-AXLE GRINDER WITH ROTATABLE SIEVE**  
Carlos O. Pujol, Marina Street No. 51, Badalona (Barcelona), Spain  
Continuation of Ser. No. 729,299, Oct. 4, 1976, abandoned. This application May 1, 1978, Ser. No. 901,911  
Claims priority, application Spain, Jul. 20, 1976, 449,975  
Int. Cl.<sup>2</sup> B02C 23/10  
U.S. Cl. 241—46.17

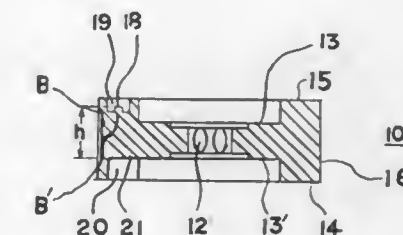


1. In a cooled horizontal-axle grinder, such as for the predispersion of solids in liquids, which grinder includes wall means defining therein a grinding chamber, grinding bodies such as balls positioned within said grinding chamber, a rotatable agitator shaft extending horizontally through said grinding chamber and supported for rotation about a substantially horizontal axis, a plurality of agitator discs mounted on said shaft for rotation therewith, said discs being axially spaced apart along said shaft and having an endmost disc positioned adjacent but axially spaced from an end wall of said chamber to define a substantially annular region therebetween which surrounds said shaft and comprises a part of said grinding chamber, said end wall having a central opening through which passes said shaft, a sieve structure associated with said region for straining the treated product which is withdrawn from the grinding chamber, a discharge reservoir located on the opposite side of said end wall from said grinding chamber, and discharge opening means communicating with said discharge reservoir, the improvement wherein said sieve structure comprises:

a first mounting structure fixed to said shaft and disposed directly adjacent the endmost disc, a second mounting

structure fixed to said shaft in axially spaced relationship to said first mounting structure, said second mounting structure being positioned in the vicinity of said end wall, an elongated thin-wall sleeve-like sieve fixedly mounted on and extending axially between said first and second mounting structures, said sieve being concentric with and spaced radially outwardly from said shaft so as to define an annular intermediate chamber therebetween which is free of obstructions, said intermediate chamber communicating with said region of the grinding chamber through said sieve, said region also being free of obstructions except for the presence of said sieve, whereby the treated product can flow from said grinding chamber radially inwardly through said region and then radially inwardly through said sieve into said intermediate chamber; said second mounting structure including a support member fixed to the shaft and a support sleeve positioned in concentric and surrounding relationship to said shaft, said support sleeve having one end thereof fixed to said support member and the other end thereof fixedly connected to the adjacent end of said sieve, said support sleeve passing through the central opening in said end wall and being spaced radially from said shaft to define a compartment therebetween which is free of obstructions and which is in open coaxial communication with said intermediate chamber, said support sleeve being rotatably and sealingly supported on said end wall, and a plurality of radial openings formed through said support sleeve on the opposite side of said end wall from said sieve for permitting discharge of the treated product from said compartment into said discharge reservoir.

**4,162,047**  
**HUB FOR USE IN A TAPE CASSETTE**  
Noritsugu Hashimoto, Takaoka, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan  
Filed Feb. 17, 1978, Ser. No. 878,727  
Claims priority, application Japan, Feb. 18, 1977, 52-19389[U]  
Int. Cl.<sup>2</sup> B65H 75/26; B29F 1/00  
U.S. Cl. 242—58.5



1. A hub for use in a tape cassette for winding a recording tape, said hub comprising:

- a cylindrical body on which a recording tape is wound;
- a first outer annular surface formed on one end of said cylindrical body;
- a first inner annular surface formed coaxially with said first outer annular surface and being stepped inwardly from said first outer annular surface;
- a second outer annular surface formed on an opposite outer end of the cylindrical body to the first outer annular surface;
- a second inner annular surface formed on an opposite inner annular surface to the first inner annular surface and being stepped inwardly from the second outer annular surface;
- a drive shaft inserting hole defined at the center portion of the hub;
- a notch defined in the cylindrical body for fastening the end portion of the recording tape in association with a tape securing member adapted to fit into the notch;
- a resin injection gate surrounded by a first concave recess defined in the first outer annular surface; and
- a second concave recess formed on the second outer annular

surface at a position opposite to the resin injection gate, the bottom face of the second concave recess being substantially parallel to the second inner annular surface.

4,162,048

### SPINNING REEL WITH ADJUSTABLE BAIL ARM RETURN SPRING

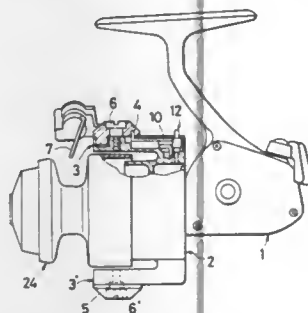
Kounin Sasaki, Fukuyama, Japan, assignor to Ryobi Ltd., Fuchu, Japan

Filed Feb. 16, 1978, Ser. No. 878,352

Claims priority, application Japan, Feb. 16, 1977, 52-18269[U]  
Int. Cl.<sup>2</sup> A01K 89/00

U.S. Cl. 242—84.2 G

5 Claims



1. In a spinning reel including a reel body, a rotor journaled to the reel body, a pair of bail supports projecting outwardly from the diametrically opposite sides of the rotor, a bail arm secured at one end to a bail arm lever and at the other end to a bail arm pivot cam, both rotatably journaled on the bail supports, spring tension adjustment means characterized by:

- a bail arm return spring positioned in one of the bail supports which secures the bail arm lever, one end of the spring being fitted into the bail arm lever, and
- a cam member rotatably supported in the bail support, the other end of the bail arm return spring being contacted to the cam member to change the biasing force thereof.

4,162,049

### FISHING REEL APPARATUS

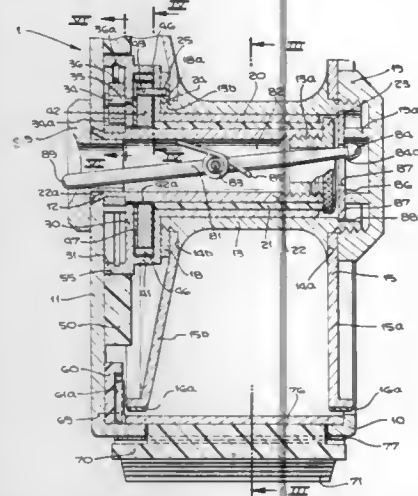
William H. Stutz, Jr., 231 N. Hollywood Way, Burbank, Calif. 91505

Filed Sep. 14, 1977, Ser. No. 833,238

Int. Cl.<sup>2</sup> A01K 89/02

U.S. Cl. 242—84.5 R

9 Claims



1. In a fishing reel for storing, retrieving, and controlling the withdraw of fishing line from the reel, said fishing reel having a reel frame mountable to an associated fishing rod and a line spool having peripheral spool rim portions rotatably mounted

with respect to said reel frame, the improvement in said fishing reel comprising:

- support spindle means rotatably mounted with respect to said reel frame for supporting and mounting said line spool;
- means for preventing relative rotation between said spindle means and said line spool;
- drag hub means having peripheral hub portions and being rotatably mounted to said frame and operationally connected to said support spindle means by a unidirectional clutch;
- drag shoe means having a portion thereof fixedly mounted relative to said frame, said drag shoe means being generally coplanar with and in contact with said peripheral hub portions of said drag hub means are provided for restricting rotation of said hub means relative to said frame;
- variable means for pre-selectably varying contact pressure between said drag hub means and said drag shoe means thereby pre-selectably varying the amount said rotation of said hub is restricted;
- manual brake means operable independently of operation of said drag shoe means having arcuate pressure plate means mounted to said reel frame adjacent said peripheral spool rim portions of said line spool for supplementally restricting rotation of said line spool when said pressure plate means is manually adjusted radially inwardly relative to said spool and is brought into contact with said peripheral rim portions of said line spool; and
- actuator means associated with said variable means and said manual brake means for actuating said variable means when said actuator means is adjusted circumferentially with respect to said spool and for actuating said manual brake means when said actuator means is adjusted radially with respect to said spool.

4,162,050

### OUTSIDE PAYOFF

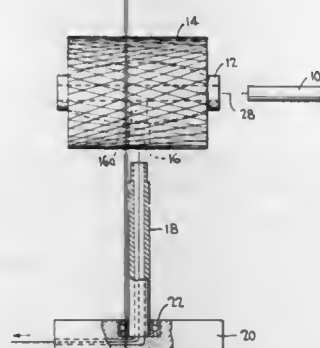
William A. Wagner, Somers, and Frank W. Kotzur, Mahopac, both of N.Y., assignors to Windings, Inc., Goldens Bridge, N.Y.

Filed Sep. 6, 1977, Ser. No. 831,085

Int. Cl.<sup>2</sup> B65H 55/00

U.S. Cl. 242—163

17 Claims



1. A method for providing outside payoff from at least one package of flexible strip-like material wound in a figure-8 pattern with a radial hole extending from the central core space of the winding to the outer coil thereof, comprising the steps of:

- inserting a swivable support member having a longitudinal axis into the radial hole of the wound material;
- mounting said support member to enable oscillation about the longitudinal axis thereof; and
- paying out the wound material from its outer end by pulling it in a direction transverse to the longitudinal axis of the wound material.

4,162,051

### TAPE RECORDER HAVING MAGNETICALLY CONTROLLED TAPE TENSIONING

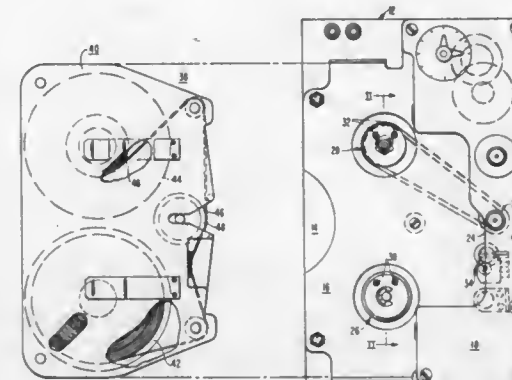
William P. Doby, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 2, 1978, Ser. No. 930,293

Int. Cl.<sup>2</sup> G03B 1/04

U.S. Cl. 242—201

8 Claims



1. A tape recorder device having a tape transport assembly for continuously moving a recording tape between supply and take-up reels, comprising:

- a capstan assembly including a capstan shaft having an upper end for drivingly engaging the recording tape, and a drive motor having a direct drive engagement with a lower end of said capstan shaft;
- a supply spindle assembly including a spindle shaft carrying a supply reel engaging member at the upper end thereof and a magnetic brake arrangement mounted about a lower portion of said shaft, said magnetic brake arrangement including axially spaced stationary and rotatable parts, one of said parts being formed of a permanent magnet material and including a plurality of circumferentially spaced magnetic poles and the other of said parts being a plate of a permeable magnetic material, and said supply spindle assembly further including a non-magnetic spacer washer made of plastic film material supporting said rotating part on said stationary part such that the axial spacing of said parts is determined by the thickness of said washer and retarding forces are produced by both the frictional engagement between said washer and said rotating part and magnetic coupling between said stationary and rotating parts; and
- a take-up spindle assembly including a spindle shaft carrying a take-up reel engaging member at the upper end thereof and a clutch arrangement mounted about a lower portion of said spindle shaft, said clutch arrangement including driving and driven parts with said driven part being connected in continuously driven relationship with the lower end of said capstan shaft.

4,162,052

### NIGHT GUIDANCE OF SELF-PROPELLED MISSILES

Pierre M. L. Lametol, Ville d'Avray, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Dec. 15, 1976, Ser. No. 750,813

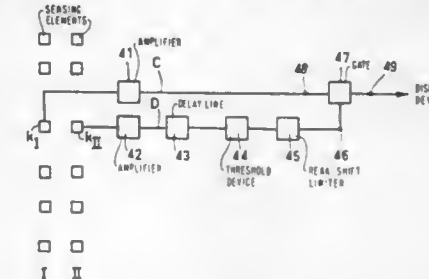
Claims priority, application France, Dec. 22, 1975, 75 39285  
Int. Cl.<sup>2</sup> F41G 1/32, 1/36

U.S. Cl. 244—3.16

5 Claims

3. A thermal telescope having a display device associated therewith for the night guidance of a self-propelled missile carrying an infrared tracer towards a target, comprising first detection means sensitive to infrared energy in a first spectral range corresponding to the maximum radiation from the target and the environment thereof, second detection means sensitive to infrared energy in a second spectral range corresponding to the maximum radiation from the tracer, first circuit means

connected to the output of said first detection means, second circuit means connected to the output of said second detection means and means for subtracting the output of said second



circuit means from the output of said first circuit means, said subtractor means having its output connected to said display device.

4,162,053

### BRAKE DEVICE FOR ROTATING BODY

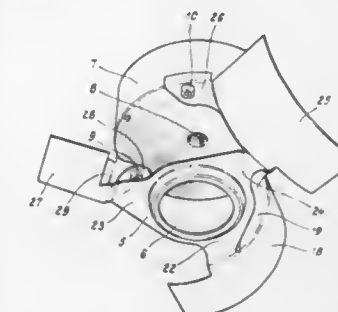
Björn O. Björnson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Nov. 28, 1977, Ser. No. 855,140

Claims priority, application Sweden, Dec. 27, 1976, 7614551  
Int. Cl.<sup>2</sup> B64D 19/02

U.S. Cl. 244—3.27

8 Claims



1. Braking assembly for retarding linear and rotative movement of a load carrying unit after ejection of the unit from an in-flight projectile, shell or the like, said braking assembly comprising:

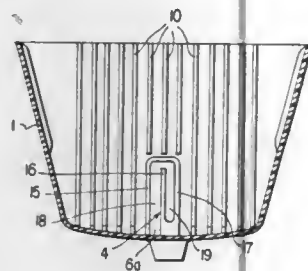
- a cylindrically-shaped hollow container surrounding said load carrying unit, said container having a closed end portion positioned adjacent an end portion of said unit;
- a plurality of fasteners spaced about the periphery of said closed end portion of said container, said fasteners fixedly joining said adjacent end portions to one another;
- slit means extending through portions of said cylindrically shaped container and closed end portion for dividing said container into a plurality of sections, each said section having a substantially concave end portion extending circumferentially about a portion of said load carrying unit;
- whereby each of said concave end portions pivots away from said unit to form a blade-like member having a concave brake surface functioning to retard both the linear and rotative movement of said carrying unit and attached container.



**4,162,054**  
**FILTERING DEVICE FOR PRODUCING EXTRACTS FROM COFFEE OR TEA**

Reinhard Häuslein, Minden, Fed. Rep. of Germany, assignor to Melitta-Werke Bentz & Sohn KG, Minden, Fed. Rep. of Germany

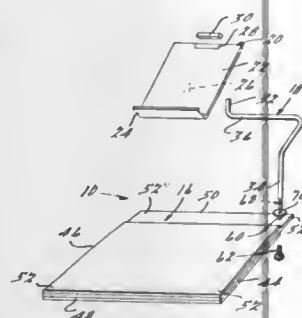
Filed Jun. 8, 1978, Ser. No. 913,759  
Int. Cl.<sup>2</sup> B01D 23/28; B65B 39/00; B67C 11/00  
U.S. Cl. 248—94 5 Claims



1. In a one-piece, molded, filter holder device for producing aromatic extracts from coffee or tea, including a filter vessel having an extract outlet and arranged to receive a filter bag, the improvement wherein said vessel is provided with an outlet opening in the vicinity of its bottom and said extract outlet comprises a plurality of guide ribs projecting from the interior wall of said vessel and defining a first channel section extending upwardly from a location spaced from said outlet opening and immediately adjacent the lowest point of the interior of said vessel, and a second channel section communicating at its lower end with said outlet opening, said first and second channel sections communicating with one another at their upper ends to form a conduit which is laterally open toward the interior of said vessel, said guide ribs being arranged to permit a filter bag inserted in said vessel to rest tightly thereagainst to close the laterally open side of said conduit and to enable said conduit to operate as a siphon, when the filter bag is filled with water, with the lower end of said first channel section defining a suction opening, whereby cleaning of all interior surfaces is facilitated.

**4,162,055**  
**COPYHOLDING DEVICE**  
Rodney Summers, 9200 Gale Rd., Pontiac, Mich. 48054  
Filed Dec. 14, 1977, Ser. No. 860,600  
Int. Cl.<sup>2</sup> F16M 13/00

U.S. Cl. 248—441 R 1 Claim

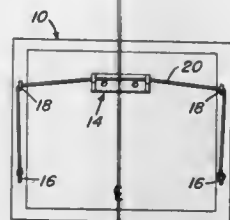


1. A copyholding device comprising, a generally flat base assembly adapted to have a typewriter or similar apparatus mounted thereon, said base assembly being of a multiple layer construction including a relatively rigid intermediate layer, a lower relatively soft and compliant layer providing an acoustical barrier, and an upper layer that is also of a soft and compliant nature but which is not as soft and compliant as said lower layer and is intended to limit movement of said

typewriter or similar apparatus relative to said base assembly, said intermediate layer extending outwardly from the adjacent edges of said upper and lower layers at one side of said base assembly and defining a projecting flange portion, said flange portion having an opening formed at one end thereof through which an upwardly extending fastening element is disposed, a pivot pin fixedly secured to the upper side of said flange portion by said fastening element, a support column secured at the lower end thereof to said base assembly and extending upwardly to a position above the typewriter, said support column having vertically spaced upper and lower end sections, and a generally horizontally extending section disposed between and interconnecting said end sections, said lower end section defining a blind bore adapted to nestingly receive the upper end of said pivot pin for pivotally mounting said column upon said base assembly, and said upper end section being telescopically and pivotally connectable to an easel-like support platform fabricated of a molded polymeric material, said support platform including a support portion extending outwardly therefrom and underlying and supporting worksheets which are to be copied with the typewriter.

**4,162,056**  
**PICTURE HANGING SYSTEM**  
Ritchie R. Moorhead, P.O. Box 6, Athens, Pa. 18810  
Filed Jun. 9, 1978, Ser. No. 913,946  
Int. Cl.<sup>2</sup> A47G 1/24

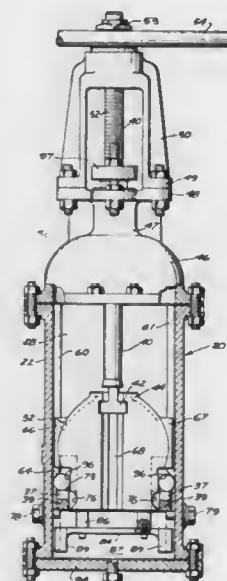
U.S. Cl. 248—495 5 Claims



1. In a hanging system for a wall hanging; a wall hanging, a flexible suspension member, a wall mount for receiving a horizontal intermediate section of the flexible suspension member and supporting said suspension member, and means on the wall hanging to mount said suspension member, said means comprising a pair of anchor members fixed to the wall hanging to the opposite sides of and below the center of gravity of the wall hanging, and a pair of guide members fixed to the wall hanging vertically above and aligned with the anchor members, said flexible suspension member having the opposite ends thereof fixed to the anchor members, said suspension member extending from one anchor member vertically about the guide member thereabove, horizontally across to the second guide member and vertically to the second anchor member therebelow, said intermediate section of the flexible suspension member comprising that section between the guide members, said intermediate section being tensioned between the guide members independently of said wall mount.

**4,162,057**  
**LINEAR RETRACTABLE SEAL VALVE**  
Javed Qasim, Diamond Bar, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 5, 1978, Ser. No. 893,708  
Int. Cl.<sup>2</sup> F16K 25/00  
U.S. Cl. 251—168 11 Claims

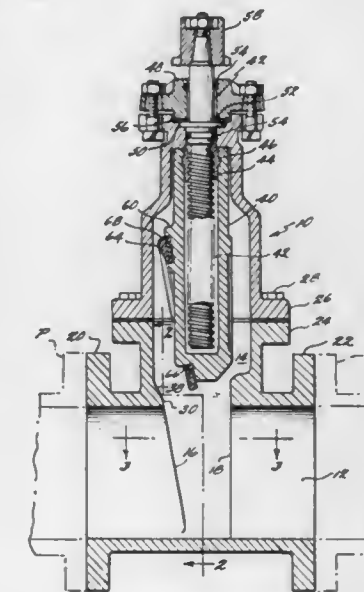


1. In a linear retractable seal valve having a body with an inlet and outlet port and a fluid passageway therebetween, said body having a lateral passageway perpendicular to the fluid passageway with a wedge-slip assembly moveable longitudinally therein from a valve open first location within the lateral passageway to a distant second location where the assembly is positioned in the fluid passageway between the two ports of the valve, said assembly having at least one closure slip with an inside face of the slip slideably engaging a tapering face of the wedge and with the slip at second location being restrained from further longitudinal movement and moveable in a perpendicular direction of the longitudinal assembly movement into closure engagement with one of the valve ports, two diametrically-opposed guide rails extending longitudinally of the inside face of the lateral passageway and into the fluid passageway, said assembly being moveably held by grooves at opposite side edges of the wedge to the guide rails of the valve body, said guide rails lying in a plane paralleling the two valve ports, with the valve being returned to its open position through a reverse sequential movement, the improvement:

wherein at least one of said rails terminates at the second location on the inside wall of the fluid passageway and with the end surface of the terminated rail providing a ramp;  
said wedge on at least one side edge thereof having a locking notch extending in a transverse direction to the longitudinal assembly movement, said notch being in the side edge of the wedge adjacent the terminated rail;  
a roller parallel to the locking notch in engagement with a supporting surface of the slip and positioned to move into and out of the notch at the second valve location, said roller when in the locking notch of the wedge and in engagement with the longitudinal edge of the adjacent guide rail serving to lock the slip to the wedge, thus precluding perpendicular movement of the slip during longitudinal movement of the assembly between the two valve locations, said roller in one of its positions unlocks the slip from the wedge by moving out of the locking notch and into engagement with the ramp at the end of said rail.

**4,162,058**  
**RESILIENT SEATED GATE VALVE WITH IMPROVED SEAT ARRANGEMENT**  
Daniel A. Ellis, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed May 19, 1977, Ser. No. 798,686  
Int. Cl.<sup>2</sup> F16K 3/314 20 Claims  
U.S. Cl. 251—326

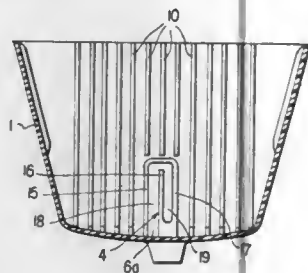


1. A gate valve structure for use in mains carrying a fluid, said gate valve structure comprising:  
a valve casing having a through-bore for the flow of fluid, an elongated chamber intersecting said through-bore intermediate its ends and defining inlet and outlet ports to the chamber, and a valve seat in said casing surrounding one of said ports in said through-bore, said valve seat lying generally in a plane which converges at an acute angle to a plane normal to the axis of the through-bore, and said valve seat having an upper planar portion facing toward the other of said ports except at a bottom portion thereof where it merges into and forms a smooth and uninterrupted portion of said through-bore, said planar portion of said valve seat having an outer arcuate edge;  
a generally flat gate member reciprocable in said elongated chamber from a closed position across said through-bore and seating against said valve seat to an opened position out of said through-bore, said gate member including a body member having an annular planar surface lying generally in a plane converging at an acute angle to a plane normal to the axis of the through-bore and generally complementary to the plane of said valve seat, said planar surface of said body member being surrounded on its radially outer periphery adjacent its upper portion by an arcuate shoulder terminating in circumferentially spaced ends and extending axially from the body member, said planar surface being further provided on its radially inner periphery by an annular shoulder extending axially from the body member, an annular resilient seal member received on said planar surface and bounded by the annular shoulder and the arcuate shoulder, said annular seal member being generally rectangular in radial section and having an upper bulbous portion extending axially therefrom for engaging the upper portion of said valve seat facing the other of said ports, said bulbous portion of said seal member, when relaxed, having a maximum axial thickness adjacent its upper portion in a plane extending through an axis of movement of said gate member and merging into a minimum axial thickness of said seal member at its lower portion, said seal member with its bulbous portion defining a valve seat engaging portion complementary to said valve seat when said gate member is in the closed position,

**4,162,054**  
**FILTERING DEVICE FOR PRODUCING EXTRACTS**  
**FROM COFFEE OR TEA**

Reinhard Häuslein, Minden, Fed. Rep. of Germany, assignor to Melitta-Werke Bentz & Sohn KG, Minden, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,759  
 Int. Cl.<sup>2</sup> B01D 23/28; B65B 39/00; B67C 11/00  
 U.S. Cl. 248—94 5 Claims

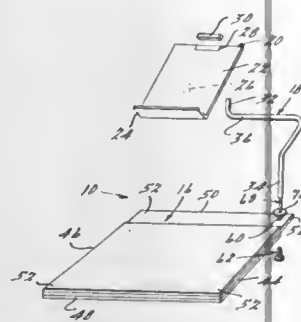


1. In a one-piece, molded, filter holder device for producing aromatic extracts from coffee or tea, including a filter vessel having an extract outlet and arranged to receive a filter bag, the improvement wherein said vessel is provided with an outlet opening in the vicinity of its bottom and said extract outlet comprises a plurality of guide ribs projecting from the interior wall of said vessel and defining a first channel section extending upwardly from a location spaced from said outlet opening and immediately adjacent the lowest point of the interior of said vessel, and a second channel section communicating at its lower end with said outlet opening, said first and second channel sections communicating with one another at their upper ends to form a conduit which is laterally open toward the interior of said vessel, said guide ribs being arranged to permit a filter bag inserted in said vessel to rest tightly thereagainst to close the laterally open side of said conduit and to enable said conduit to operate as a siphon, when the filter bag is filled with water, with the lower end of said first channel section defining a suction opening, whereby cleaning of all interior surfaces is facilitated.

**4,162,055**  
**COPYHOLDING DEVICE**  
 Rodney Summers, 9200 Gale Rd., Pontiac, Mich. 48054  
 Filed Dec. 14, 1977, Ser. No. 860,600  
 Int. Cl.<sup>2</sup> F16M 13/00

U.S. Cl. 248—441 R

1 Claim



1. A copyholding device comprising, a generally flat base assembly adapted to have a typewriter or similar apparatus mounted thereon, said base assembly being of a multiple layer construction including a relatively rigid intermediate layer, a lower relatively soft and compliant layer providing an acoustical barrier, and an upper layer that is also of a soft and compliant nature but which is not as soft and compliant as said lower layer and is intended to limit movement of said

typewriter or similar apparatus relative to said base assembly,

said intermediate layer extending outwardly from the adjacent edges of said upper and lower layers at one side of said base assembly and defining a projecting flange portion,

said flange portion having an opening formed at one end thereof through which an upwardly extending fastening element is disposed,

a pivot pin fixedly secured to the upper side of said flange portion by said fastening element,

a support column secured at the lower end thereof to said base assembly and extending upwardly to a position above the typewriter,

said support column having vertically spaced upper and lower end sections, and a generally horizontally extending section disposed between and interconnecting said end sections,

said lower end section defining a blind bore adapted to nestingly receive the upper end of said pivot pin for pivotally mounting said column upon said base assembly, and said upper end section being telescopically and pivotably connectable to an easel-like support platform fabricated of a molded polymeric material,

said support platform including a support portion extending outwardly therefrom and underlying and supporting worksheets which are to be copied with the typewriter.

**4,162,056**

**PICTURE HANGING SYSTEM**

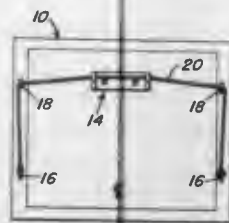
Ritchie R. Moorhead, P.O. Box 6, Athens, Pa. 18810

Filed Jun. 9, 1978, Ser. No. 913,946

Int. Cl.<sup>2</sup> A47G 1/24

U.S. Cl. 248—495

5 Claims

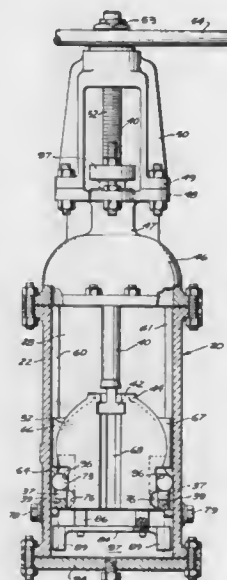


1. In a hanging system for a wall hanging; a wall hanging, a flexible suspension member, a wall mount for receiving a horizontal intermediate section of the flexible suspension member and supporting said suspension member, and means on the wall hanging to mount said suspension member, said means comprising a pair of anchor members fixed to the wall hanging to the opposite sides of and below the center of gravity of the wall hanging, and a pair of guide members fixed to the wall hanging vertically above and aligned with the anchor members, said flexible suspension member having the opposite ends thereof fixed to the anchor members, said suspension member extending from one anchor member vertically about the guide member thereabove, horizontally across to the second guide member and vertically to the second anchor member therebelow, said intermediate section of the flexible suspension member comprising that section between the guide members, said intermediate section being tensioned between the guide members independently of said wall mount.

**4,162,057**  
**LINEAR RETRACTABLE SEAL VALVE**  
 Javed Qasim, Diamond Bar, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.  
 Filed Apr. 5, 1978, Ser. No. 893,708  
 Int. Cl.<sup>2</sup> F16K 25/00

U.S. Cl. 251—168

11 Claims



1. In a linear retractable seal valve having a body with an inlet and outlet port and a fluid passageway therebetween, said body having a lateral passageway perpendicular to the fluid passageway with a wedge-slip assembly moveable longitudinally therein from a valve open first location within the lateral passageway to a distant second location where the assembly is positioned in the fluid passageway between the two ports of the valve, said assembly having at least one closure slip with an inside face of the slip slideably engaging a tapering face of the wedge and with the slip at second location being restrained from further longitudinal movement and moveable in a perpendicular direction of the longitudinal assembly movement into closure engagement with one of the valve ports, two diametrically-opposed guide rails extending longitudinally of the inside face of the lateral passageway and into the fluid passageway, said assembly being moveably held by grooves at opposite side edges of the wedge to the guide rails of the valve body, said guide rails lying in a plane paralleling the two valve ports, with the valve being returned to its open position through a reverse sequential movement, the improvement:

wherein at least one of said rails terminates at the second location on the inside wall of the fluid passageway and with the end surface of the terminated rail providing a ramp;

said wedge on at least one side edge thereof having a locking notch extending in a transverse direction to the longitudinal assembly movement, said notch being in the side edge of the wedge adjacent the terminated rail;

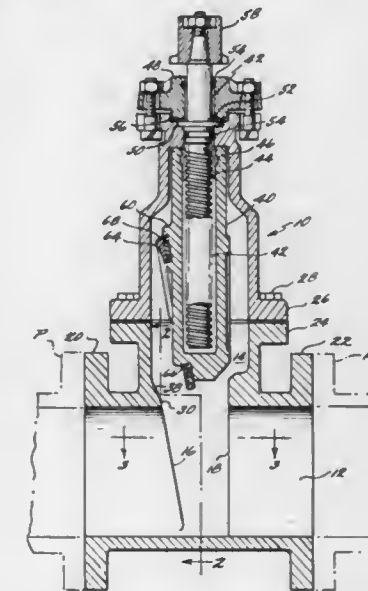
a roller parallel to the locking notch in engagement with a supporting surface of the slip and positioned to move into and out of the notch at the second valve location, said roller when in the locking notch of the wedge and in engagement with the longitudinal edge of the adjacent guide rail serving to lock the slip to the wedge, thus precluding perpendicular movement of the slip during longitudinal movement of the assembly between the two valve locations, said roller in one of its positions unlocks the slip from the wedge by moving out of the locking notch and into engagement with the ramp at the end of said rail.

**4,162,058**  
**RESILIENT SEATED GATE VALVE WITH IMPROVED SEAT ARRANGEMENT**  
 Daniel A. Ellis, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed May 19, 1977, Ser. No. 798,686  
 Int. Cl.<sup>2</sup> F16K 3/314

U.S. Cl. 251—326

20 Claims



1. A gate valve structure for use in mains carrying a fluid, said gate valve structure comprising:

a valve casing having a through-bore for the flow of fluid, an elongated chamber intersecting said through-bore intermediate its ends and defining inlet and outlet ports to the chamber, and a valve seat in said casing surrounding one of said ports in said through-bore, said valve seat lying generally in a plane which converges at an acute angle to a plane normal to the axis of the through-bore, and said valve seat having an upper planar portion facing toward the other of said ports except at a bottom portion thereof where it merges into and forms a smooth and uninterrupted portion of said through-bore, said planar portion of said valve seat having an outer arcuate edge;

a generally flat gate member reciprocable in said elongated chamber from a closed position across said through-bore and seating against said valve seat to an opened position out of said through-bore, said gate member including a body member having an annular planar surface lying generally in a plane converging at an acute angle to a plane normal to the axis of the through-bore and generally complementary to the plane of said valve seat, said planar surface of said body member being surrounded on its radially outer periphery adjacent its upper portion by an arcuate shoulder terminating in circumferentially spaced ends and extending axially from the body member, said planar surface being further provided on its radially inner periphery by an annular shoulder extending axially from the body member, an annular resilient seal member received on said planar surface and bounded by the annular shoulder and the arcuate shoulder, said annular seal member being generally rectangular in radial section and having an upper bulbous portion extending axially therefrom for engaging the upper portion of said valve seat facing the other of said ports, said bulbous portion of said seal member, when relaxed, having a maximum axial thickness adjacent its upper portion in a plane extending through an axis of movement of said gate member and merging into a minimum axial thickness of said seal member at its lower portion, said seal member with its bulbous portion defining a valve seat engaging portion complementary to said valve seat when said gate member is in the closed position.



and said bulbous portion of said seal member preventing the lower portion of said seal member from dragging across said edge of said seat when said gate member is opened and closed;  
means for retaining said seal member on the body member of said gate member; and  
valve stem means operatively connected to said gate member and extending through said valve casing, said valve stem means being operative to move said gate member between the closed and opened positions.

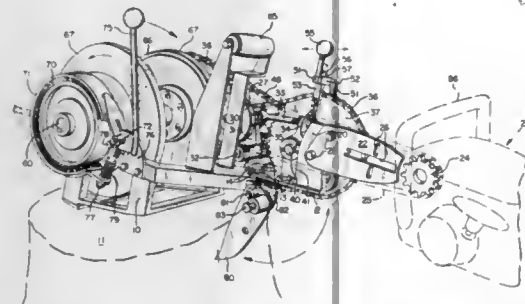
4,162,059

## PORTABLE WINCH

Cleo L. Fletchall, 4526 Maria Ave., NE., Salem, Oreg. 97303  
Filed Aug. 29, 1977, Ser. No. 828,298  
Int. Cl.<sup>2</sup> B66D 3/18

U.S. Cl. 254—187.4

7 Claims



1. A portable winch comprising a frame adapted to rest on a support, said frame extending lengthwise horizontally and having a front end and a rear end, a bracket mounted on said rear end of said frame, an upstanding vertical plate on said bracket having bolt holes for connection with one end of an adapter bar on a chain saw motor, said adapter bar guiding a drive chain driven by said motor, a first transverse shaft mounted on a pivotal arm on said bracket, an adjustable link connected between said arm and said bracket, a driven sprocket on said first shaft driven by said drive chain, a second transverse shaft mounted on said bracket rearward from said first shaft, a first sprocket on said second shaft driven by a second chain on a second sprocket on said first shaft, a clutch sprocket on said second shaft having a jaw clutch connection with said first sprocket on said second shaft, a clutch handle for shifting said clutch sprocket axially on said second shaft to engage and disengage said clutch, a transverse winch drum shaft mounted on the front end of said frame forward from said first shaft, a sprocket on said winch drum shaft driven by a third chain from said clutch sprocket, a hand brake on said winch drum shaft, and means to adjust said bracket lengthwise on said frame to tighten said third chain, said adjustable link serving to tighten said second chain, and said adapter bar and chain saw motor having means to tighten said drive chain.

4,162,060

## SEMI-AUTOMATIC WATER TABLE

Harry E. Anderson, Pittsburgh; Kenneth E. Helsel, Sewickley, and Raymond E. Heasley, McKees Rocks, all of Pa., assignors to Anderson Engineers, Inc., Carnegie, Pa.  
Filed Apr. 21, 1977, Ser. No. 789,509  
Int. Cl.<sup>2</sup> B23K 7/08

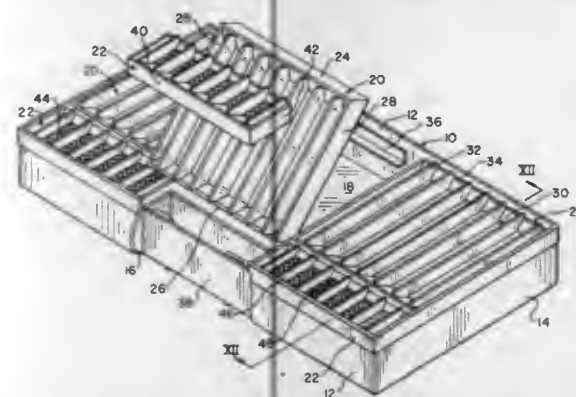
U.S. Cl. 266—49

19 Claims

1. A water table suitable for use with a burning machine comprising:

- A. a tank for holding water;
- B. frame means carrying burning bars positioned in the open top of the tank and forming a burning table;

C. means for tilting said frame means relative to the tank;  
D. means for supporting said frame means for lateral movement and for stabilizing the frame during tilting of the frame for emptying said tank and for lowering it; and  
E. means for changing the level of water in the tank.



ment and for stabilizing the frame during tilting of the frame for emptying said tank and for lowering it; and  
E. means for changing the level of water in the tank.

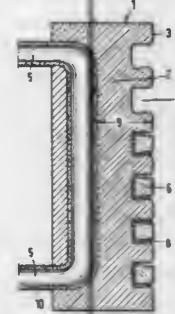
4,162,061

## COOLING ELEMENT FOR A METALLURGICAL FURNACE

Hans-Eugen Bühler, Rheurdt; Günter Robusch, Essen; Herbert Schäfer, Dinslaken, and Karl-Heinz Peters, Duisburg, all of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vorm. August Thyssen-Hütte, Duisburg, Fed. Rep. of Germany  
Filed Apr. 17, 1978, Ser. No. 896,795  
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719165

Int. Cl.<sup>2</sup> C21B 7/10  
U.S. Cl. 266—193

11 Claims



1. A cooling element for a metallurgical furnace, said cooling element including  
a cast iron body having a front surface provided with recessed portions and a refractory lining facing the interior of the furnace received within said cast iron body and terminating substantially flush with the plane of the front surface of said cast iron body,  
said cooling element having steel tubes for conveying a cooling fluid medium anchored in said cast iron body towards the rear surface thereof away from and spaced from said refractory lining,  
said recessed portions having a cross-section which widens from the front surface of the cast iron body towards the rear thereof,  
said refractory lining has a cross-section which substantially corresponds to the cross-section of said recessed portions and including a short measurement, said refractory lining being inserted into said recessed portions forming a space between said received refractory lining and the inner peripheral surface of said recessed portions, and  
mortar filling said space and holding said refractory lining to said cast iron body facing the interior of the furnace.

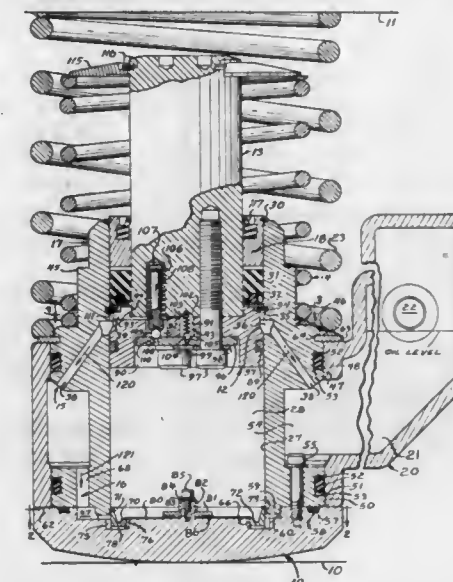
4,162,062

## HYDRAULIC RAILWAY CAR SWAY DAMPER

Paul Strauss, Chicago, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.

Filed Jun. 2, 1977, Ser. No. 802,799  
Int. Cl.<sup>2</sup> B61F 5/12, 5/24; F16F 9/24, 9/36  
U.S. Cl. 267—8 R

18 Claims



1. In a hydraulic snubber apparatus for sway control of railroad cars comprising a body defining a hydraulic cylinder having a closed end and an open end, a piston in the cylinder and having a normal rest position therein and movable from the rest position deeper into the cylinder, a piston rod connected to said piston and extending outside of said cylinder, said body including a bearing and sealing means about the piston rod, a hydraulic fluid reservoir, discharge passageway means between the reservoir and the cylinder for the flow of hydraulic fluid from the cylinder to the reservoir as the piston moves deeper into the cylinder, orifice means and first check valve means in said discharge passageway means, return passageway means between the reservoir and the cylinder for the flow of hydraulic fluid from the reservoir to the cylinder as the piston moves toward the rest position, second check valve means in said return passageway means, and spring means for urging said piston toward its retracted position, the improvement:

wherein said body comprises

a main body member having an upper end and a lower end, an internal cylindrical opening adjacent the lower end and forming said cylinder and two external annular faces, one being adjacent said lower end and the other spaced from said lower end;  
means across said lower end and forming said closed end;  
a reservoir member having two, spaced, internal annular faces mating with said annular faces of said body member;  
said members defining said reservoir which is at least partially between said mating faces, said body having O-ring grooves at said mating faces;  
O-rings in said grooves and forming fluid seals at said mating faces; and  
an upwardly facing annular seat, said spring means resting on said seat and extending upwardly therefrom;  
comprising abutment means adjacent the distal end of the piston rod and secured thereto, the upper end of the spring means bearing against the abutment means; and  
wherein said discharge passageway means extends upwardly from the cylinder to above the cylinder end of the piston and thence to said reservoir at an upper portion thereof.

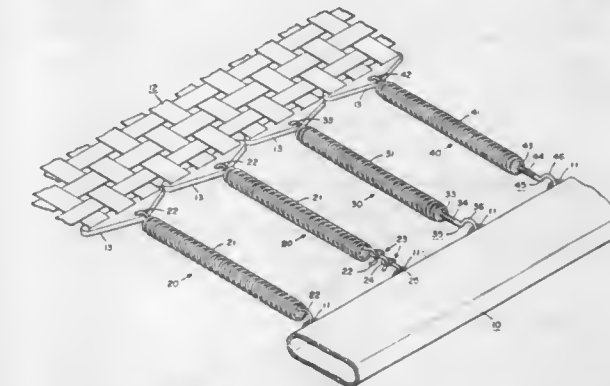
4,162,063

## ADJUSTABLE SPRINGS FOR TRAMPOLINES AND THE LIKE

George P. Nissen, and Harlan J. Kelly, both of Cedar Rapids, Iowa, assignors to Nissen Corporation, Cedar Rapids, Iowa

Filed Jan. 15, 1976, Ser. No. 649,508  
Int. Cl.<sup>2</sup> A63B 5/18; F16F 1/12  
U.S. Cl. 267—73

5 Claims



1. In a trampoline having a flexible bed spacedly surrounded by a frame, and a plurality of extensible helical spring assemblies resiliently suspending the bed relative to the frame, each spring assembly having a spring body with opposite axial ends, one of the ends having a first hook thereat engaging one of the bed and the frame, the other end having a second hook thereat engaging the other of the bed and the frame, the improvement wherein the second hook includes a shank portion extending axially into said spring body end and a hook portion disposed at the outer end of the shank portion, the shank portion being cylindrical and having an external helical thread extending axially along the cylindrical periphery of the shank portion; an anchor member at said spring body end having a bore therethrough axially of the spring and slidably receiving the shank portion; and a retaining member disposed within the spring body inboard of the inner axial end of the anchor member, the retaining member having a bore therethrough axially of the spring body with an internal helical thread complementary with and threadably engaging the external thread of the shank portion.

4,162,064

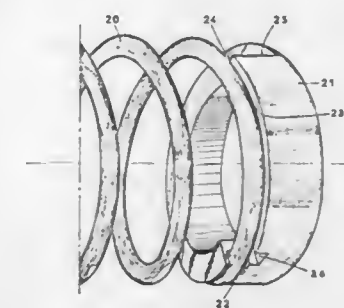
## LINEAR SPRING AND END THRUST MEMBER

Daniel A. Bouton, Vigneux; Jean E. Martoglio, Guignes Rabutin, and Jean-Pierre Maulat, Saint Maur, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 8, 1978, Ser. No. 875,971  
Claims priority, application France, Feb. 8, 1977, 77 04143  
Int. Cl.<sup>2</sup> F16F 1/12

U.S. Cl. 267—177

3 Claims



1. Device for linearly converting a rectilinear displacement into a force and vice-versa, comprising: a helical compression spring having at each end a means holding the end loops



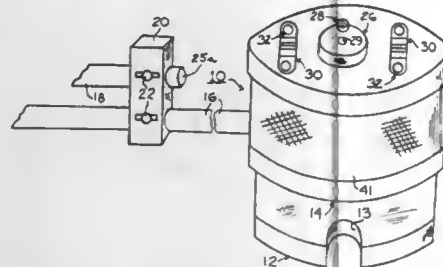
thereof stationary relative to each other, consisting of a helical groove machined in a cup which constitutes the support surface of the spring, characterized by the fact that a helical ramp, whose generatrix is rectilinear and perpendicular to the axis of the helix, extends from one end of the groove as an extension of one side thereof, a notch transverse to the ramp is provided in said ramp at its junction with the groove, and said spring has loops which fit within the helical groove and are adhesively adhered therein up to said notch while a portion of loop engages the helical ramp free of adherence thereto, said notch serving to prevent the adhesive from flowing from said groove to said ramp.

#### 4,162,065 WORK HOLDING FIXTURE FOR CYLINDRICAL WORKPIECES

Andrew Rea, 10271 Nottingham, Detroit, Mich. 48224  
Filed Jun. 20, 1978, Ser. No. 917,336  
Int. Cl.<sup>2</sup> B23Q 3/00

U.S. Cl. 269—294

6 Claims



1. A work holding fixture for cylindrical workpieces comprising a first member having a flat base and a cylindrical portion upstanding from said base, a horizontal V-groove formed in the upper end of said cylindrical portion, and a pair of clamps having fastening means for fastening to said cylindrical position, said clamps having cross-bars which span said V-groove for clamping cylindrical workpieces therein, vertical flats formed on opposite sides of said first member including the base and cylindrical portion thereof, said V-groove extending between said flats, said first member capable of being held via any of the three flats thereon for grinding cylindrical workpieces held in said V-groove, said first member also capable of being bolted via its base for milling cylindrical workpieces held in said V-groove, and a second member having a hollow cylindrical body which fits over and slides on the cylindrical portion of said first member, and aligned central apertures in said first and second members for carrying out a drilling operation on cylindrical workpieces held in said V-groove.

#### 4,162,066 SIGNATURE MACHINES

William B. McCain, Hinsdale; James F. Cosgrove; John Vente, both of Western Springs, and Thomas R. Flavin, Mokena, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Jun. 6, 1977, Ser. No. 803,750  
Int. Cl.<sup>2</sup> B65H 39/02

U.S. Cl. 270—54

6 Claims

1. In a cyclically operable signature feeding machine, where signatures each having a sheet with a lap margin and a short leg sheet attached by a fold to a backbone, are extracted in successive machine cycles one by one from a supply hopper and are transported sequentially by grippers on a rotatable extracting cylinder to a register gauge where they are released with the backbone adjacent the register gauge, whereafter each signature thus released is withdrawn from the register gauge and then opened, so its sheets are spread apart, by opposed grippers respectively carried by a rotatable lap cylinder and an opposed

rotatable opening cylinder preliminary to dropping the opened signature in straddling relation on a saddle conveyor:

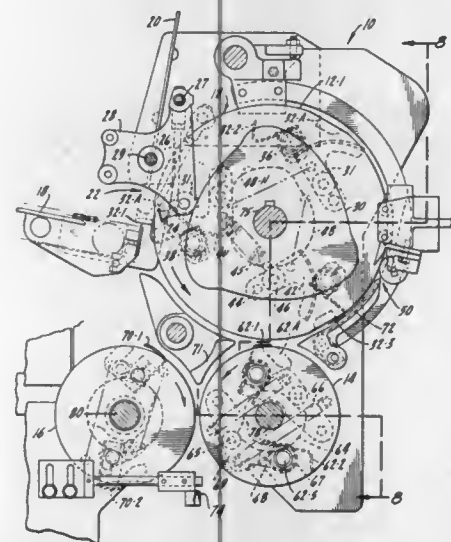
said extracting cylinder having three sets of grippers spaced equidistantly about and supported on the circumference thereof, and actuating means operable to open and close the grippers;

each of the lap and opening cylinders having two sets of grippers supported thereon and spaced approximately 180° apart, together with actuating means operable to open and close those grippers;

timing means for synchronizing operability of the second-named actuating means so that a set of grippers on the lap cylinder closes on the lap margin of a signature already released to the register gauge a set of grippers on the extracting cylinder has closed on the backbone of a signature extracted from the hopper and is transporting it to the register gauge;

extraction means for extracting the signatures from the hopper by applying negative atmospheric pressure thereto and, in timed relation, for releasing an extracted signature to a related gripper means on the extracting cylinder by applying atmospheric pressure; and

means connected to the extraction means to advance the time for both applying negative pressure and atmospheric



pressure when the machine cycles are repeated in a continuous run mode of the machine compared to discontinuous cycles when the machine is in a jog mode.

5. In a cyclically operable signature feeding machine, where signatures are extracted one by one from a supply hopper in successive machine cycles and are transported sequentially by gripper means on a rotatable extracting cylinder to a predetermined release point where they are released:

extraction means for extracting a signature from the hopper by communicating negative atmospheric pressure thereto at a predetermined time and for releasing the thus extracted signature to the gripper means on the extracting cylinder by next in time communicating to said extracted signature atmospheric pressure;

a pair of selectable mutually exclusive valve means respectively operable each to alternate communication of negative and atmospheric pressure to said extraction means at different times when the machine cycles are repeated in a continuous run mode of the machine compared to discontinuous cycles when the machine is in a jog mode, the time for application of negative pressure and atmospheric pressure in the continuous mode occurring sooner than the time for applying negative pressure and atmospheric pressure in the jog mode;

and a selector to select the respective valve means.

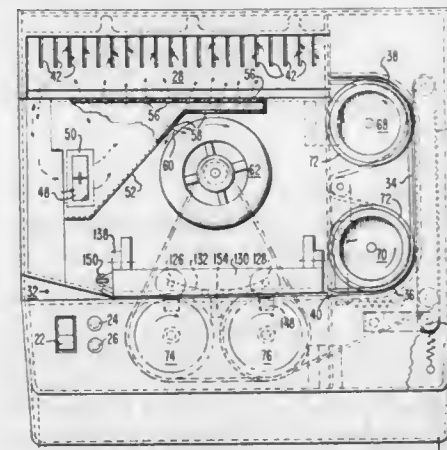
#### 4,162,067 AIR ASSISTED AUTOMATIC DOCUMENT STACKING APPARATUS

Anthony Horak, Detroit; Felix A. Rachiatore, Rochester, and Christopher O. Lada, Ann Arbor, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 25, 1977, Ser. No. 827,588  
Int. Cl.<sup>2</sup> B65H 29/38

U.S. Cl. 271—177

9 Claims



1. Document stacking apparatus comprising an open document receiving receptacle;

means for applying continuous positive air pressure to said receptacle to deflect a document out of the path of other documents entering said receptacle; and

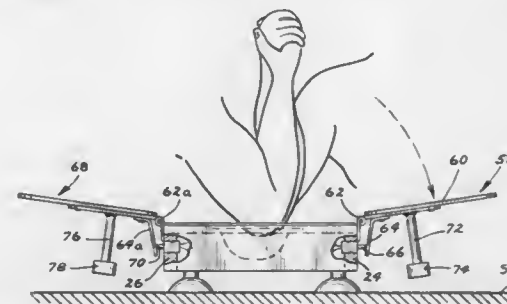
means for producing continuous negative air pressure within said receptacle by withdrawing air from between the stacked documents effectively forcing said documents to closely bunch together within said receptacle.

#### 4,162,068 DEVICE FOR ARM WRESTLING

Mark J. Berg, 1420 E. 6th St., Superior, Wis. 54880  
Filed Aug. 1, 1977, Ser. No. 820,726  
Int. Cl.<sup>2</sup> A63B 67/00; A63F 9/00

U.S. Cl. 273—1 E

6 Claims



1. A device for use in arm wrestling comprising:

(a) a substantially flat top base having a rectangular formation with parallel opposed first and second spaced depending side portions and parallel opposed first and second spaced depending end portions,

(b) a first wing member pivotally mounted at one end thereof to said first side portion of said base substantially centrally thereof and normal thereto,

(c) a second wing member pivotally mounted at one end thereof to said second side portion of said base substantially centrally thereof and normal thereto,

(d) a first switch carried by said first side portion in alignment with said first wing portion,

(e) a second switch carried by said second side portion in alignment with said second wing portion,

(f) a first flange connected to the underside of said first wing

member in alignment with said first switch adapted to actuate said first switch when said first wing member is pivotally moved to a predetermined position,

(g) a second flange connected to the underside of said second wing member in alignment with said second switch adapted to actuate said second switch when said second wing member is pivotally moved to a predetermined position,

(h) means carried by the top of said base on which the elbows of each of two arm wrestling participants are positioned and supported,

(i) stop means carried by the underside of each of said wing members and extending downwardly thereof for limiting the downward pivotal movement thereof,

(j) electrically operated indicator means carried by said base and connected to a source of power and actuated by either or both of said first and second switches when the switches are actuated by either or both of said first and second flanges of said wing members.

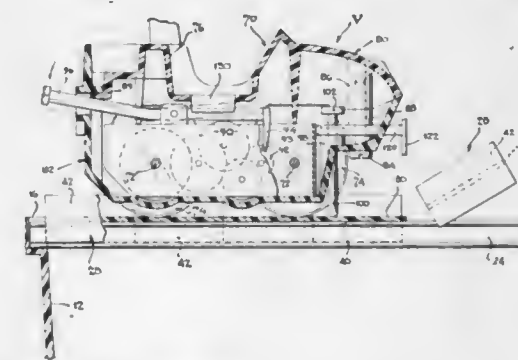
#### 4,162,069 ACTION SKILL GAME

Adolph E. Goldfarb, Tarzana, and Delmar K. Everitt, Woodland Hills, both of Calif., assignors to Adolph E. Goldfarb, Northridge, Calif.

Filed Feb. 9, 1978, Ser. No. 876,420  
Int. Cl.<sup>2</sup> A63F 9/00

U.S. Cl. 273—1 R

37 Claims



1. A skill game comprising:

(a) support means having a starting end and including a pair of spaced apart generally parallel rails, extending generally longitudinally from said starting end,

(b) a plurality of planks sized to be positioned generally transversely on said spaced apart rails to form an object supporting surface extending longitudinally from said starting end, said planks having irregular edges where they are to be placed in relationship to a next adjacent plank, each irregular edge on each plank conforming to the irregular edge of at least no more than a few of said plurality of planks but which is capable of conforming to an irregular edge of at least one plank so that said planks may be placed in successive adjacent conforming relationships to form a generally continuous extension of said supporting surface, and

(c) a movable object capable of being propelled longitudinally across said object supporting surface at a speed such that the player of the game must attempt to lay the planks in conforming adjacent relationship starting from said starting end and before travel of the movable object is interrupted.

34. A method of playing a game of skill comprising:

(a) starting forward movement of an object along a roadway which is to be extended forwardly,

(b) selecting one of a plurality of planks to be placed generally transversely across a pair of spaced apart rails, which extend forwardly in alignment with the roadway, said planks having one or more spaced apart edges designed to



mate with edges of adjacently positioned planks, the selection being of a plank having an edge that will mate with the then forwardmost edge of the roadway,

- (c) positioning the selected plank on the rails in mating relationship to that forwardmost edge, whereby said plank forms a forward extension of said roadway, said selection and positioning being attempted at a fast enough rate to extend the roadway before the moving object can be beyond said forwardmost end, and
- (d) repeating steps (b) and (c) until a determined goal is achieved or the object does go beyond said forwardmost end.

4,162,070

## DEVICE FOR TENNIS INSTRUCTION

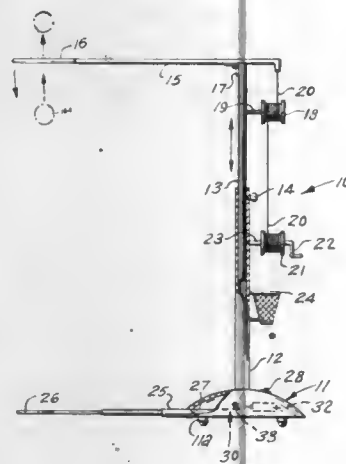
Barbara Georges, 1109 College View Dr., Monterey Park, Calif. 91754

Filed Mar. 30, 1978, Ser. No. 891,906

Int. Cl.<sup>2</sup> A63B 61/00

U.S. Cl. 273—29 A

6 Claims



1. A device for tennis instruction, comprising in combination, a hollow base, a vertically upward sleeve secured on said base, a tube slidably received in said sleeve, an upper portion of said tube extending outwardly of an upper end of said sleeve, a set screw threaded in a side of said sleeve bearing at its end against a side of said tube for selective securement together, a first arm having a hinge along a longitudinally intermediate portion thereof, said hinge being secured to an upper end of said tube, one end of said first arm having an eye into which a tennis ball is tossed by a player, and a mechanism connected to an opposite end of said first arm for pivoting said arm about said hinge.

4,162,071  
GOLF TEE

Barry M Fish, and Alfred G. Ward, both of 8131 Yonge St., Thornhill, Ontario, Canada (L3T 2C6)

Filed Aug. 29, 1977, Ser. No. 828,485

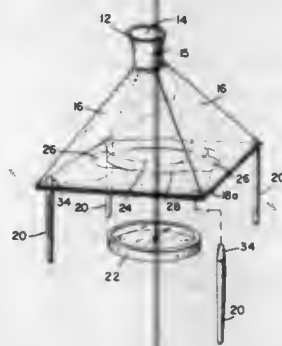
Int. Cl.<sup>2</sup> A63B 57/00

U.S. Cl. 273—33

4 Claims

1. An improved golf tee comprising a generally pyramidal shaped housing including a plurality of ascendant transparent generally triangular side walls, each of said side walls having first and second oblique edges adjoining another of said plurality of said walls, each of said plurality of said walls being uniformly bevelled below the upper vertex thereof and thereby defining a truncation in said housing, a fluted cylindrical member mounted on said truncation in said housing having an upstanding free end on which a golf ball may be removably

mounted, a planar base member substantially parallel to said truncation therein, and a plurality of leg members releasably



mountable on said base of said housing for elevating said housing above a playing surface.

4,162,072

## BALL GAME APPARATUS COMPRISING A FRAME TO WHICH A MESH OR FABRIC IS ATTACHED

Volker Schultze, and Paul Ayasse, both of Renchen, Fed. Rep. of Germany, assigns to Volker Schultze Elektro-mechanische Apparate, Fed. Rep. of Germany

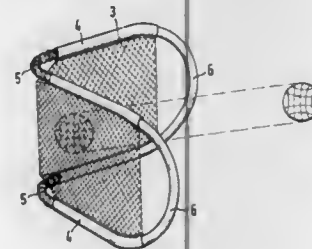
Filed Apr. 18, 1977, Ser. No. 788,541

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638574

Int. Cl.<sup>2</sup> A63B 65/12

U.S. Cl. 273—96 R

18 Claims



1. Ball game apparatus for pitching, throwing or striking of balls, comprising:

- a first relatively rigid frame part,
- a second relatively rigid frame part,
- flexible mesh means connected to and carried by said first and second frame parts,
- handle means at each of said first and second frame parts,
- and hinge means hingedly interconnecting said first and second frame parts for accommodating movement of said frame parts between an extended position and a kinked position so that a ball can be propelled from the surface of the mesh means upon movement of said frame parts from said kinked to said extended positions,
- said hinge means including resilient means continuously biasing said first and second frame parts toward said extended position so that ball throwing movement of said frame parts is aided by said resilient means.

15. A method of pitching, throwing or striking balls with an apparatus of the type having:

- a first relatively rigid frame part,
- a second relatively rigid frame part,
- flexible mesh means connected to and carried by said first and second frame parts,
- handle means at each of said first and second frame parts,
- and hinge means hingedly interconnecting said first and second frame parts for accommodating movement of said frame parts between an extended position and a kinked position so that a ball can be propelled from the surface of

the mesh means upon movement of said frame parts from said kinked to said extended positions, said hinge means including resilient means continuously biasing said first and second frame parts toward said extended position so that ball throwing movement of said frame parts is aided by said resilient means; said method comprising:

manually moving said first and second frame parts to a kinked position against the force of said resilient means with a ball disposed in contact with said mesh means, and subsequently moving said first and second frame parts to said extended position with the aid of said resilient means, with a consequent propelling of said ball from the surface of the mesh means.

4,162,073

## HOLLOW PYRAMID CONTAINING INDICIA-BEARING SPHERES

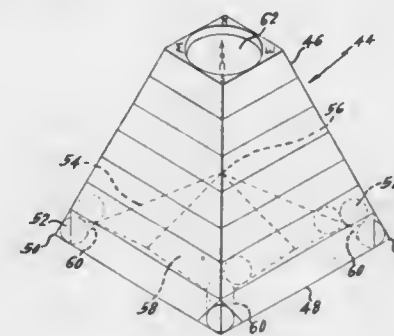
Patrick H. Norris, 11470 Soforeno Dr., Jacksonville, Fla. 32218

Filed Jul. 15, 1977, Ser. No. 815,933

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—144 B

10 Claims



1. A random choice means comprising:
  - a. a partially hollow pyramidal enclosure having an upper region and having a base having at least three basal corners, three of said corners being transparent;
  - b. a plurality of spheres enclosed within said pyramidal enclosure, said spheres sized such that not more than one of said spheres is capable of resting in each of the three said basal corners, each of said spheres having individual indicia thereon;
  - c. means for directing said spheres toward said basal corners when said pyramidal enclosure is at rest on said base, said means for directing being mounted to said pyramidal enclosure interiorly thereof,

so constructed and arranged that inverting said pyramidal enclosure causes said spheres to randomize at a position adjacent said upper region, and that subsequent re-inversion causes one of said spheres to come to rest in each of three said basal corners thereby exhibiting said indicia through said transparent basal corner.

4,162,074

## GOLF PUTTER

William B. Thomson, 9132 Gettysburg Dr., Huntington Beach, Calif. 92646

Continuation-in-part of Ser. No. 716,603, Aug. 23, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,164

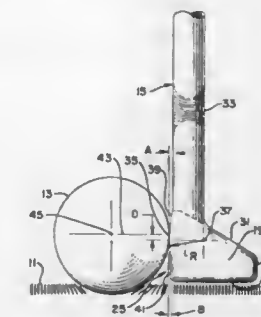
Int. Cl.<sup>2</sup> A63B 53/04

U.S. Cl. 273—175

6 Claims

1. In a golf putter having a shaft and a head, an improved face on one side of the head for stroking a golf ball, comprising: an elongate face surface; an elongate convex striking surface protruding forwardly from said face surface, and extending generally horizontal therealong; the extreme forward apex portion of said convex striking

surface being disposed only slightly below the center of a standard size golf ball when the ball and head are resting on a typical putting surface on which the club is designed to be used and also when the putter head is held slightly above the putting surface; and



said convex surface having a generally arcuate portion of about 0.7 inches radius at said apex and transitioning to an upper surface generally tangent to said arcuate surface and disposed at about 3° to the vertical.

4,162,075

## BOARD GAME INVOLVING ELECTRIC UTILITY PLANT OPERATIONS AND FINANCE

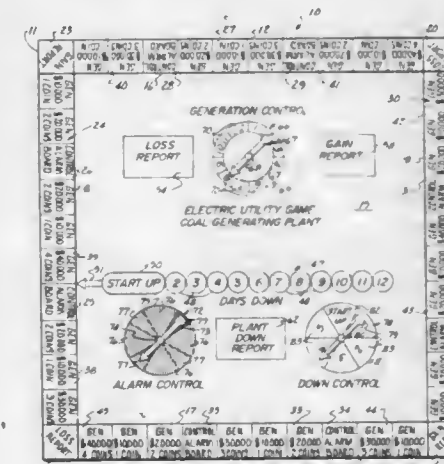
Albert H. Iannucci, 1522 W. Atlanta Ave., Phoenix, Ariz. 85041

Filed May 4, 1978, Ser. No. 902,831

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—256

7 Claims

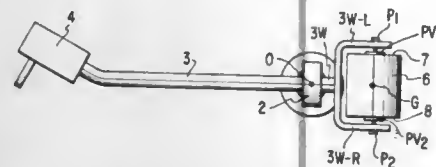


1. A board game relating to the financial gains and losses associated with the operating of electric utility plants, said board game comprising:

- (a) a playing board having four side edges and a playing surface;
- (b) a plurality of marginally disposed playing sections arranged in alignment along each side edge of said board, at least one of said playing sections displaying a symbol indicative of a financial gain report, at least one of said playing sections displaying a symbol indicative of a financial loss report, at least one of said playing sections displaying a symbol indicative of a control board alarm, and the remaining ones of said playing sections displaying symbols indicative of various financial gains resulting from electric power generation;
- (c) a plurality of special playing sections arranged in a line across the playing surface of said board such that none of said special playing sections is contiguous with any said marginally disposed playing sections, each of said special playing sections displaying a different symbol indicative

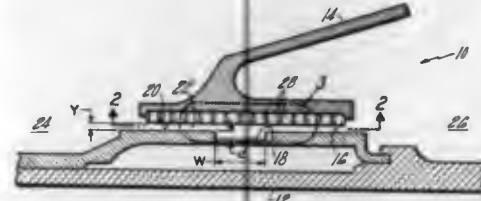
- of a number of days down, with those symbols arranged in a numerical progression;
- (d) a start up playing section interposed between, and contiguous with the numerically low end of said plurality of special playing sections and at least one of said marginally disposed playing sections that are arranged along one of the side edges of said board;
- (e) a plurality of financial gain report cards each bearing a symbol corresponding to the symbol on said financial gain report playing sections;
- (f) a plurality of financial loss report cards each bearing a symbol corresponding to the symbol on said financial loss report playing sections;
- (g) a plurality of plant down report cards each identifying a different type of plant alarm condition and the number of days down resulting from that alarm condition;
- (h) a plurality of playing pieces movable on said board;
- (i) a first chance device mounted on said board for determining the number of said marginally disposed playing sections over which said playing pieces are movable;
- (j) a second chance device mounted on said board for determining if a playing piece is to be moved onto said special playing section;
- (k) a third chance device mounted on said board for determining the number of said special playing sections over which said playing pieces are movable; and
- (l) at least one financial gain and loss scorekeeping means for recording the gains and losses.

**4,162,076**  
**TONE ARM**  
Hisayoshi Nakatsuka, Mitaka, Japan, assignor to Namiki Precision Jewel Co., Ltd., Tokyo, Japan  
Filed Dec. 12, 1977, Ser. No. 859,541  
Claims priority, application Japan, Mar. 30, 1977, 52-35621  
Int. Cl.<sup>2</sup> G11B 3/14  
U.S. Cl. 274—23 R 9 Claims



1. A tone arm for use in a phonograph record player having a base, said tone arm comprising
- tone arm shaft having pick up means disposed at one end thereof and a balance weight disposed at the other end thereof, said tone arm shaft having a longitudinal axis extending between said ends thereof,
- a tone arm shaft holder for pivotally mounting said tone arm shaft with respect to the phonograph record player base about a vertical axis, and
- balance weight mounting means for pivotally mounting said balance weight with respect to said tone arm shaft about a balance weight axis which substantially intersects said longitudinal axis of the tone arm shaft and is spaced from said vertical axis about which the tone arm shaft pivots where the center of gravity of said balance weight lies substantially on said balance weight axis.

**4,162,077**  
**WIDE CHANNEL SEAL**  
David E. Crow, Glastonbury, Conn., and Nathan E. Harrison, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.  
Filed Dec. 28, 1977, Ser. No. 865,267  
Int. Cl.<sup>2</sup> F16J 15/44, 15/40  
U.S. Cl. 277—53 7 Claims

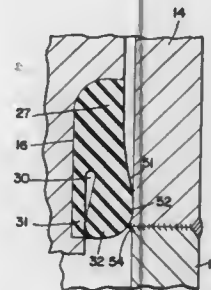


1. A seal structure of the type for impeding the leakage of a gaseous medium between the rotor and stator assemblies of a rotary machine wherein said structure comprises a cylindrical land having a honeycomb material adhered thereto and an opposing cylindrical land having a circumferentially extending groove disposed therein.

**4,162,078**  
**INJECTABLE PACKING FORMULATION CONTAINING FLEXIBLE GRAPHITE**  
Carl V. Cox, Middleburgh Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.  
Filed Feb. 1, 1978, Ser. No. 874,323  
Int. Cl.<sup>2</sup> B65D 53/00; E21B 33/00; C10M 5/00, 7/00  
U.S. Cl. 277—102 42 Claims

1. An injectable packing formulation comprising particulate flexible graphite and a liquid lubricant.

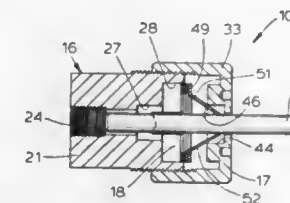
**4,162,079**  
**RESILIENT PACKING RING AND ASSEMBLY**  
Jerry G. Jelinek, La Habra, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio  
Filed Feb. 2, 1978, Ser. No. 874,438  
Int. Cl.<sup>2</sup> F16J 15/32  
U.S. Cl. 277—205 10 Claims



1. A packing ring of resilient material, said ring having an unrecused base portion at one end and having an annular recess extending axially inwardly from the other end thereof to form radially inner and outer lips, said recess having an axial length of less than one half of the overall axial length of said packing ring, said inner and outer lips having substantially equal axial lengths, said inner lip having substantially straight cylindrical axially extending inner and outer walls and having a substantially uniform radial thickness of less than one fourth of the radial thickness of said base, said outer lip having a maximum radial thickness of at least three times the radial thickness of the inner lip, said outer lip having a substantially straight inner wall and an outer corner at its free end that is

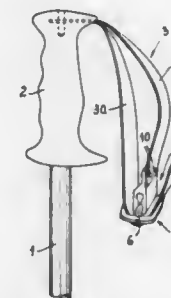
convexly curved on a radius equal to at least 50% of the maximum thickness of said lip.

**4,162,080**  
**DRILL CHUCK**  
James R. Buck, P.O. Box 125, Richland, Mich. 49083  
Filed Nov. 4, 1977, Ser. No. 848,410  
Int. Cl.<sup>2</sup> B23B 31/04, 31/12  
U.S. Cl. 279—1 DC 13 Claims



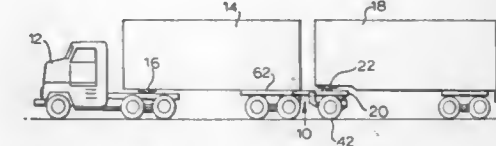
1. In a drill chuck having a rotatable housing means and tool holding means supported thereon and disposed for grippingly engaging the shank of a tool, the improvement wherein said tool holding means comprises a support ring and a plurality of resilient arms fixed to said support ring in angularly spaced relationship and projecting radially inwardly therefrom, said arms having surface means on the inner free ends thereof adapted for gripping engagement with the tool shank, said support ring being of a laminated construction and formed from a plurality of ringlike washers which are axially stacked and fixedly connected together, and at least some of said washers having said resilient arms fixedly and integrally connected thereto.

**4,162,081**  
**SAFETY RELEASE HAND LOOP FOR SKI POLE**  
Claude Joseph, 60 Avenue de Geneve, Sallanches, (Haute Savoie), France  
Filed Feb. 9, 1978, Ser. No. 876,210  
Claims priority, application France, Feb. 10, 1977, 77 04302  
Int. Cl.<sup>2</sup> A63C 11/22  
U.S. Cl. 280—11.37 H 9 Claims



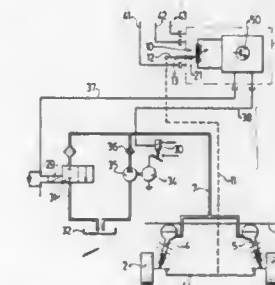
1. In combination with a ski pole, a hand loop comprising:
- a pair of flexible straps each having a free end and an opposite end secured to said pole;
- a buckle formed with a pair of openings through which one of said free ends extends and having a projecting holding formation, said buckle being slidable and positionable along said strap having said one free end for adjustment of said loop; and
- a clip on the other of said free ends having an elastically deflectable portion defining a recess in which said formation is snugly engageable, whereby on pulling-apart of said free ends said formation of said buckle can elastically deform said portion and pull out of said recess.

**4,162,082**  
**SELF-STEERING DOLLY**  
Norman R. Curry, Mississauga, Canada, assignor to Auto Steering Trailers Limited, Oakville, Canada  
Filed Jul. 13, 1978, Ser. No. 924,296  
Int. Cl.<sup>2</sup> B62D 53/00  
U.S. Cl. 280—81 A 5 Claims



1. A transport dolly for releasable tandem connection of a rearward vehicle to a forward vehicle comprising:
- a dolly frame;
- means at the forward end of the dolly frame for releasably rigidly connecting the dolly frame to the frame of the forward vehicle by which the dolly and the rearward vehicle are to be towed;
- a fifth wheel connection mounted on the dolly frame to releasably receive the front end of the rearward vehicle;
- a dolly axle;
- a spring suspension connected to the dolly frame and the dolly axle and mounting the dolly axle to the dolly frame;
- two stub axles mounted by king pins on the dolly axle at respective ends thereof for steering pivoting movement about respective king pin axes;
- two road wheels mounted respectively by the stub axles and on which the dolly runs;
- link means connecting the stub axles for simultaneous pivoting steering movement about their respective axes under the effect of sideways-directed forces applied to the road wheels by movement of the forward vehicle as it is steered away from a straight line; and
- centering means connected between the link means and the dolly frame and urging the road wheels to a centered straight ahead attitude.

**4,162,083**  
**LEVELING CONTROL FOR MOTOR VEHICLES**  
Erich Zabler, Karlsruhe; Heiner Gassmann, Esslingen; Steffen Schneider, Moglingen, and Steffen Straub, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Sep. 23, 1977, Ser. No. 836,886  
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646547  
Int. Cl.<sup>2</sup> B60G 11/26  
U.S. Cl. 280—703 10 Claims



1. A leveling system for a vehicle which includes a chassis and a body, said system including:
- a source of hydraulic fluid under pressure;
- a leveling means connected between said chassis and said body of said vehicle to raise and lower the body with



respect to said chassis by hydraulic pressure supplied by said source of hydraulic pressure;  
 indicator means, including linkage between said chassis and said body to provide a signal related to the relative vertical distance therebetween; and  
 electronic circuit means including damping means for processing and damping said signal and for controlling said leveling means in dependence thereon, and wherein the improvement comprises:  
 said indicator means includes a housing attached to said chassis, said housing containing a converter for converting mechanical motion to an electrical signal and further includes a pivoting lever attached to said converter and to said chassis to thereby convert the relative motion of said chassis with respect to said body into said signal; and  
 said leveling means includes at least one solenoid valve, controlled by said electronic circuit means in dependence on said damped signal.

4,162,084

## EXERCISING BICYCLE

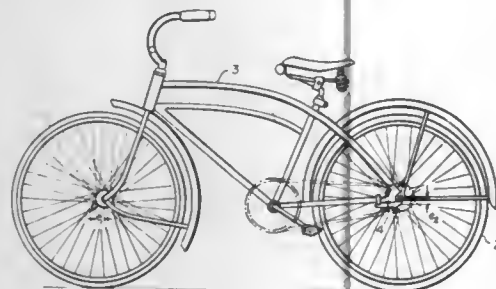
Stanley J. Mikina, Berna-Knoll 21, Rte. 2, Hendersonville, N.C. 28739

Filed Jan. 27, 1978, Ser. No. 873,007

Int. Cl.<sup>2</sup> B62K 17/00 B62L 1/10

U.S. Cl. 280—229

1 Claim



1. A bicycle adapted for forward travel and equipped with circular wheels having concentric circular hubs, eccentrically mounted axles on said hubs whose axles are displaced radially from the geometric wheel centers for the purpose of imparting a sinusoidal vertical oscillation to said axles and attached bicycle frame and its rider, these oscillations to be superposed on and to be the result of the forward motion of the bicycle, a caliper brake including movable shoes mounted so as to surround a perimetrical portion of one of said wheels, and an auxiliary rim mounted on the rim of said wheel having a braking track concentric with said wheel axles for frictional engagement by said shoes.

4,162,085

## SWINGABLE TRANSPORT BAR

Thomas D. Miranowski, Breckenridge, Minn., assignor to Frontier, Inc., West Fargo, N. Dak.

Filed Nov. 25, 1977, Ser. No. 854,823

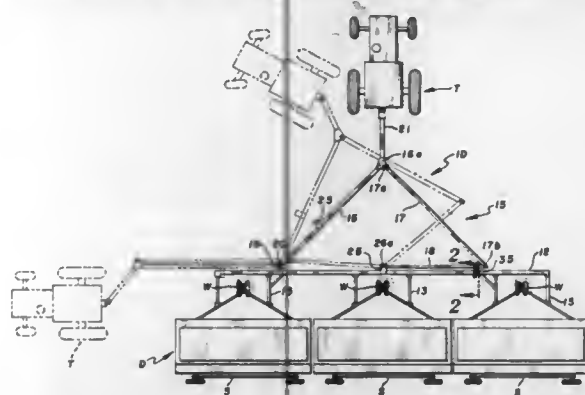
Int. Cl.<sup>2</sup> B60D 1/14

U.S. Cl. 280—412

5 Claims

1. A connector arrangement for towing of vehicles by a towing vehicle in a first operative position and a second travel position, said connector arrangement including:  
 a. an attachment bar arranged and constructed to extend generally transversely across a frontal portion of the article to be towed;  
 b. a first link member of a first longitudinal dimension; said first link member having a first and a second end, said first end being pivotally attached to said attachment bar;  
 c. a second link member of a first longitudinal dimension, said second link member having a first and second end,

said first end thereof being pivotally attached to said second end of said first link member;  
 d. a third link member of a second longitudinal dimension, said third link having a first and second end, said first end thereof being pivotally attached to said attachment bar and said second end being pivotally attached to said second end of said second link member.  
 e. said dimensions of said links and the positions of attachment therefore providing a connector arrangement of a



triangular configuration in a first operative towing position and a configuration wherein said attachment bar and said first and second link members are arranged in side by side relation to provide a travel position; and  
 f. connector means provided for releasably connecting one of said links to said attachment bar for maintaining said links in a triangular configuration for operative towing and for releasably connecting a second of said links to maintain said first and second links in said side by side relation.

4,162,086

## TRAILER APPARATUS AND GROUND SUPPORT THEREFOR

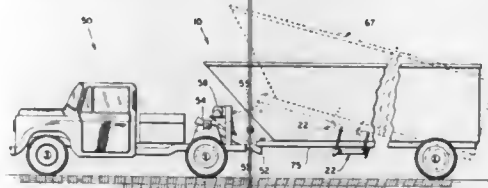
Ronald L. Bond, Valdosta; E. Chris Daughdrill, Lake Park; Henry T. Brice, Valdosta, all of Ga., and Phineas E. Horton, III, Portsmouth, Va., assignors to Swacars Sales, Inc., Valdosta, Ga.

Division of Ser. No. 611,133, Sep. 8, 1975, Pat. No. 4,054,301, which is a continuation-in-part of Ser. No. 480,606, Jun. 19, 1974, abandoned, which is a continuation of Ser. No. 377,752, Jul. 9, 1973, Pat. No. 3,858,939. This application Oct. 13, 1977, Ser. No. 841,722

Int. Cl.<sup>2</sup> B62D 53/06

U.S. Cl. 280—425 R

2 Claims



1. A vehicular system in which a towing vehicle is selectively and interchangeably connectable to support and tow any one of a number of trailers;  
 each said trailer comprising coupling means located at the forward end of the trailer;  
 traveling wheel means located rearwardly of said hitch means;  
 and ground support means located forwardly of said traveling wheel means;  
 said ground support means being selectively disposable in a ground contacting position to support said forward end of a trailer at predetermined elevation above the ground when the trailer is disconnected from a towing vehicle;

said towing vehicle having a hitch means selectably connectable to said coupling means of said trailer;  
 said towing vehicle further comprising support means for said hitch means, said support means being selectably movable in a substantially vertical direction either to a lower position whereat said hitch means is below and disconnected from said trailer coupling means while the forward end of said trailer is supported by said ground support means, and an upper position whereat said hitch means engages said trailer hitch means and elevates said trailer front end sufficiently to permit said ground support means to be elevated from ground contact;  
 a said ground support means comprising support member selectively movable into downwardly depending position for contact with the ground;  
 locking means interconnecting said support member with said trailer, said locking means being selectively operative to lock said support member in said depending position and being operative in response to elevation of said trailer above said predetermined elevation to unlock said support member;  
 means defining a socket for selectively receiving a mating portion of said support member to retain said support member in said downwardly depending position;  
 said locking means comprising a lost motion connection which permits said support member, when in downwardly depending position, to undergo a limited extent of motion with respect to said socket as said trailer is raised or lowered with respect to said predetermined elevation, so that said support member is locked into said downwardly depending position by said socket when said trailer is lowered to said predetermined elevation for ground support by said support member;  
 support moving means operatively connected to said support member for moving said unlocked support member upwardly to a raised position out of ground contact;  
 said support moving means comprises a crank supported on said trailer and having a crank arm extending alongside said support member;  
 means operatively interconnecting said crank arm and said support member to permit said downwardly depending support member to undergo said limited extent of motion; and  
 operating means associated with said crank to rotate said crank so that said crank arm moves said unlocked support member upwardly to said raised position.

4,162,087

## SELF-PROPELLED TRANSLATABLE WORKING UNIT FOR TRACTOR VEHICLE

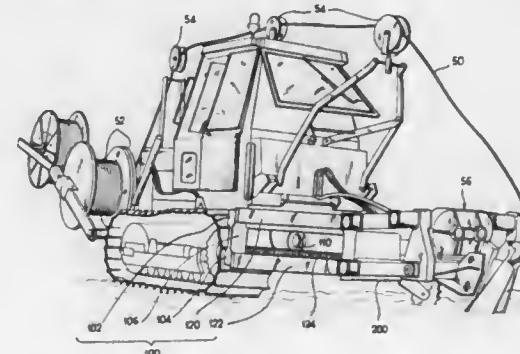
Jean-Claude Avrillon, Vlerzon, France, assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 26, 1977, Ser. No. 845,759

Int. Cl.<sup>2</sup> B60D 7/00

U.S. Cl. 280—460 A

7 Claims



1. In a tractor vehicle, a working unit adapted to be mounted thereon comprising an assembly support provided with at least

one guide, said assembly support having a rack extending parallel to said one guide, said support provided with at least two bearings which are pivotally mounted to said vehicle for pivotal movement of said support about a transverse horizontal axis, lugs mounted on said support and pivot cylinders mounted between said vehicle and said lugs to control the pivoting of said support about said transverse horizontal axis, a tool-holder chassis mounted to slide on the guide, a hydraulic motor mounted on the tool-holder chassis, said motor having a vertical rotating shaft driving at least one toothed pinion which cooperates with said rack to provoke the displacement of the tool-holder chassis along the whole of said guide, locking means adapted mechanically to lock the tool-holder chassis at all points of its path with respect to the guide.

4,162,088

## POWERED SNOW SKI

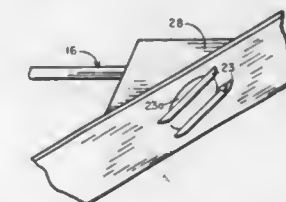
Gordon K. Best, 1809 "H" St. SE. #10, Auburn, Wash. 98002, and Dennis O. Best, P.O. Box 14, Springdale, Wash. 99173

Filed Mar. 20, 1978, Ser. No. 887,998

Int. Cl.<sup>2</sup> B62M 27/02

U.S. Cl. 280—606

4 Claims



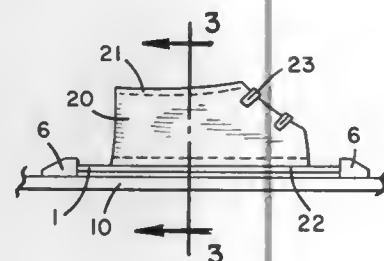
2. A powered snow ski comprising, in combination:  
 an elongate ski body defining a steering shaft hole in the forward medial part and a drive belt slot in the rearward medial part;  
 a steering mechanism having two thin, spaced, parallel rudders with substantial areal surface in a vertical plane depending from a thin rudder plate having its principal areal surface in a horizontal plane substantially parallel to the ski body and perpendicular to the rudders, the rudder plate being irrotatably carried immediately below the ski body by a rudder control arm journaled in the steering shaft hole, with an elongate steering column irrotatably communicating with the rudder control arm by a universal joint and extending upwardly and rearwardly therefrom to support a handle bar at its upper end above the medial part of the ski body;  
 a driving mechanism housing, carried by the ski body to define a chamber above the drive belt slot, journaling paired opposed drive belt rollers in the forward and rearward parts of the chamber, said drive belt rollers carrying therebetween an endless drive belt with a portion of its peripheral surface depending through the driving belt slot and below the ski body to operatively communicate with an underlying supportive surface;  
 a motor carried by the upper part of the driving mechanism housing; and  
 mechanical linkage operatively interconnecting the motor with at least one belt roll of the endless drive belt to transmit motion of the motor to the drive belt to cause locomotion of the ski body over an underlying supportive surface.

4,162,089

## SKI BINDING

Franz Alber, Nordwestbahnstr. 15/10, Vienna, Austria (A 1020)  
 Filed Oct. 3, 1977, Ser. No. 838,894  
 Claims priority, application Austria, Oct. 4, 1976, 107360/76  
 Int. Cl.<sup>2</sup> A63C 9/00  
 U.S. Cl. 280—618

9 Claims



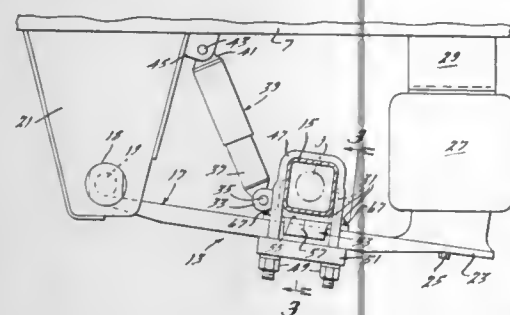
1. A combined ski boot and ski binding comprising:  
 (a) a ski boot having a lower portion made of pliant material integral with an upper portion made of rigid material;  
 (b) a ski binding having:  
 (1) a sole plate adapted to be releasably connected to the top surface of a ski with side edges of the sole plate extending generally parallel to the longitudinal axis of the ski;  
 (2) fastening members hinged to the side edges of the sole plate; and  
 (c) cooperating fastening means for releasably interconnecting said fastening members and said upper portion of said ski boot, said cooperating fastening means having a first component associated with said fastening members and a second component associated with said upper portion of said ski boot.

4,162,090

## VEHICLE AXLE SUSPENSION ASSEMBLY

Robert B. Schwartz, Grosse Pointe Wds., Mich., assignor to Fruehauf Corporation, Detroit, Mich.  
 Filed Mar. 6, 1978, Ser. No. 883,371  
 Int. Cl.<sup>2</sup> B60G 11/00

U.S. Cl. 280—688



1. In a vehicle axle suspension assembly comprising a trailing arm, a locator plate adapted to be welded to an axle section, said locator plate having an interference fit on said arm and being substantially rigid with said arm, said plate being U-shaped in cross section with the legs of the U engaged with and conforming to the sides of the arm, the sides of the arm have convex shoulder means facing away from said plate and the legs of said plate extending overcenter so as to be mechanically locked behind the shoulder means, whereby said arm is substantially free of welding stresses.

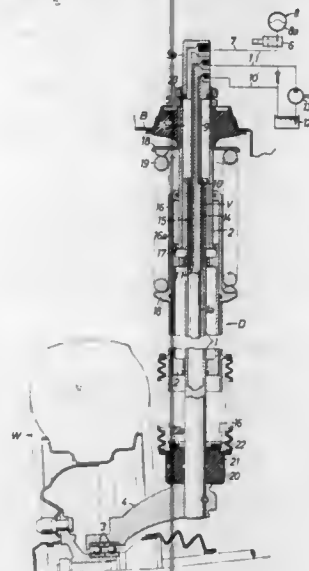
4,162,091

## WHEEL SUSPENSION APPARATUS FOR A VEHICLE

Shoichi Sano, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
 Filed Dec. 7, 1977, Ser. No. 858,459  
 Claims priority, application Japan, Dec. 14, 1976, 51-150230  
 Int. Cl.<sup>2</sup> B60G 11/26

U.S. Cl. 280—702

6 Claims



1. A wheel suspension apparatus for a vehicle comprising a hydraulic damper disposed between the body and a wheel of the vehicle and including an inner cylinder and an outer cylinder slidably fitted thereover to define a main hydraulic chamber; an auxiliary cylinder slidably fitted over the outer peripheral surface of said outer cylinder to define an auxiliary hydraulic chamber therebetween in communication with said main chamber, said auxiliary cylinder being urged in one axial direction under the hydraulic pressure in said auxiliary chamber; and a suspension coil spring disposed under compression between said auxiliary cylinder and said outer cylinder for resiliently biasing the former in the other axial direction.

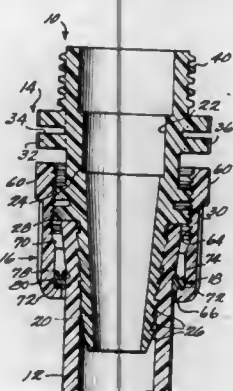
4,162,092

## HOSE COUPLING

Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.  
 Filed Oct. 6, 1977, Ser. No. 839,996  
 Int. Cl.<sup>2</sup> F16L 35/00

U.S. Cl. 285—39

15 Claims



1. Apparatus for a re-usable attachment to garden hoses in a wide range of sizes to provide a conventional hose fitting on an end thereof, said apparatus comprising:

- (1) a tubular shank member molded of plastic material, said shank member having  
 (a) an opening extending interiorly therethrough which is frustoconical at one end portion thereof,  
 (b) a series of hose engaging ring sections on the exterior of said one end portion extending therefrom toward the opposed end thereof, the diameter of each ring section extending from said one end portion exceeding the diameter of the preceding ring sections,  
 (c) a threaded section on the exterior of said shank member adjacent the ring section of largest diameter, said threaded section having a diameter in excess of the diameter of said adjacent ring section,  
 (d) a gripping section on the exterior of said shank member spaced from said threaded section, said gripping section extending radially outwardly beyond the periphery of said threaded section, and  
 (e) a fitting on the end of said shank member opposite from said one end portion thereof,  
 (2) a tubular collar member molded of plastic material, said collar member having  
 (a) exterior gripping surfaces,  
 (b) an interior threaded section in one end portion of a size to engage the exterior threaded section on said shank member,  
 (c) an interior radially inwardly directed annular flange on the other end portion having an interior diameter greater than the diameter of the largest ring section on said shank member, and  
 (d) an interior generally cylindrical surface extending between said threaded section and said annular flange having a diameter size intermediate the interior diameter size of said threaded section and said annular flange, and  
 (3) a plurality of annular sizing members molded of plastic material, each of said sizing members comprising a split ring having  
 (a) an outer section of an exterior size to fit within said collar member in surface-to-surface engagement with the interior cylindrical surface of said collar member and an axially inwardly facing surface of the flange thereof, the exterior size of the outer section of each sizing member being the same, and  
 (b) an inner section of an interior size to engage the exterior of an end portion of a hose the interior of which is engaged over a plurality of the ring sections on the exterior of said shank member, the interior size of the inner section of each sizing member being less than the interior diameter size of said flange and different from one another.

4,162,093

## HEAT-INSULATED PIPE-LINES

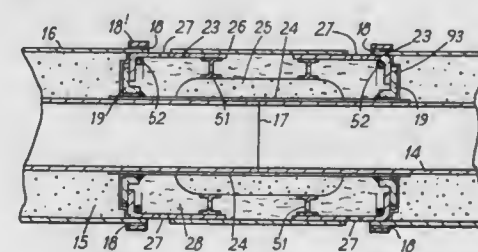
Frantisek Sigmund, 19 rue du Calvaire, 92210 Saint-Cloud, France  
 Filed Jun. 13, 1977, Ser. No. 806,288

Claims priority, application United Kingdom, Jun. 14, 1976, 24605/76

U.S. Cl. 285—47

Int. Cl.<sup>2</sup> F16L 59/16

24 Claims



1. A heat-insulated joint between two heat-insulated pipe units, each of said pipe units comprising:

- (1) a pipe,  
 (2) an outer jacket of fluid-impervious material surrounding said pipe in coaxially spaced relationship therewith, and a filling of expanded heat-insulating material provided between said pipe and said outer jacket and extending over the greater part of the length of said pipe, the end parts of said pipe projecting beyond the corresponding ends of said filling and the end parts of said outer jacket projecting likewise but for a shorter distance, so that annular recesses are formed in the ends of the pipe unit, and said heat-insulated joint comprising:  
 means interconnecting proximate projecting end parts of the pipes of said two pipe units,  
 annular seals of rubberlike material located in the annular recesses in the proximate ends of the two pipe units, each annular seal having an outer circumferential portion lying in contact with the radially inner surface of the projecting end part of the jacket of the respective pipe unit and an annular portion supported by at least the radially outer part of the end face of the filling of the respective pipe unit,  
 a tubular cover extending across the gap between the proximate end parts of the jackets and having its ends joined to the outer circumferential portions of said annular seals, and  
 a further expanding filling of heat-insulating foam material within the annular space enclosed by the seals and the cover and surrounding the interconnected pipe end parts, the outer circumferential portions of the annular seals being held by said further filling in fluid-tight sealing contact with the radially inner surfaces of the projecting jacket end parts and the annular portions of the annular seals being pressed by said further filling in fluid-tight sealing relation toward the end faces of the corresponding pipe units.

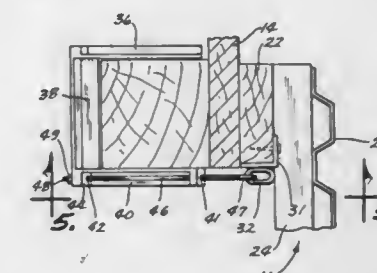
4,162,094

## POLE BUILDING DOOR LOCK

Donald D. Williams, 415 W. Chapel St., Marengo, Ill. 60152  
 Filed Nov. 7, 1977, Ser. No. 848,945  
 Int. Cl.<sup>2</sup> E05C 19/18

U.S. Cl. 292—288

3 Claims



1. A lock assembly and a door having a frame defining a doorway and including an upright post of a rectangular shape in transverse cross section at one side of the doorway, said lock assembly comprising:

- (a) a clamp member of a U-shape and of a size to receive said post therein,  
 (b) said post having a first side remote from the door, a second side opposite said first side, a third side facing the doorway and a fourth side opposite said third side,  
 (c) said clamp member having a base section and a pair of leg sections to receive the post member in a straddling relation therebetween with the base section opposite said first side, with the one of said pair of leg sections opposite said third side having a hook portion projected laterally outwardly from said second side when the base section is in engagement with said first side,  
 (d) a hook portion connecting member, and  
 (e) a hook portion connecting member.



(e) means for securing said connecting member on the inner surface of the door such that when the door is in a doorway closing position, said hook portion is connectible with said connecting member to hold the base portion in engagement with said first post side.

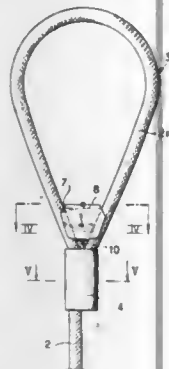
#### 4,162,095 CABLE SLINGS

Jean-Francois Archer, Villennes, France, assignor to Stas - Societe Technique d'Accessoire Specialises, Sartrouville, France

Filed Apr. 29, 1977, Ser. No. 792,229  
Claims priority, application France, May 13, 1976, 76 15160  
Int. Cl.<sup>2</sup> B66C 1/18

U.S. Cl. 294-74

7 Claims



1. The cable combination which comprises a cable sling formed by a cable of which at least one end is folded back in such a manner as to form a loop and a sleeve retaining the said end of the cable, the loop having a crotch adjacent said sleeve, a marking plate comprising a stirrup member which is threaded onto the end of the loop adjacent to the sleeve, and a retaining cable operative to secure the stirrup member to the sleeve, said retaining cable being folded back to provide two ends, said two ends of the retaining cable being imprisoned in the sleeve.

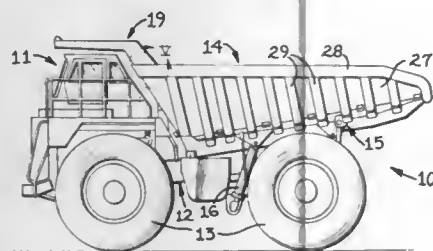
#### 4,162,096 MODULAR TRUCK BODY

Bernard E. Proeschl, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 10, 1977, Ser. No. 850,433  
Int. Cl.<sup>2</sup> B62D 27/00

U.S. Cl. 296-196

9 Claims



1. A modular truck body disposed on a longitudinal axis thereof comprising

- a unitary first module having a generally L-shaped cross section to define a generally vertical first side section and a generally horizontal first bottom section,
- a unitary second module having a generally L-shaped cross section to define a generally vertical second side section spaced laterally from said first side section and a generally horizontal second bottom section having a lateral width substantially less than the lateral width of said first bottom section, said first and second bottom sections separated

from each other by a separation line extending longitudinally the full lengths thereof and which is laterally disposed in substantial offset relationship relative to the longitudinal axis of said truck body, and securing means extending along said separation line and securing said first and second bottom sections together, said securing means comprises a plurality of longitudinally spaced releasable fastening means detachably securing said first and second modules together at said separation line.

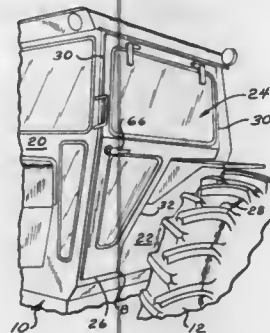
#### 4,162,097 VEHICLE CAB STRUCTURE

Frank F. Scribner, Stout, Iowa, assignor to Royal Industries, Inc., Waterloo, Iowa

Filed Nov. 15, 1976, Ser. No. 742,689  
Int. Cl.<sup>2</sup> E05D 15/28; B60J 1/00

U.S. Cl. 296-190

5 Claims



1. A vehicle construction comprising: a vehicle frame; spaced apart wheels on said frame; an operator cab mounted on said frame between said wheels and having an access opening with opposed sides and closeable by an access door with generally vertically extending sides and adjacent to one of said wheels, said door having a lower extremity below the uppermost extent of said one wheel and a relief in one side thereof and at said lower extremity; a generally horizontally directed link within said cab having one end pivoted to said cab at a location intermediate said opening sides and an opposite end pivoted to said door on the interior surface thereof between said door one side and said intermediate location; and a horizontally slidable connection between said door adjacent said door one side and said cab; whereby when said door is opened, said door will be rotated and translated to allow said lower extremity to clear said one wheel.

#### 4,162,098 PROTECTIVE LINER FOR PICKUP TRUCKS

Sam M. Richardson, III, P.O. Box 1582, El Dorado, Ark. 71730

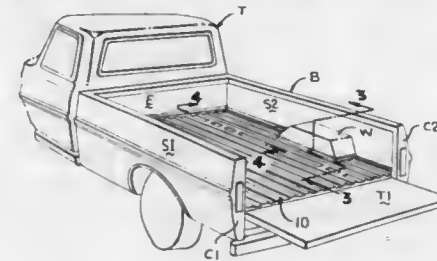
Filed Jun. 13, 1977, Ser. No. 806,097  
Int. Cl.<sup>2</sup> B62D 33/00

U.S. Cl. 296-39 R

12 Claims

1. A protective liner for a pickup truck bed comprising a one-piece plastic member having a pair of opposite longitudinal edge portions and a pair of opposite transverse edge portions, said longitudinal edge portions having relieved areas adapted to receive wheel wells of the pickup truck bed, a plurality of generally parallel upwardly projecting lands and upwardly opening valleys disposed longitudinally of said member, a first short upstanding sidewall bordering one of said transverse edge portions, second and third short upstanding sidewalls bordering said longitudinal edge portions, said first through third sidewalls merging with respective first through third terminal bordering edges adapted to be contiguously

disposed relative to an inner body wall of the pickup truck bed, each of said bordering edges being defined by a first horizontal wall merging with each short upstanding sidewall, a downwardly directed wall merging with each first horizontal wall, and an outwardly directed second horizontal terminal wall merging with each downwardly directed wall.



wardly directed wall merging with each first horizontal wall, and an outwardly directed second horizontal terminal wall merging with each downwardly directed wall.

#### 4,162,099 MOTOR-DRIVEN VEHICLE, ESPECIALLY FOR USE IN MINING OPERATIONS

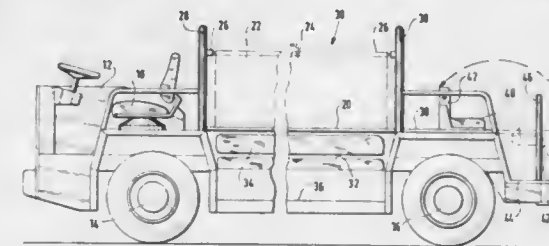
Jörg Schopf, Stuttgart, Fed. Rep. of Germany, assignor to Schopf Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,663  
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632246

Int. Cl.<sup>2</sup> B62D 33/00

U.S. Cl. 296-63

6 Claims



1. A self-propelled, motor-driven, steerable vehicle having a vehicle body with at least two axles and substantially parallel longitudinal boundaries, for selectively transporting material and personnel, especially for use in underground mining operations, comprising: a plane, substantially uninterrupted loading platform for the material to be transported, two benches or seat rows for transporting persons, said benches or rows being arranged below the loading platform opposite each other and respectively parallel to the longitudinal boundaries of the vehicle, said loading platform having parts respectively covering each bench or seat row, and means pivotally connecting said loading platform parts at said vehicle body so as to be respectively pivotable upwardly about an axis extending in the longitudinal direction of the vehicle substantially parallel to said longitudinal boundaries, and means for locking said parts in their upwardly pivoted position, said bench or seat rows having back rests facing towards said longitudinal axis of the vehicle and having seat surfaces arranged offset with respect to said longitudinal boundaries inwardly towards said longitudinal axis of said vehicle so far that within the longitudinal vehicle boundaries a space is left, and a foot rest arranged at a suitable height for the persons to be transported and arranged in said space, said means for pivotally connecting said loading platform parts at the vehicle body being provided in the area of their adjacent, inner longitudinal edges facing away from the outer longitudinal boundaries of the vehicle.

#### 4,162,100 COVER ASSEMBLY FOR OPEN BOXES OF VEHICLES

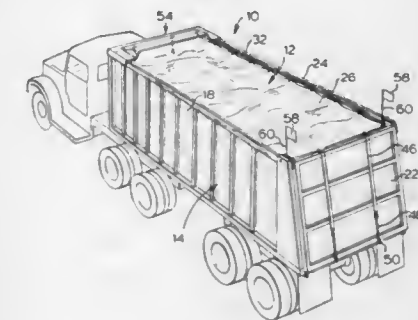
Pasquale Muscillo, 1715 Britannia Rd. E., Mississauga, Ontario, Canada (L4W 2A3)

Filed Apr. 7, 1977, Ser. No. 785,456

Int. Cl.<sup>2</sup> B60P 7/04

U.S. Cl. 296-100

8 Claims



1. A cover assembly for open boxes of vehicles, where the open box has a bottom, side walls and end walls, and where a load of particulate, granular or lumpy material is to be carried in said open box, comprising:

- (a) a pair of substantially rigid guide means mounted in said box along each of said side walls near the top edge thereof;
- (b) a cover of flexible material having a width at least equal to the width between said guide means and a length substantially equal to the length of said box secured at a first end of said box in the upper portion thereof, said flexible material being secured at least at the corners thereof closest to said first end of said box;
- (c) a plurality of guidable means secured along each edge of said flexible material and engaging said guide means;
- (d) means for securing the end of said flexible material remote from said first end of said box when said flexible material is extended along the length thereof; and
- (e) indicator means secured at the corners of said flexible cover remote from the corners secured at said first end, so as to indicate the position along each side wall of said box where a respective corner and indicator means may be located at any time.

#### 4,162,101 WALKER FOR INVALID PERSONS

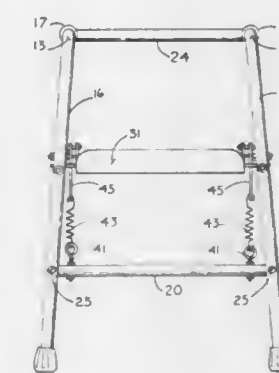
John E. McCague, Sr., and Elinor M. McCague, both of 3236 E. Lester, Tucson, Ariz. 85716

Filed Sep. 8, 1977, Ser. No. 831,373

Int. Cl.<sup>2</sup> F16M 13/08; A61H 3/00

U.S. Cl. 297-6

1 Claim



1. A walker for invalid persons comprising a right side, a left side, a front side, and seat means interiorly to said right, left, and front sides; said left side and said right side each comprising an "A" frame structure having two spaced apart upright



members and at least two horizontal members; said front side comprising one member each of said right side and said left side upright members and at least two horizontal members, said horizontal members attached to said left side and right side upright members; said seat means including a seat, upright lever means attached at right angles to said seat and on opposite sides thereon between said seat and said left and right side upright member, a plurality of stops, and pivotal means, said pivotal means attached to said upright lever means and said front side means; and spring means operably attached to said upright lever means, said spring means including a spring and elongated spring extension means, said spring attached at one end to one of said front side horizontal members and at the other end to one end of said elongated spring extension means, the other end of said spring extension means attached to said upright lever means, said spring extension means defining elongated metal means having an arcuate portion cut therefrom, said arcuate portion arranged to surround on one side said seat pivotal means; said stops engaging said front side vertical members when said seat is in a upright vertical position and said stops engaging said left side and said right side horizontal members when said seat is in a horizontal position; and said left side and right side vertical members are provided with rubber feet and said left side and right side cross-member is provided with rubber grips whereby when said seat is down, said upright lever, the spring means, and pivotal means are in a substantially straight vertical line and when said seat is not being used and pivots upward, it will be substantially in line with the front side interiorly to said right, left and front sides and provide maximum interior space for the person walking to walk in.

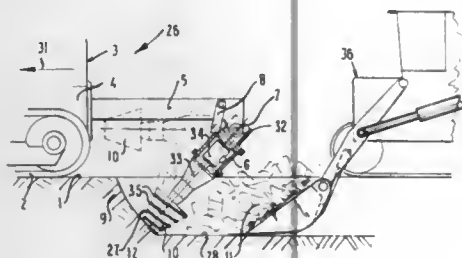
4,162,102

**METHOD AND DEVICE FOR LOOSENING STONY SOIL**  
Joannes A. Rooymans, Mulderberg, Netherlands, assignor to Ballast-Nedam Groep N.V., Amstelveen, Netherlands  
Filed May 19, 1977, Ser. No. 798,674  
Claims priority, application Netherlands, May 26, 1976, 7605721

Int. Cl.<sup>2</sup> E02F 5/04

U.S. Cl. 299—10

8 Claims



1. The method of excavating a trench in stony soil, which comprises the steps of:

- providing a cutting head having a body which is symmetrical about an axis of rotation and which has a forward end face and a side surface behind said face, and at least one helical row of cutters projecting outwardly from said side surface so as likewise to be disposed behind said face;
- positioning said cutting head below ground surface such that said side surface as well as said axis of rotation is inclined downwardly and forwardly at an acute angle with respect to the horizontal whereby during subsequent forward motion of the cutting head only said face contacts stony soil which is undisturbed;
- plowing said cutting head forwardly along a horizontal path through the soil so that said face breaks up the undisturbed soil which it contacts ahead of said cutters, and simultaneously rotating said cutting head about said axis whereby said cutters further break up the soil and mound

it upwardly in loosened state within a trench defined along the plowing path of the cutting head; subsequently removing the loosened soil from within the trench; and including, during step (c), the step of swinging said cutting head back and forth in a horizontal plane whereby the trench which is formed is wider than said cutting head.

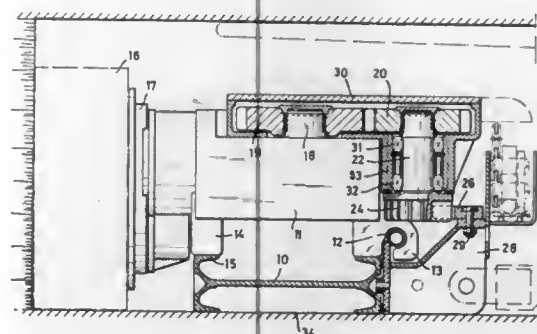
4,162,103

**DRIVE ARRANGEMENTS FOR MINING MACHINES**  
Werner Georg, Walter Heberling, both of Lünen, and Fritz Borgschulte, Bergkamen-Oberaden, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Lünen, Fed. Rep. of Germany  
Filed May 10, 1977, Ser. No. 795,655  
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623340

Int. Cl.<sup>2</sup> E21C 29/02

U.S. Cl. 299—43

17 Claims



1. In a drive system for propelling a mineral winning machine along a toothed track by a driven toothed wheel engaging said toothed track, said machine having a cutter, a body and transmission assembly, said assembly comprising:

- a generally L-shaped auxiliary transmission housing detachably mounted to the machine and having a top section and a side section,
- first and second generally upstanding shafts located in said side section of the housing,
- said shafts carrying pinions at their lower ends and gearwheels at their upper ends,
- both said pinions being effective to mesh with said track,
- bearings for rotatably mounting the shafts, and
- a detachable drive gearwheel located in said top section and mounted on a drive shaft of separate drive means and directly meshing with the gearwheels at the upper ends of the shafts within the top section of the housing,
- said auxiliary transmission being removably disposed as a unit from said body.

4,162,104

**CUTTING MACHINE**

Peter Kogler, Knittelfeld, and Alfred J. Zitz, Zeltweg, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed May 24, 1977, Ser. No. 799,937

Claims priority, application Austria, May 25, 1976, 3837/76

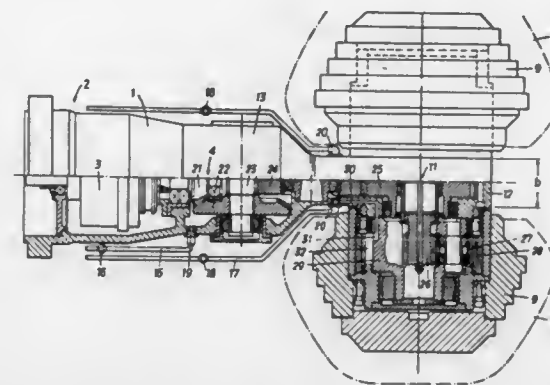
Int. Cl.<sup>2</sup> E21C 27/24

U.S. Cl. 299—75

6 Claims

1. In a mine cutting machine which includes a hollow cutting arm that can be swiveled in all directions with the cutting arm being provided with hollow cutting heads on each side of the end thereof, each cutting head being hinged around an axis which is located vertically to the longitudinal position of the cutting arm, in which by the swiveling of the cutting arm the cutting heads are moved across the mine face and driven by reduction gearing drive means located in the hollowed portion

of said cutting arm and wherein at least the last phase of the reduction gearing drive means is disposed within the hollowed portion of said cutting heads, the improvement comprising having at least a portion of the reduction gear housing within the cutting axis in communication with the hollowed portion of the cutting heads providing a separate oil supply tank on the cutting arm at a point between the cutting motor and the cutting machine for holding a separate supply of oil, connecting at least one oil supply line between said oil supply tank and the housing of the reduction gearing drive means adjacent said cutting heads, providing at least one oil discharge line between said oil supply tank and the housing of said reduction gearing drive means at a distance from said cutting heads, pump means



for circulating oil from said oil supply tank through said at least one oil supply line and said at least one oil discharge line so that a flow of oil is established from said oil supply tank through said at least one oil supply line through at least portion of the reduction gear housing over the last phase of the reduction gear drive means within said cutting heads and back to said oil supply tank through said at least one oil discharge line, and cooling means for cooling oil held in said oil supply tank wherein each of said cutting heads includes means defining hollow spaces located therein and wherein said at least one oil supply line discharges cooled oil into said hollow spaces within said cutting heads and wherein said at least one oil discharge line is connected to that portion of the reduction gear housing closest to said cutting motor.

4,162,105

**BASE FLANGED TIRE CARRYING RIMS, WHEELS AND FASTENING ASSEMBLIES**

William D. Walther, Kettering, Ohio, assignor to Dayton Walther Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 749,243, Dec. 13, 1976, Pat. No. 4,129,336, which is a continuation-in-part of Ser. No. 592,502, Jul. 9, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,297

Int. Cl.<sup>2</sup> B60B 23/10

U.S. Cl. 301—12 R

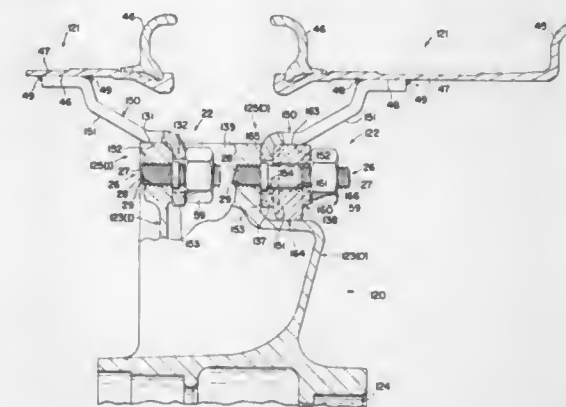
6 Claims

1. A combination of dual inner and outer tire carrying rims seated and locked by inner and outer rim fastening assemblies on a vehicle wheel,

said wheel (120) having a plurality of inner and outer spoke members, each of said inner spoke members having a felloe comprising a radially outer axially oriented surface (131) substantially parallel to the rotational axis of said wheel and an adjacent radially inwardly directed surface (132) substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an axially projecting component of said fastening assemblies, each of said outer spoke members having a felloe comprising a radially inwardly directed surface (137) substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an axially projecting component of said fastening assemblies and an adjacent

radially inner axially oriented lateral surface (138) substantially parallel to the rotational axis of said wheel, each of said rims (121) having radially outwardly projecting bead flanges and radially inwardly projecting mounting flanges, each of said mounting flanges (150) having a radially outer portion integrally attached to a conforming annular surface on a base portion of said rim between said bead flanges,

each said mounting flange further having a medial portion comprising an axially oriented radially inner surface (152), each said mounting flange still further having a radially inwardly directed leg portion (153) adjacent said axially oriented surface and oriented substantially perpendicular to the rotational axis of said rim and having a bore therein for receiving said axially projecting component of said fastening assemblies, said bore having an effective diameter greater than the effective diameter of an axially projecting component of said fastening assemblies, each said outer rim fastening assembly (122) comprising said axially projecting component and a clamp element (160) and a rotatable nut (59) carried thereon, said clamp element having a bore (161) therein for receiving said axially projecting component, said bore having an effective diameter greater than the effective diameter of said axially projecting component, each said clamp element further having dual concentric and segmental axially movable axially oriented surfaces; a radially outer surface (163) and a radially inner surface (164),



each said clamp element still further having parallel axially movable radially directed surfaces; an axially inner surface (165) and an axially outer surface (166), whereby, said inner rim is seated on, and thereafter locked on, said wheel by initial and final tightening of said inner rim fastening assemblies against each said mounting flange leg portion, said initial tightening of said inner rim fastening assemblies seating said axially oriented mounting flange surfaces (152) in concentric registry with said axially oriented wheel felloe surfaces (131); said final tightening of said inner rim fastening assemblies locking said rim on said wheel by the full surface engagement of said mounting flange leg portions (153) with said radially inwardly directed wheel felloe surfaces (132), and, whereby, said outer rim is seated on, and thereafter locked on, said wheel by initial and final tightening of said outer rim fastening assemblies, said initial tightening of said rotatable nuts (59) against said axially outer clamp element surfaces (166) seating said axially oriented mounting flange surfaces (152) in concentric registry with said radially outer clamp element surfaces (163) and seating said radially inner clamp element surfaces (164) in concentric registry with said radially inner axially oriented wheel felloe surfaces (138); said final tightening of said rotatable nuts (59) against said axially outer clamp element surfaces (166) locking said rim on said wheel by the full surface engagement of said axially inner clamp element surfaces



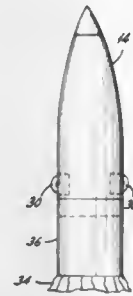
(165) with said mounting flange leg portions (153) and by the full surface engagement of said mounting flange leg portions (153) with said radially inwardly directed wheel flange surfaces (137).

**4,162,106**  
**PNEUMATIC VEHICLE WITH CENTRALLY MOUNTED GUIDE MEANS**

Leo B. Lawrence, Tollgate Rd., Pipersville, 18947 and Joseph Del Rossi, 465 Elm Ave., Churchville, Pa. 18966  
Continuation-in-part of Ser. No. 730,337, Oct. 7, 1976, abandoned. This application Feb. 2, 1978, Ser. No. 874,383  
Int. Cl.<sup>2</sup> A63H 29/16

U.S. Cl. 406—185

5 Claims



1. A toy vehicle adapted to be propelled through a track arrangement by pressurized fluid, said vehicle comprising a body member made of generally light-weight material and having a cross-section smaller than the inner periphery of the track arrangement, seal means attached to one end of said body member for engaging the inner periphery of the track arrangement and minimizing the passage of pressurized fluid around the vehicle, said seal means comprising a thin flexible diaphragm having one end carried on one end of the body member, the other end of said diaphragm having a diameter slightly larger than the inner periphery of the track arrangement whereby pressurized fluid expands the seal against the inner periphery of the track arrangement and guide means circumferentially spaced around the periphery of said body member for guiding said vehicle relative to the inner periphery of the track arrangement, said guide means being restricted to the area of said body member portion radially adjacent the center of gravity of said body member.

**4,162,107**  
**BRAKING SYSTEM FOR A RAILWAY CAR**  
Gennady S. Bazilevich, Zheleznogorsk Kurskol oblasti; Alexander F. Gorin, Kremenchug Poltavskoi oblasti; Vladimir N. Lozinsky, Zheleznogorsk Kurskol oblasti; Vladimir I. Ly-senko, Kaliningrad; Vladimir M. Nosach, Poltavskaya oblast, Kremenchugsky raion, selo Kameno-Potoki; Grigory I. Solod, Moscow, and Yakov M. Sterinzat, Kremenchug Poltavskoi oblasti, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatel'sky Proektno-Tekhnologicheskij Institut Vagonostroenia, U.S.S.R.

Filed Jan. 30, 1978, Ser. No. 873,689

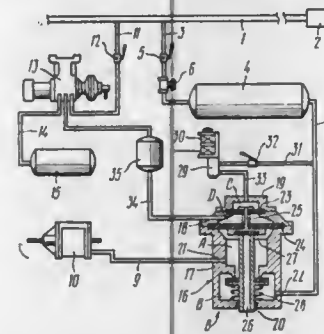
Int. Cl.<sup>2</sup> B60T 13/74

U.S. Cl. 303—3

1 Claim

1. A braking system for a railway car comprising: a source of compressed air; a compressed air line connected to said source of compressed air; an auxiliary receiver connected to said compressed air line; a brake cylinder selectively communicating with said auxiliary receiver and atmosphere; a pneumatic air distributor communicating with said compressed air line; an electropneumatic valve connected to said auxiliary receiver; a valve means communicating with said pneumatic air distributor, with said electropneumatic valve, and with said auxiliary receiver for controlling the communication of said brake cylinder with the auxiliary receiver and atmosphere; said pneumatic air distributor and electropneumatic valve being adapted to

control said valve means; said valve means comprising: a casing having an inlet and an outlet for compressed air, a movable member accommodated in said casing and adapted for disconnecting the inlet from the outlet of said casing, two diaphragms spaced apart from each other within said casing and interconnected for combined movement, said two diaphragms being of different surface areas, chambers defined by said diaphragms in said casing, one of said chambers defined in said casing by one

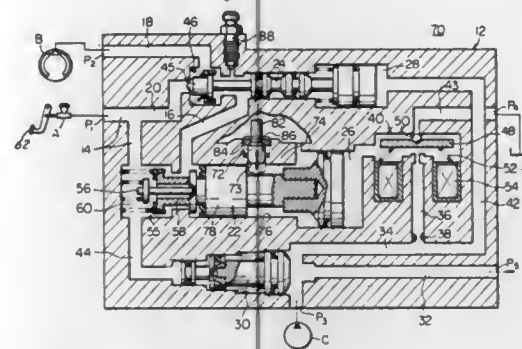


of said diaphragms, which is of a smaller surface area, communicating with said electropneumatic valve, the other of said chambers defined in said casing by the other of said diaphragms, which is of a greater surface area, communicating with said pneumatic air distributor, said diaphragms being connectible with said movable member during application of brakes for combined movement; and means for communicating said valve means with atmosphere.

**4,162,108**  
**HYDRAULIC ANTI-SKID DEVICE**  
Kazuaki Shimizu, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan  
Filed Aug. 19, 1977, Ser. No. 826,250  
Claims priority, application Japan, Aug. 23, 1976, 51-100373  
Int. Cl.<sup>2</sup> B60T 13/68

U.S. Cl. 303—115

4 Claims



1. A hydraulic anti-skid device for a hydraulic braking system, comprising  
a pump generating a hydraulic fluid pressure,  
means defining a first passage receiving a hydraulic braking pressure,  
means defining a second passage communicable with said first passage,  
means defining a third passage communicating with said first passage,  
means defining a fourth passage alternatively communicable with said second and third passages for passing the braking pressure from said first passage to the outside of said anti-skid device, an expansion valve located between said first and second passages for controlling communication therebetween, said expansion valve having first means fed

with the hydraulic fluid pressure from said pump, said expansion valve assuming a first position in which it effects communication between said first and second passages when said first means is fed with the hydraulic fluid pressure and a second position in which it obstructs communication between said first and second passages when said first means is not fed with the hydraulic fluid pressure,

a bypass valve located between said fourth passage and both said second and third passages for controlling communication therebetween, said bypass valve having second means fed with the hydraulic fluid pressure, said bypass valve assuming a first position in which it effects communication between said second and fourth passages and obstructs communication between said third and fourth passages when said second means is fed with the hydraulic fluid pressure and a second position in which it obstructs communication between said second and fourth passages and effects communication between said third and fourth passages when said second means is not fed with the hydraulic fluid pressure,

manually operated locking means engageable with said expansion valve for locking said expansion valve in said first position, said locking means having a rest position in which it is disengaged from said expansion valve for permitting same to be moved into said second position and an operative position in which it is engaged with said expansion valve for preventing same from being moved into said position, said locking means having means for manually moving said locking means from said rest position into said operative position and vice versa, and manually operated retaining means engageable with said locking means for retaining said locking means in said rest position, said retaining means having a retaining position in which it is engaged with said locking means for retaining same in said rest position and a non-retaining position in which it is removed from said locking means for permitting same to be moved into said operative position, said retaining means having means for manually moving said retaining means from said retaining position into said non-retaining position and vice versa.

**4,162,109**  
**BONDED GUIDE RIM IN A RACE FOR A ROLLING BEARING**

Hermann Müennich, Bad Kissingen, and Klaus Kispert, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 2, 1977, Ser. No. 764,975

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 7603570[U]

Int. Cl.<sup>2</sup> F16C 33/58

U.S. Cl. 308—216

14 Claims



1. In a bearing including outer and inner races and a plurality of roller elements distributed in at least one raceway defined between said races, the improvement in combination therewith, wherein one of said races comprises an annular member about a central axis with opposite end portions, a separate guide rim means having at least a portion extending radially closer to the other race than one of said end portions, said guide rim means and one end portion defining a pair of adja-

cent surfaces, and attachment means comprising a strip of cured thermo-setting cross-linked resin situated between said adjacent surfaces, said strip having opposite sides engaging and bonded to said surfaces and comprising substantially the sole means on said bearing for securing said guide rim means to said annular member, said roller elements axially engaging said radially extending portion of said guide rim means whereby thrust forces on said bearing are applied to said strip.

**4,162,110**  
**SEALED THRUST BEARING WITH RESILIENT SEAL HAVING A METAL PORTION**

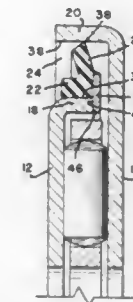
Cameron G. Gardella, Woodbury, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Mar. 6, 1978, Ser. No. 883,638

Int. Cl.<sup>2</sup> F16C 33/78

U.S. Cl. 308—234

5 Claims



1. A thrust bearing comprising: a first thrust race and a second thrust race longitudinally spaced from the first thrust race, at least one of the two radial peripheries of the first thrust race being radially spaced from the corresponding radial periphery of the second thrust race; a plurality of rollers located between said thrust races; and a resilient seal including an annular elastomeric portion adapted to seal the radial space between said corresponding radial peripheries, and an annular metal portion in contact with one of the races to positively keep the seal in its sealing position between the races.

**4,162,111**  
**PIEZOELECTRIC ULTRASONIC TRANSDUCER WITH DAMPED HOUSING**

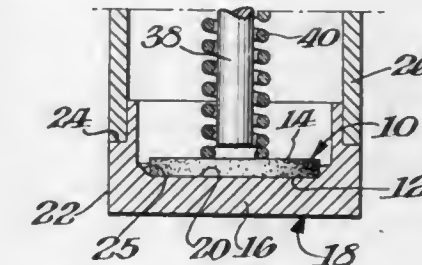
Alvin E. Brown, Claremont, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 25, 1977, Ser. No. 827,599

Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—326

3 Claims



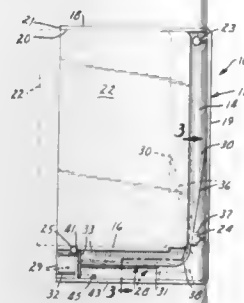
1. An ultrasonic transducer comprising:  
an electrical coaxial connector having an electrically insulated pin,  
an acoustically transparent diaphragm,  
a tubular housing interconnecting said diaphragm and said connector, said housing having a tube axis, said diaphragm having a face internal of said housing,

a flat piezoelectric crystal having one face in contact with said diaphragm, and  
a compression spring in compression between said connector pin and another face of said crystal for electrically and acoustically coupling said crystal to said diaphragm internal face and electrically coupling said connector pin to said another crystal face, said diaphragm defining a protuberant peripheral internal face bevel for centering said crystal thereon for electrically insulating the other face of said crystal from said housing, an elongated spring guide having an axis, an axial bore fitted on said connector pin, and an axial stud for guiding said spring, said diaphragm being unitary and defining a tubular rim coaxial with and secured to said housing for damping unwanted vibrations in said housing, said rim having an axial length less than four times the wavelength of sound therein at the operating frequency of said crystal.

**4,162,112**  
**STORAGE ASSEMBLY FOR A TAPE MAGAZINE**  
Anthony W. Konkler, Lakeland, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Jan. 23, 1978, Ser. No. 871,174  
Int. Cl.<sup>2</sup> A47B 81/06

U.S. Cl. 312-15

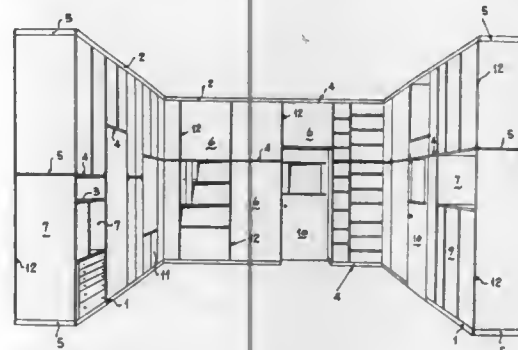
5 Claims



1. In a storage assembly for a tape magazine comprising a housing including rectangularly disposed side, end and rear walls defining a socket having an open side adapted to slidably receive a said magazine, and means for ejecting a said magazine comprising a first stiff elongate portion having a manually engageable end, means mounting said first elongate portion adjacent and parallel to said end walls with said manually engageable end adjacent the open end of said socket for reciprocal motion between a normal position with said manually engageable end outermost and an eject position with said manually engageable end innermost, a second stiff elongate portion having an engaging end adapted to engage the innermost side of a said magazine within said socket, means mounting said second elongate portion in a position along said rear wall for pivotal motion from a normal position with said engaging end adjacent said rear wall and an eject position with said engaging end projecting into said socket to partially displace a magazine therein; means for providing engagement between said portions to move said second elongate portion from said normal to said eject position upon manual movement of said first portion from said normal to said eject positions, and means for biasing said first and second elongate portions to their normal positions, the improvement, wherein:

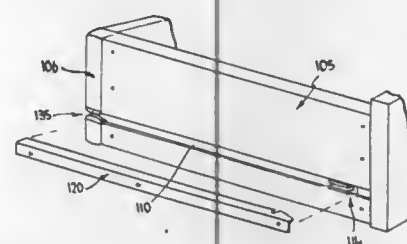
said first and second stiff portions are included in a one piece integral member of elastic resilient polymeric material, said member also having a relatively thin flexible portion connecting said first and second portions and providing both said means for providing engagement and said means for biasing.

**4,162,113**  
**COMPOSITE MODULAR FURNITURE**  
Piero Pallavicini, Via Fabio Filzi, 23, Milano, Italy  
Filed Nov. 17, 1977, Ser. No. 852,555  
Claims priority, application Italy, May 9, 1977, 23337 A/77  
Int. Cl.<sup>2</sup> A47B 53/00; F16B 12/00  
U.S. Cl. 312-199 6 Claims



1. In a modular piece of furniture, in combination:  
a first and a second upright wall member with vertical edges angularly adjoining each other;  
a first and a second hollow upright profile respectively secured to said vertical edges of said first and second wall members, each of said profiles having a generally trapezoidal cross-section with outwardly converging flanks separated by a slot;  
a vertical bar alongside said first profile having a tenon received in the slot thereof;  
a first hinge element secured to said bar; and  
a second hinge element pivotally connected with said first hinge element, said second hinge element having a base received in the slot of said second profile whereby said wall members are relatively swingable about the pivotal axis of said hinge elements.

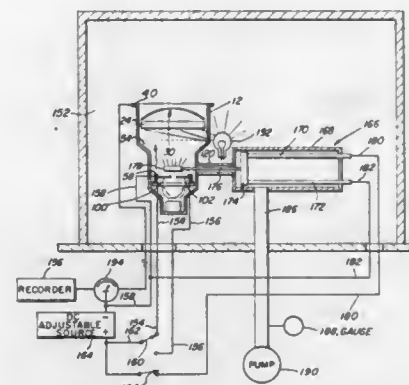
**4,162,114**  
**DRAWERS AND DRAWER COMPONENTS**  
Leon G. Litchfield, and Terence Hardy, both of Belper, England, assignors to L. B. (Plastics) Limited, Derbyshire, England  
Filed Jul. 15, 1977, Ser. No. 816,039  
Claims priority, application United Kingdom, Apr. 26, 1977, 17290/77  
Int. Cl.<sup>2</sup> A47B 88/04, 88/14  
U.S. Cl. 312-330 R 21 Claims



1. A drawer assembly comprising a drawer having tracks formed in the sides thereof adapted to receive any one of a plurality of interchangeable drawer runners of different form and a plurality of alternatively useable guide and bearing members adapted to slidingly support and guide the rear end of the drawer on the respective forms of runner, wherein one form of runner is of angle section having a mounting flange by means of which the runner may be mounted at a suitable location in a drawer supporting structure and a drawer-engaging flange projecting at right angles to the mounting flange and adapted to extend into the track in the associated drawer side, a front

guide and bearing member being detachably mounted at the forward end of the runner for sliding movement longitudinally of said track and said rear guide and bearing member being disposed in vertical alignment with the associated rear corner of the drawer and having a slot dimensioned to slidingly receive said drawer-engaging flange of the runner.

**4,162,115**  
**METHOD OF FABRICATING IMAGE INPUT SCREEN**  
James R. Caraher, Stamford, Conn., assignor to The Machlett Laboratories, Inc., Stamford, Conn.  
Division of Ser. No. 784,207, Apr. 4, 1977. This application Apr. 20, 1978, Ser. No. 898,009  
Int. Cl.<sup>2</sup> H01J 9/02, 9/20, 9/233  
U.S. Cl. 316-4 5 Claims



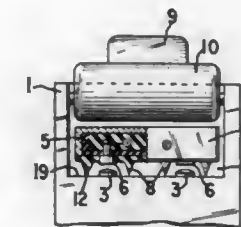
1. A method of fabricating an input screen for an image intensifier tube and comprising the steps of:  
providing an envelope having an input faceplate and an output faceplate;  
disposing an output screen within the envelope adjacent the output faceplate and in alignment therewith;  
supporting an input screen scintillator layer of fluorescent material within the envelope in alignment with the input faceplate and in spaced opposing relationship with the output screen;  
supporting a controllable oxygen liberating source in communication with the scintillator layer;  
oxygenating the fluorescent material of the scintillator layer with oxygen controllably liberated from the source; and  
depositing an input screen photocathode layer of photoemissive material on the surface of the scintillator layer adjacent the output screen.

**4,162,116**  
**DETACHABLE, WATER-TIGHT CONNECTION ELEMENTS FOR DETONATING DEVICES AND COMPONENTS WHICH PROCESS FOR THE IGNITION SIGNAL**  
Kurt Lehmann, Sythen near Haltern, Fed. Rep. of Germany, assignor to Wasagchemie GmbH, Munich, Fed. Rep. of Germany  
Continuation of Ser. No. 533,517, Dec. 17, 1974, abandoned.  
This application Apr. 26, 1978, Ser. No. 899,897  
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1974, 2436534  
Int. Cl.<sup>2</sup> H01R 13/52 6 Claims

U.S. Cl. 339-60 M

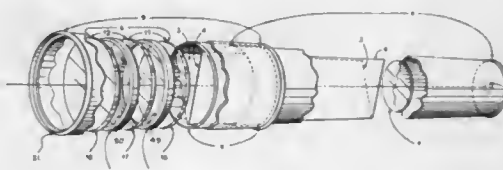
1. A device to accomplish a water-tight electrical and mechanical connection between contacts in detonating devices connectable under water by divers wearing gloves comprising:  
(a) an electrical device having a rigid surface containing at least two electrical contacts each terminating in a contact area,  
(b) at least one detachable connecting element comprising a coupling part having at least two contact pins each terminating in a contact area mounted thereon, each of said

contact pins being in electrical contact with a sealed lead-in wire, and a closed sealing bead disposed around but offset from each of said contact pins of a pliable electrically-insulating material adapted to form a closed sealing surface with an adjacent surface when under pressure, each of said closed sealing beads when not under pressure being of sufficient extension whereby when said contact areas of said at least two contact pins and said at least two electrical contacts are abutting, each of said closed sealing beads is compressed by said rigid surface of said electrical device, and



(c) means in connection with said electrical device to apply pressure on said at least one detachable connecting element comprising an eccentric roller with a lever fixed to said roller whereby each of the said contact pins each terminating in a contact area is in electrical and mechanical contact with and abuts the contact area of each of said electrical contacts and said sealing beads are deformed against said rigid surface forming a water-tight seal on application of said pressure.

**4,162,117**  
**OPTICAL IMAGE MULTIPLYING DEVICE**  
Jeanne A. Gantz, 1972 El Dorado Ave., Berkeley, Calif. 94707, and David W. Kelso, 3929 Everett Ave., Oakland, Calif. 94602  
Filed Sep. 30, 1977, Ser. No. 838,150  
Int. Cl.<sup>2</sup> G02B 27/08 6 Claims



1. In an optical image multiplying device having an ocular body, an ocular aperture in one end, reflecting planes contained in said ocular body, and an object cell mounted on the other end of said body, the improvement comprising:  
first and second tumbler objects within said object cell, each object carrying a pictorial representation on a first region thereof, said pictorial representation on said first region of said first object including a light transmitting portion through which details of said pictorial representation of said second object can be seen when viewed through said light transmitting portion.

**4,162,118**  
**WAVEGUIDE IMAGING SYSTEM**  
Esther M. Conwell, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.  
Filed Apr. 1, 1977, Ser. No. 783,573  
Int. Cl.<sup>2</sup> G02B 5/14 4 Claims

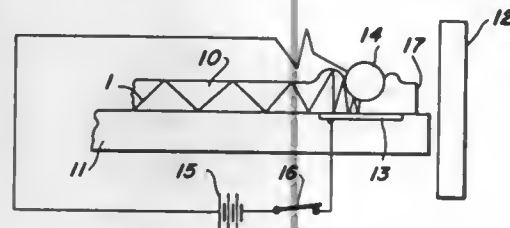
U.S. Cl. 350-96.13

1. A waveguide system for forming a line pattern of illumi-



nated and non-illuminated bits on an imaging surface, the system comprising:

- (a) an imaging member having an imaging surface;
- (b) a unitary waveguide means for guiding radiation propagating therein, the unitary waveguide being formed from identical elastomeric material and shaped so as to include a coupling means for coupling light into the waveguide means, lens means for collimating the light and a plurality of individual waveguide means arranged substantially parallel to each other in substantially the same plane, the plane being oriented with respect to the imaging surface



- so that light emanating from the waveguide system impinges the imaging surface to form a line of bits; and
- (c) field means comprising electrodes positioned on either side of the individual waveguide means so that, when subjected to voltage pulses, the field between the electrodes will attract the electrodes toward each other, altering the dimensional cross-section of the waveguide means between the charged electrodes and attenuating the light propagating therethrough to produce on the imaging surface a line pattern of illuminated and non-illuminated bits.

4,162,119

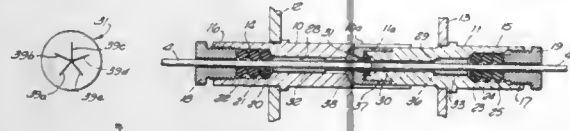
## FIBER OPTIC POSITION INDICATOR

David S. Goodman, Mission Viejo, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.  
Filed Nov. 18, 1977, Ser. No. 852,859

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.21

15 Claims



1. A device for indicating the connected-in-place condition of a physically removable subassembly having electrical connections intended to make and disengage with and from fixed electrical connections in a mounting arrangement in response to corresponding translational movements, comprising:

a first fiber optic light conducting element mounted in substantially fixed relationship with said removable subassembly, said element having a first end arranged with respect to a part of said removable subassembly to facilitate visual observation of light emitted therefrom when said device is in said connected-in-place condition in said mounting arrangement, the second end of said element being oriented to receive light from an external point along a light path substantially parallel to said translational movements when said subassembly is in said connected-in-place condition;

second means comprising a source of light and means fixed with respect to said mounting arrangement for directing light along said parallel path from a fixed location aligned with said first fiber optic element second end;

and third means operative as a function of the axial spacing along said parallel path between said fixed location and said fiber optic element first end to prevent substantial light transmission through said optical spacing when said axial spacing is less than a predetermined amount corre-

sponding to said connected-in-place condition of said subassembly, and otherwise to permit light transfer between said first fiber optic element and said second means.

4,162,120

## THERMAL COMPENSATOR LINKAGE

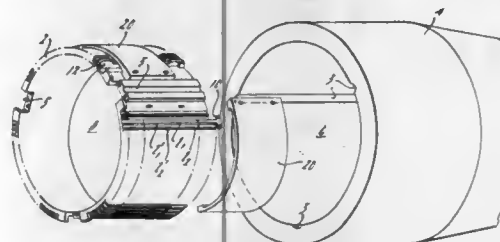
Isabel L. Moreno, Long Beach, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Dec. 2, 1977, Ser. No. 856,699

Int. Cl.<sup>2</sup> G02B 7/02

U.S. Cl. 350—253

9 Claims



1. A thermal compensator mechanism for maintaining a preset focal length in an optical system throughout a predetermined range of environmental temperatures, comprising:

a relatively movable lens mounting structure;

a relatively fixed support structure;

a linkage assembly, including a plurality of elongated link elements with known linear coefficients of expansion, connected to said lens mounting structure and to said support structure for moving said lens mounting structure linearly with respect to said support structure in response to environmental temperature changes;

wherein elongated link elements are arranged in link pairs and each said link pair includes a first link element having a relatively large linear coefficient of expansion and a second link element having a relatively small linear coefficient of expansion; and

further wherein said first and second elongated link elements of each link pair are connected together at their corresponding first ends and folded at said connection so that their respective second ends are adjacent each other.

4,162,121

## LINEAR ARRAY MODULATOR

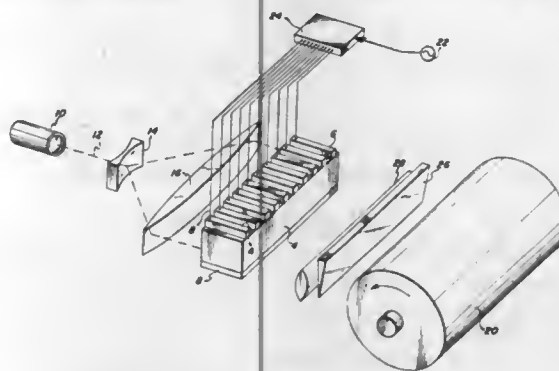
Gary K. Starkweather, Saratoga, and John C. Urbach, Portola Valley, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1977, Ser. No. 787,406

Int. Cl.<sup>2</sup> G02F 1/33

U.S. Cl. 350—358

4 Claims



1. An optical system including: means for providing a high intensity light beam of large area, an acousto-optic device disposed in the path of said light

beam and including an acousto-optic media having a plurality of transducers bonded thereto, each of said transducers having an electrode associated therewith, first means for providing a radio frequency signal, second means coupled to said electrodes and said first means for supplying said radio frequency signal simultaneously to selected of said transducers whereby sound waves are provided within the portions of said media aligned with said selected transducers and portions of said light beam are simultaneously diffracted by said sound waves, and a light sensitive medium disposed to receive simultaneously said portions of said light beam diffracted by said sound waves whereby spots of light are written in parallel on said light sensitive medium.

4,162,122

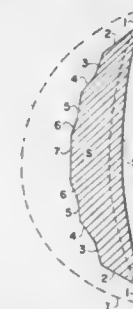
## ZONAL BIFOCAL CONTACT LENS

Allen L. Cohen, 5795 Stevens Forest Rd., Columbia, Md. 21045

Filed Sep. 14, 1977, Ser. No. 833,368

Int. Cl.<sup>2</sup> G02B 3/08, 3/10; G02C 7/04

U.S. Cl. 351—161



1. A zonal bifocal contact lens which is designed with a concave-convex shape, with the posterior concave surface being adapted to adhere to and float on the cornea, the anterior convex surface being divided into annular zones, the individual zones presenting alternately, inclinations to the optical axis of the contact lens, corresponding approximately to the curvatures of a distance and near correction focal power, adjacent annular zones interfaced continuously so as not to present any steps or jumps upon the anterior surface of the contact lens wherein the inclinations of the annular zones have been adjusted to give slightly deeper troughs between the adjacent zones than would occur in matching the distance and near curvatures exactly, and adjusted in particular, so that an overlying tear layer would itself form a surface matching, in the corresponding zones, the distance and near curvatures as closely as possible.

4,162,123

## AUTOMATIC FOCUSING SYSTEM

Tadao Isono, Kokubunji, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1977, Ser. No. 855,582

Claims priority, application Japan, Nov. 30, 1976, 51/143000

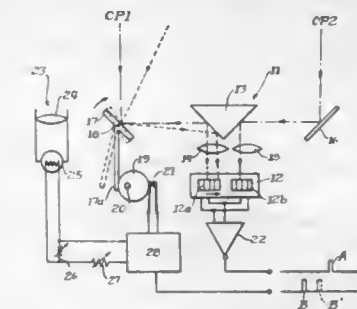
Int. Cl.<sup>2</sup> G03B 7/08

U.S. Cl. 354—25

7 Claims

1. A camera with a lens adapted to be used for automatic focusing comprising an automatic focusing detection means including a photo responsive cell being cyclically subjected to light emanating from a subject for detection of a maximum light intensity for determination of the distance of the subject from the camera, a reference pulse generating means associated with said photo responsive cell to periodically generate a pulse indicative of a condition of such cycling and light sensitive means responsive to the intensity of the light emanating

from the subject connected to control the timing of the reference pulse so that a predetermined amount of delay may be



added to reference pulse proportional to the light level of light from the subject.

4,162,124

## PASSIVE OPTICAL RANGEFINDER-SEXTANT

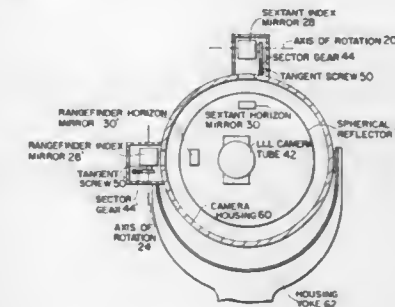
Sidney Feldman, Silver Spring, Md., and George G. Barton, Jr., Harkers Island, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1978, Ser. No. 882,285

Int. Cl.<sup>2</sup> G01C 3/08; G01B 11/26; G01C 1/00

U.S. Cl. 356—4

8 Claims



1. A remotely controllable navigational instrument, comprised of:

a concave spherical reflector exposable to objects lying along its principal axis, having a single focal point;

a first and a second set of orthogonally arranged and remotely adjustable sextant optics, each including an index mirror disposed along a radial normal to the principal axis, and each reflecting onto the spherical reflector a primary image of one or more objects distant from the instrument;

a first index mirror rotatable about a horizontal axis normal to the principal axis of the spherical reflector;

the second index mirror rotatable about a third axis normal to the horizontal and the principal axes;

the horizontal and third axes equidistant from the principal axis;

first and second encoder means each mechanically linked to a different one of the sextant optics and each independently producing a position signal indicative of angular movement of the linked sextant optics;

first and second circuit means each coupled to a different one of the encoder means and each providing an output indicative of the respective angular movement;

an electronic camera located beyond the focal point for converting images upon the spherical reflector into a video signal for display;

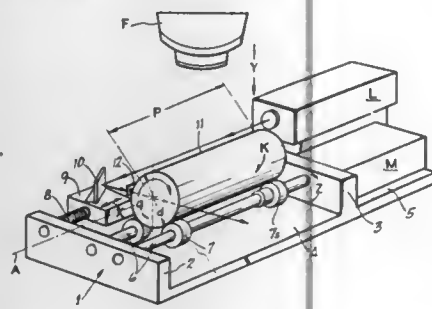
control means including means for eliminating all components of the video signal but those components representing pairs of parallel features of the primary images having a preferred orientation, means for displaying the pairs of parallel features by scanning a display surface, means for

selecting from the display surface of field-of-view containing a pair of the parallel features, and means for producing a control signal varying in proportion to the spacing between the pair of parallel features; and, means controlled by the control signal for producing a signal representative of the spacing.

#### 4,162,125 PROCESS AND DEVICE FOR DETECTING INCLUSIONS IN CRYSTALS

Walter Schmidt, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland  
Filed May 9, 1977, Ser. No. 794,793  
Claims priority, application Switzerland, May 20, 1976, 6321/76

Int. Cl.<sup>2</sup> G01N 27/32  
U.S. Cl. 356—30 17 Claims



1. In a process for detecting inclusions in a rod-shaped single crystal of gallium-gadolinium garnet having a long axis, the steps comprising:

placing said crystal in air;  
passing a concentrated beam of energy of high intensity through said crystal in a direction substantially perpendicular to the long axis of the crystal; and  
observing said crystal in direct face-to-face relationship in a direction approximately perpendicular to the direction of the beam which passes through said crystal, whereby inclusions in said crystal are detected by scattering said beam.

8. A device for detecting inclusions in a rod-shaped single crystal of gallium-gadolinium garnet having a long axis which comprises:

means for supporting said crystal in air;  
means for projecting a concentrated beam of energy of high intensity so that said beam of energy travels in a direction substantially perpendicular to said long axis of said crystal; and  
means for observing said crystal approximately perpendicular to the direction in which said beam of energy is traveling when it enters said crystal, whereby inclusions in said crystal are detected by scattering said beams and are observed in direct face-to-face relationship.

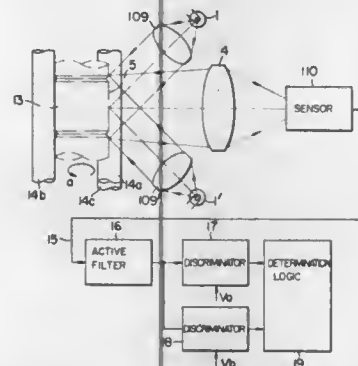
4,162,126  
SURFACE DETECT TEST APPARATUS  
Yasuo Nakagawa, Yokohama, and Toshimitsu Hamada, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan  
Filed Dec. 9, 1977, Ser. No. 859,206  
Claims priority, application Japan, Dec. 10, 1976, 51-147764; Dec. 24, 1976, 51-154882

Int. Cl.<sup>2</sup> G01N 21/48  
U.S. Cl. 356—237 3 Claims

1. A surface defect test apparatus comprising:  
an illumination means for illuminating collimated lights onto a surface of an object at a predetermined area including at least a unit picture element, obliquely to said predetermined area from two opposing directions;  
a sensor arranged to pick up diffused reflection lights from said predetermined area on said surface of said object in

the direction perpendicular to said surface, said sensor having a function to scan the entire surface area of said object;

a first classification means for a defect pattern for said surface as a broken cavity pattern when a bright image signal in an image signal derived from said sensor in response to the diffused reflection light which varies in accordance with a surface condition at each of the picture elements in said predetermined area exceeds a predetermined threshold which is higher than an average level of said image signal;

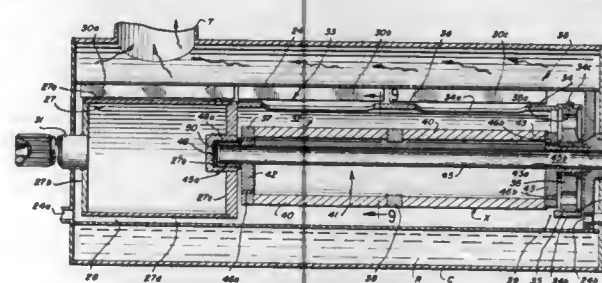


a second classification means for classifying the defect pattern for said surface as a pit or crack pattern when a dark image signal in said image pattern does not exceed a predetermined threshold which is lower than said average level; and

a discrimination means for discriminating the pit pattern and the crack pattern by a relation between a length of contour and an area of the pattern classified by said second classification means.

4,162,127  
DASHER ASSEMBLY  
Alden H. Wakeman, Lake Mills, and Leonard R. Helliger, Fort Atkinson, both of Wis., assignors to Crepac, Inc., Lake Mills, Wis.

Filed Dec. 27, 1977, Ser. No. 864,631  
Int. Cl.<sup>2</sup> A23G 9/16  
U.S. Cl. 366—149 6 Claims



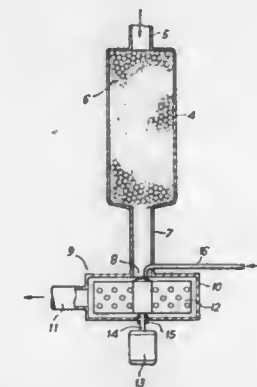
1. A freezing apparatus for ice cream mix or the like comprising an elongated cylindrical freezer chamber having a refrigerated interior surface, a first inlet for a first product ingredient adjacent one end of the chamber, a second inlet for a second product ingredient spaced from said first inlet, and a product outlet adjacent the opposite end of the chamber; and a power driven dasher assembly mounted within said chamber for rotation about a central longitudinal axis of said chamber; said assembly including a substantially cylindrical imperforate first section having one end thereof disposed adjacent said first inlet, the exterior of said first section coacting with the refrigerated interior surface of said chamber to form an elongated, relatively narrow annular passage through which the first product ingredient from the first inlet flows at a selected rate and is in contact with the refrigerated interior surface of the

chamber and is cooled thereby to a predetermined temperature whereby the first product ingredient is at an optimum viscosity for being subjected to a vigorous whipping action; an elongated skeletal second affixed to and extending longitudinally from said first section and terminating adjacent the product outlet end of said chamber, said second section occupying substantially the remainder of said chamber through which the first product ingredient flows while at said predetermined temperature, said first and second sections rotating as a unit about said chamber central axis; first means carried by and movable with said first and second sections and in scraping contact with the refrigerated interior surface and removing therefrom any frozen product ingredient; and an elongated second means mounted within said skeletal second section of rotation independently thereof about a second axis offset with respect to the chamber axis, said second means being provided with an elongated hollow shaft having one end thereof supported by an end of said first section from which said skeletal second section extends, said hollow shaft being in communication with the chamber second inlet, said hollow shaft one end coacting with the supporting end of said first section to form an inlet for introducing the second product ingredient within the skeletal second section; said rotating second means imparting vigorous whipping action to and intermixing both product ingredients as they flow through the portion of the chamber occupied by the second section and effecting controlled overrun of the product dispensed from the chamber outlet.

4,162,128  
FOAM PRODUCTS  
Dennis H. Ogden, Wolverhampton, and Frank G. Smith, Sutton Coldfield, both of England, assignors to British Industrial Plastics Limited, Manchester, England

Filed Oct. 7, 1977, Ser. No. 840,356  
Claims priority, application United Kingdom, Jul. 11, 1977, 28899/77

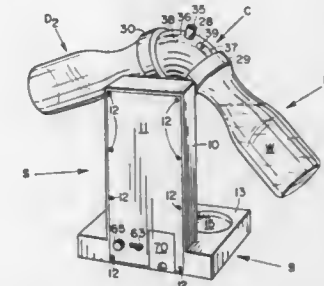
Int. Cl.<sup>2</sup> B01F 3/08, 7/18, 15/02  
U.S. Cl. 366—154 9 Claims



1. In apparatus for producing low density, self-sustaining foams of cured urea/formaldehyde resin material, said apparatus comprising a foam generating column having inlet means for unfoamed liquid and air, outlet means for foam and a foam generating medium interposed between said inlet and outlet means,

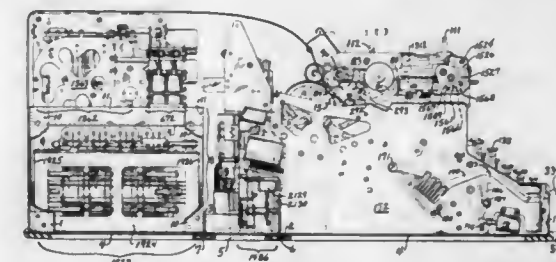
the improvement comprising a centrifugal mixing head positioned immediately downstream of said outlet means and including a casing, an impeller rotatably mounted therein, an inlet communicating with said outlet means and directed substantially axially with respect to the axis of rotation of the impeller and an outlet directed substantially tangentially relative to said axis, together with a nozzle for supplying unfoamed liquid to the inlet to said mixing head.

4,162,129  
WINE AERATOR  
Glen W. Bartholemew, Jr., San Antonio, Tex., assignor to Wine Breather, Inc., San Antonio, Tex.  
Filed Aug. 29, 1977, Ser. No. 828,536  
Int. Cl.<sup>2</sup> B01F 11/00, 13/02  
U.S. Cl. 366—211 6 Claims



1. A wine breather apparatus, comprising:  
A support stand with a coupler removably connecting two wine containers;  
said coupler including a flow path for flowing wine back and forth between two containers;  
means for oscillating the coupler to pour wine back and forth between the containers through the coupler to aerate the wine;  
the coupler including a valve for allowing air into the wine while preventing the spilling of the wine;  
said coupler being removably mounted on the support stand; and operably connected with a motor to oscillate the coupler to aerate the wine;  
the valve including an air-inlet tube communicating air from outside the coupler to within and a ball for preventing splashing of the wine out of the air-inlet tube; and  
the valve including two air-outlet tubes connected with the air-inlet tube for connecting outside air into the coupler and containers; and  
each air-outlet tube having a seat for the ball to block the air-outlet tube which extends into the container into which wine is being poured.

4,162,130  
APPARATUS FOR PERFORMING DELETING OPERATIONS WHILE BACKSPACING IN A COMPOSING MACHINE  
William S. Gubelmann, deceased, late of convent, N.J.; by Walter S. Gubelmann, executor, Palm Beach, Fla., and William R. Grier, New Vernon, N.J., assignors to R & I Patent Corporation, Morristown, N.J.  
Division of Ser. No. 213,045, Dec. 28, 1971, Pat. No. 3,993,179.  
This application Oct. 15, 1976, Ser. No. 732,970  
Int. Cl.<sup>2</sup> B41J 5/36  
U.S. Cl. 400—4 20 Claims



1. An apparatus for performing deleting operations in a composing machine for correcting composing errors made during text character and print condition composing operations, comprising forward composing means including character and function keys, text display means responsive to said



character and function keys for displaying text characters in conditions according to said function keys, a record means, encoding means responsive to said character and function keys for sequentially encoding different information bits on said record means in forward encoding sequences, said information bits representing text character information and print condition information, normally ineffective delete reading means located one code space extend beyond said encoding means for sensing the last effective bit of encoded information on the record means, delete key means operable for rendering said delete reading means effective, and backspace decoding means controlled by said delete reading means for sequentially reversing said composing operations and deleting text character information and print condition information from said record means by direct reading of the encoded text and function information from said record means on a last-in first-out basis, said backspace decoding means placing said apparatus in the text character print condition existing just prior to encoding of the last deleted character.

4,162,131

**DRIVE CIRCUIT FOR PRINTING HEAD**

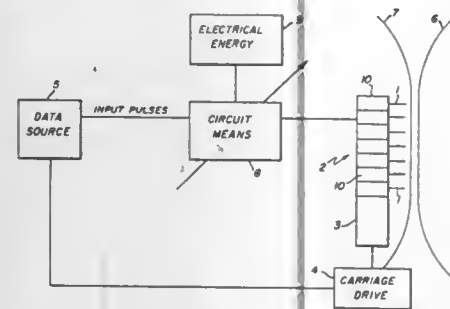
Andrew B. Carson, Jr., Waynesboro, and Michael J. Tuso, Afton, both of Va., assignors to General Electric Company, Waynesboro, Va.

Filed Nov. 2, 1977, Ser. No. 847,853

Int. Cl.<sup>2</sup> B41J 3/12

U.S. Cl. 400—124

13 Claims



13. In combination a plurality of printing elements, a source of individual drive pulses for actuating respective ones of said elements to print multiple element matrix symbols by impact printing, means for insuring that said drive pulses result in said printing elements producing constant impact forces over a wide range of printing rates comprising means for individually modifying the energy of the drive pulses actuating individual ones of said printing elements by an amount which varies as a function of the frequency of such last named drive pulses.

4,162,132

**IMPLEMENTS**

Werner Kress, Ulm-Lehr; Johann Katzer, Neu-Ulm; Franz Lopic, Burlafingen, and Willi Hepperle, Westerstetten, all of Fed. Rep. of Germany, assignors to Gardena Kress and Kastner GmbH, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,317

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617621

Int. Cl.<sup>2</sup> B25G 3/02

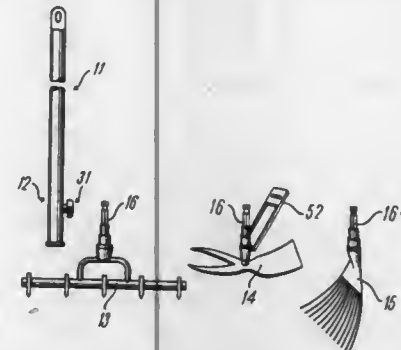
U.S. Cl. 403—361

36 Claims

1. In combination with a set of implements comprising at least one handle and a plurality of implement heads, a quick-connect coupling system comprising:

- first and second interengageable parts, each of said implement heads having said first coupling part thereon and said handle having said second coupling part thereon, whereby each implement head can be selectively attached to said handle;
- one of said coupling parts comprising a female coupling sleeve having an open mouth and being provided with a

moveable locking member thereon and the other of said coupling parts comprising a male coupling pin having a fixed locking surface thereon with which said locking member can cooperate to lock said coupling parts together, said coupling pin and said coupling sleeve having mutually abutting surfaces which are so shaped and adapted to one another that said mutually abutting surfaces prevent said pin from turning relative to said sleeve and include axial abutment faces effective in an insertion direction; and,



means providing tilt-free guidance of said pin in said sleeve, said guide means including guide portions which are located in a region near the mouth of said coupling sleeve and which have radial clearance for facilitating insertion of said coupling pin and axial lengths such that a space is formed between said pin and said sleeve, said coupling pin being tilted into a non-coaxial position within said coupling sleeve when engaged by said locking member, a portion of said pin occupying a portion of said space and said clearance being largely eliminated.

4,162,133

**RESIN REINFORCED EXPANSION ANCHOR AND METHOD OF INSTALLATION**

Carl A. Clark, Liverpool, and John Rogala, Syracuse, both of N.Y., assignors to The Eastern Company, Syracuse, N.Y.

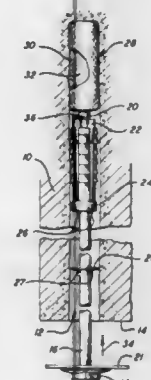
Continuation-in-part of Ser. No. 835,367, Sep. 21, 1977,

abandoned. This application Mar. 2, 1978, Ser. No. 882,797

Int. Cl.<sup>2</sup> E21D 21/00; F16B 33/04

U.S. Cl. 405—258

31 Claims



1. A combined resin-mechanical system for anchoring a bolt in a drill hole in a mine roof, or the like, said system comprising:

- (a) an elongated bolt having a head at one end and threaded from the opposite end for at least a portion of its length;
- (b) an expansion anchor including a hollow, radially expandable shell and a tapered nut having large and small ends, the latter being disposed in one end of said shell, said bolt

extending axially through said shell and threaded into said nut;

- (c) a destructible capsule containing quick-setting adhesive and catalyst hardener resin materials in separate compartments, said capsule being rupturable upon advance of said bolt thereto for mixture and hardening of said resin materials about said bolt within a drill hole; and
- (d) means providing rotation of said anchor together with and in response to rotation of said bolt in one direction and allowing said anchor to be held rotationally stationary as said bolt is rotated in the opposite direction for threaded advancement into said nut, thereby expanding said shell for engagement of the outer surface thereof with the interior of the drill hole.

4,162,134

**APPARATUS FOR ADJUSTING VERTICAL POSITION OF DRILLS IN MULTIPLE SPINDLE DRILLING MACHINE**

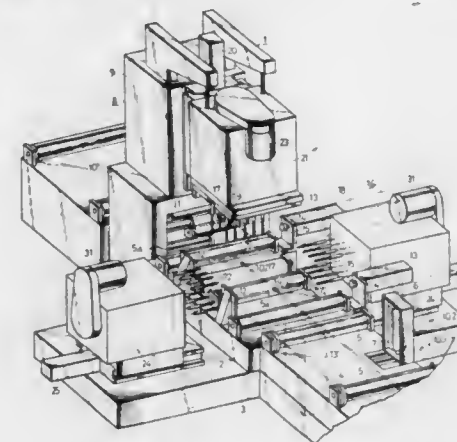
Toshikatsu Kitagawa, Seki, Japan, assignor to Miyakawa Industry Company Limited, Seki, Japan

Filed Jan. 12, 1978, Ser. No. 869,016

Int. Cl.<sup>2</sup> B23B 39/18, 39/16

U.S. Cl. 408—46

8 Claims



1. In an apparatus for adjusting the vertical position of drills in a multiple spindle drilling machine having:

- (a) drills attached in two lateral upper and lower rows to a gear box of the multiple spindle drilling machine, said two groups of drills being arranged so that the drills of the respective groups can be simultaneously moved in the vertical direction;
- (b) a motor for driving and rotating the two groups of drills;
- (c) moving means disposed to connect said two groups of drills so that they are moved in the vertical direction according to the height of drilling position of a material to be processed; and,
- (d) positioning means attached to the gear box to regulate the vertical movement of the drills of the respective groups within a certain range and set the vertical position thereof;

the improvement therein, wherein

- (e) the drills of the two groups are attached to a pair of upper and lower movable members respectively, which are mounted on said gear box slidably in the vertical direction, and,
- (f) said moving means includes at least one hydraulic cylinder attached to said upper movable member, said cylinder having a rod, the lower end of said rod being connected to the lower movable member.

4,162,135

**QUARTER BALE TURNING APPARATUS**

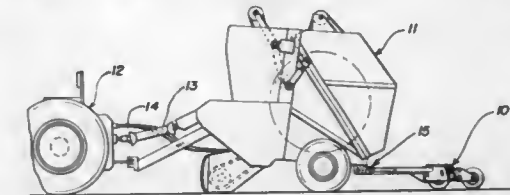
Shaun A. Seymour, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 1, 1977, Ser. No. 856,441

Int. Cl.<sup>2</sup> B65G 7/00

U.S. Cl. 414—780

16 Claims



1. A bale turning apparatus for use with a bale forming machine having a bale outlet defining a predetermined path of travel along which completed bales move for deposition on the ground, said bale turning apparatus comprising:

- (a) a mobile frame attachable to the bale forming machine,
- (b) support means connected to the frame and extending at least partially across said predetermined path of travel, said support means further having conveying means mounted thereon, said conveying means including bale gripping means movable along at least a portion of the length of said support means; and
- (c) bale-engaging means mounted to at least a portion of said support means and being movable relative thereto across at least a portion of said predetermined path of travel with said bale gripping means for engaging completed bales and turning them a predetermined angle about a vertical axis prior to assuming a position of rest on the ground.

4,162,136

**COOLED BLADE FOR A GAS TURBINE ENGINE**

Roger J. Parkes, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

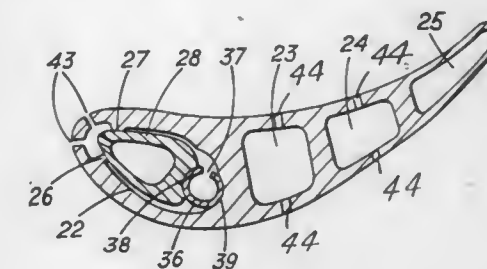
Filed Apr. 1, 1975, Ser. No. 563,144

Claims priority, application United Kingdom, Apr. 5, 1974, 15310/74

Int. Cl.<sup>2</sup> F01D 5/18

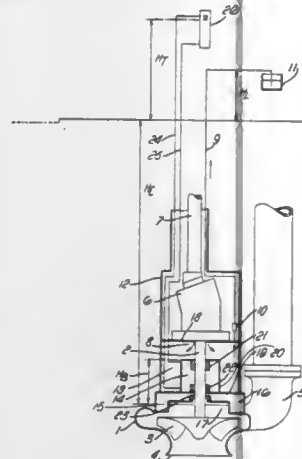
U.S. Cl. 416—97 R

7 Claims



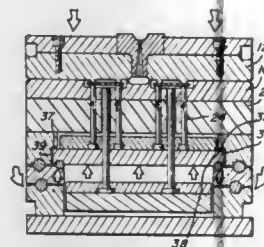
1. A cooled blade for a gas turbine engine comprising an aerofoil portion having a cavity therein, a cooling air entry tube within the cavity, said cavity having an interior surface with a part which forms a locating surface for said tube, a longitudinally extending depression formed in the outer surface of said cooling air entry tube, a further part of the interior surface of the cavity having a longitudinally extending depression facing the depression formed in the outer surface of said cooling air entry tube, and a resilient tube trapped between the depressions in said cooling air entry tube and said further part.

**4,162,137**  
**SUBMERSIBLE, HYDRAULICALLY-DRIVEN PUMP**  
**ROTATING ABOUT A VERTICAL AXIS**  
 Leiv Bjerke, Oslo, Norway, assignor to Thune-Eureka A/S,  
 Tranby, Norway  
 Filed Sep. 12, 1977, Ser. No. 832,412  
 Claims priority, application Norway, Oct. 21, 1976, 763590  
 Int. Cl.<sup>2</sup> F04B 17/00  
 U.S. Cl. 417—405



1. In a cargo vessel, a submersible, hydraulically-driven pump rotating about a vertical axis, the pump having a housing and a hydraulic motor and an impeller and a short shaft between the hydraulic motor and the impeller and a hydraulic pipe feeding the motor, a cofferdam around the hydraulic pipe and the hydraulic motor, extending from the pump housing to up above the cargo level in the vessel, and a shaft seal between the motor and impeller; the improvement in which the cofferdam is formed as three consecutive chambers around the shaft, extending between the hydraulic motor and the impeller, whereby the upper, first chamber is a receptacle for oil leakage from the hydraulic motor, and the next, second chamber contains a sealing liquid under pressure and is sealed at the top and at the bottom by respective mechanical shaft seals against the upper, first chamber and the lower, third chamber, respectively.

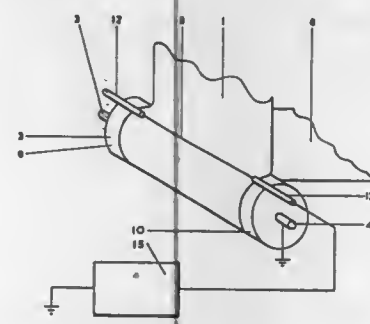
**4,162,138**  
**FLOATING INSERT INJECTION MOLD**  
 John R. Byrne, Watertown, Wis., assignor to Will Ross Inc.,  
 Milwaukee, Wis.  
 Filed Dec. 27, 1977, Ser. No. 864,177  
 Int. Cl.<sup>2</sup> B29F 1/10  
 U.S. Cl. 425—125



1. In an injection mold assembly for encapsulating inserts, said assembly having an "A" side plate, a "B" side plate, mold clamping means associated therewith and an ejector housing, the improvement which comprises:  
 "B" side clamping pin retaining means having at least one clamping pin retained thereon for clamping said inserts between said "A" side plate and said clamping pin, said

"B" side clamping pin retaining means being movable relative to said ejector housing and said "B" plate, and apportionment means associated with said ejector housing and said "B" side clamping pin retaining means to direct a predetermined amount of mold clamping force to said "B" side clamping pin retaining means and said "B" plate, said apportionment means being a lever arm pivotably arranged between said ejector housing, said "B" side plate and said "B" side plate clamping pin retaining means.

**4,162,139**  
**CASTING OF POLYMERIC FILM**  
 David J. Groves, Hitchin, and Albert Mason, Stevenage, both of  
 England, assignors to Imperial Chemical Industries Limited,  
 London, England  
 Division of Ser. No. 599,935, Jul. 28, 1975, Pat. No. 4,046,842,  
 and a continuation-in-part of Ser. No. 440,571, Feb. 7, 1975,  
 abandoned, and a continuation-in-part of Ser. No. 336,047, Feb.  
 26, 1973, abandoned. This application May 3, 1977, Ser. No.  
 793,429  
 Claims priority, application United Kingdom, Feb. 7, 1973,  
 6031/73; Aug. 5, 1974, 34337/74  
 Int. Cl.<sup>2</sup> B29C 25/00  
 U.S. Cl. 425—174.8 E

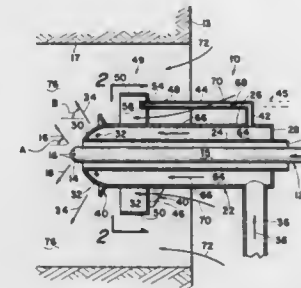


1. An apparatus for quenching a molten polymeric film, which comprises a cooled and electrically earthed casting surface for quenching the molten film, an electrode located in spaced relation from the path of the film surface and in the proximity of the region of first contact of the molten film and the casting surface, the electrode being connected to a source of alternating voltage having a symmetrical or asymmetrical waveform for applying a voltage to said electrode the peak to peak value of which exceeds the inception voltage of said electrode by at least 1 kilovolt, said source providing an output which exceeds 4.0 kilovolts peak to peak and has a frequency not exceeding that at which positive and negative electrostatic charges emitted by the electrode are unable to cross the space between the electrode and the molten film before the polarity of the voltage on the electrode changes, whereby, in operation electrostatic charges are emitted by the electrode and deposited by the applied electric field upon the molten film to cause the film to adhere to the casting surface.

**4,162,140**  
**NOX ABATEMENT IN BURNING OF GASEOUS OR LIQUID FUELS**  
 Robert D. Reed, Tulsa, Okla., assignor to John Zink Company,  
 Tulsa, Okla.  
 Filed Sep. 26, 1977, Ser. No. 836,379  
 Int. Cl.<sup>2</sup> F23C 1/08  
 U.S. Cl. 431—284

1. In a burner system for burning gaseous or liquid fuel, the improved construction for minimization of the production of NOx, comprising:  
 (a) a primary burner means comprising:  
 1. a liquid burner tube and means to supply liquid fuel under pressure to said liquid burner tube; said liquid burner tube closed at its distal end; said closure includ-

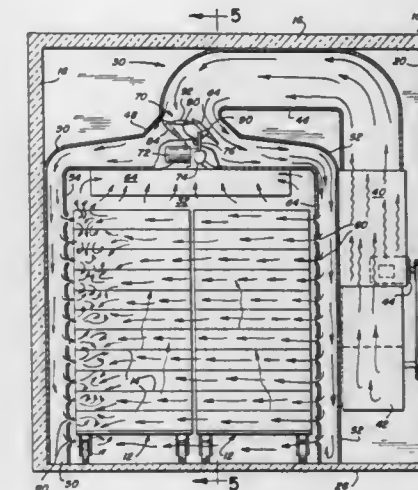
ing a plurality of ports arranged symmetrically, each port in a radial plane, and at a selected angle A to the axis of said liquid burner tube;  
 2. a gaseous burner tube comprising a pair of coaxial tubes, with means to supply gas under pressure to the annular space between said two tubes; the annular space closed at the distal end; said closure including a plurality of ports arranged symmetrically, each port in a radial plane, and at a selected angle B to the axis of said gaseous burner tube;  
 (b) means to supply combustion air around the outer surface of said gaseous burner tube;



(c) secondary burner means surrounding said gaseous burner tube, and upstream a selected distance from said ports, and means to supply a selected quantity of secondary gaseous fuel to said secondary burner means to form a whirling annulus of flame about said gaseous burner tube, an annular opening between said gaseous burner tube and said secondary burner means;  
 whereby said secondary burner means utilizes part of said combustion air to burn said secondary gaseous fuel;  
 whereby the products of combustion of said secondary fuel burning, move with said combustion air downstream, into the zone of combustion of said primary combustion means.

**4,162,141**  
**VARIABLE AIR FLOW OVEN**  
 Clarence W. West, 208 S. LaSalle St., Chicago, Ill. 60604  
 Filed Dec. 27, 1977, Ser. No. 865,041  
 Int. Cl.<sup>2</sup> F27B 9/00, 5/16  
 U.S. Cl. 432—144

5 Claims



1. In a variable air flow oven, having an air circulating system and a heating unit, the improvement which comprises a variable air directing control means for varying positive pressures of heated air flow from opposite sides of the oven through jet orifice means causing interaction of heated air jets from opposite sides of the oven meeting at a region of common velocity for causing a turbulence and mixing of the heated air which region of heated turbulent air travels from one side of the oven to the other substantially throughout a heating period.



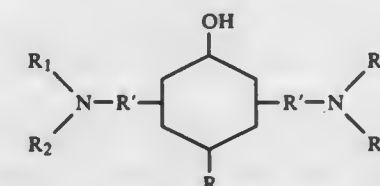
# CHEMICAL

**4,162,142**  
**TRITIUM LABELING OF ORGANIC COMPOUNDS DEPOSITED ON POROUS STRUCTURES**  
 Richard L. E. Ehrenkauf, Speonk; Alfred P. Wolf, Setauket, both of N.Y., and Wylie C. Hembree, Woodcliff Lake, N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
 Filed Jun. 29, 1978, Ser. No. 920,412  
 Int. Cl.<sup>2</sup> G01M 23/12; G21H 5/00  
 U.S. Cl. 260—326.2 10 Claims

1. In the process of labeling an organic compound with tritium by reacting said compound with tritium gas activated by microwave discharge, the improvement of enhancing the desired reaction, which comprises depositing a film of said compound on the extensive surface of permeable material having very fine pores, and contacting said compound while deposited on said permeable material with tritium gas activated by microwave discharge and recovering the resulting tritium labeled organic compound from said permeable material.

**4,162,143**  
**EMULSIFIER BLEND AND AQUEOUS FUEL OIL EMULSIONS**  
 Joseph B. Yount, III, Newark, Del., assignor to ICI Americas Inc., Wilmington, Del.  
 Filed Mar. 13, 1978, Ser. No. 885,758  
 Int. Cl.<sup>2</sup> C01L 1/32  
 U.S. Cl. 44—51 30 Claims

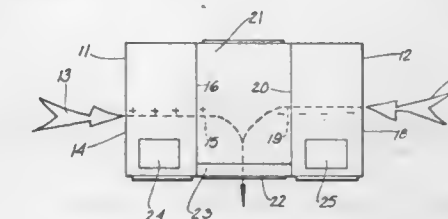
1. A blend useful in preparing stable aqueous fuel oil emulsions comprising:  
 (a) compounds selected from a reaction product prepared by reacting:  
 (1) from about 1 to about 300 mols of an alkyleneoxide  
 (2) a mol of polyamine condensation product characterized by the general formula:



wherein R is an organic radical selected from the group consisting of alkyl and cycloalkyl radicals having from 4–12 carbon atoms, wherein R' is an alkylene radical, wherein R<sub>1</sub> and R<sub>1</sub>' are each selected from the group consisting of hydrogen and an acyclic hydrocarbon radical having from 1 to 18 carbon atoms and wherein R<sub>2</sub> and R<sub>2</sub>' are each organic alkylene polyamine radicals containing from 1 to 3 amine groups selected from the group consisting of primary and secondary amine groups, each of said amine group being separated from any other amine group in said composition by 2–6 carbon atoms, or an organic carboxylic acid salt of said reaction product; and at least one of the compounds selected from the group consisting of:

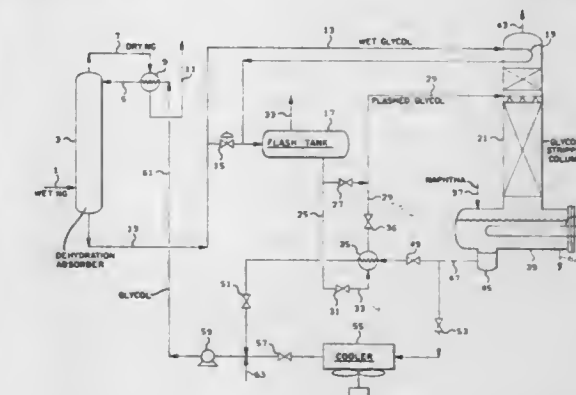
- a nonionic compound prepared by reacting from about 10 to about 300 mols of an alkyleneoxide with hydroxyl containing compounds having 1–8 carbon atoms and alkyl phenols, wherein, the alkyl substituents have 2–15 carbon atoms; and
- an anionic compound selected from alkyl, aryl, and polyoxypropylene and polyoxyethylene ether esters of sulphuric, sulphonic and phosphoric acids and inorganic and organic neutral salts thereof.

**4,162,144**  
**METHOD AND APPARATUS FOR TREATING ELECTRICALLY CHARGED AIRBORNE PARTICLES**  
 William A. Cheney, Cincinnati, Ohio, assignor to United Air Specialists, Inc., Cincinnati, Ohio  
 Filed May 23, 1977, Ser. No. 799,464  
 Int. Cl.<sup>2</sup> B03C 1/00  
 U.S. Cl. 55—5 10 Claims



- A method for preventing the deposition of airborne particles on walls and other exposed surfaces in an enclosed area containing air contaminated with particles, said method comprising the steps of:  
 a. in a first two stage electrostatic precipitator air cleaner, passing air contaminated with particles from the enclosed area over a positively charged ionizer to produce air containing positively charged particles, collecting some of said positively charged particles on one or more collector plates in a first collector positioned downstream from said positively charged ionizer, and exhausting from said first collector a relatively clean airstream containing some positively charged particles;
- in a second two stage electrostatic precipitator air cleaner, passing air contaminated with particles from the enclosed area over a negatively charged ionizer to produce air containing negatively charged particles, collecting some of said negatively charged particles on one or more collector plates in a second collector positioned downstream from said negatively charged ionizer, and exhausting from said second collector a relatively clean airstream containing some negatively charged particles; and
- mixing said air streams
- exhausting said mixed airstreams from said first and second collectors into the enclosed area.

**4,162,145**  
**REGENERATION OF LIQUID ABSORBENTS**  
 Carl E. Alleman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
 Filed Dec. 9, 1977, Ser. No. 858,935  
 Int. Cl.<sup>2</sup> B01D 53/14; C07C 29/26  
 U.S. Cl. 55—32 10 Claims



- A method for separating a water component and a glycol component from a liquid mixture thereof said method comprising:

ing distilling said liquids in the presence of a liquid naphtha fraction having a boiling range from at least that of the lower boiling component up to the boiling point of the higher boiling component.

**4,162,146**  
**MULTI-CHAMBER ADSORBENT GAS FRACTIONATOR**  
**WITH NON-JAMMING EFFLUENT FLOW CONTROL**  
**VALVE**

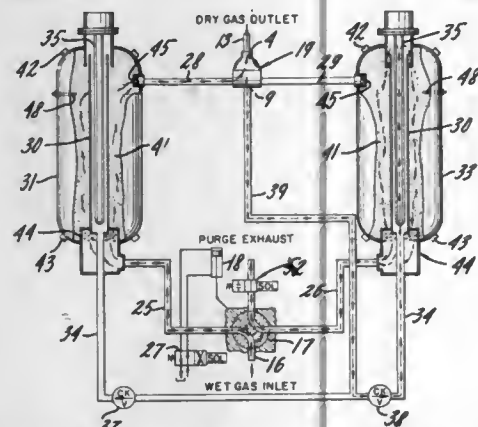
Chesterfield F. Seibert, Cortland, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,280

Int. Cl.<sup>2</sup> B01D 53/04

U.S. Cl. 55-163

13 Claims



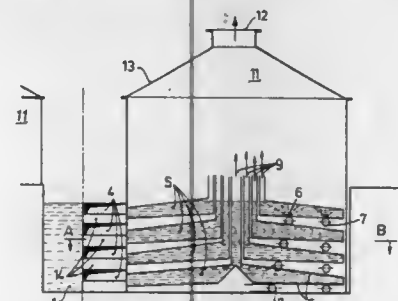
1. Apparatus for reducing the concentration of a first gas in a mixture thereof with a second gas to below a limiting maximum concentration thereof in the second gas, comprising, in combination, a pair of vessels; a chamber in each vessel for a bed of particulate friable sorbent having a preferential affinity for the first gas; an influent line for delivering influent gas to each sorbent chamber; an influent flow control valve in the influent line for directing the influent gas to the one of the chambers that is on-stream for adsorption; an effluent line for delivering effluent gas from each sorbent chamber; an effluent flow control valve in the effluent line for directing the effluent gas from the chamber that is on-stream for adsorption; the effluent valve comprising a valve housing; a valve chamber in the housing having separate substantially vertically oriented inlets and inlet passages leading thereinto, one from the effluent line from each sorbent chamber; a substantially horizontally oriented valve seat across each inlet; and a free-rolling ball valve seating against the valve seats and responsive to effluent line gas pressure at each inlet related to downstream pressure displacing the ball upwardly away from the valve seat into the valve chamber and opening the inlet leading from the sorbent chamber on-stream for adsorption, directing the ball to seat at the valve seat across the other inlet leading from the sorbent chamber off-stream for adsorption and close that inlet, thereby preventing effluent gas flow through that inlet into the off-stream chamber; and a bleed line in the housing for effluent purge gas flow bypassing the closed inlet and interconnecting at least one of the valve chamber and the substantially vertically oriented inlet passages with one of the effluent lines for reverse purge flow of effluent gas from the inlet passage with a change of flow direction from the direction of flow in the inlet passage and thence through the effluent line into the sorbent chamber that is off-stream for adsorption but on-stream for regeneration to regenerate the sorbent bed with such purge flow.

**4,162,147**  
**APPARATUS FOR TREATING EFFLUENTS**  
Wilhelm Haverkamp, Essen, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany  
Filed Jun. 5, 1978, Ser. No. 912,522  
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726233

Int. Cl.<sup>2</sup> B01D 19/00

U.S. Cl. 55-191

10 Claims



1. An apparatus for removing harmful substances from effluents which flow through an effluent channel, comprising wall means forming at one side of the effluent channel a treating chamber having an upper gas outlet opening; at least two superposed trays in said treating chamber and each having an upper inlet and a lower outlet connected by a spiral flow path, said inlets being located in the effluent channel so that effluent flowing in the channel is compelled to enter into them, said trays having respective bottom walls provided with nozzles and respective top walls provided with concentric gas outlets which communicate with the interior of said treating chamber; and means for supplying treating gas to said nozzles so that the gas issues from said nozzles and travels through the effluent in the respective tray to entrain harmful substances present in the effluent.

**4,162,148**  
**FILTERING APPARATUS**  
Joachim Fürstenberg, Alchelberg, Fed. Rep. of Germany, assignor to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany  
Continuation of Ser. No. 725,851, Sep. 23, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,349

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1975, 2542300

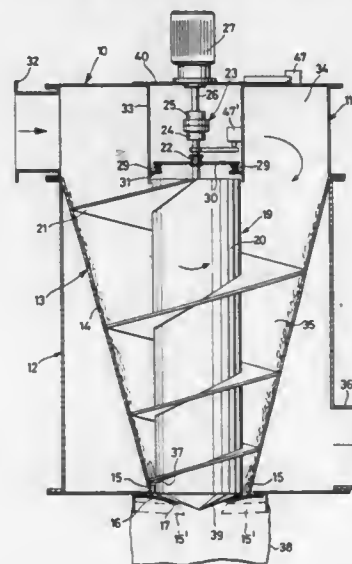
Int. Cl.<sup>2</sup> B01D 45/18, 46/04; B65B 1/20

U.S. Cl. 55-272

24 Claims

1. A filter apparatus for removal of fibers from a stream of moving air comprising:  
a hollow casing having an air inlet for unfiltered air having fibers suspended therein and an air outlet for filtered air;  
a fiber filtering assembly having an elongated hollow fiber filter positioned within said casing so as to define an unfiltered air chamber and a clean air chamber and having an inlet and an outlet axially spaced from each other, said inlet communicating with the casing inlet, said fiber filter having openings therethrough sized to trap fiber particles but permitting the flow of air therethrough to the casing outlet;  
a screw conveyor having a helical flight of substantially the same radius as the inner surface of said fiber filter and which extends at least substantially the length of the hollow casing and positioned within said fiber filter and being substantially co-extensive therewith for providing means for axially displacing the fibers to the fiber filter outlet; means defining an opening in said casing surrounding and adjacent to the fiber filter outlet;  
flexible means supported on said casing and positioned adjacent said casing opening so as to at least partially close said casing opening; and

means for driving said conveyor, whereby fibers trapped on the inner surface of said fiber filter are compacted and moved toward said flexible means until they exit from said casing.

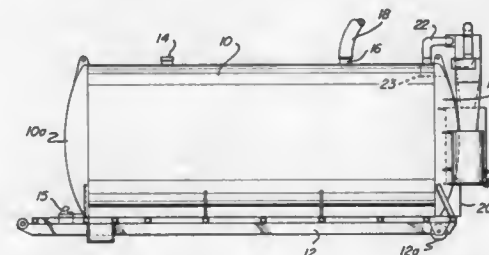


**4,162,149**  
**GRAVEL AND DUST SEPARATOR AND CONTAINER**  
**FOR VACUUM CLEANING SYSTEMS**  
Clayton G. Mekelburg, 2609 S. Raritan, Englewood, Colo. 80110  
Filed Jan. 3, 1978, Ser. No. 866,809

Int. Cl.<sup>2</sup> B01D 50/00; A47L 9/16

U.S. Cl. 55-315

7 Claims



1. A container and separator assembly for a vacuum cleaning system constructed and arranged for releasable connection to a separable air pump and drive and releasable connection to flexible vacuum tubes, comprising:

- an enclosed container constructed and arranged for handling by conventional trash handling means, and having a lower door for removal of content by tilting the container including airtight seal means for said lower door, and having inlet means for releasable connection to flexible vacuum tubes, and an outlet;
- at least two series connected cyclone separators for cleaning air passing out of said container outlet mounted on said container;
- passage means from said container outlet to the upstream one of said at least two series connected cyclone separators for passing air;
- storage means including separate containers for each of said at least two cyclone separators for accumulating solid matter removed by said at least two cyclone separators;
- means for emptying said storage means; and
- air outlet means from the downstream one of said at least two cyclone separators, and said air outlet means has means for releasable attachment to air pump means.

**4,162,150**  
**APPARATUS FOR SEPARATING WATER AND STEAM**  
**IN A NUCLEAR STEAM GENERATOR**  
William R. Carson, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.  
Filed Nov. 17, 1977, Ser. No. 852,271  
Int. Cl.<sup>2</sup> F22B 37/26; B01D 53/26

U.S. Cl. 55-337

9 Claims

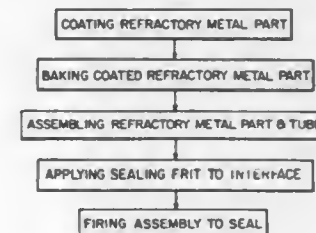


1. A steam-water separator that comprises in combination an outer cylindrical housing disposed in an axially upright position, a perforate housing concentrically aligned within the outer housing having axially disposed inlet and outlet ports at opposite ends thereof arranged to provide an annular space between inner and outer housing members, spinner vanes in the inlet port of the perforate housing adapted to subject fluid flowing axially therethrough to a rotary movement that imparts centrifugal force to said liquid sufficient to move the liquid radially through the perforations of the inner housing while the steam continues to flow axially to said outlet port, inclined spinner vanes that comprise forward and aft leaves joined by a continuous bight in the annular space between inner and outer housing members for imparting a rotary movement to the water flowing therethrough, and apertures in the outer housing wall for venting residual steam radially there-through after it has been separated from water by passing over the vanes in the annular space between housing members.

**4,162,151**  
**METHOD OF FORMING ARC TUBE END SEAL**  
Ranbir S. Bhalla, West Paterson, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Division of Ser. No. 796,579, May 13, 1977, Pat. No. 4,103,200.  
This application Feb. 8, 1978, Ser. No. 875,956  
Int. Cl.<sup>2</sup> C03B 23/20; C03C 27/02

U.S. Cl. 65-42

9 Claims

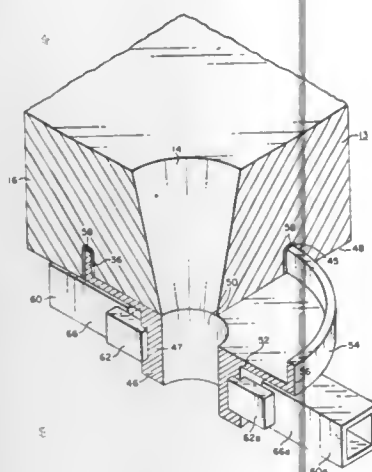


1. The method of bonding a refractory metal to a high alumina content material comprising the steps of:  
coating the refractory metal with a slurry which principally comprises silicon metal and a liquid vehicle;  
baking the refractory metal having a slurry thereon in a vacuum for a predetermined time at a predetermined temperature;  
coating one of said high alumina content material and said coated refractory metal with a sealing frit principally comprising calcia and alumina;  
assembling said high alumina content material and said refractory metal with said sealing frit therebetween; and  
baking said assembly in accordance with a predetermined sealing schedule whereby an improved bond is provided between said refractory metal and said high alumina content material.



**4,162,152**  
**MOLTEN GLASS METERING DEVICE FOR MAKING LAMP BASES**  
 James Petro, Little Falls, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Sep. 9, 1977, Ser. No. 831,723  
 Int. Cl.<sup>2</sup> C03B 5/26

U.S. Cl. 65—164



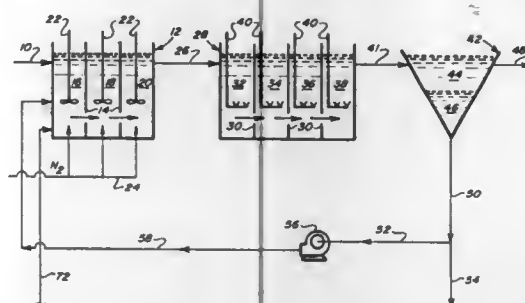
1. A molten glass metering device for rapidly and accurately controlling the viscosity and thus the rate of flow of molten glass from an orifice in a wall of a glass melting furnace, the outer portion of said wall having provided therein an annular-shaped slot spaced from and encircling said orifice, said orifice positioned in said furnace to have a quantity of molten glass positioned thereover to permit gravity flow of a stream of molten glass therethrough, said device comprising:

- (a) a high-temperature-resistant chemically stable electrically conductive metal member including an integral hollow elongated member aligned with said orifice, said hollow elongated member having an inlet end for contact with said outer wall portion of said furnace so that molten glass passing from said furnace will flow through said hollow member, said metal member also including an integral flange member extending radially outwardly from said inlet end of said hollow member and an integral upturned lip member continuous about the periphery of said flange member, said upturned lip member sized to fit into said slot in said outer wall portion of said furnace to permit sealing of said lip member in said slot;
- (b) water-cooled electrical contact members affixed to opposite side portions of said metal member, and said contact members adapted to be connected to a source of electrical energy to pass current through said metal member and self-resistance heat same to a predetermined temperature; and
- (c) electrical control means for controlling the self-resistance heating of said metal member to vary in a rapid and controllable fashion the temperature thereof thereby to control the temperature and thus the viscosity of glass within said orifice to control the rate of glass flow therethrough.

**4,162,153**  
**HIGH NITROGEN AND PHOSPHOROUS CONTENT BIOMASS PRODUCED BY TREATMENT OF A BOD-CONTAINING MATERIAL**  
 Marshall L. Spector, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.  
 Continuation-in-part of Ser. No. 676,266, Apr. 12, 1976, Pat. No. 4,056,465. This application Jul. 25, 1977, Ser. No. 818,786  
 The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.  
 Int. Cl.<sup>2</sup> C02C 1/06

U.S. Cl. 71—12

17 Claims



1. An improved high nitrogen- and phosphorus- content biomass characterized by a phosphorous content of at least about 3.96% and produced by the operation of an activated sludge process which inhibits proliferation of filamentous biomass, said process consisting essentially of:

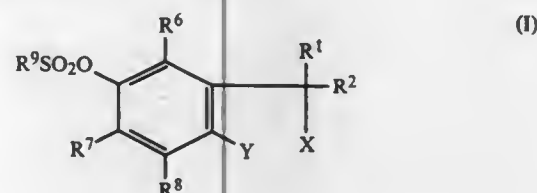
- (a) first forming a mixed liquor by mixing activated biomass with nitrogen-, phosphorus-, and BOD-containing influent and initially treating the mixed liquor under anaerobic conditions such as to be substantially free of NO<sub>x</sub>- and to have a dissolved oxygen content of less than 0.7 ppm; thereby effecting selective production of nonfilamentous microorganisms capable of sorbing BOD under anaerobic conditions, whereby said microorganisms effect a decrease in BOD content of said mixed liquor;
- (b) oxidizing BOD in the mixed liquor to cause removal of BOD by contact with oxygen containing gas under conditions selected to maintain a dissolved oxygen content of at least 1 ppm;
- (c) settling the oxidized mixed liquor so as to separate a supernatant liquid from a more dense biomass;
- (d) employing a portion of the separated biomass as the activated biomass in an initial mixing with BOD-containing influent; and
- (e) recovering another portion of the settled and separated biomass as product.

**4,162,154**  
**HERBICIDALLY-ACTIVE SULPHONATES**  
 Peter S. Gates, and Derek Baldwin, both of Cambridge, England, assignors to Fisons Limited, London, England  
 Filed Feb. 3, 1978, Ser. No. 875,189  
 Claims priority, application United Kingdom, Feb. 5, 1977, 4847/77; Feb. 5, 1977, 4848/77; Feb. 5, 1977, 4849/77; Aug. 5, 1977, 32839/77

Int. Cl.<sup>2</sup> A01N 9/14; C07D 307/79, 307/86  
 U.S. Cl. 71—88

9 Claims

1. A sulphonate of the formula:



wherein X and Y together represent a group —CHR<sup>3</sup>—O—, the free oxygen atom of which is attached to the benzene ring; R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup>, which may be the same or different, each represent hydrogen or C 1 to 6 alkyl; R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup>, which may be the same or different, each represent hydrogen, C 1 to 6 alkyl, halogen, cyano, C 2 to 6 carboxylic acyl, or C 1 to 4 alkoxy; and R<sup>9</sup> represents C 1 to 6 alkyl, phenyl or C 7 to 10 phenylalkyl (each of which may be unsubstituted or substituted by one or more chlorine or bromine atoms, C 1 to 4 alkyl groups, C 1 to 4 alkoxy groups or nitro groups), C 5 to 7 cycloalkyl, C 1 to 4 alkylamino, or dialkylamino wherein each alkyl moiety has from 1 to 4 carbon atoms.

9. A herbicidal composition which comprises from 0.5 to 85% by weight of one or more compounds according to claim 1 in association with a suitable carrier and/or surface active agent.

**4,162,155**  
**COMPOSITIONS**  
 David W. Young, Homewood, Ill., assignor to Howard Hall & Company, Cos Cob, Conn.  
 Continuation of Ser. No. 568,919, Apr. 17, 1975, abandoned.  
 This application Feb. 25, 1977, Ser. No. 772,139  
 Int. Cl.<sup>2</sup> A01N 9/02, 9/24

U.S. Cl. 71—110

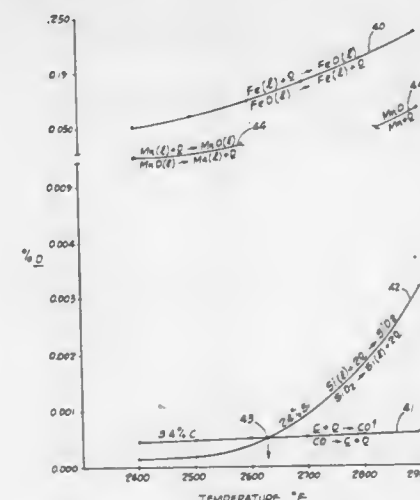
6 Claims

1. An aqueous agriculturally-active composition comprising isooctenyl-2,4-dichlorophenoxy acetate; N-acetyl-p-aminophenol in an amount sufficient to stabilize isooctenyl-2,4-dichlorophenoxy acetate from deterioration; and water.

**4,162,156**  
**PROCESS FOR MELTING CAST IRON BORINGS**  
 Dewain H. Naffziger, Warren, Ohio, assignor to Advance Achievement Systems, Inc., Warren, Ohio and Wisconsin Centrifugal Inc., Waukesha, Wis.  
 Filed May 2, 1977, Ser. No. 792,553  
 Int. Cl.<sup>2</sup> C21C 5/52

U.S. Cl. 75—12

10 Claims



1. A process for melting cast iron borings, having a composition containing carbon and a silicon constituent, comprising the steps of:

- (a) continuously charging a quantity of borings to a coreless induction furnace having power coils containing a molten heel of cast iron therein;
- (b) maintaining the level of the melt in said furnace within the range of from about 50% to about 105% of the height of the said power coils for said furnace to establish a meniscus at the upper surface of said melt;
- (c) maintaining the temperature of said melt at not less than about 100° F. above the SiO<sub>2</sub>/CO inversion temperature T established by the relationship

$$T = \frac{-28,693}{\log \frac{(\% \text{ Si})}{(\% \text{ C})^2}} - 16.16$$

where T is expressed in degrees Kelvin; and,

(d) controlling said charging step to introduce said borings at a rate to maintain the dissolved oxygen content of said melt below the Si/SiO<sub>2</sub> thermodynamic equilibrium as shown in FIG. 4 without causing the temperature of said melt to fall below 100° F. above T; wherein said borings are drawn beneath the surface of said melt without surface slag formation.

**4,162,157**  
**SECONDARY HARDENING STEEL HAVING IMPROVED COMBINATION OF HARDNESS AND TOUGHNESS**  
 Earl R. Parker, San Leandro; Victor F. Zackay; Manjeshwar S. Bhat, both of Berkeley, and Warren M. Garrison, Jr., Oakland, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
 Filed May 15, 1978, Ser. No. 906,308  
 Int. Cl.<sup>2</sup> C22C 38/02, 38/06

U.S. Cl. 75—124

8 Claims

1. A secondary hardening alloy steel composition consisting essentially of about 0.25–0.5% carbon, about 0.5–1.0% manganese, about 1.5–3.0% nickel, about 0–1.0% chromium, about 1.75–2.5% molybdenum, about 0–0.4% vanadium, and an additive selected from about 1–3% aluminum and a combination of at least about 1% aluminum and at least about 1% silicon for a combined Al+Si content of about 2–4%, the balance being iron and impurity elements.

**4,162,158**  
**FERRITIC Fe-Mn ALLOY FOR CRYOGENIC APPLICATIONS**  
 Sun-Keun Hwang, Rockypoint, N.Y., and John W. Morris, Jr., Berkeley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
 Filed Dec. 28, 1978, Ser. No. 973,844  
 Int. Cl.<sup>2</sup> C22C 38/04

U.S. Cl. 75—124

2 Claims

1. A ferritic alloy steel composition consisting essentially of about 10–13% manganese, about 0.002–0.01% boron, about 0.1–0.5% titanium, about 0–0.05% aluminum, and the remainder iron with incidental impurities normally associated therewith.

**4,162,159**  
**CAST IRON MODIFIER AND METHOD OF APPLICATION THEREOF**  
 Lev V. Peregodov, ulitsa Puzakova, 39, kv. 231; Mikhail M. Malashin, ulitsa Liteizina, 74, kv. 30, both of Tula; Anatoly S. Naletov, ulitsa Novo-Cheremushkinskaya, 38, kv. 67, Moscow; Jury Y. Nenakhov, Scheglovskaya zasedka, dachny poselok, 3 proezd, 18, Tula, and Evgeny A. Sokolov, 11 Parkovaya ulitsa, 54, korpus 1, kv. 35, Moscow, all of U.S.S.R.  
 Filed Apr. 18, 1978, Ser. No. 897,269  
 Int. Cl.<sup>2</sup> C22C 33/08

U.S. Cl. 75—130 R

3 Claims

1. A cast iron modifier containing, in % by weight:

silicon	from 30 to 40
rare-earth elements	from 2 to 8
calcium	from 10 to 20
aluminum	from 15 to 30
carbon	from 10 to 30
sulphur	from 0.1 to 0.3
iron	the balance.

**4,162,160**  
ELECTRICAL CONTACT MATERIAL AND METHOD  
FOR MAKING THE SAME

Gerald J. Witter, Waukegan, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Filed Aug. 25, 1977, Ser. No. 827,590

Int. Cl.<sup>2</sup> B22F 5/00

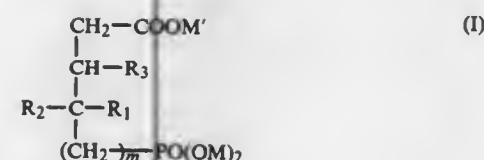
U.S. Cl. 75—246

27 Claims

1. A material for use in electrical contacts comprising a conductive metallic constituent in the amount of about 20% to 50% by weight, nickel in the amount of about 2% to 13% by weight, phosphorus in the amount of about 90–1000 ppm, and the balance including a refractory metallic constituent.

9. A material for use in electrical contacts comprising a conductive constituent in the amount of about 20% to 50% by weight, nickel in the amount of about 4% to 13% by weight, and the balance including a refractory metallic constituent, and when sintered in electrical contacts characterized by significantly decreased mean temperature rise of the contacts when subjected to 1,000 switching cycles at a rate of 12.85 cycles per minute under a current load of 20 amperes at 120 volts AC at 60 cycles per second with a 75% power factor compared to essentially the same contacts sintered under the same conditions and subjected to the same number of switching cycles at the same rate under the same load conditions and made of essentially the same material except that such material contains less than 2% by weight of nickel.

16. A material for use in electrical contacts consisting essentially of silver in the amount of about 20% to 50% by weight, nickel in the amount of about 2% to 13% by weight, phosphorus in the amount of about 90 to 1000 ppm and the remainder tungsten.



wherein

R<sub>1</sub> is —COOM' or —PO(OM)<sub>2</sub>;  
R<sub>2</sub> is a hydrogen atom, an alkyl group containing 1 to 4 carbon atoms, —(CH<sub>2</sub>)<sub>n</sub>COOM' or a phenyl group;  
R<sub>3</sub> is a hydrogen atom or —COOM';  
M and M', which may be the same or different, each is a hydrogen atom, an alkali metal atom or an ammonium group;  
m is 0 or 1; and  
n is 1 to 4.

**4,162,162**  
DERIVATIVES OF ARYL KETONES AND  
p-DIALKYL-AMINOARYLALDEHYDES AS VISIBLE  
SENSITIZERS OF PHOTOPOLYMERIZABLE  
COMPOSITIONS

Thomas E. Dueber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1978, Ser. No. 903,947

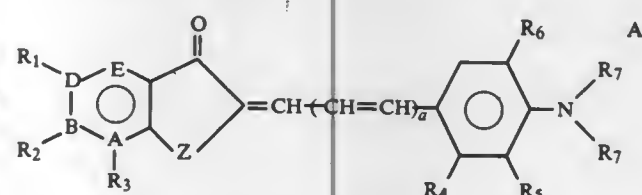
Int. Cl.<sup>2</sup> G03C 1/70

U.S. Cl. 96—115 P

17 Claims

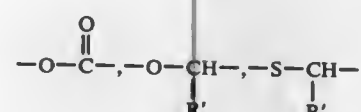
1. A photopolymerizable composition comprising an admixture of

- (1) at least one non-gaseous ethylenically unsaturated compound having a boiling point above 100° C. at normal atmospheric pressure and being capable addition polymerization;
- (2) at least one 2,4,5-triarylimidazolyl dimer consisting of two lophin radicals bound together by a single covalent bond; and
- (3) a sensitizing amount of an arylidene aryl ketone compound of the formulae:



wherein:

A, B, D, E are carbon atoms or one may be solely a nitrogen atom;  
R<sub>1</sub> is H, OH or CH<sub>3</sub>O;  
R<sub>2</sub> is H, OH, CH<sub>3</sub>O or N(R<sub>6</sub>)<sub>2</sub>;  
R<sub>3</sub> is H, OH or CH<sub>3</sub>O;  
a is 0 or 1;  
Z is >C=O, CHOH, >C(CH<sub>3</sub>)<sub>2</sub>, —CH<sub>2</sub>—, wherein b is 1, 2 or 3,



wherein R' is H, phenyl, or Z is linked with R<sub>4</sub> where Z is

**4,162,161**  
REVERSAL COLOR PHOTOGRAPHIC PROCESS

Isao Shimamura, and Yasuharu Nakamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 8, 1977, Ser. No. 822,764

Claims priority, application Japan, Aug. 6, 1976, 51-94375

Int. Cl.<sup>2</sup> G03C 5/50

U.S. Cl. 96—59

9 Claims

1. A reversal color photographic process in which color development is carried out in the presence of a color coupler which comprises subjecting an image-wise exposed silver halide color photographic light-sensitive material to a first black-and-white development and then (a) color developing said light-sensitive material with a color developing solution containing a p-phenylene diamine or derivative thereof color developer, a water-soluble stannous salt and a phosphonocarboxylic acid compound; or (b) processing said light-sensitive material with a fogging bath containing a water-soluble stannous salt and a phosphonocarboxylic acid compound and then color developing said light-sensitive material with a p-phenylene diamine or derivative thereof color developer, whereby silver halide which was not developed in the first development is developed in the presence of a color coupler to form color images, said phosphonocarboxylic acid compound being represented by the general formula (I):

**4,162,163**  
COATING FOR GOLD OR GOLD ALLOY CASTINGS FOR  
DENTAL BRIDGES AND CROWNS

John C. Subelka, Plainsboro, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 18, 1978, Ser. No. 870,390

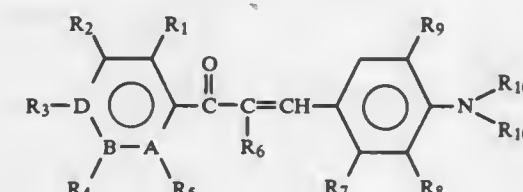
Int. Cl.<sup>2</sup> C09D 5/38

U.S. Cl. 106—1.13

10 Claims

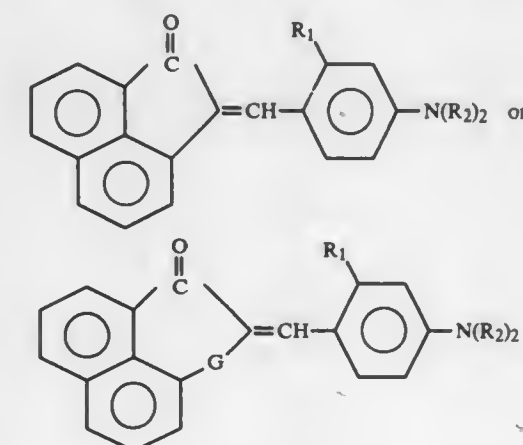
1. A powder-liquid system consisting of two separate components which are mixed for preparing dispersions useful for coating gold and gold alloy castings for dental bridges and crowns the first component consisting of a gold powder having an average particle size of from 5 to 16 μm and, as the second component, a liquid vehicle suitable for dispersing said gold powder consisting of a solution of an alkali metal or alkaline earth metal borate salt and a stannous tin salt in an organic solvent selected from the group consisting of glycerine, ethylene glycol and propylene glycol.

and R<sub>4</sub> is —O— or >N—CH<sub>3</sub> a being O;  
R<sub>4</sub> is H, CH<sub>3</sub>, OH, CH<sub>3</sub>O;  
R<sub>5</sub> is H or R<sub>5</sub>+R<sub>7</sub> is —CH<sub>2</sub>CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>—, —O—CH<sub>2</sub>CH<sub>2</sub>—;  
R<sub>6</sub> is H or R<sub>6</sub>+R<sub>7</sub> is —CH<sub>2</sub>CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>—, —O—CH<sub>2</sub>CH<sub>2</sub>—; and  
R<sub>7</sub> is CH<sub>3</sub>, —(CH<sub>2</sub>)<sub>n</sub>—CH<sub>3</sub> where n is 1 to 5, —CH<sub>2</sub>C—H<sub>2</sub>—Cl, —CH<sub>2</sub>CH<sub>2</sub>OH, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>;



wherein:

A, B, D are carbon atoms or one may be solely a nitrogen atom;  
R<sub>1</sub> is H, CH<sub>3</sub>, —OCH<sub>2</sub>CH<sub>2</sub>OR, wherein R is H, CH<sub>3</sub>, —CH<sub>2</sub>CH<sub>2</sub>OR' wherein R' is CH<sub>3</sub> or CH<sub>3</sub>CH<sub>2</sub>—;  
R<sub>2</sub> is H, CH<sub>3</sub>, OH or CH<sub>3</sub>O;  
R<sub>3</sub> is H, OH, CH<sub>3</sub>O, CH<sub>3</sub>, F, Br, CN or N(R<sub>9</sub>)<sub>2</sub>;  
R<sub>2</sub>+R<sub>3</sub> is —O—CH<sub>2</sub>—O—;  
R<sub>4</sub> is H, CH<sub>3</sub> or CH<sub>3</sub>O;  
R<sub>5</sub> is H, CH<sub>3</sub>, —OCH<sub>2</sub>CH<sub>2</sub>OR, wherein R is H, CH<sub>3</sub>, —CH<sub>2</sub>CH<sub>2</sub>OR' wherein R' is CH<sub>3</sub> or CH<sub>3</sub>CH<sub>2</sub>—;  
R<sub>6</sub> is H, CH<sub>3</sub> or phenyl;  
R<sub>7</sub> is H, CH<sub>3</sub>, OH or CH<sub>3</sub>O;  
R<sub>8</sub> is H;  
R<sub>9</sub>+R<sub>10</sub> is —CH<sub>2</sub>CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>—, —OCH<sub>2</sub>CH<sub>2</sub>—;  
R<sub>9</sub> is H, R<sub>9</sub>+R<sub>10</sub> is —CH<sub>2</sub>CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>—, —OCH<sub>2</sub>CH<sub>2</sub>—; and  
R<sub>10</sub> is CH<sub>3</sub>, —(CH<sub>2</sub>)<sub>n</sub>—CH<sub>3</sub> wherein n is 1 to 5; and



wherein  
G is



—O—, or —S—;  
R<sub>1</sub> is H, CH<sub>3</sub> or —OCH<sub>3</sub>, and  
R<sub>2</sub> is CH<sub>3</sub> or —CH<sub>2</sub>CH<sub>3</sub>,  
the ketone having its maximum absorption in the range of 350 to 550 nm.

**4,162,164**  
CYANINE DYE BASED HIGH SATURATION  
SYMPATHETIC INK HAVING TIME DELAYED  
DISAPPEARANCE

An-Chung R. Lin, Fairport, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 13, 1977, Ser. No. 796,622

Int. Cl.<sup>2</sup> C09D 11/00, 11/02

U.S. Cl. 106—21

5 Claims

1. A high saturation disappearing sympathetic ink having a time delayed disappearance consisting essentially of:

a solvent, and,  
a reactive additive consisting of 1.7 to 8% by weight of the ink, the reactive additive consisting essentially of a pH acid base indicator cyanine dye consisting of 9% to 42% by weight of said reactive additive and the remaining portion of the reactive additive consisting of an effective solvent soluble acid chosen from a group consisting of citric acid, tartaric acid, oxalic acid, acetic acid, formic acid, phosphorous acid, phosphoric acid, zinc chloride, aluminum chloride, stannic chloride and mixtures thereof; said solvent consisting essentially of the remainder of the ink by weight, the solvent being chosen from the group in which said acids are soluble and consisting of methoxy triethylene glycol, triethylene glycol, diethylene glycol, tetraethylene glycol, ethylene glycol, phenol ethylene glycol ether, butoxy diethylene glycol, butoxy triethylene glycol, ethylene glycol monobutyl ether and diethylene glycol monobutyl ether and butyl alcohol and benzyl alcohol and methyl alcohol and mixtures thereof, and wherein said ink remains 50% visible 5 minutes after application of the ink to paper and disappears to a less than 20% visibility eight hours from printing and on exposure to air.

**4,162,165**  
PROCESS FOR THE PRODUCTION OF  
MICROCAPSULAR COATING COMPOSITIONS  
CONTAINING PIGMENT PARTICLES AND  
COMPOSITIONS PRODUCED THEREBY

Gerhart Schwab, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 16, 1977, Ser. No. 807,250

Int. Cl.<sup>2</sup> C09D 11/00

U.S. Cl. 106—21

13 Claims

1. A process for the production of hot melt coating compositions containing microcapsules and inorganic pigment particles comprising:

- (a) preparing an aqueous dispersion of microcapsules;
- (b) adding inorganic pigment particles to said aqueous dispersion of said microcapsules with mixing, said inorganic pigment particles being added in an amount from about 0.1% to about 20% by weight based on the weight of said microcapsules;



- (c) spraying said dispersion of said microcapsules and said inorganic pigment particles into a heated atmosphere, thereby drying said dispersion and producing a free-flowing powder of said microcapsules, said inorganic pigment particles being substantially deposited on and adhered to said microcapsules; and
- (d) dispersing said free-flowing powder of said microcapsules having said inorganic pigment particles deposited thereon in a liquid hot melt suspending medium.

4,162,166

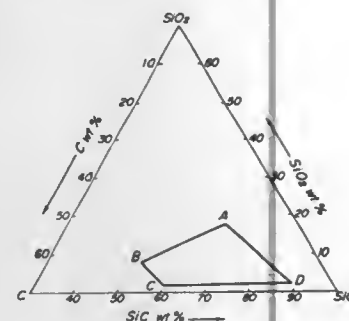
**POROUS, LIGHTWEIGHT, PARTICULATE AGGREGATES AND PROCESS OF MANUFACTURE**  
Jose Walls-Muyelo, Dakota 222-100, Mexico, Mexico (18)  
Continuation of Ser. No. 718,276, Aug. 27, 1976, abandoned.  
This application May 1, 1978, Ser. No. 901,873  
Claims priority, application Mexico, Aug. 27, 1975, 160361  
Int. Cl.<sup>2</sup> C04B 31/02

U.S. Cl. 106—40 R 18 Claims

1. A porous lightweight particulate aggregate comprising expanded and vitrified low alkalinity particles having a density of not more than about 60 g/dm<sup>3</sup>, a compression strength of from about 195 to about 275 Kg/cm<sup>2</sup>, a temperature resistance without undue fusion or deformation up to about 1250° C. and an expansion ratio of up to about 15 times the original volume of said particles, said expanded and vitrified low alkalinity particles having been obtained by heating and firing dried particles of the composition comprising an alkali metal silicate having an M<sub>2</sub>O/SiO<sub>2</sub> ratio of from about 1:2 to about 1:4 wherein M is an alkali metal, from about 0.1 to about 50% by weight of said alkali metal silicate of silica, from about 0.1 to about 200% by weight of said alkali metal silicate of an alkaline earth metal silicate, and from about 0.1 to about 30% by weight of said alkali metal silicate of boric acid which upon firing produces a silicate-tetraborate glass.

4,162,167

**PROCESS AND AN APPARATUS FOR PRODUCING SILICON CARBIDE CONSISTING MAINLY OF BETA-TYPE CRYSTAL**  
Ryo Enomoto, Ohgaki; Mitihito Yoshioka, Yoro, and Takao Yokoyama, Ohgaki, all of Japan, assignors to Ibigawa Electric Industry Co., Ltd., Gifu, Japan  
Filed May 16, 1977, Ser. No. 797,609  
Claims priority, application Japan, May 24, 1976, 51-60501; May 26, 1976, 51-61432  
Int. Cl.<sup>2</sup> C04B 35/56; C01B 31/36  
U.S. Cl. 106—44 6 Claims

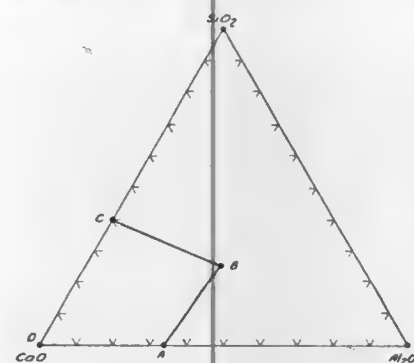


1. A process for producing silicon carbide consisting mainly of  $\beta$ -type crystal, comprising preparing a starting material by blending silica and carbon in a mole ratio of C/SiO<sub>2</sub> of 3.2-5.0; charging the starting material into a top portion of a vertical-type reaction vessel having a preheating zone, a heating zone and a cooling zone in this order, said heating zone having a filling width 1 of from 0.10 to 0.35 m; descending the charged starting material by gravity through the preheating zone to the heating zone, the descending rate U in m/hr of said charged starting material at the inlet of said heating zone being

$\exp(-7.16 \pm 0.39) \leq U \leq \exp(-4.63 \pm 1.72)$ ; heating the starting material in the heating zone at a temperature of 1,600°-2,000° C. by electrically indirect heating in a horizontal direction to effect formation of silicon carbide; cooling the resulting reaction product in the cooling zone under a non-oxidizing atmosphere; and then recovering the cooled product from the bottom portion of the reaction vessel to obtain a product having a composition ratio by weight of silicon carbide, silica and free carbon which lies within the area represented by the area ABCD shown in FIG. 1 of the accompanying drawings.

4,162,168

**REFRACTORY MATERIAL**  
Russell D. Smith, Midland, and R. James Bushong, Gladwin, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.  
Filed Dec. 3, 1976, Ser. No. 747,278  
Int. Cl.<sup>2</sup> C04B 35/04  
U.S. Cl. 106—58 9 Claims



1. A refractory grain material consisting essentially of at least about 97 percent by weight MgO grains, from about 1 to about 3 percent by weight of a combination of CaO, SiO<sub>2</sub>, and Al<sub>2</sub>O<sub>3</sub>, and up to about 1 percent by weight of at least one oxide selected from the group consisting of Fe<sub>2</sub>O<sub>3</sub> and B<sub>2</sub>O<sub>3</sub>, wherein the relative amounts of CaO, SiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> are controlled so that a solid ternary compound of CaO-SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> is present between the MgO grains, said compound further characterized as being within the area bounded by points A-B-C-D in the Figure, which points A-B-C-D represent the following composition:

Point	% CaO	% SiO <sub>2</sub>	% Al <sub>2</sub> O <sub>3</sub>
A	67	0	33
B	40	25	35
C	60	40	0
D	100	0	0

4,162,169

**ALKALI-METAL SILICATE BINDERS AND METHODS OF MANUFACTURE**  
John B. Schutt, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.  
Filed Dec. 21, 1977, Ser. No. 862,880  
Int. Cl.<sup>2</sup> C09D 1/02, 1/04  
U.S. Cl. 106—74 21 Claims

1. An inorganic alkali-metal silicate binder consisting essentially of an alkali-metal silicate, silicone and water in the form of a hydrogel sol.

4,162,170

**METHOD OF OBTAINING GRANULATED AND DEFLUORATED PHOSPHOGYPSUM**  
Ivan N. Grancharov, Fanka D. Tudjarova, Yovka P. Bakalova; Yoncho G. Pelovski; Nikola B. Videnov, and Ivan P. Dombalov, all of Sofia, Bulgaria, assignors to Vish Chimiko-Tekhnologicheski Institute, Sofia, Bulgaria  
Continuation of Ser. No. 810,985, Jun. 29, 1977, abandoned.  
This application Aug. 28, 1978, Ser. No. 937,091  
Int. Cl.<sup>2</sup> C04B 11/00

U.S. Cl. 106—109 5 Claims

1. A method for the production of granulated and defluorated phosphogypsum for thermal processing which comprises the steps of:

- preliminarily drying phosphogypsum, from phosphoric acid manufacture, to a residual moisture content of from 0.5 to 10 percent;
- mixing said preliminarily dried phosphogypsum with sulfuric acid of concentration range 55 to 98%, and granulation-binding additives, in solution, said sulfuric acid being added in amounts of from 0.5 to 15 weight parts and said binding additives being added in amounts of from 0.01 to 6 weight parts per 100 parts of said phosphogypsum, said binding additives being selected from the group consisting of carbamide, ammonium nitrate, carboxymethyl-cellulose, calcium nitrate, polyethylene oxide and the distillation fluids from soda production;
- granulating said mixture; and
- then heating the granules to a temperature in the range of 170° C. to 700° C. to drive off fluorine-containing gases and to strengthen said granules for subsequent thermal processing in fluidized beds.

4,162,171

**VARNISH COMPOSITION**  
To S. Tse, and Pul Y. Tse, both of 1244 Innes Ave., Los Angeles, Calif. 90026  
Filed Dec. 19, 1977, Ser. No. 862,153  
Int. Cl.<sup>2</sup> C08L 93/00

U.S. Cl. 106—226 7 Claims

1. A varnish composition which comprises tung oil, pine tar, turpentine oil, tin and lead oxide, the components of said composition being present in an amount ranging from about 35 to about 50% tung oil, about 1 to about 5% pine tar, about 35 to about 50% turpentine oil, about 5 to about 13% tin, and about 0.5 to about 5% lead oxide, by weight.

4,162,172

**METHOD OF REMOVING DENTAL CEMENT FROM SURFACES**  
James J. Longo, Wilmington, Del., assignor to DHP Corporation, Wilmington, Del.  
Continuation-in-part of Ser. No. 766,701, Feb. 8, 1977, Pat. No. 4,129,456. This application Feb. 6, 1978, Ser. No. 875,306  
Int. Cl.<sup>2</sup> B08B 3/08, 3/12

U.S. Cl. 134—1 7 Claims

1. In a method of removing a hardened zinc oxyphosphate dental cement from a surface, the improvement comprising forming a substantially aqueous or alcoholic solution of citric acid having a concentration of at least 1 gm citric acid per 10 ml of solution, and applying for at least about 3 minutes an amount of said solution to said surface effective to remove said cement.

4,162,173

**MOLTEN SALT LEACH FOR REMOVAL OF INORGANIC CORES FROM DIRECTIONALLY SOLIDIFIED EUTECTIC ALLOY STRUCTURES**  
Ronald H. Arendt; Marcus P. Borom; Irvin C. Huseby, all of Schenectady, and Frederic J. Klag, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
Division of Ser. No. 775,749, Mar. 9, 1977, Pat. No. 4,082,566.  
This application Sep. 19, 1977, Ser. No. 834,100  
Int. Cl.<sup>2</sup> B08B 3/08, 3/10

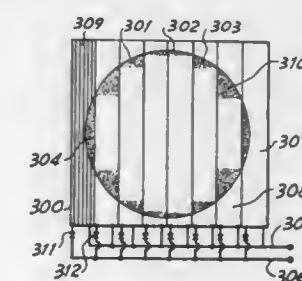
U.S. Cl. 134—2 8 Claims

1. A method for removing ceramic cores from castings of superalloy materials including the process steps of

- preparing a molten leachant salt bath of a mixture of 67 mole percent sodium fluoride and 33 mole percent calcium fluoride leachant salts;
- covering the molten leachant salt bath with a controlled atmosphere which has an oxygen content of less than 50 ppm;
- immersing the casting and the ceramic core in the molten leachant salt bath;
- leaching the core material from the casting in the molten leachant salt bath, and
- rinsing the casting to remove leachant products from the casting by immersing the casting in a molten salt rinse both having a composition of 9 mole percent NaCl, 36 mole percent KCl, and 55 mole percent LiCl.

4,162,174

**SOLAR CELL ARRAY**  
Roy Kaplow, Newton, and Robert I. Frank, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.  
Filed Mar. 10, 1978, Ser. No. 885,217  
Int. Cl.<sup>2</sup> H01L 31/04  
U.S. Cl. 136—89 PC 13 Claims



1. A semiconductor solar-cell array in combination with means providing a confined concentration of solar radiation on the radiation exposure surfaces of said solar cell array, wherein the area of confined concentration may shift to the extent that tracking mechanism may fail to keep the cell array in continuous precise alignment with the sun, said array comprising a plurality of adjacent solar-cell segments having said radiation-exposure surfaces in a common geometrical surface positioned in said area of confined concentration, the collective overall area of said exposure surfaces being greater than said area of confined concentration, each of said segments comprising a plurality of like series-connected solar-cell units, each of which cell units produces an electrical output upon solar-radiation exposure, and electrical connecting means establishing parallel connection of said segments.

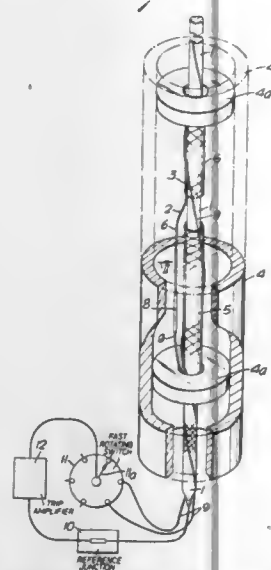
11. A semiconductor solar-cell array in accordance with claim 1, wherein solar-cell segments are generally rectangular and arranged in parallel and disposed into solar-cell groups, each cell group being positioned adjacent to another cell group, all cell groups being mounted on a common support structure, and the parallel solar-cell segments within one cell group being generally perpendicular to the parallel solar-cell segments of an adjacent cell group.

**4,162,175**  
**TEMPERATURE SENSORS**  
 Kenneth J. Salt, Dorchester, and Colin A. Wintle, Wareham, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 16, 1977, Ser. No. 825,048  
 Claims priority, application United Kingdom, Aug. 18, 1976, 34486/76

Int. Cl.<sup>2</sup> H01L 35/02  
 U.S. Cl. 136—233

7 Claims



1. A temperature sensor assembly for measuring the temperature at axially spaced positions along the bore of a tube including at least one stringer for insertion into the tube bore the stringer comprising a central conductor of homogeneous metal, the conductor having an insulated exterior with axially spaced uninsulation regions, metal foil strips attached to said regions, thermojunctions formed on unattached portions of said strips, an electrical conductor leading from the free end of each strip, a reference thermojunction external to said tube, and scanning means connected to said electrical conductors for successively presenting the electrical outputs from said electrical conductors to measuring means for indicating the temperatures at axially spaced positions along said tube as represented by said outputs.

**4,162,176**  
**METHOD FOR FORMING FLOATING GATE SEMICONDUCTOR DEVICE BY SELECTIVE ION-IMPLANTATION**

Akihito Tsuda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

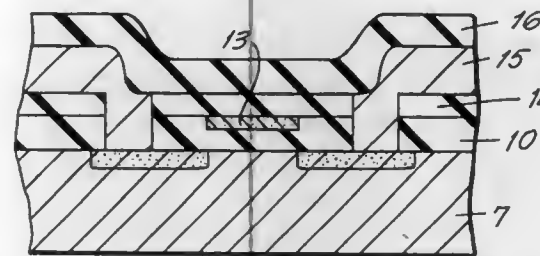
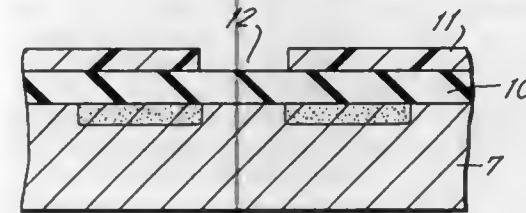
Filed Aug. 19, 1976, Ser. No. 715,767  
 Claims priority, application Japan, Aug. 22, 1975, 50-102425  
 Int. Cl.<sup>2</sup> H01L 21/265, 21/324; B01J 17/00

U.S. Cl. 148—1.5

15 Claims

1. A method for forming a floating gate semiconductor device having a substrate, source and drain regions formed in spaced relation on the surface of said substrate and an insulating layer on the surface of said substrate at least in the region between said source and drain regions, comprising the steps of providing a substrate of a first conductivity type, forming source and drain regions in spaced relation in said substrate by diffusing impurities of a second conductivity type opposite to said first conductivity type in the surface of said substrate; forming an oxide layer on the surface of said substrate; forming a photo-resist layer on the surface of said oxide before ion implantation, said photo-resist layer having an opening there-through exposing the surface of said oxide intermediate said source and drain regions of said substrate; and forming a float-

ing gate in the surface of said oxide layer in the region intermediate said source and drain by ion implantation without im-



planting ions in said substrate or the surface of said oxide layer covered by said photo-resist layer.

**4,162,177**  
**METHOD OF FORMING SOLAR CELL WITH DISCONTINUOUS JUNCTION**

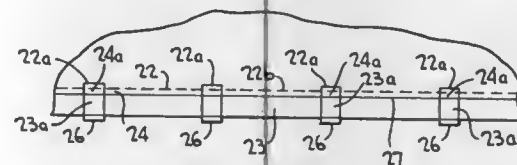
Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Division of Ser. No. 775,961, Mar. 28, 1977, Pat. No. 4,106,047.  
 This application Mar. 6, 1978, Ser. No. 883,972

Int. Cl.<sup>2</sup> H01L 27/14, 29/04, 31/04

U.S. Cl. 148—179

7 Claims



1. A method of forming a back junction in a silicon solar energy cell having a front surface adapted to receive light impinging thereon and an opposed back surface, comprising applying to the back surface of a silicon wafer a discontinuous coating of a metal capable of forming a back junction, and heating the wafer at a temperature sufficient to cause the discontinuous layer to be alloyed into and penetrate said back surface and form a discontinuous step junction at said surface so that when light impinges on the front surface of the wafer, the cell will generate electricity at a generally constant voltage over a substantial range of light intensities.

**4,162,178**  
**REACTIVE CATALYST FOR AMINO RESINS**  
 Andrew C. Markessini, Salonic, Greece, assignor to Tenkros A.G., Basel, Switzerland

Division of Ser. No. 839,248, Oct. 4, 1977. This application Apr. 6, 1978, Ser. No. 893,851

Claims priority, application Greece, Oct. 12, 1976, 10988/51908

Int. Cl.<sup>2</sup> B29J 5/00

U.S. Cl. 156—62.2

8 Claims

1. In a method of bonding water penetrable lignocellulosic particles with a catalytically polycondensed amino resin, the improvement which comprises curing the amino resin at a

temperature higher than room temperature and sufficient to effect curing in the presence of 1 to 30% by weight of an additional catalyst system, based on the weight of the amino resin and calculated on the basis of 100% solids content, comprising an aqueous solution of a mixture of organic and inorganic components, the organic component being formaldehyde and urea or a nonresinous condensation product of formaldehyde and urea, and the inorganic component being a water soluble alkali metal halide.

2. The improvement defined in claim 1, wherein the additional catalyst system contains the organic and inorganic component in a ratio of 0.1 to 1.5 parts by weight of organic components per 1.0 part by weight of inorganic component, the amount of water depending upon the solubility of the organic and inorganic components and the solids content required for the production system used.

4. The improvement defined in claim 1, wherein the catalyst system is added to the amino resin, together with a catalytically effective amount of ammonium chloride so that the production rates are increased by up to 30 percent while simultaneously allowing up to 30 percent by weight less resin solids to be used without imparting any loss in bonding strength.

**4,162,179**  
**REFRACTORY ARTICLE AND METHOD OF MAKING THE SAME**

Patsie C. Campana, 2614 Sherwood Dr., Lorain, Ohio 44053  
 Division of Ser. No. 748,451, Dec. 8, 1976, Pat. No. 4,135,939.

This application Oct. 13, 1978, Ser. No. 951,128

Int. Cl.<sup>2</sup> C04B 37/00

U.S. Cl. 156—89

4 Claims

1. A method of forming a monolithic lining in a receptacle for receiving molten metal comprising:

providing a lining including a plurality of refractory articles composed of from about 50 to about 70 weight percent fine silica sand particles, said fine silica sand particles having an average particle size ranging from about 0.06 to about 0.10 mm.; from about 10 to about 30 weight percent coarse silica sand particles, said coarse silica sand particles having a maximum particle size of about 3.0 mm.; and from about 15 to about 30 weight percent of an alumina containing clay binder, with the total content of alumina in said unfired article ranging from about 6.0 to about 9.0 weight percent; and

heating said lining to a temperature sufficient to cause at least the surface of said refractory articles to become plastic so as to bond juxtaposition refractory articles together.

**4,162,180**  
**PRODUCING EMBOSSED WALL- OR CEILING-COVERING OF CELLULOSIC PULP AND TWO DIFFERENT DISCRETE THERMOPLASTIC MATERIALS**  
 Arthur Burton, Tameside, and Roy Conway, Dukinfield, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 14, 1977, Ser. No. 777,425

Claims priority, application United Kingdom, Mar. 30, 1976, 12736/76

Int. Cl.<sup>2</sup> B31F 1/08; B32B 31/00; D02G 3/00

U.S. Cl. 156—220

4 Claims

1. A method of producing an embossed wall- or ceiling-covering comprising the steps of:

providing a sheet containing from 10 to 90% by weight of cellulosic pulp fibres and from 10 to 90% by weight of discontinuous fibres of two different discrete synthetic thermoplastic polymeric materials, the fibres of the two different materials being independent,

heating the sheet to a temperature intermediate the temperatures of plasticity of the two different thermoplastic materials so that the fibres of one of the thermoplastic materials

are rendered plastic and fuse together, the other thermoplastic material retaining its fibrous structure, and embossing the sheet while still hot from said heating step.

**4,162,181**  
**LABELING STATION OF A MACHINE FOR LABELING OBJECTS, ESPECIALLY BOTTLES**

Rudolf Zadow, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

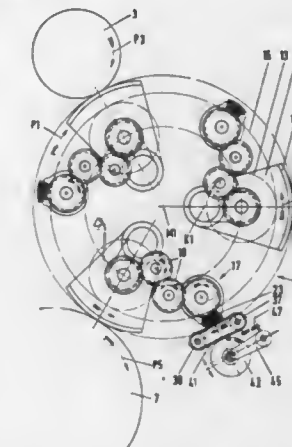
Filed Jan. 11, 1978, Ser. No. 868,557

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701808

Int. Cl.<sup>2</sup> B65C 9/08; B41M 1/00

U.S. Cl. 156—384

9 Claims



1. A labeling station in a machine of the type for labeling objects, especially bottles, and having a plurality of successively disposed stations, comprising a gluing means, a labeling magazine station having an upper portion for holding flat labels and a label transfer station, said labeling station comprising: at least one pickup element for labels having an outwardly curved receiving surface, a revolving carrier, means rotatably mounting each pickup element on the carrier and between the pickup surface and the center of curvature, means driving each pickup element such that upon moving past the stations upon each revolution of the carrier, its receiving surface rolls against the upper flat label of the label magazine station, marking means associated with each pickup element and having a field for at least one marking type, means rotatably and pivotally mounting each marking means on the carrier and for driving same synchronously with the associated pickup element wherein the pivot point thereof is diametrically opposite the type field, the radius of curvature of the type field and the eccentricity of the mounting of the pivot point of the marking means is coordinated with the circulation path of the area to be printed on the pickup element to effect the rolling of the type field upon the receiving surface of the pickup element.

**4,162,182**  
**LABELING MACHINE FOR APPLYING LABELS TO POLYGONAL CONTAINERS**

John G. Wesley, Berwyn, Ill., assignor to Labellette Company, Forest Park, Ill.

Continuation of Ser. No. 682,641, May 3, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,442

Int. Cl.<sup>2</sup> B65C 3/12

U.S. Cl. 156—487

2 Claims

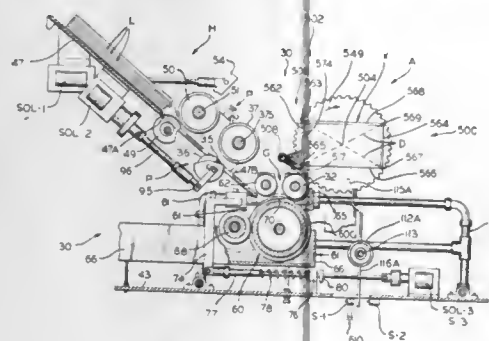
1. In a labeling machine for applying labels to containers of quadrilateral transverse cross-sectional configuration and defining external side walls forming external corners extending longitudinally thereof along the sides of the container, said machine including a label supply hopper, a glue applying station, and a labeling station including means for supporting and rotating the container to be labeled about a horizontal axis



at the labeling station with the container longitudinal axis coincident with said horizontal axis, and means for feeding labels longitudinally thereof along a predetermined feed path from the hopper through the glue applying station to a label applying relation position with the container at the labeling station, the improvement wherein:

said means for supporting and rotating the container comprises:

- a pair of spaced apart holder members journaled for rotation about said axes,
- means for holding said holder members against movement laterally of said axes,
- said holder members including means for mounting one of the containers therebetween by engaging the ends thereof for rotating same about said axes,
- means for synchronously rotating said holder members about said axes to rotate the container held thereby about said axes whereby the container corners rotate in a circular path that is concentric with said axes,
- said glue applying station including means for applying glue to the underside of the label when received from said label supply station,
- and said feeding means including a rotatable label feed roller paralleling said axes and journaled relative thereto to dispose the periphery of said feed roller in close adjacency to but spaced from said container corner circular path, said feed roller also being disposed below the level of said axes and in overlying relation to said feed path,
- a label feed guide mounted below said feed roller and includ-



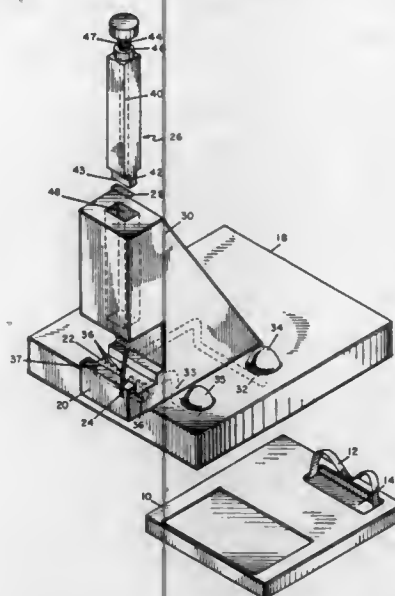
ing guide surfacing concentric with said feed roller periphery and disposed to direct the leading end of a label to be applied to the container to the label applying position, means for rotating said feed roller oppositely of the direction of rotation of said holder members at a speed whereby said feed roller periphery has a surface speed approximating the speed of the container corners along said circular path, and including a label wiping device mounted between said container supporting means and the hopper above and adjacent to said feed roller and comprising:

- a brush member mounted to parallel said axes and including a projecting brush flap,
- said flap being proportioned and positioned for wiping engagement with the side walls of the container mounted by said holder members, adjacent the label applying position, when the container is supported by said supporting means,
- means for maintaining said brush member flap in biased relation against the container side walls when said holder members are rotated,
- said rotating means rotating said holder members in the direction that moves the container corners consecutively past said feed roller and said brush member in that order, whereby, when a container to be labeled is rotated by said holder members and a label to be applied to the container is moved to said label applying relation position, the label is wiped on the container about said side walls and corners thereof by the wiping engagement of the brush member flap with the container,
- and means for oscillating said brush member sidewise of said flap during rotation of said holder members, while said

flap is maintained in engagement with the container, when the leading end of the label is being applied to the container engages the container, whereby the label leading end is subjected to an oscillating brushing action of said flap thereagainst and against the container.

4,162,183  
MAGNETIC TAPE SPLICER  
Allen C. Estes, Box 357B, Sebago Lake, Me. 04075  
Filed Feb. 6, 1978, Ser. No. 875,324  
Int. Cl.<sup>2</sup> B29C 27/00; G03D 15/04  
U.S. Cl. 156—505

1 Claim



1. A device for splicing cartridge-held magnetic tape utilizing splicing tape segments and wherein said magnetic tape is accessible through an opening in said cartridge, comprising:

- a splicing block adapted to be of a width less than the width of the access opening of said cartridge to said magnetic tape;
- a tape guideway disposed in said splicing block having a bottom and sides;
- a cutter guide slot defined in said splicing block within the sides of said tape guideway;
- a first set of air ports defined in said tape guideway's bottom positioned to one side of said cutter guide slot;
- a second set of air ports defined in said tape guideway's bottom positioned to the opposite side of the guide slot relative to said first set of air ports;
- a first vacuum means adapted to create a suction through said first set of air ports;
- a second vacuum means adapted to create a suction through said second set of air ports independently of said first vacuum means;
- a splicing tape segment holder having a base with at least one air hole defined therein;
- a third vacuum means adapted to create a suction through said air hole in order to hold a splicing tape segment to said base to join magnetic recording tape ends when said splicing tape segment holder when holding a splicing tape segment is maneuvered into a position so that said splicing tape segment contacts the magnetic tape ends to be joined; and
- a base member having a top, a front side, and downwardly projecting a rear side with said splicing block affixed at said front side disposed above the area for positioning of the magnetic tape cartridge so that the magnetic tape, after being placed in said tape guideway, is not laterally displaced from its vertical extension out of said cartridge, said base member further having defined therein a magnetic tape cartridge receipt aperture adapted to receive a

magnetic tape cartridge in a position so that its magnetic tape can be placed in said tape guideway when the rear of said magnetic tape cartridge makes contact with and is prevented from further rearward movement by said downwardly projecting rear side so as to cause the desired alignment of said magnetic tape beneath said tape guideway.

4,162,184  
PRODUCING LAYERED PENTA-ULTRAPHOSPHATE MONOCRYSTALS

Wolfgang Kruehler, Unterhaching, and Rolf Plaetner, Otto-brunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Aug. 4, 1977, Ser. No. 821,782  
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639221

Int. Cl.<sup>2</sup> B01J 17/06

U.S. Cl. 156—621

11 Claims

1. A process for the producing a monocrystalline penta ultraphosphate layer on a monocrystalline penta ultraphosphate substrate comprising the steps of

(A) mixing a starting material consisting essentially of neodymium oxide and yttrium oxide with phosphoric acid at the rate of at least about 0.2 grams of said starting material for each 10 grams of said phosphoric acid, the mol ratio of neodymium oxide to yttrium oxide in any given said starting material being defined by the relationship:

$$\frac{(1-x) \text{ Mol Nd}_2\text{O}_3}{x \text{ Mol Y}_2\text{O}_3}$$

where x is a number between 0 and 1,

(B) first heating the resulting mixture to a temperature ranging from about 160° to 200° C. for a time sufficient to substantially completely dehydrate said phosphoric acid,

(C) secondly heating the resulting so heated mixture to a temperature ranging from about 360° to 430° C. for a time sufficient to substantially completely dissolve all compounds present of neodymium and yttrium in said phosphoric acid,

(D) thirdly heating the resulting solution mixture to a temperature ranging from about 450° to 550° C. for a time of from about 10 to 15 hours,

(E) introducing into the so heated solution mixture the (0,0,1) face of a preformed monocrystalline substrate having the chemical structure:



where z is a number between 0 and 1,

(F) maintaining the resulting mixture with said substrate so introduced thereto at said temperature ranging from about 450° to 550° C. for a time sufficient to epitaxially grow on said one substrate face a monocrystalline layer which consists of a compound having the chemical structure:



where x is a number between 0 and 1, and

(G) separating a product comprising said substrate and said layer from residual phosphoric acid.

4,162,185  
UTILIZING SATURATED AND UNSATURATED HALOCARBON GASES IN PLASMA ETCHING TO INCREASE ETCH OF SiO<sub>2</sub> RELATIVE TO Si

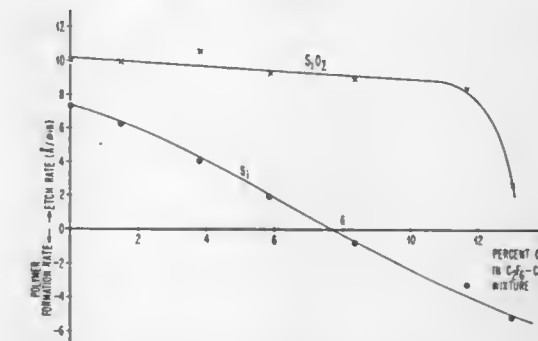
John W. Coburn, and Harold F. Winters, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1978, Ser. No. 888,882

Int. Cl.<sup>2</sup> C23F 1/00

U.S. Cl. 156—643

9 Claims



1. A method of adjusting the SiO<sub>2</sub>/Si etch rate ratio in an article having both SiO<sub>2</sub> and Si in a plasma etching system comprising the steps of

- introducing a controllable flow rate of a saturated halocarbon gas into a plasma etching system,
- introducing a controllable flow rate of an unsaturated halocarbon gas into said plasma etching system to mix with the saturated hydrocarbon gas and form a plasma, and
- adjusting the relative flow rates of the saturated halocarbon and the unsaturated halocarbon gases to control the SiO<sub>2</sub>/Si etch rate ratio.

4,162,186  
ALKALINE SURFACTANT SYSTEM FOR DE-INKING PRINTED FIBROUS MATERIAL

Donald C. Wood, Des Plaines, and Robert L. McLaughlin, Wilmette, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 750,850, Dec. 15, 1976, abandoned. This application Feb. 23, 1978, Ser. No. 880,660  
Int. Cl.<sup>2</sup> D21C 5/02

U.S. Cl. 162—5

19 Claims

1. A process for de-inking printed fibrous material which comprises the steps of:

(a) adding said printed fibrous material in substantially dry form to an aqueous, surfactant-containing de-inking solution in an amount to form a slurry containing no more than about 10 weight percent of fibrous material solids, the aforesaid surfactants constituting a mixture of at least one water-soluble nonionic surfactant and at least one oil-soluble nonionic surfactant present in said slurry in an amount of about 0.1 to about 5 weight percent, based on the weight of said fibrous material solids, the weight ratio of said water-soluble nonionic surfactant to said oil-soluble nonionic surfactant in said mixture being in a range of about 6:1 to about 3:1, said water-soluble nonionic surfactant being ethoxylated aliphatic alcohols containing from 9 to 15 carbon atoms and having an average of about 7 to about 15 ethyleneoxy units per mole of alcohol, and said oil-soluble nonionic surfactant being ethoxylated aliphatic alcohols containing from 9 to 15 carbon atoms and having an average of about 0.5 to about 3.5 ethyleneoxy units per mole of alcohol; and

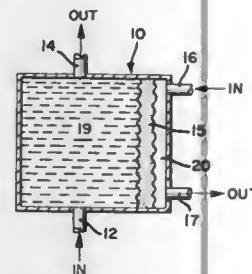
(b) agitating said slurry at a temperature in the range of about room temperature to about the boiling temperature of the solution to reduce said fibrous material substantially to individual fibers and to separate the ink present on the fibers therefrom.

**4,162,187**  
**PROCESS FOR PRODUCTION OF SODIUM THIOSULFATE AND SODIUM HYDROXIDE**  
 Glen C. Smith, and Frederick W. Sanders, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio  
 Continuation-in-part of Ser. No. 468,471, May 9, 1974, Pat. No. 4,024,229, which is a continuation-in-part of Ser. No. 87,504, Nov. 6, 1970, abandoned. This application May 12, 1977, Ser. No. 796,078

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.  
 Int. Cl.<sup>2</sup> D21C 11/04

U.S. Cl. 162—29

7 Claims



1. In a process for the oxidation of sodium sulfide or sodium hydrosulfide, the steps consisting essentially of: (1) providing a gaseous oxidant, an aqueous reductant containing sodium sulfide or sodium hydrosulfide, and particulate activated carbon having a particle size of between 9 millimicrons and one inch and having a surface area of from 3 square meters per gram to in excess of 950 square meters per gram (BET), and which has been partially encapsulated with 0.1-100% by weight of carbon of a polytetrafluoroethylene resin, said oxidant and reductant being capable of forming an interface when brought into contact with each other, said partially encapsulated carbon particles being relatively free from chemical attack by said oxidant, said reductant, and the reaction products, and (2) bringing said oxidant, reductant and partially encapsulated carbon particles into contact with each other, thereby effecting the oxidation of sodium sulfide or sodium hydrosulfide to produce a sodium thiosulfate and sodium hydroxide containing solution.

**4,162,188**  
**PROCESS FOR PRODUCING PULP**  
 Masato Nakamura, Yoshika Nomura, and Tamio Katori, all of Tokyo, Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan  
 Filed Aug. 30, 1977, Ser. No. 829,005  
 Claims priority, application Japan, May 18, 1977, 52/57275  
 Int. Cl.<sup>2</sup> D21C 3/02

U.S. Cl. 162—76

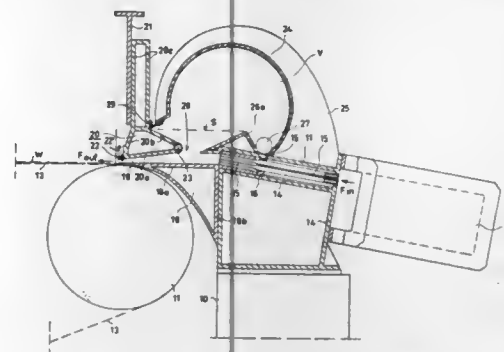
12 Claims

1. A process for the production of pulp comprising the step of cooking lignocellulosic materials in an alkaline or a sulfite-containing cooking liquor, in the presence of between 0.005 and 1% by weight of a compound selected from the group consisting of maleic acid, sodium maleate, potassium maleate, maleic anhydride, fumaric acid, sodium fumarate, potassium fumarate, mesaconic acid and sodium mesaconate to improve pulp quality and pulp cooking yield.

**4,162,189**  
**PAPER MACHINE HAVING A HEADBOX PROVIDED WITH AN AIR TANK**  
 Alvi Kirjavainen, Jyväskylä, Finland, assignor to Valmet Oy, Finland  
 Filed Apr. 7, 1978, Ser. No. 894,493  
 Claims priority, application Finland, Apr. 15, 1977, 771209  
 Int. Cl.<sup>2</sup> D21F 1/02

U.S. Cl. 162—337

12 Claims



1. In a paper machine, a headbox comprising slice means through which a pulp suspension discharges from the headbox, distribution header means for receiving the pulp suspension and distributing the same, turbulence passage means comprising a turbulence passage member having a plurality of parallel flow passages each being of relatively small cross section, the downstream ends of said passages communicating with said distribution header means and the upstream ends of said passages terminating in the vicinity of said slice means so that the pulp suspension is received from said distribution header means and travels through said parallel flow passages along a path of flow from the distribution header means toward said slice means, and air-tank means for containing air under pressure which acts on the flowing pulp suspension in the space defined between the upstream ends of said parallel flow passages and said slice means as the pulp suspension travels toward said slice means for attenuating pressure fluctuations and disturbances in the pulp suspension, said air-tank means being operatively connected with said slice means immediately adjacent thereto for acting on the pulp suspension flow in the immediate vicinity of said slice means.

**4,162,190**  
**PAPER MAKERS WET FELTS**  
 Gordon Ashworth, Burnley, England, assignor to Scapa-Porritt Limited, Blackburn, England  
 Continuation of Ser. No. 633,106, Nov. 18, 1975, abandoned, which is a continuation of Ser. No. 465,315, Apr. 29, 1974, abandoned. This application Aug. 8, 1977, Ser. No. 823,020  
 Int. Cl.<sup>2</sup> D21F 7/08, 7/12

U.S. Cl. 162—359

9 Claims

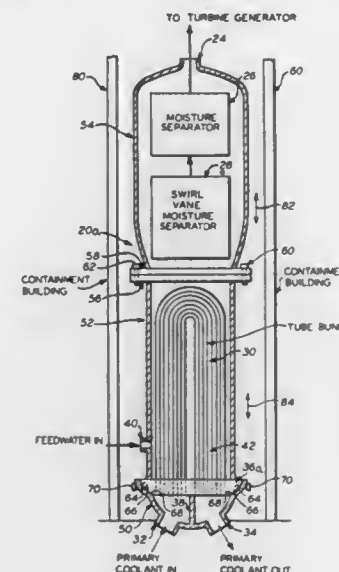
1. In a papermaking apparatus of the type having a movable endless belt conveying a wet web of paper between a pair of pressure rollers for driving water out of said web and then passing said web to a drying zone for removing additional water from said web, the improvement wherein said belt comprises:

a surface layer formed from water absorbent non-woven fibrous material, and a backing layer coarser than the surface layer and formed from water absorbent wads of separate fibers, said surface layer having hydrophobic properties in that said surface layer has a critical surface tension less than 33 dynes/cm, and said surface layer being held in intimate contact with said backing layer with fibers of said surface layer penetrating and needled into said backing layer to integrate said layers so that water forced into said surface layer by said pressure rollers is readily taken up by both said layers to be retained thereby.

**4,162,191**  
**MODULAR STEAM GENERATOR FOR USE IN NUCLEAR POWER PLANTS**  
 Alexander Cella, Robinwood Dr., Great Notch, N.J.  
 Filed Apr. 29, 1977, Ser. No. 792,195  
 Int. Cl.<sup>2</sup> G21C 19/28

U.S. Cl. 176—65

8 Claims



1. In a steam generator for use in a pressurized water nuclear power plant in which a turbine generator is driven by the steam output of said steam generator to provide electrical power therefrom, wherein said steam generator comprises a vertically extending hollow outer housing having an upper housing portion having a steam outlet therein communicable with the turbine generator for providing steam generated within said steam generator to said turbine generator and a moisture separator means within the interior thereof in communication with said steam outlet for drying the generated steam provided to said steam outlet, and with said lower housing portion having heat exchange fluid and feedwater inlets and a vertically extending tube bundle within the interior thereof in flow through communication with said heat exchange fluid inlet for enabling heat exchange fluid provided through said inlet therefor to flow through said tube bundle for providing said generated steam from feedwater provided through said inlet therefor, said tube bundle having a tube sheet at one end thereof for supporting said tube bundle with the tubes comprising said tube bundle extending through said tube sheet in said flow through communication with said heat exchange fluid inlet; the improvement comprising a base module, a tube bundle module removably mountable on said base module in sealing relationship therewith, and an uppermost dryer module removably mountable on said tube bundle module in sealing relationship therewith for providing a vertically assemblable modular structure for said steam generator, said vertically assemblable base module and tube bundle module comprising said lower housing portion, and said dryer module comprising said upper housing portion, said dryer module having said steam outlet at one end thereof and a closure flange at the other end thereof and having said moisture separator means within the interior thereof, said tube bundle module having a closure means at the upper end thereof and a closure flange at the lower end thereof and containing said tube bundle within the interior thereof with said tube sheet comprising said lower end closure flange, said dryer module closure flange and said tube bundle module upper closure means effectuating said sealing relationship between said tube bundle module and said dryer module, said base module uppermost portion comprising an outer shell having an arcuately tapered interior wall forming an arcuate lip portion with said base module having said

heat exchange fluid inlet therein, said tube bundle in said vertically assembled tube bundle module being in said flow through communication with said heat exchange fluid inlet, the exterior surface of said tube sheet closure flange being arcuately tapered complementary to said base module outer shell interior wall arcuately tapered portion and removably insertable therein in self-supporting bearing relationship against said lip portion for effectuating said sealing relationship between said tube bundle module and said base module essentially as a result of the associated weight of said vertically assembled dryer module and said tube bundle module bearing on said tube sheet closure flange and being supported on said base module while simultaneously facilitating closure by said tube sheet closure flange, whereby ready access to and removal of said tube bundle module in situ from said nuclear power plant steam generator is facilitated.

**4,162,192**  
**METHOD FOR PURIFICATION OF HBS ANTIGEN**  
 Kyosuke Mizuno, Atsushi Miyano, Yoshihito Ishihara, and Nobuya Ohtomo, all of Kumamoto, Japan, assignors to Juridical Foundation, Kumamoto, Japan  
 Filed Sep. 28, 1978, Ser. No. 946,733  
 Int. Cl.<sup>2</sup> A61K 39/12

U.S. Cl. 435—239

4 Claims

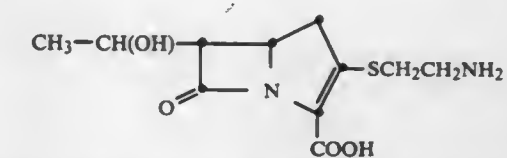
1. A method for purification of HBs antigen, which comprises passing an HBs antigen-containing solution prepared from blood plasma or serum through an anion exchanger and then passing the resulting effluent through a cation exchanger.

**4,162,193**  
**ENZYMATIC CLEAVAGE OF N-ACYL-THIENAMYCINS**  
 Jean S. Kahan, and Frederick M. Kahan, Rahway, N.J., assignors to Merck & Co., Inc., Rahway, N.J.  
 Filed Aug. 19, 1977, Ser. No. 825,883  
 Int. Cl.<sup>2</sup> C12D 13/06

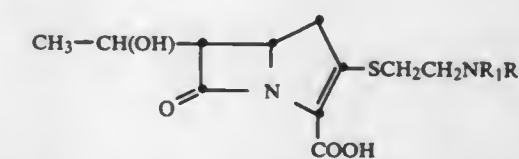
U.S. Cl. 43—121

5 Claims

1. A method for the preparation of thienamycin having the structure:



which comprises bringing into contact a compound having the formula:



wherein R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of hydrogen and acyl radical wherein R<sub>1</sub> and R<sub>2</sub> are not both hydrogen, with a penicillin amidohydrolase, which contact causes the removal of the acyl radical.



4,162,194

## KINETIC ASSAY FOR ACID PHOSPHATASE AND COMPOSITION THEREFORE

Kenneth J. Pierre; Ker-Kong Tung, and Henriette Nadj, all of Vista, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 758,518, Jan. 11, 1977, Pat. No. 4,097,336, which is a continuation-in-part of Ser. No. 657,976, Feb. 13, 1976, Pat. No. 4,036,697. This application Dec. 12, 1977, Ser. No. 859,411

Int. Cl.<sup>2</sup> G01N 31/14, 33/16

U.S. Cl. 435—15

19 Claims

1. A reagent system for an acid phosphatase assay comprising:

- (a) maltose;
- (b) an organic phosphate selected from a group consisting of  $\beta$ -glycerophosphate, phenol phosphate, p-nitrophenol phosphate, alpha-naphthyl phosphate, adenosine-3'-monophosphate, thymolphthalein monophosphate, and phenolphthalein monophosphate;
- (c) maltose phosphorylase;
- (d) a co-enzyme selected from a group consisting of beta-nicotinamide-adenine dinucleotide, beta-nicotinamide-adenine dinucleotide phosphate, and mixtures thereof;
- (e) glucose-6-phosphate dehydrogenase;
- (f) beta-D-phosphoglucomutase; wherein the above are present in the amount such that the acid phosphatase to be assayed is rate-limiting, and
- (g) a non-phosphate containing buffer having a pH from about 4.5 to about 6.

12. An acid phosphatase assay comprising:

- (a) performing simultaneous reactions at a pH of from about 4.5 to about 6 which comprise:

- (i) reacting an organic phosphate selected from a group consisting of beta-glycerophosphate, phenyl phosphate, p-nitrophenyl phosphate, alpha-naphthyl phosphate, adenosine-3'-monophosphate, thymolphthalein monophosphate, and phenolphthalein monophosphate in the presence of acid phosphatase to release inorganic phosphate;
  - (ii) reacting maltose with phosphate ions in the presence of maltose phosphorylase to form glucose and  $\beta$ -D-glucose-1-phosphate;
  - (iii) reacting  $\beta$ -D-glucose-1-phosphate in the presence of  $\beta$ -D-phosphoglucomutase to form glucose-6-phosphate; and
  - (iv) reacting glucose-6-phosphate in the presence of glucose-6-phosphate dehydrogenase and a co-enzyme selected from a group consisting of  $\beta$ -nicotinamide-adenine dinucleotide,  $\beta$ -nicotinamide-adenine dinucleotide phosphate, and mixtures thereof to form the reduced form of said co-enzyme and 6-phosphogluconate; and
- (b) measuring the rate of production of said reduced co-enzyme,

wherein the acid phosphatase being measured is rate-limiting and wherein a non-phosphate buffer is used to control said pH.

4,162,195

## BIOLOGICAL TESTING DEVICE AND METHOD OF MEASURING TOXICITY OF SEWAGE

Peter Solyom, Stockholm; Bengt Boman, Akersberga, and Håkan Björndal, Norsborg, all of Sweden, assignors to Aktiebolaget Källe-Regulatorer, Saffle, Sweden

Continuation-in-part of Ser. No. 564,552, Apr. 2, 1975, abandoned. This application Oct. 28, 1977, Ser. No. 846,454 Claims priority, application Sweden, Apr. 4, 1974, 7404556

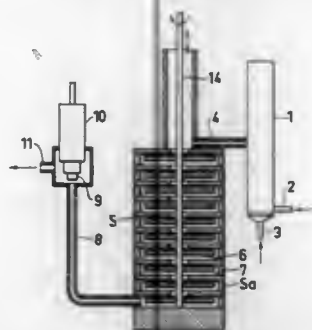
Int. Cl.<sup>2</sup> G01N 33/18

U.S. Cl. 43—310

10 Claims

1. A biological testing device for measuring the toxicity of a sewage sample, comprising an aerating means for dissolving oxygen into the sample to form an aerated sample, an enclosure adapted to be completely filled with and completely enclose said aerated sample and containing interspaced interfacing surfaces which are substantially parallel to each other and

adapted to support biological films of microorganisms completely submerged in the aerated sample, said surfaces being spaced from each other so as to cause said films to form a biological mass between said surfaces and said surfaces being movable relative to each other in directions causing said films



to abrade each other so as to maintain said mass at a thickness substantially fixed by the interspaced distance of the surfaces, means for completely filling said enclosure with said aerated sample, and means for measuring the oxygen content of said sample after a residence time in said enclosure.

4,162,196

## ADAPTOR COLLAR

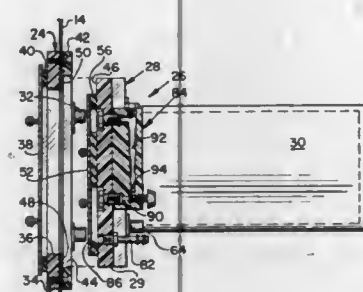
Max H. Folsom, Portland, Oreg., and Michael D. Dickman, Philadelphia, Pa., assignors to National Appliance Company, Portland, Oreg.

Filed Nov. 24, 1976, Ser. No. 744,611

Int. Cl.<sup>2</sup> C12K 1/10

U.S. Cl. 435—313

13 Claims



1. An adaptor collar which attaches to a receptacle to form a portable transport unit for transporting objects between remote locations and an airtight controlled atmosphere chamber and for maintaining objects in a controlled atmosphere during transporting comprising:

a main frame member having a clamping surface, a receptacle receiving surface adapted to detachably receive the mouth of a jar-like receptacle and a central passageway extending through said main frame member from said clamping surface to a position on said receptacle receiving surface where said passageway will register with the mouth of a receptacle received by said receptacle receiving surface;

door means, on said clamping surface, repeatedly alternately positionable between a closed position, wherein said central passageway is blocked, and an open position, wherein objects may be passed through said passageway; and inlet means adapted to admit a stream of gaseous medium into said passageway at a point between said door means and said receptacle receiving surface.

4,162,197

## FURFURAL REFINING UNIT CONTROL SYSTEM

Avilino Sequeira, Jr.; John D. Begnaud, and Frank L. Barger, all of Port Arthur, Tex., assignors to Texaco Inc., New York, N.Y.

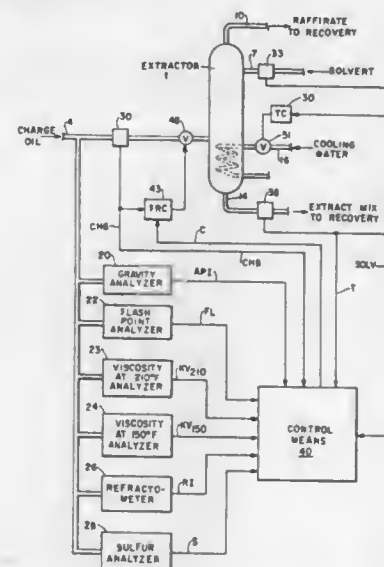
Continuation of Ser. No. 851,999, Nov. 16, 1977, abandoned.

This application Jun. 5, 1978, Ser. No. 912,909

Int. Cl.<sup>2</sup> C10G 21/00; C06G 7/58

U.S. Cl. 196—14.52

15 Claims



1. A control system for a furfural refining unit receiving charge oil and furfural solvent, one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control system, treats the received charge oil with the received furfural to yield means for sampling the charge oil and providing a signal API corresponding to the API gravity of the charge oil, flash point analyzer means for sampling the charge oil and providing a signal FL corresponding to the flash point temperature of the charge oil, viscosity analyzer means for sampling the charge oil and providing signals KV<sub>150</sub> and KV<sub>210</sub> corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, sulfur analyzer for sampling the charge oil and providing a signal S corresponding to the sulfur content of the charge oil, a refractometer samples the charge oil and provides a signal RI corresponding to the refractive index of the charge oil, flow rate sensing means for sensing the flow rates of the charge oil and of the furfural and providing signals CHG and SOLV, corresponding to the charge flow rate and the furfural flow rate, respectively, means for sensing the temperature of the extract-mix and providing a corresponding signal T, and control means connected to all of the analyzer means, the refractometer, and to all the sensing means for controlling the other flow rate of the charge oil and the furfural flow rates in accordance with signals API, FL, KV<sub>150</sub>, KV<sub>210</sub>, S, RI, CHG, T and SOLV.

4,162,198

SEPARATION OF A MIXTURE OF C<sub>4</sub>-HYDROCARBONS BY EXTRACTIVE DISTILLATION

Dieter Stockburger, Gruenstadt; Klaus Volkamer, Frankenthal; Detlef Bender, Wachenheim; Klaus-Juergen Schneider, Neustadt; Harald Schwentker, Weisenheim; Ulrich Wagner, Limburgerhof, and Hans-Martin Weitz, Bad Dürkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,469

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724365

Int. Cl.<sup>2</sup> B01D 3/40, 3/06; C07C 7/08

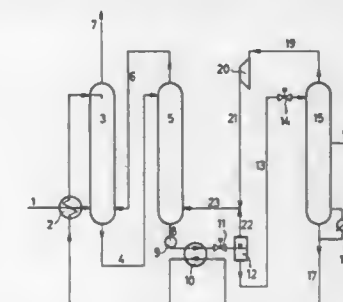
U.S. Cl. 203—23

6 Claims

1. A process for separating, by means of a selective solvent, a mixture of C<sub>4</sub>-hydrocarbons which contains some hydrocar-

bons which are more soluble in the selective solvent and some which are less soluble therein and recovering the selective solvent in a solvent recovery zone, which process comprises:

- a. separating the hydrocarbon mixture, in an extractive distillation zone, into a top product which contains the less soluble hydrocarbons and an extract bottoms stream which contains the more soluble hydrocarbons and the selective solvent,
- b. passing the extract bottoms stream taken off the extractive distillation zone to a higher pressure than the pressure in the extractive distillation zone,
- c. heating the extract bottoms stream which is under this higher pressure in a heat exchange zone, by indirect heat exchange with the selective solvent obtained as the bottom product from the solvent recovery zone,
- d. subjecting the heated extract bottoms stream to a flash evaporation and letting down the pressure of the heated extract bottoms stream, in a flash evaporation, to a pres-



sure which is at least equal to the pressure in the extractive distillation zone and is higher than the pressure in the solvent recovery zone,

- e. recycling the vapor component of the extract bottoms stream obtained from the flash evaporation to the extractive distillation zone while a liquid phase bottoms stream remaining after the flash evaporation is fed to the solvent recovery zone,
- f. separating the liquid phase bottoms stream obtained from the flash evaporation in the solvent recovery zone into a product containing the hydrocarbons and, as the bottom product, the selective solvent which has been freed from the hydrocarbons,
- g. recycling the resulting selective solvent via the heat exchange zone to the extractive distillation zone, and
- h. recycling at least a portion of the product the product which is obtained from the solvent recovery zone and contains the hydrocarbons to the extractive distillation zone, after increasing the pressure in a compression zone.

4,162,199

## REMOVING ORGANIC COMPONENTS FROM AN AQUEOUS CLEANING SOLUTION

Joseph J. English, Sycamore, Ill., assignor to Earl J. Kuntz, Chicago, Ill., a part interest

Filed May 18, 1976, Ser. No. 687,520

Int. Cl.<sup>2</sup> B01D 11/04, 3/00

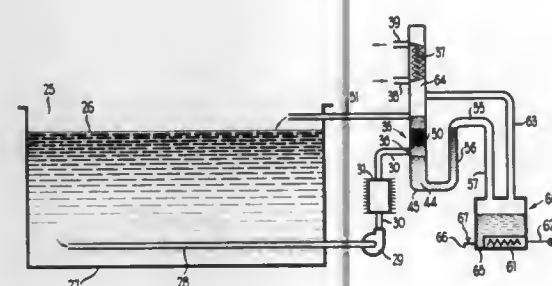
U.S. Cl. 203—39

8 Claims

1. A method for removing organic components from a cleaning solution in a container comprising:

- (A) at least intermittently removing portions of said solution from said container;
- (B) establishing intimate contact between said portions and an amount of solvent substantially immiscible with and of a different specific gravity than said solution, said solvent having a greater solubility for said organic components than the solubility said cleaning solution has for said organic components;
- (C) returning, after said intimate contact, said portions to said container;

(D) separating, after said intimate contact, organic components from said amount of solvent; and

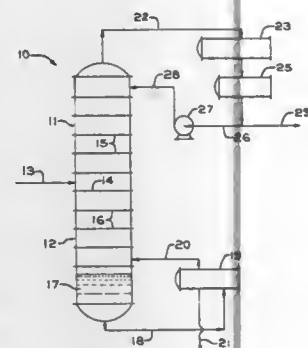


(E) after said separating of organic components from said amount of solvent, establishing contact between said amount of solvent and a portion of said cleaning solution.

**4,162,200**  
**PREPARATION OF PURE DIMETHYL CARBONATE**  
Walter Himmele, Walldorf; Karl Fischer, Worms; Gerd Kaibel, Lampertheim; Kurt Schneider, Bad Duerkheim, and Rudolf Irnich, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Filed Jan. 23, 1978, Ser. No. 871,547  
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706684

Int. Cl.<sup>2</sup> B01D 3/40; C07C 69/00  
U.S. Cl. 203—58 5 Claims  
1. A process for obtaining pure dimethyl carbonate from its solution in methanol, which comprises subjecting the solution to extractive distillation in a column over a temperature range of from at least 60° C. at the column top to not more than 250° C. at the column bottom, employing, as the extractant, an aprotic organic liquid which is substantially inert toward dimethyl carbonate, has an atmospheric boiling point above 100° C., is miscible with dimethyl carbonate in all proportions and has a dielectric constant  $\epsilon$  of from 4 to 90 and a dipole moment  $\mu$  of from 1.5 to 5 Debye.

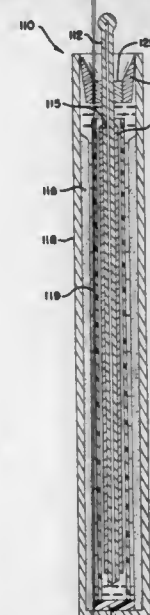
**4,162,201**  
**PURIFICATION AND RECOVERY OF ETHYLENE DICHLORIDE**  
Aurelio M. Crico, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.  
Filed Jul. 12, 1978, Ser. No. 923,856  
Int. Cl.<sup>2</sup> B01D 3/36; C07C 19/02  
U.S. Cl. 203—67 3 Claims



1. In a process for purifying liquid ethylene dichloride by distillation wherein the impurities comprising carbon tetrachloride and chloroform are separated from the ethylene dichloride as a light fraction, the improvement comprising refluxing the light fraction until the chloroform concentration in

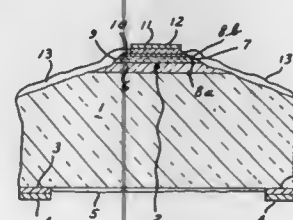
the reflux exceeds 51.5 mole percent, thereafter maintaining the chloroform concentration in the reflux at greater than 51.5 mole percent and recovering ethylene dichloride that is substantially free of chloroform and carbon tetrachloride.

**4,162,202**  
**MEANS FOR IMPROVING CONTACT BETWEEN LI AND THE ANODE CURRENT COLLECTOR**  
Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.  
Division of Ser. No. 664,782, Mar. 8, 1976, Pat. No. 4,080,489.  
This application Jan. 5, 1978, Ser. No. 867,068  
Int. Cl.<sup>2</sup> C25D 5/48, 7/06  
U.S. Cl. 204—2.1 8 Claims



1. A method for adhering an alkali metal to a metallic surface substantially inert to said alkali metal comprising the steps of coating said metallic surface with a layer of a metal which is capable of spontaneously alloying with said alkali metal at ambient temperatures; and applying said solid alkali metal on said coated metallic surface with sufficient pressure to enable said plated metal to alloy with said solid alkali metal.

**4,162,203**  
**METHOD OF MAKING A NARROW-BAND INVERTED HOMO-HETEROJUNCTION AVALANCHE PHOTODIODE**  
Richard C. Eden, Thousand Oaks, and Kenichi Nakano, N. Hollywood, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.  
Division of Ser. No. 808,496, Jun. 21, 1977, Pat. No. 4,110,778.  
This application Jun. 28, 1978, Ser. No. 920,741  
Int. Cl.<sup>2</sup> H01L 31/18  
U.S. Cl. 204—38 R 2 Claims

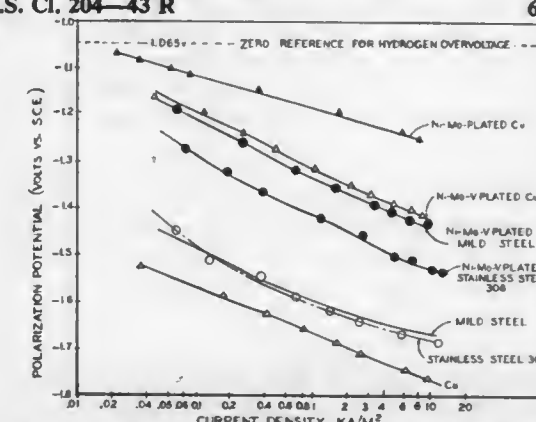


1. A method of fabricating an inverted avalanche photodi-

ode upon a selectively transparent, doped semiconductor substrate of a first conductivity type comprising the steps of:

- growing a buffer layer of selectively transparent, doped semiconductor material, having a lattice structure matching said substrate and being of said first conductivity type;
- growing an active layer of selectively absorbent, doped semiconductor material having a lattice structure matching the buffer layer upon the buffer layer, where the grown material is of the same conductivity type as the buffer layer;
- adding opposite conductivity type dopant during the growth of the active layer in sufficient quantities to reverse the conductivity type of any subsequent growth, at a time when the active layer growth is only a few microns in thickness;
- growing a contact layer of doped semiconductor material having a lattice structure matching the active layer upon the active layer, with the conductivity type matching that of the immediately preceding growth, to form a wafer consisting of a substrate with multiple layers deposited thereupon;
- forming an electrical contact upon the contact layer;
- masking and etching the side of the wafer upon which the layers are grown to form a mesa;
- forming an electrical contact upon the substrate side of the wafer;
- depositing passivation material, of a type which induces opposite conductivity type surface channels on the active layer grown in step b, upon all mesa surfaces etched during step e; and
- depositing an anti-reflective coating material upon the substrate side of the wafer in the area where incoming light energy enters the substrate.

**4,162,204**  
**PLATED METALLIC CATHODE**  
Han C. Kuo, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.  
Filed Apr. 3, 1978, Ser. No. 892,554  
Int. Cl.<sup>2</sup> C25D 3/56, 3/02, 17/10  
U.S. Cl. 204—43 R 6 Claims



1. Electrolytic method for producing a catalytically coated cathode for an electrolytic cell for the production of an alkali metal hydroxide and halogen gas from an alkali metal halide, said method comprising the steps of:

- forming an aqueous solution of alkali metal molybdate at a concentration of 1-40 grams/liter, nickel salts and a complexing agent selected from the group consisting of alkali metal citrates and alkali metal pyrophosphates with proportions adjusted so that the resultant coating contains more than 50 percent by weight of molybdenum,
- adjusting the pH between 9 and 11,
- locating a clean support formed of a metal selected from the group consisting of copper and copper base alloys at the cathode in an electrolytic bath of said aqueous solution, and
- passing current in said bath with a cathodic current density of 0.4 A/dm<sup>2</sup> to 50 A/dm<sup>2</sup> for a duration sufficient

to make said resultant coating from about 1  $\mu$ m to about 5  $\mu$ m thick.

**4,162,205**  
**METHOD OF ELECTROPLATING TIN AND ALKALINE ELECTROPLATING BATH THEREFOR**  
Harold P. Wilson, Huron, Ohio, and Walter C. Bradbury, Townsend, Ga., assignors to Vulcan Materials Company, Birmingham, Ala.  
Filed Oct. 19, 1978, Ser. No. 952,855  
Int. Cl.<sup>2</sup> C25D 3/60 22 Claims

U.S. Cl. 204—43 S 22 Claims  
12. An aqueous solution for plating a tin-containing alloy on a conductive substrate which solution comprises tin ions, alkali metal hydroxide, and a compound selected from the group consisting of at least one alkali metal bismuth salt of a linear polyhydroxymonocarboxylic acid having at least six carbon atoms, at least one alkali metal bismuthyl compound of glucono-delta-lactone, and mixtures thereof.

**4,162,206**  
**SEPARATION OF IODINE FROM MERCURY CONTAINING SCRUBBING SOLUTIONS**  
Leland L. Burger, Richland, and Randall D. Scheele, Kennewick, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Nov. 16, 1978, Ser. No. 961,174  
Int. Cl.<sup>2</sup> C25B 1/24 5 Claims

U.S. Cl. 204—94 5 Claims  
1. A process for recovering iodine from a nitric acid scrub solution containing mercuric nitrate and iodine comprising: adjusting the nitric acid concentration from about 1 to 16.0 M to prepare a feed solution; passing a current through the feed solution at a current density of from about 0.1 to 1.0 amps/cm<sup>2</sup> to react the iodine with the mercuric nitrate and form mercuric iodate which precipitates out; and recovering the precipitated mercuric iodate.

**4,162,207**  
**PROCESS FOR THE CONVERSION OF SULFUR DIOXIDE**  
Stephen K. Boyer, 339 Wayne Ave., Springfield, Pa. 19064, and Steven M. Slater, 1 Garden Ct., Cambridge, Mass. 02138  
Filed Sep. 5, 1978, Ser. No. 939,220  
Int. Cl.<sup>2</sup> B01J 1/10 12 Claims

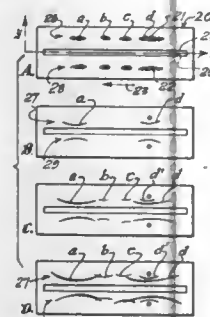
U.S. Cl. 204—157.1 R 12 Claims  
1. A process for converting sulfur dioxide to sulfur trioxide, comprising exposing an oxygen-photosensitizing substance to activating radiation in an aqueous medium in the presence of oxygen and sulfur dioxide.

**4,162,208**  
**QUANTITATIVE PROTEIN ANALYSIS BY IMMUNODIFFUSION**  
Frédéric J. Aladjem, and Padmasini K. Ayenger, both of 845 Las Palmas Rd., Pasadena, Calif. 91102  
Division of Ser. No. 546,351, Feb. 3, 1975, Pat. No. 4,097,149.  
This application Apr. 3, 1978, Ser. No. 892,953  
Int. Cl.<sup>2</sup> G01N 27/26, 33/16, 21/20 22 Claims

U.S. Cl. 204—180 G 22 Claims  
1. Method of obtaining a quantitative measure of the concentration of a protein in an antigen sample which has been subjected to immunoelectrophoresis with an antibody source containing an antibody specific to said protein to produce at least one precipitation zone, said method comprising optically imaging said zone on the image surface of a video camera tube, developing electrical position signals which represent two-dimensional position coordinates at a plurality of surface



positions corresponding to selected positions of the zone image, deriving electronically from said position signals an electrical parameter signal representing a zone parameter which varies in characteristic manner with said protein concentration,



and comparing the parameter signal with a set of reference parameter signals derived correspondingly from reference zones produced by equivalent immunoelectrophoresis of a plurality of reference antigen solutions containing respective known concentrations of said protein to provide a quantitative measure of the concentration of said protein in said sample.

4,162,209

## METHOD OF PRODUCING CHAFF

Denis V. Butler, Fareham, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jan. 13, 1978, Ser. No. 869,153

Claims priority, application United Kingdom, Jan. 18, 1977, 1874/77

Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—192 C

4 Claims

1. A method of producing chaff for deflecting electromagnetic radiation, which method comprises the steps of winding a plurality of glass carrier filaments into groups, sputtering a coating of aluminum on to said plurality of carrier filaments in the presence of an electrostatic field of sufficient magnitude to confine said aluminum to the vicinity of said filaments, and cutting the coated filaments into small pieces.

4,162,210

## METHOD FOR COVERING A FIRST LAYER OR LAYER SEQUENCE SITUATED ON A SUBSTRATE WITH AN ADDITIONAL SECOND LAYER BY A SPUTTERING-ON PROCESS

Hans-Raimund Deppe, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

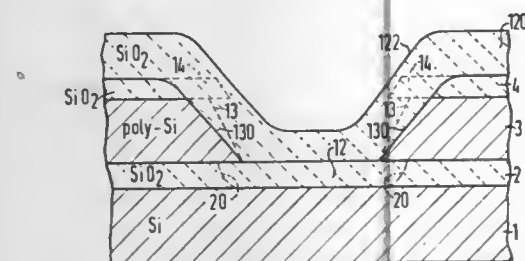
Filed Jan. 26, 1978, Ser. No. 872,433

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705611

Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—192 EC

11 Claims



1. A method for covering a first layer means comprising an

etched structure situated on a substrate and having under-etchings with a second layer by means of sputter depositing material from a high frequency sputtering source with a given target voltage, comprising the steps of: applying a grid potential to the substrate during said sputter depositing in order to fill the under-etchings, said grid potential amounting to between one-tenth and one-third of the target voltage applied to the sputtering source.

4,162,211

## COMBINATION ELECTRODE ASSEMBLY

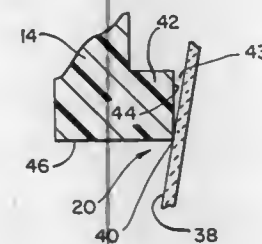
Paul Jerrold-Jones, Claremont, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 25, 1977, Ser. No. 772,370

Int. Cl.<sup>2</sup> G01N 27/36

U.S. Cl. 204—195 G

6 Claims



1. An electrochemical combination electrode assembly comprising:

an outer tubular container of nonconductive material having an inner annular surface adjacent an open end thereof; an elongated electrode body of nonconductive material coaxial with said open end of said container and having an ion sensitive structure closing one end thereof and an annular exterior surface adjacent said ion sensitive structure;

one of said inner and exterior surfaces being inclined relative to the other and inclined relative to an intersecting surface which intersects said other surface defining at the intersection thereof a circular edge dimensioned to engage and make line contact with the inclined one of said surfaces as said electrode body is coaxially inserted into said container; and

an annular liquid junction for said electrode assembly defined by said circular edge in pressure contact with said inclined surface, the degree of pressure between said edge and said inclined surface determining at least in part the rate of flow of liquid through said junction.

4,162,212

COMBINATION PROCESS FOR OCTANE UPGRADING THE LOW-OCTANE C<sub>5</sub>-C<sub>6</sub> COMPONENT OF A GASOLINE POOL

Stephen J. Miller, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 30, 1978, Ser. No. 938,291

Int. Cl.<sup>2</sup> C07C 15/02, 5/24; B01J 29/28

U.S. Cl. 208—79

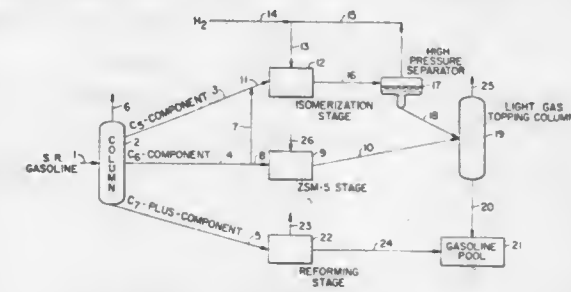
13 Claims

1. A process for producing a hydrocarbon blend having a motor octane number above about 78 from a C<sub>5</sub>-component and a C<sub>6</sub>-component, said components comprising mixtures of paraffinic hydrocarbons and, when admixed, boiling in the range of from about 25° C. to 70° C. and having a combined motor octane number below about 65, which comprises:

passing a portion of said C<sub>6</sub>-component in contact with a ZSM-5-type crystalline aluminosilicate in at least one of the HZSM-5 and Zn-HZSM-5 forms under a temperature condition within the range of 400° to 550° C. and a pressure condition within the range of from about 0.5 to 10

atmospheres to produce a resulting hydrocarbon mixture having a motor octane number above about 100, said zeolite having a silica-to-alumina mol ratio in the range of from about 40 to 160, and said portion, based upon the sum of the volumes of said components, being in the range of from about 10 to 40 percent thereof;

passing said C<sub>5</sub>-component and any remainder of said C<sub>6</sub>-component in contact with a hydrocarbon-isomerizing



catalyst under isomerizing conditions, including a temperature condition within the range of from about 0° C. to 400° C. and a pressure condition within the range of from about 0.5 to 100 atmospheres to produce a resultant hydrocarbon mixture having a motor octane number above about 70; and

combining at least a major portion of each of said resulting mixtures to produce said blend.

4,162,213

## CATALYTIC CRACKING OF METAL-CONTAMINATED OILS

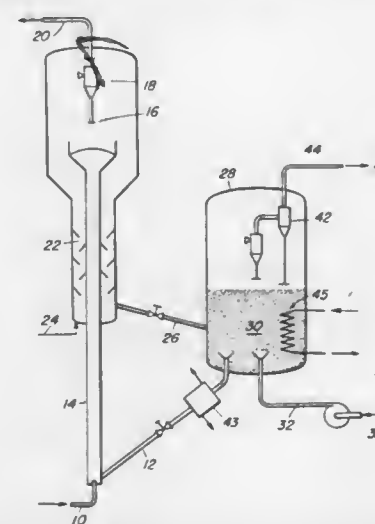
Fred S. Zrinscak, Sr., Woodbury Heights, and Grant G. Karsner, Westville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 681,379, Apr. 29, 1976, abandoned. This application Aug. 7, 1978, Ser. No. 931,574

Int. Cl.<sup>2</sup> C10G 11/04; B01J 8/24

U.S. Cl. 208—89

25 Claims



1. A process for catalytically cracking a metal-contaminated residual feedstock containing about 0.50 to 15.0 Nickel Equivalents of metal, which comprises, in combination:

contacting said feedstock under cracking conditions in a cracking zone and in the absence of added hydrogen with fluidized, regenerated cracking catalyst characterized by a metals content of 700 to 5,000 Nickel Equivalent of metal and having less than about 0.10 wt. % residual carbon, whereby forming cracked products and deactivated, coked catalyst;

separating said deactivated, coked catalyst from said cracked products;

passing said separated, deactivated catalyst to a regeneration zone;

contacting said deactivated coked catalyst in said regeneration zone with an excess of oxygen containing gas at 1300 to 1400°F. to form said regenerated cracking catalyst having less than about 0.10 wt. % residual carbon with production of a flue gas containing free oxygen;

and recycling said regenerated catalyst to said cracking zone, whereby selectively forming liquid cracked products.

4,162,214

## METHOD OF PREPARING BENZENE AND XYLENES

Gdal N. Maslyansky, Moskovsk prospekt, 189, kv. 64; Georgy L. Rabinovich, ulitsa Antonova-Ovseenko, 19, korpus 2, kv. 104; Leonid M. Treiger, Moskovsky prospekt, 189, kv. 64; Boris K. Gokhman, ulitsa Volnova, 11, kv. 2, and Viktor D. Seleznev, prospekt Obukhovskoi oborony, 108, korpus 4, kv. 58, all of, Leningrad, U.S.S.R.

Filed Oct. 4, 1977, Ser. No. 839,347

Int. Cl.<sup>2</sup> C07C 3/58; C10G 35/06

U.S. Cl. 585—471

14 Claims

1. A method of preparing benzene and xylenes from catalytic rates of reforming of gasoline fractions comprising a mixture of aromatic C<sub>6</sub>-C<sub>10</sub> hydrocarbons and non-aromatic hydrocarbons comprising: separating a low-boiling fraction from said reforming catalytic rate by distillation at a temperature of from 90° to 108° C.; treating the remaining high-boiling fraction comprising toluene, C<sub>8</sub>-C<sub>10</sub> aromatic hydrocarbons and paraffin hydrocarbons, in the presence of a hydrogen-containing gas at a temperature within the range of from 450° to 600° C. under a pressure of from 10 to 60 atm in contact with a catalyst consisting of 1 to 85% by weight of H-mordenite, 0.1 to 10% by weight of a hydrogenating component selected from the group consisting of:

- (a) oxides or sulfide of molybdenum;
- (b) oxides or sulfides of molybdenum combined with nickel;
- (c) oxides or sulfides of molybdenum combined with cobalt; and
- (d) platinum;

the balance being constituted by a binder, to produce a liquid aromatic hydrocarbon product; subjecting said liquid aromatic hydrocarbon product to rectification to produce benzene, toluene, total xylenes and C<sub>9</sub>-C<sub>10</sub> aromatic hydrocarbons; separating p- and o-xylenes from the total xylenes; separating the benzene; recycling to the high-boiling fraction treatment a stream selected from the group consisting of toluene, toluene + aromatic C<sub>9</sub>-C<sub>10</sub> hydrocarbons, and toluene + aromatic C<sub>9</sub>-C<sub>10</sub> hydrocarbons + m-xylene.

4,162,215

## DISPLACEMENT OF A LIQUID A BY A LIQUID B IN A SUSPENSION

Günther Klotz, Berg-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,813

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627333

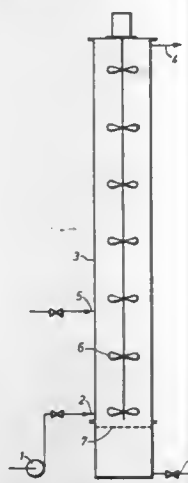
Int. Cl.<sup>2</sup> B01D 11/00; D21C 9/02; B06B 3/02, 5/14

U.S. Cl. 210—21

8 Claims

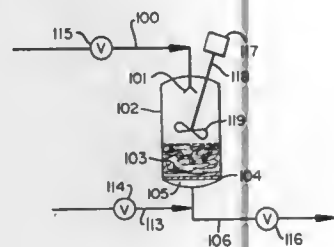
1. A process for the displacement by a liquid B of a liquid A in a suspension having a solids content of from 0.5 to 20% which ascends a suspension column while being stirred, comprising feeding the liquid B into the column, at a point above the inlet for the suspension, but in the lower half of the column, discharging the displaced liquid A from the column from an

outlet below the inlet for the suspension, discharging the suspension including liquid B from the column from an outlet



adjacent the top of the column and providing a screen between the inlet for the suspension and the outlet for liquid A.

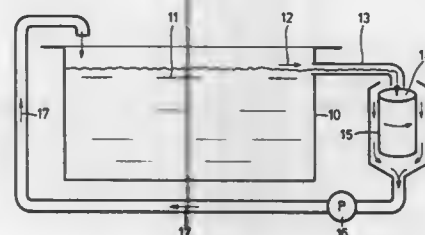
**4,162,216**  
**PROCESS FOR REMOVAL OF SUSPENDED SOLIDS FROM LIQUID**  
Evan K. Nyer, Monroe, N.Y., assignor to Union Carbide Corporation, New York, N.Y.  
Filed Oct. 25, 1977, Ser. No. 845,300  
Int. Cl.<sup>2</sup> B01D 23/24  
U.S. Cl. 210-73 R 17 Claims



1. In a process for removal of solids from a liquid containing suspended solids including the steps of:  
a) providing a filtration vessel containing a filter bed of discontinuous polyurethane particles;  
b) flowing said liquid containing suspended solids through said filter bed in said filtration vessel for deposition of said solids on said polyurethane particles to form solids-depleted liquid, and discharging solids-depleted liquid from said filtration vessel, until said filter bed is at least partially loaded with deposited solids;  
c) terminating the flow of liquid through said filter bed; and  
d) removing deposited solids from the discontinuous polyurethane particles in said filter bed, thereby renewing said filter bed for solids removal from said liquid containing suspended solids,  
the improvement wherein the removal of deposited solids from the discontinuous polyurethane particles of said filter bed comprises the steps of:  
adding at least one bed volume of a regeneration liquid to said filtration vessel,  
mechanically mixing said filter bed of discontinuous polyurethane particles having said solids deposited thereon in a total volume of liquid in said filtration vessel comprising said regeneration liquid and the hold-up liquid in said filter bed resulting from said termination of liquid flow there-through, without removal of liquid from said filtration vessel during said mixing therein, to cause deposited solids to disengage from said discontinuous polyurethane parti-

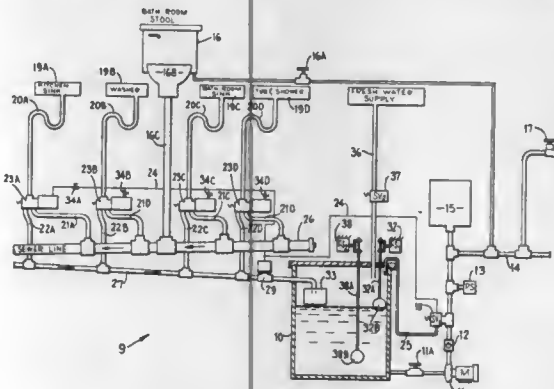
cles and pass into said total liquid volume, thereby forming solids-enriched liquid, and discharging said solids-enriched liquid from said filtration vessel.

**4,162,217**  
**METHOD FOR SEPARATING IMPURITIES FROM A CHEMICAL METALLIZING BATH**  
Günther Herrmann, Nürnberg, Fed. Rep. of Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt, Fuerth, Fed. Rep. of Germany  
Filed Mar. 15, 1978, Ser. No. 886,671  
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732927  
Int. Cl.<sup>2</sup> B01D 45/12  
U.S. Cl. 210-84 3 Claims



1. A method for separating impurities from a metallizing bath, in the absence of electrical current in the bath including the steps of feeding the bath solution to a centrifuge, removing the impurities by precipitating onto the drum wall by centrifugal force, and subsequently removing the metallic impurities from the centrifuge wall by activation of the centrifuge wall as an anode.

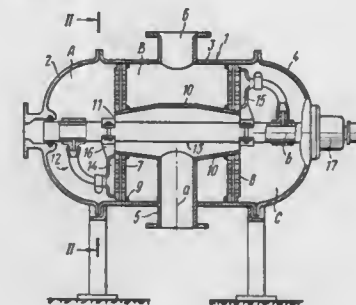
**4,162,218**  
**WATER REUSE SYSTEM**  
Gerald L. McCormick, Rte. 7, Allegan, Mich. 49010  
Filed Jun. 27, 1977, Ser. No. 810,039  
Int. Cl.<sup>2</sup> C02B 3/08; C02C 1/40  
U.S. Cl. 210-104 12 Claims



1. A water reuse system applicable to a water use system of the type in which water drained from a point of use is normally discarded through a sewer line or the like to which the point of use drain connects, said water reuse system being arranged for supplying water drained from such point of use to a point of reuse, such water reuse system comprising in combination:  
a holding tank for storing used water;  
means responsive to a demand for water at said point of reuse for transferring water from said holding tank to said point of reuse;  
means including a drain conduit for channeling water from said point of use drain alternatively to said drain conduit

and to said sewer line, said drain conduit having an outlet connected with said holding tank and an inlet to which said point of use drain is additionally connectible;  
valve means interposed in said drain conduit between point of use drain and holding tank, and being responsive to an excessive water level in said holding tank for blocking entry into said holding tank of water draining from said point of use, said valve means comprising a fail-safe valve of remote actuated type interposed in said drain conduit downstream of the point of use drains served by said holding tank, biasing means continuously urging said fail-safe valve to its closed position for blocking entry of used water into said holding tank from said point of use, externally powered valve operator means energized in response to a low water level in said holding tank for overcoming said biasing means and opening said fail-safe valve, said biasing means closing said valve upon failure of said valve operator or failure of external power to said valve operator means to prevent holding tank overflow.

**4,162,219**  
**SELF-CLEANING FILTER**  
Mark U. Miropolsky; David L. Maizlik; Anatoly A. Dobrovolsky; Igor K. Gerasimovich; Ariel S. Levinson; Iosif P. Naidich, all of Moscow; Georgy A. Menkh, Kemerovo, and Alexandr A. Yasminov, Moscow, all of U.S.S.R., assignors to Proizvodstvennoe obiedinenie "Tekhnenergokhimprom", U.S.S.R.  
Filed Jan. 12, 1978, Ser. No. 869,012  
Claims priority, application U.S.S.R., Jan. 28, 1977, 2447783  
Int. Cl.<sup>2</sup> B01D 35/16  
U.S. Cl. 210-108 1 Claim



1. A self-cleaning filter for purifying a liquid of particles suspended therein, comprising: a housing; at least one filtering partition accommodated within said housing; a chamber for a liquid to be purified defined within said housing to one side of said filtering partition; a chamber for the clarified liquid defined within said housing to the opposite side of said filtering partition; a pipe for the inlet of the liquid to be purified into said chamber for the liquid to be purified, arranged on said housing within said chamber for the clarified liquid and having its geometric axis extending substantially parallel with the plane of said filtering partition; another pipe extending centrally of said chamber for the clarified liquid, having its geometric axis substantially perpendicular to the plane of said filtering partition and communicating with said inlet pipe for the liquid to be purified; an opening made through said filtering partition, of a size and shape corresponding to the size and shape of the cross-section of said another pipe; said another pipe being connected to the edges of said opening to supply the liquid to be purified into said chamber for the liquid to be purified; the arrangement of said pipes, effecting the supply of said liquid to be purified, within said chamber for clarified liquid providing for uniform distribution of the liquid to be purified across the section of the filter and facilitating the dismantling of the filter for replacement of said filtering partition during the service life of the filter; an outlet pipe for the clarified liquid arranged on said housing within said chamber for the clarified liquid; means for flushing said filtering partition with a current of the liquid, flowing in a reverse direction

upon the pressure drop between said chambers for the liquid to be purified and the clarified liquid attaining a predetermined value, said flushing means including a hollow shaft rotatably mounted in said housing and disposed substantially coaxially within said another pipe, means coupled to said hollow shaft for rotation therewith engaging said filtering partition on the side thereof defining said chamber for the liquid to be purified for receiving the current of reverse flowing liquid and means fluidly communicating said engaging means for directing the reverse flowing liquid to the interior of said hollow shaft.

**4,162,220**  
**BLOOD FILTER**  
Francis M. Servas, Belle Mead, N.J., assignor to Johnson & Johnson, New Brunswick, N.J. and Purolator, Del.  
Continuation-in-part of Ser. No. 756,220, Jan. 3, 1977, Pat. No. 4,096,070. This application Apr. 3, 1978, Ser. No. 892,629  
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> B01D 29/06  
U.S. Cl. 210-448 2 Claims



1. In a blood filter of the type having an inlet spike for insertion into an outlet of a blood bag, said spike being made from a plastic material selected from the group consisting of polyolefins, polycarbonates, polystyrene, polyacrylics, polyesters, polyacrylonitrile, nylon, polyphenylene oxides, polysulfones, polyvinylchloride and their copolymers, the improvement comprising the outer surface of said spike, that is the surface which is to contact the bag opening during insertion of the filter, having a uniformly roughened finish of from 50 to 200 microinches, whereby the spike may be easily inserted and removed from the outlet of each of a series of blood bags without the use of a lubricant.

**4,162,221**  
**SYNTHETIC MUSK-BASED COMPOSITION, ITS PRODUCTION AND APPLICATIONS**  
Louis Dürr, Paris, and Francis Legrand, Mulhouse, both of France, assignors to Societe des Produits Chimiques et Matieres Colorantes de Mulhouse, Paris, France  
Filed Jan. 27, 1978, Ser. No. 872,756  
Claims priority, application France, Jan. 31, 1977, 77 02663  
Int. Cl.<sup>2</sup> C11B 9/00; C11D 3/50  
U.S. Cl. 252-1 28 Claims  
1. In a composition comprising nitrated synthetic musk, the improvement wherein the composition concurrently comprises from 0.5 to 50 percent by weight of a modifying agent; the percentage by weight being based on the total weight of





product values and iron are selectively extracted from the feed solution thereby loading the extractant;

- c. contacting the loaded extractant with a first aqueous strip selected from the group consisting of a nitric acid solution and an oxalate solution, the oxalate solution selected from the group consisting of oxalic acid and tetramethylammonium hydrogen oxalate, and trimethylammonium hydrogen oxalate, the nitric acid solution selectively stripping americium, curium and rare earth values and the oxalate solution selectively stripping neptunium, plutonium, fission product zirconium, niobium and molybdenum and iron values, the uranium values remaining in the extractant, whereby some of the actinide values and some of the other values are stripped from the extractant, forming a partially loaded extractant; and
- d. contacting the partially loaded extractant with the other of the strip solutions of step (c), whereby the remaining actinide values and some of the other values are stripped from the extractant, thereby recovering the actinide values from the waste solution.

4,162,231

#### METHOD FOR RECOVERING PALLADIUM AND TECHNETIUM VALUES FROM NUCLEAR FUEL REPROCESSING WASTE SOLUTIONS

E. Philip Horwitz, Elmhurst, and Walter H. Delphin, Woodbridge, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,347

Int. Cl.<sup>2</sup> G21F 9/04, 9/06

U.S. Cl. 252—301.1 W

3 Claims

1. A method for recovering palladium and technetium values from a nitric acid nuclear fuel reprocessing waste solution containing these and actinide, rare earth and fission product values comprising:

- adjusting the nitric acid concentration of the solution to 0.5 to 3.0 M;
- contacting the solution with an extractant of 0.05 to 0.5 M tricaprylmethylammonium nitrate in an inert water-immiscible aromatic or aliphatic hydrocarbon diluent whereby the palladium and technetium values are selectively extracted from the solution; and
- contacting the extractant containing these values with an aqueous solution 4 to 8 M in nitric acid whereby the palladium and technetium values are selectively stripped from the extractant, thereby recovering the palladium and technetium values.

4,162,232

#### RARE EARTH ACTIVATED RARE EARTH FLUORGERMANATE

Ramon L. Yale, Ulster, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 891,072, Mar. 29, 1978, abandoned. This application Aug. 9, 1978, Ser. No. 932,096

Int. Cl.<sup>2</sup> C09K 11/46

U.S. Cl. 252—301.4 F

10 Claims

1. A luminescent composition consisting essentially of a rare earth activated rare earth fluorogermanate represented by the formula:  $[R_1R_2R_3R_4]_x F_b Ge O_c$  wherein  $R_1$  is selected from Y, La and Gd,  $R_2$  is selected from Eu, Gd, Tb and Pr and  $R_1$  and  $R_2$  are different rare earth elements,  $x$  is from about 0.9 to about 0.9998,  $a$  is from about 2 to 4,  $b$  is from about 0.85 to about 3.15 and  $c$  is from about 4 to about 7.5.

4,162,233

#### ISOMERIZATION-ALKYLATION SYSTEMS COMPRISING A GR. III A LEWIS ACID AND A NON-REACTIVE APROTIC SOLVENT

George M. Kramer, Berkeley Heights, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 22, 1978, Ser. No. 889,033

Int. Cl.<sup>2</sup> B01J 31/02, 27/10; C07C 3/18, 5/24

U.S. Cl. 252—429 R

19 Claims

1. A stable acid system comprising a Lewis acid being characterized as having a "Selectivity Parameter" (I/E)<sub>MCP</sub> greater than about 0.5 and being represented by the formula  $MX_n$  wherein M is a Group IIIA element of the Periodic Table, X is a halogen and n is the ratio of halogen atoms to atoms of M dissolved in a non-reactive aprotic solvent selected from the group consisting of methylene chloride, methylene bromide, 1,2-dichloroethane, 1,1-dibromocyclopropane, 1,1-dichlorocyclopropane, cis or trans-1,2-dichlorocyclopropane and cis or trans-1,2-dibromocyclopropane, and wherein the concentration of said Lewis acid in the non-reactive aprotic solvent is greater than about 0.01 molar.

12. A stable catalyst composition comprising an admixture of a Lewis acid selected from the group consisting of  $AlBr_3$ ,  $GaBr_3$  and  $GaCl_3$ , a non-reactive aprotic solvent selected from the group consisting of methylene bromide and methylene chloride and a promoter selected from the group consisting of t-butyl bromide and t-butyl chloride, wherein the concentration of the Lewis acid in the non-reactive aprotic solvent ranges from about 0.5 to about 3 molar.

13. A stable catalyst composition comprising an admixture of (a) a Lewis acid being characterized as having a "Selectivity Parameter" (I/E)<sub>MCP</sub> greater than about 0.5 and being represented by the formula  $MX_n$  wherein M is a Group IIIA element of the Periodic Table, X is a halogen and n is the ratio of halogen atoms to atoms of M dissolved in (b) a non-reactive aprotic solvent selected from the group consisting of halogenated  $C_1-C_3$  alkanes, halogenated cyclopropane and halogenated  $C_2-C_3$  alkenes, wherein the  $C_2-C_3$  compounds contain at least 2 halogen atoms per mole of compound, and wherein the concentration of the Lewis acid in the non-reactive aprotic solvent is greater than 0.01 molar, and (c) an effective amount of a promoter selected from the group consisting of t-butyl bromide and t-butyl chloride.

4,162,234

#### OXIDATION CATALYSTS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Macedonia, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 490,532, Jul. 22, 1974, abandoned. This application Jul. 1, 1977, Ser. No. 812,072

Int. Cl.<sup>2</sup> B01J 21/02, 27/14, 27/02, 23/10

U.S. Cl. 252—432

21 Claims

1. Catalysts of the formula:



wherein X is Y, Zr, S, Th or mixture thereof;

A is an alkali metal, thallium or mixture thereof;

D is nickel, cobalt, calcium, strontium, cadmium, or mixture thereof;

E is phosphorus, arsenic, boron, antimony or mixture thereof; and

wherein

a is greater than 0 and less than 5;

b and d are 0-4;

c is 0.1 to 20;

f and g are 0.1-10; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present, said catalyst being free of chromium.

4,162,235

#### CATALYSTS

Gary J. K. Acres; Barry J. Cooper, and Brian Harrison, all of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Mar. 14, 1977, Ser. No. 777,308

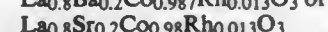
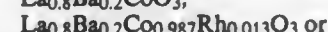
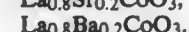
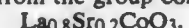
Claims priority, application United Kingdom, Jun. 17, 1976, 25141/76

Int. Cl.<sup>2</sup> B01J 21/04, 23/10, 23/48, 23/58

U.S. Cl. 252—462

7 Claims

1. A catalyst suitable for catalysing oxidation and reduction processes in a gas and capable of removing oxygen from a gas containing an excess of oxygen and restoring at least a part of such removed oxygen to a gas having an oxygen deficiency, the catalyst comprising a support carrying at least one precious metal selected from platinum, gold, silver, rhodium, ruthenium, palladium, iridium and osmium and a perovskite selected from the group consisting of:



the support being stabilized by the inclusion therein of lanthanum oxide or barium oxide.

4,162,236

#### DETERGENT COMPOSITIONS CONTAINING MIXTURES OF ALKYL BENZENE SULFONATES AS THE DETERGENT ACTIVE

Harold E. Feierstein, Creve Coeur, Mo., and Mark E. Davis, Lexington, Ky., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 867,074, Jan. 5, 1978, abandoned. This application Sep. 25, 1978, Ser. No. 945,732

Int. Cl.<sup>2</sup> C11D 1/22

U.S. Cl. 252—558

5 Claims

1. A solid detergent composition which comprises at least 5 percent by weight, based on the total weight of the composition, of a surfactant consisting essentially of a mixture of alkyl benzene sulfonates having 10 to 15 carbons in the alkyl chains wherein

- (A) greater than 55 mole percent of the alkyl benzene sulfonates have alkyl chains of greater than 11 carbon atoms, (B) the alkyl chains having 12 or more carbon atoms have a 2-phenyl content of greater than 60 percent of the total 2-phenyl content.

4,162,237

#### CEMENT FOR WALL AND FLOOR COVERINGS AND THE LIKE

Albert Kauderer, Tobelwasenweg 23, 7315 Wilhelm, Fed. Rep. of Germany

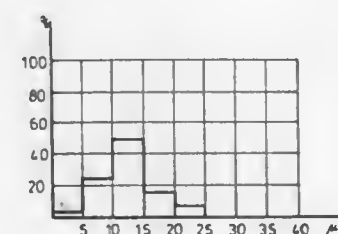
Filed Apr. 11, 1977, Ser. No. 786,304

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615725; Feb. 22, 1977, 2707571; Feb. 22, 1977, 2707570

Int. Cl.<sup>2</sup> C08L 1/28

U.S. Cl. 260—17 R

32 Claims



1. A cement for attaching coverings to walls, floors, ceilings and similar bases, comprising:
- an adhesive substance which, when dried, is flexible; and
- a filler powder admixed with said adhesive substance, said

filler powder being insoluble in and chemically non-reactive with said adhesive substance and substantially non-adherent to said adhesive substance and having a very small grain size such that the maximum of the distribution curve of the grain size lies in the region from 0.005 mm to 0.035 mm and wherein the grain size of at least the major portion by weight of said filler powder is uniform to within  $\pm 0.018$  mm, the cement having a viscosity such that the thickness of the cement in the dried condition is at least twice the average grain size of said filler powder; whereby, when said cement has dried, said coverings may be removed from said bases by pulling off said coverings to thereby split said cement in a manner which leaves a substantially continuous part of the cement layer on said bases and another such part on said coverings.

27. A covering for walls, floors, or ceilings or similar bases, one surface of which is supplied with a layer of a cement that comprises:

an adhesive substance which, when dried, is flexible;

a filler powder admixed with said adhesive substance, said filler powder being insoluble in and chemically non-reactive with said adhesive substance and substantially non-adherent to said adhesive substance and having a very small grain size such that the maximum of the distribution curve of the grain size lies in the region from 0.005 mm to 0.035 mm and wherein the grain size of at least the major portion by weight of said filler powder is uniform to within  $\pm 0.018$  mm, the cement having a viscosity such that the thickness of the cement in the dried condition is at least twice the average grain size of said filler powder; whereby, when said cement has dried, said coverings may be removed from said bases by pulling off said coverings to thereby split said cement in a manner which leaves a substantially continuous part of the cement layer on said bases and another such part on said coverings.

4,162,238

#### FOUNDRY MOLD OR CORE COMPOSITIONS AND METHOD

Horacio E. Bergna, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 448,689, Mar. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,124, Jul. 17, 1973, abandoned. This application Mar. 24, 1976, Ser. No. 670,076

Int. Cl.<sup>2</sup> C08L 31/04; B28B 7/34

U.S. Cl. 260—29.6 S

26 Claims

1. A sand core or mold composition comprising of foundry sand, 1-6% by weight of the sand of an aqueous solution or dispersion of a firm-forming resin adhesive and 3 to 15% by weight of the sand of an aqueous binder comprising an aqueous sodium, potassium or lithium silicate solution or mixtures thereof and amorphous silica, the binder characterized by (1) a molar ratio of silica to alkali metal oxide of from 3.5:1 to 10:1; (2) a weight fraction of the total silica present as amorphous silica is from 2 to 75%; (3) a weight fraction of the total silica present as silicate ions is from 98 to 25% and the amorphous silica has a particle size of from 2 nanometers to 500 nanometers and the sand core or mold possesses a compressive strength sufficiently low to permit easy crushing after said core or mold is used in preparing a metal casting.

13. A method for making a sand core or a sand mold useful in the casting of molten metal which comprises mixing foundry sand 1-6% by weight of the sand of an aqueous solution or dispersion of a film-forming resin adhesive and 3 to 15% by weight of the sand of a binder which comprises an aqueous sodium, potassium or lithium silicate solution or mixtures thereof and amorphous silica having a particle size of from 2 nanometers to 500 nanometers, the amount of silicate and amorphous silica being adjusted to form a binder with (1) a molar ratio of silica to alkali metal oxide ranging from 3.5:1 to 10:1, (2) the weight fraction of total silica present as amorphous silica of from 2 to 75% and (3) a weight fraction of the total



silica present as silicate ions of from 98 to 25%, forming the sand and binder mixtures into the desired shape and setting the formed mixture.

**4,162,239**  
**PROCESS FOR THE PRODUCTION OF TRANSPARENT POLYMERS OF VINYL CHLORIDE WITH VERY HIGH IMPACT STRENGTH**

René Nicolet, Fribourg, and Robert Schärer, Dudingen, both of Switzerland, assignors to Lonza Ltd., Gampel, Valais, Switzerland

Continuation of Ser. No. 530,374, Dec. 6, 1974, abandoned. This application Aug. 27, 1976, Ser. No. 718,165

Claims priority, application Switzerland, Nov. 14, 1974, 15185/74

Int. Cl.<sup>2</sup> C08L 27/06

U.S. Cl. 260—29.7 UP

18 Claims

1. The process for the preparation of a transparent, weather-resistant vinyl chloride polymer having a very high impact strength by the polymerization of vinyl chloride either together with or without other copolymerizable monomers in aqueous dispersion by the emulsion polymerization method in the presence of at least one acrylic acid ester copolymer which consists essentially of emulsion polymerizing vinyl chloride or a monomer mixture containing at least 80 percent by weight of vinyl chloride in the presence of a dispersion of at least one acrylic acid copolymer containing of 90 to 99.7 percent by weight of units of at least one acrylic acid ester and 0.3 to 10 percent by weight of units of a polyfunctional monomer, said acrylic acid ester copolymer having a mean particle diameter of 30 to 150 nm, determined by soap titration, said acrylic acid ester copolymer being used in a quantity such that the resultant vinyl polymer contains 4 to 20 percent by weight of acrylic acid ester units, said acrylic acid ester being selected from the group consisting of propyl acrylate, isopropyl acrylate, butyl acrylate, isobutyl acrylate, hexyl acrylate, 2-ethyl hexyl acrylate, lauryl acrylate, myristyl acrylate and stearyl acrylate, and said polyfunctional monomer being selected from the group consisting of allyl acrylate, allyl methacrylate, allyl crotonate, allyl cinnamate, methallyl acrylate, methallyl methacrylate, monoallyl maleate, monoallyl fumarate, diallyl oxalate, dimethallyl oxalate, diallyl glutarate, diallyl adipate, diallyl phthalate, diallyl terephthalate, tetra-allyl pyromellitate, diallyl maleate, dimethallyl maleate, diallyl fumarate, diallyl isocyanurate, triallyl cyanurate, triallyl phosphate, trimethylol propane diallyl ester, trimethylol propane diallyl ether monomethacrylate and tetra-allyl oxyethane.

**4,162,240**  
**PROCESS FOR PRODUCTION OF NOVEL POLYMER EMULSION**

Minoru Hino, Takatsuki; Seimei Yasui, Takarazuka, and Akira Shintani, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 13, 1977, Ser. No. 815,263

Claims priority, application Japan, Jul. 22, 1976, 51-87806; Sep. 22, 1976, 51-114280; Mar. 25, 1977, 52-33471; Apr. 19, 1977, 52-45268

Int. Cl.<sup>2</sup> C08L 2/22

U.S. Cl. 260—29.7 B

8 Claims

1. A process for production of a polymer emulsion comprising emulsion polymerizing in an aqueous system at least one adduct which has been at least partially esterified, imidated, or amidated by reacting said adduct with a compound selected from at least one member of the group consisting of aminoethyl methacrylate, t-butylaminoethyl methacrylate, 2-hydroxyethyl methacrylate, 2-hydroxyethyl acrylate, 2-hydroxypropyl methacrylate, glycidyl methacrylate, glycidyl acrylate and N-methylol-methacrylamide in an aqueous system in the presence or absence of a vinyl monomer, said adduct being produced by adding an  $\alpha,\beta$ -unsaturated dicarboxylic acid or anhydride thereof to a synthetic unsaturated polymer, having a number average molecular weight of 150 to 30,000 and an iodine value

of 50 to 500, selected from at least one member of the group consisting of a diene polymer, C<sub>5</sub> petroleum resin and C<sub>9</sub> petroleum resin, wherein the addition ratio of the  $\alpha,\beta$ -unsaturated dicarboxylic acid or anhydride thereof to the synthetic unsaturated resin is in the range of 3 to 60% by weight and wherein the partial esterification, imidation and amidation is carried out in the range of 10 to 90% of the total acid value of the adduct.

**4,162,241**  
**POLYVINYL CHLORIDE THERMOPLASTIC BLEND COMPOSITIONS HAVING IMPROVED GLASS TRANSITION TEMPERATURES**

Nathan H. Canter, Edison, and Neville G. Thame, Montclair, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 14, 1977, Ser. No. 787,368

Int. Cl.<sup>2</sup> C08L 23/16, 27/06

U.S. Cl. 260—30.8 R

8 Claims

1. A polymeric blend composition which comprises:  
(a) a polyvinyl chloride resin; and  
(b) about 5 to about 20 parts by weight of a neutralized sulfonated elastomeric polymer per 100 parts by weight of said polyvinylchloride resin, said neutralized sulfonated elastomeric polymeric being formed from an elastomeric polymer being selected from the group consisting of a copolymer of an isoolefin and a conjugated multiolefin (Butyl rubber) and EPDM terpolymers, said blend having a glass transition temperature equal to or greater than a glass transition temperature of said polyvinyl chloride resin.

**4,162,242**  
**POLYOL STABILIZATION ADDITIVE FOR POLYPYRROLIDONE**

Ralph House, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 781,597, Mar. 28, 1977, abandoned.

This application May 24, 1978, Ser. No. 908,889

Int. Cl.<sup>2</sup> C08K 5/05

U.S. Cl. 260—30.8 R

11 Claims

1. A composition of matter comprising a major amount of normally solid poly-2-pyrrolidone and 0.1–5 weight percent of a polyhydric alcohol having a boiling point of about 200°–300° C. or greater.

**4,162,243**  
**HIGH STRENGTH, EXTRUDABLE SILICONE ELASTOMER COMPOSITIONS**

Chi-Long Lee, Midland; Myron T. Maxson, Sanford, and Leo F. Stebleton, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 8, 1978, Ser. No. 904,176

Int. Cl.<sup>2</sup> C08L 83/04

U.S. Cl. 260—37 SB

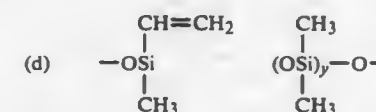
21 Claims

1. A silicone elastomeric composition consisting essentially of a product obtained by mixing  
(A) 100 parts by weight of a triorganosiloxy endblocked polydimethylsiloxane fluid in which the triorganosiloxy units are selected from the group consisting of dimethylvinylsiloxy and methylphenylvinylsiloxy, said fluid being a mixture of polymeric species of varying molecular weight where each species is present in an amount sufficient to collectively provide a molecular weight distribution such that there is present at least one polymeric species (1) at a concentration greater than the concentrations of adjacent polymeric species of lower and higher molecular weight where polymeric species (1) is identified as a peak molecular weight as determined by gel permeation chromatographic analysis and there being a peak molecular weight of polymeric species in the range of from 68,000 to 135,000 at a major concentration, in said fluid the molecular weight of the lowest molecular weight

polymeric species being in the range of from 854 to 3146 and the molecular weight of the highest molecular weight species being in the range of from 174,000 to 370,000, the mixture of polymeric species having a molecular weight distribution such that a dispersity index has a value greater than 3.8,

(B) from 20 to 60 parts by weight of a reinforcing amorphous silica having a surface area of greater than 100 square meters per gram, the surface of the silica having silicon atoms to which are bonded organosiloxane groups selected from the group consisting of

(a)  $(CH_3)_3SiO-$ ,  
(b)  $CH_2=CH(CH_3)_2SiO((CH_3)_2SiO)_x-$ ,  
(c)  $CH_2=CH(CH_3)(C_6H_5)SiO((CH_3)_2SiO)_x-$ , and



in which x is an integer of 0 to 20 and y is an integer of 1 to 5, the organosiloxane groups being present in an amount such that there is from 0.05 to 0.32 percent by weight vinyl based on the weight of the silica and the organosiloxane groups being present in a mole ratio such that there is from 7 to 50 moles of (a) for each mole of (b), (c), (d) or mixtures thereof,

(C) an amount of a fluid organohydrogensiloxane sufficient to provide from 1 to 3 inclusive silicon-bonded hydrogen atoms per vinyl radical in (A) and (B) combined, said organohydrogensiloxane having an average of at least three silicon-bonded hydrogen atoms per molecule and consisting essentially of units selected from a group consisting of methylhydrogensiloxane, dimethylsiloxane, dimethylhydrogensiloxy, trimethylsiloxy and SiO<sub>2</sub> units, and

(D) an amount of a platinum catalyst sufficient to provide at least one part by weight platinum per one million parts by weight of (A), said platinum catalyst being soluble in (A), the silicone elastomer composition having a viscosity such that at least 45 grams per minute of the composition can be extruded through a 3.175 millimeter orifice under a pressure of 620 kilopascals.

**4,162,244**  
**COATING COMPOSITIONS**

James L. Bertram, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1978, Ser. No. 937,022

Int. Cl.<sup>2</sup> C09D 3/58

U.S. Cl. 260—37 EP

5 Claims

1. In a weldable coating composition comprising an electrically conductive pigment, an epoxy resin binder and solvent, the improvement which comprises employing as the epoxy resin binder, the reaction product of

(1) an epoxy resin having an average of more than one but less than three vicinal epoxy groups per molecule which is a polycyclydyl ether of a polyhydroxyl-containing compound or mixture of such epoxy resins wherein said epoxy resins have an epoxide equivalent weight of less than about 250 and that when said epoxy resin contains aromatic or cycloaliphatic groups substituted with halogen atoms said equivalent weight is calculated on the basis of the halogen atoms being hydrogen atoms; with  
(2) (a) from about 90 to about 100 equivalent percent of a compound having only two amine hydrogen atoms and  
(b) from about 0 to about 10 equivalent percent of a compound having only one amine hydrogen;  
and wherein the epoxy:amine hydrogen equivalent ratio is from about 0.90:1 to about 1.1:1.

**4,162,245**  
**METHOD OF PREPARING AN IMPROVED ORGANIC RESIN COMPOSITION AND AN IMPROVED ORGANIC RESIN THEREBY**

Warde T. Collins, and Mary D. Fey, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 9, 1978, Ser. No. 868,009

Int. Cl.<sup>2</sup> C08K 9/06

U.S. Cl. 260—40 R

4 Claims

1. A method of preparing an improved organic resin composition consisting of

(A) acidifying water to a pH of 3 to 5 using a water-miscible organic carboxylic acid;  
(B) adding thereto, with constant agitation, chloropropyltrimethoxysilane and thereafter stirring the components (A) and (B) until the solution clears;  
(C) adding to the solution particulate aluminatrichhydrate and thoroughly mixing the combination of (A), (B), and (C) at a high speed for a time sufficient to treat the particulate aluminatrichhydrate with the hydrolysis product of component (B);  
(D) removing volatile materials from the combination to obtain a treated particulate aluminatrichhydrate;  
(E) mixing the product (D) with an organic resin capable of being heat cured and thereafter  
(F) removing entrapped air from (E) to obtain an organic resin having a reduced viscosity over that of an unmodified organic resin.

**4,162,246**  
**HYDANTOIN DERIVATIVES AND THEIR USE AS POLYMER STABILIZERS**

Nobuo Soma; Syoji Morimura; Takao Yoshioka, and Tomoyuki Kurumada, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Dec. 13, 1977, Ser. No. 860,172

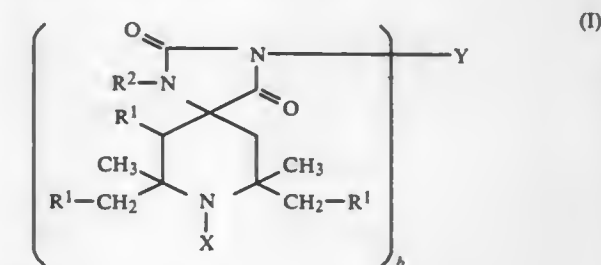
Claims priority, application Japan, Dec. 27, 1976, 51-157784

Int. Cl.<sup>2</sup> C07D 471/10; C08K 5/34

U.S. Cl. 260—45.8 NT

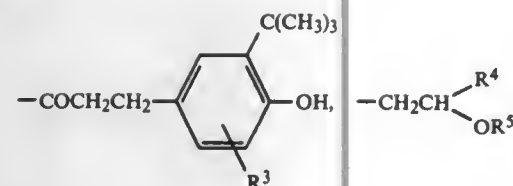
11 Claims

9. A polymer composition stabilized against photo- and thermal-deterioration, wherein there is incorporated, in an amount sufficient to prevent said deterioration, a hydantoin derivative having the general formula (I):

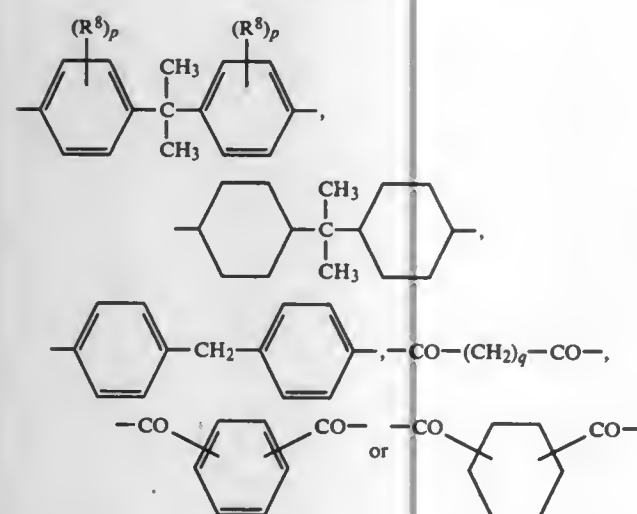


wherein:

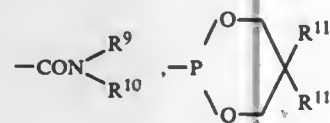
R<sup>1</sup> represents a hydrogen atom or a methyl group;  
R<sup>2</sup> represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, an allyl group, an acetyl group or a benzyl group;  
X represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having 3 or 4 carbon atoms, a cyanoalkyl group having 2 or 3 carbon atoms, a 2,3-epoxypropyl group, a benzyl group, an aliphatic acyl group having up to 18 carbon atoms, or a group of formula



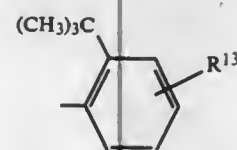
or  $-\text{CH}_2\text{COOR}^6$  wherein:  
 $\text{R}^3$  represents an alkyl group having from 1 to 4 carbon atoms;  
 $\text{R}^4$  represents a hydrogen atom, a methyl group or a phenyl group;  
 $\text{R}^5$  represents a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, an allyl group, a benzyl group or an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms wherein the aromatic moiety is unsubstituted or has one or more  $\text{C}_1$ - $\text{C}_4$  alkyl and/or hydroxy substituents; and  
 $\text{R}^6$  represents an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having 3 or 4 carbon atoms or a phenyl group;  
 $b$  is 2 or 3; and  
 when  $b=2$ :  
 $\text{Y}$  represents one of the groups of formula  
 $-\text{CH}_2\text{CH}(\text{OZ})\text{CH}_2-[\text{O}-\text{CH}_2-\text{CH}(\text{OZ})\text{CH}_2]_2-$ ,  $-\text{CH}_2\text{CH}(\text{OZ})\text{CH}_2-[\text{OCH}_2\text{C}(\text{R}^7)\text{H}]_m-\text{OCH}_2\text{CH}(\text{OZ})-\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}(\text{OZ})\text{C}-\text{H}_2-[\text{OWO}-\text{CH}_2\text{CH}(\text{OZ})\text{CH}_2]_n-$ , or  $\text{CH}_2\text{CH}(\text{OZ})-\text{CH}_2-$  in which:  
 $m$  and  $n$  each represents an integer of from 1 to 10;  
 $\text{R}^7$  represents a hydrogen atom or a methyl group;  
 $\text{W}$  represents one of the groups of formula



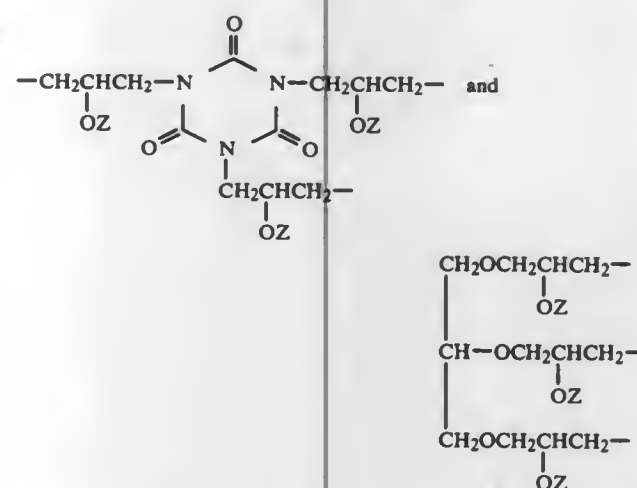
wherein:  
 $p$  is 0, 1 or 2;  
 $\text{R}^8$  represents a halogen atom; and  
 $q$  is an integer of from 1 to 10; and  
 $\text{Z}$  represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, an allyl group, a benzyl group, an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms wherein the aromatic moiety is unsubstituted or has one or more  $\text{C}_1$ - $\text{C}_4$  alkyl and/or hydroxy substituents, or one of the groups of formulae



or  $-\text{P}(\text{OR}^{12})_2$  in which:  
 $\text{R}^9$  represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;  
 $\text{R}^{10}$  represents an alkyl group having from 1 to 18 carbon atoms, a phenyl group, a substituted phenyl group having one or more methyl, chlorine and/or bromine substituents, a naphthyl group or a cyclohexyl group;  
 $\text{R}^{11}$  represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; and  
 $\text{R}^{12}$  represents an alkyl group having from 1 to 4 carbon atoms, a phenyl group or a group of formula



in which  $\text{R}^{13}$  represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;  
 when  $b=3$ :  
 $\text{Y}$  represents one of the groups of formulae



in which  $\text{Z}$  is as defined above; or an acid addition salt thereof.

4,162,247

# BIS-(ALKYLPHENYL)-ALKANECARBOXYLIC ACID HYDRAZIDES, THEIR PREPARATION AND USE

Norbert Mayer, Gablingen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

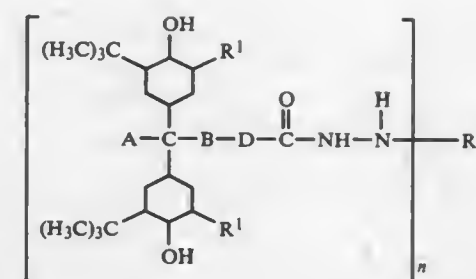
Filed Mar. 13, 1978, Ser. No. 885,905

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711206

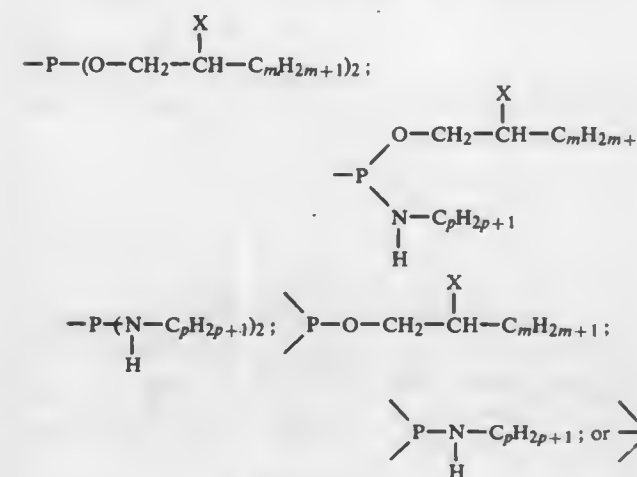
Int. Cl.<sup>2</sup> C08K 5/51, 5/49, 5/25; C07C 103/22; C07F 9/02 U.S. Cl. 260-45.9 NC

6 Claims

1. Compounds of the formula



in which  
 $n$  is 1, 2 or 3;  
 $\text{A}$  and  $\text{B}$  represent together with the carbon atom separating them a cycloalkyl ring having from 5 to 12 carbon atoms;  
 $\text{D}$  is a chemical bond or a  $\text{C}_1$  to  $\text{C}_3$ -alkylene radical and  
 $\text{R}^1$  is  $\text{H}$  or a  $\text{C}_1$  to  $\text{C}_4$ -alkyl radical, while  
 $\text{R}^2$  is either (a) a hydrogen atom or (b) corresponding to the meaning of  $n$ , a mono-, bi- or tri-valent phosphorus containing radical having the structure:



in which  $m$  is an integer of from 0 to 30,  $p$  is an integer of from 10 to 20, and  $x$  is  $\text{H}$  or  $\text{OH}$ , and in the case (b)  $\text{A}$  may also be  $\text{H}$  or  $\text{C}_1$  to  $\text{C}_8$ -alkyl and  $\text{B}$  may also be  $\text{C}_1$  to  $\text{C}_8$ -alkylene.

4. Stabilized polyethylene or polypropylene wherein a compound as claimed in claim 1 is contained as stabilizer.

4,162,248

# SOMATOSTATIN ANALOGS

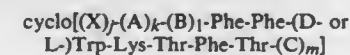
Robert G. Strachan, Warrington; William J. Paleveda, Lansdale; Daniel F. Veber, Ambler, and Frederick W. Holly, Glenside, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J. Continuation-in-part of Ser. No. 781,610, Mar. 28, 1977, which is a continuation-in-part of Ser. No. 732,692, Oct. 14, 1976, abandoned. This application Apr. 7, 1978, Ser. No. 894,266

Int. Cl.<sup>2</sup> A61K 37/02; C07C 103/52

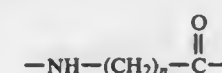
U.S. Cl. 260-112.5 S

12 Claims

1. Compounds of the formula:



wherein  
 $\text{X}$  is



and  $n=0$  to 4;  
 $\text{A}$  is Lys,  $\epsilon$ -INOC-Lysine;

$\text{B}$  is Asn, Ala,  $\alpha$ -aminobutyric acid;  
 $\text{C}$  is Ser, Gly;  $j, k, l$  and  $m$  are 0 or 1, with the proviso that  $j, k, l$  and  $m$  are not all 1 and not all 0; wherein the ring formed by the peptide backbone contains 24 to 33 atoms and pharmaceutically acceptable non-toxic acid addition salts thereof.

4,162,249

# ANTHRANILIC ACID ARYLESTER-AZO-AMINONAPHTHOL SULFONIC ACID DYES

Michael Yelland, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 6, 1976, Ser. No. 747,993

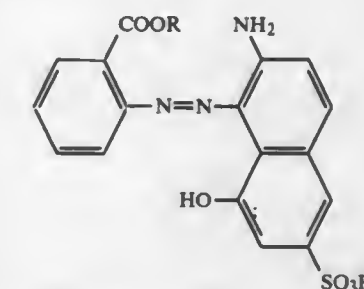
Claims priority, application United Kingdom, Jan. 16, 1976, 1786/76

Int. Cl.<sup>2</sup> C09B 29/30

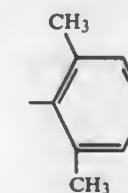
U.S. Cl. 260-199

1 Claim

1. A water soluble monoazo dye which, in the form of the free acid, has the formula:



wherein  $\text{R}$  represents a radical of the formula:



4,162,250

# 3-AMINOAZETIDINONE DERIVATIVES

Thomas F. Buckley, Albany, Calif., and John G. Gleason, Delran, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

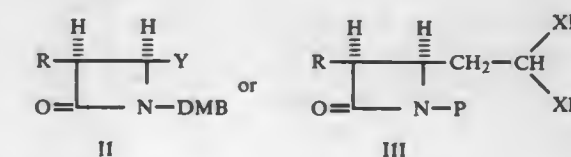
Division of Ser. No. 822,774, Aug. 8, 1977, Pat. No. 4,122,262, which is a continuation-in-part of Ser. No. 721,251, Sep. 8, 1976, Pat. No. 4,089,956. This application Jun. 6, 1978, Ser. No. 913,181

Int. Cl.<sup>2</sup> C07D 205/08, 403/04

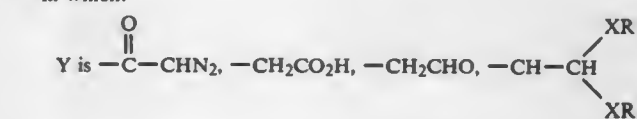
U.S. Cl. 260-239 A

10 Claims

1. A compound of the formula:

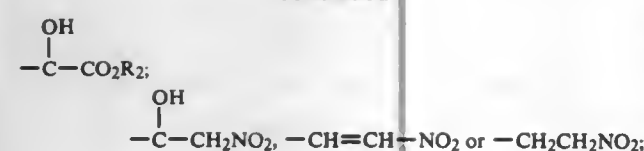


in which:



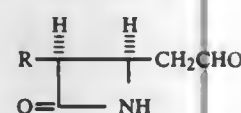


-continued



P is hydrogen or

R is amino, azido or blocked amino;  
R<sub>1</sub> is lower alkyl;  
R<sub>2</sub> is a carboxyl blocking group;  
X is thio or oxy; and  
DMB is 2,4-dimethoxybenzyl.  
5. A compound of the formula:



in which R is azido or a blocked amino.

10. Diphenylmethyl cis[3-azido-2-formylmethyl-4-oxoazetidinyl]-1-hydroxyacetate.

4,162,251

PROCESS FOR THE PREPARATION OF  $\beta$ -LACTAM COMPOUNDS

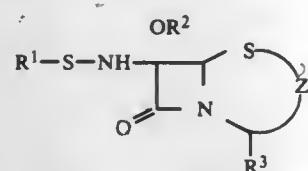
Tetsuo Hiraoka, and Takeo Kobayashi, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan  
Division of Ser. No. 779,907, Mar. 21, 1977. This application  
Nov. 11, 1977, Ser. No. 850,719

Claims priority, application Japan, Apr. 5, 1976, 51-37958  
Int. Cl.<sup>2</sup> C07D 499/04, 501/02

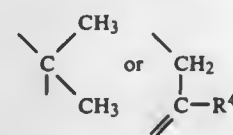
U.S. Cl. 260—239.1

4 Claims

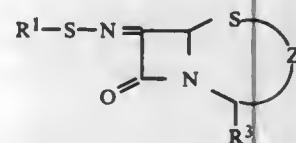
1. A process for the preparation of a compound having the formula



wherein R<sup>1</sup> represents phenyl group substituted with from one to 5 members selected from nitro, cyano, halogen or alkoxy-carbonyl having 1-4 carbon atoms in the alkyl moiety; R<sup>2</sup> represents an alkyl group having 1-4 carbon atoms; R<sup>3</sup> represents carboxyl group or a protected carboxyl group selected from the group consisting of an alkoxy-carbonyl having 1-4 carbon atoms in the alkoxy moiety, halogenoalkoxy-carbonyl having 1-4 carbon atoms in the alkoxy moiety, benzyloxy-carbonyl and benzyloxy-carbonyl substituted with nitro or methoxy in the phenyl group, diphenylmethoxycarbonyl, trialkylsilyloxy-carbonyl having 1-4 carbon atoms in each alkyl moiety, phenacyloxy-carbonyl and phenacyloxy-carbonyl substituted with halogen or nitro, acyloxy-carbonyl, halogenoacyloxy-carbonyl, dialkylphosphinoxy-carbonyl having 1-4 carbon atoms in the alkyl moiety, dihalogenophosphinoxy-carbonyl, and aminocarbonyl; Z represents a fragment of the formula

wherein R<sup>4</sup> is selected from the group consisting of alkyl hav-

ing 1-4 carbon atoms, alkoxy having 1-4 carbon atoms, halogen, carbamoyloxymethyl, alkanoyloxymethyl having 1-4 carbon atoms in the alkyl moiety, benzoyloxymethyl, and heterocyclic thiomethyl selected from the group consisting of tetrazolyl, 1-alkyltetrazolyl, 1-carboxyalkyltetrazolyl, 1-alkoxycarbonylalkyltetrazolyl, 1-sulfoalkyltetrazolyl, 1-aminosulfonylalkyltetrazolyl, 1-mono- or dialkylaminosulfonylalkyltetrazolyl, 1-aminoalkyltetrazolyl, 1-mono- or dialkylaminoalkyltetrazolyl, isoxazolyl, imidazolyl, thiazolyl, triazolyl, thienyl, thiadiazolyl, methylthiadiazolyl, pyrimidinyl- and pyridylthiomethyl, and a pharmaceutically acceptable salt thereof; which comprises reacting a compound having the formula



with an alcohol having the formula



in the presence of a compound selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal carbonates, and alkali metal alkoxides.

4,162,252

## PROCESS FOR PREPARING

3-[(BENZAMIDOPIPERID-1-YL)ALKYL] INDOLES  
George O. Weston, Havant, England, assignor to John Wyeth & Brother Limited, Maldenhead, United Kingdom  
Filed Feb. 28, 1977, Ser. No. 772,058

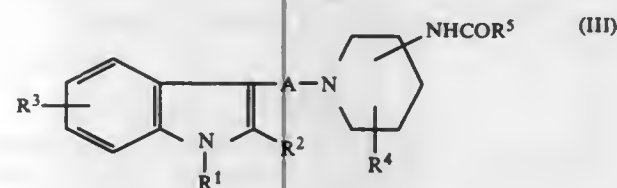
Claims priority, application United Kingdom, Mar. 12, 1976, 10114/76

Int. Cl.<sup>2</sup> C07D 401/06

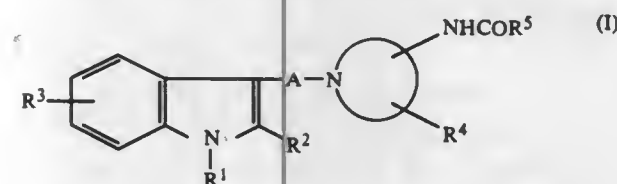
U.S. Cl. 546—201

5 Claims

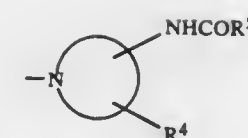
1. A process for preparing compounds of general formula (III)



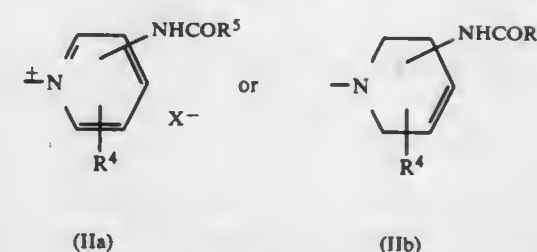
wherein R<sup>1</sup> represents hydrogen, lower alkyl, lower aralkyl or aroyl, R<sup>2</sup> represents hydrogen, lower alkyl or aryl, R<sup>3</sup> represents hydrogen, halogen, lower alkoxy, hydroxy or lower alkyl, R<sup>4</sup> represents hydrogen, halogen or lower alkyl, R<sup>5</sup> represents aryl (including heterocyclic aryl), lower alkoxy, aryloxy, lower aralkyl, lower aralkyloxy, diaryl-lower alkyl or cycloalkyl of 5 to 7 carbon atoms, and A is an alkylene radical of 1-4 carbon atoms in which a compound of formula I



in which formula



represents a ring system of general formula



wherein A, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are as defined in connection with formula (II) and X is an anion, is reduced with an alkali-metal borohydride in a solvent selected from alkanols of 3-4 carbon atoms, glycol ethers or dioxane, and if desired converting the product to an acid addition salt.

4,162,253

## ACARICIDAL AGENTS

Richard M. Acheson, Oxford; Ian R. Cox, North Harrow; John K. Stubbs, and Alexander B. Penrose, both of Deal, all of England, assignors to Pfizer Inc., New York, N.Y.  
Division of Ser. No. 738,382, Nov. 2, 1976, Pat. No. 4,076,817.

This application Jul. 1, 1977, Ser. No. 812,172

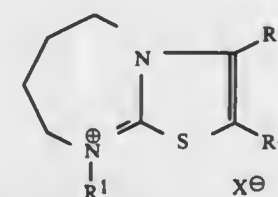
Claims priority, application United Kingdom, Nov. 5, 1975, 45961/75; Nov. 5, 1975, 45962/75

Int. Cl.<sup>2</sup> C07D 513/04

U.S. Cl. 260—306.7 T

9 Claims

1. A compound of the formula:



wherein X<sup>⊖</sup> is a pharmaceutically acceptable anion; R<sup>1</sup> is an alkyl group having from 10 to 20 carbon atoms; when taken separately, each of R<sup>2</sup> and R<sup>3</sup> is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, phenyl and phenyl substituted by up to two members which may be the same or different and are selected from the group consisting of fluoro, chloro, bromo, hydroxy, alkyl having from one to three carbon atoms, alkoxy having from one to three carbon atoms, cyano, nitro and trifluoromethyl, and when R<sup>2</sup> and R<sup>3</sup> are taken together they form a tetramethylene group.

4,162,254

## BENZOXAZOLE ULTRAVIOLET STABILIZERS

Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.  
Division of Ser. No. 745,717, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 484,845, Jul. 1, 1974, abandoned. This application Oct. 12, 1977, Ser. No. 841,264

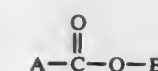
Int. Cl.<sup>2</sup> C07D 263/54

U.S. Cl. 260—307 D

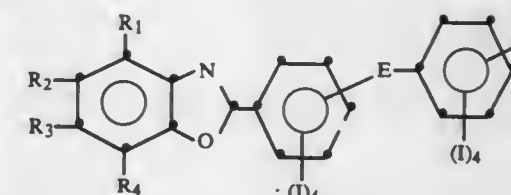
28 Claims

1. A composition of matter having the formula

(II)



wherein A is a member having the formula:



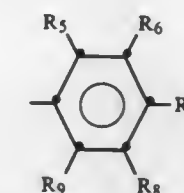
wherein

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are hydrogen, chloro, bromo, lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy, cyano and the substituents R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, and R<sub>3</sub> and R<sub>4</sub> combined with the carbon atoms to which they are attached are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>;

I is the same as R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> and is present on all positions of the benzenoid ring, except the carbon atoms attached to the heterocyclic substituent and the carbon atom attached to the E group, said E group is attached to the benzenoid ring in either the meta or para position from the carbon atom connected to the heterocyclic substituent; and

E is a member selected from the group consisting of, lower alkyloxy, oxy-lower alkyl and oxy;

B is a group having the formula



wherein at least one R<sub>5</sub> or R<sub>9</sub> is hydrogen and the other R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> and R<sub>9</sub> are hydrogen, lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy, hydroxy, carboalkoxy, nitrile, chloro, bromo and the substituents R<sub>5</sub> and R<sub>6</sub>, R<sub>6</sub> and R<sub>7</sub>, R<sub>7</sub> and R<sub>8</sub>, and R<sub>8</sub> and R<sub>9</sub> combined with the carbon atoms to which they are attached are joined alkylene groups completing a carbocyclic ring which can be substituted with any of the substituents listed above for R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> and R<sub>9</sub>.

4,162,255

PROCESS FOR EXTRACTING ARISTOLOCHIC ACIDS  
Rolf Madaus, Köln-Bruck, and Klaus Gorler, Bensberg-Refrath, both of Fed. Rep. of Germany, assignors to Dr. Madaus & Co., Cologne, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 843,004

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646545

Int. Cl.<sup>2</sup> C07D 317/44

U.S. Cl. 260—340.5 R

17 Claims

1. Process for obtaining aristolochic acids from aristolochic plant species by alkaline extraction, comprising:

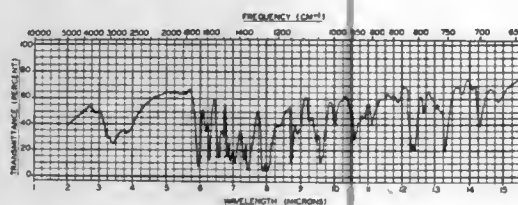
- extracting the aristolochic plant species in slightly alkaline medium comprising an aqueous solution of a secondary or tertiary alkali phosphate or an aqueous sodium bicarbonate solution;
- acidifying the extract with a mineral acid to a pH of 5 to 3;

- (c) dissolving the precipitate in an ester of an aliphatic carboxylic acid of 1 to 10 carbon atoms of an alcohol of 1 to 10 carbon atoms, and filtering off insoluble components;
- (d) extracting the obtained solution with aqueous alkali;
- (e) acidifying the extract with a mineral acid to a pH value of 5 to 3; and

(f) recrystallizing the precipitated aristolochic acids.

17. Process as claimed in claim 1 wherein the aristolochic plant species is *Radix aristolochia clematidis* and the process is carried out by

- (a) extracting *Radix aristolochia clematidis* with about 0.06 molar aqueous sodium phosphate solution;



- (b) acidifying the resulting extract with diluted sulfuric acid, hydrochloric acid or phosphoric acid to a pH value of about 4.0;
- (c) dissolving the precipitate in ethylacetate and filtering off insoluble components from the extract;
- (d) extracting the obtained solution with 0.1 N aqueous sodium hydroxide solution;
- (e) acidifying the extract with dilute sulfuric acid to a pH value of 4.0; and
- (f) separating the precipitated product and recrystallizing same from a solution of N,N-dimethyl formamide containing, in an amount of 20% based on the N,N-dimethyl formamide used, a mixture of methanol/ethyl acetate (2:1).

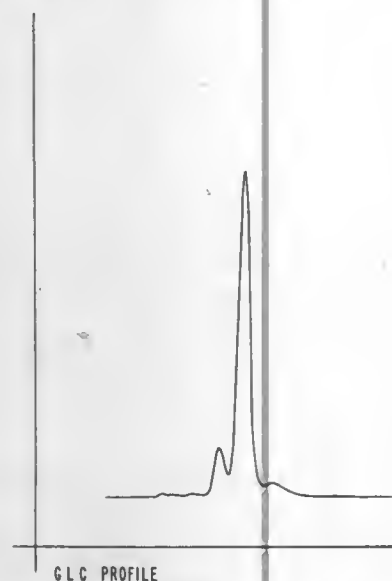
#### 4,162,256 PROCESS FOR THE PRODUCTION OF COMPOUNDS USEFUL IN PERFUMERY

Mark A. Sprecker, Sea Bright, and Ernst T. Theimer, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

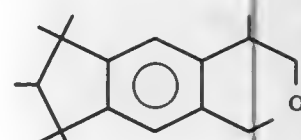
Filed Apr. 19, 1978, Ser. No. 897,903  
Int. Cl.<sup>2</sup> C07D 311/04; C07C 49/76

U.S. Cl. 260—345.2

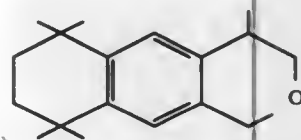
7 Claims



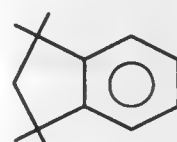
1. A process for preparing an isochroman derivative having a structure selected from the group consisting of



and



comprising the steps of reacting a hydrocarbon reactant which is an indane or tetrahydronaphthalene derivative having a structure selected the group consisting of:



and



with propylene oxide in the presence of a solvent consisting essentially of at least one aliphatic saturated C<sub>5</sub>-C<sub>10</sub> hydrocarbon, said, aliphatic saturated hydrocarbon being halogen-free, at a temperature between -20° C. and -5° C. in the presence of an aluminum chloride catalyst; the weight ratio of the aliphatic saturated hydrocarbon to the indane or tetrahydronaphthalene derivative being from 1:10 up to 10:1; the mole ratio of aluminum chloride to propylene oxide being from 1:1 up to 2:1; the mole ratio of indane or tetrahydronaphthalene derivative to propylene oxide being from 1:1 up to 10:1; followed by addition of a lower C<sub>1</sub>-C<sub>6</sub> alkanol at a temperature of -20° C. to 0° C.; the mole ratio of aluminum chloride to C<sub>1</sub>-C<sub>6</sub> alkanol being from 2:1 up to 1:2; followed by addition at a temperature of from 20° C. up to 80° C. of a formaldehyde equivalent having the structure:



wherein R'<sub>11</sub> represents C<sub>1</sub> to C<sub>6</sub> alkyl, or paraformaldehyde; and then quenching the resulting reaction mass by pouring it into water.

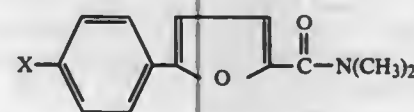
4,162,257  
N,N-DIMETHYL-5-PHENYL-2-FURAMIDES  
Stanford S. Pelosi, Jr., and Chia-Nien Yu, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,862  
Int. Cl.<sup>2</sup> C07D 307/68

U.S. Cl. 260—347.3

3 Claims

1. A compound of the formula:



wherein X represents amino or chloro.

#### 4,162,258 NOVEL COMPOUNDS SPIRO[5-ISOPROPYLBICYCLO[3.1.0]HEXANE-2,2'-OXIRANES], PROCESS FOR THE PRODUCTION OF THE NOVEL COMPOUNDS, AND PROCESS FOR THE PRODUCTION OF SABINENE HYDRATES THEREFROM

Moriaki Higo, Hiratsuka; Haruhiko Toda, Minami-ashigara; Kunitomo Suzuki, Yamanishi, and Yasukuni Nishida, Odawara, all of Japan, assignors to The Lion Dentrifrice Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,337

Claims priority, application Japan, Apr. 6, 1977, 52/39199; Jun. 6, 1977, 52/66567; Jun. 6, 1977, 52/66568; Jun. 16, 1977, 52/71396; Sep. 29, 1977, 52/117160

Int. Cl.<sup>2</sup> C07D 303/04

U.S. Cl. 260—348.11

3 Claims

1. Spiro[5-isopropylbicyclo[3.1.0]hexane-2,2'-oxiranes].

4,162,259  
FUSIDIC ACID DERIVATIVES  
Welf von Daehne, Rungsted Kyst, and Poul R. Rasmussen, Frederikssund, both of Denmark, assignors to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske fabrik Produktionsaktienselskab), Ballerup, Denmark  
Continuation of Ser. No. 744,978, Nov. 24, 1976, Pat. No. 4,100,276. This application May 16, 1978, Ser. No. 906,664  
Claims priority, application United Kingdom, Dec. 3, 1975, 49714/75; Apr. 20, 1976, 16015/76

Int. Cl.<sup>2</sup> A61K 31/56; C07J 9/00

U.S. Cl. 260—397.1

9 Claims

1. 3α,11α-dihydroxy-16β-(2'-methoxyphenyl) thiofusida-13(17),24-dien-21-oic acid and pharmaceutically acceptable, non-toxic salts or easily hydrolysable esters thereof.

#### 4,162,260 OIL PURIFICATION BY ADDING HYDRATABLE PHOSPHATIDES

Jacobus C. Segers, Nieuwerkerk aan de IJssel, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,720

Claims priority, application United Kingdom, Sep. 10, 1976, 37643/76

Int. Cl.<sup>2</sup> C11B 3/04; C09F 5/10

U.S. Cl. 260—424

22 Claims

1. A process for removing impurities from triglyceride oils comprising admixing a hydratable phosphatide with said oils and separating from said oil said phosphatide together with impurities of the oil by any conventional degumming process.

14. Process according to claim 1, in which after the addition of the phosphatide and before the degumming with water an acid or anhydride is added.

#### 4,162,261 NOVEL SOLVENTS FOR THE CATALYTIC PROCESS FOR MAKING POLYHYDRIC ALCOHOLS

Leonard Kaplan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 727,646, Sep. 29, 1976, abandoned. This application Sep. 13, 1977, Ser. No. 832,384

Int. Cl.<sup>2</sup> C07C 27/06

U.S. Cl. 260—449 L

9 Claims

1. In the process which comprises making alkane polyols by reacting hydrogen and oxides of carbon in a solvent solution containing a rhodium carbonyl complex the improvement which comprises employing as a solvent a crown ether consisting essentially of carbon, hydrogen and oxygen.

#### 4,162,262 PROCESS FOR PRODUCING TWO-CARBON ATOM COMPOUNDS FROM SYNTHESIS GAS WITH MINIMAL PRODUCTION OF METHANOL

Paul C. Ellgen, Saint Albans, and Madan M. Bhasin, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 669,480, Mar. 23, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 841,054

Int. Cl.<sup>2</sup> C07C 27/06

U.S. Cl. 260—449 R

8 Claims

1. In a process for the reaction of a synthesis gas containing carbon monoxide and hydrogen in the presence of a hydrogenation catalyst, the improvement for selectively producing two-carbon atom oxygenated hydrocarbon products while minimizing the production of methanol which comprises continuously contacting said synthesis gas with a heterogeneous catalyst comprising rhodium in combination with at least one element selected from the group consisting of thorium and uranium, the mole ratio of uranium and/or thorium to rhodium being at least 1:1000, at reaction conditions such that product efficiencies based on carbon consumption in excess of 10 percent are achieved and ethanol, acetic acid and acetaldehyde are formed in an amount which is at least about 50 weight percent of the two or more carbon atom compounds obtained by the reaction, and the conversion of CO is limited to no more than about one-fourth, whereby the production of methanol is reduced such that the carbon efficiency to methanol is lower than the corresponding carbon efficiency when thorium and uranium are absent from the catalyst, which reaction conditions include a temperature within the range of from about 150°-450° C., a pressure within the range of from about 15-10,000 psig, and a mole ratio of hydrogen to carbon monoxide within the range of from about 20:1 to 1:200.

#### 4,162,263 MANUFACTURE OF ALIPHATIC OR CYCLOALIPHATIC ISOCYANATES

Fritz Zanker, Worms, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,145

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703281

Int. Cl.<sup>2</sup> C07C 118/00

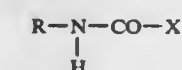
U.S. Cl. 260—453 P

4 Claims

1. A process for the manufacture of an isocyanate of the formula



where R is an aliphatic radical of 1 to 10 carbon atoms or a cycloaliphatic radical of 5 to 12 carbon atoms, which comprises thermally decomposing an aliphatic or cycloaliphatic carbamic acid halide of the formula



(III)

where R has the above meaning and X is halogen, in the presence of an inert organic solvent which has a lower boiling point than that of the resulting isocyanate, in a reaction vessel surmounted by a rectifying unit which is in turn surmounted by a reflux condenser, and under reflux conditions, condensing the resulting isocyanate in the rectifying unit at a temperature above the boiling point of the solvent at the prevailing pressure, removing the hydrogen halide formed during the decomposition through the reflux condenser and condensing the solvent in the reflux condenser.

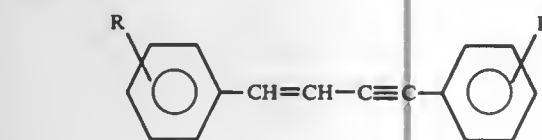


4,162,264  
**PROCESS FOR PREPARING  
 DIPHENYLPHOSPHINYLACETIC ACID HYDRAZIDE**  
 Alexandr I. Razumov, ulitsa Akademika Gubkina, 17, kv. 34;  
 Raisa I. Tarasova, ulitsa 8 Marta, 2, kv. 28; Valentina G.  
 Nikolaeva, ulitsa Kurchatova, 4, kv. 66, and Rimma L.  
 Yafarova, ulitsa Zhdanova, 66, kv. 62, all of Kazan, U.S.S.R.  
 Filed Oct. 5, 1977, Ser. No. 839,554  
 Int. Cl.<sup>2</sup> C07C 102/00

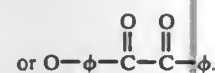
U.S. Cl. 260—558 H 7 Claims  
 1. A process for preparing diphenylphosphinylacetic acid hydrazide comprising reacting diphenylchlorophosphine with ethylene oxide in a medium of an inert organic solvent, heating the reaction mixture in the presence of an alkyl ester of a haloacetic acid to the formation of an alkyl ester of diphenylphosphinylacetic acid, and reacting the alkyl ester of diphenylphosphinylacetic acid with hydrazine hydrate.

4,162,265  
**AROMATIC ENYNE COMPOUNDS AND THEIR  
 SYNTHESIS**  
 Fred E. Arnold, Centerville; Bruce A. Reinhardt, New Carlisle,  
 and Frederick L. Hedberg, Xenia, all of Ohio, assignors to The  
 United States of America as represented by the Secretary of  
 the Air Force, Washington, D.C.  
 Filed Sep. 27, 1978, Ser. No. 946,290  
 Int. Cl.<sup>2</sup> C07C 87/52, 49/76, 39/18

U.S. Cl. 260—578 4 Claims  
 1. A difunctional aromatic enyne compound having the following formula:



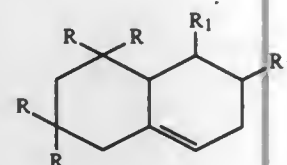
in which R is NH<sub>2</sub>, OH



4,162,266  
**TRIMETHYL-ACETYL OCTALINS, PROCESS FOR  
 MAKING AND FRAGRANCE COMPOSITIONS  
 CONTAINING SAME**  
 Daniel Helmlinger, Dübendorf, and Peter Naegeli, Wettingen,  
 both of Switzerland, assignors to Givaudan Corporation, Clif-  
 ton, N.J.

Filed Jun. 14, 1976, Ser. No. 695,349  
 Claims priority, application Switzerland, Jun. 25, 1975,  
 8251/75

Int. Cl.<sup>2</sup> C07C 49/61  
 U.S. Cl. 260—586 F 2 Claims  
 1. An amber aroma-possessing mixture of compounds of the general formula



wherein three of the R-symbols represent methyl groups and the fourth R-symbol represents a hydrogen atom and one of the R<sub>1</sub>-symbols represents a hydrogen atom and the other R<sub>1</sub>-symbol represents an acetyl group.

4,162,267  
**PRODUCTION OF CYCLOHEXANONE**  
 William B. Fisher, and Jan F. Van Peppen, both of Chester, Va.,  
 assignors to Allied Chemical Corporation, Morris Township,  
 Morris County, N.J.  
 Filed Jun. 22, 1978, Ser. No. 918,134  
 Int. Cl.<sup>2</sup> C07C 27/00, 29/20, 45/00

U.S. Cl. 260—586 P 10 Claims  
 1. A controlled process for preparation of cyclohexanone by liquid phase, catalytic hydrogenation of phenol in 2 to 8 hydrogenation stages by using a sodium-promoted palladium-on-carbon catalyst at a temperature of 135° C. to 184° C. and correlating a predetermined mole ratio of phenol to cyclohexanone with a predetermined maximum temperature in each of the hydrogenation stages, whereby intrinsic safety of operation is achieved by operating at temperatures at or below the atmospheric boiling point in each reactor, said process being further characterized by use of a hydrogenation gas comprising hydrogen and nitrogen and recycling unreacted gas to the reaction to promote flashing overhead of product cyclohexanone, at least part of the unreacted gas being cooled to cryogenic temperatures prior to recycling to remove excess inerts from the system.

4,162,268  
**PROCESS FOR PREPARING DIACETYL BENZENE**  
 Tetsuya Miyake; Kohji Noguchi, and Kohichi Fujimoto, all of  
 Kawasaki, Japan, assignors to Asahi Kasei Kogyo K.K.,  
 Osaka, Japan  
 Filed Oct. 6, 1977, Ser. No. 840,073  
 Claims priority, application Japan, Oct. 22, 1976, 51-126188  
 Int. Cl.<sup>2</sup> C07C 45/04

U.S. Cl. 260—592 17 Claims  
 1. A process for preparing diacetylbenzene using a liquid phase oxidation reaction which comprises contacting a heterogeneous mixture of (A) about 98 to about 25 percent by volume of an organic liquid phase containing at least one compound selected from the group consisting of diethylbenzene and ethylacetophenone and (B) about 2 to about 75 percent by volume of an aqueous liquid phase containing, as a catalyst, at least about 0.01 mol/l of at least one water-soluble salt selected from the group consisting of the acetates, propionates, sulfates, nitrates and chlorides of manganese (II), cobalt (II), nickel (II), chromium (III), copper (II) and iron (III) and having a pH of about 1 to about 6 with a molecular oxygen-containing gas at a temperature of about 100° C. to about 180° C. under a pressure of about 1 to about 50 Kg/cm<sup>2</sup> to effect liquid phase oxidation reaction; separating the resulting reaction mixture into the aqueous liquid phase and the organic liquid phase; and recovering diacetylbenzene from the separated organic liquid phase by distillation.

4,162,269  
**PURIFICATION PROCESS FOR  
 3-PHENOXYBENZALDEHYDE**  
 Masato Mizutani, Takarazuka; Akio Higo, Osaka; Nobuo  
 Ohno, Toyonaka, and Hajime Hirai, Nishinomiya, all of  
 Japan, assignors to Sumitomo Chemical Company, Limited,  
 Osaka, Japan  
 Filed Aug. 16, 1977, Ser. No. 825,154  
 Claims priority, application Japan, Aug. 20, 1976, 51/100040  
 Int. Cl.<sup>2</sup> C07C 45/24

U.S. Cl. 260—600 R 3 Claims  
 1. A process of purifying 3-phenoxybenzaldehyde which comprises reacting crude 3-phenoxybenzaldehyde with an alkali metal or ammonium bisulfite or a metabisulfite in the presence of an organic quaternary ammonium salt, an inorganic acid salt of organic tertiary amines or a macrocyclic polyether as a catalyst, isolating the resulting 3-phenoxybenzaldehyde bisulfite adduct, and decomposing it by using an acid or a base or by heating, wherein the molar ratio of the catalyst to 3-phenoxybenzaldehyde is from 0.001 to 0.3,

wherein the molar ratio of the alkali metal or ammonium bisulfite to 3-phenoxybenzaldehyde is from 1.0 to 1.5 and the molar ratio of the metabisulfite to 3-phenoxybenzaldehyde is from 0.5 to 0.75, wherein the reaction temperature is 0° to 80° C., and wherein the reaction medium is water or a mixture of water and a difficulty water-soluble solvent containing neither ketone group nor aldehyde group, wherein the organic quaternary ammonium salt has the formula R<sub>1</sub>R<sub>2</sub>R<sub>3</sub>R<sub>4</sub>NX in which R<sub>1</sub> is a straight-chain or branched alkyl having 1 to 20 carbon atoms, phenyl, benzyl or 3-phenoxybenzyl, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are a straight-chain or branched alkyl having 1 to 12 carbon atoms which may be the same or different and X is halogen or hydroxyl; wherein the organic acid salt of the organic tertiary amine is a hydrochloride, hydrobromide, sulfate, nitrate, sulfite bisulfate, or bisulfite of triethylamine, trimethylamine, triethanolamine, N-methylpyrrolidine, or triethylenediamine; and wherein the macrocyclic polyether is 2,3,11,12-dibenzo-1,4,7,10,13,16-hexaoxacyclooctadeca-2,11-diene(dibenzo-18-crown-6), 2,3,11,12-dicyclohexyl-1,4,7,10,13, 16-hexaoxacyclooctadecane(dicyclohexyl-18-crown-6), 4,7,13,18-tetraoxa-1,10-diazabicyclo[8,5,5]icosane, 4,7,13,16,21-pentaoxa-1,10-diazabicyclo[8,8,5]tricosane, 4,7,13,16,21,24-hexaoxa-1,10-diazabicyclo[8,8,8]hexacosane, or 5,6-benzo-4,7,13,16,21, 24-hexaoxa-1,10-diazabicyclo[8,8,8]-hexacosane.

4,162,270  
**PROCESS FOR PRODUCING  
 4,4'-DIHYDROXYDIPHENYLSULFONE OF HIGH  
 PURITY**  
 Eiji Ogata; Koji Ono, and Shoji Nakagaki, all of Wakayama,  
 Japan, assignors to Konishi Chemical Industry Co., Ltd.,  
 Wakayama, Japan  
 Continuation-in-part of Ser. No. 771,546, Feb. 24, 1977,  
 abandoned. This application Apr. 14, 1978, Ser. No. 896,611  
 Int. Cl.<sup>2</sup> C07C 147/10

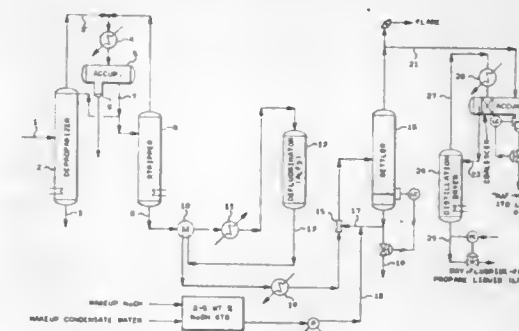
U.S. Cl. 260—607 AR 3 Claims  
 1. A process for producing 4,4'-dihydroxydiphenyl sulfone of extremely high purity which comprises the steps of reacting phenol with sulfuric acid in a solvent inert to the reactants under refluxing while separating off the water produced by the reaction until at least about 80% of the water to be produced is removed from the reaction system, and then removing said solvent progressively and finally substantially completely from the reaction system while maintaining the reaction mixture at a temperature of 160° to 200° C. throughout the solvent removal to effect isomerization of 2,4'-dihydroxydiphenylsulfone to 4,4'-dihydroxydiphenyl sulfone.

4,162,271  
**SELECTIVE HYDROGENATION OF  
 CYCLOPENTADIENE TO FORM CYCLOPENTENE  
 USING RANEY NICKEL CATALYST AND ALCOHOLS  
 BOILING ABOVE 95° C. IN THE REACTION MIXTURE**  
 Lawson G. Wideman, Akron, Ohio, assignor to The Goodyear  
 Tire & Rubber Company, Akron, Ohio  
 Filed Nov. 11, 1977, Ser. No. 850,576  
 Int. Cl.<sup>2</sup> C07C 5/02

U.S. Cl. 585—274 5 Claims  
 1. In a process for the preparation of cyclopentene which comprises selectively hydrogenating cyclopentadiene in the liquid phase by contacting cyclopentadiene with hydrogen in the presence of a hydrogenation catalyst comprising a highly dispersed form of nickel selected from the group comprising Raney nickel or a modified Raney nickel the improvement comprising using an alcohol boiling above 99° C. as the reaction medium and in which the volume ratio of alcohol to cyclopentadiene ranges from 1/1 to 10/1.

4,162,272  
**SAFER PRODUCTION OF DRY LIQUID PROPANE  
 SUBSTANTIALLY FREE FROM HF AND ORGANIC  
 FLUORIDE**  
 Lucien H. Vautrain, Sweeny, Tex., assignor to Phillips Petro-  
 leum Company, Bartlesville, Okla.  
 Filed Jan. 10, 1978, Ser. No. 868,363  
 Int. Cl.<sup>2</sup> C07C 9/14

U.S. Cl. 62—24 4 Claims

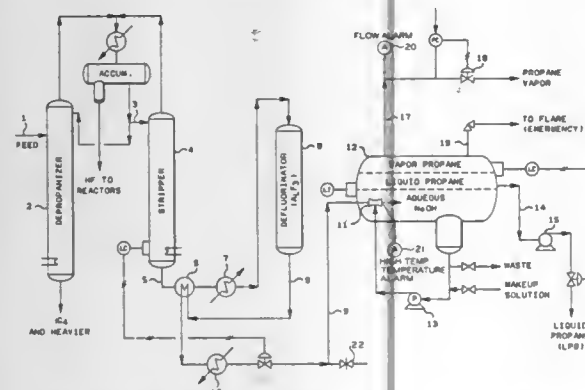


1. A process for the production of a liquid propane substantially free from organic fluoride, hydrogen fluoride and water, in a safe manner, the steps which comprise obtaining a stream of propane in a depropanizing zone wherein a hydrocarbon stream containing propane is fractionated to obtain said propane stream, passing the propane-containing stream to an HF stripping zone to strip HF from said propane stream, heating the liquid propane stream separated from said HF stripping zone to a temperature at which organic fluorides contained therein can be decomposed in a defluorinating zone, containing aluminum fluoride, passing said heated propane stream to said defluorinating zone, to break up organic fluorides to form HF in said propane stream, cooling said defluorinated propane stream and passing same into a mixing section, which is relatively small compared with the volume of a settling zone in which the phases are to be settled and separated, into a contact with a flowing stream of aqueous sodium hydroxide solution having a concentration of not over about 5 percent by weight sodium hydroxide to neutralize hydrogen fluoride, forming sodium fluoride, and immediately passing the thus contacted mixture into said settling zone, recovering from said settling zone a propane phase and drying said propane phase to obtain said liquid propane substantially free from HF, organic fluorides and water.

4,162,273  
**ALKALINE TREATMENT OF LIQUID PROPANE  
 CONTAINING HF**  
 Frank W. Skraba, Sweeny, Tex., assignor to Phillips Petroleum  
 Company, Bartlesville, Okla.  
 Filed Jan. 10, 1978, Ser. No. 868,364  
 Int. Cl.<sup>2</sup> C07C 9/14; C10G 19/02

U.S. Cl. 585—854 6 Claims  
 1. In the treatment of propane-containing stream resulting from an alkylation operation in which HF catalyst is employed and in which said stream has been subjected to an HF stripping to remove HF therefrom and to a defluorination step to decompose organic fluorides to form HF, the invention which

comprises admixing said stream with a small portion of an aqueous alkaline treating agent in a mixing section to neutralize



HF, said section being at a locus within a relatively large body of said treating agent.

4,162,274

#### CROSSLINKABLE URETHANE RESINS CONTAINING VINYL AND CARBOXYL GROUPS

Hans J. Rosenkranz, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Dec. 10, 1976, Ser. No. 749,454

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557408

Int. Cl.<sup>2</sup> C08L 63/10

U.S. Cl. 528—75

6 Claims

1. A product produced by the steps of reacting (a) a polyepoxide having more than one 1,2-epoxide group per molecule with at least one unsaturated acid selected from the group consisting of acrylic acid and methacrylic acid until 60 to 100 mol% of the 1,2-epoxide groups are converted into  $\beta$ -hydroxy acrylic or methacrylic acid ester groups, (b) reacting 30 to 90 mol% of the hydroxy groups of said  $\beta$ -hydroxy ester groups with an isocyanate to form urethane groups and (c) reacting 10 to 70 mol% of the hydroxy groups of said  $\beta$ -hydroxy ester groups with a cyclic dicarboxylic acid anhydride to form acid semiester groups.

4,162,275

#### FLAME-RESISTANT FIBER

Gordon M. Moulds, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 383,038, Jul. 26, 1973, abandoned. This application Jun. 17, 1977, Ser. No. 807,736

Int. Cl.<sup>2</sup> C08L 61/10, 61/28, 77/10; D01F 11/08

U.S. Cl. 525—428

6 Claims

1. A fiber comprising poly(metaphenylene isophthalamide) containing distributed substantially throughout its whole interior finely divided deposits comprised of a tetrakis hydroxymethyl phosphonium compound cross-linked to a reactive resin selected from the group of melamine formaldehyde condensates and phenol formaldehyde condensates in an amount sufficient to provide at least 0.4% by weight phosphorus, based on the total weight of fiber, the phosphonium compound and the reactive resin having been absorbed into water-swollen, never dried poly(metaphenylene isophthalamide) fibers before cross-linking.

4,162,276

#### NONBURNING, NON-DIPPING POLYURETHANE COMPOSITIONS

Yong S. Rim, Woodbridge, and Walter Nudenberg, Newtown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.  
Filed May 1, 1978, Ser. No. 901,874

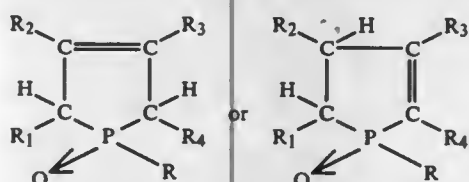
Int. Cl.<sup>2</sup> C08K 5/34, 5/53; C08L 75/04

U.S. Cl. 525—2

14 Claims

1. A flame-retarded non-drip polyurethane composition comprising:

- a polyurethane elastoplastic polymer;
- about 3 to about 25 parts by weight per 100 parts by weight of polymer of a hexaalkoxymethylmelamine;
- about 5 to about 25 parts by weight per 100 parts by weight of polymer of (1) a non-polymeric organic halogen compound wherein the compound is selected from the group consisting of chlorine and/or bromine containing aliphatic, aromatic and alicyclic compounds having a halogen content of about 35% to about 80% by weight said compound being substantially non-volatile and non-reactive toward the polyurethane polymer or (2) a polymer selected from the group consisting of polyvinylchloride, neoprene and chlorinated polyethylene; and
- about 3 parts to about 20 parts by weight per 100 parts by weight of polyurethane polymer of a P-substituted phosphacyclopentene-1-oxide having the general formula:



wherein R is C<sub>1</sub>-C<sub>4</sub> alkyl, phenyl or phenyl substituted with bromine or chlorine and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>4</sub> alkyl, phenyl, chlorine or bromine.

4,162,277

#### THERMOPLASTIC RESINS WITH POLYINDENE OR COUMARONE-INDENE RESIN

George S. Li, Aurora, and Irving Rosen, Warrensville Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 816,245, Jul. 18, 1977, Pat. No. 4,117,040, which is a continuation of Ser. No. 644,122, Dec. 24, 1975, Pat. No. 4,066,717. This application May 24, 1978, Ser. No. 909,323

Int. Cl.<sup>2</sup> C08L 69/00

U.S. Cl. 525—146

1 Claim

1. A composition having improved physical properties comprising a blend of (A) 100 parts by weight of a commercially available thermoplastic synthetic resin and (B) from 1 to 50 parts by weight of a member selected from the group consisting of polyindene and a coumarone-indene resin.

4,162,278

#### FLAME RETARDANT POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING A PENTAERYTHRITYL PHOSPHONATE

Albrecht H. Granzow, Franklin Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

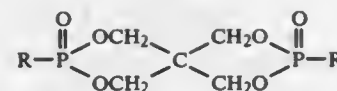
Filed Apr. 28, 1978, Ser. No. 900,827

Int. Cl.<sup>2</sup> C08L 51/00, 53/00

U.S. Cl. 525—2

9 Claims

1. A flame retardant polyphenylene ether resin/rubber-modified, high-impact polystyrene thermoplastic composition comprising an effective flame retarding amount of a pentaerythrityl phosphonate compound represented by the formula:



wherein R is methyl, phenyl, benzyl, or mono-, di- or trimethylbenzyl.

4,162,279

#### PHOSPHONOXYCARBOXAMIDES

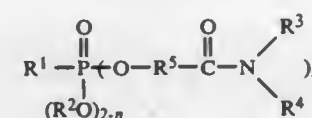
Edward N. Walsh, New City, and Ralph B. Fearing, Bardonia, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 28, 1977, Ser. No. 837,072

Int. Cl.<sup>2</sup> C07F 9/11, 9/40

U.S. Cl. 260—943

1. A compound of the formula



wherein R<sup>1</sup> and R<sup>2</sup> are selected from the group consisting of aryl and alkyl having from 1-6 carbon atoms and may be the same or different; R<sup>3</sup> represents hydrogen or —CH<sub>2</sub>OH; R<sup>4</sup> represents hydrogen, —CH<sub>3</sub>, —CH<sub>2</sub>OH, or —C<sub>2</sub>H<sub>4</sub>OH, R<sup>5</sup> represents —CH<sub>2</sub>—, and n represents 1 or 2.

4,162,280

#### PREPARATION OF PHOSPHORYLATED AMIDINES

Eckart Kranz, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Mar. 17, 1978, Ser. No. 887,899

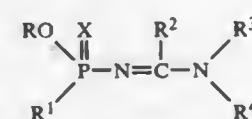
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715933

Int. Cl.<sup>2</sup> C07F 9/24

U.S. Cl. 260—968

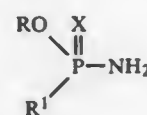
9 Claims

1. A process for the preparation of a phosphorylated amidine of the formula

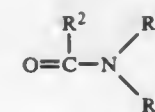


in which

R is alkyl or aryl,  
R<sup>1</sup> is alkyl, alkoxy, alkylthio, alkenylthio, aralkylthio, mono- or di-alkylamino, dialkenylamino, halogenoalkoxy or phenyl,  
R<sup>2</sup> is hydrogen, alkyl or aryl,  
R<sup>3</sup> and R<sup>4</sup> each independently is alkyl or alkenyl or R<sup>3</sup> and R<sup>4</sup>, with the nitrogen atom to which they are attached, form a heterocyclic ring which can optionally be interrupted by a further hetero-atom, and  
X is oxygen or sulphur,  
which comprises reacting a phosphoric acid ester-amide of the formula



with a carboxamide of the formula



at a temperature between about 0° and 50° C. in the presence of a member selected from the group consisting of dimethyl sulphate, diethyl sulphate, thionyl chloride, phosgene, phosphorus oxytrichloride, phosphorus oxytribromide, phosphorus pentachloride, zinc chloride, acetic anhydride and a formylation Vilsmeier's aldehyde synthesis catalyst, and then reacting the mixture with a base.

4,162,281

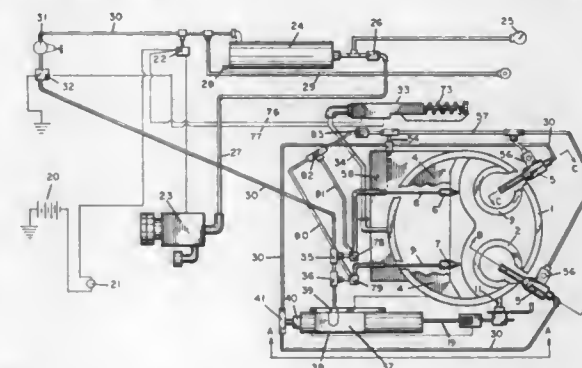
#### CARBURETOR FUEL ATOMIZATION APPARATUS

Robert E. Ingraham, 13 Hampstead Rd. Box 696, South Danville, N.H. 03881

Continuation-in-part of Ser. No. 783,001, Mar. 30, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,474  
Int. Cl.<sup>2</sup> F02M 69/08

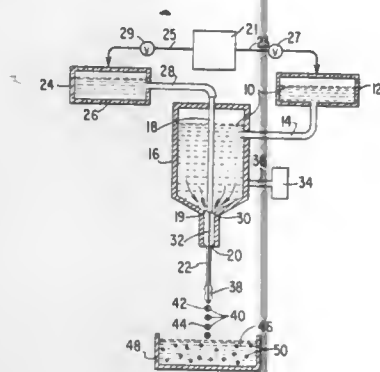
U.S. Cl. 261—30

5 Claims





periodically disturbing said liquid jet to separate said liquid jet including said core and said sheath liquids into unconnected uniform droplets containing a uniform amount of said core liquid, said sheath liquid and said disbursed material;



applying like-repelling charges to each of said uniform droplets; and  
forming uniformly sized particles from said uniform droplets.

4,162,283

**METHOD OF MELTING MAGNETICALLY WEAK PARTICLES OF ARBITRARY SHAPE INTO SUBSTANTIALLY SPHERICALLY-SHAPED GLOBULES**  
Werner J. Borer, Flurlingen; Tibor Kugler, Thayngen, and Tomas Zuzak, Feuerthalen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 24, 1978, Ser. No. 871,951

Claims priority, application Switzerland, Dec. 8, 1977, 15045/77

Int. Cl.<sup>2</sup> B29C 23/00

U.S. Cl. 264—15

10 Claims

1. A method for re-shaping relatively magnetically weak ferrite particles of arbitrary shapes so as to form substantially spherically-shaped globules comprising:

- (A) transporting said particles by means of a first carrier gas stream within a conduit;
- (B) separating said particles in said first carrier gas stream from said first carrier gas stream;
- (C) feeding said separated particles into a second warm gas stream having a relatively hot region and a relatively cool region;
- (D) melting said particles in said relatively hot region of said warm gas stream;
- (E) passing said melted particles to said cool region of said warm gas stream wherein said particles solidify into substantially spherically-shaped globules; and
- (F) discharging said solidified globules from said second warm gas stream.

4,162,284

**METHOD OF PRODUCING MECHANICALLY STRONG PELLETS FROM NON-OXIDIZABLE METAL OXIDES**  
Erik Q. Dahl, Vågsbygd, Norway, assignor to Elkem-Spilgerverket A/S, Oslo, Norway

Continuation of Ser. No. 610,135, Sep. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 453,319, Mar. 21, 1974, abandoned. This application Mar. 9, 1977, Ser. No. 775,696

Int. Cl.<sup>2</sup> C04B 35/04

U.S. Cl. 264—66

5 Claims

1. A process for the preparation of pellets from non-oxidizable metal oxides consumably utilizable in smelting processes from non-oxidizable metal oxides which pellets are for introduction into a smelting furnace during its operation comprising forming pellets from a composition consisting essentially of one or more non-oxidizable metal oxides consumably utilizable

in smelting processes admixed with water and a carbon-containing material, the carbon-containing material being present in an amount of from at least about 0.5% carbon by weight to about 2.5% carbon by weight of non-oxidizable metal oxide, whereby the temperature of the pellets is maintained below the level at which undesirable sintering together of the pellets into lumps may result and thereafter sintering the pellets in a shaft furnace at a maximum shaft furnace temperature of approximately 1400° C. by supplying heat thereto and wherein the carbon-containing material supplies at least part of the heat for the sintering.

4,162,285

**METHOD FOR PRODUCING A CERAMIC HONEYCOMB STRUCTURE HAVING NO CRACKS**  
Isao Tanabashi, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Jun. 6, 1977, Ser. No. 804,160

Claims priority, application Japan, Jun. 10, 1976, 51-67058

Int. Cl.<sup>2</sup> C04B 33/32

U.S. Cl. 264—66

7 Claims

1. A method of producing a crack-free ceramic honeycomb structure having a multiplicity of parallel channels extending therethrough, which comprises:

- compounding ceramic starting material powders, adding a composition of water and a polyhydric alcohol in a mixture ratio by weight of 85:15-5:95 to the ceramic powders and kneading the resulting mixture,
- shaping the mixture into a honeycomb structure by extrusion,
- drying the shaped honeycomb structure at a temperature which evaporates water but does not evaporate the polyhydric alcohol to evaporate water by passing air through the channels of the honeycomb structure, wherein the polyhydric alcohol adjusts the humidity to achieve uniform drying and to alleviate cracking in the drying of the honeycomb structure,
- heating the honeycomb structure at a temperature which evaporates the polyhydric alcohol to evaporate the polyhydric alcohol, and then
- firing the honeycomb structure.

4,162,286

**WET PELLETER HAVING VARIABLE ANNULUS BETWEEN SHELL AND SHAFT**

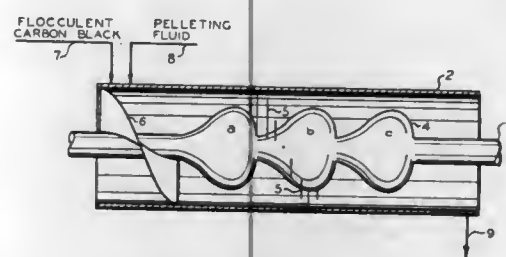
Thomas J. Gunnell, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1978, Ser. No. 870,681

Int. Cl.<sup>2</sup> C09C 1/56

U.S. Cl. 264—117

14 Claims



1. A method for pelleting a mass of particles in a pelleting zone, as with a pelleting fluid to compact and to densify the same in said zone, which comprises in said zone passing said particles and fluid through alternate zones of changing cross-sectional area formed in said zone, thereby subjecting said particles to a series of alternating compressions and decompressions.

4,162,287

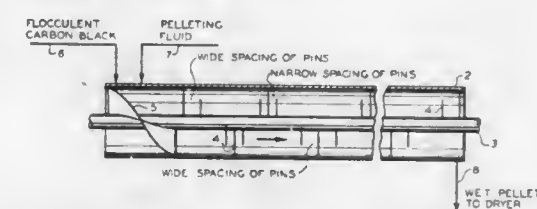
**APPARATUS FOR PELLETING FLOCCULENT PARTICLES**

Thomas J. Gunnell, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1978, Ser. No. 870,682

Int. Cl.<sup>2</sup> C09C 1/56

U.S. Cl. 264—117



1. A method for pelleting a mass of particles, e.g., flocculent carbon black, which comprises subjecting said particles to a compression and decompression by passing said particles through a pelleting zone wherein a helix of tines is arranged to have a variable pitch, the pitch having alternate decreasing and increasing values along the helix, thus, to effect compression and expansion action on the mass in the pelleting.

4,162,288

**MANUFACTURE OF MARBLED DETERGENT BARS**  
Leslie Hunt, Wirral; Ian T. Nicolson, Birkenhead, and Thomas M. Whitfield, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

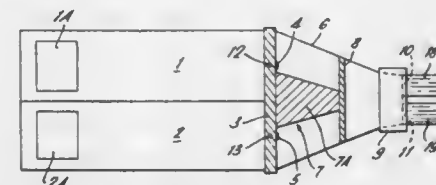
Filed Mar. 21, 1977, Ser. No. 779,774

Claims priority, application United Kingdom, Mar. 26, 1976, 12242/76

Int. Cl.<sup>2</sup> B29F 3/12

U.S. Cl. 264—75

8 Claims



1. A method of injecting a fluid into a detergent mass of a different color to form a product of generally striped or marbled appearance, said method comprising the steps of:

- (a) extruding a detergent mass as two portions each through a respective multi-apertured section of an apertured plate simultaneously into a common extrusion cone;
- (b) injecting fluid of a different color into each of said mass portions concomitantly as said mass portions begin to enter said extrusion cone; and
- (c) advancing said mass portions impregnated with said different colored fluid under extrusion pressure in spaced relation with one another along opposite side surfaces of a partition disposed in said extrusion cone, said opposite side surfaces each being partially conical and cooperating with the interior of said extrusion cone to present two separate chambers through which said fluid-impregnated mass portions are separately extruded respectively.

4,162,289

**FILTER UNIT FOR AVOIDING ENVIRONMENTAL POLLUTION IN CEMETERIES**

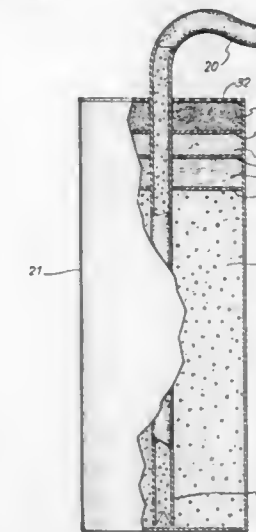
Carlos R. Gomez, and Horst Eller, both of Mexico City, Mexico, assignors to Internacional de Ciencia y Tecnologia, S.A., Mexico City, Mexico

Filed Feb. 25, 1977, Ser. No. 772,046

Int. Cl.<sup>2</sup> B01J 8/04; E04H 13/00; B01D 53/04

3 Claims U.S. Cl. 422—170

4 Claims



1. A filter for removing harmful gases and unpleasant odors from decomposing corpses, said filter comprising an elongated container hermetically sealed at one end and having a perforated inlet extending substantially across the opposite end, an exit duct projecting through said perforated inlet and extending through substantially the entire length of said container to terminate just short of said hermetically sealed end whereby gases entering the container through said perforated inlet end pass through substantially the entire container length before entering the exit duct for passage in the reverse direction for venting to atmosphere, first separator means located within said container and extending around said exit duct and diametrically across said container substantially to isolate a first compartment within said container proximate said perforated inlet end containing inert and porous material to filter large particles and retain the contents of the container in position, second separator means located downstream of the first separator means in the gas flow direction substantially to isolate a second compartment containing oxalic acid to remove amines from the gas flow, third separator means located downstream of the second separator means in the gas flow direction substantially to isolate a third compartment containing a metallic salt selected from the group consisting of copper sulphate, mercuric chloride and lead acetate to remove sulfur components from the gas flow and activated charcoal disposed between said third separator means and said hermetically sealed end of the container to envelop the entrance end of the exit duct and remove remaining unpleasant odorous gases.

4,162,290

**PARALLEL STEAM REFORMERS TO PROVIDE LOW ENERGY PROCESS**

Duffer B. Crawford; Colman L. Becker, and Joseph R. LeBlanc, all of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 743,426, Nov. 19, 1976, Pat. No. 4,079,017.

This application Dec. 29, 1977, Ser. No. 865,559

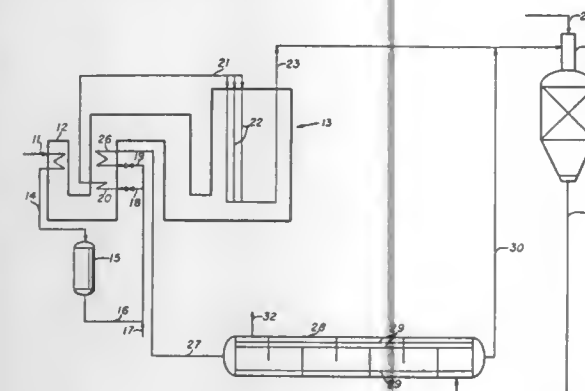
Int. Cl.<sup>2</sup> B01J 8/04, 8/06

U.S. Cl. 422—190

4 Claims

1. A system for the steam reforming of hydrocarbons which comprises:  
(1) in parallel

- (a) a steam reforming furnace having a radiant section, reforming tubes in said radiant section, and means for producing radiant heat, for primary reforming a first mixture of hydrocarbon feed and steam;
- (b) an exchanger-reactor having indirect heat exchange means for primary reforming a second mixture of hydrocarbon feed and steam passing therethrough;
- (2) a secondary reformer;



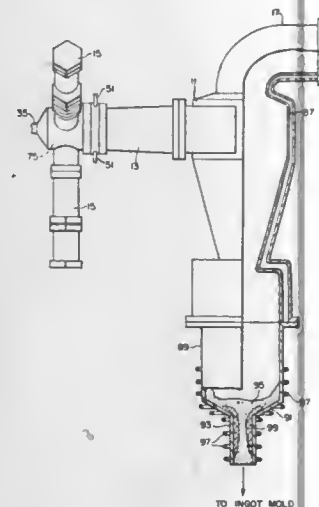
- (3) means for combining the effluents from said steam reforming furnace and said exchanger-reactor, and introducing said combined effluents to said secondary reformer; and
- (4) means for passing the effluent from said secondary reformer to said exchanger-reactor to supply the heat for the primary reforming of said mixture of hydrocarbon feed and steam passing therethrough.

4,162,291

**LIQUID SILICON CASTING CONTROL MECHANISM**  
Frank G. Arcella, Bethel Park; Charles B. Wolf, Irwin, and Maurice G. Fey, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1977, Ser. No. 841,409  
Int. Cl.<sup>2</sup> B01D 57/00; B01J 10/00; C25B 1/02; C22B 4/02  
U.S. Cl. 422—198

6 Claims



1. A liquid silicon casting mechanism comprising an arc heater having spaced cylindrical electrodes forming an arc chamber, means connected to and external of the chamber for forming an electric arc in the space between the electrodes, means connected to and external of the electrodes for injecting gas into the arc chamber through the space to form an arc stream that extends into and downstream of the chamber, means associated with the arc heater for feeding into the arc stream a quantity of a reductant, a plenum chamber connected

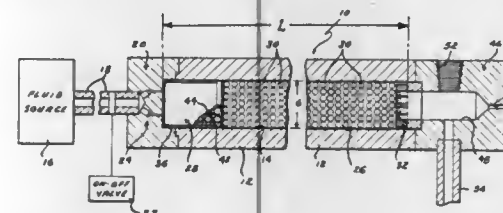
to and communicating with the arc chamber to combine the reductant and the arc stream, means downstream of the arc chamber for introducing a silicon compound into the arc stream in said plenum chamber, a reaction chamber downstream of the plenum chamber for producing a mixture of liquid elemental silicon and a salt of the reductant, means downstream of the reaction chamber for separating the liquid silicon and the salt, a collecting receptacle for the liquid silicon having tap hole means for draining liquid silicon therefrom, and control means associated with the tap hole means for regulating flow of the silicon through said hole means comprising a tubular constricted opening, cooling means for freezing liquid silicon in the tap hole means, and heating means for melting liquid silicon in the tap hole means.

4,162,292

**HIGH PRESSURE HYDRAZINE GAS GENERATOR**  
John A. Speeds, San Jose, Costa Rica, and Robert D. Marcy, Chatsworth, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 20, 1977, Ser. No. 844,082  
Int. Cl.<sup>2</sup> B01J 7/02; F02C 3/24; F02K 7/08  
U.S. Cl. 422—206

9 Claims



1. A high pressure hydrazine thermal bed gas generator comprising a housing, a decomposition chamber situated within said housing, means for introducing liquid hydrazine into said decomposition chamber, a removable initiator pack located within said decomposition chamber, said initiator pack comprising a container having a rupturable vapor barrier constituting at least part of one wall thereof and containing therein material capable of chemically reacting with said liquid hydrazine and producing a high temperature as a result thereof and heat retaining material positioned within said container and adjacent said chemically reacting material, said container being so positioned within said chamber to provide rupture of said vapor barrier by the introduction of said liquid hydrazine, additional heat retaining material located within said decomposition chamber adjacent said initiator pack for maintaining said high temperature generated therein and means located within said housing and operably connected to said decomposition chamber for allowing the expulsion therefrom of gases under extremely high pressure, said gases being generated within said chamber as a result of the decomposition of said liquid hydrazine.

4,162,293

**APPARATUS FOR PREPARATION OF A COMPOUND OR AN ALLOY**

Klaus Zeuch, Eckental, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Continuation of Ser. No. 559,015, Mar. 17, 1975, abandoned.  
This application Dec. 27, 1976, Ser. No. 754,518

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1974, 2414827

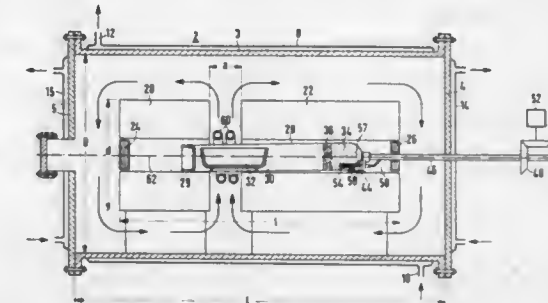
Int. Cl.<sup>2</sup> B01J 17/26

U.S. Cl. 422—247

8 Claims

1. In apparatus for the preparation of a compound or an alloy having one component with a substantially higher vapor pressure than the other using a closed horizontal reaction ampule having its ends disposed in and surrounded by first and second

hollow cylindrical heating ovens with the reaction ampule and ovens arranged within an enclosed pressurized vessel at a pressure in the range of 6 to 35 bar, the ovens being arranged one behind the other in the direction of the axis of the ampule at a predetermined distance from each other, and inductive heating means for heating material disposed within the ampule in a narrow zone in the middle portion between the ovens to a



temperature of about 1500° C. whereby heat is radiated inside the ampule and heats the wall of the ampule at said middle portion, the improvement comprising the ampule having its ends supported within the respective heating ovens and its middle portion between the heating ovens supported only by the rigidity of the ampule itself, and means for intensely cooling the wall of the ampule at said middle portion by convection within said pressurized vessel.

4,162,294

**PROCESS FOR WORKING UP NONFERROUS METAL HYDROXIDE SLUDGE WASTE**

Lothar Witzke, Brühl, and Wolfgang Müller, Mannheim-Rheinau, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany  
Filed Sep. 26, 1978, Ser. No. 945,846

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743812

Int. Cl.<sup>2</sup> C01G 3/10, 37/14, 9/00, 53/10

U.S. Cl. 423—24

6 Claims

1. A process for treating nonferrous metal hydroxide sludge waste which contains chromium, aluminum, copper, zinc, and nickel as nonferrous metals and recovering and separating the nonferrous metals by the consecutive steps of:

- mixing an alkali hydroxide or alkali carbonate with the nonferrous metal sludge waste in at least stoichiometric amounts, based on the chromium content of the waste sludge, drying the mixture at temperatures of less than 200° C. and roasting the dried mass in a current of air at temperatures of 400° to 800° C. for 0.5 to 3 hours, subsequently adding the hot roasted material to water, separating off the alkali chromate formed and washing the water-insoluble residue;
  - treating the residue from step (a) with 10 to 20 weight percent of sulfuric acid at pH values not greater than 2 and at temperatures of 50° to 100° C. for 0.5 to 5 hours, and separating off the acid-insoluble residue from the sulfuric acid solution obtained;
  - separating the copper from this solution by liquid-liquid extraction and working up the copper-free solution by:
    - precipitating and separating the remaining aluminum and chromium(III) portions at pH values of 4 to 6 as hydroxides or basic sulfates and then
    - separating the zinc from the remaining solution by liquid-liquid extraction; and
    - separating the nickel from the remaining solution by liquid-liquid extraction;
- and working up the individual nonferrous metal fractions obtained from steps (c), and (c1), (c2), and (c3) by conventional procedures.

4,162,295

**METHOD FOR PRODUCTION OF ALKALI METAL CHROMATES FROM CHROME ORES**

Somanahalli N. Subbanna, Camillus; Thomas R. Morgan, Solway, and Douglas G. Frick, La Fayette, all of N.Y., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Nov. 14, 1977, Ser. No. 851,230

Int. Cl.<sup>2</sup> C01G 37/14

U.S. Cl. 423—61

14 Claims

1. A method for the manufacture of alkali metal chromates having a low alumina content, which comprises the following steps:

- reacting in a first roasting step a mixture comprising chrome ore, recycled residue from a prior roasting step and alkali metal salt, the amount of alkali metal salt being in the range of from about 35 to 80 percent of the stoichiometric amount required to react with chrome in said mixture, in an oxygen-containing atmosphere at a temperature of from about 900° to 1200° C. for a time period of at least about 30 minutes while maintaining a Bichromate Equivalent to aluminum oxide ratio in said mixture in the range of from about 3.0:1 to 10:1;
- cooling the first roast mixture and leaching said cooled mixture with a leach liquor having a pH between 4.5 and 12.0 to remove the alkali metal chromate values and to form a first roast mix residue;
- recycling at least a portion of said residue to step (a);
- reacting in a second roasting step the remainder of said residue with an additional amount of alkali metal salt, the amount being about 30 to 60 percent of the stoichiometric amount of alkali metal salt required to react with the chrome in said residue, in an oxygen-containing atmosphere at a temperature of from about 900° to 1200° C. for a time period of at least about 45 minutes while maintaining a Bichromate Equivalent to aluminum oxide ratio in the second reaction mixture in the range of from about 1.5:1 to 4:1;
- cooling the resulting second roast mixture and leaching said cooled mixture with a leach liquor having a pH between 4.5 and 12.0 to remove said alkali metal chromate values; and
- recovering alkali metal chromate values removed in steps (b) and (e).

4,162,296

**LIQUID-LIQUID EXTRACTION OF NICKEL**

Wolfgang Müller, Mannheim; Lothar Witzke, Brühl, and Werner Gottfried, Altlussheim, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany  
Filed Jan. 25, 1978, Ser. No. 872,101

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704181

Int. Cl.<sup>2</sup> C01G 51/00

U.S. Cl. 423—139

6 Claims

1. In a method for the liquid-liquid extraction of nickel from aqueous solutions thereof which contain alkali metal ions wherein the aqueous solution is contacted with an organic phase containing an extraction agent, the improvement which comprises the organic phase containing from about 1 to 10 parts by volume of di-2-ethylhexyl phosphoric acid and from about 3 to 30 parts by volume of naphthenic acid, and wherein extraction is carried out by contacting up to four separate volumes of the aqueous solution sequentially with the same organic phase and then stripping the nickel-charged organic phase to produce a nickel containing eluate, and wherein separate extractions are each carried out at a pH in the range from about 6 to 7.5 for a period of less than five minutes each.



# 4,162,297 RECOVERY OF MAGNESIUM CHLORIDE FROM BRINES

André Aubry, Mulhouse, and Michel Bichara, Pfaffstätt-Richwiller, both of France, assignors to Mines de Potasse d'Alsace S.A., Mulhouse, France

Filed Nov. 23, 1977, Ser. No. 854,445

Claims priority, application France, Nov. 25, 1976, 76 35461 Int. Cl.<sup>2</sup> C01F 5/30

U.S. Cl. 423—158

1. A method of separating magnesium chloride from an aqueous brine consisting essentially of water as the solvent having dissolved therein a mixture of metallic chlorides of which magnesium chloride is present in major quantities, and alkali metal chlorides are present in substantial quantities which process comprises adding dioxane to said aqueous brine, thereby forming a magnesium chloride-containing precipitate separating the precipitate from the aqueous brine and then separating the dioxane contained in the precipitate from the precipitate to recover solid magnesium chloride hydrate.

# 4,162,298 METHOD OF IMMOBILIZING CARBON DIOXIDE FROM GAS STREAMS

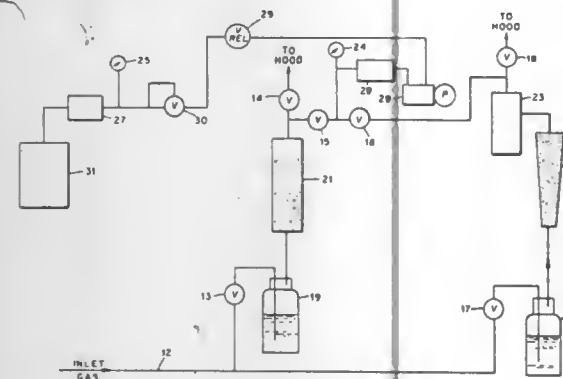
David W. Holladay, Knoxville, and Gary L. Haag, Oliver Springs, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 9, 1978, Ser. No. 932,152

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—230

10 Claims



6. In the operation of an industrial facility which generates an off-gas stream containing carbon dioxide, the method of removing said carbon dioxide comprising:

- providing a bed of particulate barium hydroxide monohydrate,
- directing said stream through said bed while continuously introducing water vapor to said bed in an amount corresponding to from 10 to 100% of the saturation-value for said stream to effect conversion of said bed to barium carbonate, and
- continuously withdrawing the resulting carbon-dioxide-depleted stream from said bed.

# 4,162,299 PROCESS FOR THE REMOVAL OF SULFUR OXIDES

Tetsu Takeyama, Kyoto; Akio Takahashi; Kiichiro Matsumura, both of Otsu, and Keiya Kitagawa, Minoo, all of Japan, assignors to Toray Engineering Co., Ltd., Osaka, Japan

Filed Jan. 4, 1978, Ser. No. 866,855

Int. Cl.<sup>2</sup> C01B 17/00

U.S. Cl. 423—242

4 Claims

1. A process for removing sulfur oxides from a waste gas containing said sulfur oxides, comprising contacting said gas with an aqueous scrubbing solution containing aluminate and at least one additional compound selected from the group

consisting of aluminum sulfate and alum and having a pH of from 2 to 4.5, the concentration of said additional compound in the scrubbing solution being within the range of from 1 to 30% by weight.

# 4,162,300 PRODUCTION OF MADDRELL SALT

Renate Adrian; Raban von Schenck, both of Hurth; Klaus Somme, Heidelberg, and Hermann Weber, Hemsbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Hurth-Knapsack, Fed. Rep. of Germany

Continuation of Ser. No. 786,372, Apr. 11, 1977, abandoned.

This application Sep. 25, 1978, Ser. No. 945,502

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616740

Int. Cl.<sup>2</sup> C01B 15/16, 25/26

U.S. Cl. 423—314

4 Claims

1. A process for making pure Maddrell salt by heating a sodium phosphate to temperatures of 250° to 420° C., which comprises using as the sodium phosphate starting material sodium trimetaphosphate, admixing the starting material, prior to heating it, with 0.5 to 5 weight % of orthophosphoric acid, polyphosphoric acid, phosphorus pentoxide or at least one salt of a volatile base forming polyphosphoric acid at the temperatures specified, and calcining the resulting mixture over the period necessary to transform the starting material to Maddrell salt.

# 4,162,301 FLEXIBLE MICROCRYSTALLINE ZIRCONIUM CARBIDE FABRIC

Bernard H. Hamling, Warwick, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 737,842, Jun. 18, 1968, abandoned, which is a continuation-in-part of Ser. No. 602,571, Dec. 19, 1966, Pat. No. 3,403,008, which is a continuation-in-part of Ser. No. 522,380, Jan. 24, 1966, abandoned. This application Oct. 16, 1973, Ser. No. 406,887

Int. Cl.<sup>2</sup> C01B 31/34

U.S. Cl. 423—440

1 Claim

1. A flexible microcrystalline zirconium carbide fabric which can be folded upon itself without creasing or breaking, the individual fibers of which have:

- a tensile strength greater than 100,000 pounds per square inch,
- a crystal grain size of less than two tenths of a fiber diameter,

said zirconium carbide having a melting point of at least about 3300° F.

# 4,162,302 DECOMPOSITION OF WATER

Chikara Hirayama, Franklin Borough, Pa., and Lee E. Brecher, Lexington, Ky., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 16, 1978, Ser. No. 906,498

Int. Cl.<sup>2</sup> C01B 1/02, 13/02

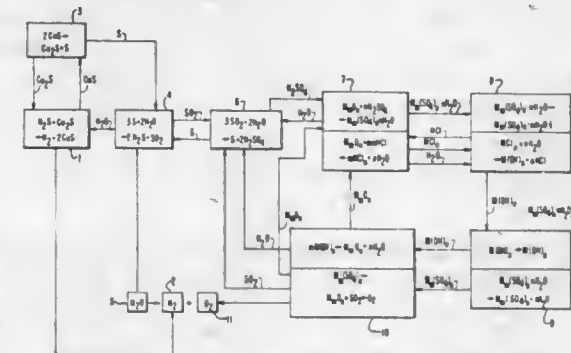
U.S. Cl. 423—579

19 Claims

1. A process for decomposing water into hydrogen and oxygen comprising

- reacting hydrogen sulfide with cuprous sulfide to produce said hydrogen and cupric sulfide according to the equation  $H_2S + Cu_2S \rightarrow H_2 + 2CuS$ ;
- decomposing said cupric sulfide to produce said cuprous sulfide and sulfur according to the equation  $2CuS \rightarrow Cu_2S + S$ ;
- reacting said sulfur with water to produce said hydrogen sulfide and sulfur dioxide according to the equation  $3S + 2H_2O \rightarrow 2H_2S + SO_2$ ;
- reacting said sulfur dioxide with water to produce sulfur

and sulfuric acid according to the equation  $3SO_2 + 2H_2O \rightarrow S + 2H_2SO_4$ ; and



(5) decomposing said sulfuric acid to produce said sulfur dioxide, water, and said oxygen according to the equation  $2H_2SO_4 \rightarrow 2SO_2 + O_2 + 2H_2O$ .

# 4,162,303 POTENCY AND ATOXICITY TEST FOR MODIFIED NEUROTOXIN

Murray J. Sanders, 3009 Spanish Trail Rd., Delray Beach, Fla. 33444

Filed Jun. 17, 1977, Ser. No. 807,654

Int. Cl.<sup>2</sup> A61K 29/00, 35/58; C12K 9/00

U.S. Cl. 424—9

16 Claims

1. A test method for determining the absence or presence of toxins in and the potency of modified neurotoxins comprising:

- providing on a growth substrate a thin sheet of viable cells which exhibit an uninhibited growth potential of at least  $10^6$  Plaque Forming Units of Semliki Forest Virus under the test conditions, the cells being harvested from the kidney cells of an embryo, fetus or baby specimen of a fowl or animal,
- treating the thin cell sheet with test modified neurotoxin and incubating the treated cell sheet for at least  $\frac{1}{2}$  hour;
- examining the incubated cell sheet for cell destruction, wherein the absence of cell destruction shows the absence of toxins in the modified neurotoxin and the presence of cell destruction shows the presence of toxins in the modified neurotoxin;
- inoculating the treated cell sheet with Semliki Forest Virus; and
- counting the number of viral plaques in the remaining culture, whereby the potency of the modified neurotoxin is determined by the percent reduction in viral plaques produced by the use of the modified neurotoxin in the culture.

# 4,162,304 STREPTOMYCETAL ANTIBIOTIC

Stephen J. Box, Horsham, and John D. Hood, Cranleigh, both of England, assignors to Beecham Group Limited, Great Britain

Continuation-in-part of Ser. No. 716,953, Aug. 23, 1976, abandoned, which is a division of Ser. No. 664,917, Mar. 8, 1976, abandoned. This application Sep. 22, 1976, Ser. No. 725,677

Claims priority, application United Kingdom, Mar. 15, 1975, 10914/75

Int. Cl.<sup>2</sup> A61K 35/00

U.S. Cl. 424—117

20 Claims

11. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a pharmaceutical composition which comprises an antibacterially effective amount of a pharmaceutically acceptable di-basic salt of MM 17880 which is at least 75% pure formula  $MM\ 17880$  is a diacidic solid of the molecular weight  $C_{11}H_{18}N_2O_8 \cdot 11N_2S_2$

which in the form of a substantially pure di-sodium salt has the following characteristics:

- when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infrared spectrum substantially as shown in FIG. 1;
- it has a characteristic nuclear magnetic resonance spectrum which when taken in deuterium oxide is substantially as shown in FIG. 2;
- it has a characteristic ultra-violet spectrum which in water has an absorption maximum at about 297 m.μ. substantially as shown in FIG. 3;
- it possesses antibacterial activity against certain gram-positive and gram-negative organisms, including strains of *Bacillus subtilis*, *Enterobacter cloacae*, *Escherichia coli*, *Klebsiella aerogenes*, *Proteus mirabilis*, *Salmonella typhimurium*, *Serratia marcescens* and *Staphylococcus aureus*; and
- when mixed with ampicillin or amoxycillin, it synergizes their antibacterial activity against certain bacteria, including strains of *Staphylococcus aureus* and *Klebsiella aerogenes*, in combination with a pharmaceutically acceptable carrier.

# 4,162,305 ANTIBIOTIC XK-99 AND PROCESS FOR PRODUCTION THEREOF

Takashi Nara, Tokyo; Ryo Okachi, Machida; Isao Kawamoto, Hiratsuka; Tomoyasu Sato, and Tetsuo Oka, both of Machida, all of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1978, Ser. No. 891,263

Claims priority, application Japan, Mar. 31, 1977, 52-35215 Int. Cl.<sup>2</sup> A61K 35/00

U.S. Cl. 424—120

5 Claims

1. XK-99, an antibacterial composition of matter characterized by:

- a molecular weight of 390;
- a melting point about 250° C. with decomposition;
- Specific Rotation:  $\alpha_D^{25} = -360^\circ$  (C=0.1 methanol);
- ultraviolet absorption spectra essentially as shown in FIG. 1;
- infrared absorption spectrum essentially as shown in FIG. 2; and
- a found elemental analysis of 58.24% C, 4.57% H and 9.89% N.

# 4,162,306 MEDICINE FOR TREATING DIARRHEA

Hans-Georg Laves, Gehrden near Hannover, Fed. Rep. of Germany, assignor to Laves-Arzneimittel G.m.b.H. & Co. K.G., Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,423

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715384

Int. Cl.<sup>2</sup> A61K 33/44

U.S. Cl. 424—125

3 Claims

1. A medicinal composition suitable for treating diarrhea which comprises 15-30% medicinal carbon, 20-40% Bolus alba, 1-3% pectin, 20-40% sweet whey powder, and 10-20% lactose.

# 4,162,307 METHOD FOR ANAESTHESIA BY USE OF A PENTAPEPTIDE

Samuel Wilkinson, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 21, 1978, Ser. No. 926,795

Claims priority, application United Kingdom, Jul. 22, 1977, 30909/77

Int. Cl.<sup>2</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177

4 Claims

1. A method for the induction and/or maintenance of anaesthesia in a mammal, comprising the administration to the mam-

mal of an anaesthetic-effective, non-toxic amount of a peptide of formula



or a pharmacologically and pharmaceutically acceptable acid addition salt thereof.

4,162,308

**WATER SOLUBLE EXTRACTS OF CERTAIN MARINE RED ALGAE AND PROCESSES FOR USE THEREOF**  
Natasha I. Calvin, and Robert J. Ellis, both of Box 112, Auke Bay, Ak. 99821

Filed Apr. 10, 1978, Ser. No. 894,831  
Int. Cl.<sup>2</sup> A61K 35/78, 31/70

U.S. Cl. 424—195

4 Claims

1. A method of treating and relieving pain of herpetic virus infections in humans comprising the steps of:  
intimately contacting the surface region directly infected with said virus with a water soluble extract of a marine red algae selected from the group consisting of *Turnerella mertensiana*, *Schizymenia epiphytica* and *Turnerella pennyi*, and mixtures thereof.

4,162,309

**WATER SOLUBLE EXTRACTS OF CERTAIN MARINE RED ALGAE AND PROCESSES FOR USE THEREOF**  
Natasha I. Calvin, and Robert J. Ellis, both of Box 112, Auke Bay, Ak. 99821

Filed Apr. 10, 1978, Ser. No. 894,833  
Int. Cl.<sup>2</sup> A61K 35/78, 31/70

U.S. Cl. 424—195

3 Claims

1. A method of treating and relieving pain of herpetic virus infections in humans comprising the steps of:  
intimately contacting the surface region directly infected with said virus with a water soluble extract of a marine red algae selected from the group consisting of *Neodilsea americana* and *Neodilsea integra* and mixtures thereof.

4,162,310

**COMBATING ARTHROPODS WITH O-ALKYL-O-[5-SUBSTITUTED-PYRIMIDIN(4-YL)]-(THIONO)(THIOL)-PHOSPHORIC(PHOSPHONIC)ACID ESTERS**

Fritz Maurer; Hans-Jochem Riebel; Rolf Schröder, all of Wuppertal; Ingeborg Hamann, Cologne, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1977, Ser. No. 827,511

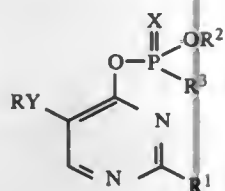
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639256

Int. Cl.<sup>2</sup> A01N 9/36; C07F 9/65

U.S. Cl. 424—200

10 Claims

1. An O-alkyl-O-[5-substituted-pyrimidin (4-yl)]-(thiono)(thiol)-phosphoric (phosphonic acid ester of the formula



in which

R and R<sup>2</sup> each independently is alkyl with 1 to 6 carbon atoms,  
R<sup>1</sup> is hydrogen or alkyl with 1 to 6 carbon atoms,  
R<sup>3</sup> is alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 6 carbon atoms, or phenyl, and

X and Y each independently is oxygen or sulphur.

8. An arthropodocidal composition containing as active ingredient an arthropodocidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodocidally effective amount of a compound according to claim 1.

4,162,311

**MEDICINAL PREPARATION WITH PRONOUNCED VEGETOTROPIC AND ANTIPILEPTIC EFFECT FOR TREATING PSYCHONEUROTIC DISORDERS**

Alexandr I. Razumov, ulitsa Ak. Gubkina, 17, kv. 34; Irina V. Zaikonnikova, ulitsa Chekhova, 4b, kv. 1; Vladimir S. Chudnovsky, ulitsa Dekabristov, 189, kv. 59; Galina F. Rzhetskaya, ulitsa Stepana Khalturina, 16, kv. 72; Raisa I. Tarasova, ulitsa 8 Marta, 2, kv. 28; Nina A. Bljukherova, ulitsa Ershova, 20, kv. 57; Rimma L. Yafarova, ulitsa Zhdanova, 66, kv. 62, all of Kazan; Grigory Y. Avrutsky, ulitsa 3 Parkovaya, 38, korpus 1 kv. 109, Moscow; Vladimir G. Belikov, ulitsa Krasnoarmeiskaya, 11a, kv. 15, Pyatigorsk, and Anatoly V. Litvinenko, ulitsa Pionerskaya, 14, kv. 37, Kazan, all of U.S.S.R.

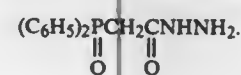
Filed Nov. 4, 1977, Ser. No. 848,583

Int. Cl.<sup>2</sup> A61K 31/66

U.S. Cl. 424—211

3 Claims

1. Method of providing a vegetotropic and antiepileptic effective a patient requiring the same, which comprises administering to such patient a vegetotropic and antiepileptic effective amount of the hydrazide of diphenylphosphinylacetic acid of the formula:



4,162,312

**PHENOXYBENZYLPHOSPHONIUM SALTS AND DERIVATIVES THEREOF AND USE AS FUNGICIDES**

Michael J. Brown, Randolph Township, Morris County, N.J., assignor to GAF Corporation, New York, N.Y.

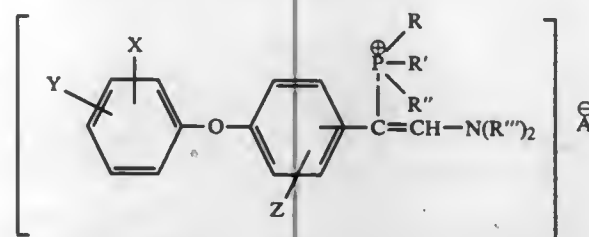
Filed Dec. 16, 1977, Ser. No. 861,205

Int. Cl.<sup>2</sup> A01N 9/36; C07C 91/16

U.S. Cl. 424—211

11 Claims

1. The compound having the formula:



wherein A<sup>⊖</sup> is a halogen anion; X, Y and Z are each independently hydrogen, a halogen atom or haloalkyl group of from 1 to 4 carbon atoms; R, R' and R'' are each independently phenyl, halophenyl, haloalkylphenyl of from 7 to 12 carbon atoms or alkyl of from 1 to 6 carbon atoms, optionally substituted with halogen; and each R''' is independently hydrogen or alkyl of from 1 to 4 carbon atoms, optionally substituted with halogen.

6. The process of controlling fungus infection in plants which comprises treating said fungus infection with a fungicidally effective amount of at least one compound of claim 1.

4,162,313  
**PHENOXYBENZYLPHOSPHONIUM SALT INSECTICIDES**

Michael J. Brown, Randolph Township, Morris County, N.J., assignor to GAF Corporation, New York, N.Y.

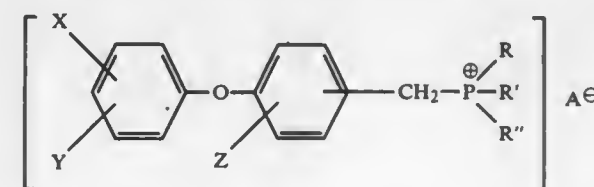
Filed Dec. 16, 1977, Ser. No. 861,204

Int. Cl.<sup>2</sup> A01N 9/36

U.S. Cl. 424—217

15 Claims

1. A process for controlling insects on plants which comprises applying to said insects an insecticidally effective amount of a compound having the formula:



wherein A<sup>⊖</sup> is a halogen anion; X, Y and X are each independently hydrogen, a halogen atom or a haloalkyl group of from 1 to 4 carbon atoms; R, R' and R'' are each independently phenyl, halophenyl, haloalkylphenyl of from 7 to 12 carbon atoms or alkyl of from 1 to 6 carbon atoms, optionally substituted with halogen.

4,162,314  
7[2(SUBSTITUTED PHENYL)2-(AMINO)ACETAMIDO]CEPHALOSPORIN DERIVATIVES

Rudolf Gottschlich; Rolf Gericke; Horst Juraszyk; Jürgen Seubert; Wighard Strehlow; Helmut Wahlig; Rolf Bergmann, and Elvira Dingeldein, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 806,241

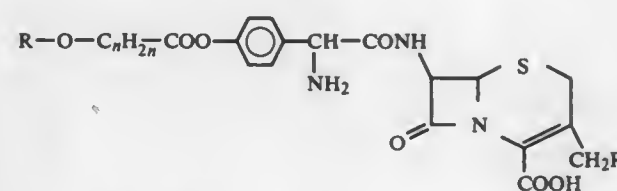
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 2626558; Mar. 19, 1977, 2712225

Int. Cl.<sup>2</sup> A61K 31/545; C07D 501/22, 501/32

U.S. Cl. 424—246

5 Claims

1. A compound of the formula



wherein R is alkyl of up to 6 carbon atoms or H; R<sup>1</sup> is hydrogen or acetoxy; and n is 0 or an integer from 1 to 8; or a readily-cleavable ester or a pharmaceutically acceptable salt of the carboxy group thereof; said readily-cleavable ester being a tert-butyl, trimethylsilyl, benzyl, benzhydryl, trichloroethyl, benzylmethyl, p-methoxybenzyl, methoxymethyl or pivaloyloxymethyl ester.

4. A pharmaceutical compositions, comprising an amount per unit dosage effective to produce a systemic antibacterial effect upon administration, of a compound of claim 1, in admixture with a pharmaceutically-acceptable carrier.

5. A method of treating a patient afflicted with a bacterial infection comprising administering to the affected patient an antibacterial amount of a compound of claim 1.

4,162,315  
**AGRICULTURAL FUNGICIDAL COMPOSITION**  
Taichiro Shigematsu; Tetsuya Shibahara; Makoto Nakazawa, all of Yokohama; Masayuki Tomida, Sagami-hara, and Toshio Munakata, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Division of Ser. No. 638,761, Dec. 8, 1975, Pat. No. 4,049,820.

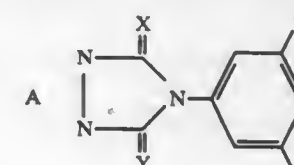
This application Jun. 29, 1977, Ser. No. 810,999

Claims priority, application Japan, Dec. 13, 1974, 49-143183  
Int. Cl.<sup>2</sup> A01N 9/22; C07D 487/04

U.S. Cl. 424—250

8 Claims

1. A method of killing plant pathogenic fungi which comprises applying to said fungi a fungicidally effective amount of a compound represented by the following formula:



wherein each of X and Y represents oxygen or sulfur, and A represents alkylene having 4 carbon atoms which may have branched methyl.

4,162,316  
**1-SUBSTITUTED-4-(1,2-DIPHENYLETHYL)PIPERAZINE DERIVATIVES AND COMPOSITIONS CONTAINING THE SAME**

Haruki Nishimura, Ikeda; Hitoshi Uno, Takatsuki; Kagayaki Natsuka, Ibaraki; Noriaki Shimokawa, Nagaokakyo; Masanao Shimizu, Kobe, and Hideo Nakamura, Tenri, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 663,158, Mar. 2, 1976, Pat. No. 4,080,453.

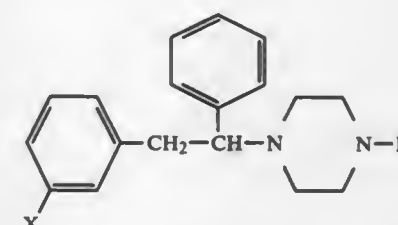
This application Aug. 4, 1977, Ser. No. 821,918

Claims priority, application Japan, Mar. 12, 1975, 50-30559; Jul. 22, 1975, 50-89849; Jul. 22, 1975, 50-89851; Jul. 22, 1975, 50-89852; Jul. 22, 1975, 50-89853; Nov. 27, 1975, 50-142496  
Int. Cl.<sup>2</sup> C07D 241/04; A61K 31/495

U.S. Cl. 424—250

15 Claims

1. A compound of the formula:



wherein X is hydroxy or an alkanoyloxy having from 2 to 5 carbon atoms; and R is an unsubstituted monocycloalkyl having from 5 to 8 carbon atoms, or a pharmaceutically acceptable salt thereof.

4,162,317  
**SUCCINIC ACID ESTERS OF 2-HYDROXYBUTYL-4,5-DIHYDRO-3(2H)-PYRIDAZINONES AND THEIR USE AS MUSCLE RELAXANT AGENTS**

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed May 25, 1978, Ser. No. 909,516

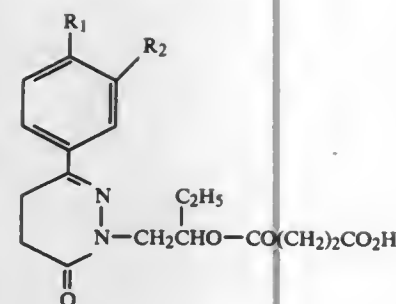
Int. Cl.<sup>2</sup> C07D 237/14; A61K 31/50

U.S. Cl. 424—250

4 Claims

1. A compound of the formula





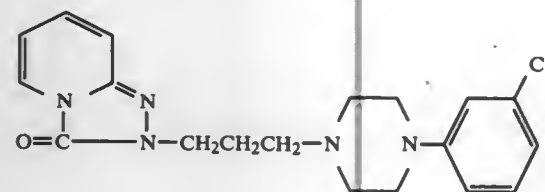
where  $R_1$  is hydrogen fluoro or chloro, and  $R_2$  is hydrogen, chlorine or lower alkyl having 1 to 4 carbon atoms.

3. A pharmaceutical composition useful in the treatment of muscle tension consisting essentially of a therapeutically effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier therefore.

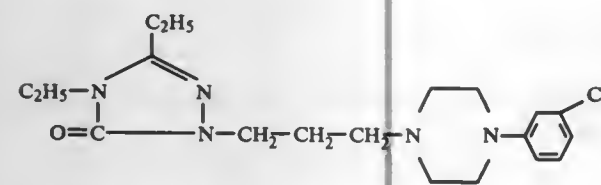
**4,162,318**  
**USE OF TRAZODONE AND ETOPERIDONE IN PARKINSONISM AND IN OTHER EXTRAPYRAMIDAL SYNDROMES CHARACTERIZED BY TREMORS**  
 Bruno Silvestrini, Rome, Italy, assignor to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A., Rome, Italy  
 Division of Ser. No. 793,336, May 3, 1977, Pat. No. 4,132,791.  
 This application Jul. 17, 1978, Ser. No. 925,499

Claims priority, application Italy, May 5, 1976, 49321 A/76  
 Int. Cl.<sup>2</sup> A61K 31/495

U.S. Cl. 424—250 2 Claims  
 1. A process for the treatment of tremors in Parkinsonism and in other extrapyramidal syndromes which comprises administering orally to a human afflicted with Parkinsonism an amount of trazodone of the formula

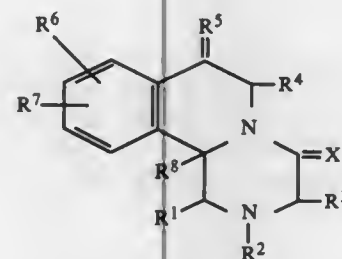


or of etoperidone of the formula:



in the range of about 25 mg. three times a day.

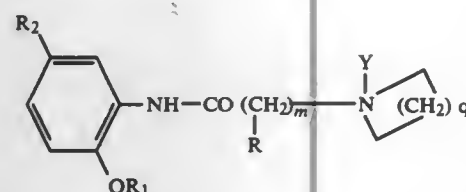
**4,162,319**  
**RING SUBSTITUTED PYRAZINO-ISOQUINOLINE DERIVATIVES AND THEIR PREPARATION**  
 Jürgen Seubert; Rolf Pohlke, both of Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany  
 Division of Ser. No. 817,467, Jul. 20, 1977, Pat. No. 4,120,961, which is a division of Ser. No. 607,810, Aug. 26, 1975, Pat. No. 4,051,243. This application Aug. 7, 1978, Ser. No. 931,576  
 Claims priority, application Fed. Rep. of Germany, Aug. 28, 1974, 2441261  
 Int. Cl.<sup>2</sup> A61K 31/495; C07D 405/02, 401/02  
 U.S. Cl. 424—250 11 Claims  
 1. A compound of the formula



**4,162,322**  
**N-ACYL ANILINES USED TO INHIBIT GASTRIC**  
**HYPERSECRETION**

Charles Malen, Fresnes; Pierre Roger, St.-Cloud, and Xavier Pascaud, Paris, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Med., Suresnes, France  
 Division of Ser. No. 656,553, Feb. 9, 1976, Pat. No. 4,080,452.  
 This application Feb. 27, 1978, Ser. No. 881,537  
 Claims priority, application United Kingdom, Feb. 14, 1975, 6294/75

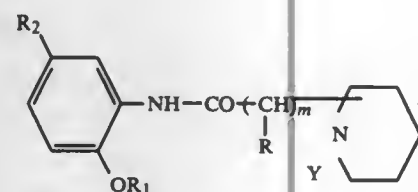
Int. Cl.<sup>2</sup> A61K 31/445; C07D 295/00  
 U.S. Cl. 424—267  
 1. A compound of the formula



wherein

- m is 0 or an integer of 1 to 5;  
 q is 2 or 3;  
 R is hydrogen or lower alkyl of 1 to 6 carbon atoms in the chain;  
 R<sub>1</sub> is lower alkyl of 1 to 6 carbon atoms, lower alkenyl of 1 to 6 carbon atoms, lower cycloalkyl of 3 to 7 ring carbon atoms or phenyl lower alkyl of 1 to 6 carbon atoms in the side chain;  
 R<sub>2</sub> is cyano, trifluoromethyl or lower alkanoyl of 1 to 6 carbon atoms;  
 Y is lower alkyl of 1-6 carbon atoms.

3. A compound selected from a member having the formula



wherein:

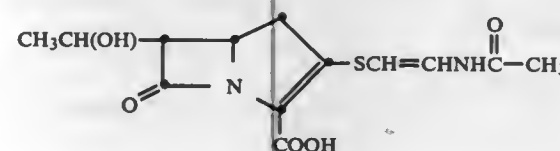
- m is 0 or an integer of 1 to 5;  
 R is hydrogen or lower alkyl of 1 to 6 carbon atoms in the chain;  
 R<sub>1</sub> is lower alkyl of 1 to 6 carbon atoms, lower alkenyl of 1 to 6 carbon atoms, lower cycloalkyl of 3 to 7 ring carbon atoms or phenyl lower alkyl of 1 to 6 carbon atoms in the side chain;  
 R<sub>2</sub> is cyano, trifluoromethyl or lower alkanoyl of 1 to 6 carbon atoms;  
 Y is lower alkyl of 1-6 carbon atoms, when present and the acid addition salts thereof with organic or mineral acids.

10. A method of inhibiting gastric hypersecretion and delay in gastric evacuation which comprises administering to warm-blooded animals suffering or disposed to suffer from said ailment an inhibitorily effective amount of a compound of claim 3.

**4,162,323**  
**ANTIBIOTIC N-ACETYL-DEHYDRO-THIENAMYCIN**  
 Jean S. Kahan, Rahway, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1977, Ser. No. 788,491  
 Int. Cl.<sup>2</sup> C07D 487/04; A61K 31/40

U.S. Cl. 424—274  
 1. The compound having the following structure:

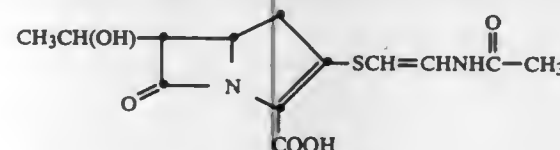


or its pharmaceutically acceptable salts wherein the compound has 300 MHz nuclear magnetic resonance characteristic signals having chemical shifts in ppm as 1.29 (d, J=6, CH<sub>3</sub>); 2.08



3.10 (d, d, J=12.5, 8.7, 1H of CH<sub>2</sub>C); 3.21 (d, d, J=12.5, 9.5, 1H of CH<sub>2</sub>C); 3.39 (d, d, J=6.0, 2.5, H<sub>6</sub>); 4.22 (m, H<sub>5</sub> and H<sub>7</sub>); 6.07 (d, J=13.5, HC=); 7.19 (d, J=13.5, HC=).

2. A composition comprising an antibacterial effective amount of the compound having the following structure:



or its pharmaceutically acceptable salts wherein the compound has 300 MHz nuclear magnetic resonance characteristic signals having chemical shifts in ppm as 1.29 (d, J=6, CH<sub>3</sub>); 2.08

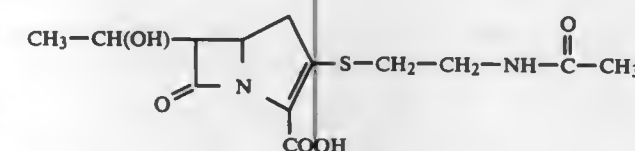


3.10 (d, d, J=12.5, 8.7, 1H of CH<sub>2</sub>C); 3.21 (d, d, J=12.5, 9.5, 1H of CH<sub>2</sub>C); 3.39 (d, d, J=6.0, 2.5, H<sub>6</sub>); 4.22 (m, H<sub>5</sub> and H<sub>7</sub>); 6.07 (d, J=13.5, HC=); 7.19 (d, J=13.5, HC=) and a non-toxic pharmaceutically acceptable carrier therefore.

**4,162,324**  
**ANTIBIOTICS 890A<sub>1</sub> AND 890A<sub>3</sub>**  
 Patrick J. Cassidy, Rahway; Robert T. Goegelman, Linden; Edward O. Stapley, Metuchen, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 634,300, Nov. 21, 1975, abandoned.  
 This application Aug. 25, 1977, Ser. No. 827,504  
 Int. Cl.<sup>2</sup> C07D 487/04; A61K 31/40

U.S. Cl. 424—274  
 1. The compound 890A<sub>1</sub> having the structure:



and its pharmaceutically acceptable salts.

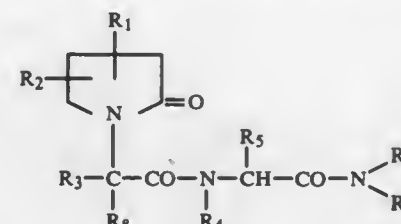
4. A composition comprising an antibacterial effective

amount of the compound 890A<sub>1</sub> and pharmaceutically acceptable salts thereof and a non-toxic pharmaceutically acceptable carrier therefore.

**4,162,325**  
**N-SUBSTITUTED LACTAMS**  
 Ludovic Rodriguez, Brussels, and Lucien Marchal, Lillois, both of Belgium, assignors to UCB, Société Anonyme, Saint-Gilles-lez-Brussels, Belgium

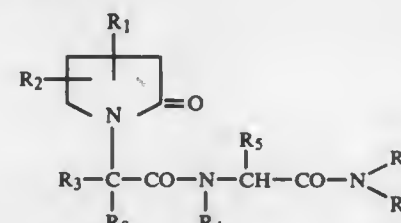
Filed Oct. 19, 1977, Ser. No. 843,692  
 Claims priority, application United Kingdom, Oct. 22, 1976, 43934/76

Int. Cl.<sup>2</sup> C07D 207/26; A61K 31/40  
 U.S. Cl. 424—274  
 1. An N-substituted 2-pyrrolidinone having the formula



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> represent independently a hydrogen atom, alkyl having 1 to 4 carbon atoms or phenyl, and R<sub>8</sub> is a hydrogen atom or R<sub>8</sub> and R<sub>3</sub> together are ethylene or trimethylene.

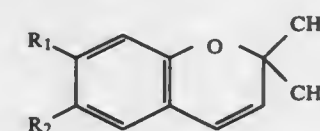
12. A composition having activity on the mnemonic processes, a protective activity against aggressions of the hypoxic type and which is useful in the prevention and treatment of cerebrovascular or cardiovascular injuries comprising an effective amount for said uses of an N-substituted 2-pyrrolidinone having the formula



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> represent independently a hydrogen atom, alkyl having 1 to 4 carbon atoms or phenyl, and R<sub>8</sub> is a hydrogen atom or R<sub>8</sub> and R<sub>3</sub> together are ethylene or trimethylene, and a pharmaceutically acceptable solid or liquid carrier.

**4,162,326**  
**INSECT CONTROL AGENTS**  
 Alexander Mihailovski, Kensington, Calif., assignor to Stauffer Chemical Company, Westport, Conn.  
 Filed Sep. 27, 1978, Ser. No. 946,245  
 Int. Cl.<sup>2</sup> A61K 31/35; C07D 311/02

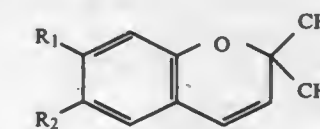
U.S. Cl. 424—283  
 1. A compound having the formula



in which one of R<sub>1</sub> and R<sub>2</sub> is C<sub>3</sub>-C<sub>4</sub> alkyloxy or C<sub>3</sub> alkenoxy and the other is hydrogen or methoxy.

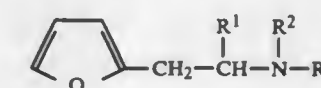
11. A method of controlling insects comprising applying to

the insect or habitat thereof an effective controlling amount of a compound having the formula



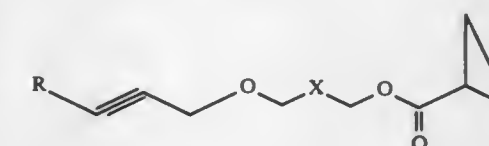
in which one of R<sub>1</sub> and R<sub>2</sub> is C<sub>3</sub>-C<sub>4</sub> alkyloxy or C<sub>3</sub> alkenoxy and the other is hydrogen or methoxy.

**4,162,327**  
**N,N-DISUBSTITUTED-2-FURYLETHYL AMINES**  
 József Knoll; Zoltan Esery; Judit Hermann née Vörös; Zoltán Török; Éva Somfai, all of Budapest, and Gábor Bernáth, Szeged, all of Hungary, assignors to Chinoin Gyógyszer Es Vegyeszeti Termeken Gyara Rt., Budapest, Hungary  
 Filed Dec. 27, 1976, Ser. No. 754,278  
 Claims priority, application Hungary, Dec. 29, 1975, OE 1632  
 Int. Cl.<sup>2</sup> A61K 31/34; C07D 307/52  
 U.S. Cl. 424—285  
 1. A racemic or optically active compound of the formula



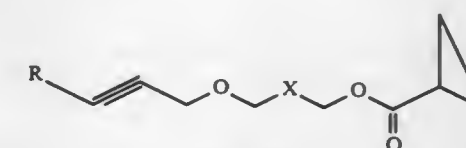
or a pharmaceutically effective salt thereof wherein R<sup>1</sup> and R<sup>2</sup> are lower alkyl and R<sup>3</sup> is halogenoalkenyl with 2 or 3 carbon atoms and chloro or bromo as the halogen, or propynyl.

**4,162,328**  
**CYCLOPROPANE CARBOXYLIC ACID ESTERS**  
 Rene Zurfluh, Bulach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.  
 Filed Mar. 23, 1978, Ser. No. 889,598  
 Claims priority, Austria, Apr. 1, 1977, 2308/77  
 Int. Cl.<sup>2</sup> C07C 69/74; A01N 9/24  
 U.S. Cl. 424—305  
 1. A compound of the formula:



wherein X is alkylene having 6 to 10 carbon atoms, 1,4-cyclohexylene or 1,4-phenylene; and R is hydrogen or alkyl having 1 to 3 carbon atoms.

8. An insecticidal composition which comprises a compatible carrier material and as an active ingredient one or more compounds of the formula:



wherein X is alkylene having 6 to 10 carbon atoms, 1,4-cyclohexylene or 1,4-phenylene; and R is hydrogen or alkyl having 1 to 3 carbon atoms  
 11. A method of controlling insects comprising applying to



4,162,329  
COMBATING FUNGI WITH DICARBOXYLIC ACID  
MONO-ARYLHYDRAZIDES

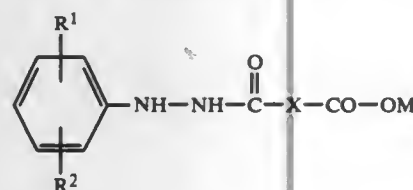
Engelbert Kühle, Bergisch-Gladbach; Erich Klauke, Odenthal, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,547

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712434

Int. Cl.<sup>2</sup> A61K 31/175, 31/193; C07C 130/30  
U.S. Cl. 424—319 7 Claims

1. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of at least one dicarboxylic acid monoarylhazide, or a salt thereof, of the formula



in which

R<sup>1</sup> and R<sup>2</sup> each independently is hydrogen, halogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylmercapto, trihalogenomethyl, trihalogenomethoxy, trihalogenomethylmercapto or nitro,

X is an alkylene, alkenylene, cycloalkylene, cycloalkenylene, cycloalkadienylene or phenylene radical, and

M is hydrogen or one equivalent of an alkali or alkaline earth metal or ammonium.

4,162,330  
ACYLUREA INSECTICIDES

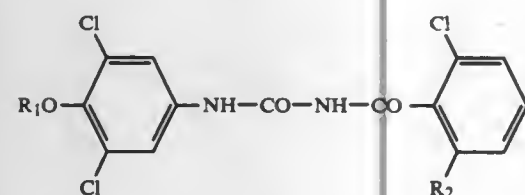
Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,444

Claims priority, application Switzerland, Jul. 28, 1977, 9349/77; Jun. 29, 1978, 7101/78

Int. Cl.<sup>2</sup> C07C 127/22; A01N 9/12  
U.S. Cl. 424—322 9 Claims

1. N-Phenyl-N'-benzoylurea of the formula I



wherein

R<sub>1</sub>—represents  $\text{CH}_2=\text{CH}-\text{CH}_2-$ ,  $\text{CHCl}=\text{CCl}-$ ,  $\text{CHCl}=\text{CH}-\text{CH}_2-$ ,  $\text{CH}_2=\text{CCl}-\text{CH}_2-$ ,  $\text{CCl}_2=\text{CH}-\text{CH}_2-$ ,  $\text{CHCl}=\text{CCl}-\text{CH}_2-$  or  $\text{CH}=\text{C}-\text{CH}_2-$ , and

R<sub>2</sub>—represents hydrogen or chlorine.

4,162,331  
SUBSTITUTED  
N-(CARBOXYMETHYL)-3-AMINOPROPAN-2-OL  
DERIVATIVES

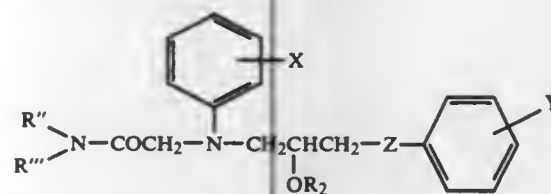
Hiromu Murai; Katsuya Ohata; Hiroshi Enomoto; Shoichi Chokai; Mitsuhiro Machara; Katsuhide Salto, and Takayuki Ozaki, all of Kyoto, Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Division of Ser. No. 692,878, Jun. 4, 1976, Pat. No. 4,064,252. This application Jan. 24, 1977, Ser. No. 762,021

Claims priority, application Japan, Jun. 17, 1975, 50-74014; Jun. 17, 1975, 50-74015

Int. Cl.<sup>2</sup> C07C 103/76  
U.S. Cl. 424—324 15 Claims

1. A compound of the formula:



wherein

Z is oxygen or sulfur;  
X is hydrogen, halogeno, lower alkyl, lower alkoxy, carboxy, carbo(lower alkoxy) or carbamoyl;

Y, when Z is sulfur, is hydrogen, halogeno or lower alkyl, or, when Z is oxygen, hydrogen, halogeno, lower alkyl, lower alkoxy, aralkoxy, hydroxy, carboxy, or carbo(lower alkoxy);

R<sub>2</sub> is hydrogen, lower alkyl or alkanoyl of 1 to 7 carbon atoms; and

each of R'' and R''' taken independently is hydrogen, phenyl, unsubstituted or substituted with up to two methyl groups, or lower alkyl unsubstituted or substituted by hydroxy, lower alkoxy, carbo(lower alkoxy) or phenyl, and the pharmaceutically acceptable salts thereof.

4,162,332  
METHOD AND APPARATUS FOR PRODUCING A MEAT  
ANALOG

Boleslaw Sienkiewicz, Pearl River; William J. Meyer, Orangeburg, and Joseph Giaccone, Elmsford, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 395,793, Sep. 10, 1973, Pat. No. 3,999,474. This application Oct. 18, 1976, Ser. No. 733,579

Int. Cl.<sup>2</sup> A23J 3/00 16 Claims

U.S. Cl. 426—249 16 Claims  
(I) 1. A process for preparing simulated meat products which comprises:

(a) preparing at least one slurry comprising oil, water and heat coagulable protein;

(b) applying at least one layer of said slurry to a moving surface to form a layered mass of the slurry; and  
(c) subjecting the layered mass to moist heat at substantially atmospheric pressure by conveying said mass through a heat-set chamber comprised of humidified air having a wet bulb temperature of from about 205 to 212° F. and a dry bulb temperature of from about 220 to 280° F., for a period of time sufficient to raise the internal temperature thereof to about 180° to 200° F. to coagulate said heat coagulable protein therein without removing significant amounts of moisture therefrom, whereby undue product expansion does not occur.

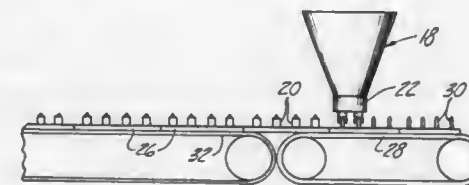
4,162,333  
METHOD AND APPARATUS FOR MAKING FILLED  
FOOD PRODUCT

Richard L. Nelson, and Walter P. Nelson, both of Battle Creek, Mich., assignors to Mars Incorporated, McLean, Va.

Filed Aug. 3, 1978, Ser. No. 930,757

Int. Cl.<sup>2</sup> A21C 3/04, 9/06; A21D 8/02

U.S. Cl. 426—283 4 Claims



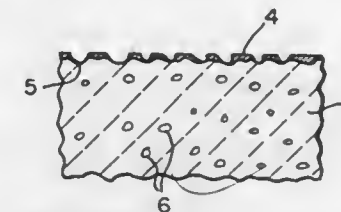
1. The method of making a food article having a tubular body portion of relatively rigid baked dough filled with relatively softer food material, the steps comprising: extruding a plurality of dough pieces each of a tubular cross section and of a predetermined length onto a plurality of support members disposed in an extruding zone to engage the interior of said dough pieces and wherein the exterior of said dough pieces is maintained in an unsupported condition, moving said support members and dough pieces through a baking zone for a predetermined period of time to form tubular body portions, removing the body portions from said support members and returning said support members to said extruding zone, transferring said body portions to holding members, moving said holding members and body portions to a filling zone and filling said tubular body portions with relatively soft food material.

4,162,334  
METHOD FOR BAKING IN TERRA SIGILLATA COATED  
PAN

William B. Crandall, Alfred Station, and Linda J. Wasserstein, Rockville Centre, both of N.Y., assignors to Alfred University Research Foundation Inc., Alfred, N.Y.

Division of Ser. No. 791,507, Apr. 27, 1977. This application Aug. 21, 1978, Ser. No. 935,663

Int. Cl.<sup>2</sup> A21D 8/06  
U.S. Cl. 426—505 9 Claims



1. A method for baking bread having taste and physical characteristics of brick oven baked bread, said method comprising baking bread dough in a bread pan comprising a porous fired brickware body having a water permeability of at least about 2% and having at least its baking surfaces coated with a fired terra sigillata coating, said coating closing only a portion of the pores of said surfaces of said body such that the brickware body imparts the taste and physical qualities of brick oven baked bread to the bread in the bread pan while rendering said surfaces free from sticking propensities toward the baked bread.

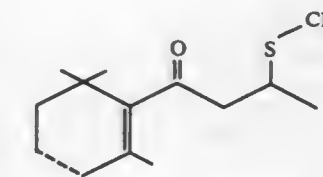
4,162,335  
FLAVORING WITH  
1-[3-(METHYLTHIO)BUTYRYL]-2,6,6-TRIMETHYL-  
CYCLOHEXENE AND THE 1,3-CYCLOHEXADIENE  
ANALOG

Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel; Anne S. Hruza, Brick Town; Manfred H. Vock, Locust; Louis S. Frederick, Holmdel, and Joaquin F. Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 774,055, Mar. 3, 1977, Pat. No. 4,107,209. This application Jun. 21, 1978, Ser. No. 917,689

Int. Cl.<sup>2</sup> A23L 1/226  
U.S. Cl. 426—535 3 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff which comprises adding thereto about 0.5 ppm up to about 20 ppm by weight based on total composition of a substantially pure synthetically produced 1-(3-(methylthio)butyryl)-2,6,6-trimethyl-cyclohexene or the 1,3-cyclohexadiene analog defined by the structure:



wherein the dashed line is a carbon-carbon single bond or a carbon-carbon double bond.

4,162,336  
MONOSACCHARIDE-CONTAINING DRY PET FOOD  
HAVING YIELDABLE ELASTIC STRUCTURE

Arthur V. Brown, Jr., Bessemer, and Richard J. Karrasch, Sterrett, both of Ala., assignors to The Jim Dandy Company, Birmingham, Ala.

Filed Nov. 21, 1977, Ser. No. 853,540  
Int. Cl.<sup>2</sup> A23L 1/09 4 Claims

U.S. Cl. 426—623 4 Claims  
4. A process for making a compressibly deformable extruded food comprising the steps of

forming a mixture consisting essentially of 7½ to 20% by weight of a hexose monosaccharide selected from the group consisting of aldohexoses, ketohexoses, and mixtures thereof, with 15% to 35% by weight of ground cereal grains, 15% to 35% by weight of non-adhesive protein selected from the group consisting of fish meal, fleshy animal byproducts and acid-coagulated gluten meal and water,

introducing the mixture into the barrel of an extruder, applying sufficient pressure in the extruder barrel, without added steam, whereby to cook said extruded food causing it to reach a temperature above boiling point of water, extruding to flash off a portion of the moisture and to puff the remaining ingredients, whereby to produce an undried product having a moisture content of substantially 20%, and drying during continuous cooling without reheating to a moisture content of substantially 15% by weight.

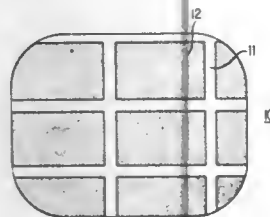
**4,162,337**  
**PROCESS FOR FABRICATING III-V SEMICONDUCTING DEVICES WITH ELECTROLESS GOLD PLATING**

Lucian A. D'Asaro, and Yutaka Okinaka, both of Madison, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 14, 1977, Ser. No. 851,612  
 Int. Cl.<sup>2</sup> C23C 3/02

U.S. Cl. 427—92

20 Claims



1. A process for fabricating III-V semiconductor devices with at least one gold plated surface in which the III-V semiconductor comprises at least one element selected from the group consisting of gallium, aluminum and indium characterized in that the process comprises the steps of

- (a) activating at least one surface of a III-V semiconductor using an acid solution of hydrofluoric acid and activator species containing at least one ion selected from the group consisting of gold, platinum and palladium and solvent consisting of at least one substance selected from the group consisting of water and weak organic acid with up to three carbon atoms; and
- (b) exposing the activated surface to an electroless gold plating solution so as to produce a gold layer on the III-V semiconductor surface.

**4,162,338**  
**COATED CEMENTED CARBIDE ELEMENTS AND THEIR MANUFACTURE**

Wilfried Schintmeister, Reutte, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.  
 Division of Ser. No. 571,695, Apr. 25, 1975, Pat. No. 4,101,703, which is a continuation of Ser. No. 329,128, Feb. 2, 1973, abandoned. This application Feb. 3, 1978, Ser. No. 875,071  
 Claims priority, application Austria, Feb. 4, 1972, 896/72; Jul. 21, 1972, 6317/72

Int. Cl.<sup>2</sup> B05D 1/36, 3/10, 7/14

U.S. Cl. 427—249

24 Claims

3. A method of producing an article of manufacture comprising a cemented carbide substrate bearing an adherent wear-resistant coating, the composition of said coating varying through its depth and thickness from titanium carbide rich, titanium nitride poor closest to the substrate to titanium nitride rich, titanium carbide poor furthest from the substrate, said method comprising depositing titanium compounds from gaseous mixtures comprising a gaseous titanium compound, a hydrocarbon gas and a nitrogen-containing gas, regulating the quantities of hydrocarbon gas and nitrogen-containing gas present in the mixture at any given time to provide first a hydrocarbon gas rich, nitrogen gas poor mixture and finally a hydrocarbon gas poor, nitrogen gas rich mixture, to thereby deposit from the vapor phase an essentially pure titanium carbide coating layer closest to said substrate, an intermediate coating layer of titanium carbonitrides and an essentially pure coating layer of titanium nitride furthest from said substrate.

**4,162,339**  
**NEWSPRINT COUPON SEPARATOR**

Friedrich J. Week, 1339 S. Seventh Ave., Hacienda Heights, Calif. 91745; James Hunkins, 13001 Aclare Pl., Cerritos, Calif. 90701, and Samuel J. Rinsler, 712 N. Kings Rd., Los Angeles, Calif. 90069

Division of Ser. No. 596,999, Jul. 18, 1975, Pat. No. 4,073,982.  
 This application Feb. 7, 1978, Ser. No. 875,813  
 Int. Cl.<sup>2</sup> B41M 7/00; B32B 29/06

U.S. Cl. 428—43

6 Claims

1. A paper article of manufacture comprising a paper sheet having integrally formed therein a coupon demarked from the remainder of the sheet by pre-determined boundaries comprised of moist, weakened paper containing a paper weakening composition which provides and maintains moisture in the paper for an extended period of time, and whereby hand removal of the coupon from the paper sheet by tearing along said boundaries is facilitated.

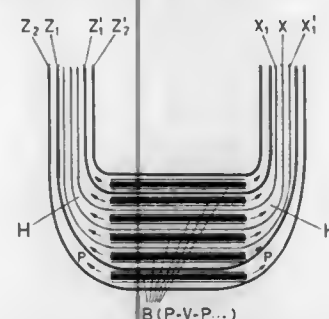
**4,162,340**  
**METHOD OF MANUFACTURING SLOT INSULATION FOR DYNAMO-ELECTRIC MACHINES FROM MOLDED LAMINATES AND SLOT INSULATION PRODUCED BY THE METHOD**

Heinz Fuchs, Embrach, Switzerland, assignor to Micafil AG, Zurich, Switzerland

Filed Mar. 9, 1977, Ser. No. 775,921  
 Int. Cl.<sup>2</sup> B32B 3/08, 3/00

U.S. Cl. 428—83

11 Claims



1. A profiled laminated insulation material having adjacent leg portions disposed at a right angle to each other for installation in the slots of a dynamo-electric machine which comprises a number of carrier bands of a resin treated insulation material extending throughout both leg portions, and at least one reinforcing ply of insulation material and strip of a fiber-filled resinous molding material capable of flow under pressure interposed between adjacent carrier bands throughout one of said leg portions to impart increased thickness thereto, said resinous molding material also being extended into and homogeneously filling the spaces in the transition region between the thickened and non-thickened leg portions.

11. A method for producing a laminated insulation structure for installation in the slots of a dynamo-electric machine comprising the steps of:

- assembling a number of layers of insulation material, including one or more layers of resin-treated paper and at least one layer of resin-treated woven glass filaments covering each side of said one or more layers of resin-treated paper, for lamination to each other;
- inserting at least one ply of fiber-reinforced insulation material and at least one strip of a fiber-filled epoxy resin between adjacent layers of the insulation material to impart increased thickness to a predetermined region of the laminated structure; and
- supplying sufficient pressure to the assembly of the layers of insulation material, fiber-reinforced ply and epoxy resin to cause lamination thereof and flow of some of the epoxy resin into spaces in the transition areas between the pre-

terminated thickened region and the non-thickened portions of the structure.

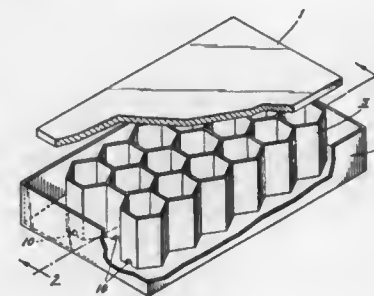
**4,162,341**  
**HONEYCOMB INSULATION STRUCTURE**

Richard V. Norton, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Division of Ser. No. 661,907, Feb. 26, 1976, Pat. No. 4,088,723, and a continuation-in-part of Ser. No. 500,966, Aug. 26, 1974, abandoned. This application Nov. 21, 1977, Ser. No. 853,968  
 Int. Cl.<sup>2</sup> B32B 3/12

U.S. Cl. 428—117

3 Claims



1. A thermal insulating structure comprising:

- (1) a honeycomb spacer having notches on one edge of the honeycomb spacer;
- (2) cells of the honeycomb spacer partially filled with foam wherein
  - (a) an empty space exists along portions of the honeycomb spacer leaving the notches;
  - (b) an integral foam skin covers the other edge of the honeycomb spacer;
  - (c) foam filling the remainder of the cells; and
- (3) the density of foam within a majority of the cells is between from about 2 pounds per cubic foot to about 20 pounds per cubic foot and the density of the integral foam skin is between from about 20 pounds per cubic foot to about 80 pounds per cubic foot.

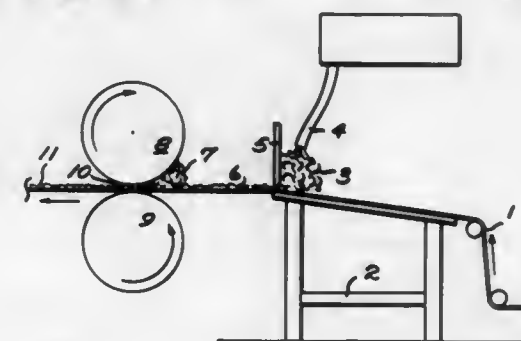
**4,162,342**  
**FOAM COATED CEILING BOARD FACING AND METHOD OF MAKING THE SAME**

William C. Schwartz, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 30, 1976, Ser. No. 718,624  
 Int. Cl.<sup>2</sup> B32B 3/12; B05D 5/00

U.S. Cl. 428—159

22 Claims



1. A process for manufacturing a cellular foam coated, sculptured, nubby fabric useful as a ceiling board facing and the like, comprising:

- forming on at least one face of a nubby textured fabric a uniform layer of a cellular foamed latex containing vinyl

chloride polymer, a cell producing surfactant, a white powdered pigment, and a flame retardant, passing said nubby textured fabric coated with a uniform layer of cellular foamed latex between gapped means for removing foam and sculpturing said uniform layer of cellular foamed latex, the gap of said gapped means being adjusted to leave sufficient foam on the fabric to provide extra depth and nubiness to said fabric face without crushing said cellular foam, and drying and curing said cellular foam coated, sculptured, nubby fabric.

19. A cellular foam coated, sculptured, nubby fabric useful as a ceiling board facing manufactured by the process of:

- forming on at least one face of a nubby textured fabric a uniform layer of cellular foamed latex containing vinyl chloride polymer, a cell producing surfactant, a white powdered pigment, and a flame retardant, passing said nubby textured fabric coated with a uniform layer of cellular foamed latex between gapped means for removing foam and sculpturing said uniform layer of cellular foamed latex, the gap of said gapped means being adjusted to leave sufficient foam on the fabric to provide extra depth and nubiness to said fabric face without crushing said cellular foam, and drying and curing said cellular foam coated, sculptured, nubby fabric.

**4,162,343**  
**MULTILAYER LIGHT-REFLECTING FILM**  
 Forrest S. Wilcox, Montrose; Jules Pinsky, Scarborough, and Scott A. Cooper, Yorktown Heights, all of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,800

Int. Cl.<sup>2</sup> G02B 1/10, 5/28; B32B 27/30, 27/32

U.S. Cl. 428—212

16 Claims

1. A transparent thermoplastic resinous film of at least 10 substantially uniformly thick layers comprising a core having a pair of generally parallel surface layers thereon, said core comprising a plurality of generally parallel layers, said surface and core layers being of transparent thermoplastic resinous material in which the contiguous adjacent layers are of diverse resinous material differing in refractive index by at least about 0.03, each surface layer being of greater thickness than any of the core layers and the combined thickness of the surface layers being at least 5% of the thickness of said core, wherein at least one of said diverse resinous materials is a mixture of polyolefin and ethylene vinyl acetate.

13. In a process of forming a transparent thermoplastic resinous film of at least 10 generally parallel layers in which contiguous adjacent layers are of diverse resinous material differing in refractive index by at least 0.03, by coextrusion, the improvement which comprises forming each surface layer so as to be a greater thickness than any of the core layers and such that the combined thickness of the surface layers is at least 5% of the thickness of said core and forming at least one of said diverse resinous materials from a mixture of polyethylene and ethylene vinyl acetate, whereby a substantially uniform thickness of said layers is realized.

**4,162,344**  
**POROUS RESIN IMPREGNATED STRATIFIED FIBER FLEXIBLE SHEET BACKED MAT AND PROCESS OF FORMING THE SAME**

James M. Rones, Atlanta, Ga., assignor to American Manufacturing Company, Atlanta, Ga.

Filed Jul. 27, 1978, Ser. No. 928,334

Int. Cl.<sup>2</sup> B32B 7/02, 31/00

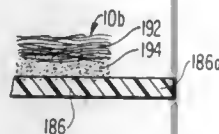
U.S. Cl. 428—212

2 Claims

1. A high integrity, form maintaining, wear resistant porous fiber mat comprising:



a solitary, integral, composite non-woven omni-directional thermosetting binder impregnated fiber web consisting of a first stratified sublayer of coarse denier fiber and a second stratified sublayer of fine denier fiber, and an integral sheet of cured thermoplastic backing material bonded to the fine denier fiber stratified sublayer, with the surface portions of said fine denier fiber stratified sublayer being embedded within said thermoplastic backing material,



whereby, said coarse denier fiber presents an outer surface layer having greater resistance to physical deformation and wear under heavy use, and said fine denier fiber stratified sublayer surface portion provides improved locking of the non-woven, omni-directional thermosetting binder impregnated fiber web to said backing material by partial embedment of the fine denier fiber stratified sublayer within said thermoplastic backing material.

4,162,345

## DEPOSITION METHOD AND PRODUCTS

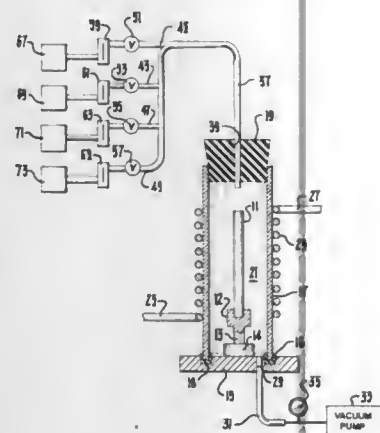
Robert A. Holz, La Canada, Calif., assignor to Chemetal Corporation, Pacolma, Calif.

Continuation of Ser. No. 702,436, Jul. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,391, Jun. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 358,110, May 7, 1973, abandoned. This application Nov. 7, 1977, Ser. No. 849,122

Int. Cl.<sup>2</sup> C23C 29/00

U.S. Cl. 428—328

23 Claims



1. A method for producing a hard deposit on a substrate, comprising, providing a gaseous volatile halide of tungsten or molybdenum, reacting said volatile halide spaced from the surface of the substrate in the presence of an alcohol, ketone or ether to form a first intermediate compound of tungsten or molybdenum which is spaced from the surface of the substrate, reacting said first intermediate compound in the presence of gaseous hydrogen and one or more gases containing oxygen and carbon to cause the deposition on the substrate of a second intermediate compound of tungsten or molybdenum which is in a liquid phase, and reacting the liquid phase second intermediate compound on the surface of the substrate to produce a hard deposit containing essentially tungsten or molybdenum

and carbon and having a modulus of rupture in bending exceeding 200 kilograms per square millimeter.

4,162,346

## HIGH PERFORMANCE WHOLLY AROMATIC POLYAMIDE FIBERS

Rufus S. Jones, Jr., Randolph; Marshall Tan, Ridgefield Park, and Eul W. Choe, Randolph, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 726,090, Sep. 23, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,792

Int. Cl.<sup>2</sup> D02G 3/00

U.S. Cl. 428—364

7 Claims

1. A high performance sulfonated poly-p-phenyleneterephthalamide having a sulfur content of about 0.5 to 10 percent by weight as sulfonic acid and/or sulfonate groups attached to the aromatic nuclei of said poly-p-phenyleneterephthalamide which exhibits a single filament tenacity of at least 15 grams per denier, an elongation of at least 1.5 percent, and an initial modulus of at least 400 grams per denier.

4,162,347

## METHOD FOR FACILITATING TRANSPORTATION OF PARTICULATE ON A CONVEYOR BELT IN A COLD ENVIRONMENT

Carl T. Montgomery, Sperry, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,501

Int. Cl.<sup>2</sup> B32B 9/04; C09K 3/118

U.S. Cl. 428—411

16 Claims

1. A method for facilitating transportation of particulate solids on a conveyor belt, at least a portion of which is exposed to a temperature of less than 0° C., comprising:

(a) contacting the surface of said belt upon which the particulate solids are transported with from about 0.001 to about 0.01 gallons per square foot of belt surface, of a composition containing from about 0.05 to about 2% by weight a dimethyl polysiloxane, with the balance consisting substantially of water soluble components comprising

(A) a water soluble polyhydroxy compound or monoalkyl ether thereof, and

(B) a water soluble organic nonvolatile compound having at least one hydrophilic group, said compound (B) being different from said compound (A), said composition being substantially free of corrosion inducing metal halide salts;

(b) placing particulate solids on the treated belt;

(c) moving the belt so that said solids are transported; and

(d) exposing at least a portion of the treated belt surface to a temperature of less than 0° C.

4,162,348

## COLORING OF INORGANIC SUBSTRATES AND MINERAL MATERIALS

Shigeru Juzu; Hiroyuki Okazaki, both of Toyonaka, and Yasuyuki Suzuki, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 457,303, Apr. 2, 1974, abandoned. This application Jan. 28, 1976, Ser. No. 653,163

Claims priority, application Japan, Apr. 2, 1973, 48-38155

Int. Cl.<sup>2</sup> B05B 5/00; D06L 3/12

U.S. Cl. 428—474

20 Claims

1. A method for coloring an inorganic substrate, which comprises contacting the inorganic substrate in separate steps but in any order with (1) a cationic component comprising

(a) a water soluble cationic resin or an aqueous solution of a water soluble cationic resin, said cationic resin comprising at least one of polyamide-polyamine-epichlorohydrin resins, polyamine-epichlorohydrin resins, polyvinylamine-polyacrylamide-epichlorohydrin resins and polyethyleneimine polymers,

- (b) an aqueous solution of said water soluble cationic resin and a water soluble cationic dye, or
  - (c) an aqueous dispersion of said water soluble cationic resin, a cationic dispersing agent plus a water insoluble dye or pigment, and with (2) an anionic component comprising
  - (d) an aqueous solution of a water soluble anionic dye,
  - (e) an anionic dispersing agent or an aqueous solution of an anionic dispersing agent,
  - (f) an aqueous solution of an anionic dispersing agent and a water soluble anionic dye, or
  - (g) an aqueous dispersion of an anionic dispersing agent plus a water insoluble dye or pigment and with at least one of the cationic component (1) or the anionic component (2) containing a colorant comprising at least one of a pigment, a direct dye, an acid dye, a reactive dye, a vat dye, a disperse dye, and an anionic fluorescent brightener.
12. An inorganic substrate colored by the method of claim 1.

4,162,349

## FABRICATION OF Co-Cr-Al-Y FEED STOCK

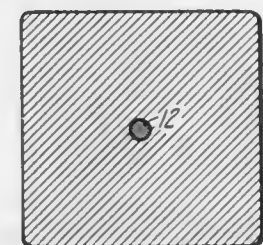
Richard C. Elam, Manchester, and Nicholas E. Ulion, Marlborough, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 800,112, May 24, 1977, Pat. No. 4,110,893, which is a continuation-in-part of Ser. No. 582,036, May 29, 1975, abandoned, Ser. No. 739,213, Nov. 5, 1976, abandoned, is a division of said Ser. No. 582,036. This application Dec. 15, 1977, Ser. No. 861,031

Int. Cl.<sup>2</sup> B21F 00/00; B22F 3/24

U.S. Cl. 428—614

2 Claims



1. An ingot for use as feed stock in a coating operation, in which the ingot is vaporized in a crucible, said ingot being of a shape and dimension to fit the crucible, said ingot being a coating alloy including chromium, cobalt, and aluminum and also including a reactive element yttrium, the alloy not being readily workable whereas the reactive element is workable and the alloy without the reactive element is workable, said ingot having a centrally extending rod of the reactive element yttrium, the remainder of the ingot including chromium, cobalt, and aluminum without the reactive element yttrium and having the proper proportion of these elements of the alloy therein, the ratio of the cross-sectional area of the rod to the cross-sectional area of the remainder of the ingot being substantially the percentage of the reactive element yttrium in the alloy, thereby assuring the desired percentage of the reactive element in the vapor produced for the coating operation, the ingot when completed being melted and vaporized for a coating operation.

4,162,350

## MAGNETIC RECORD MEMBER

Masabiro Yanagisawa, and Yoji Suganuma, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 700,191, Jun. 28, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,185

Claims priority, application Japan, Jul. 1, 1975, 50/81201

The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> B32B 15/00

U.S. Cl. 428—633

7 Claims

1. A magnetic record member comprising: an alloy disc; a

non-magnetic alloy layer coated on the alloy disc and polished to a mirror surface; a magnetic metal thin film medium coated on the polished non-magnetic alloy layer; and a polysilicate film including 2 to about 56 weight percent silanol radicals coated on the surface of the magnetic metal thin film for protecting, preserving and enhancing the useful life of the record member.

4,162,351

## METAL-HALOGEN CELL OPERATION WITH STORAGE OF HALOGEN VIA ORGANIC COMPLEXATION EXTERNAL TO THE ELECTROCHEMICAL CELL

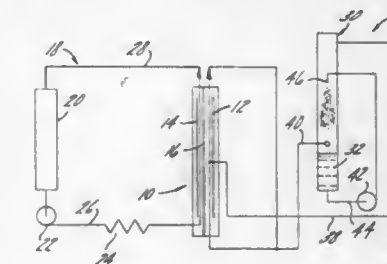
Ronald A. Putt, Palatine, and Mark J. Montgomery, Lake Zurich, both of Ill., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 12, 1977, Ser. No. 841,391

Int. Cl.<sup>2</sup> H01M 8/08

U.S. Cl. 429—15

10 Claims



1. A battery system comprising at least one cell, an electrolyte containing halogen therein and at least one negative electrode and one halogen positive electrode positioned in said cell, a storage means for halogen in the liquid phase located externally of the cell, means for circulating electrolyte between said storage means and said cell, and means providing sufficient liquid-liquid contact between the electrolyte and the halogen in said storage means to maintain the desired concentration of halogen in the electrolyte.

9. A method of operating a battery system including at least one halogen positive electrode and an electrolyte containing halogen which comprises providing a storage for halogen in a liquid phase external of the cell, circulating electrolyte between the halogen storage and the cell, and providing sufficient liquid-liquid contact in the storage between the electrolyte and the halogen to maintain the desired concentration of halogen in the electrolyte.

4,162,352

## BATTERY WITH BORON-LITHIUM ALLOY ANODE

Raymond A. Sutula, Laurel, and Frederick E. Wang, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1976, Ser. No. 726,368

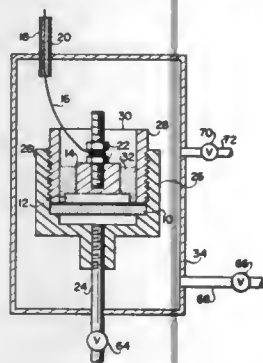
Int. Cl.<sup>2</sup> H01M 12/06

U.S. Cl. 429—29

6 Claims

1. A current generating electrochemical cell comprising an anode material, a cathode material, and an electrolyte selected from the group consisting of solid and fusible electrolytes positioned between and in contact with said anode material

and said cathode material wherein said anode material consists essentially of from about 50 weight percent to about 90 weight



percent of lithium and from about 10 weight percent to about 50 weight percent of boron.

4,162,353

### METHOD OF PRODUCING FLEXIBLE FLAME RETARDED POLYURETHANE FOAM

Anthony J. Papa, Saint Albans, and Walter W. Runyan, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

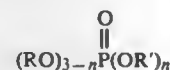
Division of Ser. No. 644,789, Dec. 29, 1975, Pat. No. 4,097,559. This application Apr. 3, 1978, Ser. No. 892,752

Int. Cl.<sup>2</sup> C08K 5/52

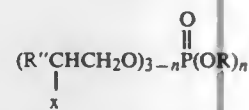
U.S. Cl. 521—107

10 Claims

1. A method for producing a flexible polyurethane foam which comprises reacting and foaming a reaction mixture containing: (a) an organic polyisocyanate; (b) a polyol; (c) a catalyst for the reaction of (a) and (b); (d) a blowing agent; and (e) a polyphosphate thermal condensate comprising the reaction product of an unsubstituted trialkylphosphate having the following structure:



wherein R is CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub> or C<sub>4</sub>H<sub>9</sub>; R' is a C<sub>5</sub> to C<sub>10</sub> hydrocarbon chain and n is 0, 1 or 2 with a 2-haloalkyl phosphate having the following structure:



wherein x is Cl or Br; R'' is H, CH<sub>3</sub>, CH<sub>2</sub>Cl or CH<sub>2</sub>Br; and R and n are defined above, said thermal condensate being present in an amount sufficient to impart flame retardancy to the resulting flexible polyurethane foam.

4,162,354

### PROMOTERS FOR RADIATION INDUCED CROSS-LINKING IN POLYMER SUBSTANCES

Dale S. Pearson, and Anton Shurpik, both of Hauppauge, N.Y., assignors to The Firestone Tire & Rubber Co., Akron, Ohio. Continuation of Ser. No. 555,110, Mar. 4, 1975, which is a continuation of Ser. No. 395,177, Sep. 7, 1973, abandoned, which is a division of Ser. No. 148,883, Jun. 1, 1971, Pat. No. 3,843,502. This application Feb. 21, 1978, Ser. No. 879,435

Int. Cl.<sup>2</sup> C08F 28/00

U.S. Cl. 525—3

5 Claims

1. Vulcanizable compositions suitable for the formation of vulcanizates of diolefin rubbers by exposure to high energy ionizing radiation at a total dose of from about 0.1 to 15 Mrads, said compositions comprising diolefin rubbers having an aver-

age molecular weight of from about 100,000 to about 500,000 together with from about 0.1 to 5% based on the total weight of at least one polyhydrosulfide direct radiation vulcanization promoter together with from about 0.1 to 5% of an indirect radiation vulcanization promoter which is a low molecular weight halogenated aliphatic or aromatic hydrocarbon containing up to about 10 carbon atoms.

4,162,355

### COPOLYMERS OF (A) AMINIMIDES AND (B) VINYL PENDANT PRIMARY HALOMETHYL MONOMERS USEFUL FOR AFFINITY CHROMATOGRAPHY

John C. M. Tsibris, Gainesville, Fla., assignor to Board of Regents, for and on behalf of the University of Florida, Tallahassee, Fla.

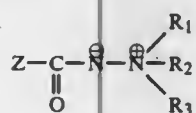
Filed Jun. 30, 1976, Ser. No. 701,410

Int. Cl.<sup>2</sup> C08F 4/04, 14/02, 20/52, 214/02

U.S. Cl. 526—293

2 Claims

1. A polymer suitable for use in affinity chromatography comprising an addition copolymer of (1) at least one aminimide of the structural formula:



wherein

R<sub>1</sub> and R<sub>2</sub> are the same or different and represent lower alkyl;

R<sub>3</sub> represents an organic group, and

Z represents the residue of a polymerizable vinyl compound, and (2) a vinyl compound having at least one pendant primary halomethyl group.

4,162,356

### METHOD AND COMPOSITION FOR RENDERING FLEXIBLE SHEET MATERIAL NON-ADHERENT

Maurice E. Grenoble, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 748,738, Dec. 9, 1976, abandoned, which is a division of Ser. No. 593,571, Jul. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 523,898, Nov. 14, 1974, abandoned. This application Mar. 13, 1978, Ser. No. 885,645

Int. Cl.<sup>2</sup> C08L 83/04

U.S. Cl. 528—31

5 Claims

1. A solventless composition for rendering flexible sheet materials non-adherent to surfaces which normally adhere thereto, said composition consisting essentially of:

(a) A silanol chainstopped polysiloxane having the formula:



wherein R is a monovalent hydrocarbon radical or a cyanoalkyl radical and t has a value which will give a viscosity between 300 and 1000 cstks at 25° C.;

(b) An organic hydrogenpolysiloxane of the formula:



wherein R is the same as hereinabove defined, a is 0 to 3, b is 0.005 to 2.0 and a plus b is 0.8 to 3; and

(c) an amount of a catalyst for curing said composition.

4,162,357

### PROCESS FOR THE PRODUCTION OF SYNTHETIC RESINS CONTAINING ISOCYANURATE GROUPS

Rolf Kubens, Odenthal, and Heinrich Heine, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,534

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722400

Int. Cl.<sup>2</sup> C08G 18/02

U.S. Cl. 528—67

10 Claims

1. In a process for the production of heat-resistant synthetic resins containing isocyanurate groups by the polymerization of organic polyisocyanates in the presence of catalysts which accelerate the trimerization of isocyanate groups, the improvement wherein said polyisocyanate component is a mixture of isomers and/or homologs of polyisocyanates of the diphenylmethane series containing more than 20%, by weight, of 2,4'-diisocyanatodiphenylmethane.

4,162,358

### POLYAROMATIC AMINE CURING AGENTS FOR EPOXY RESINS

Edward T. Marquis, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,364

Int. Cl.<sup>2</sup> C08G 59/50

U.S. Cl. 528—120

15 Claims

1. A curable epoxy resin composition consisting essentially of:

a vicinal epoxide; and, an effective amount of a methylene bridged polyaromatic amine curing agent prepared by the steps of mixing and reacting, in the presence of a solid acidic catalyst, at a temperature of from about 100° C. to about 300° C., (1) an aniline, (2) a mononuclear aromatic diamine having amine groups bonded to nonadjacent carbon atoms of the aromatic ring; and (3) formaldehyde; wherein the amount of the mononuclear aromatic diamine present is from about 2 mole percent to about 8 mole percent, based upon the total amine charged, and the mole ratio of the total amine charged to formaldehyde is from about 2.5 to about 8; to produce a methylene bridged polyaromatic amine material;

whereby, when such composition is cured, an epoxy resin having improved heat distortion temperature is obtained.

4,162,359

### PRODUCTION OF CELLULOSE ACETATE

Phyllis C. Leithem, McCleary, and Romeo Conca, Shelton, both of Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,285

Int. Cl.<sup>2</sup> C08B 1/02, 3/06

U.S. Cl. 536—70

7 Claims

1. In a process for producing cellulose acetate from highly purified cellulosic dissolving pulp comprising subjecting the dissolving pulp to a bleaching sequence including at least one alkaline extraction stage and acetylating the bleached pulp to convert the pulp to cellulose acetate,

the improvement in which the yellowness index of the cellulose acetate is reduced comprising carrying out the alkaline extraction stage in the presence of from 0.2 to 3.3% based on dry pulp weight of a peroxide selected from the group consisting of hydrogen peroxide and sodium peroxide.

4,162,360

### 3-CARBAMOYLOXYMETHYL-7-SUBSTITUTED OXIMINO ACETAMIDO CEPHALOSPORANIC ACID DERIVATIVES

Janice Bradshaw, Harrow; Martin C. Cook, Liverpool, and Gordon I. Gregory, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England. Division of Ser. No. 668,246, Mar. 18, 1976, Pat. No. 4,060,686, which is a continuation-in-part of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Sep. 13, 1977, Ser. No. 832,956

Claims priority, application United Kingdom, Dec. 21, 1973, 59517/73

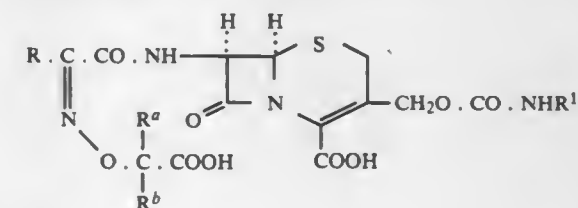
The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 501/32, 501/34

U.S. Cl. 544—16

4 Claims

1. A cephalosporin antibiotic of the formula



wherein

R is thienyl, furyl or phenyl;

R<sup>a</sup> is methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

R<sup>b</sup> is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

R<sup>1</sup> is hydrogen or methyl; or a physiologically acceptable salt, ester, or 1-oxide thereof.

4,162,361

### MORPHINE/APOMORPHINE REARRANGEMENT PROCESS

Roman R. Lorenz; Edward D. Parady, and William H. Thielking, all of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

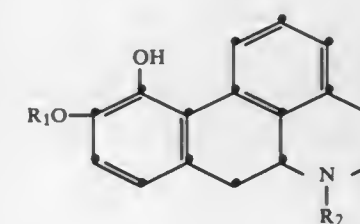
Continuation-in-part of Ser. No. 757,888, Jan. 10, 1977, abandoned. This application May 18, 1978, Ser. No. 907,901

Int. Cl.<sup>2</sup> C07D 215/14

U.S. Cl. 546—72

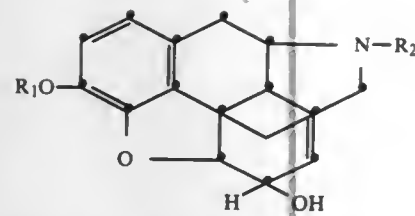
7 Claims

1. The process for preparing a compound having the formula:



where R<sub>1</sub> is hydrogen or lower-alkyl; and R<sub>2</sub> is hydrogen, lower-alkyl, lower-alkenyl, lower-alkynyl, phenyl-lower-alkyl or cycloalkyl-lower-alkyl which comprises the steps of heating at a temperature in the range from 125° to 140° C. a compound having the formula:





where  $R_1$  and  $R_2$  have the meanings given above with anhydrous orthophosphoric acid under a partial vacuum and hydrolyzing the resulting phosphate esters in an aqueous medium.

**4,162,362**  
**PROCESS FOR THE PREPARATION OF**  
**DIPHENYLMETHANE DICARBAMATES AND**  
**POLYMETHYLENE POLYPHENYL CARBAMATES**  
Edward T. Shawl, Wallingford, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.  
Filed Oct. 20, 1978, Ser. No. 953,135  
Int. Cl.<sup>2</sup> C07C 125/04

**U.S. Cl. 560—25** **13 Claims**  
1. A process for the preparation of diphenylmethane dicarbamates and polymethylene polyphenyl carbamates which comprises reacting an N-aryl carbamic acid ester with a carbonyl compound selected from formaldehyde, para-formaldehyde or trioxane or mixtures thereof, at a temperature of from ambient to about 170° C. in the presence of an organic sulfonic acid catalyst medium selected from alkane sulfonic acids, halogenated alkane sulfonic acids or aromatic sulfonic acids which have an acid concentration of at least 75 percent and recovering the desired carbamates.

**4,162,363**  
**CONVERSION OF DIENES OR MONOOLEFINS TO**  
**DIESTERS**  
Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
Filed Aug. 25, 1977, Ser. No. 827,641  
Int. Cl.<sup>2</sup> C07C 67/05

**U.S. Cl. 560—246** **41 Claims**  
1. A process for the production of diesters which comprises: reacting at least one unsaturated reactant selected from conjugated diolefins and monoolefins with oxygen and a carboxylic acid reactant media employing a catalyst system comprising (A) a sulfur source and (B) an alkali metal compound, optionally (C) with a halide source; wherein said unsaturated reactant is selected from unsubstituted and substituted diolefins and monoolefins wherein the substituents are selected from the group consisting of halogen, cyano, —COOR', and hydrocarbyl radicals, wherein R' is hydrogen or an alkyl or aryl radical, said carboxylic acid media is selected from the group consisting of mono- and dicarboxylic aliphatic and aromatic acids and mixtures with acid anhydrides, having 2 to 18 carbon atoms per molecule, said (A) sulfur source is sulfur, sulfur chloride, sulfur bromide or mixture; said (B) alkali metal compound is a halide, nitrate, carboxylate, oxide, sulfide, or hydroxide, or lithium, sodium, potassium, or cesium, including mixtures; and wherein said optional (C) halide source is a chloride, bro-

mide, or mixture, and is a media soluble said (A) or (B) wherein said (A) or (B) is the halide, or is a haloolefin.

**4,162,364**  
**PROCESS FOR THE PREPARATION OF**  
**2-(3-BENZOYLPHENYL)-PROPIONIC ACID**  
Boris Zupancic, Ljubljana, and Branko Jenko, Ljubljana-Polje, both of Yugoslavia, assignors to LEK Tovarna farmacevtskih in kemskih izdelkov, n.s.o., Ljubljana, Yugoslavia  
Filed Oct. 17, 1977, Ser. No. 842,822  
Claims priority, application Yugoslavia, Oct. 18, 1976, 2547/76

**Int. Cl.<sup>2</sup> C07C 51/24, 51/33**  
**U.S. Cl. 562—408** **13 Claims**  
1. A process for the preparation of 2-(3-benzoylphenyl)-propionic acid which comprises treating 1-(3-benzoylphenyl)-propine with a thallium(III) salt in a lower alcohol to form 2-(3-benzoylphenyl)-propionic ester; and hydrolyzing said ester to form 2-(3-benzoylphenyl)-propionic acid.

**4,162,365**  
**LIQUID PHASE AIR OXIDATION PROCESS FOR**  
**MAKING PHTHALIC ACIDS**  
Ferdinand List, and Helmut Alfs, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany  
Continuation of Ser. No. 176,262, Aug. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 773,349, Nov. 4, 1968, abandoned. This application Jul. 13, 1976, Ser. No. 704,955  
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1967, 1643827

**Int. Cl.<sup>2</sup> C07C 51/33**  
**U.S. Cl. 562—416** **18 Claims**  
1. In a process for the liquid phase oxidation of a dialkyl benzene dissolved in a lower carboxylic acid at a concentration of 5 to 25 weight % with a molecular oxygen-containing gas in the presence of a bromine-activated heavy metal compound catalyst to give phthalic, isophthalic and terephthalic acids, the improvement which comprises carrying out the oxidation at a temperature of 160° to 190° C. in the presence of said catalyst consisting essentially of a catalytic amount of a bromine-activated cobalt compound ranging from 0.5 to 5 grams of cobalt per liter of reaction solution and introducing a sufficient amount of said oxygen-containing gas into said liquid phase such that the reaction will contain a large excess of oxygen at all times and the waste gas produced contains an excess amount of oxygen, forming coarse granules of dicarboxylic acid where 80% of said particles are greater than 100 microns and continuously separating said granules in a centrifuge.

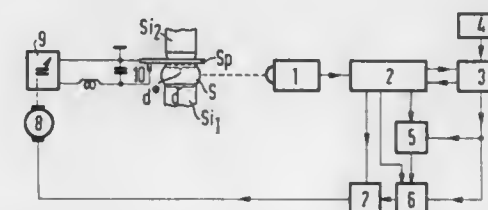
**4,162,366**  
 **$\alpha$ -TRIFLUOROMETHYL-3-PHENOXYBENZYL**  
**ALCOHOL**  
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.  
Division of Ser. No. 765,014, Feb. 2, 1977. This application Apr. 7, 1978, Ser. No. 894,263  
Int. Cl.<sup>2</sup> C07C 43/20  
**U.S. Cl. 568—637** **1 Claim**  
1.  $\alpha$ -Trifluoromethyl-3-phenoxybenzyl alcohol.

## ELECTRICAL

**4,162,367**  
**METHOD OF CRUCIBLE-FREE ZONE-MELTING A**  
**SEMICONDUCTOR ROD AND APPARATUS FOR**  
**CARRYING OUT THE METHOD**

Friedrich Ticak, Munich, and Hans Stut, Grobenzell, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
Filed Jul. 10, 1978, Ser. No. 923,384  
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1977, 2731250

**Int. Cl.<sup>2</sup> H05B 5/08; B01J 17/08**  
**U.S. Cl. 13—1** **7 Claims**



1. Method of crucible-free zone-melting a semiconductor rod which comprises monitoring a melting zone formed in and traveling through a semiconductor rod surrounded by an induction heating coil, producing a respective signal corresponding to values of the actual diameters  $d$  of the semiconductor rod at a crystallization interface of the melting zone, comparing the signals corresponding to the actual diameter values  $d$  with a signal corresponding to a nominal diameter value  $d_0$ , so as to produce a signal corresponding to a respective first control deviation  $\Delta d$ , continuously combining the signals corresponding to the actual diameter values  $d$  and the signal corresponding to the respective first control deviation  $\Delta d$  to form respective signals corresponding to a new nominal diameter value  $d_0^*$ , respectively, in accordance with the relationships:

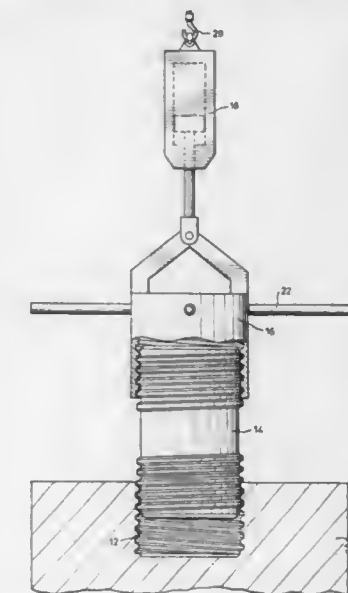
(a)  $d_0^* = k \cdot d_0 \pm \Delta d$ , wherein  
(b)  $0.3 \leq k \leq 1.4$ , and  $k$  = a constant,

comparing the respective signals corresponding to the new nominal diameter value  $d_0^*$  to respective signals corresponding to an actual diameter value  $d_1^*$  of the melting zone in a given substantially horizontal cross section thereof located between a melting interface and a maximal, substantially horizontal cross section of the melting zone and having a fixed spacing from at least one of said induction heating coil and said melting interface so as to produce a signal corresponding to a respective second control deviation  $\Delta d^*$ , and controlling with the signal corresponding to the respective second control deviation  $\Delta d^*$  an operating parameter having an effect upon the geometry of the melting zone so as to adjust the respective actual diameter value  $d_1^*$  to the nominal diameter value.

**4,162,368**  
**ASSEMBLY OF FURNACE ELECTRODES**  
Ernest R. Brazier, Maidenhead, England, assignor to ERCO Industries Limited, Islington, Canada  
Filed Dec. 20, 1977, Ser. No. 862,407  
Int. Cl.<sup>2</sup> H05B 7/14

**U.S. Cl. 13—18 C** **9 Claims**  
1. In a method of adding a new electrode segment to an elongate electrode suspended in a furnace wherein the electrode is formed by joining segments having threaded sockets at either end by a correspondingly threaded nipple, the improvement which comprises the following steps:  
(a) one end of said nipple is screwed into the socket of a first electrode segment constituting the top end of said electrode at least once while maintaining a tension load between said nipple and said electrode segment,  
(b) the other end of said nipple is screwed into one of the sockets of a second electrode segment constituting said

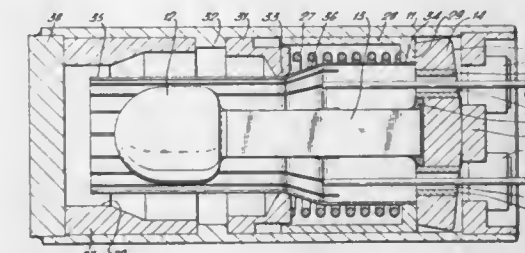
new electrode segment at least once while maintaining a tension load between said nipple and said second electrode segment, said steps (a) and (b) being effected to result in a combination of said nipple screwed into either one of said electrode segments but not both, in the socket into which said nipple was previously screwed under tension, and



(c) said combination is screwed into said socket of the other of said electrode segments while maintaining a tension load between said combination and said other of said electrode segments.

**4,162,369**  
**THERMOELECTRIC BATTERY, PROTECTED AGAINST**  
**SHOCKS AND ACCELERATIONS**  
Michael H. Brown, Newbury, and John Myatt, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, England  
Filed Oct. 27, 1977, Ser. No. 846,209  
Int. Cl.<sup>2</sup> H01L 37/00

**U.S. Cl. 136—202** **5 Claims**



1. A thermoelectric battery comprising a casing enclosing a thermoelectric assembly of elongated form, the assembly comprising a heat source, a heat sink and a thermoelectric unit attached to and extending between the heat source and the heat sink, with at least the heat source end of the assembly defining an annular space with the casing, a heat-conducting mass disposed at the heat sink end of the assembly and attached to the casing, a resilient mounting for the thermoelectric unit for reducing the stress applied thereto in the event of shock or acceleration applied to the battery, the heat source being surrounded by a cage of spring fingers which are not normally in contact with the heat source or the thermoelectric unit, each of said fingers being anchored at one end and having the other end thereof normally free, and extending into the said annular space between the heat source and the casing, and an abutment member positioned to be engaged by a free end of a spring finger in the event that the spring finger is bowed to a predetermined

extend by the force of the heat source displaced into engagement with the spring finger under the effect of shock or acceleration, the positioning of the spring fingers and the abutment member being such that the cage of spring fingers provides two stages of arresting force for the heat source when displaced by rocking motion of the assembly in excess of a predetermined amount under shock or acceleration, the first stage comprising the arresting force provided by simple bowing of the free ends of spring finers when engaged by the heat source and the second stage, provided under severe shock or acceleration, comprising the arresting force provided by the bending of a spring finger between two points of support.

4,162,370

## CURRENT CARRYING HOSE ASSEMBLY

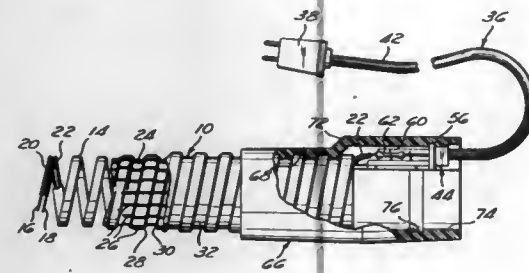
George T. Dunn, and Alcide W. Choiniere, both of Abbeville, S.C., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Jun. 24, 1977, Ser. No. 809,905

Int. Cl.<sup>2</sup> A47L 9/24; F16L 11/11, 11/12

U.S. Cl. 174-47

11 Claims



2. An electric current and fluid carrying hose assembly comprising:
  - a pair of helically wound electrical conductors defining a tubular bore and a cover on said helically wound conductors, said helically wound conductors and cover forming a hose; and
  - an end connector cuff having screw threads therein of the same pitch and configured to screw onto the end of said hose on said helix defined by the helically wound conductors in said hose, said end cuff being screwed onto the end of said hose.

4,162,371

## METHOD OF AND MEANS FOR ESTABLISHING TWO-WAY COMMUNICATION BETWEEN TWO STATIONS INTERCONNECTED BY A SINGLE SIGNAL LINK

Piero Belforte, Turin, Italy, assignor to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

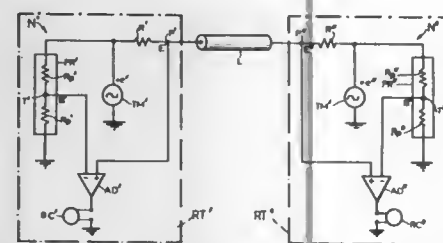
Filed Jan. 13, 1978, Ser. No. 869,171

Claims priority, application Italy, Jan. 14, 1977, 67083 A/77

Int. Cl.<sup>2</sup> H04L 5/14

U.S. Cl. 178-58 R

13 Claims



1. A method of facilitating simultaneous signaling in two directions between a pair of stations of a telecommunication

system interconnected by an unbalanced transmission line constituting a two-way signal link, comprising the steps of: generating, at each of said stations, an outgoing signal as a first unbalanced voltage with reference to ground; splitting said outgoing signal between a conductor of said transmission line and a local circuit; extracting, at each of said stations, from said conductor a composite signal as a second unbalanced voltage including an incoming signal and a component of said outgoing signal; deriving from said local circuit a compensating signal substantially identical with said component; and subtracting said compensating signal from said composite signal, thereby producing a further unbalanced voltage substantially corresponding to said incoming signal.

4,162,372

## DEVICE FOR ELECTRONICALLY GENERATING THE RADIATION EFFECTS PRODUCED BY A ROTARY LOUDSPEAKER

Ulrich Gross, Geldrop, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

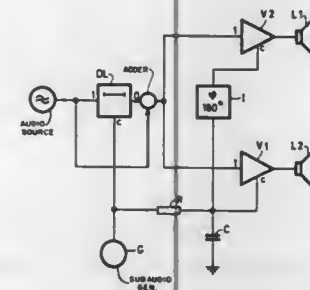
Filed Nov. 10, 1977, Ser. No. 850,234

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653454

Int. Cl.<sup>2</sup> G10H 1/02; H04M 1/00

U.S. Cl. 179-1 J

6 Claims



1. A circuit for electronically generating the radiation effects produced by a rotary loudspeaker for use with two loudspeakers, said circuit comprising means for generating a subaudio frequency signal; a variable delay means having signal input means for receiving an audio signal, control input means for receiving said subaudio frequency signal and for varying the delay thereof, and an output means for providing a delayed signal; two amplifiers each having a signal input means for jointly receiving said audio and delayed signals, a gain control input means for receiving said subaudio frequency signal in phase opposition respectively, and an output adapted to be coupled to said loudspeakers respectively; and a phase inverter coupled between said gain control input means.

4,162,373

## FLEXIBLE ACOUSTIC COUPLER

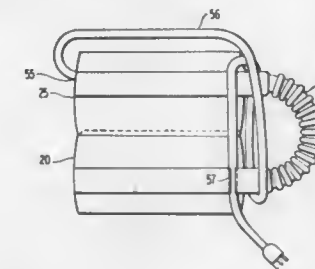
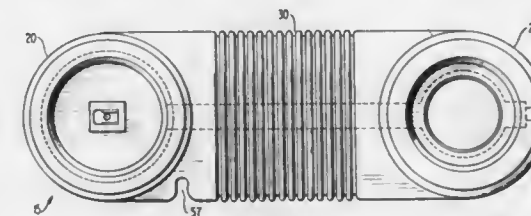
Jack F. Ingber, San Diego, Calif., assignor to Systems Consultants, Inc., Washington, D.C.

Filed Jun. 29, 1978, Ser. No. 920,612

Int. Cl.<sup>2</sup> H04M 11/00

U.S. Cl. 179-1 C

11 Claims



9. An acoustic coupler comprising a pair of muff means each for acoustic coupling with a telephone handset and means joining said muff means for folding movement to bring said muff means into adjoining relation.

4,162,374

## VOICE-SWITCHED TELEPHONE SET

Jean-Philippe Girard, 2, rue Pierre-Joseph Redouté, 92360 Meudon-La-Forêt, France, and Antoine Bernard, 57, Rue du Professeur Einstein, 94260 Fresnes, France

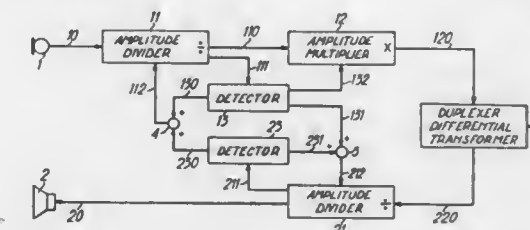
Filed Dec. 29, 1977, Ser. No. 865,692

Claims priority, application France, Dec. 31, 1976, 76 39791

Int. Cl.<sup>2</sup> H04M 9/08

U.S. Cl. 179-1 HF

1 Claim



1. A loudspeaker telephone set comprising:
  - a transmitter channel comprising in series a microphone, transmitter attenuator, transmitter amplifier, and duplexer;
  - a receiver channel comprising in series said duplexer, receiver attenuator, and loudspeaker;
  - means for detecting a transmitter channel speech signal present at the transmitter attenuator output;
  - means for detecting a receiver channel speech signal at the receiver attenuator output;
  - means for adding said detected transmitter and receiver speech signals, thereby forming a summed signal;
  - means for connecting said summed signal to a control terminal on each of said transmitter attenuator and receiver attenuator, and
  - said transmitter amplifier means comprising an amplifier multiplier formed by a balanced modulator having two inputs respectively receiving the transmitter channel

speech signal and the detected transmitter channel speech signal.

4,162,375

## TIME-DIVISION MULTIPLEX SWITCHING NETWORK WITH SPATIAL SWITCHING STAGES

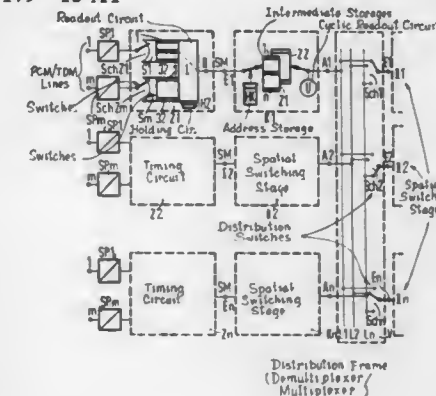
Max Schlichte, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany Continuation of Ser. No. 729,717, Oct. 5, 1976, abandoned, which is a continuation of Ser. No. 644,865, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 552,809, Dec. 25, 1975, abandoned, which is a continuation of Ser. No. 343,238, Mar. 21, 1973, abandoned. This application Jan. 19, 1978, Ser. No. 870,750

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1972, 2214202

Int. Cl.<sup>2</sup> H04J 3/00

U.S. Cl. 179-15 AT

4 Claims



1. A switching network for interconnecting time-division multiplex (TDM) lines which transmit pulse code modulated (PCM) signals having a plurality of individual PCM words, said switching network having a plurality of time and spatial switching circuits associated with different groups of said TDM lines, wherein the individual PCM words are transmitted in parallel form from incoming TDM lines to outgoing TDM lines through said time and spatial switching circuits, said switching network comprising:

intermediate storage means in each of said spatial switching circuits, said intermediate storage means having a plurality of individual storage positions, each of which is individually assigned to a predetermined destination route in said switching network;

writing means connected to said intermediate storage means for writing individual PCM words into said storage positions pursuant to addresses corresponding to the destination routes to be followed by each PCM word, said writing means writing each PCM word into said storage positions during a time interval individually allocated to the origin route of the PCM word, the time interval forming part of the time slot of the time channel associated with that PCM word;

reading means connected to said intermediate storage means for cyclically reading the PCM words from said storage positions in the next time slot;

said switching network including a plurality of said spatial switching circuits in a first stage and a plurality of said spatial switching circuits in at least a second stage following said first stage and

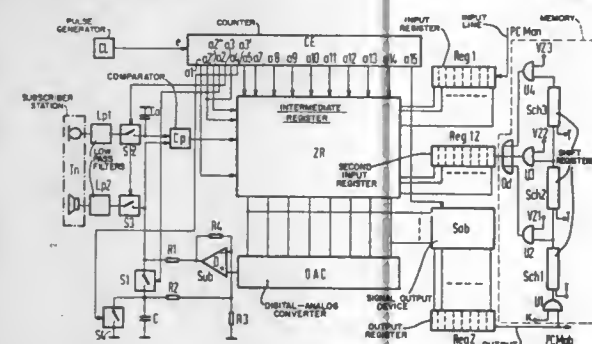
demultiplexer-multiplexer means for connecting the outputs of said spatial switching circuits of said first stage to the inputs of said spatial switching circuits of said second stage to distribute PCM signals, which are interleaved in time at said outputs of said first stage according to destination routes, among said inputs of said second stage corresponding to the destination routes.



**4,162,376**  
**CONFERENCE CALL CIRCUIT USING REVERSIBLE ANALOG TO DIGITAL CONVERTER**  
 Peter Hirschmann, Puchheim, and Ernst Höfer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
 Filed Jul. 21, 1978, Ser. No. 926,920  
 Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733227

Int. Cl.<sup>2</sup> H04M 3/00; H03K 13/02  
 U.S. Cl. 179—18 BC

4 Claims



4. A method for operating a telecommunication subscriber station connected to an input line and an output line connecting to other subscriber stations with which conference connections can be maintained by the formation of summation signals, comprising the steps of:

- creating a transmitted analog signal in the subscriber station and converting the analog signal to a transmitted digital signal which is placed on the output line;
- storing the transmitted digital signal and then later converting the stored transmitted digital signal to a stored transmitted analog signal;
- receiving a digital summation signal from the input line containing the transmitted digital signal of the subscriber station together with transmitted digital signals from the other subscriber stations; and
- converting the digital summation signal to an analog summation signal and subtracting the stored transmitted analog signal to create a resulting analog received signal for the subscriber station.

**4,162,377**  
**DATA BASE AUTO BILL CALLING USING CCIS DIRECT SIGNALING**

Allison B. Mearns, Ocean, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Jul. 13, 1978, Ser. No. 924,169

Int. Cl.<sup>2</sup> H04M 15/00  
 U.S. Cl. 179—18 D

12 Claims



1. A method of automatically deriving authorization information from a data base system for billing a special service call to a number other than the number of the station from which the call originates and characterized by

receiving at said data base system a special service call billing message from a communication system and deriving a billing verification message at said data base in response to said special call billing message, and transmitting said verification message from said data base system to said communication system to control the further establishment of call connections in accordance with said verification message.

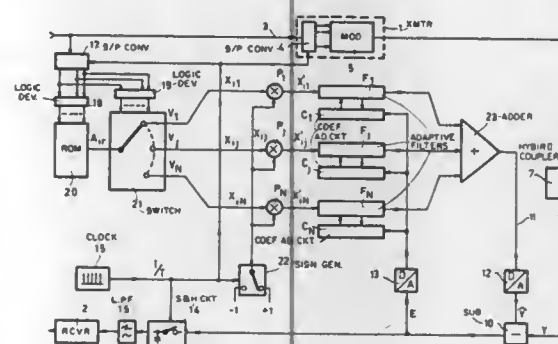
**4,162,378**  
**DIGITAL ECHO CANCELER FOR A MODEM FOR DATA TRANSMISSION BY MEANS OF MODULATION OF A CARRIER**

Jean-Pierre Baudoux, Paris, and Cesar D. Macchi, Orsay, both of France, assignors to Telecommunications Radioelectriques et Telephoniques TRT, Paris, France

Filed Jan. 16, 1978, Ser. No. 869,508  
 Claims priority, application France, Jan. 17, 1977, 77 01197; Jun. 15, 1977, 77 18342

Int. Cl.<sup>2</sup> H04B 3/24  
 U.S. Cl. 179—170.2

18 Claims



1. A digital echo canceler for a modem for data transmission by means of modulation of a carrier by symbols derived from the binary data to be transmitted and occurring at instant  $iT$ , where  $i$  is a variable integer and  $1/T$  the symbol rate, the transmitter and the receiver of this modem being connected to the transmission line through a hybrid coupler, the echo canceler receiving the binary data to be transmitted and supplying an echo copy signal which is adjusted in an adaptive manner for reducing an error signal formed by the difference between the modulated carrier signal received from the hybrid coupler and the echo copy signal, said echo canceler comprising an assembly of adaptive digital filters, means responsive to each symbol configuration at each instant  $iT$  for generating at least a signal representing a number depending on the amplitude allotted to the carrier at said instant  $iT$  and for applying said number signal to at least a given section of said assembly of adaptive digital filters, said filters providing output signals, means for combining said output signals for forming a digital version of the echo copy signal, an assembly of adjusting circuit means for receiving said error signal in digital form and for minimizing a predetermined function of said error signal and for adjusting the coefficients of said filters.

**4,162,379**  
**APPARATUS FOR DERIVING A FEEDBACK CONTROL SIGNAL IN A THERMAL SYSTEM**

Carl R. Sebens, Stratford, and Chester G. Fisher, III, Southport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 25, 1977, Ser. No. 772,162  
 Int. Cl.<sup>2</sup> H05B 1/02

U.S. Cl. 219—497

1 Claim

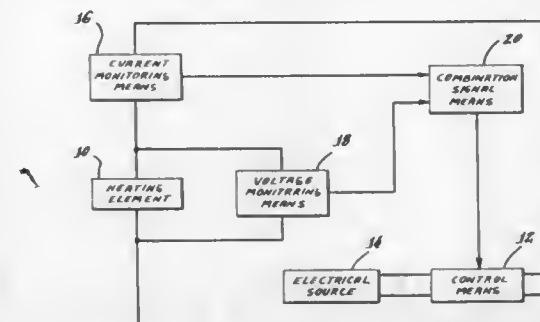
1. In an atomic absorption spectrophotometer, which develops temperatures up to at least about 3000° C., having heat

supplied by applying alternating current to an electrical element, the combination comprising:

means for monitoring the current flow through the heating element including a toroidal coil disposed about one electrical connection to the heating element while output from said toroidal coil is connected across a resistor with one side thereof being grounded;

means for monitoring the voltage drop across the heating element including an operational amplifier having the noninverting input thereof grounded through a first resistor and the output therefrom connected to the inverting input thereof through a second resistor while said inputs thereof are also connected separately across the heating element through third and fourth resistors respectively, output from said operational amplifier being proportional to the voltage drop across the heating element in accordance with the values of said resistors; and

means for linearly combining independent functions of the



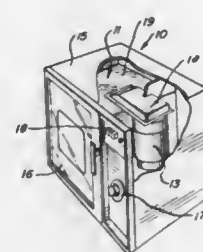
outputs from said current monitoring means and said voltage monitoring means as a composite signal; including a second operational amplifier having the noninverting input thereof grounded through a first resistor and the output therefrom connected to the inverting input thereof through a first variable resistor, each output from said current monitoring means and said voltage monitoring means being separately connected to the inverting and noninverting inputs of said second operational amplifier through AC to DC converters and second and third variable resistors respectively, the output from said second operational amplifier being the algebraic difference between variable functions relating to the outputs from said current monitoring means and said voltage monitoring means with the variability being in proportion to said first, second and third variable resistors; said first, second and third variable resistors being variably responsive to the variation of the electrothermal parameters of the graphite furnace.

**4,162,380**  
**WAVEGUIDE ASSEMBLY FOR MICROWAVE OVEN**  
 Harry D. Burke, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 31, 1977, Ser. No. 801,724  
 Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 F

19 Claims



1. In a microwave oven having wall means defining an oven

cavity, said wall means defining an inlet opening, and microwave energy generating means externally of said cavity, an improved waveguide for delivering microwave energy from said generating means through said inlet opening into said cavity, comprising:

a first waveguide member; and

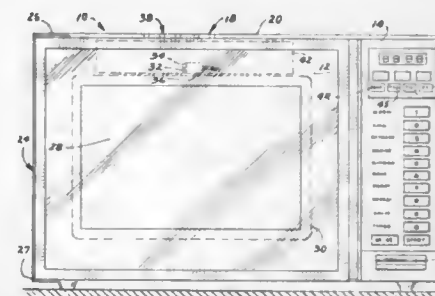
a second waveguide member secured in sealed relationship to said first waveguide member to define therewith a partial waveguide conduit having an inlet opening and an outlet opening, said partial waveguide conduit being secured in sealed relationship to said wall means with said partial waveguide conduit outlet opening generally aligned with said wall means inlet opening to define a substantially closed conduit for conducting microwave energy from said generating means successively through said partial waveguide conduit inlet opening through said partial waveguide conduit, and through said aligned partial waveguide conduit outlet opening and wall means inlet opening into said cavity, said partial waveguide conduit outlet opening being substantially larger than said wall means inlet opening and overlying the wall means about said inlet opening whereby a substantial portion of said wall means adjacent said wall means inlet opening defines with said partial waveguide conduit said improved waveguide.

**4,162,381**  
**MICROWAVE OVEN SENSING SYSTEM**  
 Ronald G. Buck, Burnsville, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 30, 1977, Ser. No. 829,081  
 Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 B

21 Claims



1. A method of controlling cooking in a microwave oven heating cavity comprising the steps of:

- storing a microwave cooking algorithm in a programmable controller in a microwave oven;
- providing a circulation path from an entrance ventilation port to an exit ventilation port through said microwave oven, said path including said microwave oven heating cavity;
- electromagnetically isolating a humidity sensor and a temperature sensor from said microwave oven heating cavity, said sensors being located in said ventilation path;
- coupling microwave energy to said microwave oven heating cavity;
- sensing the time dependent environmental conditions of said microwave heating cavity with said sensors during microwave heating in said cavity; and
- controlling said microwave energy according to said stored cooking algorithm for said sensed time dependent environmental conditions.

10. A microwave oven sensing system comprising:  
 a. a microwave oven heating cavity  
 b. microwave power means coupled to said cavity; and  
 c. sensor means positioned to sense time dependent environmental conditions of humidity and temperature during microwave cooking in said microwave oven heating cavity.

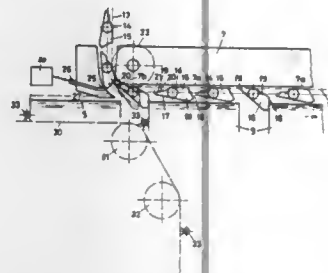
**4,162,382**  
**TRANSPORT DEVICE FOR AN ELECTRICAL**  
**RESISTANCE WELDING MACHINE**

Fred Schach, Le Landeron, Switzerland, assignor to Fael S.A.,  
 Saint-Blaise, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,819

Claims priority, application Switzerland, Nov. 9, 1976,  
 14088/76

Int. Cl.<sup>2</sup> B23K 1/16; B65G 19/00; B21D 51/26; B23K 37/04  
 U.S. Cl. 219—64 10 Claims



1. A transport device for an electrical resistance welding machine for producing lengthwise seams at workpieces to be welded to one another, the transport device delivering the workpieces to the welding machine at a predetermined welding speed, said transport device comprising:

- at least one endless chain;
- means for mounting said endless chain for revolving movement adjacent the workpieces which are to be transported and moving in a predetermined direction of transport along a feed path;
- a guide rail stationarily arranged adjacent one run of said endless chain;
- pawls;
- means incorporating pivot pins for hinged mounting the pawls at the endless chain in spaced relation from one another;
- each pawl having a pair of pawl arms extending to opposite sides of its associated pivot pin;
- one pawl arm of each pawl having a contact surface intended to bear against an end of the workpiece to be engaged by such pawl;
- the other pawl arm of each pawl having a control surface bearing against said guide rail which is stationarily arranged adjacent said one run of said endless chain;
- said mounting means for said endless chain comprising at least two sprocket wheels over which travels said endless chain;
- said guide rail including a linear section and at each end of said linear section a respective section which extends in a substantially curved configuration at the region of a neighboring one of the sprocket wheels in such a manner that upon arrival of a pawl along a curved infed path at the feed path the pawl arm having the contact surface is controllably rocked into its engagement position with a related workpiece and upon outfeed of the pawl out of the feed path the contact surface of the pawl arm retains its feeding position which is essentially perpendicular with respect to the direction of transport of the workpieces.

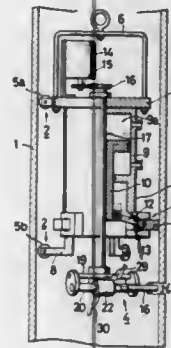
**4,162,383**  
**OXY-ARC APPARATUS FOR CUTTING INSIDE A PIPE**  
 Masanobu Hamasaki, Takamatsu, Japan, assignor to Agency of  
 Industrial Science & Technology, Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,472

Claims priority, application Japan, Dec. 24, 1975, 50-155649  
 Int. Cl.<sup>2</sup> B23P 1/00

U.S. Cl. 219—68 6 Claims  
 1. A device for cutting a pipe by the oxy-arc cutting process, which comprises, in combination,  
 a cylinder internally incorporating a piston and downwardly extending into a circular skirt,  
 a plurality of claws connected to the lower part of said

piston and adapted to be radially thrust out in the direction of the inner wall of a pipe by the descent of said piston,  
 a plurality of guide rollers radially protruding in the direction of the inner wall of the pipe, some of said guide rollers from adjacent the upper peripheral surface of said cylinder and the others from the peripheral surface of the downwardly extended skirt of said cylinder.  
 said plurality of claws protruding at a level between the levels containing the upper and lower groups of guide rollers;  
 a rotary shaft pierced axially through said cylinder and said



piston, with one end of said rotary shaft protruding from the upper surface of said cylinder and provided with a driving unit for the rotary shaft,  
 an oxy-arc cutting rod disposed at the other end of said rotary shaft by movable means that maintain the leading end of said oxy-arc cutting rod in contact under a fixed force with the inner wall of the pipe at a fixed angle less than 90°, and  
 means for supplying said oxy-arc cutting rod with electric power and oxygen; whereby said movable means move to maintain said oxy-arc cutting rod in contact with the inner wall of the pipe as the oxy-arc cutting rod is consumed by the oxy-arc cutting process.

**4,162,384**  
**MANUAL DOWNSHIFT DEACCELERATION SHIFT**  
**LEVER WITH SWITCH ARRAY**

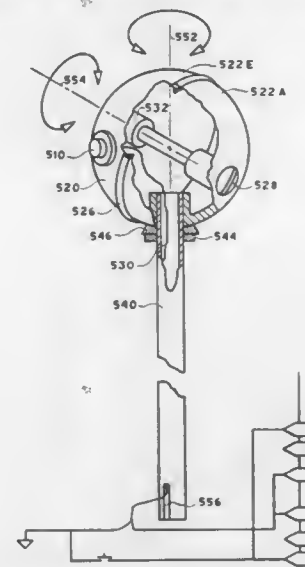
Gustave J. Chicoine, 2468 Briarwood Dr., San Jose, Calif. 95125  
 Division of Ser. No. 659,223, Feb. 19, 1976. This application Jan.  
 24, 1977, Ser. No. 762,043

Int. Cl.<sup>2</sup> H01H 9/06

U.S. Cl. 200—61.88 10 Claims

1. A device which permits a driver to manually activate the vehicle braking lights while repositioning the shift lever via a shift knob mounted on the threaded end portion thereof during transmission downshift deacceleration, comprising:  
 a switch support bracket having an aperture therethrough adapted to receive the threaded end portion of the shift lever, and to be releasably secured on the threaded end portion of the shift lever proximate the shift knob, the bracket is rotatable about the longitudinal axis of the threaded end portion when released;  
 a manually operated switch for activating the braking lights, mounted on the switch support bracket at a position along an arc of rotation about the longitudinal axis of the threaded end portion determined by rotating the switch support bracket when released; and  
 threaded means adapted to engage the threaded end portion

of the shift lever for releasably securing the switch support bracket to the shift lever to permit rotation of the



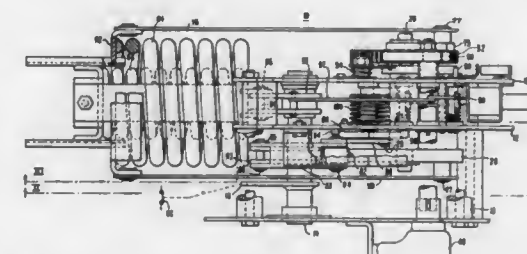
bracket and positioning of the switch along the arc of rotation when released.

**4,162,385**  
**DUAL SPRING CIRCUIT INTERRUPTER APPARATUS**  
 Fred Bould, Edgewood Borough, and Peter M. Kowalik, Penn  
 Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1976, Ser. No. 728,477

Int. Cl.<sup>2</sup> H01H 3/30

U.S. Cl. 200—153 SC 3 Claims



1. A circuit interrupter operating mechanism, comprising:  
 (a) a support;  
 (b) contact closing means disposed upon said support and disposable in mechanical relationship with the contacts of a circuit interrupter for closing said contacts;  
 (c) releasable contact opening means disposed upon said support and disposable in mechanical relationship with said contacts of said circuit interrupter for opening said contacts;  
 (d) closing spring means disposed upon said support, said closing spring means having a first end which is disposed in fixed relation with said support and a second end which is movable relative to said support between a first fixed position when said closing spring means is charged and a second fixed position when said closing spring means is discharged, said second end being disposed in mechanical relationship with said contact closing means to initiate a closing operation for said contact closing means upon discharge of said closing spring means;  
 (e) opening spring means disposed upon said support within said closing spring means, said opening spring means having a first end which is affixed to said support and a second end which is connected in mechanical relationship with said contact opening means and which is maintained in a

generally fixed position thereby prior to release of said contact opening means, said second end of said opening spring means being interconnected mechanically with said second end of said closing spring means for being moved by said second end of said closing spring means during the discharging of said closing spring means to thereby charge said opening spring means in compression, said second end of said opening spring means moving upon release of said contact opening means to discharge said opening spring means independently of said closing spring means to thus force an opening operation in said contact opening means;

(f) charging means disposed upon said support for charging said closing spring means; and

(g) releasing means disposed upon said support for releasing said contact opening means.

**4,162,386**  
**METHOD OF AND MEANS FOR SECURING AN**  
**ELECTRIC SWITCH OPERATING LEVER IN A**  
**ONE-HOLE MOUNTING BUSHING**

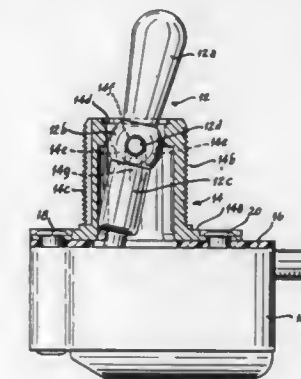
James E. Bourgeois, and Leonardus J. Josemans, both of Smithfield, N.C., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 7, 1977, Ser. No. 849,335

Int. Cl.<sup>2</sup> H01H 03/04

U.S. Cl. 200—339

3 Claims



1. In an electric switch or the like having a unitary one-hole mounting bushing and a toggle operating lever, the improvement comprising, providing said lever with oppositely disposed aligned pivot trunnions, providing bearing socket means internally of said bushing in which said lever trunnions seat and said lever is thereby constrained for pivotal movement in one plane, and diametrically opposed portions of the side wall of said bushing sheared through and bent inwardly of said side wall to underlie said pivot trunnions of said lever to thereby restrain the latter against withdrawal from said bearing socket means.

**4,162,387**  
**CAR BODY WELDING ASSEMBLY SYSTEM**  
 Ettore De Candia, 78240 Chambourcy, Montaign, France

Filed Jun. 6, 1977, Ser. No. 803,960

Int. Cl.<sup>2</sup> B23K 09/12

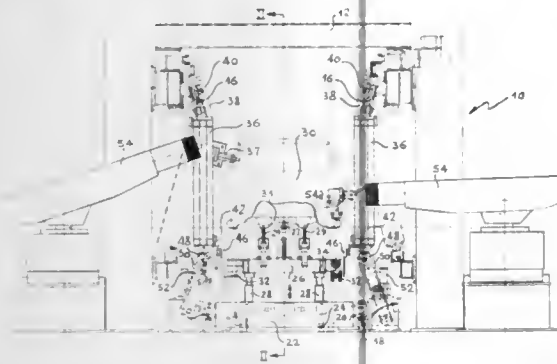
U.S. Cl. 219—79

20 Claims

1. A vehicle body welding system comprising, means for accurately positioning an underbody at a main framing welding station, side gate means for accurately positioning other major components of the body relative to said underbody at said station, and means for welding said other components in fixed relation to said underbody while accurately interpositioned at said welding station, said system side gate means including interchangeable means for accurately locating said other components of different bodies at said station; means for

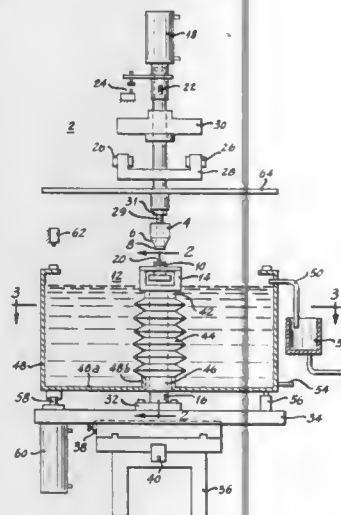


mounting said side gate means for movement between an open position for admitting introduction of a preliminary preassembled body and a closed position in which said side gate means



clamps the body in its configuration for welding; and differently programmable means for welding said other components to match each different body at said station.

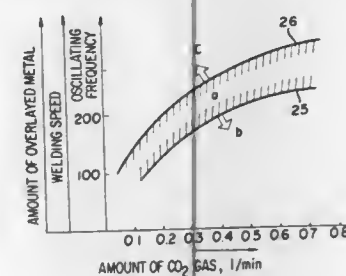
**4,162,388**  
**APPARATUS AND METHOD FOR SUBMERGED PERCUSSION WELDING**  
Erich E. Heider, West Allis, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.  
Filed Oct. 28, 1976, Ser. No. 736,594  
Int. Cl.<sup>2</sup> B23K 9/22  
U.S. Cl. 219—96 21 Claims



1. In combination with a percussion welder, wherein a pair of parts to be welded are carried by a pair of electrodes, one of said parts having a small projection to act as an arc starter, said parts being brought together such that said arc starter touches the other of said parts and a means to pass a large current through said arc starter such that said arc starter explodes and vaporizes and an arc passes across facing surfaces of said parts, and including means applying a follow-up force pushing said facing surfaces together to instantaneously close the gap created between said facing surfaces by said explosion of said arc starter, whereby said parts are welded, the improvement comprising:  
a container;  
liquid confined in said container;  
means for submerging said parts in said liquid such that said parts are in intimate contact with said liquid during explosion and vaporization of said arc starter.

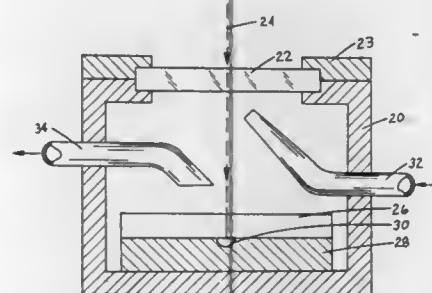
**4,162,389**  
**WELDING APPARATUS**  
Wataru Shimada; Kazumichi Machida; Susumu Hoshinouchi; Seigo Hiramoto, and Masaru Okada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1977, Ser. No. 792,342  
Claims priority, application Japan, May 19, 1976, 51-58106  
Int. Cl.<sup>2</sup> B23K 9/12  
U.S. Cl. 219—121 P 6 Claims



1. A welding apparatus for welding a base metal which comprises:  
a reverse polarity soft plasma arc source;  
means for supplying shield gas connected to said arc source; welding rod feeding means disposed adjacent to said arc source;  
means for supplying arc current, in reverse polarity, to said arc source operably connected to said arc source and said base metal;  
means for controlling feeding speed of said welding rod corresponding to said arc current; and  
means for imparting a transverse oscillation to said arc source at a predetermined speed and for incorporating an active gas at a predetermined rate in said shield gas wherein said predetermined rate of incorporating active gas is automatically controlled correspondingly to said transverse oscillating speed of said arc source.

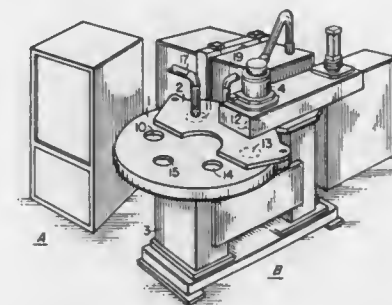
**4,162,390**  
**LASER WELDING CHAMBER**  
Thomas J. Kelly, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.  
Filed Oct. 3, 1977, Ser. No. 839,027  
Int. Cl.<sup>2</sup> B23K 9/00  
U.S. Cl. 219—121 LM 12 Claims



1. An apparatus for welding with a laser beam comprising:  
a. a gas tight vessel enclosing a workpiece to be welded;  
b. a light transmitting means for passage of said laser beam into said vessel, said light transmitting means positioned to permit impingement of said laser beam on said workpiece;  
c. a gas inlet means for introducing a gas stream into said vessel, said gas inlet means positioned to impinge said gas stream on said light transmitting means and intersect said laser beam; and

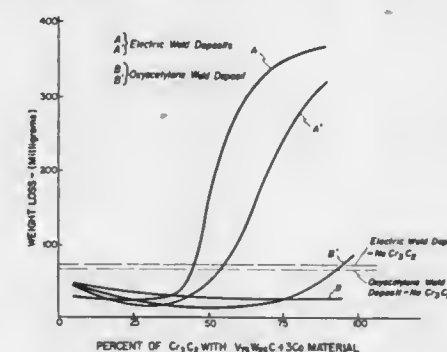
d. a gas exhaust means for the removal of gas from said vessel.

**4,162,391**  
**SLIDING VACUUM SEAL MEANS**  
Albert M. Sciaky, Palos Park, Ill., assignor to Sciaky Bros., Inc., Chicago, Ill.  
Filed Dec. 19, 1977, Ser. No. 861,988  
Int. Cl.<sup>2</sup> B23K 9/00  
U.S. Cl. 219—121 EB 7 Claims



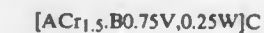
1. An electron beam welding machine for the continuous welding of parts in series comprising a circular table, a seal plate disposed above said circular table, sealable pockets arranged equi-distant from each other adjacent the outer edge of the said table, means within said pockets for supporting workpieces to be welded by an electron beam, means for rotating the said table in a step wise fashion against a sealing arrangement comprising "N" number of continuous flexible seals mounted upon the said seal plate one surrounding the next so as to form "N" number of sealed spaces between the table and the seal plate, additional continuous resilient seals surrounding areas adjacent to each end of the outermost of the aforementioned sealed spaces, means for positioning one of said pockets so that it communicates with the innermost of the aforementioned sealed spaces which is maintained at a desired welding pressure while the following N-1 pockets are positioned so that they communicate each with a separate space which is maintained at a pressure intermediate to the atmospheric pressure and the welding pressure, means for generating, focusing and deflecting a beam of electrons, and means for indexing each of said pockets in sequence into a position under the said electron beam means for a pre-set interval of time.

**4,162,392**  
**HARD FACING OF METAL SUBSTRATES**  
Harry J. Brown, Lewiston, and Kuldip S. Chopra, Grand Island, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.  
Filed Jul. 13, 1977, Ser. No. 815,316  
Int. Cl.<sup>2</sup> B32B 15/00; B23K 35/22  
U.S. Cl. 219—146.51 2 Claims



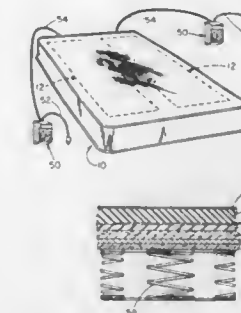
1. A hard-facing rod comprising a metal sheath having a

core of hard facing material consisting essentially of chemically combined vanadium, tungsten and carbon in weight proportions of 0.75VC, 0.25WC and about 5% to 40% by weight of Cr<sub>3</sub>C<sub>2</sub> admixed therewith from 0 to 100% of said Cr<sub>3</sub>C<sub>2</sub> being chemically combined with said chemically combined vanadium, tungsten and carbon in the form of a vanadium, tungsten, chromium carbide having the empirical formula:



where A=0.05 to 0.4  
B=0.6 to 0.95  
A+B=1.0  
and up to 15% by weight in the aggregate of cobalt, iron, molybdenum and nickel.

**4,162,393**  
**ELECTRIC HEATING MATTRESS**  
Allen J. Balboni, Chepachet, R.I., assignor to Bel Air Industries Inc., Providence, R.I.  
Continuation of Ser. No. 786,865, Apr. 12, 1977, abandoned, which is a continuation of Ser. No. 620,548, Oct. 8, 1975, abandoned. This application Jul. 18, 1978, Ser. No. 925,809  
Int. Cl.<sup>2</sup> H05B 3/36  
U.S. Cl. 219—217 2 Claims



2. An electric heating mattress, comprising a base layer of flexible and compressible material, an upper layer of foam material of substantially the same length and width as said base layer and defining an occupant supporting member, and a heating pad interposed between said base layer and said upper layer of foam material and including a heating area that occupies less than the full length and width of said layers, said heating area including a plurality of separate heating zones that are disposed in head-to-foot relation and normally underlie an occupant, wherein a selected portion of the body of said occupant may be heated as desired, the upper layer of foam having a cellular construction that without a load applied thereto normally inhibits the transfer of heat therethrough, the cellular foam material from which said upper layer is formed being compressible under the load of an occupant on the upper surface thereof to the extent that transfer of heat is permitted therethrough for increasing the temperature of the portions of the upper layer in contact with said occupant, said heating pad being defined by at least one layer of flexible material to which electrically insulated resistance wires are secured, said resistance wires defining the heating area, said pad as interposed between said foam layer and said base layer being located more closely adjacent to the upper surface of said mattress than the bottom thereof, wherein heat is more readily transferred through the areas of the upper layer of foam compressed by the occupant to the body of the occupant, means for securing said pad in place between said base and upper layers, means for encasing said base and upper layers with said heating pad therebetween for the location thereof in oriented relation, means electrically connected to said resistance wires and to a source of electricity for supplying current to said resistance wires in said heating zones, and means for controlling the flow

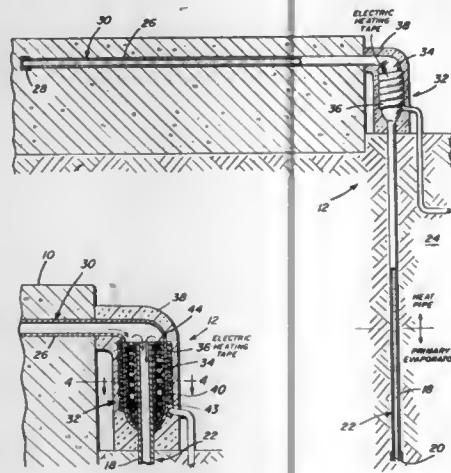
of current to said resistance wires in said heating zones for controlling the temperature of said heating zones and the occupant supporting layer located thereover.

#### 4,162,394 AUXILIARY EVAPORATOR FOR DUAL MODE HEAT PIPES

Ernest C. Faccini, 32 Blair Ave., Rock Springs, Wyo. 82901  
Filed Jul. 12, 1977, Ser. No. 815,063  
Int. Cl.<sup>2</sup> F28D 15/00; H05B 1/00

U.S. Cl. 219—341

8 Claims



1. Heat pipe apparatus comprising means containing a condensable working fluid and having a vertically disposed energy input portion and an energy output portion, the energy output portion including a condenser portion in which the working fluid condenses to release heat, the condensed working fluid returning to the energy input portion for vaporization by energy applied to the input portion externally thereof, the energy input portion comprising:

primary evaporator means comprising a tubular member sealed at one end and open at its other end for containing at least a portion of the working fluid, at least a portion of the working fluid being vaporized therein; and

auxiliary evaporator means comprising a tubular sleeve disposed in concentrically spaced relationship about the open end of the tubular member, said tubular sleeve having a closed end portion sealed to the outer wall surfaces of the tubular member whereby a condensate receiving space is defined between the inner wall surfaces of the tubular sleeve and the outer wall surfaces of the tubular member, and the other end of said tubular sleeve extending upwardly of the open end of the tubular member and being in communication with said condenser portion for containing a portion of the working fluid and being disposed between the condenser portion and the primary evaporator means, said auxiliary evaporator means being so constructed and so arranged relative to said primary evaporator means that all of the condensed working fluid returning to the energy input portion enters the auxiliary evaporator means prior to return of a portion thereof to the primary evaporator means, said auxiliary evaporator including a heat producing means for supplying heat thereto.

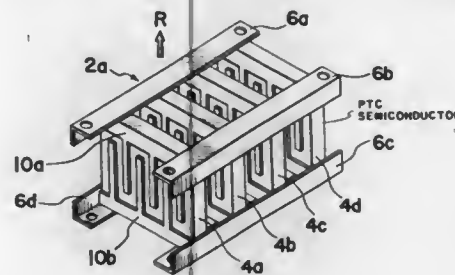
#### 4,162,395 HEATING UNIT FOR HEATING FLUID Takashi Kobayashi, and Toshikazu Nakamura, both of Yokaichi, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 3, 1976, Ser. No. 692,526  
Claims priority, application Japan, Nov. 7, 1975, 50-152141[U]

Int. Cl.<sup>2</sup> H05B 3/14

U.S. Cl. 219—367

8 Claims



1. A heating unit for heating fluid comprising: a plurality of PTC semiconductor elements each comprising a PTC semiconductor heating body having two opposite flat surfaces parallel to each other and four corners formed at the periphery thereof, an electrode assembly bonded on at least one of said two opposite flat surfaces, said electrode assembly being constituted by first and second sets of electrodes, each set having a plurality of spaced finger-like strips which are electrically connected to each other at one end thereof said strips being disposed in such a manner that neighboring strips are members of the opposite first or second set of electrodes, and first and second terminals bonded on said periphery of said heating body in electrically insulated relation to each other, said first and second terminals being connected to said first and second sets of electrodes, respectively; and supporting means including two pairs of bar members each made of electrically conductive material and having an L-shaped cross sectional configuration, said bar members of one pair being connected to an adjacent two of four corners of each of said elements and said bar members of the other pair being connected to the remaining two corners of each of said elements for supporting said plurality of PTC semiconductor elements in face to face relation to each other and for electrically connecting said first terminals of said elements to each other by said bar members of one pair and electrically connecting said second terminals of said elements to each other by said bar members of said other pair, said supporting means further including means for positioning said PTC semiconductor elements at spaced apart predetermined distances to define a passage for fluid to pass between adjacent members of said PTC semiconductor elements, said PTC semiconductor elements being secured to said bar members for rigid connection therebetween.

#### 4,162,396 TESTING COPY PRODUCTION MACHINES Guy J. Howard, Boulder; Walter C. McCrumb, Berthoud, and Paul R. Spivey, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

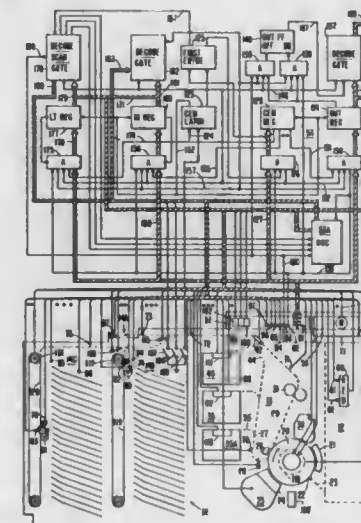
Filed Oct. 27, 1977, Ser. No. 846,083  
Int. Cl.<sup>2</sup> G06F 11/00

U.S. Cl. 235—304

20 Claims

1. In a cyclically operable machine, having a control means for cycling the machine through a series of machine cycles and having a plurality of individual control and sensory components, the improvement comprising: switching means for selectively switching said machine between an operating mode and a maintenance mode;

operating means responsive to said control means and to said switching means for operating said individual control components in predetermined sequences during said machine cycles while in the operating mode; input means responsive to said switching means for supplying input signals to said control means representative of operating parameters when said machine is in said operating mode and representative of separate addresses for

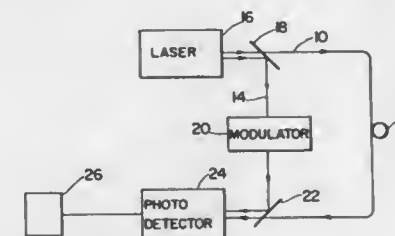


selecting separate ones of said individual components when said machine is in said maintenance mode; and means for exercising in said maintenance mode said individual control components, said exercising means including means coupled to said control means for operating while in the maintenance mode said selected individual control component; whereby each of said individual control components can be selectively operated independently for maintenance purposes.

#### 4,162,397 FIBER OPTIC ACOUSTIC SENSOR Joseph A. Bucaro, Herndon, Va.; Edward F. Carome, South Euclid, Ohio, and Henry D. Dardy, Upper Marlboro, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1978, Ser. No. 920,091  
Int. Cl.<sup>2</sup> H04B 9/00; G01V 1/00; H04B 11/00  
U.S. Cl. 250—199

9 Claims



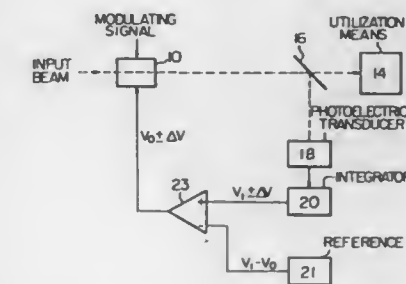
1. An optical system for detecting acoustic wave energy in a fluid medium which comprises: first and second optical paths, said first optical path including a single-optic-fiber, repetitive-path, acoustic-wave sensor means which may be placed in a fluid medium to detect an acoustic wave, said second optical path including a single optic fiber acoustically isolated from said fluid medium in parallel with said first optic path; means for directing optical radiation in equal amounts through said first and second optical paths;

means in said second path for modulating said radiation passing therethrough; optical radiation detector means for detecting said radiation passing through said first and second paths; and means for displaying the output from said detector means.

#### 4,162,398 BIAS CONTROL CIRCUIT FOR LIGHT MODULATORS Kanji Kayanuma, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan Filed Sep. 13, 1977, Ser. No. 832,892 Claims priority, application Japan, Sep. 14, 1976, 51-110056 Int. Cl.<sup>2</sup> G01J 1/32

U.S. Cl. 250—205

8 Claims



1. A circuit arrangement for controlling the bias potential of a light modulator disposed in the path of a laser beam to modulate the energy thereof in accordance with a modulating electrical signal, wherein said light modulator has an operating characteristic which varies as a function of a biasing potential applied thereto and wherein the intensity of said laser beam has a tendency to vary as a function of time, comprising: means disposed in the path of the modulated beam for transmitting a fraction of said beam to utilization means and reflecting the other fraction of said beam; means responsive to said reflected laser beam for generating a second electrical signal representative of the mean value of the modulated energy of said laser beam; means for generating a third electrical signal representative of the deviation of said second signal from a first reference value, said third signal being applied to said light modulator as said biasing potential; means disposed in the path of said laser beam incident on said light modulator for reflecting a fraction of said beam and transmitting the other fraction of said beam to said light modulator; means responsive to the last-mentioned reflected beam for generating a fourth electrical signal which is a replica of the intensity of said beam; and means for generating a fifth electrical signal representative of the deviation of said fourth signal from a second reference value for cancelling an error present in said modulated light energy as a result of said variation of the intensity of said laser beam.

#### 4,162,399 OPTICAL ENCODER WITH FIBER OPTICS Charles L. Hudson, North Little Rock, Ark., assignor to BEI Electronics, Inc., Little Rock, Ark. Filed Sep. 16, 1977, Ser. No. 833,817 Int. Cl.<sup>2</sup> G01D 5/34

U.S. Cl. 250—231 SE

1 Claim

1. An optical encoder, comprising a code member having first and second parallel adjacent longitudinal code tracks, each of said tracks having alternate segments of relatively high and relatively low reflectivity, said segments of said first and second code tracks being staggered whereby the segments of relatively high and



low reflectivity of said first track are opposite the segments of relatively low and high reflectivity of said second track,

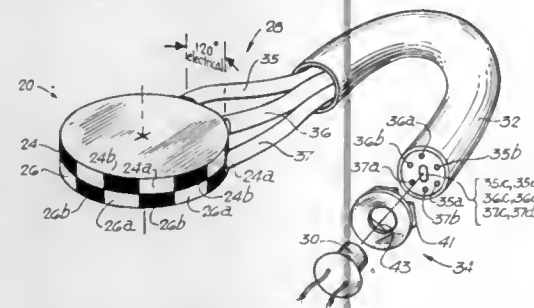
a fiber optic cable assembly including a plurality of fiber optic cables having terminal ends opposite a plurality of longitudinally spaced points along said code member, means mounting said code member and said fiber optic cables for relative longitudinal movement,

each of said fiber optic cables having first and second light transmitting fiber optic elements with their terminal ends opposite said respective first and second code tracks for illuminating said code tracks,

each of said fiber optic cables having first and second light receiving fiber optic elements disposed with their receiving ends opposite the respective first and second code tracks for receiving reflected light therefrom,

said first light transmitting fiber optic element and said first light receiving fiber optic element of each cable being disposed with their ends adjacent each other with a boundary therebetween extending transversely to the longitudinal direction of said first code track,

said second light transmitting fiber optic element and said second light receiving fiber optic element of each cable



being disposed with their ends adjacent each other with a boundary therebetween extending transversely to the longitudinal direction of said second code track, and an optical illuminating and reading head having a centrally disposed light source,

said head having a plurality of photoelectric detectors grouped around said light source,

one of said photoelectric detectors being provided for each of said fiber optic cables,

said fiber optic cable assembly extending between said code member and said head,

all of said first and second light transmitting fiber optic elements having light receiving ends disposed adjacent one another and opposite said light source to receive illumination therefrom for transmission to said code tracks,

each of said photoelectric detectors having first and second photoelectric sensors sharing a common substrate,

the first and second light receiving fiber optic elements of each of said fiber optic cables having terminal ends opposite the respective first and second photoelectric sensors of the corresponding photoelectric detector for delivering the reflected light thereto.

4,162,400

**FIBER OPTIC WELL LOGGING MEANS AND METHOD**  
Robert W. Pitts, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

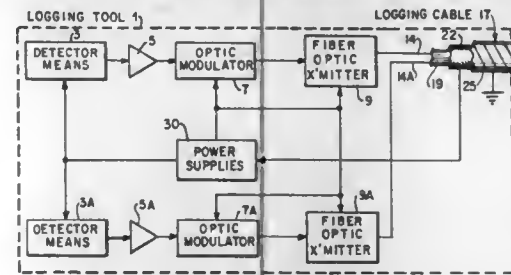
Filed Sep. 9, 1977, Ser. No. 831,844  
Int. Cl.<sup>2</sup> G01V 5/00

U.S. Cl. 250-256

9 Claims

1. A well logging system for providing at least one output corresponding to a condition sensed in a bore-hole traversing an earth formation, comprising a logging instrument including means for sensing the condition and providing electrical data pulses corresponding in number and peak amplitude to the

sensed condition, and first converting means connected to the sensing means for providing a light pulse for each received electrical pulse and corresponding in intensity to the peak amplitude of the electrical pulses; a well logging cable including a light conductor, and said logging instrument further includes means for applying the light pulses to one end of the



light conductor; and surface apparatus including second converting means connected to the other end of the light conductor for converting each light pulse into corresponding electrical pulse having a peak amplitude corresponding to the intensity of the light, and means connected to the second converting means for processing the electrical pulses therefrom to provide the output corresponding to the sensed condition.

4,162,401

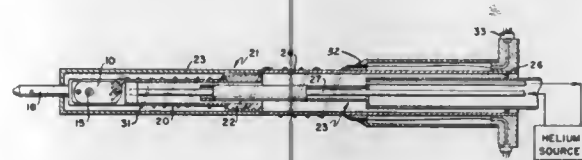
**HIGH-RESOLUTION, CRYOGENIC, SIDE-ENTRY TYPE SPECIMEN STAGE**

Wayne E. King, Woodridge, and Karl L. Merkle, Clarendon Hills, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 17, 1978, Ser. No. 906,816  
Int. Cl.<sup>2</sup> G01N 23/00

U.S. Cl. 250-311

9 Claims



1. A side-entry type cryogenic specimen stage for a high-voltage electron microscope in which in-situ electrical resistivity measurements can be made comprising a copper block within which a specimen can be positioned in the electron beam of an electron microscope, one end of said copper block constituting a specimen heat exchanger, means for directing a flow of helium at cryogenic temperature thereinto, and at least four electrical leads running from the specimen to the exterior of the microscope for resistivity measurements.

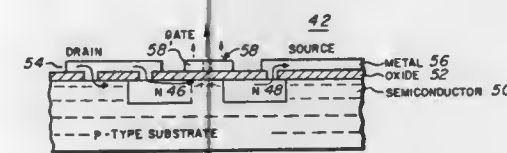
4,162,402

**FERROELECTRIC IMAGING SYSTEM**  
George S. Hopper, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1977, Ser. No. 861,812  
Int. Cl.<sup>2</sup> H01J 31/49

U.S. Cl. 250-332

10 Claims



1. A ferroelectric imaging system comprising:

- a chopper for interrupting infrared energy emanating from a scene;
- a lens system for focusing the infrared energy emanating from the scene;
- a detector structure including a ferroelectric detector matrix for receiving the focused infrared energy and producing electrical signals representative of the scene, a switching matrix operatively connected to the ferroelectric detector matrix for selectively charging portions of the ferroelectric detector matrix, a drive means connected to the switching matrix for operating the switching matrix, a voltage bias means connected to the switching matrix for charging the ferroelectric detector matrix in response to operation of the switching matrix, a read out means connected to the ferroelectric detector matrix for reading out signals representative of the infrared energy impinging on the ferroelectric detector matrix;
- a video processor connected to the read out means for processing the electrical signals of the ferroelectric detector matrix into video signals; and
- a display connected to the video processor for displaying the video signals representative of the scene.

4,162,403

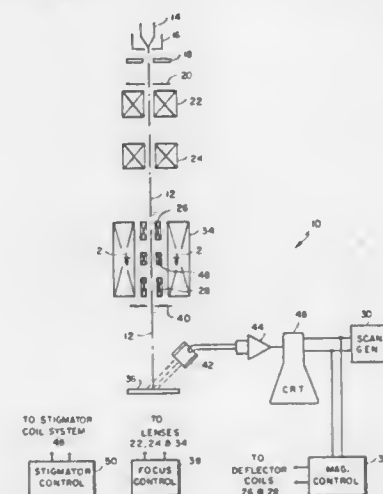
**METHOD AND MEANS FOR COMPENSATING FOR CHARGE CARRIER BEAM ASTIGMATISM**

Nell H. Baumgarten, Needham, Mass., assignor to Advanced Metals Research Corp., Bedford, Mass.

Filed Jul. 26, 1978, Ser. No. 928,086  
Int. Cl.<sup>2</sup> G21K 1/08; G01M 23/00

U.S. Cl. 250-396 ML

12 Claims



1. A method of compensating for charge carrier beam astigmatism in equipment of the type that utilizes such a beam in the generation of an image and that includes astigmatism correcting means including first and second manually and independently adjustable drive means for providing the astigmatism correcting means with first and second drive signals, respectively, to enable a shaping of the beam so as to reduce the astigmatism, each of said first and second drive signals having a range of values, said method comprising the steps of:

- generating with the beam a mapped X-Y image characterized in that each point with coordinates (V<sub>1</sub>, V<sub>2</sub>) within said mapped image shows the effect of said first drive means providing the astigmatism correcting means with a drive signal of value V<sub>1</sub> and said second drive means providing the astigmatism correcting means with a drive signal of value V<sub>2</sub>;
- selecting the coordinate location of said mapped image corresponding to the best-corrected area of said mapped image; and
- applying the drive signal values corresponding to said

selected coordinate location to the astigmatism correcting means.

4,162,404

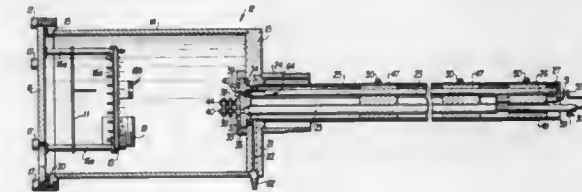
**METHOD AND APPARATUS FOR SURFACE IONIZATION MONITOR FOR PARTICULATES**

Wade L. Fite; Richard L. Myers, and Richard T. Brackmann, all of Pittsburgh, Pa., assignors to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 711,231, Aug. 3, 1976, Pat. No. 4,093,855, which is a continuation of Ser. No. 465,163, Apr. 29, 1974, Pat. No. 3,973,121, which is a continuation-in-part of Ser. No. 319,442, Dec. 29, 1972, Pat. No. 3,808,433. This application Aug. 2, 1978, Ser. No. 930,361  
Int. Cl.<sup>2</sup> H01J 27/00

U.S. Cl. 250-423 R

11 Claims



1. A method of monitoring particulates borne in a surrounding gaseous medium which comprises the interception of said particulates by a hot filament, causing said particulates to decompose into bursts of ions, collecting said ions by a nearby electrode, providing a bias potential differential between said electrode and said filament of about 100 or more volts, viewing from a distance through radiation transmission means infrared and optical radiation from said filament and automatically varying the heating power provided to said filament whereby said radiation as viewed is maintained constant, and counting said bursts having a predetermined total charge.

4,162,405

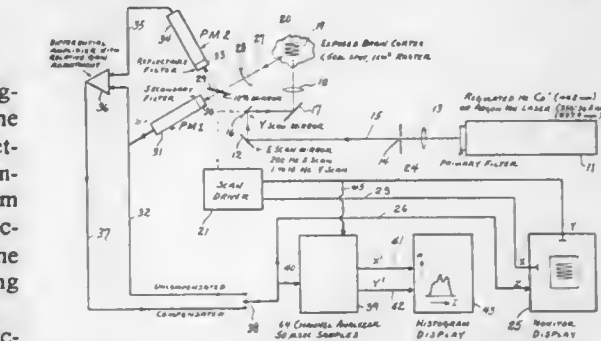
**FLYING SPOT FLUORO-METER FOR OXIDIZED FLAVOPROTEIN AND REDUCED PYRIDINE NUCLEOTIDE**

Britton Chance, and John R. Sorge, both c/o Johnson Research Foundation, University of Pennsylvania, Philadelphia, Pa. 19174

Filed May 23, 1978, Ser. No. 908,794  
Int. Cl.<sup>2</sup> G01N 21/38

U.S. Cl. 250-461 B

18 Claims



9. A fluorometer apparatus for measuring the metabolic state of an area of animal tissue comprising a source of excitation radiation, means to direct said radiation from said source in the form of a beam to said area, means to deflect the beam to provide a repeated flying spot raster pattern on said area, whereby to generate emission radiation from the respective illuminated spots of the area of intensities in accordance with their metabolic state, photoelectric sensing means, means to direct the emission radiation to said sensing means, whereby to

generate electrical signals in accordance with the emission intensities of the illuminated spots, and means to form an output on-line histogram display from said electrical signals indicating the relative intensities of the radiation emitted from said respective illuminated spots.

4,162,406

**X-RAY APPARATUS COMPRISING AN INTERMITTENTLY DISPLACEABLE FILM HOLDER**  
Kurt Gieschen, and Walter Schmedemann, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

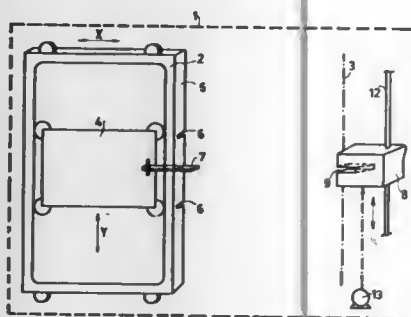
Filed Aug. 9, 1977, Ser. No. 823,106

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636078

Int. Cl.<sup>2</sup> G11B 1/00

U.S. Cl. 250-468

7 Claims



1. An X-ray apparatus comprising a support frame, a carriage mounted in said support frame for displacement along a first direction between at least a first position and a parking position, a film holder mounted in said carriage for displacement relative to said carriage in a second direction transverse to said first direction, means for releasably locking said film holder with respect to said carriage in one of a plurality of recording positions spaced along a line extending in a direction generally parallel to said second direction, catch means arranged adjacent said parking position for displacement in a direction parallel to said second direction between a second plurality of spaced positions corresponding to said plurality of recording positions, said catch means being arranged to engage said locking means, release said film holder from said carriage and releasably secure said film holder to said catch means for displacement therewith upon displacement of said carriage into said parking position, and means for displacing said catch means between said positions of said second plurality to thereby displace said film holder secured thereto between said recording positions.

4,162,407

**TRAY FOR X-RAY FILM CASSETTES**

James D. Sharp, Laverne, Calif., assignor to MAP International, Wheaton, Ill.

Filed Oct. 25, 1977, Ser. No. 844,806

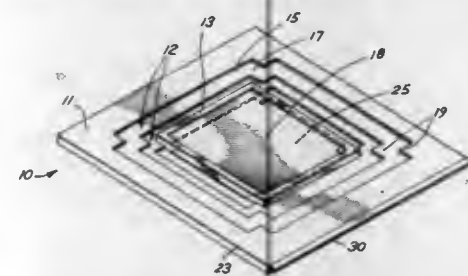
Int. Cl.<sup>2</sup> G11B 1/00

U.S. Cl. 250-468

9 Claims

1. A tray for film cassettes of the type having lateral surfaces and base surface, said tray comprising, in combination: a plurality of cassette support tiers, each tier including fixed side support walls and an intersecting fixed base support ledge, said walls and ledge forming a plurality of fixed

corner blocks which substantially engage said lateral surfaces and base surface of said cassette to restrain said



cassette in a substantially fixed position, whereby said tray restrains any of a plurality of different sized film cassettes.

4,162,408

**OPTICAL MARK SENSE DETECTOR**

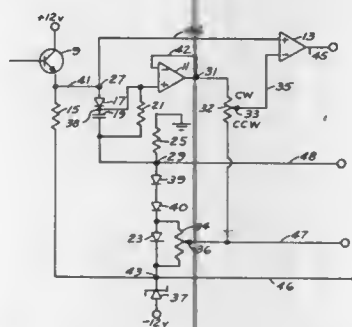
Emmert S. Hansen, Slater, Iowa, assignor to Bourns, Inc., Riverside, Calif.

Filed Oct. 17, 1977, Ser. No. 842,656

Int. Cl.<sup>2</sup> G06K 7/10

U.S. Cl. 250-555

10 Claims



1. In a multichannel optical data detecting system in which detection is accomplished in each channel by comparing electromagnetic radiation introduced into optics in the absence of objects to be detected to that electromagnetic radiation introduced into optics when objects to be detected are encountered by said optics, the improvement in each channel comprising: means for developing a first signal as a function of incident electromagnetic radiation upon a background field in the absence of said objects to be detected; means for deriving second signals as a function of said first signal and the introduction into said optics of objects to be detected; means to store and hold increases to said first signal; means to prevent attenuation of said stored first signal; high impedance input means responsive to said first signal and operative to furnish said first signal to subsequent circuitry so as to have negligible effect on said first signal; threshold adjusting means furnishing a threshold level and responsive to said high impedance input means; signal compensating means effective to cooperate in the control of said threshold adjusting means; means for comparing said threshold level with signal level developed by the introduction of objects to be detected into said optics.

4,162,409

**DEVICE FOR CONVERTING THE ENERGY OF SEA WATER**

Ivan P. Nedyalkov, Sofia; Kanchov T. Kanchev, Gabrovo, and Svetoslav R. Trenkov, Sofia, all of Bulgaria, assignors to CUV "Progress", Sofia, Bulgaria

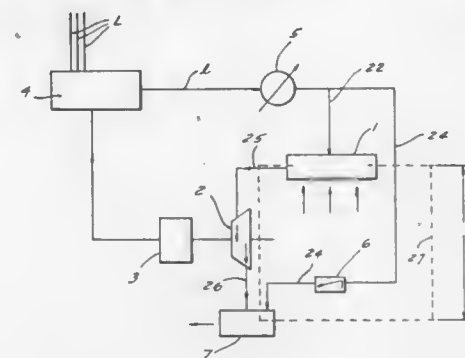
Filed Jun. 8, 1977, Ser. No. 804,790

Claims priority, application Bulgaria, Jun. 8, 1976, 33402

Int. Cl.<sup>2</sup> F03B 13/10

U.S. Cl. 290-53

8 Claims



1. A device for converting the energy of sea waves into electrical energy, comprising a tank-like inlet converter for receiving sea water from the peaks of waves, a water-driven turbine connected to the inlet converter to be driven by the water discharged from the inlet converter, a tank-like outlet converter receiving spent water from the turbine and discharging it to the troughs of waves, an electrical generator driven by the turbine, at least one controllable outlet valve on the outlet converter, and a compressor for delivering air under variable, controlled pressure to said converters, the inlet and outlet valves being controlled by the pressure of air within the inlet and outlet converters, respectively.

4,162,410

**VERTICAL-AXIS WINDMILL**

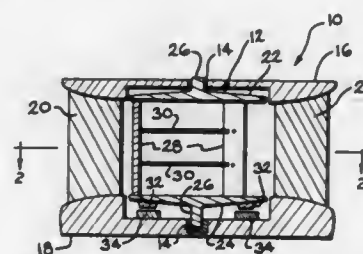
James L. Amick, 1464 Cedar Bend Dr., Ann Arbor, Mich. 48105

Filed Nov. 30, 1977, Ser. No. 856,000

Int. Cl.<sup>2</sup> F03D 9/00

U.S. Cl. 290-55

6 Claims



1. A vertical-axis windmill comprising a rotor having upper and lower disks in spaced relationship and three straight symmetrical airfoils fixedly attached to said upper and lower disks adjacent to the outer circumferences thereof, said airfoils being aligned circumferentially relative to said disks in equiangular relationship and with the leading and trailing edges of the airfoils equidistant from the axis of said disks, and a stator having upper and lower stationary supports of greater radial dimensions than said disks and defining axisymmetric surfaces in which said disks are recessed, said surfaces having a gap between them outward of said rotor that increases in a vertical direction with increasing distance from said rotor, and a ring of at least three straight vertical vanes of symmetric cross section connected to said stationary supports radially outward of said disks, said vanes being aligned radially relative to the axis of said rotor so as to define with said surfaces outward of said

rotor venturi-like throats leading radially inward to said airfoils.

4,162,411

**CHARGE TRANSFER ANALOG PROCESSING APPARATUS FOR SERIAL-TO-PARALLEL CONVERSION**

Tatsuo Sakaue, Yokohama, and Mineo Iwasawa, Kanagawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

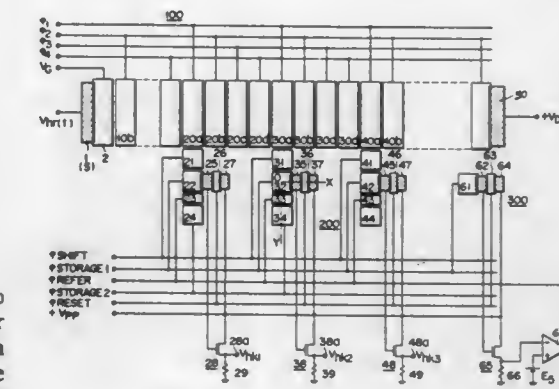
Filed Jun. 3, 1977, Ser. No. 803,402

Claims priority, application Japan, Jun. 3, 1976, 51-64104

Int. Cl.<sup>2</sup> G11C 19/28; H01L 29/78; H03H 7/28

U.S. Cl. 307-221 D

4 Claims



1. A charge transfer analog signal processing apparatus for serial-to-parallel conversion, comprising: a charge transfer device with a plurality of stages for shifting analog signal charge packets sampled in one direction; transfer pulse supply means for supplying transfer pulses for a predetermined period of time to said charge transfer device and for shifting the signal charge packets along said charge transfer device; pairs of first and second storage means each pair of which is coupled with said each stage of said charge transfer device, said first storage means being coupled with said corresponding and receiving the signal charge packets stored in said corresponding stages and storing the same therein, said first storage means then storing an amount of charge which subsequently increases with time during a storage period due to dark current charge, said second storage means coupled with said first storage means and receiving only the signal charge packets from said first storage means and storing the same which in turn are transferred to said first storage means after the dark current charge is exhausted from said first storage means; means coupled with said first storage means for exhausting the dark current charge from said first storage means when said first storage means store only the dark current charge; read-out means coupled with said first storage means for reading out the signal charge stored in said first storage means.

4,162,412

**MICROWAVE POWER LIMITER COMPRISING A SINGLE-GATE FET**

Daniel D. Mawhinney; Herbert J. Wolkstein, both of Livingston; Arye Rosen, Cherry Hill, all of N.J., and Zygmund Turski, Selden, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,656

Int. Cl.<sup>2</sup> H03G 11/04; H04B 3/04

U.S. Cl. 307-237

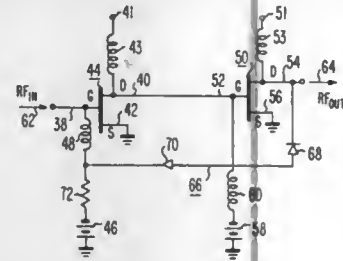
3 Claims

3. A power limiter for generating an output RF signal of



substantially constant power level in response to an input RF signal of varying power level, comprising:

- a first multistage amplifier responsive to said input RF signal for generating a first output RF signal;
- a second multistage amplifier responsive to said first output RF signal for generating a second output RF signal;
- each of said first and second amplifiers including one or more field effect type transistors each having gate, drain and source electrodes, said transistors of each amplifier being connected in cascaded arrangement;
- means for biasing said transistors of said first amplifier to produce a predetermined gain level of said first output RF signal;



means for biasing said transistors of said second amplifier such that said second amplifier is operated in a saturated condition at the gain level of said first output RF signal, such that said second output RF signal is substantially constant with said varying input RF power and the final output power variation is small compared to the input power variation; and

feedback circuit means between the gate electrode of a preceding transistor and the drain electrode of a succeeding transistor of said second amplifier to provide a predetermined voltage to said preceding transistor to reduce said final output power variation.

4,162,413

## SEMICONDUCTOR SWITCH

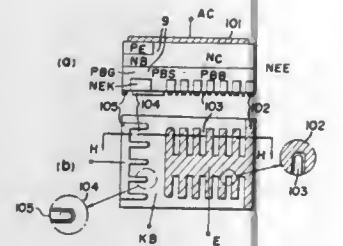
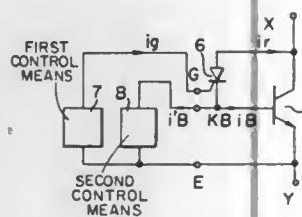
Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 704,492, Jul. 12, 1976, abandoned. This application Oct. 19, 1977, Ser. No. 843,665

Claims priority, application Japan, Sep. 12, 1975, 50-111303 Int. Cl.<sup>2</sup> H03K 17/04, 17/56

U.S. Cl. 307—253

4 Claims



1. A semiconductor switch comprising:  
a transistor having a collector, an emitter and a base,

a thyristor having two main electrodes and a gate, the main electrodes being connected in between the collector and the base of the transistor,  
means for connecting the collector and the emitter of the transistor between an external power source and a load,  
control means for applying a control signal to the gate of the thyristor,  
means for supplying pulse current to the base of the transistor,  
the pulse current being supplied to the base by the pulse supplying means to turn off the thyristor by generating a reverse bias between the two main electrodes of the thyristor,  
a diode having an anode and a cathode,  
the anode of the diode being connected to one of the main electrodes of the thyristor,  
the cathode of the diode being connected to the other main electrode of the thyristor.

4,162,414

## GENERATOR UNIT WITH BUILT-IN THERMALLY PROTECTED VOLTAGE REGULATOR

Yoshinobu Takabatake, Kariya, Japan, assignor to Nippondenso Co., Ltd., Alchi, Japan

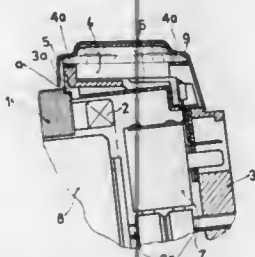
Filed Apr. 13, 1977, Ser. No. 787,152

Claims priority, application Japan, Apr. 21, 1976, 51-50221[U]

Int. Cl.<sup>2</sup> H02K 11/00

U.S. Cl. 310—68 R

3 Claims



1. A generator unit for a vehicle comprising an alternating current generator having a shaft, a stator core (1) and a casing including a bearing cover (3) affixed to a bearing that holds said shaft, and further comprising:

- a voltage regulator unit (4) mounted on a portion of the periphery of said bearing cover (3) and having a base member (4a) for facilitating mounting;
- a frame member (3a) for supporting said regulator by its base member (4a) with reference to said bearing cover (3) and holding said regulator away from said stator core (1) in such a way that a free space gap (a) is provided between said stator core (1) and the said voltage regulator (4);
- an insulating plate (6) mounted on said frame member (3a) between said voltage regulator (4) and the interior of said casing in such a way as to leave a gap between said insulating plate (6) and said stator core (1) which communicates with said gap between said core (1) and said voltage regulator (4); and
- a cover (5) for said voltage regulator (4) fitting thereover outwardly from said bearing cover (3) and leaving a gap between itself and said core (1) so as to allow air to enter therethrough into said gap between said core and said voltage regulator.

4,162,415

## ACOUSTIC SURFACE WAVE TRANSDUCER AND FILTER BUILT AROUND THIS TRANSDUCER

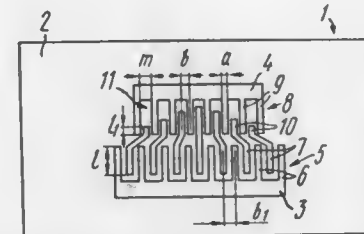
Anatoly S. Andreev; Alexandr S. Bagdasarian, both of Moskovskaya oblast; Jury V. Gulyaev, Moscow, and Anatoly M. Kmita, Moskovskaya oblast, all of U.S.S.R., assignors to Institut Radiotekhniki i Elektroniki Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Jul. 11, 1978, Ser. No. 923,547

Claims priority, application U.S.S.R., Jul. 22, 1977, 2510211 Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—313

17 Claims



1. An acoustic surface wave interdigital transducer comprising:

- a piezoelectric substrate;
- a first contact area arranged on said piezoelectric substrate;
- a second contact area arranged on said piezoelectric substrate;
- a main row of electrodes having longitudinal axes, said row being arranged on said piezoelectric substrate and having a first group of said electrodes electrically connected to said first contact area and a second group of said electrodes in parallel to said electrodes of the first group and disposed therebetween so that overlapping portions of said electrodes of the same length are formed;
- a first auxiliary row of electrodes, having longitudinal axes, arranged on said piezoelectric substrate between the main row of said electrodes and the second contact area; the first auxiliary row of said electrodes including a third group of said electrodes galvanically coupled to the second contact area, and a fourth group of said electrodes parallel to said electrodes of the third group connected directly to the corresponding electrodes of the second group of the main row and arranged between said electrodes of the third group so that at least a part of these have, with said electrodes of the third group, overlapping portions of a variable length; each electrode of the fourth group, together with the adjacent electrodes of the third group and the adjoining portions of the second contact area forming a capacitor which connects the corresponding electrodes of the second group of the main row to the second contact area, the capacitance of this capacitor being defined by a specified impulse response of the transducer; said electrodes of the third and fourth groups of the first auxiliary row being arranged so that the distances between said longitudinal axes of the adjacent electrodes of the third and fourth groups are selected so that they differ from the distances between said longitudinal axes of the adjacent electrodes of the first and second groups of the main row.

4,162,416

## DYNAMIC SENSE-REFRESH DETECTOR AMPLIFIER

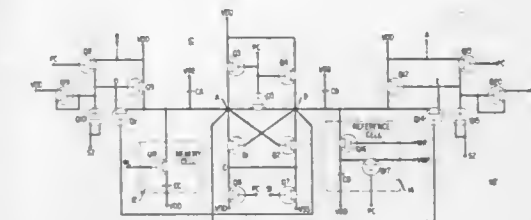
David Beecham, Coopersburg, and Howard C. Kirsch, Emmaus, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1978, Ser. No. 869,844

Int. Cl.<sup>2</sup> H03K 5/20, 3/286, 3/353; G11C 7/06

U.S. Cl. 307—362

8 Claims



1. A sense-refresh detector comprising:

- first and second switching devices, each device having a control terminal and first and second output terminals;
- first and second input/output terminals, the first output terminal of the first device and the control terminal of the second device being coupled to the first input/output terminal and the first output terminal of the second device and the control terminal of the first device being coupled to the second input/output terminal;
- voltage equalization circuit means coupled to both input/output terminals for essentially equalizing periodically the potentials of both input/output terminals;
- first and second essentially identical load-refresh circuits, each load-refresh circuit comprising a capacitor circuit means having first and second terminals and third, fourth, and fifth switching devices each having a control terminal and first and second output terminals;
- the control terminal of the third device of each load-refresh circuit being coupled to the first output terminal of the fourth device, the second output terminal of the fifth device, and the second terminal of the capacitor circuit means;
- the second output terminals of the third and fourth devices being coupled together and being coupled to one input/output terminal;
- voltage setting circuit means being coupled to the second output terminals of the first and second devices for periodically setting the potential of said terminals to a preselected potential;
- conductive enabling circuit means being coupled to the second output terminals of the first and second switching devices for periodically facilitating conduction through the first and/or second switching device;

being characterized in that:

- the control terminal of the fourth device of the first load-refresh circuit is coupled to the second input/output terminal; and
- the control terminal of the fourth device of the second load-refresh circuit is coupled to the first input/output terminal.

4,162,417

## ELECTROMECHANICAL ESCAPEMENT

Richard Grudzinski, La Chaux-de-Fonds, Switzerland, assignor to Universo S.A., La Chaux-de-Fonds, Switzerland

Filed Oct. 4, 1977, Ser. No. 839,367

Claims priority, application Switzerland, May 2, 1977, 5451/77

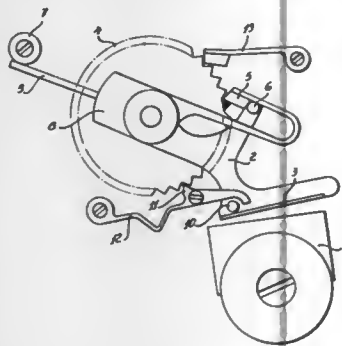
Int. Cl.<sup>2</sup> H02K 7/06

U.S. Cl. 310—21

5 Claims

1. Electromechanical escapement comprising an electromagnetic motor adapted to be controlled by an electric impulse of short duration, a toothed wheel, drive means for driving said toothed wheel in one direction, a magnetic member adapted to

be moved by said electromagnetic motor upon actuation of said motor, a spring for storing and releasing the kinetic energy of movement of said magnetic member, said spring driving said drive means, indexing means for preventing movement of said wheel in a direction opposite the direction in which the wheel



is driven by said drive means, locking means for preventing movement of said wheel in the direction in which said wheel is driven by said drive means except when said wheel is driven by said drive means, and means disabling said locking means when said drive means drives said wheel.

4,162,418

## STEPPING MOTOR FOR ELECTRONIC CLOCK

Katsumi Kawaii, and Shinya Inabe, both of Kawasaki, Japan, assignors to Niles Parts Co., Ltd., Japan

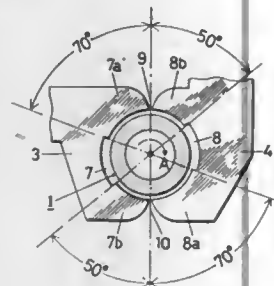
Filed Apr. 28, 1977, Ser. No. 791,777

Claims priority, application Japan, Dec. 14, 1976, 51-167551[U]

Int. Cl.<sup>2</sup> H02H 37/17

U.S. Cl. 310—49 R

1 Claim



1. A stepping motor for an electronic clock comprising a motor coil for producing a magnetic force in response to a pulse current provided from a predetermined electronic circuit, a stator for conducting said magnetic force, and a rotor to be rotated by the action of said magnetic force conducted by said stator, said stator having two pairs of projecting portions and a pair of recess portions surrounding said rotor, said recess portions each having a recess formed therein, said rotor composed of a cylindrical permanent magnet having six magnetic poles equally divided with each other, said projecting portions and said recess portions respectively symmetrically located with respect to a rotor shaft, wherein one projecting portion of each pair of said projecting portions is respectively located within an angular range of 50° from a pole gap in a predetermined direction of rotation of said rotor, each one of said recess portions subsequently located with an angular range of 60° from the terminal end of the said one projecting portion in said predetermined direction as above, and the other of each pair of said projecting portions being respectively located within an angular range of 70° from the terminal end of said recess portion in said predetermined direction.

4,162,419  
ALTERNATOR HAVING IMPROVED RECTIFIER COOLING

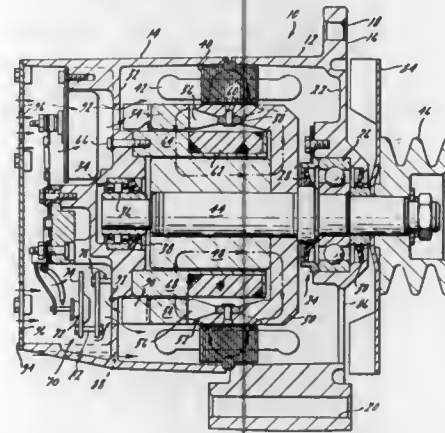
Larry E. DeAngelis, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 2, 1977, Ser. No. 856,696

Int. Cl.<sup>2</sup> H02K 1/22

U.S. Cl. 310—266

6 Claims



1. An alternator having improved air cooling, which comprises:

- a housing of substantially cylindrical shape, said housing having front and rear portions, said front portion being cup-shaped and having an end wall and said rear portion having an intermediate wall;
- a rotor assembly comprising a shaft journaled for rotation about its axis, said shaft being located within said housing between said end wall of said housing front portion and said intermediate wall of said housing rear portion; a first ferromagnetic member attached to said shaft for rotation therewith; a second ferromagnetic member abutting said first member and attached to said shaft for rotation therewith, said second member being substantially cup-shaped, having pole fingers extending in a direction parallel with the axis of said shaft and defining an annular space between said first member and said pole fingers of said second member; a third ferromagnetic member mounted for rotation with said shaft, said third member having pole fingers interleaved with, but spaced from, the pole fingers of said second member; and a fan blade attached to said third member for rotation therewith, said fan blade being positioned between said third member and said intermediate wall of said housing rear portion;
- an armature mounted within said housing radially outwardly of said rotor assembly;

- a field coil positioned in said annular space between said first member and said pole fingers of said second member, said field coil being adapted to generate a magnetic field in said rotor assembly ferromagnetic members and in said armature; and
- a rectifier assembly for rectifying alternating voltage generated in said armature, said rectifier assembly being located within said housing rear portion on the side of its intermediate wall opposite the side on which said rotor assembly is located.

4,162,420

## X-RAY TUBE HAVING ROTATABLE AND RECIPROCATABLE ANODE

John K. Grady, 277 Baker Ave., West Concord, Mass. 01781

Filed Jun. 5, 1978, Ser. No. 912,185

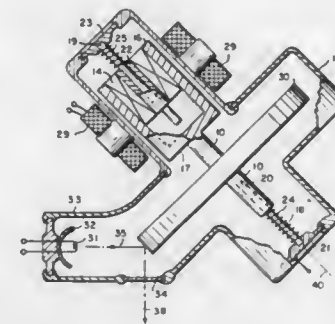
Int. Cl.<sup>2</sup> H01J 35/10

U.S. Cl. 313—60

11 Claims

- 1. An X-ray tube comprising: an envelope enclosing an electron beam source including a

cathode for projecting electrons along a beam axis and including a window for X-rays to emerge; an anode disc axially rotatable and reciprocable and having its edge in the path of the beam axis, said edge being



parallel to the axis of the disc, said beam source being disposed to direct the electron beam at an acute angle of incidence to the edge to produce an X-ray that is transmitted through said window; means to rotate and reciprocate said anode on its axis.

4,162,421

## CATHODE RAY TUBE HAVING CORRUGATED SHADOW MASK WITH SLITS

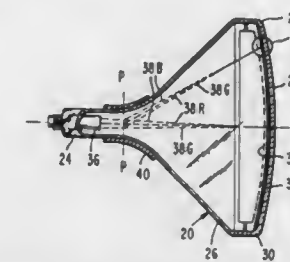
Albert M. Morrell, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 729,592, Oct. 4, 1976, Pat. No. 4,136,300, which is a continuation-in-part of Ser. No. 559,778, Mar. 29, 1975, abandoned. This application Oct. 7, 1977, Ser. No. 840,395

Int. Cl.<sup>2</sup> H01J 29/07

U.S. Cl. 313—403

8 Claims



- 1. In a cathode-ray tube utilizing an apertured mask color selection technique, the improvement comprising, an apertured mask having an array of parallel corrugations in an active apertured portion thereof and the center-to-center spacing of apertures in said mask varying with respect to variations in the mask-to-screen spacing in at least one direction across said mask, said mask including a plurality of slit-shaped apertures aligned in columns and the spacing between the apertures and the screen varying in a cyclic manner in a direction perpendicular to the corrugations as a result of the corrugations.

4,162,422

## COMPOSITE DIGITAL AND ANALOGUE FLUORESCENT DISPLAY PANEL DEVICE

Kiyoshi Morimoto, and Akira Harada, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Continuation of Ser. No. 737,168, Oct. 29, 1976, abandoned.

This application Sep. 21, 1978, Ser. No. 944,350

Claims priority, application Japan, Oct. 31, 1975, 50-130542

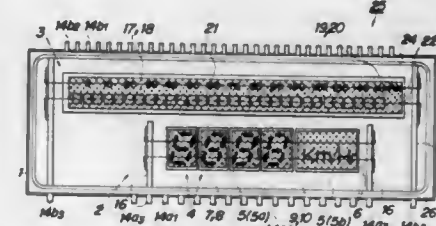
Int. Cl.<sup>2</sup> H01J 63/02, 63/06

U.S. Cl. 313—496

4 Claims

- 1. A flat plate type composition fluorescent display panel device comprising:

an insulating base plate; a digital display section formed on a portion of the surface of said base plate, said digital display section having a plurality of segment anodes which selectively perform digital display of multi-column characters, figures, symbols and the like by using said segment anodes; an analog display section formed on another portion of the surface of said base plate adjacent said digital display section, said analog display section having a plurality of dot anodes disposed along a line and a plurality of pattern anodes provided in the vicinity of the dot anodes and which selectively performs substantially analog dot-shaped and/or bar-shaped display by using said dot anodes to indicate the amplitude of an analog signal and the pattern anodes to represent the number, quantity and the like of the display given by the dot anodes, said dot anodes and said segment anodes formed in a common plane; a fluorescent substance layer disposed on said segment anodes, said pattern anodes and said dot anodes for emitting light when bombarded with electrons; cathode electrode means suspended over said segment anodes, said pattern anodes and said dot anodes for emitting electrons which bombard said fluorescent substance layer;



a wiring film layer disposed on the surface of said base plate between said base plate and said display sections for making electrical connection to said dot anodes, said pattern anodes, and said segment anodes; an insulating layer disposed between said wiring film layer and said dot anodes, said pattern anodes, and said segment anodes for maintaining electrical isolation between adjacent dot anodes, adjacent pattern anodes and adjacent segment anodes; a light transparent cover plate attached to said base plate for external viewing of said analog display and said digital display; and an evacuated space between said cover plate and said base plate, said evacuated space enabling electrons emitted from said cathode electrode means to travel relatively unimpeded to said segment anodes, said pattern anodes, and said dot anodes respectively; whereby said wiring film layer, said insulating layer, said dot anodes, said pattern anodes, and said segment anodes, and said fluorescent layer are produced in a laminated manner, thereby providing an integrated analog and digital fluorescent display panel device.

4,162,423

## LINEAR ACCELERATORS OF CHARGED PARTICLES

Duc T. Tran, Buc, France, assignor to C.G.R. MeV, Buc, France

Filed Dec. 9, 1977, Ser. No. 859,193

Claims priority, application France, Dec. 14, 1976, 76 37625

Int. Cl.<sup>2</sup> H01J 25/10

U.S. Cl. 315—5.41

7 Claims

- 1. A linear accelerator for accelerating charged particles comprising:

a particle source; an accelerating structure including a bunching section and an accelerating section, each respectively constituted by a plurality of resonant cavities electromagnetically coupled



1. A variable inductance apparatus for ballasting a high-intensity discharge lamp, said apparatus comprising:
  - a. a laminated iron core member having an E-I configuration wherein the E-conformed part thereof comprises a main leg member having three transverse leg members connected thereto proximate the ends and mid-portion thereof and projecting at right angles therefrom; the I-conformed part of said core member having dimensions similar to said main leg member and positioned as a yoke proximate the projecting ends of said transverse leg members; and non-magnetic gaps having predetermined spacings provided intermediate said yoke member and at least two of the proximate projecting ends of said transverse leg members;
  - b. a main winding having a predetermined number of turns wrapped about one of said transverse leg members; means for connecting said main winding in series circuit relationship with an AC energizing source and said high-intensity discharge lamp to be ballasted; and said main winding and said core member coacting to provide two closed magnetic paths;
  - c. a control winding wrapped about a leg member of said core member other than the said leg member about which said main winding is wrapped and said control winding also encircling the flux path of only one of said closed magnetic paths which are formed by said core member and said main winding; and
  - d. bilateral switch means having output terminals and a control terminal, said switch means having a closed state in which conduction therethrough is provided at said output terminals, and said switch means having an open

state in which an open circuit is provided at said output terminals, and said control terminal is adapted to receive an actuating signal to control the conducting state of said switch means; said control winding connected to the control terminal of said switch means to actuate and switch means to a closed state at a predetermined time in each half cycle of energizing potential for said HID lamp as normally operated; whereby on closing of said switch means the resulting counter mmf generated in one of said closed magnetic paths of said core member decreases by a predetermined amount the inductance of said apparatus to control in a predetermined fashion the average power delivered to said HID lamp.

4,162,429

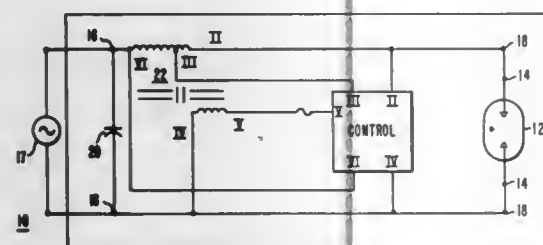
# BALLAST CIRCUIT FOR ACCURATELY REGULATING HID LAMP WATTAGE

Robert T. Elms, and Joseph C. Engel, both of Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 776,804, Mar. 11, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,581 Int. Cl.<sup>2</sup> H05B 41/36

U.S. Cl. 315—284

4 Claims



1. In combination, an operating circuit for controlling at about a predetermined nominal rated value the wattage drawn by a high-intensity-discharge lamp means during normal operation thereof and for limiting the line current drawn by said lamp means during starting thereof to less than the line current drawn by said lamp means during normal operation thereof, and said lamp means having lamp terminals and a nominal rated operating voltage and current, said circuit comprising:

- input terminals adapted to be connected to an AC line voltage source having a predetermined nominal rating, and output terminals adapted to be connected to the terminals of said lamp means;
- current controlling means in circuit intermediate said input terminals and said output terminals, said current controlling means having a first operating mode in which a current less than said lamp means nominal operating current is passed to said output terminals and through said lamp means as connected thereacross, said current controlling means also having a second operating mode in which a current greater than said lamp means nominal operating current is passed to said output terminals and through said lamp means as connected thereacross, and the ratio of the magnitude of current passed to said output terminals and said lamp means in said first mode being less than 2:1;
- switch means operable to switch said current controlling means between said two operating modes thereof during each half cycle of said AC line voltage, said switch means comprising a gate-controlled AC switch, and ramp capacitor means of predetermined rating in circuit with the gate of said AC switch means and operable to effect the gating of said AC switch means when a predetermined voltage signal is developed across said ramp capacitor means;
- line voltage sensing means for measuring the magnitude of said AC line voltage and generating a first current signal the magnitude of which is indicative of the deviation of line voltage from nominal, and said first current signal

feeding into said ramp capacitor means during each half cycle of said AC line voltage;

- lamp voltage sensing means for measuring the voltage drop across said lamp means both during lamp startup when the voltage drop thereacross is relatively small and also during normal lamp operation and generating a second current signal the magnitude of which is indicative of the deviation of operating lamp voltage from nominal, and said second current signal also feeding into said ramp capacitor means during each half cycle of said AC line voltage;
- means for discharging said ramp capacitor means to a predetermined potential at a predetermined time in each half cycle of said AC line voltage, and said ramp capacitor means thereafter being charged in the same half cycle, with the time interval in each half cycle of said AC line voltage which is required to develop said AC switch gating signal being determined by the cumulative charge delivered thereto by said first current signal and said second current signal; and
- during startup of said lamp means, said second current signal having minimal value due to the low voltage drop across said lamp means to provide at most only a slow voltage variation in the charge on said ramp capacitor means and to maintain said current controlling means in said first mode for at least the substantial portion of each half cycle of said AC line voltage, and after said lamp means is operating normally with approximately nominal voltage drop thereacross, the predetermined capacitance of said ramp capacitor means coupled with the cumulative charge delivered thereto by said first current signal and said second current signal coupled with the relatively small ratio of current passed by said current controlling means in said second mode to current passed by said current controlling means in said first mode providing a stable and accurate control of wattage drawn by said normally operating lamp means.

4,162,430

# COMPACT BALLAST FOR FLUORESCENT LAMP WHICH PROVIDES EXCELLENT LAMP POWER REGULATION

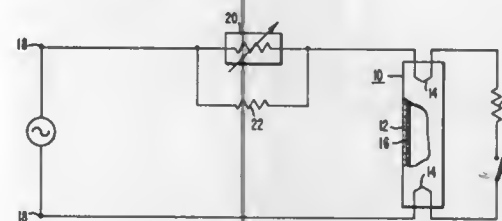
Laurence H. Cadoff, Wilkins Township, Allegheny County; Douglas M. Mattox, O'Hara Township, Allegheny County, and Robert T. Elms, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 30, 1978, Ser. No. 910,814

Int. Cl.<sup>2</sup> H05B 41/16

U.S. Cl. 315—309

6 Claims



1. In combination, a circuit for operating a low-pressure, positive-column, mercury-vapor discharge lamp which is adapted to be operated with a predetermined AC rms voltage drop thereacross and a predetermined rms current there-through to establish a predetermined rated power consumption therein, said discharge lamp requiring a starting voltage which exceeds said operating voltage by at least a predetermined amount, and said lamp also requiring for continuing operation the application of a reignition voltage thereacross at the beginning of each half cycle of said lamp operating voltage, which

reignition voltage exceeds said lamp operating voltage by at least a predetermined amount, said circuit comprising:

- input terminals adapted to be connected to a predetermined AC rms line voltage which is from about 120% to about 150% of said predetermined lamp rms operating voltage;
- ballast means connected in series with said lamp to be operated, said series-connected ballast means and said lamp adapted to be connected across said input terminals, said ballast means comprising a parallel-connected positive temperature coefficient (PTC) resistor and a fixed value resistor, and the relative values of said PTC resistor and said fixed value resistor displaying the following relationships with respect to one another and with respect to said lamp to be operated:
  - the room temperature ohmic resistance of said PTC resistor is from about one-third of about twice the ohmic resistance of said fixed value resistor,
  - the ohmic resistance of said fixed value resistor is sufficiently low to sustain a discharge in said lamp, and
  - the rms voltage drop across said ballast means during operation of said ballasted lamp is at least about twenty percent of said rms lamp operating voltage to provide for adequate starting voltage for said lamp as well as providing adequate reignition voltage for said lamp at the beginning of each half cycle of said lamp operating potential;
- said PTC resistor displaying a curve of temperature vs. resistance which breaks and rises sharply after a predetermined PTC resistor transition temperature is reached; and
- heat sink means associated with said PTC resistor to cause the resistance of said PTC resistor to be maintained during lamp operation at about said transition temperature and with a relatively constant power dissipation therein within the range of from about one-third to about one-tenth of said lamp rated power consumption, and said PTC resistor and said fixed value resistor being substantially thermally insulated from one another.

4,162,431

# METHOD AND APPARATUS FOR CONTROLLING THE EROSION OF ARC PRODUCING ELECTRODES

Allen P. George, Norton; Harold Homer, Hartlepool, and Christopher J. Richardson, Gulsborough, all of England, assignors to Tioxide Group Limited, Billingham, England

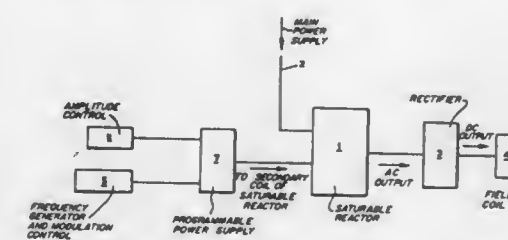
Filed Aug. 15, 1977, Ser. No. 824,660

Claims priority, application United Kingdom, Sep. 2, 1976, 26502/76

Int. Cl.<sup>2</sup> H05B 41/16; H05H 1/26

U.S. Cl. 315—346

12 Claims



1. Apparatus for prolonging the life of least one electrode of two or more electrodes between which an arc is sustained comprising:

- a field coil surrounding that part of the electrode whereon the arc foot is formed;
- a system for supplying direct current to the field coil; and
- a current oscillator, the output of the current oscillator and the direct current supply system being interconnected in such a manner that the current to the field coil can be oscillated at a frequency in the range  $5 \times 10^{-1}$  to  $1 \times 10^{-4}$  Hz.

4,162,432

# REPETITIVELY PUMPED ELECTRON BEAM DEVICE

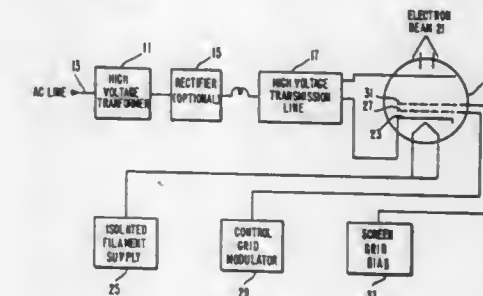
Leland G. Schlitt, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,638

Int. Cl.<sup>2</sup> H01S 3/09

U.S. Cl. 315—349

11 Claims



1. Apparatus for producing repetitive pulses of electrons in an excitable medium, the apparatus comprising:

- a source of electrons;
- a cathode connected to the source of electrons;
- an anode, spaced apart from the cathode, for accelerating the electrons from the cathode in response to an electric potential difference between cathode and anode;
- a transmission line of predetermined length, operatively associated with the cathode, for storage of current pulses of at least 0.25 MeV;
- insulator means, connected to one end of the transmission line and to the anode, for maintaining an electric potential difference between the cathode and the anode for periods of time greater than ten microseconds and for permitting the gun to operate at high vacuum; and
- pulse producing means, operatively associated with the anode, for producing a sequence of at least two electric potential pulses with pulse repetition rates of  $10^4$ – $10^6$  Hz at the anode so as to cause a sequence of at least two pulses of electrons to move from cathode to anode.

4,162,433

# CIRCUIT ARRANGEMENT INCLUDING A LINE DEFLECTION CIRCUIT

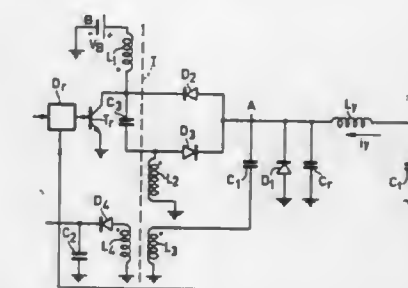
Johannes S. A. van Hattum; Engelbertus S. P. van Veen, and Wilhelmus M. Dorn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 670,875, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 473,771, May 28, 1974, abandoned. This application Jul. 19, 1977, Ser. No. 816,958

Int. Cl.<sup>2</sup> H01J 29/70

U.S. Cl. 315—411

16 Claims



1. A circuit arrangement comprising a line deflection circuit means for generating a line frequency sawtooth-shaped deflection current through a line deflection coil and a voltage supply circuit switching at the line frequency, the line deflection



### 1. A dual channel servo control system for aircraft automatic



pilots for positioning a control surface in accordance with an input command signal comprising

first and second substantially identical servomotor channels responsive to said input command signal and including corresponding first and second servomotors each normally providing substantially identical first and second output motions in response to said command signal, each of said channels further including corresponding first and second tachometers for supplying first and second signals proportional to the velocity of its corresponding servomotor,

differential means responsive to said first and second servomotor outputs and having an output coupled to position said control surface,

feedback means responsive to said differential output for supplying first and second rate feedback signals to said first and second channels, respectively, such that upon failure of one of said channels said first and second tachometers supply servomotor velocity signals having a differential value that is large compared with the motion of said control surface, and

monitoring means responsive to said first and second servomotor velocity signals for disabling the operation of said failed channel, said monitoring means having a failure detection threshold dependent at least in part upon a predetermined value of the difference between said first and second servomotor velocity signals.

4,162,439

## RAPID-CHARGING CIRCUIT

Arthur Schneider, Völknerode, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Fed. Rep. of Germany

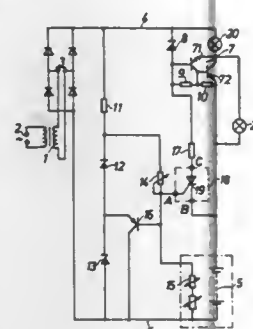
Filed Jun. 29, 1977, Ser. No. 811,058

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634863

Int. Cl.<sup>2</sup> H02J 7/10

U.S. Cl. 320—40

2 Claims



1. A circuit for controlling rapid charging of an accumulator with a pulsating current, said circuit including an electronic switch arranged in a charging circuit of said accumulator to be switched on through a control electrode to charge said accumulator and to be blocked upon said accumulator reaching a voltage corresponding to an adjustable reference voltage, said circuit being characterized by:

- said electronic switch being formed as a transistor;
- an emitter resistor arranged relative to said transistor;
- means applying to said transistor a control voltage that is substantially constant at least during the duration of a pulse of said charge current;
- a comparator;
- a base of said transistor serving as said control electrode and being connected to the output of said comparator;
- one input of said comparator being connected to the charge voltage of said accumulator;
- another input of said comparator being connected to said reference voltage so that the output of said comparator

assumes a potential that blocks said transistor when said charge voltage exceeds said reference voltage;

- two feed conductors connected to said accumulator;
- a first one of said conductors having a high potential and a second one of said conductors having a low potential;
- a potentiometer arranged to provide said reference voltage;
- a resistor connected in series with said potentiometer;
- said resistor having a negative temperature coefficient and being arranged in thermal communication with said accumulator;
- a constant voltage source arranged in parallel with said potentiometer and said resistor;
- said constant voltage source being formed as a series connection of two zener diodes connected to said feed conductors;
- a cathode of a first one of said zener diodes being connected with said potentiometer;
- an anode of a second one of said zener diodes being connected with said resistor; and
- a pnp transistor arranged in parallel with said second zener diode and having a base connected to a junction between said potentiometer and said resistor.

4,162,440

## LIMIT CONTROLLER

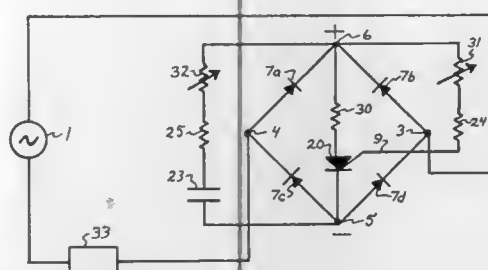
Frank K. Luteran, R.D.#1 Box 387, Montdale, Pa. 18447

Filed Jul. 8, 1977, Ser. No. 813,943

Int. Cl.<sup>2</sup> G05F 1/44

U.S. Cl. 323—22 SC

12 Claims



1. A circuit for regulating current flow from an alternating voltage, through a load, which comprises:

- a diode bridge having first and second input terminals and first and second bridge terminals, the alternating voltage connected to the input terminals and producing positive voltage pulses at the first bridge terminal and negative voltage pulses at the second bridge terminal;
- a control element connected in series with the bridge terminals, the control element having a control input;
- a first control connected to the control input and the first bridge terminal capable of conducting a signal into the control input thereby making the control element conductive;
- energy storage means storing DC energy for conduction through the control element, a first side of the storage means connected to the second bridge terminal;
- a second control serially connected to a second side of the energy storage means and the first bridge terminal and capable of conducting DC energy from the storage means to the bridge and maintaining conduction of the control element, the energy storage means and the second control connected in parallel relationship with the first and second bridge terminals.

# 4,162,441 APPARATUS FOR CONTROL OF DC POWER BY ELECTROMAGNETIC INDUCTION

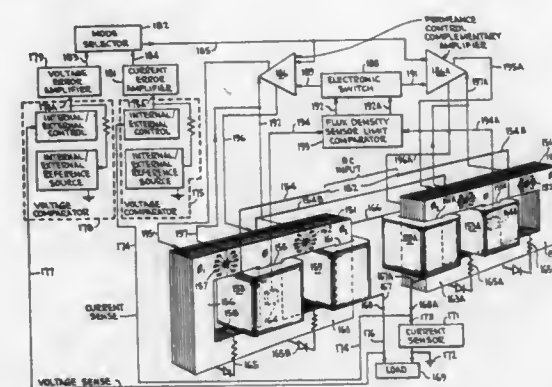
Nathan A. Moerman, 7310 Maple Ave., Chevy Chase, Md. 20015

Division of Ser. No. 762,896, Jan. 26, 1977, Pat. No. 4,112,347, which is a division of Ser. No. 635,007, Nov. 25, 1975, Pat. No. 4,020,440. This application Nov. 7, 1977, Ser. No. 848,979

Int. Cl.<sup>2</sup> G05F 1/22, 7/00

U.S. Cl. 323—57

2 Claims



1. In an electromagnetic induction means for the transformation of one form of direct current power to another form of direct current power:

- a first and a second identical means for providing a plurality of variable permeance closed magnetic paths;
- each of said identical means having an input path means, an output path means, a bypass path means, an input winding means on said input path means, an output winding means on said output path means, a first electromagnetically coupled variable permeance control means between said input path means and said output path means, a second electromagnetically coupled variable permeance control means between said input path means and said bypass path means,
- a pair of direct current source terminal means,
- a means connecting said first and second input winding means in series with said pair of direct current source terminal means,
- a current sensing means,
- a first and a second output terminal means,
- a means connecting said first output terminal means, said first and second output winding means, said current sensing means and said second output terminal means in series aiding configuration,
- a first, second, third and fourth reverse transient suppression means, each having a winding means, a unidirectional current flow and energy absorbing means and means connecting said winding means to said flow and absorbing means,
- said first suppression means surrounding said bypass path means of said first identical means,
- said second suppression means surrounding said output path means of said first identical means,
- said third suppression means surrounding said bypass path means of said second identical means,
- said fourth suppression means surrounding said output path means of said second identical means,
- a first voltage comparator means having a reference voltage means and an output voltage setting means producing a voltage error output signal,
- a voltage feedback means connecting said first output terminal means and said first voltage comparator means,
- a second voltage comparator means having a reference voltage means and an output current setting means producing a current error output signal,
- a current feedback means connecting said second output

terminal means and said second voltage comparator means,

an operating mode selector means,

a means connecting the voltage error signal output of said first voltage comparator means as a first input to said operating mode selector means,

a means connecting the current error signal output of said second voltage comparator means as a second input to said operating mode selector means,

a first and a second complementary control amplifier means,

a means connecting the output of said operating mode selector means as the first input to both of said amplifier means,

means connecting the complementary control outputs of said first amplifier means to said first and second variable permeance control means in said first identical means,

means connecting the complementary control outputs of said second amplifier means to said first and second variable permeance control means in said second identical means,

a first flux density sensing means magnetically coupled to said input path means of said first identical means,

a second flux density sensing means magnetically coupled to said input path means of said second identical means,

a flux density sensor limit comparator means,

an electronic switch means having a first and a second alternately operating output means,

means connecting the output of said first flux density sensor as one input to said flux density sensor limit comparator means,

means connecting the output of said second flux density sensor as a second input to said flux density sensor limit comparator means,

means connecting the output of said flux density sensor limit comparator means as the controlling input to said electronic switch means,

means for connecting said first output of said electronic switch means as a second input to said first amplifier means,

means for connecting said second output of said electronic switch means as a second input to said second amplifier means,

whereby said voltage and current error signals enable the amplifier means to provide stabilization control for the contiguous direct current pulse power,

said amplifiers alternate the minimum permeance state and the variable permeance state between said first and second identical means in response to the output of said flux density limit comparator means being a switching input to said electronic switch means which enables alternate ones of said first and second amplifier means, the degree of permeance control provided to said first and second electromagnetically coupled variable permeance control means being a function of the said error signals.

4,162,442

## CAPACITOR EQUIPMENT

Harry Fränk, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Feb. 28, 1978, Ser. No. 882,158

Claims priority, application Sweden, Oct. 13, 1977, 7711515

Int. Cl.<sup>2</sup> H02J 3/18

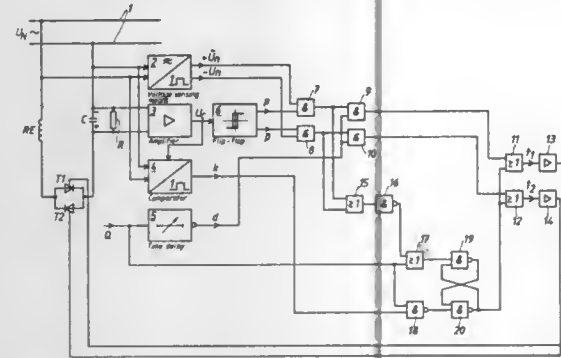
U.S. Cl. 323—106

2 Claims

1. Capacitor equipment for connection to an AC network, comprising a capacitor connected in series with a bi-directional static switch for connection to the network and disconnection from the network of the capacitor, a discharge resistor connected to the capacitor for discharging the capacitor after said disconnection, voltage sensing means for sensing the instantaneous values of the AC network voltage and of the capacitor voltage, comparator means connected to said voltage sensing means and to said switch for connecting said capacitor to the network when the difference between said instantaneous values is lower than a predetermined level, means for periodically



making said switch conducting during a predetermined time interval after disconnection of the capacitor from the network, thereby keeping said capacitor charged with a voltage of con-



stant polarity during said interval, and means for making said switch non-conducting after the end of said interval, thereby allowing the capacitor to discharge through said discharge resistor.

4,162,443

## SPEED MEASURING SYSTEMS

Malcolm Brearley, Solihull, and Roger J. Banks, Radford, both of England, assignors to Girling Limited, Birmingham, England

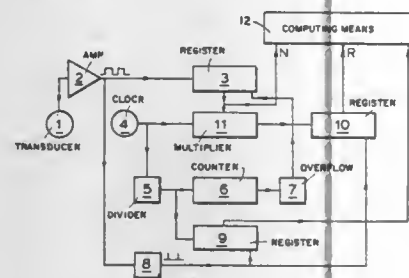
Filed Oct. 31, 1977, Ser. No. 846,761

Claims priority, application United Kingdom, Nov. 9, 1976, 46490/76

Int. Cl.<sup>2</sup> G01R 23/02

U.S. Cl. 324—78 D

20 Claims



1. A method of measuring the frequency of a pulse signal comprising counting the number of complete pulse cycles and measuring the fractional value of any incomplete pulse cycle occurring during a fixed sampling period, and summing said number of complete pulse cycles and said fractional value of any incomplete pulse cycle so as to obtain a total proportional to said frequency, said fractional value of an incomplete pulse cycle being measured by counting clock pulses occurring during said incomplete pulse cycle and comparing this with clock pulses occurring during a complete pulse cycle.

4,162,444

## PEAK LEVEL DETECTOR

Gregg S. Rodgers, Indianapolis, Ind., assignor to Tuscan Corporation, Indianapolis, Ind.

Filed Jul. 8, 1977, Ser. No. 813,811

Int. Cl.<sup>2</sup> G01R 19/16; H03K 5/20

U.S. Cl. 324—103 P

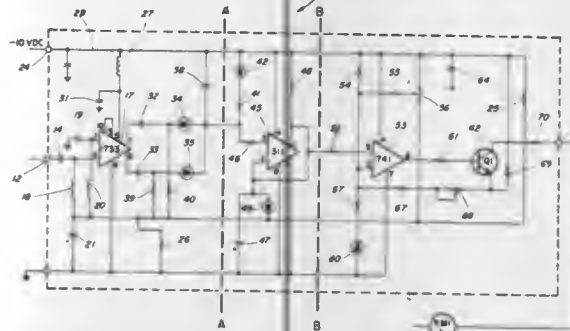
17 Claims

1. A peak detector circuit which comprises means for linearly displaying, on a display device, the peak level of video modulated, incoming signals as well as CW incoming signals received from a signal source which means includes:

- (a) first peak detector means coupled to said signal source and incorporating a full wave detector providing a volt-

age on a first capacitor representative of peaks of said incoming signal;

- (b) second peak detector means coupled to said first capacitor for measuring peaks thereon and providing a second



capacitor with a larger time constant than the first capacitor; and

- (c) display driver means for linearly producing a signal proportional to the signal on said second capacitor.

4,162,445

## DIGITAL SPEEDOMETER

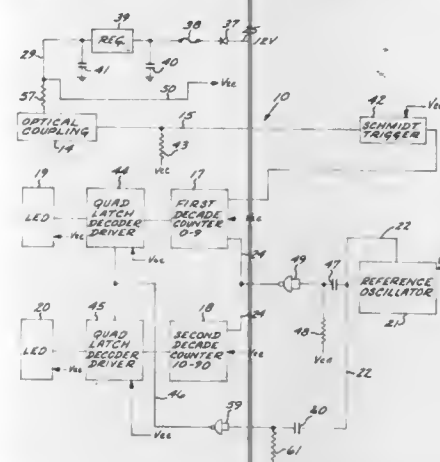
Scott Campbell, 2025 E. Whiting, Apt. G, Fullerton, Calif. 92632

Filed Dec. 12, 1977, Ser. No. 859,583

Int. Cl.<sup>2</sup> G01P 3/36; G01R 25/00

U.S. Cl. 324—175

9 Claims



1. A digital speedometer for use in an automotive vehicle having an electrical power system and a rotatable mechanical speedometer driver comprising:

- a transducer arranged for mounting on said vehicle and adapted for engagement with said speedometer driver that is located within a vehicle transmission line housing in an automotive vehicle, wherein said transducer includes:
- a transducer housing with an annular threaded fitting adapted to threadably engage with a threaded speedometer driver access port in an said automotive vehicle transmission line housing,
- a shaft mounted for rotation within said transducer housing and having a termination at one end adapted for mechanical coupling with said speedometer driver and arranged coaxially within said threaded fitting,
- a rotatable member carried upon said shaft,
- an optical encoder operatively associated with said rotatable member for sensing speed of rotation thereof and for emitting pulses at a pulse rate responsive thereto,
- an electrical signal lead extending from said transducer housing,

an electrical power lead extending from said transducer housing and connected to said vehicle power system, counting means coupled to receive pulses from said optical encoder on said electrical signal lead, and having a reset, buffer storage means connected to said counting means and having latch enabling means which, when enabled, load an accumulated pulse count from said counting means into said buffer storage means,

display means remotely located from said transducer and connected to said buffer storage means for displaying an image representation of the number of pulses loaded in said buffer storage means,

a variable oscillator for emitting periodic electrical pulses at a predetermined frequency less than the frequency of pulse emission from said optical encoder and having a common output connected both to said reset of said counting means and to said latch enabling means of said buffer storage means, to both enable said buffer storage means and thereafter to reset said counting means with the same pulse,

oscillator adjustment means for varying the frequency of oscillator output, and

electrical connections for obtaining electrical energy for said counting means, said display means, said buffer storage means, and for said oscillator and adapted for connection to the electrical power system of said automotive vehicle.

4,162,446

## TRANSCIVER WITH ONLY ONE REFERENCE FREQUENCY

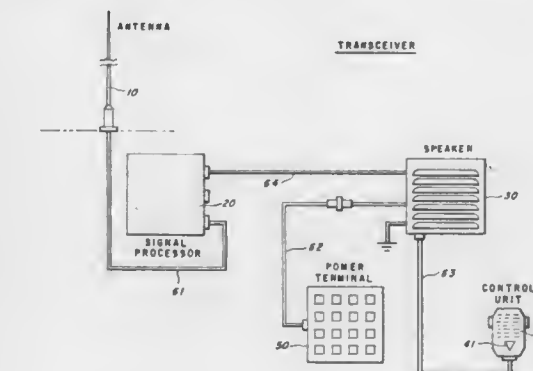
Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1977, Ser. No. 791,450

Int. Cl.<sup>2</sup> H04B 1/40

U.S. Cl. 325—15

10 Claims



1. A transceiver comprised of:

- (a) first mixer means having inputs coupled to simultaneously receive (1) input signals comprised of a plurality of non-overlapping frequency channels and (2) mixing frequency signals of a second selectable frequency, for generating in response thereto, first mixer output signals in which said input signal is shifted in frequency such that the center frequency of a selected one of said frequency channels is shifted to a predetermined frequency;
- (b) filter means coupled to said mixer means for defining a frequency range of said first mixer output signals around said predetermined center frequency to filter out all but said selected one of said frequency channels;
- (c) detector means having an input coupled to said filter and coupled to receive first clocking signals of a first selectable frequency for demodulating said selected one frequency channel;
- (d) first transducer means coupled to said demodulator means for converting said demodulated frequency channel into audible sound;

(e) second transducer means for converting audible sound into information signals;

(f) modulator means having inputs coupled to said second transducer means for receiving said information signals and coupled to receive first clocking signals of said first selectable frequency for modulating said information signals in response to said first selectable frequency;

(g) switch means selectively coupling said first mixer means and said modulator means to said filter means;

(h) second mixer means having inputs coupled to simultaneously receive (1) input signals from said filter means and (2) mixing frequency signals of said second selectable frequency, for generating in response thereto, second mixer output signals in which said input signal is shifted in frequency such that the center frequency of the filtered frequency channel is shifted to a predetermined frequency;

(i) means for coupling said second mixer means to an antenna means for transmission of said second mixer output signals;

(j) reference frequency generator means for generating clocking signals of a single reference frequency;

(k) mixing frequency generator means comprised of programmable counter means coupled to said reference frequency generator means for selectively generating said second selectable frequency to said first and second mixer means; and

(l) modulator/detector clocking means comprised of programmable counter means coupled to said reference frequency generator means and to said modulator means and to said detector means for generating said first selectable clocking signals thereto.

4,162,447

## FREQUENCY SYNTHESIS METHOD FOR AN AM-SSB TRANSMITTER-RECEIVER

Toshihiko Teshirogi, Machida, and Sumio Tsuruta, Kawagoe, both of Japan, assignors to Cybernet Electronic Corporation, Kanagawa, Japan

Filed May 3, 1977, Ser. No. 793,302

Claims priority, application Japan, Jun. 30, 1976, 51-77178; Jun. 30, 1976, 51-77179

Int. Cl.<sup>2</sup> H04B 1/40

U.S. Cl. 325—18

2 Claims



1. A frequency synthesis method for transmission and reception of AM-SSB signals using a PLL synthesizer in a AM-SSB transceiver having a transmitter section and a receiver section which comprises the steps of:

during the transmission of AM and first sideband signals, supplying a mixer with an offset frequency of an offset oscillator and an output frequency of a voltage-controlled oscillator;

applying a difference signal frequency outputted from said mixer to a variable frequency divider in the PLL synthesizer;  
 using a sum signal frequency outputted from said mixer as the local oscillation frequency of the receiver section and as an input to a mixer of the transmitter section where a transmitting frequency is produced;  
 supplying the mixer of the transmitter section with a transmitter section local oscillation frequency as a further input; and  
 for the transmission of the other sideband signal, simultaneously shifting both the offset frequency and the transmitter section local oscillation frequency by predetermined amounts.

4,162,448

## RADIO SIGNALLING SYSTEMS

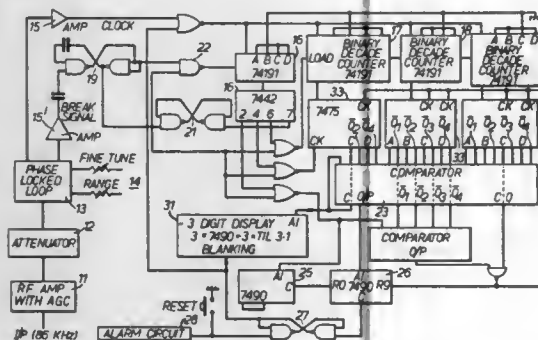
William D. Gilmour, deceased, late of Glastonbury, England (by Margaret Gilmour, successor), assignor to Lewis Security Systems Limited, Surrey, England

Filed Mar. 16, 1977, Ser. No. 778,150

Int. Cl.<sup>2</sup> H04B 7/00

U.S. Cl. 325—37

3 Claims



2. A radio signalling system including a number of portable tokens each capable of transmitting signals in the form of a carrier frequency which is common to the tokens, with spaced modulation pulses superimposed on the carrier and defining a carrier burst between successive of said pulses, the number of carrier frequency cycles in a carrier burst between successive modulation pulses being different for different tokens, and a receiver capable of distinguishing between received signals from tokens with different characteristic numbers of cycles in their bursts, said receiver comprising a display of a symbol identifying the number of cycles in a received burst of carrier frequency.

4,162,449

## APPARATUS FOR COMMUNICATING RECEIPT OF TRANSMITTED MESSAGES

Bernard Bouyssounouse, and Chantal Bouyssounouse, both of 840 Hamilton Ave., Palo Alto, Calif. 94301

Filed Apr. 14, 1978, Ser. No. 896,314

Int. Cl.<sup>2</sup> H04B 1/00

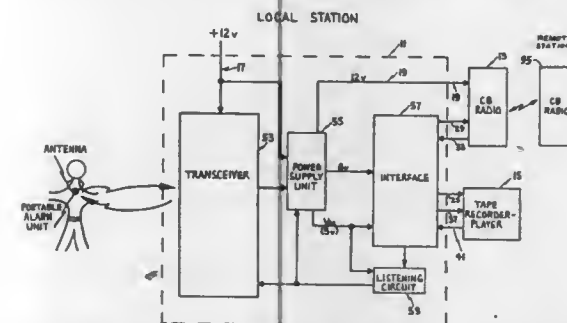
U.S. Cl. 325—55

6 Claims

1. In a communication system including a portable unit capable of transmitting and receiving signals, a player unit capable of playing a pre-recorded emergency message, and a CB radio capable of communicating with a listener at a remote CB radio station, an apparatus comprising:

transceiver means disposed for producing a second signal in response to receiving a first signal from the portable unit, and for transmitting to said portable unit, in response to a fourth signal, a fifth signal indicating receipt by the listener of the emergency message;  
 power supply means coupled to receive the second signal

from the transceiver means and coupled to the CB radio for providing power and activating said radio;  
 interface means coupled to the power supply means, to the CB radio, and to the player unit for activating the player unit causing it to play the emergency message and the CB radio to transmit the message in response to power applied by the power supply means, for deactivating the player causing it to stop playing the emergency message and the CB radio to stop transmitting the message in response to a



selected signal from the player unit, and for producing a third signal representing a reply received by the CB radio from the listener; and  
 listening circuit means coupled to receive the third signal from the interface means, and coupled to the transceiver and power supply means for applying the fourth signal to the transceiver means upon detecting a selected acknowledgement message in the listener's reply indicating receipt by the listener of the transmitted emergency message.

4,162,450

## PROGRAMMABLE DIVIDER

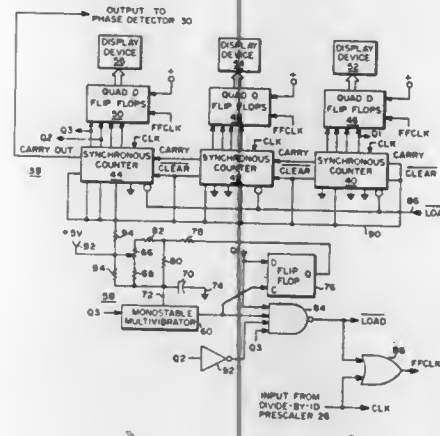
Carl F. Buhner, Framingham, Mass., assignor to GTE Laboratories Incorporated, Stamford, Conn.

Filed Dec. 16, 1977, Ser. No. 861,360

Int. Cl.<sup>2</sup> H04B 1/26

U.S. Cl. 325—419

8 Claims



1. For use in a frequency synthesizer having a phase-locked loop including an electrically controllable oscillator, a reference frequency source, and a phase detector circuit for comparing the output from the reference frequency source with a divided-down output from the electrically controllable oscillator; a programmable divider for generating the divided-down output comprising

a counter circuit means operable to count through a recurring sequence of counts in response to clock pulses applied thereto and having an output connection coupled to the phase detector circuit;  
 counter control means coupled to the counter circuit means comprising  
 means for applying clock pulses to the counter circuit

means at a rate dependent upon the output from the electrically controllable oscillator,  
 timing means for providing a variable time delay period, said timing means initiating a variable time delay period in response to the occurrence of a first predetermined count in the counter circuit means and producing an indication upon termination of the variable time delay period, and  
 loading means coupled to the timing means for loading a second predetermined count into the counter circuit means in response to an indication from the timing means upon termination of said variable time delay period;

said counter circuit means being operable to apply an output pulse to the phase detector circuit in response to the occurrence of a third predetermined count in the counter circuit means.

4,162,451

## MESFET-DEVICE SURFACE-WAVE-DEVICE CHANNEL SELECTOR

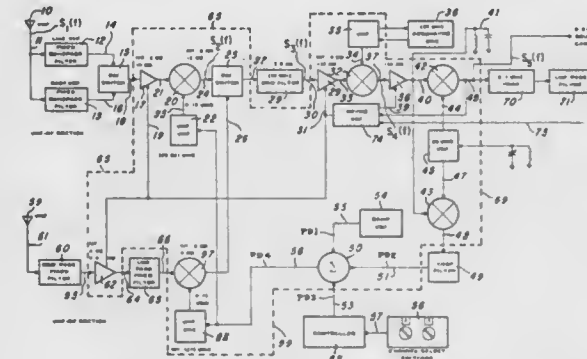
Darrell L. Ash, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 5, 1977, Ser. No. 813,202

Int. Cl.<sup>2</sup> H04B 1/16

U.S. Cl. 325—451

12 Claims



1. A radio frequency-intermediate frequency section of a frequency channel selector for obtaining a selected channel of frequencies from a plurality of non-overlapping frequency channels, said radio frequency-intermediate frequency section comprising:

at least one mixing means including a metal semiconductor field effect transistor and having first and second inputs coupled to simultaneously receive radio frequency signals representative of the plurality of frequency channels and mixing signals of a selected intermediate frequency for frequency shifting the selected frequency channel to a predetermined center frequency in the intermediate frequency range; and

acoustic surface wave filter means connected to the output of said mixing means for essentially passing only the channel of said predetermined center frequency.

4,162,452

## CHANNEL SELECTION FOR A TELEVISION RECEIVER HAVING LOW-GAIN HIGH FREQUENCY RF-IF SECTION

Darrell L. Ash, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 5, 1977, Ser. No. 813,137

Int. Cl.<sup>2</sup> H04B 1/16

U.S. Cl. 325—373

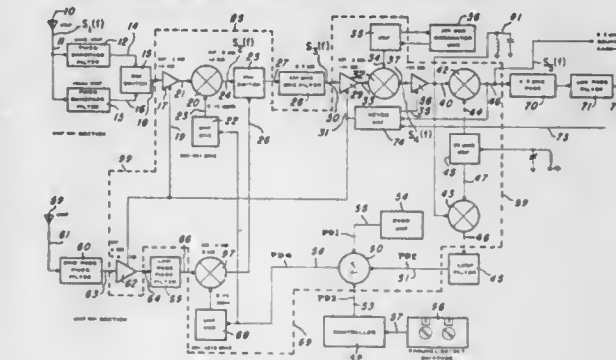
8 Claims

1. In a channel selector for a television receiver including a radio frequency section and an intermediate frequency section, the combination comprising:  
 spectrum filter means disposed in the radio frequency section for receiving radio frequency signals representative

of a plurality of television channels and for filtering at least one frequency spectrum of television channels from the received signals;

at least one mixing means connected to the output of said spectrum filter means, said mixing means including a metal semiconductor field effect transistor and having first and second inputs coupled to simultaneously receive said frequency spectrum of television channels from said spectrum filter means and mixing signals of a selected intermediate frequency for frequency shifting the selected frequency channel of said frequency spectrum of television channels to a high intermediate frequency substantially greater than 45 MHz;

channel selecting filter means having an input coupled to the output of said mixing means for filtering said selected frequency channel at said high intermediate frequency so as to pass said selected frequency channel;



second mixing means disposed in the intermediate frequency section and having first and second inputs coupled to simultaneously receive the filtered selected frequency channel at said high intermediate frequency from the output of said channel selecting filter means and mixing signals of a predetermined fixed frequency for frequency shifting said filtered selected frequency channel at said high intermediate frequency to a substantially lower second intermediate frequency; and

amplifier means having a relatively high gain disposed in said intermediate frequency section and connected to the output of said second mixing means for providing gain to said filtered selected frequency channel at the lower second intermediate frequency, the added gain provided by said amplifier means in said intermediate frequency section being substantially in excess of the total gain provided to the signal in the radio frequency section through said channel selecting filter means.

4,162,453

## DURATION RANGE DETERMINATION OF INCURSIONS BY A VARIABLE SIGNAL

Ralph G. Rudolph, Edgewood Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 27, 1977, Ser. No. 819,531

Int. Cl.<sup>2</sup> H03K 5/20, 9/08

U.S. Cl. 328—111

5 Claims

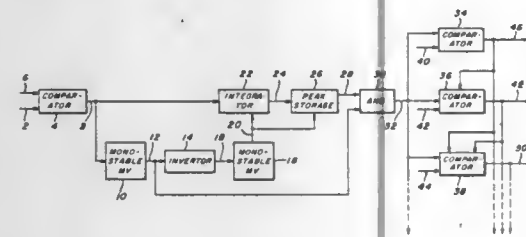
1. A circuit for determining whether the duration of each incursion by a variable signal on one side of a selected level occurs within a selected range comprising  
 means for generating a squared waveform signal having pulses corresponding to each incursion by the variable signal from the selected level,

an integrator circuit connected to the generating means for providing a first intermediate signal indicative of the duration of each pulse resulting from incursions on one side of the selected level,

a gating circuit connected to the generating means and the integrator circuit and responsive to the trailing edge of

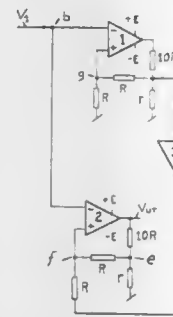


each pulse for providing an intermediate pulse having a magnitude corresponding to the first intermediate signal, and



**4,162,454**  
**NOISE IMMUNE VOLTAGE COMPARATOR**  
Svein E. Olsen, Fölvägen 16, Södertälje, Sweden  
Filed Dec. 14, 1977, Ser. No. 860,375  
Claims priority, application Sweden, Jun. 15, 1977, 7706953

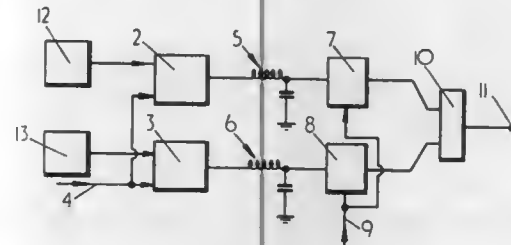
Int. Cl.<sup>2</sup> H03K 5/153  
U.S. Cl. 328—147 16 Claims



1. A voltage comparator including at least first and second amplifier circuits; input means for coupling the input circuit of each amplifier circuit to an input signal which is a function of the difference between a voltage to be compared and a reference voltage; threshold level shift means coupled between the output of the first amplifier circuit and the input circuit of the second amplifier circuit for modifying the threshold level of the second amplifier circuit in accordance with the output of the first amplifier circuit, the output of the second amplifier circuit forming the output of the voltage comparator; positive feedback circuits coupled to each of said amplifier circuits, respectively, for conditioning said amplifier circuits for bistable operation and for providing said first amplifier circuit with positive hysteresis; the output of said threshold level shift means being combined with the positive feedback signal of the second amplifier circuit, said combined signals being applied to said input circuit of said second amplifier circuit to establish a noise immune, bistable comparator having a hysteresis gap which is selectively greater than, less than or equal to zero depending upon the degree of positive feedback of said second amplifier circuit and the magnitude of the output signal of said threshold level shift means, the noise immunity of the comparator depending generally on the degree of positive feedback of said first amplifier circuit, which exhibits positive hysteresis.

**4,162,455**  
**AMPLIFIER SYSTEMS**  
David R. Birt, Charlwood, England, assignor to Communications Patents Limited, London, England  
Filed Jan. 4, 1978, Ser. No. 866,816  
Claims priority, application United Kingdom, Jan. 7, 1977, 476/77

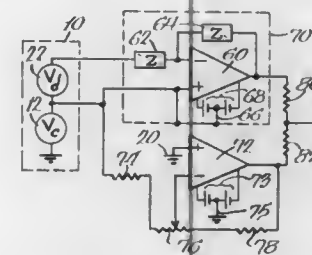
Int. Cl.<sup>2</sup> H03F 3/38  
U.S. Cl. 330—10 5 Claims



1. An amplifier system comprising at least two Class D amplifiers the outputs of which drive a common system output to provide modulated RF output signals, switching frequency generating means for providing separate clock pulse trains to said at least two Class D amplifiers, and means interlacing the said separate clock pulse trains to obtain cancellation of switching frequency ripple at the common system output thereby modulating said RF output signals to produce a modulated carrier.

**4,162,456**  
**DIFFERENTIAL AMPLIFYING SYSTEM**  
Henry J. Lukes, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.  
Filed Jan. 10, 1978, Ser. No. 868,427

Int. Cl.<sup>2</sup> H03F 3/45  
U.S. Cl. 330—69 21 Claims



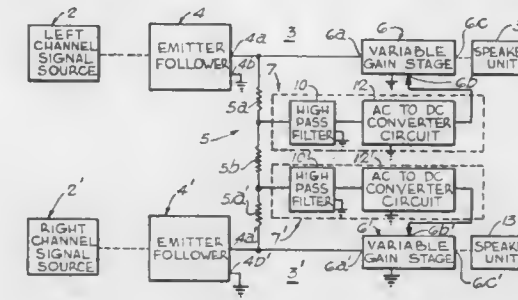
1. A differential signal processing system for eliminating a common mode component of a composite signal comprised of the common mode component and a differential component, said signal being provided by a signal source having a ground terminal and two output terminals separated from the ground terminal, said signal processing system comprising:

a main differential amplifier having inverting and noninverting input terminals, and an output terminal, said noninverting input terminal being operatively connected to one of the signal source output terminals, said inverting input terminal being operatively connected by means of a first input impedance to the other of said signal source output terminals, and a first feedback circuit connecting said differential amplifier output terminal to said inverting input terminal thereof;  
an inverting auxiliary amplifier having its inverting input terminal connected by means of a second input impedance to said one signal source output terminal and its noninverting input terminal connected to ground, said auxiliary amplifier including a second feedback circuit connecting the output terminal thereof to said inverting input terminal thereof; and

means for combining the output of said main differential amplifier and the output of said auxiliary amplifier effective to provide at an output terminal of said combining means an output signal corresponding to only the differential signal.

**4,162,457**  
**EXPANSION CIRCUIT FOR IMPROVED STEREO AND APPARENT MONAURAL IMAGE**  
Robert M. Grodinsky, 4448 W. Howard, Skokie, Ill. 60076  
Filed Dec. 30, 1977, Ser. No. 866,021

Int. Cl.<sup>2</sup> H03F 3/68  
U.S. Cl. 330—295 18 Claims



1. An expander circuit for a multi-channel amplifier system including left and right amplifier channels respectively driving left and right speaker units, each channel including a variable gain stage therein whose gain varies in direct proportion to the amplitude of control signals fed to control signal input terminals thereof, said expander circuit comprising left and right expansion control signal providing means having inputs for receiving respectively left and right amplifier channel signals and output terminals connected respectively to said control signal input terminals of said variable gain stages of said left and right amplifier channels, at which output terminals the expansion control signals respectively appear in proportion to the amplitudes of the sum of the signal components fed to said inputs, the improvement comprising signal coupling circuit means for coupling the signals of said amplifier channels to the input terminals of said expansion control signal providing means, said signal coupling circuit means including respective means associated with said channels for respectively coupling at least a portion of the signals therein having substantially different waveforms to the input terminals of the expansion control signal providing means of the associated channels and for cross-coupling a substantially lesser proportion of the same to the input terminal of the expansion control signal providing means of the non-associated channels, whereby the original signal separation of the two amplifier channels is substantially maintained in spite of said expansion.

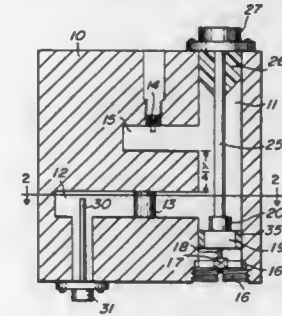
**4,162,458**  
**TM COAXIAL CAVITY OSCILLATOR AND POWER COMBINER**

Michael Dydyk, Scottsdale, and Joseph R. Tuzzolino, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed May 26, 1978, Ser. No. 910,162

Int. Cl.<sup>2</sup> H03B 7/14 10 Claims

1. In oscillatory apparatus for frequencies on the order of microwave, millimeter wave and above, including primary oscillatory circuitry having an active device coupled into said circuitry for sustaining oscillations therein and a first resonant circuit tuned to have an operating mode at a predetermined frequency, a second resonant circuit tuned to operate at the predetermined frequency and coupled to said primary oscillatory circuitry for controlling oscillations therein to the pre-

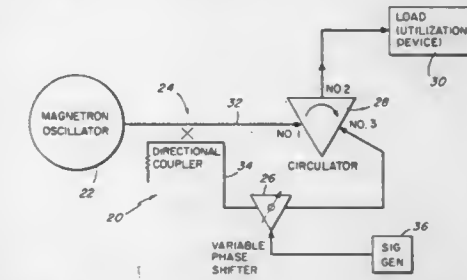
termined frequency, and output means coupled to said first resonant circuit for removing power therefrom at the predeter-



mined frequency, the improvement comprising a TM coaxial cavity forming the first resonant circuit.

**4,162,459**  
**MAGNETRON TUNING CIRCUIT**  
Howard Scharfman, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.  
Filed Sep. 18, 1978, Ser. No. 943,582

Int. Cl.<sup>2</sup> H03B 9/10 4 Claims  
U.S. Cl. 331—90



1. A tuning circuit for a microwave source comprising:  
a circulator;  
a directional coupler connected between an output port of said source and a first terminal of said circulator, a second terminal of said circulator providing power for a load; and  
a phase shifter connected between said directional coupler and third terminal of said circulator, said directional coupler providing a fraction of the power of the output signal of said source to said phase shifter, the phase of said phase shifter effecting the reflection coefficient of power reflected back into said output port of said source for controlling the frequency thereof.

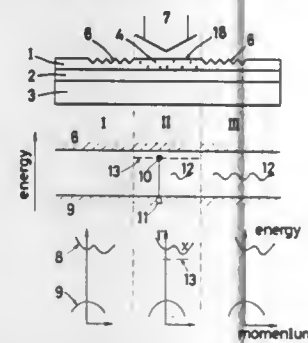
**4,162,460**  
**OPTICAL CIRCUIT ELEMENT**  
Shunichi Gonda, Higashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan  
Filed Mar. 28, 1977, Ser. No. 781,886

Claims priority, application Japan, May 26, 1976, 51-60158; Jun. 21, 1976, 51-72227  
Int. Cl.<sup>2</sup> H01S 3/19 6 Claims

U.S. Cl. 331—94.5 H

1. An optical circuit element comprising  
(a) a waveguide of a semiconductor material,  
(1) the composition of said semiconductor material being near the direct-indirect transition point and  
(2) said waveguide having integrally formed therein a region wherein stimulated emission occurs, said region being formed by doping a portion of said waveguide with an isoelectronic impurity, the energy level of said isoelectronic impurity being established within the forbidden band of said doped region,  
(b) means for producing a population inversion of electrons

in the energy level of said doped region and holes in the valance band of said doped region,  
(c) means for recombining the electrons in said impurity level and holes in said valance band, and



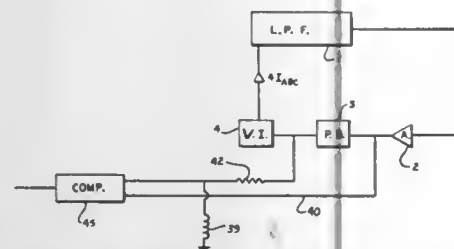
(d) means for introducing an input light having a wavelength corresponding to the energy difference between said level of said isoelectronic impurity and said valance band into said doped region whereby electrons in said impurity level and holes in said valance band are recombined to amplify said input light.

4,162,461

**APPARATUS FOR EXTRACTING THE FUNDAMENTAL FREQUENCY FROM A COMPLEX AUDIO WAVE FORM**  
David W. Wallis, Atlanta, and William H. Stewart, Mableton, both of Ga., assignors to S.W.I.S., Inc., Atlanta, Ga.  
Filed Jul. 25, 1977, Ser. No. 818,383  
Int. Cl.<sup>2</sup> H03H 7/10, 7/14

U.S. Cl. 333-174

4 Claims



1. Apparatus for extracting the fundamental frequency from a complex wave form having harmonics, said apparatus comprising a low pass filter having a plurality of sections each including capacitance means of fixed capacitance and a variable transconductance, amplifier means to which the output of said filter is supplied, peak detector means to which the output of said amplifier means is supplied, a voltage to current converter to which the output of said peak detector means is supplied, circuit means for supplying the output signal from said voltage to current converter to each of said variable transconductances thereby to vary the frequency response characteristic of said low pass filter, and comparator means for receiving an alternating current signal dependent upon the output of said filter and for receiving a direct current signal dependent upon the output of said peak detector means and for comparing said signals and for supplying the resultant signal to an output circuit.

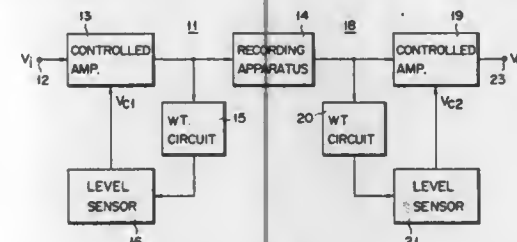
4,162,462

**NOISE REDUCTION SYSTEM**

Kenjiro Endoh, Higashimine; Kazuo Kitagawa, Kawasaki, and Hideshi Kira, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan  
Filed May 23, 1977, Ser. No. 799,337  
Claims priority, application Japan, May 21, 1976, 51-57863  
Int. Cl.<sup>2</sup> H04B 1/64

U.S. Cl. 333-14

11 Claims



1. A noise reduction system having an encoder for compressing the dynamic range of an input program signal in accordance with the amplitude thereof and for delivering a compressed signal to a signal transmission medium, and a decoder for expanding the dynamic range of an output signal of the signal transmission medium in accordance with the amplitude thereof, said encoder and decoder having emphasis and de-emphasis circuits for respectively and inversely emphasizing and de-emphasizing a specified frequency range of an operational audio frequency band, said specified frequency range not lying within a main frequency range in which the majority of the energy of said program input signal lies, comprising:

said encoder having a transfer function that for a predetermined relatively high level program input signal exhibits low gain over the full operational audio frequency band and a low degree of frequency emphasis in said specified frequency range, and that for relatively low-level and intermediate level program input signals exhibits high gain over the full operational audio frequency band and a high degree of frequency emphasis for the specified frequency range; and, said decoder having a substantially inverse transfer function relative to that of said encoder.

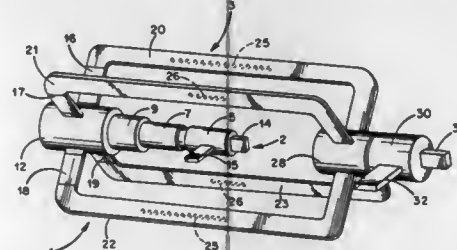
4,162,463

**DIPLEXER APPARATUS**

Joseph G. DiTullio, Woburn, and Leonard I. Parad, Framingham, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.  
Filed Dec. 23, 1977, Ser. No. 863,807  
Int. Cl.<sup>2</sup> H01P 1/17, 1/20, 5/16

U.S. Cl. 333-117

14 Claims



1. Diplexer apparatus comprising:

first transducer means having first and second input ports and an output port, said first transducer means being operative to receive first and second signals within a first frequency bandwidth at the first and second input ports, respectively, and to establish said signals at the output port thereof to be orthogonal and linearly-polarized with respect to each other;

first polarizer means coupled to the first transducer means and operative to transform the orthogonal linearly-polarized signals at the output port of the first transducer means to orthogonal circularly-polarized signals;  
electromagnetic wave conducting means having a first port coupled to the first polarizer means and a second port, said electromagnetic wave conducting means being operative to pass the circularly-polarized signals from the first polarizer means to the second port thereof, said electromagnetic wave conducting means further having a third port and a fourth port and being further operative to receive first and second circularly-polarized signals within a second frequency bandwidth at the second port and to couple orthogonal vectoral components of said circularly-polarized signals within the second frequency bandwidth to the third and fourth ports;

second polarizer means coupled to the third and fourth ports of the electromagnetic wave conducting means and operative to introduce a predetermined phase shift differential between the vectoral components of the circularly-polarized signals at the third and fourth ports, said phase shifted vectoral components being orthogonal and linearly-polarized with respect to each other; and  
output means coupled to the second polarizer means and having first and second output ports, said output means being operative to combine the vectoral components of the orthogonal linearly-polarized signals derived by the second polarizer means from the first and second circularly-polarized signals into first and second resultant orthogonal linearly-polarized signals each corresponding to a different one of the circularly-polarized signals and to present the first and second resultant linearly-polarized signals to separate ones of the first and second output ports.

4,162,464

**DELAY LINE**

Otto Breltenbach, Nuremberg, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Fed. Rep. of Germany  
Filed Nov. 11, 1977, Ser. No. 850,598

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651597

Int. Cl.<sup>2</sup> H01P 9/02; H03H 7/30

U.S. Cl. 333-138

2 Claims



1. Delay line comprising:

a core;

a first group of insulated conductors being electrically connected in parallel, and being at their respective ends wound around the core in parallel relation to each other and in helical configuration;

a second group of insulated conductors also connected in parallel at their respective ends and being wound around the core in parallel relation to each other and in a helical configuration having opposite pitch so that the conductors of the first group intersect the conductors of the second groups establishing multiple intersections but without making contact, the conductors of the first group being braided with the conductors of the second group so that each conductor of the first group runs alternately over and under the conductors of the second group and vice versa, the first and second groups each constitute, respectively, signal path and return path for the delay line.

4,162,465

**SURFACE ACOUSTIC WAVE DEVICE WITH REFLECTION SUPPRESSION**

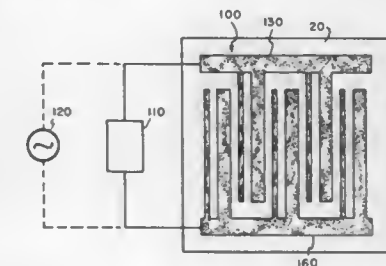
Bill J. Hunsinger, Mahomet, Ill., and Kentaro Hanma, Yokohama, Japan, assignors to University of Illinois Foundation, Urbana, Ill.

Filed Sep. 14, 1977, Ser. No. 833,028

Int. Cl.<sup>2</sup> H03H 9/04, 9/32, 9/30; H01L 41/10

U.S. Cl. 333-151

12 Claims



1. A transducer for a surface acoustic wave device which includes an acoustic wave propagating substrate, said transducer being adapted to coupling to an electrical load and/or source, comprising:

a pair of interdigitated comb electrodes formed on said substrate;

means for applying an electrical load and/or source across said pair of comb electrodes;

each of said comb electrodes having a plurality of interdigitated electrode fingers, the widths of at least some of the adjacent fingers thereof being different and selected as a function of the impedance of said load and/or source to produce mechanical electrical loaded (MEL) reflections in said substrate which tend to cancel regeneration wave (RW) reflections generated at said transducer in said substrate.

4,162,466

**SURFACE ACOUSTIC WAVE RESONATOR**

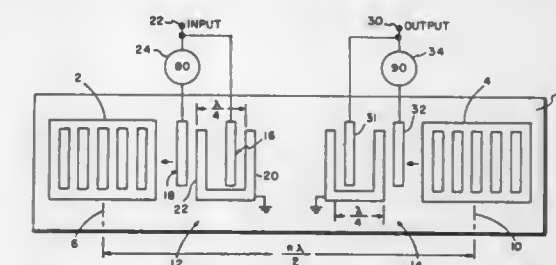
Bill J. Hunsinger, Mahomet, and Roger D. Fildes, Urbana, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Sep. 28, 1977, Ser. No. 837,569

Int. Cl.<sup>2</sup> H03H 9/02, 9/26, 9/32, 9/04

U.S. Cl. 333-194

7 Claims



1. A surface acoustic wave resonator responsive to a frequency of wavelength  $\lambda$  comprising dielectric support means having first and second reflector means spaced apart by an integral number of  $\lambda/2$  wavelengths;

unidirectional transducer means arranged between said reflector means and responsive to an input signal including said frequency, to induce a unidirectionally propagating, uniform beam; acoustic wave in said dielectric support means in the direction of said first reflector means; and  
output means positioned between said unidirectional transducer means and said second reflector means for sensing and providing output signals indicative of the oscillation of said surface waves between said reflector means.



4,162,467

**CIRCUIT BREAKER CONTACT STRUCTURE**

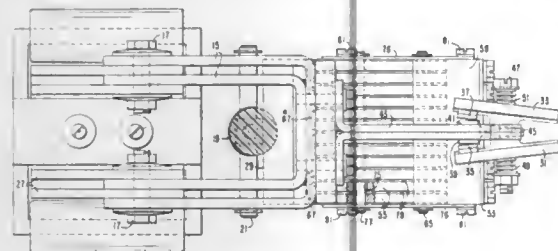
Albert R. Cellerini, Louis N. Ricci, and James O. Rexroad, all of Beaver, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 16, 1977, Ser. No. 806,969

Int. Cl.<sup>2</sup> H01H 75/10

U.S. Cl. 335—16

6 Claims



1. A circuit interrupter with current withstand capability comprising stationary contact means and movable contact means movable between open and closed position, terminal conductor means comprising first and second terminals, the stationary contact means comprising first and second conductors being substantially parallel and having a gap therebetween, the movable contact means being connected to the first terminal and the second conductor being connected to the second terminal, the first conductor being pivotally mounted in the second conductor, the second conductor being in the zone of pivotal movement of the first conductor, the current path through the interrupter being from the first terminal and through the movable contact means, the first conductor, the second conductor, and then to the second terminal so that when a fault-current of minimal predetermined conditions occurs a magnetic flux occurs between the first and second conductors to urge the first conductor toward the movable contact means, and bias means for urging the first conductor toward the movable contact means.

4,162,468

**MANUALLY OR ELECTRICALLY OPERABLE ELECTRICAL SWITCH**

Derek Thornley, Nelson, England, assignor to Lucas Industries Limited, Birmingham, England

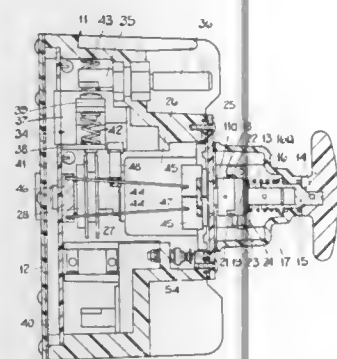
Filed Sep. 21, 1977, Ser. No. 835,359

Claims priority, application United Kingdom, Oct. 5, 1976, 41226/76

Int. Cl.<sup>2</sup> H01H 67/00

U.S. Cl. 335—106

6 Claims



1. An electrical switch including a fixed contact, a movable contact, movable into and out of engagement with the fixed contact and resiliently biased out of engagement with the fixed contact, a rotatable operating member and a cam rotatable with the operating member and cooperating through the intermediary of a cam follower with the movable contact, the cam being rotatable in one direction from a rest position to an

operative position wherein as a result of cooperation between the cam and the cam follower the movable contact is moved into engagement with the fixed contact, electromagnetic means for moving the cam in the direction of its rotational axis relative to the cam follower, the cam and the operating member being rotatable in the reverse direction from said operative position back to said rest position to permit disengagement of the movable contact from the fixed contact, said cam carrying first and second cam forms each of which is capable, upon rotation of the cam in said one direction, of moving the movable contact into engagement with the fixed contact, said second cam form commencing adjacent the termination of the first cam form, and each cam form including first and second cam tracks, the cam follower cooperating with the first cam track of one of the first and second cam forms during rotation of the cam in said one direction and cooperating with the second cam track of said one of the cam forms during reverse rotation of the cam, there being a guide surface associated with each cam form whereby when the cam has been rotated to its operative position the cam follower is caused to cooperate with the second cam track rather than the first cam track during reverse rotation of the cam, each second cam track including a plateau of a height such that the movable contact is retained in engagement with the fixed contact, and each plateau terminating, during reverse rotation of the cam in a step which, when reached by the cam follower during reverse rotation of the cam permits the movable contacts to move abruptly out of engagement with the fixed contact, and, each cam form further including, adjacent the guide surface a shoulder with which the cam follower cooperates during axial movement of the cam relative to the cam follower to achieve abrupt disengagement of the movable contact from the fixed contact, whereby, operation of said electromagnetic means in the operative position of the cam results in movement of the movable contact to its rest position without reverse rotation of the operating member, and the termination of the first cam form adjacent the commencement of the second cam form being such that after movement of the movable contact by the first cam form to engage the fixed contact, and subsequent return of the movable contact to its rest position by axial movement of the cam further rotation of the operating member and cam in said one direction results in the cam follower cooperating with the second cam form so that the movable contact can again be moved to engage the fixed contact by rotation of the operating member in said one direction, the cam and the operating member in effect being rotated beyond said operative position to achieve cooperation between the cam follower and the second cam form.

4,162,469

**COAXIAL SWITCH WITH MAGNETIC LOCKING**  
John P. Nijman, Wheaton, Ill., and Kamal S. Boutros, Toronto, Canada, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed May 23, 1977, Ser. No. 799,672

Int. Cl.<sup>2</sup> H01H 3/56

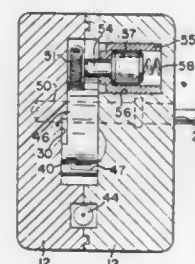
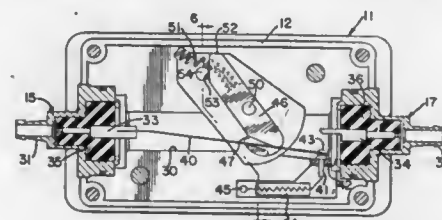
U.S. Cl. 335—186

7 Claims

1. A magnetically-locked switch assembly comprising, in combination:

a switch unit housing defining an interior chamber;  
an input connector communicating with said chamber;  
an output connector communicating with said chamber;  
contact means within said chamber having a first position establishing electrical connection between said input connector and said output connector, and a second position providing electrical isolation between said input connector and said output connector;  
actuating means including a contact actuator member and an externally accessible member for positioning said contact means in a selected one of said first and second positions;  
magnetic locking means in said chamber physically inaccessible from the exterior of said housing and responsive to an externally-applied magnetic field for preventing actuation

of said contact actuator member between said first and second positions in the absence of said field; and clutch means disposed between said externally accessible



member and said contact actuator member for preventing the application of sufficient force to damage said contact actuator member when actuation thereof is prevented by said magnetic locking means.

4,162,470

**MAGNETIZING APPARATUS AND METHOD FOR PRODUCING A STATICALLY CONVERGED CATHODE RAY TUBE AND PRODUCT THEREOF**

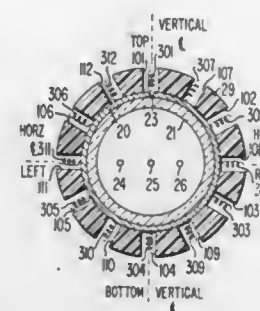
Joseph L. Smith, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,093

Int. Cl.<sup>2</sup> H01F 7/00

U.S. Cl. 335—210

22 Claims



1. A magnetizing apparatus for use in the static convergence of three in-line electron beams within a cathode ray tube including a magnetic material located adjacent to a neck portion of said cathode ray tube, comprising:

a first plurality of windings suitably arranged for positioning about said neck portion in proximity to said magnetic material and adapted to receive a magnetizing current of sufficient magnitude that will create permanently magnetized regions within said magnetic material that produce a magnetic field within said cathode ray tube for like motion of the outer electron beams, a first multiplicity of windings of said first plurality providing for like motion in a predetermined direction and a second multiplicity providing for like motion in a direction substantially orthogonal to the direction provided by said first multiplicity; and a second plurality of windings suitably arranged for position-

ing about said neck portion in proximity to said magnetic material and adapted to receive a magnetizing current of sufficient magnitude that will create permanently magnetized regions within said magnetic material that produce a magnetic field within said cathode ray tube for opposite motion of said outer electron beams, a third multiplicity of windings of said second plurality providing for opposite motion in a predetermined direction and a fourth multiplicity providing for opposite motion in a direction substantially orthogonal to the direction provided by said third multiplicity, said first and second pluralities located in two planes generally perpendicular to the central axis of said cathode ray tube, the windings of said first and second pluralities so angularly oriented about said neck portion as to create compact nonoverlapping permanently magnetized regions.

4,162,471

**ELECTROMAGNET LIFTING DEVICE**

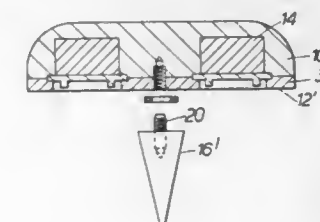
John Peace, Guisborough; Harold Wright, Stockton-on-Tees, and Kenneth Clague, Guildford, all of England, assignors to British Steel Corporation, London, England

Filed Sep. 9, 1977, Ser. No. 831,875

Int. Cl.<sup>2</sup> H01F 7/20

U.S. Cl. 335—291

9 Claims



1. An electromagnet lifting device for lifting loose ferrous articles comprising: a ferromagnetic body having an electromagnetic excitation winding contained therein and a relatively flat contacting surface, and a pole comprising a ferromagnetic pole piece extending outwardly away from the body, the pole piece having a relatively wide base abutting the contacting surface of the body and tapering to an apex remote from the base, whereby the pole piece can readily penetrate a collection of loose ferrous articles and cause the articles to be attracted to the pole piece.

4,162,472

**LINKAGES**

Roy C. Turner, Cippenham, and Philip J. Constable, Denham, both of England, assignors to Drayton Controls (Engineering) Limited, England

Filed Jul. 6, 1977, Ser. No. 813,331

Claims priority, application United Kingdom, Jul. 7, 1976, 28327/76

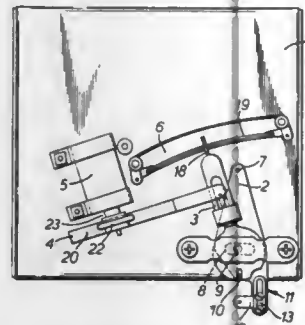
Int. Cl.<sup>2</sup> H01C 10/14

U.S. Cl. 338—116

22 Claims

1. An electromechanical transducer comprising: a base, a first link pivotally connected at one end to the base, a second link pivotally and directly connected to the base, an electrical resistance element in the form of a track mounted on the base, and a wiper arm mounted at one end of the second link and slidably engaging the track, the first link and the second

link being so coupled that pivoting of one link is operative to pivot the other link and the angle through which the



second link pivots is substantially greater than the angle through which the first link pivots.

4,162,473

**DRILLING MUD LEVEL MEASUREMENT**

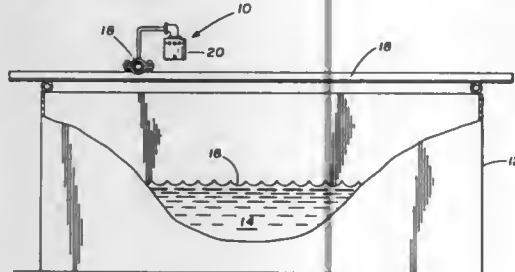
Joseph G. Utasi, Katy, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 13, 1978, Ser. No. 877,437

Int. Cl.<sup>2</sup> G01S 9/68; G01F 23/00

U.S. Cl. 340-1 L

6 Claims



1. An apparatus for measuring the level of drilling mud in a mud pit, wherein ambient air is above the drilling mud, comprising:

- a detector positioned above said drilling mud for directing energy through the ambient air between said detector and said drilling mud and receiving returned energy from said drilling mud,
- said detector including means for sensing temperature,
- an annular shroud located above said drilling mud and positioned around said detector, and
- means for promoting and allowing ambient air to circulate upward from said drilling mud through said shroud thereby insuring that said means for sensing temperature is sensing temperature of said ambient air.

4,162,474

**YAW-COMPENSATED CORRELATING SONAR TRACKING SYSTEM**

Alan Broder, Albertson; Paul Shapiro, Brooklyn, and Seening Yee, Whitestone, all of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sep. 21, 1964, Ser. No. 398,486

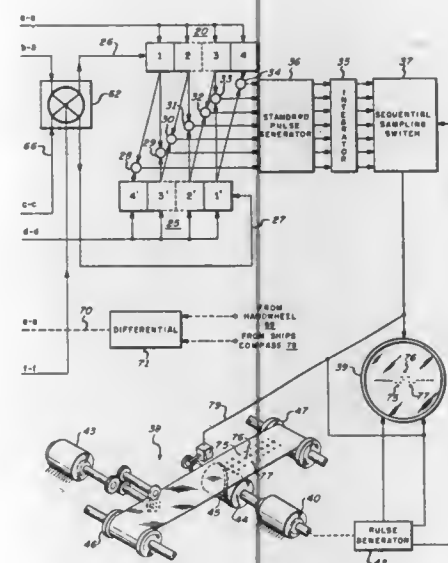
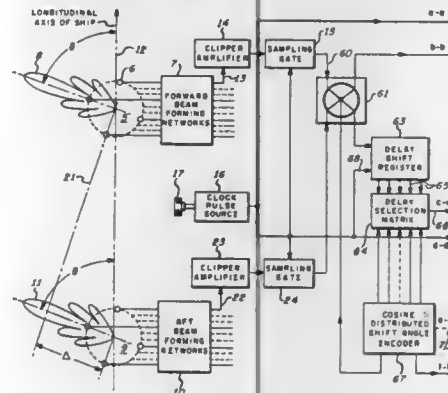
Int. Cl.<sup>2</sup> G01S 3/80

U.S. Cl. 340-6 R

9 Claims

1. Apparatus comprising a pair of signal sensors spatially displaced from each other, means connected to each sensor for quantizing the signals at the output thereof, first and second two-mode reversing switches, each switch having two inputs respectively connected to two outputs in one mode and having said two inputs inversely connected to said two outputs in the other mode,

each quantized signal being applied to a respective input of said first switch, one output of said first switch being connected to one input of said second switch, variable delay means connected between the other output of said first switch and the other input of said second switch, means for controlling the delay of said variable delay means and the modes of said first and second switches,



a signal correlator connected to the outputs of said second switch to produce an output signal representing the correlation function of the signals at the outputs of said second switch, and signal integrating means responsive to said output signals.

4,162,475

**TRANSDUCER UTILIZING SAMPLING**

Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec, Canada (H3R 1K3), and Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1)

Filed Mar. 24, 1978, Ser. No. 889,899

Int. Cl.<sup>2</sup> H04B 11/00

U.S. Cl. 340-8 R

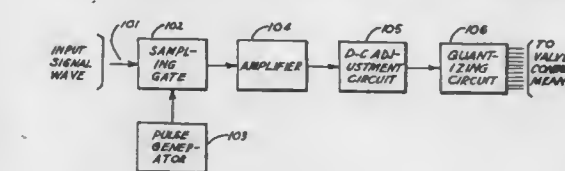
19 Claims

1. An apparatus for using electrical signal wave energy to control the generation of mechanical wave energy in a fluid medium, which comprises:

- means for producing a sequence of samples of said electrical signal wave at the Nyquist rate for said signal wave or faster, and
- means for comparison of the amplitude of each of said signal samples with a set of predetermined amplitudes, and means for determining the substantial coincidence of the

amplitude of each of said samples with the amplitude of one of said set of predetermined amplitudes, and if such coincidence does not exist, of determining which amplitude of said set of predetermined amplitudes is closest in value to said sample, and

means for energizing a unique combination of one or more output leads from said means for determining coincidence or near-coincidence, for each signal sample, and



means for opening or closing one or more of a plurality of orifices in a chamber containing fluid under pressure, in response to said energization of said unique combination of output leads for each of said samples, so that the power emitted from said chamber is substantially proportional to the power of said signal sample.

4,162,476

**ACCELERATION BALANCED HYDROPHONE II**

Bryce L. Fanning, Dartmouth, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

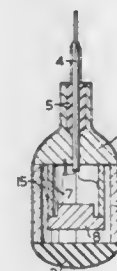
Filed Oct. 21, 1976, Ser. No. 734,407

Claims priority, application Canada, Feb. 18, 1976, 245994

Int. Cl.<sup>2</sup> H04B 13/00

U.S. Cl. 340-10

10 Claims



1. A hydrophone comprising:

- (a) a concentric pair of cylindrical transducers nestingly mounted to form a common chamber with the axes of said cylinders positioned parallel to a vertical axis of said chamber;
- (b) a first of said transducers comprising a radially poled pressure sensitive cylindrical piezoelectric acoustic transducer mounted parallel to the hydrophone axis;
- (c) a second of said transducers comprising a cylindrical accelerometer mounted within the isolation-formed interior of the cylinder of the first transducer;
- (d) the cylinder of said accelerometer transducer having a diameter and length which are smaller than the diameter and length of said cylindrical piezoelectric transducer for isolating therein the accelerometer from acoustic pressure; and
- (e) means for connecting the electrical outputs of the transducer and the accelerometer in a subtracting configuration.

4,162,477

**REMOTE CONTROL SYSTEM FOR TRAFFIC SIGNAL CONTROL SYSTEM**

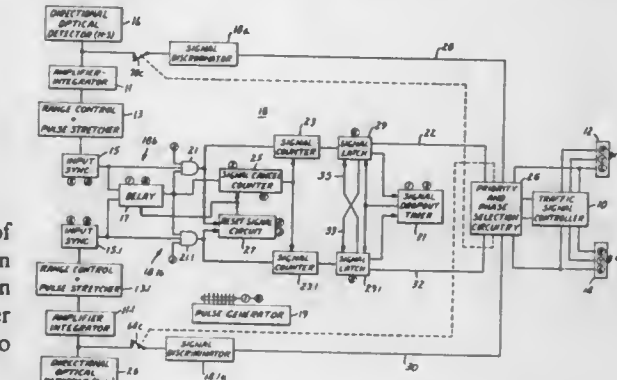
John A. Munkberg, Forest Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 3, 1977, Ser. No. 803,037

Int. Cl.<sup>2</sup> G08G 1/07

U.S. Cl. 340-32

5 Claims



1. A multiple priority remote control system responsive to at least two different optical energy signals transmitted from vehicles approaching a traffic intersection defined by at least two intersecting roadways for the remote control of a traffic control system for the intersection having a controller for controlling red, yellow and green traffic signal lights, the controller including a control switch for selectively connecting electrical power to the traffic lights with a timing control for timing the operation of the control switch, the remote control system including

- a first detector means for the intersection for detecting the optical energy signals transmitted from vehicles approaching the intersection along one roadway for the intersection; said first detector means having an output at which a signal is produced when an optical signal is detected;
- a second detector means for the intersection for detecting the optical energy signals transmitted from vehicles approaching the intersection along another roadway for the intersection; said second detector means having an output at which a signal is produced when an optical signal is detected;
- a signal discriminator means operatively connected to said output of said first detector means for providing first and second control signals, said first control signal provided in response to detection by the first detector means of at least one of the optical energy signals, said second control signal provided in response to detection by the first detector means of a predetermined one of the possible optical energy signals;
- said signal discriminator means operatively connected to said output of said second detector means for providing third and fourth control signals, said third control signal provided in response to detection by the second detector means of at least one of the optical energy signals, the fourth control signal provided in response to detection by the second detector means of the predetermined one of the possible optical energy signals;
- a control circuit operatively connected to the controller, said signal discriminator means and the green light circuits of the traffic signal lights for each roadway of the intersection, said control circuit responsive to any one of said control signals for placing said control switch under the control of said control circuit to present the green light associated with such initial control signal except when said any one of said control signals is said first control signal and said fourth control signal is presented while said first control signal is present, said control circuit then responding, as though said fourth control signal was said



any one of said control signals, to present the green light associated with said fourth control signal and except when said any one of said control signals is said third control signal and said second control signal is presented while said third control signal is present, said control circuit then responding, as though said second control signal was said any one of said control signals, to present the green light associated with said second control signal.

**4,162,478**  
**CIRCUIT ARRANGEMENT FOR TESTING OPERATING AND/OR CAPACITY CONDITIONS IN AUTOMOTIVE VEHICLES**

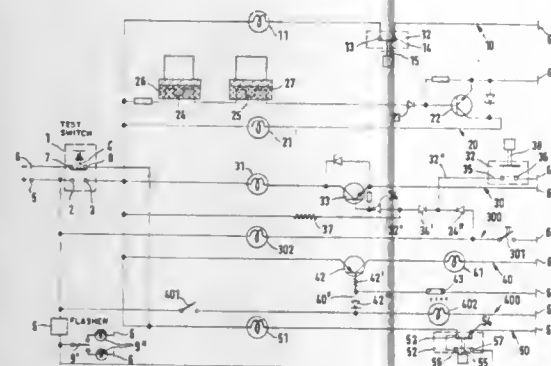
Manfred Huber, Munich; Karl Kapfhammer, Germering; Erwin Schwegler, Dachau; Franz Jochmann, Munich, and Alfred Krappel, Ismaning, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany  
Filed Nov. 11, 1976, Ser. No. 740,941

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550570

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 340—52 F

20 Claims



1. A circuit for testing operating and capacity conditions of an automotive vehicle comprising plural parallel circuits each containing at least one pilot lamp and switching means operable in accordance with an operating or capacity condition, and a single test switch to simultaneously energize said pilot lamps independently of vehicle operation, wherein each of said switching means is connected in series with at least one pilot lamp and with said single test switch, and wherein each of said switching means is electrically conductive during normal operating and capacity conditions.

**4,162,479**  
**AUTOMOBILE BURGLAR ALARM WITH BATTERY VOLTAGE SENSING MEANS**

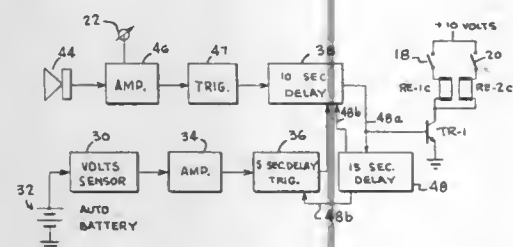
Larry C. Nickell, Lewisburg, and John L. McCormack, Fairlea, both of W. Va., assignors to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Filed Dec. 13, 1977, Ser. No. 860,157

Int. Cl.<sup>2</sup> B60R 25/10

U.S. Cl. 340—63

13 Claims



1. An automobile burglar alarm having automobile battery voltage sensing means to be mounted in an automobile at a

location accessible to the operator, comprising battery voltage level sensor means to be connected to the positive terminal of the automobile battery for providing an output signal level indicating the battery voltage level and responsive to reduction in the automobile battery voltage when an automobile dome light or trunk light supplied by the battery is turned on to provide a changed output signal level indicative of the reduced battery voltage level, a headlight control relay and a horn control relay for energizing the automobile headlights and horn of the associated automobile, a normally non-conducting transistor connected in circuit with said relays to a supply voltage source to energize the relays when the transistor conducts, a timer circuit connected to said normally non-conducting transistor to supply a timed output signal for causing the transistor to conduct for a predetermined short conduction interval, and an operational amplifier coupled to said sensor means and said timer circuit for supplying an amplified signal adequate to cause the timer circuit to produce said timed output signal in predetermined time relation responsive to said changed output signal level of said battery voltage sensor means, said battery voltage level sensor means being a resistance-capacitor circuit formed of a resistor connected to the automobile battery terminal and a capacitor connected in series between said resistor and electrical ground for establishing a voltage level at the connection between the resistor and capacitor corresponding to the battery voltage level when the capacitor charges up to the full battery voltage over a relatively long delay period determined by the values of the resistor and capacitor, said operational amplifier being coupled to said connection between the capacitor and resistor and providing means responsive to a reduction in the voltage level at said connection which persists for a predetermined time period after the battery voltage reduces responsive to energization of the automobile dome light or trunk light to render the operational amplifier non-responsive to short term high voltage spikes and provide said amplified signal responsive to signal level changes typically less than about 200 millivolts.

**4,162,480**  
**GALOIS FIELD COMPUTER**

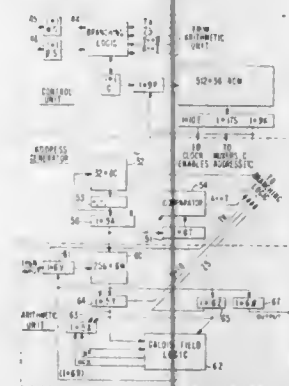
Elwyn R. Berlekamp, Berkeley, Calif., assignor to Cyclotomics, Inc., Berkeley, Calif.

Filed Jan. 28, 1977, Ser. No. 763,513

Int. Cl.<sup>2</sup> G06F 11/12

U.S. Cl. 340—146.1 AL

17 Claims



1. A stored program digital computer for correcting errors in cyclic encoded streams of data elements, comprising:

- (a) an arithmetic unit for performing arithmetic and logical operations upon portions of said data streams to decode said portions of data streams, said arithmetic unit comprising data memory means having addressable elements for retaining said data elements, multiplier means to supply an operand for multiplication, multiplier register means to supply another operand for multiplication, addend register means for holding an operand for addition, data memory addressing means for retrieving selected data

elements to supply a selected one of said operands, Galois field logic means selectably operable upon said multiplier and multiplicand registers to generate a finite field product, and said Galois field logic means selectably operable on said addend register to form a finite field sum with said product, said data memory means adapted to also retain the results of said Galois field logic means operation and said multiplier means adapted to supply said operand selectably from the result of a prior Galois field logic operation;

- (b) an address generator for developing address information for transmittal to said arithmetic unit to address the data memory of said arithmetic unit, said address generator comprising

address generator memory means having addressable elements for retaining information from which addresses are developed for said data memory of said arithmetic unit, address register means for retaining information derived from said address generator memory means, means for transferring the information content of a selected element of said address generator memory means to said address register means, means to modify the content of address register means in accord with a shift register sequence, test register means for retaining a datum and comparator means to detect equality of the content of said address register means with the content of said test register means, and

- (c) a control unit for controlling the sequence of operations performed by said arithmetic unit and said address generator, said control unit comprising

control memory means for storing the instructions defining the sequence of operations required for effecting corrections in said data streams, said control memory means having addressable elements and means for addressing said control memory means, said control memory addressing means adapted to sequentially address said control memory means, said sequence referenced from a selectable base address, means for selecting said base address, control register means for retaining the content of an element of said control memory means, said control memory element controlling the state of said computer, and means for transferring a portion of the content of said address generator in response to a signal defined by said control register content.

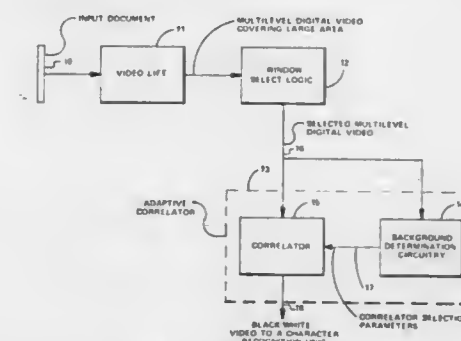
**4,162,481**  
**ADAPTIVE CORRELATOR FOR VIDEO PROCESSING**  
Dale R. DuVall, Keller, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed Dec. 22, 1976, Ser. No. 753,665

Int. Cl.<sup>2</sup> G06K 9/00

U.S. Cl. 340—146.3 AG

12 Claims



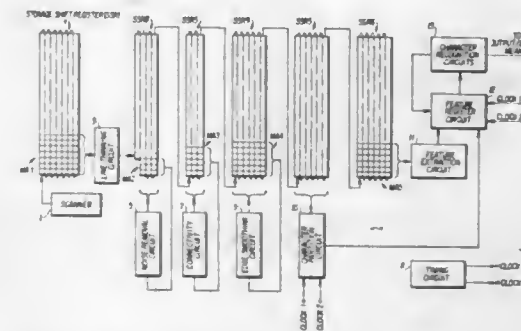
1. A method of continuously referencing the reflectivity of a document surface in order to distinguish the background from printed information thereon, comprising the steps of: optically scanning the document to produce picture elements representative of discrete portions of the document; quantizing a value for each picture element dependent upon the reflectivity of the documents represented by that element; processing groups of

picture elements for comparing against each of a plurality of correlation curves, continually and aperiodically selecting one of the correlation curves for selecting a correlation value for each picture element.

**4,162,482**  
**PRE-PROCESSING AND FEATURE EXTRACTION SYSTEM FOR CHARACTER RECOGNITION**  
Chauchang Su, West Bloomfield Township, Oakland County, Mich., assignor to Burroughs Corporation, Detroit, Mich.  
Filed Dec. 7, 1977, Ser. No. 858,311  
Int. Cl.<sup>2</sup> G06K 9/12

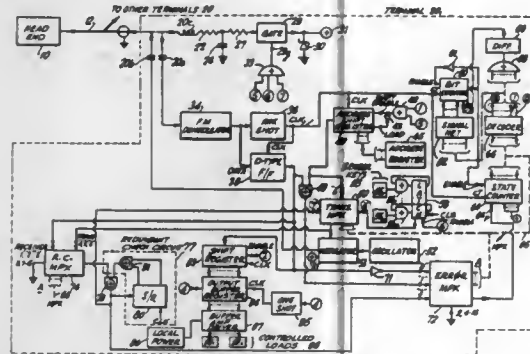
U.S. Cl. 340—146.3 H

12 Claims



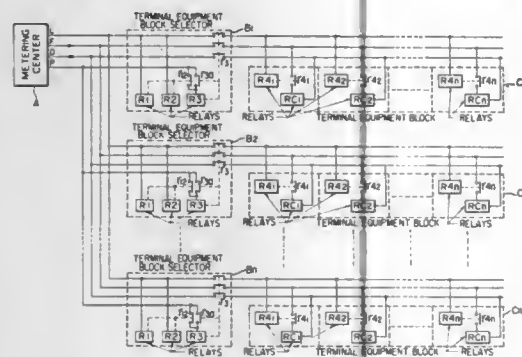
1. Apparatus for machine recognition of hand-written or machine printed characters comprising:  
means for scanning said character;  
means for generating a matrix of black and white points from said scanned character, said matrix being stored in a storage shift register;  
means for non-iteratively thinning said matrixed character to generate a centerline representative of said matrixed character;  
means for removing isolated points in said thinned character matrix;  
means for filling in discontinuities appearing in said centerline of said matrixed character;  
means for removing spurious points adjoining said centerline of said matrixed character;  
means for partitioning said thinned character matrix into a plurality of regions;  
means for scanning a plurality of areas of said regions, each of said areas comprising a plurality of subregions, wherein said scanned areas overlap a plurality of said regions and wherein said areas each have a center point;  
means for detecting a pattern of black and white points in each of said scanned areas;  
means for generating a unique coded value representative of said detected pattern in each of said scanned areas;  
means for comparing said coded value with a known set of values corresponding to geometrical stroke features until a match is detected;  
means for generating an output signal indicative of the detection of one of said stroke features, in each of said scanned areas;  
means for assigning said detected stroke feature to said area containing said center element of each of said scanned areas;  
means for detecting sequentially said assigned stroke features for each of said plurality of regions;  
means for comparing said sequentially detected stroke features with a known set of sequences corresponding to characters previously identified; and  
means for assigning said matrixed character to said previously identified character having stroke sequences most closely corresponding to those detected from said matrixed character.

**4,162,483**  
**BILATERAL MASTER STATION-PLURAL SATELLITE STATION SIGNALLING APPARATUS**  
 Alan W. Entenman, Hicksville, N.Y., assignor to Intech Laboratories, Inc., Bohemia, N.Y.  
 Filed Apr. 1, 1977, Ser. No. 783,740  
 Int. Cl.<sup>2</sup> H04N 1/44; H04B 1/06; H04Q 9/00  
 U.S. Cl. 340—147 R 19 Claims



1. In combination, station means for transmitting and receiving plural bit messages comprising an address field, a data field and an encryption field; said station means including:  
 a state counter;  
 received message demodulating means;  
 station address storing register means;  
 error signal multiplexer means having plural data inputs, an output for selectively setting said state counter to a predetermined state, and addressing control means connected to the output of said state counter for interconnecting one of said multiplexer data inputs with said multiplexer output depending upon the content of said state counter;  
 address error means having inputs connected to said station address storing register means and said demodulating means and an output connected to a first one of said plural error signal multiplexer inputs; and  
 encryption field verifying means having an input connected to said demodulating means and an output connected to a second input of said error signal multiplexer means.

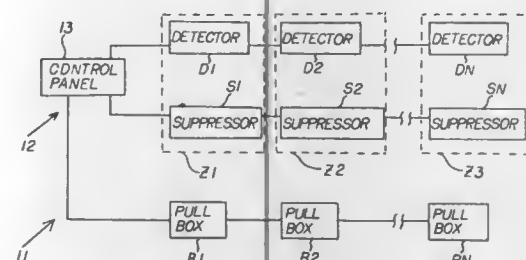
**4,162,484**  
**DATA COLLECTION SYSTEM**  
 Takeshi Abe, Yokohama; Keishin Tsuchiya, Tachikawa; Kazuhito Saito; Toshiaki Mizuta, both of Kawasaki, and Ichiro Yoshihara, Funabashi, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan  
 Filed May 18, 1977, Ser. No. 798,019  
 Claims priority, application Japan, May 26, 1976, 51-60776  
 Int. Cl.<sup>2</sup> H04Q 9/00 4 Claims  
 U.S. Cl. 340—150



1. A data collection system of the type wherein a metering center sequentially selects a number of remote terminal equipment block selectors and then through the selected terminal equipment block selector sequentially selects a plurality of terminal equipment units connected to said selected selector

thereby reading the data of said terminal equipment unit into said metering center, comprising:  
 a terminal equipment selection bus comprising a plurality of terminal equipment selection lines for selecting one of said terminal equipment block selectors and for subsequently selecting one of the terminal equipment units connected to said one block selector;  
 first means at said metering center for sequentially applying first and second corresponding coded signals of limited duration to said terminal equipment selection bus;  
 power lines for coupling said metering center to said terminal equipment block selectors;  
 a data output bus comprising lines for coupling said metering center to said terminal equipment block units;  
 second means associated with said one terminal equipment block selector comprising latching means for coupling said terminal equipment selection bus and said data output bus to all of the terminal equipment units connected to said one terminal equipment block selector, in response to said sequentially applied corresponding first and second coded signals;  
 third means at said metering center for applying a third coded signal to said terminal equipment selection bus, after said first and second coded signals have terminated, to energize a selected one of the terminal equipment units connected to said one selected terminal equipment block selector, to cause meter data from said energized unit to be transferred to said metering center, via said data output bus; and  
 fourth means for de-energizing said second means after termination of said third coded signal, to uncouple said terminal equipment selection bus from said terminal equipment units connected to said one terminal equipment block selector.

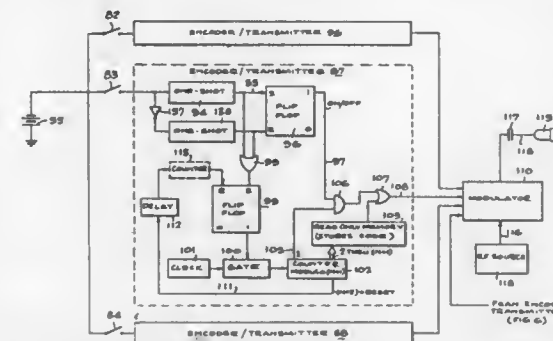
**4,162,485**  
**FIRE PROTECTION APPARATUS**  
 Enio Facchini, Framingham, and Carl I. Swanson, Boylston, both of Mass., assignors to Walter Kidde and Company, Inc., Clifton, N.J.  
 Division of Ser. No. 595,626, Jul. 14, 1975, Pat. No. 4,017,844.  
 This application Jan. 7, 1977, Ser. No. 757,615  
 Int. Cl.<sup>2</sup> G08B 25/00 7 Claims  
 U.S. Cl. 340—289



1. A fire control system comprising:  
 a plurality of detectors, each located in a different zone so as to provide an alarm signal in response to the presence of combustion products therein;  
 extinguishing means for selectively discharging a fire extinguishing agent into any of said different zones;  
 a plurality of manual pull stations, one located in the immediate vicinity of and associated with each of said zones and manually operable to induce discharge thereinto of said extinguishing agent from said extinguishing means; each of said pull stations comprising signal means energizable to provide a visual indication of an abnormal condition, a box for mounting on a support surface, a first electrical switch mounted in said box and manually operable from an open to a closed position, latch means for latching said

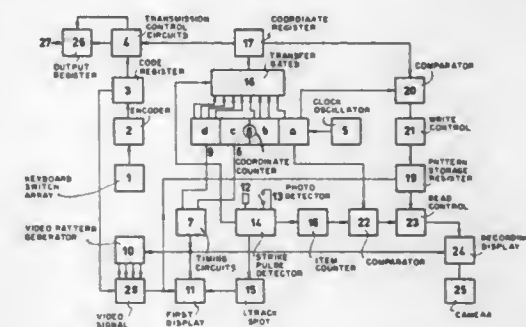
first switch in said closed position, a second electrical switch mounted in said box and manually operable from an open to a closed position so as to provide an initiation signal for initiating release of said extinguishing agent into an associated zone, restoring means for returning said second switch to said open position after being manually actuated into said closed position, and mechanical indicator means for providing a visual indication in response to movement of said first switch into said closed position; and  
 control circuit means connecting said detectors in each zone with said pull station associated with that zone, said control circuit means energizing said signal means in a given pull station in response to an alarm signal from an associated detector and comprising a control panel interconnected between all of said detectors, said extinguishing means, and all of said pull stations, said control panel providing an alert signal in response to operation of one of said first electrical switches to a closed position.

**4,162,486**  
**ENCODED ELECTRICAL CONTROL SYSTEMS**  
 Leopold S. Wyler, Beverly Hills, Calif., assignor to TRE Corporation, Beverly Hills, Calif.  
 Division of Ser. No. 660,686, Feb. 23, 1976, Pat. No. 4,141,332.  
 This application Jan. 7, 1977, Ser. No. 757,632  
 Int. Cl.<sup>2</sup> H04M 11/04 3 Claims  
 U.S. Cl. 340—310 A



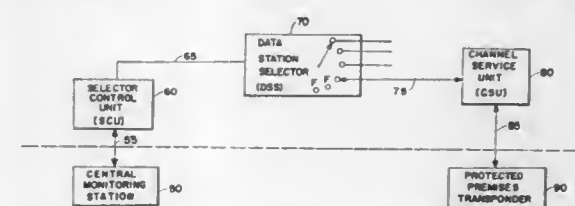
2. An encoded electrical control system for remote control of devices powered from a common electrical distribution system, comprising:  
 a controller including a switch and a control member, and an associated encoder/transmitter providing a unique, encoded signal in response to actuation of said switch, said encoder/transmitter providing said encoded signal repetitively at a repetition rate determined by the setting of said control member,  
 transmission means for transmitting the encoded signals from said encoder/transmitter over said electrical distribution system, and  
 respective receiver/decoder means associated with each device to be controlled, each receiver/decoder means being connected to receive the encoded signals transmitted over said distribution system and to effectuate control of said respective device in response to receipt only of the unique code associated with that specific receiver/decoder means, and wherein the associated receiver/decoder means effectuates control of the associated device in proportion to the repetition rate of said encoded signal.

**4,162,487**  
**SYSTEM FOR THE TRANSMISSION AND RECEPTION OF ENCODED INFORMATION**  
 Malcolm Macaulay, 34 Jacka Crescent, Campbell, A.C.T., Australia (2601)  
 Filed Jul. 7, 1976, Ser. No. 703,278  
 Claims priority, application Australia, Jul. 8, 1975, PC2287  
 Int. Cl.<sup>2</sup> G06F 3/14 7 Claims  
 U.S. Cl. 340—744



1. A system for the transmission and reception of selected information comprising  
 keyboard means for performing a first encoding step of designating for display a group of information selected from the total information and generating an associated first code signal,  
 means for displaying said designated group of information, photodetector means associated with said display, means for performing a second encoding step designating an item within said selected group and means for generating a second code signal, representative of said designated item,  
 means for combining both said signals to give a combined signal,  
 means for transmitting said combined signal in association with said means for receiving said combined signal, means for separating said combined signal into said first and said second code signal,  
 means for decoding said first code signal to designate a particular character generator corresponding to the selected encoded group,  
 decoder means responsive to said second code signal to select the encoded item within the selected group, and means responsive to said designated character generator to record and to display the selected item.

**4,162,488**  
**ALARM SYSTEM**  
 Howard M. Silverman, Livingston; David G. Barleen, Parsippany, and Thomas R. DeLalla, Flanders, all of N.J., assignors to Emergency Products Corporation, Parsippany, N.J.  
 Filed Mar. 11, 1977, Ser. No. 776,753  
 Int. Cl.<sup>2</sup> G08B 26/00 28 Claims  
 U.S. Cl. 340—505





tially establishing connections between said primary port and each of said plurality of secondary ports;  
central monitoring station apparatus connected to said switching means primary port, said central monitoring station apparatus including:  
means for successively generating said predetermined signal at equally spaced predetermined intervals;  
means operative at the termination of each occurrence of said predetermined signal for transmitting a START signal over the connection established by said switching means;  
means for detecting predetermined tones received over said connection after the termination of said START signal; and  
means responsive to a tone absence for recognizing an alarm condition; and  
a plurality of transponder units each located at a respective protected premises and each connected to a respective one of said switching means secondary ports, said respective protected premises including a plurality of protected zones, with one or more sensor elements disposed at each of said protected zones for providing status indications of each of said protected zones, each of said transponder units including:  
clock means responsive to receipt of said START signal over said switching means connection for defining a plurality of time slots each corresponding to one of said protected zones;  
means for transmitting selected ones of said predetermined tones during corresponding ones of said plurality of time slots over said connection; and  
means responsive to an indication from a sensor element of said alarm condition in one of said protected zones for inhibiting the transmission of tones in the time slot corresponding to said one protected zone, so as to produce said tone absence for recognition by said recognizing means in said central monitoring station apparatus.

4,162,489

# **FIRE ALARM SYSTEM COMPRISING A PLURALITY OF ALARMS WHICH MAY BE OPERATED BY WAY OF AN ALARM LOOP**

Peer Thilo, and Otto W. Moser, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

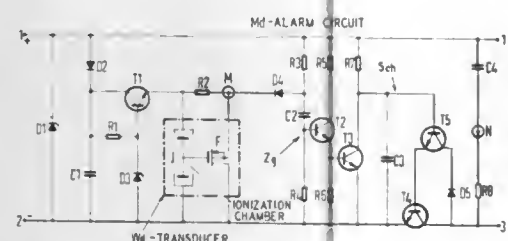
Filed Aug. 4, 1977, Ser. No. 821,837

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2638068

Int. Cl.<sup>2</sup> G08B 17/00

U.S. Cl. 340—518

7 Claims



1. A fire alarm system comprising: a plurality of alarm circuits which are connectible in an alarm loop for interrogation; and  
a central control connected to said alarm loop including means for applying operating power to said alarm circuits and means for receiving signals generated by said alarm circuits,  
each of said alarm circuits comprising:  
a detector for detecting a predetermined characteristic of a fire and generating a representative first signal, signaling means connected to said detector and operated by

said first signal to amplify and place the same as an amplified second signal on said loop,  
said signaling means including a timing circuit having a load resistance connected in parallel to said loop by said signaling means.

4,162,490

# **TOILET TRAINING DEVICE**

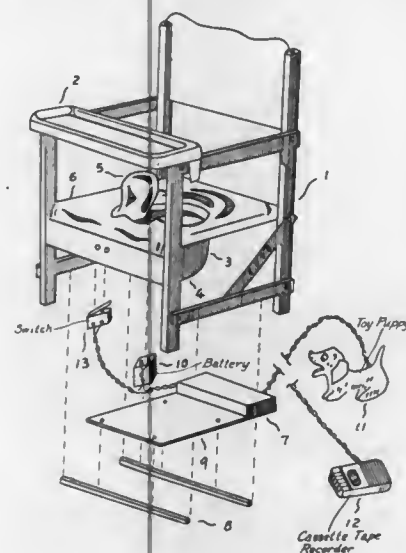
Fang-Cheng Fu, and Chien-Hung Fu, both of 792 Oak Ridge Ct., Brighton, Mich. 48116

Filed Jan. 26, 1978, Ser. No. 872,568

Int. Cl.<sup>2</sup> G08B 21/00; A47K 11/02

U.S. Cl. 340—603

7 Claims



1. A toilet training device which is readily adapted for use with conventional nursery training chairs wherein a non-contact electronic sensor is employed to detect dielectrically the presence of urine and stool in said receptacle which is placed on top of said sensing board for control of said battery-powered toy to reward the toddler and to signal the trainer when toddler's elimination begins comprising:

- nursery training chair means for training of toddlers in orderly habits of discharging urine and stool as well, said nursery training chair means comprising said seat surface with said deflector, said receptacle and said fixture;
- non-contact electronic sensor means, adapted to be mounted on said nursery training chair, for detecting said urine and stool in said receptacle;
- sensing board means, adapted to provide said support for said receptacle and said sensing element;
- a battery;
- a diode having an anode and a cathode series connected with said battery source, said anode being adapted to be coupled to said positive terminal of said battery source to provide reverse polarity protection;
- battery-powered toy means, adapted to be coupled to said non-contact electronic sensor, to provide said pleasant sound upon contact of said urine and stool against said inner surface of said receptacle;
- pressure sensitive switch means, adapted to be mounted on said nursery training chair, to turn the system on when the nursery training chair is occupied; and
- means coupling said non-contact electronic sensor, said battery, said diode, said pressure sensitive switch, and said battery-powered toy.

4,162,491

# **INDUCTIVE POSITION SENSOR WITH MINIMUM OUTPUT SIGNAL LEVEL CAPACITIVELY COUPLED TO INDICATE FAILURE OF DEVICE**

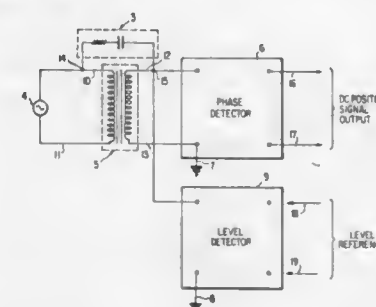
George G. Gochis, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Jan. 11, 1978, Ser. No. 868,483

Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 340—646

1 Claim



- Apparatus for indicating the angular position of one object with respect to another comprising:  
a source of power;  
an inductive position sensor having a primary coil connected to the source of power and a secondary coil, said secondary coil magnetically coupled to the primary coil and mounted for movement relative thereto in a manner which varies the magnetic coupling as relative movement occurs thereby producing an output signal on the secondary coil proportional to said relative movement, said inductive position sensor having a point of zero output in the middle of its range of positions;  
a coupling capacitor connected from the primary coil to the secondary coil to impress a minimum signal level at the output of the secondary coil;  
a phase detector connected to receive the output signal of the inductive position sensor and to generate a D.C. signal proportional to the output signal of the position sensor, but independent of the minimum signal level; and  
a level detector connected to the output of the position sensor to receive the minimum signal level, to compare said minimum signal level to a predetermined reference level, and to generate an alarm signal in response to changes in the minimum signal level.

4,162,492

# **METHOD AND APPARATUS FOR IMAGE SIGNAL GENERATION AND IMAGE DISPLAY**

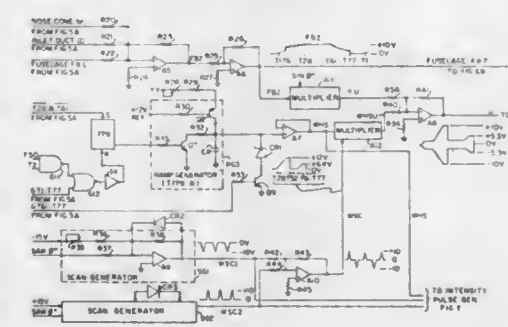
Robert E. Jones, Jr., Timonium, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Aug. 25, 1972, Ser. No. 283,673

Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 340—723

66 Claims



- Image signal forming means, comprising  
means for forming a first analog envelope-forming signal, the effective envelope amplitude of which varies in time as

a function of a sectional outline bounding a portion of a first area desired to be imaged,  
means for forming a second analog envelope-forming signal in time-overlapping timed phase relation with said first signal and the effective envelope amplitude of which varies in time as a function of a further sectional outline bounding a portion of a respective second area desired to be simultaneously imaged,  
means for adding said first and second signals and for forming as a function thereof a composite envelope-forming signal the effective envelope of which varies in time as a function of both of said first and second areas,  
means for forming a common time reference ramp trace-sweep signal in time-overlapping relation with, and for use in common with, said composite envelope-forming signal to effect trace movement in a direction transverse to trace movement effected by said composite envelope-forming signal,  
means for generating an A.C. carrier signal varying through multiple repetitive cycles within the time span duration of one occurrence of said common time ramp reference signal,  
and means for producing an envelope image-forming signal formed of repetitive cycles corresponding in frequency to said A.C. carrier signal, the successive peak-to-peak amplitude of which repetitive cycles is a function of said composite envelope-forming signal.

4,162,493

# **GRAPHIC DISPLAY SYSTEMS**

John Ross, Claremont, and Amedeo F. Sala-Spini, Morley, both of Australia, assignors to Random Electronics International Pty. Limited, New South Wales, Australia

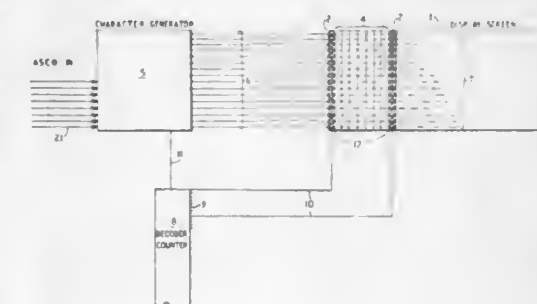
Filed Jan. 7, 1977, Ser. No. 757,734

Claims priority, application Australia, Jan. 13, 1976, 4507/76

Int. Cl.<sup>2</sup> G06F 3/14; G09F 9/00

U.S. Cl. 340—752

20 Claims



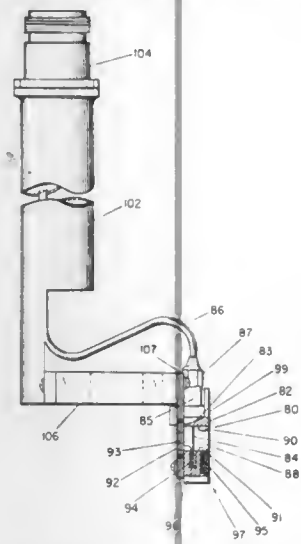
- A display system for depicting in motion at least one graphic made up of dot elements arranged in a matrix form of dot rows and at least two dot columns, said graphic being displayed by creating a series of stationary images in successive display state periods, with the graphic appearing to move across the display system as different stationary images are created, a dot row of the matrix being a group of cells of the matrix arranged parallel to the direction of apparent motion of the graphic, a dot column of the matrix being a group of cells of the matrix arranged orthogonally to the direction of apparent motion of the graphic, said series of stationary images advancing in the direction of apparent motion at the rate of one dot column per display state period, comprising:

an array of picture element sources, said picture element sources arranged in a stationary element matrix of element columns and element rows generally corresponding to the dot matrix such that every element row, being a group of cells arranged parallel to the direction of apparent motion of the graphic, contains picture element sources spaced apart throughout its length, and every element column, being a group of cells arranged orthogonally to the direction of apparent motion, has zero to n picture element





- b. a liquid medium selected from the group consisting of water or deuterium oxide, said microwave antenna probe



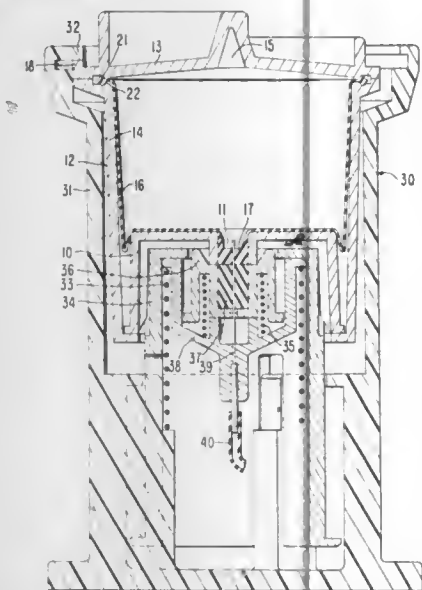
and the target being completely immersed in said liquid medium.

4,162,501

**INK SUPPLY SYSTEM FOR AN INK JET PRINTER**  
Charles S. Mitchell, Palo Alto, and Glenn D. Maxwell, Saratoga, both of Calif., assignors to Silonics, Inc., Sunnyvale, Calif.  
Filed Aug. 8, 1977, Ser. No. 822,538  
Int. Cl.<sup>2</sup> G01D 15/16

U.S. Cl. 346—140 R

24 Claims



1. A sealed pressurizable and interchangeable ink cartridge for an ink jet printer having a cartridge receptacle with an ink supply connector protrudable therefrom, said cartridge comprising:

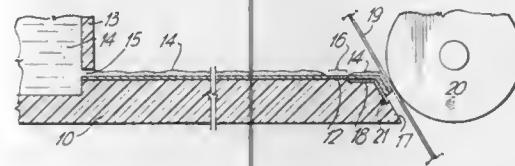
a housing adapted to be received by the printer receptacle, a piston slidably engaged within said housing, means for providing a fluid seal between the piston and said housing as it slides back and forth therein, and a septum carried by said piston and forming a sealed inlet that is penetratable by said receptacle connector, whereby fluid communication is achieved between the interior of the cartridge and the receptacle and further whereby the cartridge can be pressurized by moving said piston with respect to said housing to reduce the fluid volume therein.

4,162,502

**PRINTER WITH ELECTROSTATIC INK CONTROL**  
Paolo Cielo, and William D. Westwood, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada  
Filed May 5, 1978, Ser. No. 903,187  
Int. Cl.<sup>2</sup> G01D 15/18

U.S. Cl. 346—140 R

10 Claims



1. A printer with electrostatic ink control, comprising:  
a substrate including an ink reservoir at one end and a printing position at the other end;  
a plurality of strips of hydrophilic material extending side by side on said substrate from said reservoir towards said printing position;  
at least one orifice in a wall of said reservoir for the supply of ink to said strips;  
electrostatic means associated with each strip for controlling the flow of ink along said strip to said printing position.

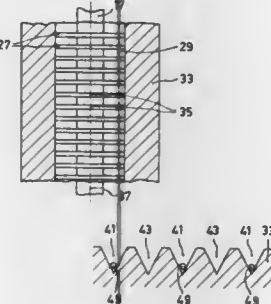
4,162,503

**PRINTING HEAD WITH TAUT WIRE ELECTRODES**  
Theodorus H. Potma, Eindhoven, and Gerhardus T. H. Tomassen, Someren, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.  
Filed Dec. 15, 1977, Ser. No. 860,703  
Claims priority, application Netherlands, Feb. 18, 1977, 7701721

Int. Cl.<sup>2</sup> G03G 17/00; G01D 15/06

U.S. Cl. 346—163

8 Claims



1. A recording device having a backing member, and a recording head having a support and a plurality of recording electrodes mounted in the support and arranged in a row, for marking an electro-sensitive record carrier moving along a path between the backing member and the electrodes perpendicular to the row, wherein

the plurality of electrodes is formed by a plurality of taut wires disposed parallel to each other, each wire being supported in grooves at two locations in a unitary support equally spaced from a central contact region, the wire extending freely between the grooves, said contact regions being arranged in a straight line and the backing member being arranged opposite said line.

4,162,504

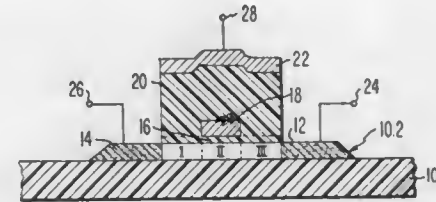
**FLOATING GATE SOLID-STATE STORAGE DEVICE**  
Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corp., New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,766

Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357—23

14 Claims



1. A floating gate storage device comprising:  
a body of semiconductor material having a pair of semiconductor regions of a first type of conductivity embedded therein and spaced a given distance one from the other;  
an intermediate semiconductor region of an opposite type conductivity defining the space between the pair of regions;  
a first layer of insulating material having a given thickness disposed on the intermediate region;  
a floating gate member, the width of which is narrower than the given distance between the regions of first conductivity, centrally disposed over the intermediate region and insulated therefrom by the first layer of insulating material;  
a second layer of insulating material having a greater thickness than that of the first insulating layer disposed on both the floating gate member and those portions of the first insulating layer not covered by the floating gate member; and  
a control gate member, the width of which is the same as the given distance between the regions of first conductivity, centrally disposed on the second insulating layer, over the intermediate region, and insulated from the floating gate member by the second layer of insulating material.

4,162,505

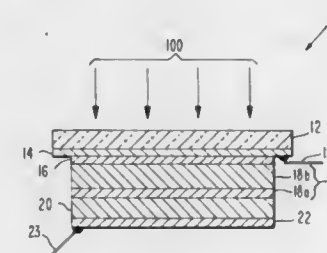
**INVERTED AMORPHOUS SILICON SOLAR CELL UTILIZING CERMET LAYERS**  
Joseph J. Hanak, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,564

Int. Cl.<sup>2</sup> H01L 27/14

U.S. Cl. 357—30

11 Claims



1. In an amorphous silicon solar cell which comprises a body of hydrogenated amorphous silicon with a means for ohmically contacting said body of hydrogenated amorphous silicon incident to solar radiation and a metal layer ohmically contacting said body of hydrogenated amorphous silicon opposite to said incident surface, the improvement which comprises:  
a transparent high work function metal cermet layer disposed between and contacting said means for forming an

ohmic contact and said body of hydrogenated amorphous silicon; and

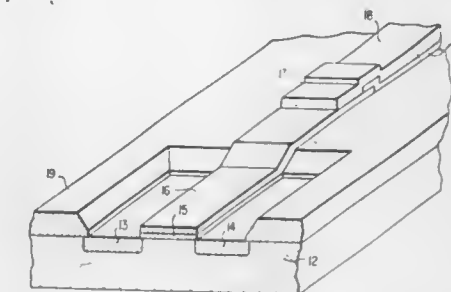
- a thick film cermet layer disposed between said metal layer ohmically contacting said body of hydrogenated amorphous silicon opposite to said incident surface and said body of hydrogenated amorphous silicon.

4,162,506

**SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH DUAL THICKNESS POLY-SILICON WIRING**  
Sakae Takei, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan  
Continuation of Ser. No. 786,595, Apr. 11, 1977, abandoned.  
This application Jul. 10, 1978, Ser. No. 923,223  
Claims priority, application Japan, Apr. 27, 1976, 51-47190  
Int. Cl.<sup>2</sup> H01L 29/04

U.S. Cl. 357—59

3 Claims



1. A high-speed semiconductor integrated circuit device comprising:  
a semiconductor substrate of one conductivity type having source and drain regions formed therein of another conductivity type;  
an insulating oxide film formed on the substrate bridging the source and drain regions;  
a gate electrode layer formed by a first polycrystalline silicon film disposed and etched on the insulating oxide film; and  
an interconnecting wiring layer formed by a second polycrystalline silicon film connected with the gate electrode layer, the second polycrystalline silicon film having a thickness greater than the thickness of the first polycrystalline silicon film;  
whereby the resistance of the interconnecting wiring layer is reduced as a result of the greater thickness of the second polycrystalline silicon film made possible by the fact that the gate electrode layer and interconnecting wire layer are not formed in a body, thereby correspondingly increasing the speed of the semiconductor integrated circuit device without increasing the thickness of the gate electrode layer, and therefore without increasing gate electrode layer side etching.

4,162,507

**CONTACT STRUCTURE FOR A MULTIPLE SEMICONDUCTOR COMPONENT**  
Konrad Fischer, Bad Rappenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Dec. 28, 1977, Ser. No. 865,596

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702571

Int. Cl.<sup>2</sup> H01L 23/48, 29/44, 29/52

U.S. Cl. 357—68

10 Claims

1. A contact structure for a multiple component semiconductor device made up of a number of two terminal individual components having individual finger-shaped connections for one contact of each component respectively and a large area connecting contact to which are connected the other contacts

1. An electronic signal processor, comprising the combination of a video amplifier having at the input of said video amplifier a means of accepting a video signal and at the output of said video amplifier a means of providing a video signal,



means disposed in said video amplifier to incorporate a periodicity indicator signal into said video signal as said video signal passes through said video amplifier; a periodicity indicator signal generator having at the input of said periodicity indicator signal generator means of accepting a reference signal and at the output of said periodicity indicator signal generator a means of connection to said video amplifier for incorporation of said periodicity indicator signal into said video signal as said video signal passes through said video amplifier, a means included within said periodicity indicator signal generator of selecting duration and timing of said periodicity indicator signal relative to said reference signal; a synchronization signal detector connected to said video amplifier capable of determining the presence of synchronization signals within said video signals as said video signal passes through said video amplifier, means of which said synchronization signal detector prevents incorporation of said periodicity indicator signal into said video signal during intervals when said synchronization signals are present in said video signal; and a means of providing electrical current to said video amplifier, said periodicity indicator signal generator and said synchronization signal detector.

4,162,513

## TELEVISION SYSTEM SCHEDULER

Billy W. Beyers, Jr., Greenfield, and Adam J. Suchko, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

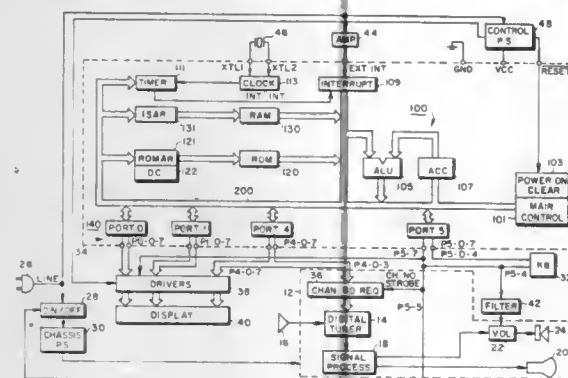
Filed Sep. 26, 1978, Ser. No. 945,042

Claims priority, application United Kingdom, Sep. 30, 1977, 40763/77

Int. Cl.<sup>2</sup> H04N 5/48; H04B 1/26

U.S. Cl. 358—191

15 Claims



1. In a television system, apparatus comprising: digital tuner means for tuning said television system to various channels identified by respective channel numbers in a predetermined range of numbers in response to binary signals representing said channel numbers; programmable means for at least temporarily storing binary signals representing information to be selected by a user; keyboard means including a plurality of digit keys for normally generating binary signals representing said channel numbers in response to the operation of said digit keys by said user; and control means responsive to the operation of at least one of said digit keys to generate binary signals representing channel numbers within said predetermined range of numbers for causing said digital tuner means to tune said television system to respective channels and responsive to the operation of at least one of said digit keys to generate binary signals representing a predetermined number not within said predetermined range of said numbers for enabling said programmable means to receive binary signals generated in response to the subsequent operation of said digit keys.

# 4,162,514 ARRANGEMENT FOR SEMICONDUCTOR POWER COMPONENTS

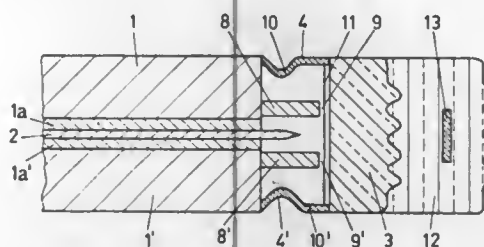
Patrick De Bruyne, Station Siggenthal, and Lutz Niemeyer, Oberrohrdorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland  
Filed Sep. 19, 1977, Ser. No. 834,263

Claims priority, application Switzerland, Oct. 27, 1976, 13521/76

Int. Cl.<sup>2</sup> H02H 7/20

U.S. Cl. 361—2

14 Claims



1. An installation for semiconductor power components, said installation including at least one semiconductor power component placed between contact pieces and enclosed in a housing including an insulator having an inner wall surrounding the contact pieces and connected thereto by connecting pieces having an inner wall interior to said housing, wherein, in order to increase the explosion safety of said installation upon the formation of an arc, there is provided the improvement comprising: current conductors laterally adjoining the contact pieces and annularly surrounding said contact pieces in the immediate vicinity of said semiconductor power component, said current conductors separated from the interior wall of the insulator only by narrow gaps, the width of said gaps dimensioned so that no looping of the arc into the gap occurs.

4,162,515

## ELECTRICAL SHOCKING DEVICE WITH AUDIBLE AND VISIBLE SPARK DISPLAY

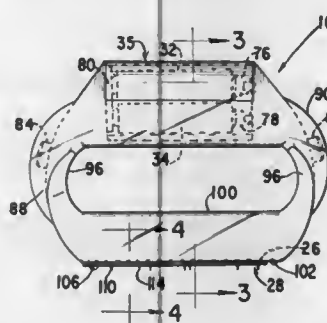
Gary A. Henderson, Arvada, and Guy H. Williams, Jr., Parker, both of Colo., assignors to American Home Products Corp., New York, N.Y.

Continuation-in-part of Ser. No. 752,575, Dec. 20, 1976, Pat. No. 4,092,695. This application Mar. 31, 1978, Ser. No. 892,351

Int. Cl.<sup>2</sup> F41B 15/04

U.S. Cl. 361—232

10 Claims



1. A hand-held electrical shocking device which in the energized, operative condition produces a visible and audible external spark and is capable of delivering a jolting electrical shock comprising  
a. a non-conductive hollow housing having a hand grip at a first housing portion;

b. first and second conductive plates connected to a second housing portion and being spaced apart from each other by a non-conductive member;  
c. a low voltage power source positioned within said housing;  
d. an electronic circuit means coupled to said power source and said first and second plates, said electronic circuit means being adapted to provide a series of short duration, high voltage, low current electrical impulses to said first and second plates.

4,162,516

## METER BOX WITH DISCONNECT MEANS

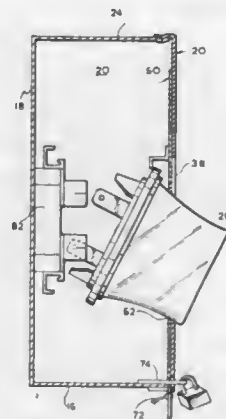
Dale F. Becker, Seneca, S.C., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 21, 1978, Ser. No. 898,360

Int. Cl.<sup>2</sup> H02B 9/00

U.S. Cl. 361—372

13 Claims



13. A combination enclosure meter and disconnect device comprising:  
a socket and a meter having interengaging connecting members, said meter having a forward transparent front portion;  
a housing and cover therefor enclosing said meter and said socket to prevent tampering therewith, said cover including an aperture aligned with said socket, wherein the forward transparent portion of said meter, when connected in said socket, extends through said aperture for allowing reading thereof;  
said socket including pivotal means for allowing rotation of said meter from its normal position fully connected to said socket to a second position in which some of said terminals are disconnected from said socket.

4,162,517

## TRIM ASSEMBLY FOR PANELBOARD

Ronald H. Reed, Versailles, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 17, 1977, Ser. No. 842,773

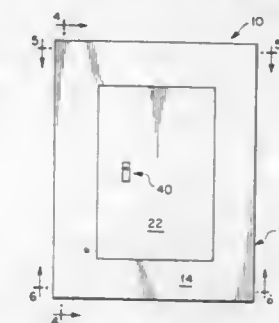
Int. Cl.<sup>2</sup> H02B 1/04

U.S. Cl. 361—358

7 Claims

1. A panelboard trim assembly comprising:  
a cabinet having an open end, said cabinet also having a perimeter;  
a cabinet cover having a perimeter overlapping said perimeter of said cabinet to cover said open end of said cabinet, said cover having an opening aligned with said cabinet open end providing access to said open end of said cabinet;  
means on said cover for clamping said cover to said cabinet, a door movably carried by said cover to close said cover opening in response to movement of said door to one position and uncover said cover opening in response to movement of said door to another position,  
a hopper carried by said cabinet and covered by said cabinet

cover, said hopper being accessible through said cover opening in response to the movement of said door to said other position,  
a pair of spaced rabbets projecting from said cover toward



said hopper in surrounding relationship to the perimeter of said cover opening,  
and a flange on said hopper projecting toward said cover in surrounding relationship to the perimeter of said cover opening and received intermediate said rabbets.

4,162,518

## ANODE BODY FOR SOLID ELECTROLYTIC CAPACITOR

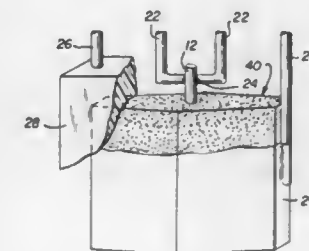
Horace E. Curlis, Jr., Anderson, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,722

Int. Cl.<sup>2</sup> H01G 9/00

U.S. Cl. 361—433

4 Claims



1. A slab shaped anode body of pressed anodizeable metal powder having side surfaces which are relatively narrow with respect to the length of the anode body measured between the side surfaces and having a substantially symmetrical elongate cross-section perpendicular to its shorter central axis, the length of said cross-section being substantially greater than the width of said cross-section, said width varying from a maximum at its center to a minimum at the relatively narrow sides of the anode body.

4,162,519

## DATA PROCESSOR WITH ADDRESS ALLOCATION TO OPERATIONS

Lorenz Hanewinkel, Paderborn, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 650,071, Jan. 19, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 844,885  
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1975, 2502005

Int. Cl.<sup>2</sup> G06F 3/00, 9/00

U.S. Cl. 364—200

11 Claims

1. A microprocessor, comprising, in combination, input means for receiving a sequence of instruction words all having the same number of instruction word bits, at least a first selected one of said instruction words having a number of operation code bits equal in number to said number of instruction word bits and no address bits, at least a second selected one of

1. A peripheral controller-processor for storing, controlling and monitoring the transfer of data between a central process-

1. In an electromagnetic induction means for the conversion of an input high frequency alternating current power source to an output low frequency alternating current power output, an alternating current power transformer means having an input, an output and a bypass variable permeance closed

magnetic path means and a first and a second permeance control section,

said output path means integral with said first control section and said input path means to form a first closed path,

said bypass means integral with said second control section and said input path means to form a second closed path,

an input winding means surrounding said input path means, means connecting a high frequency alternating current power source across said input winding means,

a low frequency alternating current reference signal source, an output winding means having a pair of end connector means and a central connecting means surrounding said output path means having induced therein a modulated envelope of said input high frequency alternating current input signal by said low frequency alternating current reference signal,

a fullwave controlled rectifier combination means connected to said pair of end connecting means to convert said modulated envelope into a low frequency alternating current power output determined by said low frequency reference signal,

a crossover signal generator means wherein the zero crossover point of said low frequency alternating current reference signal produces a crossover output signal,

means connecting said low frequency signal source to said crossover signal generator means,

an electronic switch means having a pair of alternately activated output signal means,

means connecting the output of said crossover signal generator means as the controlling inputs to said electronic switch means,

means connecting said outputs of said electronic switch means and said fullwave rectifier means to provide the phased commutation thereof,

an alternating current to direct current fullwave converter means having a first and a second output means,

a voltage comparator means including a voltage reference means and an internal and external voltage control means, said voltage comparator means generating a voltage error output signal,

a complementary control amplifier means,

a feedback means connected between the output of said fullwave controlled rectifier combination means and said converter means,

said first output means of said converter means connected to said internal and external voltage control means,

said second output means of said converter means connected as a first input to said complementary control amplifier means,

said low frequency reference signal source connected to said voltage reference means,

the output of said voltage comparator means connected as a second input to said complementary control amplifier means,

the complementary amplifier means energized by said error signal from said voltage comparator means for apportioning the control current between the said first and second permeance control sections to apportion the magnetic flux in the input path between the said output path and the said bypass path in response to the said error signal to stabilize and enable the control of said low frequency alternating current power output,

the apportioning of flux between the output and bypass paths enables said input high frequency power to be induced in said output winding in a modulated envelope defined by the low frequency reference signal.



**4,162,523**  
**STATIC CIRCUIT ARRANGEMENT FOR PRODUCTION OF 3-PHASE CURRENT OF VARIABLE FREQUENCY AND OUTPUT POWER**

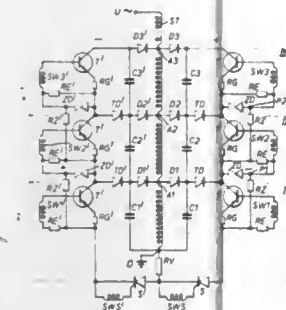
Werner Ansorge, Vogelbeerweg 3, 773 Villinger, Schwarzwald, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,641

Claims priority, application United Kingdom, Apr. 28, 1976, 17290/76

U.S. Cl. 363-43

Int. Cl.<sup>2</sup> H02M 7/00



1. A static circuit arrangement for the production of three-phase currents, comprising a plurality of waveform generating stages arranged in a series cascade, at least a first one of said stages comprising three waveform generating circuits connected in parallel; a respective current source for each said stage; and control means operable to render each one of said three circuits conductive in turn and connect the conductive circuit in series with the remainder of the cascade.

**4,162,524**  
**DC-DC CONVERTER**  
 Leonard E. Jansson, Banstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

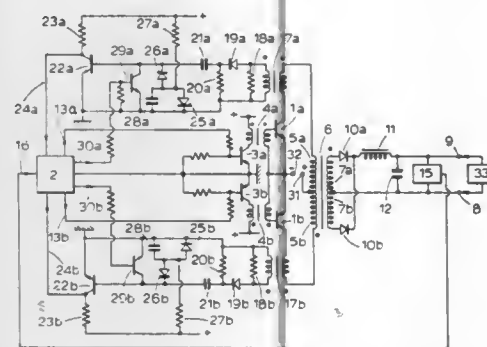
Filed Apr. 19, 1977, Ser. No. 788,799

Claims priority, application United Kingdom, Apr. 21, 1976, 16106/76

U.S. Cl. 363-56

Int. Cl.<sup>2</sup> H02M 3/335

12 Claims



1. A dc - dc converter comprising a switching transistor, a switching signal source having an output coupled to a control electrode of said transistor, an inductance connected in series combination with the main current path of said transistor across a DC supply source, means for coupling the inductance to a pair of output terminals via a rectifier with a polarity such that, when a load is present across said output terminals and the switching transistor is made to conduct, the rectifier will be forward biased, a current change sensing circuit having an input coupled to the main current path of said switching transistor for sensing if the increase in the current in said main current path occurring during a given part of said transistor conduction period reaches a given value, which part does not include the start of the corresponding conduction period, and

means coupling an output of said sensing circuit to the input of a current control circuit connected in circuit for controlling the switching transistor main current to prevent said current from exceeding the transistor rating if said given value is reached.

**4,162,525**  
**POWER SYSTEM HAVING AN INDUCTIVE CHARGE EFFECT LIMITING INVERTER**

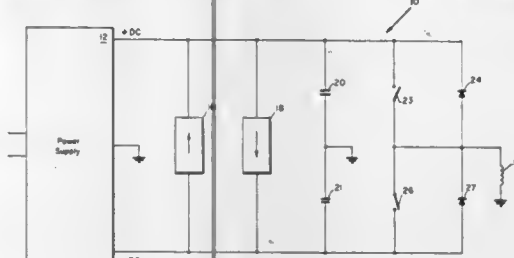
Herbert N. Epp, Palos Verdes Peninsula, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 30, 1977, Ser. No. 782,659

Int. Cl.<sup>2</sup> H02M 3/335

U.S. Cl. 363-71

4 Claims



1. A high efficiency power system having a power supply for providing pulse width modulated power to an inductive load from first and second power buses, each bus having a particular voltage, comprising:

first switch means coupling said power supply and said inductive load for providing pulse width modulated power having a first polarity to said load from said first power bus and for interrupting said power for preselected time periods;

first energy storage means coupled to said second power bus for storing energy from said inductive load having a second polarity during said periods of power interruption; first energy transfer means coupled between said first and second power buses for converting said energy stored in said energy storage means from said second polarity to said first polarity and for transferring said energy to said first power bus, said first energy transfer means having a transformer having first and second terminals coupled alternately to opposite ones of said first and second power buses so as to periodically reverse the coupling of said transformer across said buses for converting said second polarity energy to said first polarity energy; and first and second diodes coupled to said first and second terminals, respectively, and said first power bus, said diodes for alternately conducting energy from said first energy storage means whenever the absolute voltage of said second bus exceeds the absolute voltage of said first bus.

**4,162,526**  
**FAILSAFE PRIMARY POWER CONTROL APPARATUS FOR SYSTEMS USING COMPUTER CONTROLLED POWER SEQUENCING**

Albert E. Gass; Harry W. Gottshall, both of Poughkeepsie; Manfred O. Schaber, Hyde Park, and Lawrence Trombino, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,090

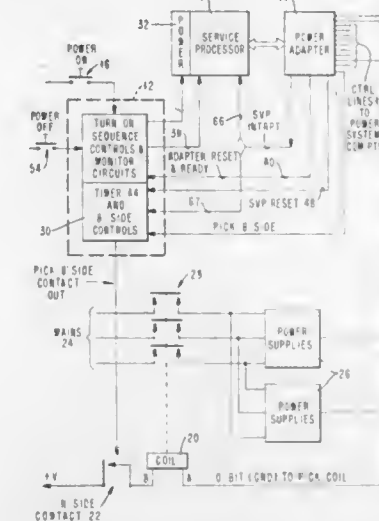
Int. Cl.<sup>2</sup> G06F 11/00

U.S. Cl. 364-200

8 Claims

1. A failsafe primary power control apparatus for systems using computer controlled power sequencing comprising: means for supplying fault signals from the power elements of the power system indicative of detected power faults;

means responsive to the fault signals from the power elements to provide an interrupt signal; processor means responsive to said interrupt signal for supplying an encoded signal when the processor is operable; decoder means responsive to said encoded signal to provide a decoded timer reset signal;



a timer having a preset time interval started in response to said interrupt signal and providing a power-off signal upon running a full time interval and responsive to said decoded timer reset signal for stopping the timer before running a full interval and resetting the timer to the beginning of the preset time interval; means responsive to said power-off signal for removing power from said power elements.

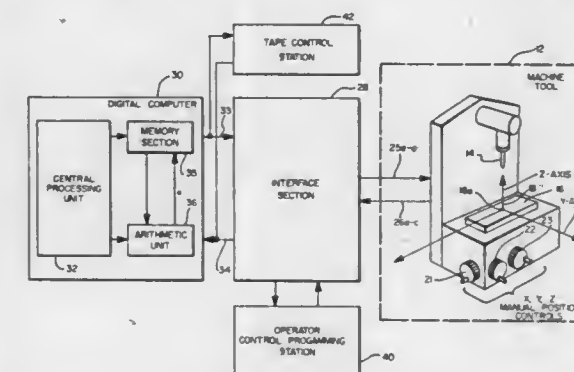
**4,162,527**  
**NUMERICALLY CONTROLLED MACHINE TOOL SYSTEM WITH PROGRAMMABLE TOOL OFFSET**  
 James C. Kilbane, Belmont, and Samuel M. Hamill, III, Scituate, both of Mass., assignors to Hamill Company, Inc., Norwell, Mass.

Filed Jul. 29, 1977, Ser. No. 820,230

Int. Cl.<sup>2</sup> G06F 15/46; G05B 19/24

U.S. Cl. 364-474

14 Claims



1. A machine tool system comprising a cutting element and workpiece positioning table, and control means for controlling the position of said cutting element with respect to said positioning table, said control means including:

A. means for storing an ordered succession of data sequences, each sequence including:  
 i. identification data representative of the relative position of said sequence in said ordered succession,

ii. coordinate data representative of an associated spatial point measured with respect to said positioning table,  
 iii. path data representative of a selected path type for said cutting element to approach said associated spatial point,  
 iv. offset data representative of an offset path which is parallel to and offset from a direct path of the selected type which intersects said associated spatial point, said offset data characterizing a magnitude and direction for the offset of said offset path,  
 v. sequence type data representative of the type of said sequence, said sequence being a start/stop type when said sequence is the first of a contiguous group of sequences in said succession, said contiguous group being terminated by the sequence immediately preceding the next start/stop type sequence, and said sequence being an intermediate type when said sequence is one of the other sequences in said contiguous group, wherein the associated spatial points of said group define a shape, said shape being a closed shape when the spatial points associated with the first and last sequences in said group are identical, and said shape being an open shape otherwise,

B. means for selecting one of said succession of sequences as a current sequence,

C. path determining means responsive to said selected sequence, said path determining means including means for determining a tool path to be followed by said cutting element for a current sequence, said tool path comprising a line segment extending from the current coordinates of said cutting element to a final point, wherein:

i. when said current sequence is a start/stop type, and  
 a. when the shape defined by said contiguous group is open, said final point is defined by the intersection of a next subsequent offset path and a straight line segment, said next subsequent sequence offset path being uniformly separated from a direct path of the type specified by the path data of the next subsequent sequence, said separation being in accordance with the offset data of said next subsequent sequence, and  
 said direct path intersecting the spatial points associated with the current sequence and next subsequent sequence in said succession, and  
 said straight line segment being perpendicular to said direct path at the spatial point associated with the current sequence, and

b. when the shape defined by said contiguous group is closed, said final point is defined by the intersection of a next subsequent sequence offset path and a last sequence offset path, said next subsequent sequence offset path being uniformly separated from a first direct path of the type specified by the path data of the next subsequent sequence, said separation being in accordance with the offset data of said next subsequent sequence, and  
 said first direct path intersecting the spatial points associated with the current and next subsequent sequences, and  
 said last sequence offset path being uniformly separated from a second direct path of the type specified by the path data of the last sequence in said contiguous group, said separation being in accordance with the offset data of said last sequence, and  
 said second direct path intersecting the spatial points associated with said last sequence and the sequence immediately preceding said last sequence, and

ii. when said current sequence and next subsequent sequence are intermediate types, and  
 said final point is defined by the intersection of a current sequence offset path and a next subsequent sequence offset path,

said current sequence offset path being uniformly separated from a first direct path of the type specified by said path data of said current sequence, said separation being in accordance with the offset data of said current sequence,

said first direct path intersecting the spatial points associated with the current sequence and next previous sequence, and

said next subsequent sequence offset path being uniformly separated from a second direct path of the type specified by said path data of said next subsequent sequence, said separation being in accordance with the offset data of said next subsequent sequence, said second direct path intersecting the spatial points associated with the current sequence and next subsequent sequence, and

iii. when said current sequence is an intermediate type and the next subsequent sequence is a start/stop type, and

a. when the shape defined by said contiguous group of said current sequence is open;

said final point is defined by the intersection of a current sequence offset path and a straight line segment,

said current sequence offset path being uniformly separated from a direct path of the type specified by the path data of said current sequence, said separation being in accordance with the offset data of said current sequence,

said direct path intersecting the spatial points associated with the current sequence and said next previous sequence,

said straight line being perpendicular to said direct path at the spatial point associated with said current sequence, and

b. when the shape defined by said contiguous group of said current sequence is closed:

said final point is defined by the intersection of a current sequence offset path and a first intermediate sequence offset path,

said current sequence offset path being uniformly separated from a first direct path of the type specified by the path data of said current sequence with said separation being in accordance with the offset data of said current sequence,

said first direct path intersecting the spatial points associated with the current sequence and next previous sequence,

said first intermediate sequence offset path being uniformly separated from a second direct path of the type specified by the path data of the first intermediate sequence of the contiguous group of said current sequence with said separation being in accordance with the offset data of said first intermediate data,

said second direct path intersecting the spatial points associated with the current sequence and said first intermediate sequence,

D. drive means responsive to said path determining means for a current sequence to control the relative motion of said cutting element along said determined tool path.

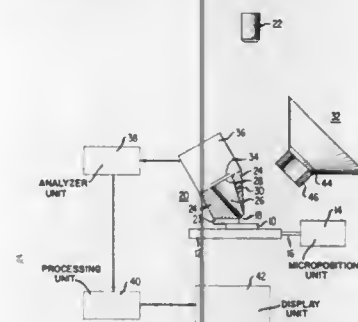
#### 4,162,528 X-RAY-FLUORESCENCE MEASUREMENT OF THIN FILM THICKNESSES

Juan R. Maldonado, Berkeley Heights, and Dan Maydan, Short Hills, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 863,466, Dec. 22, 1977, abandoned, which is a continuation of Ser. No. 687,462, May 18, 1976, abandoned. This application Mar. 31, 1978, Ser. No. 892,105

Int. Cl.<sup>2</sup> G06F 15/20; G01N 23/22  
U.S. Cl. 364—563

10 Claims



1. A method for simultaneously measuring in an x-ray-fluorescence system the thickness of two thin films made of A and B, respectively, deposited on top of each other on a substrate made of C, where A, B and C designate metals, said method comprising the steps of

calibrating said measuring system by

(A) irradiating with x-rays in said system known-thickness samples of an uncoated substrate of A, an uncoated substrate of B, an uncoated substrate of C, an uncoated layer of A, a layer of A on a substrate of C, a layer of A on a substrate of B, a layer of B on a substrate of C, and a layer of A on a layer of B on a substrate of C,

(B) and measuring the number of counts in specified line windows of each of said uncoated samples to provide reference counts of the fluorescence excited therein and also measuring the number of counts in specified line windows of said coated samples to provide reference counts of the fluorescence excited therein including reference counts representative of the per-unit attenuation of the coating layers on fluorescence excited in the underlying layer or substrate,

irradiating in said system an unknown-thickness A-on-B-on-C sample with x-rays to excite fluorescence in said unknown-thickness sample,

measuring the respective number of counts in respective selected line windows of the metals A, B and C of said unknown-thickness sample in response to said irradiation, and calculating the thicknesses of the A and B constituents of said unknown-thickness sample in accordance with interaction formulae that relate the reference counts obtained during said calibration step with the counts obtained during measurement of the unknown-thickness sample.

#### 4,162,529 INTERRUPTION CONTROL SYSTEM IN A MULTIPROCESSING SYSTEM

Seigo Suzuki, Yokohama, and Selji Eguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 747,191, Dec. 3, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,306

Claims priority, application Japan, Dec. 4, 1975, 50/144629  
Int. Cl.<sup>2</sup> G06F 9/18, 13/00

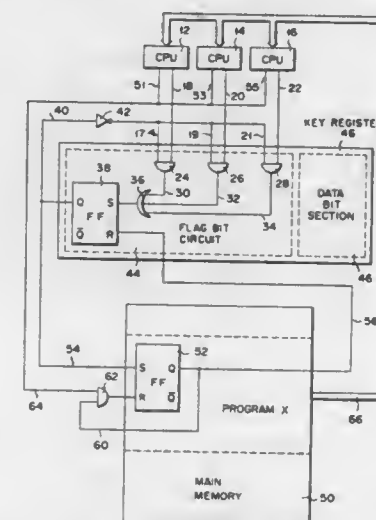
U.S. Cl. 364—200  
1. An entry requirement control system for a data processing system comprising:

a plurality of central processing units each including means for generating an entry requirement to read a program, means for executing the program and means for generating an END signal when execution of the program is completed;

a common main memory connected to each of said processing units and including a program to be accessed by the processing units;

a key register connected between said central processing units and said memory, said key register including a first flag bit circuit having a first set terminal, a first reset terminal, a first output terminal and a first flag bit wherein, upon receipt of an entry requirement from one of the processing units, said first flag bit circuit is set, a first output signal is generated and access to the program by the remaining processing units is inhibited;

a second flag bit circuit, having a second set terminal, a second reset terminal, a second output terminal and a



second flag bit, for receiving said first output signal from said first flag bit circuit to generate a second output signal and allowing access to the program by said one processing unit, wherein said second flag bit circuit is set in response to said first output signal from said first flag bit circuit to inhibit access to said program by said remaining processing units, and wherein said second output signal is applied to said first reset terminal of said first flag bit circuit;

first reset means for conducting said second output signal to said first reset terminal of the first flag bit circuit to reset the first flag bit circuit, said first reset means being provided between said first reset terminal of said first flag bit circuit and said second output terminal of the second flag bit circuit; and

second reset means for resetting the second flag bit circuit in response to a condition that said second output signal and said END signal coexist, said second reset means being provided between said central processing units and said second reset terminal of the second flag bit circuit.

#### 4,162,530 AUTOMATIC ENERGY SUPPLY SYSTEMS OF THE MULTI-RATE CALCULATING TYPE

Shoji Kusui, Tokyo, and Kazuo Kitagawa, Hiroshima, both of Japan, assignors to Nihon Vending Machine Co., Ltd., Hiroshima, Japan

Filed Dec. 16, 1977, Ser. No. 861,164  
Claims priority, application Japan, Dec. 21, 1976, 51-152942  
Int. Cl.<sup>2</sup> G01R 11/57, 11/24

U.S. Cl. 364—464  
1. An automatic energy supply system of the multi-rate calculating type for controlling an amount of energy supplied to a customer comprising:

a pulse generating integrating means coupled to an energy

source for integrating said amount of energy supplied to a customer and for generating an electric signal whenever a predetermined unit of said energy is supplied;

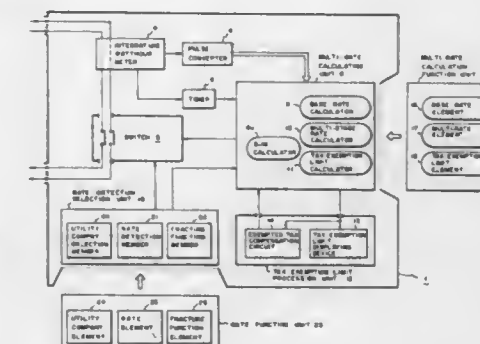
a pulse converter means for converting said electric signal into at least one pulse signal;

a timer means for generating a time signal corresponding to a predetermined rate calculating interval;

a switching means coupled to said energy source for switching said energy supplied to the customer on and off;

a multi-rate calculation function unit comprising a plurality of element means for providing energy rate parameters and tax parameters;

a rate function unit comprising a rate element means for providing money parameters which represent an amount of money corresponding to a predetermined amount of purchased energy;



a rate detection selection unit comprising a rate detection member means responsive to said money parameter provided by said rate element means, said rate detection member means being a means for producing a rate signal corresponding to said predetermined amount of purchased energy; and

a multi-rate calculating unit means coupled to said switching means and responsive to said time signal, to said at least one pulse signal, to said rate signal and to said energy rate and said tax rate parameters provided by said multi-rate calculation function unit, said multi-rate calculating unit means being a means for providing a sum signal to said switching means which causes said switching means to switch off when said amount of energy supplied to the customer corresponds to said predetermined amount of purchased energy and to said parameters regarding energy rates and tax.

#### 4,162,531 METHOD AND APPARATUS FOR PROGRAMMABLE AND REMOTE NUMERIC CONTROL AND CALIBRATION OF ELECTRONIC INSTRUMENTATION

France Rode, Los Altos; Peter Lindes, Palo Alto; Ralph F. Eschenbach, Los Altos, and Zvonko A. Fazarinc, Portola Valley, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 759,308, Jan. 14, 1977, Pat. No. 4,099,240.  
This application May 22, 1978, Ser. No. 908,032  
Int. Cl.<sup>2</sup> G06F 3/14; H01J 29/00

U.S. Cl. 364—571  
1. Electronic signal processing apparatus for processing analog signals comprising:

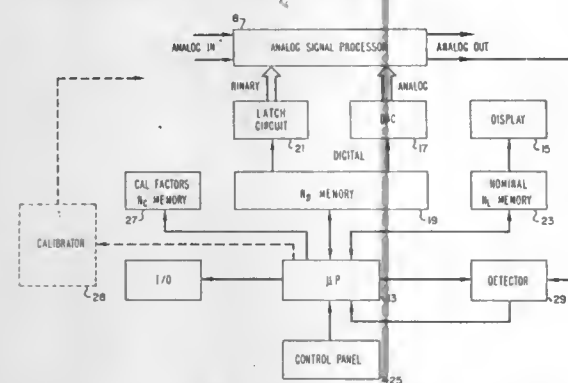
memory means for storing digital data representing control settings of analog operational functions performed by the apparatus, and for storing digital data representing calibration factors for calibrating said analog operational functions;

computing means coupled to the memory means for computing the numerical value of digital data representing operational control signals for controlling said analog opera-



tional functions as a mathematical function of corresponding control settings and calibration factors, and for storing the digital data representing said operational control signals in the memory means; and

a control panel coupled to the memory and computing means having first input means mounted thereon manually operable for causing the computing means to compute incremented and decremented values of the digital data representing the control settings of the analog operational functions performed by the apparatus;



control means coupled to the memory means and computing means for producing operational control signals in response to the digital data representing said operational control signals, and applying the operational control signals to the analog operational functions associated with each of the control settings and calibration factors for processing the analog signals; and

the control panel further including display means for displaying the incremented or decremented value of the control settings to the user.

4,162,532

#### PROGRAMMABLE CALCULATOR INCLUDING DATA FORMAT DISPLAY CONTROL MEANS

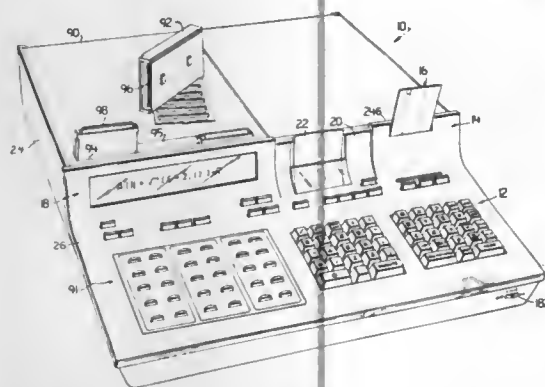
Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivor W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,222

Int. Cl.<sup>2</sup> G06K 15/18; G06F 3/14

U.S. Cl. 364—710

5 Claims



1. An electronic calculator comprising: keyboard input means including a plurality of alphabetic and numeric keys for entering at least one line of one or more alphabetic statements into the calculator, a display control key for entering a display statement into the calculator,

and an execute control key for initiating execution of a line of alphabetic statements entered into the calculator; memory means, coupled to said keyboard input means, for storing each line of alphabetic statements as it is being entered into the calculator from said keyboard input means and for storing a program comprising a plurality of lines of alphabetic statements entered into the calculator; said memory means including a plurality of data storage registers for storing data entered into the calculator; processing means, coupled to said keyboard input means and memory means, for selectively processing a single line of alphabetic statements entered into the calculator from said keyboard input means and a program previously stored in said memory means to perform selected functions and to compute the results of selected algebraic expressions; and

display means, coupled to said processing means, for providing a visual indication of each line of one or more alphabetic statements entered into the calculator and of the results of selected functions and algebraic expressions processed by said processing means;

said processing means being responsive to actuation of said execute control key following entry of a display statement that specifies selected alphabetic information to be displayed for causing said display means to visually display the alphabetic information specified in that display statement, said processing means being further responsive to a display statement encountered during processing of a program stored in said memory means for causing said display means to visually display the alphabetic information specified in that display statement.

4,162,533

#### TIME COMPRESSION CORRELATOR

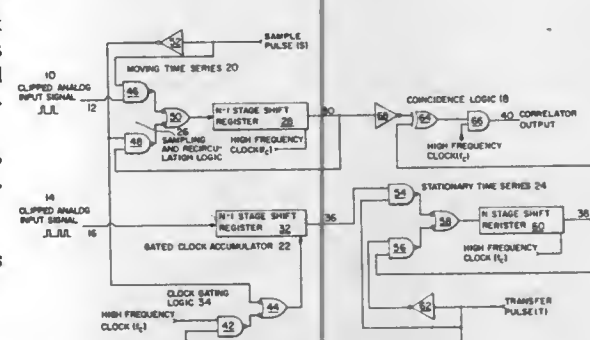
David P. Riccl, Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,324

Int. Cl.<sup>2</sup> G06F 15/34

U.S. Cl. 364—728

6 Claims



6. A correlator for the comparison of first and second clipped analog signals as a function of the time delay between them for use with an external source of timing pulses including high frequency clock pulses  $C$  having a frequency  $f_c$ , a waveform period of  $1/f_c$ , and a pulse width of  $1/f_c$ ; sample pulses  $S$  having a waveform period of  $N/f_c$ , and a pulse width of  $1/f_c$ , and transfer pulses having waveform period of  $N(N \times 1/f_c)$  and a pulse width of  $N/f_c$  comprising:

a first shift register having  $N-1$  stages, a clock input coupled to said external source of high frequency clock pulses, a data input port and a data output port; sampling and recirculation logic coupled to said external source of sample pulses, gating said first clipped analog signal into said data input port of said first shift register, and recirculating data from said output port of said first shift register back to said input port of said first shift register, whereby data at said output port of said first shift register is gated back to said input port of said first shift

register only when the complement of a sample pulse is present and whereby new data from said first clipped analog signal can appear at said data input port of said first shift register only in the presence of a sample pulse and whereby once said first shift register is filled with data, each succeeding data sample of said first clipped analog signal replaces the oldest of such data samples stored and whereby a high frequency  $N$ -bit replica of the accumulated data within said register is presented at said output of said first shift register during each sample period;

a second shift register having  $N-1$  stages, a clock input, a data input port, and a data output port coupled to said second clipped analog signal;

clock gating logic coupled to said external source of transfer pulses, sample pulses, and high frequency clock pulses, having an output coupled to said clock input of said second shift register whereby data is shifted in said second shift register on transitions of the high frequency clock in the presence of a transfer pulse or on transitions of the sample pulse when not in the presence of a transfer pulse and whereby an  $N$ -bit replica of data accumulated in said register is produced at said output port of said second shift register during every  $N$ th sample period;

a third shift register having  $N$  stages, a clock input coupled to said external source of high frequency clock pulses, a data input port and a data output port;

stationary time series recirculation logic coupled and responsive to said external source of transfer pulses and gating said output port of said second shift register to said input port of said third shift register and gating said output port of said third shift register back to said input port of said third shift register whereby data appearing at said output port of said third shift register will be a high frequency  $N$ -bit replica of data stored in said third shift register and transferred from said output of said second shift register; and

coincidence logic coupled to said outputs of said first shift register and said third shift register whereby the data at said respective outputs are compared bit by bit and whereby a correlator output is generated that is proportional to the degree of coincidence between said first and second clipped analog signals.

4,162,534

#### PARALLEL ALIGNMENT NETWORK FOR D-ORDERED VECTOR ELEMENTS

George H. Barnes, Wayne, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 29, 1977, Ser. No. 820,234

Int. Cl.<sup>2</sup> G06F 7/00

U.S. Cl. 364—900

5 Claims

1. A parallel data access alignment network for aligning data between  $N$  input ports and  $N$  output ports wherein  $N$  is an integer greater than one, said data comprising  $d$ -ordered vector data elements spaced  $d$  modulo  $N$  input ports apart, said network comprising:

a plurality of  $\log_2 N$  rounded up to the nearest integer of ordered levels serially connected between said  $N$  input and  $N$  output ports, each said ordered level including;

a plurality of  $N$  input channels for receiving in parallel data from the preceding ordered level in said plurality of ordered levels with said plurality of  $N$  input channels of the lowest ordered level receiving in parallel data from said  $N$  input ports,

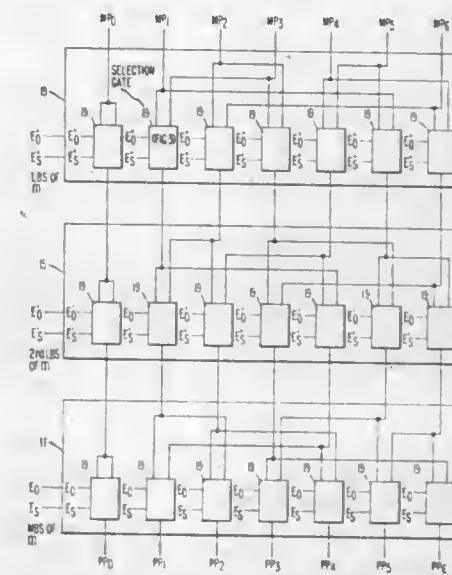
a plurality of  $N$  output channels for sending in parallel data to the succeeding level in said plurality of ordered levels with said plurality of  $N$  output channels of the highest ordered level sending in parallel data to said  $N$  output ports,

means for providing direct data flow between one input channel in said  $N$  input channels and one output channel to said  $N$  output channels, and

means responsive to a transposition control signal for providing selectively direct data flow and transposed data

flow between all other channels in said  $N$  input and  $N$  output channels, said transposed data flow provided being equal in number of channels transposed to  $k$  raised to the power 2 raised to the power  $(L-1)$  wherein  $k$  is relatively prime to  $N$  and is a primitive root of  $N$  and  $L$  is the order of the level in said plurality of ordered levels; and

transposition selection means for selecting levels in said plurality of ordered levels for transposed data flow, said transposition selection means providing said transposition control signal therefor generated from the relationship



$d = k^m$  modulo  $N$  wherein  $d$  is said  $d$ -ordered vector data element input port spacing,  $k$  is said prime relative to  $N$ ,  $N$  is said integer greater than one, and  $m$  is said transposition control signal expressed in binary form with said least significant bit of  $m$  provided to said lowest ordered level in said plurality of ordered levels, said increasingly significant bits of  $m$  provided individually and respectively to said increasing order of levels in said plurality thereof and said most significant bit of  $m$  provided to said highest ordered level in said plurality of ordered levels.

4,162,535

#### TRIANGULAR HIGH SPEED I/O SYSTEM FOR CONTENT ADDRESSABLE MEMORIES

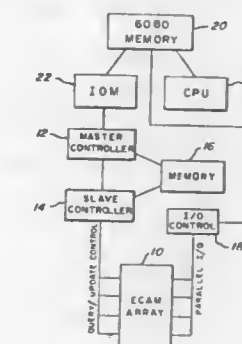
George A. Anderson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 12, 1977, Ser. No. 824,012

Int. Cl.<sup>2</sup> G06F 13/00; H04Q 3/52

U.S. Cl. 364—900

8 Claims

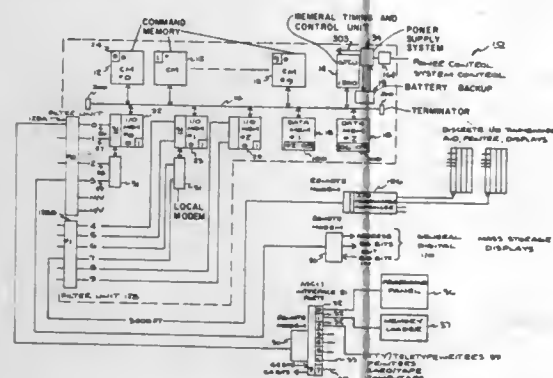


1. A switching matrix for simultaneously interconnecting a plurality of input/output communication lines wherein said

matrix is comprised of a plurality of logical switching circuits arranged in rows and columns, each of said circuits comprising a pair of data lines, one of which is an output line and the other of which is an input line, each of said lines passing therethrough and through each corresponding switching circuit in a given column, a pair of word lines, one of which is an output line and the other of which is an input line, each of said lines passing therethrough and through each corresponding switching circuit in a given column, a pair of logic lines passing through each circuit and through corresponding switching circuits of each row, a first pair of gating means responsive to a first control signal for selectively connecting a word output line to a data output line by way of a first logic line, a second pair of gating means responsive to a second control signal for selectively connecting a data input line to a word input line by way of a second logic line, and control logic signal means connected to said first pair of gating means for selectively generating said first control signal, said control logic signal means further including means connected to said second pair of gating means for selectively generating said second control signal, and means for selectively connecting input or output lines of a switching circuit in one row or column to input or output lines of a switching circuit in another row or column.

4,162,536

**DIGITAL INPUT/OUTPUT SYSTEM AND METHOD**  
Richard E. Morley, Mason, N.H., assignor to Gould Inc., Modicon Div., Rolling Meadows, Ill.  
Division of Ser. No. 646,412, Jan. 2, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,407  
Int. Cl.<sup>2</sup> H04L 1/14, 1/16, 1/18; G08C 25/02  
U.S. Cl. 364—900 59 Claims



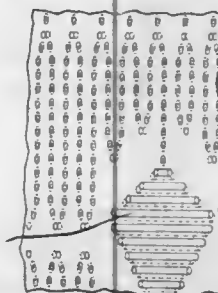
1. A method of sending selected output data from a local location to a remote location and sending selected input data from the remote location to the local location, comprising the steps of:

- (1) the local location selecting and sending output data to the remote location;
- (2) the remote location receiving and echoing back to the local location the output data sent in step 1;
- (3) the local location receiving and error-checking the echoed selected output data with that sent in step 1;
- (4) if an error is detected in step 3, returning to step 1;
- (5) if no error is detected in step 3, the local location generating and sending to the remote location a first signal indicating desired selected input data;
- (6) the remote location receiving and echoing the received first signal to the local location;
- (7) the remote location obtaining the desired selected input data;
- (8) the local location receiving the echoed first signal and error-checking it with the first signal sent in step 5;
- (9) if an error is detected in step 8, returning to step 5;
- (10) if no error is detected in step 8, assuming at the local

- location that a successful transfer of output data from the local location to the remote location has occurred;
- (11) the local location generating and sending a second signal to the remote location, the second signal requesting transferral of the input data obtained in step 7;
  - (12) the remote location receiving the second signal and sending to the local location the desired selected input data obtained in step 7;
  - (13) the local location receiving and storing the requested input data;
  - (14) the local location generating and sending a third signal requesting the transferral of the same input data requested in step 11 to the remote location;
  - (15) the remote location receiving the third signal and echoing back the desired selected input data to the local location;
  - (16) the local location receiving and storing the desired selected input data sent in step 15 and error-checking this data with that received in step 13;
  - (17) if an error is detected in step 16, the local location substituting the data received in step 16 for that received in step 13 and returning to step 14; and
  - (18) if no error is detected in step 16, the local location assuming a successful transfer of input data has occurred from the remote location to the local location and returning to step 1.

4,162,537

**MAGNETIC BUBBLE MEMORY**  
Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Jun. 12, 1978, Ser. No. 914,959  
Int. Cl.<sup>2</sup> G11C 19/08  
U.S. Cl. 365—19 8 Claims



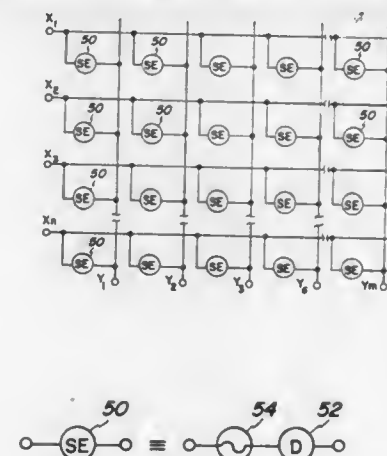
4. A propagate arrangement for moving magnetic bubbles along a path in a layer of magnetic material in which magnetic bubbles can be moved, said arrangement comprising first and second layers of electrically conducting material adjacent a surface of said layer of magnetic material, said first and second layers being separated by a layer of electrically insulating material, said first and second layers bearing first and second patterns of apertures respectively, said first and second patterns being offset with respect to one another for defining a path for bubbles in said layer of magnetic material.

4,162,538

**THIN FILM PROGRAMMABLE READ-ONLY MEMORY HAVING TRANSPOSABLE INPUT AND OUTPUT LINES**  
David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.  
Filed Jul. 27, 1977, Ser. No. 819,310  
Int. Cl.<sup>2</sup> G11C 17/00, 11/34  
U.S. Cl. 365—96 14 Claims

1. A Read only memory comprising:  
a matrix of first and second sets of conductors the cross-points of which are connected by non-crystalline semiconductor switches in series with a fuse, each of said switching devices having a symmetrical voltage-current (V-I)

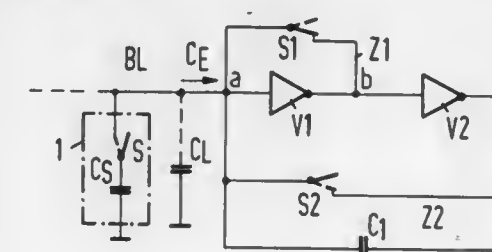
characteristic regardless of polarity state and comprises in either polarity state a non-linear high resistance state region and a negative differential low resistance state region, selected ones of said fuses being opened by driving their corresponding switches into said negative differential low resistance state region to provide a rapid rise of



current through said fuse whereby a plurality of data words are stored in said memory, and means for applying a signal of a predetermined magnitude to the input terminal of a preselected conductor of either said first or second set of conductors whereby a signal corresponding to a predetermined data word is provided at the output terminals of the other set of conductors.

4,162,539

**READ-OUT CIRCUIT FOR DIGITAL STORAGE ELEMENTS**  
Ernst Hebenstreit, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Jul. 3, 1978, Ser. No. 921,496  
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734137  
Int. Cl.<sup>2</sup> G11C 11/24  
U.S. Cl. 365—149 6 Claims



1. A read-out circuit for digital storage elements wherein a bit line is connected to a storage capacitor is connected to the input of a first inverting amplifier stage which has its output connected to the input of a second inverting amplifier stage, and wherein the first amplifier stage can be bridged with a first switch, and wherein the output of the second amplifier stage can be connected to the input of the first amplifier stage by way of a second switch, characterized in that the input (a) of the first amplifier stage (V1) and the output (c) of the second amplifier stage (V2) are connected to one another through a capacitor (C1).

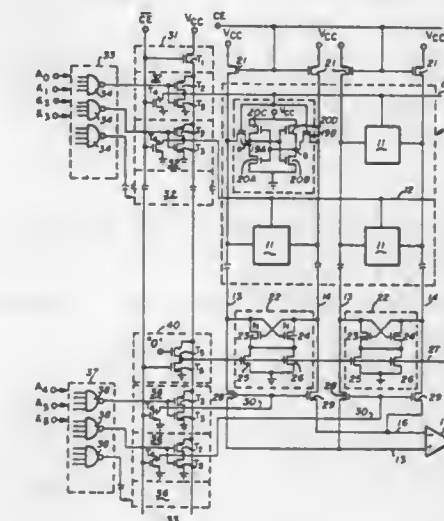
4,162,540

**CLOCKED MEMORY WITH DELAY ESTABLISHER BY DRIVE TRANSISTOR DESIGN**  
Hisashige Ando, Santa Clara, Calif., assignor to Fujitsu Limited, Japan

Filed Mar. 20, 1978, Ser. No. 887,954  
Int. Cl.<sup>2</sup> G11C 7/00, 7/06

U.S. Cl. 365—194

14 Claims



1. A clock memory formed on a semiconductor substrate comprising:

- a semiconductor substrate;
- a memory matrix having a plurality of memory cells arranged in rows and columns on the semiconductor substrate;
- a plurality of parallel word select lines in said memory matrix on the substrate with each of said word select lines connected to the memory cells in a common row;
- a plurality of parallel bit lines in said memory matrix on the substrate, said bit lines crossing said word select lines and each bit line connected to said memory cells in a common column;
- a row drive network having a plurality of row drive circuits connected to said word select lines for driving said word select lines, said row drive circuits each being (operated by) connected to a clock signal source with the output state of said row drive circuits being responsive to said clock signal and including a drive transistor of a predetermined channel length and channel width;
- a row address decoder connected to the row drive network for receiving address signals and generating control signals to said row drive circuits pursuant to the address signals;
- a plurality of column select lines on the substrate with each column select line being coupled to bit lines of a common column;
- a column drive network having a plurality of column drive circuits with each column drive circuit being connected to a column select line for driving said bit lines coupled to said column select line, said column drive circuits each being connected to said clock signal source with the output state of said column drive circuits being responsive to said clock signal;
- a column address decoder connected to the column drive network for receiving address signals and generating control signals to said column drive circuits pursuant to the address signals;
- a plurality of presense amplifiers connected to said bit lines for detecting signals from selected memory cell in the selected column, each of said presense amplifiers having a latch and gate transistor;
- a sense clock line on the substrate and parallel to said word



select lines, said sense clock being connected to each of said presense amplifiers; and  
 a presense drive circuit connected to said sense clock line for generating a sense clock signal over the sense clock line, the presense drive circuit being connected to said clock signal source and including a transistor formed in the substrate with controlled (charging) driving current capability dependent on the capacitive load of the sense clock line so as to delay the sense clock signal on the sense clock line to maintain constant time delay between the signals on the word select line and the sense clock line whereby the clock signal on the sense clock line is delayed and synchronized relative to the word select signal traveling on the word select line of the selected column.

4,162,541

# APPARATUS FOR OVERSCRIBING BINARY DATA OF A SELECTED POLARITY INTO A SEMICONDUCTOR STORE

David Hartke, Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 17, 1977, Ser. No. 769,596

Int. Cl.<sup>2</sup> G11C 5/02, 7/00, 8/00

U.S. Cl. 365—230

2 Claims

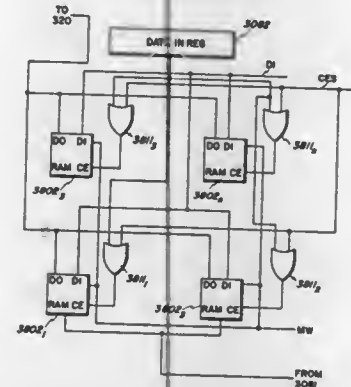
1. Apparatus for overscribing binary data of a selected polarity into a semiconductor store, comprising:

- a source of a data signal of a selected electrical polarity;
- a semiconductor store including an array of memory chips each enabled by a corresponding chip enable signal, each memory chip including a read/write terminal for selecting the direction of data transfer thereby and a data-in terminal connected to said source for receiving said data signal of said selected polarity;
- addressing means including signal generating means for

providing a write signal to said read/write terminals in lagging relationship relative to said chip enable signals for selecting storage locations for said data signal within said memory chips for write-in of the data signal at those selected locations;

means for generating a common logic signal;

a data register having stored therein a plurality of binary signals; and



a plurality of gates each connected to provide said chip enable signals to selected ones of said memory chips in response to receipt of one of said binary signals from said data register and said logic signal for enabling said memory chips to selectively store said data signal of said selected electrical polarity.

## DESIGN PATENTS

GRANTED JUL. 24, 1979

### ERRATA

For	See
CLASS	PATENT NO.
D14-070 .....	252,425
D21-052 .....	252,473
D48-002 .....	252,475

# DESIGNS

JULY 24, 1979

252,416  
CANDY

Roy K. Wills, Jr., Oxford, Ohio, assignor to International Leisure Activities, Inc.

Filed Oct. 7, 1977, Ser. No. 840,505

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—17



252,417  
CANDY

Roy K. Wills, Jr., Oxford, Ohio, assignor to International Leisure Activities, Inc.

Filed Oct. 7, 1977, Ser. No. 840,506

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—17



252,418  
CANDY

Roy K. Wills, Jr., Oxford, Ohio, assignor to International Leisure Activities, Inc.

Filed Oct. 7, 1977, Ser. No. 840,507

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—15



252,419  
CANDY

Roy K. Wills, Jr., Oxford, and Austin L. Hayward, Springfield, both of Ohio, assignors to International Leisure Activities, Inc.

Filed Oct. 11, 1977, Ser. No. 841,326

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—17



252,420

SOLE FOR A SHOE

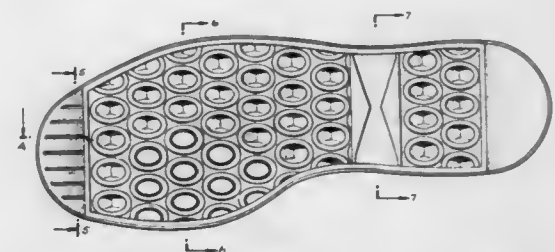
Paul E. Bowers, Terryville, Conn., and Dennis P. Dolinsky, Cincinnati, Ohio, assignors to Uniroyal, Inc.

Filed Jul. 27, 1977, Ser. No. 819,513

Term of patent 14 years

Int. Cl. D2—04

U.S. Cl. D2—320



252,421

PLATFORM SOLE FOR SHOES

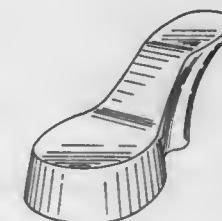
Wayne A. Meeter, 1128 E. 170th St., South Holland, Ill. 60473

Filed Oct. 4, 1977, Ser. No. 839,787

Term of patent 14 years

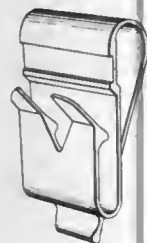
Int. Cl. D2—04

U.S. Cl. D2—322





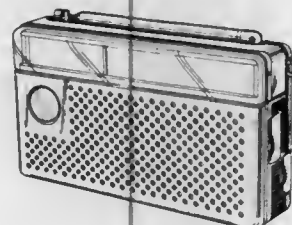
**252,422**  
**HOLDER FOR GOLF BALL MARKERS**  
 Eugene Gillenwater, 1745 Carson Ave., Dorval, Quebec, Canada  
 Filed Aug. 9, 1977, Ser. No. 823,206  
 Term of patent 14 years  
 Int. Cl. D2-07; D19-65  
 U.S. Cl. D2-400



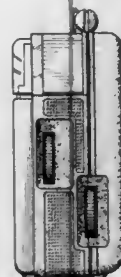
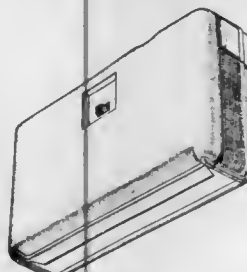
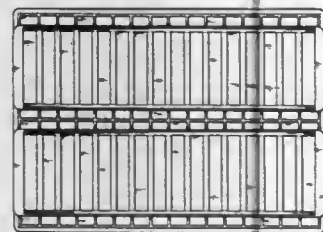
**252,424**  
**RECORDING TAPE CARTRIDGE TRAY**  
 Leslie Bokor, New York, N.Y., assignor to Le-Bo Products Company, Inc., Maspeth, N.Y.  
 Filed Jul. 28, 1977, Ser. No. 820,018  
 Term of patent 14 years  
 Int. Cl. D3-02  
 U.S. Cl. D3-35



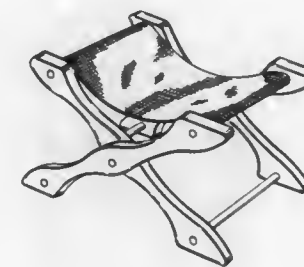
**252,425**  
**PORTABLE RADIO RECEIVER**  
 Masanori Hamada, Yao; Kunio Hoshino, Kadoma, and Kikuo Ohta, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan  
 Filed Nov. 10, 1976, Ser. No. 740,590  
 Claims priority, application Japan, May 11, 1976, 51-17522  
 Term of patent 14 years  
 Int. Cl. D14-03  
 U.S. Cl. D14-70



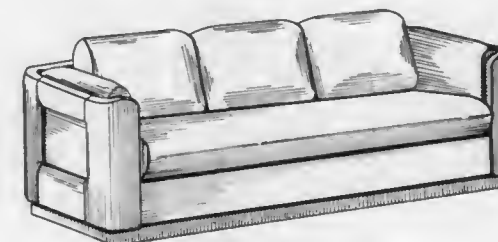
**252,423**  
**COMBINED RECORDING TAPE CARTRIDGE AND CASSETTE TRAY**  
 Leslie Bokor, New York, N.Y., assignor to Le-Bo Products Company, Inc., Maspeth, N.Y.  
 Filed Jul. 28, 1977, Ser. No. 820,017  
 Term of patent 14 years  
 Int. Cl. D3-02  
 U.S. Cl. D3-35



**252,426**  
**FOOTSTOOL**  
 Don A. Brelsford, Box 1172, Telluride, Colo. 81435  
 Filed Sep. 14, 1977, Ser. No. 833,228  
 Term of patent 14 years  
 Int. Cl. D6-01  
 U.S. Cl. D6-34



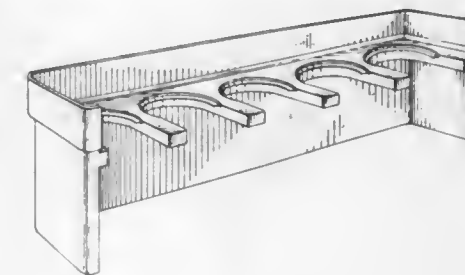
**252,427**  
**SEAT**  
 Lester Beall, High Point, N.C., assignor to Trend Line Furniture Corporation, Hickory, N.C.  
 Filed Sep. 1, 1977, Ser. No. 829,994  
 Term of patent 14 years  
 Int. Cl. D6-01  
 U.S. Cl. D6-63



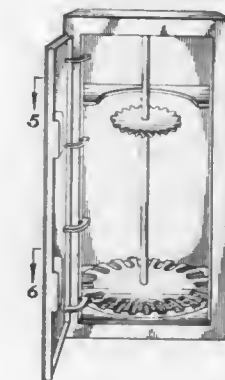
**252,428**  
**CHAIR**  
 Don A. Brelsford, Box 1172, Telluride, Colo. 81435  
 Filed Sep. 14, 1977, Ser. No. 833,400  
 Term of patent 14 years  
 Int. Cl. D6-01  
 U.S. Cl. D6-68



**252,429**  
**RACK FOR SPICE CONTAINERS**  
 Andre Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada  
 Filed Apr. 20, 1978, Ser. No. 898,506  
 Term of patent 14 years  
 Int. Cl. D6-04  
 U.S. Cl. D6-125



**252,430**  
**GUN CABINET**  
 Ervin C. Oakley; George R. Bell, and William E. Poole, all of Winston Salem, N.C., assignors to ECO Industries, Inc.  
 Filed May 20, 1977, Ser. No. 798,912  
 Term of patent 14 years  
 Int. Cl. D6-04  
 U.S. Cl. D6-167



**252,431**  
**TABLE**  
 Murray C. Pfister, San Francisco, Calif., assignor to Knoll International, Inc., Greenwich, Conn.  
 Filed Apr. 6, 1977, Ser. No. 785,088  
 Term of patent 14 years  
 Int. Cl. D6-03  
 U.S. Cl. D6-177

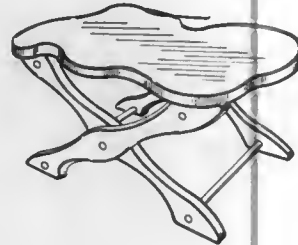


252,432

## COFFEE TABLE

Don A. Brelsford, Box 1172, Telluride, Colo. 81435  
 Filed Sep. 14, 1977, Ser. No. 833,383  
 Term of patent 14 years  
 Int. Cl. D6—03

U.S. Cl. D6—177

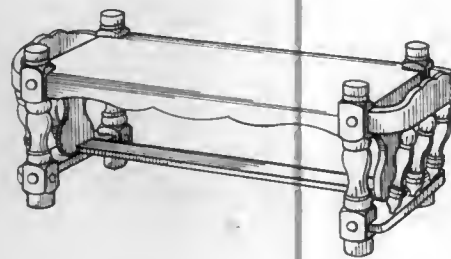


252,433

## TABLE

Lester Beall, Jr., High Point, N.C., assignor to Trend Line Furniture Corporation, Hickory, N.C.  
 Filed Sep. 1, 1977, Ser. No. 831,637  
 Term of patent 14 years  
 Int. Cl. D6—03

U.S. Cl. D6—179

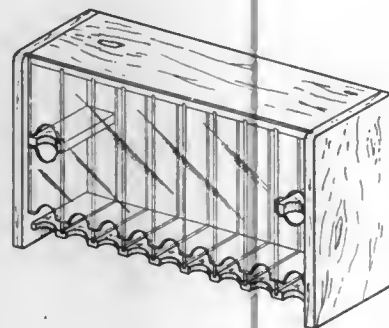


252,434

## COMBINED DISPENSING AND DISPLAY CASE

Douglas Wright, Rte. 3, Box 363C, Greeneville, Tenn. 37743  
 Filed May 26, 1978, Ser. No. 909,814  
 Term of patent 14 years  
 Int. Cl. D20—02; D6—04

U.S. Cl. D6—189



252,435

## MULTI-COMPARTMENTED STORAGE RACK FOR SUNDRIES

Howard Sussman, c/o Crackerbarrel Marketing Inc., East Shore Rd., Huntington, N.Y. 11743  
 Filed May 16, 1977, Ser. No. 797,586  
 Term of patent 14 years  
 Int. Cl. D6—04

U.S. Cl. D6—189

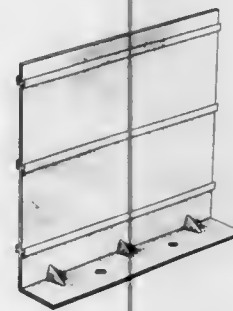


252,436

## SIDE SUPPORT PANEL FOR PULL-OUT DRAWER UNITS

Clayton A. Elliott, 1931 Arbor La., Union, N.J. 07083  
 Division of Ser. No. 740,773, Nov. 11, 1976. This application  
 Jun. 19, 1978, Ser. No. 916,709  
 Term of patent 14 years  
 Int. Cl. D6—06

U.S. Cl. D6—191



252,437

## FOLDABLE MIRROR

Elihu Cohen, New York, N.Y., assignor to Triña, Inc., Fall River, Mass.  
 Filed Jul. 18, 1977, Ser. No. 817,025  
 Term of patent 14 years  
 Int. Cl. D6—07

U.S. Cl. D6—237

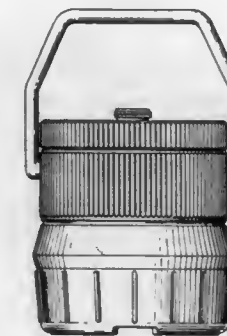


252,438

## PICNIC JUG OR SIMILAR ARTICLE

John P. Cannon, Overland Park, Kans., assignor to Plattner Industries, Inc., Ottawa, Kans.  
 Filed Apr. 22, 1977, Ser. No. 790,068  
 Term of patent 14 years  
 Int. Cl. D07—01

U.S. Cl. D7—177



252,439

## PAIL HANGER

James A. Smith, 9401 Bennie La., Ooltewah, Tenn. 37363  
 Filed Sep. 14, 1977, Ser. No. 833,381  
 Term of patent 14 years  
 Int. Cl. D7—05; D6—06

U.S. Cl. D7—187



252,441

## PEDESTAL TYPE GARBAGE CAN HOLDER

Johnny G. Allen, 603 Cedar Ave., Albany, Ga. 31701  
 Division of Ser. No. 759,293, Jan. 13, 1977, Pat. No. Des. 248,364. This application Feb. 14, 1978, Ser. No. 877,781  
 Term of patent 14 years  
 Int. Cl. D7—07

U.S. Cl. D7—189

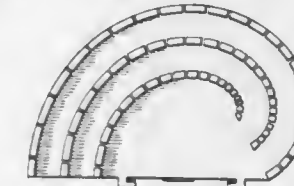


252,442

## O-RING FIXTURE

A. Peter Draffone, Lombard, Ill., assignor to B. W. Darrah, Inc., Carol Stream, Ill.  
 Filed Sep. 22, 1976, Ser. No. 725,651  
 Term of patent 14 years  
 Int. Cl. D8—99

U.S. Cl. D8—71



252,443

## SUN UMBRELLA HOLDER

Joseph P. De Giorgis, 9040 El Cajon Way, #3, Sacramento, Calif. 95826  
 Filed Apr. 26, 1976, Ser. No. 679,997  
 Term of patent 14 years  
 Int. Cl. D8—99

U.S. Cl. D8—373

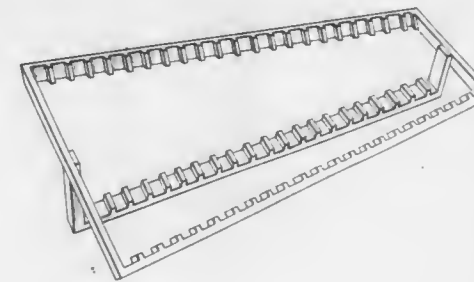


252,440

## COOKING POT TOP AND LID ORGANIZER

William P. Hamilton, 27800 Emery Rd., Cleveland, Ohio 44128  
 Filed Oct. 13, 1977, Ser. No. 841,877  
 Term of patent 14 years  
 Int. Cl. D7—05; D6—04

U.S. Cl. D7—188





252,444  
BOTTLE

Albert H. Torongo, Jr., Yardley, Pa., assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Filed Mar. 14, 1977, Ser. No. 777,199  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-116

252,445  
BOTTLE

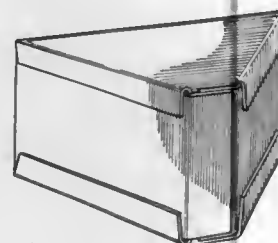
David A. Rhodes, Absecon, N.J., assignor to Carson Products Company, Savannah, Ga.  
Filed May 6, 1977, Ser. No. 794,635  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-141

252,446  
DISPENSING CARTON

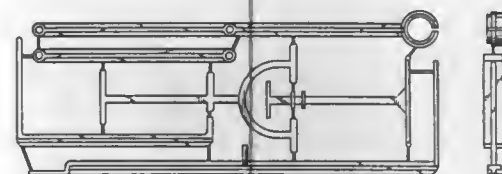
David K. Traugott, Diamond Bar, Calif., assignor to Kimberly-Clark Corporation  
Filed Aug. 20, 1976, Ser. No. 716,294  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-171

252,447  
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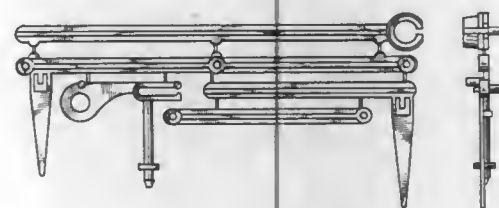
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Company, Skokie, Ill.  
Filed Apr. 25, 1977, Ser. No. 790,746  
Term of patent 14 years  
Int. Cl. D9-99

U.S. Cl. D9-193

252,448  
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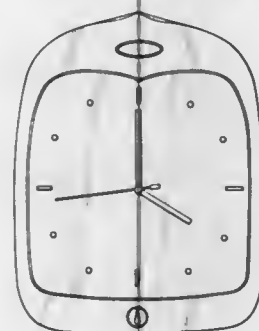
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Company, Skokie, Ill.  
Filed Apr. 25, 1977, Ser. No. 790,747  
Term of patent 14 years  
Int. Cl. D9-99

U.S. Cl. D9-193

252,449  
CLOCK

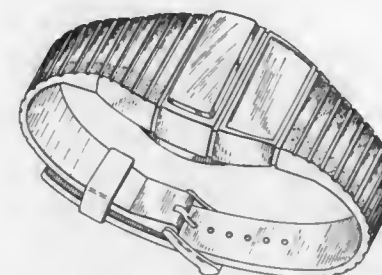
Merritt J. Nelson, 857 Indian Lake Rd., Sparta, Mich. 49345  
Filed Nov. 3, 1975, Ser. No. 627,942  
Term of patent 14 years  
Int. Cl. D10-01

U.S. Cl. D10-12

252,450  
WRIST WATCH

Eugene J. Sulek, Plano, and Clarence D. Zierhut, Richardson, both of Tex., assignors to Texas Instruments Incorporated  
Filed Jun. 1, 1977, Ser. No. 802,408  
Term of patent 14 years  
Int. Cl. D10-02

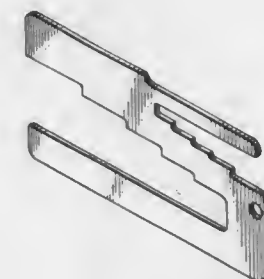
U.S. Cl. D10-32



## 252,451

CHAIN WEAR INSPECTION GAUGE  
Edward R. Behnke, Lockport, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.  
Filed Jan. 13, 1978, Ser. No. 869,114  
Term of patent 14 years  
Int. Cl. D10-04

U.S. Cl. D10-64



## 252,452

TENNIS CHARM PENDANT OR SIMILAR ARTICLE  
Andrew A. Fermahin, P.O. Box 27885, Honolulu, Hi. 96827  
Continuation-in-part of Ser. No. 766,361, Feb. 7, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,839  
Term of patent 14 years  
Int. Cl. D11-01

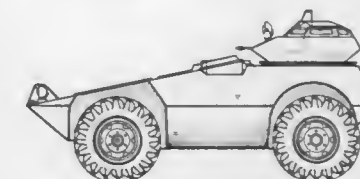
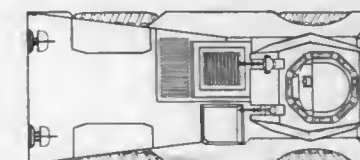
U.S. Cl. D11-81



## 252,453

COMBINED ARMORED VEHICLE AND TURRET  
Irving Appelblatt, West Bloomfield, and Theodore A. Jackson, Utica, both of Mich., assignors to Cadillac Gage Company  
Filed Mar. 14, 1977, Ser. No. 777,172  
Term of patent 14 years  
Int. Cl. D12-13

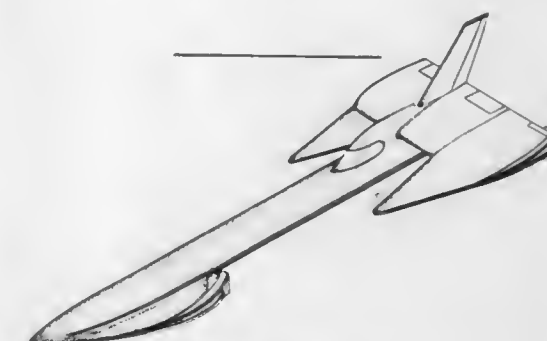
U.S. Cl. D12-12



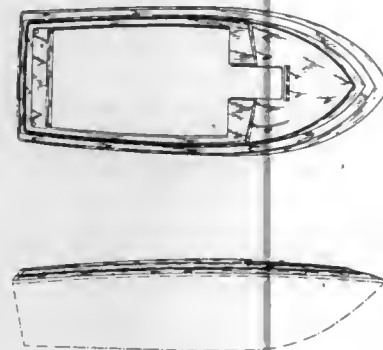
## 252,454

HIGH PERFORMANCE WATER VEHICLE  
Arthur L. Williams, 11301 Yolanda Ave., Los Angeles, Calif. 91324  
Filed Mar. 1, 1977, Ser. No. 773,316  
Term of patent 14 years  
Int. Cl. D12-06

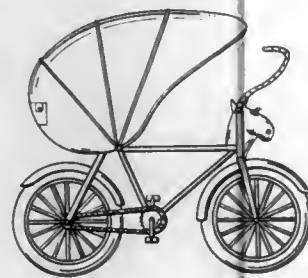
U.S. Cl. D12-66



**252,455**  
**BOAT DECK**  
 John K. Adams, P.O. Box 5370 West Village, Aspen, Colo. 81615  
 Filed Apr. 7, 1977, Ser. No. 785,491  
 Term of patent 14 years  
 Int. Cl. D12-06  
 U.S. Cl. D12-70



**252,456**  
**BICYCLE**  
 Esther M. Phillips, 1336 Straight Path, Wyandanch, L. I., N.Y. 11798  
 Filed May 9, 1977, Ser. No. 794,791  
 Term of patent 14 years  
 Int. Cl. D12-11  
 U.S. Cl. D12-108



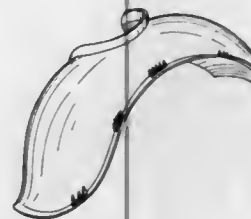
**252,457**  
**STEERING-WHEEL RIM, FOR MOTORCARS AND WATERCRAFT**  
 Giovanni Conterno, Vedano Olona, Italy, assignor to Personal S.p.A., Abbiate Guazzone, Italy  
 Filed Jun. 29, 1977, Ser. No. 811,179  
 Term of patent 14 years  
 Int. Cl. D12-16  
 U.S. Cl. D12-176



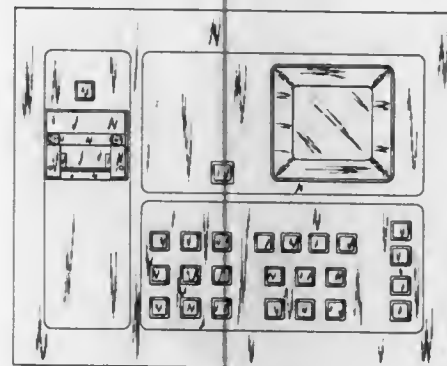
**252,458**  
**VEHICULAR INNER PROTECTIVE MUDGUARD**  
 Leo Laine, Polttimonkatu 10, SF-26130 Rauma 13, Finland  
 Filed May 27, 1977, Ser. No. 801,051  
 Claims priority, application Finland, Feb. 24, 1977, 77126  
 Term of patent 14 years  
 Int. Cl. D12-16  
 U.S. Cl. D12-184



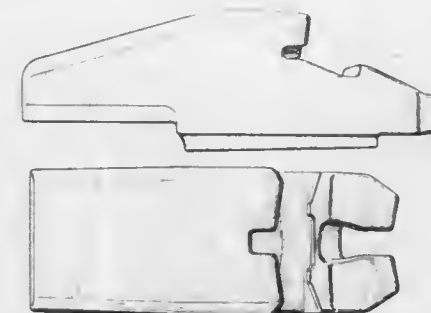
**252,459**  
**VEHICULAR INNER PROTECTIVE MUDGUARD**  
 Leo Laine, Polttimonkatu 10, SF-26130 Rauma 13, Finland  
 Filed May 27, 1977, Ser. No. 801,157  
 Claims priority, application Finland, Feb. 24, 1977, 77125  
 Term of patent 14 years  
 Int. Cl. D12-16  
 U.S. Cl. D12-184



**252,460**  
**CONTROL PANEL FOR A FIRE CONTROL COMBAT SIMULATOR**  
 Carmelo P. Millia, Troy, and Richard L. Gray, Fraser, both of Mich., assignors to Chrysler Corporation  
 Filed Apr. 11, 1977, Ser. No. 786,733  
 Term of patent 7 years  
 Int. Cl. D14-02  
 U.S. Cl. D14-40



**252,461**  
**TOOTH ADAPTOR FOR EXCAVATING EQUIPMENT**  
 Jouko K. Korpi, Degerfors, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden  
 Filed Sep. 1, 1977, Ser. No. 829,840  
 Claims priority, application Sweden, Mar. 8, 1977, 770544  
 Term of patent 14 years  
 Int. Cl. D15-04  
 U.S. Cl. D15-28



**252,462**  
**ROLL BAR SAFETY FRAME FOR A TRACTOR**  
 Malcolm White, Long Marston, nr. York, England, assignor to Susan Beck White, Tadcaster, England  
 Filed Nov. 4, 1977, Ser. No. 831,337  
 Claims priority, application United Kingdom, May 10, 1977, 980003/77  
 Term of patent 14 years  
 Int. Cl. D15-03  
 U.S. Cl. D15-28



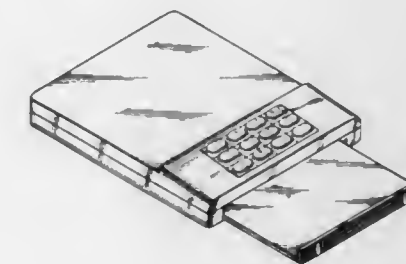
**252,463**  
**EXTENSIBLE STABILIZER FOR ATTACHMENT TO A BASS DRUM LUG WING NUT AND DRUMMER'S STOOL LEG OR THE LIKE**  
 Joseph G. Cocuzzo, 84 D Marion Pepe Dr., Lodi, N.J. 07644  
 Filed Mar. 28, 1977, Ser. No. 781,735  
 Term of patent 14 years  
 Int. Cl. D17-99, 04  
 U.S. Cl. D17-22



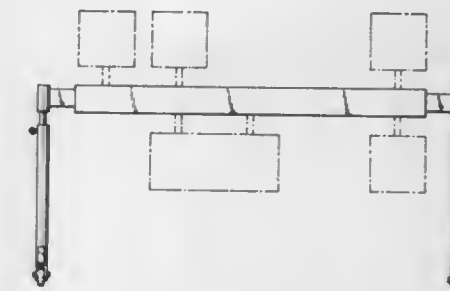
**252,464**  
**FOUNTAIN PEN NIB**  
 Elmer D. Thompson, Janesville, and Martin E. Wacha, Beloit, both of Wis., assignors to The Parker Pen Company, Janesville, Wis.  
 Filed Dec. 5, 1977, Ser. No. 857,871  
 Term of patent 14 years  
 Int. Cl. D19-06  
 U.S. Cl. D19-55



**252,465**  
**TELEPHONE INDEX**  
 Hans Halm, Herne, Fed. Rep. of Germany, assignor to Niveau AG, Basel, Switzerland  
 Filed Nov. 2, 1977, Ser. No. 847,745  
 Claims priority, application Switzerland, Jun. 16, 1977, 50/77  
 Term of patent 14 years  
 Int. Cl. D19-02  
 U.S. Cl. D19-76



**252,466**  
**DISPLAY BAR FOR REMOVABLY HOLDING STEMMED PLACARDS**  
 William Tidwell, New York, N.Y., assignor to SCM Corporation, New York, N.Y.  
 Filed Nov. 14, 1977, Ser. No. 850,958  
 Term of patent 14 years  
 Int. Cl. D20-03  
 U.S. Cl. D20-41





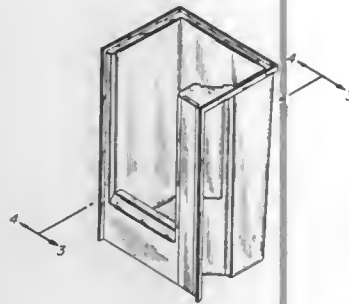
252,467  
COMBINED SHOWER STALL AND HYDROTHERAPY  
BATHTUB

Roy A. Jacuzzi, Moraga, and Ralph D'Innocente, Pleasant Hill,  
both of Calif., assignors to Jacuzzi Whirlpool Bath, Inc.,  
Walnut Creek, Calif.

Filed Dec. 7, 1977, Ser. No. 858,467  
Term of patent 14 years

Int. Cl. D23—02

U.S. Cl. D23—49



252,469  
CABINET FOR DENTAL UNIT

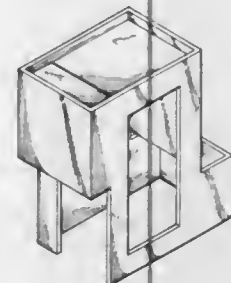
Robert L. Mallory, and Sheila A. Mallory, both of 3160A N.  
Truckee La., Sparks, Nev. 89431

Filed Aug. 8, 1977, Ser. No. 822,621

Term of patent 14 years

Int. Cl. D24—01

U.S. Cl. D24—4



252,468  
REFRIGERATION UNIT FOR TRUCKS

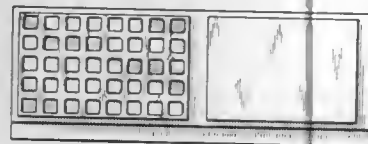
Ronald W. Seipp, Apple Valley, Minn., assignor to Thermo King  
Corporation, Minneapolis, Minn.

Filed Dec. 30, 1976, Ser. No. 755,770

Term of patent 14 years

Int. Cl. D23—04

U.S. Cl. D23—142



252,470  
URINARY CATHETER ADAPTER HAVING A FILTERED  
AIR VENT, OR THE LIKE

Kenneth E. Pawlak, Mundelein, Ill., assignor to Abbott Labora-  
tories, North Chicago, Ill.

Filed Jul. 22, 1977, Ser. No. 818,024

Term of patent 14 years

Int. Cl. D24—02

U.S. Cl. D24—54



252,471  
PERIPHERAL FRAME MEMBER FOR USE IN A MOTOR  
VEHICLE

Edward G. Broadbent, 91, Park La., Sandbach, Cheshire, En-  
gland (CW119EE)

Filed Jan. 6, 1978, Ser. No. 867,414

Claims priority, application United Kingdom, Dec. 3, 1977, U.S. Cl. D21—52  
982482/77

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—74



252,472  
DRYER

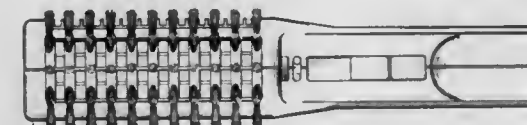
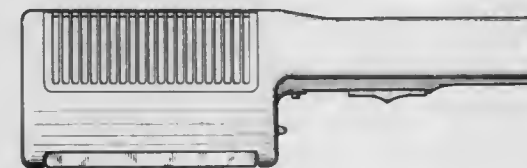
John Wistrand, 74 Journey's End Rd., New Canaan, Conn.  
06018

Filed Apr. 21, 1977, Ser. No. 789,379

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D28—13



252,473  
CHESS PIECES

John W. Brown, 1847 W. Estes Ave., Chicago, Ill. 60626

Filed Aug. 9, 1976, Ser. No. 712,725

Term of patent 14 years

Int. Cl. D21—01



252,474  
COMBINED BANK AND PHOTOGRAPH HOLDER

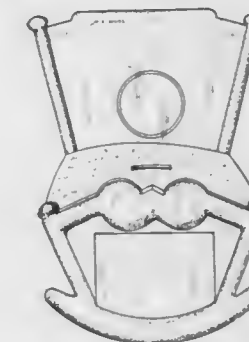
Herbert J. Abrams, 3675 N. Country Club Dr., North Miami  
Beach, Fla. 33180

Filed Sep. 17, 1976, Ser. No. 724,480

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D99—36



252,475  
FLOATING WICK FLICKER LAMP

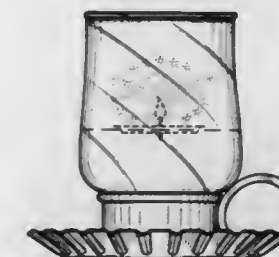
George A. Schwebel, Lancaster, Pa., assignor to Susquehanna  
Broadcasting Co., York, Pa.

Filed Oct. 27, 1977, Ser. No. 846,272

Term of patent 14 years

Int. Cl. D26—01

U.S. Cl. D48—2



# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. R. Nelson Co., Inc.: See—  
Weiss, Kenneth; and Fieder, Martin, 4,161,853, Cl. 52-288.000.
- AAI Corporation: See—  
Jones, Robert E., Jr., 4,162,492, Cl. 340-723.000.
- AB Bofors: See—  
Bjornson, Bjorn O., 4,162,053, Cl. 244-3.270.
- Abbott, Jerry J.; Bernardelli, William J.; Thompson, John A.; and Caudill, Allison H., to International Business Machines Corporation. Electrophotographic developer with carrier overflow control. 4,161,923, Cl. 118-658.000.
- Abbott Laboratories: See—  
Nara, Takashi; Okachi, Ryo; Kawamoto, Isao; Sato, Tomoyasu; and Oka, Tetsuo, 4,162,305, Cl. 424-120.000.
- Abe, Takeshi; Tsuchiya, Keishin; Saito, Kazuhiro; Mizuta, Toshiaki; and Yoshihara, Ichiro, to Ricoh Co., Ltd. Data collection system. 4,162,484, Cl. 340-150.000.
- Abels, Theodor; and Gotz, Bernhard, to Linde Aktiengesellschaft. Vehicle with internal-combustion engine. 4,161,992, Cl. 180-306.000.
- ACF Industries, Incorporated: See—  
Behle, Gunter R., 4,161,958, Cl. 137-316.000.
- Achelpohl, Fritz; Tetenborg, Konrad; and Feldkamper, Richard, to Windmoller & Holscher. Apparatus for unreeling valved sacks which are reeled in overlapping formation. 4,162,025, Cl. 221-72.000.
- Acheson, Richard M.; Cox, Ian R.; Stubbs, John K.; and Penrose, Alexander B., to Pfizer Inc. Acaricidal agents. 4,162,253, Cl. 260-306.70T.
- Acres, Gary J. K.; Cooper, Barry J.; and Harrison, Brian, to Johnson, Matthey & Co., Limited. Catalysts. 4,162,235, Cl. 252-462.000.
- Acro, Inc.: See—  
Robinson, Mark L., 4,161,813, Cl. 29-460.000.
- Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake booster. 4,161,867, Cl. 60-547.00A.
- Adrian, Renate; von Schenck, Raban; Somme, Klaus; and Weber, Hermann, to Hoechst Aktiengesellschaft. Production of Maddrell salt. 4,162,300, Cl. 423-314.000.
- Advance Achievement Systems, Inc.: See—  
Naffziger, Dewein H., 4,162,156, Cl. 75-12.000.
- Advanced Metals Research Corp.: See—  
Baumgarten, Neil H., 4,162,403, Cl. 250-396.0ML.
- Aerojet-General Corporation: See—  
Qasim, Javed, 4,162,057, Cl. 251-168.000.
- Agency of Industrial Science & Technology: See—  
Gonda, Shunichi, 4,162,460, Cl. 331-94.50H.
- Hamasaki, Masanobu, 4,162,383, Cl. 219-68.000.
- Air Products and Chemicals, Inc.: See—  
Spector, Marshall L., 4,162,153, Cl. 71-12.000.
- Aisin Seiki Co., Ltd.: See—  
Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, 4,161,919, Cl. 112-275.000.
- Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, 4,161,920, Cl. 112-275.000.
- Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, 4,161,921, Cl. 112-275.000.
- Aisin Seiki Kabushiki Kaisha: See—  
Adachi, Yoshiharu, 4,161,867, Cl. 60-547.00A.
- Kamiyama, Shuichi, 4,161,866, Cl. 60-517.000.
- Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor switch. 4,162,413, Cl. 307-253.000.
- Aktiebolaget Kalle-Regulatorer: See—  
Solyom, Peter; Boman, Bengt; and Bjornstal, Hakan, 4,162,195, Cl. 43-310.000.
- Aktiebolaget SKF: See—  
Hallerback, Stig L.; and Lachonius, Leif, 4,162,039, Cl. 239-214.250.
- Aladjem, Frederick J.; and Ayenger, Padmasini K. Quantitative protein analysis by immunodiffusion. 4,162,208, Cl. 204-180.00G.
- Alber, Franz. Ski binding. 4,162,089, Cl. 280-618.000.
- Alfred University Research Foundation Inc.: See—  
Crandall, William B.; and Wasserstein, Linda J., 4,162,334, Cl. 426-505.000.
- Alfs, Helmut: See—  
List, Ferdinand; and Alfs, Helmut, 4,162,365, Cl. 562-416.000.
- All Phase Electronics, Inc.: See—  
Whitson, Donald W., 4,161,925, Cl. 119-158.000.
- Alleman, Carl E., to Phillips Petroleum Company. Regeneration of liquid absorbents. 4,162,145, Cl. 55-32.000.
- Allied Chemical Corporation: See—  
Fisher, William B.; and Van Peppen, Jan F., 4,162,267, Cl. 260-586.00P.
- Subbanna, Somanahalli N.; Morgan, Thomas R.; and Frick, Douglas G., 4,162,295, Cl. 423-61.000.
- American Brands, Inc.: See—  
Glock, Eugene, 4,161,953, Cl. 131-140.00P.
- American Cyanamid Company: See—  
Granzow, Albrecht H., 4,162,278, Cl. 525-2.000.
- American Filtrona Corporation: See—  
Collins, Terrence, 4,161,823, Cl. 33-179.000.
- American Home Products Corp.: See—  
Henderson, Gary A.; and Williams, Guy H., Jr., 4,162,515, Cl. 361-232.000.
- American Hydraulic Propulsion Systems, Inc.: See—  
Tobias, Jaromir, 4,161,906, Cl. 91-498.000.
- American Manufacturing Company: See—  
Rones, James M., 4,162,344, Cl. 428-212.000.
- Amick, James L. Vertical-axis windmill. 4,162,410, Cl. 290-55.000.
- Anderson Company, The: See—  
Mohnach, Michael G.; Harbison, William H.; and Wittwer, Robert O., 4,161,798, Cl. 15-250.130.
- Anderson Engineers, Inc.: See—  
Anderson, Harry E.; Helsel, Kenneth E.; and Heasley, Raymond E., 4,162,060, Cl. 266-49.000.
- Anderson, George A., to Honeywell Inc. Triangular high speed I/O system for content addressable memories. 4,162,535, Cl. 364-900.000.
- Anderson, Harry E.; Helsel, Kenneth E.; and Heasley, Raymond E., to Anderson Engineers, Inc. Semi-automatic water table. 4,162,060, Cl. 266-49.000.
- Ando, Hisashige, to Fujitsu Limited. Clocked memory with delay establisher by drive transistor design. 4,162,540, Cl. 365-194.000.
- Andreev, Anatoly S.; Bagdasarian, Alexandr S.; Gulyaev, Jury V.; and Kmita, Anatoly M., to Institut Radiotekhniki i Elektroniki Akademii Nauk SSSR. Acoustic surface wave transducer and filter built around this transducer. 4,162,415, Cl. 310-313.000.
- Andrews, Allen H.: See—  
Stone, Vaughn L.; Rhind, Terence K.; Andrews, Allen H.; and Hendrie, John M., 4,161,887, Cl. 73-720.000.
- Andrews, Peter: See—  
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,162,319, Cl. 424-250.000.
- Ansoerge, Werner. Static circuit arrangement for production of 3-phase current of variable frequency and output power. 4,162,523, Cl. 363-43.000.
- Antenore, Ronald L.: See—  
Capra, Nicholas G.; and Antenore, Ronald L., 4,162,030, Cl. 222-321.000.
- Appalachian Electronic Instruments, Inc.: See—  
Nickell, Larry C.; and McCormack, John L., 4,162,479, Cl. 340-63.000.
- Applegate, Robert D. Incineration apparatus with adjustable air curtain. 4,161,916, Cl. 110-203.000.
- Arcella, Frank G.; Wolf, Charles B.; and Fey, Maurice G., to Westinghouse Electric Corp. Liquid silicon casting control mechanism. 4,162,291, Cl. 422-198.000.
- Archer, Jean-Francois, to Stas - Societe Technique d'Accessoire Specialises. Cable slings. 4,162,095, Cl. 294-74.000.
- Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Molten salt leach for removal of inorganic cores from directionally solidified eutectic alloy structures. 4,162,173, Cl. 134-2.000.
- Arnold, Fred E.; Reinhardt, Bruce A.; and Hedberg, Frederick L., to United States of America, Air Force. Aromatic enyne compounds and their synthesis. 4,162,265, Cl. 260-578.000.
- Arya, Satya P., to General Atomic Company. Method for container loading and unloading. 4,162,018, Cl. 414-786.000.
- Arzberger, William; and Brown, Merle S., to Jet Spray Corp. Dispenser for perishable beverages. 4,161,971, Cl. 141-362.000.
- Asahi Kasei Kogyo K.K.: See—  
Miyake, Tetsuya; Noguchi, Kohji; and Fujimoto, Kohichi, 4,162,268, Cl. 260-592.000.
- Asea Aktiebolag: See—  
Frank, Harry, 4,162,442, Cl. 323-106.000.
- Ash, Darrell L., to Texas Instruments Incorporated. MESFET-device surface-wave-device channel selector. 4,162,451, Cl. 325-451.000.
- Ash, Darrell L., to Texas Instruments Incorporated. Channel selection for a television receiver having low-gain high frequency RF-IF section. 4,162,452, Cl. 325-373.000.
- Ashlow Steel & Engineering Company, Limited: See—  
Ashton, John C., 4,161,872, Cl. 72-95.000.
- Ashton, John C., to Ashlow Steel & Engineering Company, Limited. Rolling mills. 4,161,872, Cl. 72-95.000.
- Ashworth, Gordon, to Scapa-Porritt Limited. Paper makers wet felts. 4,162,190, Cl. 162-359.000.
- Atlantic Richfield Company: See—  
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Ballantyne, Joseph M., to Cornell Research Foundation, Inc. Tunnel injection of minority carriers in semi-conductors. 4,161,814, Cl. 29-580.000.  
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Barber, Antony D., to CompAir Construction & Mining Limited. Reciprocating hydraulic motors. 4,161,989, Cl. 173-105.000.  
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Himmele, Walter; Fischer, Karl; Kaibel, Gerd; Schneider, Kurt; and Irnich, Rudolf, 4,162,200, Cl. 203-58.000.  
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Zanker, Fritz, 4,162,263, Cl. 260-453.00F.  
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Kuhle, Engelbert; Klauke, Erich; and Frohberger, Paul-Ernst, 4,162,329, Cl. 424-319.000.  
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,162,310, Cl. 424-200.000.  
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,162,320, Cl. 424-251.000.  
Rosenkranz, Hans J., 4,162,274, Cl. 528-75.000.  
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Franckowiak, Gerhard; Vater, Wulf; Heise, Arend; Kazda, Stanislaw; and Stoepel, Kurt, 4,162,321, Cl. 424-266.000.  
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Huber, Manfred; Kapfhammer, Karl; Schweiger, Erwin; Jochmann, Franz; and Krappel, Alfred, 4,162,478, Cl. 340-52.00F.  
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BBC Brown, Boveri & Company, Limited: See—  
De Bruyne, Patrick; and Niemeyer, Lutz, 4,162,514, Cl. 361-2.000.  
Beach, Richard L., to Hunt-Wesson Foods, Inc. Apparatus for sorting fruits and vegetables. 4,162,011, Cl. 209-637.000.  
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Becker, Dale F., to Sangamo Weston, Inc. Meter box with disconnect means. 4,162,516, Cl. 361-372.000.  
Beckman Instruments, Inc.: See—  
Jerrold-Jones, Paul, 4,162,211, Cl. 204-195.00G.  
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,162,194, Cl. 435-15.000.  
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Beecham Group Limited: See—  
Box, Stephen J.; and Hood, John D., 4,162,304, Cl. 424-117.000.  
Begnaud, John D.: See—  
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Behle, Gunter R., to ACF Industries, Incorporated. Fixture assembly for removing operating assembly from bottom operable tank car valve while closure portion remains in closed position in the tank. 4,161,958, Cl. 137-316.000.  
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BEI Electronics, Inc.: See—  
Hudson, Charles L., 4,162,399, Cl. 250-231.0SE.  
Bel Air Industries Inc.: See—  
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Belikov, Vladimir G.: See—  
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D'Asaro, Lucian A.; and Okinaka, Yutaka, 4,162,337, Cl. 427-92.000.  
Maldonado, Juan R.; and Maydan, Dan, 4,162,528, Cl. 364-563.000.  
Mearns, Allison B., 4,162,377, Cl. 179-18.00D.  
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Bendig, Lothar; and Fusser, Rolf, to Filterwerk Mann & Hummel GmbH. Device for regulating the intake air temperature of a carburetor-equipped internal combustion engine. 4,161,930, Cl. 123-122.00D.  
Bendix Corporation, The: See—  
Laird, James C.; and Tomlin, Robert L., 4,161,883, Cl. 73-421.50A.  
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Darnfors, Kristina E., 4,161,794, Cl. 5-441.000.  
Benseler, Hans; and Schaefer, Horst, to Puma-Sportschuhfabriken Rudolf Dassler KG. Outer sole for shoe especially sport shoes as well as shoes provided with such outer sole. 4,161,828, Cl. 36-32.00R.

Berg, Mark J. Device for arm wrestling. 4,162,068, Cl. 273-1.00E.  
Bergamini, Giorgio, to Nuovo Pignone S.p.A. Seven-segmented electromechanical digital indicator. 4,161,832, Cl. 40-451.000.  
Bergmann, Rolf: See—  
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Bergna, Horacio E., to Du Pont de Nemours, E. I., and Company. Foundry mold or core compositions and method. 4,162,238, Cl. 260-29.60S.  
Berlekamp, Elwyn R., to Cyclotomics, Inc. Galois field computer. 4,162,480, Cl. 340-146.1AL.  
Bernard, Antoine: See—  
Girard, Jean-Philippe; and Bernard, Antoine, 4,162,374, Cl. 179-1.0HF.  
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Bernardo, Edward T.; Faure, Louis H.; Johnson, Alfred H.; and Pittwood, Donald G., to International Business Machines Corporation. Method and apparatus for making a semiconductor device mounting element embodying an embedded fan-out wire arrangement. 4,161,817, Cl. 29-630.00B.  
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Bertram, James L., to Dow Chemical Company, The. Coating compositions. 4,162,244, Cl. 260-37.0EP.  
Best, Dennis O.: See—  
Best, Gordon K.; and Best, Dennis O., 4,162,088, Cl. 280-606.000.  
Best, Gordon K.; and Best, Dennis O. Powered snow ski. 4,162,088, Cl. 280-606.000.  
Beyers, Billy W., Jr.; and Suchko, Adam J., to RCA Corporation. Television system scheduler. 4,162,513, Cl. 358-191.000.  
Bhalla, Ranbir S., to Westinghouse Electric Corp. Method of forming arc tube end seal. 4,162,151, Cl. 65-42.000.  
Bhasin, Madan M.: See—  
Ellgen, Paul C.; and Bhasin, Madan M., 4,162,262, Cl. 260-449.00R.  
Bhat, Manjeshwar S.: See—  
Parker, Earl R.; Zackay, Victor F.; Bhat, Manjeshwar S.; and Garrison, Warren M., Jr., 4,162,157, Cl. 75-124.000.  
Bichara, Michel: See—  
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Bichon, Daniel, to Battelle Memorial Institute. Synthetic membrane for wound-dressings. 4,161,948, Cl. 128-156.000.  
Birt, David R., to Communications Patents Limited. Amplifier systems. 4,162,455, Cl. 330-10.000.  
Bissell, Robert D., to Dresser Industries, Inc. Pressure gauge construction. 4,161,888, Cl. 73-740.000.  
Bjerke, Leiv, to Thune-Eureka A/S. Submersible, hydraulically-driven pump rotating about a vertical axis. 4,162,137, Cl. 417-405.000.  
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Solyom, Peter; Boman, Bengt; and Bjornal, Hakan, 4,162,195, Cl. 43-310.000.  
Bjornson, Bjorn O., to AB Bofors. Brake device for rotating body. 4,162,053, Cl. 244-3.270.  
Black, John W., to Pemco-Kalamazoo, Inc. Rotary indexing mechanism. 4,161,893, Cl. 74-813.00R.  
Blaupunkt-Werke GmbH: See—  
Pohlmann, Gottfried; and Schneider, Egon, 4,161,995, Cl. 181-150.000.  
Bljukherova, Nina A.: See—  
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Bloham, Samuel D., to Moffatt, Donald B. Air inlet apparatus. 4,161,941, Cl. 126-85.00B.  
Board of Regents, for and on behalf of the University of Florida: See—  
Tsibris, John C. M., 4,162,355, Cl. 526-293.000.  
Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Magnetic bubble memory. 4,162,537, Cl. 365-19.000.  
Bobrick, Mitchell, to Eldon Industries, Inc. Vertical file construction. 4,162,014, Cl. 211-50.000.  
Boman, Bengt: See—  
Solyom, Peter; Boman, Bengt; and Bjornal, Hakan, 4,162,195, Cl. 43-310.000.  
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, to Swacars Sales, Inc. Trailer apparatus and ground support therefor. 4,162,086, Cl. 280-425.00R.  
Bonnie Enterprises, Inc.: See—  
Hennise, Bonnie C.; and Cousins, Synde, 4,161,806, Cl. 24-201.00A.  
Borer, Werner J.; Kugler, Tibor; and Zuzak, Tomas, to Swiss Aluminium Ltd. Method of melting magnetically weak particles of arbitrary shape into substantially spherically-shaped globules. 4,162,283, Cl. 264-15.000.  
Borgschulte, Fritz: See—  
Georg, Werner; Hebertling, Walter; and Borgschulte, Fritz, 4,162,103, Cl. 299-43.000.  
Borom, Marcus P.: See—  
Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., 4,162,173, Cl. 134-2.000.

Bossert AG: See—  
Bossert, Walter, 4,161,891, Cl. 74-548.000.  
Bossert, Friedrich: See—  
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Franckowiak, Gerhard; Vater, Wulf; Heise, Arend; Kazda, Stanislaw; and Stoepel, Kurt, 4,162,321, Cl. 424-266.000.  
Bossert, Walter, to Bossert AG. Operating handle attachment arrangement, particularly window crank for automotive vehicles. 4,161,891, Cl. 74-548.000.  
Bothun, Maynard E.; Larson, Curtis A.; Lighiner, Gayland E.; and Wilson, David R., to International Business Machines Corporation. Magazine-lid combination for jacketed magnetic disks. 4,162,007, Cl. 206-444.000.  
Bould, Fred; and Kowalik, Peter M., to Westinghouse Electric Corp. Dual spring circuit interrupter apparatus. 4,162,385, Cl. 200-153.0SC.  
Bourgeois, James E.; and Josemans, Leonardus J., to Cutler-Hammer, Inc. Method of and means for securing an electric switch operating lever in a one-hole mounting bushing. 4,162,386, Cl. 200-339.000.  
Bourns, Inc.: See—  
Hansen, Emmert S., 4,162,408, Cl. 250-555.000.  
Stone, Vaughn L.; Rhind, Terence K.; Andrews, Allen H.; and Hendrie, John M., 4,161,887, Cl. 73-720.000.  
Bouton, Daniel A.; Martoglio, Jean E.; and Maulat, Jean-Pierre, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Linear spring and end thrust member. 4,162,064, Cl. 267-177.000.  
Boutros, Kamal S.: See—  
Nijman, John P.; and Boutros, Kamal S., 4,162,469, Cl. 335-186.000.  
Bouyssounouse, Bernard; and Bouyssounouse, Chantal. Apparatus for communicating receipt of transmitted messages. 4,162,449, Cl. 325-55.000.  
Bouyssounouse, Chantal: See—  
Bouyssounouse, Bernard; and Bouyssounouse, Chantal, 4,162,449, Cl. 325-55.000.  
Bowman, Robert W.: See—  
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,161,816, Cl. 29-628.000.  
Box, Stephen J.; and Hood, John D., to Beecham Group Limited. Streptomycin antibiotic. 4,162,304, Cl. 424-117.000.  
Boyer, Stephen K.; and Slater, Steven M. Process for the conversion of sulfur dioxide. 4,162,207, Cl. 204-157.10R.  
Brackmann, Richard T.: See—  
Fite, Wade L.; Myers, Richard L.; and Brackmann, Richard T., 4,162,404, Cl. 250-423.00R.  
Bradbury, Walter C.: See—  
Wilson, Harold P.; and Bradbury, Walter C., 4,162,205, Cl. 204-43.00S.  
Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., to Glaxo Laboratories Limited. 3-Carbamoyloxymethyl-7-substituted oximino acetamido cephalosporanic acid derivatives. 4,162,360, Cl. 544-16.000.  
Braid, Milton, to Mobil Oil Corporation. Lubricant compositions of enhanced antioxidant properties. 4,162,225, Cl. 252-50.000.  
Brazier, Ernest R., to ERCO Industries Limited. Assembly of furnace electrodes. 4,162,368, Cl. 13-18.00C.  
Brearley, Malcolm; and Banks, Roger J., to Girling Limited. Speed measuring systems. 4,162,443, Cl. 324-78.00D.  
Brecher, Lee E.: See—  
Hirayama, Chikara; and Brecher, Lee E., 4,162,302, Cl. 423-579.000.  
Breitenbach, Otto, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Delay line. 4,162,464, Cl. 333-138.000.  
Brice, Henry T.: See—  
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, 4,162,086, Cl. 280-425.00R.  
Bridger, Robert F., to Mobil Oil Corporation. Solubilized borates of bis-oxazoline and lubricant compositions containing the same. 4,162,224, Cl. 252-49.600.  
Brinkley, James W.: See—  
Specker, Lawrence J.; Higgins, Aubin M.; and Brinkley, James W., 4,161,874, Cl. 73-12.000.  
British Industrial Plastics Limited: See—  
Ogden, Dennis H.; and Smith, Frank G., 4,162,128, Cl. 366-154.000.  
British Steel Corporation: See—  
Peace, John; Wright, Harold; and Clague, Kenneth, 4,162,471, Cl. 335-291.000.  
Broder, Alan; Shapiro, Paul; and Yee, Seening, to Sperry Rand Corporation. Yaw-compensated correlating sonar tracking system. 4,162,474, Cl. 340-6.00R.  
Brooks, Carson L.; Carson, John W.; and Culbreth, Garland T., to Reynolds Metals Company. Ingot casting. 4,161,978, Cl. 164-49.000.  
Brouwer Turf Equipment Limited: See—  
Gerrits, Theodorus P. H., 4,161,858, Cl. 56-7.000.  
Brown, Alvin E., to Du Pont de Nemours, E. I., and Company. Piezo-electric ultrasonic transducer with damped housing. 4,162,111, Cl. 310-326.000.  
Brown, Arthur V., Jr.; and Karrasch, Richard J., to Jim Dandy Company, The. Monosaccharide-containing dry pet food having yieldable elastic structure. 4,162,336, Cl. 426-623.000.  
Brown, Donald A.; and LaLonde, Paul D., to Donn Products, Inc. Suspension ceiling system. 4,161,856, Cl. 52-667.000.  
Brown, Harry J.; and Chopra, Kuldeep S., to Union Carbide Corporation. Hard facing of metal substrates. 4,162,392, Cl. 219-146.510.  
Brown, Merle S.: See—  
Arzberger, William; and Brown, Merle S., 4,161,971, Cl. 141-362.000.



Brown, Michael H.; and Myatt, John, to United Kingdom Atomic Energy Authority. Thermoelectric battery, protected against shocks and accelerations. 4,162,369, Cl. 136-202.000.

Brown, Michael J., to GAF Corporation. Phenoxybenzylphosphonium salts and derivatives thereof and use as fungicides. 4,162,312, Cl. 424-211.000.

Brown, Michael J., to GAF Corporation. Phenoxybenzylphosphonium salt insecticides. 4,162,313, Cl. 424-217.000.

Bucaro, Joseph A.; Carome, Edward F.; and Dardy, Henry D., to United States of America, Navy. Fiber optic acoustic sensor. 4,162,397, Cl. 250-199.000.

Buck, James R. Drill chuck. 4,162,080, Cl. 279-1.0DC.

Buck, Ronald G., to Litton Systems, Inc. Microwave oven sensing system. 4,162,381, Cl. 219-10.55B.

Buckley, Thomas F.; and Gleason, John G., to SmithKline Corporation. 3-Aminoazetidinone derivatives. 4,162,250, Cl. 260-239.00A.

Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, to Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte. Cooling element for a metallurgical furnace. 4,162,061, Cl. 266-193.000.

Buhrer, Carl F., to GTE Laboratories Incorporated. Programmable divider. 4,162,450, Cl. 325-419.000.

Bunker Ramo Corporation: See—

Nijman, John P.; and Boutros, Kamal S., 4,162,469, Cl. 335-186.000.

Burger, Leland L.; and Scheele, Randall D., to United States of America, Energy. Separation of iodine from mercury containing scrubbing solutions. 4,162,206, Cl. 204-94.000.

Burke, Harry D., to Whirlpool Corporation. Waveguide assembly for microwave oven. 4,162,380, Cl. 219-10.55F.

Burlington Industries, Inc.: See—

Schwartz, William C., 4,162,342, Cl. 428-159.000.

Burroughs Corporation: See—

Bacon, James R., 4,162,494, Cl. 343-5.0EM.

Barnes, George H., 4,162,534, Cl. 364-900.000.

Cook, Darwen J.; and Millers, Donald A., II, 4,162,520, Cl. 364-200.000.

Horak, Anthony; Rachiatore, Felix A.; and Lada, Christopher O., 4,162,067, Cl. 271-177.000.

Lin, An-Chung R., 4,162,164, Cl. 106-21.000.

Su, Chauchang, 4,162,482, Cl. 340-146.30H.

Burroughs Wellcome Co.: See—

Wilkinson, Samuel, 4,162,307, Cl. 424-177.000.

Burton, Arthur; and Conway, Roy, to Imperial Chemical Industries Limited. Producing embossed wall- or ceiling-covering of cellulosic pulp and two different discrete thermoplastic materials. 4,162,180, Cl. 156-220.000.

Bushong, R. James: See—

Smith, Russell D.; and Bushong, R. James, 4,162,168, Cl. 106-58.000.

Butler, Denis V., to Plessey Handel und Investments AG. Method of producing chaff. 4,162,209, Cl. 204-192.00C.

Byrne, John R., to Will Ross Inc. Floating insert injection mold. 4,162,138, Cl. 425-125.000.

C.G.R. MeV: See—

Tran, Duc T., 4,162,423, Cl. 315-5.410.

Cadoff, Laurence H.; Mattox, Douglas M.; and Elms, Robert T., to Westinghouse Electric Corp. Compact ballast for fluorescent lamp which provides excellent lamp power regulation. 4,162,430, Cl. 315-309.000.

Calder: See—

Gentil, Patrick R., 4,161,830, Cl. 40-2.200.

Calvin, Natasha I.; and Ellis, Robert J. Water soluble extracts of certain marine red algae and processes for use thereof. 4,162,308, Cl. 424-195.000.

Calvin, Natasha I.; and Ellis, Robert J. Water soluble extracts of certain marine red algae and processes for use thereof. 4,162,309, Cl. 424-195.000.

Calzetta, Robert K., to General Signal Corporation. High resolution optical position code detector for information recorded on record carrier partially in humanly intelligible form. 4,162,035, Cl. 235-456.000.

Cambridge Instrument Company, Inc.: See—

Grossman, Hyman, 4,161,945, Cl. 128-696.000.

Camco, Incorporated: See—

Watkins, Fred E., 4,161,960, Cl. 137-458.000.

Watkins, Fred E., 4,161,984, Cl. 166-315.000.

Campana, Patsie C. Refractory article and method of making the same. 4,162,179, Cl. 156-89.000.

Campbell, Scott. Digital speedometer. 4,162,445, Cl. 324-175.000.

Camph Engineering Company AB: See—

Camph, Sven E., 4,161,999, Cl. 188-196.0BA.

Camph, Sven E., to Camph Engineering Company AB. Automatic slack adjuster. 4,161,999, Cl. 188-196.0BA.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: See—

Fanning, Bryce L., 4,162,476, Cl. 340-10.000.

Canon Kabushiki Kaisha: See—

Tsunekawa, Tokuchi; Nakamura, Zenzo; Okubo, Osamu; and Uchiyama, Takashi, 4,162,426, Cl. 315-151.000.

Canter, Nathan H.; and Thame, Neville G., to Exxon Research & Engineering Co. Polyvinyl chloride thermoplastic blend compositions having improved glass transition temperatures. 4,162,241, Cl. 260-30.80R.

Capra, Nicholas G.; and Antenore, Ronald L., to J. Claybrook Lewis and Associates, Ltd. Disposable package dispenser having a pressure release channel. 4,162,030, Cl. 222-321.000.

Caraher, James R., to Machlett Laboratories, Inc., The. Method of fabricating image input screen. 4,162,115, Cl. 316-4.000.

Carey, Lee F., to Textron Inc. Extendible/expandable nozzle for rocket engines and the like and method of making same. 4,162,040, Cl. 239-265.330.

Carl Freudenberg, Firma: See—

Schmitt, Wilhelm; and Schumacher, Herbert, 4,161,976, Cl. 152-239.000.

Carome, Edward F.: See—

Bucaro, Joseph A.; Carome, Edward F.; and Dardy, Henry D., 4,162,397, Cl. 250-199.000.

Carpenter, David A., to MRC Corporation. Mass properties measurement system. 4,161,876, Cl. 73-63.000.

Carson, Andrew B., Jr.; and Tuso, Michael J., to General Electric Company. Drive circuit for printing head. 4,162,131, Cl. 400-124.000.

Carson, John W.: See—

Brooks, Carson L.; Carson, John W.; and Culbreth, Garland T., 4,161,978, Cl. 164-49.000.

Carson, William R., to Combustion Engineering, Inc. Apparatus for separating water and steam in a nuclear steam generator. 4,162,150, Cl. 55-337.000.

Carton-Craft Corp.: See—

Wagner, Kenneth E., 4,161,833, Cl. 40-539.000.

Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, to Merck & Co., Inc. Antibiotics 890A<sub>1</sub> and 890A<sub>3</sub>. 4,162,324, Cl. 424-274.000.

Caterpillar Tractor Co.: See—

Day, Ralph R., 4,161,865, Cl. 60-385.000.

Goloff, Alexander; and Denning, Ralph E., 4,161,890, Cl. 74-214.000.

Proeschl, Bernard E., 4,162,096, Cl. 296-196.000.

Caudill, Allison H.: See—

Abbott, Jerry J.; Bernardelli, William J.; Thompson, John A.; and Caudill, Allison H., 4,161,923, Cl. 118-658.000.

Celanese Corporation: See—

Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui W., 4,162,346, Cl. 428-364.000.

Cella, Alexander. Modular steam generator for use in nuclear power plants. 4,162,191, Cl. 176-65.000.

Cellerini, Albert R.; Ricci, Louis N.; and Rexroad, James O., to Westinghouse Electric Corp. Circuit breaker contact structure. 4,162,467, Cl. 335-16.000.

Celt, James M.: See—

Larsen, Theodore E.; and Celt, James M., 4,162,425, Cl. 315-150.000.

Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: See—

Economopoulos, Mario; Respen, Yves J.; and Wilmotte, Stephane H., 4,161,800, Cl. 15-302.000.

Chambers Corporation: See—

Scherer, Richard M., 4,161,939, Cl. 126-19.00R.

Chance, Britton; and Sorge, John R. Flying spot fluoro-meter for oxidized flavoprotein and reduced pyridine nucleotide. 4,162,405, Cl. 250-461.00B.

Chatterji, Arun K. Electrostatic toner with an antiplasticizer. 4,162,226, Cl. 252-62.10P.

Chemetal Corporation: See—

Holz, Robert A., 4,162,345, Cl. 428-328.000.

Chemische Werke Huls Aktiengesellschaft: See—

List, Ferdinand; and Alfs, Helmut, 4,162,365, Cl. 562-416.000.

Cheney, William A., to United Air Specialists, Inc. Method and apparatus for treating electrically charged airborne particles. 4,162,144, Cl. 55-5.000.

Chevron Research Company: See—

House, Ralph, 4,162,242, Cl. 260-30.80R.

Miller, Stephen J., 4,162,212, Cl. 208-79.000.

Chicoine, Gustave J. Manual downshift deacceleration shift lever with switch array. 4,162,384, Cl. 200-61.880.

Chino Gygysler Es Vegyeszeti Termeken Gyara Rt.: See—

Knoll, Jozsef; Ecsery, Zoltan; Hermann nee Voros, Judit; Torok, Zoltan; Somfai, Eva; and Bernath, Gabor, 4,162,327, Cl. 424-285.000.

Choe, Eui W.: See—

Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui W., 4,162,346, Cl. 428-364.000.

Choiniere, Alcide W.: See—

Dunn, George T.; and Choiniere, Alcide W., 4,162,370, Cl. 174-47.000.

Chokai, Shoichi: See—

Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoi-chi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,162,331, Cl. 424-324.000.

Chopra, Kuldeep S.: See—

Brown, Harry J.; and Chopra, Kuldeep S., 4,162,392, Cl. 219-146.510.

Chrysler Corporation: See—

Dunne, Carroll J., Jr., 4,161,879, Cl. 73-229.000.

Eshelman, Robert W.; and Crall, Frederick W., 4,161,886, Cl. 73-722.000.

Teague, Kenneth W.; and Graham, Kenneth A., 4,161,928, Cl. 123-102.000.

Chudnovsky, Vladimir S.: See—

Razumov, Alexandr I.; Zaikonnikova, Irina V.; Chudnovsky, Vladimir S.; Rzhetskaya, Galina F.; Tarasova, Raisa I.; Bljukherova, Nina A.; Yafarova, Rimma L.; Avrutsky, Grigory Y.

Belikov, Vladimir G.; and Litvinenko, Anatoly V., 4,162,311, Cl. 424-211.000.

Ciba-Geigy Corporation: See—

Ehrenfreund, Josef, 4,162,330, Cl. 424-322.000.

Cielo, Paolo; and Westwood, William D., to Northern Telecom Limited. Printer with electrostatic ink control. 4,162,502, Cl. 346-140.00R.

Clague, Kenneth: See—

Peace, John; Wright, Harold; and Clague, Kenneth, 4,162,471, Cl. 335-291.000.

Clark, Carl A.; and Rogala, John, to Eastern Company, The. Resin reinforced expansion anchor and method of installation. 4,162,133, Cl. 405-258.000.

Coburn, John W.; and Winters, Harold F., to International Business Machines Corporation. Utilizing saturated and unsaturated halocarbon gases in plasma etching to increase etch of SiO<sub>2</sub> relative to Si. 4,162,185, Cl. 156-643.000.

Cochran, Michael J., to Texas Instruments Incorporated. Transceiver with only one reference frequency. 4,162,446, Cl. 325-15.000.

Cohen, Allen L. Zonal bifocal contact lens. 4,162,122, Cl. 351-161.000.

Collins, Terrence, to American Filtrona Corporation. Circumference measuring gauge. 4,161,823, Cl. 33-179.000.

Collins, Warde T.; and Fey, Mary D., to Dow Corning Corporation. Method of preparing an improved organic resin composition and an improved organic resin thereby. 4,162,245, Cl. 260-40.00R.

Collonia, Harald, to VDO Adolf Schindling AG. Speed regulating device for motor vehicles. 4,161,994, Cl. 180-179.000.

Columbia Machine, Inc.: See—

Schmitt, Robert A., 4,162,016, Cl. 414-85.000.

Combustion Engineering, Inc.: See—

Carson, William R., 4,162,150, Cl. 55-337.000.

Mabery, Thomas L., 4,161,873, Cl. 72-324.000.

Communications Patents Limited: See—

Birt, David R., 4,162,455, Cl. 330-10.000.

CompAir Construction & Mining Limited: See—

Barber, Antony D., 4,161,989, Cl. 173-105.000.

Conca, Romeo: See—

Leithem, Phyllis C.; and Conca, Romeo, 4,162,359, Cl. 536-70.000.

Concepts For Children, Inc.: See—

Tucker, Larry H., 4,162,013, Cl. 211-43.000.

Constable, Philip J.: See—

Turner, Roy C.; and Constable, Philip J., 4,162,472, Cl. 338-116.000.

Conterno, Giovanni, to Personal S.p.A. Steering-wheel rim. 4,161,892, Cl. 74-552.000.

Conway, Roy: See—

Burton, Arthur; and Conway, Roy, 4,162,180, Cl. 156-220.000.

Conwell, Esther M., to Xerox Corporation. Waveguide imaging system. 4,162,118, Cl. 350-96.130.

Cook, Darwen J.; and Millers, Donald A., II, to Burroughs Corporation. Intelligent input-output interface control unit for input-output subsystem. 4,162,520, Cl. 364-200.000.

Cook, Martin C.: See—

Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., 4,162,360, Cl. 544-16.000.

Cooke, Chathan M., to United States of America, Energy. Dielectric gas mixtures containing sulfur hexafluoride. 4,162,227, Cl. 252-63.500.

Cooper, Barry J.: See—

Acres, Gary J. K.; Cooper, Barry J.; and Harrison, Brian, 4,162,235, Cl. 252-462.000.

Cooper, Scott A.: See—

Wilcox, Forrest S.; Pinsky, Jules; and Cooper, Scott A., 4,162,343, Cl. 428-212.000.

Copson, Alexander G. Divers exhaust valve. 4,161,947, Cl. 128-142.300.

Cornell Research Foundation, Inc.: See—

Ballantyne, Joseph M., 4,161,814, Cl. 29-580.000.

Cosgrove, James F.: See—

McCain, William B.; Cosgrove, James F.; Vente, John; and Flavin, Thomas R., 4,162,066, Cl. 270-54.000.

Coulter Electronics, Inc.: See—

Fulwyler, Mack J.; and Hatcher, C. William, 4,162,282, Cl. 264-9.000.

Cousins, Synde: See—

Hennise, Bonnie C.; and Cousins, Synde, 4,161,806, Cl. 24-201.00A.

Covington, Wayne F.: See—

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.

Cowan, Robert E.: See—

Doss, James D.; Cowan, Robert E.; Newell, Robert H.; and McCabe, Charles W., 4,161,950, Cl. 128-303.140.

Cox, Carl V., to Union Carbide Corporation. Injectable packing formulation containing flexible graphite. 4,162,078, Cl. 277-102.000.

Cox, Ian R.: See—

Acheson, Richard M.; Cox, Ian R.; Stubbs, John K.; and Penrose, Alexander B., 4,162,253, Cl. 260-306.70T.

Crall, Frederick W.: See—

Eshelman, Robert W.; and Crall, Frederick W., 4,161,886, Cl. 73-722.000.

Crandall, William B.; and Wasserstein, Linda J., to Alfred University Research Foundation Inc. Method for baking in terra sigillata coated pan. 4,162,334, Cl. 426-505.000.

Crawford, Duffer B.; Becker, Colman L.; and LeBlanc, Joseph R., to Pullman Incorporated. Parallel steam reformers to provide low energy process. 4,162,290, Cl. 422-190.000.

Creed, Clark E., to Monarch Machine Company, Inc. Theft prevention assembly for use with car wheels. 4,161,896, Cl. 81-121.00A.

Crepaco, Inc.: See—

Wakeman, Alden H., 4,161,909, Cl. 99-453.000.

Wakeman, Alden H.; and Heiliger, Leonard R., 4,162,127, Cl. 366-149.000.

Crepeau, Charles E.: See—

Mulvey, Robert F.; and Crepeau, Charles E., 4,161,855, Cl. 52-612.000.

Crico, Aurelio M., to PPG Industries, Inc. Purification and recovery of ethylene dichloride. 4,162,201, Cl. 203-67.000.

Crosby, George A.: See—

Leslie, John H.; and Crosby, George A., 4,161,910, Cl. 100-26.000.

Crow, David E.; and Harrison, Nathan E., to United Technologies Corporation. Wide channel seal. 4,162,077, Cl. 277-53.000.

Crute, Billy G., to Stant Manufacturing Company, Inc. Pressure-vacuum relief fuel tank cap with roll-over safety valve feature. 4,162,021, Cl. 220-202.000.

CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A.: See—

Belforte, Piero, 4,162,371, Cl. 178-58.00R.

Culbreth, Garland T.: See—

Brooks, Carson L.; Carson, John W.; and Culbreth, Garland T., 4,161,978, Cl. 164-49.000.

Curlis, Horace E., Jr., to Union Carbide Corporation. Anode body for solid electrolytic capacitor. 4,162,518, Cl. 361-433.000.

Curry, Norman R., to Auto Steering Trailers Limited. Self-steering dolly. 4,162,082, Cl. 280-81.00A.

Cutler-Hammer, Inc.: See—

Bourgeois, James E.; and Josemans, Leonardus J., 4,162,386, Cl. 200-339.000.

Heider, Erich E., 4,162,388, Cl. 219-96.000.

CUV "Progress": See—

Nedyalkov, Ivan P.; Kanchev, Kancho T.; and Trenkov, Svetoslav R., 4,162,409, Cl. 290-53.000.

Cybernet Electronic Corporation: See—

Teshirogi, Toshihiko; and Tsuruta, Sumio, 4,162,447, Cl. 325-18.000.

Cyclotomics, Inc.: See—

Berlekamp, Elwyn R., 4,162,480, Cl. 340-146.1AL.

Dahl, Erik Q., to Elkem-Spigerverket A/S. Method of producing mechanically strong pellets from non-oxidizable metal oxides. 4,162,284, Cl. 264-66.000.

Dainippon Pharmaceutical Co., Ltd.: See—

Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 4,162,316, Cl. 424-250.000.

Dallen, John A.; and Green, Harry W., to Standard Products Company, The. Waste disposal system and method. 4,161,792, Cl. 4-111.100.

Dana Corporation: See—

Yant, Kenneth B., 4,162,001, Cl. 192-53.00E.

Zlotek, Thaddeus F., 4,162,000, Cl. 192-41.00A.

Dardy, Henry D.: See—

Bucaro, Joseph A.; Carome, Edward F.; and Dardy, Henry D., 4,162,397, Cl. 250-199.000.

Darnfors, Kristina E., to Bengt Petersson New Products Investment AB. Inflatable cushion. 4,161,794, Cl. 5-441.000.

D'Asaro, Lucian A.; and Okinaka, Yutaka, to Bell Telephone Laboratories, Incorporated. Process for fabricating III-V semiconducting devices with electrodeless gold plating. 4,162,337, Cl. 427-92.000.

Datacon, Inc.: See—

Howard, Warren L.; and Dorcas, Eugene E., 4,162,027, Cl. 222-23.000.

Daughdrill, E. Chris: See—

Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, 4,162,086, Cl. 280-425.00R.

Davis, Mark E.: See—

Feierstein, Harold E.; and Davis, Mark E., 4,162,236, Cl. 252-558.000.

Day, David R.; and McElroy, Lucian G. Fluid stripping apparatus. 4,161,801, Cl. 15-316.00R.

Day, Ralph R., to Caterpillar Tractor Co. Steering control with hydraulic follow-up. 4,161,865, Cl. 60-385.000.

Dayton Walther Corporation: See—

Walther, William D., 4,162,105, Cl. 301-12.00R.

DeAngelis, Larry E., to Ford Motor Company. Alternator having improved rectifier cooling. 4,162,419, Cl. 310-266.000.

De Bruyne, Patrick; and Niemeyer, Lutz, to BBC Brown, Boveri & Company, Limited. Arrangement for semiconductor power components. 4,162,514, Cl. 361-2.000.

De Candia, Ettore. Car body welding assembly system. 4,162,387, Cl. 219-79.000.

DeLalla, Thomas R.: See—

Silverman, Howard M.; Barleen, David G.; and DeLalla, Thomas R., 4,162,488, Cl. 340-505.000.

Delphin, Walter H.: See—

Horwitz, E. Philip; Delphin, Walter H.; and Mason, George W., 4,162,230, Cl. 252-301.10W.

Horwitz, E. Philip; and Delphin, Walter H., 4,162,231, Cl. 252-301.10W.

Del Rossi, Joseph: See—

Lawrence, Leo B.; and Del Rossi, Joseph, 4,162,106, Cl. 406-185.000.



- Denning, Ralph E.: See—  
Goloff, Alexander; and Denning, Ralph E., 4,161,890, Cl. 74-214.000.
- Deppe, Hans-Raimund, to Siemens Aktiengesellschaft. Method for covering a first layer or layer sequence situated on a substrate with an additional second layer by a sputtering-on process. 4,162,210, Cl. 204-192.0EC.
- DeSoto, Inc.: See—  
Wood, Donald C.; and McLaughlin, Robert L., 4,162,186, Cl. 162-5.000.
- Detecta-Kraan B.V.: See—  
Stuitje, Cornelis C., 4,161,875, Cl. 73-23.000.
- Detector Electronics Corporation: See—  
Larsen, Theodore E.; and Celt, James M., 4,162,425, Cl. 315-150.000.
- Dey, Arabinda N., to P. R. Mallory & Co. Inc. Means for improving contact between Li and the anode current collector. 4,162,202, Cl. 204-2.100.
- D'Hooge, Richard E., and Pasek, Frank S., to Rixson-Firemark, Inc. Heat-actuated door latch. 4,161,804, Cl. 16-48.500.
- DHP Corporation: See—  
Longo, James J., 4,162,172, Cl. 134-1.000.
- Dickman, Michael D.: See—  
Folsom, Max H.; and Dickman, Michael D., 4,162,196, Cl. 435-313.000.
- Dienes Werke GmbH & Co. K.G.: See—  
Wingen, Peter, 4,161,898, Cl. 83-171.000.
- Dietz, Wolfgang F. W., to RCA Corporation. Regulator with short circuit protection. 4,162,434, Cl. 315-411.000.
- Dingeldein, Elvira: See—  
Gottschlich, Rudolf; Gericke, Rolf; Juraszyk, Horst; Seubert, Jürgen; Strehlow, Wigard; Wahlig, Helmut; Bergmann, Rolf; and Dingeldein, Elvira, 4,162,314, Cl. 424-246.000.
- DiTullio, Joseph G., and Parad, Leonard I., to GTE Sylvania Incorporated. Diplexer apparatus. 4,162,463, Cl. 333-117.000.
- Dixon, James R. Wheel cover lock. 4,161,869, Cl. 70-166.000.
- Dobrovolsky, Anatoly A.: See—  
Miropolsky, Mark U.; Maizlik, David L.; Dobrovolsky, Anatoly A.; Gerasimovich, Igor K.; Levinson, Ariel S.; Naich, Josef P.; Menkh, Georgy A.; and Yasminov, Alexandr A., 4,162,219, Cl. 210-108.000.
- Doby, William P., to Westinghouse Electric Corp. Tape recorder having magnetically controlled tape tensioning. 4,162,051, Cl. 242-201.000.
- Dr. Madaus & Co.: See—  
Madaus, Rolf; and Gorler, Klaus, 4,162,255, Cl. 260-340.50R.
- Dolejsi, Miroslav, to Atlas Copco Aktiebolag. Exhaust muffler. 4,161,996, Cl. 181-230.000.
- Doll, Gunther: See—  
Zillgitt, Ulrich; Kuhn, Wolfgang; and Doll, Gunther, 4,162,424, Cl. 315-82.000.
- Dombalov, Ivan P.: See—  
Grancharov, Ivan N.; Tudjarova, Fanka D.; Bakalova, Yovka P.; Pelovski, Yoncho G.; Videnov, Nikola B.; and Dombalov, Ivan P., 4,162,170, Cl. 106-109.000.
- Donn Products, Inc.: See—  
Brown, Donald A.; and LaLonde, Paul D., 4,161,856, Cl. 52-667.000.
- Dorcas, Eugene E.: See—  
Howard, Warren L.; and Dorcas, Eugene E., 4,162,027, Cl. 222-23.000.
- Dorn, Wilhelm M.: See—  
van Hattum, Johannes S. A.; van Veen, Engelbertus S. P.; and Dorn, Wilhelm M., 4,162,433, Cl. 315-411.000.
- Doss, James D.; Cowan, Robert E.; Newell, Robert H.; and McCabe, Charles W., to United States of America. Energy. Electrosurgical knife. 4,161,950, Cl. 128-303.140.
- Dow Chemical Company, The: See—  
Bertram, James L., 4,162,244, Cl. 260-37.0EP.
- Fournier, Onazip J.; and Nelson, Wayne F., 4,161,985, Cl. 166-321.000.
- Katzer, Melvin F.; Klimpel, Richard R.; and Manfroy, Willy, 4,162,045, Cl. 241-16.000.
- Manfroy, Willy; and Klimpel, Richard R., 4,162,044, Cl. 241-16.000.
- Montgomery, Carl T., 4,162,347, Cl. 428-411.000.
- Smith, Russell D.; and Bushong, R. James, 4,162,168, Cl. 106-58.000.
- Dow Corning Corporation: See—  
Collins, Warde T.; and Fey, Mary D., 4,162,245, Cl. 260-40.00R.
- Lee, Chi-Long; Maxson, Myron T.; and Stebleton, Leo F., 4,162,243, Cl. 260-37.05B.
- Dowa Co. Ltd.: See—  
Miyahara, Kingo, 4,161,908, Cl. 99-349.000.
- Downen, David N.; and Eichenberger, Bert A., to Rockwell International Corporation. Reactive sheets. 4,162,496, Cl. 343-18.00A.
- Drapeau, Donald F.: See—  
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,161,816, Cl. 29-628.000.
- Drayton Controls (Engineering) Limited: See—  
Turner, Roy C.; and Constable, Philip J., 4,162,472, Cl. 338-116.000.
- Dresser Industries, Inc.: See—  
Bissell, Robert D., 4,161,888, Cl. 73-740.000.
- Utasi, Joseph G., 4,162,473, Cl. 340-1.00L.
- Dubiel, Oswald; and Pretzel, Dieter, to LuK Lammen und Kupplungs-bau GmbH. Friction clutch. 4,162,002, Cl. 192-99.00A.
- Dueber, Thomas E., to Du Pont de Nemours, E. I., and Company. Derivatives of aryl ketones and p-dialkyl-aminoaryaldehydes as visible sensitizers of photopolymerizable compositions. 4,162,162, Cl. 96-115.00P.
- Dunn, George T.; and Choiniere, Alcide W., to Automation Industries, Inc. Current carrying hose assembly. 4,162,370, Cl. 174-47.000.
- Dunn, William H., to Singer Company. The. Rollover and wipe projective circuit for an electrical switching array. 4,161,918, Cl. 112-158.00E.
- Dunne, Carroll J., Jr., to Chrysler Corporation. Composite tangential and axial exhaust fluid flowmeter. 4,161,879, Cl. 73-229.000.
- Du Pont de Nemours, E. I., and Company: See—  
Bergna, Horacio E., 4,162,238, Cl. 260-29.60S.
- Brown, Alvin E., 4,162,111, Cl. 310-326.000.
- Dueber, Thomas E., 4,162,162, Cl. 96-115.00P.
- Moulds, Gordon M., 4,162,275, Cl. 525-428.000.
- Durr, Louis; and Legrand, Francis, to Societe des Produits Chimiques et Matieres Colorantes de Mulhouse. Synthetic musk-based composition, its production and applications. 4,162,221, Cl. 252-1.000.
- DuVall, Dale R., to Recognition Equipment Incorporated. Adaptive correlator for video processing. 4,162,481, Cl. 340-146.3AG.
- Dydyk, Michael; and Tuzzolino, Joseph R., to Motorola, Inc. TM coaxial cavity oscillator and power combiner. 4,162,458, Cl. 331-56.000.
- Dynamit Nobel AG: See—  
Stelzer, Harry, 4,161,854, Cl. 52-309.100.
- E. B. Metal & Rubber Industries, Inc.: See—  
Jacobs, Philip F.; Friedman, Evelyn; and Southall, Peter, 4,162,026, Cl. 221-92.000.
- Eastern Company, The: See—  
Clark, Carl A.; and Rogala, John, 4,162,133, Cl. 405-258.000.
- Eastman Kodak Company: See—  
Irick, Gether, Jr.; and Kelly, Charles A., 4,162,254, Cl. 260-307.00D.
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Kuhle, Engelbert; Klauke, Erich; and Frohberger, Paul-Ernst, 4,162,329, Cl. 424-319.000.
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Ando, Hisashige, 4,162,540, Cl. 365-194.000.
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Gottschlich, Rudolf; Gericke, Rolf; Juraszyk, Horst; Seubert, Jürgen; Strehlow, Wighard; Wahlig, Helmut; Bergmann, Rolf; and Dingeldein, Elvira, 4,162,314, Cl. 424-246.000.
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Georg, Werner; Heberling, Walter; and Borgschulte, Fritz, 4,162,103, Cl. 299-43.000.
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Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,162,324, Cl. 424-274.000.
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Maslyansky, Gdal N.; Rabinovich, Georgy L.; Treiger, Leonid M.; Gokhman, Boris K.; and Seleznev, Viktor D., 4,162,214, Cl. 585-471.000.
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Madaus, Rolf; and Gorler, Klaus, 4,162,255, Cl. 260-340.50R.
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Muller, Wolfgang; Witzke, Lothar; and Gottfried, Werner, 4,162,296, Cl. 423-139.000.
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Gass, Albert E.; Gottshall, Harry W.; Schaber, Manfred O.; and Trombino, Lawrence, 4,162,526, Cl. 364-200.000.
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Abels, Theodor; and Gotz, Bernhard, 4,161,992, Cl. 180-306.000.
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Morley, Richard E., 4,162,536, Cl. 364-900.000.
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- Grenoble, Maurice E., to General Electric Company. Method and composition for rendering flexible sheet material non-adherent. 4,162,356, Cl. 528-31.000.
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- Grieshaber, Hermann: See—  
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- GTE Sylvania Incorporated: See—  
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- Hanaya, Morimasa, to Toyo Pulp Co., Ltd. Apparatus for producing chips from logs of timber. 4,161,972, Cl. 144-176.000.
- Hane, Shinichi, to Yamshita & Associates Ltd.; and Hane, Shinichi. Liquid sprinkling device of composite pipe type. 4,162,041, Cl. 239-266.000.
- Hanewinkel, Lorenz, to Nixdorf Computer AG. Data processor with address allocation to operations. 4,162,519, Cl. 364-200.000.
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- Hart, Ronald D. Portable earth core sampling machine. 4,161,988, Cl. 173-32.000.
- Hartke, David, to Xerox Corporation. Apparatus for overscribing binary data of a selected polarity into a semiconductor store. 4,162,541, Cl. 365-230.000.
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- Hauslein, Reinhard, to Melitta-Werke Bentz & Sohn KG. Filtering device for producing extracts from coffee or tea. 4,162,054, Cl. 248-94.000.
- Haverkamp, Wilhelm, to Krupp-Koppers GmbH. Apparatus for treating effluents. 4,162,147, Cl. 55-191.000.
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- Hayes, Jerry R., to L. R. Nelson Corporation. Hose coupling. 4,162,092, Cl. 285-39.000.
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- Heberling, Walter: See—  
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- Hedberg, Frederick L.: See—  
Arnold, Fred E.; Reinhardt, Bruce A.; and Hedberg, Frederick L., 4,162,265, Cl. 260-578.000.
- Heider, Erich E., to Cutler-Hammer, Inc. Apparatus and method for submerged percussion welding. 4,162,388, Cl. 219-96.000.
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Kinney, Philip C.; Heilman, Marlin S.; and Langer, Alois A., 4,161,952, Cl. 128-786.000.



Heine, Heinrich: See—  
Kubens, Rolf; and Heine, Heinrich, 4,162,357, Cl. 528-67.000.  
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Bauer, Heinrich F.; Helbling, Gerhard; and Hildebrandt, Florian, 4,161,877, Cl. 73-140.000.  
Helminger, Daniel; and Naegeli, Peter, to Givaudan Corporation. Trimethyl-acetyl octalins, process for making and fragrance compositions containing same, 4,162,266, Cl. 260-586.00F.  
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Hentschel, Claus; Martin, Karl; and Volckaert, Leonard, to Bayer Aktiengesellschaft. Hydroculture plant pot with an inserted container for receiving a hydroculture fertilizer, 4,161,844, Cl. 47-62.000.  
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Kress, Werner; Katzer, Johann; Lopic, Franz; and Hepperle, Willi, 4,162,132, Cl. 403-361.000.  
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Knoll, Jozsef; Eszery, Zoltan; Hermann nee Voros, Judith; Torok, Zoltan; Somfai, Eva; and Bernath, Gabor, 4,162,327, Cl. 424-285.000.  
Hernandez, Sebastian: See—  
Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,162,324, Cl. 424-274.000.  
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Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.  
Rode, France; Lindes, Peter; Eschenbach, Ralph F.; and Fazarinc, Zvonko A., 4,162,531, Cl. 364-571.000.  
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Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,161,816, Cl. 29-628.000.  
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Specker, Lawrence J.; Higgins, Aubin M.; and Brinkley, James W., 4,161,874, Cl. 73-12.000.  
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Mizutani, Masato; Higo, Akio; Ohno, Nobuo; and Hirai, Hajime, 4,162,269, Cl. 260-600.00R.  
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Bauer, Heinrich F.; Helbling, Gerhard; and Hildebrandt, Florian, 4,161,877, Cl. 73-140.000.  
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Hino, Minoru; Yasui, Seimei; and Shintani, Akira, to Sumitomo Chemical Company, Limited. Process for production of novel polymer emulsion, 4,162,240, Cl. 260-29.70B.  
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Mizutani, Masato; Higo, Akio; Ohno, Nobuo; and Hirai, Hajime, 4,162,269, Cl. 260-600.00R.  
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Nakagawa, Yasuo; and Hamada, Toshimitsu, 4,162,126, Cl. 356-237.000.  
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Hashimoto, Noritsugu, 4,162,047, Cl. 242-68.500.  
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Hodges, Bill J., deceased, 4,162,015, Cl. 211-87.000.  
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Adrian, Renate; von Schenck, Raban; Somme, Klaus; and Weber, Hermann, 4,162,300, Cl. 423-314.000.  
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,162,247, Cl. 260-45.9NC.  
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Zurfluh, Rene, 4,162,328, Cl. 424-305.000.  
Hofmann, Karl: See—  
Eblen, Ewald; and Hofmann, Karl, 4,162,043, Cl. 239-533.300.  
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Roberts, Patrick J.; Hogan, Kevin P.; and Kealy, Thomas, 4,161,827, Cl. 36-11.000.  
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Holly, Frederick W.: See—  
Strachan, Robert G.; Paleveda, William J.; Veber, Daniel F.; and Holly, Frederick W., 4,162,248, Cl. 260-112.50S.  
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George, Allen P.; Homer, Harold; and Richardson, Christopher J., 4,162,431, Cl. 315-346.000.  
Homeyer, Bernhard: See—  
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,162,320, Cl. 424-251.000.  
Honda Giken Kogyo Kabushiki Kaisha: See—  
Sano, Shoichi, 4,162,091, Cl. 240-702.000.  
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Honeywell Inc.: See—  
Anderson, George A., 4,162,535, Cl. 364-900.000.  
Sverson, Asbjorn M., 4,161,809, Cl. 29-157.30D.  
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Nakamura, Masato; Nomura, Yoshika; and Katori, Tamio, 4,162,188, Cl. 162-76.000.  
Hood, John D.: See—  
Box, Stephen J.; and Hood, John D., 4,162,304, Cl. 424-117.000.  
Hopper, George S., to Texas Instruments Incorporated. Ferroelectric imaging system, 4,162,402, Cl. 250-332.000.  
Horak, Anthony; Rachiatore, Felix A.; and Lada, Christopher O., to Burroughs Corporation. Air assisted automatic document stacking apparatus, 4,162,067, Cl. 271-177.000.  
Horton, Phineas E., III: See—  
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, 4,162,086, Cl. 280-425.00R.  
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House, Ralph, to Chevron Research Company. Polyol stabilization additive for polypyrrolidone, 4,162,242, Cl. 260-30.80R.  
Hovsepian, Charles J., to Packaging Systems Corporation. Cosmetic dusting powder container, 4,162,010, Cl. 206-823.000.  
Howard, Guy J.; McCrumb, Walter C.; and Spivey, Paul R., to International Business Machines Corporation. Testing copy production machines, 4,162,396, Cl. 235-304.000.  
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Young, David W., 4,162,155, Cl. 71-110.000.  
Howard, Warren L.; and Dorcas, Eugene E., to Datacon, Inc. Remote readout device for a pump, 4,162,027, Cl. 222-23.000.

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Wilson, Richard A.; Mookherjee, Braja D.; Hruza, Anne S.; Vock, Manfred H.; Frederick, Louis S.; and Vinals, Joaquin F., 4,162,335, Cl. 426-535.000.  
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Mommson, Gordon V.; Hemming, Dale R.; and Hudrlik, Richard E., 4,162,042, Cl. 239-526.000.  
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Epp, Herbert N., 4,162,525, Cl. 363-71.000.  
Hui, Danny C. T. Electrically powered toy aircraft, 4,161,843, Cl. 46-75.000.  
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Weck, Friedrich J.; Hunkins, James; and Rinsler, Samuel J., 4,162,339, Cl. 428-43.000.  
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Beach, Richard L., 4,162,011, Cl. 209-637.000.  
Huseby, Irvin C.: See—  
Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., 4,162,173, Cl. 134-2.000.  
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Iannucci, Albert H. Board game involving electric utility plant operations and finance, 4,162,075, Cl. 273-256.000.  
Ibigawa Electric Industry Co., Ltd.: See—  
Enomoto, Ryo; Yoshioka, Mitihiro; and Yokoyama, Takao, 4,162,167, Cl. 106-44.000.  
ICI Americas Inc.: See—  
Yount, Joseph B., III, 4,162,143, Cl. 44-51.000.  
Imperial Chemical Industries Limited: See—  
Burton, Arthur; and Conway, Roy, 4,162,180, Cl. 156-220.000.  
Groves, David J.; and Mason, Albert, 4,162,139, Cl. 425-174.80E.  
Yelland, Michael, 4,162,249, Cl. 260-199.000.  
Inabe, Shinya: See—  
Kawaki, Katsumi; and Inabe, Shinya, 4,162,418, Cl. 310-49.00R.  
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Keith, James D.; and Gray, Bruce E., 4,162,437, Cl. 318-410.000.  
Ingber, Jack F., to Systems Consultants, Inc. Flexible acoustic coupler, 4,162,373, Cl. 179-1.00C.  
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Hayashi, Hisao, 4,161,836, Cl. 42-16.000.

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Roberts, Patrick J.; Hogan, Kevin P.; and Kealy, Thomas, 4,161,827, Cl. 36-11.000.

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Gantz, Jeanne A.; and Kelso, David W., 4,162,117, Cl. 350-4.200.

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Kersting, Emil F.: See—  
Sack, Ernst T.; Nordmeyer, Friedrich; and Kersting, Emil F., 4,161,885, Cl. 73-597.000.

Kidd, David. Fish hook. 4,161,840, Cl. 43-43.400.

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Land, Edwin H.; and Kinsman, Gordon F., 4,161,815, Cl. 29-623.400.

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Endoh, Kenjiro; Kitagawa, Kazuo; and Kira, Hideshi, 4,162,462, Cl. 333-14.000.

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Kirkland, Edward O., to Smith, Donald K. Anti-spill device. 4,162,020, Cl. 220-1.00B.

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Beecham, David; and Kirsch, Howard C., 4,162,416, Cl. 307-362.000.

Kispert, Klaus: See—  
Muennich, Hermann; and Kispert, Klaus, 4,162,109, Cl. 308-216.000.

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Kitagawa, Keiya: See—  
Takeyama, Tetsu; Takahashi, Akio; Matsumura, Kiichiro; and Kitagawa, Keiya, 4,162,299, Cl. 423-242.000.

Kitagawa, Toshikatsu, to Miyakawa Industry Company Limited. Apparatus for adjusting vertical position of drills in multiple spindle drilling machine. 4,162,134, Cl. 408-46.000.

Klauke, Erich: See—  
Kuhle, Engelbert; Klauke, Erich; and Frohberger, Paul-Ernst, 4,162,329, Cl. 424-319.000.

Klein, Konrad: See—  
Hartmannsgruber, Max; Schulz, Gunter; Klein, Konrad; and Wolf, Horst, 4,161,862, Cl. 57-92.000.

Klimpel, Richard R.: See—  
Katzer, Melvin F.; Klimpel, Richard R.; and Manfroy, Willy, 4,162,045, Cl. 241-16.000.

Manfroy, Willy; and Klimpel, Richard R., 4,162,044, Cl. 241-16.000.

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Klotz, Gunther, to Bayer Aktiengesellschaft. Displacement of a liquid A by a liquid B in a suspension. 4,162,215, Cl. 210-21.000.

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Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., 4,162,173, Cl. 134-2.000.

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Knight, Arlen M.; and Hachtmann, William R. Drapery and drapery pleat cleaning tool head. 4,161,802, Cl. 15-331.000.

Knoll, Jozsef; Ecsery, Zoltan; Hermann nee Voros, Judit; Torok, Zoltan; Somfai, Eva; and Bernath, Gabor, to Chinoin Gyogyszer Es Vegyeszeti Termeken Gyara Rt. N,N-Disubstituted-2-furyl ethyl amines. 4,162,327, Cl. 424-285.000.

Kobashi, Kiyoshi: See—  
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Kobayashi, Takashi; and Nakamura, Toshikazu, to Murata Manufacturing Co., Ltd. Heating unit for heating fluid. 4,162,395, Cl. 219-367.000.

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Hiracka, Tetsuo; and Kobayashi, Takeo, 4,162,251, Cl. 260-239.100.

Kodaira, Kozo: See—  
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Kogler, Peter; and Zitz, Alfred J., to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Cutting machine. 4,162,104, Cl. 299-75.000.

Kogure, Hiroshi: See—  
Yagi, Shizuo; Fujii, Isao; and Kogure, Hiroshi, 4,161,927, Cl. 123-75.00B.

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Ogata, Eiji; Ono, Koji; and Nakagaki, Shoji, 4,162,270, Cl. 260-607.0AR.

Konkier, Anthony W., to Minnesota Mining and Manufacturing Company. Storage assembly for a tape magazine. 4,162,112, Cl. 312-15.000.

Kostanecki, Andrew T., to Kransco Manufacturing, Inc. Monolithic polymer foam sailboat hull. 4,161,796, Cl. 9-6.00P.

Kotzur, Frank W.: See—  
Wagner, William A.; and Kotzur, Frank W., 4,162,050, Cl. 242-163.000.

Kowalik, Peter M.: See—  
Bould, Fred; and Kowalik, Peter M., 4,162,385, Cl. 200-153.0SC.

Koyama, Masaya. Automatic sprayer. 4,162,037, Cl. 239-332.000.

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Krappel, Alfred: See—  
Huber, Manfred; Kapfhammer, Karl; Schweiger, Erwin; Jochmann, Franz; and Krappel, Alfred, 4,162,478, Cl. 340-52.00F.

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Haverkamp, Wilhelm, 4,162,147, Cl. 55-191.000.

Kubens, Rolf; and Heine, Heinrich, to Bayer Aktiengesellschaft. Process for the production of synthetic resins containing isocyanurate groups. 4,162,357, Cl. 528-67.000.

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Schievelbein, Vernon H.; Kudchadker, Mohan V.; Varmon, James E.; and Whittington, Lawrence E., 4,161,982, Cl. 166-269.000.

Kugler, Tibor: See—  
Borer, Werner J.; Kugler, Tibor; and Zuzak, Tomas, 4,162,283, Cl. 264-15.000.

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Kuhn, Wolfgang: See—  
Zillgitt, Ulrich; Kuhn, Wolfgang; and Doll, Gunther, 4,162,424, Cl. 315-82.000.

Kuntz, Earl J.: See—  
English, Joseph J., 4,162,199, Cl. 203-39.000.

Kuo, Han C., to Olin Corporation. Plated metallic cathode. 4,162,204, Cl. 204-43.00R.

Kupper, Wilhelm, to W. Schlafhorst & Co. Device for assorting inadequately wound coils. 4,162,012, Cl. 209-662.000.

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Kusui, Shoji; and Kitagawa, Kazuo, to Nihon Vending Machine Co., Ltd. Automatic energy supply systems of the multi-rate calculating type. 4,162,530, Cl. 364-464.000.

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Litchfield, Leon G.; and Hardy, Terence, 4,162,114, Cl. 312-330.00R.

L. Klooster & Zonen B.V.: See—  
Klooster, Leefert, 4,161,973, Cl. 144-224.000.

L. R. Nelson Corporation: See—  
Hayes, Jerry R., 4,162,092, Cl. 285-39.000.

Labelette Company: See—  
Wesley, John G., 4,162,182, Cl. 156-487.000.

Labinsky, Michael: See—  
Maringer, Albert; and Labinsky, Michael, 4,161,962, Cl. 137-557.000.

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Hallerback, Stig L.; and Lachonius, Leif, 4,162,039, Cl. 239-214.250.

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Horak, Anthony; Rachiatore, Felix A.; and Lada, Christopher O., 4,162,067, Cl. 271-177.000.

Laird, James C.; and Tomlin, Robert L., to Bendix Corporation. The Conditioning assembly for continuous stack monitoring. 4,161,883, Cl. 73-421.50A.

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Lamb, George D. Method and apparatus for filling down garments. 4,161,970, Cl. 141-114.000.

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Kinney, Philip C.; Heilman, Marlin S.; and Langer, Alois A., 4,161,952, Cl. 128-786.000.

Larsen, Lawrence E.: See—  
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Larsen, Theodore E.; and Celt, James M., to Detector Electronics Corporation. Ultraviolet detection tube quenching circuitry. 4,162,425, Cl. 315-150.000.

Larson, Curtis A.: See—  
Bothun, Maynard E.; Larson, Curtis A.; Lightner, Gayland E.; and Wilson, David R., 4,162,007, Cl. 206-444.000.

Larson, Ivar W.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.

Lavelle Aircraft Company: See—  
Barnes, Robert W., 4,161,870, Cl. 70-278.000.

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Laves, Hans-Georg, 4,162,306, Cl. 424-125.000.

Laves, Hans-Georg, to Laves-Arzneimittel G.m.b.H. & Co. K.G. Medicine for treating diarrhea. 4,162,306, Cl. 424-125.000.

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- Thilo, Peer; and Moser, Otto W., 4,162,489, Cl. 340-518.000.
- Motoren-und Turbinen-Union Munchen GmbH: See—
- Bauer, Heinrich F.; Helbling, Gerhard; and Hildebrandt, Florian, 4,161,877, Cl. 73-140.000.
- Motorola, Inc.: See—
- Dydyk, Michael; and Tuzzolino, Joseph R., 4,162,458, Cl. 331-56.000.
- Moulds, Gordon M., to Du Pont de Nemours, E. I., and Company. Flame-resistant fiber. 4,162,275, Cl. 525-428.000.



MRC Corporation: See—

Carpenter, David A., 4,161,876, Cl. 73-65.000.

Muckerheide, Myron C. Laser system and method and laser amplifier for use therewith. 4,161,944, Cl. 128-654.000.

Mueller Co.: See—

Ellis, Daniel A., 4,162,058, Cl. 251-326.000.

Muennich, Hermann; and Kispert, Klaus, to SKF Kugellagerfabriken GmbH. Bonded guide rim in a race for a rolling bearing. 4,162,109, Cl. 308-216.000.

Muller, Wolfgang; Witke, Lothar; and Gottfried, Werner, to Th. Goldschmidt AG. Liquid-liquid extraction of nickel. 4,162,296, Cl. 423-139.000.

Muller, Wolfgang: See—

Witzke, Lothar; and Muller, Wolfgang, 4,162,294, Cl. 423-24.000.

Mulvey, Robert F.; and Crepeau, Charles E., to General Electric Company. Thermal insulation material and process for making the same. 4,161,855, Cl. 52-612.000.

Munakata, Toshio: See—

Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,162,315, Cl. 424-250.000.

Munkberg, John A., to Minnesota Mining and Manufacturing Company. Remote control system for traffic signal control system. 4,162,477, Cl. 340-32.000.

Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, to Nippon Shinyaku Co., Ltd. Substituted N-(carboxymethyl)-3-aminopropan-2-ol derivatives. 4,162,331, Cl. 424-324.000.

Murata Manufacturing Co., Ltd.: See—

Kobayashi, Takashi; and Nakamura, Toshikazu, 4,162,395, Cl. 219-367.000.

Musillo, Pasquale. Cover assembly for open boxes of vehicles. 4,162,100, Cl. 296-100.000.

Myatt, John: See—

Brown, Michael H.; and Myatt, John, 4,162,369, Cl. 136-202.000.

Myers, Richard L.: See—

Fite, Wade L.; Myers, Richard L.; and Brackmann, Richard T., 4,162,404, Cl. 250-423.00R.

Nadj, Henriette: See—

Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,162,194, Cl. 435-15.000.

Naegeli, Peter: See—

Helminger, Daniel; and Naegeli, Peter, 4,162,266, Cl. 260-586.00F.

Naffziger, Dewein H., to Advance Achievement Systems, Inc.; and Wisconsin Centrifugal Inc. Process for melting cast iron borings. 4,162,156, Cl. 75-12.000.

Nagura, Nobuyoshi: See—

Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, 4,161,919, Cl. 112-275.000.

Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, 4,161,920, Cl. 112-275.000.

Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, 4,161,921, Cl. 112-275.000.

Naidich, Iosif P.: See—

Miropolsky, Mark U.; Maizlik, David L.; Dobrovolsky, Anatoly A.; Gerasimovich, Igor K.; Levinson, Ariel S.; Naidich, Iosif P.; Menkh, Georgy A.; and Yasminov, Alexandr A., 4,162,219, Cl. 210-108.000.

Nakagaki, Shoji: See—

Ogata, Eiji; Ono, Koji; and Nakagaki, Shoji, 4,162,270, Cl. 260-607.0AR.

Nakagawa, Yasuo; and Hamada, Toshimitsu, to Hitachi, Ltd. Surface detect test apparatus. 4,162,126, Cl. 356-237.000.

Nakamura, Hideo: See—

Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 4,162,316, Cl. 424-250.000.

Nakamura, Masato; Nomura, Yoshika; and Katori, Tamio, to Honshu Seishi Kabushiki Kaisha. Process for producing pulp. 4,162,188, Cl. 162-76.000.

Nakamura, Toshikazu: See—

Kobayashi, Takashi; and Nakamura, Toshikazu, 4,162,395, Cl. 219-367.000.

Nakamura, Yasuharu: See—

Shimamura, Isao; and Nakamura, Yasuharu, 4,162,161, Cl. 96-59.000.

Nakamura, Zenzo: See—

Tsunekawa, Tokuchi; Nakamura, Zenzo; Okubo, Osamu; and Uchiyama, Takashi, 4,162,426, Cl. 315-151.000.

Nakano, Jiro: See—

Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,161,929, Cl. 123-119.00A.

Nakano, Kenichi: See—

Eden, Richard C.; and Nakano, Kenichi, 4,162,203, Cl. 204-38.00R.

Nakatsuka, Hisayoshi, to Namiki Precision Jewel Co., Ltd. Tone arm. 4,162,076, Cl. 274-23.00R.

Nakazawa, Koji; Kikuchi, Toshiaki; and Fujita, Toshihito, to Nitto Boseki Co., Ltd. Apparatus for manufacturing a glass fiber chopped strand mat. 4,161,897, Cl. 83-73.000.

Nakazawa, Makoto: See—

Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,162,315, Cl. 424-250.000.

Naletov, Anatoly S.: See—

Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; Nenakhov, Jury Y.; and Sokolov, Evgeny A., 4,162,159, Cl. 75-130.00R.

Namiki Precision Jewel Co., Ltd.: See—

Nakatsuka, Hisayoshi, 4,162,076, Cl. 274-23.00R.

Nara, Takashi; Okachi, Ryo; Kawamoto, Isao; Sato, Tomoyasu; and Oka, Tetsuo, to Abbott Laboratories. Antibiotic XK-99 and process for production thereof. 4,162,305, Cl. 424-120.000.

National Appliance Company: See—

Folsom, Max H.; and Dickman, Michael D., 4,162,196, Cl. 435-313.000.

Natsuka, Kagayaki: See—

Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 4,162,316, Cl. 424-250.000.

Naylor, Donald B. Invertible prefabricated door. 4,161,845, Cl. 49-380.000.

Nedyalkov, Ivan P.; Kanchev, Kancho T.; and Trenkov, Svetoslav R., to CUV "Progress". Device for converting the energy of sea water. 4,162,409, Cl. 290-53.000.

Nelson, Richard L.; and Nelson, Walter P., to Mars Incorporated. Method and apparatus for making filled food product. 4,162,333, Cl. 426-283.000.

Nelson, Walter P.: See—

Nelson, Richard L.; and Nelson, Walter P., 4,162,333, Cl. 426-283.000.

Nelson, Wayne F.: See—

Fournier, Onazip J.; and Nelson, Wayne F., 4,161,985, Cl. 166-321.000.

Nenakhov, Jury Y.: See—

Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; Nenakhov, Jury Y.; and Sokolov, Evgeny A., 4,162,159, Cl. 75-130.00R.

Neptune Eastech, Inc.: See—

Fussell, Theodore J., Jr., 4,161,878, Cl. 73-194.0VS.

New Asian Corporation: See—

Whang, Uoo S., 4,161,847, Cl. 51-33.00W.

Newell, Robert H.: See—

Doss, James D.; Cowan, Robert E.; Newell, Robert H.; and McCabe, Charles W., 4,161,950, Cl. 128-303.140.

Neyraud, Rene, to Verdol, SA. Method to connect two string-like members. 4,161,969, Cl. 139-90.000.

NGK Insulators, Ltd.: See—

Tanabashi, Isao, 4,162,285, Cl. 264-66.000.

Nickell, Larry C.; and McCormack, John L., to Appalachian Electronic Instruments, Inc. Automobile burglar alarm with battery voltage sensing means. 4,162,479, Cl. 340-63.000.

Nicolet, Rene; and Schaefer, Robert, to Lonza Ltd. Process for the production of transparent polymers of vinyl chloride with very high impact strength. 4,162,239, Cl. 260-29.7UP.

Nicolson, Ian T.: See—

Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., 4,162,288, Cl. 264-75.000.

Niemeyer, Lutz: See—

De Bruyne, Patrick; and Niemeyer, Lutz, 4,162,514, Cl. 361-2.000.

Nihon Beru-Haueru Kabushiki Kaisha: See—

Isono, Tadao, 4,162,123, Cl. 354-29.000.

Nihon Vending Machine Co., Ltd.: See—

Kusui, Shoji; and Kitagawa, Kazuo, 4,162,530, Cl. 364-464.000.

Nijman, John P.; and Boutros, Kamal S., to Bunker Ramo Corporation. Coaxial switch with magnetic locking. 4,162,469, Cl. 335-186.000.

Nikolaeva, Valentina G.: See—

Razumov, Alexandr I.; Tarasova, Raisa I.; Nikolaeva, Valentina G.; and Yafarova, Rimma L., 4,162,264, Cl. 260-558.00H.

Niles Parts Co., Ltd.: See—

Kawaki, Katsumi; and Inabe, Shinya, 4,162,418, Cl. 310-49.00R.

Nippon Electric Co., Ltd.: See—

Yanagisawa, Masahiro; and Suganuma, Yoji, 4,162,350, Cl. 428-633.000.

Nippon Hoso Kyokai: See—

Kamegaya, Takeo; Yokozawa, Minoru; Kaneko, Ryuichi; and Matsuzaki, Hideomi, 4,162,427, Cl. 315-169.100.

Nippon Kogaku K. K.: See—

Matsui, Sei, 4,162,498, Cl. 354-155.000.

Nippon Shinyaku Co., Ltd.: See—

Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,162,331, Cl. 424-324.000.

Nippondenso Co., Ltd.: See—

Takabatake, Yoshinobu, 4,162,414, Cl. 310-68.00R.

Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, to Aisin Seiki Co., Ltd. Motor control system for sewing machine. 4,161,919, Cl. 112-275.000.

Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, to Aisin Seiki Co., Ltd. Motor control system for one stitch sewing control of a sewing machine. 4,161,920, Cl. 112-275.000.

Nishida, Koji; Kawai, Taneichi; Hamajima, Shigemitsu; Nagura, Nobuyoshi; and Hida, Tsuneo, to Aisin Seiki Co., Ltd. Motor control system for sewing machine. 4,161,921, Cl. 112-275.000.

Nishida, Yasukuni: See—

Higo, Moriaki; Toda, Haruhiko; Suzuki, Kunitomo; and Nishida, Yasukuni, 4,162,258, Cl. 260-348.110.

Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, to Dainippon

Pharmaceutical Co., Ltd. 1-Substituted-4-(1,2-diphenylethyl)piperazine derivatives and compositions containing the same. 4,162,316, Cl. 424-250.000.

Nissan Motor Company, Limited: See—

Inamoto, Hiroshi; and Morita, Yoshinori, 4,161,851, Cl. 52-208.000.

Shimizu, Kazuaki, 4,162,108, Cl. 303-115.000.

Nissen Corporation: See—

Nissen, George P.; and Kelly, Harlan J., 4,162,063, Cl. 267-73.000.

Nissen, George P.; and Kelly, Harlan J., to Nissen Corporation. Adjustable springs for trampolines and the like. 4,162,063, Cl. 267-73.000.

Nisshin Sangyo Co., Ltd.: See—

Ota, Hiroshi, 4,161,905, Cl. 91-363.00R.

Nitto Boseki Co., Ltd.: See—

Nakazawa, Koji; Kikuchi, Toshiaki; and Fujita, Toshihito, 4,161,897, Cl. 83-73.000.

Nixdorf Computer AG: See—

Hanewinkel, Lorenz, 4,162,519, Cl. 364-200.000.

Nogier, Paul. Needle implanting apparatus. 4,161,943, Cl. 128-1.300.

Noguchi, Kohji: See—

Miyake, Tetsuya; Noguchi, Kohji; and Fujimoto, Kohichi, 4,162,268, Cl. 260-592.000.

Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation control system for an internal combustion engine. 4,161,929, Cl. 123-119.00A.

Nomura, Yoshika: See—

Nakamura, Masato; Nomura, Yoshika; and Katori, Tamio, 4,162,188, Cl. 162-76.000.

Nordmeyer, Friedrich: See—

Sack, Ernst T.; Nordmeyer, Friedrich; and Kersting, Emil F., 4,161,885, Cl. 73-597.000.

Norman, Thomas W. Self-storing step structure for vehicular mounting. 4,161,997, Cl. 182-93.000.

Norris, Patrick H. Hollow pyramid containing indicia-bearing spheres. 4,162,073, Cl. 273-144.00B.

Northern Telecom Limited: See—

Ciello, Paolo; and Westwood, William D., 4,162,502, Cl. 346-140.00R.

Norton, Richard V., to Suntech, Inc. Honeycomb insulation structure. 4,162,341, Cl. 428-117.000.

Nosach, Vladimir M.: See—

Bazilevich, Gennady S.; Gorin, Alexandr F.; Lozinsky, Vladimir N.; Lysenko, Vladimir I.; Nosach, Vladimir M.; Solod, Grigory I.; and Sterinatz, Yakov M., 4,162,107, Cl. 303-3.000.

Noyon, Gustave M., to Societe Internationale d'Investissements et de Participations par abreviation INTERPAR. Granular or pulverulent product storing and handling installation. 4,162,017, Cl. 414-313.000.

Nudenberg, Walter: See—

Rim, Yong S.; and Nudenberg, Walter, 4,162,276, Cl. 525-2.000.

Nuovo Pignone S.p.A.: See—

Bergamini, Giorgio, 4,161,832, Cl. 40-451.000.

Nyer, Evan K., to Union Carbide Corporation. Process for removal of suspended solids from liquid. 4,162,216, Cl. 210-73.00R.

Nyssen, James. Method and apparatus for the manufacture of reinforced smooth flow pipe. 4,161,811, Cl. 29-429.000.

Ogata, Eiji; Ono, Koji; and Nakagaki, Shoji, to Konishi Chemical Industry Co., Ltd. Process for producing 4,4'-dihydroxydiphenylsulfone of high purity. 4,162,270, Cl. 260-607.0AR.

Ogden, Dennis H.; and Smith, Frank G., to British Industrial Plastics Limited. Foam products. 4,162,128, Cl. 366-154.000.

Ohata, Katsuya: See—

Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,162,331, Cl. 424-324.000.

Ohno, Nobuo: See—

Mizutani, Masato; Higo, Akio; Ohno, Nobuo; and Hirai, Hajime, 4,162,269, Cl. 260-600.00R.

Ohtomo, Nobuya: See—

Mizuno, Kyosuke; Miyanojima, Atsushi; Ishihara, Yoshimitsu; and Ohtomo, Nobuya, 4,162,192, Cl. 435-239.000.

Oka, Tetsuo: See—

Nara, Takashi; Okachi, Ryo; Kawamoto, Isao; Sato, Tomoyasu; and Oka, Tetsuo, 4,162,305, Cl. 424-120.000.

Okachi, Ryo: See—

Nara, Takashi; Okachi, Ryo; Kawamoto, Isao; Sato, Tomoyasu; and Oka, Tetsuo, 4,162,305, Cl. 424-120.000.

Okada, Masaru: See—

Shimdada, Wataru; Machida, Kazumichi; Hoshinouchi, Susumu; Hiramoto, Seigo; and Okada, Masaru, 4,162,389, Cl. 219-121.00P.

Okazaki, Hiroyuki: See—

Juzu, Shigeru; Okazaki, Hiroyuki; and Suzuki, Yasuyuki, 4,162,348, Cl. 428-474.000.

Okinaka, Yutaka: See—

D'Asaro, Lucian A.; and Okinaka, Yutaka, 4,162,337, Cl. 427-92.000.

Okubo, Osamu: See—

Tsunekawa, Tokuchi; Nakamura, Zenzo; Okubo, Osamu; and Uchiyama, Takashi, 4,162,426, Cl. 315-151.000.

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Weninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including data format display control means. 4,162,532, Cl. 364-710.000.

Olin Corporation: See—

Kuo, Han C., 4,162,204, Cl. 204-43.00R.

Oliver, Richard L.: See—

Rasmussen, Jerome J. M.; Waldman, Richard C.; and Oliver, Richard L., 4,161,968, Cl. 138-118.100.

Olsen, Svein E. Noise immune voltage comparator. 4,162,454, Cl. 328-147.000.

Omark Industries, Inc.: See—

Pomeroy, Raymond V., 4,162,033, Cl. 227-10.000.

Ono, Koji: See—

Ogata, Eiji; Ono, Koji; and Nakagaki, Shoji, 4,162,270, Cl. 260-607.0AR.

Osaka, Susumu: See—

Toda, Minoru; Osaka, Susumu; and Matsumoto, Yasushi, 4,162,511, Cl. 358-128.000.

Osder, Stephen S., to Sperry Rand Corporation. Dual servo automatic pilot with improved failure monitoring. 4,162,438, Cl. 318-564.000.

Ota, Hiroshi, to Nisshin Sangyo Co., Ltd. Hydraulic servomechanism. 4,161,905, Cl. 91-363.00R.

Ozaki, Takayuki: See—

Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,162,331, Cl. 424-324.000.

P. R. Mallory &amp; Co. Inc.: See—

Dey, Arabinda N., 4,162,202, Cl. 204-2.100.

Packaging Systems Corporation: See—

Hovsepian, Charles J., 4,162,010, Cl. 206-823.000.

Padmore &amp; Barnes International Limited: See—

Roberts, Patrick J.; Hogan, Kevin P.; and Kealy, Thomas, 4,161,827, Cl. 36-11.000.

Pako Corporation: See—

Strunc, Gerald R., 4,161,899, Cl. 83-371.000.

Paleveda, William J.: See—

Strachan, Robert G.; Paleveda, William J.; Veber, Daniel F



Peters, Karl-Heinz: See—  
Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, 4,162,061, Cl. 266-193.000.

Peters, Klaus-Jürgen: See—  
Knapp, Heinrich; Greiner, Max; Peters, Klaus-Jürgen; and Jaggle, Gunther, 4,161,961, Cl. 137-501.000.

Peterson, Brent A.: See—  
Peterson, Lyle R.; and Peterson, Brent A., 4,161,850, Cl. 52-65.000.

Peterson, Lyle R.; and Peterson, Brent A.: Room divider, 4,161,850, Cl. 52-65.000.

Petro, James, to Westinghouse Electric Corp. Molten glass metering device for making lamp bases, 4,162,152, Cl. 65-164.000.

Pfahler, Gerhard: See—  
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,162,247, Cl. 260-45.9NC.

Pfizer Inc.: See—  
Acheson, Richard M.; Cox, Ian R.; Stubbs, John K.; and Penrose, Alexander B., 4,162,253, Cl. 260-306.70T.

Phelps, Paul S., to Star Sales Company. Folding pocket knife having replaceable blades, 4,161,818, Cl. 30-157.000.

Phillips Petroleum Company: See—  
Alleman, Carl E., 4,162,145, Cl. 55-32.000.

Grason, James T.; and Williams, Ralph P., 4,162,223, Cl. 252-33.200.

Gunnell, Thomas J.; and Hann, Paul D., 4,162,286, Cl. 264-117.000.

Gunnell, Thomas J.; and Hann, Paul D., 4,162,287, Cl. 264-117.000.

Skraba, Frank W., 4,162,273, Cl. 585-834.000.

Stapp, Paul R., 4,162,363, Cl. 560-246.000.

Thomas, William E., 4,162,004, Cl. 206-349.000.

Vautrain, Lucien H., 4,162,272, Cl. 62-24.000.

Worley, Nathan T., 4,161,805, Cl. 19-98.000.

Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, to Beckman Instruments, Inc. Kinetic assay for acid phosphatase and composition therefore, 4,162,194, Cl. 435-15.000.

Pietrantonio, Frank. Glass cutter, 4,161,819, Cl. 30-164.950.

Pinsky, Jules: See—  
Wilcox, Forrest S.; Pinsky, Jules; and Cooper, Scott A., 4,162,343, Cl. 428-212.000.

Pitrat, Alain, to Societe Anonyme des Equipements S.E.I.M. Safety-type dashboard control for choke or the like, 4,161,993, Cl. 180-90.000.

Pitts, Robert W., Jr., to Texaco Inc. Fiber optic well logging means and method, 4,162,400, Cl. 250-256.000.

Pittwood, Donald G.: See—  
Bernardo, Edward T.; Faure, Louis H.; Johnson, Alfred H.; and Pittwood, Donald G., 4,161,817, Cl. 29-630.00B.

Plaettner, Rolf: See—  
Kruehler, Wolfgang; and Plaettner, Rolf, 4,162,184, Cl. 156-621.000.

Plessey Handel und Investments AG: See—  
Butler, Denis V., 4,162,209, Cl. 204-192.00C.

Pohlke, Rolf: See—  
Seubert, Jürgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,162,319, Cl. 424-250.000.

Pohlmann, Gottfried; and Schneider, Egon, to Blaupunkt-Werke GmbH. Loudspeaker housing forming a closed, damped system, particularly for automotive installation, 4,161,995, Cl. 181-150.000.

Polaroid Corporation: See—  
Land, Edwin H.; and Kinsman, Gordon F., 4,161,815, Cl. 29-623.400.

Pomeroy, Raymond V., to Omark Industries, Inc. Powder actuated tool, 4,162,033, Cl. 227-10.000.

Potma, Theodorus H.; and Tomassen, Gerhardus T. H., to U.S. Philips Corporation. Printing head with taut wire electrodes, 4,162,503, Cl. 346-163.000.

PPG Industries, Inc.: See—  
Crico, Aurelio M., 4,162,201, Cl. 203-67.000.

Pretzel, Dieter: See—  
Dubiel, Oswald; and Pretzel, Dieter, 4,162,002, Cl. 192-99.00A.

Prill, Robert S., to Singer Company, The. Updating an en-route Tacan navigation system to a precision landing aid, 4,162,495, Cl. 343-7.300.

Probst, Karl: See—  
Schafer, Anton; and Probst, Karl, 4,161,911, Cl. 100-96.000.

Production Engineering Research Association of Great Britain, The: See—  
Beard, James H.; Lea, Cyril; and Ludwig, Bernard W., 4,161,810, Cl. 29-427.000.

Proeschl, Bernard E., to Caterpillar Tractor Co. Modular truck body, 4,162,096, Cl. 296-196.000.

Proizvodstvennoe obiedinenie "Tekhnenergokhimprom": See—  
Miropolsky, Mark U.; Maizlik, David L.; Dobrovolsky, Anatoly A.; Gerasimovich, Igor K.; Levinson, Ariel S.; Naidich, Iosif P.; Menkh, Georgy A.; and Yasminov, Alexandr A., 4,162,219, Cl. 210-108.000.

Propst, Paul L.: See—  
Propst, Robert L.; and Propst, Paul L., 4,161,803, Cl. 16-18.00A.

Propst, Robert L.; and Propst, Paul L.: Caster, 4,161,803, Cl. 16-18.00A.

Prosky, Howard S., to Electromedics, Inc. Linearized digital thermometer, 4,161,880, Cl. 73-342.000.

Pujol, Carlos O. Horizontal-axle grinder with rotatable sieve, 4,162,046, Cl. 241-46.170.

Pullman Incorporated: See—  
Crawford, Duffer B.; Becker, Colman L.; and LeBlanc, Joseph R., 4,162,290, Cl. 422-190.000.

Marsh, Ronald W., 4,161,914, Cl. 105-344.000.

Pulsepower Systems, Incorporated: See—  
Groen, William; and Elmore, Lester C., 4,161,904, Cl. 89-7.000.

Puma-Sportschuhfabriken Rudolf Dassler KG: See—  
Benseler, Hans; and Schaefer, Horst, 4,161,828, Cl. 36-32.00R.

Purolator: See—  
Servas, Francis M., 4,162,220, Cl. 210-448.000.

Putt, Ronald A.; and Montgomery, Mark J., to Electric Power Research Institute, Inc. Metal-halogen cell operation with storage of halogen via organic complexation external to the electrochemical cell, 4,162,351, Cl. 429-15.000.

Qasim, Javed, to Aerojet-General Corporation. Linear retractable seal valve, 4,162,057, Cl. 251-168.000.

Quest, Roland G. Boat ramp, 4,161,795, Cl. 9-1.600.

Quinlan, Kenneth P.: See—  
Hutta, Joseph J.; and Quinlan, Kenneth P., 4,161,826, Cl. 34-12.000.

R & I Patent Corporation: See—  
Gubelmann, William S.; deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,162,130, Cl. 400-4.000.

Rabinovich, Georgy L.: See—  
Maslyansky, Gdal N.; Rabinovich, Georgy L.; Treiger, Leonid M.; Gokhman, Boris K.; and Seleznev, Viktor D., 4,162,214, Cl. 585-471.000.

Rachiatore, Felix A.: See—  
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Ross, John; and Sala-Spini, Amedeo F., 4,162,493, Cl. 340-752.000.

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RCA Corporation: See—  
Beyers, Billy W., Jr.; and Suchko, Adam J., 4,162,513, Cl. 358-191.000.

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Morrell, Albert M., 4,162,421, Cl. 313-403.000.

Smith, Joseph L., 4,162,470, Cl. 335-210.000.

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DuVall, Dale R., 4,162,481, Cl. 340-146.3AG.

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Reed, Robert D., to John Zink Company. NOx abatement in burning of gaseous or liquid fuels, 4,162,140, Cl. 431-284.000.

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Arnold, Fred E.; Reinhardt, Bruce A.; and Hedberg, Frederick L., 4,162,265, Cl. 260-578.000.

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Restle, Donald J. Picture mounting and display, 4,161,831, Cl. 40-160.000.

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Cellerini, Albert R.; Ricci, Louis N.; and Rexroad, James O., 4,162,467, Cl. 335-16.000.

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Brooks, Carson L.; Carson, John W.; and Culbreth, Garland T., 4,161,978, Cl. 164-49.000.

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Ricoh Co., Ltd.: See—  
Abe, Takeshi; Tsuchiya, Keishin; Saito, Kazuhito; Mizuta, To-shiaki; and Yoshihara, Ichiro, 4,162,484, Cl. 340-150.000.

Ridge, George W.: See—  
Storm, Donald P.; and Ridge, George W., 4,161,859, Cl. 56-364.000.

Ridgway, H. C., to Telco Industries, Inc. Rotary sprinkler impact arm spring adjustment, 4,162,038, Cl. 239-206.000.

Riebel, Hans-Jochem: See—  
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,162,310, Cl. 424-200.000.

Riha, Jerry, to Elder, Robert K. Gap setting means, 4,161,824, Cl. 33-180.0AT.

Rim, Yong S.; and Nudenberg, Walter, to Uniroyal, Inc. Nonburning, non-dripping polyurethane compositions, 4,162,276, Cl. 525-2.000.

Rinsler, Samuel J.: See—  
Weck, Friedrich J.; Hunkins, James; and Rinsler, Samuel J., 4,162,339, Cl. 428-43.000.

Rixson-Firemark, Inc.: See—  
D'Hooge, Richard E.; and Pasek, Frank S., 4,161,804, Cl. 16-48.500.

Robert Bosch GmbH: See—  
Eblen, Ewald; and Hofmann, Karl, 4,162,043, Cl. 239-533.300.

Eckert, Konrad; Holzbaur, Siegfried; Wessel, Wolf; and Grieshaber, Hermann, 4,161,935, Cl. 123-139.0AW.

Greiner, Max; and Temmen, Bernhard, 4,161,964, Cl. 138-26.000.

Holzbaur, Siegfried, 4,161,932, Cl. 123-139.0AW.

Knapp, Heinrich; Greiner, Max; Peters, Klaus-Jürgen; and Jaggle, Gunther, 4,161,961, Cl. 137-501.000.

Stump, Gerhard, 4,161,933, Cl. 123-139.0AW.

Stump, Gerhard, 4,161,934, Cl. 123-139.0AW.

Zabler, Erich; Gassmann, Heiner; Schneider, Steffen; and Straub, Steffen, 4,162,083, Cl. 280-703.000.

Zillgitt, Ulrich; Kuhn, Wolfgang; and Doll, Gunther, 4,162,424, Cl. 315-82.000.

Roberts, Patrick J.; Hogan, Kevin P.; and Kealy, Thomas, to Padmore & Barnes International Limited. Articles of footwear, 4,161,827, Cl. 36-11.000.

Robertson, Kenneth D., to United States of America, Army. Non-contact velocimeter using arrays, 4,162,509, Cl. 356-28.000.

Robinson, Mark L., to Acro, Inc. Method of string attaching to game racket handle, 4,161,813, Cl. 29-460.000.

Robles, Enrique C., to Lever Brothers Company. Process for preparing colored detergent flakes, 4,162,228, Cl. 252-90.000.

Robusch, Gunter: See—  
Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, 4,162,061, Cl. 266-193.000.

Rockwell International Corporation: See—  
Downen, David N.; and Eichenberger, Bert A., 4,162,496, Cl. 343-18.00A.

Rode, France; Lindes, Peter; Eschenbach, Ralph F.; and Fazarinc, Zvonko A., to Hewlett-Packard Company. Method and apparatus for programmable and remote numeric control and calibration of electronic instrumentation, 4,162,531, Cl. 364-571.000.

Rodgers, Gregg S., to Tuscan Corporation. Peak level detector, 4,162,444, Cl. 324-103.00P.

Rodriguez, Ludovic; and Marchal, Lucien, to UCB, Societe Anonyme. N-substituted lactams, 4,162,325, Cl. 424-274.000.

Rogala, John: See—  
Clark, Carl A.; and Rogala, John, 4,162,133, Cl. 405-258.000.

Roger, Pierre: See—  
Malen, Charles; Roger, Pierre; and Pascaud, Xavier, 4,162,322, Cl. 424-267.000.

Rollei-Werke Franke & Heidecke: See—  
Schneider, Arthur, 4,162,439, Cl. 320-40.000.

Rolls-Royce Limited: See—  
Jubb, Albert, 4,161,917, Cl. 110-263.000.

Parkes, Roger J., 4,162,136, Cl. 416-97.00R.

Rones, James M., to American Manufacturing Company. Porous resin impregnated stratified fiber flexible sheet backed mat and process of forming the same, 4,162,344, Cl. 428-212.000.

Rooymans, Joannes A., to Ballast-Nedam Groep N.V. Method and device for loosening stony soil, 4,162,102, Cl. 299-10.000.

Rosen, Arye: See—  
Mawhinney, Daniel D.; Wolkstein, Herbert J.; Rosen, Arye; and Turski, Zygmund, 4,162,412, Cl. 307-237.000.

Rosen, Irving: See—  
Li, George S.; and Rosen, Irving, 4,162,277, Cl. 525-146.000.

Rosenkranz, Hans J., to Bayer Aktiengesellschaft. Crosslinkable urethane resins containing vinyl and carboxyl groups, 4,162,274, Cl. 528-75.000.

Ross, John; and Sala-Spini, Amedeo F., to Random Electronics International Pty. Limited. Graphic display systems, 4,162,493, Cl. 340-752.000.

Royal Industries, Inc.: See—  
Scribner, Frank F., 4,162,097, Cl. 296-190.000.

Rudolph, Ralph G., to United States Steel Corporation. Duration range determination of incursions by a variable signal, 4,162,453, Cl. 328-111.000.

Ruger, Herbert, to Siemens Aktiengesellschaft. Cooling capsule for thyristors, 4,161,980, Cl. 165-168.000.

Runyan, Walter W.: See—  
Papa, Anthony J.; and Runyan, Walter W., 4,162,353, Cl. 521-107.000.

Ruscigno, Harry G. Detonator assembly, 4,161,797, Cl. 9-316.000.

Russell, Homer C.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.

Rybczynski, Jerzy: See—  
Bartos, Dezzo I.; and Rybczynski, Jerzy, 4,162,003, Cl. 206-219.000.

Ryobi Ltd.: See—  
Sasaki, Kounin, 4,162,048, Cl. 242-84.20G.

Rzhevskaya, Galina F.: See—  
Razumov, Alexandr I.; Zaikonnikova, Irina V.; Chudnovsky, Vladimir S.; Rzhetskaya, Galina F.; Tarasova, Raisa I.; Bljukherova, Nina A.; Yafarova, Rimma L.; Avrutsky, Grigory Y.; Belikov, Vladimir G.; and Litvinenko, Anatoly V., 4,162,311, Cl. 424-211.000.

S.W.I.S., Inc.: See—  
Wallis, David W.; and Stewart, William H., 4,162,461, Cl. 333-174.000.

Sack, Ernst T.; Nordmeyer, Friedrich; and Kersting, Emil F., to Sack GmbH. Measuring apparatus for measuring the roll gap in gauge-controlled roll stands, 4,161,885, Cl. 73-597.000.

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Sack, Ernst T.; Nordmeyer, Friedrich; and Kersting, Emil F., 4,161,885, Cl. 73-597.000.

Saito, Kazuhito: See—  
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoi-chi; Machara, Mitsuhiro; Saito, Kazuhito; and Ozaki, Takayuki, 4,162,331, Cl. 424-324.000.

Saito, Kazuhito: See—  
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Sakaue, Tatsuo; and Iwasawa, Mineo, to Tokyo Shibaura Electric Co., Ltd. Charge transfer analog processing apparatus for serial-to-parallel conversion, 4,162,411, Cl. 307-221.00D.

Sala-Spini, Amedeo F.: See—  
Ross, John; and Sala-Spini, Amedeo F., 4,162,493, Cl. 340-752.000.

Salt, Kenneth J.; and Wintle, Colin A., to United Kingdom Atomic Energy Authority. Temperature sensors, 4,162,175, Cl. 136-233.000.

Sanders, Frederick W.: See—  
Smith, Glen C.; and Sanders, Frederick W., 4,162,187, Cl. 162-29.000.

Sanders, Murray J. Potency and atoxicity test for modified neurotoxin, 4,162,303, Cl. 424-9.000.

Sandoz, Inc.: See—  
Houlihan, William J., 4,162,317, Cl. 424-250.000.

Sangamo Weston, Inc.: See—  
Becker, Dale F., 4,162,516, Cl. 361-372.000.

Sankyo Company Limited: See—  
Hiraoka, Tetsuo; and Kobayashi, Takeo, 4,162,251, Cl. 260-239.100.

Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kururadai, Tomoyuki, 4,162,246, Cl. 260-45.8NT.

Sano, Shiochi, to Honda Giken Kogyo Kabushiki Kaisha. Wheel suspension apparatus for a vehicle, 4,162,091, Cl. 280-702.000.

Sato, Tomoyasu: See—  
Nara, Takashi; Okachi, Ryo; Kawamoto, Isao; Sato, Tomoyasu; and Oka, Tetsuo, 4,162,305, Cl. 424-120.000.

Sauvain, Roger: See—  
Voumard, Hugues; and Sauvain, Roger, 4,161,849, Cl. 51-215.0CP.

Sasaki, Kounin, to Ryobi Ltd. Spinning reel with adjustable bail arm return spring, 4,162,048, Cl. 242-84.20G.

Scanlan, Dennis R., Jr., to Scanlan International, Inc. Needle driver, 4,161,951, Cl. 128-340.000.

Scanlan International, Inc.: See—  
Scanlan, Dennis R., Jr., 4,161,951, Cl. 128-340.000.

Scapa-Porritt Limited: See—  
Ashworth, Gordon, 4,162,190, Cl. 162-359.000.

Schaber, Manfred O.: See—  
Gass, Albert E.; Gottshall, Harry W.; Schaber, Manfred O.; and Trombino, Lawrence, 4,162,526, Cl. 364-200.000.

Schaefer, Horst: See—  
Benseler, Hans; and Schaefer, Horst, 4,161,828, Cl. 36-32.00R.

Schaefer, Robert: See—  
Nicolet, Rene; and Schaefer, Robert, 4,162,239, Cl. 260-29.7UP.

Schaefer, Anton; and Probst, Karl, to Lindemann Maschinenfabrik GmbH. Presses for baling waste materials, 4,161,911, Cl. 100-96.000.

Schafer, Herbert: See—  
Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, 4,162,061, Cl. 266-193.000.

Schalch, Fred, to Fael S.A. Transport device for an electrical resistance welding machine, 4,162,382, Cl. 219-64.000.

Scharfman, Howard, to Raytheon Company. Magnetron tuning circuit, 4,162,459, Cl. 331-90.000.

Schatz, Friedrich: See—  
Scheffler, Ernst; Schatz, Friedrich; and Ziemek, Gerhard, 4,161,966, Cl. 138-112.000.

Schaubert, Daniel H.: See—  
Jones, Howard S., Jr.; Farrar, Frederick G.; and Schaubert, Daniel H., 4,162,499, Cl. 343-700.0MS.

Scheele, Randall D.: See—  
Burger, Leland L.; and Scheele, Randall D., 4,162,206, Cl. 204-94.000.



Scheffler, Ernst; Schatz, Friedrich; and Ziemek, Gerhard, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Spacer for coaxial tube systems. 4,161,966, Cl. 138-112.000.

Scherer, Richard M., to Chambers Corporation. Oven liner suspension assembly. 4,161,939, Cl. 126-19.00R.

Schievelbein, Vernon H.; Kudchadker, Mohan V.; Varnon, James E.; and Whittington, Lawrence E., to Texaco Inc. High conformance enhanced oil recovery process. 4,161,982, Cl. 166-269.000.

Schievelbein, Vernon H., to Texaco Inc. High conformance oil recovery process. 4,161,983, Cl. 166-269.000.

Schintlmeister, Wilfried, to Schwarzkopf Development Corporation. Coated cemented carbide elements and their manufacture. 4,162,338, Cl. 427-249.000.

Schlichte, Max, to Siemens Aktiengesellschaft. Time-divison multiplex switching network with spatial switching stages. 4,162,375, Cl. 179-15.0AT.

Schlitt, Leland G., to United States of America, Energy. Repetitively pumped electron beam device. 4,162,432, Cl. 315-349.000.

Schmedemann, Walter. See—  
Gieschen, Kurt; and Schmedemann, Walter, 4,162,406, Cl. 250-468.000.

Schmidt, Walter, to Swiss Aluminium Ltd. Process and device for detecting inclusions in crystals. 4,162,125, Cl. 356-30.000.

Schmitt, Robert A., to Columbia Machine, Inc. Article stacker with overhead finger rake. 4,162,016, Cl. 414-85.000.

Schmitt, Wilhelm; and Schumacher, Herbert, to Carl Freudenberg, Firma. Anti skid chain. 4,161,976, Cl. 152-239.000.

Schneider, Arthur, to Rollei-Werke Franke & Heidecke. Rapid-charging circuit. 4,162,439, Cl. 320-40.000.

Schneider, Egon. See—  
Pohlmann, Gottfried; and Schneider, Egon, 4,161,995, Cl. 181-150.000.

Schneider, Heinz. See—  
Jansen, Hermann; and Schneider, Heinz, 4,161,959, Cl. 137-340.000.

Schneider, Klaus-Juergen. See—  
Stockburger, Dieter; Volkamer, Klaus; Bender, Detlef; Schneider, Klaus-Juergen; Schwenker, Harald; Wagner, Ulrich; and Weitz, Hans-Martin, 4,162,198, Cl. 203-23.000.

Schneider, Kurt. See—  
Himmele, Walter; Fischer, Karl; Kambel, Gerd; Schneider, Kurt; and Irnich, Rudolf, 4,162,200, Cl. 203-58.000.

Schneider, Steffen. See—  
Zabler, Erich; Gassmann, Heiner; Schneider, Steffen; and Straub, Steffen, 4,162,083, Cl. 280-703.000.

Schoellkopf, Ernst H., to Ironflex AG. Leakage protective apparatus for storage containers or the like. 4,161,957, Cl. 137-205.000.

Schopf, Jorg, to Schopf Maschinenbau GmbH. Motor-driven vehicle, especially for use in mining operations. 4,162,099, Cl. 296-63.000.

Schopf Maschinenbau GmbH. See—  
Schopf, Jorg, 4,162,099, Cl. 296-63.000.

Schouten, Peter, to Huyck Corporation. Means and method for packaging endless fabrics. 4,162,009, Cl. 206-389.000.

Schroder, Rolf. See—  
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,162,310, Cl. 424-200.000.

Schultz, Karl V. Adobe wall construction. 4,161,852, Cl. 52-250.000.

Schultze, Volker; and Ayasse, Paul, to Volker Schultze Elektromechanische Apparate. Ball game apparatus comprising a frame to which a mesh or fabric is attached. 4,162,072, Cl. 273-96.00R.

Schulz, Gunter. See—  
Hartmannsgruber, Max; Schulz, Gunter; Klein, Konrad; and Wolf, Horst, 4,161,862, Cl. 57-92.000.

Schumacher, Herbert. See—  
Schmitt, Wilhelm; and Schumacher, Herbert, 4,161,976, Cl. 152-239.000.

Schutt, John B., to United States of America, National Aeronautics and Space Administration. Alkali-metal silicate binders and methods of manufacture. 4,162,169, Cl. 106-74.000.

Schwab, Gerhart, to Mead Corporation, The. Process for the production of microcapsular coating compositions containing pigment particles and compositions produced thereby. 4,162,165, Cl. 106-21.000.

Schwartz, Robert B., to Fruehauf Corporation. Vehicle axle suspension assembly. 4,162,090, Cl. 280-688.000.

Schwartz, William C., to Burlington Industries, Inc. Foam coated ceiling board facing and method of making the same. 4,162,342, Cl. 428-159.000.

Schwarzkopf Development Corporation. See—  
Schintlmeister, Wilfried, 4,162,338, Cl. 427-249.000.

Schweiger, Erwin. See—  
Huber, Manfred; Kapfhammer, Karl; Schweiger, Erwin; Jochmann, Franz; and Krappel, Alfred, 4,162,478, Cl. 340-52.00F.

Schwenker, Harald. See—  
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Sciaky, Albert M., to Sciaky Bros., Inc. Sliding vacuum seal means. 4,162,391, Cl. 219-121.0EB.

Sciaky Bros., Inc. See—  
Sciaky, Albert M., 4,162,391, Cl. 219-121.0EB.

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Malen, Charles; Roger, Pierre; and Pascaud, Xavier, 4,162,322, Cl. 424-267.000.

Scribner, Frank F., to Royal Industries, Inc. Vehicle cab structure. 4,162,097, Cl. 296-190.000.

Sebens, Carl R.; and Fisher, Chester G., III, to Perkin-Elmer Corporation. The. Apparatus for deriving a feedback control signal in a thermal system. 4,162,379, Cl. 219-497.000.

Segers, Jacobus C., to Lever Brothers Company. Oil purification by adding hydratable phosphatides. 4,162,260, Cl. 260-424.000.

Seibert, Chesterfield F., to Pall Corporation. Multi-chamber adsorbent gas fractionator with non-jamming effluent flow control valve. 4,162,146, Cl. 55-163.000.

Seleznev, Viktor D. See—  
Maslyansky, Gdal N.; Rabinovich, Georgy L.; Treiger, Leonid M.; Gokhman, Boris K.; and Seleznev, Viktor D., 4,162,214, Cl. 585-471.000.

Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., to Texaco Inc. Furfural refining unit control system. 4,162,197, Cl. 196-14.520.

Servas, Francis M., to Johnson & Johnson; and Purolator. Blood filter. 4,162,220, Cl. 210-448.000.

Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, to Merck Patent Gesellschaft mit Beschränkter Haftung. Ring substituted pyrazino-isquinoline derivatives and their preparation. 4,162,319, Cl. 424-250.000.

Seubert, Jurgen. See—  
Gottschlich, Rudolf; Gericke, Rolf; Juraszyk, Horst; Seubert, Jurgen; Strehlow, Wighard; Wahlig, Helmut; Bergmann, Rolf; and Dingeldein, Elvira, 4,162,314, Cl. 424-246.000.

Severson, Asbjorn M., to Honeywell Inc. Method of fabricating a solar absorber panel. 4,161,809, Cl. 29-157.30D.

Seymour, Shaun A., to Sperry Rand Corporation. Quarter bale turning apparatus. 4,162,135, Cl. 414-780.000.

Shanley, John P. Container having slideable closure means. 4,162,024, Cl. 220-350.000.

Shapiro, Paul. See—  
Broder, Alan; Shapiro, Paul; and Yee, Seening, 4,162,474, Cl. 340-6.00R.

Sharp, James D., to MAP International. Tray for x-ray film cassettes. 4,162,407, Cl. 250-468.000.

Shaw, Edward T., to Atlantic Richfield Company. Process for the preparation of diphenylmethane dicarbamates and polymethylene polyphenyl carbamates. 4,162,362, Cl. 560-25.000.

Shibahara, Tetsuya. See—  
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,162,315, Cl. 424-250.000.

Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, to Mitsubishi Chemical Industries Limited. Agricultural fungicidal composition. 4,162,315, Cl. 424-250.000.

Shigenobu, Kouhei, to Tokyo Aircraft Instrument Co., Ltd.; and Tokyo Aircraft Instrument Co., Ltd. Turn rate indicator of aircraft using gyroscope. 4,161,884, Cl. 73-304.000.

Shimamura, Isao; and Nakamura, Yasuharu, to Fuji Photo Film Co., Ltd. Reversal color photographic process. 4,162,161, Cl. 96-59.000.

Shimdada, Wataru; Machida, Kazumichi; Hoshinouchi, Susumu; Hiramoto, Seigo; and Okada, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Welding apparatus. 4,162,389, Cl. 219-121.00P.

Shimizu, Kazuaki, to Nissan Motor Company, Limited. Hydraulic anti-skid device. 4,162,108, Cl. 303-115.000.

Shimizu, Masanao. See—  
Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 4,162,316, Cl. 424-250.000.

Shimokawa, Noriaki. See—  
Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 4,162,316, Cl. 424-250.000.

Shinshu Seiki Kabushiki Kaisha. See—  
Usui, Kiyofumi; and Kodaira, Kozo, 4,161,912, Cl. 101-99.000.

Shintani, Akira. See—  
Hino, Minoru; Yasui, Seimei; and Shintani, Akira, 4,162,240, Cl. 260-29.70B.

Shurpik, Anton. See—  
Pearson, Dale S.; and Shurpik, Anton, 4,162,354, Cl. 525-3.000.

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Deppe, Hans-Raimund, 4,162,210, Cl. 204-192.0EC.

Hebenstreit, Ernst, 4,162,539, Cl. 365-149.000.

Hirschmann, Peter; and Hoefler, Ernst, 4,162,376, Cl. 179-18.0BC.

Kruehler, Wolfgang; and Plaettner, Rolf, 4,162,184, Cl. 156-621.000.

Maringer, Albert; and Labinsky, Michael, 4,161,962, Cl. 137-557.000.

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Su, Chauchang, to Burroughs Corporation. Pre-processing and feature extraction system for character recognition. 4,162,482, Cl. 340-146.30H.

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Hino, Minoru; Yasui, Seimei; and Shintani, Akira, 4,162,240, Cl. 260-29.70B.

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Summersby, E. John. Computer tape reel handling device. 4,162,031, Cl. 224-45.00K.

Sundstrand Data Control, Inc.: See—  
Lukes, Henry J., 4,162,456, Cl. 330-69.000.

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Norton, Richard V., 4,162,341, Cl. 428-117.000.

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Facchini, Enio; and Swanson, Carl I., 4,162,485, Cl. 340-289.000.

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Schmidt, Walter, 4,162,125, Cl. 356-30.000.

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Ingber, Jack F., 4,162,373, Cl. 179-1.00C.

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Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui W., 4,162,346, Cl. 428-364.000.

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Walker, Henry V., 4,161,901, Cl. 84-115.000.

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Ridgway, H. C., 4,162,038, Cl. 239-206.000.

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Greiner, Max; and Temmen, Bernhard, 4,161,964, Cl. 138-26.000.

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Markessini, Andrew C., 4,162,178, Cl. 156-62.200.

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Marquis, Edward T.; and Waddill, Harold G., 4,162,358, Cl. 528-120.000.

Park, Jack H., 4,161,981, Cl. 166-261.000.

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Ash, Darrell L., 4,162,451, Cl. 325-451.000.

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Carey, Lee F., 4,162,040, Cl. 239-265.330.

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Muller, Wolfgang; Witzke, Lothar; and Gottfried, Werner, 4,162,296, Cl. 423-139.000.

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Canter, Nathan H.; and Thame, Neville G., 4,162,241, Cl. 260-30.80R.

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Lorenz, Roman R.; Parady, Edward D.; and Thielking, William H., 4,162,361, Cl. 546-72.000.

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Seubert, Jurgen; Pohle, Rolf; Thomas, Herbert; and Andrews, Peter, 4,162,319, Cl. 424-240.000.

Thomas, William E., to Phillips Petroleum Company. Carrying case. 4,162,004, Cl. 206-349.000.

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Abbott, Jerry J.; Bernardelli, William J.; Thompson, John A.; and Caudill, Allison H., 4,161,923, Cl. 118-658.000.

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Kennedy, Thomas E.; and Thompson, Thomas H., 4,161,868, Cl. 62-256.000.

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Bjerke, Leiv, 4,162,137, Cl. 417-405.000.

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Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, 4,162,061, Cl. 266-193.000.

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Sakae, Tatsuo; and Iwasawa, Mineo, 4,162,411, Cl. 307-221.00D.

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Potma, Theodorus H.; and Tomassen, Gerhardus T. H., 4,162,503, Cl. 346-163.000.

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Laird, James C.; and Tomlin, Robert L., 4,161,883, Cl. 73-421.50A.

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Takeyama, Tetsu; Takahashi, Akio; Matsumura, Kiichiro; and Kitagawa, Keiya, 4,162,299, Cl. 423-242.000.

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Knoll, Jozsef; Ecsery, Zoltan; Hermann nee Voros, Judit; Torok, Zoltan; Somfai, Eva; and Bernath, Gabor, 4,162,327, Cl. 424-285.000.

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Toyo Pulp Co., Ltd.: See—  
Hanaya, Morimasa, 4,161,972, Cl. 144-176.000.

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Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,161,929, Cl. 123-119.00A.

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Wyler, Leopold S., 4,162,486, Cl. 340-310.00A.

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Nedyalkov, Ivan P.; Kanchev, Kancheo T.; and Trenkov, Svetoslav R., 4,162,409, Cl. 290-53.000.

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Gass, Albert E.; Gottshall, Harry W.; Schaber, Manfred O.; and Trombino, Lawrence, 4,162,526, Cl. 364-200.000.

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Tse, To S.; and Tse, Pui Y., 4,162,171, Cl. 106-226.000.

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Rodgers, Gregg S., 4,162,444, Cl. 324-103.00P.

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Tyler Refrigeration Corp.: See—  
Kennedy, Thomas E.; and Thompson, Thomas H., 4,161,868, Cl. 62-256.000.

UCB, Societe Anonyme: See—  
Rodriguez, Ludovic; and Marchal, Lucien, 4,162,325, Cl. 424-274.000.

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Elam, Richard C.; and Ulion, Nicholas E., 4,162,349, Cl. 428-614.000.

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Hamling, Bernard H., 4,162,301, Cl. 423-440.000.

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Rim, Yong S.; and Nudenberg, Walter, 4,162,276, Cl. 525-2.000.

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Cheney, William A., 4,162,144, Cl. 55-5.000.

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Brown, Michael H.; and Myatt, John, 4,162,369, Cl. 136-202.000.

Salt, Kenneth J.; and Wintle, Colin A., 4,162,175, Cl. 136-233.000.

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Air Force: See—  
Arnold, Fred E.; Reinhardt, Bruce A.; and Hedberg, Frederick L., 4,162,265, Cl. 260-578.000.

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Speeds, John A.; and Marcy, Robert D., 4,162,292, Cl. 422-206.000.

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Jacobi, John H.; and Larsen, Lawrence E., 4,162,500, Cl. 343-772.000.

Jones, Howard S., Jr.; Farrar, Frederick G.; and Schaubert, Daniel H., 4,162,499, Cl. 343-700.0MS.

Lough, Lewis E., 4,161,835, Cl. 42-1.00A.

Robertson, Kenneth D., 4,162,509, Cl. 356-28.000.

Energy: See—  
Burger, Leland L.; and Scheele, Randall D., 4,162,206, Cl. 204-94.000.

Cooke, Chathan M., 4,162,227, Cl. 252-63.500.

Doss, James D.; Cowan, Robert E.; Newell, Robert H.; and McCabe, Charles W., 4,161,950, Cl. 128-303.140.

Ehrenkauf, Richard L. E.; Wolf, Alfred P.; and Hembree, Wylie C., 4,162,142, Cl. 260-326.200.

Holladay, David W.; and Haag, Gary L., 4,162,298, Cl. 423-230.000.

Horwitz, E. Philip; Delphin, Walter H.; and Mason, George W., 4,162,230, Cl. 252-301.10W.

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Hwang, Sun-Keun; and Morris, John W., Jr., 4,162,158, Cl. 75-124.000.

King, Wayne E.; and Merkle, Karl L., 4,162,401, Cl. 250-311.000.

Parker, Earl R.; Zackay, Victor F.; Bhat, Manjeshwar S.; and Garrison, Warren M., Jr., 4,162,157, Cl. 75-124.000.

Schlitt, Leland G., 4,162,432, Cl. 315-349.000.

National Aeronautics and Space Administration: See—  
Schutt, John B., 4,162,169, Cl. 106-74.000.

Navy: See—  
Bucaro, Joseph A.; Carome, Edward F.; and Dardy, Henry D., 4,162,397, Cl. 250-199.000.

Feldman, Sidney; and Barton, George G., Jr., 4,162,124, Cl. 356-4.000.

Hulland, Burton L.; and Weinstein, Arnold P., 4,162,497, Cl. 343-100.0LE.

Ricci, David P., 4,162,533, Cl. 364-728.000.

Sutula, Raymond A.; and Wang, Frederick E., 4,162,352, Cl. 429-29.000.

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Gieschen, Kurt; and Schmedemann, Walter, 4,162,406, Cl. 250-468.000.

Gross, Ulrich, 4,162,372, Cl. 179-1.00J.

Jansson, Leonard E., 4,162,524, Cl. 363-56.000.

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van Hattum, Johannes S. A.; van Veen, Engelbertus S. P.; and Dorn, Wilhelmus M., 4,162,433, Cl. 315-411.000.

United States Steel Corporation: See—  
Rudolph, Ralph G., 4,162,453, Cl. 328-111.000.



United Technologies Corporation: See—  
Crow, David E.; and Harrison, Nathan E., 4,162,077, Cl. 277-53.000.  
Elam, Richard C.; and Ulion, Nicholas E., 4,162,349, Cl. 428-614.000.  
University of Illinois Foundation: See—  
Hunsinger, Bill J.; and Hanna, Kentaro, 4,162,465, Cl. 333-151.000.  
Hunsinger, Bill J.; and Fildes, Roger D., 4,162,466, Cl. 333-194.000.  
Universo S.A.: See—  
Grudzinski, Richard, 4,162,417, Cl. 310-21.000.  
Uno, Hitoshi: See—  
Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 4,162,316, Cl. 424-250.000.  
UOP Inc.: See—  
Maffei, Vere, 4,161,825, Cl. 34-12.000.  
Urbach, John C.: See—  
Starkweather, Gary K.; and Urbach, John C., 4,162,121, Cl. 350-358.000.  
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Utasi, Joseph G., to Dresser Industries, Inc. Drilling mud level measurement, 4,162,473, Cl. 340-1.00L.  
Valmet Oy: See—  
Kirjavainen, Alvi, 4,162,189, Cl. 162-337.000.  
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Van Peppen, Jan F.: See—  
Fisher, William B.; and Van Peppen, Jan F., 4,162,267, Cl. 260-586.00P.  
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Varmuza, Milan J., to Avalanche Limited. Adjustable table, 4,161,915, Cl. 108-144.000.  
Varnon, James E.: See—  
Schievelbein, Vernon H.; Kudchadker, Mohan V.; Varnon, James E.; and Whittington, Lawrence E., 4,161,982, Cl. 166-269.000.  
Vater, Wulf: See—  
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Franckowiak, Gerhard; Vater, Wulf; Heise, Arend; Kazda, Stanislaw; and Stoepel, Kurt, 4,162,321, Cl. 424-266.000.  
Vautrain, Lucien H., to Phillips Petroleum Company. Safer production of dry liquid propane substantially free from HF and organic fluoride, 4,162,272, Cl. 62-24.000.  
VDO Adolf Schindling AG: See—  
Collonia, Harald, 4,161,994, Cl. 180-179.000.  
Veber, Daniel F.: See—  
Strachan, Robert G.; Paleveda, William J.; Veber, Daniel F.; and Holly, Frederick W., 4,162,248, Cl. 260-112.50S.  
Vente, John: See—  
McCain, William B.; Cosgrove, James F.; Vente, John; and Flavin, Thomas R., 4,162,066, Cl. 270-54.000.  
Verdol, S.A.: See—  
Neyraud, Rene, 4,161,969, Cl. 139-90.000.  
Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: See—  
Kogler, Peter; and Zitz, Alfred J., 4,162,104, Cl. 299-75.000.  
Victor Company of Japan, Limited: See—  
Kayanuma, Kanji, 4,162,398, Cl. 250-205.000.  
Videnov, Nikola B.: See—  
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Vinals, Joaquin F.: See—  
Wilson, Richard A.; Mookherjee, Braja D.; Hruza, Anne S.; Vock, Manfred H.; Frederick, Louis S.; and Vinals, Joaquin F., 4,162,335, Cl. 426-535.000.  
Vish Chimiko-Tekhnologicheskii Institute: See—  
Grancharov, Ivan N.; Tudjarova, Fanka D.; Bakalova, Yovka P.; Pelovski, Yoncho G.; Videnov, Nikola B.; and Dombalov, Ivan P., 4,162,170, Cl. 106-109.000.  
Vock, Manfred H.: See—  
Wilson, Richard A.; Mookherjee, Braja D.; Hruza, Anne S.; Vock, Manfred H.; Frederick, Louis S.; and Vinals, Joaquin F., 4,162,335, Cl. 426-535.000.  
Vogel, Uriel. Engine parameter modulation, 4,161,926, Cl. 123-32.0EA.  
Volckaert, Leonard: See—  
Hentschel, Claus; Martin, Karl; and Volckaert, Leonard, 4,161,844, Cl. 47-62.000.  
Volkamer, Klaus: See—  
Stockburger, Dieter; Volkamer, Klaus; Bender, Detlef; Schneider, Klaus-Juergen; Schwentker, Harald; Wagner, Ulrich; and Weitz, Hans-Martin, 4,162,198, Cl. 203-23.000.  
Volker Schultze Elektro-mechanische Apparate: See—  
Schultze, Volker; and Ayasse, Paul, 4,162,072, Cl. 273-96.00R.  
Volsky, Bill V. Audio frequency ionization ignition system, 4,161,936, Cl. 123-148.00E.

von Daehne, Welf; and Rasmussen, Poul R., to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske fabrikk Produktionsaktienselskab). Fusidic acid derivatives, 4,162,259, Cl. 260-397.100.  
von Schenck, Raban: See—  
Adrian, Renate; von Schenck, Raban; Somme, Klaus; and Weber, Hermann, 4,162,300, Cl. 423-314.000.  
Voumard, Hugues; and Sauvain, Roger, to Voumard Machines Co. Auxiliary workpiece-loading and -unloading apparatus, 4,161,849, Cl. 51-215.0CP.  
Voumard Machines Co.: See—  
Voumard, Hugues; and Sauvain, Roger, 4,161,849, Cl. 51-215.0CP.  
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Bazilevich, Gennady S.; Gorin, Alexandr F.; Lozinsky, Vladimir N.; Lysenko, Vladimir I.; Nosach, Vladimir M.; Solod, Grigory I.; and Sterinzat, Yakov M., 4,162,107, Cl. 303-3.000.  
Vulcan Materials Company: See—  
Wilson, Harold P.; and Bradbury, Walter C., 4,162,205, Cl. 204-43.00S.  
W. Schlafhorst & Co.: See—  
Kupper, Wilhelm, 4,162,012, Cl. 209-662.000.  
Waddill, Harold G.: See—  
Marquis, Edward T.; and Waddill, Harold G., 4,162,358, Cl. 528-120.000.  
Wagner, Kenneth E., to Carlton-Craft Corp. Cutout display device, 4,161,833, Cl. 40-539.000.  
Wagner, Ulrich: See—  
Stockburger, Dieter; Volkamer, Klaus; Bender, Detlef; Schneider, Klaus-Juergen; Schwentker, Harald; Wagner, Ulrich; and Weitz, Hans-Martin, 4,162,198, Cl. 203-23.000.  
Wagner, William A.; and Kotzur, Frank W., to Windings, Inc. Outside payoff, 4,162,050, Cl. 242-163.000.  
Wahlig, Helmut: See—  
Gottschlich, Rudolf; Gerjcke, Rolf; Juraszyk, Horst; Seubert, Jurgen; Strehlow, Wighard; Wahlig, Helmut; Bergmann, Rolf; and Dingeldein, Elvira, 4,162,314, Cl. 424-246.000.  
Wakeman, Alden H., to Crepaco, Inc. Ultrahigh temperature heating system, 4,161,909, Cl. 99-453.000.  
Wakeman, Alden H.; and Heiliger, Leonard R., to Crepaco, Inc. Dasher assembly, 4,162,127, Cl. 366-149.000.  
Walden, Jack M.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.  
Waldman, Richard C.: See—  
Rasmussen, Jerome J. M.; Waldman, Richard C.; and Oliver, Richard L., 4,161,968, Cl. 138-118.100.  
Waldorf, Lindsey E.; and Montoe, Kenneth E., to Waldorf, Lindsey E. Motor speed controller, 4,162,436, Cl. 318-139.000.  
Walker, Henry V., to Teledyne Industries, Inc. Dynamically adaptive player piano roll to magnetic tape forming system and playback, 4,161,901, Cl. 84-115.000.  
Wallis, David W.; and Stewart, William H., to S.W.I.S., Inc. Apparatus for extracting the fundamental frequency from a complex audio wave form, 4,162,461, Cl. 333-174.000.  
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Walsh, Edward N.; and Fearing, Ralph B., to Stauffer Chemical Company. Phosphonoxycarboxamides, 4,162,279, Cl. 260-943.000.  
Walter Kidde and Company, Inc.: See—  
Facchini, Enio; and Swanson, Carl I., 4,162,485, Cl. 340-289.000.  
Walther, William D., to Dayton Walther Corporation. Base flanged tire carrying rims, wheels and fastening assemblies, 4,162,105, Cl. 301-12.00R.  
Wang, Frederick E.: See—  
Sutula, Raymond A.; and Wang, Frederick E., 4,162,352, Cl. 429-29.000.  
Ward, Alfred G.: See—  
Fish, Barry M.; and Ward, Alfred G., 4,162,071, Cl. 273-33.000.  
Ward, Gerald G., to International Harvester Company. Plow and plow mounting bracket therefor, 4,161,986, Cl. 172-266.000.  
Ward, Russell L. Swivel device for supporting a balanced or semi-balanced fishing rod and indicating when a fish strikes, 4,161,839, Cl. 43-17.000.  
Wasagchemie GmbH: See—  
Lehmann, Kurt, 4,162,116, Cl. 339-60.00M.  
Wasserstein, Linda J.: See—  
Crandall, William B.; and Wasserstein, Linda J., 4,162,334, Cl. 426-505.000.  
Watkins, Fred E., to Camco, Incorporated. High and low tubing pressure actuated well safety valve, 4,161,960, Cl. 137-458.000.  
Watkins, Fred E., to Camco, Incorporated. Well locking device and method, 4,161,984, Cl. 166-315.000.  
Watson, Robert E.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.  
Wayser, Alain. Shoes intended for playing golf, 4,161,829, Cl. 36-127.000.  
Webb, Robert. Combination mirror/hair dryer, 4,161,955, Cl. 132-9.000.  
Weber, Hermann: See—  
Adrian, Renate; von Schenck, Raban; Somme, Klaus; and Weber, Hermann, 4,162,300, Cl. 423-314.000.

Weck, Friedrich J.; Hunkins, James; and Rinsler, Samuel J. Newsprint coupon separator, 4,162,339, Cl. 428-43.000.  
Weed Eater, Inc.: See—  
Moore, James L., 4,161,820, Cl. 30-276.000.  
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Franckowiak, Gerhard; Vater, Wulf; Heise, Arend; Kazda, Stanislaw; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Sulphur-containing amino-dihydroxydipyrindines, and their use as medicaments, 4,162,321, Cl. 424-266.000.  
Weinstein, Arnold P.: See—  
Hulland, Burton L.; and Weinstein, Arnold P., 4,162,497, Cl. 343-100.0LE.  
Weiss, Kenneth; and Fieder, Martin, to A. R. Nelson Co., Inc. Resilient wall protector, 4,161,853, Cl. 52-288.000.  
Weitz, Hans-Martin: See—  
Stockburger, Dieter; Volkamer, Klaus; Bender, Detlef; Schneider, Klaus-Juergen; Schwentker, Harald; Wagner, Ulrich; and Weitz, Hans-Martin, 4,162,198, Cl. 203-23.000.  
Welker, Scott D. Shelter, 4,161,924, Cl. 119-19.000.  
Wenninger, Fred, Jr.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.  
Werner H.K. Peters Maschinenfabrik G.m.b.H.: See—  
Wittstock, Gerhard, 4,161,808, Cl. 29-33.00R.  
Wesley, John G., to Labelette Company. Labeling machine for applying labels to polygonal containers, 4,162,182, Cl. 156-487.000.  
Wessel, Wolf: See—  
Eckert, Konrad; Holzbaur, Siegfried; Wessel, Wolf; and Grieshaber, Hermann, 4,161,935, Cl. 123-139.0AW.  
West, Clarence W. Variable air flow oven, 4,162,141, Cl. 432-144.000.  
Western Electric Company, Incorporated: See—  
Pavlas, Emil P., 4,162,034, Cl. 228-37.000.  
Westinghouse Electric Corp.: See—  
Arcella, Frank G.; Wolf, Charles B.; and Fey, Maurice G., 4,162,291, Cl. 422-198.000.  
Bhalla, Ranbir S., 4,162,151, Cl. 65-42.000.  
Bould, Fred; and Kowalik, Peter M., 4,162,385, Cl. 200-153.0SC.  
Cadoff, Laurence H.; Mattox, Douglas M.; and Elms, Robert T., 4,162,430, Cl. 315-309.000.  
Cellerini, Albert R.; Ricci, Louis N.; and Rexroad, James O., 4,162,467, Cl. 335-16.000.  
Doby, William P., 4,162,051, Cl. 242-201.000.  
Elms, Robert T., 4,162,428, Cl. 315-284.000.  
Elms, Robert T.; and Engel, Joseph C., 4,162,429, Cl. 315-284.000.  
Hirayama, Chikara; and Brecher, Lee E., 4,162,302, Cl. 423-579.000.  
McCalmont, David, 4,162,008, Cl. 206-590.000.  
Petro, James, 4,162,152, Cl. 65-164.000.  
Weston, George O., to John Wyeth & Brother Limited. Process for preparing 3-[(benzamidopiperid-1-yl)alkyl] indoles, 4,162,252, Cl. 546-201.000.  
Westwood, William D.: See—  
Ciolo, Paolo; and Westwood, William D., 4,162,502, Cl. 346-140.00R.  
Whang, Uoo S. Center of curvature, 4,161,846, Cl. 51-33.00W.  
Whang, Uoo S., to New Asian Corporation. Apparatus and method for performing aspherical operations on a workpiece, 4,161,847, Cl. 51-33.00W.  
Wheelabrator-Frye Inc.: See—  
Jones, George F., 4,161,848, Cl. 51-163.200.  
Whirlpool Corporation: See—  
Burke, Harry D., 4,162,380, Cl. 219-10.55F.  
Whitfield, Thomas M.: See—  
Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., 4,162,288, Cl. 264-75.000.  
Whitson, Donald W., to All Phase Electronics, Inc. Electronic controls for automatically operating a cattle dipping vat, 4,161,925, Cl. 119-158.000.  
Whittington, Lawrence E.: See—  
Schievelbein, Vernon H.; Kudchadker, Mohan V.; Varnon, James E.; and Whittington, Lawrence E., 4,161,982, Cl. 166-269.000.  
Wideman, Lawson G., to Goodyear Tire & Rubber Company. The Selective hydrogenation of cyclopentadiene to form cyclopentene using Raney nickel catalyst and alcohols boiling above 95° C. in the reaction mixture, 4,162,271, Cl. 585-274.000.  
Wierze, Hartmut: See—  
Mayer, Norbert; Pfahler, Gerhard; and Wierze, Hartmut, 4,162,247, Cl. 260-45.9NC.  
Wilcox, Forrest S.; Pinsky, Jules; and Cooper, Scott A., to Meari Corporation. The Multilayer light-reflecting film, 4,162,343, Cl. 428-212.000.  
Wilkinson, Samuel, to Burroughs Wellcome Co. Method for anaesthesia by use of a pentapeptide, 4,162,307, Cl. 424-177.000.  
Will Ross Inc.: See—  
Byrne, John R., 4,162,138, Cl. 425-125.000.  
Williams, Donald D. Pole building door lock, 4,162,094, Cl. 292-288.000.  
Williams, Guy H., Jr.: See—  
Henderson, Gary A.; and Williams, Guy H., Jr., 4,162,515, Cl. 361-232.000.  
Williams, Ralph P.: See—  
Gragson, James T.; and Williams, Ralph P., 4,162,223, Cl. 252-33.200.

Wilmotte, Stephane H.: See—  
Economopoulos, Mario; Respen, Yves J.; and Wilmotte, Stephane H., 4,161,800, Cl. 15-302.000.  
Wilson, David R., to International Business Machines Corporation. Magnetic diskette magazine, 4,162,006, Cl. 206-444.000.  
Wilson, David R.: See—  
Bothun, Maynard E.; Larson, Curtis A.; Lightner, Gayland E.; and Wilson, David R., 4,162,007, Cl. 206-444.000.  
Wilson, Harold P.; and Bradbury, Walter C., to Vulcan Materials Company. Method of electroplating tin and alkaline electroplating bath therefor, 4,162,205, Cl. 204-43.00S.  
Wilson, Richard A.; Mookherjee, Braja D.; Hruza, Anne S.; Vock, Manfred H.; Frederick, Louis S.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Flavoring with 1-[3-(methylthio)-butyryl]-2,6,6-trimethyl-cyclohexene and the 1,3-cyclohexadiene analog, 4,162,335, Cl. 426-535.000.  
Windings, Inc.: See—  
Wagner, William A.; and Kotzur, Frank W., 4,162,050, Cl. 242-163.000.  
Windmoller & Holscher: See—  
Achelpohl, Fritz; Tetenborg, Konrad; and Feldkamper, Richard, 4,162,025, Cl. 221-72.000.  
Wine Breather, Inc.: See—  
Bartholemew, Glen W., Jr., 4,162,129, Cl. 366-211.000.  
Wingen, Peter, to Dienes Werke GmbH & Co. K.G. Heated cutting device, 4,161,898, Cl. 83-171.000.  
Winters, Harold F.: See—  
Coburn, John W.; and Winters, Harold F., 4,162,185, Cl. 156-643.000.  
Wintle, Colin A.: See—  
Salt, Kenneth J.; and Wintle, Colin A., 4,162,175, Cl. 136-233.000.  
Wisconsin Centrifugal Inc.: See—  
Naffziger, Dewein H., 4,162,156, Cl. 75-12.000.  
Witter, Gerald J., to Fansteel Inc. Electrical contact material and method for making the same, 4,162,160, Cl. 75-246.000.  
Wittstock, Gerhard, to Werner H.K. Peters Maschinenfabrik G.m.b.H. Machine for cutting continuous sheet material, 4,161,808, Cl. 29-33.00R.  
Wittwer, Robert O.: See—  
Mohnach, Michael G.; Harbison, William H.; and Wittwer, Robert O., 4,161,798, Cl. 15-250.130.  
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Witzke, Lothar: See—  
Muller, Wolfgang; Witzke, Lothar; and Gottfried, Werner, 4,162,296, Cl. 423-139.000.  
Wolf, Alfred P.: See—  
Ehrenkauf, Richard L. E.; Wolf, Alfred P.; and Hembree, Wylie C., 4,162,142, Cl. 260-326.200.  
Wolf, Charles B.: See—  
Arcella, Frank G.; Wolf, Charles B.; and Fey, Maurice G., 4,162,291, Cl. 422-198.000.  
Wolf, Horst: See—  
Hartmannsgruber, Max; Schulz, Gunter; Klein, Konrad; and Wolf, Horst, 4,161,862, Cl. 57-92.000.  
Wolkstein, Herbert J.: See—  
Mawhinney, Daniel D.; Wolkstein, Herbert J.; Rosen, Arye; and Turski, Zygmund, 4,162,412, Cl. 307-237.000.  
Wood, Donald C.; and McLaughlin, Robert L., to DeSoto, Inc. Alkaline surfactant system for de-inking printed fibrous material, 4,162,186, Cl. 162-5.000.  
Worley, Nathan T., to Phillips Petroleum Company. Process and apparatus for carding fibers, 4,161,805, Cl. 19-98.000.  
Wright, Floyd H., to General Electric Company. Method and apparatus for electronically commutating a direct current motor without position sensors, 4,162,435, Cl. 318-138.000.  
Wright, Harold: See—  
Peace, John; Wright, Harold; and Clague, Kenneth, 4,162,471, Cl. 335-291.000.  
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Xerox Corporation: See—  
Conwell, Esther M., 4,162,118, Cl. 350-96.130.  
Hartke, David, 4,162,541, Cl. 365-230.000.  
Starkweather, Gary K.; and Urbach, John C., 4,162,121, Cl. 350-358.000.  
Thornburg, David D., 4,162,538, Cl. 365-96.000.  
Yafarova, Rimma L.: See—  
Razumov, Alexandr I.; Tarasova, Raisa I.; Nikolaeva, Valentina G.; and Yafarova, Rimma L., 4,162,264, Cl. 260-558.00H.  
Razumov, Alexandr I.; Zaikonnikova, Irina V.; Chudnovsky, Vladimir S.; Rzhetskaya, Galina F.; Tarasova, Raisa I.; Bljukherova, Nina A.; Yafarova, Rimma L.; Avrutsky, Grigory Y.; Belikov, Vladimir G.; and Litvinenko, Anatoly V., 4,162,311, Cl. 424-211.000.  
Yagi, Shizuo; Fujii, Isao; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection for divided auxiliary chamber of engine, 4,161,927, Cl. 123-75.00B.  
Yale, Ramon L., to GTE Sylvania Incorporated. Rare earth activated rare earth fluorogermanate, 4,162,232, Cl. 252-301.40F.  
Yamshita & Associates Ltd.: See—  
Hane, Shinichi, 4,162,041, Cl. 239-266.000.  
Yanagisawa, Masahiro; and Suganuma, Yoji, to Nippon Electric Co., Ltd. Magnetic record member, 4,162,350, Cl. 428-633.000.



- Yant, Kenneth B., to Dana Corporation. Free ring synchronizer having oppositely acting spring means. 4,162,001, Cl. 192-53.00E.
- Yasminov, Alexandr A.: See—  
 Miropolsky, Mark U.; Maizlik, David L.; Dobrovolsky, Anatoly A.; Gerasimovich, Igor K.; Levinson, Ariel S.; Naidich, Iosif P.; Menkh, Georgy A.; and Yasminov, Alexandr A., 4,162,219, Cl. 210-108.000.
- Yasui, Seimei: See—  
 Hino, Minoru; Yasui, Seimei; and Shintani, Akira, 4,162,240, Cl. 260-29.70B.
- Yee, Seening: See—  
 Broder, Alan; Shapiro, Paul; and Yee, Seening, 4,162,474, Cl. 340-6.00R.
- Yelland, Michael, to Imperial Chemical Industries Limited. Anthranilic acid arylester-azo-aminonaphthol sulfonic acid dyes. 4,162,249, Cl. 260-199.000.
- Yockey, Francis J.: See—  
 Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,162,532, Cl. 364-710.000.
- Yokoyama, Takao: See—  
 Enomoto, Ryo; Yoshioka, Mitihiro; and Yokoyama, Takao, 4,162,167, Cl. 106-44.000.
- Yokozawa, Minoru: See—  
 Kamegaya, Takeo; Yokozawa, Minoru; Kaneko, Ryuichi; and Matsuzaki, Hideomi, 4,162,427, Cl. 315-169.100.
- Yoshihara, Ichiro: See—  
 Abe, Takeshi; Tsuchiya, Keishin; Saito, Kazuhito; Mizuta, Toshiaki; and Yoshihara, Ichiro, 4,162,484, Cl. 340-150.000.
- Yoshioka, Mitihiro: See—  
 Enomoto, Ryo; Yoshioka, Mitihiro; and Yokoyama, Takao, 4,162,167, Cl. 106-44.000.
- Yoshioka, Takao: See—  
 Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,162,246, Cl. 260-45.8NT.
- Young, David W., to Howard Hall & Company. Compositions. 4,162,155, Cl. 71-110.000.
- Yount, Joseph B., III, to ICI Americas Inc. Emulsifier blend and aqueous fuel oil emulsions. 4,162,143, Cl. 44-51.000.
- Yu, Chia-Nien: See—  
 Pelosi, Stanford S., Jr.; and Yu, Chia-Nien, 4,162,257, Cl. 260-347.300.
- Zabler, Erich; Gassmann, Heiner; Schneider, Steffen; and Straub, Steffen, to Robert Bosch GmbH. Leveling control for motor vehicles. 4,162,083, Cl. 280-703.000.
- Zackay, Victor F.: See—  
 Parker, Earl R.; Zackay, Victor F.; Bhat, Manjeshwar S.; and Garrison, Warren M., Jr., 4,162,157, Cl. 75-124.000.
- Zaikonnikova, Irina V.: See—  
 Razumov, Alexandr I.; Zaikonnikova, Irina V.; Chudnovsky, Vladimir S.; Rzhetskaya, Galina F.; Tarasova, Raisa I.; Bljukherova, Nina A.; Yafarova, Rimma L.; Avrutsky, Grigory Y.; Belikov, Vladimir G.; and Litvinenko, Anatoly V., 4,162,311, Cl. 424-211.000.
- Zanker, Fritz, to BASF Aktiengesellschaft. Manufacture of aliphatic or cycloaliphatic isocyanates. 4,162,263, Cl. 260-453.00P.
- Zeuch, Klaus, to Siemens Aktiengesellschaft. Apparatus for preparation of a compound or an alloy. 4,162,293, Cl. 422-247.000.
- Ziegler, Kurt. Locking mechanism. 4,161,871, Cl. 70-356.000.
- Ziemek, Gerhard: See—  
 Scheffler, Ernst; Schatz, Friedrich; and Ziemek, Gerhard, 4,161,966, Cl. 138-112.000.
- Zillgitt, Ulrich; Kuhn, Wolfgang; and Doll, Gunther, to Robert Bosch GmbH. Load trim compensating vehicle headlight deflection system. 4,162,424, Cl. 315-82.000.
- Zimmermann & Jansen GmbH: See—  
 Jansen, Hermann; and Schneider, Heinz, 4,161,959, Cl. 137-340.000.
- Zinser Textilmaschinen GmbH: See—  
 Hartmannsgruber, Max; Schulz, Gunter; Klein, Konrad; and Wolf, Horst, 4,161,862, Cl. 57-92.000.
- Zitz, Alfred J.: See—  
 Kogler, Peter; and Zitz, Alfred J., 4,162,104, Cl. 299-75.000.
- Zlotek, Thaddeus F., to Dana Corporation. Sprag for one-way clutches. 4,162,000, Cl. 192-41.00A.
- Zodrow, Rudolf, to Jagenberg-Werke Aktiengesellschaft. Labeling station of a machine for labeling objects, especially bottles. 4,162,181, Cl. 156-384.000.
- Zrinscak, Fred S., Sr.; and Karsner, Grant G., to Mobil Oil Corporation. Catalytic cracking of metal-contaminated oils. 4,162,213, Cl. 208-89.000.
- Zuesse, Lance E. Support for maintaining head in upright position. 4,161,946, Cl. 128-75.000.
- Zupancic, Boris; and Jenko, Branko, to LEK Tovarna farmacevtskih in kemichnih izdelkov, n.s.o. Process for the preparation of 2-(3-benzoylphenyl)-propionic acid. 4,162,364, Cl. 562-408.000.
- Zurfluh, Rene, to Hoffmann-La Roche Inc. Cyclopropane carboxylic acid esters. 4,162,328, Cl. 424-305.000.
- Zuzak, Tomas: See—  
 Borer, Werner J.; Kugler, Tibor; and Zuzak, Tomas, 4,162,283, Cl. 264-15.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

## PATENTS WERE ISSUED ON THE 24TH DAY OF JULY, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bodenseewerk Perkin-Elmer & Co., GmbH: See—  
 Lahmann, Werner K., Re. 30,051, Cl. 356-325.000.
- Bundy, Gordon L., to Upjohn Company. The PG-type, 1,9-lactones. Re. 30,053, Cl. 542-426.000.
- Claycomb, Jackson R., to Schlumberger Technology Corporation. Apparatus for transmitting well bore data. Re. 30,055, Cl. 340-18.0LD.
- Davies, Terrence A.; and Pedder, David J., to Square D Company. Electrical contact material and process. Re. 30,052, Cl. 75-234.000.
- Hansel, William B., to Suntech, Inc. Interlock system for a gasoline dispensing nozzle. Re. 30,050, Cl. 141-207.000.
- Lahmann, Werner K., to Bodenseewerk Perkin-Elmer & Co., GmbH. Chopper arrangement for atomic absorption spectrophotometer. Re. 30,051, Cl. 356-325.000.
- Ong, Kian K., to U.S. Philips Corporation. Control device. Re. 30,054, Cl. 325-390.000.
- Pedder, David J.: See—  
 Davies, Terrence A.; and Pedder, David J., Re. 30,052, Cl. 75-234.000.
- Power Transfer Corporation: See—  
 Schutz, Ewald, Re. 30,049, Cl. 74-425.000.
- Schlumberger Technology Corporation: See—  
 Claycomb, Jackson R., Re. 30,055, Cl. 340-18.0LD.
- Schutz, Ewald, to Power Transfer Corporation. Power transfer. Re. 30,049, Cl. 74-425.000.
- Square D Company: See—  
 Davies, Terrence A.; and Pedder, David J., Re. 30,052, Cl. 75-234.000.
- Suntech, Inc.: See—  
 Hansel, William B., Re. 30,050, Cl. 141-207.000.
- U.S. Philips Corporation: See—  
 Ong, Kian K., Re. 30,054, Cl. 325-390.000.
- Upjohn Company, The: See—  
 Bundy, Gordon L., Re. 30,053, Cl. 542-426.000.

## LIST OF PLANT PATENTEEES

- Conklin, H. A. Rose plant. 4,441, 7-24-79, Cl. 2.000.
- Epp, Maximilian J., to Pan-American Plant Company. African violet named Brilliant Eva. 4,443, 7-24-79, Cl. 69.000.
- Pan-American Plant Company: See—  
 Epp, Maximilian J., 4,443, Cl. 69.000.
- Shawver, James R. Fuchsia plant. 4,442, 7-24-79, Cl. 84.000.

## LIST OF DESIGN PATENTEEES

- Abbott Laboratories: See—  
 Pawlak, Kenneth E., 252,470, Cl. D24-54.000.
- Abrams, Herbert J. Combined bank and photograph holder. 252,474, 7-24-79, Cl. D99-36.000.
- Adams, John K. Boat deck. 252,455, 7-24-79, Cl. D12-70.000.
- Aktiebolaget Bofors: See—  
 Korpi, Jouko K., 252,461, Cl. D15-28.000.
- Allen, Johnny G. Pedestal type garbage can holder. 252,441, 7-24-79, Cl. D7-189.000.
- Appelblatt, Irving; and Jackson, Theodore A., to Cadillac Gage Company. Combined armored vehicle and turret. 252,453, 7-24-79, Cl. D12-12.000.
- B. W. Darrah, Inc.: See—  
 Draffone, A. Peter, 252,442, Cl. D8-71.000.
- Beall, Lester, to Trend Line Furniture Corporation. Seat. 252,427, 7-24-79, Cl. D6-63.000.
- Beall, Lester, Jr., to Trend Line Furniture Corporation. Table. 252,433, 7-24-79, Cl. D6-179.000.
- Behnke, Edward R., to Columbus McKinnon Corporation. Chain wear inspection gauge. 252,451, 7-24-79, Cl. D10-64.000.
- Bell, George R.: See—  
 Oakley, Ervin C.; Bell, George R.; and Poole, William E., 252,430, Cl. D6-167.000.
- Bokor, Leslie, to Le-Bo Products Company, Inc. Combined recording tape cartridge and cassette tray. 252,423, 7-24-79, Cl. D3-35.000.
- Bokor, Leslie, to Le-Bo Products Company, Inc. Recording tape cartridge tray. 252,424, 7-24-79, Cl. D3-35.000.
- Bowers, Paul E.; and Dolinsky, Dennis P., to Uniroyal, Inc. Sole for a shoe. 252,420, 7-24-79, Cl. D2-320.000.
- Brelsford, Don A. Footstool. 252,426, 7-24-79, Cl. D6-34.000.
- Brelsford, Don A. Chair. 252,428, 7-24-79, Cl. D6-68.000.
- Brelsford, Don A. Coffee table. 252,432, 7-24-79, Cl. D6-177.000.
- Broadbent, Edward G. Peripheral frame member for use in a motor vehicle. 252,471, 7-24-79, Cl. D25-74.000.
- Brown, John W. Chess pieces. 252,473, 7-24-79, Cl. D21-52.000.
- Cadillac Gage Company: See—  
 Appelblatt, Irving; and Jackson, Theodore A., 252,453, Cl. D12-12.000.
- Cannon, John P., to Plattner Industries, Inc. Picnic jug or similar article. 252,438, 7-24-79, Cl. D7-77.000.
- Carson Products Company: See—  
 Rhodes, David A., 252,445, Cl. D9-141.000.
- Chrysler Corporation: See—  
 Milia, Carmelo P.; and Gray, Richard L., 252,460, Cl. D14-40.000.
- Cocuzzo, Joseph G. Extensible stabilizer for attachment to a bass drum lug wing nut and drummer's stool leg or the like. 252,463, 7-24-79, Cl. D17-22.000.
- Cohen, Elihu, to Trina, Inc. Foldable mirror. 252,437, 7-24-79, Cl. D6-237.000.
- Columbus McKinnon Corporation: See—  
 Behnke, Edward R., 252,451, Cl. D10-64.000.
- Conterno, Giovanni, to Personal S.p.A. Steering-wheel rim, for motorcars and watercraft. 252,457, 7-24-79, Cl. D12-176.000.
- De Giorgis, Joseph P. Sun umbrella holder. 252,443, 7-24-79, Cl. D8-373.000.
- D'Innocente, Ralph: See—  
 Jacuzzi, Roy A.; and D'Innocente, Ralph, 252,467, Cl. D23-49.000.
- Dolinsky, Dennis P.: See—  
 Bowers, Paul E.; and Dolinsky, Dennis P., 252,420, Cl. D2-320.000.
- Draffone, A. Peter, to B. W. Darrah, Inc. O-ring fixture. 252,442, 7-24-79, Cl. D8-71.000.
- ECO Industries, Inc.: See—  
 Oakley, Ervin C.; Bell, George R.; and Poole, William E., 252,430, Cl. D6-167.000.
- Elliott, Clayton A. Side support panel for pull-out drawer units. 252,436, 7-24-79, Cl. D6-191.000.
- Fermahin, Andrew A. Tennis charm pendant or similar article. 252,452, 7-24-79, Cl. D11-81.000.
- Gillenwater, Eugene. Holder for golf ball markers. 252,422, 7-24-79, Cl. D2-400.000.
- Gray, Richard L.: See—  
 Milia, Carmelo P.; and Gray, Richard L., 252,460, Cl. D14-40.000.
- Halm, Hans, to Niveau AG. Telephone index. 252,465, 7-24-79, Cl. D19-76.000.
- Hamada, Masanori; Hoshino, Kunio; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Portable radio receiver. 252,425, 7-24-79, Cl. D14-70.000.
- Hamilton, William P. Cooking pot top and lid organizer. 252,440, 7-24-79, Cl. D7-188.000.
- Hayward, Austin L.: See—  
 Wills, Roy K., Jr.; and Hayward, Austin L., 252,419, Cl. D1-17.000.

Hoshino, Kunio: See—  
Hamada, Masanori; Hoshino, Kunio; and Ohta, Kikuo, 252,425, Cl. D14-70.000.

International Leisure Activities, Inc.: See—  
Wills, Roy K., Jr., 252,417, Cl. D1-17.000.

International Leisure Activities, Inc.: See—  
Wills, Roy K., Jr., 252,416, Cl. D1-17.000.

Wills, Roy K., Jr., 252,418, Cl. D1-15.000.

Wills, Roy K., Jr.; and Hayward, Austin L., 252,419, Cl. D1-17.000.

Jackson, Theodore A.: See—  
Appelblatt, Irving; and Jackson, Theodore A., 252,453, Cl. D12-12.000.

Jacuzzi, Roy A.; and D'Innocente, Ralph, to Jacuzzi Whirlpool Bath, Inc. Combined shower stall and hydrotherapy bathtub. 252,467, 7-24-79, Cl. D23-49.000.

Jacuzzi Whirlpool Bath, Inc.: See—  
Jacuzzi, Roy A.; and D'Innocente, Ralph, 252,467, Cl. D23-49.000.

Kimberly-Clark Corporation: See—  
Traugott, David K., 252,446, Cl. D9-171.000.

Knoll International, Inc.: See—  
Pfister, Murray C., 252,431, Cl. D6-177.000.

Korpi, Jouko K., to Aktiebolaget Bofors. Tooth adaptor for excavating equipment. 252,461, 7-24-79, Cl. D15-28.000.

Kupperman, Dennis: See—  
Kupperman, Sam; and Kupperman, Dennis, 252,447, Cl. D9-193.000.

Kupperman, Sam; and Kupperman, Dennis, 252,448, Cl. D9-193.000.

Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Company. Pantograph package. 252,447, 7-24-79, Cl. D9-193.000.

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Laine, Leo. Vehicular inner protective mudguard. 252,458, 7-24-79, Cl. D12-184.000.

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Le-Bo Products Company, Inc.: See—  
Bokor, Leslie, 252,423, Cl. D3-35.000.

Bokor, Leslie, 252,424, Cl. D3-35.000.

Mallory, Robert L.; and Mallory, Sheila A. Cabinet for dental unit. 252,469, 7-24-79, Cl. D24-4.000.

Mallory, Sheila A.: See—  
Mallory, Robert L.; and Mallory, Sheila A., 252,469, Cl. D24-4.000.

Matsushita Electric Industrial Co., Ltd.: See—  
Hamada, Masanori; Hoshino, Kunio; and Ohta, Kikuo, 252,425, Cl. D14-70.000.

Meeter, Wayne A. Platform sole for shoes. 252,421, 7-24-79, Cl. D2-322.000.

Milia, Carmelo P.; and Gray, Richard L., to Chrysler Corporation. Control panel for a fire control combat simulator. 252,460, 7-24-79, Cl. D14-40.000.

Morin, Andre. Rack for spice containers. 252,429, 7-24-79, Cl. D6-125.000.

Nelson, Merritt J. Clock. 252,449, 7-24-79, Cl. D10-12.000.

Niveau AG: See—  
Halm, Hans, 252,465, Cl. D19-76.000.

Oakley, Ervin C.; Bell, George R.; and Poole, William E., to ECO Industries, Inc. Gun cabinet. 252,430, 7-24-79, Cl. D6-167.000.

Ohta, Kikuo: See—  
Hamada, Masanori; Hoshino, Kunio; and Ohta, Kikuo, 252,425, Cl. D14-70.000.

Parker Pen Company, The: See—  
Thompson, Elmer D.; and Wacha, Martin E., 252,464, Cl. D19-55.000.

Pawlak, Kenneth E., to Abbott Laboratories. Urinary catheter adapter having a filtered air vent, or the like. 252,470, 7-24-79, Cl. D24-54.000.

Personal S.p.A.: See—  
Conterno, Giovanni, 252,457, Cl. D12-176.000.

Pfister, Murray C., to Knoll International, Inc. Table. 252,431, 7-24-79, Cl. D6-177.000.

Phillips, Esther M. Bicycle. 252,456, 7-24-79, Cl. D12-108.000.

Plattner Industries, Inc.: See—  
Cannon, John P., 252,438, Cl. D7-77.000.

Poole, William E.: See—  
Oakley, Ervin C.; Bell, George R.; and Poole, William E., 252,430, Cl. D6-167.000.

Procter & Gamble Company, The: See—  
Torongo, Albert H., Jr., 252,444, Cl. D9-116.000.

RB Toy Development Company: See—  
Kupperman, Sam; and Kupperman, Dennis, 252,447, Cl. D9-193.000.

Kupperman, Sam; and Kupperman, Dennis, 252,448, Cl. D9-193.000.

Rhodes, David A., to Carson Products Company. Bottle. 252,445, 7-24-79, Cl. D9-141.000.

Schwebel, George A., to Susquehanna Broadcasting Co. Floating wick flicker lamp. 252,475, 7-24-79, Cl. D48-2.000.

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Tidwell, William, 252,466, Cl. D20-41.000.

Seipp, Ronald W., to Thermo King Corporation. Refrigeration unit for trucks. 252,468, 7-24-79, Cl. D23-142.000.

Smith, James A. Pail hanger. 252,439, 7-24-79, Cl. D7-187.000.

Sulek, Eugene J.; and Zierhut, Clarence D., to Texas Instruments Incorporated. Wrist watch. 252,450, 7-24-79, Cl. D10-32.000.

Susquehanna Broadcasting Co.: See—  
Schwebel, George A., 252,475, Cl. D48-2.000.

Sussman, Howard. Multi-compartmented storage rack for sundries. 252,435, 7-24-79, Cl. D6-189.000.

Texas Instruments Incorporated: See—  
Sulek, Eugene J.; and Zierhut, Clarence D., 252,450, Cl. D10-32.000.

Thermo King Corporation: See—  
Seipp, Ronald W., 252,468, Cl. D23-142.000.

Thompson, Elmer D.; and Wacha, Martin E., to Parker Pen Company, The. Fountain pen nib. 252,464, 7-24-79, Cl. D19-55.000.

Tidwell, William, to SCM Corporation. Display bar for removably holding stemmed placards. 252,466, 7-24-79, Cl. D20-41.000.

Torongo, Albert H., Jr., to Procter & Gamble Company, The. Bottle. 252,444, 7-24-79, Cl. D9-116.000.

Traugott, David K., to Kimberly-Clark Corporation. Dispensing carton. 252,446, 7-24-79, Cl. D9-171.000.

Trend Line Furniture Corporation: See—  
Beall, Lester, 252,427, Cl. D6-63.000.

Beall, Lester, Jr., 252,433, Cl. D6-179.000.

Trina, Inc.: See—  
Cohen, Elihu, 252,437, Cl. D6-237.000.

Uniroyal, Inc.: See—  
Bowers, Paul E.; and Dolinsky, Dennis P., 252,420, Cl. D2-320.000.

Wacha, Martin E.: See—  
Thompson, Elmer D.; and Wacha, Martin E., 252,464, Cl. D19-55.000.

White, Malcolm, to White, Susan Beck. Roll bar safety frame for a tractor. 252,462, 7-24-79, Cl. D15-28.000.

White, Susan Beck: See—  
White, Malcolm, 252,462, Cl. D15-28.000.

Williams, Arthur L. High performance water vehicle. 252,454, 7-24-79, Cl. D12-66.000.

Wills, Roy K., Jr., to International Leisure Activities, Inc. Candy. 252,416, 7-24-79, Cl. D1-17.000.

Wills, Roy K., Jr., to International Leisure Activities, Inc. Candy. 252,417, 7-24-79, Cl. D1-17.000.

Wills, Roy K., Jr., to International Leisure Activities, Inc. Candy. 252,418, 7-24-79, Cl. D1-15.000.

Wills, Roy K., Jr.; and Hayward, Austin L., to International Leisure Activities, Inc. Candy. 252,419, 7-24-79, Cl. D1-17.000.

Wistrand, John. Dryer. 252,472, 7-24-79, Cl. D28-13.000.

Wright, Douglas. Combined dispensing and display case. 252,434, 7-24-79, Cl. D6-189.000.

Zierhut, Clarence D.: See—  
Sulek, Eugene J.; and Zierhut, Clarence D., 252,450, Cl. D10-32.000.

## CLASSIFICATION OF PATENTS

ISSUED JULY 24, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 4		CLASS 47		552	4,161,892	119 A	4,161,929	CLASS 160		192 C	4,162,209
111.1	4,161,792	62	4,161,844	813 R	4,161,893	122 D	4,161,930			192 EC	4,162,210
134	4,161,793			863	4,161,894	122 E	4,161,931	381	4,161,977	195 G	4,162,211
CLASS 5		380	4,161,845	CLASS 75		139 AW	4,161,932	CLASS 162		CLASS 206	
441	4,161,794						4,161,933	5	4,162,186	219	4,162,003
CLASS 9		33 W	4,161,846	12	4,162,156		4,161,934	29	4,162,187	349	4,162,004
1.6	4,161,795		4,161,847	124	4,162,157	148 E	4,161,935	76	4,162,188	362	4,162,005
6 P	4,161,796	163.2	4,161,848	130 R	4,162,158	169 EL	4,161,937	337	4,162,189	389	4,162,009
316	4,161,797	215 CP	4,161,849	234	Re.30,052	198 F	4,161,938	359	4,162,190	444	4,162,006
		CLASS 52		246	4,162,160	CLASS 126			CLASS 164		4,162,007
CLASS 13		65	4,161,850	CLASS 81		19 R	4,161,939	49	4,161,978	590	4,162,008
1	4,162,367	208	4,161,851	121 A	4,161,896	85 B	4,161,940		CLASS 165	823	4,162,010
18 C	4,162,368	250	4,161,852	CLASS 83		271	4,161,941	95	4,161,979	CLASS 208	
CLASS 15		288	4,161,853				4,161,942	168	4,161,980	79	4,162,212
250.13	4,161,798	309.1	4,161,854	73	4,161,897	CLASS 128			CLASS 166	89	4,162,213
260	4,161,799	612	4,161,855	171	4,161,898	1.3	4,161,943	261	4,161,981	CLASS 209	
302	4,161,800	667	4,161,856	371	4,161,899	75	4,161,946	269	4,161,982	637	4,162,011
316 R	4,161,801	CLASS 53		409	4,161,900	142.3	4,161,947		4,161,983	662	4,162,012
331	4,161,802	97	4,161,857	CLASS 84		156	4,161,948	315	4,161,984	CLASS 210	
CLASS 16		CLASS 55		115	4,161,901	247	4,161,949	321	4,161,985	21	4,162,215
18 A	4,161,803	5	4,162,144	375	4,161,902	303.14	4,161,950		CLASS 172	73 R	4,162,216
48.5	4,161,804	32	4,162,145	CLASS 87		340	4,161,951	266	4,161,986	84	4,162,217
CLASS 19		163	4,162,146	57	4,161,903	654	4,161,944	791	4,161,987	104	4,162,218
98	4,161,805	191	4,162,147	CLASS 89		696	4,161,945		CLASS 173	108	4,162,219
CLASS 24		272	4,162,148	7	4,161,904	786	4,161,952		CLASS 174	448	4,162,220
201 A	4,161,806	315	4,162,149	CLASS 91		CLASS 131		32	4,161,988	CLASS 211	
263 SW	4,161,807	337	4,162,150	363 R	4,161,905	140 P	4,161,953	105	4,161,989	43	4,162,013
CLASS 29		7	4,161,858	498	4,161,906	173	4,161,954		4,161,990	50	4,162,014
33 R	4,161,808	364	4,161,859	CLASS 93		9	4,161,955	47	4,162,370	87	4,162,015
157.3 D	4,161,809	370	4,161,860	51.1	4,161,907	CLASS 132			CLASS 176	CLASS 219	
427	4,161,810	CLASS 57		CLASS 96		CLASS 134		65	4,162,191	10.55 B	4,162,381
429	4,161,811	22	4,161,861	59	4,162,161	1	4,162,172		CLASS 178	64	4,162,380
446	4,161,812	92	4,161,862	115 P	4,162,162	2	4,162,173	58 R	4,162,371	10.55 F	4,162,382
460	4,161,813	124	4,161,863	CLASS 99		167 C	4,161,956		CLASS 179	68	4,162,383
580	4,161,814	CLASS 58		349	4,161,908	89 PC	4,162,174		CLASS 180	79	4,162,387
623.4	4,161,815	23 R	4,161,864	453	4,161,909	202	4,162,369	1 C	4,162,373	96	4,162,388
628	4,161,816	CLASS 60		CLASS 100		233	4,162,175	1 HF	4,162,374	121 EB	4,162,391
630 B	4,161,817	385	4,161,865	26	4,161,910	CLASS 101		1 J	4,162,375	121 LM	4,162,390
CLASS 30		517	4,161,866	96	4,161,911	CLASS 105		15 AT	4,162,376	121 P	4,162,389
157	4,161,818	547 A	4,161,867	CLASS 106		458	4,161,960	18 BC	4,162,377	146.51	4,162,392
164.95	4,161,819	CLASS 62		99	4,161,912	501	4,161,961	18 D	4,162,378	217	4,162,393
276	4,161,820	24	4,162,272	CLASS 107		557	4,161,962	170.2	4,162,379	341	4,162,394
CLASS 33		256	4,161,868	CLASS 108		592	4,161,963		CLASS 181	367	4,162,395
41 R	4,161,821	CLASS 65		200	4,161,913	CLASS 138		53 FE	4,161,991	497	4,162,399
174 R	4,161,822	42	4,162,151	344	4,161,914	26	4,161,964	90	4,161,993	CLASS 220	
179	4,161,823	164	4,162,152	CLASS 109		45	4,161,965	179	4,161,994	1 B	4,162,020
180 AT	4,161,824	CLASS 70		1.13	4,162,163	112	4,161,966	306	4,161,992	202	4,162,021
CLASS 34		166	4,161,869	21	4,162,164	113	4,161,967		CLASS 182	224	4,162,022
12	4,161,825	278	4,161,870	40 R	4,162,166	118.1	4,161,968	93	4,161,997	258	4,162,023
	4,161,826	356	4,161,871	44	4,162,167	CLASS 139		190	4,161,998	350	4,162,024
CLASS 36		CLASS 71		58	4,162,168	90	4,161,969		CLASS 183		CLASS 222
11	4,161,827	12	4,162,153	74	4,162,169	CLASS 141		196 BA	4,161,999	23	4,162,027
32 R	4,161,828	88	4,162,154	109	4,162,170	207	4,161,970		CLASS 188	129.4	4,162,028
127	4,161,829	110	4,162,155	226	4,162,171	114	4,161,971		CLASS 189	131	4,162,029
CLASS 40		CLASS 72		144	4,161,915	362	4,161,972		CLASS 192	321	4,162,030
2.2	4,161,830	95	4,161,872	CLASS 110		176	4,161,973	41 A	4,162,000	CLASS 224	
160	4,161,831	324	4,161,873	203	4,161,916	224	4,161,973	53 E	4,162,001	45 K	4,162,031
451	4,161,832	CLASS 73		263	4,161,917	287	4,161,974	99 A	4,162,002	CLASS 226	
539	4,161,833	12	4,161,874	CLASS 112		CLASS 144			CLASS 196	81	4,162,032
606	4,161,834	23	4,161,875			176	4,161,972		CLASS 200	CLASS 227	
CLASS 42		65	4,161,876	158 E	4,161,918	224	4,161,973	14.52	4,162,197	10	4,162,033
1 A	4,161,835	140	4,161,877	275	4,161,919	287	4,161,974		CLASS 203		CLASS 228
16	4,161,836	194 VS	4,161,878	CLASS 113		1.5	4,162,176	61.88	4,162,384	37	4,162,034
CLASS 43		229	4,161,879	CLASS 114		179	4,162,177	153 SC	4,162,385	CLASS 235	
4	4,161,837	342	4,161,880	297	4,161,922	CLASS 180		339	4,162,386	47	4,162,036
17	4,161,838	343 R	4,161,881	CLASS 115		62.2	4,162,178		CLASS 204	206	4,162,038
42.11	4,161,838	368.3	4,161,882	CLASS 116		89	4,162,179	2.1	4,162,202	214.25	4,162,039
43.13	4,161,841	421.5 A	4,161,883	CLASS 117		220	4,162,180	38 R	4,162,203	265.33	4,162,040
43.4	4,161,840	504	4,161,884	CLASS 118		384	4,162,181	43 R	4,162,204	366	4,162,041
85	4,161,842	597	4,161,887	658	4,161,923	487	4,162,182	43 S	4,162,205	232	4,162,042
121	4,162,193	722	4,161,886	CLASS 119		505	4,162,183	94	4,162,206	362	4,162,043
310	4,162,195	740	4,161,888	19	4,161,924	621	4,162,184	157.1 R	4,162,207	526	4,162,044
CLASS 44		CLASS 74		158	4,161,925	643	4,162,185	180 G	4,162,208	533.3	4,162,045
51	4,162,143	5 R	4,161,889	CLASS 123		487	4,162,186				
CLASS 46		214	4,161,890	32 EA	4,161,926	505	4,162,187				
75	4,161,843	425	Re.30,049	75 B	4,161,927	621	4,162,188				
		548	4,161,891	102	4,161,928	643	4,162,189				



CLASS 241	968	4,162,280	115	4,162,108	CLASS 335	171	4,162,522	4,162,324
16	4,162,044	CLASS 261	30	4,162,281	CLASS 307	16	4,162,467	4,162,325
46.17	4,162,045	CLASS 264	9	4,162,282	221 D	4,162,411	106	4,162,326
	4,162,046	CLASS 264	15	4,162,283	237	4,162,412	186	4,162,327
CLASS 242	9	4,162,282	66	4,162,284	253	4,162,413	210	4,162,328
68.5	4,162,047	4,162,283	75	4,162,285	362	4,162,416	291	4,162,329
84.2 G	4,162,048	4,162,284	117	4,162,286	CLASS 308	216	4,162,109	4,162,330
84.5 R	4,162,049	4,162,285		4,162,287	234	4,162,110	116	4,162,331
163	4,162,050	4,162,286			CLASS 310	21	4,162,417	CLASS 425
201	4,162,051	4,162,287			49 R	4,162,418	49 R	4,162,138
CLASS 244	3.16	4,162,052	49	4,162,080	68 R	4,162,414	68 R	4,162,139
3.27	4,162,053	4,162,053	193	4,162,061	266	4,162,419	266	4,162,332
CLASS 248	94	4,162,054	193	4,162,061	313	4,162,415	313	4,162,333
441 R	4,162,055	4,162,055			326	4,162,111	326	4,162,334
495	4,162,056	4,162,056			CLASS 312	15	4,162,112	CLASS 426
CLASS 250	199	4,162,397	177	4,162,064	32	4,162,477	32	4,162,335
205	4,162,398	4,162,398			52 F	4,162,478	52 F	4,162,336
231 SE	4,162,399	4,162,399			63	4,162,479	63	4,162,337
256	4,162,400	4,162,400			146.1 AL	4,162,480	146.1 AL	4,162,338
311	4,162,401	4,162,401			146.3 AG	4,162,481	146.3 AG	4,162,339
332	4,162,402	4,162,402			146.3 H	4,162,482	146.3 H	4,162,340
396 ML	4,162,403	4,162,403			147 R	4,162,483	147 R	4,162,341
423 R	4,162,404	4,162,404			150	4,162,484	150	4,162,342
461 B	4,162,405	4,162,405			289	4,162,485	289	4,162,343
468	4,162,406	4,162,406			310 A	4,162,486	310 A	4,162,344
555	4,162,408	4,162,408			505	4,162,488	505	4,162,345
CLASS 251	168	4,162,057			518	4,162,489	518	4,162,346
326	4,162,058	4,162,058			603	4,162,490	603	4,162,347
CLASS 252	1	4,162,221			646	4,162,491	646	4,162,348
32.7 E	4,162,222	4,162,222			723	4,162,492	723	4,162,349
33.2	4,162,223	4,162,223			744	4,162,487	744	4,162,350
49.6	4,162,224	4,162,224			752	4,162,493	752	4,162,351
50	4,162,225	4,162,225			CLASS 343	5 EM	4,162,494	CLASS 429
62.1 P	4,162,226	4,162,226			7.3	4,162,495	7.3	4,162,352
63.5	4,162,227	4,162,227			18 A	4,162,496	18 A	4,162,353
90	4,162,228	4,162,228			100 LE	4,162,497	100 LE	4,162,354
301.1 W	4,162,229	4,162,229			700 MS	4,162,499	700 MS	4,162,355
	4,162,230	4,162,230			772	4,162,500	772	4,162,356
	4,162,231	4,162,231			CLASS 346	140 R	4,162,501	CLASS 430
301.4 F	4,162,232	4,162,232			163	4,162,502	163	4,162,357
429 R	4,162,233	4,162,233			163	4,162,503	163	4,162,358
432	4,162,234	4,162,234			CLASS 350	4.2	4,162,117	CLASS 431
462	4,162,235	4,162,235			96.13	4,162,118	96.13	4,162,359
558	4,162,236	4,162,236			96.21	4,162,119	96.21	4,162,360
CLASS 254	187.4	4,162,059			253	4,162,120	253	4,162,361
CLASS 260	17 R	4,162,237			358	4,162,121	358	4,162,362
29.6 S	4,162,238	4,162,238			CLASS 351	161	4,162,122	CLASS 432
29.7 B	4,162,240	4,162,240			CLASS 354	25	4,162,123	CLASS 433
29.7 UP	4,162,239	4,162,239			155	4,162,498	155	4,162,363
30.8 R	4,162,241	4,162,241			CLASS 356	4	4,162,124	CLASS 434
	4,162,242	4,162,242			28	4,162,509	28	4,162,364
37 EP	4,162,244	4,162,244			30	4,162,125	30	4,162,365
37 SB	4,162,243	4,162,243			237	4,162,126	237	4,162,366
40 R	4,162,245	4,162,245			325	Re.30,051	325	4,162,367
45.8 NT	4,162,246	4,162,246			CLASS 357	23	4,162,504	CLASS 435
45.9 NC	4,162,247	4,162,247			30	4,162,505	30	4,162,368
112.5 S	4,162,248	4,162,248			59	4,162,506	59	4,162,369
199	4,162,249	4,162,249			68	4,162,507	68	4,162,370
239 A	4,162,250	4,162,250			CLASS 358	9	4,162,303	CLASS 436
239.1	4,162,251	4,162,251			18	4,162,508	18	4,162,371
306.7 T	4,162,253	4,162,253			128	4,162,510	128	4,162,372
307 D	4,162,254	4,162,254			139	4,162,511	139	4,162,373
326.2	4,162,142	4,162,142			191	4,162,513	191	4,162,374
340.5 R	4,162,255	4,162,255			CLASS 361	2	4,162,514	CLASS 437
345.2	4,162,256	4,162,256			232	4,162,515	232	4,162,375
347.3	4,162,257	4,162,257			358	4,162,517	358	4,162,376
348.11	4,162,258	4,162,258			372	4,162,516	372	4,162,377
397.1	4,162,259	4,162,259			433	4,162,518	433	4,162,378
424	4,162,260	4,162,260			CLASS 362	113	4,162,521	CLASS 438
449 L	4,162,261	4,162,261			CLASS 363	251	4,162,523	CLASS 439
449 R	4,162,262	4,162,262			267	4,162,524	267	4,162,379
453 P	4,162,263	4,162,263			274	4,162,525	274	4,162,380
558 H	4,162,264	4,162,264						
578	4,162,265	4,162,265						
586 F	4,162,266	4,162,266						
586 P	4,162,267	4,162,267						
592	4,162,268	4,162,268						
600 R	4,162,269	4,162,269						
607 AR	4,162,270	4,162,270						
943	4,162,279	4,162,279						

D1—	15	252,418	63	252,427	D7—	237	252,437	193	252,447	176	252,457	D20—	41	252,466		
	17	252,416	68	252,428		77	252,438		252,448		184	252,458	D21—	52	252,473	
		252,417	125	252,429		187	252,439	D10—	12	252,449		252,459	D22—	49	252,467	
D2—	320	252,419	167	252,430		188	252,440		32	252,450	D14—	40	252,460	D23—	142	252,468
	322	252,421	177	252,431	D8—	189	252,441		64	252,451		70	252,425	D24—	4	252,469
	400	252,422		252,432		71	252,442	D11—	81	252,452	D15—	28	252,461		54	252,470
D3—	35	252,423	179	252,433	D9—	373	252,443	D12—	12	252,453		22	252,462	D25—	74	252,471
		252,424	189	252,434		116	252,444		66	252,454	D17—	22	252,463	D28—	13	252,472
		252,424		252,435		141	252,445		70	252,455	D19—	55	252,464	D48—	2	252,475
D6—	34	252,426	191	252,436		171	252,446		108	252,456		76	252,465	D99—	36	252,474

## CLASSIFICATION OF PLANTS

P—	2	4,441	69	4,443	84	4,442			
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# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

2 : 4,162,308	4,162,242	4,161,910	4,162,124	4,162,042	4,162,537
4,162,309	4,161,938	4,162,169	4,162,085	4,161,950	4,162,267
5 : 4,162,098	4,162,326	4,161,963	4,162,177	4,162,112	4,162,282
4,162,399	4,161,968	4,162,352	4,162,381	4,162,289	4,162,275
6 : 4,161,802	4,162,373	4,161,986	4,162,441	4,162,425	4,162,129
4,161,937	4,162,384	4,162,024	4,162,492	4,162,477	4,162,397
4,162,057	4,162,445	4,162,029	4,162,500	4,162,535	4,162,509
4,162,070	4,162,449	4,162,032	4,162,522	4,161,939	4,162,201
4,162,111	4,162,480	4,162,034	4,162,533	4,161,795	4,162,840
4,162,185	4,162,486	4,162,058	4,161,813	4,161,958	4,161,873
4,162,203	4,162,501	4,162,062	4,161,815	4,162,236	4,161,901
4,162,208	4,162,520	4,162,066	4,161,822	4,162,281	4,162,150
4,162,211	4,162,525	4,162,092	4,161,826	4,162,536	4,162,358
4,162,345	4,162,531	4,162,094	4,161,971	4,161,869	4,162,400
4,162,407	4,162,538	4,162,096	4,162,174	4,161,878	4,162,254
4,162,432	4,162,540	4,162,141	4,162,202	4,161,907	4,162,298
8 : 4,161,880	4,162,541	4,162,155	4,162,227	4,161,918	4,162,405
4,162,149	4,161,923	4,162,160	4,162,403	4,161,940	4,162,416
9 : 4,162,110	4,161,970	4,162,182	4,162,420	4,161,945	4,162,421
4,162,349	4,162,396	4,162,199	4,162,450	4,162,008	4,162,428
01 : 4,162,336	4,162,515	4,162,230	4,162,459	4,162,010	4,162,820
04 : 4,162,028	4,162,532	4,162,231	4,162,463	4,162,013	4,161,846
4,162,075	4,161,796	4,162,351	4,162,485	4,162,023	4,161,847
4,162,101	4,161,816	4,162,391	4,162,527	4,162,030	4,161,942
4,162,438	4,161,888	4,162,401	4,162,531	4,162,036	4,161,944
4,162,458	4,161,896	4,162,457	4,161,801	4,162,151	4,161,955
06 : Re.30,052	4,161,979	4,162,465	4,161,803	4,162,152	4,161,981
4,161,797	4,162,077	4,162,466	4,161,868	4,162,163	4,161,982
4,161,837	4,162,115	4,162,469	4,161,886	4,162,191	4,161,983
4,161,839	4,162,276	4,161,798	4,161,889	4,162,193	4,161,984
4,161,852	4,162,379	4,161,812	4,161,893	4,162,213	
4,161,887	4,162,491	4,161,845	4,161,931	4,162,220	
4,161,904	4,162,143	4,161,848	4,162,000	4,162,225	
4,161,954	4,162,162	4,161,914	4,162,055	4,162,233	
4,161,965	4,162,172	4,161,916	4,162,065	4,162,241	
4,162,011	4,162,238	4,162,021	4,162,067	4,162,256	
4,162,014	4,162,341	4,162,044	4,162,080	4,162,278	
4,162,018	4,162,499	4,162,435	4,162,090	4,162,312	
4,162,022	4,161,871	4,162,444	4,162,168	4,162,313	
4,162,031	4,161,951	4,162,470	4,162,218	4,162,317	
4,162,045	4,162,019	4,162,512	4,162,243	4,162,323	
4,162,049	4,162,073	4,162,513	4,162,324	4,162,324	
4,162,069	4,162,303	4,162,063	4,162,333	4,162,337	
4,162,074	4,162,355	4,162,097	4,162,410	4,162,346	
4,162,079	4,162,086	4,162,408	4,162,419	4,162,377	
4,162,117	4,162,344	4,161,834	4,162,436	4,162,412	
4,162,119	4,162,461	4,161,900	4,162,482	4,162,488	
4,162,120	4,161,804	4,161,925	4,162,490	4,162,495	
4,162,121	4,162,005	4,161,809	4,161,838	4,162,504	
4,162,157	4,161,859	4,162,517	4,161,899	4,162,505	
4,162,171	4,162,183	4,162,006	4,162,510	4,162,510	
4,162,194	4,161,865	4,162,122	4,162,007	4,162,528	
4,162,212	4,161,890				

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 33

4,161,824	4,162,015	4,162,106	45 : 4,161,805	4,161,985	4,162,131
4,161,831	4,162,140	4,162,135	4,162,370	4,162,027	4,162,267
4,161,856	4,162,145	4,162,153	4,162,516	4,162,038	4,162,275
4,161,874	4,162,223	4,162,207	4,162,518	4,162,129	4,162,397
4,161,879	4,162,272	4,162,222	47 : 4,161,818	4,162,197	4,162,509
4,161,924	4,162,273	4,162,232	4,161,840	4,162,201	4,161,988
4,161,928	4,162,286	4,162,248	4,161,873	4,162,244	4,162,016
4,161,967	4,162,287	4,162,291	4,161,901	4,162,290	4,162,088
4,162,001	4,162,347	4,162,302	4,162,150	4,162,358	4,162,206
4,162,035	4,162,363	4,162,362	4,162,204	4,162,400	4,162,359
4,162,078	4,162,496	4,162,385	4,162,254	4,162,402	4,162,456
4,162,105	4,161,902	4,162,404	4,162,298	4,162,446	54 : 4,161,883
4,162,144	4,162,033	4,162,405	4,162,451	4,162,451	4,162,261
4,162,156	4,162,059	4,162,416	4,161,793	4,162,452	4,162,262
4,162,165	4,162,196	4,162,421	4,161,807	4,162,473	4,162,333
4,162,179	Re.30,049	4,162,428	4,161,820	4,162,481	4,162,479
4,162,187	Re.30,050	4,162,429	4,161,846	4,162,521	55 : 4,161,909
4,162,205	4,161,825	4,162,430	4,161,847	4,161,850	4,161,944
4,162,234	4,161,855	4,162,434	4,161,942	4,161,955	4,162,068
4,162,265	4,161,870	4,162,440	4,161,960	4,161,799	4,162,127
4,162,271	4,161,949	4,162,453	4,161,981	4,161,835	4,162,138
4,162,277	4,161,952	4,162,467	4,161,982	4,161,953	4,162,388
4,162,380	4,161,977	4,162,494	4,161,983	4,161,978	56 : 4,162,020
4,161,997	4,162,056	4,162,534	4,161,984	4,161,998	4,162,394
4,162,004	4,162,060	4,162,593			

## DESIGN PATENTS

6 : 252,454	09 : 252,432	252,470	34 : 252,436	252,456	252,419
252,467	252,472	252,473	252,445	252,466	252,440
8 : 252,455	12 : 252,474	252,438	252,463	252,427	252,444
9 : 252,420	13 : 252,441	252,449	252,423	252,430	252,475
06 : 252,431	15 : 252,452	252,460	252,424	252,433	252,434
252,443	17 : 252,421	252,453	252,435	252,416	47 : 252,439
252,446	252,442	252,468	252,437	252,417	252,450
08 : 252,426	252,447	252,469	252,451	252,418	55 : 252,464
252,428					

## PLANT PATENTS

06 : 4,441	17 : 4,442				
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OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE

July 31, 1979

Volume 984

Number 5

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	984 OG 38
Reissue Applications Filed . . . . .	984 OG 38
Patent Notices	
Certificates of Correction for the Week of July 31, 1979 . . . . .	984 OG 39
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	984 OG 40
Condition of Patent Applications . . . . .	984 OG 41
Reissue Patents Granted (30,056) . . . . .	1051
Plant Patents Granted (4,444) . . . . .	1053
Patents Granted	
General and Mechanical (4,162,542) . . . . .	1055
Chemical (4,162,892) . . . . .	1173
Electrical (4,163,117) . . . . .	1239
Design Patents Granted (252,476) . . . . .	1299
Index of Patentees . . . . .	PI 1
Indices of Reissues, Plants and Designs . . . . .	PI 26
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Plants . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Plants . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of Information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(1) for an international application containing 80 sheets or less	\$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 80 sheets	3.50
Designation fee under PCT Rule 15.1(II)	45.00

July 3, 1979. LUTRELLE F. PARKER,  
Acting Commissioner of  
Patents and Trademarks.

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 235,141, Re. S.N. 038,189, Filed May 11, 1979, Cl. D13/1 A, BUILDING, Ralph J. Ramer, Owner of Record: *Hallmark Leisure Homes, Inc., Tampa, Fla.*, Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 290

4,020,197, Re. S.N. 017,339, Filed Mar. 5, 1979, Cl. 427/304, PROCESS FOR THE CATALYTIC SENSITIZATION OF NON-METALLIC SURFACES FOR SUBSEQUENT ELECTROLESS METALLIZATION, Horst Steffen, Owner of Record: *Kollmorgen Technologies Corporation, Dallas, Tex.*, Attorney or Agent: George B. Finnegan, et al., Ex. Gp.: 162

4,073,322, Re. S.N. 036,745, Filed May 7, 1979, Cl. 141/169, HIGH-SPEED FILLING MACHINE, Richard N. Bennett, Owner of Record: *National Instrument Company, Inc., Baltimore, Md.*, Attorney or Agent: Paul M. Craig, et al., Ex. Gp.: 243

984 OG 38

# PATENT NOTICES

## Certificates of Correction for the Week of July 31, 1979

3,626,831	4,130,220	4,146,272	4,149,239
3,984,518	4,130,487	4,146,335	4,149,248
3,985,676	4,130,629	4,146,342	4,149,254
4,021,441	4,130,680	4,146,378	4,149,268
4,028,856	4,131,457	4,146,487	4,149,296
4,032,059	4,133,647	4,146,504	4,149,437
4,048,956	4,134,234	4,146,538	4,149,459
4,060,878	4,134,819	4,146,776	4,149,512
4,061,626	4,135,270	4,147,125	4,149,564
4,071,054	4,136,040	4,147,332	4,149,687
4,072,980	4,136,114	4,147,388	4,149,899
4,079,028	4,136,729	4,147,410	4,149,904
4,081,826	4,136,946	4,147,471	4,149,990
4,082,584	4,137,204	4,147,504	4,150,167
4,084,122	4,137,655	4,147,571	4,150,393
4,092,728	4,138,845	4,147,620	4,150,526
4,093,052	4,138,354	4,147,858	4,150,738
4,096,829	4,138,551	4,147,939	4,150,743
4,097,459	4,138,822	4,148,116	4,150,846
4,097,968	4,139,175	4,148,127	4,151,003
4,102,805	4,139,379	4,148,140	4,151,202
4,105,886	4,139,488	4,148,390	4,151,399
4,105,700	4,139,924	4,148,411	4,151,467
4,107,009	4,140,188	4,148,432	4,151,481
4,107,209	4,143,255	4,148,446	4,152,002
4,108,537	4,143,444	4,148,479	4,152,147
4,112,079	4,144,176	4,148,483	4,152,578
4,113,417	4,144,314	4,148,489	4,152,748
4,114,377	4,144,522	4,148,536	4,152,827
4,115,850	4,145,388	4,148,575	4,152,884
4,118,583	4,145,534	4,148,671	4,153,384
4,118,771	4,145,535	4,148,773	4,153,802
4,122,082	4,145,561	4,148,827	4,153,906
4,126,477	4,145,695	4,148,875	4,154,718
4,126,619	4,145,699	4,148,972	
4,128,367	4,146,156	4,149,001	
4,129,083	4,146,257	4,149,026	

984 OG 39



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	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
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	St. Louis Public Library	(314) 241-2288 Ext. 214
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New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.

984 OG 40

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

### CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAIARNA, Director.....	8-11-78
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....	5-2-78
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....	7-6-78
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....	3-20-78
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director.....	12-1-77
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director.....	11-2-77
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....	2-3-78
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director.....	6-1-78
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director.....	8-25-78
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....	8-25-77
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 290—C. D. QUARFORTH, Director.....	5-17-77
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director.....	2-22-78
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Apparatuses; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....	5-11-78
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director.....	4-7-78
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director.....	1-30-78
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director.....	12-20-77
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 610, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,553 to 3,031,668, inclusive  
Plant Patents..... Numbers 2,135 to 2,142, inclusive

984 OG 41

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# REISSUES

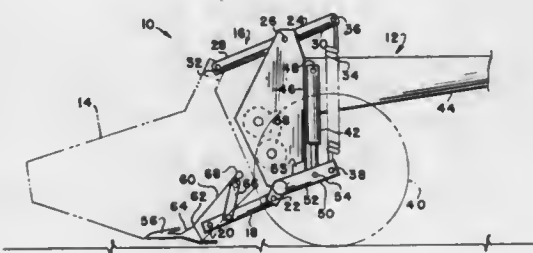
JULY 31, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## Re. 30,056 CROP HARVESTING MACHINE HEADER SUSPENSION SYSTEM

Lawrence M. Halls, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.  
Original No. 3,959,957, dated Jun. 1, 1976, Ser. No. 544,028, Jan. 24, 1975. Application for reissue Apr. 21, 1978, Ser. No. 898,745

Int. Cl.<sup>2</sup> A01D 47/00  
U.S. Cl. 56—208 17 Claims

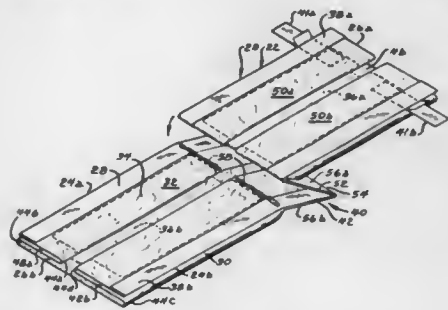


12. A crop harvesting machine, comprising:  
a mobile frame adapted to move across a field in a forward direction;  
an elongated header disposed forwardly of said frame and extending transversely to said forward direction for harvesting crop material from the field and delivering said crop material rearwardly as said mobile frame advances forwardly;  
a pair of upper and lower elongated rolls generally horizontally mounted on said frame rearwardly of said header, not weight bearing upon said lower links set forth below, for receiving said harvested crop material being delivered rearwardly by said header and conditioning said crop material as it moves rearwardly into the bite defined between said rolls; and  
means for suspending said header from said frame for substantially complete independent movement of said header during field operation relative to said frame and rolls, said means for suspending including a pair of spaced apart lower links respectively pivotally interconnecting corresponding lower opposite lateral end portions of said header and said frame, each one of said lower links being pivotally movable independently of the other, a pair of spaced apart upper links respectively pivotally interconnecting corresponding upper opposite lateral end portions of said header and said frame, each one of said upper links being pivotally mounted on said frame for movement independent of the other, and resilient means connected to said frame and operably supporting the lateral end portions of said header so as to counterbalance the weight of a respective one of said opposite lateral end portions of said header and thereby support said respective one lateral end portion of said header in an operating position relative to the field while at the same time enabling said respective one lateral end portion of said header to vertically move relative to the other lateral end portion thereof and floatingly follow the contour of the field as said mobile frame moves across the field.

## Re. 30,057 DISPOSABLE DIAPER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.  
Original No. 3,943,930, dated Mar. 16, 1976, Ser. No. 511,848, Oct. 3, 1974. Application for reissue Sep. 26, 1977, Ser. No. 836,405

Int. Cl.<sup>2</sup> A61F 13/16  
U.S. Cl. 128—287 18 Claims



24. A disposable diaper comprising:  
an absorbent pad assembly having a pair of waistline portions, a crotch region intermediate the waistline portions, a fluid impervious backing sheet, a fluid pervious cover sheet, an absorbent pad intermediate the backing and cover sheets, a plurality of longitudinally extending folds defining a pleated configuration of the pad assembly having a longitudinally extending central panel, and a pair of outermost panels overlying the central panel, and lateral fold means of the pleated pad assembly in said crotch region; and  
means for securing a sufficient portion of the outermost panels together in said lateral fold means to maintain the pad assembly in its laterally folded configuration responsive to longitudinal expansion of the central panel,  
said lateral fold means comprising a lateral tuck in the pad assembly including a lateral fold line and first and second longitudinal sections of the pad assembly extending from the lateral fold line toward opposite waistline portions of the pad assembly, and the longitudinal length of each of the longitudinal sections being approximately 1/2 inch (1.27 cms.) to 2 inches (5.08 cms.).—;

## Re. 30,058 SHUTTLE SPEED CONTROL DEVICE

Yukio Katahira, Sayama, Japan, assignor to Nihon Beru-Haneru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

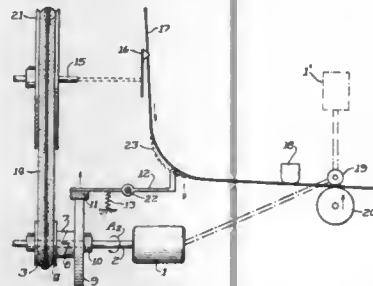
Original No. 3,992,305, dated Nov. 16, 1976, Ser. No. 625,964, Oct. 28, 1975. Application for reissue Sep. 22, 1977, Ser. No. 835,937

Claims priority, application Japan, Nov. 22, 1974, 49-134917  
Int. Cl.<sup>2</sup> G03B 31/00

U.S. Cl. 352—14 3 Claims  
1. A shuttle speed control device for [a] sound motion picture [camera] cameras and projectors including a drive motor having an output shaft driving a shuttle for transporting film intermittently through an exposure station and a capstan for transporting film constantly through a sound station, and a film loop sensor arranged between the exposure station and the sound station, the control device comprising:  
a first half pulley fixed to said motor output shaft;  
a second half pulley coupled to said first half pulley and adjustable along said motor output shaft;  
transmission means arranged about said half pulleys and coupled to said shuttle for powering said shuttle;



a brake disk rotatably supported on said output shaft;  
a first pawl member arranged on said second half pulley;  
a second pawl member arranged on said brake disk for engagement with said first pawl member;  
a brake member on said film loop sensor movable responsive to variations in the size of the film loop whereby [an increase] a decrease in film loop size causes said brake



member to engage said brake disk to increase the rate of operation of said shuttle relative to the rate of rotation of said capstan, and [decrease] an increase of said film loop size causes said brake member to release said brake disk to decrease the rate of operation of said shuttle relative to the rate of rotation of said capstan.

Re. 30,059

## ASSAY FOR MYASTHENIA GRAVIS

Jon M. Lindstrom, Del Mar, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.  
Original No. 4,033,722, dated Jul. 5, 1977, Ser. No. 603,243, Aug. 8, 1975. Application for reissue Mar. 20, 1978, Ser. No. 888,691

Int. Cl.<sup>2</sup> G01N 33/16; A61K 43/00

U.S. Cl. 23—230.3

8 Claims

1. A biochemical assay system comprising a complex of acetylcholine receptor protein derived from [human] mammalian muscle with toxin labeled with a radioactive isotope.

Re. 30,060

## METHOD FOR AGGLOMERATING WET-COLLECTED FUME FOR USE IN METALLURGICAL FURNACES AND AGGLOMERATES PRODUCED THEREBY

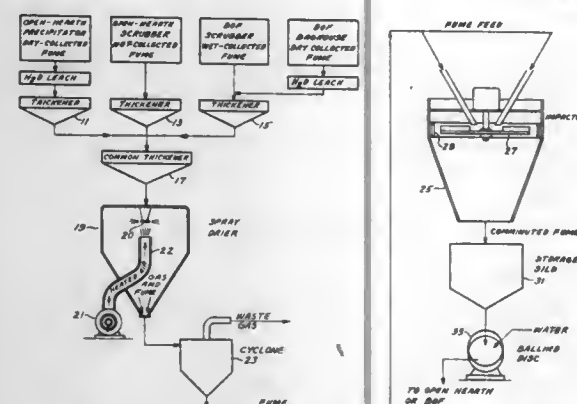
John W. Kreiger, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Original No. 4,004,916, dated Jan. 25, 1977, Ser. No. 592,287, Jul. 1, 1975. Application for reissue May 5, 1978, Ser. No. 903,297

Int. Cl.<sup>2</sup> C22B 1/08

U.S. Cl. 75—3

21 Claims



1. A method for utilizing moisture-bearing iron-containing fume from steelmaking furnaces to produce "green" balls

suitable for charging into steelmaking furnaces to recover said iron, comprising:

- substantially instantaneously drying said fume,
- impact-fracturing a portion of said fume whereby the Blaine surface area of said fume is not less than about 8,000 square centimeters per gram, and
- balling said fume on a balling device while adding sufficient moisture to produce effective agglomeration.

Re. 30,061

## NONWOVEN FIBROUS PRODUCT AND METHOD OF MAKING THE SAME

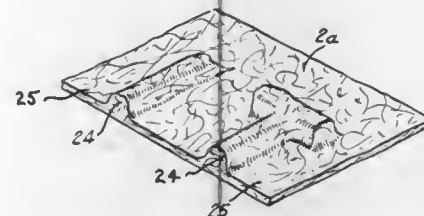
Robert C. Shepherd, Oak Lawn, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Original No. 3,759,775, dated Sep. 18, 1973, Ser. No. 140,247, May 4, 1971. Division of Ser. No. 487,577, Jul. 11, 1974, abandoned, which is a continuation of Ser. No. 878,246, Nov. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 570,390, Jul. 26, 1966, abandoned. Application for reissue Jun. 9, 1976, Ser. No. 694,328

Int. Cl.<sup>2</sup> B32B 5/02, 5/18; D04H 1/68

U.S. Cl. 156—78

21 Claims



1. The method of making a stabilized low density nonwoven fabric comprising the steps of:

providing a nonwoven web of discrete fibers;  
impregnating said web with an aqueous liquid, the liquid being distributed throughout the web with a minor amount of added material also being distributed throughout the web, said added material acting as a binder capable of stabilizing said fibers as an interconnected web, said added material so acting as an agent altering the surface tension of the aqueous liquid to effectively form upon heating aqueous membranes within the web of spaced and interconnected fibers;

rapidly vaporizing the volatile portions of said aqueous liquid by applying heat substantially to an internal portion of said impregnated web at a rate sufficient to cause the expanding volatile portions of said aqueous liquid to form said aqueous membranes and to exert expansive forces on said aqueous membranes between said fibers and to thereby separate portions of said web and produce a puffed web portion; and

setting the material which acts as a binder while said fibers are in the puffed condition to secure said fibers to one another at interconnections therebetween and thereby to define stable enlarged interstices between the fibers.

## PLANT PATENTS

GRANTED JULY 31, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,444

## DOGWOOD TREE

Glen E. Handy, Rte. 2, Box 347, Troutdale, Oreg. 97060

Filed Jul. 10, 1978, Ser. No. 923,086

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—51

1 Claim

1. A new and distinct variety of flowering dogwood tree substantially as herein shown and described, characterized particularly as to novelty by unusually large leaves with a majority of the leaves having a dark colored margin and a light colored sharply defined central area, blooms which typically appear when the tree is extremely young, many petals of the blooms having a red tip, an upright habit of growth and brilliant dark red Fall leaf color.

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# PATENTS

GRANTED JUL. 31, 1979

## ERRATA

For CLASS	See PATENT NO.
409-064 .....	4,162,647
118-076 .....	4,162,680
119-003 .....	4,162,681
119-016 .....	4,162,682
119-051 R .....	4,162,683
119-073 .....	4,162,684
119-103 .....	4,162,685
122-149 .....	4,162,686
280-801 .....	4,162,715
414-736 .....	4,162,732
414-078 .....	4,162,733
414-027 .....	4,162,734
414-514 .....	4,162,735
406-094 .....	4,162,811
354-010 .....	4,162,846
435-007 .....	4,162,895
435-075 .....	4,162,938
435-254 .....	4,162,939
435-119 .....	4,162,940
435-023 .....	4,162,941
435-017 .....	4,162,942
585-481 .....	4,163,028
525-449 .....	4,163,029
525-429 .....	4,163,030
525-005 .....	4,163,031
525-074 .....	4,163,032
525-053 .....	4,163,033
525-530 .....	4,163,097



PATENTS

GRANTED JULY 31, 1979

GENERAL AND MECHANICAL

4,162,542

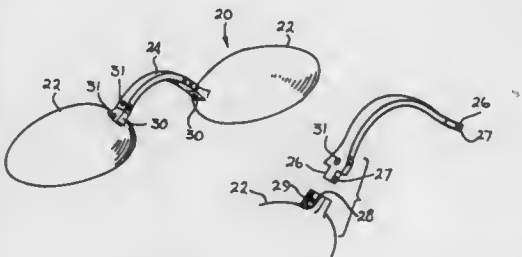
EYE PROTECTORS

Jerome M. Frank, 10549 Valparaisa St., Los Angeles, Calif. 90034

Filed May 9, 1977, Ser. No. 795,180  
Int. Cl.<sup>2</sup> A61F 9/02

U.S. Cl. 2-15

18 Claims



12. Improved eye protectors comprising:  
a pair of substantially nontransmissive eye cups, each for fitting over one eye of a user,  
each of said eye cups having an approximately elliptical shape being generally complimentary to the shape of the eye to fit against the skin above and below the eyes within the eye socket outline, each of said eye cups having a socket means on its outer surface adjacent one end thereof and  
a bridge member for fitting over the nose bridge of a user, said bridge member being of substantially transparent plastic and having a substantially rectangular cross-section, said bridge member having ends shaped to releasably fit with said socket means on each of said eye cups to hold them in a substantially cooperative functional disposition.

4,162,543

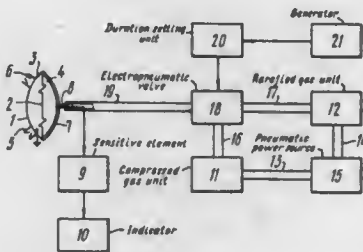
ARTIFICIAL HEART

Valery I. Shumakov; Moisei A. Lokshin; Vadim V. Vlasov; Vitaly A. Buryinin, and Nikolai V. Novikov, all of Moscow, U.S.S.R., assignors to Institut Transplantatsil Organov i Tkanel, U.S.S.R.

Filed Aug. 23, 1977, Ser. No. 827,029  
Int. Cl.<sup>2</sup> A61F 1/24; A61M 1/03

U.S. Cl. 3-1.7

9 Claims



1. An artificial heart comprising at least one blood circulating pump having:  
a housing;  
a diaphragm arranged in said housing and dividing said housing into two chambers, i.e. a hydraulic chamber and a pneumatic chamber;  
said hydraulic chamber having an inlet valve and an outlet valve which are adapted to be connected in the circulation of a patient;  
said pneumatic chamber having a nipple for the supply and discharge of gas and a conducting transparent coating applied onto the internal wall of said pneumatic chamber

so that said coating and the surface of the blood circulating in said hydraulic chamber form a capacitor whose capacity varies depending on changes in the volume of the hydraulic chamber, said capacitor serving as a blood volume transducer of the pump;

a system for controlling the supply of gas to and the discharge of gas from said pneumatic chamber of said pump, comprising:

- an electric power source;
- a pneumatic power source;
- an element sensitive to changes in the volume of blood in said hydraulic chamber of said pump, which sensitive element is an RC bridge one of whose arms incorporates said blood volume transducer of said pump;
- an indicator of the volume of blood in said hydraulic chamber of said pump, connected to said sensitive element;
- a compressed gas unit having a pneumatic input and an output, said pneumatic input being connected by means of a pneumatic line to said pneumatic power source;
- a rarefied gas unit having a pneumatic input and a pneumatic output, said pneumatic input being connected by means of a pneumatic line to said pneumatic power source;
- an electropneumatic valve having two pneumatic inputs, an electric input and a pneumatic output, said pneumatic output being connected by means of a pneumatic line to said nipple of said pneumatic chamber of said pump, one of said pneumatic inputs being connected through a pneumatic line to said compressed gas unit, while the second pneumatic input is connected through a pneumatic line to said rarefied gas unit;
- a clock pulse generator which performs the function of a pulse rate setting unit;
- a unit for setting the duration of the compressed gas intake, having an electric input and an electric output, said electric input being connected to said clock pulse generator, whereas said electric output is connected to the electric input of said electropneumatic valve.

4,162,544

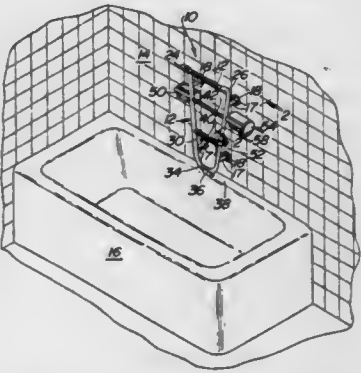
SAFETY RAILING

Joseph T. Freeman, Philadelphia, and Aaron Colish, Bala Cynwyd, both of Pa., assignors to Bath-Ladd Corporation, Philadelphia, Pa.

Filed Feb. 3, 1978, Ser. No. 874,720  
Int. Cl.<sup>2</sup> A47K 3/12

U.S. Cl. 4-185 H

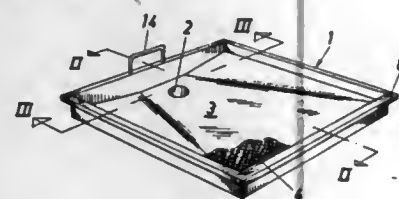
10 Claims



1. A safety railing for attachment to a wall adjacent a bathtub comprising:  
a frame substantially in the configuration of an isosceles triangle with the corners of the triangle being curvilinear; said frame being adapted to be attached spaced from and

substantially parallel to a wall with the portion of said frame forming the base of the triangle being uppermost and in a generally horizontal disposition and the portion of said frame forming the apex of the triangle contacting a portion of a bathtub;  
means for attaching said frame to a wall;  
means for holding soap attached to said frame; and  
a box for storing articles during bathing attached to said frame, said box having a top contoured to shed water.

**4,162,545**  
**SINK FOR WASH-BASINS, DRAINBOWLS AND THE LIKE**  
Jan-Åke Hallén, Brinketorsvägen 3, Partille, Sweden (433 00)  
Continuation of Ser. No. 696,182, Jan. 15, 1976, abandoned.  
This application Nov. 3, 1977, Ser. No. 848,303  
Claims priority, application Sweden, Jun. 17, 1975, 7506914  
Int. Cl.<sup>2</sup> E03C 1/26  
U.S. Cl. 4—190 4 Claims

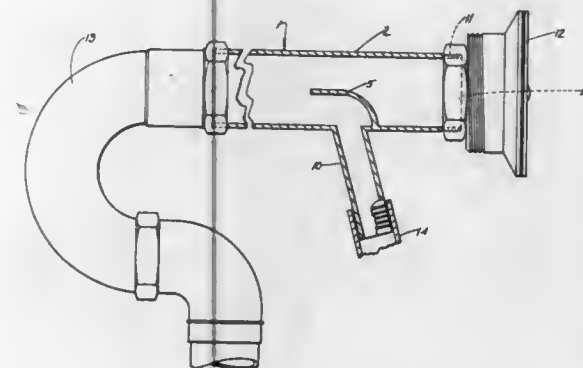
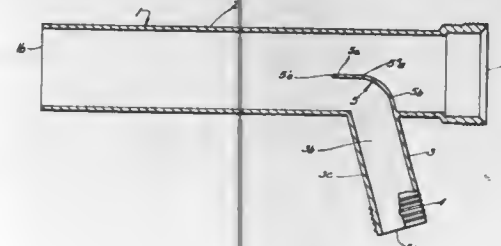


1. In a sink intended to be used for wash-basins, drainbowls and the like including a trough-shaped vessel having a drainage opening located at its lowest part, a splash-guard detachable fitted at the upper part of the sink and extending over substantially the entire opening thereof, the improvement comprising said splash-guard being formed by a closed meshed lattice having thin parallel intermediate walls forming the lattice openings said intermediate walls having an extension larger than or at least equal to the largest cross-sectional measure of said lattice openings in a direction perpendicular to the plane of the upper surface of the sink and the lattice being substantially as deep as the smallest depth of the vessel.

**4,162,546**  
**BRANCH TAIL PIECE**  
Kenneth R. Shortell, Cincinnati, Ohio, assignor to Carrcraft Manufacturing Company, Cincinnati, Ohio  
Filed Oct. 31, 1977, Ser. No. 847,097  
Int. Cl.<sup>2</sup> E03D 9/04  
U.S. Cl. 4—191 11 Claims

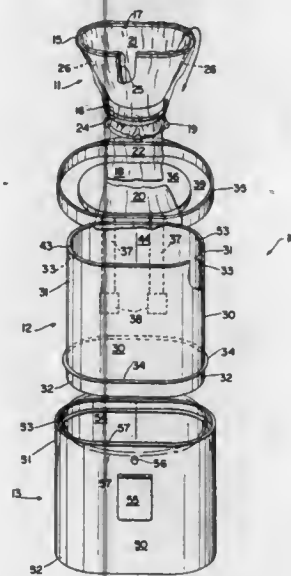
1. A branch tail piece for connecting the waste water outlet of an automatic dishwasher or the like to a waste drain system having a sink strainer and a trap, said tail piece comprising a hollow tubular body portion having an upper sink strainer engaging end including means for coupling said tail piece to the sink strainer and a lower trap engaging end adapted to engage the trap, a hollow tubular branch member extending outwardly from said body portion and having an inlet port and an outlet port, said outlet port communicating with the interior of said body portion, said branch member including means for coupling said inlet port to the waste water outlet of the automatic dishwasher or the like, and a baffle located within said body portion adjacent said outlet port of said branch member to provide a channeled flow path for directing the flow of the waste water within said tail piece to prevent the waste water from being expelled from said sink strainer engaging end of said tail piece, said baffle comprising a planar portion and an arcuate portion, said planar portion extending chordwise across the interior of said body portion, the lower edge of said planar portion extending at least as far as a line projected along the inner surface of said branch member such that said baffle extends at least across said branch member outlet part, said arcuate portion extending across the interior of said body portion, the lower end of said arcuate portion being attached to

the upper edge of said planar portion, the upper edge of said arcuate portion being attached to the inner wall of said body portion between said outlet port and said sink strainer engaging



end, whereby said baffle deflects downwardly the hot waste water from the dishwasher and dissipates the heat, thus protecting the body portion of said tail piece from damage.

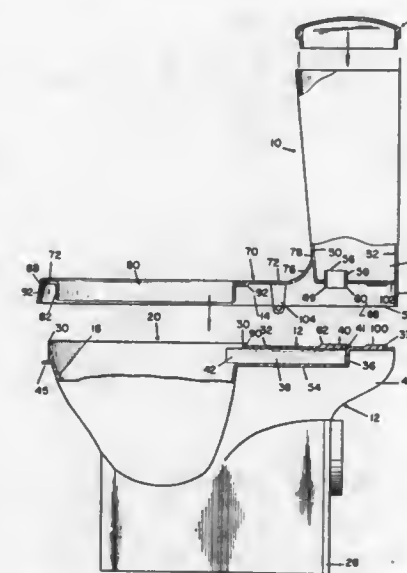
**4,162,547**  
**POCKET CUSPIDOR**  
Allen N. Jenkins, Rte. 2, West, Miss. 39192  
Filed Oct. 12, 1978, Ser. No. 950,714  
Int. Cl.<sup>2</sup> A61J 19/00  
U.S. Cl. 4—259 29 Claims



1. A cuspidor comprising a mouthpiece having an upper end and a lower end, the mouthpiece having an opening extending therethrough between the upper end and the lower end, a flexible waterproof bag having an upper end and a lower end and an interior surface and an exterior surface, the said bag being open at its upper end and closed at its lower end whereby spitum may be introduced into the interior thereof via the open

end and retained therein by the closed lower end in contact with the said interior surface and out of contact with the said exterior surface when the bag is in an upright position, the said upper end of the bag being passed upward through the said opening in the mouthpiece from the lower end of the mouthpiece opening to the upper end thereof, the said upper end of the bag also being passed upward through the mouthpiece opening a substantial distance past the said upper end of the mouthpiece and being opened and folded in its open condition around the opening in the said upper end of the mouthpiece and then passed downward onto the outer surface of the mouthpiece whereby the exterior surface of the upper end portion of the bag is in contact with the opening in the mouthpiece and the outer surface thereof and the interior surface of the upper end portion of the bag is exposed, and retaining means carried by the mouthpiece for releasably retaining the said open upper end portion of the bag thereon, the retaining means being effective to retain the said upper end of the bag on the outer surface of the mouthpiece at a point a substantial distance beneath the top thereof during use of the cuspidor whereby misdirected spitum is deposited on the resultant exposed interior surface of the upper end portion of the bag, and the retaining means being adapted to be released following use of the cuspidor whereby upon release of the retaining means the said upper end of the bag may be pulled downward through the mouthpiece opening and the bag removed from the mouthpiece without the interior surface of the bag touching the mouthpiece and whereby the contents of the bag may be disposed of in a sanitary manner.

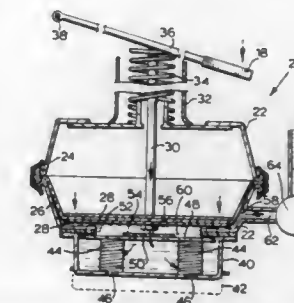
**4,162,548**  
**WATER CLOSETS**  
Frederick W. H. Groombridge, Welwyn, and Ronald N. Butler, Prestwood, both of England, assignors to Celanese Corporation, New York, N.Y.  
Filed Feb. 27, 1978, Ser. No. 881,310  
Claims priority, application United Kingdom, Apr. 13, 1977, 15298/77  
Int. Cl.<sup>2</sup> E03D 1/00, 3/00, 5/00, 11/00  
U.S. Cl. 4—300 10 Claims



1. A water closet shell comprising:  
(a) a basin component formed in one piece of molded plastics material and having an upwardly open bowl, an open waste outlet, a water inlet passage having a discharge opening into the bowl, adjacent the top thereof, and an inlet opening, and a supporting portion whereby the basin may be supported in place; and  
(b) a cistern component formed in one piece of molded plastics material and having an upwardly open tank including an outlet opening adapted to be in register with

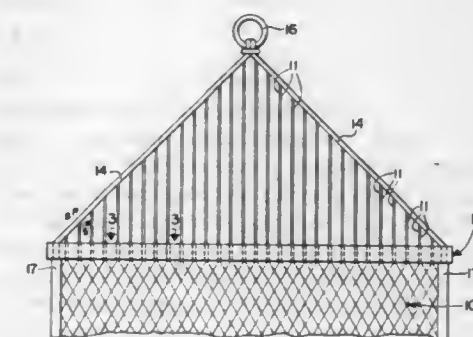
said inlet opening of said water passage when the water closet is assembled, whereby said tank communicates with said water passage; and a flushing rim section including: a connecting wall extending from said tank and adapted to surmount the bowl when the water closet is assembled, and a sleeve adapted to project downwardly from said connecting wall and into said bowl when the water closet is assembled, the sleeve then being spaced inwardly from the upper end of said bowl and from the discharge end of said water passage to define with said bowl a downwardly open flushing channel extending around the upper end of said bowl.

**4,162,549**  
**FILTERING ELEMENTS**  
Paul A. S. Charles, Rockford, Ill., and Frederic D. M. Williams, Mississauga, Canada, assignors to Royal Flush (1979) Inc., Hamilton, Canada  
Filed Jan. 3, 1978, Ser. No. 866,629  
Int. Cl.<sup>2</sup> E03D 5/01; B01D 35/02  
U.S. Cl. 4—318 9 Claims



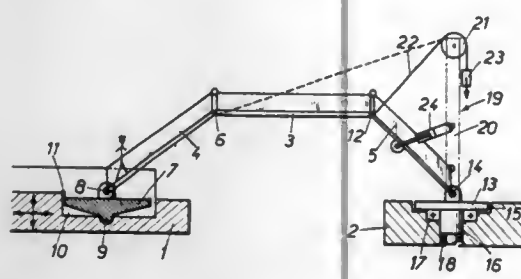
1. A filter element comprising means establishing a flow path having an inlet and an outlet, a coil spring filter element disposed in the flow path for liquid passing from the inlet to the outlet to pass through the coils thereof to be filtered, a member in the flow path movable by reverse movement of liquid in the path from the outlet toward the inlet, the movable member being mechanically connected to the coil spring filter element and compressing it axially upon said movement to reduce the flow capacity through the coils thereof during the said reverse liquid flow backwashing through the filter element.

**4,162,550**  
**HAMMOCK**  
Millard L. Willingham, Anniston, Ala., assignor to Carl R. Glipson, Anniston, Ala.  
Filed Feb. 16, 1978, Ser. No. 878,278  
Int. Cl.<sup>2</sup> A45F 3/22  
U.S. Cl. 5—123 7 Claims



1. A hammock comprising:  
(a) an elongated body supporting member formed of netted



- 4,162,551
- FOOTBRIDGE FOR CONNECTION BETWEEN A FIXED INSTALLATION AND AN OSCILLATING INSTALLATION
- Francisco de Assis Manuel Serrano, Issy-les-Moulineaux, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines, Paris, France
- Filed Mar. 27, 1978, Ser. No. 890,510
- Claims priority, application France, Mar. 25, 1977, 77 09084
- Int. Cl.<sup>2</sup> E01D 1/00
- U.S. Cl. 14—69.5
- 6 Claims
- 
1. A footbridge for connection between a fixed installation and an oscillating installation, said installations having decks, said footbridge comprising three sections consisting of a central section and two end sections hinged to respective ends of said central section, said central section being maintained at an upper level with respect to the level of the decks of said fixed and oscillating installations, rotatable platforms adapted to be secured to said decks, the ends of said end sections not secured to said central section being hinged respectively to said rotatable platforms, said rotatable platform adapted to be secured to the deck of said oscillating installation being provided with one member of a ball joint adapted for engagement with the other member of said ball joint to be located on said deck, the upper surface of said platforms being substantially level with the upper surface of said decks, and means for compensating for the weight of said footbridge.

4,162,552

CLEANING DEVICE FOR CIRCULAR DISCS

Heinrich J. Winter, Hainburg-Hessen, Fed. Rep. of Germany, assignor to Heinrich Josef Winter Kunststoffverarbeitung und Werkzeugbau GmbH, Hainburg am Main, Fed. Rep. of Germany

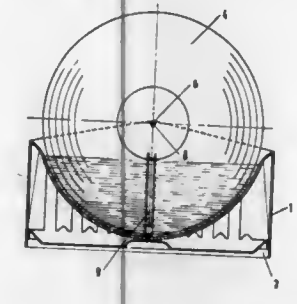
Filed Jul. 10, 1978, Ser. No. 923,174

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732697

Int. Cl.<sup>2</sup> A46B 11/00; A47B 81/06; G11B 3/58, 23/50

U.S. Cl. 15—104.92

15 Claims



1. A cleaning device for circular discs having a central bore, said device comprising:  
a cleaning tank, a cross-section of the tank being in the shape of a segment of a circle;  
a base on which the tank stands;  
a supporting box formed by the base providing a downwardly opening space;  
two opposed side walls of the tank;  
a shaft supported on the side walls to hold a disc for rotation between the side walls and  
a drying rack having a base, and supporting means on which a disc may be deposited after cleaning;  
wherein the drying rack is of such a size that it can be accommodated in the space of the supporting box for storage with the supporting means flanking the tank.

4,162,553

TOOTH CLEANER

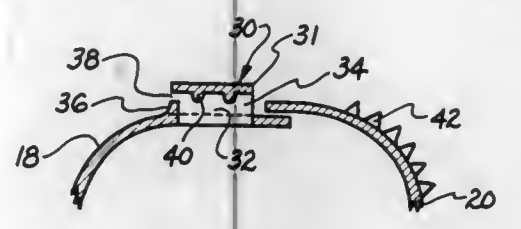
Patrick J. Bruno, 6, Anderson Dr., Albany, N.Y. 12205

Filed Dec. 27, 1977, Ser. No. 864,717

Int. Cl.<sup>2</sup> A46B 1/00

U.S. Cl. 15—167 R

1 Claim



1. A disposable toothbrush comprising a molded one piece integrally formed elongated strip of plastic material including a centrally disposed base portion having a plurality of bristles emanating from the surface thereof, said base portion being thicker than the strip and adding rigidity thereto and serving as a strong junction between the bristles and the strip for maintaining the bristles in an upstanding orientation during the cleaning operation, a first strip portion and a second strip portion extending outwardly from opposite sides of said base portion, respectively, said first strip portion including an integrally formed fastener portion forming a longitudinally extending passage including an inner wall provided with an inner wall protrusion, said second strip portion including a second integrally formed fastener portion comprising a longitudinally extending tongue provided with a plurality of longitudinally

spaced upstanding tongue protrusions adapted to be forced into latched engagement with said inner wall protrusion at various positions of adjustment for securing said toothbrush to a finger of a user, wherein said longitudinally extending opening includes a restricted end aperture forming a guide for urging said upstanding tongue protrusions into latched engagement with said inner wall protrusion and an unrestricted entrance aperture that permits easy one-handed insertion of the tongue portion into and through the passage.

4,162,554

RETRACTABLE BRUSH WITH RESISTANCE TO POPPING APART

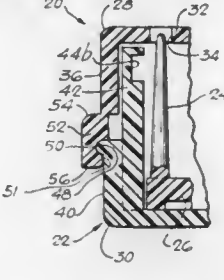
Lester R. Peilet, 6144 N. Talman Ave., Chicago, Ill. 60659

Filed Dec. 9, 1977, Ser. No. 859,029

Int. Cl.<sup>2</sup> A46B 9/10, 15/00, 17/06

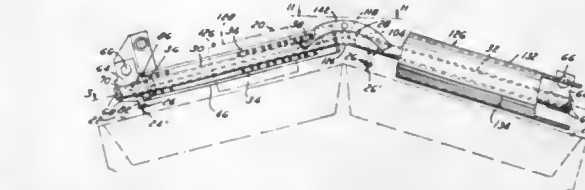
U.S. Cl. 15—184

4 Claims



2. A retractable brush, comprising  
a casing made of a resilient plastic material and having generally cup shaped front and rear members which are relatively rotatable,  
said front member having a front wall and an annular generally cylindrical side wall projecting rearwardly therefrom,  
said front wall having a plurality of bristle receiving openings therein,  
said rear member having a rear wall with an annular generally cylindrical side wall projecting forwardly therefrom,  
a bristle carrying member movable in said casing and having bristles movable outwardly and retractable rearwardly through said openings, and  
operating means in said casing for advancing and retracting said bristle carrying member in response to relative rotation of said front and rear members in opposite directions, said annular side wall of said front member having a continuously circular internal inwardly projecting annular lip thereon and an internal annular groove therein immediately in front of said annular lip,  
said annular side wall of said rear member having a continuously circular external annular lip projecting outwardly therefrom and slidably received in said internal groove, said internal and external annular lips overlapping substantially when assembled and being dimensioned for assembly by snapping together under heavy manual pressure, said annular lips and said annular groove interlocking with a snug sliding fit therebetween and without any looseness for largely obviating any accidental disconnection of said internal and external annular lips due to gripping pressure on said casing.

trained so as to have a pair of reaches extending therebetween in a parallel relationship to the guide; a wiper support received within the guide for translatable movement along the length thereof in opposite directions; said wiper support having an extension that projects through the slot in the guide and a connection portion that extends transversely with respect to



the guide slot externally of the guide; a slidable connection between the connection portion of the wiper support and the drive loop; and means for rotatively driving one of the sheaves in a single direction to thereby drive the loop and move the wiper support in a reciprocal manner through the slidable connection.

4,162,556

PROCESS AND APPARATUS FOR REMOVAL OF TRASH DEPOSITS ON OPEN-END SPINNING MACHINE

Henri van Ditschulzen; Fritz Schumann, both of Ingolstadt; Georg Goldammer, Gaimersheim, and Richard Glaser, Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

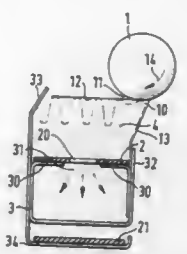
Filed Aug. 3, 1977, Ser. No. 821,359

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634770

Int. Cl.<sup>2</sup> B08B 7/00, 5/04; A47L 5/38; D01H 11/00

U.S. Cl. 15—312 R

10 Claims



1. An apparatus for removing trash containing both coarse and fine particles from an open-end spinning machine after said trash has been separated from fibrous material and deposited in said collection chamber, said collection chamber being positioned below a releasing roll forming part of said open-end spinning machine, said apparatus comprising:  
a conveyor belt traveling through said collection chamber removing predominantly the coarser particles of said trash;  
means defining a trash separating opening providing communication between said releasing roll and said collection chamber through which said trash separated from said fibrous material passes into said collection chamber after separation,  
a fiber air stream flowing through said trash separating opening to said spinning machine, and  
means for successively moving a stream of air along the length of said chamber for withdrawing predominantly the smaller particles of said trash from said collection chamber without adversely affecting said spinning operation.

4,162,555

WIPER DRIVE ASSEMBLY

Theodore A. Jackson, Utica, Mich., assignor to Cadillac Gage Company, Warren, Mich.

Filed Jul. 14, 1978, Ser. No. 924,466

Int. Cl.<sup>2</sup> B60S 1/46, 1/20, 1/44

U.S. Cl. 15—250.01

30 Claims

1. A wiper drive assembly comprising: an elongated guide of a hollow construction having an elongated slot extending along the length thereof; a continuous drive loop of a flexible construction; a pair of sheaves over which the drive loop is

**4,162,557**  
**PROCESS FOR TURNING A COATED CASING INSIDE OUT**

Jerome J. M. Rasmussen, Burbank, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,817

The portion of the term of this patent subsequent to May 31, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> A22C 13/02

U.S. Cl. 17-45

18 Claims



1. A process for turning an elongated flexible tubing inside out which comprises:

- humidifying a length of flexible tubing to at least 8 percent moisture level based on the total weight of the tubing;
- shirring the humid length of flexible tubing to form a shirred stick;
- deshirring and everting the flexible tubing of the shirred stick by drawing one end of the tubing through the bore of the shirred stick and out through the opposite end;
- inflating the everted deshirred tubing as it is exiting from the stick bore; and
- flattening the everted, inflated tubing.

**4,162,558**  
**FISH SCALER TOOL**  
Carlos R. Rubio, 650 NW. 59 Ave., Miami, Fla. 33126  
Filed May 30, 1978, Ser. No. 910,374  
Int. Cl.<sup>2</sup> A22C 25/02

U.S. Cl. 17-67

1 Claim



1. A fish scaler tool for use with a motor driven drill having a chuck means, said fish scaler comprising:

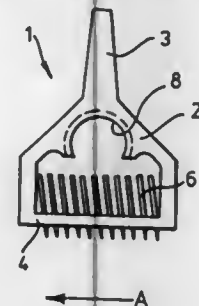
- a generally elongate cylindrical member of stainless steel having a first end zone and a second end zone, said second end zone comprising an axially extending chuck engageable length of about 3/16 inch diameter to mate with the chuck means of the motor driven drill, said first end zone having an exterior surface and comprising a solid elongate body of about 4 inches in length and of about 1/2 inch in overall diameter of the exterior surface, said first end zone terminating at a beveled terminal end and having a plurality of spiral grooves in the exterior surface extending in equispaced relation between the beveled end to adjacent said first end zone, and each of said grooves defining an edge facing the beveled end along the lines of intersection

of the spiral groove at the exterior surface and a plurality of radially inwardly extending recesses of generally semi-circular form extending radially depthwise and toward the first end zone from said lines of intersection, said recesses being equispaced along said lines of intersection and comprising a plurality of integral tooth surfaces on said first end zone whereby, when said motor is energized and said tool is in engagement with the chuck means of a drill driven by said motor, the tool is adapted for use in rapidly scaling fish.

**4,162,559**  
**CARDING APPARATUS**  
David B. Stewart, Newtyle, Scotland, assignor to Wm. R. Stewart & Sons (Hacklemakers) Limited, Dundee, Scotland  
Filed Oct. 6, 1977, Ser. No. 840,027  
Int. Cl.<sup>2</sup> D01G 15/08, 15/24

U.S. Cl. 19-113

19 Claims

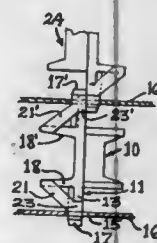


1. A carding flat comprising a rigid substrate defining an array of apertures and a plurality of individual pins each secured in a respective one of said apertures in the substrate, said substrate being an elongated member having a longitudinal axis and axially opposite hollow end portions defining hollow areas, said end portions each including an internal axially extending partially cylindrical surface opening in a direction generally transversely of said longitudinal axis into the hollow area of each hollow end portion, and axial ends of each cylindrical surface terminating at a counter bored cylindrical surface likewise opening in a direction generally transversely of the longitudinal axis into the hollow area of each hollow end portion.

**4,162,560**  
**SPACER SUPPORT FOR PANEL MEMBERS**  
Jack W. Thomsen, LaGrange Park, Ill., assignor to Weckessar Company, Inc., Chicago, Ill.  
Filed Dec. 19, 1977, Ser. No. 862,000  
Int. Cl.<sup>2</sup> A44B 21/00, 17/00

U.S. Cl. 24-73 P

4 Claims



1. A spacer support assembly connectible to either side of a panel member having a circular mounting hole formed therein into which portions of cooperating assemblies are projectable so as to connect a plurality of panels in stacked spaced relation comprising:

- an elongated molded plastic body,
- said body terminating at each end solely by a pair of longitudinally extending legs,

- said pair legs being semi-circular in cross section and extending from one side of a longitudinal center plane that extends through the longitudinal center line of said body and adapted for projection through one-half of the mounting hole formed in the panel member,
- means provided by said legs for embracing a wall portion of the panel member defining the mounting hole formed therein, and
- means carried by said body adjacent to both ends thereof and inwardly of said legs and yieldably engaging an opposite wall portion of the panel member defining the mounting hole and cooperating with said means provided by said legs for detachably mounting said spacer support assembly to the panel member.

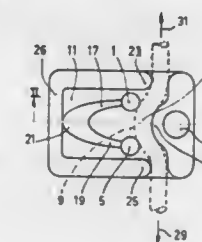
**4,162,561**  
**STRAIN-RELIEF DEVICE FOR A CABLE**  
Jacobus H. Tillemans, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.  
Filed Nov. 16, 1977, Ser. No. 852,069

Claims priority, application Netherlands, Jan. 5, 1977, 7700045

Int. Cl.<sup>2</sup> F16G 11/03

U.S. Cl. 24-129 R

2 Claims



1. A strain-relief device for a cable, having a clamping space bounded by three clamping members for engaging a cable portion, the first and third members bearing on one side of the cable near the respective ends of the portion while the second member bears against the other side near the middle of said portion, said members being so disposed relative each other that said portion is curved, in the clamping space; and having a frame to which said clamping members are connected, wherein said frame has surfaces engaging the cable at locations spaced from said curved portion, said surfaces defining a longitudinal direction of the cable; said frame and said members are parts of a unitary body; and said first and third members respectively are formed by the ends of two arms arranged to be movable resiliently and substantially parallel to said longitudinal direction, while the second member is stationary relative to the frame.

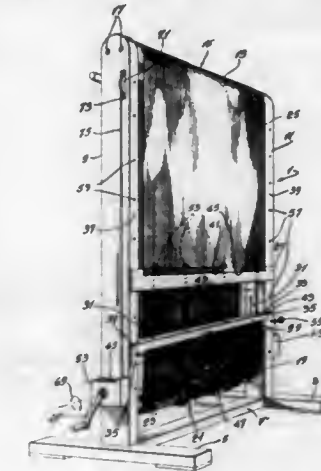
**4,162,562**  
**LOOM FOR HIGH WARP TAPESTRY**  
Andree Beauregard, 477, Saint-François-Xavier, Bureau 204, Montreal, Quebec, Canada  
Filed Mar. 23, 1978, Ser. No. 889,482  
Int. Cl.<sup>2</sup> D03D 29/00

U.S. Cl. 28-151

13 Claims

1. In a loom for high warp tapestry which is made of a substantially rectangular frame mounted on a base, and wherein said frame is adapted to receive a warp in downwardly displaceable fashion along its length, the improvement wherein said frame is made of two substantially parallel upright vertical members, an upper guide bar and a lower guide bar, said upper guide bar and said lower guide bar having means to permit sliding of said warp along said upper and lower guide bars, a pair of transverse horizontal elongated holding members which are adapted to slide along said upright vertical members at the rear of the frame in parallel fashion to one another, hooking means on said elongated holding members to separately hook and retain the ends of said warp, means

for drawing said holding members closer to one another to increase the rigidity on said warp, and means for fixedly

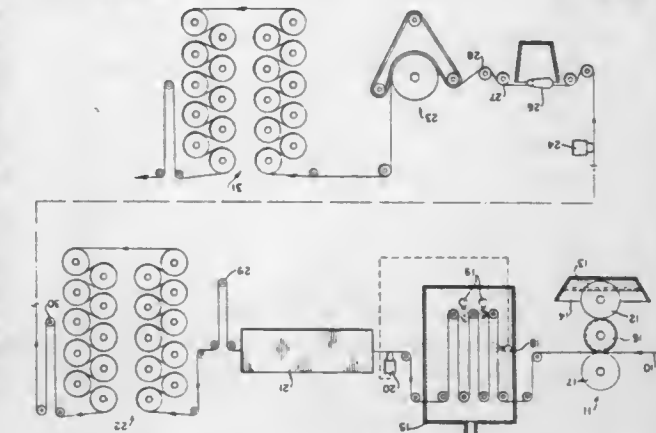


mounting one of said holding members relative to said upright members.

**4,162,563**  
**INTEGRATED METHOD OF FINISHING, STRAIGHTENING AND COMPRESSIVE PRESHRINKING OF FABRIC**  
Jackson Lawrence, West Sand Lake, and Robert S. Cramer, Burnt Hills, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.  
Filed Nov. 28, 1977, Ser. No. 855,123  
Int. Cl.<sup>2</sup> D06C 21/00, 29/00

U.S. Cl. 28-163

5 Claims



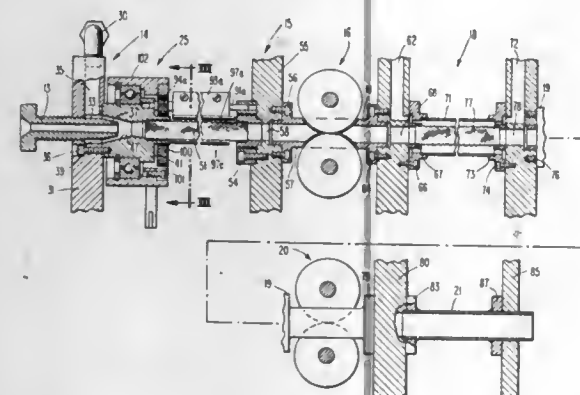
1. An integrated method of finishing, straightening and compressive preshrinking of a fabric web comprising the steps of:

- applying finishing additives and moisture by passing said fabric web through a three-roll coating unit containing said additives in a water base, the amount of moisture applied being in the range of 15% to 30% by weight;
- applying a water spray to said fabric web, the additional moisture applied being in the range of 0% to 20% by weight of fabric web;
- subjecting said fabric web to steam to cause said fabric web to relax to cause penetration and dispersion of the previously applied moisture and of the finishing additives and to additionally moisten said fabric web, the additional moisture applied being in the range of 0% to 15% by weight of fabric web;
- sensing the amount of moisture in the fabric web and adjusting the amount of water spray applied to obtain precisely a predetermined optimum moisture level in said



fabric web in order to efficiently process the fabric web during straightening;  
 (e) straightening the fabric web to orient the filler yarns relative to the warp yarns;  
 (f) partially drying the fabric web to a level wherein said fabric web can be compressively preshrunk;  
 (g) compressively preshrinking the fabric web; and  
 (h) fully drying said fabric web.

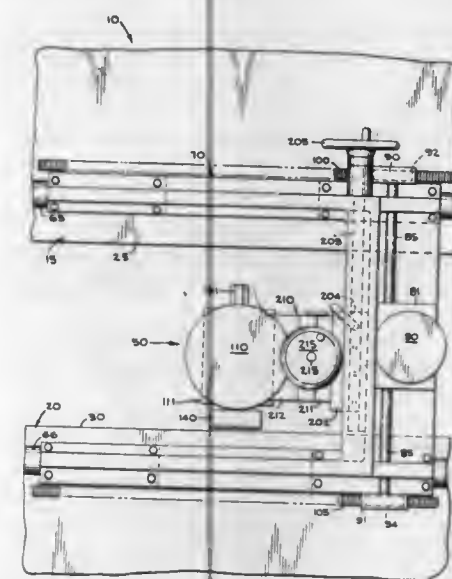
**4,162,564**  
**METHOD AND APPARATUS FOR STUFFER CRIMPING STRAND MATERIAL**  
 Robert K. Stanley, 620 Meadowvale La., Media, Pa. 19063  
 Filed Jun. 27, 1977, Ser. No. 809,992  
 Int. Cl.<sup>2</sup> D02G 1/12, 1/20  
 U.S. Cl. 28—248 7 Claims



1. In apparatus for compressively crimping funicular textile material, including means for feeding such material together with propellant fluid into a confining region for temporary retention therein, wherein propellant fluid is permitted to diffuse laterally from an upstream portion of the temporarily confining region in which the textile material accumulates in a downstream portion thereof in crimped configuration, the improvement comprising means for sensing such lateral diffusion mounted adjacent an upstream portion of the region, and including also control means responsive and operatively connected to the sensing means for controlling a physical condition to which the textile material is subjected in the process including a plurality of vanes surrounding a portion of the region and mounted for deflection outward therefrom by positive flow of the diffusing fluid.

7. In compressive crimping of funicular textile material propelled lengthwise and accompanied by flow of propellant fluid into a first laterally confined region, wherein propelled textile material accumulates temporarily as a compressed mass in a downstream portion of the region, and at least some such fluid diffuses laterally from a lengthwise portion of the region unoccupied by the compressed mass, the improvement comprising utilizing positive lateral diffusion of such fluid to control the accumulation of compressed textile material in the region by controlling the temperature of the fluid with which the textile material comes into contact, including the steps of taking up the textile material from the leading edge of the compressed mass thereof in the region, confining the textile material temporarily in a successive region for fluid treatment therein, injecting treating fluid into the latter region, and adjusting the temperature of such treating fluid to heat-treat the textile material to a greater extent the further it tended to accumulate in the first region and to heat-treat the textile material to a lesser extent the less it tended to accumulate in the first region.

**4,162,565**  
**PRESS BRAKE MILLING MACHINE**  
 Jon A. Rubenzer, 5468 Glennan Ct., San Jose, Calif. 95129  
 Filed Mar. 27, 1978, Ser. No. 890,070  
 Int. Cl.<sup>2</sup> B23C 7/00; B23Q 11/00  
 U.S. Cl. 29—33 R 11 Claims



1. A combination milling machine and press brake, said press brake comprising an upper slide member having an edge and a lower bed member having an edge disposed in parallel relation with said upper slide member, said milling machine comprising:

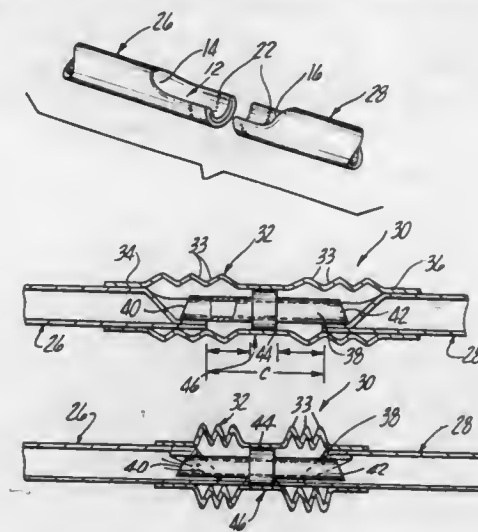
- (a) an upper way attached to said upper slide member;
- (b) a lower way attached to said lower bed member in parallel relation with said upper way;
- (c) a carriage engaging said upper way and said lower way to be moved therealong;
- (d) means on said carriage for advancing said carriage along said upper way and said lower way; and
- (e) a cutter mounted on said carriage for movement therewith and disposed in engagement with an edge of said press brake for milling the edge in engagement therewith.

**4,162,566**  
**METHOD AND COUPLING FOR SEVERING AND REJOINING SEALED TUBING**  
 William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.  
 Filed Dec. 12, 1977, Ser. No. 859,770  
 Int. Cl.<sup>2</sup> B23P 15/00; F16L 35/00  
 U.S. Cl. 29—157 R 15 Claims

1. A method of severing and rejoining a fluid pressure vessel intermediate its length thereof, the method comprising the steps of:

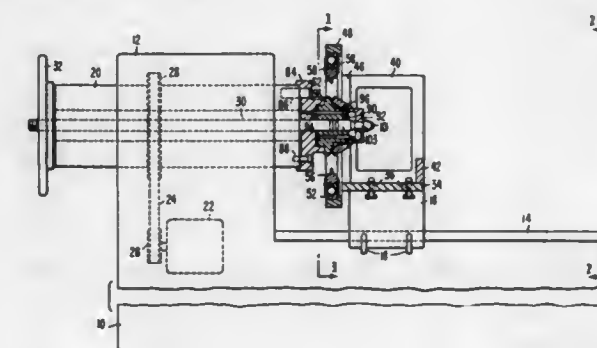
- crimping together the walls of said fluid pressure vessel at a point at which said fluid pressure vessel is to be severed;
- sealing together the interior contacting surfaces of said crimped walls;
- severing said fluid pressure vessel intermediate said sealed areas of said crimped walls to form crimped fluid pressure vessel ends;
- placing said severed fluid pressure vessel ends within a coupling member, said coupling having a rejoinder coupling body section formed with collapsible portions to enable axial compression thereof and a pair of integral end sections, each configured to receive a respective one of said crimped ends, with said crimped ends being spaced apart within said coupling;
- sealing together a respective coupling end section with a respective severed fluid pressure vessel end;

disposing within said body section, prior to assembly thereof of said respective fluid pressure vessel severed ends, a piercing tool, said piercing tool having oppositely directed penetrating ends with said piercing tool being positioned in said rejoinder coupling body section during said disposing step with each of said penetrating ends directed towards a respective fluid pressure vessel end; moving said crimped fluid pressure vessel ends axially



towards each other to advance each of said piercing tool penetrating ends towards a respective crimped fluid pressure vessel end to cause penetration of each of said crimped fluid pressure vessel ends; establishing fluid communication through said penetrated crimped fluid pressure vessel ends and said interior of said rejoinder coupling body section to thereby reestablish fluid communication between said fluid pressure vessel ends.

**4,162,567**  
**METHOD FOR MAKING A SHEET METAL PULLEY**  
 Robert P. Guetzlaff, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.  
 Division of Ser. No. 657,154, Feb. 11, 1976, Pat. No. 4,083,215.  
 This application Dec. 20, 1977, Ser. No. 862,571  
 Int. Cl.<sup>2</sup> B21H 1/04; B21D 22/16  
 U.S. Cl. 29—159 R 4 Claims

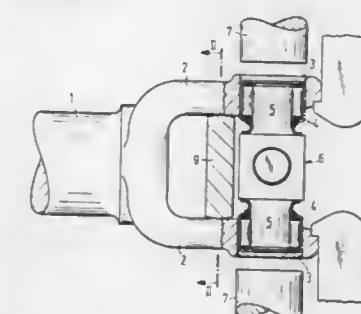


1. A method of making a sheet metal pulley including the steps of:

- (A) forming a pair of sheet metal pulley hubs each having a cup portion with a radially outwardly extending flange at one end and nestling the two hubs together one within the other with the radially extending flanges in side-by-side relationship; and
- (B) rotating the nested hubs about a fixed axis extending through said hubs while simultaneously urging a tapered projection on the radially inner surface of a rotatable,

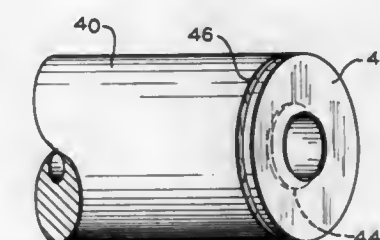
annular forming tool between the flanges to spread the flanges and form a V-groove with only minor relative rotary movement between the flanges and the forming tool in their area of contact.

**4,162,568**  
**APPARATUS FOR UNIVERSAL JOINT ASSEMBLY**  
 Karl Spless, Herzogenaurach, Fed. Rep. of Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Fed. Rep. of Germany  
 Filed Sep. 27, 1977, Ser. No. 836,999  
 Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645267  
 Int. Cl.<sup>2</sup> B25B 27/14  
 U.S. Cl. 29—281.3 4 Claims



1. An apparatus for assembling universal joints formed by the connection of two shafts forked at their ends with a universal joint spider and having anti-friction bearings arranged in opposite bores in the shaft forks for accommodating the spider trunnions comprising holding means for engaging each facing portion of the fork arms to support the fork arms of a shaft forked at its end at their free end and for absorbing reaction forces from the pressing-in force, means for pressing-in anti-friction bearings arranged in opposite bores in the shaft forks and support means for engaging the inner facing portions of the fork arms at the sides of the bore opposite the holding means.

**4,162,569**  
**METHOD OF MAKING METAL GASKETS**  
 John A. Damusis, Cicero, and Sam M. Rageb, Franklin Park, both of Ill., assignors to Dana Corporation, Toledo, Ohio  
 Filed Oct. 17, 1977, Ser. No. 842,723  
 Int. Cl.<sup>2</sup> B23P 17/00  
 U.S. Cl. 29—417 2 Claims



1. A method of making flanged gasket elements including the steps of:  
 providing a length of metal tubing;  
 initially working the end portion of said tubing by the removal of a quantity of material from the peripheral side wall of said tubing to form a wall lying in a plane substantially perpendicular to the axis of said tubing and bending

the wall lying in the plane perpendicular to the axis of said tubing; and  
removing a predetermined length of said tubing including the end portion from said tubing.

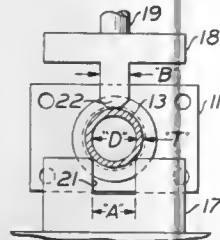
#### 4,162,570 METHOD AND APPARATUS FOR SEPARATING A FITTING FROM A TUBE

Jack H. Trittipoe, Elwood, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 27, 1978, Ser. No. 881,288  
Int. Cl.<sup>2</sup> B23P 19/04

U.S. Cl. 29—427

3 Claims



1. A method of separating a fitting from an end portion of a tube which extends into and is mechanically joined to the fitting, comprising the steps of:  
positioning the tube between a pair of die members;  
moving one of the die members toward the other die member and collapsing the end portion of the tube sufficiently for breaking the mechanical connection between the end portion of the tube and the fitting; and  
removing the fitting from the collapsed end portion of the tube.

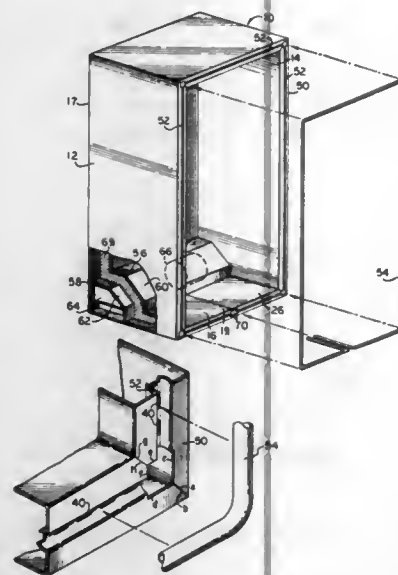
#### 4,162,571 METHOD OF CONSTRUCTING REFRIGERATOR CABINET

Julius B. Horvay, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 749,164, Dec. 9, 1976, Pat. No. 4,114,065.  
This application May 5, 1978, Ser. No. 903,276  
Int. Cl.<sup>2</sup> B23P 3/00, 19/04; B21D 51/00

U.S. Cl. 29—460

9 Claims



1. The method of forming a refrigerator cabinet which comprises:  
stamping a single sheet of metal to form a plurality of first portions and a plurality of second portions and to form a

section including a plurality of perforations between said first portions and said second portions;  
bending said sheet to cause said first portions to form the top, side and bottom outer walls of the refrigerator cabinet and to cause said second portions to form the top, side and bottom inner walls of the cabinet and to cause said perforated section to form a surface framing a door opening of the cabinet.

#### 4,162,572 PROVIDING SOLDER ON ELECTRICAL CONTACTS

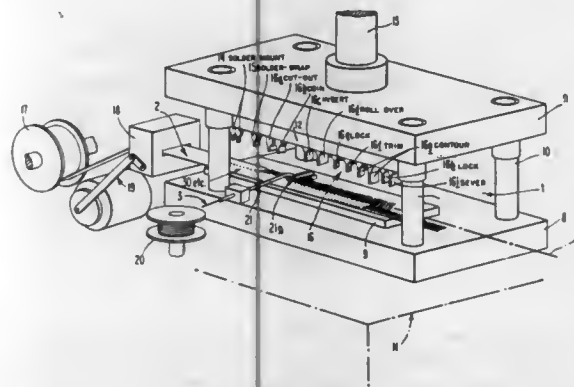
John J. Rozmus, 1030 Derwydd La., Berwyn, Pa. 19312

Filed Nov. 7, 1977, Ser. No. 848,803

Int. Cl.<sup>2</sup> H01R 9/00

U.S. Cl. 29—630 D

5 Claims



1. In a method of consecutively forming electrical contacts from at least one metal strip worked in a progressive die, which method includes providing a progressive die with its punch pad and die pad having a plurality of fabricating punch means and die means respectively spaced at fabricating stations along said axis for forming said contacts, feeder mechanism intermittently feeding the metal strip between the pads and operating said fabricating punch and die means and said feeder mechanism to consecutively form contacts, the improvement which comprises the method of providing each contact with a solder band secured thereto comprising the steps of:

providing said punch pad with a plurality of solder punch means and said die pad with a plurality of solder die means respectively spaced at solder stations along an axis and configured and movable to perform steps (a) through (d) as specified below:

- (a) providing a solder strip;
- (b) providing feed mechanism for feeding the solder strip adjacent the metal strip;
- (c) upon operation of the progressive die and at successive dwells of the metal strip perform the following steps:

(a) while an area of the metal strip is at one of said solder stations use solder punch means and die means to punch a pair of cut-outs to form a solder mounting section therebetween;

(b) while said solder mounting section is at an other of said solder stations use the solder feed mechanism to place a segment of the solder strip adjacent said mounting section;

(c) while said solder mounting section and said solder segment are maintained at said other solder station, use solder punch and die means to cut said solder segment so that portions thereof respectively extend outwardly on opposite sides of said mounting section;

(d) while said mounting section and cut solder are maintained at said other solder station use solder punch and die means to wrap said outwardly extending portions over said mounting section so the solder is self-secured thereto; and

repeat steps (a) through (d) on the body strip and solder strip

until said steps being simultaneously performed and continue said simultaneous operation to consecutively provide contacts with a solder band.

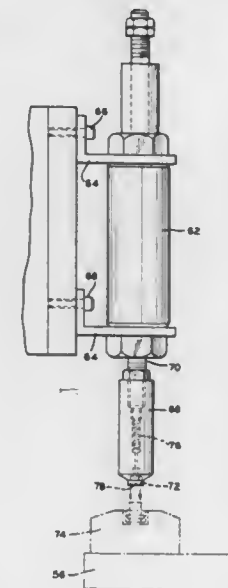
#### 4,162,573 ASSEMBLY APPARATUS

William J. Payne, Greensburg, Pa., assignor to Modulus Corporation, Chagrin Falls, Ohio

Division of Ser. No. 792,933, May 2, 1977, Pat. No. 4,100,666.  
This application Mar. 6, 1978, Ser. No. 883,700

U.S. Cl. 29—705

5 Claims



1. Apparatus to assemble a strain indicator of the type including a tensile element and an indicator having a fixed reference and an indicator area movable with respect to said reference, said apparatus comprising:

- (a) support means to retain said tensile element in a fixed position;
- (b) tensile pull means to grip a portion of said tensile element and exert a tensile force thereon in order to create movement of said indicator area relative to said reference;
- (c) gap measuring means to measure the distance between said reference and said indicator area with said tensile element in a state of tension;
- (d) adjustment means to adjust said gap to a predetermined value with said tensile element under load;
- (e) indicator fixing means to fix said indicator to said tensile member after gap adjustment.

#### 4,162,574 HAIR CLIPPER

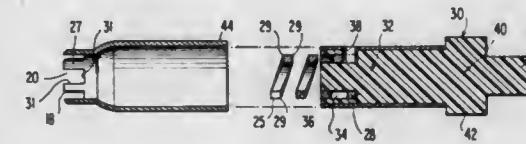
Mack S. Johnston, 1065 Lomita Blvd. #220, Harbor City, Calif. 90710

Filed Feb. 27, 1978, Ser. No. 881,808

Int. Cl.<sup>2</sup> B26B 19/14

U.S. Cl. 30—29.5

15 Claims



1. A cutter for cutting facial hair in the vicinity of the nostrils and ears comprising:

a body portion having a cutter end with teeth upstanding therefrom;  
slot means being defined between said teeth wherein at least one of said slot means includes a slot having an open end for receiving hair therein;  
a coil means rotatably carried within said body portion, said coil means having at least a portion thereof being located adjacent said slot means whereby rotation of said coil means results in cutting of said hair extending into said slot means.

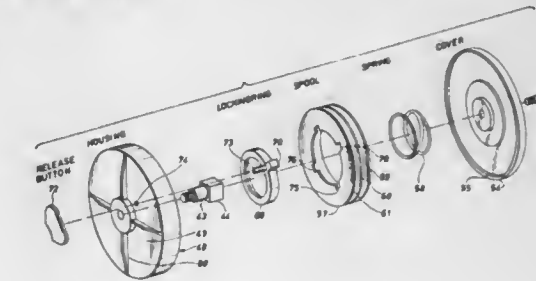
#### 4,162,575 ROTARY CUTTING ASSEMBLY

George C. Ballas, Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Continuation of Ser. No. 706,623, Jul. 19, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,931

Int. Cl.<sup>2</sup> A01D 55/18; B65H 75/14  
U.S. Cl. 30—347

1 Claim



1. As a subcombination,  
a spool-like member having a hollow core portion with at least three spaced apart external flange portions extending radially outwardly from the outer periphery of said core portion;  
said core portion being open internally at one end thereof and with one of said external flanges being integrally joined to said core portion at said one end and terminating at the inner periphery of said one end of said core portion and at the other end having an internal flange integral with another of said external flanges and extending inwardly of the inner periphery of said core portion towards the axis of said core portion but in annular spaced relationship thereto;  
said internal flange having a plurality of uniformly shaped and uniformly angularly spaced-apart recesses therein for sequentially accommodating a key member; and  
a pair of flexible non-metallic line members each being wound about the outer periphery of said core portion between respective pairs of said external flanges.

#### 4,162,576 APPLIANCES FOR TREATING TEETH

Kiyochika Takemoto, Kodaira; Yasuo Suzuki, Higashi Kurume; Yoshihito Ochiai, Fujisawa; Syozi Nakashima, Ninomiya, and Midori Hayashi, Yamakita, all of Japan, assignors to Lion Hamigaki Kabushiki Kaisha, Japan

Filed Mar. 23, 1977, Ser. No. 780,367

Claims priority, application Japan, Mar. 24, 1976, 51-35364[U]

Int. Cl.<sup>2</sup> A61C 3/00

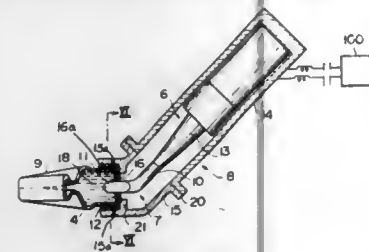
U.S. Cl. 32—40 R

3 Claims

1. For use in applying to teeth a reinforcing acid-resistant layer of a tooth decay retarding agent, vibrator means for providing ultrasonic vibrations and including a vibratory tip, casing means housing said vibrator means and having a tubular open end region in the interior of which said vibratory tip is at least partly situated, and an elastic membrane wall carried by said casing means at said tubular open end region thereof and extending across said tubular open end region of said casing



means, said vibratory tip extending through said elastic membrane wall while being surrounded and fluid-tightly engaged by said membrane wall, said membrane wall maintaining its fluid-tight engagement with said tip during vibration of the latter and further including a hollow tray means for receiving teeth which are to be treated, said hollow tray means having a hollow interior containing a liquid medium for transmitting the ultrasonic vibrations, and said tray means terminating in an

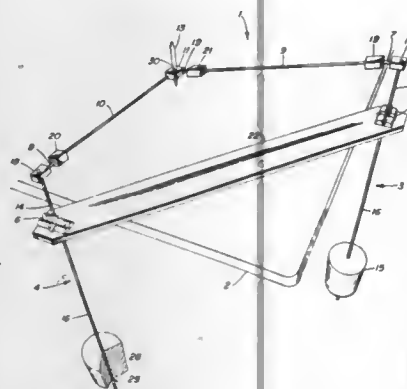


elongated tubular portion adapted to be received in said tubular open end region of said casing means, said tubular portion of said tray means terminating in an end wall which when said tubular portion of said tray means is situated in said tubular open end region of said casing means becomes situated next to said membrane wall while said vibratory tip pierces through said end wall of said tray means to extend into and engage the liquid medium for transmitting vibrations through the latter to said tray means.

**4,162,577**  
**PENDULUM DRAWING MACHINE**  
Michael A. Cosman, 5175 Shalee St., Kearns, Utah 84118  
Filed Oct. 31, 1977, Ser. No. 846,631  
Int. Cl.<sup>2</sup> B43L 11/06, 9/20

U.S. Cl. 33—27 L

16 Claims



1. A pendulum drawing machine for making various designs on a sheet positioned on a planar horizontal surface of a base, the machine comprising:

- Two pendulum arms having weighted ends;
- A mounting means for pivotally mounting the pendulum arms to the base, the arms being mounted in a vertical position relative to the planar surface of the base and positioned such that the weighted ends extend below the planar surface of the base and the unweighted ends extend above the planar surface;
- A pivot means for pivotally supporting the pendulum arms on the mounting means;
- Two horizontal arms;
- Arms attaching means for pivotally and rotationally attaching the horizontal arms to the ends of the pendulum arms extending above the planar surface of the base, the arms attaching means comprising a single, straight, nonextensible, noncompressible, resilient rod which (a) allows only limited rotation of the horizontal arms (1) about the axis of the horizontal arms, (2) about the axis of the pendu-

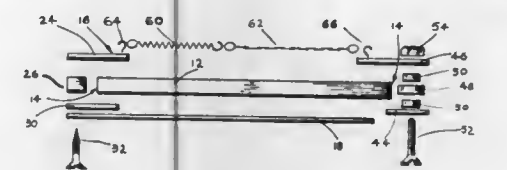
lum arms, and (3) about an axis parallel to the pivot axis of the pendulum arms and which (b) prevents translational movement of the horizontal arms relative to the pendulum arms;

- A penholder attached to the ends of the horizontal arms opposite the ends attached to the arms attaching means, the penholder holding a pen for drawing designs on a sheet.

**4,162,578**  
**T-SQUARE**  
Emmanuel G. Astarita, 107-2 Dune Grassway, Downsview, Ontario, Canada (M3N 3K2)  
Filed Jun. 5, 1978, Ser. No. 912,294  
Int. Cl.<sup>2</sup> B43L 13/02

U.S. Cl. 33—443

6 Claims



1. A self-supporting T-square comprising:

- a main body consisting of an elongated straight edge member having a head at one end thereof formed with a first slipway channel extending longitudinally thereof and opening laterally toward the other end of said straight edge member, said channel having at least one longitudinally extending face thereof arranged to frictionally engage a marginal edge of a drawing board for sliding movement therealong;
- a carriage which does not directly engage said main body, said carriage having a second mounting channel formed therein, said second mounting channel opening towards said first slipway channel of said head and being adapted to receive a support rail for movement therealong;
- resilient tensioning means connecting said carriage and said main body, said resilient tensioning means being adapted to urge said carriage toward said main body;
- said carriage being spaced from said main body and connected thereto solely by said resilient tensioning means whereby said main body may be moved freely along said first marginal edge and is displaceable relative to said carriage in the direction of movement along the marginal edge with said resilient tensioning means serving to urge said carriage towards lateral alignment with said head when said carriage is in engagement with a marginal edge of a drawing board in use.

**4,162,579**  
**ARCHERY SIGHT**  
Wakelf James, P.O. Box 16, Hagar Shores, Mich. 49039  
Filed May 12, 1978, Ser. No. 905,166  
Int. Cl.<sup>2</sup> F41G 1/00; F41B 5/00

U.S. Cl. 33—265

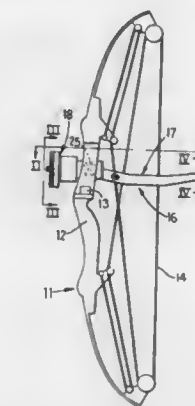
9 Claims

1. An archery sighting device for fixed attachment to a bow in the vicinity of the hand grip portion thereof, said sighting device comprising:

- horizontally elongated arm means having an intermediate portion for fixed connection to the bow;
- front sight means mounted on said arm means adjacent the forward end thereof so as to be positioned adjacent but forwardly of said bow;
- rear sight means mounted on the rearward end of said arm means at a position disposed rearwardly of the bow string when the latter is in its nondrawn position;
- said front sight means including a plurality of individual

sighting elements which are selectively individually usable in conjunction with said rear sight means depending upon the distance between the bow and the target;

said elongated arm means including front and rear elongated arm sections which individually extend substantially longitudinally of the arm means and are disposed substantially in end-to-end relationship, said front arm section being releasably secured to said bow and projecting both forwardly and rearwardly thereof, said front sight means



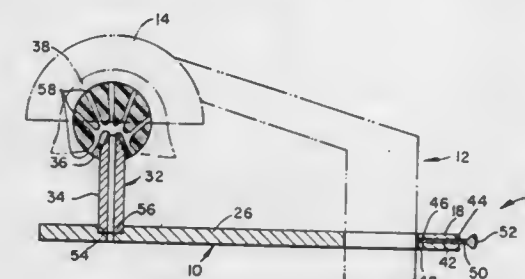
being mounted on the front end of said front arm section, and said rear arm section projecting rearwardly from said front arm section and having said rear sight means mounted on the rear end thereof; and

releasable connecting means for joining together the front and rear ends of said rear and front arm sections respectively, for permitting the rear arm section to be vertically angularly adjusted relative to said front arm section about a substantially horizontal adjustment axis to vertically adjust the position of said rear sight means.

**4,162,580**  
**WIG DRYING ATTACHMENT FOR HAIR DRYERS**  
Georgia E. Hess, 910 N. Madison St., Benton, Ill. 62812  
Filed Aug. 29, 1977, Ser. No. 828,873  
Int. Cl.<sup>2</sup> F26B 25/00

U.S. Cl. 34—103

4 Claims



1. A wig drying attachment for hair dryers comprising a planar sheet having a substantially U-shaped portion and an elongated arm portion integral with and radiating from said U-shaped portion, said U-shaped portion adapted to engage and partially encircle a portion of said hair dryer, means for clamping said U-shaped portion about said portion of said hair dryer, means for securing a wig support to the free end of said elongated arm, said means for securing including a hollow rod, said arm having an aperture disposed adjacent the free end thereof, said rod for securement on one end thereof to said arm, said one end of said rod communicating with said aperture, a solid wig form removeably secured to the other end of said rod, said wig form having a plurality of elongated openings therethrough, said openings being in communication with

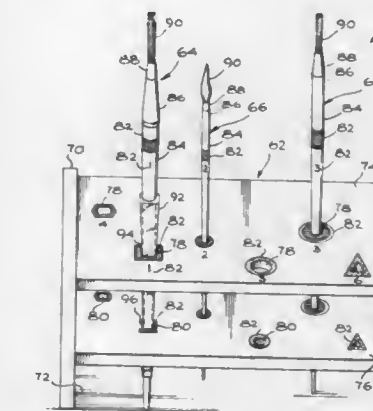
the interior of said rod and in communication with the exterior surface of said wig form.

**4,162,581**  
**EDUCATIONAL TEACHING AND STORAGE SYSTEM AND METHOD**  
Robert F. O'Connor, 20747 Londelius, Canoga Park, Calif. 91306

Filed Apr. 20, 1977, Ser. No. 789,137  
Int. Cl.<sup>2</sup> G09B 1/06

U.S. Cl. 35—8 R

3 Claims



1. An improved educational and storage teaching system, said system comprising, in combination:

- a rack having a plurality of spaced apertures extending therethrough;
- a plurality of art paintbrushes releasably disposed in said apertures;
- a plurality of individual indicia or coding mechanisms associated with said rack and said brushes and relating particular ones of said brushes to particular ones of said apertures for proper placement of said brushes in said apertures;
- wherein said apertures are of different sizes and shapes and wherein said brushes have cross-sections of complementary sizes and shapes; and,
- wherein said brushes bear shape and size imparting sleeves.

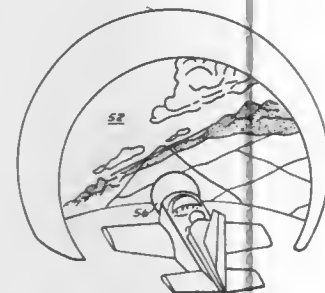
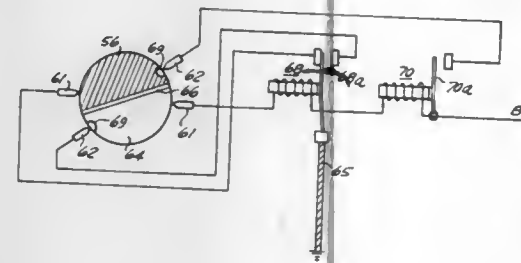
**4,162,582**  
**FLIGHT TRAINER AND ENTERTAINMENT DEVICE FOR SIMULATING AERIAL ACROBATICS**  
John T. McGraw, 528 Ashwood, Flushing, Mich. 48433, and George F. Killeen, 2421 Tandy Dr., Flint, Mich. 48507  
Filed Jan. 9, 1978, Ser. No. 867,921  
Int. Cl.<sup>2</sup> G09B 9/08

U.S. Cl. 35—12 N

7 Claims

1. In a flight trainer type aircraft having mechanism simulating that of an aircraft and including simulated airplane manual controls; a partial spherical shaped screen located forwardly relative to the aircraft where views projected thereon may be seen by the operator of the controls; a sphere located forwardly of the aircraft; support means for said sphere for permitting its rotation in three control planes; a plurality of projectors mounted inside said sphere for rotation therewith and for projecting adjacent sectorial views on said screen; and electrical drive means connected intermediate said controls and said sphere for rotating said sphere and said projectors in said planes in unison with the operation of said controls to simulate aerial acrobatics, said sphere including two electri-

cally conductive parts, means for insulating one part from the other; an electrical power supply; and means for electrically



connecting at least one of said parts and their associated projectors to the power supply in all positions of the sphere.

4,162,583

# SHOE STIFFENER

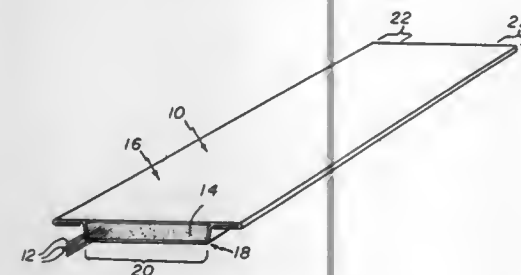
John W. Darrin, Reading, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Filed Oct. 26, 1977, Ser. No. 845,837

Int. Cl.<sup>2</sup> A43B 13/42; A43D 31/00

U.S. Cl. 36—76 R

5 Claims



1. An article for use as a shoe reinforcement comprising: an elongate sleeve surrounding a matrix which includes an externally activatable thermosetting resin, said resin being in a fluent form, said sleeve and resin being flexible and deformable as a unit to enable the article to be formed to the contour of a selected portion of the shoe assembly; said sleeve being defined by first and second facing plastic strips sealed together at their lateral marginal edges to define margins by which the sleeve may be manipulated; the material from which the second strip is formed being thermoplastic and meltable at a predetermined temperature; the first strip being formed from a material which will substantially maintain its tensile strength at said predetermined temperature, the marginal portions of said first and second strip being heat sealed to each other; said marginal portions defining a folded sandwich configuration in which the outermost layers of the margin are defined by the marginal portions of the first strip and wherein the inner portion of the sandwich is formed at least in part from the material of the second strip, the internal portion of the margin being fused in a substan-

tially integral mass which is sealed to the outermost layer of the margins; said margins of said sleeve being substantially free of curl and extending laterally in a generally flat configuration.

4,162,584

# EXCAVATING WHEEL WITH CAM ASSISTED BUCKET WALL EJECTOR

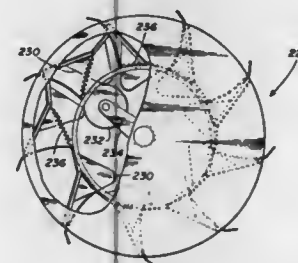
Charles L. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Division of Ser. No. 745,860, Nov. 29, 1976, which is a division of Ser. No. 660,515, Feb. 23, 1976, Pat. No. 4,062,562, which is a continuation of Ser. No. 554,671, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 400,043, Sep. 24, 1973, Pat. No. 3,897,109, which is a continuation-in-part of Ser. No. 238,089, Mar. 28, 1972, abandoned. This application May 10, 1978, Ser. No. 904,383

Int. Cl.<sup>2</sup> E02F 3/18

U.S. Cl. 37—190

1 Claim



1. An excavating wheel comprising: a pair of spaced apart side plates mounted for rotation about and each extending radially outwardly with respect to a central axis of rotation; a plurality of stationary walls each extending between the side plates and each having outwardly projecting material cutting means; said stationary walls being stationary with respect to the side plates; a plurality of movable walls each extending between the side plates for cooperation with one of the stationary walls to define a digging bucket; said plurality of stationary walls and said plurality of movable walls cooperating with the side plates to define a plurality of digging buckets positioned immediately adjacent one another about the entire periphery of the excavating wheel; each of said movable walls being supported by the side plates for pivotal movement between a material receiving position and a material dumping position; means entirely enclosed by the digging buckets and the side plates and responsive to rotation of the excavating wheel for positively pivoting the movable wall of each digging bucket to the material receiving position during one portion of said rotation and for positively pivoting the movable wall of each digging bucket to the material dumping position during another portion of said rotation; and said means for positively pivoting the movable wall of each digging bucket comprising: a spring connected to each movable wall for normally positioning the movable wall in the material receiving position; a cam mounted on each movable wall; and means fixedly supported at a point offset from the rotational axis of the excavating wheel for engagement with the cams on the movable walls to pivot each movable wall to the material dumping position against the action of the spring associated therewith.

4,162,585

# DISPLAY PANEL WITH MOVABLE POSTERS

Jean-Claude Decaux, Paris, France, assignor to J. C. Decaux Paris, Publicite Abribus, Boulogne-Billancourt, France

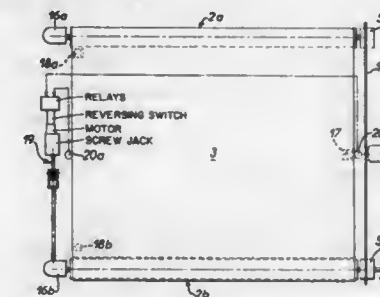
Filed Jun. 7, 1977, Ser. No. 804,247

Claims priority, application France, Jun. 9, 1976, 76 17326

Int. Cl.<sup>2</sup> G09F 11/24

U.S. Cl. 40—518

4 Claims



1. In a display panel structure for movable posters comprising a frame, two parallel spools mounted on the frame to rotate about their axes which are spaced apart in a first plane, a band having longitudinally extending edges and carrying posters arranged in succession on the band, the band having ends respectively connected to the spools and being, in a region of the band between the spools, substantially contained in a second plane parallel to said first plane, drive means for driving in rotation selectively one of the spools at a time so that a first of the spools is a band take up spool and a second of the spools is a band feed spool and vice-versa, and two permanently operative detecting means mounted on the frame and respectively associated with said edges for detecting transverse drift of the band in either transverse direction; the improvement comprising means for correcting the drift of the band which comprise means mounting the first spool on the frame to be inclinable in either direction relative to the second spool in said first plane and shifting means associated with and responsive to the two detecting means and connected to the first spool for inclining the first spool relative to the second spool in said first plane in a first direction when one of the detecting means detects a drift and in a second direction when the other of the detecting means detects a drift and thereby cause the band to move in a direction opposed to the drift.

4,162,586

# GUN WITH CUSHIONED GRIP SAFETY

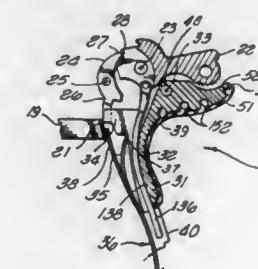
Frank A. Pachmayr, Los Angeles, Calif., assignor to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed Oct. 3, 1977, Ser. No. 838,806

Int. Cl.<sup>2</sup> F41C 23/00

U.S. Cl. 42—71 P

8 Claims



1. A gun comprising: a handle; a trigger at the front of said handle adapted to be actuated rearwardly;

means for firing a cartridge upon movement of the trigger; and, a grip safety element at the rear of said handle which is mounted for slight forward movement by the hand of the user when he squeezes the handle and actuates the trigger, and which is constructed to prevent rearward cartridge firing movement of the trigger when the grip safety element is in a rear active position, but to permit such rearward movement of the trigger when the grip safety element is in a forward released position to which it is displaced by squeezing of the handle; said grip safety element including a rigid part and a layer of softer cushioning material carried by said part at the back side thereof for engaging the user's hand and cushioning the contact therewith.

4,162,587

# FISHING POLE

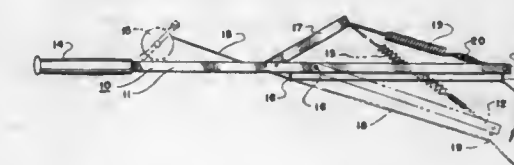
David H. Dethlefs, 4117 NE. 10th Pl., Renton, Wash. 98055

Filed Oct. 7, 1976, Ser. No. 730,666

Int. Cl.<sup>2</sup> A01K 91/00

U.S. Cl. 43—18 R

6 Claims



1. A fishing pole comprising: a first rod section fabricated of a rigid material, a handle at one end thereof, said rod section carrying a reel and a ferrule; a second rod section being fabricated of a rigid material and being hingedly mounted at one of its terminal ends to the other end of said first rod section, said second rod section having on its outer terminal end a ferrule, fishing line from said reel being strung through said ferrule on said first rod section and through said ferrule on said second rod section; and means urging said first and second rod sections into alignment, including an outrigger issuing transversely from the other end of said first section at an obtuse angle with respect to said handle and being rigidly mounted to said first section, and a spring which is mounted between the outer end of said outrigger and the outer end portion of said second section.

4,162,588

# LIVE ANIMAL TRAP

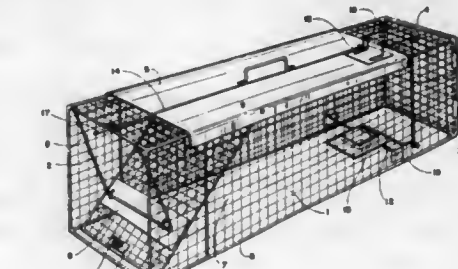
Melvin F. Wyant, Box 291, Monroe City, Ind. 47557

Filed Dec. 2, 1977, Ser. No. 856,620

Int. Cl.<sup>2</sup> A01M 23/02

U.S. Cl. 43—61

2 Claims



1. A live animal trap for capturing and restraining a live animal, said live animal trap comprising



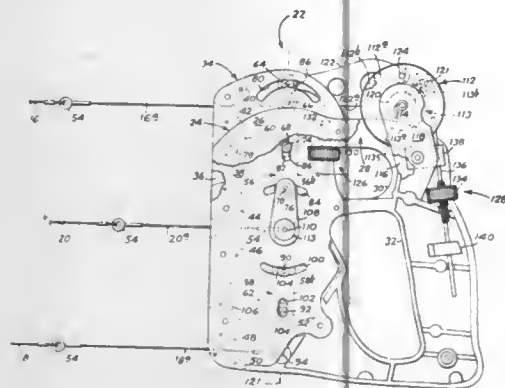
a cage having an open front, a closed bottom, a back, a closed top and a pair of closed sides;  
 a door pivotally mounted at the top of the sides in the cage at one end and having a hook at its opposite end;  
 a rod rotatably mounted parallel to and above the bottom in the cage near the back;  
 a bait tray affixed to the rod in a manner whereby said tray is rotated by an animal taking bait therefrom; and  
 a trigger device including a plurality of linking rods coupling the bait tray to the hook of the door in a manner whereby the door is maintained in open position substantially next-adjacent the top in the cage by one of the linking rods when the bait tray is free from disturbance and said one of said linking rods is withdrawn for the hook of the door to close the door and seal the cage when the bait tray is rotated, said trigger device comprising a first linking rod affixed to the bait tray in the cage, a second linking rod coupled to the first linking rod and extending from said first linking rod through the cage and through the top of the cage to the outside thereof, a third linking rod extending along the top of the cage outside the cage and having spaced opposite first and second ends, the first end of the third linking rod cooperating with the hook of the door and a fourth angular linking arm rotatably mounted on top of the cage outside the cage and coupling the outside end of the second linking arm to the second end of the third linking arm in a manner whereby counter-clockwise rotation of the bait tray moves the first and second linking rods up toward the top of the cage and moves the third linking rod from the front to the back to release the hook.

4,162,589

**TETHERED MODEL AIRCRAFT CONTROL SYSTEM**  
 Oba L. St. Clair, 15035 Larkwood Ln., Eugene, Oreg. 97405  
 Filed Apr. 25, 1977, Ser. No. 790,187  
 Int. Cl.<sup>2</sup> A63H 27/04

U.S. Cl. 46—77

11 Claims



1. A three-line system for controlling the flight of an engine-powered, tethered model aircraft, with control resulting from changes made in the relative positions of the lines tethering the aircraft, said system comprising

a first control-adjustment mechanism including a first frame mountable in such an aircraft and a first plurality of links pivotally connected to said first frame and to each other and providing a set of spaced relatively movable first mounting points having connecting means thereat whereby said first links are adapted for mounting one set of ends of tethering lines used in conjunction with said system, relative movement of said first mounting points occurring solely through nonsliding, nontranslating pivoting action of said first plurality of links relative to each other and to said first frame under the influence of such lines, and  
 a second control-adjustment mechanism including a second

frame constructed for hand-holding by an operator, and a second plurality of links pivotally connected to said second frame and to each other and providing a set of spaced relatively movable second mounting points also having connecting means thereat whereby said second links are adapted for mounting the opposite set of ends of such tethering lines, relative movement of said second mounting points occurring solely through nonsliding, nontranslating pivoting action of said second plurality of links relative to each other and to said second frame.

7. In a three-line tethered-aircraft control system, a hand-holdable linkage arrangement for accommodating attachment of ends of control lines, and further for accommodating relative movement of such lines to effect control of an aircraft, said linkage arrangement comprising

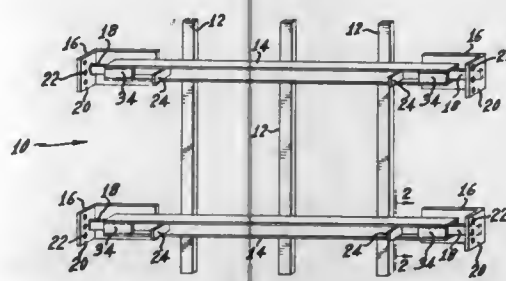
a hand-holdable frame,  
 first and second elongated stabilizer links,  
 an elongated floating link, including means adjacent its ends for accommodating the attachment of such control line ends,  
 first pivot means pivoting said first stabilizer link adjacent one of its ends to said frame, and second pivot means pivoting said first stabilizer link adjacent its opposite end to said floating link at a point intermediate the latter's opposite ends, and  
 third pivot means pivoting said second stabilizer link adjacent one of its ends to said frame, and fourth pivot means pivoting said second stabilizer link adjacent its opposite end to another point on said floating link also intermediate the latter's opposite ends,  
 the pivot axes provided by said pivot means being substantially parallel.

4,162,590

**BURGLAR BAR APPARATUS**  
 Vernon A. Earley, 327 Woodbine St., Jacksonville, Fla. 32206  
 Filed Jan. 16, 1978, Ser. No. 869,951  
 Int. Cl.<sup>2</sup> E06B 3/68

U.S. Cl. 49—55

12 Claims



1. In a rectangular burglar bar apparatus for mounting within a rectangular frame opening in a building and having a plurality of spaced bars connected to generally fit such opening, the improvement comprising a pair of extendable frame mounting means attached to one side of said apparatus and each having a frame plate, each said mounting means having an extendable member affixed to said plate to position said plate in contact with the adjacent frame element defining one side of the rectangular frame opening and to be affixed thereto, said spaced bars including a pair of elongated and parallel channel members having opposite end portions, said extendable members being respectively and slideably mounted to adjacent and respective end portions of said channel members a pair of stop means disposed on respective said adjacent end portions for limiting the extension of said extendable members, each of said stop means including elements connected to respective said adjacent end portions, each of said extendable members having a flange portion engageable with respective said element to limit the extension of said extendable member, and guard means mounted to each said plate and extending toward said

apparatus to generally overlie each of said extendable members.

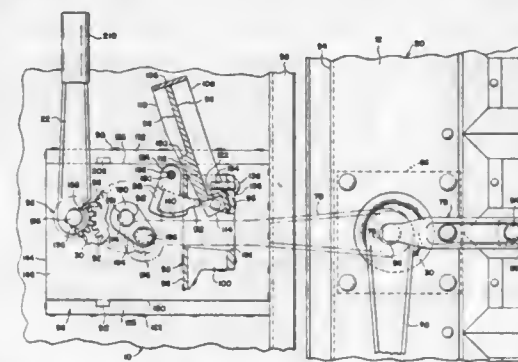
4,162,591

DOOR DRIVER

Thorvald Madland, Arlington Heights, and Thomas C. Soddy, Downers Grove, both of Ill., assignors to The Youngstown Steel Door Company, Cleveland, Ohio  
 Filed Jan. 31, 1977, Ser. No. 763,853  
 Int. Cl.<sup>2</sup> E05C 3/36; E05F 11/54

U.S. Cl. 49—277

1 Claim



1. A door driver on a railway house car having a door opening for moving a door between a first and a second position comprising:

a structural member adjacent said opening;  
 a hat-shaped member and a reinforcing member secured to said structural member;  
 a lever rotatably mounted on said structural member adjacent said opening;  
 a plurality of drivingly interconnected drive members in addition to said lever and operatively connected thereto including a pinion fixed to rotate with said lever to drive at least one other gear member which, in turn, is operatively connected to a crank means to cause rotation thereof;  
 a hasp means selectively drivingly interconnected to said crank means;  
 said hasp means being mounted on said door for motion in both a plane parallel to the face of the door and a plane vertical to the face of the door to permit selective interconnection with said crank means;  
 and, means to permit said hasp means to be selectively locked in said selective interconnection with said crank means thereby to selectively maintain said door in a closed and locked condition.

4,162,592

SLIDING DOOR

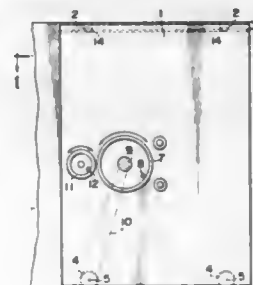
Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co. Ltd., Kumamoto, Japan  
 Filed Jun. 1, 1977, Ser. No. 802,445  
 Claims priority, application Japan, Jun. 2, 1976, 51/71245[U]; Jun. 2, 1976, 51/71246[U]; Jun. 15, 1976, 51/77928[U]  
 Int. Cl.<sup>2</sup> E05F 11/00

U.S. Cl. 49—358

4 Claims

1. A door adapted to be moved on a rail laid along a wall thereby to close an opening formed in the wall comprising:  
 a door body having a plurality of wheels and an axle for mounting each of said wheels on said body;  
 a first manually rotatable member having a shaft rotatably attached to one side wall of the door;  
 a rotary driving member of a predetermined diameter coaxially carried by said shaft;  
 a rotary driven member carried by one of said axles and having a diameter larger than that of said driving member;  
 an endless power transmission member connected between said driving and driven members;

a second manually rotatable member having a first shaft rotatably attached to said one side of said door;  
 locking means having a second shaft operably coupled to said first shaft, wherein the rotation of said first shaft is transmitted to said second shaft, said locking means locking said door body in the closed position when said second manually rotatable member is operated; and  
 stopper means having detecting means partially extending out of the side end of the door and positioned for detecting



a wall contact, and engagement means for positively locking said secondary manually rotatable member in a fixed condition when said detecting means are not actuated wherein said stopper means comprises a toothed wheel formed coaxially with said locking means on said second shaft, said detecting means comprising a projecting rod extending out of the side end of the door said rod actuating said engagement means for engagement with said toothed wheel.

4,162,593

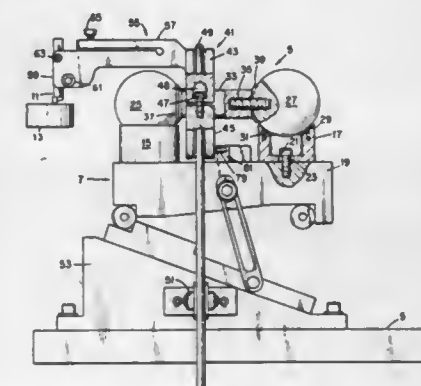
**TOOL HOLDER FOR PREPARATION AND INSPECTION OF A RADIUS EDGE CUTTING TOOL**  
 Charles Asmanes, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 28, 1978, Ser. No. 881,965

Int. Cl.<sup>2</sup> B24B 19/00

U.S. Cl. 51—218 R

4 Claims



1. A displaceable tool holding fixture, for holding a radius edge cutting tool in a tool edge preparing apparatus, comprising:

a pair of precision formed steel balls;  
 a shaft rigidly connected between said pair of balls;  
 a pair of rigid cylindrical bearing seats each having a rim portion of the upper edge thereof beveled to receive respective ones of said pair of balls in a minimal contact seating arrangement, said bearing seats mounted on a support means of said preparing apparatus and aligned to displaceably receive said balls so that said balls are free to rotate in said seats about an axis extending through the center of both balls;

a tool holding means attached to and extending from said shaft for selectively holding said radiused edge tool aligned so that said axis of rotation of said balls is aligned with the axis about which said tool edge is generated when contacting a rotating preparing device; and means for oscillatory rotation of the tool holding fixture through a selected arc sector coincident with the radiused edge sector of said tool.

**4,162,594**  
**MOVABLE SEATING METHOD**  
Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed Apr. 18, 1978, Ser. No. 897,546  
Int. Cl.<sup>2</sup> E04H 3/12

U.S. Cl. 52—9

28 Claims



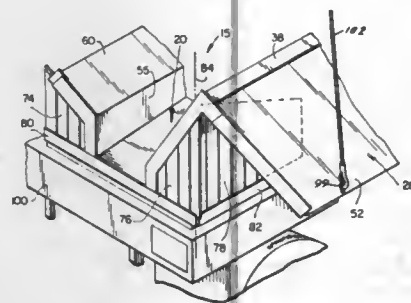
1. A method of setting up and taking down a grandstand formed of a plurality of portable grandstand seating sections having a normal seating arrangement sloping upwardly and rearwardly from forward to rearward ends thereof, comprising the steps of: providing ground-engagable wheel means and a central footing on each of said seating sections between said forward and rearward ends, one of said wheel means and said central footing being made retractable and extendable for alternately assuming a ground-engaging position; placing said wheel means in said ground-engaging position; disposing each of said sections in a storage position by pivoting said each section at said wheel means so that said forward and rearward ends are at substantially the same elevation; transporting one of said sections from said storage position by moving it on said wheel means to a predetermined grandstand location; raising said rearward end of said one section at said grandstand location about an axis at said wheel means until said one section is in an erect position having said normal setting arrangement; moving said central footing into said ground-engaging position; shoring up said rearward end for supporting said one section in said erect position; lifting and shifting said one section in said erect position so as to move it into a predetermined grandstand position to commence formation of the grandstand.

**4,162,595**  
**PREFABRICATED ROOF STRUCTURE AND ERECTION METHOD**  
Mario L. Ramos, and John Ramos, both of Terrace Ave., Naugatuck, Conn. 06770

Filed Jan. 11, 1978, Ser. No. 868,481  
Int. Cl.<sup>2</sup> F04B 1/346

U.S. Cl. 52—69

30 Claims



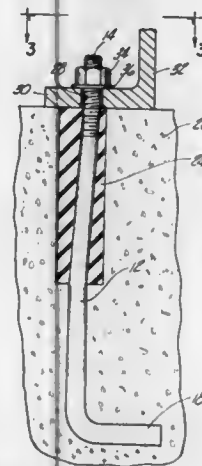
1. A roof structure comprising a truss assembly including a

plurality of horizontally extending truss beams and a plurality of braces extending between and connecting said truss beams in laterally spaced parallel relation, a horizontally elongated roof panel assembly supported on said truss assembly and having a plurality of roof panel sections including an inclined roof panel section supported in a fixed upwardly inclined position on said truss assembly, one of said roof panel sections being connected to the upper end of another said roof panel section to pivot relative thereto about a horizontal axis between one position wherein said one panel section extends laterally outwardly from said other roof panel section and another position wherein said one panel section depends in a generally vertically disposed position from said other roof panel section, and lifting means attached at critical balance positions to said one roof panel section and at least another of said roof panel sections for raising said one roof panel section from said one to said other position and for lifting said roof panel assembly and said truss assembly with said one roof panel section in said one position.

**4,162,596**  
**ANCHOR BOLT ASSEMBLY**  
Bernard A. Damman, 6700 Puttygutt, St. Clair, Mich. 48079  
Filed Sep. 8, 1977, Ser. No. 831,383  
Int. Cl.<sup>2</sup> E04B 1/38

U.S. Cl. 52—295

3 Claims



1. An anchor bolt assembly comprising: an anchor bolt having a threaded end and an anchor end; a tubular sleeve having an internal bore positioned annularly around and extending along said bolt between the ends thereof, said ends of said bolt projecting outwardly from the ends of said sleeve, wherein said sleeve is constructed of a resilient hard rubber material, said sleeve being radially inwardly compressed around said anchor bolt to thereby form a fluid seal between said sleeve and said anchor bolt so that the internal bore of said sleeve remains substantially entirely in contact with the anchor bolt despite radial displacement of the anchor bolt to thereby maintain the fluid seal between said sleeve and said bolt.

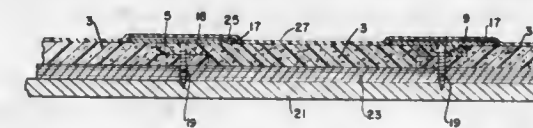
**4,162,597**  
**INSULATION BLOCK AND MOUNTING MEANS THEREFOR**  
Thomas L. Kelly, 50 Randolph Ave., Waterbury, Conn. 06710  
Filed May 2, 1977, Ser. No. 792,784  
Int. Cl.<sup>2</sup> E04B 5/00

U.S. Cl. 52—410

1 Claim

1. A structure including a deck, a roof supported thereon and a plurality of rows of relatively rigid insulation blocks laid thereon in abutting position, means provided on certain insulation blocks providing a mating and sealing relationship between abutting insulation blocks and spaced apart pads pro-

vided at the adjacent corners of each four adjacent insulation blocks and each of said pads extending partially over a portion of each of the four abutting adjacent insulation blocks, means extending through said pads, the insulation blocks, the roof, and the deck for securing said pads in proper spaced apart position on said insulation blocks, and for securing said insulation blocks to said roof and deck, and said insulation blocks are

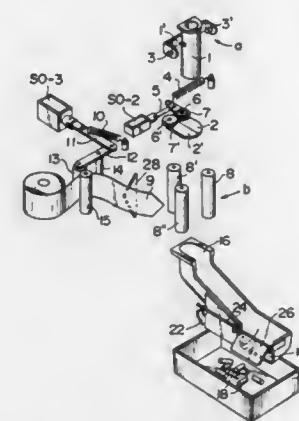


formed of a material to which adhesive is unacceptable, adhesive being acceptable to said pads, and a flexible sheet means overlaying said insulation blocks and pads and an adhesive applied to each of said pads and said flexible sheet means adhering and bonded to each of said spaced apart pads, said flexible sheet means being bonded to said insulation blocks solely at the spaced apart pads and being free of said insulation blocks in the areas between said pads.

**4,162,598**  
**APPARATUS FOR REMOVING IRREGULAR STACK OF COINS**  
Kenkichi Watanabe, and Hideshi Sentoku, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Japan  
Filed Dec. 12, 1977, Ser. No. 859,675  
Int. Cl.<sup>2</sup> B65B 57/10, 57/12

U.S. Cl. 53—54

3 Claims

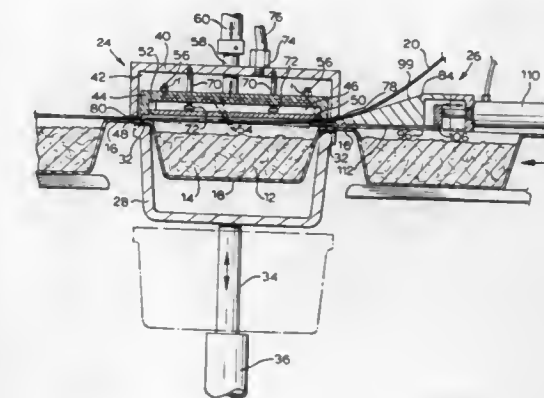


1. A coin packaging machine comprising:  
(a) an accumulating cylinder for accumulating a predetermined number of coins and an electrically operated shutter means to discharge coins from said cylinder;  
(b) an electrically operated means adjacent said cylinder to wrap packaging paper around the periphery of a columnar stack of coins coming from said cylinder;  
(c) a coin store box adjacent said packaging means and a guiding spout between said packaging means and said coin box for guiding packaged coins to said box;  
(d) means for removing irregular coins comprising:  
(1) a detector on said cylinder to determine when misstacked coins are accumulated;  
(2) an electrically operated gate on said guiding spout positioned to prevent, when closed, coins from entering said box;  
(3) electrical means to open said shutter means and close said guiding spout gate when a signal from said detector indicates the presence of misstacked coins.

**4,162,599**  
**VACUUM PACKAGING**  
Rhoden R. Kyle, Toronto, Canada, assignor to C. A. Pemberton & Co. Limited, Toronto, Canada  
Filed Jun. 19, 1978, Ser. No. 916,721  
Int. Cl.<sup>2</sup> B65B 31/02, 31/04

U.S. Cl. 53—77

8 Claims



1. In combination, a sealing unit and a vacuum unit for use in a vacuum packaging machine in which a container spaced formed between oppositely disposed sealing faces have a pair of sealable webs is to be evacuated before the webs are sealed together about the periphery of the container space, said sealing unit comprising;

(a) first and second sealing dies mounted one on either side of a sealing plane for movement relative to one another between an open position to permit movement of a package forming web assembly therebetween and a closed position for engaging and sealing said web assembly, said sealing unit having an input end for receiving web to be sealed between said dies and an output end through which sealed packages are discharged; said vacuum unit comprising;  
(b) primary spacer means located adjacent said input end of said sealing dies, said primary spacer means being spaced from said first die to form a first web feeding passage therebetween and spaced from said second die to form a second web feeding passage therebetween whereby said primary spacer means is located between oppositely disposed sealing faces of webs being fed into said dies through said first and second web feeding passages,  
(c) secondary spacer means located adjacent said input end of said dies and mounted for movement between a retracted position permitting closure of the dies to effect sealing and an extended position maintaining at least a portion of the webs in a spaced relationship to permit evacuation of the container space formed therebetween,  
(d) means for driving said secondary spacer means to and fro between said retracted and extended positions,  
(e) vacuum passage means in said vacuum drawing unit opening towards said sealing dies for communicating with the interior of a packaging space when said secondary spacer means is in said extended position to maintain said webs in a spaced relationship whereby atmosphere from the container space may be withdrawn through said vacuum passage means prior to sealing of the webs.



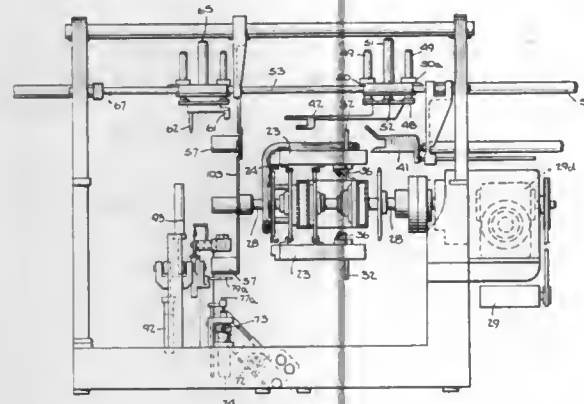
**4,162,600**  
**APPARATUS AND METHOD FOR FOLDING AND**  
**BANDING SKEINS OF YARN**

Thomas E. Westall, and Frank Miller, both of Marion, N.C.,  
 assignors to The American Thread Company, Stamford, Conn.  
 Filed May 2, 1978, Ser. No. 902,032

Int. Cl.<sup>2</sup> B65B 63/04

U.S. Cl. 53—120

15 Claims



1. An apparatus for folding and banding skeins of yarn comprising:

- (a) a conveyor transport means having a plurality of movable generally "U" shaped loading platforms each of said loading platforms being provided with a pair of collapsible pegs which extend through the upper surface of said platforms, said platforms and pegs being adapted to transport unfolded skeins of yarn from a loading portion of the apparatus to a folding portion of the apparatus when the unfolded skeins are positioned over a pair of said pegs.
- (b) a first generally "Y" shaped movable claw adapted to move across the path of the transport means and cooperate with said pairs of pegs to mechanically fold the skein of yarn positioned over said pegs,
- (c) a second generally "U" shaped movable claw adapted to position the folded skein within a banding tube, said banding tube having positioned on its outer surface a pre-formed paper band,
- (d) a doffing mechanism comprising a skein removing means and a band removal means, said skein removing means comprising a downwardly extending pin adapted to fit within the folded end portion of the folded skein when said skein is positioned within the banding tube, said band removal means comprises an arc-like member adapted to fit in frictional contact with the pre-formed band positioned on the outer surface of said banding tube, said skein removing means and said band removal means acting simultaneously to slide the pre-formed band off the banding tube as the folded skein is withdrawn from said tube said simultaneous removal of the pre-formed band and folded skein resulting in the band being positioned around the central portion of said folded skein,
- (e) a band forming means comprising a first and a second band forming finger, said first and second fingers being generally parallel to each other and adapted to move in independent, opposite arc-like directions around the general circumference of said banding tube so as to wrap a band forming slip around said tube,
- (f) a band slip transfer means adapted to transfer band forming slips from a supply tray to the pair of band forming fingers for wrapping around the band tubes, and
- (g) a sealing means for sealing the band forming slips into bands, subsequent to said slips being wrapped around said banding tubes,
- (h) a pre-formed band transfer means comprising a rotatable plate having positioned on the perimeter of one face surface a plurality of banding tubes, said plate being adapted to rotatably move each of said tubes from the band form-

ing portion of the apparatus to a position in alignment with the folding portion of the apparatus,  
 (i) a timing means for controlling the action of elements a through h such that they cooperate with each other to provide for a continuous folding and banding operation.

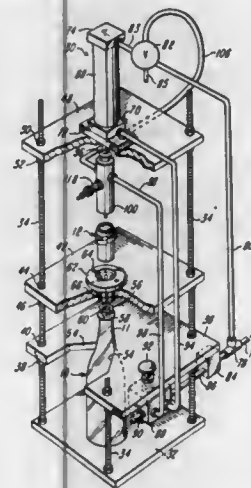
**4,162,601**  
**SECONDARY CLOSURE, METHOD AND APPARATUS**  
 David O. Allen, Wilmington, Ohio, assignor to Buckeye Mold-  
 ing Company, New Vienna, Ohio

Filed Aug. 19, 1977, Ser. No. 825,964

Int. Cl.<sup>2</sup> B65B 7/28; B67B 5/00, 3/22; B23P 11/02

U.S. Cl. 53—292

13 Claims



1. Apparatus for applying a capsule onto a bottle neck, said capsule being of the type comprising a sleeve member having opposite end portions and perforate panel means traversing one of said end portions, said apparatus including a ram having an opening to said panel means, said ram having means for sealingly engaging said capsule at said one of said end portions in surrounding relation to said opening, means for supporting said capsule between said ram and said neck, means for relatively moving said ram and said neck to respectively engage said capsule at said opposite end portions, means for injecting a fluid under pressure through said opening and said panel means into said capsule for supporting the same against collapse upon relative movement of said ram and said neck, said means for injecting a fluid under pressure including check valve means biased by the fluid under pressure to a position wherein the fluid under pressure is prevented from exiting from said opening, said check valve means including means engaging said capsule at said one of said end portions for displacing said check valve means so that fluid under pressure exits from said opening during at least part of the relative movement of said ram and said neck toward one another.

**4,162,602**  
**METHOD AND APPARATUS FOR FILLING AND**  
**CLOSING LARGE SACKS**

Fritz Achelpohl; Richard Feldkämper; Carl Langemeyer; Konrad Tetenborg, and Hartmut Upmeyer, all of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,200

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 2652010

Int. Cl.<sup>2</sup> B65B 1/04, 7/06, 39/08, 43/30

U.S. Cl. 53—415

6 Claims

1. A method of filling and closing large sacks, each large sack having a tube section including side walls, a base, and an open end portion to receive the material to be poured therein, the method comprising the steps of: engaging the open end portion

**4,162,604**  
**PACKAGING MACHINES USING RETRACTILE**  
**THERMOPLASTIC FILM**

Giuseppe Bartolomei, Rua Guanas 63, Sao Paulo, Brazil

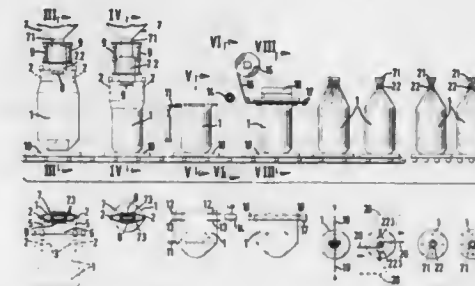
Filed Jul. 6, 1977, Ser. No. 813,230

Claims priority, application Brazil, Jul. 16, 1976, 7604648

Int. Cl.<sup>2</sup> B65B 53/02

U.S. Cl. 53—557

8 Claims



folding the upper end portion of the sack over onto itself, placing closure tape onto the folded-over end portion of the sack and one sack wall and welding the folded-over end portion to the sack wall, moving the inclined side wall portion of the sack, disposed above the poured material, through an angle to a substantially vertical position, folding the empty upper portion of the sack in a zig-zag manner, pulling the zig-zag folded portion together to form a frill, and clipping the sack portion, with an annular clip, beneath the frill.

**4,162,603**  
**METHOD AND APPARATUS FOR TRANSFORMING BY**  
**PRESSING VOLUMINOUS MATERIAL INTO BALES**

Nils E. Strömberg, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

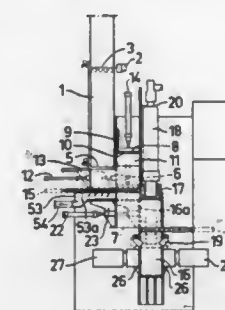
Filed Apr. 17, 1978, Ser. No. 897,121

Claims priority, application Sweden, May 5, 1977, 7705269

Int. Cl.<sup>2</sup> B65B 1/24, 63/02

U.S. Cl. 53—438

21 Claims



1. A method of baling material, including the steps of supplying layers of said material into a pressing chamber, compressing the material after each layer is received by applying a first compression force to each of said layers in turn, applying a greater compression force to all of said layers at once after receipt of a last layer, partially reducing said greater compression force after a predetermined time so that the compressed material in the shape of a bale is permitted to expand, and thereafter binding said material into a bale while said partially reduced compression force upon said bale is maintained.

1. A compact heat-shrink packaging machine comprising, a grating; means for supplying longitudinally over the grating an elongate, longitudinally folded plastic, heat-shrinkable film for packaging in lengths of the folded films articles heat-sealed therein; a single unit for sealing successively lengths of the heat-shrinkable film each into a package and shrinking it about articles therein with heat and cutting the film along a seal transverse of the film to sever the sealed package from the film and effect a seal along the leading edge of the film for a next successive length of film to be made into a package with articles therein; said single unit comprising means defining a compartment within which said grating is disposed and having a hinged lid for opening the compartment to allow advancing the film longitudinally and introducing longitudinally a length of said heat-shrinkable film on to said grating and articles in said length of film to be packaged therein and for closing said compartment for heat-sealing and shrinking said length of film; said unit having an electrically energized sealing element having one arm along a side edge of the compartment and over which the length of film is advanced longitudinally and disposed for heat sealing the length of film transversely of the folded film and having another arm along another side edge of the compartment over which an open side of the folded film is advanced for heat sealing along the length of the open side of said length of film to close it; said lid having edges for sealing the compartment closed overlying both arms of said sealing element when the lid is closed for pressing the film overlying said arms of said sealing element and jointly with said sealing element effecting sealing of said length of film into a package and cutting the film along the seals effected; said unit having electrically energized heating elements in said compartment for heating the air therein; driven air-circulating means for circulating air heated by said heating elements through said grating to shrink the length of heat-shrinkable film about the articles therein; whereby in order to make a first package a leading length of said film is first sealed transversely along a leading edge with said one arm and lid and the lid is opened and said length of film is advanced over said grating and sealed with said articles therein and the film is severed from said length while the lid is closed and the leading edge thereof is sealed for insertion of articles into the next successive length of film before advancing it onto the grating.

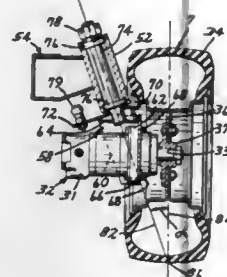


4,162,605  
**REAR WHEEL SUPPORT APPARATUS FOR A THREE WHEEL VEHICLE**  
 Paul H. Olin, Bloomington, and David J. Scherbring, Edina, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Feb. 7, 1978, Ser. No. 875,755  
 Int. Cl.<sup>2</sup> A01D 35/24

U.S. Cl. 56—7

10 Claims



1. An improved self-propelled mowing machine suitable for cutting grass and the like, which comprises:

- a body;
- three drive wheels rotatably carried on the body for movably supporting the body relative to the ground, two of the drive wheels being located opposite to one another and the third drive wheel being disposed in a triangular relationship relative to the first two drive wheels;
- at least one cutting unit located on the body and suited for engaging the ground to cut the grass; and
- means for pivotably supporting the third drive wheel for steering the body, the supporting means being connected to a selectively operable steering mechanism on the body, the supporting means being further configured such that rotation of the third drive wheel from a normal straight ahead position to a turned position relative to the body tends to move the body upwardly, whereby the weight of the body bears down on the third drive wheel and tends to move the third drive wheel back to its normal straight ahead position when the steering mechanism is released by an operator.

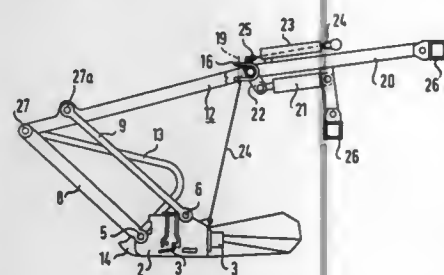
4,162,606  
**MOWER FOR MOUNTING ON THE FRONT END OF AN AGRICULTURAL VEHICLE**  
 Ernst Weichel, Postfach 1180, 7326 Heiningen, Fed. Rep. of Germany

Filed Nov. 1, 1977, Ser. No. 847,548  
 Claims priority, application Fed. Rep. of Germany, Nov. 19, 1976, 2652736

Int. Cl.<sup>2</sup> A01D 35/14

U.S. Cl. 56—15.9

5 Claims



1. A mower for mounting on the front end of an agricultural vehicle comprising a substantially U-shaped frame having first and second arms with free ends extending in the direction of travel when the mower is in a cutting position, means pivotally connecting said frame to the front end of the vehicle for move-

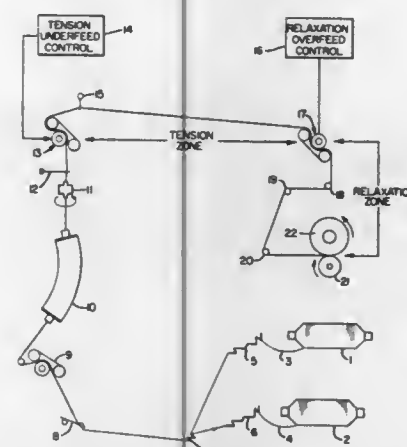
ment of said frame between a non-operating and the cutting position, first and second rocker arms pivotally connected at one end thereof to the free ends of said first and second arms respectively for pivotal movement about an axis transverse to the direction of travel of said mower, at least one cutter assembly having first and second support shoes at the ends thereof pivotally suspended from the other ends of said first and second rocker arms, said pivotal connection of said rocker arms to the free ends of said U-shaped frame arms being located in front of the pivotal connection of said support shoes to the other ends of said rocker arms with respect to the direction of travel when said mower is in the cutting position, and a third rocker arm extending parallel to and positioned behind said first rocker arm with respect to the direction of travel of said mower, said third rocker arm being pivotally connected to one end thereof to said first arm of said U-shaped frame and to said first support shoe of said cutter assembly at the other end thereof.

4,162,607  
**ENTANGLED YARNS**  
 Bron W. Spivey, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jul. 1, 1977, Ser. No. 812,436  
 Int. Cl.<sup>2</sup> D02J 1/22; D02G 1/00

U.S. Cl. 57—287

13 Claims



1. A process for producing bundle yarn having neutral torque from a plurality of groups of textured filaments comprising the steps of:

- supplying a prescribed degree of positive tension to respective plural separated groups of textured filaments by passing the separated groups of textured filaments from a first yarn feed roller means to a second yarn feed roller means, at least two of said groups having been imparted with opposing torques;
- bringing the tensioned plural separated groups of textured filaments together; and
- causing the tensioned groups of textured filaments to relax between said second yarn feed roller means and a yarn take-up means, whereby the oppositely-torqued groups of textured filaments are caused to tangle themselves together to form bundle yarn having a resultant neutral torque.

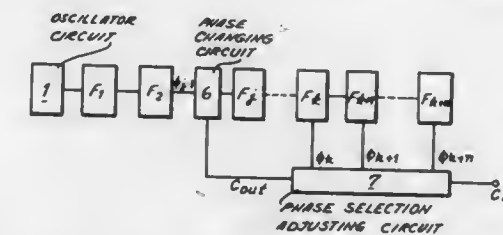
4,162,608  
**ELECTRONIC TIMEPIECE FREQUENCY REGULATING CIRCUIT**  
 Shinji Morozumi, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 583,922, Jun. 5, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,358

Claims priority, application Japan, Jun. 5, 1974, 49-63670  
 Int. Cl.<sup>2</sup> G04C 3/00

U.S. Cl. 58—23 R

15 Claims



1. In an electronic timepiece including oscillator means for producing a high frequency time standard signal, divider means having a series-connected chain of frequency divider stages, at least one of said divider stages in response to the application of said high frequency time standard signal to said divider means producing a timekeeping signal, and display means adapted to display time in response to said timekeeping signal applied thereto, the improvement comprising phase changing means series-connected to said series-connected divider chain between a divider stage just prior thereto and a next divider stage for applying an intermediate frequency signal from said divider stage just prior thereto to said next divider stage, phase selection adjusting signal means coupled to at least one of said series-connected divider stages in said divider chain after said next divider stage for receiving a control frequency signal produced thereby, and in response thereto selectively applying a two-state phase selection adjusting signal to said phase changing means, said phase changing means being adapted to be selectively disposed into one of a retard mode and an advance mode, said phase changing means in response to said intermediate frequency signal produced by the divider stage just prior thereto and the phase selection adjusting signal being adapted to apply to the next divider stage said intermediate frequency signal retarded by at least 180° for each change of state of said phase selection adjusting signal applied thereto when said phase adjustment means is disposed in a retard mode, said phase changing means being further adapted in response to the intermediate frequency signal produced by the divider stage just prior thereto and the phase selection adjusting signal applied thereto to apply to the next divider stage said intermediate frequency signal advanced by at least 180° for each change of state of said phase selection adjusting signal applied thereto when said phase changing means is disposed in an advance mode.

4,162,609  
**FILM DISPLAY CLOCK**  
 Masaaki Oishi, Itaru Ashida, and Tetsuro Suzuki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Jul. 22, 1977, Ser. No. 818,329  
 Claims priority, application Japan, Jul. 23, 1976, 51-87868

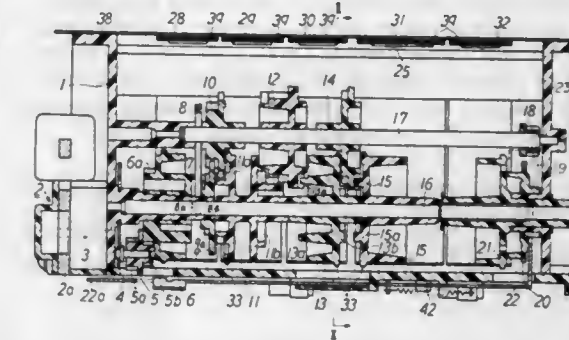
Int. Cl.<sup>2</sup> G04B 19/20; G04C 21/16

U.S. Cl. 58—38 R

9 Claims

1. A digital film display clock comprising a casing having a horizontally elongate window at its front, a horizontal drum shaft disposed rearwardly of and parallel to the length of said window, a seconds drum, unit minutes drum, tens minute drum and hour drum on said shaft, all of said drums being of equal diameter, a seconds film band, unit minutes film band, tens minute film band and hour film band running on and driven by said drums respectively, all of said film bands being digital and of the same length, guide means for guiding said film bands

past said windows to be viewed therethrough, said guide means comprising interior guide means engaging inner faces of said bands and exterior guide means engaging outer faces of said bands, said guide means for all of said bands being aligned with one another, a synchronous motor for driving said seconds drum, first carry-over means actuated by said seconds



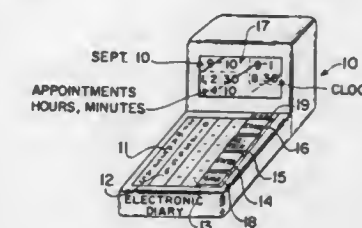
drum for intermittently driving said unit minutes drum, second carry-over means actuated by said unit minutes drum for intermittently driving said tens minutes drum, and third carry-over means actuated by said tens minutes drum for intermittently driving said hour drum, whereby digits on said bands are successively viewable through said window to present a digital time reading.

4,162,610  
**ELECTRONIC CALENDAR AND DIARY**  
 Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20015  
 Filed Dec. 31, 1975, Ser. No. 645,645

Int. Cl.<sup>2</sup> G04B 47/00

U.S. Cl. 58—148

13 Claims



1. An electronic diary, calendar, and clock comprising: an electronic clock for cumulatively determining the actual date and time-of-day as a number of functions including minutes, hours, days, and months, an electronic visual display for displaying the actual time-of-day, day and month, an electronic memory means for storing a plurality of time-of-day appointments for each of a plurality of different days, including present and future days, manually controlled means coupled to said memory for selecting, at will, each of the present and future days, individually, and for entering into and storing in said memory for that selected day digital data corresponding to a plurality of different time-of-day appointments, said manually controlled means including manually controlled correction and update means for selectively changing and updating, at will, in the memory the digital data for any given appointment time-of-day for any of said given present and future days, thereby to enable the schedule of time appointments in said memory for any given day to be corrected and rendered current at any time, said manually controlled means including manually controlled retrieval means for selectively accessing said elec-



tronic memory, at will, for any one of the plurality of different days, and for reading out the stored schedule of time-of-day appointments to said electronic display for concurrently displaying the plural appointment times for that day.

4,162,611

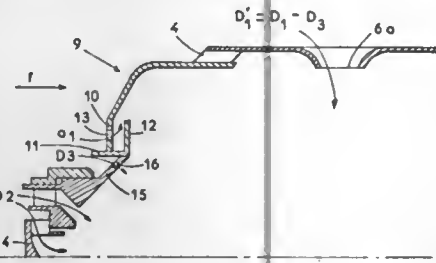
**COMBUSTION CHAMBER FOR TURBO ENGINES**  
Jacques E. J. Caruel, Dammarie les Lys; Jean R. Bedue, Creteil; Bruno Deroide, Montgeron la Foret; Jean-Paul R. Gaillac, Combs la Ville, and Philippe M. D. Gastebois, Melun, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jul. 5, 1977, Ser. No. 812,636  
Claims priority, application France, Jul. 7, 1976, 76 20707; May 18, 1977, 77 16071

Int. Cl.<sup>2</sup> F02C 7/22

U.S. Cl. 60—39,65

24 Claims



1. In a combustion chamber for turbo engines, comprising a primary or combustion zone, provided with primary holes providing for the radial injection of a first air flow, a dilution and mixing zone, in which a second air flow is injected, and at least one injector of the pneumatic atomization prevaporization type, mounted on the base, with their axes parallel to that of the chamber means providing for the introduction of the fuel due to a third air flow, characterized in that between each injector and the base of the chamber which is located upstream of the primary zone, an intermediate segment is provided having dimensions which are reduced with respect to those of the chamber and defining a volume which flares in the direction of the gas flow and the walls of which are provided with a large number of small diameter holes, which are uniformly distributed, permitting the injection of a fourth flow of air in the form of jets which penetrate the carburized mixture from the injector, the first, third, and fourth air flows in total comprising the primary air which is necessary for the combustion reactions, this fourth flow of air representing 1/6 to 1/4 of the primary air, the third and fourth air flows which are added being such that they form a stoichiometric mixture with the fuel which is injected at low operation in the intermediate zone; the first, third and fourth air flows which are added form, with the fuel, a stoichiometric mixture in the combustion zone during normal operation.

4,162,612

**EXHAUST GAS CLEANING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE**

Tadao Mitsuda, Susono; Takeru Yasuda, Nagoya, and Yoshiaki Fukumori, Obu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of Japan

Filed Oct. 25, 1977, Ser. No. 845,233

Claims priority, application Japan, Jul. 5, 1977, 52/79475

Int. Cl.<sup>2</sup> F01N 3/15

U.S. Cl. 60—276

9 Claims

1. An exhaust gas cleaning apparatus for an internal combustion engine, said apparatus comprising:  
a three-way catalytic converter, arranged in the exhaust system of said engine, for effectively eliminating toxic components remaining in the exhaust gas when the air-fuel

ratio of the exhaust gas directed to said converter is kept near a stoichiometric value;

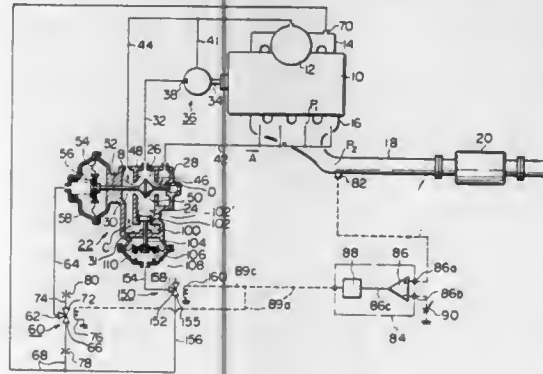
air pump means driven by the crankshaft of said engine; pipe means connected on one end thereof to said air pump means for receiving secondary air from said air pump means and connected on the other end thereof to said exhaust system at a position located upstream of said catalytic converter for introducing secondary air into said exhaust system;

a flow control valve means having an air chamber located on said pipe means, said valve means has a diaphragm for forming a vacuum chamber on one side thereof, said diaphragm operating to control the amount of secondary air directed from said air chamber toward said exhaust system in accordance with the vacuum pressure level in said vacuum chamber, an outlet on said air chamber communicating with said other end, said valve means coacting with said outlet to control air flow therethrough;

a vacuum switching valve means capable of selectively communicating said vacuum chamber with the engine intake system for controlling the amount of secondary air passed through said flow control valve means;

a sensor means arranged in the exhaust system for detecting a predetermined value of the air-fuel ratio near said stoichiometric value;

a control unit for operating said vacuum switching valve means in such a manner that said switching valve means is in a first position when a first electric signal, which indi-



cates that the air-fuel ratio is smaller than the predetermined value, is received by said control unit to increase the amount of secondary air directed into said exhaust system from said air chamber of said flow control valve means, and in such a manner that said switching valve means is in a second position when another electric signal, which indicates that the air-fuel ratio is larger than the predetermined value, is received by said control unit for decreasing the amount of secondary air directed into said exhaust system from said air chamber;

a by-pass valve means for selectively connecting said air chamber with the atmosphere; and

an actuator means connected to said control unit for operating said by-pass valve means in such a manner that said by-pass valve means is situated so that said air chamber is disconnected from the atmosphere when said vacuum switching valve means is switched to its first position, so as to cause a rapid increase of a limited amount of secondary air directed to said exhaust system for quickly increasing the air-fuel ratio to a value near said stoichiometric value, and in such a manner that said by-pass valve is situated so that said air chamber is connected with the atmosphere when said vacuum switching valve means is switched to its second position, so as to cause a rapid decrease of a small amount of secondary air for quickly decreasing the air-fuel ratio to a value near said stoichiometric value, whereby the air-fuel ratio of the exhaust gas directed to said three-way catalytic converter is effec-

tively maintained near said stoichiometric value for producing an idealized operation of said converter.

4,162,613

**EXHAUST GAS PURIFIER OF AN INTERNAL COMBUSTION ENGINE**

Tetsuomi Tamura, Toyota, and Kolchi Mizutani, Seto, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

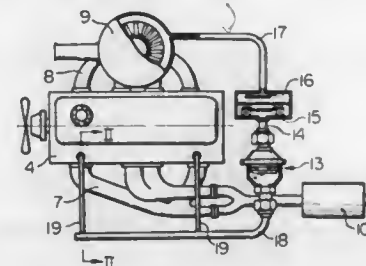
Continuation of Ser. No. 674,238, Apr. 6, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,072

Claims priority, application Japan, Dec. 26, 1975, 50-154848

Int. Cl.<sup>2</sup> F01N 3/10; F02M 25/06

U.S. Cl. 60—278

9 Claims



1. An exhaust gas purifier in a four-stroke internal combustion engine having an exhaust passage and an air cleaner having therein a dust portion and a clean portion which is connected to a cylinder of the engine, said purifier comprising: a secondary air conduit communicating said dust portion with said exhaust passage; a silencer disposed in said secondary air conduit; a reed valve disposed in said secondary air passage between said silencer and said exhaust passage and arranged to open automatically in response to a decrease in pressure below a predetermined value in said exhaust passage to permit the supply of a secondary air into said exhaust passage; and an air filter disposed in said secondary air passage between said silencer and said reed valve.

4,162,614

**PRESSURE FLUID OPERATED POWER PLANT**

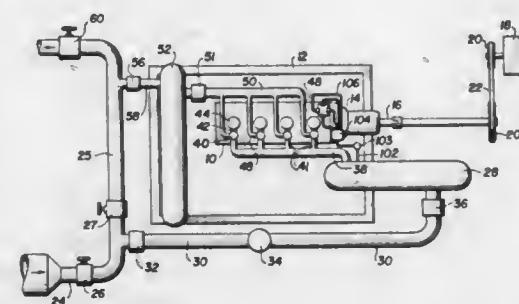
John E. Holleyman, Monroe, La., assignor to J.J.J. Air Injection Systems, Monroe, La.

Filed Sep. 13, 1977, Ser. No. 832,723

Int. Cl.<sup>2</sup> F15B 11/20, 13/07

U.S. Cl. 60—370

4 Claims



1. A power plant adapted to have its pistons and its valves operated by a pressure fluid comprising, in combination; a piston and cylinder type engine having a drive shaft rotatable by the reciprocating pistons; and inlet manifold connected to a source of pressure fluid and an exhaust manifold; a unitary inlet and exhaust valve means positioned between and connected to each cylinder and said manifolds; timing means including a pressure fluid distributor connected to each of said unitary valve means for admitting pressure fluid thereto to move it cyclically to inlet position for admitting pressure fluid to said cylinders to reciprocate said pistons; and spring means for

returning each of said unitary valve means to exhaust position upon the completion of each of said piston's working stroke.

4,162,615

**HYDRAULIC FLUID TANK PRESSURIZATION DEVICE**  
Giorgio Grattapaglia, and Carlo Cecchi, both of Torino, Italy, assignors to Fiat-Allis Macchine Movimento Terra S.p.A., Lecce, Italy

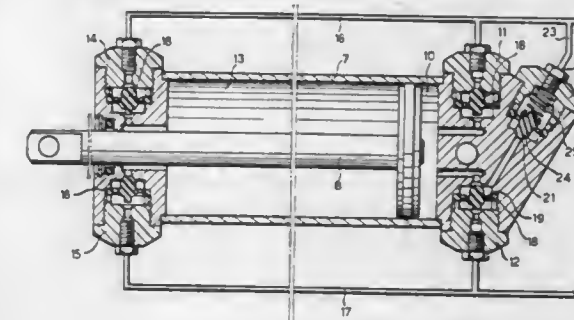
Filed Jun. 23, 1977, Ser. No. 809,154

Claims priority, application Italy, Jul. 28, 1976, 68885 A/76

Int. Cl.<sup>2</sup> F04B 49/08; F15B 1/06

U.S. Cl. 60—478

4 Claims



1. An air pressurizing system for pressurizing an air space in a reservoir containing hydraulic fluid which varies in quantity in response to movement of hydraulically actuated equipment coupled in fluid communication therewith comprising

a pneumatic cylinder having a reciprocable piston and piston rod movable within a chamber for compressing air within said chamber,

the piston rod of said pneumatic cylinder operatively connected by mechanical means to hydraulically actuated equipment for movement of said reciprocal piston in response to movement of the hydraulically actuated equipment mechanically connected thereto,

air inlet valve means in fluid communication with said pneumatic cylinder chamber for passing air thereto in response to reciprocal movement of said piston rod,

air outlet valve means in fluid communication with said pneumatic cylinder chamber for passing compressed air therefrom in response to reciprocal movement of said piston rod,

reservoir means for containing hydraulic fluid which varies in quantity in response to movement of the hydraulically actuated equipment mechanically connected to said pneumatic cylinder and having an air space therein which varies in volume in response to the amount of hydraulic fluid contained in the reservoir means,

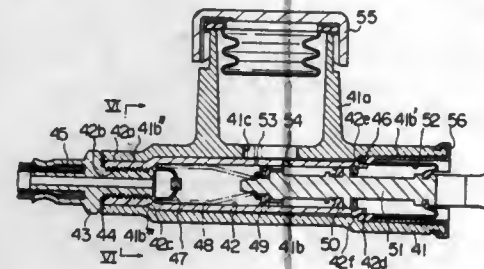
discharge conduit means providing direct and continuous open fluid communication between said air outlet valve means and said reservoir means and acting solely to pass air compressed by movement of said piston rod to said air space for maintaining a predetermined level of pressurization thereof during movement of the hydraulically actuated equipment, and

pressure relief means in fluid communication with said air outlet valve means and said discharge conduit means to control the pressurization of air delivered to said reservoir means,

said pressure relief means comprising a pressure relief valve having an outlet in fluid communication with said air inlet valve means to bypass compressed air thereto when the compressed air passed from said air outlet valve means through said discharge conduit means to said air space increases the pressurization of the air space above a predetermined level.

**4,162,616**  
**HYDRAULIC MASTER CYLINDER**  
 Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Kanagawa, Japan  
 Division of Ser. No. 678,718, Apr. 2, 1976, abandoned. This application Oct. 12, 1977, Ser. No. 841,435  
 Int. Cl.<sup>2</sup> F15B 7/00  
 U.S. Cl. 60—533

5 Claims



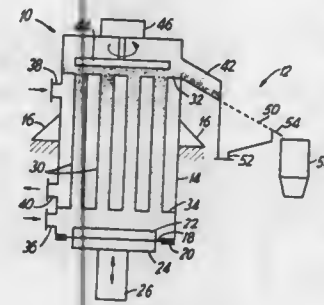
1. A hydraulic master cylinder for use in a vehicle braking system, said master cylinder comprising:  
 a housing having extending therethrough a bore including a large diameter portion, a small diameter portion and a shoulder joining said large and small diameter portions;  
 a liner formed of a corrosion-resistant material and including a large diameter portion, a small diameter portion and a shoulder joining said large and small diameter portions of said liner;  
 said liner being tightly and nonrotatably positioned within said bore of said housing, with the outer surfaces of said large and small diameter portions of said liner tightly contacting the inner surfaces of said large and small diameter portions of said bore of said housing, respectively;  
 a piston slidably positioned within said liner;  
 said small diameter portion of said liner having a threaded inner surface; and  
 a connecting member having an externally threaded portion in threaded engagement with said threaded inner surface of said small diameter portion of said liner and an outwardly extending flange axially abutting a free end surface of said housing, said connecting member thereby comprising means for axially urging said liner toward said small diameter portion of said bore and for thereby urging the outer surface of said shoulder of said liner against the inner surface of said shoulder of said bore, said connecting member having extending therethrough a passage for communicating the interior of said liner with an exterior wheel cylinder.

**4,162,617**  
**PULSED CRYSTALLIZER WITH STRIPS OF REDUCED HEAT EXCHANGE**  
 Paul Schmidt, Heinrich-Kampchenstr. 3, 4300 Essen 17, and Peter Walzel, Brunnenstrasse 47, 4300 Essen 1, both of Fed. Rep. of Germany  
 Filed Jul. 14, 1977, Ser. No. 815,713  
 Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711789; Austria, Mar. 18, 1976, 2027/76  
 Int. Cl.<sup>2</sup> B01D 9/04  
 U.S. Cl. 62—123

8 Claims

1. Apparatus for crystallizing chemical species in a fluid comprising a fixedly mounted heat exchange surface for cooling the fluid to cause crystals to form in the fluid and means for pulsating the fluid at a frequency between 0.5 and 200 Hz with a component of pulsation parallel to the heat exchange surface having amplitude at least 0.5 mm to prevent any crystals from forming on the heat exchange surface, the heat exchange sur-

face including a plurality of longitudinal, laterally spaced zones of reduced heat transfer substantially parallel to the direction

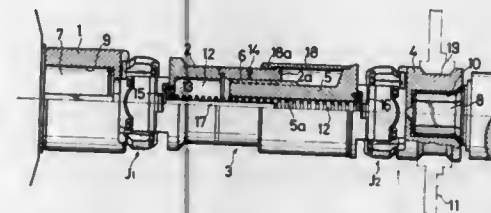


of pulsation of the fluid to prevent crystals from forming in the fluid adjacent the zones of reduced heat transfer.

**4,162,618**  
**DEVICE FOR ROLLS IN HIGH SPEED ROLLING MILLS AND THE LIKE**

Hiroji Okuda, Kitakatsuragi-gun, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan  
 Filed Jul. 25, 1977, Ser. No. 819,216  
 Int. Cl.<sup>2</sup> F16D 3/06; F16C 35/08  
 U.S. Cl. 64—23

1 Claim



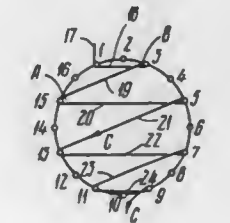
1. A driving device for rolls in high speed rolling mills and the like, wherein a drive shaft element and a driven shaft element are interconnected by a drive shaft which is longitudinally extensible and which effects the centering of the drive shaft element and of the driven shaft element and the transmission of torque by means of joint members included at two places in the drive shaft, said driving device comprising:

a shaft assembly which renders said drive shaft longitudinally extensible, said shaft assembly comprising two shaft members in the form of sleeves fitted together as by a spline connection so as to be only axially slidable, said shaft assembly having a drive fitting yoke coupled to one end thereof by one of said joint members for the transmission of the rotational force of the drive shaft element, at least one spring provided between spring seats at ends of the two shaft elements and supported on the driven side at its outer peripheral portion by an inner hole of the driven shaft element and on the drive shaft side at its inner peripheral portion by a support shaft fixed in the end of the drive shaft element, said spring urging the shaft assembly in a direction which extends the shaft assembly, a driven fitting yoke in the form of a bottomed cylindrical body coupled to the other end of the shaft assembly by the other joint member and loosely fitted on the driven shaft element in such a manner that the transmission of torque to the driven shaft element is possible, said driven fitting yoke and said driven shaft element having a fit between an oval-shaped modified shaft and a hole of a corresponding shape, the inner bottom of said driven fitting yoke and the end surface of said driven shaft element being provided at their respective centers with fitting means for bringing the axes of the driven fitting yoke and the driven shaft element into alignment with each other, said fitting means being a conical opening and a conical projection adapted to be tightly fitted in the conical opening, said conical opening

being provided either at the center of the inner bottom surface of the driven fitting yoke or at the center of the end surface of the driven shaft element, said conical projection being provided at the other center.

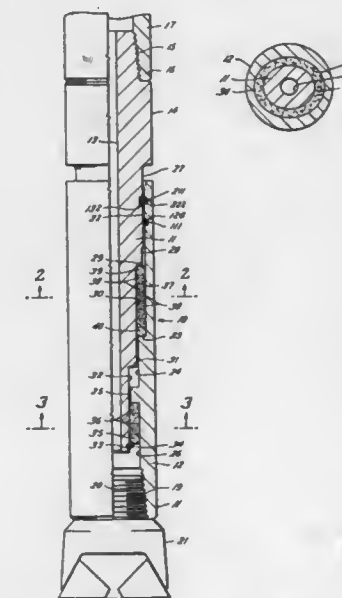
**4,162,620**  
**CIRCUIT-KNIT CLOSED END TUBULAR ARTICLE**  
 Vladimir K. Raevich, Kutuzovskiy prospekt, 9, kv. 188; Evgeny I. Petrov, ulitsa Beloveshskaya, 91, kv. 77; Elena N. Kolesnikova, Melerovskiy proezd, 1/1, korpus 2, kv. 44, and Alexander K. Saxon, Sirenevyy bulvar, 69, korpus 4, kv. 17, all of Moscow, U.S.S.R.  
 Continuation of Ser. No. 639,430, Dec. 10, 1975, abandoned, which is a continuation of Ser. No. 428,858, Dec. 27, 1973, abandoned, which is a continuation of Ser. No. 269,187, Jul. 5, 1972, abandoned. This application Feb. 9, 1978, Ser. No. 876,241  
 Claims priority, application U.S.S.R., Jul. 6, 1971, 1671923; Jul. 6, 1971, 1671924  
 Int. Cl.<sup>2</sup> D04B 9/56  
 U.S. Cl. 66—187

4 Claims



**4,162,619**  
**DRILL STRING SHOCK SUB**  
 Jeddy D. Nixon, Jr., Houston, Tex., assignor to Maurer Engineering, Inc., Houston, Tex.  
 Filed Feb. 8, 1978, Ser. No. 875,991  
 Int. Cl.<sup>2</sup> F16D 3/17; E21B 17/42  
 U.S. Cl. 64—23

17 Claims



1. A shock sub for use in a drill string for absorbing longitudinal, radial, and torsional vibration and impact loads comprising:

a tubular housing adapted for connection to one part of a drill string,  
 a mandrel extending longitudinally into said housing and having an end portion adapted for connection to another part of a drill string,  
 said mandrel and said housing each having a shape defining a non-circular annular cavity when assembled together, compressible, elastic, metallic spring means positioned in and substantially filling said non-circular annular cavity, such springs means being compressible longitudinally, radially and circumferentially of said cavity to absorb longitudinal, radial and torsional vibration and impact loads and to transmit rotary movement between said housing and said mandrel upon rotation of one of said members by said drill string, and  
 means securing said housing and mandrel together to maintain said spring means in longitudinal compression.

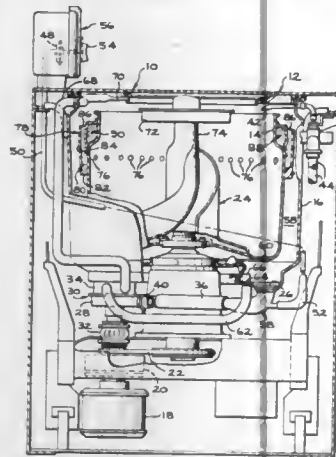
**4,162,621**  
**BASKET OVERFLOW FOR WATER RECIRCULATING CLOTHES WASHING MACHINE**  
 Aidan M. Stone, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.  
 Filed Apr. 17, 1978, Ser. No. 896,874  
 Int. Cl.<sup>2</sup> D06F 13/02, 23/04, 37/00  
 U.S. Cl. 68—23.2

5 Claims

1. In a clothes washing machine including:  
 a tub;  
 a generally cylindrical clothes receiving basket mounted within said tub, said basket being formed with a series of openings in the bottom thereof;  
 means for washing and rinsing clothes disposed in said basket and removing water from said basket after said washing and rinsing;  
 recirculation pump means causing water entering said tub through said basket openings to be recirculated into said basket at a faster rate than water flow into said tub



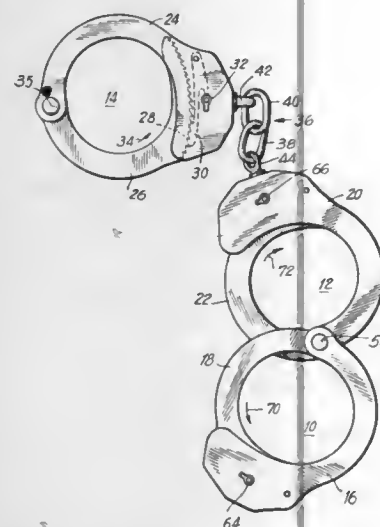
through said bottom openings in said basket during said washing and rinsing;  
 whereby said level of water in said tub is reduced below the level of said water in said basket during said washing and rinsing;  
 a series of overflow openings formed about the periphery of said basket at a level vertically spaced above said bottom basket openings;  
 a gutter ring secured to the exterior of said basket extending about said basket periphery at a level substantially aligned with said overflow openings in said basket;



said gutter ring defining a trough extending about said basket and in fluid communication with said overflow openings;  
 said gutter ring including an upper edge extending vertically above the level of said overflow openings, whereby water flow enters said trough and rises to said upper edge of said gutter ring prior to overflow into said tub;  
 whereby the water level in said basket will rise to the level of said upper edge of said gutter ring.

**4,162,622**  
**MULTIPLE-CUFF HANDCUFF**  
 Joseph Daleo, Deer Park, N.Y., assignor to Triple Cuff Corporation, Melville, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,368  
 Int. Cl.<sup>2</sup> E05B 75/00  
 U.S. Cl. 70—16



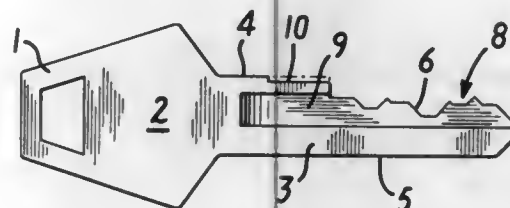
1. A multiple-cuff handcuff comprising first means including first and second cuffs pivotally interconnected for movement in two parallel planes, a third cuff, and coupling means flexibly coupling said third cuff to said first means, said coupling means

including a chain consisting of a plurality of interengaged links, said first means including a pivot pin common to said first and second cuffs and about which said first and second cuffs pivot in said planes, said first and second cuffs being free on said pin to pivot into overlapping, generally coincident relation.

**4,162,623**  
**KEY AND LOCK SYSTEM**  
 Noelle Yorio, and Albert E. Yorio, both of 70 W. St., Harrison, N.Y. 10582

Continuation-in-part of Ser. No. 780,662, Jun. 8, 1977. This application Sep. 15, 1977, Ser. No. 833,447  
 Int. Cl.<sup>2</sup> E05B 19/06, 27/04  
 U.S. Cl. 70—364 A

11 Claims



1. A lock system comprising a combination of (1) a first pin-tumbler lock having an outer cylinder and a rotating cylinder plug, the cylinder plug having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the outer cylinder and cylinder plug, wherein the lock pins project into the barrel; (2) a second pin-tumbler lock, substantially shorter than the first lock, having an outer cylinder and a rotating cylinder plug, the cylinder plug having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the outer cylinder and cylinder plug, wherein the lock pins project into the barrel, and (3) a key having a conventional handle portion and shank portion with a series of notches and projections extending along one longitudinal edge of the shank portion which engage the tumbler pins of the first pin-tumbler lock upon insertion of the key so as to render the lock operable, and which engage the tumbler pins of the second pin-tumbler lock upon insertion of the key to render the second lock operable.

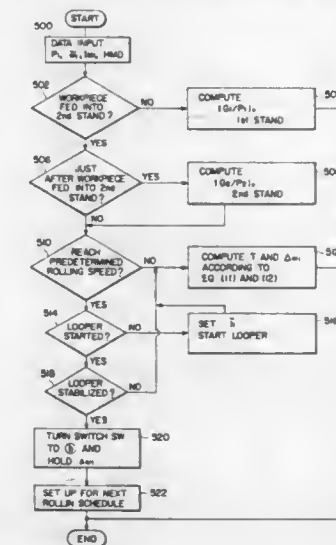
**4,162,624**  
**TENSION CONTROL METHOD FOR A ROLLING MILL**  
 Yasuo Morooka, and Shinya Tanifuji, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 31, 1978, Ser. No. 892,180  
 Claims priority, application Japan, Mar. 31, 1977, 52/35269  
 Int. Cl.<sup>2</sup> B21B 37/00  
 U.S. Cl. 72—8

12 Claims

1. In the control of a tension of a workpiece which is rolled by a tandem rolling mill, a tension control method for a rolling mill characterized in that a loopless tension control in which a tension is computed from a driving current for rolls and a rolling load and in which the tension is controlled in accordance with a deviation from a desired tension is executed during a threading stage of a top end of the workpiece and during a tail-out stage, while a tension control with a loop is executed during a steady rolling from completion of said

threading stage of said top end to commencement of said tail-out stage, both the tension controls being changed-over in



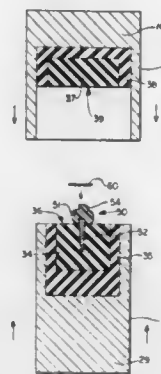
dependence on the rolling process so as to control said tension of said workpiece.

**4,162,625**  
**METHOD AND APPARATUS FOR FORMING DENTAL COPINGS**

David E. Simmons, 3600 Prytanla St., New Orleans, La. 70115  
 Filed Jan. 24, 1978, Ser. No. 871,810  
 Int. Cl.<sup>2</sup> B21D 22/12

U.S. Cl. 72—54

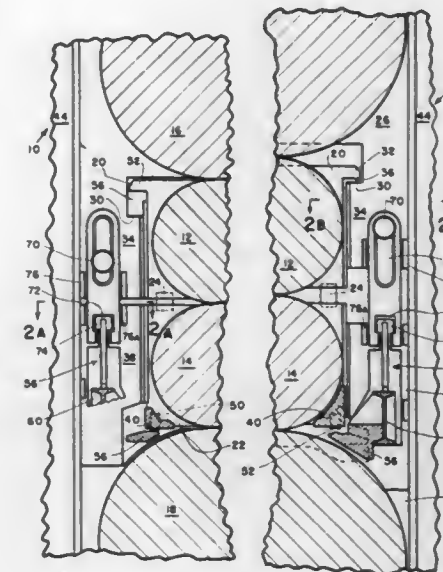
22 Claims



1. An apparatus for forming dental copings comprising:  
 a. a first compression member providing a first pliable compression surface;  
 b. a tooth die attachable to the surface of said first compression member at said first pliable surface;  
 c. a second compression member in cooperative relationship to said first compression member said second compression member providing a second pliable compression surface;  
 d. a sheet of coping material sized to coverably fit over said tooth die; and  
 e. compression means for urging said first compression and said second compression member together, said sheet of coping material being deformed to substantially conform to the shape of said tooth die when said first compression member and said second compression member are urged together by said compression means.

**4,162,626**  
**ROLLING MILL**  
 Elmer E. Decima, Pittsburgh, and Albert T. Briggs, Tarentum, both of Pa., assignors to Wean United, Inc., Pittsburgh, Pa.  
 Filed May 3, 1978, Ser. No. 902,534  
 Int. Cl.<sup>2</sup> B21B 31/10  
 U.S. Cl. 72—238

11 Claims



1. In a rolling mill or the like having a pair of work roll assemblies each including a pair of opposed bearing chocks, a pair of back up roll assemblies each including a pair of opposed bearing chocks in which one of said back up roll assemblies cooperate with one of said work roll assemblies and the other said back up roll assembly cooperates with the other work roll assembly and the upright housing for receiving said work roll and back up roll assemblies with their axes arranged in a horizontal disposition, and means for raising and lowering the uppermost back up roll assembly relative to said lowermost back up roll assembly, the improvement comprising:

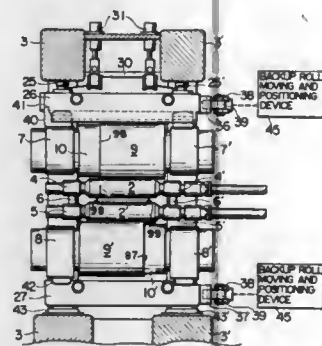
a frame having spaced apart parallel runners extending between and connected to the opposite sides of said opposed chocks of said lower work roll assembly, said runners having means on their lower surfaces for allowing said lower work roll chocks to be supported on movement into and out of said housing,  
 a pair of spaced apart tracks constructed and arranged to extend between said opposed chocks of said lower work roll assembly in an overhung relationship with respect to a different one of said runners,  
 strap means for each back up roll chock connected to the inside or the outside of the vertical surface thereof for carrying a different one of said tracks and adapted on movement of said upper back up roll chocks to bring said tracks into and out of supporting relationship with said runners, and  
 means for allowing said lower work roll assembly to selectively support said upper work roll assembly so that when so supported and when said lower work roll assembly is supportable by said tracks, both said work roll assemblies as a unit can be inserted into or removed from said housing.

# 4,162,627 ROLLING MILL

Shigeru Shida, and Toshiyuki Kajiwara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan  
Continuation of Ser. No. 560,687, Mar. 21, 1975, abandoned, which is a continuation of Ser. No. 378,915, Jul. 13, 1973, abandoned. This application Mar. 16, 1978, Ser. No. 887,369  
Claims priority, application Japan, Jul. 17, 1972, 52-70817  
Int. Cl.<sup>2</sup> B21B 31/18

U.S. Cl. 72—247

3 Claims



1. A rolling mill comprising: an upper and a lower work roll arranged to contact a strip or workpiece for rolling the same; metal chock means for rotatably supporting each end of said upper and lower work rolls; work roll bending means for applying a roll bending force interposed between the metal chock means of said upper work roll and the metal chock means of said lower work roll; an upper and a lower backup roll arranged in a position outside of the associated upper and lower work rolls; metal chock means for rotatably supporting each end of said upper and lower backup rolls; an upper and a lower guide frame arranged in a position outside of each of said backup rolls on a side thereof remote from the associated work roll, said guide frames each extending over a width of respective roll surfaces of the upper and lower backup rolls at a spacing from the respective roll surfaces and contacting said metal chock means for said upper and lower backup rolls so as to transmit a rolling force applied to said upper and lower guide frames to said upper and lower backup rolls through said metal chock means for said backup rolls; and means for axially displacing said upper and lower backup rolls in an opposite direction to bring a side edge of an effective roll surface of the respective backup rolls substantially in vertical alignment with respective side edges of the strip or workpiece.

# 4,162,628 LOAD CELL

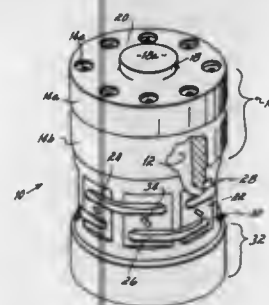
Georg Oetjen, and David L. Eck, both of Columbus, Ohio, assignors to Reliance Electric Company, Cleveland, Ohio  
Filed Dec. 23, 1977, Ser. No. 863,797  
Int. Cl.<sup>2</sup> G01L 5/12

U.S. Cl. 73—141 A

18 Claims

1. A load cell comprising, in combination: a hollow central measuring column subject to strains to be measured, a base section for supporting said hollow central measuring column, and a load receiving section for receiving a load at substantially one point and transmitting the load substantially uniformly to said hollow central measuring column, said load

receiving section including an extension extending into the hollow portion of said hollow central measuring column to reduce the deflection of said load receiving section when load is applied to the load cell.



# 4,162,629

## TENSILE FORCE LOAD CELL ASSEMBLY

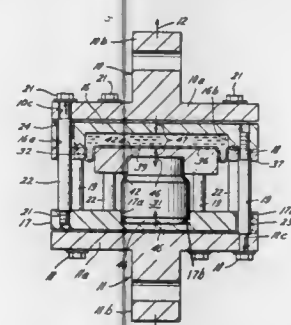
Clayton L. Howard, Santa Rosa, Calif., assignor to Baker International Corporation, Orange, Calif.

Filed May 16, 1978, Ser. No. 906,523

Int. Cl.<sup>2</sup> G01L 1/26

U.S. Cl. 73—141 R

12 Claims



6. In a load cell assembly for providing an output signal corresponding to an axially applied tensile load: first and second axially spaced apart radially extending load receiving plates having axially disposed hook means on the outer sides thereof for connection to the load; first and second radially extending load cell plates disposed between the load receiving plates, the first load cell plate being positioned toward the second load receiving plate and the second load cell plate being positioned toward the first load receiving plate; rigid means connecting the first and second load receiving plates respectively to the first and second load cell plates; an electrical load cell centrally mounted on the first load cell plate for delivering an output signal corresponding to the force applied thereto; a centrally disposed chamber formed in the second load cell plate; a body of fluid enclosed within the chamber; a radially extending flexible diaphragm mounted on the second load cell plate and forming one wall of the chamber; and piston means disposed between the diaphragm and the load cell for transmitting force between the diaphragm and the load cell.

# 4,162,630

## MEASUREMENT AND RECONSTRUCTION OF THREE-DIMENSIONAL FLUID FLOW

Steven A. Johnson, Rochester, Minn., assignor to University of Utah, Salt Lake City, Utah

Filed Sep. 20, 1976, Ser. No. 725,152

Int. Cl.<sup>2</sup> G01F 1/66

U.S. Cl. 73—194 A

9 Claims

1. The method of measuring the fluid vector flow field

# 4,162,632 LOAD CELL

Ralph E. Steinmueller, Detroit, Mich., assignor to Harry W. Dietert Co., Detroit, Mich.  
Division of Ser. No. 745,930, Nov. 29, 1976, Pat. No. 4,083,236.  
This application Feb. 27, 1978, Ser. No. 881,631  
Int. Cl.<sup>2</sup> G01D 13/00

U.S. Cl. 73—432 A

8 Claims



through a measurement region which contains a plurality of volume elements comprising the steps of: transmitting and receiving acoustic energy through the measurement region along a plurality of rays through said region such that each volume element within the region in which flow is to be reconstructed is traversed by a set of rays having components in each direction for which flow components are to be reconstructed;

- measuring the time for transmission of the acoustic energy through the measurement region along said plurality of rays; and determining the speed of sound and fluid velocity throughout the measurement region by solving the simultaneous set of line integrals which relate the fluid velocity and sound speed to the measured propagation time along said rays.

# 4,162,631

## RARE EARTH OR YTTRIUM, TRANSITION METAL OXIDE THERMISTORS

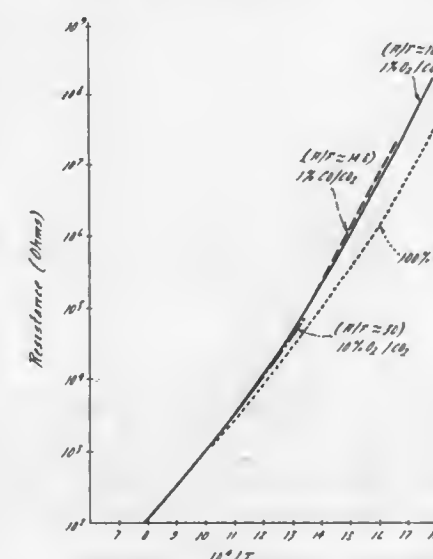
Eleftherios M. Logothetis, Birmingham; Kamlakar R. Laud, and John K. Park, both of Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1977, Ser. No. 857,498

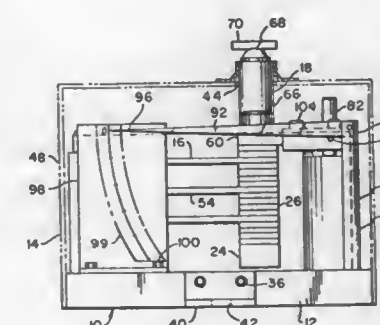
Int. Cl.<sup>2</sup> G01K 7/18; H01B 1/06

U.S. Cl. 73—362 AR

10 Claims



1. A method of sensing temperature in an oxygen varying environment that contains combustion engine exhaust gas which comprises exposing to the environment a thermistor composition comprising (a) transition metal comprising iron, (b) one or more rare earth of the lanthanide series or yttrium and (c) oxygen in a respective molar ratio of the ions of about 1:1:3 and detecting its resistance.



1. Indicator structure comprising a post, an indicator arm extending substantially perpendicularly to the post, pivot means for pivotally securing one end of the indicator arm to one end of the post, said indicator arm having a free end, a scale secured in a fixed position adjacent the free end of the indicator arm, a pin movable longitudinally of the post in response to a parameter which it is desired to indicate positioned adjacent the post in contact with said indicator arm whereby the indicator arm is permitted to pivot about the one end of the post in accordance with the movement of the pin, and means for mounting the pin for movement longitudinally of the indicator arm including means movable in accordance with the parameter it is desired to indicate, an L-shaped bracket, and slot and bolt means securing the L-shaped bracket to the means movable in accordance with the parameter it is desired to indicate.

# 4,162,633

## BALANCING MACHINE

Richard Muller, Lynchburg, Va., assignor to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

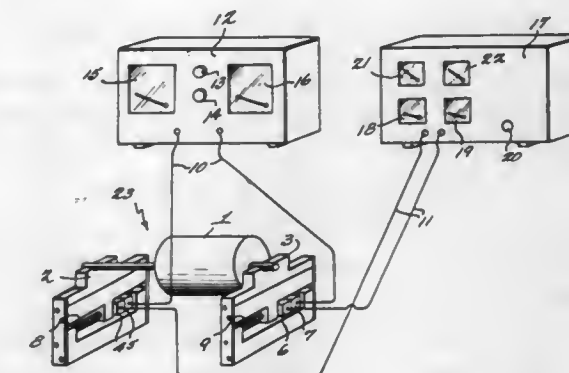
Filed Jul. 5, 1978, Ser. No. 922,053

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730439

Int. Cl.<sup>2</sup> G01M 1/22

U.S. Cl. 73—462

1 Claim



1. An apparatus for balancing bodies of rotation comprising: support means for supporting a body at two points during rotation; two measuring load cells at each said point for each producing a signal indicating unbalance;

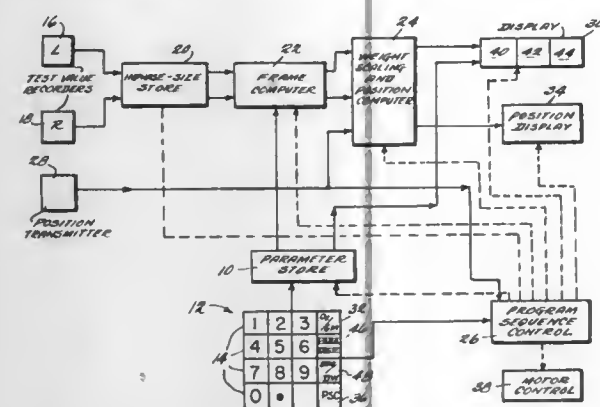


measuring electronics for determining and indicating the amount of unbalance;  
processing electronics for determining and indicating the amounts and locations of unbalance and for transmitting said amounts and locations to a processing machine for correcting unbalance; and  
means for connecting one of said cells at each of said points to said measuring electronics and the other to said processing electronics.

#### 4,162,634 METHOD OF AND APPARATUS FOR BALANCING ROTORS

Dionys Hofmann, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany  
Filed Aug. 22, 1978, Ser. No. 935,844  
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740454

Int. Cl.<sup>2</sup> G01M 1/22  
U.S. Cl. 73—462 10 Claims



1. A method of balancing an imbalanced rotor in at least one plane, said method comprising the steps of:  
storing the geometrical parameter value of said rotor;  
measuring, during a test run, test values representative of imbalances;  
storing said test values;  
transmitting, in accordance with a program sequence control means, said geometrical parameter value and said test values to a frame computer; and  
determining the size and phase relationship of counterweights to balance the rotor, utilizing said stored parameter and test values.

#### 4,162,635 SYSTEM FOR MONITORING THE CONDITION OF A PIPELINE

William C. Triplett, Ingleside; Walter H. Brauer, Houston; Robert Burke, Corpus Christi, and Richard Morrow, Mission, all of Tex., assignors to Triad & Associates, Inc., Robstown, Tex.

Filed Jan. 3, 1978, Ser. No. 866,486  
Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—623 8 Claims  
1. Apparatus for scanning the interior of a pipeline having a radius R, comprising:

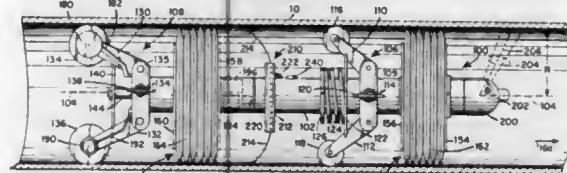
- A. an elongated body member having a longitudinal axis,
- B. bogie assembly including means for maintaining the longitudinal axis of said body member substantially coaxial with the central axis of said pipeline,
- C. sealing means extending radially from said body member, and including means for establishing a fluid-tight seal between regions in a pipeline ahead of said apparatus and regions behind said apparatus, whereby said apparatus is responsive to the pressure differential across said sealing means to move at a velocity V along said pipeline axis

from regions of relatively high pressure to regions of relatively low pressure.

D. sensor means powered by said power supply for detecting one or more physical characteristics of portions of said pipeline adjacent to said apparatus, and for generating sensor data signals representative of said conditions, said sensor means including:

ultrasonic surface wave transponder including:

- i. means for transmitting an ultrasonic surface wave excitation beam at an angle  $\theta$  with respect to said pipeline axis, where  $\theta$  is measured from said pipeline axis ahead of said body member and is less than  $\pi/2$  radians, and for receiving an oppositely directed wave disturbance, said transmitted beam being adapted to excite ultrasonic waves on the interior surface of said pipeline, and having a beam width at least equal to L in the direction of said pipeline axis at a distance R from said axis, and a beam width  $\Delta$  which is small compared with  $2\pi R$  in the direction transverse to said axis at a distance R from said axis,
- ii. means for rotating said transmitting and receiving means at an angular velocity equal to  $2\pi V/L$  radians per second, and



iii. means for generating an ultrasonic surface wave sensor data signal representative of said received wave disturbance, said surface wave sensor data signal being representative of the interior surface condition of said pipeline at the point of incidence on said pipeline of said transmitted excitation beam,

wherein said sensor means further includes an inner diameter (ID) sensor means for generating ID sensor data signals representative of the inner diameter of portions of said pipeline adjacent to said apparatus, wherein said ID sensor means includes a yoke assembly fixed to said body member and extending about the circumference thereof, and a plurality of elongated, resilient whisker members, each of said whisker members extending radially with respect to said longitudinal axis from said yoke member and adapted for engaging a portion of the inner surface of said pipeline adjacent to said apparatus, and each of said whisker members being coupled to an associated piezoelectric transducer at said yoke member, said piezoelectric transducers including means for generating said ID sensor data signals from motions of said whisker members resulting from the interaction of said whisker members with said inner surface portions.

#### 4,162,636 MOUNT FOR ULTRASONIC TEST HEAD

Dieter Lather, Rheurdt; Wolfgang Terschüren, Mülheim; Kurt Hannüschöck, Sonsbeck II; Günter Simoneit, and Karl Ries, both of Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

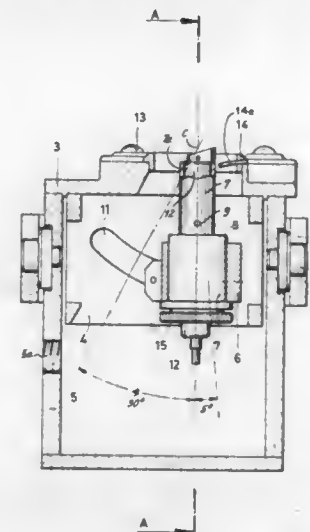
Filed Dec. 1, 1977, Ser. No. 856,223  
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2655364

Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—638 5 Claims

1. A device for mounting an ultrasonic test transducer in a water container being open at the top, comprising:  
gimbal support means for suspension of the container;

a cover plate having an opening and mounted to the top of the container, said cover having particular means for engagement with a test object to obtain a particular relation position to that test object;  
a frame extending down from the plate, adjacent to the opening into the container;  
a tubular mount having a particular axis; and



means for mounting the tubular mount to the frame and securing the mount thereto at a selective angle of the axis, the transducer being received by and mounted in the mount in particular relation to the axis, so that the orientation of the transducer is determined by the selected angle, and the transducer faces the opening in any position of adjustment.

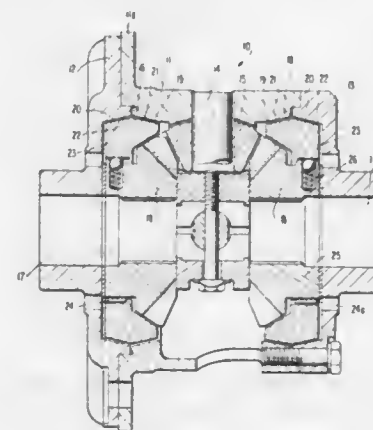
#### 4,162,637 SELF-LOCKING DIFFERENTIAL GEAR FOR MOTOR VEHICLES, ESPECIALLY BEVEL GEAR DIFFERENTIAL GEAR

Werner Altmann, Remchingen-Nöttingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,319  
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706051

Int. Cl.<sup>2</sup> F16H 1/44

U.S. Cl. 74—711 26 Claims



1. A self-locking differential gear for motor vehicles, comprising a rotating differential gear housing means which accommodates differential gear means, said differential gear means operatively engaging with driven gears arranged on axle shafts, and means for locking the differential gear coordinated to each differential gear means, said locking means being

operatively connected with the driven gears, characterized in that an inertia means is coordinated to each driven gear, which is rotatable and axially movable with respect to the driven gear by a thread means against the action of return means, and in that said inertia means is in operative connection with double-acting locking means.

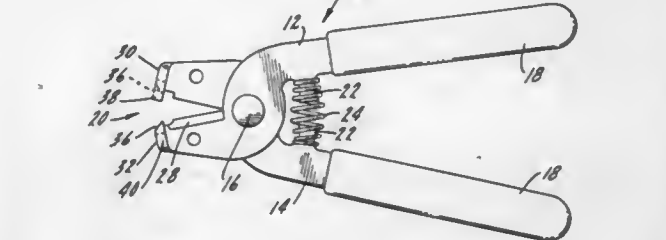
#### 4,162,638 PRECISION WIRE STRIPPER

Daniel McCord, Geneva, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation of Ser. No. 741,702, Nov. 15, 1976, abandoned.

This application Nov. 28, 1977, Ser. No. 855,243

Int. Cl.<sup>2</sup> H02G 1/12 5 Claims



1. In a wire stripper, a pair of longitudinally disposed levers pivoted together about an axis lateral to the longitudinal plane of the levers to perform a scissors action, manually operable handles on the levers on one side of the pivot and opposed stripping jaws on the levers on the other side, the jaws being offset to one side axially of the general longitudinal plane of the levers and having at least one set of opposed insulation cutting notches therein, and paired longitudinally disposed guide surfaces on each of the jaws on each side of the opposed notches to assure alignment of the opposed notches upon closing of the jaws, the guide surfaces on one jaw laterally bounding the guide surfaces on the other jaw.

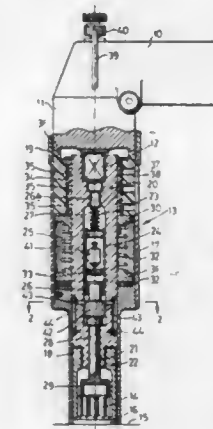
#### 4,162,639 LOAD INDICATING NUT WRENCH

Peter J. Gill, Wolverhampton, England, assignor to G.K.N. Fasteners Limited, West Midlands, England

Filed May 11, 1977, Ser. No. 795,897

Int. Cl.<sup>2</sup> B25B 23/14 2 Claims

U.S. Cl. 81—52.4 R



1. A load indicating wrench for tightening a nut and bolt fastener assembly, which assembly includes a load indicating element and a bolt having a shank, and presents two contact datum points, said element being of a type in which a portion of the element undergoes plastic deformation when the bolt

shank reaches a predetermined tension during tightening of the assembly, such plastic deformation resulting in a reduction in a dimension of the assembly measured in the direction axially of the bolt shank, and a corresponding change in the distance between the two contact datum points, said wrench comprising, in combination: first detecting means composed of an outer casing having an end wall engaging one datum point when the wrench engages the assembly; torque applying means within said casing for engaging the assembly to apply torque thereto; second detecting means centrally located within said casing and composed of a member contacting the second datum point when the wrench engages the assembly and axially movable within said casing; and signal generating means composed of a mechanically operated switch having two parts movable relative to one another into signal generating switching position, one part of said switch being fixed relative to said casing and the other part of said switch being movable with said member for causing said switch to reach its signal generating position when such reduction in the dimension of the assembly reaches a value at which a selected distance exists between the two contact datum points.

4,162,640

## HOSE-CLAMP PLIERS

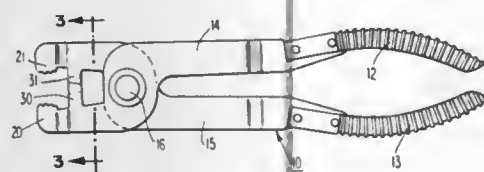
Robert L. Arnold, Lancaster, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.

Filed Apr. 3, 1978, Ser. No. 892,898

Int. Cl.<sup>2</sup> B25B 7/02

U.S. Cl. 81—311

2 Claims



2. A pair of pliers for use in fastening and unfastening a hose clamp having ratchet teeth interlocking means at the two ends of a split annulus, said pair of pliers comprising:

- first and second levers;
- a pivot stud on which said first and second levers are mounted for pivotal movement;
- first and second primary jaw members at the forward ends of said first and second levers;
- first and second secondary jaw members at the forward end of said first and second levers, said secondary jaw members being located rearward of said primary jaw members and forward of said pivot stud, said secondary jaw members extending toward each other to take up overlapping positions when said pliers are closed, said first and second primary jaw members being at substantial spaced separation when said pliers are closed.

4,162,641

## AUTOMATIC LOADING AND UNLOADING FOR NUMERICALLY CONTROLLED TURRET PUNCH

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Oct. 28, 1977, Ser. No. 846,532

Int. Cl.<sup>2</sup> B65H 29/28, 31/20

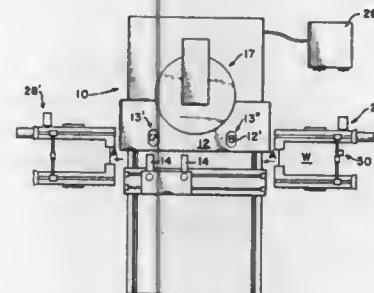
U.S. Cl. 83—71

16 Claims

1. An assembly comprising a numerically controlled turret punch and an automatic workpiece feeding assembly therefor; said turret punch having workpiece clamping means, a punching station, means for moving said workpiece clamping means in each of two perpendicular horizontal directions with respect to said punching station, a table, and at least one locator stop associated with said table providing an original orientation for a workpiece to be brought into operative association with the clamping means;

said workpiece feeding assembly including a loader maga-

zine located on one side of said table and having an adjustable volume for feeding a stack of workpieces to be fed to said turret punch; ejector means associated with said loader magazine for horizontally feeding workpieces one at a time in a feed direction from the loader magazine receiving volume to the turret punch; an unloader magazine, located on the opposite side of said table as said loader magazine, having an adjustable volume for receiving a stack of workpieces to be received from the turret punch; an automatic means for controlling said loader



magazine and said unloader magazine to transfer each workpiece in a stack from said loader magazine to the turret punch, into said unloader magazine; further comprising

power means associated with said at least one locator stop for moving said stop vertically between positions above and below said table, and for moving said stop horizontally toward and away from said clamping means so that a workpiece engaged thereby may be moved from a position horizontally spaced from said clamping means into operative association with said clamping means.

4,162,642

## ECCENTRIC CUTTERS FOR LONGITUDINALLY SEVERING ELONGATED MATERIAL TO BE DRAWN

Johann Greven, Aachen, Fed. Rep. of Germany, assignor to SCHUMAG GmbH, Aachen, Fed. Rep. of Germany

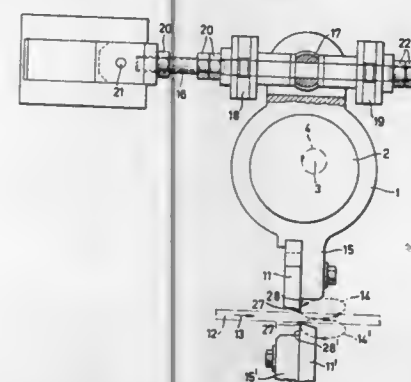
Filed Aug. 29, 1977, Ser. No. 828,886

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638629

Int. Cl.<sup>2</sup> B25B 7/14

U.S. Cl. 83—328

9 Claims



1. Eccentric cutters for severing continuously traveling elongated material comprising two eccentrics disposed in a common plane and eccentrically mounted in stationary bearing means, the eccentrics being rotatable in opposite directions and in synchronism with the travel of the elongated material during the severing operation, means defining between said two eccentrics, a travel path for the traveling elongated material, each of said eccentrics comprising a ring, a knife extending radially outwardly from each ring toward the other ring and toward said travel path between said eccentrics, and respective

means cooperating with each of said rings for controlling orientation of said knives with respect to the elongated material for severing the elongated material, said control means being linked to each ring at a substantially diametrically opposite point thereof from said knives, said control means comprising a rod, said ring being pivotably connected to one end of said rod at a location of said ring at which said control means are linked to the respective ring and extending from said pivot location thereof substantially parallel to said travel path, said rod being pivotable at the other end thereof at a fixed point.

4,162,643

## HEAD LOCKING MEANS FOR AUTOMATIC SLITTER SCORER

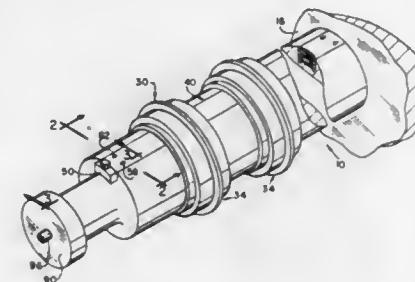
Robert E. Coburn, Warmister, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Jul. 11, 1977, Ser. No. 814,749

Int. Cl.<sup>2</sup> B23D 19/06, 35/00

U.S. Cl. 83—499

14 Claims



1. Apparatus including a shaft, a plurality of heads slideable along said shaft, means for selectively positioning said heads in predetermined locations along said shaft, the improvement comprising:

- an elongated expandable chamber means extending along the central portion of said shaft for simultaneously locking all heads to said shaft when said chamber means is pressurized and a friction drag surface projecting in a radial direction with respect to the periphery of said shaft for a predetermined distance into contact with said heads,
- means independent from said chamber means to prevent inadvertent movement of the heads relative to the shaft when said chamber means is unpressurized including means for adjusting the radial distance of the outer periphery of said drag surface relative to the longitudinal axis of said shaft so that said drag surface may project beyond the periphery of said shaft while said chamber is unpressurized.

4,162,644

## AUTOMATIC RHYTHM ACCOMPANIMENT APPARATUS IN AN ELECTRONIC ORGAN

Masao Sakashita, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Oct. 27, 1977, Ser. No. 846,208

Claims priority, application Japan, Oct. 30, 1976, 51-130053; Nov. 11, 1976, 51-134660; Nov. 12, 1976, 51-135143; Nov. 26, 1976, 51-157500[U]

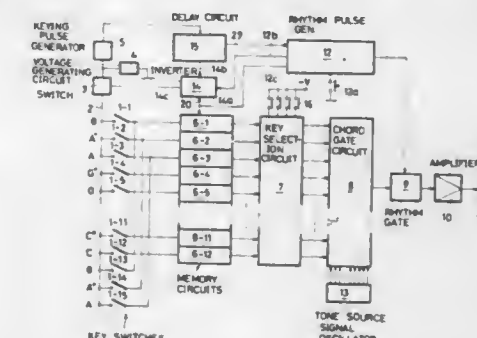
Int. Cl.<sup>2</sup> G10H 1/00, 5/00

U.S. Cl. 84—1.03

6 Claims

1. In an automatic accompaniment apparatus in an electronic organ having a keyboard for melody provided with a plurality of key switches for accompaniment, respective first ends of the key switches being connected to a voltage generating circuit and respective other ends of the key switches being connected to memory circuits, the memory circuits having outputs connected to a key selection circuit, a chord gate circuit connected to the key selection circuit for being opened and closed thereby, a rhythm pulse generator, and a rhythm gate controlled by the rhythm pulse generator, the chord gate circuit

and rhythm gate being interposed in a circuit connecting a tone source oscillator and a speaker for producing in the speaker a rhythm accompaniment tone corresponding to the first tone in each bar of a melody, the improvement comprising a circuit connected between the key switches and the voltage generating circuit including a switch element having a control electrode, a keying pulse generator having input and output terminals, the input terminal being connected to said switch element,



a delay circuit connected to the output terminal of the keying pulse generator and an inverter connected to said delay circuit and to said control electrode of the switch element, said inverter and delay circuit being connected to said rhythm pulse generator such that the inverter is activated by a first pulse in one bar of the rhythm pulse generator to generate a signal for bringing said switch element into "ON" position, and a signal for bringing said switch element into "OFF" position is generated by a delay pulse from said delay circuit.

4,162,645

## METHOD OF MAKING A CARTRIDGE

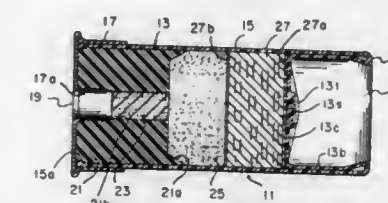
David D. Abbott, Baltimore County, Md., assignor to AAI Corporation, Cockeysville, Md.

Continuation of Ser. No. 495,720, Aug. 6, 1974, abandoned, which is a continuation of Ser. No. 313,004, Dec. 7, 1972, abandoned, which is a continuation of Ser. No. 13,066, Feb. 20, 1970, abandoned. This application Nov. 19, 1976, Ser. No. 743,390

Int. Cl.<sup>2</sup> F42B 33/10

U.S. Cl. 86—23

14 Claims



1. The method of making a cartridge, comprising holding a dual bore tubular shell casing having two interconnecting bores of respectively a small diameter for an ignition charge and a large diameter for a propellant charge, said casing having a closed base end with a primer therein in effective primer ignition communication with said small diameter bore, and an open mouth forward end, flowing a measured loose granular primer-ignitable ignition charge in laterally guided relation through and past said open mouth and directly into said small diameter bore, flowing a measured loose granular propellant charge through said mouth while holding said casing against intermixing movement, inserting a close-fitting disc wad into said casing to a distance spaced longitudinally inwardly from said open



mouth end and longitudinally outwardly from the settled surface of said propellant charge, star crimping said open mouth end of said casing to a position across said disc wad, reverse-roll-forming the star-crimped said open end by exerting peripheral axial rolling force on the annular periphery of the star-crimped end of said casing to thereby reverse-roll-form the star-crimped end of said casing and thereby correspondingly axially moving said disc wad downwardly into containing and geometrically stabilizing seated relation with said propellant charge, and thereupon sealing the resulting recessed star-crimped end of said casing.

3. The method of making a cartridge, comprising holding a tubular shell casing, having a closed base end and an open mouth forward end, inserting a propellant charge through said mouth, inserting a close-fitting disc wad into said casing to a distance adjacent and spaced longitudinally inwardly from said open mouth end and spaced longitudinally outwardly from the ultimate effective settled and desired contained condition surface of said propellant charge, star-crimping said open mouth end of said casing to a position across said disc wad, reverse-roll-forming the star-crimped said open end by exerting peripheral axial rolling force on the annular periphery of the star-crimped end of said casing to thereby reverse-roll-form the star-crimped end of said casing and to correspondingly axially move said disc wad downwardly into containing and geometrically stabilizing seated relation with said propellant charge, and thereupon sealing the resulting recessed star-crimped end of said casing.

4,162,646

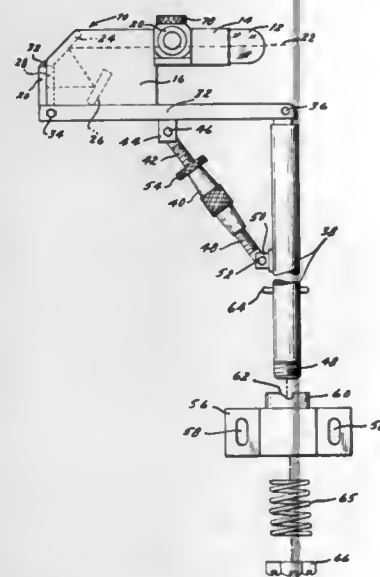
## TARGET ACQUISITION SYSTEM

Joseph M. Henderson, Jr., 8239 Dr. Craik Ct., Alexandria, Va. 22306

Filed Apr. 14, 1977, Ser. No. 787,679

Int. Cl.<sup>2</sup> F41G 3/22

U.S. Cl. 89—41 EA



1. A target acquisition system including an optical gunsight means comprising:

a gunsight mounting plate, adapted to receive and secure an optical gunsight including means moving said sight in azimuth and being bifurcated at one end; post means having a generally cylindrical shape and adapted to engage said mounting plate pivotally at the bifurcated end, and further having a threaded portion at the end distally from the pivot engaging end, and a cam follower means extending outwardly from the post, transverse to its longitudinal axis; turnbuckle means pivotally attached between said

mounting plate and said post providing elevation adjustment about the pivot point between said gunsight mounting plate and the post; an adapter plate including a surface mating plate having an annular aperture for receiving said post and further including a cam ring having a plurality of detents whereby said cam follower will allow only selected rotation of the post means; nut means for engaging the threaded portion of the post, and spring means surrounding the post and mounted between the cam ring and nut thereby applying preselected bias to the cam follower on the cam surface.

4,162,647

## MILLING MACHINE GUARD

Douglas E. Aslen, 16 Pinfold La., Romiley, Cheshire, England

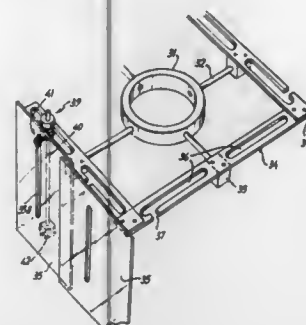
Filed Jun. 14, 1977, Ser. No. 806,558

Claims priority, application United Kingdom, Jun. 17, 1976, 25074/76

Int. Cl.<sup>2</sup> B23C 9/00

U.S. Cl. 409—64

19 Claims



1. In a milling machine having a rotatable milling cutter including a guard which comprises, a mounting block on such mounting bar, a pair of support rods each extending from such block substantially in said plane, on an opposite side of said block and each having at least a part extending transversely of the mounting bar, a pair of support blocks, each movably mounted on one of said support rods and adjustable axially thereof, and a pair of guard panels, each supported by and adjustable relative to one of the said support blocks for movement in a direction generally perpendicular to the axes of its mounting bar and its support rod and normal to the said plane thereof.

4,162,648

## APPARATUS FOR CONVERTING A CARTON OR THE LIKE INTO A PRESELECTED CONFIGURATION

Jack D. Kincheloe, 1620 E. Sierra, Fresno, Calif. 93710

Filed Oct. 17, 1977, Ser. No. 843,067

Int. Cl.<sup>2</sup> B31D 5/00

U.S. Cl. 93—1 G

4 Claims

1. An apparatus for converting a milk carton or the like, having a bottom wall integral with four upstanding, substantially right-angularly related side walls bounding an internal receptacle, into a child's block having substantially parallel end walls interconnected by four substantially right-angularly related side walls, the apparatus comprising:

A. a rigid form having a bottom wall and four substantially right-angularly related exterior surfaces arranged for individual facing engagement with the side walls of the milk carton when the form is fitted within said internal receptacle of the milk carton to retain the milk carton in rigidly erect condition and at least one of said surfaces of the form extending to a predetermined edge remote from said bottom wall;

B. a rigid housing having a bottom wall substantially normal to and integral with four substantially right-angularly

related side walls bounding an interior dimensioned to receive the milk carton, having said form fitted therein, in nested relation therein and in abutting engagement with the bottom wall of said housing, three of said side walls of the housing having edges remote from the bottom wall of the housing and disposed in a plane substantially parallel to said bottom wall and the fourth of said side walls of the housing extending to a remote edge spaced from said plane a distance not less than the distance from the bottom wall of the housing to the plane; and



C. a pair of said members borne by the fourth side wall of the housing between said plane and the remote edge of the fourth side wall, disposed for individual facing engagement with side walls of the milk carton in right-angular relation to the fourth side wall of the housing when the milk carton is received in said nested relation in the housing, and the side members having edges interconnecting edges of the side walls of the housing in said plane and the remote edge of the fourth side wall of the housing whereby the milk carton can be marked along said edges to delineate courses for severing of the milk carton in said converting of the milk carton to a child's block.

4,162,649

## SHEET STACK DIVIDER

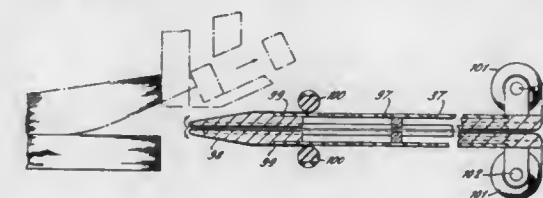
John N. Thornton, Huntingdon, England, assignor to Wiggins Teape Limited, Hampshire, England

Filed May 18, 1977, Ser. No. 797,915

Int. Cl.<sup>2</sup> B31B 1/98

U.S. Cl. 93—93 D

17 Claims



1. A layboy mechanism for the continuous stacking and delivery of batches of sheet material received from a delivery mechanism and comprising means for continuously assembling sheets into a downwardly moving stack, divider means downwardly movable with the stack for dividing the stack as it is formed into batches containing a predetermined number of sheets, auxiliary support means which move between an operative support position and an inoperative position clear of the stack, means for operating said divider means to cause an opening between the lowermost batch and a batch above it to enable the auxiliary support means to enter the stack at said

opening, and means for removing said lowermost batch whilst the remainder of the stack above it is supported by said auxiliary support means.

4,162,650

## BARBEQUE PIT APPARATUS

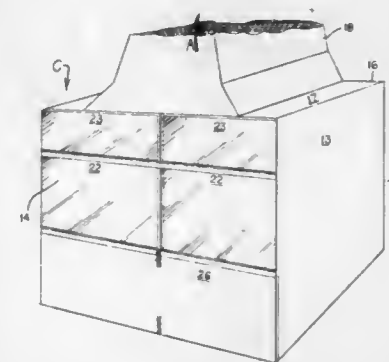
McKinley D. Davis, 210 Ridge Dr.; Robert Stearnes, 324 Ridge Dr., both of DeKalb, Ill. 60115, and Lemuel Carter, Jr., 4012 W. 19th Pl., Gary, Ind. 46404

Filed May 8, 1978, Ser. No. 903,918

Int. Cl.<sup>2</sup> A47J 37/00

U.S. Cl. 99—419

12 Claims



1. Cooking apparatus for barbequing meat and the like, comprising, in combination, a housing including a frame being provided with front, rear, and side walls defining an enclosure, a combustion chamber defined in the lower portion of said enclosure having an open upper end for transmitting heat and smoke, a receptacle mounted to said housing over said combustion chamber, means for removably supporting said receptacle in said enclosure interior in overlying relationship with said combustion chamber, a plurality of elongated skewer assemblies removably mounted to said housing, each skewer assembly comprising a support member and a plurality of vertically extending skewers secured to said support member for supporting meat such as ribs to be cooked, horizontally disposed rack means removably supported in said enclosure interior mounted to said skewer assemblies in overlying relationship with said skewer assemblies for supporting additional meat to be cooked, said rack means comprising a planar surface defining a plurality of apertures allowing gases to pass therethrough and means on said frame for removably supporting said plurality of skewer assemblies in side-by-side relationship in said enclosure above said receptacle.

4,162,651

## DOCUMENT PRINTER

Allan Chertok, Bedford, Mass., assignor to Concord Computing Corporation, Bedford, Mass.

Filed Apr. 26, 1976, Ser. No. 680,062

Int. Cl.<sup>2</sup> B41F 1/00

U.S. Cl. 101—287

2 Claims

1. Apparatus for printing a message on a document comprising

a document feed path defined with respect to a rigid chassis, a printing station along said path, said printing station including impact printing means and document drive means, each of said printing means and drive means comprising first and second subunits positioned, respectively, below and above said document feed path;

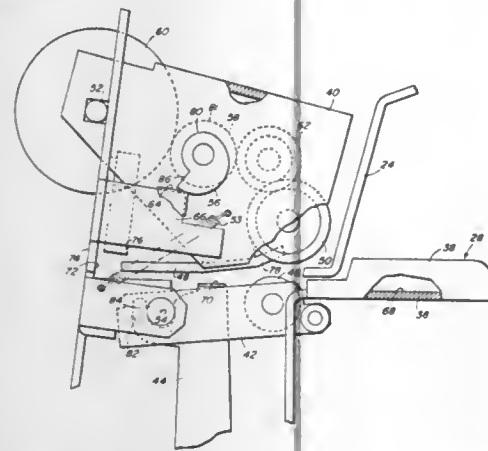
first and second frames supported in said chassis, said first subunits supported on said first frame and said second subunits supported on said second frame, said first frame supported to position said first subunits below said document feed path, and, said second frame being movable between a first position

in which said drive means subunit supported thereon is spaced apart from a document positioned on said feed path and a second position in which that drive means subunit engages a document positioned on said feed path and also in which said impact printing means subunits are located with respect to each other so as to enable printing a message on said document;

a drive system for moving said second frame to its second position when a document is properly located for printing and for moving said second frame to its first position after printing of the document has been completed,

wherein said first and second subunits of said drive means comprise first and second rollers, said apparatus further including means for driving one of said rollers,

wherein said second frame is supported on said chassis for rotational movement between said first and second positions about an axis of rotation that is parallel to the axes of said rollers; said drive system including second frame biasing means for biasing said second frame toward its first position,



wherein said first frame is supported on said chassis for limited rotational motion with respect to said chassis about an axis of rotation parallel to the axes of said rollers, said apparatus further including first frame biasing means urging said first frame in a direction such that said first roller is urged toward contact with said second roller, said apparatus further including first and second stop means engagable with said first frame, said first stop means defining the limit of travel of said first roller toward said second roller such that said first roller will intercept a document proceeding along said document feed path whereby said document will avoid interfering contact with the uppermost portions of said printing means subunit supported on said first frame, said first frame biasing means having less biasing force than the biasing means for said second frame, whereby movement of said second frame to its second position forces said first frame to engage said second stop means.

4,162,652

# DEVICE FOR CLEANING CYLINDER BEARERS ON PRINTING PRESSES

Herbert Rebel, Rodgau, and Claus Simeth, Muhlheim, both of Fed. Rep. of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,546

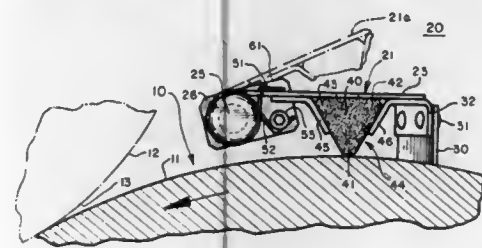
Int. Cl.<sup>2</sup> B41F 35/00; B41L 41/00

U.S. Cl. 101—425

8 Claims

1. A device for continuously cleaning a bearer in a printing press having a frame comprising, in combination, a carrier in the form of a plate pivoted on the frame for movement of its outer end portion toward and away from the bearer, a scraper of wearable material secured to the end portion of the plate and oriented in a generally axial direction with respect to the bearer, a spring interposed between the frame and the

carrier for biasing the carrier toward the bearer, and a stop on the frame interposed in the path of biased movement of the



carrier to prevent the metal of the carrier from scraping the surface of the bearer when the scraper becomes worn away.

4,162,653

# RAILWAY VEHICLE BOGIES RESILIENTLY INTERCONNECTED AXLE BOXES

Alan H. Wickens, Duffield, England, assignor to British Railways Board, London, England

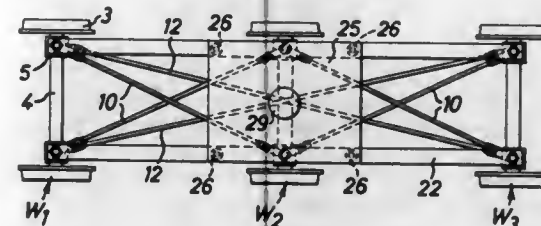
Filed Jul. 22, 1976, Ser. No. 707,577

Claims priority, application United Kingdom, Jul. 25, 1975, 31214/75

Int. Cl.<sup>2</sup> B61F 5/00, 5/30, 5/40, 5/52

U.S. Cl. 105—166

6 Claims



1. In a railway vehicle, running gear for said vehicle comprising in combination,

at least three wheelsets each including a live axle,

an axle bearing supporting each said axle,

elastic means for interconnecting at least one axle bearing of each wheelset with at least one axle bearing of each adjacent wheelset, said elastic interconnecting means being operative in response to movement of said wheelsets away from their parallel and aligned positions to produce restoring forces to restore said wheelsets to their parallel and aligned positions, and

additional elastic means extending continuously between and interconnecting at least one axle bearing of one wheelset with the diagonally opposite axle bearing of a non-adjacent wheelset.

4,162,654

# POLLUTION CONTROLLED INCINERATION SYSTEM

Albert W. Spitz, Wyncote, and Milton I. Schwab, Philadelphia, both of Pa., assignors to Trio Process Corporation, Wyncote, Pa.

Filed Jun. 15, 1977, Ser. No. 806,831

Int. Cl.<sup>2</sup> F23G 5/12; F23J 15/00

U.S. Cl. 110—212

15 Claims

1. In a pollution controlled incinerator system to clean gases of combustion produced within an incinerator, the combination of

a non-movable duct system having at least one inlet opening and an outlet opening;

a standpipe means positioned over the inlet opening to raise the effective height of the inlet opening above the duct system;

separate, flue-loss, portable incinerator means overfitting

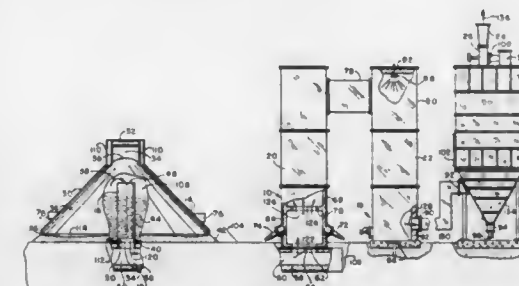
the duct inlet opening and the standpipe means, said incinerator means being adapted to direct gases of combustion through the inlet opening; and

non-movable pollution control system means receiving the gases of combustion from the duct system outlet opening;

said pollution control system means comprising means to clean at least some of the gases of combustion.

12. The method of controlling polluted air resulting from waste incinerator comprising the steps of

piling waste material about a hollow standpipe and covering the waste material and standpipe with a portable incinerator;



incinerating the waste material within the portable incinerator and creating gases of combustion;

directing the gases downwardly through the standpipe from within the incinerator into the inlet opening of a duct system;

inducing the gases through the duct system to a duct system outlet;

directing the gases upwardly through the outlet into a pollution control apparatus;

cleaning the gases within the apparatus; and

discharging the cleaned gases to atmosphere.

4,162,655

# HEAT PRODUCING DEVICE

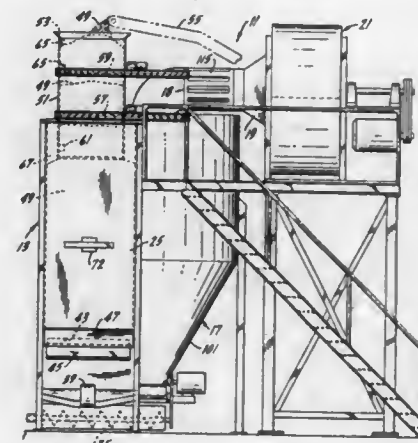
Stanley L. Bozdech, DeKalb, Ill.; Thomas E. Lipinski, Akron, Ohio; John W. Allen, Hudson; Stanley J. Ryba, Broadview Heights, both of Ohio; G. B. Kirby Meacham, Cohasset, Mass.; Charles Anthony, Jr., Livingston, N.J.; Dan L. Pattyn, Sycamore, and Frank Bauer, Wayne, both of Ill., assignors to DeKalb AgResearch, Inc., DeKalb, Ill.

Filed Mar. 13, 1978, Ser. No. 885,507

Int. Cl.<sup>2</sup> F23G 5/12

U.S. Cl. 110—212

8 Claims



1. A heat producing device utilizing solid carbonaceous material, especially material of a cellulosic composition as fuel, said device including:

a gasifier for the carbonaceous material,

said gasifier having a gas outlet,

a burner supplied by said gas outlet,

a cyclonic burning chamber and particle separator connected to said burner,

said cyclonic burning chamber and particle separator having a heat outlet and a particle discharge outlet,

an adjustable air inlet and mixing chamber installed in said heat outlet for adding ambient air to reduce the temperature of the heat discharged from said heat outlet, and

a discharge fan having an inlet connected to said mixing chamber and an outlet for discharging the heat received therefrom.

4,162,656

# WASTE DISPOSAL BY INCINERATION

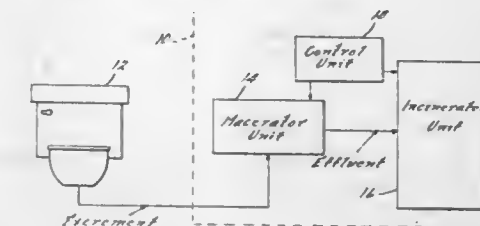
John A. Dallen, Port Clinton, Ohio, and Harry W. Green, Sarasota, Fla., assignors to The Standard Products Company, Cleveland, Ohio

Division of Ser. No. 738,531, Nov. 3, 1976, abandoned. This application Apr. 27, 1977, Ser. No. 791,496

Int. Cl.<sup>2</sup> F23G 5/00

U.S. Cl. 110—221

11 Claims



1. In a waste disposal system for disposing of excrement including an incinerator having a burner and a first fuel valve for supplying a minimum amount of fuel to said burner and a second fuel valve for supplying an additional amount of fuel to said burner, the method of disposing of excrement including the steps of:

converting the excrement to a substantially liquified effluent;

igniting said burner;

feeding effluent into said incinerator;

regulating said second fuel valve in response to the exhaust gas temperature to boil away the liquid in said effluent at a first average fuel-to-air mixture;

terminating the feeding of effluent into the incinerator;

and regulating said second fuel valve in response to the exhaust gas temperature after said liquid has been boiled away to incinerate the remaining waste material at a second lower average fuel-to-air mixture.

4,162,657

# DEVICE FOR INSERTING ORNAMENTAL THREADS IN STITCHES OF SEAMS ON A SEWING MACHINE

Franco Prandini, Busto Arsizio, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Jul. 31, 1978, Ser. No. 929,381

Claims priority, application Italy, Sep. 15, 1977, 27546 A/77

Int. Cl.<sup>2</sup> D05C 7/08

U.S. Cl. 112—101

6 Claims

1. A device for inserting ornamental threads in stitches of seams formed on a sewing machine of the type having support framework including a base with a vertical column and an arm extending from the column for supporting the machine's needle bar having at least one needle carried thereby, the improvement comprising:

(a) a rotatably driven cam shaft journaled in spaced bearing brackets mounted on the machine and extending in a direction parallel with the arm;

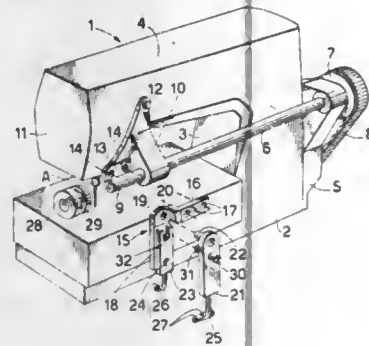
(b) a control cam assembled on one end of said cam shaft adjacent the needle bar;

(c) a support plate attached to one of said bearing brackets;



(d) at least one thread guide lever pivotably mounted on said support plate which includes:

- (i) a protruding finger defining a follower extending into operative association with said control cam for pivoting said thread guide lever to and fro in timed sequence with the stitching cycle; and



- (ii) a thread guide attached to and movable with said thread guide lever for presenting at least one ornamental thread to a position during formation of stitches for incorporation into the seam formed thereby.

4,162,658

#### FLOATING LIQUID-STORAGE TANK HAVING SIDE WALLS OF DOUBLE-HULL CONSTRUCTION

Toshimasa Okabe; Hiroyuki Shimada; Toshio Hanano; Naofumi Murao, all of Nagasaki; Kazuyoshi Mori, Tokyo; Hirohisa Tomikawa, Nagasaki; Akira Mizokami, Nagasaki; Yasuyuki Maehara, Nagasaki, and Masanori Shuku, Nagasaki, all of Japan, assignors to Mitsubishi Jukogo Kabushiki Kaisha, Tokyo, Japan

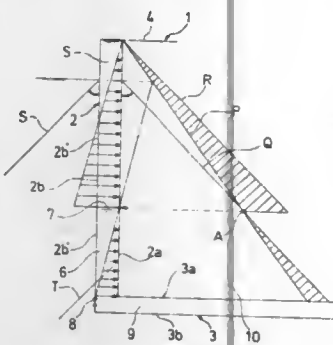
Filed Nov. 10, 1977, Ser. No. 850,372

Claims priority, application Japan, Nov. 25, 1976, 51/141456

Int. Cl.<sup>2</sup> B63B 25/08

U.S. Cl. 114—74 A

2 Claims



1. A floating liquid-storage tank having side walls of double-hull construction for storing a liquid lighter in specific gravity than water, characterized in that the double-hull side walls consist of inner and outer hull sections and have watertight partition plates for dividing the hollows of said side walls into non-communicated upper and lower ballast tanks, said outer hull sections of said upper ballast tanks being built to be resistant to the external water pressure, and those of said lower ballast tanks being non-pressure resistant, and holes in the outer hull sections of the lower ballast tank through which the water outside can have access to the lower tanks, said partition plates being horizontally located slightly below the level of the intersection of the liquid-pressure distribution line defined by the liquid pressure within the tank when the tank is fully loaded and the external-water-pressure distribution line defined by the outside water pressure in the direction of depth of the storage tank when the tank is in the full loaded condition.

4,162,659

#### BOOKMARK

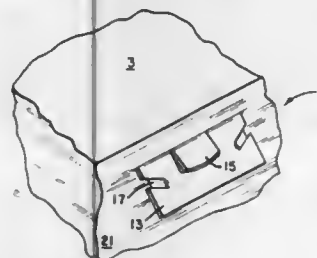
Richard M. Burke, Rte. 163, R.D. #3, Fort Plain, N.Y. 13339

Filed Oct. 18, 1978, Ser. No. 952,472

Int. Cl.<sup>2</sup> B42D 9/00

U.S. Cl. 116—234

5 Claims



1. A bookmark for use with a book whose pages form an edge to underline and indicate a line or passage on a page selected by the reader; said bookmark being of integral, one-piece construction and comprising a flat body having a leg and tab; said flat body underlining and indicating said selected line or passage when said bookmark is disposed and inserted in said book, said tab being of tongue-like configuration and being defined by a surrounding slot, said leg and tab having a common bend or crease at which said leg depends from the plane of said flat body at an acute angle and from which said tab has an articulated free end depending from the plane of said flat body at a lesser angle, said depending leg having teeth for retentively engaging the edge of said book's pages to maintain said bookmark in the position where same has been disposed and said book has been closed, and said tab being manipulative by the reader to cam-open said closed book to the particular page on which said bookmark had been disposed and inserted by the reader's appropriately engaging said articulated free end of said tab between his thumb and index finger and twisting same to effect such cam-opening action.

4,162,660

#### DIRTY AIR FILTER INDICATOR

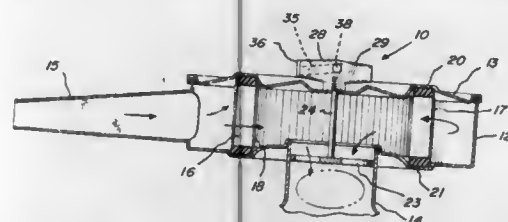
Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391, and Edward P. Christian, Lees Island, N. Twin Lake, Crystal, Minn. 55429

Filed Jun. 29, 1978, Ser. No. 920,179

Int. Cl.<sup>2</sup> B01D 35/00; G01L 19/12

U.S. Cl. 116—268

3 Claims



1. A dirty filter indicator device for use with an air cleaner for an internal combustion engine in which there is a housing secured to the vehicle, said housing having inlet and outlet openings, an annular filter element in said housing with the inner and outer annular walls of said filter element being in communication respectively with said inlet and outlet openings, a detachable outer cover secured to said housing, and a threaded rod projecting from said housing through an opening in said cover of greater cross-sectional area than that of said rod, said threaded rod being designed to have a nut secured thereto for clamping said outer cover in position against said housing:

said indicator device comprising a central portion having a threaded opening therein for threaded engagement with

the threaded rod of the cleaner and having a base designed to engage in fluid tight relationship the outer wall of the detachable cover of the cleaner and having a recess in said base of larger cross-sectional area than the opening through the detachable cover and designed to overlie said opening, said indicator device having two laterally extending arms projecting from said central portion to provide means for readily tightening said indicator device on said threaded rod against said cover, said indicator device further having an inclined passage extending through at least part of one of said arms and said central portion, said passage communicating at its outer end with the atmosphere and at its inner end with said recess and being inclined downwardly from adjacent said central portion to the outer end thereof, and said indicator device having a ball disposed in said inclined passage, said ball normally resting in the outer lower portion of said passage but movable upwardly towards said central portion when the differential pressure thereacross increases as a result of the filter becoming dirty, at least a portion of the laterally extending arm in which said passage is located being transparent so that the position of the ball can be observed.

4,162,661

#### INTERNAL COMBUSTION ENGINE WITH COMBUSTION CHAMBERS WHICH CREATE A SQUISH AND SWIRL OF AN AIR-FUEL MIXTURE

Kiyoshi Nakanishi, and Takeshi Okumura, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

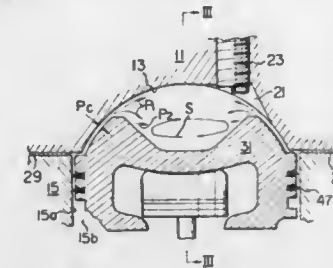
Filed Aug. 22, 1977, Ser. No. 826,560

Claims priority, application Japan, Feb. 25, 1977, 52-021433

Int. Cl.<sup>2</sup> F02F 3/28

U.S. Cl. 123—30 C

6 Claims



1. An internal combustion engine with a combustion chamber, said engine comprising:

- a cylinder;
- a cylinder head having an inner wall defining the upper boundary of the combustion chamber;
- a reciprocable piston in said cylinder, said piston having a circular top end and at least two raised circumferentially spaced portions thereon, each of said portions comprising:
- a first radially outermost substantially part-spherical surface spaced a small distance from the inner wall when the piston is in the top dead center position to create a squish of an air-fuel mixture,
- a radially innermost surface opposite said outermost surface, and
- a concave surface at one circumferential end of each portion extending between the innermost and the outermost surfaces from the top to the bottom thereof, said concave surface extending at the lower end thereof at a relatively small gradient to the top end of the piston to produce mixture swirl flows in a direction perpendicular to the axis of the piston as it approaches its top dead center position.

4,162,662

#### TWO-STROKE INTERNAL COMBUSTION ENGINES

Jean Melchior, 66 Boulevard Maurice-Barrès, 9220 Neuilly-sur-Seine, France

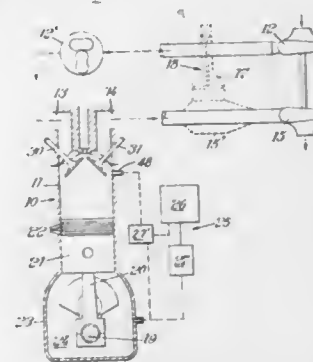
Filed Jan. 13, 1977, Ser. No. 758,997

Claims priority, application France, Jan. 15, 1976, 76 00971

Int. Cl.<sup>2</sup> F02B 75/02, 77/00

U.S. Cl. 123—65 VD

14 Claims



1. A supercharged two stroke internal combustion engine, having:

- a cylinder block and a cylinder head cooperating with at least one piston reciprocally received in a cylinder formed in said cylinder block to define at least one expandable combustion chamber,
- at least one intake valve slidably received in said cylinder head and cooperating with an intake valve seat to control air flow from an intake pipe into said chamber,
- at least one exhaust valve slidably received in said cylinder head and cooperating with an exhaust valve seat to control gas flow from said combustion chamber to an exhaust pipe,
- and means for operating said intake and exhaust valves in proper time sequence with the displacement of said piston, whereby both said valves are open while the piston is at its bottom dead center,
- said intake valve, intake pipe and cylinder head being so arranged and constructed to cause a progressively increasing non-uniform intake clearance opening oriented such that in response to opening movement of the said intake valve, the largest intake orifice area is developed at least initially closest to that portion of the wall of said cylinder must remote from said exhaust valve seat, so as to cause air to be directed toward the piston and substantially parallel to the wall of said cylinder upon opening of the intake valve and to thereby sheet-wise scavenge the chamber along a loop therein without substantial direct flow of air from the intake pipe to the exhaust pipe along the cylinder head.

4,162,663

#### STRATIFIED CHARGE FOUR-STROKE ENGINE

Josef Ehrlich, Ashridge, Near Berkhemsted, England, assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 20, 1977, Ser. No. 808,075

Claims priority, application United Kingdom, Jul. 5, 1976, 27910/76

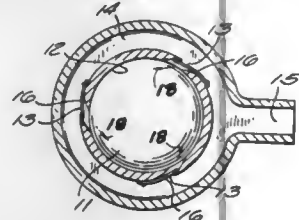
Int. Cl.<sup>2</sup> F02B 75/04

U.S. Cl. 123—75 B

4 Claims

1. An internal combustion engine comprising a cylinder, a piston movable in said cylinder between top dead center and bottom dead center positions, a plurality of air entry ports located in the cylinder adjacently above said piston when said piston is at bottom dead center and adapted to be opened and closed in response to piston movement, said air entry ports being arranged around said cylinder in an angularly spaced series and extending generally tangentially from said cylinder so that air entering said cylinder through said ports swirls

within said cylinder, an air chamber extending at least partially circumferentially around said cylinder and communicating with a source of air and with said plurality of said air entry



ports, and a separate reed valve operatively associated with each of said ports for preventing flow from said cylinder to said air chamber and permitting flow into said cylinder from said air chamber.

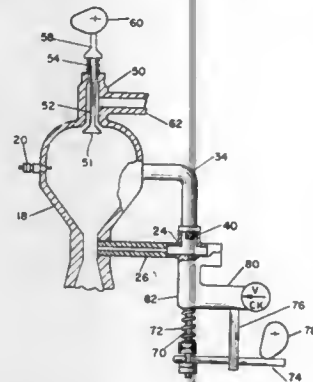
4,162,664

### INTERNAL COMBUSTION ENGINE AND FUEL INTRODUCING MEANS THEREFOR

Maurice C. Fleming, 1013 23rd St. W., Bradenton, Fla. 33505  
Continuation-in-part of Ser. No. 583,980, Jun. 5, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,639  
Int. Cl.<sup>2</sup> F02B 75/04, 3/00

U.S. Cl. 123—75 B

11 Claims



1. In an internal combustion engine having a cylinder and a piston within the cylinder movable during a compression stroke to compress air in an upper portion of the cylinder, and the piston being driven down during a power stroke when the compressed air admixed fuel is ignited and is combusted, the improvement in means for fuel introduction and combustion thereof comprising:

- (a) an enlarged precombustion chamber connected by a venturi passage to the upper portion of the cylinder so that during the compression stroke a part of the compressed air is forced through the venturi passage into the precombustion chamber, the precombustion chamber having an ignition means;
- (b) a combustible fuel introducing means having a fuel chamber connected by a small opening to the venturi passage, valved means for conveying fuel to the fuel chamber from a fuel reservoir, said valved means disposing an increment of fuel from the fuel chamber to said opening when the gas pressure in the precombustion chamber is low so that on the compression stroke compressed air flowing through the venturi passage will induce a reduced pressure at the opening whereby to draw the increment of fuel into the venturi passage and cause it to be admixed with the passing air stream so as to provide a combustible air-fuel mixture in the precombustion chamber; and
- (c) a by-pass conduit for conveying gases from the precombustion chamber to the fuel introducing means, a pressure transmitting means in the by-pass conduit to apply pres-

sure from the gases therein to the fuel in said fuel chamber at a point spaced from the opening in the venturi passage, whereby when the ignition means ignites the combustible mixture in the precombustion chamber and causes combustion and a high gas pressure develops, a high velocity hot gas stream flows through the venturi passage into the upper portion of the cylinder thereby inducing a reduced pressure on another increment of fuel at said opening and concurrently gases under high pressure pass through the by-pass conduit to the pressure transmitting means so as to apply pressure to and thereby forcibly eject an increment of fuel through the opening into the high velocity hot gas stream in the venturi passage for thorough admixture therewith and to provide for ignition and a more complete and efficient combustion with the air in the upper portion of the cylinder, and thereby completing the power stroke of the piston.

4,162,665

### MULTI-SPARK IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

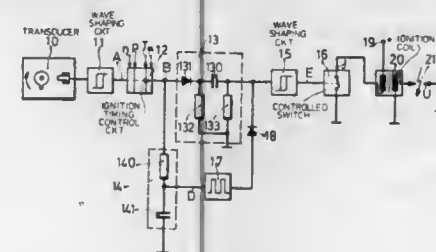
Günter Gräther, Pinache, and Friedrich Rabus, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed May 23, 1977, Ser. No. 799,247

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623864

Int. Cl.<sup>2</sup> F02P 3/02

U.S. Cl. 123—117 R

11 Claims



1. In a sequential multiple spark pulse ignition system having an ignition coil (20) and at least one spark gap (21) connected to the secondary of the coil (20);
- a controlled switch (16) connected to the primary of the coil and controlling current flow therethrough;
- means (10, 11, 12) furnishing a signal (B) controlling generation of an ignition event;
- and means to separately control the closing and opening of said controlled switch (16) for generation of the first spark pulse of said sequential multiple spark pulses and the next subsequent spark pulses comprising
- a circuit stage (13) including a R/C function network connected to and controlling said controlled switch (16) to control supply of current to the coil to store energy for a first spark pulse;
- a frequency generator (17) controlling repetitive opening and closing of the controlled switch (16) for an ignition event to generate said sequential spark pulses upon opening, after prior closing, of said controlled switch;
- and a time delay circuit (14), serially connected to the frequency generator (17), the series circuit formed by the time delay circuit (14) and the frequency generator (17) being connected in parallel to the circuit stage (13), said circuit stage (13) providing a control pulse to the controlled switch (16) upon sensing an ignition event signal from said signal furnishing means (10, 11, 12) and said time delay circuit initiating a timing interval and after elapse thereof, controlling application of pulses from the frequency generator to the controlled switch (16).

4,162,666

### SPARK ADVANCE APPARATUS FOR CONTROLLING THE IGNITION INSTANT OF A SPARK PLUG INDEPENDENT OF THE MAGNITUDE OF A POWER SOURCE IGNITING THE SPARK PLUG

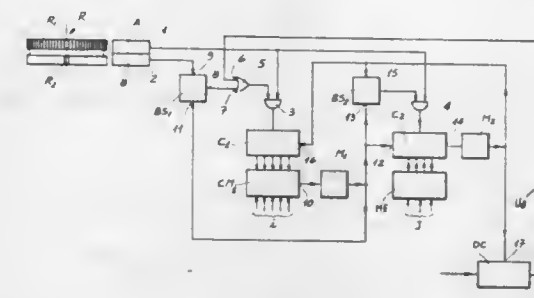
Mauro Maloglio, Turin, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy  
Filed Jul. 25, 1977, Ser. No. 818,571

Claims priority, application Italy, Jul. 27, 1976, 25743 A/76

Int. Cl.<sup>2</sup> F02P 5/06

U.S. Cl. 123—117 D

11 Claims



1. An ignition timing apparatus for use in an internal combustion engine of the type having in combination a cylinder, a piston, a power source and a spark plug having a spark gap, said apparatus comprising:

- (1) charge storage means for storing energy supplied by said power source at a rate determined by the magnitude of said power source;
- (2) control means for:
  - (a) applying power generated by said power source to said charge storage means during a charge storage period beginning at a charge initiation instant and ending when the energy stored by said charge storage means reaches a predetermined level; and
  - (b) discharging the energy stored by said charge storage means across said spark gap of said spark plug immediately after the energy stored by said charge storage means reaches said predetermined level; and
- (3) timing circuit means for controlling said charge initiation instant in such a manner that said energy stored by said charge storage means is discharged across said spark gap at an instant which is determined by the speed of said engine and at least one other engine parameter but is independent of the magnitude of said power supply, said timing circuit means comprising:
  - (a) pulse generator means for generating a train of pulses having a frequency proportional to the speed of said engine;
  - (b) first counter means for counting the number of pulses generated by said pulse generator means during successive first and second time periods, said first time period corresponding to said charge storage period, said second time period beginning when said cylinder reaches its top dead center position and terminating when said first counter has counted a first predetermined number of pulses;
  - (c) second counter means for counting the number of pulses generated by said pulse generator means during a third time period beginning at the end of said second time period and ending when said second counter has counted a second predetermined number of pulses;
  - (d) count adjust means for varying the value of said second predetermined number of pulses as a function of said at least one engine parameter; and
  - (e) means for causing said control means to apply said power source to said power generated by said charge storage means when said second counter means has counted said second predetermined number of pulses.

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### ELECTRONIC IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

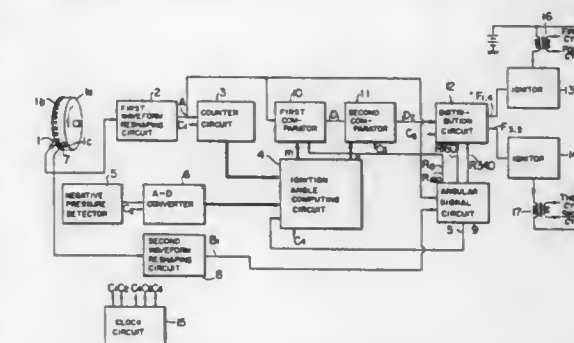
Hisasi Kawal, Toyohashi, and Kazuo Iwase, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan  
Filed Jan. 10, 1978, Ser. No. 868,314

Claims priority, application Japan, Feb. 3, 1977, 52-10900

Int. Cl.<sup>2</sup> F02P 5/04

U.S. Cl. 123—117 D

8 Claims



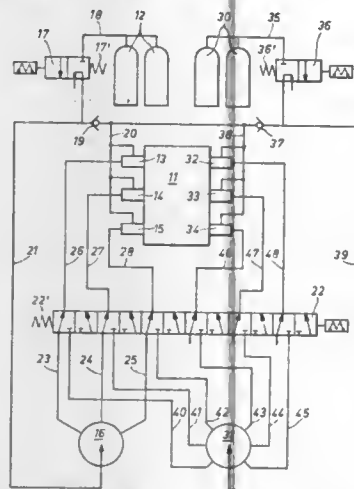
1. An electronic ignition timing control system for internal combustion engines comprising:

- a rotational angle detector (1, 2) operatively coupled to the ring gear (1a) of the multicylinder engine for producing a rotational angle signal (a) each time one of a plurality of equi-spaced teeth (1b) provided on said ring gear is detected;
- a reference angle detector (7, 8) operatively coupled to the ring gear of a multicylinder engine for producing a reference angle signal (B<sub>i</sub>) each time a tooth (1c) provided on said ring gear is detected, said tooth being positioned to represent the reference position of one cylinder of said multicylinder engine;
- a parameter detector (3, 5, 6) for detecting the operating parameter of said multicylinder engine;
- an ignition angle computing circuit (4) connected to said parameter detector and including a memory in which a plurality of ignition angle data are memorized as ignition retard angles with respect to said reference angle position in correspondence with a plurality of parameter data, said ignition angle computing circuit proportionally interpolating two of said ignition angle data corresponding to adjacent two of parameter data one and the other of which are respectively larger and smaller than the output value of said condition detector;
- an angular pulse circuit (9) connected to said rotational angle detector and said reference angle detector for counting the number of said rotational angle signal in response to said reference angle signal, said angular pulse circuit producing a first and second pulses (R<sub>0</sub>, R<sub>180</sub>) when the count value thereof reaches predetermined first and second valves, respectively;
- a comparison circuit (10, 11) connected to said rotational angle detector, said ignition angle computing circuit and said angular pulse circuit for comparing the number of rotational angle signal with the output value of said ignition angle computing circuit in response to said first and second pulses to thereby determine first and second ignition timings;
- first ignition means (13, 16) for producing a high voltage in synchronism with said first ignition timing and simultaneously applying the high voltage to two cylinders of said multicylinder engine; and
- second ignition means (14, 17) for producing another high voltage in synchronism with said ignition timing and simultaneously applying the high voltage to other two cylinders of said multicylinder engine.



4,162,668

**DIESEL INTERNAL COMBUSTION ENGINE**  
Karl Jacob, Friedrichshafen; Franz Edmaier, Markdorf; Robert Schulmeister, and Stefan Walz, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany  
Filed Jul. 15, 1977, Ser. No. 816,186  
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632015  
Int. Cl.<sup>2</sup> F02N 17/00; F02B 33/00; F02M 23/04  
U.S. Cl. 123—179 F 11 Claims



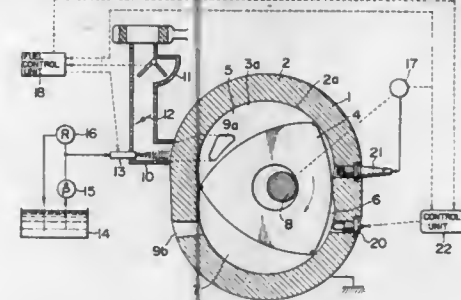
1. A multi-cylinder diesel internal combustion engine with a supercharger means and a charging air starting means including a starting air reservoir means, and means for selectively communicating said starting air reservoir means with at least some air inlet valves associated with cylinders of the engine during a starting operation of the engine, the improvement comprising:  
an additional air reservoir means for storing a quantity of supplemental charging air,  
means for selectively communicating said additional air reservoir means with the air inlet valves during at least one of an acceleration of the engine and a sudden loading of the engine,  
the air inlet valves include a first set of air inlet valves and a second set of air inlet valves, and  
wherein said starting air reservoir means selectively communicates with only said first set of air inlet valves and said additional air reservoir means selectively communicates with both said first and second sets of air inlet valves.

4,162,669

**IGNITION SYSTEM FOR ROTARY PISTON ENGINES**  
Toshihiko Igashira, Toyokawa; Shunzo Yamaguchi, Okazaki; Hisasi Kawai, Toyohashi; Seiji Morino, and Naoki Umeda, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan  
Filed Feb. 2, 1978, Ser. No. 874,483  
Claims priority, application Japan, Feb. 22, 1977, 52-18953; Feb. 23, 1977, 52-19607  
Int. Cl.<sup>2</sup> F02B 53/12; F02P 19/02  
U.S. Cl. 123—210 5 Claims

1. An ignition system for a rotary piston engine comprising: a glow plug mounted in an epitrochoidal housing of an engine on the leading side of the trochoidal minor axis of said housing in the direction of rotation of a rotor; engine speed detecting means for detecting the rotational speed of said engine; parameter detecting means for detecting the amount of fuel supply to said engine or an engine operating parameter related to said amount of fuel supply; and an ignition control circuit connected to said engine speed detecting means and said parameter detecting means and

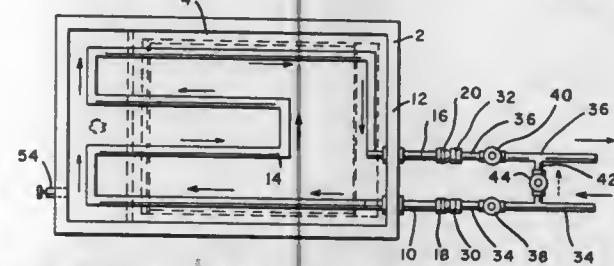
responsive to the signals therefrom to control the supply of power to said glow plug thereby to maintain the tem-



perature of said glow plug within a predetermined temperature range.

4,162,670

**FOOD WARMER ASSEMBLY FOR USE WITH A VEHICLE ENGINE**  
Victor Hays, Eagle Creek, British Columbia, Canada  
Filed Oct. 31, 1977, Ser. No. 847,239  
Int. Cl.<sup>2</sup> B60H 1/04  
U.S. Cl. 126—19.5 8 Claims



1. A food warmer assembly for use with a vehicle engine, said assembly comprising a chest having a compartment therein and including a removable top means, retaining means disposed in said compartment for support of foodstuffs, a first supply conduit extending through a wall of said chest, a heating conduit disposed in said compartment and connected to said first supply conduit, a first return conduit extending through a wall of said chest, said first return conduit being connected to said heating conduit, said first supply and return conduits having at their ends respectively a supply coupling first portion and a return coupling first portion adapted for connection respectively to a supply coupling second portion and a return coupling second portion, a second supply conduit having a first end connected to a source for engine coolant and a second end having said supply coupling second portion thereon, a second return conduit having a first end connected to said source for engine coolant and a second end having said return coupling second portion thereon, a supply valve disposed in said second supply conduit proximate said supply coupling second portion and a return valve disposed in said second return conduit proximate said return coupling second portion, a bypass conduit extending from said second supply conduit to said second return conduit, and a bypass valve disposed in said bypass conduit, said bypass conduit being disposed between said source and said supply and return valves.

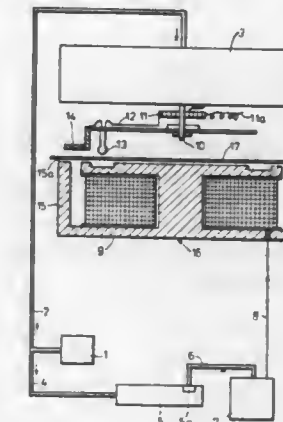
4,162,671

**SOLAR ENERGY PANEL AND MEDIUM FOR USE THEREIN**  
Donald Christy, 1005 Washington, Scott City, Kans. 67871  
Filed Aug. 15, 1977, Ser. No. 824,269  
Int. Cl.<sup>2</sup> F24H 7/00; F24J 3/02  
U.S. Cl. 126—400 11 Claims

1. A method of storing solar energy comprising the steps of: providing a liquid container, placing in said container an organic material having a rela-

4,162,674

**INSTRUMENT FOR RECORDING BLOOD PRESSURE**  
Johann Klein, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Dec. 6, 1977, Ser. No. 857,962  
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657612  
Int. Cl.<sup>2</sup> A61B 5/02; G01D 5/06  
U.S. Cl. 128—680 7 Claims



tively high heat of fusion and a melting point of between 50° F. and 168° F. and selected from the group consisting of C<sub>15</sub> to C<sub>36</sub> paraffinic hydrocarbons and C<sub>8</sub> to C<sub>14</sub> aromatic hydrocarbons; and exposing said material in said container to the sunlight



thereby changing said material from a solid to a liquid state whereby to store the solar energy in the liquid until such time as the liquid solidifies releasing the heat of fusion.

4,162,672

**MAGNETO-THERAPEUTIC DEVICE**  
Selichi Yazaki, Nara, Japan, assignor to Fujimoto Company, Limited, Osaka, Japan  
Filed Feb. 2, 1978, Ser. No. 874,645  
Int. Cl.<sup>2</sup> A61N 1/42  
U.S. Cl. 128—1.3 3 Claims



1. A magneto-therapeutic device comprising an adhesive base sheet, a hard disc-shaped permanent magnet of ferrite having a convex top face, a diameter of about 5 mm and a thickness at its center of about 2.5 mm and having a magnetic field of 500 to 1,000 oersteds in intensity and adhered to the base sheet in the center of its adhesive face, and a release sheet affixed to the adhesive face of the base sheet except the center portion thereof.

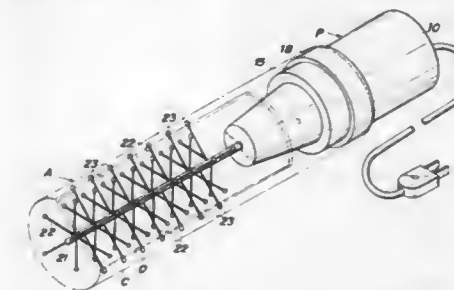
4,162,673

**METHOD OF TESTING THE POSITION OF A NEEDLE ASSEMBLY IN THE EPIDURAL SPACE**  
Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.  
Division of Ser. No. 680,959, Apr. 28, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,478  
Int. Cl.<sup>2</sup> A61B 5/00 3 Claims

1. A method of testing the position of a needle assembly in the epidural space of a patient's body, the assembly having a tip and an elongated passageway communicating between the tip and a shallow open cavity, comprising the steps of: positioning the tip and a distal passageway portion of the assembly inside the patient's body with the tip located adjacent the epidural space and with the cavity located outside the patient's body in an upright position; placing a testing liquid in the upright cavity of the assembly; and advancing the assembly into the body while determining whether the testing liquid passes from the cavity to the passageway or the exterior of the needle assembly tip in the patient's body.

4,162,675

**WHOLE BODY SPECIFIED AREA STIMULATING THERAPY DEVICE**  
Sooji Kawada, No. 49-6, 5-Chome, Nakano, Nakano-ku, Tokyo, Japan  
Filed Sep. 15, 1977, Ser. No. 833,754  
Claims priority, application Japan, Oct. 4, 1976, 51-119145  
Int. Cl.<sup>2</sup> A61H 23/00 4 Claims



1. A whole body specified area stimulating therapy device comprising a power drive unit, a body specified area stimulating device, and a head specified area stimulating device; said power drive unit is formed by mounting a motor in a motor case, a shaft of the motor is extended upward to provide a polygonal portion at the tip thereof, and a male thread is formed on the outer periphery of the upper part of the motor case; the body specified area stimulating device is provided on

the upper part of a case which is fitted and fixed to the upper part of the motor case, the case is connected to the motor case by a connecting ring provided with a female thread screwing with the male thread of the motor case, a large number of thin bars having elasticity are fixed to an operating shaft which is extended upward of the outside of the case from the inside of the case, beating members like balls are mounted on the tips of the thin bars, a transparent cover having an opening portion can be mounted on a case surrounding according to necessity in such a way that it covers the beating members, and the connecting member fixed to the lower end of the operating shaft is fitted to the polygonal portion of the shaft of the motor so as to connect the shaft of the motor and the operating shaft; the head specified area stimulating device is provided in a case which is fitted and fixed to the upper part of the motor case, the case is provided with a projecting portion having an opening portion at its tip, the case is connected to the motor case by the connecting ring having female thread screwing the male thread formed on the motor case, is interlocked with the shaft of the motor by the connecting member and a specified area stimulating member having elasticity provided with a large number of projections is provided at a tip portion of a rod means for converting the rotating motion of the motor to the reciprocating motion in right and left directions; the body specified area stimulating device and the head specified area stimulating device are interchangeably mounted on the power drive unit to be used for therapy.

4,162,676

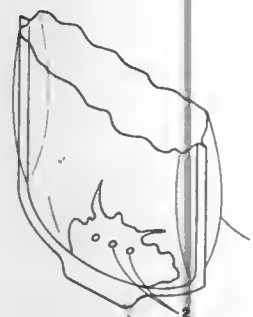
**BLOOD BAG HAVING CO<sub>2</sub> ABSORBENT THEREIN**  
Thomas D. Talcott, Santa Barbara, Calif., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 712,106, Aug. 5, 1976, Pat. No. 4,082,509.  
This application Aug. 4, 1977, Ser. No. 821,668

Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—214 D

3 Claims



1. A blood storage system which comprises a blood storage container having attached thereto conventional infusion and transfusion apparatus and which contains, in said container, a cured silicone rubber which has Ca(OH)<sub>2</sub> compounded therein.

4,162,677

**CRYOGENIC DEVICE AND METHOD FOR NECROTIZING AND SHAVING LIVE TISSUE**  
Harold D. Gregory, West Covina, Calif., assignor to Virginia M. Gregory, West Covina, Calif.

Filed May 19, 1977, Ser. No. 798,364

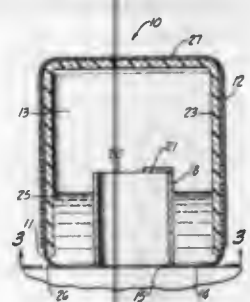
Int. Cl.<sup>2</sup> A61B 17/36

U.S. Cl. 128—303.1

16 Claims

1. A cryogenic device for treating skin and/or live tissue cryogenically comprising:  
means providing a hollow storage chamber for liquid cryogen having a cryogen storing portion thereof heat insulated and adapted to store a cryogen charge when said device is not in use and having a metallic wall thereof adapted to be flooded on its interior with liquid cryogen

while the exterior surface of said metallic wall is held in close heat exchange relation to tissue to be cooled; and



means for conducting gaseous cryogen from said storage chamber through said metallic wall and discharging the same past the interface between the tissue undergoing cooling and said exterior surface of said metallic wall.

4,162,678

**SURGICAL APPARATUS FOR SIMULTANEOUS RESECTION OF SOFT TISSUES AND THEIR SUTURING WITH METAL STAPLES**

Vladimir M. Fedotov; Boris A. Smirnov; Valery V. Revo, and Sergei N. Lapchenko, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatel'skiy I Ispytatelnyy Institut Meditsinskiy Tekhniki, U.S.S.R.

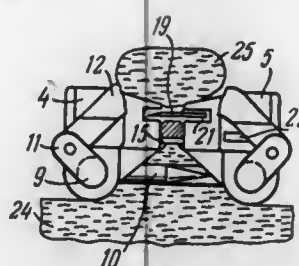
Filed Oct. 13, 1977, Ser. No. 843,706

Claims priority, application U.S.S.R., Dec. 17, 1976, 2430153

Int. Cl.<sup>2</sup> A61B 17/32

U.S. Cl. 128—305

2 Claims



1. A surgical apparatus for the simultaneous resection of soft tissues and their suturing with metal staples, comprising: an elongated anvil branch; an elongated staple branch hinge-connected with said anvil branch; a jaw on each said branch; the jaw of the anvil branch being situated opposite the jaw of the staple branch; said anvil branch being provided with a longitudinal row of grooves for clinching the ends of staples; said staple branch having slots for the staples situated opposite said grooves, and a longitudinal slot; staple tappets housed in said staple slots; a plank situated in said longitudinal slot of the staple branch and movable therealong; a wedge bevel at the end of said plank, facing the jaw and intended for interacting with said staple tappets when ejecting the staples; a clamp for locking the branches in a position when they are drawn together up to the suturing clearance; two rotation shafts, each of which is set along one of said branches; needles for grasping soft tissue, secured on said rotation shafts substantially perpendicularly to the latter; cranks rigidly secured on said rotation shafts so that upon drawing the branches together the rotation of said shafts with the needles towards each other is ensured, resulting in the areas of soft tissue grasped by the needles being forced into the clearance between the branches, with the formation of a roll of soft tissue intended for excision; a blade for excising said roll of soft tissue situated in said staple branch, longitudinally movable together with said plank.

4,162,679

**METHOD AND DEVICE FOR THE IMPLANTATION OF ONE OR MORE PACEMAKER ELECTRODES IN A HEART**

Erik G. B. Reenstierna, Borgeby 11, 230 50 Bjärred, Sweden

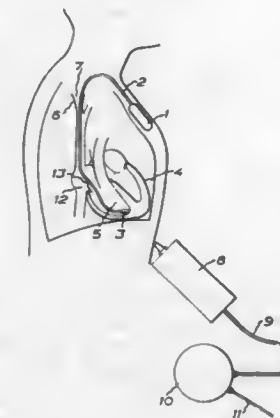
Filed Sep. 28, 1977, Ser. No. 837,476

Claims priority, application Sweden, Sep. 28, 1976, 7610696

Int. Cl.<sup>2</sup> A61N 1/04

U.S. Cl. 128—419 P

6 Claims



1. A method of transvenously implanting at least one pacemaker electrode in a heart with said electrode electrically connectible, by means of an electric line, to said pacemaker for transferring stimulation pulses to the heart, comprising the steps of  
inserting the electrode which is connected to a body of material actuable by a magnetic field of force in a selected vein,  
applying a magnetic field of force and guiding said electrode and connected body of material to a selected region of the heart,  
applying and holding a permanent magnet to the body of the patient to maintain said electrode and connected body of material in contact with the selected region of the heart for the period of time required for growth of body tissue which will maintain electrode positioning.

4,162,680

**NON-POLLUTING SYSTEM FOR METAL SURFACE TREATMENTS**

Lester Coch, Northport, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

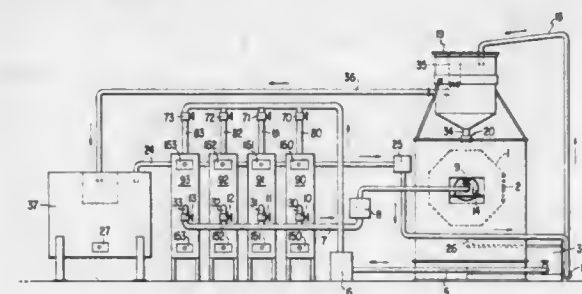
Division of Ser. No. 694,830, Jun. 10, 1976, Pat. No. 4,062,990.

This application Sep. 8, 1977, Ser. No. 831,691

Int. Cl.<sup>2</sup> B05C 3/08

U.S. Cl. 118—76

1 Claim



1. Apparatus for the mechanical impact plating of metal parts with impacting media comprising:  
a rotary plating barrel having an opening for introducing into said barrel: parts to be plated, plating material and impacting media;  
a hopper disposed above said rotary barrel for receiving

impacting media and including an outlet which can be aligned with said barrel opening when said opening is rotated upwardly, so that said impacting media can be deposited into said barrel;

a bin disposed below said barrel for receiving liquid and impacting media discharged from said barrel opening when said opening is rotated downwardly;

a water storage tank;

means fluidly connecting said hopper with an inlet of said water storage tank to conduct water from said hopper to said storage tank;

means fluidly connecting an outlet of said water storage tank with said hopper and including an eductor communicating with an impacting media outlet of said bin to receive and conduct said impacting media from said bin to said hopper;

a plurality of storage container means, each having an inlet and an outlet;

first conduit means connected between a liquid outlet of said bin and said inlets of said storage container means;

first selectively actuable valve means connected to said first conduit means to direct fluid from said bin selectively to the inlets of said container means so that liquid from said plating barrel which is discharged into said bin can be stored in a selected one of said storage container means;

second conduit means, separate from said first conduit means and connected between the outlets of said container means and an inlet of said barrel for conducting liquid from said storage container means to said barrel;

second selectively actuable valve means connected to said second conduit means to direct liquid selectively from said storage container means to said barrel so that the liquid from a previous cycle can be re-used in a subsequent cycle;

third conduit means for adding make-up liquid to said barrel; and

said storage means each including a port located at a lower end thereof to enable precipitated sludge to be removed from said container means.

4,162,681

FISH-BAIT TANK

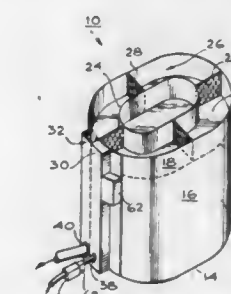
David L. Patterson, 18951 Walnut St., Fountain Valley, Calif. 92708

Filed Jan. 30, 1978, Ser. No. 873,354

Int. Cl.<sup>2</sup> A01K 61/00

U.S. Cl. 119—3

8 Claims



1. A bait tank comprising:

a housing having a perimetrical side wall integrated with a bottom wall, said side wall having inner and outer surfaces and top and bottom ends;

a fluid intake head provided with intake port means and a fluid discharge head provided with discharge port means, with each of said intake and discharge heads being integrated with the outer surface of said side wall, said intake and discharge heads having elongated configurations and being substantially vertically and adjacently disposed with



the height of each of the intake and discharge heads being about the same as the height of the side wall; intake aperture means traversing said side wall and disposed within the perimeter of said intake head for extending fluid communication from said intake head to the interior of said housing, said intake aperture means comprising a plurality of vertically spaced orifices; discharge aperture means traversing said side wall and disposed within the perimeter of said discharge head for extending fluid communication from the interior of said housing to said discharge head; and level control means cooperating with said discharge aperture means for selectively controlling fluid level in said housing.

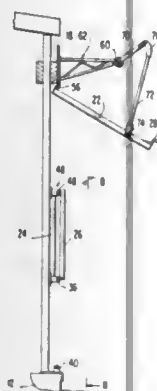
4,162,682

# PIVOTAL SECTIONALIZED WALL FOR HOG RAISING ENCLOSURE

Wayne K. Miller, deceased, late of Ord, Nebr., and by Sharon Miller, executrix, 418 S. 17th. St., Ord, Nebr. 68862  
Filed Jan. 25, 1978, Ser. No. 872,107  
Int. Cl.<sup>2</sup> A01K 1/00

U.S. Cl. 119—16

10 Claims



1. A sectionalized pivotal wall construction for an animal raising enclosure having a foundation, spaced vertical support posts, a horizontal roof support resting thereon, and a roof, said wall comprising:

- a first elongated rectangular panel extending between adjacent vertical support posts adjacent the foundation; first releasable locking means carried by said first panel for normally connecting each lower corner of said first panel to the enclosure;
- a second elongated rectangular panel extending between adjacent vertical support posts and disposed adjacent said first panel; second releasable locking means carried by said second panel for normally connecting each upper corner of said second panel to the adjacent support post; first hinge means connecting the adjacent upper portion of said first panel and lower portion of said second panel for permitting pivotal movement thereof from a closed position wherein both of said panels lie in a common vertical plane to an open position wherein said panels lie in adjacent vertical planes;
- a third elongated rectangular panel extending horizontally between adjacent vertical support posts and vertically between said second panel and the roof supports; second hinge means connecting the upper portion of said panel to the roof support for permitting pivotal movement thereof from a closed position wherein said third panel lies in the vertical plane containing said first and second panels to an open position wherein said third panel lies in a plane disposed at an angle to the vertical; and drive means carried by said structure for moving said third panel from a closed to an open position.

## 4,162,683 ANIMAL FEEDER USING MAGNETICALLY BIASED SWITCH

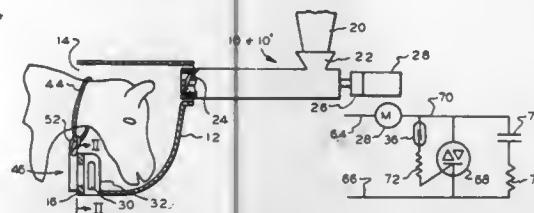
Cletus A. Brooks, Onsted, Mich., assignor to Selective Feeder Company, Onsted, Mich.

Filed Jun. 21, 1977, Ser. No. 808,992

Int. Cl.<sup>2</sup> A01K 5/02

U.S. Cl. 119—51 R

10 Claims



1. A selective animal feeder system for feeding selected animals of a group from a feed dispenser comprising in combination, a feed trough having an animal head access opening, a feed storage container, electrically energized feed transfer means selectively transferring feed from said container to said trough during energization of said transfer means, proximity operated feed transfer control means located adjacent said head access opening controlling operation of said feed transfer means, said control means including an electric switch operable by the influence of magnetic field forces between open and closed conditions located adjacent said access opening, a permanent biasing magnet adjacent said access opening and switch operably related to and biasing said switch having first and second poles of opposite polarity in spaced relation, the poles of said biasing magnet being related to said access opening in a predetermined manner, a second permanent magnet having first and second poles of opposite polarity in a spaced relation substantially corresponding to the spaced relation of the poles of said biasing magnet and adapted to be worn by the animal to be fed and oriented on the animal in a predetermined manner whereby said poles of said second magnet will be oriented to said access opening and biasing magnet in a predetermined manner upon the animal inserting its head within said opening, said switch being selectively operated to said open and closed conditions upon the animal inserting its head within said opening to locate said second magnet within the magnetic field of said biasing magnet in dependence upon the relationship of the polarity of the poles of said magnets.

4,162,684

# SOLAR ICE MELTER FOR USE AT LOW AMBIENT TEMPERATURES

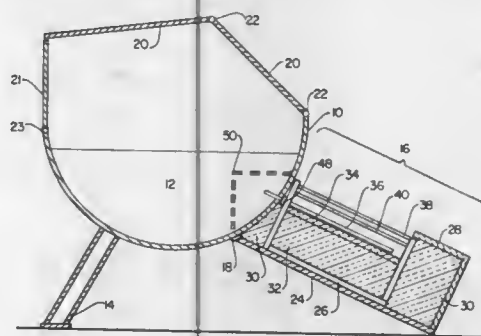
Charles C. Loveless, Jr., 1508 W. 8th St., Roswell, N. Mex. 88201

Continuation-in-part of Ser. No. 840,312, Oct. 7, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,650

Int. Cl.<sup>2</sup> A01K 7/00; F24J 3/02

U.S. Cl. 119—73

5 Claims



1. A device for watering animals from a suitable water re-

ceptacle adapted for use at low ambient air temperatures at which the water in the receptacle is at least partially frozen, comprising:

- an open receptacle containing ice;
- a solar energy collector rigidly fixed to said receptacle and disposed to transmit heat into the ice contained in said receptacle, wherein said receptacle and said solar energy collector are oriented to face in a substantially southeasterly direction and at an angle above the horizontal so as to receive maximum energy from the morning sun;
- an outer shell having first insulation means disposed inside its peripheral walls;
- a wooden collector box open along its upper face, disposed inside said outer shell and surrounded about its periphery by said first insulation means;
- second insulation means lining the bottom of said collector box;
- a heat-conducting absorber surface prepared to absorb impinging solar radiation and disposed sunward of said second insulation means;
- a heat pipe affixed to said absorber surface so as to receive heat therefrom and dispose to conduct heat into the ice contained in said receptacle; and
- a cover over said outer shell comprising at least one sheet of a transparent material.

4,162,685

# BOVINE SURGICAL TABLE

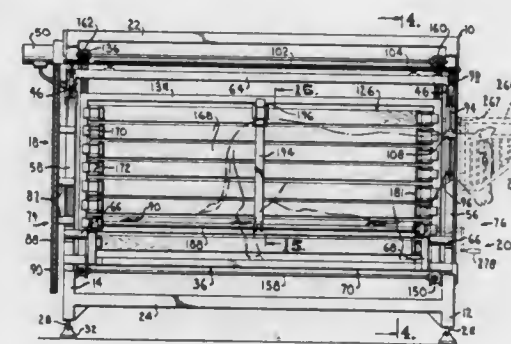
George E. Knappenberger, P.O. Box 277, Haven, Kans. 67543

Filed Jan. 4, 1977, Ser. No. 756,791

Int. Cl.<sup>2</sup> A61D 3/00

U.S. Cl. 119—103

18 Claims



1. In a surgical table:

- an animal-receiving cage having opposed, entrance and exit openings;
- a pair of side-by-side stanchion posts at said exit opening, each of said posts having opposed, upper and lower ends; means mounting said posts for movement inwardly toward each other to capture the neck of an animal therebetween, and outwardly away from each other to release the restrained animal;
- locking means coupled with said posts for automatically holding the same in an animal-restraining position upon movement of said posts toward each other to said position; and
- quick-release means operably associated with said locking means for operating the latter to release said posts for outward movement away from said position, whereby to permit the animal to leave the cage through the exit opening;
- said locking means including locking components on said lower ends of the posts, a transversely extending holding bar selectively engageable with said components at any of a number of spacings between said lower ends of the posts to set the width of the exit opening at the bottom thereof, a transversely extending, toothed member adjacent said upper ends of the posts, and locking dogs on said upper

ends engaging said member as said posts move inwardly toward each other to said animal-restraining position.

4,162,686

# INDUSTRIAL BOILER UTILIZING MULTIPLE FUELS AND HAVING REDUCED PARTICULATE EMISSION AND METHOD OF COMBUSTION

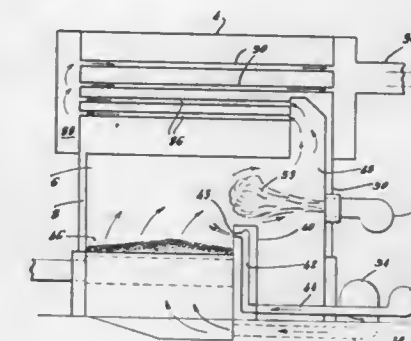
Harold B. Infield, Garfield Heights, Ohio; Albert Morrison, III, Landisville, and William A. Tauskey, Sr., Bradford Woods, both of Pa., assignors to North American Manufacturing Company, Cleveland, Ohio; Burnham Corporation, Irvington, N.Y. and Combustion Service and Equipment Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1977, Ser. No. 842,467

Int. Cl.<sup>2</sup> F23C 1/02; F22B 7/12

U.S. Cl. 122—149

10 Claims



1. A boiler adapted to burn coal with reduced particulate emission, said boiler including a combustion chamber and a fire-tube section, said combustion chamber being positioned below said fire-tube section and having a flue gas exit at one end thereof to discharge hot combustion gases from said combustion chamber, said combustion chamber including a coal-burning area and a combustion gas passage from said coal-burning area to said flue gas exit, said coal-burning area being beneath a major portion of said fire-tube section but not directly beneath said flue gas exit, whereby passage of coal combustion gases from said coal-burning area through said combustion gas passage is at an angle from the vertical, said combustion chamber further including an oil or gas burner removed from said coal-burning area positioned at the opposite end of said combustion chamber from said coal-burning area and below and proximate to said flue gas exit, said burner being directed so that its flame extends horizontally through said combustion gas passage toward the end of the combustion chamber having said coal-burning area, past said flue gas exit, across the path of said coal combustion gases, whereby the direction of the flame from said burner opposes the direction of flow of said coal combustion gases and particulate emission resulting from burning of coal, and means for varying the relative quantities of coal and oil or gas being burned.

4,162,687

# DENTAL FLOSSING DEVICE

Leonard G. Lorch, 1352 Emerson St., Palo Alto, Calif. 94301

Filed Jun. 6, 1978, Ser. No. 912,951

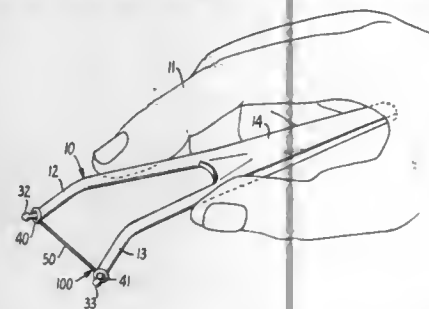
Int. Cl.<sup>2</sup> A61C 15/00

U.S. Cl. 132—91

6 Claims

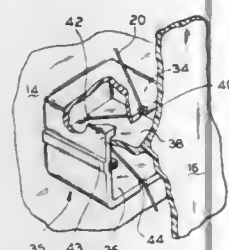
1. A device for flossing teeth comprising: a handle with a pair of resilient arms extending therefrom, each of said arms having a finger extending therefrom, the longitudinal axes of said fingers forming an angle of between 30° and 180° with each other;

grommet retaining means carried by each arm; a length of flossing material; and a pair of grommets connected to the ends of said flossing material, such that said grommets are readily attached to



and detached from said grommet retaining means by sliding onto and off said grommet retaining means and being held in position on said grommet retaining means by the diverging angle formed by said fingers.

**4,162,688**  
**MEDICATING FLOSS DISPENSER AND METHOD OF APPLYING MEDICATION TO HUMAN TEETH**  
Emanuel B. Tarrson, Chicago, and Stevan Tisma, Niles, both of Ill., assignors to John O. Butler Company, Chicago, Ill.  
Filed Sep. 7, 1977, Ser. No. 831,150  
Int. Cl.<sup>2</sup> A61C 15/00  
U.S. Cl. 132—92 A

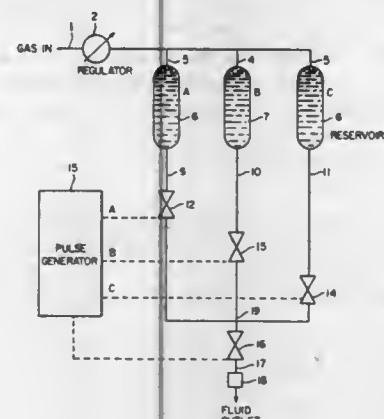


1. A medicating dental floss dispenser comprising a holder having a bobbin rotatably mounted therein, a medicine chamber located in said holder and positioned adjacent said bobbin, said medicine chamber including a plurality of bearing surfaces which are distributed throughout said chamber to cause the floss to follow a relatively long path through the medicine chamber, said bearing surfaces alternately squeezing and relaxing said floss without disturbing the lay of the fibers so that the floss becomes saturated with the medicine while it moves through said chamber, means for drawing said floss from said bobbin, through said medicine chamber, and out a port in said holder and means for maintaining a back tension in said floss while it travels from said bobbin, through said holder, and to the outside of said holder.

**4,162,689**  
**TIME DIVISION FLOW CONTROL**  
Joseph J. Zdrodowski, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.  
Filed Jul. 14, 1977, Ser. No. 815,469  
Int. Cl.<sup>2</sup> G01F 11/00

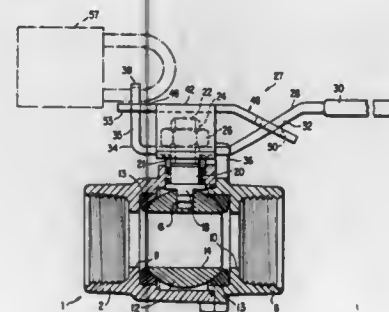
U.S. Cl. 137—266 10 Claims  
1. A time division fluid flow system comprising in combination:  
(A) one or more fluid stream inlet means, each fluid stream inlet means providing a fluid stream,  
(B) pulse generator means;  
(C) one or more pulse valve means, wherein one said pulse valve means is in operative relationship to one of said fluid stream inlet means, said pulse valve means being under

control of said pulse generator means as to their respective duty cycles whereby a final fluid stream derived from the aforesaid fluid stream is provided under time division flow



control when the repetition period of said pulse valve means is less than one second and the sum of the duty cycles of said pulse valves is less than the repetition period.

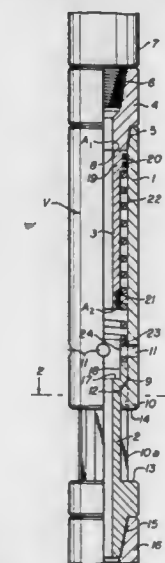
**4,162,690**  
**VALVE LOCKING DEVICE**  
Carl S. Anderson, Worcester, Mass., assignor to Jamesbury Corp., Worcester, Mass.  
Filed Nov. 18, 1977, Ser. No. 852,837  
Int. Cl.<sup>2</sup> F16K 35/06  
U.S. Cl. 137—385 9 Claims



1. A locking device for a rotary valve having a stem assembly for rotation of said valve between an open or closed position, which comprises:  
a handle assembly adapted to be connected to said stem assembly for rotation of said valve, and having a handgrip portion at a first end thereof and a securing member at a second end thereof;  
locking means mounted on said handle assembly at a position spaced from said securing member so as to interfittingly cooperate with said handle assembly securing member and adapted to cooperate with an abutment means mounted on said housing to secure said valve handle in both the valve open position and the valve closed position.

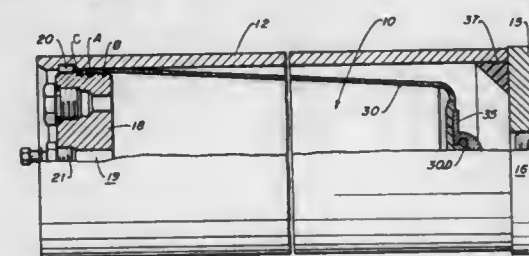
**4,162,691**  
**TUBULAR VALVE DEVICE**  
Lee E. Perkins, Houma, La., assignor to Kajan Specialty Co., Inc., Houma, La.  
Filed Sep. 19, 1977, Ser. No. 834,283  
Int. Cl.<sup>2</sup> F16K 11/10  
U.S. Cl. 137—613 13 Claims  
1. Valve apparatus comprising:  
a first tubular member;

a second tubular member telescopically engaging said first tubular member for axial movement between a retracted position and an extended position, said first and second tubular members forming a flow passage through which fluid communication may be established between opposite ends of said apparatus;  
port means through the walls of one of said tubular members by which fluid communication may be established between said flow passage and the exterior of said apparatus;



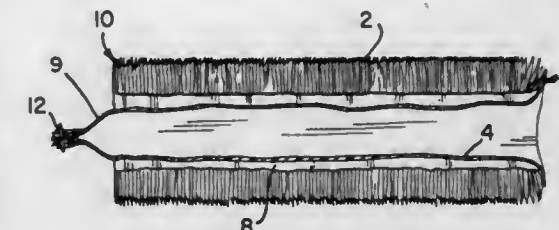
closure means carried by one of said tubular members for selectively opening and closing said port means to permit or prevent said fluid communication with the exterior of said apparatus when said second tubular member is in said extended position; and  
biasing means biasing said closure means toward an opened position.

**4,162,692**  
**HYDRO-PNEUMATIC FLEXIBLE BLADDER ACCUMULATOR**  
Edward M. Greer, Beverly Hills; Frank S. Wyle, Los Angeles, both of Calif., and Martin R. Packer, Handforth, England, assignors to Hydrotrole Limited, Stockport, United Kingdom  
Filed Sep. 7, 1976, Ser. No. 720,886  
Int. Cl.<sup>2</sup> F16L 55/04  
U.S. Cl. 138—30 4 Claims



1. A hydro-pneumatic accumulator comprising: an elongated tube open at both ends and having a peripheral groove on the inner surface thereof adjacent to one of said ends; a closure cap mounted within said one end of said tube having a gas port extending therethrough, said closure cap having an inner end spaced radially inwardly from the inner surface of said tube to form a mounting means, said mounting means having a pair of axially spaced peripheral grooves formed thereon; a flat disc-shaped plate affixed to said other end of said tube and having a liquid port extending therethrough; a spacer ring formed of deformable material mounted at said other end of said tube engaging the inner surface of said tube and the inner surface of said plate; a thimble-shaped bladder of a resilient, deformable material mounted in said tube with its mouth extending over said mounting means in resilient engagement therewith, said bladder having an internal integral sealing bead surrounding the rim of its mouth to be compressibly received in the inner one of said grooves, and an integral anchoring bead surrounding its mouth axially displaced inwardly from the sealing bead to be received in the outer one of said grooves; and a removable snap ring received in the peripheral groove extending around the inner surface of said tube at said one end thereof for retaining the closure cap in said one end of said shell, said sealing bead having essentially the shape of an O-ring, said anchoring bead having a triangular shape, the inner one of said grooves on said mounting means which receives said sealing bead having a rectangular configuration, and the outer one of said grooves on said mounting means which receives said anchoring bead having a complementary triangular shape.

**4,162,693**  
**REVERSIBLE SHIRRED CASING AND METHOD FOR PRODUCING IT**  
John H. Beckman, Downers Grove, Ill., assignor to Union Carbide Corporation, New York, N.Y.  
Filed Jan. 17, 1978, Ser. No. 870,198  
Int. Cl.<sup>2</sup> A22C 13/00  
U.S. Cl. 138—118.1 15 Claims



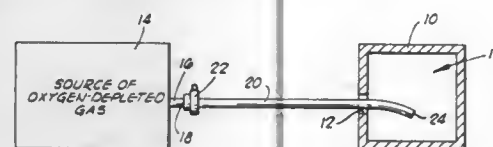
1. A shirred tubular casing having a portion of a first end of the casing deshirred and disposed within the bore of the casing with the deshirred casing extending to the vicinity of a second end of the shirred tubular casing, said deshirred casing proximal the second end of the shirred casing being gathered and closed by closure means disposed external of the deshirred casing such that the inner deshirred casing has an open end which is integral with the first end of the shirred tubular casing and a closed end at the second end of the shirred tubular casing, said closed end comprising closure means disposed outside of the deshirred casing so that material fed into the open end of the inner deshirred casing down to its second end will not contact the closure means employed for closing the end of the deshirred casing and when the material is continuously fed into the open end through the shirred tubular casing and out the closed end of the shirred casing, the shirred casing will turn inside out so that the external surface of the shirred casing will contact the material fed into the casing.

**4,162,694**  
**METHOD FOR AMELIORATING HAZARDOUS CONDITIONS ASSOCIATED WITH CONTAINERS WHICH CONTAIN VAPORS OF COMBUSTIBLE LIQUID**  
Oscar D. Caldwell, 2420 SW. 32nd, Oklahoma City, Okla. 73119  
Filed Jul. 15, 1977, Ser. No. 815,916  
Int. Cl.<sup>2</sup> B65B 3/04  
U.S. Cl. 141—1 8 Claims

1. A method for ameliorating the hazardous conditions associated with containers which contain, within an interior thereof, vapors of combustible liquids, comprising the steps of: introducing an oxygen-depleted gas into the interior of the container, comprising the steps of:  
providing a source of the oxygen-depleted gas;  
establishing fluid communication between the source of



the oxygen-depleted gas and the interior of the container; and  
passing the oxygen-depleted gas from the source into the interior of the container;  
permitting the oxygen-depleted gas and vapors of combustible liquids to escape from the container; and



maintaining the introducing of oxygen-depleted gas and the permitting of the oxygen-depleted gas and the vapors of the combustible liquids to escape from the container for a period of time sufficient to render the environment about the container relatively safe for blacksmithing operations.

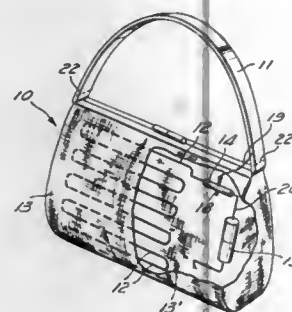
#### 4,162,695 HANDBAG WITH THERMAL THEFT PROTECTION SYSTEM

Lawrence L. Moses, 3728 Cherrywood Ave., Los Angeles, Calif. 90018

Filed Jul. 28, 1978, Ser. No. 928,740  
Int. Cl.<sup>2</sup> A45C 11/08

U.S. Cl. 150—35

6 Claims



1. A handbag with theft protection device comprising:  
a bag portion having an opening for access thereto;  
a carrying strap attached to said bag portion;  
a source of electrical current;  
a heating means to heat the outer surface of said handbag to a high temperature;  
a switch means connected in series with said heating means and said source of electrical current; and  
a removable non-conductive circuit breaker member connected to said carrying strap and the switch means, which circuit breaker member activates the switch means when an excessive removal force is applied to the carrying strap.

#### 4,162,696 SUPPORT FOR A CAMERA

Jürgen Sprung, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,152  
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714871

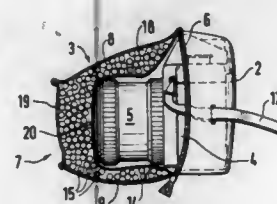
Int. Cl.<sup>2</sup> B65B 11/00

U.S. Cl. 150—52 J

11 Claims

1. A combined camera stand and camera case, comprising in combination a cushion-like member forming a wall of the camera case, said cushion-like member having an adequate pliability and thickness for adjusting its shape to the contours of an object,  
being operative for retaining its adjusted shape until manu-

ally changed for supporting a camera, and alternatively for plially accommodating the camera in said case, and including two end walls flexibly interconnected along their peripheries to define a hollow interspace therebetween,



the volume of said interspace being arbitrarily changeable, and  
pliable means for filling at least part of said hollow interspace, said pliable means being changeable in shape and dimensions.

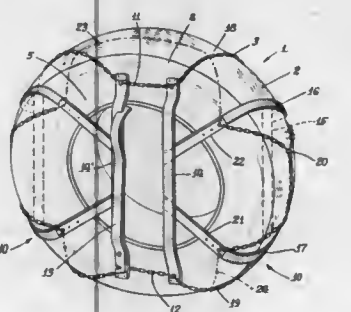
#### 4,162,697 REMOVABLE ANTISKID DEVICE ON A VEHICLE WHEEL, IN PARTICULAR, AN AUTOMOBILE WHEEL

Peter Zinner, CH-3901 Termen, Switzerland

Filed Aug. 3, 1977, Ser. No. 821,524  
Int. Cl.<sup>2</sup> B60C 27/00, 27/02

U.S. Cl. 152—217

8 Claims



1. A removable antiskid device for use on an automobile wheel or the like and including:  
two parts gripping two oppositely lying wheel segments respectively, each of said parts comprising  
an outer first straight strip lying against the outside of the wheel and having two ends,  
an inner second straight strip lying against the inside of the wheel and having two ends, and  
flexible members connecting the ends of the inner strip with the ends of the outer strip and flexible members connecting the strips intermediate their ends, at least some of said members having antiskid characteristics, the flexibility of the members permitting them to conform to tires of various configurations, said members extending across the tire in the segment thereof defined by the ends of the first strip; and  
connecting means on the outside of the wheel and connecting said outer strips of said two parts at two locations on said outer strips, which locations are adjacent the ends of the outer strips, and holding each part against the respective wheel segments, said connecting means being releasable to permit said parts to be moved off the respective wheel segments.

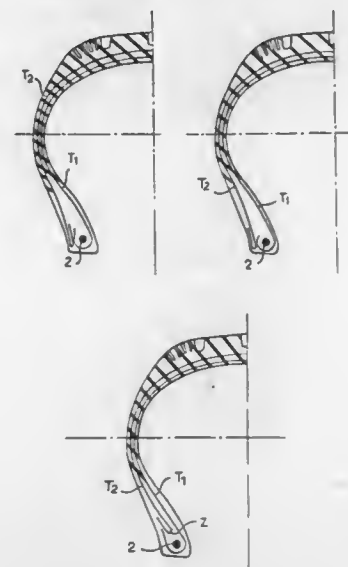
#### 4,162,698 RADIAL PNEUMATIC TIRES PROVIDED WITH A STRUCTURE FOR STIFFENING THE WALLS

Claudio Merli, Cormano, and Carlo Francia, Monza, both of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Sep. 22, 1977, Ser. No. 835,757  
Claims priority, application Italy, Oct. 5, 1976, 27993A/76  
Int. Cl.<sup>2</sup> B60C 9/08, 15/00

U.S. Cl. 152—354 RB

6 Claims



1. A pneumatic tire having an annular tread portion, a pair of axially spaced bead portions disposed radially inwardly relative to said tread portion, each bead portion including a substantially circular bead core, a pair of axially spaced side wall portions extending from said bead portions to said tread portion and a carcass ply structure having radially disposed reinforcing threads extending from one bead portion to the other bead portion, said carcass ply structure being comprised of at least two plies, one of said plies being turned back and anchored to each bead core along each edge thereof and the other of said plies being folded back upon itself adjacent each edge to form a rib disposed adjacent to but not anchored to the respective bead core and having the free edge thereof disposed between said rib and the line joining the points of maximum width of the side walls when the tire is inflated.

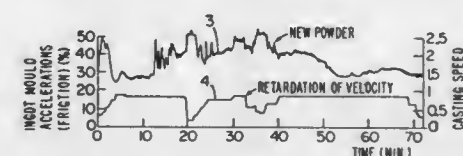
#### 4,162,699 CONTROLLING CONTINUOUS CASTING

Bernard G. Mairy, Sclayn-Andenne, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Oct. 5, 1977, Ser. No. 839,413  
Claims priority, application Belgium, Oct. 5, 1976, 846970; Apr. 15, 1977, 853687; Jun. 20, 1977, 646061  
Int. Cl.<sup>2</sup> B22D 11/16

U.S. Cl. 164—4

8 Claims



1. A method of controlling a continuous casting process in which the upper surface of molten metal within an oscillating mold is covered by a protective powder, the method comprising: covering said upper surface of molten metal with a powder of given composition; observing the external appearance of the metal issuing from the mold and recording the actual dis-

placements or accelerations of the mold; and modifying the composition of the powder until the quality of the ingot skin can be considered as an optimum, to which corresponds the optimum lubrication of the mold and an ideal acceleration spectrum; subsequently recording the acceleration spectrum of the mold; comparing the recorded spectrum with the ideal spectrum; and modifying a parameter having an effect on the ingot quality at the time at which it is formed in the mold, so as to take up any difference observed between the two spectra.

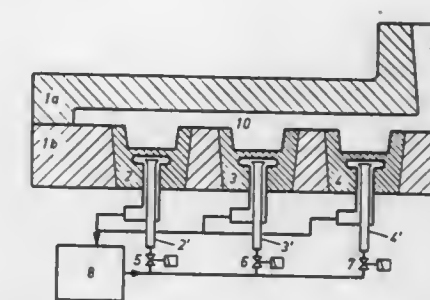
#### 4,162,700 MECHANISMS FOR CONTROLLING TEMPERATURE AND HEAT BALANCE OF MOLDS

Friedhelm Kahn, 2, Muhlbachstrasse, D 6332 Ehringshausen, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,109  
Int. Cl.<sup>2</sup> B22D 27/04, 15/00

U.S. Cl. 164—154

5 Claims



1. Apparatus for casting and controlling the mold heat input and output comprising:  
(a) an upper mold half with a riser therein;  
(b) a lower mold half with a plurality of combined heating and cooling devices located therein, each of said devices laterally spaced sequentially from a lesser to a greater distance away from said riser;  
(c) each of said devices communicating with means for independently supplying heating and cooling mediums thereto; and  
(d) control means for initially simultaneously supplying said heating medium to each said device and then selectively supplying said cooling medium thereto beginning with said device at said greater distance and proceeding sequentially to said lesser distance for directional solidification in said mold halves beginning at said greater distance and proceeding to said lesser distance.

#### 4,162,701 THERMAL CONTROL CANISTER

Stanford Ollendorf, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 21, 1977, Ser. No. 853,677  
Int. Cl.<sup>2</sup> G05D 23/00

U.S. Cl. 165—32

9 Claims

1. Apparatus for maintaining a heat dissipating load at a substantially constant temperature, comprising:  
a canister having a plurality of walls in close thermal heat transfer relationship for holding said load therein in heat exchange relationship with at least one of said walls;  
a plurality of transfer heat pipes at each end of said canister and in heat exchange relationship with the exterior of each of said walls, said transfer heat pipes having longitudinal axes extending transverse to the longitudinal axis of said canister and having ends thereof in heat exchange rela-

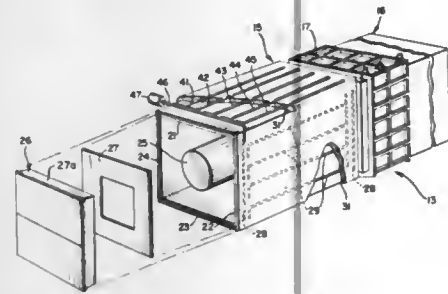
relationship with adjacent ends of said transfer heat pipes on adjacent walls;

a plurality of isothermalizer heat pipes extending between said transfer heat pipes at each end of said canister and in heat exchange relationship with the exterior of said walls and said transfer heat pipes, said isothermalizer heat pipes having longitudinal axes extending parallel to the longitudinal axis of said canister;

a thermal insulator surrounding the exterior of said walls, said transfer heat pipes and said isothermalizer heat pipes;

a thermal radiator covering at least one portion of the exterior surface of said thermal insulator;

a plurality of heat pipes embedded within said thermal radiator having longitudinal axes extending parallel to the longitudinal axis of said canister; and



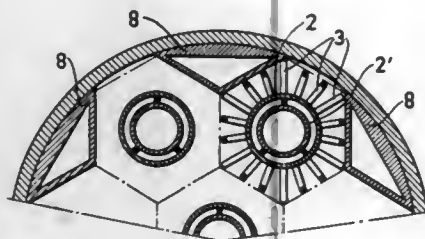
at least one feedback variable conductance heat pipe in heat exchange relationship with an end of said heat pipes and having a longitudinal axis transverse to the longitudinal axis of said canister, said feedback variable conductance heat pipe having one end extending inwardly through said thermal insulator and in heat exchange relationship with at least one of said transfer heat pipes at one of said ends of said canister, said variable conductance heat pipe including a reservoir having a noncondensable fluid therein that expands and contracts as a function of temperature for controlling the number of said heat pipes in heat exchange relationship with said feedback variable conductance heat pipe.

#### 4,162,702 DEVICE FOR DIVIDING THE FLOW IN A HEAT EXCHANGER

Sven E. A. Andersson, Sodertälje, Sweden, assignor to AB Svenska Maskinverken, Järfälla, Sweden  
Filed Mar. 29, 1977, Ser. No. 782,555  
Int. Cl.<sup>2</sup> F28D 7/12

U.S. Cl. 165—142

7 Claims



1. A device at a heat exchanger for two media, comprising parallel tubes with surface-enlarging pins and flown through by one of the media and flown about by the second medium in a direction substantially in parallel with the first medium, which tubes are positioned in a casing with a chamber at each end and are so arranged, that the longitudinal passageways with projecting pins between the tubes connect the two chambers, and filler bodies are provided in the spaces between the tubes and the casing having no projecting pins, characterized in that at least some of the filler bodies are hollow at their ends

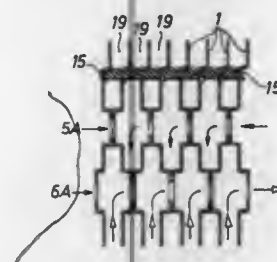
and open each into one of said chambers, that the connecting opening for each inlet or outlet for the medium flowing between the tubes is positioned through the casing in a point between the two chambers and so, that in this point the entire cross-section provided with pins communicates with the connecting opening.

#### 4,162,703 PLATE-TYPE HEAT EXCHANGER

Jan A. Bosaeus, Nyköping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden  
Filed Feb. 11, 1977, Ser. No. 769,234  
Claims priority, application Sweden, Feb. 12, 1976, 7601607  
Int. Cl.<sup>2</sup> F28F 3/08

U.S. Cl. 165—167

11 Claims



1. A heat exchanger comprising:

a plurality of plates arranged in a stack, each plate having, in a first direction, a first end portion, a second end portion and an intervening heat exchange surface, the first end portion having both an inlet passageway for a first fluid and an outlet passageway for a second fluid, and the second end portion having both an inlet passageway for the second fluid and an outlet passageway for the first fluid, means being provided in order to for separating the plates from one another to define spaces, the spaces being located adjacent one another with each space being between adjacent plates,

the space on one side of each plate carrying the first fluid and the space on the other side of each plate carrying the second fluid,

the inlet and the outlet of each end portion each being arranged in the form of a plurality of openings located in at least one row extending in a second direction transversely of the first direction of the plates, and

elements for separating the inlet from the outlet in each end portion of each plate, the elements being provided in the spaces between the adjacent plates, with all the openings of the inlet at one end portion of each plate, and all the openings of the outlet at the other end portion of the adjacent plate, communicating with the space between the adjacent plates.

#### 4,162,704 PRESSURE CONTROL DEVICE

Albert W. Gunther, P.O. Box 615, Harvey, La. 70059  
Filed Feb. 23, 1978, Ser. No. 880,370  
Int. Cl.<sup>2</sup> E21B 19/16

U.S. Cl. 166—77.5

21 Claims

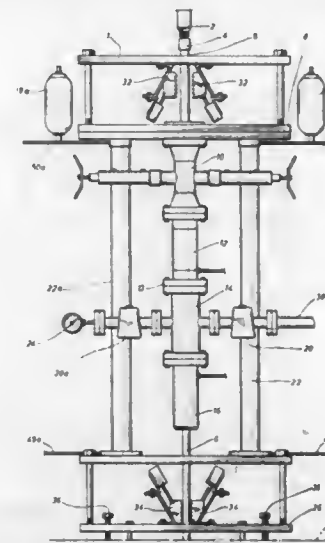
1. A pressure control device for controlling the pressure around a threaded pipe connection in a tubing string held in place by an upper slip set which grips the string above said connection and a lower slip set which grips the string below said connection, said control device comprising:

a rotatable upper platform adapted for use with said upper slip set to enable rotation of a first joint of pipe above said connection and, to prevent upward movement of said first joint relative to said platform;

a stationary lower base adapted for use with said lower slip

set to prevent rotation of a second joint of pipe below said connection and, to support the weight of said string;

means adapted for connection to said platform for forming a pressure containing enclosure around said threaded pipe connection, said connection joining said first joint to said second joint, said enclosure having a longitudinal opening;



pressure release means adapted for connection to said pressure enclosure means for the controlled release of pressure within said enclosure; and

means adapted for connecting to said platform and to said base for longitudinally positioning said enclosure from a first position in which said connection protrudes above said platform to a second position in which said connection is contained within said enclosure.

#### 4,162,705 CENTER SECTION FOR OIL WELL PERFORATION TESTING DEVICE

Milton L. Daigle, 359 S. Van Ave., Houma, La. 70306  
Continuation-in-part of Ser. No. 802,481, Jun. 1, 1977, Pat. No. 4,103,741. This application Apr. 28, 1978, Ser. No. 901,307  
Int. Cl.<sup>2</sup> E21B 33/122

U.S. Cl. 166—186

4 Claims



1. In combination with a pair of axially spaced tubular well tool subsections including adjacent end portions and to be serially connected in an elongated well tool to include a central longitudinal passage therethrough, an outlet from said passage to the exterior of said tool between longitudinally spaced packer zones thereof spaced between said sections and a fluid bypass through said tool, independent of said longitudinal

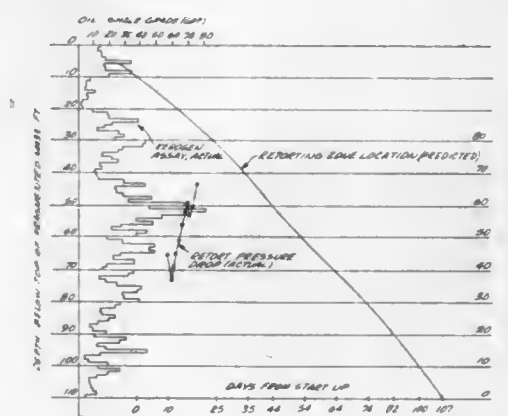
passage, communicated at its opposite ends with the exterior of said tool on remote sides of said packer zones, a tool assembly for connection between said sections, said assembly including an inner tubular member and an outer tubular section telescoped over said inner tubular member, said inner member and outer section including pairs of corresponding loosely telescoped end portions defining annular passages therebetween, first means sealingly coupling the end portions of said inner tubular members within the adjacent end portions of said subsections, second means sealingly coupling the remote ends of said outer tubular member to said adjacent ends, one pair of section end portions including ports opening therethrough from the corresponding annular passages to the exterior of said tool assembly, said outer tubular section including axially spaced mounting portions disposed intermediate said ports for supporting packer assemblies therefrom, said assembly including port means communicating the interior of said inner tubular member with the exterior of said assembly intermediate said mounting portions independent of said annular passages and defining passage means communicating said annular passages independent of said port means and the interior of said inner tubular member, the interior of said inner tubular member being straight, unobstructed and "fully open" throughout the length of said inner tubular member, the inner tubular member including a diametrically enlarged midportion whose exterior is sealingly secured within the midportion of the interior of said outer tubular section, said port means comprising aligned ports formed through said sealingly secured midportions, said inner tubular member including a pair of opposite end member sections and a center member section into which the adjacent ends of said end member sections are removably threadedly engaged and comprising said diametrically enlarged midportion, a sleeve secured within the midportion of said outer tubular section, said outer tubular section midportion, said sleeve and diametrically enlarged midportion having aligned ports formed therethrough, said diametrically enlarged midportion being loosely telescoped in said sleeve defining an annular passage therebetween, and weld material formed completely about the adjacent ends of said sleeve and enlarged midportion ports bridging said annular passage, said aligned ports and weld material defining said port means.

#### 4,162,706 DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN OIL SHALE RETORT BY MONITORING PRESSURE DROP ACROSS THE RETORT

Chang Y. Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.  
Filed Jan. 12, 1978, Ser. No. 868,924  
Int. Cl.<sup>2</sup> E21B 43/24

U.S. Cl. 166—251

31 Claims



3. A method for determining the locus of a processing zone advancing through a fragmented permeable mass of particles containing oil shale in an in situ oil shale retort in a subterra-



nean formation containing oil shale, the retort having an inlet gas introduced thereto and an effluent gas passing therefrom, the method comprising the steps of:

- determining kerogen content in formation containing oil shale at selected locations in the retort before processing the selected locations;
- determining, at least twice, the pressure difference between the inlet gas to the retort and the effluent gas from the retort during processing; and
- determining the first derivative of such determined pressure difference versus time.

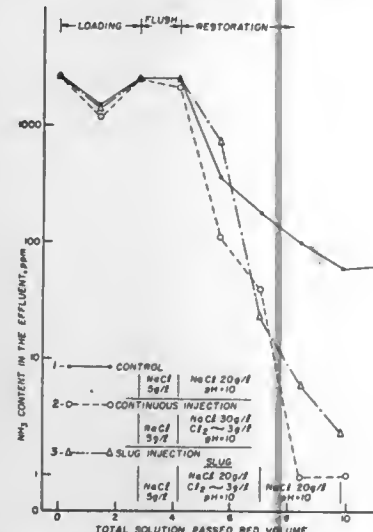
**4,162,707**  
**METHOD OF TREATING FORMATION TO REMOVE AMMONIUM IONS**  
 Tsoung-yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,760

Int. Cl.<sup>2</sup> E21B 43/22, 43/27, 43/28

U.S. Cl. 166—252

18 Claims



1. A method of treating a subterranean clay-containing formation having ammonium ions absorbed on the clay, the method comprising:

- flushing said formation with a halogenated restoration fluid having a halogen therein which reacts with ammonia in the formation to decompose said ammonia.

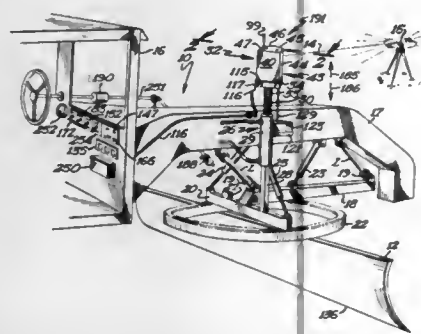
**4,162,708**  
**TOOL CARRYING VEHICLE WITH LASER CONTROL APPARATUS**  
 Phillip R. Johnson, Mandan, N. Dak., assignor to Dakota Electric, Inc., Mandan, N. Dak.

Filed Feb. 3, 1975, Ser. No. 546,544

Int. Cl.<sup>2</sup> E02F 3/76, 3/85

U.S. Cl. 172—4.5

8 Claims



1. In combination with a vehicle having a power supply and

movable over a given land surface and having a tool attached to the vehicle and movable toward and away from a laser reference plane generated by a swinging laser beam, and further including a power device carried by the vehicle, energizable by the power supply, and operatively connected with said tool to move said tool toward and away from the laser reference plane, an apparatus for maintaining a predetermined distance between said tool and the laser reference plane comprising:

- a detector housing;
- a detector support frame carried by said detector housing and having an outer periphery facing outwardly from said housing;
- a laser reference plane detector carried by said detector support frame and energizable by the power supply, said detector including first and second laser beam detecting arrays, each said array including at least one light-sensitive device attached to said outer periphery of said detector support frame, said light-sensitive device of each array substantially centered on a common plane, with the common planes of said first and second arrays being generally parallel to and spaced from one another to define a zone therebetween, said first and second arrays producing first and second control signals, respectively, in response to detecting the laser reference plane;
- a mounting carried by said vehicle and supporting said detector housing such that said zone is said predetermined distance from said tool, said mounting being movable relative to said vehicle to move said detector housing in response to movement of said tool relative to said vehicle to thereby maintain said predetermined distance between said tool and said zone of said detector when said tool is moved relative to said vehicle;

electrical control circuitry energizable by the power supply and operatively connected to said first and second detecting arrays to receive said first and second control signals from said arrays, said control circuitry connected to said power device and responsive to said first and second control signals to actuate said power device to move said tool relative to said vehicle, causing said detector housing to be moved relative to said vehicle by said mounting so said detector in said detector housing closely follows the laser reference plane to retain the reference plane between said arrays, thus assuring said tool in said predetermined distance from the laser reference plane; and

said detector support frame including means for controlling the coarseness of grading comprising a first carriage with one of said laser beam detecting arrays being mounted on said first carriage, said first carriage being wholly within said detector housing and movably mounted relative to said second array for movement toward and away from said second array to thereby vary the distance of separation between said arrays to permit said zone to be of a predetermined width suitable to the degree of coarseness permissible in working the given land surface.

**4,162,709**  
**SOD HARVESTING SEVERING MEANS FOR FORMING AND ORIENTING INDIVIDUAL SOD PADS**  
 Woodrow L. Wilson, Columbus, Ohio, assignor to Wilson-Miner R & D, Groveport, Ohio

Filed Jul. 21, 1977, Ser. No. 817,547

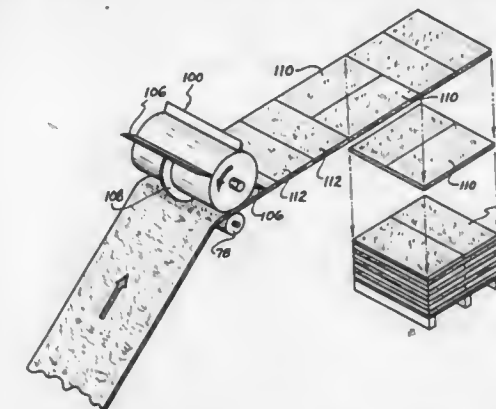
Int. Cl.<sup>2</sup> A01B 45/04

U.S. Cl. 172—20

11 Claims

6. In an apparatus for harvesting sod, the combination of a portable frame means adapted for movement over a field of sod; cutting means mounted on said frame means and adapted to separate a strip of sod from the ground; conveying means mounted on said frame means adjacent to said cutting means for carrying said strip of sod rearwardly; severing means mounted on said frame means adjacent to said conveying means for severing said continuous strip of sod in a manner to

form sod pads of relatively uniform length and width, said severing means including a rotary knife means including a plurality of blades extending transversely to the direction of travel of said strip of sod and at least one blade disposed be-



tween two of said transverse blades and extending longitudinally relative to the direction of travel of said strip of sod; and means for receiving and discharging said sod pads severed by said knife means.

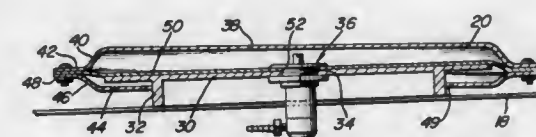
**4,162,710**  
**LOG TRUCK SCALE PAD AND POP-OFF VALVE**  
 Fred E. Sjogren, Coos Bay, Oreg., assignor to Kenneth A. Sjogren, Coquille; Alan L. Sjogren and Glenda J. Sjogren, both of Coos Bay, all of Oreg., part interest to each

Filed Nov. 14, 1977, Ser. No. 854,311

Int. Cl.<sup>2</sup> G01G 19/10, 5/04

U.S. Cl. 177—141

7 Claims

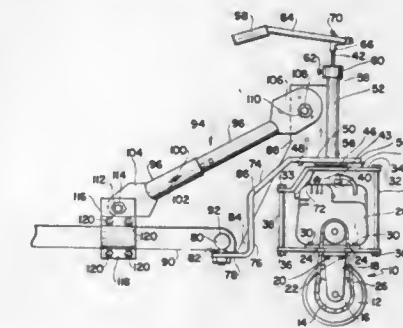


1. A scale pad for a log bunk, said pad including a horizontal table including a central portion and a support portion for rigid support from an underlying vehicle mounting portion, an upper top plate including a downwardly directed peripheral flange and centered over said table, a diaphragm sealingly secured to and extending between remote portions of said peripheral flange below said top plate and overlying and supported from said table and sealingly secured thereto about said central portion, said top plate and table including coating means guiding said top plate from said table for vertical movement relative thereto, limited horizontal shifting relative thereto and limited canting relative thereto in all directions about a central zone of said table, and a vertically elongated pop-off valve assembly sealingly secured through said central portion of said table, including a central upstanding and upwardly projectable tubular piston plunger engageable with the underside of said top plate and projectable upwardly in response to said valve assembly being charged at its lower end below said plunger, said assembly including vent means operative to vent said assembly, below said piston plunger, to the ambient atmosphere in response to upward movement of said plunger beyond a predetermined level and to close said assembly against venting to the ambient atmosphere upon lowering of said plunger below said predetermined level.

**4,162,711**  
**TRAILER DRIVE APPARATUS**  
 Gordon Cornelius, 15231 Jasper St., N.W., Anoka, Minn. 55303  
 Filed Sep. 14, 1977, Ser. No. 833,091  
 Int. Cl.<sup>2</sup> B62D 51/04

U.S. Cl. 180—13

2 Claims



1. A trailer drive apparatus for connection to a trailer hitch and bar comprising a wheel, a gasoline operated engine, an engine mounting plate, said gasoline operated engine having an output shaft, said output shaft rotationally coupled to said wheel, said wheel journaled to said engine mounting plate, a support plate, means to journal said engine mounting plate to said support plate about a vertical axis, means to removably couple said support plate to the trailer hitch on the hitch bar, a truss, one end of said truss pivotably and lockingly engaged to the trailer hitch bar, means to adjustably and lockingly vary the length of said truss, a rod, a plate, one end of said rod fixedly secured to said plate, said plate fixedly secured to said engine mounting plate in spaced apart relationship, said gasoline operated engine disposed intermediate said engine mounting plate and said plate, a tube, one end of said tube fixedly secured to said support plate, a portion of said rod being journaled within said tube, the other end of said truss pivotably and lockingly secured to said tube, a handlebar, said handlebar fixedly secured to the other end of said rod, wherein said support plate extends outwardly from the exterior portion of said gasoline operated engine and downwardly therefrom whereby said gasoline operated engine may be rotated 360° and whereby rotating said handlebar manually causes said motor mounting plate to rotate said 360°.

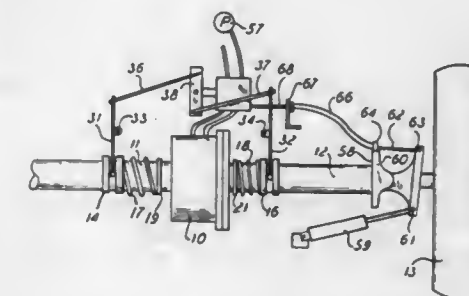
**4,162,712**  
**VEHICLE DIFFERENTIAL CONTROL**  
 Carl D. Nelson, Glendale, Ariz., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 27, 1978, Ser. No. 890,326

Int. Cl.<sup>2</sup> B60K 17/30

U.S. Cl. 180—253

4 Claims



1. In a vehicle drive system having a differential including a fluid actuated lock-up element, two wheel axles drivingly connected with said differential and extending from opposite sides thereof, a ground wheel steerably connected with the extending end of each of said axles, steering mechanism con-

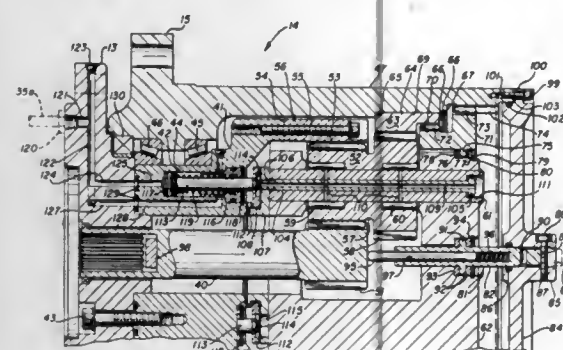
ected with each of said wheels, and a fluid power source, the improvement comprising means for controlling said lock-up element in response to both the relative rotational speeds of said axles and the steering position of said steering mechanism, said controlling means including: a valve housing movably mounted on said vehicle, a closure means movably mounted in said housing whereby relative movement between said closure means and said housing controls fluid flow between said fluid power source and said lock-up element; first means for moving one of said housing and said closure means in response to a relative rotation between said axles, and second means for moving the other of said housing and said closure means in response to movement of said steering mechanism.

**4,162,713**  
**PLANETARY TRANSMISSION WITH HYDRAULIC ENGAGEMENT AND DISENGAGEMENT**  
Marshall D. Heitman, Cedar Hill, and Joe D. Butler, Houston, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 3, 1978, Ser. No. 892,885  
Int. Cl.<sup>2</sup> B60K 7/00

U.S. Cl. 180—242

41 Claims



1. In a planetary transmission shiftable between drive engaged and drive disengaged states: power shift means with transmission shift output means; a transmission housing rotatably mounted on said power shift means; drive power input means adapted for drive power input from a first end of said transmission; a removable cover on a second end of said transmission; sun gear means drive connected to said drive power input means; a planetary carrier; planetary gear means rotatably mounted in said planetary carrier, and with said planetary carrier rotatably mounted within said transmission housing; first ring gear means non-rotatably mounted on said power shift means; second ring gear means rotatably mounted within said transmission housing; said planetary gear means driven by said sun gear means and in meshed engagement with both said first and second ring gears; ring gear clutch means; clutch means non-rotatably mounted by said transmission housing shiftable into and out of clutched engagement with said ring gear clutch means; and axially shiftable transmission means interconnecting shift output means of said power shift means and said clutch means non-rotatably mounted by said transmission housing.

**4,162,714**  
**SAFETY INTERLOCK SYSTEM FOR FIRE TRUCK PUMP THROTTLE CONTROL**

Richard R. Correll, 320 Escobar Rd., Portola Valley, Calif. 94025

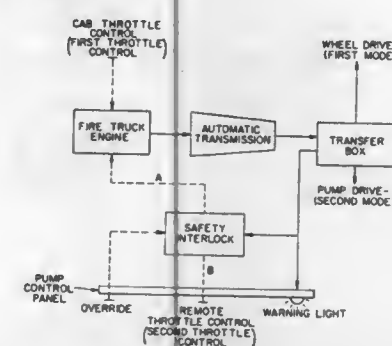
Filed Mar. 15, 1978, Ser. No. 886,860  
Int. Cl.<sup>2</sup> B60K 25/06

U.S. Cl. 180—53 R

17 Claims

1. In a vehicle of the type in which the engine can either propel the vehicle or drive a pump carried by the vehicle for dispensing fluids, the vehicle having a first throttle control which is manually operable from its cab for varying the engine

speed when the vehicle is being driven, and a second throttle control remote from the cab for varying the engine speed when the engine is driving the pump, the vehicle further having a transfer box which is coupled through an automatic transmission to the engine, the transfer box being manually shiftable from a first mode in which it operatively connects the engine with the vehicle wheels, to a second mode in which it operatively connects the engine with the pump, the improvement comprising:

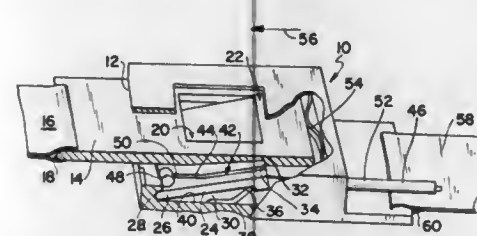


means for detecting the mode of the transfer box; and means responsive to the detection means for locking the second throttle control in its closed position when the transfer box is in its first mode to prevent the engine speed from being advanced from a position remote from the cab while the engine is engaged with the drive wheels of the vehicle.

**4,162,715**  
**AUTOMATIC RELEASING SEAT BELT**  
George Coulombe, 289 Tenby St., Coquitlam, Canada  
Filed Oct. 26, 1977, Ser. No. 845,485  
Int. Cl.<sup>2</sup> B60R 21/10

U.S. Cl. 280—801

4 Claims



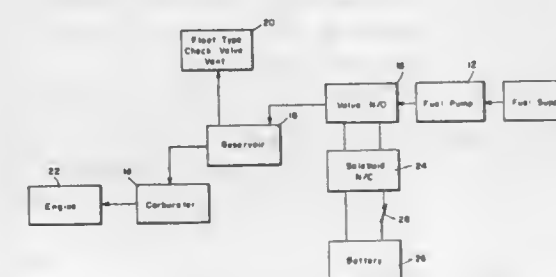
1. An automatic releasing seat belt comprising a pair of belts, one end of one of said pair of belts secured to a tongue-like plate, one end of the other of said pair of belts secured to a housing, means to manually releasably secure said tongue-like plate to said housing, said means to manually releasably secure includes said housing having a cavity, said housing having a slot, said slot communicating with the exterior of said housing and said cavity, said housing having an opening, said opening being disposed adjacent said slot, a camming plate, said camming plate being disposed within said cavity, one end of said camming plate being pivotably engaged within said cavity, said tongue-like plate having an opening, said opening in said tongue-like plate being disposed adjacent said opening in said housing when said tongue-like plate is disposed passing through said slot, the other end of said camming plate being disposed in touching engagement with a portion of the marginal edges of said opening in said tongue-like plate, a spring, said spring urging said other end of said camming plate in said touching engagement, whereby the application of manually applied force to said camming plate causes said other end thereof to be disengaged from said portion of said marginal edges of said opening of said tongue-like plate releasing said

tongue-like plate from said housing, means to release said tongue-like plate from engagement with said housing upon the occurrence of an impact on a sensor, said means to release said tongue-like plate includes a flexible cable, said flexible cable having an inner cable and a sheath, said inner cable slidably engaged within said sheath, a rod, said rod fixedly secured to one end of said inner cable, said rod being disposed within said cavity, said housing having another opening, a portion of said inner cable adjacent said one end thereof disposed passing through said another opening, one end of said sheath adjacent said one end of said inner cable disposed fixedly secured to said another opening, a solenoid, said solenoid having a plunger therein, the other end of said inner cable fixedly secured to said plunger, said solenoid having a housing, the other end of said sheath fixedly secured to said housing of said solenoid, a helical spring, said helical spring urging said plunger outwardly from said solenoid, whereby energizing said solenoid causes said plunger to be urged away from said other end of said sheath and whereby said rod is displaced slidably along a lateral surface of said camming plate causing said other end of said camming plate to be disengaged from said portion of said marginal edges of said opening in said tongue-like plate, means to variably adjust the sensitivity of said sensor responsive to said impact, a timer, means to operate said timer upon said impact, whereby said timer delays said release from engagement of said tongue-like plate to said housing a period of time after the occurrence of said impact.

**4,162,716**  
**FORCED ENGINE DISABLEMENT SYSTEM**  
Howard D. Lisnow, 2765 Carson St., Torrance, Calif. 90503  
Filed Feb. 21, 1978, Ser. No. 879,095  
Int. Cl.<sup>2</sup> B60R 25/04

U.S. Cl. 180—287

8 Claims



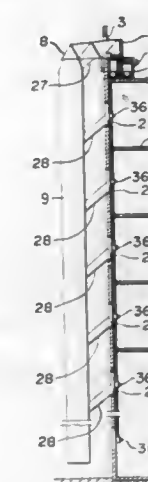
1. A theft protection device for limiting fuel in a vehicle having a fuel pump, a carburetor and an engine comprising: a reservoir located above the carburetor connected in series with the fuel line between the fuel pump and the carburetor and adapted to hold a limited supply of fuel, a float type check valve vent located in the uppermost part of said reservoir for sealing said vent in the presence of fuel from the fuel pump filling said reservoir, and a single normally opened controllable valve connected in series with the line between the fuel pump and said reservoir for pressurizing said reservoir with fuel from the fuel pump and feeding said pressurized fuel from said reservoir to said carburetor whereby closing said normally opened controllable valve gravity feeds the engine with said limited fuel from said reservoir by opening said float type check valve vent until the fuel is exhausted and the engine stalls.

**4,162,717**  
**ESCAPE DEVICE**  
Katsuo Orii, and Haruo Fushima, both of Sagami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1977, Ser. No. 852,499  
Claims priority, application Japan, Nov. 29, 1976, 51-143102; Nov. 29, 1976, 51-143107; Dec. 15, 1976, 51-151387  
Int. Cl.<sup>2</sup> A62B 1/20

U.S. Cl. 182—48

5 Claims

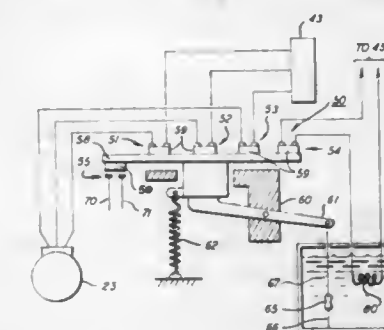


1. A fire escape comprising an escape means; a hardware which is expandable or foldable and hangs said escape means therefrom; a storage container for storing said escape means and said hardware; and a brace frame which has said hardware provided in said storage container so as to be movable vertically from the inside of said storage container; whereby, with raising of said brace frame, a part of said escape means is thrown out and down from said storage container and the falling force of said escape means partly thrown out is used to pull out said remaining escape means and to deploy said hardware.

**4,162,718**  
**HYDRAULIC ELEVATOR**  
Donald F. Lamprey, 114 Glenwood Dr., Liverpool, N.Y. 13088  
Filed Aug. 15, 1977, Ser. No. 824,295  
Int. Cl.<sup>2</sup> B66B 5/02

U.S. Cl. 187—29 A

4 Claims



1. In a hydraulically operated lift of the type having a motor driven pump for drawing fluid from a reservoir and delivering the fluid under pressure to a ram adapted to raise and lower the lift, valve means for directing fluid between the reservoir and the ram, computer means for controlling the operation of the pump motor and the valve means to raise and lower the lift, the improvement comprising switch means having motor contacts electrically interposed between a starter and the pump motor, said switch means



being movable between a first operative position in which the motor contacts are closed to provide power to said motor and a second operable position in which said motor contacts are opened to inactivate said motor, biasing means for urging the switch means toward the second operable position, and thermal sensitive means in heat transfer relation with the fluid contained in the reservoir for physically holding the switch in said first operative position when the temperature of the fluid is below a predetermined level and to immediately release the switch means when the fluid temperature reaches said predetermined level whereby the pump motor is immediately inactivated.

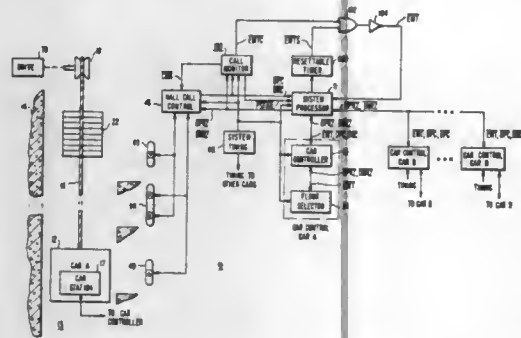
#### 4,162,719 ELEVATOR SYSTEM

Alan L. Husson, Hackettstown, and Marvin Kurland, East Brunswick, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1977, Ser. No. 856,065  
Int. Cl.<sup>2</sup> B66B 5/02

U.S. Cl. 187—29 R

7 Claims



1. An elevator system for a building having a plurality of floors, comprising:  
a plurality of elevators cars,  
first means mounting said plurality of elevator cars for movement in the building to serve the floors therein,  
second means for registering calls for elevator service,  
car control means for each of said plurality of elevator cars, said car control means enabling each elevator car to respond to a call for elevator service registered on said second means,  
third means for operating said elevator cars under group supervisory control to serve said calls for elevator service,  
fourth means providing a reset signal for said second means when an elevator car serves a registered call for elevator service,  
and monitoring means responsive to said second and fourth means, said monitoring means including timing means having a predetermined timing period, said timing means being enabled to run as long as there is an unanswered call for elevator service registered on said second means, said timer means being reset to the start of its predetermined timing period each time said fourth means resets any registered call for elevator service, said monitoring means providing a predetermined control signal when said timing means is not reset by said fourth means and is allowed to reach the end of its predetermined timing period,  
said third means being responsive to said monitoring means, removing said elevator cars from group supervisory control by said third means in response to the predetermined control signal being provided by said monitoring means.

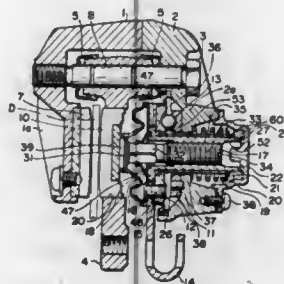
#### 4,162,720 MECHANICAL DISC BRAKE

Tetsuo Harakawa, Funabashi, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Nov. 10, 1977, Ser. No. 850,485  
Claims priority, application Japan, Nov. 20, 1976, 51-139921  
Int. Cl.<sup>2</sup> F16D 65/56

U.S. Cl. 188—71.9

4 Claims



1. A mechanical disc brake comprising:  
a rotary disc;  
a caliper having first and second legs disposed on the opposite sides of said rotary disc;  
said second leg having a through-hole extending in the axial direction of said disc;  
said first leg having mounted thereon a first friction pad facing a first side of said disc;  
a stationary support having mounted thereon a second friction pad facing a second side of said disc;  
a bolt extending between said first and second legs and having an intermediate portion slidably received in said support;  
a ramp member mounted against rotation on said second leg;  
a rotational input receiving lever mounted for rotation;  
a linear output generation member connected to said lever for movement in unison therewith;  
balls received in aligned grooves formed in adjacent faces of said ramp member and said linear output generation member, such that rotation of said lever and said linear output generation member will cause linear movement of said lever and said linear output generation member away from said ramp member and toward said disc;  
a leaf spring mounted for movement in unison with said lever, said leaf spring having ratchet pawls;  
a nut including an integral flange having an outer periphery which is positioned between said linear output generation member and said leaf spring, such that said nut is moved linearly upon linear movement of said linear output generation member, said flange having an inner face formed with ratchet teeth for engaging said ratchet pawls;  
a push rod extending through said nut in threaded engagement therewith for applying said second friction pad against said second side of said disc upon linear movement of said nut;  
a spring having first and second ends, said first end of said spring abutting against said second leg; and  
a sleeve rotatably surrounding said nut and having an open first end connected to said linear output generation member and an open second end abutting against said second end of said spring, such that said spring normally biases said linear output generation member towards said second leg.

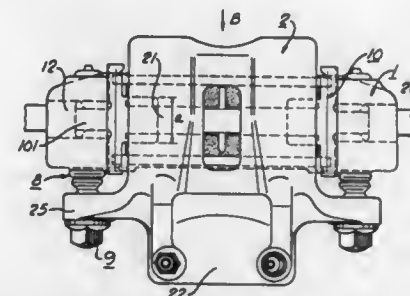
#### 4,162,721 SLIDING CALIPER TYPE DISC BRAKE

Michio Moriya, Toyonaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,516  
Claims priority, application Japan, Jul. 28, 1976, 51-101601[U]; Mar. 3, 1977, 52-23436; Apr. 14, 1977, 52-47608[U]  
Int. Cl.<sup>2</sup> F16D 65/02

U.S. Cl. 188—73.3

12 Claims



1. A sliding caliper type disc brake comprising, a brake disc which is capable of rotation, a torque member which is fixed to the frame of the vehicle or another similar part of the vehicle and which has circumferentially spaced torque receiving parts on both sides of the disc respectively, friction pads which are coupled with said torque receiving parts and guided so as to be mutually slidable on said torque receiving parts to permit frictional braking engagement of said pads to opposite sides of said disc, and a caliper member which straddles over the outer circumference of said disc and is operable to move said friction pads into braking engagement with said disc, said caliper slidably guided with respect to said torque member by a pair of pins connected to and extending from one of said members and slidably received in corresponding guide holes penetrating through the other of said members, the improvement comprising a pair of bush boots of an elastic material seated in and lining said guide holes and normally closed at one end thereof for respectively slidably receiving said pins therein and normally closing off the free ends of said pins from the exterior atmosphere, said bush boots having integral dust boots at the other ends thereof which freely expand and contract between said members to close off said pins from the exterior atmosphere at their ends of extending connection to said one member, a small aperture provided in the normally closed end of said bush boots to vent the interior volume of said bush boots between the free ends of said pins and the normally closed end of said bush boots directly to the exterior atmosphere and said apertures being normally closed by the elasticity of said bush boots to prevent entry therethrough of foreign matter into the interior volume of said bush boots.

#### 4,162,722

#### APPARATUS FOR COLLATING CANS AND OTHER ARTICLES

Leon Early, Mistletoe Farm, Wendling, Norwich, Norfolk, England

Filed Jan. 7, 1977, Ser. No. 757,542  
Claims priority, application United Kingdom, Jan. 10, 1976, 906/76

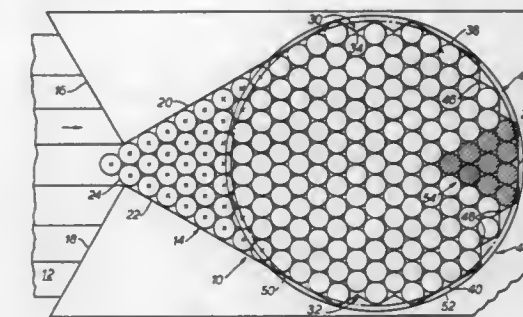
U.S. Cl. 198—418

Int. Cl.<sup>2</sup> B65G 47/26

9 Claims

1. In a collating apparatus for grouping and nesting articles of circular cross-section for subsequent handling, said apparatus having:  
conveyor means for advancing a plurality of said articles in a direction of travel,  
converging wall means disposed above said conveyor to engage said articles, said converging wall means being spaced to define a throat therebetween through which the articles must pass, and,  
group-forming wall means downstream of said throat to and

against which articles are conveyed by said conveyor means;  
the improvement comprising:  
said group-forming wall means having a central rectilinear wall length wider than said throat against which articles initially passing through said throat engage and abut, said wall length being disposed substantially perpendicular to said conveyor means direction of travel,



said central wall length on each end thereof connecting with pocket-forming wall lengths having irregular article-engaging surfaces and extending generally laterally and upstream of said conveyor means direction of travel, thereby to define an overall generally semi-circular group-forming wall means, and,  
diverging wall lengths extending downstream from said throat and connecting respectively with the upstream ends of said pocket-forming wall lengths.

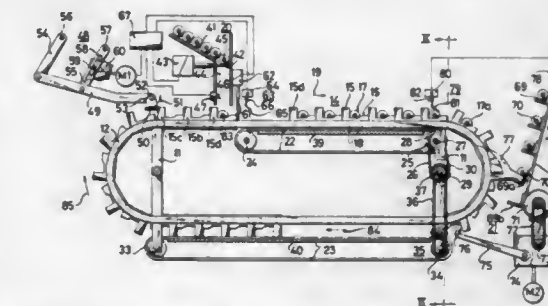
#### 4,162,723 BUFFER STORAGE DEVICE FOR TRANSFERRING TEXTILE COILS

Willi Küpper, Rickelrath, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 718,519, Aug. 30, 1976, abandoned.  
This application Mar. 14, 1978, Ser. No. 886,410  
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 2538273

Int. Cl.<sup>2</sup> B65G 35/06, 43/08  
U.S. Cl. 198—469

7 Claims

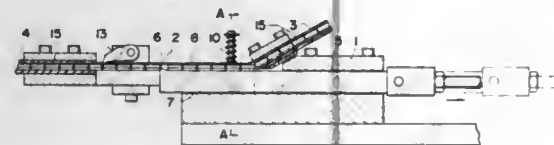


1. Buffer storage device for transferring textile coils from an irregularly operating coil feeding device to a uniformly advancing coil delivery device having a given coil delivery velocity comprising a multiplicity of identical transport elements for at least one textile coil, respectively, said transport elements being shiftable towards one another, a conveyor section extending from the coil feeding device to the coil

delivery device, said transport elements being movable on said conveyer section from the coil feeding device to the coil delivery device, and means for varying the velocity of travel of said transport elements along said conveyer section in at least two velocity states so that the travel velocity thereof before reaching the coil delivery device, in travel direction of the transport elements, corresponds to the given coil delivery velocity and otherwise is greater than the coil delivery velocity.

**4,162,724**  
**COMPONENT CONVEYING ARRANGEMENT**  
Katsumi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo Seikakusho, Osaka, Japan  
Filed Dec. 12, 1977, Ser. No. 859,592  
Claims priority, application Japan, Dec. 11, 1976, 51-166294[U]

Int. Cl.<sup>2</sup> B65G 25/10  
U.S. Cl. 198—534 22 Claims

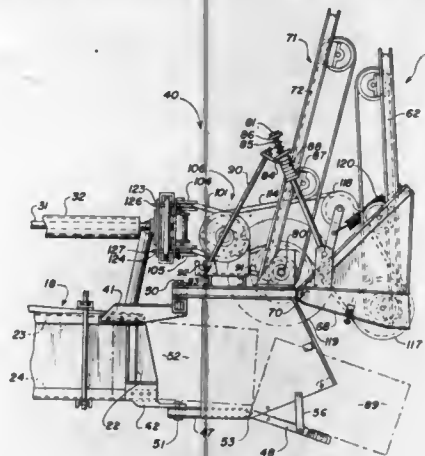


1. A conveyor arrangement for conveying small component parts to an automatic assembling machine, the arrangement comprising:  
a support means,  
guide track means,  
guide track means extending along at least a portion of a length of the support means for guiding a movement of the component parts,  
means reciprocally arranged at said support means for advancing said component parts from said guide track means, and  
means for preventing the component parts from leaving said guide track means including a pair of plate elements arranged on respective sides of said guide track means so as to at least partially overlie the same, means for fixing each of said plate elements to said support means so that a first end of each of said plate elements is fixedly mounted at said support means and a second end of each of said plate elements is freely movable within predetermined limits.

**4,162,725**  
**BALE THROWER**  
Charles A. Smith, New Holland, and Clair S. Adams, Akron, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.  
Filed Jun. 30, 1977, Ser. No. 811,792  
Int. Cl.<sup>2</sup> B65G 15/14, 31/02, 21/10  
U.S. Cl. 198—628 10 Claims

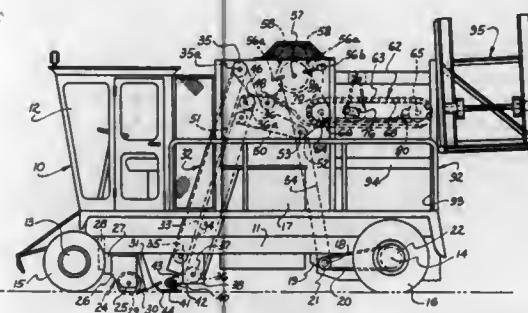
4. The combination of a hay baler and a bale thrower, said combination comprising:  
(a) a hay baler having an elongated bale case which extends in a fore-and-aft direction relative to ground travel, said bale case having a top wall and a bottom wall and including a rearward end opening through which bales are discharged;  
(b) a first frame means affixed to the discharge end of the bale case;  
(c) a second frame means pivotally fixed about a vertical axis to said first frame means;  
(d) a bale thrower pivotally affixed to said second frame means for selective movement about at least one horizontal axis between a first position in operative alignment

with said rearward end opening of said bale case and a second position wherein said entire bale thrower is substantially out of alignment with said rearward end opening of said bale case; and  
(e) drive means operably connected to said bale thrower.



stantially out of alignment with said rearward end opening of said bale case; and  
(e) drive means operably connected to said bale thrower.

**4,162,726**  
**SOD HARVESTING MACHINE HAVING MEANS FOR CONVEYING AND STACKING SOD PADS**  
William W. Hudson, and Woodrow W. Wilson, both of Columbus, Ohio, assignors to Wilson-Miner R & D, Groveport, Ohio  
Filed Jul. 21, 1977, Ser. No. 817,710  
Int. Cl.<sup>2</sup> B65G 15/04, 47/36, 67/08; A01B 45/04  
U.S. Cl. 198—678 10 Claims



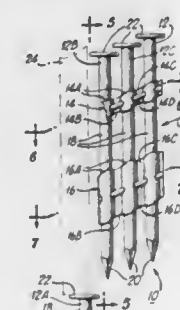
10. In a machine for handling sod pads, the combination of:  
a frame;  
a conveyer supported on said frame for movement along a conveyer path including a plurality of spaced apart conveyer members each carrying a plurality of teeth disposed at locations to penetrate the sod pads from the top in a manner to successively carry the pads along said conveyer path; means for driving said conveyer along said conveyer path; means for discharging the sod pads from said teeth at a preselected location along said conveyer path, said last mentioned means including a plurality of stripper members for stripping the sod pads off of said teeth; means mounting each stripper member on the frame for movement along a stripping path carrying the respective stripper members between said conveyer members and against a sod pad disposed at said preselected location to strip the pad off of said teeth; and power means for driving each stripper member along its stripping path.

**4,162,727**  
**CONVEYOR BELT**  
Frank B. Summers, Marblehead, Mass., assignor to Fabreeka Products Company, Boston, Mass.  
Filed Oct. 26, 1977, Ser. No. 845,634  
Int. Cl.<sup>2</sup> B65G 15/42, 21/20  
U.S. Cl. 198—688 1 Claim



1. The combination with a conveyor frame and flat bed supported thereby of a conveyor belt arranged to be moved along the bed, said belt comprising a laminate of two fabric plies with a ply of rubberoid therebetween, said belt having a flat bottom surface for freedom of movement along the bed and a top side for implementing motion to material to be transported by the belt, said top side comprising parallel, longitudinally spaced, transversely extending, upwardly-convex ribs interspersed with flat planar surfaces and said ribs occupying a major portion of the width of the belt between its longitudinal edges, rigid skirt boards mounted to the frame along the opposite longitudinal sides of the bed, said rigid skirt boards overlying the opposite side of the belt and having top sides sloping obliquely downwardly toward the top of the bed for confining material transported by the belt, and bottom sides parallel to and spaced from the bed and said belt having along its opposite longitudinal sides planar portions, the surfaces of which lie in the plane of the interspersed planar portions, said planar portions at the sides extending laterally from the ends of the ribs beneath the bottom sides of the skirt board, longitudinally-extending grooves in the top side of the belt situated between the planar surfaces at the sides and the ends of the ribs and flexible skirts fastened to the inclined top sides of the skirt boards so as to slope downwardly toward the top of the belt and positioned with their lower edges extending beyond the lower edges of the skirt boards into the longitudinally-extending grooves.

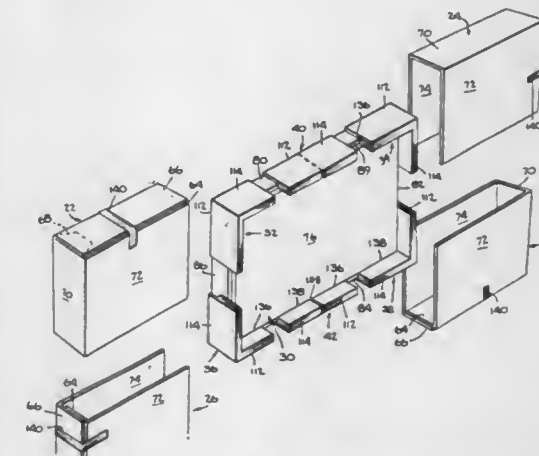
**4,162,728**  
**FASTENER ASSEMBLY**  
Ali I. Uzumcu, Elk Grove Village; Elmer J. Thorsen, Jr., Wood Dale, and Robert M. Demkowicz, Cicero, all of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.  
Filed Dec. 8, 1977, Ser. No. 858,835  
Int. Cl.<sup>2</sup> B65D 73/02  
U.S. Cl. 206—345 17 Claims



1. In a fastener assembly of the type including a pair of frangible strips holding a plurality of fasteners with their shanks parallel and with their heads and points disposed at opposite sides of the assembly; the improvement in accordance with which the strip adjacent the points of the fasteners is substantially stronger than the strip adjacent the fastener

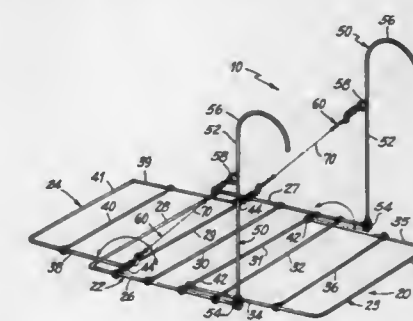
heads, said strips being formed of extruded plastic material, and said stronger strip having an overall average height significantly larger than that of said weaker strip.

**4,162,729**  
**PROTECTIVE PACKAGING DEVICE**  
Louis Kaiser, Orange, and Charles J. Pascal, Newtown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.  
Filed Oct. 17, 1977, Ser. No. 842,643  
Int. Cl.<sup>2</sup> B65D 5/42, 85/30  
U.S. Cl. 206—592 17 Claims



1. In combination with an article having a stepped peripheral side portion, a packaging insert comprising, a sheet of flexible foldable material of predetermined thickness having front and rear surfaces, opposite upper and lower edges and first and second side edges, a first, second, third and fourth score-line extending across said first and second side edges at respective predetermined spacings from said upper edge to form four equal first, second, third and fourth foldable portions, and a tail portion extending beyond said fourth scoreline to said lower edge, said insert being folded along said first, second, third and fourth scorelines in accordion fashion, to form a stepped away portion from said tail portion, the predetermined thickness of said insert being selected such that the stepped away portion of said insert substantially corresponds with and engages the stepped peripheral side portion of said article.

**4,162,730**  
**PORTABLE ARTICLE HANGER**  
William H. Steere, Jr., and Marjorie S. Steere, both of 53A Cambridge Ct., Lakewood, N.J. 08701  
Filed Apr. 18, 1977, Ser. No. 788,548  
Int. Cl.<sup>2</sup> A47F 5/01  
U.S. Cl. 211—118 5 Claims



1. A portable article hanger adapted for folding into a compact configuration when not in use, comprising:



- (a) an article support unit comprised of (i) a central planar array of article support elements comprising a peripheral frame element and a plurality of spaced, transverse article support elements disposed between opposing sides of said frame element and (ii) at least one terminal planar array comprising a peripheral frame element and a plurality of transverse article support elements disposed between said opposing sides of said frame element, said terminal planar array being in pivotal engagement with the penultimate transverse article support element of one end of the central array and adapted for cantilevered engagement with the ultimate article support element thereof, said penultimate transverse article support element being in adjustable slidable engagement with said frame element of said central planar array; and
- (b) a means for pendulously suspending said article support unit in a plurality of erected positions for actively supporting articles, said suspending means comprising:
- a suspension element; and
  - a linearly adjustable element, which is adapted to be adjusted in length, said linearly adjustable element being in operative engagement with the suspension element and the article support unit for adjustably stabilizing said article support unit in a substantially horizontal plane by changing said article support unit from one erected position to another, whereby the center of gravity of the hanger is altered.

4,162,731

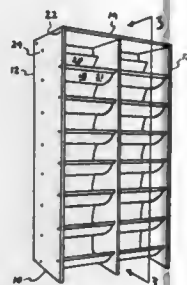
**LIGHTWEIGHT, QUICK ASSEMBLY FURNITURE**

Theodore C. DeGroot, Box 17-2, Lebanon, N.J. 08833

Filed Jan. 9, 1978, Ser. No. 867,666

Int. Cl.<sup>2</sup> A47F 5/00

U.S. Cl. 211-126



1. An article of furniture comprising: a plurality of load bearing members formed from a light weight and low strength material; a plurality of extending members interconnecting said load bearing members for forming a shell therewith when interconnected; a shelf means formed from a light weight flexible material having a first engaging surface formed thereon for engaging said extending members; said engaging surface having a flexible detent member formed thereon for engaging said extending member in a positive locking action; and, said engaging surface is formed in an "e" shape where the open portion of the "e" is smaller than said extending member; said "e" is formed into a latch member which requires releasing to nondestructively remove the extending member from engagement with said "e" shape.

4,162,732

**COIL TRANSFER MACHINE**

Howard E. Redman, Duxbury, Mass., assignor to Mathewson Corporation, Quincy, Mass.

Filed May 9, 1977, Ser. No. 795,329

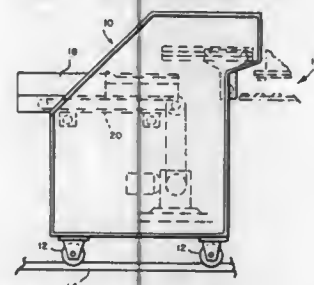
Int. Cl.<sup>2</sup> B21F 45/00; B66C 1/42

U.S. Cl. 414-736

2 Claims

1. Apparatus for presenting a row of coils with the coils in the row at a predetermined spacing and properly oriented to coil receiving means at a different predetermined spacing in a

spring assembly machine comprising a plurality of spaced magazines for receiving groups of coils, coil gripping means situated at the discharge ends of the magazines for gripping the coils at said ends and transferring them to the receiving means of the spring assembly machine, means supporting the gripping means for arcuate movement about a horizontal axis from a position confronting the magazine to a position confronting the assembly machine and for relative movement along the support to change the spacing between the coils from the spacing corresponding to the spacing of the magazines to a spacing corresponding to the spacing of the coil receiving means of the spring assembly machine, said means supporting the gripping means comprising a rotatably oscillatable beam, blocks corresponding in number to the gripping means having at one side planar surfaces to which the grippers are attached and means at the other side for mounting the blocks to the beam for move-



ment longitudinally thereof and relative to each other, spaced parallel lugs at the upper ends of the blocks, means connecting the lugs of adjacent blocks, said means collectively connecting all of the blocks longitudinally of the beam, said means being adjustable to determine the minimum distance between blocks and further adjustable to limit the maximum distance between blocks, a rigid rod connected to the block at one end of the beam, means for rotating the beam to move the blocks arcuately in planes perpendicular to the axis of the beam approximately 180° from a position in which the grippers confront the coils in the magazines to a position in which they confront the receiving means of the spring assembly machine and means for effecting reciprocation of the rod lengthwise of the beam in timed relation to the oscillation of the beam to effect movement of the grippers along the beam from a spacing corresponding to the spacing of the magazines to a spacing corresponding to the spacing of the receivers.

4,162,733

**ARTICLE STACKING APPARATUS**

Raymond L. Wiseman, 1550 S. Macon St., Aurora, Colo. 80012

Filed Jun. 21, 1977, Ser. No. 808,715

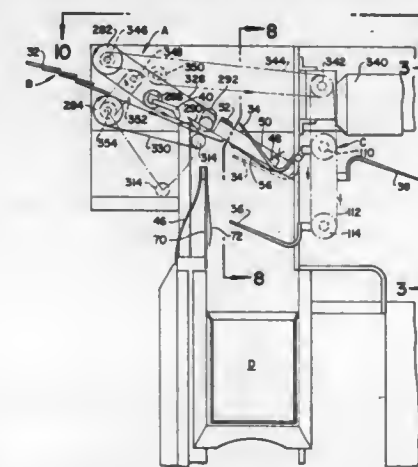
Int. Cl.<sup>2</sup> B65G 57/06

U.S. Cl. 414-78

33 Claims

1. Stacker apparatus comprising: bottom support means movable downwardly from an upper position for receiving and forming a stack of flat articles moving generally flatways one after another transversely toward said stacker apparatus, said support means in said upper position being first movable generally downwardly with snap acting intercept motion for intercepting the leading edge of a flat article and beginning formation of a new stack of such articles, said support means then being movable downwardly with stack forming motion different from said intercept motion, said support means being

movable substantially more rapidly with said intercept motion than with said stack forming motion, and said intercept motion



and said stack forming motion also being substantially different from one another by motion characteristics other than speed.

4,162,734

**ALIGNING AND STACKING ARRANGEMENT**

Karl Dangelmaier, Göppingen-Holzheim, and Alfred Bareis, Uhingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

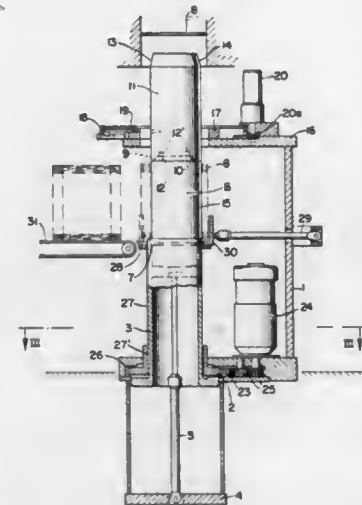
Filed Nov. 28, 1977, Ser. No. 855,267

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653914

Int. Cl.<sup>2</sup> B65G 57/16; B65H 31/32

U.S. Cl. 414-27

7 Claims



1. An arrangement for aligning and stacking laminations and for transporting formed stacks of laminations, the laminations being provided with a circular inner and/or outer circumference and having stamped patterns defining a plurality of stampings distributed about the circumference of the laminations at equal centering angles, the arrangement comprising:

a stack forming means for receiving laminations fed individually thereto including at least two stack forming elements mounted so as to be selectively separable, said stack forming elements being disposed one above the other in a longitudinal direction of the stack forming means so as to form an upper stack forming element and a lower stack forming element, means selectively displaceable into and out of an intermediate stack forming area which surrounds the stack forming means at least in an area of the upper stack forming element for selectively engaging said upper stack forming

element so as to maintain said upper stack forming element in a fixed position when said lower stack forming element is displaced to a lowered position and for forming an intermediate stack of laminations including a first ring member rotatably mounted at the intermediate stack forming area, a second ring member fixedly mounted at the intermediate stack forming area, means for selectively rotating said first ring member relative to said second ring member, a plurality of intermediate stack forming members displaceably mounted in said second ring member for a radial displacement, and means arranged at said first and second ring members for causing a displacement of the intermediate stack forming members upon a rotation of said first ring member, and means for rotating only said lower stack forming element through stepwise predetermined increments when said lower stack forming element is in the lowered position with the predetermined increments being constituted by a whole number multiple of the central angle of the stampings.

4,162,735

**SELF-LOADING/UNLOADING APPARATUS FOR CARGO CARRYING TRUCK OR TRAILER**

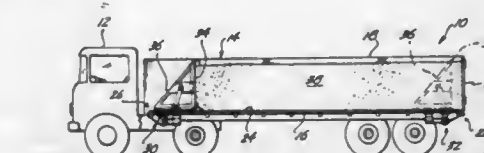
Milburn Lewis, 18418 94th Ave. NE., Bothell, Wash. 98011

Filed Jul. 26, 1977, Ser. No. 819,122

Int. Cl.<sup>2</sup> B60P 1/00

U.S. Cl. 414-514

7 Claims



1. In a self-unloading apparatus for a cargo-carrying truck or trailer body having sidewalls and a bed therebetween that extends from a forward end to an aft end of the body, wherein said apparatus is the type including a flexible belt covering said bed and means for driving said belt fore and aft, and further including a load pushing bulkhead disposed between said sidewalls and mounted for relative fore and aft movement with respect to said bed, the combination therewith comprising:

a support frame for said bulkhead, said support frame supportively mounting said bulkhead on said body for fore and aft movement relative thereto;

an elongate drive bar affixed to said belt so as to extend crosswise of said bed;

forward and rear drive bar catch means provided on said bulkhead support frame and arranged with respect to said drive bar means such that aft movement of said belt relative to said bulkhead during an unloading operation causes said drive bar means to move into contact with said aft shoulder means and entrain said bulkhead along with said belt as said belt is driven aft during unloading of cargo from the body, and such that forward movement of said belt relative to said bulkhead causes said drive bar means to move into contact with said forward catch means on said bulkhead frame to entrain said bulkhead along with said belt as said belt is driven forward to return said belt and bulkhead to their initial positions adjacent the forward end of said bed, said forward and rear catch means being spaced apart in the fore/aft direction so as to cause a lost motion of said bulkhead relative to said belt at the beginning of each unloading operation, and,

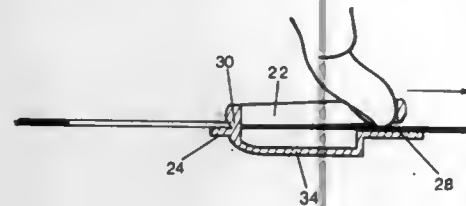
parallel motion means connected between said drive bar means and said bulkhead support frame for maintaining said bulkhead parallel to said drive bar means during the lost motion of said bulkhead relative to said belt.

Fig. 1 is a perspective view of a mechanical device, likely a lamp or light fixture. It features a base (20) with a central column (21) rising from it. The top assembly (22) includes a lamp housing (27) with a lens (28) and a reflector (29). Various components are labeled with numbers and letters, including 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 81

and further independent safety lack means carried in part by said cover and in part by said body for preventing relative movement from said first position to said second position during a superpressure condition when the pressure sealed in said cooker exceeds that ambient to said cooker by more than a predetermined amount, and for venting said cooker except during said superpressure condition in said first relative position.

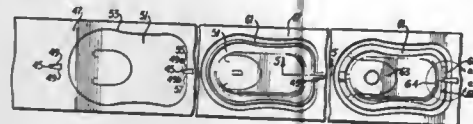


**4,162,742**  
**EASY OPENING TOP CLOSURE MEMBER FOR A CONTAINER**  
 Kuno J. Vogt, 4250 1/2 Fairmont Ave., San Diego, Calif. 92105  
 Filed Jul. 24, 1978, Ser. No. 927,368  
 Int. Cl.<sup>2</sup> B65D 41/32  
 U.S. Cl. 220—269



1. An easy opening top closure member for a containing comprising:  
 a container top member having an aperture of a predetermined configuration,  
 a closure member for said aperture having an exterior portion and an interior portion,  
 said exterior portion being in the form of a retaining ridge that extends upwardly from said interior portion, said retaining ridge functioning to provide a surface against which the tip of a finger can be pushed to uncover and also cover said aperture,  
 said interior portion being in the form of a disc whose lateral dimensions are greater than that of said aperture whereby the outer periphery of said disc functions as a pressure sealing lip against the underside of said top member, and the lower portion of said retaining ridge being frangibly connected to said disc along a predetermined portion of said retaining ridge whereby either a downward force against a predetermined area of said disc or an upward pulling force against a predetermined portion of said retaining ridge will cause said retaining ridge to separate from said disc along said predetermined frangible portion thereby allowing said closure member to be slid rearwardly and forwardly to respectively open and close said closure member.

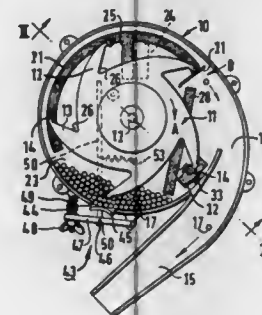
**4,162,743**  
**TAB SYSTEM**  
 Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.  
 Division of Ser. No. 865,447, Dec. 29, 1977, Pat. No. 4,130,074.  
 This application Jul. 21, 1978, Ser. No. 926,669  
 Int. Cl.<sup>2</sup> B65D 41/32  
 U.S. Cl. 220—270



1. In a tab comprising a body having an inner surface to be mounted facing a container wall, said container wall having a tear panel therein, an outer surface to be mounted facing away from said container wall, a lifting end to be lifted away from the container wall to sever said tear panel, an attachment portion for fastening said tab to said container wall and for allowing pivotal movement of said tab when said lifting end is lifted and a forward end for impinging with force on said container wall and tab dab is thereby caused to pivot, the improvement comprising an end portion of a severed stitch affixed to an end of said tab, said stitch being located between the ends of an outer peripheral edge of the body which is curled onto the inner surface thereof except at a gap formed at

said stitch and wherein said gap is equal in width to the width of said stitch.

**4,162,744**  
**SEED DISPENSING DEVICE**  
 Robert J. Barker, 26 Ashley Rd., Newmarket, Suffolk, and Brynley M. Barker, 18 Saxon Rise, Bury St. Edmunds, Suffolk, both of England  
 Filed Oct. 27, 1977, Ser. No. 846,011  
 Claims priority, application United Kingdom, Oct. 28, 1976, 44763/76  
 Int. Cl.<sup>2</sup> A01C 7/04  
 U.S. Cl. 221—251

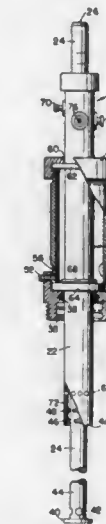


1. A seed dispensing device comprising a housing defining a reservoir for holding a mass of seeds, a wheel member mounted in a substantially vertical plane for rotation in one direction within said housing, a number of spoke-like projections radiating from said wheel member, a cup mounted on the radially outer end of each said projection and so oriented that the cup mouth opens tangentially and forwardly in said direction of rotation of the wheel member for picking up one seed from the reservoir on rotation of said wheel member, opposed brushes arranged within the housing beyond the reservoir in said direction of rotation which brushes brush against the cups to aid retention of seeds therein as each cup is rotated past the top dead center position, outlet means from said housing situated outside the periphery of wheel member beyond said brushes in the direction of rotation for receiving seeds discharged from said cups under the combined action of centrifugal and gravitational forces and dispensing the same, ejecting means to eject foreign matter from the mass of seeds contained in the reservoir, the ejecting means comprising an aperture formed in the lower part of the housing, a plate partially blocking said aperture, and driving means to impart an oscillatory movement to the plate whereby foreign matter is rolled out of the aperture when said plate is oscillated by said driving means, and cleaning brush means for cleaning each cup prior to the cups entering the mass of seeds in said reservoir.

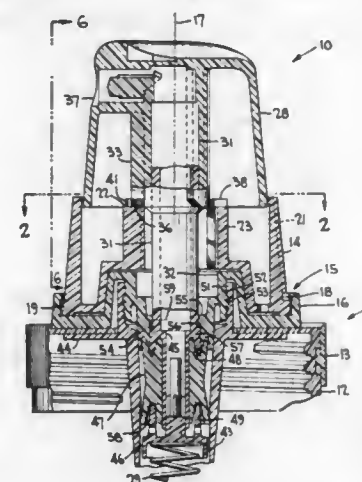
**4,162,745**  
**SUBSTANTIALLY DRIP-PROOF PROBE FOR EXTRACTING TOXIC FLUIDS FROM HERMETICALLY SEALED CONTAINERS**  
 David L. Anderson, Jr., 23799 Monterey, Salinas Hwy. Unit #51, Salinas, Calif. 93901  
 Continuation-in-part of Ser. No. 807,823, Jun. 20, 1977, Pat. No. 4,108,336. This application Oct. 11, 1977, Ser. No. 840,973  
 Int. Cl.<sup>2</sup> B08B 3/02, 9/08; B67D 5/02  
 U.S. Cl. 222—148

1. In a probe adapted to be employed in extracting a liquid chemical from a shipping container characterized by a pouring spout of a tubular configuration having an external thread, the improvement comprising:  
 an extensible extraction stinger of a tubular configuration; coupling means including a collar concentrically related to the stinger having an internally threaded cavity adapted to receive an externally threaded pouring spout in a threaded relationship, and a bore coaxially related to said cavity for

supporting said stinger for reciprocation relative to the cavity adapted to releasably couple the probe to the spout and supporting the stinger for axial extension through said



**4,162,746**  
**LIQUID DISPENSER LOCKING MEANS**  
 Walter F. Anderson, West Covina, and Ronald A. Meyer, San Dimas, both of Calif., assignors to Diamond International Corporation, New York, N.Y.  
 Filed Jun. 22, 1977, Ser. No. 809,008  
 Int. Cl.<sup>2</sup> B65D 47/34  
 U.S. Cl. 222—153

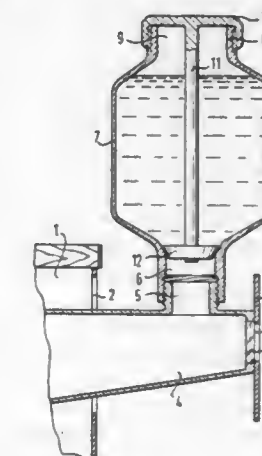


1. A liquid dispenser, comprising, a container closure member, a locking member mounted on said closure member for rotation about a central axis thereof, a plunger member disposed for reciprocating movement between a lowered position and a spring-biased raised position, said plunger member being rotatable about said central axis and extending through axial openings in said closure and said locking members, said locking member including an annular abutment surrounding said plunger member and extending radially thereof, said plunger member including at least one radially extending rib having a first radial extent and an end surface engageable with said annular abutment for maintaining said plunger member in said raised position, said annular abutment having at least one groove for the reception of said rib upon relative rotation of said locking member and said plunger member thereby permitting said plunger member to be reciprocated to said lowered

position, said abutment having a pair of pegs adjacent opposite sides of said groove and another peg spaced from said groove, said pegs extending toward said plunger member with at least portions thereof lying at radial distances from said axis less than said first radial extent of said rib whereby, when said plunger member is locked in said raised position, said plunger member and said locking member are rotatable together in one direction and another as said rib respectively abuts one of said pair of pegs and said another peg, said pair of pegs preventing inadvertent alignment between said rib and said groove so that said plunger member remains in said locked position until said rib is forced past one of said pair of pegs into alignment with said groove upon relative rotation of said plunger member and said locking member.

**4,162,747**  
**REFILL CONTAINER FOR PUMPABLE ACTIVE INGREDIENTS OF WASHING AGENTS**  
 Richard Graf, Berlin, Fed. Rep. of Germany, assignor to Bosch Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Apr. 21, 1977, Ser. No. 789,620  
 Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622125  
 Int. Cl.<sup>2</sup> B67D 3/00

U.S. Cl. 222—185



1. The refill container for pumpable active ingredients of washing agents to replenish washing agents stored in supply receptacles with filling openings in a washing machine for cleaning household articles which washing agents can be conducted into the cleaning chamber of the washing machine by pump devices, comprising a non-collapsible fill container having a pouring spout, the shape and size of which fits exactly the shape and size of the filling opening of the supply receptacle of the washing machine and has means for tightly but detachably connecting the pouring spout to the filling opening whereby the refill container is temporarily attached to the filling opening to empty its contents into the supply receptacle of the washing machine and whereby by virtue of the pouring spout fitting exactly the shape and size of the filling opening, ensuring that the contents of the container enter the supply receptacle intended for it, wherein said refill container has a filling and venting opening for filling said refill container when empty and for venting said refill container when emptying its contents to refill said supply receptacle, and said refill container has a closing device which simultaneously closes said filling and venting opening and the discharge opening of said pouring spout, and wherein the filling and venting opening and the pouring spout opening are lined up opposite each other and wherein the filling and venting opening has an externally threaded nozzle and whereby a screw cap extends over and closes-off said filling and venting opening, and wherein said screw cap has a stay extending into said refill container to a



disk plug which closes off the opposite pouring spout opening from the inside.

4,162,748

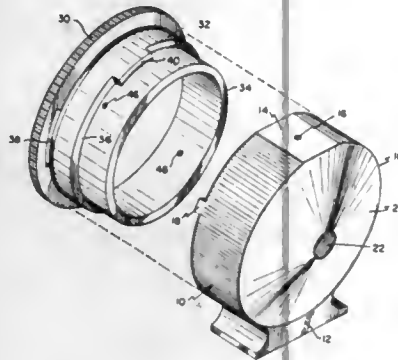
**DISPENSER USING BELLEVILLE DIAPHRAGM**  
Robert S. Bennett, Easton, Conn., assignor to Risdon Manufacturing Company, Torrington, Conn.

Filed Jan. 13, 1978, Ser. No. 869,040

Int. Cl.<sup>2</sup> B65D 37/00

U.S. Cl. 222—632

8 Claims



1. A manually operable dispenser comprising: first and second shallow hollow cylinders, each cylinder having a wall with an outer surface, a closed end and an open end, said cylinders being interconnected at their open ends with the first cylinder being disposed concentrically within the second cylinder, the cylinders having first cooperating means defining a channel on the outer surface of the first cylinder which forms a circular arc and which lies in a plane perpendicular to the axes of the cylinders, the first cylinder having first and second oppositely disposed openings extending through the cylinder wall and lying in the plane of the channel, the second cylinder having a third opening extending through the cylinder wall and lying in the plane of the channel, said cylinders being provided with second cooperating means which enables each cylinder to be rotatable through a selected arc with respect to the other cylinder between open and closed positions, said third opening, when the cylinders are in the open position being in registration both with the first opening and the channel and when the cylinders are in the closed position being out of registration with the first opening and the channel, the closed end of the second cylinder defining a bellville diaphragm.

4,162,749

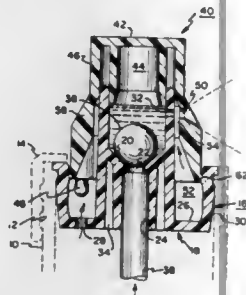
**SQUEEZABLE DISPENSER WITH OUTLET CLOSURE**  
Robert A. Bennett, Easton, Conn., assignor to Risdon Manufacturing Company, Torrington, Conn.

Filed Feb. 27, 1978, Ser. No. 881,440

Int. Cl.<sup>2</sup> B05B 11/04

U.S. Cl. 222—633

7 Claims



1. A dispenser comprising: an integral body having a vertical hollow cylindrically

shaped first element open at its upper end, said first element having an inverted vertical hollow truncated cone disposed therein intermediate the ends, the cone having an upper and larger opening peripherally secured to the inner wall of the first element and a lower smaller opening, the first element having a first vertical cylindrical bore with an upper end coincident with the lower opening of the cone and a lower end coincident with the lower end of the first element, said body further having a flat horizontal annulus secured at its inner periphery to the outer periphery of the first element at its lower end and extending outward therefrom, said annulus having a second vertical bore extending therethrough said body also having a generally cylindrical vertically elongated second element secured at its lower end to the outer periphery of the annulus and extending upward, the outer surface of the second element being adapted to engage detachably the inner surface of the top open neck of a vertical squeezable flexible container, said first element having a third horizontal bore extending therethrough in a position adjacent but below the upper end thereof;

a ball movable up and down in the first element between the lower end of the cone and the upper end of the first element, the diameter of the ball being smaller than the inner diameter of the first element and larger than the diameter of the smaller cone opening;

a hollow cylindrical dip tube disposed in the first bore, the upper end of the tube being open and coincident with the lower cone opening, the lower end of the tube being open and extending past the lower end of the first element; and

a hollow pull top closed at a top end and extending downwardly, said top having a first vertical hollow cylinder open at its lower end and extending downwardly from said top end into the upper end of the first element, the outer surface of the cylinder slidably engaging the inner wall of the first element, said top further having a hollow generally cylindrical vertical member open at its lower end and secured at its upper end to the top end of the top, said member extending downwardly and slidably between the outer surface of the first element and the inner surface of the second element, said member being always in sealing engagement with the inner surface of the second element and having a vertical plug at its lower end movable into and out of sealing engagement with the second bore, said member having a fourth horizontal bore extending therethrough and movable into and out of alignment with said third bore.

4,162,750

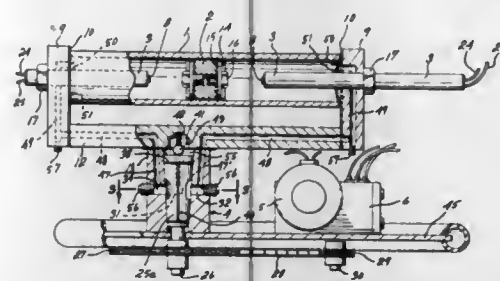
**MEASURING AND DISPENSING APPARATUS**  
Normand Demers, 126 Sherbrooke St., Thetford Mines, and Claude Martin, R.R. No. 2, Garthby, both of Canada

Filed Sep. 19, 1977, Ser. No. 834,485

Int. Cl.<sup>2</sup> G01F 11/06; F01L 25/08

U.S. Cl. 222—250

6 Claims



1. An apparatus for dispensing a measured volume of liquid comprising an elongated tubular body having an inside wall surface and end walls closing both ends of said body, a pair of stop rods extending through the respective end walls inwardly within said tubular body, (piston means including) a free piston

movable longitudinally within said body in fluid-tight contact with said body and inside wall and having abutment surfaces at each side thereof adapted to abut the inner end of the respective stop rods upon the free piston reaching one of two limit positions, said free piston defining two measuring chambers in said body, one chamber on each of the opposite sides of said free piston and between said sides and the respective end walls, each chamber having at least one port, a source of liquid under pressure to be measured and dispensed, a liquid circuit including a control valve comprising a valve body having an inlet port connected to said source of liquid under pressure, an outlet port and two additional ports connected to said measuring chambers, respectively, said control valve further having a valve member movable within said valve body between a first position connecting said inlet port to one of said chambers and said outlet port to the other of said chambers, and a second position connecting said inlet port to said other chamber and said outlet port to said one chamber, an electric driving means to move said valve member between said two positions, and an electric supply circuit for controlling said electric driving means and including two normally open electrical switches parallel connected in series in said supply circuit and mounted at the inner ends of the respective stop rods and both spaced from the abutment surfaces of said free piston when said free piston takes a central position within said cylinder, said free piston upon reaching anyone of said two limit positions causing closing of the associated electrical switch and energization of said electric driving means to move said valve member from one to the other of its two positions thereby reversing the movement of the free piston and causing the opening of the associated switch and stopping of said electric driving means.

4,162,751

**ROTARY MEASURING CHAMBER WITH SIZE ADJUSTMENT**

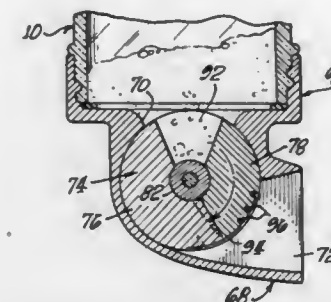
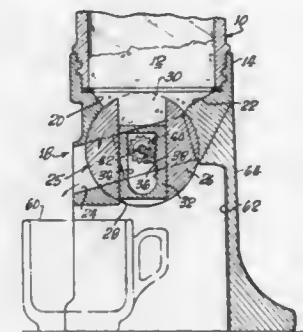
Lillian Hetland, P.O. Box 882 (Park Ave. P.O.), Pomona, Calif. 91766, and Peter R. Schneeweiss, 1630 W. Covina Blvd., #108, San Dimas, Calif. 91773

Filed Jan. 3, 1977, Ser. No. 756,090

Int. Cl.<sup>2</sup> G01F 11/24

U.S. Cl. 222—293

6 Claims



1. A measuring-and-dispensing apparatus to be employed with jar containers to dispense various granulated and powdered materials, wherein said apparatus comprises:

a cap-mounting body arranged to be removably secured to said jar container;  
a housing on said cap and having a throat disposed therein wherein said throat includes an inlet opening and a discharge outlet opening,  
said inlet opening being formed with downwardly inclined walls whereby a smooth flow of material will enter said compartment,  
rotor valve means disposed within said housing,  
said rotor valve means comprising a rotor body rotatably mounted within said throat, said body having an enlarged bore disposed therethrough,  
a slidable piston adjustably positioned within said bore of said rotor body to define therewith an adjustable volumetric compartment,  
said piston carrying volumetric adjustment means including a longitudinal slot, a rack formed in said slot, a pinion gear rotatable within said slot, a shaft on which said pinion gear is mounted having a free end and a knob on the opposite end to adjust and set a predetermined volume of said compartment, and  
stop means to control the rotational movement of said rotor valve means.

4. A measuring-and-dispensing apparatus to be employed with jar containers to dispense various granulated and powdered materials, wherein said apparatus comprises:

a cap-mounting body arranged to be removably secured to said jar container,  
a housing on said cap and having a throat disposed therein wherein said throat includes an inlet opening and a discharge outlet opening,  
rotor valve means disposed within said housing and having an adjustable volumetric compartment,  
said inlet opening being formed with downwardly inclined walls whereby a smooth flow of material will enter said compartment,  
said rotor valve means comprising first and second segments defining said adjustable volumetric compartment therebetween, a bushing member affixed to the first segment wherein the second segment is rotatable relative to said first segment, a rotatable shaft mounted in said housing and fixed to said bushing whereby said segments rotate with said shaft, said shaft having a head member for manual rotation thereof, and  
stop means to control the rotational movement of said rotor valve means.

4,162,752

**ROTATING DRUM SPREADER**

Larry S. Satterfield, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 5, 1977, Ser. No. 812,699

Int. Cl.<sup>2</sup> B07B 1/24

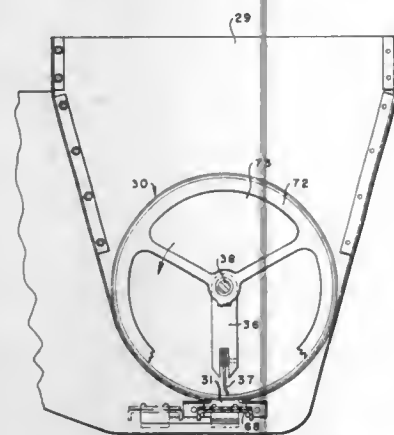
U.S. Cl. 222—342

7 Claims

1. A device for dispensing powder on a surface, comprising: housing means forming a powder storage bin having a powder discharge slot formed therein, said slot extending substantially across the width of said powder storage bin;  
a drum having a foraminous peripheral surface;  
means for rotatably mounting said drum within said powder storage bin;  
a stationary wiper blade means for forcing powder through the foramina in said drum;  
means for mounting said wiper blade within said drum and for maintaining said wiper blade in engagement with the interior of the peripheral surface of said drum in close



proximity to said powder discharge slot, said wiper blade engaging the interior of the peripheral surface of said



drum continuously across the width of said powder discharge slot; and means for rotating said drum.

4,162,753

## NECKTIE HANGER

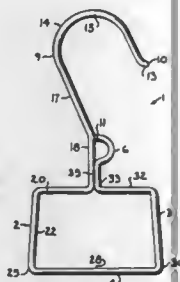
William R. Brown, 4815 W. 61 Ter., Mission, Kans. 66205

Filed Jul. 13, 1978, Ser. No. 924,177

Int. Cl.<sup>2</sup> A47J 51/097

U.S. Cl. 223—85

3 Claims



1. A necktie hanger formed of a continuous wire and comprising:

- a curved hook portion including an apex and a downwardly extending hook shank for suspending said hanger from a hanger rack;
- a generally vertical coplanar hanger shank merged with said hook shank and vertically aligned with said hook apex;
- a substantially straight and horizontal coplanar first spreader portion connected to said hanger shank;
- a downwardly and slightly outward extending coplanar first limb having a lower end;
- a horizontal, coplanar crossarm having opposite ends, one end being joined to said first limb lower end and extending a distance commensurate with the width of a longitudinal midpoint of a necktie to be draped over said crossarm, said crossarm having a longitudinal midpoint vertically aligned with said hanger shank and said hook apex for balance of said hanger;
- an upwardly and slightly inwardly extending coplanar second limb having a lower end connected to the other end of said crossarm;
- a substantially straight and horizontal coplanar second spreader portion connected to said second limb and extending toward said hanger shank whereby a trapezoidal opening for receipt of neckties is defined by said first and second spreader portion, said first and second limbs and said crossarm;
- a coplanar eye connected to said second spreader portion and having portions lying against said hanger shank, said

eye and said hanger shank being connected by a weld formation; and

- a flexible line connector tied to said hanger through said eye for tethering said hanger to an anchor.

4,162,754

## COMBINATION WATCHBAND AND WRITING INSTRUMENT

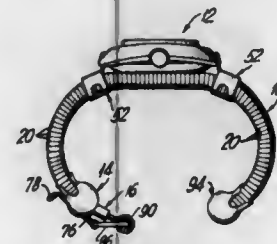
Charlie Fleming, 1511 Fulton St., Brooklyn, N.Y. 11216

Filed Dec. 22, 1977, Ser. No. 863,212

Int. Cl.<sup>2</sup> G04B 47/00; A44C 5/00

U.S. Cl. 224—165

12 Claims



1. A watchband comprising:
  - a tubular flexible band member; coupling means for connecting a watch onto the band member;
  - a flexible writing instrument removably disposed in and along the length of said band member with a writing point extending outwardly from one end of said band member; stiffening means positioned in said band member for providing a pliant and ductile characteristic to the band member, whereby the flexible band member and stiffening means may be bent to conform to the wearer's wrist and easily straightened again for use of the watchband as a pen;
  - an end cap connected to said one end of said band member; said end cap being provided with cover means for selectively providing access to said writing point.

4,162,755

## LUGGAGE CARRIER ASSEMBLY

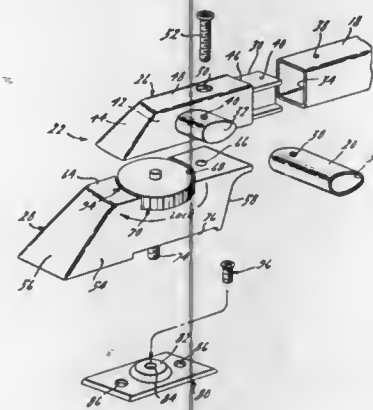
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Oct. 27, 1977, Ser. No. 845,846

Int. Cl.<sup>2</sup> B60R 9/00

U.S. Cl. 224—326

15 Claims



1. A luggage carrier assembly for an automotive vehicle or the like, said carrier assembly comprising a pair of spaced parallel article constraining members and a pair of stanchion elements associated with each of said members,

each of said stanchion elements having spaced apart upstanding opposing side portions and a generally horizontally extending portion provided with a vertically disposed opening communicable at its lower end with cooperable mounting means attached to the vehicle upon which the assembly is mounted,

a generally vertically arranged fastening member disposed in part and movable within each of said openings and adapted for engagement with said cooperable mounting means on the vehicle,

said fastening member being vertically movable along a generally vertical axis located between the side portions of the associated stanchion element, and

a manually engageable locking member disposed adjacent said horizontal portion of each of said stanchion elements and operatively connected with the upper end of the fastening member therein, at least one of said side portions having an access opening disposed above said mounting means and below said article constraining members, each of said locking members having an outer peripheral portion projecting laterally through at least one of said side openings and outwardly beyond at least one of said side portions of the associated of said stanchion elements, whereby said peripheral portion of said locking member may be manually engaged and rotated about said axis to thereby vertically move the fastening member connected thereto between engaged and disengaged relationship with said mounting means on said vehicle for selectively securing said stanchion element and said associated article constraining member to said vehicle, and for moving the same relative to said vehicle.

4,162,756

## AUTOMATIC STOP MECHANISM

Ghislain M. A. M. Aldenboven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

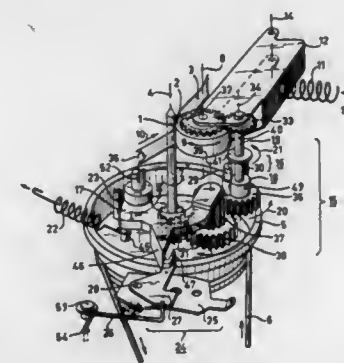
Filed Nov. 7, 1977, Ser. No. 849,024

Claims priority, application Netherlands, Nov. 11, 1976, 7612510

Int. Cl.<sup>2</sup> B65H 25/32

U.S. Cl. 226—43

10 Claims



1. A stop mechanism for an apparatus having means for driving an article along a path, said mechanism comprising:
  - a differential mechanism comprising a slip coupling, a primary coupling section, a secondary coupling section, and a zero member;
  - means for mounting and rotationally urging the primary coupling section during operation of the apparatus independent of local interruption of article movement;
  - means for mounting and rotationally driving the secondary coupling section responsive to local movement of the article;
  - means for mounting and connecting the zero member for urging the zero member in first and second opposite directions responsive to the relative difference in rotational speeds of said primary and secondary coupling sections; and

means for performing a control function responsive to movement of the zero member in the second direction; wherein the slip coupling is a uni-directional coupling interconnecting said primary and secondary coupling sections and permitting relative slip between said sections in one direction only, upon local interruption of article movement said slip coupling preventing relative speed difference between one of said sections and the other section, while continued rotational urging against the primary coupling section moves the zero member in the second direction.

4,162,757

## MANUFACTURING APPARATUS

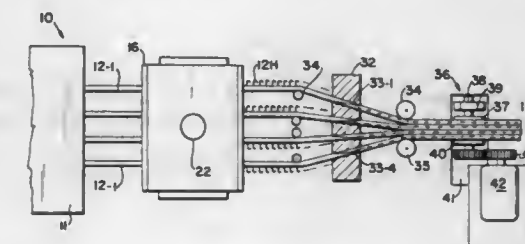
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Nov. 24, 1976, Ser. No. 744,505

Int. Cl.<sup>2</sup> B29F 3/00

U.S. Cl. 228—1 R

10 Claims



1. An apparatus for forming a strip of fastening material having a plurality of rows of fastening elements molded integral with and protruding from a surface thereof, said apparatus comprising:

first means for continuously forming and parallelly feeding a plurality of strip-like elements in a given direction, wherein each of said strip-like elements contain a row of fastening formations integrally formed with a base strip portion and protruding outwardly from such base strip portion,

second means downstream of said first means for receiving and continuously bringing such strip-like elements into engagement with each other as they are fed with the fastening formations of each strip-like element extending parallel to the fastening formations of the other strip-like elements, and

third means downstream of said second means for edgewise securing said strip-like elements together to provide a unitary formation thereof, which formation contains said plurality of rows of fastening formations protruding outwardly from a surface thereof.

4,162,758

## METHOD FOR PRODUCING CLAD STEEL PIPES

Makoto Mikarai, Chiba, Japan, assignor to Asahi Kasei Kogyo Kabushiki-Kaisha and The Japan Steel Works, Ltd., both of Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,132

Claims priority, application Japan, Jul. 26, 1976, 51-88109; Dec. 24, 1976, 51-154911

Int. Cl.<sup>2</sup> B23K 19/00

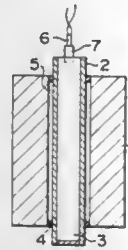
U.S. Cl. 228—131

9 Claims

1. A method of producing clad steel pipes using a cylindrically shaped base metal member of a carbon steel and a cylindrically shaped cladding metal member selected from the group consisting of a stainless steel, nickel or a nickel alloy said method comprising:

- positioning said base metal member with respect to said cladding metal member such that the cylindrical surfaces of said base metal member and said cladding metal member are opposed to each other;
- welding at least one edge portion of the shorter of said

base metal member or said cladding metal member to the cylindrical surface of the other of said base metal member or said cladding metal member; and



(c) hot rolling, at least one time, said base metal member and said cladding metal member at a temperature of 850° C.-1300° C. with a reduction ratio of at least 15% in said first hot rolling.

4,162,759

## FOOD PACKAGING TRAY

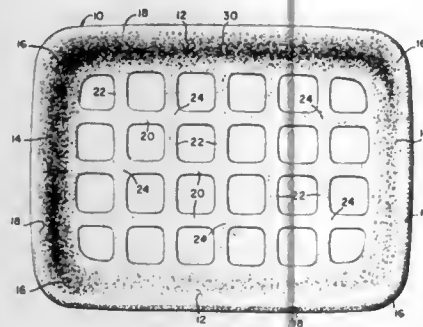
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.

Continuation of Ser. No. 866,131, Dec. 30, 1977. This application Aug. 4, 1978, Ser. No. 931,212

Int. Cl.<sup>2</sup> B65D 1/00, 65/00

U.S. Cl. 229-2.5 R

7 Claims



1. In a generally rectangular one-use, throw-away tray molded of inexpensive opaque material and primarily for the packaging of produce in conjunction with a transparent overwrap film-heat sealed thereabout, said tray comprising a pair of upwardly and outwardly inclined opposite side walls, each of said side walls forming a long side of said tray; a pair of upwardly and outwardly inclined opposite end walls, each of said end walls being adjacent to each said side wall and disposed at generally right angles thereto and thereby forming the rectangular configuration of said tray; a peripheral lip extending about said tray at the top of said end and side walls; and bottom wall means for providing visibility to the bottom interior of the tray for supporting the produce at the bottom of said tray; the improvement wherein:

said bottom wall means for providing visibility to the bottom of said tray comprises a plurality of generally flat ribs extending across said tray in at least two directions to define therebetween a plurality of open windows, said ribs constituting window frame structure around each open window and being of generally trapezoidal cross-section with a width approximately two and one-half times as great as the thickness thereof, the upper surface edges thereof being rounded with the terminal peripheral portion of each window frame being located substantially below the upper surfaces of said ribs; said end and side walls extending into a curved annular portion surrounding the open windows, and said annular portion extending

smoothly into the ends of said ribs on the interior of said tray.

4,162,760

## DISC CENTRIFUGE WITH UNDERFLOW DISCHARGE

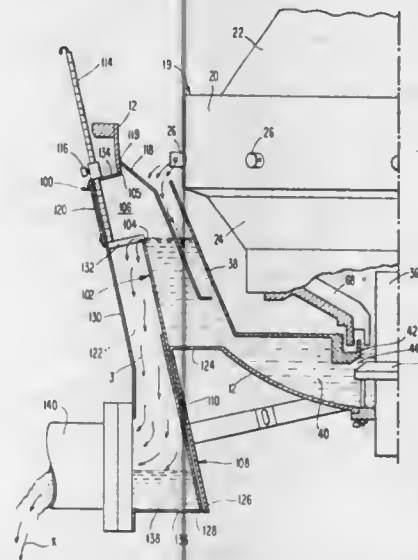
John H. Hill, Wayne, Pa., assignor to Peanwatt Corporation, Philadelphia, Pa.

Filed Jul. 10, 1978, Ser. No. 923,135

Int. Cl.<sup>2</sup> B04B 11/02

U.S. Cl. 233-19 R

16 Claims



1. A centrifuge for separating a solids-liquid slurry, comprising:

- (a) a rotor, rotatable about a vertical axis, including:
  - (i) a vertically upstanding central drive shaft;
  - (ii) a plurality of parallel frusto-conical discs, vertically spaced one from another and secured about said shaft;
  - (iii) a hollow housing connected to said shaft and rotatable unitarily therewith, surrounding said discs and spaced apart therefrom, said housing having:
    - (1) a frusto-cylindrical central portion, having a plurality of horizontally directed nozzles for discharge of thickened solids therethrough outwardly of said rotor;
    - (2) an upper frusto-conical skirt tapering upwardly from said central portion towards said shaft, a portion of said upper skirt proximate said shaft being spaced from said shaft, said space defining a clarified liquid discharge orifice; and
    - (3) a lower frusto-conical skirt tapering convergently downwardly from said central portion;
- (b) a stationary casing surrounding said rotor, for receiving thickened solids discharged by said nozzles, said drive shaft extending upwardly therethrough, a space between said casing and said shaft at said casing upper extremity defining a liquid outlet;
- (c) motor means for turning said rotor by rotating said shaft;
- (d) a stationary inlet feed tube extending upwardly through said casing and into said housing, said housing being spaced thereabout;
- (e) a stationary baffle interposed between said rotor and a lower portion of said casing below said nozzles, connected to said casing interior, separated from said inlet feed tube by an annular space;
 

wherein said casing lower portion, said baffle and said inlet feed tube define a recycle thickened solids sump and wherein said annular space between said baffle and said inlet tube defines a recycle thickened solids inlet from said sump into said housing;
- (f) a toroidal ring moveable vertically about said feed tube, from within said sump to within said recycle solids inlet,

to vary the size of said recycle solids inlet upon ring vertical movement; and  
(g) an overflow well, secured to said casing exterior, for holding excess solids material discharged through said nozzles, communicating with said casing interior via an overflow orifice in said casing at a position below the upper extremity of said baffle.

4,162,761

## FLOW-THROUGH COIL PLANET CENTRIFUGES WITH ADJUSTABLE ROTATION/REVOLUTION OF COLUMN

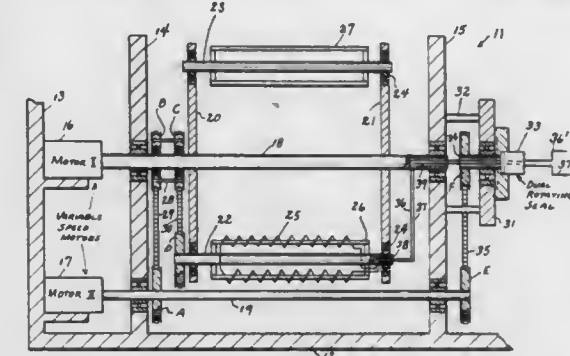
Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Nov. 30, 1977, Ser. No. 856,172

Int. Cl.<sup>2</sup> B04B 5/02, 9/08

U.S. Cl. 233-24

10 Claims



1. A flow-through coil planet centrifuge having a central rotational axis, comprising, two independent stationary motors one of which is mounted out of the central rotational axis, centrifuge rotor means rotatably mounted on the central rotational axis, means drivingly coupling one of said motors to said rotor means, a coiled tubular column and including an inlet and an outlet end both extending outside the rotor means along the central rotational axis, means rotatably mounting said column on said rotor means for rotation on an axis parallel to and spaced from the central rotational axis, means to feed fluid into the inlet end of said tubular column and out the outlet end during operation of the centrifuge, and planetary means drivingly coupling the other motor to said coiled column.

4,162,762

## DATA PROCESSING MACHINE, ESPECIALLY CIPHERING EQUIPMENT

Peter Frutiger, Sonnhalde 18, Wangen, Switzerland

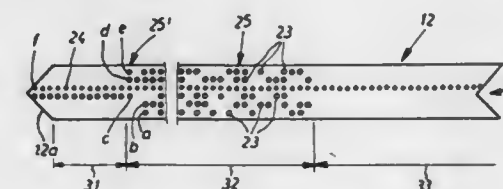
Filed Nov. 2, 1977, Ser. No. 847,788

Claims priority, application Switzerland, Nov. 10, 1976, 14162/76

Int. Cl.<sup>2</sup> G06K 7/10, 21/04; H04L 15/12

U.S. Cl. 235-461

7 Claims



1. A perforated tape reader comprising:  
a scanner adapted to scan teleprinter perforated tapes having a number of essentially parallel information tracks formed by information perforations and a feed track formed by feed perforations, said feed track being essentially parallel to said information tracks, the size of said information perforations being different than the size of said feed

perforations, said scanner being adapted to generate output signals indicative of the relative magnitude of each of said perforations as said perforations pass said scanner; means for advancing said perforated tape past said scanner; and  
circuit means responsive to said output signals for determining which of said scanned tracks constitute said information tracks and which of said scanned tracks constitutes said feed track as a function of the size of said information and feed perforations.

4,162,763

## WATER JET VALVE ASSEMBLY

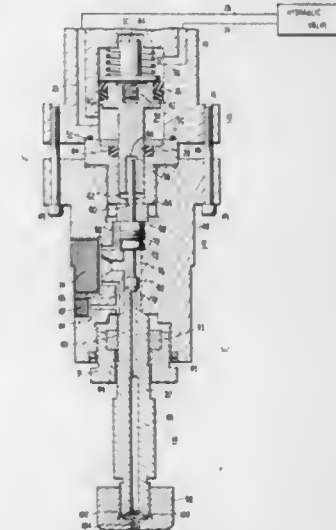
Bobby L. Higgins, Dallas, Tex., assignor to Camsco, Inc., Richardson, Tex.

Filed Jan. 10, 1978, Ser. No. 868,244

Int. Cl.<sup>2</sup> B05B 1/08

U.S. Cl. 239-101

10 Claims



1. A valve assembly comprising:  
hydraulic switch means, piston means moveable in response to said hydraulic switch means, means to bias said piston means in one direction;  
input means for receiving a source of high-pressure liquid, a cavity disposed in a liquid transfer relationship with said input means, a valve stem of a first material disposed in said cavity and extending to said piston means, said stem having a tip of a second material to effect a long life seal; seal means disposed between said piston means and said cavity, said seal means having an annular seal around said valve stem of a solid material that will deform under the influence of high-pressure liquid; and  
output means coupled to said cavity, said output means having a valve seat for engaging said valve stem when said piston is pushed in said one direction, an expansion section for obtaining a laminar flow of high-pressure liquid, and a nozzle for shaping said flow of liquid upon release.

4,162,764

## PERSONNEL AIR COOLING DEVICE

Robert K. Millsap, 500 E. 1st, Pana, Ill. 62557

Filed Oct. 18, 1977, Ser. No. 843,435

Int. Cl.<sup>2</sup> B05B 9/08

U.S. Cl. 239-152

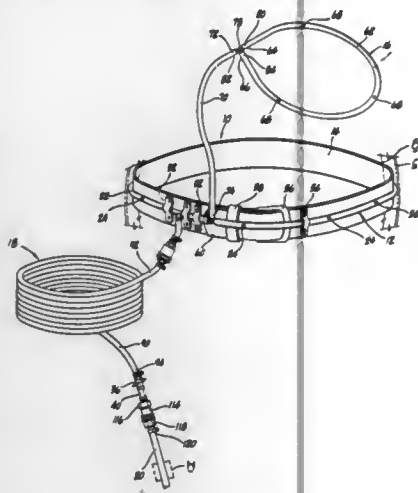
3 Claims

1. A personnel temperature control device for use with a high pressure outlet, the device comprising:

- (a) waist belt means,
- (b) elongate air tube means, including:
  1. connection means connected to the waist belt means,



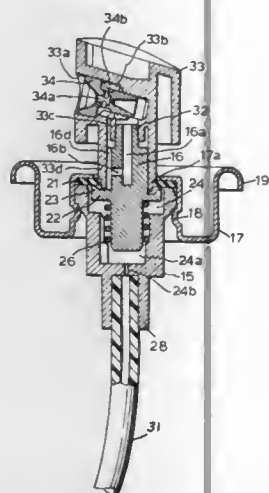
2. a neck-encircling loop portion adapted to hang freely about the neck, and
3. a portion connected between the neck-encircling portion and the connection means,
4. at least the neck-encircling loop portion including a plurality of longitudinally spaced air outlet apertures for expelling air outwardly in a direction transverse to the longitudinal axis of the air tube means onto the upper body of the wearer.



- (c) an extension air line means including opposed ends, one of said ends being connected to said connection means, and the other end being connected to the high pressure outlet, and
- (d) regulator valve means at one end of the extension air line means for controlling air pressure supply to air tube means.

**4,162,765**  
**AEROSOL DISPENSER UTILIZING CO<sub>2</sub> AS PROPELLANT**  
 Pasquale R. Riccio, 54 Pelham Rd., Salem, N.H. 03079  
 Filed Jan. 24, 1978, Ser. No. 871,983  
 Int. Cl.<sup>2</sup> B05B 7/32  
 U.S. Cl. 239—337

2 Claims

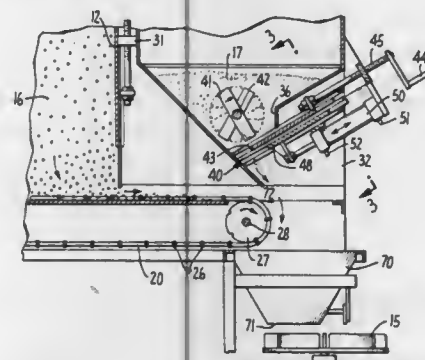


1. An aerosol type dispensing package comprising: a container; a dispensing valve means on said container having a nozzle means on the outside of the container with a passage extending longitudinally therethrough and at least one lateral passage opening into said longitudinal passage, a main flow path extending part way through said valve means from within said container, valve actuating means forming part of said dispensing valve means and including obturating means obtu-

rating the end of said main flow path within said valve means and movable to the open position upon actuating of said valve actuating means; one flow path extending from said end of said main flow path through said dispensing valve means from said obturating means to said longitudinal passage and a second flow path extending from said end of said main flow path through said dispensing valve means from said obturating means to said lateral passage, dip tube means extending from said valve means to near the bottom of said container and being in communication with said main flow path where it is connected to said valve means; a body of a solution of a product to be dispensed in said container and filling said container to a level below the top of the container for leaving a gas space in the upper part of said container above said body of solution; and a carbon dioxide propellant under pressure and dissolved in said solution and in gaseous form in the space in said container above said body of solution.

**4,162,766**  
**VEHICULAR SPREADER FOR ICY ROADS AND THE LIKE**  
 Dale K. Ten Broeck, 1168 Douglas La., Redding, Calif. 96001; Stanley N. Cuson, 35757 Ballantine Pl., Fremont, Calif. 94536, and Hal K. Sorenson, 4560 Lawrence Dr., Roseville, Calif. 95678  
 Filed Sep. 16, 1977, Ser. No. 833,886  
 Int. Cl.<sup>2</sup> E01H 5/00; B01F 15/02  
 U.S. Cl. 239—656

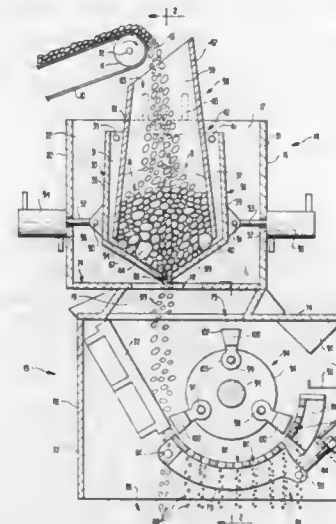
6 Claims



1. In a vehicle for applying materials to icy or snow-covered roadways, having a storage tank carrying a first material and a spreader for applying said first material to the roadway, the improvement comprising: auxiliary storage means mounted behind said storage tank for carrying a second material to be applied to the roadway, first discharge means for removing said materials from said storage tank, second discharge means for removing said second material from said auxiliary storage means, mixing means for mixing said materials, said second discharge means being positioned to discharge said second material on said first discharge means upstream of said mixing means, and control means for regulating the proportions of said first and second materials discharged from said storage tank and from said auxiliary storage means prior to said materials being applied to the roadway by said spreader.

**4,162,767**  
**IMPACTING CRUSHER WITH VARIABLE FLOW FEED DISTRIBUTOR**  
 William F. Hahn, Devon, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.  
 Filed Nov. 7, 1977, Ser. No. 849,142  
 Int. Cl.<sup>2</sup> B02C 13/286  
 U.S. Cl. 241—30

27 Claims



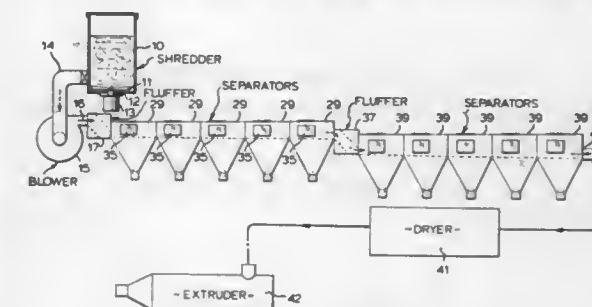
1. Apparatus comprising in combination an impacting crusher and a feed distributor; said impacting crusher having an inlet, a rotor within the housing and an outlet, the rotor comprising a shaft having rotating impact members mounted thereon and extending outwardly from the shaft along a given length of said shaft to define a relatively wide rotor, the width of said inlet being substantially equal to or greater than the width of the rotor; said distributor including an enclosure defined by confining means for surrounding an inventory of material laterally and from beneath, said confining means including a moveable supporting member defining a portion of the enclosure and being positioned to bear at least a portion of the weight of the inventory, said enclosure being openable to define an opening which is presented to the rotor, is elongated in a horizontal direction generally parallel to the rotor axis, is about as long as the width of the rotor, is positioned with its ends substantially above the ends of the rotor and is of substantially uniform width across the width of the rotor, said moveable member being connected with closing means having the property of exerting sufficient closing force on said moveable member to keep the entire length of said opening covered by said inventory while said inventory is flowing through the opening, and being responsive to the inventory present in the enclosure for moving said moveable member and respectively decreasing and increasing the width of said opening in response to decreased and increased inventory, whereby such apparatus will cause the material passing through said opening to be distributed substantially uniformly across the length of the opening, so that the side and central portions of the rotor will receive substantially equal quantities of the material over an extended period of operation.

**4,162,768**  
**APPARATUS FOR SEPARATING PAPER FIBRES FROM PORTIONS OF POLYETHYLENE FILM MATERIAL**  
 Blaine Froats, 210 Morrison Rd., Oakville, Ontario, Canada  
 Filed Nov. 8, 1977, Ser. No. 849,548  
 Int. Cl.<sup>2</sup> B02C 23/18, 23/20  
 U.S. Cl. 241—45

8 Claims

1. Apparatus for stripping damp paper fibers from portions of polyethylene film comprising: a shredding device for converting said polyethylene sheet/-paper fibre to substantially uniform balls of paper fibre and small portions of polyethylene film, the uniform balls of

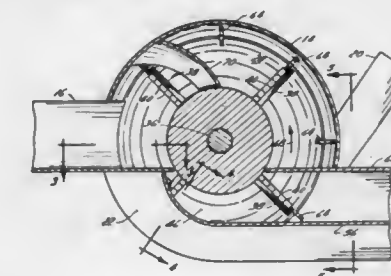
paper fibre having an average diameter of about 2 mm; means including an air blower for entraining said balls and film portions in a stream of air and projecting them along a predetermined pathway; a first plurality of impact surfaces in said pathway to impact said paper fibre balls and polyethylene film to strip said paper fibres from said polyethylene film portions; a cascade of baffle separators having alternate high velocity passages and low velocity chambers in series to provide air entrainment of said poly-



ethylene film portions while allowing said paper balls to fall out in the low velocity chambers, a screen defining a bottom wall for said cascade of baffle separators; gravity collection chambers beneath the screens of each of said low velocity chambers to receive the denser, damp paper fibre balls that fall out through the screen in said low velocity chamber; means to remove the paper fibre balls from the collection chambers, and means to collect the polyethylene portions at the downstream end of the cascade of baffle separators.

**4,162,769**  
**WHOLE TREE CHIPPER**  
 Joseph A. Lapointe, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada  
 Continuation-in-part of Ser. No. 855,073, Nov. 25, 1977, which is a continuation-in-part of Ser. No. 677,317, Apr. 15, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,795  
 Int. Cl.<sup>2</sup> B02C 18/22, 23/08  
 U.S. Cl. 241—68

12 Claims



1. A whole tree chipper comprising a housing having a rotor therein, said housing including a circumferential wall and chip chambers formed at each axial end thereof; said rotor being formed by a pair of substantially identical axially aligned frusto-conical hollow discs connected together at their minimum diameter axial ends and rotatable about their common axis, at least one knife projecting from the conical outer face of each disc; a slot through said conical outer face adjacent said knife for directing chips cut by said knife to the interior of said hollow disc and into said chip chamber at the adjacent axial end of said rotor; means to rotate said rotor; an inlet through said circumferential wall for feeding tree lengths with twigs and branches thereon substantially longitudinally through said inlet and against said conical faces of said rotor; a debris outlet through said circumferential wall; a debris chamber in said

housing between said circumferential wall and said conical faces of said discs, means separating said debris chamber from said chip chambers, said debris chamber extending between said inlet and said debris outlet, said debris outlet connected with said debris chamber, means on said rotor for ejecting debris from said debris chamber through said debris outlet, and a chip outlet from each of said chip chambers for ejecting the chips from said chip chamber whereby chips are ejected from said chipper separate from debris, said debris including at least some of said twigs and branches.

4,162,770

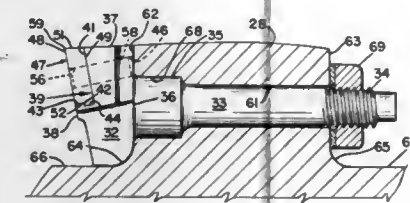
## TOOTH BREAKER MEMBERS

Herbert H. Lewis, Ponte Vedra Beach, Fla., assignor to Montgomery Industries International, Inc., Jacksonville, Fla.

Filed Dec. 9, 1977, Ser. No. 859,147

Int. Cl.<sup>2</sup> B02C 13/06, 13/28

U.S. Cl. 241—191



1. A breaker tooth member comprising a metal head having an integral rearwardly projecting mounting shank provided with a threaded end, said head being formed opposite said shank with a flat front surface extending at an angle to the axis of said shank, means forming a forwardly open recess at said front surface having a flat back face intersecting a bottom ledge provided all along its forward portion with a lip and having a downwardly displaced region between the lip and said back surface for defining a locking formation, and an integral harder wear resistant metal sharp edged element mounted in said recess flush against said back face, said element being correspondingly formed along its bottom edge to interfit and interlock with said ledge, the front surface of said lip and the forward surface of said element being flat and substantially in the plane of said head front surface, and means for securing said element on the head comprising a plurality of pins having tight friction fit in aligned bores in said head and element.

4,162,771

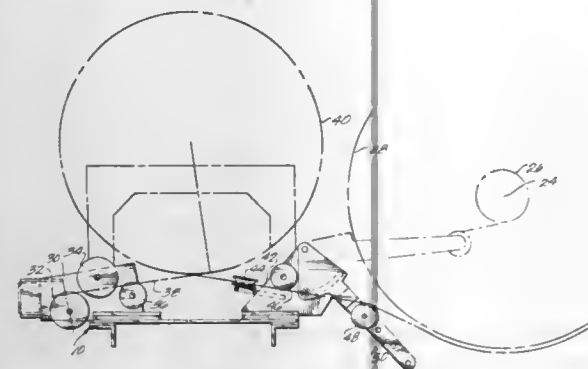
## ROD TENSIONER

Robert L. West, Portland, Oreg., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Aug. 15, 1977, Ser. No. 824,404

Int. Cl.<sup>2</sup> B21F 17/00; B65H 77/00, 81/08

U.S. Cl. 242—7.22



1. Apparatus for applying tension to a filament while feeding

the filament, comprising a frame, a circular member, means rotatably supporting the circular member on the frame for rotation about its axis of revolution, the filament passing around at least a portion of said member, a hydraulic pump, means supporting the pump, said pump supporting means being rotatable about the axis of revolution of the circular member, drive means connecting the circular member to the pump for driving the pump by rotation of the circular member, load sensing means mounted on the frame and engaging the pump supporting means, the load sensing means limiting rotation of the pump supporting means, the load sensing means engaging the pump supporting means at a radial distance from said axis of revolution that is substantially equal to the radius of the circular member.

4,162,772

## SEAT BELT RETRACTING AND WINDING DEVICE

Toshiaki Shimogawa, Nishio, and Satoshi Kuwakado, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

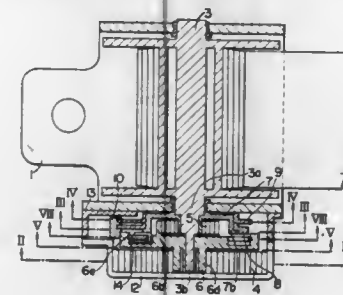
Filed Jan. 6, 1978, Ser. No. 867,499

Claims priority, application Japan, Feb. 18, 1977, 52-19241[U]

Int. Cl.<sup>2</sup> A62B 35/00; B65H 75/48

U.S. Cl. 242—107

7 Claims



1. A seat belt retracting and winding device comprising a frame; a winding reel rotatably supported by said frame; spring means connected between said frame and said winding reel and including a first spring and a second spring, said winding reel being adapted to wind thereon a seat belt with a spring force of at least one of said first and second springs; means operable in response to the rotation of said winding reel for controlling said spring means to operate selectively under a first operative condition and a second operative condition exerting larger and smaller spring forces, respectively, on said seat belt, whereby the winding force exerted on said seat belt is reduced when said spring means is operated under said second operative condition; and impact relaxing means disposed between said first and second springs and slowly releasing the compression of one of said first and second springs when the operative condition is changed over from the second condition to the first condition under predetermined rotation of the reel to wind the seat belt.

4,162,773

## DEVICE FOR USE IN EMERGENCY LOCKING MECHANISM FOR WEBBING-TYPE SEAT BELTS

Jan-Olof Wallin, Ellerau, Sweden, assignor to Irvin Industries, Inc., Sweden

Filed Apr. 10, 1978, Ser. No. 894,767

Claims priority, application Sweden, Apr. 22, 1977, 7704686

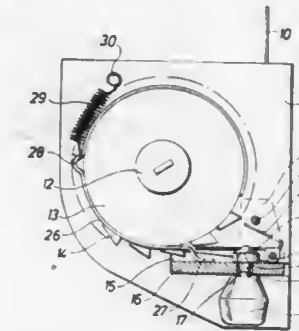
Int. Cl.<sup>2</sup> A62B 35/02; B65H 75/48

U.S. Cl. 242—107.4 A

12 Claims

1. A device for use in emergency locking of webbing-type vehicle safety belts, comprising

a casing adapted to be mounted in a vehicle, a spindle rotatable on said casing and having thereon a webbing-type safety belt, a ratchet wheel secured to said spindle for rotation therewith, a locking device interlockable with said ratchet wheel to lock said spindle against rotation in a belt unwinding direction,



a vehicle-triggered device mounted on said locking device and disposed to be activated by pre-set changes of motion of said vehicle, and an arm connected to said locking device and engageable with the ratchet-wheel upon activation of said vehicle triggered device whereby force is transferred to the arm by the continued rotation of the ratchet-wheel and is passed on by said arm to the locking device which, in turn, is caused to interlock with the ratchet-wheel.

4,162,774

## BELT DRIVE CARTRIDGE

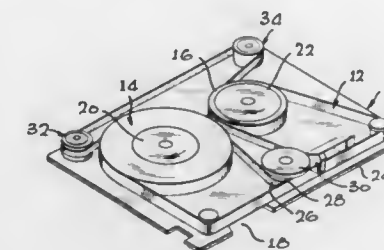
George W. Bowers, Hayward, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Oct. 17, 1977, Ser. No. 842,542

Int. Cl.<sup>2</sup> G03B 1/04

U.S. Cl. 242—192

10 Claims



9. A belt drive tape cartridge comprising: a tape with end portions formed in a pair of rolls; a drive roller; at least one guide roller; a belt extending about said drive roller and guide roller, and against said tape rolls; and a riding roller having a peripheral portion of elastomeric material bearing against said guide roller, whereby to produce a hysteresis energy loss and therefore drag on the belt which, in turn, produces tape tension.

4,162,775

## TRACKING AND/OR GUIDANCE SYSTEMS

Roger Voles, London, England, assignor to E M I Limited, Hayes, England

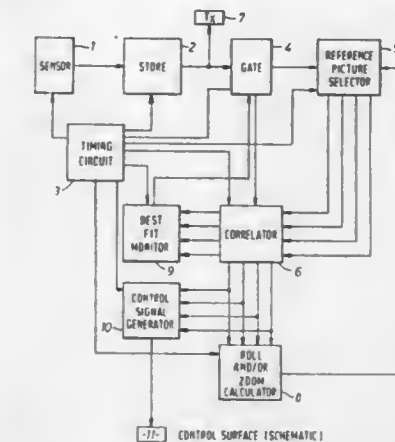
Filed Nov. 19, 1976, Ser. No. 743,343

Claims priority, application United Kingdom, Nov. 21, 1975, 48068/75

Int. Cl.<sup>2</sup> F42B 15/02; F41G 9/00, 7/00; F42B 15/10

U.S. Cl. 244—3.17

3 Claims



1. A tracking and/or guidance system for a vehicle, the system comprising a sensor providing electrical signals forming representations of a field of view of a region towards which the vehicle is travelling, a reference picture selector deriving a plurality of portions from the said electrical signals, the portions forming reference representations of respective portions of a preselected area of the said field view, a correlator circuit correlating each reference representation with a further representation, subsequently provided by the sensor, in each of a plurality of different positions relative to the further representation, means ascertaining the respective positions of best fit of the reference representations with corresponding portions of the further representation, and means utilising the ascertained positions to rotate and/or change the scale of the reference representations to compensate for rotational misalignment and/or changes of scale between the representation from which the reference representations were derived and the further representation.

4,162,776

## AERIAL PHOTOGRAPHY CAMERA MOUNT ASSEMBLY FOR A HELICOPTER

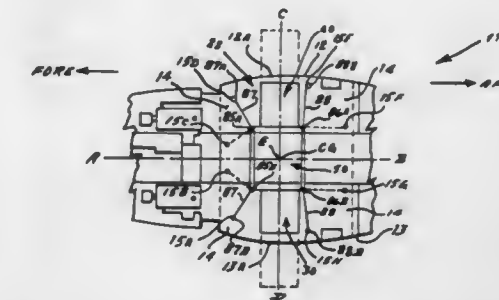
Clarence E. Sibley, HQ26TRW, Box 1331, APO New York, N.Y. 09860, and Francisco C. Sablan, 13 Woodland Dr., Mary Esther, Fla. 32569

Filed Feb. 15, 1978, Ser. No. 877,936

Int. Cl.<sup>2</sup> B64D 47/08

U.S. Cl. 244—118 R

8 Claims



1. An aerial photography camera mount assembly, adapted for use with an aerial photography camera having weight, and with a helicopter having a starboard side with an opening



therein, a port side with an opening therein, a planar horizontal internal surface located between said openings, a first plurality of cargo tiedown rings affixed to said horizontal internal surface, and a center of gravity located in said horizontal surface and having a longitudinal axis and a transverse axis that intersect and from an intersection, that are perpendicular to each other, and that are coplanar with said horizontal internal surface, and wherein said transverse axis is situated between and aligned with said starboard and port side openings, comprising:

- a first means for mounting, supporting, and releasably holding said camera in an angularly adjustable position, with said first means having weight;
- a second means, operatively associated with said first means, for counterbalancing said weight of said first means, and said weight of said camera that is mounted, supported, and releasably held by said first means;
- a third means, operatively associated with said first and second means, for removably holding said first and second means in parallel, equal spaced-apart relationship, and for detachably interconnecting said first and second means, and also for slidably moving simultaneously said first means and said second means in diametrically opposed directions, with said third means positioned on said horizontal internal surface of said helicopter, and also centrally located over said center of gravity and said intersection of said transverse and longitudinal axes, and additionally releasably attached to some of said first plurality of cargo tiedown rings;
- and, a fourth means, releasably connected to said third means, and in selective cooperative engagement with said first means and said second means, for preventing inadvertent jettisoning of said first means, of said camera releasably held by said first means, and of said second means, from said helicopter;

whereby when said helicopter is in stable flight, and said first means with said releasably held camera are extended and are retracted through one of said side openings in said helicopter, and said second means is extended and is retracted through said other of said openings in said helicopter, said center of gravity and said horizontal and transverse axes remain in a stable condition, and said helicopter remains in stable flight.

4,162,777

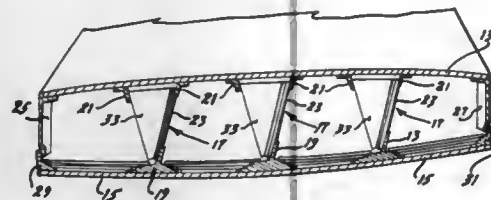
#### CANTED SPAR WITH INTERMEDIATE INTERCOSTAL STIFFENERS

William W. Gilbert, III, and Eduardo W. Gomez, both of Fort Worth, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 2, 1978, Ser. No. 902,131  
Int. Cl.<sup>2</sup> B64C 3/22

U.S. Cl. 244—123

3 Claims



1. A box construction for an aircraft wing having an upper skin and a laminated lower skin with front and rear spars positioned therebetween at the forward and aft edges thereof, said aircraft wing comprising a plurality of pairs of upper spar caps extending spanwise along the length of the inner surface of the wing upper skin and fixedly attached thereto, said pairs of upper spar caps being spaced chordwise across the wing structure and canted to the upper surface thereof, a plurality of lower spar caps extending spanwise along the length of the inner surface of the wing lower skin and fixedly attached

thereto and canted to the surface thereof, each of said lower spar caps being positioned under and midway between each pair of said upper spar caps, a spar web fixedly attached between each of said lower spar caps and one of each of said pairs of upper spar caps and extending spanwise along the length of the wing structure, and a plurality of intercostal stiffeners at spaced intervals spanwise along the length of the wing structure wherein each intercostal stiffener is of substantially triangular configuration positioned apex downwardly between the other of each of said pairs of upper spar caps and one of said spar webs thereby providing sufficient stabilization to prevent upper skin buckling up to ultimate design stress with a minimum of shear webs at significant weight savings.

4,162,778

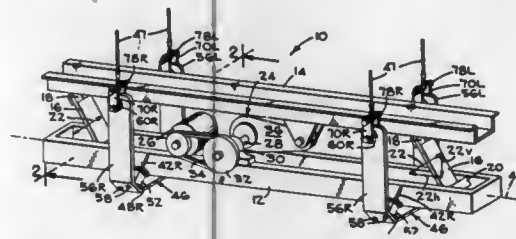
#### VIBRATING MACHINE SUSPENSION

Robert E. Kraft, Indiana Borough, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 1, 1977, Ser. No. 820,982  
Int. Cl.<sup>2</sup> F16F 15/00; B65G 27/08

U.S. Cl. 248—610

11 Claims



1. A suspension for mounting a vibrating machine to supports, said suspension comprising a plurality of U-shaped stirrups that are spaced longitudinally of the machine, each stirrup extending transversely of the machine between opposed supports, each stirrup being mounted for pivotal movement about its own axis of rotation that extends transversely of the machine, each stirrup having a center of percussion in relationship to the axis of rotation of the individual stirrup, each stirrup having surfaces at locations spaced below its axis of rotation, said surfaces being located to intersect an axis that extends parallel to the axis of rotation and that passes through the center of percussion of the stirrup, said surfaces providing support for the machine so that vibrational forces in a direction longitudinally of the machine are applied to the stirrup with the resultant of such forces being located at the center of percussion of the stirrup, whereby such forces impart rotational motion to each individual stirrup about its own axis of rotation without causing a reactive pressure on the supports adjacent the axis of rotation in a direction longitudinally of the machine, each U-shaped stirrup having a center of gravity that is spaced perpendicularly from the axis of rotation of the stirrup, said machine supporting surfaces being located to intersect a plane wherein the axis of rotation and the center of gravity of the stirrup are contained, said surfaces being located on the side of the center of gravity opposite from the axis of rotation, the perpendicular distance between the axis of rotation and the axis passing through the center of percussion being equal to  $I_0/\bar{a}M$  where  $I_0$  is the amount of inertia of the stirrup taken about the axis of rotation,  $\bar{a}$  is the distance from the center of gravity to the axis of rotation, and  $M$  is the mass of the stirrup.

4,162,779

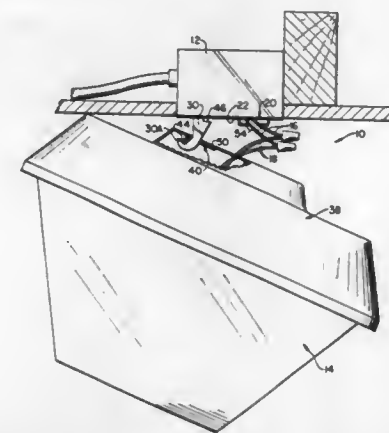
#### OUTLET BOX MOUNTING DEVICE

Frank Van Steenhoven, Killingworth, and Thomas D. Hirt, Meriden, both of Conn., assignors to The Miller Company, Meriden, Conn.

Filed Dec. 14, 1977, Ser. No. 860,596  
Int. Cl.<sup>2</sup> B42F 13/00

U.S. Cl. 248—343

15 Claims U.S. Cl. 249—144



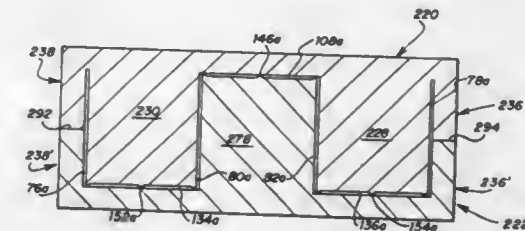
1. A light fixture mounting device comprising a service outlet box having a bottom cover plate, light fixture suspension means on the bottom cover plate providing temporary light fixture suspension, a light fixture having an upper housing in underlying relation to the bottom cover plate, and light fixture locking means including a bolt keeper depending from the bottom cover plate and releasable slide bolt means on the upper housing, the bolt keeper and slide bolt means cooperating and providing permanent light fixture mounting when the upper housing of the light fixture is in aligned confronting relation to the bottom cover plate.

4,162,781

#### MOLD FOR PLASTIC COLLAPSIBLE ARTICLE CARRIER

Paul J. Morcom, Rte. 1, Box 235, Henderson, Tex. 75652  
Division of Ser. No. 667,679, Mar. 17, 1976, Pat. No. 4,113,087.  
This application Apr. 24, 1978, Ser. No. 899,263  
Int. Cl.<sup>2</sup> B29C 1/00; B29F 1/06

5 Claims



1. A mold used with a plastic injection molding machine for manufacturing a plastic collapsible article carrier having hinged end, side and bottom members comprising:  
a first die having a first plurality of alternating cavity and core members; and  
a second die having a second plurality of alternating cavity and core members which are offset from said first plurality of members, such that when said first and second dies are mated with one another the core members of said first die align and mate with said cavity members of said second die and said cavity members of said first die align and mate with said core members of said second die to form the collapsible article carrier which has side walls vertically offset from one another, said core members including planar end surfaces, said planar end surfaces including first and second convex hinge-forming projections parallel to one another and extending from opposite edges of said planar end surfaces, wherein said projections mold the hinged connections of the side and end walls of the collapsible article carrier.

4,162,782

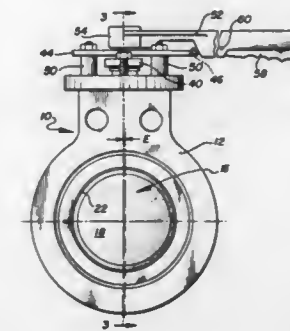
#### SEAL ASSEMBLY FOR BUTTERFLY VALVE

Ronald D. Wilkins, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,787  
Int. Cl.<sup>2</sup> F16K 25/00

U.S. Cl. 251—173

23 Claims



1. In a butterfly valve having a valve body with a flow passage therethrough, an annular groove in the body about the flow passage, and a valve disc mounted in the flow passage for movement between open and closed positions relative to the flow passage;

an improved seal assembly mounted in said groove for sealing against the outer periphery of the valve disc in the closed position thereof, said seal assembly comprising a metallic body and an elastomeric face seal;

4,162,780

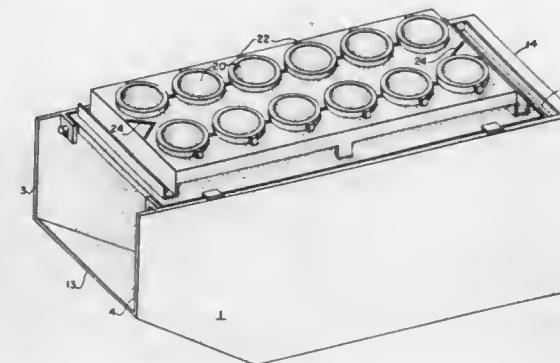
#### ICE CUBE SERVICE

Armand T. Rankin, New Albany, Ind., assignor to Stone City Products, Inc., Bedford, Ind.

Filed May 20, 1977, Ser. No. 798,845  
Int. Cl.<sup>2</sup> F25C 1/24

U.S. Cl. 249—127

3 Claims

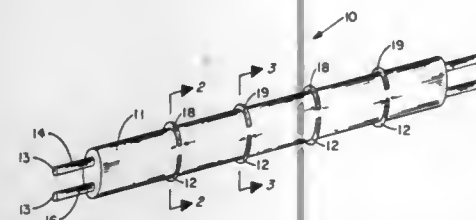


1. An ice cube tray comprising two longitudinally extended rows of less than half spherical flexible compartments attached to and penetrating through a flexible tray bed, wherein distortion means are provided on the top and on the bottom of the tray bed, said distortion means being attached in both places to sides of the compartment and the tray bed.

said metallic body including a pair of outer resilient legs having outer ends contacting the bottom of the groove and a pair of spaced inner legs having outer ends contacting the outer periphery of the valve disc in the closed position of the valve disc to provide metal-to-metal sealing contact with the outer periphery of the disc along two spaced metallic sealing surfaces formed by the ends of the inner legs, said elastomeric face seal being positioned between the spaced inner legs and contacting the disc sealing surface in the closed position of the disc to provide sealing contact with the outer periphery of the disc along a sealing surface between the spaced metallic sealing surfaces;

said resilient inner legs and said elastomeric face seal being deflected outwardly relative to said resilient outer legs upon engagement of said disc with the inner legs and face seal in the closed position thereby to bias the seal assembly against the valve disc for establishing the three aforementioned sealing surfaces between the seal assembly and the outer periphery of the valve disc in the closed position of the valve disc.

**4,162,783**  
**ELECTRIC FENCE CABLE ASSEMBLY**  
V. William Crist, Jr., Box C, Wessington Springs, S. Dak. 57382  
Filed Mar. 31, 1978, Ser. No. 892,233  
Int. Cl.<sup>2</sup> A01K 3/00  
U.S. Cl. 256—10 5 Claims



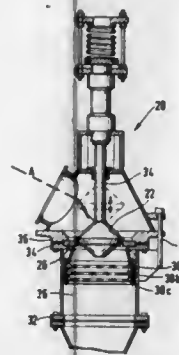
1. An improvement in an electrified cable assembly for use with electrically charged fences having a fence charger for providing an electric charge, the improvement comprising: a first conductor electrically connected to the fence charger; a second conductor electrically connected to ground; unitary insulating means disposed about said first and second conductors such that said conductors are electrically insulated from each other and the environment; a first electrically conductive contact unit disposed proximate said insulating means and in electrical contact with said first conductor; and a second electrically conductive contact unit disposed proximate said insulating means distant said first conductor and in electrical contact with said second conductor.

**4,162,784**  
**PRESSURE EQUALIZATION APPARATUS AND METHOD**  
Edouard Legille, Luxembourg; Rene N. Mahr, Howald-Hesperange, and Carlo Heinz, Luxembourg, all of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg  
Filed Feb. 18, 1977, Ser. No. 770,193  
Claims priority, application Luxembourg, Mar. 8, 1976, 74505  
Int. Cl.<sup>2</sup> F27B 11/12  
U.S. Cl. 266—176 9 Claims

1. In a pressure equalization system for use with a shaft furnace charging installation, the pressure equalization system including a valve and a tubular conduit in series relation to the valve and defining an axis, said tubular conduit providing for the flow of a stream of pressurized gas including entrained

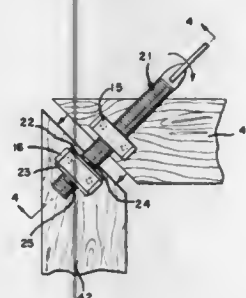
particulate material therethrough, the improvement comprising:

a movable tubular housing, said tubular housing having an axis and defining a segment of the conduit, said movable tubular housing being pivotal with respect to the conduit to translate said housing axis in a direction transverse to the axis of the conduit to provide access to the interior of the housing; and



disc means releasably positioned within said tubular housing for subdividing said stream of pressurized gas including entrained particulate material delivered thereto into a plurality of jets, said disc means being formed of a highly wear-resistant material and being impacted by the entrained particulate material when the stream of pressurized gas is delivered through the tubular housing to thereby reduce the speed and energy of the entrained particulate material and to reduce the wear on the portion of the conduit downstream of said disc means.

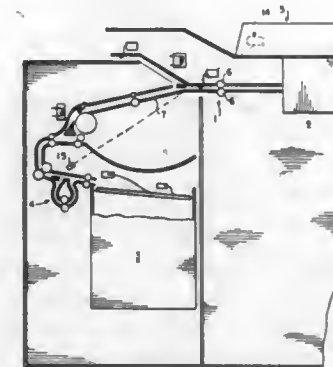
**4,162,785**  
**MITER CLAMP**  
George P. Johnson, 1951 Hollywood Pkwy., York, Pa. 17403  
Filed Mar. 9, 1978, Ser. No. 884,763  
Int. Cl.<sup>2</sup> B25B 5/14  
U.S. Cl. 269—41 1 Claim



1. In combination: a miter joint comprising two mitred pieces, each piece having front and back surfaces, two sides and a mitred end surface, the mitred end surfaces of the pieces being in abutting relationship and forming a common joint line, the back of each piece defining at least two pin-receiving holes perpendicular to the back surface and at equal distances from the joint line, the holes in each piece being so located that a line between corresponding holes in the two pieces is perpendicular to the joint line; and a clamp comprising first and second members mounted on a common cylindrical shaft for relative movement toward and away from each other in the axial direction of the shaft, first and second sets of parallel coextensive pins mounted on the first and second members respectively and so oriented as to define first and second planes perpendicular to the axis of the shaft, and means for applying

force in the axial direction of the shaft to move the first and second members toward each other and to hold the members in axial position with respect to each other, wherein the first set of pins is received in the holes in the first mitred piece and the second set of pins is received in the holes in the second mitred piece.

**4,162,786**  
**JOB SEPARATION BY A SKEWED TROUGH IN THE PAPER PATH**  
Michael K. Bullock, Boulder County, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.  
Continuation-in-part of Ser. No. 727,873, Sep. 29, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,618  
Int. Cl.<sup>2</sup> B65H 29/58  
U.S. Cl. 271—64 27 Claims

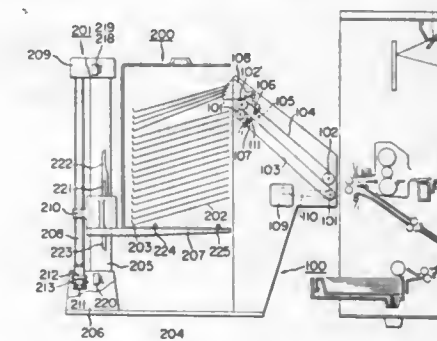


1. Apparatus for offsetting sheets laterally with respect to their path of travel in a predetermined direction comprising: (a) feeding means for feeding sheets in a predetermined direction and with predetermined orientation to said direction, first in one plane along a first section of said path and then along a second section of said path, the first and second section of said path being disposed in the same plane, said sheets being in said predetermined orientation, but offset, when resident in said second section of said path; (b) trough shaped guide means connecting said two sections and extending out of said plane in skewed relation to said predetermined direction, said guide means comprising a plurality of serially disposed and individual skewed turns, each individual turn of which is formed about an axis skewed relative to said predetermined direction, and each such axis being parallel with each other such axis and being containable within a plane parallel to a sheet while it is in the first section of said path; and (c) control means for directing sheets from the first section of said path, through said guide means and onto the second section of said path as they are being fed in said predetermined direction along the first and second sections of said path.

**4,162,787**  
**SHEET SORTING DEVICE**  
Reiji Shirahase, Tokyo, and Shigehiro Komori, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 754,171, Dec. 27, 1976, abandoned, which is a continuation of Ser. No. 612,723, Sep. 12, 1975, abandoned. This application Apr. 17, 1978, Ser. No. 897,055  
Int. Cl.<sup>2</sup> B65H 31/24  
U.S. Cl. 271—173 4 Claims

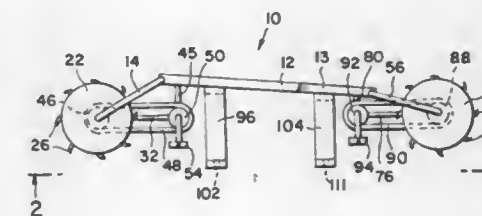
1. A sheet sorting device for collecting sheets supplied from a fixed discharge opening, comprising: a tray casing, and a plurality of trays for receiving sheets thereon, wherein each of said trays is mounted at a first edge thereof for pivotal movement, and wherein said sheets are received at a second edge of said trays, said first

and second edges being opposed to each other and said trays slanting upwardly toward said first edges thereof; a plurality of displacement transmission means pivotally mounted on said tray casing for respective engagement with said trays; means for moving said tray casing to successively align each tray with said fixed discharge opening; and



control means for pivoting a plurality of said displacement transmission means to pivotally move a plurality of said trays, simultaneously, to widen the space between the second edges of adjacent trays at the sheet inlet opening for each tray, as each said tray is successively aligned with the fixed discharge opening.

**4,162,788**  
**SWIMMING AND EXERCISING APPARATUS**  
Gerard Turnier, 61-35 98th St., Rego Park, N.Y. 11374  
Filed Jul. 18, 1977, Ser. No. 816,336  
Int. Cl.<sup>2</sup> A63B 35/04  
U.S. Cl. 272—71 4 Claims

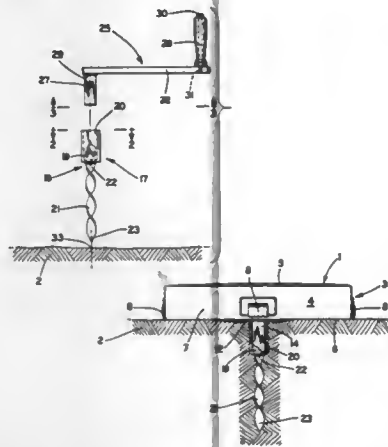


1. A swimming and exercising apparatus comprising a substantially flat body supporting section, first and second frame sections extending from opposite ends of said body supporting section, each of said frame sections comprising a pair of lateral arms secured at one end thereof to said body section, a crossbar joining the other end of said lateral arms of each of said frame sections, said crossbar of said first frame lying in a first horizontal plane parallel to said body supporting section, the crossbar of said second frame lying in a second horizontal plane parallel to said body supporting section, said second horizontal plane being closer to said body supporting section than said first horizontal plane, wheel means rotatably mounted on each crossbar of each of said frame sections, said wheel means comprising a pair of opposed wheels on the crossbar of said first frame and a pair of opposed wheels on the crossbar of said second frame, cog means extending from the periphery of each of said wheel means for drivingly engaging water or a planar surface which said wheel means may engage, first and second pedal means mounted substantially at the ends of said body supporting section in the area where said first and second frame sections extend from said body supporting section, said first pedal means aligned with said crossbar of said first frame and arranged to be operated by hand, said second pedal means aligned with said crossbar of said second frame means arranged to be operated by foot, said first pedal means drivingly con-



ected to said wheel means on said first frame for individually driving each of said wheels on said first frame, said second pedal means drivingly connected to said wheel means on said second frame for individually driving each of said wheels on said second frame so that greater or lesser exercising forces may be applied independently to each of said wheels by said first pedal means and said second pedal means.

**4,162,789**  
**BASEBALL BASE AND INSTALLATION APPARATUS**  
William D. Hollaway, 2000 - 34th St. NW., Canton, Ohio 44709  
Filed Nov. 16, 1977, Ser. No. 852,090  
Int. Cl.<sup>2</sup> A63B 71/00  
U.S. Cl. 273-25 4 Claims



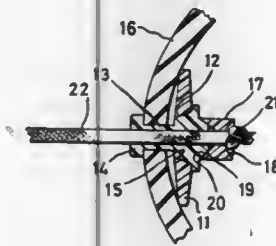
1. A kit for laying out a baseball field and for removably installing the bases therefor including:

- three bases, each of said bases having a bottom surface;
- post means adapted to be mounted on the base and extend vertically downwardly from the bottom surface;
- anchor means adapted to be removably installed in the ground, said anchor means including a top socket member having a hollow interior complementary to the configuration of the post means and a screw auger firmly secured to the bottom of the socket member and extending vertically downwardly from said socket member;
- brace means having a lug with a configuration complementary to the interior of the socket member and a handle for rotating the lug, said lug being adapted to be telescopically inserted into the interior of the socket member to removably install the anchor means in the ground by rotatably advancing the screw auger into the ground upon rotation of the brace means handle until the top of the socket member is flush with the top of the ground;
- the post means being adapted to be telescopically inserted into the socket member to secure the base in a fixed predetermined position on a baseball field after removal of the brace means lug; and
- flexible measuring means for determining the position of the bases on a baseball field.

**4,162,790**  
**CONNECTOR ASSEMBLY FOR A BALL AND CORD**  
David R. Kelsey, Barnet, England, assignor to D. R. K. Limited, Barnet, England  
Filed Feb. 21, 1978, Ser. No. 879,376  
Claims priority, application United Kingdom, Mar. 18, 1977, 11570/77  
Int. Cl.<sup>2</sup> A63B 67/10, 43/00  
U.S. Cl. 273-58 C 10 Claims

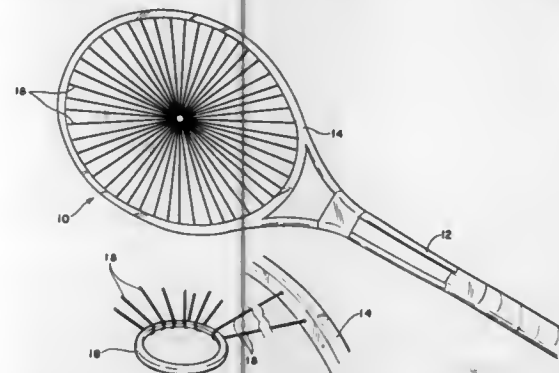
1. A connector assembly means connecting a cord to a hollow ball having an aperture in the wall thereof for retainably receiving an end of the cord comprising a tubular member extending through the aperture in the wall of the ball, said member having flanges adjacent the ends thereof and a bore

for passage of the cord therethrough into the interior of the ball, one of said flanges being positioned outside the ball and the other of said flanges being positioned inside the ball, and a flexible washer having an aperture and mounted on said tubular member and being positioned entirely within the ball between the interior wall of the ball and the internal flange, said washer being free from direct contact with the cord extending through the bore of said tubular member, said washer being in



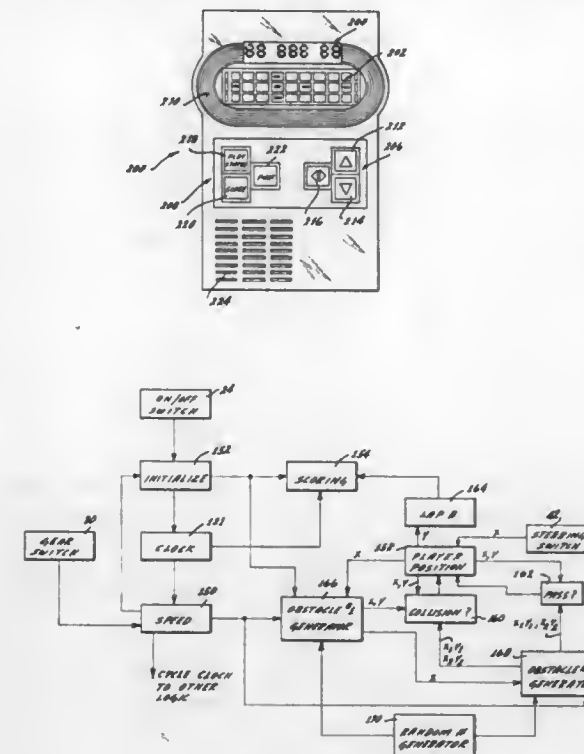
cooperative surface engagement with said internal flange and, when no external forces are exerted on the ball or cord, being spaced from the interior wall of said ball near the aperture of the ball thereby engaging the interior wall of the ball only remotely of the apertures of both the washer and ball to provide a spaced relationship between the washer and the interior wall of the ball at the aperture such that, in use, tension or shock loading applied to the cord will cause the washer to flex toward and against the interior wall of the ball.

**4,162,791**  
**TENNIS RACQUET HAVING RADIALY ARRAYED STRINGS**  
Jack C. Seehase, 1200 Osceola Ave., Winter Park, Fla. 32789  
Filed Oct. 20, 1977, Ser. No. 844,026  
Int. Cl.<sup>2</sup> A63B 51/00  
U.S. Cl. 273-73 D 11 Claims



1. A racquet comprising a head of generally oval shape, said head being strung with a plurality of tensioned strings extending radially inwardly from a frame forming a closed loop, and a central ring of small size disposed approximately in the center of the string array, with at least some of the radially arrayed strings extending through and around said central ring, said central ring being smaller than the ball to be used with said racquet, and together with said string array forming an effective, substantially planar striking surface.

**4,162,792**  
**OBSTACLE GAME**  
Richard S. Chang, Rolling Hills Estates, and George J. Klose, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.  
Filed Jan. 12, 1977, Ser. No. 758,605  
Int. Cl.<sup>2</sup> A63F 9/00, 9/14  
U.S. Cl. 273-85 G 8 Claims

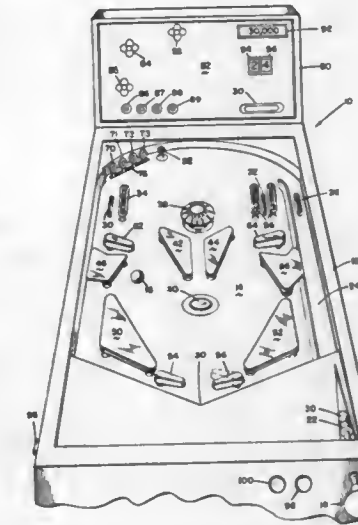


1. An electronic game comprising:  
a display having segments operable within a playing field of at least three lanes and at least six rungs per lane, each of said segments being illuminatable for displaying indicia representative of the location of a player's piece and also that of obstacles;  
means for moving the player's piece indicium from one lane of the field to another lane of the field in response to a manual input;  
means internal to the game for automatically advancing the obstacle indicia on the playing field towards the player's piece indicium;  
means for providing a predetermined algorithm; and  
means for automatically determining whether or not the player's piece indicium and an obstacle indicia have collided, and, if a collision has occurred, for then automatically moving said player's piece indicium back one rung in response to the collision in accordance with said predetermined algorithm.

**4,162,793**  
**GAME SCORING SYSTEM**  
Gary J. Cummings, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.  
Filed Mar. 27, 1978, Ser. No. 890,143  
Int. Cl.<sup>2</sup> A63D 3/02  
U.S. Cl. 273-121 A 13 Claims

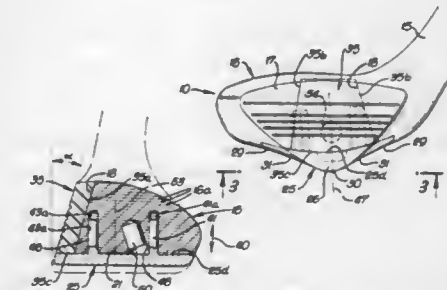
1. In a game apparatus for a plurality of players wherein each player takes a given number of turns per game for scoring points by actuating any one or more of a number of targets in response to an at least partially player-controlled object device, said game comprising:

player operable means for selecting a scoring mode for that turn;  
a predetermined plurality of target means;  
means for detecting the actuation of each of said predetermined plurality of target means;  
a first register means for accumulating the score of the player for that game;



a second register means for accumulating the score of the player for that turn;  
means for sensing completion of that player's turn; and  
means responsive to said sensing means, said detecting means and selection of said player operable means for altering the contents of said first register means by the contents of said second register means.

**4,162,794**  
**GOLF CLUB HEAD SOLE PLATE WITH STUDS INTERLOCKING TO HEAD LAMINATIONS**  
Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa del Rey, Calif. 90271  
Filed Dec. 12, 1977, Ser. No. 859,324  
Int. Cl.<sup>2</sup> A63B 53/04  
U.S. Cl. 273-174 12 Claims



1. In combination with a golf club head having multiple laminations which extend in vertically stacked relation and generally horizontally, the head having a bottom surface and a recess sunk upwardly in the head from said bottom surface, there being a head lamination extending across the upper interior of the recess, the recess being everywhere several laminations deep in vertical dimensions, the improvement comprising  
(a) a metallic sole plate received upwardly into the recess,  
(b) the plate having an upper side and defining multiple studs projecting upwardly from said upper side into corresponding openings extending upwardly in the head from said recess, the vertical dimensions of the studs exceeding the combined thicknesses of at least two of the laminations through which the studs project,

- (c) there being adhesive bonding material bonding the studs to the walls of said openings,
- (d) the sole plate having a downwardly projecting keel which extends rearwardly from the front face of the club head, the studs located at opposite sides of and being spaced from a vertical plane which extends forwardly and rearwardly, and bisects said keel, the studs being generally parallel and being of one-piece integral construction with the sole plate,
- (e) the studs being generally cylindrical and vertically elongated, whereby the studs, bonding material and laminations cooperate to distribute impact loads to the keel and to the plate directly into multiple laminations at locations at opposite sides of said plane.

4,162,795

# SEALING DEVICE FOR OPENINGS OF A CONTAINER WHICH CAN BE LOADED WITH AND EMPTIED OF BATCHES OF FLUID LOOSE MATERIAL, VISCOUS DEPOSITS, SLUDGES OR THE LIKE

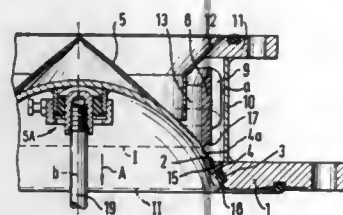
Andras Kanics, Laasphe, Fed. Rep. of Germany, assignor to Mittelmann GmbH & Co. KG, Laasphe, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,616

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1976, 7639803[U]; Dec. 20, 1976, 7639879[U]

Int. Cl.<sup>2</sup> F16J 15/56

U.S. Cl. 277-237 R



1. In a sealing device for an opening in the wall of a container which is loaded with or emptied of a charge of fluid loose material, viscous deposits, sludges or the like and which after the loading or the emptying is sealed tightly, said sealing device having a movably supported sealing element which can be brought into sealing abutment with a sealing seat, secured to the wall, by means of its sealing surface, the improvement comprising wherein said sealing element has a sealing surface which can be brought into linear sealing abutment with said sealing seat, above this line of sealing abutment a freely movable casing having a diameter smaller than that of the sealing abutment line is supported on said sealing surface of said sealing element during the first part of the opening operation until said line of sealing abutment is positioned below said sealing seat and is free of engagement therewith in the following movement of said sealing element and wherein a material guide device is provided for said charge, by means of which it can be guided onto the area of said sealing element enclosed by said casing resting on said sealing surface of said sealing element and on a side of said casing remote from said sealing seat to thereby protect said sealing seat from engagement with said material during the opening and closing movement of said sealing element.

4,162,796

# TANK MOUNTING APPARATUS FOR TRACTORS

Harold C. Mead, Charles City, Iowa, assignor to Nixdorff Krein Industries, Inc., St. Louis, Mo.

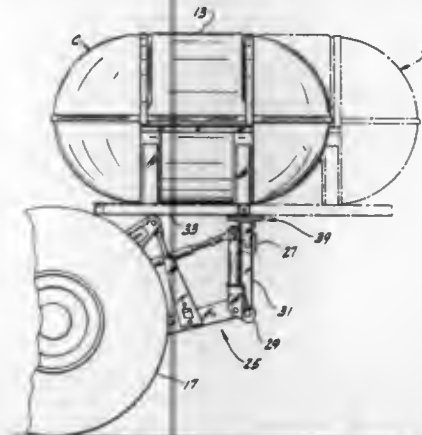
Filed Mar. 2, 1978, Ser. No. 882,779

Int. Cl.<sup>2</sup> B60P 3/22

U.S. Cl. 280-5 R

23. Apparatus for mounting a container upon a four-wheel drive tractor having a three-point lifting hitch by means of said

hitch, said hitch extending rearwardly outward from said tractor, said apparatus comprising a horizontal frame adapted to extend horizontally lengthwise under said container for supporting said container with the center of gravity of said container positioned between the ends of said horizontal frame, a vertical frame including multiple points of attachment for attachment to said hitch, pivot means securing an upper end of said vertical frame to said horizontal frame at a location on said



horizontal frame proximate one end thereof, with said center of gravity being at a position rearward of said vertical frame, said pivot means permitting pivoting of said horizontal frame in a horizontal plane with respect to said vertical frame for relocating said center of gravity to a position forward of said vertical frame, whereby, after attachment of said vertical support to said hitch and lifting thereof, said pivoting of said horizontal frames causing relocating of said center of gravity to a position forward from said vertical frame.

4,162,797

# EXERCISE TRICYCLE

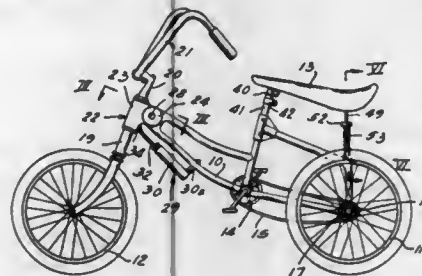
Thomas W. McBride, 716 E. Main St., Hoopeston, Ill. 60942

Filed Oct. 3, 1977, Ser. No. 838,751

Int. Cl.<sup>2</sup> B62K 5/06; B62M 1/20

U.S. Cl. 280-275

12 Claims



1. An exercise tricycle having a rigid frame, a pair of spaced rear rotary running wheels mounting the rear portion of the frame, a front rotary steering wheel mounting the front portion of the frame, a seat supported on and above the rear portion of the frame, and pedal operated driving means mounted on the frame intermediate said front and rear wheels at a suitable location below said seat and having a driving connection with said rear wheels, and comprising:

- a fork attached to said front wheel and having an upwardly extending journal end portion having a stem attached to a handlebar;
- bearing sleeve means within which said journal end portion is rotatable for steering maneuver of said front wheel by manipulation of said handlebar;
- said frame front portion having a single forwardly extending part providing terminal projection means for attachment to said bearing sleeve means;
- means pivotally connecting said bearing sleeve means on a

single horizontal axis to said terminal projection means, whereby said fork and thereby said front wheel can be shifted between a rearward position and a forwardly extended position by manipulating said handlebar for rocking said bearing sleeve and thereby said fork about said horizontal axis and correspondingly shifting the center of gravity of the tricycle;

and biasing means operating between said bearing sleeve means and said frame for normally urging said sleeve means, fork and wheel toward one of said positions.

4,162,798

# HITCHING APPARATUS

Newman C. Foley, 6705 John Ave., Superior, Wis. 54880

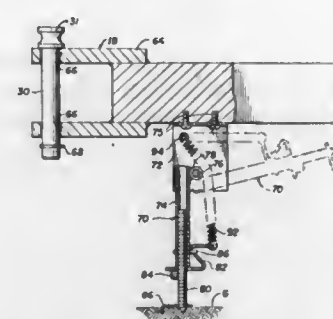
Division of Ser. No. 759,776, Jan. 17, 1977. This application

Dec. 9, 1977, Ser. No. 859,158

Int. Cl.<sup>2</sup> B60D 1/14

U.S. Cl. 280-475

5 Claims



1. A device for supporting a tongue on a vehicle to be towed, said supporting device comprising a tubular leg member pivotally connected at its upper end to the tongue, a threaded shaft slidably mounted within said leg member and having a lower end engageable with the ground, means for releasably locking said shaft and said leg member in predetermined relative positions to adjust the height of the tongue, said locking means comprising a bracket movably mounted on said leg member and having a threaded nut section engageable with said threaded shaft, and means for urging said leg member upwardly away from the ground to a position adjacent the tongue.

4,162,799

# TRUCK SUSPENSION SYSTEM

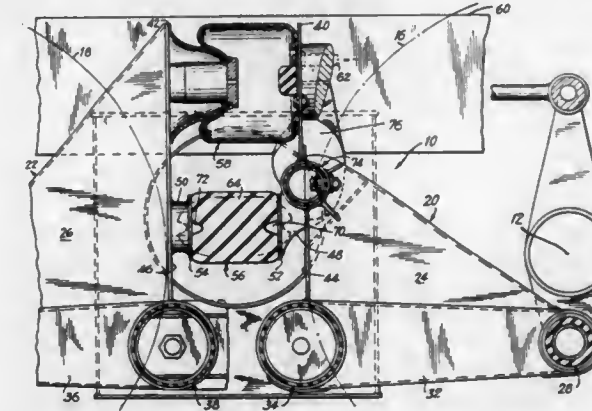
Elwood H. Willets, 102 S. Penatquit Ave., Bay Shore, N.Y. 11706

Continuation-in-part of Ser. No. 807,002, Jun. 16, 1977, Pat. No. 4,132,432. This application Jul. 29, 1977, Ser. No. 820,369

Int. Cl.<sup>2</sup> B60G 5/00

U.S. Cl. 280-683

2 Claims



1. A multiple axle vehicle suspension structure, comprising,

in combination: transversely extending axles spaced from one another longitudinally with respect to the longitudinal axis of said vehicle suspension structure, frame members spaced transversely with respect to one another and extending between said axles, opposing rocker beam assemblies separately trunnioned in said structure at an elevation beneath the elevation of said frame members, said opposing rocker beam assemblies being supported at longitudinally extending ends thereof by said axles, multiple spring means reactive with respect to said axles for operationally equalizing the load as between said axles, said multiple spring means comprising an air spring and a compressive means disposed in parallel and both intermediate and cooperative with upwardly extending faces of said opposing rocker beam assemblies, said compressive means comprising a compressive resistant elastomer as a spring member and being characterized by the absence of spring members and means other than said elastomer, said elastomeric member disposed beneath said air spring and above trunnion points of said rocker beam assemblies.

4,162,800

# COMBINATION BOOKMARK AND WRITING INSTRUMENT HOLDER

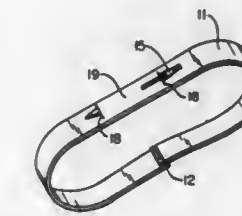
Fred P. Gonot, Jr., 86 W. Lane Ave., Apt. 1-G, and Louis Kallantas, 154 W. Sixth Ave., both of Columbus, Ohio 43201

Filed Jul. 11, 1977, Ser. No. 814,451

Int. Cl.<sup>2</sup> B42D 9/00

U.S. Cl. 281-42

1 Claim



1. A combination bookmark and holder for writing instruments comprising a continuous ribbon of elastic material of a sufficient length so that said ribbon will fit snugly around the average book in a direction parallel to the spine of said book, of a width greater than the diameter of the writing instrument and wherein the length of said ribbon is substantially greater than its width and which ribbon is provided with at least two, spaced, slits (writing instrument receiving-means), extending transversely across the majority of the width of said ribbon releasably to hold a writing instrument in substantial alignment with the lengthwise dimension of said ribbon, while said ribbon functions as a bookmark.

4,162,801

# GAS LINE LEAD-IN ASSEMBLY

Fred C. Kresky, John H. Loveland, and Bryce B. Evans, all of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Dec. 16, 1977, Ser. No. 861,106

Int. Cl.<sup>2</sup> F16L 11/12

U.S. Cl. 285-45

5 Claims



1. A lead-in conduit assembly for gas lines and the like characterized by its flexibility comprising, in combination, an annu-



lar end fitting having attachment means defined thereon and including an annular nipple having a first end sealingly affixed to said fitting and a second free end, a flexible synthetic plastic tube coaxially sealingly mounted on said nipple free end in communication therewith, an annular socket member mounted upon said nipple free end in radial spaced relationship thereto wherein said member and nipple free end define an annular socket chamber, an end of said tube being received within said socket chamber, said socket member being radially contracted on said tube sealingly and frictionally mounting said tube upon said nipple free end, an annular plug closely circumscribing said tubing axially spaced from said nipple, and a flexible metal hose encompassing said nipple and radial spaced therefrom having a first end mounted on said fitting and a second end mounted over said plug, means attaching said hose second end to said plug, said metal hose being capable of flexible lateral deformation whereby said assembly may be readily formed into a bend without kinking of said tube.

4,162,802

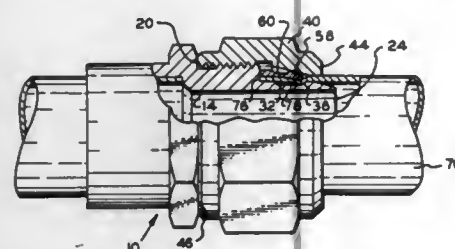
## PERMANENT FLARELESS TUBE CONNECTOR

Robert G. Cox, Rives Junction, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 27, 1978, Ser. No. 890,128  
Int. Cl.<sup>2</sup> F16L 19/08

U.S. Cl. 285—343

4 Claims



1. A flareless tube connector fitting comprising in combination, a tubular fitting body including a nipple having a free end and an outer surface for receiving a soft metal tube thereon, an annular groove defined in said outer nipple surface defining an annular shoulder surface on said nipple facing away from free end, threads defined upon said fitting body for receiving a compression nut thereon, a first radial abutment shoulder defined on said fitting body adjacent said threads facing said nipple free end, a second radial abutment shoulder defined on said fitting body adjacent said nipple and facing said nipple free end, a threaded annular compression nut adapted to be threaded upon said fitting threads, said nut having an annular inner conical cam compression surface radially positioned over said nipple surface upon said nut being fully assembled to said fitting body, and an annular radially deformable compression sleeve having first and second ends circumscribing a tube inserted on said nipple whereby said sleeve first end engages said second abutment shoulder and said sleeve second end engages said nut cam compression surface, said sleeve being formed of a soft metal and including a central region intermediate said ends thereof, the radial wall thickness of said sleeve at said central region being less than the sleeve radial wall thickness at said second end whereby the reduced wall thickness at said central region defines a hinge portion and facilitates the inward sleeve deformation adjacent said second end thereof, said hinge portion and said second end of said sleeve being in radial alignment with said annular groove whereby tightening of said nut deforms said sleeve second end thereof radially inwardly deforming the tube material into said nipple groove and into engagement with said nipple annular shoulder surface, said nut abutting said first radial abutment shoulder upon complete assembly of said fitting body and nut.

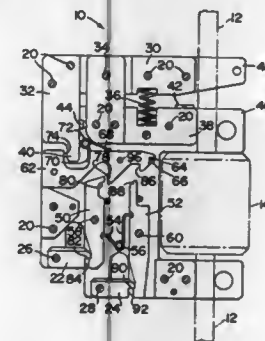
4,162,803  
LATCH RELEASE DEVICE

J. Kenneth Rolfes, 216½ 13th Ave., NE. St., Petersburg, Fla. 33701

Filed Dec. 9, 1977, Ser. No. 859,231  
Int. Cl.<sup>2</sup> B66C 1/38

U.S. Cl. 294—83 R

14 Claims



1. A latch release device responsive to a mechanical force comprising, in combination: a latch housing; operating arm means movably disposed on said housing and disposed to receive a mechanical impulse; first latch means pivotally attached to said housing; first sear means movably disposed on said housing in engaging relation to said first latch means whereby said first latch means is normally retained in a closed position; sear biasing means operatively disposed between said housing and said first sear means, whereby said first sear means is normally urged to a retaining relation with said first latch means; and trigger bar means disposed in movable interconnecting relation between said operating arm means and said first sear means whereby a mechanical force directed to said operating arm means will be transmitted to said first sear means to overcome said sear biasing means and open said first latch means.

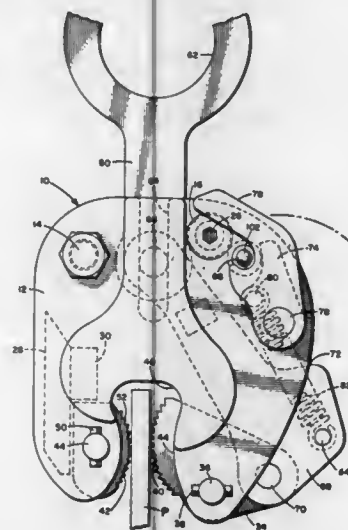
4,162,804  
LIFTING CLAMP

William Davies, Jacksonville, Fla., assignor to J. C. Renfro and Sons, Inc., Jacksonville, Fla.

Filed Feb. 8, 1978, Ser. No. 876,006  
Int. Cl.<sup>2</sup> B66C 1/48

U.S. Cl. 294—101

20 Claims



1. A lifting clamp for articles such as steel plates comprising: a clamp body including a pair of spaced side plates, said body defining a slot through said side plates to receive an

article to be lifted, said slot being laterally enlarged inwardly of its open outer end, a pair of opposed jaws mounted on pivot pins connected to said body on opposite sides of said slot adjacent said open end of said slot with said jaws having convex gripping surfaces facing inwardly from the opposite sides of said slot, each of said pivot pins being perpendicular to said side plates, one of said jaws being a gripping jaw pivotally mounted for opening and closing movement relative to the other jaw and the other jaw being a cam jaw, a shackle mounted for guided movement in said clamp body and adapted for connection to a lifting force, link means connecting said shackle to said gripping jaw to close said gripping jaw when a lifting force is applied to said shackle, said link means and said gripping jaw forming an assembly, locking means having a manually operated handle pivotally mounted outside of said clamp body and a spring between said side plates connected to said assembly, said spring being tensioned by rotation of said handle to urge said gripping jaw toward its closing position and released by reverse rotation of said handle to free said gripping jaw to move to its open position, said cam jaw being unconnected to said shackle and mounted for free pivotal movement about its pivot pin with its convex gripping surface extending eccentrically above its pivot pin to be cammed inwardly in the slot into closer gripping relation with said gripping jaw in response to a downward load on said convex gripping surfaces, and said clamp body being relieved to enlarge the side of said slot past said cam jaw to completely enclose the outer surface of said cam jaw opposite its gripping surface and said clamp body being relieved to enlarge the side of said slot above the pivot pin for said cam jaw so that the upper end of a plate engaged between said jaws can pivot around said cam jaw while maintaining gripping contact with the convex gripping surface of said cam jaw and without engaging said side of the slot.

4,162,805  
DRIVE ARRANGEMENT FOR A MOVABLE VEHICLE PANEL

August Hirschberger, Munich, Fed. Rep. of Germany, assignor to Webasto-Werke W. Baier GmbH & Co., Fed. Rep. of Germany

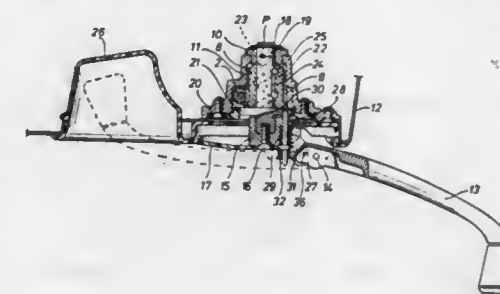
Filed Dec. 20, 1977, Ser. No. 862,621

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657850

Int. Cl.<sup>2</sup> B60J 7/02

U.S. Cl. 296—137 G

14 Claims



1. A drive arrangement for a movable vehicle panel member apparatus including a vehicle panel member and a driving means for moving said panel member with respect to adjacent vehicle structure, said driving means including: a rotatable driving member which is drivingly connected to move said panel member in response to rotational movements of said driving member, said driving member having a first stop means, a rotatable shaft,

a crank member drivingly connected to said shaft for applying rotational movement to said shaft, and transmission means carried by said shaft, said transmission means forming a second stop means engageable with said first stop means to rotate said driving member along with said transmission means, said first and second stop means being arranged so that said transmission means can be freely rotated from a first position with the second stop means engaging one end travel limit of said first stop means to a second position with the second stop means engaging an opposite end travel limit of said first stop means, said transmission means being formed by a freely traveling device disposed between said shaft and said rotatable driving member in a pair of grooves formed in surfaces thereof so as to enable said crank to move through substantially 360° without moving said panel.

4,162,806

## SAFETY FOLDING CHAIR

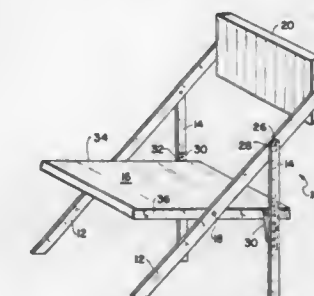
Yush-Chye Cho, 2320 Glenmore Ter., Rockville, Md. 20850

Filed Dec. 16, 1977, Ser. No. 861,122

Int. Cl.<sup>2</sup> A47C 4/00

U.S. Cl. 297—19

5 Claims



1. A safety folding chair comprises a seat portion having a pair of opposed marginal side walls, a pair of front leg portions pivotally secured to said side walls, a pair of rear leg portions pivotally secured to said front leg portions adjacent the uppermost ends thereof, a pair of plates, said pair of plates secured to said rear leg portions intermediate said walls and said rear leg portions, said pair of plates having an elongated slot therein, the uppermost region of said elongated slot having a hook-like down turned shape, a pair of pins, one end of said pair of pins fixedly secured to said side walls, the other end of said pair of pins disposed passing through said slots, means to selectively position said seat portion relative to a plane defined by the lowermost regions of said front leg portions and said rear leg portions when said lowermost regions are disposed in spaced apart relationship from one another, said means to selectively position including a pair of fasteners and a plurality of holes being located in said pair of plates, said plurality of holes being disposed in spaced apart relationship, said plurality of holes extending along the length of said rear leg portions, said pair of fasteners passing through a pair of said plurality of holes and removably secured to each of said pair of rear leg portions.

4,162,807

## LUMBAR SUPPORT REGULATING APPARATUS

Noboru Yoshimura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 31, 1977, Ser. No. 847,465

Claims priority, application Japan, Nov. 1, 1976, 51-131381; Nov. 22, 1976, 51-140580

Int. Cl.<sup>2</sup> A47C 7/46

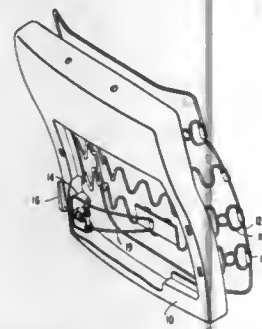
U.S. Cl. 297—284

5 Claims

1. A lumbar support regulating apparatus disposed within a seat back comprising a rigid seat back frame, spring means secured to said seat back frame, a torsion spring, pivot means



on said frame pivotally supporting said torsion spring and disposed parallel to said seat back frame, a lumbar support plate connected to one end of said torsion spring and disposed between said spring means and said torsion spring to distribute the force of said torsion spring to said spring means, cam means rotatably mounted on said frame on an axis parallel to said seat



back frame and including a cam having a plurality of radially disposed cam faces thereon engageable with the other end of said torsion spring, said pivot means being disposed orthogonal to the axis of rotation of said cam and positioned axially of said cam so as to be within the radial extent of said cam and means for locating said cam relative to the other end of said torsion spring.

4,162,808

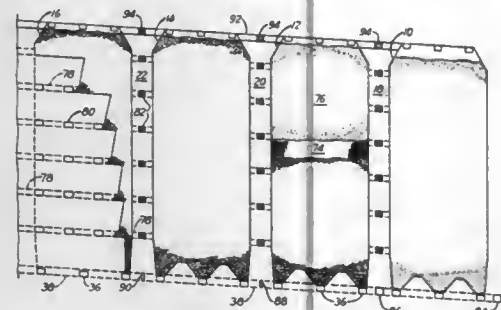
**IN-SITU RETORTING OF CARBONACEOUS DEPOSITS**  
Rudolph Kvapil, Denver, and K. Malcolm Clews, Littleton, both of Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa. and Standard Oil Company (Indiana), Chicago, Ill.

Filed May 23, 1978, Ser. No. 908,798

Int. Cl.<sup>2</sup> E21C 41/12

U.S. Cl. 299—2

13 Claims



1. A method of producing fluid fuels by combustion of combustible material in carbonaceous deposits in in-situ retorts comprising successively constructing in a subsurface carbonaceous deposit in-situ retorts in a row by the sequence of stopping the retorts for rubblization and rubblizing the carbonaceous material in the retorts, each of the retorts having an inlet and an outlet spaced from the inlet, successively igniting the carbonaceous deposit in each of the retorts in series beginning at the retort at one end of the row and finishing at the retort at the opposite end of the row, injecting combustion air into the inlet of a first retort in which the carbonaceous deposit has been ignited to cause a combustion front to move through the retorts toward the outlet and release a fluid fuel from the carbonaceous deposit therein, delivering the fluid fuel from the outlet of the retort in which combustion is proceeding to the surface, maintaining at least a second retort fully rubblized between the retort in which combustion is proceeding and retorts in which stopping or rubblization is proceeding, injecting combustion air into the second retort and blocking flow therefrom to maintain the entire second retort at substantially the

inlet pressure of the combustion air to prevent flow of combustion products from the first retort to the second retort.

4,162,809

**OSCILLATING CARPET AND TILE STRIPPER**

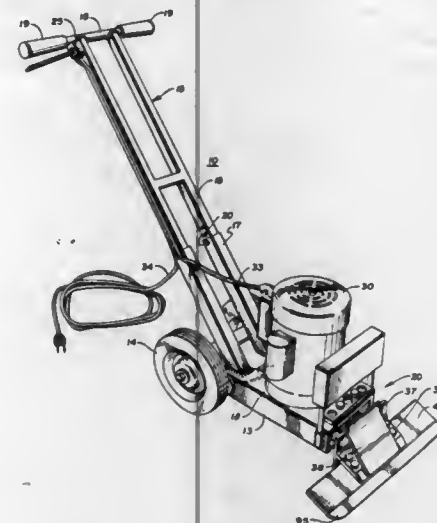
Lloyd E. Anderson, 6408 74th Ave. N. Brooklyn Park, Minn. 55429, and Gilbert L. Alinder, 17029 Fiesta Ct., Sun City, Ariz. 85351

Filed Feb. 6, 1978, Ser. No. 875,226

Int. Cl.<sup>2</sup> A47L 11/12

U.S. Cl. 299—37

14 Claims



1. A carpet and tile stripping machine comprising: a support frame; motor means mounted on said frame; said motor means including eccentric means driven by said motor means to produce orbital motion in a substantially horizontal plane; handle means connected to the rear portion of said frame for guiding and maneuvering said carpet stripping machine; a cutting blade mounting assembly positioned on said frame for orbital movement in a substantially horizontal plane, said assembly having an elongated drive bar portion and a transversely extending cutting blade mounting portion; said elongated drive bar portion being operatively connected to said eccentric means with said cutting blade mounting portion being positioned beyond the front of said frame whereby the cutting blade portion is driven in an orbital, substantially horizontal path by said eccentric means; and means connected to the drive bar portion at the front end of the frame for restricting the movement of said bar portion at the front end of the frame to reduce the effect of centrifugal force on said blade mounting assembly.

4,162,810

**RACK APPARATUS ON A FACE CONVEYOR FOR A MINING MACHINE**

Klaus Oberste-Beulmann, Sprockhovel, Fed. Rep. of Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengießerei m.b.H., Bochum, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,853

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729302

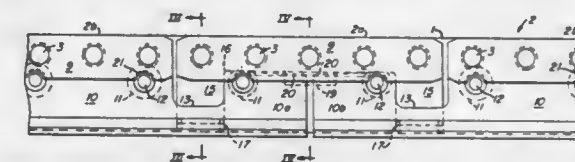
Int. Cl.<sup>2</sup> E21C 29/02

U.S. Cl. 299—43

10 Claims

1. In combination, a face conveyor including conveyor tray sections, a drum-cutter mining machine including drive gear means to propel the mining machine along the face conveyor relative to a mine face, and a rack apparatus for guiding and advancing said drum-cutter mining machine along the mine face, said rack apparatus including a plurality of rack members each having rack gear teeth at spaced-apart intervals to mesh with said drive gear means, said plurality of rack members

including movable rack segments each bridging a joint between said conveyor tray sections, said plurality of rack members further including non-bridging rack segments each supported by an individual one of said conveyor track sections,



the non-bridging rack segments each having extended end members forming interlocking surfaces with surfaces on a movable rack segment to limit slidability thereof in the longitudinal direction of said face conveyor relative to the non-bridging rack segments.

4,162,811

**PNEUMATIC CONVEYOR**

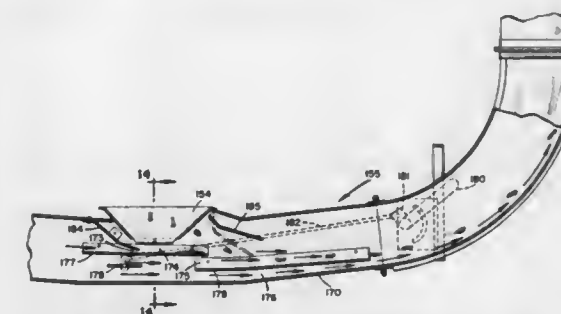
Oliver K. Hobbs, P.O. Box 1306, Suffolk, Va. 23434

Filed Sep. 13, 1973, Ser. No. 396,807

Int. Cl.<sup>2</sup> B65G 53/06, 53/58

U.S. Cl. 406—94

3 Claims



1. A pneumatic conveyor comprising a hollow conduit having a discharge end, means for introducing air into the conduit, means through one wall of the conduit for introducing material to be conveyed into the conduit downstream of the said means for introducing air and upstream of the said discharge end, a conduit wall opposite said material introducing means, a first plate disposed across the space enclosed by the conduit and extending longitudinally from a point upstream of the means for introducing material to be conveyed to a point downstream thereof, said first plate being immediately opposite the said material introducing means, a second plate extending transversely across the conduit and spaced between the first plate and the said opposite wall of the conduit, said second plate extending longitudinally downstream from adjacent to the downstream end of the first plate whereby the velocity of the air is increased at longitudinally spaced points to form air jets along the conduit and flow of material through the conduit is thereby accelerated and a check-valve provided in the conduit downstream of the upstream end of the first plate and upstream of the downstream end of the second plate, said check-valve comprising a plate pivotably fixed adjacent to the top of the conduit and adapted to swing with downstream flow of air through the conduit into an open position and to move towards a closed position upon obstruction of air flow and an increase in back pressure downstream thereof until said obstruction is removed.

4,162,812

**ROTARY BEARING ASSEMBLY**

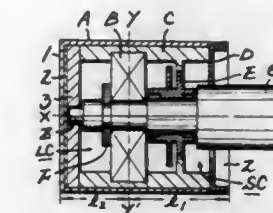
Toshiyasu Takata, Onomichi; Akira Takata, Ibaraki, and Shinsuke Tsukumo, Ikeda, all of Japan, assignors to NTN Toyo Bearing Company, Ltd., Osaka, Japan

Filed Dec. 19, 1977, Ser. No. 862,041

Int. Cl.<sup>2</sup> F16C 19/12, 33/72

U.S. Cl. 308—172

9 Claims



1. A rotary bearing assembly comprising a cylindrical cell member having a bottom and an opposed open end, a shaft member having a groove and an end adapted to engage with the bottom of said cylindrical cell member to support thrusts applied from the outside of said cell member, a ring received in said groove for supporting thrust loads applied from the inside of said cell member, a bearing member fitted between said shaft member and said cylindrical cell member, a two-piece split sleeve positioned within and adjacent to said cylindrical cell member, a two-piece split sealing element positioned between said split sleeve and said shaft member on the side of said bearing member facing the open end of said cell member, and an annular slipping-off prevention and sealing member positioned about said shaft member at the open end of said cell member, and wherein said bearing member divides the interior of said cell member into a lubricating oil reservoir and a sealing chamber

4,162,813

**BEARING ASSEMBLY AND THE LIKE FOR USE IN CORROSIVE AND NON-CORROSIVE ATMOSPHERES**

Douglas N. Mashburn, Knoxville; Harold C. Woodall, Kingston, and Ralph R. Wright, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 666,533

Int. Cl.<sup>2</sup> F16C 33/24

U.S. Cl. 308—237 R

10 Claims

8. A machine element comprising first and second members having relatively movable mutually contacting surface portions, each of said portions having a hardness exceeding about 500 HV<sub>100</sub> on the Vickers hardness scale, one of said surface portions being alumina and the other chemically deposited nickel, said surface portions having a coating of a lubricant which is stable in halogen-containing atmospheres.

4,162,814

**LIGHTED DISPLAY CHAMBER**

James J. Garbero, 1114 McClaren Dr., Carmichael, Calif. 95608, and Ronald F. Cook, 8 NW. Eighth St., Pendleton, Oreg. 97801.

Filed Jul. 17, 1978, Ser. No. 924,913

Int. Cl.<sup>2</sup> A47B 77/00

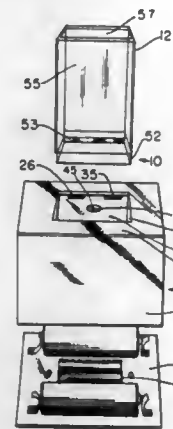
U.S. Cl. 312—223

15 Claims

1. A lighted display chamber for articles comprising a bottom section and a transparent top section, said top section being adapted to close a switch to switch on illumination source in said bottom section upon predetermined oriented contact of said top section with said bottom section, said top section including at least one upstanding side wall having an electrical contact at the bottom edge thereof, said bottom section being configured boxlike and comprising



a floor having a bore therethrough for the transmission of light, and at least one upstanding side wall, secured normal to said floor and extending downwardly therefrom, thereby defining a space for the disposition of an illumination source, an illumination source disposed in said space and adapted to transact light through said floor's bore,

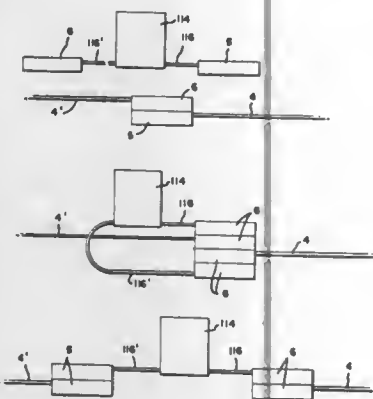


means disposed in said bottom section adapted to cooperate with the electrical contact of said top section to switch on said illumination source when said top section is placed in contact with said bottom section in a predetermined orientation.

**4,162,815**  
**MEANS FOR CABLE SECTION AND EQUIPMENT TRANSFER WITHOUT SERVICE INTERRUPTION**  
James E. Fleischacker, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.  
Continuation-in-part of Ser. No. 783,127, Mar. 31, 1977, which is a continuation-in-part of Ser. No. 630,589, Nov. 10, 1975, abandoned. This application Jan. 11, 1978, Ser. No. 868,597  
Int. Cl.<sup>2</sup> H01R 13/00

U.S. Cl. 339-19

4 Claims

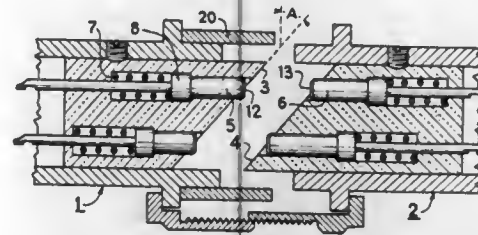


1. A method for incorporating electrical equipment into a multiconductor transmission line cable having cable sections serially connected by stackable electrical connectors having wire-receiving electrical terminals which become interconnected when said connectors are stacked one on the other, the steps comprising:

connecting one of said stackable electrical connectors to an input cable of said electrical equipment,  
connecting a second of said stackable electrical connectors to an output cable of said electrical equipment,  
stacking said one of said stackable electrical connectors to a first pair of stackable connectors which serially connect one of said cable sections in said transmission line,  
stacking said second stackable electrical connectors to a

second pair of stackable connectors which serially connect said one of said cable sections in said transmission line, thereby connecting said electrical equipment electrically in parallel with said one of said cable sections, and disconnecting the electrical connectors of said one of said cable sections from said transmission line leaving said electrical equipment serially connected in said transmission line.

**4,162,816**  
**MULTI-CHANNEL SELF-CORRECTING CONNECTOR**  
Christian Malsot, Suresnes, France, assignor to Socapex, Suresnes, France  
Filed Dec. 27, 1977, Ser. No. 864,704  
Claims priority, application France, Dec. 31, 1976, 76 39719  
Int. Cl.<sup>2</sup> H01R 9/04  
U.S. Cl. 339-64 M 26 Claims

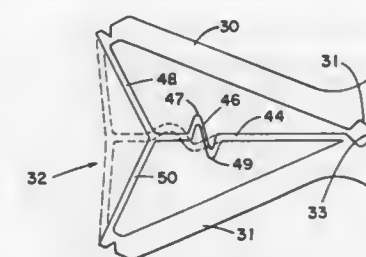


1. A multichannel connector comprising  
(1) a pair of cylindrical ferrules, each having  
(a) a longitudinal axis,  
(b) a supporting end face shaped in the form of a single plane, and encircling said longitudinal axis,  
(c) a contact surface, and  
(d) a plurality of corresponding contact elements in homologous relation opening at said surface;  
(2) means for centering each of said ferrules so that said longitudinal axis of each of said ferrules coincide, said end faces being in confronting relation;  
(3) said single plane of each ferrule being inclined at a same angle with respect to a plane, perpendicular said longitudinal axis;  
(4) said end faces being of such dimension that said end faces make mutual contact when said ferrules are moved longitudinally toward each other; and  
(5) said contact between end faces when said ferrules are axially urged together causing a rotational coupling of faces to mate said end faces and said corresponding contact elements.

**4,162,817**  
**ELECTRICAL CONNECTOR**  
Barry D. Briggs, New Concord, and Ray L. Lawter, Zanesville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio  
Filed Mar. 30, 1978, Ser. No. 892,046  
Int. Cl.<sup>2</sup> H01R 13/20  
U.S. Cl. 339-75 MP 8 Claims

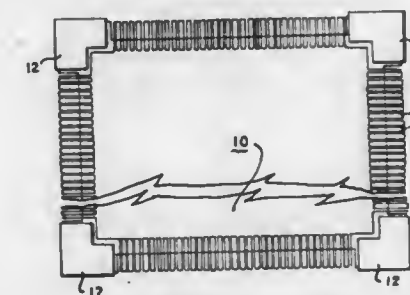
1. A connector for coupling together the conductors of a plurality of electrical components comprising;  
an elongated one piece body formed of a flexible electrical insulating material having a pair of jaw portions for clamping together the conductors of said components located therebetween;  
a pair of spaced-apart lever portions each connected to one of said jaw portions and extending outwardly therefrom, each lever portion joined together adjacent said jaw portions forming a fulcrum portion for affecting the movement of its associated jaw portion upon the movement of the lever portions;  
a first flexible portion interconnecting the ends of the lever portions;

and a second flexible portion secured to the first flexible portion intermediate its ends and the one piece body adjacent the fulcrum portion, said first and second flexible



portions being moved to a deformed position upon the inward movement of said lever portions for constantly urging the lever portions to a position in which the jaw portions provide a clamping pressure on said conductors.

**4,162,818**  
**INTERCONNECTION FOR PLANAR ELECTRONIC CIRCUITS**  
Jacob H. Martin, Wellesley, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.  
Filed Dec. 28, 1977, Ser. No. 865,268  
Int. Cl.<sup>2</sup> H01R 13/00  
U.S. Cl. 339-112 R 6 Claims

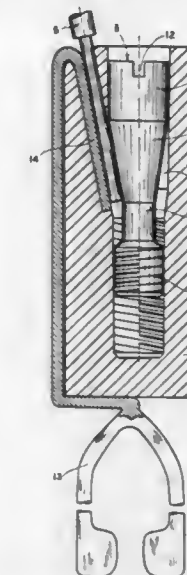


1. A multiple circuit board packaging system for electronic devices comprising:  
at least one planar electronic circuit board, having a plurality of connecting leads radiating outwardly to the edge of the board on one side;  
a planar circuit board support means having high heat transfer qualities affixed to one side of the circuit board forming a package;  
protective means covering the circuit board on the side away from the support means;  
circuit board interconnecting means comprising at least two wall like members, each having a plurality of sequentially positioned angulated slots on one side for receiving a circuit board package and means for resiliently securing a circuit board in the slot while simultaneously making electrical contact with circuit connecting leads.

**4,162,819**  
**ELECTRICAL TERMINAL**  
Klaus Eisert, Blomberg, Fed. Rep. of Germany, assignor to Phönix Elektrizitätsgesellschaft H. Knümann & Co., Blomberg, Fed. Rep. of Germany  
Filed Mar. 23, 1978, Ser. No. 889,434  
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713494  
Int. Cl.<sup>2</sup> H01R 9/10 10 Claims

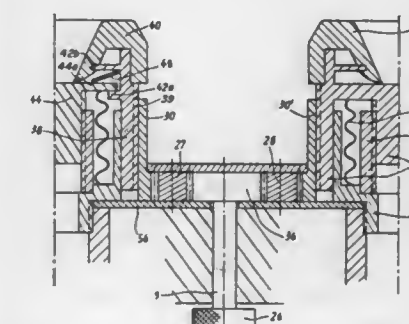
3. An electric terminal device comprising a body formed with a screw passage and with a wire passage converging

toward and merging with said screw passage, said body having a face at which both said passages open close to one another, said wire passage being adapted to receive an electric conductor, and a screw threadedly received in said body and disposed in said screw passage for clamping said wire in said body, said screw having a cylindrical thread-free guide portion accessible



to enable rotation of said screw, a conical thread-free clamping portion intermediate said guide portion and the opposite end of said screw, and a threaded portion at said opposite end of said screw, said conical portion converging toward said threaded portion and said passages including an acute angle between them.

**4,162,820**  
**BINOCULAR TELESCOPE**  
Kurt Schwab, Innsbruck, and Richard Koblka, Fritzens, both of Austria, assignors to D. Swarovski & Co., Wattens, Austria  
Filed Nov. 29, 1977, Ser. No. 855,760  
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654325  
Int. Cl.<sup>2</sup> G02B 7/06 5 Claims



1. In a binocular telescope having a pair of eye-pieces set in threaded mounts wherein a mutual drive simultaneously focuses both eyepieces and frictional clutch means connects the eyepieces to one another so that the clutch means slips when one eyepiece is held stationary while the other eyepiece is turned so as to selectively render the eye-pieces independently adjustable, wherein the improvement is characterized by:  
the first eye-piece including a first lens tube and first adjusting tube which are rigidly connected to one another and

are both restricted to axial movement with respect to the binocular telescope;

the second eye-piece including a second lens tube, and means for restraining the lens tube to axial movement only, and a second adjusting tube, coaxially disposed with relation to the second lens tube, wherein the second adjusting tube is both axially and rotatably adjustable and is coupled to the second lens tube by the friction clutch means; and

the mutual drive including central drive means that operates rotatable means connected to the adjusting tubes of both eyepieces and to the central drive means, whereby rotation of the central drive means rotates said rotatable means for axially displacing said adjusting tubes and said lens tubes; wherein rotation of said second adjusting tube axially moves said second lens tube and, through said rotatable means and said central drive means, axially moves said first lens tube, as long as said clutch couples said second adjusting means to said second lens tube; and wherein, when there is a predetermined resistance to rotation between the second adjusting tube and the rotatable means, the second adjusting tube rotates and moves axially relative to the rotatable means to displace the second lens tube axially while the first lens tube remains stationary.

#### 4,162,821 MEANS FOR IN-LINE CONNECTION OF OPTICAL FIBER PAIRS

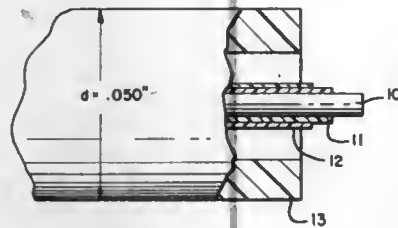
William L. Schumacher, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1977, Ser. No. 862,478

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.21

8 Claims



5. A connector for connecting together ends of at least one pair of optical fibers, said connector comprising:

first and second connector portions each having a datum surface and constructed to grip a respective one of said optical fibers with end sections of said fibers extending toward each other from said datum surfaces; and third and fourth matable connector portions connected respectively to said first and second connector portions, respectively, and each having at least one opensided groove formed in a surface thereof;

said grooves being matable with each other when said third and fourth connector portions are mated to form at least one bore smaller than the diameter of each said cores with said bore substantially axially aligned with the remainder of said optical fibers gripped in said first and second connector portions;

said end sections of said at least one pair of optical fibers being retained in said at least one of said bores between said third and fourth connector portions with end surfaces of said optical fibers in substantial concentric relationship with each other and spaced apart a distance not more than one and one-half the diameter of each said end sections; said third and fourth connector portions further each being substantially comprised of an elastomeric material with the grooved portions thereof which contact said end sections having an index of refraction less than the index of refraction of the outer surfaces of said end sections.

#### 4,162,822 ZOOM LENS ASSEMBLY WITH RESTRICTABLE ZOOMING RANGE

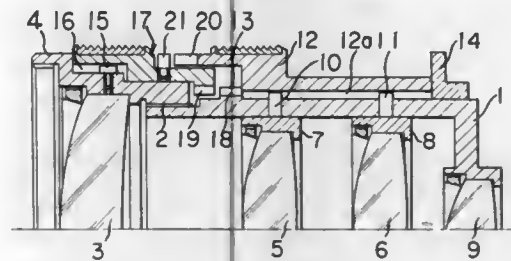
Masahiko Nonogaki, Kōnan, Japan, assignor to Elmo Company Limited, Nagoya, Japan

Filed Mar. 30, 1977, Ser. No. 782,784

Claims priority, application Japan, Apr. 9, 1976, 51-45012[U] Int. Cl.<sup>2</sup> G02B 7/10, 15/18

U.S. Cl. 350—187

1 Claim



1. In a zoom lens assembly for a photographic camera including a focussing ring, a zooming ring and a stationary fixed tube for supporting said rings and associated lens, the improvement comprising means for making operation of the lens assembly free from the necessity of focussing for certain conditions of the lens assembly, said improvement comprising locking means for fixing said focussing ring at a hyperfocal position on said fixed tube and means cooperating with said locking means for restricting the rotation and hence the zooming range of said zooming ring, whereby a sharp image will be recorded at said hyperfocal distance of said focussing ring as set by said locking means, through the restricted zooming range, said fixed tube having a recess therein and said zooming ring having a recess therein, and said locking means comprising a first projection on said focussing ring for engagement with said recess in said fixed tube for defining said hyperfocal position, and said restricting means comprising a second projection provided on said focussing ring and engageable in said recess in said zooming ring, said recess in said zooming ring having a dimension corresponding to the restricted zooming range, said second projection being engaged in said recess in said zooming ring when said first projection engages in said recess in said fixed tube.

#### 4,162,823 LENS MOUNT FOR PHOTOGRAPHIC RECORDING APPARATUS

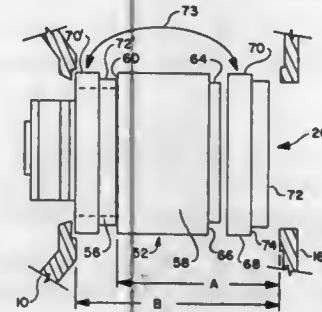
Brian K. Jorgensen, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 31, 1977, Ser. No. 847,373

Int. Cl.<sup>2</sup> G02B 7/04

U.S. Cl. 350—252

1 Claim



1. A lens structure for use in a photographic recording apparatus including an image plane, an object plane, and film, the lens structure comprising:

a tubular cylindrical mounting sleeve having a first mounting shoulder on one end thereof and a second mounting shoulder on the other end thereof;

a lens assembly removably attached to said mounting sleeve; and

a tubular cylindrical spacer interchangeably mounted on said first or said second mounting shoulder to increase the distance between said lens assembly and the film in the first instance and to increase the distance between the lens assembly and the object plane in the second instance, thereby providing two different magnification ratios without refocusing.

#### 4,162,824 NONIMAGING RADIANT ENERGY COLLECTOR AND CONCENTRATOR

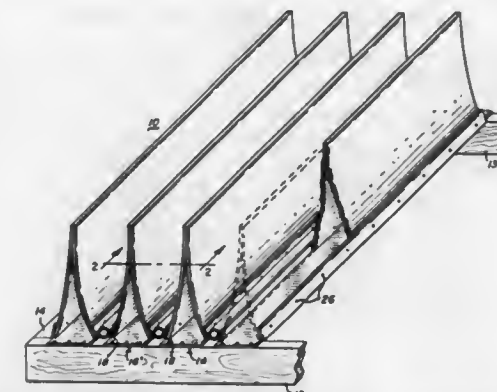
Horace Z. Ma, 1420 Farwood Dr., East Lansing, Mich. 48823

Filed Jun. 30, 1978, Ser. No. 920,786

Int. Cl.<sup>2</sup> G02B 5/10

U.S. Cl. 350—293

19 Claims



1. A nonimaging radiant energy collector comprising:

a base member;

a plurality of resiliently deformable, planar vanes having parallel upper and lower end portions, a back surface and a reflective front surface; and

means for attaching said vanes to said base member in pairs, each pair including two vanes having facing back surfaces and separated lower end portions, the lower end portions being inclined towards one another to make the same preselected angle with a plane of symmetry and the upper and lower end portions of each vane being separated so that the upper end portions of a pair of vanes are urged against one another and deform the planar vanes into concave vanes.

#### 4,162,825 METHOD FOR ADJUSTING THE RADIUS OF CURVATURE OF A SPHERICAL MIRROR

James R. Dowty, Newport Beach, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Aug. 5, 1977, Ser. No. 822,176

Int. Cl.<sup>2</sup> G02B 5/10

U.S. Cl. 350—295

2 Claims

1. A method of adjusting the radius of curvature of a spherical mirror defined by a reflective concave front surface and a convex back surface with a common surrounding edge, including the steps of:

providing a relatively fixed element having a defined circular locus of contact points at a first diameter in contact with one of said surfaces of said mirrors;

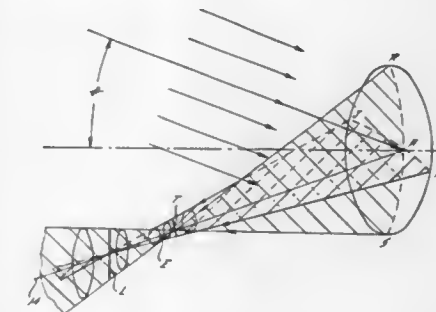
providing a forming element having a defined circular locus of contact points concentric with said fixed element contact points at a second diameter different than said first diameter in contact with the other surface of said mirror; applying a couple to said spherical mirror through said

forcing element and said fixed element to adjust the radius of curvature of said spherical mirror;

monitoring said radius adjustment and generating an electrical signal in response thereto;

generating a command signal indicative of a desired amount of mirror adjustment;

comparing said monitoring signal with said command signal to generate a difference signal;



employing said difference signal to control the amount of adjustment in said couple applying step; and

wherein said relatively fixed element is provided in contact with said concave surface and said forcing element is provided having a circular locus of contact points at a second diameter larger than said first diameter and contacting said convex surface of said mirror.

#### 4,162,826 SIGHT GLASS ASSEMBLY AND METHOD FOR ITS PRODUCTION

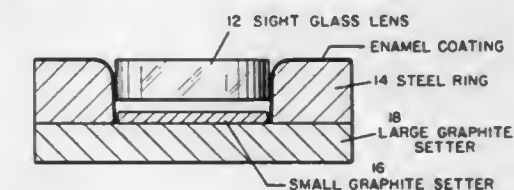
Roland R. Van der Beck, Pittsford, and James W. Chapman, Penfield, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,076

Int. Cl.<sup>2</sup> C03C 27/02

U.S. Cl. 350—319

5 Claims



1. A sight glass assembly comprising a lens of soda-lime plate glass mounted in and compressed by an enamelled steel, Inconel or Incolloy metal ring having a wall thickness at least equal to 0.3 times the diameter of said lens, said metal ring having an enamel coating, and said lens being fused to said coating.

2. A method of making a sight glass assembly comprising:

(a) placing a non-adhesive substrate setter within a bore of a steel, Inconel or Incolloy metal ring having a wall thickness at least equal to 0.3 times the inside diameter of the ring and having an enamel coating

(b) placing a soda-lime plate glass lens in the bore of said enameled ring;

(c) heating the substrate, the metal ring and the glass lens so arranged to the flowpoint temperature of said lens so that said ring expands and said lens conforms to the bore of said ring and is fused to said enamel coating;

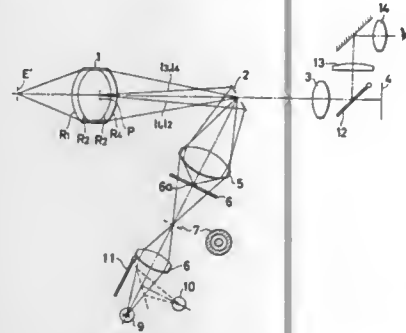
(d) and cooling said ring and said lens to compress said glass lens within said enameled ring.



**4,162,827**  
**WIDE ANGLE OBJECTIVE FOR OPHTHALMOSCOPIC INSTRUMENT**  
 Yuji Ito, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,877  
 Claims priority, application Japan, Jun. 9, 1976, 51/67521  
 Int. Cl.<sup>2</sup> A61B 3/14  
 U.S. Cl. 351—7

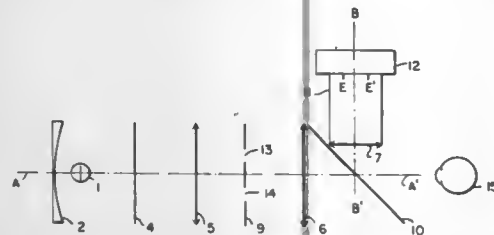
7 Claims



1. An ophthalmoscopic optical instrument having a wide angle of view of an object comprising:
  - objective lens means having a positive refractive power and including a triplet cemented lens consisting of a negative meniscus lens convex toward the object, a biconvex lens and a negative meniscus lens concave toward the object; said triplet cemented lens having outer lens surfaces and cemented surfaces
  - an image forming lens for re-imaging an image formed by said objective lens means; and
  - an illuminating system having at least one light source for illumination of the object, apertured mirror for directing the illuminating light rays toward the object, and optical means for transmitting the light rays emanating from said light source to said apertured mirror, said apertured mirror being positioned on the object end of said image forming lens group; said apertured mirror being positioned between said objective lens means and said image forming lens; masking means positioned between said light source and said apertured mirror for substantially eliminating reflection from the outer lens surfaces and cemented surfaces of said triplet cemented lens; light-detecting means positioned on the image end of said image forming lens and light directing means positioned between said image forming lens group and said light-detecting means to direct the imaging light to an observing system for observation of an image of the object.

**4,162,828**  
**APPARATUS AND METHODS FOR DIRECTLY MEASURING THE REFRACTION OF THE EYE**  
 Joseph N. Trachtman, 57 Hicks St., New York, N.Y. 11201  
 Filed Sep. 30, 1977, Ser. No. 838,107  
 Int. Cl.<sup>2</sup> A61B 3/10  
 U.S. Cl. 351—9

9 Claims



1. Optometer apparatus for directly measuring the refraction of the eye comprising:
  - a radiation source;
  - Scheiner principle means for imaging a pair of slits onto the

plane of the pupil of an eye to be measured to form a retinal image, said Scheiner principle means projecting two slits of parallel light in Maxwellian view onto said plane of said pupil of said eye to be measured;

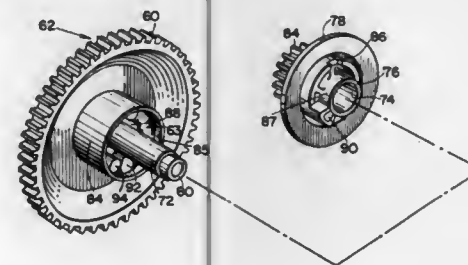
sensor array means including a plurality of sensor elements arranged in an array, each of said sensor elements producing an electrical signal having a magnitude which is a function of incident radiation received by that sensor element, said sensor array means being responsive to incident radiation to produce a plurality of electrical signals corresponding to an element-to-element energy distribution of radiation imaged upon said sensor means; and

means for imaging said retinal image upon said sensor array means.

**4,162,829**  
**PHOTOGRAPHIC FILM DRIVE SYSTEM EMPLOYING INERTIA DUMPER/ENERGY DISSIPATER**  
 Gerald H. Cook, Lynnfield, and Bernard W. Ruck, Milford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1978, Ser. No. 867,015  
 Int. Cl.<sup>2</sup> G03B 1/00  
 U.S. Cl. 352—166

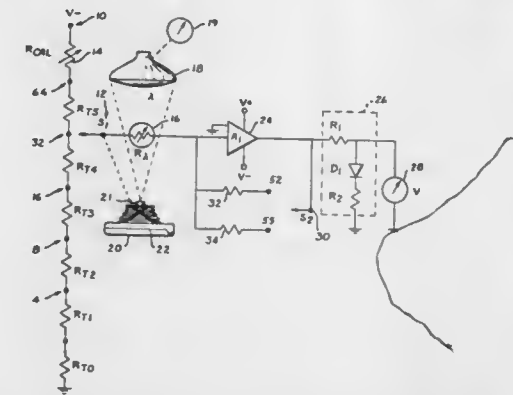
5 Claims



1. In a mechanical transmission system for advancing an elongated web of material from a first spool, to which one of its ends is attached and around which a major portion of its length is initially coiled, onto and around a second spool, to which the other of its ends is attached, the improvement comprising:
    - a driving member mounted for rotation about a given axis;
    - means coupled to the second spool for defining a first arcuate surface spaced a fixed distance radially from said axis and extending parallel to said axis;
    - means coupled to said driving member for defining a second arcuate surface facing said first arcuate surface in spaced apart parallel relationship to define a channel therebetween extending circumferentially of said axis;
    - a pair of abutment surfaces respectively connected to said driving member and said first arcuate surface defining means to be disposed in facing relationship in circumferential registry with said channel; and
    - a yieldably resilient shock absorber disposed along said channel intermediate said abutment surfaces, whereby rotary motion is imparted to the second spool from said driving member through said shock absorber which is adapted to absorb shock forces by compressing when the web has been completely uncoiled from the first spool or sudden increased resistance to web advancement is otherwise experienced,
- said shock absorber being structured to expand widthwise of said channel to be engaged between said first and second arcuate surfaces as it absorbs said shock forces or forces resulting from increased resistance to web advancement, whereby the dissipation of energy so absorbed therein is resisted by frictional forces between said shock absorber and said arcuate surfaces so that said shock absorber only gradually returns to its original expanded configuration upon termination of power to said driving member.

**4,162,830**  
**VIDEO PHOTOGRAPHIC SYSTEM**  
 Alan E. Gee, Sunnyvale, Calif., assignor to American Optical Corporation, Southbridge, Mass.  
 Filed Apr. 7, 1977, Ser. No. 785,391  
 Int. Cl.<sup>2</sup> G01D 9/42; G03B 27/76; G01J 1/44  
 U.S. Cl. 354—23 R

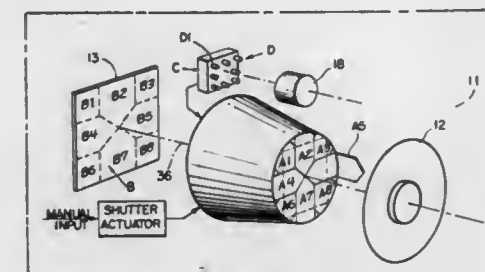
5 Claims



1. Control apparatus in a video-photographic system for coordinating variables such as exposure time, film reciprocity and illumination, to photograph film characteristic comprising: photodetector means disposed in said video-photography system and subject to the same illumination as the film in said system; voltmeter means for recording the voltage output of said photodetector means; non-linear voltage divider means including a first resistor in series with diode means and a second resistor, said first resistor being interposed in series between said photodetector means and said voltmeter means, and said voltmeter means and said diode means and second resistor being disposed in parallel with said voltmeter means, said first and second resistors and said diode being selected to provide a binary relationship with said voltmeter means such that about one-fourth full scale voltage on said diode means provides substantially a mid-scale reading on said voltmeter means; variable non-linear voltage divider means connected to said photodetector means, said variable non-linearity having a predetermined relationship to the reciprocity failure rate of photographic film used in said system.

**4,162,831**  
**CAMERA AND METHOD FOR SELECTIVELY COMPRESSING SCENE BRIGHTNESS**  
 Nathan Gold, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.  
 Continuation of Ser. No. 756,433, Jan. 3, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,960  
 Int. Cl.<sup>2</sup> G03B 7/08  
 U.S. Cl. 354—31

31 Claims



1. In a camera having a lens assembly for directing image-carrying rays from a scene to a frame of film material located at the camera focal plane, said film material having a density range extending between given minimum and maximum exposure density limits, the improvement comprising:

means for sensing the brightness of each of a plurality of spacially oriented areas of said scene;

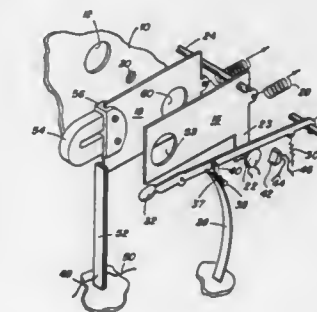
a multizone shutter arrangement having a plurality of independently actuatable spacially oriented portions for independently varying the transmission of at least a significant portion of the image-carrying rays from each said scene area to a pictorially corresponding area of said film material;

means for independently actuating each said shutter portion; and

control means responsive to said brightness sensing means for defining at least a first and second exposure factor in accordance with the brightness of said scene areas and said density range and for selectively controlling said actuating means to control at least one of said shutter portions in accordance with said first exposure factor to thereby expose a corresponding film area at said first exposure factor and to control at least another shutter portion in accordance with a said second exposure factor to thereby expose another corresponding film area at said second exposure factor.

**4,162,832**  
**EXPOSURE CONTROL WITH PIEZOELECTRIC LATCH CONTROL**  
 Lee F. Frank, and James K. Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
 Filed Nov. 14, 1977, Ser. No. 851,321  
 Int. Cl.<sup>2</sup> G03B 7/08; H01R 39/08  
 U.S. Cl. 354—51

10 Claims



1. In exposure control apparatus for use in a camera of the type having (a) an aperture, (b) a shutter blade having an aperture-open position and an aperture-closing position, and (c) spring means for urging the shutter blade toward its aperture-closing position, the improvement comprising:
  - magnet means for holding the shutter blade against the force of the spring means when the shutter blade is in its aperture-open position;
  - a piezoelectric motor element, movable upon being subjected to an electrical voltage, for pushing said shutter blade away from said magnet means, whereby said shutter blade will move to its aperture-closing position under the influence of the spring means; and
  - light-responsive means for applying an electrical voltage to said element after a time delay dependent on the level of scene illumination.

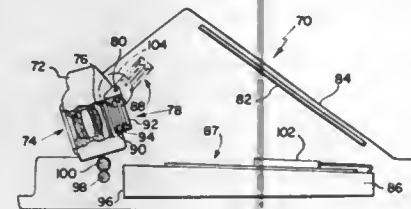
**4,162,833**  
**PHOTOGRAPHIC CAMERA**  
 William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.  
 Division of Ser. No. 529,904, Dec. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 428,454, Dec. 26, 1973, abandoned. This application Aug. 15, 1977, Ser. No. 824,416  
 Int. Cl.<sup>2</sup> G09B 17/52  
 U.S. Cl. 354—86

8 Claims

1. Photographic apparatus of the self-developing type for

use with film units requiring an even number of geometrical reversals and with film units requiring an odd number of geometrical reversals to provide a geometrically non-reversed positive image in the film unit, comprising:

- means for locating a film unit in position for exposure;
- pressure-applying means including at least two juxtaposed members for spreading a processing fluid across a photo-sensitive layer of the film unit;
- lens means for geometrically reversing an image of a subject along two orthogonal axes;
- optical means including first and second means each of which geometrically reverses the image of the subject

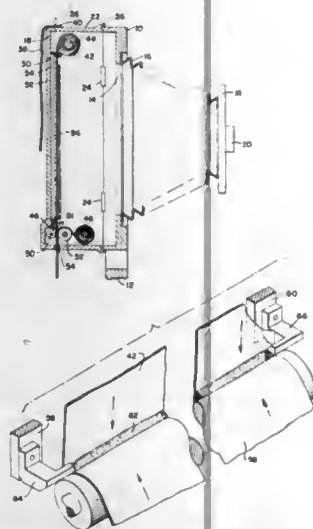


along only one of said orthogonal axes, said optical means being mounted on the side of said lens means which is opposite to the side of said lens means which faces the subject to be photographed; and

means for moving said first means between a first position wherein it is in optical alignment with said lens means and said second means so as to receive the image being transmitted by said lens means when the film unit requires an even number of geometrical reversals and a second position out of optical alignment with said lens means and said second means when the film unit requires an odd number of geometrical reversals.

**4,162,834**  
**PROCESSING APPARATUS FOR LARGE FORMAT CAMERAS**  
Allan D. MacLean, North Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.  
Filed Dec. 23, 1977, Ser. No. 863,992  
Int. Cl.<sup>2</sup> G03B 17/50

U.S. Cl. 354—86



1. A large format camera of the type in which a negative film sheet may be exposed and thereafter processed in conjunction with a positive film sheet to provide a positive image photographic print, said camera comprising:

- a film exposure plane;
- a pair of elongated processing rollers;
- means for mounting said processing rollers for rotation in

closely spaced apart relation with respect to each other so as to define a pressure applying gap therebetween through which the negative film sheet may be advanced from the film plane and the positive film sheet may be advanced from a stored position spaced apart from said film plane to converge with the negative film sheet along said pressure applying gap;

means for accommodating the deposition of a select quantity of processing fluid composition between the converging negative and positive film sheets at a location closely adjacent said pressure applying gap, said quantity of processing composition being selected to be sufficient to be spread over an area between the negative and positive film sheets corresponding to the entire exposed area as the film sheets are drawn through the processing rollers; and

means for retaining the spread of the processing composition inside the side edges of said negative and positive film sheets as the film sheets are advanced through said rollers, said spread retaining means comprising a pair of opposed nozzle members stationed respectively between said negative and positive film sheets adjacent opposed side edges thereof, each of said nozzle members having outside convergent surfaces complementary to the convergent film sheets and a nozzle opening between said convergent surfaces through which pressurized air may be discharged between the film sheets in a direction inwardly from the side edges of the film sheets and toward said roller gap so as to intersect the direction of film sheet advancement at an acute angle in order to retain the processing composition within the confines of the side edges of the film sheets during the spreading of the processing composition between the film sheets as the film sheets are advanced through said processing roller gap.

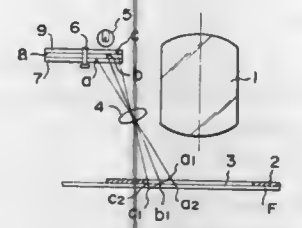
**4,162,835**  
**DATA PRINTING DEVICE FOR CAMERA**  
Seiji Asano, Okegawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan  
Filed May 24, 1977, Ser. No. 800,060  
Claims priority, application Japan, May 26, 1976, 51-67194[U]

7 Claims

U.S. Cl. 354—106

Int. Cl.<sup>2</sup> G03B 17/24, 27/68

3 Claims



1. Data printing means built into a camera which includes a taking lens having an optical axis perpendicular to the surface of a film loaded in the camera comprising, a focusing lens in the camera having an optical axis passing through a part of the film loaded in the camera and inclined at an angle with respect to the optical axis of the taking lens, and data carrying means including a plurality of stacked data carrying plates which carry different indicia, one of the indicia on each plate being selectively put into alignment with the optical axis of said focusing lens, each of said plates having a thickness that the indicia on the different plates are at different distances from the surface of said film, characterized in that said plates are parallel to the surface of said film and said different indicia items carried by the different plates are different in size in such a way that the sizes of the images focused on the film by said focusing lens are substantially the same.

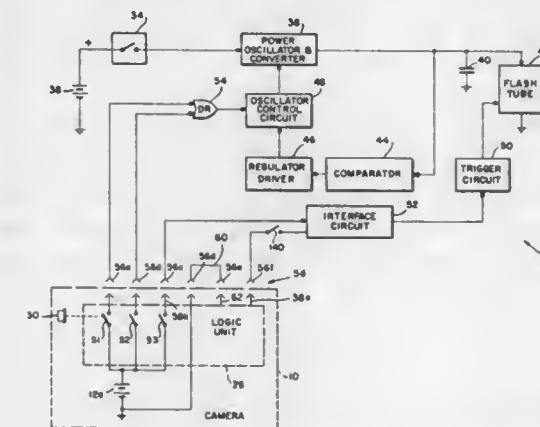
**4,162,836**  
**ELECTRONIC FLASH INHIBIT ARRANGEMENT**  
George C. Harrison, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 21, 1978, Ser. No. 917,477

Int. Cl.<sup>2</sup> G03B 3/10, 15/05

U.S. Cl. 354—139

6 Claims



1. Electronic flash apparatus for use with a camera of the type having a variable focus objective lens and having automatic focusing means with ranging means for the automatic focusing of the objective lens, electrically-energizable camera control means responsive to manual actuation for automatically operating the ranging means for driving the objective lens to a focus position with respect to a scene to be photographed, and means for providing a camera signal commencing in response to the manual actuation of the control means and not later than the automatic focusing operation, and wherein the camera focusing means is subject to detrimental interference from spurious electromagnetic radiation, said electronic flash apparatus having

- an energy-storage capacitor and a flash-discharge tube, charging means energizable by an applied supply voltage for producing an alternating voltage and a direct voltage in response thereto, and for charging the capacitor with the direct voltage,
- means responsive to a flash fire signal from the camera for discharging the capacitor through the flash tube, and further comprising
- control means responsive to said camera signal for disabling said charging means from producing said alternating voltage, so that the flash apparatus is disabled from producing spurious electromagnetic radiation, during at least the operation of the camera focusing means.

**4,162,837**  
**MOTOR DRIVE DEVICE FOR CAMERA**  
Keisuke Haraguchi, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Sep. 7, 1977, Ser. No. 831,319  
Claims priority, application Japan, Sep. 7, 1976, 51-106913  
Int. Cl.<sup>2</sup> G03B 1/18

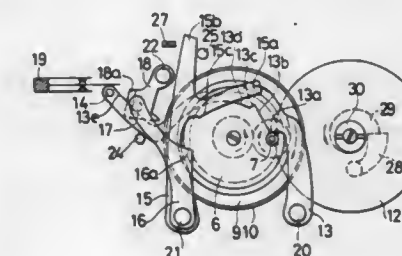
U.S. Cl. 354—173

6 Claims

1. A motor drive device for a camera comprising:

- a motor,
- a sun gear driven by said motor,
- driven means for providing an output film drive to the film winding members in a camera,
- an internal gear coupled to said driven means,
- a planet gear meshing with said sun gear and said internal gear, said planet gear being adapted to revolve around said sun gear, and
- locking means for elastically locking said planet gear when said internal gear is free to rotate so that said planet gear

is prevented from revolving around said sun gear while permitted to rotate about its own axis and acts as a relay

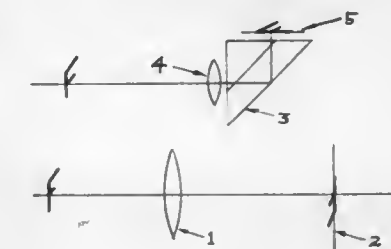


gear to transmit the drive force of said motor to said driven means.

**4,162,838**  
**CAMERA VIEWFINDER**  
Norman C. Allen, P.O. Box 58565, Houston, Tex. 77508  
Filed Dec. 30, 1977, Ser. No. 865,955  
Int. Cl.<sup>2</sup> G03B 13/02

U.S. Cl. 354—223

4 Claims



1. An accessory for use with a camera to aid in viewing the image being transmitted by the lens through the shutter to the film thereof, said accessory comprising an imaging lens, an Amici roof prism, and a diffuse viewing screen suitably positioned relative to each other so as to allow viewing of the image obtained by said accessory lens on said screen in a normal, facile manner, said accessory having means for mounting same on a camera in a suitable position thereon relative to the camera lens, said viewing screen being adapted to be rotated about an axis parallel to the axis of the camera lens and perpendicular to the axis of the film to enable the said accessory to be optionally used as a waist level viewer and a right angle viewer.

**4,162,839**  
**DUAL PREFERENCE CAMERA FOR DIGITALLY DISPLAYING PRESET AND COMPUTED VALVES**  
Yukio Mashimo, Tokyo; Nobuaki Sakurada, Yokohama; Tadashi Ito, Yokohama; Fumio Ito, Yokohama; Nobuhiko Shinoda, and Hiroyasu Murakami, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 604,532, Aug. 14, 1975, Pat. No. 4,064,515. This application May 13, 1977, Ser. No. 796,716  
Claims priority, application Japan, Aug. 30, 1974, 49-99687  
Int. Cl.<sup>2</sup> G03B 7/08

U.S. Cl. 354—23 D

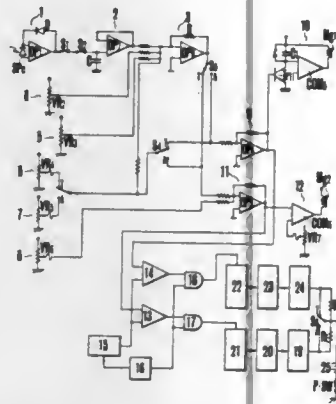
5 Claims

1. A camera comprising:

- (a) a light measuring circuit for producing an analog signal corresponding to the brightness of a photographic object.
- (b) shutter speed signal forming means for producing an analog signal corresponding to a preset shutter speed value,
- (c) a computing circuit for producing an analog signal corresponding to an aperture value for correct exposure on the



- basis of said analog signals from light measuring circuit and shutter speed signal forming means,
- (d) pulse generating means for producing pulses,
- (e) reference signal forming means for forming an analog signal corresponding to a number of pulses from pulse generating means,
- (f) a first comparison circuit for comparing the analog signals from said computing circuit and said reference signal forming means, and producing a signal when both analog signals have a predetermined relationship,
- (g) a second comparison circuit for comparing the analog signals from said shutter speed signal forming means and said reference signal forming means and producing a signal when both analog signals have a predetermined relationship,



- (h) first counter circuit for counting said pulses from said pulse generating means and terminating the counting operation in response to the signal from said first comparison circuit,
- (i) a second counter circuit for counting said pulses from said pulse generating means and terminating the counting operation in response to the signal from said second comparison circuit,
- (j) a first display circuit for displaying an aperture value for correct exposure on the basis of content of said first counter circuit,
- (k) a second display circuit for displaying said preset shutter speed value on the basis of content of said second counter circuit.

4,162,840

## FOCAL PLANE SHUTTER

Osamu Ooba, Abiko; Katsumi Kaneko, Ageo; Nobuyoshi Inoue, Kawagoe, and Toshihisa Saito, Tokyo, all of Japan, assignors to Copal Company Limited, Tokyo, Japan

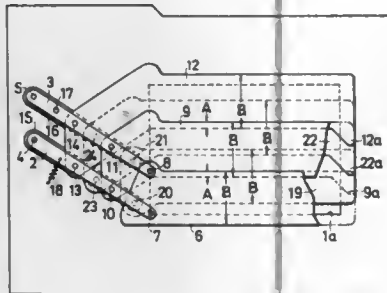
Filed Mar. 20, 1978, Ser. No. 888,384

Claims priority, application Japan, Mar. 24, 1977, 52-32425

Int. Cl.<sup>2</sup> G03B 9/40

U.S. Cl. 354—246

3 Claims



1. A focal plane shutter comprising a base plate having an

exposure aperture formed thereon, a pair of upper arms rotatably supported on said base plate, main shutter blades made of a plurality of opaque laminae supported on said pair of upper arms to open and close said exposure aperture and increasing the area of the overlap with each other in the course of opening said exposure aperture by the movement of said pair of upper arms and reducing the area of the overlap with each other in the course of closing said exposure aperture by the movement of said pair of upper arms, a pair of lower arms rotatably supported coaxially respectively with said pair of upper arms on said base plate and capable of moving integrally with said pair of upper arms, and auxiliary shutter blades made of a plurality of opaque laminae supported on said pair of lower arms and covering the respective reduced overlapping zones of said main shutter blades when said main shutter blades close said exposure aperture and overlapping in conformity with main shutter blades when said main shutter blades open said exposure aperture.

4,162,841

# APPARATUS FOR DEVELOPING FILMS, AND PARTICULARLY X-RAY FILMS AS EMPLOYED IN DENTAL APPLICATIONS

Giorgio Dragone, Via Redaelli, 2, Olginate (Como), Italy

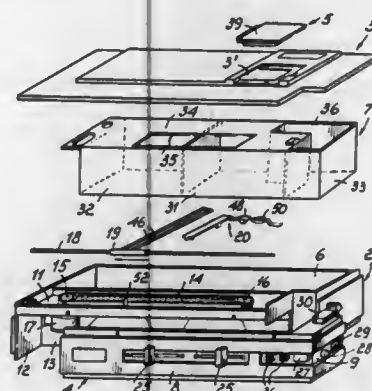
Filed Sep. 30, 1977, Ser. No. 839,026

Claims priority, application Italy, Jan. 10, 1977, 19133 A/77

Int. Cl.<sup>2</sup> G03D 3/10

U.S. Cl. 354—310

7 Claims



1. An apparatus for developing exposed films, in particular X-ray exposed films as employed in dental applications, comprising an opaque housing, an opening in said housing, a cover for light-tight closing said opening, developing, fixing and washing baths for said films within said housing, entraining means movable along a path within said housing for entraining said films and causing immersion of said films into said developing, fixing and washing baths at subsequent times, wherein said cover defines a magazine for an exposed film wrapped in a protective wrapping having a closing tab and comprises a frame having at least one first seat therein, an exit mouth open toward said path of said entraining means and an edge adjacent said exit mouth to cause said tab of said wrapping inserted in said cover to become folded on said edge and slideably clamped between said cover and said housing and to project out of said housing when said cover is arranged within said opening, whereby pulling of said projecting tab causes advancement of said film along said at least one first seat out of said wrapping and said cover to said entraining means.

4,162,842

# METHOD AND APPARATUS FOR DEVELOPING A LATENT, ELECTROSTATIC IMAGE IN NON-IMPACT PRINTING

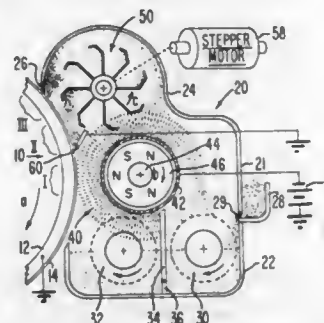
Alexander C. Wu, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 763,307, Jan. 28, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,430

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355—3 DD

14 Claims



2. Apparatus for developing a latent, electrostatic image on a dielectric surface comprising:

a source of particulate, ferromagnetic toner material; magnetic brush means, in communication with said source, for receiving toner material from said source and rotationally transporting it past a first region on said dielectric surface to tone the latent, electrostatic image in the first region;

an impeller that rotates in circular motion about a single central axis thereof, said impeller for receiving residual toner material rotationally transported beyond the first region by said magnetic brush means and for impelling said received toner material toward a second region to tone the latent, electrostatic image in the second region; and

guide means that are curvilinear in shape, said guide means for guiding toner material centrifugally escaping said magnetic brush means toward a third region on said dielectric surface to form a toning cloud adjacent thereto to tone the latent, electrostatic image in the third region, said guide means being located adjacent the rotating impeller so that the rotating impeller assists the guide means by creating a vortex flow to facilitate the flow of toner material through the guide means.

4,162,843

# COLOR ELECTROSTATIC COPYING MACHINE

Satoru Inoue; Masaakira Umehara; Kazuo Aramaki; Hideo Inuzuka, and Kouji Yamanobe, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 855,926

Claims priority, application Japan, Dec. 14, 1976, 51-149345; Dec. 28, 1976, 51-157626

Int. Cl.<sup>2</sup> G03G 15/01

U.S. Cl. 355—4

13 Claims

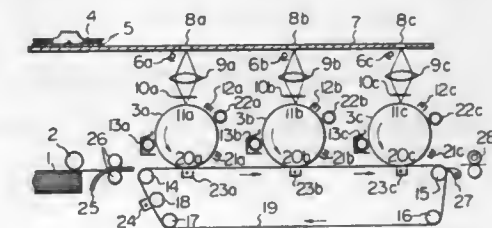
1. A color electrostatic copying machine comprising:

first, second and third photoconductive drums; imaging means for radiating three light images of an original document in three primary colors onto the first, second and third drums to form three respective electrostatic images;

developing means for applying three toner substances of three primary colors to the first, second and third drums to develop the three electrostatic images and produce three primary color images respectively;

an endless belt for conveying a copy sheet into successive engagement with the first, second and third drums in register with the three color toner images respectively; transfer charging means for applying an electrostatic charge

to the belt of a first polarity which is opposite to a second polarity of the toner substances to successively transfer the three color toner images to the copy sheet; and



compensation means for counteracting an accumulation of charge of the second polarity on the copy sheet due to accumulation of toner substance thereon.

4,162,844

# REPRODUCTION MACHINE WITH DUPLEX IMAGE SHIFT

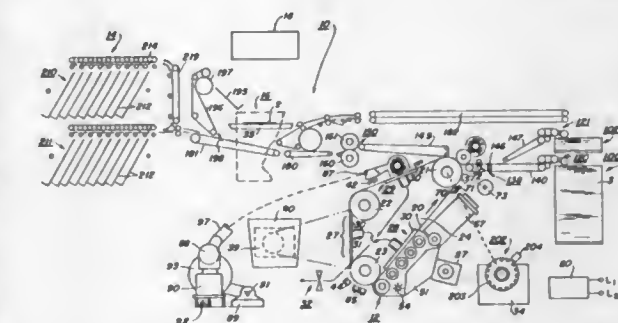
Robert L. Traister, Penfield, and Stephen P. Wilczek, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,034

Int. Cl.<sup>2</sup> G03G 15/00; C03B 27/76

U.S. Cl. 355—14

6 Claims



3. In an electrostatic apparatus for producing copies of an original, having an apparatus including a moving photoreceptor; means for charging the photoreceptor in preparation for imaging; exposure means for generating latent electrostatic images of the original on the photoreceptor, the exposure means including illumination means; means for developing the latent electrostatic images; feeding means for bringing copy sheets into predetermined registered relationship with images developed on said photoreceptor; and transfer means for transferring images developed on the photoreceptor to both sides of the copy sheets,

the improvement comprising:

control means for selectively changing the operational timing of said illumination means to match the location of the developed image on one side of said copy sheet with the developed image on the other side of said copy sheet.

4,162,845

# COPIER FOR GREATER THAN STANDARD LENGTH DOCUMENTS

Wayne R. Smith, Henrietta, and William G. Miller, East Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 15, 1977, Ser. No. 833,424

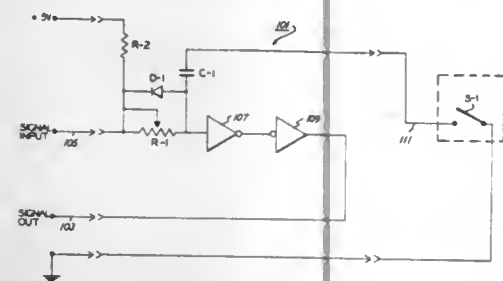
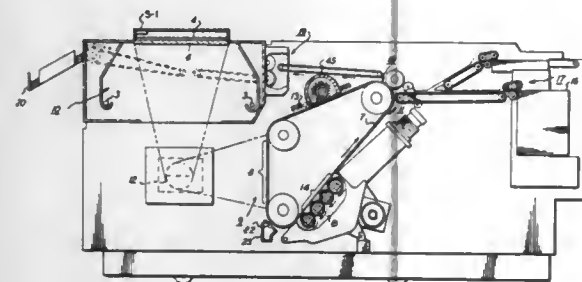
Int. Cl.<sup>2</sup> G03G 15/00; G03B 27/76

U.S. Cl. 355—14

3 Claims

1. In an electrostatic reproduction machine including a photoconductive member moveable past processing stations

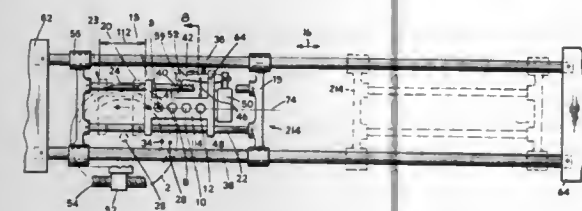
including means for charging said member, means for exposing said member to document information to produce latent electrostatic images thereof on said member, means for developing the electrostatic images on said member and a discharge lamp positioned upstream from said developing means at a predetermined position operative to discharge said photoconductive member for a predetermined period prior to its advancing to the development station, and the improvement wherein circuit means for providing control signals in a first mode of operation to activate said discharge lamp at a preset interval corresponding to a standard document dimension,



said circuit means includes means for providing control signals in a second mode of operation to activate said discharge lamp at preset intervals which are delayed from a reference associated with the intervals of said standard document dimension to enable imaging from document information having a dimension greater than said standard document dimension, and switching means for selecting either said first or second mode of operation at the option of a machine operator.

**4,162,846**  
**PHOTOGRAPHIC TYPE COMPOSING MACHINE AND METHOD**  
Louis M. Moyroud, 202 Grove Way, Delray Beach, Fla. 33444  
Filed Sep. 29, 1975, Ser. No. 617,847  
Claims priority, application United Kingdom, Oct. 1, 1977, 42636/77

Int. Cl.<sup>2</sup> G03B 23/00  
U.S. Cl. 354—10 44 Claims



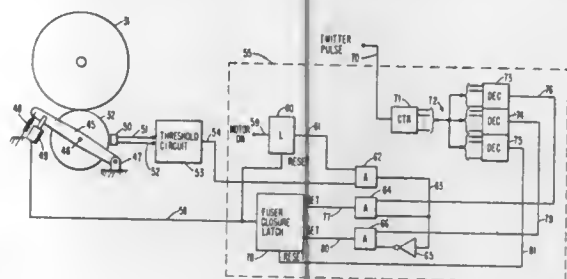
1. In a photographic type composing machine, the combination of a character matrix bearing a plurality of styles of characters, support means for defining a recording surface, lens means for projecting character images from said matrix towards said recording surface with a selectively variable size, drive means for driving said matrix relative to said recording

surface, locking means for maintaining said matrix and said lens means in fixed relationship to one another so as to travel together during type composition and for permitting said matrix and said lens means to move relative to one another, and control means for selectively operating said locking means and said drive means to move said matrix and said lens means relative to one another for changing the size and/or style of the characters being composed.

22. A matrix disc for photocopying, said disc bearing characters in concentric arrays, the characters in adjacent arrays being aligned with one another along the line tangent to a circle concentric with said arrays and having a diameter substantially less than that of said disc, said disc including a hub area located centrally on said disc and having a substantial area, said circle being of greater diameter than said hub area.

**4,162,847**  
**HOT ROLL FUSER EARLY CLOSURE INHIBITOR**  
Fred Y. Brandon, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Oct. 6, 1977, Ser. No. 839,856  
Int. Cl.<sup>2</sup> G03G 15/00; F27B 9/28

U.S. Cl. 355—14 5 Claims



1. In a copier system having a heated fuser roller and a backup roller with the rollers mounted for closure movement therebetween and with controls for causing roller closure for either a first or second predetermined time period prior to arrival of a sheet at the nip of the rollers where the first predetermined time period is longer than the second predetermined time period, the improvement comprising:

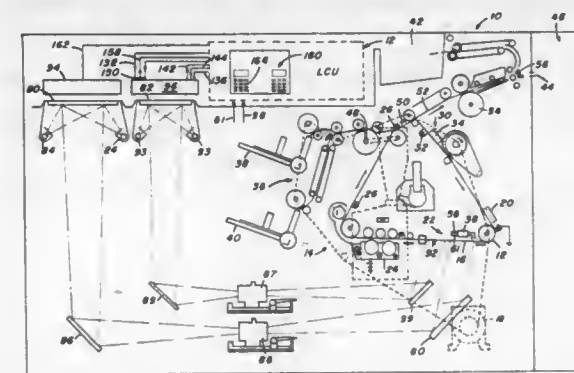
means responsive to the past history of the closure of the rollers for providing an output indicative that the backup roller temperature is approaching a level at which sheets tend to adhere to the backup roller, and means responsive to said past history responsive means output for inhibiting the system controls from causing the first predetermined time period roller closure.

**4,162,848**  
**APPARATUS FOR SELECTIVELY COPYING FROM TWO DIFFERENT DOCUMENTS**  
Albert H. Platt, III, deceased, late of Pittsford, N.Y. (by Barbara B. Platt, administratrix), assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 12, 1978, Ser. No. 923,873  
Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355—14 9 Claims  
1. Document copying apparatus comprising: a first platen for receiving a document to be copied, a second platen spaced from the first platen for receiving another document to be copied, means operable when actuated for making copies of documents received on the respective platens, and control

means responsive to the presence of a document on the second platen for actuating said making means to make a copy of the



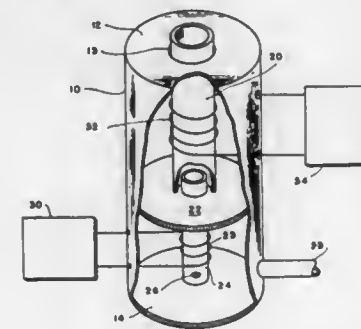
document on the second platen prior to making a copy of the document on the first platen.

**4,162,849**  
**SELECTED ELEMENT CONCENTRATION FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPIC MEASUREMENTS**

Bernhard W. Huber, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,265  
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712420; Jun. 4, 1977, 2705409  
Int. Cl.<sup>2</sup> G01N 1/28

U.S. Cl. 356—36 22 Claims



1. A method for concentrating a desired element of a sample in a graphite furnace tube for atomic absorption spectroscopy, said method comprising the steps of: heating the sample to the vaporization temperature of the desired element in a zone near the bore of the graphite tube; and maintaining said graphite tube at an elevated second temperature that is lower than said vaporization temperature whereby said desired element will condense on the inner surface of said graphite tube.

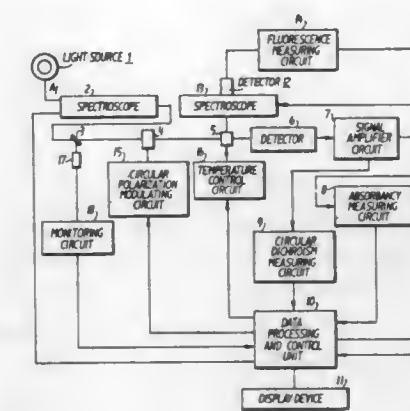
**4,162,850**  
**FIELD TEST FOR SCHISTOSOMA EGGS**  
Kenneth S. Warren, Cleveland, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio  
Filed Mar. 1, 1976, Ser. No. 662,790  
Int. Cl.<sup>2</sup> B01D 13/00; C12K 1/04; G01N 31/00, 33/16  
U.S. Cl. 356—38 2 Claims

1. A process for rapidly ascertaining the presence of Schistosoma eggs in a patient comprising taking a urine sample from the patient, passing about 5 to 10ml of the urine sample through a substantially transparent microporous membrane having a diameter of about 10 to 20mm and pores of a maximum diameter of the order of about 10 μm, drying the membrane, wetting

the membrane with saline solution, viewing substantially the entire membrane under a microscope at a magnification varying from about 25 to 50X, and counting any Schistosoma eggs viewed under the microscope.

**4,162,851**  
**SIMULTANEOUS PHOTOMETERING METHOD AND ASSEMBLY FOR MULTI-DIMENSIONAL MEASUREMENTS CONCERNING BIOLOGICALLY RELATED MATERIALS**  
Akiyoshi Wada, 11-4, Akasaka 8-chome, Minato-ku, Tokyo, Japan

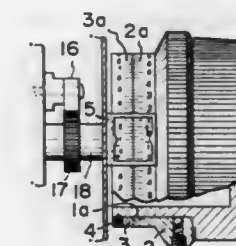
Filed Mar. 29, 1978, Ser. No. 891,366  
Int. Cl.<sup>2</sup> G01N 21/00 3 Claims  
U.S. Cl. 356—73



1. A simultaneous photometering method for multi-dimensional measurements concerning biologically related materials, which comprises the steps of: radiating periodically left and right alternating circular polarizations of selected wavelength lights onto given samples; detecting the transmissions through said samples and measuring the circular dichroism and absorbency at a time; simultaneously detecting the strength of fluorescence emitted from said samples radiated; and displaying and recording said circular dichroism, absorbency and fluorescent strength in correlative manners.

**4,162,852**  
**METHOD AND DEVICE FOR MEASURING DIOPTERS OF ASTIGMATIC LENSES**  
Takatoshi Ishihara, Sohka, and Yoshiaki Watanabe, Ageo, both of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed May 13, 1977, Ser. No. 796,595  
Claims priority, application Japan, May 15, 1976, 51-55527  
Int. Cl.<sup>2</sup> G01B 9/00 5 Claims  
U.S. Cl. 356—125



1. Device for measuring diopeters of astigmatic lenses, which comprises means for carrying a lens to be tested, means for providing a focusing plane, actuating means for providing a relative axial movement between said lens and said focusing



plane, a primary scale coupled with said actuating means so that it is moved together with said actuating means, and a secondary scale coupled with said actuating means so that it is moveable together with said actuating means and said primary scale when the actuating means is actuated, said secondary scale also being mounted for separate movement when it is actuated relative to the actuating means and the primary scale, said primary and secondary scales having the same but oppositely directed graduations and being positioned in proximity to each other and in opposed relationship so that they can be read together and index means fixed relative to the device for reading the primary and secondary scales.

4,162,853

## ILLUMINATION MEASUREMENT DEVICE

Stephen S. Squillace, St. Clair Shores; David L. DiLaura, and Steven M. Stannard, both of Ann Arbor, all of Mich., assignors to Smith, Hinchman & Grylls Associates, Inc., Detroit, Mich.

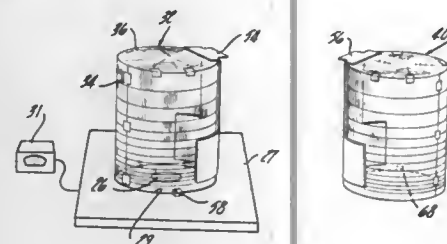
Continuation of Ser. No. 744,641, Nov. 24, 1976, abandoned.

This application Jan. 16, 1978, Ser. No. 869,785

Int. Cl.<sup>2</sup> G01J 1/10, 1/42; G02B 27/32

U.S. Cl. 356—225

28 Claims



1. In a system for determining ESI of a lighting system for a known task and known background, the apparatus comprising: photometer means for providing an output signal having a magnitude varying in accordance with the intensity of light incident thereon and including a receiving device for receiving the incident light, and first envelope means for encasing said receiving device and for modulating the intensity of the incident light from the lighting system as a function of the magnitude of the background reflectance factor  $\beta_b$  at preselected viewing angle whereby said photometer means will provide an indication of the magnitude of background luminance  $L_b$  and second envelope means for encasing said receiving device and for modulating the intensity of the incident light from the lighting system as a function of the magnitude of the task reflectance factor  $\beta_t$  at a preselected viewing angle whereby said photometer means will provide an indication of the magnitude of task luminance  $L_t$ , at least one of said first and second envelope means comprising a first light transmitting envelope with the transmittance of said first envelope varying at selectively spaced locations in accordance with variations in the reflectance  $\beta$  effective on the incident light at each of said spaced locations, said first envelope having at least at some of said spaced locations blocking means being generally opaque for blocking out a preselected portion thereof such that the total transmittance through said some of said spaced locations has a magnitude related to the magnitude of reflectance  $\beta$  effective on the incident light therethrough.

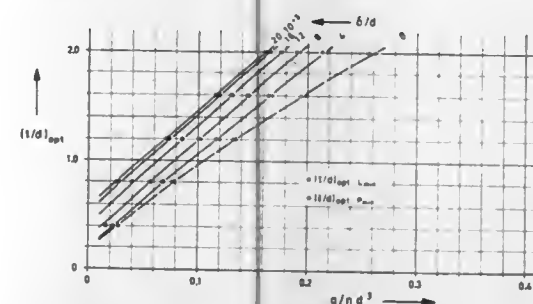
4,162,854  
MULTI-SHAFT SCREW EXTRUDER  
Martin Ullrich, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Mar. 2, 1977, Ser. No. 773,871

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611908

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.  
Int. Cl.<sup>2</sup> B29B 1/10

U.S. Cl. 366—83

2 Claims



1. A multi-shaft screw extruder with screw shafts arranged intermeshing in pairs and rotating in the same sense in pairs of which each screw shaft of a pair has at least one double or triple threaded pressure build-up section corresponding to that of the other screw shaft, wherein at least part of the pressure build-up sections have a ratio of screw pitch  $t$  to housing internal diameter  $d$  which lies within the range of the following relationship:

$0.7 \cdot f(h/d, \delta/d, q/nd^3) < t/d < 1.8 \cdot f(h/d, \delta/d, q/nd^3)$ , where  $q$  is the volumetric throughput of a screw pair,  $n$  is the screw shaft rotational speed,  $h$  is the thread depth, measured from the screw thread base to the housing inner wall and  $\delta$  is the radial screw clearance between the screw crest and the housing inner wall and in which:

$$f\left(\frac{h}{d}, \frac{\delta}{d}, \frac{q}{nd^3}\right) = \frac{A}{h} \cdot \left[ a + b \cdot \frac{q}{nd^3} + c \cdot \left(\frac{q}{nd^3}\right)^2 \right]$$

and

$$a = a_0 + b_0(\delta/d) + c_0(\delta/d)^2 + d_0(67/d)^3$$

$$b = a_1 + b_1(\delta/d) + c_1(\delta/d)^2 + d_1(\delta/d)^3$$

$$c = a_2 + b_2(\delta/d) + c_2(\delta/d)^2 + d_2(\delta/d)^3$$

in which in the case of triple threaded pressure build-up sections  $A = 0.1082$

$a_0 = 0.18173$	$b_0 = -9.9396$	$c_0 = 3926.6$	$d_0 = -122.604$
$a_1 = 8.2230$	$b_1 = 170.46$	$c_1 = -10.833$	$d_1 = 219.048$
$a_2 = -4.8033$	$b_2 = 1053.6$	$c_2 = -80.154$	$d_2 = 1.793.827$

and in which in the case of double threaded pressure build-up sections  $A = 0.206$

$a_0 = 0.18175$	$b_0 = -4.970$	$c_0 = 981.65$	$d_0 = -15.325$
$a_1 = 5.1394$	$b_1 = 53.267$	$c_1 = -1692.6$	$d_1 = 17.113$
$a_2 = -1.8763$	$b_2 = 205.78$	$c_2 = -7827.6$	$d_2 = 87.589$

and where the following relations are valid:  $f(h/d, \delta/d, q/nd^3) < 2.0$ ;  $q/nd^3 > 0.01$ ;  $0.0015 < \delta/d < 0.02$ ; and  $0.06 < (h/d)$  triple threaded  $< 0.13$  and  $0.11 < (h/d)$  double threaded  $< 0.29$ .

4,162,855

## MAGNETIC STIRRER APPARATUS

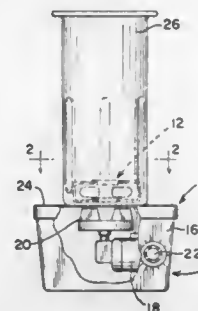
Charles E. Bender, Fairfield, Pa., assignor to Spectroderm International, Inc., Fairfax, Va.

Continuation-in-part of Ser. No. 622,013, Oct. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 524,788, Nov. 18, 1974, abandoned. This application Mar. 4, 1977, Ser. No. 774,422

Int. Cl.<sup>2</sup> B01F 13/08

U.S. Cl. 366—274

2 Claims



1. A stirrer apparatus particularly adapted for magnetic coupling to a magnetic drive to agitate a substance, such as a fluid, culture, sample or the like contained in a vessel when moved by the magnetic drive, including stirrer positioning means disposed within said vessel containing said substance to be agitated and independent therefrom, said stirrer positioning means including a positioning cage having a central mounting portion and a vessel engaging portion of substantially fixed vertical and horizontal dimensions extending radially outwardly therefrom, rotor assembly means rotatably mounted on said stirrer positioning means and being supported thereby within said vessel, generally parallel to an interior surface thereof and to said magnetic drive, said rotor assembly means being magnetically coupled to and magnetically rotatable by said magnetic drive at a desired speed relative to said vessel, said radially outwardly extending vessel engaging portion of said positioning cage extends beyond said rotor assembly means, and said rotor assembly means includes hub means formed for mounting within said central mounting portion of said positioning cage, said hub means being freely movably relative thereto, and magnetic impeller means mounted on said hub means for rotation therewith relative to said vessel, said hub means including spaced upper and lower collar members with said cage comprising an open substantially flat and horizontal wire means to provide said cage, said hub means having a generally vertical passageway formed therein along an axis of rotation of said hub means, said passageway being capable of receiving fluid supply means therethrough, a portion of said fluid supply means being disposed below said hub means for introducing or drawing fluid from said vessel.

4,162,856

## AGITATION APPARATUS

William W. Bassett, Wayzata, and Eugene D. Johnson, Spring Lake Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 689,879, May 25, 1976, abandoned.

This application Jan. 11, 1978, Ser. No. 868,659

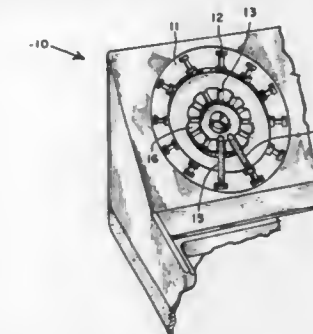
Int. Cl.<sup>2</sup> B01F 9/02

U.S. Cl. 366—213

6 Claims

1. An apparatus for the low speed agitation of fluids comprising: rotatable agitating means, said agitating means further comprising, a disc-shaped member having a plurality of recesses in the surface thereof for receiving single containers of fluid to be agitated such that the normally vertically disposed axes of the containers are parallel to the plane of the disc and wherein said recesses are completely open above the plane of said disc such that said containers are retained

solely by gravity therein and may be placed therein or removed therefrom during the rotation of said disc;



support means for supporting said agitating means at a position such that said containers are retained in said recesses by gravity; and drive means for rotating said disc means.

4,162,857

## APPARATUS FOR STIRRING GRAIN

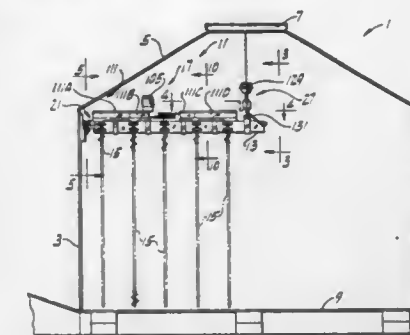
Gary A. Spurling, Taylorville, Ill., assignor to Specialized Products, Inc., Taylorville, Ill.

Filed Dec. 12, 1977, Ser. No. 859,322

Int. Cl.<sup>2</sup> B01F 7/24, 7/30

U.S. Cl. 366—261

18 Claims



1. Apparatus for stirring a mass of grain stored in a bin, the bin having a cylindrical wall and a roof, and a track extending in a circle around the inside of the wall in a generally horizontal plane above the level of grain in the bin, the track being mounted on supports spaced at intervals around the inside of the wall, said apparatus comprising

a beam;

means for mounting the beam for swinging in a generally horizontal plane above the grain about the vertical central axis of the bin, said beam mounting means comprising means for suspending the beam from the roof of the bin adjacent one end of the beam constituting its inner end and providing a pivot for the beam to swing around the bin generally on its said vertical central axis, the beam extending out from said suspending means toward the bin wall, a carriage at the other end of the beam constituting its outer end, and wheels on the carriage adapted to roll on said track;

an electric motor carried by the carriage;

a drive from said electric motor to at least one of said wheels for driving the carriage around the track thereby to swing the beam around said central vertical axis;

a plurality of augers carried by the beam extending down from the beam at spaced intervals along the length of the beam;

a plurality of bearing means, one for each auger, mounted on one side of the beam, the upper ends of the augers extending up above the top of the beam;

a second electric motor carried by the beam at a location between the ends of the beam;  
a first drive means from said second motor to the upper ends of the augers which are between said second motor and the outer end of the beam;  
a second drive means from said second motor to the upper ends of the augers which are between said second motor and said suspending means;  
a retainer for the carriage carried by the beam spaced outwardly from the outer end of the beam; the carriage comprising an elongate body extending transversely with respect to the beam between the outer end of the beam and said retainer;  
and a pin mounted at the outer end of the beam for sliding movement axially of the pin and in the direction of the length of the beam from an extended position in which it extends out from the end of the beam through said carriage and into a hole in the retainer, to a retracted position in which the pin is retracted from the carriage for removal of the carriage from the beam.

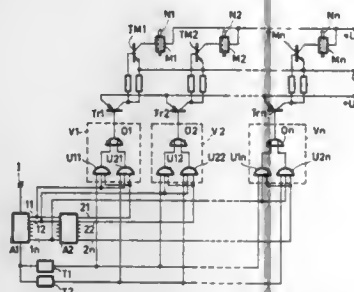
4,162,858

**STYLUS PRINTER IMPACT ENERGY CONTROL**  
Klaus Brandenburg, Webbach, Fed. Rep. of Germany, assignor to U.S. Phillips Corporation, New York, N.Y.  
Filed Jul. 28, 1977, Ser. No. 819,757  
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635398

Int. Cl.<sup>2</sup> B41J 3/12

U.S. Cl. 400—124

1 Claim



1. A stylus printer, comprising a number of printing styli which are arranged one underneath the other, each stylus being movable by an electromagnet so as to print a dot on a record carrier, the arrangement being such that a character to be printed can be built up in columns by selective actuation of the magnets in combination with a relative movement of the record carrier with respect to the printing styli, a magnet being actuated by one energy pulse or by a series of energy pulses, depending on the shape of the character to be printed, further including means for the selective actuation of the magnets including means for control including means to determine whether a magnet to be actuated has already been actuated during the printing of the directly preceding column, and to supply a magnet where this is the case with a pulse containing a quantity of energy which is smaller than that applied to a magnet where this is not the case,

said means for control including means to vary the energy of the pulses by variation of the pulse length,  
said means for control further including a clock generator which is capable of controlling a number of switches, each of which actuates one of the magnets when actuated, and also comprising a register which is adapted to store per column to be printed the data indicating which magnets are to be actuated and to supply a pulse from the clock generator to the relevant switches or not in dependence of these data, and further including two registers which are connected to each other so that each time after the printing of a column the contents of the first register are transferred to the second register, there being provided two clock generators which generate pulse series having the

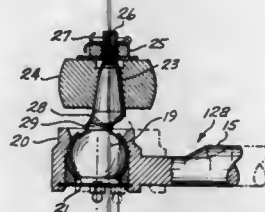
same frequency, the pulses of the first clock generator having a duration longer than those of the second clock generator, each output of the first register being connected, together with the corresponding output of the second register, via a logic network, to the associated switch, said means for control conducting a pulse from one of the clock generators when the first register indicates that the relevant stylus must print a dot, a pulse from the second clock generator being conducted when the second register indicates that the same stylus has also printed a dot during the printing of the previous column, a pulse from the first clock generator being conducted when this is not the case.

4,162,859

**VEHICLE STEERING KNUCKLE ARM ANGLE COMPENSATOR**

Lloyd O. McAfee, 4441 - 26th Ave. West, Seattle, Wash. 98199  
Filed Dec. 27, 1977, Ser. No. 864,521  
Int. Cl.<sup>2</sup> F16C 11/00; F16D 1/12, 3/00  
U.S. Cl. 403—75

15 Claims



1. Vehicle steering knuckle arm angle compensator means comprising a tie rod adjustable in effective length and having a spherical ball joint component, and a connector including a spherical ball joint component complementary to and fitted with said tie rod ball joint component and a shank projecting generally radially from said connector ball joint component, said shank having a joint portion spaced from said connector ball joint component for attachment to a steering knuckle arm and swivelably adjustable relative thereto as said ball joint components are relatively swivelably adjusted and said shank further having an offset rigidly connecting said connector ball joint component and said joint portion.

4,162,860

**FLANGE-SCREW CONNECTION FOR RODS IN THREE-DIMENSIONAL FRAMEWORKS**

Max Mengeringhausen, and Reinhard Schmelde, both of Würzburg, Fed. Rep. of Germany, assignors to MERO-Raumstruktur GmbH & Co., Würzburg, Fed. Rep. of Germany  
Filed Aug. 24, 1978, Ser. No. 936,343  
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743269

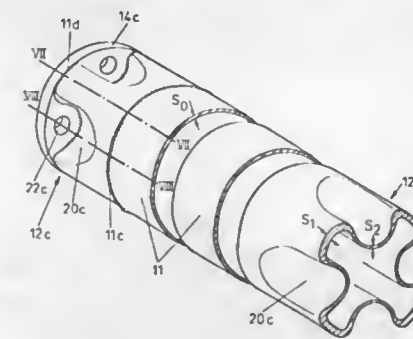
Int. Cl.<sup>2</sup> F16B 9/02; F16L 41/00

U.S. Cl. 403—199

7 Claims

1. A flange-screw connection between a rod and a junction means comprising corresponding support surfaces, characterized in that a flange (14) is secured to a connecting part (12) provided at the end of the rod which is of such cross-section as to have the same (area) moment of inertia as the rod (11), the

flange comprising bores (22) adapted to receive fastening screws (21) therethrough, said bores being disposed close to



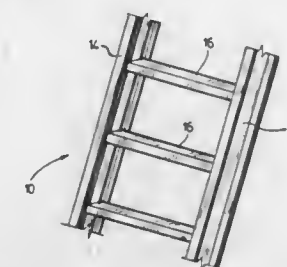
the outer periphery of said flange and each terminating in an insertion-cavity (20) for receiving the fastening screws.

4,162,861

**STRUCTURAL JOINT**

Robert Reid, Willowdale, and Kaljo Lustvee, Islington, both of Canada, assignors to Daymond Limited, Mississauga, Canada  
Filed Jan. 5, 1978, Ser. No. 867,289  
Int. Cl.<sup>2</sup> B25G 3/00; F16B 7/00, 12/08; F16L 41/00  
U.S. Cl. 403—242

4 Claims



1. A structural joint formed upon joining two elements, said first element having a flange portion of malleable material, said second element having an elongate recess with an arcuate internal surface, the recess edges defining an elongate entrance to said recess where a leg defines at least an upper part of said recess internal surface, the extremity of said leg defining an edge of said recess, said first element having a rigid tongue portion spaced from said flange by a gap which is adapted to receive said leg on joining formation, said flange being deformed in said recess to form at least a portion of a coil therein which contacts the recesses' internal surface, said leg having an over-turned portion which overlies a portion of said deformed flange to define a recess entrance smaller than the coiled flange, said leg having an abutment which abuts a longitudinally extending portion of a side of said tongue to clamp said leg between said tongue side and coiled flange, the arrangement being such that when a force is exerted to remove the coiled flange from the recess the clamping action on said leg is increased by virtue of said leg abutment interfering with and binding against said longitudinally extending side portion of said tongue.

4,162,862

**PAVEMENT STRIPING APPARATUS AND METHOD**  
James S. Harker, 5232 Hickory Pl.; Earl J. Harris, 1411 Morrie Ave., and Edward L. Haak, 5020 Greybull Ave., all of Cheyenne, Wyo. 82001

Filed Apr. 7, 1978, Ser. No. 894,440

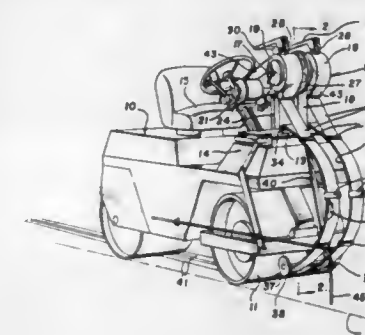
Int. Cl.<sup>2</sup> E01C 23/16

U.S. Cl. 404—72

9 Claims

8. A method of applying striping tape to fresh hot asphaltic pavement during the finish rolling of the pavement in a single combined operation, comprising the steps of rolling fresh hot asphaltic paving material to produce a finished wear surface

thereon, simultaneously utilizing the rolling movement of a pavement roller to continually pull pavement striping tape from a tape source, and positively guiding said striping tape



4,162,863

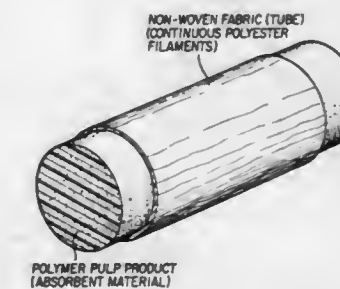
**DEVICE FOR SOIL IRRIGATION**

Yves Gaudard; Henri Guillemaud, both of Lyons, and Jacques Perfetti, Caluire, all of France, assignors to Rhone-Poulenc-Textile, Lyons, France  
Filed Oct. 14, 1977, Ser. No. 842,311  
Claims priority, application France, Oct. 28, 1976, 76 32941; Jan. 7, 1977, 77 20549

Int. Cl.<sup>2</sup> E02B 13/00

U.S. Cl. 405—45

7 Claims



1. An irrigation system for the irrigation of soils to facilitate the growth of plants, trees, crops or germination of seeds, wherein it is desired to regulate and meter the moisture level of soil, said system comprising an absorbent product filling contained within a permeable textile filter envelope, wherein the absorbent product filling is an amorphous, synthetic polymer pulp or a textile in the form of a tow of hydrophilic continuous filaments, said system being connected to and in fluid flow communication with a liquid supply source.

4,162,864

**SYSTEM FOR AND METHOD OF MOVING SEA WATER BY UTILIZING TIDAL FLOW AND EBB**

Yoshiki Maeda, and Chikako Maeda, both of 20-1-1361, Moto-Machi Hiroshima-shi, Hiroshima-ken, Japan  
Filed Oct. 14, 1977, Ser. No. 842,149

Claims priority, application Japan, Oct. 16, 1976, 51-124102; Mar. 12, 1977, 52-27445; Jul. 30, 1977, 52-91521

Int. Cl.<sup>2</sup> E02B 9/00, 9/04

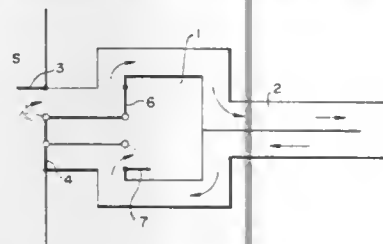
U.S. Cl. 405—75

23 Claims

1. A system for moving seawater by utilizing tidal flow and ebb comprising:  
at least one reservoir,



at least one floodgate for inlet and at least one floodgate for outlet provided on said reservoir, at least one channel having two opposite ends respectively connected to said floodgates of the reservoir, and at least one inlet floodgate and at least one outlet floodgate provided on said channel and open directly to the sea, characterized in that when the tide is rising, the inlet floodgate provided on the channel and open directly to the sea and said floodgate for inlet provided on said reservoir and separated at a certain distance from said inlet



floodgate are opened, whereas an outlet floodgate provided on the channel and open directly to the sea and said floodgate for outlet provided on said reservoir, and separated at a certain distance from said outlet floodgate are shut, thereby producing the current of the seawater through the channel in a direction; and when the tide is receding, said floodgate for inlet and said inlet floodgate are shut and said floodgate for outlet and said outlet floodgate are opened, thereby maintaining the current through the channel in the same direction as in the case of the rising tide.

#### 4,162,865 METHOD FOR LAYING CARRIER CABLES, SUCH AS TELEPHONE LINES

Philippe Aubet, 3, rue des Princes d'Albon, Yvetot, France (76190)

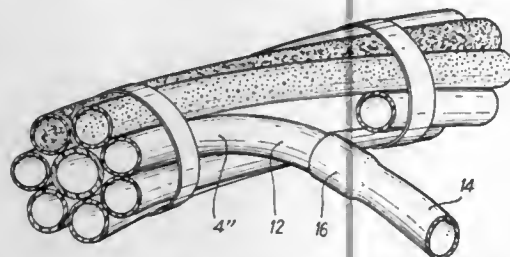
Filed May 9, 1977, Ser. No. 795,282

Claims priority, application France, May 13, 1976, 76 14400

Int. Cl.<sup>2</sup> F16L 1/00

U.S. Cl. 405—154

2 Claims



1. A method for laying carrier cables, such as telecommunication lines (telephone, telex, connection by cable from a television relay) and for connecting individual users to a distribution system, whereby at least one linear main cable is buried and adapted to receive junctions made from place to place to connect secondary branch cables supplying individual apparatus, said method comprising the steps of burying a bundle of tubular pipes connected at one end to at least one connection box supplied by a main cable, the main cable being engaged in one of the pipes of the bundle, from one end of said pipe to the other, at least certain of the pipes assembled together in a bundle are left empty when the bundle (containing the main cable) is laid and they are buried with the bundle assembly, after which, when a new subscriber is subsequently to be connected, the bundle is unearthed at the location of the connection to be made and one of the empty pipes forming part of the bundle is severed, a secondary branch cable is passed from a connection box into the section of this pipe, emerging therefrom at the severed end thereof, this secondary branch cable is

then engaged in and conveyed by a secondary connection pipe terminating at the apparatus to be supplied, the free end of the severed pipe is securely connected to the inlet of the secondary connection pipe, thus ensuring a continuous tubular support conveying the branch cable from the connection box to the apparatus to be connected.

#### 4,162,866 H-SHAPED STEEL SHEET PILE WALL

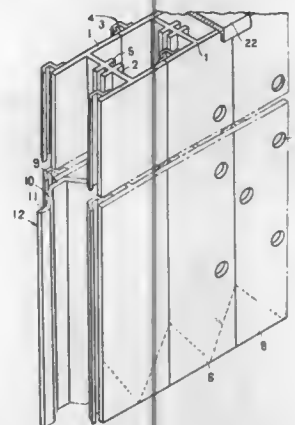
Takeichi Kita, and Takuji Kita, both of 2-288 Mineoka-cho, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed May 4, 1978, Ser. No. 902,891

Int. Cl.<sup>2</sup> E02D 5/08

U.S. Cl. 405—277

3 Claims



1. An H-shaped steel sheet pile wall made of H-shaped units wherein in each unit central parts of two opposing side plates (1) are coupled by a coupling plate (2) comprising in combination:

- an AH-shaped steel sheet pile units (6) each unit of which is formed with an engaging piece (3) at one edge of the side plate (1) and fitting piece means (4) adapted to fit said engaging piece (3), at the other edge of said side plate in a manner to be continuous along the respective edges of the side plates;
- fitting grooves (5) on both opposite surfaces of the coupling plates (2) in each unit in a manner to extend in a lengthwise direction of said coupling plate in opposition to each other;
- BH-shaped steel sheet pile units (8) each of which is provided with opposing apertures (7) at predetermined positions of both said side plates (1) of the AH-shaped steel sheet pile;
- joining reinforcement members (12) in the form of a trestle, with two edges, each of which has at both its edges protuberant pieces (11) adapted to fit said fitting grooves (5) of the adjacent and opposing coupling plates of the coupled steel sheet piles;
- A top piece (9) and oblique pieces (10) on each joining reinforcement member (12), contacting with the rear surface of connected parts of said side plates so that the sheet piles are fitted and coupled into one row by the use of said joining reinforcement members (11), the protuberant pieces (11) fitting snugly into the grooves (5) and being integrally molded at both edges thereof; and,
- a partition plate (13) for closing the open surface of the H-shaped steel plate (6,8) with engaging pieces (14) which snugly fit the engaging pieces (3) and fitting piece means (4), and having fitting grooves (15) in which said protuberant pieces (11) are fitted.

#### 4,162,867 DUAL CUTTER BORING HEAD

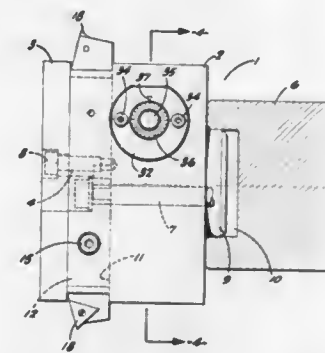
Donald J. Calcaterra; Robert A. Rhinefrank, both of Stockton, and Donald W. Barton, Manteca, all of Calif., assignors to Carando Machine Works, Stockton, Calif.

Filed Apr. 17, 1978, Ser. No. 896,681

Int. Cl.<sup>2</sup> B23B 51/00

U.S. Cl. 408—157

8 Claims



1. A dual cutter boring head comprising a body adapted for rotation about a predetermined axis, the body having a diametral channel therein, a pair of tool-holding slides disposed in side-by-side relation in the channel, the channel having a bottom, means retaining the slides in the channel in engagement with the bottom thereof, each slide having an outer end projecting from a corresponding side of the body, a cutter mounted on each slide at said outer end, a member journaled in the body for rotation about the axis thereof, such member having a face open to the bottom of the channel, a pair of pins on said member in spaced-apart, radially-opposed relation, the pins projecting from the face of said member into the channel, the slides having transverse slots therein, the pins engaging in corresponding slots whereby—upon part-circle rotation of such member—the pins move the slides in opposition in the channel to adjust the cutters, means on the body operable from exteriorly thereof arranged to cause such part-circle rotation of said member, and releasable means normally securing the slides against movement in the channel.

#### 4,162,868 INVALID FEEDING DEVICE

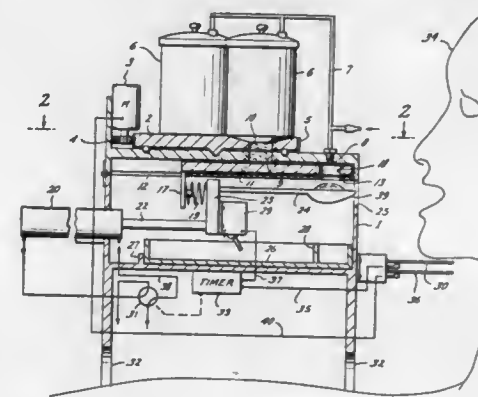
Patrick Stapleton, 1738 Colquitt; Hubbard P. Browne, 1627 Colquitt, both of Houston, Tex. 77098, and Dallas D. Weatherholt, 13207 Buxley, Houston, Tex. 77045

Filed Dec. 20, 1977, Ser. No. 862,655

Int. Cl.<sup>2</sup> A47G 21/08

U.S. Cl. 414—9

1 Claim



1. In an invalid feeding device, a housing, a food container table on said housing, a port extending therethrough, food transport means reciprocally mounted in said housing, a movable

table mounted in said housing between the upper wall thereof and said transport, a port in said table, means for moving said table into alignment with said port in said food container table and in sequence into alignment with said food transport, means for moving said food transport out of said housing into invalid feeding position, a removable spill tray anchored in said housing, a switch carried by said transport which moves against said spill tray at the end of each stroke to actuate said switch and reverse the movement of said transport.

#### 4,162,869 UNMANNED CONVEYING CONTROL SYSTEM

Shinichi Hitomi, Hiratsuka; Tetsuya Nakayama, Fujisawa, and Tetsuji Funabashi, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

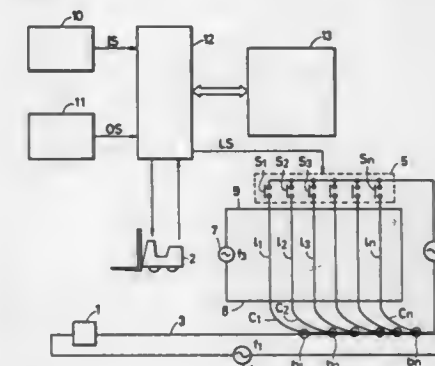
Filed Aug. 1, 1977, Ser. No. 820,995

Claims priority, application Japan, Aug. 6, 1976, 51-93786; Aug. 6, 1976, 51-93789; Aug. 6, 1976, 51-93792

Int. Cl.<sup>2</sup> B65G 67/00

U.S. Cl. 414—70

6 Claims

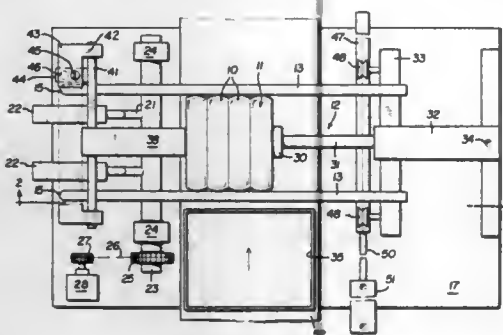


1. An unmanned conveying control system comprising: main leader cables energized by a guide signal of a first frequency; lane leader cables energized by a guide signal of a second frequency; an unmanned travelling vehicle running along said leader cables for conveying a load, said vehicle being guided by the guide signals flowing through said leader cables; means for superimposing upon said first and second frequencies a third frequency corresponding to the storing of a load and a fourth frequency corresponding to the delivering out of a load; a memory for storing data including the position of a load placed on a lane in a work area and the number of layers of the load; means for rewriting the contents of said memory each time an operation of storing or delivering out of the load is completed; leader cable selection means for selecting suitable ones from among said leader cables for forming a load conveying way between a predetermined base position and a desired position in the work area; a central control unit for controlling said leader cable selection means and giving load conveying instructions to said vehicle in accordance with the contents of said memory; and loading and unloading control means mounted on said vehicle for detecting the presence or absence of a load in front of said vehicle and the number of layers of the load and for loading and unloading the load in response to said load conveying instructions.

**4,162,870**  
**HORIZONTAL STACKER FOR BAKED GOODS AND THE LIKE**  
 Donald W. Storm, 5857 Upper Straits Blvd., Orchard Lake, Mich. 48033

Filed Sep. 22, 1977, Ser. No. 835,450  
 Int. Cl.<sup>2</sup> B65G 57/00  
 U.S. Cl. 414—107

3 Claims



1. A horizontal stacker for relatively flattened, roughly disk shaped, soft items, such as baked muffins, doughnuts and the like baked goods, comprising:

- an arm having a normally horizontal, load portion for receiving a horizontally arranged item to be stacked, and an opposite, pivotally mounted portion, and means for pivoting the arm for moving the load portion thereof into an upright position for thereby carrying the item into a roughly vertical position, i.e., rested upon an edge thereof;
- a horizontally elongated support means having a load end for receiving and supporting said items as the items are placed thereon, one by one, by said arm;
- a swinging barrier means located near the arm and the portion of said horizontal support means adjacent the arm of swinging above the support means and towards the support means in an arc which is generally aligned with the axis of the support means, whereby pivoting of the arm loaded with an item causes the barrier means to swing upwardly to clear the item and then to swing downwardly again to support the item against horizontal movement in the direction of the load end;
- a force applying means for applying a horizontal force in a direction axial of the support means, i.e., towards the load end thereof, against the item furthest from the load end for compacting the stack of items against the barrier, with said force applying means moving in response to the addition of further items to the stack formed on the support means to maintain a relatively uniform low level force to the horizontal stack of items;
- spaced apart guide means having portions being generally parallel to said horizontally elongated support means, said items being supported by said support means between said guide means, said support means and said guide means comprising wire-like elements arranged beneath and along the opposite sides of the stacked items;
- and means for moving said wire-like support means in a direction parallel to the plane in which the wire-like guide means lie to thereby release the horizontally stacked items as a unit.

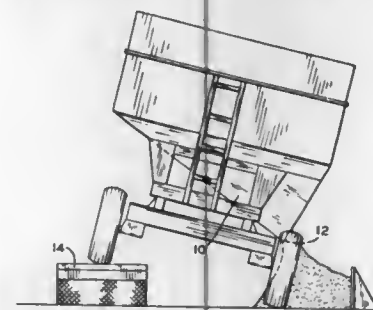
**4,162,871**  
**SIDE-LIFTING APPARATUS FOR HOPPER WAGONS**  
 James W. Norden, P.O. Box 242, Woodburn, Ind. 46797  
 Filed Mar. 3, 1978, Ser. No. 883,326  
 Int. Cl.<sup>2</sup> B65G 67/42

U.S. Cl. 414—376

7 Claims

1. A side-lifting apparatus for side-dumping wagons having front and rear wheels on opposite sides thereof, comprising a horizontal platform device onto which a wagon may be rested having stationary and vertically movable sections, said vertically movable section being elongated having opposite parallel

sides, said movable section further being positioned to support the front and rear wheels on one side of a wagon disposed on said platform device and movable from a first position level with said stationary section to a second position thereabove; a pair of power-lifting mechanisms disposed beneath and connected to and supporting the opposite end portions of said movable section to maintain the latter level and selectively to raise it above the level of said stationary section thereby to tilt a wagon resting thereon sideways, each of said power-lifting mechanisms including two upright telescopically slidably engaged guiding tubes having upper and lower ends, respectively, the upper end of one tube being rigidly secured to said

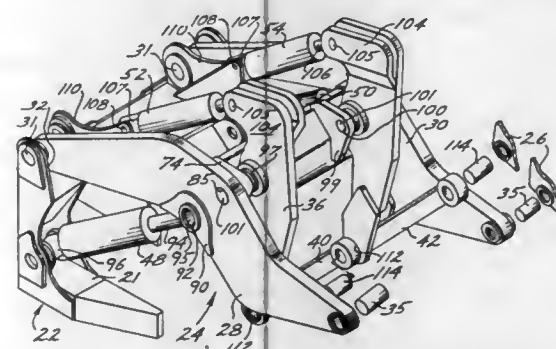


movable platform section, a rigid stationary frame, said other tube being rigidly secured at its lower end to said stationary frame, double acting fluid power cylinders disposed within said tubes, respectively, and having the piston rod connected to one and the cylinder operatively connected to the other of said tubes whereby actuation of said power cylinders telescopes said tubes, said tubes overlapping in telescoped relation when said movable section is in either of its first and second positions and supporting said movable section against any move other than vertical, whereby said movable section may be elevated and lowered in level horizontal condition by selective actuation of said pair of power-lifting mechanisms.

**4,162,872**  
**LIFT ARM ASSEMBLY**  
 Frank A. Grooss, Morton, and Gerald P. Simmons, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.  
 Filed Dec. 13, 1977, Ser. No. 859,362  
 Int. Cl.<sup>2</sup> E02F 3/82

U.S. Cl. 414—713

14 Claims



1. In a low clearance front end loader vehicle having a frame, a bucket, and a lift and tilt structure on said frame for moving said bucket, said lift and tilt structure comprising a pair of substantially parallel lift arms pivotally attached at one end to said frame and at the other end to said bucket, a crossbrace extending between and being attached to said lift arms, said crossbrace being tubular in cross section and having a longitudinal web therein for adding torsional strength to said crossbrace, said crossbrace having end plates rigidly secured

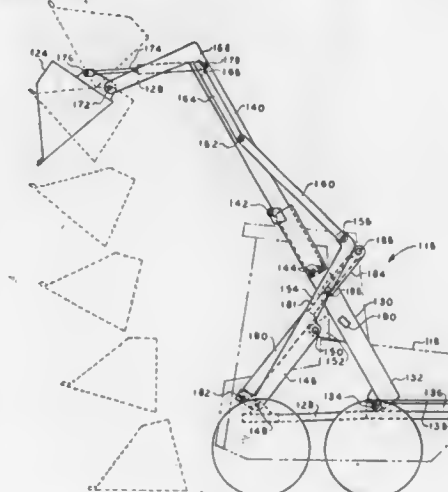
thereto, said end plates being secured to the inside faces of said spaced lift arms, a lift cylinder pivotally connected between said frame and each of said lift arms, a pair of tilt arms pivotally connected to said lift arms, a tilt cylinder pivotally connected to each of said tilt arms and to said frame, and means connecting said tilt arms to said bucket above the connection of said lift arms to said bucket.

**4,162,873**  
**EXTENSIBLE BOOM LIFT**  
 Raymond E. Smith, Jr., 385 E. Greenwood, Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 758,810, Jan. 12, 1977, Pat. No. 4,070,807. This application Jan. 30, 1978, Ser. No. 873,597  
 The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.  
 Int. Cl.<sup>2</sup> E02F 3/70

U.S. Cl. 414—718

16 Claims



1. A lift for raising a workpiece, comprising:  
 a pivotal boom having an extensible load end terminating in an upper reach and a pivot end;  
 means for supporting said boom so that said boom pivot end is horizontally movable but substantially vertically fixed;  
 a support arm having one end held from substantial horizontal motion and pivotally mounted for rotation about a substantially horizontal axis and a second end pivotally mounted to said boom;  
 means for raising and lowering said boom so that as said boom load end is elevated, its boom pivot end responds by moving substantially horizontally toward said support arm;  
 a workpiece arm extending from the load end of said boom;  
 means for supporting the workpiece on said workpiece arm at a location below the upper reach of the load end of said boom; and  
 means for continuously extending said extensible load end as said load end is elevated, whereby said workpiece arm is elevated and lifts the workpiece in an arc such that the workpiece is extended farther horizontally from the lift when in its elevated position than when in its unelevated position.

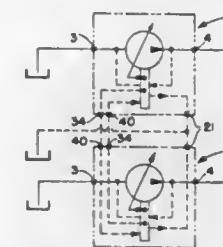
**4,162,874**  
**HORSEPOWER SUMMATION CONTROL FOR VARIABLE DISPLACEMENT**  
 Walter E. Marietta, Mentor, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio  
 Filed Nov. 7, 1977, Ser. No. 848,786  
 Int. Cl.<sup>2</sup> F04B 49/00

U.S. Cl. 417—216

8 Claims

1. A horsepower summation control for first and second variable displacement pumps each having pump means, high

and low fluid pressure zones, displacement adjusting means including a fluid pressure operated member to increase the displacement of said pump means in response to increase in fluid pressure in said high pressure zone, pressure compensating means operative, upon increase of fluid pressure in said high pressure zone to a predetermined value, to intercommunicate said high and low pressure zones for movement of said member in displacement decreasing direction, a spring-biased

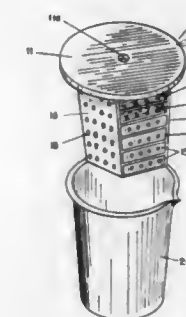


horsepower control valve, a spring-biased displacement feedback control valve, and cam means on said fluid pressure operated member operative upon movement in displacement decreasing direction to increase the spring bias on said valves; said pumps being interconnected to define a fluid flow path from the high pressure zone of each pump via its horsepower control valve to the low pressure zone of the other pump via its displacement feedback control valve.

**4,162,875**  
**DECALCIFICATION CABINET FOR OSSEOUS AND DENTAL SPECIMENS**  
 Virginia J. Lux, Dover, Del., and Peter J. Tsaknis, Mt. Airy, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
 Filed Apr. 26, 1978, Ser. No. 900,388  
 Int. Cl.<sup>2</sup> B01F 13/08

U.S. Cl. 366—273

4 Claims



1. An apparatus for decalcifying osseous and dental tissues comprising a container of decalcifying solution, a cabinet including a top portion and base portion, said base portion including a plurality of drawers therein, said cabinet and drawers containing a plurality of holes therein through which a decalcifying solution can flow, said top portion having support edges which extend laterally outwardly from the sides of the base portion of the cabinet for suspending said cabinet in said container, said top portion of said container resting on the upper edges of the container so that said base portion is suspended within said solution above the base of the container and providing closure means for preventing the escape of fluids from said container, a stirring magnet for stirring the decalcifying solution being positioned in said solution beneath said cabinet.

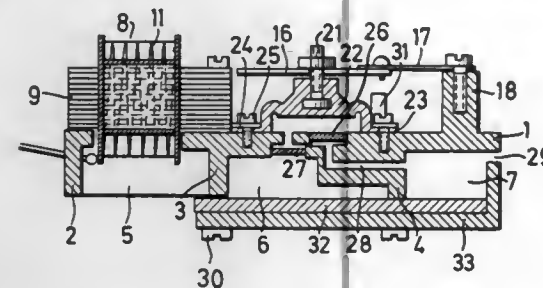


**4,162,876**  
**ELECTROMAGNETICALLY DRIVEN DIAPHRAGM PUMP**  
 Erwin Kolfertz, Bebelallee 9, Solingen-Merscheid, Fed. Rep. of Germany (5650)

Filed Jan. 4, 1977, Ser. No. 756,695  
 Claims priority, application Fed. Rep. of Germany, Jan. 28, 1976, 2603098; Oct. 7, 1976, 2645175  
 Int. Cl.<sup>2</sup> F04B 43/00

U.S. Cl. 417-413

26 Claims



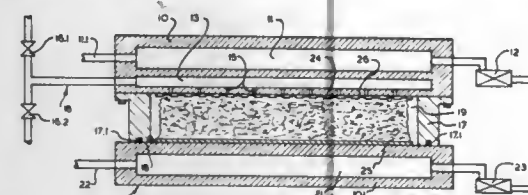
1. A diaphragm pump having means including a diaphragm defining a pumping chamber, an arm mounted for oscillating movement, means connecting said arm to said diaphragm and electromagnet means for oscillating said arm to move said diaphragm to and fro, said electromagnet means including core means having pole faces and coil means adapted, when energized, to produce a magnetic field including principal lines of magnetic force and said arm being mounted for said oscillating movement in a plane which is perpendicular to said principal lines of magnetic force and parallel to said pole faces, a half-wave rectifier having an input and an output, an alternating current supply, means connecting said input to said alternating current supply, means connecting one end of said coil means to said output and means for connecting the other end of said coil means to said alternating current supply.

**4,162,877**  
**METHOD AND APPARATUS FOR CONSOLIDATING PARTICLE BOARD**  
 Donald W. Nyberg, North Vancouver, Canada; assignors to Hawker Siddeley Canada Ltd., Toronto, Canada.

Filed Sep. 16, 1977, Ser. No. 834,050  
 Claims priority, application United Kingdom, Sep. 23, 1976, 39437/76  
 Int. Cl.<sup>2</sup> B29J 5/04

U.S. Cl. 425-84

4 Claims



1. In a press for compressing a mat of fibrous particles in the production of particle board:  
 (a) a pair of upper and lower heated platens having confronting pressing faces and movable between open and closed positions,  
 (b) a solid non-porous metallic caul plate for transporting the mat into position between the platens,  
 (c) peripheral sealing means on one of the platens for effecting sealing engagement with the other of the platens so as to provide a sealed chamber enclosing the mat and caul plate as the platens are moved into compressing engagement with the mat,  
 (d) a labyrinth extending through the upper platen connect-

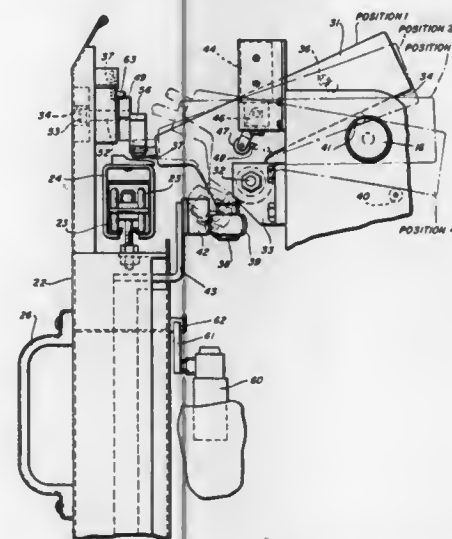
able selectively to a source of steam and a source of suction,  
 (e) a plurality of passages extending from the labyrinth and opening through the pressing face of the upper platen to enable steam to be injected into and exhausted from the chamber.

**4,162,878**  
**SAFETY LATCH SYSTEM**  
 Thomas C. Puglisi, Kensington, and Kurt M. Strobel, Southington, both of Conn., assignors to Litton Industrial Products, Inc., New Britain, Conn.

Filed Nov. 21, 1977, Ser. No. 853,394  
 Int. Cl.<sup>2</sup> B29F 1/00

U.S. Cl. 425-152

9 Claims



1. In an injection molding machine having first and second mold halves, said mold halves being mounted on first and second platens which are movable to cycle said mold halves from an open position to a closed position and back to an open position, and a safety gate which is movable from an open position allowing access to the mold halves to a closed position in which access is blocked, a mechanism comprising:  
 first means pivotally mounted on said machine and responsive to the closed position of said safety gate to pivot to a first position,  
 safety bar means mounted on the first platen and responsive to the closed position of said mold halves for supporting the first means in a second position,  
 second means pivotally mounted and positioned on said safety gate for latching with the first means in the first and the second positions to prevent the opening of the safety gate when the mold halves are in the closed position, and  
 a rest pin mounted on said first means, said rest pin being supported by said safety bar means to pivot said first means to a third position when the mold halves are open, said first means in the third position allowing the opening of the safety gate.

**4,162,879**  
**INTERCHANGEABLE ROTATING TABLES FOR INJECTION BLOW MOLDING MACHINES**  
 Alexander G. Makowski, Bound Brook, N.J., assignor to Rainville Company, Inc., Middlesex, N.J.

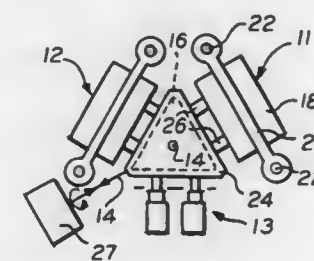
Filed Aug. 26, 1977, Ser. No. 828,186  
 Int. Cl.<sup>2</sup> B29D 23/03

U.S. Cl. 425-183

10 Claims

1. An injection blow molding machine including in combination a center post means intermittently movable about and along its axis, an indexing plate means secured to the center

post means for movement therewith during successive intermittent movement of the post means both angularly about said axis and axially between raised and lowered positions, a relatively fixed table of the machine at a lower level than the indexing plate means and toward and from which the indexing plate means moves when the center post means moves axially, machine means connected to the table that aligns with openings through the indexing plate means when the indexing plate means is at an angular position at which it moves vertically, a plurality of head means of different size from one another and constructed to support core rods of different size from those on



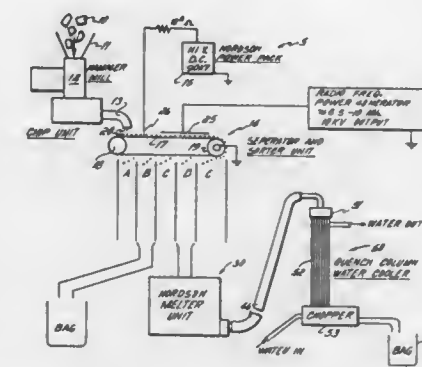
the other head means, all of the head means having openings in bottom faces thereof for register with the openings in the indexing plate means, dowels and sockets in each head means and the indexing plate means in positions to orient any one of the head means with the indexing plate means to register the openings in each head means with corresponding openings in the indexing plate means when any one of the head means is attached to the indexing plate means, and injection, blowing and stripper operational station means at angularly spaced locations around the post means and the indexing plate means and the head means carried by the indexing plate means.

**4,162,880**  
**PLASTIC SCRAP RECOVERY APPARATUS**  
 Walter H. Cobbs, Jr., Amherst, and Martin J. Stewart, Strongsville, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 27, 1976, Ser. No. 754,244  
 Int. Cl.<sup>2</sup> B29B 1/03

U.S. Cl. 425-202

16 Claims



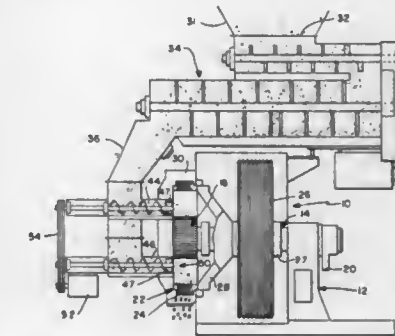
1. A plastic scrap recovery system comprising, a hopper for receiving articles containing plastic material to be recovered, breaking means for breaking said articles into chips, means for separating non-plastic components of said articles from said chips and for sorting heterogeneous mixtures of the chips into batches of discrete homogeneous component plastic materials, melting means for melting a selected one of said discrete plastic component materials, pelletizing means for converting said melted plastic compo-

nent material into solid pellets of said plastic component material, and means for transporting molten plastic material from said melting means to said pelletizing means.

**4,162,881**  
**PELLET MILL WITH IMPROVED FEED SYSTEM**  
 George W. Morse, 9444 S. Wales Way, Elk Grove, Calif. 95624  
 Filed May 24, 1978, Ser. No. 909,286  
 Int. Cl.<sup>2</sup> B29C 1/00; B30B 3/00, 4/28

U.S. Cl. 425-331

5 Claims



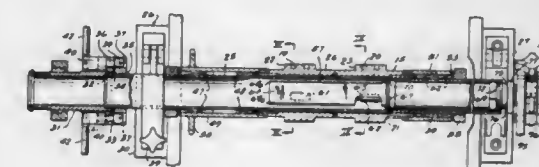
1. A two roller pellet mill comprising means forming a pellet die cavity including a vertical rotatable cylindrical pellet die member first and second rollers mounted side-by-side in said die cavity each having a roller pressing surface closely adjacent to opposing inner surfaces of said die member and forming first and second pressing zones therewith, said die member being divided into first and second hemispheres of rotation along a vertical center line, said first die pressing zone being disposed in the first hemisphere of rotation of said die member from the top of the die member, and said second die pressing zone being disposed in the second hemisphere of rotation from the top of the die member, and means for feeding pelletizable material to said die cavity including first and second conduits with respective first and second outlet openings, said first outlet opening being disposed to deposit said pelletizable material in said first hemisphere of rotation above said first roller of said first die pressing zone, and said second outlet opening being disposed to deposit essentially all of said pelletizable material under said first roller and in said first hemisphere of rotation, whereby pelletizable material falling from said second outlet opening onto the die member in the first hemisphere is spread out uniformly thereon under the influence of gravity and is carried thereon during rotation to the bottom of the rotating die member where it is held against the die member by centrifugal force during rotation to be carried to the second pressing zone.

**4,162,882**  
**VALVE MECHANISM FOR SANDWICH CREME**  
 Edward Rose, Skokie, Ill., assignor to Peters Machinery Company, Chicago, Ill.

Filed Mar. 22, 1978, Ser. No. 888,867  
 Int. Cl.<sup>2</sup> B29F 3/01, 3/04

U.S. Cl. 425-376 B

10 Claims



1. In extrusion apparatus for use in applying creme to at least two laterally spaced rows of cookies travelling along a sand-

wiching machine at the same rates of speed, the improvement comprising:

- a rotating stencil disposed above said rows of cookies and extending transversely thereof, said stencil having a series of annular ports therein corresponding to the spacing between the centers of said rows of cookies and of an outer diameter corresponding to the amount of creme to be deposited on the cookies,
- means rotatably driving said stencil at the speed of travel of the cookies,
- a non-rotatable stencil sleeve closely fitting said stencil and having at least two longitudinally spaced aligned ports therein corresponding to the spacing of the ports in said stencil, said stencil sleeve forming a bearing support for said stencil,
- a creme inlet into one end of said stencil sleeve, and a single valve spaced from said inlet and extending axially of said stencil sleeve and adjustable to equalize the flow of creme through said ports in said stencil sleeve and assure that the row of cookies farthest from said inlet receives the same amount of creme as the row of cookies closest to said inlet,
- said valve having a cross-section which is a segment of a circle and being integral with a generally cylindrical valve block and extending generally axially therefrom.

4,162,883

#### APPARATUS FOR THERMOFORMING HOLLOW ARTICLE HAVING A HIGH L/D RATIO

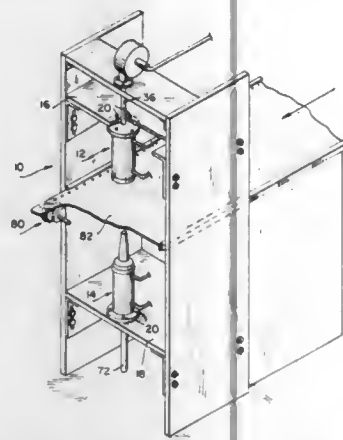
Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 717,636, Aug. 25, 1976, Pat. No. 4,130,387, Ser. No. 583,427, Jun. 3, 1975, Pat. No. 4,085,177, Ser. No. 506,333, Sep. 16, 1974, abandoned, Ser. No. 469,404, May 13, 1974, abandoned, and Ser. No. 448,191, Mar. 5, 1974, abandoned. This application Oct. 14, 1977, Ser. No. 842,254

Int. Cl.<sup>2</sup> B29C 17/04

U.S. Cl. 425—387.1

7 Claims



1. An apparatus for thermoforming a hollow article from a sheet of thermoplastic material which comprises:
  - an upper and lower support platforms fixedly mounted in spaced relationship to said apparatus;
  - a male mold assembly including a male member means for assisting in the formation of said hollow article, said male mold assembly being mounted on one of said support platform;
  - a female mold assembly including a female member means having a leading edge portion and formed with a chamber, said female mold assembly being mounted on said other support platform, said male mold means and said female member means being positioned relative to each other at a distance greater than the length of said hollow article to be formed;
  - means for supply and passing said sheet of thermoplastic

material between said male mold assembly and said female mold assembly;

fluid cylinder means associated with said female mold assembly for extending said female member means to cause said leading edge of said female member means to contact a selected portion of said sheet of thermoplastic material and thereafter to cause said leading edge of said female member means to pass through the plane of said sheet of thermoplastic material;

fluid cylinder means associated with said male mold assembly for extending said male member means through said selected portion of said sheet of thermoplastic means defined by said leading edge of said female member means and into said chamber of said female member means, each said fluid cylinder means including means for returning said female member means and said male member means to an initial position; and

means for removing said thus formed hollow article from said apparatus.

4,162,884

#### APPARATUS FOR SHAPING PLASTICS FOILS

Arthur Vetter, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Wolfertschwenden, Fed. Rep. of Germany

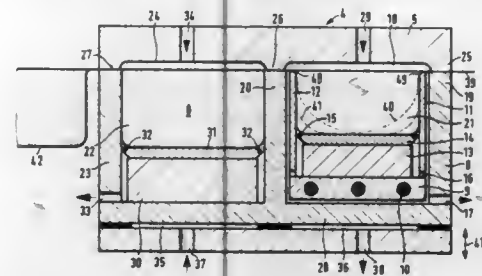
Filed Jun. 3, 1977, Ser. No. 803,103

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2638759

Int. Cl.<sup>2</sup> B29C 17/04

U.S. Cl. 425—388

11 Claims



1. Deep drawing moulding apparatus for shaping thermoplastic foil-type material into a container comprising:
  - a mould assembly including a hollow chamber portion formed therein,
  - a mould cavity within said chamber defining an inner surface including a bottom portion, at least one sidewall portion, and a junction portion which joins said bottom portion to said sidewall portion;
  - heat source means for heating said mould cavity to a temperature which is at a level over substantially the entire said inner surface portion that is at least as high as the deformation temperature of said foil-type material, said heat source means comprising the only source of heat for said foil-type material which is heated to a temperature at least as high as said deformation temperature;
  - means for positioning at the opening of said mould cavity a portion of said thermoplastic material at a temperature below its deformation temperature,
  - means extending through said junction portion for providing suction to progressively draw said foil into contact with said sidewall portion and also with said bottom portion before contacting said junction portion to provide continuous progressive heating and deformation of said foil-type material as said material progressively contacts the inner surface of said mould cavity.

4,162,885

#### APPARATUS FOR HOT MOLDING OF MATERIAL

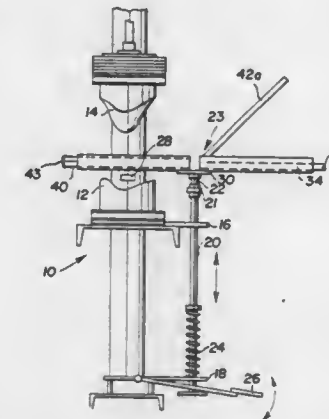
John R. Asel, Lorraine, Canada, assignor to Canadian Lady-Canadelle Inc., Montreal, Canada

Filed Nov. 7, 1977, Ser. No. 849,368

Int. Cl.<sup>2</sup> B29C 17/03

U.S. Cl. 425—400

6 Claims



1. Holding means for holding material during forming by a die, comprising two substantially flat parts each with a pair of apertures which are hinged together so as to be movable from a closed condition in which the apertures are in register so forming a common pair of apertures and in which a piece of material may be held between said parts to extend across said common aperture, to an open position in which material may be loaded and unloaded into and out of the holding means, and wherein one of said hinged parts has spring biased movable mountings carrying pins which are surrounded by the substantially flat area of the respective part and project towards the other of said hinged parts so that in the closed position the pins penetrate and hold material which is held substantially flat between said parts, said pins being spaced apart around each of said apertures and being movable towards their respective aperture of the one part against a spring resistance at least some of said pins being located between said apertures and being movable away from each other as they move toward their respective apertures.

4,162,886

#### DEVICE FOR REMOVING A RUNNER FROM A MULTIPLE PLATE DIE

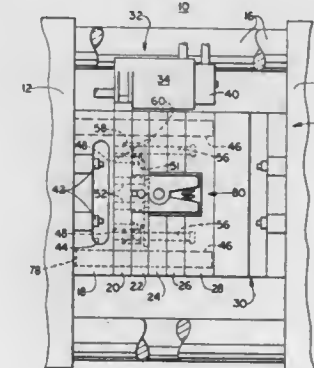
Maeford J. Holland, 845 Wesleyan Dr., Fairfield, Ohio 45014, and Robert B. Raines, 3490 Sodom Rd., Hamersville, Ohio 45130

Filed Mar. 13, 1978, Ser. No. 885,954

Int. Cl.<sup>2</sup> B29C 1/00; B29F 1/14

U.S. Cl. 425—556

10 Claims



1. The combination of a molding machine which includes a

pair of die plates having faces which engage face-to-face, there being a runner groove in one of said faces and means for advancing at least one of said plates toward and away from the other of said plates between open and closed positions, there being a mold cavity in communication with the runner groove and means for injecting molding material along the runner groove into the mold cavity, a runner forming in the runner groove during injection, with a device for removing the runner from the runner groove which comprises a runner carrier member having a head portion which extends into the runner groove so that a portion of the runner forms around the head portion, means for moving the runner carrier member laterally away from said one of the faces when the plates are in open position to separate the runner from the runner groove, and means for removing the runner from the head portion.

4,162,887

#### OIL BURNER

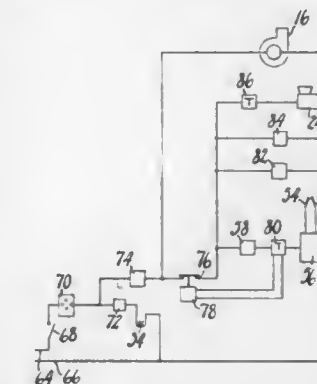
David Gray, Bournemouth, England, assignor to Greenmac Limited, London, England

Filed May 23, 1977, Ser. No. 799,327

Int. Cl.<sup>2</sup> F23N 5/00

U.S. Cl. 431—28

4 Claims

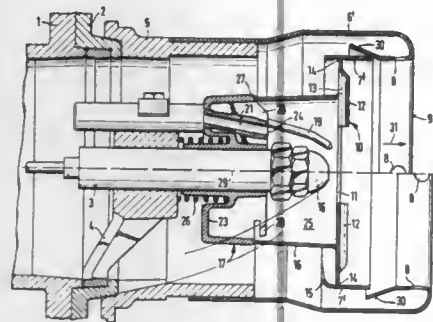


1. An oil burner comprising:
  - (a) an oil/air jet nozzle having a central oil orifice and an outer air orifice, and having a conduit thereabout;
  - (b) a chamber for combustion oil;
  - (c) means for preheating oil in said chamber;
  - (d) an oil control valve;
  - (e) means connecting said chamber through said oil control valve to said central oil orifice;
  - (f) an air pressure responsive switch;
  - (g) an air control valve;
  - (h) means for supplying air under pressure through said air pressure responsive switch and said air control valve to said outer orifice, for atomizing oil through said central orifice;
  - (i) means for supplying combustion air through said conduit about said nozzle;
  - (j) a discontinuous electrically-operated ignition means adjacent said nozzle for providing an ignition spark when it is desired to initiate ignition;
  - (k) means for detecting the absence of ignition; and
  - (l) control means operated by said detecting means and said pressure responsive switch for closing said oil control valve and air control valve on detection of loss of air pressure, for actuating said ignition means on detection of absence of ignition, and for closing said oil control valve and air control valves on failure of said ignition means to ignite the oil/air mixture from said nozzle.



4,162,888  
**BURNER FOR LIQUID FUELS**  
 Siegfried Weishaupt, and Hermann Kopp, Biberacherstr. 54,  
 both of D-7959 Schwendi, Wurt., Fed. Rep. of Germany  
 Filed Mar. 21, 1978, Ser. No. 888,664  
 Claims priority, application Fed. Rep. of Germany, Mar. 22,  
 1977, 2712564  
 Int. Cl.<sup>2</sup> F23Q 3/00; F23C 5/06  
 U.S. Cl. 431—265

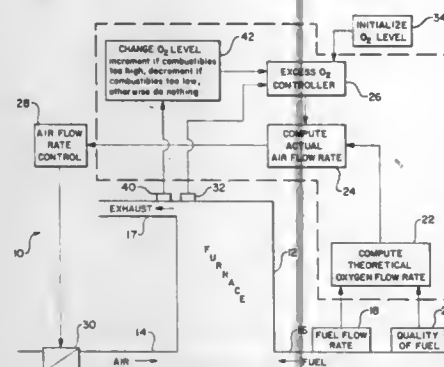
4 Claims



1. A burner for liquid fuel comprising: an air supply pipe with discharge opening; at least one pressure atomizer jet having a discharge opening and located concentrically in said air supply pipe; a combustion chamber; a pot-shaped means located between the discharge opening of said air supply pipe and the discharge opening of said jet and being open towards said combustion chamber; said pot-shaped means having a shell with radial openings and extending to the discharge opening of said air supply pipe and closing said discharge opening of said air supply pipe; said pot-shaped means having a bottom forming a baffle plate with a center opening and radial slots extending therefrom; ignition electrodes; a pot-shaped member upstream of said baffle plate and enclosing a space containing said atomizer jet and said ignition electrodes; pipe means; said pot-shaped member having bottom means penetrated by said pipe means, said pipe means having a discharge opening located upstream of and between said ignition electrodes; said pot-shaped member having a rim diameter substantially smaller than the diameter measured by outer ends of said radial slots and larger than a diameter of said center opening of said baffle plate.

4,162,889  
**METHOD AND APPARATUS FOR CONTROL OF EFFICIENCY OF COMBUSTION IN A FURNACE**  
 Michael S. Shigemura, Cupertino, Calif., assignor to Measurex Corporation, Cupertino, Calif.  
 Continuation-in-part of Ser. No. 750,391, Dec. 14, 1976, abandoned. This application May 8, 1978, Ser. No. 903,942  
 Int. Cl.<sup>2</sup> F23N 5/18  
 U.S. Cl. 431—76

6 Claims

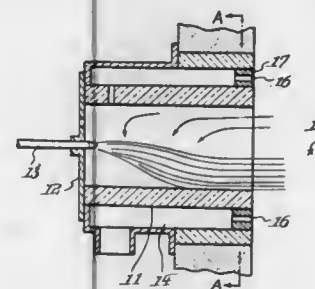


1. A system to control the efficiency of combustion of fuel in a furnace, said furnace having a fuel input, an air input, and an

exhaust output, and operating near peak efficiency as determined by an excess oxygen level, said system responsive to changes in the flow rate of the fuel or the quality of the fuel to restore the operation of said furnace to near peak efficiency, comprises: A feedforward subsystem having:  
 means for computing a theoretical oxygen flow rate needed to combust the flow rate and quality of said fuel;  
 means for calculating an actual air flow rate based upon said theoretical oxygen flow rate and said excess oxygen level;  
 means for controlling the flow rate of air at the air input, in response to said actual air flow rate;  
 A feedback subsystem having:  
 means for detecting the amount of combustibles at the exhaust output; and  
 means for adjusting the excess oxygen level in response to said detecting means.

4,162,890  
**COMBUSTION APPARATUS**  
 Yasuo Hirose, Yokohama, Japan, assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.  
 Filed May 2, 1977, Ser. No. 792,978  
 Int. Cl.<sup>2</sup> F23D 15/00  
 U.S. Cl. 431—351

6 Claims



1. A combustion apparatus comprising:  
 A. a combustion chamber;  
 B. a tile structure having inner and outer side walls, said inner side wall defining an interior cavity of said tile structure, and an end communicating with said combustion chamber;  
 C. a disk-shaped cover plate attached to an opposite end of said tile structure;  
 D. an annular air passage adjacent said outer side wall of said tile structure and connected to a source of air above atmospheric pressure;  
 E. a burner means extending through said cover plate and positioned so that it directs a stream of fuel at a velocity sufficient to create a Coanda effect axially through said interior cavity to said combustion chamber whereby combustion gases are drawn back through said interior cavity to mix with said stream of fuel;  
 F. an air stream inlet on one side only and in said tile structure connecting said air passage to said interior cavity and positioned so that combustion air in an amount less than that necessary to burn said fuel stoichiometrically enters said interior cavity in a direction normal to said stream of fuel and stabilizes the position of said stream of fuel along a portion of said inner side wall opposite said air stream inlet; and  
 G. a baffle plate placed between said annular air supply passage and said combustion chamber, said baffle plate having one or more air jets passing therethrough connecting said air passage to said combustion chamber, at least one of said jets being located on substantially the same side of said tile as said air stream inlet, whereby combustion air is supplied to said combustion chamber at a velocity of not less than about 30 meters per second.

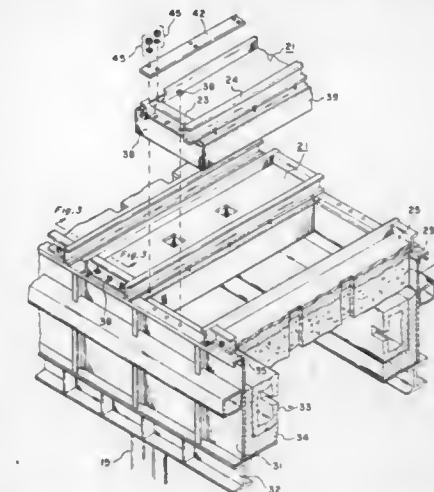
4,162,891  
**SCRAP PREHEATER MODULAR ROOF ASSEMBLY**  
 John R. Felinor, Burlington, N.J., and William J. Love, Jr., Perkasi, Pa., assignors to Melting Systems, Incorporated, Burlington, N.J.  
 Filed Sep. 1, 1977, Ser. No. 829,901  
 Int. Cl.<sup>2</sup> F27D 1/18  
 U.S. Cl. 432—247

6 Claims

1. In a scrap preheating system including a conveyor upon which the scrap to be preheated is positioned, an elongate preheater hood having side walls adjacent the conveyor and a roof assembly including burner means for directing flames upon the scrap, the improvements in the preheater roof assembly permitting ease of repair to the conveyor and preheater hood itself comprising:

a plurality of precast refractory modular roof assemblies of substantially identical configuration positioned in side by side relation transverse to the longitudinal axis of the preheater hood, each modular roof assembly including a roof supporting frame carried by the side walls of the

preheater hood and a precast refractory assembly supported by the roof supporting frame and depending from



the roof supporting frame in close engagement with the side walls of the preheater hood.

# CHEMICAL

## 4,162,892 METHOD OF MANUFACTURING CONTINUOUS COIL SLIDE FASTENERS

William R. Wright, Warren; Theodore Murphy, Monson; Kenneth Piazzo, West Warren, and August Leal, Monson, all of Mass., assignors to Wm. E. Wright Co., West Warren, Mass.

Filed Dec. 6, 1977, Ser. No. 858,071  
Int. Cl.<sup>2</sup> D06P 3/00, 5/00

U.S. Cl. 8-4

10 Claims



1. Method of manufacturing coil type slide fasteners comprising the steps of forming a pair of slide fastener coils from polyester monofilament material at a moderate temperature to facilitate coil forming, intermeshing said coils and securing the same along adjacent edges of a pair of fabric webs formed of yarn of the same material as the coils, whereby a continuous length of slide fastener chain is formed; continuously moving said chain in tensioned condition while performing the following sequential treatments; applying to said chain a thermosol-ling liquid dispersion dye in solution with a thickener in a sufficient quantity to promote application of a uniform film of the dispersion dye on said fastener coils; subjecting the material forming said chain for the first time to a temperature in the range of 380°-420° F. which is substantially higher than the coil forming temperature for simultaneously thermosetting said polyester and thermosol-ling said dispersion dye whereby said dye in its solid phase sublimates and its vapor penetrates the molecular structure of said polyester to effect color fast dyeing of the chain and then washing said chain to remove said thickener.

## 4,162,893 PROCESS FOR DYEING HUMAN HAIR WITH DIAZO SALTS

Arthur Bühler, Rheinfelden; Alfred Fasciati, Bottmingen, and Walter Hungerbühler, Riehen, all of Switzerland, assignors to Henkel Kommanditgesellschaft auf Aktien Henkel K G a A, Dusseldorf-Holthausen, Fed. Rep. of Germany

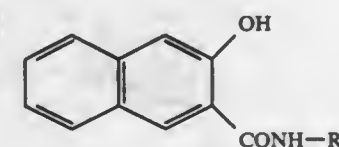
Filed Dec. 21, 1977, Ser. No. 862,696  
Claims priority, application Switzerland, Dec. 27, 1976, 16349/76

Int. Cl.<sup>2</sup> A61K 7/13

U.S. Cl. 8-10.1

7 Claims

1. A process for dyeing human hair with developing dyes which comprises applying to said hair, at temperatures of from about 15° to 40° C., an effective amount for dyeing of aqueous solutions of diazo salts and coupling components successively in any desired sequence, or simultaneously, and coupling said diazo salts and coupling components with each other, wherein the coupling component is a 2-hydroxy-naphthalene-3-carboxylic acid amide of the formula



wherein R represents a member selected from the group consisting of an unsubstituted aryl group and a substituted aryl group.

## 4,162,894 POSITIVE SHUT-OFF FOR CATALYST FEED SYSTEM

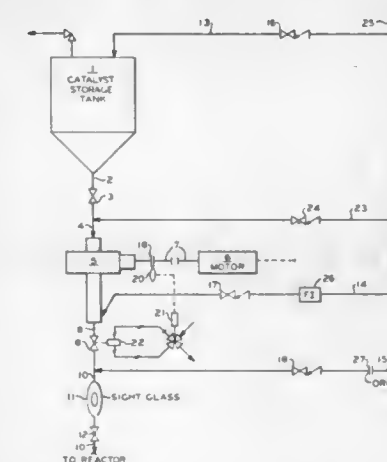
William R. Tribble, Pasadena, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 26, 1976, Ser. No. 652,271

Int. Cl.<sup>2</sup> G05D 7/00

U.S. Cl. 23-230 A

4 Claims



4. In a method for controlling catalyst feed to a reactor comprising supplying catalyst through a ball feed valve in response to a control condition in the reactor the improvement in assuring positive shut-off of the catalyst feed comprising: (a) automatically operating a shut-off valve placed downstream of the feed valve to concurrently open said shut-off valve and said feed valve with closing of the shut-off valve initiated by positioning of the feed valve for discharge of catalyst to the reactor with positive closing of the feed valve and shut-off valve.

## 4,162,895 MOUSE SERUM

Cesar L. Cambiaso, and Pierre L. Masson, both of Brussels, Belgium, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,537

Claims priority, application United Kingdom, Dec. 10, 1976, 51739/76

Int. Cl.<sup>2</sup> G01N 33/16, 31/14

U.S. Cl. 435-7 B

25 Claims

1. A method of analysing a liquid for the presence therein of Ab, Ag or Ab:Ag, which includes the step of adding to the liquid, before or after adding other reagents, the active fraction of whole mouse serum, to bind with Ab:Ag present in or generated in the sample.

## 4,162,896

### MICRO-ANALYSIS PROCESS AND DEVICE

Peter Hosli, Paris, France, assignor to Institut Pasteur, Paris, France

Filed Feb. 27, 1978, Ser. No. 881,354

Claims priority, application France, Mar. 9, 1977, 77 07016

Int. Cl.<sup>2</sup> B01L 3/00; G01N 1/10

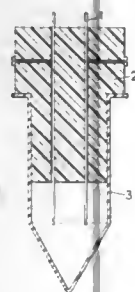
U.S. Cl. 23-230 R

28 Claims

9. A micro-analysis process comprising the steps of: (a) taking up at least one reagent used during the analysis by means of at least one taking up-measuring out element operating by surface tension; (b) positioning said at least one element inside a container; and



(c) subjecting the element and container assembly to centrifugation of a sufficient intensity for the reagent taken to



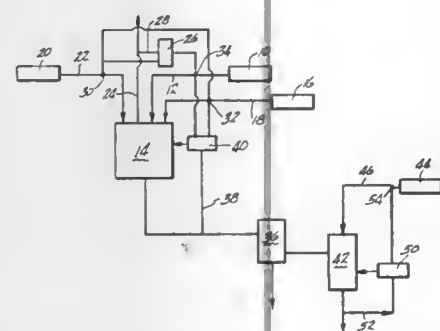
separate from the element and to be projected to the bottom of the container.

#### 4,162,897 METHOD OF MEASURING NITROGEN TRICHLORIDE IN A PROCESS FOR THE SAFE PRODUCTION OF POLYCHLOROISOCYANURATES

Italo A. Capuano, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 744,489, Nov. 24, 1976, Pat. No. 4,087,607.  
This application Sep. 20, 1977, Ser. No. 834,939

Int. Cl.<sup>2</sup> G01N 31/08  
U.S. Cl. 23—232 C



1. A method of analyzing effluent gases from a polychloroisocyanurate product for nitrogen trichloride which comprises:

- introducing said effluent gases into a first zone,
- introducing a carrier gas into said first zone to form a gaseous mixture,
- passing said gaseous mixture from said first zone through a chromatographic column to separate said nitrogen trichloride from said gaseous mixture,
- passing said nitrogen trichloride from said chromatographic column to a detector to measure the concentration of said nitrogen trichloride from said chromatographic column,
- recording said concentration of nitrogen trichloride on a recording device,
- providing said recording device with an upper limit for the concentration of nitrogen trichloride in said effluent gases, and
- activating an alarm when said upper limit of said concentration is reached or exceeded.

#### 4,162,898 PROCESS FOR REMOVING SULFUR FROM COAL

Donald B. Anthony, Aurora, and Allan V. Marse, Independence, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 31, 1978, Ser. No. 891,962  
Int. Cl.<sup>2</sup> C10L 9/10; C10B 57/00

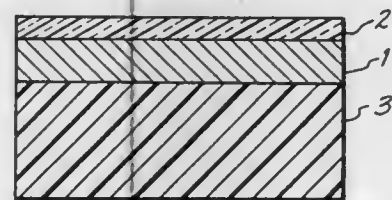
- U.S. Cl. 44—1 R 8 Claims
- A process for removing sulfur from coal comprising contacting the coal with a leachant comprising an aqueous solution containing sodium nitrate, sodium nitrite and a base.
  - The process of claim 1 wherein said base is sodium hydroxide.

#### 4,162,899 POLISHING FOIL OR POLISHING PLATE

Sandor Molnar, Neuhausen, and Wolfhart Rieger, Buch, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,561  
Claims priority, application Switzerland, Sep. 8, 1976, 11380/76

Int. Cl.<sup>2</sup> B24D 11/02  
U.S. Cl. 51—295



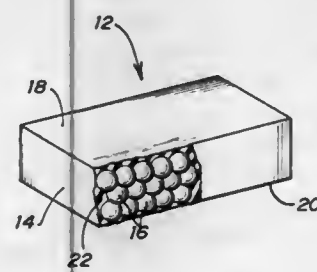
- 9 Claims
- A polishing foil or polishing plate which is used together with a polishing substance for preparing the surfaces of materials, in particular for polishing metallographic, petrographic and ceramographic samples which comprises a first layer of a metallic base having a polishing surface provided with a second non-metallic layer selected from the group consisting of an inorganic oxide, inorganic phosphate, inorganic chromate, inorganic molybdate and inorganic oxalate layers which covers the polishing surface, acts as a polishing substrate and is intimately and directly bonded to the said metallic base with the presence of an intermediate layer therebetween.

#### 4,162,900 COMPOSITION HAVING IMPROVED WEAR RESISTANT AND COMPRESSION RESILIENT PROPERTIES

Oliver S. Judd, Arlington, Tex., assignor to The Hutson Corporation, Arlington, Tex.

Filed Sep. 13, 1976, Ser. No. 722,813  
Int. Cl.<sup>2</sup> B24D 3/32

U.S. Cl. 51—295 10 Claims



- A composition having improved wear resistant and compression resilient properties which is particularly suited for use

as a liner for an industrial vibratory finishing machine to reduce abrasion damage, comprising:

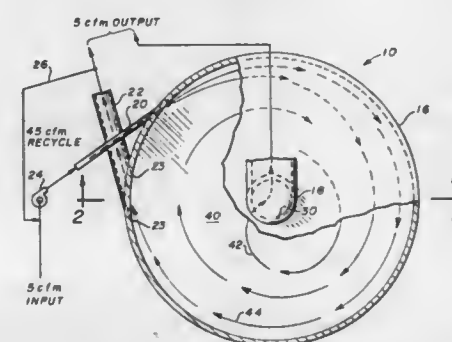
- a compressible elastomeric substrate having a working surface subject to abrasion, and a non-working surface not subject to abrasion in spaced relationship with the working surface; and
- a plurality of separate abrasive resistant members of predetermined solid geometric configurations comprising particles and randomly arranged between the surfaces of said substrate with at least certain of said abrasive resistant members having surfaces positioned closely adjacent to the working surface, and with an effective amount of substrate between each of said abrasive resistant members and the non-working surface of said substrate to allow compression of said abrasive resistant members within said substrate.

#### 4,162,901 VORTEX GAS SEPARATOR

David N. Enegess, Broad Brook, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Apr. 28, 1975, Ser. No. 572,253  
Int. Cl.<sup>2</sup> B01D 53/04

U.S. Cl. 55—17 23 Claims



1. An apparatus for effecting the separation of a gas mixture into at least a first fraction and a second fraction, wherein said apparatus comprising:

- a non-rotating cylindrical container having a first disc at one end and a second disc at the other end connected by a cylindrical side wall and wherein said first and second discs are substantially parallel;
- a first fluid outlet at the central axis of said cylindrical container;
- a second fluid outlet at the periphery of said cylindrical container;
- means for injecting said gas mixture into said cylindrical container, said means inducing a gas vortex within said cylindrical container; and
- a substance suspended on the interior of said cylindrical container, said substance being more interactive with said first fraction of said gas mixture than with said second fraction of said gas mixture.

23. A method for separating a gas mixture into at least a first fraction and a second fraction, wherein said method comprising the steps of:

- swirling said gas mixture in a vortex;
- causing a first fraction of said gas mixture to lose more energy than a second fraction of said gas mixture by contacting said swirling gas mixture with a substance which is more interactive with said first fraction than with said second fraction;
- removing a portion of said first fraction from the center of said vortex; and
- removing a portion of said second fraction of said gas mixture from the periphery of said vortex.

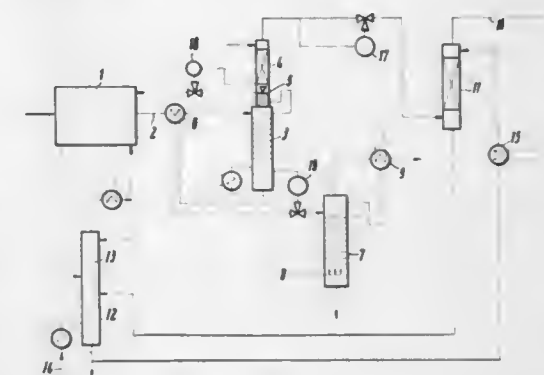
#### 4,162,902 REMOVING PHENOLS FROM WASTE WATER

Paul Wiesner, Oberursel, and Hans-Martin Stonner, Schwalbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 693,040, Jun. 4, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,429

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1975, 2527983

Int. Cl.<sup>2</sup> B01D 19/00, 53/14  
U.S. Cl. 55—54 1 Claim



1. A process for removing phenols as well as the volatile compounds  $\text{NH}_3$ ,  $\text{CO}_2$  and  $\text{H}_2\text{S}$  from waste water resulting from gasification or degasification of coal by means of liquid-liquid countercurrent extraction of the phenols with isopropylether thereby achieving a phenol laden solvent layer and a dephenolized aqueous layer, by an organic solvent, followed by two consecutive distillation steps for separate recovery of acid gases  $\text{CO}_2$  and  $\text{H}_2\text{S}$ , solvent and ammonia with a low acid gas content, comprising:

- Extracting the waste water in countercurrent with a low-boiling organic solvent, thereby achieving a phenol laden solvent layer and a dephenolized aqueous layer, and separating the layers;
- stripping off from the aqueous layer under superatmospheric pressure as vapors  $\text{CO}_2$ ,  $\text{H}_2\text{S}$ , small amounts of  $\text{NH}_3$  and the organic solvent contained therein;
- condensing the vapors of step (b) by washing them under pressure with from 5 to 20% by weight of the cold dephenolized aqueous layer from step (a) thereby to remove the  $\text{NH}_3$  as well as most of the organic solvent, thus achieving an aqueous/organic mixture with an organic solvent content exceeding the physical solubility of the organic solvent in water, settling the excess solvent by gravity as an organic layer which is drawn off from the aqueous layer which is returned to step (b);
- scrubbing the acidic vapors from step (c) with cold circulating phenol from step (f) to recover the last traces of solvent and  $\text{NH}_3$  to receive a  $\text{CO}_2$  and  $\text{H}_2\text{S}$  acid gas freed of solvent and  $\text{NH}_3$ ;
- stripping the bottom product of step (b) with live steam under atmospheric pressure, thereby achieving as overhead vapors a concentrated  $\text{NH}_3$ -vapor with only small amounts of  $\text{CO}_2$  and  $\text{H}_2\text{S}$ , which can be either burned or condensed, and as a bottom product a treated waste water suitable for biological treatment;
- distilling the solvent layer from step (a) in a distillation column thereby achieving as overhead product a pure solvent which is condensed and recycled to step (a) and as bottom product a phenol which is partly used for scrubbing of the acidic vapors in step (d) and partly discharged as crude phenol.

4,162,903

**PHYSICAL SOLVENT ABSORPTION OF CARBON DIOXIDE AND HYDROGEN SULPHIDE FOR THE DEACIDIFICATION OF INDUSTRIAL GASEOUS MIXTURES**

Claude Blanc, Jean-Yves Chenard, both of Pau; Jean-Jacques Delpuech, Laxou, and Olivier Oliveau, Lescar, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

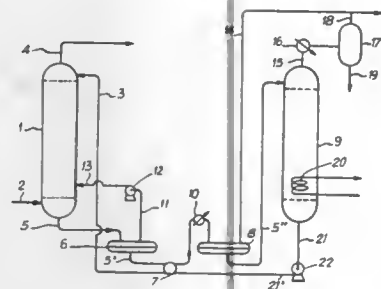
Filed Mar. 8, 1978, Ser. No. 884,211

Claims priority, application France, Mar. 9, 1977, 77 06953

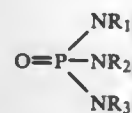
Int. Cl.<sup>2</sup> B01D 19/00

U.S. Cl. 55—73

5 Claims



1. A process for the absorption of impurities from a gas mixture that contains at least one impurity selected from the group consisting of H<sub>2</sub>S, CO<sub>2</sub>, COS, CS<sub>2</sub>, mercaptans, sulfides and disulfides, each having a partial pressure of at least one bar, said process consisting in contacting the gas mixture with a solvent, pure or mixed with water, in an absorption zone maintained at a total pressure higher than atmospheric pressure and at a temperature between 10° and 80° C., said solvent having the formula:



wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are C<sub>1</sub> to C<sub>4</sub> alkyl radicals, said solvent being liquid at a temperature above 40° C., exhibiting at 40° C. a CO<sub>2</sub> absorption capacity of at least 0.5% by weight per bar of partial pressure of this component, a methane capacity of less than 0.015% by weight per bar of partial pressure of this component and a vapor pressure less than 0.5 Torr at 40° C., and removing from said absorption zone said solvent having absorbed therein H<sub>2</sub>S and/or CO<sub>2</sub>.

4,162,904

**SILENCER-SEPARATOR DEVICE**

Paul E. Clay, and James K. Floyd, both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 10, 1978, Ser. No. 895,146

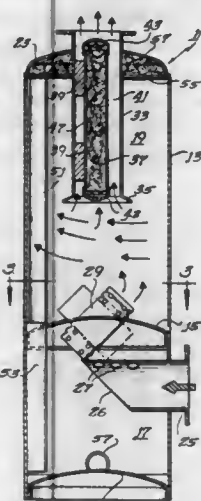
Int. Cl.<sup>2</sup> B01D 50/00; F01N 3/02

U.S. Cl. 55—276

10 Claims

1. A silencer-separator device comprising:  
a generally cylindrical casing which is generally circular in cross section;  
means intermediate the ends of said casing dividing it into an upper separator chamber and a lower expansion chamber;  
means closing the bottom of said expansion chamber;  
an inlet pipe communicating with said expansion chamber for directing a gas stream thereinto;  
at least two flow tubes defining at least two passages through said dividing means, said flow tube means being disposed at an angle between about 30° and about 60° to the vertical and being located to direct the gas upward into said separator chamber with a swirling movement along the interior wall surface of said casing;  
means closing the upper end of said separator chamber;  
central outlet means which extends downward through said upper closure means and which is located generally along the axis of said casing, said outlet means being generally tubular in shape and having an entrance located a substantial vertical distance below said upper closure means;

rator chamber with a swirling movement along the interior wall surface of said casing;  
means closing the upper end of said separator chamber;  
central outlet means which extends downward through said upper closure means and which is located generally along the axis of said casing, said outlet means being generally tubular in shape and having an entrance located a substantial vertical distance below said upper closure means;



peripheral baffle means adjacent said interior wall surface of said separator which collects particles entrained in the gas stream; and,  
means disposed vertically below said peripheral baffle means for removing the collected particles from said upper chamber.

4,162,905

**AIR INTAKE FILTER WITH CYCLONE SEPARATOR STAGE**

Gustav Schuler, Ludwigsburg, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

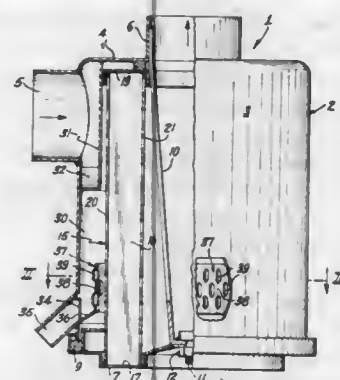
Filed Dec. 7, 1977, Ser. No. 858,337

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 7638324[U]

Int. Cl.<sup>2</sup> B01D 45/16, 45/06

U.S. Cl. 55—337

3 Claims



1. A filter assembly designed to serve as an air intake filter for a combustion engine, compressor, or other air-aspirating machine, the filter assembly comprising in combination:  
an enclosed round filter housing defining a longitudinal axis for the filter assembly, one axial side of the housing being accessible through a removable cover;  
a hollow-cylindrical filter element extending axially inside

the filter housing and thereby subdividing the enclosed housing space into a clean air space inside the filter element and an annular raw air space between the filter element and the housing;

an air inlet communicating with the raw air space of the housing, and an air outlet communicating with the clean air space of the housing;

a dust-collecting sash arranged in the raw air space, near an axial extremity thereof;

first air deflecting means arranged inside the raw air space of the housing for imparting to the incoming flow of raw air a helical swirl which is directed towards the dust-collecting sash, the raw air space thereby serving as a separation chamber, while a cyclone-type air precleaning action takes place in said chamber, heavier particulate matter entrained by the air being projected against the dust-collecting sash in the separation chamber;

a dust discharge port arranged near the dust-collecting sash of the separation chamber;

a perforated baffle collar concentrically surrounding the filter element with a flow gap therebetween and extending axially from the dust-collecting sash of the separation chamber a distance into said chamber, the perforation of said baffle collar thereby serving as a second air deflecting means

for guiding a portion of the helically swirling raw air inwardly from the separation chamber, through the baffle collar, towards the filter element, in a flow direction which has a circumferential motion component opposed to the circumferential motion component of said helically swirling raw air, said deflection in the circumferential sense preventing the air flow from entraining the heavier particulate matter through the perforation of the baffle collar.

4,162,906

**SIDE OUTLET TUBE**

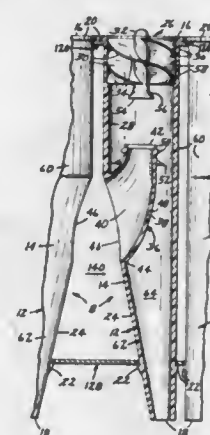
Bruce M. Sullivan, Burnsville, and Allen M. Kaluza, Minneapolis, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed May 5, 1977, Ser. No. 794,045

Int. Cl.<sup>2</sup> B01D 45/16

U.S. Cl. 55—346

12 Claims



1. A side outlet cyclone separator tube through which contaminant-laden air flows, comprising:

(a) a first conduit member having a continuous side wall and an inner surface defining a generally axial passageway between inlet and outlet ends thereof, said continuous side wall having an aperture disposed intermediate said inlet and outlet;

(b) a second conduit member having a continuous side wall and inner and outer surfaces defining a passageway between an inlet end disposed within said axial passageway proximate said inlet end of said first conduit member and an outlet end terminating at said aperture, said second

conduit member having a curved central axis with the inside diameter thereof measured along planes normal to said central axis gradually increasing from said inlet end of said second conduit member to said outlet aperture;

(c) vortex generating means affixed to said first conduit member within said axial passageway at said inlet end thereof whereby a circular flow component is imparted to the axial flow of aid contaminant-laden air such that contaminants are centrifugally blown toward said inner surface of said first conduit member to exit through said outlet end thereof, while clean air is channeled through said second conduit member to discharge through said aperture in said side wall of said first conduit member; and  
(d) baffle means affixed to said outer surface of said second conduit member proximate said inlet end thereof to prevent the reverse flow of contaminants into said inlet end of said second conduit member.

4,162,907

**GLASS SHEET MANUFACTURING METHOD AND APPARATUS**

Frank Anderson, 1105 Beech Ave., Charleston, W. Va. 25302

Filed Apr. 7, 1978, Ser. No. 894,510

Int. Cl.<sup>2</sup> C03B 18/02, 21/02

U.S. Cl. 65—29

56 Claims



1. An automated all-electric glass manufacturing apparatus comprising:

vertical air-cooled furnace means for melting raw materials into molten glass, said furnace means having a top, a base, and a throat opening at said base of said furnace means;  
transverse air-cooled refiner means coupled to said furnace throat opening for receiving said molten glass from said furnace means, and for maintaining said molten glass in a homogenous molten stage, said refiner means having a plurality of molten glass exit openings;

refiner glass level maintaining means for controlling the molten glass intake of said refiner means from said furnace throat openings;

molten glass metering means for forming a glass charge of a predetermined volume of molten glass, and for delivering said molten glass charge from said molten glass exit openings of said refiner means; and,

molten glass extruding means for receiving said glass charge from said metering means and for forming said charge into a sheet of semi-molten glass of predetermined thickness, said extruding means comprising a pair of rollers and means to apply controlled pressure to said glass charge to feed said charge through said rollers.

34. A molten tin bath for imparting an ideal smoothness to a sheet of semi-molten glass deposited on said tin bath, said tin bath comprising:

a molten tin bath container having rectangular bottom, front, back and side steel plated faces and an open top face;

molten tin within said molten tin bath container;

electrode means traversing the interior of said container for maintaining said molten tin in the molten state;

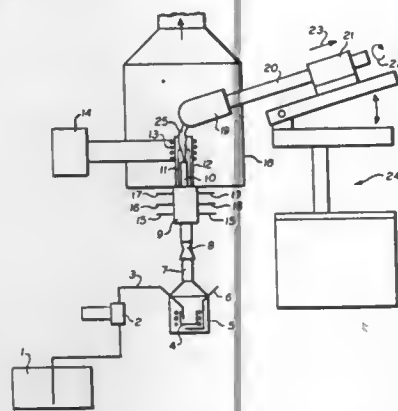
an external flat flange seated horizontally on said front, back and side steel plated faces around the perimeter of said open top face, said external flange overlapping said front, back and side faces and having a plurality of recessed indentations proportionately spaced in said external flange;



scrap glass rejection means for removing scrap glass from said flat flange, said glass rejection means comprising a rotating bar, a plurality of rejection forks rigidly attached to said rotating bar, said rejection forks horizontally seated in said recessed indentations of said external flange when said rotating bar is rotated in a first direction, and said rejection forks rotated to a substantially vertical position when said rotating bar is rotated in a second direction opposite to said first direction; whereby scrap glass lying on said external flange is removed from said molten tin bath as a result of the horizontal to vertical rotation of said rejection forks.

42. A method for the automated manufacturing of sheet glass comprising the steps of:  
melting raw glass batch materials in a vertical furnace;  
maintaining molten glass in a homogenous state in a transverse refiner;  
cooling the walls of said furnace and said refiner;  
maintaining a constant predetermined refiner molten glass level within said refiner;  
forming a discrete molten glass charge of a predetermined volume of molten glass and delivering said glass charge from said refiner;  
extruding said glass charge into a sheet of semi-molten glass of a predetermined thickness over a molten tin bath.  
56. A method for the automated manufacture of sheet glass comprising the steps of:  
forming a sheet of semi-molten glass on a molten tin bath; and  
cutting said sheet of semi-molten glass to predetermined sizes while said glass sheet is in the semi-molten state on said molten tin bath.

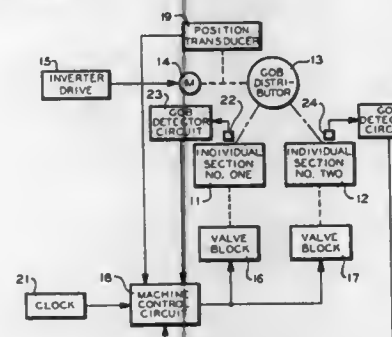
**4,162,908**  
**METHOD OF PRODUCING SYNTHETIC QUARTZ GLASS, APPARATUS FOR THE PRACTICE OF THE METHOD, AND USE OF THE SYNTHETIC QUARTZ GLASS**  
Karlheinz Rau, Hanau; Fritz Simmat, Gelnhausen; Albert Muhlrich, Frankfurt, and Norbert Treber, Krieffel, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany  
Continuation of Ser. No. 713,541, Aug. 11, 1976, abandoned.  
This application Feb. 3, 1978, Ser. No. 874,965  
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536457  
Int. Cl.<sup>2</sup> C03C 17/00, 17/02, 25/02  
U.S. Cl. 65—60 D 12 Claims



1. A method for forming a coating of a fluorine containing synthetic OH ion-free quartz glass on a refractory support which comprises passing a hydrogen-free silicon compound, gaseous oxygen and vaporous  $\text{CCl}_2\text{F}_2$ ,  $\text{CClF}_3$  or  $\text{CF}_4$  in a hydrogen free gas stream through an induction coupled plasma burner whereby said hydrogen-free silicon compound reacts with said oxygen to form synthetic OH ion-free quartz glass,

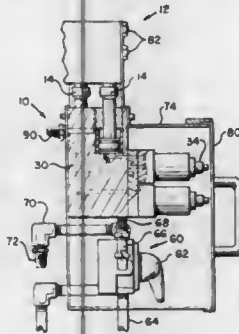
the amount of said  $\text{CCl}_2\text{F}_2$ ,  $\text{CClF}_3$  or  $\text{CF}_4$ , passed through said burner, being sufficient to yield a fluorine content in the quartz glass in an amount of at least 500 grams per kg of quartz to be produced whereby there is formed a fluorine-doped synthetic OH ion-free quartz glass and depositing said fluorine-doped synthetic OH ion-free quartz glass as a coating on a refractory support.

**4,162,909**  
**HOT GOB DETECTOR FOR CONTROLLING A GLASSWARE FORMING MACHINE**  
Homer D. F. Peters, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio  
Filed Dec. 1, 1977, Ser. No. 856,473  
Int. Cl.<sup>2</sup> C03B 9/40  
U.S. Cl. 65—163 15 Claims



1. In a glassware forming machine including means for distributing gobs of molten glass at a predetermined rate from a source of the gobs; means for forming glassware articles in a timed, predetermined sequence of steps from the gobs received from the distributing means; means for generating timing signals; and control means responsive to the timing signals for cyclically controlling the actuation of the forming means in cycles of the timed, predetermined sequence of steps, the improvement comprising: a gob detection means responsive to the presence of a gob proximate the forming means for generating a time reference signal to the control means and wherein the control means includes means responsive to said time reference signal for adjusting the starting time of the subsequent forming cycle of the timed, predetermined sequence of steps.

**4,162,910**  
**VALVE BLOCK ASSEMBLY**  
Kurt Lining, and Charles L. Wood, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.  
Continuation of Ser. No. 516,223, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 208,199, Dec. 15, 1971, abandoned. This application Jan. 28, 1976, Ser. No. 653,059  
Int. Cl.<sup>2</sup> C03B 9/40  
U.S. Cl. 65—163 5 Claims

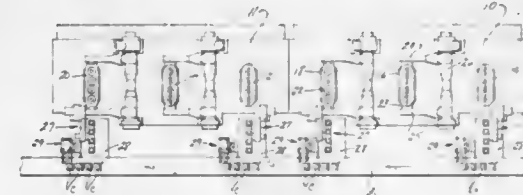


1. In a glass forming machine which performs, in sequence,

a plurality of steps to produce glass articles, an improved means for controlling the operational sequence of a plurality of movable components in said machine by controlling the pressure of an operational fluid at each of a plurality of component actuating means, said controlling means comprising:

a source of pressurized gas,  
a valve block having a plurality of cavities therein,  
a piston positioned in each cavity, each piston being selectively movable with respect to its associated cavity to an extended position,  
a plurality of solenoid operated valve means, said valve means each controllably coupling said pressurized air to one of said cavities to thereby move said piston in said cavity to said extended position,  
means for generating electrical signals for energizing said solenoid operated valve means at predetermined intervals to thereby control the movement of said pistons in said cavities in a preselected manner, and  
a plurality of mechanically operated pneumatic valves, each of said valves controlling the flow of fluid under pressure to thereby control said glass forming machine, each pneumatic valve having an operating rod extending therefrom which controls the operation of its associated valve when moved, said operating rods being aligned and engaged with a corresponding one of said pistons, each operating rod being moved by the movement of a corresponding piston to its extended position to thereby initiate a step in the operation of said glass forming machine.

**4,162,911**  
**PLURAL GLASS FORMING MACHINES WITH LEHR CONVEYOR**  
James D. Mallory, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio  
Filed Jul. 14, 1977, Ser. No. 815,626  
Int. Cl.<sup>2</sup> C03B 9/00, 19/02; B25J 3/00  
U.S. Cl. 65—229 1 Claim



1. An array of a plurality of glass container forming machine sections in which each forming machine section comprises a split parison molding unit, a split blow molding unit, said parison molding unit having a plurality of mold cavities therein, said blow molding unit having a plurality of mold cavities therein and being laterally displaced from said parison molding unit, the axes of the parison cavities being in spaced aligned relation and lying in a first plane, the axes of the blow mold cavities being in similarly spaced aligned relation and lying in a second plane parallel to said first plane, means for simultaneously transferring parisons from the parison forming unit to the blow molding unit, said transfer means being pivotally mounted on said apparatus about an axis disposed in right angular relation to an in a plane parallel to the axes of said cavities, a second blow molding unit having a plurality of mold cavities having their axes in spaced aligned relation similarly to that of said parison cavities and lying in a third plane parallel to said first plane on that side of said parison mold opposite said first mentioned blow molding unit, and a second transfer means pivotally mounted about an axis disposed in right angular relation to and in a plane parallel to the axes of said parison cavities, said parisons being moved through parallel arcs from inverted position at the parison forming station to an upright position at the blow molding stations whereby said parisons are subjected to the same centrifugal and gravitational forces during transfer; the improvement comprising one plural cavity container forming machine in juxtaposition to another such

that the adjacent plural cavity blow molding units of the separate sections are in planes that are parallel to each other and to the pivot axis of the parison transfer means and the spacing between all of the molding units, both parison molding units and blow molding units are equal, a machine conveyor extending past the array of forming machines with its longitudinal axis being normal to the planes of the split lines of all the molding units in the array of machines.

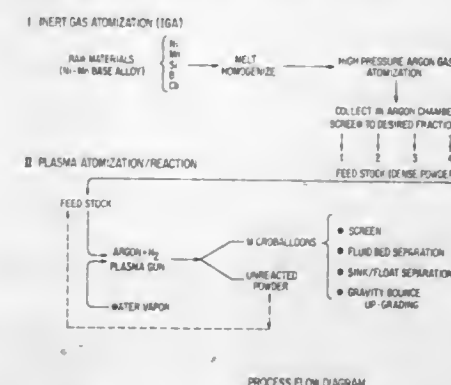
**4,162,912**  
**COMPOSITION AND PROCESS FOR CONTROLLING MILKWEED VINE**  
Raghavan Charudattan, 8520 NW. 2nd Pl., Gainesville, Fla. 32601, assignor to Raghavan Charudattan, Gainesville, Fla.  
Filed Feb. 7, 1978, Ser. No. 875,846  
Int. Cl.<sup>2</sup> A01N 9/00  
U.S. Cl. 71—79 5 Claims

1. A biological herbicide composition for the control of milkweed vine said composition comprising: *Araujia mosaic* virus and an agronomically acceptable carrier.

**4,162,913**  
**1,2-DIMETHYL-3,5-DIPHENYLPYRAZOLIUM-2,2-DICHLOROPROPIONATE**  
Richard W. Feeny, Hightstown, N.J., assignor to American Cyanamid Co., Stamford, Conn.  
Division of Ser. No. 307,689, Nov. 17, 1972, abandoned. This application Oct. 14, 1975, Ser. No. 622,299  
Int. Cl.<sup>2</sup> A01N 9/22; C07D 231/10  
U.S. Cl. 71—92 2 Claims

1. The compound 1,2-dimethyl-3,5-diphenylpyrazolium-2,2-dichloropropionate.  
2. A method for the control of wild oats and other undesirable grasses comprising:  
applying to the foliage of the undesirable plant species a herbicidally effective amount of the compound 1,2-dimethyl-3,5-diphenylpyrazolium-2,2-dichloropropionate.

**4,162,914**  
**PROCESSES FOR MAKING HOLLOW METAL MICROBALLOONS AND THE PRODUCTS THEREOF**  
George D. Cremer, Lemon Grove, Calif., assignor to International Harvester Company, Chicago, Ill.  
Filed Oct. 4, 1977, Ser. No. 839,351  
Int. Cl.<sup>2</sup> B22F 9/00  
U.S. Cl. 75—0.5 B 21 Claims



1. A method of forming hollow, metallic microballoons having high surface integrity which comprises the steps of: preparing a finely divided feedstock powder with a specified range of particle sizes from a self-scavenging metallic alloy which exhibits high fluidity and a high liquid film strength and which undergoes a minimal volume change and is favorable to the formation of a smooth surface topography upon solidification; introducing said powder into a plasma arc to melt the particles of said powder; making available in said arc a gas which can diffuse into and inflate the molten particles into

hollow microballoons; and solidifying and collecting said microballoons.

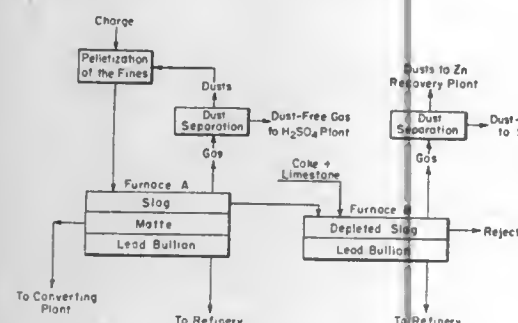
# 4,162,915 PROCESS FOR TREATING LEAD-COPPER-SULPHUR CHARGES

Robert H. Maes, Hove, and Luc M. Fontainas, Antwerp, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Sep. 1, 1977, Ser. No. 829,780  
Claims priority, application Belgium, Sep. 6, 1976, 732  
Int. Cl.<sup>2</sup> C22D 7/06

U.S. Cl. 75-14

13 Claims



1. A process for pyrometallurgically treating a Pb-Cu-S charge containing at least one of the elements Fe, Ag, Bi, Zn and Sn, to recover the metal values of said charge, comprising the steps of:

(a) smelting the charge while maintaining chemically reducing, neutral or oxidizing conditions under which said smelting produces

(i) a slag phase containing at least about 10% Pb;

(ii) a copper matte phase containing less than about 65% Cu, the amount of said copper content decreasing with decreasing Cu:S ratio in the Pb-Cu-S charge; and

(iii) a lead bullion phase, the strength of the reducing conditions employed in said smelting step being greater with increasing degree of oxidation of the Pb-Cu-S charge and greater with decreasing content of Pb in the slag phase produced in said smelting step and the strength of the oxidizing conditions employed in said smelting step being lower with increasing degree of oxidation of the Pb-Cu-S charge and lower with decreasing content of Pb in the slag phase produced in said smelting step;

(b) separating from each other the slag, copper matte and lead bullion phases produced in step (a);

(c) reducing the slag phase separated in step (b), in the molten state, with a strong reducing agent whereby the lead content of the slag phase is lowered to a value less than about 2% thereby producing a lead bullion phase; and

(d) separating from each other the slag and lead bullion phases produced in step (c), thereby obtaining in step (a) a matte phase which is substantially free of Fe, collecting in step (a) most of the Ag in the matte and bullion phases, most of the Bi in the bullion phase and most of the Fe, Zn and Sn in the slag phase, and obtaining in step (c) a lead bullion which is almost free from Ag and Bi, a slag which is almost free from Zn and Sn and fly ashes containing most of the Zn.

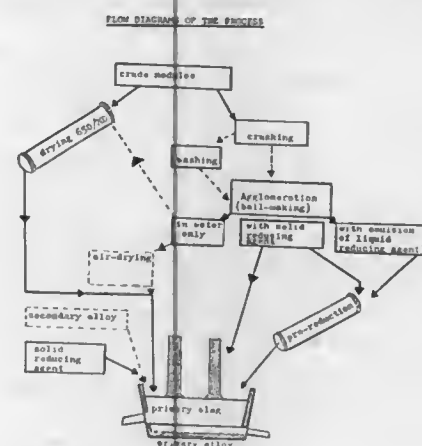
# 4,162,916 PROCESS FOR THE TREATMENT OF COMPLEX METAL ORES CONTAINING, IN PARTICULAR, MANGANESE AND COPPER, SUCH AS OCEANIC NODULES

Louis Septier, Francis Dubrous, and Michel Demange, all of Le Fayet, France, assignors to Societe Francaise d'Electrometallurgie Sofrem, Paris, France

Filed Mar. 27, 1978, Ser. No. 890,524  
Claims priority, application France, Apr. 4, 1977, 77 10862  
Int. Cl.<sup>2</sup> C22B 47/00

U.S. Cl. 75-21

12 Claims



1. A process for the pyrometallurgical treatment of complex metal ores, which contains, in addition to manganese and iron, small quantities of nickel, cobalt and copper in amounts up to a total of 4% by weight, comprising treating the ore by fusion in an electric arc furnace in the presence of a reducing agent to produce a primary slag containing manganese, some of the copper and some of the iron and a primary alloy containing nickel, cobalt, most of the copper and some of the iron, separating the primary slag from the primary alloy, subjecting the primary slag to the action of a reducing agent to produce a secondary slag of copper-free manganese oxide and a secondary alloy containing the remaining copper and iron.

# 4,162,917 METHOD AND COMPOSITION FOR TREATING MOLTEN FERROUS METALS TO PRODUCE NODULAR IRON

Robert D. McWhorter, and Perry C. Jones, both of Birmingham, Ala., assignors to Schuler Industries, Inc., Birmingham, Ala.

Filed Jun. 29, 1978, Ser. No. 920,365  
Int. Cl.<sup>2</sup> C21C 7/02

U.S. Cl. 75-130 R

12 Claims

1. In a composition for use in the treatment of molten metals and alloys of the iron group by submerging the composition into molten metal to effect the formation of nodular iron: a compressed bonded mechanical mixture comprising,

(a) particles containing a reactive metal selected from the group consisting of alkali, alkaline earth, rare earth metal and alloys and mixtures thereof,

(b) particles of soluble synthetic graphite,

(c) a binder bonding said particles containing reactive metal and said particles of soluble synthetic graphite together, and

(d) said particles of soluble synthetic graphite being of a size to provide an initial protective refractory material around said particles containing reactive metal to control the release of said reactive metal into the molten metal upon submerging the compressed bonded mechanical mixture into the molten metal whereupon said soluble synthetic graphite is absorbed by the molten metal to cause nucleation of the graphite.

# 4,162,918 RARE EARTH METAL DOPED DIRECTIONALLY SOLIDIFIED EUTECTIC ALLOY AND SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1977, Ser. No. 847,779  
Int. Cl.<sup>2</sup> B22D 21/06; C22C 19/00

U.S. Cl. 75-171

4 Claims

1. A directionally solidifiable eutectic alloy casting material NiTaC-13 having a high resistance to metal-mold interface reaction during casting including less than 3 weight percent of a rare earth metal as a dopant material in its material composition, the rare earth metal is one whose metal cation is in the ceramic material comprising the mold and/or core in contact therewith.

# 4,162,919 LAMINATES FOR THE MANUFACTURE OF FLEXOGRAPHIC PRINTING PLATES USING BLOCK COPOLYMERS

Peter Richter, Ludwigshafen; August Wigger, Waldsee; Gerhard Fahrbach, Plankstadt; Erhard Selter, Ludwigshafen, and Helmut Barzynski, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 635,629, Nov. 26, 1975, abandoned.  
This application Nov. 16, 1977, Ser. No. 851,824  
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456439

Int. Cl.<sup>2</sup> G03C 1/78, 1/68, 1/76, 5/00  
U.S. Cl. 96-87 R

8 Claims

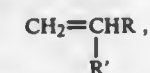
1. Laminates for the production of relief printing plates and comprising

(a) a layer RS consisting essentially of a photocrosslinkable mixture of at least one soluble polymer P and at least one monomer M which is compatible with polymer P and has at least one photocrosslinkable C—C double bond, which mixture contains a photoinitiator and, optionally, conventional additives and is soluble in developer solutions used to form the relief in the imagewise-exposed layer RS,

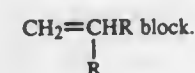
(b) a non-photocrosslinkable elastomeric underlayer U which has a Shore A hardness of from 15 to 70 and is insoluble in said developer solutions,

(c) a non-photocrosslinkable stabilizing layer ST which is insoluble in said developer solutions,

wherein the photocrosslinkable layer RS contains, as polymer P, a soluble two-block copolymer consisting essentially of from 30 to 95% by weight of a diene hydrocarbon having 4 to 5 carbon atoms and from 5 to 70% by weight of a monomer of the formula



where R is hydrogen or CH<sub>3</sub>; R' is phenyl or C<sub>1-4</sub> alkyl substituted phenyl, which two-block copolymer has a viscosity number (measured on a 0.5% w/w solution in toluene at 25° C.) of 60 to 350 ml/g, or a partially hydrogenated product thereof and which has either a sudden or gradual transition between the diene hydrocarbon block and the



# 4,162,920 LITHOGRAPHIC PLATE FINISHER

Thomas N. Gillich, Berkeley Heights, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation of Ser. No. 682,327, May 3, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 833,943  
Int. Cl.<sup>2</sup> C09K 3/00

U.S. Cl. 106-14.5

9 Claims

1. An emulsion-type lithographic plate finisher comprising a solvent phase including a hydrocarbon petroleum solvent solution of an oleophilic solvent-soluble surfactant, and an aqueous phase including tapioca dextrin, at least one salt which is not severely corrosive to aluminum, and water.

# 4,162,921 GLASS-CRYSTALLINE MATERIAL AND METHOD OF PRODUCING SAME

Pavel I. Litvinov, Novorogozhskaya ulitsa, 11, korpus 2, kv. 25; Vitaly M. Firsov, 9 Parkovaya ulitsa, 8, kv. 25, and Galina B. Knyazher, ulitsa Klimashkina, 21, kv. 28, all of Moscow, U.S.S.R.

Filed Jan. 5, 1977, Ser. No. 756,988  
Int. Cl.<sup>2</sup> C03C 3/22; C03B 32/00

U.S. Cl. 106-39.8

8 Claims

1. A glass-crystalline material consisting essentially of silica, in an amount of 31 to 45% by weight, alumina in an amount of 20 to 30% by weight, magnesia in an amount of 5 to 15% by weight, titania in an amount of 15 to 25% by weight and 14 to 17 wt % of the oxides of the rare earth elements selected from group consisting of cerium, lanthanum, praseodymium and neodymium; having crystalline phases of cordierite, rutile and a compound of perrierite-like structure and having dielectric properties including a dielectric constant,  $\epsilon=10$ , and a dielectric loss factor  $\tan \delta=3-5 \times 10^{-4}$  Hz.

7. A process for the production of the glass-crystalline material for dielectric substrates which comprises the steps of forming a glass melt composed of silica, alumina, magnesia and titania and 14 to 17 wt % of the oxides of the rare earth elements selected from group consisting of cerium, lanthanum, praseodymium and neodymium; forming shaped articles of said glass; heating said glass articles to the maximum crystallization temperature for said glass composition at a rate of 60°-300° C. per hour and then holding said articles at said maximum crystallization temperature for a period of 3 to 6 hours to develop dielectric properties including a dielectric constant,  $\epsilon=10$ , and a dielectric loss factor  $\tan \delta=3-5 \times 10^{-4}$  at 10<sup>10</sup> Hz and crystalline phases of cordierite, rutile and a compound of perrierite-like structure.

# 4,162,922 METHOD AND APPARATUS FOR THE LOWERING OF THE ALKALI CONTENT OF CEMENT CALCINED TO COMPLETION

Horst Herchenbach, Troisdorf, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 26, 1976, Ser. No. 690,273

Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523367

Int. Cl.<sup>2</sup> C04B 7/02

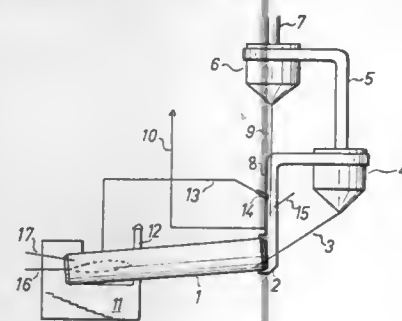
U.S. Cl. 106-100

3 Claims

1. In the method of lowering the alkali metal content in the calcining to a finish of a pulverized raw material to be used in the manufacture of cement wherein the material is thermally treated in a furnace system in several steps including a preheating step, a separate deacidifying step, and a sintering step in a kiln, the improvements comprising introducing an alkali reduc-



ing chlorine containing additive material during said separate deacidifying step and introducing an additional residual quan-



tity of said alkali reducing chlorine containing additive material in said sintering step.

#### 4,162,923 CALCIUM ALUMINATE BASED REFRACTORY HYDRAULIC BINDER AND ITS PROCESS OF PREPARATION

Jean M. Schmitt, Paris, and Alain Mathieu, Montelimar, both of France, assignors to Lafarge Foudu International, Paris, France

Filed Feb. 9, 1978, Ser. No. 876,553  
Claims priority, application France, Dec. 12, 1977, 77 37308  
Int. Cl.<sup>2</sup> C04B 7/32

U.S. Cl. 106—104 13 Claims  
1. A process of preparing a ground refractory hydraulic binder containing calcium aluminates which comprises: mixing from 45 to 65% clinker particles containing 45 to 72% CA phase, the balance being almost exclusively constituted by CA<sub>2</sub> phase, 55 to 35% alumina particles, 0.01 to 0.3% sodium citrate and 0.01 to 0.3% of pentasodium tripolyphosphate, the percentages being by weight of the entire mixture wherein the clinker, the alumina or both are ground before or after mixing.

#### 4,162,924 SHAPED BODIES OF CALCIUM SILICATE AND PROCESS FOR PRODUCING SAME

Kazuhiko Kubo; Akira Takahashi, and Kenichi Ohashi, all of Gifu, Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

Filed Feb. 11, 1977, Ser. No. 769,402  
Claims priority, application Japan, Feb. 13, 1976, 51-15267; Nov. 4, 1976, 51-132850  
Int. Cl.<sup>2</sup> C04B 1/00, 7/34

U.S. Cl. 106—120 26 Claims  
1. A shaped body of calcium silicate characterized by being composed of globular secondary particles interconnected with one another and each made up of lath-like xonotlite or foshagite crystals having been three-dimensionally interlocked with one another and having an index of crystallite antigrrowth of at least 15, the globular secondary particles having had an outside diameter of about 10 to about 80  $\mu$ m and an apparent density of up to 0.13 g/cm<sup>3</sup> and having been in the form of a shell with a hollow interior space and a thickness of about 0.3 to about 10  $\mu$ m before being shaped into the body.

#### 4,162,925 PHOSPHATED LOCUST BEAN GUMS

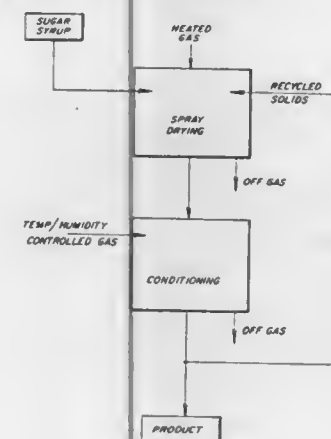
Karl H. O. Tiefenthaler, and Erich W. K. Nittner, both of Kreuzlingen, Switzerland, assignors to Meyhall Chemical AG, Kreuzlingen, Switzerland

Filed May 10, 1978, Ser. No. 904,689  
Int. Cl.<sup>2</sup> C08L 5/00  
U.S. Cl. 106—208 10 Claims  
1. A phosphated locust bean gum having a degree of substitution of about 0.03 to about 0.5.

#### 4,162,926 METHOD OF DRYING COMPLEX SUGAR SOLUTIONS

Preston L. Veltman, Severna Park, and John J. Blouin, Catonsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jan. 11, 1978, Ser. No. 868,661  
Int. Cl.<sup>2</sup> B01D 1/18; C13F 1/00  
U.S. Cl. 127—62 3 Claims



1. A process suitable for drying complex sugar solutions to form stable, solid, particulate product therefrom comprising (a) drying in a drying zone dispersed complex sugar solutions in a current of heated gas and in the presence of from about 1 to 10 parts by weight of separately introduced recycled conditioned solids per part by weight of solids in solution to produce a solid product; said heated gas has an inlet temperature of from about 100 to 300 degrees C. and an outlet temperature of from about 60 to 120 degrees C; (b) contacting in a conditioning zone the formed solid product with a conditioning gas having a humidity of less than 50% and having a temperature below the melting point of the formed solid for a time sufficient to reduce the water content of said solids to not greater than 0.5 percent; and (c) recycling a portion of said conditioned solids to said drying zone to be used as said recycled solids in step (a).

#### 4,162,927 APPARATUS FOR CRYSTALLIZING SUGAR SOLUTION AND MOTHER LIQUORS CONTINUOUSLY BY EVAPORATION

Rafael Morfin-Alvarez, Ingenio Independencia Martinez de la Torre, Veracruz, Mexico

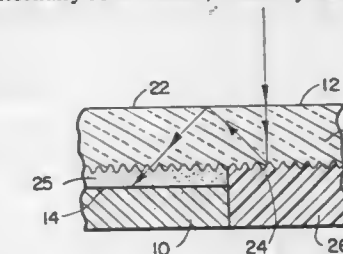
Continuation of Ser. No. 607,730, Aug. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 401,465, Sep. 27, 1973, abandoned. This application May 11, 1977, Ser. No. 795,833

Claims priority, application Mexico, Nov. 13, 1972, 139691  
Int. Cl.<sup>2</sup> C13F 1/02, 1/12; B01D 9/02

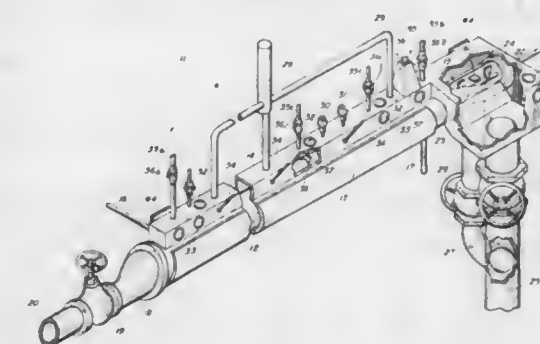
U.S. Cl. 127—16 6 Claims  
1. An apparatus for continuously crystallizing sugar by evaporating liquid under vacuum from a highly concentrated mass, comprising a horizontal, elongated, hollow, cylindrical vessel for receiving the mass to be processed, the vessel having a slot extending completely along its upper wall and also hav-

ing a feeding end and a discharge end; a rectangular cover coupled to the vessel and defining a vapor chamber which communicates with the interior of the vessel by way of said slot; a steam heating jacket located around the vessel for heating the interior thereof; means for imparting a helicoidal movement to the mass in process, said means for imparting a helicoidal movement comprising a shaft disposed within the vessel and extending along substantially the entire length thereof, means mounting the shaft within the vessel so as to extend substantially along the central axis thereof and to be rotatable within the vessel about the longitudinal axis of the shaft, drive means connected to the shaft to bring about rotation of the shaft about the longitudinal axis thereof, and a plurality of paddle members secured to the shaft and each having a blade extending substantially radially of the shaft to a position adjacent the interior surface of the vessel; means for adding liquid to the mass in process in order to control the concentration of

energy to strike said surface of incidence at such angles as to be internally re-reflected, whereby the energy is caused



to progress toward the active surfaces of the solar cells of said plurality.



the mass, said means for adding liquid comprising a multiplicity of tubes for distribution of liquid coupled to the vessel through the rectangular cover at regularly spaced intervals along the upper portion of the rectangular cover, elbow couplings connected to the distribution tubes, reduction tubes extending perpendicular to the central axis of the hollow cylindrical body, and sight holes laterally located at regularly spaced intervals along said rectangular cover, in line with said reduction tubes; means located near the discharge end of the vessel for regulating the level to which the vessel is filled by the mass in process, said level regulating means comprising a barrier slidably coupled to the hollow cylindrical body near its discharging end and means located on said rectangular cover for actuating said barrier; feeding means and feeding control means coupled to the feeding end of the vessel; and discharging means and discharge control means coupled to the discharge end of the vessel.

#### 4,162,928 SOLAR CELL MODULE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Neal F. Shepard, Jr., King of Prussia, Pa.

Filed Sep. 29, 1978, Ser. No. 946,994  
Int. Cl.<sup>2</sup> H01L 31/04

U.S. Cl. 136—89 PC 1 Claim

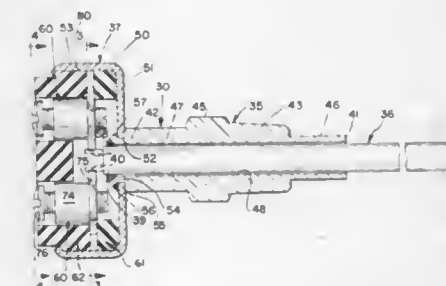
1. An improved solar cell module comprising:  
A. an internally reflective, transparent cover plate having a pair of opposed surfaces including a substantially smooth planar surface of incidence for accepting incident solar energy, and a uniformly textured surface characterized by a plurality of uniformly configured indentations;  
B. a plurality of silicon solar cells adhesively bonded at the active surfaces thereof to mutually spaced portions of said textured surface and defining therebetween interspaces; and  
C. means comprising a layer of diffusely reflective material deposited on said textured surface in the interspaces defined between said cells for internally reflecting solar

#### 4,162,929 ENGINE MANIFOLD TEMPERATURE SENSING DEVICE

Philip F. Finney, Villa Park, Ill., assignor to Thermo-Couple Products Company, Inc., Winfield, Ill.

Filed Apr. 5, 1978, Ser. No. 893,761  
Int. Cl.<sup>2</sup> H01L 35/02

U.S. Cl. 136—233 20 Claims



1. In a temperature sensing device for monitoring the temperature of moving gases in a duct including a sheathed thermocouple sensing element having a junction end and an output end and a pair of leads at the output end and means for supporting the element to mount same in a wall of the duct, the improvement in the means for supporting the element which comprises a mounting stem adapted to be fitted in an opening in the duct wall and to extend both within the duct and outside the duct, and having a central opening therethrough for receiving the element, said element extending within the duct beyond the inner end of the stem a sufficient amount to fully expose the junction end to the flow of gases within the duct and extending slightly beyond the outer end of the stem, a gas seal at the output end of the element to seal between the element and the stem to prevent gas flow therebetween and to secure the element to the stem, said gas seal being a brazed or welded connection between the peripheries of the element and the stem, the fit between the element and the stem being such that a clearance is provided to allow some freedom of movement between the junction end of the thermocouple and the inner end of the stem so that the point of highest stress of the element is at the gas seal and to provide effective damping to the element under vibratory conditions, and terminal means for providing electrical connection to the element leads.

**4,162,930**  
**AUSTENITIC STAINLESS STEEL HAVING EXCELLENT RESISTANCE TO INTERGRANULAR AND TRANSGRANULAR STRESS CORROSION CRACKING**  
 Seizaburo Abe; Masao Kozima, both of Yokohama, and Yuzo Hosoi, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Mar. 30, 1977, Ser. No. 782,788  
 Claims priority, application Japan, Mar. 30, 1976, 51/34188  
 Int. Cl.<sup>2</sup> C22C 38/48

U.S. Cl. 148—38

2 Claims

1. An austenitic stainless steel having excellent intergranular and transgranular stress corrosion cracking resistance, consisting essentially of not more than 0.02% total carbon, not more than 0.004% of carbon in solid solution, 9 to 18% of nickel, 15 to 22% of chromium, 0.5 to 2% of manganese, 0.3 to 3.5% of silicon, not more than 0.013% total phosphorus, not more than 0.005% phosphorus in solid solution, not more than 0.006% sulfur, not more than 0.02% nitrogen, not more than 0.01% oxygen, and niobium in an amount corresponding to  $15 \leq \text{Nb/C} \leq 20$ , with the balance being iron, and said steel having Nb(P)C or Nb(PC) precipitated in grains, said steel having been subjected to a sensitization treatment.

**4,162,931**  
**METHOD EMPLOYING POLYAMIDE THERMOPLASTIC ADHESIVES**  
 Ernest L. Yeakey, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.  
 Division of Ser. No. 659,873, Feb. 20, 1976, Pat. No. 4,128,525, which is a continuation-in-part of Ser. No. 528,458, Nov. 29, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,013

Int. Cl.<sup>2</sup> C09J 5/00

U.S. Cl. 156—331

1 Claim

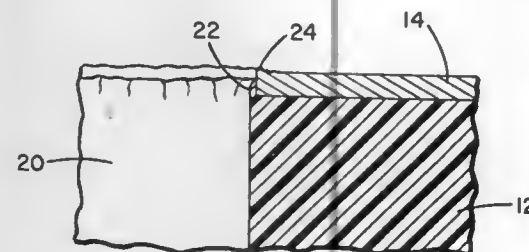
1. In a method of bonding two solid surfaces to each other by means of a bonding layer of a thermoplastic adhesive, the improvement which comprises utilizing as said adhesive a formulation comprising a plasticizer, compatible with a polyamide polymer, said polyamide polymer comprising:  
 a resinous polyamide reaction product having a molecular weight less than about 10,000 and being prepared from a polyoxypropylene polyamine selected from the group consisting of diamines, triamines and mixtures thereof, and having an average molecular weight of about 190 to about 3,000, piperazine and an aliphatic or aromatic dicarboxylic acid, ester or anhydride having about 4 to about 20 carbon atoms per molecule.

**4,162,932**  
**METHOD FOR REMOVING RESIN SMEAR IN THROUGH HOLES OF PRINTED CIRCUIT BOARDS**  
 Jiri Konicek, Florence, Mass., assignor to Perstorp, AB, Perstorp, Sweden

Filed Oct. 26, 1977, Ser. No. 845,584  
 Int. Cl.<sup>2</sup> C03C 15/00, 25/06

U.S. Cl. 156—630

3 Claims



1. In a method for the production of through holes in a laminate used for printed wiring and consisting of an insulating base of glass fiber reinforced thermosetting resin provided on

at least one side with a thin continuous layer of copper or copper alloy, comprising laminating said layer of copper or copper alloy under heat and pressure to a final base-forming material consisting of at least one sheet of glass fiber reinforced thermosetting resin, and subsequently drilling or punching holes in said laminate causing the formation of resin smear in said layer of copper or copper alloy, the improvement consisting of applying a water-jet stream to said resin smear to remove it from said laminate.

**4,162,933**  
**EXOTHERMIC HEAT AS A MEANS OF DETERMINING THE DEGREE OF DELIGNIFICATION**

Michael I. Sherman, and James R. Prough, both of Glens Falls, N.Y., assignors to Kamyr Inc., Glens Falls, N.Y.  
 Continuation of Ser. No. 722,414, Aug. 24, 1976, abandoned, which is a continuation of Ser. No. 555,269, Mar. 4, 1975, abandoned, which is a continuation of Ser. No. 360,472, May 15, 1973, abandoned. This application Jul. 7, 1977, Ser. No. 813,648  
 Int. Cl.<sup>2</sup> D21C 3/24

U.S. Cl. 162—17

5 Claims

1. A continuous process for digesting cellulosic fibrous material in an elongated vertical continuous digester to provide pulp having a desired predetermined degree of delignification, comprising the steps of:  
 continuously charging cellulosic fibrous material into the top of the digester at a substantially constant rate;  
 impregnating the cellulosic fibrous material with digesting liquor;  
 while maintaining substantially steady-state conditions, treating the material with heated digesting liquor while passing the material through a digesting stage of the digester so that the material undergoes a delignification reaction and so that the material is delignified;  
 discharging the delignified material from the bottom of the digester at a substantially constant rate;  
 continuously determining the exothermic heat of the delignification reaction in the digesting stage, and thereby determining the degree of delignification occurring in the digesting stage, by (i) determining the temperature rise occurring during the delignification reaction in the digesting stage, which step is accomplished by measuring the temperature of fibrous material and liquid generally adjacent the top of the digesting stage, and measuring the temperature of fibrous material and liquid generally adjacent the bottom of the digesting stage, and (ii) by determining the heat capacity of the cellulosic material and digesting liquor in the digesting stage;  
 comparing the degree of delignification occurring in the digesting stage with the desired predetermined degree of delignification; and  
 adjusting the amount of cellulosic fiber material continuously charged into the top of the digester to maintain the desired predetermined degree of delignification.

**4,162,934**  
**METHOD OF PRODUCING SORPTION BODIES**  
 Per Norbäck, Lidingö, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Oct. 25, 1977, Ser. No. 845,433  
 Claims priority, application Sweden, Oct. 26, 1976, 7611888  
 Int. Cl.<sup>2</sup> C04B 43/04; D21D 3/00

U.S. Cl. 162—155

2 Claims

1. The method of producing a sorption body comprising the steps of forming sheets of asbestos paper from asbestos fibre pulp having molecular sieves placed therein; arranging the sheets in contact with each other at spaced points to form transactional channels therebetween for the media which are to pass through the body with the sheets supporting each other; subjecting the sheets to an increase in temperature sufficient to drive off the organic binding agents present in the paper and to break down the asbestos fibre into an amorphous

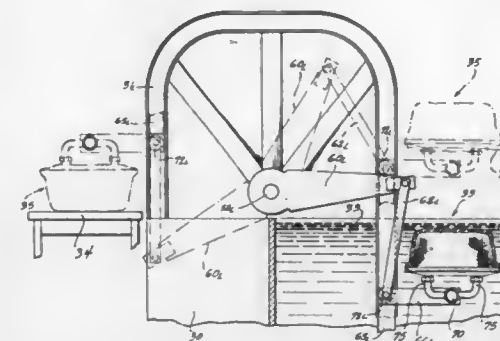
product; said step of subjecting the sheet to an increase in temperature comprising the steps of subjecting the sheets first to a temperature of between 400° C. and 500° C. to burn off the organic constituents of the asbestos sheets and then heating the sheets to a temperature of between 700° C. and 800° C. to convert the asbestos fibres to a powdery consistency; and thereafter applying a further stiffening coating of at least one, preferably inorganic, constituent by precipitating the coating onto the sheets.

**4,162,935**  
**PAPIER-MACHÉ COFFIN AND METHOD OF MAKING IT**

Harry Kollmann, Calgary, Canada, and Roland H. Goetsch, Milwaukee, Wis., assignors to Idris AG, Switzerland  
 Division of Ser. No. 618,753, Oct. 2, 1975, Pat. No. 4,034,447.  
 This application May 31, 1977, Ser. No. 801,858  
 Int. Cl.<sup>2</sup> D21J 7/00

U.S. Cl. 162—220

7 Claims



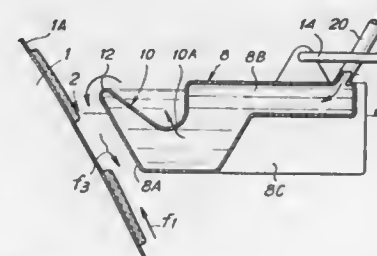
1. The method of molding a coffin for an adult human being of papier-maché from molds formed of a pervious material such as screen comprising: immersing the mold in a slurry of paper pulp in an inverted position so that the coffin is formed on the mold with its open top facing downwardly; applying a suction to the interior of the mold to draw the paper pulp onto the face of the mold while it is in said inverted position whereby the paper pulp on the mold will tend to flow downwardly by gravity along the face of the mold to form a heavier concentration of pulp along the open edge of the coffin to strengthen this area of the coffin structure; removing the mold with the paper pulp on it out of the slurry of pulp; applying suction to the interior of the mold to remove water from the pulp that is on the mold and compacting it; and applying air pressure to the interior of the mold to release the papier-maché coffin from the mold.

**4,162,936**  
**WASHING DEVICE FOR IMPERMEABLE AREAS OF CYLINDER MOLDS**

Armando Frezzotti, Fabriano, Italy, assignor to Fibrostamp S.R.L., Milan, Italy  
 Filed Dec. 19, 1977, Ser. No. 861,633  
 Claims priority, application Italy, Dec. 23, 1976, 9713 A/76  
 Int. Cl.<sup>2</sup> D21F 1/32, 1/44

U.S. Cl. 162—276

10 Claims





two continuous opposed faces of a C-shaped element positioned below and in cooperation with said bendable surface.

4,162,938

## ANTIBIOTIC COMPOUND

Donald E. Nettleton, Jr., Jordan; Terrence W. Doyle, Fayetteville, and William T. Bradner, Manlius, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

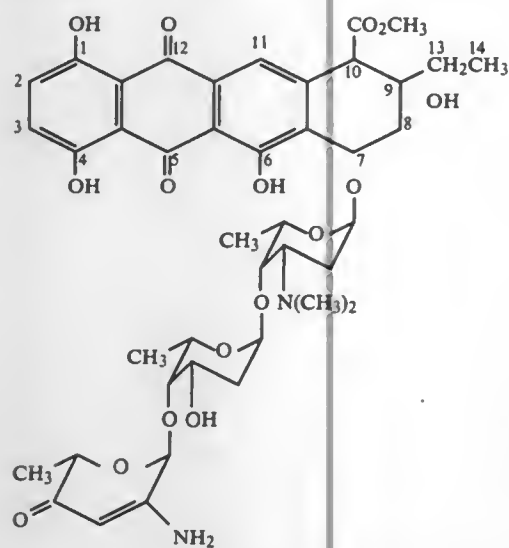
Division of Ser. No. 872,291, Jan. 25, 1978, Pat. No. 4,123,608, which is a continuation-in-part of Ser. No. 816,427, Jul. 18, 1977, abandoned. This application May 30, 1978, Ser. No. 910,408

Int. Cl.<sup>2</sup> C12D 9/14

U.S. Cl. 435—75

2 Claims

1. A process for preparing rudolphomycin having the structural formula



which comprises cultivating *Actinosporangium* sp. ATCC 31127 in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a substantial amount of rudolphomycin is produced by said organism in said culture medium and isolating and recovering said rudolphomycin from the culture medium substantially free of substances co-produced therewith.

4,162,939

## METHOD FOR THE CULTIVATION OF BASIDIOMYCETES BELONGING TO THE GENUS CORIOLUS OF POLYPORACEAE

Chikao Yoshikumi, Kunitachi; Takao Furusho, Tokyo; Kenichi Matsunaga, and Noriyuki Toyoda, both of Hino, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1977, Ser. No. 824,117

Claims priority, application Japan, Aug. 30, 1976, 51-102628

Int. Cl.<sup>2</sup> C12D 13/04; C12B 1/08, 3/12

U.S. Cl. 435—254

4 Claims

1. In a method of cultivation of a Basidiomycete belonging to the genus *Coriolus* comprising cultivating said Basidiomycete in a synthetic culture medium at a temperature of 25°±3° C., under stationary or submerged conditions, the wherein improvement comprises:

cultivating said Basidiomycete in a glucose-yeast extract culture medium consisting of 7.5 to 15% by weight of glucose, yeast extract and water, with the weight ratio of glucose to yeast extract being 3:1 to 15:1.

4,162,940

## METHOD FOR PRODUCING ANTIBIOTIC C-15003 BY CULTURING NOCARDIA

Eiji Higashide, Takarazuka; Mitsuko Asai, Takatsuki, and Seiichi Tanida, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 29, 1977, Ser. No. 811,448

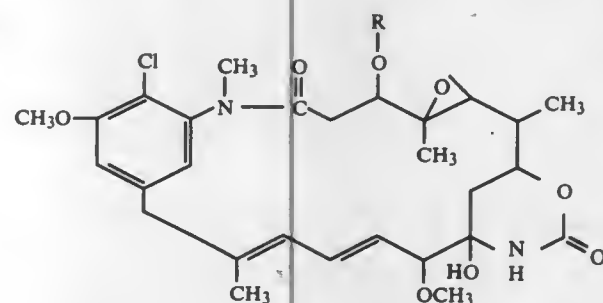
Claims priority, application Japan, Mar. 31, 1977, 52-37166; Apr. 1, 1977, 52-37886

Int. Cl.<sup>2</sup> C12D 9/20

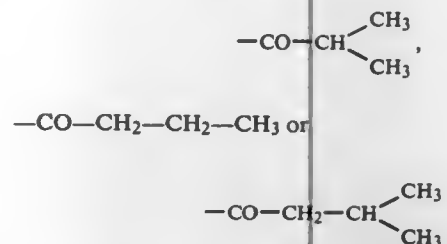
U.S. Cl. 435—119

2 Claims

1. A method for producing Antibiotic C-15003 which has the general formula:



wherein R represents



which comprises cultivating a microorganism belonging to the genus *Nocardia* and being capable of producing Antibiotic C-15003 in a culture medium containing assimilable carbon sources and digestible nitrogen sources until Antibiotic C-15003 is substantially accumulated therein, and recovering Antibiotic C-15003.

4,162,941

## METHOD FOR DETERMINING A PROTEOLYTIC ENZYME

Leif E. Aurell, Molndal, and Karl G. Claeson, Saro, both of Sweden, assignors to AB Kabi, Stockholm, Sweden

Division of Ser. No. 631,974, Nov. 14, 1975, Pat. No. 4,028,318.

This application Mar. 4, 1977, Ser. No. 774,350

Claims priority, application Sweden, Dec. 5, 1974, 7415229

Int. Cl.<sup>2</sup> G01N 31/14

U.S. Cl. 435—23

12 Claims

1. A method for diagnostic determination of a proteolytic enzyme designated as Xa factor which comprises contacting said proteolytic enzyme with a chromogenic substrate represented by the following formula:



or its salts, where R<sub>1</sub> is selected from the group consisting of hydrogen, alkanol having from 1 to 12 carbon atoms, cyclohexylcarbonyl, benzoyl, benzoyl substituted with one or two halogen atoms, methylamine or phenyl groups, benzene sulphonyl and toluenesulphonyl; R<sub>2</sub> is a chromophoric group; A<sub>1</sub> is selected from the group consisting of a single bond, and the amino acids selected from the group consisting of Gly, Ala, Val, Leu, Ileu, Pro, Met, Phe and Tyr; and A<sub>2</sub> is selected from the group consisting of the amino acids Glu, Gln, Asp, and

Asn, and then spectrophotometrically measuring the degree of enzymatic hydrolysis caused by said proteolytic enzyme acting on said substrate.

4,162,942

## MONITORING ETHYLENE OXIDE STERILIZATION RESIDUAL WITH ENZYMES

Donald A. Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed May 17, 1977, Ser. No. 797,736

Int. Cl.<sup>2</sup> C12K 1/00; G01N 31/14

U.S. Cl. 435—17

13 Claims

1. A method for determining the presence of ethylene oxide residual in a material previously sterilized with ethylene oxide comprising

- contacting said material with an extracting agent so as to remove at least a portion of any ethylene oxide sterilization residual present in the material,
- reacting said extracted ethylene oxide sterilization residual with enzyme which becomes inactivated by ethylene oxide sterilization residual, and
- determining the loss of enzyme activity.

4,162,943

## SLOT PYROLYSIS REACTOR AND METHOD OF PYROLYSIS

Norman W. Green, Upland, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

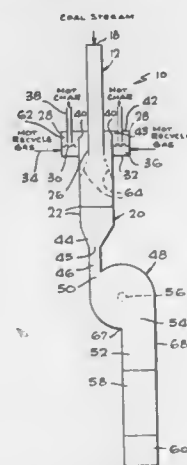
Continuation of Ser. No. 699,995, Jun. 25, 1976, abandoned.

This application Nov. 4, 1977, Ser. No. 848,711

Int. Cl.<sup>2</sup> B04C 5/04; C10B 1/04, 49/16

U.S. Cl. 201—12

36 Claims



15. A pyrolysis process which comprises passing a high velocity stream of a particulate primary material to be pyrolyzed through a rectangular slot to form a high velocity slot jet of said particulate material having a rectangular cross section, injecting said slot jet into a substantially rectangular pyrolysis zone, introducing a fluidized particulate secondary material as heat source into said pyrolysis zone and mixing said particulate primary material and said particulate secondary material in said pyrolysis zone, and passing the resulting stream of said mixed particulate primary and secondary materials through said pyrolysis zone and pyrolyzing said mixture therein, passing the resulting stream of pyrolysis products through a chamber having a rectangular cross section which reduces in size in the direction of flow, introducing said stream of pyrolysis products tangentially into a cylindrical separator zone, removing solids from said separator zone after said stream has passed around only a fraction of the circumference of said separator zone and removing gases from said separator zone.

4,162,944

## SPOTTING METHOD AND APPARATUS FOR COKE OVEN BATTERIES

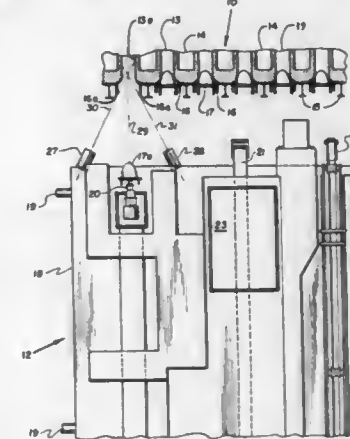
John A. Belcher, Pleasant Hills Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 11, 1977, Ser. No. 850,768

Int. Cl.<sup>2</sup> C10B 33/10, 41/02; G01S 5/16

U.S. Cl. 201—41

8 Claims



1. A method of spotting a machine in relation to an open hot coke oven, the walls of which have incandescent surfaces, so that a part of the machine is aligned accurately with the oven, said method comprising aiming detectors at oblique angles toward the extended center line of said part from both the left and right sides thereof, and positioning the machine where both said detectors "see" directly the incandescent surfaces of the walls at opposite sides of the open oven simultaneously.

4,162,945

## INSTALLATION AND PROCESS FOR MULTISTAGE-CONTROLLED FLASH EVAPORATION

Marinus J. Hofstede, Berkel & Rodenrys; Gerardus Beentjes, Opmeer, both of Netherlands; Laslo Szücs, and Csaba Tasnádi, both of Budapest, Hungary, assignors to Cojafex B.V., Rotterdam, Netherlands

Filed Apr. 7, 1977, Ser. No. 785,715

Int. Cl.<sup>2</sup> B01D 1/22

U.S. Cl. 202—173

11 Claims



1. Multi-stage flash evaporator, in particular suitable for the desalinization of sea water, comprising at least one, essentially slot-shaped, generally downwardly extending passage channel leading from the upper supply of liquid to be evaporated to the lower exhaust of unevaporated liquid, which passage channel

constitutes a series of alternately snail-shell-shaped convolute spaces and bag-shaped buffer spaces acting as a liquid lock or syphon, in the former spaces having a vapor exhaust near their center, and with centrifugal force the separation of vapor from liquid taking place and in the latter spaces mainly transportation of unevaporated liquid from a snail-shell-shaped space to the next lower snail-shell-shaped space taking place.

4,162,946

# PROCESS FOR CONCENTRATING HALOGENOANTHRAQUINONES

Bernd Thelen, Leverkusen; Norbert Majer, Schildgen; Reinold Schmitz, Blecher, and Hans-Samuel Bien, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

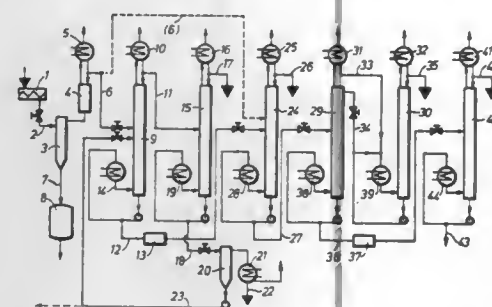
Continuation of Ser. No. 637,489, Dec. 3, 1975, abandoned. This application Sep. 1, 1977, Ser. No. 829,848

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1974, 2458022; Jul. 17, 1975, 2531929

Int. Cl.<sup>2</sup> B01D 3/10, 3/28; C07C 49/68

U.S. Cl. 203—72

20 Claims



1. A process for concentrating a feed comprising essentially mono-, di- or tri-halogenated anthraquinones or mixtures thereof which comprises subjecting said feed containing at least two of said mono-, di- or tri-halogenated anthraquinones or mixture thereof to fractional vacuum distillation in a heated rectification column or a cascade of columns having an efficiency corresponding to about 20 to 50 theoretical stages with an absolute pressure at the top of about 0.5 to 50 mm Hg and a reflux to take-off ratio of about 5/1 to 50/1 to provide a concentrated halogenoanthraquinone fraction and withdrawing overhead as distillate the concentrated halogenoanthraquinone fraction.

4,162,947

# ACID ZINC PLATING BATHS AND METHODS FOR ELECTRODEPOSITING BRIGHT ZINC DEPOSITS

Valerie M. Canaris, Parma, Ohio, assignor to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed May 22, 1978, Ser. No. 908,567

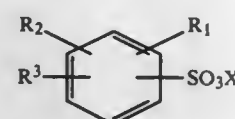
Int. Cl.<sup>2</sup> C25D 3/22

U.S. Cl. 204—55 R

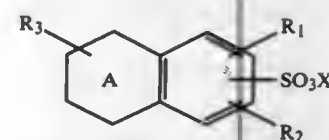
20 Claims

1. An aqueous acidic plating bath for the electrodeposition of a bright zinc deposit on a substrate which comprises

- (A) zinc ions,
- (B) ammonium ions, and
- (C) a mixture of aromatic sulfonic acids or salts thereof comprising at least one compound having the general formula



and at least one compound having the general formula



11

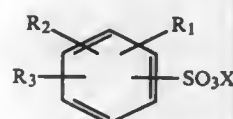
wherein

R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each independently hydrogen or lower alkyl groups,

X is hydrogen, ammonia or any metal with the proviso that the metal sulfonate is soluble in the bath, and A is a saturated, unsaturated or aromatic ring.

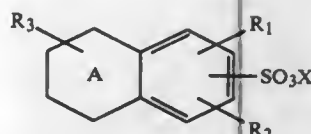
18. An additive composition for an aqueous acidic zinc electroplating bath comprising a mixture of

- (a) at least one aromatic sulfonic acid or salt having the general formula



I

- (b) at least one aromatic sulfonic acid or salt having the general formula



11

wherein

R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each independently hydrogen or lower alkyl groups,

X is hydrogen, ammonia or any metal with the proviso that the metal sulfonate is soluble in the bath, and A is a saturated, unsaturated or aromatic ring,

- (c) at least one polyoxyalkylated naphthol or a polyalkylene glycol ether, and

- (d) an aromatic carbonyl-containing compound.

4,162,948

# METHOD OF DEHALOGENATING HALOGENATED HYDROCARBON TO YIELD ELEMENTAL HALOGEN

Kiyoshi Yagil, Kamifukuoka, and Hideki Oshio, Kawagoe, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Apr. 13, 1978, Ser. No. 895,962

Claims priority, application Japan, Apr. 26, 1977, 52/47385  
Int. Cl.<sup>2</sup> C25B 3/02

U.S. Cl. 204—80

10 Claims

1. A method of dehalogenating a halogenated hydrocarbon with liberation of the detached halogen in elemental form, the method comprising the step of subjecting to electrolysis a reaction system containing water, a halogenated hydrocarbon to be dehalogenated, said halogenated hydrocarbon in said reaction system is a halogenated alkane having at least two but not more than three carbon atoms and at least two atoms of at least one halogen selected from the group consisting of fluorine, chlorine and bromine; with the proviso that the halogens to be removed are on different carbon atoms, zinc chloride and a detergent.

4,162,949

# REDUCTION OF STEEL CATHODE OVERPOTENTIAL

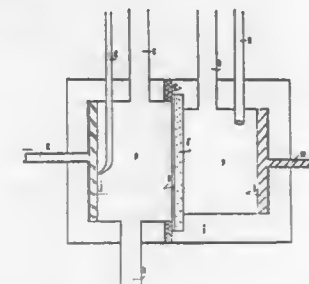
Kenneth E. Hine, St. Bruno, Canada, assignor to Canadian Industries Limited, Montreal, Canada  
Filed Nov. 17, 1978, Ser. No. 961,629

Claims priority, application Canada, Nov. 23, 1977, 291588

Int. Cl.<sup>2</sup> C25F 1/06, 3/06

U.S. Cl. 204—140

5 Claims



1. A method for reducing the hydrogen overpotential at the steel cathode of a cell for the electrolysis of brine comprising:
  - (a) immersing the steel cathode in an alkaline electrolyte of alkalinity ranging from pH 8 to 50% by weight sodium hydroxide in the presence of a counter electrode; and
  - (b) polarizing the steel cathode anodically at a current density of 0.015 to 0.1 kiloampere per-square meter and at a temperature of 0° C. to 75° C. for a period of 0.5 to 60 minutes.

4,162,950

# TREATMENT OF EFFLUENTS

John J. MacGregor, Tokers Green, England, assignor to Matthey Rustenburg Refiners (Proprietary) Limited, Johannesburg, South Africa

Continuation of Ser. No. 815,005, Jul. 12, 1977, Pat. No.

4,127,458. This application Sep. 15, 1978, Ser. No. 942,814

Claims priority, application United Kingdom, Jul. 13, 1976, 29093/76

Int. Cl.<sup>2</sup> C25C 1/20

U.S. Cl. 204—149

2 Claims

1. A process for recovering platinum group metal present as a stable complex dissolved in an aqueous effluent from a platinum group metals refinery which comprises (1) adjusting the pH of the effluent as necessary to an alkaline pH of at least 10; (2) heating the effluent to a temperature above 60° C.; (3) electrolyzing the effluent at said temperature and alkaline pH using an anode potential having a half-cell voltage of at least 7.5 volts and a current density of at least 0.2 A/cm<sup>2</sup> so as to break down said complex by anodic oxidation and precipitate metal present in the complex; and (4) filtering off the thus precipitated metal.

4,162,951

# ELECTROPLATING APPARATUS WITH SELECTIVELY INTERCHANGEABLE, CONNECTABLE DRUMS

Richard Tscherswitschke, Dieselstrasse 21, Leinfelden-Echterdingen, Fed. Rep. of Germany (7022), and Hans Henig, Albrecht-Achilles-Str. 48, Nuremberg, Fed. Rep. of Germany (8500)

Filed Oct. 27, 1978, Ser. No. 955,165

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748763

Int. Cl.<sup>2</sup> C25C 7/00

U.S. Cl. 204—213

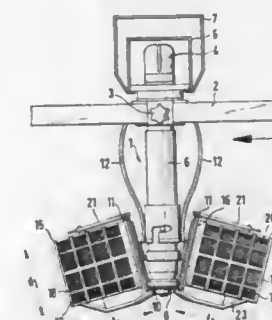
13 Claims

1. A device to facilitate electroplating of a plurality of small elements by moving said elements in an electroplating solution while at the same time passing an electroplating current into said solution, said apparatus comprising:

- at least one cylindrical drum means for containing and supporting said elements in said solution, said drum means

including a cylindrical portion having two ends and one end portion fixed across one end of said cylinder, at least one of said portions permitting said solution to flow there-through;

cover means for removably covering said other end of said cylindrical portion forming a closed container through which said solution may pass;



connecting means removably connecting said other end to said cover means;  
rotation means, connected to said cover means, for rotating said cover means and said drum means in said solution about an axis of rotation; and  
current means for supplying an electroplating current through said cover means and into said drum means.

4,162,952

# APPARATUS FOR ELECTROLYSIS BY PROJECTION

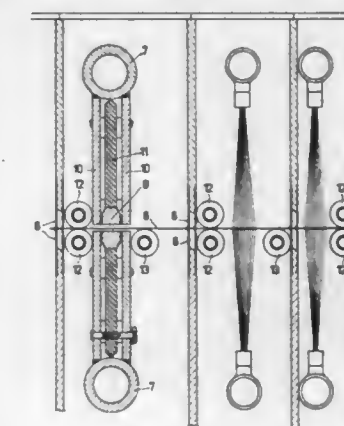
Michel Tribout, Breuillet, France, assignor to Societe Anonyme dite: F.M.C., Pierrelaye, France

Filed Feb. 23, 1978, Ser. No. 880,845

Int. Cl.<sup>2</sup> C25D 7/06, 17/00

U.S. Cl. 204—224 R

4 Claims



1. Electrolysis apparatus for deposition or removal of a metal on at least partially electrically conductive parts comprising a closed chamber, means for conveying flat parts through said chamber along a pre-determined path, means for projecting a sheet of electrolyte transversely of and toward said path so that the sheet of electrolyte impinges on the articles moving along the path, electrode means upstream of said projecting means for electrical connection to one side of an energizing circuit, means for connecting said flat parts to the other side of the energizing circuit during travel of the parts through said chamber, additional chambers adjacent to said first mentioned closed chamber, and wherein an exit opening of one chamber is the inlet opening of the next adjacent chamber, seal means between said chambers for isolating said chambers from each other while permitting the passage of said flat parts through said chambers, said seal means permitting main-



tenance of a neutral gas pressure within said chambers to prevent entrance of atmospheric air into said chambers, and means in said additional chambers for further treating said parts by projecting a liquid sheet toward said parts in said additional chambers.

**4,162,953**  
**MONOPOLAR ELECTROLYTIC DIAPHRAGM CELLS WITH REMOVABLE AND REPLACEABLE DIMENSIONALLY STABLE ANODES AND METHOD OF INSERTING AND REMOVING SAID ANODES**

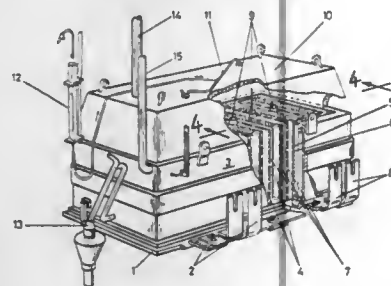
Oronzio De Nora; Giuseppe Bianchi, and Giovanni Meneghini, all of Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Dec. 21, 1977, Ser. No. 862,674

Claims priority, application Italy, Jul. 1, 1977, 25326 A/77  
Int. Cl.<sup>2</sup> C25B 11/03, 11/10, 9/04

U.S. Cl. 204—252

11 Claims



1. In a monopolar electrolytic cell, a conductive bottom, a cell can, containing spaced, hollow, tubular, diaphragm-covered cathodes, on said cell bottom, a cell top, positive current connections to said bottom, negative current connections to said cell can, spaced current conductors electrically connected to and extending upward from said cell bottom between said cathodes, flexible current-carrying arms on said current-carrying conductors, flat valve metal anodes resting loosely on said cell bottom between said current conductors and said cathodes, spring-held contacts between said flat valve metal anodes and said flexible current-carrying arms whereby current connection can be made and broken between said anodes and said current-carrying arms, and an electrically conducting electrocatalytic coating on said anodes.

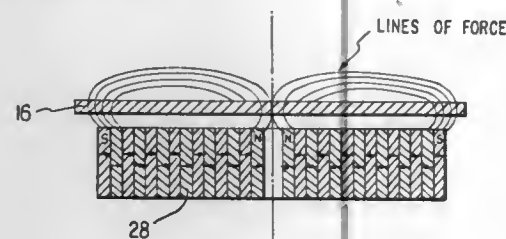
**4,162,954**  
**PLANAR MAGNETRON SPUTTERING DEVICE**  
Charles F. Morrison, Jr., Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Filed Aug. 21, 1978, Ser. No. 935,358

Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—298

42 Claims



1. In a planar magnetron sputtering device including a cathode of target material to be sputtered; wherein said cathode includes a planar sputtering surface, at least a portion of which is disposed about a center line perpendicular to the plane of said surface, an anode adapted for establishing an accelerating electric field between said anode and cathode and magnetic

means for establishing a magnetic field adjacent the planar sputtering surface of said cathode for lengthening the path traveled by electrons removed from said cathode; and wherein the lines of force of the magnetic field extend over the planar sputtering surface of said cathode and pass through the cathode in the vicinity of said center line,

the improvement where said magnetic means comprises means for causing a majority of said magnetic lines of force to pass through said cathode in the vicinity of said center line at angles of 45° or less with respect to said planar sputtering surface to thereby enhance the uniformity of cathode erosion.

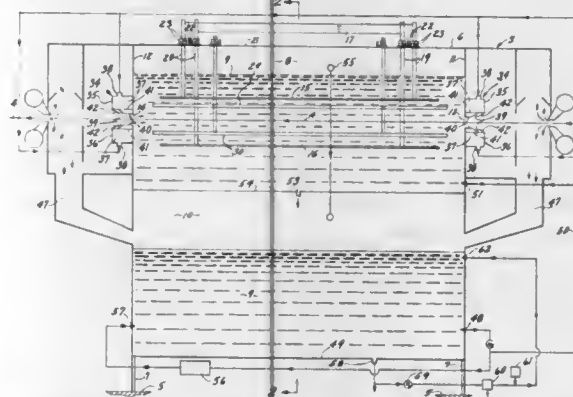
**4,162,955**  
**ELECTRODEPOSITION COATING APPARATUS**  
Alex J. Schrengenberger, Neshanic, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 10, 1978, Ser. No. 949,873

Int. Cl.<sup>2</sup> C25D 17/02, 13/16

U.S. Cl. 204—299 EC

18 Claims



1. An apparatus in which a traveling web, such as a continuous sheet of metal, is treated, comprising:

(a) a tank having a horizontally elongated treatment chamber for holding a liquid used in the treatment of the web as it travels through the chamber, the tank having longitudinally spaced end walls with horizontally aligned openings through which the traveling web enters and exits the chamber;

(b) a liquid seal adjacent each of the openings in the end walls to prevent the escape of liquid from the chamber through the openings, each liquid seal comprising:

(I) a pair of parallel, elongated nozzles disposed normal to the direction in which the web travels, each of the nozzles having a longitudinal compartment with an inlet and at least one longitudinally extending slot facing the traveling web, the slot being at least coextensive with an adjacent opening;

(II) means for circulating liquid, under pressure, through the inlet into the compartment and uniformly out through the slot of each of the nozzles; and

(III) means adjacent the slots for directing liquid, under pressure, from the slots angularly against the traveling web at an angle substantially less than 90° relative to the plane of the web, in the direction of the chamber to create a turbulent back flow of liquid of sufficient mass and velocity to, (i) block the escape of liquid through the openings, and (ii) support the traveling web adjacent the end walls.

**4,162,956**  
**COAL DEASHING PROCESS HAVING IMPROVED SOLVENT RECOVERY TECHNIQUES**

Donald E. Rhodes, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 887,866

Int. Cl.<sup>2</sup> C10G 1/00

U.S. Cl. 208—8 LE

13 Claims

1. A process comprising:  
mixing in a first mixing zone a process solvent with coal; solubilizing the coal at elevated temperature and pressure and flashing the resultant mixture to produce a prepared mixture comprising soluble coal products, insoluble coal products and some of the process solvent;  
mixing the prepared mixture with a deashing solvent in a second mixing zone to provide a feed mixture, said deashing solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2-8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6-9 carbon atoms, heterocyclic amines containing from about 5-9 carbon atoms, and phenols containing from about 6-9 carbon atoms and their homologs;

introducing the feed mixture into a first separation zone and separating said mixture into a first heavy fraction comprising insoluble coal products and some deashing solvent and first light fraction comprising soluble coal products, deashing solvent and some process solvent;

withdrawing the first heavy fraction from the first separation zone;

introducing the first light fraction into a third mixing zone; introducing at least a portion of a third light fraction from a third separation zone into the third mixing zone to mix with the first light fraction contained therein;

withdrawing the mixture from the third mixing zone;

introducing the mixture into a second separation zone;

separating the mixture in the second separation zone into a second heavy fraction comprising soluble coal products and some deashing solvent and a second light fraction comprising deashing solvent and some process solvent;

withdrawing the second heavy fraction from the second separation zone;

withdrawing the second light fraction from the second separation zone;

introducing the second light fraction into a third separation zone;

separating the second light fraction into a third heavy fraction comprising process solvent and a third light fraction comprising deashing solvent;

withdrawing the third light fraction from the third separation zone;

returning at least a portion of the third light fraction comprising deashing solvent to the third mixing zone for introduction therein;

returning the remaining third light fraction to the second mixing zone to aid in providing the feed mixture;

withdrawing the third heavy fraction from the third separation zone; and

returning at least a portion of the third heavy fraction to the first mixing zone to aid in solubilizing said coal.

**4,162,957**  
**METHOD OF FEEDING SOLIDS TO A PROCESS UNIT**  
Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 888,283

Int. Cl.<sup>2</sup> C10G 1/00

U.S. Cl. 208—8 R

18 Claims

1. A process for simultaneously melting and introducing a solid, coal derived feed into a process unit comprising:  
introducing said solid, coal derived feed into an extruder; heating said solid, coal derived feed within said extruder to melt said feed and provide a molten feed;  
discharging said molten feed from said extruder at an elevated pressure; and  
introducing said discharged molten feed into a process unit.

**4,162,958**  
**PROCESS FOR THE DISCHARGE OF ASH CONCENTRATE FROM A COAL DEASHING SYSTEM**  
Roger A. Baldwin, Warr Acres, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 888,104

Int. Cl.<sup>2</sup> C10G 1/00

U.S. Cl. 208—8 LE

5 Claims

1. In a process for separating a feed mixture comprising soluble coal products, insoluble coal products and a solvent in a separation zone, said solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2-8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6-9 carbon atoms, heterocyclic amines containing from about 5-9 carbon atoms, and phenols containing from about 6-9 carbon atoms and their homologs, in which said feed mixture is maintained in said separation zone at an elevated temperature and pressure to separate said feed mixture into a light fraction and into a heavy fraction comprising insoluble coal products and some solvent and in which withdrawing said heavy fraction from said separation zone and reducing the pressure level of said heavy fraction at least about 100 psig fails to yield a dry, powdery, ash concentrate composition, the improvement which comprises:

reducing the temperature level of the heavy fraction after pressure reduction to a temperature level below about 550 degrees F. to continuously yield a dry, powdery, ash concentrate composition.

**4,162,959**  
**PRODUCTION OF HYDROGENATED HYDROCARBONS**  
Kandaswamy Duraiswamy, Laverne, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 699,993, Jun. 25, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,294

Int. Cl.<sup>2</sup> C10G 1/00, 1/06; C10B 49/16, 53/06

U.S. Cl. 208—8 R

26 Claims

20. A continuous process for recovery of liquid hydrocarbon values from a particulate coal feed comprising the steps of:

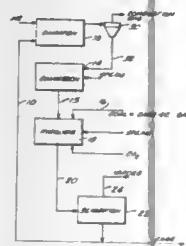
(a) oxidizing particulate coal resulting from pyrolysis of the particulate coal feed in an oxidation zone in the presence of a source of oxygen to produce hot particulate char and a combustion gas;

(b) passing hot particulate and combustion gas from the oxidation zone to a separation zone and separating in the separation zone hot particulate char from the combustion gas;

(c) pyrolyzing the particulate coal feed by introducing the



particulate coal feed and a particulate source of heat including hot particulate char from the separation zone in a flash pyrolysis reaction zone having a temperature of from about 600° to about 2000° F. and a solids residence time less than 5 seconds to yield a pyrolysis product stream containing particulate char and a vapor mixture comprising volatilized hydrocarbons including middle distillates;

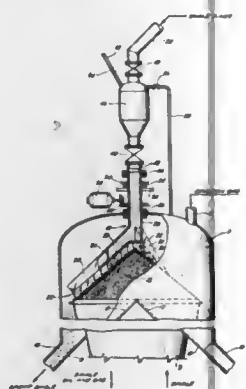


- (d) introducing into the pyrolysis reaction zone carbon dioxide in an amount of about 0.1 to about 20 SCF per pound of hot particulate char introduced for interaction with char therein for avoiding catalytic cracking of volatilized hydrocarbons; and
- (e) condensing hydrocarbons including middle distillates from the vapor mixture.

4,162,960

**SHALE RETORTING PROCESS AND APPARATUS**  
Roland O. Dhondt, Long Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.  
Filed Mar. 29, 1978, Ser. No. 891,280  
Int. Cl.<sup>2</sup> C10G 1/02; C10B 31/02, 49/06, 53/06  
U.S. Cl. 208—11 R

12 Claims



1. In a shale retorting process wherein a bed of granular crushed oil shale essentially free of particles having a diameter less than about 1/16 inch and above about 4 inches is passed upwardly through a retort, countercurrently to a preheated downflowing oxygen-free eduction gas to educe product oil and gas therefrom, and wherein spent shale is allowed to overflow by gravity from the top perimeter of said retort thereby forming a free-standing cone of spent shale extending above the top of said retort through which said preheated downflowing eduction gas passes, the improved method for retorting raw crushed oil shale fines essentially free of particles having a diameter greater than about 1/4 inch which comprises:

- (1) distributing said raw shale fines over an upper portion of the surface of said cone of spent shale at a rate no greater than about 15 weight-percent of total raw shale, including fines, being fed to said retort, said upper portion of surface being selected so as to provide a sufficient residence time of said shale fines gravitating down the surface of said cone to the perimeter of said retort to effect retorting of said fines; and
- (2) controlling the flow rate and the temperature of said eduction gas so as to produce product gas and oil from said upflowing shale and said shale fines.

4,162,961

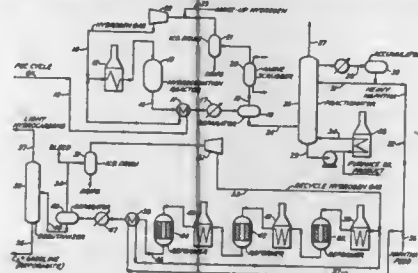
**CYCLE OIL CONVERSION PROCESS**

Joseph F. Marmo, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 393,894, Sep. 4, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,066  
Int. Cl.<sup>2</sup> C10G 39/00

U.S. Cl. 208—57

7 Claims

1. A process which comprises contacting a feed consisting essentially of cycle oil and containing at least 65 volume percent aromatics with a hydrogenation catalyst in a hydrogenation zone under hydrogenation conditions, such hydrogenation catalyst comprising a metal of Group VI-B and a metal of Group VIII composited with an alumina support, recovering a furnace oil fraction from the hydrogenation zone effluent,



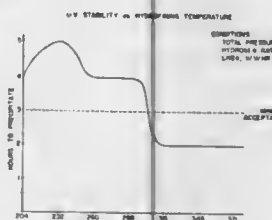
recovering a naphtha fraction from said hydrogenation effluent, passing said recovered naphtha fraction to a reforming zone containing a reforming catalyst, maintaining reforming conditions within said reforming zone, and recovering a reformate product from said reforming zone.

4,162,962

**SEQUENTIAL HYDROCRACKING AND HYDROGENATING PROCESS FOR LUBE OIL PRODUCTION**

Bruce E. Stangeland, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
Filed Sep. 25, 1978, Ser. No. 945,743  
Int. Cl.<sup>2</sup> C10G 13/02, 37/06; B01J 35/10  
U.S. Cl. 208—58

11 Claims



1. A process for upgrading a hydrocrackate lube oil stock boiling in the range above 290° C. and having a UV stability below 3 hours, comprising: (1) contacting said stock and hydrogen gas with a catalyst containing Group VI-B and Group VIII hydrogenating components disposed upon a porous carrier consisting essentially of alumina having a pore volume in the range of from about 0.4 to 1.1 cc per gram, of which at least 70% is in pores having diameters in the range of from about 80 to 150 Angstroms, said contacting being under hydrogenating conditions, including (a) a temperature in the range of from about 200° to 300° C., (b) a total pressure in the range of from about 129 to 171 atmospheres, (c) a hydrogen rate in the range of from about 382 to 509 standard cubic meters of hydrogen gas per kiloliter of feed, and (d) a liquid hourly space velocity in the range of from about 1 to 3 V/V/hr, said Group VI-B component being selected from the group consisting of molybdenum and tungsten, and said Group VIII component being selected from the group consisting of cobalt and nickel, said components being in at least one of the metal, oxide and sulfide forms thereof, and being present in a total effective amount,

calculated as metal and based upon the catalyst by weight, in the range of from about 1 to 20%; and (2) recovering, as a result of said contacting, a product lube oil having a UV stability of at least 4 hours.

4,162,963

**METHOD FOR PRODUCING HYDROCARBON FUELS AND FUEL GAS FROM HEAVY POLYNUCLEAR HYDROCARBONS BY THE USE OF MOLTEN METAL HALIDE CATALYSTS**

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn. and The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 21, 1978, Ser. No. 926,785

Int. Cl.<sup>2</sup> B01J 27/32; C10G 13/02, 1/06

U.S. Cl. 208—108

8 Claims

1. In a process for hydrocracking heavy polynuclear carbonaceous feedstocks to produce lighter hydrocarbon fuels by contacting said heavy feedstocks with hydrogen in the presence of molten zinc chloride catalyst in a hydrocracking zone, thereafter separating at least a major portion of said lighter hydrocarbon fuels from the spent molten zinc chloride and thereafter regenerating the spent molten zinc chloride by incinerating the spent molten zinc chloride by combustion of carbon and sulfur compounds in said spent molten zinc chloride in an incineration zone, the improvement comprising:

- (a) contacting said heavy feedstocks and said hydrogen in the presence of said molten zinc chloride in said hydrocracking zone at reaction conditions effective to convert a major portion of said heavy feedstocks to lighter hydrocarbon fuels;
- (b) contacting said spent molten zinc chloride with oxygen in a liquid phase gasification zone at a temperature and pressure sufficient to vaporize from about 25 to about 75 weight percent of said spent zinc chloride, said oxygen being introduced in an amount sufficient to remove from about 60 to about 90 weight percent of the carbon contained in said spent molten zinc chloride and produce a fuel gas; and
- (c) incinerating the remaining molten zinc chloride by combustion of the carbon and sulfur compounds in said remaining molten zinc chloride in an incineration zone to vaporize said remaining zinc chloride.

4,162,964

**METHOD OF HANDLING ASH-RICH MATERIAL IN A COAL DEASHING PROCESS**

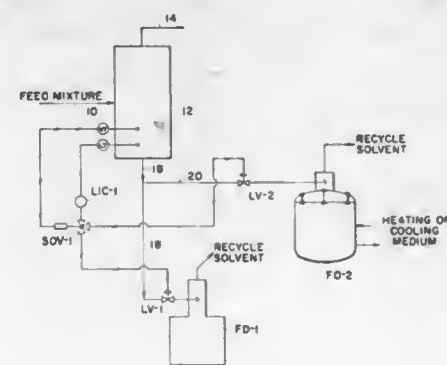
Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 887,869

Int. Cl.<sup>2</sup> B01D 3/06; C10G 1/04; B01D 11/04

U.S. Cl. 208—177

4 Claims



1. A continuous coal deashing process comprising: introducing a feed mixture comprising soluble coal products, insoluble coal products and a solvent into a separation zone, said solvent consisting essentially of at least one

substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2-8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6-9 carbon atoms, heterocyclic amines containing from about 5-9 carbon atoms, and phenols containing from about 6-9 carbon atoms and their homologs;

maintaining said separation zone at a temperature level in the range of from about 400 degrees F. to about 700 degrees F. and a pressure level in the range of from about 700 psig to about 1000 psig to effect a separation of said feed mixture into a light phase and a heavy phase within said separation zone;

providing a monitoring system to measure the viscosity of the heavy phase and compare the measured viscosity with a reference viscosity, said measurement being indicative of the physical characteristics of the heavy phase when withdrawn from the separation zone;

withdrawing the heavy phase from the separation zone; and transmitting a signal from the monitoring system to activate a selection means which directs the flow of said withdrawn heavy phase to a flash drum when said measured viscosity exceeds said reference viscosity and to an alternate process unit when said measured viscosity is below said reference viscosity.

4,162,965

**PROCESS FOR THE REMOVAL OF SOLID PARTICULATE MATERIALS FROM CRUDE SHALE OILS**

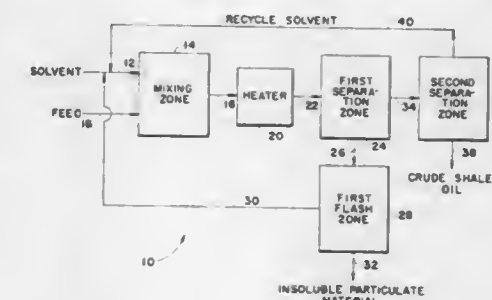
Thomas W. Clapper, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 7, 1978, Ser. No. 914,900

Int. Cl.<sup>2</sup> C10G 21/00

U.S. Cl. 208—177

17 Claims



1. A process for reducing the insoluble particulate material content in crude shale oil produced by eduction of oil-bearing shale deposits, comprising:

admixing crude shale oil containing insoluble particulate material with a solvent to provide a feed mixture; introducing said feed mixture into a first separation zone; maintaining said first separation zone at a temperature level in the range of from about 400 degrees F. to about 750 degrees F. and a pressure level in the range of from about 500 psig to about 2000 psig to separate said feed mixture in said first separation zone into a first light fraction comprising crude shale oil and solvent and a first heavy fraction comprising insoluble particulate material, some solvent and some crude shale oil;



withdrawing said first heavy fraction separated in said first separation zone; and  
withdrawing said first light fraction separated in said first separation zone.

**4,162,966**  
**FLOTATION OF DEEP MINED COAL WITH WATER-IN-OIL EMULSIONS OF SODIUM POLYACRYLATE**

Robert E. Finch, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 696,460, Jun. 16, 1976, abandoned, and Ser. No. 807,770, Jun. 20, 1977, abandoned. This application Jan. 19, 1978, Ser. No. 870,559

Int. Cl.<sup>2</sup> B03D 1/02

U.S. Cl. 209—166

5 Claims

1. A method of increasing the yield of deep mined coal undergoing a concentration treatment of froth flotation by using as a flotation promoter an invertible water-in-oil emulsion of sodium polyacrylate latex in a dosage calculated as 0.017–0.5 lb of dry sodium polyacrylate per ton of dry coal and recovering a concentrate of said coal in said froth.

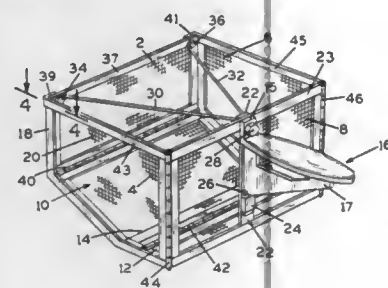
**4,162,967**  
**ARCHAEOLOGICAL SIFTING BASKET**  
Ralph F. Gironda, Jr., 147 Webster Ave., New Rochelle, N.Y. 10801

Filed Dec. 14, 1977, Ser. No. 860,553

Int. Cl.<sup>2</sup> B07B 1/02

U.S. Cl. 209—235

12 Claims



1. A method of excavating an archaeological site having a plurality of levels by using an archaeological sifting basket having a bottom wall which bottom wall has a front and rear planar area arranged at an angle to each other comprising placing said archaeological basket on a relatively lower level with said basket resting stably upon said rear planar area, brushing material to be sifted from a relatively higher area into said basket thereby lowering the said relatively upper level to an intermediate level above said relatively lower level, subsequently resting said archaeological sifting basket on said relatively lower level with said basket resting upon said front planar area, brushing material to be sifted from said intermediate level into said basket, and sifting the material brushed into said basket.

**4,162,968**  
**SCREEN APPARATUS FOR SORTING FRAGMENTED MATERIAL**

Derald B. Gellhaus, Yankton, S. Dak., assignor to Kolberg Manufacturing Corporation, Yankton, S. Dak.

Filed Mar. 16, 1978, Ser. No. 887,026

Int. Cl.<sup>2</sup> B07B 1/48

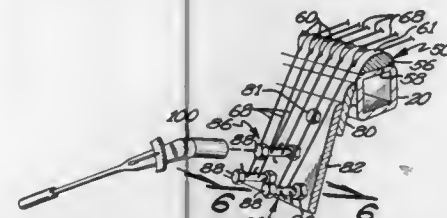
U.S. Cl. 209—400

4 Claims

1. A screen apparatus for sorting fragmented material comprising:

a substantially rigid, rectangular screen box frame having first and second ends and including first and second longi-

tudinal side walls and support means fixed to and positioned between said side walls of said frame;  
a plurality of elongated, wire spacing members, a said member being removably mounted to said support means, and each said member having a mounting surface confronting and engaging said support means and each said member having an arcuate, generally convex face oriented upwardly and away from said support means;  
each of said elongated members having therealong a multiplicity of generally parallel guideways equally spaced from one another at a predetermined distance of separation and aligned parallel to said longitudinal side walls, the said guideways of each said member being longitudinally aligned with corresponding guideways of the remaining said members to define a multiplicity of straight line paths extending between said ends;  
wire retention means adjacent said first and second ends of said frame;  
a multiplicity of screen wire lengths extending longitudi-



nally over said frame along a multiplicity of said straight line paths between said first and second ends and retained by said wire retention means, each said wire length being confined in a plurality of longitudinally aligned guideways of said elongated members to thereby maintain said predetermined distance of separation between adjacent wire lengths;  
each of said elongated members comprising a metal strip having a substantially arcuate outer periphery;  
each of said guideways having a substantially V-shaped cross section so as to closely confine a said wire length having any of a predetermined range of diameters;  
each said guideway having an arcuate, generally convex floor; and  
said floor of each said guideway intersecting said outer periphery of each said elongated strip at a location spaced downwardly from said wire length passing through said guideway to thereby substantially eliminate destructive rubbing of the wire length against the intersection of said floor of said guideway and said face.

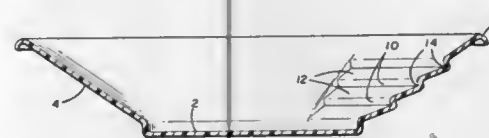
**4,162,969**  
**APPARATUS FOR SEPARATING MATERIAL BY SPECIFIC GRAVITY**  
Roy Lagal, 2416½ E. Main, Lewiston, Id. 83501, assignor to Roy Lagal, Lewiston, Id.

Filed Jul. 8, 1977, Ser. No. 813,957

Int. Cl.<sup>2</sup> B03B 5/02

U.S. Cl. 209—447

10 Claims



9. In an apparatus for separation according to specific gravity of particulate materials which are carried by a fluid comprising a circular flat bottom surface, a truncated conical surface extending outward therefrom and concentric stepped indentations comprising a first surface substantially perpendic-

ular to the conical surface and a second surface joined to the first surface and extending from the point of juncture to points lying in the plane of the conical surface, the improvement comprising an angle of 90° between the first and second surfaces the point of juncture of such surfaces having a typical radius of substantially zero.

**4,162,970**  
**INJECTORS AND THEIR USE IN GASSING LIQUIDS**  
Marko Zlokarnik, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

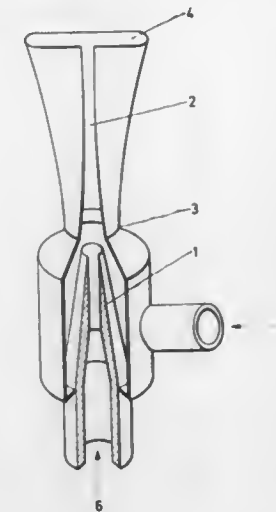
Filed Jul. 25, 1977, Ser. No. 818,893

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634494

Int. Cl.<sup>2</sup> C02B 3/08; C02C 1/12

U.S. Cl. 210—15

5 Claims



1. In a process for intensifying mass transfer in a gas-liquid system by contacting a gas with a liquid utilizing the energy of a propulsion jet to produce very fine gas bubbles, the improvement which comprises passing a liquid through an injector comprising a propulsion jet nozzle, a housing thereabout and a mixing chamber communicating with said housing, said nozzle including a liquid inlet and a throat outlet directed toward the mixing chamber, said housing including a gas inlet, said mixing chamber communicating with said inlets and itself having a round inlet and a substantially slit-shaped outlet of about 5 to 25 times the cross-sectional area of the throat outlet, intimately contacting the gas with a liquid in the mixing chamber, the liquid velocity in the said chamber ranging from 5 to 30 meters per second, the ratio of the gas throughput in m<sup>3</sup> per hour to the propulsion jet throughput in m<sup>3</sup> per hour ranging from about 1:1 to about 20:1.

**4,162,971**  
**INJECTORS WITH DEFLECTORS FOR THEIR USE IN GASSING LIQUIDS**

Marko Zlokarnik, Cologne, and Klaus Elgeti, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,894

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634496

Int. Cl.<sup>2</sup> C02B 3/08; C02C 1/12

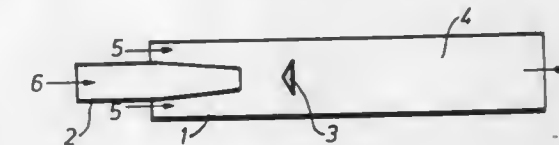
U.S. Cl. 210—15

15 Claims

1. In an injector for the dispersion of a gas into a liquid and comprising a gas inlet, a liquid inlet, and a mixing chamber communicating with said inlets and itself having an inlet and at least one outlet, the improvement which comprises positioning said liquid inlet axially of the mixing chamber, positioning said gas inlet upstream of the mixing chamber so as to provide a gas stream surrounding the liquid stream with both streams aimed

in the same direction, and providing one deflecting element disposed in the mixing chamber along the axis of the liquid inlet, whereby the liquid is distributed across the full cross-section of the mixing chamber.

12. In a process for intensifying mass transfer in a gas-liquid system by causing a gaseous medium to make contact with a liquid medium utilizing the energy of a propulsion jet for producing very fine gas bubbles, the improvement which comprises impinging the liquid medium at a velocity of between about 5 to 30 meters per second against a deflecting



surface so as to bring the liquid into intimate contact with gas in at least one subsequent mixing chamber which tapers continuously, the gas throughput in m<sup>3</sup> per hour being about 2 to 20 times the throughput of the propulsion jet in m<sup>3</sup> per hour, the liquid and gas being introduced through an injector which houses the mixing chamber, the injector being provided with a liquid inlet axially of the mixing chamber, a gas inlet positioned upstream of the mixing chamber so as to provide a gas stream surrounding the liquid stream with both streams aimed in the same direction, and a deflecting element disposed axially in the mixing chamber and against which the liquid jet impinges.

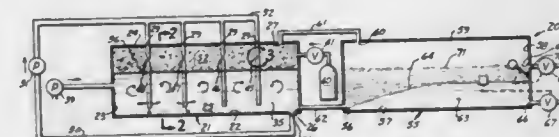
**4,162,972**  
**ENCLOSED FLOTATION DEVICE**  
Gerald G. Green, 6868 Los Verdes Dr., Palos Verdes, Calif. 90274

Continuation of Ser. No. 792,099, Apr. 29, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,640

Int. Cl.<sup>2</sup> B03D 1/24; B01F 3/04

U.S. Cl. 210—44

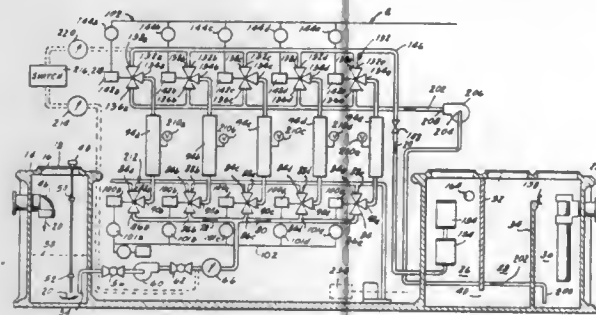
16 Claims



1. A process for clarifying by flocculation a turbid liquid which forms a foam with injected gas, and which contains material which, with gas, will form a floatable floc, said process comprising: in an injection vessel, on a continuous basis injecting into a body of said liquid a gas compatible with said liquid, whereby to form a foam atop the body of liquid and to form components of floc within said body of liquid; retaining said foam in said injection vessel in such manner as to prevent its escape; continuously and for a substantial period of time reinjecting into said body of liquid such of said gas which escapes said body of liquid and at least some of said foam, whereby substantially to eliminate loss of liquid in the form of foam; thereafter on a continuous basis transferring liquid from said body of liquid to a closed flocculation vessel wherein said liquid is quietly contained, whereby to form a three phase system comprising liquid at the bottom, high solid floc atop the liquid and froth-gas atop the floc, and on a continuous basis withdrawing liquid and floc from levels where their respective phase exists.



4,162,973  
**WATER POLISHING SYSTEM**  
 William M. Lynch, Glen Ellyn, Ill., assignor to AFL Industries, Inc., West Chicago, Ill.  
 Filed Jun. 2, 1977, Ser. No. 802,814  
 Int. Cl.<sup>2</sup> B01D 21/24, 29/36, 29/38, 35/12  
 U.S. Cl. 210—73 W 18 Claims

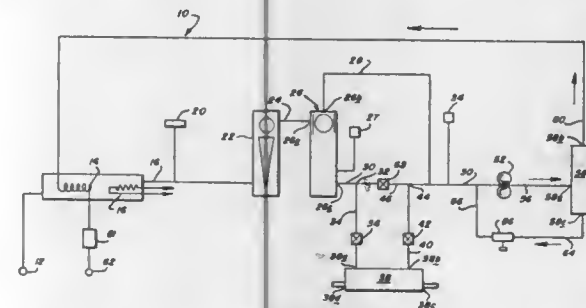


1. A modular water polishing system for removing suspended solids and emulsified oils from a flow of waste water comprising,

- a self-contained transportable support structure including a support platform,
- a first, surge tank mounted on said platform and having supply means for charging a substantially continuous source of said waste water into the surge tank,
- a second, coalescing and outlet tank carried by said platform and separated from said surge tank and connected to an outlet from said system,
- pumping means carried by said support structure for pumping said waste water through an inlet communicating with said surge tank,
- a plurality of first 3-way valves each having a first, second and third port, said first ports of said valves connected respectively in parallel to an output of said pumping means, said first 3-way valves having an operative flow path between said first port and said third port, and a backwash flow path between said third port and said second port,
- a plurality of filter units mounted on said support structure outside of said tanks to remove said suspended solids from said flow and having a bottom appurtenance connected respectively to said third port of said first 3-way valves,
- a plurality of second 3-way valves each having a first, second and third port, of which their first ports are connected respectively to a top appurtenance of said filter units, said second 3-way valves having an operative flow path between their first port and third port and a backwash flow path between their second port and their first port,
- a plurality of coalescers to separate said suspended oils from said flow, and mounted in said second coalescing and outlet tank and communicating jointly with said third ports of said second 3-way valves,
- oil accumulation means for collecting coalesced oils comprising a first widthwise partition mounted in said second tank and having a bottom edge spaced above the bottom of such tank to provide a submerged outlet for said flow of waste water, and a second widthwise partition mounted in said second tank spaced from said first partition and having a top horizontal edge to provide an overflow weir for said waste water flow into a clean water chamber separated from the remainder of the second tank by said second partition, said top edge selectively positioned to maintain a liquid level in said second tank to maintain said coalescers in a submerged condition within said second tank,

- backwashing means to remove separated solids from said filter units, said backwashing means including, an intake in said clean water chamber connecting to a backwash pump, a first backwash line communicating an outlet of said backwash pump in parallel to said second ports of said second 3-way valves, respectively, and a second backwash line connecting in parallel said second port of said first 3-way valves,
- actuating means comprising a first set of actuators carried by and operatively connected to said first 3-way valves for selectively opening and closing said operative and backwash flow paths in said first and second valves,
- said actuating means comprising a second set of actuators carried by and operatively connected to said second 3-way valves cooperating with said first set of actuators to selectively open and close said operative and backwash flow paths in said first and second valves,
- control means operatively connected to said actuating means to selectively activate said actuating means and place a part of said plurality of said first and second 3-way valves and the associated filter unit in a backwash mode and a remainder of said first and second 3-way valves and associated filter units in an operative mode, wherein said actuators are selectively operated by said control means to change said 3-way valves from an operative mode to a backwash mode to allow selective backwashing of individual filter units while the system continues to operate through all other of said filter units and uninterrupted through said coalescers.

4,162,974  
**DEAIRING AND RECIRCULATION SYSTEMS FOR DIALYSIS MACHINES**  
 Stanley J. Pernic, Round Lake, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.  
 Filed Apr. 15, 1977, Ser. No. 787,753  
 Int. Cl.<sup>2</sup> B01D 31/00  
 U.S. Cl. 210—120 8 Claims



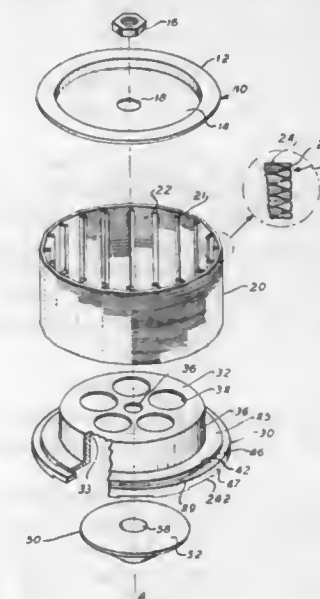
7. A dialysis machine for drawing dialysis solution through a dialyzer under a negative pressure and for removing dissolved and entrained gases from the dialysis solution prior to delivery to the dialyzer, said machine comprising:
- selectively adjustable flow control valve means for controlling the volume of fresh dialysis solution flowing therethrough,
  - deairing tank means downstream of said valve means for receiving dialysis solution from said valve means, said deairing tank means including dialysis solution inlet means through which dialysis solution enters said deairing tank means, gas outlet means and deaerated dialysis solution outlet means associated with said dialyzer,
  - substantially constant speed and constant volume suction pump means operatively associated with said deairing tank means and positioned downstream of and connected to said dialyzer for applying a negative pressure thereto and operatively associated with said gas outlet means and said dialysis solution outlet means for drawing deaerated dialysis solution from said deairing tank means through

- the dialyzer to said pump means, and for drawing gas from said deairing tank means to said pump means,
- air separation and holding tank means, positioned downstream of said pump means, for receiving said gas and spent-dialysis solution, said separation tank means having an inlet, a drain outlet adjacent the top of the separation tank means and a recirculation outlet adjacent the bottom of the separation tank means, and said separation tank means being shaped and constructed so as to permit gas and gas-containing spent-dialysis solution to exit said separation tank means through said drain outlet and to permit spent-dialysis solution with a lesser gas content to be drawn from said separation tank means through said recirculation outlet; and
  - negative pressure control valve means, positioned downstream of the separation tank means, for adjusting negative pressure in a dialyzer and cooperatively associated with said recirculation outlet and the upstream side of said pump means so that spent-dialysis solution having a lesser gas content is drawn from said recirculation tank means through said control valve means to said pump means; wherein said deairing tank means is elongated and adapted to be positioned in an upright attitude and has:
    - a hollow, elongated and tubular casing,
    - end cap means for closing each end of said casing,
    - said dialysis solution inlet means adjacent the upper end of the casing,
    - said deaerated dialysis solution outlet means adjacent the lower end of the casing,
    - said outlet means in the upper end cap means, and
    - an internal baffle-and-check valve assembly for closing the gas outlet means from flow when the liquid level reaches a predetermined level and for assuring the proper opening and closing of said gas outlet means, said assembly comprising:
      - tubular baffle means secured at one end to said end cap means, surrounding said gas outlet means and being spaced from said casing, said baffle means extending from said cap means and terminating in an open end, which is positioned between said dialysis solution inlet means and said deaerated dialysis solution outlet means;
      - ball-valve means positioned within said baffle means for sealingly engaging said gas outlet means,
      - means retaining said ball-valve means in said baffle means between said gas outlet means and said other end of said baffle means; and
      - said assembly being constructed so that incoming dialysis solution will flow against said baffle means and prevent direct flow against said ball-valve means.

4,162,975  
**HIGH VELOCITY COMPOSITE STRAINER**  
 Ralph C. Adams, Somers Point; Arthur C. Epstein, Hamilton Square, both of N.J.; William J. Maroney, Williston Park, N.Y., and Albert B. Mindler, Princeton, N.J., assignors to Permutit Company, Inc., Paramus, N.J.  
 Filed Feb. 7, 1978, Ser. No. 875,911  
 Int. Cl.<sup>2</sup> B01D 25/02, 25/32  
 U.S. Cl. 210—124 23 Claims

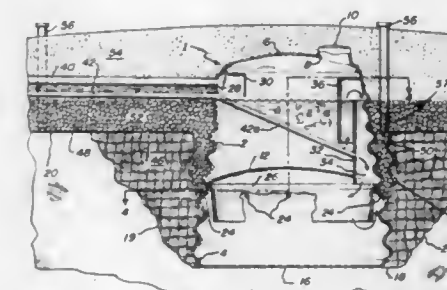
16. A high velocity composite strainer for use in a fluid environment containing particulate matter comprising:
- a high volume low velocity strainer unit having openings between the interior and exterior portions thereof;
  - a low volume high velocity closeable separator unit having an inner and an outer peripheral surface and at least one row of peripheral openings communicating between said outer and said inner surfaces;
  - means for providing for fluid flow between the interior portion of said high volume low velocity strainer unit and said low volume high velocity separator unit;
  - means for interrupting fluid flow between the interior of

said high volume low velocity strainer unit and said low volume high velocity separator unit, while permitting the



flow into the interior of said low volume high velocity unit and out of the peripheral openings therein.

4,162,976  
**SEWAGE DISPOSAL SYSTEM**  
 Arnold A. Monson, 6516 Zane Ave., Apt. 204, Minneapolis, Minn. 55429  
 Filed May 30, 1978, Ser. No. 910,867  
 Int. Cl.<sup>2</sup> B01D 1/00, 21/10, 21/24; C02C 1/16  
 U.S. Cl. 210—170 17 Claims



1. A waste treatment system comprising:
- a tank assembly comprising an upper tank unit having sewage inlet means and a lower tank unit disposed below said upper tank unit, said upper and lower tank units having sidewalls, with said upper tank unit having a top wall and said lower tank unit having a bottom wall, a dividing wall between said tank units, and said lower tank unit being connected in fluid flow communication with said upper tank unit, whereby sewage is initially reduced in first and second stages of anaerobic digestion in said upper and lower tank units;
- baffle means extending vertically within said upper tank unit to a predetermined liquid level therein and having a bottom, outlet end in fluid flow communication with said lower tank unit, said baffle means defining a generally vertically extending flow passage through which liquid flows from said upper tank unit into said lower tank unit and within which a column of liquid is maintained to exert hydrostatic pressure on liquid within said lower tank unit; liquid effluent discharge means in said lower tank unit opening into the space around said lower tank unit;
- a dispersion reservoir surrounding said tank assembly, said

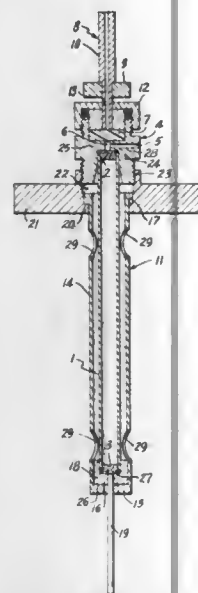


reservoir comprising an excavation in the ground of predetermined area and depth around said tank assembly within which said tank assembly is disposed; liquid impervious sealing means extending from the top of said reservoir excavation over the surface thereof and engaging said tank assembly in sealing contact therewith at a location thereon below said liquid effluent discharge means; and particulate material of predetermined size and grade filling said reservoir, whereby liquid effluent is forced under the hydrostatic pressure of said liquid column from said lower unit discharge means upwardly and outwardly through said particulate matter within said reservoir and evaporates therein, with the resulting vapors dispersing to the atmosphere through said particulate material.

4,162,977

# MEANS FOR REMOVABLY SECURING SEPARATION COLUMN WITHIN COLUMN CHROMATOGRAPHY APPARATUS

Claude Guillemin, Paris, and Christian Mayen, Creteil, both of France, assignors to Prolabo, Paris, France  
Filed Feb. 28, 1978, Ser. No. 881,916  
Claims priority, application France, May 2, 1977, 77 14000  
Int. Cl.<sup>2</sup> B01D 15/08  
U.S. Cl. 210—198 C 8 Claims



1. In chromatography apparatus including a dispensing head, a device for removably securing chromatography separation column means in operative relationship to said dispensing head, said device including:

a generally tubular engagement column adapted to receive and carry said separation column means, and including means at one end thereof defining a first bearing surface arranged to be engageable with one axial end of separation column means carried thereby;

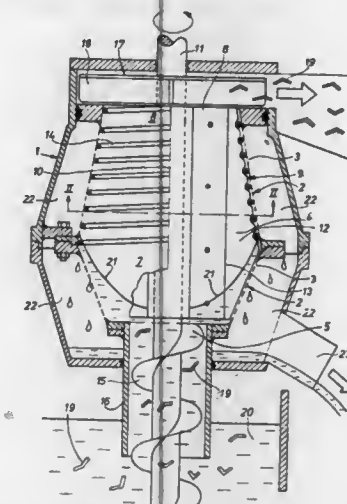
means for removably connecting the other end of said engagement column with said dispensing head, said dispensing head having a second bearing surface thereon arranged to confront the other axial end of separation column means carried by said engagement column when said engagement column is connected with said dispensing head; and

adjustable means for applying a selected, substantially axial compressive stress to separation column means carried by said engagement column when the other end of said engagement column is connected with said dispensing head, said stress being applied through said engagement column and said first and said second bearing surfaces, whereby to secure said separation column means carried by said en-

gagement column in operative relationship with said dispensing head.

4,162,978  
SEPARATOR

Sten M. Lidman, Tumba, Sweden, and Engelbert Baum, Vienna, Austria, assignors to Alfa-Laval AB, Tumba, Sweden  
Filed Sep. 15, 1978, Ser. No. 942,789  
Claims priority, application Sweden, Sep. 19, 1977, 7410444  
Int. Cl.<sup>2</sup> B01D 29/36  
U.S. Cl. 210—213 8 Claims



1. In a separator for separating solid constituents from a mixture of liquid and solids, the combination of means forming a chamber defined substantially by a surface of revolution, the chamber having a central axis and being provided at one end with an inlet for supplying the mixture to a first part of the chamber, the peripheral wall of the chamber being perforated for draining liquid from the chamber, the other end of the chamber having an outlet for discharging solid constituents from a second part of the chamber, a rotor mounted in the chamber for rotation around said central axis, guide means having turns extending helically along said peripheral wall and forming therewith a helical path for leading solid constituents toward said outlet, and carrier means on the rotor for engaging mixture from said inlet and causing the mixture to rotate along said perforated peripheral wall, there being a passage allowing ambient gaseous medium to enter the chamber so that the rotor's action on the mixture maintains a free liquid surface in said first part of the chamber, the carrier means and rotor coating with the guide means to carry a liquid-bearing cake of the solid constituents through said free liquid surface and thence through said second part of the chamber to said outlet, during draining of said cake.

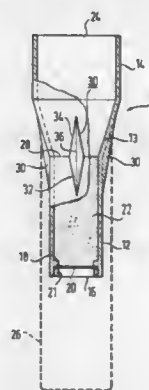
4,162,979

# DEVICE FOR THE CHEMICAL AND/OR PHYSICAL TREATMENT OF LIQUIDS

August W. Wahlefeld; Siegfried Looser, both of Wellheim, and Klaus A. Sturmman, Oberaltling-Seefeld, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany  
Filed Oct. 18, 1977, Ser. No. 843,299  
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 7636679  
Int. Cl.<sup>2</sup> B01D 27/02  
U.S. Cl. 210—282 11 Claims

10. A device for the treatment of liquids, comprising a flow-through vessel having an inlet and an outlet and containing therein a treatment agent between the inlet and the outlet, the flowthrough vessel comprising a substantially cylindrical tube having one end at the outlet and a conically widening tube

section connected to the other end of said cylindrical tube and integral therewith, bearing members disposed in the transitional region between the cylindrical tube and the conical tube section, on the outer side thereof for bearing on the upper edge of a collection vessel receptive of the cylindrical tube said

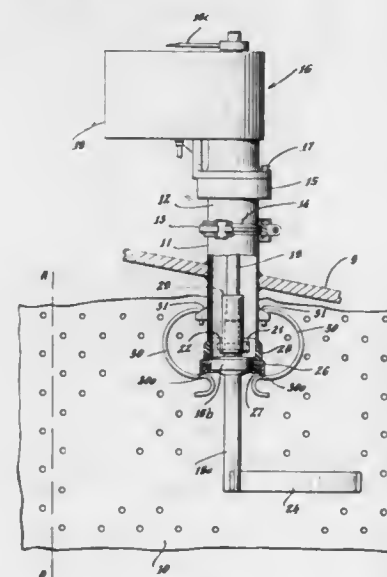


bearing members comprising roof-shaped outwardly extending ribs, each of which forms, with the cylindrical tube and the conical section, an acute-angled triangular member, and having gable lines bridging the hollow throat in the transition region between the cylindrical tube and the conical tube section.

4,162,980

# LOAD INDICATOR FOR CENTRIFUGES

Bradley I. Berit, New Paltz, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.  
Filed Jun. 2, 1978, Ser. No. 912,026  
Int. Cl.<sup>2</sup> B01D 33/10  
U.S. Cl. 210—360 R 8 Claims



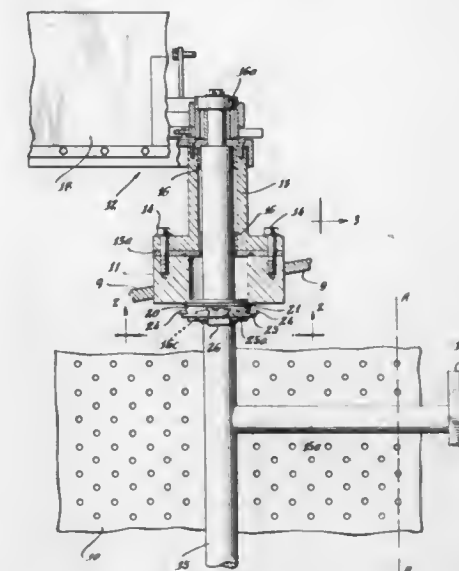
1. In combination with a centrifugal basket mounted for rotation about a vertical axis and adapted to receive a mixture of liquid and solids to be centrifuged, and a stationary frame cover overlying the basket, a load indicator comprising a sleeve extending through a hole in said cover and secured thereto, a generally vertical shaft mounted for rotation in the sleeve and projecting through the lower end thereof into the basket, a paddle secured to the lower portion of said shaft and engageable with the inner surface of an annular mass of solids being centrifuged in the basket, indicating means overlying said cover and including mechanism operable by the paddle through said shaft to indicate changes in the position of said inner surface relative to said axis, sealing means surrounding

the shaft in sealing engagement therewith below said sleeve, and releasable means clamping said sealing means in sealing engagement with the lower end of said sleeve, said releasable means including spring clips having upper portions secured to said sleeve and having lower portions engaging said sealing means.

4,162,981

# DISCHARGER FOR CENTRIFUGES

Bradley I. Berit, New Paltz, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.  
Filed Jun. 2, 1978, Ser. No. 912,027  
Int. Cl.<sup>2</sup> B01D 33/10, 35/16  
U.S. Cl. 210—375 5 Claims



1. In combination with a centrifugal separator including a basket mounted for rotation about an axis and having an annular wall surrounding said axis, and a stationary frame cover overlying the basket, said cover having a hole offset from said axis, a discharger comprising a hollow boss secured to said cover and extending downwardly through said hole, a shaft mounted for rotation in said boss and extending downwardly through said boss, a scraper carried by the shaft below said boss, means mounted on said cover for rotating the shaft intermittently in opposite directions to swing the scraper toward and away from said annular wall, thereby scraping deposited material from the interior of said wall as the basket rotates, a collar surrounding the shaft below said boss and having annular means in sealing engagement with the shaft and with said boss, and releasable means for urging the collar upwardly into sealing engagement with said boss, said collar having a downwardly tapering outer wall, said releasable means including a generally U-shaped clip having legs which straddle said collar, and means depending from said boss for releasably retaining the clip with its legs pressed against said downwardly tapering wall.

4,162,982

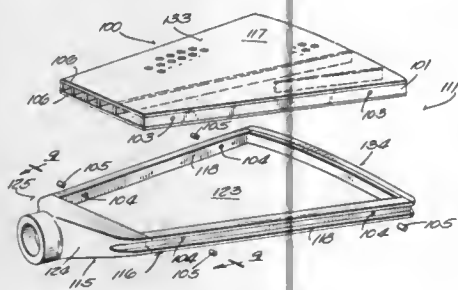
# VACUUM FILTER SEGMENT WITH REPLACEABLE SECTOR PLATES

Ray J. Chesner, Brookfield, Wis., assignor to American Scan-mec, Inc., Brookfield, Wis.  
Filed Sep. 6, 1977, Ser. No. 830,863  
Int. Cl.<sup>2</sup> B01D 33/26  
U.S. Cl. 210—486 5 Claims

1. A vacuum filter segment comprising, in combination, a generally sector-shaped frame including a generally sector-shaped frame member partially defining a generally sec-

tor-shaped central open area and wall means secured to said frame member for defining a throat which communicates with said sector-shaped central open area and which is adapted for sealing engagement with a vacuum manifold, said frame member and said wall means defining the perimeter of said central open area, said frame member including a pair of side members secured to said wall means and extending on opposite sides of said central open area, said side members each including at least one aperture extending transversely therethrough,

a unitary sector plate assembly including a pair of sector plates adapted for supporting a filter medium and includ-



ing apertures extending therethrough for affording communication between said central open area and the filter medium, said sector plates including a pair of side bars extending between the side edges of said sector plates, said side bars including apertures adapted for being aligned with said side member apertures when said sector plate assembly is located in a mounted position within said perimeter of said central open area, and

fastening means for extending into said aligned apertures for removably securing said sector plate assembly in said mounted position without requiring integral bonding or welding of said fastening means to said sector-shaped frame.

4,162,983

#### FABRIC CARE COMPOSITION CONTAINING STARCH AND SURFACTANT

Samuel M. Johnson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 13, 1978, Ser. No. 885,925

Int. Cl.<sup>2</sup> D06M 13/00

U.S. Cl. 252—8.6

11 Claims

1. A liquid fabric care composition suitable for restoring body to fabrics comprising:

- from about 1% to about 25% of a gelatinized and stabilized vegetable starch prepared by exposing a water dispersion of a gelatinized vegetable starch to a pH of from about 10 to about 13 to stabilize said starch and thereafter neutralizing any excess alkali to provide a pH of from about 4 to about 9;
- from about 5% to about 50% of a surface-active detergent selected from the group consisting of anionic, non-ionic, zwitterionic and amphoteric surface-active detergents and mixtures thereof;
- up to about 20% of an electrolyte;
- from about 25% to about 94% water, said composition having a pH of from about 4 to about 11.

4,162,984

#### TEXTILE TREATMENT COMPOSITIONS

Frans DeBlock, Merchtem; Pierre C. E. Goffinet, and Fleming Sorensen, both of Brussels, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 30, 1978, Ser. No. 910,914

Claims priority, application United Kingdom, May 30, 1977, 22740/77

Int. Cl.<sup>2</sup> D06M 13/34

U.S. Cl. 252—8.8

9 Claims

1. A textile treatment composition in the form of an aqueous dispersion and comprising

- a water-insoluble cationic fabric softener;
- a water-insoluble nonionic fabric softener; and
- from 0.1% to 10% of an aromatic mono- or di-carboxylic acid.

4,162,985

#### MULTIGRADE LUBRICANTS CONTAINING INTERPOLYMERS

Zenovie M. Holnbec, Parma Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 402,230, Oct. 1, 1973,

abandoned. This application Oct. 6, 1977, Ser. No. 839,957

Int. Cl.<sup>2</sup> C10M 1/48, 3/42, 1/16, 3/10

U.S. Cl. 252—32.7 E

23 Claims

1. A shear stable multigraded gear oil composition comprising (A) at least about 30 weight percent of a base oil having a viscosity of about 40–2000 SUS at 100° F., (B) at least one extreme pressure agent in an amount sufficient to impart extreme pressure properties thereto, and (C) at least about 5 weight percent of at least one oil-soluble interpolpolymer, said interpolpolymer being a hydrogenated interpolpolymer of at least one monovinyl-arene or substituted monovinyl-arene and of at least one C<sub>4–6</sub> conjugated diene and/or at least one C<sub>3–6</sub> alpha-olefin, said polymer having a number average molecular weight of about 750–10,000 and being present in an amount such as to allow the lubricating oil composition to be a multigraded gear oil having a minimum winter grade of SAE 75W and a maximum normal grade of SAE 250, said base oil being at least one natural oil, synthetic oil or mixture of same and with the proviso that when the base oil is a mixture of synthetic and natural oils, it contains about 5–95 weight percent of at least one synthetic oil.

4,162,986

#### OIL-SOLUBLE HIGH METAL CONTENT TRANSITIONAL METAL ORGANIC OXY, HYDROXY, COMPLEXES

Anthony Alkaitis, Cleveland Heights, and Paul L. Cells, Cleveland, both of Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 808,407, Jun. 20, 1977,

abandoned. This application Feb. 27, 1978, Ser. No. 881,363

Int. Cl.<sup>2</sup> C10M 1/40, 1/24; C10L 1/32; B21B 45/02

U.S. Cl. 252—33.2

30 Claims

1. An oil-soluble and hydrocarbon-soluble overbased transition metal organic composition consisting essentially of a metal oxide and a hydroxyl-metal-carboxylate or -sulfonate complex wherein the metal content which comprises at least one metal which is a transitional metal is in chemical combination partly with oxygen in a polynuclear metal oxide crystallite core and partly with at least two different aliphatic or alicyclic monocarboxylic acids or a mixture of one or more aliphatic or alicyclic monocarboxylic and aliphatic or aromatic monosulfonic acids containing at least two carbon atoms as hydroxyl-metal-carboxylate and hydroxy-metal-sulfonate groups, at least one of the acids being a monocarboxylic acid containing at least seven carbon atoms, and when the second acid is also a monocarboxylic acid, the second acid contains a number of carbon atoms in its longest chain differing by at least two carbon atoms from the total number of carbon atoms in the other, at least a

portion of the carboxylate and sulfonate groups being hydrogen bonded to oxygen atoms of the core, and the remainder of the carboxylate and sulfonate groups are unbonded and in equilibrium with the bonded groups, and the ratio of total metal moles to the total moles of organic acid is greater than one.

4,162,987

#### ENZYME-CONTAINING AUTOMATIC DISHWASHING DETERGENT COMPOSITION

Edward J. Maguire, Jr., and Eugene J. Panchari, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 699,416, Jun. 24, 1976, abandoned.

This application Jan. 16, 1978, Ser. No. 869,881

Int. Cl.<sup>2</sup> C11D 3/37

U.S. Cl. 252—135

9 Claims

1. A cleaning composition, particularly suitable for use in automatic dishwashers, consisting essentially of:

- from about 0.5% to about 20% of an alkoxyated non-ionic surface-active agent selected from the group consisting of:
  - the condensation product of one mole of a carboxylic acid having from about 10 to about 18 carbon atoms with from about 5 to about 50 moles of ethylene oxide;
  - the condensation product of an alcohol having from about 10 to about 24 carbon atoms with from about 5 to about 50 moles of ethylene oxide;
  - polyethylene glycol having a molecular weight of from about 1400 to about 30,000;
  - the condensation product of one mole of alkyl phenol wherein the alkyl chain contains from about 8 to about 18 carbon atoms with from about 4 to about 50 moles of ethylene oxide;
  - the condensation product of benzyl chloride and an ethoxylated alkyl phenol wherein the alkyl group has from about 6 to about 12 carbon atoms and wherein from about 12 to about 20 moles of ethylene oxide have been condensed per mole of alkyl phenol;
  - polyetheresters of the formula



wherein x is from 4 to 20 and R is an alkyl group with from 1 to 4 carbon atoms;

(vii) polyoxyalkylene compounds of the formula



wherein Y is an organic radical having from about 1 to about 18 carbon atoms and containing x reactive hydrogen atoms and the values of n and m are such that the (C<sub>2</sub>H<sub>4</sub>O) content is from about 10% to about 90% by weight

- the alkoxyated nonionic surface-active agents having the formula (i) through (vi) in which the terminal hydroxyl of the alkoxy group is acylated with a monobasic acid; and
- mixtures thereof
- from about 0.001% to about 5% of an enzyme mixture which consists essentially of:
  - a proteolytic enzyme having a proteolytic activity of 80% to 100% of maximum activity when measured at pH 12 using the Anson Hemoglobin method carried out in the presence of urea; and
  - an amylolytic enzyme which exhibits an amylolytic activity of greater than 50% of maximum when measured at pH 8 by the SKB method at 37° C., wherein said enzymes are present in a ratio of from about 4:1 to about 1:4 by weight, and wherein said enzyme mixture is present in such an amount that the final cleaning composition has an amylolytic activity of at least 150 Kilo Novo

units per kilogram and a proteolytic activity of at least 6.0 Anson units per kilogram;

(c) from 0% to about 5% of a suds-regulating agent selected from the group consisting of:

- a siloxane having the formula:



wherein x is from about 20 to about 2,000 and R and R' are each alkyl or aryl groups selected from the group consisting of methyl, ethyl, propyl, butyl and phenyl;

- A microcrystalline wax having a melting point in the range from about 35° C. to about 115° C. and a saponification value of less than 100;
- an alkyl phosphate ester component selected from the group consisting of stearyl acid phosphate and oleyl acid phosphate;
- a siloxane/glycol copolymer self-emulsifying suds suppressor; and
- mixtures thereof;
- from 0% to about 60% of a detergent builder selected from the group consisting of sodium and potassium polyphosphates, carbonates, bicarbonates, alkali silicates, polyacetates, carboxylates, polycarboxylates, polyhydroxy-sulfonates and mixtures thereof; and
- from 0% to about 20% water.

4,162,988

#### BIPHENYL ESTER LIQUID CRYSTAL COMPOUNDS

Robert C. Maze; Everett P. Oppenheim, both of Tempe, and Reese M. Reynolds, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

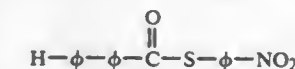
Continuation of Ser. No. 707,479, Jul. 21, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,623

Int. Cl.<sup>2</sup> C07C 143/68; C09K 3/34

U.S. Cl. 252—299

2 Claims

1. A compound having the formula



wherein φ represents a benzene ring and wherein the designated groups are substituted at the para ring position.

2. An improved liquid crystal composition comprising a substantially eutectic mixture of two or more phenylbenzoate ester liquid crystal compounds selected from the group consisting of C<sub>2</sub>H<sub>5</sub>—φ—CO<sub>2</sub>—φ—CN, C<sub>4</sub>H<sub>9</sub>—φ—CO<sub>2</sub>—φ—CN, C<sub>5</sub>H<sub>11</sub>—φ—CO<sub>2</sub>—φ—CN, and CH<sub>3</sub>O—φ—CO<sub>2</sub>—φ—C<sub>5</sub>H<sub>11</sub>, wherein the improvement comprises the addition to said mixture of a compound having the formula of claim 1.

4,162,989

#### OIL-IN-WATER EMULSION

Keneth H. Flournoy, Levelland; Ricardo L. Cardenas, and Joseph T. Carlin, both of Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 664,712, Mar. 8, 1976, Pat. No. 4,108,193.

This application Aug. 24, 1977, Ser. No. 827,296

Int. Cl.<sup>2</sup> F17D 1/17; B01J 13/00

U.S. Cl. 252—312

4 Claims

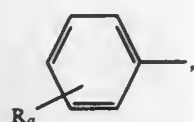
1. An oil-in-water emulsion comprising a hydrocarbon phase and as the aqueous phase about 10 percent to about 40 percent by volume based on the volume of the hydrocarbon of an aqueous solution comprising from about 0.01 to about 2.0 weight percent of an anionic surfactant selected from the group consisting of:

- compounds of the formula:





wherein R is selected from the group consisting of alkyl of from 8 to 25 carbon atoms and

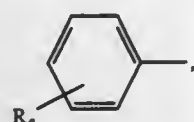


wherein R<sub>a</sub> is alkyl of from 8 to 20 carbon atoms, g is an integer of from 1 to about 20 and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and the ammonium ion;

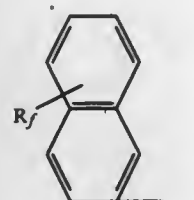
(B) sulfonates of the formula:



wherein R<sub>d</sub> is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;

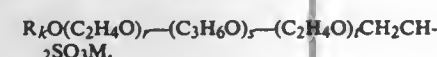


wherein R<sub>e</sub> is alkyl of from 8 to 20 carbon atoms and

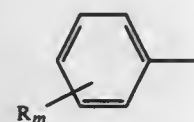


wherein R<sub>f</sub> is alkyl of from 1 to 10 carbon atoms; h is an integer of from 1 to 24 and M has the same meaning as described above in (A);

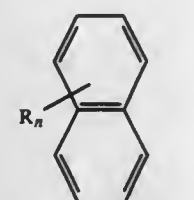
(C) sulfonates of the formula:



wherein R<sub>k</sub> is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;



wherein R<sub>m</sub> is alkyl of from 8 to 20 carbon atoms, and



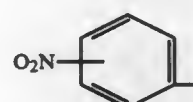
wherein R<sub>n</sub> is alkyl of from 1 to 10 carbon atoms; r is an integer of from 1 to about 18; s is an integer of from 1 to about 12, t is an integer of from 1 to about 20, and the sum of r+s+t is not more than 30, wherein at least 60 percent of the oxyalkylene

units are oxyethylene units and wherein M has the same meaning as described in (A) above; and

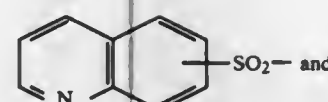
(D) mixtures of the above described surfactants; from about 0.01 to about 1.0 weight percent of an alkalinity agent selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide and mixtures thereof and from about 0.01 to about 0.50 weight percent of a material selected from the group consisting of (1) a guanidine salt, (2) an oxyalkylated nitrogen-containing aromatic compound having the formula:



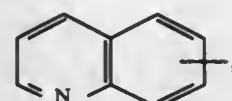
wherein R<sub>1</sub> is selected from the group consisting of:



(a)



(b)



(c)

wherein R<sub>w</sub> is alkylene of from 2 to 4 inclusive carbon atoms and x is an integer of from about 5 to about 50 and (3) mixture of (1) and (2) above.

4,162,990

#### METHOD AND COMPOSITION FOR RETARDING WATER EVAPORATION

John J. Rowlette, Arcadia, Calif., assignor to Duane D. Erway, South Pasadena, Calif., a part interest

Filed Feb. 22, 1974, Ser. No. 444,827

Int. Cl.<sup>2</sup> B01J 1/18

U.S. Cl. 252-383

18 Claims

1. A water evaporation retardant consisting essentially of a mixture of a saturated aliphatic interface-active hydrocarbon in solution with a spreading agent that is soluble in both water and the hydrocarbon, the mixture having a sufficiently small specific gravity to float on water.

4,162,991

#### RECOVERING COBALT AND BROMIDE CATALYST VALUES USING A STRONG ANION EXCHANGE RESIN

Peter J. V. Jones, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 3, 1978, Ser. No. 883,309

Claims priority, application United Kingdom, Apr. 25, 1977, 17130/77

Int. Cl.<sup>2</sup> B01J 23/94, 27/32; C01G 51/00; C07C 51/33

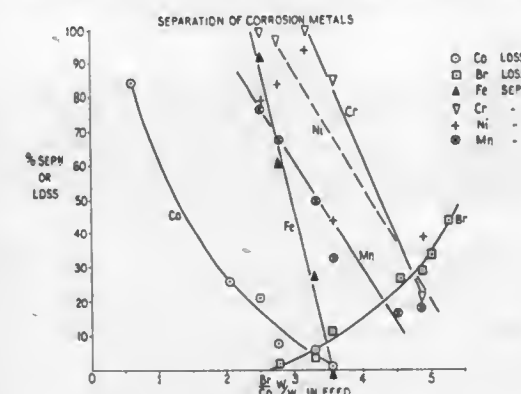
U.S. Cl. 252-413

10 Claims

1. A process for recovering cobalt catalyst values from the reaction mother liquor resulting from the oxidation in the liquid phase to a mono of polycarboxylic acid of a feedstock oxidisable thereto by means of a molecular oxygen-containing gas in presence of a lower aliphatic monocarboxylic acid and of a catalyst comprising cobalt and bromide ions followed by separation of the said mono or polycarboxylic acid from the said reaction mother liquor, which process comprises,

(1) providing in the said reaction a mother liquor having a cobalt concentration from 0.1% to 10% by weight of cobalt in said lower aliphatic monocarboxylic acid, and,

having the bromide concentration so that the ratio of bromide to cobalt is from 1.5:1 to 4.5:1 by weight, (2) contacting the resulting solution containing cobalt and bromide ions with a strongly basic anion exchange resin



whereby cobalt and bromide values are adsorbed on said resin, and

(3) eluting cobalt and bromide values from said anion exchange resin with lower aliphatic monocarboxylic acid containing more than 10% by weight of water.

4,162,992

#### OXIDATION AND AMMOXIDATION CATALYSTS

Kenneth V. Wise, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1978, Ser. No. 866,596

Int. Cl.<sup>2</sup> B01J 29/16, 23/16; C07C 51/24, 120/02

U.S. Cl. 252-456

9 Claims

1. A catalyst for oxidation and ammoxidation of hydrocarbons consisting essentially of catalytic components having the empirical formula



wherein a is at least 6, b is 1, and c is a number such that the ratio of c/a is at least 0.5, and x is a number taken to satisfy the valence requirements of the metal ions present.

4,162,993

#### METAL CATALYST SUPPORT

William B. Retallick, West Chester, Pa., assignor to Oxy-Catalyst, Inc., West Chester, Pa.

Filed Apr. 6, 1978, Ser. No. 894,180

Int. Cl.<sup>2</sup> B01J 35/02

U.S. Cl. 252-477 R

5 Claims

1. A spiral formed by winding a strip of metal upon itself; (a) said strip having indentations of uniform height so that the spacing between layers of the spiral is equal to this height, (b) said indentations being spaced along the strip in a pattern that varies and is not repeated in any layer of the spiral, so that the indentations in successive layers cannot coincide and nest together.

4,162,994

#### POWDERED DETERGENT COMPOSITIONS CONTAINING A CALCIUM SALT OF AN ANIONIC SURFACTANT

John Kowalchuk, Palisades Park, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,320

Int. Cl.<sup>2</sup> C11D 1/83, 1/12, 3/065

U.S. Cl. 252-532

26 Claims

1. A mechanically mixed, non-spray dried, powdered laundry detergent composition comprising:

- from about 4 to about 20 weight percent of the calcium salt of a non-soap, organic anionic surfactant;
- from about 4 to about 20 weight percent of an ethoxylated alcohol nonionic surfactant;
- from about 5 to about 70 weight percent of an alkali metal salt of a builder compound that precipitates hardness ions in water; and
- from 0 to about 40 weight percent of calcium carbonate as a crystallization seed; the percentages being based on the total weight of the composition.

4,162,995

#### METHOD AND COMPOSITION FOR RECLAIMING POLYURETHANE

Martin B. Sheratte, 6827 Nita Ave., Canoga Park, Calif. 91303

Filed Jul. 1, 1976, Ser. No. 701,672

Int. Cl.<sup>2</sup> C08J 11/00; C08G 18/00

U.S. Cl. 260-2.3

41 Claims

1. A process for decomposing polyurethane which comprises treating said polyurethane with ammonia in the absence of water, said ammonia selected from the group consisting of ammonia gas and anhydrous ammonia, completely liquefying said polyurethane, and recovering the reaction mixture.

4,162,996

#### FIBROUS MATERIALS USEFUL AS LEATHER SUBSTITUTES AND CONSISTING ESSENTIALLY OF LEATHER FIBERS, FIBRILS OR FIBRIDES OF SYNTHETIC POLYMERS AND CELLULOSE FIBERS

Paolo Parrini, Ferrara; Giuseppe Peroni, Gussago (Brescia); Guglielmo Corrieri, and Gian P. Righi, both of Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 25, 1977, Ser. No. 772,096

Claims priority, application Italy, Feb. 26, 1976, 20617 A/76

Int. Cl.<sup>2</sup> D21H 15/20; C08L 89/00, 89/06, 7/02

U.S. Cl. 260-4 R

5 Claims

1. Fibrous material useful as a leather substitute and consisting essentially of:

- a fibers mixture made up of 30-60% by weight of leather fibers; 35-65% by weight of synthetic polymer fibrils, or fibrides having a surface area exceeding 1 m<sup>2</sup>/g, the synthetic polymers being polymers of monomers selected from the group consisting of olefins, amides, styrene, acrylonitrile, acrylates, vinyl chloride and oxymethylene, and copolymers of said monomers;
- 5-15% by weight of cellulose fibers; and
- a polymeric organic binder for the fibrous material constituting said mixture, in an amount comprised between 3 and 50 parts by weight per 100 parts by weight of the fibers mixture.

4,162,997

#### HEAT-FUSIBLE PASTES FOR PRINTING INKS, ADHESIVES AND MOLDINGS

Robert M. Walsh, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 2, 1978, Ser. No. 882,847

Int. Cl.<sup>2</sup> C08L 91/00, 93/04

U.S. Cl. 260-27 R

17 Claims

1. A composition of matter in paste form comprising discrete solid particles of a glassy thermoplastic polymeric material, said polymeric material having been prepared from at least 51% of at least one monomer selected from the group consisting of acrylate-type monomers and monovinylidene aromatic monomers, said polymeric material having a glass transition temperature of at least about 50° C., and a particle diameter between about 0.05 micron and about 50 microns, said discrete solid particles of polymeric material being dispersed in a tackifying, cohesion-increasing material whose softening point is at or below room temperature, said polymeric material and said cohesion-increasing material being present in said composition

in a ratio of polymeric material to cohesion-increasing material of between about 1:6 to about 1:1.

4,162,998

# PROCESS FOR PREPARATION OF ASPHALT-EPOXY RESIN COMPOSITION

Tadashi Doi, Osaka, and Harumi Takahashi, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan  
Filed Apr. 13, 1978, Ser. No. 896,692

Claims priority, application Japan, Apr. 22, 1977, 52-47107  
Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260—28 R

14 Claims

1. A process for preparing an asphalt-epoxy resin composition which comprises: mixing heated asphalt at a temperature of from about 40° to about 250° C., with a mixture of (A) diepoxy compound and (B) an amine having only two amino hydrogen atoms in the molecule and having either an aliphatic hydrocarbon group having 8 to 22 carbon atoms or an alkyl-phenyl group in which the alkyl has 8 to 22 carbon atoms, said diepoxy compound (A) reacting with said amine (B) to form a thermoplastic linear epoxy resin uniformly distributed in said asphalt.

4,162,999

# BLENDS CONTAINING ELASTOMERS

John Bohemen, Leatherhead, England, assignor to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 873,550, Jan. 30, 1978, abandoned. This application Feb. 6, 1978, Ser. No. 875,435  
Int. Cl.<sup>2</sup> C08L 91/00; C08F 14/02; C08C 19/20

U.S. Cl. 260—28.5 B

14 Claims

1. A composition which comprises a blend of a chlorine-containing synthetic elastomer and a hardened extract having a saturated hydrocarbon content of not more than 10% w/w and obtained by blowing a gas containing free oxygen into a petroleum extract at elevated temperatures, the petroleum extract having been obtained by the solvent extraction of a product of petroleum refining which is a distillate petroleum fraction or a deasphalted petroleum residue or a blend of this deasphalted residue and distillate, which product boils above 350° C. at atmospheric pressure and which contains a major proportion of aromatic hydrocarbons, characterized in that the composition contains about at least 0.03% by weight, based on the total composition, of an aliphatic amine containing 8 to 24 carbon atoms in the molecule.

4,163,000

# FOUNDRY MOLD COMPOSITION AND PROCESS FOR PRODUCING FOUNDRY MOLD

Jiro Kashima, and Synji Sato, both of Urawa, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan  
Filed Dec. 1, 1977, Ser. No. 856,805

Claims priority, application Japan, Dec. 3, 1976, 51-145809; Apr. 6, 1977, 52-39752; Apr. 6, 1977, 52-39753; Jul. 22, 1977, 52-88490

Int. Cl.<sup>2</sup> C08L 25/04; B28B 7/34

U.S. Cl. 260—29.6 S

11 Claims

1. A foundry mold composition which comprises a foundry mold sand, a binder in an amount of at least 1 part by weight per 100 parts by weight of the sand and sufficient to bind the sand and less than 1 part by weight of clay per 100 parts by weight of the sand, said binder consisting essentially of an aqueous solution of a water-soluble copolymer of a maleic acid-type monomer selected from the group consisting of maleic acid, maleic anhydride and maleic acid esters and a styrene comonomer and water glass and having a weight ratio of copolymer solids to water glass solids of 1:0.5 to 10.

10. A process for producing a foundry mold, which comprises mixing 100 parts by weight of a foundry mold sand containing less than 1 part by weight of clay with from about 2 to about 10 parts by weight of a binder consisting essentially of water glass and an aqueous solution of a water-soluble copolymer of a maleic acid type monomer selected from the

group consisting of maleic acid, maleic anhydride and maleic acid esters and a styrene comonomer and having a viscosity of about 500 to about 10,000 centipoises, forming the mixture into a mold, and contacting the mold with carbon dioxide gas.

4,163,001

# WATER BASE FLEXOGRAPHIC DYE INK

Constantine G. Carumpalos, and Harry E. Pansing, both of Cincinnati, Ohio, assignors to Borden, Inc., Columbus, Ohio  
Continuation of Ser. No. 365,337, May 30, 1973, abandoned.  
This application Sep. 25, 1978, Ser. No. 945,220

Int. Cl.<sup>2</sup> C09D 11/10

U.S. Cl. 260—29.6 MN

9 Claims

1. A water-based chlorine-bleachable dye ink concentrate comprising 1-10 parts by weight of an alkali-stable basic dye containing at least one amino group laked by reaction with 5-20 parts by weight of a laking resin selected from the group consisting essentially of acidic phenolic resins, acidic acrylic resins and mixtures thereof, in a liquid medium consisting essentially of 30-55 parts by weight of butyl Carbitol®, 20-35 parts by weight of water, 0.25-5 parts by weight of dissolved sodium benzoate, 1-3 parts by weight of a nonionic surfactant, 0.05-0.2 part by weight of a defoamer, 5-10 parts by weight of a dissolved acrylic acid binder resin, and 1-5 parts by weight of aminoalcohol.

4,163,002

# FILLER-FORTIFIED POLYALKYLENTEREPHTHALATE MOLDING COMPOSITIONS

Werner Pohl, Troisdorf-Spich; Ernst Schainberg, Troisdorf; Werner Schmidt, St. Augustin, and Günter Tappe, Troisdorf-Sieglar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany  
Filed Jun. 20, 1977, Ser. No. 808,413

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627869

Int. Cl.<sup>2</sup> C08J 3/20; C08K 7/14; C08L 67/02

U.S. Cl. 260—40 R

19 Claims

1. A process for preparing a filler-fortified polyalkyleneterephthalate molding composition which comprises mixing a filler with a precondensate having a viscosity number of from 40 to 160 cm<sup>3</sup>/g of poly-(1,4-butylene)-terephthalate and/or poly-(1,3-propylene)-terephthalate, forming the resultant mixture into a shape and thereafter polymerizing the precondensate by solid-phase condensation under solid-phase condensation conditions.

4,163,003

# UNSATURATED EPOXIDES AS COUPLING AGENTS FOR CARBON FIBERS AND UNSATURATED MATRIX RESINS

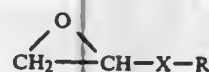
James T. Paul, Jr., and Winfred E. Weldy, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.  
Filed May 23, 1975, Ser. No. 580,501

Int. Cl.<sup>2</sup> C08K 7/02, 9/04

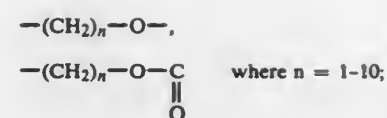
U.S. Cl. 260—40 R

37 Claims

1. A composite structure which is a cured admixture comprising (a) carbon fibers, (b) an unsaturated matrix resin and (c) an unsaturated epoxide bifunctional coupling agent having the general structural formula:



wherein X is a radical selected from the group consisting of



and divalent alkyl, aryl, aralkyl and alkaryl radicals containing up to 20 carbon atoms, and R is an unsaturated radical selected from the group consisting of

- ethylenically unsaturated C<sub>1</sub>-C<sub>4</sub> aliphatic radicals,
- an aryl radical containing an ethylenically unsaturated C<sub>1</sub>-C<sub>4</sub> aliphatic substituent
- the alpha - terpinyl radical,
- the gamma - terpinyl radical and
- the abietyl radical.

4,163,004

# DENTAL FILLING MATERIALS

Wallace A. Erickson, Chicago, and Byoung I. Suh, Glen Ellyn, both of Ill., assignors to Wallace A. Erickson & Company, Chicago, Ill.

Filed Jun. 17, 1977, Ser. No. 807,555

Int. Cl.<sup>2</sup> C08K 9/04

U.S. Cl. 260—42.14

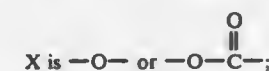
7 Claims

1. A process for treating a finely divided inorganic filler for improving its bonding properties to an active polyfunctional polymerizable monomer having at least two acrylic end groups, which method comprises treating said finely divided inorganic filler with a solution of a tetra (alkenyloxy) titanium di (di-alkyl) phosphite having the formula

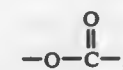


wherein R<sub>1</sub> is an organic radical having the formula —A—(XB)<sub>n</sub> in which

A is a straight or branched chain, divalent or trivalent, hydrocarbon radical having 3 to 8 carbon atoms;



B is a straight or branched chain hydrocarbon radical having at least one terminal double bond and 3 to 8 carbon atoms when X is —O—, or 2 to 7 carbon atoms when X is



n is 1 or 2; and

R<sub>2</sub> is a straight or branched chain alkyl group having 6 to 16 carbon atoms;

removing excess solution; and heating said filler at a temperature of about 110°-130° C. for a period sufficient to improve the shelf life of a mixture of said monomer, said filler, and a free radical generating catalyst suitable for polymerizing said monomer.

4,163,005

# HALOBENZENE SULFONATE FLAME RETARDANTS

James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

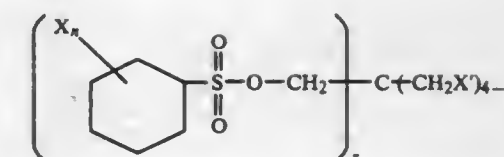
Filed Aug. 11, 1977, Ser. No. 823,773

Int. Cl.<sup>2</sup> C07C 143/68; C08K 5/42

U.S. Cl. 260—45.7 S

13 Claims

1. A halobenzene sulfonate of the formula



wherein X and X' are independently selected halogen, n is an integer of from 1 to 5, and r is an integer of from 1 to 4.

7. A flame retardant plastic polymer composition comprising a polymer and a flame retarding amount of a sulfonate compound of claim 1.

4,163,006

# COMPOSITIONS STABILIZED WITH POLYALKYLTHIOBENZENES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Gelby Corporation, Ardsley, N.Y.

Filed May 9, 1977, Ser. No. 795,269

Int. Cl.<sup>2</sup> C08K 5/37; C10M 1/38, 1/42

U.S. Cl. 260—45.8 NT

10 Claims

1. A method of stabilizing organic material subject to oxidative deterioration by incorporating therein 0.01 to 5% of a stabilizer having the formula



wherein

R is an alkyl group of 1 to 24 carbon atoms, a cycloalkyl group of 4 to 7 carbon atoms or an alkylcycloalkyl group of 7 to 30 carbon atoms,

R' is an alkyl group of 1 to 18 carbon atoms,

n is an integer from 2 to 6

x is an integer from 0 to 4 provided that n + x is not greater than 6.

2. A method of claim 1 wherein said organic material is selected from an olefinic polymer, chlorinated polyolefin, a diene rubber and lubricating oil.

4,163,007

# NEW STABILIZERS

Hanns Lind, Fullinsdorf, and Paul Moser, Riehen, both of Switzerland, assignors to Ciba-Gelby Corporation, Ardsley, N.Y.  
Filed Jul. 27, 1977, Ser. No. 819,526

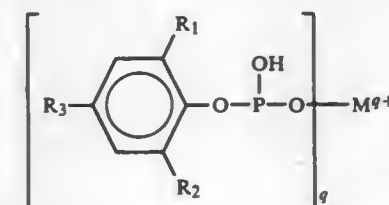
Claims priority, application Switzerland, Jul. 30, 1976, 9764/76

Int. Cl.<sup>2</sup> C08K 5/52; C07F 7/22, 9/02

U.S. Cl. 260—45.75 R

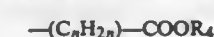
7 Claims

1. A compound of the general formula I



wherein

R<sub>1</sub> and R<sub>2</sub> independently of one another are C<sub>1</sub>-C<sub>8</sub>-alkyl, C<sub>5</sub>-C<sub>8</sub>-cycloalkyl or C<sub>7</sub>-C<sub>9</sub>-aralkyl, R<sub>3</sub> is a group of the formula II



(II)

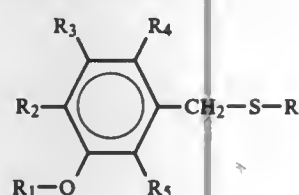


wherein n is 0 to 6,  
R<sub>4</sub> is C<sub>1</sub>-C<sub>24</sub>-alkyl, phenyl, or alkyl-substituted phenyl having 1-12 C atoms in the alkyl moiety,  
q is 1, 2 or 3,  
M<sup>+</sup> is H<sup>+</sup> or a mono-, bi- or trivalent metallic cation.  
5. A polymer containing a compound of the formula I according to claim 1.

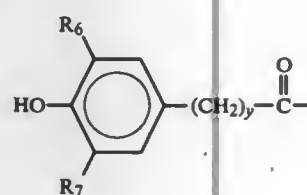
**4,163,008**  
**DUAL PURPOSE STABILIZER COMPOUNDS AND POLYMER COMPOSITIONS CONTAINING SAME**  
Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio  
Filed Mar. 31, 1978, Ser. No. 892,005  
Int. Cl.<sup>2</sup> C08K 5/36; C07C 153/07

U.S. Cl. 260—45.85 B

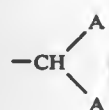
1. Compounds of the formula



wherein  
R and R<sub>1</sub> are the same and are selected from among the following

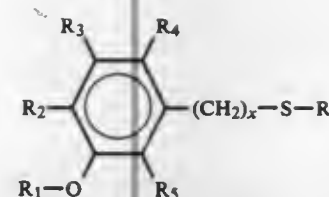


with  
R<sub>6</sub> and R<sub>7</sub> being an aliphatic hydrocarbon radical of 3 to 10 carbon atoms; and y being 0-5;  
R<sub>2</sub> is a tertiary aliphatic hydrocarbon radical having from 4 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 4 to 10 carbon atoms, where the carbon atom of attachment to the aromatic ring is fully substituted;  
R<sub>3</sub> is hydrogen, halogen, an aliphatic hydrocarbon radical having from 1 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 3 to 10 carbon atoms; and  
R<sub>4</sub> and R<sub>5</sub> is

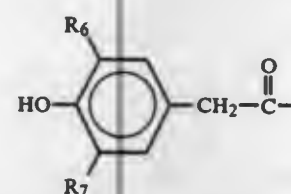


where  
A and A' are independently selected from among hydrogen, an aliphatic hydrocarbon radical of 1 to 10 carbon atoms or an alicyclic hydrocarbon radical of 3 to 10 carbon atoms.

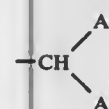
3. A composition comprising a polymer which is sensitive to oxidative degradation and an antioxidant effective amount of at least one compound of the formula



wherein  
R and R<sub>1</sub> are the same and are selected from among the following



6 Claims with  
R<sub>6</sub> and R<sub>7</sub> being an aliphatic hydrocarbon radical of 3 to 10 carbon atoms; and y being 0-5;  
R<sub>2</sub> is a tertiary aliphatic hydrocarbon radical having from 4 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 4 to 10 carbon atoms, where the carbon atom of attachment to the aromatic ring is fully substituted;  
R<sub>3</sub> is hydrogen, halogen, an aliphatic hydrocarbon radical having from 1 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 3 to 10 carbon atoms; and  
R<sub>4</sub> and R<sub>5</sub> is

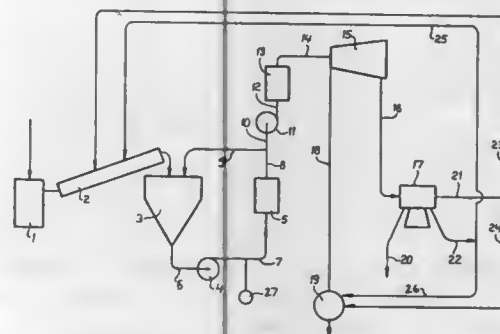


where  
A and A' are independently selected from among hydrogen, an aliphatic hydrocarbon radical of 1 to 10 carbon atoms or an alicyclic hydrocarbon radical of 3 to 10 carbon atoms.

**4,163,009**  
**METHOD OF SEPARATING ANIMAL RAW MATERIAL**  
Poul Filstrup, Virum, Denmark, assignor to Alfa-Laval AB, Tumba, Sweden  
Filed Jan. 24, 1978, Ser. No. 871,828  
Claims priority, application Sweden, Jan. 27, 1977, 77008423  
Int. Cl.<sup>2</sup> A23J 1/02

U.S. Cl. 260—112 R

3 Claims



1. A method of separating animal raw material, such as slaughter-hour offal, into one fat fraction and at least one protein fraction, which comprises the steps of finely dividing

the raw material, subjecting the finely divided raw material continuously to a first heating to heat it to a relatively low temperature of 45° to 70° C. and at constant viscosity, said first heating being effected by circulating the finely divided raw material through a circuit which includes a heating zone, and means to maintain constant viscosity quickly heating a flow of warm material from said first heating to a higher temperature of 85° to 100° C., immediately separating said quickly heated flow by centrifugal separation to provide said fat fraction and said protein fraction, and adding water to the material subjected to said first heating.

**4,163,010**  
**ISOLATION OF PROTEINACEOUS MATERIALS**  
John T. Garbutt, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa  
Filed Apr. 27, 1978, Ser. No. 900,499  
Int. Cl.<sup>2</sup> A23J 1/16

U.S. Cl. 260—112 R

6 Claims

1. A process which comprises subjecting corn steep liquor to ultrafiltration to obtain a retentate containing protein, treating the retentate with an alkaline precipitating agent to precipitate non-proteinaceous material in said retentate, and separating the precipitate from said protein-containing retentate.

**4,163,011**  
**PEPTIDE COMPOUNDS AND COMPOSITIONS**  
Richard J. Orts, Rte. 3, Box 251C, Stillwater, Okla. 74074  
Filed Aug. 28, 1978, Ser. No. 937,300  
Int. Cl.<sup>2</sup> C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 R

2 Claims

1. A bovine pineal antigonadotrophic tripeptide, being substantially free from all other pineal-derived substances, which is characterized by the amino acid sequence: Threonine-serine-lysine.

**4,163,012**  
**PROCESS FOR THE PREPARATION OF CONCENTRATED DYESTUFF SOLUTIONS**  
Erich Kramer, Horst Nickel, both of Leverkusen, and Fritz Puchner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Oct. 28, 1975, Ser. No. 626,477  
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1974, 2451257

Int. Cl.<sup>2</sup> C09B 35/16, 41/00

U.S. Cl. 260—182

2 Claims

1. In a process for the preparation of concentrated aqueous or aqueous-organic solutions of low electrolyte content of azo or disazo dyestuffs containing sulfonic acid groups obtained by diazotization with sodium nitrite in the presence of sulfuric acid and by coupling, the improvement which consists essentially of performing the alkaline coupling reaction in the presence of calcium hydroxide whereby calcium sulfate is simultaneously precipitated and separated from the reaction medium and a concentrated solution of the resulting dyestuff is recovered.

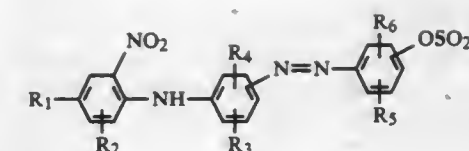
**4,163,013**  
**DIPHENYLAMINE-AZO-HYDROCARBYLSULFONYL-PHENYL DYESTUFFS**  
Herbert Hugl; Karl H. Schlundhütte, both of Leverkusen; Kersten Trautner, Cologne, and Gerhard Wolfrum, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jul. 6, 1977, Ser. No. 813,315  
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630990

Int. Cl.<sup>2</sup> C09B 43/18

U.S. Cl. 260—206

7 Claims

1. Azo dyestuffs according to the formula



wherein

R<sub>1</sub> represents H, NO<sub>2</sub>, CN, CF<sub>3</sub>, halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, SO<sub>2</sub>X<sub>1</sub>, SO<sub>2</sub>OX<sub>1</sub>, CONX<sub>2</sub>X<sub>3</sub>, SCN, OX<sub>1</sub>, SX<sub>1</sub> or NX<sub>2</sub>X<sub>3</sub>, R<sub>2</sub> represents H, NO<sub>2</sub>, halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, OX<sub>1</sub> or phenyl, R<sub>3</sub> and R<sub>4</sub> independently of one another represent H, halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, SO<sub>2</sub>X<sub>1</sub>, SO<sub>2</sub>OX<sub>1</sub>, COX<sub>1</sub>, CONX<sub>2</sub>X<sub>3</sub>, NX<sub>2</sub>X<sub>3</sub>, OH, OX<sub>1</sub> or phenyl, R<sub>5</sub> represents H, halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, OX<sub>1</sub> or phenyl, R<sub>6</sub> represents H or C<sub>1</sub>-C<sub>4</sub>-alkyl, X<sub>1</sub> denotes C<sub>1</sub>-C<sub>4</sub>-alkyl, phenyl, benzyl or phenethyl, X<sub>2</sub> and X<sub>3</sub> independently of one another denote H, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>5</sub>-C<sub>7</sub>-cycloalkyl, phenyl, benzyl, phenethyl or the radical of a heterocyclic structure or, conjointly with the N atom, denote a 5-membered to 7-membered saturated heterocyclic structure, Z represents C<sub>1</sub>-C<sub>4</sub>-alkyl, benzyl, phenethyl, C<sub>5</sub>-C<sub>7</sub>-cycloalkyl or phenyl, and the above-mentioned alkyl, benzyl, phenethyl, cycloalkyl and phenyl radicals as well as the heterocyclic radicals can contain further non-ionic substituents.

**4,163,014**  
**3,4,5,6-TETRAHYDROPYROMELLITDIIMIDES**  
Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
Division of Ser. No. 802,168, May 31, 1977, Pat. No. 4,125,536, which is a division of Ser. No. 603,221, Aug. 8, 1975, Pat. No. 4,056,542, which is a division of Ser. No. 360,962, May 16, 1973, Pat. No. 3,932,457. This application Aug. 21, 1978, Ser. No. 935,195

Int. Cl.<sup>2</sup> C07D 487/04

U.S. Cl. 260—326 C

3 Claims

1. N,N'-diphenyl-3,4,5,6-tetrahydropyromellitdiimide.  
2. N,N'-dialkyl-3,4,5,6-tetrahydropyromellitdiimides.

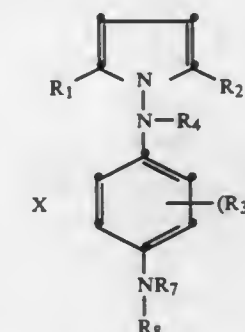
**4,163,015**  
**1-(ARYLAMINO)PYRROLES**  
Robert E. Johnson, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.  
Division of Ser. No. 730,162, Oct. 7, 1976, Pat. No. 4,138,405, which is a division of Ser. No. 585,448, Jan. 9, 1975, Pat. No. 4,051,147, which is a continuation-in-part of Ser. No. 372,324, Jun. 21, 1973, abandoned. This application May 22, 1978, Ser. No. 908,468

Int. Cl.<sup>2</sup> C07D 403/12, 207/50

U.S. Cl. 260—326.25

2 Claims

1. A compound having the formula:



where R<sub>1</sub> and R<sub>2</sub> are each hydrogen or each lower-alkyl; R<sub>3</sub> is hydrogen; R<sub>4</sub> is lower-alkanoyl or benzoyl; X represents two

hydrogen atoms; R<sub>7</sub> is hydrogen; R<sub>8</sub> is lower-alkyl, phenyl or 1-pyrrolyl, or R<sub>7</sub> and R<sub>8</sub> taken together with the nitrogen atom to which they are attached represent nitroso; n is the integer 1, and where the phenyl ring of the group R<sub>4</sub> when benzoyl or the R<sub>8</sub> group when phenyl can be substituted by lower-alkyl, lower-alkoxy or from one to two halogens.

4,163,016

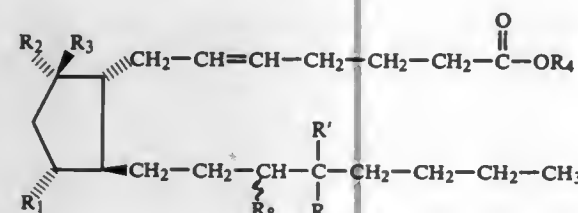
## 16-SUBSTITUTED PROSTAGLANDINS

George W. Holland, and Perry Rosen, both of North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.  
Filed Jul. 5, 1977, Ser. No. 813,068

Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 260—345.8 P

1. A compound of the formula:



wherein R<sub>4</sub> is hydrogen or lower alkyl; R<sub>2</sub> is hydroxy; R<sub>3</sub> is hydrogen or taken together with R<sub>2</sub> forms oxo; R<sub>1</sub> is lower alkyl; R' is fluoro or trifluoromethyl; R is hydrogen, fluoro or lower alkyl; R<sub>8</sub> is hydroxy, benzoyloxy, lower alkanoyloxy, benzyloxy, benzhydryloxy, trimethylsilyloxy; or tetrahydropyranyloxy or their optical antipodes or racemates thereof.

4,163,017

## HIGH PURITY CHENODEOXYCHOLIC ACID AND METHOD FOR OBTAINING SAME

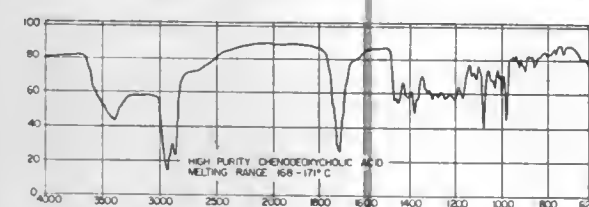
Siegfried Maeke, Kirchdorf, and Paul Rambacher, Rosenheim-Mitterfeld, both of Fed. Rep. of Germany, assignors to Diarmalt Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,080

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613346

Int. Cl.<sup>2</sup> C07J 9/00

U.S. Cl. 260—397.1



1. The method for producing chenodeoxycholic acid suitable for human therapeutic use, characterized by a monoclinic crystallographic system with the lattice parameters

$$\begin{aligned} a &= 19.1 \pm 0.29 \text{ \AA} \\ b &= 8.21 \pm 0.12 \text{ \AA} \\ c &= 15.1 \pm 0.22 \text{ \AA} \end{aligned}$$

$$\beta = 100^\circ \pm 1.5^\circ;$$

the crystals being in the form of relatively flat prisms or needles with blunted edges; a melting range of 168°–171° C.; and an infrared absorption spectrum essentially as shown in FIG. 1, which method comprises dissolving a crude chenodeoxycholic acid in acetonitrile containing 0–10% water at a temperature substantially above 18° C. to form a solution in which the weight ratio of solvent to crude chenodeoxycholic acid is from about 8:1 to about 40:1; cooling said solution to at least 18° C. but above the freezing point of the solution and thereby causing the pure chenodeoxycholic acid to precipitate in crystalline form; and recovering the crystalline product.

4,163,018  
PROCESS FOR PREPARING METAL SALTS OF ALKYL PHOSPHATES

Fusao Tada, Toyonaka; Jajitoku Shimizu, Nara; Tsutomu Asaoka, Kishiwada, and Fuminori Matsumoto, Sakai, all of Japan, assignors to Sakai Chemical Industry Company, Ltd., Japan  
Filed Dec. 13, 1977, Ser. No. 860,408

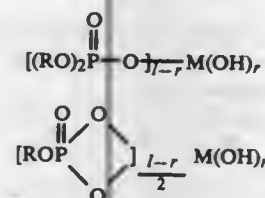
Claims priority, application Japan, Dec. 18, 1976, 51-153175

Int. Cl.<sup>2</sup> C07F 3/06

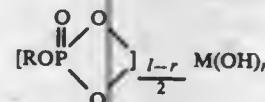
U.S. Cl. 260—429.9

4 Claims

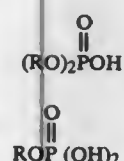
1. A process for preparing metal salts of an alkyl phosphate corresponding to either one of the formulae:



and



having a high apparent specific volume which comprises reacting an alkyl phosphate corresponding to either one of the formulae:



and

in the form of its alkali metal salt, with a metal salt of the formula: M<sub>n</sub>X<sub>m</sub> in an aqueous medium at a temperature of from about 50° to 80° C., and recovering the reaction product from the reaction mixture, followed by filtration, water washing, drying and pulverizing, the operations on the recovery and thereafter being carried out at a temperature of not higher than 80° C.; in the above formulae R being an alkyl group of not less than 12 carbon atoms, M being an alkaline earth metal, aluminum or zinc, X being halogen, sulfate or nitrate, 1 being an integer corresponding to the atomic valency of M, r being the integer 0, 1 or 2, m being the integer 1, 2 or 3 and n being the integer 1 or 2.

4,163,019

## PRODUCTION OF 4,4'-ALKYLIDENE DIPHENYL DIISOCYANATE

Frank D. Mango, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

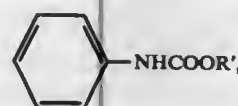
Filed Jul. 10, 1978, Ser. No. 922,903

Int. Cl.<sup>2</sup> C07C 118/00, 119/048, 125/06

U.S. Cl. 260—453 P

10 Claims

2. Process for the selective production of 4,4'-methylene diphenyl diisocyanate, consisting essentially of the steps of  
(1) condensing formaldehyde with a compound



wherein R' is the residue of an alcohol which is capable of reacting with phenyl isocyanate to produce the corresponding carbamate and which does not contain any reactive groups that interfere with the reactions, of steps (1) and (2), under mild condensation reaction conditions in a polar solvent, to yield the dicarbamate of formula

4,163,022

## CARBAMYLGUANIDINE ANTIMICROBIAL COMPOUNDS

Julius Diamond, Mountain Lakes, N.J., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 757,577, Jan. 7, 1977, Pat. No.

4,115,447, and Ser. No. 757,600, Jan. 7, 1977, Pat. No.

4,115,448, which is a division of Ser. No. 546,549, Feb. 3, 1975,

Pat. No. 4,002,962. This application Aug. 7, 1978, Ser. No.

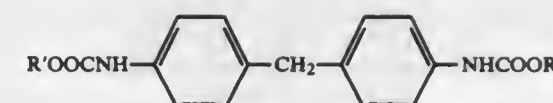
931,511

Int. Cl.<sup>2</sup> C07C 127/15; A61K 31/17

U.S. Cl. 260—553 R

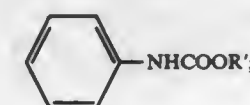
7 Claims

1. A compound having the formula Z-B-Y-B'-Z wherein Y is a bivalent organic radical selected from the group consisting of C<sub>2</sub>-C<sub>12</sub> alkylene, C<sub>5</sub>-C<sub>12</sub> cycloalkylene, C<sub>5</sub>-C<sub>12</sub> cycloalkylenebis(loweralkyl), C<sub>6</sub>-C<sub>12</sub> arylene and loweralkylarylene, C<sub>7</sub>-C<sub>12</sub> arylene loweralkyl, and C<sub>8</sub>-C<sub>12</sub> arylenebis(loweralkyl); B is a substituted guanidino group selected from the group consisting of carbamylguanidino and thiocarbamylguanidino; B' is B or biguanidino, provided that B' is biguanidino only when B is carbamylguanidino bonded to Y through the guanidino portion of the group; and Z is selected from the group consisting of C<sub>4</sub>-C<sub>12</sub> dialkylaminoalkyl; C<sub>1</sub>-C<sub>10</sub> alkoxy C<sub>10</sub>-C<sub>2</sub> alkyl having a total carbon content of C<sub>3</sub>-C<sub>14</sub>; C<sub>1</sub>-C<sub>10</sub> alkylthio C<sub>10</sub>-C<sub>2</sub> alkyl having a total carbon content of C<sub>3</sub>-C<sub>14</sub>; phenoxy C<sub>2</sub>-C<sub>6</sub> alkyl; phenylthio C<sub>2</sub>-C<sub>6</sub> alkyl; C<sub>7</sub>-C<sub>14</sub> arylcycloalkyl; and C<sub>6</sub>-C<sub>14</sub> aryl and aralkyl substituted with one or more radicals selected from the group consisting of phenoxy, nitro, cyano, C<sub>2</sub>-C<sub>6</sub> acyl, benzoyl, alkoxy carbonyl, diloweralkylamino, with the proviso that when Y is C<sub>2</sub>-C<sub>12</sub> alkylene, and B and B' are carbamylguanidino then Z is additionally selected from the group consisting of C<sub>7</sub>-C<sub>14</sub> aralkyl and aralkyl substituted with one or more radicals selected from the group consisting of loweralkyl, trifluoromethyl, loweralkoxy, trifluoromethoxy, loweralkylthio, halo, loweralkylsulfonyl, fluorosulfonyl and alkylsulfonyl; and with the further proviso that when B is thiocarbamylguanidino; or B' is thiocarbamylguanidino or biguanidino, then Z is additionally selected from the group consisting of C<sub>1</sub>-C<sub>12</sub> alkyl; C<sub>3</sub>-C<sub>12</sub> alkenyl; C<sub>3</sub>-C<sub>12</sub> alkynyl; C<sub>3</sub>-C<sub>12</sub> cycloalkyl, C<sub>4</sub>-C<sub>12</sub> cycloalkylalkyl; C<sub>6</sub>-C<sub>14</sub> aryl; C<sub>7</sub>-C<sub>14</sub> aralkyl; and C<sub>6</sub>-C<sub>14</sub> aryl and aralkyl substituted with one or more radicals selected from the group consisting of loweralkyl, trifluoromethyl, loweralkoxy, trifluoromethoxy, loweralkylthio, halo, and loweralkylsulfonyl, and pharmacologically acceptable addition salts of these compounds with acids represented by nHA wherein n = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



and water;

(2) reacting said dicarbamate with phenyl isocyanate in the presence of a catalytic amount of an effective exchange reaction catalyst under mild reaction conditions to yield 4,4'-methylene diphenyl diisocyanate and



and

(3) continuously removing and recovering said diisocyanate from the exchange reaction mixture.

4,163,020

## 2-TRICHLOROMETHYL-4-NITROBENZENESULFENIC ACID DERIVATIVES

Helmut Hagen, Frankenthal; Wolfgang Reuther, Ziegelhausen; Ernst-Helrich Pommer, Limburgerhof, and Helmut Fleig, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,523

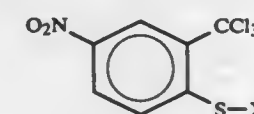
Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721917

Int. Cl.<sup>2</sup> C07C 161/02, 145/00

U.S. Cl. 260—454

3 Claims

1. A 2-trichloromethyl-4-nitrobenzenesulfenic acid derivative of the formula



where X is —Cl or —CN.

4,163,021

## SYNTHESIS OF 2,6,10-TRIMETHYL-UNDECAN-1-OL

Noel Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 796,929, May 16, 1977, Pat. No. 4,107,183, which is a division of Ser. No. 638,722, Dec. 8, 1975, Pat. No.

4,041,058, which is a continuation-in-part of Ser. No. 544,154,

Jan. 27, 1975, abandoned. This application May 12, 1978, Ser.

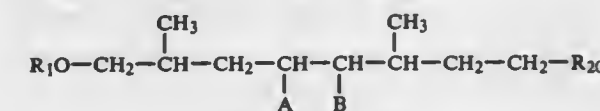
No. 905,324

Int. Cl.<sup>2</sup> C07C 143/68

U.S. Cl. 260—456 P

2 Claims

1. A compound of the formula:



wherein A and B are individually hydrogen or taken together form a carbon to carbon bond; R<sub>20</sub> is MgX or —OR<sub>6</sub>; X is halogen; R<sub>6</sub> is p-toluenesulfonyl, naphthylsulfonyl or lower alkylsulfonyl; R<sub>1</sub> is benzyl, benzhydryl, trityl, methoxymethyl, trimethylsilyl, tetrahydropyranyl or t-butyl, with the proviso that when R<sub>1</sub> is benzyl, benzhydryl or trityl, A and B form a carbon to carbon bond.

4,163,023

## TREATMENT OF PHOTOGRAPHIC PROCESSING SOLUTIONS

Akira Endo, and Tohru Kitahara, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1976, Ser. No. 746,753

Claims priority, application Japan, Dec. 2, 1975, 50-143537; Oct. 19, 1976, 51-125838

Int. Cl.<sup>2</sup> C07C 143/75, 91/06,



4,163,024

**PROCESS FOR CONTROLLING THE CATALYTIC CO-OLIGOMERIZATION OF 1,3-DIENES WITH SCHIFF'S BASES**

Paul Heimbach; Achim Roloff, and Erich F. Nabbefeld-Arnold, all of Mülheim, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH., Mülheim, Fed. Rep. of Germany  
Filed Aug. 1, 1977, Ser. No. 820,962

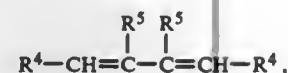
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638430

Int. Cl.<sup>2</sup> C07C 119/00

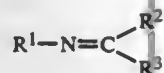
U.S. Cl. 260—566 R

4 Claims

1. A process which comprises condensing a 1,3-diene of the formula



wherein R<sup>4</sup> and R<sup>5</sup>, independently of one another, represent hydrogen or an alkyl group having 1 to 4 carbon atoms with a Schiff base of the formula



wherein each of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 5 to 7 ring members, aralkyl in which the aryl portion is carbocyclic and has up to 10 ring members and the alkyl portion has up to 7 carbon atoms; or dimethylamino or dimethylamino substituted by alkyl ethers having up to 12 carbon atoms, alkyl esters having up to 12 carbon atoms or C=N double bonds, in the presence of a nickel (O)—containing catalyst, and optionally in the presence of a conventional electron donor and a conventional weakly H-acid compound, said weakly H-acid compound being a primary or secondary amine, a cycloalkyl amine having 4 to 8 ring members, a carbocyclic arylamine having up to 10 ring members, a mono- or di-aza-cyclic carbocyclic amine having 5 to 7 ring members, and unsaturated carbocyclic cycloaliphatic amine having up to 3 double bonds and optionally N-alkylated wherein the N-alkyl portion has up to 7 carbon atoms, an alkyl- or aryl-phosphorhydrogen compound, an alcohol, an organic acid or water, with a molar ratio of Ni: weakly H-acid compound of from 1:0 to 1:10.

4,163,025

**PROCESS FOR THE PRODUCTION OF BENZYLAMINE AND DIBENZYLAMINE**

Richard A. Plunkett, Elkhart; Jerry L. Neff, Nappanee, and Timothy A. Bemish, Bremen, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 16, 1975, Ser. No. 541,494

Int. Cl.<sup>2</sup> C07C 85/12

U.S. Cl. 260—570.9

7 Claims

1. A process for preparing benzylamine, which comprises passing undiluted benzonitrile and hydrogen countercurrently through a catalyst bed, wherein the catalyst is selected from the class consisting of Raney nickel, zirconium promoted reduced nickel and platinum, under suitable conditions of temperature and pressure to thereby hydrogenate the benzonitrile and produce the desired reaction product, wherein the pressure is greater than about 115 p.s.i.a. and the ratio of hydrogen flow to benzonitrile flow based upon the relative volumes passed per unit of time in countercurrent fashion is less than about 600.

4,163,026

**PRODUCTION OF TETRABUTYLHEXAMETHYLENEDIAMINE BY REDUCTIVE ALKYLATION OF HEXAMETHYLENEDIAMINE WITH BUTYRALDEHYDE**

Harold J. Hintz, Riverview, Mich., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 12, 1977, Ser. No. 832,301

Int. Cl.<sup>2</sup> C07C 85/08

U.S. Cl. 260—583 P

7 Claims

1. A process for the production of tetrabutylhexamethylenediamine from butyraldehyde and hexamethylenediamine comprising continuously reacting controlled amounts of butyraldehyde with hexamethylenediamine in the presence of a catalyst selected from the group consisting of platinum and palladium at a pressure of 300–500 psig and a temperature of 70°–90° C.

4,163,027

**WORKING-UP OF REACTION MIXTURES CONTAINING CYCLOHEXANOL AND CYCLOHEXANONE**

Peter Magnussen, Bad Duerkheim; Guenter Herrmann, Neustadt, and Elmar Frommer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,985

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650892; Oct. 8, 1977, 2745448

Int. Cl.<sup>2</sup> C07C 27/12, 27/26, 29/24, 45/24

U.S. Cl. 260—586 P

9 Claims

1. In a process for working up reaction mixtures containing cyclohexanol and cyclohexanone, which have been obtained by oxidizing cyclohexane with molecular oxygen or gases containing molecular oxygen, in the liquid phase, at from 130° to 200° C. under a pressure of from 5 to 25 bars, working-up being effected by treatment with aqueous solution of an alkali metal hydroxide and/or alkali metal carbonate in two stages, the fresh aqueous alkali metal hydroxide and/or alkali metal carbonate solution being fed to the second stage and the separated spent alkali being brought into contact with fresh reaction mixture in the first stage, the improvement of carrying out the treatment in the first stage in the presence of inert gases and separating off the inert gases before the second stage.

4,163,028

**XYLENE ISOMERIZATION**

Samuel A. Tabak, Wenonah, and Roger A. Morrison, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 818,171, Jul. 22, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,681

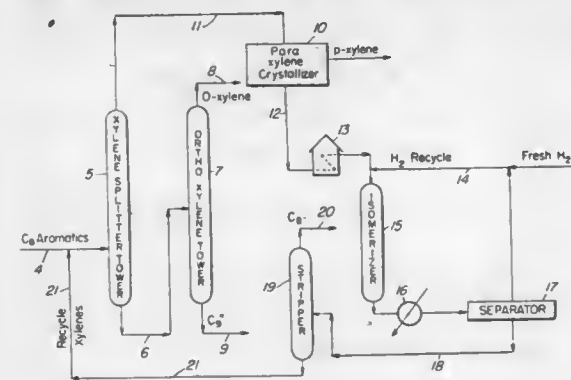
Int. Cl.<sup>2</sup> C07C 5/24

U.S. Cl. 585—481

13 Claims

1. In a process for isomerizing the xylene content of a charge mixture of eight carbon atom aromatic hydrocarbon compounds which mixture contains xylene and ethyl benzene by contact at conversion conditions with a catalyst comprising a zeolite having a silica/alumina ratio greater than 12 and a constraint index of 1 to 12, the improvement resulting in con-

version of ethyl benzene to benzene which comprises using as said catalyst a zeolite having a silica/alumina ratio of at least



500 maintaining a conversion temperature of about 800° F. to about 1000° F.

4,163,029

**HIGH SOLIDS COATING COMPOSITIONS**

Oliver W. Smith, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 690,185, May 26, 1976, Pat. No. 4,101,603.

This application Apr. 20, 1978, Ser. No. 898,104

Int. Cl.<sup>2</sup> C08L 67/04; C08G 63/76; C08L 61/32

U.S. Cl. 525—449

17 Claims

1. A high solids composition comprising from (I) 20 to 80 weight percent of polycaprolactone derivative and (II) from 80 to 20 weight percent of a combined mix; wherein said combined mix (II) is a mixture of a methylolated melamine and a non-volatile low molecular weight polyol having a molecular weight of from 62 to about 1000 and from 2 to 6 hydroxyl groups wherein the methylolated melamine comprises from 40 to 90 weight percent of said combined mix; and wherein said polycaprolactone derivative (I) is a carboxyl modified polycaprolactone-epoxide adduct reaction product mixture of (i) a polycaprolactone polyol, (ii) from 0.2 to 1 mole of an organic diepoxide per mole of polycaprolactone initially charged and (iii) from 0.1 to 0.5 carboxylic anhydride equivalent per each unreacted hydroxyl equivalent present of an intramolecular anhydride of a polycarboxylic acid.

4,163,030

**NOVEL POLYETHERAMIDE-IMIDE PHENOLIC RESIN BLENDS**

Eugene G. Banucci, Scotia, and Edith M. Boldebeck, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 628,330, Nov. 3, 1975. This application Jul. 3, 1978, Ser. No. 921,366

Int. Cl.<sup>2</sup> C08L 63/00, 71/00, 77/00, 79/00

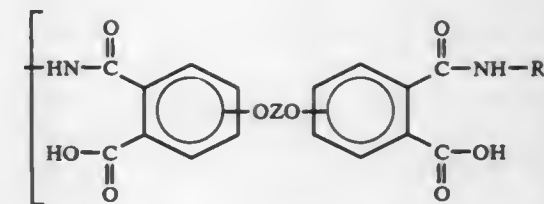
U.S. Cl. 525—429

20 Claims

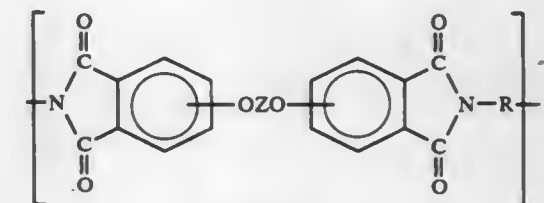
1. A polyetheramide-imide phenolic resin blend comprising a polyetheramide-imide resin and a phenolic resin of the formula, respectively,



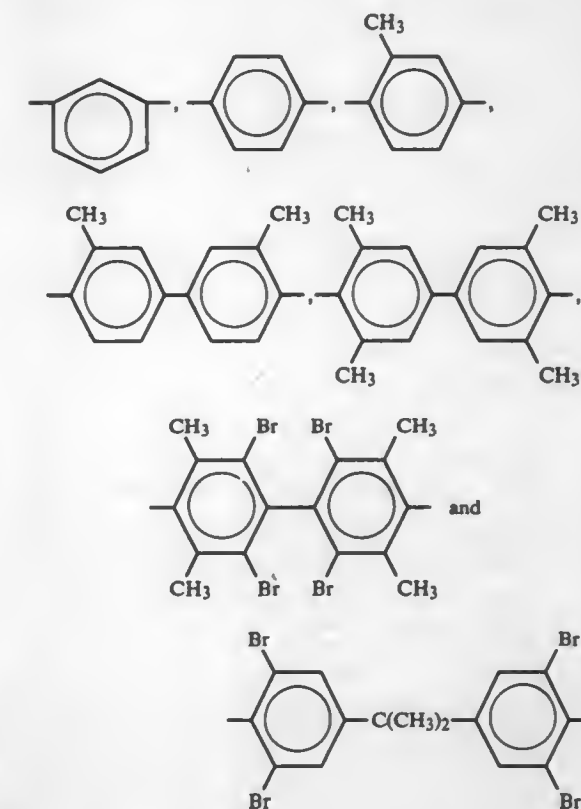
wherein A represents a polyamide unit and B represents a polyimide unit of a polyetheramide-imide resin, m represents a mole fraction number greater than or equal to zero, C represents a phenolic resin, a represents a resin blend proportion number greater than zero and less than 1, the sum of a plus b equals 1.0, further wherein said polyamide unit is of the formula:



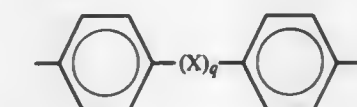
and said polyimide unit is of the formula:



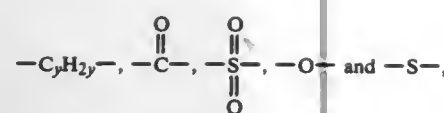
wherein the O—Z—O units of said polyamide or said polyimide units are in the 3 or 3' or 4 or 4' positions and Z is a member of the class consisting of (1)



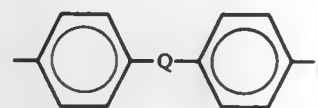
and (2) divalent organic radicals of the general formula



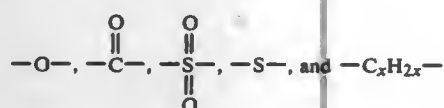
where X is a member selected from the class consisting of divalent radicals of the formulas



where q is 0 or 1, y is a whole number from 1, to 5, and R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6-20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2-20 carbon atoms, C<sub>2-8</sub> alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of



and x is a whole number from 1 to 5 inclusive and further wherein said phenolic resin has an average molecular weight in excess of 125.

4,163,031

#### POWDER COMPOSITION AND METHOD OF PREPARATION

Martin J. Hannon, Martinsville, and Alex S. Forschirm, Parsippany, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,963

Int. Cl.<sup>2</sup> C08L 43/04, 53/00; C09L 83/04

U.S. Cl. 525-5

1. A powder composition useful for coating applications comprising a melt blend mixture of from about 25 to about 90% by weight of

(a) a block copolymer which is selectively hydrogenated to at least some degree and having at least two kinds of polymer blocks wherein one polymer block is designated by A and a second polymer block is designated by B such that prior to hydrogenation,

(1) each A is a polymer end block of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said blocks A comprising from about 5 to about 50% by weight of the total block copolymer, and

(2) each B is a polymer mid block having a number average molecular weight of from about 30,000 to about 300,000, and formed from a conjugated diene selected from homopolymers of at least one conjugated diene having 4 to 10 carbon atoms per molecule, said blocks B comprising from about 50 to about 95% by weight of the total block copolymer, and

(b) from about 10 to about 75% by weight of at least one melt flow modifier selected from the group consisting of (1) monovinyl arene homopolymers, (2) alpha alkyl monovinyl arene homopolymers, and (3) copolymers of monovinyl arenes and alpha alkyl monovinyl arenes,

wherein the aromatic portions of the polymers described in (b)(1), (2) and (3) are at least partially hydrogenated to remove the aromatic character thereof,

wherein said powder composition possesses good melt flow characteristics under zero shear conditions.

4,163,032

#### THERMOPLASTIC MOLDING COMPOSITIONS

Lothar Liebig, Frank Wingler, Karl-Heinz Ott, all of Leverkusen; Gert Humme, Odenthal, and Alfred Pischtschan, Kuersten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,000

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747823

Int. Cl.<sup>2</sup> C08L 51/04

U.S. Cl. 525-74

4 Claims

1. A thermoplastic molding composition comprising a polymer mixture of

(A) 25 to 95% by weight of a graft polymer of 70 to 30% by weight of a mixture of 95 to 50% by weight of styrene and of 5 to 50% by weight of acrylonitrile on 30 to 70% by weight of an EPDM-rubber, and

(B) 5 to 75% by weight of a terpolymer of acrylonitrile, maleic acid anhydride and styrene, the terpolymer containing 10 to 30 parts by weight of acrylonitrile, 7.5 to 15 parts by weight of maleic acid anhydride, and 82.5 to 55 parts by weight of styrene in copolymerised form.

4,163,033

#### METHOD OF POLYMERIZING VINYL HALIDE WITH OLEFIN POLYMERS AND COPOLYMERS AND COMPOSITIONS THEREOF

Akio Takahashi, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 674,202, Apr. 5, 1976, which is a continuation-in-part of Ser. No. 427,895, Dec. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 251,099, May 8, 1972, abandoned. This application Nov. 30, 1976, Ser. No. 746,046

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C08F 255/2, 255/4, 255/6, 255/10

U.S. Cl. 525-53

44 Claims

1. In the process for the preparation of a vinyl chloride polymer comprising polymerizing in bulk in liquid phase vinyl chloride alone or in combination with up to 50% by weight based on the total weight of monomer of another ethylenically unsaturated monomer copolymerizable therewith, in the presence of a trunk polymer and a free radical initiator compound for said polymerization, wherein the trunk polymer is present during the polymerization only during the period which commences at 0% to about 20% conversion of the monomer or monomers to polymer and concludes with the end of the polymerization, the improvement which comprises employing as the trunk polymer about 0.05% to about 20% by weight, based upon said vinyl chloride monomer, of a trunk polymer consisting essentially of an olefin trunk polymer which is selected from the group consisting of:

(A) a homopolymer of an aliphatic hydrocarbon olefin monomer of 2 to 8 carbon atoms,

(B) a copolymer of two or more of said olefin monomers, and

(C) a polymer of at least one of said olefin monomers and no more than 15% by weight, based on the weight of the polymer, of a non-conjugated aliphatic hydrocarbon polyene of 4 to 18 carbon atoms wherein all of the carbon-to-carbon double bonds do not form a conjugated system, said olefin polymer being soluble, partially soluble or dispersible in said monomer or monomers of the polymerization reaction, and said olefin polymer having a weight average molecular weight of about 50,000 to about 1,000,000.

4,163,034

#### POLYPHOSPHINITES AND A PROCESS FOR THEIR PREPARATION

Walter Dürsch; Fritz Linke, both of Königstein, and Manfred Flnke, Fischbach, all of Fed. Rep. of Germany, assignors to Hoechst AG., Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 749,792, Dec. 13, 1976, Pat. No. 4,096,208. This application Jan. 23, 1978, Ser. No. 871,755

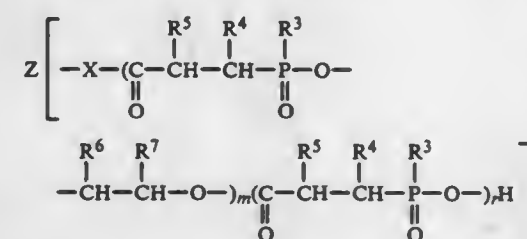
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1975, 2556482; Oct. 9, 1976, 2645786; Oct. 22, 1976, 2647745

Int. Cl.<sup>2</sup> C07F 9/32

U.S. Cl. 260-931

3 Claims

1. Compounds of the general formula



in which

X is NR<sup>1</sup> with R<sup>1</sup> being hydrogen or (C<sub>1</sub>-C<sub>4</sub>)-alkyl,

R<sup>3</sup> is a (C<sub>1</sub>-C<sub>4</sub>)-alkyl group which may be substituted, preferably monosubstituted, by halogen, especially chlorine, a cycloalkyl group having up to 8 carbon atoms, especially cyclopentyl, cyclohexyl, an alkenyl group having up to 4 carbon atoms, especially vinyl and allyl, a phenyl or benzyl group optionally substituted by halogen, preferably chlorine and/or bromine, and preferably carrying 1 to 3 substituents,

R<sup>4</sup> is hydrogen or a (C<sub>1</sub>-C<sub>4</sub>)-alkyl group, preferably methyl, R<sup>5</sup> is hydrogen or a (C<sub>1</sub>-C<sub>2</sub>)-alkyl group, preferably methyl, with at least one of the radicals R<sup>4</sup> and R<sup>5</sup> preferably being hydrogen,

R<sup>6</sup> is hydrogen, methyl, chloromethyl,

R<sup>7</sup> is hydrogen, methyl or ethyl, preferably hydrogen,

m stands for numbers in the range of from 1 to 20, preferably from 2 to 20, especially from 2 to 6,

n stands for numbers in the range of from 1 to 6, preferably from 2 to 6,

r is 0 to 1, preferably 0,

Z is a n-valent radical of the group consisting of C<sub>1</sub>-C<sub>18</sub> alkyl which may be interrupted by an amino group; phenyl which may be substituted by halogen atoms; benzy; biphenyl or di-cyclohexylmethane.

4,163,035

#### AQUARIUM WATER AERATION DEVICE

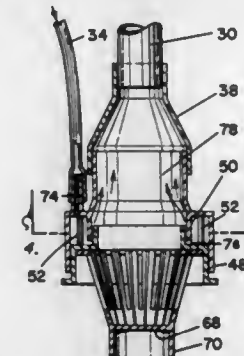
Egon Gorsky, 306 W. Dudley Ave., Westfield, N.J. 07090, assignor to Egon Gorsky, Westfield, N.J.

Filed Jan. 16, 1978, Ser. No. 869,576

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 261-77

10 Claims



1. In combination, a water tube and aerator apparatus comprising a tube having first and second ends and an aerator

housing comprising an upper body member and a lower body member, said upper body member including a water chamber therein and connected to said second tube end, said lower body member having water inlet means, said upper body member having an interior wall surface and a first circumferential wall spaced from the interior wall surface and defining an air chamber therebetween, air inlet means in communication with said air chamber, said lower body member of said aerator housing having a second circumferential wall defining a passageway therethrough in communication with said water chamber, said second circumferential wall including a top edge and a surface disposed adjacent to said first circumferential wall of said upper body member to form a large plurality of axially extending air passages communicating with said air chamber and opening into said water chamber contiguous with the top edge of said second circumferential wall, whereupon air pumped into said air chamber passes through said passages to form a large plurality of minute air streams directed axially upward into said water chamber for sparging water therein and moving said water into said tube.

4,163,036

#### PROCESS FOR PRODUCING MINERAL WOOL FIBERS PROVIDED WITH A BINDER

Wilhelm Ransmayr, and Heinz Mally, both of Linz, Austria, assignors to Vereinigte Oesterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft, Vienna, Austria

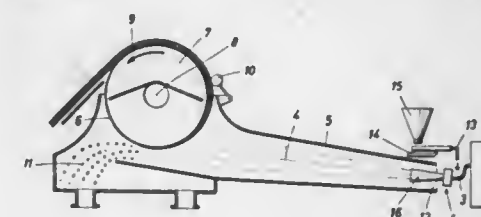
Filed Sep. 26, 1977, Ser. No. 836,608

Claims priority, application Austria, Sep. 30, 1976, 7279/76

Int. Cl.<sup>2</sup> B01J 2/02

U.S. Cl. 264-12

4 Claims



1. A process of producing mineral wool fibers provided with a binder, which comprises

producing a stream of molten mineral material, adding binder powder which is compatible with said mineral material to said stream in a predetermined proportion, and jointly blasting said mineral material stream containing said binder powder through a blasting nozzle to form mineral wool fibers provided with said binder.

4,163,037

#### METHOD FOR MAKING THERMOPLASTIC FOAMS

George E. Niznik, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 669,028, Mar. 22, 1976, Pat. No. 4,097,425, and a continuation-in-part of Ser. No. 608,451, Aug. 28, 1975, abandoned. This application Mar. 15, 1978, Ser. No. 886,726

Int. Cl.<sup>2</sup> B29H 7/20

U.S. Cl. 264-54

8 Claims

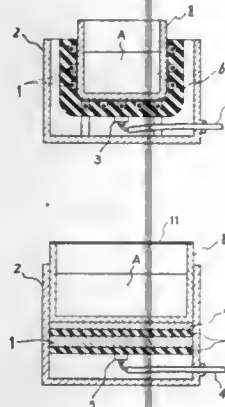
1. A method for making a shaped thermoplastic foam which comprises,

(1) making a substantially uniform blend of a dihydrooxadiazinone and an organic thermoplastic polymer, where there is utilized from 0.1 to 1.0% by weight of dihydrooxadiazinone, based on the weight of the blend, and

(2) injection molding the blend at temperatures in the range of between about 170° C. to about 400° C.



**4,163,038**  
**FUMIGATING METHOD AND APPARATUS**  
 Akira Nishimura; Takano Kashiwara; Fukuyasu Okuda, and Masanaga Yamaguchi, all of Aiko, Japan, assignors to Earth Chemical Company, Limited, Hyogo, Japan  
 Filed Mar. 2, 1978, Ser. No. 882,921  
 Claims priority, application Japan, Mar. 3, 1977, 52/23475; Apr. 20, 1977, 52/45585; May 13, 1977, 52/61975[U]  
 Int. Cl.<sup>2</sup> A61L 1/00, 3/00; A01M 13/00  
 U.S. Cl. 422—36 16 Claims



1. A fumigating method comprising heating a mixture of an active ingredient and a blowing agent indirectly with a heating element capable of evolving heat by application of an electric current or a heating element capable of evolving heat by contact with air to thermally decompose the blowing agent without entailing combustion and to volatilize the active ingredient, said blowing agent being decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas and contacting an object, material or area to be treated with the so-generated fumigant.

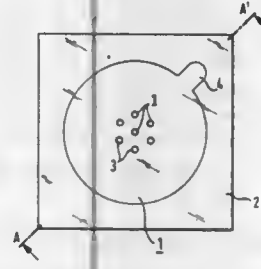
11. A fumigating apparatus for practicing the method as defined in claim 1 comprising accommodated therein a mixture of an active ingredient and a blowing agent, and a heating element capable of evolving heat by application of an electric current, the mixture and the heating element being separated from each other by a partition interposed therebetween and providing a heat transfer surface, said blowing agent being decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas.

14. A fumigating apparatus for practicing the method as defined in claim 1 comprising accommodated therein a mixture of an active ingredient and a blowing agent, and a heating element capable of evolving heat by contact with air, the mixture and the heating element being separated from each other by a partition interposed therebetween and providing a heat transfer surface, said blowing agent being decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas.

**4,163,039**  
**DIAGNOSTIC MEANS FOR THE RAPID DETECTION OF MUCOVISCIDOSIS**  
 Hinderk M. Emrich, Lortzingsstrasse 16, D-8011 Vaterstetten, Fed. Rep. of Germany  
 Filed Jan. 11, 1978, Ser. No. 868,556  
 Int. Cl.<sup>2</sup> G01N 33/16  
 U.S. Cl. 422—56 12 Claims

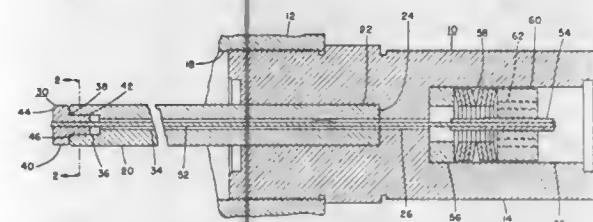
1. Diagnostic means for the rapid detection of mucoviscidosis, comprising  
 (1) an absorbent sheet,  
 (2) an indicator associated with said sheet, said indicator producing a color change when the diagnostic means is contacted by a subject's sweat having a concentration of sodium or chloride ions of at least 50 meq./l; and

(3) a transparent envelope which envelops the indicator-associated sheet, said envelope being perforated on one



surface to permit absorption of sweat directly from the skin surface of the subject into said absorbent sheet.

**4,163,040**  
**CATALYST SPRAY NOZZLE**  
 Henri A. Van den Bossche, Antwerp, Belgium, assignor to National Distillers and Chemical Corporation, New York, N.Y.  
 Filed Nov. 21, 1977, Ser. No. 853,601  
 Int. Cl.<sup>2</sup> B01J 3/04; B05B 1/32; C08F 110/02  
 U.S. Cl. 422—131 1 Claim



1. In a high pressure reactor for polymerizing ethylene into polyethylene, the improvement comprising a liquid catalyst injection nozzle for injecting a finely atomized spray of liquid catalyst into the reactor, said nozzle comprising:

(a) an injector housing having therein an injection passageway with a discharge end through which liquid catalyst is injected into the reactor, said injection passageway comprising a first cylindrical portion proximate the discharge end of said passageway, and a second cylindrical portion having a larger diameter than said first portion of the injection passageway, said housing at said discharge end having a flat, radially oriented annular surface;

(b) a valve element for closing the discharge end of said passageway comprising a first section having a substantially cylindrical shape which is positioned within said first cylindrical portion of said passageway and having a plurality of flats formed in the cylindrical outer wall of the first section, said flats extending axially along the first portion of the passageway to permit liquid catalyst to flow axially through gaps formed between the first cylindrical portion of the injection passageway and the flats on the first section of the valve element, and a second cylindrical section having a larger diameter than said first section, with an annular shoulder being formed at the juncture of said sections, said annular shoulder being arranged at the discharge end of said injection passageway, the surface of said annular shoulder being complementary to said flat, radially-oriented annular surface on said housing and adapted to close thereagainst;

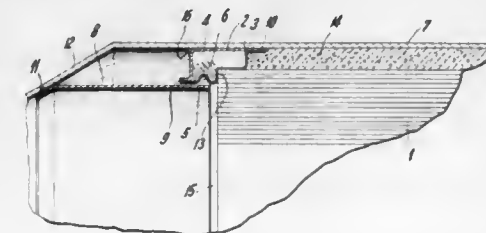
(c) means mounted entirely within said housing for normally biasing said complementary surface of said valve element into closing engagement with said annular surface at the discharge end of said passageway with a predetermined force including a plurality of Belleville spring washers arranged coaxially within said second cylindrical portion of the injection passageway;

(d) a rod extending axially through said injection passageway and through said Belleville washers and being con-

nected at one end to said first cylindrical section of the valve element and at the other end to said Belleville spring washers for biasing the annular shoulder of the valve element against the discharge end of the injection passageway, said rod including an external threaded portion at the end portion thereof adjacent the washers, and a nut having internal threads threadably engaged with the external threads on said threaded portion of the rod, said nut being mounted on said rod and bearing against the Belleville washer located axially remotest from the discharge end of said injection passageway, said nut being adapted to be adjustably screwed onto the rod for selectively adjusting said predetermined force biasing the annular shoulder of the valve element against the discharge end of the injection passageway, a plurality of axial holes in said nut extending therethrough to allow for the flow of liquid catalyst through said passageway; and

(e) means for enabling the liquid catalyst to be supplied to said injection passageway at a pressure in excess of and opposite to the predetermined force of said biasing means to bias said valve element away from engagement with the discharge end of said injection passageway and facilitate liquid catalyst to be expelled through the space therebetween, atomizing said liquid catalyst and causing said catalyst to be injected into the reactor as an atomized spray.

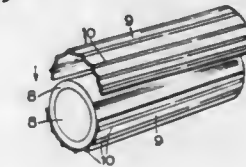
**4,163,041**  
**SUPPORT FOR ELASTICALLY MOUNTING A CERAMIC HONEYCOMB CATALYST**  
 Gerhard Gaysert, Esslingen, Fed. Rep. of Germany, assignor to J. Eberspacher, Esslingen, Fed. Rep. of Germany  
 Filed May 29, 1974, Ser. No. 474,163  
 Int. Cl.<sup>2</sup> F01N 3/15; B01J 35/04, 8/02  
 U.S. Cl. 422—179 8 Claims



1. A catalyst support arrangement comprising an axially extending ceramic, honeycomb catalyst having a first end and a second end each extending transversely of the axis thereof, an axially extending tubular housing laterally enclosing said catalyst and arranged to be traversed by the exhaust gases of an internal combustion engine so that the exhaust gases flow axially through said housing and over said honeycomb catalyst, said housing having an inner surface, at least one ring-shaped holding member mounted within the housing adjacent the first end of said catalyst with the axis thereof extending in generally parallel relation with the axis of said housing, wherein the improvement comprises that said holding member has an axially extending inner wall spaced radially inwardly from the inner surface of said housing, an axially extending outer wall spaced radially outwardly from said inner wall, a first end wall extending transversely of the radially inner and outer walls and located between the first end and second end of said catalyst and a second end wall spaced from said first end wall and extending transversely of said radially inner and outer walls with said second end wall spaced axially outwardly from the first end of said catalyst and with said inner and outer walls and said first and second end walls defining a closed generally box-shaped cavity, said holding member includes an annular rigid holding angle having a first leg extending in the axial direction of said housing and a second leg extending transversely of the axial direction of said housing with said second leg extending radially inwardly from said first leg and said

second leg forming said second end and said first leg forming said outer wall, and a molded part formed of a soft flexible material and forming said inner wall and said first end, said molded part secured to said second leg of said holding angle and disposed in sliding contact with said first leg of said holding angle and said molded part forming a shoulder extending transversely of the axial direction of said housing and elastically supporting the first end of said catalyst.

**4,163,042**  
**CONTAINERS FOR CATALYSTS FOR EXHAUST EMISSION CONTROL**  
 John H. Lynch, St. Annes-on-Sea, England, assignor to T.I. Silencer Services Limited, Lancashire, England  
 Filed Jan. 14, 1974, Ser. No. 433,371  
 Claims priority, application United Kingdom, Jan. 13, 1973, 1879/73; Aug. 3, 1973, 37064/73  
 Int. Cl.<sup>2</sup> B01J 8/00; F01N 3/15  
 U.S. Cl. 422—179 5 Claims



1. A container assembly for an exhaust emission control catalyst comprising a cylindrical substrate body carrying said catalyst and having a cylindrical surface and two end faces designed for exhaust gas flow from one of said end faces to the other, a compressible resilient cushioning layer surrounding the cylindrical surface of said body, an open-seam sheet metal shroud surrounding said cushioning layer, said shroud, by virtue of the open seam, being of variable circumference and being thereby compressible around said cushioning layer, said shroud having formed in the wall thereof a plurality of outwardly projecting circumferentially spaced ribs, and a cylindrical sheet metal casing of fixed circumferential dimensions, in which said substrate, enclosed in said cushioning layer and said shroud, is received, with said ribs on said shroud making line contact with the inner surface of said casing and the remainder of said shroud being spaced away from said casing, the circumferential dimensions of said casing being such that said cushioning layer is under compression by the action of said shroud.

5. A method of assembling a cylindrical body of a monolithic substrate carrying an exhaust emission control catalyst into a cylindrical housing of fixed circumferential dimension comprising the steps of wrapping a resilient cushioning layer around the cylindrical surface of said body, enclosing the wrapped cushioning layer in an open-seam sheet metal substantially cylindrical shroud, said shroud being of variable circumferential extent by virtue of said open-seam and said shroud having formed thereon a plurality of circumferentially spaced outwardly projecting longitudinally extending ribs, each of said ribs tapering to zero at one end of said shroud, the housing and layer of cushioning material being selected that the resulting assembly of said substrate body, layer of cushioning material and shroud has a greater circumferential dimension than said housing, squeezing said shroud such as to compress said cushioning layer until the circumferential dimension of said shroud at least at the end where the ribs taper to zero is less than the circumferential dimension of said housing, inserting said end into said housing, and thereafter exerting an axial force on said assembly until it comes to rest within said housing



with said ribs resiliently urged into line contact with the inner surface of said housing by the resilience of said cushioning layer.

4,163,043

**PROCESS FOR REMOVING H<sub>2</sub>S AND CO<sub>2</sub> FROM GASES AND REGENERATING THE ADSORBING SOLUTION**  
Claude Dezel, Maisons Laffitte; André Deschamps, Noisy le Rol, and Sigismund Franckowiak, Rueil Malmaison, all of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

Filed Mar. 24, 1978, Ser. No. 889,803

Claims priority, application France, Mar. 25, 1977, 77 09255 Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—234 10 Claims

1. A process for selectively desulfurizing a gas containing both hydrogen sulfide and carbon dioxide with sulfur dioxide production, which process comprises the steps of:

- contacting said gas with an aqueous absorption solution of sodium hydroxide, potassium hydroxide or ammonia to absorb said hydrogen sulfide and said carbon dioxide as sodium sulfide, potassium sulfide or ammonium sulfide respectively and sodium carbonate, potassium carbonate or ammonium carbonate, respectively;
- reacting resultant sulfide and carbonate-containing solution from step (a) with copper oxide to form a precipitate consisting essentially of copper sulfide, and to produce additional sodium hydroxide, potassium hydroxide or ammonia in the solution;
- separating said precipitate consisting essentially of copper sulfide from resultant solution of step (b);
- roasting separated copper sulfide precipitate from step (c) to convert said copper sulfide to copper oxide and sulfur dioxide, and separately recovering resultant copper oxide and a sulfur dioxide containing gas;
- recycling resultant copper oxide from step (d) to step (b) as said copper oxide, and (f) recycling separated solution from step (c) to step (a) as said aqueous absorption solution.

4,163,044

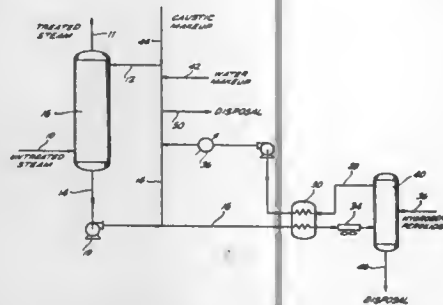
**METHOD FOR REMOVING HYDROGEN SULFIDE FROM STEAM**

Byron B. Woertz, Claremont, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Nov. 25, 1977, Ser. No. 854,486

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—234 13 Claims



1. A process for continuously treating hydrogen sulfide-containing steam to reduce the hydrogen sulfide content of the steam, comprising:

- contacting said hydrogen sulfide-containing steam in a contacting stage with an aqueous alkaline solution comprised of a water-soluble alkali metal hydroxide so as to absorb hydrogen sulfide from said steam and produce a treated steam having a reduced hydrogen sulfide content, said solution being introduced into contacting stage at a temperature between about 212° F. and 700° F. which is

about the temperature of the steam entering said contacting stage;

- withdrawing said aqueous, alkaline solution containing absorbed hydrogen sulfide from said contacting stage;
- introducing hydrogen peroxide into at least a portion of said aqueous alkaline solution containing absorbed hydrogen sulfide to effect a reduction in the sulfide content of the solution and form a treated solution containing environmentally harmless reaction products, said portion of said aqueous solution to which said hydrogen peroxide is introduced being at a temperature which substantially prevents thermal decomposition of the hydrogen peroxide introduced thereinto;
- heating said treated solution to about the temperature of the steam entering the contacting stage; and
- recycling said heated, treated solution to said contacting stage to provide at least a portion of said aqueous alkaline solution introduced thereinto.

4,163,045

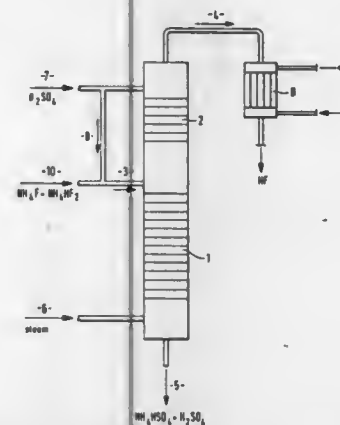
**PROCESS FOR PRODUCING HYDROGEN FLUORIDE FROM AN AQUEOUS SOLUTION OF HYDROGEN FLUORIDE AND SULFURIC ACID**

Arie Van der Meer, Helsinki, and Lauri A. Lepomaa, Espoo, both of Finland, assignors to Kemira OY, Helsinki, Finland  
Filed Dec. 15, 1977, Ser. No. 860,971

Claims priority, application Finland, Dec. 27, 1976, 763707; Dec. 27, 1976, 763708

Int. Cl.<sup>2</sup> C01B 7/22

U.S. Cl. 423—483 2 Claims



1. A process for separating hydrogen fluoride from an aqueous solution of hydrogen fluoride and sulfuric acid, comprising stripping the aqueous solution of hydrogen fluoride and sulfuric acid by steam in a separation zone; passing hydrogen fluoride released in said steam stripping through a drying zone and contacting it in the drying zone with a batch of strong sulfuric acid in order to produce generally water-free hydrogen fluoride of a desired concentration; and passing the sulfuric acid from the drying zone to the separation zone, said steam being absorbed substantially in the sulfuric acid.

4,163,046

**RECOVERY OF SELENIUM**

Kohur N. Subramanian; Alexander Illis, both of Mississauga, and Norman C. Nissen, Oakville, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,384

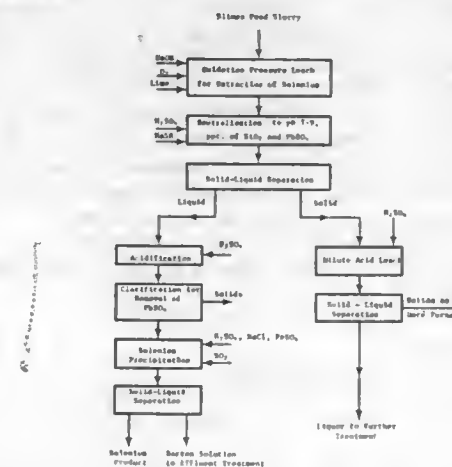
Claims priority, application Canada, May 24, 1977, 279062 Int. Cl.<sup>2</sup> C01B 19/00

U.S. Cl. 423—510 11 Claims

1. A process for recovery of selenium from anode slimes containing selenium comprising:

- subjecting such slimes to a caustic oxidative leach to convert selenium values to the hexavalent form;

(b) neutralizing the product of the caustic leach with sulfuric acid to a pH of about 7 to about 9 with subsequent separation of the leach residue from the neutralized caustic leach solution;



(c) acidifying the separated neutralized leach solution with sufficient sulfuric acid to provide an acidified solution containing about 100 to about 200 grams per liter of sulfuric acid, and

(d) clarifying the resultant solution to obtain a further purified selenium-containing solution.

4,163,047

**PROCESS FOR PRODUCING SULFURIC ACID FROM WASTE ACID AND IRON SULFATE**

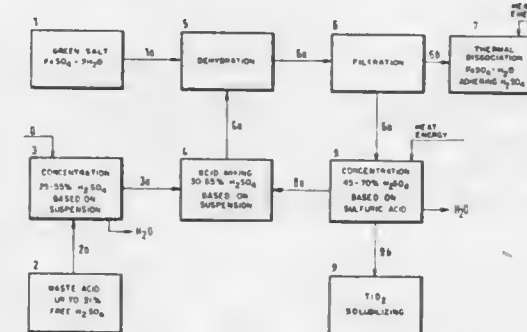
Karl-Heinz Dörr, Mainz; Georg Daradimos, Mainz; Hugo Grimm; Georg Schmidt, both of Frankfurt am Main; Rudolf Gerken, Krefeld-Traar; Christoph Mücke, Krefeld-Bockum, and Hermann Wieschen, Cologne, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed Jan. 30, 1977, Ser. No. 811,798

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1976, 2630196

Int. Cl.<sup>2</sup> C01B 17/90, 17/50; C01G 23/00, 49/02

U.S. Cl. 423—531 11 Claims



1. A process for the recovery of sulfuric acid from waste sulfuric acid containing iron sulfate and from solid iron sulfate of high water content of crystallization which consists essentially of:

- concentrating waste sulfuric acid to an acid concentration of 25-55 weight percent, based upon the suspension, by removing water therefrom;
- mixing the concentrated acid of Step A with recycled concentrated sulfuric acid obtained from Step E to form a resultant acid mixture of acid concentration of 30-65 weight percent, based upon the suspension;
- adding said solid iron sulfate of high water content of

crystallization to the acid mixture of Step B thereby obtaining iron sulfate of low water content of crystallization;

D. separating the iron sulfate of low water content from the resultant sulfuric acid solution of Step C;

E. concentrating the separated sulfuric acid solution of Step D to an acid concentration of 45-70 weight percent, based on salt-free acid, and recycling at least a portion thereof to Step B; and

F. thermally decomposing the iron sulfate from Step D to produce iron oxide and sulfur dioxide.

4,163,048

**ACYLAMINO-1,2,4-OXADIAZOLE OR THIADIAZOLE DERIVATIVES AS ANTI-HYPERSENSITIVITY AGENTS**

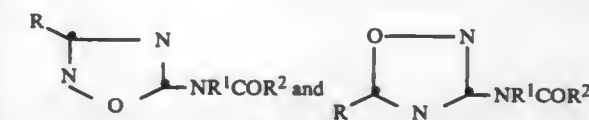
William J. Ross, Lightwater; John P. Verge, Henley-on-Thames, and William R. N. Williamson, Slough, all of England, assignors to Lilly Industries Limited, London, England  
Division of Ser. No. 691,952, Jun. 1, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,943

Claims priority, application United Kingdom, Jun. 5, 1975, 24224/75

Int. Cl.<sup>2</sup> A61K 31/42, 31/425

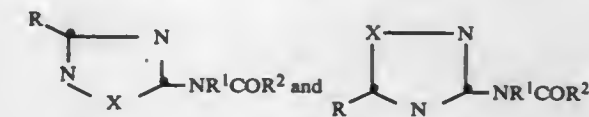
U.S. Cl. 424—45 6 Claims

1. A pharmaceutical formulation for the treatment of an immediate hypersensitivity condition of the type represented by asthma, comprising as active ingredient a chemotherapeutically-effective amount of a compound selected from the group consisting of:



wherein R is C<sub>1-4</sub> haloalkyl, C<sub>1-4</sub> alkyl, C<sub>3-10</sub> cycloalkyl, or halogen; R<sup>1</sup> is C<sub>1-10</sub> alkyl, 2-propenyl, C<sub>3-6</sub> alkynyl, C<sub>2-6</sub> alkoxyalkyl, C<sub>2-6</sub> carboxyalkyl, C<sub>1-6</sub> haloalkyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl or optionally R<sup>3</sup>-substituted phenyl-C<sub>1-6</sub> alkyl; R<sup>2</sup> is C<sub>1-8</sub> alkyl, C<sub>1-6</sub> haloalkyl, C<sub>2-6</sub> alkenyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, optionally R<sup>3</sup>-substituted phenyl, optionally R<sup>3</sup>-substituted phenyl-C<sub>1-6</sub> alkyl or optionally R<sup>3</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl; and R<sup>3</sup> is halogen, trifluoromethyl, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy or nitro; provided that when R<sup>1</sup> is C<sub>3-6</sub> alkynyl, the —C≡C— group cannot be directly adjacent to the nitrogen; in admixture with a pharmaceutically acceptable carrier therefor.

4. A method of treating an animal suffering from or susceptible to an immediate hypersensitivity condition of the type represented by asthma which comprises administering to the animal a chemotherapeutically effective amount of a compound selected from the group consisting of:



wherein X is O or S; R is C<sub>1-4</sub> alkyl, C<sub>3-10</sub> cycloalkyl, optionally R<sup>3</sup>-substituted phenyl or halogen; R<sup>1</sup> is C<sub>1-10</sub> alkyl, 2-propenyl, C<sub>2-6</sub> alkoxyalkyl, C<sub>2-6</sub> carboxyalkyl, C<sub>1-6</sub> haloalkyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl or optionally R<sup>3</sup>-substituted phenyl-C<sub>1-6</sub> alkyl; R<sup>2</sup> is C<sub>1-8</sub> alkyl, C<sub>1-6</sub> haloalkyl, C<sub>2-6</sub> alkenyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, optionally R<sup>3</sup>-substituted phenyl, optionally R<sup>3</sup>-substituted phenyl-C<sub>1-6</sub> alkyl or optionally R<sup>3</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl; and R<sup>3</sup> is halogen, trifluoromethyl, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy or nitro; provided that: when X is O; R is phenyl and R<sup>2</sup> is methyl, R<sup>1</sup> cannot be methyl or benzyl.



**4,163,049**  
**COMPOSITION ACTIVE WITH RESPECT TO**  
**ERYTHEMA SOLARE**

Michel F. Aubin, Fougères Agris, France, assignor to Societe d'Etudes et de Participation O.H.F., Asnières, France  
Filed May 6, 1977, Ser. No. 794,588

Claims priority, application France, May 6, 1976, 76 13599  
Int. Cl.<sup>2</sup> A61K 7/42, 35/64, 35/78

U.S. Cl. 424—59

7 Claims

1. A composition active with respect to erythema solare, which comprises synergistic a mixture of tinctures of *Apis mellifica* at a dilution of from 4° CH to 15° CH and *Calendula* at a dilution of from a third decimal to 9° CH.

**4,163,050**  
**METHOD OF TREATING HYPERCHOLESTEROLEMIA**  
**WITH CANDIMYCIN**

Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.  
Division of Ser. No. 521,289, Nov. 6, 1974, Pat. No. 4,039,659, which is a division of Ser. No. 177,512, Sep. 2, 1971, Pat. No. 3,855,409, which is a continuation of Ser. No. 221,062, Jan. 26, 1972, Pat. No. 3,966,910, and a continuation of Ser. No. 24,797, Apr. 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, Mar. 31, 1967, Pat. No. 3,627,879. This application May 9, 1977, Ser. No. 794,920

Int. Cl.<sup>2</sup> A61K 35/00

U.S. Cl. 424—115

3 Claims

1. A process for treating hypercholesterolemia in a large mammal in need of said treatment which comprises orally administering an effective dose for treating hypercholesterolemia of candimycin to said mammal.

**4,163,051**  
**STREPTOMYCETAL ANTIBIOTIC**  
Stephen J. Box, Horsham, and John D. Hood, Cranleigh, both of England, assignors to Beecham Group Limited, Great Britain  
Continuation-in-part of Ser. No. 716,971, Aug. 23, 1976, abandoned, which is a division of Ser. No. 664,917, Mar. 8, 1976, abandoned. This application Sep. 23, 1976, Ser. No. 725,864  
Claims priority, application United Kingdom, Mar. 15, 1975, 10914/75

Int. Cl.<sup>2</sup> A61K 35/00

U.S. Cl. 424—124

9 Claims

1. A process for the preparation of the di-sodium or di-potassium salt of MM 17880 which is at least 75% pure wherein MM 17880 is a di-acidic solid of the molecular formula  $C_{11-14}H_{18-25}O_{8-11}N_2S_2$  which in the form of a substantially pure di-sodium salt has the following characteristics:

- when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infrared spectrum substantially as shown in FIG. 1;
- it has a characteristic nuclear magnetic resonance spectrum which when taken in deuterium oxide is substantially as shown in FIG. 2;
- it has a characteristic ultra-violet spectrum which in water has an absorption maximum at about 297 n.m. substantially as shown in FIG. 3;
- it possesses antibacterial activity against certain gram-positive and gram-negative organisms, including strains of *Bacillus subtilis*, *Enterobacter cloacae*, *Escherichia coli*, *Klebsiella aerogenes*, *Proteus mirabilis*, *Salmonella typhimurium*, *Serratia marcescens* and *Staphylococcus aureus*; and
- when mixed with ampicillin or amoxycillin, it synergizes their antibacterial activity against certain bacteria, including strains of *Staphylococcus aureus* and *Klebsiella aerogenes*;

which comprises chromatographically purifying a solution of MM 17880 by passing said solution in an aqueous lower alcohol through a bed containing a recoverable amount of cellulose, collecting those fractions having a UV absorption maximum at about 297 nm and removing the solvent from the solution

thereby obtaining the di-sodium or di-potassium salt of MM 17880 in at least 75% purity.

**4,163,052**  
**PESTICIDAL**  
**O-[3-T-BUTYLPYRAZOL-5-YL]PHOSPHORIC AND**  
**THIONOPHOSPHORIC ACID ESTERS**

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Rolf Schröder, all of Wuppertal; Wolfgang Behrenz, Overath; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Aug. 24, 1977, Ser. No. 827,512

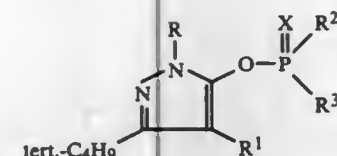
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639258

Int. Cl.<sup>2</sup> A01N 9/36; C07F 9/65

U.S. Cl. 424—200

10 Claims

1. A compound of the formula



in which

R is hydrogen, alkyl with 1 to 4 carbon atoms, cyanoalkyl with 1 to 4 alkyl carbon atoms, or phenyl optionally carrying at least one halogen, or halogenoalkyl, alkyl or alkylthio substituent wherein the alkyl has up to 4 carbon atoms,

R<sup>1</sup> is hydrogen, halogen, or alkyl or alkylthio with 1 to 6 carbon atoms.

R<sup>2</sup> is alkoxy or alkyl with 1 to 8 carbon atoms, or phenyl, R<sup>3</sup> is alkoxy with 1 to 6 carbon atoms, and

X is oxygen or sulphur.

9. A method of combating arthropods, nematodes or fungi which comprises applying to such arthropods, nematodes or fungi or to a habitat thereof an arthropodically, nematocidally or fungicidally effective amount of a compound according to claim 1.

**4,163,053**  
**ANTI-HYPERTENSIVE 5-[2-(SUBSTITUTED**  
**ANILINOALKYLAMINO)-1-HYDROXYALKYL]-**  
**SALICYLAMIDES**

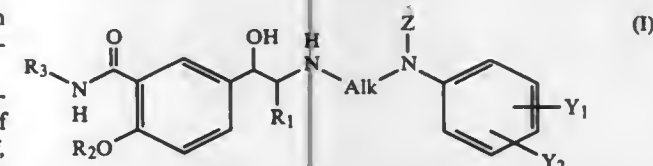
Bernard R. Neustadt, and Elijah H. Gold, both of West Orange, N.J., assignors to Schering Corporation, Kenilworth, N.J.  
Filed Dec. 27, 1977, Ser. No. 864,983

Int. Cl.<sup>2</sup> C07C 103/26, 143/75; A61K 31/165, 31/18

U.S. Cl. 424—230

22 Claims

1. A compound of the formula



wherein

R<sub>1</sub> is hydrogen or lower alkyl;  
R<sub>2</sub> is hydrogen, lower alkyl, lower alkoxy(lower)alkyl, or hydroxy(lower)alkyl;

R<sub>3</sub> is hydrogen or lower alkyl;  
Alk is an acyclic or cyclic alkylene bridge containing 2–10 carbon atoms, with the proviso that there are 2–6 carbon atoms separating the nitrogen atoms;

Z is hydrogen, lower alkyl, lower alkanoyl, lower alkylsul-

fonyl, arylsulfonyl, lower alkoxy(lower)alkyl or 2,2,2-trifluoroethyl;

Y<sub>1</sub> and Y<sub>2</sub> are independently hydrogen, halogen, hydroxy, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino, mono- or di- (lower)alkylamino, lower alkanoylamino, lower alkylsulfonylamino, arylsulfonylamino, N-lower alkyl-N-lower alkanoylamino, or N-lower alkyl-N-lower alkylsulfonylamino; and the pharmaceutically acceptable acid addition salts thereof.

12. A pharmaceutical composition useful in the treatment of hypertension containing an antihypertensive amount of a compound of claim 1 together with a pharmaceutical carrier therefor.

17. A method of effecting an antihypertensive response on a mammal in need of such therapy which comprises administering to said mammal a composition of claim 12.

**4,163,054**

**ANTI-HYPERTENSIVE COMPOSITIONS**

Alexander Scriabine, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.  
Division of Ser. No. 766,635, Feb. 8, 1977, Pat. No. 4,086,354, which is a division of Ser. No. 657,825, Feb. 13, 1976, Pat. No. 4,055,645. This application Oct. 12, 1977, Ser. No. 841,269  
Int. Cl.<sup>2</sup> A61K 31/33, 31/15

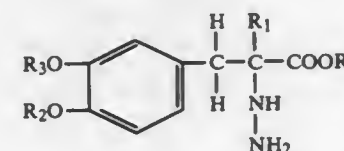
U.S. Cl. 424—244

8 Claims

1. A pharmaceutical composition for treating hypertension containing an effective amount of

- guanethidine or a pharmaceutically acceptable salt thereof, and
- racemic mixture of L-isomer of a hydrazino phenyl propionic acid decarboxylase inhibitor wherein the weight ratio of (b):(a) is 40:1 or less.

2. The pharmaceutical composition of claim 1 wherein said decarboxylase inhibitor has the formula:



wherein R, R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently selected from hydrogen or C<sub>1</sub>–C<sub>4</sub>-alkyl, and pharmaceutically acceptable salts thereof.

**4,163,055**

**2,9-DIOXATRICYCLO[4,3,1,0<sup>3,7</sup>] DECANE DERIVATIVES**  
**AND PHARMACEUTICAL COMPOSITIONS THEREOF**  
Peter W. Thies, Hanover, and Akiji Asai, Wennigsen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany  
Filed Feb. 18, 1977, Ser. No. 770,055

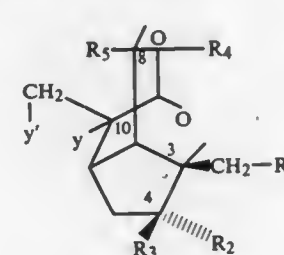
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, 2607106

Int. Cl.<sup>2</sup> C07D 405/06; A61K 31/445

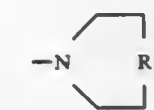
U.S. Cl. 424—267

18 Claims

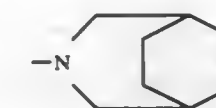
1. A compound selected from the group of 2,9-dioxatricyclo[4,3,0<sup>3,7</sup>] decanes of formula I



wherein R<sub>1</sub> represents a group of the formula



wherein R<sub>10</sub> represents a bond or alkylene containing 1 to 3 carbon atoms or the group of the formula



one of R<sub>2</sub> and R<sub>3</sub> is hydrogen and the other represents hydroxy, an acyloxy group Z—COO— wherein Z is alkyl or alkenyl containing 1 to 4 carbon atoms or phenyl, or a carbamoyloxy group Z—NHCOO— wherein Z is alkyl or alkenyl containing 1 to 4 carbon atoms or phenyl, or R<sub>2</sub> and R<sub>3</sub> jointly represent oxygen;

one of R<sub>4</sub> and R<sub>5</sub> is hydrogen and the other represents alkoxy containing 1 to 6 carbon atoms or benzyloxy;

and y and y' each represent hydrogen or jointly form a bond; and pharmaceutically-acceptable acid addition salts thereof.

10. A pharmaceutical composition comprising an inert carrier material and a sedatively or soporifically effective amount of a compound as defined in claim 1.

**4,163,056**

**PESTICIDAL TRIAZAPENTADIENES**

Odd Kristiansen, Möhlin, and Dieter Dürr, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,673

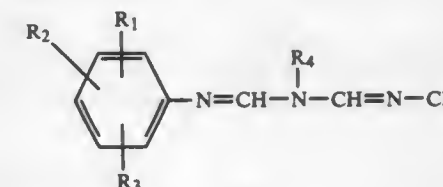
Claims priority, application Switzerland, Sep. 29, 1977, 11911/77

Int. Cl.<sup>2</sup> A01N 9/20; C07C 125/08

U.S. Cl. 424—324

7 Claims

1. A triazapentadiene of the formula



in which R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each hydrogen, halogen, C<sub>1</sub>–C<sub>3</sub> alkyl or trifluoromethyl, and R<sub>4</sub> is C<sub>1</sub>–C<sub>4</sub> alkyl.

7. A method of combatting pests of the class Insecta or of the order Acarina at a locus, which method comprises applying to the locus an insecticidally or acaricidally effective amount of a compound as claimed in claim 1.

**4,163,057**

**ISOXAZOLE-4-CARBOXAMIDES AS TRANQUILIZERS,**  
**SLEEP-INDUCERS AND MUSCLE RELAXANTS**

Jeffrey Nadeison, Denville, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

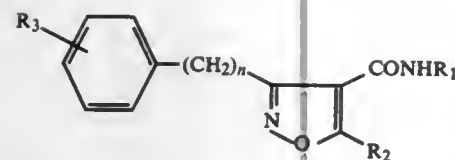
Filed Dec. 27, 1977, Ser. No. 864,380

Int. Cl.<sup>2</sup> A61K 31/42; C07D 261/14, 261/10

U.S. Cl. 424—272

9 Claims

1. A compound of the formula



where

R<sub>1</sub> is hydrogen or lower alkyl having 1 to 4 carbon atoms, and

R<sub>2</sub> is hydrogen or straight chain lower alkyl having 1 to 4 carbon atoms, and

R<sub>3</sub> is hydrogen, fluoro, chloro, lower alkoxy having 1 to 4 carbon atoms or trifluoromethyl,

and

n is 1, 2, 3 or 4.

9. A pharmaceutical composition which comprises a pharmacologically effective amount of a compound of claim 1 and a pharmaceutically acceptable diluent or carrier therefor.

**4,163,058**  
**DERIVATIVES OF 5,5-DIPHENYLHYDANTOIN**  
**EXHIBITING ENHANCED SOLUBILITY AND THE**  
**THERAPEUTIC USE THEREOF**

Valentino J. Stella, Lawrence, and Kenneth B. Sloan, Eudora, both of Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

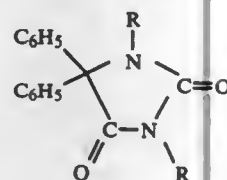
Filed Apr. 22, 1977, Ser. No. 790,087

Int. Cl.<sup>2</sup> A61K 31/415; C07D 233/74

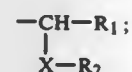
U.S. Cl. 424-273 R

13 Claims

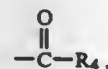
1. A 5,5-diphenylhydantoin compound having the formula:



wherein R represents H or a member selected from the group consisting of



wherein R<sub>1</sub> represents a member selected from the group consisting of H and C<sub>1</sub>-C<sub>7</sub> straight or branched alkyl; wherein X is -O- or -S-; and wherein R<sub>2</sub> represents



wherein R<sub>4</sub> is an acyl residue of any naturally occurring protein amino acid; with the proviso that R in both occurrences cannot represent H simultaneously; or the pharmaceutically acceptable acid addition or basic salts, C<sub>1</sub>-C<sub>4</sub> alkylhalide quaternary salts or N-oxide thereof.

**4,163,059**  
**PESTICIDALLY ACTIVE**  
**4,5-DICHLORO-3-SUBSTITUTED-PHENYLIMINO-1,2-**  
**DITHIOLENES**

Edgar Enders; Ingeborg Haimann; Wilhelm Brandes; Peter Kraus, all of Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,940

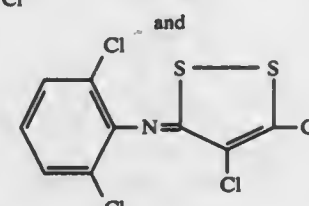
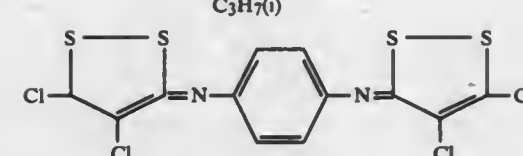
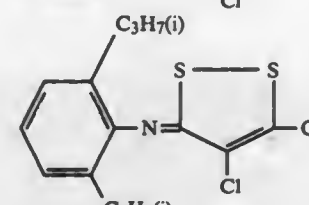
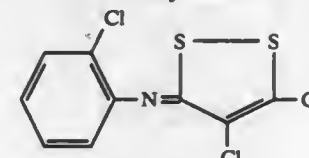
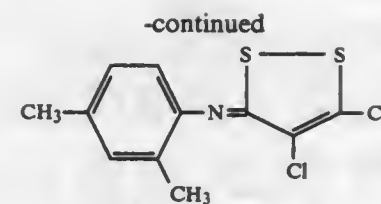
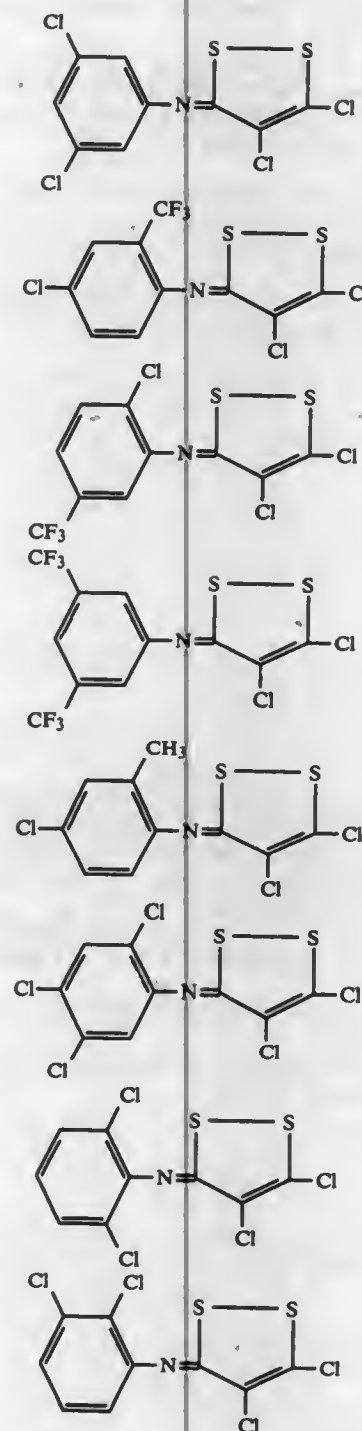
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637692; Feb. 19, 1977, 2707227

Int. Cl.<sup>2</sup> A61K 31/385; C07D 339/02

U.S. Cl. 424-277

15 Claims

1. A compound selected from the group consisting of



14. An arthropodocidal, nematocidal or fungicidal composition containing as active ingredient an arthropodocidally, nematocidally or fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

**4,163,060**  
**ARALKYLAMINO CARBOXYLIC ACIDS AND**  
**DERIVATIVES HAVING SPASMOLYTIC ACTIVITY**  
Jan Hartog, and Johannes M. A. Zwagemakers, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 564,789, Apr. 3, 1975, Pat. No. 4,034,103.

This application Jan. 17, 1977, Ser. No. 759,798

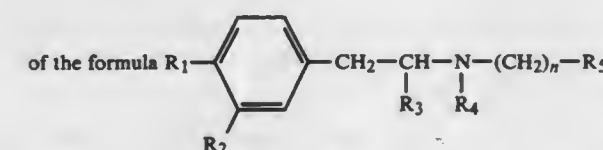
Claims priority, application Netherlands, Apr. 8, 1974, 7404732

Int. Cl.<sup>2</sup> A61K 31/275; C07C 101/16, 103/28, 121/78

U.S. Cl. 424-278

28 Claims

1. Compounds of



wherein R<sub>1</sub> is an alkyl group, an alkoxy group, an alkylthio group or a dialkylamino group, which substituents have up to 2 carbon atoms, a hydroxy group, a hydrogen atom, a chlorine atom or a fluorine atom, R<sub>2</sub> is a hydrogen atom or, if R<sub>1</sub> is a hydrogen atom, one of the remaining substituents summed up for R<sub>1</sub>, while R<sub>1</sub> and R<sub>2</sub> both may be an alkoxy group having 1 or 2 carbon atoms or together a methylene dioxy group or ethylene dioxy group; R<sub>3</sub> is an alkyl group having 1 or 2 carbon atoms; R<sub>4</sub> is an alkyl group having 1 to 3 carbon atoms; n is an integer from 3 to 20 and R<sub>5</sub> is a group COOR<sub>6</sub>, wherein R<sub>6</sub> is

a hydrogen atom, an ethyl group or a propyl group, a group CONR<sub>7</sub>R<sub>7</sub>', wherein R<sub>7</sub> and R<sub>7</sub>' which may be equal or different, each is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms or a group CN providing that when R<sub>6</sub> is a hydrogen atom, n is larger than 5 and salts thereof formed with pharmaceutically acceptable acids.

26. A spasmolytic composition comprising, in a spasmolytically effective amount, a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

**4,163,061**  
**3-PHENYL-2-THIOXO-2H,5H-PYRANO[3,2-c][1]BENZO-**  
**PYRAN-5-ONE DERIVATIVES, A PROCESS OF MAKING**  
**AND A METHOD OF USING THEM AS RODENTICIDES**  
Erik Frandsen, Højby, Denmark; Gottfried Bohtz, Basel, and Günter Mattern, Liestal, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,958

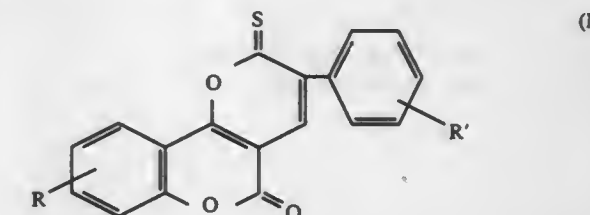
Claims priority, application Switzerland, Apr. 21, 1977, 4955/77

Int. Cl.<sup>2</sup> A01N 9/28; C07D 311/08

U.S. Cl. 424-279

9 Claims

1. A 3-phenyl-2-thioxo-2H,5H-pyrano[3,2-c][1]benzopyran-5-one of the formula I



wherein each of R and R' independently represents hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen.

**4,163,062**  
**FUNGICIDAL**  
**BENZALDEHYDE-N-FORMYL-PHENYLHYDRAZONES**  
Michael T. Clark, Sittingbourne, and Pieter ten Haken, Herne Bay, both of England, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 838,772, Oct. 3, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,652

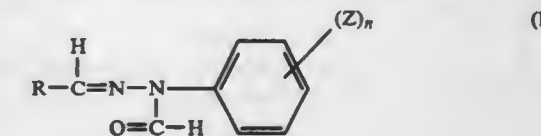
Claims priority, application United Kingdom, Oct. 5, 1976, 41300/76

Int. Cl.<sup>2</sup> A01N 9/20, 9/24; C07C 103/10

U.S. Cl. 424-324

5 Claims

1. A compound, being one of ten having the formula:



the ten being individual species wherein the substituent moieties are as follows, the number preceding the moiety, Z, indicating the position of that moiety on the phenyl ring:

R	N	Z
phenyl	1	4-Cl
4-methoxyphenyl	0	—
4-chlorophenyl	0	—
4-fluorophenyl	0	—
4-bromophenyl	0	—
4-methylphenyl	0	—
3-fluorophenyl	0	—



-continued-

R	N	Z
3-methylphenyl	0	—
4-methylphenyl	1	4-F
4-(isopropyl)phenyl	1	—

3. A method for killing unwanted fungi on plants which comprises subjecting such fungi to a fungicidal amount of a compound of claim 1.

4,163,063

AMINOTETRALIN ADRENERGIC  $\beta$ -AGONISTS

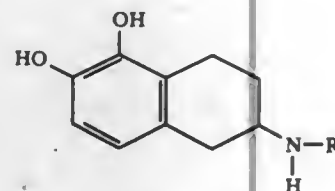
Joseph G. Cannon, and John P. Long, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Jan. 2, 1976, Ser. No. 646,300  
Int. Cl.<sup>2</sup> A61K 31/135

U.S. Cl. 424—330

8 Claims

1. A method of producing smooth muscle tissue relaxation therapy in a mammal requiring such therapy which comprises internally administering to said mammal an amount effective to produce smooth muscle tissue relaxation, of a compound of the formula:



wherein R is alkyl having from 1 to 6 carbon atoms.

4,163,064

## METHOD OF PRODUCING DRIED, DE-SHELLED BRINE SHRIMP CYSTS

Marjorie M. Hill, 9903 Candia Dr., Whittier, Calif. 90603  
Filed Mar. 6, 1978, Ser. No. 884,067  
Int. Cl.<sup>2</sup> A01K 61/00; A23L 1/325

U.S. Cl. 426—2

9 Claims

6. The method of producing an edible and hatchable aquaculture product, comprising the steps of soaking a quantity of dry brine shrimp eggs in fresh water for a time sufficient to saturate the eggs, thereafter denuding said eggs by adding a solution of sodium hypochlorite to said fresh water in sufficient quantity to provide an alkaline medium capable of dissolving the outer shells of said water-soaked eggs and retaining said eggs in said medium for a time sufficient to dissolve the outer shells of said eggs, agitating the eggs in said medium while maintaining the temperature of said medium below 40° C. during the dissolving of said shells, separating the resultant denuded cysts from said medium by pouring said mixture of cysts and medium through a fine mesh, rinsing the separated denuded cysts in an acidic liquid to neutralize any residual alkaline medium thereon, and thereafter drying said denuded cysts while maintaining the temperature of said cysts below 40° C.

4,163,065

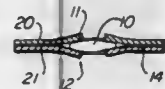
## EDIBLE INTERLOCKED COMPONENTS FOR CEREMONIAL INGESTION

Wallace F. Cilek, St. Paul, Minn., assignor to Eugene T. Cilek and Gregory J. Cilek, both of St. Paul, Minn., part interest to each

Continuation-in-part of Ser. No. 770,397, Feb. 22, 1977, abandoned. This application Apr. 20, 1978, Ser. No. 898,451  
Int. Cl.<sup>2</sup> A21D 13/00; A23L 2/02

U.S. Cl. 426—94

9 Claims



1. A storable wholly edible article for ceremonial religious ingestion, said article consisting of two components of discrete shape interlocked and unified together with each component visible to the naked eye on visual inspection of said article, one of said components consisting of crisp unleavened bread material and the other of said components consisting of a single unitary structure in the form of a capsule of fruit-flavored non-bread material, said capsule being of a darker color than said bread material and having a predetermined shape, at least 80 percent of the total volume of said bread material in said article being in the form of a substantially flat planar structure of wafer-thin thickness extending outwardly from said capsule, said bread material of said flat wafer-thin planar structure occupying more than 75 percent of the total area of a two-dimensional plane struck through said article at a location within and bisecting said flat wafer-thin planar structure, said capsule being at a location intersected by said two-dimensional plane, at least a portion of said bread material of said article extending out of said flat wafer-thin planar structure and snugly overlapping said capsule on opposite sides thereof as viewed from opposite sides of said two-dimensional plane, such that said capsule is locked in position in said article, at least a portion of said capsule being exposed to direct view and not covered by any said bread material, the thickness of said article being greatest at the location of said capsule, all other portions of said article being of wafer-thin thickness not exceeding two millimeters.

4,163,066

## FREE-FLOWING, NON-CHARRING SOLID FAT USEFUL FOR POPPING POPCORN

Ron G. Mason, Arlington, and Herbert L. Rice, Fort Worth, both of Tex., assignors to Richard D. Emerick, Fort Worth, Tex.

Filed Nov. 10, 1977, Ser. No. 850,447  
Int. Cl.<sup>2</sup> A23D 5/00; A23L 1/18

U.S. Cl. 426—99

10 Claims

7. A method of popping popcorn in popping equipment comprising the steps of:

- hydrogenating an edible vegetable oil consisting essentially of edible triglycerides containing predominately 16-18 carbon atoms, inclusive, to have a melting point above 122° F.;
- melting said hydrogenated edible vegetable oil;
- while said hydrogenated edible vegetable oil is molten, homogeneously admixing a water soluble, edible, inorganic salt of particle sizes small enough to remain in substantially homogeneous admixture during solidification of said mixture of hydrogenated vegetable oil and salt; said particle sizes being at least as small as -100 mesh; said hydrogenated edible vegetable oil and salt being admixed in respective concentrations within the respective ranges of 50-95 and 5-50 percents by weight;
- solidifying said substantially homogeneous admixture of said hydrogenated edible vegetable oil and said salt;
- subdividing said solidified hydrogenated vegetable oil and

salt into free flowing solid particles of a mean particle size of about 0.2 inches but less than 1 inch;

f. admixing a first quantity of said free flowing solid particles of said hydrogenated edible vegetable oil and said salt with a second quantity of the popcorn; said first and second quantities of said free flowing particles of said hydrogenated edible vegetable oil and salt and said popcorn being within respective proportions of 10-30 and 70-90 percents by weight; and

g. popping said popcorn with said fat and salt with essentially no tar and char build-up, practically no smoke and fumes, and no excessive oil accumulation.

4,163,067

## GLYCYRRHIZIN-FREE FRACTIONS FROM LICORICE ROOT AND PROCESS FOR OBTAINING SUCH FRACTIONS

Harold A. Hartung, West Collingswood, N.J., assignor to MacAndrews and Forbes Company, Camden, N.J.

Continuation-in-part of Ser. No. 695,537, Jun. 14, 1976, abandoned. This application Feb. 2, 1977, Ser. No. 764,896  
Int. Cl.<sup>2</sup> A23L 1/22

U.S. Cl. 426—573

13 Claims

1. A process for recovery of deglycyrrhized fractions from water insoluble licorice root residue remaining after extraction of fresh licorice root with an unbuffered aqueous extractant having a pH of from about 3 to about 12 to obtain primary root extracts having pH values between about 5 and about 6 which comprises:

- treating the water insoluble residue with an aqueous alkaline extractant producing an aqueous alkaline extract having a pH less than 10 and an insoluble residue;
- separating and isolating said aqueous alkaline extract and said insoluble residue;
- treating the aqueous alkaline extract with sufficient acid to acidify the extract to a pH of from about 2 to about 6, forming an acid soluble fraction and an acid insoluble residue;
- separating and isolating said acid soluble fraction and said acid insoluble residue;
- treating the acid insoluble residue with sufficient alkali to solubilize and alkalinize the residue to a pH of from about 8 to less than 10 forming an alkali soluble fraction; and recovering said acid soluble fraction and said alkali soluble fraction, said fractions being essentially glycyrrhizin-free, lacking the flavor characteristic of licorice.

4,163,068

## FLAVORING WITH TERPENYL ETHERS

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel; all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 872,937, Jan. 27, 1978, Pat. No. 4,131,687. This application Sep. 5, 1978, Ser. No. 939,897  
Int. Cl.<sup>2</sup> A23L 1/226

U.S. Cl. 426—538

6 Claims

1. A method for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.5 parts per million up to about 100 parts per million of a C<sub>10</sub>-terpenyl ether selected from the group consisting of:  
1,8-Dimethoxy-p-menthane; and  
1,8-Diethoxy-p-menthane

4,163,069

## NON-FAT DRY MILK SUBSTITUTE PRODUCT

Nicholas Melachouris, White Plains; Brenda B. Fracaroli, Ossining, and Constance R. Corbett, White Plains, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.  
Filed Oct. 11, 1977, Ser. No. 840,684  
Int. Cl.<sup>2</sup> A23C 21/00

U.S. Cl. 426—582

45 Claims

1. A non-fat dry milk substitute product comprising lactalbumin, sodium hexametaphosphate and a modified whey solids product derived from a process of adding a divalent metal ion to a raw whey feed and adjusting the pH to a value above about 6 at a temperature below about 140° F. (60° C.) thereby causing precipitation of the modified whey solids product; wherein the protein content of the non-fat dry milk substitute product is from about 17% to about 30%, (by weight, dry basis); wherein the weight ratio (dry basis) of modified whey solids to lactalbumin is from about 2:1 to about 5:1; and wherein the weight ratio (dry basis) of sodium hexametaphosphate to lactalbumin is from about 0.05:1 to about 0.20:1.

4,163,070

## SHROUDING SKINNED MEAT CARCASSES

Beverly E. Williams, P.O. Box 299, San Mateo, Calif. 94401, assignor to B. E. Williams and K. I. Williams, both of San Mateo, Calif.

Filed May 4, 1977, Ser. No. 793,744  
Int. Cl.<sup>2</sup> A23B 4/00

U.S. Cl. 426—642

3 Claims

1. A method of treating freshly slaughtered and skinned meat carcasses to smooth the fat surface, increase the whiteness of the outer fat surface and reduce carcass weight shrinkage comprising the steps of applying to each carcass a shroud consisting of a rectangular cloth consisting essentially of yarns, said cloth being thoroughly wetted with an aqueous saline solution, the yarns in said cloth consisting of a blend of cotton and polyester fibers, the density of the yarns in the cloth being less than 36 per inch in the longitudinal direction and less than 36 per inch in the transverse direction to provide interstices for capillary attraction and ventilation of the carcass surface and the accommodation of skewers without substantial fracturing of the yarns, said interstices retaining said aqueous solution when the shroud is wetted, said cloth being applied with skewers to tension the shroud on the carcass to insure that the interstices remain open to retain the solution entrained when the fabric is wet; maintaining said shrouded carcass in a cooling room to thereby cool the shrouded carcass to the cooling room temperature over a period of time sufficient to cause the shroud to lose the free surface moisture thereof and thereafter peeling the shroud from the carcass.

4,163,071

## METHOD FOR FORMING HARD WEAR-RESISTANT COATINGS

Merle H. Weatherly, Indianapolis, and Robert C. Tucker, Jr., Brownsburg, both of Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,704  
Int. Cl.<sup>2</sup> B05D 3/06

U.S. Cl. 427—34

5 Claims

1. A method for forming a hard wear-resistant coating on an engine valve made of nitrogen strengthened iron-base alloy which comprises preheating the engine valve to a temperature of from 650° C. to 1000° C., depositing with a plasma or D-gun process a composition consisting essentially of 28 Cr-1.1 C-1.0 Si-4.0 W-3.0 Fe-3.0 Ni-Bal Co, all in wt.% whereby a fine uniform dispersion of carbide particles is found throughout the coating to provide said hard wear-resistant coating.  
2. A method for forming hard wear-resistant coatings on metallic substrates which comprises



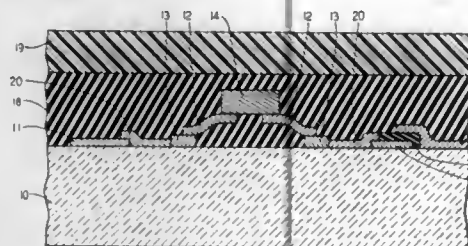
- (a) preheating the substrate to a temperature in the range of from 350° to 1000° C.,  
 (b) depositing with plasma or D-gun process a composition consisting essentially of 28 Cr-1.1 C-1.0 Si-4.0 W-3.0 Fe-3.0 Ni-Bal Co, all in wt.%, while maintaining such substrates with said temperature range; whereby a fine uniform dispersion of carbide particles is formed throughout the coating to provide said hard wear-resistant coatings.

4,163,072

## ENCAPSULATION OF CIRCUITS

Nicholas A. Soos, Macungie, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Jun. 7, 1977, Ser. No. 804,439  
 Int. Cl.<sup>2</sup> H01L 23/30; B05D 1/38  
 U.S. Cl. 427—96

13 Claims



1. A method of encapsulating circuit components comprising the steps of:  
 applying over said components a first layer comprising a room temperature vulcanizing silicone rubber which cures by reaction with moisture;  
 while said first layer is in a substantially uncured state, applying over said first layer a second layer comprising a polymer selected from the group consisting of polyurethane and epoxy; and  
 exposing the resulting structure to moisture at a temperature and for a time sufficient to cure both of said layers so that the two layers adhere strongly to one another.

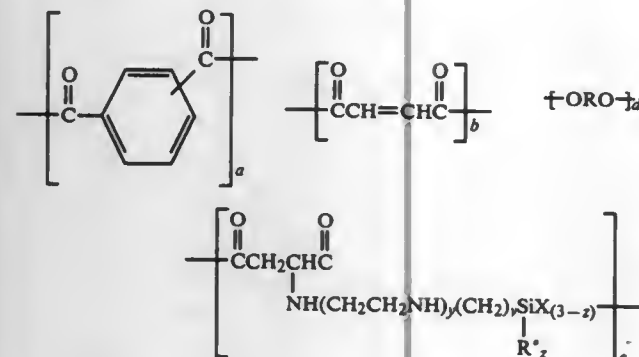
4,163,073

## PROCESS FOR TREATING INORGANIC SILICEOUS SURFACES

Enrico J. Pepe, and James G. Marsden, both of Amawalk, N.Y., assignors to Union Carbide Corporation, New York, N.Y.  
 Division of Ser. No. 813,074, Jul. 5, 1977, Pat. No. 4,122,074.  
 This application Jul. 17, 1978, Ser. No. 813,074  
 Int. Cl.<sup>2</sup> B05D 7/00

12 Claims

1. A process for rendering inorganic siliceous material compatible with and adherent to organic resins comprising coating the surfaces of said inorganic siliceous material, prior to or at the time of combination with said organic resin, with a polymer having a molecular weight of greater than 1000 comprising units of the formula



lent alkyl, aryl or aralkyl group; X is a monovalent alkoxy, hydroxy or oxy- group; y is 0 or 1; v is an integer of 1 to 6; z is 0, 1 or 2; a is a mole fraction of 0 or 0.004 to 0.6; and b, d and e are mole fractions ranging from about 0.004 to about 0.6 with the proviso that d is greater than, equal to or slightly less than the sum of a, b and e.

4,163,074

## METHOD FOR FAST ADHESION OF SILVER TO NITRIDE TYPE CERAMICS

Yoshihiro Ebata, Kawanishi; Yasuo Toibana, Ikeda; Tsuneo Uetsuki, Kawanishi; Saburo Kose, and Makoto Kinoshita, both of Ikeda, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan  
 Filed Apr. 18, 1978, Ser. No. 897,372  
 Claims priority, application Japan, Apr. 20, 1977, 52-46221  
 Int. Cl.<sup>2</sup> C04B 41/38

U.S. Cl. 427—229

6 Claims

1. A method for fast adhesion of silver to a nitride type ceramic article, which comprises:  
 coating the surface of the nitride type ceramic article with a mixture consisting of copper sulfide and kaolin, the mixing ratio of copper sulfide and kaolin being 99 to 80% by weight of the former to 1 to 20% by weight of the latter, heating the ceramic article coated with the mixture in a nitrogen-containing atmosphere at a temperature in the range of from 900° to 1300° C.,  
 overcoating the thermally treated ceramic article with silver carbonate, and  
 heating the ceramic article overcoated with silver carbonate in a nitrogen-containing atmosphere at a temperature in the range of from 700° to 940° C.

4,163,075

## ELECTRIC DISCHARGE RECORDING MATERIAL

Shiro Nakano, Suita, and Masaru Koike, Mishima, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan  
 Filed Jul. 7, 1977, Ser. No. 813,776  
 Claims priority, application Japan, Jul. 8, 1976, 51-81513; Jul. 8, 1976, 51-81514; Jan. 12, 1977, 52-2658; Mar. 9, 1977, 52-26361

Int. Cl.<sup>2</sup> G32B 5/16; G01D 15/06

U.S. Cl. 428—328

19 Claims

1. A composite discharge recording material which comprises  
 (a) an electric discharge-breakable semiconductive resin layer having a surface resistance of  $10^5$  to  $10^{16}$  ohms and a volume resistance of  $10^3$  to  $10^{14}$  ohms-cm, said resin layer being formed by dispersing a conductivity-imparting agent in a resin matrix;  
 (b) a metal-containing resin layer having a surface resistance of at least  $10^8$  ohms and a volume resistance of not more than  $10^4$  ohms-cm laminated on one surface of the semiconductive resin layer (a), said resin layer being prepared by dispersing an electrically conductive and stable metal powder having a specific resistance of not more than  $2 \times 10^{-4}$  ohm-cm and a particle diameter of from 0.2 to 20 microns in a resin matrix which is a film-forming, electrically insulative thermoplastic or thermosetting resin; and  
 (c) a conductive layer laminated on the other surface of the semiconductive resin layer (a) and having a surface resistance of not more than  $10^4$  ohms and a volume resistance of not more than  $10^2$  ohms-cm, said conductive layer comprising a thermoplastic or thermosetting resin having a conductivity-imparting agent dispersed therein, or a vacuum-deposited metal layer or a metal foil layer.

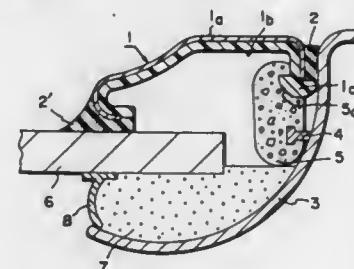
4,163,076

## SYNTHETIC RESIN WINDOW MOLDING

Hisanori Katoh, Tokyo, Japan, assignor to Inoue Gomu Kogyo Kabushiki Kaisha, Aichi, Japan  
 Filed Oct. 5, 1977, Ser. No. 839,752  
 Int. Cl.<sup>2</sup> B32B 15/08

U.S. Cl. 428—339

6 Claims



1. A window molding comprising:

- (a) a layer of synthetic resin having first and second end portions at the opposite ends thereof, said resin layer with said first and second end portions forming an approximate C-shape, wherein the first end portion is an anchor and the second end portion is bent at an angle with respect to the remainder of said resin layer;  
 (b) a stainless foil adhered to one surface of said resin layer wherein said first and second end portions of said one surface extend beyond the ends of said stainless foil; and  
 (c) first and second protective layers of soft plastic material, said first protective layer being adhered to one end portion of said stainless foil and said first end portion of said resin layer and said second protective layer being adhered to the other end portion of said stainless foil and said second end portion of resin layer.

4,163,077

## CONTAMINATION-TOLERANT PRESSURE-SENSITIVE ADHESIVE TAPE

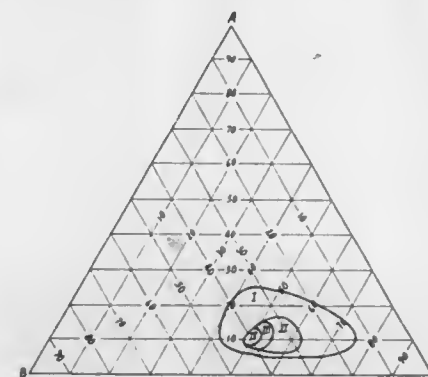
Stephen A. Antonsen, Vancouver, Canada, and David P. Boaz, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 19, 1978, Ser. No. 897,851

Int. Cl.<sup>2</sup> C09J 7/02

U.S. Cl. 428—355

11 Claims



1. Pressure-sensitive tape comprising a sheet backing coated with a layer of normally tacky and pressure-sensitive adhesive which is not only capable of maintaining useful bonding properties even after its surface has been contaminated with talc but which also has good shear adhesion, a force of at least 15 grams per centimeter width being required to remove said pressure-sensitive tape from a talc-contaminated polyethylene film, said adhesive consisting essentially of a blend of 100 parts by weight of

- (a) 5-25 parts by weight of a rubbery synthetic block copolymer selected from the class consisting of:

- (1) A-B, A-B-A or blends of A-B and A-B-A wherein A is a polymer of styrene and B is selected from the class consisting of homopolymers of isoprene and copolymers of ethylene and butylene and  
 (2) radial or teleblock copolymer consisting of several polystyrene-terminated elastomeric branches, each of said branches being a homopolymer of isoprene extending from a central hub;  
 (b) 15-50 parts by weight of polyterpene-type tackifier resin which is solid at room temperature; and  
 (c) 40-75 parts by weight of a polyterpene-type tackifier resin which is liquid at room temperature.

4,163,078

## HYDROPHILIC BI-COMPONENT THREADS

Ulrich Reinehr, Dormagen; Christian Pieper, Neuss, and Peter Kleinschmidt, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,229

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2625908

Int. Cl.<sup>2</sup> D01D 5/06; D01F 8/04, 8/08; D07G 3/04

U.S. Cl. 428—373

6 Claims



1. A bicomponent filament or fiber of two different fiber-forming synthetic polymers in which the two components are eccentric to each other and in which at least one component has a core/sheath structure with a microporous core, and a sheath denser than the core; and in which the bicomponent filament or fiber has a moisture absorption of at least 1.5 at 65% relative atmospheric humidity and 21° C., a moisture absorption of at least 5% at 90% relative atmospheric humidity and 21° C.; and a water-retention power of at least 10%.

4,163,079

## METHOD FOR FACILITATING TRANSPORTATION OF PARTICULATE ON A CONVEYOR BELT IN A COLD ENVIRONMENT

Frank J. Beafore, Greensburg, Pa., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,500

Int. Cl.<sup>2</sup> B32B 9/04; C09K 3/18

U.S. Cl. 428—411

14 Claims

1. A method for facilitating transportation of particulate solids on a conveyor belt, at least a portion of which is exposed to a temperature of less than 0° C., comprising:  
 (a) contacting the surface of said belt upon which the particulate solids are transported with from about 0.001 to about 0.005 gallons per square foot of belt surface, of a composition consisting substantially of water soluble components comprising  
 (A) a water soluble polyhydroxy compound or monoalkyl ether thereof, and  
 (B) a water soluble organic nonvolatile compound having at least one hydrophilic group, said compound (B) being different from said compound (A), said composition being substantially free of corrosion inducing metal halide salts;  
 (b) placing particulate solids on the treated belt;



- (c) moving the belt so that said solids are transported; and  
(d) exposing at least a portion of the treated belt surface to a temperature of less than 0° C.

**4,163,080**  
**FLEXIBLE DOUBLE-LAYER POLYPROPYLENE LAMINATES FOR THE PACKAGING OF FOOD PRODUCTS**

Pierpaolo Buzio, Rho, and Lucio Edefonti, Busto Arsizio, both of Italy, assignors to Società Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Apr. 13, 1978, Ser. No. 895,822  
Claims priority, application Italy, Apr. 13, 1977, 22393-A/77  
Int. Cl.<sup>2</sup> B32B 27/40

U.S. Cl. 428—424 7 Claims

1. A flexible double-layer polypropylene laminate consisting essentially of a biaxially oriented film consisting essentially of isotactic polypropylene with an atactic polypropylene content of less than 6% by weight and an intrinsic viscosity, measured in decalin at 135° C. with an UBBELOHDE viscometer (standard ASTM D 1601), of from 1.5 to 3.0 dl/g, adhesively bonded with a non-oriented film consisting essentially of a mixture of isotactic polypropylene and atactic polypropylene, the latter in an amount of from 15 to 30% by weight of the total weight of the said mixture, the said isotactic polypropylene of said mixture having an intrinsic viscosity (standard ASTM D 1601) of from 1.0 to 1.5 dl/g and the said atactic polypropylene of said mixture having a density (standard ASTM D 1505) of from 0.855 to 0.865 g/cm<sup>3</sup> and a viscosity when fused at 160° C., determined with a rotational viscometer, of from 3,000 to 10,000 cps.

4. A process for producing a flexible double-layer plastic laminate, which comprises preparing a biaxially oriented film consisting essentially of isotactic polypropylene with an atactic polypropylene content of less than 6% by weight and an intrinsic viscosity of from 1.5 to 3.0 dl/g, as measured at 135° C. in decalin with an UBBELOHDE viscometer (standard ASTM D 1601), and a non-oriented film consisting essentially of a mixture of isotactic polypropylene and atactic polypropylene, the latter being present in the mixture in an amount of from 15 to 30% by weight, said isotactic polypropylene of said mixture having an intrinsic viscosity (standard ASTM D 1601) of from 1.0 to 1.5 dl/g and said atactic polypropylene of said mixture having a density (standard ASTM D 1505) of from 0.855 to 0.865 g/cm<sup>3</sup> and a viscosity when fused at 160° C., determined with a rotational viscometer, of from 3,000 to 10,000 cps, applying on to at least one of the surfaces to be bonded of said films an adhesive in an amount of from 1.5 to 3 g per m<sup>2</sup> of surface, and laminating the said films at a temperature of from 60° to 80° C.

**4,163,081**  
**SELF-ADHERING SILICONE COMPOSITIONS AND PREPARATIONS THEREOF**

Jay R. Schulz, Bangor Township, Bay County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

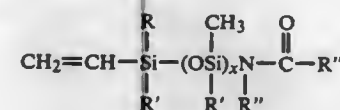
Filed May 8, 1978, Ser. No. 904,175  
Int. Cl.<sup>2</sup> C08L 83/04

U.S. Cl. 428—429 27 Claims

1. A composition comprising a product obtained by mixing (A) a vinyl-containing polydiorganosiloxane having an average of about two silicon-bonded vinyl radicals per molecule, an average ratio of organo radicals per silicon atom within a range of greater than 2 up to and including 2.03 and each organo radical of the polydiorganosiloxane being a monovalent radical selected from the group consisting of hydrocarbon radicals and fluorinated alkyl radicals both having less than 7 carbon atoms per radical, (B) an organosilicon compound having an average of at least 3 silicon-bonded hydrogen atoms per organosilicon compound molecule and valences of any silicon atom in the organosilicon compound not satisfied by a hydrogen bond are satisfied by a divalent oxygen atom or an organo radical wherein each organo radical is a monovalent radi-

cal selected from the group consisting of hydrocarbon radicals and fluorinated alkyl radicals both having less than 7 carbon atoms per radical, the organo-silicon compound having no more than one silicon-bonded hydrogen atom on any one silicon atom,

- (C) a platinum catalyst, and  
(D) an amidosiloxane of the formula



where R is a methyl, ethyl, or phenyl radical; R' is a methyl, ethyl, or 2-(perfluoroalkyl)ethyl radical in which the perfluoroalkyl radical contains 1 to 4 inclusive carbon atoms; R'' is a methyl or ethyl radical; and x is an integer of from 3 to 20,

(A) and (B) being present in amount sufficient to provide a mole ratio of silicon-bonded hydrogen atoms in (B) to silicon-bonded vinyl radical in (A) in the range of 0.5 to 10, (D) being present in amounts of 0.01 to 2.5 parts by weight per 100 parts by weight of the composition.

**4,163,082**  
**U.V.-RADIATION METHOD FOR DECREASING SURFACE TACK OF DISPOSED ORGANOPOLYSILOXANE GREASES AND GELS**

David J. Romenesko, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 23, 1978, Ser. No. 953,515  
Int. Cl.<sup>2</sup> C08F 30/08; C08L 43/04

U.S. Cl. 428—447 8 Claims

1. A process for reducing the surface tack of an organopolysiloxane gel or grease, adheringly disposed on a substrate, said process comprising

- (I) applying to the surface of said disposed gel or grease a continuous layer of a liquid organopolysiloxane-composition which is convertible by ultraviolet radiation to the solid state and which consists essentially of a mixture of (a) an organopolysiloxane wherein an average of at least two of the organic radicals per molecule are silicon-bonded olefinic radicals selected from the group consisting of vinyl and butenylene and (b) a hydrogen-containing organopolysiloxane, free of aliphatic unsaturation, wherein the average molecule contains at least two hydrogen radicals selected from the group consisting of silicon-bonded hydrogen and mercaptoalkyl hydrogen, at least one of (a) and (b) having an average of more than two of said olefinic radicals and said hydrogen radicals, respectively, per molecule, and (II) exposing the applied continuous layer of convertible liquid to ultraviolet radiation until it is converted to a continuous layer of solid organopolysiloxane.

**4,163,083**  
**PROCESS FOR IMPROVING CORROSION RESISTANT CHARACTERISTICS OF CHROME PLATED ALUMINUM AND ALUMINUM ALLOYS**

Michael J. Pryor, Woodbridge, Conn., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 816,315, Jul. 18, 1977, Pat. No. 4,111,763.

This application Apr. 11, 1978, Ser. No. 895,412  
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> B32B 15/20, 3/00, 15/04; C25D 11/04  
U.S. Cl. 428—472 3 Claims

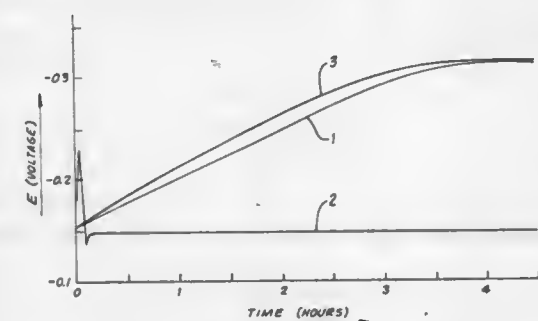
1. A coated article which is readily plated by standard plating techniques and characterized by high corrosion resistance to the acid nature of the plating bath comprising an aluminum substrate, a microporous anodic oxidized crystalline surface on

said substrate including in part comparatively large pores substantially normal to said substrate, and an electronically conductive oxide of high ionic resistance continuously distributed in said microporous anodic oxidized crystalline surface and said large pores so as to form a continuous high corrosion resistant barrier layer.

**4,163,084**  
**ELECTROCHEMICALLY STABLE CATHODE**  
Keh-Chi Tsai, Saratoga, and Ernest L. Littauer, Los Altos Hills, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jul. 27, 1978, Ser. No. 928,544  
Int. Cl.<sup>2</sup> H01M 6/04

U.S. Cl. 429—206 5 Claims



1. An electrochemical cell consisting essentially of an anode, a cathode having an essentially continuous layer of ruthenium on its surface and an aqueous alkaline salt electrolyte in which said anode and cathode are immersed, said electrolyte containing a reducible species selected from the group consisting of peroxy ions, chlorine and oxygen which is electrochemically reduced at said cathode.

**4,163,085**  
**PROCESS FOR THE PRODUCTION OF POLYOLEFIN FOAM SHEETS CONTAINING PORE REGULATORS**  
Werner Kühnel, Neunkirchen, and Paul Spielau, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,604  
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543248

Int. Cl.<sup>2</sup> C08J 9/00

U.S. Cl. 521—96 24 Claims

1. A process for the production of a continuous foam sheet by thermal crosslinking and foaming of a synthetic resin of a polyolefin shaped into a sheet or panel and containing an organic peroxide, and a blowing agent, which comprises adding to and finely distributing in the synthetic resin of a polyolefin and containing an organic peroxide and a blowing agent at below the decomposition temperature of the peroxide and of the blowing agent in the thermoplastic range, at least one pore regulator selected from the group consisting of oligomeric and polymeric saturated dicarboxylic acid esters and dicarboxylic acid ester mixtures having a flow point or melting range below the decomposition temperature of the peroxide and of the blowing agent, said dicarboxylic acid esters or dicarboxylic acid ester mixtures containing, as the diol component, residues of one or more saturated diols of the formula  $-\text{O}-\text{R}'-\text{O}-$ , wherein R' represents an alkylene residue of 2-8 carbon atoms in the chain or an alkylene residue of 2-8 carbon atoms in the chain having one or more cycloalkyl groups or one or more alkyl groups of 1-3 carbon atoms.

**4,163,086**  
**NOVEL OXYALKYLATED POLYOL PREPOLYMERS, FLAME RETARDANT INTERPOLYMERS PREPARED THEREFROM, AND PROCESSES FOR THE PREPARATION THEREOF**

Thirumurti Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 745,049, Nov. 26, 1976, Pat. No. 4,108,808.  
This application Mar. 31, 1978, Ser. No. 892,271

Int. Cl.<sup>2</sup> G08G 18/00

U.S. Cl. 521—155 34 Claims

25. A process for preparing a cellular polyurethane interpolymer comprising interpolymerizing an organic polyisocyanate with at least one oxyalkylated polyol in the presence of a foaming agent, the said polyol being a reactive liquid polyol prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1-8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol and being oxyalkylated with about 1-10 moles of an alkylene oxide containing about 2-4 carbon atoms, the said prepolymer having a viscosity of about 1000-500,000 centipoises at 25° C. and containing about 1.1-6 moles of interpolymerized aldehyde and about 3.1-15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith.

**4,163,087**  
**METHOD FOR PRODUCTION OF NEW THERMAL AND CHEMICAL RESISTANT POLYURETHANE PLASTICS**

Zbigniew Brzozowski, Jędrzej Kielkiewicz, Gabriel Rokiel, Andrzej Kaminski, Danuta Chomlec, and Bogusław Goraj, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

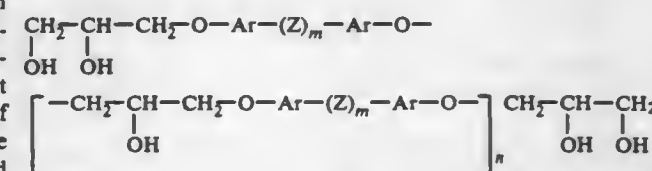
Continuation of Ser. No. 611,840, Sep. 9, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 843,703

Claims priority, application Poland, Sep. 12, 1974, 174046; Jun. 23, 1975, 181469; Jun. 23, 1975, 181474

Int. Cl.<sup>2</sup> C08G 18/14, 18/48, 18/32

U.S. Cl. 521—176 9 Claims

1. A method for production of thermal and chemical resistant polyurethane plastics, in the form of foams, these foams being obtained from reaction of di- or poly-isocyanates with polyols, wherein the polyols have the formula 1:



in which Ar is either a substituted or unsubstituted benzene, naphthalene, or anthracene ring, said substituents being one or more alkyl, aryl or allyl radicals or halogen atoms; Z is the oxygen atom, an SO<sub>2</sub> group or a divalent radical,  $-\text{CRR}_1-$ , where R and R<sub>1</sub> may be identical or different and are either a hydrogen atom or an alkyl radical; m is 0 or 1; and n is 0 or an integer 1-10, or their mixtures with other low-viscosity polyols, said mixtures being reacted with di- or poly-isocyanates in the presence of catalysts, foaming agents and solvents.



4,163,088

# ANTISTATIC POLYAMIDE COMPOSITIONS WITH POLYALKYLENEGLYCOL ETHER HAVING SECONDARY TERMINAL URETHANE GROUPS

Hans E. Künzel, Dormagen; Claus-Rüdiger Bernert, Bomlitz; Günter Arend, Dormagen; Francis Bentz, Cologne; Helmut Sinner, and Dieter Brokmeler, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 554,516, Mar. 3, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 808,051

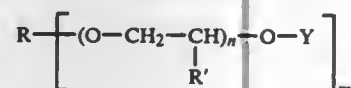
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1974, 2409715

Int. Cl.<sup>2</sup> C08L 77/02; C08G 69/46

U.S. Cl. 525—433

8 Claims

1. An antistatic polyamide composition consisting essentially of a polycarbonamide and, as an antistatic agent, from 0.5 to 20% by weight, based on said polycarbonamide, of a polyalkylene glycol ether with secondary terminal urethane groups corresponding to the general formula:



in which

m is a number of from 1 to 6;

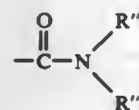
n is a number of from 3 to 60;

R is an m-functional radical selected from the group consisting of alkyl, cycloalkyl, alkenyl, aralkyl, aryl, alkaryl, or any of alkyl, cycloalkyl, and alkenyl containing oxygen or nitrogen as a hetero atom;

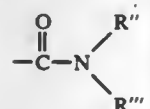
R additionally is Y when m = 1;

R' is hydrogen, C<sub>1</sub>-C<sub>5</sub>-alkyl, cycloalkyl, aryl, alkaryl, or aralkyl;

Y is hydrogen or



provided that at least 70% of the Y radicals are



R'' and R''', independently of each other, are C<sub>1</sub>-C<sub>30</sub>-alkyl, cycloalkyl, aryl, aralkyl, alkaryl;

R'' and R''' additionally are C<sub>1</sub>-C<sub>30</sub>-alkyl interrupted by nitrogen or oxygen as a hetero atom, or are joined together to form a heterocyclic ring containing nitrogen or oxygen as a hetero atom.

4,163,089

# METHOD OF POLYMERIZING ACRYLONITRILE WITH CERTAIN ACIDIC MONOMERS

George Palethorpe, Durham, N.C., assignor to Monsanto Company, Decatur, Ala.

Filed May 14, 1975, Ser. No. 577,521

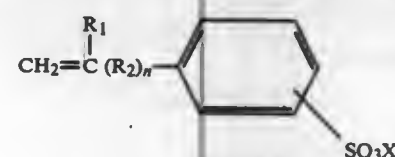
Int. Cl.<sup>2</sup> C08F 220/46

U.S. Cl. 526—80

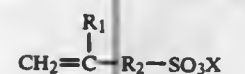
4 Claims

1. In a method of continuously polymerizing in the presence of an effective initiator/catalyst system 35 to 85 weight percent, based on total monomer weight, of acrylonitrile with 10 to 65 weight percent of at least one non-acidic monoolefinic monomer copolymerizable with acrylonitrile and 0.5 to 5

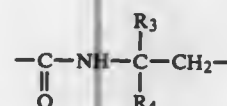
weight percent of an acidic monomer selected from the group consisting of



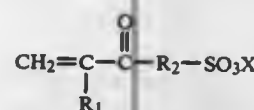
where R<sub>1</sub> is —H or —CH<sub>3</sub>, R<sub>2</sub> is —CH<sub>2</sub>O—, —O—, or —CH<sub>2</sub>—, n is 0 or 1 and X is Na, K or H,



where R<sub>1</sub> is —H or —CH<sub>3</sub>, R<sub>2</sub> is —CH<sub>2</sub>— or a structure of the type



where R<sub>3</sub> and R<sub>4</sub> are H or —CH<sub>3</sub> and X is H, Na or K, and



where R<sub>1</sub> is H or —CH<sub>3</sub> and R<sub>2</sub> is —CH<sub>2</sub>— or —CH<sub>2</sub>C—H<sub>2</sub>— and X is H, Na or K wherein the acrylonitrile and the nonacidic mono-olefinic monomer are continuously charged to a reaction vessel having a predetermined dwell time, the improvement comprising feeding to the reaction vessel at least 65 percent of said acidic monomer percent in a first time period and then feeding the remainder of said acidic monomer in a second time period, said first and second periods making up a cycle, said first time period being 5 to 25 percent of the second time period and the length of the cycle being 15 to 25 percent of said dwell time.

4,163,090

# PROCESS FOR PREPARING NORMALLY CRYSTALLINE VINYLIDENE HALIDE POLYMERS HAVING SUPERIOR FLOW PROPERTIES EMPLOYING A COMBINATION OF COLLOIDAL SILICA AND NON-IONIC WATER SOLUBLE CELLULOSE ETHER HAVING A VISCOSITY OF ABOUT 5 CP OR LESS AS STABILIZING AGENTS

Ralph M. Wiley; Merritt R. Meeks, both of Midland, and Burke A. Beebe, Gladwin, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 27, 1977, Ser. No. 836,935

Int. Cl.<sup>2</sup> C08F 2/20, 4/34, 14/08

U.S. Cl. 526—88

7 Claims

1. In a process of making solid bodies of normally crystalline vinylidene halide polymers in the form of spheroidal globules comprising the steps of forming a mixture of a polymerizable liquid and an aqueous non-solvent liquid medium, the non-solvent liquid medium containing a water-dispersible, water-insoluble, colloidal solid particle emulsifier; mechanically agitating the mixture to disperse the polymerizable liquid as smaller-than-stable droplets in the non-solvent liquid medium; bringing the resulting unstable dispersion to a condition of quiescence, whereby the unstable droplets undergo a limited coalescence to form a stable suspension of droplets; treating

the stable suspension with a stabilizing agent to prevent agglomeration of the droplets; and thereafter subjecting the suspension to polymerization conditions without high turbulence;

the improvement which comprises employing in combination colloidal silica as the solid particle emulsifier, and a low molecular weight, non-ionic, water-soluble cellulose ether, having a viscosity grade of about 5 centipoise or less, as the stabilizing agent.

4,163,091

# PROCESS FOR THE POLYMERIZATION OF CHLOROPRENE

Hans-Jürgen Pettelkau, Burscheid, and Gerhard Hohmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,360

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627452

Int. Cl.<sup>2</sup> C08F 2/00, 4/30, 36/18

U.S. Cl. 526—208

5 Claims

1. An activator/initiator composition for the polymerization of chloroprene containing 95 to 50% by weight of formamidine sulphonic acid, 4.5 to 25% by weight of an inorganic peroxy compound and 0.5 to 25% by weight of an alkali metal salt of anthraquinone-2-sulphonic acid.

3. A monomer containing composition comprising chloroprene and up to 50% by weight, based on total monomer, of a monomer which is copolymerizable with chloroprene and from 0.02 to 0.6% by weight, based on total monomer, of the activator/initiator composition of claim 1.

4,163,092

# CATIONIC HYDROGELS BASED ON HYDROXYALKYL ACRYLATES AND METHACRYLATES

Robert Steckler, Crofton, Md., assignor to Plastomedical Sciences, Inc., Briarcliff Manor, N.Y.

Division of Ser. No. 549,096, Feb. 11, 1975, Pat. No. 4,060,678. This application Aug. 18, 1977, Ser. No. 825,521

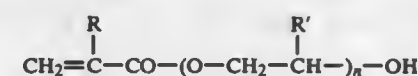
Int. Cl.<sup>2</sup> C08F 220/06

U.S. Cl. 526—292

6 Claims

1. The cationic, polymeric hydrogel produced by the process which comprises simultaneously polymerizing and cross-linking, in the presence of a free radical polymerization catalyst in an amount of from about 0.05 to about 4 weight percent, based on the total weight of monomers, and at a temperature of from about 20° C. to about 125° C., a mixture consisting essentially of the following monomers:

(a) about 40 to about 95 weight percent, based on the total weight of monomers of an acrylic monomer selected from the group consisting of glyceryl monoacrylates and monomethacrylates and acrylic monomers having the formula:

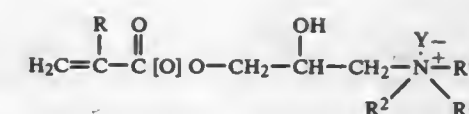


wherein:

R and R' each represents hydrogen or lower alkyl of 1 to about 6 carbon atoms;

n represents an integer of from 1 to about 50;

(b) about 50 to about 0.05 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated cationic monomer, capable of copolymerizing with (a), and which is a quaternary ammonium compound having the formula:



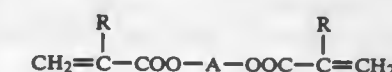
wherein:

R represents H or CH<sub>3</sub>;

R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup>, each of which may be the same or different, each represents alkyl, phenyl or aralkyl; and

Y represents an anion forming the anionic portion of a quaternary ammonium group;

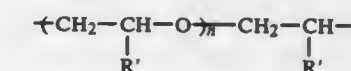
(c) about 0.2 to about 12 weight percent, based on the total weight of monomers, of a polymerizable cross-linking agent capable of copolymerizing with (a) and (b): and having the formula:



wherein

R represents a member of the group consisting of hydrogen and alkyl of from 1 to about 4 carbon atoms;

A represents alkylene of from 2 to about 10 carbons or a polyglycol ether group of the formula:



in which

R' represents a member of the group consisting of hydrogen and alkyl of 1 to 2 carbon atoms; and

n represents an integer of from 1 to about 20; and

(d) from 0 to about 50 weight percent, based on the total weight of monomers, of other monoethylenically unsaturated monomers capable of copolymerizing with (a), (b) and (c); and selected from the group consisting of: acrylamides, methacrylamides, alkyl acrylates, alkyl methacrylates, N-vinyl lactams, N-vinyl succinimide, N-vinyl diglycolimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone and N-vinyl imidazole;

Provided that (a) ≥ (d) and (a) + (d) = about 40 to about 95 weight percent; and when an N-vinyl lactam, N-vinyl succinimide, N-vinyl diglycolimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone or N-vinyl imidazole is used it is present in an amount of less than 20 weight percent.

4,163,093

# PROCESS FOR THE PRODUCTION OF POLYESTERS FOR AIR-DRYING UNSATURATED POLYESTER RESINS

Bernhard Hess, Moers, and Klaus Kraft, Muelheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,575

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645657

Int. Cl.<sup>2</sup> C08L 67/06

U.S. Cl. 528—301

2 Claims

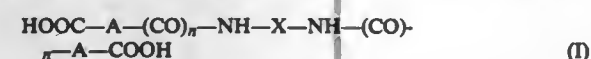
1. A process for producing an unsaturated polyester comprising the condensation product of (a) an α,β-ethylenically unsaturated dicarboxylic acid or an anhydride thereof, (b) a dihydric alcohol which is free from β,γ-ethylenically unsaturated ether groups and (c) an alcohol having at least one β,γ-ethylenically unsaturated ether group, said process comprising the steps of initially condensing a mixture consisting of (a) and (b) in the absence of oxygen at 140° to 220° C. to form a polyes-





of diacids (a) and (b) with diols (c) and (d) so that the composition of the polyester comprises

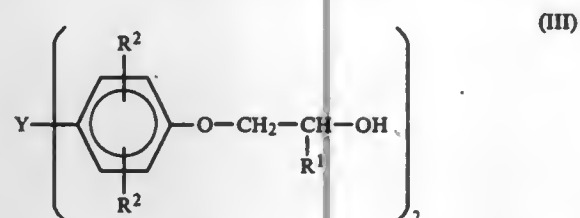
- (a) from 25 to 50 mol %, based on total polyester, of radicals of at least one dicarboxylic acid which contain NH groups and is of the formula I



in which A represents o-phenylene, m-phenylene, p-phenylene, 1,4-naphthylene or 1,6-naphthylene, n is 0 or 1, and X, when n is 0, represents a radical of formula II



- in which R is methyl, ethyl, cyclohexyl or phenyl, or x, when n is 1, represents a divalent hydrocarbon radical of aliphatic or aromatic character;
- (b) from 25 to 0 mol %, based on the total polyester, of radicals of terephthalic acid, isophthalic acid or a mixture thereof; and
- in the diol component of the polyester
- (c) from 0 to 25 mol %, based on the total polyester, of radicals of one or more diols containing aliphatic diol groups; and
- (d) from 50 to 25 mol %, based on the total polyester, of radicals of at least one bisphenol derivative of formula III



in which R<sup>1</sup> represents hydrogen, methyl or ethyl, R<sup>2</sup> represents hydrogen, chloro, bromo or methyl, and Y represents methylene, ethylene, phenylmethylene, diphenylmethylene, methylphenylmethylene, alkylidene of 2 to 4 carbon atoms, 1,1-dichloroethylidene, 1,1,1-trichloroethylidene, cycloalkylidene of 5 to 8 carbon atoms, a direct bond, O, S or SO<sub>2</sub>, wherein the radicals (a) and (b) are attached to radicals (c) and (d) through ester linkages in a random distribution.

#### 4,163,100 RAPIDLY CRYSTALLIZING POLYESTER COMPOSITIONS

Peter Bier, and Rudolf Binsack, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 828,453, Aug. 29, 1977, abandoned. This application Mar. 24, 1978, Ser. No. 889,710  
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639428

Int. Cl.<sup>2</sup> C08G 63/70, 63/76

U.S. Cl. 525—3

6 Claims

1. Rapidly crystallizing thermoplastic compositions comprising

- (a) about 70 to 99.5% by weight of a high molecular weight polyalkylene terephthalate having an intrinsic viscosity of at least 0.6 dl/g (as measured on a 0.5% by weight solution

in a mixture of phenol and tetrachloroethane in a ratio by weight of 1:1 at a temperature of 25° C.) and

- (b) about 0.5 to 30% by weight of a sulphonic acid ester obtainable by the reaction of

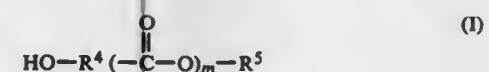
(1) an alkyl sulphochloride corresponding to the formula



in which

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> represent H, Cl, SO<sub>2</sub>Cl and n represents integers from 3 to 33 and the molar ratio of C to SO<sub>2</sub>Cl is between about 35:1 and 1.25:1 with

(2) equivalent quantities of a compound corresponding to the formula

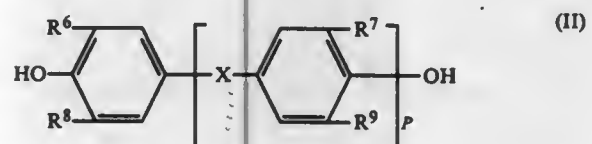


in which

R<sup>4</sup> represents a difunctional aromatic radical containing from 6 to 14 carbon atoms,

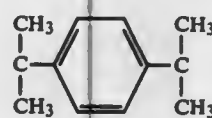
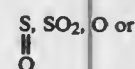
R<sup>5</sup> represents an alkyl, cycloalkyl or aryl radical containing from 1 to 20 carbon atoms and

M = 0 or 1, or



in which

R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup> are the same or different and represent a hydrogen atom, an alkyl radical containing from 1 to 4 carbon atoms, a chlorine or bromine atom, and x represents a single bond, an alkylene or alkylidene radical containing from 1 to 8 carbon atoms, a cycloalkylene or cycloalkylidene radical containing from 5 to 15 carbon atoms, S,



and P = O or 1.

#### 4,163,101 METHOD OF PREPARING MODIFIED OR UNMODIFIED POLY-(ALKYLPENTAMETHYLENTEREPHTHALAMIDE)

Gerhard Schade, Witten-Bommern; Norbert Vollkommer, Troisdorf, and Helmut Wemheuer, Bochum-Langendreer, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany  
Filed Jun. 3, 1977, Ser. No. 803,338

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627342

Int. Cl.<sup>2</sup> C08G 69/28

U.S. Cl. 528—347

6 Claims

1. A process for preparing a poly-(alkylpentamethyleneterephthalamide) having a relative viscosity of 1.38 to 3.35, measured in concentrated sulphuric acid at 25° C. at a concentration of 1 gram of polymer in 100ml of solution, which comprises heating an aqueous solution of the salt of

terephthalic acid and alkylpentamethylenediamine and a water soluble low molecular weight oligoamide of said terephthalic acid and said alkylpentamethylenediamine, the mixture of said salt and oligoamide having a 20-50 mole percent carbonamide groups and 50-80 mole percent salt groups, from a temperature in the range of 130° to 150° C. at atmospheric pressure up to a polycondensation temperature in the range of 250° to 300° C.

#### 4,163,102 1,5-BIS(α,α,α-TRIFLUORO-P-TOLYL)-1,4-PENTADIEN-3-ONE

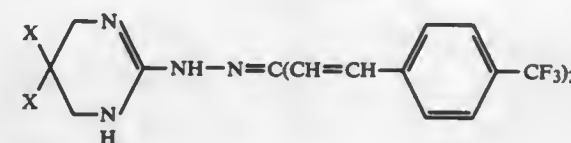
(1,4,5,6-TETRAHYDRO-2-PYRIMIDINYL)HYDRAZONES  
James B. Lovell, Pennington, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Continuation-in-part of Ser. No. 793,116, May 2, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,755  
Int. Cl.<sup>2</sup> C07D 211/78; A01N 9/22

U.S. Cl. 542—417

3 Claims

1. A compound of the formula:



wherein X is hydrogen or methyl.

#### 4,163,103 NOVEL DERIVATIVES OF 9-SUBSTITUTED PHENYL-3,7-DIMETHYL-NONA-2,4,6,8-TETRAENE

Werner Bollag, Basel; Rudolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

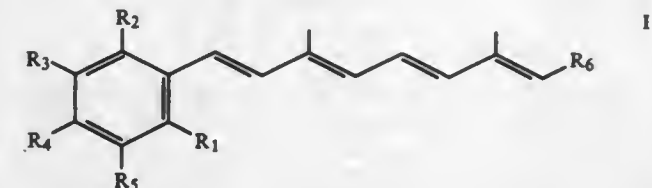
Division of Ser. No. 816,409, Jul. 18, 1977, Pat. No. 4,107,190, which is a division of Ser. No. 613,676, Sep. 15, 1975, Pat. No. 4,054,589. This application May 8, 1978, Ser. No. 903,639  
Claims priority, application Switzerland, Sep. 26, 1974, 13032/74; Jul. 9, 1975, 8962/75

Int. Cl.<sup>2</sup> C09F 5/00; C11C 3/02, 1/00; A01N 9/24

U.S. Cl. 542—427

1 Claim

1. A compound of the formula:



wherein one of R<sub>1</sub> and R<sub>2</sub> is halogen or lower alkyl, and the other is halogen or lower alkoxy; R<sub>3</sub> and R<sub>5</sub> are hydrogen or halogen or lower alkyl; with the proviso that one of R<sub>3</sub> and R<sub>5</sub> is other than halogen; R<sub>4</sub> is halogen or lower alkoxy, amino, mono (lower alkyl) amino or di (lower alkyl) amino; and R<sub>6</sub> is alkanoyloxymethyl, carboxyl, alkenyloxycarbonyl, alkynyloxycarbonyl, or N-heterocyclylcarbonyl wherein the N-heterocyclyl moiety is selected from the group consisting of piperidino, morpholino, thiomorpholino and pyrrolidino; and salts thereof.

#### 4,163,104 HETEROCYCLIC CONTAINING HYDRAZINECARBOTHIOAMIDES

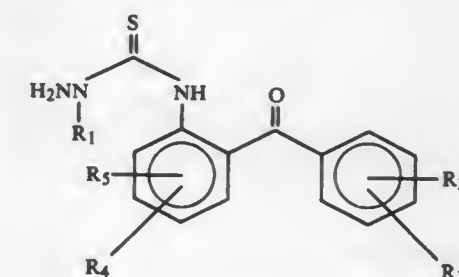
Thomas C. Britton, and Donald L. Trepanier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 818,683, Jul. 25, 1977, which is a continuation-in-part of Ser. No. 769,125, Feb. 16, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,913  
Int. Cl.<sup>2</sup> C07D 295/14

U.S. Cl. 544—160

1 Claim

1. A compound of the formula



wherein R<sub>1</sub> represents a substituted lower alkyl wherein the substituent is selected from the group consisting of morpholino, piperidino or pyrrolidino and R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> independently represent hydrogen, lower alkyl, halo or loweralkylthio.

#### 4,163,105 ARYLOXYMETHYL IMIDAZOLINES

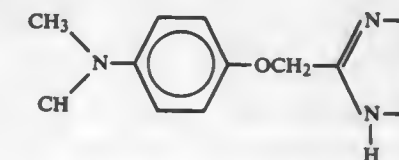
Don V. Wysong, Farwell, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 16, 1975, Ser. No. 623,179  
Int. Cl.<sup>2</sup> C07D 233/22

U.S. Cl. 548—342

3 Claims

1. An aryloxymethyl imidazoline having the formula



and the pharmaceutically-acceptable salts thereof.

#### 4,163,106 PROSTAGLANDIN PRECURSORS AND PROCESSES FOR PREPARING THE SAME

Kiyosi Kondo, Yamato, and Daiei Tunemoto, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,053  
Claims priority, application Japan, Feb. 25, 1976, 51-18839; Feb. 25, 1976, 51-18840; Feb. 27, 1976, 51-20078; Feb. 27, 1976, 51-20079; Mar. 1, 1976, 51-21163

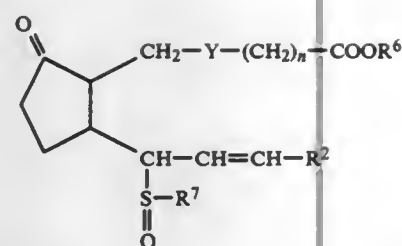
Int. Cl.<sup>2</sup> C07C 177/00, 147/14

U.S. Cl. 560—11

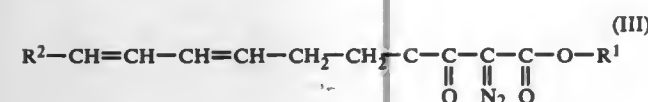
24 Claims

1. A process for preparing a compound of the formula (II)

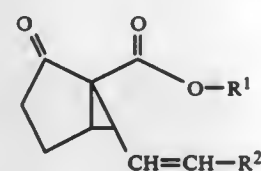




wherein  $R^2$  represents a substituted or unsubstituted alkyl group having 1 to 8 carbon atoms,  $R^6$  represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms,  $R^7$  represents an alkyl group having 1 to 4 carbon atoms or an aryl group,  $Y$  represents a  $-\text{CH}_2\text{CH}_2-$  group or a  $-\text{CH}=\text{CH}-$  group, and  $n$  is an integer of 0 to 6, which comprises subjecting an  $\alpha$ -diazo- $\beta$ -keto ester compound of the formula (III)



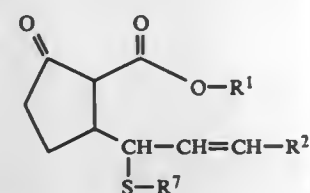
wherein  $R^2$  is as defined above, and  $R^1$  represents an alkyl group having 1 to 4 carbon atoms or an aryl group, to a carbene or carbenoid formation either by a catalytic reaction in the presence of a trace amount of a metal or metal salt catalyst or a photodecomposition through exposure to light to produce a 6-alkenylbicyclo[3.1.0]hexanone compound of the formula (I)



wherein  $R^1$  and  $R^2$  are as defined above, reacting the thus obtained 6-alkenyl-bicyclo[3.1.0]hexanone compound at from about  $0^\circ$  to about  $100^\circ$  C. with approximately equimolar amount of a mercaptan compound of the formula (V)



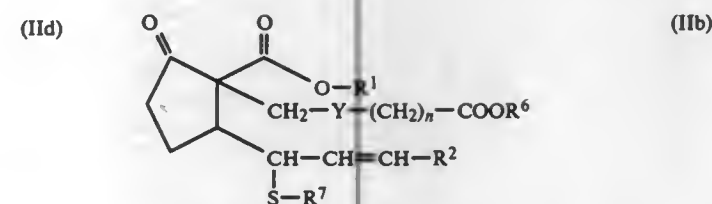
wherein  $R^7$  is as defined above, in the presence of a base to produce a cyclopentanone sulfide compound of the formula (IIa)



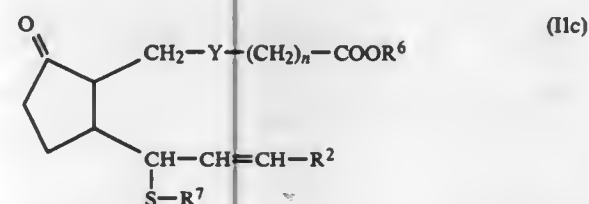
wherein  $R^1$ ,  $R^2$  and  $R^7$  are as defined above, reacting the thus obtained cyclopentanone compound at from about  $-80^\circ$  to about  $150^\circ$  C. with approximately equimolar amount of an alkylating agent of the formula (VI)



wherein  $R^6$ ,  $Y$  and  $n$  are as defined above, and  $Z$  represents a halogen atom, a tosyloxy group or an acyloxy group, in the presence of a base to produce a compound of the formula (IIb)

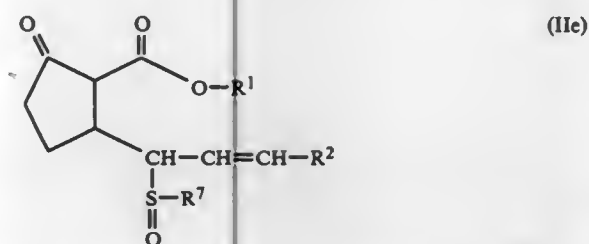


wherein  $R^1$ ,  $R^2$ ,  $R^6$ ,  $R^7$ ,  $Y$  and  $n$  are as defined above, subjecting the thus obtained compound of the formula (IIb) to either (1) heat-treatment at a temperature of about  $50$  to about  $200^\circ$  C. in the presence of an alkali metal compound and an inert polar solvent, or (2) an acid or alkali hydrolysis at a temperature of about  $0^\circ$  to about  $150^\circ$  C. followed by heat-treatment at a temperature of about  $50^\circ$  to about  $200^\circ$  C. to produce a compound of the formula (IIc)

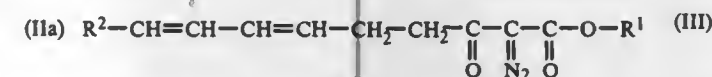


wherein  $R^2$ ,  $R^6$ ,  $R^7$ ,  $Y$  and  $n$  are as defined above, and oxidizing the thus obtained compound of the formula (IIc) with an oxidizing agent at a temperature of about  $-80^\circ$  to about  $100^\circ$  C. in an inert solvent.

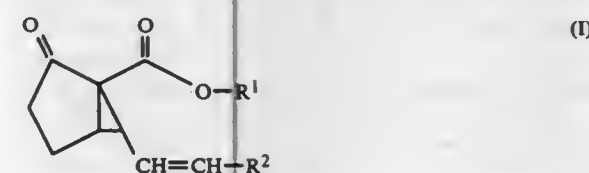
17. A process for preparing a compound of the formula (Ile)



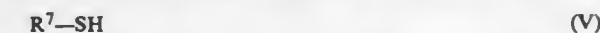
wherein  $R^1$  represents an alkyl group having 1 to 4 carbon atoms or an aryl group,  $R^2$  represents a substituted or unsubstituted alkyl group having 1 to 8 carbon atoms, and  $R^7$  represents an alkyl group having 1 to 4 carbon atoms or an aryl group, which comprises subjecting an  $\alpha$ -diazo- $\beta$ -keto ester compound of the formula (III)



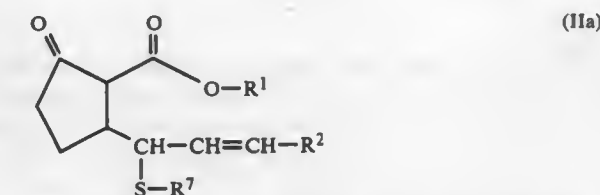
wherein  $R^2$  is as defined above, and  $R^1$  represents an alkyl group having 1 to 4 carbon atoms or an aryl group to a carbene or carbenoid formation either by catalytic reaction in the presence of a trace amount of a metal or metal salt catalyst or a photo-decomposition through exposure to light to produce a 6-alkenyl bicyclo [3.1.0]hexanone compound of the formula (I)



wherein  $R^1$  and  $R^2$  are as defined above, reacting the thus obtained 6-alkenyl-bicyclo[3.1.0]hexanone compound at from about  $0^\circ$  C. to about  $100^\circ$  C. with approximately equimolar amount of a mercaptan compound of the formula (V)



wherein  $R^7$  is as defined above, in the presence of a base to produce a cyclopentanone sulfide compound of the formula (IIa)



wherein  $R^1$ ,  $R^2$  and  $R^7$  are as defined above, and oxidizing the thus obtained cyclopentanone sulfide compound with an oxidizing agent in an inert solvent at from about  $-80^\circ$  to about  $100^\circ$  C.

4,163,107

#### $\omega$ -ARYL-CIS-13-PGF COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

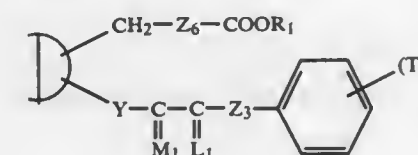
Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,185

Int. Cl.<sup>2</sup> C07C 177/06

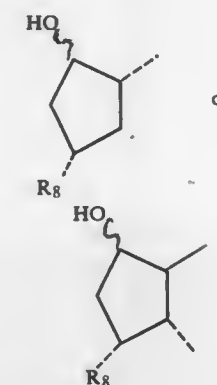
U.S. Cl. 560—61

37 Claims

1. A prostaglandin analog of the formula:



wherein D is



wherein  $R_8$  is hydrogen or hydroxy;

wherein  $Y$  is  $\text{cis}-\text{CH}=\text{CH}-$ ;

wherein  $Z_6$  is

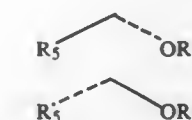
- (1)  $\text{cis}-\text{CH}=\text{CH}-\text{CH}_2-(\text{CH}_2)_g-\text{CH}_2-$ ,
- (2)  $\text{cis}-\text{CH}=\text{CH}-\text{CH}_2-(\text{CH}_2)_g-\text{CF}_2-$ ,
- (3)  $\text{cis}-\text{CH}_2-\text{CH}=\text{CH}-(\text{CH}_2)_g-\text{CH}_2-$ ,
- (4)  $-(\text{CH}_2)_3-(\text{CH}_2)_g-(\text{CH}_2)-$ , or
- (5)  $-(\text{CH}_2)_3-(\text{CH}_2)_g-\text{CF}_2-$ ,

wherein  $g$  is one, 2, or 3;

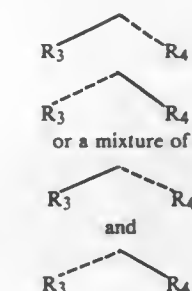
wherein  $Z_3$  is oxa or methylene;

wherein  $T$  is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and  $s$  is zero, one, 2, or 3, the various  $T$ 's

being the same or different, with the proviso that not more than two  $T$ 's are other than alkyl; wherein  $M_1$  is



wherein  $R_5$  and  $R_6$  are hydrogen or methyl, with the proviso that one of  $R_5$  and  $R_6$  is methyl only when the other is hydrogen; wherein  $L_1$  is



wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro and  $Z_3$  is methylene; and

wherein  $R_1$  is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,163,108

#### PROSTAGLANDINS

Roelof K. Beerthuis; David A. van Dorp, both of Vlaardingen, and Diederik H. Nugteren, Rhoon, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 704,551, Feb. 12, 1968, abandoned.

This application Mar. 21, 1973, Ser. No. 343,269

Claims priority, application United Kingdom, Feb. 16, 1967, 7495/67

Int. Cl.<sup>2</sup> C07C 177/600

U.S. Cl. 560—121

10 Claims

1. The prostaglandin which is a  $1\alpha$ -(6-carboxyhexyl)-4 $\alpha$ -hydroxy-cyclopentan-2-one having in the  $5\beta$ -position a 3S-hydroxy-n-alk-1-enyl group of 7 or 9 carbon atoms, its pharmacologically acceptable carboxylic acid salt or its carboxylic ester with a C<sub>10</sub> to C<sub>15</sub> alkanol.

4,163,109

#### PROCESS FOR THE PREPARATION OF CYCLIC KETONES

Paul J. Teisseire, Grasse; Marcel Plattier, Antibes, and Edouard Giraudi, La Roquette sur Siagne, all of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

Filed Jul. 13, 1977, Ser. No. 815,213

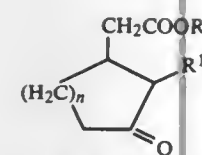
Claims priority, application Switzerland, Jul. 16, 1976, 9136/76; Nov. 8, 1976, 14030/76

Int. Cl.<sup>2</sup> C07C 69/74, 67/32

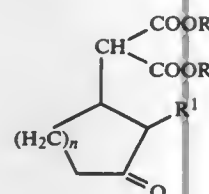
U.S. Cl. 560—122

9 Claims

1. A process for the preparation of compounds of the formula



in which R represents an alkyl group containing 1 to 3 carbon atoms, R<sup>1</sup> represents an alkyl or alkenyl group containing 3 to 6 carbon atoms and n represents 1 or 2, wherein a compound of the general formula



in which R, R<sup>1</sup> and n have the meanings given above is reacted with from 1 to 1.5 molar equivalents of water, per molar equivalent of compound of formula II, at such an elevated temperature as to produce a yield of not less than about 60% of the compound of formula I.

4,163,110

## 11-DEOXY-2,2-DIFLUORO-PGE COMPOUNDS

Gordon L. Bundy, Portage, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 609,410, Sep. 2, 1975. This application Apr. 17, 1978, Ser. No. 897,222  
Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 560—121

1. 11-Deoxy-2,2-difluoro-PGE<sub>2</sub>, methyl ester.

4,163,111

## 2-CYCLOPENTENONE DERIVATIVES

Sigeru Torii; Hideo Tanaka, and Yulchi Kobayashi, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhim Kabushiki Kaisha, Osaka, Japan

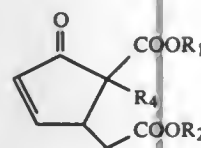
Filed Jun. 8, 1978, Ser. No. 913,745  
Claims priority, application Japan, Aug. 12, 1977, 52/97171; Aug. 12, 1977, 52/97172

Int. Cl.<sup>2</sup> C07C 69/74, 61/20

U.S. Cl. 560—122

3 Claims

1. A 2-cyclopentenone derivative represented by the formula



wherein R<sub>1</sub> and R<sub>2</sub> are lower straight-chain or branched-chain alkyl, alkenyl or aralkyl, and R<sub>4</sub> is 2-pentenyl or 2-pentynyl.

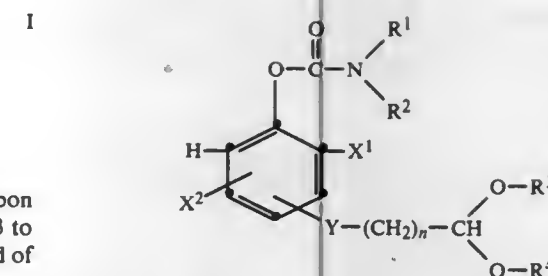
4,163,112

O-ALKOXY- AND ALKYLTHIOPHENYL CARBAMATES  
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 4, 1977, Ser. No. 784,213  
Int. Cl.<sup>2</sup> C07C 125/06; A61K 31/27

U.S. Cl. 560—132

1. A compound of the formula



wherein R<sup>1</sup> is selected from the group consisting of hydrogen, alkyl and alkoxy; R<sup>2</sup> is selected from the group consisting of alkyl and alkenyl; X<sup>1</sup> and X<sup>2</sup> are each selected from the group consisting of hydrogen, alkyl and halogen; Y is selected from the group consisting of oxygen and sulfur; n is the integer 1 or 2; and R<sup>3</sup> and R<sup>4</sup> are each alkyl

4,163,113

## ESTER DIOL ALKOXYLATE ACRYLATES

Robert J. Knopf, Saint Albans, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

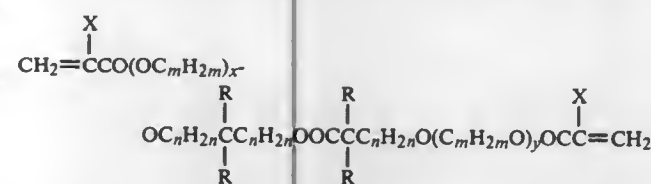
Filed Sep. 29, 1977, Ser. No. 837,839

Int. Cl.<sup>2</sup> C07C 69/67

U.S. Cl. 560—185

10 Claims

1. An ester diol alkoxyate acrylate of the formula:



wherein m is an integer having a value of from 2 to 4; n is an integer having a value of from 1 to 5; x and y are integers having a value of from 1 to 20; X is a hydrogen or methyl; and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms.

4,163,114

## ESTER DIOL ALKOXYLATES

Joseph V. Koleske, Charleston, and Robert J. Knopf, Saint Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

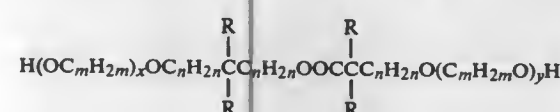
Filed Sep. 29, 1977, Ser. No. 837,838

Int. Cl.<sup>2</sup> C07C 69/66

U.S. Cl. 560—186

10 Claims

1. An ester diol alkoxyate of the formula:



wherein m is an integer having a value of from 2 to 4; n is an integer having a value of from 1 to 5; x and y are integers each having a value of from 1 to 20; and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms.

4,163,115

## PREPARATION OF ESTERS OF POLY-(TETRAMETHYLENE ETHER) GLYCOL

George E. Heinsola, Newark; Ivan M. Robinson, Wilmington, both of Del.; Gerfried Pruckmayr, Media, Pa., and Walter W. Gilbert, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 751,211, Dec. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 672,555, Mar. 31, 1976, abandoned. This application Jan. 13, 1978, Ser. No. 869,272

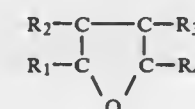
Int. Cl.<sup>2</sup> C07C 67/24

U.S. Cl. 560—240

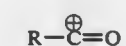
13 Claims

1. A process for preparing ester end-capped poly(tetramethylene ether) glycol, or ester end-capped poly(tetramethylene ether) glycol copolymer, the process comprising (A) bringing together, at a temperature of 0° to 120° C.,

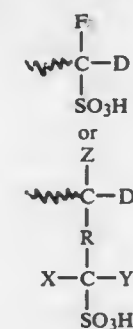
(1) tetrahydrofuran, and optionally, up to 50% by weight of the tetrahydrofuran of a copolymerizable alkyl tetrahydrofuran represented by the structure



where any one of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> or R<sub>4</sub> is an alkyl radical of 1 to 4 carbon atoms, the remaining R's being hydrogen; (2) an acylium ion precursor which is a compound capable of generating, under reaction conditions, an acylium ion represented by the structure



where R is hydrogen or a hydrocarbon radical, (3) as a catalyst, a homopolymer of an ethylenically unsaturated monomer (a) containing groups such that the final polymer will contain groups of the formula



wherein represents the polymer chain or a segment thereof; D is hydrogen, an aliphatic or aromatic hydrocarbon

radical of 1 to 10 carbon atoms, a halogen or a segment of the polymer chain;

X and Y are hydrogen, halogen or an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms, but at least one of X or Y must be fluorine;

R is a linear or branched linking group having up to 40 carbon atoms in the principal chain; and

Z is hydrogen, halogen or an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms;

or a copolymer of monomer (a) with at least one other copolymerizable ethylenically unsaturated monomer (b), the homopolymer or copolymer being effectively free of functional groups which interfere with the reaction; and

(4) optionally, an aliphatic carboxylic acid of 1 to 36 carbon atoms; and then

(B) separating the resulting ester end-capped poly(tetramethylene ether) glycol product from the reaction mass.

4,163,116

## PROCESS FOR PRODUCING BISPHENOLS

Charles V. Hedges, Mt. Vernon, and Victor Mark, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

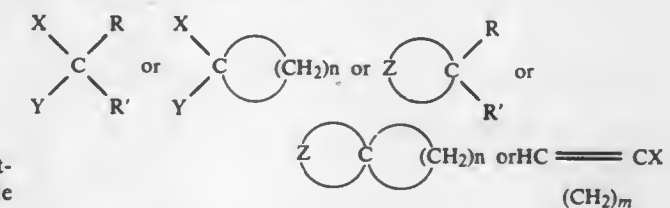
Filed Feb. 10, 1978, Ser. No. 876,706

Int. Cl.<sup>2</sup> C07C 37/00, 37/12

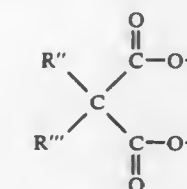
U.S. Cl. 568—723

11 Claims

1. A process for the production of bisphenols which comprises reacting a phenol containing at least one reactive hydrogen and a compound of the formula



wherein R and R' are independently selected from the group consisting of hydrogen, lower alkyl or aryl; X is lower alkoxy; Y is lower alkoxy, aryloxy or the same as X; Z is the divalent radical



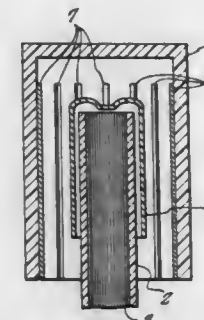
wherein R'' and R''' are independently selected from the same group as R and R', and n is an integer from 3 to 9; m=(n-1), or a mixture of such compounds, in the presence of an acidic condensing agent.



# ELECTRICAL

4,163,117  
HEAT-RECOVERABLE ARTICLES AND THEIR USE  
Bruce D. Campbell, Redwood City, and Eugene F. Lopez, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 19, 1978, Ser. No. 897,805  
Int. Cl.<sup>2</sup> H02G 15/04; B29C 27/00; B32B 31/00; F16L 25/00  
U.S. Cl. 174—74 A 39 Claims



1. A method of covering a substrate with a covering member which is sealed around at least one section of said substrate, which method comprises

(1) providing an assembly comprising an elongate substrate and a covering member, said covering member comprising a heat-shrinkable band portion which has a closed cross-section and passes around a section of said substrate; said section of the substrate comprising an exterior wall portion composed of a first crystalline polymeric composition which has a gel fraction of at most 0.3 and a crystalline melting point  $T_1$  and in which there is dispersed an absorptive material which absorbs electromagnetic radiation; and said band portion comprising a heat-shrinkable interior wall portion composed of a second crystalline polymeric composition which has a gel fraction of at least 0.3 and a crystalline melting point  $T_2$  equal to at least  $(T_1 + 5)^\circ\text{C.}$  and in which there is dispersed an absorptive material which absorbs electromagnetic radiation; and (2) exposing the exterior of said heat-shrinkable band portion to electromagnetic radiation, said radiation and said absorptive materials and the amounts thereof being such that said band portion absorbs a fraction of said radiation which heats said band portion to its shrinkage temperature and transmits a fraction of said radiation, at least a portion of the transmitted fraction being absorbed by said exterior wall portion of the substrate and heating said exterior wall portion of the substrate to a temperature which is at least equal to its crystalline melting point  $T_1$ , whereby said interior wall portion of the covering member shrinks into direct sealing contact with said exterior wall portion of the substrate.

22. A generally tubular heat-shrinkable article which comprises at least one heat-shrinkable band portion which has a closed cross-section and which comprises a heat-shrinkable interior wall portion composed of a cross-linked polymeric composition, which composition comprises (a) a cross-linked crystalline olefin polymer having a gel fraction of at least 0.3, a density of at least 0.95 and a modulus at  $175^\circ\text{C.}$  of at least 40 psi, and (b) an infra-red-absorptive filler dispersed in said polymer in amount such that said band portion, when exposed to radiation having a wavelength of 1.15 microns, transmits 5 to 50% of the radiation.

35. An article comprising an electrical cable having an insulating jacket and a generally tubular covering member therefor, the covering member comprising a heat-shrinkable band portion which has a closed cross-section and which passes around a section of the insulating jacket, the insulating jacket being composed of a first polymeric composition comprising a crystalline olefin polymer having a crystalline melting point  $T_1$  and a gel fraction of at most 0.3 and, dispersed in the polymer, an infra-red-absorptive filler; and the band portion being composed of a second polymeric composition comprising a

cross-linked crystalline olefin polymer having a crystalline melting point  $T_2$  which is at least  $(T_1 + 5)^\circ\text{C.}$  and a gel fraction of at least 0.3 and, dispersed in the cross-linked polymer, an infra-red-absorptive filler in amount such that the band portion, when exposed to radiation having a wavelength of 1.15 microns, transmits 5 to 50% of the radiation, the amounts of infra-red-absorptive materials in the first and second polymeric composition being such that when the exterior of the heat-shrinkable band portion is exposed to infra-red radiation of a selected wavelength the band portion absorbs a fraction of the radiation which heats said band portion to its shrinkage temperature and transmits a fraction of the radiation which is absorbed by the section of the insulating jacket and heats the exterior thereof to a temperature which is at least equal to its crystalline melting point  $T_1$ , whereby the band portion shrinks into direct sealing contact with the section.

## 4,163,118 BUSBAR SYSTEM OF ELECTRIC HIGH-VOLTAGE SWITCHGEAR

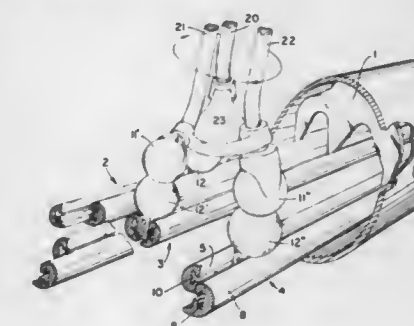
Pieter Mariën, De Meeren; Rintje Boersma, Harmelen, and Gijbert W. Irik, Bilthoven, all of Netherlands, assignors to Coq B.V., Utrecht, Netherlands

Filed Mar. 21, 1978, Ser. No. 888,779  
Claims priority, application Netherlands, Apr. 19, 1977, 7704276

Int. Cl.<sup>2</sup> H02G 5/06

U.S. Cl. 174—99 B

8 Claims



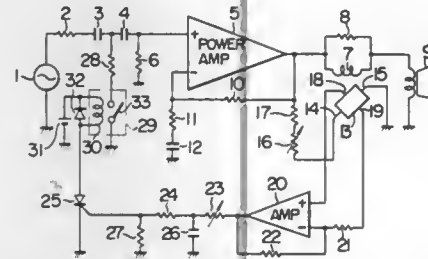
1. In a busbar system, the combination of:  
a support and an insulator carried by said support;  
a busbar attached to said insulator in spaced relation to said support, said busbar comprising a pair of elongate, parallel rods, each having an inner face and an outer face, said outer faces being semicircular and said inner faces being disposed in spaced relation to each other so that said outer faces define a generally cylindrical envelope, said insulator having a portion disposed between said inner faces and said inner faces of the bars each having a longitudinally extending T-slot; and  
means for attaching said busbar to said insulator, said means comprising a pair of bolts having their heads received in the respective T-slots of said bars whereby the attachment may be made at a selected longitudinal position along said busbar.

**4,163,119**  
**PROTECTIVE CIRCUIT FOR ELECTROACOUSTIC TRANSDUCER WITH HALL ELEMENT AND VOICE COIL TEMPERATURE RISE TIME CONSTANT CIRCUIT**  
 Tatsuo Baba, Toyokawa; Yoshito Ohmura, Aichi; Hiroshi Fukushima, and Hideo Fukuma, both of Toyokawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 20, 1977, Ser. No. 834,901  
 Claims priority, application Japan, Sep. 27, 1976, 51-114762  
 Int. Cl.<sup>2</sup> H04R 3/00

U.S. Cl. 179-1 F

10 Claims



1. A protective circuit for an electroacoustic transducer which receives the output of a low-frequency power amplifier and converts the received output to a corresponding acoustic signal, comprising:

an inductive element for receiving the output signal of said low-frequency power amplifier and generating magnetic flux corresponding to the current of said output signal of said power amplifier, said electroacoustic transducer receiving through said inductive element said output signal of said low-frequency power amplifier;

a Hall-effect element having a pair of input terminals and a pair of output terminals, so disposed as to be subjected to the magnetic field induced by said inductive element; means for supplying said output signal of said low-frequency power amplifier to said pair of input terminals of said Hall-effect element;

means for obtaining a Hall dc voltage corresponding to the power of said output signal of said low-frequency power amplifier from said pair of output terminals;

a time constant circuit having a time constant in accordance with the time constant of temperature rise in the voice coil of said electroacoustic transducer, for receiving said Hall dc voltage and delivering an output obtained by varying said Hall dc voltage depending upon said time constant; and

means for receiving the output voltage of said time constant circuit and shifting down the signal level of the low-frequency signal supplied to said electroacoustic transducer when said output voltage exceeds a predetermined level.

**4,163,120**  
**VOICE SYNTHESIZER**  
 Milton Baumwolsper, Brooklyn, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Apr. 6, 1978, Ser. No. 894,042  
 Int. Cl.<sup>2</sup> G10L 1/00

U.S. Cl. 179-1 SM

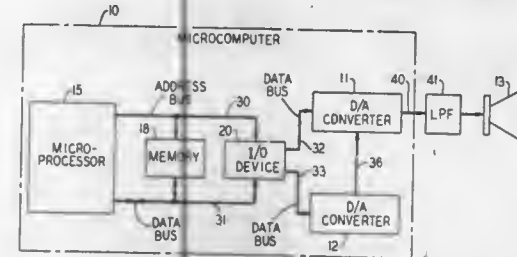
6 Claims

1. A voice synthesizer (FIG. 1) arranged with a memory (18) for storing basis functions (FIGS. 4A through 4L), each basis function including a set of data representing a speech waveform segment recorded at a basic storage rate and each basis function defining a waveform segment within a pitch period and including plural formants F1 and F2; the synthesizer BEING CHARACTERIZED BY

each basis function being represented by a data point plotted on a single line (46) on a chart having first and second formant log-log axes (FIG. 3), and

means (11, 12, 13, 15, 20, 30, 31, 32, 33, 36, 40, 41) for producing a speech waveform segment within the pitch period

and approximately representing a data point located off of the single line (46) on the chart by selecting and reading



out of the memory (16) in the pitch period one of the basis functions at a rate different than the basic storage rate.

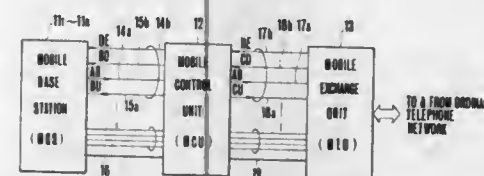
**4,163,121**  
**RADIO CHANNEL CONTROL SYSTEM FOR MOBILE RADIO TELEPHONE SYSTEMS**

Noriaki Yoshikawa, Yokosuka; Hitoshi Komagata, Yokohama, and Yoshio Sato, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 30, 1977, Ser. No. 829,061  
 Claims priority, application Japan, Aug. 30, 1976, 51-102612  
 Int. Cl.<sup>2</sup> H04Q 7/00

U.S. Cl. 179-2 EB

20 Claims



1. In a mobile radio telephone system of the type wherein a service area of the system is divided into a plurality of radio zones, base stations are installed in respective radio zones, each of said base stations is connected to a control unit respectively through a common control channel and a plurality of speech channels, and said control unit is connected to an ordinary telephone network, a radio channel control system comprising a plurality of signal lines for carrying signaling information extending between each of said base stations and said control unit, each signal line being associated with a corresponding one of the plurality of speech channels, and each of said speech channels including speech lines and signal lines for carrying signaling information concerning the associated speech channel.

**4,163,122**  
**METHOD AND APPARATUS FOR AUTOMATICALLY CORRECTING ERRORS IN A CYCLIC ROUTING MEMORY OF A TIME DIVISION MULTIPLEXED TRUNK EXCHANGE**

Barend L. de Goede, Leidschendam, Netherlands, assignor to De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Continuation-in-part of Ser. No. 688,395, May 20, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,764  
 Claims priority, application Netherlands, May 22, 1975, 7506031

Int. Cl.<sup>2</sup> H04Q 11/04

U.S. Cl. 179-15 AT

10 Claims

1. A method for automatically correcting errors in a cyclic routing memory of a four-wire TMD telecommunication exchange, comprising

(A) a switching means for switching the two channels of the

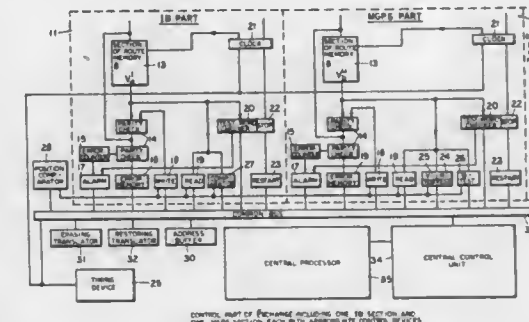
four-wire connection over two different switching paths, which switching part comprises:

1. an input means
2. a switching element
3. an output means

(B) a control means for controlling said switching means, which control means comprises:

4. a cyclic routing memory for consecutively establishing a plurality of switching paths between said input means and said output means via said switching element
5. a central control unit for providing the cyclic routing memory with switching data,

said method comprising:



(a) storing said switching data for the control of the two different direction switching paths of one connection in two separate columns of said cyclic routing memory for each switching path direction, and

(b) deriving lost switching data in one column for one switching path from the data of the other switching path of the same connection by

1. finding which direction path had the loss,
2. transforming the remaining data in said lost path to corresponding data in the other path direction,
3. finding the location of the path in said other direction which corresponds to the transformed data,
4. transforming the data from the other found path to reproduce the lost data, and
5. writing the lost transformed data into said lost path.

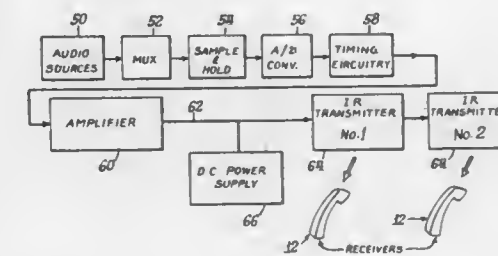
**4,163,123**  
**ELECTRONIC TOUR GUIDE SYSTEM**  
 Harvey A. Brodsky, 9323 Lincolnwood Dr., Evanston, Ill. 60203, and William D. Becker, 1057 W. Belden Ave., Chicago, Ill. 60614

Filed Jun. 19, 1978, Ser. No. 916,857

Int. Cl.<sup>2</sup> H04J 3/08; H04B 9/00

U.S. Cl. 179-15 AL

23 Claims



1. A tour guide system for use in a building such as a museum, art gallery or the like, comprising:  
 message source means having a plurality of channels of information signals comprising messages about exhibits or the like within the building;  
 means for multiplexing the channels of information signals and applying the information signals to one or more electrical conductors which extend throughout the building;  
 means located along the conductor for demultiplexing the

plurality of channels of information signals and deriving a single channel of information signals in an exhibit area;  
 means associated with said demultiplexing means for converting said derived channel of signal information to frequency modulated infrared energy and transmitting the infrared energy into the area adjacent the exhibit;  
 portable receiver means being responsive to said infrared energy for converting the same to electrical signals and including means for transducing said electrical signals to sound, thereby enabling a user carrying said portable receiver means to listen to the message being received.

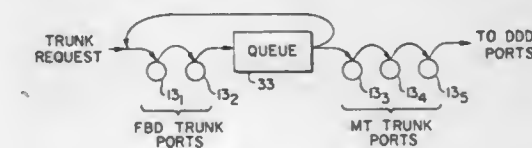
**4,163,124**  
**FINITE STORAGE-TIME QUEUE**  
 Charles H. Jolissaint, Sunnyvale, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Filed Jul. 24, 1978, Ser. No. 927,185

Int. Cl.<sup>2</sup> H04Q 3/64

U.S. Cl. 179-18 D

16 Claims



1. A method of queuing a plurality of serially generated communication link requests in a communication system having a plurality of calling stations and ordered groups of communication links, each group having a different priority level, said method comprising the steps of:

- (a) sensing each of a plurality of serially generated communication link requests from a plurality of calling stations;
- (b) scanning a first group of said communication links for availability of one of the communication links therein in response to said step of sensing;
- (c) connecting the calling station associated to a given request to one of said communication links in said first group, if available;
- (d) queuing said requests for a first fixed time period if none of said communication links in said first group is available during said step (b) of scanning;
- (e) repeating said step (b) of scanning and said step (c) of connecting;
- (f) sensing the number of requests queued;
- (g) scanning a second group of said communication links for availability of one of the communication links therein when a request has been queued for said first fixed time period or the number of queued requests exceeds a first predetermined maximum; and
- (h) connecting the calling station associated to the oldest queued request to one of said communication links in said second group.

**4,163,125**  
**PUSHBUTTON KEYBOARD SYSTEM**  
 Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.  
 Division of Ser. No. 347,026, Apr. 2, 1973, Pat. No. 3,858,202, which is a division of Ser. No. 148,503, Jun. 1, 1971, Pat. No. 3,725,907. This application Jul. 29, 1974, Ser. No. 492,670. The portion of the term of this patent subsequent to Apr. 3, 1990, has been disclaimed.

Int. Cl.<sup>2</sup> H01H 13/70

U.S. Cl. 200-5 A

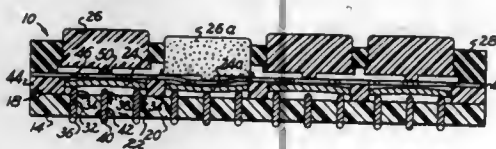
3 Claims

1. A keyboard having a plurality of normally open contact switches, said keyboard comprising:  
 a circuit board having first and second sides;  
 a plurality of spaced first electrical contacts, each contact extending through said circuit board from said first side of



said circuit board to said second side thereof and being electrically connected to selective circuits on said second side;

- a plurality of second contacts, each formed as a curved resilient plate of electrically conductive material spaced from said first contact in a normally open position and having a peripheral edge along at least a portion of which said second contact is supported;
- a contact support on said first side of said circuit board spaced from each of said first contacts and supporting said second contacts along at least a portion of their peripheral edges, said contact support being connectable to a potential, each of said switches completing a circuit upon deflection of the center of said plate from said normally open



position to a closed position against a corresponding first contact when pressure is exerted against said center, said center snapping back to said normally open position upon removal of said pressure;

- an insulative element covering said first side of said circuit board to hold said second contacts in position with respect to said first contacts and to keep foreign material out of said contacts, said element including a layer of thin flexible material completely covering said second contacts;
- a plurality of depressible keys; and
- means for positioning said keys with one of said keys adjacent each of said second contacts with said layer of flexible material therebetween, each of said keys being selectively depressible to deflect a respective plate from said normally open position to a closed position.

4,163,126

## TENSION INDICATING DEVICE

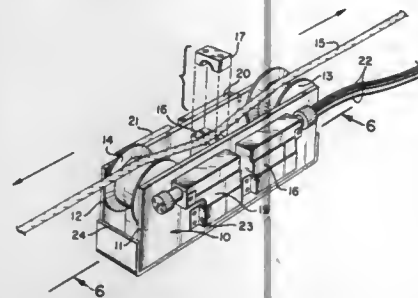
Max Van Mastrigt, Tarzana, Calif., assignor to W. C. Dillon and Co. Inc., Van Nuys, Calif.

Filed Mar. 9, 1978, Ser. No. 885,000

Int. Cl.<sup>2</sup> B65H 25/14

U.S. Cl. 200—61.13

10 Claims



1. A device for indicating when a tension in a rope has reached a predetermined value, including, in combination:

- (a) a rigid frame having spaced rope guide means for engaging spaced points on the same side of said rope;
- (b) means securing a portion of said rope between said spaced points and laterally displaced from a straight line between said spaced points so that the portions of rope extending generally in opposite directions from the point of securement define an angle with each other less than 180°;
- (c) elongated bending beam means secured at one portion to said means securing a portion of said rope and said frame and at another portion to said rigid frame so that increased

tension in said rope will deflect said bending beam means; and

- (d) indicating means on said frame responsive to deflection of said bending beam means a predetermined amount defined by said predetermined value of tension.

4,163,127

## POSITION SENSITIVE SAFETY SWITCH

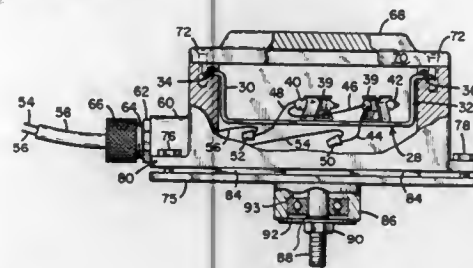
John W. Herou, Milaca, Minn., assignor to J. H. Electric Co., Inc., Princeton, Minn.

Filed Jan. 11, 1978, Ser. No. 868,701

Int. Cl.<sup>2</sup> H01H 35/00

U.S. Cl. 200—61.47

3 Claims



1. A safety switch for use in a combustible environment, comprising:

- (a) a box-like housing having a pair of end walls separated from one another by an integrally formed, spaced apart pair of side walls and having a bottom member bonded to a first edge surface of said side and end walls;
- (b) a support bracket attached between said pair of end walls and wholly contained within said housing;
- (c) first and second mercury-type switches each having spaced apart contacts and a pool of mercury enclosed in a sealed container, said switches being attached to said support bracket and having the longitudinal axes of their containers disposed along intersecting lines such that when said housing is mounted in a predetermined orientation said pool of mercury in each of said sealed containers electrically closed its associated contacts;
- (d) a cover plate adapted to be attached to second edge surfaces of said pairs of side and end walls;
- (e) a plate having first and second planar surfaces;
- (f) resilient spacer means disposed on said first planar surface;
- (g) a cylindrical tubular member disposed on said second planar surface and extending outwardly therefrom;
- (h) an axle journaled for rotation within said cylindrical tubular member; and
- (i) means for coupling said plate to said bottom member with said resilient spacer means abutting the outer surface of said bottom member, the arrangement being such that rotation of said housing about said axle by a predetermined angle in a first direction from said predetermined orientation causes the mercury pool in said first switch to electrically open its associated contacts and rotation of said housing about said axle by a predetermined angle in a second direction from said predetermined orientation causes the mercury pool in said second switch to electrically open its associated contacts.

4,163,128

## SAFETY BUCKLE WITH SWITCH

John S. Miskowicz, Rolling Prairie, Ind., assignor to Gateway Industries, Inc., Chicago, Ill.

Filed Sep. 19, 1977, Ser. No. 834,248

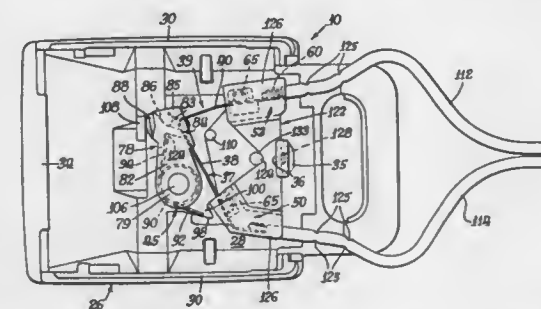
Int. Cl.<sup>2</sup> H01H 3/20, 1/42; A44B 11/26

U.S. Cl. 200—61.58 B

8 Claims

1. In a safety belt buckle, the combination comprising a buckle housing, a latch lever, opening means in said housing for receiving a latch plate to latch with said latch lever, switch

means in said housing for indicating the presence of said latch plate in said opening means, said switch means comprising a pair of flexible contact arms movable between an open position in which said arms are spaced apart and a closed position in which said arms touch, and a one-piece actuator for moving said arms between open and closed position, said actuator being pivotally mounted to said housing at one end and having a portion at the other end extending into said opening means



and further having at the other end a first surface for engaging one of said arms and a second surface for engaging the other of said arms to bend said other arm relative to said one arm when said actuator is moved, said first surface being disposed to cause said first one contact arm to slideably disengage from said second arm when said latch plate is inserted and then to shift said second contact arm further away from said first contact arm.

4,163,129

## CONDITION RESPONSIVE CONTROL SWITCH UNITS

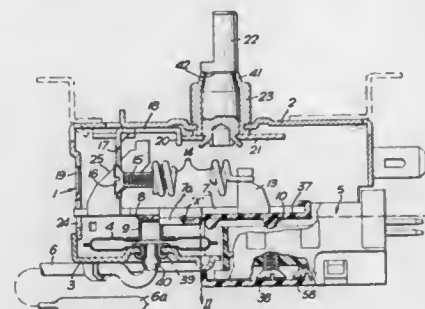
Guglielmo Rossi, Stutensee Friedrichstal, Fed. Rep. of Germany, and Vincenzo Ferloni, Lurate, Italy, assignors to Ranco Incorporated, Columbus, Ohio

Filed May 9, 1977, Ser. No. 794,721

Int. Cl.<sup>2</sup> H01H 35/24

U.S. Cl. 200—81.4

19 Claims



1. A control switch unit comprising:
- a housing having a housing wall;
- a fluid-filled power element mounted within the housing opposite said housing wall;
- an operating lever pivotally mounted in the housing and cooperating with the power element;
- a switch located in the housing and cooperating with the operating lever to be operated by the power element through the lever, both the power element and the switch being disposed on the same side of the operating lever and on opposite sides of the pivot axis of the lever;
- a tension spring located within the housing and acting on the opposite side of the operating lever from the power element and the switch, said tension spring exerting a moment on the lever in opposition to the power element;
- cam means acting upon the spring to adjust the tension thereof and to predetermine the operating point of the switch under control of the power element;
- a setting shaft connected to the cam means for adjustment of

the latter, said setting shaft being rotatable in said housing wall;

said cam means comprising a cam disc located within the housing and attached to the cam setting shaft, and including a cam slider engaged by the cam disc, said cam slider carrying anchorage means for one end of the tension spring; and,

an auxiliary cam mounted on the cam setting shaft, a cam following mechanism operatively associated with the auxiliary cam, and an auxiliary switch within the housing, connected in series with the first switch, and engageable by said cam following mechanism.

4,163,130

## VACUUM INTERRUPTER WITH PRESSURE MONITORING MEANS

Yoshiyuki Kubota; Yukio Kurosawa, and Hiroaki Sugawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

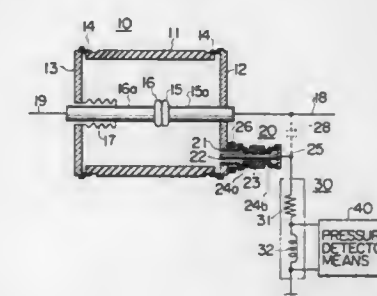
Filed Jul. 23, 1976, Ser. No. 708,098

Claims priority, application Japan, Jul. 25, 1975, 50-90087; Dec. 3, 1975, 50/142940

Int. Cl.<sup>2</sup> H01H 33/66

U.S. Cl. 200—144 B

14 Claims



1. A pressure monitoring arrangement for use with a vacuum interrupter having an envelope evacuated to a predetermined degree of vacuum and a pair of separable electrodes arranged in said envelope for connection to a high voltage circuit, comprising a pair of vacuum pressure detector electrodes supported in spaced insulated relationship to each other in communication with the interior of said envelope, one of said detector electrodes being conductively connected to said high voltage circuit, a series connection member which consists of the series connection of at least two different voltage allotment elements selected from the group consisting of a resistance, an inductance and a capacitor and having a voltage allotment ratio varied in dependence on frequency, said series connection member being connected between the other one of said detector electrodes and ground potential, and vacuum pressure detector means connected in parallel with a part of said series connection member for detecting a voltage produced by a change of current flowing through said series connection member, whereby said voltage is detected as a measure of the pressure of said envelope.

4,163,131

## DUAL-COMPRESSION GAS-BLAST PUFFER-TYPE INTERRUPTING DEVICE

John F. Perkins, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1977, Ser. No. 823,820

Int. Cl.<sup>2</sup> H01N 33/88

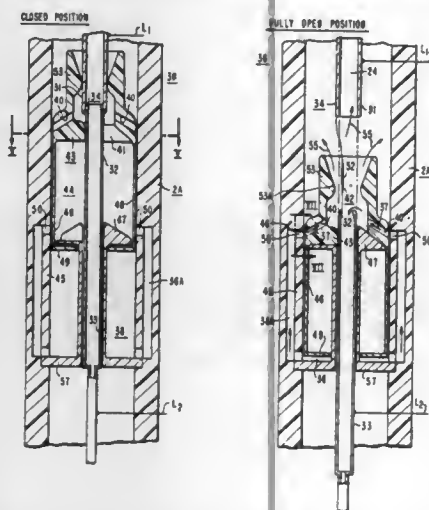
U.S. Cl. 200—148 A

14 Claims

1. A dual-piston-acting gas-blast puffer-type circuit-interrupter comprising, in combination:

- (a) means defining primary and secondary compression chambers,
- (b) means for supplying arc extinguishing fluid to said primary and secondary compression chambers;

- (c) means defining primary and secondary movable pistons movable within said primary and secondary compression chambers;  
 (d) means for moving said pistons;  
 (e) movable nozzle means movable with said primary and secondary movable pistons defining an arcing chamber;



- (f) a pair of separable arcing contacts separable to initiate an arc therebetween within said arcing chamber; and,  
 (g) valve means operable by the movement of said movable primary and secondary pistons to initiate separate flows of arc-extinguishing fluid from said primary and said secondary compression chambers into said arcing chamber.

4,163,132

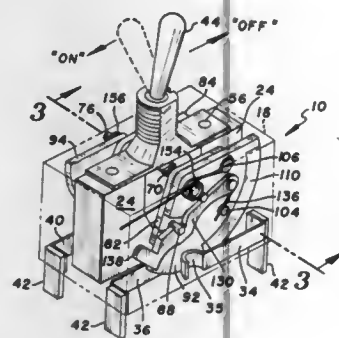
**DOUBLE-POLE SINGLE-THROW SWITCH**

John J. Reiter, 6521 Stevens Ave. South, Minneapolis, Minn. 55423

Filed Nov. 23, 1977, Ser. No. 854,136  
Int. Cl.<sup>2</sup> H01H 3/00, 21/04

U.S. Cl. 200—153 M

10 Claims

**1. In an electric switch:**

- (a) a housing of insulating material having a recess in one face defining a bottom wall and side walls;  
 (b) a swivel plate having pivot means extending between opposed side walls, said swivel plate being disposed in said recess generally transverse to said opposed side walls;  
 (c) first and second side plates aligned parallel to said opposed side walls and fixedly secured to opposed side edges of said swivel plate for movement therewith, at least one of said side plates having a latch pin extending outwardly therefrom toward said opposed side walls;  
 (d) first and second rocker plates mounted outwardly of said first and second side plates on said pivot means for at least limited rotation thereabout, said rocker plates having the general shape of a segment of a circular disc and at least one of said rocker plates having an arcuate notch formed inwardly from one radial edge thereof for receiving said

- latch pin on said one of said side plates when said rocker plate is in a first orientation relative to said one of said side plates;  
 (e) spring biased latch means coupled to said one of said first and second rocker plates and adapted to cooperate with said latch pin on said one of said side plates;  
 (f) spring means operatively connected between said housing and said one of said first and second rocker plates for normally urging said one rocker plate to a predetermined orientation with respect to said housing;  
 (g) switch actuating means affixed to said housing and coupled to said swivel plate and movable between a first and a second position; and  
 (h) first and second sets of electrical contacts disposed in said recess proximate said bottom wall and said opposed side walls and generally aligned with said first and second rocker plates such that during at least a portion of the travel of said rocker plates, said contacts of said first set are separately said first rocker plate and said contacts of said second set are separated by said second rocker plate.

4,163,133

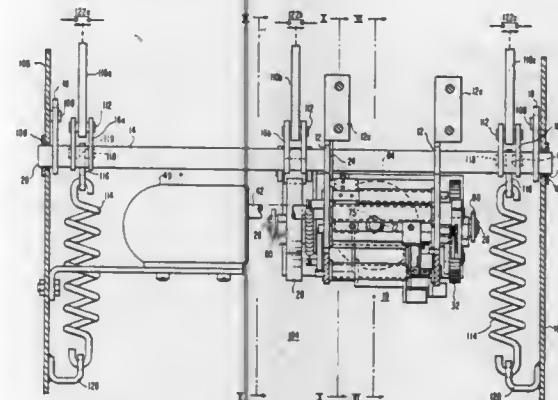
**CIRCUIT BREAKER APPARATUS INCLUDING JACK SHAFT SUPPORT**

Fred Bould, Edgewood Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 680,829, Apr. 28, 1976, abandoned.  
This application May 18, 1978, Ser. No. 907,074Int. Cl.<sup>2</sup> H01H 3/30

U.S. Cl. 200—153 SC

5 Claims

**1. A circuit interrupter, comprising:**

- (a) a base;  
 (b) three separable main contact means disposed upon said base;  
 (c) three lever means, one for each of said separable main contact means interconnected with said contact means for moving said contact means;  
 (d) rotatable jack shaft means for moving said lever means, each end of said jack shaft means being disposed in thrust bearing relationship with said base for substantially bearing the thrust from the two outer of said three lever means as said contact means moves; and  
 (e) operating mechanism means disposed upon said base for moving said jack shaft means, said operating mechanism means comprising a pair of spaced support members, said operating mechanism means also comprising a cam the shaft of which is movably supported by said pair of spaced support members but which is disposed outboard thereof for actuating said jack shaft means to rotate in appropriate circumstances for thus moving said contact means, only one of said pair of support members also having a bearing surface thereon which engages said jack shaft means relatively near said middle lever means of said three lever means for substantially bearing the thrust of said middle lever means as said contact means moves, said middle

lever means also being disposed outboard of said pair of spaced support members.

4,163,134

**SAFETY JUMPER CABLES**

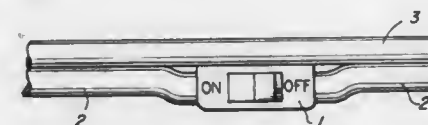
Charles R. Budrose, Melrose, Mass., assignor to Upaya, Inc., Saugus, Mass.

Filed Nov. 7, 1977, Ser. No. 849,310

Int. Cl.<sup>2</sup> H01H 13/08, 21/10

U.S. Cl. 200—157

15 Claims

**1. Jumper cable apparatus comprising:**

- a pair of electrical cables each having on either end clamp means enabling connection of the cables to battery terminals,  
 and switch means in at least one of said cables and having a connecting position and a disconnecting position,  
 each clamp means having an actuating handle and associated control switch at the handle operated by squeezing the handle.

4,163,135

**HIGH CURRENT SWITCHES USING MULTI-LOUVERED CONTACT STRIPS**

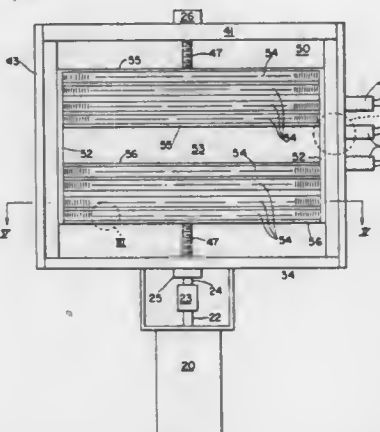
Donald B. Steen, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,590

Int. Cl.<sup>2</sup> H01H 3/40

U.S. Cl. 200—158

14 Claims

**1. A switch for use in carrying at least 10,000 amperes comprising:**

- a plurality of stationary metal bus bars insulated from each other;  
 at least one movable metal bus bar with each of said stationary and movable bus bars having a switching surface which is flat, the switching surfaces of the plurality of the stationary bus bars being positioned so as to lie within a plane surface along which said movable bus bar may be moved to open and close electrical circuits, the flat switching surface of said movable bus bar being positioned facing toward and parallel to said plane surface and in contact with at least one of said stationary bus bars switching surfaces, the movable bus bar being configured so that when it is positioned overlapping portions of two stationary bus bars, current will flow from one stationary

bus bar through the movable bus bar to the other stationary bus bar;

a plurality of contact strips making said contact positioned so that said current will flow through the contact strips between the movable bus bar and a stationary bus bar, each of said contact strips having a plurality of spring like contacts which press against the flat switching surfaces of both the movable bus bar and the adjacent stationary bus bars;

actuator means for moving the movable bus bar within said switch so that an electrical circuit may be opened and closed between different stationary bus bars through the contact strips and the movable bus bar.

4,163,136

**SNAP-IN MEANS FOR MOUNTING ELECTRICAL DEVICES OR THE LIKE IN A SUPPORT PANEL APERTURE**

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

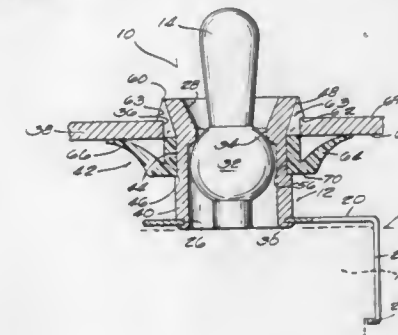
Continuation of Ser. No. 632,637, Nov. 17, 1975, abandoned.

This application Mar. 16, 1977, Ser. No. 777,962

Int. Cl.<sup>2</sup> H01H 13/04

U.S. Cl. 200—296

8 Claims



1. A snap-in mounting means for a device adapting the device to be mounted from the back of and through a hole in a support panel to secure the device to the panel so that part of the device is accessible from the front of the panel comprising an elongated bushing carrying the accessible part of the device and adapted to be received in the panel mounting hole, said bushing including a first shank portion, a second shank portion of a reduced outer dimension, a radially extending shoulder integrally connecting said first and second shank portions and an enlarged camming section extending from the outer extremity of said second shank portion; a grommet including a radially yieldable sleeve slidably and stretchably mounted on said first bushing shank portion to form a subassembly and a radially outwardly tapered locking collar on the outer end of said sleeve, said grommet being axially spaced inwardly from said bushing camming section so that said bushing camming section initially extends beyond the outer end of said grommet, said sleeve terminating in an inner edge and having an outer dimension less than the dimension of the panel mounting hole to allow insertion of said subassembly partly through the hole, said locking collar having a cross section intermediate its ends approximating, but less than, the dimension of the panel mounting hole and terminating at the inner end in a shoulder extending radially outwardly from said sleeve to a dimension larger than the panel mounting hole, and

biasing means for urging said grommet in an axial direction away from the back of the panel,

said bushing and grommet subassembly being insertable as a unit through the panel mounting hole to compress said locking collar radially inwardly and permit passage thereof through the panel mounting hole and to stress said biasing means against the back of the panel with said



locking collar thereafter expanding to its normal position where said locking collar shoulder engages the front side of the panel, said bushing being axially movable to permit it to be pulled back to slide axially within said grommet sleeve for engaging said bushing camming section with the interior of said grommet sleeve to cam said grommet sleeve radially outwardly into engagement with the inner edge of the panel mounting hole and further expand said locking collar on the front of the panel and for slipping said grommet sleeve off said first shank portion onto said reduced second shank portion and snapping said inner edge into engagement with said bushing shoulder, said grommet thereafter cooperating with said biasing means to hold said locking collar shoulder in tight engagement with the front side of the panel.

4,163,137

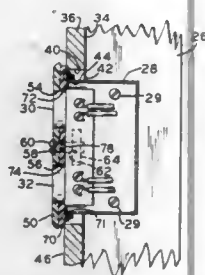
## ELECTRICAL BOX SEAL CONSTRUCTION

Joseph B. Close, Jr., 3426 Rockwood Dr., Fort Wayne, Ind. 46805

Continuation-in-part of Ser. No. 842,685, Oct. 17, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 926,000 Int. Cl.<sup>2</sup> H01H 9/04

U.S. Cl. 200—302

8 Claims



1. In the combination of a wall having an opening therein and having an outer surface, an electrical box mounted in said opening, an electrical device mounted in said box and having a surface generally flush with said wall opening and at least one portion protruding outwardly from said surface thereof and beyond said box and wall surface, a cover plate having a peripheral edge defining a shallow recess, and means for securing said cover plate to said device with said recess facing said box and with said edge engaging said wall surface surrounding said opening and defining a peripheral area therewith, said cover plate having at least one opening therein for receiving said portion of said device, the improvement comprising: a gasket for sealing around said opening and said device to prevent passage of air, said gasket comprising a thin sheet of flexible, air-impervious, material larger than said wall opening and smaller than said cover plate and having at least one opening therein for receiving said protruding portion of said device, said sheet having pressure sensitive adhesive on one side thereof and being adhered to said peripheral area of said wall and to at least a part of said surface of said device.

4,163,138

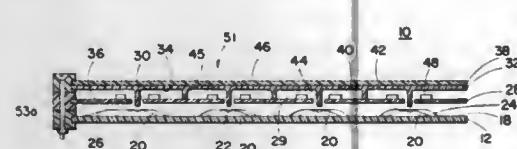
FLUSH LIGHTED FLAT KEYBOARD ASSEMBLY  
Phillip L. Harden, Roanoke, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Mar. 17, 1978, Ser. No. 887,742

Int. Cl.<sup>2</sup> H01H 09/02

U.S. Cl. 200—310

15 Claims



1. In a flat keyboard assembly comprising a support member

having flat opposite sides, at least two spaced switches on one side of said support member each including a resilient, metallic momentary-contact switch element selectively actuatable from a first to a second position in response to force exerted thereon, a flexible switch actuator member having flat opposite sides with one side thereof in spaced facing relationship with said one side of said support member and said switch elements, said one side of said actuator member having at least two switch-actuating projections thereon respectively extending toward and in alignment with said switch elements, and a flexible keyboard member having flat opposite sides, one side of said keyboard member abutting the other side of said actuator member whereby force exerted on said keyboard member in general alignment with a said switch element deflects said keyboard member and actuator member thereby causing a said projection to apply actuating force on the respective switch element, a light source; means for mounting said light source adjacent said one side of said actuator member in the space between said switches and said one side of said actuator member and between said projections; conductors connected to said light source for energizing the same; said actuator member being formed of light-transmissive material, at least one selected area of said keyboard member being light-transmissive thereby being illuminated by said light source; and means for maintaining said support member and keyboard member in assembled relation.

4,163,139

## COOKING VESSEL CAPACITIVE DECOUPLING FOR INDUCTION COOKING APPARATUS

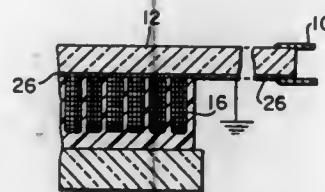
Terence D. Malarkey, Monroeville, and William C. Moreland, II, Export, both of Pa., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Sep. 18, 1972, Ser. No. 290,045

Int. Cl.<sup>2</sup> H05B 5/04

U.S. Cl. 219—10.49 R

11 Claims



1. In an induction heating cooking device including a cook top sheet, and at least one relatively flat work coil underlying said sheet, and through which an alternating current flows to generate a magnetic field for producing current for heating a cooking vessel adapted to be placed on said sheet over said coil, grounded electrostatic shielding means interposed between said coil and the location of said cooking vessel on said sheet, said shielding means being comprised of electrically conductive material of a character and arranged to significantly reduce the capacitive coupling between said coil and said vessel without significantly reducing the inductive coupling between said coil and said vessel.

4,163,140

## PLANT AND A PROCESS FOR SINTERING CERAMIC PRODUCTS

Gerard Bardet, Paris, France, assignor to Automatismes & Technique, Arcueil and Desmarquest et C., Montrouge, both of, France

Filed Aug. 24, 1976, Ser. No. 717,259

Claims priority, application France, Aug. 26, 1975, 75 26286

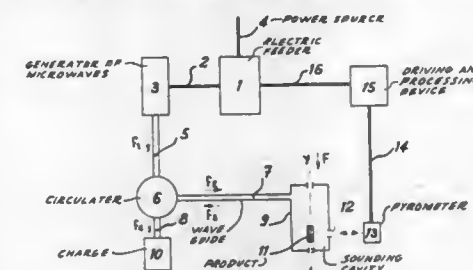
Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 B

4 Claims

1. A plant for sintering or melting ceramic or refractory products, comprising means provided with a cavity for receiv-

ing such products, an electric current supply, means for generating microwave power, means for feeding said current to said generating means, means for delivering said power to said cavity to heat a product therein, means for detecting the temperature of a product in said cavity and generating a corresponding electric signal, means for comparing said signal with a reference value and generating a differential electric signal, a driving electronic device responsive to said differential signal, means electrically connecting said device to said electric current feeding means for controlling said electric current feeding means to control the value of the microwave power delivered to said cavity to reduce said signal differential to zero, a cou-



pling ring associated with said cavity, a detector with crystal connected with said ring for generating a voltage signal, an amplifying circuit for said voltage signal connected with said detector, a contactor with a predetermined threshold value responsive to said amplified signal, and a driving electronic device provided with a time-circuit RC and connected with said contactor to interrupt delivery of said power to said cavity when the value of said amplified signal exceeds said predetermined threshold, said last-mentioned driving electronic device restoring delivery of power to the cavity when the time determined by the time-circuit RC elapses after the amplified signal has fallen under said threshold value.

4,163,141

## MICROWAVE OVEN

Junzo Tanaka, Fujidara, and Toshio Kai, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

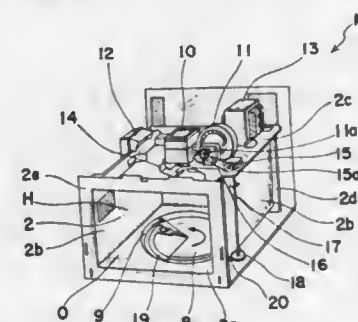
Filed Apr. 14, 1977, Ser. No. 787,460

Claims priority, application Japan, Apr. 14, 1976, 51-42844; Apr. 26, 1976, 51-47974

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 F

6 Claims



1. A microwave oven comprising:

an oven defining structure;

a heating cavity within said oven defining structure, said heating cavity being defined by a base plate formed of a non-magnetic metallic material and by a top wall, a front wall having an access opening therein, a pair of side walls, and a rear wall, said walls being formed of magnetic metallic material, said base plate being joined at junctions to said front wall, said side walls and said rear wall;

door means for selectively opening and closing said access opening in said front wall;  
means for supplying microwave energy into said heating cavity;  
rotary table means, selectively and readily removably positioned to rotate in contact with a top surface of said base plate within said heating cavity, for receiving an object to be heated, said rotary table means being free of any fixed attachment to said base plate;  
magnetic means, mounted below said base plate and exterior of said heating cavity, for rotating said rotary table means within said heating cavity; and  
coating means, covering said junctions and said top surface of said base plate, except the orbital area thereof to be contacted by said rotary table means, for preventing corrosion of said heating cavity.

4,163,142

## METHOD AND APPARATUS FOR ASSEMBLING RINGS

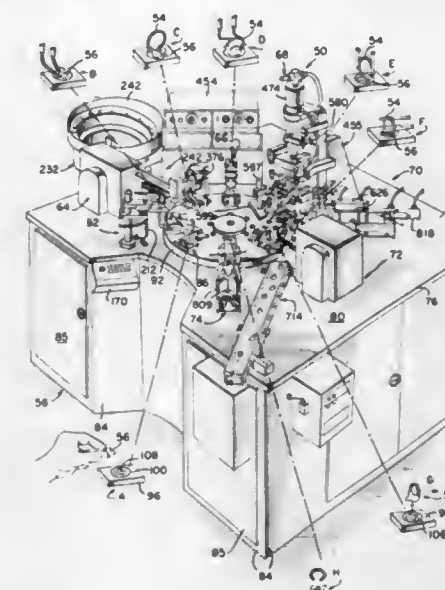
Theodore Descovich, Mahwah; Jack F. Smith, Kenilworth, and Edward D. Riordan, South Somerville, all of N.J., assignors to Avon Products, Inc., New York, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,615

Int. Cl.<sup>2</sup> B23K 11/02

U.S. Cl. 219—79

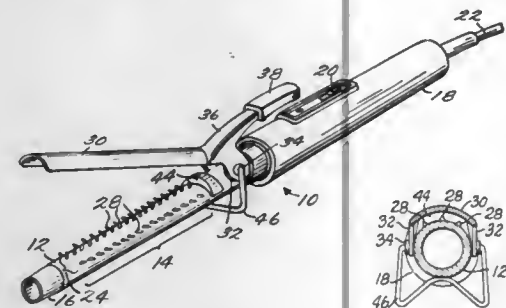
57 Claims



1. An apparatus for automatically assembling serially a ring from a ring shank and ring setting comprising:  
apparatus supporting means;  
advancing means operatively connected to said supporting means for supporting at least one work holding means which includes a nest member adapted for releasably holding said ring setting, and for successively and incrementally advancing said work holding means from a loading station to and through a plurality of discrete working stations, including ring shank placing station, bonding station, and bond testing station;  
ring shank placing means located at said ring shank placing station for selectively placing said ring shank on the ring setting, said ring shank placing means including ring shank feeder means including a vibrating parts feeder having an exit ramp for receiving one after another a continuous succession of ring shanks discharged from said vibrating parts feeder and supporting said ring shanks throughout an elongated length of said exit ramp, track means connected to and supported by said apparatus supporting means, said track means being arranged to cooperate with said exit ramp for enabling said ring shanks to pass thereon from said track means, ring shank control means including indicating means operatively connected across said track

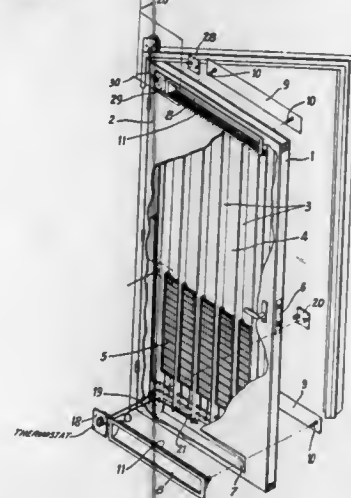
means for indicating when a predetermined quantity of ring shanks has been received by said track means and arresting means being actuatable by said indicating means for directing a stream of fluid pressure onto said exit ramp to prevent the passage of ring shanks to said track means, ring shank lifting means operatively connected to said apparatus supporting means for selectively lifting an individual one of said ring shanks from said track means and locating each said ring shank to a position to be grasped, and ring shank carriage means movable from said position at which it grasps said ring shank to a position at which said ring shank is adapted to be placed in said ring setting; bonding means situated at said bonding station for selectively bonding the ring shank to the ring setting to form said ring; and bond testing means situated at said bonding station for indicating good and bad bonds.

**4,163,143**  
**HAIRDRESSING DEVICE**  
Joseph J. Federico, 432 Avery Pl., Bellevue, Nebr. 68005, and William L. Gass, 2205 S. 86th St., Omaha, Nebr. 68124  
Continuation-in-part of Ser. No. 875,171, Feb. 6, 1978, abandoned. This application Jul. 11, 1978, Ser. No. 923,691  
Int. Cl.<sup>2</sup> H05B 1/00; A45D 1/18  
U.S. Cl. 219—225



1. A hair curling iron comprising:  
generally cylindrical heatable barrel means adapted to have a lock of hair wrapped thereabout for curling the same, said barrel means having forward and rearward ends;  
means for heating a longitudinal section of said barrel means to hair curling temperature;  
a handle secured to said rearward end of said barrel means for manipulating said barrel means;  
a plurality of substantially pointed hair-combing teeth secured to and projecting generally radially from said barrel means along a circumferential segment of said longitudinal section;  
a hair-confining member having an operative portion generally arcuate in transverse section and generally coextensive with said barrel means segment, said portion being adapted, in operative position, to overlie said barrel means segment in generally parallel relation and confine hair therebetween;  
means pivotally mounting said member to said iron adjacent said barrel means rearward end for movement between said operative position and a non-operative position away from said barrel means segment;  
manually manipulable operating means secured to said member and extending generally along said handle for pivotally moving said member between said positions; and  
stop means independent of said teeth provided on one of said member and said barrel means for maintaining a predetermined spaced relation between said member and said barrel means and between said members and the ends of said teeth in said operative position of said member to minimize clamping pressure by said member on hair confined between said member and said barrel means.

**4,163,144**  
**HEATED DOORS**  
Jacques A. Régnier, Limoges, France, assignor to Elmetherm, Saint-Auvent, France  
Filed Apr. 23, 1976, Ser. No. 679,697  
Claims priority, application France, Apr. 25, 1975, 75 12924; Dec. 31, 1975, 75 40204  
Int. Cl.<sup>2</sup> E06B 5/00; F24H 9/08  
U.S. Cl. 219—368

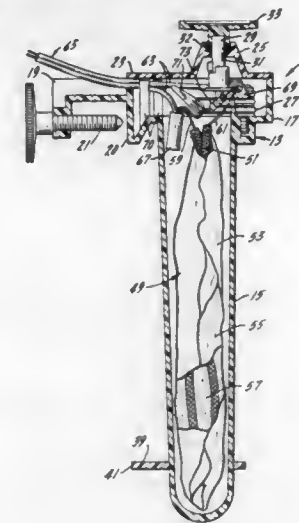


1. A heated door comprising, two spaced apart wood face panels, at least one of said panels having a lower fresh air inlet opening and an upper heated air outlet opening; means defining a plurality of chimneys between said face panels and extending along substantially the entire height of said panels, said chimneys comprising, a plurality of upright wood laths extending between the face panels and extending along substantially the entire height of said panels, and means securing the laths to said face panels in spaced apart relation width-wise of the door; the distance between two adjacent laths not exceeding 150 mm; electric heating element means in said chimneys in a lower third of said door for heating air in said chimneys to cause flow from said inlet opening to said outlet opening; and means for supplying electrical energy to said heating element means.

**4,163,145**  
**AQUARIUM HEATER**  
Paul C. Neff, 277 Park Ave., Antioch, Ill. 60002  
Continuation-in-part of Ser. No. 910,091, May 30, 1978, abandoned. This application Jul. 19, 1978, Ser. No. 926,152  
Int. Cl.<sup>2</sup> H05B 1/02, 3/80  
U.S. Cl. 219—523

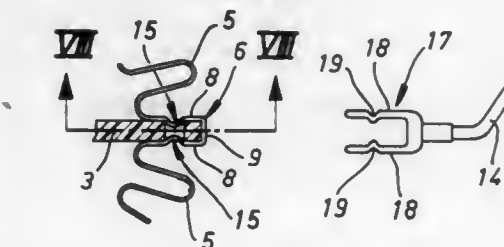
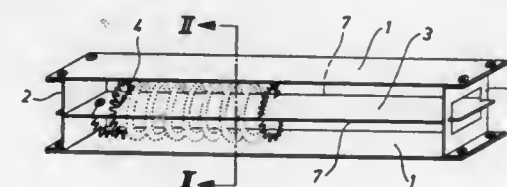
1. An aquarium heater including:  
a heat resistant plastic housing having at least one end which is located in the water to be heated and at least one other end, at least a portion of which is located out of the water to be heated,  
said end of said housing which is located in the water to be heated is closed and said portion of the other end of the housing which is located out of the water to be heated has at least one opening therein,  
an insulated heat producing electrical resistance wire positioned in said housing and formed in the shape of at least one loop,  
a metallic foil enclosing at least a part of said loop of insulated wire and positioned between said insulated resistance wire and all portions of said housing which are normally in contact with the water to be heated, said metallic foil being formed and adapted to conduct and evenly distribute heat from the insulated electrical resistance wire to the plastic housing,  
means to connect said insulated electrical resistance wire to a source of electrical current with said means extending

through said opening in the portion of the housing located out of the water, and



means to control the flow of electrical current through said insulated electrical resistance wire.

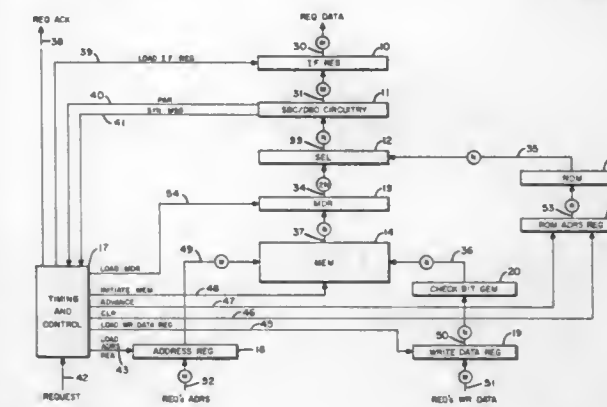
**4,163,146**  
**ELECTRICAL HEATING ELEMENT COMPRISING A HELIX OF WIRE WOUND ON AT LEAST ONE INSULATING PLATE**  
Klaus Meywald, Kandel, Fed. Rep. of Germany, assignor to Firma Fritz Eichensauer, Fed. Rep. of Germany  
Filed Sep. 16, 1977, Ser. No. 834,052  
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644093  
Int. Cl.<sup>2</sup> H05B 3/06  
U.S. Cl. 219—542



1. A heating device comprising:  
(a) at least one supporting plate of insulating material;  
(b) a heating element comprised of a resistance heating wire which is bent in a meander shape formed of zigzag shape loops and wound in a helix about the supporting plate, said resistance heating wire being provided with opposed loops which are fitted over longitudinal edges of the supporting plate; and  
(c) voltage taps fitted on said loops secured to the longitudinal edges of the insulating material, said voltage taps being formed by bifurcate spring clips having a forked web and an electrical connector for enabling lower voltages to be

tapped from said heating wire to power other components of the heating device.

**4,163,147**  
**DOUBLE BIT ERROR CORRECTION USING DOUBLE BIT COMPLEMENTING**  
James H. Scheuneman, St. Paul, and John R. Trost, Anoka, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.  
Filed Jan. 20, 1978, Ser. No. 871,048  
Int. Cl.<sup>2</sup> G06F 11/12  
U.S. Cl. 235—312



3. In a semiconductor memory subsystem containing single bit error correction/double bit error detection circuitry, SBC/DBD, and a memory storage bank having a plurality of addressable locations of N bit data words, permitting access to a data word upon request and transferring said accessed data word to the requesting apparatus, the improvement comprising:

inhibiting means responsively coupled to said single bit error correction/double bit error detection circuitry for inhibiting said transfer to said requesting apparatus of said accessed data word if said accessed data word contains a double bit error;  
complementing means responsively coupled to said memory storage bank and said single bit error correction/double bit error detection circuitry for sequentially complementing each different combination of two bit positions of said N-bit word containing said double bit error thereby creating corresponding modified accessed data words; and  
enabling means responsively coupled to said memory storage bank, said single bit error correction/double bit error detection circuitry and said complementing means for enabling said transfer to said requesting apparatus of a one of said corresponding modified accessed data words whose two bit positions causing said double bit error have been complemented by said complementing means.

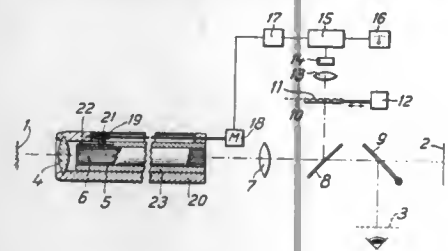
**4,163,148**  
**AUTOMATIC FOCUSING DEVICE PROBE COMPRISING A FOCUSING DEVICE AND METHOD OF FOCUSING A PROBE**  
Rainer Fritsche, and Helmut Ringelhan, both of Wetzlar, Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany  
Filed Feb. 16, 1978, Ser. No. 878,454  
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708507  
Int. Cl.<sup>2</sup> G01V 1/20  
U.S. Cl. 250—201

8. A probe for examining an object such as an object within a hollow channel or bore comprising:  
(a) an elongated tubular member adapted to be inserted into said channel or bore;  
(b) a first focusing means positioned within said tubular



member proximate one end thereof for permitting positioning of said first focusing means adjacent said object to be examined;

- (c) an optical fiber bundle positioned within said tubular member and aligned for receiving light from said object via said first focusing means;
- (d) a grating structure positioned for receiving an image of said object, said grating structure having a grating constant whose spatial frequency is matched to at least one spatial frequency component of the spatial frequency spectrum contained in the structures of said object image;



- (e) photoelectric receiving means for providing electrical output signals in response to light resulting from said object image and emanating from said grating structure;
- (f) means for focusing light from said grating structure onto said photoelectric receiving means; and
- (g) display means connected to receive said electrical output signals for providing a display of the position of said probe, whereby said probe may be positioned for providing a display of maximum light amplitude indicating a maximum focusing condition of said probe.

4,163,149

## AUTOMATIC FOCUSING APPARATUS

Susumu Sawano, Tachikawa, Japan; Yoshito Tsunoda, Stanford, Calif., and Takeshi Maeda, Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

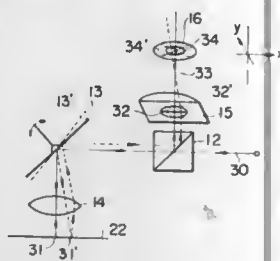
Filed Jul. 28, 1977, Ser. No. 819,861

Claims priority, application Japan, Jul. 28, 1976, 51-89093; Aug. 9, 1976, 51-94001

Int. Cl.<sup>2</sup> G01J 1/36;

U.S. Cl. 250—204

14 Claims



1. In an optical recorded information playback apparatus having a light source for generating a light beam; an information recorded medium; a first optical system which converges said light beam from said light source onto said information recorded medium; a photodetector which consists of four photodetection portions arranged in orthogonal pairs for converting the light beam from said recorded medium into respective electric signals; a second optical system including at least an optical element having a unidirectional lens action for directing the light beam from said recorded medium to said photodetector; first means responsive to a focusing signal for controlling a defocusing of said first optical system; and second means responsive to the difference between the combined electric signals generated from one pair of the orthogonal photodetection portions opposing one another in a longitudinal direction and the combined electric signals from the other pair of the orthogonal photodetection portions opposing one another in a lateral direction for generating said focusing signal

according to the shape of the spot of said light beam on said photodetection portions; the improvement comprising

an automatic focusing compensating apparatus comprising third means for generating a compensation signal to compensate for a disturbance to the focusing signal in response to the difference between signals generated from the opposing pair of photodetection portions in at least one orthogonal direction and fourth means for applying said compensation signal to said second means to adjust the value of said focusing signal.

4,163,150

## PROCESS AND APPARATUS FOR AUTOMATICALLY REALIZING KÖHLER'S PRINCIPLE OF ILLUMINATION

Hans-Werner Stankewitz, Steindorf, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

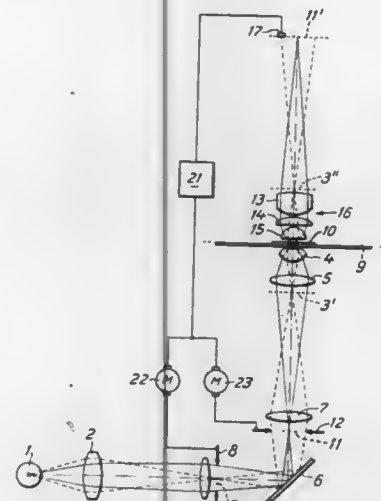
Filed Sep. 28, 1977, Ser. No. 837,402

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644341

Int. Cl.<sup>2</sup> G01J 1/32

U.S. Cl. 250—205

22 Claims



1. A process for automatically adjusting the illumination system of a microscope having a variable magnification system which comprises the steps of:

- (a) measuring the extent of illumination of the viewable portion of the viewing plane or planes conjugated thereto with a sensing means which emits a measurement signal;
- (b) converting said measurement signal into a control signal; and
- (c) feeding said control signal to adjustment means for automatically adjusting said degree of illumination in accordance with Köhler's Principle in response to the magnification chosen, by varying at least one of (i) a diaphragm or (ii) the focal length.

4,163,151

## SEPARATED ION SOURCE

John R. Bayless, Malibu; Robert L. Seliger, Agoura; James W. Ward, Canoga Park, and James E. Wood, Newbury Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 28, 1977, Ser. No. 865,280

Int. Cl.<sup>2</sup> B01D 39/44; H01J 39/34

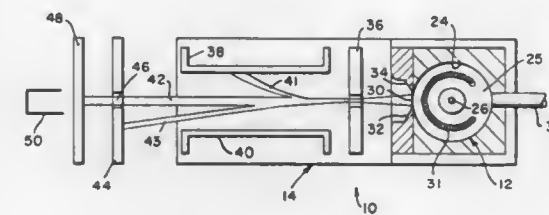
U.S. Cl. 250—296

3 Claims

1. A high current separated ion source comprising: means for producing along a path a high aspect ratio substantially rectangular ribbon ion beam of substantially

rectangular cross section and having a height and a thickness;

magnetic field means for producing a magnetic field in the direction of the height of the beam across said path; first and second separator electrodes positioned on opposite sides of said path laterally of said path in the thickness dimension of the beam for applying an electric field across said path, said separator electrodes being positioned with respect to said magnetic field means so that said electric field is transverse with respect to said magnetic field to separate unwanted ion species laterally from the ion beam; said means for producing a ribbon ion beam comprising a cylindrical tubular cathode electrode and a central anode electrode therein, for defining a plasma discharge space within said cathode and around said anode which contains



gas to be ionized and through which electrons pass to ionize the gas, said means for producing a magnetic field also producing a magnetic field in said discharge space to lengthen the electron path in said discharge space to produce a Penning discharge;

walls defining a narrow rectangular slot opening in said cathode electrode through which ions are extracted to form the high aspect ratio substantially rectangular ribbon ion beam, said slot opening in said cathode electrode being oriented in a direction parallel to the axis of said cylindrical cathode; and

an accelerator electrode positioned adjacent to the beam path to accelerate ions which have been extracted from said cathode slot along the beam path so that a separated ion beam having an ion current above 100 microamperes is formed.

4,163,152

## PENCIL-SHAPED RADIATION DETECTION IONIZATION CHAMBER

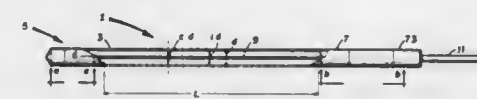
Arata Suzuki, Pittsburgh, Pa., assignor to Capintec Inc., Montvale, N.J.

Filed Sep. 26, 1977, Ser. No. 836,800

Int. Cl.<sup>2</sup> H01J 39/28

U.S. Cl. 250—374

17 Claims



1. A radiation detection ionization chamber comprising an elongated cylindrical tubing forming an outer wall of the chamber and having a length along a major axis of the tubing substantially greater than the diameter of the tubing, an elongated center electrode disposed centrally along the major axis of the tubing, said tubing and said center electrode made of air equivalent plastic, a first electrical cable conductor, a second electrical cable conductor, cable connecting means at one end of said tubing for connecting one end of said center electrode to said first electrical cable conductor and for connecting said tubing to said second electrical cable conductor, end supporting means at the opposite end of said tubing for supporting the tubing and the opposite end of said center electrode within the tubing and comprising means for tensioning said center elec-

4,163,153

## ION BEAM MEANS

Hifumi Tamura, Hachioji, and Tohru Ishitani, Sayama, both of Japan, assignors to Hitachi, Ltd., Japan

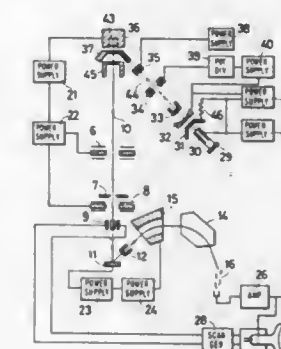
Filed Nov. 17, 1977, Ser. No. 852,203

Claims priority, application Japan, Nov. 19, 1976, 51/138328

Int. Cl.<sup>2</sup> C01M 23/00; H01J 27/00

U.S. Cl. 250—423 R

7 Claims



1. An ion beam apparatus comprising: an ion source;

an ion-beam-focusing lens system for focusing a primary-ion-exciting ion beam emitted from said ion source;

an electrostatic deflector for deflecting said exciting ion beam;

a solid ion source adapted to emit ions upon receiving ion bombardment by said exciting ion beam;

an extracting electrode for extracting ions emitted from said solid ion source and;

a controlling electrode disposed between said solid ion source and said extracting electrode, said controlling electrode having gaps for allowing said exciting ion beam and the ion beam emitted from said solid ion source to pass therethrough, respectively.

4,163,154

## NEUTRON PERSONNEL DOSIMETER

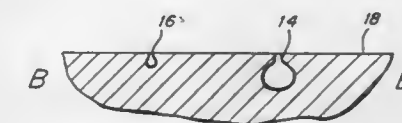
Robert V. Wheeler, Lemont, and Richard A. Oswald, Berwyn, both of Ill., assignors to Technical Operations, Incorporated, Boston, Mass.

Filed Jul. 21, 1977, Ser. No. 817,696

Int. Cl.<sup>2</sup> G01T 1/04

U.S. Cl. 250—473

7 Claims



1. A method of neutron dosimetry which comprises the steps of exposing a dielectric track recorder to the products of (n,α) and carbon and oxygen recoil reactions so as to cause the formation in the track recorder of damage sites due to the resulting alpha particles and recoiling carbon atoms and oxygen atoms, developing those damage sites simultaneously in a way to distinguish the alpha-caused sites from the carbon/oxygen-caused sites, and from the so-developed damage sites determining the frequency of occurrence of each reaction.

# 4,163,155 DEFINING A LOW-DENSITY PATTERN IN A PHOTORESIST WITH AN ELECTRON BEAM EXPOSURE SYSTEM

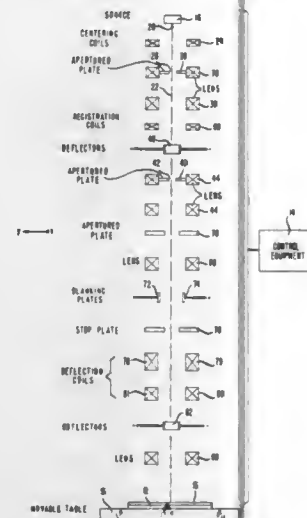
David S. Alles, Covent Station; Alfred U. Mac Rae, Berkeley Heights, and Roger F. W. Pease, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 7, 1978, Ser. No. 894,420

Int. Cl.<sup>2</sup> A61K 27/02

U.S. Cl. 250—492 B

5 Claims



1. A method of operating a raster-scan-mode-of-operation electron beam lithographic system to irradiate a workpiece (10, 12) that is supported on a continuously moving table (16), said method being CHARACTERIZED BY the step of generating deflection signals that in effect exactly compensate for both table motion and the regular raster scan deflection signals of said system to cause the electron beam of dwell only on each of multiple selected portions of a low-density pattern for a time that is substantially greater than the time during which each portion would be exposed during regular raster scanning of the surface of the workpiece.

# 4,163,156 METHOD OF MODIFYING THE PERFORMANCE CHARACTERISTICS OF A JOSEPHSON JUNCTION

Kurt Daetwyler, Oberrieden, and Rudolf Jaggi, Langnau a/A, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 794,499, May 6, 1977, abandoned. This application Sep. 6, 1978, Ser. No. 940,054

Claims priority, application Switzerland, May 19, 1976, 6234/76

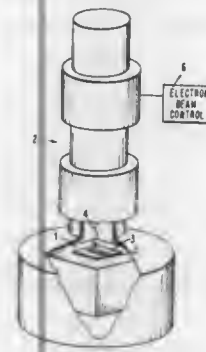
Int. Cl.<sup>2</sup> A61K 27/02

U.S. Cl. 250—492 B

7 Claims

1. A method of modifying the junction characteristics of a device capable of carrying Josephson current comprising the step of:

scanning an area of the junction region of said device with an electron beam of acceleration voltage in the range of



10-30 kv and current dosage of the order of magnitude of 1A sec/cm sq. to modify the resistance of said an area.

# 4,163,157 DATA MEDIUM SCANNING PROCESS AND APPARATUS

Claude F. Guignard, Plessis-Robinson, France, and Bernard J. Perrette, 2 Hameau des Colombes, Domaine, St. Francois d'Assise, 78 La-Celle-Saint-Cloud, France, assignors to Traitement de l'Information et Techniques Nouvelles, Morangis; Banque de France, Paris and Bernard Julien Perrette, La-Celle-Saint-Cloud, all of, France

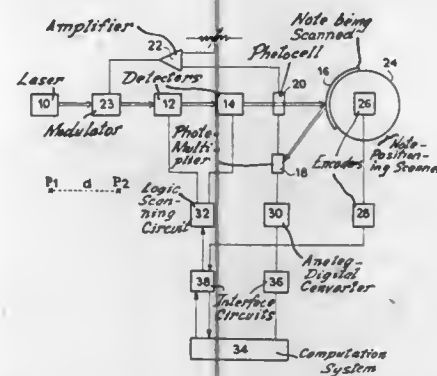
Filed Aug. 1, 1977, Ser. No. 820,643

Claims priority, application France, Jul. 30, 1976, 76 23424

Int. Cl.<sup>2</sup> G01N 21/30

U.S. Cl. 250—561

14 Claims



1. A process for parallel-line scanning of a moving data medium such as a paper bank note by means of a beam, said medium being transported with a definite speed, including the steps of measuring two coordinates of the location of a benchmark point of the moving medium with respect to two coordinates of a fixed point of reference, measuring the skew of a benchmark of the moving medium with respect to a fixed direction, computing the coordinates of the origin of a first scanning line from the coordinates of said benchmark point and according to the skew of said benchmark, computing the coordinates of the origins of the other scanning lines from the spacing desired between consecutive scanning lines and the origin of a previous scanning line and according to the skew of said benchmark, computing the skew of scanning lines according to the skew of the benchmark, scanning said medium so that the consecutive lines begin at the origins with the computing coordinates and are of the computed skew.

# 4,163,158 SEWING MACHINE BOBBIN THREAD RUN-OUT ALARM USING REFLECTED LIGHT

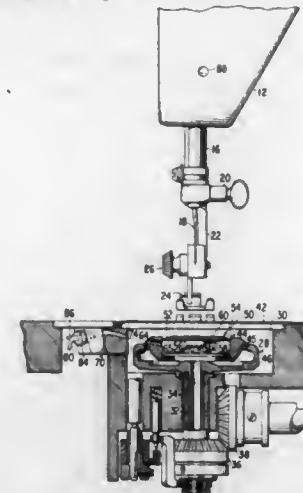
Donald J. Coughenour, Morristown; Jack Brown, Union, and John A. Herr, Garwood, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 25, 1978, Ser. No. 900,026

Int. Cl.<sup>2</sup> G01N 21/30

U.S. Cl. 250—561

9 Claims



1. An apparatus for indicating the approaching end of a bobbin thread supply for a sewing machine comprising a bobbin having a core with a plurality of reflecting surfaces formed thereon, a light source for illuminating the reflecting surfaces on said bobbin core, a photodetector means for sensing light reflected from said reflecting surfaces, an electronic circuit for distinguishing between flashing light reflected from said bobbin core and ambient light, and signalling means controlled by said electronic circuit for advising a sewing machine operator when depletion of said bobbin thread exposes said reflecting surfaces on said bobbin core and causes light reflected from said bobbin core to flash.

# 4,163,159 ATTENUATION-FREE ELECTRONIC SWITCH

Erich Bächle, Ulm; Rudolf Schehrer, Geislingen and Dietrich Höppner, Blaustein-Wipplingen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Fed. Rep. of Germany

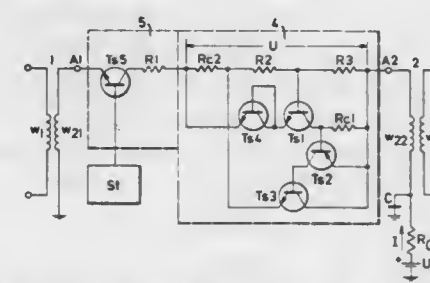
Filed Dec. 16, 1977, Ser. No. 862,826

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657589

Int. Cl.<sup>2</sup> H03K 17/00

U.S. Cl. 307—255

4 Claims



1. In an electronic switch defining a signal transmission path extending between two terminals each arranged to be connected at a respective point in a circuit, the switch being switchable between an OFF-state in which it presents a high impedance between the terminals and an ON-state, and the switch including components defining an open circuit stable negative resistance such that in the an ON-state signals are permitted to pass in both directions along the transmission path

and provide attenuation compensation for such signals, the improvement wherein said negative resistance comprises:

a first transistor of a first conductivity type and a second transistor of the opposite conductivity type having its base connected directly to the collector of said first transistor; a first resistor connected between the emitter and base of said second transistor; a second resistor connected between the base of said first transistor and the emitter of said second transistor, with the point of connection between said resistors and the emitter of said second transistor constituting one terminal of said switch; a third transistor of the first conductivity type having its base connected to the collector of said second transistor and having its collector connected to the emitter of said second transistor; a third resistor connected between the base of said first transistor and the emitter of said third transistor; a fourth resistor having one end directly connected to that end of said third resistor which is connected to the emitter of said third transistor; and a diode connected between the other end of said fourth resistor and the emitter of said first transistor and poled to operate in its forward conduction direction when the collector-emitter path of said first transistor is conductive, and

said switch further comprises a control transistor of the first conductivity type having its collector connected to the other end of said fourth resistor and whose emitter constitutes the other terminal of said switch, and switching control means connected to the base of said control transistor for supplying thereto a control signal which determines the conductive state of said control transistor and thus the switching state of said switch.

# 4,163,160 INPUT STAGE FOR AUTOMOTIVE IGNITION CONTROL CIRCUIT

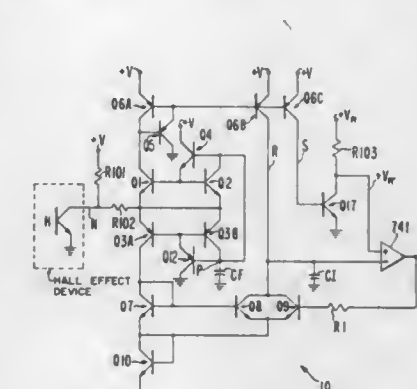
Jerome A. Frazee, Milpitas, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 22, 1978, Ser. No. 889,152

Int. Cl.<sup>2</sup> H03K 5/153

U.S. Cl. 307—260

11 Claims



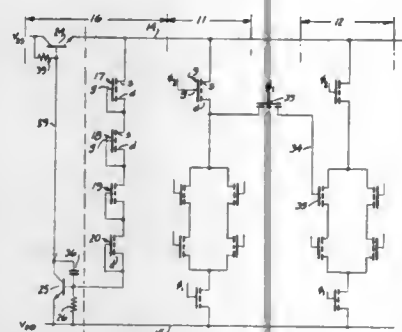
1. An input stage circuit for supplying an output signal from an output node in response to an input signal supplied to an input node, said input stage circuit comprising:

a first and a second voltage supply for providing first and second reference voltages, respectively, wherein the first voltage supply is connected to the input node; a first current divider for dividing a current flowing out of the input node into a first current and a second current; a second current divider for dividing a current flowing into the input node into a third and a fourth current; and a first capacitor connected to be discharged by said first current and charged by said third current;



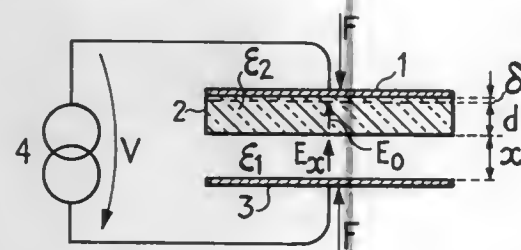
a second capacitor connected to be charged by said second current and discharged by said fourth current; and a voltage comparator connected to said second capacitor and to said second voltage supply for producing the output signal at the output node.

**4,163,161**  
**MOSFET CIRCUITRY WITH AUTOMATIC VOLTAGE CONTROL**  
Winston G. Walker, Irvine, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.  
Filed Nov. 24, 1975, Ser. No. 634,545  
Int. Cl.<sup>2</sup> H03K 17/00; G05F 1/40  
U.S. Cl. 307—297



1. An integrated circuit having a plurality of enhancement mode metal oxide semiconductor field effect transistor devices formed on a substrate of semiconductive material and conductors for applying a voltage to said devices, comprising a voltage control device connected to control the voltage applied to said transistor devices through said conductors, a group of additional enhancement mode metal oxide semiconductor field effect transistor devices formed on said substrate, each of said additional devices having a drain, a source, and a control gate connected to said drain; means connecting the drain of each of said additional devices except the last to the source of a succeeding one of said additional devices, means connecting the source of the first of said additional devices to one of said conductors, and means connecting the drain of the last of said additional devices to said voltage control device whereby to bias said voltage control device in accordance with the combined threshold voltages of said additional devices.

**4,163,162**  
**BISTABLE ELECTRET SYSTEM**  
François Micheron, Paris, France, assignor to Thomson-CSF, Paris, France  
Filed Dec. 28, 1977, Ser. No. 865,330  
Claims priority, application France, Jan. 4, 1977, 77 00075  
Int. Cl.<sup>2</sup> H01G 7/02  
U.S. Cl. 307—400

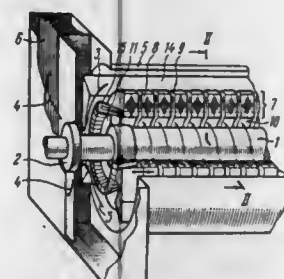


1. Bistable electret system comprising a pair of fixed elec-

trodes forming a capacitor, a moving armature arranged between said fixed electrodes for occupying two rest positions respectively close to each of said fixed electrodes, at least one intermediate electrode integral with said moving armature, electrical biasing means connected to said electrodes for creating switching forces enabling said moving armature to move from one of said rest positions to the other and vice-versa, layers of electret material arranged in the gap of said capacitor for creating electrostatic holding forces preventing said moving armature from leaving one of said rest positions under the sole action of said switching forces, and electrical control means connected to said intermediate electrode for releasing said electrostatic holding forces.

**4,163,163**  
**NON-SALIENT POLE SYNCHRONOUS ELECTRIC GENERATOR**  
Elrikh I. Gurevich, prospekt Kosmonavtov, 50 korpus 4, kv. 72; Iosif F. Filippov, Pulkovskaya ulitsa, 17, kv. 39; Igor A. Prigorovskiy, ulitsa Basseinaya, 53, kv. 4; Garri M. Khutoretsky, ulitsa Altalskaya, 20, kv. 5, all of Leningrad, and Alexandr I. Vorontsov, ulitsa Khazova, 43, kv. 94, Leningrad-Pushkin, all of U.S.S.R.

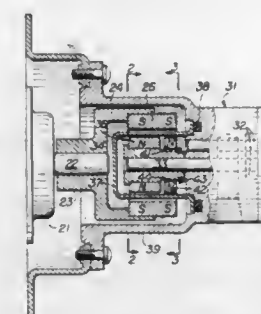
Filed Apr. 6, 1976, Ser. No. 674,216  
Int. Cl.<sup>2</sup> H02K 9/00  
U.S. Cl. 310—59



1. A non-salient pole synchronous electric generator comprising: a stator having a frame and a core mounted thereon; a rotor; fans installed on the end faces of said rotor and arranged to produce depression and pressure zones during operation; gas coolers having an inlet and an outlet and accommodated in said frame in close proximity to said fans and communicating with said pressure zone, said core of said stator being fitted around said rotor and made of stacks with radial channels therebetween, said rotor and the internal surface of said stator core being spaced from each other to form an air gap therebetween; circular partitions installed in said air gap in close proximity to said end faces of said stator core for separating said air gap along the gas flow path from said depression zone of said fans, said frame and the external surface of said stator core being spaced from each other and forming a space therebetween; radial partitions dividing said space into an even number of sections, said sections communicating in pairs with each other along the gas flow path through said air gap, the first section of each pair of communicating sections being arranged to introduce the gas flow into said radial channels of said core and communicating with the outlet from said gas coolers, the second section of each pair of communicating sections being arranged to discharge the gas flow from said radial channels of said core to said fans and communicating with said depression zone of said fans.

**4,163,164**  
**SPLIT MAGNET DRIVE**  
Ferdinandus A. Pieters, Walnut Creek, Calif., assignor to Micropump Corporation, Concord, Calif.  
Filed Oct. 11, 1977, Ser. No. 841,034  
Int. Cl.<sup>2</sup> H02K 7/11  
U.S. Cl. 310—103

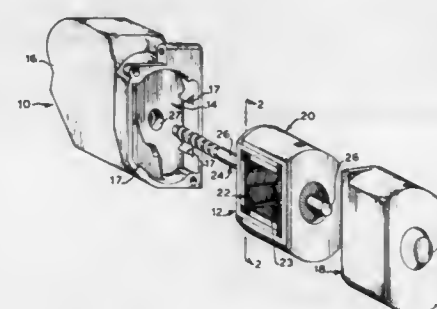
10 Claims



1. A magnetic drive comprising an annular first magnet, an annular second magnet in driving proximity to said first magnet, drive means for driving said first magnet, drive means driven by said second magnet, and an annular control member in proximity to one of said magnets, said control member being independent of rotation of said driven means, said control member having at least one position of movement when said control magnet is in frictional contact with one of said magnets, said first and second magnets each having a plurality of magnetic poles.

**4,163,165**  
**PERMANENT MAGNET MOTOR**  
James A. Purdy, Sylvania, Ohio, assignor to Eltra Corporation, Toledo, Ohio  
Filed Aug. 18, 1977, Ser. No. 825,491  
Int. Cl.<sup>2</sup> H02K 21/78  
U.S. Cl. 310—154

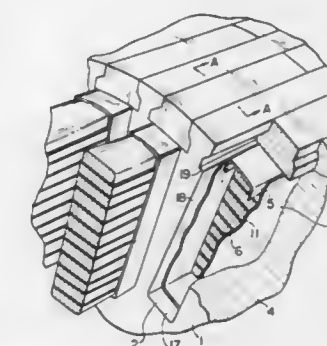
5 Claims



1. A permanent magnet motor comprising: a stator assembly, permanent magnet means mounted on said assembly, an armature including an armature shaft rotatably supported at each motor end, said shaft passing through said stator, said shaft and said stator being magnetically isolated at the point of passage and said stator providing a homogeneous magnetic circuit for said permanent magnet means from substantially opposite sides of said armature, said circuit passing through at least one motor end and around said shaft, said stator comprising a U-shaped member of low reluctance material, said member characterized by two substantially parallel sides interconnected by a bight, said armature shaft passing through a hole in said bight somewhat larger than said shaft, said parallel sides supporting said permanent magnet means, and additional magnetic material surrounding the hole in said bight.

**4,163,166**  
**FIELD WINDING ASSEMBLY FOR ROTOR IN ELECTRIC ROTARY MACHINE**  
Hiroyuki Kamiya, Hitachi, Ken Takahashi, Ibaraki; Seiji Watanabe, Hitachi, and Yasuyuki Wachi, Takahagi, all of Japan, assignors to Hitachi, Ltd., Japan  
Filed Jul. 21, 1977, Ser. No. 817,743  
Claims priority, application Japan, Jul. 23, 1976, 51-88534  
Int. Cl.<sup>2</sup> H02K 3/36  
U.S. Cl. 310—215

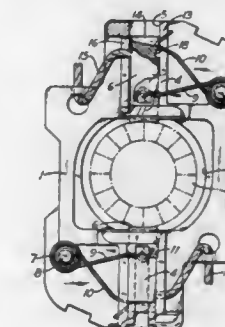
8 Claims



1. A field winding assembly for rotors in electric rotary machines which is mounted into an open slot formed in the rotor and secured by a wedge which is disposed in said slot closer to its open side, said field winding assembly comprising a conductor section mounted into said slot together with an insulator, said insulator including a lower insulating member of a substantially U-shaped cross-section for covering sides of said conductor section which are adjacent to bottom and side walls of said slot, and an upper insulating member of a substantially U-shaped cross-section for completely surrounding said conductor section in cooperation with said lower insulating member and having a base portion which is disposed adjacent to said wedge in said slot, and means provided in said base portion of said upper member to provide said upper insulating member with flexibility for lateral contraction and expansion, wherein said flexibility providing means comprises a plurality of grooves formed in said upper insulating member at both inner and outer surfaces of said base portion in positions offset to one another.

**4,163,167**  
**ELECTRIC MOTOR BRUSH HOLDER**  
Edward J. Zelt; William L. Dippold; Robert L. Gerg, and Raymond W. Klaiber, Jr., all of St. Marys, Pa., assignors to Stackpole Carbon Company, St. Marys, Pa.  
Filed Dec. 2, 1977, Ser. No. 856,661  
Int. Cl.<sup>2</sup> H02K 13/00  
U.S. Cl. 310—242

4 Claims



1. A brush holder comprising a frame having a central opening therethrough for the commutator of an electric motor, the frame being provided with a pair of brush housings beside said

opening 180° apart, each housing having a passage therethrough with inner and outer ends, a brush slidably disposed in said passage, one side of said housing being provided with a longitudinal slot therethrough beside the brush, a stud projecting from said frame at said one side of the housing, and a torsion spring having a central coil encircling said stud and having end portions extending laterally away from the coil toward said housing with the free ends of the springs biased toward each other, the inner end portion of said housing having an abutment facing toward the inner end of the housing, one end of the spring engaging said abutment to prevent said end from moving toward the outer end of the housing, the outer end of the side of the brush beside said slot being provided with a notch, and the opposite end of the spring extending through said slot and projecting into said notch to hold the brush retracted in said passage until said opposite end of the spring is removed from the notch and placed against the outer end of the brush to move the inner end of the brush into commutator-engaging position.

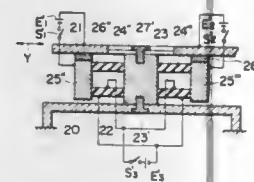
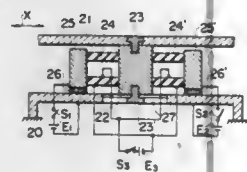
**4,163,168**  
**TWO-DIRECTIONAL PIEZOELECTRIC DRIVEN FINE ADJUSTING DEVICE**

Isao Ishikawa, Hino, and Yoshio Sakitani, Saitama, both of Japan, assignors to Hitachi, Ltd., Japan  
Filed Jul. 28, 1977, Ser. No. 820,011

Claims priority, application Japan, Jul. 28, 1976, 51-89092  
Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—328

18 Claims



1. A two-directional fine adjusting device comprising a fixed base, a movable plate, first and second counter piezoelectric members which are fixed to each other and which are expandable and contractable in directions different from each other in response to selective application of electric signals, first and second slide members which are respectively fixed to two points in the expanding and contracting direction of said first counter piezoelectric member and which come into slide contact with said fixed base, first and second electrical attraction means responsive to applied electric signals for attracting and fastening the respective first and second slide members to said fixed base, third and fourth slide members which are respectively fixed to two points in the expanding and contracting direction of said second counter piezoelectric member and which come into slide contact with said movable plate, third and fourth electrical attraction means responsive to applied electric signals for attracting and fastening the respective third and fourth slide members to said movable plate, means for selectively applying electric signals for expansion and contraction to the respective first and second counter piezoelectric members, and means for selectively supplying electric signals to said first, second, third and fourth electrical attraction means to effect operation thereof.

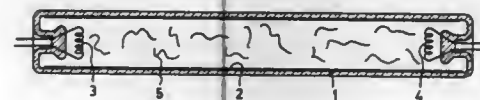
**4,163,169**  
**LOW-PRESSURE GAS DISCHARGE LAMP**  
Jan Hasker, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 534,206, Dec. 19, 1974, abandoned. This application Sep. 25, 1975, Ser. No. 616,653  
Claims priority, application Netherlands, Jul. 11, 1974, 7409366

U.S. Cl. 313—203

Int. Cl.<sup>2</sup> H01J 61/04

16 Claims



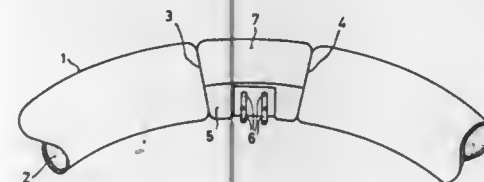
1. A low-pressure gas discharge lamp which comprises: an envelope, two spaced electrodes, and a solid state body having a plurality of elements which comprise a structure permeable to the discharge between said electrodes, said body extending over at least half the electrode distance and being thinly distributed over the discharge space, with oblique orientation of each of said plurality of elements to each of the rest of said plurality of elements of said body, the ratio between the volume of the body and the volume of the discharge space being between  $0.6 \times 10^{-6} f/\lambda$  and  $0.6 \times 10^{-3} f/\lambda$  where  $f$  represents the quotient of the volume and the area of said body in microns and  $\lambda$  is a constant equal to 1 micron, said electrode distance divided by the average diameter of the cross-section of the discharge space perpendicular to the discharge axis being greater than five, said volume of said body being the sum of the volumes of all of said elements in said body, said area of said body being the sum of the area of all said elements of said body, said body being present over at least 80% of the electrode distance, and wherein as an average each cubic mm of the volume of the discharge space has disposed therein between  $5 \times 10^{-6}$  mg and  $5 \times 10^{-3}$  mg of the body.

**4,163,170**  
**LOW-PRESSURE GAS DISCHARGE LAMP**  
Wilhelmus M. J. Van Gils, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,735  
Claims priority, application Netherlands, Sep. 14, 1976, 7610169

U.S. Cl. 313—217

1 Claim



1. A low-pressure gas discharge lamp provided with an elongated curved lamp vessel having first and second ends disposed in opposed spaced relationship, an ionizable medium disposed in said vessel, each of said ends of said lamp vessel each including a feedthrough wire extending through said end, and a lamp base accommodating both of said ends, said base being manufactured of an electrically non-conducting material and engaging the axial extremities of said ends over less than half of the circumferential extent of said ends, said lamp base including first and second contact pins which extend at most from points proximate the center line of said lamp vessel in a direction generally perpendicular to and away from the center

line of said lamp vessel, said lamp further including electrically conducting filament extension pieces, each of said extension pieces being connected at right angles to one of said feedthrough wires near the center line of the lamp vessel outside the lamp base to the corresponding feedthrough wires, each of said filament extension pieces engaging one of said contact pins, said first and second contact pins being cylindrical and one of said extension pieces being disposed within each of said contact pins, said apparatus further including a cover cap extending about the circumferential extent of said ends of said lamp vessel not covered by said base.

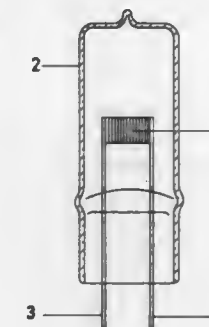
**4,163,171**  
**HALOGEN CYCLE INCANDESCENT LAMP**  
Ewald Wurster, Grünwald, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft für Elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,536  
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650298

Int. Cl.<sup>2</sup> H01K 1/32, 1/50

U.S. Cl. 313—221

7 Claims



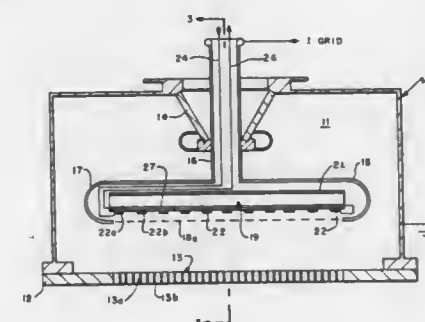
1. An incandescent lamp comprising a hermetically sealed hard glass envelope encasing a tungsten filament connected to lead wires hermetically sealed in said hard glass and containing an inert gas filling together with a halogen additive, said hard glass envelope consisting essentially of hard glass selected from the group consisting of aluminosilicate hard glass and borosilicate hard glass which contains substantially no alkali and carbon monoxide, and contains less than 0.03% by weight of water and less than 0.1 μliter/g carbon dioxide dissolved therein.

**4,163,172**  
**SLIDING SPARK SOURCE COLD CATHODE ELECTRON GUN AND METHOD**  
Gary K. Loda, Danville, Calif., assignor to Systems, Science and Software, Hayward, Calif.

Filed Jul. 8, 1977, Ser. No. 813,892  
Int. Cl.<sup>2</sup> H01J 1/46, 21/10

U.S. Cl. 313—302

3 Claims



1. A broad beam electron gun comprising: cold cathode

means including an insulating substrate and a plurality of discrete electrodes disposed on said substrate to form a plurality of spark gaps therebetween lying along a path; anode means spaced from and juxtaposed with said cathode means; high voltage supply means connected between said cathode and anode means; cathode supply means for applying a voltage across said plurality of electrodes to generate a spark therebetween sequentially across each said gap resulting in the formation of a plasma in the space adjacent said cathode means, and a conductive strip spaced from and substantially coextensive with said electrodes for providing interelectrode capacitive coupling between said electrodes and said strip, said insulating substrate being a cylindrical insulator with said electrodes affixed along one side on the exterior of said insulator.

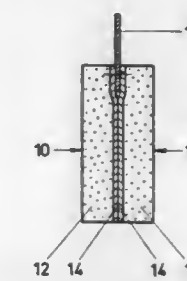
**4,163,173**  
**POROUS ELECTRODE BODY FOR ELECTRICAL ACCUMULATORS**  
Sten B. C. Norling, Oskarshamn, Sweden, assignor to Nife-Jungner AB, Oskarshamn, Sweden

Filed Feb. 22, 1977, Ser. No. 770,950  
Claims priority, application Sweden, Feb. 23, 1976, 20890/76

Int. Cl.<sup>2</sup> H01J 1/02, 1/14, 1/48; H01K 1/04

U.S. Cl. 313—352

9 Claims



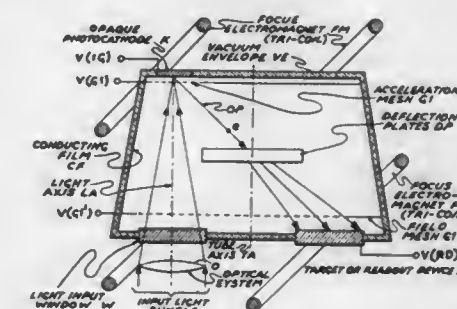
1. A porous electrode body for electrical accumulators, which comprises at least two cohesive layers, at least one of which is a porous layer of sintered metal powder and at least one of which is a thinner layer of the same solid metal as that of the porous layer, which thinner layer is produced by fusion and solidification of one of the external surfaces of the adjacent porous layer.

**4,163,174**  
**OBLIQUE STREAK TUBE**  
Charles B. Johnson, Fort Wayne, Ind., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Jun. 13, 1977, Ser. No. 805,955  
Int. Cl.<sup>2</sup> H01J 39/07, 39/10

U.S. Cl. 315—10

6 Claims



1. An oblique streak tube having a vacuum envelope with a longitudinal axis comprising: means disposed in and at one end of said envelope responsive to light passing through the other end of said envelope along a light axis spaced from and parallel to said longitudinal axis to produce photoelectrons; an accelerating mesh having a given potential applied



thereto disposed within said envelope adjacent said first means to rapidly accelerate said photoelectrons away from said means in a path toward said other end of said envelope at an angle oblique to said light axis and said longitudinal axis;

- a field mesh having said given potential applied thereto disposed within said envelope and adjacent said other end of said envelope, said given potential applied to said accelerating mesh and said field mesh providing a region of constant potential between said accelerating mesh and said field mesh to enable deflection of said photoelectrons adjacent said path in said region, said photoelectrons having a constant velocity in said region;
- readout means having a selected potential applied thereto greater than said given potential disposed in said other end of said envelope in said path adjacent said field mesh, said readout means being capable of providing an output photoelectron streak image for said tube, said given potential applied to said field mesh and said selected potential cooperating to accelerate said photoelectrons adjacent said path to said readout means;
- magnetic means disposed externally of said envelope coextensive with said means and said readout means to provide a focusing magnetic field parallel to said path to focus said photoelectrons on said readout means; and
- deflection plates disposed adjacent said path between said accelerating mesh and said field mesh in said region to deflect said focused photoelectrons across said readout means to produce said output photoelectron streak image on said readout means;
- and means external to said streak tube for supplying said given potential to said accelerating mesh and to said field mesh.

4,163,175

#### MAGNETRON FOR WHICH LEAKAGE OF H.F. NOISE IS MINIMIZED

Norio Tashiro, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

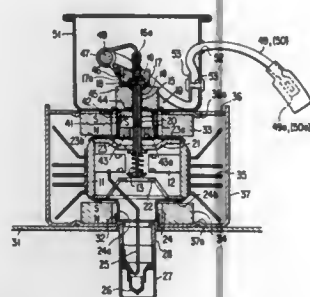
Filed Jan. 23, 1978, Ser. No. 871,644

Claims priority, application Japan, Jan. 21, 1977, 52-5479; Nov. 4, 1977, 52-148002[U]; Nov. 9, 1977, 52-150126[U]; Nov. 11, 1977, 52-151166[U]; Nov. 11, 1977, 52-151167[U]

Int. Cl.<sup>2</sup> H01J 25/50

U.S. Cl. 315-39.51

18 Claims



1. A magnetron comprising:
- an anode cylinder having one or more resonant cavities defined therein;
  - a cathode having an end and located on the axis of the anode cylinder;
  - a cathode holder supporting the cathode at the end of the cathode and extending in the direction thereof;
  - magnetic means for providing a magnetic field substantially parallel to the axis in an interaction space defined between the resonant cavities and the cathode and the cathode holder;
  - an evacuated envelope member hermetically sealed with the anode cylinder and constituting an evacuated envelope in cooperation with the anode cylinder;
  - a heat conducting member connected thermally to the anode

cylinder and located in the vicinity of the cathode holder; and

- a high-frequency energy absorber located close to the cathode holder in an evacuated area defined by the evacuated envelope and being in contact thermally with the heat conducting member, wherein the high-frequency energy absorber is shielded against a magnetic flux generated from the magnetic means.

4,163,176

#### ENERGY SAVING FLUORESCENT LAMP

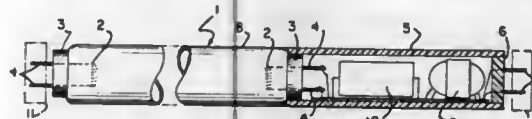
Sheppard Cohen, Danvers; Fredrick W. Paget, Rockport; William J. Roche, Merrimack; Tadius T. Sadoski, Salem, and Carlo S. Bessone, Cambridge, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 7, 1977, Ser. No. 840,408

Int. Cl.<sup>2</sup> H01J 17/34, 61/56

U.S. Cl. 315-53

6 Claims



1. An elongated fluorescent lamp and elongated extension base for use in a pair of sockets spaced a predetermined distance apart, the fluorescent lamp being shorter than said predetermined distance but the length of the lamp and extension base equalling said predetermined distance, the extension base containing an impedance the purpose of which is to reduce current flow in the lamp.

4,163,177

#### OSCILLATION GENERATOR PROVIDING OSCILLATIONS OF VARYING AMPLITUDE

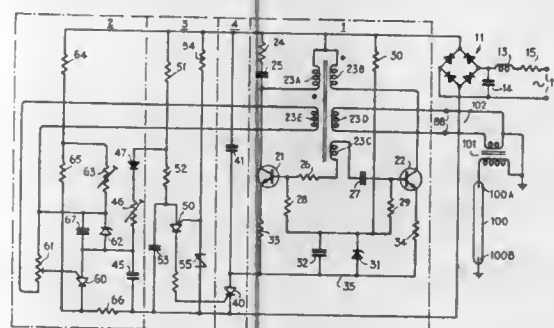
Arthur R. Warner, 11, Portsmouth Rd., Kingston-upon-Thames, Surrey, and Derrick A. Ward, 1 High Beech, Croydon Manor Rd., South Croydon, Surrey, both of England

Filed Oct. 17, 1977, Ser. No. 842,490

Int. Cl.<sup>2</sup> H05B 37/02; H03B 3/02

U.S. Cl. 315-208

13 Claims



1. In an oscillation generator providing a succession of oscillations of repetitively and progressively varying amplitude, the improvement comprising:
- oscillator means providing output oscillations varying in amplitude with an operating voltage applied thereto;
  - a supply capacitor;
  - a periodically fluctuating voltage source;
  - charging means coupling said supply capacitor to said voltage source by way of an SCR (semiconductor controlled rectifier) to develop a voltage across said capacitor;
  - means coupling said oscillator means to receive said voltage across said capacitor as said operating voltage;
  - control means developing firing pulses of which the timing

with respect to said fluctuating voltage varies progressively in a cyclic manner;

and means applying said firing pulses to fire said SCR.

10. The invention claimed in claim 1 and further including means coupling said oscillations to an electric discharge lamp.

4,163,178

#### FLASH LIGHT DISCHARGE DEVICE

Tsutomu Hosono, Tokyo, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

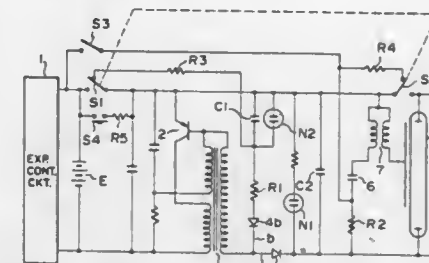
Filed Apr. 18, 1977, Ser. No. 788,606

Claims priority, application Japan, Apr. 16, 1976, 51-43316; May 15, 1976, 51-61502[U]

Int. Cl.<sup>2</sup> H05B 37/00, 39/00, 41/14

U.S. Cl. 315-241 P

7 Claims



1. A flash discharge device comprising:
- a blocking oscillator;
  - a first rectifier connected to said blocking oscillator to receive output signals therefrom and polarized to rectify output signals in one polarity;
  - a strobe circuit connected to said first rectifier and comprising a strobe tube and a main capacitor connected thereto to store electric charge supplied through said first rectifier to operate said strobe tube;
  - a second rectifier connected to said blocking oscillator to receive output signals therefrom and polarized oppositely from said first rectifier to rectify in the opposite polarity said blocking oscillator output signals applied to said second rectifier; and
  - voltage indicating means connected to said second rectifier to be energized by the oppositely polarized rectified signals therefrom,
- said voltage indicating means comprising:
- a neon tube,
  - a second capacitor connected in parallel with said neon tube,
  - a resistor connected in series with said second capacitor and said second rectifier, and
  - switching means connected to said voltage indicating means and said blocking oscillator to cause said neon tube to flash periodically and thereby periodically discharge said second capacitor while said blocking oscillator is operating to charge said main capacitor.

4,163,179

#### CIRCUIT FOR PROVIDING SAW-TOOTH CURRENT IN A COIL

Attilio Farina, and Giuseppe Zappala, both of Turin, Italy, assignors to Indesit Industria Elettrodomestici Italiana S.p.A., Turin, Italy

Filed Apr. 11, 1978, Ser. No. 895,413

Claims priority, application Italy, Apr. 29, 1977, 67959 A/77

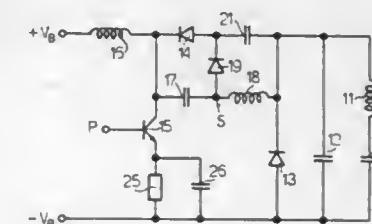
Int. Cl.<sup>2</sup> H01J 29/70, 29/76

U.S. Cl. 315-408

10 Claims

1. In a circuit for providing saw-tooth current with a trace and retrace interval in a coil, in particular a deflection coil of a television kinescope, in which the said coil is connected to a trace and retrace condenser with which it forms a resonant circuit; in which at least a first diode is connected in parallel to the said resonant circuit with such polarity that it is made conductive by the saw-tooth current during the first part of the trace interval; in which the said resonant circuit is also con-

nected, through a second diode, to a controllable switch, with a control electrode, connected to a source of periodic signals which make it conductive at least during the last part of the trace interval, the said second diode being connected with such polarity that it is made conductive by the saw-tooth current during the last part of the trace interval; in which the said controllable switch is connected to a supply voltage source through a first inductor; and, finally, in which part of the energy stored in the said first inductor, during the interval in



which the said controllable switch is conductive, is transferred, during the retrace interval, to the said resonant circuit through a third diode, the improvement wherein means are provided, connected in series to the said second diode, the said controllable switch, the said first diode, and a first condenser connected in series between the said first diode and the said second diode, to produce, at least during the conduction interval of the said controllable switch, a d.c. voltage with substantially the same amplitude but with opposite polarity to the voltage produced at the terminals of the said first condenser.

4,163,180

#### STRETCHABLE MATERIAL REWINDING MACHINE

Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.

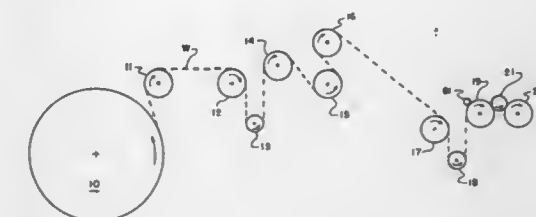
Division of Ser. No. 750,469, Dec. 14, 1976, Pat. No. 4,103,840.

This application Jan. 6, 1978, Ser. No. 867,230

Int. Cl.<sup>2</sup> B65H 61/00

U.S. Cl. 318-6

3 Claims



1. A stretchable material rewinding machine comprising a plurality of web guide rolls along a web route between a material supply reel and a rewind reel, a rotational power source, a first rotational power transmission link between said power source and said supply reel, a second rotational power transmission link between said power source and said rewind reel and, motor speed control means for varying the rotational speed of said power source, the improvement comprising:

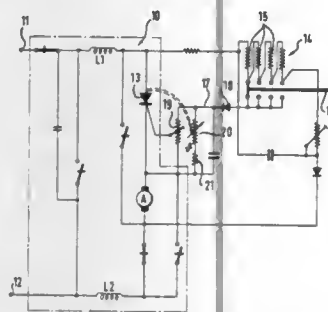
- A. Pulse generating means for emitting an electrical pulse corresponding to a discrete length of web wound onto said rewind reel;
- B. First pulse counting means for receiving and counting a first number of said pulses and transmitting a first speed control signal to said speed control means during a corresponding first counting interim, said first speed control signal ceasing at the end of said first counting interim;
- C. Second pulse counting means for receiving and counting a second number of said pulses and transmitting a second speed control signal to said speed control means during a

corresponding second counting interim, said second counting interim beginning at the end of said first counting interim and said second speed control signal ceasing at the end of said second counting interim.

**4,163,181**  
**VARIABLE-SPEED ELECTROMOTIVE DRIVE, ESPECIALLY FOR HOUSEHOLD APPLIANCES SUCH AS DOUGH KNEADERS**  
Karl-Heinz Farber, Giengen, Fed. Rep. of Germany, assignor to Bosch Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,703  
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655574

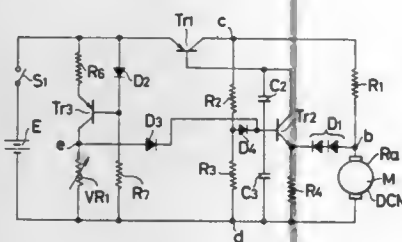
Int. Cl.<sup>2</sup> H02P 5/40  
U.S. Cl. 318—245 3 Claims



1. In a variable-speed electric motor drive including a universal motor having a power supply line wherein a thyristor is connected and operated in a phase gating circuit, a firing circuit for the thyristor, a step-wise adjustable voltage divider having an output and with a plurality of fixed resistors and a slider by means of which the speed of the universal motor can be set step-wise to a desired speed, a control line extending from the voltage divider to the thyristor in which control line is a diode and another voltage divider in the form of a trimmer potentiometer for varying the rotary speed of the motor, and a temperature-dependent second resistance associated with the firing circuit and thermally coupled to the thyristor, said second resistance being shunted across said other voltage divider.

**4,163,182**  
**ACTUATING CIRCUIT FOR D.C. MOTOR**  
Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Jun. 21, 1977, Ser. No. 808,669  
Claims priority, application Japan, Jun. 22, 1976, 51-73730; Jun. 22, 1976, 51-73732

Int. Cl.<sup>2</sup> H02P 5/00  
U.S. Cl. 318—331 7 Claims

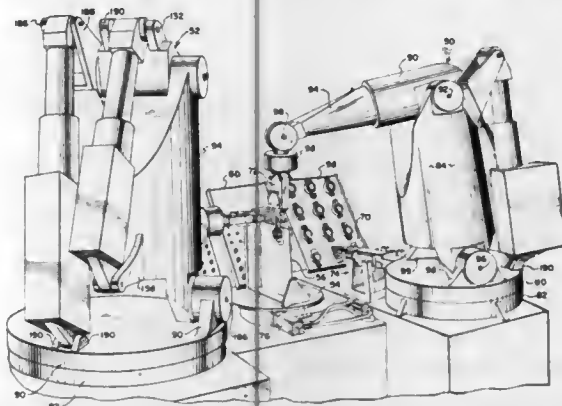


4. A speed control device for D.C. motor comprising:  
(a) an electric power supply circuit;  
(b) a resistor bridge circuit having branches and output terminals, the resistor bridge circuit including the D.C. motor in one branch thereof and producing from the

output terminals a first voltage corresponding to the speed of rotation of the D.C. motor;  
(c) driving means connected between the electric power supply circuit and the resistor bridge circuit to supply driving current to said resistor bridge circuit;  
(d) driving current control means coupled to at least an output terminal of the bridge circuit for controlling said driving means on the basis of said first voltage;  
(e) a constant voltage circuit comprising a constant current circuit and variable resistor means connected in series with said constant current circuit for producing a desired output voltage, said constant voltage circuit being connected parallel to said electric power supply circuit; said constant voltage circuit having an output terminal and said driving current control means having an input terminal; and  
(f) one-way conductive means connected between the output terminal of said constant voltage circuit and the input terminal of said driving current control means to apply an energizing voltage from said constant voltage circuit to the input terminal of said driving current control means at the time of actuation of said D.C. motor.

**4,163,183**  
**PROGRAMMABLE AUTOMATIC ASSEMBLY SYSTEM**  
Joseph F. Engelberger, Newtown; Torsten H. Lindbom, Brookfield; Maurice J. Dunne, Newtown; William Perzley, Weston; Wilbur N. Roberts, Newtown, and Horace L. Gardner, Ridgefield, all of Conn., assignors to Unimat, Inc., Danbury, Conn.

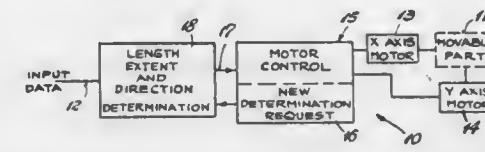
Filed Oct. 28, 1975, Ser. No. 625,932  
Int. Cl.<sup>2</sup> G05B 19/42  
U.S. Cl. 318—568 78 Claims



1. In a programmable manipulator the combination of, a manipulator arm, means for moving said arm to different positions in a plurality of independent axes, memory storage means for storing digital representations corresponding to different positions of said arm in said axes, encoder means for each of said axes and operative to develop position signals corresponding to the actual position of said arm is said plurality of axes, means controlled in part by said encoder means for calculating new digital representations during an initial teaching operation which are different from said position signals and correspond to a desired new position of said arm, and means for storing said calculated digital representations in said memory storage means.

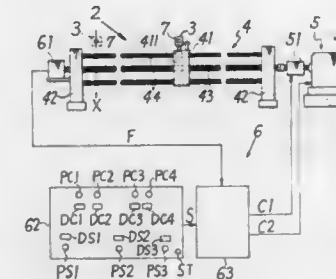
**4,163,184**  
**ARCuate MOVEMENT NUMERICAL CONTROL METHOD AND SYSTEM**  
Albert C. Leenbouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 4, 1974, Ser. No. 512,295  
Int. Cl.<sup>2</sup> G05B 19/24  
U.S. Cl. 318—573 29 Claims



1. The method of producing actual relative movement along two coordinate axes with a minimum deviation from a commanded path comprising the steps of subdividing the movement into a plurality of successive lengths, normally providing a plurality of different possible extents for each length with the extent of each possible length being defined by a number of increments on each axis and with each possible length being no more than a set number of increments on each axis from the extents of the immediately prior length, selecting the extent which has the least deviation size, and producing a relative movement of the selected extent of the length with the movement for each length occurring over the same constant time interval for each length and in which the step of selecting includes the step of investigating the size of the deviation which would be produced by each possible length.

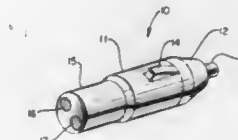
**4,163,185**  
**OBJECT LOCATING APPARATUS**  
Masateru Tokuno, Nishinomlya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan  
Filed Aug. 6, 1976, Ser. No. 712,045  
Claims priority, application Japan, Mar. 4, 1976, 51-24489  
Int. Cl.<sup>2</sup> G05B 19/28  
U.S. Cl. 318—601 5 Claims



1. An apparatus for locating at a predetermined position along the length of a blade carrier the blades of a slitter-scoring for longitudinally slitting and scoring a web of material comprising:  
a laser device remotely positioned out of engagement with said blade carrier for projecting a laser beam onto an adjacent blade carrier to indicate a predetermined position on said blade carrier at which a blade of said slitter-scoring should be positioned;  
means for movably supporting said laser device along a line parallel to said blade carrier so that a plurality of predetermined positions may be indicated along said blade carrier at which a blade of said slitter-scoring should be positioned;  
means for driving said means for movably supporting said laser device so as to move the laser device along said line parallel to said blade carrier;  
said means for movably supporting said laser device includes means for tilting said laser device so as to project a laser beam onto an adjacent blade carrier which is not in the

same plane as said means for movably supporting said laser device;  
command means for initiating movement of the laser device along said line parallel to said blade carrier;  
control means being programmed with a value representing the distance of said predetermined position along said blade carrier;  
means for generating a signal representing the distance from a reference point that the laser device has moved along said line parallel to said blade carrier; and  
means for comparing said signal with said value and generating a stop signal to said drive means to stop the laser device so that the laser beam is projected onto an adjacent blade carrier to indicate a predetermined position on said blade carrier at which a blade of said slitter-scoring should be positioned.

**4,163,186**  
**BATTERY STATE-OF-CHARGE INDICATOR**  
William E. Haley, 1430 Francis La., Plano, Tex. 75040  
Filed Oct. 6, 1977, Ser. No. 839,929  
Int. Cl.<sup>2</sup> G08B 21/00  
U.S. Cl. 320—48 15 Claims



1. A state-of-charge indicator for a battery comprising: a pair of current flow activated indicator means, first terminal means and second terminal means, a pair of transistors with collector elements serially connected through respective indicator means of said pair of current flow activated indicator means to said first terminal means, a common resistive member connected to the emitter elements of said pair of transistors with each transistor connected through said common resistive member to said second terminal means, first means biasing the base-emitter junction of said first transistor as the differential between a fixed reference potential and the voltage drop across said common resistive member, and second means biasing the base-emitter junction of said second transistor as the differential between a potential defined as a predetermined function of the voltage across said terminal means and the voltage drop across said common resistive member, and means for connecting said first and second terminal means to respective battery terminals.

**4,163,187**  
**ALTERNATOR HAVING SINGLE STATOR WITH DUAL WINDINGS AND COMPOUND OUTPUT**  
Serge J. H. Thomas, Paris, France, assignor to Motorola Automobile, Angers, France  
Filed Dec. 31, 1975, Ser. No. 645,493  
Claims priority, application France, Jan. 9, 1975, 75 00583  
Int. Cl.<sup>2</sup> H02P 9/10  
U.S. Cl. 322—29 27 Claims

1. In an alternator for supplying rectified current at varying speeds having a rotor, a field winding on the rotor, a stator, the stator having slots for receiving stator windings, and output terminal wherein the improvement comprises:  
a single stator having  
at least one first stator winding received in the slots having

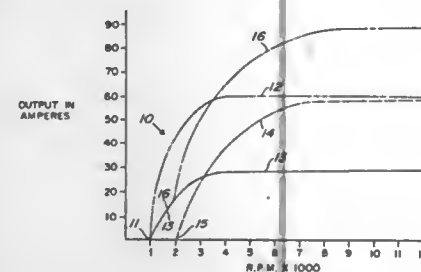


a first number of turns of wire of a first cross sectional area adapted to provide a predetermined voltage output at a first predetermined rotor velocity and to provide a current output at rotor velocities higher than a second predetermined velocity,

at least one second stator winding received in the slots having a second number of turns of wire of a second cross sectional area adapted to provide at a third predetermined rotor velocity a voltage output equal to the predetermined voltage output of the first stator winding, the second number of turns of wire being less than the first number of turns and the second cross sectional area being greater than the first cross sectional area, the third velocity being intermediate the first and second velocities,

the second winding being adapted to provide a current output substantially greater than the current output of the first winding at rotor velocities higher than the second velocity,

means for rectifying the outputs, and  
means for adding the rectified output currents whereby a compound curve output is provided at the alternator output terminals.



2. In an alternator as for an engine ignition system for supplying rectified current at constant voltage while operating at varying speeds, the system including an alternator having at least a rotor, a field winding on the rotor, and a stator, the stator being adapted to receive stator windings, the system comprising:

(a) at least one first stator winding adapted to provide a predetermined voltage output at a first predetermined rotor velocity, and adapted to provide a first current output at rotor velocities higher than the first predetermined velocity,

(b) at least one second stator winding having a voltage output lower than the predetermined voltage at the first predetermined rotor velocity, the second winding being adapted to reach the predetermined voltage at a second predetermined velocity, the second velocity being higher than the first predetermined velocity and the second winding being adapted to provide a current output greater than the output of the first winding at rotor velocities substantially higher than the second predetermined velocity,

(c) means for rectifying the outputs, and

(d) means for adding the rectified output currents to provide a continuous output current after the first predetermined rotor velocity is attained.

4,163,188

# SYSTEM FOR ESTABLISHING AND STEERING A PRECISE CURRENT

Daniel D. Culmer, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 30, 1978, Ser. No. 910,508

Int. Cl.<sup>2</sup> G05F 1/56

U.S. Cl. 323-4

5 Claims

1. A system for establishing a precise reference current and steering the precise reference current through a load, comprising

a first node;

a reference resistance connected between the first node and a common terminal;

means for maintaining a first reference voltage at the first node to establish a precise current flow through the reference resistance;

a field effect transistor having its source connected to a supply voltage terminal;

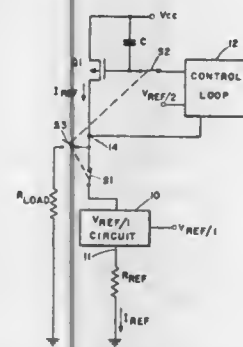
a capacitance connected between the source and the gate of the field effect transistor;

a first switch for connecting the field effect transistor in series with the reference resistance;

a second node in the series circuit between the first switch and the field effect transistor;

a control loop connected to the second node and to a second reference voltage terminal;

a second switch for connecting the control loop to the gate of the field effect transistor; and



a third switch connected to the second node for connecting the field effect transistor in series with a said load;

wherein when the first and second switches are closed and the third switch is open, the control loop causes the capacitance to be charged until the voltage at the second node matches the second reference voltage to thereby provide a voltage across the gate and source of the field effect transistor for sustaining the flow of the precise current from the field effect transistor and through the reference resistor;

whereby when the first and second switches are opened and the third switch is closed, the charge on the capacitance causes the precise current to continue to flow from the field effect transistor and the third switch steers the current through the load.

4,163,189

# TRANSFORMER WITH A FERROMAGNETIC CORE FOR D-C AND A-C SIGNALS

Kurt Smutny, Neunkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

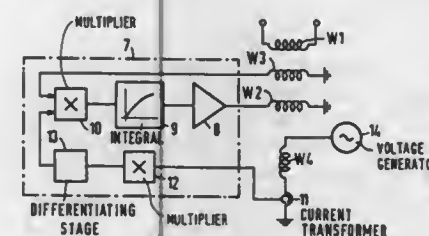
Filed May 31, 1977, Ser. No. 802,036

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625354

Int. Cl.<sup>2</sup> H01F 21/08

U.S. Cl. 323-6

15 Claims



1. A transformer for d-c and a-c signals comprising:

- (a) a ferromagnetic core capable of having therein two independent magnetic fluxes;
- (b) a primary winding wound on said core;
- (c) a secondary winding wound on said core;
- (d) a supplemental winding, wound on said core, for changing the permeability of said core;
- (e) means for supplying a periodically changing current coupled to said supplemental winding to produce a secondary magnetic flux in said core which is independent of the magnetic flux of said primary and said secondary windings;
- (f) means for measuring the change in the magnetic characteristics in said core; and
- (g) means responsive to said means for measuring to supply a d-c current to said secondary winding, which current acts to cancel the effect of the permeability change on said means for measuring to thereby force equalization of the magnetization in said primary and said secondary windings.

4,163,190

# APPARATUS FOR CONTROL OF ELECTRICAL CURRENT BY ELECTROMAGNETIC INDUCTION

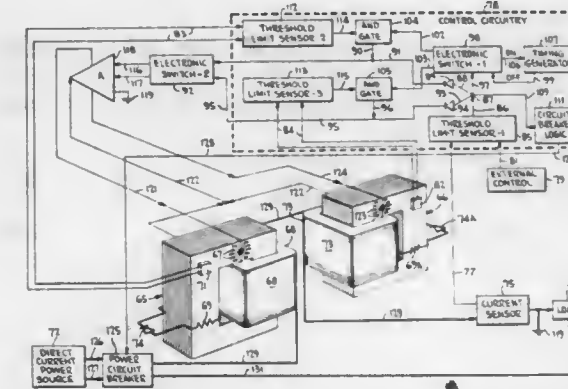
Nathan A. Moerman, 7310 Maple Ave., Chevy Chase, Md. 20015

Division of Ser. No. 762,896, Jan. 26, 1977, Pat. No. 4,112,347, which is a division of Ser. No. 635,007, Nov. 25, 1975, Pat. No. 4,020,440. This application Nov. 7, 1977, Ser. No. 849,149

Int. Cl.<sup>2</sup> G05F 1/04, 7/00

U.S. Cl. 323-6

4 Claims



4. An electromagnetic induction means for the control of a direct current power circuit comprising,

a first and a second identical variable permeance closed magnetic path means,

a first electromagnetically coupled permeance control means in said first variable permeance closed magnetic path means,

a second electromagnetically coupled permeance control means in said second variable permeance closed magnetic path means,

a first load current winding surrounding said first variable permeance closed magnetic path means,

a second load current winding surrounding said first variable permeance closed magnetic path means,

a second load current winding surrounding said second variable permeance closed magnetic path means,

a direct current circuit breaker means including a magnetic transformer means,

a current sensing means,

a load terminal means,

means for serially connecting said direct current circuit breaker means, said first load current winding, said second load current winding, said current sensing means and said load terminal means,

a first reverse transient suppression means having a third winding means surrounding said first variable permeance

closed magnetic path, a first unidirectional current flow and electrical energy absorbing means,

means for serially connecting said third winding means, said first unidirectional current flow and electrical energy absorbing means,

a second reverse transient suppression means having a fourth winding means surrounding said second variable permeance closed magnetic path, a second unidirectional current flow and electrical energy absorbing means,

means for serially connecting said fourth winding means, said second unidirectional current flow and electrical energy absorbing means,

a load current sensing voltage feedback means,

a threshold load current limit sensor means,

means connecting said feedback means between said current sensing means and said threshold load current limit sensor means,

a first and a second electronic switch means, each having a first and a second input means and a first and a second output means, said first electronic switch also having a timing pulse output means,

a direct current circuit breaker decision circuit means,

a timing generator means,

a first and a second diode means,

a means connecting the output of said threshold load current limit sensor means to the anode of each of said diode means, to said first input of said first electronic switch means and to said decision circuit means,

a means connecting the output of said decision circuit means to said direct current circuit breaker means,

a means connecting said timing pulse output means to said timing generator means,

a means connecting the output of said timing generator means to the second of said input means to said first electronic switch,

a first and a second flux density sensor means,

a first and a second threshold voltage level detector and signal generating means,

means coupling said first flux density sensor means to said first variable permeance closed magnetic path means,

means coupling said second flux density sensor means to said second variable permeance closed magnetic path means,

means connecting the output of said first flux density sensor means to said first threshold voltage level detector means,

means connecting the output of said second flux density sensor means to said second threshold voltage level detector means,

a first and a second logic AND gating means,

a first and a second trigger connecting means,

a means connecting the output of said first threshold voltage level detector means as one of the inputs to said first logic AND gating means,

a means connecting the output of said second threshold voltage level detector means as one of the inputs to said second logic AND gating means,

a means connecting the first output of said first electronic switch means as the second input to said first logic AND gating means,

a means connecting the second output of said first electronic switch means as the second input to said second logic AND gating means,

said first trigger connecting means connected to the cathode of said first diode means, to the output of said first logic AND gating means, and to the first input of said second electronic switch means,

said second trigger connecting means connected to the cathode of said second diode means, to the output of said second logic AND gating means, and to the second input of said second electronic switch means,

a commutation amplifier means,

a means connecting said first output of said second electronic switch means as the first input of said commutation amplifier means,

a means connecting said second output of said second electronic switch means as the first input of said commutation amplifier means,

a means connecting said second output of said second electronic switch means as the first input of said commutation amplifier means,

a means connecting said second output of said second electronic switch means as the first input of said commutation amplifier means,

a means connecting said second output of said second electronic switch means as the first input of said commutation amplifier means,

a means connecting said second output of said second electronic switch means as the first input of said commutation amplifier means,

tronic switch means as the second input of said commutation amplifier means, the switching output means of said commutation amplifier means connected as the input means for said first and second variable permeance control means, the output of said commutation amplifier means switched between the inputs of said first and second electromagnetically coupled variable permeance control means to effect a minimum permeance state in one and a maximum permeance state in the other of said first and second variable permeance control magnetic paths and produce thereby on continued switching of said commutation amplifier an average counter electromotive force to reduce the said load current to a controlled operating limit, an override control means to provide external actuating means, means connecting said override control means to said threshold load current limit sensor means, said threshold load current limit sensor means providing an output of control signals upon the occurrence of a current level above the level established within said threshold load current limit sensor, upon the receipt of a predetermined number of said control signals, said direct current circuit breaker decision circuit means produces an output signal to provide said magnetic transformer means therein momentary load current suppression means coincident with the operation of said direct current circuit breaker means.

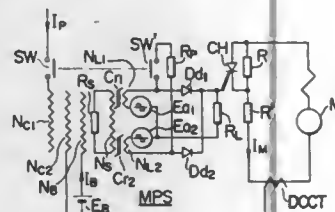
4,163,191

**MAGNETIC PHASE SHIFTER CONTROL SYSTEM**  
Hisakatsu Kiwaki, Hiroshi Narita, and Hiroshi Sato, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan  
Filed Aug. 16, 1977, Ser. No. 825,042

Claims priority, application Japan, Sep. 3, 1976, 51-104896  
Int. Cl.<sup>2</sup> H02P 5/16, 5/18

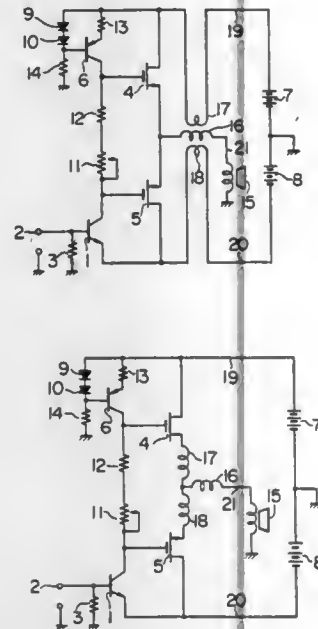
U.S. Cl. 323—89 M

17 Claims



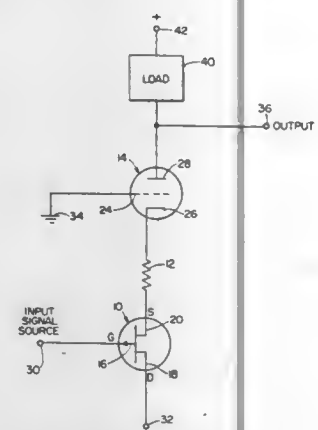


amplifier stage for supplying the output signal of said preamplifier stage to said power amplifier stage;  
 a load circuit connected with said output terminal of said power amplifier stage to receive the output signal of said power amplifier stage whereby a signal path for the audio-frequency signal is established between the input means supplying the audio-frequency signal and the load circuit through the push-pull power amplifier;  
 DC power source means for supplying power via a current path to said preamplifier stage and said power amplifier stage; and



magnetic coupling means comprising a first coupling coil connected in series with the signal path of said audio-frequency signal and a second coupling coil connected in series with the current path of current supplied from said DC power source means for supplying the harmonic components of current flowing through said current path to said signal path with the phase and the signal level which cancel the harmonic components of current included in said output signal supplied to said load circuit.

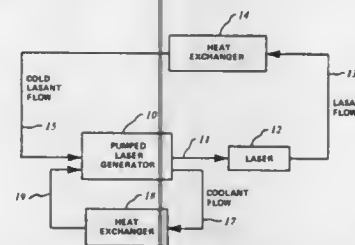
**4,163,198**  
**AUDIO AMPLIFIER**  
 David W. Berning, 11007 Candlelight La., Potomac, Md. 20854  
 Filed Dec. 8, 1977, Ser. No. 858,649  
 Int. Cl.<sup>2</sup> H03F 3/16  
 U.S. Cl. 330—277



1. An amplifier circuit comprising:  
 a vacuum tube having a cathode, a plate, and at least one

grid located between said cathode and said plate, said grid connected to a ground potential;  
 load means connected between said plate and a source of positive voltage;  
 means for extracting an output signal developed across said load means;  
 a P-channel field effect transistor having a source electrode, a drain, and at least one gate;  
 said drain connected to a source of negative voltage;  
 circuit means for connecting said cathode and said source electrode; and  
 said gate adapted to be connected to an input signal source.

**4,163,199**  
**THERMAL-RADIATION EXCITED  
 VIBRATIONAL-EXCHANGE PUMPED LASER  
 GENERATOR**  
 Charles E. Treanor, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.  
 Filed Jul. 1, 1977, Ser. No. 812,033  
 Int. Cl.<sup>2</sup> H01S 3/091  
 U.S. Cl. 331—94.5 G 13 Claims



1. A method for optically pumping a laser from an incoherent radiation source including the steps of:  
 passing a lasant gas through a laser generator;  
 supplying incoherent radiation containing the correct wavelengths for absorption by the lasant gas into the laser generator;  
 filtering the incoherent radiation supplied into the laser generator to reject wavelengths unsuitable for vibrational absorption whereby only correct wavelengths reach the lasant gas which is then excited by vibration-vibration exchange while remaining otherwise cool; and  
 passing the excited lasant gas to a laser cavity where the excited lasant gas relaxes to produce lasing.

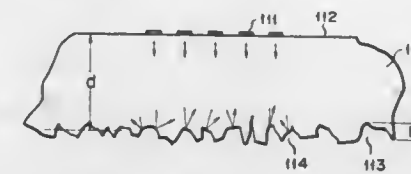
**4,163,200**  
**LASER BEAM ARRANGEMENT**  
 John M. DeMaggio, 117-14 125th St., S. Ozone Park, N.Y. 11420  
 Filed Jul. 11, 1977, Ser. No. 814,672  
 Int. Cl.<sup>2</sup> H01S 3/08  
 U.S. Cl. 331—94.5 C 4 Claims



1. In a laser arrangement of the type including an elongated body having a longitudinal axis and two longitudinally spaced ends and containing an excitable medium in which light rays substantially parallel to the longitudinal axis are excited during the operation of the arrangement, reflected from two mirrors each arranged at one of the ends of the body, and eventually

emitted through one of the ends of the body in the form of a laser beam, the improvement wherein each of the mirrors is concave and reflects all those light rays, which impinge upon the same in parallelism with the longitudinal axis, toward a focusing location situated in a focal plane passing through the longitudinal axis and spaced from the associated mirror more than a half of the distance between the mirrors; and further comprising a diverging lens positioned intermediate said focusing locations of the two mirrors and so configured as to refract those light rays, which have been reflected from the mirrors toward the respective focusing locations, into a substantial parallelism with the longitudinal axis and closer to said focusing locations than the originally excited light rays.

**4,163,201**  
**ELASTIC SURFACE WAVE DEVICE**  
 Sadao Takahashi, Tokyo, and Toshio Sudo, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan  
 Filed Nov. 9, 1977, Ser. No. 849,945  
 Claims priority, application Japan, Nov. 9, 1976, 51-133720; Nov. 9, 1976, 51-133721  
 Int. Cl.<sup>2</sup> H03H 9/26, 9/32; H01L 41/18  
 U.S. Cl. 333—194 4 Claims



1. An elastic surface wave device comprising an X-cut Li-TaO<sub>3</sub> piezoelectric substrate whose thickness d satisfies the following expression

$$\frac{2.13n}{f_l} < d < \frac{2.13(n+2)}{f_u}$$

where

n: an odd number of 1, 3, 5, 7 . . .

f<sub>l</sub>: a minimum frequency (MHz) of a filter pass band

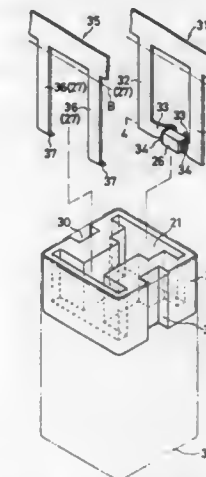
f<sub>u</sub>: a maximum frequency (MHz) of a filter pass band

d: a thickness (mm) of the Li-TaO<sub>3</sub> substrate and transducers formed on one surface of the substrate.

**4,163,202**  
**TUNING APPARATUS AND METHOD OF PRODUCING THE SAME**  
 Toyooki Tunematsu, Kanzaki; Selichl Takeno, and Testuo Yamaguchi, both of Youkaichi, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan  
 Filed Apr. 4, 1978, Ser. No. 893,394  
 Claims priority, application Japan, Apr. 15, 1977, 52-48167[U]  
 Int. Cl.<sup>2</sup> H03J 3/20 16 Claims

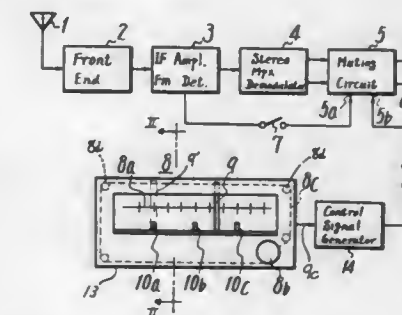
1. A tuning apparatus comprising a capacitor chip, a coil, a base member which has a hollow space for receiving said capacitor chip and on which said coil is mounted, and a plurality of external terminals projecting from said base member and electrically connected to said capacitor chip and coil, said plurality of external terminals being prepared of comb-shaped formed parts in the form of electrically conductive metal members each having a plurality of comb teeth, wherein at least two comb teeth selected from said plurality of comb teeth are inserted at their front ends into said hollow space of said base member and fixed in position by resin poured into said hollow space, the roots of said comb teeth being then severed to separate said comb teeth from

each other, thereby providing at least two independent external terminals,  
 said capacitor chip having its two terminals directly connected to the portions of said at least two external terminals



nals corresponding to said front ends of said comb teeth, whereby said capacitor chip and the front ends of said comb teeth are covered with said resin within said hollow space.

**4,163,203**  
**TUNING APPARATUS FOR SELECTING PRESET BROADCAST FREQUENCIES**  
 Kokichi Morii, Chigasaki, and Kohei Hanelshi, Musashino, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed Mar. 28, 1978, Ser. No. 890,916  
 Claims priority, application Japan, Mar. 30, 1977, 52-35979; Apr. 5, 1977, 52-38740  
 Int. Cl.<sup>2</sup> H03J 1/02, 3/12, 1/04  
 U.S. Cl. 334—86 8 Claims



1. A tuning apparatus for a broadcast receiver comprising a dial scale representing broadcast frequencies over a predetermined frequency band, a dial indicator movable along said dial scale for indicating the broadcast frequency to which the apparatus is tuned, sensor means coupled with said indicator for movement therewith in respect to said dial scale, said sensor means including photo-sensitive means and a light source for directing light upon said photo-sensitive means across a gap therebetween, presetting means positionable along said dial scale from outside the dial scale for selecting at least one broadcast frequency to be received and having shutter means which extends into said gap of said sensor means when said indicator is disposed to indicate the broadcast frequency selected by said presetting means, whereby to block the impingement of light on said photo-sensitive means from said light source, control signal generating means connected with said photo-sensitive means for producing a muting control signal in response to the extending of said shutter means of said presetting means into said gap of said sensor means, and circuit means responsive to said muting control signal to mute the

transmission of a signal by said tuning apparatus in the absence of said muting control signal.

4,163,204

## PRESSURE-SENSITIVE RESISTORS

Ryoichi Sado, Saitama; Akio Nakamura, Toda, and Naoki Kodama, Omiya, all of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Ninonbashi, Japan

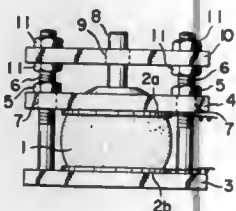
Filed Dec. 26, 1978, Ser. No. 973,088

Claims priority, application Japan, Dec. 30, 1977, 51-160713

Int. Cl.<sup>2</sup> H01C 10/10, 10/12

U.S. Cl. 338—114

2 Claims



1. A pressure-sensitive variable resistor comprising (a) an electroconductive rubbery elastomer member composed of an electrically insulating rubbery elastomer as a matrix and an electroconductive powder uniformly dispersed in the matrix, (b) a pair of electrodes provided in contact with the opposite surfaces of the electroconductive rubbery elastomer member, (c) a means for giving a compressive force between the electrodes sufficient to keep the electroconductive rubbery elastomer member under compression to an extent exceeding the value with which the electric resistance between the electrodes is minimal and beyond which the electric resistance between the electrodes increases as the compression increases, and (d) a means for adjusting the compression given to the electroconductive rubbery elastomer member in a region where the electric resistance between the electrodes increases as the compression increases.

4,163,205

## ACOUSTO-OPTICAL DEVICE FOR REMOVING BUBBLE PULSE FROM REFLECTED SONAR SIGNAL

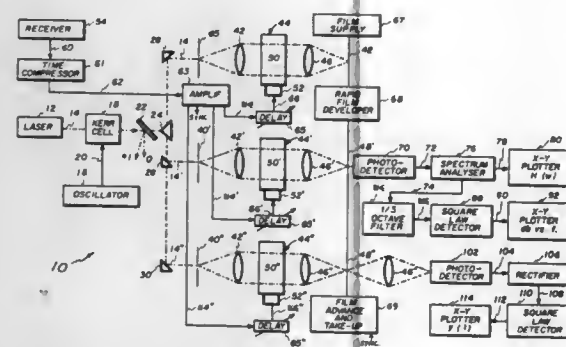
Daniel Barron, 6001 W. Esplanade Ave., Metairie, La. 70003

Filed Jan. 26, 1978, Ser. No. 872,401

Int. Cl.<sup>2</sup> G01V 1/38, 1/28

U.S. Cl. 340—7 R

12 Claims



1. Apparatus for processing first electrical signals representative of incident and reflected acoustic signals generated by an underwater explosion and characterized by unwanted incident and reflected signals as well as incident signals of interest  $x(t)$  and reflected signals of interest  $y(t)$ , said apparatus comprising: a source of coherent light;

shutter means for modulating said light by interruption and passing thereof at a predetermined strobe frequency; means for directing said light modulated by said shutter in a predetermined path; acousto-optical modulator means, responsive to said electrical signals, for diffracting said light in said path in accordance with said acoustic signals; lens means for focusing said diffracted light at a predetermined focal plane; direct positive photographic film means disposed at said focal plane for producing on said film means a positive photographic image of a diffraction interference pattern corresponding to the inverse Fourier transform  $1/X(w)$  of a predetermined incident signal of interest; whereby said film means forms a filter such that, when directly illuminated by light diffracted by said acousto-optical modulator means in accordance with said reflected signals so as to form a diffraction interference pattern at said focal plane corresponding to the Fourier transform  $Y(w)$  of said reflected signals of interest, light is passed by said filter in accordance with  $Y(w)/X(w)$ ; whereas light forming diffraction interference patterns at said focal plane corresponding to Fourier transforms of said unwanted signals is blocked by said filter.

4,163,206

## APPARATUS AND METHOD FOR SEISMIC WAVE DETECTION

Ernest M. Hall, Jr., Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 704,149, Jul. 12, 1976,

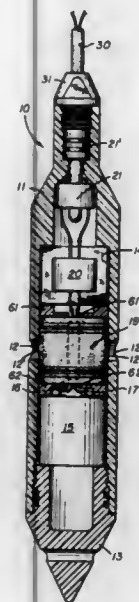
abandoned, and Ser. No. 679,416, Apr. 22, 1976, abandoned. This

application Nov. 4, 1977, Ser. No. 848,704

Int. Cl.<sup>2</sup> G01V 1/16; H04R 15/00, 17/00

U.S. Cl. 340—17 R

3 Claims



1. A seismic sensor comprising in combination: a rigid housing; a pressure sensor, encased in a module that is removably mounted in the housing, for generating a first signal proportional to pressure applied to the sensor; a separate acceleration sensor, encased in a module that is removably mounted beneath said pressure sensor module in the housing, for generating a second signal proportional to acceleration forces applied to the housing; and means for electrically connecting said pressure sensor in series directly with said accelerometer sensor to produce a third sum signal.

4,163,207

## TIRE DEFLATION WARNING DEVICE

Alan M. Dodd, Walsall, England, assignor to Dunlop Limited, England

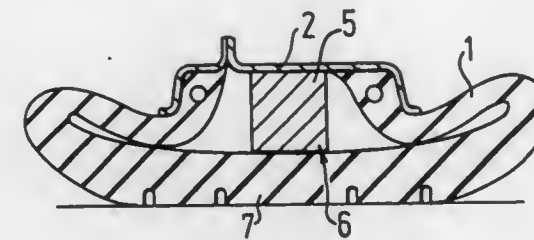
Filed Jun. 2, 1976, Ser. No. 692,190

Claims priority, application United Kingdom, Jun. 4, 1975, 24046/75

Int. Cl.<sup>2</sup> B60C 17/00

U.S. Cl. 340—58

6 Claims



1. A tire deflation warning device for a road vehicle comprising noise producing means on a single inflation chamber tire and wheel assembly to produce disturbing noise frequencies in the range of 80 to 280 Hz only when the tire is running at normal road speeds in a deflated condition, said frequencies being transmittable through a vehicle suspension to the vehicle body, the noise producing means comprising a noisy formation situated inside said single inflation chamber and positioned to contact the assembly other than at the noisy formation itself to generate a disturbing noise frequency as the tire runs in a deflated condition.

4,163,208

## AUTOMATIC WIRELESS TIRE PRESSURE MONITORING SYSTEM

Ernest J. Merz, 745 Old State Rd., Berwyn, Pa. 19312

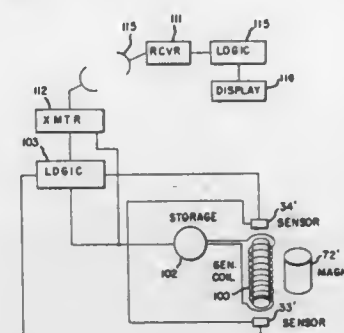
Continuation-in-part of Ser. No. 641,817, Dec. 18, 1975. This

application Aug. 16, 1977, Ser. No. 825,177

Int. Cl.<sup>2</sup> B60C 23/04

U.S. Cl. 340—58

14 Claims



1. An automatic vehicle tire pressure monitoring system comprising: a pressure sensitive actuator mounted on the wheel of said vehicle; means for generating a magnetic field mounted on said wheel and adjustable by said pressure sensitive actuator when the pressure in said vehicle tire changes; an electromagnetic coil located on the chassis of said vehicle so that an electromagnetic potential is generated within the coil by said magnetic field; a transmitter connected to said electromagnetic coil, said transmitter receiving its power from said electromagnetic coil; and magnetic field sensors on the chassis of said vehicle, said sensors being responsive to said magnetic field and con-

nected to said transmitter so that said transmitter transmits signals representing tire pressure.

4,163,209

## TECHNIQUE FOR CONTROLLING MEMORYFUL NON-LINEARITIES

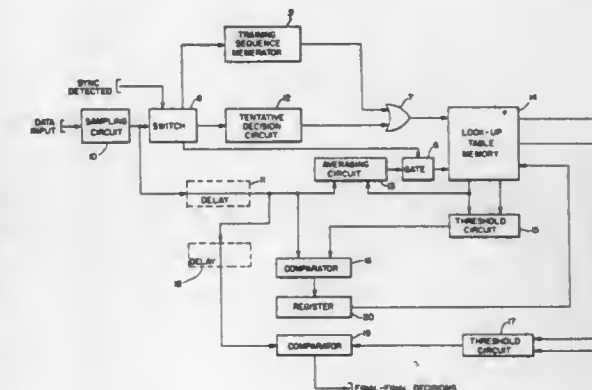
Daniel D. McRae, West Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 28, 1977, Ser. No. 837,443

Int. Cl.<sup>2</sup> G08C 25/00

U.S. Cl. 340—146.1 E

29 Claims

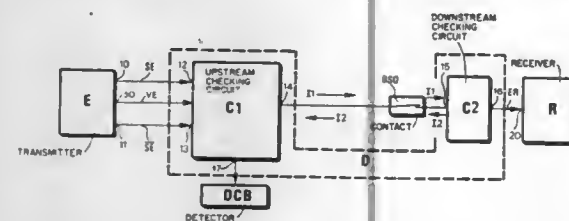


1. In a data communications system for processing received data transmitted through a data transmission path containing memoryful non-linearities, wherein received data to be processed is sampled, to provide sequential values representative of transmitted data symbols, a method for combatting the effects of said memoryful non-linearities in said transmitted data comprising the steps of:

storing, in a memory, a plurality of data symbol set values representative of the average effects imparted by the memoryful non-linearity-containing transmission path on pluralities of each of the respective sets of data symbols of which transmitted data to be processed may be comprised; converting sequentially sampled values representative of received data symbols transmitted through said data transmission path into a first series of data symbols; successively addressing said memory in accordance with the sequential sets of data symbols contained within said first series of data symbols, and thereby reading out from said memory, for each of said sequential sets, a first data symbol set value contained in the memory location identified by said each of said sequential sets, and a second data symbol set value contained in a memory location identified by another data symbol set which differs from said each symbol set by one of the symbols therein; comparing a respective sequentially sampled value representative of a received data symbol, the location of which received data symbol coincides with the location of said one of said symbols in said each of said sequential sets, with a threshold value defined in accordance with said first and second data symbol set values; and decoding said respective sequentially sampled value as the symbol contained in said location of either said first data symbol set or said second data symbol set, in accordance with whether or not said sequentially sampled value exceeds said threshold value, whereby, for said sequentially sampled values of received data symbols there is obtained a decoded series of data symbols corresponding to the data symbols transmitted through said data transmission path.



**4,163,210**  
**ARRANGEMENT FOR CHECKING A CONTACT**  
 INSERTED BETWEEN A TRANSMITTER CIRCUIT AND  
 A RECEIVER CIRCUIT TO ALLOW ELECTRICAL  
 SIGNALS TO BE TRANSMITTED  
 Georges M. Giraud, Le Vesinet, France, assignor to Compagnie  
 Internationale pour l'Informatique Cii-Honeywell Bull (So-  
 ciete Anonyme), Paris, France  
 Filed Feb. 6, 1978, Ser. No. 875,564  
 Claims priority, application France, Feb. 7, 1977, 77 03317  
 Int. Cl.<sup>2</sup> G06F 11/00; G08B 29/00; H04L 25/02  
 U.S. Cl. 340—146.1 E 5 Claims

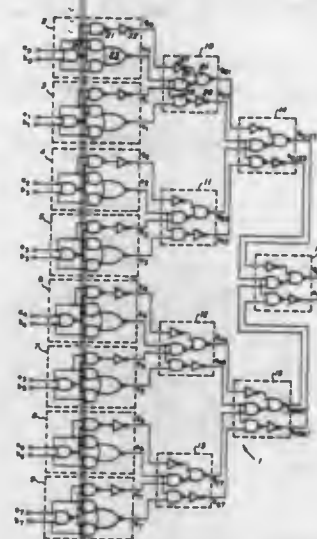


1. An arrangement for checking the quality of contact between a transmitter circuit situated upstream and a receiver circuit situated downstream, the contact being made to enable electrical signals corresponding to logic 1 and 0 states produced by the transmitter circuit to be transmitted in series to an input of the receiver circuit, comprising first circuit means situated upstream of the contact and connected to receive the output of the transmitter circuit, second circuit means situated downstream of the contact and connected to the input of the receiver circuit, the first circuit means being adapted to produce, at a first output, a continuous current in a predetermined direction or the opposite direction in the presence of a transmitter signal at the transmitter output representing a logic 1 or 0 state, the second circuit being adapted to generate, at an output connected to the input of the receiver circuit, a signal corresponding to the logic state generated by the transmitter circuit when said continuous current in the corresponding direction is emitted by the first circuit, the first circuit being adapted to emit a signal at a second output when the said continuous current is present for indicating that the contact is satisfactory.

**4,163,211**  
**TREE-TYPE COMBINATORIAL LOGIC CIRCUIT**  
 Kenichi Miura, Saratoga, Calif., assignor to Fujitsu Limited, Japan  
 Filed Apr. 17, 1978, Ser. No. 897,132  
 Int. Cl.<sup>2</sup> G06F 7/02, 7/50, 11/10  
 U.S. Cl. 340—146.2 13 Claims

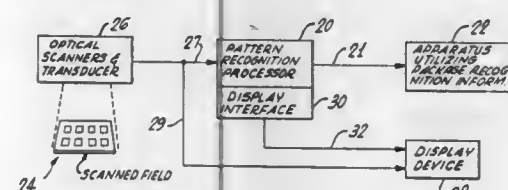
1. A tree-type logic circuit comprising:  
 a plurality of cascading circuits, each of said cascading circuits having four input terminals, two output terminals and an internal logic circuit, each of said cascading circuits being connected in multi-stages to form a tree, said internal logic circuit having means for generating signals of Boolean function  $G_{K+1} = G_K \vee E_{K+1}$  and  $E_{K+1} = E_K \wedge e_l$  wherein  $G_K$  is a signal applied to the first terminal of said four input terminals,  $E_K$  is a signal applied to the second terminal of said four input terminals,  $g_l(G_{K+1})$  is a signal applied to the third terminal of said four input terminals and  $e_l(E_{K+1})$  is a signal applied to the fourth terminal of said four input terminals; where  $K$  and  $l$  are either an integer between 0 and  $N-1$  or any concatenation thereof, and " $N$ " is the total number of input signal paths, " $\vee$ " means concatenation operator for two integers;  
 first signal generating means for applying first  $N$  binary bit input signals  $g_0$  to  $g_{N-1}$  to said first and third terminals of

each of said cascading circuits in the first stage, consecutively; and



second signal generating means for applying second  $N$  input signals  $e_0$  to  $e_{N-1}$  to said second and fourth terminals of said cascading circuits in the first stage consecutively.

**4,163,212**  
**PATTERN RECOGNITION SYSTEM**  
 Walter R. Buerger, Torrance; Kenneth K. Dixon, San Pedro, and Jacques F. Monier, Torrance, all of Calif., assignors to Excellon Industries, Torrance, Calif.  
 Filed Sep. 8, 1977, Ser. No. 831,667  
 Int. Cl.<sup>2</sup> G06K 9/04  
 U.S. Cl. 340—146.3 H 33 Claims

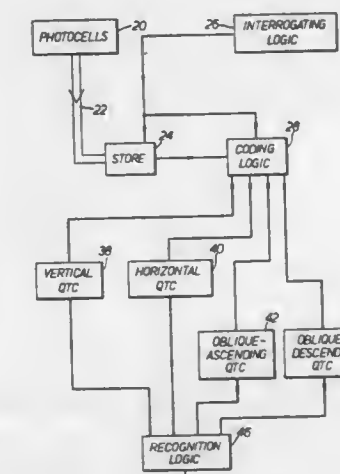


1. A method for locating the centers of distinguishable areas falling within a selected size range in a field of interest, said method comprising the steps of:  
 scanning the field in a raster scan sequence of parallel lines oriented in a first scanning direction;  
 generating image signals indicative of portions of the parallel lines that overlap the distinguishable areas; and  
 processing the image signals to obtain a centerline signal representative of the locus of center points of the portions of the parallel lines that overlap the distinguishable areas, said processing step also including disregarding image signals indicative of distinguishable areas falling outside a selected size range.

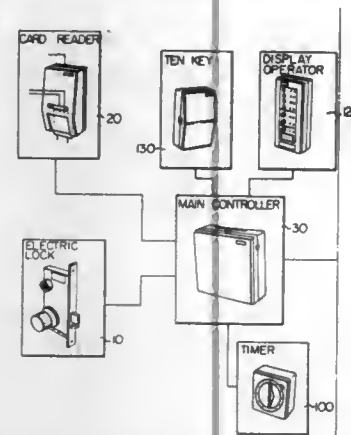
**4,163,213**  
**ALPHANUMERIC CHARACTER IDENTIFICATION**  
 Morton Nadler, Le Celle Saint-Cloud, France, assignor to Norprint Limited, England  
 Filed Nov. 2, 1977, Ser. No. 847,894  
 Claims priority, application United Kingdom, Nov. 4, 1976, 45872/76  
 Int. Cl.<sup>2</sup> G06K 9/00  
 U.S. Cl. 340—146.3 D 19 Claims

1. A method of character identification, comprising the steps

forming on a predetermined area a representation of the character to be identified,  
 subjecting the area to a plurality of frame scans, the scans comprising at least three scans of respectively different directions,  
 detecting during each scan whether or not each element of the said area includes part of the character representation, producing in response to each said scan either no code or one or more of the following codes in dependence on the shape of the character representation, namely codes respectively representing a START, a FINISH, an OPENING and a CLOSING of the character representation, monitoring the said codes to divide the character representation into segments thereof each of which at least partially embraces a concavity thereof,  
 storing those codes of each segment which relate to convexity-shapes in a part of the storage means which is identified with that segment,  
 storing those codes of each segment which relate to concavity-shapes in a part of the storage means which is identified with that segment and is different from the said part which is identified with the same segment but is for storing those codes relating to convexity-shapes thereof,

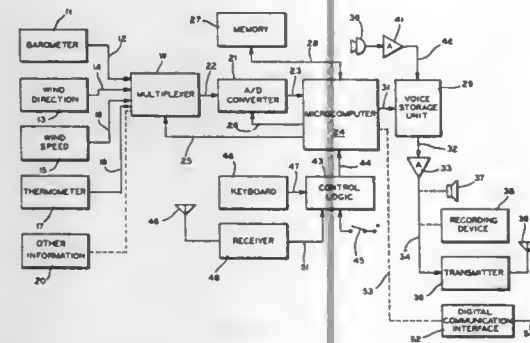


- (b) a main controller means connected to said lock means for controlling the locking and unlocking of said lock means said main controller means including a comparator means said lock means transmitting to said main controller means a normal operation signal upon completion of said locking or unlocking;
- (c) card reader means coupled to said main controller means for reading the data on a card and transmitting said data to said comparator of said main controller means wherein said data is compared to predetermined data; and
- (d) display means coupled to said main controller means wherein when said data from said card reader means is in



agreement with said predetermined data, said main controller means transmits a locking or unlocking drive signal to said lock means, and when said data from said card reader is not in agreement with said predetermined data, said main controller means transmits a first alarm signal to said display means, and wherein when said main controller means receives a normal operation signal from said lock means, said main controller means transmits a confirmation signal to said display means, and when said main controller means does not receive a normal operation signal from said lock means, said main controller means transmits a second alarm signal to said display means.

**4,163,216**  
**SYSTEM FOR TRANSMITTING AIRPORT WEATHER INFORMATION**  
 Roberto Arpino, 4722 Shire Ridge Rd. W., Columbus, Ohio 43220  
 Filed Aug. 29, 1977, Ser. No. 828,304  
 Int. Cl.<sup>2</sup> G01C 21/00; H04Q 9/00  
 U.S. Cl. 340—152 R 16 Claims



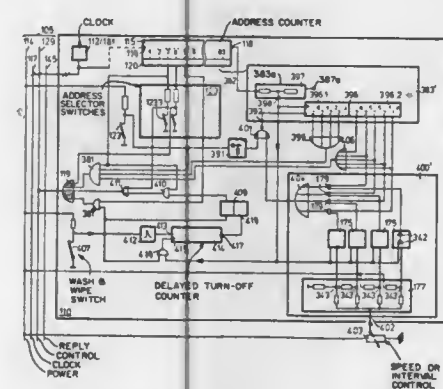
1. A system for transmitting realtime weather and other pertinent information to an airplane having a radio receiver comprising:
- a source of a signal representing instantaneous weather information;
- means responsive to said weather information signal over a predetermined time interval for determining a real-time

weather information value and for generating an address signal representing said real-time weather information value;

means for storing a plurality of signals representing real-time weather information messages, said storage means being responsive to said address signal for generating the one of said plurality of message signals corresponding to said real-time weather information value; and

transmitting means responsive to said one message signal for transmitting said one message signal to the radio receiver whereby said real-time weather information message is audibly reproduced for the pilot.

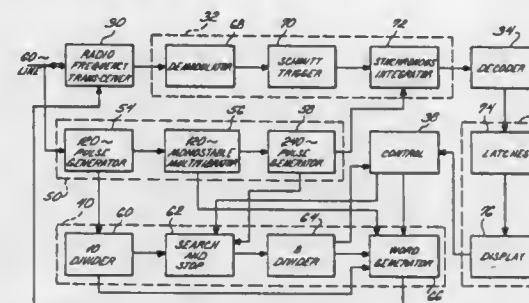
**4,163,217**  
**REMOTE LOAD CONTROL SYSTEM**  
 Jürgen Wesemeyer, Nürnberg, and Georg Haubner, Berg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Nov. 17, 1977, Ser. No. 852,323  
 Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2654026  
 Int. Cl.<sup>2</sup> H04Q 11/04  
 U.S. Cl. 340—167 R 21 Claims



1. Remote control system for selection of at least one periodically or cyclically operating load of a plurality of selectable switchable loads (122) from a central station (110) connected together by a ring bus system (106) wherein the bus system (106) includes a power bus (114), a clock bus (117) and a control bus (129); wherein the central station includes a clock source (112), load address means (123) including selector switches (123.1 . . . ) to select connection of a selected load (122) to the power bus (114), and means (115) providing control signals synchronized with clock pulses from the clock source for addressing loads in accordance with a selection of the load addressing means; and wherein at least one of the loads is a periodically or cyclically operating load (122.1) requiring cyclical intermittent power from said power bus (114), said at least one load (122) including a load control receiver, and a decoding stage (130, 131, 135) forming part of said load control receiver (111) and being connected to both said clock bus (117) and said control bus (129) to decode address command signals on the control bus (129) appearing in synchronism with the clock pulse on the clock bus (117); and wherein, in accordance with the invention, the central station further includes cyclical pulse generation means (112, 382) and coincidence means (381) having its input connected to both said cyclical pulse generation means and the specific selector switch (123.1, 123.1/2, 123') controlling said at least one periodically or cyclically operating load (122.1)

to control connection of said at least one cyclically operating load to the power bus in accordance with the pulses derived from said cyclical pulse generation means.

**4,163,218**  
**ELECTRONIC MULTIPLE DEVICE CONTROL SYSTEM**  
 William I. L. Wu, 44 Little Fox La., Westport, Conn. 06880  
 Filed Sep. 13, 1976, Ser. No. 722,543  
 Int. Cl.<sup>2</sup> H04B 3/54  
 U.S. Cl. 340—310 A 27 Claims



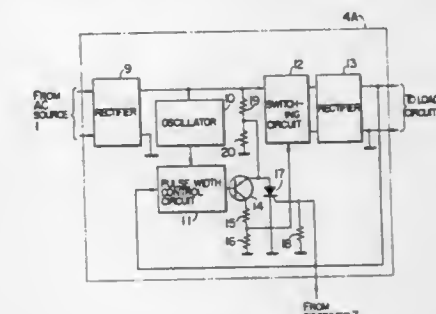
1. An electronic control system for controlling the operation of a plurality of electrical devices which are energized from AC power lines, said control system comprising:
- (a) a single central unit connected to the power lines and including:
- (1) central transceiver means for transmitting an encoded oscillating signal of one frequency onto the power lines;
  - (2) central encoding means for encoding said oscillating signal with an encoded signal in synchronization with the frequency of the AC power for selective control of electrical devices;
  - (3) central control means connected to said encoding means for selecting the electrical device to be controlled and its desired state;
- (b) unitary switch units respectively interconnected between power lines and each electrical device being operative for both local and centralized control of the electrical device with the local control and the centralized control placing the electrical device in respective opposite states from each other, each switch unit including:
- (4) switch transceiver means for receiving the encoded oscillating signal from the power lines;
  - (5) switch decoding means coupled to the switch transceiver means for detecting the encoded signal;
  - (6) switch control means connected to said switch decoding means for setting the selected electrical devices to the desired state, and
  - (7) local control means for selectively locally operating the electrical device independently of the central unit and placing the electrical device in a state opposite from that which it was placed by the central unit.

**4,163,219**  
**REMOTE CONTROL DEVICE FOR ELECTRONIC APPARATUS**  
 Takao Kato; Keizo Shimizu, and Takeshi Maruyama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan  
 Filed Jan. 19, 1978, Ser. No. 870,677  
 Claims priority, application Japan, Feb. 8, 1977, 52-12174; Mar. 9, 1977, 52-24812  
 Int. Cl.<sup>2</sup> H04Q 7/00 6 Claims

- U.S. Cl. 340—310 R
1. A remote control device for the on-off control of power supply comprising:
- a power supply voltage stabilizing circuit including a first rectifying circuit rectifying an ac voltage supplied from an ac power source to provide a non-stabilized dc voltage, a switching circuit chopping said dc voltage, an oscillating circuit generating a pulse signal for driving said switching

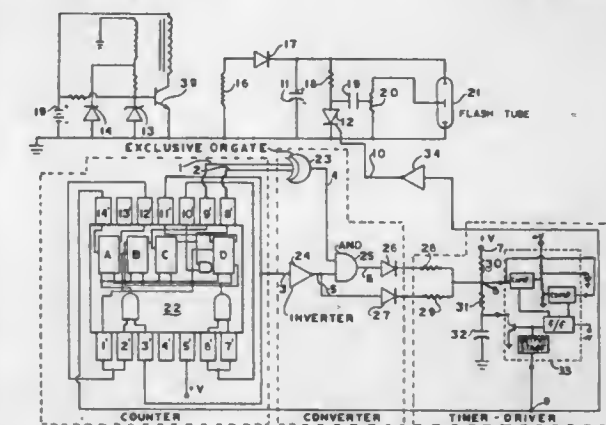
circuit, a second rectifying circuit rectifying and smoothing said chopped dc voltage again to provide a dc output voltage, and a control circuit detecting a fluctuating component in said dc output voltage and controlling said switching circuit so as to remove the fluctuating component;

a load circuit supplied with said dc output voltage of said second rectifying circuit; and



at least one electronic switch means actuated in response to the application of a remote control signal, said at least one electronic switch means being connected with at least one of said switching circuit, said second rectifying circuit, said oscillating circuit and said control circuit for disabling the circuit operation of said circuit.

**4,163,220**  
**DISTRESS SIGNALLING DEVICE**  
 Lee A. Henningsen; John E. Hare, and David J. Amann, all of Erie, Pa., assignors to Firetrol, Inc., Erie, Pa.  
 Filed Apr. 15, 1977, Ser. No. 787,822  
 Int. Cl.<sup>2</sup> G08B 5/38; H05B 41/24, 41/34  
 U.S. Cl. 340—331 6 Claims



1. An apparatus for visual transmission of a coded S.O.S. distress signal through a high energy flash tube comprising:
- a timer and driver circuit capable of producing a timed output signal in response to a charging signal applied to its input, said timer having its output coupled to the flash tube;
- a binary coded decade counter having its input coupled to the output of said timer and driver circuit so as to advance the binary count;
- converter means having its input coupled to the output of said decade counter and its output coupled to the input of said timer and driver circuit, said converter providing a parallel conductive charging path to said timer responsive to the binary output of the decade counter so as to lengthen or shorten the duration between the pulses produced at the output of said timer and driver circuit; and a



high energy flash tube circuit coupled to another output of said timer and driver circuit for energizing the flash tube.

4,163,221

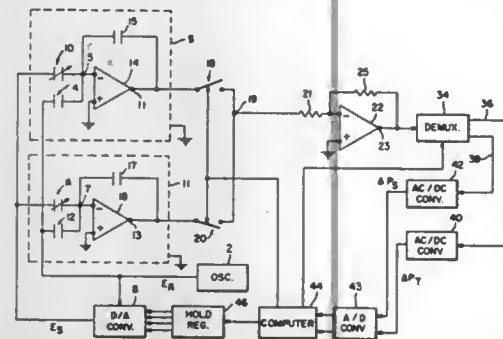
**CAPACITANCE TO DIGITAL CONVERSION SYSTEM**  
Henry R. Kosakowski, Denville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Apr. 17, 1978, Ser. No. 896,951

Int. Cl.<sup>2</sup> H03K 13/02

U.S. Cl. 340—347 AD

4 Claims



1. In a capacitance to digital conversion system wherein a digital representation is provided of the capacitance value of a condition sensing capacitor or the value of the stimulus to which said condition sensing capacitor is exposed, said system including said condition sensing capacitor, a reference capacitor, a feedback capacitor, operational amplifier means, means connecting said condition sensing capacitor and said reference capacitor as input impedances to said operational amplifier means, means connecting said feedback capacitor from the output to the input of said operational amplifier means in inverse feedback relationship, the output of said operational amplifier means constituting an error signal, means for converting said error signal to a digital error signal, means for integrating said digital error signal and storing the result of integration, a source of alternating reference signal, means for varying the amplitude of said reference signal in accordance with said integrated error signal to provide a sensing signal, means applying said reference signal to said reference capacitor, and means applying said sensing signal to said sensing capacitor, said reference signal and said sensing signal being applied to the respective capacitors in inverse phase relationship;

the improvement comprising:

an electrically conductive housing enclosing in a single structure said reference capacitor, said sensing capacitor, said feedback capacitor and said operational amplifier means, said operational amplifier means including an amplifier having inverting and non-inverting inputs; means permanently connecting said reference capacitor, said sensing capacitor and said feedback capacitor to said inverting input of said amplifier; and means connecting said housing and said non-inverting input of said amplifier to a point of common potential.

4,163,222

**SYNCHRONOUS PHASE DETECTED KEYBOARD**  
Donald C. Gove, Manchester, Mass., assignor to Amkey, Incorporated, Andover, Mass.

Continuation of Ser. No. 662,195, Feb. 27, 1976, abandoned.

This application Sep. 29, 1977, Ser. No. 837,653

Int. Cl.<sup>2</sup> G06F 3/02

U.S. Cl. 340—365 S

5 Claims

1. In an electronic data processing entry-system, a synchronous phase detected keyboard, comprising in combination:  
a printed circuit board whose conductors form a matrix of row coordinates and column coordinates, said row and column coordinates not physically intersecting because of

discontinuities in said conductors at each possible intersection point of the matrix;

a plurality of key switch assemblies similarly arranged in a row and column matrix configuration and able to communicate with said printed circuit board, each of said key switch assemblies having an electrically-free floating key switch coupling plate to effect capacitive coupling between a row coordinate and a column coordinate of said printed circuit board at a corresponding possible intersection point of the matrix when said key switch assembly is actuated;

a gating means associated with said row coordinates;

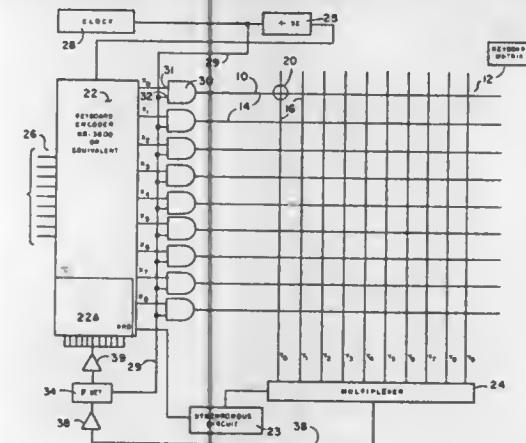
an encoder which sequentially transmits an input signal to said gating means associated with said row coordinates;

a clock means to provide a burst of high frequency pulses which is transmitted to said gating means associated with said row conductors;

said gating means to be turned on by said encoder signal allowing said high frequency pulses to be coupled sequentially into each of the row coordinates;

a reference line which also carries the burst of high frequency pulses generated by said clock means in an alternate path which bypasses the keyboard matrix;

a multiplexer which sequentially addresses each column coordinate of the matrix and receives said burst of high frequency pulses which has been coupled between a particular row coordinate and the column coordinate then



being addressed, due to actuation of the appropriate key switch assembly, said multiplexer then transferring the received burst through a single output channel;

a dividing counter means, driven by said clock means, which simultaneously drives said encoder and said multiplexer;

a single string data transference line which receives and carries the output signal from said multiplexer;

a current amplification means upon said single string data transference line to amplify the multiplexer output signal, a phase detection means upon said single string transference line having comparator terminals to receive from said reference line the high frequency pulses and to mix it with the amplified multiplexer output signal to distinguish false signals and generate a characteristic output voltage pulse at an amplitude proportional to the in-phase portion of the multiplexer output signal;

a thresholding amplifier which transmits and amplifies the characteristic voltage pulse generated by said phase detection means only if it exceeds a predetermined threshold, and a read only memory, integrated with said encoder which is driven by the dividing counter means and synchronized so as to be scanning in the same sequence and at the same rate as the multiplexer, and said memory receives and recognizes the amplified characteristic output voltage pulse from said phase detection means via the thresholding amplifier and generates a unique digital code which identifies to the data processing system the particular key switch assembly which has been actuated.

4,163,223

**BUZZER WITH ELECTRONIC INTEGRATED OSCILLATION CIRCUIT**

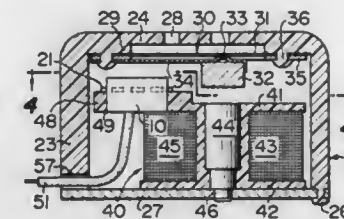
Yukio Sato; Mototaka Harakawa, and Yoshio Mitumori, all of Shizuoka, Japan, assignors to Star Seimitsu Kabushiki Kaisha, Japan

Filed Jan. 23, 1978, Ser. No. 871,403

Claims priority, application Japan, Jan. 21, 1977, 52-6501[U] Int. Cl.<sup>2</sup> G08B 3/00

U.S. Cl. 340—384 R

5 Claims



1. A buzzer comprising a vibration unit; an electromagnet transducer for electromagnetically exciting the vibration unit and including a core which is operatively disposed with respect to the vibration unit, a bobbin fitted on the core and a coil assembly disposed on the bobbin; and electrical components which cooperate with the coil assembly to form an electronic oscillation circuit, the electric components being formed on or in an integrated circuit module which includes terminals for connection of the oscillation circuit with the power source and other terminals for connection of the coil assembly with the oscillation circuit, the module being mounted on the bobbin.

4,163,224

**DISPLAY DEVICE WITH MEMORY**

Katsuya Yasuda, Yokohama, and Akio Adachi, Machida, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

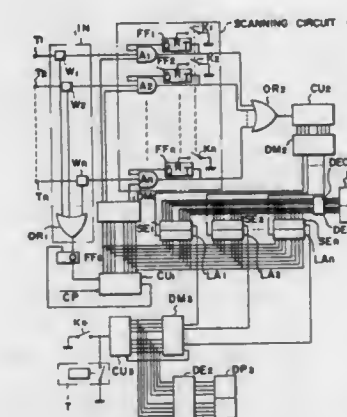
Filed Feb. 25, 1977, Ser. No. 772,338

Claims priority, application Japan, Feb. 27, 1976, 51-020951

Int. Cl.<sup>2</sup> G08B 25/00

U.S. Cl. 340—520

1 Claim



1. A display device with a memory comprising:

a plurality of terminal units, each for measuring a physical parameter and producing a signal when the physical parameter exceeds a predetermined limit;

a first OR means connected to said plurality of terminal units for producing a signal when at least one of said terminal units produces a signal;

a first counting means connected to said first OR means for initiating a counting operation at a predetermined rate when said first OR means produces a signal and for resetting said counting operation when the count reaches the number of said plurality of terminal units;

a plurality of AND means, each having a first input con-

nected to a corresponding one of said plurality of terminal units and second and third inputs, for producing an output when each of said first, second and third inputs receive a signal;

a plurality of flip-flop circuits, each connected to a corresponding one of said plurality of AND means, for applying a signal to said second input of said corresponding AND means after being manually reset and for applying no signal to said second input of said corresponding AND means after said corresponding AND means produces an output, whereby said corresponding AND means is inhibited from producing an output after having once produced an output until said flip-flop circuit is manually reset;

a first decoder means connected to said first counting means and said third inputs of said plurality of AND means, for applying a signal to said third input of the one of said plurality of AND means which corresponds to the count of said first counting means, whereby said AND means produces an output only when the count of said first counting means corresponds to said AND means;

a second OR means connected to said plurality of AND means for producing a signal when one of said plurality of AND means produces a signal;

a second counting means connected to said second OR means for counting the number of times said second OR means produces a signal;

a plurality of memory means, each having a memory storage input means connected to said first counting means, a memory storage output means, a storage enable input and a recall enable input, for storing therein said count of said first counting means upon application of a signal to said storage enable input and for producing a signal corresponding to said number stored therein from said memory storage output means upon application of a signal to said recall enable input;

a second decoder means connected to said second counting means and said plurality of memory means, for applying a signal to said storage enable input of the one of said plurality of memory means corresponding to the count of said second counting means upon the count operation of said second counting means, whereby the count of said first counting means is stored in said memory means corresponding to the count of said second counting means;

a third counting means for counting under manual control and for resetting said counting operation when the count reaches the number of said plurality of terminal units;

a third decoder means connected to said third counting means and said plurality of memory means, for applying a signal to said recall enable input of the one of said plurality of memory means corresponding to said the count of said third counting means;

a first display means connected to said third counting means for producing a display corresponding to the count of said third counting means; and

a second display means connected to said memory storage output means of said plurality of memory means for producing a display corresponding to the number stored in said memory means having said third decoder means applying a signal to said recall enable input thereof.

4,163,225

**MAILBOX SIGNALLING DEVICE**

George W. Engel, 126 Bay View Dr., Toms River, N.J. 08753

Filed Jul. 5, 1977, Ser. No. 812,750

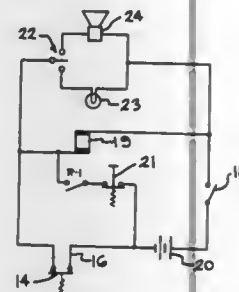
Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 340—569

3 Claims

1. A signalling device for a mailbox having a door, or the like, said device comprising, in combination,  
(a) a biased, normally closed, first electrical switch that is held open by said door when said door is closed,  
(b) a control box located at a position remote from said mailbox,

- (c) control means located within said control box, said control means including,
- (1) signalling means,
  - (2) an "on-off" switch,
  - (3) a normally closed re-set switch,
  - (4) latchable switching means consisting of a normally open switching portion and a current responsive portion for closing said switching portion,
  - (5) a source of electrical energy; and
- (d) electrical circuit means consisting of
- (1) a first loop from said source to said first switch and therefrom to said signalling means and therefrom through said "on-off" switch to said source,



- (2) a second loop from said source to said first switch and therefrom to said current responsive portion of said latchable switching means and therefrom through said "on-off" switch to said source; and
- (3) a hold-in loop having two branches, the first of said branches leading from said source through said re-set switch to one side of said normally open portion of said latchable switching means and from the other side of said normally open portion through said current responsive portion thereof and said "on-off" switch to said source, and the second of said branches leading from said other side of said normally open portion to said signalling means and therefrom through said "on-off" switch to said source.

#### 4,163,226 ALARM CONDITION DETECTING APPARATUS AND METHOD

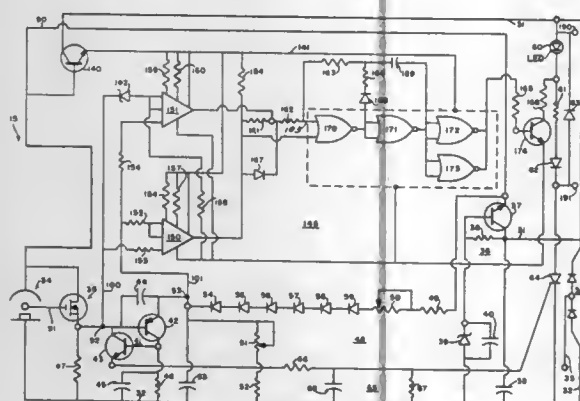
Francis T. Ogawa, Lakewood, Colo., assignor to Statitrol Division Emerson Electric Co., Lakewood, Colo.

Filed Sep. 2, 1977, Ser. No. 830,326

Int. Cl.<sup>2</sup> G08B 17/10

U.S. Cl. 340—629

22 Claims



13. Apparatus for detecting the change of a selected condition from a normal to an alarm level, comprising: a plurality of means for detecting the degree of the selected condition at points throughout a selected zone; control means for supervising each of said condition detecting means, said control means having bus means for sup-

plying operating power to each of said condition detecting means;

means connecting each of said condition detecting means across said bus means as parallel loads, each of said condition detecting means being operable to indicate whether the degree of the selected condition being detected is in a normal range, fault condition or alarm state by changes in its load impedance appearing across said bus means, said control means being operable in response to such changes in the parallel load appearing across said bus means to correspondingly indicate condition normal, fault occurrence or alarm state.

#### 4,163,227 APPARATUS FOR MONITORING ARCING OF BRUSHES IN A DYNAMOELECTRIC MACHINE

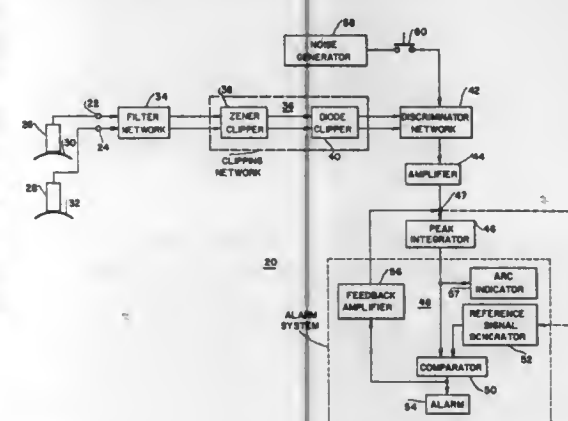
Fred H. Sawada, Scotia; Frank M. Klementowski, Saratoga Springs, and James S. Bishop, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 1, 1978, Ser. No. 901,579

Int. Cl.<sup>2</sup> H02K 11/00

U.S. Cl. 340—662

11 Claims



1. Apparatus for monitoring arcing of brushes in a generator wherein said arcing may be masked by high-amplitude noise spikes produced by solid-state switching devices in the excitation system of said generator, said apparatus comprising: signal receiving means for receiving from a generator brush a composite signal including a brush arcing signal of amplitude S, a noise spike of amplitude N, and a low-frequency signal, said brush arcing signal and said noise spike occurring in the same high-frequency band and having a signal-to-noise ratio, S/N, which may be so low that said noise spike substantially masks said brush arcing signal from accurate detection;
- a filter for removing said low-frequency signal from said composite signal;
- a clipping network for removing from said composite signal all components above a preselected amplitude to provide a clipped signal with S'/N' ratio at least equal to a preselected value, where S' and N' are respectively the amplitude of said brush arcing signal and said noise spike after their passage through said clipping network;
- an amplifier responsive to said filtered and clipped composite signal to produce an amplified signal;
- an integrator connected to said amplifier and operable to produce an integrated signal in response to said amplified signal; and
- an alarm system operable to compare said integrated signal with a reference signal and to produce an alarm signal when said integrated signal exceeds said reference signal.

#### 4,163,228 INFORMATION DISPLAY SYSTEM HAVING DIGITAL LOGIC INTERCONNECTIONS

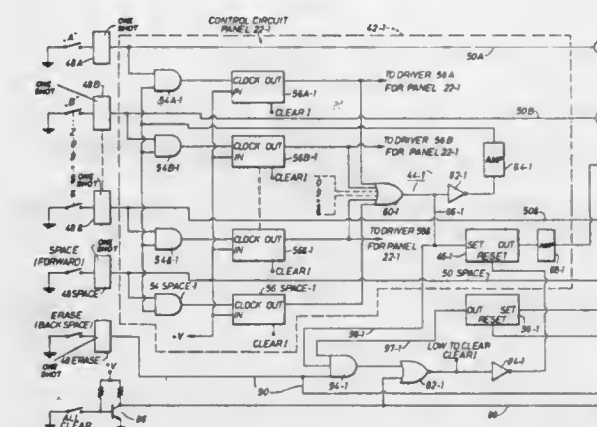
Kambiz M. Sadjadi, 2420 Yorktown St., Apt. 485, Houston, Tex. 77056

Filed Jun. 27, 1977, Ser. No. 810,483

Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 340—711

3 Claims



1. An information display system comprising: a display board having plurality of display panels, each display panel having an array of lamps associated therewith which, when energized, visually transmit information to a viewer;
- a keyboard having a plurality of keys, each key corresponding to an informational character, the actuation of any key generating an actuating signal of a first time duration;
- a control circuit associated with each display panel for energizing that panel in response to an actuating signal, each control circuit being connected to each key such that an actuating signal generated by actuation of any key is applied simultaneously to each control circuit;
- a logic arrangement connected within each control arrangement, each logic circuit being responsive to the energization state of the display panel with which it is associated and to the energization states of the panels next-successive and next-previous thereto;
- each logic arrangement being operative to enable the control circuit to energize its associated panel only upon the conditions that the next-previous panel is energized and the associated panel and the next-successive panel are not energized; and
- a delay circuit connected to each control circuit and to the control circuit of the next-successive panel, each delay circuit being responsive to the energization of the panel with which it is associated to apply to the next-successive panel, after a time delay greater than the first time duration, a signal representative of the energized state of the associated panel.

#### 4,163,229 COMPOSITE SYMBOL DISPLAY APPARATUS

Leslie J. Bodin, Stonybrook, and Francis C. Marino, Dix Hills, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 18, 1978, Ser. No. 870,298

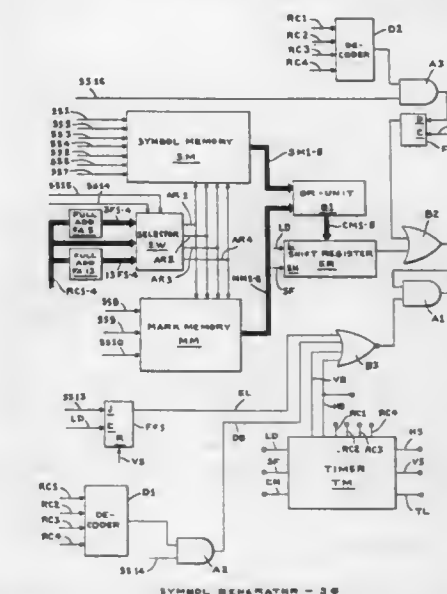
Int. Cl.<sup>2</sup> G06K 15/20

U.S. Cl. 340—745

10 Claims

1. In a display system having a display device wherein each symbol is displayed as a set of rows of indicia, apparatus for transferring the rows of indicia to the display device comprising: a source of groups of coded combinations of signal each representing a symbol to be displayed, each group having a first sub-group actually representing a basic symbol and a second sub-group representing a possible modification of the basic symbol, a first memory means having a plurality of stor-

age locations for storing the sets of rows of indicia representing the basic symbols, a second memory means having a plurality of storage locations for storing sets of rows of indicia representing supplementary marks associated with some of the basic symbols, means for transferring the first sub-group of each group of coded combinations of signals to said first memory



means for selecting for transfer to the display device the rows of indicia of a basic symbol and the second sub-group of each group of coded combinations of signals to said second memory means for selecting for transfer to the display device the rows of indicia of a supplementary mark whereby a modified symbol is displayed in response to the emission of one group of a coded combination of signals by said source.

#### 4,163,230 DISPLAY DEVICE FOR ELECTRONIC TIMEPIECES

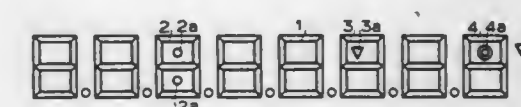
Tsuyoshi Konli, Kawagoe, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 705,258, Jul. 14, 1976. This application Jun. 27, 1977, Ser. No. 810,074

Int. Cl.<sup>2</sup> G09F 9/32

U.S. Cl. 340—765

10 Claims



1. An electro-optical display for use in an electronic timepiece displaying at least a first function and a second function, said display comprising: a plurality of segmented numeric-display elements arranged in a course to display numbers representing information of the first and second functions of the timepiece, at least one compound display element in said course of numeric-display, elements, said compound display element including seven electro-optical display segments having rectangular shapes and positioned in a figure-eight pattern forming two free areas between the segments, said display segments being positioned to display a range of numerals representing information of the first function only of the timepiece upon selective actuation thereof, and an electro-optical signal member having a non-rectangular shape and positioned within one of the two free areas between said electro-optical segments, said member indicating the second function only of the timepiece.



tion until there is a phase difference between the two modes of oscillation.

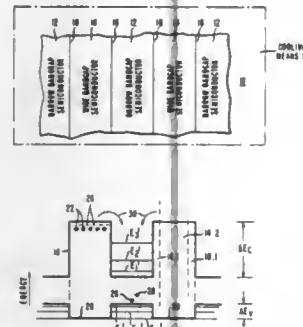
4,163,237

# HIGH MOBILITY MULTILAYERED HETEROJUNCTION DEVICES EMPLOYING MODULATED DOPING

Raymond Dingle, Summit; Arthur C. Gossard, Warren, and Horst L. Störmer, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Apr. 24, 1978, Ser. No. 899,402  
Int. Cl.<sup>2</sup> H01L 29/161

U.S. Cl. 357—16

11 Claims



1. A high mobility semiconductor device comprising: a first plurality of narrow bandgap semiconductor layers, and a second plurality of wide bandgap semiconductor layers interleaved with and contiguous with said first plurality, said wide bandgap and narrow bandgap layers being substantially lattice-matched to one another so as to form substantially defect-free heterojunctions at the interfaces between said layers, said layers having a conduction or valence band step of sufficient magnitude to confine carriers to said narrow bandgap layers, and characterized in that said layers are adapted such that the impurity-concentration-thickness product of said wide bandgap layers exceeds the impurity-concentration-thickness product of said narrow bandgap layers.

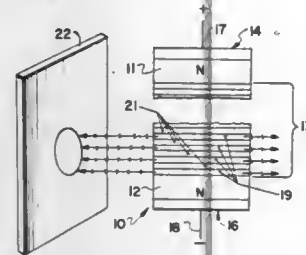
4,163,238

# INFRARED SEMICONDUCTOR DEVICE WITH SUPERLATTICE REGION

Leo Esaki, Chappaqua, and Raphael Tsu, Mt. Kisco, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Jun. 9, 1978, Ser. No. 914,099  
Int. Cl.<sup>2</sup> H01L 33/00

U.S. Cl. 357—17

13 Claims



1. An optical device comprising a superlattice semiconductor element, said semiconductor element including a plurality of alternating barrier and light emitting layers, said light emitting layers each having a pair of allowed states separated by an energy corresponding to a light frequency, means for applying a voltage across said superlattice semiconductor element transverse to said layers, and means for conveying light corresponding to said light frequency to said light emitting layers.

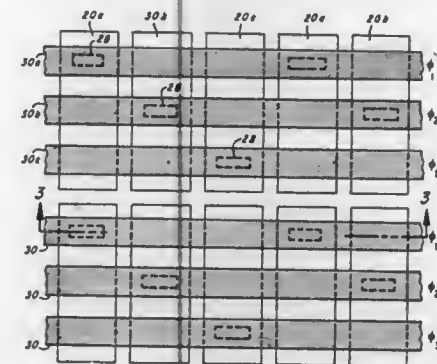
4,163,239

# SECOND LEVEL PHASE LINES FOR CCD LINE IMAGER

David L. Carter, Upper Montclair, N.J., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Continuation of Ser. No. 524,437, Nov. 18, 1974, abandoned, which is a division of Ser. No. 414,484, Nov. 9, 1973, Pat. No. 3,869,572, which is a continuation of Ser. No. 214,365, Dec. 30, 1971, abandoned. This application Jan. 3, 1977, Ser. No. 756,505  
Int. Cl.<sup>2</sup> H01L 27/04, 29/78; G11C 19/28

U.S. Cl. 357—24

5 Claims



1. An optical imager comprising a charge coupled device shift register defining a signal propagation path and including: (a) a semiconductor substrate having a first relatively thin insulating layer over one surface thereof; (b) a first level of conductors defining a plurality of elongated electrodes over said first insulating layer, said electrodes extending transversely of said signal propagation path and in spaced parallel relation with each other along said propagation path, the elongated electrodes included in said first level of conductors being arranged in at least two sets of phase electrodes wherein the respective electrodes included in the sets of phase electrodes are arranged consecutively to define a sequence of successive electrodes from each of the sets of phase electrodes; (c) a second relatively thick insulating layer over said first level of conductors defining a plurality of apertures selectively exposing portions of said elongated electrodes in a predetermined continuing staggered sequence related to the number of sets of phase electrodes; (d) a second level of conductors at a different level than said first level of conductors and defining a plurality of substantially parallel conductive strips overlying said second insulating layer and extending lengthwise of said signal propagation path with each of said plurality of conductive strips transversely overlying substantially all of said electrodes and positioned wholly within the length dimensions of said elongated electrodes, said conductive strips included in said second level of conductors being arranged in the same number of phase sets as the electrodes included in said first level of conductors, each of said conductive strips extending through apertures in said second relatively thick insulating layer and ohmically contacting only electrodes included in the set of phase electrodes to which the respective conductive strip corresponds; and (e) means for selectively applying individual phases of multiphase clocks to respective ones of said conductive strips.

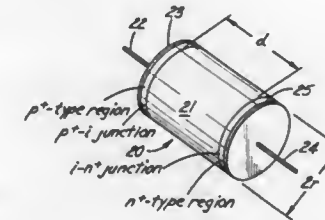
4,163,240

# SENSITIVE SILICON PIN DIODE FAST NEUTRON DOSIMETER

Philip R. Swinehart, Columbus, and John M. Swartz, Westerville, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio  
Filed Mar. 21, 1977, Ser. No. 779,346  
Int. Cl.<sup>2</sup> H01L 27/14

U.S. Cl. 357—29

8 Claims



1. A personnel dosimeter comprising a semiconductor mass wherein said semiconductor mass is silicon diffused with an impurity to provide a p<sup>+</sup>-type junction, a n<sup>+</sup>-type junction, and a high resistivity zone therebetween, having an effective bulk carrier lifetime greater than about 100 microsecs., and said mass is formed to present a structure in which the ratio of its edge area to volume is equal to, or greater than, four times its inverse base width.

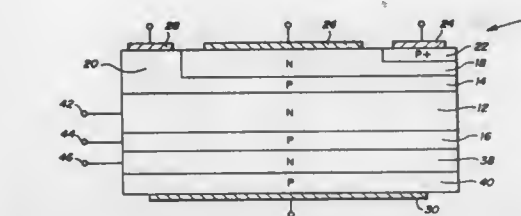
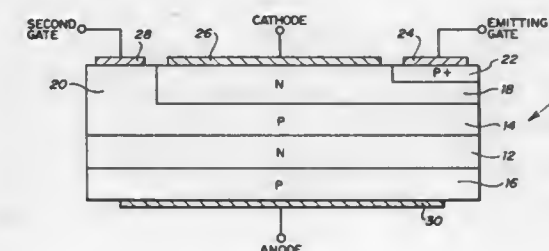
4,163,241

# MULTIPLE EMITTER AND NORMAL GATE SEMICONDUCTOR SWITCH

Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234  
Continuation of Ser. No. 586,741, Jun. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 538,917, Jan. 6, 1975, abandoned. This application Nov. 18, 1977, Ser. No. 852,686  
Int. Cl.<sup>2</sup> H01L 29/74

U.S. Cl. 357—38

6 Claims



1. An emitter gate semiconductor rectifier comprising: a semiconductor body including at least four interleaved layers of alternating opposite first and second semiconductor conductivity types to form a plurality of P-N junctions; said semiconductor body having a first exterior layer of said first semiconductor conductivity type and a second exterior layer of said second semiconductor conductivity type; an emitting gate region of said first semiconductor conductivity type formed in said second exterior layer of said semiconductor body;

a first gate electrode contacting said emitting gate region to provide switching control of said rectifier; an anode electrode contacting said first exterior layer of said semiconductor body; a cathode electrode contacting said second exterior layer of said semiconductor body; and a second gate electrode contacting an intermediate layer of said semiconductor body having said first semiconductor conductivity type, said intermediate layer extending through a portion of said second exterior layer and said second gate electrode lying adjacent said cathode electrode but which is electrically and spatially isolated from said emitting gate region.

4,163,242

# MOS STORAGE INTEGRATED CIRCUIT USING INDIVIDUAL FET ELEMENTS

Karl-Ulrich Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

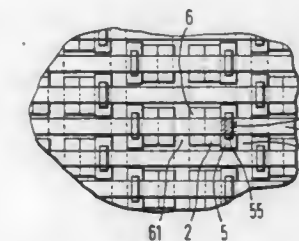
Continuation of Ser. No. 414,215, Nov. 9, 1973, abandoned. This application May 16, 1977, Ser. No. 797,339

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1972, 2255529

Int. Cl.<sup>2</sup> H01L 27/10

U.S. Cl. 357—41

1 Claim



1. An integrated circuit comprising a semiconductor substrate and a plurality of one-transistor storage cells supported on said substrate, each of said storage cells having an individual field effect transistor and a capacitor connected in series therewith, said field effect transistors being formed in a single plane by a plurality of spaced pairs of diffusion zones in a surface of said substrate, said substrate forming a channel zone between each of said pairs of diffusion zones, a first diffusion zone of each of said pairs being formed as a common diffusion zone shared with a plurality of said field effect transistors, said integrated circuit including a first electrically insulating layer superposed on said surface of said substrate, a first electrically conducting coating superposed on said insulating layer between the two diffusion zones of each pair of said zones to form a gate electrode of a field effect transistor, a second electrically conductive coating superposed on said insulating layer to form an electrode of a capacitor connected in series with each field effect transistor, said first and second conductive coatings being disposed in a single conductor plane, a second insulating layer superposed on said first and second conducting layers and having a plurality of recesses aligned with a portion of each gate electrode, whereby each of said recesses is disposed at least partially above a channel zone of a transistor of a one-transistor storage cell, and a third electrically conductive layer in the form of a strip superposed on said second insulating layer for establishing electrical contact through said recesses, with the gate electrodes of a plurality of field effect transistors located partially under said strip, said first diffusion zones being disposed in said substrate in a plurality of elongate, spaced apart parallel zones each defining a column of said transistors, said strips being disposed in a plurality of elongate, spaced apart parallel strips transverse to said first diffusion zones each defining a row of said transistors, the transistors in each said row being arranged in back-to-back relationship in pairs, with the transistors of each pair being



located between and connected to adjacent ones of said first diffusion zones, and being separated in a direction transverse to said rows, by adjacent ones of said strips from others of said pairs.

#### 4,163,243 ONE-TRANSISTOR MEMORY CELL WITH ENHANCED CAPACITANCE

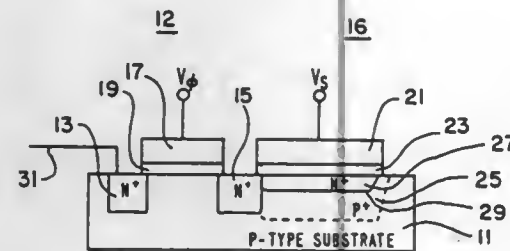
Theodore I. Kamins, Mt. View, and Charles G. Sodini, San Francisco, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 30, 1977, Ser. No. 838,199

Int. Cl.<sup>2</sup> H01L 27/04; G11C 11/24

U.S. Cl. 357—41

3 Claims



1. A semiconductor memory cell comprising: a substrate of a semiconductor material of a first conductivity type; an insulating layer on a portion of said substrate; an electrically conducting gate on said insulating layer having a voltage applied thereto with respect to said substrate to create a depletion layer at the surface of said substrate in which charges can be stored; an enhanced region of said first conductivity type but of higher conductivity than said substrate under said electrically conducting gate and extending from said insulating layer into said substrate, said depletion layer and any charges stored therein lying substantially wholly within said enhanced region; gating means for introducing charge into said cell to represent a logical state and allowing sensing of charge in said cell to indicate a logical state represented by charge stored in said cell.

#### 4,163,244 SYMMETRICAL INTEGRATED INJECTION LOGIC CIRCUIT

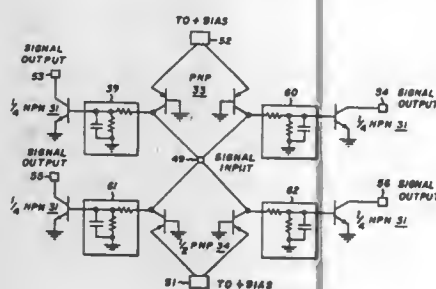
Louis J. Ragonese, and Neng-Tze Yang, both of Liverpool, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,375

Int. Cl.<sup>2</sup> H01L 27/04

U.S. Cl. 357—44

13 Claims



1. In a monolithic integrated injection logic circuit, the combination comprising:

(a) at least a first, second, and third vertical transistor means formed on a substrate, each comprising:

- (1) a first emitter region of a first polarity material,
- (2) a first base region of a second polarity material lying above and next to said first emitter region to form an input junction,
- (3) a plurality of separate first collector regions of a material of said first polarity, disposed on top of and horizontally bounded by a continuation of the material of which said first base region is formed so as to form a plurality of separate output junction regions and a like plurality of incremental vertical transistors localized under said collector regions, said first collector regions being arranged at substantially equal horizontal distances from a first center of symmetry, and
- (4) a base contact applied to said base region near said center of symmetry for matched collector current response to base control, and

(b) complementary transistor means formed on said substrate for injecting base current into said vertical transistor means in substantially equal paths to each incremental vertical transistor, comprising:

- (1) a second emitter region of a material of said second polarity,
- (2) a second base region of a material of said first polarity next to said second emitter region to form at least one input junction,
- (3) a second collector region of a material of said second polarity next to said second base region to form at least one injector output junction and formed as a continuation of the material of which said first base region is formed for base current injection to said vertical transistor means, and
- (c) means connecting a first collector region of each of said first and second vertical transistor means to the first base region of said third vertical transistor means.

#### 4,163,245 INTEGRATED CIRCUIT DEVICE

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

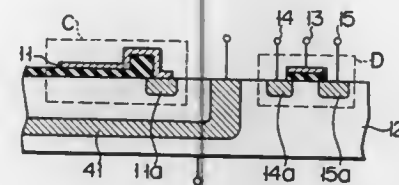
Filed Dec. 23, 1976, Ser. No. 753,814

Claims priority, application Japan, Dec. 26, 1975, 50-156621

Int. Cl.<sup>2</sup> H01L 27/02

U.S. Cl. 357—51

6 Claims



1. An integrated circuit device comprising at least one capacitive circuit element, at least one MOS active circuit element having at least one p-n junction, both elements being formed on a semiconductor substrate of one conductivity type and a carrier absorption region of an opposite conductivity type to that of said semiconductor substrate formed in said semiconductor substrate between said capacitive element and said MOS active element, said absorption region being impressed with the highest absolute level of voltage among those impressed on said circuit elements included in said integrated circuit device to catch minority carriers injected from said MOS active circuit element into said semiconductor substrate.

#### 4,163,246 SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE EMPLOYING A POLYCRYSTALLINE SILICON AS A WIRING LAYER

Kunio Aomura, and Kenji Okada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

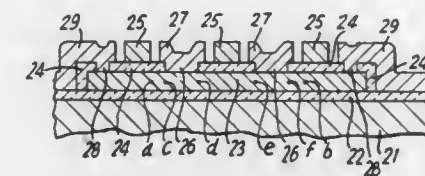
Filed Feb. 2, 1978, Ser. No. 874,551

Claims priority, application Japan, Feb. 7, 1977, 52-12760

Int. Cl.<sup>2</sup> H01L 23/48

U.S. Cl. 357—68

13 Claims



1. A semiconductor device comprising a semiconductor substrate, an insulating film formed on a major surface of said semiconductor substrate; a first wiring structure including an elongated silicon layer formed on said insulating film, first and second electrical connections respectively made to a first and a second portion of said silicon layer, and at least one metallic layer electrically coupled to a third portion of said silicon layer between said first and second portions; and a second wiring structure including a conductive layer running over and isolated from a fourth portion of said silicon layer between said first and second portions, said conductive layer of said second wiring structure being isolated from said metallic layer of said first wiring structure, and said fourth portion being positioned between said third portion and one of said first and second portions.

#### 4,163,247 COLOR TELEVISION CAMERA WITH TIME MULTIPLEXING OF LUMINANCE AND CHROMINANCE INFORMATION

Gerd Bock, Brunswick; Gerd Grand, Braunschweig-Watenbutel, and Andreas Ilmer, Brunswick; all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

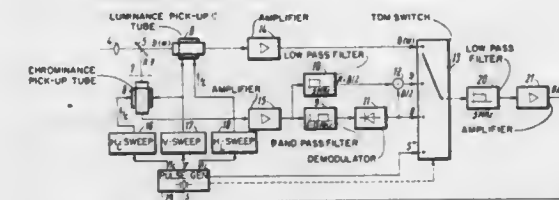
Filed Apr. 29, 1977, Ser. No. 792,260

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619027

Int. Cl.<sup>2</sup> H04N 9/04

U.S. Cl. 358—12

5 Claims



1. A color television camera comprising means for splitting incident light into luminance and chrominance components, separate luminance and chrominance opto-electric transducer means arranged to receive on light sensitive surfaces thereof focussed images of the luminance and chrominance components respectively of the incident light, respective means for effecting line-by-line scanning of the light sensitive surfaces of the luminance and chrominance transducer means to produce electrical signals bearing luminance and chrominance information respectively, the scanning means for the chrominance transducer means being adapted to effect line scanning of the chrominance component during the line blanking intervals of the scanning means for the luminance component, and means for interleaving by time division multiplex electrical signals

derived from the luminance and chrominance transducer means.

#### 4,163,248 FIELD SEQUENTIAL TRANSMISSION OF LUMINANCE AND CHROMINANCE INFORMATION

Jürgen Heltmann, Seebach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

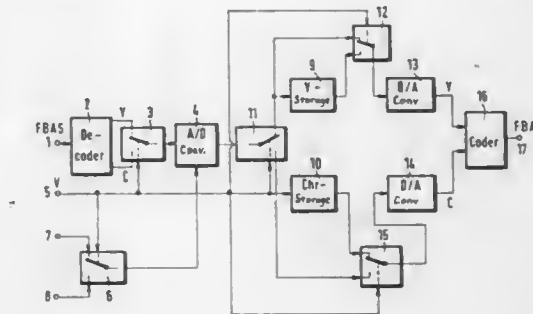
Filed Oct. 3, 1977, Ser. No. 839,111

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 2644706

Int. Cl.<sup>2</sup> H04N 9/02, 9/40

U.S. Cl. 358—12

20 Claims



1. In a method of transmitting a color T.V. signal from a receiver into a recorder, from a transmitter to a receiver, from a color T.V. camera into a transmitter, or the like, the step of transmitting the luminance component and the chrominance component of the color T.V. signal alternately and during different respective field-periods of the T.V. signal.

#### 4,163,249 PICTURE PROCESSING SYSTEM FOR TELEVISION

Peter C. Michael, Newbury; Richard J. Taylor, Barnes, and Martin R. Trump, Newbury, all of England, assignors to Micro Consultants Limited, Berkshire, England

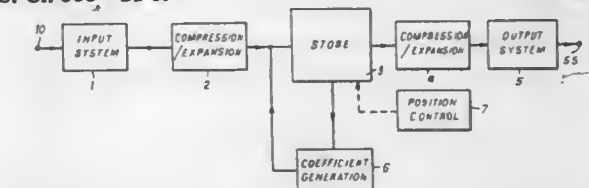
Filed Oct. 12, 1977, Ser. No. 841,519

Claims priority, application United Kingdom, Oct. 14, 1976, 42751/76; Jul. 26, 1977, 31355/77; Jul. 26, 1977, 31356/77; Jul. 26, 1977, 31357/77; Jul. 26, 1977, 31358/77; Jul. 29, 1977, 31996/77

Int. Cl.<sup>2</sup> H04N 9/535

U.S. Cl. 358—21 R

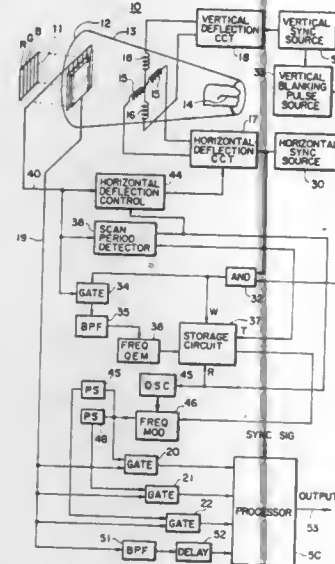
21 Claims



1. A T.V. picture processing system comprising: (a) input means for receiving T.V. picture information; (b) input processing means for modifying the size of the picture from information received from said input means; (c) storage means for storing the input processed picture information; (d) co-efficient generator means connected to said store for providing modification of incoming data to said store in dependence on the co-efficient generated and on data stored in said store; (e) output processing means for modifying the size of the picture from information received from said storage means; and (f) output means for receiving the information from said output processing means.

**4,163,250**  
**INDEX TUBE COLOR TELEVISION SYSTEM WITH DEFLECTION RATE ERROR CORRECTION**  
 Kaoru Tomii, and Yoshihiro Hosokawa, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

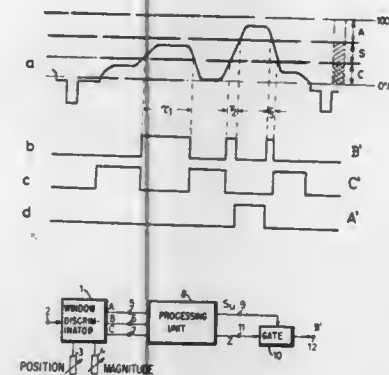
Filed Dec. 16, 1977, Ser. No. 861,428  
 Claims priority, application Japan, Dec. 17, 1976, 51/152520  
 Int. Cl.<sup>2</sup> H04N 9/07, 9/24  
 U.S. Cl. 358—45



1. A color television system, comprising:  
 a surface having an image area on which an image is formed; periodically repetitive groups of vertically oriented color stripes located on said image area;  
 a plurality of electron impingement sensors located in a single horizontal row on said surface adjacent to but outside said image area and positionally associated with said color stripes;  
 a vertically oriented electron impingement sensing stripe located on said surface adjacent to but outside said image area;  
 means for producing an electron beam;  
 deflection means for causing said electron beam to scan said surface horizontally along a plurality of line paths to form successive rasters on said surface, thereby resulting in the generation of a first index signal produced in response to the impingement of said beam upon said plurality of sensors at the start of the formation of each raster, and a second index signal produced in response to the impingement of said beam upon said sensing stripe at the start of each horizontal line scan;  
 pulse repetition rate-to-voltage conversion means for converting the first index signal into a voltage signal representative of the instantaneous pulse repetition rate of the first index signal and thereby of the instantaneous sweep speed of the electron beam;  
 storage means including a plurality of storage locations; and storage device control means for writing said voltage signal into said storage locations of said storage means at the start of each raster scan and retrieving the stored signal at intervals in response to said second index signal.

**4,163,251**  
**APPARATUS FOR THE AMPLITUDE DISCRIMINATION OF A VIDEO SIGNAL**  
 Gerhard R. Kamin, Traisa, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Mar. 17, 1978, Ser. No. 887,835  
 Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711611  
 Int. Cl.<sup>2</sup> H04N 7/18, 5/14  
 U.S. Cl. 358—107

7 Claims

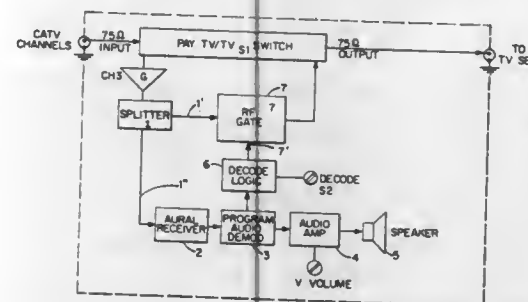


1. In an apparatus for the amplitude discrimination of a video signal of the kind in which the video signal is applied to a window discriminator which is adapted to deliver a first binary signal during periods when the amplitude of the video signal lies in a predetermined sub-range of the total amplitude range of the video signal, the improvement comprising means for producing a second binary signal during periods when the amplitude of the video signal lies below the said amplitude sub-range and a third binary signal when the amplitude of the video signal lies above the said amplitude sub-range, means for storing the binary signals, means for analysing the stored signals two-dimensionally in accordance with a predetermined criterion to determine whether the first binary signal at any instant corresponds to an edge transition between a picture area whose video signal amplitude lies above the said sub-range and a picture area whose video signal amplitude lies below the said sub-range, and means for suppressing the first binary signal when such criterion is fulfilled.

**4,163,252**  
**SUBSCRIPTION TELEVISION DECODER APPARATUS**  
 Kantil Mistry, Old Bridge, and Martin Sperber, Cranford, both of N.J., assignors to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Nov. 3, 1976, Ser. No. 738,621  
 Int. Cl.<sup>2</sup> H04N 7/16  
 U.S. Cl. 358—118

5 Claims

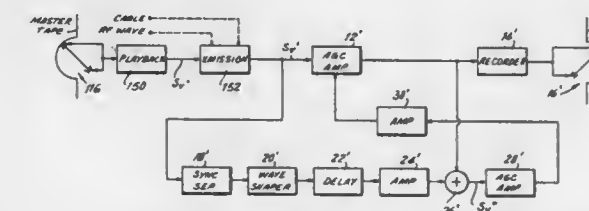


1. In a scrambled-and-encoded television signal decoding and unscrambling apparatus for use with television radio-frequency signals that comprise an encoded aural signal comprising audio-program and pilot tone signals and a scrambled video

signal including a repetitive modulation of scan synchronizing signals that has attenuated the same to substantially blanking level, but without affecting and altering the video signal information, with the rate of such blanking adjusted to a value that produces psychological discomfort to a viewer of the resulting shifting television picture on a normal receiver; apparatus having, in combination, means for receiving said television signals; switching means operable in one position to apply said signals along a direct path to a television receiving set and in another position to apply said signals through a decoding and unscrambling path to said set; said decoding and unscrambling path comprising means for splitting the received signals into first and second parts; means for feeding only the first part of the received signals, including the video signal information, but excluding said second part, to radio-frequency gated amplifier means; means for feeding only the second part to aural receiver means including audio demodulating means for recovering the audio program signal and the pilot tone signal, and without passing the second part through said gated amplifier means; decoding logic means responsive to the recovered pilot tone signal and connected between said audio demodulating means and said amplifier means to control the amplifier means to restore the synchronizing signals to normal level and thus stop the repetitive television picture shifting in accordance with the said pilot tone signal recovery, thus restoring the scan synchronizing signals to the video signal; means for amplifying and reproducing the decoded program audio signal output of said audio demodulating means; and means for applying the synchronizing signal-restored video signal output of said radio-frequency gated amplifier means to said television receiving set.

**4,163,253**  
**METHOD OF AND APPARATUS FOR MODIFYING A VIDEO SIGNAL TO PREVENT UNAUTHORIZED RECORDING AND REPRODUCTION THEREOF**  
 Minoru Morio, and Masahiro Kambara, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed Mar. 22, 1977, Ser. No. 780,242  
 Claims priority, application Japan, Mar. 23, 1976, 51-31592  
 Int. Cl.<sup>2</sup> H04N 7/16  
 U.S. Cl. 358—120

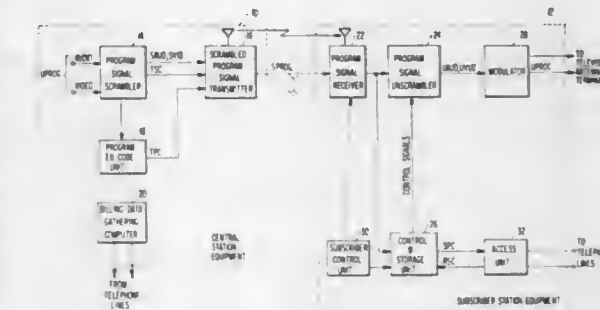
20 Claims



1. A method of providing an anti-piracy video signal of the type having horizontal line intervals defined between periodic horizontal blanking intervals such that the anti-piracy video signal will produce a video picture on a standard video display device but will prevent reproducing of an unauthorized recording of such signal by means of a video recorder having an automatic gain control circuit responsive to predetermined portions of the video signal in said horizontal blanking intervals; said method comprising the steps of generating pulse signals each having an amplitude which is sufficient to cause overcompensation of said automatic gain control circuit when made effective on the latter at the same time as one of said predetermined portions of the video signal, and inserting said generated pulse signals into respective horizontal blanking intervals of said video signal at fixed locations relative to said predetermined portions of the video signal such that, on unauthorized recording of the resulting anti-piracy video signal by said video recorder, said overcompensation of the automatic gain control circuit occurs and the resulting recorded video signal is excessively attenuated.

**4,163,254**  
**METHOD AND SYSTEM FOR SUBSCRIPTION TELEVISION BILLING AND ACCESS**  
 Robert S. Block, 8620 N. Pelham Pkwy., Milwaukee, Wis. 53217, and John R. Martin, 3129 W. Mill Rd., Milwaukee, Wis. 53209  
 Filed Feb. 14, 1977, Ser. No. 768,404  
 Int. Cl.<sup>2</sup> H04N 7/16, 7/00  
 U.S. Cl. 358—122

14 Claims



1. A billing system for obtaining billing information regarding programs actually viewed by a subscriber of a pay television system comprising:  
 means for transmitting at a predetermined carrier frequency a scrambled television program signal containing a block of television program material and an identification code unique to the block of program material being transmitted;  
 means at a subscriber station for selectively receiving the transmitted program signal and for selectively unscrambling the program signal to permit viewing of the block of program material being transmitted in response to subscriber action indicating acceptance for viewing of the block of program material;  
 means for detecting the identification code in the program signal received at the subscriber station and for temporarily storing a program identification code for subsequent transmission as an electrical signal in response to the detected identification code and to the subscriber action indicating acceptance for viewing of the block of program material; and  
 means connected to said detecting and storing means for selectively accessing the program identification code stored at the subscriber station on other than a real time basis and for transmitting the stored program identification signal to a remote location in response to a command signal received from the remote location to thereby provide billing information at the remote location as to programs actually viewed by the subscriber.

**4,163,255**  
**BILLING METHOD AND SYSTEM FOR A SUBSCRIBER OF A PAY TELEVISION SYSTEM**  
 H. George Pires, Parlin, N.J., assignor to Teleglobe Pay-TV System, Inc., Rego Park, N.Y.  
 Continuation of Ser. No. 737,856, Nov. 1, 1976, Pat. No. 4,115,807, which is a continuation-in-part of Ser. No. 706,929, Jul. 19, 1976, Pat. No. 4,068,264. This application Jun. 15, 1978, Ser. No. 915,935  
 Int. Cl.<sup>2</sup> H04N 7/16  
 U.S. Cl. 358—122

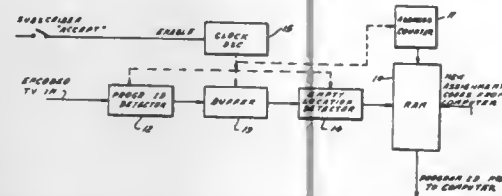
8 Claims

1. In a pay television system furnishing television programs to a plurality of subscribers each having receiving-decoding means for receiving encoded television signals and furnishing corresponding decoded television signals, each of said receiving-decoding means having decoder storage means having a plurality of decoder storage locations including a first set of decoder storage locations for storing billing data indicative of charges to be billed to said subscriber and a second set of decoder storage locations for storing a subscriber identification



number, said pay television system having central computing means for computing the charge to each of said subscribers in response to billing signals applied thereto, said central computing means having computer storage means having a plurality of computer storage locations:

- a billing method of one of said subscribers, comprising, in combination, the steps of:
- at said receiving-decoding means: generating billing signals and subscriber identification signals, corresponding, respectively to said billing data and said subscriber identification number; and transmitting said billing and subscriber identification signals to said central computing means in a first predetermined sequence;
- at said central computing means: receiving said billing and subscriber identification signals and storing corresponding billing data; furnishing an arbitrary start point number signifying a predetermined bit in said billing data in said first predetermined sequence in response to said subscriber identification signals; transmitting billing signals starting



at said arbitrary start point and said subscriber identification signals back to said receiving-decoding means in a second sequence having a predetermined relationship to said first sequence, whereby only selected ones of said billing signals determined in accordance with said arbitrary start point number are transmitted back to said receiving-decoding means; and transmitting confusion signals in place of the remaining one of said billing signals;

at said receiving-decoding means: reading-out data from said decoder storage locations starting at said arbitrary start point number in said second predetermined sequence, thereby furnishing read-out signals; receiving said billing and customer identification signals transmitted by said central computing means and furnishing corresponding decoder-received signals; comparing said read-out signals to said decoder-received signals; and erasing said billing data stored in said first set of decoder storage locations only upon correspondence between said read-out signals and said decoder received signals, thereby clearing said first set of decoder storage locations for new billing data.

4,163,256

## ELECTRONIC PHOTOGRAPHY SYSTEM

Willis A. Adcock, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 736,975, Oct. 29, 1976, Pat. No. 4,057,830, which is a continuation of Ser. No. 543,106, Jan. 22, 1975, abandoned, which is a continuation of Ser. No. 460,396, Apr. 12, 1974, abandoned, which is a continuation of Ser. No. 266,826, Jun. 27, 1972, abandoned. This application Jun. 23, 1977, Ser. No. 809,258

The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H04N 5/78, 7/18

U.S. Cl. 358—127

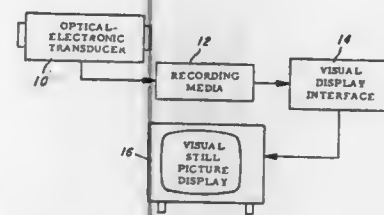
2 Claims

1. An electronic still picture photography system comprising:

- (a) an electronic camera including:
- (i) an optical electronic image transducer device having storage capability for storing data representing an optical image;
- (ii) a scanning means for scanning said image transducer to read said data; and
- (iii) a momentary actuation means;
- (b) a recording apparatus for recording said data received

from said electronic camera on a selected portion of a recording medium;

- (c) means coupling said momentary actuation means to said recorder apparatus for controlling said recorder to record data representing a different single optical image on each such selected portion of said recording medium in response to each different actuation;



- (d) a playback apparatus for reading, one at a time, selected ones of said single optical images from said recording medium, said playback apparatus including means for generating a video signal to play back said selected ones of said optical images on a television receiver-type display device.

4,163,257

## SPATIAL TONER FOR IMAGE RECONSTITUTION

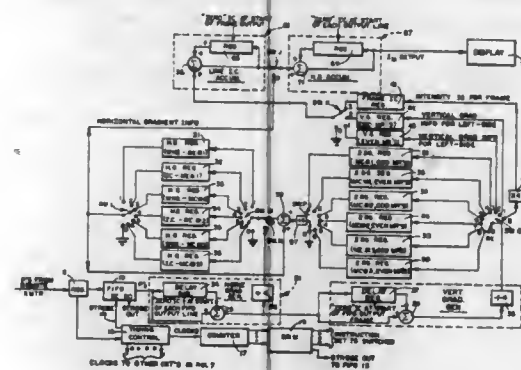
Stanley A. White, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1977, Ser. No. 864,962

Int. Cl.<sup>2</sup> H04N 7/12

U.S. Cl. 358—133

6 Claims



1. An apparatus for reconstituting picture point intensity signals representative of a video image from a sequence of two-dimensional, data-compacted, received pixels, said apparatus comprising:

- means for utilizing the first one of the sequence of received data-compacted pixels to develop the initial intensity of the first one of a plurality of horizontal lines in a reconstituted picture;
- means for selectively generating horizontal and vertical gradient information as a function of the received pixels; means selectively responsive to the initial intensity of any given horizontal line in the reconstituted picture and to associated vertical gradient information for developing by a first interpolation the initial intensity for the following horizontal line; and
- means selectively responsive to the initial intensity of said given horizontal line and to the horizontal gradient information associated with said given horizontal line for computing a sequence of picture point intensity signals along said given horizontal line by second interpolations.

4,163,258

## NOISE REDUCTION SYSTEM

Norio Ebihara, and Kaichi Tatsuzawa, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

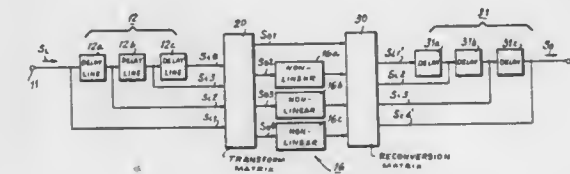
Filed Dec. 21, 1976, Ser. No. 753,081

Claims priority, application Japan, Dec. 26, 1975, 50-157206

Int. Cl.<sup>2</sup> H04N 5/21, 7/04; H04B 1/10; G01T 1/16

U.S. Cl. 358—167

24 Claims



1. A method of reducing the noise of an input signal having components present in a give frequency spectrum, comprising the steps of deriving an orthogonal transform of said input signal, said orthogonal transform having n transformed signal components representing different respective portions of the frequency spectrum of said input signal; suppressing those transformed signal components, other than the transformed signal component representing the lower portion of said frequency spectrum, whose signal levels are less than a threshold level; and reconverting said n transformed signal components, less said suppressed components, substantially into said input signal.

4,163,259

## WINDOWED TUNING SYSTEM WITH SYNCHRONOUS DETECTOR

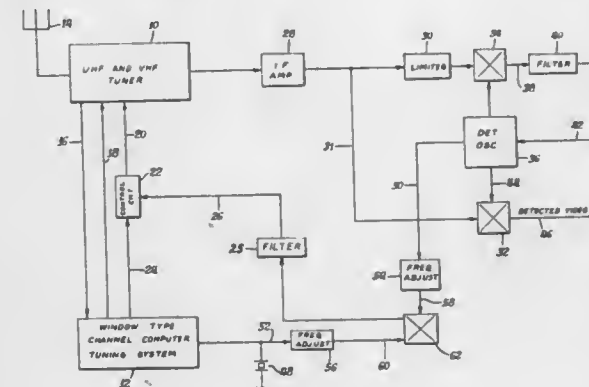
Peter C. Skerlos, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 14, 1977, Ser. No. 860,505

Int. Cl.<sup>2</sup> H04N 5/44, 5/50

U.S. Cl. 358—191

9 Claims



1. In a television receiver having a tuner for tuning the receiver to a restricted frequency "window" about the nominal carrier frequency of a desired channel; a combined video detection and automatic frequency control system for detecting the video components of an intermediate frequency signal derived from the carrier frequency and for locking the tuner to the carrier frequency of a received television signal, comprising:

- a synchronous detector receiving the intermediate frequency signal for demodulating the video components thereof, said synchronous detector including a detector oscillator electronically tunable to a predetermined nominal frequency of intermediate frequency signal;
- a fixed frequency reference oscillator;
- control means receiving the output of said detector oscillator and the output of said reference oscillator for developing a control signal representative of the deviation of the

detector oscillator frequency from the nominal frequency of the intermediate frequency signal; and

means for coupling the control signal to the tuner for locking the tuner to the frequency of the received carrier signal.

4,163,260

## SYSTEM FOR REDUCING BAND WIDTH OF IMAGE SIGNAL

Nobuyoshi Hisao, Neyagawa, and Takeshi Agui, Yokohama, both of Japan, assignors to Mita Industrial Company, Osaka, Japan

Continuation-in-part of Ser. No. 760,312, Jan. 18, 1977,

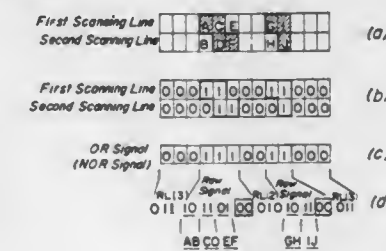
abandoned. This application Jan. 9, 1978, Ser. No. 867,868

Claims priority, application Japan, Jan. 24, 1976, 51/6876

Int. Cl.<sup>2</sup> H04N 1/00

U.S. Cl. 358—261

6 Claims



1. A system for reducing or compressing the band-width of image signals comprising circuit means for logically summing bit signals of picture elements in the same position on at least two scanning lines to form an 0-section and a 1-section, and circuit means for coding by a run length code said 0- and 1-sections for transmission.

4,163,261

## OVERLAP RECORDING DEVICE FOR SOUND CINECAMERA

Isami Ito, Suwa, Japan, assignor to Chicon Industries Incorporated, Suwa, Japan

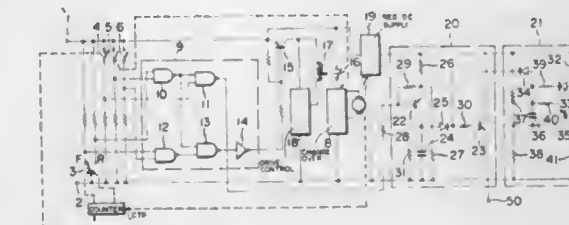
Filed Aug. 29, 1977, Ser. No. 828,770

Claims priority, application Japan, Nov. 11, 1976, 52-135556

Int. Cl.<sup>2</sup> G11B 27/02

U.S. Cl. 360—13

8 Claims



1. An overlap recording device for a sound cinecamera provided with a reversible, film feeding motor and an electric circuit for sound recording, said electric circuit having means for supplying a recording signal to be recorded and an AC recording bias current for erasing sounds previously recorded, said overlap recording device comprising:

- operating means actuable for reversing and restoring forward motion of said motor, as well as for generating an instruction signal;
- a controlling signal generating circuit means responsive to said instruction signal for (1) generating a sound record controlling signal during the time of film reverse-winding for overlap recording, and for (2) changing said controlling signal according to a predetermined time constant at the time of restarting forward film feeding by said film feeding motor;
- a sound recording signal control circuit means responsive to

said changing of said controlling signal for raising the level of said recording signal in said sound recording circuit in correspondence thereto;

AC bias control circuit means simultaneously responsive to said changing of said controlling signal for raising the level of said AC recording bias current to said sound recording circuit and correspondingly the erasing effect on a previously recorded sound, in correspondence thereto;

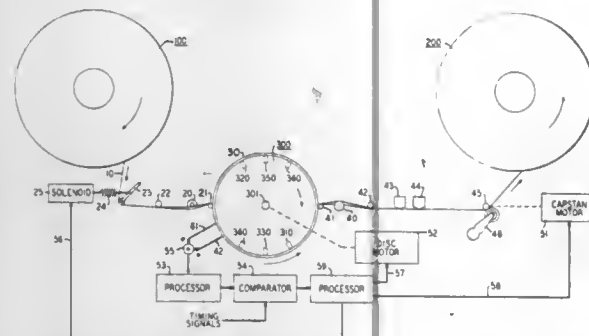
whereby fade-in recording of a sound is accompanied by simultaneous fade-out erasing of a prior recorded sound, both in response to said control signal.

#### 4,163,262 HELICAL VIDEO TAPE RECORDER ARRANGEMENT SUITABLE FOR HIGH QUALITY EDITING

Harry Kaemmerer, Franklin Township, Somerset County, N.J., assignor to Americal Telephone and Telegraph, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,063  
Int. Cl.<sup>2</sup> H04N 5/795; G11B 27/02, 21/04, 5/52  
U.S. Cl. 360-14

6 Claims



1. An editing system for a helical video tape recorder having a supply and take-up arrangement for video tape capable of storing video and synchronization information on parallel diagonal tracks thereon, a rotating and slotted drum over whose surface video tape from such supply and take-up arrangement moves in its direction of rotation and within whose slot a counter-rotating disc provides support for transducer heads in contact with tape passing on the surface of such drum comprising:

at least one record-reproduce transducer head mounted on said disc for alternative recording or sensing of video information on said moving tape;

at least one synchronization-sensing transducer head mounted on said disc in advance with respect to the direction of rotation thereof of said record-reproduce transducer head for responding to synchronization information on said moving tape, and

at least one erasing transducer head mounted on said disc intermediate of said record-reproduce and synchronization-sensing heads for erasing video information to be edited out without destroying synchronization information.

#### 4,163,263 METHOD AND APPARATUS FOR TAPE RECORDING TIME-SPACED SEGMENTS OF VIDEO INFORMATION FROM A VIDEO CAMERA

Gerhard Rotter, Mission Viejo, Calif., assignor to Basf Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,456  
Int. Cl.<sup>2</sup> H04N 5/785, 5/04

U.S. Cl. 360-14

8 Claims

1. For use in a video recorder of the longitudinal type, a method for recording sequential, time-spaced scenes of video information from a video camera on a recording tape in such a

manner that the scenes may be reproduced without loss of synchronization, said method comprising the steps of:

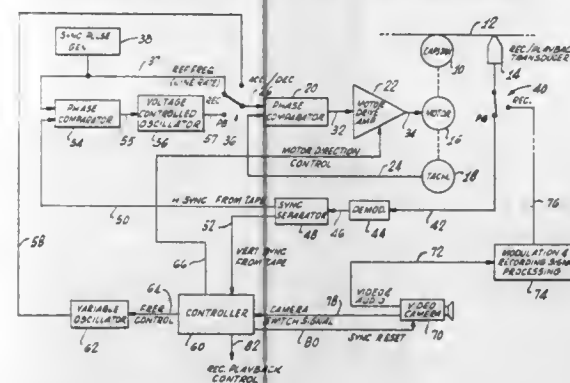
decelerating the tape to a stop after recording a scene;

backspacing the tape for a preselected time or distance;

accelerating the tape to recording speed in the original direction upon actuation of a control to begin recording the next scene;

reading synchronization signals from the tape;

synchronizing movement of the tape, as determined from the synchronization signals read therefrom, with synchronization signals associated with the video camera; and



switching the recorder to a recording mode to record the next scene;

wherein said synchronizing step includes synchronizing horizontal synchronization pulses read from the tape with horizontal synchronization pulses used to operate the camera, and resetting vertical synchronization of the camera to correspond to vertical synchronization signals read from the tape;

and wherein said steps of accelerating the tape, reading synchronization signals and synchronizing movement of the tape are performed with such speed as to minimize delay at the start of recording each scene.

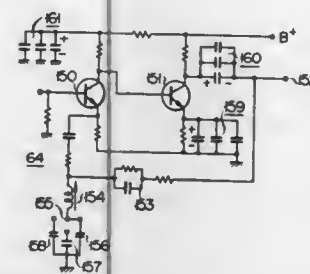
#### 4,163,264 NOISE IMPROVEMENT BY CAPACITOR BANK IN MAGNETIC RECORDING AND PLAYBACK APPARATUS

Kazuo Ishii, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 14, 1977, Ser. No. 768,426  
Claims priority, application Japan, Feb. 13, 1976, 51-14567  
Int. Cl.<sup>2</sup> G11B 5/02; H03H 7/08

U.S. Cl. 360-68

9 Claims



1. A magnetic recording and reproduction apparatus comprising:

a recording amplifier for amplifying an audio signal;

a recording magnetic head for recording an output signal from said recording amplifier on a magnetic tape;

an output circuit for coupling the output signal of said recording amplifier to said recording magnetic head;

an oscillator for supplying a high frequency bias signal to said recording magnetic head at the time of the recording;

a reproduction magnetic head for reproducing a signal recorded on the magnetic tape;

a reproduction amplifier for amplifying an output signal from said reproduction magnetic head; and

a power supply circuit for impressing a supply voltage to said recording amplifier; and

said output circuit provided with a capacitor block comprising means for reducing harmonic distortion, said means comprising a plurality of capacitors connected in parallel and having successively smaller capacitance values, with at least one of the smaller value capacitors being of the lower inner loss type;

whereby the effective internal loss of said block of capacitors is decreased and harmonic distortion reduced.

#### 4,163,265 MAGNETIC DISC MEMORY AND MAGNETIC DISC FOR THIS MEMORY

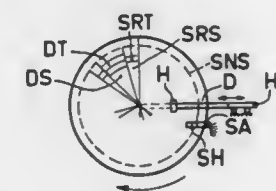
Alfred van Herk, Eindhoven, and Duco W. J. Pulle, Valkenswaard, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,273  
Claims priority, application Netherlands, Mar. 10, 1977, 7702570

Int. Cl.<sup>2</sup> G11B 21/10, 5/12

U.S. Cl. 360-77

10 Claims



1. A magnetic disc memory, comprising:  
means for positioning a magnetic head on a track,  
a disc sub-divided into sectors having groups of data tracks and sectors having groups of servo tracks in an alternating manner;

said servo tracks defining the data tracks which are staggered over one half track pitch with respect thereto;

each servo track containing magnetization changes serving as reference transitions for reference purposes;

said servo sectors having for each group of servo tracks, stepwise magnetization changes serving as measuring transitions from track to track formed by magnetization changes of alternating polarity for position detection purposes;

said magnetization changes generating signals in said magnetic head;

a detection circuit receiving said signals from said magnetic head, having first means for detecting positive and negative transitions of said stepwise magnetization changes of alternate polarity and having position detection means to generate information based upon said changes of alternate polarity information with respect to a track number reached in a group;

said detection circuit having second means for detecting said reference transitions and an additional transition provided for every other servo track in the vicinity of said reference transitions;

said detection circuit generating control reference pulses which are also supplied to the said means for generating information with respect to a track number reached in a group;

an amplitude control circuit having means for providing the positioning of said magnetic head between two adjacent servo tracks.

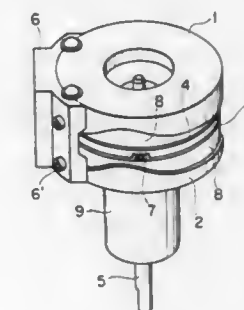
#### 4,163,266 MAGNETIC TAPE SCANNING ASSEMBLY FOR USE IN VIDEO TAPE RECORDER AND PLAYBACK APPARATUS

Takeo Tamamura, Hitachi; Naotatsu Asahi, Katsuta; Makoto Nakayama, Hitachi-ohda; Masataka Kasai, Mito; Akira Saito, Katsuta, and Toshimichi Terada, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1978, Ser. No. 872,454  
Claims priority, application Japan, Jan. 28, 1977, 52-7773  
Int. Cl.<sup>2</sup> G11B 5/52, 15/60, 21/18

U.S. Cl. 360-84

17 Claims



1. A magnetic tape scanning assembly comprising:

(1) guiding means including a cylindrical stationary drum member for slidably guiding a magnetic tape along the smooth surface of a guiding path formed in the periphery of said drum;

(2) a rotatable magnetic head assembly including at least one magnetic head which is slightly radially protruded from the periphery of said drum and is located in a position to be in slidable contact with the surface of the magnetic tape, whereby said magnetic head scans the magnetic tape as it travels along said path;

(3) means for coaxially supporting said magnetic head assembly and guiding drum in such a manner that a small clearance is formed between the lower end of said magnetic head assembly and the upper end of said drum, whereby said magnetic head assembly rotates irrespectively of said drum;

(4) means for driving said supporting means; and

(5) wherein at least said path of said drum is made of an aluminum-silicon alloy consisting essentially of 8 to 15% by weight of silicon, 1 to 4% by weight of copper, 0.05 to 0.6% by weight of magnesium, and the balance being aluminum, an average grain size of round eutectic silicon crystals in the alloy being not larger than 5  $\mu$ m, and generally continuous, fine machining lines with a roughness of 1 to 6  $\mu$ m formed on the surface of the guiding path in a direction of travel of the magnetic tape.

#### 4,163,267 FLYING HEAD WITH COMPOUND-FOIL

Dean DeMoss, Camarillo, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 26, 1978, Ser. No. 909,793  
Int. Cl.<sup>2</sup> G11B 5/60, 15/64, 17/32

U.S. Cl. 360-102

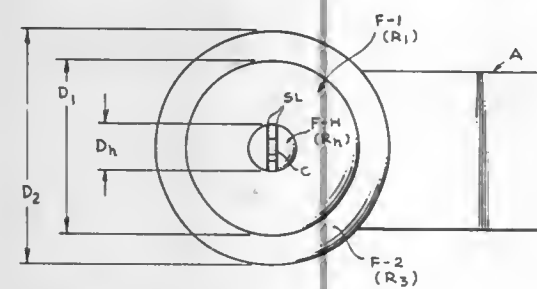
12 Claims

1. In a combined transducer-stabilizer array adapted for stabilizing and transducing passing flexible media, the combination including transducer structure disposed in a prescribed head-foil of given curvature and adapted to mount a transducer structure and to be presented in convex, "air-bearing-generating" relation with said passing media, the improvement therewith comprising:

a rigidly-fixed mounting foil arranged and adapted to sup-



port said head-foil and exhibiting a somewhat flatter convex curvature relative to said passing media so as to create



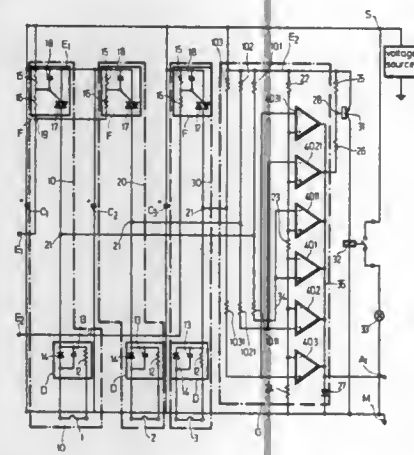
a prescribed "entry zone" air bearing film upstream of the related film generated by said head-foil.

**4,163,268**  
**CIRCUIT ARRANGEMENT FOR MONITORING READINESS FOR OPERATION OF ACTUATING DEVICES OF A SAFETY APPARATUS FOR VEHICLES**  
Johann Spies, Pfaffenhofen, and Alfons Wöhrli, Schrobenehausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany  
Filed Apr. 4, 1977, Ser. No. 784,334

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614491

Int. Cl.<sup>2</sup> H02H 3/00  
U.S. Cl. 361—1

12 Claims



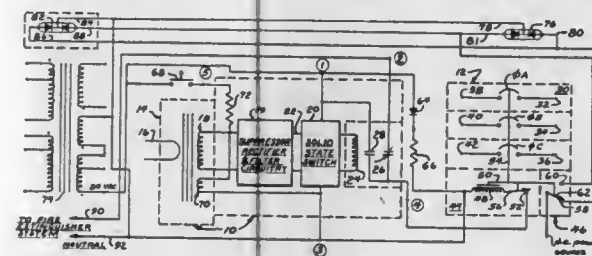
1. For a collision-sensor responsive vehicle safety device, a trigger circuit comprising: a pair of series-connected safety circuits, said pair including a safety release element and a solid switch as well as a filter for controlling the solid state switch and a Zener diode having a grounded anode, a tap connected between said safety circuits of said pair, a supplemental safety circuit connected to said tap, said supplemental safety circuit including two comparators for said release element, coupling means for coupling the voltage of the tap to the non-inverting input of the respective second comparator and the inverting input of the first comparator, and a voltage divider defining an upper and a lower reference voltage limit, said voltage divider being connected to the inverting input of the second comparator and the non-inverting input of the first comparator, connecting means connecting the outputs of the comparators in parallel for forming error signals.

**4,163,269**  
**GROUND FAULT AND FIRE DETECTOR SYSTEM**  
William F. Helwig, Jr., Downers Grove, and Henry D. Jeffries, Jr., Brookfield, both of Ill., assignors to Avtec Industries, Inc., Downers Grove, Ill.

Filed May 6, 1977, Ser. No. 794,356  
Int. Cl.<sup>2</sup> H02H 3/16

U.S. Cl. 361—42

10 Claims



1. A ground fault and fire detector system for an A.C. electrical power distribution apparatus comprising: circuit interrupter means having at least one pole for disconnecting an electrical load power supply from at least one load; single-pole circuit means operatively connected to said interrupter means for controlling said interrupter means; said single-pole means being operable to disconnect a power supply from a load upon being activated by separate sources of electrical power being imposed thereon in response to detection of a ground fault or detection of fire, respectively; ground fault sensing means operatively positioned with respect to at least one wire for detecting a ground fault current; said sensing means being interposed between the single-pole circuit means and a ground fault electrical power supply of less than 120 volts to control the power from the ground fault electrical power supply to the single-pole circuit means; said sensing means including relay means responsive to detection of a ground fault current to electrically couple said ground fault power supply to the single-pole means for disconnecting said electrical load power supply from at least one load; and said single-pole circuit means being further coupled to a fire extinguish system to supply power from a fire system electrical power supply of at least 120 volts A.C. to the single-pole circuit means for activating said interrupter means upon occurrence of a fire independently of said ground fault sensing means to disconnect said electrical load power supply from at least one load.

**4,163,270**  
**SAFETY APPARATUS FOR USE WITH A THREE-PHASE AC MOTOR**

Louis J. Marus, 9151 Riverbluff Rd., Millington, Tenn. 38053  
Filed Jan. 27, 1978, Ser. No. 872,886

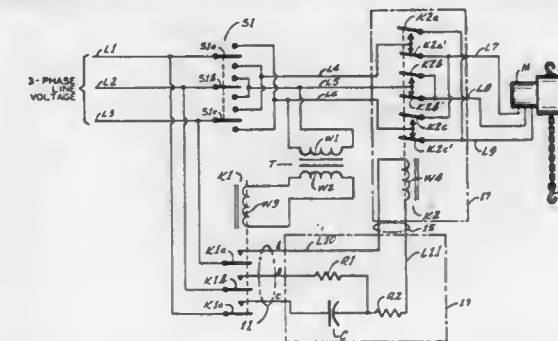
Int. Cl.<sup>2</sup> H02H 3/26

U.S. Cl. 361—77

9 Claims

1. Safety apparatus for use with a three-phase AC reversible direction motor, said motor providing movement of a machine in one direction or the other dependent upon the direction of motor rotation, said motor adapted to be connected to a three-phase AC power source by a three-lead wiring connection for operating said motor, said motor having a plurality of motor leads interconnected with a multiple pole motor direction control switch, said direction control switch providing selective alternate closed positions for selective reversal of the direction of said motor for selectively controlling the direction of movement of said machine by phase connection reversal, said poles of said switch being connected to said three-phase AC power source by said three-lead AC wiring connection,

said motor being adapted to operate in a correct direction if provided by AC power from said power source having a correct phase relationship and said motor being adapted to operate in an incorrect direction if provided by AC power from said power source having an incorrect phase relationship, said apparatus comprising phase detection means for detecting the phase relationship of said AC power provided by said wiring connection, said phase detection means including circuitry having three inputs respectively interconnected with the three leads of said wiring connection and having at least two outputs providing signal voltage between them having a first level indicative of a correct phase relationship provided by said wiring connection but a second level indicative of said incorrect phase relationship provided by said wiring connection, a wiring connection adapted to be completed for connecting said phase detection means to said three-phase AC power source in predetermined phase connection relationship regard-



less of which of said alternate closed positions is provided by said direction control switch, relay means interconnected with sets of contacts of said direction control switch and adapted for being energized for completing said wiring connection only when said direction control switch is in one of said alternate closed positions, phase corrector means for receiving said signal voltage and comprising at least two sets of contacts interconnected with at least two of said motor leads, said sets of contacts being normally operative when said signal voltage has said first level to provide a first circuit interconnection of each of said two motor leads with a respective one of two of the leads with a respective opposite one of said two leads of said wiring connection, whereby said apparatus ensures movement of said machine in a selected direction of movement corresponding to selective operation of said direction control switch to either of said alternate closed positions regardless of any incorrect phase relationship provided by said wiring connection.

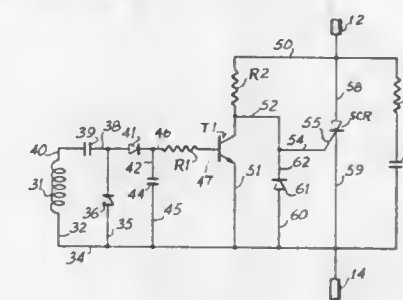
**4,163,271**  
**ELECTRONIC SWITCHING APPARATUS**  
James C. Sturrock, Atlanta, Ga., assignor to Michael L. Manning, Athens, Ga.

Filed Sep. 2, 1977, Ser. No. 830,089

Int. Cl.<sup>2</sup> H03K 17/00, 17/72

U.S. Cl. 361—93

3 Claims



1. In a plurality of electrical circuits wherein a first circuit of

said plurality of electrical circuits controls a second circuit of said plurality of electrical circuits, said second circuit having a supply voltage and a load, and switch means for selectively disconnecting said load from said second circuit, first relay means for operating said switch means for selectively disconnecting said load, and switching apparatus for operating said first relay means in response to a current in said first circuit, said switching apparatus being characterized by sensing means for sensing an electric current in said first circuit, said sensing means comprising a coil adjacent to said first circuit for having a voltage induced therein, detecting means for determining when said sensing means senses an electric current in said first circuit, first selective conducting means connected in series with said first relay means for selectively energizing said first relay means, said first selective conducting means including a gate for causing said first selective conducting means to conduct, circuit means connecting said gate to said supply voltage, and second selective conducting means for shunting said supply voltage around said gate in response to said detecting means, and further characterized in that said first relay means is constructed to operate on a voltage of approximately half said supply voltage.

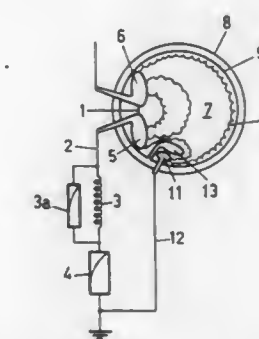
**4,163,272**  
**ARRANGEMENT FOR ARC-QUENCHING IN ARRESTERS**  
René Rudolph, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland  
Filed Nov. 10, 1977, Ser. No. 850,374

Claims priority, application Switzerland, Jan. 20, 1977, 67077/77

Int. Cl.<sup>2</sup> H01T 1/04

U.S. Cl. 361—127

9 Claims

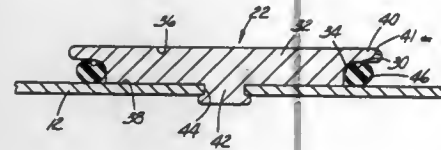


1. In an arrangement for quenching the arc formed in an arrester for the purpose of current limiting and which includes at least one device equipped with a discharge path and at least one leakage resistor, and wherein means are included for bridging the resistor with a time delay following firing of the discharge path the improvement wherein said discharge path contains at least one quenched arc gap established by a pair of spaced principal electrodes located within a quenching chamber and an associated blow-out coil for magnetically influencing the arc formed in said chamber, said quenching chamber also including an auxiliary electrode which together with the principal electrode adjacent thereto forms an auxiliary arc gap, said auxiliary electrode being connected by a conductor directly to one end of said leakage resistor, the other end of said leakage resistor being electrically connected to the said principal electrode which is adjacent said auxiliary electrode.

4,163,273  
**CORONA DISCHARGE APPARATUS AND METHOD  
 HAVING MEANS FOR IMPROVED MOUNTING OF  
 CORONA DISCHARGE WIRE**  
 John P. Stocke, Palatine, Ill., assignor to AM International,  
 Inc., Los Angeles, Calif.

Filed Aug. 1, 1977, Ser. No. 820,415  
 Int. Cl.<sup>2</sup> F24F 3/12  
 U.S. Cl. 361—229

7 Claims

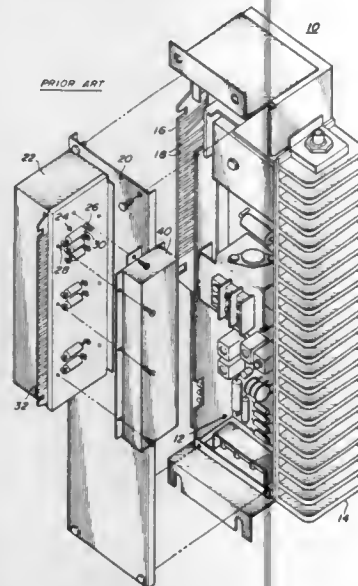


1. A corona discharge apparatus comprising: a support means, a plurality of binding posts mounted on said support means, each of said binding posts being so configured as to provide a peripheral recess, a resilient O-ring compressively retained in said recess, and a corona discharge wire extending between the binding posts and anchored thereto by being frictionally gripped between said O-ring and the surface of said recess.

4,163,274  
**UNIFIED CHASSIS FOR A TWO-WAY RADIO**  
 Walter E. Carolus, Wheaton; Bryan L. Cullen, Crystal Lake, and Stanley W. Gorkik, Buffalo Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.  
 Continuation of Ser. No. 688,624, May 21, 1976, abandoned.  
 This application Nov. 21, 1977, Ser. No. 853,160  
 Int. Cl.<sup>2</sup> H05K 5/00

U.S. Cl. 361—417

2 Claims



1. An electrical component chassis comprising: a first electrical circuit structure; a second electrical circuit structure; electrical components for electrically intercoupling the first and second circuit structures; and interconnect means for forming a rigid mechanical interconnection between the first and the second electrical circuit structures, said interconnect means comprising a pair of metallic "U" shaped channels, each channel having first and second end flanges and an interior curved portion, the first end flange of each "U" shaped channel being adapted to be mechanically affixed to one of the first and second electrical circuit structures, and the interior curved portion provided with means for receiving and mounting the

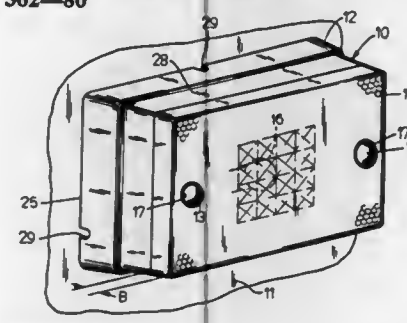
electrical components therein; and a central circuit board structure, said central circuit board being adapted to be mechanically affixed to each "U" channel second end flange for forming a rigid mechanical interconnection between said first and second circuit structures, said central circuit board having electrical circuitry thereon for coupling signals between said first and second circuit structure.

4,163,275  
**CONVERTER MEANS FOR VEHICLE LIGHT**  
 Bernard R. Weber, Elm Grove; Brian A. Hanson, Hartford, and Alton J. Cunningham, Slinger, all of Wis., assignors to Wesbar Corporation, West Bend, Wis.

Filed Aug. 19, 1977, Ser. No. 826,174  
 Int. Cl.<sup>2</sup> B60Q 1/00

U.S. Cl. 362—80

11 Claims



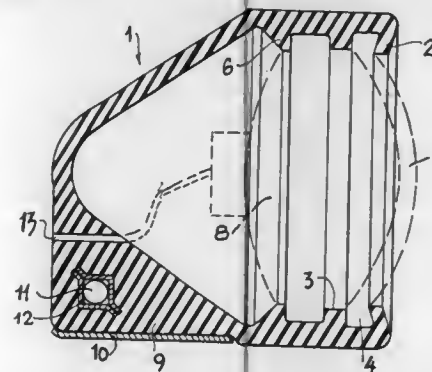
1. In a vehicle light: a base; first means on said base for supporting a bulb in a predetermined position relative to said base and having contact means for electrically connecting said bulb for energization from a power source remote from said base; and converter means including an adapter assembly releasably connected to said first means in place of a bulb for supporting a bulb in a different location than said predetermined location and for electrically connecting said last-recited bulb for energization from said contact means, said adapter assembly comprising an electrically conductive support bracket engageable with said contact means and said base, a bulb socket mounted on said support bracket, and a conductor connected between said bulb socket and said contact means.

4,163,276  
**LIGHTING MEANS, ESPECIALLY HEADLIGHTS OF  
 VEHICLES**  
 Baruch Tabatchnik-Michaeli, 33 Derech Eilat, Ramat Gan, Israel

Filed Jul. 1, 1977, Ser. No. 812,044  
 Claims priority, application Israel, Jul. 4, 1976, 50206  
 Int. Cl.<sup>2</sup> F21M 3/14

U.S. Cl. 362—255

5 Claims



1. A casing for lighting means, especially for headlights for

vehicles, comprising a cup-shaped body arranged to receive a lighting unit and having an open front end through which the light rays are directed and a closed rear end opposite said front end and an axis extending through said body transversely of said front and rear ends, said body having a continuous annularly shaped lateral wall with an outer surface and an inner surface encircling the axis and extending between said front and rear ends, said lateral wall being closed, said body being integrally molded of a resilient elastomer, the edge of said body defining said open front end comprising an inwardly projecting annular rim completely encircling the axis of said body, a first annular rib formed in the inner surface of the lateral wall of said body completely encircling the axis thereof and spaced from said rim toward the closed rear end, the adjacent surfaces of said rim and said first rib forming a first annular groove for receiving and holding the edge of a lens to be positioned across the open front end of said body, a second annular rib formed in the inner surface of the lateral wall of said body completely encircling the axis thereof and spaced from said first rib toward the closed rear end and said first and second ribs forming therebetween a second annular groove for receiving and holding the edge of a lighting unit to be positioned within said casing, and a block-like extension formed integrally with and extending outwardly from the outer surface of the lateral wall of said body adjacent the rear end thereof for connecting the casing to a vehicle without requiring a connecting member extending from the outer surface through the inner surface of said body, said block-like extension extending in the axial direction of said body from a location rearwardly of said second annular groove toward the rear end of said body and also extending in the circumferential direction of the outer surface of said body for only an angular portion thereof.

4,163,277  
**SPOTLIGHT**  
 Charles W. Altman, 5 Rudolph Ter., Yonkers, N.Y. 10701  
 Filed Aug. 12, 1977, Ser. No. 824,060  
 Int. Cl.<sup>2</sup> F21V 7/00

U.S. Cl. 362—263

5 Claims

1. An axial spotlight for use with a metal halide high intensity discharge lamp having forward and rear terminals and a longitudinal axis therebetween, the invention comprising an ellipsoidal reflector having a main axis, a metal mounting frame thermally connecting said forward terminal to said reflector and means for mounting said lamp with its longitudinal axis coincident with the main axis of said reflector.

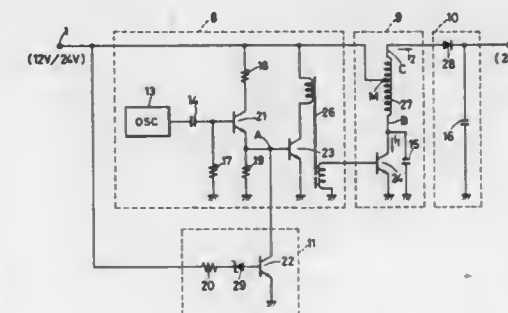
4,163,278  
**VOLTAGE SUPPLY CIRCUIT RESPONSIVE TO PLURAL  
 POSSIBLE DC INPUT LEVELS**

Yoshinori Onoue, Mitaka; Katsuji Matsuura, Sagami, and Shigenori Takahashi, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1977, Ser. No. 860,078  
 Claims priority, application Japan, Dec. 17, 1976, 51-152725  
 Int. Cl.<sup>2</sup> H02M 3/335

U.S. Cl. 363—101

10 Claims



1. A voltage supply circuit comprising:

input means for receiving a DC input voltage having one of plural possible levels;

DC-AC inverter means for inverting said DC input voltage including a boosting transformer having at least one winding with end terminals and an intermediate terminal, and inverter drive means for providing a pulsed current to said transformer;

means connecting said input means to said intermediate terminal for applying said DC voltage to said transformer at said intermediate terminal; and

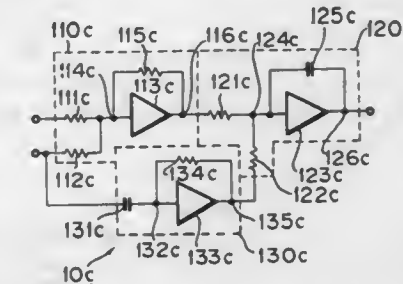
control circuit means for controlling said inverter drive means and which alternatively selects between a first condition in which said inverter drive means is made operative and a boosted voltage is provided at one end terminal of said boosting transformer, and a second condition in which said inverter drive means is made inoperative so that said DC input voltage is provided at said end terminal, said control circuit means including level-detecting means for detecting the level of said DC input voltage and switching means selecting between said first and second conditions on the basis of the level of said DC input voltage detected by said level detecting means.

4,163,279  
**DERIVATIVE MINOR LOOP TYPE CONTROLLER**  
 Tomiharu Kubota, Numazu, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 880,005  
 Claims priority, application Japan, Feb. 23, 1977, 52/19009  
 Int. Cl.<sup>2</sup> G06G 7/66; G05B 11/42

U.S. Cl. 364—105

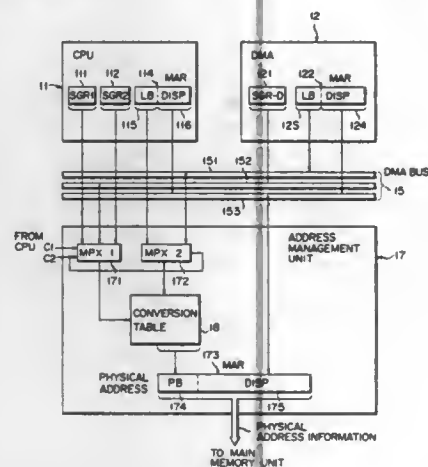
9 Claims



1. A controller for controlling a controlled system in connection with detecting means which detects the output of said controlled system and feeds back a corresponding detected signal to said controller such that a reference input signal to said controller and the fed-back detected signal coincide with each other, said controller comprising first amplifying means for amplifying the error between a reference input signal and the detected signal, second amplifying means for amplifying the error between the output of said first amplifying means and another signal to provide the resulting output as manipulating signal to said controlled system, and first-linear derivative amplifying means for differentiating with respect to time in a first-linear derivative manner and amplifying the detected signal to provide the resulting output as the other signal to the second amplifying means whereby, during the time when the error between the reference input signal and the magnitude of the detected and fed-back signal is relatively large, control is made such that the value of the first-linear derivative of the detected and fed-back signal is constant in an overshooting-free mode.



**4,163,280**  
**ADDRESS MANAGEMENT SYSTEM**  
 Ryuichi Mori, Tokyo; Tadao Ichikawa, and Yukio Shiraogawa, both of Fuchu, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan  
 Filed Jun. 17, 1977, Ser. No. 807,500  
 Claims priority, application Japan, Jun. 30, 1976, 51-76417  
 Int. Cl.<sup>2</sup> G06F 3/00, 5/00, 9/20, 13/00  
 U.S. Cl. 364-200 20 Claims



1. In a data processing system comprising a main memory unit including a local and shared memory, a central processing unit for executing a program including a first register having first logical addresses and segment registers comprising segment block data for address expansion, and direct memory access devices adapted to gain direct access to the main memory unit each including a second register having second logical addresses and a segment register comprising segment block data for address expansion,

an address management unit for controlling access to either the local or shared memory by the central processing unit or direct memory access devices comprising a conversion table for converting logical addresses selectively received from the segment registers and first and second registers of the central processing unit and direct memory access devices into physical addresses for accessing the main memory unit.

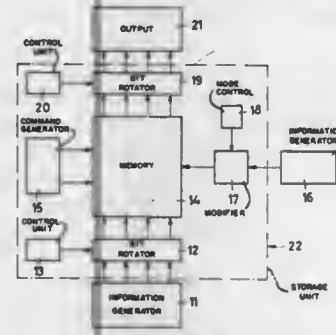
**4,163,281**  
**METHOD AND APPARATUS FOR THE ROTATION OF A BINARY-DATA MATRIX, INTENDED PARTICULARLY TO BE USED AS A STORAGE UNIT HAVING A TWO-WAY ACCESS MODE FOR ELECTRONIC COMPUTERS**

Luigi Stringa, Arenzano, Italy, assignor to Elettronica San Giorgio Elsas S.p.A., Genova-Sestri, Italy  
 Filed Sep. 29, 1977, Ser. No. 837,862  
 Claims priority, application Italy, Jun. 30, 1977, 25276 A/77  
 Int. Cl.<sup>2</sup> G06F 7/00 4 Claims

2. An apparatus for rotating a binary-data matrix formed by a plurality of bit strings arranged as respective rows of the matrix, comprising:

- first bit-rotating means for sequentially receiving said bit strings of the matrix and rotating the bits of each string through a number of bit positions which number of bit positions increases by one from each string to the next string;
- a digital memory including rows and columns of individually addressable cells, a data input of said memory connected to the output of said first bit-rotating means;
- write and readout command generating means associated with said memory for controlling the writing of said

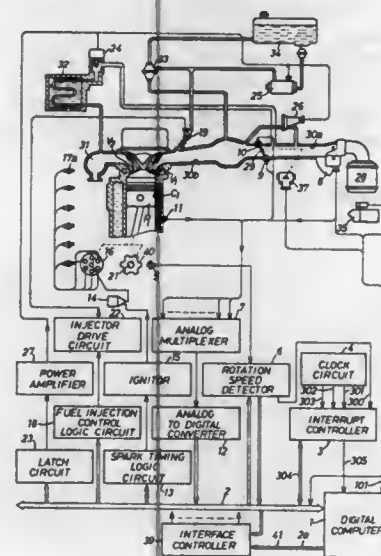
- strings having rotated bits into said memory and the reading out of modified strings of bits from said memory;
- address generating means associated with said memory for addressing selected cells of said memory;
- an address modifier interposed between said address generating means and said memory;
- mode control means associated with said address modifier for changing the addressing of said memory by said address modifier from a writing condition, in which all the cells of a memory row are simultaneously addressed at any write command to allow parallel writing of said



strings having rotated bits in respective cell rows of the memory, to a readout condition, in which one cell of each column is addressed at any readout command to allow parallel readout of said modified strings of bits each including all the bits comprised in a respective row of a desired rotated matrix; and

- second bit-rotating means for sequentially receiving said modified strings from said memory and rotating the bits of each modified string to change the sequence of said bits according to that of said respective row of the rotated matrix.

**4,163,282**  
**ELECTRICAL CONTROL METHOD AND APPARATUS FOR COMBUSTION ENGINES**  
 Takashi Yamada, Anjo; Shinji Shirasaki, Kariya; Yukio Sakakibara, Anjo, and Hiroyasu Fukaya, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
 Filed Sep. 16, 1977, Ser. No. 834,042  
 Claims priority, application Japan, Sep. 24, 1976, 51-115227  
 Int. Cl.<sup>2</sup> G06F 7/70; F02D 21/04  
 U.S. Cl. 364-431 20 Claims



1. An electrical control apparatus adapted for use with a

combustion engine having an output shaft driven by mechanical energy converted from heat energy caused by the combustion of an air-fuel mixture, said engine including first and second control means for controlling the combustion of said air-fuel mixture in accordance with changes of a condition of said engine, said apparatus comprising:

- a first electrical circuit for generating an electrical signal in the form of a binary number, said signal indicating a condition of said engine as of a selected instant in time during operation of said engine;
- a digital computer for repetitively and sequentially calculating first and second values corresponding to respective settings of said first and second control means by receiving therein said electrical signal, said computer being programmed to calculate said first and second values from a first function describing a desired relationship between the condition of said engine and the setting of said first control means; and from a second function describing another desired relationship between the condition of said engine and the setting of said second control means;
- a second electrical circuit coupled between said digital computer and said first and second control means for converting said first and second values into the settings of said first and second control means;
- a detector for generating a synchronized pulse which is synchronized with and in response to the rotation of said output shaft, said computer initiating calculation of said first value in response to receipt of said synchronized pulse;
- a clock circuit for generating at least one clock pulse in a predetermined time interval, said computer initiating calculation of said second value in response to receipt of said clock pulse; and
- an interrupt controller for receiving said synchronized pulse and said clock pulse and for causing said computer to initiate calculation of said first value upon receiving said synchronized pulse during the calculation of said second value in said computer, and to subsequently complete the calculation of said second value after said first value has been calculated.

20. A method for controlling a combustion engine having an output shaft driven by mechanical energy converted from heat energy caused by the combustion of an air-fuel mixture, said engine including first control means for controlling the amount of air-fuel mixture metered into said engine and/or the spark-ignition timing of said engine and second control means for controlling the amount of exhaust gases recirculated from an exhaust pipe into said engine, said method comprising the steps of:

- generating an electrical signal in the form of a binary number, said signal indicating a condition of said engine as of a selected instant in time during operation of said engine;
- generating output pulses at a frequency proportional to the rotational speed of said output shaft to initiate the calculation of a first value;
- generating clock pulses at a predetermined frequency, the frequency of said clock pulses being lower than that of said output pulses;
- sequentially calculating first and second values corresponding to respective settings of said first and second control means by a computer programmed to calculate said first and second values from a first function describing a desired relationship between the condition of said engine and the setting of said first control means and from a second function describing another desired relationship between the condition of said engine and the setting of said second control means, each calculation of the first and second values being executed by using said binary number electrical signal in response to said output pulses and said clock pulses, respectively;
- issuing an interrupt request signal in response to one of said output pulses during the calculation of said second value in said computer to prohibit the calculation of said second value in said computer and simultaneously initiate

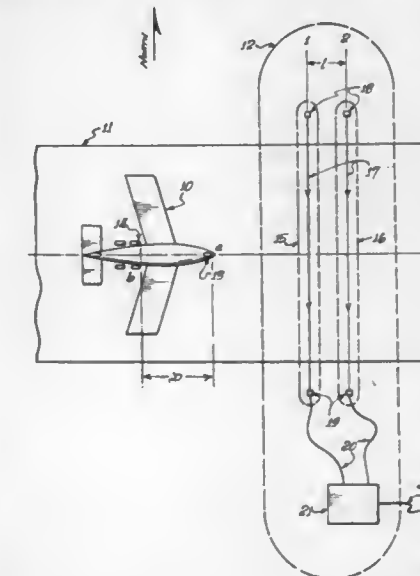
the calculation of said first value in said computer, the remainder of the prohibited calculation being executed in said computer after completion of the calculation of said first value;

- issuing an interrupt prohibit signal during the calculation of said first value to continue the calculation of said first value in said computer;
- converting said first and second calculated values into the settings of said first and second control means; and
- continuously repeating the above sequence of steps for controlling the combustion of the air-fuel mixture in response to any changes in said binary number electrical signal.

**4,163,283**  
**AUTOMATIC METHOD TO IDENTIFY AIRCRAFT TYPES**

Ronald A. Darby, 256 Kuulei Rd., Kailua, HI. 96734  
 Filed Apr. 11, 1977, Ser. No. 786,560  
 Int. Cl.<sup>2</sup> G01B 7/04 25 Claims

U.S. Cl. 364-439



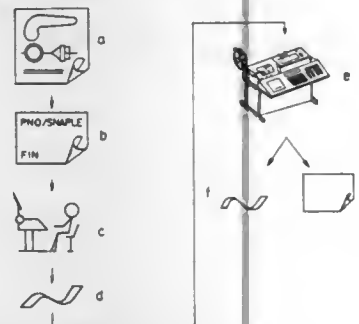
1. A method to automatically classify the type of aircraft moving on the ground by automatically determining sufficient physical characteristics unique to the landing gear of each given type of aircraft, said characteristics being the nominal major wheelbase, the total number of axles, and the spacing of the main carriage axles, comprising the steps of: providing a system comprising a sensor set, a data transmission link, a processor, and a data read-out device; said sensor set comprising two sensor systems located at a known distance apart which are activated by the wheels of the aircraft and produce a sequence of signal pulses, said data transmission link to transmit the signal pulses to the processor, said processor to generate signals representative of the type of aircraft, the location of the aircraft and the speed of the aircraft in response to time intervals between signal pulses, and wheelbase characteristics from a look-up table in the memory bank of said processor, and said data read-out device to indicate the type of aircraft, the location of the sensor set, time of an event, direction of travel of the aircraft, and the speed of the aircraft.

4,163,284

## NC TAPE PRODUCING SYSTEM

Hajimu Kishi; Naganori Miyoshi, and Masaki Seki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1977, Ser. No. 832,643  
Claims priority, application Japan, Sep. 10, 1976, 51-107923  
Int. Cl.<sup>2</sup> G05B 19/42; G06F 15/46  
U.S. Cl. 364-474 5 Claims



1. An NC tape producing system comprising:
  - (a) a desk type cabinet having a top board and a leg portion supporting said top board,
  - (b) a general purpose digital processor together with a memory and an initial program loader stored in a read-only memory, mounted in said leg portion of said cabinet,
  - (c) a printer, a keyboard panel, a tape input unit and a tape output unit mounted on said top board, and connected to said processor through an input/output control unit,
  - (d) said keyboard panel having a keyboard with a plurality of character keys, a plurality of auxiliary switches connected to said processor, a power switch for controlling the power supply to the present NC tape producing system, and a mini-board panel,
  - (e) said mini-board panel having a plurality of guidance lamps connected to said processor, a plurality of instruction keys connected to said processor to interrupt the same, and a plurality of function keys connected to said processor, and
  - (f) a mini-board sheet with a plurality of holes for covering said mini-board panel to indicate the role of each key.

4,163,285

## CONTROL CIRCUIT FOR METAL PAPER PRINTER HEAD

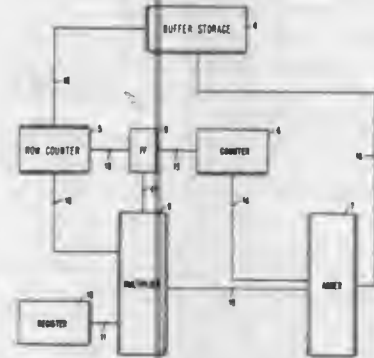
Dietrich J. Bahr; Karl H. Burckardt, both of Herrenberg, and Helmut Hasselmeier, Aidingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,392  
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715889  
Int. Cl.<sup>2</sup> G06F 3/12 6 Claims

1. In a printing apparatus having a plurality of activatable elements each responsive to data from a main store for recording marks along a print line in a predetermined marking row and being staggered different distances along said print line, a circuit for controlling the activation of said elements comprising:

buffer storage means having a plurality of storage cells each addressable by row and column counts;  
row counter means for cyclically addressing each said row of said buffer storage means; and  
column means for addressing each said column in said buffer storage means, said column means including:  
bistable means responsive to each cycle of said row counter for changing from one stable state to the other;  
second counter means responsive to said bistable means in

said one state for incrementing the count of said counter means;  
multiplier means responsive to said bistable means being in one said state for forming products of a constant D and the



count of said row counter and being disabled by said bistable means being in the other said state; and  
adder means for adding the output value of said second counter means and said products for addressing said buffer storage columns.

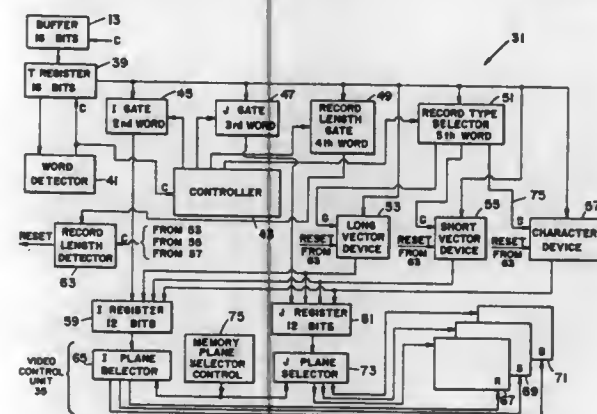
4,163,286

## DIGITAL PLOTTING SYSTEM FOR DISPLAYING STRAIGHT LINE INFORMATION

Edward R. Reins, Monterey, and Charles D. B. Curry, Pacifica, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 14, 1977, Ser. No. 851,022  
Int. Cl.<sup>2</sup> G06F 3/14 17 Claims

U.S. Cl. 364-719



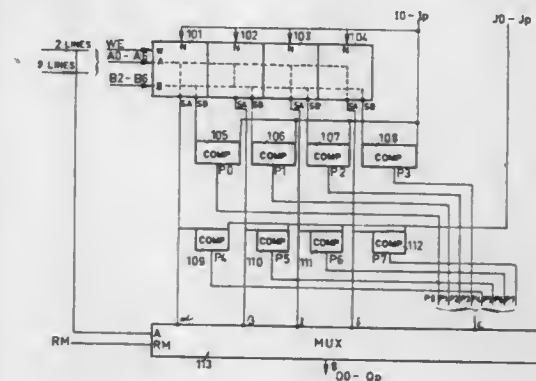
1. A digital plotting system comprising:
  - (a) a processor for processing a binary coded signal representing predetermined graphic information representing a straight line within a rectangular coordinate system having first and second mutually orthogonal coordinate lines and said coded signal including information defining the initial starting point, the length, the sector and the slope of said straight line;
  - (b) said processor including an I register for defining one coordinate of the rectangular coordinate system and a J register for defining the other coordinate of said rectangular coordinate system wherein each of said I and J registers includes increment and decrement inputs;
  - (c) said processor including first means operatively connected to said I and J registers for loading the initial starting point of said straight line of said predetermined graphic information in said I and J registers;
  - (d) said processor including second means for storing the length of said straight line of said predetermined graphic information representing a straight line;

4,163,288

## ASSOCIATIVE MEMORY

Daniel Vinot, Sucy-en-Brie, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 6, 1977, Ser. No. 785,233  
Claims priority, application France, Apr. 15, 1976, 76 11234  
Int. Cl.<sup>2</sup> G06F 7/04; G11C 15/00  
U.S. Cl. 364-900 2 Claims



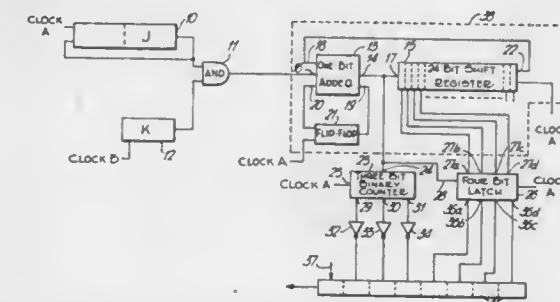
1. An associative memory comprising:
  - (a) memory means for storing a plurality of data;
  - (b) first and second addressing means coupled to the memory means to address data locations in the memory means;
  - (c) first comparator means having a first input, a second input, and an output;
  - (d) means for applying data to the second input of the first comparator means;
  - (e) means for coupling the first input of the first comparator means to the memory means to enable the comparison of the data content of the memory location addressed by the first addressing means with data applied to the second input of the first comparator means;
  - (f) second comparator means having a first input, a second input, and an output;
  - (g) means for applying data to the second input of the second comparator means;
  - (h) means for coupling the first input of the second comparator means to the memory means to enable the comparison of the data content of the memory location addressed by the second addressing means with data applied to the second input of the second comparator means;
  - (i) a multiplexer having first and second data inputs, a data output, and a control signal input, said multiplexer serving to transmit data from either the first data input or the second data input to the data output as determined by the control signal input;
  - (j) means for coupling said multiplexer first data input to the memory means to receive the data content of the memory location addressed by one of the addressing means; and
  - (k) means including an AND circuit for coupling said multiplexer second data input to the outputs of said comparators to receive data indicating whether there is an address conflict.

4,163,287

## BINARY MULTIPLIER CIRCUIT INCLUDING CODING CIRCUIT

Ernst A. Munter, and Carmine A. Ciancibello, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 20, 1978, Ser. No. 898,165  
Int. Cl.<sup>2</sup> G06F 7/52; H03K 13/24  
U.S. Cl. 364-757 14 Claims



1. A multiplier circuit for multiplying a first unsigned binary number having a maximum of n binary bits by a second unsigned binary number having a maximum of m binary bits and producing an unsigned coded binary product having a maximum of q binary bits, wherein n, m and q are all positive integers, (n+m)>q, said multiplier circuit comprising:
  - (a) an accumulator means, including a shift register having (n+m) bit locations for storing both the partial products and the final non-coded product of said first and second binary numbers, said register being preset to an initial binary value;
  - (b) a (q-p) bit binary counter connected so as to increase its count by one, for every logic 0 input to said register, said counter being reset to zero at the occurrence of every logic 1 at the input of said register, wherein p is a positive integer, 0<p<q;
  - (c) a latch circuit connected so as to receive the bits stored in the p most significant bit locations of said register, said latch circuit being responsive to the input signal to said register so as to load the bits from said register into said latch circuit at every occurrence of a logic 1 at the input to said register;
  - (d) the most significant bits of said coded product being the base-minus-one complement of the final count stored in said counter, and the least significant bits of said coded product being the final binary number stored in said latch circuit.

4,163,289

## SIXTEEN BIT MICROCOMPUTER MEMORY BOARDS FOR USE WITH EIGHT BIT STANDARD CONNECTOR BUS

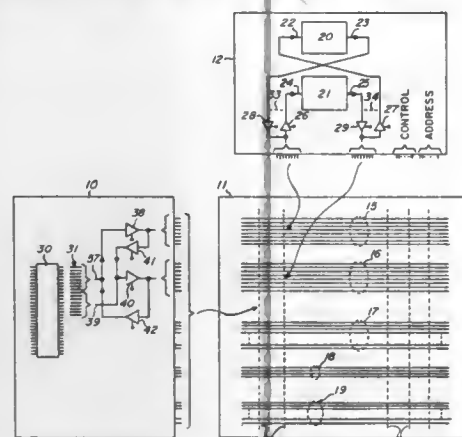
Robert W. Schmidt, Stafford, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,398  
Int. Cl.<sup>2</sup> G11C 13/00 8 Claims

1. A microcomputer comprising: a processor board containing a microprocessor having sixteen bit bidirectional data



terminals; a sixteen bit memory board containing separate eight bit unidirectional Data In and Data Out lines; a connector board containing a standardized bus with a plurality of plug-in connectors to receive the processor board and memory boards, the connector board having separate eight bit Data In and Data Out lines for connection to said lines on the memory boards; unidirectional means on the memory board to connect



the eight bit Data In and Data Out lines to two separate memory arrays on the memory board, the unidirectional means being connected in opposite direction for one of the memory arrays relative to the other; and connecting means on the processor board to connect the sixteen bit bidirectional data terminals to the two separate eight bit Data In and Data Out lines of the connector board.

#### 4,163,290 HOLOGRAPHIC VERIFICATION SYSTEM WITH INDEXED MEMORY

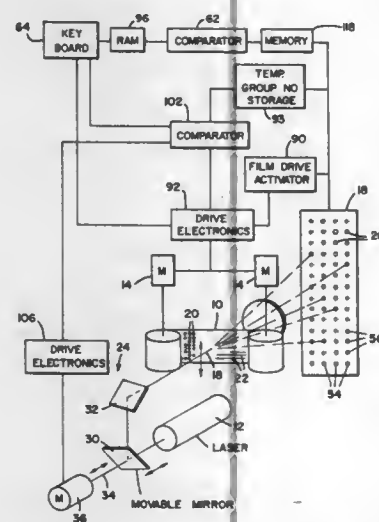
Kent K. Sutherland, Los Altos; Ted J. Crowther, Saratoga, and Kent A. Salmond, Los Gatos, all of Calif., assignors to Optical Data System, Mountain View, Calif.

Filed Feb. 8, 1974, Ser. No. 440,897

Int. Cl.<sup>2</sup> G11C 13/04

U.S. Cl. 365-125

29 Claims



1. A binary data storage and retrieval system for the high-speed determination of the presence or absence of a given

information unit comprising an elongate strip having a multiplicity of individual holograms evenly distributed over a plurality of elongate hologram channels on the strip, the holograms defining a holographic memory, each hologram being a holographic record of a binary spot pattern; a light source for generating binary spot patterns from holograms in any one of the channels by illuminating holograms belonging to such channel only; means for detecting such generated spot patterns; the strip including holographic index means identifying the holograms in each channel for selecting the channel in which the information unit would be recorded if present in the memory; means for directing light from the source to the selected channel; and advancing means cooperating with the light directing means for first searching the index, thereafter directing the light to the selected channel and thereafter reading the memory.

#### 4,163,291 INPUT-OUTPUT CONTROL CIRCUIT FOR FIFO MEMORY

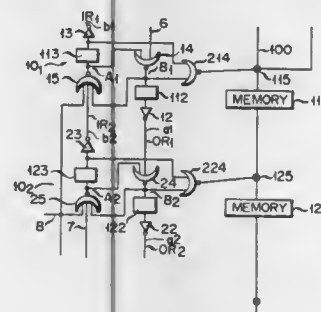
Seigo Suzuki, Yokohama, and Yoshiaki Moriya, Inga, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan  
Filed Oct. 15, 1976, Ser. No. 732,965

Claims priority, application Japan, Oct. 15, 1975, 50-123235; Oct. 15, 1975, 50-123237; Nov. 18, 1975, 50-138550

Int. Cl.<sup>2</sup> G11C 7/00, 19/00

U.S. Cl. 365-221

8 Claims



1. A memory input-output control device for controlling the read-write operation of a first-in first-out memory having a plurality of sequentially-arranged memory elements (111, 121), comprising an input control line (6); an output control line (7); and a plurality of data control circuit elements (101, 102) sequentially connected between the input and output control lines (6, 7), each of said data control circuit elements being connected to one of the plurality of sequentially-arranged memory elements and comprising a circuit having an input control signal output terminal (a1 or a2) and an output control signal output terminal (b1 or b2), wherein the input control line, during a write operation, is supplied with an input control pulse signal and the output control signal output terminal (b1 or b2) of each of said data control circuit elements, in response to the input control pulse signal, has a binary signal representing the full or empty state of the respective memory element, and wherein the output control line, during a read operation, is supplied with an output control pulse signal and the input control signal output terminal of each of said data control circuit elements, in response to the output control pulse signal, has a binary signal representing the full or empty state of the respective memory element.

## DESIGN PATENTS

GRANTED JUL. 31, 1979

### ERRATA

For	See
CLASS	PATENT NO.
D21-027 .....	252,530
D03-074 .....	252,535

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DESIGNS

JULY 31, 1979

252,476  
CANDY

Roy K. Wills, Jr., Oxford, Ohio, assignor to International Leisure Activities, Inc.

Filed Oct. 7, 1977, Ser. No. 840,513  
Term of patent 14 years  
Int. Cl. D01—01

U.S. Cl. D1—16



252,477  
CANDY

Roy K. Wills, Jr., Oxford, Ohio, assignor to International Leisure Activities, Inc.

Filed Oct. 7, 1977, Ser. No. 840,515  
Term of patent 14 years  
Int. Cl. D01—01

U.S. Cl. D1—17



252,478  
CORD LEADER

C. Tom Grimes, 2615 Dean Ave., Des Moines, Iowa 50317

Filed Jan. 19, 1977, Ser. No. 760,455  
Term of patent 14 years  
Int. Cl. D03—99

U.S. Cl. D3—28



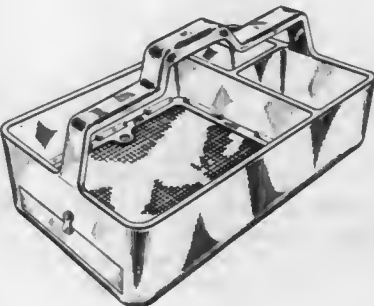
252,479

CADDY FOR NOTIONS

Jolene Goeden, 4515 Pleasant Ave. South, Minneapolis, Minn. 55409

Filed Sep. 1, 1977, Ser. No. 829,991  
Term of patent 14 years  
Int. Cl. D3—99

U.S. Cl. D3—68



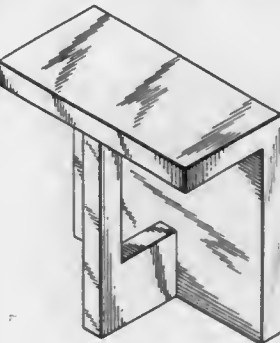
252,480

INVERTIBLE TABLE

Erwin J. Grauert, Yonkers, N.Y., assignor to Grauert Enterprises, Inc.

Filed Aug. 8, 1977, Ser. No. 822,783  
Term of patent 14 years  
Int. Cl. D6—03

U.S. Cl. D6—3



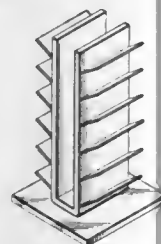


252,481

**DISPLAY RACK FOR EYEGLASS CASES**  
Kenneth G. Gordon, 4320 Greer Rd., Woodland Hills, Calif. 91364

Filed Jul. 3, 1978, Ser. No. 921,866  
Term of patent 14 years  
Int. Cl. D20-02

U.S. Cl. D6-24



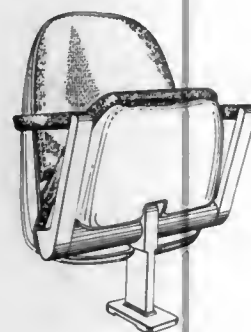
252,482

**THEATER CHAIR**

Leif Blodde, Holland, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Jun. 27, 1977, Ser. No. 810,117  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-26



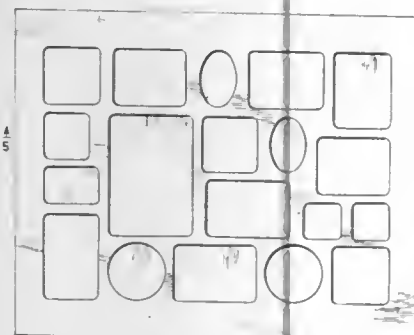
252,483

**PICTURE FRAME**

Vincent Lanci, 1411-116th St., and Angelo Lanci, 9-24-130th St., both of College Point, N.Y. 11356

Filed Mar. 10, 1977, Ser. No. 776,469  
Term of patent 14 years  
Int. Cl. D6-07

U.S. Cl. D6-234



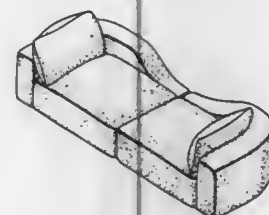
252,484

**SOFA OR SIMILAR UNIT OF FURNITURE**

Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc., Boone, N.C.

Filed Apr. 19, 1977, Ser. No. 788,850  
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-63



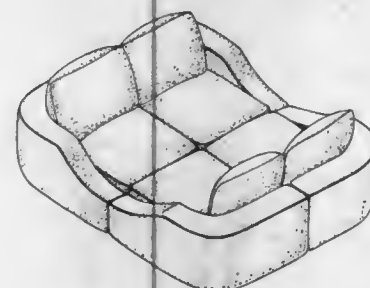
252,485

**LOUNGE SEAT**

Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.

Filed Apr. 19, 1977, Ser. No. 788,841  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-59



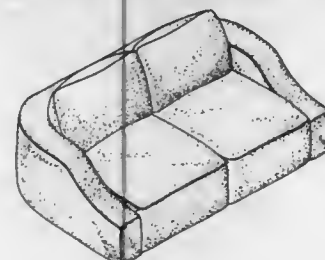
252,486

**SOFA OR SIMILAR UNIT OF FURNITURE**

Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.

Filed Apr. 19, 1977, Ser. No. 788,842  
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-63



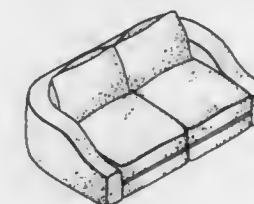
252,487

**CONVERTIBLE SOFA OR SIMILAR UNIT OF FURNITURE**

Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.

Filed Apr. 19, 1977, Ser. No. 788,843  
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-63



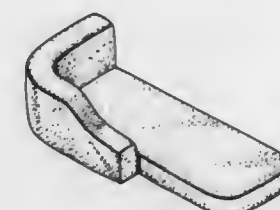
252,488

**CONVERTIBLE SEAT OR SIMILAR UNIT OF FURNITURE**

Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.

Filed Apr. 19, 1977, Ser. No. 788,844  
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-64



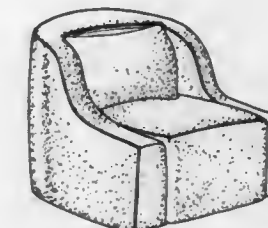
252,490

**SEAT OR SIMILAR UNIT OF FURNITURE**

Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.

Filed Apr. 19, 1977, Ser. No. 788,996  
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-71



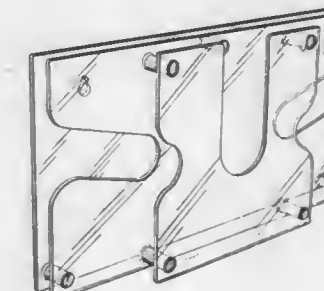
252,491

**FOOD PROCESSOR TOOL HOLDER**

Paul R. Hoffman, Toronto, and Hans K. Wallenwein, Thornhill, both of Canada, assignors to Plasti-Fab Co. Ltd., Markham, Canada

Filed Dec. 5, 1977, Ser. No. 857,741  
Claims priority, application Canada, Jun. 10, 1977, 100677  
Term of patent 14 years  
Int. Cl. D6-04; D7-06

U.S. Cl. D6-130



252,489

**CONVERTIBLE SEAT OR SIMILAR UNIT OF FURNITURE**

Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.

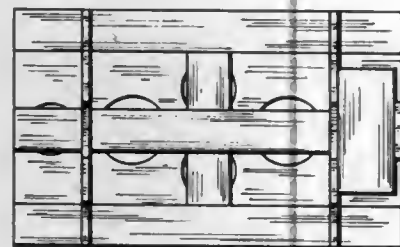
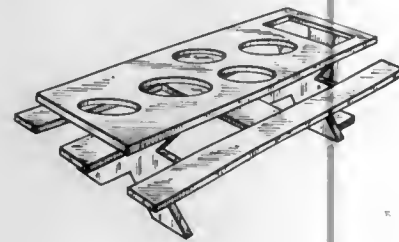
Filed Apr. 19, 1977, Ser. No. 789,001  
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-64



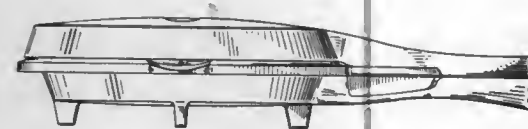
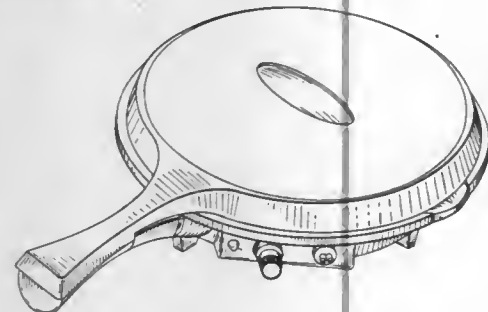
252,492  
**COMBINED CONDIMENT AND NAPKIN HOLDER**  
 Delbert H. Synder, 940 Everett Rd., Fremont, Ohio 43420  
 Filed Mar. 9, 1977, Ser. No. 776,006  
 Term of patent 14 years  
 Int. Cl. D7-06

U.S. Cl. D7-52



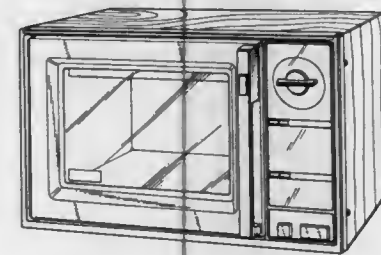
252,493  
**FRY PAN**  
 George Barradas, Greenwich, Conn., assignor to SCM Corporation, New York, N.Y.  
 Filed Jun. 27, 1977, Ser. No. 810,236  
 Term of patent 14 years  
 Int. Cl. D7-02

U.S. Cl. D7-94



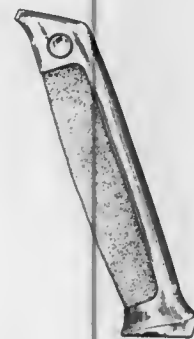
252,494  
**MICROWAVE OVEN**  
 Daisaku Mori, Kouriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan  
 Filed Nov. 15, 1977, Ser. No. 851,656  
 Claims priority, application Japan, Jul. 8, 1977, 52-27008  
 Term of patent 14 years  
 Int. Cl. D7-02

U.S. Cl. D7-128



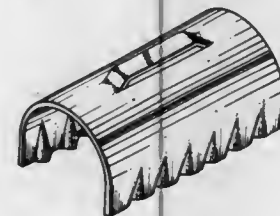
252,495  
**COVER FOR HANDLE OF A HAMMER**  
 Carl-Arne Breger, Malmo, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden  
 Filed Mar. 18, 1977, Ser. No. 779,238  
 Term of patent 14 years  
 Int. Cl. D8-02

U.S. Cl. D8-80



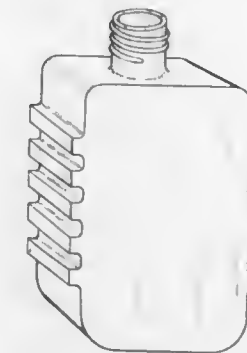
252,496  
**CABLE STRAP SADDLE**  
 Richard L. Double, 1926 Roxanne Ave., Long Beach, Calif. 90813  
 Filed Jul. 13, 1977, Ser. No. 815,191  
 Term of patent 14 years  
 Int. Cl. D8-08

U.S. Cl. D8-356



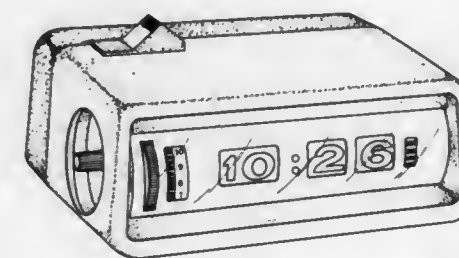
252,497  
**BOTTLE**  
 André Courreges, Neuilly sur Seine, France, assignor to Piade, Paris, France  
 Filed Apr. 20, 1977, Ser. No. 789,122  
 Term of patent 14 years  
 Int. Cl. D9-01

U.S. Cl. D9-168



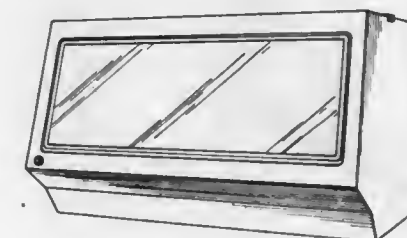
252,498  
**DIGITAL CLOCK**  
 Koji Terada, 2-149-2, Kosugigoten-cho, Nakahara-ku, Kawasaki City, Kanagawa Prefecture, Japan  
 Filed Sep. 21, 1977, Ser. No. 835,249  
 Claims priority, application Japan, Mar. 3, 1977, 52-11708  
 Term of patent 14 years  
 Int. Cl. D10-01

U.S. Cl. D10-15



252,499  
**CLOCK**  
 Ken Shimasaki, Hong Kong, Hong Kong, assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.  
 Filed Sep. 22, 1977, Ser. No. 835,846  
 Claims priority, application United Kingdom, Mar. 29, 1977, 979470  
 Term of patent 14 years  
 Int. Cl. D10-01

U.S. Cl. D10-15



252,500  
**LEVELING INSTRUMENT**  
 John F. Mason, 122 W. Second St., Pass Christian, Miss. 39571  
 Filed Sep. 7, 1977, Ser. No. 831,336  
 Term of patent 14 years  
 Int. Cl. D10-04

U.S. Cl. D10-69



252,501  
**INNER DIAMETER MICROMETER**  
 Mineo Yamauchi, and Masao Nakahara, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd.  
 Filed Feb. 22, 1978, Ser. No. 880,235  
 Term of patent 14 years  
 Int. Cl. D10-04

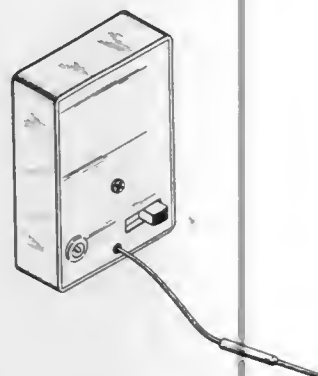
U.S. Cl. D10-73





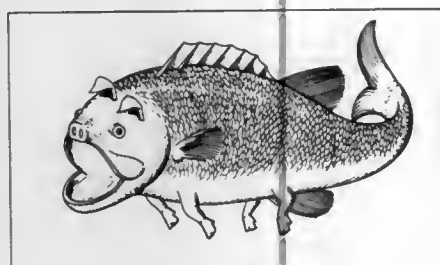
**252,502**  
**RECHARGEABLE BATTERY CHECKER**  
 William T. Kelly, III, Wilton, Conn., assignor to Union Carbide Corporation, New York, N.Y.  
 Filed Feb. 7, 1977, Ser. No. 766,384  
 Term of patent 14 years  
 Int. Cl. D10-04

U.S. Cl. D10-77



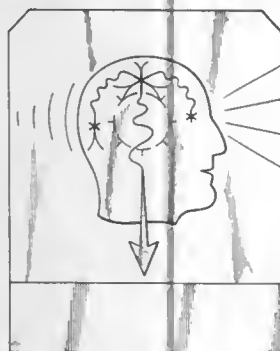
**252,503**  
**PLACARD OR THE LIKE**  
 Alan A. Alaniz, 10531 Sagebluff, Houston, Tex. 77089  
 Filed Apr. 18, 1977, Ser. No. 788,240  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-134



**252,504**  
**PLAQUE OR SIMILAR ARTICLE**  
 Walter Gehrig, 1530 Lucky St., Oceanside, Calif. 92054  
 Filed Aug. 12, 1976, Ser. No. 713,990  
 Term of patent 14 years  
 Int. Cl. D11-02

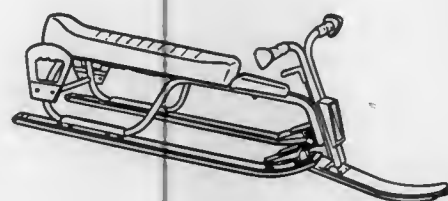
U.S. Cl. D11-136



**252,505**  
**SNOW SLED**  
 Gennady G. Derkach, Timiryazevskaya ulitsa, 9, kv. 93, Moscow; Vladimir A. Kovtonjuk, Jubileiny prospekt, 74, kv. 234, Khimki Moskovskoi oblasti; Valentin A. Kuryabin, Shenskursky proezd, 6 "b", kv. 102, Moscow; Boris B. Makhonov, Putevoi proezd, 28, kv. 37, Moscow, and Lev A. Kuzmichev, Bolshaya Marlinskaya ulitsa, 7, korpus 2, kv. 39, Moscow, all of U.S.S.R.

Filed Oct. 21, 1976, Ser. No. 734,598  
 Term of patent 7 years  
 Int. Cl. D12-14

U.S. Cl. D12-9



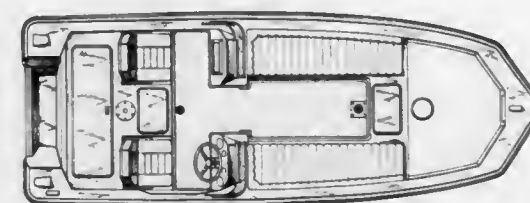
**252,506**  
**WEAR POINT FOR AGRICULTURAL FERTILIZER SHANK**  
 Charles J. Clark, N. 6609 Washington, Spokane, Wash. 99208  
 Filed Feb. 28, 1977, Ser. No. 772,512  
 Term of patent 14 years  
 Int. Cl. D15-03

U.S. Cl. D15-29



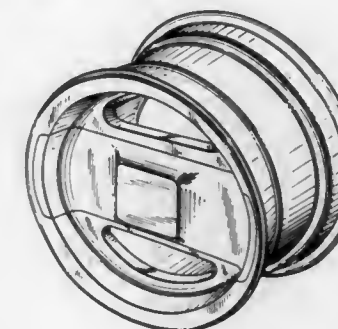
**252,507**  
**COMBINATION PLEASURE AND FISHING BOAT**  
 Forrest L. Wood, Flippin, Ark., assignor to Wood Manufacturing Company, Incorporated, Flippin, Ark.  
 Filed Feb. 23, 1977, Ser. No. 771,336  
 Term of patent 14 years  
 Int. Cl. D12-06

U.S. Cl. D12-62



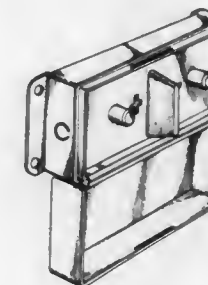
**252,509**  
**WHEEL**  
 Edward A. Kozloski, Babylon, N.Y., assignor to Fiat Motors of North America, Inc., Montvale, N.J.  
 Division of Ser. No. 816,283, Jul. 18, 1977, Pat. No. Des. 248,849, which is a division of Ser. No. 719,721, Sep. 2, 1976, Pat. No. Des. 246,239. This application May 3, 1978, Ser. No. 902,774  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-209



**252,510**  
**TERMINAL FOR JUMP CABLES**  
 Raoul G. Fima, 7454 Gaynor Ave., Van Nuys, Calif. 91406  
 Filed Apr. 27, 1977, Ser. No. 791,371  
 Term of patent 14 years  
 Int. Cl. D13-03

U.S. Cl. D13-13



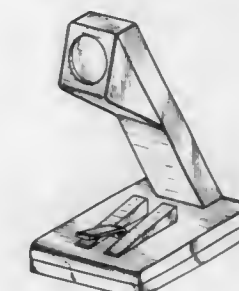
**252,508**  
**WIND DEFLECTOR**  
 Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.  
 Filed Nov. 14, 1977, Ser. No. 851,523  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-181



**252,511**  
**MICROPHONE STAND**  
 Marlin J. Genz, P.O. Box 17, Clitherall, Minn. 56524  
 Filed May 23, 1977, Ser. No. 799,756  
 Term of patent 14 years  
 Int. Cl. D14-03

U.S. Cl. D14-13



252,512

## CASSETTE RECORDER

Andries Van Deuren, Houthalen, Belgium, assignor to U.S. Philips Corporation, Tarrytown, N.Y.  
 Filed May 6, 1977, Ser. No. 794,570  
 Claims priority, application United Kingdom, Nov. 15, 1976, 977937

Term of patent 14 years  
 Int. Cl. D14—01

U.S. Cl. D14—6

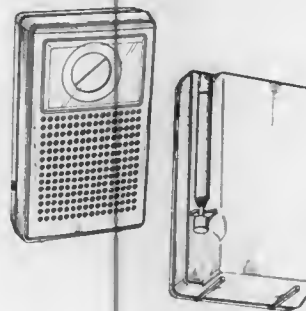


252,514

## PORTABLE RADIO

Takeyoshi Kawano, Kyoto, and Munenori Fujimoto, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kasoma, Japan  
 Filed Mar. 15, 1977, Ser. No. 777,979  
 Claims priority, application Japan, Sep. 20, 1976, 51-37491  
 Term of patent 14 years  
 Int. Cl. D14—03

U.S. Cl. D14—70



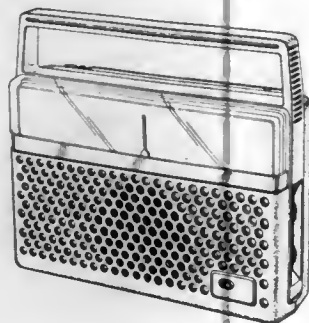
252,513

## PORTABLE RADIO RECEIVER

Katsuhiko Makino, Hsarakata, and Kikuo Ohta, Katoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 10, 1976, Ser. No. 740,459  
 Claims priority, application Japan, May 11, 1976, 51-17523  
 Term of patent 14 years  
 Int. Cl. D14—03

U.S. Cl. D14—70

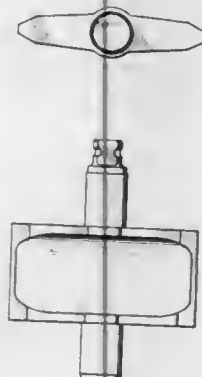


252,515

## FLAPPER VALVE BLADE FOR A CONCRETE PUMP OR THE LIKE

John T. McGraw, Laguna Beach, Calif., assignor to Thomsen Equipment Company, Gardena, Calif.  
 Filed May 20, 1977, Ser. No. 798,914  
 Term of patent 14 years  
 Int. Cl. D15—02

U.S. Cl. D15—7

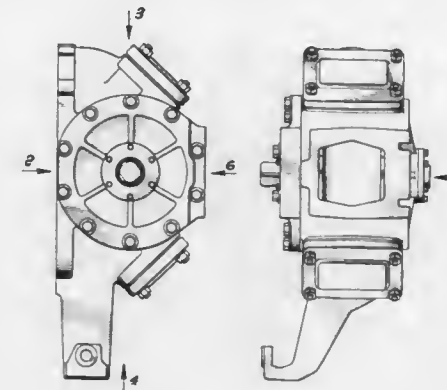


252,516

## FLOW CONTROL VALVE CHAMBER FOR A CONCRETE PUMP OR THE LIKE

John T. McGraw, Laguna Beach, Calif., assignor to Thomsen Equipment Company, Gardena, Calif.  
 Filed Jun. 15, 1977, Ser. No. 806,757  
 Term of patent 14 years  
 Int. Cl. D15—02

U.S. Cl. D15—7

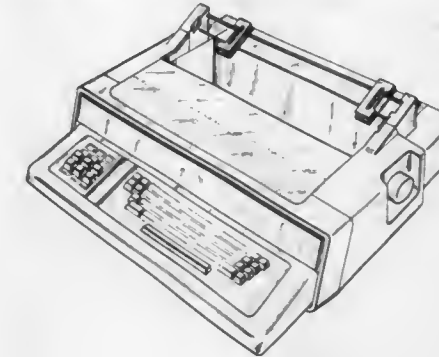


252,519

## PRINTER HOUSING

David E. Roche, Nashua, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.  
 Filed Jan. 10, 1977, Ser. No. 758,027  
 Term of patent 14 years  
 Int. Cl. D18—02

U.S. Cl. D18—23

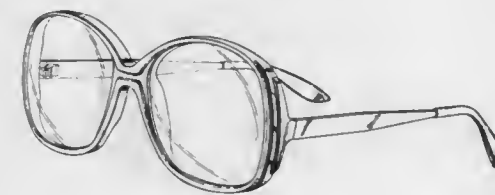


252,517

## PAIR OF SPECTACLES

Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.  
 Filed Sep. 12, 1977, Ser. No. 832,246  
 Term of patent 14 years  
 Int. Cl. D16—06

U.S. Cl. D16—65

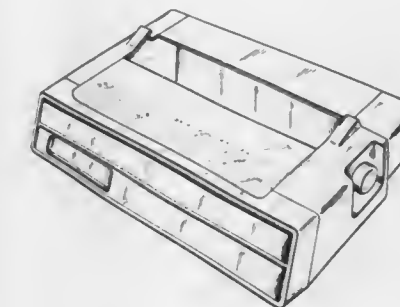
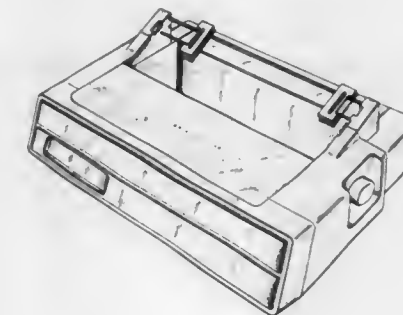
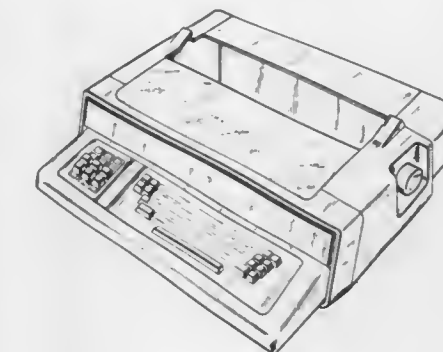
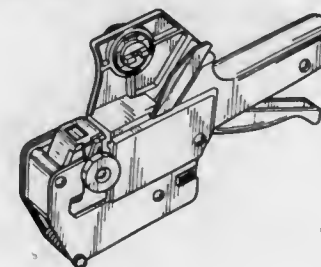


252,518

## HAND OPERATED LABELING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan  
 Filed Jun. 8, 1977, Ser. No. 805,624  
 Term of patent 14 years  
 Int. Cl. D18—02

U.S. Cl. D18—14





252,520  
COMBINED WRITING INSTRUMENT AND CLIP FOR A  
GOLFER OR THE LIKE

Yasuhiro Ijiri, 454 Higashi-Okaya, Sasayama-cho, Taki-gun,  
Hyogo Pref., Japan

Filed Feb. 7, 1978, Ser. No. 875,939

Claims priority, application Japan, Aug. 12, 1977, 52-32213  
Term of patent 14 years

Int. Cl. D19-06

U.S. Cl. D19-46



252,522  
TOY SPACEMAN FIGURE

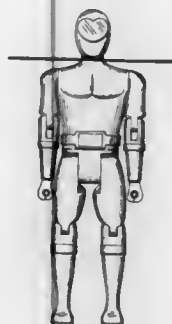
Lawrence T. Jones, Playa Del Rey, and Anson Sims, Granada  
Hills, both of Calif., assignors to California R & D Center,  
Culver City, Calif.

Filed Jan. 23, 1978, Ser. No. 871,156

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-177



252,523  
FISHING LURE BODY

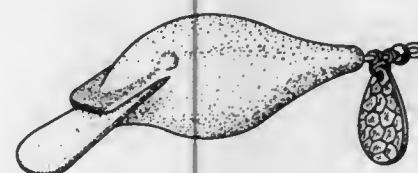
Donald W. Dake, 6460 Salem Ave., Clayton, Ohio 45315

Filed Aug. 15, 1977, Ser. No. 824,989

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-28



252,521  
DOLL

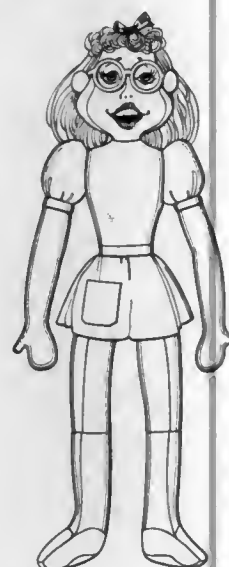
Thomas J. McPartland, 2301 Tigertail Ave., Miami, Fla. 33133

Filed Aug. 3, 1977, Ser. No. 821,562

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-171



252,524  
LIQUID STERILIZER UNIT

James H. Lewis, 68 Glass Ave., London, Ontario, N5W 1Z7,  
Canada

Filed Aug. 2, 1976, Ser. No. 710,361

Claims priority, application Canada, Feb. 5, 1976, 05-02-76-2

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-3



252,525  
STOVE

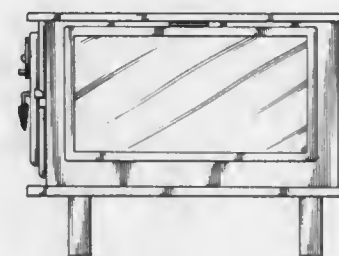
Richard A. Russo, 31 Holiday Rd., Holbrook, Mass. 02343

Filed Apr. 18, 1977, Ser. No. 788,124

Term of patent 14 years

Int. Cl. D23-03

U.S. Cl. D23-97



252,528  
RAZOR

Russell P. Harshberger, P.O. Box 601, Pasadena, Calif. 91102

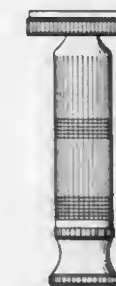
Division of Ser. No. 728,982, Oct. 4, 1976, Pat. No. Des.

250,849. This application Jun. 12, 1978, Ser. No. 915,989

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-46



252,529  
TWEEZER

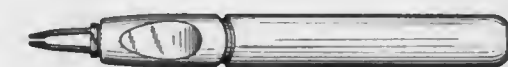
Robert A. Chleda, Westport, Conn., assignor to Clairol Incorporated

Filed Sep. 8, 1977, Ser. No. 831,586

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-55



252,530

MINIATURE GOLF GAME BOARD

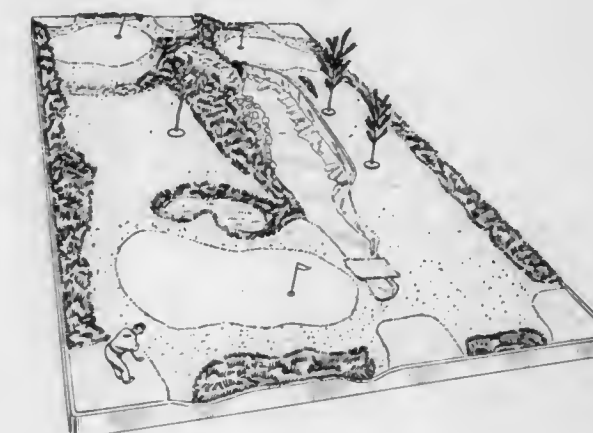
Bernard O. Budish, Minneapolis, Minn., assignor to Victory  
Games, Issaquah, Wash.

Filed Dec. 16, 1977, Ser. No. 861,434

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-27



252,527  
THEATER BUILDING

Terry W. Huffhines, 5300 N. Mersington, Kansas City, Mo.  
64119

Filed Aug. 5, 1977, Ser. No. 822,045

Term of patent 14 years

Int. Cl. D25-03

U.S. Cl. D25-11

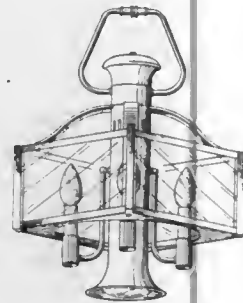


252,531

## LIGHT FIXTURE

Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605  
 Filed Jun. 2, 1977, Ser. No. 802,979  
 Term of patent 14 years  
 Int. Cl. D26—05

U.S. Cl. D48—3

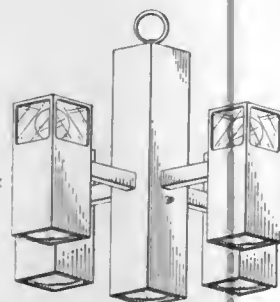


252,532

## LIGHT FIXTURE

Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605  
 Filed Jun. 2, 1977, Ser. No. 802,987  
 Term of patent 14 years  
 Int. Cl. D26—05

U.S. Cl. D48—3

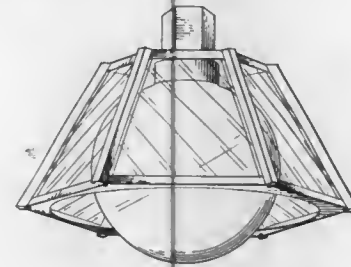


252,533

## LIGHT FIXTURE

Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605  
 Filed Jun. 2, 1977, Ser. No. 802,978  
 Term of patent 14 years  
 Int. Cl. D26—05

U.S. Cl. D48—23 R



252,534

## FLASH LIGHT CASE

Wing-Hung Lun, Chun Fat Factory Bldg. 3 Tsat Po St., Kowloon, Hong Kong  
 Filed Apr. 25, 1977, Ser. No. 790,802  
 Term of patent 14 years  
 Int. Cl. D26—02

U.S. Cl. D48—24 A

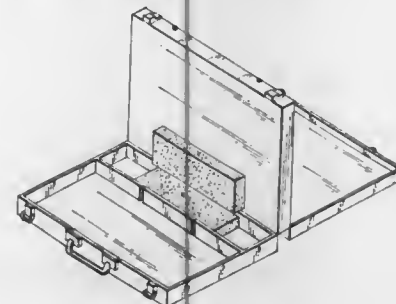


252,535

## COMBINED STORAGE AND CARRYING CASE FOR ART SUPPLIES

Juanita H. MacEvoy, R.R. 2 Box 16, Little Bay Rd., Wading River, N.Y. 11792  
 Filed May 23, 1977, Ser. No. 799,758  
 Term of patent 14 years  
 Int. Cl. D3—02

U.S. Cl. D3—74



## LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1979

NOTE—Arranged in accordance with the first significant character or word of the name  
 (in accordance with city and telephone directory practice).

- AAI Corporation: See—  
 Abbott, David D., 4,162,645, Cl. 86-23.000.  
 AB Kabi: See—  
 Aurell, Leif E.; and Claeson, Karl G., 4,162,941, Cl. 435-23.000.  
 AB Svenska Maskinverken: See—  
 Andersson, Sven E. A., 4,162,702, Cl. 165-142.000.  
 Abbott, David D., to AAI Corporation. Method of making a cartridge. 4,162,645, Cl. 86-23.000.  
 Abe, Seizaburo; Kozima, Masao; and Hosoi, Yuzo, to Nippon Steel Corporation. Austenitic stainless steel having excellent resistance to intergranular and transgranular stress corrosion cracking. 4,162,930, Cl. 148-38.000.  
 ACF Industries, Incorporated: See—  
 Wilkins, Ronald D., 4,162,782, Cl. 251-173.000.  
 Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeyer, Hartmut, to Windmoller & Holscher. Method and apparatus for filling and closing large sacks. 4,162,602, Cl. 53-415.000.  
 Adachi, Akio: See—  
 Yasuda, Katsuya; and Adachi, Akio, 4,163,224, Cl. 340-520.000.  
 Adams, Clair S.: See—  
 Smith, Charles A.; and Adams, Clair S., 4,162,725, Cl. 198-628.000.  
 Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., to Permutit Company, Inc. High velocity composite strainer. 4,162,975, Cl. 210-124.000.  
 Adcock, Willis A., to Texas Instruments Incorporated. Electronic photography system. 4,163,256, Cl. 358-127.000.  
 Addmaster Corporation: See—  
 Walker, Winston G., 4,163,161, Cl. 307-297.000.  
 Aeroquip Corporation: See—  
 Cox, Robert G., 4,162,802, Cl. 285-343.000.  
 Kresky, Fred C.; Loveland, John H.; and Evans, Bryce B., 4,162,801, Cl. 285-45.000.  
 AFL Industries, Inc.: See—  
 Lynch, William M., 4,162,973, Cl. 210-73.00W.  
 Agency of Industrial Science & Technology, Ministry of International Trade & Industry: See—  
 Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.  
 Agui, Takeshi: See—  
 Hisao, Nobuyoshi; and Agui, Takeshi, 4,163,260, Cl. 358-261.000.  
 Aisan Industry Co., Ltd.: See—  
 Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiaki, 4,162,612, Cl. 60-276.000.  
 Aisin Seiki Kabushiki Kaisha: See—  
 Yoshimura, Noboru, 4,162,807, Cl. 297-284.000.  
 Aktiebolaget Atomenergi: See—  
 Bosaeus, Jan A., 4,162,703, Cl. 165-167.000.  
 Aktiebolaget Carl Munters: See—  
 Norback, Per, 4,162,934, Cl. 162-155.000.  
 Akzona Incorporated: See—  
 Spivey, Bron W., 4,162,607, Cl. 57-287.000.  
 Albertson, Robert V.; and Christian, Edward P. Dirty air filter indicator. 4,162,660, Cl. 116-268.000.  
 Albright, James A., to Velsicol Chemical Corporation. Halobenzene sulfonate flame retardants. 4,163,005, Cl. 260-45.70S.  
 Aldenhoven, Ghislans M. A. M., to U.S. Philips Corporation. Automatic stop mechanism. 4,162,756, Cl. 226-43.000.  
 Alfa-Laval AB: See—  
 Filstrup, Poul, 4,163,009, Cl. 260-112.00R.  
 Lidman, Sten M.; and Baum, Engelbert, 4,162,978, Cl. 210-213.000.  
 Alinder, Gilbert L.: See—  
 Anderson, Lloyd E.; and Alinder, Gilbert L., 4,162,809, Cl. 299-37.000.  
 Alkatis, Anthony; and Cells, Paul L., to Mooney Chemicals, Inc. Oil-soluble high metal content transitional metal organic oxy, hydroxy, complexes. 4,162,986, Cl. 252-33.200.  
 Allen, David O., to Buckeye Molding Company. Secondary closure, method and apparatus. 4,162,601, Cl. 53-292.000.  
 Allen, John W.: See—  
 Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.  
 Allen, Norman C. Camera viewfinder. 4,162,838, Cl. 354-223.000.  
 Alles, David S.; Mac Rae, Alfred U.; and Pease, Roger F. W., to Bell Telephone Laboratories, Incorporated. Defining a low-density pattern in a photoresist with an electron beam exposure system. 4,163,155, Cl. 250-492.00B.  
 Altman, Charles W. Spotlight. 4,163,277, Cl. 362-263.000.  
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 Amann, David J.: See—  
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 American Cyanamid Co.: See—  
 Feeny, Richard W., 4,162,913, Cl. 71-92.000.  
 Lovell, James B., 4,163,102, Cl. 542-417.000.  
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 Gillich, Thomas N., 4,162,920, Cl. 106-14.500.  
 American Optical Corporation: See—  
 Gee, Alan E., 4,162,830, Cl. 354-23.00R.  
 American Scanmec, Inc.: See—  
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 American Sterilizer Company: See—  
 Gunther, Donald A., 4,162,942, Cl. 435-17.000.  
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 Westall, Thomas E.; and Miller, Frank, 4,162,600, Cl. 53-120.000.  
 Ameron, Inc.: See—  
 West, Robert L., 4,162,771, Cl. 242-7.220.  
 Amkey, Incorporated: See—  
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 Schumacher, William L., 4,162,821, Cl. 350-96.210.  
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 Anderson, David L., Jr. Substantially drip-proof probe for extracting toxic fluids from hermetically sealed containers. 4,162,745, Cl. 222-148.000.  
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 Mikarai, Makoto, 4,162,758, Cl. 228-131.000.  
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 Asai, Akiji: See—  
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Asel, John R., to Canadian Lady-Canadelle Inc. Apparatus for hot molding of material. 4,162,885, Cl. 425-400.000.

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Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,162,609, Cl. 58-38.00R.

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Bardet, Gerard, 4,163,140, Cl. 219-10.55B.

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Avtec Industries, Inc.: See—  
Helwig, William F., Jr.; and Jeffries, Henry D., Jr., 4,163,269, Cl. 361-42.000.

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Chasar, Dwight W., 4,163,008, Cl. 260-45.85B.

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Lining, Kurt; and Wood, Charles L., 4,162,910, Cl. 65-163.000.

Ballas, George C., to Weed Eater, Inc. Rotary cutting assembly. 4,162,575, Cl. 30-347.000.

Banks, Donald S.: See—  
Zuerndorfer, Henry D.; Maurer, Hans A.; and Banks, Donald S., 4,163,231, Cl. 343-5.0CM.

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Bareis, Alfred: See—  
Dangelmaier, Karl; and Bareis, Alfred, 4,162,734, Cl. 414-27.000.

Barker, Brynley M.: See—  
Barker, Robert J.; and Barker, Brynley M., 4,162,744, Cl. 221-251.000.

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Barron, Daniel. Acousto-optical device for removing bubble pulse from reflected sonar signal. 4,163,205, Cl. 340-7.00R.

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Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., 4,162,867, Cl. 408-157.000.

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Richter, Peter; Wigger, August; Fahrbach, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.

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Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.

Magnussen, Peter; Herrmann, Guenter; and Frommer, Elmar, 4,163,027, Cl. 260-586.00P.

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Rotter, Gerhard, 4,163,263, Cl. 360-14.000.

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Narayan, Thirumurti; and Cenko, Moses, 4,163,086, Cl. 521-155.000.

Bassett, William W.; and Johnson, Eugene D., to Honeywell Inc. Agitation apparatus. 4,162,856, Cl. 366-213.000.

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Freeman, Joseph T.; and Colish, Aaron, 4,162,544, Cl. 4-185.00H.

Batzer, Hans: See—  
Buxbaum, Lothar; Habermeier, Jürgen; and Batzer, Hans, 4,163,099, Cl. 528-172.000.

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Baum, Engelbert: See—  
Lidman, Sten M.; and Baum, Engelbert, 4,162,978, Cl. 210-213.000.

Bauman, Marcus: See—  
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Pernic, Stanley J., 4,162,974, Cl. 210-120.000.

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Bier, Peter; and Binsack, Rudolf, 4,163,100, Cl. 525-3.000.

Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-581.000.

Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.

Hess, Bernhard; and Kraft, Klaus, 4,163,093, Cl. 528-301.000.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.

Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.

Klein, Johann, 4,162,674, Cl. 128-680.000.

Kramer, Erich; Nickel, Horst; and Puchner, Fritz, 4,163,012, Cl. 260-182.000.

Kubens, Rolf; Ehrhard, Fritz; and Gebauer, Herbert, 4,163,095, Cl. 528-67.000.

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Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.

Pettelkau, Hans-Jürgen; and Hohmann, Gerhard, 4,163,091, Cl. 526-208.000.

Reinehr, Ulrich; Pieper, Christian; and Kleinschmidt, Peter, 4,163,078, Cl. 428-373.000.

Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.

Ullrich, Martin, 4,162,854, Cl. 366-83.000.

Zlokarnik, Marko, 4,162,970, Cl. 210-15.000.

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Rudolph, Rene, 4,163,272, Cl. 361-127.000.

Beafore, Frank J., to Dow Chemical Company. The. Method for facilitating transportation of particulate on a conveyor belt in a cold environment. 4,163,079, Cl. 428-411.000.

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Becker, William D.: See—  
Brodsky, Harvey A.; and Becker, William D., 4,163,123, Cl. 179-15.0AL.

Beckman, John H., to Union Carbide Corporation. Reversible shirred casing and method for producing it. 4,162,693, Cl. 138-118.100.

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Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.

Beebe, Burke A.: See—  
Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., 4,163,090, Cl. 526-88.000.

Beecham Group Limited: See—  
Box, Stephen J.; and Hood, John D., 4,163,051, Cl. 424-124.000.

Beentjes, Gerardus: See—  
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, 4,162,945, Cl. 202-173.000.

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Belcher, John A., to United States Steel Corporation. Spotting method and apparatus for coke oven batteries. 4,162,944, Cl. 201-41.000.

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Alles, David S.; Mac Rae, Alfred U.; and Pease, Roger F. W., 4,163,155, Cl. 250-492.00B.

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Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., 4,163,237, Cl. 357-16.000.

Soos, Nicholas A., 4,163,072, Cl. 427-96.000.

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Plunkett, Richard A.; Neff, Jerry L.; and Bemish, Timothy A., 4,163,025, Cl. 260-570.900.

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Bendix Corporation, The: See—  
Kosakowski, Henry R., 4,163,221, Cl. 340-347.0AD.

Bennett, Robert A., to Risdson Manufacturing Company. Squeezeable dispenser with outlet closure. 4,162,749, Cl. 222-633.000.

Bennett, Robert S., to Risdson Manufacturing Company. Dispenser using bellville diaphragm. 4,162,748, Cl. 222-632.000.

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Berit, Bradley I., to De Laval Separator Company, The. Discharger for centrifuges. 4,162,981, Cl. 210-375.000.

Bernert, Claus-Rudiger: See—  
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Berning, David W. Audio amplifier. 4,163,198, Cl. 330-277.000.

Bessone, Carlo S.: See—  
Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.

Bianchi, Giuseppe: See—  
De Nora, Oronzio; Bianchi, Giuseppe; and Meneghini, Giovanni, 4,162,953, Cl. 204-252.000.

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Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.

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Binsack, Rudolf: See—  
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Bishop, James S.: See—  
Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., 4,163,227, Cl. 340-662.000.

Bixler, Kenneth D.: See—  
Reifers, Richard F.; and Bixler, Kenneth D., 4,162,759, Cl. 229-250R.

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Block, Robert S.; and Martin, John R. Method and system for subscription television billing and access. 4,163,254, Cl. 358-122.000.

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Mistry, Kantilal; and Sperber, Martin, 4,163,252, Cl. 358-118.000.

Bloom Engineering Company, Inc.: See—  
Hirose, Yasuo, 4,162,890, Cl. 431-351.000.

Blouin, John J.: See—  
Veltman, Preston L.; and Blouin, John J., 4,162,926, Cl. 127-62.000.

Boaz, David P.: See—  
Antonson, Stephen A.; and Boaz, David P., 4,163,077, Cl. 428-355.000.

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Bodenseewerk Perkin-Elmer & Co., GmbH: See—  
Huber, Bernhard W., 4,162,849, Cl. 356-36.000.

Bodin, Leslie J.; and Marino, Francis C., to Burroughs Corporation. Composite symbol display apparatus. 4,163,229, Cl. 340-745.000.

Boehringer Mannheim GmbH: See—  
Wahlefeld, August W.; Looser, Siegfried; and Sturmman, Klaus A., 4,162,979, Cl. 210-282.000.

Boeing Company, The: See—  
Fitzsimmons, George W., 4,163,232, Cl. 343-6.80R.

Boersma, Rintje: See—  
Marien, Pieter; Boersma, Rintje; and Irik, Gijsbert W., 4,163,118, Cl. 174-99.00B.

Bohemen, John, to British Petroleum Company Limited, The. Blends containing elastomers. 4,162,999, Cl. 260-28.50B.

Bohtz, Gottfried: See—  
Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, 4,163,061, Cl. 424-279.000.

Boldebeck, Edith M.: See—  
Banucci, Eugene G.; and Boldebeck, Edith M., 4,163,030, Cl. 525-429.000.

Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. Novel derivatives of 9-substituted phenyl-3,7-dimethyl-2,4,6,8-tetraene. 4,163,103, Cl. 542-427.000.

Borden, Inc.: See—  
Carumpalos, Constantine G.; and Pansing, Harry E., 4,163,001, Cl. 260-29.6MN.

Bosaeus, Jan A., to Aktiebolaget Atomenergi. Plate-type heat exchanger. 4,162,703, Cl. 165-167.000.

Bosch Siemens Hausgerate GmbH: See—  
Farber, Karl-Heinz, 4,163,181, Cl. 318-245.000.

Graf, Richard, 4,162,747, Cl. 222-185.000.

Boit, John A. Luggage carrier assembly. 4,162,755, Cl. 224-326.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Pushbutton keyboard system. 4,163,125, Cl. 200-5.00A.

Bould, Fred, to Westinghouse Electric Corp. Circuit breaker apparatus including jack shaft support. 4,163,133, Cl. 200-153.05C.

Bowers, George W., to Verbatim Corporation. Belt drive cartridge. 4,162,774, Cl. 242-192.000.

Bowmar Instrument Corporation: See—  
Harden, Phillip L., 4,163,138, Cl. 200-310.000.

Box, Stephen J.; and Hood, John D., to Beecham Group Limited. Streptomycetal antibiotic. 4,163,051, Cl. 424-124.000.

Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, to DeKalb AgResearch, Inc. Heat producing device. 4,162,655, Cl. 110-212.000.

Bradner, William T.: See—  
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,162,938, Cl. 435-75.000.

Brandenburg, Klaus, to U.S. Philips Corporation. Stylus printer impact energy control. 4,162,858, Cl. 400-124.000.

Brandes, Wilhelm: See—  
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.

Brandon, Fred Y., to International Business Machines Corporation. Hot roll fuser early closure inhibitor. 4,162,847, Cl. 355-14.000.

Brauer, Walter H.: See—  
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, 4,162,635, Cl. 73-623.000.

Briggs, Albert T.: See—  
Decima, Elmer E.; and Briggs, Albert T., 4,162,626, Cl. 72-238.000.

Briggs, Barry D.; and Lawter, Ray L., to NCR Corporation. Electrical connector. 4,162,817, Cl. 339-75.0MP.

Bristol-Myers Company: See—  
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,162,938, Cl. 435-75.000.

British Petroleum Company Limited, The: See—  
Bohemen, John, 4,162,999, Cl. 260-28.50B.

British Railways Board: See—  
Wickens, Alan H., 4,162,653, Cl. 105-166.000.

Britton, Thomas C.; and Trepanier, Donald L., to Dow Chemical Company, The. Heterocyclic containing hydrazinecarbothioamides. 4,163,104, Cl. 544-160.000.

Brodsky, Harvey A.; and Becker, William D. Electronic tour guide system. 4,163,123, Cl. 179-15.0AL.

Brokmeier, Dieter: See—  
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.

Brooks, Cletus A., to Selective Feeder Company. Animal feeder using magnetically biased switch. 4,162,683, Cl. 119-51.00R.

Brown, Jack: See—  
Coughenour, Donald J.; Brown, Jack; and Herr, John A., 4,163,158, Cl. 250-561.000.

Brown, William R. Necktie hanger. 4,162,753, Cl. 223-85.000.

Browne, Hubbard P.: See—  
Stapleton, Patrick; Browne, Hubbard P.; and Weatherholt, Dallas D., 4,162,868, Cl. 414-9.000.

Bruno, Patrick J. Tooth cleaner. 4,162,553, Cl. 15-167.00R.

Brzozowski, Zbigniew; Kielkiewicz, Jędrzej; Rokicki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguslaw, to Politechnika Warszawska. Method for production of new thermal and chemical resistant polyurethane plastics. 4,163,087, Cl. 521-176.000.

Buckeye Molding Company: See—  
Allen, David O., 4,162,601, Cl. 53-292.000.

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Bullock, Michael K., to International Business Machines Corporation. Job separation by a skewed trough in the paper path. 4,162,786, Cl. 271-64.000.

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Burckardt, Karl H.: See—  
Bahr, Dietrich J.; Burckardt, Karl H.; and Hasselmeier, Helmut, 4,163,285, Cl. 364-710.000.

Burke, Richard M. Bookmark. 4,162,659, Cl. 116-234.000.

Burke, Robert: See—  
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, 4,162,635, Cl. 73-623.000.

Burnham Corporation: See—  
Infeld, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.

Burroughs Corporation: See—  
Bodin, Leslie J.; and Marino, Francis C., 4,163,229, Cl. 340-745.000.

DeMoss, Dean, 4,163,267, Cl. 360-102.000.

Wu, Alexander C., 4,162,842, Cl. 355-3.0DD.

Burnin, Vitaly A.: See—  
Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Burnin, Vitaly A.; and Novikov, Nikolai V., 4,162,543, Cl. 3-1.700.

Bush Universal, Inc.: See—  
Darrin, John W., 4,162,583, Cl. 36-76.00R.



- Butler, Joe D.: See—  
Heitman, Marshall D.; and Butler, Joe D., 4,162,713, Cl. 180-242.000.
- Butler, Ronald N.: See—  
Groombridge, Frederick W. H.; and Butler, Ronald N., 4,162,548, Cl. 4-300.000.
- Buxbaum, Lothar; Habermeyer, Jürgen; and Batzer, Hans, to Ciba-Geigy Corporation. Polyesters prepared from NH containing carboxylic acids. 4,163,099, Cl. 528-172.000.
- Buzio, Pierpaolo; and Edefont, Lucio, to Società Italiana Resine S.I.R. S.p.A. Flexible double-layer polypropylene laminates for the packaging of food products. 4,163,080, Cl. 428-424.000.
- C. A. Pemberton & Co. Limited: See—  
Kyle, Rhoden R., 4,162,599, Cl. 53-77.000.
- Cadillac Gage Company: See—  
Jackson, Theodore A., 4,162,555, Cl. 15-250.010.
- Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., to Carando Machine Works. Dual cutter boring head. 4,162,867, Cl. 408-157.000.
- Caldwell, Oscar D. Method for ameliorating hazardous conditions associated with containers which contain vapors of combustible liquid. 4,162,694, Cl. 141-1.000.
- California Institute of Technology: See—  
Ross, Ronald G., 4,163,194, Cl. 324-29.500.
- Calspan Corporation: See—  
Becker, Harold D., 4,163,233, Cl. 343-12.00R.
- Treanor, Charles E., 4,163,199, Cl. 331-94.50G.
- Cambiaso, Cesar L.; and Masson, Pierre L., to Technicon Instruments Corporation. Mouse serum. 4,162,895, Cl. 435-7.00B.
- Campbell, Bruce D.; and Lopez, Eugene F., to Raychem Corporation. Heat-recoverable articles and their use. 4,163,117, Cl. 174-74.00A.
- Camsco, Inc.: See—  
Higgins, Bobby L., 4,162,763, Cl. 239-101.000.
- Canadian Industries Limited: See—  
Hine, Kenneth E., 4,162,949, Cl. 204-140.000.
- Canadian Lady-Canadelle Inc.: See—  
Asel, John R., 4,162,885, Cl. 425-400.000.
- Canaris, Valerie M., to R. O. Hull & Company, Inc. Acid zinc plating baths and methods for electrodeposition bright zinc deposits. 4,162,947, Cl. 204-55.00R.
- Cannon, Joseph G.; and Long, John P., to University of Iowa Research Foundation. Aminotetralin adrenergic  $\beta$ -agonists. 4,163,063, Cl. 424-330.000.
- Canon Kabushiki Kaisha: See—  
Ito, Yui, 4,162,827, Cl. 351-7.000.
- Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyasu, 4,162,839, Cl. 354-23.00D.
- Shirahase, Reiji; and Komori, Shigehiro, 4,162,787, Cl. 271-173.000.
- Tanikoshi, Kinji, 4,163,182, Cl. 318-331.000.
- Capintec Inc.: See—  
Suzuki, Arata, 4,163,152, Cl. 250-374.000.
- Capuano, Italo A., to Olin Corporation. Method of measuring nitrogen trichloride in a process for the safe production of polychloroisocyanurates. 4,162,897, Cl. 23-232.00C.
- Carando Machine Works: See—  
Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., 4,162,867, Cl. 408-157.000.
- Cardenas, Ricardo L.: See—  
Flournoy, Kenneth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,162,989, Cl. 252-312.000.
- Carlin, Joseph T.: See—  
Flournoy, Kenneth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,162,989, Cl. 252-312.000.
- Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., to Motorola, Inc. Unified chassis for a two-way radio. 4,163,274, Cl. 361-417.000.
- Carcraft Manufacturing Company: See—  
Shortell, Kenneth R., 4,162,546, Cl. 4-191.000.
- Carter, David L., to Texas Instruments Incorporated. Second level phase lines for CCD line imager. 4,163,239, Cl. 357-24.000.
- Carter, Lemuel, Jr.: See—  
Davis, McKinley D.; Stearnes, Robert; and Carter, Lemuel, Jr., 4,162,650, Cl. 99-419.000.
- Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., to Société Nationale d'Etude et de Construction de Moteurs d'Aviation. Combustion chamber for turbo engines. 4,162,611, Cl. 60-39.650.
- Carumpalos, Constantine G.; and Pansing, Harry E., to Borden, Inc. Water base flexographic dye ink. 4,163,001, Cl. 260-29.6MN.
- Case Western Reserve University: See—  
Warren, Kenneth S., 4,162,850, Cl. 356-38.000.
- Caterpillar Tractor Co.: See—  
Grooss, Frank A.; and Simmons, Gerald P., 4,162,872, Cl. 414-713.000.
- Tritipoe, Jack H., 4,162,570, Cl. 29-427.000.
- Cecchi, Carlo: See—  
Grattapaglia, Giorgio; and Cecchi, Carlo, 4,162,615, Cl. 60-478.000.
- Celanese Corporation: See—  
Groombridge, Frederick W. H.; and Butler, Ronald N., 4,162,548, Cl. 4-300.000.
- Hannon, Martin J.; and Forschirm, Alex S., 4,163,031, Cl. 525-5.000.
- Cells, Paul L.: See—  
Alkatis, Anthony; and Cells, Paul L., 4,162,986, Cl. 252-33.200.
- Caner, Moses: See—  
Narayan, Thirumurti; and Caner, Moses, 4,163,086, Cl. 521-155.000.
- Central Glass Company, Limited: See—  
Yagii, Kiyoshi; and Oshio, Hideki, 4,162,948, Cl. 204-80.000.
- Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: See—  
Mairy, Bernard G., 4,162,699, Cl. 164-4.000.
- Cha, Chang Y., to Occidental Oil Shale, Inc. Determining the locus of a processing zone in an oil shale retort by monitoring pressure drop across the retort. 4,162,706, Cl. 166-251.000.
- Chang, Richard S.; and Klose, George J., to Mattel, Inc. Obstacle game. 4,162,792, Cl. 273-85.00G.
- Chapman, James W.: See—  
Van der Beck, Roland R.; and Chapman, James W., 4,162,826, Cl. 350-319.000.
- Charles, Paul A. S.; and Williams, Frederic D. M., to Royal Flush (1979) Inc. Filtering elements. 4,162,549, Cl. 4-318.000.
- Charudattan, Raghavan, to Charudattan, Raghavan. Composition and process for controlling milkweed vine. 4,162,912, Cl. 71-79.000.
- Chasar, Dwight W., to B. F. Goodrich Company, The. Dual purpose stabilizer compounds and polymer compositions containing same. 4,163,008, Cl. 260-45.85B.
- Chenard, Jean-Yves: See—  
Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.
- Chertok, Allan, to Concord Computing Corporation. Document printer. 4,162,651, Cl. 101-287.000.
- Chesner, Ray J., to American Scannec, Inc. Vacuum filter segment with replaceable sector plates. 4,162,982, Cl. 210-486.000.
- Chevron Research Company: See—  
Stangeland, Bruce E., 4,162,962, Cl. 208-58.000.
- Chinon Industries Incorporated: See—  
Ito, Isami, 4,163,261, Cl. 360-13.000.
- Cho, Yush-Chye. Safety folding chair. 4,162,806, Cl. 297-19.000.
- Chomicz, Danuta: See—  
Brzozowski, Zbigniew; Kielkiewicz, Jędrzej; Rokieli, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.
- Christian, Edward P.: See—  
Albertson, Robert V.; and Christian, Edward P., 4,162,660, Cl. 116-268.000.
- Christy, Donald. Solar energy panel and medium for use therein. 4,162,671, Cl. 126-400.000.
- Ciancibello, Carmine A.: See—  
Munter, Ernst A.; and Ciancibello, Carmine A., 4,163,287, Cl. 364-757.000.
- Ciba-Geigy Corporation: See—  
Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., 4,163,097, Cl. 525-531.000.
- Buxbaum, Lothar; Habermeyer, Jürgen; and Batzer, Hans, 4,163,099, Cl. 528-172.000.
- Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, 4,163,061, Cl. 424-279.000.
- Kristiansen, Odd; and Durr, Dieter, 4,163,056, Cl. 424-324.000.
- Lind, Hanns; and Moser, Paul, 4,163,007, Cl. 260-45.75R.
- Seiz, Wolfgang; and Moser, Roland, 4,163,096, Cl. 528-69.000.
- Spivack, John D., 4,163,006, Cl. 260-45.8NT.
- Zondler, Helmut; and Schneider, Wolfgang, 4,163,098, Cl. 528-99.000.
- Cilek, Eugene T.: See—  
Cilek, Wallace F., 4,163,065, Cl. 426-94.000.
- Cilek, Gregory J.: See—  
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- Cilek, Wallace F., to Cilek, Eugene T.; and Cilek, Gregory J., part interest to each. Edible interlocked components for ceremonial ingestion. 4,163,065, Cl. 426-94.000.
- Citizen Watch Co. Ltd.: See—  
Konii, Tsuyoshi, 4,163,230, Cl. 340-765.000.
- Claeson, Karl G.: See—  
Aurell, Leif E.; and Claeson, Karl G., 4,162,941, Cl. 435-23.000.
- Clapper, Thomas W., to Kerr-McGee Corporation. Process for the removal of solid particulate materials from crude shale oils. 4,162,965, Cl. 208-177.000.
- Clark, Michael T.; and ten Haken, Pieter, to Shell Oil Company. Fungicidal benzaldehyde-N-formyl-phenylhydrazones. 4,163,062, Cl. 424-324.000.
- Clay, Paul E.; and Floyd, James K., to American Air Filter Company, Inc. Silencer-separator device. 4,162,904, Cl. 55-276.000.
- Clews, K. Malcolm: See—  
Kvapil, Rudolph; and Clews, K. Malcolm, 4,162,808, Cl. 299-2.000.
- Clive-Smith, Martin, to Sea Containers, Ltd. Collapsible container. 4,162,737, Cl. 220-1.500.
- Close, Joseph B., Jr. Electrical box seal construction. 4,163,137, Cl. 300-302.000.
- Cluett, Peabody & Co., Inc.: See—  
Lawrence, Jackson; and Cramer, Robert S., 4,162,563, Cl. 28-163.000.
- Cobb, Raymond L., to Phillips Petroleum Company. 3,4,5,6-Tetrahydropyromellitimides. 4,163,014, Cl. 260-326.00C.
- Cobbs, Walter H., Jr.; and Stewart, Martin J., to Nordson Corporation. Plastic scrap recovery apparatus. 4,162,880, Cl. 425-202.000.
- Coburn, Robert E., to Molins Machine Company, Inc. Head locking means for automatic slitter scorer. 4,162,643, Cl. 83-499.000.
- Coch, Lester, to Walde Kohinoor, Inc. Non-polluting system for metal surface treatments. 4,162,680, Cl. 118-76.000.

- Cohen, Noel; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of 2,6,10-trimethyl-undecan-1-ol. 4,163,021, Cl. 260-456.00P.
- Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., to GTE Sylvania Incorporated. Energy saving fluorescent lamp. 4,163,176, Cl. 315-53.000.
- Cojafex B.V.: See—  
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, 4,162,945, Cl. 202-173.000.
- Colish, Aaron: See—  
Freeman, Joseph T.; and Colish, Aaron, 4,162,544, Cl. 4-185.00H.
- Combustion Engineering Inc.: See—  
Enege, David N., 4,162,901, Cl. 55-17.000.
- Combustion Service and Equipment Corporation: See—  
Infeld, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.
- Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines: See—  
Serrano, Francisco de Assis Manuel, 4,162,551, Cl. 14-69.500.
- Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): See—  
Giraud, Georges M., 4,163,210, Cl. 340-146.10E.
- Vinot, Daniel, 4,163,288, Cl. 364-900.000.
- Concord Computing Corporation: See—  
Chertok, Allan, 4,162,651, Cl. 101-287.000.
- Continental Oil Company: See—  
Gorin, Everett, 4,162,963, Cl. 208-108.000.
- Cook, Gerald H.; and Ruck, Bernard W., to Polaroid Corporation. Photographic film drive system employing inertia dumper/energy dissipater. 4,162,829, Cl. 352-166.000.
- Cook, Ronald F.: See—  
Garbero, James; and Cook, Ronald F., 4,162,814, Cl. 312-223.000.
- Cooper Laboratories, Inc.: See—  
Diamond, Julius, 4,163,022, Cl. 260-553.00R.
- Copal Company Limited: See—  
Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.
- Coq B.V.: See—  
Marien, Pieter; Boersma, Rintje; and Irik, Gijsbert W., 4,163,118, Cl. 174-99.00B.
- Corbellini, Glaucio. Water-removal blade for paper-making machines. 4,162,937, Cl. 162-352.000.
- Corbett, Constance R.: See—  
Melachouris, Nicholas; Fracaro, Brenda B.; and Corbett, Constance R., 4,163,069, Cl. 426-582.000.
- Cornelius, Gordon. Trailer drive apparatus. 4,162,711, Cl. 180-13.000.
- Correll, Richard R. Safety interlock system for fire truck pump throttle control. 4,162,714, Cl. 180-53.00R.
- Corrieri, Guglielmo: See—  
Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.
- Cosman, Michael A. Pendulum drawing machine. 4,162,577, Cl. 33-27.00L.
- Coughenour, Donald J.; Brown, Jack; and Herr, John A., to Singer Company, The. Sewing machine bobbin thread run-out alarm using reflected light. 4,163,158, Cl. 250-561.000.
- Coulombe, George. Automatic releasing seat belt. 4,162,715, Cl. 280-801.000.
- Cox, Robert G., to Aeroquip Corporation. Permanent flareless tube connector. 4,162,802, Cl. 285-343.000.
- Cramer, Robert S.: See—  
Lawrence, Jackson; and Cramer, Robert S., 4,162,563, Cl. 28-163.000.
- Cremer, George D., to International Harvester Company. Processes for making hollow metal microballoons and the products thereof. 4,162,914, Cl. 75-0.50B.
- Crist, V. William, Jr. Electric fence cable assembly. 4,162,783, Cl. 256-10.000.
- Crowther, Ted J.: See—  
Sutherland, Kent K.; Crowther, Ted J.; and Salmond, Kent A., 4,163,290, Cl. 365-125.000.
- Cudzik, Daniel F., to Reynolds Metals Company. Tab system. 4,162,743, Cl. 220-270.000.
- Cullen, Bryan L.: See—  
Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., 4,163,274, Cl. 361-417.000.
- Culmer, Daniel D., to National Semiconductor Corporation. System for establishing and steering a precise current. 4,163,188, Cl. 323-4.000.
- Cummings, Gary J., to Mattel, Inc. Game scoring system. 4,162,793, Cl. 273-121.00A.
- Cunningham, Alton J.: See—  
Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., 4,163,275, Cl. 362-80.000.
- Curry, Charles D. B.: See—  
Reins, Edward R.; and Curry, Charles D. B., 4,163,286, Cl. 364-719.000.
- Cuson, Stanley N.: See—  
Ten Broeck, Dale K.; Cuson, Stanley N.; and Sorenson, Hal K., 4,162,766, Cl. 239-656.000.
- Cutler-Hammer, Inc.: See—  
Piber, Earl T., 4,163,136, Cl. 200-296.000.
- D. R. K. Limited: See—  
Kelsey, David R., 4,162,790, Cl. 273-58.00C.
- D. Swarovski & Co.: See—  
Schwab, Kurt; and Koholka, Richard, 4,162,820, Cl. 350-36.000.
- Daetwyler, Kurt; and Jaggi, Rudolf, to International Business Machines Corporation. Method of modifying the performance characteristics of a Josephson junction. 4,163,156, Cl. 250-492.00B.
- Daigle, Milton L. Center section for oil well perforation testing device. 4,162,705, Cl. 166-186.000.
- Daimler-Benz Aktiengesellschaft: See—  
Altmann, Werner, 4,162,637, Cl. 74-711.000.
- Dakota Electron, Inc.: See—  
Johnson, Phillip R., 4,162,708, Cl. 172-4.500.
- Daleo, Joseph, to Triple Cuff Corporation. Multiple-cuff handcuff. 4,162,622, Cl. 70-16.000.
- Dallen, John A.; and Green, Harry W., to Standard Products Company, The. Waste disposal by incineration. 4,162,656, Cl. 110-221.000.
- Damman, Bernard A. Anchor bolt assembly. 4,162,596, Cl. 52-295.000.
- Damasis, John A.; and Rageb, Sam M., to Dana Corporation. Method of making metal gaskets. 4,162,569, Cl. 29-417.000.
- Dana Corporation: See—  
Damasis, John A.; and Rageb, Sam M., 4,162,569, Cl. 29-417.000.
- Dangelmaier, Karl; and Bareis, Alfred, to L. Schuler GmbH. Aligning and stacking arrangement. 4,162,734, Cl. 414-27.000.
- Daradimos, Georg: See—  
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
- Darby, Ronald A. Automatic method to identify aircraft types. 4,163,283, Cl. 364-439.000.
- Darrin, John W., to Bush Universal, Inc. Shoe stiffener. 4,162,583, Cl. 36-76.00R.
- Davies, William, to J. C. Renfroe and Sons, Inc. Lifting clamp. 4,162,804, Cl. 294-101.000.
- Davis, McKinley D.; Stearnes, Robert; and Carter, Lemuel, Jr. Barbecue pit apparatus. 4,162,650, Cl. 99-419.000.
- Daymond Limited: See—  
Reid, Robert; and Lustvee, Kaljo, 4,162,861, Cl. 403-242.000.
- De Laval Separator Company, The: See—  
Berit, Bradley L., 4,162,980, Cl. 210-360.00R.
- Berit, Bradley L., 4,162,981, Cl. 210-375.000.
- De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: See—  
de Goede, Barend L., 4,163,122, Cl. 179-15.0AT.
- DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, to Procter & Gamble Company, The. Textile treatment compositions. 4,162,984, Cl. 252-8.800.
- Decaux, Jean-Claude, to J. C. Decaux Paris, Publicite Abrisbus. Display panel with movable posters. 4,162,585, Cl. 40-518.000.
- Decima, Elmer E.; and Briggs, Albert T., to Wean United, Inc. Rolling mill. 4,162,626, Cl. 72-238.000.
- Deere & Company: See—  
Guetzlaff, Robert P., 4,162,567, Cl. 29-159.00R.
- de Goede, Barend L., to De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Method and apparatus for automatically correcting errors in a cyclic routing memory of a time division multiplexed trunk exchange. 4,163,122, Cl. 179-15.0AT.
- DeGroot, Theodore C. Lightweight, quick assembly furniture. 4,162,731, Cl. 211-126.000.
- DeKalb AgResearch, Inc.: See—  
Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Mescham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.
- Delpuech, Jean-Jacques: See—  
Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.
- DeMaggio, John M. Laser beam arrangement. 4,163,200, Cl. 331-94.50C.
- Demange, Michel: See—  
Septier, Louis; Dubrous, Francis; and Demange, Michel, 4,162,916, Cl. 75-21.000.
- Demers, Normand; and Martin, Claude. Measuring and dispensing apparatus. 4,162,750, Cl. 222-250.000.
- Demkowicz, Robert M.: See—  
Uzumcu, Ali I.; Thorsen, Elmer J., Jr.; and Demkowicz, Robert M., 4,162,728, Cl. 206-345.000.
- DeMoss, Dean, to Burroughs Corporation. Flying head with compound-foil. 4,163,267, Cl. 360-102.000.
- De Nora, Oronzio; Bianchi, Giuseppe; and Meneghini, Giovanni, to Oronzio de Nora Impianti Elettrochimici S.p.A. Monopolar electrolytic diaphragm cells with removable and replaceable dimensionally stable anodes and method of inserting and removing said anodes. 4,162,953, Cl. 204-252.000.
- Deroide, Bruno: See—  
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.
- Deschamps, Andre: See—  
Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismund, 4,163,043, Cl. 423-234.000.
- Descovich, Theodore; Smith, Jack F.; and Riordan, Edward D., to Avon Products, Inc. Method and apparatus for assembling rings. 4,163,142, Cl. 219-79.000.
- Desnarquest et C.: See—  
Bardet, Gerard, 4,163,140, Cl. 219-10.55B.
- Dethlefs, David H. Fishing pole. 4,162,587, Cl. 43-18.00R.
- Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismund, to Institut Francais du Pétrole. Process for removing H<sub>2</sub>S and CO<sub>2</sub> from



- gases and regenerating the adsorbing solution. 4,163,043, Cl. 423-234.000.
- Dhondt, Roland O., to Union Oil Company of California. Shale retorting process and apparatus. 4,162,960, Cl. 208-11.00R.
- Diamalt Aktiengesellschaft: See—
- Maeke, Siegfried; and Rambacher, Paul, 4,163,017, Cl. 260-397.100.
- Diamond International Corporation: See—
- Anderson, Walter F.; and Meyer, Ronald A., 4,162,746, Cl. 222-153.000.
- Reifers, Richard F.; and Bixler, Kenneth D., 4,162,759, Cl. 229-2.50R.
- Diamond, Julius, to Cooper Laboratories, Inc. Carbamylguanidine antimicrobial compounds. 4,163,022, Cl. 260-553.00R.
- DiLaura, David L.: See—
- Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., 4,162,853, Cl. 356-225.000.
- Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., to Bell Telephone Laboratories, Incorporated. High mobility multilayered heterojunction devices employing modulated doping. 4,163,237, Cl. 357-16.000.
- Dippold, William L.: See—
- Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klai-ber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.
- Dixon, Kenneth K.: See—
- Buerger, Walter R.; Dixon, Kenneth K.; and Monier, Jacques F., 4,163,212, Cl. 340-146.30H.
- Dodd, Alan M., to Dunlop Limited. Tire deflation warning device. 4,163,207, Cl. 340-58.000.
- Doi, Tadashi; and Takahashi, Harumi, to Kao Soap Co., Ltd. Process for preparation of asphalt-epoxy resin composition. 4,162,998, Cl. 260-28.00R.
- Domtar Inc.: See—
- Lapointe, Joseph A., 4,162,769, Cl. 241-68.000.
- Donaldson Company, Inc.: See—
- Sullivan, Bruce M.; and Kaluza, Allen M., 4,162,906, Cl. 55-346.000.
- Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, to Metallgesellschaft Aktiengesellschaft; and Bayer Aktiengesellschaft. Process for producing sulfuric acid from waste acid and iron sulfate. 4,163,047, Cl. 423-531.000.
- Dow Chemical Company, The: See—
- Beafore, Frank J., 4,163,079, Cl. 428-411.000.
- Britton, Thomas C.; and Trepanier, Donald L., 4,163,104, Cl. 544-160.000.
- Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., 4,163,090, Cl. 526-88.000.
- Wysong, Don V., 4,163,105, Cl. 548-342.000.
- Dow Corning Corporation: See—
- Romenesko, David J., 4,163,082, Cl. 428-447.000.
- Schulz, Jay R., 4,163,081, Cl. 428-429.000.
- Talco, Thomas D., 4,162,676, Cl. 128-214.00D.
- Dowd, Daniel J., to Westvaco Corporation. Stretchable material re-winding machine. 4,163,180, Cl. 318-6.000.
- Dowty, James R., to Ford Aerospace & Communications Corp. Method for adjusting the radius of curvature of a spherical mirror. 4,162,825, Cl. 350-295.000.
- Doyle, Terrence W.: See—
- Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,162,938, Cl. 435-75.000.
- Dragone, Giorgio. Apparatus for developing films, and particularly X-ray films as employed in dental applications. 4,162,841, Cl. 354-310.000.
- Dubrous, Francis: See—
- Septier, Louis; Dubrous, Francis; and Demange, Michel, 4,162,916, Cl. 75-21.000.
- Dunlop Limited: See—
- Dodd, Alan M., 4,163,207, Cl. 340-58.000.
- Dunne, Maurice J.: See—
- Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.
- Duo-Fast Corporation: See—
- Uzumcu, Ali I.; Thorsen, Elmer J., Jr.; and Demkowicz, Robert M., 4,162,728, Cl. 206-345.000.
- Du Pont de Nemours, E. I., and Company: See—
- Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.
- Duraiswamy, Kandaswamy, to Occidental Petroleum Corporation. Production of hydrogenated hydrocarbons. 4,162,959, Cl. 208-8.00R.
- Durr, Dieter: See—
- Kristiansen, Odd; and Durr, Dieter, 4,163,056, Cl. 424-324.000.
- Dursch, Walter; Linke, Fritz; and Finke, Manfred, to Hoechst AG. Polyphosphinites and a process for their preparation. 4,163,034, Cl. 260-931.000.
- Dynatit Nobel AG: See—
- Kuhnel, Werner; and Spielau, Paul, 4,163,085, Cl. 521-96.000.
- Dynatit Nobel Aktiengesellschaft: See—
- Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.
- Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, 4,163,101, Cl. 528-347.000.
- E M I Limited: See—
- Voles, Roger, 4,162,775, Cl. 244-3.170.
- Early, Vernon A. Burglar bar apparatus. 4,162,590, Cl. 49-55.000.
- Early, Leon. Apparatus for collating cans and other articles. 4,162,722, Cl. 198-418.000.
- Earth Chemical Company, Limited: See—
- Nishimura, Akira; Kashiwara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,163,038, Cl. 422-36.000.
- Eastman Kodak Company: See—
- Frank, Lee F.; and Lee, James K., 4,162,832, Cl. 354-51.000.
- Platt, Albert F., III, deceased, 4,162,848, Cl. 355-14.000.
- Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, to Agency of Industrial Science & Technology. Ministry of International Trade & Industry. Method for fast adhesion of silver to nitride type ceramics. 4,163,074, Cl. 427-229.000.
- Eberspacher, J.: See—
- Gaysert, Gerhard, 4,163,041, Cl. 422-179.000.
- Ebihara, Norio; and Tatsuzawa, Kaichi, to Sony Corporation. Noise reduction system. 4,163,258, Cl. 358-167.000.
- Eck, David L.: See—
- Oetjen, Georg; and Eck, David L., 4,162,628, Cl. 73-141.00A.
- Edefonti, Lucio: See—
- Buzio, Pierpaolo; and Edefonti, Lucio, 4,163,080, Cl. 428-424.000.
- Edmaier, Franz: See—
- Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, 4,162,668, Cl. 123-179.00F.
- Ehrhard, Fritz: See—
- Kubens, Rolf; Ehrhard, Fritz; and Gebauer, Herbert, 4,163,095, Cl. 528-67.000.
- Ehrlich, Josef, to Outboard Marine Corporation. Stratified charge four-stroke engine. 4,162,663, Cl. 123-75.00B.
- Eisert, Klaus, to Phonix Elektrizitätsgesellschaft H. Knemann & Co. Electrical terminal. 4,162,819, Cl. 339-247.000.
- Electronica San Giorgio Elsas S.p.A.: See—
- Stringa, Luigi, 4,163,281, Cl. 364-200.000.
- Elgeti, Klaus: See—
- Zlokarnik, Marko; and Elgeti, Klaus, 4,162,971, Cl. 210-15.000.
- Elmetherm: See—
- Reynier, Jacques A., 4,163,144, Cl. 219-368.000.
- Elmo Company Limited: See—
- Nonogaki, Masahiko, 4,162,822, Cl. 350-187.000.
- Eltra Corporation: See—
- Purdy, James A., 4,163,165, Cl. 310-154.000.
- Emerick, Richard D.: See—
- Mason, Ron G.; and Rice, Herbert L., 4,163,066, Cl. 426-99.000.
- Emrich, Hinderk M. Diagnostic means for the rapid detection of mucoviscidosis. 4,163,039, Cl. 422-36.000.
- Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Pesticidally active 4,5-dichloro-3-substituted-phenylimino-1,2-dithiolenes. 4,163,059, Cl. 424-277.000.
- Endo, Akira; and Kitahara, Tohru, to Fuji Photo Film Co., Ltd. Treatment of photographic processing solutions. 4,163,023, Cl. 260-556.00A.
- Enegess, David N., to Combustion Engineering Inc. Vortex gas separator. 4,162,901, Cl. 55-17.000.
- Engel, George W. Mailbox signalling device. 4,163,225, Cl. 340-569.000.
- Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., to Unimation, Inc. Programmable automatic assembly system. 4,163,183, Cl. 318-568.000.
- Epstein, Arthur C.: See—
- Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mingler, Albert B., 4,162,975, Cl. 210-124.000.
- Erickson, Wallace A.; and Suh, Byoung I., to Wallace A. Erickson & Company. Dental filling materials. 4,163,004, Cl. 260-42.140.
- Ernst Leitz Wetzlar GmbH: See—
- Fritsche, Rainer; and Ringelhan, Helmut, 4,163,148, Cl. 250-201.000.
- Stankewitz, Hans-Werner, 4,163,150, Cl. 250-205.000.
- Erway, Duane D.: See—
- Rowlette, John J., 4,162,990, Cl. 252-383.000.
- Esaki, Leo; and Tsu, Raphael, to United States of America, Army. Infrared semiconductor device with superlattice region. 4,163,238, Cl. 357-17.000.
- Euteco S.p.A.: See—
- Merli, Claudio; and Francia, Carlo, 4,162,698, Cl. 152-354.00B.
- Evans, Albert B., Jr.: See—
- Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.
- Evans, Bryce B.: See—
- Kresky, Fred C.; Loveland, John H.; and Evans, Bryce B., 4,162,801, Cl. 285-45.000.
- Excellon Industries: See—
- Buerger, Walter R.; Dixon, Kenneth K.; and Monier, Jacques F., 4,163,212, Cl. 340-146.30H.
- Fabbrica Italiana Magneti Marelli S.p.A.: See—
- Maioglio, Mauro, 4,162,666, Cl. 123-117.00D.
- Fabreka Products Company: See—
- Summers, Frank B., 4,162,727, Cl. 198-688.000.
- Fahrback, Gerhard: See—
- Richter, Peter; Wigger, August; Fahrback, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.
- Fairchild Camera and Instrument Corporation: See—
- Frazee, Jerome A., 4,163,160, Cl. 307-260.000.
- Farber, Karl-Heinz, to Bosch Siemens Hausgerate GmbH. Variable-speed electromotive drive, especially for household appliances such as dough kneaders. 4,163,181, Cl. 318-245.000.

- Farina, Attilio; and Zappala, Giuseppe, to Indesit Industria Elettrodomestici Italiana S.p.A. Circuit for providing saw-tooth current in a coil. 4,163,179, Cl. 315-408.000.
- Fasciati, Alfred: See—
- Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,162,893, Cl. 8-10.100.
- Faulstich, George W., to Three Sisters Ranch Enterprises. Plastic cap and container construction. 4,162,736, Cl. 215-256.000.
- Federico, Joseph J.; and Gass, William L. Hairdressing device. 4,163,143, Cl. 219-225.000.
- Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., to Vsesojuzny Nauchno-Issledovatel'skiy Ispytatelny Institut Meditsinskoi Tekhniki. Surgical apparatus for simultaneous resection of soft tissues and their suturing with metal staples. 4,162,678, Cl. 128-305.000.
- Feeny, Richard W., to American Cyanamid Co. 1,2-Dimethyl-3,5-diphenylpyrazolium-2,2-dichloropropionate. 4,162,913, Cl. 71-92.000.
- Feldkamper, Richard: See—
- Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeyer, Hartmut, 4,162,602, Cl. 53-415.000.
- Fellnor, John R.; and Love, William J., Jr., to Melting Systems, Incorporated. Scrap preheater modular roof assembly. 4,162,891, Cl. 432-247.000.
- Ferloni, Vincenzo: See—
- Rossi, Guglielmo; and Ferloni, Vincenzo, 4,163,129, Cl. 200-81.400.
- Fiat-Allis Macchine Movimento Terra S.p.A.: See—
- Grattapaglia, Giorgio; and Cecchi, Carlo, 4,162,615, Cl. 60-478.000.
- Fibrostamp S.R.L.: See—
- Frezzotti, Armando, 4,162,936, Cl. 162-276.000.
- Filippov, Iosif F.: See—
- Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khutoretzky, Garri M.; and Vorontsov, Alexandr I., 4,163,163, Cl. 310-59.000.
- Filstrup, Paul, to Alfa-Laval A.B. Method of separating animal raw material. 4,163,009, Cl. 260-112.00R.
- Filterwerk Mann & Hummel GmbH: See—
- Schuler, Gustav, 4,162,905, Cl. 55-337.000.
- Finch, Robert E., to Nalco Chemical Company. Flotation of deep mined coal with water-in-oil emulsions of sodium polyacrylate. 4,162,966, Cl. 209-166.000.
- Finke, Manfred: See—
- Dursch, Walter; Linke, Fritz; and Finke, Manfred, 4,163,034, Cl. 260-931.000.
- Finney, Philip F., to Thermo-Couple Products Company, Inc. Engine manifold temperature sensing device. 4,162,929, Cl. 136-233.000.
- Firetrol, Inc.: See—
- Henningsen, Lee A.; Hare, John E.; and Amann, David J., 4,163,220, Cl. 340-331.000.
- Firsov, Vitaly M.: See—
- Litvinov, Pavel I.; Firsov, Vitaly M.; and Knyazher, Galina B., 4,162,921, Cl. 106-39.800.
- Fitzsimmons, George W., to Boeing Company, The. Dual mode microwave mixer. 4,163,232, Cl. 343-6.80R.
- Fleig, Helmut: See—
- Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.
- Fleischhacker, James E., to AMP Incorporated. Means for cable section and equipment transfer without service interruption. 4,162,815, Cl. 339-19.000.
- Fleming, Charlie. Combination watchband and writing instrument. 4,162,754, Cl. 224-165.000.
- Fleming, Maurice C. Internal combustion engine and fuel introducing means therefor. 4,162,664, Cl. 123-75.00B.
- Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., to Texaco Inc. Oil-in-water emulsion. 4,162,989, Cl. 252-312.000.
- Floyd, James K.: See—
- Clay, Paul E.; and Floyd, James K., 4,162,904, Cl. 55-276.000.
- FMC Corporation: See—
- Kraft, Robert E., 4,162,778, Cl. 248-610.000.
- Foley, Newman C. Hitching apparatus. 4,162,798, Cl. 280-475.000.
- Fontaines, Luc M.: See—
- Maes, Robert H.; and Fontaines, Luc M., 4,162,915, Cl. 75-14.000.
- Ford Aerospace & Communications Corp.: See—
- Dowty, James R., 4,162,825, Cl. 350-295.000.
- Ford Motor Company: See—
- Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,162,631, Cl. 73-362.00A.R.
- Forschirm, Alex S.: See—
- Hannon, Martin J.; and Forschirm, Alex S., 4,163,031, Cl. 525-5.000.
- Fracaroli, Brenda B.: See—
- Melachouris, Nicholas; Fracaroli, Brenda B.; and Corbett, Constance R., 4,163,069, Cl. 426-582.000.
- Francia, Carlo: See—
- Merli, Claudio; and Francia, Carlo, 4,162,698, Cl. 152-354.00B.
- Frankowiak, Sigismund: See—
- Dezael, Claude; Deschamps, Andre; and Frankowiak, Sigismund, 4,163,043, Cl. 423-234.000.
- Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, to Ciba-Geigy Corporation. 3-Phenyl-2-thioxo-2H-5H-pyran[3,2-c][1]benzopyran-5-one derivatives, a process of making and a method of using them as rodenticides. 4,163,061, Cl. 424-279.000.
- Frank, Jerome M. Eye protectors. 4,162,542, Cl. 2-15.000.
- Frank, Lee F.; and Lee, James K., to Eastman Kodak Company. Exposure control with piezoelectric latch control. 4,162,832, Cl. 354-51.000.
- Frazee, Jerome A., to Fairchild Camera and Instrument Corporation. Input stage for automotive ignition control circuit. 4,163,160, Cl. 307-260.000.
- Freeman, Joseph T.; and Colish, Aaron, to Bath-Ladd Corporation. Safety railing. 4,162,544, Cl. 4-185.00H.
- Frezzotti, Armando, to Fibrostamp S.R.L. Washing device for impermeable areas of cylinder molds. 4,162,936, Cl. 162-276.000.
- Fritsche, Rainer; and Ringelhan, Helmut, to Ernst Leitz Wetzlar GmbH. Automatic focusing device probe comprising a focusing device and method of focusing a probe. 4,163,148, Cl. 250-201.000.
- Fritz Eichenauer, Firma: See—
- Meywald, Klaus, 4,163,146, Cl. 219-542.000.
- Froats, Blaine. Apparatus for separating paper fibres from portions of polyethylene film material. 4,162,768, Cl. 241-45.000.
- Frommer, Elmar: See—
- Magnussen, Peter; Herrmann, Guenter; and Frommer, Elmar, 4,163,027, Cl. 260-586.00P.
- Frutiger, Peter. Data processing machine, especially ciphering equipment. 4,162,762, Cl. 235-461.000.
- Fuji Photo Film Co., Ltd.: See—
- Endo, Akira; and Kitahara, Tohru, 4,163,023, Cl. 260-556.00A.
- Fuji Photo Optical Co., Ltd.: See—
- Asano, Seiji, 4,162,835, Cl. 354-106.000.
- Hosono, Tsutomu, 4,163,178, Cl. 315-241.00P.
- Fujimoto Company, Limited: See—
- Yazaki, Seiichi, 4,162,672, Cl. 128-1.300.
- Fujitsu Limited: See—
- Miura, Kenichi, 4,163,211, Cl. 340-146.200.
- Fukaya, Hiroyasu: See—
- Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, 4,163,282, Cl. 364-431.000.
- Fukuma, Hideo: See—
- Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.
- Fukumori, Yoshiki: See—
- Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, 4,162,612, Cl. 60-276.000.
- Fukushima, Hiroshi: See—
- Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.
- Funabashi, Tetsuji: See—
- Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, 4,162,869, Cl. 414-70.000.
- Furusho, Takao: See—
- Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, 4,162,939, Cl. 435-254.000.
- Fushima, Haruo: See—
- Orii, Katsuo; and Fushima, Haruo, 4,162,717, Cl. 182-48.000.
- G.K.N. Fasteners Limited: See—
- Gill, Peter J., 4,162,639, Cl. 81-52.40R.
- Gaillac, Jean-Paul R.: See—
- Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.
- Garbero, James; and Cook, Ronald F. Lighted display chamber. 4,162,814, Cl. 312-223.000.
- Garbutt, John T., to Grain Processing Corporation. Isolation of proteinaceous materials. 4,163,010, Cl. 260-112.00R.
- Gardner, Horace L.: See—
- Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.
- Gass, William L.: See—
- Federico, Joseph J.; and Gass, William L., 4,163,143, Cl. 219-225.000.
- Gastebois, Philippe M. D.: See—
- Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.
- Gateway Industries, Inc.: See—
- Miskowicz, John S., 4,163,128, Cl. 200-61.58B.
- Gaudard, Yves; Guillemaud, Henri; and Perfetti, Jacques, to Rhone-Poulenc-Textile. Device for soil irrigation. 4,162,863, Cl. 405-45.000.
- Gaudig, Jay R.: See—
- Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.
- Gaysert, Gerhard, to Eberspacher, J. Support for elastically mounting a ceramic honeycomb catalyst. 4,163,041, Cl. 422-179.000.
- Gebauer, Herbert: See—
- Kubens, Rolf; Ehrhard, Fritz; and Gebauer, Herbert, 4,163,095, Cl. 528-67.000.
- Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: See—
- Oberste-Beulmann, Klaus, 4,162,810, Cl. 299-43.000.
- Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik: See—
- Hofmann, Dionys, 4,162,634, Cl. 73-462.000.
- Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik: See—
- Muller, Richard, 4,162,633, Cl. 73-462.000.
- Gee, Alan E., to American Optical Corporation. Video photographic system. 4,162,830, Cl. 354-23.00R.
- Gellhaus, Derald B., to Kolberg Manufacturing Corporation. Screen apparatus for sorting fragmented material. 4,162,968, Cl. 209-400.000.
- General Electric Company: See—
- Banucci, Eugene G.; and Boldebeck, Edith M., 4,163,030, Cl. 525-429.000.
- Hedges, Charles V.; and Mark, Victor, 4,163,116, Cl. 568-723.000.
- Horvay, Julius B., 4,162,571, Cl. 29-460.000.



- Huseby, Irvin C., 4,162,918, Cl. 75-171.000.  
 Niznik, George E., 4,163,037, Cl. 264-54.000.  
 Ragonese, Louis J.; and Yang, Neng-Tze, 4,163,244, Cl. 357-44.000.  
 Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., 4,163,227, Cl. 340-662.000.  
 Stone, Aidan M., 4,162,621, Cl. 68-23.200.  
 Webb, William M., 4,162,566, Cl. 29-157.00R.  
 Gerg, Robert L.: See—  
 Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klai-ber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.  
 Gerken, Rudolf: See—  
 Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Her-mann, 4,163,047, Cl. 423-531.000.  
 Gilbert, Walter W.: See—  
 Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.  
 Gilbert, William W., III; and Gomez, Eduardo W., to United States of America, Air Force. Canted spar with intermediate intercostal stiff-eners, 4,162,777, Cl. 244-123.000.  
 Gill, Peter J., to G.K.N. Fasteners Limited. Load indicating nut wrench, 4,162,639, Cl. 81-52.40R.  
 Gillich, Thomas N., to American Hoechst Corporation. Lithographic plate finisher, 4,162,920, Cl. 106-14.500.  
 Gipson, Carl R.: See—  
 Willingham, Millard L., 4,162,550, Cl. 5-123.000.  
 Giraud, Georges M., to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Arrangement for checking a contact inserted between a transmitter circuit and a receiver circuit to allow electrical signals to be transmitted, 4,163,210, Cl. 340-146.10E.  
 Giraudi, Edouard: See—  
 Teisseire, Paul J.; Plattier, Marcel; and Giraudi, Edouard, 4,163,109, Cl. 560-122.000.  
 Gironde, Ralph F., Jr. Archaeological sifting basket, 4,162,967, Cl. 209-235.000.  
 Glaser, Richard: See—  
 van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.  
 Goetsch, Roland H.: See—  
 Kollmann, Harry; and Goetsch, Roland H., 4,162,935, Cl. 162-220.000.  
 Goffinet, Pierre C. E.: See—  
 DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, 4,162,984, Cl. 252-8.800.  
 Gold, Elijah H.: See—  
 Neustadt, Bernard R.; and Gold, Elijah H., 4,163,053, Cl. 424-230.000.  
 Gold, Nathan, to Polaroid Corporation. Camera and method for selectively compressing scene brightness, 4,162,831, Cl. 354-31.000.  
 Goldammer, Georg: See—  
 van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.  
 Gomez, Eduardo W.: See—  
 Gilbert, William W., III; and Gomez, Eduardo W., 4,162,777, Cl. 244-123.000.  
 Gonot, Fred P., Jr.; and Kalliantas, Louis. Combination bookmark and writing instrument holder, 4,162,800, Cl. 281-42.000.  
 Goraj, Boguskaw: See—  
 Brzozowski, Zbigniew; Kielkiewicz, Jędrzej; Rokicki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.  
 Gorcik, Stanley W.: See—  
 Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., 4,163,274, Cl. 361-417.000.  
 Gordon, Harry W.; and Schaffner, Carl P., to Schmid Laboratories, Inc. Method of treating hypercholesterolemia with candimycin, 4,163,050, Cl. 424-115.000.  
 Gorin, Everett, to Continental Oil Company; and United States of America, Energy. Method for producing hydrocarbon fuels and fuel gas from heavy polynuclear hydrocarbons by the use of molten metal halide catalysts, 4,162,963, Cl. 208-108.000.  
 Gorsky, Egon, to Gorsky, Egon. Aquarium water aeration device, 4,163,035, Cl. 261-77.000.  
 Gossard, Arthur C.: See—  
 Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., 4,163,237, Cl. 357-16.000.  
 Gove, Donald C., to Amkey, Incorporated. Synchronous phase de-tected keyboard, 4,163,222, Cl. 340-365.00S.  
 Graf, Richard, to Bosch Siemens Hausgerate GmbH. Refill container for pumpable active ingredients of washing agents, 4,162,747, Cl. 222-185.000.  
 Grain Processing Corporation: See—  
 Garbutt, John T., 4,163,010, Cl. 260-112.00R.  
 Grand, Gerd: See—  
 Bock, Gerd; Grand, Gerd; and Ilmer, Andreas, 4,163,247, Cl. 358-12.000.  
 Granda, Edward J.: See—  
 Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.  
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 Green, Harry W.: See—  
 Dallen, John A.; and Green, Harry W., 4,162,656, Cl. 110-221.000.  
 Green, Norman W., to Occidental Petroleum Corporation. Slot pyroly-sis reactor and method of pyrolysis, 4,162,943, Cl. 201-12.000.  
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 Gray, David, 4,162,887, Cl. 431-28.000.  
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 Gregory, Virginia M.: See—  
 Gregory, Harold D., 4,162,677, Cl. 128-303.100.  
 Greven, Johann, to SCHUMAG GmbH. Eccentric cutters for longitu-dinally severing elongated material to be drawn, 4,162,642, Cl. 83-328.000.  
 Grimm, Hugo: See—  
 Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Her-mann, 4,163,047, Cl. 423-531.000.  
 Groombridge, Frederick W. H.; and Butler, Ronald N., to Celanese Corporation. Water closets, 4,162,548, Cl. 4-300.000.  
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 Grumman Aerospace Corporation: See—  
 Schultz, Jack L., 4,163,235, Cl. 343-100.00A.  
 GTE Sylvania Incorporated: See—  
 Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.  
 Guetzlaff, Robert P., to Deere & Company. Method for making a sheet metal pulley, 4,162,567, Cl. 29-159.00R.  
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 Guillemaud, Henri: See—  
 Gaudard, Yves; Guillemaud, Henri; and Perfetti, Jacques, 4,162,863, Cl. 405-45.000.  
 Guillemin, Claude; and Mayen, Christian, to Prolabo. Means for remov-ably securing separation column within column chromatography apparatus, 4,162,977, Cl. 210-198.00C.  
 Gulf Oil Corporation: See—  
 Kvapil, Rudolph; and Clews, K. Malcolm, 4,162,808, Cl. 299-2.000.  
 Gulf Research & Development Company: See—  
 Marmo, Joseph F., 4,162,941, Cl. 208-57.000.  
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 Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khuto-retsky, Garri M.; and Vorontsov, Alexandr I. Non-salient pole syn-chronous electric generator, 4,163,163, Cl. 310-59.000.  
 Haak, Edward L.: See—  
 Harker, James S.; Harris, Earl J.; and Haak, Edward L., 4,162,862, Cl. 404-72.000.  
 Habermeier, Jurgen: See—  
 Buxbaum, Lothar; Habermeier, Jurgen; and Batzer, Hans, 4,163,099, Cl. 528-172.000.  
 Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, to BASF Aktiengesellschaft. 2-Trichloromethyl-4-nitrobenzenesulfenic acid derivatives, 4,163,020, Cl. 260-454.000.  
 Hahn, William F., to Pennsylvania Crusher Corporation. Impacting crusher with variable flow feed distributor, 4,162,767, Cl. 241-30.000.  
 Haley, William E. Battery state-of-charge indicator, 4,163,186, Cl. 320-48.000.  
 Hall, Ernest M., Jr., to Western Geophysical Co. of America. Apparatus and method for seismic wave detection, 4,163,206, Cl. 340-17.00R.  
 Hallen, Jan-Ake. Sink for wash-basins, drainbowls and the like, 4,162,545, Cl. 4-190.000.  
 Hammann, Ingeborg: See—  
 Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.  
 Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.  
 Hanano, Toshio: See—  
 Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Machara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.  
 Haneishi, Kohei: See—  
 Morii, Kokichi; and Haneishi, Kohei, 4,163,203, Cl. 334-86.000.  
 Hannon, Martin J.; and Forschurn, Alex S., to Celanese Corporation. Powder composition and method of preparation, 4,163,031, Cl. 525-5.000.  
 Hannoschock, Kurt: See—  
 Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simo-neit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.

- Hanson, Brian A.: See—  
 Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., 4,163,275, Cl. 362-80.000.  
 Haragushi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Motor drive device for camera, 4,162,837, Cl. 354-173.000.  
 Haraikawa, Tetsuo, to Tokico Ltd. Mechanical disc brake, 4,162,720, Cl. 188-71.900.  
 Harakawa, Mototaka: See—  
 Sato, Yukio; Harakawa, Mototaka; and Mitumori, Yoshio, 4,163,223, Cl. 340-384.00R.  
 Harden, Phillip L., to Bowmar Instrument Corporation. Flush lighted flat keyboard assembly, 4,163,138, Cl. 200-310.000.  
 Hare, John E.: See—  
 Henningsen, Lee A.; Hare, John E.; and Amann, David J., 4,163,220, Cl. 340-331.000.  
 Harker, James S.; Harris, Earl J.; and Haak, Edward L. Pavement stripping apparatus and method, 4,162,862, Cl. 404-72.000.  
 Harrell, John T.: See—  
 Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.  
 Harris Corporation: See—  
 McRae, Daniel D., 4,163,209, Cl. 340-146.10E.  
 Harris, Earl J.: See—  
 Harker, James S.; Harris, Earl J.; and Haak, Edward L., 4,162,862, Cl. 404-72.000.  
 Harrison, George C., to Polaroid Corporation. Electronic flash inhibit arrangement, 4,162,836, Cl. 354-139.000.  
 Harry W. Dietert Co.: See—  
 Steinmueller, Ralph E., 4,162,632, Cl. 73-432.00A.  
 Harshaw Chemical Company, The: See—  
 Swinehart, Philip R.; and Swartz, John M., 4,163,240, Cl. 357-29.000.  
 Hartog, Jan; and Zwagemakers, Johannes M. A., to U.S. Philips Corpo-ration. Aralkylamino carboxylic acids and derivatives having spas-molytic activity, 4,163,060, Cl. 424-278.000.  
 Hartung, Harold A., to MacAndrews and Forbes Company. Glycyrrhi-zin-free fractions from licorice root and process for obtaining such fractions, 4,163,067, Cl. 426-573.000.  
 Hasker, Jan, to U.S. Philips Corporation. Low-pressure gas discharge lamp, 4,163,169, Cl. 313-203.000.  
 Hasselmeier, Helmut: See—  
 Bahr, Dietrich J.; Burckardt, Karl H.; and Hasselmeier, Helmut, 4,163,285, Cl. 364-710.000.  
 Haubner, Georg: See—  
 Wesemeyer, Jurgen; and Haubner, Georg, 4,163,217, Cl. 340-167.00R.  
 Hayashi, Midori: See—  
 Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Naka-shima, Syozo; and Hayashi, Midori, 4,162,576, Cl. 32-40.00R.  
 Hayashida, Yoshihiro, to Tokico Ltd. Hydraulic master cylinder, 4,162,616, Cl. 60-533.000.  
 Hays, Victor. Food warmer assembly for use with a vehicle engine, 4,162,670, Cl. 126-19.500.  
 Hedges, Charles V.; and Mark, Victor, to General Electric Company. Process for producing bisphenols, 4,163,116, Cl. 568-723.000.  
 Heimbach, Paul; Roloff, Achim; and Nabbeled-Arnold, Erich F., to Studiengesellschaft Kohle mbH. Process for controlling the catalytic co-oligomerization of 1,3-dienes with Schiff's bases, 4,163,024, Cl. 260-566.00R.  
 Heinrich Josef Winter Kunststoffverarbeitung und Werkzeugbau GmbH: See—  
 Winter, Heinrich J., 4,162,552, Cl. 15-104.920.  
 Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., to Du Pont de Nemours, E. I., and Company. Preparation of esters of poly-(tetramethylene ether) glycol, 4,163,115, Cl. 560-240.000.  
 Heinz, Carlo: See—  
 Legille, Edouard; Mahr, Rene N.; and Heinz, Carlo, 4,162,784, Cl. 266-176.000.  
 Heitman, Marshall D.; and Butler, Joe D., to Otis Engineering Corpora-tion. Planetary transmission with hydraulic engagement and disen-gagement, 4,162,713, Cl. 180-242.000.  
 Heitmann, Jurgen, to Robert Bosch GmbH. Field sequential transmis-sion of luminance and chrominance information, 4,163,248, Cl. 358-12.000.  
 Helwig, William F., Jr.; and Jeffries, Henry D., Jr., to Avtec Industries, Inc. Ground fault and fire detector system, 4,163,269, Cl. 361-42.000.  
 Henderson, Joseph M., Jr. Target acquisition system, 4,162,646, Cl. 89-41.00A.  
 Henig, Hans: See—  
 Tscherschwitzke, Richard; and Henig, Hans, 4,162,951, Cl. 204-213.000.  
 Henkel Kommanditgesellschaft auf Aktien: See—  
 Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,162,893, Cl. 8-10.100.  
 Henningsen, Lee A.; Hare, John E.; and Amann, David J., to Firetrol, Inc. Distress signalling device, 4,163,220, Cl. 340-331.000.  
 Heraeus Quarzschmelze GmbH: See—  
 Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Nor-bert, 4,162,908, Cl. 65-60.00D.  
 Herchenbach, Horst, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for the lowering of the alkali content of ce-ment calcined to completion, 4,162,922, Cl. 106-100.000.  
 Hercules Incorporated: See—  
 Paul, James T., Jr.; and Weldy, Winfred E., 4,163,003, Cl. 260-40.00R.  
 Walsh, Robert M., 4,162,997, Cl. 260-27.00R.  
 Herou, John w., to J. H. Electric Co., Inc. Position sensitive safety switch, 4,163,127, Cl. 200-61.470.  
 Herr, John A.: See—  
 Coughenour, Donald J.; Brown, Jack; and Herr, John A., 4,163,158, Cl. 250-561.000.  
 Herrmann, Guenter: See—  
 Magnussen, Peter; Herrmann, Guenter; and Frommer, Elmar, 4,163,027, Cl. 260-586.00P.  
 Hess, Bernhard; and Kraft, Klaus, to Bayer Aktiengesellschaft. Process for the production of polyesters for air-drying unsaturated polyester resins, 4,163,093, Cl. 528-301.000.  
 Hess, Georgia E. Wig drying attachment for hair dryers, 4,162,580, Cl. 34-103.000.  
 Hetland, Lillian; and Schneeweiss, Peter R. Rotary measuring chamber with size adjustment, 4,162,751, Cl. 222-293.000.  
 Hewlett-Packard Company: See—  
 Kamins, Theodore I.; and Sodini, Charles G., 4,163,243, Cl. 357-41.000.  
 Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, to Takeda Chemical Industries, Ltd. Method for producing Antibiotic C-15003 by cultur-ing nocardia, 4,162,940, Cl. 435-119.000.  
 Higgins, Bobby L., to Camco, Inc. Water jet valve assembly, 4,162,763, Cl. 239-101.000.  
 Hill, John H., to Pennwalt Corporation. Disc centrifuge with underflow discharge, 4,162,760, Cl. 233-19.00R.  
 Hill, Marjorie M. Method of producing dried, de-shelled brine shrimp cysts, 4,163,064, Cl. 426-2.000.  
 Hine, Kenneth E., to Canadian Industries Limited. Reduction of steel cathode overpotential, 4,162,949, Cl. 204-140.000.  
 Hintz, Harold J., to Monsanto Company. Production of tetrabutylhex-amethylenediamine by reductive alkylation of hexamethylenediamine with butyraldehyde, 4,163,026, Cl. 260-583.00P.  
 Hirose, Yasuo, to Bloom Engineering Company, Inc. Combustion apparatus, 4,162,890, Cl. 431-351.000.  
 Hirschberger, August, to Webasto-Werke W. Baier GmbH & Co. Drive arrangement for a movable vehicle panel, 4,162,805, Cl. 296-137.00G.  
 Hirt, Thomas D.: See—  
 Van Steenhoven, Frank; and Hirt, Thomas D., 4,162,779, Cl. 248-343.000.  
 Hisao, Nobuyoshi; and Agui, Takeshi, to Mita Industrial Company. System for reducing band width of image signal, 4,163,260, Cl. 358-261.000.  
 Hitachi, Ltd.: See—  
 Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.  
 Ishikawa, Isao; and Sakitani, Yoshio, 4,163,168, Cl. 310-328.000.  
 Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, 4,163,166, Cl. 310-215.000.  
 Kato, Takao; Shimizu, Keizo; and Maruyama, Takeshi, 4,163,219, Cl. 340-310.00R.  
 Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, 4,163,191, Cl. 323-89.00M.  
 Kubota, Yoshiyuki; Kurosawa, Yukio; and Sugawara, Hiroyuki, 4,163,130, Cl. 200-144.00B.  
 Morooka, Yasuo; and Tanifuji, Shinya, 4,162,624, Cl. 72-8.000.  
 Sampei, Tohru, 4,163,197, Cl. 330-263.000.  
 Sawano, Susumu; Tsunoda, Yoshito; and Maeda, Takeshi, 4,163,149, Cl. 250-204.000.  
 Shida, Shigeru; and Kajiwara, Toshiyuki, 4,162,627, Cl. 72-247.000.  
 Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.  
 Tamura, Hifumi; and Ishitani, Tohru, 4,163,153, Cl. 250-423.00R.  
 Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, to Kabu-shiki Kaisha Komatsu Seisakusho. Unmanned conveying control system, 4,162,869, Cl. 414-70.000.  
 Hobbs, Oliver K. Pneumatic conveyor, 4,162,811, Cl. 406-94.000.  
 Hochiki Corporation: See—  
 Yasuda, Katsuya; and Adachi, Akio, 4,163,224, Cl. 340-520.000.  
 Hoechst A.G.: See—  
 Dursch, Walter; Linke, Fritz; and Finke, Manfred, 4,163,034, Cl. 260-931.000.  
 Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Pesticidal O-[3-t-butylpyrazol-5-yl]phosphoric and thionophosphoric acid esters, 4,163,052, Cl. 424-200.000.  
 Hoffmann-La Roche Inc.: See—  
 Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,163,103, Cl. 542-427.000.  
 Cohen, Noel; and Saucy, Gabriel, 4,163,021, Cl. 260-456.00P.  
 Holland, George W.; and Rosen, Perry, 4,163,016, Cl. 260-345.80P.  
 Zdrodowski, Joseph J., 4,162,689, Cl. 137-266.000.  
 Hofmann, Dionys, to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinen-fabrik. Method of and apparatus for balancing rotors, 4,162,634, Cl. 73-462.000.  
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 Hohmann, Gerhard: See—  
 Pettelkau, Hans-Jurgen; and Hohmann, Gerhard, 4,163,091, Cl. 526-208.000.  
 Holland, George W.; and Rosen, Perry, to Hoffmann-La Roche Inc. 16-Substituted prostaglandins, 4,163,016, Cl. 260-345.80P.



Holland, Maeford J.; and Raines, Robert B. Device for removing a runner from a multiple plate die. 4,162,886, Cl. 425-556.000.  
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 Holubec, Zenovie M., to Lubrizol Corporation. The. Multigrade lubricants containing interpolymers. 4,162,985, Cl. 252-32.70E.  
 Homeyer, Bernhard: See—  
 Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.  
 Honeywell Inc.: See—  
 Bassett, William W.; and Johnson, Eugene D., 4,162,856, Cl. 366-213.000.  
 Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, to Sony Corporation. Demodulating apparatus with phase shift compensation. 4,163,196, Cl. 329-50.000.  
 Hood, John D.: See—  
 Box, Stephen J.; and Hood, John D., 4,163,051, Cl. 424-124.000.  
 Hooker Chemicals & Plastics Corp.: See—  
 Takahashi, Akio, 4,163,033, Cl. 525-53.000.  
 Hoppner, Dietrich: See—  
 Bachle, Erich; Schehrer, Rudolf; and Hoppner, Dietrich, 4,163,159, Cl. 307-255.000.  
 Horvay, Julius B., to General Electric Company. Method of constructing refrigerator cabinet. 4,162,571, Cl. 29-460.000.  
 Hosli, Peter, to Institut Pasteur. Micro-analysis process and device. 4,162,896, Cl. 23-230.00R.  
 Hosoi, Yuzo: See—  
 Abe, Seizaburo; Kozima, Masao; and Hosoi, Yuzo, 4,162,930, Cl. 148-38.000.  
 Hosokawa, Yoshihiro: See—  
 Tomii, Kaoru; and Hosokawa, Yoshihiro, 4,163,250, Cl. 358-45.000.  
 Hosono, Tsutomu, to Fuji Photo Optical Co., Ltd. Flash light discharge device. 4,163,178, Cl. 315-241.00P.  
 Howard, Clayton L., to Baker International Corporation. Tensile force load cell assembly. 4,162,629, Cl. 73-141.00R.  
 Huber, Bernhard W., to Bodenseewerk Perkin-Elmer & Co., GmbH. Selected element concentration for flameless atomic absorption spectroscopic measurements. 4,162,849, Cl. 356-36.000.  
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 Hughes Aircraft Company: See—  
 Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., 4,163,151, Cl. 250-296.000.  
 Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Diphenylamine-azo-hydrocarbylsulfonylphenyl dyestuffs. 4,163,013, Cl. 260-206.000.  
 Humme, Gert: See—  
 Liebigs, Lothar; Wiegler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.  
 Hungerbuhler, Walter: See—  
 Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,162,893, Cl. 8-10.100.  
 Huseby, Irvin C., to General Electric Company. Rare earth metal doped directionally solidified eutectic alloy and superalloy materials. 4,162,918, Cl. 75-171.000.  
 Husson, Alan L.; and Kurland, Marvin, to Westinghouse Electric Corp. Elevator system. 4,162,719, Cl. 187-29.00R.  
 Hutson Corporation, The: See—  
 Judd, Oliver S., 4,162,900, Cl. 51-295.000.  
 Hutson, Jerald L. Multiple emitter and normal gate semiconductor switch. 4,163,241, Cl. 357-38.000.  
 Hydrotrole Limited: See—  
 Greer, Edward M.; Wyle, Frank S.; and Packer, Martin R., 4,162,692, Cl. 138-30.000.  
 Ichikawa, Tadao: See—  
 Mori, Ryuichi; Ichikawa, Tadao; and Shiraogawa, Yukio, 4,163,280, Cl. 364-200.000.  
 Ideal Industries, Inc.: See—  
 McCord, Daniel, 4,162,638, Cl. 81-9.50R.  
 Idra AG: See—  
 Kollmann, Harry; and Goetsch, Roland H., 4,162,935, Cl. 162-220.000.  
 Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition system for rotary piston engines. 4,162,669, Cl. 123-210.000.  
 Iida, Makoto, to Security Patrols Co., Ltd. Safety lock system for controlling access to an area in response to predetermined data inputs. 4,163,215, Cl. 340-149.00A.  
 Illis, Alexander: See—  
 Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., 4,163,046, Cl. 423-510.000.  
 Ilmer, Andreas: See—  
 Bock, Gerd; Grand, Gerd; and Ilmer, Andreas, 4,163,247, Cl. 358-12.000.  
 Imperial Chemical Industries Limited: See—  
 Jones, Peter J. V., 4,162,991, Cl. 252-413.000.  
 Indesit Industria Elettrodomestici Italiana S.p.A.: See—  
 Farina, Attilio; and Zappala, Giuseppe, 4,163,179, Cl. 315-408.000.  
 Industriewerk Schaeffler OHG: See—  
 Spiess, Karl, 4,162,568, Cl. 29-281.300.  
 Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., to North American Manufacturing Company; Burnham Corporation; and Combustion Service and Equipment Corporation. Industrial

boiler utilizing multiple fuels and having reduced particulate emission and method of combustion. 4,162,686, Cl. 122-149.000.  
 Inoue Gomu Kogyo Kabushiki Kaisha: See—  
 Katoh, Hisanori, 4,163,076, Cl. 428-339.000.  
 Inoue, Nobuyoshi: See—  
 Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.  
 Inoue, Satoru; Umehara, Masakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, to Ricoh Company, Ltd. Color electrostatic copying machine. 4,162,843, Cl. 355-4.000.  
 Institut Francais du Pétrole: See—  
 Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismond, 4,163,043, Cl. 423-234.000.  
 Institut Pasteur: See—  
 Hosli, Peter, 4,162,896, Cl. 23-230.00R.  
 Institut Transplantatssii Organov I Tkanci: See—  
 Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Buryin, Vitaly A.; and Novikov, Nikolai V., 4,162,543, Cl. 3-1.700.  
 International Business Machines Corporation: See—  
 Bahr, Dietrich J.; Burckardt, Karl H.; and Hasselmeier, Helmut, 4,163,285, Cl. 364-710.000.  
 Brandon, Fred Y., 4,162,847, Cl. 355-14.000.  
 Bullock, Michael K., 4,162,786, Cl. 271-64.000.  
 Daetwyler, Kurt; and Jaggi, Rudolf, 4,163,156, Cl. 250-492.00B.  
 International Flavors & Fragrances Inc.: See—  
 Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Grand, Edward J., 4,163,068, Cl. 426-538.000.  
 International Harvester Company: See—  
 Cremer, George D., 4,162,914, Cl. 75-0.50B.  
 International Nickel Company, Inc.: See—  
 Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., 4,163,046, Cl. 423-510.000.  
 International Telephone & Telegraph Corp.: See—  
 Johnson, Charles B., 4,163,174, Cl. 315-10.000.  
 INTERX Research Corporation: See—  
 Stella, Valentino J.; and Sloan, Kenneth B., 4,163,058, Cl. 424-273.00R.  
 Inuzuka, Hideo: See—  
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 Irik, Gijbert W.: See—  
 Marien, Pieter; Boersma, Rintje; and Irik, Gijbert W., 4,163,118, Cl. 174-99.00B.  
 Irvin Industries, Inc.: See—  
 Wallin, Jan-Olof, 4,162,773, Cl. 242-107.40A.  
 Ishihara, Taketoshi; and Watanabe, Yoshiaki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Method and device for measuring dioptrics of astigmatic lenses. 4,162,852, Cl. 356-125.000.  
 Ishii, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Noise improvement by capacitor bank in magnetic recording and playback apparatus. 4,163,264, Cl. 360-68.000.  
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 Ishitani, Tohru: See—  
 Tamura, Hifumi; and Ishitani, Tohru, 4,163,153, Cl. 250-423.00R.  
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 Ito, Isami, to Chinon Industries Incorporated. Overlap recording device for sound cinemacamera. 4,163,261, Cl. 360-13.000.  
 Ito, Tadashi: See—  
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 Ito, Yoichiro, to United States of America, Health, Education and Welfare. Flow-through coil planet centrifuges with adjustable rotation/revolution of column. 4,162,761, Cl. 233-24.000.  
 Ito, Yuji, to Canon Kabushiki Kaisha. Wide angle objective for ophthalmoscopic instrument. 4,162,827, Cl. 351-7.000.  
 Iwase, Kazuo: See—  
 Kawai, Hisasi; and Iwase, Kazuo, 4,162,667, Cl. 123-117.00D.  
 J. C. Decaux Paris, Publicite Atribus: See—  
 Decaux, Jean-Claude, 4,162,885, Cl. 40-518.000.  
 J. C. Renfroe and Sons, Inc.: See—  
 Davies, William, 4,162,804, Cl. 294-101.000.  
 J. H. Electric Co., Inc.: See—  
 Herou, John W., 4,163,127, Cl. 200-61.470.  
 J. I. Case Company: See—  
 Nelson, Carl D., 4,162,712, Cl. 180-253.000.  
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 Holleyman, John E., 4,162,614, Cl. 60-370.000.  
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 Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Diesel internal combustion engine. 4,162,668, Cl. 123-179.00F.  
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 Daetwyler, Kurt; and Jaggi, Rudolf, 4,163,156, Cl. 250-492.00B.  
 James, Wakelf. Archery sight. 4,162,579, Cl. 33-265.000.

Jamesbury Corp.: See—  
 Anderson, Carl S., 4,162,690, Cl. 137-385.000.  
 Japan Steel Works, Ltd.: See—  
 Mikarai, Makoto, 4,162,758, Cl. 228-131.000.  
 Jeffries, Henry D., Jr.: See—  
 Helwig, William F., Jr.; and Jeffries, Henry D., Jr., 4,163,269, Cl. 361-42.000.  
 Jenkins, Allen N. Pocket cuspidor. 4,162,547, Cl. 4-259.000.  
 John O. Butler Company: See—  
 Tarrson, Emanuel B.; and Tisma, Stevan, 4,162,688, Cl. 132-92.00A.  
 Johnson, Charles B., to International Telephone & Telegraph Corp. Oblique streak tube. 4,163,174, Cl. 315-10.000.  
 Johnson, Eugene D.: See—  
 Bassett, William W.; and Johnson, Eugene D., 4,162,856, Cl. 366-213.000.  
 Johnson, George P. Miter clamp. 4,162,785, Cl. 269-41.000.  
 Johnson, Phillip R., to Dakota Electron, Inc. Tool carrying vehicle with laser control apparatus. 4,162,708, Cl. 172-4.500.  
 Johnson, Robert E., to Sterling Drug Inc. 1-(Arylamino)pyrroles. 4,163,015, Cl. 260-326.250.  
 Johnson, Samuel M., to Procter & Gamble Company, The. Fabric care composition containing starch and surfactant. 4,162,983, Cl. 252-8.600.  
 Johnson, Steven A., to University of Utah. Measurement and reconstruction of three-dimensional fluid flow. 4,162,630, Cl. 73-194.00A.  
 Johnston, Mack S. Hair clipper. 4,162,574, Cl. 30-29.500.  
 Jolissaint, Charles H., to Rolm Corporation. Finite storage-time queue. 4,163,124, Cl. 179-18.00D.  
 Jones, Clifford W. Valve cover. 4,162,740, Cl. 220-85.00P.  
 Jones, Perry C.: See—  
 McWhorter, Robert D.; and Jones, Perry C., 4,162,917, Cl. 75-130.00R.  
 Jones, Peter J. V., to Imperial Chemical Industries Limited. Recovering cobalt and bromide catalyst values using a strong anion exchange resin. 4,162,991, Cl. 252-413.000.  
 Jorgensen, Brian K., to Tektronix, Inc. Lens mount for photographic recording apparatus. 4,162,823, Cl. 350-252.000.  
 Judd, Oliver S., to Hutson Corporation, The. Composition having improved wear resistant and compression resilient properties. 4,162,900, Cl. 51-295.000.  
 K-D Manufacturing Company: See—  
 Arnold, Robert L., 4,162,640, Cl. 81-311.000.  
 Kabushiki Kaisha Daini Seikosha: See—  
 Kamiya, Masaaki, 4,163,193, Cl. 324-29.500.  
 Kabushiki Kaisha Kawai Gakki Seisakusho: See—  
 Sakashita, Masao, 4,162,644, Cl. 84-1.030.  
 Kabushiki Kaisha Komatsu Seisakusho: See—  
 Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, 4,162,869, Cl. 414-70.000.  
 Kabushiki Kaisha Meidensha: See—  
 Kubota, Tomiharu, 4,163,279, Cl. 364-105.000.  
 Kabushiki Kaisha Osaka Packing Seizosho: See—  
 Kubo, Kazuhiko; Takahashi, Akira; and Ohashi, Kenichi, 4,162,924, Cl. 106-120.000.  
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 Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,162,609, Cl. 58-38.00R.  
 Kabushiki Kaisha Suwa Seikosha: See—  
 Morozumi, Shinji, 4,162,608, Cl. 58-23.00R.  
 Kaemmerer, Harry, to Americal Telephone and Telegraph. Helical video tape recorder arrangement suitable for high quality editing. 4,163,262, Cl. 360-14.000.  
 Kahn, Friedhelm. Mechanisms for controlling temperature and heat balance of molds. 4,162,700, Cl. 164-154.000.  
 Kai, Toshio: See—  
 Tanaka, Junzo; and Kai, Toshio, 4,163,141, Cl. 219-10.55F.  
 Kaiser, Louis; and Pascal, Charles J., to Uniroyal, Inc. Protective packaging device. 4,162,729, Cl. 206-592.000.  
 Kajan Specialty Co., Inc.: See—  
 Perkins, Lee E., 4,162,691, Cl. 137-613.000.  
 Kajiwara, Toshiyuki: See—  
 Shida, Shigeru; and Kajiwara, Toshiyuki, 4,162,627, Cl. 72-247.000.  
 Kali-Chemie Pharma GmbH: See—  
 Thies, Peter W.; and Asai, Akiji, 4,163,055, Cl. 424-267.000.  
 Kalliantas, Louis: See—  
 Gonot, Fred P., Jr.; and Kalliantas, Louis, 4,162,800, Cl. 281-42.000.  
 Kaloi, Cyril M., to United States of America, Navy. Reactively loaded corner fed electric microstrip dipole antennas. 4,163,236, Cl. 343-700.00MS.  
 Kaluza, Allen M.: See—  
 Sullivan, Bruce M.; and Kaluza, Allen M., 4,162,906, Cl. 55-346.000.  
 Kambara, Masahiro: See—  
 Morio, Minoru; and Kambara, Masahiro, 4,163,253, Cl. 358-120.000.  
 Kamin, Gerhard R., to Robert Bosch GmbH. Apparatus for the amplitude discrimination of a video signal. 4,163,251, Cl. 358-107.000.  
 Kamins, Theodore I.; and Sodini, Charles G., to Hewlett-Packard Company. One-transistor memory cell with enhanced capacitance. 4,163,243, Cl. 357-41.000.  
 Kaminski, Andrzej: See—  
 Brzozowski, Zbigniew; Kielkiewicz, Jędrzej; Rokietki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Bogusław, 4,163,087, Cl. 521-176.000.

Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, to Hitachi, Ltd. Field winding assembly for rotor in electric rotary machine. 4,163,166, Cl. 310-215.000.  
 Kamiya, Masaaki, to Kabushiki Kaisha Daini Seikosha. Battery voltage detecting apparatus for an electronic timepiece. 4,163,193, Cl. 324-29.500.  
 Kamy Inc.: See—  
 Sherman, Michael I.; and Prough, James R., 4,162,933, Cl. 162-17.000.  
 Kaneko, Hiroshi: See—  
 Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, 4,163,214, Cl. 340-146.3AC.  
 Kaneko, Katsumi: See—  
 Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.  
 Kanics, Andras, to Mittelmann GmbH & Co. KG. Sealing device for openings of a container which can be loaded with and emptied of batches of fluid loose material, viscous deposits, sludges or the like. 4,162,795, Cl. 277-237.00R.  
 Kao Soap Co., Ltd.: See—  
 Doi, Tadashi; and Takahashi, Harumi, 4,162,998, Cl. 260-28.00R.  
 Kasai, Masataka: See—  
 Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.  
 Kashiwara, Takanobu: See—  
 Nishimura, Akira; Kashiwara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,163,038, Cl. 422-36.000.  
 Kashima, Jiro; and Sato, Synji, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Foundry mold composition and process for producing foundry mold. 4,163,000, Cl. 260-29.60S.  
 Kato, Takao; Shimizu, Keizo; and Maruyama, Takeshi, to Hitachi, Ltd. Remote control device for electronic apparatus. 4,163,219, Cl. 340-310.00R.  
 Katoh, Hisanori, to Inoue Gomu Kogyo Kabushiki Kaisha. Synthetic resin window molding. 4,163,076, Cl. 428-339.000.  
 Kawada, Sooji. Whole body specified area stimulating therapy device. 4,162,675, Cl. 128-55.000.  
 Kawai, Hisasi; and Iwase, Kazuo, to Nippon Soken, Inc. Electronic ignition timing control system for internal combustion engines. 4,162,667, Cl. 123-117.00D.  
 Kawai, Hisasi: See—  
 Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.  
 Kawakami, Hiromi: See—  
 Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.  
 Kawatani, Takahiko: See—  
 Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, 4,163,214, Cl. 340-146.3AC.  
 Kelly, Thomas L. Insulation block and mounting means therefor. 4,162,597, Cl. 52-410.000.  
 Kelsey, David R., to D. R. K. Limited. Connector assembly for a ball and cord. 4,162,790, Cl. 273-58.00C.  
 Kemira OY: See—  
 Van der Meer, Arie; and Lepomaa, Lauri A., 4,163,045, Cl. 423-483.000.  
 Kendall Company, The: See—  
 Patel, Bhupendra C., 4,162,673, Cl. 128-748.000.  
 Kerr-McGee Corporation: See—  
 Baldwin, Roger A., 4,162,958, Cl. 208-8.0LE.  
 Clapper, Thomas W., 4,162,965, Cl. 208-177.000.  
 Leonard, Robert E., 4,162,957, Cl. 208-8.00R.  
 Leonard, Robert E., 4,162,964, Cl. 208-177.000.  
 Rhodes, Donald E., 4,162,956, Cl. 208-8.0LE.  
 Khutoretsky, Garri M.: See—  
 Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovskiy, Igor A.; Khutoretsky, Garri M.; and Vorontsov, Alexandr I., 4,163,163, Cl. 310-59.000.  
 Kielkiewicz, Jędrzej: See—  
 Brzozowski, Zbigniew; Kielkiewicz, Jędrzej; Rokietki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Bogusław, 4,163,087, Cl. 521-176.000.  
 Killeen, George F.: See—  
 McGraw, John T.; and Killeen, George F., 4,162,582, Cl. 35-12.00N.  
 Kincheloe, Jack D. Apparatus for converting a carton or the like into a preselected configuration. 4,162,648, Cl. 93-1.00G.  
 Kinoshita, Hiroyuki, to Tokyo Shibaura Electric Co., Ltd. Integrated circuit device. 4,163,245, Cl. 357-51.000.  
 Kinoshita, Makoto: See—  
 Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.  
 Kishi, Hajimu; Miyoshi, Naganori; and Seki, Masaki, to Oki Electric Industry Co., Ltd. NC tape producing system. 4,163,284, Cl. 364-474.000.  
 Kita, Takeichi; and Kita, Takuji. H-shaped steel sheet pile wall. 4,162,866, Cl. 405-277.000.  
 Kita, Takuji: See—  
 Kita, Takeichi; and Kita, Takuji, 4,162,866, Cl. 405-277.000.  
 Kitahara, Tohru: See—  
 Endo, Akira; and Kitahara, Tohru, 4,163,023, Cl. 260-556.00A.  
 Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, to Hitachi, Ltd. Magnetic phase shifter control system. 4,163,191, Cl. 323-89.00M.



- Klaiber, Raymond W., Jr.: See—  
Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klaiber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.
- Klein, Johann, to Bayer Aktiengesellschaft. Instrument for recording blood pressure. 4,162,674, Cl. 128-680.000.
- Kleinschmidt, Peter: See—  
Reinehr, Ulrich; Pieper, Christian; and Kleinschmidt, Peter, 4,163,078, Cl. 428-373.000.
- Klementowski, Frank M.: See—  
Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., 4,163,227, Cl. 340-662.000.
- Klockner-Humboldt-Deutz Aktiengesellschaft: See—  
Herchenbach, Horst, 4,162,922, Cl. 106-100.000.
- Klose, George J.: See—  
Chang, Richard S.; and Klose, George J., 4,162,792, Cl. 273-85.000.
- Knappenberger, George E. Bovine surgical table. 4,162,685, Cl. 119-103.000.
- Knopf, Robert J.; and Koleske, Joseph V., to Union Carbide Corporation. Ester diol alkoxylate acrylates. 4,163,113, Cl. 560-185.000.
- Knopf, Robert J.: See—  
Koleske, Joseph V.; and Knopf, Robert J., 4,163,114, Cl. 560-186.000.
- Knyazher, Galina B.: See—  
Litvinov, Pavel I.; Firsov, Vitaly M.; and Knyazher, Galina B., 4,162,921, Cl. 106-39.800.
- Kobayashi, Yuichi: See—  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,163,111, Cl. 560-122.000.
- Kodama, Naoki: See—  
Sado, Ryoichi; Nakamura, Akio; and Kodama, Naoki, 4,163,204, Cl. 338-114.000.
- Kohlka, Richard: See—  
Schwab, Kurt; and Kohlka, Richard, 4,162,820, Cl. 350-36.000.
- Koike, Masaru: See—  
Nakano, Shiro; and Koike, Masaru, 4,163,075, Cl. 428-328.000.
- Kolberg Manufacturing Corporation: See—  
Gelhaus, Derald B., 4,162,968, Cl. 209-400.000.
- Koleske, Joseph V.; and Knopf, Robert J., to Union Carbide Corporation. Ester diol alkoxylates. 4,163,114, Cl. 560-186.000.
- Koleske, Joseph V.: See—  
Knopf, Robert J.; and Koleske, Joseph V., 4,163,113, Cl. 560-185.000.
- Smith, Oliver W.; and Koleske, Joseph V., 4,163,029, Cl. 525-449.000.
- Kolesnikova, Elena N.: See—  
Raevich, Vladimir K.; Petrov, Evgeny I.; Kolesnikova, Elena N.; and Saxon, Alexandr K., 4,162,620, Cl. 66-187.000.
- Kolfertz, Erwin. Electromagnetically driven diaphragm pump. 4,162,876, Cl. 417-413.000.
- Kollmann, Harry; and Goetsch, Roland H., to Idra AG. Papier-mache coffin and method of making it. 4,162,935, Cl. 162-220.000.
- Komagata, Hitoshi: See—  
Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, 4,163,121, Cl. 179-2.0EB.
- Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, to Nippon Telegraph and Telephone Public Corporation. Character recognition system. 4,163,214, Cl. 340-146.3AC.
- Komori, Shigehiro: See—  
Shirahase, Reiji; and Komori, Shigehiro, 4,162,787, Cl. 271-173.000.
- Kondo, Kiyosi; and Tunemoto, Daiji, to Sagami Chemical Research Center. Prostaglandin precursors and processes for preparing the same. 4,163,106, Cl. 560-11.000.
- Kongo Co. Ltd.: See—  
Taniwaki, Genshi, 4,162,592, Cl. 49-358.000.
- Konicek, Jiri, to Perstorp, A.B. Method for removing resin smear in through holes of printed circuit boards. 4,162,932, Cl. 156-630.000.
- Konii, Tsuyoshi, to Citizen Watch Co. Ltd. Display device for electronic timepieces. 4,163,230, Cl. 340-765.000.
- Kopp, Hermann: See—  
Weishaupt, Siegfried; and Kopp, Hermann, 4,162,888, Cl. 431-265.000.
- Kosakowski, Henry R., to Bendix Corporation. The. Capacitance to digital conversion system. 4,163,221, Cl. 340-347.0AD.
- Kose, Saburo: See—  
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.
- Kowalchuk, John, to Lever Brothers Company. Powdered detergent compositions containing a calcium salt of an anionic surfactant. 4,162,994, Cl. 252-532.000.
- Koyo Seiko Company Limited: See—  
Okuda, Hiroji, 4,162,618, Cl. 64-23.000.
- Kozima, Masao: See—  
Abe, Seizaburo; Kozima, Masao; and Hosoi, Yuzo, 4,162,930, Cl. 148-38.000.
- Kraft, Klaus: See—  
Hess, Bernhard; and Kraft, Klaus, 4,163,093, Cl. 528-301.000.
- Kraft, Robert E., to FMC Corporation. Vibrating machine suspension. 4,162,778, Cl. 248-610.000.
- Kramer, Erich; Nickel, Horst; and Puchner, Fritz, to Bayer Aktiengesellschaft. Process for the preparation of concentrated dyestuff solutions. 4,163,012, Cl. 260-182.000.
- Kraus, Peter: See—  
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.
- Kresky, Fred C.; Loveland, John H.; and Evans, Bryce B., to Aeroquip Corporation. Gas line lead-in assembly. 4,162,801, Cl. 285-45.000.
- Kristiansen, Odd; and Durr, Dieter, to Ciba-Geigy Corporation. Pesticidal triazapentadienes. 4,163,056, Cl. 424-324.000.
- Kubens, Rolf; Ehrhard, Fritz; and Gebauer, Herbert, to Bayer Aktiengesellschaft. Process for the solvent-free production of solid plastic moldings sealing compounds and insulations using a polyisocyanate mixture containing 2,4-diisocyanatodiphenylmethane. 4,163,095, Cl. 528-67.000.
- Kubo, Kazuhiko; Takahashi, Akira; and Ohashi, Kenichi, to Kabushiki Kaisha Osaka Packing Seizusho. Shaped bodies of calcium silicate and process for producing same. 4,162,924, Cl. 106-120.000.
- Kubota, Tomiharu, to Kabushiki Kaisha Meidensha. Derivative minor loop type controller. 4,163,279, Cl. 364-105.000.
- Kubota, Yoshiyuki; Kurosawa, Yukio; and Sugawara, Hiroyuki, to Hitachi, Ltd. Vacuum interrupter with pressure monitoring means. 4,163,130, Cl. 200-144.00B.
- Kuhnel, Werner; and Spielau, Paul, to Dynamit Nobel AG. Process for the production of polyolefin foam sheets containing pore regulators. 4,163,085, Cl. 521-96.000.
- Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Bröckmeier, Dieter, to Bayer Aktiengesellschaft. Antistatic polyamide compositions with polyalkyleneglycol ether having secondary terminal urethane groups. 4,163,088, Cl. 525-433.000.
- Kupper, Willi, to W. Schlafhorst & Co. Buffer storage device for transferring textile coils. 4,162,723, Cl. 198-469.000.
- Kureha Kagaku Kogyo Kabushiki Kaisha: See—  
Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, 4,162,939, Cl. 435-254.000.
- Kurland, Marvin: See—  
Husson, Alan L.; and Kurland, Marvin, 4,162,719, Cl. 187-29.00R.
- Kurosawa, Yukio: See—  
Kubota, Yoshiyuki; Kurosawa, Yukio; and Sugawara, Hiroyuki, 4,163,130, Cl. 200-144.00B.
- Kuwakado, Satoshi: See—  
Shimogawa, Toshiaki; and Kuwakado, Satoshi, 4,162,772, Cl. 242-107.000.
- Kvapil, Rudolph; and Clews, K. Malcolm, to Gulf Oil Corporation; and Standard Oil Company (Indiana). In-situ retorting of carbonaceous deposits. 4,162,808, Cl. 299-2.000.
- Kyle, Rhoden R., to C. A. Pemberton & Co. Limited. Vacuum packaging. 4,162,599, Cl. 53-77.000.
- L. Schuler GmbH: See—  
Dangelmaier, Karl; and Barcis, Alfred, 4,162,734, Cl. 414-27.000.
- Lafarge Fondu International: See—  
Schmitt, Jean M.; and Mathieu, Alain, 4,162,923, Cl. 106-104.000.
- Lagal, Roy, to Lagal, Roy. Apparatus for separating material by specific gravity. 4,162,969, Cl. 209-447.000.
- Lamprey, Donald F. Hydraulic elevator. 4,162,718, Cl. 187-29.00A.
- Langemeyer, Carl: See—  
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeier, Hartmut, 4,162,602, Cl. 53-415.000.
- Lapchenko, Sergei N.: See—  
Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.
- Lapointe, Joseph A., to Domtar Inc. Whole tree chipper. 4,162,769, Cl. 241-68.000.
- Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, to Mannesmann Aktiengesellschaft. Mount for ultrasonic test head. 4,162,636, Cl. 73-638.000.
- Laud, Kamlakar R.: See—  
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,162,631, Cl. 73-362.0AR.
- Laurel Bank Machine Co., Ltd.: See—  
Watanabe, Kenkichi; and Sentoku, Hideshi, 4,162,598, Cl. 53-54.000.
- Lawrence, Jackson; and Cramer, Robert S., to Cluett, Peabody & Co., Inc. Integrated method of finishing, straightening and compressive preshrinking of fabric. 4,162,463, Cl. 28-163.000.
- Lawter, Ray L.: See—  
Briggs, Barry D.; and Lawter, Ray L., 4,162,817, Cl. 339-75.0MP.
- Leal, August: See—  
Wright, William R.; Murphy, Theodore; Piazza, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
- Lee, James K.: See—  
Frank, Lee F.; and Lee, James K., 4,162,832, Cl. 354-51.000.
- Leenhouts, Albert C., to Superior Electric Company. The. Arcuate movement numerical control method and system. 4,163,184, Cl. 318-573.000.
- Legille, Edouard; Mahr, Rene N.; and Heinz, Carlo, to S.A. des Anciens Etablissements Paul Wurth. Pressure equalization apparatus and method. 4,162,784, Cl. 266-176.000.
- Lemelson, Jerome H. Manufacturing apparatus. 4,162,757, Cl. 228-1.00R.
- Leonard, Robert E., to Kerr-McGee Corporation. Method of feeding solids to a process unit. 4,162,957, Cl. 208-8.00R.
- Leonard, Robert E., to Kerr-McGee Corporation. Method of handling ash-rich material in a coal deashing process. 4,162,964, Cl. 208-177.000.
- Lepomaa, Lauri A.: See—  
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- Lever Brothers Company: See—  
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Cannon, Joseph G.; and Long, John P., 4,163,063, Cl. 424-330.000.
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Holubec, Zenovie M., 4,162,985, Cl. 252-32.70E.
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Reid, Robert; and Lustvee, Kaljo, 4,162,861, Cl. 403-242.000.
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Maeda, Yoshiki; and Maeda, Chikako, 4,162,864, Cl. 405-75.000.
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Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.
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Ransmayr, Wilhelm; and Mally, Heinz, 4,163,036, Cl. 264-12.000.
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Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.
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Sturrock, James C., 4,163,271, Cl. 361-93.000.
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Hedges, Charles V.; and Mark, Victor, 4,163,116, Cl. 568-723.000.
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Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., 4,162,975, Cl. 210-124.000.
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Pepe, Enrico J.; and Marsden, James G., 4,163,073, Cl. 427-221.000.
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Anthony, Donald B.; and Marse, Allan V., 4,162,898, Cl. 44-1.00R.
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Demers, Normand; and Martin, Claude, 4,162,750, Cl. 222-250.000.
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Cambiaso, Cesar L.; and Masson, Pierre L., 4,162,895, Cl. 435-7.00B.
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Redman, Howard E., 4,162,732, Cl. 414-736.000.
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Schmitt, Jean M.; and Mathieu, Alain, 4,162,923, Cl. 106-104.000.
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Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, 4,163,018, Cl. 260-429.900.
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Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, 4,162,939, Cl. 435-254.000.
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Tanaka, Junzo; and Kai, Toshio, 4,163,141, Cl. 219-10.55F.
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Onoue, Yoshinori; Matsuura, Katsuji; and Takahashi, Shigenori, 4,163,278, Cl. 363-101.000.
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Chang, Richard S.; and Klose, George J., 4,162,792, Cl. 273-85.00G.
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Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, 4,163,061, Cl. 424-279.000.
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MacGregor, John J., 4,162,950, Cl. 204-149.000.
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Nixon, Jeddy D., Jr., 4,162,619, Cl. 64-23.000.
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Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.
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Zuendorf, Henry D.; Maurer, Hans A.; and Banks, Donald S., 4,163,231, Cl. 343-5.0CM.
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Guillemin, Claude; and Mayen, Christian, 4,162,977, Cl. 210-198.00C.
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Shigemura, Michael S., 4,162,889, Cl. 431-76.000.
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Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., 4,163,090, Cl. 526-88.000.
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Fellnor, John R.; and Love, William J., Jr., 4,162,891, Cl. 432-247.000.
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De Nora, Oronzio; Bianchi, Giuseppe; and Meneghini, Giovanni, 4,162,953, Cl. 204-252.000.
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Scribaine, Alexander, 4,163,054, Cl. 424-244.000.
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Mengeringhausen, Max; and Schmidek, Reinhard, 4,162,860, Cl. 403-199.000.
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Spies, Johann; and Wohrl, Alfons, 4,163,268, Cl. 361-1.000.
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Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
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Maes, Robert H.; and Fontaines, Luc M., 4,162,915, Cl. 75-14.000.
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Wright, William V., 4,162,738, Cl. 220-21.000.
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Anderson, Walter F.; and Meyer, Ronald A., 4,162,746, Cl. 222-153.000.
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Tiefenthaler, Karl H. O.; and Nittner, Erich W. K., 4,162,925, Cl. 106-208.000.
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Michael, Peter C.; Taylor, Richard J.; and Trump, Martin R., 4,163,249, Cl. 358-21.00R.
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Pieters, Ferdinandus A., 4,163,164, Cl. 310-103.000.
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Schregenberger, Alex J., 4,162,955, Cl. 204-299.0EC.
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Plunkett, Richard A.; Neff, Jerry L.; and Bemish, Timothy A., 4,163,025, Cl. 260-570.900.
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Van Steenhoven, Frank; and Hirt, Thomas D., 4,162,779, Cl. 248-343.000.
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Westall, Thomas E.; and Miller, Frank, 4,162,600, Cl. 53-120.000.
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Miller, Wayne K., deceased; and Miller, Sharon, executrix, 4,162,682, Cl. 119-16.000.
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Smith, Wayne R.; and Miller, William G., 4,162,845, Cl. 355-14.000.
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Satterfield, Larry S., 4,162,752, Cl. 222-342.000.
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Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., 4,162,975, Cl. 210-124.000.
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Antonsen, Stephen A.; and Boaz, David P., 4,163,077, Cl. 428-355.000.
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Hisao, Nobuyoshi; and Agui, Takeshi, 4,163,260, Cl. 358-261.000.
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Orii, Katsuo; and Fushima, Haruo, 4,162,717, Cl. 182-48.000.
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Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.
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Kanics, Andras, 4,162,795, Cl. 277-237.00R.
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Sato, Yukio; Haraoka, Mototaka; and Mitumori, Yoshio, 4,163,223, Cl. 340-384.00R.
- Miura, Kenichi, to Fujitsu Limited. Tree-type combinatorial logic circuit. 4,163,211, Cl. 340-146.200.
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Kishi, Hajimu; Miyoshi, Naganori; and Seki, Masaki, 4,163,284, Cl. 364-474.000.

- Mizokami, Akira: See—  
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.
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Tamura, Tetsuomi; and Mizutani, Koichi, 4,162,613, Cl. 60-278.000.
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Tabak, Samuel A.; and Morrison, Roger A., 4,163,028, Cl. 585-481.000.
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Payne, William J., 4,162,573, Cl. 29-705.000.
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Coburn, Robert E., 4,162,643, Cl. 83-499.000.
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- Monier, Jacques F.: See—  
Buerger, Walter R.; Dixon, Kenneth K.; and Monier, Jacques F., 4,163,212, Cl. 340-146.30H.
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Hintz, Harold J., 4,163,026, Cl. 260-583.00P.
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- Monson, Arnold A. Sewage disposal system. 4,162,976, Cl. 210-170.000.
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Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.
- Montgomery Industries International, Inc.: See—  
Lewis, Herbert H., 4,162,770, Cl. 241-191.000.
- Mookherjee, Braja D.: See—  
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.
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Alkatis, Anthony; and Cells, Paul L., 4,162,986, Cl. 252-33.200.
- Morcom, Paul J. Mold for plastic collapsible article carrier. 4,162,781, Cl. 249-144.000.
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Malarkey, Terence D.; and Moreland, William C., II, 4,163,139, Cl. 219-10.49R.
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- Morii, Kokichi; and Haneishi, Kohei, to Sony Corporation. Tuning apparatus for selecting preset broadcast frequencies. 4,163,203, Cl. 334-86.000.
- Morino, Seiji: See—  
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- Moriya, Michio, to Sumitomo Electric Industries, Ltd. Sliding caliper type disc brake. 4,162,721, Cl. 188-73.300.
- Moriya, Yoshiaki: See—  
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- Morooka, Yasuo; and Tanifuji, Shinya, to Hitachi, Ltd. Tension control method for a rolling mill. 4,162,624, Cl. 72-8.000.
- Morozumi, Shinji, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece frequency regulating circuit. 4,162,608, Cl. 58-23.00R.
- Morrison, Albert, III: See—  
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- Morrison, Charles F., Jr., to Vac-Tec Systems, Inc. Planar magnetron sputtering device. 4,162,954, Cl. 204-298.000.
- Morrison, Roger A.: See—  
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- Morrow, Richard: See—  
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- Morse, George W. Pellet mill with improved feed system. 4,162,881, Cl. 425-331.000.
- Moser, Paul: See—  
Lind, Hanns; and Moser, Paul, 4,163,007, Cl. 260-45.75R.
- Moser, Roland: See—  
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- Moses, Lawrence L. Handbag with thermal theft protection system. 4,162,695, Cl. 150-35.000.
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- Motorola, Inc.: See—  
Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., 4,163,274, Cl. 361-417.000.
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- Moyroud, Louis M. Photographic type composing machine and method. 4,162,846, Cl. 354-10.000.
- Mucke, Christoph: See—  
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Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, 4,162,908, Cl. 65-60.00D.
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- Multivac Sepp Haggenmuller KG: See—  
Vetter, Arthur, 4,162,884, Cl. 425-388.000.
- Munter, Ernst A.; and Ciambello, Carmine A., to Northern Telecom Limited. Binary multiplier circuit including coding circuit. 4,163,287, Cl. 364-757.000.
- Murakami, Hiroyasu: See—  
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- Murphy, Theodore: See—  
Wright, William R.; Murphy, Theodore; Piazza, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
- Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. Flavoring with terpenyl ethers. 4,163,068, Cl. 426-538.000.
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- Nadelson, Jeffrey, to Sandoz, Inc. Isoxazole-4-carboxamides as tranquilizers, sleep-inducers and muscle relaxants. 4,163,057, Cl. 424-272.000.
- Nadler, Morton, to Norprint Limited. Alphanumeric character identification. 4,163,213, Cl. 340-146.30D.
- Nakamura, Akio: See—  
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- Nakashima, Syozi: See—  
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- Nakayama, Makoto: See—  
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- Nakayama, Tetsuya: See—  
Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, 4,162,869, Cl. 414-70.000.
- Nalco Chemical Company: See—  
Finch, Robert E., 4,162,966, Cl. 209-166.000.
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Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, 4,163,191, Cl. 323-89.00M.
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Sauer, Donald G., 4,162,883, Cl. 425-387.100.
- National Distillers and Chemical Corporation: See—  
Van den Bossche, Henri A., 4,163,040, Cl. 422-131.000.
- National Presto Industries, Inc.: See—  
Walker, Duane H.; and Quarderer, Darrell W., 4,162,741, Cl. 220-203.000.
- National Semiconductor Corporation: See—  
Culmer, Daniel D., 4,163,188, Cl. 323-4.000.
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Briggs, Barry D.; and Lawter, Ray L., 4,162,817, Cl. 339-75.0MP.
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Plunkett, Richard A.; Neff, Jerry L.; and Bemish, Timothy A., 4,163,025, Cl. 260-570.900.
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- Nelson, Carl D., to J. I. Case Company. Vehicle differential control. 4,162,712, Cl. 180-253.000.
- Nelson, Harlan I. Label dispenser. 4,162,739, Cl. 221-70.000.



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- Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., to Bristol-Myers Company. Antibiotic compound. 4,162,938, Cl. 435-75.000.
- Neustadt, Bernard R.; and Gold, Elijah H., to Schering Corporation. Anti-hypertensive 5-[2-(substituted anilinoalkylamino)-1-hydroxyalkyl]salicylamides. 4,163,053, Cl. 424-230.000.
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Kramer, Erich; Nickel, Horst; and Puchner, Fritz, 4,163,012, Cl. 260-182.000.
- Nife-Jungner AB: See—  
Norling, Sten B. C., 4,163,173, Cl. 313-352.000.
- Nippon Electric Co., Ltd.: See—  
Aomura, Kunio; and Okada, Kenji, 4,163,246, Cl. 357-68.000.
- Nippon Soken, Inc.: See—  
Kawai, Hisasi; and Iwase, Kazuo, 4,162,667, Cl. 123-117.00D.
- Nippon Steel Corporation: See—  
Abe, Seizaburo; Kozima, Masao; and Hosoi, Yuzo, 4,162,930, Cl. 148-38.000.
- Nippon Telegraph and Telephone Public Corporation: See—  
Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, 4,163,214, Cl. 340-146.3AC.
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Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., 4,163,046, Cl. 423-510.000.
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Tiefenthaler, Karl H. O.; and Nittner, Erich W. K., 4,162,925, Cl. 106-208.000.
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Mead, Harold C., 4,162,796, Cl. 280-5.00R.
- Nixon, Jeddy D., Jr., to Maurer Engineering, Inc. Drill string shock sub. 4,162,619, Cl. 64-23.000.
- Niznik, George E., to General Electric Company. Method for making thermoplastic foams. 4,163,037, Cl. 264-54.000.
- Nonogaki, Masahiko, to Elmo Company Limited. Zoom lens assembly with restrictable zooming range. 4,162,822, Cl. 350-187.000.
- Norback, Per, to Aktiebolaget Carl Munters. Method of producing sorption bodies. 4,162,934, Cl. 162-155.000.
- Norden, James W. Side-lifting apparatus for hopper wagons. 4,162,871, Cl. 414-376.000.
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- Norling, Sten B. C., to Nife-Jungner AB. Porous electrode body for electrical accumulators. 4,163,173, Cl. 313-352.000.
- Norprint Limited: See—  
Nadler, Morton, 4,163,213, Cl. 340-146.30D.
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- Northern Telecom Limited: See—  
Munter, Ernst A.; and Ciambello, Carmine A., 4,163,287, Cl. 364-757.000.
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- NTN Toyo Bearing Company, Ltd.: See—  
Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, 4,162,812, Cl. 308-172.000.
- Nugteren, Diederik H.: See—  
Beerthuis, Roelof K.; van Dorp, David A.; and Nugteren, Diederik H., 4,163,108, Cl. 560-121.000.
- Nyberg, Donald W. Method and apparatus for consolidating particle board. 4,162,877, Cl. 425-84.000.
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Cha, Chang Y., 4,162,706, Cl. 166-251.000.
- Occidental Petroleum Corporation: See—  
Duraiswamy, Kandaswamy, 4,162,959, Cl. 208-8.00R.
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- Ogawa, Francis T., to Statitrol Division Emerson Electric Co. Alarm condition detecting apparatus and method. 4,163,226, Cl. 340-629.000.
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Kubo, Kazuhiko; Takahashi, Akira; and Ohashi, Kenichi, 4,162,924, Cl. 106-120.000.
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Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.
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- Okada, Kenji: See—  
Aomura, Kunio; and Okada, Kenji, 4,163,246, Cl. 357-68.000.
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Kishi, Hajimu; Miyoshi, Nagahori; and Seki, Masaki, 4,163,284, Cl. 364-474.000.
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Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,162,661, Cl. 123-30.00C.
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Capuano, Italo A., 4,162,897, Cl. 23-232.00C.
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Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.
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- Oppenheim, Everett P.: See—  
Maze, Robert C.; Oppenheim, Everett P.; and Reynolds, Reese M., 4,162,988, Cl. 252-299.000.
- Optical Data System: See—  
Sutherland, Kent K.; Crowther, Ted J.; and Salmond, Kent A., 4,163,290, Cl. 365-125.000.
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- Orts, Richard J. Peptide compounds and compositions. 4,163,011, Cl. 260-112.50R.
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Yagii, Kiyoshi; and Oshio, Hideki, 4,162,948, Cl. 204-80.000.
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Wheeler, Robert V.; and Oswald, Richard A., 4,163,154, Cl. 250-473.000.
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Heitman, Marshall D.; and Butler, Joe D., 4,162,713, Cl. 180-242.000.
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Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,163,111, Cl. 560-122.000.
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Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.
- Outboard Marine Corporation: See—  
Ehrlich, Josef, 4,162,663, Cl. 123-75.00B.
- Owens-Illinois, Inc.: See—  
Mallory, James D., 4,162,911, Cl. 65-229.000.
- Oxy-Catalyst, Inc.: See—  
Retallick, William B., 4,162,993, Cl. 252-477.00R.
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- Pachmayr Gun Works, Inc.: See—  
Pachmayr, Frank A., 4,162,586, Cl. 42-71.00P.
- Packer, Martin R.: See—  
Greer, Edward M.; Wyle, Frank S.; and Packer, Martin R., 4,162,692, Cl. 138-30.000.
- Paget, Fredrick W.: See—  
Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.
- Paethorpe, George, to Monsanto Company. Method of polymerizing acrylonitrile with certain acidic monomers. 4,163,089, Cl. 526-80.000.
- Pancheri, Eugene J.: See—  
Maguire, Edward J., Jr.; and Pancheri, Eugene J., 4,162,987, Cl. 252-135.000.

- Pansing, Harry E.: See—  
Carumpalos, Constantine G.; and Pansing, Harry E., 4,163,001, Cl. 260-29.6MN.
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Logothetis, Eleftherios M.; Laud, Kamalakar R.; and Park, John K., 4,162,631, Cl. 73-362.0AR.
- Parker-Hannifin Corporation: See—  
Marietta, Walter E., 4,162,874, Cl. 417-216.000.
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Kaiser, Louis; and Pascal, Charles J., 4,162,729, Cl. 206-592.000.
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Wurster, Ewald, 4,163,171, Cl. 313-221.000.
- Patterson, David L. Fish-bait tank. 4,162,681, Cl. 119-3.000.
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- Paul, James T., Jr., and Weldy, Winfred E., to Hercules Incorporated. Unsaturated epoxides as coupling agents for carbon fibers and unsaturated matrix resins. 4,163,003, Cl. 260-40.00R.
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Alles, David S.; Mac Rae, Alfred U.; and Pease, Roger F. W., 4,163,155, Cl. 250-492.00B.
- Peilet, Lester R. Retractable brush with resistance to popping apart. 4,162,554, Cl. 15-184.000.
- Pennsylvania Crusher Corporation: See—  
Hahn, William F., 4,162,767, Cl. 241-30.000.
- Pennwalt Corporation: See—  
Hill, John H., 4,162,760, Cl. 233-19.00R.
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Gaudard, Yves; Guillemaud, Henri; and Perfetti, Jacques, 4,162,863, Cl. 405-45.000.
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- Perkins, Lee E., to Kajan Specialty Co., Inc. Tubular valve device. 4,162,691, Cl. 137-613.000.
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Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., 4,162,975, Cl. 210-124.000.
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Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.
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Guignard, Claude F.; and Perrette, Bernard J., 4,163,157, Cl. 250-561.000.
- Perrette, Bernard Julien: See—  
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- Perstorp, AB: See—  
Konicek, Jiri, 4,162,932, Cl. 156-630.000.
- Perzley, William: See—  
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.
- Peters, Homer D. F., to Owens-Illinois, Inc. Hot gob detector for controlling a glassware forming machine. 4,162,909, Cl. 65-163.000.
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Rose, Edward, 4,162,882, Cl. 425-376.00B.
- Petrov, Evgeny I.: See—  
Raevich, Vladimir K.; Petrov, Evgeny I.; Kolesnikova, Elena N.; and Saxon, Alexander K., 4,162,620, Cl. 66-187.000.
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Cobb, Raymond L., 4,163,014, Cl. 260-326.00C.
- Tribble, William R., 4,162,894, Cl. 23-230.00A.
- Phonix Elektrizitatsgesellschaft H. Knemann & Co.: See—  
Eisert, Klaus, 4,162,819, Cl. 339-247.000.
- Piazza, Kenneth: See—  
Wright, William R.; Murphy, Theodore; Piazza, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
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- Pieper, Christian: See—  
Reinehr, Ulrich; Pieper, Christian; and Kleinschmidt, Peter, 4,163,078, Cl. 428-373.000.
- Pieters, Ferdinandus A., to Micropump Corporation. Split magnet drive. 4,163,164, Cl. 310-103.000.
- Pires, H. George, to Teleglobe Pay-TV System, Inc. Billing method and system for a subscriber of a pay television system. 4,163,255, Cl. 358-122.000.
- Pischtschan, Alfred: See—  
Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.
- Plastomedical Sciences, Inc.: See—  
Steckler, Robert, 4,163,092, Cl. 526-292.000.
- Platt, Albert P., III, deceased (by Platt, Barbara B., administratrix), to Eastman Kodak Company. Apparatus for selectively copying from two different documents. 4,162,848, Cl. 355-14.000.
- Platt, Barbara B., administratrix: See—  
Platt, Albert P., III, deceased, 4,162,848, Cl. 355-14.000.
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Teisseire, Paul J.; Plattier, Marcel; and Giraudi, Edouard, 4,163,109, Cl. 560-122.000.
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- Gold, Nathan, 4,162,831, Cl. 354-31.000.
- Harrison, George C., 4,162,836, Cl. 354-139.000.
- MacLean, Allan D., 4,162,834, Cl. 354-86.000.
- Plummer, William T., 4,162,833, Cl. 354-86.000.
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- Pommer, Ernst-Heinrich: See—  
Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.
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Stubbings, James H., 4,162,641, Cl. 83-71.000.
- Prandini, Franco, to Rockwell-Rimoldi S.p.A. Device for inserting ornamental threads in stitches of seams on a sewing machine. 4,162,657, Cl. 112-101.000.
- Prigorovsky, Igor A.: See—  
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DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, 4,162,984, Cl. 252-8.800.
- Johnson, Samuel M., 4,162,983, Cl. 252-8.600.
- Maguire, Edward J., Jr.; and Pancheri, Eugene J., 4,162,987, Cl. 252-135.000.
- Prolabo: See—  
Guillemin, Claude; and Mayen, Christian, 4,162,977, Cl. 210-198.00C.
- Prough, James R.: See—  
Sherman, Michael I.; and Prough, James R., 4,162,933, Cl. 162-17.000.
- Pruckmayr, Gerfried: See—  
Heinsolhn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.
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- Puchner, Fritz: See—  
Kramer, Erich; Nickel, Horst; and Puchner, Fritz, 4,163,012, Cl. 260-182.000.
- Puglisi, Thomas C.; and Strobel, Kurt M., to Litton Industrial Products, Inc. Safety latch system. 4,162,878, Cl. 425-152.000.
- Pulle, Duco W. J.: See—  
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- Purdy, James A., to Eltra Corporation. Permanent magnet motor. 4,163,165, Cl. 310-154.000.
- Quaraderer, Darrell W.: See—  
Walker, Duane H.; and Quaraderer, Darrell W., 4,162,741, Cl. 220-203.000.
- R. O. Hull & Company, Inc.: See—  
Canaris, Valerie M., 4,162,947, Cl. 204-55.00R.
- Rabus, Friedrich: See—  
Gratner, Gunter; and Rabus, Friedrich, 4,162,665, Cl. 123-117.00R.
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- Rageb, Sam M.: See—  
Damusis, John A.; and Rageb, Sam M., 4,162,569, Cl. 29-417.000.
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- Raines, Robert B.: See—  
Holland, Maeford J.; and Raines, Robert B., 4,162,886, Cl. 425-556.000.
- Rainville Company, Inc.: See—  
Makowski, Alexander G., 4,162,879, Cl. 425-183.000.
- Rambacher, Paul: See—  
Macke, Siegfried; and Rambacher, Paul, 4,163,017, Cl. 260-397.100.



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 Raychem Corporation: *See—*  
 Campbell, Bruce D.; and Lopez, Eugene F., 4,163,117, Cl. 174-74.00A.  
 Raytheon Company: *See—*  
 Zuerndorfer, Henry D.; Maurer, Hans A.; and Banks, Donald S., 4,163,231, Cl. 343-5.0CM.  
 RCA Corporation: *See—*  
 Sutphin, Eldon M., Jr., 4,163,192, Cl. 324-15.000.  
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 Reid, Robert; and Lustvee, Kaljo, to Daymond Limited. Structural joint. 4,162,861, Cl. 403-242.000.  
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 Reinehr, Ulrich; Pieper, Christian; and Kleinschmidt, Peter, to Bayer Aktiengesellschaft. Hydrophilic bi-component threads. 4,163,078, Cl. 428-373.000.  
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 Oetjen, Georg; and Eck, David L., 4,162,628, Cl. 73-141.00A.  
 Rengo Co., Ltd.: *See—*  
 Tokuno, Masateru, 4,163,185, Cl. 318-601.000.  
 Retallick, William B., to Oxy-Catalyst, Inc. Metal catalyst support. 4,162,993, Cl. 252-477.00R.  
 Reuther, Wolfgang: *See—*  
 Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.  
 Revo, Valery V.: *See—*  
 Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.  
 Reynier, Jacques A., to Elmetherm. Heated doors. 4,163,144, Cl. 219-368.000.  
 Reynolds Metals Company: *See—*  
 Cudzik, Daniel F., 4,162,743, Cl. 220-270.000.  
 Reynolds, Reese M.: *See—*  
 Maze, Robert C.; Oppenheim, Everett P.; and Reynolds, Reese M., 4,162,988, Cl. 252-299.000.  
 Rhinefrank, Robert A.: *See—*  
 Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., 4,162,867, Cl. 408-157.000.  
 Rhodes, Donald E., to Kerr-McGee Corporation. Coal deashing process having improved solvent recovery techniques. 4,162,956, Cl. 208-8.0LE.  
 Rhone-Poulenc-Textile: *See—*  
 Gaudard, Yves; Guillemaud, Henri; and Perfetti, Jacques, 4,162,863, Cl. 405-45.000.  
 Riccio, Pasquale R. Aerosol dispenser utilizing CO<sub>2</sub> as propellant. 4,162,765, Cl. 239-337.000.  
 Rice, Herbert L.: *See—*  
 Mason, Ron G.; and Rice, Herbert L., 4,163,066, Cl. 426-99.000.  
 Richter, Peter; Wigger, August; Fahrback, Gerhard; Seiler, Erhard; and Barzynski, Helmut, to BASF Aktiengesellschaft. Laminates for the manufacture of flexographic printing plates using block copolymers. 4,162,919, Cl. 96-87.00R.  
 Ricoh Company, Ltd.: *See—*  
 Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.  
 Riebel, Hans-Jochem: *See—*  
 Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.  
 Rieger, Wolfhart: *See—*  
 Molnar, Sandor; and Rieger, Wolfhart, 4,162,899, Cl. 51-295.000.  
 Ries, Karl: *See—*  
 Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simonet, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.  
 Righi, Gian P.: *See—*  
 Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.  
 Ringelhan, Helmut: *See—*  
 Fritsche, Rainer; and Ringelhan, Helmut, 4,163,148, Cl. 250-201.000.  
 Riordan, Edward D.: *See—*  
 Descovich, Theodore; Smith, Jack F.; and Riordan, Edward D., 4,163,142, Cl. 219-79.000.  
 Risdon Manufacturing Company: *See—*  
 Bennett, Robert A., 4,162,749, Cl. 222-633.000.  
 Bennett, Robert S., 4,162,748, Cl. 222-632.000.  
 Robert Bosch GmbH: *See—*  
 Bock, Gerd; Grand, Gerd; and Ilmer, Andreas, 4,163,247, Cl. 358-12.000.  
 Grather, Gunter; and Rabus, Friedrich, 4,162,665, Cl. 123-117.00R.  
 Heitmann, Jürgen, 4,163,248, Cl. 358-12.000.  
 Kamin, Gerhard R., 4,163,251, Cl. 358-107.000.  
 Wesemeyer, Jürgen; and Haubner, Georg, 4,163,217, Cl. 340-167.00R.  
 Roberts, Wilbur N.: *See—*  
 Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.  
 Robinson, Ivan M.: *See—*  
 Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.  
 Roche, William J.: *See—*  
 Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.  
 Rockwell International Corporation: *See—*  
 White, Stanley A., 4,163,257, Cl. 358-133.000.  
 Rockwell-Rimoldi S.p.A.: *See—*  
 Prandini, Franco, 4,162,657, Cl. 112-101.000.  
 Rokicki, Gabriel: *See—*  
 Brzozowski, Zbigniew; Kjekiewicz, Jędrzej; Rokicki, Gabriel; Kaminski, Andrzej; Chmiec, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.  
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 Rebel, Herbert; and Simeth, Claus, 4,162,652, Cl. 101-425.000.  
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 Rollei-Werke Franke & Heidecke: *See—*  
 Sprung, Jürgen, 4,162,696, Cl. 150-52.00J.  
 Rolm Corporation: *See—*  
 Jolissaint, Charles H., 4,163,124, Cl. 179-18.00D.  
 Roloff, Achim: *See—*  
 Heimbach, Paul; Roloff, Achim; and Nabbefeld-Arnold, Erich F., 4,163,024, Cl. 260-566.00R.  
 Romensko, David J., to Dow Corning Corporation. U.V.-radiation method for decreasing surface tack of disposed organopolysiloxane greases and gels. 4,163,082, Cl. 428-447.000.  
 Rose, Edward, to Peters Machinery Company. Valve mechanism for sandwich creme. 4,162,882, Cl. 425-376.00B.  
 Rosen, Perry: *See—*  
 Holland, George W.; and Rosen, Perry, 4,163,016, Cl. 260-345.80P.  
 Ross, Ronald G., to California Institute of Technology. Voltage-current-power meter for photovoltaic solar arrays. 4,163,194, Cl. 324-29.500.  
 Ross, William J.; Verge, John P.; and Williamson, William R. N., to Lilly Industries Limited. Acylamino-1,2,4-oxadiazole or thiadiazole derivatives as anti-hypersensitivity agents. 4,163,048, Cl. 424-45.000.  
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 Rowlette, John J., to Erway, Duane D., a part interest. Method and composition for retarding water evaporation. 4,162,990, Cl. 252-383.000.  
 Royal Flush (1979) Inc.: *See—*  
 Charles, Paul A. S.; and Williams, Frederic D. M., 4,162,549, Cl. 4-318.000.  
 Rozmus, John J. Providing solder on electrical contacts. 4,162,572, Cl. 29-630.00D.  
 Rubenzer, Jon A. Press brake milling machine. 4,162,565, Cl. 29-33.00R.  
 Rubio, Carlos R. Fish scaler tool. 4,162,558, Cl. 17-67.000.  
 Ruck, Bernard W.: *See—*  
 Cook, Gerald H.; and Ruck, Bernard W., 4,162,829, Cl. 352-166.000.  
 Rudolph, Rene, to BBC Brown, Boveri & Company Limited. Arrangement for arc-quenching in arresters. 4,163,272, Cl. 361-127.000.  
 Ruegg, Rudolf: *See—*  
 Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,163,103, Cl. 542-427.000.  
 Ryba, Stanley J.: *See—*  
 Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.  
 Ryser, Gottlieb: *See—*  
 Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,163,103, Cl. 542-427.000.  
 Sablan, Francisco C.: *See—*  
 Sibley, Clarence E.; and Sablan, Francisco C., 4,162,776, Cl. 244-118.00R.  
 Sadjadi, Kambiz M. Information display system having digital logic interconnections. 4,163,228, Cl. 340-711.000.  
 Sado, Ryoichi; Nakamura, Akio; and Kodama, Naoki, to Shin-Etsu Polymer Co., Ltd. Pressure-sensitive resistors. 4,163,204, Cl. 338-114.000.

- Sadoski, Tadius T.: *See—*  
 Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.  
 Sagami Chemical Research Center: *See—*  
 Kondo, Kiyosi; and Tunemoto, Daiei, 4,163,106, Cl. 560-11.000.  
 St. Clair, Oba L. Tethered model aircraft control system. 4,162,589, Cl. 46-77.000.  
 Saint-Gobain Industries: *See—*  
 Sauer, Gerd, 4,163,195, Cl. 325-313.000.  
 Saito, Akira: *See—*  
 Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.  
 Saito, Toshihisa: *See—*  
 Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.  
 Sakai Chemical Industry Company, Ltd.: *See—*  
 Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, 4,163,018, Cl. 260-429.900.  
 Sakakibara, Yukio: *See—*  
 Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, 4,163,282, Cl. 364-431.000.  
 Sakashita, Masao, to Kabushiki Kaisha Kawai Gakki Seisakusho. Automatic rhythm accompaniment apparatus in an electronic organ. 4,162,644, Cl. 84-1.030.  
 Sakitani, Yoshio: *See—*  
 Ishikawa, Isao; and Sakitani, Yoshio, 4,163,168, Cl. 310-328.000.  
 Sakurada, Nobuaki: *See—*  
 Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyasu, 4,162,839, Cl. 354-23.00D.  
 Salmond, Kent A.: *See—*  
 Sutherlin, Kent K.; Crowther, Ted J.; and Salmond, Kent A., 4,163,290, Cl. 365-125.000.  
 Sampo, Tohru, to Hitachi, Ltd. Audio-frequency power amplifier. 4,163,197, Cl. 330-263.000.  
 Sanders, James M.: *See—*  
 Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.  
 Sandoz, Inc.: *See—*  
 Nadelson, Jeffrey, 4,163,057, Cl. 424-272.000.  
 Sato, Hiroshi: *See—*  
 Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, 4,163,191, Cl. 323-89.00M.  
 Sato, Synji: *See—*  
 Kashima, Jiro; and Sato, Synji, 4,163,000, Cl. 260-29.60S.  
 Sato, Yoshio: *See—*  
 Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, 4,163,121, Cl. 179-2.0EB.  
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 Satterfield, Larry S., to Milliken Research Corporation. Rotating drum spreader. 4,162,752, Cl. 222-342.000.  
 Satterwhite, Charles L., to Unit Rig & Equipment Co. Excavating wheel with cam assisted bucket wall ejector. 4,162,584, Cl. 37-190.000.  
 Saucy, Gabriel: *See—*  
 Cohen, Noel; and Saucy, Gabriel, 4,163,021, Cl. 260-456.00P.  
 Sauer, Donald G., to National Can Corporation. Apparatus for thermofforming hollow article having a high L/D ratio. 4,162,883, Cl. 425-387.100.  
 Sauer, Gerd, to Saint-Gobain Industries. Vehicle antenna and window amplifier. 4,163,195, Cl. 325-313.000.  
 Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., to General Electric Company. Apparatus for monitoring arcing of brushes in a dynamoelectric machine. 4,163,227, Cl. 340-662.000.  
 Sawano, Susumu; Tsunoda, Yoshito; and Maeda, Takeshi, to Hitachi, Ltd. Automatic focusing apparatus. 4,163,149, Cl. 250-204.000.  
 Saxon, Alexander K.: *See—*  
 Raevich, Vladimir K.; Petrov, Evgeny I.; Kolesnikova, Elena N.; and Saxon, Alexander K., 4,162,620, Cl. 66-187.000.  
 Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, to Dynamit Nobel Aktiengesellschaft. Method of preparing modified or unmodified poly(alkylpentamethyleneterephthalamide). 4,163,101, Cl. 528-347.000.  
 Schaffner, Carl P.: *See—*  
 Gordon, Harry W.; and Schaffner, Carl P., 4,163,050, Cl. 424-115.000.  
 Schainberg, Ernst: *See—*  
 Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.  
 Schehrer, Rudolf: *See—*  
 Bachle, Erich; Schehrer, Rudolf; and Hoppner, Dietrich, 4,163,159, Cl. 307-255.000.  
 Scherbring, David J.: *See—*  
 Olin, Paul H.; and Scherbring, David J., 4,162,605, Cl. 56-7.000.  
 Schering Corporation: *See—*  
 Neustadt, Bernard R.; and Gold, Elijah H., 4,163,053, Cl. 424-230.000.  
 Scheuneman, James H.; and Trost, John R., to Sperry Rand Corporation. Double bit error correction using double bit complementing. 4,163,147, Cl. 235-312.000.  
 Schmid Laboratories, Inc.: *See—*  
 Gordon, Harry W.; and Schaffner, Carl P., 4,163,050, Cl. 424-115.000.  
 Schmidek, Reinhard: *See—*  
 Mengeringhausen, Max; and Schmidek, Reinhard, 4,162,860, Cl. 403-199.000.  
 Schmidt, Georg: *See—*  
 Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.  
 Schmidt, Paul; and Walzel, Peter. Pulsed crystallizer with strips of reduced heat exchange. 4,162,617, Cl. 62-123.000.  
 Schmidt, Robert W., to Texas Instruments Incorporated. Sixteen bit microcomputer memory boards for use with eight bit standard connector bus. 4,163,289, Cl. 365-51.000.  
 Schmidt, Werner: *See—*  
 Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.  
 Schmitt, Frederick L.: *See—*  
 Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.  
 Schmitt, Jean M.; and Mathieu, Alain, to Lafarge Fondu International. Calcium aluminate based refractory hydraulic binder and its process of preparation. 4,162,923, Cl. 106-104.000.  
 Schmitz, Reinold: *See—*  
 Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.  
 Schneeweiss, Peter R.: *See—*  
 Hetland, Lillian; and Schneeweiss, Peter R., 4,162,751, Cl. 222-293.000.  
 Schneider, Wolfgang: *See—*  
 Zondler, Helmut; and Schneider, Wolfgang, 4,163,098, Cl. 528-99.000.  
 Schrengenberger, Alex J., to Midland-Ross Corporation. Electrodeposition coating apparatus. 4,162,955, Cl. 204-299.0EC.  
 Schroder, Rolf: *See—*  
 Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.  
 Schubert & Salzer: *See—*  
 van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.  
 Schuler, Gustav, to Filterwerk Mann & Hummel GmbH. Air intake filter with cyclone separator stage. 4,162,905, Cl. 55-337.000.  
 Schuler Industries, Inc.: *See—*  
 McWhorter, Robert D.; and Jones, Perry C., 4,162,917, Cl. 75-130.00R.  
 Schulmeister, Robert: *See—*  
 Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, 4,162,668, Cl. 123-179.00F.  
 Schultz, Jack L., to Grumman Aerospace Corporation. Satellite system. 4,163,235, Cl. 343-100.05A.  
 Schulz, Jay R., to Dow Corning Corporation. Self-adhering silicone compositions and preparations thereof. 4,163,081, Cl. 428-429.000.  
 Schumacher, William L., to AMP Incorporated. Means for in-line connection of optical fiber pairs. 4,162,821, Cl. 350-96.210.  
 SCHUMAG GmbH: *See—*  
 Greven, Johann, 4,162,642, Cl. 83-328.000.  
 Schumann, Fritz: *See—*  
 van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.  
 Schundehutte, Karl H.: *See—*  
 Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.  
 Schwab, Kurt; and Koholka, Richard, to D. Swarovski & Co. Binocular telescope. 4,162,820, Cl. 350-36.000.  
 Schwab, Milton I.: *See—*  
 Spitz, Albert W.; and Schwab, Milton I., 4,162,654, Cl. 110-212.000.  
 SCM Corporation: *See—*  
 Turpin, Edward T., 4,163,094, Cl. 528-45.000.  
 Scriabine, Alexander, to Merck & Co., Inc. Anti-hypertensive compositions. 4,163,054, Cl. 424-244.000.  
 Sea Containers, Ltd.: *See—*  
 Clive-Smith, Martin, 4,162,737, Cl. 220-1.500.  
 Security Patrols Co., Ltd.: *See—*  
 Iida, Makoto, 4,163,215, Cl. 340-149.00A.  
 Seehase, Jack C. Tennis racquet having radially arrayed strings. 4,162,791, Cl. 273-73.00D.  
 Seiler, Erhard: *See—*  
 Richter, Peter; Wigger, August; Fahrback, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.  
 Seiz, Wolfgang; and Moser, Roland, to Ciba-Geigy Corporation. Epoxy resin mixture for the production of flexible moulded articles. 4,163,096, Cl. 528-69.000.  
 Seki, Masaki: *See—*  
 Kishi, Hajimu; Miyoshi, Naganori; and Seki, Masaki, 4,163,284, Cl. 364-474.000.  
 Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*  
 Kashima, Jiro; and Sato, Synji, 4,163,000, Cl. 260-29.60S.  
 Nakano, Shiro; and Koike, Masaru, 4,163,075, Cl. 428-328.000.  
 Selective Feeder Company: *See—*  
 Brooks, Cletus A., 4,162,683, Cl. 119-51.00R.



- Seliger, Robert L.: See—  
Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., 4,163,151, Cl. 250-296.000.
- Sentoku, Hideshi: See—  
Watanabe, Kenkichi; and Sentoku, Hideshi, 4,162,598, Cl. 53-54.000.
- Septier, Louis; Dubrous, Francis; and Demange, Michel, to Societe Francaise d'Electrometallurgie Sofrem. Process for the treatment of complex metal ores containing, in particular, manganese and copper, such as oceanic nodules. 4,162,916, Cl. 75-21.000.
- Serrano, Francisco de Assis Manuel, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines. Foot-bridge for connection between a fixed installation and an oscillating installation. 4,162,551, Cl. 14-69.500.
- Shell Oil Company: See—  
Clark, Michael T.; and ten Haken, Pieter, 4,163,062, Cl. 424-324.000.  
Mango, Frank D., 4,163,019, Cl. 260-453.00P.
- Shepard, Neal F., Jr.: See—  
United States of America, National Aeronautics and Space Administration; and Shepard, Neal F., Jr., 4,162,928, Cl. 136-89.0PC.
- Sheratte, Martin B. Method and composition for reclaiming polyurethane. 4,162,995, Cl. 260-2.300.
- Sherman, Michael I.; and Prough, James R., to Kamyr Inc. Exothermic heat as a means of determining the degree of delignification. 4,162,933, Cl. 162-17.000.
- Shida, Shigeru; and Kajiwara, Toshiyuki, to Hitachi, Ltd. Rolling mill. 4,162,627, Cl. 72-247.000.
- Shigemura, Michael S., to Measurux Corporation. Method and apparatus for control of efficiency of combustion in a furnace. 4,162,889, Cl. 431-76.000.
- Shimada, Hiroyuki: See—  
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- Shimizu, Jajimu: See—  
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- Shimizu, Keizo: See—  
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- Shimogawa, Toshiaki; and Kuwakado, Satoshi, to Nippon Soken, Inc. Seat belt retracting and winding device. 4,162,772, Cl. 242-107.000.
- Shin-Etsu Polymer Co., Ltd.: See—  
Sado, Ryoichi; Nakamura, Akio; and Kodama, Naoki, 4,163,204, Cl. 138-114.000.
- Shinjo, Katsumi, to Yugenkaisha Shinjo Seikakusho. Component conveying arrangement. 4,162,724, Cl. 198-534.000.
- Shinoda, Nobuhiko: See—  
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- Shirahase, Reiji; and Komori, Shigehiro, to Canon Kabushiki Kaisha. Sheet sorting device. 4,162,787, Cl. 271-173.000.
- Shiraogawa, Yukio: See—  
Mori, Ryoichi; Ichikawa, Tadao; and Shiraogawa, Yukio, 4,163,280, Cl. 364-200.000.
- Shirasaki, Shinji: See—  
Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, 4,163,282, Cl. 364-431.000.
- Shortell, Kenneth R., to Carrcraft Manufacturing Company. Branch tail piece. 4,162,546, Cl. 4-191.000.
- Shuku, Masanori: See—  
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- Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Burynin, Vitaly A.; and Novikov, Nikolai V., to Institut Transplantatsii Organov I Tkancei. Artificial heart. 4,162,543, Cl. 3-1.700.
- Shuster, Edward J.: See—  
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- Sibley, Clarence E.; and Sablan, Francisco C. Aerial photography camera mount assembly for a helicopter. 4,162,776, Cl. 244-118.00R.
- Siemens Aktiengesellschaft: See—  
Smutny, Kurt, 4,163,189, Cl. 323-6.000.
- Stein, Karl-Ulrich, 4,163,242, Cl. 357-41.000.
- Simeth, Claus: See—  
Rebel, Herbert; and Simeth, Claus, 4,162,652, Cl. 101-425.000.
- Simmat, Fritz: See—  
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, 4,162,908, Cl. 65-60.00D.
- Simmons, David E. Method and apparatus for forming dental copings. 4,162,625, Cl. 72-54.000.
- Simmons, Gerald P.: See—  
Grooss, Frank A.; and Simmons, Gerald P., 4,162,872, Cl. 414-713.000.
- Simoneit, Gunter: See—  
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.
- Singer Company, The: See—  
Coughenour, Donald J.; Brown, Jack; and Herr, John A., 4,163,158, Cl. 250-561.000.
- Sinner, Helmut: See—  
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.
- Sjogren, Alan L.: See—  
Sjogren, Fred E., 4,162,710, Cl. 177-141.000.
- Sjogren, Fred E., to Sjogren, Kenneth A.; Sjogren, Alan L.; and Sjogren, Glenda J., part interest to each. Log truck scale pad and pop-off valve. 4,162,710, Cl. 177-141.000.
- Sjogren, Glenda J.: See—  
Sjogren, Fred E., 4,162,710, Cl. 177-141.000.
- Sjogren, Kenneth A.: See—  
Sjogren, Fred E., 4,162,710, Cl. 177-141.000.
- Skerlos, Peter C., to Zenith Radio Corporation. Windowed tuning system with synchronous detector. 4,163,259, Cl. 358-191.000.
- Sloan, Kenneth B.: See—  
Stella, Valentino J.; and Sloan, Kenneth B., 4,163,058, Cl. 424-273.00R.
- Smirnov, Boris A.: See—  
Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.
- Smith, Charles A.; and Adams, Clair S., to Sperry Rand Corporation. Bale thrower. 4,162,725, Cl. 198-628.000.
- Smith, Hinchman & Grylls Associates, Inc.: See—  
Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., 4,162,853, Cl. 356-225.000.
- Smith, Jack F.: See—  
Descovich, Theodore; Smith, Jack F.; and Riordan, Edward D., 4,163,142, Cl. 219-79.000.
- Smith, Oliver W.; and Koleske, Joseph V., to Union Carbide Corporation. High solids coating compositions. 4,163,029, Cl. 525-449.000.
- Smith, Raymond E., Jr. Extensible boom lift. 4,162,873, Cl. 414-718.000.
- Smith, Wayne R.; and Miller, William G., to Xerox Corporation. Copier for greater than standard length documents. 4,162,845, Cl. 355-14.000.
- Smutny, Kurt, to Siemens Aktiengesellschaft. Transformer with a ferromagnetic core for d-c and a-c signals. 4,163,189, Cl. 323-6.000.
- Socapex: See—  
Malsot, Christian, 4,162,816, Cl. 339-64.00M.
- Societa Italiana Resine S.I.R. S.p.A.: See—  
Buzio, Pierpaolo; and Edefonti, Lucio, 4,163,080, Cl. 428-424.000.
- S.A. des Anciens Etablissements Paul Wurth: See—  
Legille, Edouard; Mahr, Rene N.; and Heinz, Carlo, 4,162,784, Cl. 266-176.000.
- Societe Anonyme dite: F.M.C.: See—  
Tribout, Michel, 4,162,952, Cl. 204-224.00R.
- Societe Anonyme Roure Bertrand Dupont: See—  
Teisseire, Paul J.; Plattier, Marcel; and Giraudi, Edouard, 4,163,109, Cl. 560-122.000.
- Societe d'Etudes et de Participation O.H.F.: See—  
Aubin, Michel F., 4,163,049, Cl. 424-59.000.
- Societe Francaise d'Electrometallurgie Sofrem: See—  
Septier, Louis; Dubrous, Francis; and Demange, Michel, 4,162,916, Cl. 75-21.000.
- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: See—  
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.
- Societe Nationale Elf Aquitaine (Production): See—  
Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.
- Soddy, Thomas C.: See—  
Madland, Thorvald; and Soddy, Thomas C., 4,162,591, Cl. 49-277.000.
- Sodini, Charles G.: See—  
Kamins, Theodore I.; and Sodini, Charles G., 4,163,243, Cl. 357-41.000.
- Sony Corporation: See—  
Ebihara, Norio; and Tatsuzawa, Kaichi, 4,163,258, Cl. 358-167.000.
- Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.
- Mori, Kokichi; and Haneishi, Kohei, 4,163,203, Cl. 334-86.000.
- Morio, Minoru; and Kambara, Masahiro, 4,163,253, Cl. 358-120.000.
- Onoue, Yoshinori; Matsuura, Katsuji; and Takahashi, Shigenori, 4,163,278, Cl. 363-101.000.
- Soos, Nicholas A., to Bell Telephone Laboratories, Incorporated. Encapsulation of circuits. 4,163,072, Cl. 427-96.000.
- Sorensen, Fleming: See—  
DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, 4,162,984, Cl. 252-8.800.
- Sorenson, Hal K.: See—  
Ten Broeck, Dale K.; Cuson, Stanley N.; and Sorenson, Hal K., 4,162,766, Cl. 239-656.000.
- Specialized Products, Inc.: See—  
Spurling, Gary A., 4,162,857, Cl. 366-261.000.
- Spectroderm International, Inc.: See—  
Bender, Charles E., 4,162,855, Cl. 366-274.000.
- Sperber, Martin: See—  
Mistry, Kantilal; and Sperber, Martin, 4,163,252, Cl. 358-118.000.

- Sperry Rand Corporation: See—  
Scheuneman, James H.; and Trost, John R., 4,163,147, Cl. 235-312.000.
- Smith, Charles A.; and Adams, Clair S., 4,162,725, Cl. 198-628.000.
- Spielau, Paul: See—  
Kuhnel, Werner; and Spielau, Paul, 4,163,085, Cl. 521-96.000.
- Spies, Johann; and Wohrl, Alfons, to Messerschmitt-Bolkow-Blohm GmbH. Circuit arrangement for monitoring readiness for operation of actuating devices of a safety apparatus for vehicles. 4,163,268, Cl. 361-1.000.
- Spies, Karl, to Industriewerk Schaeffler OHG. Apparatus for universal joint assembly. 4,162,568, Cl. 29-281.300.
- Spitz, Albert W.; and Schwab, Milton I., to Trio Process Corporation. Pollution controlled incineration system. 4,162,654, Cl. 110-212.000.
- Spivack, John D., to Ciba-Geigy Corporation. Compositions stabilized with polyalkylthiobenzenes. 4,163,006, Cl. 260-45.8NT.
- Spivey, Bron W., to Akzona Incorporated. Entangled yarns. 4,162,607, Cl. 57-287.000.
- Sprung, Jurgen, to Rollei-Werke Franke & Heidecke. Support for a camera. 4,162,696, Cl. 150-52.00J.
- Spurling, Gary A., to Specialized Products, Inc. Apparatus for stirring grain. 4,162,857, Cl. 366-261.000.
- Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., to Smith, Hinchman & Grylls Associates, Inc. Illumination measurement device. 4,162,853, Cl. 356-225.000.
- Stach, Leonard J., to Velsicol Chemical Corporation. O-alkoxy- and alkylthiophenyl carbamates. 4,163,112, Cl. 560-132.000.
- Stackpole Carbon Company: See—  
Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klai-ber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.
- Standard Oil Company, The: See—  
Anthony, Donald B.; and Marse, Allan V., 4,162,898, Cl. 44-1.00R.
- Standard Oil Company (Indiana): See—  
Kvapil, Rudolph; and Clews, K. Malcolm, 4,162,808, Cl. 299-2.000.
- Standard Products Company, The: See—  
Dallen, John A.; and Green, Harry W., 4,162,656, Cl. 110-221.000.
- Stangeland, Bruce E., to Chevron Research Company. Sequential hydrocracking and hydrogenating process for lube oil production. 4,162,962, Cl. 208-58.000.
- Stankewitz, Hans-Werner, to Ernst Leitz Wetzlar GmbH. Process and apparatus for automatically realizing Kohler's principle of illumination. 4,163,150, Cl. 250-205.000.
- Stanley, Robert K. Method and apparatus for stuffer crimping strand material. 4,162,564, Cl. 28-248.000.
- Stannard, Steven M.: See—  
Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., 4,162,853, Cl. 356-225.000.
- Stapleton, Patrick; Browne, Hubbard P.; and Weatherholt, Dallas D. Invalid feeding device. 4,162,868, Cl. 414-9.000.
- Statilord Division Emerson Electric Co.: See—  
Ogawa, Francis T., 4,163,226, Cl. 340-629.000.
- Stauffer Chemical Company: See—  
Melachouris, Nicholas; Fracaroli, Brenda B.; and Corbett, Constance R., 4,163,069, Cl. 426-582.000.
- Stearnes, Robert: See—  
Davis, McKinley D.; Stearnes, Robert; and Carter, Lemuel, Jr., 4,162,650, Cl. 99-419.000.
- Steckler, Robert, to Plastomedical Sciences, Inc. Cationic hydrogels based on hydroxyalkyl acrylates and methacrylates. 4,163,092, Cl. 526-292.000.
- Steen, Donald B., to United States of America, Navy. High current switches using multi-louvered contact strips. 4,163,135, Cl. 200-158.000.
- Steere, Marjorie S.: See—  
Steere, William H., Jr.; and Steere, Marjorie S., 4,162,730, Cl. 211-118.000.
- Steere, William H., Jr.; and Steere, Marjorie S. Portable article hanger. 4,162,730, Cl. 211-118.000.
- Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. MOS storage integrated circuit using individual FET elements. 4,163,242, Cl. 357-41.000.
- Steinmueller, Ralph E., to Harry W. Dietert Co. Load cell. 4,162,632, Cl. 73-432.00A.
- Stella, Valentino J.; and Sloan, Kenneth B., to INTERX Research Corporation. Derivatives of 5,5-diphenylhydantoin exhibiting enhanced solubility and the therapeutic use thereof. 4,163,058, Cl. 424-273.00R.
- Stendel, Wilhelm: See—  
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.
- Sterling Drug Inc.: See—  
Johnson, Robert E., 4,163,015, Cl. 260-326.250.
- Stewart, David B., to Wm. R. Stewart & Sons (Hacklemakers) Limited. Carding apparatus. 4,162,559, Cl. 19-113.000.
- Stewart, Martin J.: See—  
Cobbs, Walter H., Jr.; and Stewart, Martin J., 4,162,880, Cl. 425-202.000.
- Stocke, John P., to AM International, Inc. Corona discharge apparatus and method having means for improved mounting of corona discharge wire. 4,163,273, Cl. 361-229.000.
- Stone, Aidan M., to General Electric Company. Basket overflow for water recirculating washing machine. 4,162,621, Cl. 68-23.200.
- Stone City Products, Inc.: See—  
Rankin, Armand T., 4,162,780, Cl. 249-127.000.
- Stonner, Hans-Martin: See—  
Wiesner, Paul; and Stonner, Hans-Martin, 4,162,902, Cl. 55-54.000.
- Storm, Donald W. Horizontal stacker for baked goods and the like. 4,162,870, Cl. 414-107.000.
- Stormer, Horst L.: See—  
Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., 4,163,237, Cl. 357-16.000.
- Stringa, Luigi, to Elettronica San Giorgio Elsas S.p.A. Method and apparatus for the rotation of a binary-data matrix, intended particularly to be used as a storage unit having a two-way access mode for electronic computers. 4,163,281, Cl. 364-200.000.
- Strobel, Kurt M.: See—  
Puglisi, Thomas C.; and Strobel, Kurt M., 4,162,878, Cl. 425-152.000.
- Stromberg, Nils E., to Sunds Aktiebolag. Method and apparatus for transforming by pressing voluminous material into bales. 4,162,603, Cl. 53-438.000.
- Stubbings, James H., to Potomac Applied Mechanics, Inc. Automatic loading and unloading for numerically controlled turret punch. 4,162,641, Cl. 83-71.000.
- Studiengesellschaft Kohle mbH.: See—  
Heimbach, Paul; Roloff, Achim; and Nabbefeld-Arnold, Erich F., 4,163,024, Cl. 260-566.00R.
- Sturmann, Klaus A.: See—  
Wahlefeld, August W.; Looser, Siegfried; and Sturmann, Klaus A., 4,162,979, Cl. 210-282.000.
- Sturrock, James C., to Manning, Michael L. Electronic switching apparatus. 4,163,271, Cl. 361-93.000.
- Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., to International Nickel Company, Inc., The. Recovery of selenium. 4,163,046, Cl. 423-510.000.
- Sudo, Toshio: See—  
Takahashi, Sadao; and Sudo, Toshio, 4,163,201, Cl. 333-194.000.
- Sugawara, Hiroyuki: See—  
Kubota, Yoshiyuki; Kurosawa, Yukio; and Sugawara, Hiroyuki, 4,163,130, Cl. 200-144.00B.
- Suh, Byoung I.: See—  
Erickson, Wallace A.; and Suh, Byoung I., 4,163,004, Cl. 260-42.140.
- Sullivan, Bruce M.; and Kaluza, Allen M., to Donaldson Company, Inc. Side outlet tube. 4,162,906, Cl. 55-346.000.
- Sumitomo Electric Industries, Ltd.: See—  
Moriya, Michio, 4,162,721, Cl. 188-73.300.
- Summers, Frank B., to Fabreka Products Company. Conveyor belt. 4,162,727, Cl. 198-688.000.
- Sunds Aktiebolag: See—  
Stromberg, Nils E., 4,162,603, Cl. 53-438.000.
- Superior Electric Company, The: See—  
Leenhouts, Albert C., 4,163,184, Cl. 318-573.000.
- Sutherland, Kent K.; Crowther, Ted J.; and Salmond, Kent A., to Optical Data System. Holographic verification system with indexed memory. 4,163,290, Cl. 365-125.000.
- Suthphn, Eldon M., Jr., to RCA Corporation. Ignition spark zone duration circuit. 4,163,192, Cl. 324-15.000.
- Suzuki, Arata, to Capintec Inc. Pencil-shaped radiation detection ionization chamber. 4,163,152, Cl. 250-374.000.
- Suzuki, Seigo; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Input-output control circuit for FIFO memory. 4,163,291, Cl. 365-221.000.
- Suzuki, Tetsuro: See—  
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,162,609, Cl. 58-38.00R.
- Suzuki, Yasuo: See—  
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,162,576, Cl. 32-40.00R.
- Swartz, John M.: See—  
Swinehart, Philip R.; and Swartz, John M., 4,163,240, Cl. 357-29.000.
- Swinehart, Philip R.; and Swartz, John M., to Harshaw Chemical Company, The. Sensitive silicon pin diode fast neutron dosimeter. 4,163,240, Cl. 357-29.000.
- Swiss Aluminium Ltd.: See—  
Molnar, Sandor; and Rieger, Wolfhart, 4,162,899, Cl. 51-295.000.
- Pryor, Michael J., 4,163,083, Cl. 428-472.000.
- Sybron Corporation: See—  
Van der Beck, Roland R.; and Chapman, James W., 4,162,826, Cl. 350-319.000.
- Systems, Science and Software: See—  
Loda, Gary K., 4,163,172, Cl. 313-302.000.
- Szucs, Laslo: See—  
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tsnadi, Csaba, 4,162,945, Cl. 202-173.000.
- T.I. Silencer Services Limited: See—  
Lynch, John H., 4,163,042, Cl. 422-179.000.
- Tabak, Samuel A.; and Morrison, Roger A., to Mobil Oil Corporation. Xylene isomerization. 4,163,028, Cl. 585-481.000.
- Tabatchnik-Michaeli, Baruch. Lighting means, especially headlights of vehicles. 4,163,276, Cl. 362-255.000.
- Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, to Sakai Chemical Industry Company, Ltd. Process for preparing metal salts of alkyl phosphates. 4,163,018, Cl. 260-429.900.
- Takahashi, Akio, to Hooker Chemicals & Plastics Corp. Method of polymerizing vinyl halide with olefin polymers and copolymers and compositions thereof. 4,163,033, Cl. 525-53.000.
- Takahashi, Akira: See—  
Kubo, Kazuhiko; Takahashi, Akira; and Ohashi, Kenichi, 4,162,924, Cl. 106-120.000.



- Takahashi, Harumi: See—  
Doi, Tadashi; and Takahashi, Harumi, 4,162,998, Cl. 260-28.00R.  
Takahashi, Ken: See—  
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, 4,163,166, Cl. 310-215.000.  
Takahashi, Sadao; and Sudo, Toshio, to Tokyo Shibaura Electric Co., Ltd. Elastic surface wave device. 4,163,201, Cl. 333-194.000.  
Takahashi, Shigenori: See—  
Onoue, Yoshinori; Matsuura, Katsuji; and Takahashi, Shigenori, 4,163,278, Cl. 363-101.000.  
Takata, Akira: See—  
Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, 4,162,812, Cl. 308-172.000.  
Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, to NTN Toyo Bearing Company, Ltd. Rotary bearing assembly. 4,162,812, Cl. 308-172.000.  
Takeda Chemical Industries, Ltd.: See—  
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,162,940, Cl. 435-119.000.  
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syoji; and Hayashi, Midori, to Lion Hamigaki Kabushiki Kaisha. Appliances for treating teeth. 4,162,576, Cl. 32-40.00R.  
Takeno, Seiichi: See—  
Tunematu, Toyooki; Takeno, Seiichi; and Yamaguchi, Testuo, 4,163,202, Cl. 334-76.000.  
Talcott, Thomas D., to Dow Corning Corporation. Blood bag having CO<sub>2</sub> absorbent therein. 4,162,676, Cl. 128-214.00D.  
Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, to Hitachi, Ltd. Magnetic tape scanning assembly for use in video tape recorder and playback apparatus. 4,163,266, Cl. 360-84.000.  
Tamura, Hifumi; and Ishitani, Tooru, to Hitachi, Ltd. Ion beam means. 4,163,153, Cl. 250-423.00R.  
Tamura, Tetsuomi; and Mizutani, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifier of an internal combustion engine. 4,162,613, Cl. 60-278.000.  
Tanaka, Hideo: See—  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,163,111, Cl. 560-122.000.  
Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,163,141, Cl. 219-10.55F.  
Tanida, Seiichi: See—  
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,162,940, Cl. 435-119.000.  
Tanifuji, Shinya: See—  
Morooka, Yasuo; and Tanifuji, Shinya, 4,162,624, Cl. 72-8.000.  
Tanikoshi, Kinji, to Canon Kabushiki Kaisha. Actuating circuit for D.C. motor. 4,163,182, Cl. 318-331.000.  
Taniwaki, Genshi, to Kongo Co. Ltd. Sliding door. 4,162,592, Cl. 49-358.000.  
Tappe, Gunter: See—  
Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.  
Tarrson, Emanuel B.; and Tisma, Stevan, to John O. Butler Company. Medicating floss dispenser and method of applying medication to human teeth. 4,162,688, Cl. 132-92.00A.  
Tashiro, Norio, to Tokyo Shibaura Electric Co., Ltd. Magnetron for which leakage of H.F. noise is minimized. 4,163,175, Cl. 315-39.510.  
Tasnadi, Csaba: See—  
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, 4,162,945, Cl. 202-173.000.  
Tatsuzawa, Kaichi: See—  
Ebihara, Norio; and Tatsuzawa, Kaichi, 4,163,258, Cl. 358-167.000.  
Tauskey, William A., Sr.: See—  
Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.  
Taylor, Richard J.: See—  
Michael, Peter C.; Taylor, Richard J.; and Trump, Martin R., 4,163,249, Cl. 358-21.00R.  
Technical Operations, Incorporated: See—  
Wheeler, Robert V.; and Oswald, Richard A., 4,163,154, Cl. 250-473.000.  
Technicon Instruments Corporation: See—  
Cambiaso, Cesar L.; and Masson, Pierre L., 4,162,895, Cl. 435-7.00B.  
Teisseire, Paul J.; Plattier, Marcel; and Giraudi, Edouard, to Societe Anonyme Roure Bertrand Dupont. Process for the preparation of cyclic ketones. 4,163,109, Cl. 560-122.000.  
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Jorgensen, Brian K., 4,162,823, Cl. 350-252.000.  
Teleglobe Pay-TV System, Inc.: See—  
Pires, H. George, 4,163,255, Cl. 358-122.000.  
Ten Broeck, Dale K.; Cuson, Stanley N.; and Sorenson, Hal K. Vehicular spreader for icy roads and the like. 4,162,766, Cl. 239-656.000.  
ten Haken, Pieter: See—  
Clark, Michael T.; and ten Haken, Pieter, 4,163,062, Cl. 424-324.000.  
Terada, Toshimichi: See—  
Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.  
Terschuren, Wolfgang: See—  
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simonit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.

- Tetenborg, Konrad: See—  
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeyer, Hartmut, 4,162,602, Cl. 53-415.000.  
Texaco Development Corp.: See—  
Yeakey, Ernest L.; and Waddill, Harold G., 4,162,931, Cl. 156-331.000.  
Texaco Inc.: See—  
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,162,989, Cl. 252-312.000.  
Texas Instruments Incorporated: See—  
Adcock, Willis A., 4,163,256, Cl. 358-127.000.  
Boulanger, Henry J., 4,163,125, Cl. 200-5.00A.  
Carter, David L., 4,163,239, Cl. 357-24.000.  
Schmidt, Robert W., 4,163,219, Cl. 365-51.000.  
Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Process for concentrating halogenanthraquinones. 4,162,946, Cl. 203-72.000.  
Thermo-Couple Products Company, Inc.: See—  
Finney, Philip F., 4,162,929, Cl. 136-233.000.  
Thies, Peter W.; and Asai, Akiji, to Kali-Chemie Pharma GmbH. 2,9-Dioxatricyclo[4,3,1,0<sup>3,7</sup>] decane derivatives and pharmaceutical compositions thereof. 4,163,053, Cl. 424-267.000.  
Thomas, Serge J. H., to Motorola Automobile. Alternator having single stator with dual windings and compound output. 4,163,187, Cl. 322-29.000.  
Thompson, Stanley C. Golf club head sole plate with studs interlocking to head laminations. 4,162,794, Cl. 273-174.000.  
Thomsen, Jack W., to Weckesser Company, Inc. Spacer support for panel members. 4,162,560, Cl. 24-73.00P.  
Thomson-CSF: See—  
Micheron, Francois, 4,163,162, Cl. 307-400.000.  
Thornton, John N., to Wiggins Teape Limited. Sheet stack divider. 4,162,649, Cl. 93-93.00D.  
Thorsen, Elmer J., Jr.: See—  
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Three Sisters Ranch Enterprises: See—  
Faulstich, George W., 4,162,736, Cl. 215-256.000.  
Tiefenthaler, Karl H. O.; and Nittner, Erich W. K., to Meyhall Chemical AG. Phosphated locust bean gums. 4,162,925, Cl. 106-208.000.  
Tillemans, Jacobus H., to U.S. Philips Corporation. Strain-relief device for a cable. 4,162,561, Cl. 24-129.00R.  
Tisma, Stevan: See—  
Tarrson, Emanuel B.; and Tisma, Stevan, 4,162,688, Cl. 132-92.00A.  
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Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.  
Tokico Ltd.: See—  
Harakawa, Tetsuo, 4,162,720, Cl. 188-71.900.  
Hayashida, Yoshihiro, 4,162,616, Cl. 60-533.000.  
Tokuhara, Masaharu: See—  
Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.  
Tokuno, Masateru, to Rengo Co., Ltd. Object locating apparatus. 4,163,185, Cl. 318-601.000.  
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Ishihara, Taketoshi; and Watanabe, Yosiaki, 4,162,852, Cl. 356-125.000.  
Tokyo Shibaura Electric Co., Ltd.: See—  
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Kinoshita, Hiroyuki, 4,163,245, Cl. 357-51.000.  
Mori, Ryuichi; Ichikawa, Tadao; and Shiraogawa, Yukio, 4,163,280, Cl. 364-200.000.  
Suzuki, Seigo; and Moriya, Yoshiaki, 4,163,291, Cl. 365-221.000.  
Takahashi, Sadao; and Sudo, Toshio, 4,163,201, Cl. 333-194.000.  
Tashiro, Norio, 4,163,175, Cl. 315-39.510.  
Tomii, Kaoru; and Hosokawa, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Index tube color television system with deflection rate error correction. 4,163,250, Cl. 358-45.000.  
Tomikawa, Hirohisa: See—  
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Machara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, to Otsuka Kagaku Yakuhim Kabushiki Kaisha. 2-Cyclopentenone derivatives. 4,163,111, Cl. 560-122.000.  
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Olin, Paul H.; and Scherbring, David J., 4,162,605, Cl. 56-7.000.  
Toyoda, Noriyuki: See—  
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Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.  
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, 4,162,612, Cl. 60-276.000.  
Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,162,661, Cl. 123-30.00C.  
Tamura, Tetsuomi; and Mizutani, Koichi, 4,162,613, Cl. 60-278.000.  
Trachtman, Joseph N. Apparatus and methods for directly measuring the refraction of the eye. 4,162,828, Cl. 351-9.000.  
Traister, Robert L.; and Wilczek, Stephen P., to Xerox Corporation. Reproduction machine with duplex image shift. 4,162,844, Cl. 355-14.000.

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Guignard, Claude F.; and Perrette, Bernard J., 4,163,157, Cl. 250-561.000.  
Trautner, Kersten: See—  
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.  
Treanor, Charles E., to Calspan Corporation. Thermal-radiation excited vibrational-exchange pumped laser generator. 4,163,199, Cl. 331-94.50G.  
Treber, Norbert: See—  
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, 4,162,908, Cl. 65-60.00D.  
Trepanier, Donald L.: See—  
Britton, Thomas C.; and Trepanier, Donald L., 4,163,104, Cl. 544-160.000.  
Triad & Associates, Inc.: See—  
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, 4,162,635, Cl. 73-623.000.  
Tribble, William R., to Phillips Petroleum Company. Positive shut-off for catalyst feed system. 4,162,894, Cl. 23-230.00A.  
Tribout, Michel, to Societe Anonyme dite: F.M.C. Apparatus for electrolysis by projection. 4,162,952, Cl. 204-224.00R.  
Trio Process Corporation: See—  
Spitz, Albert W.; and Schwab, Milton I., 4,162,654, Cl. 110-212.000.  
Triple Cuff Corporation: See—  
Daleo, Joseph, 4,162,622, Cl. 70-16.000.  
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, to Triad & Associates, Inc. System for monitoring the condition of a pipeline. 4,162,635, Cl. 73-623.000.  
Trittipoe, Jack H., to Caterpillar Tractor Co. Method and apparatus for separating a fitting from a tube. 4,162,570, Cl. 29-427.000.  
Trost, John R.: See—  
Scheuneman, James H.; and Trost, John R., 4,163,147, Cl. 235-312.000.  
Trump, Martin R.: See—  
Michael, Peter C.; Taylor, Richard J.; and Trump, Martin R., 4,163,249, Cl. 358-21.00R.  
Tsai, Keh-Chi; and Littauer, Ernest L., to Lockheed Missiles & Space Company, Inc. Electrochemically stable cathode. 4,163,084, Cl. 429-206.000.  
Tsaknis, Peter J.: See—  
Lux, Virginia J.; and Tsaknis, Peter J., 4,162,875, Cl. 366-273.000.  
Tschewitschke, Richard; and Henig, Hans. Electroplating apparatus with selectively interchangeable, connectable drums. 4,162,951, Cl. 204-213.000.  
Tsu, Raphael: See—  
Esaki, Leo; and Tsu, Raphael, 4,163,238, Cl. 357-17.000.  
Tsukumo, Shinsuke: See—  
Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, 4,162,812, Cl. 308-172.000.  
Tsunoda, Yoshito: See—  
Sawano, Susumu; Tsunoda, Yoshito; and Maeda, Takeshi, 4,163,149, Cl. 250-204.000.  
Tucker, Robert C., Jr.: See—  
Weatherly, Merle H.; and Tucker, Robert C., Jr., 4,163,071, Cl. 427-34.000.  
Tunematu, Toyooki; Takeno, Seiichi; and Yamaguchi, Testuo, to Murata Manufacturing Co., Ltd. Tuning apparatus and method of producing the same. 4,163,202, Cl. 334-76.000.  
Tunemoto, Daiei: See—  
Kondo, Kiyosi; and Tunemoto, Daiei, 4,163,106, Cl. 560-11.000.  
Turnier, Gerard. Swimming and exercising apparatus. 4,162,788, Cl. 272-71.000.  
Turpin, Edward T., to SCM Corporation. Heat curing water soluble homopolyurethanes. 4,163,094, Cl. 528-45.000.  
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Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.  
Ullrich, Martin, to Bayer Aktiengesellschaft. Multi-shaft screw extruder. 4,162,854, Cl. 366-83.000.  
Umeda, Naoki: See—  
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.  
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Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.  
Unimation, Inc.: See—  
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.  
Union Carbide Corporation: See—  
Beckman, John H., 4,162,693, Cl. 138-118.100.  
Knopf, Robert J.; and Koleske, Joseph V., 4,163,113, Cl. 560-185.000.  
Koleske, Joseph V.; and Knopf, Robert J., 4,163,114, Cl. 560-186.000.  
Pepe, Enrico J.; and Marsden, James G., 4,163,073, Cl. 427-221.000.  
Rasmussen, Jerome J. M., 4,162,557, Cl. 17-45.000.  
Smith, Oliver W.; and Koleske, Joseph V., 4,163,029, Cl. 525-449.000.  
Weatherly, Merle H.; and Tucker, Robert C., Jr., 4,163,071, Cl. 427-34.000.  
Union Oil Company of California: See—  
Dhondt, Roland O., 4,162,960, Cl. 208-11.00R.  
Woertz, Byron B., 4,163,044, Cl. 423-234.000.

- Uniroyal, Inc.: See—  
Kaiser, Louis; and Pascal, Charles J., 4,162,729, Cl. 206-592.000.  
Unit Rig & Equipment Co.: See—  
Satterwhite, Charles L., 4,162,584, Cl. 37-190.000.  
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Air Force: See—  
Gilbert, William W., III; and Gomez, Eduardo W., 4,162,777, Cl. 244-123.000.  
Martin, Jacob H., 4,162,818, Cl. 339-112.00R.  
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Esaki, Leo; and Tsu, Raphael, 4,163,238, Cl. 357-17.000.  
Lux, Virginia J.; and Tsaknis, Peter J., 4,162,875, Cl. 366-273.000.  
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Asmanes, Charles, 4,162,593, Cl. 51-218.00R.  
Gorin, Everett, 4,162,963, Cl. 208-108.000.  
Mashburn, Douglas N.; Woodall, Harold C.; and Wright, Ralph R., 4,162,813, Cl. 308-237.00R.  
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Ito, Yoichiro, 4,162,761, Cl. 233-24.000.  
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Shepard, Neal F., Jr. Solar cell module. 4,162,928, Cl. 136-89.00C.  
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Ollendorf, Stanford, 4,162,701, Cl. 165-32.000.  
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Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.  
Kaloi, Cyril M., 4,163,236, Cl. 343-700.00MS.  
Reins, Edward R.; and Curry, Charles D. B., 4,163,286, Cl. 364-719.000.  
Steen, Donald B., 4,163,135, Cl. 200-158.000.  
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Aldenhoven, Ghislans M. A. M., 4,162,756, Cl. 226-43.000.  
Brandenburg, Klaus, 4,162,858, Cl. 400-124.000.  
Hartog, Jan; and Zwagemakers, Johannes M. A., 4,163,060, Cl. 424-278.000.  
Hasker, Jan, 4,163,169, Cl. 313-203.000.  
Tillemans, Jacobus H., 4,162,561, Cl. 24-129.00R.  
Van Gils, Wilhelmus M. J., 4,163,170, Cl. 313-217.000.  
van Herk, Alfred; and Pulle, Duco W. J., 4,163,265, Cl. 360-77.000.  
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Belcher, John A., 4,162,944, Cl. 201-41.000.  
University of Iowa Research Foundation: See—  
Cannon, Joseph G.; and Long, John P., 4,163,063, Cl. 424-330.000.  
University of Utah: See—  
Johnson, Steven A., 4,162,630, Cl. 73-194.00A.  
Upaya, Inc.: See—  
Budrose, Charles R., 4,163,134, Cl. 200-157.000.  
Upjohn Company, The: See—  
Bundy, Gordon L.; and Nelson, Norman A., 4,163,110, Cl. 560-121.000.  
Yankee, Ernest W., 4,163,107, Cl. 560-61.000.  
Upmeyer, Hartmut: See—  
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeyer, Hartmut, 4,162,602, Cl. 53-415.000.  
Uzumcu, Ali I.; Thorsen, Elmer J., Jr.; and Demkowicz, Robert M., to Duo-Fast Corporation. Fastener assembly. 4,162,728, Cl. 206-345.000.  
Vac-Tec Systems, Inc.: See—  
Morrison, Charles F., Jr., 4,162,954, Cl. 204-298.000.  
Van den Bossche, Henri A., to National Distillers and Chemical Corporation. Catalyst spray nozzle. 4,163,040, Cl. 422-131.000.  
Van der Beck, Roland R.; and Chapman, James W., to Sybron Corporation. Sight glass assembly and method for its production. 4,162,826, Cl. 350-319.000.  
Van der Meer, Arie; and Lepomaa, Lauri A., to Kemira OY. Process for producing hydrogen fluoride from an aqueous solution of hydrogen fluoride and sulfuric acid. 4,163,045, Cl. 423-483.000.  
van Disshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, to Schubert & Salzer. Process and apparatus for removal of trash deposits on open-end spinning machine. 4,162,556, Cl. 15-312.00R.  
van Dorp, David A.: See—  
Beerthuis, Roelof K.; van Dorp, David A.; and Nugteren, Diederik H., 4,163,108, Cl. 560-121.000.  
Van Gils, Wilhelmus M. J., to U.S. Philips Corporation. Low-pressure gas discharge lamp. 4,163,170, Cl. 313-217.000.  
van Herk, Alfred; and Pulle, Duco W. J., to U.S. Philips Corporation. Magnetic disc memory and magnetic disc for this memory. 4,163,265, Cl. 360-77.000.  
Van Mastrigt, Max, to W. C. Dillon and Co. Inc. Tension indicating device. 4,163,126, Cl. 200-61.130.  
Van Steenhoven, Frank; and Hirt, Thomas D., to Miller Company, The. Outlet box mounting device. 4,162,779, Cl. 248-343.000.  
Velsicol Chemical Corporation: See—  
Albright, James A., 4,163,005, Cl. 260-45.70S.  
Stach, Leonard J., 4,163,112, Cl. 560-132.000.  
Veltman, Preston L.; and Blouin, John J., to W. R. Grace & Co. Method of drying complex sugar solutions. 4,162,926, Cl. 127-62.000.  
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Bowers, George W., 4,162,774, Cl. 242-192.000.  
Vereinigte Oesterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft: See—  
Ransmayr, Wilhelm; and Mally, Heinz, 4,163,036, Cl. 264-12.000.



- Verge, John P.: See—  
Ross, William J.; Verge, John P.; and Williamson, William R. N., 4,163,048, Cl. 424-45.000.
- Vetter, Arthur, to Multivac Sepp Haggenmuller KG. Apparatus for shaping plastics foils. 4,162,884, Cl. 425-388.000.
- Vinot, Daniel, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Associative memory. 4,163,288, Cl. 364-900.000.
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- Vock, Manfred H.: See—  
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.
- Vogt, Kuno J. Easy opening top closure member for a container. 4,162,742, Cl. 220-269.000.
- Voies, Roger, to E M I Limited. Tracking and/or guidance systems. 4,162,775, Cl. 244-3.170.
- Vollkommer, Norbert: See—  
Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, 4,163,101, Cl. 528-347.000.
- Vorontsov, Alexandr I.: See—  
Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khutoretzky, Garri M.; and Vorontov, Alexandr I., 4,163,163, Cl. 310-59.000.
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Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.
- W. C. Dillon and Co. Inc.: See—  
Van Mastrigt, Max, 4,163,126, Cl. 200-61.130.
- W. R. Grace & Co.: See—  
Veltman, Preston L.; and Blouin, John J., 4,162,926, Cl. 127-62.000.
- W. Schlafhorst & Co.: See—  
Kupper, Willi, 4,162,723, Cl. 198-469.000.
- Wachi, Yasuyuki: See—  
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, 4,163,166, Cl. 310-215.000.
- Wada, Akiyoshi. Simultaneous photometering method and assembly for multi-dimensional measurements concerning biologically related materials. 4,162,851, Cl. 356-73.000.
- Waddill, Harold G.: See—  
Yeakey, Ernest L.; and Waddill, Harold G., 4,162,931, Cl. 156-331.000.
- Wahlefeld, August W.; Looser, Siegfried; and Sturmann, Klaus A., to Boehringer Mannheim GmbH. Device for the chemical and/or physical treatment of liquids. 4,162,979, Cl. 210-282.000.
- Walde Kohinoor, Inc.: See—  
Coch, Lester, 4,162,680, Cl. 118-76.000.
- Walker, Duane H.; and Quaderer, Darrell W., to National Presto Industries, Inc. Pressure cooker. 4,162,741, Cl. 220-203.000.
- Walker, Winston G., to Addmaster Corporation. MOSFET circuitry with automatic voltage control. 4,163,161, Cl. 307-297.000.
- Wallace A. Erickson & Company: See—  
Erickson, Wallace A.; and Suh, Byoung I., 4,163,004, Cl. 260-42.140.
- Wallin, Jan-Olof, to Irvin Industries, Inc. Device for use in emergency locking mechanism for webbing-type seat belts. 4,162,773, Cl. 242-107.40A.
- Walsh, Robert M., to Hercules Incorporated. Heat-fusible pastes for printing inks, adhesives and moldings. 4,162,997, Cl. 260-27.00R.
- Walz, Stefan: See—  
Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, 4,162,668, Cl. 123-179.00F.
- Walzel, Peter: See—  
Schmidt, Paul; and Walzel, Peter, 4,162,617, Cl. 62-123.000.
- Ward, Derrick A.: See—  
Warner, Arthur R.; and Ward, Derrick A., 4,163,177, Cl. 315-208.000.
- Ward, James W.: See—  
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- Warner, Arthur R.; and Ward, Derrick A. Oscillation generator providing oscillations of varying amplitude. 4,163,177, Cl. 315-208.000.
- Warren, Kenneth S., to Case Western Reserve University. Field test for Schistosoma eggs. 4,162,850, Cl. 356-38.000.
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- Watanabe, Seiji: See—  
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, 4,163,166, Cl. 310-215.000.
- Watanabe, Yosiaki: See—  
Ishihara, Taketoshi; and Watanabe, Yosiaki, 4,162,852, Cl. 356-125.000.
- Waterhouse, John S.: See—  
Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., 4,163,097, Cl. 525-531.000.
- Wean United, Inc.: See—  
Decima, Elmer E.; and Briggs, Albert T., 4,162,626, Cl. 72-238.000.
- Weatherholt, Dallas D.: See—  
Stapleton, Patrick; Browne, Hubbard P.; and Weatherholt, Dallas D., 4,162,868, Cl. 414-9.000.
- Weatherly, Merle H.; and Tucker, Robert C., Jr., to Union Carbide Corporation. Method for forming hard wear-resistant coatings. 4,163,071, Cl. 427-34.000.
- Webasto-Werke W. Baier GmbH & Co.: See—  
Hirschberger, August, 4,162,805, Cl. 296-137.00G.
- Webb, William M., to General Electric Company. Method and coupling for severing and rejoining sealed tubing. 4,162,566, Cl. 29-157.00R.
- Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., to Wesbar Corporation. Converter means for vehicle light. 4,163,275, Cl. 362-80.000.
- Weckesser Company, Inc.: See—  
Thomsen, Jack W., 4,162,560, Cl. 24-73.00P.
- Weed Eater, Inc.: See—  
Ballas, George C., 4,162,575, Cl. 30-347.000.
- Weichel, Ernst. Mower for mounting on the front end of an agricultural vehicle. 4,162,606, Cl. 56-15.900.
- Weishaupt, Siegfried; and Kopp, Hermann. Burner for liquid fuels. 4,162,888, Cl. 431-265.000.
- Weldy, Winfred E.: See—  
Paul, James T., Jr.; and Weldy, Winfred E., 4,163,003, Cl. 260-40.00R.
- Wemheuer, Helmut: See—  
Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, 4,163,101, Cl. 528-347.000.
- Wesbar Corporation: See—  
Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., 4,163,275, Cl. 362-80.000.
- Wesemeyer, Jürgen; and Haubner, Georg, to Robert Bosch GmbH. Remote load control system. 4,163,217, Cl. 340-167.00R.
- West, Robert L., to Ameron, Inc. Rod tensioner. 4,162,771, Cl. 242-7.220.
- Westall, Thomas E.; and Miller, Frank, to American Thread Company, The. Apparatus and method for folding and banding skeins of yarn. 4,162,600, Cl. 53-120.000.
- Western Geophysical Co. of America: See—  
Hall, Ernest M., Jr., 4,163,206, Cl. 340-17.00R.
- Westinghouse Electric Corp.: See—  
Bould, Fred, 4,163,133, Cl. 200-153.05C.
- Husson, Alan L.; and Kurland, Marvin, 4,162,719, Cl. 187-29.00R.
- Perkins, John F., 4,163,131, Cl. 200-148.00A.
- Westvaco Corporation: See—  
Dowd, Daniel J., 4,163,180, Cl. 318-6.000.
- Wheeler, Robert V.; and Oswald, Richard A., to Technical Operations, Incorporated. Neutron personnel dosimeter. 4,163,154, Cl. 250-473.000.
- White Consolidated Industries, Inc.: See—  
Malarkey, Terence D.; and Moreland, William C., II, 4,163,139, Cl. 219-10.49R.
- White, Stanley A., to Rockwell International Corporation. Spatial toner for image reconstruction. 4,163,257, Cl. 358-133.000.
- Wickens, Alan H., to British Railways Board. Railway vehicle bogies resiliently interconnected axle boxes. 4,162,653, Cl. 105-166.000.
- Wieschen, Hermann: See—  
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mücke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
- Wiesner, Paul; and Stonner, Hans-Martin, to Metallgesellschaft Aktiengesellschaft. Removing phenols from waste water. 4,162,902, Cl. 55-54.000.
- Wigger, August: See—  
Richter, Peter; Wigger, August; Fahrback, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.
- Wiggins Teape Limited: See—  
Thornton, John N., 4,162,649, Cl. 93-93.00D.
- Wilczek, Stephen P.: See—  
Traister, Robert L.; and Wilczek, Stephen P., 4,162,844, Cl. 355-14.000.
- Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., to Dow Chemical Company, The. Process for preparing normally crystalline vinylidene halide polymers having superior flow properties employing a combination of colloidal silica and non-ionic water soluble cellulose ether having a viscosity of about 5 cp or less as stabilizing agents. 4,163,090, Cl. 526-88.000.
- Wilkins, Ronald D., to ACF Industries, Incorporated. Seal assembly for butterfly valve. 4,162,782, Cl. 251-173.000.
- Willets, Elwood H. Truck suspension system. 4,162,799, Cl. 280-683.000.
- Wm. E. Wright Co.: See—  
Wright, William R.; Murphy, Theodore; Piazio, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
- Wm. R. Stewart & Sons (Hacklemakers) Limited: See—  
Stewart, David B., 4,162,559, Cl. 19-113.000.
- Williams, B. E.: See—  
Williams, Beverly E., 4,163,070, Cl. 426-642.000.
- Williams, Beverly E., to Williams, B. E.; and Williams, K. I. Shrouding skinned meat carcasses. 4,163,070, Cl. 426-642.000.
- Williams, Frederic D. M.: See—  
Charles, Paul A. S.; and Williams, Frederic D. M., 4,162,549, Cl. 4-318.000.
- Williams, K. I.: See—  
Williams, Beverly E., 4,163,070, Cl. 426-642.000.
- Williamson, William R. N.: See—  
Ross, William J.; Verge, John P.; and Williamson, William R. N., 4,163,048, Cl. 424-45.000.
- Willingham, Millard L., to Gipson, Carl R. Hammock. 4,162,550, Cl. 5-123.000.

- Wilson-Miner R & D: See—  
Hudson, William W.; and Wilson, Woodrow W., 4,162,726, Cl. 198-678.000.
- Wilson, Woodrow L., 4,162,709, Cl. 172-20.000.
- Wilson, Woodrow L., to Wilson-Miner R & D. Sod harvesting severing means for forming and orienting individual sod pads. 4,162,709, Cl. 172-20.000.
- Wilson, Woodrow W.: See—  
Hudson, William W.; and Wilson, Woodrow W., 4,162,726, Cl. 198-678.000.
- Windmoller & Holscher: See—  
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeyer, Hartmut, 4,162,602, Cl. 53-415.000.
- Wingler, Frank: See—  
Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.
- Winter, Heinrich J., to Heinrich Josef Winter Kunststoffverarbeitung und Werkzeugbau GmbH. Cleaning device for circular discs. 4,162,552, Cl. 15-104.920.
- Wise, Kenneth V., to Monsanto Company. Oxidation and amoxidation catalysts. 4,162,992, Cl. 252-456.000.
- Wiseman, Raymond L. Article stacking apparatus. 4,162,733, Cl. 414-78.000.
- Woertz, Byron B., to Union Oil Company of California. Method for removing hydrogen sulfide from steam. 4,163,044, Cl. 423-234.000.
- Wohrl, Alfons: See—  
Spies, Johann; and Wohrl, Alfons, 4,163,268, Cl. 361-1.000.
- Wolfrum, Gerhard: See—  
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.
- Wood, Charles L.: See—  
Lining, Kurt; and Wood, Charles L., 4,162,910, Cl. 65-163.000.
- Wood, James E.: See—  
Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., 4,163,151, Cl. 250-296.000.
- Woodall, Harold C.: See—  
Mashburn, Douglas N.; Woodall, Harold C.; and Wright, Ralph R., 4,162,813, Cl. 308-237.00R.
- Wright, Ralph R.: See—  
Mashburn, Douglas N.; Woodall, Harold C.; and Wright, Ralph R., 4,162,813, Cl. 308-237.00R.
- Wright, William R.; Murphy, Theodore; Piazio, Kenneth; and Leal, August, to Wm. E. Wright Co. Method of manufacturing continuous coil slide fasteners. 4,162,892, Cl. 8-4.000.
- Wright, William V., to Metrolina Design Group. Stacking plastic bottle case. 4,162,738, Cl. 220-21.000.
- Wu, Alexander C., to Burroughs Corporation. Method and apparatus for developing a latent, electrostatic image in non-impact printing. 4,162,842, Cl. 355-3.0DD.
- Wu, William I. L. Electronic multiple device control system. 4,163,218, Cl. 340-310.00A.
- Wurster, Ewald, to Patent-Treuhand Gesellschaft für Elektrische Glühlampen mbH. Halogen cycle incandescent lamp. 4,163,171, Cl. 313-221.000.
- Wyant, Melvin F. Live animal trap. 4,162,588, Cl. 43-61.000.
- Wyle, Frank S.: See—  
Greer, Edward M.; Wyle, Frank S.; and Packer, Martin R., 4,162,692, Cl. 138-30.000.
- Wysong, Don V., to Dow Chemical Company, The. Aryloxymethyl imidazolines. 4,163,105, Cl. 548-342.000.
- Xerox Corporation: See—  
Smith, Wayne R.; and Miller, William G., 4,162,845, Cl. 355-14.000.
- Traister, Robert L.; and Wilczek, Stephen P., 4,162,844, Cl. 355-14.000.
- Yagii, Kiyoshi; and Oshio, Hideki, to Central Glass Company, Limited. Method of dehalogenating halogenated hydrocarbon to yield elemental halogen. 4,162,948, Cl. 204-80.000.
- Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, to Nippondenso Co., Ltd. Electrical control method and apparatus for combustion engines. 4,163,282, Cl. 364-431.000.
- Yamaguchi, Masanaga: See—  
Nishimura, Akira; Kashiwara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,163,038, Cl. 422-36.000.
- Yamaguchi, Shunzo: See—  
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.
- Yamaguchi, Testuo: See—  
Tunematu, Toyooki; Takeno, Seichi; and Yamaguchi, Testuo, 4,163,202, Cl. 334-76.000.
- Yamamoto, Yoshihiro: See—  
Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.
- Yamanobe, Kouji: See—  
Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.
- Yan, Tsoung-yuan, to Mobil Oil Corporation. Method of treating formation to remove ammonium ions. 4,162,707, Cl. 166-252.000.
- Yang, Neng-Tze: See—  
Ragonese, Louis J.; and Yang, Neng-Tze, 4,163,244, Cl. 357-44.000.
- Yankee, Ernest W., to Upjohn Company, The.  $\omega$ -Aryl-cis-13-PGF compounds. 4,163,107, Cl. 560-61.000.
- Yasuda, Katsuya; and Adachi, Akio, to Hochiki Corporation. Display device with memory. 4,163,224, Cl. 340-520.000.
- Yasuda, Takeru: See—  
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiaki, 4,162,612, Cl. 60-276.000.
- Yazaki, Seichi, to Fujimoto Company, Limited. Magneto-therapeutic device. 4,162,672, Cl. 128-1.300.
- Yeakey, Ernest L.; and Waddill, Harold G., to Texaco Development Corp. Method employing polyamide thermoplastic adhesives. 4,162,931, Cl. 156-331.000.
- Yorio, Albert E.: See—  
Yorio, Noelle; and Yorio, Albert E., 4,162,623, Cl. 70-364.00A.
- Yorio, Noelle; and Yorio, Albert E. Key and lock system. 4,162,623, Cl. 70-364.00A.
- Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, to Nippon Telegraph and Telephone Public Corporation; and Nippon Electric Co., Ltd. Radio channel control system for mobile radio telephone systems. 4,163,121, Cl. 179-2.0EB.
- Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for the cultivation of Basidiomycetes belonging to the genus Coriolus of Polyporaceae. 4,162,939, Cl. 435-254.000.
- Yoshimura, Noboru, to Aisin Seiki Kabushiki Kaisha. Lumbar support regulating apparatus. 4,162,807, Cl. 297-284.000.
- Youngstown Steel Door Company, The: See—  
Madland, Thorvald; and Soddy, Thomas C., 4,162,591, Cl. 49-277.000.
- Yugenkaisha Shinjo Seikakusho: See—  
Shinjo, Katsumi, 4,162,724, Cl. 198-534.000.
- Zappala, Giuseppe: See—  
Farina, Attilio; and Zappala, Giuseppe, 4,163,179, Cl. 315-408.000.
- Zdrodowski, Joseph J., to Hoffmann-La Roche Inc. Time division flow control. 4,162,689, Cl. 137-266.000.
- Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klaiber, Raymond W., Jr., to Stackpole Carbon Company. Electric motor brush holder. 4,163,167, Cl. 310-242.000.
- Zenith Radio Corporation: See—  
Skerlos, Peter C., 4,163,259, Cl. 358-191.000.
- Zimmer, Peter. Removable antiskid device on a vehicle wheel, in particular, an automobile wheel. 4,162,697, Cl. 152-217.000.
- Zlokarnik, Marko, to Bayer Aktiengesellschaft. Injectors and their use in gassing liquids. 4,162,970, Cl. 210-15.000.
- Zlokarnik, Marko; and Elgeti, Klaus, to Bayer Aktiengesellschaft. Injectors with deflectors for their use in gassing liquids. 4,162,971, Cl. 210-15.000.
- Zondler, Helmut; and Schneider, Wolfgang, to Ciba-Geigy Corporation. Coating compound based on epoxide resin, an amine curing agent, and a hydrazine modifier. 4,163,098, Cl. 528-99.000.
- Zuerndorfer, Henry D.; Maurer, Hans A.; and Banks, Donald S., to Raytheon Company. Radar mapping technique. 4,163,231, Cl. 343-5.00CM.
- Zwagemakers, Johannes M. A.: See—  
Hartog, Jan; and Zwagemakers, Johannes M. A., 4,163,060, Cl. 424-278.000.
- Zweifel, Hans: See—  
Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., 4,163,097, Cl. 525-531.000.



# LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bethlehem Steel Corporation: *See—*  
 Kreiger, John W., Re. 30,060, Cl. 75-3.000.  
 Colgate-Palmolive Company: *See—*  
 Schaar, Charles H., Re. 30,057, Cl. 128-287.000.  
 Halls, Lawrence M., to Sperry Rand Corporation. Crop harvesting machine header suspension system. Re. 30,056, Cl. 56-208.000.  
 Johnson & Johnson: *See—*  
 Shepherd, Robert C., Re. 30,061, Cl. 156-78.000.  
 Katahira, Yukio, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Shuttle speed control device. Re. 30,058, Cl. 352-14.000.  
 Kreiger, John W., to Bethlehem Steel Corporation. Method for agglomerating wet-collected fume for use in metallurgical furnaces and agglomerates produced thereby. Re. 30,060, Cl. 75-3.000.  
 Lindstrom, Jon M., to Salk Institute for Biological Studies. The. Assay for myasthenia gravis. Re. 30,059, Cl. 23-230.300.  
 Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See—*  
 Katahira, Yukio, Re. 30,058, Cl. 352-14.000.  
 Salk Institute for Biological Studies, The: *See—*  
 Lindstrom, Jon M., Re. 30,059, Cl. 23-230.300.  
 Schaar, Charles H., to Colgate-Palmolive Company. Disposable diaper. Re. 30,057, Cl. 128-287.000.  
 Shepherd, Robert C., to Johnson & Johnson. Nonwoven fibrous product and method of making the same. Re. 30,061, Cl. 156-78.000.  
 Sperry Rand Corporation: *See—*  
 Halls, Lawrence M., Re. 30,056, Cl. 56-208.000.

# LIST OF PLANT PATENTEEES

- Handy, Glen E. Dogwood tree. 4,444, 7-31-79, Cl. 51.000.

# LIST OF DESIGN PATENTEEES

- Alaniz, Alan A. Placard or the like. 252,503, 7-31-79, Cl. D11-134.000.  
 American Optical Corporation: *See—*  
 Canavan, Richard W., III, 252,517, Cl. D16-65.000.  
 American Seating Company: *See—*  
 Blodde, Leif, 252,482, Cl. D6-26.000.  
 Barradas, George, to SCM Corporation. Fry pan. 252,493, 7-31-79, Cl. D7-94.000.  
 Blodde, Leif, to American Seating Company. Theater chair. 252,482, 7-31-79, Cl. D6-26.000.  
 Breger, Carl-Arne, to Sandvik Aktiebolag. Cover for handle of a hammer. 252,495, 7-31-79, Cl. D8-80.000.  
 Budish, Bernard O., to Victory Games. Miniature golf game board. 252,530, 7-31-79, Cl. D21-27.000.  
 California R & D Center: *See—*  
 Jones, Lawrence T., and Sims, Anson, 252,522, Cl. D21-177.000.  
 Canavan, Richard W., III, to American Optical Corporation. Spectacles. 252,517, 7-31-79, Cl. D16-65.000.  
 Centronics Data Computer Corp.: *See—*  
 Roche, David E., 252,519, Cl. D18-23.000.  
 Chieda, Robert A., to Clairol Incorporated. Tweezer. 252,529, 7-31-79, Cl. D28-55.000.  
 Clairol Incorporated: *See—*  
 Chieda, Robert A., 252,529, Cl. D28-55.000.  
 Clark, Charles J. Wear point for agricultural fertilizer shank. 252,506, 7-31-79, Cl. D15-29.000.  
 Courreges, Andre, to Piade. Bottle. 252,497, 7-31-79, Cl. D9-168.000.  
 Dake, Donald W. Fishing lure body. 252,523, 7-31-79, Cl. D22-28.000.  
 DeNyse, Robert G. Furnace. 252,526, 7-31-79, Cl. D23-97.000.  
 Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A. Snow sled. 252,505, 7-31-79, Cl. D12-9.000.  
 Double, Richard L. Cable strap saddle. 252,496, 7-31-79, Cl. D8-356.000.  
 Fairchild Camera and Instrument Corporation: *See—*  
 Shimasaki, Ken, 252,499, Cl. D10-15.000.  
 Fiat Motors of North America, Inc.: *See—*  
 Kozloski, Edward A., 252,509, Cl. D12-209.000.  
 Fima, Raoul G. Terminal for jump cables. 252,510, 7-31-79, Cl. D13-13.000.  
 Fujimoto, Munenori: *See—*  
 Kawano, Takeyoshi; and Fujimoto, Munenori, 252,514, Cl. D14-70.000.  
 Gehrig, Walter. Plaque or similar article. 252,504, 7-31-79, Cl. D11-136.000.  
 Genz, Marlin J. Microphone stand. 252,511, 7-31-79, Cl. D14-13.000.  
 Glassman, Fredrick R. Light fixture. 252,531, 7-31-79, Cl. D48-3.000.  
 Glassman, Fredrick R. Light fixture. 252,532, 7-31-79, Cl. D48-3.000.  
 Glassman, Fredrick R. Light fixture. 252,533, 7-31-79, Cl. D48-23.000.  
 Goeden, Jolene. Caddy for notions. 252,479, 7-31-79, Cl. D3-68.000.  
 Gordon, Kenneth G. Display rack for eyeglass cases. 252,481, 7-31-79, Cl. D6-24.000.  
 Grauert Enterprises, Inc.: *See—*  
 Grauert, Erwin J., 252,480, Cl. D6-3.000.  
 Grauert, Erwin J., to Grauert Enterprises, Inc. Invertible table. 252,480, 7-31-79, Cl. D6-3.000.  
 Grimes, C. Tom. Cord leader. 252,478, 7-31-79, Cl. D3-28.000.  
 Harada, Toshio: *See—*  
 Mori, Daisaku; Harada, Toshio; and Takahashi, Hanji, 252,494, Cl. D7-128.000.  
 Harshberger, Russell P. Razor. 252,528, 7-31-79, Cl. D28-46.000.  
 Hoffman, Paul R.; and Wallenwein, Hans K., to Plasti-Fab Co. Ltd. Food processor tool holder. 252,491, 7-31-79, Cl. D6-130.000.  
 Huffhines, Terry W. Theater building. 252,527, 7-31-79, Cl. D25-11.000.  
 Ijiri, Yasuhiro. Combined writing instrument and clip for a golfer or the like. 252,520, 7-31-79, Cl. D19-46.000.  
 International Leisure Activities, Inc.: *See—*  
 Wills, Roy K., Jr., 252,476, Cl. D1-16.000.  
 Wills, Roy K., Jr., 252,477, Cl. D1-17.000.  
 Investments & Innovative Concepts, Inc.: *See—*  
 Petersilie, Frank W., 252,484, Cl. D6-63.000.  
 Petersilie, Frank W., 252,485, Cl. D6-59.000.  
 Petersilie, Frank W., 252,486, Cl. D6-63.000.  
 Petersilie, Frank W., 252,487, Cl. D6-63.000.  
 Petersilie, Frank W., 252,488, Cl. D6-64.000.  
 Petersilie, Frank W., 252,489, Cl. D6-64.000.  
 Petersilie, Frank W., 252,490, Cl. D6-71.000.  
 Jones, Lawrence T.; and Sims, Anson, to California R & D Center. Toy spaceman figure. 252,522, 7-31-79, Cl. D21-177.000.  
 Kabushiki Kaisha Sato Kenkyusho: *See—*  
 Sato, Yo, 252,518, Cl. D18-14.000.  
 Kawano, Takeyoshi; and Fujimoto, Munenori, to Matsushita Electric Industrial Co., Ltd. Portable radio. 252,514, 7-31-79, Cl. D14-70.000.  
 Kelly, William T., III, to Union Carbide Corporation. Rechargeable battery checker. 252,502, 7-31-79, Cl. D10-77.000.  
 Kovtonjuk, Vladimir A.: *See—*  
 Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A., 252,505, Cl. D12-9.000.  
 Kozloski, Edward A., to Fiat Motors of North America, Inc. Wheel. 252,509, 7-31-79, Cl. D12-209.000.

- Kuryabin, Valentin A.: *See—*  
 Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A., 252,505, Cl. D12-9.000.  
 Kuzmichev, Lev A.: *See—*  
 Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A., 252,505, Cl. D12-9.000.  
 Lanci, Angelo: *See—*  
 Lanci, Vincent; and Lanci, Angelo, 252,483, Cl. D6-234.000.  
 Lanci, Vincent; and Lanci, Angelo. Picture frame. 252,483, 7-31-79, Cl. D6-234.000.  
 Lewis, James H. Liquid sterilizer unit. 252,524, 7-31-79, Cl. D23-3.000.  
 Lun, Wing-Hung. Flash light case. 252,534, 7-31-79, Cl. D48-24.00A.  
 MacEvoy, Juanita H. Combined storage and carrying case for art supplies. 252,535, 7-31-79, Cl. D3-74.000.  
 Makhonov, Boris B.: *See—*  
 Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A., 252,505, Cl. D12-9.000.  
 Makino, Katsuhiko; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Portable radio receiver. 252,513, 7-31-79, Cl. D14-70.000.  
 Mason, John F. Leveling instrument. 252,500, 7-31-79, Cl. D10-69.000.  
 Matsushita Electric Industrial Co., Ltd.: *See—*  
 Kawano, Takeyoshi; and Fujimoto, Munenori, 252,514, Cl. D14-70.000.  
 Makino, Katsuhiko; and Ohta, Kikuo, 252,513, Cl. D14-70.000.  
 Mori, Daisaku; Harada, Toshio; and Takahashi, Hanji, 252,494, Cl. D7-128.000.  
 McGraw, John T., to Thomsen Equipment Company. Flapper valve blade for a concrete pump or the like. 252,515, 7-31-79, Cl. D15-7.000.  
 McGraw, John T., to Thomsen Equipment Company. Flow control valve chamber for a concrete pump or the like. 252,516, 7-31-79, Cl. D15-7.000.  
 McPartland, Thomas J. Doll. 252,521, 7-31-79, Cl. D21-171.000.  
 Mitutoyo Mfg., Co., Ltd.: *See—*  
 Yamauchi, Mineo; and Nakahara, Masao, 252,501, Cl. D10-73.000.  
 Mori, Daisaku; Harada, Toshio; and Takahashi, Hanji, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 252,494, 7-31-79, Cl. D7-128.000.  
 Nakahara, Masao: *See—*  
 Yamauchi, Mineo; and Nakahara, Masao, 252,501, Cl. D10-73.000.  
 Ohta, Kikuo: *See—*  
 Makino, Katsuhiko; and Ohta, Kikuo, 252,513, Cl. D14-70.000.  
 Petersilie, Frank W., to Investments & Innovative Concepts, Inc. Sofa or similar unit of furniture. 252,484, 7-31-79, Cl. D6-63.000.  
 Petersilie, Frank W., to Investments & Innovative Concepts, Inc. Lounge seat. 252,485, 7-31-79, Cl. D6-59.000.  
 Petersilie, Frank W., to Investments & Innovative Concepts, Inc. Sofa or similar unit of furniture. 252,486, 7-31-79, Cl. D6-63.000.  
 Petersilie, Frank W., to Investments & Innovative Concepts, Inc. Convertible sofa or similar unit of furniture. 252,487, 7-31-79, Cl. D6-63.000.  
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CLASSIFICATION OF PATENTS

ISSUED JULY 31, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	CLASS 43	238	4,162,626	CLASS 123	99 B	4,163,118	447	4,162,969
15	18 R	4,162,587	4,162,627	30 C	CLASS 177		CLASS 210	
CLASS 3	61	4,162,588		65 VD	141	4,162,710	15	4,162,970
1.7	CLASS 44			75 B	CLASS 179			4,162,971
CLASS 4	1 R	4,162,898		117 D	1 F	4,163,119	44	4,162,972
185 H	CLASS 46			362 AR	1 SM	4,163,120	73 W	4,162,973
190	77	4,162,589		432 A	2 EB	4,163,121	120	4,162,974
191	CLASS 49			462	15 AL	4,163,123	124	4,162,975
259	55	4,162,590		623	15 AT	4,163,122	170	4,162,976
300	277	4,162,591		638	18 D	4,163,124	198 C	4,162,977
318	358	4,162,592		CLASS 74	CLASS 180		213	4,162,978
CLASS 5	CLASS 51			19.5	13	4,162,711	282	4,162,979
123	218 R	4,162,593		400	53 R	4,162,714	360 R	4,162,980
CLASS 8	295	4,162,899		CLASS 127	242	4,162,713	375	4,162,981
4	CLASS 52			16	253	4,162,712	486	4,162,982
10.1	9	4,162,594		62	287	4,162,716	CLASS 211	
CLASS 14	69	4,162,595		CLASS 128	48	4,162,717	118	4,162,730
69.5	295	4,162,596		1.3	CLASS 187		126	4,162,731
CLASS 15	410	4,162,597		214 D	29 A	4,162,718	CLASS 215	
104.92	CLASS 53			287	29 R	4,162,719	256	4,162,736
167 R	54	4,162,598		303.1	CLASS 188		CLASS 219	
184	77	4,162,599		305	71.9	4,162,720	10.49 R	4,163,139
250.01	120	4,162,600		419 P	73.3	4,162,721	10.55 B	4,163,140
312 R	292	4,162,601		680	CLASS 198		10.55 F	4,163,141
CLASS 17	415	4,162,602		748	418	4,162,722	79	4,163,142
45	438	4,162,603		91	418	4,162,723	225	4,163,143
67	557	4,162,604		92 A	469	4,162,724	368	4,163,144
CLASS 19	CLASS 55			CLASS 136	534	4,162,725	523	4,163,145
113	17	4,162,901		89 PC	628	4,162,726	542	4,163,146
CLASS 23	54	4,162,902		233	678	4,162,727	CLASS 220	
230 A	73	4,162,903		CLASS 137	688	4,162,727	1.5	4,162,737
230 R	276	4,162,904		266	5 A	4,163,125	21	4,162,738
230.3	337	4,162,905		385	61.13	4,163,126	85 P	4,162,740
232 C	346	4,162,906		613	61.47	4,163,127	203	4,162,741
CLASS 24	CLASS 56			CLASS 138	61.58 B	4,163,128	269	4,162,742
73 P	7	4,162,605		30	81.4	4,163,129	270	4,162,743
129 R	15.9	4,162,606		118.1	144 B	4,163,130	CLASS 221	
CLASS 28	208	Re.30,056		CLASS 141	148 A	4,163,131	70	4,162,739
151	287	4,162,607		1	153 M	4,163,132	251	4,162,744
163	CLASS 57			CLASS 148	153 SC	4,163,133	CLASS 222	
248	87 R	4,162,919		38	157	4,163,134	148	4,162,745
CLASS 29	CLASS 58			CLASS 150	158	4,163,135	153	4,162,746
33 R	23 R	4,162,608		35	296	4,163,136	185	4,162,747
157 R	38 R	4,162,609		52 J	302	4,163,137	250	4,162,750
159 R	148	4,162,610		CLASS 152	310	4,163,138	293	4,162,751
281.3	CLASS 60			217	CLASS 201		342	4,162,752
417	39.65	4,162,611		354 RB	12	4,162,943	632	4,162,748
427	276	4,162,612		78	41	4,162,944	633	4,162,749
460	278	4,162,613		CLASS 156	CLASS 202		CLASS 223	
630 D	370	4,162,614		331	173	4,162,945	85	4,162,753
705	478	4,162,615		630	CLASS 203		CLASS 224	
CLASS 30	533	4,162,616		CLASS 162	72	4,162,946	165	4,162,754
29.5	CLASS 62			17	CLASS 204		326	4,162,755
347	123	4,162,617		155	55 R	4,162,947	CLASS 226	
CLASS 32	CLASS 64			220	80	4,162,948	43	4,162,756
40 R	23	4,162,618		276	140	4,162,949	CLASS 228	
CLASS 33	CLASS 65			352	149	4,162,950	1 R	4,162,757
27 L	29	4,162,907		CLASS 164	213	4,162,951	131	4,162,758
265	60 D	4,162,908		154	224 R	4,162,952	CLASS 229	
443	163	4,162,909		CLASS 165	252	4,162,953	2.5 R	4,162,759
CLASS 34	229	4,162,910		32	298	4,162,954	CLASS 233	
103	CLASS 66			CLASS 166	299 EC	4,162,955	19 R	4,162,760
CLASS 35	187	4,162,620		77.5	CLASS 206		24	4,162,761
8 R	CLASS 68			142	345	4,162,728	CLASS 235	
12 N	23.2	4,162,621		167	592	4,162,729	312	4,163,147
CLASS 36	CLASS 70			CLASS 167	8 LE	4,162,956	461	4,162,762
76 R	16	4,162,622		77.5	8 R	4,162,957	CLASS 239	
CLASS 37	364 A	4,162,623		251	11 R	4,162,958	101	4,162,763
190	CLASS 71			252	57	4,162,959	152	4,162,764
CLASS 40	79	4,162,912		CLASS 172	108	4,162,960	337	4,162,765
518	92	4,162,913		4.5	177	4,162,961	656	4,162,766
CLASS 42	CLASS 72			20	CLASS 209		CLASS 241	
71 P	8	4,162,624		74 A	166	4,162,966	30	4,162,767
	54	4,162,625		CLASS 174	235	4,162,967	45	4,162,768
					400	4,162,968	68	4,162,769
							191	4,162,770



## CLASSIFICATION OF PATENTS

CLASS 242	CLASS 269	CLASS 322	CLASS 354	125	4,163,290	99	4,163,066
7.22 4,162,771	41 4,162,785	29 4,163,187	10 4,162,846	221	4,163,291	538	4,163,068
107 4,162,772	CLASS 271	CLASS 323	23 D 4,162,839	CLASS 366		573	4,163,067
107.4 A 4,162,773	64 4,162,786	4 4,163,188	31 4,162,831	83 4,162,854		582	4,163,069
192 4,162,774	173 4,162,787	6 4,163,189	51 4,162,832	261 4,162,856		642	4,163,070
CLASS 244	CLASS 272	89 M 4,163,191	86 4,162,833	273 4,162,857	CLASS 427		
3.17 4,162,775	71 4,162,788	106 4,162,835	274 4,162,834	274 4,162,855	34 4,163,071		
118 R 4,162,776	CLASS 273	139 4,162,836	124 4,162,858	CLASS 400	96 4,163,072		
123 4,162,777	25 4,162,789	173 4,162,837	CLASS 403		221 4,163,073		
CLASS 248	58 C 4,162,790	223 4,162,838	75 4,162,859	CLASS 428	229 4,163,074		
343 4,162,779	73 D 4,162,791	246 4,162,840	199 4,162,860				
610 4,162,778	85 G 4,162,792	310 4,162,841	242 4,162,861	CLASS 404	328 4,163,075		
CLASS 249	121 A 4,162,793	CLASS 325	CLASS 355	72 4,162,862	339 4,163,076		
127 4,162,780	174 4,162,794	313 4,163,195	3 DD 4,162,842	CLASS 405	355 4,163,077		
144 4,162,781	CLASS 277	CLASS 329	4 4,162,843	45 4,162,863	373 4,163,078		
CLASS 250	237 R 4,162,795	50 4,163,196	14 4,162,845	75 4,162,864	411 4,163,079		
201 4,163,148	CLASS 280	CLASS 330	36 4,162,849	154 4,162,865	424 4,163,080		
204 4,163,149	5 R 4,162,796	263 4,163,197	38 4,162,850	277 4,162,866	429 4,163,081		
205 4,163,150	275 4,162,797	277 4,163,198	73 4,162,851	CLASS 406	447 4,163,082		
296 4,163,151	475 4,162,798	CLASS 331	125 4,162,852	94 4,162,811	472 4,163,083		
374 4,163,152	683 4,162,799	94.5 C 4,163,200	225 4,162,853	CLASS 408	206 4,163,084		
423 R 4,163,153	801 4,162,715	94.5 G 4,163,199	CLASS 337	157 4,162,867	CLASS 431		
473 4,163,154	CLASS 281	CLASS 333	16 4,163,237	CLASS 409	28 4,162,887		
492 B 4,163,155	42 4,162,800	194 4,163,201	17 4,163,238	64 4,162,647	76 4,162,889		
561 4,163,156	CLASS 285	CLASS 334	24 4,163,239	CLASS 414	265 4,162,888		
4,163,157	45 4,162,801	76 4,163,202	29 4,163,240	9 4,162,868	351 4,162,890		
4,163,158	343 4,162,802	86 4,163,203	38 4,163,241	27 4,162,734	CLASS 432		
CLASS 251	CLASS 294	CLASS 338	41 4,163,242	70 4,162,869	247 4,162,891		
173 4,162,782	83 R 4,162,803	114 4,163,204	44 4,163,243	78 4,162,733	CLASS 435		
CLASS 252	101 4,162,804	CLASS 339	51 4,163,245	107 4,162,870	7 B 4,162,895		
8.6 4,162,983	CLASS 296	19 4,162,815	68 4,163,246	376 4,162,871	17 4,162,942		
8.8 4,162,984	137 G 4,162,805	64 M 4,162,816	CLASS 338	514 4,162,735	23 4,162,941		
32.7 E 4,162,985	19 4,162,806	75 MP 4,162,817	12 4,163,247	713 4,162,872	75 4,162,938		
33.2 4,162,986	284 4,162,807	112 R 4,162,818	21 R 4,163,249	718 4,162,873	119 4,162,940		
135 4,162,987	CLASS 299	247 4,162,819	45 4,163,250	736 4,162,732	234 4,162,939		
299 4,162,988	2 4,162,808	7 R 4,163,205	107 4,163,251	CLASS 417	CLASS 521		
312 4,162,989	37 4,162,809	58 4,163,207	118 4,163,252	216 4,162,874	96 4,163,085		
383 4,162,990	43 4,162,810	120 4,163,208	120 4,163,253	413 4,162,876	155 4,163,086		
413 4,162,991	CLASS 307	146.1 E 4,163,209	122 4,163,254	CLASS 422	176 4,163,087		
456 4,162,992	255 4,163,159	4,163,210	127 4,163,255	36 4,163,038	CLASS 525		
477 R 4,162,993	260 4,163,160	146.2 4,163,211	133 4,163,256	36 4,163,039	3 4,163,100		
532 4,162,994	297 4,163,161	146.3 AC 4,163,214	167 4,163,258	131 4,163,040	5 4,163,031		
CLASS 256	400 4,163,162	146.3 H 4,163,215	191 4,163,259	179 4,163,041	53 4,163,033		
10 4,162,783	CLASS 308	149 A 4,163,216	261 4,163,260	CLASS 423	74 4,163,032		
CLASS 260	172 4,162,812	152 R 4,163,217	CLASS 360	234 4,163,043	429 4,163,030		
2.3 4,162,995	237 R 4,162,813	310 A 4,163,218	13 4,163,261	483 4,163,045	433 4,163,039		
4 R 4,162,996	59 4,163,163	310 R 4,163,219	14 4,163,262	510 4,163,046	449 4,163,029		
27 R 4,162,997	103 4,163,164	331 4,163,220	68 4,163,263	531 4,163,047	531 4,163,097		
28 R 4,162,998	154 4,163,165	347 AD 4,163,221	77 4,163,265	CLASS 424	CLASS 526		
28.5 B 4,162,999	215 4,163,166	365 S 4,163,222	84 4,163,266	45 4,163,048	80 4,163,089		
29.6 MN 4,163,001	242 4,163,167	384 R 4,163,223	102 4,163,267	59 4,163,049	88 4,163,090		
29.6 S 4,163,002	328 4,163,168	520 4,163,224	CLASS 361	115 4,163,050	208 4,163,091		
40 R 4,163,003	CLASS 312	569 4,163,225	1 4,163,268	124 4,163,051	292 4,163,092		
42.14 4,163,004	223 4,162,814	629 4,163,226	42 4,163,269	200 4,163,052	CLASS 528		
45.7 S 4,163,005	CLASS 313	662 4,163,227	77 4,163,270	230 4,163,053	45 4,163,094		
45.75 R 4,163,007	203 4,163,169	711 4,163,228	93 4,163,271	244 4,163,054	67 4,163,095		
45.8 NT 4,163,006	217 4,163,170	745 4,163,229	127 4,163,272	267 4,163,055	69 4,163,096		
45.85 B 4,163,008	221 4,163,171	765 4,163,230	229 4,163,273	272 4,163,057	99 4,163,098		
112 R 4,163,009	302 4,163,172	CLASS 343	417 4,163,274	273 R 4,163,058	172 4,163,099		
4,163,010	352 4,163,173	5 CM 4,163,231	CLASS 362	278 4,163,060	301 4,163,093		
112.5 R 4,163,011	CLASS 315	6.8 R 4,163,232	80 4,163,275	279 4,163,061	347 4,163,101		
182 4,163,012	10 4,163,174	12 R 4,163,233	255 4,163,276	324 4,163,062	CLASS 542		
206 4,163,013	39.51 4,163,175	17.7 4,163,234	263 4,163,277	330 4,163,063	417 4,163,102		
326 C 4,163,014	53 4,163,176	100 SA 4,163,235	CLASS 363	CLASS 425	427 4,163,103		
326.25 4,163,015	208 4,163,177	700 MS 4,163,236	101 4,163,278	84 4,162,877	CLASS 544		
345.8 P 4,163,016	241 P 4,163,178	CLASS 350	CLASS 364	152 4,162,878	160 4,163,104		
397.1 4,163,017	408 4,163,179	36 4,162,820	105 4,163,279	183 4,162,879	CLASS 548		
429.9 4,163,018	CLASS 318	187 4,162,822	200 4,163,280	202 4,162,880	342 4,163,105		
453 P 4,163,019	6 4,163,180	252 4,162,823	431 4,163,282	331 4,162,881	CLASS 560		
454 4,163,020	245 4,163,181	293 4,162,824	439 4,163,283	376 B 4,162,882	11 4,163,106		
456 P 4,163,021	331 4,163,182	295 4,162,825	474 4,163,284	387.1 4,162,883	61 4,163,107		
553 R 4,163,022	568 4,163,183	319 4,162,826	710 4,163,285	388 4,162,884	121 4,163,108		
556 A 4,163,023	573 4,163,184	CLASS 351	719 4,163,286	400 4,162,885	122 4,163,109		
566 R 4,163,024	601 4,163,185	7 4,162,827	757 4,163,287	556 4,162,886	132 4,163,112		
570.9 4,163,025	CLASS 320	9 4,162,828	900 4,163,288	CLASS 426	185 4,163,113		
583 P 4,163,026	48 4,163,186	14 Re.30,058	CLASS 365	481 4,163,064	186 4,163,114		
586 P 4,163,027		166 4,162,829	51 4,163,289	481 4,163,065	240 4,163,115		
931 4,163,034					CLASS 568		
CLASS 261					723 4,163,116		
77 4,163,035					CLASS 585		
CLASS 264					481 4,163,028		
12 4,163,036							
54 4,163,037							
CLASS 266							
176 4,162,784							

## CLASSIFICATION OF DESIGNS

D1— 16 252,476	252,486	D8— 80 252,495	D12— 9 252,505	252,516	D23— 3 252,524
17 252,477	252,487	356 252,496	62 252,507	252,506	97 252,525
D3— 28 252,478	64 252,488	168 252,497	181 252,508	252,507	252,526
68 252,479	252,489	15 252,498	209 252,509	252,508	D25— 11 252,527
74 252,480	71 252,490	69 252,499	D13— 13 252,510	252,509	D28— 46 252,528
D6— 3 252,481	130 252,491	73 252,501	D14— 6 252,511	252,510	55 252,529
24 252,482	234 252,483	77 252,502	13 252,512	252,511	D48— 3 252,531
26 252,483	52 252,492	94 252,493	70 252,513	252,512	23 R 252,532
59 252,485	94 252,493	128 252,494	D15— 7 252,514	252,513	24 A 252,534
63 252,484					

## CLASSIFICATION OF PLANTS

P.— 51 4,444					
--------------	--	--	--	--	--

GEOGRAPHICAL INDEX  
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

6 : 4,162,581	4,162,960	4,162,912	4,162,796	4,162,802	4,163,067
4,162,648	4,162,962	4,163,209	4,163,010	4,162,824	4,163,068
4,162,681	4,162,963	4,163,271	4,163,063	4,162,842	4,163,102
4,162,692	4,162,972	4,163,283	4,162,671	4,162,853	4,163,142
4,162,706	4,162,990	4,162,969	4,162,685	4,162,870	4,163,155
4,162,742	4,162,995	Re.30,057	4,162,753	4,163,005	4,163,158
4,162,751	4,163,044	Re.30,061	4,163,058	4,163,026	4,163,221
4,162,766	4,163,064	4,162,549	4,162,566	4,163,081	4,163,225
4,162,774	4,163,070	4,162,554	4,162,571	4,163,082	4,163,237
4,162,825	4,163,117	4,162,557	4,162,621	4,163,086	4,163,239
4,163,084	4,163,126	4,162,560	4,162,904	4,163,090	4,163,252
4,163,124	4,163,164	4,162,569	4,162,614	4,163,104	4,163,255
4,163,151	4,163,172	4,162,570	4,162,625	4,163,105	4,163,262
4,163,160	4,163,194	4,162,580	4,162,691	4,163,107	4,162,684
4,163,161	4,163,211	4,162,591	4,162,704	4,163,110	4,162,553
4,163,188	4,163,212	4,162,638	4,162,705	4,163,110	4,162,553
4,163,234	4,163,236	4,162,650	4,163,205	4,162,605	4,162,563
4,163,257	4,163,243	4,162,655	4,162,610	4,162,630	4,162,622
4,163,286	4,163,263	4,162,673	4,162,641	4,162,711	4,162,623
4,162,597	4,162,688	4,162,688	4,162,645	4,162,809	4,162,659
4,162,729	4,163,290	4,162,693	4,162,701	4,162,856	4,162,718
4,162,759	4,162,733	4,162,728	4,162,761	4,162,906	4,162,754
01 : 4,162,530	4,162,740	4,162,764	4,162,806	4,162,976	4,162,788
4,162,917	4,162,786	4,162,797	4,162,926	4,163,065	4,162,799
04 : 4,162,712	4,162,808	4,162,857	4,163,092	4,163,127	4,162,826
4,162,988	4,162,847	4,162,872	4,163,135	4,163,132	4,162,828
06 : Re.30,059	4,162,954	4,162,873	4,163,190	4,163,147	4,162,832
4,162,542	4,163,226	4,162,882	4,163,198	4,162,547	4,162,844
4,162,565	4,162,595	4,162,929	4,162,651	4,162,992	4,162,845
4,162,574	4,162,596	4,162,966	4,162,690	4,162,682	4,162,848
4,162,586	4,162,748	4,162,973	4,162,727	4,163,143	4,162,918
4,162,594	4,162,779	4,162,974	4,162,752	4,162,765	4,162,933
4,162,629	4,162,878	4,163,004	4,162,818	4,163,192	4,162,938
4,162,676	4,162,883	4,163,112	4,162,829	4,162,731	4,162,967
4,162,677	4,162,897	4,163,123	4,162,831	4,162,730	4,162,980
4,162,687	4,162,901	4,163,145	4,162,833	4,162,757	4,162,981
4,162,695	4,163,083	4,163,154	4,162,834	4,162,779	4,163,006
4,162,714	4,163,183	4,163,259	4,162,836	4,162,879	4,163,015
4,162,716	4,163,184	4,163,269	4,162,892	4,162,891	4,163,030
4,162,736	4,163,218	4,163,273	4,162,932	4,162,913	4,163,033
4,162,745	4,162,875	4,163,274	4,163,134	4,162,920	4,163,037
4,162,746	4,162,997	4,162,588	4,163,176	4,162,955	4,163,050
4,162,792	4,163,003	4,162,780	4,163,222	4,162,975	4,163,069
4,162,793	4,163,115	4,162,871	4,163,231	4,162,994	4,163,073
4,162,794	4,162,538	4,162,910	4,162,555	4,163,016	4,163,120
4,162,814	4,162,590	4,163,025	4,162,579	4,163,021	4,163,199
4,162,830	4,162,666	4,163,071	4,162,582	4,163,022	4,163,200
4,162,867	4,162,770	4,163,116	4,162,596	4,163,028	4,163,227
4,162,881	4,162,776	4,163,128	4,162,631	4,163,031	4,163,233
4,162,889	4,162,791	4,163,137	4,162,632	4,163,035	4,163,235
4,162,914	4,162,803	4,163,138	4,162,683	4,163,053	4,163,238
4,162,943	4,162,804	4,163,174	4,162,755	4,163,057	4,163,244
4,162,959	4,162,846	4,162,567	4,162,801		

37 : 4,163,277	4,162,911	4,162,739	4,162,942	4,162,813	4,163,241
4,162,600	4,162,947	4,162,771	4,162,944	4,162,270	4,163,256
4,162,607	4,162,983	4,162,823	4,162,961	4,162,575	4,163,289
4,162,738	4,162,985	Re.30,056	4,162,993	4,162,584	4,162,577
4,162,815	4,162,986	Re.30,060	4,163,054	4,162,619	4,162,633
4,163,089	4,162,987	4,162,544	4,163,072	4,162,635	4,162,743
4,162,708	4,163,001	4,162,564	4,163,079	4,162,713	4,162,811
4,162,546	4,163,008	4,162,572	4,163,131	4,162,763	4,162,877
4,162,601	4,163,094	4,162,573	4,163,133	4,162,777	4,162,735
4,162,656	4,163,165	4,162,626	4,163,139	4,162,781	4,162,859
4,162,686	4,163,216	4,162,640	4,163,152	4,162,782	4,163,275
4,162,709	4,163,240	4,162,643	4,163,167	4,162,838	4,162,907
4,162,726	4,162,694	4,162,654	4,163,180	4,162,868	4,163,029
4,162,789	4,162,956	4,162,707	4,163,208	4,162,894	4,163,113
4,162,800	4,162,957	4,162,725	4,163,220	4,162,900	4,163,114
4,162,817	4,162,958	4,162,760	4,163,232	4,162,931	4,162,741
4,162,850	4,162,964	4,162,767	4,163,125	4,162,989	4,162,798
4,162,874	4,162,965	4,162,778	4,163,125	4,163,019	4,162,982
4,162,880	4,163,011	4,162,785	4,163,125	4,162,783	4,163,136
4,162,886	4,163,014	4,162,821	4,162,821	4,162,968	4,163,136
4,162,898	4,162,859	4,162,855	4,162,593	4,163,206	4,163,254
4,162,909	4,162,710	4,162,928	4,162,646	4,163,228	4,162,862

DESIGN PATENTS

6 : 252,531	252,515	12 : 252,529	28 : 252,500	37 : 252,535	39 : 252,490
252,532	252,516	252,521	29 : 252,527	252,484	252,476
252,533	252,522	252,478	33 : 252,519	252,485	252,477
05 : 252,507	252,528	25 : 252,525	36 : 252,480	252,486	252,492
06 : 252,481	252,493	26 : 252,482	252,483	252,487	252,523
252,496	252,502	27 : 252,479	252,509	252,488	252,503
252,504	252,517	252,530	252,526	252,489	252,506

PLANT PATENTS

41 : 4,444					
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**OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE**

August 7, 1979

Volume 985

Number 1

**CONTENTS**

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	985 OG 2
Board of Appeals Decisions Rendered in the Month of June 1979 . .	985 OG 2
Reissue Applications Filed . . . . .	985 OG 2
Patent Notices	
Certificates of Correction for the Week of August 7, 1979 . . . . .	985 OG 3
Disclaimers . . . . .	985 OG 3
Dedications . . . . .	985 OG 3
National Technical Information Service . . . . .	985 OG 3
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	985 OG 6
Condition of Patent Applications . . . . .	985 OG 7
Defensive Publications (T985,001) . . . . .	1
Reissue Patents Granted (30,062) . . . . .	3
Plant Patents Granted (4,445) . . . . .	7
Patents Granted	
General and Mechanical (4,163,292) . . . . .	9
Chemical (4,163,642) . . . . .	127
Electrical (4,163,867) . . . . .	191
Design Patents Granted (252,536) . . . . .	255
Index of Patentees . . . . .	PI 1
Indices of Applicants of Defensive Publications, Reissues, Plants and Designs . . . . .	PI 26
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs, Plants and Defensive Publications . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs, Plants and Applicants of Defensive Publications . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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Basic fee under PCT Rule 15.1(I) for an international application containing 80 sheets or less	\$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 80 sheets	3.50
Designation fee under PCT Rule 15.1(II)	45.00

LUTRELLE F. PARKER,  
Acting Commissioner of  
Patents and Trademarks.

## Board of Appeals Decisions Rendered in the Month of June 1979

Affirmed	227
Affirmed in Part	85
Reversed	79
Total	391

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,029,176, Re. S.N. 930,656, Filed Aug. 2, 1978, Cl. 187/52 R, DOORWAY SAFETY DEVICE, Gerald W. Mills, Owner of Record: Inventor, Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 313

# PATENT NOTICES

## Certificates of Correction for the Week of Aug. 7, 1979

P.P. 4,138	4,121,886	4,140,780	4,149,599
Re. 29,913	4,124,291	4,140,863	4,149,778
Re. 29,994	4,125,405	4,141,899	4,149,782
3,950,873	4,125,520	4,141,915	4,149,878
4,068,292	4,125,781	4,142,227	4,149,953
4,071,565	4,127,018	4,142,662	4,149,975
4,076,709	4,129,189	4,142,667	4,150,037
4,076,802	4,180,658	4,142,850	4,150,929
4,080,251	4,133,635	4,143,432	4,150,954
4,087,795	4,134,114	4,144,015	4,151,486
4,090,855	4,134,250	4,144,273	4,152,165
4,097,805	4,134,788	4,146,331	4,152,342
4,101,488	4,134,828	4,146,627	4,152,535
4,105,691	4,137,059	4,146,858	4,152,576
4,107,650	4,137,651	4,146,855	4,152,782
4,109,487	4,138,151	4,146,996	4,154,013
4,117,090	4,138,186	4,147,028	4,154,723
4,117,101	4,138,540	4,147,619	4,155,153
4,117,807	4,138,562	4,147,794	4,155,263
4,119,179	4,138,578	4,148,764	4,155,762
4,119,600	4,139,997	4,148,920	
4,120,806	4,140,444	4,149,367	
4,121,782	4,140,787	4,149,421	

## Disclaimers

Design No. 246,046.—Allen Dana Hawthorne, New Canaan, Conn. ELECTROPHOTOGRAPHIC APPARATUS OR SIMILAR ARTICAL. Patent dated Oct. 11, 1977. Disclaimer filed May 21, 1979, by the assignee, International Business Machines Corporation.

Hereby enters this disclaimer to the sole claim of said patent.

3,478,397.—Florentin J. Pearne, Alhambra, Frank S. Pearne, San Gabriel, and Frederick G. Robson, Long Beach, Calif. BRICK CUTTER AND HACKER. Patent dated Nov. 18, 1969. Disclaimer filed Aug. 24, 1978, by the assignee, AMI Industries, Inc.

Hereby enters this disclaimer to claim 6 of said patent.

3,958,905.—Homer J. Wood, Sherman Oaks, Calif. CENTRIFUGAL COMPRESSOR WITH INDEXED INDUCER SECTION AND PADS FOR DAMPING VIBRATIONS THEREIN. Patent dated May 25, 1978. Disclaimer filed Apr. 18, 1979, by the assignee, Deere & Company.

Hereby enters this disclaimer to claims 10 and 11 of said patent.

4,069,178.—Ryuzo Mikami, Ichihara, and Tsuneo Hanada, Chiba, Japan. PROCESS FOR PREPARATION OF WATER-SOLUBLE, SILICONE MODIFIED ALKYD RESINS. Patent dated Jan. 17, 1978. Disclaimer filed June 7, 1979, by the assignee, Toray Silicoes Company, Ltd.

Hereby enters this disclaimer to claims 1-5 of said patent.

4,075,418.—Mitsuo Nemoto, Machida, and Kimiyasu Honma, Kokubunji, Japan. STEREOPHONIC PICKUP CARTRIDGE. Patent dated Feb. 21, 1978. Disclaimer filed Oct. 16, 1978, by the assignee, Kabushiki Kaisha Audio-Technica.

The term of this patent subsequent to Sept. 25, 1980, has been disclaimed.

## Dedications

3,604,996.—Fritz Norman Lutz, Northfield, Ohio. CONTROLLED POWER SUPPLY SYSTEM. Patent dated

Sept. 14, 1971. Dedication filed May 29, 1979, by the assignee, The Warner & Swasey Company.

Hereby dedicates the remainder of the term of this patent to the Public.

4,063,835.—Wallace T. Husband, West Vancouver, British Columbia and Howard A. Larlee, Surrey, British Columbia, Canada. FRAME CONSTRUCTION. Patent dated Dec. 20, 1977. Dedication filed May 18, 1979, by the assignee, E-Z-Rect Metal Products, Ltd.

Hereby dedicates to the Public the entire term of said patent.

## National Technical Information Service

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,  
Patent Program Coordinator,  
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE  
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324  
Patent 4,135,494. Over-Pressure Protection Device. Filed Mar. 9, 1977. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY  
Assistant General Counsel for Patents  
Washington, D.C. 20545

Patent application 244,080. Fuel Control. Filed Apr. 14, 1972.  
Patent application 714,863. Cylindrical Radiant Energy Direction Devices With Refractive Medium. Filed Aug. 16, 1978.

Patent application 822,861. Twin Pack Hemodialyzer. Filed Aug. 8, 1977.

Patent application 839,235. Laser-Induced Separation of Hydrogen Isotopes in the Liquid Phase. Filed Oct. 4, 1977.

Patent application 841,775. Ceramic End Seal Design for High Temperature High Voltage Nuclear Instrumentation Cables. Filed Oct. 13, 1977.

Patent application 844,084. Combined Compress Air Storage, Low BTU Coal Gasification Power Plant. Filed Oct. 20, 1977.

Patent application 844,085. Solids Irradiator. Filed Oct. 20, 1977.

Patent application 844,086. CF Sub 4 Laser. Filed Oct. 20, 1977.

Patent 4,078,704. Coal Feed Lock. Filed Dec. 21, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,086,323. Process for Removal of Sulfur Compounds From Fuel Gases. Filed June 21, 1977. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,087,573. Adhesive Plasters. Filed Sept. 26, 1975. Patented May 2, 1978. Not available NTIS.

Patent 4,087,905. Method of Preparing a Powdered Electrically Insulative Separator for Use in an Electrochemical Cell. Filed Mar. 30, 1977. Patented May 9, 1978. Not available NTIS.



Patent 4,088,512. Quench-Age Method for the Fabrication of Niobium-Aluminum Superconductors. Filed Jan. 21, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,088,553. Method for Separation Boron Isotopes. Filed June 12, 1974. Patented May 9, 1978. Not available NTIS.

Patent 4,090,875. Ductile Tungsten-Nickel-Alloy and Method for Manufacturing Same. Filed Oct. 1, 1973. Patented May 23, 1978. Not available NTIS.

Patent 4,091,077. Process for Recovering Filler From Polymer. Filed Aug. 12, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,091,198. Method for Reproducibly Preparing a Low-Melting High-Carbon Yield Precursor. Filed June 21, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,103,256. Azacoumarin Dye Lasers. Filed May 25, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,257. Azacoumarin Dye Lasers. Filed May 25, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,122,897. In Situ Gasification Process for Producing Product Gas Enriched in Carbon Monoxide and Hydrogen. Filed Dec. 28, 1977. Patented Oct. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR  
Branch of Patents, 18th and C Sts., NW.,  
Washington, D.C. 20240

Patent application 942,833. Froth Flotation of Insoluble Silimes From Sylvinitic Ores. Filed Sept. 15, 1978.

Patent application 953,395. Process for Scavenging Iron From Tailings Produced by Flotation Beneficiation and for Increasing Iron Ore Recovery. Filed Oct. 23, 1978.

Patent application 954,028. Induced Air Flow Self-Cleaning Spray Nozzle. Filed Oct. 23, 1978.

Patent application 969,047. Precision Drafting Instrument. Filed Dec. 13, 1978.

Patent application 969,767. High Coercive Force Rare Earth Metal-Cobalt Magnets Containing Copper and Magnesium. Filed Dec. 15, 1978.

Patent application 969,768. Extraction of Tungsten From Ores. Filed Dec. 15, 1978.

U.S. DEPARTMENT OF THE NAVY  
Assistant Chief for Patents, Office of Naval Research  
Code 302, Arlington, Va. 22217

Patent application 903,181. High Performance Solar Still. Filed Jan. 15, 1979.

Patent application 815,327. Bionotential Movement Artifact Inhibiting System. Filed July 13, 1978.

Patent application 928,218. Pulse Generator Utilizing Superconducting Apparatus. Filed July 26, 1978.

Patent application 939,000. An Analog/Digital System for Evaluating Battery Characteristics. Filed Aug. 30, 1978.

Patent application 957,126. High Speed Frequency Tunable Microwave Filter. Filed Nov. 3, 1978.

Patent application 957,763. Diode Array Convolver. Filed Oct. 31, 1978.

Patent application 967,749. Surface Acoustic Signal Defader. Filed Dec. 6, 1978.

Patent application 970,584. Adaptive Slant Range Compensator for a Remote Optical Mapping System. Filed Dec. 18, 1978.

Patent 4,062,105. Method for Fabricating Ferroelectric Ultrasonic Transducers. Filed Dec. 20, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,090,559. Heat Transfer Device. Filed Aug. 14, 1974. Patented May 23, 1978. Not available NTIS.

Patent 4,102,574. Method and Means of Monitoring the Quality of a Fluid Dielectric. Filed May 11, 1977. Patented July 25, 1978. Not available NTIS.

Patent 4,106,504. Portable Recompression Chamber With Air Scrubber. Filed Dec. 6, 1976. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,106,910. Ras-Gas Dilution Device. Filed Aug. 16, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,107,575. Frequency-Selective Loss Technique for Oscillation Prevention in Traveling-Wave Tubes. Filed Oct. 4, 1976. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,109,062. Submersible Battery Apparatus. Filed Sept. 22, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,997. Optical Silencers. Filed Feb. 28, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,977. Pyrogen Igniter Ramjet Ignition System. Filed June 13, 1977. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,111,802. Deployable Rotor. Filed Jan. 31, 1977. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,117,329. Room-Temperature, Thin-Film, PbS Photoconductive Detector Hardened Against Laser Damage. Filed Apr. 22, 1977. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,122,412. Magneto-Optically Tuned Lasers. Filed Apr. 18, 1977. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,123,697. Electrostatic High Potential System. Filed July 5, 1977. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,123,728. Electrogenic Chemiluminescent (ECL) Laser. Filed Nov. 1, 1976. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,124,297. Ultrafast Scanning Spectrophotometer. Filed July 25, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,124,657. Room Temperature Cured Elastomer. Filed Mar. 25, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,130,821. Frequency-Angle Fire Control Radar System. Filed Apr. 8, 1977. Patented Dec. 19, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Assistant General Counsel for Patent Matters—  
NASA Code GP-2, Washington, D.C. 20546

Patent application 6,008,207. Dual Bard Combiner for Horn Antenna. Filed Jan. 31, 1979.

Patent application 6,008,209. Multifrequency Broadband Horn Antenna. Filed Jan. 31, 1979.

Patent application 960,756. A Method of Making High Temperature Seals. Filed Dec. 15, 1978.

Patent 3,626,114. Thermomagnetic Recording and Magnetic Optic Playback System. Filed Mar. 10, 1969. Patented Dec. 7, 1971. Not available NTIS.

Patent 3,837,908. Manganese Bismuth Films With Narrow Transfer Characteristics for Curie-Point Switching. Filed Nov. 1, 1972. Patented Sept. 24, 1974. Not available NTIS.

Patent 4,134,683. Multispectral Imaging and Analysis System. Filed Mar. 5, 1976. Patented Jan. 16, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR  
Branch of Patents, 18th and C Sts., NW.,  
Washington, D.C. 20240

Patent application 953,393. Process for Producing a Metastable Precursor Powder and for Producing Sialon From This Powder. Filed Oct. 12, 1978.

U.S. DEPARTMENT OF THE AIR FORCE  
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,128,113. Double Plug Shuttle Valve. Filed Aug. 27, 1976. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,128,305. Catadioptric Objective. Filed Apr. 14, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,131,593. Low Infrared Emissivity Paints Comprising an Oxime Cured Silicone Binder. Filed Oct. 13, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,132,988. Radar Intrusion Detection System. Filed Aug. 19, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,135,169. Pre-TR High Power/Intermediate Power Stage Apparatus. Filed Mar. 10, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,185. RF Loop Intruder Detection System. Filed Oct. 7, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,296. Method of Joining a Fine Wire Filament to a Connector. Filed Aug. 19, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,135,298. Deformable Heat Transfer Fin. Filed June 21, 1977. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE  
Research Agreements and Patent Branch, General Service  
Division, Federal Bldg., Agriculture Research Service  
Hyattsville, Md. 20782

Patent application 974,170. Preparation of Protein Concentrates From Whey and Seed Products. Filed Dec. 28, 1978.

Patent 4,136,169. Cross-Protective Fowl Cholera Bacterins. Filed Feb. 24, 1978. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY  
Assistant General Counsel for Patents  
Washington, D.C. 20545

Patent application 849,570. Wellbore Pressure Transducer. Filed Nov. 8, 1977.

Patent application 855,647. Directional Detector of Gamma Rays. Filed Nov. 29, 1977.

U.S. DEPARTMENT OF THE INTERIOR  
Branch of Patents, 18th and C Sts., NW.,  
Washington, D.C. 20240

Patent 4,090,135. Wireless FSK Technique for Telemetry Underground Data to the Surface. Filed June 29, 1976. Patented May 16, 1978. Not available NTIS.

Patent 4,098,866. Recovery of Uranium From Refractory Ores. Filed Apr. 15, 1977. Patented July 4, 1978. Not available NTIS.

Patent 4,104,132. Method for Eliminating Solution-Level Attack on Cathodes During Electrolysis. Filed July 22, 1977. Patented Aug. 1, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY  
Assistant Chief for Patents, Office of Naval Research  
Code 302, Arlington, Va. 22217

Patent application 6,001,031. Refractory Passivated Ion-Implanted GaAs Ohmic Contacts. Filed Jan. 1, 1979.

Patent application 943,255. Universal Tow Target Adapter. Filed Sept. 15, 1978.

Patent application 943,894. Gyrotron Travelling-Wave Amplifier. Filed Sept. 19, 1978.

Patent application 952,021. Connector Receiver for Pontoon Causeways. Filed Oct. 16, 1978.

Patent application 962,406. Hydrophone Preamplifier and Calibration Circuit. Filed Jan. 5, 1978.

Patent application 973,053. Shaft and Bore Misalignment Measurement Tool. Filed Dec. 22, 1978.

Patent 4,108,400. Dual Mode Guidance System. Filed Aug. 2, 1978. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,110,697. Digital Bypassable Register Interface. Filed Feb. 22, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,715. Broadband High Pass Microwave Filter. Filed July 27, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,112,394. Method and Means of Link Coupling With Separate Control of Link Reactance and Coupling Coefficient. Filed Jan. 3, 1977. Patented Sept. 4, 1978. Not available NTIS.

Patent 4,117,588. Method of Manufacturing Three Dimensional Integrated Circuits. Filed Jan. 24, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,117,967. Solder Extractor Apparatus. Filed May 26, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,126,033. Determination of Thermal Conductances of Bonding Layers in Infrared Photoconductor Arrays. Filed June 23, 1977. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,128,774. N Cycle Gated Periodic Waveform Generator. Filed June 20, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,131,392. Deployable Rotor. Filed Jan. 31, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,135,454. Safing a Fluoric Cartridge Initiator. Filed Sept. 14, 1977. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR  
Branch of Patents, 18th and C Sts., NW.,  
Washington, D.C. 20240

Patent 4,080,419. Foam Injection Leaching Process for Fragmented Ore. Filed Dec. 10, 1976. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,104,544. Current Limiting Circuit for Direct Current Power Supplies. Filed Mar. 16, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,120,694. Process for Purifying a Titanium-Bearing Material and Upgrading Ilmenite to Synthetic Rutile With Sulfur Trioxide. Filed Sept. 6, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,135,921. Process for the Preparation of Rare-Earth-Silicon Alloys. Filed Mar. 7, 1978. Patented Jan. 23, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Assistant General Counsel for Patent Matters—  
NASA Code GP-2, Washington, D.C. 20546

Patent application 8,002,925. Method and Alloy for Making Electrical Connections to Conductive Thin Film. Filed Jan. 12, 1979.

Patent application 6,009,889. CCD Correlated Quadruple Sampling Processor. Filed Feb. 6, 1979.

Patent application 956,529. Cooled Echelle Grating Spectrometer. Filed Oct. 31, 1978.

Patent application 969,757. Method and Technique for Installing Light-Weight Fragile, High-Temperature Fiber Insulation. Filed Dec. 16, 1978.

Patent application 974,292. Preparation of Monotectic Alloys Having a Controlled Microstructure by Directional Solidification Under Dopant-Induced Interface Breakdown. Filed Dec. 20, 1978.

Patent application 974,472. Thermal Barrier Pressure Seal. Filed Dec. 29, 1978.

Patent application 974,475. Digital Numerically Controlled Oscillator. Filed Dec. 29, 1978.

Patent 4,135,019. Low Density Bismaleimide-Carbon Microballoon Composites. Filed Mar. 16, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,127. Direct Current Transformer. Filed Mar. 29, 1977. Patented Jan. 16, 1979. Not available NTIS.

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California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
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Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.

985 OG 6

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

### PATENT EXAMINING GROUPS

Actual  
Filing Date  
of Oldest  
New Case  
Awaiting  
Action

#### CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director	8-11-78
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director	5-2-78
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director	7-6-78
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director	3-20-78
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director	12-1-77
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	

#### ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director	11-2-77
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director	2-3-78
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director	6-1-78
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director	8-25-78
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director	8-25-77
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 260—C. D. QUARFORTH, Director	5-17-77
Industrial Arts; Household, Personal and Fine Arts.	

#### MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director	2-22-78
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director	5-11-78
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director	4-7-78
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director	1-30-78
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director	12-20-77
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,553 to 3,031,663, inclusive  
Plant Patents..... Numbers 2,135 to 2,142, inclusive

985 OG 7



## DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 7, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T985,001

### COLORATION PROCESS

Grahame M. Reade, Wheathampstead; William Clarke, Middleton, and Maurice Danby, Knutsford, all of England, assignors to Imperial Chemical Industries Limited, London, England  
Filed Nov. 9, 1978, Ser. No. 958,997

Claims priority, application United Kingdom, Nov. 11, 1977, 47040/77

Int. Cl.<sup>2</sup> D06P 5/00

U.S. Cl. 8—2.5 R

No Drawing. 18 Pages Specification

Water-impregnated textiles, especially of cellulose or wool, or mixtures of cellulose and wool with synthetic fibers and synthetic textiles, such as nylon and acrylics, particularly as assembled garments, are wet-transfer printed with a transferable printing design comprising a dyestuff which is reactive with the textile by heating the impregnated textile in contact with the design while maintained in a water-impervious enclosure comprising a polyester film or sheet, such as poly(ethylene terephthalate). The design is preferably applied to the polyester film or sheet which may be pretreated to facilitate coating with the transferable design. The pretreatment may comprise a wettable resin coating such as a cross-linked copolymer of acrylic acid, methacrylic acid or their glycidyl or lower alkyl esters.

Transfer printing materials useful in the wet-transfer printing process are also disclosed and include a supporting film or sheet of a synthetic thermoplastics linear polyester such as a film of biaxially oriented heat set poly(ethylene) terephthalate, and a transferable printing layer of a textile-reactive dyestuff applied to one or both surfaces of the film or sheet.

T985,002

### SEAT BELT RETRACTOR BASE AND COVER

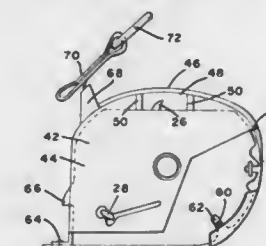
Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 821,273, Aug. 3, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,402

Int. Cl.<sup>2</sup> A62B 35/00; B65H 75/48

U.S. Cl. 242—107.4 R

2 Sheets Drawing. 10 Pages Specification



A seat belt retractor comprising a generally U-shaped frame comprising a central base portion and two upstanding flange portions attached to the sides of the base portion, each of the flange portions including an upper surface connecting two side surfaces, the upper surface being substantially flat; a shaft journaled for rotation in the flange portions; at least one ratchet wheel mounted on the shaft for rotation therewith and having a plurality of ratchet teeth along its outer circumfer-

ence, the ratchet wheel being located adjacent to one of the flange portions and being positioned such that its outer circumference is above the height of the upper surface of the one flange portion, and cover means forming a protective cover at least around the upstanding flanges of the frame, the cover having inner and outer surfaces, the inner surfaces being provided with spacing means in contact with a portion of at least the upper surface of the one flange portion for spacing the inner surface of the cover from the outer circumference of the ratchet wheel, the spacing means further providing reinforcement to the cover to resist movement of the cover against the upper surface.

T985,003

### SYNERGISTIC LIGHT STABILIZER BLENDS FOR POLY(VINYL CHLORIDE) POLYMERS

Eugene R. Bertozzi, Yardley, and Henry N. Paul, 3rd, Philadelphia, both of Pa., assignors to Thiokol Corporation, Newtown, Pa.

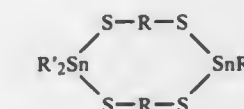
Continuation-in-part of Ser. No. 863,753, Dec. 23, 1977. This application Sep. 20, 1978, Ser. No. 944,120

Int. Cl.<sup>2</sup> C08K 5/57

U.S. Cl. 260—45.75 S

No Drawing. 22 Pages Specification

Tin salts formed by the reaction of di lower alkyl or aryl tin oxides and dimercapto ethyl formal and similar dimercapto compounds of the general formula



wherein R is  $-(\text{CH}_2)_m(\text{OCH}_2)_n-\text{O}-(\text{CH}_2)_m-(\text{OCH}_2)_p-\text{O}-$  wherein p is 0 or 1, m is 2 to about 6 and n is 0 to about 6 and R' is lower alkyl of up to about 10 carbon atoms, or carbocyclic aryl containing one or two aromatic rings when combined with conventional tin based stabilizers show a synergistic light and heat stabilizing effect in poly(vinyl chloride) polymers.

T985,004

### SYNERGISTIC ULTRAVIOLET LIGHT STABILIZER MIXTURES FOR MONO-OLEFIN POLYMERS

Henry N. Paul, 3rd, 538 E. Gravers La., Philadelphia, Pa. 19118  
Continuation of Ser. No. 908,335, May 22, 1978, abandoned, which is a continuation of Ser. No. 849,907, Nov. 9, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,892

Int. Cl.<sup>2</sup> C08K 5/37

U.S. Cl. 260—45.7 S

No Drawing. 25 Pages Specification

Polyolefins are stabilized against the degradative effects of ultraviolet light using mixtures of alkylene polysulfide polymers and conventional stabilizers such as hydroxy benzophenones, thiodipropionates and phenolic antioxidants.

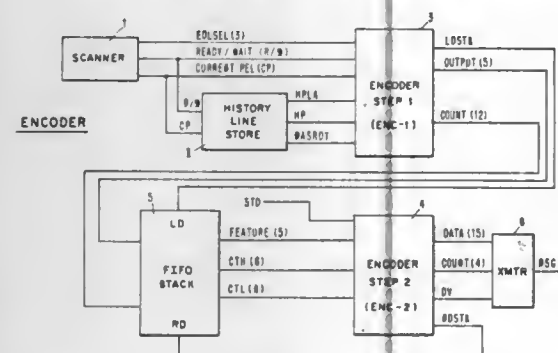
**T985,005**  
**TWO-DIMENSIONAL IMAGE DATA COMPRESSION**  
**AND DECOMPRESSION SYSTEM**  
 Gerald Goertzel, 7 Sparrow Cir., White Plains, N.Y. 10605, and  
 Joan L. Mitchell, 1206 Main St., Peekskill, N.Y. 10566

Filed Oct. 16, 1978, Ser. No. 951,532

Int. Cl.<sup>2</sup> G06F 15/20

U.S. Cl. 364-515

23 Sheets Drawing. 166 Pages Specification



A dual-mode encoding and decoding procedure enables image data to be compressed optionally in one-dimensional (1D) mode or two-dimensional (2D) mode. In 1D mode, color transitions in the image are encoded as run length features only. In 2D mode, the transitions are encoded as vertical correlation features wherever possible, and where this is not possible, the transitions are encoded as run length features. The compression achieved by run length encoding in 2D mode may be enhanced in those instances where the "history line" which precedes the current scan line contains a transition located between points that are vertically aligned with the beginning and end points of the run currently being encoded. Run length counting is suspended for those pels in the current run that could have been referenced to the history transition if the run

had ended with any of these pels, thereby enabling the run to be encoded as though it contained fewer pels than its actual length. Compression may be enhanced still further by dynamically interchanging the variable-length bit patterns respectively representing certain vertical correlation and run length prefix codes depending upon whether the preceding transition was encoded as a vertical correlation feature or a run length feature.

**T985,006**  
**RETAINING MEANS FOR PIVOT PIN**

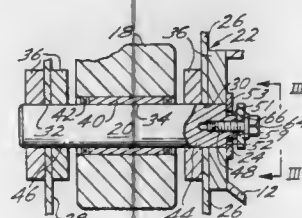
Erich E. Drochner, Bettendorf, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 30, 1978, Ser. No. 956,009

Int. Cl.<sup>2</sup> F16C 11/06; F16D 1/12, 3/00

U.S. Cl. 403-163

1 Sheets Drawing. 5 Pages Specification



Apparatus for pivotally connecting two relatively movable members has a pin having one end connectable with a retainer plate. Flat surfaces and shoulders formed on the one pin end respectively engage the plate and an aperture therein and with an end connected bolt and washer universally maintains the pin.

## REISSUES

AUGUST 7, 1979

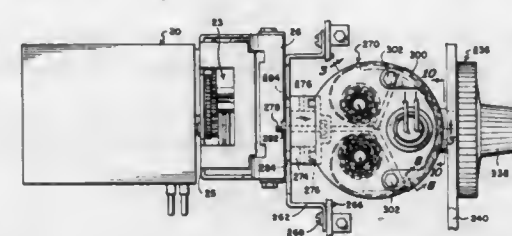
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 30,062**  
**ELONGATED STRIP TYPE INDICATOR**  
**ARRANGEMENT FOR UHF TELEVISION TUNER**  
 Alarico A. Valdetaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.  
 Original No. 3,916,820, dated Nov. 4, 1975, Ser. No. 257,846,  
 May 30, 1972. Application for reissue Nov. 4, 1977, Ser. No. 848,772

Int. Cl.<sup>2</sup> H03J 1/02, 5/04

U.S. Cl. 116-243

21 Claims



15. In a UHF tuning mechanism of the type having a continuously variable main tuning shaft, rotation of which is effective selectively to receive signals from all seventy television stations in the UHF television band, the combination of a station selector shaft, gear means interconnecting said selector shaft and said main tuning shaft, detent means connected to said selector shaft for establishing a plurality of equally spaced detent positions for said selector shaft so that all of the stations in said UHF band may be selected by rotating said selector shaft more than one revolution, a movable elongated strip of material bearing numbers corresponding to the assigned channels of each of the seventy UHF television stations, means defining a stationary single number viewing position at which only one of said numbers may be viewed at a time, driving means for moving said elongated strip past said viewing position, and means interconnecting said selector shaft and said driving means so that each UHF channel number on said elongated strip which corresponds to a detent position of said main tuning shaft is automatically viewable at said viewing position in response to rotation of said selector shaft.

**Re. 30,063**  
**HIGH PRESSURE SAFETY VALVE**  
 Jesse H. Turner, Auburn, Ind.; Cland C. Hurd, Riverside, and Frank Fiedler, Jr., Rowland Heights, both of Calif., assignors to Essex International, Inc., Fort Wayne, Ind.  
 Original No. 4,026,314, dated May 31, 1977, Ser. No. 626,817,  
 Oct. 29, 1975. Application for reissue Sep. 7, 1977, Ser. No. 831,303

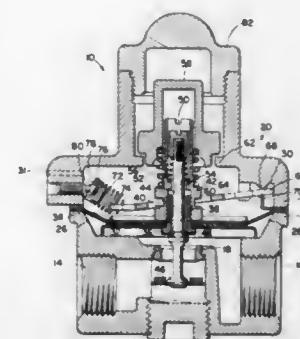
Int. Cl.<sup>2</sup> G05D 16/06

U.S. Cl. 137-116.5

5 Claims

1. A high pressure safety valve, comprising:  
 a housing having an inlet, an outlet and a main passageway connecting said inlet and said outlet;  
 main valve means movable between closed and open positions disposed in said main passageway for controlling flow therethrough;  
 differential pressure responsive means operably connected to said valve means for moving said main valve means toward and away from the closed position in response to differentials in pressure between a reference pressure and the pressure at said outlet;  
 snap acting operator means comprising a pivoted arm member and overcentering spring biasing means operatively connected to said differential pressure responsive means for moving said main valve means from the closed position to the open position, and vice versa, with a snap action when the differential pressure responsive means

moves said main valve means in a direction from the [close] closed position to the open position, and vice versa; and



relief valve means operated by said differential pressure responsive means for relieving the pressure at said outlet whenever said outlet pressure rises above a predetermined level and said main valve is in said closed position.

**Re. 30,064**  
**PROCESS FOR COLOR PHOTOGRAPHIC PROCESSING**  
 Isao Shimamura, and Junkiti Ogawa, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
 Original No. 4,083,723, dated Apr. 11, 1978, Ser. No. 771,492,  
 Feb. 24, 1977. Application for reissue Jul. 3, 1978, Ser. No. 921,677  
 Claims priority, application Japan, Feb. 24, 1976, 51-19215;  
 Sep. 29, 1976, 51-117036

Int. Cl.<sup>2</sup> G03C 5/30

U.S. Cl. 96-66.5

11 Claims

1. A process for color photographic processing, which comprises subjecting an imagewise exposed silver halide color light-sensitive material to a color development using a color developer containing;  
 (1) a p-phenylenediamine developing agent or derivative thereof and  
 (2) at least one organic compound having at least one phosphono group and at least one carboxy group in the molecule selected from the group consisting of 2-phosphonobutane-1,2,4-tricarboxylic acid, 1-phosphonopropane-1,2, 3-tricarboxylic acid, 1-phosphonobutane-2,3,4-tricarboxylic acid, 1,1-diphosphonopropane-2,3-dicarboxylic acid, 2-phosphonobutane-2,3,4-tricarboxylic acid and 2,2-diphosphonobutane-3,4-dicarboxylic acid.

**Re. 30,065**  
**NUCLEAR REACTOR**  
 Andrew J. Anthony, Tariffville, and Edward A. Gruber, Windsor Locks, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.  
 Original No. 3,366,546, dated Jan. 30, 1968, Ser. No. 511,138,  
 Dec. 2, 1965. Application for reissue Dec. 27, 1977, Ser. No. 865,000

Int. Cl.<sup>2</sup> G21C 3/30

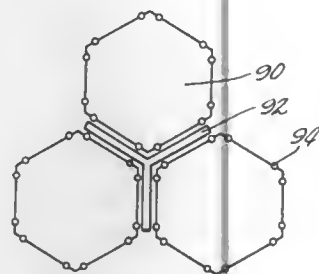
U.S. Cl. 176-76

9 Claims

1. A core for a nuclear reactor comprising a plurality of longitudinally extending generally parallel fuel elements, said fuel elements being grouped into a plurality of fuel element assemblies and control rods interposed between certain of said



fuel element assemblies, said fuel element assemblies adjacent said control rods each including a pair of spaced laterally extending support plates with said fuel elements being supported between said support plates and within the confines of a laterally extending polygon and further including longitudinally extending guide rods, said guide rods extending generally parallel and of a length coextensive with said fuel elements, said guide rods supported between said spaced support plates independently of said fuel elements and arranged in said assembly with a first portion



[of said guide rods] thereof extending [outwardly from the fuel elements grouped in said assemblies] outside of said polygon throughout the length of said guide rods towards said control rods whereby said guide rods will prevent said control rods from engaging said fuel elements and a second portion thereof extending inside of said polygon throughout the length of said guide rods, said guide rods thereby having a lateral dimension extending from outside said polygon to inside said polygon such that said guide rods are relatively rigid structural members.

Re. 30,066  
METHOD FOR SELECTIVELY REMOVING  
CHROMATES

Alfred W. Oberhofer, Downers Grove, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.  
Original No. 3,414,510, dated Dec. 3, 1968, Ser. No. 709,182, Feb. 29, 1968. Application for reissue May 27, 1977, Ser. No. 801,075

Int. Cl.<sup>2</sup> C02B 1/62

U.S. Cl. 210—30 R

11 Claims

1. The method of selectively removing chromate ions from water containing [a large amount] at least 1,000 parts per million of total dissolved solids which comprises adjusting the pH of the water being treated to a value from about 3.0 to about 5.0, acidifying a weakly basic anion exchange resin in the macroporous form and thereafter contacting said water with the acidified resin to cause selective removal of chromate ions from said water.

Re. 30,067  
IMINOIMIDAZOLIDINEDIONE AND PARABANIC  
ACID POLYMERS CONTAINING IMIDE GROUPS  
Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.  
Original No. 3,933,758, dated Jan. 20, 1976, Ser. No. 409,964, Oct. 26, 1973. Application for reissue Nov. 2, 1977, Ser. No. 847,936

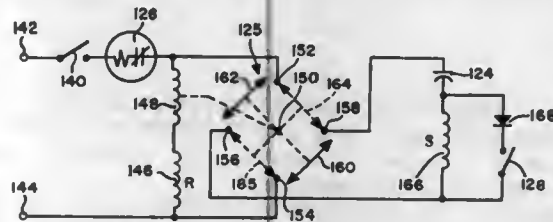
Int. Cl.<sup>2</sup> C08G 18/00

U.S. Cl. 525—419

15 Claims

1. As a composition of matter a new class of polymers

[which are] selected from the group of iminoimidazolidinedione polymers containing imide groups [or their hydrolysis



derivatives, which are parabanic] and iminoimidazolidinedione-parabanic acid polymers containing imide groups.

Re. 30,068  
PULSATING TORQUE APPARATUS AND METHOD  
Theodore F. Meyers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio  
Original No. 3,970,907, dated Jul. 20, 1976, Ser. No. 461,638, Apr. 17, 1974. Application for reissue Feb. 8, 1978, Ser. No. 876,195

Int. Cl.<sup>2</sup> H02P 1/42

U.S. Cl. 318—744

32 Claims

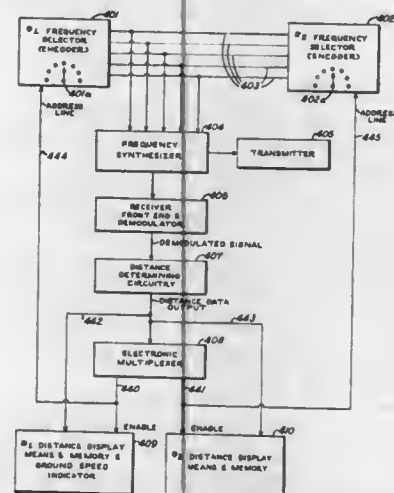
1. A waste disposer device comprising:  
a substantially hollow cylindrical stator member;  
a rotor member contained within said stator member and defining therewith a receptacle for receiving waste material, said rotor and stator members including cooperating teeth members;  
means including an induction motor for driving said rotor member;  
first control means for generating unidirectional rotation in said means for driving;  
second control means including means for simultaneously applying alternating and direct current to said means for driving for generating rapidly fluctuating bidirectional rotational movement in said means for driving, to provide disintegrating action between said rotor and said rotor members.

Re. 30,069  
MULTIPLE RANGING DME  
Wayne L. Miller, Stanhope, N.J., assignor to The Cessna Aircraft Corporation, Wichita, Kans.  
Original No. 4,035,801, dated Jul. 12, 1977, Ser. No. 646,817, Jan. 6, 1976. Application for reissue May 10, 1978, Ser. No. 904,727

Int. Cl.<sup>2</sup> G01S 9/04

U.S. Cl. 343—12 R

20 Claims



16. A method for time multiplexing a DME transmitter-receiver between [two] a plurality of selected channels corre-

sponding to [two] different ground stations and [two] different ground stations and [two] a like plurality of display-memory corresponding thereto, comprising the steps of selecting both [two] plurality of channels, causing said DME to operate on one of said [two] plurality channels, displaying the distance data output of the DME on said one channel on the display-memory means corresponding thereto,

when said distance data output occurs, switching said DME to operate on [the other] another of said [two] plurality of channels, displaying the distance data output on said other channel on the display-memory means corresponding thereto, and when said distance data output on said other channel occurs switching said DME back to operate on said one channel.

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## PLANT PATENTS

GRANTED AUGUST 7, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,445

### IMPATIENS PLANT—SENECA

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Jul. 3, 1978, Ser. No. 921,888

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name SENECA, and particularly characterized by its dark variegated foliage; its smaller, yet darker candy striping of a white flower; its more open growth habit; its spreading, yet stiff growth; and its floriferousness.

4,446

### ORCHID PLANT

Douglas R. Allen, Jacksonville, Fla., assignor to Fort Caroline Orchids, Inc., Jacksonville, Fla.

Filed Jun. 19, 1978, Ser. No. 917,027

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of Brassolaeliocattleya orchid plant substantially as herein shown and described characterized particularly as to novelty by the unique combination of a substantially concolor green flower, abundant year around

flower production, with flowers being well displayed and of very heavy substance, lasting for about a full month in a cool atmosphere, and the flower having a heavy citron scent.

4,447

### MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Aug. 21, 1978, Ser. No. 935,617

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—8

1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described characterized by buds and flowers which are (1) clear medium yellow in color, the buds and flowers resembling Yellow Jewel (miniature — U.S. Plant Pat. No. 3,827) in size and shape and (2) the bud (sepals) being well covered with short moss, said moss being soft to the touch and giving off a lemon-like fragrance when rubbed or brushed; and further characterized by a plant which is vigorous and compact, easy to propagate from soft wood cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.



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PATENTS

GRANTED AUG. 7, 1979

ERRATA

For CLASS	See PATENT NO.
065-002.....	4,163,370
414-697.....	4,163,498
414-411.....	4,163,499
350-003.72.....	4,163,542
406-012.....	4,163,582
406-198.....	4,163,583
358-113.....	4,163,602
358-287.....	4,163,605
418-236.....	4,163,635
415-006.....	4,163,636
435-174.....	4,163,691
435-254.....	4,163,692
546-084.....	4,163,745
428-378.....	4,163,754
585-431.....	4,163,761
525-067.....	4,163,762
525-290.....	4,163,763
525-002.....	4,163,764
525-314.....	4,163,765
525-230.....	4,163,766
525-534.....	4,163,834
331-094.5 H.....	4,163,976
343-715.....	4,163,981
362-358.....	4,163,998
365-003.....	4,164,026
365-015.....	4,164,027
365-020.....	4,164,028
365-036.....	4,164,029
365-162.....	4,164,030
365-233.....	4,164,031

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## P. TENTS

GRAN<sup>7</sup> AUGUST 7, 1979

### GENER<sup>3</sup> AND MECHANICAL

4,163,292

#### HIP PROSTHESIS

James E. Averett, Jr., 3612 Castlegate Dr., NW., Atlanta, Ga.  
30327

Filed Nov. 21, 1977, Ser. No. 853,451

Int. Cl.<sup>2</sup> A61F 1/24

U.S. Cl. 3—1.913

5 Claims



1. A hip prosthesis comprising a trochanteric enlargement having two right angular surfaces forming a flat base and side wall on the enlargement, an angled neck and ball head projecting above and to one side of the trochanteric enlargement, and an elongated stem of comparatively small cross section extending from the base of the trochanteric enlargement and having a flat side face in a common plane with said side wall of the trochanteric enlargement, said enlargement having two additional side walls extending substantially parallel to each other and at right angles to said first side wall, the upper portions of said additional side walls being joined by an arched portion, a plurality of spaced openings extending through said first side wall and a plurality of correspondingly spaced openings extending through each of said additional side walls and intersecting said first openings.

4,163,293

#### FLUSHING CISTERN

Ernest P. Basterfield, 22 High Rd., Eastleigh, Edenvale, Transvaal, South Africa

Filed Oct. 4, 1977, Ser. No. 839,364

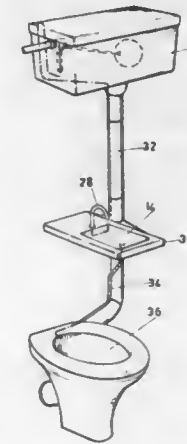
Int. Cl.<sup>2</sup> A47K 4/00

U.S. Cl. 4—3

3 Claims

1. A flushing toilet comprising: a cistern, a lid on the cistern, a valve controlled inlet means to flow water into the cistern, including a downpipe in the cistern and through which water enters the cistern, an outlet from the cistern, and a pan to receive water from the outlet, characterised by a bypass pipe inserted into the downpipe, said bypass pipe being smaller in

outside diameter than the inner diameter of the downpipe, an extension of the bypass pipe to conduct water from the bypass



pipe and discharge it into the basin, and a vent in the basin for water to drain from it.

4,163,294

#### TOILET FACILITY

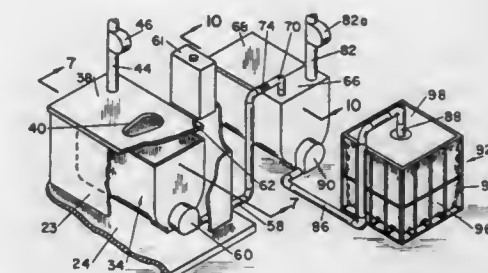
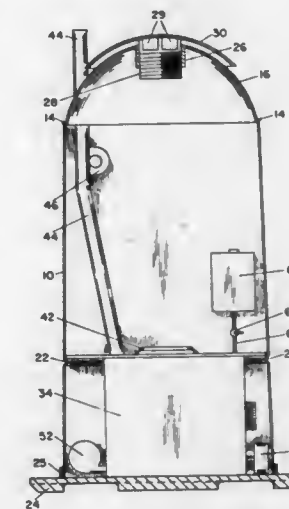
David D. Patterson, 142 Bradford, Seward, Nebr. 68434

Filed Nov. 18, 1977, Ser. No. 852,622

Int. Cl.<sup>2</sup> A47K 11/02

U.S. Cl. 4—111

21 Claims



1. A toilet facility comprising an enclosure; first and second tanks, each being capable of holding liquid waste material therein, one of the tanks being located in the enclosure such that it is capable of receiving waste material from a person in

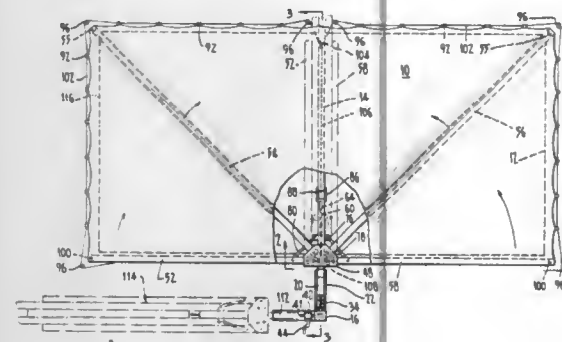


the enclosure; first and second air conduits leading into the first and second tanks, respectively, and having portions located low enough in their respective tanks to be submerged in the liquid waste material within the tanks, the submerged portions of the conduits having apertures therein, the first and second air conduits being separated sufficiently to prevent liquid waste material from transferring between the tanks by way of the air conduits; means connected with the air conduits for forcing air through the conduits with sufficient pressure to enable the air to escape through the apertures and bubble through the liquid waste material in the tanks; and control means for insuring that pressurized air is forced through the air conduit leading into the other of the tanks for a predetermined time after the last addition of waste material to the other tank, whereby the waste material in the other tank is aerated for at least the predetermined time.

#### 4,163,295 POOL COVER

Johann Schütz, 11 Willsmere Rd., Kew, Victoria, 3101, Australia

Filed Jul. 25, 1977, Ser. No. 818,861  
Claims priority, application Australia, Jul. 26, 1976, PC6762  
Int. Cl.<sup>2</sup> E04H 3/19; E04F 10/00  
U.S. Cl. 4—172.14 12 Claims

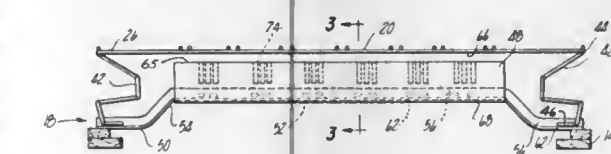


1. A collapsible swimming pool cover comprising: a central arm; a plurality of support arms having inner ends and free outer ends; means pivotally connecting said support arms at locations near the inner ends thereof to said central arm for swinging movement about generally parallel axes, said pivotal connecting means being located such that said support arms are swingable in generally the same plane between a collapsed position wherein the support arms are generally parallel and an expanded position wherein the support arms extend generally radially from said pivotal connecting means, means pivotally connecting said central arm to a support for swinging movement in a generally vertical plane between a first position in which said support arms are generally horizontal and a second position in which support arms are raised; a sheet of flexible pool-covering material attached to all said support arms in a manner such that said material becomes folded and unfolded as said support arms move to their collapsed and expanded positions, said sheet having an edge, free of rigid supports extending between the free outer ends of adjacent support arms; first power transmission means for swinging said central arm between its first and second positions; and second power transmission means for moving said support arms between their collapsed and expanded positions.

#### 4,163,296 MATTRESS FOUNDATION EMPLOYING SPRINGS AND COOPERATING FOAM BODIES

John P. Kitchen, Georgetown, and David W. Samuels, Lexington, both of Ky., assignors to Hoover Universal, Inc., Saline, Mich.

Filed Feb. 6, 1978, Ser. No. 875,203  
Int. Cl.<sup>2</sup> A47C 23/03  
U.S. Cl. 5—255 5 Claims

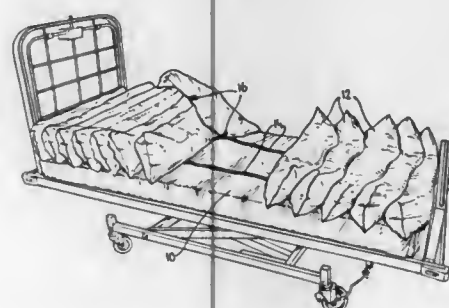


1. In a box spring assembly having a generally rectangular horizontally disposed frame which includes side and end rails, a wire grid comprising a network of wires arranged in a horizontal plane disposed a predetermined distance above said frame, selected ones of said wires extending transversely of said frame, a plurality of spring end portions arranged in a supporting relation with said grid and supported on said frame, a plurality of transverse cross rails secured to and extending between said side rails, and foam means supported on said cross rails and underlying said grid so as to provide yieldable support for said grid on said cross rails when said grid is subjected to bedding loads, said foam means being located in general alignment with at least some of said transversely extending wires so as to be engaged thereby when a bedding load is applied to said grid.

#### 4,163,297 MATTRESS

Otto W. Neumark, Cheshire, England, assignor to Beaufort Air Sea Equipment Limited, Lancashire, England

Filed Jul. 6, 1977, Ser. No. 816,090  
Claims priority, application United Kingdom, Jul. 6, 1976, 27959/76  
Int. Cl.<sup>2</sup> A47C 27/00  
U.S. Cl. 5—446 9 Claims



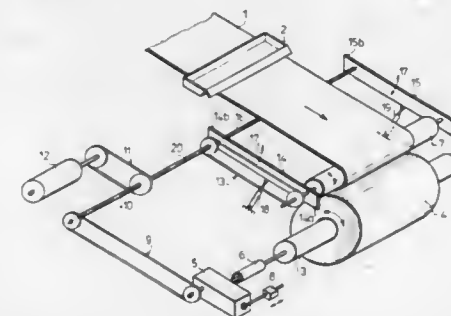
1. A bed mattress comprising a longitudinally-extending support; a selected number of small pillow-like elements positioned on said support; and connection means for quick releasably connecting said elements to said support, each element comprising an envelope formed by a flexible membrane defining an internal volume and granular material filling the internal volume to not more than 75% of its maximum capacity, said elements having first spaced-apart components of said connection means for quick releasably securing said elements at longitudinal edges thereof to second components of said connection means associated with said support, said elements being positioned in spaced side-by-side relationship to provide a predetermined limited amount of support for each other and to provide full support for at least part of a body of a user, said elements being adapted to be collectively deformed by the body until their respective internal volumes are fully occupied

by said granular material, said second components of said connection means being formed as spaced-apart members extending parallel to the longitudinal axis of the support.

#### 4,163,298 DYEING OF PILE FABRICS

Manfred Schulerer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 940,909  
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747347  
Int. Cl.<sup>2</sup> D06B 1/06, 23/00  
U.S. Cl. 8—151 14 Claims



1. In a method of cold dyeing carpet pile fabric wherein dye liquor is applied to the pile side of the fabric in an amount between 150% and 300% of the fabric weight, followed by coiling the fabric into a roll, the improvement comprising coiling the fabric under tension which is greater than about 90% of the coiling tension at which such liquor begins to emerge from the roll and which limits the quantity of such liquor emerging from the roll to not more than 5% of the quantity of liquor applied.

8. In apparatus for dyeing a web of carpet pile fabric having means for applying to the pile side of said fabric dye liquor in an amount between about 150% and 300% of the weight of said fabric, a mandrel about which said web may be coiled, and means for driving said mandrel to coil said web under tensile force into a roll with the pile side of said fabric inwards, the improvement comprising means for adjusting the tensile force applied on the roll to a magnitude greater than 90% of that required to cause said liquor to emerge from said roll but which precludes more than about 5% of said liquor emerging from said roll.

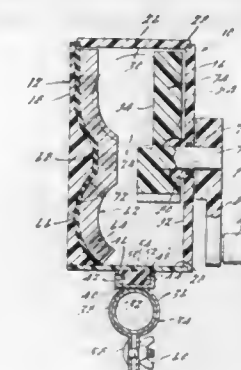
#### 4,163,299 PORTABLE GOLF BALL WASHER

Alex J. Duda, 1704 S. Pennsylvania, Lansing, Mich. 48910

Filed Feb. 27, 1978, Ser. No. 881,558  
Int. Cl.<sup>2</sup> A63B 47/04  
U.S. Cl. 15—21 A 2 Claims

1. A portable golf ball washer comprising, in combination, a housing having a peripheral wall and spaced end walls defining a cylindrical chamber having a longitudinal axis, said peripheral wall defining an opening communicating with said chamber, ball scrubbing means disposed in said chamber adjacent one of said end walls, said ball scrubbing means being of generally concave, hemi-toroidal configuration and including a plurality of bristles having the free ends thereof projecting into said chamber and disposed on a segment of an imaginary hemitorus having an inside surface with a radius of curvature substantially less than the radius of curvature of a golf ball, a manually actuatable drive member including a concave drive surface of generally semi-cylindrical configuration and rotatable in one direction about said axis to impel a golf ball in an orbital path around the longitudinal axis of said chamber and in engagement with said scrubbing means while simultaneously rotating said ball about random axes of said ball, said manually

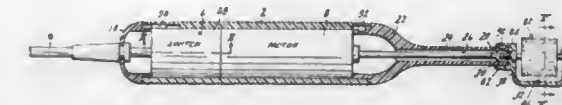
actuatable drive member also including a convex cam surface of generally involute configuration and rotatable in the opposite direction about said axis for ejecting said ball from said chamber through said opening, and removable cap means for closing said opening.



#### 4,163,300 ELECTRIC TOOTHBRUSH

Hugh D. Quint, Rte. #2, Box 90 C, Osceola, Mo. 64776

Filed Mar. 1, 1978, Ser. No. 882,368  
Int. Cl.<sup>2</sup> A46B 13/02  
U.S. Cl. 15—23 5 Claims



1. An electric toothbrush comprising:

- a. an elongated body member adapted to serve as a handle whereby the device is manually held and manipulated,
- b. a generally cylindrical brush carried by said body member at one end thereof, said brush being disposed generally coaxially with said body member and being mounted thereon for rotation about its axis,
- c. a reversible electric motor mounted in said body member and operable to rotate said brush selectively in opposite directions, and
- d. reversing switch means carried by said body member and operable to reverse the direction of rotation of said motor, said reversing switch means being operable responsively to gravity-induced movement of an element thereof to cause respectively opposite directions of said motor depending on whether said body member is held in a position with its axis inclined upwardly toward said brush, or downwardly toward said brush.

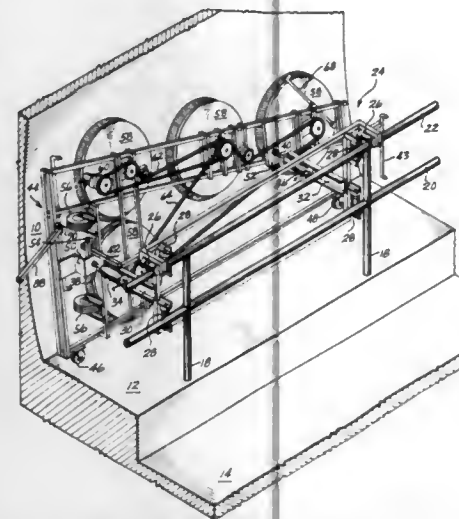
#### 4,163,301 TUNNEL OR LIKE WALL CLEANING MACHINE

Kenneth E. Griffin, 6304 204th SW., Lynnwood, Wash. 98036

Filed Jul. 11, 1978, Ser. No. 923,577  
Int. Cl.<sup>2</sup> A47L 1/38  
U.S. Cl. 15—50 R 7 Claims

1. A cleaning apparatus adapted to clean those portions of a tunnel wall or the like which are located behind railing means typically placed along a walkway beside the wall, said apparatus comprising:  
guidance carriage means adapted to engage said railing means and to be moved therealong;  
support carriage means;  
surface cleaning means rotationally secured to said support carriage means;  
drive means for rotating said surface cleaning means; and

biasing means, connected between said guidance carriage means and said support carriage means, for urging said guidance carriage means and said support carriage means in opposite directions, said support carriage means in turn

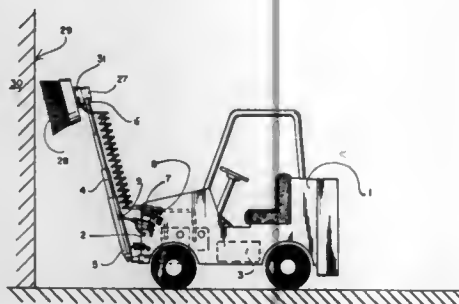


urging said surface cleaning means into contact with said wall, and said guidance carriage means being urged by said biasing means against said railing means which provides horizontal support for said guidance carriage means.

**4,163,302**  
**WALL CLEANING APPARATUS**  
Vincent Iaboni, 8469 Albanel, Montreal, Quebec, Canada (H1P 2K9)

Filed Aug. 28, 1978, Ser. No. 937,323  
Int. Cl.<sup>2</sup> A47L 11/38

U.S. Cl. 15—50 R



1. Wall cleaning apparatus, comprising  
a wheeled powered vehicle having a front and sides;  
a hydraulically controlled telescopic main boom having spaced opposite first and second ends, said main boom being mounted at its first end on the vehicle and adjustable in length from the vehicle;  
a pair of hydraulically controlled directional control cylinders and pistons each having spaced opposite first and second ends, each of said control cylinders being mounted at its first end on a corresponding side of the vehicle and affixed at its second end to the main boom;  
a hydraulic pump in the vehicle;  
a hydraulic fluid reservoir in the vehicle;  
a plurality of control valves in the vehicle;  
a hydraulic duct system connecting the hydraulic fluid reservoir, the main boom, the directional control cylinders and pistons, the hydraulic pump and the plurality of control valves in a hydraulic circuit in a manner whereby the length and direction of said main boom relative to the vehicle are controlled via said control valves;

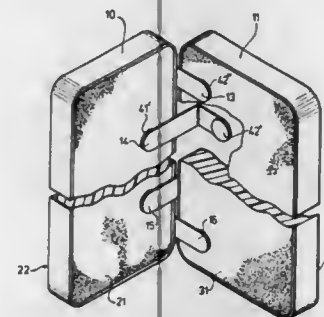
an electric motor mounted on the main boom at the second end thereof;  
a cleaning brush coupled to and driven by the motor for rotatably brushing the surface of a wall;  
a liquid housing mounted on the brush;  
a pair of liquid pumps;  
a water tank having water therein;  
a chemical cleanser tank having chemical cleanser therein;  
a pair of liquid control valves; and  
a liquid duct system having one branch connecting the water tank, one of the liquid pumps and one of the liquid control valves in a water circuit with the liquid housing in a manner whereby water is supplied to the brush under the control of said one of said valves and another branch connecting the chemical cleanser tank, the other of the liquid pumps and the other of the liquid control valves in a chemical cleanser circuit with the liquid housing in a manner whereby chemical cleanser is supplied to the brush under the control of said other of said valves.

**4,163,303**  
**HINGE STRUCTURE**  
Gary D. Hanna, Toronto, Canada, assignor to G. D. Hanna Incorporated, Don Mills, Canada

Filed Oct. 4, 1977, Ser. No. 839,268  
Claims priority, application Canada, Sep. 13, 1977, 286742  
Int. Cl.<sup>2</sup> E05D 5/06, 9/00

U.S. Cl. 16—135

6 Claims



1. A hinge structure for hingedly securing first and second structural elements to permit movement thereof, one relative to the other through substantially 360°, each of said elements having a pair of corresponding sides, wherein:  
said hinge comprises a relatively thin, wide band of substantially non-extensible material having opposite sides;  
a first one of said hinge sides is releasably securable to a first one of said structural element surfaces and a second one of said hinge sides is releasably securable to a second one of said second structural sides, to hold said structural elements in at least an adjacent abutting relationship; and  
a pair of hook and loop filamentous fastening elements is secured one to one end of said hinge on a first side thereof and one to a second end of said hinge on the second side thereof, said hook and loop filamentous fastening elements being adapted to engage with and disengage from selective portions of corresponding hook and loop filamentous surfaces on corresponding opposed surfaces of said first and second structural members.

**4,163,304**  
**ROTARY CYLINDER FITTED WITH NEEDLES OR TEETH FOR THE TREATMENT OF SLIVERS OF TEXTILE FIBERS**

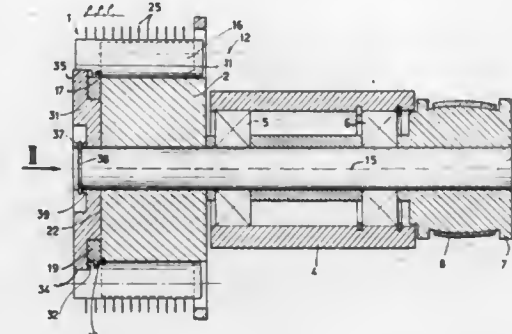
Regis Laflaquiere, Radé Janousek, and René Faessler, all of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, France

Filed Dec. 6, 1977, Ser. No. 857,940

Claims priority, application France, Dec. 16, 1976, 76 37883  
Int. Cl.<sup>2</sup> D01G 15/28

U.S. Cl. 19—97

7 Claims



1. A cylinder for the treatment of textile fibers, especially for separating the fibers of slivers employed in open-end spinning, comprising:

a rotary cylinder body having an axis;  
a plurality of longitudinal bars mounted around the periphery of said cylinder, for pivotal movement in said cylinder about axes which are parallel with the cylinder axis;  
needles or teeth, rigidly fixed on a portion of the surface of each of said bars, projecting outwardly of said cylinder;  
angular positioning means on each of said bars;  
plate means carried by said cylinder; and  
mating locking means carried by said plate means and engaging said angular positioning means to lock said bars angularly in said cylinder.

**4,163,305**  
**PROCESS AND DEVICE FOR THE MANUFACTURE OF NON WOVEN WEBS FROM FILAMENTS**

Valentin Semjonow, Hofheim, and Jürgen Foedrowitz, Hochheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

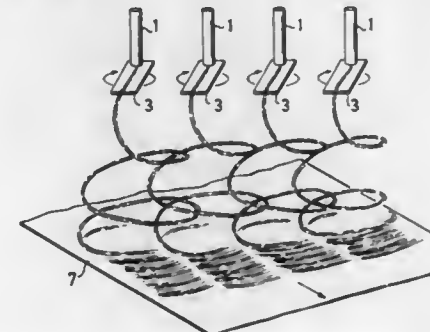
Filed Dec. 19, 1975, Ser. No. 642,400

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1974, 2460755

Int. Cl.<sup>2</sup> D01G 25/00; D04H 3/02

U.S. Cl. 19—299

25 Claims



1. The process for the manufacture of non-woven webs from filaments collected on a moving surface by laying down said filaments on the moving surface in the form of conic spread sections, which method comprises deflecting and spreading

out the filaments of a plurality of bundles of filaments to form filament veils laid down on said moving surface by continuously deflecting said bundles of filaments against one side only of associated filament deflectors, each deflector having a plane surface located at an angle to its associated bundle of filaments defining said one side and against which its associated bundle of filaments is deflected, and continuously rotating said deflectors with their plane surfaces at an angle to said filaments whereby the filaments in the bundles are deflected, dispersed and spread apart from one another into smaller bundles and individual fibers laid down on said moving surface.

16. In a device for the manufacture of non-woven webs from filaments collected on a moving surface by laying down said filaments on the moving surface the improvement comprising at least one rotatable deflector positioned to contact a filament bundle on one side only to deflect the bundle and disperse and spread out the filaments therein from one another into smaller bundles and individual filaments, said deflector having a flat planar deflecting surface and means for rotating said deflector continuously through 360° for forming conic spread apart filament sections deposited on said moving surface.

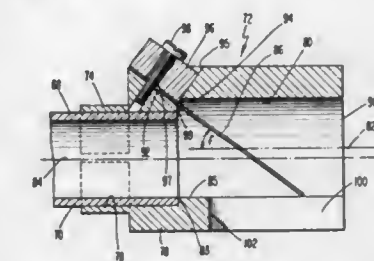
**4,163,306**  
**BOUNCE CRIMPER OUTLET APPARATUS**  
James H. Turner, Severn, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 14, 1977, Ser. No. 833,373

Int. Cl.<sup>2</sup> D02G 1/16

U.S. Cl. 28—254

4 Claims



1. In apparatus for bounce crimping a multi-filament yarn of synthetic resinous material having draw rolls for delivering the yarn to be crimped at a predetermined speed;

a yarn texturizing housing having a yarn inlet for receiving an elongated multi-filament yarn, a fluid outlet aligned with the yarn inlet through which fluid is exhausted from the housing, a fluid inlet for receiving a yarn forwarding fluid, a channel extending between the yarn inlet and the fluid outlet through which yarn and the fluid pass during texturizing, and a lateral yarn outlet communicating with the channel and defining an exit from the channel for texturized yarn;

means for supplying a heated compressible fluid, communicating with the channel and operable to draw the multi-filament yarn into the yarn inlet of the housing; and  
a foraminous surface positioned across the channel between the lateral yarn outlet and the fluid outlet, the heated fluid further serving to hurl the yarn against the foraminous surface to axially compress and crimp the yarn filaments and bounce the multi-filament yarn through the lateral yarn outlet;

an improvement comprising an outlet means operatively connected to said lateral yarn outlet for consolidating the yarn issuing therefrom, said outlet means including:

a restrictor assembly having a longitudinal bore and an inclined spring finger partially blocking the bore to provide a resistance to yarn movement out of the discharge end of said bore, said restrictor assembly also being provided with means for bypassing the spring finger and freely permitting rearward yarn movement past the spring



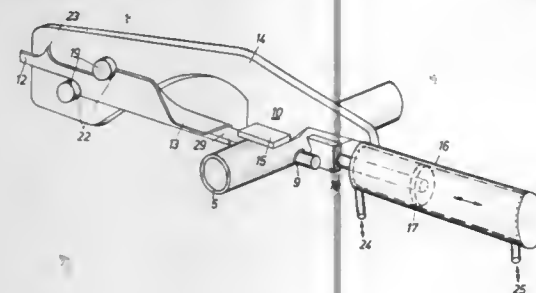
finger when the yarn is pulled rearwardly by said draw rolls, said means for bypassing including a longitudinal slot positioned opposite the spring finger and extending from a first position upstream of the spring finger to a second position downstream of the spring finger.

#### 4,163,307 DEVICE FOR TENSIONING CORONA-DISCHARGE ELECTRODE ELEMENTS

Klaus Papendick, Langen, and Lothar Peter, Rodenbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Jan. 14, 1977, Ser. No. 759,271  
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603514

Int. Cl.<sup>2</sup> H01J 9/06  
U.S. Cl. 29—25.19

4 Claims



1. The combination with an elongated corona-discharge electrode, anchored at one end to a bar, in a support frame having another bar parallel to but spaced from the first-mentioned bar, for use in an electrostatic precipitator, of a tool for tensioning said electrode, said tool comprising:

- an elongated caliper having a first arm at one end of the caliper and a second arm at the other end of the caliper;
- a fluid-pressure cylinder mounted on said first arm and provided with a piston having an abutment bearing against said other bar of said frame perpendicularly thereto, said cylinder extending parallel to said electrode;
- an engaging member on one of the arms of said caliper engaging and entraining an unanchored opposite end of said electrode for tensioning same against said other bar; positioning means on said second arm engaging said electrode for orienting said caliper relative to said electrode and vice versa;
- a laterally extending bracket fixed to said caliper for orienting said caliper relative to said other bar in a plane generally perpendicular thereto; and
- means for supplying fluid to said cylinder under pressure whereby said abutment is pressed against said other bar and said electrode is tensioned in accordance with the pressure applied to said cylinder.

4,163,308  
DEFLECTION YOKE ASSEMBLY POSITIONING  
DEVICE  
Tutomu Tawa, Yokohama, and Hiroshi Furukawa, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Mar. 7, 1978, Ser. No. 884,238  
Claims priority, application Japan, Jun. 24, 1977, 52-74344; Jul. 25, 1977, 52-88387

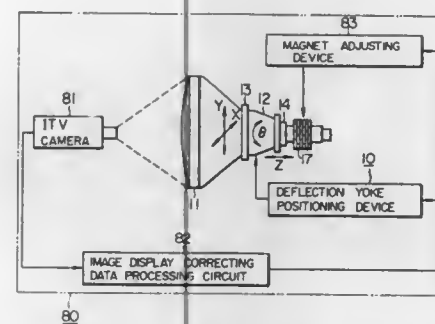
Int. Cl.<sup>2</sup> H01J 9/44  
U.S. Cl. 29—25.19

4 Claims

1. A device for positioning a deflection yoke assembly on a cathode-ray tube comprising:

- (a) first oscillating means comprising grasping means including a plurality of rollers for rotatably grasping the deflection yoke assembly in such a relation that the center of the fixing portion of the deflection yoke assembly is located on a horizontal axis, and causing controlled vertical oscillating movement of the opening portion of the deflection yoke assembly around said center of said fixing portion;

- (b) rotating means associated with said first oscillating means for causing controlled rotating movement of the deflection yoke assembly grasped by said first oscillating means around the axis of the deflection yoke assembly;
- (c) second oscillating means for supporting said first oscillating means in such a relation that said center of the fixing portion of the deflection yoke assembly grasped by said first oscillating means is located on a vertical axis, and



- turning said first oscillating means around said vertical axis thereby causing controlled horizontal oscillating movement of the opening portion of the deflection yoke assembly around said center of said fixing portion; and
- (d) sliding means carrying said second oscillating means thereon for causing controlled sliding movement of said second oscillating means in the axial direction of the neck portion of the cathode-ray tube thereby causing controlled sliding movement of the deflection yoke assembly grasped by said first oscillating means in the axial direction of the neck portion of the cathode-ray tube.

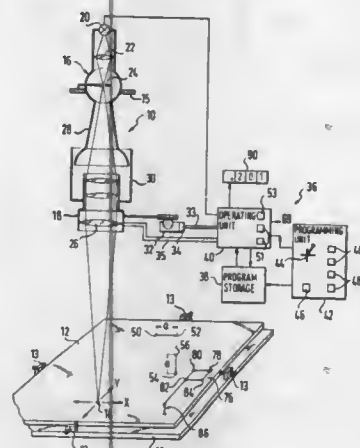
4,163,309  
ARRANGEMENT FOR MOUNTING COMPONENTS ON  
A CARRIER BOARD AND METHOD OF INDICATING  
MOUNTING LOCATIONS  
Gerd Stückler, Finkenweg 2, Brunnthal, Fed. Rep. of Germany (8011)

Filed Nov. 16, 1977, Ser. No. 851,830  
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716548

Int. Cl.<sup>2</sup> H05K 13/04

U.S. Cl. 29—407

7 Claims



1. A method of indicating at least one mounting location including a plurality of mounting spots spaced on a surface which comprises:

- (a) projecting a luminous dot on said surface;
- (b) moving the projected dot sequentially and repeatedly between the mounting spots to be indicated; and

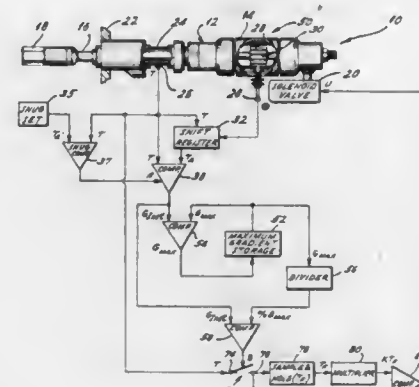
- (c) changing the direction of movement of said dot in each of said spots.

4,163,310  
TIGHTENING SYSTEM  
Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 29, 1976, Ser. No. 755,409  
Int. Cl.<sup>2</sup> B25B 23/14

U.S. Cl. 29—407

38 Claims



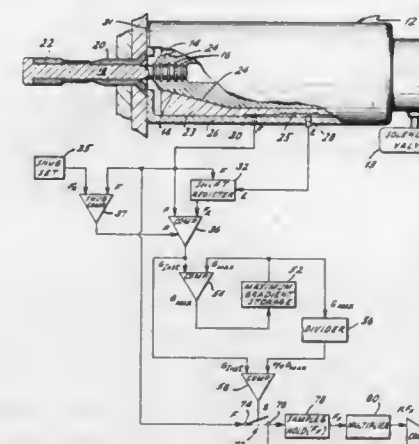
- 15. A system for installing a fastener which is capable of generating a mating internal thread in a workpiece hole to a final desired tightened condition comprising: means for detecting a thread-forming characteristic of the fastener; and means responsive to said thread-forming characteristic and at least one known characteristic of the fastener for determining the final desired tightened condition.

4,163,311  
TIGHTENING SYSTEM FOR BLIND FASTENERS  
Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Feb. 28, 1977, Ser. No. 772,411  
Int. Cl.<sup>2</sup> B25B 23/14

U.S. Cl. 29—407

43 Claims

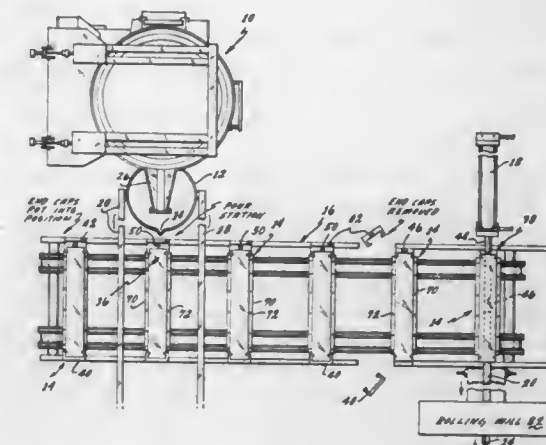


- 28. A system for installing a blind fastener in a workpiece hole to a final desired tightened condition comprising: means for detecting a bulb-forming characteristic of the blind fastener; and means responsive to said bulb-forming characteristic and at least one known characteristic of the blind fastener for determining the final desired tightened condition.

4,163,312  
METHOD AND MEANS FOR PRODUCING ROLLED  
METAL PRODUCTS  
Robert B. Green, 2106 Walnut La., Vista, Calif. 92083  
Filed May 15, 1978, Ser. No. 905,739  
Int. Cl.<sup>2</sup> B22D 11/126

U.S. Cl. 29—527.7

12 Claims

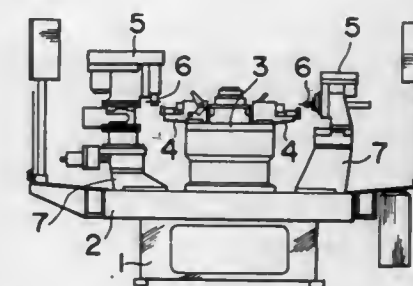


1. The process of producing rolled metal products without reheating ingots, comprising:

- (a) melting metal and providing a quantity of molten metal at a first pouring station,
- (b) providing a series of separate molds and conveying said molds on an endless path and bringing said molds serially past said first station and serially, individually pouring said molds at said first station,
- (c) moving said molds serially from said first station through a cooling area to a second ingot-extraction station and during operation of the process providing a series of molds at all times in said cooling area,
- (d) applying heat to the exterior side surfaces of the metal in said molds during at least the major portion of the movement of said molds from said first to said second station and applying sufficient heat to prevent reduction of temperature of said exterior side surfaces of the metal in said molds below a selected minimum temperature which is a temperature suitable for rolling, and
- (e) extracting the metal in said molds as ingots at said second station and immediately rolling said ingots producing said products.

4,163,313  
TRANSFER MACHINE  
Takeshi Matsuno, Fumiya Nishiyama, and Takeshi Kobayashi, all of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan  
Filed Oct. 12, 1977, Ser. No. 841,400  
Claims priority, application Japan, Oct. 12, 1976, 51-122041  
Int. Cl.<sup>2</sup> B23Q 7/00; B23B 3/00; B23C 1/16; B23G 1/20  
U.S. Cl. 29—563

3 Claims



1. A transfer machine, comprising: a movable indexing table having a plurality of workpiece positions where respective workpieces are positioned in use; a plurality of working units

each defining a working station positioned around said movable indexing table opposite a respective workpiece position; means for moving said indexing table to change the respective workpiece position which is opposite a particular working unit; wherein each of said working units comprises a tool, infeeding means for infeeding said tool toward a respective workpiece position for working on the workpiece and for withdrawing the tool from the workpiece, a slide for displacing said tool along a direction perpendicular to the infeed direction, a screw-feed mechanism for moving said tool along said slide, driving means for driving said screw-feed mechanism to move said tool along said slide, an origin detector for defining a position origin along said slide and for detecting when said tool is at said origin, a tool position detector for detecting the amount of displacement of said tool away from said origin; and a numerical control system comprising means operable for actuating said driving means for driving said screw-feed mechanism, setting circuit means cooperative with said origin and position detectors for setting the displacement of said tool along said slide from said origin, and selecting circuit means for successively selecting successive working units for successively actuating their respective driving means and for successively setting the displacement of their respective tools along their respective slides independently of the operation of said infeeding means.

4,163,314

# METHOD OF MANUFACTURING AN ELECTROMAGNETIC RELAY

Hans Sauer, Fichtenstrasse 5, 8024 Deisenhofen, Fed. Rep. of Germany, assignor to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Fed. Rep. of Germany, part interest to each

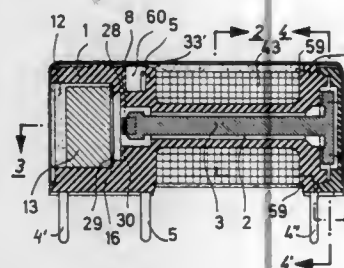
Division of Ser. No. 639,406, Dec. 10, 1975, Pat. No. 4,075,585. This application Jun. 14, 1977, Ser. No. 806,501

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1974, 2459039

Int. Cl.<sup>2</sup> H01F 41/06

U.S. Cl. 29—593

7 Claims



1. A method of manufacturing an electromagnetic relay comprising

(a) assembling

- (i) a bobbin of plastic material defining therein a protective tube, a contact chamber and a magnet chamber that together form a space which extends the entire length of the bobbin and is open at both ends,
- (ii) a contact actuator mounted to extend along the protective tube with a free end extending into the contact chamber,
- (iii) a coil on the bobbin,
- (iv) a permanent magnet made of a material actuatable as a getter and disposed in the magnet chamber to seal one end of said space while having a surface exposed to the contact chamber, and
- (v) a pair of pole shoes each having an outer end in the magnet chamber in proximity to the permanent magnet and an inner end extending into the contact chamber to form a fixed contact for cooperation with said free end of the actuator,

- (b) subjecting the space to a vacuum and an elevated temperature to drive off moisture and activate the getter,
- (c) replacing the vacuum with an atmosphere of a protective gas,
- (d) and sealing the other end of the space with a closure.

4,163,315

# METHOD FOR FORMING UNIVERSAL FILM RESISTORS

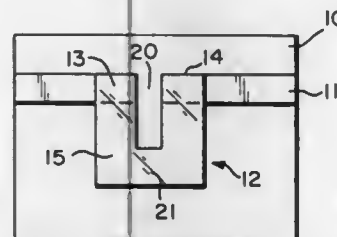
Wayne E. Neese, Hoffman Estates, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 17, 1978, Ser. No. 906,548

Int. Cl.<sup>2</sup> H01C 7/00

U.S. Cl. 29—620

5 Claims



1. The method of forming an electrical resistor comprising: applying an uninterrupted conductor on a dielectric substrate;
- depositing a resistive material, including a first end applied on said uninterrupted conductor and a second end terminating away from said conductor;
- simultaneously removing at least one portion of both said conductor and said resistive material, starting at said resistive material first end, severing said conductor, and terminating in an area of said resistive material second end; thereby, increasing the resistance of said resistor.

4,163,316

# SAFETY RAZOR

Peter Hagmann, Langendorf, and Ernst Müller, Bibern, both of Switzerland, assignors to Morris AG, Switzerland

Filed Jan. 17, 1978, Ser. No. 870,091

Claims priority, application Switzerland, Jan. 17, 1977, 546/77

Int. Cl.<sup>2</sup> B26B 21/06

U.S. Cl. 30—47

1 Claim



1. A safety razor comprising a cutting head having two oppositely disposed longitudinal surfaces and at least one cutting edge on each of said surfaces, a cutting head holder joining said cutting head, a handle, an angled extension piece joining said handle and including a recess formed at one end of said extension piece receiving said holder, cooperating means on said holder and within said recess for securing said holder against axial displacement relative to said extension piece, said holder having two parallel outer surfaces and said recess having complementary parallel surfaces which engage said outer surfaces of said holder to locate said holder circumferentially in said recess in one of two operating positions separated by 180°, and at least one of said holder and said extension piece being made of resilient material whereby said holder can be rotated in said recess between said operating positions.

4,163,317

# KNIFE ASSEMBLY

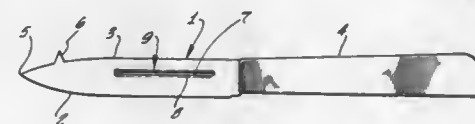
August Levanti, 562 Luton Dr., Glendale, Calif. 91206

Filed Nov. 7, 1977, Ser. No. 849,003

Int. Cl.<sup>2</sup> A47J 17/04

U.S. Cl. 30—123.7

6 Claims



1. A knife having a handle and a blade with sharpened and dull substantially smooth edges, said edges tapering to form a point, said dull edge having a point near the tip of said blade for scoring and piercing, said scoring and piercing point defined by opposing tapering straight edges protruding from said dull edge of said blade as a substantially equal angle to facilitate scoring and piercing without damaging the underlying portion of the object to be pierced and scored, said scoring and piercing point being limited by the dull side of the blade.

4,163,318

# DEVICE FOR REPLACING MISSING TEETH IN HUMAN DENTITION

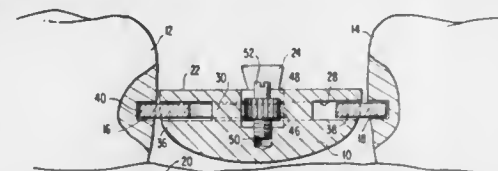
Pasquale Tigani, 5219 Ridgefield Rd., Washington, D.C. 20016

Filed Mar. 21, 1977, Ser. No. 779,852

Int. Cl.<sup>2</sup> A61C 13/30

U.S. Cl. 32—5

1 Claim



1. An artificial denture device comprising a backing member having a flat surface adapted to be disposed between two spaced apart existing teeth, groove means disposed in said backing member and opening outwardly in opposite directions on opposite sides of said backing member, a pair of arms slidably mounted in said groove means in spaced parallel relation to each other and said flat surface, operating means comprised of a screw member threaded into said backing member for rotation about an axis perpendicular to said flat surface between said arms, engaging means on said arms and said operating means for moving said arms in opposite directions upon rotation of said operating means for engaging the outer ends of said arms in opposed grooves in spaced apart existing teeth and facing means secured to said flat surface of said backing member to cover said operating means.

4,163,319

# DENTAL OCCLUDER

Gilbert Ouaknine, 6, rue Mazzini, 11100 Narbonne, France

Filed Jun. 10, 1977, Ser. No. 805,472

Claims priority, application France, Jun. 11, 1976, 76 18350

Int. Cl.<sup>2</sup> A61C 11/00

U.S. Cl. 32—32

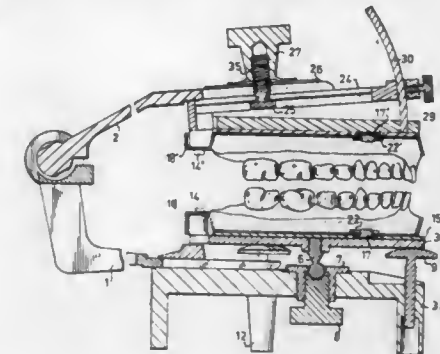
10 Claims

1. A dental occluder for placing a bottom maxillary impression and a top maxillary impression in occlusion comprising: top and bottom arms articulated relative to each other,
- a bottom base element secured to said bottom arm and including first magnetic means and first centering means,
- a bottom matrix support including second magnetic means and second centering means, said first and second magnetic means cooperatively retaining said bottom matrix support on said bottom base element and said first and

second centering means cooperatively positioning said bottom matrix support on said bottom base element.

a top base element including adjustable connection means for attaching said top base element to said top arm and further including third magnetic means and third centering means,

a top matrix support including fourth magnetic means and fourth centering means, said third and fourth magnetic means cooperatively retaining said top matrix support on said top base element and said third and fourth centering means cooperatively positioning said top matrix support on said top base element,



said adjustment connection means comprising a slide plate pivotally connected to an end of said top base element, for angular adjustment therebetween, said slide plate having an elongate slot therein and locking means passing through said slot for securing said slide plate to said top arm,

said slide plate further including at an end opposite said pivotal connection an opening through which passes a spline extending from said top base element, and means for releasably locking the position of said spline in said opening, whereby the angle between said top base element and said slide plate, and thus said top arm, may be adjusted.

4,163,320

# DENTAL OCCLUDING INSTRUMENT

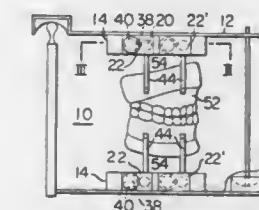
Seizo Yokota, 161, Daimyo 1-chome, Chuo-ku, City of Fukuoka, Fukuoka Prefecture, Japan

Filed Mar. 10, 1978, Ser. No. 885,216

Int. Cl.<sup>2</sup> A61C 11/00

U.S. Cl. 32—32

3 Claims



1. A dental occluding instrument comprising a pair of supporting plates disposed in opposite parallel relationship, a pair of base blocks fixedly secured to said supporting plate to face each other, a plurality of pairs of opposite holding members in the form of rods disposed substantially perpendicularly to each of said base blocks to extend toward the other base block and be aligned with said holding members operatively associated with the other base block respectively, and control means for each pair of said holding members disposed in each of said base blocks to control a spacing formed between said opposite holding members, all said holding members holding a pair of models for the upper and lower jaws in such a manner that the model for the upper jaw is put in compressive contact with free

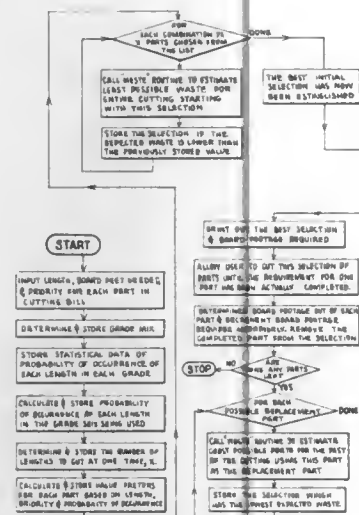


end portion of said holding members projecting beyond one of said base blocks and the model for the lower jaw is put in compressive contact with free end portions of said holding members projecting beyond the other base block.

#### 4,163,321 METHOD FOR SEQUENCING THE CUTTING OF ELONGATED STOCK

John P. Cunningham, Raleigh, N.C., assignor to Barr-Mullin, Inc., Raleigh, N.C.

Filed Oct. 21, 1977, Ser. No. 844,493  
Int. Cl.<sup>2</sup> G06F 15/46; G05B 13/00  
U.S. Cl. 33—1 S 2 Claims



1. A method for the cutting of elongated stock from a grade mix of stock being processed such as boards of lumber having randomly located unusable lengths, containing knots, discoloration or the like, to minimize waste, said method comprising: establishing the required lengths and the board footage and quantities of pieces of each length to be cut, determining and storing the grade mix of stock, establishing the probability of having a given length of usable stock in each of the grades of stock being processed, determining a value factor for each desired length based on the desired length and the probability of the occurrence of the desired length, determining the number  $x$  of lengths to be cut at one time, and for each combination of  $x$  lengths determining the least possible waste for the entire cutting starting with this selection to determine the combination of parts to be cut at one time which results in the lowest waste for the entire cutting and cutting the elongated stock using the determined combination of parts which results in the lowest waste for the entire cutting until the requirement for the established quantity for one required length has been reached.

#### 4,163,322 COMPASS WITH FINE ADJUSTMENT

Günther Partes, Brunn, Fed. Rep. of Germany, assignor to Intertech Zeichengeräte Günther Partes KG, Fed. Rep. of Germany

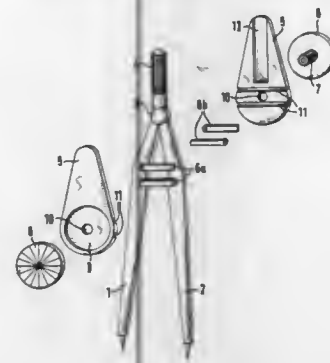
Filed Feb. 6, 1978, Ser. No. 875,409

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704864

Int. Cl.<sup>2</sup> B43L 9/22 4 Claims

1. A compass comprising a pair of compass legs pivoted about an articulation axle and fine adjustment means comprising a pair of linear spreaders pivoted to the respective compass legs in spaced relation lengthwise of the legs, each spreader extending from its pivotal connection with the respective leg towards the other leg, a drive wheel between the spreaders and between the compass legs for moving the spreaders in mutually opposed directions on rotation of the drive wheel by contact of

the drive wheel periphery with driving surfaces of the respective spreaders, the drive wheel having an axis perpendicular to the plane of the compass, support means for the drive wheel comprising front and rear half-shells defining a compass head, guide means for maintaining the spreaders in parallelism and in



driving contact with the drive wheel periphery during opening and closing of the compass and an operating disk coaxial with said drive wheel and in direct driving connection therewith for rotating said drive wheel to operate the spreaders, said operating disk being located on an outer surface of one of said half-shells.

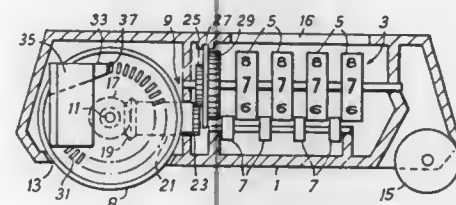
#### 4,163,323 LENGTH MEASURING DEVICES

Hans Bud, 71 Northway, London NW11 6PD, England

Filed Apr. 20, 1977, Ser. No. 789,252

Claims priority, application United Kingdom, Apr. 22, 1976, 16445/76

Int. Cl.<sup>2</sup> G01B 3/12 11 Claims



1. A length measuring device comprising a housing; a counter located in the housing with a plurality of coaxial number wheels for displaying the result of a measurement; and drive means for the counter including metering means rotatable by displacement in use of the device relatively to an article to be measured; wherein there is provided sound generating means having a part formed on the drive means and a further part secured to the housing, the two parts comprising a ring of teeth and a reed biased into contact with the teeth so as repeatedly to experience during rotation of the metering means deflection by the teeth followed by impact therewith, the housing being internally shaped to provide a sound box for the sound generating means and the repeated impacts of the reed with the teeth serving in normal usage of the device to provide a substantially continuous audible indication of rotation of the metering means.

#### 4,163,324 SURVEYING OF BOREHOLES

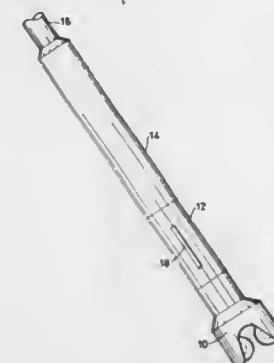
Michael K. Russell, Lynworth House, Prestbury, Cheltenham, and Anthony W. Russell, The Bittams, Crippetts Rd., Leckhampton, Cheltenham, both of England

Filed Feb. 23, 1978, Ser. No. 880,873

Claims priority, application United Kingdom, Feb. 25, 1977, 8007/77

Int. Cl.<sup>2</sup> E21B 47/022 7 Claims

U.S. Cl. 33—313



1. A method of determining the orientation of a surveying instrument in a borehole comprising the steps of determining the inclination angle of the instrument at the location thereof in the borehole, sensing, at said location, at least one vector component of the local magnetic field to determine the local magnetic field in the direction of a primary axis of the instrument aligned with the borehole, determining the azimuth angle of the instrument relative to the apparent magnetic north direction at said location, ascertaining the true horizontal and vertical components of the earth's magnetic field at the location of the borehole and determining the correction to be applied to the apparent azimuth angle from the true and apparent values for the horizontal and vertical components of the earth's magnetic field.

#### 4,163,325 VERTICALITY SENSORS

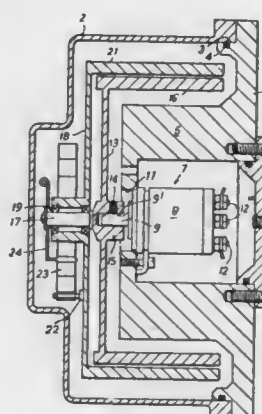
David Hughes, Blackwater, England, assignor to Sperry Rand Limited, Bracknell, England

Filed May 19, 1978, Ser. No. 907,525

Claims priority, application United Kingdom, May 21, 1977, 21573/77

Int. Cl.<sup>2</sup> G01C 9/08 8 Claims

U.S. Cl. 33—346



1. A verticality sensor comprising a casing within which is mounted a rotary pick-off device, said pick-off device having a body attached to the casing and having a rotatable shaft for relative rotational movement with respect to the casing and body, such movement producing an output signal from the

pick-off representative of the angular rotation of the casing with respect to the vertical, pendulum means mounted on the pick-off shaft for relative rotational movement with respect thereto, and inertia means fixed to the pick-off shaft and coupled to the pendulum means through a fluid, with which the casing is filled, and through spring means, the arrangement being such that when the pendulum is subjected to lateral accelerations and undergoes rotational movement relative to the pick-off, the spring means is torsioned and thereby attempts to transmit that rotational movement to the inertia member which the latter resists, whereby the effect of lateral acceleration is reduced.

#### 4,163,326 REMOTE INDICATING SOLID STATE COMPASS

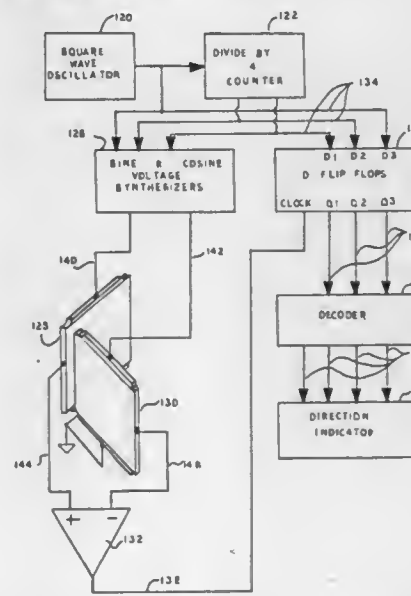
Robert A. Edwards, 12 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 452,430, Mar. 18, 1974, Pat. No. 4,030,204.

This application Jun. 10, 1977, Ser. No. 805,401

Int. Cl.<sup>2</sup> G01C 17/30 3 Claims

U.S. Cl. 33—361

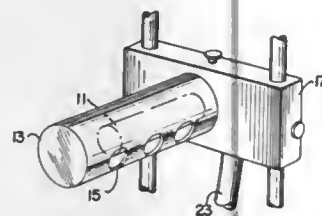


1. A remote indicating solid state compass which produces a discrete display of heading referenced to compass points for use in automobiles or the like including in combination, a digital counting means comprising counter and free running oscillator for continuously outputting digital code signals, sine and cosine voltage synthesizer circuit means for converting said digital code signals to sine and cosine voltage waveforms, magnetic heading sensing means including two Hall effect generators mounted in vertical planes at right angles to one another, one generator receiving said sine voltage across its current input terminals, the other generator receiving said cosine voltage across its current input terminals and with the two generators' Hall voltage output terminals connected in series for outputting a Hall effect generator difference voltage whose phase with respect to the applied sine voltage is proportional to heading, amplifier means for receiving said difference voltage and for producing therefrom an amplifier output signal which switches from one to the other of two levels when the polarity of said difference voltage reverses, logic D type latch circuit means receiving digital code data input from said digital counting means and clock input from said amplifier means for storing the digital code present when the clock input transitions positively, decoding means for converting codes stored in said D latches to code signals for controlling display means, display means comprising light emitting elements which indicate automobile heading relative to points of the compass.

4,163,327  
**DIRECT CONDENSER DEFROSTING SYSTEM**  
 Taylor N. Thompson, and Douglas S. Fraser, both of New Paltz, N.Y., assignors to FTS Systems, Inc., Stone Ridge, N.Y.  
 Filed Nov. 4, 1977, Ser. No. 848,497  
 Int. Cl.<sup>2</sup> F26B 5/06

U.S. Cl. 34—5

9 Claims



1. In a freeze drying apparatus for dehydrating heat-sensitive materials contained in a plurality of receptacles, including refrigeration means to provide refrigerant fluid of a temperature lower than the temperature of the material to be freeze dried, manifold means having a plurality of ports formed therein to which said receptacles may be connected, and an elongated hollow condenser member disposed within the interior of said manifold means and receiving low temperature refrigerant fluid from said refrigeration means during a freeze drying cycle, the water vapor sublimated from said materials being condensed on the outer surfaces of said condenser member to form ice, the improvement comprising:

a plurality of randomly disposed heat transfer surfaces disposed within the interior of said condenser member; an elongated conduit disposed within the interior of said condenser member adjacent an interior surface thereof; heat sensing means removably insertable into said conduit and in thermal communication therewith for monitoring the temperature of said condenser member during said freeze drying cycle; and, heating means alternately removably insertable into said conduit and in thermal communication therewith for defrosting said condenser means at the completion of said freeze drying cycle, said heating means being operable to provide thermal energy and vaporizing said refrigerant fluid within said condenser, said thermal energy being transferred by said refrigerant fluid to said randomly disposed heat transfer surfaces throughout the interior of said condenser member, whereby said refrigerant fluid and said randomly disposed heat transfer surfaces cooperate to quickly and uniformly increase the temperature of the surfaces of said condenser member to facilitate removal of the ice from the outer surfaces thereof while limiting the amount of thermal energy transferred to adjacent surfaces of the freeze dryer.

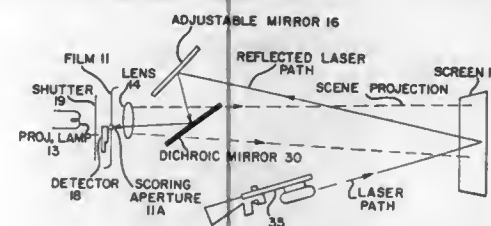
4,163,328  
**MOVING TARGET SCREEN WITH IMPROVED OPTICAL CONTROL**  
 Frederick B. Sherburne; Herman I. Pardes, and Edward S. Hughes, all of Monmouth County, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
 Filed Mar. 10, 1978, Ser. No. 885,149  
 Int. Cl.<sup>2</sup> F41G 11/00

U.S. Cl. 35—25

5 Claims

1. An electro-optical weapon firing training apparatus comprising a film projector and viewing screen, at least one weapon on which is mounted a laser means to trigger an infrared energy laser beam aimed toward said screen upon firing said weapon; said projector including optical means for projecting the images of said film for providing a target scene on said screen at which said weapon may be aimed to direct a laser beam thereat, and said screen reflecting said laser beam, said optical means including an optical lens and a dichroic mirror

positioned in the path of the projected images, said dichroic mirror being positioned at an angle with respect to the plane of said lens for allowing a major part of the visible light to pass therethrough onto said screen while reflecting the remainder of said visible light in a direction away from said lens, infrared



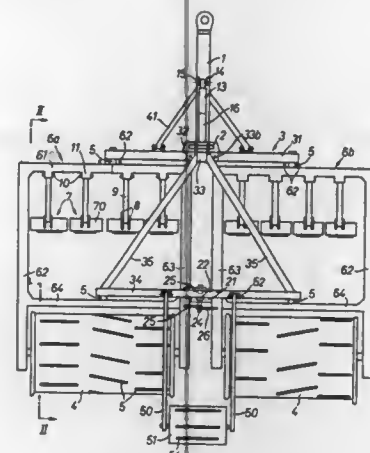
energy detection means, a first surface mirror moveably mounted in a position to receive the laser beam reflected from said screen and to reflect said laser beam onto said angled dichroic mirror, and said dichroic mirror further reflecting said laser beam energy through said lens to said detector means.

4,163,329  
**APPARATUS FOR RESURFACING A SNOW LAYER**  
 Josef Neff, Toggenburgerstrasse 114, Wil, Schweiz, Switzerland  
 Filed Jan. 27, 1978, Ser. No. 873,017  
 Claims priority, application Switzerland, Jan. 28, 1977, 1087/77

Int. Cl.<sup>2</sup> E01H 4/00

U.S. Cl. 37—10

6 Claims



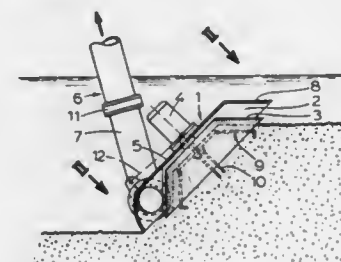
1. Apparatus for the resurfacing of a snow layer, said apparatus being of the type for connection to a tractor, having rollers for compacting the snow, and having a plurality of scrapers arranged side by side and having pivots for pivoting said scrapers vertically about an axis which is adjustable in height, the improvement therein comprising that in the direction of movement of said apparatus said scrapers are arranged in front of said rollers, that the pivots of said scrapers are disposed immediately adjacent the front of a horizontally oriented main frame which is supported at its rear end on said rollers, and that a draw bar is attached to the front of said main frame by means of a pivotable horizontal shaft for connecting said machine to a tractor, said draw bar and said main frame also being connected to an adjustment member which is adjustable in length to alter the degree of slant of said draw bar to the plane of said main frame.

4,163,330  
**DREDGE CUTTER HEAD HAVING A VOLUTE COMPARTMENT**  
 Nicolaas G. Konijn, Zuidspierdijkweg, Berkhout, Netherlands  
 Filed Jun. 14, 1977, Ser. No. 806,504  
 Claims priority, application Netherlands, Jun. 23, 1976, 7606804

U.S. Cl. 37—64

Int. Cl.<sup>2</sup> E02F 3/92

29 Claims

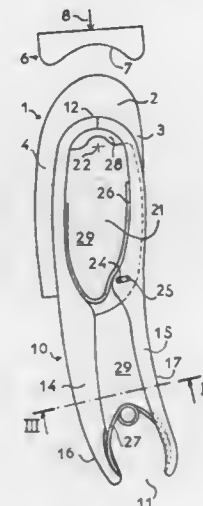


1. An apparatus for disintegrating and removing layers of earth, especially under water, comprising a housing in which at least one volute compartment is formed, which has an open lower edge, a rotor mounted in said compartment, and projecting downwardly outside the volute compartment, said rotor being rotatable about an axis which is substantially perpendicular to a plane through the lower edge of the compartment, drive means coupled to said rotor, said rotor comprising a brush in the shape of a cup provided with a central, downwardly opening cavity, a cutter element in said cavity and connected to the brush to follow the rotary motion of the brush, said cutter element protruding downwardly outside the brush, said volute compartment having a throat, discharge means connected to said compartment near said throat and means on said housing for suspension thereof from a moving device.

4,163,331  
**MACHINE FOR IRONING A SHOULDER AND A SLEEVE OF A GARMENT**  
 Henry Renaut, Roubaix, France, assignor to Societe Anonyme dite: LEMAIRE, France  
 Filed Jun. 7, 1977, Ser. No. 804,380  
 Claims priority, application France, Jul. 26, 1976, 76 23291  
 Int. Cl.<sup>2</sup> D06F 71/40

U.S. Cl. 38—12

16 Claims



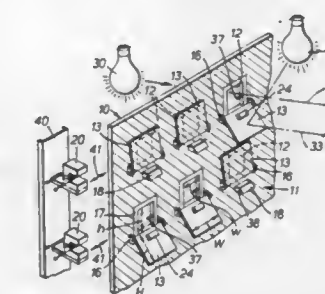
1. A machine for ironing upper garments at least in a zone comprising a shoulder, armhole and sleeve, said machine comprising a hollow former having an outer shape corresponding to the contour of at least one shoulder of the garment in wearing position, and a stretcher for stretching the sleeve of the garment, said stretcher comprising first and second elongate

members arranged to extend longitudinally inside a sleeve of a garment placed on said former, from said former to and beyond the lower end of the sleeve, means hingedly connecting said first member to said former for movement about a horizontal axis lying approximately in the median plane of said former, means interconnecting said first and second members for movement toward and away from one another and for angular movement relative to one another and tensioning means for resiliently urging said elongate member apart, said sleeve stretcher being arranged to engage longitudinally within the sleeve of a garment placed on said former and to match the interior shape of the sleeve by tensioning the sleeve transversely by the action of said tensioning means.

4,163,332  
**MATRIX DISPLAY DEVICE**  
 Hassan P. A. Salam, 80 Vicarage Ct., London, W.8, England  
 Continuation-in-part of Ser. No. 729,729, Oct. 5, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,600  
 Int. Cl.<sup>2</sup> G09F 9/30, 13/04

U.S. Cl. 40—449

15 Claims



1. An electrically controlled information display device including a two-dimensional planar array of display elements arranged in horizontal and vertical rows, characterized in that: each said display element is selectively settable to a first state in which there are simultaneously displayed to the observer two adjacent areas of which one is a light-emissive area arranged to emit light towards the observer and the other in a reflective area arranged to reflect light to the observer and to a second state in which each said area is replaced by a corresponding area of low reflectance; the light-emissive area of each said display element is a light-transmissive area in an otherwise opaque member disposed between a light source and the observer; each said display element includes a vane having a reflective face constituting said reflective area and an opposing face of lower reflectance constituting a said area of low reflectance; each said vane is arranged for pivotal movement about a hinge axis adjacent to and to one edge of the respective said light-transmissive area between a first position in which said vane covers said light-transmissive area and exposes its lower-reflectance surface to the observer and a second position in which said vane uncovers said light-transmissive area and exposes its reflective face to the observer; said vane comprises a permanent magnet arranged for cooperation with a respective one of an electromagnet assembly arranged for movement with respect to said array so that each said electromagnet is successively disposed for cooperation with each of a predetermined plurality of said permanent magnets to produce selective movement of the respective said vane between one and the other of said first and second positions; stabilizing means are provided whereby each said vane is stable in each of said first and second positions; said light source is common to a plurality of said display elements.



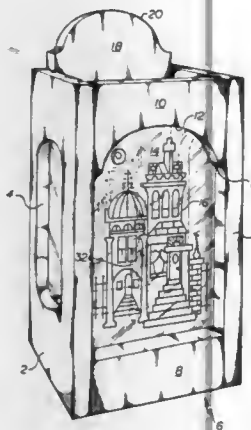
4,163,333

**CANDLE BOX**

Joseph Kwiatkowski, Rte. 1, Box 1040, Rainier, Wash. 98576  
Continuation of Ser. No. 760,649, Jan. 19, 1977, abandoned. This  
application Jun. 12, 1978, Ser. No. 914,894  
Int. Cl.<sup>2</sup> F21V 33/00

U.S. Cl. 40—561

1 Claim



1. A decorative open top candle and display box which is attractive and appears to be illuminated whether or not it contains a light source, comprising a substantial rectangular main body portion including a back member having a reflective element secured to its inner surface, a pair of parallel side members secured to the back member and extending outwardly in a forward direction therefrom, said side members including openings occupying a substantial portion of the side surface to admit air to fuel a candle when a candle is used as a light source and further to admit sufficient light to reflect on the reflective surface and when combined with the light from the top illuminate the box when an internal light source is not used, a bottom to support an optional source of light and a front completing the box, the front including a transparent panel occupying a substantial portion of the front surface having decoration thereof which will be both illuminated and reflected by the reflective element.

4,163,334

**FIREARM SHELL EXTRACTOR**

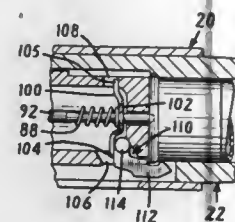
James Tollinger, Ithaca, N.Y., assignor to Ithaca Gun Company Incorporated, Ithaca, N.Y.

Continuation of Ser. No. 753,191, Dec. 22, 1976, abandoned, which is a division of Ser. No. 525,072, Nov. 19, 1974, Pat. No. 4,014,247. This application Dec. 28, 1977, Ser. No. 865,198

Int. Cl.<sup>2</sup> F41C 15/08

U.S. Cl. 42—25

1 Claim



1. A firearm, comprising:  
a barrel having a breech end;  
a bolt movable between the open position in which said breech is open, and a closed position in which said bolt closes said breech;  
a firing pin slidably mounted in said bolt for movement towards and away from said breech;

an extractor retainer in said bolt adjacent the end thereof nearest said breech;  
a firing pin spring urging said firing pin away from said breech and bearing on and urging said extractor retainer towards said breech;  
an extractor in said bolt and having a portion extending forwardly therefrom to engage the rim of a shell;  
said extractor retainer bearing on said extractor and holding said extractor in place in said bolt;  
said extractor retainer further comprising means formed centrally therein defining a central bore therethrough;  
said firing pin having a central longitudinal axis and includes a forward portion extending through said central bore;  
said bolt including means formed therein defining a slot through which said forwardly extending portion extends;  
said extractor including a trunnion pivotally mounted in said bolt and extending beyond both sides of said slot; and  
said forwardly extending portion including a hook portion and a rearwardly facing shoulder portion, said extractor retainer bearing on said shoulder portion to bias said extractor hook portion for rotation inward toward said firing pin axis.

4,163,335

**BLACK POWDER FIRING NIPPLE**

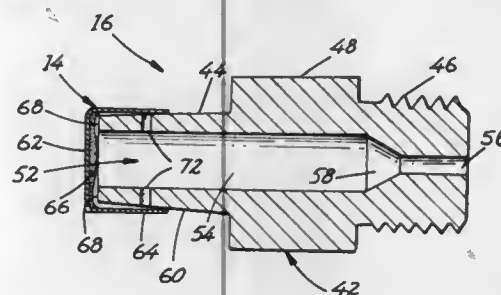
Robert K. Ives, Portland, Oreg., assignor to Michaels of Oregon Co., Portland, Oreg.

Filed Jul. 14, 1978, Ser. No. 924,611

Int. Cl.<sup>2</sup> F41C 27/00

U.S. Cl. 42—83

2 Claims



1. A nipple usable to ignite a propellant charge in a firearm of the type which employs a percussive firing cap having a skirt, said nipple comprising  
an elongate body including, adjacent one end, a cap-receiving portion, and adjacent the opposite end, a mounting portion,  
means defining a firing chamber extending axially into said nipple from said one end,  
means defining an outer surface on said cap-receiving portion, dimensioned to receive such a cap thereon, with the cap's skirt closely confronting said surface, and  
port means extending between and opening to said chamber and to a location on said surface which is covered by a cap received on said cap-receiving portion.

4,163,336

**LIVE BAIT INSERT APPARATUS**

Roger C. Carpenter, Rte. 3, Box 133 B, Fish Lake Rd., Pelican Rapids, Minn. 56572

Filed Jan. 13, 1978, Ser. No. 869,103

Int. Cl.<sup>2</sup> A01K 83/02

U.S. Cl. 43—37

5 Claims

3. Apparatus for use in fishing, comprising  
a body portion having  
a passage leading from an inlet at its forward end to an outlet at its aft end, and  
a camming surface at its forward end outward of and adjacent to said inlet,  
a plurality of substantially straight hooks, each having a

4,163,338

**ARTIFICIAL FISHING LURE**

Francois Lucarini, Contes, France, assignor to Vibrax/MCA, Inc., Watertown, Mass.

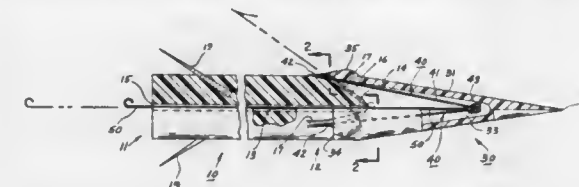
Continuation of Ser. No. 727,895, Sep. 29, 1976, abandoned. This  
application Apr. 28, 1978, Ser. No. 900,873

Claims priority, application France, Dec. 18, 1975, 75 11141  
Int. Cl.<sup>2</sup> A01K 85/01

U.S. Cl. 43—42.17

27 Claims

shank with a barb at one end and means to attach a leader at the other end,  
leader means to join said hooks together forward of said inlet of said passage and to extend through said passage and outward from its said outlet,  
means to position said hooks in a retracted position with their said means to attach a leader extending forward of their said barb ends, and with their shanks spaced angularly from each other about said forward end of said body portion and extending slantingly aft and outward, and



means, forward of said barbs of said hooks and outward of said camming surface, to restrict the forward angular movement of said hooks, said means including  
a hollow substantially conical nose portion having a pointed tip and a rear edge by which the nose part is secured to the forward end of said body portion,  
whereby, when said leader means is drawn aft relative to said body portion, the shanks of said hooks bear against its said camming surface and are driven from such retracted position outward and rotate angularly forward to a barb-extended position with the shanks bearing against said means to restrict forward angular movement.

4,163,337

**FISHING LURE**

James H. Kress, 580 Harwood Ave., Satellite Beach, Fla. 32937

Filed Oct. 25, 1977, Ser. No. 845,357

Int. Cl.<sup>2</sup> A01K 85/00

U.S. Cl. 43—42.05

11 Claims



1. A fishing lure of the type coupled to a fishing line and the shank section of a barbed fishing hook, said fishing lure comprising in combination:

an elongated housing having a front end and a rear end, said housing defining therein an elongated housing void which defines a housing aperture adjacent said rear end thereof, said housing further defining a housing bore communicating through said housing from said housing void to open adjacent said front end of said housing for movably receiving therethrough the fishing line;

a plug having a front end for removably coupling within said housing void and a rear end thereof projecting from said housing aperture, said plug having a plug bore therein communicating between said front end and said rear end thereof for movably receiving the fishing line therethrough;

a relatively rigid sleeve for coupling with said second end of said plug so as to define a skirt channel therebetween; and  
a plurality of elongated skirt elements each having a first end, a second end and a mid-section therebetween, with said mid-sections communicating through said skirt channel so as to allow said first and second ends of said skirt elements to flow substantially parallel to each other for obscuring the barbed fishing hook as said fishing lure is pulled through the water.

4,163,339

**FISHING LURE**

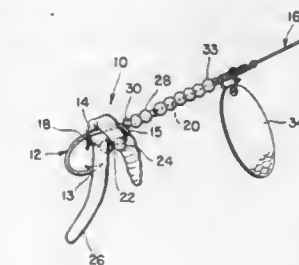
R. B. Worden, Box 384, Granger, Wash. 98932

Filed Feb. 9, 1978, Ser. No. 876,474

Int. Cl.<sup>2</sup> A01K 83/06

U.S. Cl. 43—44.4

4 Claims



1. A fishing lure comprising:  
a flexible nylon fishing line,  
a hook having a shank, a barb at one end of said shank and an eye at the other end of the shank,  
means coupling the free end of the line to the shank, the opposite end of said line passing through said eye, the line having a loop portion between said coupling means and said eye movable toward the shank for adjusting the size of the loop portion, and  
means on said opposite end of the line external of the eye for restricting movement of the line through the eye toward the barb whereby the line can be pulled through the eye to reduce the loop portion on bait adapted to be caught between the shank and loop portion said means for restricting movement of line through the eye including at

least one bead abutting the eye and having an opening threaded over the line and a separate friction member within said bead opening engaging the line and the opening for allowing only restricted movement of the line.

4,163,340

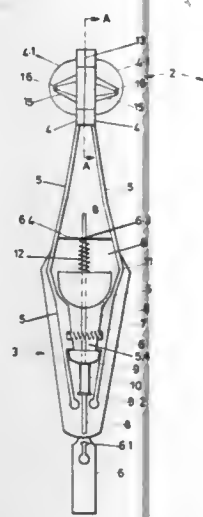
**INSECT CAPTURING AND EXTERMINATING DEVICE**  
Schalk W. van der Merwe, P.O. Box 454, Pretoria, South Africa (0001)

Filed Jan. 4, 1977, Ser. No. 756,703

Int. Cl.<sup>2</sup> A01M 3/00

U.S. Cl. 43-134

12 Claims



1. An insect capturing and exterminating device comprising a capturing unit comprising a pair of jaw members relatively movable with respect to each other, each jaw member comprising a peripheral mating portion and a central recessed portion, an actuating mechanism for actuating said jaw members to effect movement thereof with respect to each other, an insect exterminating agent in said capturing unit, an isolation unit, and an opening in at least one of said jaw members central recessed portion leading from said capturing unit to said isolation unit.

4,163,341

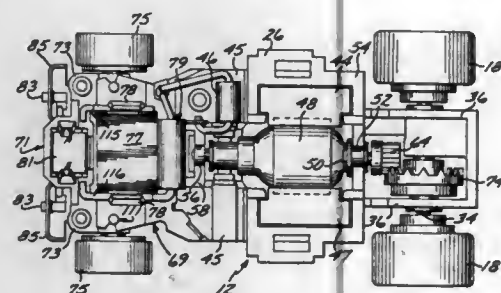
**SLOTLESS STEERING ASSEMBLY**  
Lawrence T. Jones, Playa del Rey; Anson Sims, Northridge; Ashley G. Howden, Los Angeles, and Michael J. Geery, Manhattan Beach, all of Calif., assignors to California R & D Center, Culver City, Calif.

Filed Feb. 25, 1977, Ser. No. 771,937

Int. Cl.<sup>2</sup> A63H 18/12, 18/10

U.S. Cl. 46-262

1 Claim



1. Miniature vehicle toy apparatus comprising: a first means for providing a first energizing path adapted to be supplied with a vehicle driving signal and first and

second selectively applicable turning control signals, said first means comprising a first lane of travel for said miniature vehicle;

second means for providing a second energizing path adapted to be supplied with said vehicle driving signal and said first and second turning control signals, said second means comprising a second lane of travel for said miniature vehicle;

a miniature vehicle adapted to be driven by said driving signal and having a pivotable steering means;

a coil means in said miniature vehicle for generating a magnetic field;

means for switching a first current of a first polarity through said coil means in response to application of said first control signal and for switching a second current of a second polarity through said coil means in response to said second control signal including at least a diode and a Zener diode;

means connected to said steering means and responsive to the magnetic field created by said first current for positioning said steering means in a first position to effect a change from said first lane to said second lane and responsive to the magnetic field created by said second current for positioning said steering means in a second position to effect a change from said second lane to said first lane;

means for biasing said wheels including a movable permanent magnet and a pair of pole pieces, a first pole piece providing a first steering position after an application of said first current and movement of the magnet toward the first pole piece and a second pole piece providing a second steering position after application of said second current and movement of the magnet toward the second pole piece, the permanent magnet remaining in contact with its respective pole piece to hold the wheels in the desired steering position.

4,163,342

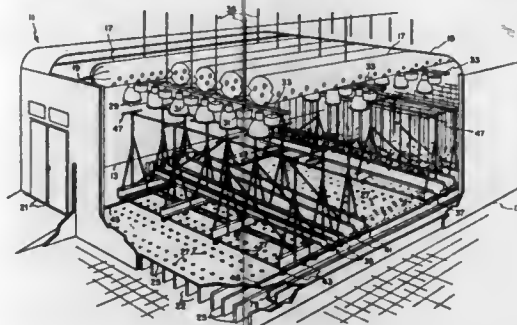
**CONTROLLED ENVIRONMENT AGRICULTURE FACILITY AND METHOD FOR ITS OPERATION**  
Lewis W. Fogg, Cazenovia; Kenneth R. Rauhala, Baldwinsville; H. Eugene Satterfield, North Syracuse, and Eion G. Scott, Fayetteville, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,965

Int. Cl.<sup>2</sup> A01G 31/02

U.S. Cl. 47-58

11 Claims



1. A controlled environment agriculture facility comprising: (a) wall and floor means defining a plant growth enclosure within which a controlled atmosphere may be maintained; (b) an array of plant grow support racks disposed within said enclosure, each said rack being of rectangular configuration with width and length dimensions and including means mounting the rack for at least limited reciprocal movement along a line parallel to its width dimension, the racks being arrayed in proximity to each other with their length dimensions in parallel relation; (c) a plurality of lamps mounted in said enclosure above said

racks and divided into groups with the lamps of each group disposed along a line parallel to the length dimension of the racks and with the lamp groups spaced along a line parallel to the width dimension of the racks, the number of such lamp groups being correlated to the number of support racks as a fractional multiple thereof;

(d) said plant grow support rack array being movable back and forth between a first position in which alternating racks of said array are disposed in sufficiently direct proximity to a respective one of said lamp groups to be subjected thereby to relatively high intensity illumination and in which the other racks of said array are disposed more distantly from the most proximate of said lamp groups so as to be subjected thereby to substantially lower intensity illumination, and a second position in which the relative intensities of illumination of the racks of said array are reversed, thus enabling even distribution of illumination as between all the plant grow support racks by shifting the plant grow support rack array back and forth between its first and second positions.

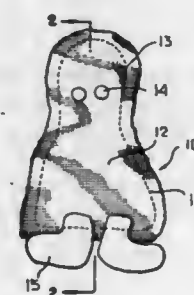
4,163,343

**EDUCATIONAL TOY AND AMUSEMENT DEVICE**  
Connie Schoenfeld, P.O. Box 661, Beverly Hills, Calif. 90210  
Filed Apr. 25, 1978, Ser. No. 899,722

Int. Cl.<sup>2</sup> A01C 1/04

U.S. Cl. 47-66

5 Claims



1. A toy comprising an outer porous housing forming a pocket therein, fluid absorbing material disposed within said pocket, said fluid absorbing material being positioned to form a recess with respect to certain portions of the outer housing, seeds disposed in said recess, and plastic material encasing said fluid absorbing material in all areas except where said seeds are positioned.

4,163,344

**OVEN HINGE MECHANISM INCLUDING CAM BALANCE MODIFIER**

Richard M. Scherer, Oxford, Miss., assignor to Chambers Corporation, Oxford, Miss.

Filed Dec. 8, 1977, Ser. No. 858,642

Int. Cl.<sup>2</sup> E05F 1/10

U.S. Cl. 49-386

4 Claims

1. For use with an oven structure having side walls, a rear wall, an access opening disposed in a substantially vertical plane opposite the rear wall and a door for the access opening, the door being movable through a plurality of positions between a vertical closed position where the door closes the access opening and a substantially horizontal open position to provide access to the interior of the oven structure, a hinge mechanism comprising:

bracket means rigidly mounted to the side wall of the oven structure having a camming surface on a horizontal top edge thereof and further including an integrally connected arm member;

said camming surface of said bracket means including a relatively long convex arcuate portion, a relatively short concave arcuate portion adjacent one end of said relatively long convex arcuate portion and a relatively short

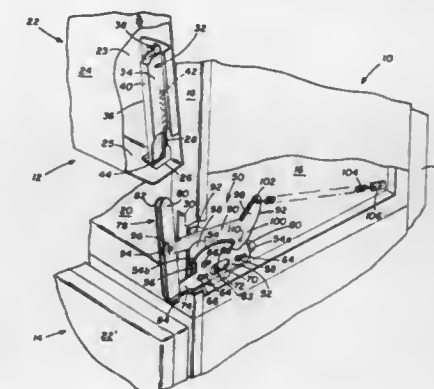
convex arcuate portion adjacent one end of said relatively short concave arcuate portion;

a hinge bracket having first and second ends, said second end thereof being pivotally secured to said arm member of said bracket means;

a channel frame secured within the door adapted to receive said hinge bracket for rendering the door pivotally cooperative with said hinge bracket for movement between the door closed position and the door open position;

a lever having first and second ends, said first end being pivotally secured to said hinge bracket between said first and second ends thereof, said second end of said lever including first and second arm members integrally connected to said lever and disposed on opposite sides of said lever to form a substantially T-shaped structure on said second end of said lever;

spring means having first and second ends for biasing said lever of the oven structure, said first end of said spring means being attached to said first arm member of said lever and said second end of said spring means being



attached to the side wall of the oven structure to a point remote from said bracket means, said spring means lying in a plane substantially perpendicular to the rear wall of the oven structure;

said second arm member of said lever including an anti-friction roller mounted for rotation about a fixed axis secured to said second arm member for frictionally engaging said camming surface of said bracket means, said anti-friction roller engaging said relatively short convex arcuate portion in the closed position of the door, such that said relatively short convex arcuate portion of said camming surface provides a relatively slight initial resistance to the opening of the door from the door closed position; and said lever acting on said camming surface is operative to counterbalance the door over a predetermined range, the counterbalancing effect of said lever increasing in the course of moving the door through the plurality of positions between the door closed position and the door open position to match the force delivered by said spring means as said spring means extends as the door moves from the door closed position to the door open position.

4,163,345

**ARRANGEMENT FOR THE GRINDING OF ROTARY PROFILE CUTTERS**

Max Meili, Viganella, Switzerland, assignor to AG fur Automatisierung, Switzerland

Filed Jun. 16, 1977, Ser. No. 807,336

Claims priority, application Switzerland, Jun. 17, 1976, 7731/76; Jun. 1, 1977, 6693/77

Int. Cl.<sup>2</sup> B24B 3/02

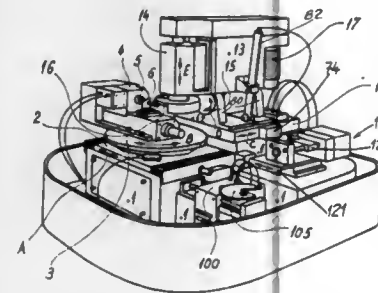
U.S. Cl. 51-33 W

4 Claims

1. Apparatus for grinding rotary profile cutters comprising, in combination, a base, a first table mounted on said base for movement linearly thereon, a platen mounted free to rotate on

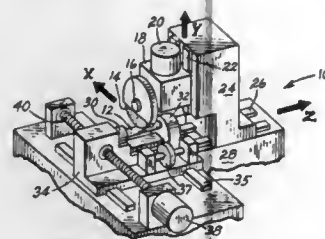


said first table, a rotatable workpiece carrier assembly fixed on said platen, the axis of said workpiece carrier intersecting and being perpendicular to the axis of rotation of said platen, a collet on said workpiece carrier for a milling cutter blank, a programmable indexer on said workpiece carrier for angular positioning of said blank in different successive angular positions, a second table movable linearly perpendicularly to the movement of the first table, a block on said second table, a grinding wheel spindle-head slidable on said block, means mounting said block pivotally on said second table for tilting movement about an axis of rotation parallel to the movements



of said second table to opposite sides of a vertical position, the sliding movement of the grinding wheel spindle-head being perpendicular to the axis of rotation of said block when said grinding wheel spindle-head is carrying the rotating grinding wheel, the plane of gyration of said grinding wheel being movable to opposite sides of the axis of rotation of said block, means for effecting pivotal movement of said block about the axis of rotation of said block during the grinding of the milling cutter blank, means for effecting linear movement of said first and second tables, and programmable means for controlling said movements.

**4,163,346**  
**GRINDING MACHINE CONTROL**  
Charles B. Matson, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio  
Filed Feb. 1, 1978, Ser. No. 874,312  
Int. Cl.<sup>2</sup> B24B 49/16, 53/14  
U.S. Cl. 51—165.77



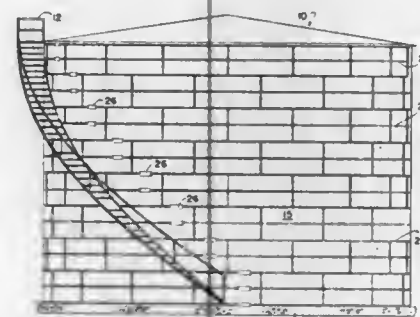
1. In a tangential grinding machine having a base, a grinding wheel, and means for effectuating a relative tangential infeed movement between a workpiece and the grinding wheel along a grinding path of varying length, an apparatus for controlling the tangential infeed rate, comprising:

- means for detecting variations in the contact portion of the tangential grinding path length; and
- means for controlling the rate of relative tangential movement between the grinding wheel and the workpiece in accordance to the detected variations in the grinding path length.

**4,163,347**  
**METHOD AND APPARATUS FOR SECURING INSULATION PANELS TO A STRUCTURE TO BE INSULATED THEREBY**

Emil Marcmann, P.O. Box 5, Medford, N.J. 08055  
Filed Nov. 8, 1977, Ser. No. 849,709  
Int. Cl.<sup>2</sup> B65D 25/18; E04B 1/74  
U.S. Cl. 52—105

8 Claims



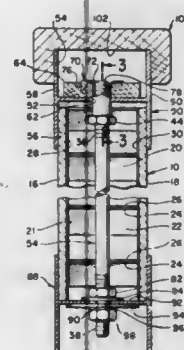
4. A combined fastener and tension indicator means for maintaining an undulated band in constant contact with the exterior surface of insulation panels which have been applied to the exterior surface of the structure to be insulated thereby and wherein said structure is subjected to expansion and contraction depending upon the atmospheric conditions, the improvement comprising said band provided with a plurality of undulations formed therein to thus present high portions and valleys therebetween, the ends of said band being secured to a fastener and tension indicator, means on said fastener and tension indicator to vary the amount of tension applied to said band the tension applied to said band causing said valleys to remain in constant contact with the exterior surface of the said panels and to exert a force thereon to thus maintain said insulation panels in close contact with the exterior surface of the structure to which the panels have been applied notwithstanding the expansion and contraction of the said structure.

**4,163,348**  
**PARTITION HAVING STABILIZING BAR AND METHOD**  
Donald K. Thomas, Jr., 1710 Laurel St., South Pasadena, Calif. 91030  
Filed Aug. 28, 1978, Ser. No. 937,226  
Int. Cl.<sup>2</sup> E04C 2/56

9 Claims

U.S. Cl. 52—241

7 Claims

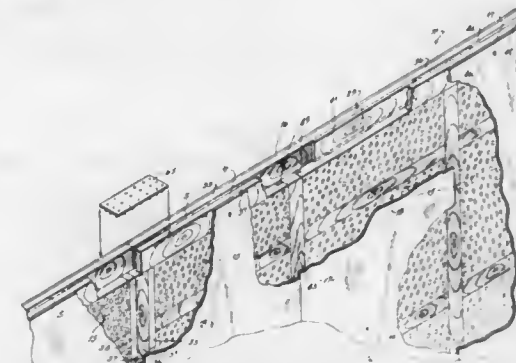


1. A partition comprising: two spaced panels forming outer wall surfaces, means spacing said panels, elongated H-shaped members fitted on each of two opposite respective ends of said panels, each H-shaped member forming an inwardly and an outwardly facing channel,

said inwardly facing channels each having a bottom adjacent edges of said panel ends and having inner faces of its side walls adjacent marginal portions of said wall surfaces, a partition stabilizing bar extending between said panels, adjacent said means spacing, and through both channel bottoms at both ends of said panels, said bar being threaded at both ends, nut means fixed to a channel bottom and extending there-through at one end of said panels, one end of said bar being threadably engaged with said nut means, a nut on said bar adjacent said one end thereof positioned to limit the engagement of said bar with said nut means, and nuts on said bar adjacent the other end thereof tightening said bar to said channel bottoms at the other end of said panels, whereby said H-shaped members are secured to said panels and said bar prevents bowing or collapse of said partition in the direction of said bar.

**4,163,349**  
**INSULATED BUILDING PANELS**  
Glenn W. Smith, P.O. Box 36, Russells Point, Ohio 43348  
Filed May 26, 1977, Ser. No. 800,697  
Int. Cl.<sup>2</sup> E04H 1/00; E04C 1/00  
U.S. Cl. 52—241

8 Claims

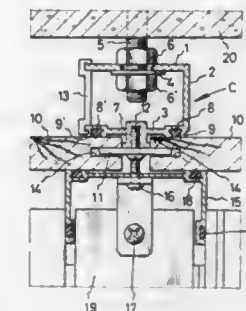


1. A plurality of wall sections joined together on a deck means provided with a mounting plate, each of said wall sections comprising a plurality of insulated panels, each of which comprise an interior insulating core, an exterior skin and an interior skin, both of which have edge portions extending beyond said core, a header bearing post disposed between each panel, the interior and exterior skins of each panel respectively overlapping approximately one-half of said bearing post and being attached thereto, header means extending across the tops of said bearing posts, foot plate means extending beneath the bottoms of said bearing posts and edge portions of said interior and exterior skins covering said header means and said foot plate means, and further including means joining one wall section to another wherein each section includes at least one end panel, said joining means including a section splice bearing post disposed between said end panels, the skins of said end panels overlapping said section splice bearing post, header means bearing members connected to the sides of upper portions of said section splice bearing post, and a relieved portion in the insulating core of each end panel for receiving one of said header means bearing members.

**4,163,350**  
**CEILING ATTACHMENT APPARATUS**  
Nobushige Doguchi, Toyama, and Moriyoshi Hayashi, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 6, 1977, Ser. No. 858,013  
Claims priority, application Japan, Dec. 7, 1976, 51-163618 [U]; Dec. 7, 1976, 51-163620 [U]  
Int. Cl.<sup>2</sup> E04B 1/62, 5/52  
U.S. Cl. 52—403

6 Claims



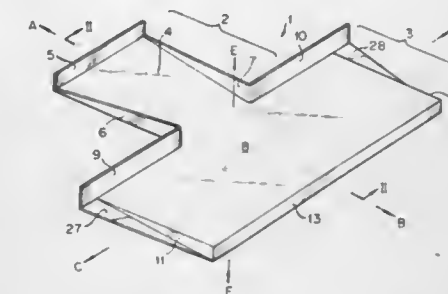
1. A ceiling attachment apparatus comprising a horizontal ceiling joist consisting of a molded frame member having a screw-inserting groove formed on the lower side thereof extending in the longitudinal direction, means adjustably rigidly fixing said joist to the ceiling, a screw to be inserted into said screw-inserting groove, at least one ceiling panel having a horizontally extending groove formed in the side edge thereof and an attaching plate inserted in said groove of the ceiling panel, said ceiling panel being disposed along the lower face of said ceiling joist, and screw means tightly securing said attaching plate against said ceiling panel and the panel thereby against the joist and in fixed relation to the ceiling.

**4,163,351**  
**ARCHITECTURAL PANEL MATERIAL FOR USE AS ROOFING MATERIAL, MATERIAL FOR EXTERNAL WALL AND THE LIKE PURPOSES**  
Takashi Ishikawa, No. 1355, Ooaza Higashine Ko, Higashine-shi, Yamagata-ken, Japan  
Filed Nov. 25, 1977, Ser. No. 854,952  
Claims priority, application Japan, Nov. 30, 1976, 51-161061 [U]

U.S. Cl. 52—542

Int. Cl.<sup>2</sup> E04D 1/18

8 Claims



1. An architectural panel useful as a roofing material or an external wall material, comprising: a thin plate having the shape of an inverted T in plan view in which the lower cross-bar portion of the T defines a main body section having an inclined area and the upper stem portion of the T defines a head section which is adapted to be overlapped by the main body sections of other like plates, said head section having an upper edge and side edges extending downwardly from the ends of said upper edge, said main body section having a lower

edge, side edges extending upwardly from the ends of said lower edge and upper edge portions extending from the upper ends of said side edges of said main body section to the lower ends of the side edges of said head section, upwardly projecting tabs extending along the upper edge portions of said main body section and projecting upwardly from the plane of said main body section, downwardly projecting tabs extending along the side edges and the lower edge of said main body section and projecting downwardly from the plane of said main body section, said downwardly projecting side edge tabs of said main body section progressively increasing in height in a direction from said upper edge portions of said main body section to said lower edge thereof, said downwardly projecting side edge tabs and lower edge tab defining the side and lower edges of a tapered space under the inclined area of said main body section which space decreases in height from said lower edge to said upper edge portions; an upwardly projecting tab extending along the upper edge of said head section and projecting upwardly from the plane of said head section, upwardly projecting tabs extending along the side edges of said head section and projecting upwardly from the plane of said head section, said upwardly projecting side edge tabs of said head section progressively increasing in height in a direction from said upper edge of said head section to the upper edge portions of said main body section, wherein the height ( $H_3$ ) of said downwardly projecting tab along the lower edge of said main body section (1) is substantially equal to the height ( $H_2$ ) of said upwardly projecting tabs along the upper edge portions of said main body portion, and (2) is substantially equal to or greater than the height ( $H_1$ ) of the upwardly projecting tab along the upper edge of said head section, and wherein the length of said head section is greater than the length of said main body section.

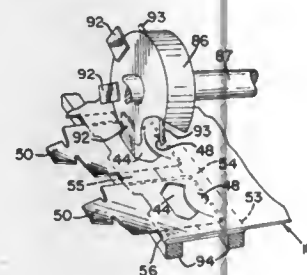
4,163,352

## BOTTLE PACKAGING MACHINE

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.  
Division of Ser. No. 805,855, Jun. 13, 1977, Pat. No. 4,100,715.  
This application Apr. 7, 1978, Ser. No. 894,502  
Int. Cl.<sup>2</sup> B65B 61/00

U.S. Cl. 53—393

5 Claims



1. A machine for packaging a group of articles having the general shape of beverage bottles in wraparound type blanks of foldable sheet material which is cut and scored to provide hingedly connected top wall, sidewall and bottom wall forming panels, the bottom wall forming panels having associated wall reinforcing panels at opposite ends of the blank which are initially held in the plane of the blanks by uncut portions of the blanks, said wall reinforcing panels being adapted, when released, to hinge on a score line spaced inwardly of the end edges of the blank so as to be folded into flat engagement with adjoining portions of the blank and to be secured by engaging end marginal portions beneath bendable tab members cut in the sidewall panels, said machine comprising a blank carrying conveyor having a generally horizontal run with means thereon for supporting successive blanks which are positioned thereon with said reinforcing panels disposed so as to travel along opposite sides of the blank supporting conveyor, and means disposed along opposite sides of said conveyor run engaging the blanks at points on opposite faces thereof for

breaking said uncut portions of successive blanks so as to release the end panels, means disposed along said conveyor run for hinging said reinforcing panels into engagement with adjoining face portions of the blanks and means disposed along said conveyor run for engaging said tab members and said reinforcing panels so as to force said tab members into overlying relation with marginal portions of said reinforcing panels thereby to secure said reinforcing panels in engagement with said adjoining portions of the blanks.

4,163,353

## METHOD OF PACKAGING COMPRESSIBLE FIBROUS BATTS

Lawrence R. Finn, Toledo; Daniel A. McCartan, Heath, both of Ohio, and Gary M. Schmandt, Bellevue, Wash., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio  
Division of Ser. No. 755,370, Dec. 29, 1976, Pat. No. 4,085,560, which is a continuation of Ser. No. 585,161, Jun. 9, 1975, abandoned. This application Feb. 13, 1978, Ser. No. 877,140  
Int. Cl.<sup>2</sup> B65B 63/02, 63/04

U.S. Cl. 53—430

8 Claims



1. A method of making a package of compressible fibrous batts comprising forming a compressible elongate layer of randomly-disposed fibers held together by a binder, severing said layer into fibrous batts of determinate length, retaining and collecting said batts in spaced, end-to-end relationship by engaging side edges of said fibrous batts, and winding the batts in a spiral configuration while applying compressive forces to the outer ones of said batts as they are being wound.

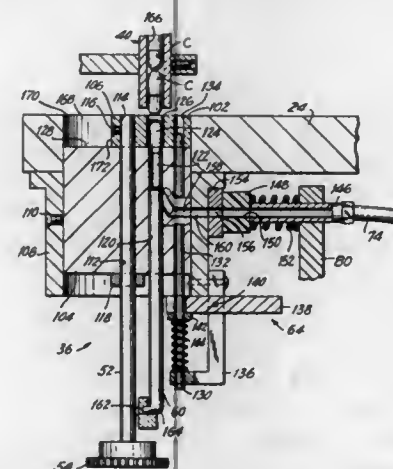
4,163,354

## METHOD AND APPARATUS FOR FILLING CAPSULES

Leonard H. Austin, 8 S. William St., Lynbrook, N.Y. 11563  
Filed Mar. 22, 1978, Ser. No. 888,845  
Int. Cl.<sup>2</sup> B65B 1/24, 1/06, 43/40

U.S. Cl. 53—436

44 Claims



38. A method for filling capsules having a body section telescoped within a cap section, said method comprising the steps of:

(a) receiving the capsule sections in a two part capsule filling station formed in a table that is rotatable about a first axis, one of the parts of the capsule filling station being rigidly

secured to the table for rotation together therewith about the first axis, the second part of the capsule filling station being coupled to the first part for rotation relative thereto about a second axis that is parallel to and spaced from the first axis, a portion of the first and the second parts of the capsule filling station in combination with a portion of the table defining a recess for receiving the material with which the capsule is to be filled, the second part of the capsule filling station being rotatable within the recess;

(b) depositing a supply of the material with which the capsule is to be filled into the recess;

(c) axially separating the two capsule sections from each other whereby the capsule body section is contained entirely within the first part of the capsule filling station and whereby the capsule cap section is contained entirely within the second part of the capsule filling station;

(d) rotating the second part of the capsule filling station with respect to the first part of the capsule filling station about the second axis whereby the material deposited in the recess is swept by the second part of the capsule filling station into the capsule body section;

(e) axially displacing the capsule body section relative to the capsule cap section whereby the two capsule sections are telescoped one into the other; and

(f) ejecting the filled capsule from the capsule filling station.

4,163,355

## CROP HARVESTING APPARATUS

John W. Edwards, Wauchula, Fla., assignor to Ginny Bee Harvester Corporation, Tampa, Fla.  
Continuation of Ser. No. 570,718, Apr. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 508,903, Sep. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,262, Oct. 26, 1973, Pat. No. 3,992,861, which is a continuation-in-part of Ser. No. 386,421, Aug. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 362,453, May 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 350,168, Apr. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 339,914, Mar. 9, 1973, abandoned. This application Nov. 16, 1976, Ser. No. 742,086  
Int. Cl.<sup>2</sup> A01D 46/20

U.S. Cl. 56—328 R

33 Claims



1. A crop harvesting apparatus comprising:  
a support member defining a plane;  
a plurality of crop-severing rods, each of said plurality having a longitudinal axis and a crop-contacting surface portion;  
each of said plurality of crop-severing rods having mounting means having a longitudinal axis and rotatably mounting its crop-severing rod on said support member for rotation of its crop-severing rod about an axis parallel to the longitudinal axis of that crop-severing rod, with the longitudinal axis of said crop-severing rods being substantially perpendicular to the support member plane for insertion of the crop-severing rods among crop-bearing foliage for harvesting of crops therefrom;  
drive means for rotating said mounting means to rotate said crop-severing rods for orbital rotation of said crop-contacting surface portions about their respective mounting means longitudinal axis;  
a plurality of crop-catching rods around said crop-severing rods for catching crops that have been severed from crop-bearing foliage; and  
means defining a crop-storage area for storing crops that have been severed from crop-bearing foliage and caught

by said crop-catching rods, including hinge means permitting hinged movement of said defining means for emptying of the crop-storage area.

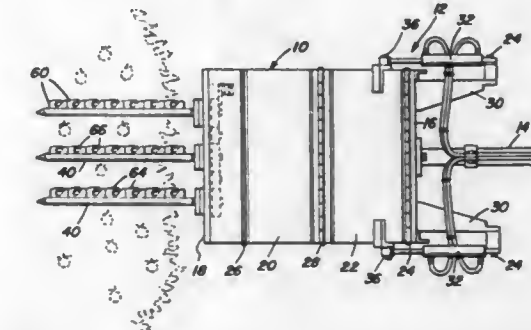
4,163,356

## TREE FRUIT PICKER

Robert J. Robbins, and Desmond W. Robbins, both of 1036 Biltmore Dr., NW., Winter Haven, Fla. 33880  
Filed Mar. 9, 1977, Ser. No. 775,945  
Int. Cl.<sup>2</sup> A01D 46/24

U.S. Cl. 56—328 R

6 Claims



1. A fruit picking apparatus including an elongated arm defining base and free ends, said arm including means defining elongated outwardly opening fruit stem receiving notches spaced therealong and opening outwardly of said arm in a direction inclined toward said base end of said arm, said notches including open opposite sides opening outwardly in opposite directions at right angles to said direction, the width of the open ends of said notches being sufficient to loosely receive fruit supporting stem portions and their leaves there-through, a mount, a plurality of said arms supported in spaced parallel relation from said mount with the free ends of said arms projecting outwardly from one side of said mount and said base ends of said arms mounted from said mount for simultaneous oscillatory angular displacement relative thereto about axes extending longitudinally of said arms, said notches being confined to corresponding longitudinal sides of said arms, said arms comprising elongated rod members each including a longitudinally extending support groove formed therein, said notches being defined in plate-like members including base portions keyed in the corresponding groove.

4,163,357

## APPARATUS FOR CABLE-TWISTING TWO YARNS

Aloys Greive, Münster, and Aloys Horstmann, Greven, both of Fed. Rep. of Germany, assignors to Hamel GmbH, Zwirnmaschinen, Münster, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 886,802, Mar. 15, 1978. This application Apr. 25, 1978, Ser. No. 899,735  
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726603; Dec. 21, 1977, 2757138  
Int. Cl.<sup>2</sup> D01H 13/04, 7/88; D02G 3/38

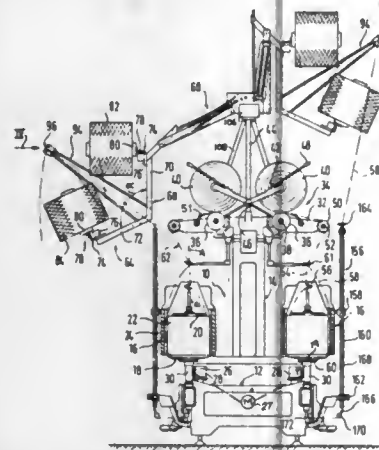
U.S. Cl. 57—58.36

25 Claims

1. An apparatus for twisting together two yarns, said apparatus comprising:  
a frame;  
a tubular spindle having and rotatable on said frame about an upright spindle axis, said spindle having a support for a supply of one of said yarns and being formed below said support with a radially open aperture;  
a rotatable take-up spool above said spindle on said frame said one yarn normally extending up from its supply and being engaged around said take-up spool;  
a holder adapted to support a supply of the other of said yarns;  
support means for displacement of said holder on said frame between an operating position generally above said take-up



spool and said spindle and a loading position below said operating position and next to said spool and spindle; guide means on said frame including a substantially closed U-shaped guide tube having an upstream end opening upwardly and directed toward said holder and a downstream end opening upwardly toward said spindle for feeding said other yarn from its supply into the lower end of said spindle, thence out through said aperture, and thence up past said supply of said one yarn to said takeup spool;

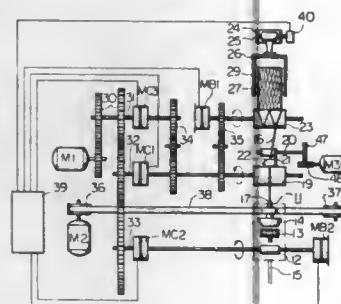


spindle drive means connected to said spindle for rotating same about said spindle axis and thereby twisting said yarns about each other; takeup drive means for rotating said takeup spool and thereby winding the twisted yarns upon said takeup spool; and means for forming a stream of gas in said guide tube from said upstream end to said downstream end for pneumatically entraining and threading a filament therethrough.

**4,163,358**  
**APPARATUS FOR CONTROLLING THE DRIVING OF AN OPEN-END SPINNING MACHINE**  
Tatuo Takeuchi, Aichi; Kazuyoshi Ono, Chiryu; Naotake Furukawa, Aichi; Katsuaki Sugiura, Okazaki; Osamu Suzuki, Obu, and Takeshi Shimizu, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jan. 19, 1978, Ser. No. 870,751  
Int. Cl.<sup>2</sup> D01H 1/12, 1/22  
U.S. Cl. 57—78

10 Claims



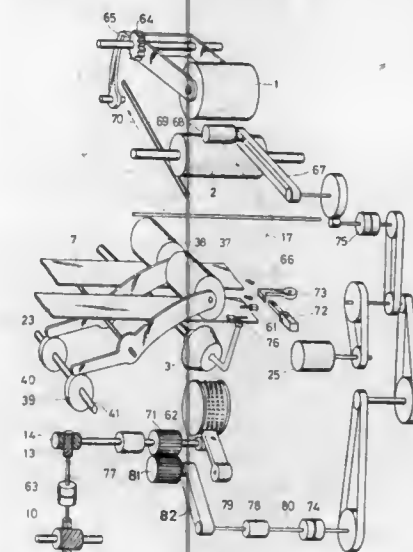
1. A driving control apparatus for an open-end spinning machine provided with a plurality of spinning units each comprising a spinning rotor, a feed roller for feeding a bundle of fibers to said spinning rotor, a winding roller for taking out a yarn from said spinning rotor and winding the yarn to form a yarn package, a holder for rotatably supporting said yarn package, and provided with a driving device for driving said feed roller and said winding roller, respectively, said driving device including clutch means; comprising means for detecting the quantity of the wound yarn on said yarn package and

control means for setting operational timings of said feed roller and said winding roller based on a value detected by said detecting means, said control means comprising (i) means for on-off controlling said clutch means at said set operational timings, and (ii) means for setting the timing of stopping of the winding roller at the time of the stopping of the machine according to a detected value of said detecting means so that the time for low-speed rotation of the winding roller prior to the stopping thereof is prolonged as the quantity of the wound yarn on said yarn package becomes large.

**4,163,359**  
**METHOD AND APPARATUS FOR DRIVING AND PIECING-UP OPEN-END SPINNING UNITS**  
Takeshige Honjo, Suita, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Jan. 6, 1975, Ser. No. 538,589  
Claims priority, application Japan, Jan. 14, 1974, 49-7217  
Int. Cl.<sup>2</sup> D01H 1/30, 15/00  
U.S. Cl. 57—93

5 Claims



1. A driving device for an open-end spinning system formed by a number of juxtaposed spinning units each comprising a rotor, a feed roller for supplying a sliver into the rotor, and a package driving drum for taking spun yarn out of the rotor, said device being characterized by a main drive transmission system and an auxiliary drive transmission system provided in common to said spinning units each of which spinning units is operatively linked with said main and auxiliary transmission systems so as to be switched separately and individually from high speed operation to low speed operation and vice versa with the aid of said transmission systems, said auxiliary transmission system including two separate drive sources for each of said spinning units, one of said separate drive sources being connected to said rotor of the associated spinning unit and the other of said separate drive sources being connected to both said feed roller and said package driving drum of the associated spinning unit, said drive sources having different speed changing modes, said main and auxiliary driving systems each including a separate transmission belt for driving the rotor.

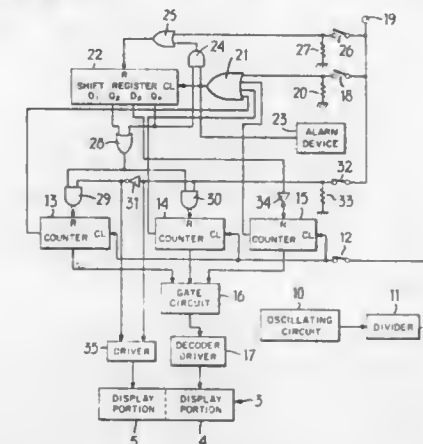
4. A method of open-end spinning of thread, comprising the steps of:

- (A) twisting the open end of the thread at a pre-determined twisting rate;
- (B) drawing off the thread at a pre-determined draw-off speed; and
- (C) increasing the numerical ratio of said twisting rate to said draw-off speed whenever the thread is being reattached to the roving and whenever a thread breakage is being repaired, wherein the step of increasing the ratio of said

twisting rate to said draw-off speed is performed while said twisting rate is lower than it is during normal spinning machine operation.

**4,163,360**  
**TIMER DEVICE**  
Kojiro Tanaka, and Kazuhiro Yoda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan  
Continuation of Ser. No. 745,377, Nov. 26, 1976, abandoned.  
This application Jul. 31, 1978, Ser. No. 929,110  
Claims priority, application Japan, Nov. 27, 1975, 50-41921  
Int. Cl.<sup>2</sup> G04C 21/00, 21/34  
U.S. Cl. 58—39.5

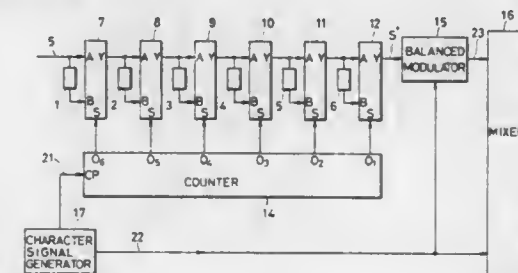
5 Claims



1. An event timer device, comprising: a plurality of memory counters each for memorizing the duration of a respective one of a plurality of different events each having a respective different predetermined duration; selecting means for selecting one of said memory counters corresponding to a selected event and for operating the selected memory counter to count down the memorized duration of the selected event; time display means comprising a single display for displaying a remaining time of the selected event; and event display means cooperative with said selecting means for displaying which event is selected.

**4,163,361**  
**TELEVISION TIME SIGNAL GENERATOR**  
Tsuneo Mikado, Hachioji, Japan, assignor to Nippon Television Industry Corporation, Hachioji, Japan  
Filed Apr. 1, 1977, Ser. No. 783,775  
Claims priority, application Japan, Jun. 15, 1976, 51-69934  
Int. Cl.<sup>2</sup> G04B 19/34  
U.S. Cl. 58—50 R

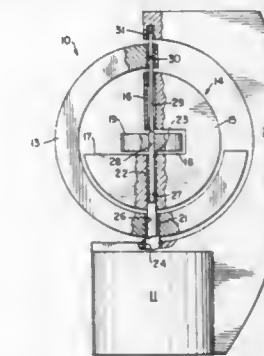
8 Claims



1. A television time signal generator, comprising: a pattern signal generator for generating a pattern signal for time display of numerals on a television picture tube and means for applying to said pattern signal a color component which varies in a predetermined order in accordance with a passage of time, whereby the color of said time display is varied in said predetermined order to represent the value of time increments.

**4,163,362**  
**ORBITAL CLOCK**  
Ronald L. Ferina, 349 Bellmore Rd., East Meadow, N.Y. 11554  
Filed Oct. 25, 1977, Ser. No. 845,026  
Int. Cl.<sup>2</sup> G04B 19/00  
U.S. Cl. 58—126 R

7 Claims



1. In a timepiece, means for visually displaying the time of day, which comprises  
(a) a clock mechanism having a minutes drive shaft and an hours drive shaft,  
(b) a first asymmetrical, three-dimensional body in driving engagement with and partially supported by said hours drive shaft at a first portion thereof, said first body having a height dimension which is substantially larger than the width dimension thereof,  
(c) a second asymmetrical, three-dimensional body in driving engagement with and partially supported by said minutes drive shaft at a first portion thereof, said second body having a height dimension which is substantially larger than the width dimension thereof,  
(d) a stationary reference member positioned adjacent said first and second asymmetrical bodies, and  
(e) a secondary support means in a moving fit relation to each of said bodies for partially supporting said bodies at second portions thereof,  
(f) said second portion of each body being spaced from said first portions in the height direction,  
(g) said asymmetrical bodies being arranged and configured whereby they are rotatable by said hours and minutes drive shafts, respectively, about an axis whereby the spatial relation between said bodies and the reference member indicates the time of day.

**4,163,363**  
**CHAIN LINK BENDING MACHINE**  
Herbert Windelbandt, Aachen-Laurensberg, and Günter Ditzes, Rodenkirchen-Weiss, both of Fed. Rep. of Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Fed. Rep. of Germany  
Division of Ser. No. 704,685, Jul. 12, 1976, Pat. No. 4,123,899.  
This application Sep. 21, 1978, Ser. No. 944,315  
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531290  
Int. Cl.<sup>2</sup> B21L 1/02

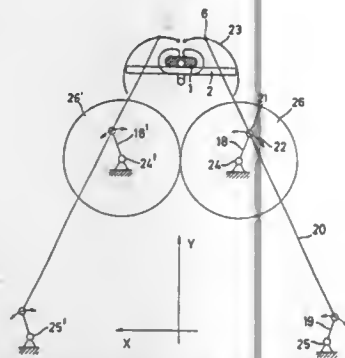
U.S. Cl. 59—27

3 Claims

1. In a chain link bending machine for forming chain links from wire pins each having a given length and two free ends; the machine including a mandrel having opposite curved work faces each having a center of curvature; bending tools having means for engaging end zones of the wire pin to provide contact locations between each end zone and the respective work tool for bending each wire pin in a bending plane about the work faces of the mandrel during the bending operation; the improvement comprising guide means for guiding said bending tools in a path having, at least in the terminal phase of the bending operation, at least the approximate shape of a circular involute, the reference point of which coinciding with

the center of curvature of the respective work faces; said guide means including a separate pivotal lever linkage associated with each bending tool; each pivotal lever linkage having

- (a) a coupling rod having first and second ends; said first end of said coupling rod pivotally supporting the respective bending tool;
- (b) a first pivot lever having first and second ends; said first end of said first pivot lever being articulated to said second end of said coupling rod;
- (c) a first fulcrum pivotally supporting said first pivot lever at said second end thereof;



- (d) a second pivot lever having first and second ends; said first end of said second pivot lever being articulated to said coupling rod at a location between said first and second ends of said coupling rod;
- (e) a second fulcrum pivotally supporting said second pivot lever at said second end thereof; said first and second pivot levers being parallel to one another; and
- (f) means for driving each pivotal lever linkage with a pin bending force.

4,163,364

# METHOD FOR RECOVERING ENERGY POSSESSED BY EXHAUST GAS FROM BLAST FURNACE

Takeshi Shirato, and Kiyomi Teshima, both of Tamano, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

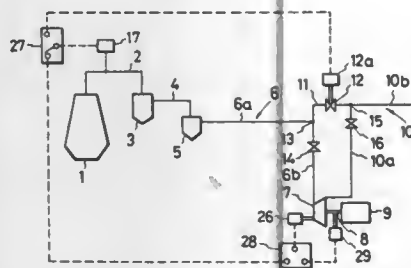
Filed Jan. 5, 1978, Ser. No. 867,278

Claims priority, application Japan, Feb. 15, 1977, 52/15817

Int. Cl.<sup>2</sup> F02C 9/02

U.S. Cl. 60—39.02

7 Claims



1. A method for recovering energy possessed by exhaust gas from a blast furnace which comprises introducing the exhaust gas from the blast furnace into a turbine, converting a part of the energy possessed by the exhaust gas to an energy for rotating the rotation shaft of the turbine and recovering the energy in the form of an electric energy, wherein an axial flow turbine is used as the turbine and the attachment angle of stationary blades of said turbine is changed according to variations of the furnace top pressure of the blast furnace so as to control the furnace top pressure at a predetermined level.

## 4,163,365 METHOD FOR REGULATING A POWER PLANT CONTAINING A GAS TURBINE ASSEMBLY AND APPARATUS FOR THE PERFORMANCE OF THE AFORESAID METHOD

Hansulrich Frutschi, Riniken, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

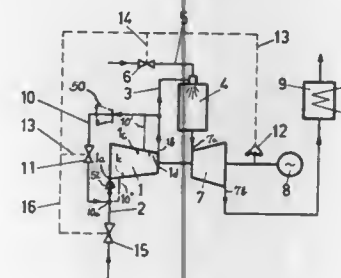
Filed Nov. 14, 1977, Ser. No. 851,279

Claims priority, application Switzerland, Dec. 2, 1976, 15174/76

Int. Cl.<sup>2</sup> F02C 3/06, 9/14

U.S. Cl. 60—39.03

6 Claims



1. A method of regulating a combined power and heat generating plant comprising a gas turbine assembly operated in an open cycle, the gas turbine assembly comprising a compressor for the combustion air, a fuel chamber and a gas turbine, a heat exchanger arranged at the exhaust gas side of the gas turbine in which there is utilized the thermal energy still contained in the exhaust gases of the gas turbine for heating purposes, the improvement which comprises the steps of:

- returning a variable quantity of air heated by the compressor back through a return flow path for the combustion air to a location in front of the compressor, in order to regulate the heating output of the heat exchanger by the exhaust gases of the gas turbine; and
- at least partially reducing the pressure energy contained in the heated air by feeding the returned air through an expansion turbine arranged in the return flow path.

4,163,366

# APPARATUS FOR DISPOSAL OF LEAKING FLUIDS IN A TURBOFAN ENGINE

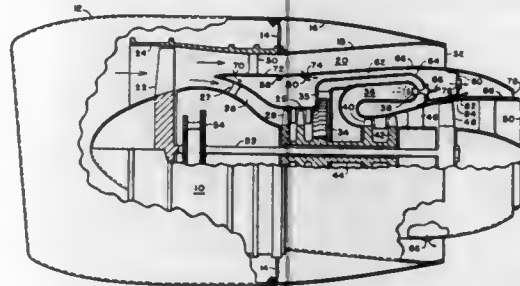
Peter Kent, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed May 23, 1977, Ser. No. 799,351

Int. Cl.<sup>2</sup> F02K 3/04, 11/04; F02C 7/30

U.S. Cl. 60—226 R

4 Claims



1. In combination with a turbofan engine having a leaking fluid disposal apparatus of the type wherein ventilating air from the bypass ducting is drawn through ports in the cowl separating the bypass ducting and the core engine stages, the cowl having at its midsection in the area containing the engine fuel lines, a diameter sufficient to form between said cowl and said core engine stages an annular shaped cavity through which said ventilating air flows, and wherein means are in-

cluded for exhausting the combination of ventilating air and vaporized leakage fluids into the confluence of the bypass airstream and the gases emitted from the tailpipe of said core engine stages, the improvement which comprises:

- turbulent flow inducing means for directing the flow of ventilating air being brought through said ports in said cowl into all cavities around the exterior of said core engine stages, said turbulent flow of air causing vaporization of all leaking fluids, said turbulent flow inducing means including
- (a) a bulkhead spacer disc of annular configuration positioned just aft of said engine fuel lines and having its outer periphery attached to the inner wall of said cowl, said spacer disc having a multiplicity of orifices therethrough for allowing passage of ventilating air, and
- (b) a cylindrical metallic shield attached at one of its ends to the inner edge of said bulkhead spacer disc, said shield encircling the hot core engine stages aft of said fuel lines and serving to prevent leaking fluids from striking surfaces of said core engine stages which are above the ignition temperature of said leaking liquids, the combination of said shield and said disc serving to cause rapid vaporization of leaking liquids during operation of said turbofan engine.

4,163,367

# HYBRID FLYWHEEL/COMPRESSED-FLUID PROPULSION SYSTEM FOR NONSTATIONARY APPLICATIONS

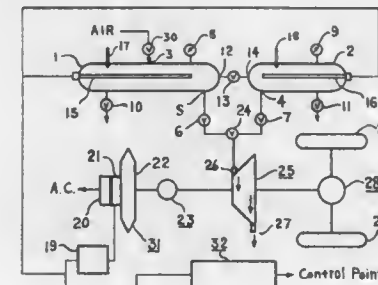
George C. Yeh, 2 Smedley Dr., Newtown Square, Pa. 19073

Filed Jan. 9, 1978, Ser. No. 867,694

Int. Cl.<sup>2</sup> F15B 1/02

U.S. Cl. 60—414

6 Claims



1. A hybrid flywheel/compressed-fluid propulsion system for a self-propelled object, said system comprising:
- (A) a rotatable drive shaft adapted to propel said object when rotated;
- (B) energy conversion means connected to said drive shaft and employing a compressible working fluid, said energy conversion means being adapted, when supplied with said working fluid in a compressed state, to expand said working fluid and produce shaft work for transmission through said drive shaft;
- (C) a primary container for storing said compressible working fluid in compressed state;
- (D) first conduit means adapted to connect said primary container and said energy conversion means, and to supply compressed working fluid to said energy conversion means;
- (E) first valve means interrupting said first conduit means and adapted to selectively control the flow of compressed working fluid to said conversion means; and
- (F) a flywheel connected to said drive shaft through disconnecting means adapted to selectively connect said disconnect, independent of said conversion means, said flywheel from said drive shaft.

4,163,368

# CENTRIFUGAL REPLENISHING PUMP FOR A HYDROSTATIC PUMP MOTOR SYSTEM

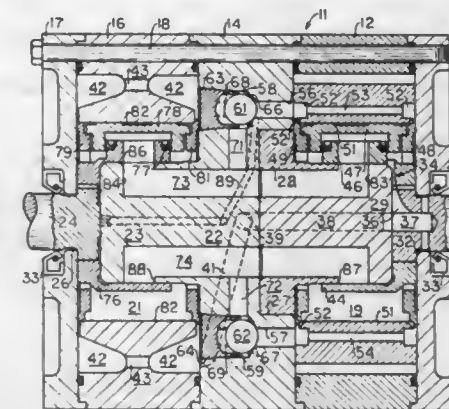
William K. Engel, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 20, 1977, Ser. No. 798,953

Int. Cl.<sup>2</sup> F16D 31/02

U.S. Cl. 60—488

5 Claims



1. In an hydrostatic pump-motor system including a housing enclosing a hydrostatic pump having rotor means with an input shaft thereto and an hydrostatic motor driven by hydraulic fluid forced from said pump, the improvement comprising: centrifugal pump means integral with said rotor means and internally within said housing and in driven connection with said input shaft, the centrifugal pump means replenishing said pump by providing an additional source of hydraulic fluid thereto; and, a plurality of passageways within said housing which communicate a sump chamber for said system to the centrifugal pump means, which communicate outlet hydraulic fluid from the centrifugal means to fluid inlets for said hydrostatic pump, and which communicate pressurized fluid from said centrifugal pump to bearing surfaces of said hydrostatic motor.

4,163,369

# AIR-TO-AIR HEAT PUMP

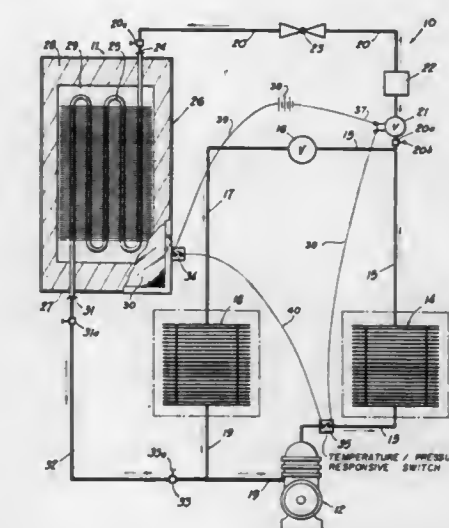
Charles Owen, 2120 Cannon Way, Marietta, Ga. 30064

Filed May 11, 1978, Ser. No. 904,924

Int. Cl.<sup>2</sup> F25B 27/00

U.S. Cl. 62—2

16 Claims



1. An improvement in the heating cycle of an air-to-air heat pump of the type having a motor driven compressor, a con-



denser, a first refrigerant line interconnecting said compressor and said condenser, an expansion valve, a second refrigerant line interconnecting said condenser and said expansion valve, an evaporator, a third refrigerant line interconnecting said expansion valve and said evaporator and a fourth refrigerant line interconnecting said evaporator and said compressor, the improvement comprising:

- means for selectively increasing the temperature of the refrigerant within said fourth line including a solar evaporator coil having an entrance port and an exit port,
- means for mounting said solar evaporator coil in the path of radiant solar energy,
- conduit means for communicating said solar evaporator coil with said heat pump,
- valve means on said conduit means and valve actuating means connected to said valve means and being operable to allow said refrigerant to pass through said conduit means into said solar evaporator coil and into said heat pump when said refrigerant in said heat pump meets a preselected condition and when the temperature of the air surrounding said coil reaches a predetermined level.

4,163,370

# CONTROLLING THE DRAWING ROLLERS TO PRODUCE DIAMETER PERTURBATIONS IN AN OPTICAL WAVEGUIDE

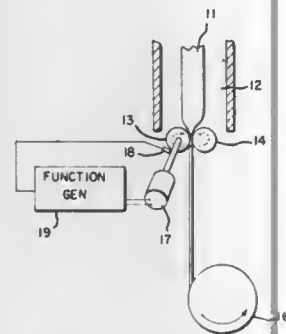
Thomas C. Kurth, Charleston, S.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,755

Int. Cl.<sup>2</sup> C03B 37/00

U.S. Cl. 65—2

4 Claims



1. The method of producing an optical waveguide comprising:

- providing a glass tube having a core with an index of refraction higher than the cladding thereof,
- heating said glass tube to the drawing temperature of the materials thereof,
- drawing the heated composite structure with a single pair of pulling rollers to reduce the cross-sectional area thereof, and
- controlling the tangential velocity of said rollers with time to produce diameter varying perturbations spaced along the length of said waveguide.

4,163,371

# VAPORIZER

Greg D. Groninger, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1977, Ser. No. 827,275

Int. Cl.<sup>2</sup> F17C 7/02

U.S. Cl. 62—50

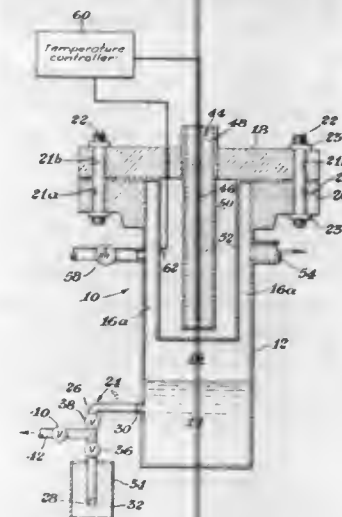
6 Claims

1. A method for vaporizing a mixture of two liquefied gases in chemical equilibrium with a binary compound thereof comprising:

- (a) withdrawing the mixture of known composition at a known temperature and a known pressure as a liquid from a supply source;
- (b) introducing the liquid mixture through a liquid supply

means into a liquid zone of an enclosed vessel to form a liquid phase;

- (c) maintaining the uppermost level of said liquid phase at least above that portion of the liquid zone in communication with the liquid supply means;
- (d) heating a portion of said liquid phase in said enclosed vessel which is located above said liquid phase which is in



communication with said liquid supply means to a temperature above the dew point temperature corresponding to vapor having substantially the same composition as the liquefied gas mixture thereby to vaporize a portion of such liquid phase to form such vapor and super heating said vapor to vaporize any of such liquid phase dispersed therein; and

- (e) removing said gaseous mixture from said vessel.

4,163,372

# CAPILLARY RETAINER CLIP

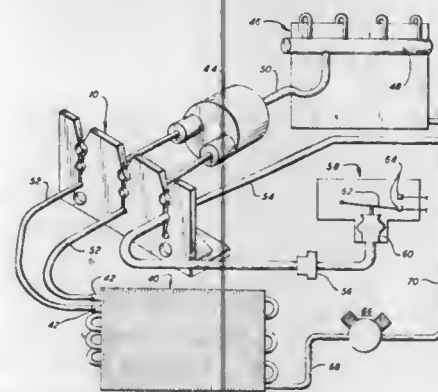
Leonard V. Frye, Syracuse, and Robert F. Crossman, DeWitt, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,020

Int. Cl.<sup>2</sup> F25B 25/00

U.S. Cl. 62—259

6 Claims



1. A refrigeration machine comprising a condenser, an evaporator, an expansion control device and a compressor for forming a closed refrigeration circuit, the expansion control device including a capillary tube mounted to conduct refrigerant from the condenser to the evaporator and means for supporting the capillary tube intermediate the ends thereof, said means including a retainer having a plurality of spaced resilient

sections, the sections being formed to define elongated openings therebetween, the confronting sides of which form a spaced region adapted to forcibly engage the exterior surface of the capillary tube as it is passed through said elongated opening.

4,163,373

# DEVICE FOR EXTRACTING MOISTURE FROM A SPACE

Willem L. N. van der Sluijs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

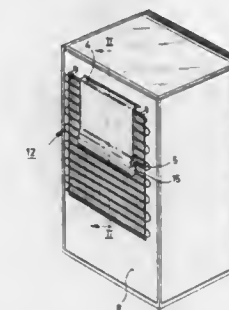
Filed Dec. 12, 1977, Ser. No. 859,645

Claims priority, application Netherlands, Jul. 2, 1977, 7701242

Int. Cl.<sup>2</sup> F25B 47/00

U.S. Cl. 62—279

7 Claims



1. A refrigerator, which comprises an external wall providing an enclosed evaporator space; an evaporator positioned in said space; a vertically disposed condenser arranged outside the refrigerator wall; a pair of openings formed in the refrigerator wall, said openings being respectively at the corresponding ends of the evaporator; a continuous length of capillary material extending past the evaporator in contact therewith, through one of said openings, and extending past the condenser in contact therewith; and a hygroscopic liquid contained in said continuous length of capillary material for absorption of moisture in said evaporator space and for elimination of moisture outside the refrigerator wall, said hygroscopic liquid having a melting temperature lower than the lowest temperature occurring adjacent the evaporator; the two ends of the continuous length of capillary material being in liquid-transmitting contact with each other so that the hygroscopic liquid flows in a closed circuit.

4,163,374

# REFRIGERATABLE BEVERAGE CONTAINER HOLDER

Stanley R. Moore; Thomas L. Crisman, and Donald R. Zivney, all of Dallas, Tex., assignors to Freeze Sleeves of America, Inc., Dallas, Tex.

Filed Dec. 21, 1977, Ser. No. 862,970

Int. Cl.<sup>2</sup> F25D 3/08

U.S. Cl. 62—457

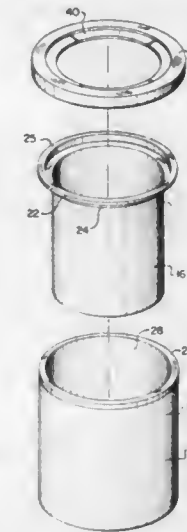
11 Claims

1. A refrigerated holder for a beverage container of the type including a cylindrical outer cup of insulative material closed on one end and open on the other, the circular edges of the open end being covered by a circular retaining ring including a first portion extending radially across the top edges and into the open end with flap portions to position a cylindrical beverage container in axial alignment with said outer cup and a second, cylindrical portion extending from the top of the cup down the outer wall to retain the ring in position around the cup, the improvement comprising:

- a cylindrical inner cup having an outer diameter less than the inner diameter of the outer cup to define an annular space therebetween and an inner diameter for receiving the cylindrical walls of a beverage container therein, said inner cup also including a radially extending flange region at the open end for positioning adjacent the top edges of

the outer cup beneath the retaining ring to seal the annular space therebeneath;

- a freezable fluid positioned within the annular space between



4,163,375

# RIGHT ANGLE LOCK

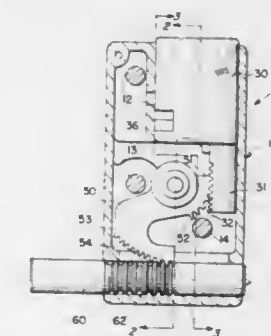
Roy K. Fujitaki, Altadena, Calif., assignor to VSI Corporation, Pasadena, Calif.

Filed Jan. 16, 1978, Ser. No. 869,549

Int. Cl.<sup>2</sup> E05B 65/06; E05C 1/06

U.S. Cl. 70—134

25 Claims



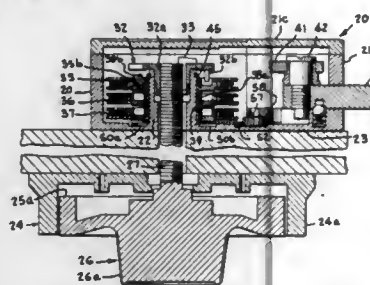
1. A right angle door lock comprising:

- (a) a housing,
- (b) a key-operated barrel assembly axially slidable in said housing;
- (c) an axially slidable bolt in said housing;
- (d) means mounting said barrel assembly and said bolt with their axes intersecting and coplanar, and
- (e) means engaging said bolt and said barrel assembly for causing conjoint movement thereof, comprising a pinion coplanar with said barrel assembly and said bolt, said barrel assembly and said bolt comprising racks, said racks being substantially coplanar;
- (f) whereby said lock may be of small thickness transverse to the plane of said axes.

**4,163,376**  
**TUMBLER WHEEL COMBINATION LOCKS WITH TORQUE ADJUSTER MEANS**  
 Benson L. Miller, and Steven Helesfal, both of Nicholasville, Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.  
 Filed Mar. 15, 1978, Ser. No. 886,922  
 Int. Cl.<sup>2</sup> E05B 37/08

U.S. Cl. 70—303 A

24 Claims



1. In a combination lock having a lock case provided with front and rear walls and a cylindrical tumbler post normally extending along a horizontal axis from one of said walls, a tumbler wheel stack formed of a plurality of peripherally gated tumbler wheels loosely journaled on said tumbler post for rotation about the axis of the tumbler post, retainer shoulder means on an end portion of the tumbler post for retaining the tumbler wheel stack thereon, a peripherally gated rotatable driving cam driven by a rotatable dial, means for driving the tumbler wheels responsive to rotation of the dial and driving cam, and a fence lever pivotally connected to a bolt for shifting the bolt between locked and unlocked positions; the improvement comprising means for adjusting the torque properties of the tumbler wheel stack including stationary inclined ramp means adjacent said tumbler post and facing toward the tumbler stack providing inclined ramp cam surfaces, a torque adjuster spring member journaled for rotation on the tumbler post between said inclined ramp means and the nearest tumbler wheel having cam follower formations bearing against said inclined ramp cam surfaces to track along the latter and having an abutment portion for asserting resilient forces directed axially against the nearest tumbler wheel urging the stack of tumbler wheels compressively against said retainer shoulder means for varying the compressive spring forces on and torque properties of the stack of tumbler wheels in accordance with the positions of the cam follower formations on the inclined ramp surfaces, and the torque adjuster spring member including an extension portion projecting laterally of the tumbler post having a coupler formation thereon, the lock case having interfitting means carried thereby interfitting with said coupler formation to releasably hold the torque adjuster member at various angular positions to which it is adjusted, and the coupler formation and interfitting means being relatively movable for rotation of the torque adjuster member through arcuate paths in either of opposite directions about the axis of said tumbler post and for restraining the same at the angular position to which it is adjusted for variably setting resilient compressive forces on the tumbler stack and thereby adjusting the torque characteristics.

**4,163,377**  
**CONTINUOUS HYDROSTATIC EXTRUSION PROCESS AND APPARATUS**

Marc Moreau, Asnieres, France, assignor to Trefimetaux, Argenteuil, France

Continuation-in-part of Ser. No. 740,489, Nov. 10, 1976, Pat. No. 4,111,023, which is a division of Ser. No. 676,908, Apr. 14, 1976, Pat. No. 4,041,745. This application Oct. 31, 1977, Ser. No. 847,098

Foreign Application Priority Data Dec. 7, 1976 [FR] France 7637556

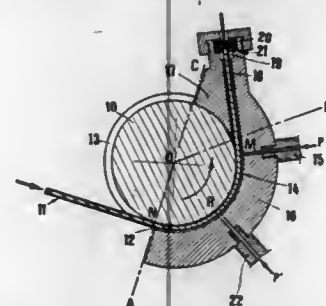
Int. Cl.<sup>2</sup> B21C 23/32, 33/00, 23/01, 23/22

U.S. Cl. 72—60

10 Claims

1. Apparatus for continuous hydrostatic extrusion of a first object, referred to as a blank, of indefinite length, into the form

of a second object, which is also of indefinite length but of different section; the apparatus comprising two co-operating coaxial members, one being a movable member, referred to as a rotor, and carrying at its surface a groove of revolution, defined by a pair of opposed side walls and a bottom, which is adapted to receive the blank to be extruded in contact with at least two of said walls and bottom to define separate outward and inward zones respectively above and below the points of contact with said two of said walls and bottom, the other member being fixed, referred to as a stator, and forming, over a first sector of the groove to contain the blank and a viscous fluid, a cover which is substantially sealed with respect to fluid, the stator also comprising, over a second sector of the groove disposed downstream of the first sector, a relief portion which



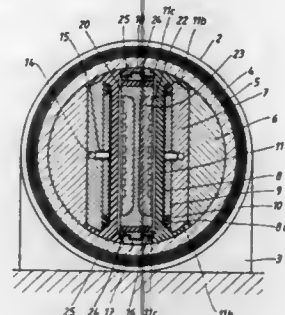
totally blocks the section of the groove and which is precisely adapted thereto to seal the section of the groove relative to the viscous fluid, means for supplying solely the outward zone of the groove with viscous fluid under high pressure from a pressure generator which can be of known type, and an aperture disposed in the stator opposite the first sector of the groove, in the vicinity of the second sector, the aperture opening by way of an elongate conduit which passes through the stator, into an extrusion chamber which communicates with the exterior through at least one die orifice, the viscous fluid supply means producing in the first sector of the groove a pressure gradient from a point of entry for the blank, at ambient pressure, to the conduit which opens into the chamber in which the extrusion pressure exists.

**4,163,378**  
**HYDRAULIC PRESS**  
 Keljo E. Hellgren, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Jun. 21, 1978, Ser. No. 917,503  
 Claims priority, application Sweden, Jun. 27, 1977, 7707358  
 Int. Cl.<sup>2</sup> B21D 22/12

U.S. Cl. 72—63

7 Claims



1. A hydraulic press for forming sheet material, comprising: a horizontally extending press stand including a vertically extending forming cavity formed therein between a pair of spaced forming pads extending between the inner surfaces of said press stand, and an elastically deformable member extending between the respective end of each said forming pad for supporting the same;

a tool carrier movable into, and out of, said forming cavity and including an upstanding tool support member having a tool forming depression on each side thereof on which sheet material is formed, said tool carrier dividing said forming cavity into a pressure cell on each side of said upstanding tool support member; and means for injecting a pressure medium into each of said pressure cells.

**4,163,379**  
**APPARATUS FOR PERFORMING A WORKING OPERATION ON THE TIP OR POINT OF A BALL POINT PEN**

Ugo Buzzi, Arzo, Switzerland, assignor to Albe S.A., Agno, Switzerland

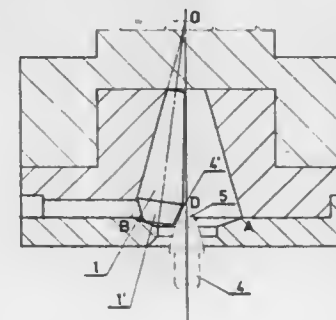
Filed Jan. 31, 1978, Ser. No. 873,835

Claims priority, application Switzerland, Feb. 2, 1977, 1291/77; Nov. 29, 1977, 14634/77

Int. Cl.<sup>2</sup> B21D 19/06

U.S. Cl. 72—121

9 Claims



1. An apparatus for performing a working operation on the tip of a ball point pen, especially a tip which is made of a hard material, such as stainless steel, comprising three similar working rollers arranged to roll without slip on a seating as a tip is being worked on the apparatus, each of said rollers having a conical or frusto-conical running surface which in use runs on the seating, which is also conical or frusto-conical, and the apex of the cone defined by the seating coinciding with the apex of each cone defined by each of the running surfaces, each of the rollers having at one end a working surface arranged so that all three working surfaces will operatively engage a ball point pen tip when operatively positioned to be worked by the apparatus by being presented along the axis of the cone defining the seating surface.

**4,163,380**  
**FORMING OF PRECONSOLIDATED METAL MATRIX COMPOSITES**

Vernon W. Masoner, Woodstock, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Oct. 11, 1977, Ser. No. 841,005

Int. Cl.<sup>2</sup> B21D 5/00

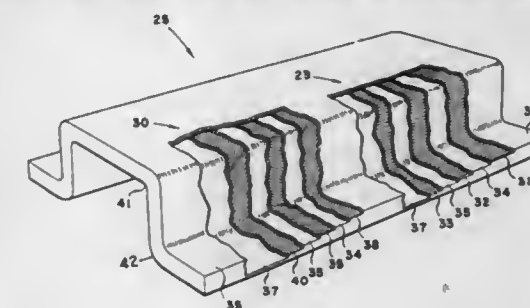
U.S. Cl. 72—342

21 Claims

1. A method of forming bends or deflections in a preconsolidated metal matrix composite workpiece consisting of boron, boric, alumina or graphite filaments in aluminum or titanium base metals, said method comprising the steps of:

- locating the composite workpiece between open male and female members of a forming die;
- bringing the workpiece and at least the die faces to a temperature of from approximately 910° F. to approximately 935° F.; and,

(c) closing the die members at a rate of from 5 to 12 mills per minute after both male and female die members are in



contact with the workpiece and until the die members are completely closed.

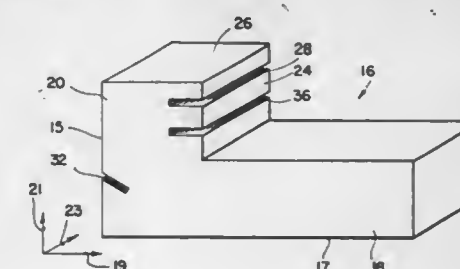
**4,163,381**  
**METHOD AND APPARATUS FOR MAKING A TROPHY COLUMN**

Jack R. Hodshon, 2363 Cecella La., Clearwater, Fla. 33515  
 Filed Jun. 19, 1978, Ser. No. 916,771

Int. Cl.<sup>2</sup> B21D 31/00

U.S. Cl. 72—477

7 Claims



1. A metal working hand tool for making a two-piece, four sided, metal trophy column having a housing formed from a first piece of sheet metal forming three of said sides with longitudinal clasp portions at the terminating edges of the first and third of said sides and a decorative insert formed from a second piece of sheet metal forming the fourth one of said sides with longitudinal clasp engaging portions at the terminating edges thereof which engage said clasps on said housing, comprising: an L-shaped body having a long handle segment with a principal outside surface along a length direction and a short metal engaging segment with a principal outside surface along a width direction perpendicular to said length direction, the L-shaped body having a depth along a longitudinal direction mutually perpendicular to said length and width directions; said short metal engaging segment having an inside surface parallel to said principal outside surface of said short segment and an end surface parallel with said principal outside surface of said long segment; a first slot in said inside surface, parallel with said end surface, having a depth approximately equal to the length of a first segment of said longitudinal clasp portion, located at a distance from said end surface approximately equal to the length of a second segment of said longitudinal clasp portion, for securing a first end of said first piece of sheet metal while it is being sequentially bent over said inside surface, said end surface and said outside surface of said short segment and over said outside surface of said long segment, forming one of said longitudinal clasp portions on one edge of said first side of said housing; said inside and outside surface of said short segment being separated by a distance approximately equal to the length of a third segment of said longitudinal clasp portion and



said end surface of said short segment and said outside surface of said long segment being separated by a distance approximately equal to the length of said first side of said housing;

a second slot in said outside surface of said short segment, having an opening parallel with said outside surface of said long segment, having a depth approximately equal to the length of a first segment of said longitudinal clasp engaging portion, said depth being at an acute angle with respect to said outside surface of said long segment, located at a distance from said outside surface of said long segment approximately equal to the length of a second segment of said longitudinal clasp engaging portion, for securing a first end of said second piece of sheet metal while it is being sequentially bent over said outside surface of said short segment and said outside surface of said long segment, forming one of said longitudinal clasp engaging portions on one edge of said decorative insert;

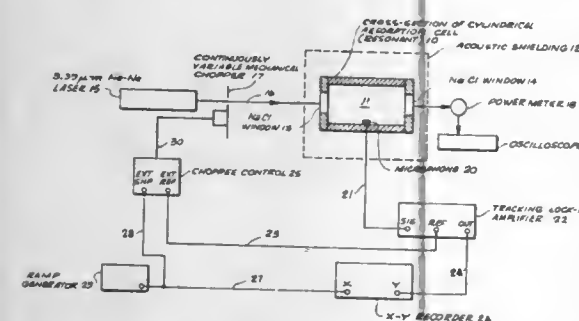
whereby a two-piece metal trophy column may be made.

**4,163,382**  
**METHOD AND APPARATUS FOR OPTOACOUSTIC SPECTROSCOPY**  
 Nabil M. Amer, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 901,048  
 Int. Cl.<sup>2</sup> G01N 31/00, 21/24

U.S. Cl. 73—24

10 Claims



1. An optoacoustic spectroscopy method comprising the steps of containing a gaseous mixture of an optically nonabsorbing gas whose properties are to be determined and an optically absorbing gas, directing pulsed light through the thus contained gaseous mixture such that at least a portion of the energy of the pulsed light is absorbed by the optically absorbing gaseous component of the mixture and communicated to the nonabsorbing gaseous component of the mixture resulting in pulsed acoustic waves, and detecting and measuring the thus produced acoustic waves, such that the velocity of sound in the optically nonabsorbing gas component, the ratio of its specific heat at constant pressure to that at constant volume, its heat conductivity, viscosity, and molecular weight can be determined.

**4,163,383**  
**BREATH TESTING SYSTEM**  
 Gary L. VanderSyde, Naperville, Ill., and John Warberg, Scarborough, Canada, assignors to Alcohol Countermeasure Systems Inc., Sarnia, Canada

Filed Mar. 7, 1978, Ser. No. 884,120  
 Int. Cl.<sup>2</sup> G01N 27/04

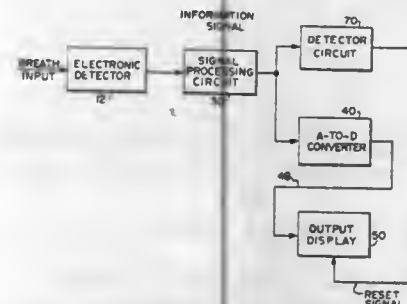
U.S. Cl. 73—27 R

7 Claims

1. In a biological gas tester of the type in which an electronic detector provides an information signal having an amplitude level which is a function of the alcohol content in the gas under test, including a signal processing circuit for delivering the information signal and an output display for providing an indication of the amplitude of the information signal, which signal is prone to error if the gas under test provides an unde-

sired chemical input to the electronic detector, the improvement which comprises:

an anomaly detector circuit, coupled to the signal processing circuit, for continually comparing the maximum value of the information signal with the instantaneous value of the information signal, and means for providing a signal to



modify operation of the output display when the rate of decrease of the information signal provides an amplitude difference between the instantaneous value and the maximum value of the information signal which indicates presence of an anomalous chemical substance in the gas under test.

**4,163,384**  
**PIEZOELECTRIC MOISTURE ANALYZERS**  
 Colin B. Blakemore, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 14, 1978, Ser. No. 896,449  
 Int. Cl.<sup>2</sup> G01N 31/00

U.S. Cl. 73—29

7 Claims

1. In a moisture analyzer for measuring the moisture content of a gas stream which contains a first acid gas comprising a piezoelectric crystal coated with a polymer selected from the group consisting of polystyrene sulfonic acid and salts of polystyrene sulfonic acid, the improvement wherein the sensitivity of the coated crystal to water in the presence of acid is stabilized by exposure of the coated crystal to a second acid gas which can be the same or different than the first acid gas for a period of time sufficient to produce stable sensitivity of the coated crystal to moisture in the presence of the first acid gas.

**4,163,385**  
**ENGINE KNOCKING METER**  
 Takayuki Kato, Aza; Kazumasa Sumi; Masanori Miyashita, both of Nagoya; Osamu Nomura, Heiwamachi, and Shouzo Naito, Bisai, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho; Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, all of Aichi, Japan

Filed Jun. 29, 1977, Ser. No. 811,207

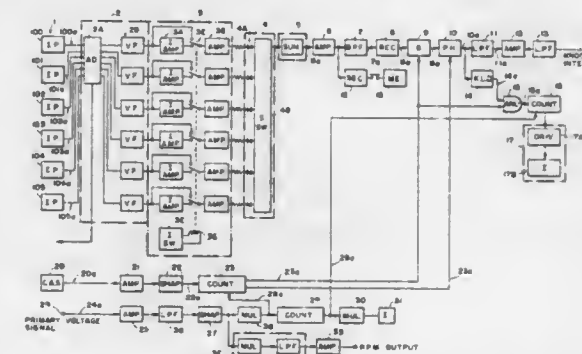
Claims priority, application Japan, Jun. 30, 1976, 51-77371  
 Int. Cl.<sup>2</sup> G01M 15/00; G01N 33/22

U.S. Cl. 73—35

11 Claims

1. An engine knocking meter comprising:  
 a first means for detecting a combustion pressure signal based on pressure in cylinders of an engine;  
 a second means for supplying those frequency components of said pressure signal which correspond to a predetermined frequency band of an engine knock signal, as a pressure signal;  
 a crank angle sensor having at least a portion thereof mounted on a crank shaft above the engine for detecting a crank angle corresponding to a predetermined knocking region;  
 a third means for producing a gate signal based on a detection signal from said crank angle sensor;  
 a gating means responsive to said pressure signal from said

second means and said gate signal from said third means to gate only that pressure signal which occurs during the presence of said gate signal;  
 a fourth means for holding a peak value of a signal from said gating means for each ignition cycle;  
 a fifth means for detecting a knocking state from a peak hold signal from said fourth means, said fifth means including a



level discriminating means for detecting the peak hold signal above a predetermined level as the knocking signal; and  
 a means for counting said knocking signals above said predetermined level supplied from said level discriminating means for a period corresponding to a predetermined number of times of ignition and indicating the count.

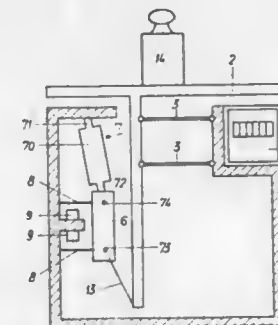
**4,163,386**  
**MASS AND FORCE METER**  
 Mario Gallo, and Johannes Wirth, both of Zurich, Switzerland, assignors to Wirth, Gallo & Co., Zurich, Switzerland  
 Filed Oct. 21, 1977, Ser. No. 844,467

Claims priority, application Switzerland, Sep. 1, 1977, 10642/77

Int. Cl.<sup>2</sup> G01L 1/10

U.S. Cl. 73—141 R

4 Claims



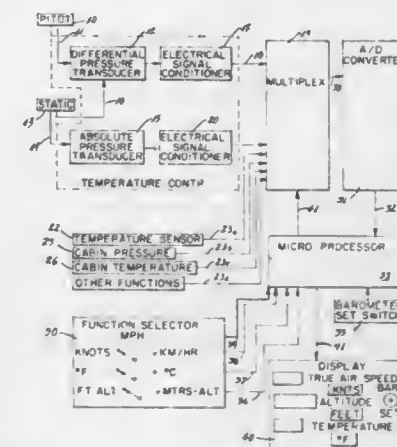
1. A mass and force meter comprising:  
 a frame,  
 a load support,  
 an evaluation and display means mounted on said frame,  
 a force distributor,  
 first and second strings vibrating transversely when electrically excited, said strings being parallel to each other and each having one end fixed to the frame and the other end fixed to said force distributor,  
 an elastic guide fixed to said frame and to said force distributor so as to be under bending pre-tension for transmitting moments to said force distributor, said guide generating thereby a pre-tensioning force transmitted by said force distributor to said first and second strings,  
 a transmission element attached to said force distributor and support for transmitting to said first and second strings a force depending on the load placed on said support,  
 means for applying to the evaluation and display means

resultant frequency variations caused by the application of said forces to said strings for computation and display of the magnitude of said load,  
 said guide and said strings guiding said force distributor in a statically defined way relative to said frame with respect to said pre-tensioning force and said force depending on the load to be measured.

**4,163,387**  
**AIRCRAFT CABIN DISPLAY UNIT**  
 Rondon L. Schroeder, 1717 S. Topeka, Wichita, Kans. 67211  
 Filed Jan. 16, 1978, Ser. No. 869,482  
 Int. Cl.<sup>2</sup> G01C 21/10

U.S. Cl. 73—178 R

4 Claims

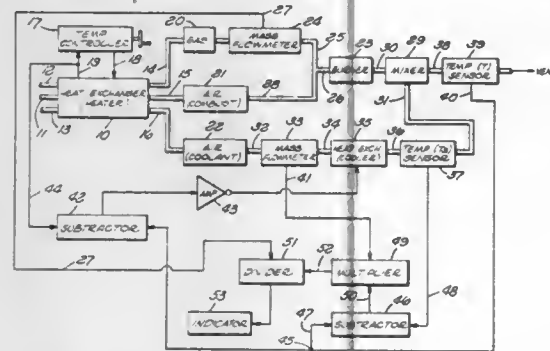


1. A cabin display unit for an aircraft having a pitot tube output and a static air pressure source;  
 a cabin display unit having first and second inputs,  
 a differential pressure transducer having said first input connected to said pitot tube output and a second input connected to said static air pressure source;  
 an absolute pressure transducer having an input connected to said static air pressure source;  
 a multiplexing means having a plurality of signal inputs, a command input and an output;  
 a first electrical signal conditioner having its input connected to the output of said differential pressure transducer, and its output connected to a signal input of said multiplexing means;  
 a second electrical signal conditioner having its input connected to an output of said absolute pressure transducer, and its output connected to a second signal input of said multiplexing means;  
 an analog to digital converter means having its input connected to the output of said multiplexing means;  
 a micro-processing unit means having its input connected to an output of said analog to digital converter means and its output connected to said cabin display unit, and having a plurality of function selector inputs and a command output connected to a command input of said multiplexing means;  
 a function selector means coupled to the inputs of said micro-processing unit for determining the particular mode of display of said display units of the air speed, temperature, and altitude of said aircraft: whereby information from said pitot static tube, and static pressure source and said temperature and altimeter, when electrically processed and applied to said micro-processing unit will have the true air speed calculated along with the altitude, temperature and other functions calculated and displayed on said cabin display unit.

4,163,388  
**CALORIMETER**  
 Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,087  
 Int. Cl.<sup>2</sup> G01K 17/00  
 U.S. Cl. 73—190 CV

6 Claims



1. A calorimeter comprising: first conduit means to carry a combustible gas, said first conduit means including a gas mass flowmeter; burner means including a combustion chamber having an inlet side; second conduit means to carry air at a flow rate approximately equal to that required to oxidize substantially all the combustible components of said gas, said first conduit means being connected to said combustion chamber on the inlet side thereof, said second conduit means also being connected to said combustion chamber inlet side; a first heater exchanger; a mixer connected from said combustion chamber; third conduit means to carry air, said third conduit means including an air mass flowmeter said first heat exchanger being actuable in a manner to maintain gas in said first conduit means and air in said second and third conduit means at the same inlet temperature  $T_2$ ; second heat exchanger having an inlet and an outlet, said third conduit means being connected to the inlet of said second heat exchanger; a first sensor connected from said second heat exchanger outlet to said mixer to produce an output signal proportional to the temperature  $T_3$  of the air entering said mixer; a second sensor for the final temperature at the output of said mixer; computer means responsive to the difference between said final temperature and said inlet temperature to drive said second heat exchanger to cool the air therein in a manner to maintain said final temperature equal to  $T_2$ ; and means responsive to the output  $W_1$  of said gas flowmeter, the output  $W_3$  said air flowmeter, and said temperature  $T_3$  and one of the other two temperatures for computing an output signal proportional to the term

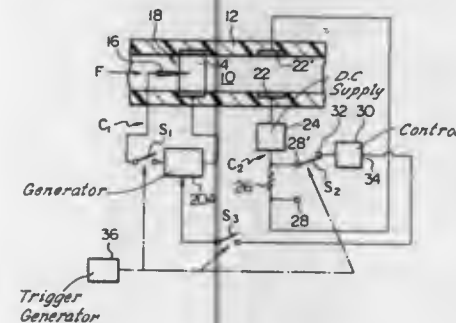
$$\frac{K_3 W_3 (T - T_3)}{W_1}$$

where  $W_1$  is the mass flow rate of the gas,  $W_3$  is the mass flow rate of the air in said third conduit means, and  $K_3$  is the specific heat of the air flowing in said third conduit means, and  $T$  is one of the temperatures  $T_1$  and  $T_2$ .

4,163,389  
**METHOD AND APPARATUS FOR ELECTRICAL MEASUREMENT OF FLUID FLOW RATE**  
 Suzuo Suzuki, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan  
 Filed Dec. 21, 1977, Ser. No. 862,983  
 Claims priority, application Japan, Dec. 23, 1976, 51/154330  
 Int. Cl.<sup>2</sup> G01F 1/64

U.S. Cl. 73—194 F 10 Claims  
 1. A method of measuring the rate of a fluid flow, comprising the steps of:

preparing a DC circuit to allow a current to flow across a flow of a fluid at a section thereof;  
 continually establishing corona discharge in another section of said flow upstream of said section to partially ionize said fluid such that a constant quantity of ions per unit volume of said fluid are formed;  
 measuring a current flowing through said DC circuit due to the presence of said ions in said fluid passing through said section;  
 temporarily stopping the establishment of said corona discharge;

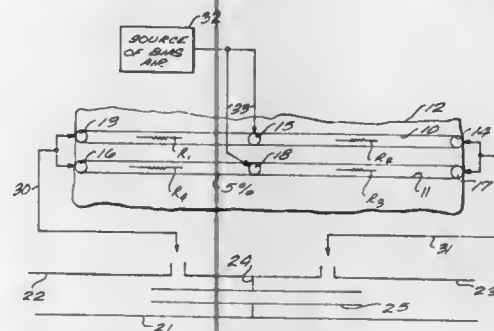


measuring a current flowing through said DC circuit while the establishment of said corona discharge is stopped thereby to detect inherent conductivity of said fluid; and adjusting at least one of (i) a voltage for establishing said corona discharge; (ii) a voltage impressed on said flow by said DC circuit and (iii) a constant of said DC circuit for detecting a current flowing therethrough such that the intensity of said current flowing through said DC circuit as the result of said corona discharge has a definite relationship with the rate of said flow irrespective of the inherent conductivity of said fluid.

4,163,390  
**BIPOLAR FLUID MEASURING APPARATUS**  
 Jerome A. Rodder, 774 Sunshine Dr., Los Altos, Calif. 94022  
 Continuation-in-part of Ser. No. 787,467, Apr. 14, 1977, abandoned. This application Jun. 23, 1977, Ser. No. 809,302  
 Int. Cl.<sup>2</sup> G01F 1/68

U.S. Cl. 73—204

4 Claims



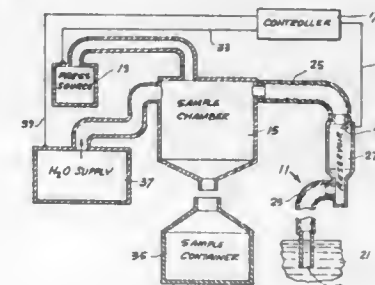
1. Fluid measuring apparatus comprising:  
 a housing having an elongated cavity enclosed on its sides;  
 a first thin elongated hot wire bent in half to extend along the length of the cavity away from a junction;  
 a second thin elongated hot wire bent in half to extend along the length of the cavity away from the junction in the same direction as the first hot wire so the first and second hot wires are side by side in the cavity;  
 first means at the junction for supporting the ends of each hot wire in spaced electrically isolated relationship from each other and connecting one end of the first and second

hot wires to each other to form in effect a first single hot wire equal in length to the first and second hot wires;  
 second means spaced along the length of the cavity from the junction for supporting the middle of the first hot wire to exert tension thereon as the length of the first hot wire changes;  
 third means spaced along the length of the cavity from the junction aside of the second supporting means for supporting the middle of the second hot wire to exert tension thereon as the length of the second hot wire changes;  
 means for forming in the housing a fluid entrance to the cavity;  
 means for forming in the housing a fluid exit from the cavity longitudinally spaced from the entrance so the hot wires lie between the entrance and the exit; and  
 means for measuring the change in resistance of the hot wires.

4,163,392  
**SAMPLER PURGE SYSTEM**  
 Richard P. Fleenor, Santa Cruz, and M. Rinley Deeds, Felton, both of Calif., assignors to Manning Environmental Corp., Santa Cruz, Calif.

Filed Oct. 2, 1978, Ser. No. 947,742  
 Int. Cl.<sup>2</sup> G01N 1/14  
 U.S. Cl. 73—421 B

7 Claims



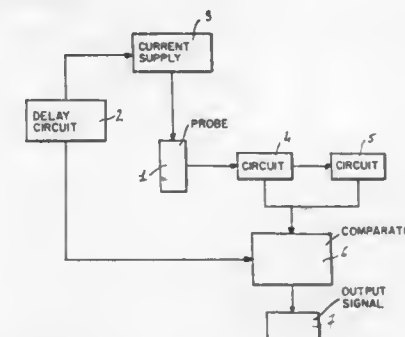
1. In a fluid sampler, an intake channel preconditioner system, comprising,  
 an intake channel having a first end communicating with a fluid to be sampled and having a second end communicating with a sample container,  
 reversible pressure means communicating with said channel for drawing said fluid up to a predetermined point in said channel and expelling fluid therefrom,  
 control means connected to said reversible pressure means including a fluid sensor disposed at a predetermined point in said intake channel between said reversible pressure means and the first end of said intake channel and producing a signal on fluid contact, said control means for causing said reversible pressure means to draw and expel fluid in said channel.

4,163,391  
**DEVICE FOR CHECKING THE LEVEL OF A LIQUID IN A TANK**

Jean-Jacques Bezard, La Garenne; Charles-Henri Jourdain, Colombes, and Bruno Lalanne, Courbevoie, all of France, assignors to Jaeger, Levallois-Perret, France  
 Filed Sep. 28, 1977, Ser. No. 837,543  
 Claims priority, application France, Oct. 6, 1976, 76 30120  
 Int. Cl.<sup>2</sup> G01F 23/10

U.S. Cl. 73—295

10 Claims

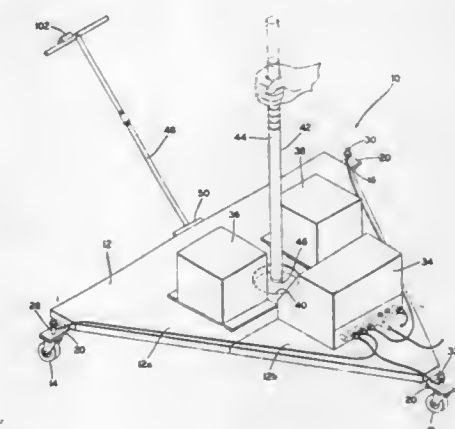


1. Apparatus for monitoring the level of a liquid in a tank, comprising:  
 an electrical resistance probe having a resistance value which increases with temperature, said probe arranged to be immersed to a level dependent upon the liquid level in said tank such that, when said probe is supplied with a constant current, the temperature and the resistance of said probe increase in dependence on the amount of said probe which is immersed;  
 means energizable for supplying a constant current through said probe to produce a voltage across said probe dependent on the temperature of said probe; and  
 means for comparing the initial voltage across said probe upon energization of said constant current supplying means with the voltage across said probe at a predetermined time after energization of said constant current supplying means, and for providing an indication dependent on said comparison, said indication being representative of the liquid level in said tank and being substantially independent of ambient temperature.

4,163,393  
**VOID DETECTOR SYSTEM**  
 Manuel Gutierrez, Golden, and Phillip F. Enger, Arvada, both of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.  
 Filed Aug. 4, 1978, Ser. No. 931,069  
 Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—584

24 Claims



1. An apparatus for non-destructively testing concrete, comprising:  
 a platform;  
 first, second and third vibration receiving transducers on said platform defining the corners of an equilateral triangle, said transducers being mechanically coupled to the concrete being tested and generating vibration responsive electrical signals;



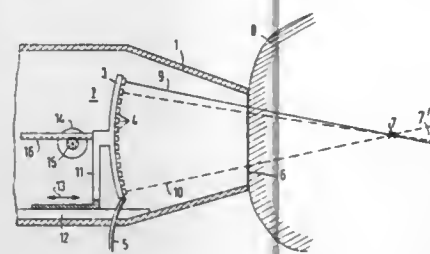
means for imparting vibration to the concrete at a position equispaced from said transducers; and means responsive to said electrical signals for indicating a condition of the concrete within an area bounded by said transducers.

**4,163,394**  
**METHOD OF ULTRASONIC SCANNING OF BODIES**  
Richard E. Soldner, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 10, 1976, Ser. No. 694,608  
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529112

Int. Cl.<sup>2</sup> A61B 10/00  
U.S. Cl. 73—626

2 Claims



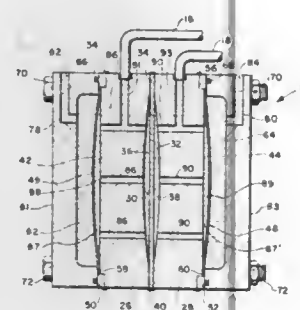
1. The method of scanning internal body regions accessible through narrow acoustic apertures, which comprises: sequentially directing ultrasonic beams from successive directions toward substantially a common point of convergence at a narrow acoustic aperture within the body such that the beams extend through the acoustic aperture and then diverge along successive scan lines forming a sector scanning configuration within an internal body region beyond the acoustic aperture, and predominantly utilizing ultrasonic echo signals produced in the sector scanning configuration beyond the point of convergence so as to predominantly provide an ultrasonic echo sectional view of the internal body region beyond such acoustic aperture.

**4,163,395**  
**PRESSURE TRANSMITTER WITH SIMPLIFIED PRESSURE SENSING HEAD**  
Lewis A. Medlar, Orelan, and William F. Newbold, Philadelphia, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 682,316, May 3, 1976, abandoned. This application Sep. 29, 1977, Ser. No. 837,714

Int. Cl.<sup>2</sup> G01L 7/08, 19/04  
U.S. Cl. 73—708

15 Claims



1. A pressure sensing head comprising head structure having a substantially flat back-up surface, a substantially flat, deformable barrier diaphragm of a preselected stiffness having first and second faces and a peripheral edge which is sealed to said surface so that said first face faces said surface,

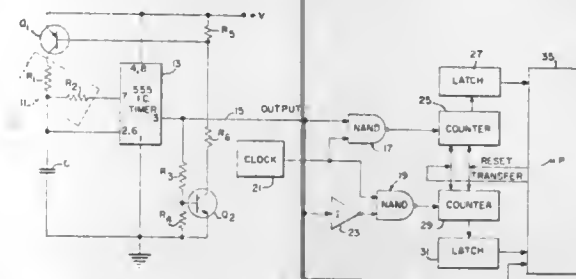
means for applying a fluid pressure force to said second face which is representative of a fluid pressure to be sensed, said surface physically matching said first face sufficiently to fully back up and support said diaphragm and prevent its deleterious deformation in the presence of values of said fluid pressure force which force said diaphragm to bottom-out against said surface, a first fluid chamber of expansible volume having fluid communication with said first face, and a preselected quantity of a substantially incompressible fill fluid completely filling said first chamber and exerting a deforming force on said first face which deforms and bows-out said diaphragm away from said surface into a dome shape to form a second fluid chamber between said first face and said surface which is completely filled with said fluid, said diaphragm stiffness and said fill fluid quantity, and hence said deforming force, being preselected, in the absence of said fluid pressure force on said second face, to cause said deforming force normally to bow-out said diaphragm by a preselected amount to a normal bowed-out position for which the traversal of said fluid pressure force throughout its normal operating range deflects said diaphragm about its said normal bowed-out position to only that extent which causes said diaphragm to deflect without oil canning, and thus to deflect with only an essentially continuous, uniform, unvarying, and consistent deflection vs. pressure characteristic, whereby the pressure of said fill fluid is consistently representative of said fluid pressure to be sensed throughout said normal operating range.

**4,163,396**  
**DIGITAL READOUT PRESSURE SENSOR**  
John B. S. Waugh, Mountain Lakes, N.J., assignor to The Singer Company, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,593  
Int. Cl.<sup>2</sup> G01L 9/06

U.S. Cl. 73—721

13 Claims



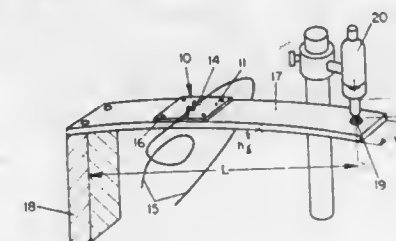
1. A digital pressure transducer comprising; a timing circuit having an output including a first level and a second level, a first resistive element  $R_1$  coupled to said timing circuit with the magnitude of at least said resistive element  $R_1$  determining the time duration  $T_1$  of said first level, a second resistive element  $R_2$  coupled to said timing circuit with the magnitude of at least the resistive element  $R_2$  determining the time duration  $T_2$  of said second level, and a pressure transducer including said first and second resistive elements  $R_1$  and  $R_2$ ; said first and second resistive elements  $R_1$  and  $R_2$  incorporated in said transducer in such a manner that a change of pressure  $P$  increases the resistance of the first resistive element  $R_1$  to increase the time duration  $T_1$  of said first level and decreases the resistance of the second resistor element  $R_2$  to decrease the time duration  $T_2$  of said second level;

the ratio  $r$  of the time duration of the first and second levels being indicative of the pressure  $P$  at the transducer.

**4,163,397**  
**OPTICAL STRAIN GAUGE**  
Alan L. Harmer, Geneva, Switzerland, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Oct. 31, 1977, Ser. No. 846,799  
Claims priority, application United Kingdom, Jul. 27, 1977, 31643/77

Int. Cl.<sup>2</sup> G01N 3/00  
U.S. Cl. 73—800



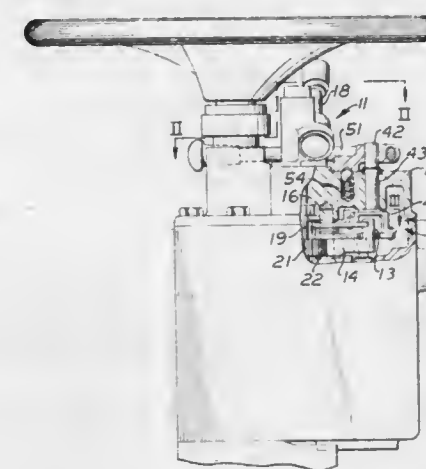
1. Apparatus for measuring strain in a solid object, comprising a curved light guiding structure comprised of a first medium surrounded by a second medium of lower refractive index than that of the first medium, means for injecting light into the structure and means for analyzing the change in the modal propagation characteristics of the light emerging from the structure, means for attaching the light guiding structure to a solid object in such a way that in use, stresses acting upon the object are translated into changes in the curvature of the structure creating changes in the modal propagation of the injected light.

**4,163,398**  
**TRANSMISSION SHIFT CONTROL LOCK ASSEMBLY**  
James E. Johnston, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 9, 1978, Ser. No. 878,125  
Int. Cl.<sup>2</sup> G05G 5/06; B60K 28/00

U.S. Cl. 74—483 K

7 Claims



1. A transmission shift control lock assembly for a transmission shift control having a support structure and a member pivotally connected to the support structure, said member being movable in an arcuate pathway between first and second positions at which the transmission is in forward and reverse drive conditions respectively, said member having an intermediate position at which the transmission is in neutral, comprising: first and second levers pivotally connected to the support structure and positioned on opposite sides of said member,

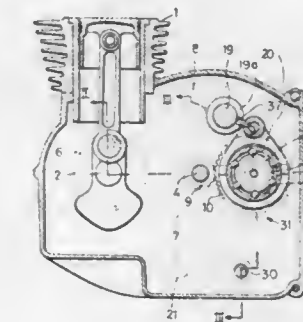
said levers being movable between a first lever position at which the member is free to move between said first and second positions and a second lever position at which the levers are contacting and maintaining the member at said intermediate position; and means for moving said first and second levers between said first and second lever positions.

**4,163,399**  
**POWER TRANSMISSION WITH PARALLEL CRANKSHAFT, INPUT SHAFT AND OUTPUT SHAFT**  
Youji Yamada, Kawagoe; Kunio Miyazaki, Oi, and Masumi Hamane, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 805,166  
Claims priority, application Japan, Jun. 18, 1976, 51-78964[U]

Int. Cl.<sup>2</sup> F16H 37/08  
U.S. Cl. 74—700

9 Claims



1. Power transmission apparatus comprising an internal combustion engine having a crank shaft, a speed-change mechanism having an input shaft and an output shaft, said crank shaft, said input shaft and said output shaft being mounted in three parallel rows, a torque converter disposed at an end portion of said input shaft and drivingly coupled thereto, two axially spaced gears rotatably mounted on said output shaft and driven in rotation from said input shaft, a shift member mounted on said output shaft between said two gears, a shift drum and a guide shaft extending parallel to said output shaft, a shift fork axially movable on said guide shaft and in engagement with said shift member and said shift drum to effect relative axial displacement of said shift member on said output shaft towards said gears and dog clutch means between said shift member and each of said two gears for engaging the same in rotation upon relative axial displacement of said shift member.

**4,163,400**  
**THRUST WASHER CONSTRUCTION FOR DIFFERENTIAL**  
William F. Fisher, and Paul C. Rosenberger, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

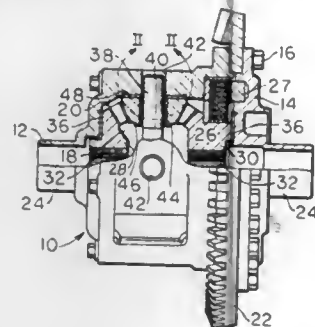
Filed Jun. 13, 1977, Ser. No. 806,046

Int. Cl.<sup>2</sup> F16H 1/38  
U.S. Cl. 74—710

2 Claims

1. A differential comprising: a housing having an internal surface defining a chamber; a drive gear secured to said housing externally thereof; a pair of side gears within said housing; a spider within said housing and between said side gears and extending into said housing at spaced locations on said internal surface; pinions journaled on and carried by said spider within said housing and engaged with said side gears; a noncircular recess in said internal surface adjacent at least one of said side gears and said pinions; and a noncircular thrust washer interposed between said internal surface and the one of said side gears and said pinions, said

washer being sized and shaped to be snugly received within said recess and abut the sides thereof over a substantial distance to fix the washer against rotation; said recess having parallel sides and a flat bottom, said bot-



tom being grooved immediately adjacent said sides, said washer having two parallel sides abutting said recess sides and overlying the adjacent groove, whereby said grooves permit said recess to be formed by broaching and thus eliminate the need for chamfering said washer.

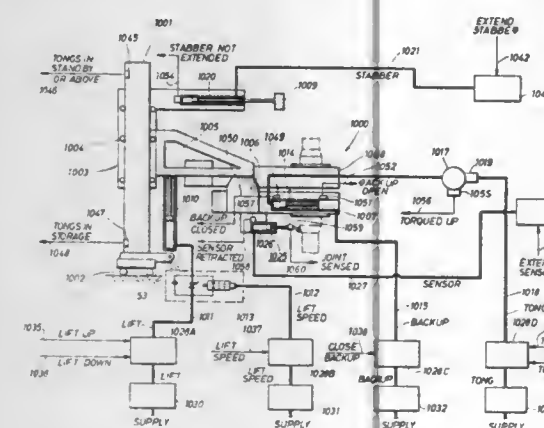
#### 4,163,401 ELECTRO-HYDRAULIC INTERFACE FOR A POWER TONGS

Loren B. Sheldon, and Robert R. Kelly, both of Houston, Tex., assignors to B. J. Hughes Inc., Houston, Tex.

Filed Mar. 15, 1977, Ser. No. 777,672  
Int. Cl.<sup>2</sup> B25B 13/50

U.S. Cl. 81—57.34

4 Claims



4. In a power driven tongs including a backup tong and a driven tong, each of the tongs operatively connected to a line for the supply of pressurized fluid thereto, each line having a manually operable valve for controlling the flow of fluid to the tong to which the line is connected, an electro-hydraulic interface module for each line comprising:

an electrically responsive solenoid valve connected in parallel to the manually operable valve;

means for selectively enabling the electrically responsive valve and simultaneously disabling the manually operable valve, the means including first and second electrically responsive select valves respectively connected to the manually operable valve and to the electrically responsive solenoid valve, the select valves being isolated against communication therebetween; and

means for simultaneously energizing the first and the second select valves to simultaneously disable the flow control capability of the manually operable valve and enable the flow control capability of the electrically responsive valve to thereby render the fluid flow in the line susceptible to

control by the electrically responsive solenoid valve in response to a predetermined electrical signal.

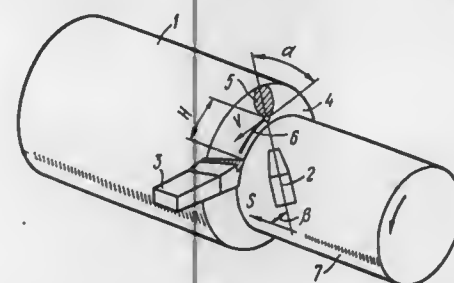
#### 4,163,402 METHOD OF MACHINING WORKPIECES AFTER PREHEATING

David G. Bykhovsky, ulitsa Esenina, 32, korpus 2, kv. 95, Leningrad; Konstantin P. Alexeev, ulitsa Truda, 15/5, kv. 16, Kolpino Leningradskoi oblasti; Viktor S. Kunin, Lesnoi proezd, 34/36, kv. 80; Valery M. Vassin, ulitsa Michurinskaya, 1, kv. 132, both of Leningrad; Valentin N. Nesterov, ulitsa Proletarskaya, 93, kv. 28; Vladimir A. Alexandrov, ulitsa Zapadnaya, 14, kv. 35, both of Kolpino Leningradskoi oblasti, and Eduard R. Fomin, ulitsa Engelsa, 38, kv. 44, Zhdanov Donetskoi oblasti, all of U.S.S.R.

Filed Mar. 23, 1978, Ser. No. 889,569  
Int. Cl.<sup>2</sup> B23B 3/00; B23C 1/00, 9/00

U.S. Cl. 82—1 C

4 Claims



1. A method of machining a workpiece after preheating, comprising

positioning of a plasma torch ahead of a tool so that the angle between the direction of cutting speed and the axis of plasma jet of said plasma torch is up to 45 deg., and the angle between the direction of feed of said tool and the axis of plasma jet of said plasma torch ranges from 10 to 45 deg.;

heating and notching the workpiece material on the surface of cutting thereof to form a groove under the action of the plasma jet of said plasma torch; and removing by said cutting tool the material of said workpiece, subjected to the action of plasma jet.

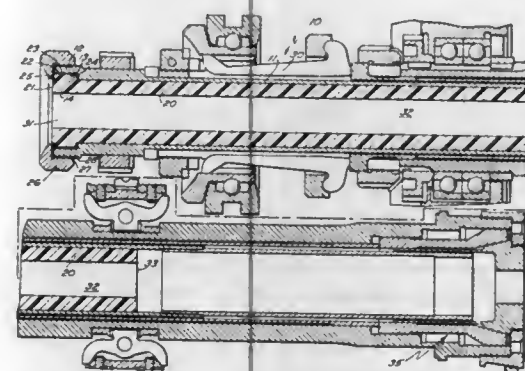
#### 4,163,403 FEED TUBE BUSHING

William Argereu, Hickory Dr., North Scituate, R.I. 02857

Filed Apr. 27, 1978, Ser. No. 900,430  
Int. Cl.<sup>2</sup> B23B 25/00

U.S. Cl. 82—38 A

4 Claims



1. In combination with a machine having a tool operating upon a bar from which the work is formed including a tube through which the bar is fed, a chuck for gripping the bar, a non metallic resilient member of a length greater than half the

length of the tube within and fitting the inner diameter of the tube, said tube having an enlarged entrance opening at one end forming a shoulder spaced inwardly from said entrance end, said member having an enlarged head, a collar fixed on said head at said entrance end with its inner edge engaging said shoulder and a cap on the entrance end of said tube engaging the outer end of said collar to hold said member against said shoulder fixed in said tube.

#### 4,163,404 POWER SAWS

Leon J. Lavis, 30 Elkin Ave., Heatherbrae, New South Wales, 2324, Australia

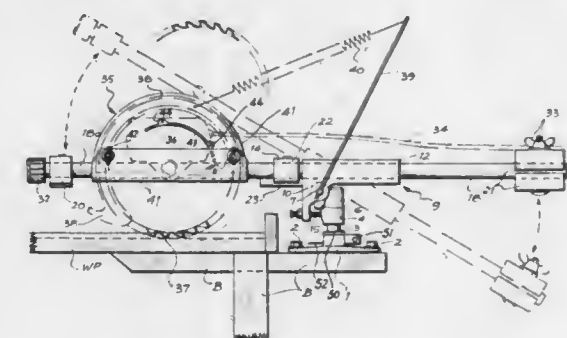
Filed Apr. 11, 1978, Ser. No. 895,479

Claims priority, application Australia, Apr. 12, 1977, PC9717

Int. Cl.<sup>2</sup> B27B 9/04

U.S. Cl. 83—165

11 Claims



1. Mounting means for operably mounting a power saw upon a base support; wherein the power saw includes an assembly of a driving motor, a saw blade mounted on the motor shaft, guard means for the saw blade, and a base plate supporting the power saw assembly; said mounting means comprising: a power saw supporting cradle mounted upon a pedestal adapted to be secured to the base support, said cradle being rotatable in a horizontal plane and tiltable in a vertical plane on said pedestal; said cradle including slide bars supported upon the pedestal and projecting through opposite side of said pedestal, and clamps supported on the slide bars, said clamps being adapted to clamp the power saw base therebetween; one said slide bar being longer than the other whereby it has a limb extending beyond the pedestal a greater distance than the other slide bar on one side of said pedestal, both said slide bars projecting substantially the same distance on the opposite side of said pedestal depending upon the length of said base plate; one said clamp being mounted upon the limb and the other said clamp being fixed on the slide bars on said one side of the pedestal; whereby said power saw assembly when secured between the clamps in one position can be raised, lowered and traversed by the cradle across a work piece for performing a plurality of functions on said work piece; and whereby the power saw assembly can be moved through 180° to an inverted position relative to said work piece for performing an additional function on said work piece, by removing and inverting said cradle in said pedestal.

#### 4,163,405 PAPER FEED CONTROL FOR AUTOMATIC PHOTOGRAPHIC PAPER CUTTER

Robert E. Diesch, Rogers, and Gerald R. Strunc, Maple Grove, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

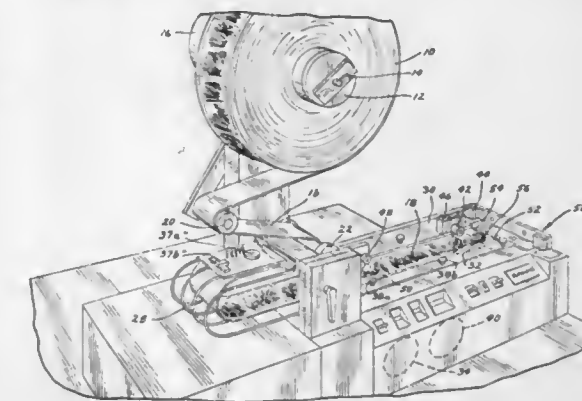
Filed Sep. 29, 1977, Ser. No. 838,000  
Int. Cl.<sup>2</sup> B26D 5/34, 7/06

U.S. Cl. 83—371

9 Claims

1. A photographic paper cutter comprising: stepper motor means for advancing the photographic paper in steps;

knife means for cutting the photographic paper; indicia sensing means for sensing indicia on the photographic paper indicative of desired locations of paper cuts and producing a cut signal when an indicium is sensed, the indicia sensing means being positioned in fixed relationship with respect to the knife means at a distance less than the shortest length of photographic paper to be cut; means for producing a feed length signal indicative of the number of steps the photographic paper is advanced from one indicium to another indicium; means for producing a signal indicative of the number of steps the paper is advanced between a desired location of a paper cut and an indicium;



feed-after-sense signal means for deriving a feed-after-sense signal from the feed length signal and the signal indicative of the number of steps the paper is advanced between a desired location of a paper cut and an indicium, wherein the feed-after-sense signal is a digital signal indicative of the number of steps the photographic paper must be advanced after a cut signal is received in order to align the desired location of paper cut associated with the sensed indicium with the knife means; and

means for controlling operation of the stepper motor means as a function of the feed-after-sense signal and the cut signal to cause the stepper motor means to advance the photographic paper until an indicium is sensed and then advance the paper an additional distance determined by the feed-after-sense signal.

#### 4,163,406 CENTERING DEVICE FOR FEEDING ARTICLES TO A FOOD SLICER

Lynn D. Crawford, San Jose, Calif., assignor to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert M. Magnuson, Lois J. Thomson, Trustees of the Estate of Roy M. Magnus, all of, Calif.

Filed Dec. 15, 1977, Ser. No. 860,865  
Int. Cl.<sup>2</sup> B26D 7/06

U.S. Cl. 83—424

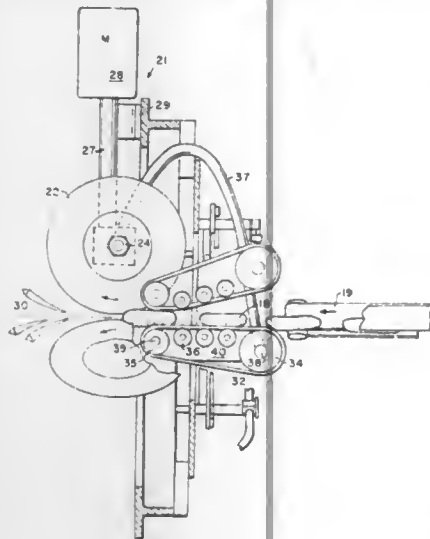
6 Claims

1. A feed apparatus for use with a slicer having a plurality of power rotated blade assemblies mounted to converge on a common center line and segment articles fed along the center line at the infeed side of said blade assemblies, comprising in combination:

a plurality of feed belts held on spaced pulleys; support means for each of said pulleys mounting each belt with an inward portion extending adjacent said center line at the infeed side of the blade assemblies and the remainder of each said belt extending radially outward therefrom; a linkage assembly connecting said support means for moving each support means in unison substantially in a radially extending plane passing through said center line; bias means for biasing said support means towards the center line; and



drive means including a flexible drive shaft connecting a power rotated blade assembly with a feed belt for rotating each belt about the supporting spaced pulleys in a direction to carry articles contacting the inward belt portion



towards the blade assemblies whereby the articles will be held between the belts and the belt support means will be moved radially outward by contact with the article to center the article on the center line of the blade assemblies

4,163,407

## PROGRAMMABLE RHYTHM UNIT

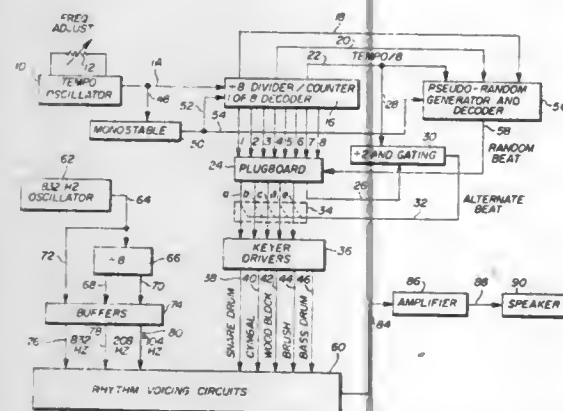
Peter E. Solender, Williamsville, N.Y., assignor to The Wurliitzer Company, DeKalb, Ill.

Filed Jan. 17, 1977, Ser. No. 759,822

Int. Cl.<sup>2</sup> G10F 1/00; G10H 1/02

U.S. Cl. 84-1.03

14 Claims



1. A programmable rhythm unit comprising: oscillator means for providing a continuous chain of pulses at a predetermined frequency, circuit means connected to said oscillator means for sequentially and repeatedly arranging said pulses in groups of an equal and predetermined number of pulses corresponding to repeating measures having an equal and predetermined number of beats per measure, said circuit means including a plurality of output lines for receiving said pulses to establish fixed beat positions in each measure, a plurality of rhythm voice input lines, a programmable array means for selectively transferring said pulse from selected ones of said output lines to selected ones of said plurality of rhythm voice input lines, pseudo-random pulse means connected to said circuit means and to said programmable array means for providing a random pulse at a predetermined beat position in each group corresponding to a random beat per measure, said programmable

array means including means selectively to transfer said random beat to selected ones of said rhythm voice input lines, to establish a programmed rhythm pattern at said rhythm voice input lines, keyer driver circuit means connected to said rhythm voice input lines, audio signal generator means, and rhythm voicing circuit means connected to said keyer driver circuit means and to said audio signal generator means for simulating the audio output of a plurality of rhythm instruments in accordance with said programmed rhythm pattern.

4,163,408

## MUSICAL TUNING DEVICE

Philip S. Capano, 2785 Sedgwick Ave., Bronx, N.Y. 10468, and

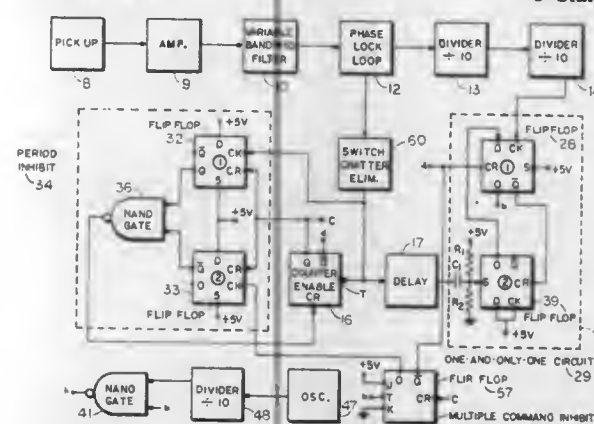
David Capano, 79 Lake Ave., Saratoga Springs, N.Y. 12866

Filed Oct. 7, 1976, Ser. No. 730,754

Int. Cl.<sup>2</sup> G10G 7/02

U.S. Cl. 84-454

3 Claims



1. A tuning device for use in tuning a musical instrument, comprising: sensing means operable for sensing a first electrical signal having a certain frequency bandwidth and corresponding to an acoustical musical note produced by said musical instrument;

frequency decoding means coupled to said sensing means and operable for

(1) producing a second signal when said first signal lies within a predetermined frequency and amplitude detection range, and

(2) producing a third signal by transforming the said first signal into a digital pulse train having a period equal to the fundamental period of the said first signal;

synchronizing means coupled to said frequency decoding means and operable for producing, upon the random occurrence of the said second signal and, by synchronization to the said third signal, a precise time gate signal equal in duration to a predetermined number of periods of the said third signal;

generating means, comprised of monolithic, semiconducting, read-only-memories (ROM's) and operable for producing a digital reference number representative of a selected musical note for tuning said musical instrument;

tuning tolerance means operable for converting a variable, user-selected potentiometer setting into a digital tolerance number representative of the limits, about perfect pitch, within which, the said first signal, after processing by the means herein claimed, is determined to be in tune;

digital processing means coupled to said generating means, said synchronizing means, and said tuning tolerance means and comprised of:

a digital pulse generator operable for producing pulse signals, gating means coupled to said pulse generator and said synchronizing means and operable for producing a truncated pulse train by passing said pulse signals for the duration of the said time gate signal produced by said synchronizing means, down/up counting means coupled to said gating means and

said generating means and operable for producing a residual digital count by causing each pulse of the pulse train produced by the said gating means to exhaustively decrement a down/up counter which has been pre-loaded to the said digital reference number of said generating means, with the condition that, should the counter decrement through zero, each subsequent, remaining pulse of the pulse train, now exhaustively increments the said counter,

magnitude comparing means coupled to said down/up counting means and said tuning tolerance means and operable for comparing the said residual digital count produced by said down/up counting means and the said digital tolerance number produced by said tuning tolerance means to produce (1) an "in tune" signal whenever the said residual digital count is numerically less than, or equal to, the said digital tolerance number, or

(2) a "flat" signal whenever the said residual count is numerically greater than the said digital tolerance number and the said down/up counter has decremented through zero, or

(3) a "sharp" signal whenever the said residual digital count is numerically greater than the said digital tolerance number and the said down/up counter has not decremented through zero,

said digital processing means processing the said digital reference number by a counting action, under the control of the said time gate signal and, by numerical comparison with the said digital tolerance number, produces a one-of-three signal;

displaying means configured as three vertically aligned light emitting diodes (LED's), coupled to said digital processing means and operable to

(1) illuminate the center LED whenever the said digital processing means produces an "in tune" signal, or

(2) illuminate the lower LED whenever the said digital processing means produces a "flat" signal, or

(3) illuminate the upper LED whenever the said digital processing means produces a "sharp" signal;

monitoring means coupled to said frequency decoding means, said synchronizing means, and said displaying means and operable for producing, should the said second signal terminate prior to the completion of the said time gate signal,

(1) a fourth signal, and

(2) a blanking signal to, and causing, said displaying means to extinguish any illuminated LED;

initialization means coupled to said monitoring means, said tuning tolerance means, and said digital processing means and operable to initialize and "restart" these stated means whenever said monitoring means produces the said fourth signal.

4,163,409

## OPTICAL METRONOMES

David O. Rumer, Jr., Rockford; Donald J. Findlay, Wheeling; Arthur E. Neumann, Winnetka, all of Ill., and Juan M. del Castillo, Risco No. 119, Mexico City, Mexico (20), assignors to Juan M. del Castillo, Mexico City, Mexico

Division of Ser. No. 722,283, Sep. 10, 1976, Pat. No. 4,082,029.

This application Dec. 9, 1977, Ser. No. 859,501

Int. Cl.<sup>2</sup> G04F 5/02

U.S. Cl. 84-484

3 Claims

1. An optical metronome for designating visually notes of music to be played, comprising:

display panel means for sequentially illuminating the notes to be played in relation to the timing designated for the musical notation,

a sheet of music with the musical notation thereon located for sequential illumination by said display panel means,

said display panel means including:

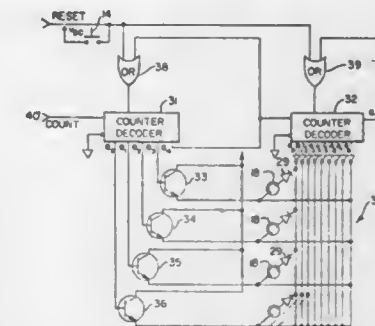
first and second counter decoder means,

said first counter decoder means having a plurality of output lines, one each of which is activated at a time, said output

lines being sequentially activated by tempo or count pulses,

said first counter decoder means having control output line means activated by said tempo or count pulse in sequence after the last of a sequence of activated output lines of said first counter decoder means,

said second counter decoder means having a plurality of output lines, one each of which is activated at a time, and which are sequentially activated by an output from said control line means of said first counter decoder means, said second counter decoder means having control line means activated in sequence after the last of a sequence of



activated output lines of said second counter decoder means,

a matrix of light sources for illuminating said notes, each of said light sources having one terminal connected to one of said plurality of output lines of said first counter decoder means and another terminal connected to one of said plurality of output lines of said second counter decoder means, each of said light sources being activated when its associated output lines are simultaneously activated, and OR gate means connected to said control lines to repeat the sequencing of the plurality of output lines of both said first and second counter decoder means.

4,163,410

## SHELL RELOADING MACHINE

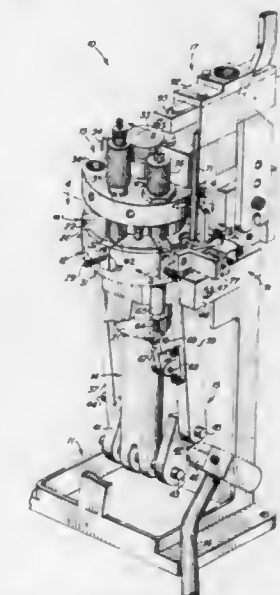
Michael J. Dillon, 7021 E. Paradise Dr., Scottsdale, Ariz. 85254

Filed Nov. 7, 1977, Ser. No. 848,985

Int. Cl.<sup>2</sup> F42B 33/02

U.S. Cl. 86-23

7 Claims



1. A shell reloading machine comprising in combination: a table,

a shell registering plate revolvably mounted thereon and adapted to carry a plurality of shells, a support mounted above said table and plate, a plurality of tools mounted on said support one at each of a plurality of work stations for preparing and reloading shells depending from said plate and arranged in a circle so as to register with a plurality of shells held by said plate, said tools sequentially comprising at each of said work stations a sizing die for reshaping the shells' outer walls and dislodging the spent primer from a primer cavity in the shell, a swaging tool assembly, primer insertion tool for inserting a new primer in the primer cavity of the shell, a powder dispenser and a bullet positioner and securing element, lever means for rotating said plate to sequentially cause registration of each of the shells held by said plate with each of said tools at each of said work stations, said lever means being mounted below said plate and comprising indexing means for engaging said plate for sequentially moving said plate from registration with one tool to registration at the next position with another tool with each predetermined movement of said lever means, means coupled to said lever arm for simultaneously moving each of said tools into registry with a shell held by said plate at each work station during predetermined movement of said lever arm, said swaging tool assembly enveloping and pressing downwardly against the associated shell when moved into registry therewith, and a ram coupled to and actuated by said lever arm for moving into the primer cavity of the shell enveloped by said swaging tool assembly in a direction opposite to the movement of said swaging tool assembly for removing any of its crimped edges.

4,163,411

## BREECH CLOSURE MECHANISM

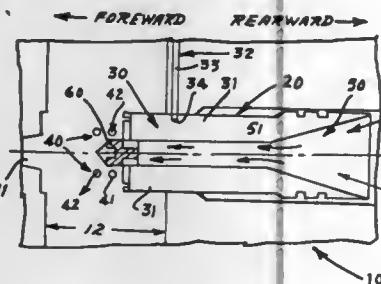
Robert N. Teng, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 29, 1977, Ser. No. 865,467

Int. Cl.<sup>2</sup> F41F 1/00

U.S. Cl. 89—1 H

6 Claims



1. A breech closure mechanism for a model launcher gun having a launch tube and a breech to the rear of said launch tube, comprising:

- means for releasably holding a model to be launched by firing said gun, wherein said means includes a slidably movable collar disposed to the rear of said launch tube and in said breech;
- means for heating said releasably held model to a preselected temperature, with said heating means operatively associated with said releasable holding means and removably positioned in said breech;
- and, means for propelling said releasable holding means, and said heated and releasably held model, to said launch tube, with said propelling means operatively associated with said releasable holding means and disposed to the rear of said slidably movable collar of said releasable holding means; whereby said breech is closed, and whereby said heated

model is inserted into said launch tube and is released therein by said releasable holding means, and also whereby said gun is then fired, thereby launching said heated model without any significant cooling thereof.

4,163,412

## FLUID CYLINDER CONTROL WITH PRECISION STOP ACTION

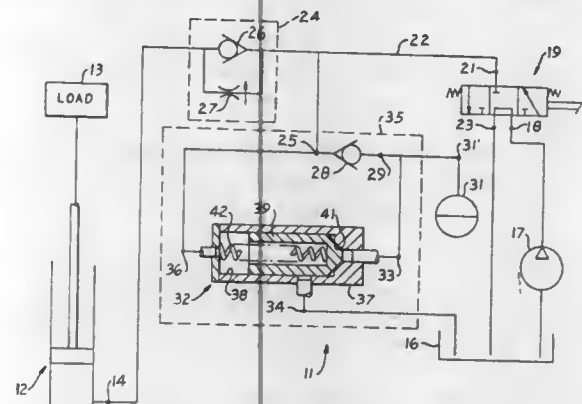
Ralph D. Porter, Euclid, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Oct. 3, 1977, Ser. No. 839,053

Int. Cl.<sup>2</sup> F15B 13/042

U.S. Cl. 91—451

6 Claims



1. A control system for a fluid-operated device comprising: a fluid reservoir and a pump for pressurizing fluid therefrom, means forming a pressurized fluid supply passage for supplying fluid to a fluid operated device,

a control valve having an inlet communicated with said pump and having an outlet communicated with said supply passage and having a drain port communicated with said reservoir, said control valve having at least one open position for transmitting pressurized fluid from said pump to said supply passage and at least one position for transmitting fluid from said supply passage to said drain port, and having at least one closed position at which said supply passage is blocked,

an accumulator, and accumulator control means having first means for communicating said supply passage with said accumulator when the pressure in said supply passage exceeds the pressure in said accumulator and for isolating said accumulator from said supply passage while second means relieves excess accumulator pressure to said reservoir during reversed relative pressure conditions, said first and second means each being responsive to pressure differentials between said supply passage and said accumulator.

4,163,413

## VEHICLE CONTROL SYSTEM

Robert B. Kennicutt, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 9, 1978, Ser. No. 878,123

Int. Cl.<sup>2</sup> F15B 13/06, 13/09

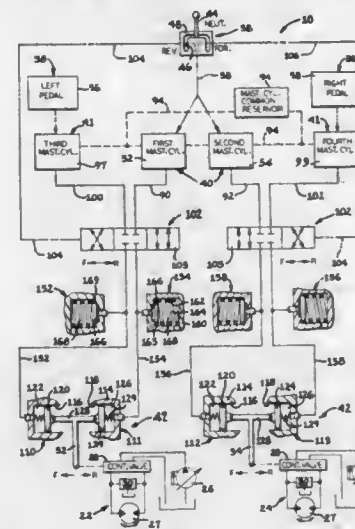
U.S. Cl. 91—521

20 Claims

1. A vehicle control system for controlling first and second drive transmission assemblies each having a control element for selectively controlling forward and reverse operation of a respective transmission assembly, each of said control elements being associated with a respective control valve, the control system comprising:

slave cylinder means for individually moving said control elements;

master cylinder means for controlling operation of said slave cylinder means; first control means for selectively controlling said control elements through said master cylinder means and operat-



ing said transmission assemblies at substantially the same speed and direction; and second control means for controllably altering the controlling of at least one of said control elements by said first control means.

4,163,414

## METHOD OF ERECTING FLAT FOLDED CASES

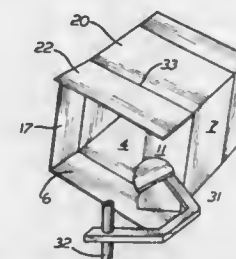
Joseph L. Bachman, Jr.; George E. Ginther, Sr., both of King of Prussia, and A. David Johnson, Jr., Radnor, all of Pa., assignors to Wayne Automation Corp., Bridgeport, Pa.

Filed Feb. 23, 1977, Ser. No. 771,166

Int. Cl.<sup>2</sup> B31B 1/76

U.S. Cl. 93—53 M

5 Claims



1. In a method of erecting a flat folded case one face of which has a first side panel including a bottom outside flap and a second adjacent side panel including a bottom inside flap and the opposite face of which has a third side panel including a bottom inside flap and a fourth side panel including a bottom outside flap, the steps of:

orienting said case with the plane of the case extending substantially vertically in a take-down plane and with the first side panel and its bottom outside flap being disposed above the second side panel and its bottom inside flap and with the score line between the first and second side panels extending substantially horizontally; moving said first side panel and its bottom outside flap from said vertical orientation downwardly in an arc so the first side panel is in a horizontal orientation and performing said motion so that the score line moves down along an arc of a circle and at the same time causing the second side panel and its bottom inside flap to rotate about said score line toward the first panel so that the second side panel and flap extend at an obtuse angle to the first side panel

when the same is in said horizontal orientation whereby the case is partially erected; and while the panels are in said obtuse orientation, holding said first side panel relatively fixed while permitting the other panels to relatively move and causing said obtuse angles to decrease respectively to substantially 90° whereby the case is fully erected.

4,163,415

## VENTILATION DEVICE

Rene E. Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, France

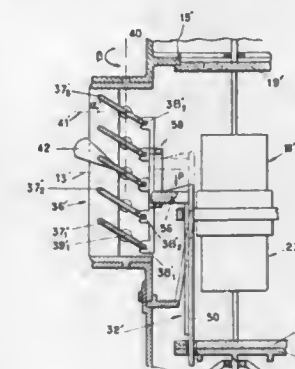
Filed Jul. 11, 1977, Ser. No. 814,630

Claims priority, application France, Jul. 12, 1976, 76 21342

Int. Cl.<sup>2</sup> B60H 1/00; F24F 13/04

U.S. Cl. 98—2.09

13 Claims



5. An air ventilation device comprising:

a feed for introducing warm air; a feed for introducing fresh air; movable air distribution means for distributing the air coming from said feeds in a direction which depends from the position of said movable air distribution means; first means for controlling said feeds to said air distribution means; and transmission means for connecting said first means to said air distribution means such that when said first means is in a first position corresponding to the introduction of warm air, said air distribution means is locked into a single position and cannot be displaced significantly and when said first means is in a position different from the first, corresponding to the introduction of fresh air, said air distribution means is free to move in at least one direction and is adapted to be hand controlled.

4,163,416

## SLOTTED OUTLET FOR THE VENTILATION OF INTERIOR SPACES

Hermann Kurrle, and Gottfried Müller, both of Kolbingen, Fed. Rep. of Germany, assignors to Schako Metallwarenfabrik Ferdinand Schäd GmbH, Kolbingen, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,867

Int. Cl.<sup>2</sup> F24F 13/06, 13/08

U.S. Cl. 98—40 R

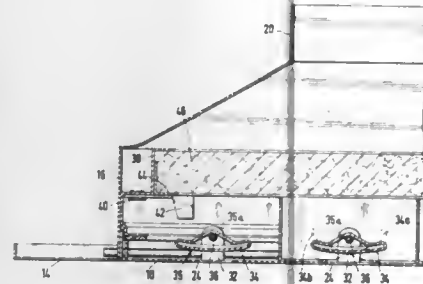
12 Claims

1. A slotted air outlet for the delivery of air into an interior space, adapted for connection to an air delivery passage, and mounted in a surface having an opening defined by the outlet comprising, in combination:

a face plate hinged to a frame, at least one elongated slot-type opening on said face plate, at least two stands fastened to said face plate on its side closest to the air delivery passage oriented parallel with each other and disposed at opposed extremities of said slot-type opening along the elongated extent thereof, a shaft supported on and extending between said stands, a tube surrounding said shaft, and a lamina fastened to said



tube said lamina being wider than the width of said slot type opening; whereby when said lamina is rotated, said tube rotates therewith and the lamina is held by friction between said tube and said shaft and said lamina causes air received from the air delivery passageway to be redirected through said



slotted opening at angles dependent upon the orientation of said lamina and wherein said slotted opening is provided with a third stand disposed in the same sense as and between said two stands and said tube and lamina are interrupted at said third stand so each lamina portion on either side of said third stand can be independently oriented.

#### 4,163,417 MASH AND WORT TUB

Alfons Wolfseder, Freising, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

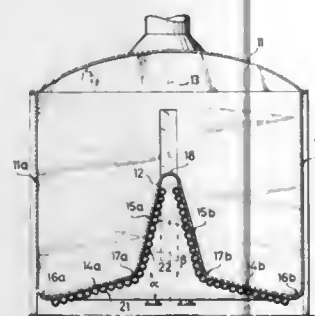
Filed Jul. 22, 1977, Ser. No. 818,148

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633281; Jun. 7, 1977, 2725758

Int. Cl.<sup>2</sup> C12H 1/00

U.S. Cl. 99—277.2

11 Claims



1. A mash and wort tub of approximately rectangular shape comprising a bottom wall and four approximately upright side walls, said bottom wall being inclined upwardly from adjacent opposite ones of the side walls toward the central portion of said tub, with the angle of incline increased at the central portion of said tub, and heating means for heating the inclined bottom wall from below said inclined bottom wall, whereby a spouting type boiling action is created in the liquid contained in the tub.

#### 4,163,418 COOKING APPARATUS

Keith Thelander, Manly West, Australia, assignor to Multimould Enterprises Pty. Ltd., Wynnum Central, Australia

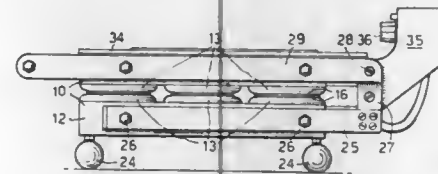
Filed Sep. 26, 1977, Ser. No. 836,772

Claims priority, application Australia, Sep. 26, 1976, 7506/76

Int. Cl.<sup>2</sup> A47J 37/00

U.S. Cl. 99—374

5 Claims



1. Cooking apparatus including: a bottom frame, a top frame hingedly connected to the bottom frame, oppositely arranged but otherwise similar upper and lower metal cooking units mounted respectively in the top and bottom frames, each of the cooking units including a generally flat face plate and a series of hot plates integrally formed with said face plate, each of said hot plates having a circular rim extending outwardly from the face plate, a concavity within the rim in which the food to be cooked is positioned, and a circular cutting bead at the outer edge of the rim, electrical heating means for simultaneously heating the face plates and series of hot plates of both cooking units, said electrical heating means including electrical heating elements mounted in contact with the surface of each cooking unit face plate remote from the hot plates of the unit, said heating elements being confined in locating ribs formed integrally with and extending downwardly from said surfaces of said plates, the thickness of said face plate in the regions thereof surrounding said hot plates being approximately one-half the thickness of said face plate in the region of said integrally formed hot plates, the positioning of said heating elements and the integral formation of said hot plates and said face plate creating residual heat in said hot plates between cooking sequences thereby ensuring the production of cooked products at a rapid rate, said cooking units being so constructed and hingedly connected that when the top frame is lowered relative to the bottom frame, the cutting beads of the hot plates of the one are brought into register and contact with the cutting beads of the hot plates of the other, thereby permitting protruding excess food to be trimmed from the edges of the superimposed hot plates.

#### 4,163,419 ROTARY COMPACTING MACHINE FOR FIBROUS MATERIAL

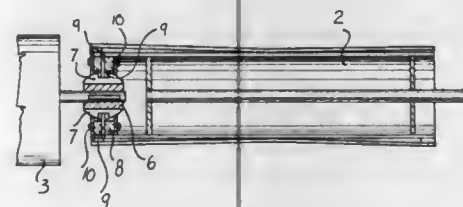
Joseph Molitorisz, 624 81st Ave. NE., Bellevue, Wash. 98004

Filed Jul. 17, 1978, Ser. No. 919,922

Int. Cl.<sup>2</sup> B30B 3/04

U.S. Cl. 100—89

1 Claim



1. A rolling-compressing apparatus for forming loose fibrous material into continuous dense cylindrical core which is cut into individual rolls of desired length, comprising: a core forming channel, said core forming channel being confined by and having a plurality of circumferentially arranged compression

rollers, each of said compression rollers receiving power drive and simultaneous radial and axial support at its drive end from a yoke mechanism, said yoke mechanism consisting of: a substantially spherical sectioned yoke having two inwardly extending and radially opposite passage ways in the entire axial length of the yoke, said substantially spherical sectioned yoke being keyed and securely mounted on the output drive shaft of the power transmission system of the drive train of said rolling-compressing apparatus, said inwardly extending and radially opposite passage ways of said substantially spherical sectioned yoke receiving inwardly extended and radially opposite pins or pin supported rollers of a substantially cylindrical ring, the inside opening of said substantially cylindrical ring being slideably received over the substantially spherical section of said yoke, said pins or pin supported rollers being securely attached to said substantially cylindrical ring, said substantially cylindrical ring being restricted against axial movement relative to said substantially spherical sectioned yoke by properly dimensioned and securely attached retaining rings on both sides of said substantially cylindrical ring, the inside opening of said retaining rings being slideably received over the substantially spherical section of said yoke, said substantially cylindrical ring being securely attached to the drive end of said compression rollers of said rolling-compressing apparatus.

#### 4,163,420 COMPACTOR ARRANGEMENT

Geoffrey Sercombe, Ruislip, England, assignor to G. S. Compactors Limited, Middlesex, England

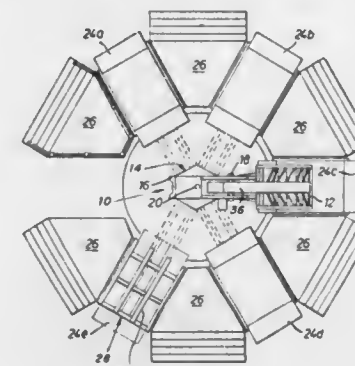
Filed Jun. 17, 1977, Ser. No. 807,518

Claims priority, application United Kingdom, Jun. 23, 1976, 26158/76

Int. Cl.<sup>2</sup> B30B 7/00

U.S. Cl. 100—223

7 Claims



1. A compactor arrangement comprising: a platen support, a pressure platen mounted on said platen support for lowering and raising movement into and out of a skip, a skip support for supporting a plurality of skips and locating the skips for reception of said platen, one of said supports being movable relative to the other said support for aligning each skip with said pressure platen to compact material in each skip, platen drive means for moving said platen in compacting strokes for compacting material in each skip which is aligned with said platen, said supports being separate and being mounted independently of one another, and cooperating means between said supports for preventing said platen support from being lifted due to forces applied during compaction of material in a skip by said platen.

#### 4,163,421 MARKER FOR ROUND OR FLAT OBJECTS

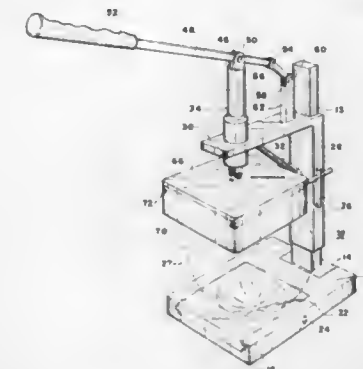
Charan J. S. Sihota, 822 Oregon St., Bakersfield, Calif. 93305

Filed Sep. 12, 1977, Ser. No. 832,801

Int. Cl.<sup>2</sup> B41F 17/00

U.S. Cl. 101—41

2 Claims



1. A marker for round and flat surfaced objects comprising a support including an object holder slidably and reversibly mounted thereon; said holder having a flat object-receiving surface on one side thereof and a cup-shaped receiving surface on the other; a type holder with character printing indicia mounted thereon and handle means resiliently connected to said type holder to move same vertically into contact with an object on said object holder to mark said object, wherein said support includes a vertical arm and a height adjustable sleeved bracket mounted thereon; said bracket having a horizontally extending arm, with lever means being pivoted on said arm and connected to said handle.

#### 4,163,422 PRINT HEAD

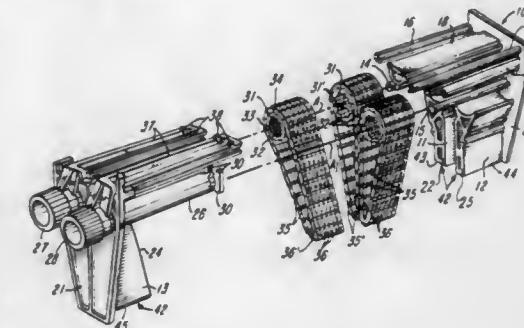
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sep. 12, 1977, Ser. No. 832,248

Int. Cl.<sup>2</sup> B41J 1/20

U.S. Cl. 101—111

9 Claims



1. A compact print head, comprising: a plurality of coaxially mounted wheels, a support having a plurality of supporting stations, and a plurality of printing bands, each printing band having a plurality of different printing elements, each printing band being trained about a wheel and the support and at least some of the printing elements being selectively registerable with any one of the supporting stations, the printing elements lying in the same plane irrespective of the supporting station with which they are registered, whereby the print head can print at least two lines of data.

4,163,423

## PROXIMITY FUZE

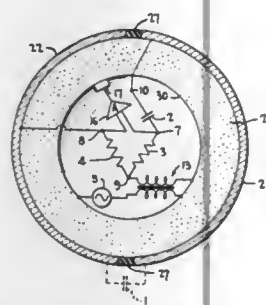
Hans W. Kohler, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 18, 1962, Ser. No. 189,250

Int. Cl.<sup>2</sup> F42C 13/00

U.S. Cl. 102—211

11 Claims



4. In a projectile comprising a casing having a first electrically conducting part, a second electrically conducting part and an electrically insulating part interposed between said first and second conducting part, a proximity detector comprising:
- a bridge circuit;
  - said bridge circuit having a first terminal connected to said first electrically conducting part of said projectile casing; and
  - said bridge circuit having a second terminal adjacent to said first terminal and connected to said second electrically conducting part of said projectile casing.

4,163,424

## HOPPER DOOR LOCKING AND ACTUATING MECHANISM

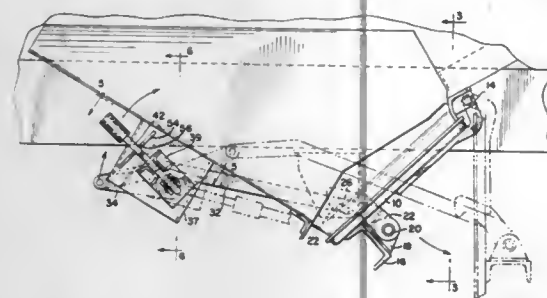
Thomas Lindauer, Schererville, Ind., assignor to Pullman Inc., Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,939

Int. Cl.<sup>2</sup> B61D 7/02, 7/18, 7/26, 49/00

U.S. Cl. 105—313

17 Claims



1. A closing and locking arrangement for a pivoted door on a hopper comprising
- a shaft,
  - bearing means rotatably mounting the shaft on the door spaced from the door pivot,
  - an elongated hook member having one end fixedly secured to the shaft and having a hook formed in the other end of the hook member,
  - a locking lug fixed relative to the hopper for cooperating with the hook on the hook member to secure the door closed,
  - an operating link directly, fixedly secured to the shaft, and crank means including an arm eccentrically pivoted to the other end of the operating link for pivoting the link to release and engage the hook with the locking lug and for pivoting the door between open and closed positions.

4,163,425

## LOAD ANCHORING SYSTEMS FOR FLATBED

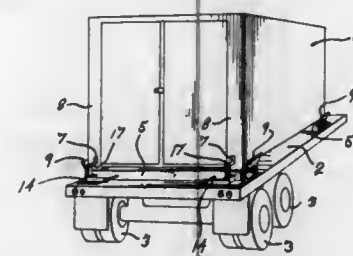
Victor Bédard, 40 Van Vliet St., Lacolle, Canada (J0J 1J0)

Filed Oct. 31, 1977, Ser. No. 847,218

Int. Cl.<sup>2</sup> B61D 17/00, 45/00

U.S. Cl. 105—366 C

6 Claims



1. A system for anchoring an elongated container in transport position longitudinally of a flat bed vehicle, said container being of the type having a recess, or aperture, made in the lower end of each corner thereof and opening at the end faces of said container, said system comprising beams secured to said flat bed transversely thereof and spaced apart longitudinally of said flat bed a distance substantially equal to the length of said container for supporting said container off said flat bed at the four corners thereof, means to positively locate the four corners of said container in vertical register with the outer ends of said beams, a slideway carried by said beams at each outer end thereof, each slideway extending through and transversely of the associated beam and being substantially parallel to the flat bed of the vehicle, an anchor member for each slideway, said anchor member having a slide portion slidable along the associated slideway for slidable movement in a direction substantially parallel to said flat bed and towards and away from the corresponding end face of said container between a container-anchoring position and a container-releasing position, respectively, a prong carried by said anchor member and facing said container end face and engaging said recess in said container-anchoring position of said anchor member and clearing said recess in said container-releasing position of said anchor member, and a locking lever associated with each anchor member freely pivotally mounted at one end about an axis extending longitudinally of said flat bed for pivotal movement in a plane transverse to the direction of slidable movement of said anchor member, to take under gravity an operative limit position, locking said anchor member in said container-anchoring position.

4,163,426

## HIGHWAY SAFETY DEVICE

Donald C. O'Neill, P.O. Box 4092, Manchester, N.H. 03108

Filed Mar. 23, 1978, Ser. No. 889,871

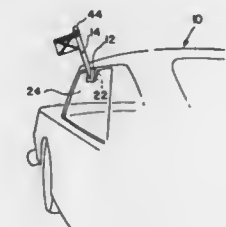
Int. Cl.<sup>2</sup> B60Q 1/32; G09F 7/00

U.S. Cl. 116—28 R

2 Claims

1. A highway safety device for use in signaling for assistance in the event of a breakdown on the highway comprising: a unit adapted to be supported on the raised side window glass of a motor vehicle, said unit having a front section, a spacer section and a spaced pair of resilient legs extending downwardly from the spacer section, prior to engagement with the window said legs having their lower ends in engagement with one side of the front section, a pole extending outwardly and upwardly from the lower portion of the other side of the front section, said unit being mounted on the car window with the front section pressed against one surface of the window and the pair of legs in spring pressed engagement with the other side of the window, the spacer being in engagement with the top edge of the window, said pole having a luminous flag movably

mounted within the pole and a light on the top for signaling passing vehicles, said flag provided with diagonally extended



4,163,427

## FREEZE-THAW INDICATOR APPARATUS

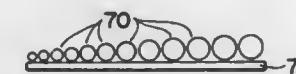
Isadore Cooperman, and Morton Salkind, both of 62 Farms Rd., Freehold, N.J. 07728

Filed Dec. 5, 1977, Ser. No. 857,299

Int. Cl.<sup>2</sup> G01K 11/06

U.S. Cl. 116—217

15 Claims



1. Freeze-thaw indicator apparatus comprising a plurality of frangible microcapsules, individual ones of which enclose water soluble dye formers mixed in dry form and individual others of which enclose colorless water in liquid form, said dye former and water enclosing microcapsules being securedly positioned on a indicia support such that as surrounding temperatures decrease to freeze the water in liquid form, the ice which is produced causes rupture of its own enclosing microcapsule and that of dye former enclosing microcapsules adjacent to it, and such that as surrounding temperatures thereafter increase above freezing, the ice which melts flows through the ruptures in said water enclosing and adjacent dye former enclosing microcapsules to solubilize the dye formers in dry form to provide a colored dye and a visual indication thereof, with selected ones of said water enclosing microcapsules and selected ones of said dye former enclosing microcapsules being predeterminedly positioned proximate each other and sized of predetermined different construction so as to exhibit a predetermined degree of responsiveness to decreases and increases in surrounding temperature in providing said colored dye and said visual indications, and with said selected water enclosing and dye former enclosing frangible microcapsules providing said visual indications on said support representative of the surrounding temperature to which all of said water enclosing and dye former enclosing frangible microcapsules are subjected and the length of time to which all of said frangible microcapsules are kept at said temperature.

4,163,428

## INDICATOR GAUGE WITH ILLUMINATED POINTER

Masao Ishikawa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

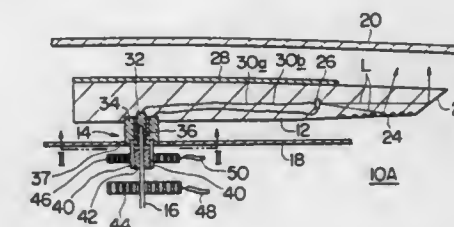
Filed Aug. 14, 1978, Ser. No. 933,618

Claims priority, application Japan, Sep. 9, 1977, 52/107969

Int. Cl.<sup>2</sup> G09F 9/00

U.S. Cl. 116—288

8 Claims



1. An indicator gauge having a spindle of a movement, a dial board substantially perpendicular to said spindle, and a viewing window in front of said dial board, said indicator gauge comprising: an indicator pointer of a transparent material arranged between said dial board and said viewing window, said pointer being formed with first and second surfaces which respectively face said dial board and said viewing window, said first surface being matted; illuminating means disposed in said pointer for emitting light rays when electrically energized; a first conductive cylindrical member mounted on an end of said spindle; a second conductive cylindrical member coaxially and spacedly disposed around said first conductive member to form therebetween a tubular clearance, said first and second conductive cylindrical members being individually and electrically connected to said illuminating means; a tubular insulating member tightly disposed in said tubular clearance, a unit of said first and second conductive cylindrical members and said insulating member being forcedly disposed in a blind bore formed in said pointer; a plurality of conductive pins having respective enlarged head portions which are forcedly disposed in a circular groove formed in an exposed end of said second conductive cylindrical member; a tubular insulating member disposed about said spindle to put on the cylindrical surface thereof said pins; a first spiral spring disposed about said spindle and connecting at its inside end to said spindle; and a second spiral spring disposed about said pins and connecting at its inside end to at least one of said pins, said first and second spiral springs being individually and electrically connected to an electrical power source.

4,163,429

## DEVICE FOR APPLYING ADHESIVE TO A PLURALITY OF STRIPS

Georges Sirelx, 9, rue Saint-Marc, 68400 Riedisheim (Haut-Rhin), France

Filed Aug. 5, 1977, Ser. No. 822,330

Claims priority, application France, Nov. 10, 1976, 76 34816

Int. Cl.<sup>2</sup> B32B 31/08, 31/12

U.S. Cl. 118—117

10 Claims

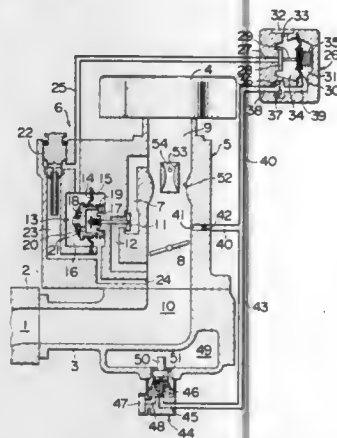
1. Apparatus for applying fluid adhesive to a plurality of strips to be wound helically to form tubular wrappings, said apparatus comprising a tank containing fluid adhesive, means for guiding said strips longitudinally over said tank wholly above said adhesive with said strips arranged in stair step fashion transversely of said tank with successive strips laterally and vertically offset from one another but partially overlapping so that an edge of an upper strip is disposed over the next lower strip, means for delivering fluid adhesive from said tank onto the uppermost of said strips, and a horizontal scraper





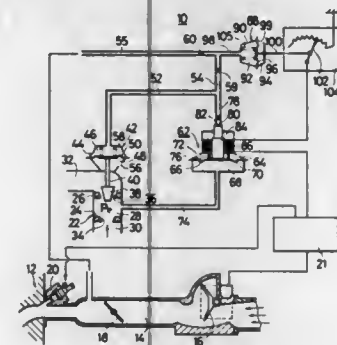
accomplishing the superficial shift of the aim of the control by varying the time constant for the integration.

**4,163,434**  
**AIR-FUEL RATIO REGULATOR FOR INTERNAL COMBUSTION ENGINE**  
 Yutaka Tsukamoto, and Bonnosuke Takamiya, both of Jojo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan  
 Filed Jun. 21, 1977, Ser. No. 808,553  
 Claims priority, application Japan, Mar. 4, 1977, 52-24023  
 Int. Cl.<sup>2</sup> F02M 23/04  
 U.S. Cl. 123—119 D 8 Claims



1. An air-fuel ratio regulator for an internal combustion engine comprising a carburetor having an air passage comprising an air inlet, venturi, a throttle valve downstream of said venturi and an intake passage downstream of said throttle valve, a by-pass air passage leading from said air inlet to said intake passage, first control valve means in said by-pass air passage for opening and closing same, said control valve means comprising a valve member movable between an open position and a closed position, a valve stem for moving said valve member, spring means acting on said valve member to bias it to closed position, a differential pressure responsive means comprising a diaphragm disposed to act on said valve stem to move said valve member to open position, a first vacuum chamber on one side of said diaphragm, a second vacuum chamber on the opposite side of said diaphragm, said vacuum chambers being so disposed that said diaphragm is moved in a direction to open said valve means when pressure in said second vacuum chamber is higher than pressure in said first vacuum chamber, first passage means connecting said first vacuum chamber directly with said intake passage, second passage means comprising a restricted orifice and a check valve connected in parallel with one another connecting said second vacuum chamber with said intake passage, said check valve being disposed to permit flow only from said first vacuum chamber to said second vacuum chamber, third passage means leading from said second vacuum chamber to the atmosphere and second control valve means in said third passage means, said second control valve means being responsive to specific operating conditions of the engine to apply atmospheric air pressure to said second vacuum chamber.

**4,163,435**  
**EXHAUST GAS RECIRCULATION CONTROL SYSTEM**  
 Yasuo Nakajima, Yokosuka; Hiroshi Kuroda, Tokyo, and Yoshimasa Hayashi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan  
 Filed Sep. 6, 1977, Ser. No. 830,865  
 Claims priority, application Japan, Sep. 7, 1976, 51/107085; Sep. 7, 1976, 51/107086  
 Int. Cl.<sup>2</sup> F02M 25/06  
 U.S. Cl. 123—119 A 15 Claims



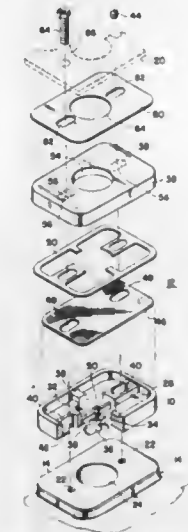
1. An exhaust gas recirculation control system in combination with an engine of an electronically controlled fuel injection type including an intake passageway, an exhaust gas passageway and first means for sensing the flow rate of air taken into the engine and for generating an output signal representative of the sensed flow rate of the engine taken air, said exhaust gas recirculation (EGR) control system comprising passage means communicating with a vacuum source for receiving a vacuum therefrom and with the atmosphere for receiving atmospheric air therefrom, electric means electrically connected to said first means for receiving said output signal therefrom and for generating an electromagnetic force corresponding to said output signal, second means operated for converting said vacuum from said vacuum source into a control vacuum representative of a function of the flow rate of the engine taken air by controlling the amount of atmospheric air, admitted into said passage means, in accordance with said electromagnetic force, an EGR passageway for providing communication between the exhaust gas passageway and the intake passageway for recirculating exhaust gases of the engine into the intake passageway, an EGR control valve disposed in said EGR passageway for controlling the effective cross sectional area thereof, and means for operating said EGR control valve in accordance with said control vacuum so that said EGR control valve increases and reduces the effective cross sectional area of said EGR passageway in accordance with increase and decrease in the flow rate of the engine taken air, respectively.

**4,163,436**  
**GASOLINE MISER**  
 Albert Fugett, Rte. 2, Box 221, Gaston, Ind. 47342  
 Filed May 25, 1977, Ser. No. 800,188  
 Int. Cl.<sup>2</sup> F02M 29/00  
 U.S. Cl. 123—141 9 Claims

1. A gasoline miser for use between the carburetor and the intake manifold of a gasoline engine, said gasoline miser comprising:  
 a substantially hollow top section;  
 a substantially hollow bottom section;  
 means for breaking liquid gas into superfine particles being

disposed between said top section and said bottom section and comprising a screen means, said screen means having a planar cross-sectional area conformal with said cross-sectional area of said chamber whereby the said planar cross-sectional area of said screen through which said liquid gas passes is substantially greater than the outlet of said carburetor; and vaporizing means,

said top and bottom sections having central holes on the exterior thereof of substantially the same size as the outlet of the carburetor and the inlet of the intake manifold, said top and bottom sections forming a chamber therebetween, said chamber having a cross-sectional area substantially greater than the cross-sectional area of said central holes.



7. In a gasoline engine having a chamber disposed between a carburetor and an intake manifold, said chamber having a screen therein and an agitator means therebelow, the method of vaporizing gas comprising the steps of:  
 passing the gasoline laden air leaving the carburetor into an expanding chamber having a width perpendicular to the direction of air flow substantially greater than the width of the inlet to the intake manifold;  
 passing the gasoline laden air from said chamber into a smaller passageway than that of said chamber;  
 directing the gasoline laden air from said smaller passageway over agitating means to thus subject said air to extreme turbulence; and  
 directing the gasoline laden air against the interior walls of said intake manifold to thus vaporize the gas particles in said gasoline laden air.

**4,163,437**  
**TRANSISTOR IGNITION CIRCUIT**  
 John A. Notaras; Angelo L. Notaras, and James P. Williams, all of Sydney, Australia, assignors to Solo Industries Pty. Limited, New South Wales, Australia  
 Filed Oct. 14, 1976, Ser. No. 732,370  
 Claims priority, application Australia, Oct. 23, 1975, PC3692; Nov. 18, 1975, PC4013; Dec. 19, 1975, PC4350; Jan. 30, 1976, PC4678; Mar. 19, 1976, PC5272; Jun. 11, 1976, PC6234  
 Int. Cl.<sup>2</sup> F02P 1/08  
 U.S. Cl. 123—148 E 22 Claims

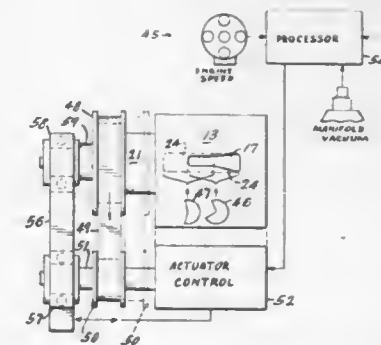
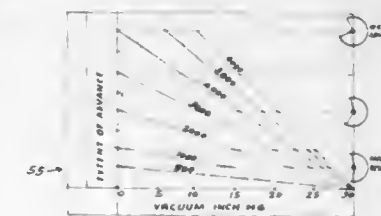
1. An ignition circuit for an internal combustion engine having a coil assembly including a primary winding with two ends and a magnet carrying rotor rotatable by said engine past said primary winding, said ignition circuit comprising:  
 first and second transistors, each having a collector, a base and an emitter, the collector of the first transistor being directly connected to one end of said primary winding and the emitter of the first transistor being directly connected to the other end of said primary winding, the second transistor having its collector-emitter conduction path

connected in parallel with the base-emitter conduction path of said first transistor;  
 a first resistor connected between base and collector of the first transistor;  
 a potential divider directly connected across the ends of said primary winding, and the base of said second transistor being connected to a point of intermediate potential on



said potential divider wherein rotation of said rotor induces a voltage between the ends of said primary winding to cause said first transistor to conduct current from said primary winding directly through the collector-emitter conduction path of said first transistor, said second transistor being turned on by said intermediate potential to turn said first transistor off when said current exceeds a predetermined value.

**4,163,438**  
**ROTARY VALVE TIMING APPARATUS**  
 William D. Guenther, Hagerstown, Ind., and Philip J. Mazziotti, Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio  
 Filed Nov. 26, 1975, Ser. No. 635,714  
 Int. Cl.<sup>2</sup> F01L 7/00  
 U.S. Cl. 123—190 A 2 Claims



1. Adjustable valve timing apparatus for an internal combustion chamber, said apparatus comprising a valve housing defining a housing port in open communication with the combustion chamber, said housing port having leading and trailing edges, a driven valve rotor within said valve housing and having at least one open passageway through said rotor and defining opposed open rotor ports for registry with said housing port upon rotation of said valve rotor, said rotor ports each having leading and trailing edges for registry with said edges of said housing port, and means adjacent said housing for shifting relative axial positions of said housing port and said rotor ports to adjust timing, wherein said leading and trailing



1. A door latch mechanism mounted within an oven and engageable with a door of said oven for locking thereof, comprising:

- a base plate with a support projecting therefrom and a pair of flanged guide rollers;
- a latch plate carried by said base plate for movement between extended and retracted positions corresponding to open and closed positions, respectively, of said oven door, said latch plate having a pair of guide slots spaced along the length thereof, each said guide slot engaged by one said guide roller and including an enlarged portion of a diameter greater than that of its corresponding guide roller, each said roller engaging a guide slot for guiding said latch plate for movement between said extended and retracted positions; and

an over-center spring mechanism carried on said base plate and comprising an arm pivotally engaged with said latch plate and reciprocally received by said support, said arm including an abutment face at an end thereof closest to said latch plate, a spring carried by said arm between said abutment and said support, and an abutment stop carried by said arm and engageable with said stop when said latch plate is in its extended position, whereby said enlarged portions of said guide slots are prevented from engaging said flanged guide rollers, whereby said latch plate is yieldably retained in either said extended position or said retracted position.

**4,163,444**  
**DOOR FOR PYROLYTIC RANGE**  
Claude Drouin, Montmagny, Canada, assignor to Les Industries BFG Limitee, Montmagny, Canada  
Filed Jan. 6, 1977, Ser. No. 757,434  
Int. Cl.<sup>2</sup> F24C 15/04

U.S. Cl. 126-198

7 Claims

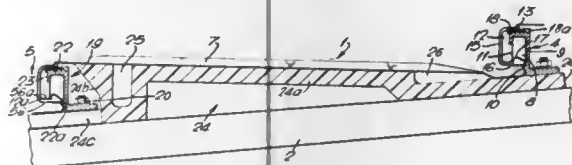


1. A door for covering the oven cavity of a pyrolytic range having a high temperature self-cleaning cycle comprising: a front panel; an intermediate second panel spaced rearwardly of said front panel and defining therewith a first air passageway; an intermediate third panel spaced rearwardly of said second panel and defining therewith a second air passageway, a rear panel spaced rearwardly of said third panel and defining therewith a third air passageway, each of said panels having a window section in viewing registry, a glass panel covering each of said window sections and secured to the respective panel, means for enclosing said panels about their peripheral edges to form a unitary door assembly, said enclosure means having openings at the bottom and top edges of the assembly for allowing cooling air to flow in said first, second, and third passageways whereby said first, second, and third passageways provide an insulating effect and reduce heat loss through said window sections, whereby the temperature on the front face of said first window section during said self-cleaning cycle is below a predetermined allowable limit for said front face.

**4,163,445**  
**ROOFING PANELS**  
Colin N. Stanger, Niavaran, 3 Grenville, Close, Cobham, Surrey, England  
Filed Apr. 1, 1977, Ser. No. 783,787  
Claims priority, application United Kingdom, Apr. 2, 1976, 13467/76

Int. Cl.<sup>2</sup> F24J 3/02  
U.S. Cl. 126-428  
15 Claims  
1. In a roof structure of the type described, the combination of  
a roof support structure;  
a plurality of interlocking elongated roofing panels mounted on said support structure to form a roof covering, each of said panels comprising an elongated sheet having a first elongated edge,

a second elongated edge spaced from and opposite to said first edge,  
the panel being secured to the support structure only along said first elongated edge,  
first and second load-bearing beam elements which extend continuously along the length of the panel and support the panel on the support structure and are formed by elongated portions of said sheet of bent configuration adjacent said first and second edges respectively,  
said first beam element being disposed generally above the sheet and said second beam element being disposed generally below the sheet,



a plurality of ribs spanning transversely between said beam elements for transmitting the load of the panel thereto,  
the first beam element supporting said second elongated edge of the next adjacent panel, and  
the second beam element constituting a cover element which overlaps the first beam element of the next adjacent panel and engages the same continuously along its entire length so as to at least partially conceal the first beam element and restrain said second elongated edge against movements in a direction normal to the plane of the panel.

**4,163,446**  
**BIOPSY NEEDLE AND REMOVABLE PAD THEREFOR**  
Khosrow Jamshidi, 610 Winston Ct., St. Paul, Minn. 55118  
Filed Jan. 31, 1978, Ser. No. 873,783  
Int. Cl.<sup>2</sup> A61B 10/00

U.S. Cl. 128-754

3 Claims

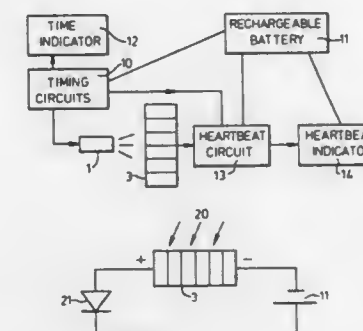


1. In combination, a biopsy needle having an elongated hollow body member with a distal cutting edge and a proximal gripping portion, and a radially extending finger gripping means near the proximal end thereof; and pad means removably mounted upon said hollow body member at the proximal end thereof;  
(a) said pad means comprising a generally disc-shaped element with first and second opposed major surfaces, said first surface being a palm engaging surface and with said second surface having a needle enveloping sleeve extending outwardly from the surface thereof; and  
(b) said needle enveloping sleeve having a radially extending bore formed through the wall thereof adjacent the juncture between said second pad surface and said sleeve for providing communication between the interior of said sleeve and atmosphere.

**4,163,447**  
**HEARTBEAT RATE MONITOR**  
Thomas Orr, Starboard House, 30 Shore Rd., Warsash, Southampton, England  
Filed Jan. 31, 1978, Ser. No. 873,977  
Claims priority, application United Kingdom, Feb. 11, 1977, 5746/77

Int. Cl.<sup>2</sup> A61B 5/02  
U.S. Cl. 128-666

9 Claims

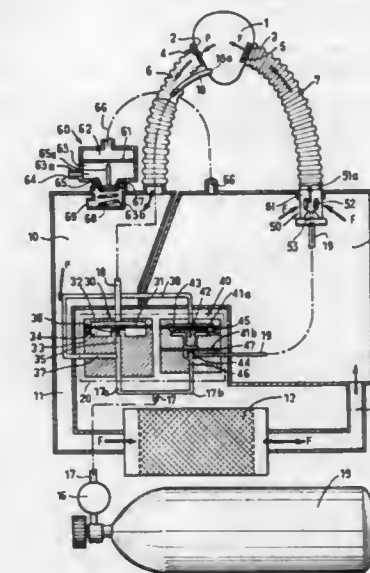


1. A heartbeat rate monitor comprising:  
a light source for transilluminating skin tissue;  
semiconductor detector means disposed to receive light from said light source reflected from said skin tissue and capable of detecting variations in the level of said light reflected from said skin tissue so as to produce an electric signal responsive to changes in arterial blood flow in said skin tissue, said detector means also being capable, on exposure to ambient light, of supplying a recharging current for a power source;  
indicator means for indicating the heartbeat rate in dependence on said electric signal;  
means for supplying said electric signal from said detector means to said indicator means;  
a rechargeable electric power source;  
means to supply said current from said detector means to said power source to recharge said power source; and  
means to energise said light source from said battery.

**4,163,448**  
**BREATHING APPARATUS**  
Gérard Grouard, Versailles, France, assignor to La Spirotechnique, Industrielle et Commerciale, Levallois, France  
Filed Sep. 8, 1976, Ser. No. 721,528  
Claims priority, application France, Sep. 15, 1975, 75 28202  
Int. Cl.<sup>2</sup> A62B 7/02

U.S. Cl. 128-142.2  
8 Claims  
1. Apparatus for supplying breathable fluid to a user, the apparatus comprising, in combination:  
a mask having an inhalation orifice, an exhalation orifice and a control orifice in the region of the mouth of the user;  
means defining an inhalation space;  
an inhalation duct interconnecting the inhalation space and the inhalation orifice;  
a supply of breathable fluid under pressure;  
means including a supply conduit having an infeed end connected to said supply and a discharge end communicating with the inhalation space;  
valve means interposed in the supply conduit and being movable in response to the application of fluid pressure between a closed position blocking the flow of unused fluid in said conduit and an open position permitting the passage of unused fluid to said discharge end;  
conduit means interconnecting the valve means and the supply of breathable fluid for applying pressure to said valve means to maintain it in its closed position; and  
a pressure sensing mechanism interposed in the conduit means for regulating the valve means in response to the respiratory pressure in the region of the mouth of the user, the pressure sensing mechanism including a control con-

duit connected to the control orifice in said mask and means responsive to a decrease in pressure in said mask for

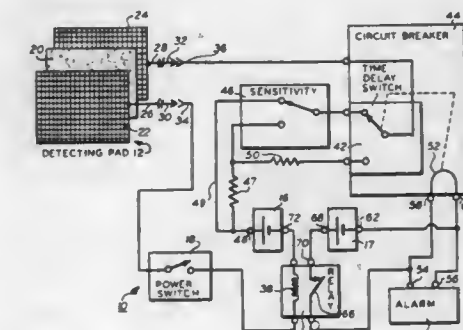


moving the valve means to its open position to thereby permit the flow of fluid from the discharge end of the supply conduit.

**4,163,449**  
**ENURESIS TREATMENT DEVICE**  
Robert A. Regal, 555 Kappock St., Riverdale, N.Y. 10471  
Filed Sep. 30, 1977, Ser. No. 838,110  
Int. Cl.<sup>2</sup> A61B 5/00

U.S. Cl. 128-138 A

8 Claims



1. A device for treating an enuretic person by conditioning said person to avoid nocturnal bed wetting, said device comprising:  
a urine detecting pad arranged to be placed underneath said person while asleep for absorbing urine discharged by said person, said pad changing its state in corresponding relationship with the quantity of urine absorbed by said pad;  
detection signal means coupled to said detecting pad for producing detection signals corresponding to the state of said urine detecting pad;  
an alarm for providing an aversive stimulus to said person; alarm energization means coupled to said alarm and said detection signal means for energizing said alarm when said detection signals are above a first level corresponding to a first quantity of said absorbed urine; and  
alarm cutoff means coupled to said alarm and said detection signal means for disabling said alarm after a particular elapsed time when said detection signals are below a second level corresponding to a second quantity of said absorbed urine, and for allowing said alarm to remain

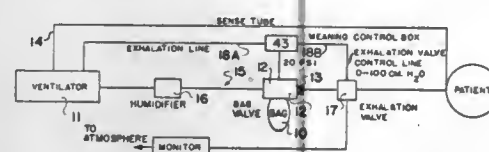


energized when said detection signals are above said second level;  
whereby said alarm is energized only over a sufficient time to provide an aversive stimulus to said person while asleep when less than said second quantity of urine is discharged by said person, and said alarm remains energized when more than said second quantity of urine is discharged by said person to thereby awaken said person.

**4,163,450**  
**METHOD AND APPARATUS FOR WEANING PATIENT FROM CONTINUOUS MECHANICAL VENTILATION**  
Bryan W. Kirk, 229 Lamont Blvd.; Monte B. Raber, 83 Corallberry Ave.; Donald J. Hatch, 91 Brian St., and Harvey E. Cramp, 122 Balfour Ave., all of Winnipeg, Canada  
Filed Jan. 27, 1977, Ser. No. 762,990  
Int. Cl.<sup>2</sup> A61M 16/00

U.S. Cl. 128—145.8

8 Claims

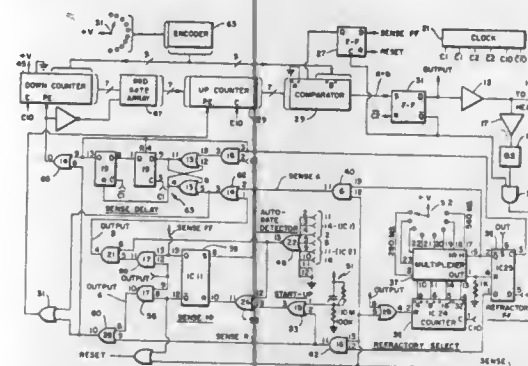


1. In a conventional ventilator which supplies assisted or unassisted breaths to a patient including a pneumatic connection extending from said ventilator, an exhalation valve operatively connected to said pneumatic connection, patient connection means extending from said exhalation valve, an exhalation valve control line operatively connected between the ventilator and the exhalation valve and means operatively connected to said exhalation valve to monitor exhaled breaths; the improvement comprising an attachment, said attachment comprising means to provide assisted breaths from the ventilator when in an "assisted" mode, means to by-pass breaths from said ventilator when in an "unassisted" mode and means operatively connected to the means to monitor the exhaled breaths whereby the ratio of "assisted" and "unassisted" breaths may be varied within limits, said means to provide "unassisted" breaths including a low resistance bag valve in said pneumatic connection, a bag connected to the bag valve, a one-way valve operatively connected between said bag and said exhalation valve providing one-way flow from said bag to said exhalation valve, the operation of said ventilator including means to open and close said bag valve whereby breaths from said ventilator are conveyed directly to said patient connection means when said bag valve is closed and said ventilator is in the "assisted" mode, and to the bag and thence to said patient connection means as required, when said bag valve is open and said ventilator is in the "unassisted" mode, said means operatively connected to said means to monitor the exhaled breaths whereby the ratio of "assisted" and "unassisted" breaths may be varied within limits, including a pressure sensor in said exhalation valve control line, a signal generator operatively connected to said pressure sensor and operated thereby each time the exhalation pressure within said control line exceeds a predetermined pressure, assisted breath counter means, and unassisted breath counter means, means operatively connecting said signal generator to said assisted breath counter means when in the "assisted" mode and to said unassisted breath counter means when in the "unassisted" mode, means to vary the ratio of connection of said signal generator to said assisted and unassisted counter means, a bag valve solenoid operatively connected to said bag valve and means to operate said bag valve solenoid operatively extending from said unassisted breath counter means to said solenoid.

**4,163,451**  
**INTERACTIVE METHOD AND DIGITALLY TIMED APPARATUS FOR CARDIAC PACING ARRHYTHMIA TREATMENT**  
Alan F. Lesnick, and Peter P. Tarjan, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.  
Filed Oct. 26, 1977, Ser. No. 845,650  
Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 PG

15 Claims



1. Cardiac pacing apparatus comprising:  
timing means for generating a series of clock pulses; means responsive to heartbeats;  
means for counting clock pulses occurring from a first heartbeat to a second heartbeat thereby to obtain a first value representing the time interval between heartbeats;  
means for generating a value which is smaller than said first value and which represents an escape interval;  
means for counting clock pulses occurring after said second sensed heartbeat to obtain a running time value;  
means for comparing said running time value with said escape interval value; and  
means responsive to said comparison for generating a stimulating pulse and for incrementing said escape interval value if said running time value becomes substantially equal to said escape interval value.

**4,163,452**  
**TOBACCO-SMOKE FILTERS**  
John D. Green, Romsey, and Ian R. Harris, Alton, both of England, assignors to British-American Tobacco Company Limited, London, England  
Filed Dec. 1, 1977, Ser. No. 856,344  
Int. Cl.<sup>2</sup> A24B 15/27; B01D 27/02

U.S. Cl. 131—10 A

11 Claims

1. An improved tobacco-smoke filter or filter material containing granules of porous activated carbon to which a nitroxide of the group consisting of the nitroxide 4-oxo-2,2,6,6-tetramethylpiperidino-oxy, the nitroxide 1-nitronyl-3-oxyl-4,4,5,5-tetramethyl-2-phenylhydroimidazole and mixtures thereof has been applied.

**4,163,453**  
**7-ALKOXY-1,2-BENZOPYRONES AS TOBACCO FLAVORANTS**

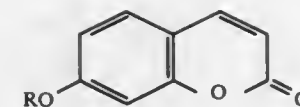
Andrew G. Kallianos, Durham, N.C., and Melvyn I. Simpson, Fargo, N. Dak., assignors to Liggett Group Inc., Durham, N.C.

Filed Oct. 12, 1976, Ser. No. 731,382  
Int. Cl.<sup>2</sup> A24B 3/12, 15/04

U.S. Cl. 131—17 R

12 Claims

9. A tobacco or smoking tobacco product having added thereto about 0.0001 to about 0.1 weight percent, based on the weight of the tobacco, of at least one compound having the formula:



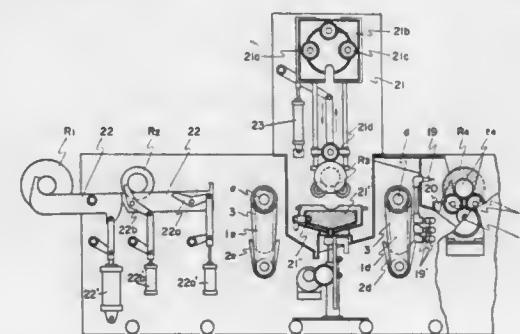
wherein R is selected from the group of straight or branched chain alkyl or alkenyl groups, having from 1 to 7 carbon atoms in the alkyl or alkenyl chain or a cyclic aliphatic or aromatic hydrocarbon group having less than 8 carbon atoms.

**4,163,454**  
**PROCESSING EQUIPMENT FOR USE IN THE PROCESSING OF A PHOTOENGRAVING CYLINDER**  
Tatsuo Shigetani, Nagareyama, Japan, assignor to Kabushiki Kaisha Think Laboratory, Japan  
Filed Mar. 7, 1978, Ser. No. 884,152

Claims priority, application Japan, Oct. 28, 1977, 52-144901[U]; Nov. 30, 1977, 52-160638[U]  
Int. Cl.<sup>2</sup> B08B 3/08

U.S. Cl. 134—57 R

3 Claims



1. In combination with automatic processing equipment for processing a photoengraving cylinder having an axis including a plurality of processing baths and swinging support means for moving the cylinder between baths, a device comprising:  
a sliding member longitudinally slidably mounted in a groove on one of said baths,  
means for moving said sliding member longitudinally along said groove axially of the cylinder in said bath,  
a pair of proximity switches displaceably mounted on said sliding member,  
means for displacing said pair of proximity switches radially relative to the cylinder, and  
means for computing processing factors from the dimensions of the cylinder sensibly connected to and controlling said means for moving and said means for displacing, said means for computing receiving its inputs from said pair of proximity switches whereby the axial length and diameter of the cylinder can be read and calculations therefrom performed.

**4,163,455**  
**CLEANING APPARATUS FOR SHIP HOLDS**  
Chris J. Hebert, and Ralph T. Hollister, both of 157 N. Leo, Baton Rouge, La. 70806  
Filed Nov. 14, 1977, Ser. No. 851,342  
Int. Cl.<sup>2</sup> B63B 59/00

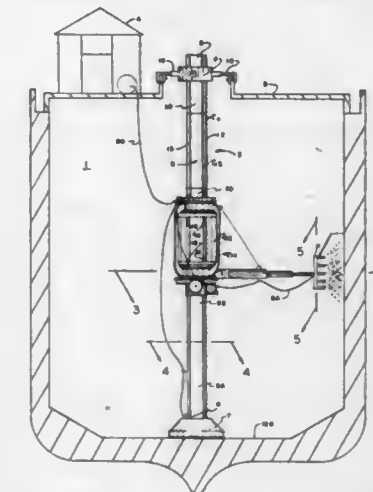
U.S. Cl. 134—167 R

7 Claims

1. An apparatus for cleaning a ship hold formed by a floor, side walls and ship deck having a hatch opening, which comprises:

(a) a central support axle vertically positionable within said hold, said central support axle comprising a metal strip having gear teeth extending into a straight line down said axle;

(b) a first securing means attached to said axle and attachable to said floor for fixedly holding said axle to said floor;  
(c) a second securing means attached to said axle and attachable to said ship deck for fixedly holding said axle vertically;  
(d) a trolley carriage attached to said axle for vertical travel up and down said axle, said trolley carriage comprising a drive means to which is attached a gear wheel having gear teeth mating with said metal strip gear teeth, a mounting brace extending around said axle forming a cavity opening away from said axle and wherein said nozzle positioning

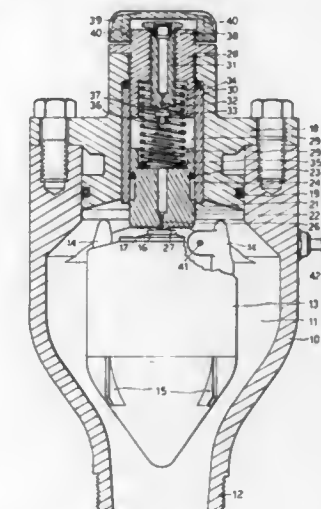


assembly comprises a circular metal block fitting into said cavity, bearing collars attached to said block and in contact with said mounting brace, a gear wheel having gear wheel teeth extending out of said cavity is attached to said block and a drive means, having a drive means gear with teeth mating with said gear wheel teeth attached to said mounting brace; and  
(e) a nozzle positioning assembly rotatably attached to said trolley carriage, said nozzle assembly having an extendable arm to which are attached water nozzles for spraying water.

**4,163,456**  
**AIR RELEASE VALVE**  
Keith R. Herron, 15 Blackburn St., Moorooka, Queensland 4105, Australia  
Filed Sep. 12, 1977, Ser. No. 832,471  
Int. Cl.<sup>2</sup> F16K 31/22

U.S. Cl. 137—202

4 Claims



1. An air release valve including:

a body,  
 a float chamber in the body,  
 a passage to the float chamber for connection to a pipe liner or container,  
 a float vertically movable in the float chamber,  
 a top chamber in the body,  
 a movable member in the form of a piston vertically movable in the top chamber and adapted to be raised in the top chamber by the float rising in the float chamber or by gas pressure in the float chamber, and first resilient means for biasing said piston downwardly,  
 a primary air release orifice through said piston from the float chamber to the top chamber,  
 a secondary air release orifice from the top chamber to atmosphere, said primary and secondary air release orifices being in series flow arrangement,  
 first sealing means connected to the float and adapted, when the float rises in the float chamber, to close said primary orifice, and  
 second sealing means in the form of a sealing pad connected to said piston by second resilient means and adapted when said piston is moved upwardly in the top chamber to close the said secondary orifice, whereby said piston can exert a force either in a closing or opening position.

4,163,457

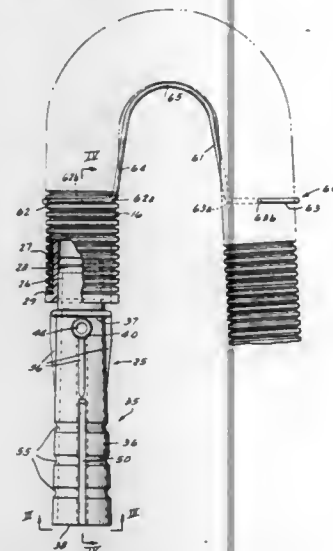
# TERMINATION FIXTURE FOR A CORRUGATED DRAIN HOSE

William Rickel, and Dennis W. Hauch, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 2, 1977, Ser. No. 793,137  
 Int. Cl.<sup>2</sup> F03C 1/12

U.S. Cl. 137—216

3 Claims



1. For use with appliances in positioning a hose relative to different liquid receiving means and for receiving and discharging pressurized liquid from the hose into the receiving means,

an elongated corrugated plastic tubular hose having favorable anti-kink characteristics and being selectively bendable but returning to elongate configuration when unstressed;

an outlet pipe having an axis and a side wall forming an internal flow passage and opposite upper and lower ends, said side wall having a conical taper with a larger inside diameter at the lower outlet end than at the upper end of said pipe, said outlet pipe further having at least one annular groove means formed therein near said lower end to reduce locally a radial thickness of

said side wall, thereby to facilitate severing said pipe to shorten its length, and

an air vent formed by a radially inwardly extending depression formed on an outer surface of said side wall, said depression extending substantially longitudinally along said outer surface from said lower end of said outlet pipe,

a plurality of planar ribs extending radially outwardly from said outer surface of said side wall, said ribs extending longitudinally along a portion of said outlet pipe;

a hose connecting means on the upper end of said outlet pipe for receiving the corrugated hose in fluid-tight relation thereto and for communicating an interior of the hose to said internal flow passage,

said hose connecting means comprising a nipple formed integrally with said upper end of said outlet pipe, said nipple having an annular groove formed near an end thereof, and a deformable cylindrical sleeve, said sleeve having a diameter intermediate between an inside diameter of said hose, and an outside diameter of said nipple, said sleeve being fitted inside said hose prior to engagement with said nipple;

a hose guide means operatively associated with said outlet pipe for securing said hose into a bent shape extending through an arc of at least 90° relative to said axis of said outlet pipe;

a molded port integral with said outlet pipe located on a side wall thereof below said hose connecting means, said molded port having an annular wall and a removable end member, said end member being co-circumferential with said side wall of said outlet pipe but having a thickness substantially less than that of said side wall, such that upon perforation of said end member a coupling of a second hose for flow into said outlet pipe is facilitated.

4,163,458

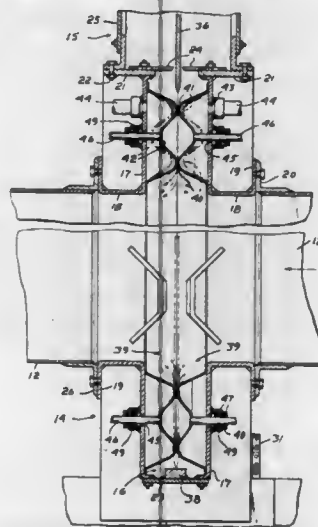
# DEVICE FOR SEALING A CONDUIT AGAINST THE FLOW OF LIQUID

Lothar Bachmann, P.O. Box 47, West Mtnot, Me. 04288  
 Filed Mar. 18, 1977, Ser. No. 778,879

Int. Cl.<sup>2</sup> F16K 3/36

U.S. Cl. 137—240

5 Claims



1. A device such as a damper or valve for use in blocking the flow of fluid through a conduit, said device including a chamber surrounding and opening into the conduit and including side walls sealed thereto, a blade mounted at one side of the conduit for movement through the chamber transversely of the conduit between a first position outside the conduit and a second conduit-blocking position, means carried by each side wall and surrounding said conduit and between said conduit

and said blade when the blade is in its first position and operable then to coact and seal the chamber against leakage through it and to engage and seal the blade when in its second position, both of said sealing means an inflatable seal operated by fluid under pressure from a first position out of the path of the blade into its sealing positions, each inflatable seal including inner and outer sealing portions sealed to the appropriate one of the chamber side walls and an intermediate channel, first seal control means to deliver fluid under pressure to said sealing portions to effect and maintain their sealing positions, second seal control means to relieve said seals of operating pressure, and third control means in communication with said intermediate channels and operable to deliver fluid thereto under a pressure that is greater than the pressure of the fluid within the conduit thereby to block the flow of the fluid within the path of said blade as it moves between said positions and to purge the sealing means and blow back into the exhaust stream settled debris.

4,163,459

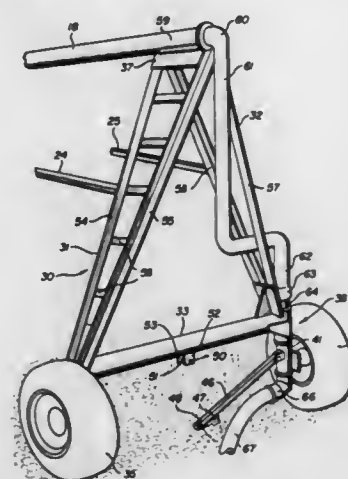
# MOBILE PIVOT TOWER FOR IRRIGATION SYSTEM

Kenneth J. Hegemann, Ewa Beach, HI., assignor to Rainmatic International, Ltd., Honolulu, HI.

Filed Oct. 26, 1977, Ser. No. 845,648  
 Int. Cl.<sup>2</sup> B05B 3/12

U.S. Cl. 137—344

11 Claims



1. A mobile pivot tower for an irrigation system, said mobile pivot tower comprising:  
 substantially vertically disposed frame means having upper and lower portions;  
 means at the upper portion of said frame means for supporting an irrigation pipe in a horizontal disposition extending away from said frame means;  
 a pair of wheels located adjacent the lower portion of said frame means;  
 each of said wheels having a horizontal axis of rotation disposed transverse to the direction in which said irrigation pipe extends;  
 and means mounting said frame means and one of said wheels for free pivotal movement about a vertical axis during an irrigating operation of said system, said mounting means being located adjacent the other of said wheels while said other wheel remains stationary.

4,163,460

# SINGLE-CONTROL TYPE OF HOT COLD WATER MIXER

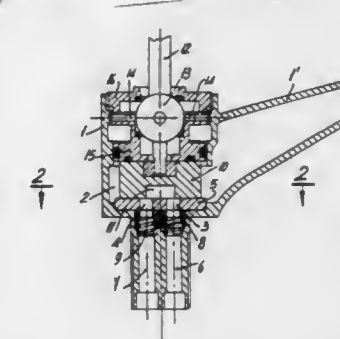
Mario Zucchetti, Gozzano, Italy, assignor to Zucchetti Rubinetteria S.p.A., Gozzano, Italy

Filed Jul. 18, 1977, Ser. No. 816,673

Claims priority, application Italy, Jul. 26, 1976, 21837/76[U]  
 Int. Cl.<sup>2</sup> F16K 11/06

U.S. Cl. 137—625.4

1 Claim



1. A single-control type of hot and cold water mixer comprising a mixer body member or casing defining a hot water inlet conduit, a cold water inlet conduit, and a mixing chamber, said hot and cold water inlet conduits opening towards said mixing chamber, and a water delivery orifice in direct communication with said mixing chamber, a mixing unit positioned within said mixing chamber and operable between a closed position, a hot water or cold water open position, and a mixing position, said mixing unit comprising a one-piece disc of ceramic material fixedly mounted within said mixing chamber having first and second apertures only extending therethrough and in fixed fluid communication with said hot and cold water inlet conduits, respectively, and free of any outlet apertures, a movable block of ceramic material having a flat face sealably slidable against a flat face of said disc, a control handle connected to said movable block to move said movable block in said mixing chamber with respect to said disc, said block having a cavity opening to said flat face and extending substantially radially to a side edge surface of said movable block to define a water passage from said inlet conduits to the mixing chamber that is exterior to said movable block, the width of the block cavity being larger than the distance or spacing between the apertures in said ceramic disc in order to communicate with either or partially with both the apertures in said disc.

4,163,461

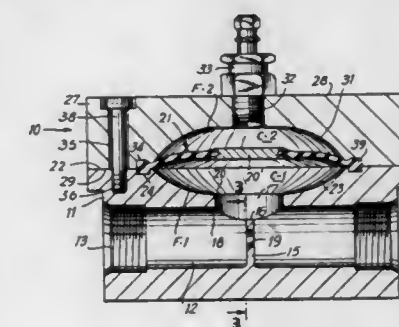
# HIGH FREQUENCY PULSE DAMPENER

Alfonse A. Jacobellis, Woodland Hills, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed Jan. 23, 1978, Ser. No. 871,503  
 Int. Cl.<sup>2</sup> F16L 55/04

U.S. Cl. 138—30

2 Claims



1. A high frequency pulse dampener device comprising a



rigid casing having a bore therethrough defining a conduit member, an upwardly directed aperture formed in said casing at right angles to said bore and in communication therewith at one end, said casing having an upwardly extending concave recess defining an oil chamber, said recess having a floor, said other end of said aperture being exposed in said floor and axially positioned therein, the periphery of said other end of said aperture defining a valve seat, a partition formed in said casing in registry with said aperture, said partition being directed normal to said bore and having its outer terminal edge portions coincident with the walls defining said bore, the upper edge of said partition terminating in proximate spaced relation to said valve seat and below the top of said bore, there being defined between said upper edge of said partition and said aperture, passage means for conducting fluid through said bore from one side of said partition to the other, a restricted flow aperture formed in said partition in axial alignment with said conduit member, the level of said valve seat being spaced from the level of the axis of said restricted flow aperture a distance substantially less than the diameter of said upwardly directed aperture, a second rigid casing complementary to said first casing, said second casing having a downwardly extending concave recess therein complementary to the recess in said first casing and defining a gas chamber, said second recess having a top wall, a port extending through said second casing axially into said second recess, a gas charging member mounted in said port, means to retain said casings together with said recesses in juxtaposition, a distensible, resilient diaphragm member clampingly supported at its periphery between said two casings, said oil chamber and said gas chamber being formed respectively between said diaphragm member and the floor and top wall of the recesses in said casings, and a valve member carried by said diaphragm and shiftable into sealing and unsealing relation against said valve seat responsive to movements of said diaphragm respectively toward and away from said seat, the area of said upwardly directed aperture being at least ten percent of the area of the diaphragm member which is exposed to the flow of fluid through said aperture.

#### 4,163,462 TEST PLUG

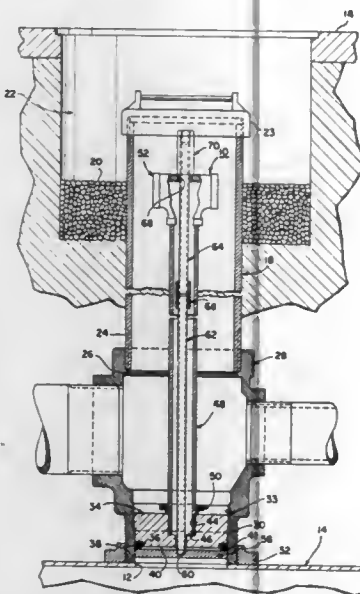
August Milo, Elizabeth, N.J., assignor to Universal Valve Co., Inc., Elizabeth, N.J.

Filed Nov. 7, 1977, Ser. No. 849,319

Int. Cl.<sup>2</sup> F16L 55/12

U.S. Cl. 138—90

19 Claims



1. A test plug for sealing an internal passageway of a vessel preparatory to pressure testing the vessel with a fluid, the

passageway including an internally threaded section and an adjacent non-threaded section, said plug including:

- a seal plate adapted to be inserted into the threaded section of the passageway, said seal plate having an externally threaded section adapted to threadedly engage the threaded section of the passageway;
- an inserting stem connected to the seal plate and extending outwardly therefrom, said stem aiding in the insertion of the seal plate into the interior of the passageway and in threadedly engaging the seal plate threaded section with the passageway threaded section;
- a compressible sealing member adjacent a lower surface of the seal plate;
- a squeeze plate underlying the sealing member and seal plate, said squeeze plate being adapted to fit within the said passageway non-threaded section and to be longitudinally movable therein; and
- squeeze plate actuating means for moving the squeeze plate upwardly within the passageway non-threaded section toward the seal plate for compressing the sealing member and thereby forcing said member laterally into sealing engagement with the interior surface of the vessel passageway.

#### 4,163,463

OXAZOLINE WAX IMPREGNATED SAUSAGE CASING  
Merrill N. O'Brien, Jr., Danville, Ill., assignor to Teepak, Inc., Chicago, Ill.

Division of Ser. No. 538,636, Jan. 6, 1975. This application Nov. 9, 1978, Ser. No. 959,396

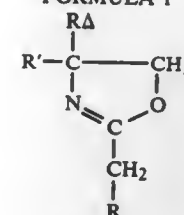
Int. Cl.<sup>2</sup> F16L 11/08; C08B 9/00

U.S. Cl. 138—118.1

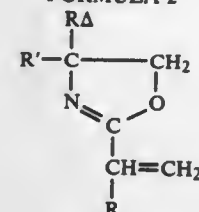
6 Claims

1. An artificial sausage casing of regenerated cellulose having impregnated therein from about 1-15% by weight of the cellulose in the casing of an oxazoline wax selected from the group consisting of:

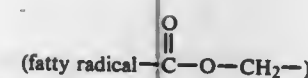
#### FORMULA 1



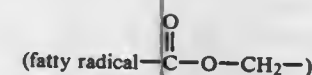
#### FORMULA 2



wherein R is a fatty acid radical having from 10-24 carbon atoms in the structure, R' is a methylol group, an alkyl group having from 1-10 carbon atoms in the structure, or a fatty acid ester radical



with the fatty radical portion having from 10-24 carbon atoms and not more than 1 unsaturated group and R' is a methylol group, an alkyl group having from 1-20 carbon atoms, or a fatty acid ester radical



with the fatty radical portion having from 10-24 carbon atoms and not more than 1 unsaturated group.

#### 4,163,464 ARRANGEMENT FOR FILLING A VESSEL WHICH IS TO BE PUT UNDER HIGH PRESSURE, WITH FREELY FLOWING SOLIDS

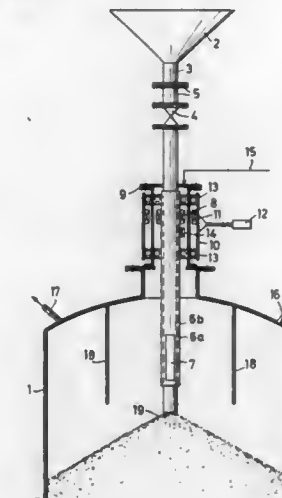
Günter Velling, Bornheim-Hersel, and Wolfhard Ruddeck, Wuppertal, both of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Fed. Rep. of Germany  
Filed Feb. 2, 1978, Ser. No. 874,670

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705763

Int. Cl.<sup>2</sup> B65B 31/00, 1/30, 57/14

U.S. Cl. 141—198

3 Claims



1. An arrangement for filling a vessel which is to be put under high pressure, with freely flowing solids from a storage vessel which is under normal pressure, comprising a supply line extending from the storage vessel to the pressure vessel and having an open-ended part extending into the pressure vessel, a pressure sealing valve which can be tightly closed to counter the working pressure in the pressure vessel, a shut-off valve which is suitable for sealing the storage vessel, both valves being arranged one behind the other in the supply line, and a tube which extends over said part of the supply line within the pressure vessel, said part of the supply line and said tube each having at least one aperture in their walls, the tube and said supply line being arranged so that relative rotational movement therebetween opens and closes the aperture or apertures in said supply line.

#### 4,163,465

APPARATUS FOR CUTTING DOVETAIL JOINTS

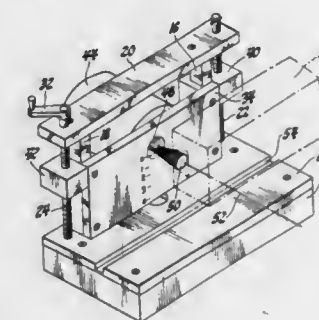
Donald Strong, 33165 Bock, Garden City, Mich. 48135

Filed Aug. 17, 1977, Ser. No. 825,300

Int. Cl.<sup>2</sup> B27F 1/04

U.S. Cl. 144—87

2 Claims



1. Apparatus for forming a dovetail groove in a wooden workpiece comprising:  
a base member;

a pair of spaced, elongated slide members mounted on the base member;  
a support member mounted between the slide members so as to be slidably movable therealong;  
a power driven router mounted on the support member so as to be movable therewith, and a cutting tool carried by the router so as to be rotated in a cutting motion about an axis spaced from the base member;  
adjustment means carried on the base member, said adjustment means comprising an elongated rotatably supported threaded member, the support member being connected to the threaded member so as to be moved between adjusted positions with respect to the base member as the threaded member is being rotated; and  
the support member and the base member being disposed to form a sliding support for a workpiece being moved along a path of motion at right angles to the axis of rotation of the cutting tool such that the cutting tool is operative to cut a dovetail slot in such workpiece.

#### 4,163,466

TUBELESS TIRE, SAFETY SUPPORT AND RIM ASSEMBLY

George T. Watts, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

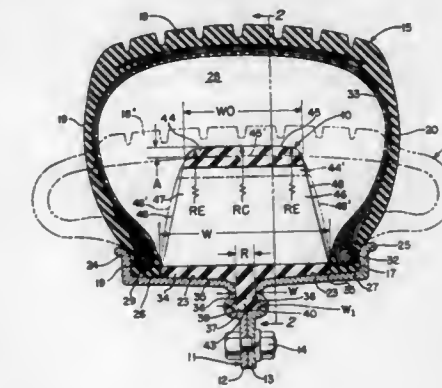
Continuation of Ser. No. 695,945, Jun. 14, 1976, abandoned.

This application Dec. 8, 1977, Ser. No. 858,703

Int. Cl.<sup>2</sup> B60C 17/04

U.S. Cl. 152—158

3 Claims



1. A tire, safety support and rim assembly comprising a split wheel rim with axially abutting sections, a pneumatic tire having a tread portion and bead portions mounted in axially spaced-apart bead seats on a generally cylindrical surface of said rim, an annular ring member of flexible resilient cushioning and sealing material having a radially inner base portion with a generally cylindrical radially inner surface mounted on said surface of said rim and extending from one of said bead portions to the other, said ring member having a radially outer portion with an outer diameter less than the diameter of said tread portion of the tire in the inflated condition and greater than the diameter of said inner base portion, an intermediate supporting portion of said ring member between said radially inner base portion and said radially outer portion, said base portion including a circumferentially continuous flange of said cushioning and sealing material on said radially inner surface of said base portion, said flange having an enlarged bulbous edge portion clamped in compression between said sections of said split rim and sealing the space between said sections, said inner surface having a base width measured axially of said ring member, said flange having a flange width measured axially of said ring member, and said base width being substantially greater than said flange width for stable transmission and cushioning of the load from said base to said rim by compression of said ring member and for holding said bead portions in a stable separated condition on said bead seats during operation

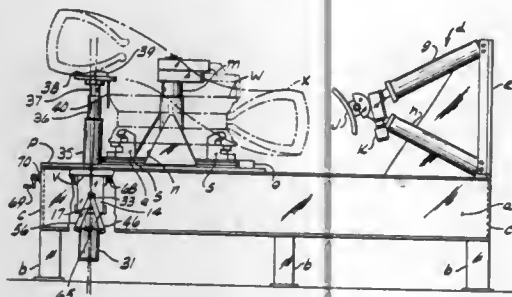
of said tire in a deflated condition with said outer portion of said ring member in engagement with said tread portion.

**4,163,467**  
**SELF-SEALING PNEUMATIC TIRE**  
Robert L. Dobson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed Jun. 8, 1973, Ser. No. 368,145  
Int. Cl.<sup>2</sup> B60C 19/12  
U.S. Cl. 152—347



1. A self-sealing pneumatic tire which comprises two spaced inextensible beads, a ground contacting tread portion, a pair of individual sidewalls extending radially inward from the axial outer edges of said tread portion to join the respective beads, a supporting structure for said tread portion and sidewalls and an integral, thin gauge, covulcanized, resilient rubber closed cell structure disposed inwardly of said supporting structure, where the internal pressure of said closed cells is greater than atmospheric pressure.

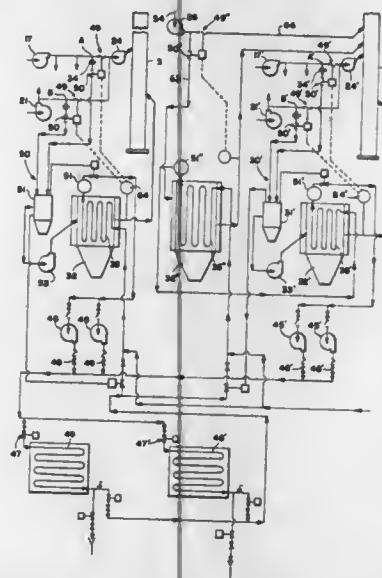
**4,163,468**  
**PIVOTED SUSPENSION FOR LINEAR ACTUATORS OF TIRE CHANGING APPARATUS AND THE LIKE**  
Thomas L. Mueller, St. Louis, Mo., assignor to S. W. Malinski, Tamaroa, Ill.  
Filed Nov. 3, 1977, Ser. No. 848,139  
Int. Cl.<sup>2</sup> B60C 25/06  
U.S. Cl. 157—1.17



1. In a tire changer having a horizontal work support provision and a linear actuator having its casing supported by a support frame beneath the level of the actuator pivotally in the support frame and for urging it to a substantially vertical position, the improvement comprising opposed horizontal trunnion means to suspend said actuator in said support frame for pivoting, forward arm and follower means to pivot outward relative to said support frame in a forward direction on corresponding movement of said casing, aft arm and follower means to pivot outward relative to said support frame in an aft direction on corresponding movement of said casing, stop means for said forward and aft arm and follower means, fixedly associated with said support frame, to limit aft pivoting of said forward arm and follower means and to

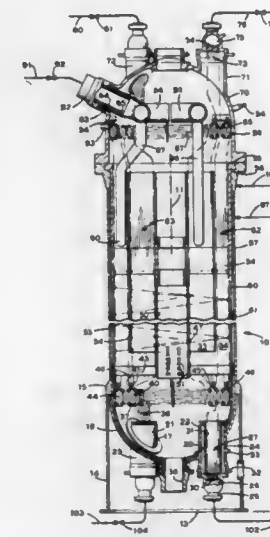
limit forward pivoting of said aft arm and follower means, and spring means, operably associated with said forward arm and follower means and with said aft arm and follower means, to urge each said arm and follower means against said stop means, whereby by said spring means the pivoting freedom of said linear actuator is restrained and on pivoting it is urged to a substantially vertical position.

**4,163,469**  
**HEAT RECLAIM SYSTEM**  
Alan English, Cleveland Heights, Ohio, assignor to Hanna Mining Company, Cleveland, Ohio  
Division of Ser. No. 508,184, Sep. 23, 1974, Pat. No. 4,067,382.  
This application May 18, 1977, Ser. No. 797,937  
Int. Cl.<sup>2</sup> F28F 27/00; F28D 15/00  
U.S. Cl. 165—35



1. A heat reclaim system for reclaiming waste heat from a material heat processing line comprising a first economizer containing a bank of serpentine coils for passage of water therethrough, means for bleeding heated air from one point on a material heat processing line and directing such heated air through said first economizer to permit extraction of heat from the air by the water passing therethrough, a second economizer containing a bank of serpentine coils for passage of water therethrough, and means for bleeding heated air from another point on such material heat processing line and directing such heated air through said second economizer to permit extraction of heat from the air by the water passing therethrough, said coils of said first and second economizers being in series to create the highest temperature difference between the air and water, each said means for bleeding heated air from the material processing line comprising a supply air conduit for passage of heated air from a point on the material heat processing line to said economizer, a supply air valve for selectively opening and closing said supply air conduit, a bypass conduit for passage of heated air from such point on such material heat processing line to a stack, a bypass air valve for selectively opening and closing said bypass conduit, and means for closing said supply air valve and opening said bypass air valve for stopping air flow through said economizer in response to a drop in the bleed-air temperature below a predetermined level to provide automatic dew point safety control.

**4,163,470**  
**INDUSTRIAL TECHNIQUE**  
Arne A. Johnsen, Barberton, and Chandrasekhara R. Kakarala, Clinton, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.  
Filed Jun. 30, 1977, Ser. No. 812,015  
Int. Cl.<sup>2</sup> F28F 9/00  
U.S. Cl. 165—70



1. An heat exchanger comprising a shell, a closure on one end of said shell for establishing a gas space within the heat exchanger, a plurality of shrouds mounted within the heat exchanger, at least one of said shrouds extending from said shell and into said gas space, said shrouds being spaced from each other and from said shell, a plurality of separate tube bundles, each of said tube bundles being mounted within said shell and between said shrouds, a plurality of valves each of said individual valves selectively establishing fluid communication through a respective one of said tube bundles, at least two inlet nozzles penetrating the heat exchanger, each of said nozzles establishing separate fluid communication with the exterior of a respective one of said tube bundles, and a plurality of inlet nozzle valves, each of said valves selectively establishing fluid communication with said respective tube bundle exteriors.

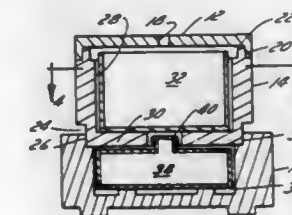
**4,163,471**  
**FORCED CONVECTION HEAT EXCHANGER FOR WARMING ARTICLES**  
Frederic Leder, 1635 Reef View Cir., Corona Del Mar, Calif. 92625  
Continuation-in-part of Ser. No. 728,470, Sep. 30, 1976, abandoned. This application May 1, 1978, Ser. No. 901,505  
Int. Cl.<sup>2</sup> F28F 9/22, 9/24  
U.S. Cl. 165—80 E



1. A forced convection heat exchanger for warming articles comprising a container having walls extending upwardly from a bottom end to define an open top end; a platform to receive

and support a baby bottle mounted within the container spaced apart from the bottom end thereof; plurality of spacers extending inwardly from the walls to position the baby bottle within the container; a set of first drain openings extending through the platform, the area of the platform relative to the total cross-sectional area of the first drain openings providing a standing head of water under turbulent flow conditions within the container substantially up to the container open top end when the container receives an average flow of water from a tap; and, a second set of drain openings within the walls below the platform.

**4,163,472**  
**YOGURT MAKER**  
Frank Taylor, Vaudreuil sur le Lac, Canada, assignor to Michel Cogger, Montreal, Canada  
Filed Jun. 22, 1977, Ser. No. 809,065  
Int. Cl.<sup>2</sup> F28D 13/00; A23C 3/02, 9/12  
U.S. Cl. 165—104 R



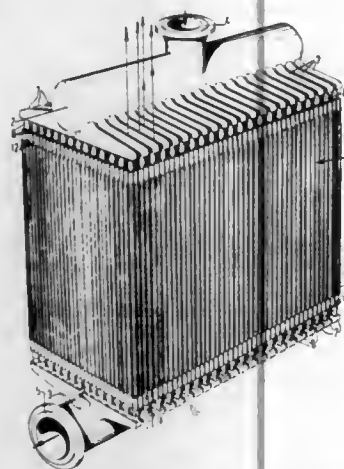
1. A yogurt maker comprising an insulated housing means, a fermentation compartment and a heat sink compartment formed in said housing means, a thermal barrier partition between said fermentation compartment and said heat sink compartment, aperture means in said thermal barrier portion to govern the rate of heat transfer from heat sink compartment to said fermentation compartment, means forming a heat sink in said heat sink compartment, means for thermally sealing said heat sink compartment, vent means for said fermentation compartment to provide the required air for fermentation to make yogurt in said fermentation compartment, said heat sink providing the sole source of thermal energy to maintain said fermentation compartment at fermentation temperature during said fermentation to make yogurt.

**4,163,473**  
**HEAT EXCHANGER**  
Gerhardus A. Engelberts, Breda, Netherlands, assignor to B.V. Machinefabriek "Breda" voorheen Backer en Rueb, Breda, Netherlands  
Continuation of Ser. No. 640,765, Dec. 15, 1975. This application Sep. 2, 1977, Ser. No. 830,311  
Claims priority, application Netherlands, Dec. 24, 1974, 7416886; Dec. 24, 1974, 7416887  
Int. Cl.<sup>2</sup> F28F 9/02  
U.S. Cl. 165—157

1. A heat exchanger comprising an elongated distribution header, an elongated collection header disposed parallel thereto, a plurality of tubes forming a tube bundle, and means for connecting said tube bundle to said headers, said connecting means comprising, a first group of relatively light and flexible elongated box-like distribution manifolds each connected at one end to said distribution header to extend outwardly from said distribution header and arranged in a linear array along one side of said distribution header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, a second group of relatively light and flexible elongated box-like distribution manifolds each connected at one end to said distribution header to extend outwardly from said distribution header in a direction opposite to that of said first group of manifolds and



arranged in a linear array along another side of said distribution header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, each distribution manifold being provided with a plurality of outlet ports disposed linearly along the side of the manifold adjacent to the end connected to the distribution header, a first group of relatively light and flexible elongated box-like collection manifolds each connected at one end to said collection header to extend outwardly from said collection header and arranged in a linear array along one side of said collection header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, a second group of relatively light and flexible elongated box-like collection manifolds each connected at one end to said collection header to extend outwardly from said collection header in a direction opposite to that of said first group of manifolds and arranged in a linear array along another side of said collection



header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, each collection manifold being spaced from and disposed opposite an associated distribution manifold and provided with a plurality of inlet ports disposed linearly along the side of the manifold adjacent to the end connected to the collection header and in alignment with the outlet ports in the oppositely disposed associated distribution manifold so that tubes of the tube bundle can be connected between each pair of opposite aligned ports of the distribution and collection manifolds, the arrangement being such that each pair of associated manifolds and the tubes connected thereto form a panel-like heat exchange unit containing only a small number of the tubes in the tube bundle and wherein the manifolds can flex when the tubes connected thereto expand or contract depending on the thermal conditions in that part of the heat exchanger, and an envelope surrounding the aforesaid elements of the heat exchanger for guiding a fluid medium around the tube bundle.

4,163,474

## INTERNALLY FINNED TUBE

Robert D. MacDonald, Phoenix, Ariz.; Robert K. Rose, Burnt Hills, N.Y., and John W. Papsdorf, Lake Orion, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 665,465, Mar. 10, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,063

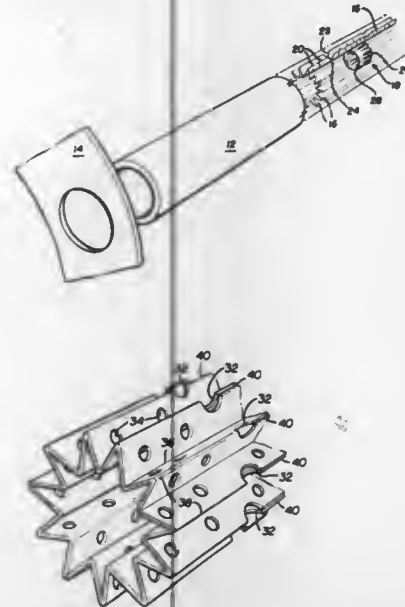
Int. Cl.<sup>2</sup> F28F 1/40

U.S. Cl. 165—179

6 Claims

1. An internally finned tube for use as part of a heat-exchanging system comprising:  
an elongated cylindrical tube;  
an array of fins in the form of a hollow integral sheet metal cylinder having V-shaped corrugations, with the corrugation ridges extending parallel to the axis of the tube when said cylinder is inserted in the tube, the outer ridges of said cylinder being in contact with the inner surface of the wall

of said tube for substantially the full length of said outer ridges, the cylinder being severed along most but not all of the length of each of said outer ridges, the severance lines severing the outer radial ends of each fin from each other to define narrow clean-cut edges longitudinally extending with sharp corners for contact with the inner surface of the tube wall said sharp edges defining therebetween a



crevice area, one of either the cylinder or the inner surface of the tube wall being clad with a material having a melting point lower than that of either the base material of the tube or of the cylinder so that said sharp edges of the fins are brazed to the inner surface of the tube said sharp edges bonded into said cladding material, the unsevered portions maintaining said cylinder as an integral unit for insertion into the tube.

4,163,475

## DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN IN SITU OIL SHALE RETORT

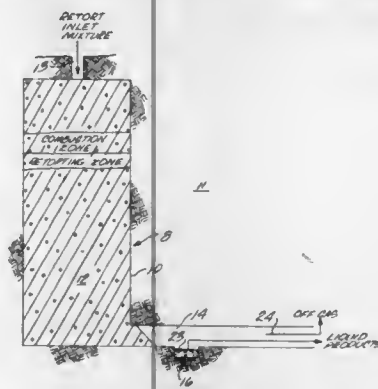
Chang Y. Cha, Bakersfield, Calif., and William J. Bartel, Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 21, 1978, Ser. No. 898,773

Int. Cl.<sup>2</sup> E21B 43/24, 47/00

U.S. Cl. 166—251

18 Claims



17. A method for determining the locus of a processing zone in a fragmented mass in an in situ oil shale retort in a subterranean formation containing oil shale, the formation including a

plurality of generally horizontal strata of differing composition, the method comprising the steps of:

determining the value of a compositional variable of such formation at a plurality of elevations in an in situ oil shale retort;  
predicting the value of a characteristic of shale oil from the fragmented mass as a function of the value of such a compositional variable of formation at said plurality of elevations in the fragmented mass;  
advancing a processing zone through the fragmented mass for decomposing kerogen in oil shale to produce gaseous and liquid products including shale oil;  
withdrawing liquid products including shale oil from a lower portion of the fragmented mass;  
measuring values of said characteristic of shale oil withdrawn from the fragmented mass; and  
correlating at least one measured value of the characteristic of shale oil with at least one predicted value of the characteristic of shale oil.

4,163,476

## SECONDARY RECOVERY PROCESS UTILIZING AN ACRYLAMIDO ALKANESULFONIC ACID POLYMER

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 753,125, Dec. 22, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,137

Int. Cl.<sup>2</sup> E21B 43/22, 43/27

U.S. Cl. 166—271

16 Claims

1. A process for recovering hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation a composition comprising an acidic aqueous polymer solution and recovering hydrocarbons through the production well, the said acidic aqueous polymer solution comprising an aqueous solution of from about 2 to about 12 percent by weight of a mineral acid selected from the group consisting of hydrochloric, sulfuric acid and mixtures thereof and from about 1 to about 7 percent by weight of hydrofluoric acid and having dissolved therein from about 0.05 to about 5 percent by weight of an oxyalkylated acrylamido alkanesulfonic acid polymer.

4,163,477

## METHOD AND APPARATUS FOR CLOSING UNDERWATER WELLS

John L. Johnson, and Billy W. Vanzant, both of San Antonio, Tex., assignors to Sub Sea Research & Development Corp., San Antonio, Tex.

Filed Mar. 2, 1978, Ser. No. 882,865

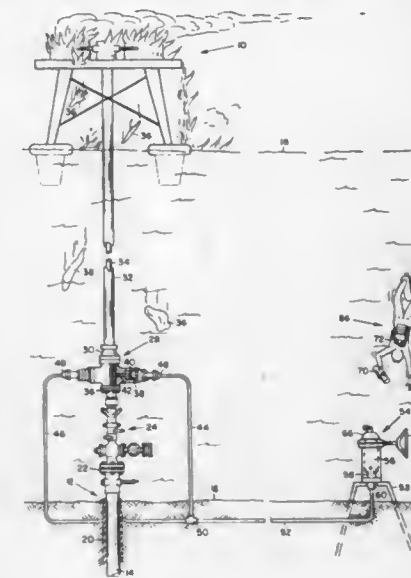
Int. Cl.<sup>2</sup> E21B 7/12

U.S. Cl. 166—362

10 Claims

1. During cases of emergency on offshore drilling platforms, a method of shutting off flow from at least one underwater well to the offshore drilling platform from a remote underwater location consisting of the following steps:  
positioning a well closure device at a wellhead of said well;  
connecting said well closure device to an energy generating device by energy transmitting means;  
providing a remote underwater location from said well and said offshore drilling platform with energizing apparatus connected to said energy generating device;  
sending a diver to said remote underwater location upon said case of emergency, said diver carrying activation means for said energy generating device to said energizing apparatus;  
activating said energy generating device by said activation means and energizing apparatus from said remote underwater location by said diver to generate energy;

communicating said energy via said energy transmitting means to said well closure device; and



closing of said well by said well closure device in response to said energy.

4,163,478

## SELF ALIGNING IMPACT ROCK DRILLING TOOL

Gerald L. Adcock, 511 Airway Dr., Lewiston, Id. 83501

Filed Sep. 15, 1978, Ser. No. 942,605

Int. Cl.<sup>2</sup> E21B 7/04, 17/10

U.S. Cl. 175—92

5 Claims



1. A self aligning downhole impact rock drilling tool adapted to receive a drill bit for forming a hole having a diameter of more than 7.5 cm. than the diameter of the tool, comprising:

an elongated cylindrical tool housing extending between an upper end and a lower end and having an outside diameter defining the tool diameter;  
an internal pneumatic chamber within the housing;  
a chuck at the lower end of the tool housing adapted to receive and securely mount a drill bit having an outside working diameter greater than 7.5 cm. of the diameter of the elongated tool housing and substantially equal to the hole diameter;

said upper end being adapted to operatively connect to an end of a drill string to receive pressurized air therefrom; a piston within the pneumatic chamber adapted to strike the drill bit;

valve means within the housing for receiving and directing pressurized air and adapted to force the piston to repeatedly strike the drill bit;

a pair of longitudinally spaced alignment rings on the cylindrical housing, each having an exterior peripheral surface spaced radially outward of the cylindrical housing and having a diameter slightly less than the diameter of a drilled hole and at least 7.5 cm. greater than the diameter of the cylindrical housing;

wherein each alignment ring is affixed by an interference fit to the housing with one ring at the upper housing end and the remaining ring spaced longitudinally from the one ring at the lower housing end to cooperate to maintain a coaxial relationship between the cylindrical tool and drilled hole by sliding engagement along the hole wall; and

wherein the alignment rings include upright flutes along the peripheral surfaces thereof to permit air and earth material to pass upward between the hole walls and alignment rings.

4,163,479

## NOISE ABSORBING DEVICE

Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blöhm GmbH, Munich, Fed. Rep. of Germany

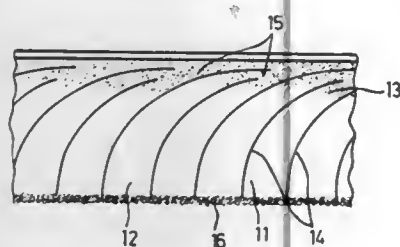
Filed Jan. 23, 1977, Ser. No. 809,173

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631812

Int. Cl.<sup>2</sup> E04B 1/99

U.S. Cl. 181—286

13 Claims



1. A noise absorbing device having a given cut-off frequency with a wavelength  $\lambda$  comprising horn means including a plurality of horn members each having large cross sectional area mouth means and small cross sectional area neck means as well as tapering horn wall means interconnecting said mouth means and neck means, said horn means being adapted to face with said mouth means toward the noise, said horn wall means having a given straight length, said horn wall means further comprising means reducing the structural depth of said horn means, as compared to said given straight length, said structural depth reducing means comprising bends in said horn wall means, said bends being uniformly shaped so that said plurality of horn members may be nested one next to the other.

4,163,480

## LINE TRAVELLING SKIPS

Stanley E. Highland, 316 Willington Ave., Chilliwack, British Columbia, Canada (V2P 2E4)

Filed Feb. 21, 1978, Ser. No. 879,035

Int. Cl.<sup>2</sup> B61B 7/06; E01B 25/16; E04G 3/10, 3/16

U.S. Cl. 182—14

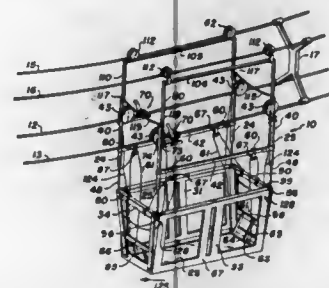
34 Claims

1. A line skip for carrying men on line means including one or more cables having obstructions thereon, such as spacers and hangers, comprising:

pulley means on said supporting means and adapted to ride on and be lifted off the line means when the skip is in use, a carriage for carrying an operator,

connecting means interconnecting the supporting means and the carriage to carry said carriage below the line means at such a level that said operator can grasp and work around the line means, and

lifting means connected to the carriage operable to enable pulley means to be lifted off the line means and then replaced thereon so said lifted pulley means can be moved



past an obstruction on said line means, said lifting means comprising:

cable engager means to be placed on the line means adjacent the pulley means to be lifted,

extensible connector means connected to and extending between the cable engager means and the carriage, and

control means manipulatable by the operator in the carriage selectively to shorten and lengthen said connector means temporarily to take the weight of the carriage off said pulley means that is to be lifted off the line means.

4,163,481

## RIM BRAKE FOR A BICYCLE

Robert Schoch, Singen, Fed. Rep. of Germany, assignor to Weimann GmbH & Co. KG, Singen, Fed. Rep. of Germany

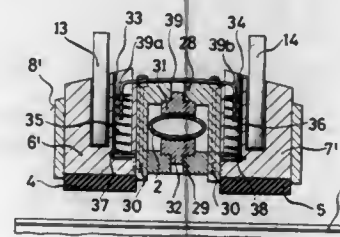
Filed Nov. 30, 1977, Ser. No. 855,991

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655699

Int. Cl.<sup>2</sup> B62L 1/10

U.S. Cl. 188—24

10 Claims



1. A cycle rim brake construction adapted for mounting on a cycle frame including a pair of frame members straddling a wheel having a rim, said construction comprising a casing having a chamber between its ends through which one of said frame members may extend; a pair of confronting clamp pads engageable on opposite sides of said one frame member and carried by said casing and accommodated in said chamber to permit relative rotation between said pads and casing about an axis substantially perpendicular to a plane defined by said rim; a pair of brake lining carriers; means for clamping said pads on said one frame member to thereby retain said casing in a position adjacent said rim; means mounting said carriers in said casing adjacent opposite ends of the latter and symmetrically of said axis for back and forth movements in directions substantially parallel to said axis toward and away from said rim; and actuating means carried by said casing for moving said carriers in a direction toward said rim.

4,163,482

## CENTER-PULL CALLIPER BRAKES FOR BICYCLES AND THE LIKE

René Lauzier, Ruy, France, assignor to Angenieux CLB S.A., St. Etienne, France

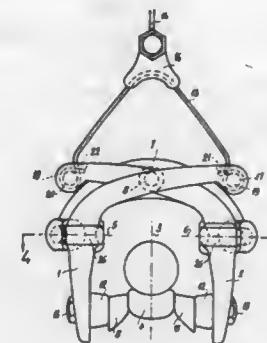
Filed Feb. 28, 1978, Ser. No. 882,053

Claims priority, application France, Mar. 14, 1977, 77 08322

Int. Cl.<sup>2</sup> B62L 1/06

U.S. Cl. 188—24

3 Claims



1. A vehicle having a frame; a wheel; and centre-pull calliper wheel brake comprising two callipers, and means mounting the callipers relative to the frame for pivotal movement about respective axes which are inclined with respect to the median plane of the wheel rim and intersect at a point situated in said median plane, wherein said two axes diverge with respect to one another along the direction of the forward movement of the wheel rim relative to the frame during rotation of said wheel.

4,163,483

## AUTOMATIC CLEARANCE ADJUSTING MECHANISM IN A BRAKE

Takashi Baba, Toyota; Hiroshi Kawaguchi, and Kohji Nishikawa, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 772,097, Feb. 25, 1977, abandoned.

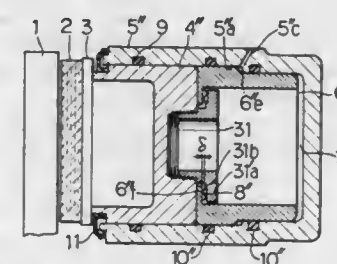
This application Apr. 12, 1978, Ser. No. 895,649

Claims priority, application Japan, Mar. 1, 1976, 51-021898

Int. Cl.<sup>2</sup> F16D 65/54

U.S. Cl. 188—71.8

1 Claim



1. An automatic clearance adjusting mechanism for a brake which is provided with a first piston fitted in a bore of a cylinder, a fluid chamber being defined by said first piston, said bore and a closed end of said cylinder, said first piston being slidable in said cylinder upon the application of fluid pressure into said chamber for urging a friction member onto a rotor member, comprising:

a second piston slidably fitted in said bore of said cylinder between said first piston and said closed end of said cylinder;

restricting means for limiting mutual separation beyond a predetermined distance between said first piston and said second piston;

a spring disposed between said first piston and said second

piston for biasing both into abutting engagement with one another; and

a frictional force generating means disposed between said cylinder and the outer periphery of said second piston for retaining said second piston with a predetermined frictional force, said mechanism characterized in that said second piston of annular cylindrical form is provided with a stepped portion formed on said outer peripheral surface thereof and the small diametered portion thereof is located remote from said first piston, an integral inwardly directed projection being formed on the inner peripheral surface of said second piston adjacent said first piston, said bore being formed with a stepped portion confronting said stepped portion of said second piston to form an annular chamber therebetween, said annular chamber being open to ambient atmosphere through a passage formed in said cylinder, and said restricting means being a plug threaded into said first piston and provided with an integral outwardly directed projection, said outwardly directed projection being normally spaced from said inwardly directed projection by a distance equal to said predetermined distance and being engageable with said inwardly directed projection upon sliding movement of said first piston in said cylinder beyond said predetermined distance to slide said second piston in said cylinder relative to said frictional force generating means.

4,163,484

## COMBINATION LUGGAGE PROTECTOR AND SPOTTER

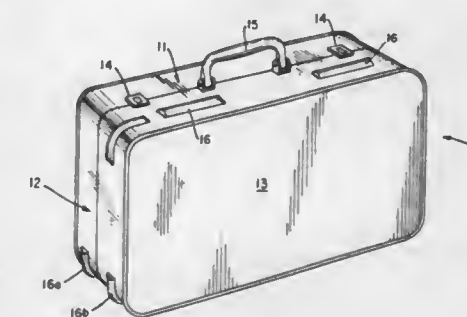
John H. Delaney, 146-25 20th Rd., Whitestone, N.Y. 11357

Filed Apr. 18, 1978, Ser. No. 897,563

Int. Cl.<sup>2</sup> A45C 13/36

U.S. Cl. 190—18 R

5 Claims



1. In combination with a luggage case of generally oblong shape having top, bottom, end and side walls meeting generally perpendicular to each other, a combination protector and spotter comprising a member having an elongated flat base portion and a rounded body portion of distinctive color, said body portion being composed of a resiliently deformable material, said base portion having a layer of contact adhesive thereon and a peelable strip of material covering said adhesive such that upon removal of said peelable strip, said luggage protector may be variably affixed to any part of one of said walls of said luggage case to protect said case from impact and to provide a source of identification of said case.

4,163,485

## CONDUCTING RAIL HANGER CONSTRUCTION

Alleyne C. Howell, Jr., 645 Mine Hill Rd., Fairfield, Conn. 06430

Filed Feb. 28, 1978, Ser. No. 882,143

Int. Cl.<sup>2</sup> B60M 1/20

U.S. Cl. 191—40

7 Claims

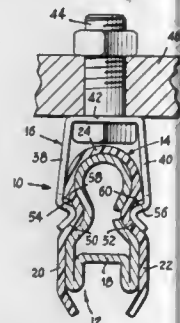
1. A rail construction, comprising in combination:

(a) an elongate conducting rail member,

(b) an insulating sheath of channel-like cross section, jacket-



- ing said rail member and having portions extending on opposite sides of said member,  
 (c) said sheath having oppositely disposed longitudinal groove formations, each providing a pair of facing shoulders,  
 (d) a spring clip of channel-like cross section,  
 (e) said clip having a web portion, and a pair of leg portions extending downward from the web portion,



- (f) said leg portions at their extremities having detent formations received in said groove formations, respectively, said detent formations being provided with shoulders that form camming surfaces, said detent formations further having cut, sharp edges intermediate the longitudinal ends of each leg portion and facing upward toward the web portion of the clip, for biting engagement with one shoulder of each pair of shoulders of the sheath, said biting engagement preventing said sheath from pulling out of said spring clip under the action of a transverse force.

#### 4,163,486 FREE WHEEL HUB

Tooru Kagata, Takoaka, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

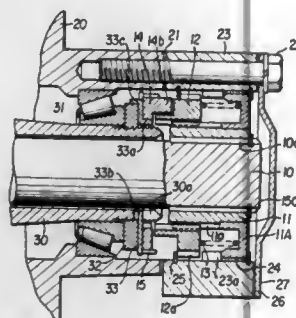
Filed Jul. 25, 1978, Ser. No. 927,911

Claims priority, application Japan, Jul. 27, 1977, 52-90630

Int. Cl.<sup>2</sup> F16D 13/04

U.S. Cl. 192—35

4 Claims



1. A free wheel hub device comprising:  
 a main body secured to a wheel;  
 an inner race secured to a wheel axle and rotatably supporting said main body at an outer peripheral portion of said inner race;  
 a toothed wheel axially movably mounted on said inner race and having a cam face and outer teeth engageable with inner teeth of said main body;  
 a spring means disposed between said inner race and said toothed wheel for disengaging said toothed wheel from said inner teeth of said main body upon non-rotation of said wheel axle;  
 a support member secured to a wheel axle tube operatively connected to said wheel axle; and  
 a shoe disposed between said toothed wheel and said support member and having a cam face for engaging with said cam

face of said toothed wheel, said shoe being rotatable on a guide surface provided on said support member, whereby upon engagement of said cam faces of said toothed wheel and said shoe said outer teeth of said toothed wheel are engaged with said inner teeth of said main body by overcoming the force of said spring means to thereby slidably rotate said shoe upon said guide surface of said support member.

#### 4,163,487 CONTACT PIN FEEDING AND ORIENTING APPARATUS

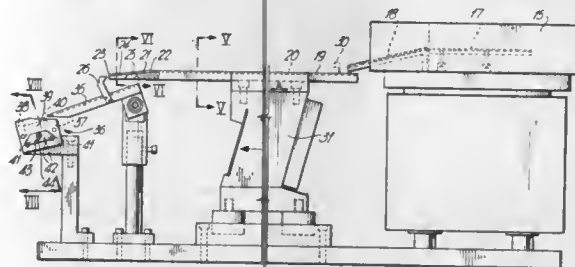
Jean M. Dupuis, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 27, 1978, Ser. No. 919,663

Int. Cl.<sup>2</sup> B65G 47/24

U.S. Cl. 198—383

10 Claims



1. Apparatus for feeding and orienting contact pins, said pins having a square cross-section, a top end and a bottom end and including a swaged portion nearer said top end, said swaged portion including protrusions extending normal to each flat surface of the pin, the apparatus comprising:

a grooved feed member including a delivery end, the grooves at said delivery end each being of channel-shaped cross-section and having a base surface and substantially vertical side surfaces spaced apart a distance to permit said swaged portions to pass therebetween, a slot extending down through the feed members from the base surface of each groove, said slots extending from an end surface at said delivery end and each slot including a first portion extending from said end surface and a second portion extending from said first portion, said second portion having a length less than the length of the swaged portion of a pin and a width to pass said swaged portion, said first portion of a width narrower than said swaged portion of a pin and wider than said square cross-section of a pin to provide a ledge on each side of the first portion of the slot; a support edge spaced from said end surface a distance less than the distance from a top end surface of a pin to an end of the swaged portion remote from said top end surface; and

means for feeding pins along the grooves of the feed member to said delivery end;

whereby when a pin is fed along a groove with its top end forward, the swaged portion is supported across said second portion of said slot to said first portion, said protrusions moving on said ledges, said top end feeding on to said support edge before said swaged portion leaves said end surface, continued feed movement moving said swaged portion off said end surface and said bottom end of said pin rotating down through said slot, said swaged portion rotating on said support edge, the bottom end falling first and followed by said top end, and whereby when a pin is fed along a groove with its bottom end forward, the bottom end falls down through the slot the swaged portion following through the second portion of the slot, so that in either feed orientation, a pin falls with its bottom end first.

#### 4,163,488 CONVEYOR SYSTEMS

Richard M. Brook, Huddersfield, England, assignor to Auto Systems Limited, Waterloo, England

Continuation-in-part of Ser. No. 652,963, Jan. 28, 1976,

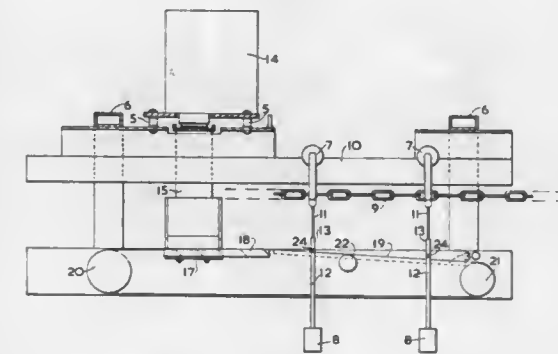
abandoned. This application May 12, 1977, Ser. No. 796,095

Claims priority, application United Kingdom, Jun. 11, 1976, 24199/76

Int. Cl.<sup>2</sup> G01G 19/14

U.S. Cl. 198—504

5 Claims



1. A conveyor system comprising:

(a) a plurality of article carriers;  
 (b) first conveyor means and a plurality of suspension means each securing one of said article carriers to said first conveyor means, said first conveyor means being arranged to convey said article carriers in succession in one direction along a predetermined path;

(c) electronic weight sensing means including a pair of spaced support members positioned at opposite sides, respectively, and adjacent to said path such that the succession of suspension means may pass therebetween with said article carriers therebelow;

(d) second conveyor means comprising a pair of spaced endless flexible members arranged for movement along opposite sides, respectively, of said path, the upper runs of said endless flexible members being adapted to move in the direction of movement of said article carriers and being inclined upwardly towards and passing over said pair of spaced support members of said weight sensing means;

(e) said first conveyor means being adapted to convey said suspension means with said article carriers between said pair of spaced endless flexible members and pair of spaced support members;

(f) each suspension means including means adapted to engage said upper runs of said endless flexible members as said suspension means moves along said path between said endless flexible members, whereby at least part of each suspension means and attached article carrier is elevated during passage between said endless flexible members by said inclined upper runs to a position where a load is applied to said pair of spaced support members, movement is imparted to said endless flexible members by said means adapted to engage the upper runs of said endless members such that said endless flexible members move at the same speed as said article carriers;

(g) said weight sensing means being arranged to emit a signal which is related to the total weight of said portion of each of said suspension means with attached article carrier and any article carried thereby.

#### 4,163,489 FEEDER APPARATUS FOR FIBROUS MATERIALS

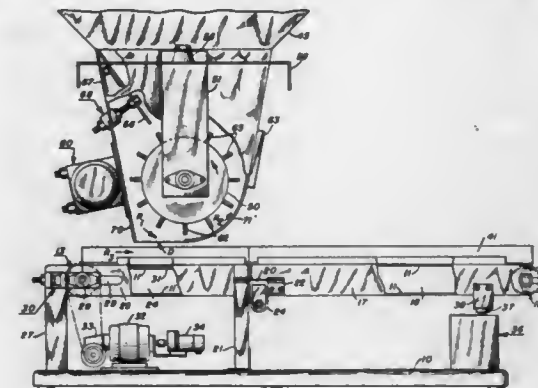
Eugene A. Wahl, 294 Forest Ave., Glen Ridge, N.J. 07028

Filed Aug. 21, 1974, Ser. No. 499,111

Int. Cl.<sup>2</sup> G01G 11/08

U.S. Cl. 198—505

24 Claims



1. An apparatus for uniform bulk feeding of material onto a conveying belt having a conveying surface positioned beneath the apparatus, said apparatus comprising:

(a) A container member having substantially enclosed sides and an open top and bottom to facilitate the entrance and egress of material;

(b) vibrating means for providing a vibratory motion to the container;

(c) a rotating drum rotatably mounted inside said container to vibrate therewith and having its axis of rotation substantially parallel to the surface of said conveying belt, means for rotating said drum said drum having a multiplicity of projections extending outward from the drum surface thereof for receiving material deposited in said container and onto the upper portion of said drum and displacing said material from said container to said conveying surface, the surface of said drum being predetermined distance from said conveying surface to lay said material into a bed in a predetermined manner on said conveying surface;

(d) baffle means extending from a first side of the container, toward which the raking of the upper portion of the drum displaces the material; and

(e) a curved plate affixed to the bottom of a second side of said container member opposite said first side and having an edge positioned between said drum projections and said conveying surface;

(f) whereby material in the container passes between the baffle means and the rotating drum and thence downwardly between the drum and said first side, whereupon a quantity of the material is directed downwardly through said open bottom onto said conveying surface and excess material is raked by said projections over the lower edge of said curved plate and is carried by the projections back up between the drum and said curved plate into said container, the remainder of said material being removed by said conveying belt.

#### 4,163,490

#### LOADING SEAL FOR INCLINED CONVEYOR

Ulrich Timm, Wauwatosa, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 25, 1977, Ser. No. 855,094

Int. Cl.<sup>2</sup> B65G 47/19, 65/52

U.S. Cl. 198—531

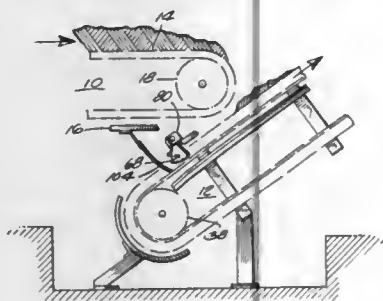
5 Claims

1. A seal and gate combination for sealing conveyed material against rearward movement on an upwardly operating inclined conveyor, comprising:

(a) a conveying surface for support and transport of the



- conveyed material and being positioned to receive discharge of conveyed material from a feeding means;
- (b) pusher means attached to said conveying surface and extending outwardly therefrom for urging the conveyed material up said inclined conveyor, said pusher means further comprising,
- (1) at least two rows of pusher elements, and,
- (2) the pusher elements of each row aligned in the direction of conveyor travel and staggered with respect to the pusher elements of each laterally adjacent row;
- (c) gate means for blocking the rearward movement of conveyed material on said conveying surface pivotally mounted above said inclined conveyor and rearward of said feeding means on an axis parallel to the conveying surface and normal to the direction of travel thereof, said gate means further comprising, a gate element for each row of pusher elements, aligned therewith in the direction of conveyor travel and adapted to rotate upwardly about said axis independently of other of said gate elements as said gate element is contacted by a pusher element on the advancing conveying surface, each gate element comprises,



- (1) a generally rectangular plate having a lower edge parallel to its axis of rotation and lying closely spaced from the conveying surface;
- (2) a gate flange attached to each plate at a lateral edge thereof adjacent the gate element of each laterally adjacent row;
- (3) each gate flange extending rearwardly from said plate and perpendicular thereto and having the shape of a circular segment with its center on the axis of rotation of said gate means; and
- (4) the lower edge of said flange having a radius approximately equal to the radius of the arc defined by the lower edge of the plate as it pivots about the axis of rotation,
- (d) seal means positioned behind said gate means and depending from above the conveying surface for further blocking the rearward movement of conveyed material on the conveying surface, said seal means further comprising, a flexible seal segment for each row of pusher elements, aligned therewith and with the gate element for said row and adapted to bend upwardly and away from the conveying surface as said seal segment is contacted by a pusher element.

4,163,491

#### WOOD VENEER CLIPPER INFEED CONVEYOR RETRACTABLE HOLDDOWN MECHANISM

Vincent M. Rock, Issaquah, and Arne R. Severinsen, Seattle, both of Wash., assignors to Elliott Bay Plywood Machines Co., Seattle, Wash.

Filed Jun. 29, 1977, Ser. No. 811,323  
Int. Cl.<sup>2</sup> B65G 15/00

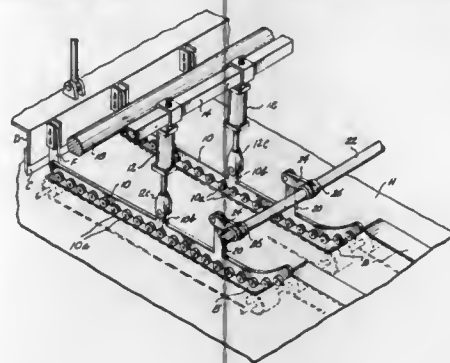
U.S. Cl. 198-836

10 Claims

1. In combination with belt conveyor means operable to support and feed wood veneer in a generally horizontal plane through a veneer clipper, a plurality of elongated transversely spaced veneer holddown bars mounted above the conveyor means in parallel relationship in positions abreast of each other

to engage and flatten the veneer under conveyance as it enters the clipper,

yieldable reversible actuator means operatively connected to the respective bars intermediate the ends thereof and selectively operable to move the bars into such holddown engagement with the veneer and retractively therefrom in paths lying in parallel vertical planes extending in the direction of feed, and when in such holddown engagement with the veneer to urge such bars yieldably against the veneer, and



operatively associated guide means connected to said bars further controlling such motion of the bars to include a vertical component of motion and also a component of motion parallel to the direction of veneer feed, the latter component of motion during bar retraction being directed opposite the direction of veneer feed,

said actuator means and guide means cooperatively programming the retraction motion of the bars with the trailing ends thereof adjacent the clipper substantially executing the vertical component of retraction before the opposite or leading ends of such bars undergo substantial retraction motion.

4,163,492

#### SAFETY PACKAGE OF TOOTHPICK HOLDER

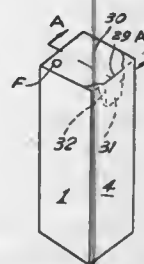
Hermogenes Rella, Itatiba, Brazil, assignor to A. Rella s/a Industria e Comercio, Sao Paulo, Brazil

Filed Mar. 7, 1978, Ser. No. 884,283

Claims priority, application Brazil, Oct. 21, 1977, 7707080  
Int. Cl.<sup>2</sup> B65D 83/02, 85/24

U.S. Cl. 206-380

9 Claims



1. A safety package for holding and dispensing toothpicks in a sanitary manner, said package comprising:

- (a) a plurality of sides and a gluing edge attached to one of said sides, said sides and said gluing edge being formed by a series of creases in a single piece of material;
- (b) a plurality of bottom edges attached to said sides which overlay one another to form a bottom of said package, said bottom edges being formed by a series of creases in said single piece of material; and
- (c) a plurality of cover edges attached to said sides which overlay one another to form a cover of said package, said cover edges being formed by a series of creases in said single piece of material and having a plurality of grooves

and a hole for providing individual output of toothpicks, wherein said cover edges further comprise:

- (i) a first cover edge including a trapezoidal projection thereon having a plurality of ears which are foldable with respect to said projection, said projection and said ears being formed by a series of creases in said single piece of material; and
- (ii) a second cover edge having a slit therein for receiving said trapezoidal projection and folded ears when said edges are overlaid whereby said cover edges are locked in place.

4,163,493

#### NEEDLE STORAGE PACKAGE

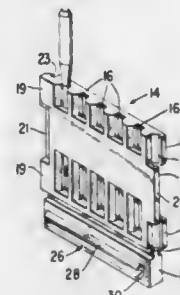
Wayne A. Current, Holmdel, N.J., assignor to The Singer Company, New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,281

Int. Cl.<sup>2</sup> B65D 85/24

U.S. Cl. 206-380

4 Claims



1. A needle storage package for sewing machine needles having a storage sector formed with opposite side edges; a base formed with front and rear surfaces; and a flexible hinge connecting said storage sector to said base; said storage sector having at least one storage compartment formed therein for the storage of sewing machine needles; said at least one storage compartment frictionally receiving and storing in a vertical position one sewing machine needle; first complementary interengaging means arranged along opposite side edges of each of said needle storage packages for connecting two of said needle storage packages together side by side; and second complementary interlocking means arranged on the front and rear surfaces of the base of each said needle storage packages for connecting two of said needle storage packages together front-to-back.

4,163,494

#### SHIPPING CONTAINER

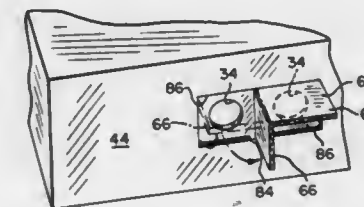
Ray H. Stollberg, Gilroy, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed May 15, 1978, Ser. No. 906,190

Int. Cl.<sup>2</sup> B65D 85/50

U.S. Cl. 206-423

6 Claims



1. A shipping container for cut flowers and the like comprising:
- a tray including a bottom wall and a plurality of tray side

walls extending from said bottom wall, at least one of said tray side walls having an aperture formed therein;

a cover for placement on said tray, said cover including a top wall and depending cover side walls, at least one of said cover side walls having an aperture formed therein, said apertures being in registry when said cover is placed on said tray, said cover additionally including closure means manually movable between a first position whereat communication is established through said apertures in registry between the interior of the shipping container and ambient atmosphere and a second position whereat said communication is interrupted, and lock means for selectively retaining said closure means in said first position, said closure means comprising a hingedly secured closure flap having first and second adjacent flap segments hingedly secured to one another along a first hinge line and said flap segments being angularly disposed relative to one another about said first hinge line when said closure means is in said first position.

4,163,495

#### PLASTIC BREAD CARRIER HAVING FOLDING END WALLS

Clarence H. Drader, R.R. #2, Sherwood Park, Alberta, Canada

Filed Sep. 21, 1977, Ser. No. 835,217

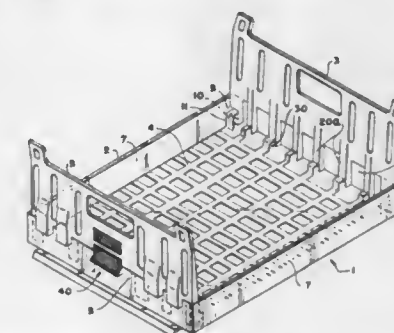
[30] Foreign Priority Application Data

Sept., 1976 [GB] United Kingdom 39928/76

Int. Cl.<sup>2</sup> B65D 21/02, 7/26; A47G 23/06

U.S. Cl. 206-506

2 Claims



1. A plastic carrier for bread and the like comprising:
- a rectangular tray having a floor section and a pair of end rails upstanding from the floor section;
- a pair of end walls connected with the tray for rotation, between a generally horizontal position overlying the floor section and a generally vertical position wherein they are disposed above the end rails, and for limited vertical movement, whereby the end walls may be shifted downward when generally vertical onto the end rails, to form upwardly projecting extensions of said end rails, or upward off the end rails;
- each said end wall having a lower edge portion comprising spaced apart downwardly extending parallel inner and outer leg portions which form a first groove extending along at least the greatest part of said end wall's length, said first groove corresponding to the thickness of the upper edge portion of the adjacent end rail whereby, when the end wall is rotated to the generally vertical position and moved downward, the leg portions may drop down over and engage the upper edge portion of the end rail, to restrain the end wall from rotating back inward toward the floor section;
- said floor section forming a second groove, disposed across the greatest part of its width adjacent the base of each end rail, for receiving the inner leg portion of the relevant end wall when the end wall has been rotated to the generally vertical position and moved downward to penetrate said second groove, a side wall of said second groove being operative to restrain the end wall from rotating further outward substantially beyond vertical; and
- releasable means for restraining upward movement of the



end walls relative to the tray when said end walls are in the downwardly shifted position;  
said releasable means comprising outer leg portions which are progressively longer toward the midsection of the end wall, whereby as each end wall is rotated upwardly, the midsection portion of the outer leg portion is first to engage the upper edge portion of the end rail, thereby causing the end rail to bow downwards as the end wall is further rotated to a generally vertical position, at which point the end rail automatically penetrates into the first groove.

4,163,496

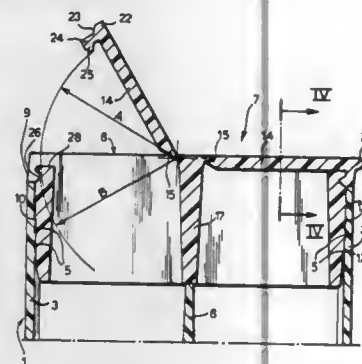
**CONTAINER FOR DISPENSING SMALL OBJECTS**  
Amilcare Dogliotti, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy

Filed Sep. 30, 1977, Ser. No. 838,176

Claims priority, application Italy, Oct. 4, 1976, 69380 A/76  
Int. Cl.<sup>2</sup> B65D 85/60, 43/16

U.S. Cl. 206—538

18 Claims



1. A container for holding and dispensing a plurality of small objects, said container comprising, in combination:

a hollow body having at least two larger side walls and two smaller side walls closed at one end by a bottom wall, said side walls defining a mouth open at the end of said container opposite said bottom wall;

a hollow closure element of plastics material having a cross sectional shape substantially the same as that of said hollow body, said hollow closure element having a main part in the form of a skirt the sides of which define at least one aperture passing through said closure element from top to bottom, said closure element being shaped such that it can be assembled to said hollow body of said container to close said mouth thereof;

a tongue for the closure of said at least one aperture of said closure element, said tongue being formed integrally with said closure element, and a portion of said tongue being of reduced section with respect to the main part of said tongue and serving as a hinge joining said tongue to said main part of said closure element; said tongue being in the form of a plate having plane parallel faces and said portion of reduced cross section constituting said integral hinge being defined by a first transverse notch, v-shaped in cross section, formed in the lower surface of said tongue, and a second transverse notch formed in the upper surface of said tongue at a position opposite said first notch; said second notch having a depth and width substantially less than that of said first notch;

means defining a seat on said closure element adapted to receive the free end of said tongue remote from said hinge in the closure position of said tongue;

a projecting part of said free end of said tongue extending beyond said seat of said closure element and providing means for engagement by the thumb of a user in opening said container;

a transverse ridge projecting from the under surface of and spaced inwardly from said free end of said tongue and

extending in a direction parallel to said hinging axis of said tongue;

means defining cooperating snap engagement means, one part of which is carried by the outer surface of said skirt defining said main part of said closure element adjacent said seat, and the other part of which is carried by said transverse ridge projecting from said free end of said tongue, for retaining said tongue in its closure position, said tongue and said transverse ridge together constituting a rigid element which is sufficiently stiff not to be deformed by forces applied to said projecting part of said tongue during the operations of opening and closing said container such that, during such operations, said portion of reduced cross section of said tongue constituting the hinge thereof reacts elastically in the manner of a spring to displacing forces applied to said tongue by said snap engagement means, said hinging axis of said tongue being spaced from the coupling surface of said snap engagement means carried by said transverse ridge on said tongue a distance less than the distance said hinging axis of said tongue is spaced from the coupling surface of said cooperating snap engagement means carried by the outer surface of said skirt forming the main part of said closure element, whereby in the closure position of said tongue it is displaced by a distance equal to the difference between said distances so that the portion of said tongue constituting said integral hinge is elastically stretched to accommodate such displacement.

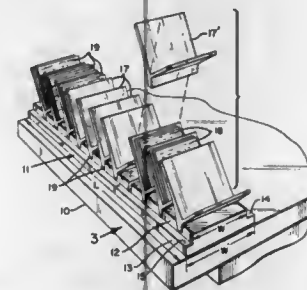
4,163,497

**PHARMACIST'S PRESCRIPTION FILE HOLDER**  
William D. McEwen, 727 Viewcrest Dr., Ventura, Calif. 93003  
Filed May 9, 1978, Ser. No. 904,326

Int. Cl.<sup>2</sup> B42F 17/12

U.S. Cl. 211—11

5 Claims



1. A pharmacist's prescription file holder comprising, in combination:

(a) an elongated board having a plurality of transverse grooves cut into its top surface; and

(b) a plurality of racks of L-shape in cross section with downwardly extending stems receivable in said grooves to support the racks in inclined positions on said board, each of said racks including side flanges integrally extending between the outer edges of the stem and lower side edges of the inclined portion of the rack, said flanges overlapping side edges of said board when said stem is received in a groove to lock the rack against lateral movement, whereby identifying information constituting the top few lines on prescription files placed in said racks is clearly visible to a pharmacist at all times so that a desired prescription file can readily be located when stored in said holder.

4,163,498

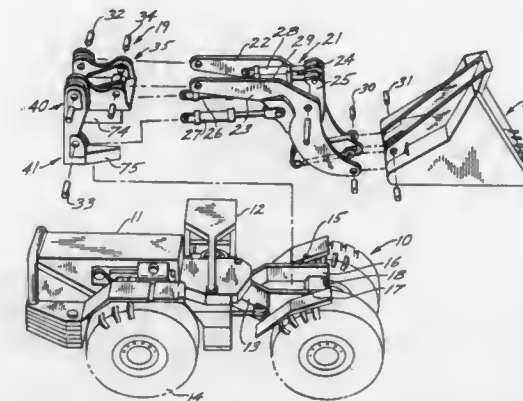
**TOWER ASSEMBLY**

Frank A. Grooss, Morton, and Gerald P. Simmons, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.  
Filed Dec. 13, 1977, Ser. No. 859,364

Int. Cl.<sup>2</sup> E02F 3/70

U.S. Cl. 414—697

9 Claims

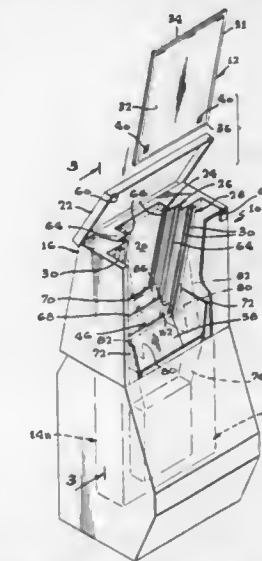


1. In a wheeled vehicle having a frame provided with laterally spaced front rail portions each defining a side and a top, a working component, and arm and control cylinder means attached to the working component for selective positioning of the working component, improved means for mounting said arm and control cylinder means to the frame comprising:

a prefabricated substantially U-shaped tower assembly having lower portions laterally adjacent said spaced rail portion sides and an upper portion overlying the space between said rail portions and supported on said tops thereof;

means removably pivotally connecting said arm and control cylinder means to the tower assembly; and  
securing means fixedly securing said tower assembly lower portions to said sides of said spaced rail portions, and said tower assembly upper portion to said tops of said spaced rail portions.

means biased to hold said cassette out of engagement with said release member until said cassette is pushed against



the bias of said retainer, and, means to move said cassette against said retainer.

4,163,500

**BOTTLE SEAL**

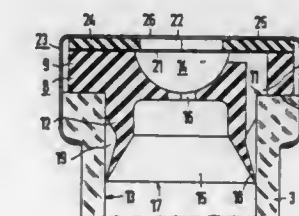
Ingemar Gunne, Sollentuna, and Bertil Almgren, Vällingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,536

Int. Cl.<sup>2</sup> B65D 51/16

U.S. Cl. 215—260

3 Claims



1. In a bottle seal for a necked bottle including a resilient stopper having an extending portion adapted to be inserted into the neck of a bottle in circumferential sealing engagement with the inner diameter wall of the bottle neck, the stopper being provided with a concentric slit area for sealing receipt of a liquid withdrawing needle, the improvement of the terminating in a lip seal engageable with the inner diameter wall of the bottle neck, a circumferential groove adjacent the lip in an outer diameter of the extension and an air channel communicating the groove with a portion of the stopper on an exterior side of the slit area remote from the lip seal.

4,163,501

**ELECTRICAL OUTLET BOX AND WALL MOUNTING CLAMP THEREFOR**

John L. Lass, Homewood, Ill., assignor to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 837,955, Sep. 29, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,178

Int. Cl.<sup>2</sup> H02G 3/08

U.S. Cl. 220—3.6

4 Claims

1. A clamp for use with an electrical outlet box, said clamp receivably located in an elongated slot in a wall of said outlet box, said clamp comprising;

4,163,499

**CASSETTE UNLOADER**

Gunter Schmidt, Malibu, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 13, 1977, Ser. No. 805,816

Int. Cl.<sup>2</sup> B65G 65/04

U.S. Cl. 414—411

7 Claims

1. An unloader for an X-ray film-holding cassette which has a pair of walls pivotally joined at one end and held together at the other end by at least one latch which can be pushed in to release the walls so they can pivot apart, said unloader comprising:

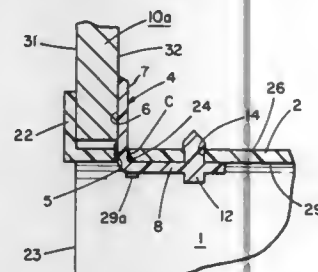
a lighttight housing;

guide means for slidably receiving one wall of said cassette in said housing and holding it inclined at an acute angle to the vertical;

a release member fixedly positioned in said housing to engage the latch on a cassette received by said guide means, whereby to release the other wall for swinging movement to an open position; and

a retainer in the path of a cassette received by said guide

a first leg outside of said outlet box and a second leg inside of said outlet box, said second leg consisting of a pair of spaced apart projections, said first and second legs being connected at a juncture and forming an initial predetermined angle slightly greater than 90 degrees, said clamp being in a first position before said outlet box is installed in a predetermined opening in a house wall, said first leg being substantially parallel and adjacent to said outlet box wall and extending toward said rear wall of said outlet box, said second leg extending into said outlet box, a central appendage connected to said first leg of said clamp near said juncture, said central appendage having a step-down end portion with a central aperture, a pair of snap buttons located on the end of said second leg opposite said juncture of said first and second legs, a snap button being located on each of said pair of spaced apart projections, for mating with a pair of apertures in said outlet box wall,



such that after said outlet box is positioned in the predetermined opening in the house wall, said clamp is manually moved to a second position by pivoting said first and second legs about said juncture in said elongated slot until said snap buttons on said second leg are located in said corresponding apertures in said outlet box wall, said first leg effectively sandwiching the house wall between said second leg and a frontal flange, extending laterally away from a front edge of said outlet box wall, thereby securing said outlet box in the house wall, and an internally threaded bore in a center post extending inwardly from said front edge of said outlet box wall and a mounting screw, such that when said clamp is in said second position, said central aperture and said threaded bore are in registration, and when said mounting screw is inserted in said threaded bore, said mounting screw extends through said central aperture of said step-down portion of said central appendage thereby substantially retaining said clamp in said second position.

#### 4,163,502 SHEET METAL CONNECTION IN ELONGATED LAMP HOUSINGS

Heinrich Korte, 60 Grosswolder Strasse, Ihrhove, Fed. Rep. of Germany (2951)

Filed Dec. 27, 1977, Ser. No. 864,969

Int. Cl.<sup>2</sup> H02G 3/08; B65D 7/00

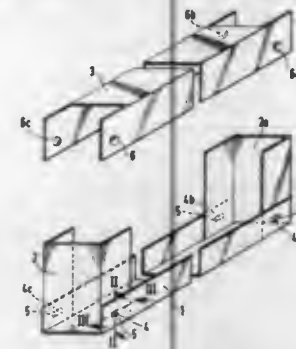
U.S. Cl. 220—3.94

4 Claims

1. In an elongated fluorescent lamp housing made of assembled sheet metal parts of the type including a prelacquered elongated, generally U-shaped lamp element, two prelacquered, generally U-shaped front faces joined to opposite ends of the lamp element and a generally U-shaped, elongated covering hood joined to the front faces and the lamp element, the improvement comprising:

at least said front faces and said lamp element being provided with overlapping and abutting surfaces defining connecting zones, said front faces and said lamp element in said connecting zones having simultaneously-formed coacting indentations formed therein from one side of the connecting zone, for joining said front faces and lamp element

rigidly together, said coacting indentations of said lamp element and said front faces each forming an unlacquered



cut edge which abut one another so as to form electrical contacts between said front faces and said lamp element.

#### 4,163,503 LID AND HOUSING

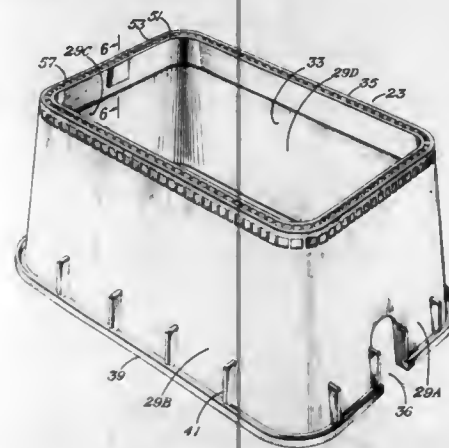
Robert M. McKinnon, Bedford, Tex., assignor to D/FW Plastics, Inc., Bedford, Tex.

Filed Sep. 20, 1978, Ser. No. 944,074

Int. Cl.<sup>2</sup> B65D 25/24

U.S. Cl. 220—18

6 Claims



3. A housing for installation in the ground, comprising: upstanding wall means formed of plastic material defining a cavity having an upper opening and a bottom opening, said upper opening being generally rectangular in shape and formed by surrounding upper wall structure having an upper edge for supporting a lid, said upper wall structure comprising an inner ridge and an outer ridge which surround said upper opening, said inner and outer ridges being joined together at a position located below said upper edge and extend away from each other in an upward direction, the top edges of said inner and outer ridges being spaced apart from each other, and a plurality of ribs extending between said inner and outer ridges at spaced apart positions, the top edges of said inner and outer ridges and of said ribs defining said upper edge of said housing.

#### 4,163,504 METAL END HAVING FLUTED END CURL

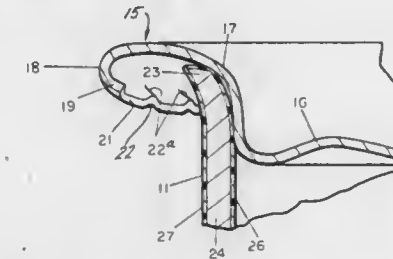
William F. Elser, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 8, 1977, Ser. No. 858,772

Int. Cl.<sup>2</sup> B65D 7/42, 3/10

U.S. Cl. 220—66

10 Claims



1. A loose metal can end for use in forming a seamed can end closure for a can body, said loose metal can end including a central panel marginally encompassed by a marginal seaming panel having a peripherally depending curled outer rim defining a convexly radiused cross-sectional configuration and concluding in a radially inwardly curled end, said curled end including means preformed therein for inducing said curled end to pinwinkle directionally away from said can body when said loose metal can end is subsequently seamed onto the end thereof, said means comprising a peripherally interspaced array of flutes respectively cresting directionally towards the interior confines of said outer rim, and said curled end with the exception of said flutes being otherwise essentially smoothly surfaced throughout the peripheral entirety thereof.

#### 4,163,505 FOLDABLE LINERS FOR FLUIDS HOLDING STORAGE TANKS

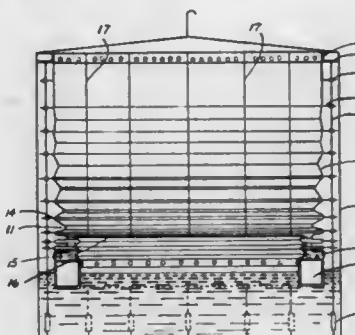
Arnold Gunther, 29 Lorelei Rd., West Orange, N.J. 07052

Filed Sep. 23, 1977, Ser. No. 836,034

Int. Cl.<sup>2</sup> B65D 89/04, 89/16

U.S. Cl. 220—85 B

5 Claims



1. A device for folding vertical liners with a polyhedral shape comprising, in combination, a liquid holding storage tank with a frame welded to the inner top portion of said tank's shell, the inner face of said frame being a vertical surface prismatically shaped and substantially concentric with the tank's shell, the distance between said inner face and said shell being substantially a small fraction of the said shell's diameter, a freely moving, substantially rigid frame, located inside the tank and free to displace in the vertical direction, the inner surface of this frame having a vertical prismatical shape substantially identical to the said welded frame, a vertical liner, concentrically located to the said tank's shell, its top portion attached to the inner face of said welded frame, its bottom portion attached to the inner face of the said freely moving frame, the vertical liner taking the shape of a polyhedral surface with a number

of faces equal to the number of faces of each of said frames, d. a plurality of vertical cables having their top portions attached to the said welded frame and their bottom portions attached to said tank's floor, the cables being located between the said vertical liner and the said tank's shell and facing said liner's vertical edges, the number of cables being equal to the number of said vertical edges, e. a plurality of strips with one of their ends attached to the edges of said vertical liner, their other end being traversed by said vertical cables and free to slide over said cables, said strips being located in a plurality of horizontal plans, said strips cooperating with said freely moving frame to fold said vertical liner for an upward displacement of said frame and to unfold said liner for a downward displacement of said frame, f. means to induce vertical motions in the said freely moving rigid frame.

#### 4,163,506 CLOSURE ASSEMBLY HAVING A TEAR TEMPLATE

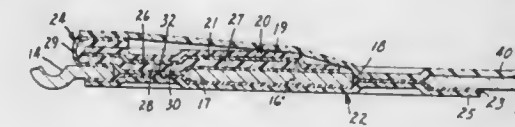
Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 23, 1978, Ser. No. 953,883

Int. Cl.<sup>2</sup> B65D 41/02

U.S. Cl. 220—260

16 Claims



1. In a hand operable easy opening closure system of the type wherein a flexible exterior tape and an interior sheet material are employed to removably seal a preformed opening in an end portion of a container, the improvement which comprises a flexible tear template, said template having a top surface and a bottom surface, said top surface being bonded to the underside of said exterior tape and said bottom surface being bonded to the top of said interior sheet material in the area of said preformed opening and being capable of removing the portion of said interior sheet material in the area of said pour hole and tearing an opening of predetermined shape in said exterior tape when said closure system is opened.

#### 4,163,507 OPTICAL SEED SENSOR FOR A SEED PLANTER MONITOR

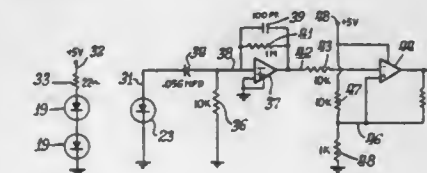
Dennis M. Bell, Hudson, Ill., assignor to International Tape-tronics Corporation, Bloomington, Ill.

Filed Mar. 20, 1978, Ser. No. 888,398

Int. Cl.<sup>2</sup> B65B 57/18

U.S. Cl. 221—2

5 Claims



1. For use with a seed monitor for a seed planter having a chute for periodically dispensing seeds, an optical seed sensor comprising: a light emitting diode means and a rapidly-responding solar cell light receiving means mounted in opposing relationship in the chute for seed passage therebetween; a light shield having a slit narrower than the diameter of a seed, said shield being disposed within the chute adjacent



to said solar cell means and interiorly thereof with said slit being transverse to the path of a seed dispensed through the chute;

said solar cell light receiving means being operable to generate a voltage output in response to the presence of light emitted from said diode means, the passage of a dispensed seed between said diode means and said solar cell means serving to temporarily reduce the intensity of the light passing through said slit to said solar cell means to temporarily reduce said voltage output thereof;

a differentiator circuit means and a comparator circuit means connected in series with said solar cell means output, said differentiator circuit means being operable to provide an output voltage proportional to the change of said solar cell means output with respect to time, and said comparator circuit means being operable to provide a counting pulse whenever the voltage output of said differentiator circuit means exceeds a predetermined threshold voltage value;

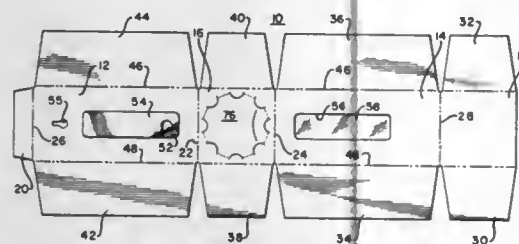
whereby said light shield limits the intensity of the light received by said rapidly-responding solar cell means for discrimination between closely spaced or partially overlapping seeds dispensed through the chutes.

**4,163,508**  
**DISPOSABLE CUP DISPENSER**  
Arden Mannor, Tatum, Tex., assignor to Carthage Cup Company, Carthage, Tex.

Filed Jun. 13, 1977, Ser. No. 805,740  
Int. Cl.<sup>2</sup> B65D 5/16

U.S. Cl. 221—310

5 Claims



1. A carton formed from a blank of flexible sheet material which is pre-cut and scored to define panel and closure portions thereby permitting the blank to be folded and erected into a tubular carton for enclosing a nested stack of cups of the type having a rolled edge and a tapered sidewall body section, the one-piece blank including a pair of longitudinal side panels and a dispensing end panel interconnecting the side panels, the dispensing end panel having pre-cut portions and perforations which delineate a tear line forming the boundary of a dispensing opening, the portion of the end panel circumscribed by the tear line being removable to permit the withdrawal of a cup from a nested stack of cups enclosed within the carton, the dispensing opening being characterized by a substantially circular edge interrupted by a plurality of radially projecting tabs which are circumferentially spaced relative to each other around the periphery of the dispensing opening, the diameter of the circular edge being substantially equal to the outside diameter of the rolled edge of the cup, and the diameter as measured between radially opposite tabs being substantially equal to the outside diameter of the tapered sidewall body portion of the cup which is joined to the rolled edge.

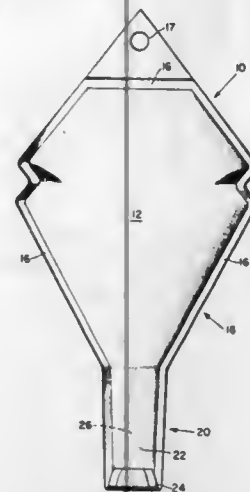
**4,163,509**  
**SQUEEZE DISPENSER WITH SELF CLOSING VALVE**  
John S. Amneus, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 836,117, Sep. 23, 1977, abandoned, said Ser. No. 836,117, is a continuation-in-part of Ser. No. 770,533, Feb. 22, 1977, abandoned. This application Mar. 23, 1978, Ser. No. 889,460

Int. Cl.<sup>2</sup> B65D 35/08, 35/52

U.S. Cl. 222—95

12 Claims



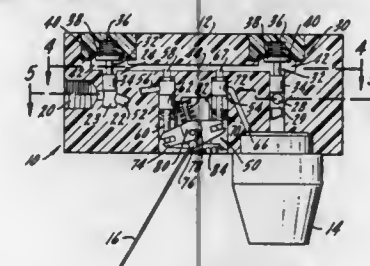
1. In a dispensing container for fluids comprising a body and a discharge spout which projects outwardly therefrom and wherein said spout comprises opposing walls of supple impermeate material interconnected at their lateral edges by seams which dispose the walls in substantially face-to-face contact when the spout is empty, the improvement which comprises: a valve portion of said spout in which said seams maintain said walls in a curled conformation in the discharge direction when empty to thereby provide a valving action, said walls at least in said valve portion comprising separate layers of said material, each of said layers having a radius of curvature with an axis generally normal to the centerlines of the walls of said spout when empty, said seams in said valve portion comprising a union of said separate layers in substantially face-to-face contact with one another, whereby the radius of curvature of one of said layers is greater than the radius of curvature of the other of said layers.

**4,163,510**  
**METHOD OF AND APPARATUS FOR DISPENSING A MULTI-CONSTITUENT BEVERAGE**  
Marshall C. Strenger, 450 Thorne, Lake Forest, Ill. 60045

Filed Aug. 12, 1977, Ser. No. 824,076  
Int. Cl.<sup>2</sup> B67D 5/56

U.S. Cl. 222—129.2

29 Claims



1. A method of dispensing a mixed beverage constituting measured quantities of a base liquid and a flavoring constituent wherein a controlled flow of base liquid and a controlled flow of flavoring constituent are selectively directed to a beverage

outlet and thereafter expelled from the outlet into a suitable container, the method comprising the steps of:

- selectively and manually actuating a pilot flow of base liquid under pressure;
- introducing said pilot flow into each of a plurality of flow valves, one each associated with independent sources of base liquid and flavoring constituent, for independently activating a flow of base liquid and a flow of flavoring constituent to the beverage outlet; and
- deactivating said pilot flow for inhibiting the flow of base liquid and flavoring constituent to the beverage outlet.

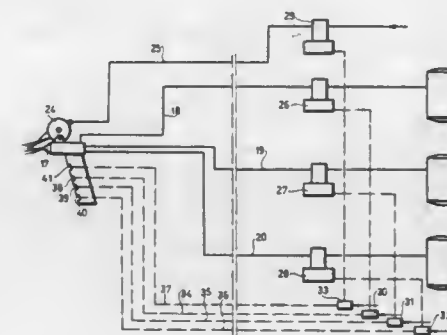
**4,163,511**  
**DISPENSER HAVING MANUALLY OPERATED AIR CONTROLLED VALVES**

Geza Kecskeméthy; György Virág; Robert Tihanyi, all of Budapest, and Zoltán Czirmai, Tatabanya, all of Hungary, assignors to Muanyagipari Kutató Intézet, Budapest, Hungary  
Filed May 9, 1977, Ser. No. 795,234

Int. Cl.<sup>2</sup> B67D 5/60

U.S. Cl. 222—144.5

2 Claims



1. In an apparatus for dispensing material, comprising a hand-held dispenser connected by at least one flexible conduit to plural sources of material under pressure to be dispensed, and valve means for selectively opening and closing said conduit to the flow of said material therethrough, said valve means being disposed in series between said flexible conduit and said sources, and means carried by said dispenser for selectively actuating said valve means; the improvement in which said actuating means comprises orifices on said dispenser that may be selectively opened or closed by the operator, small conduits interconnecting said orifices with a source of air under pressure, one said conduit being individual to each said orifice for the separate control of the flow of at least one said material to said dispenser, and means responsive to a change in pressure in any said small conduit upon opening or closing the associated one of said orifices, to actuate said valve means, said dispenser comprising a spray gun having a handle, said orifices opening through the surface of said handle.

**4,163,512**  
**SINGLE USE POURING SPOUT AND COMBINATION**  
Davis B. Dwinell, Warren, N.J., assignor to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Sep. 9, 1977, Ser. No. 831,993

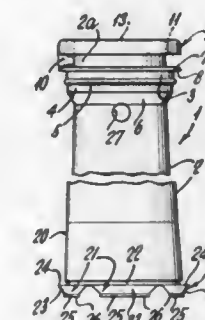
Int. Cl.<sup>2</sup> B65D 25/44

U.S. Cl. 222—525

7 Claims

1. A one-piece pull-up pouring spout integrally molded of synthetic plastic material for displacement between a lowered container sealing position and raised pouring position compris-

ing an elongated tubular body having a smooth interior surface free of internal projections, said spout having a closed upper end portion and an open lower end portion, a first selfsupported sealing surface disposed about the upper end portion of said spout tubular body dimensioned for tight sealing engagement within a container wall opening with said spout in lowered sealing position whereby said one-piece spout acts as the

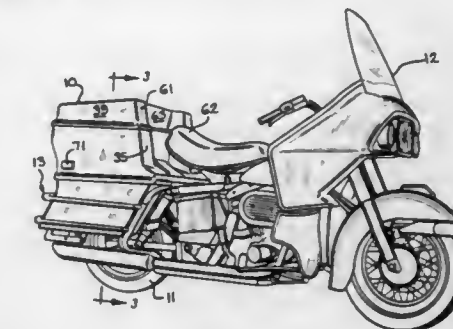


sole means for closing off the container wall opening, a second sealing surface disposed about the lower end portion of said spout for sealing engagement within a container wall opening with said spout in raised pouring position, and gripping means integrally connected to said spout for pulling said spout from said lowered sealing engagement and raising said spout from a lowered container sealing position to an extended position.

**4,163,513**  
**MOTORCYCLE SADDLEBOX**  
Ralph Kramer, 2628 Powhattan Pkwy., Toledo, Ohio 43606  
Filed May 16, 1977, Ser. No. 797,507  
Int. Cl.<sup>2</sup> B62J 9/00

U.S. Cl. 224—32 R

2 Claims



1. A saddlebox for motorcycles and the like; said saddlebox comprising a rigid, hollow container including outermost front, rear and side walls joined at their intersections to provide a closed outermost periphery and a bottom plate intersecting and joined to said walls; a pair of spaced apart innermost side walls extending upwardly from said bottom plate and inwardly from said front wall to define a wheel well extending into said box; said wheel well having an interior top well ceiling extending between said innermost side walls and interior rear well wall extending between said innermost side walls from said top well ceiling downwardly to said bottom plate to form a closed lower surface of said box; each of said innermost side walls including a generally horizontal elongate support surface protruding therefrom and spaced opposite each other to form upper and lower portions of said innermost side walls; said protruding support surfaces being adapted to rest upon rigid horizontal frame members of said cycle when said saddlebox is positioned thereon, with the rigid frame members and cycle wheel extending into said wheel well of said box; a substantially vertical structure member depending from and coextensive with each of said horizontal support surfaces and

disposed substantially perpendicular thereto and bottoming outwardly from said wheel well to join with said lower portions of each of said innermost side walls; said vertical structure members having holes therethrough adapted to receive fastening means extending through said rigid frame members and said holes; and said horizontal support surfaces and vertical structure members being substantially thicker than the rest of said saddlebox to provide reinforcing structural support.

4,163,514

## ADJUSTABLE STOCK FEED

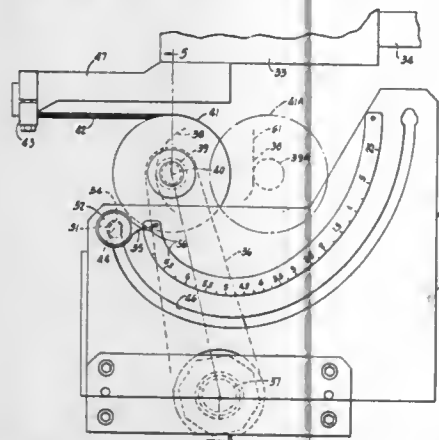
Valdas S. Ramunas, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed May 9, 1977, Ser. No. 794,918

Int. Cl.<sup>2</sup> B65H 51/18, 51/32

U.S. Cl. 226—141

19 Claims



1. An adjustable feed mechanism for feeding elongated stock to a machine, comprising, in combination, a frame, a stock feeder positioned to feed elongated stock to the machine, a support member mounted for movements in a path on said frame, actuator means connected to move said support member in said path through a given length stroke, a member having a curved track, a transversely flexible elongated linkage, means to connect said linkage to act between said actuator means and said stock feeder and engaging at least part of said curved track, means establishing a curve which is the involute of a circle on one of said connection means and said curved track, and adjustable means connected to utilize a different portion of said involute curve establishing means to change the length of elongated stock feed to the machine.

4,163,515

## DISPOSABLE STAPLER APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

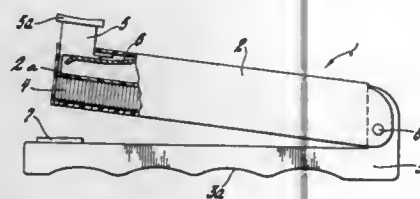
Peter R. Kapuscinski, 4117 Connie Dr., Sterling Heights, Mich. 48077

Filed Sep. 30, 1977, Ser. No. 838,382

Int. Cl.<sup>2</sup> B25C 5/00

U.S. Cl. 227—120

10 Claims



1. In a stapler apparatus of the type comprising an elongated

base member and an elongated staple magazine member pivotably secured together adjacent first ends of said members; means cooperating with said members for biasing said members in opposite directions relative to each other; said magazine member being provided at a second end thereof with staple dispensing means; said base member being provided at a second end thereof with a plate member; and said plate member and said staple dispensing means being adapted to cooperate to permit individual ones of said staples to be dispensed toward and against said plate member to perform a stapling operation when said members are pivoted toward each other, the improvement wherein:

- said magazine member has a set of staples predisposed and aligned therein;
- said set of staples being retained by a bar member superposed on said set of staples;
- said bar member being immovably affixed within said magazine member so that removing said bar member to insert a second set of staples is prevented.

4,163,516

## METHOD FOR JOINING METAL BY SOLID-STATE BONDING

L. Elkin Burkhart, Oak Ridge, Chester R. Fultz, Kingston, and Kerry A. Maulden, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,360

Int. Cl.<sup>2</sup> B23K 19/02

U.S. Cl. 228—114

3 Claims

1. A method for solid-state bonding of metallic workpieces comprising the steps of placing planar surfaces of each workpiece in a parallel abutting relationship with one another in an evacuated environment, applying an axially directed pressure loading on at least one of the workpieces for forcing said surfaces together, oscillating one of said workpieces in a rotary motion a maximum distance of up to about one degree of travel during the application of said loading, and terminating the oscillation for effecting the solid-state bond.

4,163,517

## TUBULAR CONTAINER

Hermann Kappler, Bayside, N.Y., and Norman A. Chezek, Clifton, N.J., assignors to Niemand Bros., Inc., Elmhurst, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,667

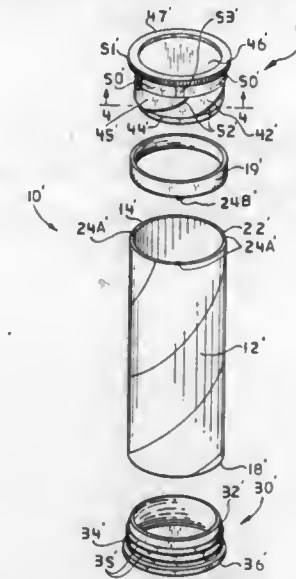
Int. Cl.<sup>2</sup> B65D 3/10

U.S. Cl. 229—45

11 Claims

1. An improved, tamper-proof, tubular container assembly, which comprises: a tubular body having a closed end, an open end, a body wall with inner and outer surfaces joining said ends, and a removable body wall portion contiguous with the open end, said inner surface being deformable; means associated with the body wall for fracturing said body wall and permanently separating the removable body wall portion, whereby access to the contents of the container assembly may be had; and a removable closure member, mounted in and closing the open end of the tubular body, said closure member comprising a hollow cylinder having: (a) a first closed end; (b) a second, beveled end, said bevel being angled toward the axis of said cylinder; (c) a cylinder wall joining the first and second ends and having inner and outer surfaces, said outer surface being divided into a screw thread zone which is contiguous with the beveled end and an attachment zone between the screw thread zone and the first closed end; and (d) a male screw thread formed on the outer surface of the cylinder in the screw thread zone; said mounting being effected by securing the inner surface of the removable

body wall portion of the tubular body to the attachment zone of the hollow cylinder, with the beveled end and screw thread zone positioned within said tubular body at a point between the closed end of the tubular body and the removable body wall portion; the removable closure member being of a dimension



whereby the screw thread will deform the inner surface of the tubular body when the removable closure member is mounted in the open end of the tubular body, and form thereon a corresponding female screw thread in which the male screw thread will slide when the removable closure member is rotated so as to screw the closure member out of the open end of the tubular body.

4,163,518

## AIR FRESHENER CARTON

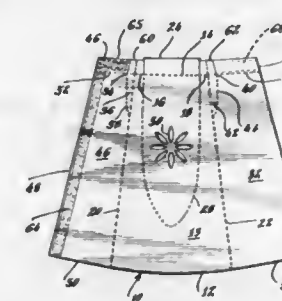
George P. Webinger, Minneapolis, Minn., assignor to Champlon International Corporation, Stamford, Conn.

Filed Jun. 9, 1978, Ser. No. 914,008

Int. Cl.<sup>2</sup> A61L 9/04; B65D 5/36

U.S. Cl. 229—8

12 Claims



1. A carton having a bottom opening for receiving an insert comprising: a front panel having a convex lower edge, first and second side edges defined by straight fold lines which convert as they extend away from said lower edge, and an upper edge having a central segment defined by a straight fold line and first and second side segments, each extending from one end of said central segment to the adjacent side edge of said front panel; first and second back panels, each extending from a side edge of said front panel to a free edge and having a curved lower edge which is a continuation of the lower edge of said front panel and an upper edge including a segment defined by a straight fold line extending between the free

edge of the panel and a point spaced from the adjacent side edge of said front panel, said first and second back panels being secured to one another in overlapping relationship; and

- a top closure including a front panel extending from the central segment of said front panel and a back flap comprising overlapping flaps extending from the straight segments at the upper edges of said first and second back panels, said front flap and said back flap being secured to one another in overlapping relationship.

4,163,519

## COMPENSATING ROTOR

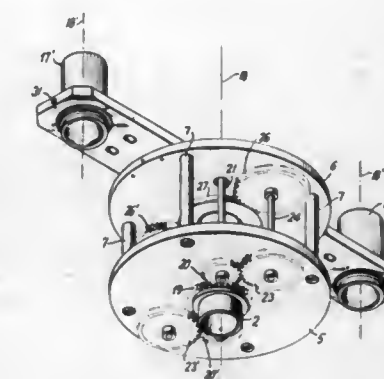
James Stabile, Scarsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1977, Ser. No. 847,615

Int. Cl.<sup>2</sup> B04B 9/08

U.S. Cl. 233—26

13 Claims



1. A compensating rotor having, in combination:

- (a) a fixed base;
- (b) a central vertical axis;
- (c) an arm assembly rotatably mounted to the fixed base;
- (d) a centrifugal processing container;
- (e) a platform rotatably mounted to the arm assembly;
- (f) means to secure the centrifugal processing container to the platform;
- (g) a stationary feed and collection system;
- (h) a flexible tubing loop for effecting the exchange of fluid between the centrifugal processing container and the stationary feed and collection system;
- (i) a tube guide mounted on the arm assembly enclosing a segment of the tubing loop; and
- (j) drive means including an inherently symmetrical load sharing epicyclic reverted gear train for rotating the platform and arm assembly in the same direction about the central vertical axis and at an angular velocity ratio of 2:1 respectively.

4,163,520

## ELECTROSTATIC LIQUID SPRAYING NOZZLE

Felix Garcia, Grenoble, and Marcel Weil, Saint-Martin-d'Heres, both of France, assignors to Air Industrie, Courbevoie, France

Continuation of Ser. No. 702,422, Jul. 6, 1976, abandoned. This application May 16, 1978, Ser. No. 906,761

Int. Cl.<sup>2</sup> B05B 5/00

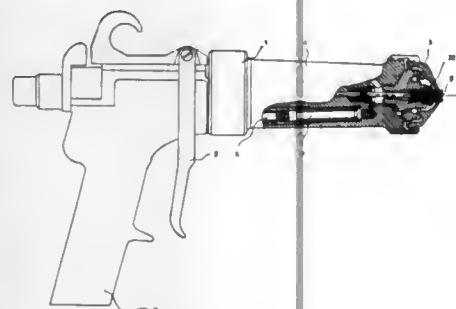
U.S. Cl. 239—707

6 Claims

1. An air-assisted electrostatic round-spray nozzle which defines an outlet for a liquid to be sprayed and comprises: at least one charging electrode made of electrically conductive material and means for connecting said electrode to a source of high voltage, diffuser means of electrically insulating material for shaping

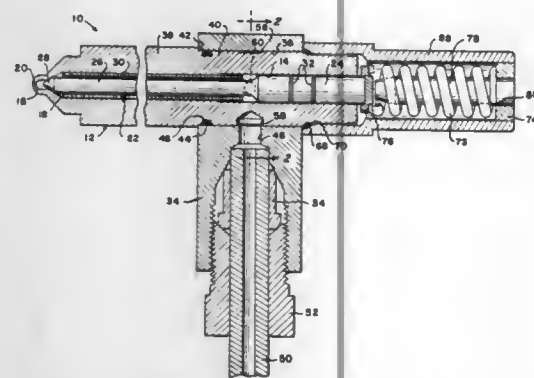


the liquid to be sprayed into a thin-walled tube before it emerges from said nozzle, said diffuser means being within said thin walled tube and having a downstream end, at least one outlet for atomizing gas adjacent said outlet for liquid to be sprayed, and wherein all exposed portions of said nozzle, except for a downstream end of said at least one electrode, are of electrically insulating material,



said downstream end of said at least one electrode comprises at least one point exposed at the downstream end of the diffuser means, said thin-walled liquid tube having a downstream portion which encircles and has the interior of its wall spaced from said downstream end of said at least one electrode, and the downstream end of said at least one electrode is located substantially in the atomizing plane of said nozzle.

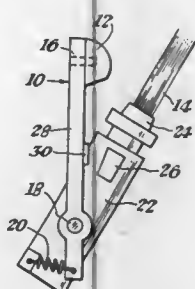
**4,163,521**  
**FUEL INJECTOR**  
Vernon D. Roosa, West Hartford, Conn., assignor to Stanadyne, Inc., Windsor, Conn.  
Filed Nov. 25, 1977, Ser. No. 854,663  
Int. Cl.<sup>2</sup> F02M 55/00  
U.S. Cl. 239—86



1. In a fuel injector for an internal combustion engine, said fuel injector having an elongated cylindrical body providing an axial bore forming a valve chamber having a valve seat and a discharge orifice at the forward end thereof, and inwardly opening pressure actuated valve in said bore for controlling the flow of fuel through said discharge orifice, and an inlet fitting for delivering pressurized fuel to said valve chamber, the improvement wherein said inlet fitting is provided with an enlarged circular opening surrounding said cylindrical body and engaging the same with a press fit, said cylindrical body and said inlet fitting defining a shallow peripheral groove therebetween, said groove having a depth which is less than

the diameter of said discharge orifice, said inlet fitting further having an inlet passage communicating with said peripheral groove to accommodate the unrestricted flow of pressurized fuel thereto, and a port through the wall of said cylindrical body to provide communication between said peripheral groove and said valve chamber, said port being angularly displaced from said inlet passage to form a filter to prevent solid particles entrained in the incoming fuel from entering the valve chamber.

**4,163,522**  
**OSCILLATING MECHANISM**  
Charles T. Hardy, Wilton Manors, Fla., assignor to Safe-T-Lawn, Inc., Hialeah, Fla.  
Filed Apr. 28, 1977, Ser. No. 791,851  
Int. Cl.<sup>2</sup> B05B 3/00  
U.S. Cl. 239—230



1. An oscillating device for operation by a fluid stream the improvement comprising: an oscillating member movable relative to the fluid stream and connected to said device, said member including a walling means on a first side of said member nearest said fluid stream and at least one dewalling means adjacent said walling means on said first side of said member, said walling means connected to said member on said first side to provide a walling force to move said member into engagement with the fluid stream when the member is near the fluid stream and when at least a portion of said walling means is in contact with said fluid stream, said dewalling means connected to said member and moved into the fluid stream by said walling means, said dewalling means providing a dewalling force to stop said member within said fluid stream and to move said member out of said fluid stream in the opposite direction from which it entered, and a positioning means connected to said member to reposition said member and said walling means near the fluid stream so that the cycle of operation may be repeated.

**4,163,523**  
**MULTICOLOR PAINT DISPENSING SYSTEM HAVING A PRESSURE RESPONSIVE COLOR CHANGE VALVE**  
Raymond A. Vincent, 9307 Marion Crescent, Detroit, Mich. 48239

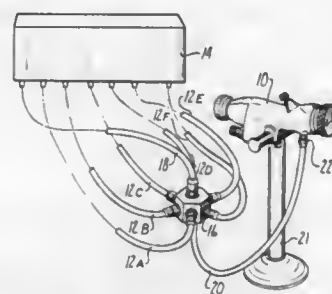
Filed Dec. 15, 1976, Ser. No. 750,836  
Int. Cl.<sup>2</sup> B67D 5/60

U.S. Cl. 239—305

1. A multi-color paint dispensing system wherein the color changing valve mechanism is proximate the dispensing paint comprising:

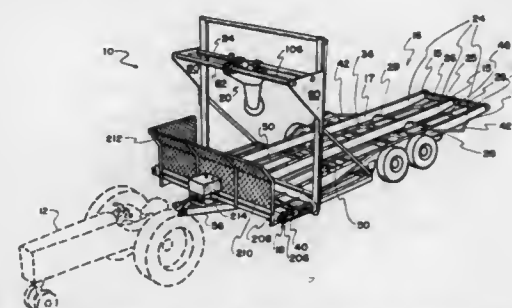
a paint atomizing gun;  
a plurality of paint supply lines;  
means remote from said atomizing gun for selectively pressurizing each of said paint supply lines;  
and a color changing valve mechanism proximate the atomizing gun and having a plurality of inlets, each inlet connected to a respective supply line and an outlet operatively connected to said atomizing gun;

said color changing valve mechanism including a plurality of paint pressure responsive valve means, each of said paint pressure responsive valve means individually connecting a respective inlet to said outlet;  
said paint pressure responsive valve means including means creating communication between said respective inlet and



outlet upon pressurization of the respective connected supply line but preventing flow out of said color changing valve mechanism through said paint pressure responsive check valve means, whereby a pressure of predetermined value in an individual paint supply line created by pressurization of said line causes paint to be dispensed from that paint supply line only.

**4,163,524**  
**VARIABLE STACK FEEDER AND METHOD**  
Ezra C. Lundahl, Providence, Utah, and J. Gordon Wiser, Kirkland, Wash., assignors to Ezra C. Lundahl, Inc., Logan, Utah  
Filed Jun. 22, 1978, Ser. No. 917,997  
Int. Cl.<sup>2</sup> B02C 18/06, 21/02  
U.S. Cl. 241—30

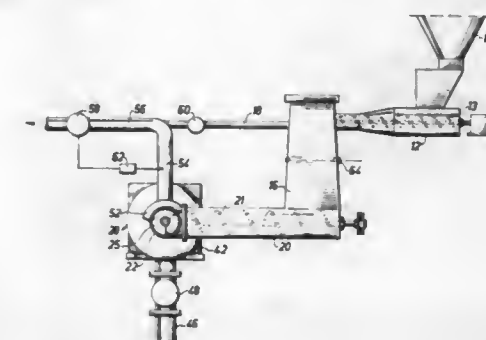


1. A method of strip slicing foliage from the end of a stack thereof comprising the steps of:  
placing the stack of foliage upon a vehicle and causing one end thereof to be disposed generally above a lateral cut foliage conveyor and generally below a cutting mechanism comprising rotatable blade means;  
rotating the blade while displacing the blade in vertical and horizontal directions in a zig-zag pattern to successively horizontally slice strips of foliage from the face of the stack, which strips fall under force of gravity upon the lateral conveyor.

**4,163,525**  
**DEVICE FOR EVACUATING BLOW-BACK STEAM IN PULP REFINING APPARATUS**  
Rolf B. Reinhold, 834 171 Place, NE., Bellevue, Wash. 98008  
Filed Dec. 27, 1977, Ser. No. 864,313  
Claims priority, application Sweden, Jan. 3, 1977, 7700047  
Int. Cl.<sup>2</sup> B02C 7/00, 23/02, 23/26; D21B 1/12  
U.S. Cl. 241—247

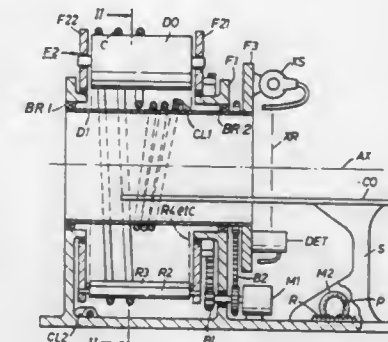
1. In a pulp refining apparatus in which lignocellulosic pulp stock is ground in an environment of superatmospheric steam in a grinding space defined between a pair of grinding members

which rotate relatively to one another within a closed housing having a stock inlet opening into which the pulp stock is advanced by means of a feed screw rotating within a feed-in passage connected to the stock inlet opening, the improvement for evacuating blow-back steam escaping through said stock inlet opening, comprising:



(a) jacket means having a perforate wall mounted about said feed-in passage for separating and receiving blow-back steam;  
(b) conduit means for evacuating blow-back steam from said jacket means;  
(c) said feed screw being effective to maintain said perforate wall free of pulp stock entrained in the blow-back steam.

**4,163,526**  
**CABLE STORAGE ASSEMBLY FOR SCANNING APPARATUS**  
Anthony M. Williams, Iver, England, assignor to EMI Limited, Hayes, England  
Filed Aug. 23, 1977, Ser. No. 827,007  
Claims priority, application United Kingdom, Aug. 21, 1976, 34938/76  
Int. Cl.<sup>2</sup> B65H 75/00  
U.S. Cl. 242—54 R

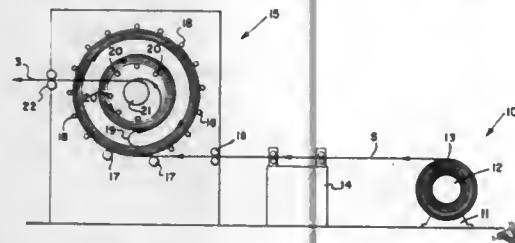


7. A cable handling arrangement for controlling a cable connecting two parts of an apparatus such as a scanning radiographic apparatus, relatively rotatable about a common axis, the arrangement including a first store means for holding a plurality of turns of the cable, wound in a first sense, stationary relative to one of said parts, a second store means for holding a plurality of turns of the cable wound in the opposite sense, stationary relative to the other part, and means operative in the course of relative rotation between said two parts of the scanning radiographic apparatus for progressively unwinding the cable from one store means and reversing and winding the cable onto the other store means, and transfer means for rotating about said axis relative to both parts and for transferring the cable, as it is reversed, from the one store to the other.

**4,163,527**  
**COIL DEPLETION SENSOR**  
 Walter J. Hood, Shaker Heights, and George Gulden, Jr., Lyndhurst, both of Ohio, assignors to Kent Corporation, Twinsburg, Ohio

Filed Aug. 9, 1978, Ser. No. 932,272  
 Int. Cl.<sup>2</sup> B65H 17/48; B21C 47/16  
 U.S. Cl. 242—55

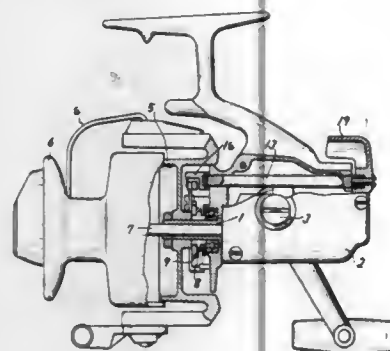
14 Claims



1. In combination, an uncoiler which carries a revoluble coil of strip material, an accumulator having revolving pinch rolls which draw strip material from the coil on said uncoiler, said accumulator at least temporarily storing a quantity of the strip material while transferring strip material to a processing line, and a control device, said control device comprising first means providing a signal proportional to the revolutions of said pinch rolls, second means providing a signal proportional to the revolutions of the coil, counter means having at least one predetermined number loaded therein and counting the occurrence of each signal from said first means, and means to reset said counter means to a said predetermined number if a signal from said second means is received by said means to reset before said counter means has counted a number equal to said predetermined number.

**4,163,528**  
**SPINNING REEL**  
 Takashi Egasaki, and Hiroshi Kawai, both of Higashikurume, Japan, assignors to Daiwa Seiko Inc., Tokyo, Japan  
 Continuation of Ser. No. 635,776, Nov. 26, 1975, abandoned.  
 This application Oct. 28, 1977, Ser. No. 846,448  
 Int. Cl.<sup>2</sup> A01K 89/01, 89/02  
 U.S. Cl. 242—84.21 R

2 Claims



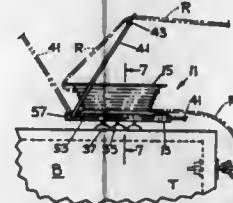
1. In a spinning reel for fishing which includes a casing having an end face; a rotor for engaging a fishing line; a sleeve rotatably supported in said casing; a handle shaft; a spool; and a spool shaft connected to said spool and inserted in said sleeve for sliding reciprocation with movement of said handle shaft to coil the fishing line on said spool upon rotation of said rotor, the improvement comprising a ratchet and a click gear secured to said sleeve; a pawl having an operating portion and means for pivotally mounting said pawl substantially at its center to said end face of said casing; a holding piece fixed to said pawl and movable therewith for holding both sides of said ratchet, said ratchet being positioned with respect to said pawl to be engageable with said pawl; an operating bar supported in said casing, said operating bar having a cam portion at an end

thereof for moving said pawl into engagement with said ratchet, said operating portion of said pawl being in contact with said cam portion; an arm having a first and a second end; means for pivotally mounting said arm to said end face of said casing, said arm having a working portion at its second end, said working portion being in contact with said cam portion for moving said first end toward said click gear under action of said cam portion; and an elastic click pawl provided on said first end of said arm, said click pawl being positioned with respect to said click gear to be engageable with said elastic click pawl contemporaneously with engagement between said pawl and said ratchet.

**4,163,529**  
**NON-ROTATING AXIALLY-PAYING-OUT SKI-ROPE BOBBIN**

Orville Krenzer, R.R. #3, Springfield, Ill. 62707; William E. Midden, 2036 S. Spring, Springfield, Ill. 62704, and Charles F. Schmid, 3408 S. Fourth, Springfield, Ill. 62703  
 Filed Sep. 14, 1977, Ser. No. 833,366  
 Int. Cl.<sup>2</sup> B65H 75/40; B63B 21/56  
 U.S. Cl. 242—85.1

9 Claims



1. A non-rotating axially-paying-out ski-rope bobbin comprising: a body shaped to define a circumferentially open annular cavity for receiving rope wound therein, means for attaching said body to a relatively flat surface with the axis of said cavity substantially perpendicular to said surface, guide-carrying means, means mounting said guide-carrying means for movement from an out-of-way rope-winding-up position generally below the cavity to a position generally above the cavity for rope paying-out, and a rope-embracing guide fixed to said guide-carrying means so as to be close to the axis of said cavity when said guide-carrying means is in its rope-paying-out position, whereby axially oriented paying-out of rope over and around the nearer-guide edge of said cavity is converted to wide-angle rearward paying-out, said rope-embracing guide being constructed and arranged to retain said rope therein while freely moving but to release said rope therefrom in response to an increased pull resulting when the rope is fully unwound and has its near end fastened to boat structure.

**4,163,530**  
**DEVICE FOR PREVENTING THE DRAWING-OUT OF A SEAT BELT WEBBING AT THE LOCK OF A RETRACTOR**  
 Yutaka Kondo, and Shuho Nishina, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

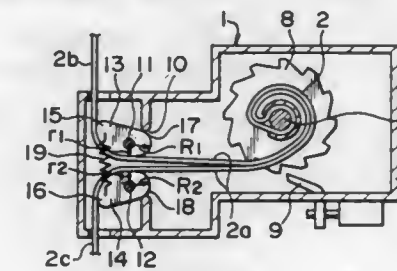
Filed Mar. 10, 1978, Ser. No. 885,333  
 Int. Cl.<sup>2</sup> A62B 35/00; B65H 75/48

U.S. Cl. 242—107.1

3 Claims

1. A seat belt system comprising:  
 a looped seat belt webbing;  
 first and second slip joints and a through-tongue plate through which said webbing is inserted;  
 a double take-up retractor about which said webbing may be wound, said retractor having a webbing take-out port;  
 first and second rollers which are disposed outside said webbing take-out port of said retractor and which are oppositely and rotatably mounted on a first shaft and a

second shaft provided in opposition to each other, respectively;  
 the respective rollers being spaced to permit said webbing to be drawn out in a state in which said webbing is attached or wound onto said retractor, having fore end sides and rear end sides and having surfaces extending between the fore end sides and rear sides which contact with webbings drawn out in one and the other directions from the space between said first and second rollers, said surfaces being formed into circular arc surfaces which extend in the respective directions in which the webbing is drawn out through the take-out port;



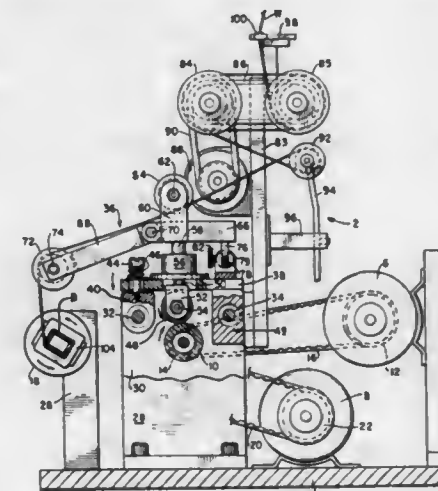
said circular arc surfaces on the rear end sides of said rollers gradually increasing in radial distance from the axes of the respective shafts in a direction from the fore end sides to the rear end sides;  
 a tension spring which is extended between the fore end sides of said rollers and which draws the respective fore end sides towards each other, said tension spring having a spring force to balance the tension needed on said webbing to draw it out; and  
 said webbing being tightly held between said rear end sides of said first and second rollers when said first and second rollers are turned by said webbing in directions in which their fore end faces move away from each other.

**4,163,531**  
**COIL WINDING APPARATUS**  
 Imrich Miller, Paterson, and Lothar Freimuth, Ringwood, both of N.J., assignors to Universal Manufacturing Corporation, Paterson, N.J.

Filed Nov. 9, 1977, Ser. No. 849,784  
 Int. Cl.<sup>2</sup> B65H 54/30

U.S. Cl. 242—158 R

15 Claims



1. Coil winding apparatus for winding a wire on a bobbin comprising:  
 support means;  
 a drive shaft arranged for axial rotation carried by said

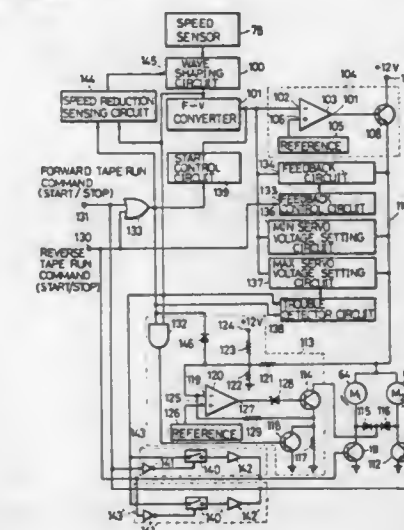
support means; means for rotating said drive shaft in a first direction;  
 carriage means, means carried by said support means for guiding said carriage means for movement in a plane parallel to the axis of rotation of said drive shaft;  
 a drive wheel in rotational tangential contact with said drive shaft, a pivot shaft, means coupling said shaft to said carriage for pivotal motion with respect thereto and means coupling said drive wheel to said pivot shaft, means coupled to said shaft for supplying the wire to said bobbin, the axes of rotation of said drive wheel and said drive shaft forming an angle whereby the rotation of said drive wheel by said drive shaft causes the movement of said carriage means, the axis of rotation of said drive wheel being offset from the axis of rotation of said drive shaft in a direction opposite to the direction of rotation of said drive shaft and drive wheel at their point of tangential contact.

**4,163,532**  
**TAPE SPEED CONTROL SERVO MECHANISM FOR A MAGNETIC TAPE CASSETTE APPARATUS**  
 Yoshiaki Sakai, Musashino, Japan, assignor to Teac Corporation, Musashino, Japan  
 Filed Jan. 13, 1978, Ser. No. 869,243

Claims priority, application Japan, Jan. 31, 1977, 52-9418; Feb. 10, 1977, 52-13608; Feb. 10, 1977, 52-13609; Feb. 10, 1977, 52-13610; Feb. 10, 1977, 52-13611; Feb. 10, 1977, 52-13612; Feb. 10, 1977, 52-13613

Int. Cl.<sup>2</sup> G11B 15/32  
 U.S. Cl. 242—186

16 Claims



1. In a magnetic tape cassette apparatus for use with a tape cassette of the type having a length of magnetic tape which extends between a pair of hubs within a housing for travel in both forward and reverse directions and which is partly exposed through a series of apertures formed in the front edge of the cassette housing, the apparatus including a magnetic head arranged for relative sliding contact with the tape through a centrally located one of the apertures in the cassette housing, a tape transport and speed control system comprising:  
 a variable speed motor for driving one of the cassette hubs;  
 another variable speed motor for driving the other cassette hub;  
 a speed sensing roller arranged for frictional contact with the tape through another of the apertures in the cassette housing which is located substantially closest to one of the cassette hubs which operates as the take-up hub during tape travel in the forward direction, whereby the speed sensing roller is held in proper frictional contact with the tape at least during forward tape travel for rotation at synchronous speed therewith;  
 speed sensor means driven by the speed sensing roller for



generating an electrical output signal representative of actual tape speed;  
 servo circuit means for comparing the output signal of the speed sensor means with a reference signal and for producing a servo output signal corresponding to the difference therebetween;  
 switching means for causing the servo output signal to be applied to a takeup side of one of the motors during tape travel in either direction; and  
 tape tension control circuit means for applying a controlled tape tension signal, derived from the servo output signal, to a supply side of one of the motors during tape travel in either direction in order to maintain constant tape tension.

4,163,533

## TAPE CASSETTE

Akira Abe, Shioyama, Japan, assignor to Sony Corporation, Tokyo, Japan

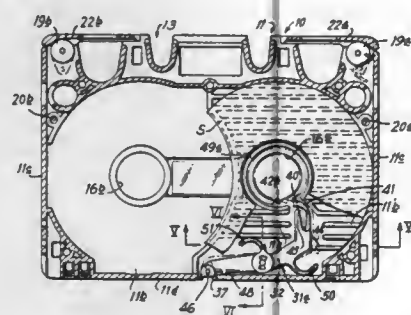
Filed Dec. 7, 1977, Ser. No. 858,277

Claims priority, application Japan, Dec. 10, 1976, 51-166471[U]

Int. Cl.<sup>2</sup> G11B 23/10

U.S. Cl. 242—198

3 Claims



3. A tape cassette comprising: a housing; at least one reel rotatably disposed in said housing and having a circular series of raked teeth which define respective substantially radially directed surfaces facing in one of the directions of rotation of the reel; a supply of tape wound on said reel so as to be unwound from the latter upon rotation of the reel in said one direction and rewound on the reel upon rotation of the latter in the opposite direction; a one-piece molded-plastic braking member for each said reel including a support lever movable in said housing about a pivot means between an engaged position and a disengaged position, a pawl-like portion on a resilient extension of said support lever so as to be positioned against said raked teeth of the respective reel in said engaged position of the support lever and being spaced from said teeth in said disengaged position, said resilient extension permitting angular displacement of said pawl-like portion relative to said support lever so that, with the latter in said engaged position, rotation of said respective reel in said opposite direction for rewinding the tape thereon causes said raked teeth to move past said pawl-like portion as the latter is angularly displaced in one direction relative to the support lever to substantially free the reel for said rotation in said opposite direction thereof, whereas rotation of said respective reel in said one direction for unwinding the tape therefrom brings one of said surfaces of the raked teeth against said pawl-like portion so as to urge the latter to be angularly displaced in the opposite direction relative to said support lever, and spring means including one resilient arm integral at one end with said support lever and extending in a direction away from said support lever into engagement with said housing for yieldably urging said support lever to said engaged position thereof; another resilient arm extending from said lever, said one resilient arm and said other resilient arm engage said housing at respective spaced apart locations both spaced from said pivot means for urging said lever to said engaged position; abutment means in said housing engageable by said pawl-like portion of the braking member in said engaged position of the support lever for block-

ing angular displacement of said pawl-like portion in said opposite direction relative to said support lever and thereby preventing unwinding of the tape from said reel; and said housing having an opening at which a portion of said support lever is accessible from the exterior of the housing for actuation of said support lever to said disengaged position against the force of said spring means.

4,163,534

## STEERING OF AN AERODYNAMIC VEHICLE

Hans-Jochen Seeger, Ganderkesee, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Fed. Rep. of Germany

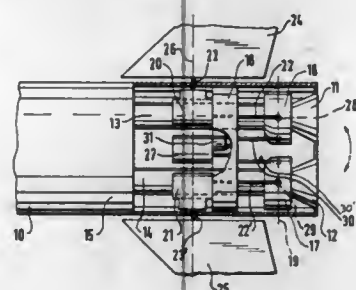
Filed May 12, 1978, Ser. No. 905,237

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721656

Int. Cl.<sup>2</sup> F42B 15/16, 15/18; B64C 15/12, 19/02

U.S. Cl. 244—3.22

9 Claims



1. Apparatus for controlling the steering of an aerodynamic, propelled vehicle, comprising:

duplex nozzles including a first and a second thrust producing nozzle;

means for mounting the first and second nozzles for pivoting on a common first axis, and for pivoting each of the nozzles on a separate axis extending transversely to the first axis;

first aerodynamic steering means for the vehicle mounted for pivoting on an axis extending in the same direction as the first axis;

first and second drive motors, respectively, coupled to the first and second nozzles for pivoting them individually about the first axis, further coupled to the first aerodynamic steering means for pivoting the first aerodynamic steering means together with pivoting the nozzles;

second aerodynamic steering means for the vehicle mounted for pivoting on an axis extending parallel to said separate axes; and

a third drive motor connected for pivoting the nozzles in unison about the separate axes and the second aerodynamic steering means about its axis.

4,163,535

## UNMANNED MULTIMODE HELICOPTER

Reginald G. Austin, Brent Knoll, Nr. Highbridge, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed Dec. 13, 1972, Ser. No. 314,494

Claims priority, application United Kingdom, Dec. 13, 1971, 57794/71

Int. Cl.<sup>2</sup> B64C 27/10

U.S. Cl. 244—17.23

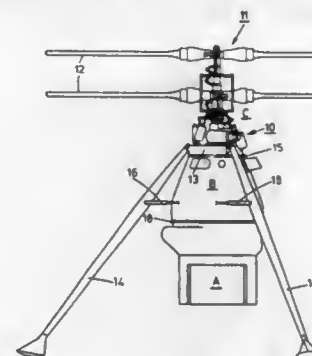
7 Claims

1. A helicopter comprising in combination,

a plurality of separable modules arranged in a substantially vertically stacked assembly,

the modules including an uppermost propulsion module, a central fuel tank module and a lowermost control and payload module, a collar supporting the propulsion mod-

ule, attachment means on said collar and suspending the fuel tank module,  
 a tripod undercarriage means attached to and equispaced



around the collar, said tripod means comprising three legs extending downwardly and outwardly, whereby during operation, all flight and landing loads are transferred to said collar.

4,163,536

## SUPPORT DEVICE

Rudolf Heller, and Kurt Schattmaier, both of Zürich, Switzerland, assignors to Contraves AG, Zürich, Switzerland

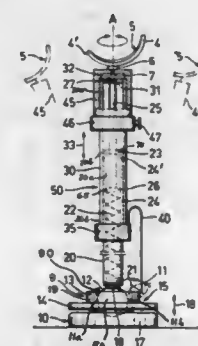
Filed Sep. 8, 1977, Ser. No. 831,431

Claims priority, application Switzerland, Oct. 28, 1976, 13595/76

Int. Cl.<sup>2</sup> B68G 5/00

U.S. Cl. 248—118

5 Claims



1. A device for assisting in the performance of exact hand movements, especially those of a surgeon when carrying out delicate micro-surgical operations, which device comprises:

at least one support member accommodated to the human arm or hand;

a single upright column means for carrying said support member;

said single upright column means having opposed end regions;

means including a hinge arrangement provided at one end region of said single upright column means for enabling a desired freedom of movement of said column means throughout a predetermined spatial region;

a first brake device cooperating with said hinge means for freely brakingly fixing the adjusted position of the column means;

means for securing the support member to the other end region of said column means and for enabling free rotational movement of said support member about the lengthwise axis of said column means;

means arranged within said column means for the continuous elevational adjustment of said column means; and a second brake device for fixing the elevationally adjusted

position of the column means and thus the support member.

said second brake device comprising:

a housing provided with recess means;

two annular brake ring members arranged in said recess means and engaging about said upright tube;

means for hingedly connecting the brake ring members at one side with said housing;

a compression spring arranged between and at the other side of said brake ring member; and

a Bowden cable for actuating said second brake device.

4,163,537

## BEARER STRUCTURE FOR ASSEMBLING MODULAR ELEMENTS

Pascal N. Mourgue, Paris, France, assignor to Societe Anonyme des Ateliers Marcadet Mobilier, Le Blanc Mesnil, France

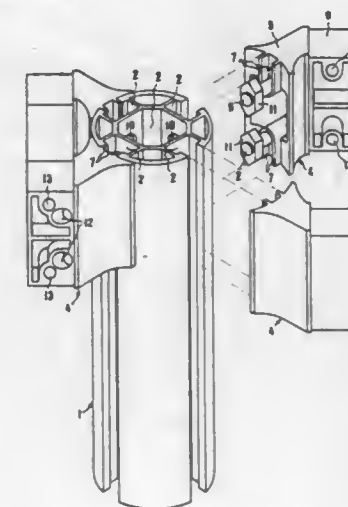
Filed Jul. 7, 1977, Ser. No. 813,466

Claims priority, application France, Jul. 12, 1976, 76 21360

Int. Cl.<sup>2</sup> F16S 3/00

U.S. Cl. 248—188.1

11 Claims



1. A bearer structure for assembling modular elements, comprising:

uprights constituted by cylindrical sectional elements having T grooves parallel to the axes of the sectional elements and regularly distributed at the periphery, said T-grooves being symmetrical about a plane containing the axes of the sectional elements, and said uprights having a central hollow;

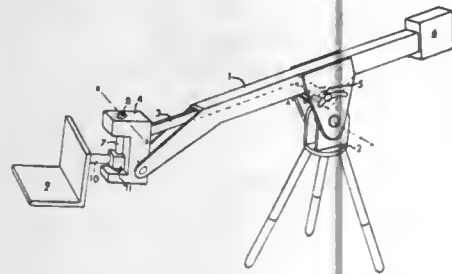
and members connecting said uprights, said connecting members comprising a part engageable and lockable in said grooves at the desired height, a projecting part, and a cross-piece fixed at its end to said projecting part, said cross-piece supporting various constituent modular elements for office units of various configurations;

wherein the wall separating the grooves from the central hollow of the sectional elements is pierced by positioning and fixing holes in which are engaged the ends of bolts passing through the connecting members; and

wherein the ends of said uprights are adapted to receive cylindrical end fittings and screw jacks, said cylindrical end fittings and screw jacks having clamped therebetween, at an upper part of said uprights, lugs connected to a partition.

**4,163,538**  
**TORSION COUNTERACTING PIVOTS**  
 Edward R. D. Gallone, Bury St. Edmunds, England, assignor to W. Vinten Limited, Bury St. Edmunds, England  
 Filed May 31, 1978, Ser. No. 911,170  
 Int. Cl.<sup>2</sup> A47F 5/00  
 U.S. Cl. 248—278

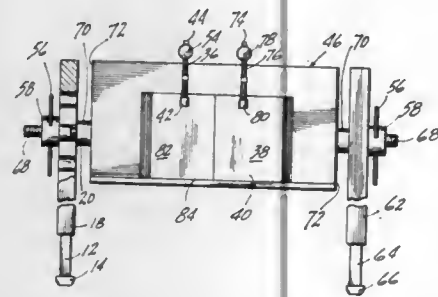
7 Claims



1. A hinged joint comprising a double ended bracket, a spindle pivotally mounted between the ends of said bracket, means mounting a first end of said spindle for rotation about the axial center thereof, and means mounting the second end of said spindle for rotation about the axial center thereof and for moving the second end of said spindle along a diametric line of the spindle during rotation of the spindle.

**4,163,539**  
**READING TABLE**  
 Duke L. Awofolu, 2600 Campcreek Pkwy #9-D, College Park, Ga. 30337  
 Filed Mar. 17, 1978, Ser. No. 887,667  
 Int. Cl.<sup>2</sup> A47B 97/04  
 U.S. Cl. 248—452

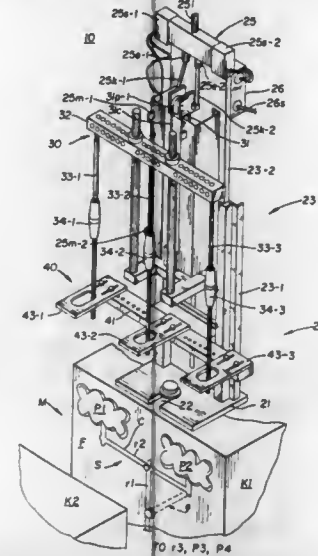
7 Claims



1. A book holding table comprising a sheet, a pair of posts, said pair of posts each having a plurality of connected spaced apart openings disposed in spaced apart relationship therein, a pair of threaded rods, said pair of threaded rods being aligned in coaxial relationship extending outwardly and fixedly secured to opposed marginal edges of said sheet, each of said pair of threaded rods residing in one of said plurality of openings, a pair of nuts, each of said pair of nuts threadingly engaged adjacent the free end of each of said threaded rods, a pair of curved rods, said each of said pair of curved rods fixedly secured to one end of said each of said pair of posts, a pair of bars, said pair of bars each having a cavity therein, said cavity being configured to reside about a marginal edge of said sheet, a rack, said rack passing through an opening in one of said bars, a gear, said gear journaled to said bar, said gear having the teeth thereof coupled to the teeth of said rack, an arm, said arm being pivotally lockingly engaged to one end of said rack, said arm being disposed in selective locations outwardly from an exterior surface of said sheet, a single bar, said single bar being disposed fixably secured to an uppermost lateral surface of said sheet and adjacent another marginal edge thereof, said another marginal edge being located opposed to said marginal edge of said sheet.

**4,163,540**  
**EJECTION OF MOLDED MATERIALS**  
 Ralph J. Cafarelli, 228 Stone St., Clinton, Mass. 01510  
 Filed Jun. 8, 1977, Ser. No. 804,558  
 Int. Cl.<sup>2</sup> B29C 7/00; B29F 1/14  
 U.S. Cl. 249—67

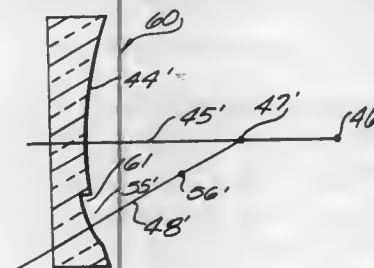
14 Claims



1. Apparatus for deflecting a molded structure from a molding machine comprising a mold with separable parts within the machine, a movable member mounted on the machine, a flexible rod secured to said movable member for entering the space between the molded structure and one of said parts when the parts are separated, said flexible rod including a protuberance having an inwardly and downwardly sloping surface at an intermediate position between the ends of said rod, and deflection means having a cam surface for engaging the inwardly and downwardly sloping surface of said protuberance during a limited portion of the stroke of said flexible rod to thereby deflect said rod and kick said molded structure from said mold.

**4,163,541**  
**MOLD FOR THE CASTING OF RESIN OPHTHALMIC LENSES HAVING A PRISMATIC SEGMENT**  
 Charles D. Campbell, La Jolla, Calif., assignor to Signet Optical Corporation, San Diego, Calif.  
 Continuation-in-part of Ser. No. 765,536, Feb. 4, 1977, abandoned. This application Feb. 9, 1978, Ser. No. 876,323  
 Int. Cl.<sup>2</sup> B29C 5/00; B29D 11/00  
 U.S. Cl. 249—117

14 Claims

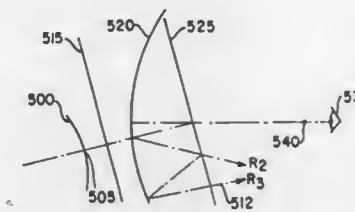


1. A mold for casting a resin ophthalmic lens comprising a disc defining a principal casting surface on one face thereof, the casting surface being a portion of a surface of revolution having a first axis of symmetry and having an effective center of curvature located therealong, the casting surface having in a selected portion thereof a recess having a bottom surface

which defines in the mold a minor casting surface and which is a portion of a surface of revolution having a second axis of symmetry, said axes of symmetry intersecting, if at all, at a location on the first axis of symmetry other than at substantially the center of curvature of the principal casting surface.

**4,163,542**  
**OPTICAL IMAGE-FORMING APPARATUS WITH TILTED BI-REFRINGENT ELEMENTS**  
 Joseph A. La Russa, Yorktown Heights, N.Y., assignor to Farand Optical Co., Inc., Valhalla, N.Y.  
 Continuation-in-part of Ser. No. 685,017, May 10, 1976, Pat. No. 4,093,347. This application Aug. 29, 1977, Ser. No. 828,783  
 The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.  
 Int. Cl.<sup>2</sup> G02B 5/32, 27/28  
 U.S. Cl. 350—3.72

4 Claims



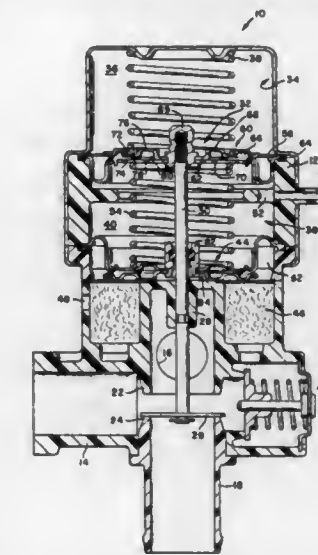
1. Optical apparatus comprising:  
 (a) display means for displaying an image toward an observer location; and  
 (b) infinity display means positioned between said display means and said observer location, said infinity display means comprising:  
 1. an optical element functioning as a beam-splitting curved mirror having a predetermined optical axis between said element and said observer location; and  
 2. a bi-refractive package comprising:  
 (A) a first quarter-wave plate disposed on the concave side of said optical element;  
 (B) a plane beam-splitting mirror disposed on the side of the first quarter-wave plate remote from the optical element;  
 (C) a second quarter-wave plate disposed on the side of the plane beam-splitting mirror remote from the first quarter-wave plate; and  
 (D) a polarizer on the side of the second quarter-wave plate remote from the plane beam-splitting mirror; the first and second quarter-wave plates having their fast axes oriented with respect to each other at a substantially integral multiple of 90°, and the polarizer having its plane of polarization oriented substantially at an odd integral multiple of 45° to the fast axis of the second quarter-wave plate;  
 wherein the bi-refractive package is tilted with respect to a plane normal to the optical axis between said element and said observer location, so that certain undesired images and reflections are directed away from said observer location and are brought to a focus closer than infinity.

**4,163,543**  
**AIR CONTROL VALVE**  
 John E. Cook, Chatham, Canada, assignor to Fram Corporation, East Providence, R.I.  
 Filed Sep. 7, 1977, Ser. No. 831,217  
 Int. Cl. F16K 31/126  
 U.S. Cl. 251—48

9 Claims

1. In a control valve, a housing defining a pair of chambers, said housing having an inlet and a pair of outlets communicating with one of said chambers, control valve means in said chamber for controlling communication between said inlet and

outlets, an actuating rod connected to said control valve means and extending into the other chamber, a pair of pistons slidably mounted in said other chamber and cooperating with said housing to define a first section between one of said pistons and a corresponding end of said other chamber, a second section between the other piston and the corresponding end of said other chamber and a third section between said pistons, said one piston being fixedly secured to said actuating rod, said other piston being slidably relative to said actuating rod, means communicating a substantially constant reference pressure to the first and second sections and a variable pressure signal to said third section, and yieldable means interconnecting said pistons and urging said one piston a predetermined distance away from the other piston for a corresponding predetermined value of said pressure signal, but permitting said one piston to



move toward the other piston when variations in said pressure signal increase the pressure differential across said one piston.  
 2. The invention of claim 1:  
 said reference pressure being atmospheric pressure, said variable pressure signal being a vacuum.  
 4. The invention of claim 2:  
 and a piston stop in said third section, said other piston moving into engagement with said piston stop when said pressure signal is communicated to said third section to thereby create a pressure differential across said other piston.  
 5. The invention of claim 4:  
 and timing valve means carried by said one piston for controlling communication between said first and third sections to permit restricted communication therebetween.

**4,163,544**  
**TWO PIECE COMPOSITE VALVE SEAL RING CONSTRUCTION**  
 James M. Fowler, Missouri City, and Bertram L. Morrison, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.  
 Filed Nov. 10, 1977, Ser. No. 850,184  
 Int. Cl.<sup>2</sup> F16K 3/02, 5/06  
 U.S. Cl. 251—328

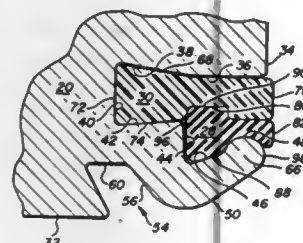
8 Claims

1. A valve comprising:  
 (a) a body with inlet and outlet flow passageways there-through, a valve chamber therein in fluid communication with the inlet and outlet passageways, a valve member in the valve chamber movable between open and closed positions, an annular groove about one of the passageways facing the valve chamber and defined by inner and outer walls;  
 (b) inner and outer concentric seal rings positioned in side by side relation in said groove with said outer seal ring



against said outer wall and said inner seal ring against said inner wall;

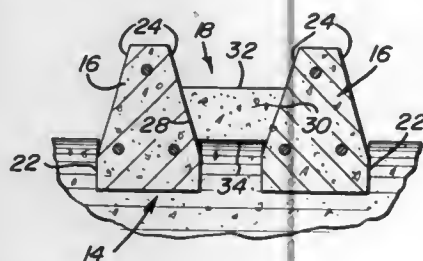
- (c) said seal rings having respective flat interfitting surfaces thereon engaged with one another in an interlocking manner to hold the seal rings together against one another in the groove and to prevent relative longitudinal movement between the seal rings, and means including an enlarged projecting portion of one seal ring projecting into an enlarged portion of the groove to secure the seal rings within the groove;



- (d) one of said seal rings being of a relatively soft elastomeric composition having good low pressure sealing characteristics and the other of said seal rings being of a relatively hard plastic composition having good high pressure sealing characteristics.

**4,163,545**  
**CATTLE GUARD**  
Joseph Ostermiller, Goulding Creek Route, Roundup, Mont. 59072

Filed Jan. 31, 1977, Ser. No. 764,462  
Int. Cl.<sup>2</sup> A01K 3/00; E01B 17/00  
U.S. Cl. 256—17



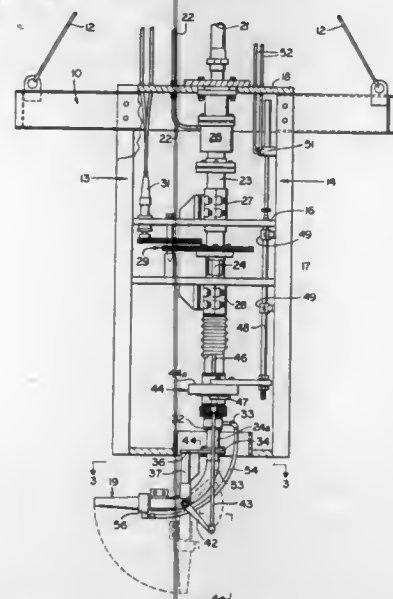
1. A cattle guard, comprising, in combination:  
(a) a plurality of spaced, coextensive, substantially parallel support beams;  
(b) a plurality of rails arranged transversely of, anchored on, and supported by the support beams, each of the rails being substantially in the form of a longitudinally extending frustum of a rectangular pyramid including longitudinally extending side walls converging toward one another and away from the support beams; and  
(c) wedge means disposed between the rails for stabilizing the rails on the support beams, the wedge means including a plurality of wedge elements each a single piece separate from the rails and in the shape of an obelisk removably arranged in inverted orientation for wedging against the converging side walls of adjacent ones of the rails and preventing rocking movement of the rails relative to the support beams.

**4,163,546**  
**APPARATUS FOR APPLYING GRANULAR REFRACTORY MATERIAL TO SURFACES**  
John C. Morris, 3573 Riverbend Rd., Birmingham, Ala. 35243; James K. Weidman, 212 Azalea Dr., Gadsden, Ala. 35901, and Michael D. Prior, P.O. Box 139, Smith Cir., Pell City, Ala. 35125

Filed Mar. 6, 1978, Ser. No. 883,731  
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> B05B 3/00

U.S. Cl. 266—281

3 Claims



1. In apparatus for applying granular refractory material to the interior surfaces of an open top ladle, furnace or the like,  
(a) a pair of generally vertically disposed telescopically related conduits,  
(b) means to supply granular refractory material to the upper end of the inner one of said conduits,  
(c) means to supply water to the upper end of the outer one of said conduits,  
(d) means to support said conduits for substantially 360° simultaneous rotation,  
(e) said inner conduit having a lower end portion projecting past the lower end of the outer conduit,  
(f) a nozzle support member secured to a projecting portion of the lower end of the inner conduit,  
(g) a mixing nozzle mounted on the support for the discharge end thereof to move in a generally vertical plane,  
(h) a flexible conduit connecting the nozzle to the inner conduit, whereby the conduit may receive and discharge granular material flowing down the inner conduit,  
(i) means to supply water from the lower end of the outer conduit to the nozzle, and  
(j) power means operatively connected to the nozzle and adapted to move it in said substantially vertical plane through an axis of substantially 90°, namely, from substantially horizontal position to substantially vertical position.

**4,163,547**  
**CLAMPING APPARATUS FOR ASSEMBLING PICTURE FRAMES**  
Henry M. Jerome, 1689 Sherway Dr., Mississauga, Ontario, Canada (L4X 1C9)

Filed Feb. 21, 1978, Ser. No. 879,230  
Int. Cl.<sup>2</sup> B25B 1/20

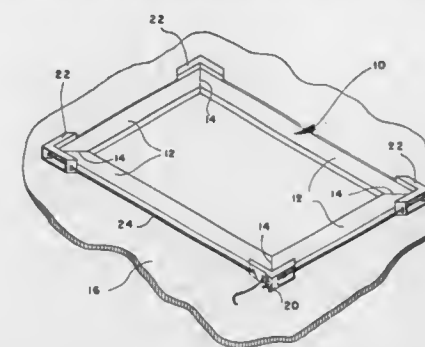
U.S. Cl. 269—42

11 Claims

1. A clamping apparatus for use in assembling a picture frame comprising:  
(a) an anchoring corner block having frame support surfaces adapted to engage adjacent ends of one pair of picture

frame members of an assembled set of picture frame members arranged in the required frame configuration,

- (b) a flexible cable,  
(c) first securing means on said anchoring corner block for securing one end of said flexible cable with respect to said anchoring corner block and second securing means on said anchoring corner block for releasably securing a second end of said flexible cable,  
(d) said flexible cable having a sufficient length to extend from said first securing means about the external periphery of the assembled set of picture frame members to said second securing means,  
(e) a plurality of secondary corner blocks, each having: a frame support surface adapted to engage and support a pair of adjacent ends of the assembled set of picture frame members, cable guide means on each secondary corner block adapted to receive and guide said flexible cable therealong such that said flexible cable may be drawn tightly about said assembled set with the tensile load



which is applied to the cable in use substantially uniformly distributed along the length of the flexible cable from said first securing means to said second securing means of said anchoring corner block,

- (f) said anchoring corner block and said secondary corner blocks each having a pair of oppositely disposed mounting faces extending in parallel planes which are uniformly spaced from a central plane located at half the height to each block such that either of said mounting faces may be located in a datum plane during assembly of a picture frame,  
(g) said guide means of each secondary corner block including a set of two guide slipways, the slipways of each set being vertically spaced with respect to one another and each set of slipways being uniformly vertically offset with respect to said central plane to provide support for said flexible cable in either one of two planes disposed on either side of said central plane whereby said flexible cable may be supported in any one of four clamping planes disposed at different heights above said datum plane.

**4,163,548**  
**METHOD OF LAPPING WEBS AND PRODUCT**  
Ernst D. Nystrand, Scottsdale, Ariz., assignor to Paper Converting Machine Company, Green Bay, Wis.

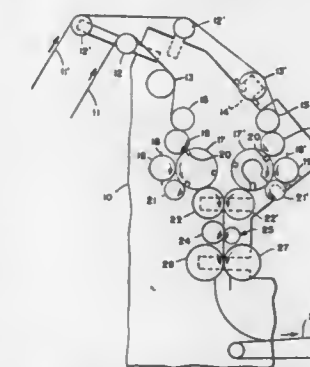
Filed Jan. 23, 1978, Ser. No. 871,236  
Int. Cl.<sup>2</sup> B41L 1/32

U.S. Cl. 270—39

3 Claims

1. A method of lapping sheets comprising:  
advancing a web from each of a pair of parent rolls, transversely severing each web into discrete identical sheets having leading and trailing edges and to form a series of moving sheets from each web wherein each sheet of a series is adjacent a preceding sheet and a following sheet, retarding each sheet in each series to lap the same relative to its preceding and following sheets,  
retarding one series relative to the other so that upon combining the two series the leading and trailing edges of one

series will be offset relative to the leading and trailing edges of the other series,  
orienting the lapped sheets in one series reversely to the orientation of the sheets in the other series so that upon



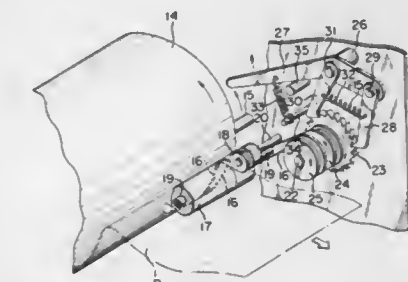
combining the two series only one of the leading and trailing edges is exposed and facing in the same direction, and  
combining the two series of sheets.

**4,163,549**  
**SEPARATOR DEVICE FOR TRANSFER MEDIUM**  
Yoshio Ito, Yokohama; Yoshikuni Tohyama, Tokyo, and Seiji Sagara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,829  
Claims priority, application Japan, Mar. 23, 1976, 51-31863  
Int. Cl.<sup>2</sup> B65H 29/56

U.S. Cl. 271—174

11 Claims



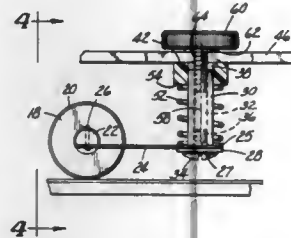
1. A separator device for use in an image formation apparatus wherein an image is transferred from a movable image bearing member to a transfer material, comprising:

a separation roller disposed downstream of a position where an image on the image bearing member is transferred onto the transfer material;  
a separation belt disposed to contact the image bearing member at said transfer position and to keep a lateral end portion of the transfer material out of contact with the image bearing member, wherein said separation belt also contacts said separation roller to guide the transfer material in a direction away from the image bearing member; rotatable means for storing an unused portion of said separation belt wound therearound;  
means for restraining the rotation of said storing means in a direction to feed out the unused portion of said belt;  
means for taking up thereon the used portion of said belt;  
means for feeding the belt from said belt storing means to said belt take-up means against the restraining action of said restraining means; and  
means for actuating said feeding means in response to the movement of an element which moves during an image formation process of said image formation apparatus.

**4,163,550**  
**PRESSURE ROLLER ASSEMBLY**  
 Joel D. Armstrong, Antioch, Ill., assignor to AM International, Inc., Los Angeles, Calif.  
 Filed Aug. 10, 1977, Ser. No. 823,435  
 Int. Cl.<sup>2</sup> B65H 3/06

U.S. Cl. 271-274

2 Claims



1. For use with a conveyor having movable surface means for engaging and moving sheet material articles, apparatus for applying pressure to sheet material articles being moved by the conveyor for holding the sheet material articles against the conveyor, said apparatus comprising a pressure roll forming a nip with the moving surface means of the conveyor, a leaf spring having a first end connected with said pressure roll and including means for supporting said pressure roll for rotation about a central axis thereof, a support post disposed normal to the longitudinal axis of said leaf spring, means for fixedly connecting a portion of said leaf spring remote from said first end to said support post to extend therefrom in cantilever fashion, means for mounting said support post including guide means for guiding said support post for axial movement and for restraining movement of said support post in directions transverse to its central axis, and means for adjusting the axial position of said support post for adjusting the pressure on a sheet material article in the nip between said pressure roll and the moving surface means, said means for adjusting the axial position of said support post comprises a rotatable member concentric with the axis of said support post and including a threaded member integral therewith, and further comprising at least one fixed support disposed in spaced relation to the movable conveyor surface means, said guide means comprising a guide block, means for biasing said guide block into engagement with said fixed support, said guide block including a bore and said support post extending through said bore, said bore defining means for guiding said support post for axial movement and for restraining movement thereof in directions transverse to its axis, said support post including an axially extending threaded bore receiving said threaded member of said rotatable member whereby rotation of said rotatable member moves said support post axially, and

wherein said means for connecting said leaf spring to said support post includes a support member affixed to said support post and wherein said support member includes a substantially flat surface portion, said leaf spring comprising a substantially flat longitudinally extending planar member, one longitudinal end portion of said leaf spring being fixedly connected with said surface portion of said support member, said means for biasing said guide block against said fixed support comprising spring means acting between said guide block and said flat surface portion of said support member.

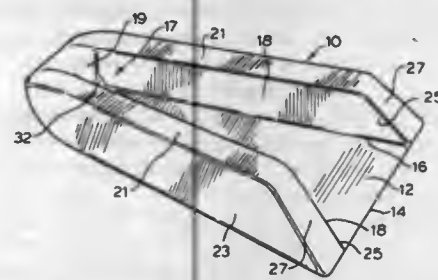
**4,163,551**  
**VAULTING PRACTICE BOX**  
 Bruce A. Simpson, 130 Howland Ave., Toronto, Ontario, Canada (M5R 3B5)  
 Filed Feb. 27, 1978, Ser. No. 881,906  
 Int. Cl.<sup>2</sup> A63B 5/00

U.S. Cl. 272-104

4 Claims

1. A vaulting practice box comprising a flat horizontal bottom wall having a rear edge, and having side edges converging forwardly from said rear edge and a front end, side walls

extending upwardly from said side edges and integral therewith, said side walls closing together at the front to form an integral structure extending upwardly from the front end of

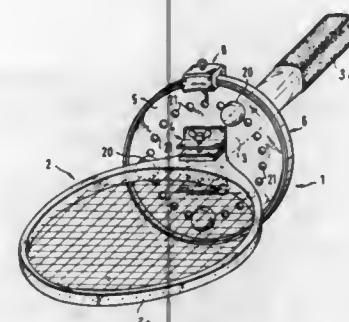


the bottom wall, and means integral with each side wall defining a pocket outwardly adjacent each side wall, said pockets being adapted to receive and retain inertial weights.

**4,163,552**  
**APPARATUS FOR FACILITATING THE PRACTICING OF TENNIS AND LIKE GAMES**  
 Marian Tiso, Kurt-Eisner-Strasse 25, D-8000 Munch 83, Fed. Rep. of Germany  
 Filed Mar. 16, 1978, Ser. No. 887,312  
 Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2713089

Int. Cl.<sup>2</sup> A63B 69/38  
 U.S. Cl. 273-29 A

20 Claims



1. Apparatus for indicating various stages of strokes which are practiced by the user of a ball-striking implement, particularly a tennis racket, having a handle and a ball-contacting portion, comprising a support which is connected to the handle; annular guide means provided on said support and spacedly surrounding the handle; and signal generating means including a carriage movably mounted on said guide means and means for producing signals in preselected positions of said carriage with respect to said guide means.

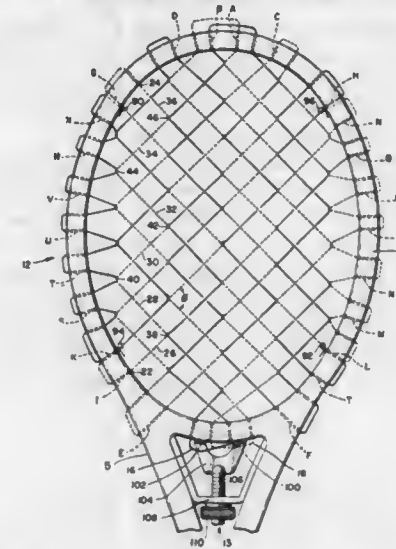
**4,163,553**  
**TENNIS RACKET AND STRINGING METHOD**  
 Robert Renfro, P.O. Box 1085, San Valley, Id. 83353  
 Filed Mar. 4, 1977, Ser. No. 774,580  
 Int. Cl.<sup>2</sup> A63B 51/00

U.S. Cl. 273-73 D

15 Claims

1. A sports racket comprising: a string support frame, having a racket handle, and a racket head attached to said handle and defining a central opening; and a string attached to said racket head and forming a pattern within said central opening, and said pattern consisting of plural, string sections each connected between two points on said frame and extending along a straight axis through said points of connection, said axes of each section being substantially parallel to the

others, and each section consisting of plural straight string segments zig-zagging along said straight axis;

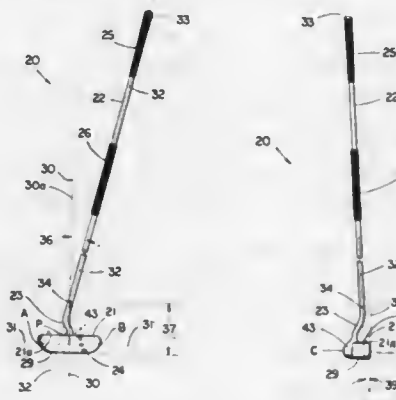


elbow-like junctions formed by adjoining segments, each said elbow-like junction of each said string section interlocking with an elbow-like junction of an adjacent section.

**4,163,554**  
**GOLF PUTTER**  
 Floyd V. Bernhardt, 5532 N. High School Rd., Indianapolis, Ind. 46254  
 Filed Sep. 19, 1977, Ser. No. 834,508  
 Int. Cl.<sup>2</sup> A63B 53/02

U.S. Cl. 273-80 C

23 Claims



1. A golf putter for putting in a modified croquet style which comprises:

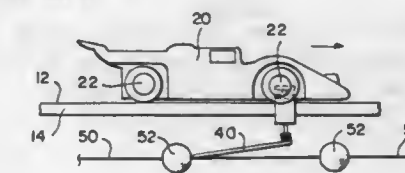
an elongated shaft having upper and lower gripping means thereon and a primary longitudinal axis;  
 a clubhead connected to said elongated shaft, said clubhead having a rear surface, a substantially flat sole portion, a ball-striking surface substantially perpendicular to said sole portion and a vertical axis;  
 said vertical axis being perpendicular to said sole portion and lying within an axis plane which is perpendicular to said ball-striking surface, said axis plane being substantially coincident with the centerline of said ball-striking surface; said ball-striking surface lying in a striking plane disposed at an angle of from 1 degree to 8 degrees with respect to said primary longitudinal axis and having zero loft when said substantially flat sole portion is substantially parallel with the ground; and said primary longitudinal axis being divergent from said axis

plane by at least 10 degrees and intersecting said axis plane at a point above said clubhead.

**4,163,555**  
**SLOT CAR GAME WITH SPIN-OUT RECOVERY CAPABILITY**  
 Robert H. Norwalt; Edward R. Hibbert, both of Northridge, and Vicki L. Schiff, Redondo Beach, all of Calif., assignors to Sega Corporation, Redondo Beach, Calif.  
 Filed Jan. 23, 1978, Ser. No. 871,261  
 Int. Cl.<sup>2</sup> A63F 9/14

U.S. Cl. 273-86 B

10 Claims

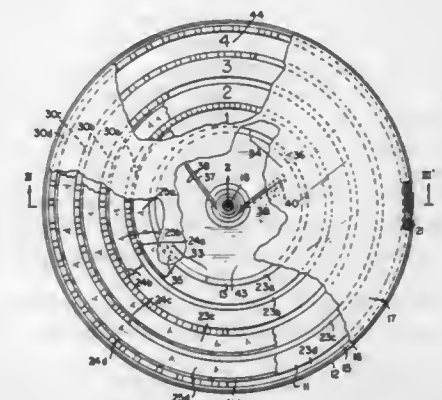


1. Improved slot car apparatus including a roadway having at least one slotted track with and at least one electrical contact strip positioned relative to each track and connected to an electrical power source, and at least one slot car vehicle adapted to travel about each of said oscillatory tracks deriving its electrical power from said at least one electrical contact strip, wherein the improvement comprises means to realign said at least one slot car vehicle after misalignment, said means comprising:

guide means secured to the underside of said at least one vehicle projecting vertically into said slotted track; and a continuous chain positioned below each of said at least one slotted track having engaging means at fixed locations about said track, said continuous chain adapted to be activated to permit the engaging means on said chain to engage the guide means of said misaligned vehicle and realign said vehicle.

**4,163,556**  
**VARIED TRACK ADVANCEMENT GAME MECHANISM**  
 George Bertin, 35 W. 93rd St., New York, N.Y. 10025  
 Filed Apr. 17, 1978, Ser. No. 896,749  
 Int. Cl.<sup>2</sup> A63F 5/04, 9/14  
 U.S. Cl. 273-86 H

8 Claims



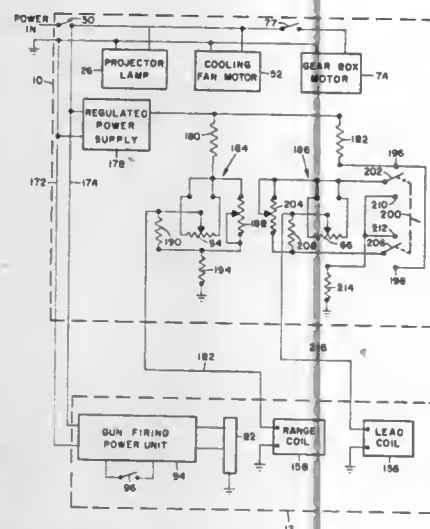
1. A varied track advancement game mechanism comprising (a) a base; (b) a plurality of circular tracks disposed on said base for concentric rotational advancement, each of said tracks having a plurality of teeth defining spaced interdenial recesses; (c) pawl means associated with each of said tracks, said pawl means being operable to engage said track teeth for advancement of said track in a first rotational direction; (d) means operable to rotationally advance in unison all of said pawl



means in said first direction and to thereby advance any of said tracks engaged by its associated pawl means; and (e) a plurality of program rings, each of said program rings being disposed in concentric, adjacent relationship with one of said tracks for independent rotational advancement, said program ring having (i) a pawl-restraining surface operable to prevent said pawl means from entering said interdental track recesses for engagement of said teeth and (ii) a plurality of notches defined in said surface and operable to permit descent of said pawl means from said restraining surface into said interdental track recesses for engagement of said teeth.

**4,163,557**  
**MOVING TARGET PRACTICE RANGE**  
 Norvel J. McLellan, 1002 N. Main St., Pleasanton, Tex. 78064  
 Filed Mar. 31, 1977, Ser. No. 783,302  
 Int. Cl.<sup>2</sup> A63F 9/02; F41J 9/14  
 U.S. Cl. 273—101.1

3 Claims

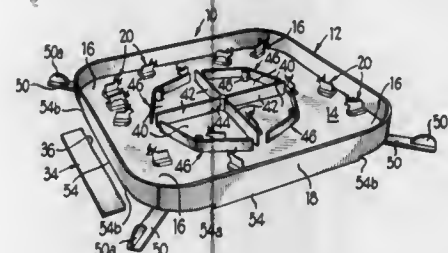


1. A moving target practice range for simulating the firing of a gun using projected light on a screen comprising:  
 a source of power;  
 projector apparatus connected to said source of power;  
 light means inside said projector apparatus receiving voltage from said source of power;  
 first reflector means inside said projector apparatus for reflecting at least a portion of illumination from said light means approximately perpendicular to said screen;  
 cam means driven by a motor means connected to said source of power, said cam means being operatively connected to said first reflector means to cause a substantially constant velocity sweep of said reflected illumination on said screen upon oscillation of said first reflector means by said cam means;  
 gun means connected to said projector apparatus for receiving adjustments therefrom, said gun means having flash means therein connected to said source of power and trigger means of said gun means for generating a flash of light upon pulling of said trigger means;  
 second reflector means in said gun means for reflecting said flash of light in approximately the same direction said gun means is pointed;  
 manual adjustment means varies adjustment voltages received by vertical positioning means and horizontal positioning means, said vertical positioning means moving said second reflector means in response to said adjustment voltages to compensate for said drop, and said horizontal positioning means moving said said reflector means in response to said adjustment voltages to compensate for said lead;  
 projector apparatus having automatic adjustment means connected to said cam means for varying therewith to change said adjustment from said projector apparatus to

said gun means in response to angle of said reflected illumination to said screen, said adjustment changing said lead and said drop in response to said angle;  
 vertical positioning means comprises a vertical solenoid means connected to a horizontal axis of a second mirror of said second reflector means, and said horizontal positioning means is a horizontal solenoid means connected to a vertical axis of said second mirror;  
 manual adjustment means is located in said projector apparatus for varying said adjustment therefrom to said vertical solenoid means and horizontal solenoid means;  
 automatic adjustment means are variable resistors operatively connected to said cam means, said variable resistors providing said adjustment voltage to said vertical solenoid means and said horizontal solenoid means to automatically compensate for said lead and said drop caused by increased distance to the reflected illumination as said angle changes.

**4,163,558**  
**VIBRATORY GAME APPARATUS**  
 Eugene Jaworski, Park Ridge, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.  
 Filed Jan. 26, 1978, Ser. No. 872,429  
 Int. Cl.<sup>2</sup> A63B 71/04; A63F 9/00  
 U.S. Cl. 273—115

12 Claims



1. A competitive vibratory game apparatus for use with one or more game pieces movable over a playing surface in response to vibration thereof, comprising:  
 an enclosure for containing said game pieces during play including a floor comprising said playing surface with an upstanding sidewall around the outer periphery of said surface;  
 a plurality of compartments inwardly of said sidewall on said playing surface, each compartment including a fixed upstanding wall portion and a movable upstanding wall portion manually operable to open and close with respect to said fixed wall portion for corralling said game pieces in said compartment; and  
 a plurality of selectively operable means for vibrating said playing surface, each including an elongated element having teeth along at least one edge adapted to be manipulated longitudinally with said teeth engaging a player selected portion of said sidewall for imparting player induced vibrations to various sections of said sidewall and said playing surface to control the movement of the playing pieces.

**4,163,559**  
**COMPARTMENTED CARD GAME BOX WITH REMOVABLE DRAWER**  
 Sadie M. Stenstrom, 108 S. Mansfield St., Ironwood, Mich. 49938

Filed Oct. 3, 1977, Ser. No. 839,004  
 Int. Cl.<sup>2</sup> A63F 1/10

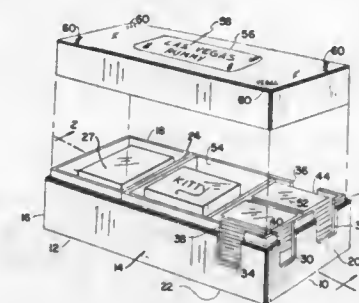
U.S. Cl. 273—148 A

1 Claim

1. A card game box kit comprising, in combination, a holder including a bottom part and a cover therefore, said cover serving as a game board and having a plurality of

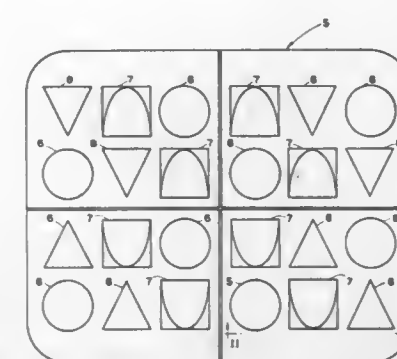
marked positions thereon to serve as emplacements for placing of cards that are dealt to a plurality of players and for laying down playing cards; a pair of compartments in said bottom part,

said bottom part formed with a bottom wall joined to vertical side walls, with said compartments divided by a vertical partition and open to the top of the bottom part, a pull out drawer detachably resting in one of said compartments, said drawer formed of a bottom wall joined to vertical side walls, with said drawer divided by at least one partition to form a plurality of compartments to serve



as storage space for playing cards, play money and other game accessories; with the vertical side walls of the drawer extending above the top of the bottom part so as to serve as support means for retaining the cover to the assembly of the bottom part and the drawer, in the closed position of the cover; in which said bottom part and said drawer have aligned vertical notches in a respective adjacent side wall of each, located so as to form a continuous opening, to provide access from the outside of the contents of a storage space of said drawer, in the assembled position of the drawer in the bottom part.

projection shapes so that any playing piece has a like plurality of unique orientations, in each of which, it can be inserted into



and retained by any recess of a particular set, and at least one die whose faces respectively display said shapes.

**4,163,561**  
**FATIGUE RESISTANT FITTINGS AND METHODS OF FABRICATION**  
 Albert Q. Butler, Odessa, Tex., assignor to Dart Industries Inc., Los Angeles, Calif.  
 Filed Aug. 15, 1978, Ser. No. 934,227  
 Int. Cl.<sup>2</sup> B23P 11/02; F16J 15/08  
 U.S. Cl. 277—9

14 Claims



**4,163,560**  
**BOARD GAME**  
 Arie Solomon, 5, Anderson St., Ramat-Aviv, Tel-Aviv, Israel  
 Filed Oct. 27, 1977, Ser. No. 846,498  
 Claims priority, application Israel, Nov. 25, 1976, 50993  
 Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—273

3 Claims

1. A board game comprising playing pieces each consisting of a body having a plurality of distinct orthogonal projection shapes and a board having sets of recesses, each set consisting of at least one recess of a shape corresponding to one of said

1. A fatigue resistant instrumentation tap and seal ring device for use in connecting sections of high pressure tubing comprising two concentric, thick-walled cylindrical shells with the outer shell being shrink-fitted onto the inner shell, said inner shell being free of threaded portions and other stress concentration points except for one or two radial bores at about midlength thereof and, axially aligned with each said radial bore, a contiguous, cleanly threaded radial aperture through said outer shell, the diameter of said threaded aperture being substantially larger than that of said radial bore but only a minor fraction of the length of said outer shell.

4,163,562

## INFLATABLE PACKER

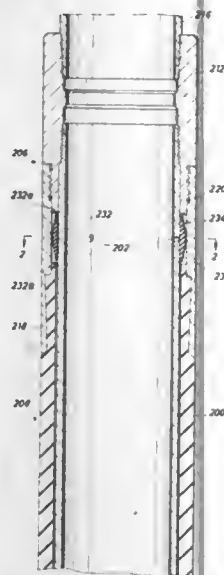
Lawrence Sanford, 4047 Hollister, Houston, Tex. 77055

Filed Apr. 18, 1977, Ser. No. 788,418

Int. Cl.<sup>2</sup> F16J 15/40

U.S. Cl. 277—34.3

18 Claims



1. A fluid set packer comprising:  
a generally tubular mandrel body having a port extending generally radially therethrough;  
an elastomeric valve element resiliently urged against the exterior of said mandrel body, and overlying said port, and said valve element having a radially inner sealing surface for said valve element having a radially inner sealing surface for sealingly engaging said mandrel body adjacent said port, said sealing surface being substantially straight in longitudinal cross section, one axially facing free end adjacent said sealing surface, and a radially outer surface, said outer surface having one pressure reaction section adjacent said one end and radially inwardly tapered toward said one end;  
a packer body carried externally of said mandrel body and comprising a pair of longitudinally spaced apart heads, one of said heads being longitudinally slidable with respect to said mandrel body, and a generally tubular radially extendable packer element interposed between said heads;  
and means defining a fluid reception chamber in communication with the radially outer side of said port;  
said packer body being operatively associated with said chamber and responsive to fluid pressure within said chamber to radially extend said packer element;  
and said valve element being operative while overlying said port to permit fluid flow from said mandrel body through said port to said chamber but prevent fluid flow from said chamber through said port to said mandrel body.

4,163,563

## ROTARY BELLOWS SEAL WITH VIBRATION-DAMPING MEANS

John J. Mullaney, Warwick, R.I., assignor to Sealol, Inc., Warwick, R.I.

Filed Apr. 12, 1978, Ser. No. 895,801

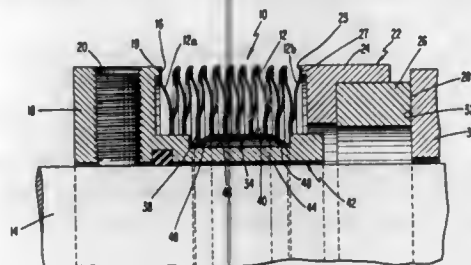
Int. Cl.<sup>2</sup> F16J 15/36

U.S. Cl. 277—88

29 Claims

1. In an apparatus having, in combination, an elongated rotatable member, an annular bellows surrounding at least a portion of the rotatable member, and means for rotating the bellows with the rotatable member, a device for damping vibration in the bellows comprising:  
damping means rotating with the rotatable member and

normally out of engagement with said bellows, said damping means being operable in response to the centrifugal



force thereon during rotation of the rotatable member to exert pressure against the inner periphery of the annular bellows.

4,163,564

## SHOPPING CART SKIS

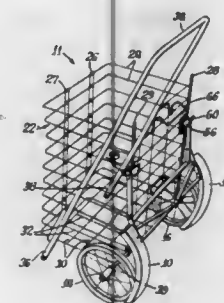
Walter Kramer, 1519 W. Henderson, Chicago, Ill. 60657

Filed Nov. 28, 1977, Ser. No. 855,293

Int. Cl.<sup>2</sup> B62B 13/18

U.S. Cl. 280—10

1 Claim



1. A grocery cart for traveling on snowy or dry surfaces comprising:  
a frame having a basket which has sides defining a receptacle for articles and a pair of wheels on said frame for rolling along a dry surface;  
a pair of skis each movable from a stowed position adjacent a side of said cart to a sliding position under a wheel of said cart for sliding along a snowy surface;  
each of said skis being located in a position above and in a plane aligned with its associated wheel and located along the sides of the basket when the skis are in the stowed position;  
a carrier means interconnecting said skis at the upper ends thereof and including a brace means extending transversely between and joined to each of said skis adjacent an upper end thereof, the lower ends of said skis being free unconnected ends;  
said skis each having inner curved surfaces for contacting curved surfaces of an associated wheel;  
a mounting means for pivotally connecting said carrier means to said frame;  
said carrier means including an articulating means pivotally connected at one end to said mounting means and pivotally connected at another end to said brace means, said articulating means being pivotal to an upward stowing position in which said another end is raised and located adjacent the rear side of said basket and to a lower position in which said another end is swung downwardly below said one end to position said skis in said sliding position, the free end of said skis engaging said wheels in said sliding position,  
means operatively connected to said cart for securing said another end of said skis in said stowed position until it is desired to move them to said sliding position.

4,163,565

## SNOW SKI APPARATUS AND METHOD OF MAKING IT

Robert C. Weber, Rte. 1, Box 290 BB, Ocean City, Md. 21842

Filed Jul. 27, 1977, Ser. No. 819,646

Int. Cl.<sup>2</sup> A63C 17/18; B62B 13/04, 19/04

U.S. Cl. 280—16

7 Claims



1. Snow ski apparatus comprising,  
a board having an upper surface for supporting the feet of a standing occupant,  
a forward runner and a rear runner which together provide an undersurface for contacting the snow when the apparatus is in use,  
first connector means connecting the forward runner to said board,  
second connector means connecting the rear runner to said board,  
said forward runner being longitudinally symmetrical and having an undersurface with a forward portion and a rear portion, said forward portion being wider than said rear portion,  
said rear runner being longitudinally symmetrical and longitudinally aligned with said front runner, said rear runner having an undersurface with a forward portion and a rear portion, said undersurface of the rear runner being wider at its rear portion than at its forward portion, said runners together providing an inwardly curved edge to facilitate turning when said board and said runners are tilted sideways.

4,163,566

## STEERING MECHANISM

Geoffrey E. E. Tapp, Farnham, England, assignor to County Commercial Cars Limited, Aldershot, England

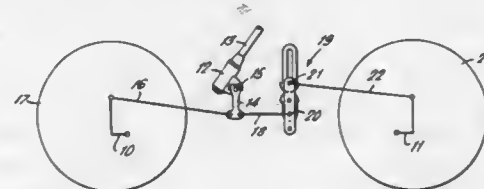
Filed Dec. 22, 1977, Ser. No. 863,575

Claims priority, application United Kingdom, Dec. 31, 1976, 54514/76

Int. Cl.<sup>2</sup> B62D 7/16

U.S. Cl. 280—91

7 Claims



1. A steering mechanism for a vehicle having steered front and rear wheels, said mechanism comprising steering linkages for connection to both sets of wheels, the steering linkage to one set of wheels including a variable length lever and means to vary the length of the lever in response to the amount of steering movement imparted to the connection to the other set of wheels, the variable length lever comprising a lever partially mounted on a pivot, means for exerting a force on the lever to rotate the lever, and means slidably mounted on the lever for transmitting a steering force to said one set of wheels in response to rotational movement of the lever, the means to vary the length of the lever comprising a link mechanism for controlling the position of said slidably mounted force transmitting means on the lever in response to rotation of the lever, said link mechanism comprising a first link pivotally mounted at one end thereof to a fixed pivot, means to rotate the first link in response to rotation of the lever, and a second link, one end of the second link being pivotally secured to the other end of the first link and the other end of the second link being slidably mounted on the lever, the means for transmitting a steering

force to the other set of wheels being connected to the other end of the second link.

4,163,567

## VEHICLE, ESPECIALLY AMUSEMENT VEHICLE

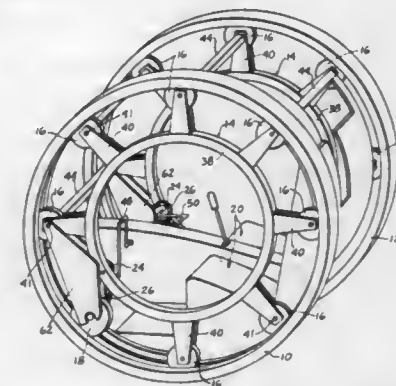
Gerald L. Barber, 1209 Edwards Rd., Greenville, S.C. 29615

Filed Mar. 9, 1977, Ser. No. 775,889

Int. Cl.<sup>2</sup> A63G 29/02

U.S. Cl. 280—208

16 Claims



1. A vehicle comprising: a pair of coaxial spaced wheels having inwardly facing annular surfaces thereon, a frame within the radial confines of said wheels extending axially between the wheels, roller means rotatable on respective horizontal axes on the frame and distributed circumferentially on the frame in the plane of and supportingly engaging each said annular surface for rotatably supporting the frame on said wheels, seat means in the frame for seating at least one occupant, the center of gravity of said frame including any occupants seated therein being substantially lower than the common axis of said wheels, means carried by the frame and under the control of the vehicle occupant for driving at least one roller pertaining to each wheel for propelling the vehicle, a member having a pivotal connection with said frame and rotatably supporting a said drive roller at a point spaced from the pivotal connection, and spring means acting between said frame and said member for urging said member in a direction to press the drive roller thereon toward the respective wheel.

4,163,568

## PIVOTABLE TRAILER HITCH

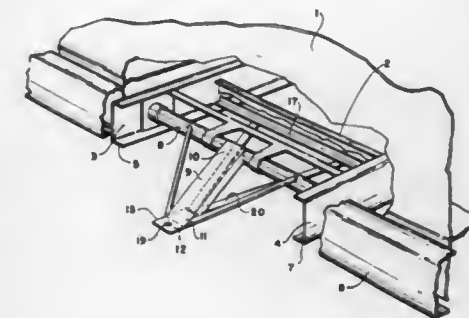
Donald D. McCumber, Owl Creek Rte., Thermopolis, Wyo. 82443

Filed Jul. 14, 1978, Ser. No. 924,740

Int. Cl.<sup>2</sup> B60D 1/16

U.S. Cl. 280—491 B

1 Claim



1. A pivotable trailer hitch for an automotive vehicle having a frame with a pair of spaced parallel side beams extending along the length of the vehicle, said frame having front and rear ends, and a rear bumper affixed to the side beams at the



rear ends thereof and extending perpendicularly thereto, said pivotable trailer hitch comprising

- a mounting bar rotatably affixed to the side beams of the frame in the area of the rear ends thereof and extending perpendicularly therebetween;
- a hitch member having spaced opposite first and second ends, the first end of said hitch member being affixed to said mounting bar and rotatable therewith and a hitch plate extending angularly with said hitch member at the second end thereof, said hitch plate having spaced opposite first and second ends with a hitch pin hole formed therethrough at the first end thereof and a pin hole formed therein at the second end thereof;
- a cross member affixed to the side beams of the frame in spaced parallel relation with said mounting bar closer to the front end of said frame than the rear end thereof;
- a cross member pin hole member in said cross member;
- a bumper pin hole member on said rear bumper; and
- a brace member having spaced opposite first and second ends having first and second pin hole members thereat, respectively, the second end of said brace member being pivotally affixed to the cross member pin hole member via a pin, the first end of said brace member being pivotally affixable to the pin hole of said hitch plate via a pin to secure said hitch member in operable position with its hitch plate substantially parallel to the plane of the side beams of the frame and below said frame and extending rearward of the rear bumper, said hitch member being releasable from said brace member and rotatable with said mounting bar to a retracted position in which said hitch plate abuts said cross member, and the first end of said brace member being pivotally affixable to the bumper pin hole member via a pin whereby said brace member supports said hitch member in the retracted position of said hitch member.

#### 4,163,569 SKI BRAKE

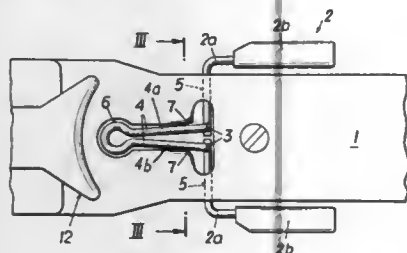
Hans Horn, Wellington, New Zealand, assignor to TMC Corporation, Baar, Switzerland

Continuation of Ser. No. 720,211, Sep. 3, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,836

Claims priority, application Austria, Sep. 23, 1975, 7266/75  
Int. Cl.<sup>2</sup> A63C 7/10

U.S. Cl. 280—605

5 Claims



1. A device for braking of a ski upon release of a ski boot from a binding comprising:

- a sole plate mounted on said ski and adapted to normally remain therewith, said sole plate having at least one binding thereon for releasably holding said ski boot to said sole plate;
- a pair of separate and identically formed substantially rigid brake members, each of said brake members having an L-shape with one leg of the L defining a braking mandrel and the other leg defining a pivot shaft, said pair of pivot shafts extending generally horizontally and transversely to the longitudinal axis of said ski;
- bearing means on said sole plate for supporting said pivot shafts for both an axial movement and a rotatable movement;
- a bifurcated spring wire tensioning lever having a pair of

resilient legs fixedly connected to said pivot shafts, and being pivotal therewith between a first upright position transverse to the longitudinal axis of said ski and a second position generally parallel to the longitudinal axis of said ski, said legs being flexible from a normal relaxed position inwardly toward each other and a tensioned position; cam means on said sole plate engaging said legs of said tensioning lever while in said tensioned position for continually urging said tensioning lever from said second position toward said first position whereat said legs are in said relaxed position; and means defining a cavity in the upper surface of said sole plate wholly receiving said tensioning lever therein when in the tensioned position thereof whereby said ski boot rests directly on said sole plate.

#### 4,163,570

#### OPTICALLY CODED DOCUMENT AND METHOD OF MAKING SAME

David L. Greenaway, Oberwil, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

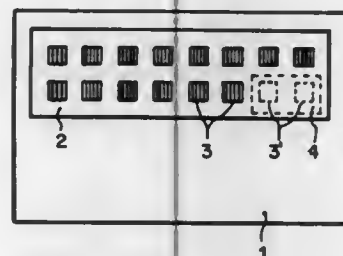
Filed Nov. 7, 1977, Ser. No. 848,871

Claims priority, application Switzerland, Dec. 21, 1976, 16084/76

Int. Cl.<sup>2</sup> B42D 15/00

U.S. Cl. 283—8 A

7 Claims



1. A document comprising an information carrier on which information is recorded in the form of optical markings, wherein said information carrier has a shape-memorizing capability to memorize the shape of a relief structure, said capability being operable by supplying energy to said information carrier, thereby producing a change in the shape of said information carrier and of said optical markings.

6. A method of making an optically coded document comprising introducing a first surface relief structure into a thermoplastic information carrier, and subsequently impressing a second surface relief structure into said information carrier in such a way that said first surface relief structure disappears and is converted into an elastic stress field.

#### 4,163,571

#### PIPE COUPLINGS

David D. Nash, Brownhills West, England, assignor to Durapipe Limited, Cannock, England

Filed Jul. 18, 1977, Ser. No. 816,642

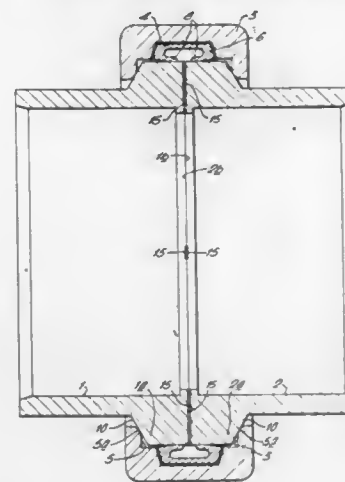
Int. Cl.<sup>2</sup> F16L 17/04

U.S. Cl. 285—106

7 Claims

1. A pipe coupling comprising two tubular parts each provided with a flange at one end, a clamping ring having an internal groove adapted to receive the flanges when the two tubular parts are disposed in end to end relationship with their flanges together, the coupling including an annular seal adapted to provide sealing between the tubular parts, and wherein each of said flanges, in axial section through the respective tubular part, on its side which faces away from said one end of the tubular part, slopes outwardly from the periphery of the tubular part towards said one end thereof, and wherein said internal groove in the clamping ring has side

walls defining the axial limits of the groove, which over their regions furthest from the axis of the coupling and thus nearest the bottom of said internal groove, extend more steeply, with respect to the axis of the coupling, than said sloping sides of said flanges and which side walls, in axial section through the coupling, are radiused in the region of their free edges, whereby said side walls flare towards the edges of the groove and, over their regions nearest the axis of the coupling and thus furthest from the bottom of said internal groove, extend less



steeply with respect to the axis of the coupling than said sloping sides of said flanges, whereby when the clamping ring is tensioned circumferentially, each said side wall of the groove engages the sloping side of the respective flange only along a continuous line of contact of the radiused part of the groove side wall with the respective flange and whereby when the coupling is assembled, a circumferential tension in the clamping ring produces a wedging action urging one flange into engagement, via the end face of its flange, with the end of the other flange.

#### 4,163,572

#### TRANSITION FITTING

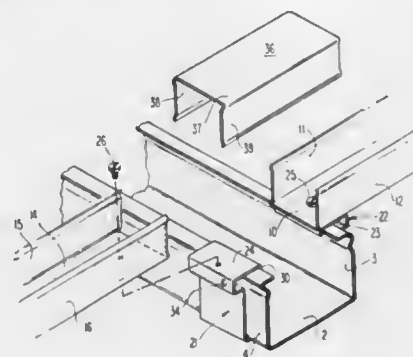
Richard D. Benscoter, Parkersburg, W. Va., assignor to Textron Inc., Providence, R.I.

Filed Nov. 7, 1977, Ser. No. 848,804

Int. Cl.<sup>2</sup> F16L 55/00

U.S. Cl. 285—121

5 Claims



1. In an overhead raceway system having a feeder duct and a pair of transverse branch ducts, each duct being channel shaped with a removable cover across the channel opening, improved transition means for the transfer of power/communication conductors from the feeder duct to the branch ducts comprising:

- a first branch duct coupling having clamp means engaging the inside and the outside of one wall of the feeder duct

and a screw threaded in the clamp means and engaging the outside of said one wall of the feeder duct, the screw being turned in to cause said engagement of the clamp means to secure the coupling in position and the coupling having a platform section supporting one of the branch ducts with the bottom of said one duct at the top of the feeder duct; a screw securing the bottom of said one branch duct to said platform section;

a second branch duct coupling having clamp means engaging the inside and the outside of the other wall of the feeder duct and a screw threaded in the clamp means and engaging the outside of said other wall of the feeder duct, the screw being turned in to cause said engagement of the clamp means to secure the coupling in position and the coupling having a platform section supporting the other branch duct with the bottom of the other branch duct at the top of the feeder duct;

a screw securing the bottom of said other branch duct to the last said platform section; and

a channel shaped cover extending between the branch ducts and being removably secured thereto by that the opposite ends of the cover walls extend over and engage the walls of the respective branch ducts.

#### 4,163,573

#### HOSE FITTING

Kazuo Yano, Tokyo, Japan, assignor to Chiyoda Tsusho K.K., Tokyo, Japan

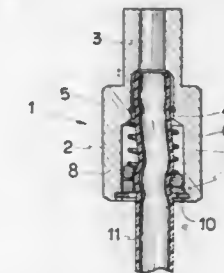
Filed Feb. 28, 1978, Ser. No. 882,198

Claims priority, application Japan, Feb. 28, 1977, 52/021309; Aug. 31, 1977, 52/115763[U]

Int. Cl.<sup>2</sup> F16L 55/00

U.S. Cl. 285—174

4 Claims



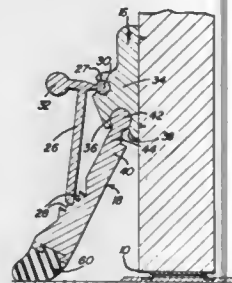
1. A hose fitting comprising a body provided therein with a longitudinal fluid passage adapted to receive a hose through the outlet thereof, an O-ring provided on the surrounding wall of said fluid passage and in the vicinity of the inlet thereof so as to give water- or air-tightness to a spaced formed between the outside surface of the hose inserted in said fluid passage and the surrounding wall thereof, and a quick hose-disconnecting mechanism provided between said O-ring and the outlet of said fluid passage for receiving said hose therethrough, gripping said hose in such a manner as to prevent reverse motion and disconnecting said hose by the aid of a manual operation, wherein said quick hose-disconnecting mechanism includes an annular retaining ring fixed to said body and provided at the outlet of said fluid passage, an inclined ring provided on said annular retaining ring and supported thereby said inclined ring having at the end thereof opposite said annular retaining ring a surface inclined relative to the longitudinal axis of said longitudinal passage, and a flat surface perpendicular to said longitudinal axis, a hose-gripping ring supported on the inclined surface of said inclined ring, said hose gripping ring having an internal cylindrical surface for gripping said hose, when supported on said inclined surface, said hose-gripping ring being adapted to rotate about its diametral direction and a coil spring in engagement with said hose-gripping ring and said body for at all times urging said hose-gripping ring against said inclined surface of said inclined ring;

whereby said hose-gripping ring is pivotable on said inclined ring at an intersection of said inclined surface and said flat surface.



surface to move said internal cylindrical surface out of hose gripping engagement to enable insertion and removal of said hose in said fitting.

**4,163,574**  
**DOOR STOP FOR INWARD OPENING DOOR**  
Jimmie A. Chezem, Rte. 9, Box 164A, Sparta, Tenn. 38583  
Filed Mar. 17, 1978, Ser. No. 887,671  
Int. Cl.<sup>2</sup> E05C 3/12  
U.S. Cl. 292—338

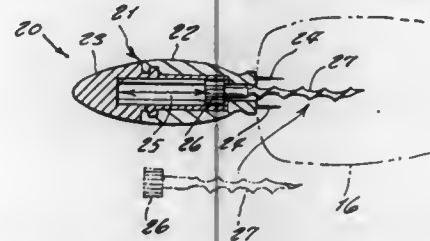


1. For use on the interior surface of a closure, an occupant safeguarding stop including a base securely mountable on an interior surface of an associated closure in a position adjacent but spaced from a jamb of the closure, a rigid leg member including base and free ends and aligned with and having its base end pivotally joined to the base and having a pressure portion on its free end arranged to be forcibly pressed and readily actuated toward a gripping position engaged with an abutment surface associated with the closure, resilient means connected to the base and the leg member for biasing the leg member toward a position displaced away from the abutment surface gripping position, locking means mounted on the base for selectively engaging the leg member and holding the leg member in any one of several gripping positions depending on the angle between the base and the leg member, which angle is a function of the distance between the base and the abutment surface, said locking means including an elongated element having one end pivotally mounted on the base with its other end extending toward the leg member, a plurality of recesses provided on the leg member at points spaced therealong and arranged for selectively receiving a terminal end portion of the other end of said element and retaining the leg member in the gripping position, the exact recess receiving the terminal end portion of the elongated element being a function of the distance between the base and the abutment surface and the desired deflection of the element, said base having a pair of parallel elongated slots formed therein including opposite ends opening endwise outwardly of remote surfaces of said base, said slots including narrow outer longitudinal portions opening laterally outwardly of a side of said base extending between said remote surfaces, the inner portions of said slots being widened and of partial cylindrical configuration, said one end of said elongated element and said base end of said leg member including transverse partial cylindrical portions extending transversely thereof and supported from said element and leg member by narrow neck portions, said element and leg member partial cylindrical portions being lengthwise received in the inner portions of said slots with said neck portions loosely received through said narrow outer slot portions, said leg member partial cylindrical portion including a first end thereof terminating inwardly of the corresponding end of the associated slot, said resilient means including a coil spring disposed within said end of said associated slot and including spring ends engaged with said leg member and base.

3 Claims

**4,163,575**  
**CORNSCREW**  
Larry P. Riedinger, Jr., c/o Geo. Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007  
Filed Aug. 29, 1977, Ser. No. 828,775  
Int. Cl.<sup>2</sup> A47G 21/00  
U.S. Cl. 294—5

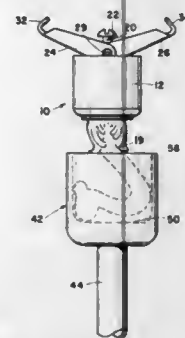
2 Claims



1. A device for holding corn for eating purposes comprising a knob having an outer surface of cornlike appearance and an inner end with prongs extending therefrom for piercing the end of an ear of corn in combination with a screw mounted in an axial opening in said knob, said screw being axially and rotatably movable relative to said knob and extending axially outward of said opening, in combination with means mounted on said knob engaging said screw for rotating and moving said screw axially relative to said knob opening.

**4,163,576**  
**MEANS FOR SUSPENDING ARTICLES FROM A CEILING**  
James B. Hoop, 8127 E. 12th Apt. 2, Tulsa, Okla. 74112  
Filed Apr. 24, 1978, Ser. No. 899,386  
Int. Cl.<sup>2</sup> A47F 13/06  
U.S. Cl. 294—19 R

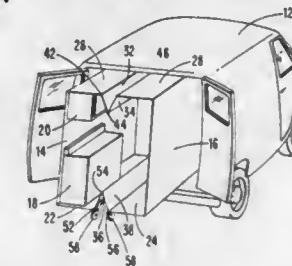
8 Claims



1. A device for facilitating securing of articles to a ceiling and comprising gripping means having alternate extended and contracted positions for selective engagement with the ceiling, sleeve means secured to said gripping means and reciprocal with respect thereto and having one end engageable with the gripping means for providing said extended and contracted positions therefor, hook means carried by said sleeve for receiving said article thereon, and tool means cooperating with the hook means for providing reciprocal movement for the sleeve means from a position remote with respect to the ceiling, and including threaded means for securing the sleeve means to the gripping means to provide said reciprocal movement therefor.

**4,163,577**  
**CAMPER MODULE**  
Ira C. Vanderslice, 100 Callie Ct., Loveland, Colo. 80537  
Filed May 12, 1978, Ser. No. 905,191  
Int. Cl.<sup>2</sup> B60P 3/34  
U.S. Cl. 296—164

10 Claims



1. A camper module, for use in combination with a rear opening van-type vehicle to form a temporary room-like interior thereof which comprises:

a frame;  
said frame including a first vertical side and a second vertical side opposite to each other capable of supporting a fixture means for relaxation and storage;  
an upper horizontal member containing a plurality of sections; said sections connected by a plurality of hinge means capable of folding said plurality of sections together;  
said upper horizontal member having a first end and a second end, said first end is affixed to said first vertical side, and said second end is affixed to said second vertical side forming a ceiling in an extended position;  
a lower horizontal member having a first end and a second end;  
said first end is affixed to said first vertical side at the opposite end in which said upper horizontal member is affixed and said second end is affixed to said second vertical side at the opposite end in which said upper horizontal member is affixed containing a plurality of sections forming a floor in said extended position;  
said plurality of sections is connected by a plurality of hinge means capable of folding said plurality of sections together;  
a plurality of foldable support means affixed to said lower horizontal members so that when said lower member is folded, said foldable support means is extended from a collapsed position to an erect position, permitting movement of said camper module;  
said upper horizontal member and said lower horizontal member simultaneously cooperate together to permit collapsing and extending of the camper module for easy removal and storage or insertion and erection of said camper module.

**4,163,578**  
**MAIN FRAME ASSEMBLY FOR ROAD VEHICLES**  
Norman F. Watson, Chipperfield, England, assignor to Stonefield Developments (Paisley) Limited, Paisley, Scotland  
Filed Apr. 19, 1977, Ser. No. 788,999  
Claims priority, application United Kingdom, Apr. 20, 1976, 15921/76

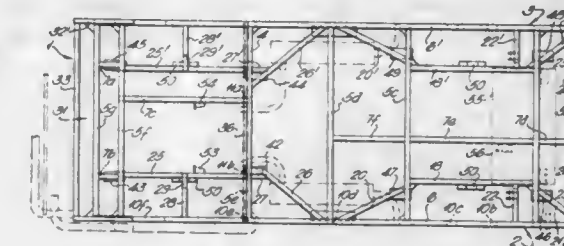
U.S. Cl. 296—204

Int. Cl.<sup>2</sup> B62D 27/00

7 Claims

1. A main frame assembly for a road vehicle comprising two parallel spaced side frames each comprising a continuous upper beam and a plurality of interconnected lower beams, connecting members free of diagonal bracing connecting said upper beam of each side frame to said lower beams of the side frame, cross members free of diagonal bracing connecting said lower beams of one of said two side frames to said lower beams of the other of said side frames, said cross members being spaced apart along the length of said side frames, and means

connecting together said upper beams adjacent their forward end only so as to define a generally U-shaped load space open



at one end, and means spacing one of said lower beams of each side frame inwardly from the others to define a wheel recess.

**4,163,579**  
**REINFORCING INSERT FOR A SUNVISOR FOR VEHICLES**

Gert Mahler, Radevormwald; Lothar Viertel, Wuppertal, and Wolfgang Meissner, Wetter, all of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Wuppertal, Fed. Rep. of Germany

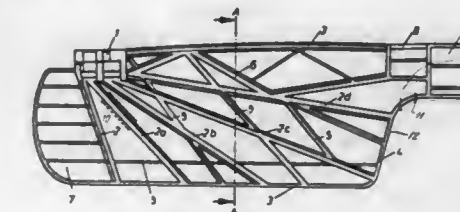
Filed Jun. 17, 1977, Ser. No. 807,586

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2633002

Int. Cl.<sup>2</sup> B60J 3/00

U.S. Cl. 296—97 H

9 Claims



1. A sun visor for a vehicle, including a visor body and a reinforcing insert inserted in said visor body; said reinforcing insert being comprised of a plastic material;  
said body having a number of side edges and having surfaces joining said side edges; a pivot bearing for said visor body and located at one said side edge and near an intersecting one of said side edges;  
said reinforcing insert comprising a plurality of tension stays extending from said pivot bearing along different respective pathways that widen apart moving away from said pivot bearing to respective regions of said reinforcing insert; said regions being at the side of said body away from and diametrically opposite said pivot bearings;  
said tension stay pathways start from said pivot bearing and widen radially as they extend to said diametrically opposite regions.

**4,163,580**  
**PRESSURE SWING RECOVERY SYSTEM FOR MINERAL DEPOSITS**

Durk J. Pearson, Palos Verdes Estates, and Jack R. Bohn, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 741,637, Nov. 15, 1976, Pat. No. 4,059,308. This application Nov. 21, 1977, Ser. No. 853,661  
Int. Cl.<sup>2</sup> E21B 43/28, 43/25

U.S. Cl. 299—5

26 Claims

1. In a process for the recovery of minerals from a subterranean mineral deposit which includes at least one soluble mineral, the steps of:

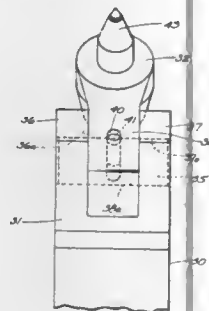
(a) drilling at least one borehole through which fluids may be introduced into said deposit;



- (b) introducing into said borehole a quantity of a predetermined solvent suitable for dissolving said mineral;  
 (c) cyclically varying the pressure in said borehole over a sufficient pressure range to repetitively vaporize and condense at least a substantial portion of said solvent so

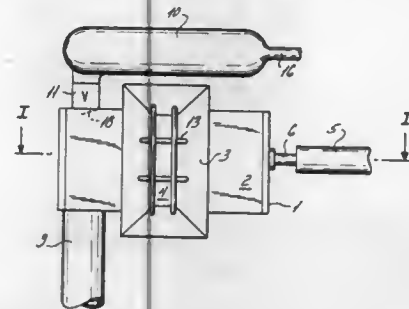
- that vaporization of said solvent in the pores and cracks of said deposit is effective to drive solute out of the pores and cracks; and  
 (d) extracting a solution of said mineral from said mineral deposit.

**4,163,581**  
**RETAINING MEANS FOR THE CONNECTING PIN WHICH JOINS A BIT HOLDER TO A BASE MEMBER**  
 Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio  
 Filed May 4, 1977, Ser. No. 793,541  
 Int. Cl.<sup>2</sup> E21C 35/18  
 U.S. Cl. 299-91



1. In a mining machine and the like having at least one driven element adapted to advance a cutter bit assembly in a cutting direction, said assembly comprising a base member affixed to said driven element, a bit holder, and a connecting pin located within aligned holes in said base member and said bit holder whereby to join said bit holder to said base member, the joined bit holder and bit member having cooperating abutment surfaces to sustain some of the resultant cutting forces encountered during mining operations, the improvement which comprises: said connecting pin being located wholly within the joined bit holder and base member; a retaining pin for said connecting pin to retain said connecting pin within said joined bit holder and base member; and structure to permit insertion of said retaining pin into said connecting pin after said connecting pin has been located within said joined bit holder and base member; said retaining pin also being located wholly within the confines of said joined bit holder and base member, said retaining pin being specifically located completely within said connecting pin and said bit holder free of said base member.

**4,163,582**  
**PNEUMATIC STOWING APPARATUS**  
 Kurt H. Voss, Hattingen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany  
 Filed Jan. 6, 1978, Ser. No. 867,511  
 Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700675; Apr. 1, 1977, 2714619  
 Int. Cl.<sup>2</sup> B65G 53/46  
 U.S. Cl. 406-12

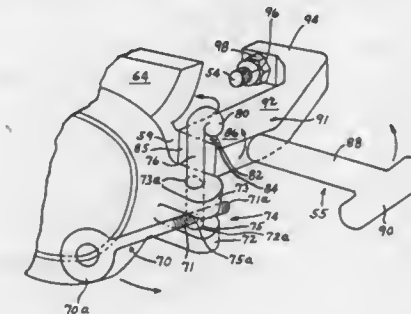


1. A pneumatic stowing apparatus, especially for filling up dams in an underground mine gallery by blowing rough mine waste resulting from blasting operations during advance of a mine gallery by means of compressed air to a point of use, said apparatus comprising a substantially closed housing having a top wall provided with an inlet opening and a pair of end walls each provided with at least one opening aligned with the opening in the other end wall; at least one discharge conduit communicating with the interior of said housing through the opening provided in one of the end walls thereof; means forming at least one elongated chamber having opposite open ends adjacent to the end walls of said housing and being movable in the interior of said housing between a material receiving position in which said chamber is aligned with said inlet opening to receive mine waste passing through said inlet opening and a discharge position in which said opposite open ends are respectively aligned with said openings in said end walls; means connected to said chamber forming means to move the latter between said positions thereof; and means for blowing off mine waste out of said chamber into said discharge conduit to be transported through the latter to a point of use, said blowing-off means including an air accumulator for accumulating compressed air, an air conduit communicating at one end with one end of said air accumulator and at the other end with the interior of said housing through said opening in the other end wall thereof, quickly opening and closing valve means in said air conduit, and a contact member which is actuated by direct contact with said chamber forming means so as to open and close said valve means in sequence with the movement of said chamber forming means so that in said discharge position of said chamber forming means the latter actuates said contact member whereby said valve means quickly opens and the compressed air accumulated in said air accumulator enters with a sudden burst through said air conduit into said chamber and blows off mine waste out of the latter into said discharge conduit.

**4,163,583**  
**PNEUMATIC HOPPER OUTLET CAP LATCH**  
 James C. Hammonds, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.  
 Filed Oct. 25, 1977, Ser. No. 844,666  
 Int. Cl.<sup>2</sup> B61D 7/02, 7/28, 49/00; B65G 53/50  
 U.S. Cl. 406-198

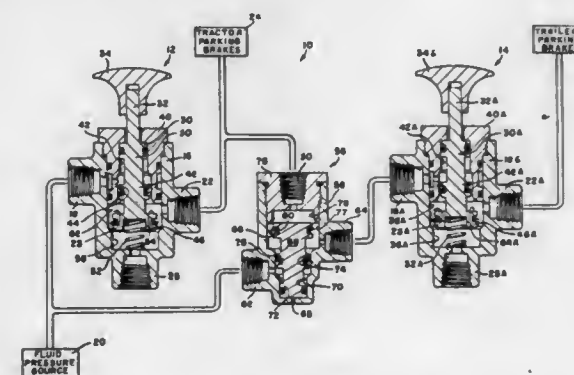
1. A hopper outlet comprising: hopper outlet walls extending downwardly having inner ends which define a discharge opening; a discharge conduit extending below said discharge opening; at least one valve element located within said discharge opening being movable between a first position closing

said discharge opening, and a second position allowing communication between said discharge opening and said discharge conduit; said valve element having an operating shaft extending generally parallel to said discharge conduit; said shaft having an operating handle located outside of said hopper walls; said discharge conduit having an end cap covering said discharge conduit; said end cap held in place with at least a pair of transversely spaced, large headed bolts pivotally mounted adjacent said discharge conduit and which engage at least a portion of said end cap; at least one of said large headed bolts being attached to a vertically extending locking member rotatably mounted on a side of said discharge conduit; said locking member being movable with said large headed bolt; said lock-



ing member having an upper locking portion of generally an inverted "J" shape; said upper locking portion having a lower locking surface adjacent to and overlying said operating handle when said handle is in the position which corresponds to the fully closed position of said valve element, whereby said locking surface prevents movement of said operating handle and said valve element from the closed position; and whereby if said valve element and its operating shaft are in an open position, said operating handle provides an obstruction for said locking member and prevents said locking member from assuming a position overlying said operating handle, and said one large headed bolt is prevented from pivoting into a position to hold the end cap in closed position.

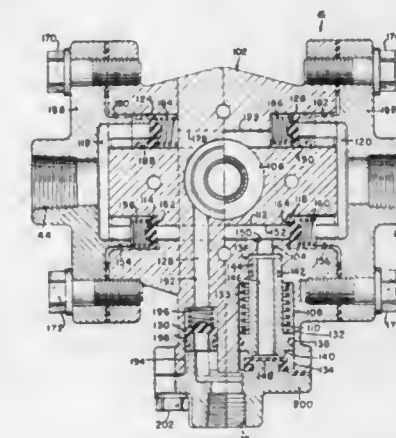
**4,163,584**  
**FLUID PRESSURE BRAKING SYSTEM**  
 James P. Koenig, Olmsted Township, Cuyahoga County, Ohio, assignor to The Bendix Corporation, Southfield, Mich.  
 Filed Feb. 17, 1978, Ser. No. 878,840  
 Int. Cl.<sup>2</sup> B60T 13/00  
 U.S. Cl. 303-7



1. In a fluid pressure braking system for an articulated vehicle comprising a tractor and a trailer, said tractor and trailer each having fluid pressure released parking brakes, a fluid pressure source, a control arrangement for controlling fluid communication from said source to said parking brakes including first valve means having an inlet connected to said source, an outlet connected to the parking brakes on the tractor, an exhaust, a valve member slidably mounted in said first valve

means and operable for manual movement from a first position closing communication between the inlet and outlet and communicating the latter to said exhaust, said valve member being movable to a second position closing said exhaust and communicating the inlet with the outlet, and second valve means having an inlet connected to the outlet of said first valve means, an outlet connected to the parking brakes on the trailer, an exhaust, valve mechanism slidably mounted in said second valve means and operable for manual movement from a first condition closing communication between the inlet and outlet and communicating the latter to said exhaust, said valve mechanism being movable to a second condition closing said exhaust and communicating the inlet with the outlet, and structure responsive to the pressure level within such second valve means for yieldably urging said valve mechanism to said condition when said pressure level drops below a predetermined level.

**4,163,585**  
**SERVICE AND EMERGENCY TRAILER VALVE**  
 John M. Ury, Hazelwood, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.  
 Continuation of Ser. No. 794,301, May 5, 1977, Pat. No. 4,080,004, which is a continuation of Ser. No. 677,405, Apr. 15, 1976, Pat. No. 4,042,281. This application Feb. 21, 1978, Ser. No. 879,082  
 Int. Cl.<sup>2</sup> B60T 15/02  
 U.S. Cl. 303-9



14. A valve for controlling air pressure in a towed vehicle air brake system which system includes an air pressure supply means which receives air from an external source of air supply, service brake means and parking brake means and only a first and a second air pressure storage means for supplying air pressure to said service brake means and parking brake means, said valve comprising:

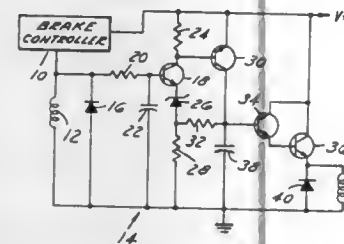
- (a) first air pressure passage means for supplying air pressure to said first and second air pressure storage means;  
 (b) second air pressure means for supplying air pressure from said first and second storage means to said parking brake means;  
 (c) unidirectional check valve means in said first and second air pressure passage means for preventing air pressure from flowing from either one of said air pressure storage means into the other and for preventing air pressure from flowing from either one of said air pressure storage means through said first air pressure passage means and out of the valve and for selectively selecting and supplying air pressure to said parking brake means from that one of the first and second air pressure storage means with the higher air pressure and for preventing the selected air pressure from returning to either one of said air pressure storage means; and  
 (d) pressure responsive valve means responsive to the pressure of said air supply means said pressure responsive



valve means having a valve member in said second air pressure passage means for controlling the application of air pressure from said second air pressure passage means to said parking brake means and for exhausting air pressure from said parking brake means to the atmosphere.

**4,163,586**  
**CONTROL SYSTEM FOR DOUBLE-ACTUATOR BRAKES**  
 Robert C. Snyder, Country Club Hills, Ill., assignor to Motor Wheel Corporation, Lansing, Mich.  
 Filed Nov. 25, 1977, Ser. No. 854,649  
 Int. Cl.<sup>2</sup> B60T 13/74  
 U.S. Cl. 303—20

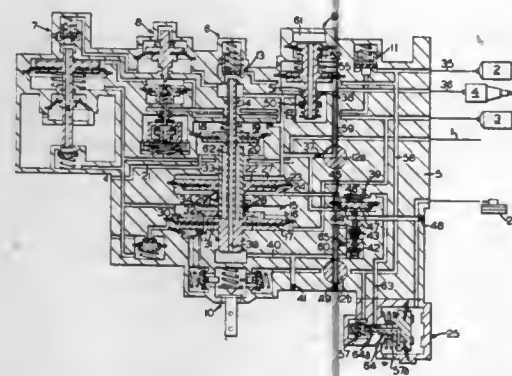
7 Claims



1. A brake control system for use on a wheeled vehicle system having at least one braked wheel comprising brake means having first and second separately actuatable electrically-operated brake actuator means disposed to apply braking forces at said at least one braked wheel and responsive to respective electrical braking signals for applying brake forces, first control means connected in series with said first actuator means for applying a first braking signal to actuate said first actuator means, and second control means connected in parallel with said first actuator means for applying a second braking signal proportional to said first braking signal to actuate said second actuator means, said brake means comprising an electric brake having brake shoe means and an actuator arm adapted to pivot about an axis which is fixed relative to said vehicle system for moving said brake shoe means into a brake drum to apply said braking forces, said first and second brake actuator means respectively comprising first and second electromagnets disposed on said actuator arm at differing moment radii with respect to said axis.

**4,163,587**  
**PNEUMATIC RAILWAY BRAKING DISTRIBUTOR**  
 Henri Limozin, Claye Souilly, and Georges Dalibout, Gagny, both of France, assignors to WABCO Westinghouse, Freinville-Sevrans, France  
 Filed Dec. 8, 1977, Ser. No. 858,489  
 Int. Cl.<sup>2</sup> B60T 8/18  
 U.S. Cl. 303—22 R

13 Claims



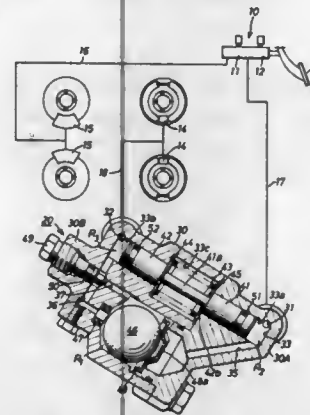
1. A fluid pressure distributor for a railway vehicle including a control valve device operative responsive to the variation of

fluid pressure in a brake pipe of the vehicle to control the vehicle brake pressure, said control valve device comprising:

- (a) supply valve means for admitting fluid under pressure to the vehicle brake cylinders in an open position and for interrupting the admission of fluid under pressure to the brake cylinders in a closed position; and
- (b) a piston assembly to effect operation of said valve means including:
  - (i) a control piston abutment subject opposingly to the fluid pressure of a brake pipe and a control reservoir in response to which an actuating force is exerted by the differential pressure therebetween to urge said piston assembly in a first direction to operate said valve means to the open position; and
  - (ii) a main reaction piston abutment and an auxiliary reaction piston abutment, each subject to the fluid under pressure admitted to the brake cylinders and independently operative responsive thereto to exert a counteracting force on said piston assembly to urge movement thereof in a direction opposite the first direction, whereby said valve means is operated to the closed position when the actuating force on said piston assembly is counterbalanced; and
- (c) control means for supplying a correction pressure to said auxiliary reaction piston abutment in opposition to the brake cylinder pressure acting thereon to vary the degree of counteracting force exerted by said reaction piston on said piston assembly and thereby modify the brake cylinder fluid pressure in accordance with a vehicle parameter to which said control means is responsive.

**4,163,588**  
**FLUID PRESSURE CONTROL DEVICE FOR VEHICLE BRAKING SYSTEMS**  
 Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan  
 Filed Feb. 16, 1978, Ser. No. 878,596  
 Claims priority, application Japan, Feb. 21, 1977, 52-20694[U]  
 Int. Cl.<sup>2</sup> B60T 8/14, 8/22  
 U.S. Cl. 303—24 C

3 Claims



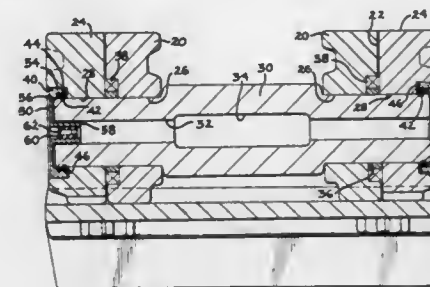
1. In a fluid pressure control device for a vehicle braking system incorporating between a master cylinder and wheel brake cylinders, comprising:

- a housing adapted to be fixedly mounted on a vehicle body frame, said housing being provided thereon with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinders and being provided therein with a stepped bore having a small diameter portion and a large diameter portion, said bore being in communication with said inlet and outlet ports respectively at the small and large diameter portions thereof, and a first chamber in communication with the small and large diameter portions of said stepped bore at opposite sides thereof;

a differential piston having small and large diameter portions slidably disposed within the respective small and large diameter portions of said stepped bore to provide second and third chambers respectively in open communication with said inlet and outlet ports, said piston being exposed at its small diameter portion in said second chamber and at its large diameter portion in said third chamber; a spring loading said piston axially in a direction toward said outlet port; and cut-off valve means including a valve seat provided on a wall of said first chamber to permit fluid flow between said second and third chambers and an inertia-controlled ball housed within said first chamber to co-operate with said valve seat to cut off fluid flow from said second chamber to said third chamber when said ball is subjected to a deceleration in excess of a predetermined value; the improvement wherein said housing includes a space between the small and large diameter portions of said stepped bore, and said spring is housed within said space between the small and large diameter portions of said stepped bore and is detachably engaged at opposite ends thereof with the small and large diameter portions of said piston, whereby said piston is loaded toward said outlet port by engagement with said spring when moved toward said inlet port and loaded toward said inlet port by engagement with said spring when moved toward said outlet port.

**4,163,589**  
**HINGE JOINT FOR TRACK LINK ASSEMBLIES**  
 Lawrence E. Fox, Peoria, and James R. Shuler, Eureka, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.  
 Filed Apr. 24, 1978, Ser. No. 899,771  
 Int. Cl.<sup>2</sup> B62D 55/20  
 U.S. Cl. 305—14

8 Claims



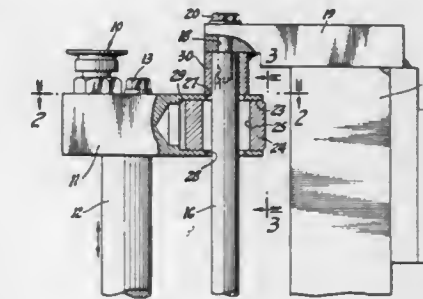
1. A track link assembly comprising:
- two meshed track links;
  - aligned bores in said links;
  - a hinge pin received in said bores for pivoting said links together;
  - annular grooves at opposite ends of said pin;
  - retaining rings in said grooves;
  - recesses in one link about the bore therein adjacent the ends of said pin and defining shoulders substantially abutted by said retaining rings; and
  - caps closing said recesses and having axial portions about the periphery of the respective retaining ring for preventing radial movement thereof.

**4,163,590**  
**UNIVERSAL FLOATING GUIDE MEANS**  
 Gregory J. Dwyer, Livonia, and Ivan L. Kauffman, Commerce Township, Oakland County, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.  
 Filed Apr. 12, 1977, Ser. No. 731,172  
 Int. Cl.<sup>2</sup> F16C 23/02  
 U.S. Cl. 308—3 R

5 Claims

1. In a guide means for guiding a linearly movable slide member, the combination comprising:

- (a) a fixed guide rod;
- (b) the slide member being provided with a bore formed on an axis perpendicular to the direction of movement and the longitudinal axis of the guide rod;
- (c) a pair of aligned bores formed through the slide member and communicating with said first mentioned bore for reception of the guide rod, and being made to a diameter

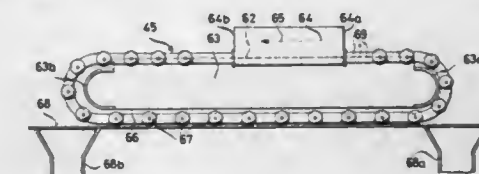


larger than the diameter of the guide rod and disposed concentric to the guide rod;

(d) a bushing slidably mounted in the first mentioned bore in the slide member and having a cross-hole therethrough, through which the guide rod is movably mounted, whereby when the slide member is moved longitudinally of the guide rod, the bushing may float relative to the slide member and the guide rod.

**4,163,591**  
**FLEXIBLE COVERING FOR POWER SUPPLY LINES, GUIDEWAYS AND THE LIKE**  
 Kurt Hennig, Georgenstr. 16, 8000 Munich 71, and Manfred Klein, Böhmerwaldstr. 11, 8045 Ismaning, both of Fed. Rep. of Germany  
 Filed Dec. 9, 1977, Ser. No. 859,045  
 Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656622  
 Int. Cl.<sup>2</sup> B23Q 11/08; H02G 11/00  
 U.S. Cl. 308—3.5

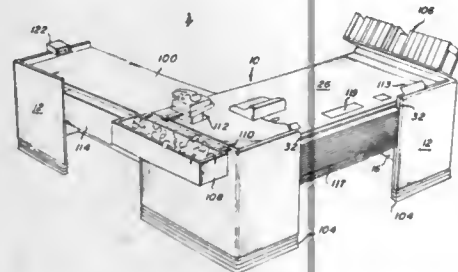
16 Claims



1. A flexible cover comprising two laterally spaced flexible chains, each of which is composed of links connected by hinge pins, the links of the chains forming lateral sides of adjacent sections of said cover, each link of one chain being connected to an opposite link of the other chain, at least at the top, by a rigid cover member to connect said lateral sides of the cover sections, the rigid cover members defining arcuate end sections which are in sliding contact with the end sections of adjacent cover sections, an arcuate end section of each rigid cover member overlapping the end section of the adjacent cover section with which it is in sliding contact, and adjacent cover sections also being provided with opposed stops which limit the angle of relative pivoting of such adjacent cover sections.

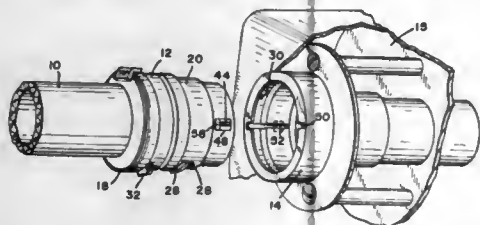


**4,163,592**  
**FURNITURE UNITS WITH L-SHAPED PANEL SUPPORTS**  
 George H. Nelson, New York, N.Y., assignor to George Nelson & Company, New York, N.Y.  
 Filed Oct. 12, 1977, Ser. No. 841,418  
 Int. Cl.<sup>2</sup> A47B 27/00  
 U.S. Cl. 312—194



1. A universal component part for articles of furniture, said component part comprising a generally L-shaped free standing panel having upper and lower horizontal edges and left and right vertical edges, said panel comprising two generally planar members and elongated members seated in peripheral recesses formed in the exterior edges of said planar members and defining with said planar members and internal cavity, said panel having a first set of slots formed in the peripheral edges of said elongated members seated in the horizontal edges of said planar members and a second set of slots formed in the peripheral edges of said elongated members seated in the vertical edges of said planar members, said slots being sized and shaped to receive brackets which extend into said internal cavity and support other component parts of said articles of furniture.

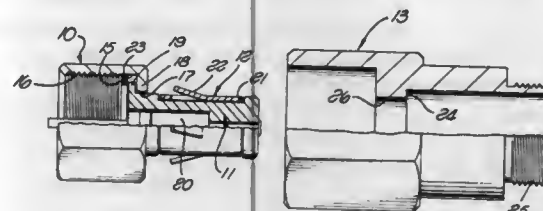
**4,163,593**  
**SEPARABLE HOSE COUPLING**  
 John Kosik, Stamford, Conn., assignor to Consolidated Foods Corporation, Old Greenwich, Conn.  
 Filed Sep. 22, 1977, Ser. No. 835,545  
 Int. Cl.<sup>2</sup> H01R 3/04  
 U.S. Cl. 339—15



1. In a separable connector for connecting a hose to a vacuum cleaner and for establishing an electric circuit between the hose and the cleaner, an inner sleeve of electrical insulating material, means for securing said sleeve to the outer surface at one end of the hose, said sleeve being formed with an outwardly extending flange at one end thereof, an outer metallic sleeve around said inner sleeve with one end thereof abutting against said flange, radial projections on one of said sleeves for spacing said sleeves apart to provide an annular space therebetween, manually retractable latch members disposed in said space and projecting through openings in said outer sleeve for releasably engaging surfaces on said vacuum cleaner, a pair of electric contacts carried by said inner sleeve and extending in spaced relation through apertures in said outer metallic sleeve, lugs of insulating material extending from said inner sleeve into said apertures at the ends of the latter adjacent to said flange for providing an insulation barrier between said contacts and the metal of said outer sleeve at said ends of the apertures and an axially extending projection from said flange engaging a

recess in the adjacent end of said outer sleeve to prevent relative rotation between the two sleeves, whereby said contacts are prevented from touching the edges of said apertures in the outer metallic sleeve.

**4,163,594**  
**ELECTRICAL CONNECTOR**  
 Sharanjit S. Auja, Whitby, Canada, assignor to International Telephone and Telegraph Company, New York, N.Y.  
 Filed Jul. 28, 1978, Ser. No. 928,999  
 Int. Cl.<sup>2</sup> H01R 13/54  
 U.S. Cl. 339—82

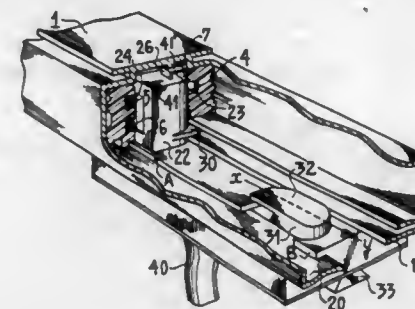


1. A tamper-proof electrical connector comprising: a termination unit including means at its forward end for connection with the output terminal of a distribution source, said unit having a cylindrical portion at its rearward end, said cylindrical portion having a groove and a shoulder at each end of the groove, said groove being positioned intermediate the ends of said portion; a cylindrical retaining clip snugly fitted around said portion between said groove shoulders and snugly in said groove so that said clip will abut said groove shoulders and will not slide off of said portion, said clip having leaf spring tines extending radially outwardly and forwardly of said unit, said unit having an external shoulder extending outwardly from and radially from said portion, said external shoulder being spaced a predetermined distance forwardly of the forward ends of said tines; and a locking shield having a bore, and first and second counterbores on each side of said bore, said first counterbore being deep enough to receive substantially the entire length of said unit forward of said portion, said first and second counterbores terminating in first and second shoulders spaced apart somewhat less than said predetermined distance, said bore having a diameter such that said locking shield is slidable on and positioned on said portion and such that said bore lies between and is locked between said unit shoulder and the ends of said tines with said first shoulder approximately abutting said unit shoulder and said tines approximately abutting said second shoulder.

**4,163,595**  
**ELECTRICAL SUPPLY DEVICE**  
 Bernard Vasseur, Lamotte-Beuvron, France, assignor to LITA, Lamotte-Beuvron, France  
 Filed Nov. 15, 1977, Ser. No. 851,803  
 Claims priority, application France, Nov. 19, 1976, 76 34918  
 Int. Cl.<sup>2</sup> H01R 13/54, 13/64  
 U.S. Cl. 339—88 R

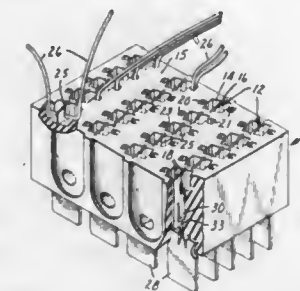
1. An electrical supply device for connecting electricity to a user apparatus comprising:  
 a plurality of insulated conductor wires partially embedded in an insulating sheath;  
 a rail having a metallic channel for receiving said wires at the periphery thereof, said channel having asymmetrical slideways situated in two different and parallel planes;  
 a sliding adapter having a flat part with guide means adapted to slidably engage said slideways for movement along said rail and along a longitudinal axis, means for locking said adapter to said rail in a selected position and a head part mounting a plurality of contacts and dimensioned for movement into said channel in a first orientation and thereafter, upon a pivot of 90° in a given direction about

an axis perpendicular to said longitudinal axis, bringing said contacts and wires into electrical connection, said guide means being formed by a groove extending along



said flat part for a length substantially equal to the length of said flat part and a guide formed at the region of the junction between said head and flat parts, said groove and guide engaging respective ones of said slideways.

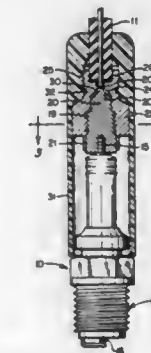
**4,163,596**  
**ELECTRICAL CONNECTOR**  
 James E. Aysta, Stillwater, and Dewain R. Goff, St. Paul Park, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
 Filed Jan. 27, 1978, Ser. No. 872,825  
 Int. Cl.<sup>2</sup> H01R 9/08  
 U.S. Cl. 339—97 P



1. A connector for insulated electrical wire comprising:  
 a body of insulating material having a wire connection well formed into one surface to receive a slotted, flat plate, electrical contact element and to closely support the outside edges of the legs of the contact element, a wire retention well formed into said one surface adjacent said wire connection well for receipt of an insulated wire to be connected, and a passageway joining said wire retention well to said wire connection well, said passageway extending into said one surface of said body and being aligned with the position of the slot in a contact element supported in said wire connection well, said passageway being constricted to engage the insulation of a said wire to be connected by a contact element in said wire connection well; said wire connection well, said passageway and said wire retention well together defining a wire path from said wire connection well through said passageway into said wire retention well, then turning and exiting from said wire retention well through said one surface of said body, and  
 a slotted, flat plate, electrical contact element in said wire connection well of said body with the open end of its slot adjacent said one surface of said body to receive and strip insulation from an insulated wire forced into said wire connection well, whereby an insulated wire may be forced into said wire connection well and simultaneously into said passageway and said wire retention well, said contact element strip-

ping insulation from the wire to make electrical contact to the wire while the passageway walls engage the wire insulation and the wire is bent in passing from said passageway and out of said wire retention well to provide strain relief for the connected wire.

**4,163,597**  
**ELECTRICAL CONNECTOR FOR A SPARK PLUG**  
 Alfred R. Brenholts, Houston, Tex., assignor to Stitt Spark Plug Company, Conroe, Tex.  
 Filed Aug. 14, 1978, Ser. No. 933,437  
 Int. Cl.<sup>2</sup> H01R 13/38  
 U.S. Cl. 339—100



1. A two-piece electrical connector for detachably, electrically connecting a lead wire with the terminal of a spark plug, comprising:

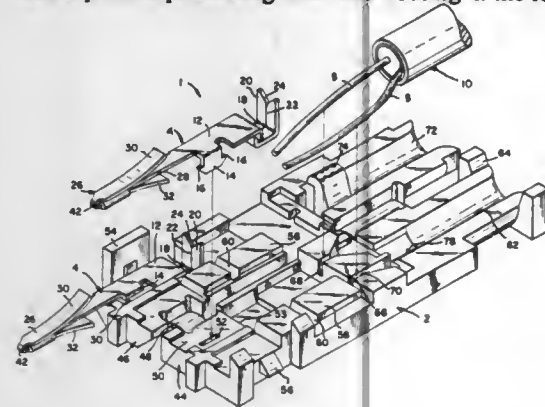
- (a) an electrically conductive male member having:
  - (i) a multiangular base portion formed with an axially disposed socket to receive the terminal of a spark plug,
  - (ii) an externally threaded intermediate portion, and
  - (iii) a pointed outer tip portion; and
- (b) an electrically conductive female member having:
  - (iv) an opening at one end thereof to receive a bared end of a lead wire,
  - (v) an internal chamber communicating with the lead wire-receiving opening and terminating at one end thereof in an annular, beveled seat disposed in adjacent, surrounding relation to said lead wire-receiving opening,
  - (vi) an intermediate, internally threaded socket adjoining said chamber, and
  - (vii) an annular, deformable skirt formed on the end of said female member opposite the lead wire-receiving opening thereof;

said male and female members being detachably connectable by threaded engagement of their threaded intermediate portions, the tip portion of said male member being arranged to clamp the bared end of said lead wire against the beveled seat of said female member upon full threaded engagement of said male and female members, and the skirt of said female member being deformable about the multiangular base portion of said male member to hold said male and female members against accidental detachment.

**4,163,598**  
**POINT-TO-POINT MINIATURE COAX CONNECTOR**  
 Edward A. Bianchi, and John H. Huber, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.  
 Filed May 17, 1978, Ser. No. 906,534  
 Int. Cl.<sup>2</sup> H01R 13/58  
 U.S. Cl. 339—107

1. In a container for attachment to a coaxial cable having a pair of electrical contacts secured respectively to a center conductor and a ground conductor of the cable and adapted

for pluggable connection into a matrix of substrate apertures lined with conductive material, the improvement comprising: a dielectric housing formed in two sections hinged together for enclosure on said cable, each contact having a slit plate conductor receiving portion and a portion protruding from said housing in the form of



a central blade flanked on either side by spring blade portions integrally joined to said center blade and flaring outwardly toward their free ends away from said center blade, whereby both flanking blades are progressively flattened from their flaring configurations flatly against said center blade upon pluggable connection of said contact protruding portions into said substrate apertures.

4,163,599

## DETACHABLE HIGH VOLTAGE CONNECTION

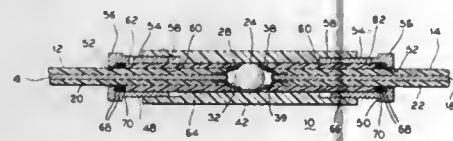
Jay S. Plugge, Waukesha, and Eugene S. Hammer, Greendale, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Mar. 6, 1978, Ser. No. 883,868

Int. Cl.<sup>2</sup> H01R 7/06

U.S. Cl. 339—115 C

10 Claims



1. A high voltage electrical cable connection for interconnecting a pair of electrical cables, each having an outer insulation layer and a central stranded conductor terminating in a cable end; said connection comprising:

- a first and second generally funnel shaped conductors in conductive contact enclosing the stranded conductor and extending from each of said cable ends;
- a spherical conductor interposed between said funnel shaped conductors; and
- means for housing and insulating said cable ends, said funnel shaped conductors, and said spherical conductor in compressive engagement within a dielectric medium to provide electrical contact through the cables.

4,163,600

## LIGHT BEAM SCANNER

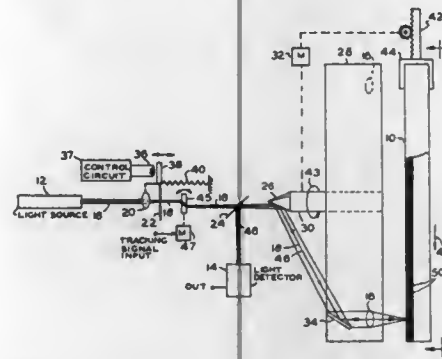
James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Division of Ser. No. 727,369, Sep. 27, 1976, Pat. No. 4,090,031, which is a continuation of Ser. No. 516,453, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 375,336, Jul. 2, 1973, Pat. No. 3,891,794. This application Jan. 19, 1978, Ser. No. 870,642

Int. Cl.<sup>2</sup> G02B 27/17

U.S. Cl. 350—6.7

6 Claims



1. A light beam scanner apparatus comprising: a rotating scanner wheel supported on a rotor shaft; a plurality of lenses and associated first mirrors mounted in lens-mirror pairs on said scanner wheel; and distributor means mounted on the rotor shaft for distributing a light beam to one of the lens-mirror pairs at a time, said distributor means including a plurality of distributor mirrors spaced around said shaft for reflecting the light beam from one distributor mirror to one of the first mirrors which first reflects said beam through its associated lens.

4,163,601

## MULTIMODE WAVEGUIDE WITH ENHANCED COUPLING WITH GUIDED MODES

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 12, 1977, Ser. No. 824,154

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.31

8 Claims



1. An optical waveguide in which light travels along said waveguide in guided and unguided modes of propagation each having a propagation constant  $\beta$ , the difference between the propagation constants for the highest order guided mode to be coupled and the next higher order mode being the critical frequency  $\omega_c$ , said waveguide comprising:

- a glass core,
- a glass cladding around said core, said core having a higher index of refraction than said cladding, and
- perturbations spaced along the length of said core, each perturbation having a departure from the unperturbed waveguide which joins smoothly to the unperturbed waveguide at the ends of the perturbation, each perturbation being approximately symmetric and changing monotonically from the ends of the perturbation to a point of maximum or minimum deviation, the change being smooth with only one inflection point on either side of the middle of the perturbation, each perturbation having a power spectrum which decreases with increasing mode

order and which has a plurality of minima, the length of each perturbation being such that the first minima in the power spectrum of the perturbation occurs at the critical frequency  $\omega_c$  and the power spectrum at frequencies greater than  $\omega_c$  has an amplitude greater than zero and at least two orders of magnitude below the peak amplitude of said power spectrum.

4,163,602

## INFRARED PICK-UP DEVICE COMPRISING AN INFRARED SENSITIVE TELEVISION PICK-UP TUBE

Klaus Schütz, Holger Helber, and Gerhard Lange, all of Bremen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

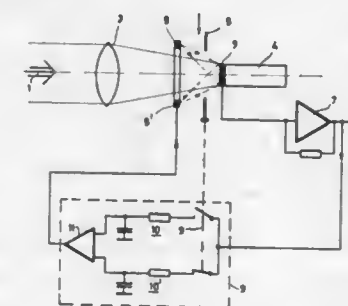
Filed Feb. 2, 1978, Ser. No. 874,526

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704847

Int. Cl.<sup>2</sup> H04N 5/33

U.S. Cl. 358—113

3 Claims



1. Infrared pick-up device comprising an infrared sensitive television pick-up tube and, arranged in the beam path for the pick-up tube, a diaphragm which is alternately in the open and closed state, the amplitude of the available video signal being proportional to the speed at which the temperature changes, an infrared radiator in the beam path for superimposing a uniform level of infrared radiation on the scene radiation, signal processing means connected to the output of the pick-up tube and the infrared radiator for controlling the quantity of radiation produced by said infra-red radiator so that the quantity of the average scene radiation plus the superimposed additional radiation is substantially equal to the radiation coming from the diaphragm in the closed state and acting on the target plate of the pick-up tube.

4,163,603

## WIDE-ANGLE PHOTOGRAPHIC OBJECTIVE

Teruyoshi Tsunashima, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

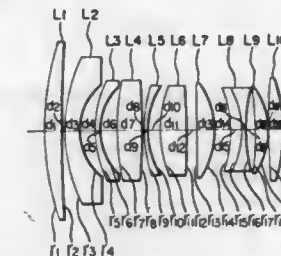
Filed Aug. 19, 1977, Ser. No. 826,144

Claims priority, application Japan, Aug. 20, 1976, 51-98765

Int. Cl.<sup>2</sup> G02B 9/64

U.S. Cl. 350—214

4 Claims



1. A wide-angle photographic objective comprising, in the order from the object side: a first component which is a positive meniscus lens having its convex surface facing the object side;

a second component which is a negative meniscus lens having its convex surface facing the object side; a third component which is a negative meniscus lens having its convex surface facing the object side; a fourth component which is a positive lens; a fifth component which is a negative meniscus lens having its convex surface facing the object side; a sixth component which is a positive lens; a seventh component which is a positive lens; an eighth component which is a biconcave negative lens comprising a doublet; a ninth component which is a positive meniscus lens having its convex surface facing the image side; and a tenth component which is a positive lens; the photographic objective satisfying the following conditions:

$$\begin{aligned} 6.1f < f_1 < 8.0f \\ -1.4f < f_2 < -1.1f \\ -2.1f < f_3 < -1.7f \\ 2.9f < f_4 < 4.0f \\ -5.0f < f_5 < -2.4f \\ 1.3f < f_6 < 1.7f \\ 1.6f < f_7 < 1.8f \\ -1.0f < f_8 < -0.8f \\ 1.3f < f_9 < 1.6f \\ 2.0f < f_{10} < 2.3f \end{aligned}$$

$$1.3 < \frac{r_2 + r_1}{r_2 - r_1} < 1.8$$

$$-2.2 < \frac{r_4 + r_3}{r_4 - r_3} < -1.8$$

$$-3.2 < \frac{r_6 + r_5}{r_6 - r_5} < -2.8$$

$$4.5 < \frac{r_{11} + r_{10}}{r_{11} - r_{10}} < 9.5$$

where  $f$  represents the total focal length of the entire system, and  $f_1, f_2, f_3, \dots, f_{10}$  represent the focal lengths of said first, second, third, . . . and tenth components, respectively; and where  $r_1, r_2, r_3, r_4, r_5, r_6$  represent the curvature radii of the surfaces of said first, second and third components, respectively, which face the object side and the image side, respectively,  $r_{10}$  represents the curvature radius of the surface of the fifth component which faces the image side, and  $r_{11}$  represents the curvature radius of the surface of the sixth component which faces the object side.

4,163,604

## PROJECTION LENS

Ellis I. Betensky, Willowdale, Canada, assignor to U.S. Precision Lens, Inc., Cincinnati, Ohio

Filed Dec. 23, 1977, Ser. No. 864,018

Int. Cl.<sup>2</sup> G02B 9/14

U.S. Cl. 350—226

10 Claims

1. A lens comprising three elements, a first biconvex element, a second biconcave element, and a third biconvex element, and further defined by the following relationship

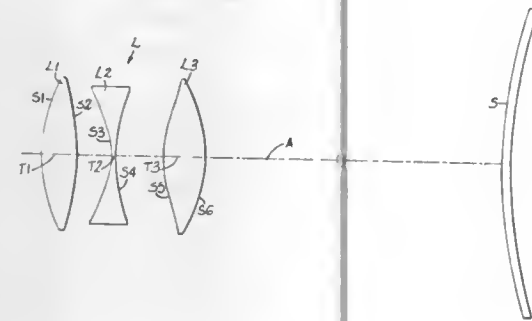
$$1.6 < \frac{1}{k} (k_1 + k_3) < 1.8$$

$$3.0 < |k_2| < 3.2$$

$$0.22 < F_N (T_1 + T_3) < 0.26$$

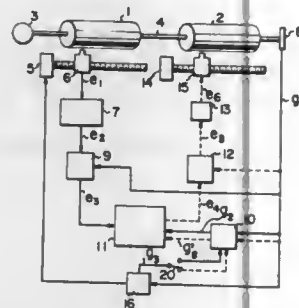


where  $k_1$ ,  $k_2$  and  $k_3$  are the powers of the first, second and third elements, respectively;  $T_1$  and  $T_3$  are the axial thick-



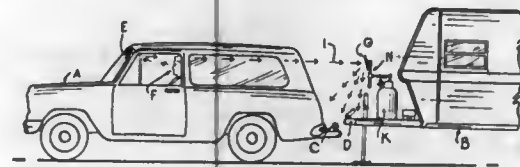
nesses of the first and third elements as a fraction of the equivalent focal length, and  $F_N$  is the F-number of the lens.

**4,163,605**  
**METHOD OF PICTURE REPRODUCTION WITH VARIABLE REPRODUCTION SCALE**  
 Mitsuhiro Yamada, Ogurusukita-danchi #30-206, 6 Goto-cho, Ogurusu-minami, Fushimi-ku, Kyoto-shi, Japan  
 Filed Jul. 13, 1977, Ser. No. 815,174  
 Claims priority, application Japan, Jul. 20, 1976, 51/86256  
 Int. Cl.<sup>2</sup> H04N 1/06  
 U.S. Cl. 358—287



1. In a picture reproducing method comprising scanning an original picture to obtain picture signals to be recorded, correcting impurities of color ink components, generating timing pulses in synchronism to a scanning speed, writing the picture signals into a memory including addressing said memory in synchronization with the timing pulses, reading out the picture signals from the memory including addressing said memory in synchronization with the timing pulses, and recording the reproduction picture from the picture signals read out from the memory; a method of varying reproduction scale, wherein either one of said steps of writing in or reading out memory address signals includes the step of addressing said memory with additional address signals synchronized to other pulses different from the timing pulses, said other pulses being inserted among the timing pulses without changing a base frequency of said timing pulses.

**4,163,606**  
**HITCH VIEWING TRAILER MIRROR WITH SNAP BUTTON CONNECTION**  
 Peter M. Granno, Rte. 1, Box 401, Molalla, Oreg. 97038  
 Filed Jun. 9, 1978, Ser. No. 914,044  
 Int. Cl.<sup>2</sup> G02B 5/10  
 U.S. Cl. 350—307

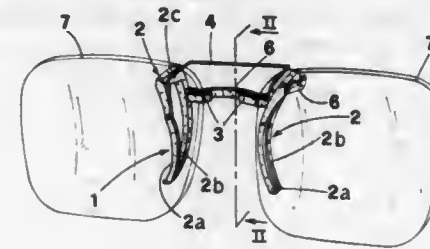


- 2 Claims
1. A hitch viewing trailer mirror support comprising:
    - (a) a horizontal extensible first arm;
    - (b) means for supporting one end of said arm to the front of a trailer and to the rear of the trailer hitch coupler;
    - (c) a mirror supporting extensible second arm;
    - (d) means for adjustably connecting one end of said second arm to the free end of said first arm;
    - (e) a convex mirror secured to the free end of said second arm, said second arm being swingable about the axis of said first arm so as to position said mirror above or below said first arm or to the right or to the left thereof, the angular position of said convex mirror on said second arm being adjusted so as to bring into view the area surrounding the trailer hitch coupler by a person sitting in a powered vehicle to be connected to the trailer when looking through the vehicle rear view mirror while backing the vehicle into a position for bringing the vehicle hitch ball into registration with the trailer hitch coupler;
    - (f) said horizontal extensible first arm including a cylindrical member having spaced apart sets of openings, the opening in each set being angularly spaced from each other 90° apart;
    - (g) said first arm also including a rod slidable in said cylindrical member and having a snap button receivable in any one of said openings;
    - (h) said means for adjustably connecting said second arm to said first arm comprising a T-shaped coupling connected to the outer end of said first arm and swingable about said arm into different angular positions;
    - (i) said second extensible arm including a tubular member adjustably receivable in said coupling and having spaced apart sets of openings, the openings in each set being angularly spaced from each other 90° apart; and
    - (j) said second arm also including a mirror supporting standard slidably received in the tubular member of said arm and having a snap button receivable in any one of said openings in the second tubular member.

**4,163,607**  
**AUXILIARY LENSES UNIT FOR GLASSES**  
 Giorgio Nannini, Via Grandi, 153, Modena, Italy  
 Filed Apr. 12, 1977, Ser. No. 786,845  
 Claims priority, application Italy, Apr. 30, 1976, 4800/76[U];  
 Jul. 23, 1976, 28967/76[U]  
 Int. Cl.<sup>2</sup> G02C 9/04  
 U.S. Cl. 351—47

- 9 Claims
1. An auxiliary lenses unit for glasses, the unit consisting of a supporting central body and of a pair of auxiliary lenses linked by a bridge which can rotate and which is supported by said central body including two pincers each made at least in part of elastic material, each of said pincers being provided with two extensions (2a) and (2b) that extend downwards and almost touch near their lower portions; an operating member (4) which forms part of said central body integral with one of the two extensions of each of said pincers and fit for supplying, through a manual push, a bending moment such as to move the two extensions of each of said pincers from one another, said

bridge having two pins (6a) at its ends which fit in said central body, said pins having a polygonal section and being fitted in



corresponding seats in said central body having the same polygonal section.

**4,163,608**  
**HYDRATABLE GAS PERMEABLE METHYL METHACRYLATE COPOLYMER**  
 Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720  
 Filed Oct. 5, 1977, Ser. No. 839,750  
 Int. Cl.<sup>2</sup> C08F 20/06; G02C 7/04  
 U.S. Cl. 351—160 H

- 3 Claims
1. A contact lens concave-convex form in section and of a curvature substantially the same as the eye to which it is applied, made of a hydrated oxygen permeable copolymer, providing an oxygen equivalent of 6.71% at a lens thickness of 0.15 millimeters said copolymer consisting of 100 parts by weight methyl methacrylate monomer copolymerized with from 1 to 50 parts by weight of N-(1,1-dimethyl-3-oxobutyl) acrylamide monomer and 2 to 30 parts by weight methacrylic acid.

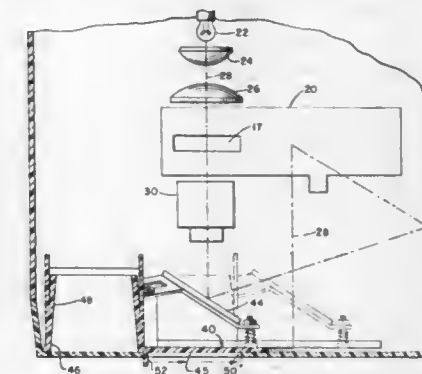
**4,163,609**  
**SELF CLEANING CONTACT LENS**  
 Charles W. Neefe, 811 Swing St., Big Spring, Tex. 79720  
 Filed Oct. 10, 1978, Ser. No. 950,211  
 Int. Cl.<sup>2</sup> G02C 7/04  
 U.S. Cl. 351—160 H

- 5 Claims
1. A contact lens of concave-convex form in section, composed of a polymeric material having a negative electrical charge present on a hydrophilic surface and the lens surface having an affinity for water, whereby the lens material, while in the eye remains wetted by the liquid tears present on the surface of the eye and the hydrophilic surface of the lens material resists the accumulation of and repels from the lens surface the natural hydrophobic oil and protein particles present in the natural tear fluid present on the surface of the eye.

**4,163,610**  
**REAR/REMOTE-SCREEN PROJECTOR**  
 William R. Sanderson, Rochester, N.Y., assignor to The Singer Company, New York, N.Y.  
 Filed Nov. 16, 1978, Ser. No. 961,304  
 Int. Cl.<sup>2</sup> G03B 21/22  
 U.S. Cl. 353—71

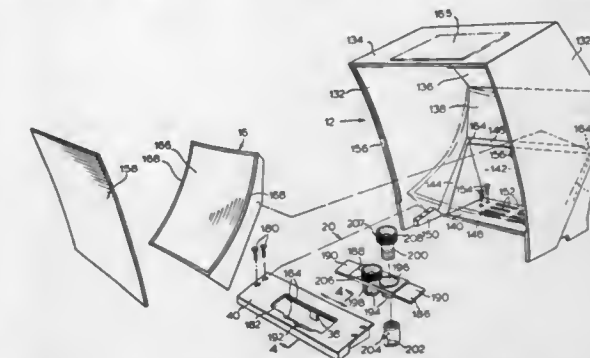
- 6 Claims
1. An apparatus for the projection of images contained on slides comprising:
    - a housing;
    - means within said housing for handling said slides;
    - means within said housing for projecting light through said slides along an optical path;
    - a projection screen mounted in one face of said housing;
    - at least one mirror located within said housing for folding said optical path of said apparatus for projecting said slide images on said projection screen;
    - a laterally shiftable frame mounted within said housing;
    - one of said mirrors mounted on said shiftable frame;
    - means for moving said frame between a first position in which said one mirror is in registry with said optical path

and a second position in which said one mirror is completely removed from said optical path; said frame extending beyond said one mirror and being formed with an aperture therethrough in a plane intersection said optical path, said aperture being located in said frame such that when said frame is in said second position said aperture is coaxial with said optical path;



stop means in cooperation with said frame for establish said first and said second positions thereof; and said housing being formed with an aperture therethrough located adjacent said frame such that when said frame is in said second position said housing aperture is coaxial with said optical path, whereby said slide images may be projected onto a remote screen.

**4,163,611**  
**MICROFICHE READER**  
 Peter J. Hall, Barrie, Canada, assignor to MicroVue Products Inc., Barrie, Canada  
 Division of Ser. No. 777,772, Mar. 15, 1977, Pat. No. 4,140,376.  
 This application Sep. 23, 1977, Ser. No. 836,211  
 Claims priority, application Canada, Dec. 16, 1976, 268032  
 Int. Cl.<sup>2</sup> G03B 23/08, 21/14  
 U.S. Cl. 353—101



- 3 Claims
1. In a microfiche reader of the type having a housing, an image projection system including projector means and a screen for receiving a projected image and an illuminating path extending from the projector means to the screen, a microfiche carriage having an upper glass flat arranged to be disposed above a microfiche in the carriage, the improvement of, a lens assembly comprising,
    - (a) a support plate mounted a substantial distance above said microfiche carriage;
    - (b) passage means opening through said support plate in alignment with the illuminating path of said projector;
    - (c) a slide member mounted in said support plate for sliding movement relative thereto in a first direction, said slide member having first and second tubular sleeves projecting downwardly therefrom and spaced in said first direction,

- said tubular sleeves each having a sufficient length to extend to adjacent said upper glass flat,
- (d) a pair of longitudinally elongated lens passages extending one through each of said tubular sleeves
- (e) a longitudinally elongated lens holder mounted in a close fitting sliding relationship within each of said lens passages, each lens holder being guided by its associated lens passage for movement between a raised position and a lowered position relative to said upper glass flat,
- (f) a lens member releasably mounted in each of said lens holders, said carriage means being slidable relative to said support plate to locate one or other of said lens members in said illuminating path of said projector, and
- (g) releasable lock means associated with each lens holder for releasably locking the slide member relative to the support plate with either of said lens members in said illuminating path in use, said lock means releasable only after its associated lens member is raised from its lowered position whereby said slide member cannot be moved relative to said support plate until each lens holder is at least partially raised.

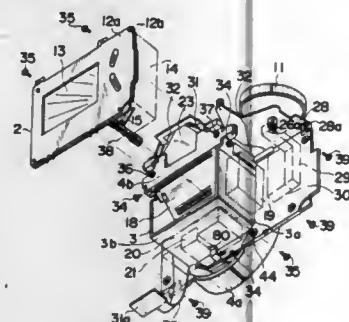
**4,163,612**  
**CAMERA STRUCTURE FOR SINGLE LENS REFLEX CAMERA**

Hiroshi Ueda, Nara; Takayoshi Miyamoto, and Masatake Niwa, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1977, Ser. No. 862,967  
Claims priority, application Japan, Dec. 27, 1976, 51-160372  
Int. Cl.<sup>2</sup> G03B 19/12, 17/02

U.S. Cl. 354—152

13 Claims



1. A single sheet lens reflex camera comprising:
- a camera body provided with a film receptacle, film transporting mechanism and operating member for effecting film advancing and shutter cocking;
- a shutter block in which a shutter mechanism and a shutter actuating and controlling mechanism are mounted as a unit on a base plate; and
- a front plate formed with a mounting for the camera objective lens and having attached thereto a mirror box which is provided with a reflex mirror, mirror driving mechanism and diaphragm driving mechanism, the front plate and elements attached thereto being coupled with the shutter block to form a sub-assembly in which said shutter actuating and control mechanism, said mirror driving mechanism and said diaphragm driving mechanism are interconnected as operable units thereby enabling independent adjustment thereof, said sub-assembly being attached to the camera body.

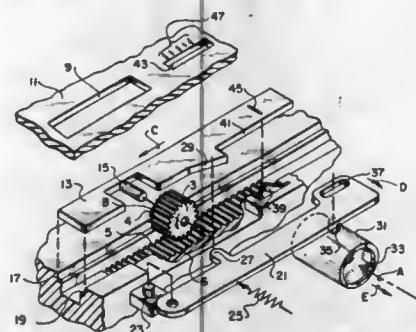
**4,163,613**  
**CAMERA FOCUS OR EXPOSURE ADJUSTMENT MECHANISM**

David C. Smart, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,858  
Int. Cl.<sup>2</sup> G03B 3/00, 7/04

U.S. Cl. 354—198

7 Claims



1. In a photographic camera of the type including a control element movable for adjusting a function in the camera; a rotatable wheel member adapted to cooperate with a fixed longitudinal member for causing said wheel member to translate along said fixed member as said wheel member is rotated in contact with said fixed member; and means coupling said control element and said wheel member for adjustably moving said control element in response to translation of said wheel member along said fixed member, the improvement comprising:

a camera body housing said wheel member and said fixed member, said camera body including exterior wall means defining a slot through which only a portion of said wheel member extends from said camera body for enabling said wheel member to be manually rotated for translation along said fixed member to adjustably move said control element.

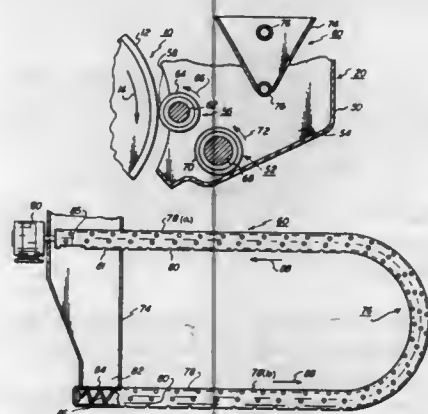
**4,163,614**  
**CLOSED LOOP PARTICLE DISPENSER**

Richard C. Vock, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,414  
Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355—3 DD

1 Claim



1. An electrophotographic printing machine of the type having an electrostatic latent image recorded on a photoconductive member, wherein the improvement includes:
- means for housing a supply of developer material comprising carrier granules and toner particles;

- means for depositing toner particles onto the latent image forming a powder image on the photoconductive member;
- a hopper defining a chamber having a supply of toner particles therein, said hopper having an aperture for discharging toner particles therefrom;
- a flexible, U-shaped tubular member having one end region thereof coupled to the aperture in said hopper for receiving toner particles and the other end region thereof positioned in the upper region of the chamber of said hopper for returning the non-dispersed toner particles thereto, said tubular member having a plurality of substantially equal spaced apertures therein for dispensing the toner particles therefrom into said housing, said tubular member having a slot in the end region thereof coupled to the aperture in said hopper for receiving the toner particles therefrom with the other end region thereof having a plurality of apertures therein for returning non-dispersed toner particles to the chamber of said hopper;
- an elongated, flexible helical member disposed interiorly of said tubular member and extending the length thereof; and
- means for rotating said helical member to advance the toner particles through said tubular member.

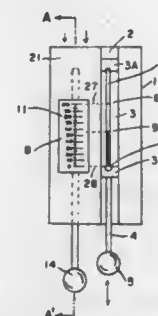
**4,163,615**  
**READER FOR HEMATOCRIT VALUE**

Alan Kwassman, 6239 Morse Ave., North Hollywood, Calif. 91606

Filed Oct. 25, 1977, Ser. No. 844,964  
Int. Cl.<sup>2</sup> G01N 33/16; G01B 11/00

U.S. Cl. 356—39

4 Claims



1. A device for determining the sedimented red cell percentage of a blood sample centrifuged in a capillary tube comprising an adjustable holding means for said capillary tube and means for producing a variable sized image of a percentage scale in close proximity to said capillary tube whereby adjustment of said image to match the linear size of said blood sample permits direct reading of sedimented red blood percentage.

**4,163,616**  
**TOP-TO-BOTTOM MIXER**

C. Kenneth Claunch, Erie, Pa., assignor to Finish Engineering Company, Inc., Erie, Pa.

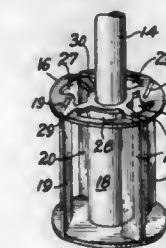
Filed Mar. 23, 1978, Ser. No. 889,371  
Int. Cl.<sup>2</sup> B01F 5/12

U.S. Cl. 366—262

14 Claims

1. A top-to-bottom mixer comprising,
- a body,
- a hollow tube attached to said body and adapted to extend downward through a relatively small hole in a container of liquid,
- said body comprising,
- motor means having a shaft,
- said shaft is connected to said motor means and extending through said hollow tube concentric thereto,
- circulation means in said tube fixed to the said concentric shaft causing a downflow through said tube,
- discharge openings in the wall of said tube adjacent the

lower end thereof for discharging liquid from said circulation means causing a high flow of fluid across the bottom



of said container when said motor rotates said concentric shaft at a relatively high speed.

**4,163,617**  
**BALL JOINT**

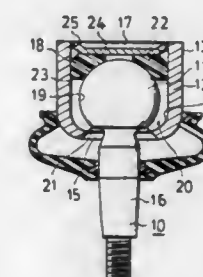
Akira Nemoto, Toyohashi, Japan, assignor to Musashiseimitsukoguo Kabushikikaisha, Japan

Filed Feb. 6, 1978, Ser. No. 875,485

Claims priority, application Japan, Feb. 14, 1977, 52-14773; Feb. 14, 1977, 52-14774

U.S. Cl. 403—132

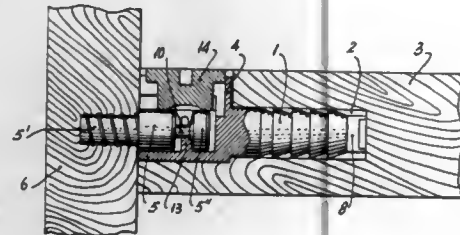
9 Claims



1. A ball joint comprising:
- (i) a hollow housing at least part of the inner surface of which terminating at one open end of the housing is cylindrical, the other end of said housing having an aperture smaller than said one open end,
- (ii) a bearing member disposed in said housing,
- (iii) a ball stud including a ball head on a shank, said ball stud being positioned with said ball head within said housing and abutted by said bearing member, and said ball stud extending through said aperture,
- (iv) a resiliently deformable closing plate, said plate being circular and including a circumferential peripheral portion which is inclined with respect to the median plane of the plate such that the plate has concavity at one major face and convexity at the other major face, the greatest diameter of said peripheral portion in the unconstrained state being greater than the internal diameter of said cylindrical inner surface of the housing, said closing plate being press-fitted with resilient deformation into the open end of the housing with its concavity presented towards the bearing member for the application of pressure between the bearing member and the ball head, the peripheral portion engaging at its greatest diameter with the cylindrical inner surface, as a result of the stress generated by resilient deformation of the plate, to secure the plate against return movement with respect to the housing towards said open end.

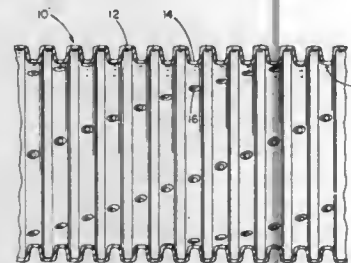


4,163,618  
**JOINT FOR FURNITURE**  
 Florello Giovannetti, via Marsiano 4, Milan, Italy  
 Filed Apr. 6, 1978, Ser. No. 893,983  
 Claims priority, application Italy, May 19, 1977, 23782 A/77  
 Int. Cl.<sup>2</sup> F16B 21/02  
 U.S. Cl. 403—245



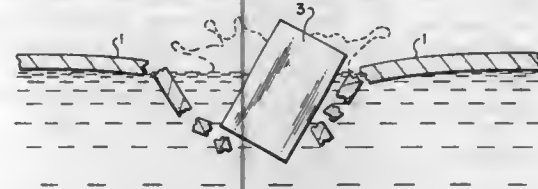
1. A joint for furniture, comprising a shank and head for fastening in an opening formed in a first panel, said head removably engaging with a pin projecting from a second panel to interconnect the first and second panels, said pin having a shaped head, wherein the joint head defines a seat coaxial with said shank, which seat is open at the front and top for the introduction of said pin from above; said seat in the joint head having longitudinal slots formed internally and a transverse rib extending from an intermediate portion of the bottom of said seat engageable with the shaped end of the pin; a clamping cover operatively associated with said seat for clamping the pin and for closing at top of said seat, said clamping cover having projecting tabs rotationally engageable in said longitudinal slots provided internally of said head.

4,163,619  
**CORRUGATED DRAINAGE TUBING WITH HELICALLY ARRANGED DRAINAGE OPENINGS**  
 David E. Fales, Springfield, Ill., assignor to Rainer Isolierrohr-fabrik Max Drossbach, Fed. Rep. of Germany  
 Filed Sep. 30, 1977, Ser. No. 838,367  
 Int. Cl.<sup>2</sup> E02B 11/00  
 U.S. Cl. 405—49



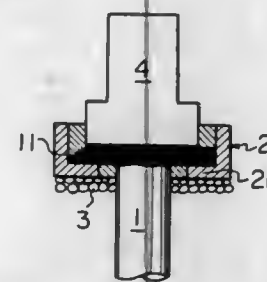
1. Corrugated drainage tubing of organic thermoplastic material comprising a tubular wall of alternating peaks and valleys and a plurality of drainage openings in the valleys, characterized in that a like plurality of spaced drainage openings are provided about the circumference of each valley in the base thereof, the drainage openings in each valley are axially and circumferentially offset of wall material from the nearest adjacent drainage opening in adjacent valleys and, together with the nearest adjacent drainage openings in successive adjacent valleys, form a plurality of arrays of drainage openings extending along parallel helical lines at an acute angle in the range of about 14°-37° to the longitudinal tubing axis, and each said drainage opening is axially spaced by wall material from each adjacent helical array and the drainage openings of each said adjacent helical array for an axial distance comprising a plurality of valleys.

4,163,620  
**METHOD AND APPARATUS FOR INCREASING THE VERTICAL LOAD BEARING CAPACITY OF ICE**  
 Gunter J. Lichtenberger, Dallas, Tex., assignor to Sun Oil Company, Ltd., Calgary, Canada  
 Filed Feb. 27, 1978, Ser. No. 881,441  
 Int. Cl.<sup>2</sup> F25D 1/00  
 U.S. Cl. 405—217



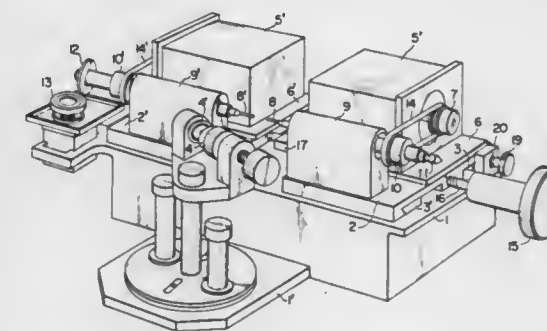
1. A method for increasing the load bearing capacity of a natural ice sheet comprising the steps of:  
 (A) introducing an inflatable member beneath the ice sheet in the predetermined area;  
 (B) inflating the inflatable member;  
 (C) monitoring the inclination of the ice sheet in the predetermined area; and  
 (D) terminating the inflation step when the inclination reaches a predetermined angle.

4,163,621  
**METHOD FOR FORMING A CONTINUOUS FOOTING WITH PREFABRICATED FOOTING BLOCKS**  
 Tadayasu Higuchi, 5-6-15, Sakuragaoka, Setagaya-ku, Tokyo, Japan  
 Filed Feb. 8, 1978, Ser. No. 875,975  
 Int. Cl.<sup>2</sup> E02D 5/50  
 U.S. Cl. 405—255



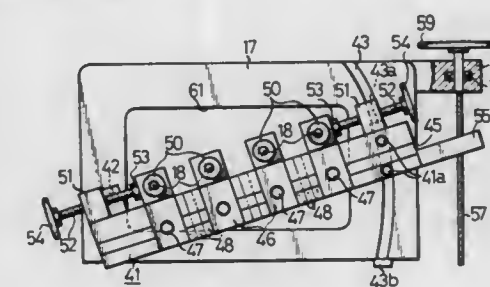
1. A method for forming a continuous footing for constructing a building on a concrete pile foundation comprising: placing a leveling element comprising a base plate having an aperture for receiving the top of a concrete pile and side walls having indentations at each pile so that said aperture receives each of the tops of the concrete piles remaining above the ground level after they have been driven into the soil, breaking the tops of the concrete piles so as to expose the reinforcing bars of the piles, bending down the exposed reinforcing bars onto the surface of the base plate, fixing the pile and the leveling element by filling mortar, placing pre-fabricated footing blocks so that at least a part thereof is received in one of the indentations, thus forming a continuous footing, and fixing the footing blocks.

4,163,622  
**DRILLING MACHINE**  
 Hayao Akaba, Akishima, and Takuzo Takeuchi, Fussa, both of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan  
 Filed Oct. 27, 1977, Ser. No. 846,039  
 Claims priority, application Japan, Oct. 29, 1976, 51/130290  
 Int. Cl.<sup>2</sup> B23B 39/22, 41/00  
 U.S. Cl. 408—27



1. A lens drilling machine comprising, in combination, a base for supporting first and second lens holding means, a table means for each of a pair of drilling means, the table means supporting the drilling means and being slidable on the base; each drilling means having a shaft gripping at one end thereof a drill in axial opposing alignment with the other drill and shaft and means for turning each drill in the same direction at a synchronized speed; the table means including means for permitting the drills to axially approach to or axially separate from each other symmetrically with respect to a lens fixedly supported by the first holding means in order to drill a hole completely through the lens from both sides of the lens simultaneously, at least one shaft having at an end opposite to the drill end a diamond cutter means for cutting a groove in the lens for fixing hooks to the lens and the second lens holding means being located immediately adjacent to the cutter means.

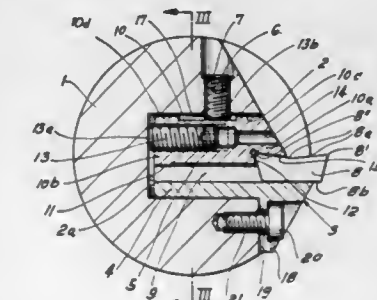
4,163,623  
**MULTIPLE SPINDLE DRILLING MACHINE FOR WIDE FLANGE BEAMS**  
 Toshikatsu Kitagawa, Seki, Japan, assignor to Miyakawa Industry Company, Limited, Seki, Japan  
 Filed Nov. 16, 1977, Ser. No. 852,005  
 Int. Cl.<sup>2</sup> B23B 39/20  
 U.S. Cl. 408—46



1. A multiple spindle drilling machine comprising drilling means attached to a movable attachment stand to drill a web of a wide flange beam, said drilling means including a plurality of drills aligned in the lateral direction of the web, spindles for supporting the respective drills and spindle holding members for supporting the respective spindles, gripping means disposed to grip all the spindle holding members from both the outer sides and fix them onto the movable attachment stand so that they cannot be moved, and shifting means for swinging and shifting the movable attachment stand from the point on a line intersecting rectangularly a flange of the wide flange beam to the point on a line intersecting obliquely the flange of the

wide flange beam with one end of the movable attachment stand being the center.

4,163,624  
**TOOLHOLDER FOR RECESSING OPERATIONS, IN PARTICULAR A BORING BAR**  
 Otto Eckle, Löchgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany  
 Filed Jan. 23, 1978, Ser. No. 871,553  
 Claims priority, application, Fed. Rep. of Germany, Feb. 9, 1977, 7703785  
 Int. Cl.<sup>2</sup> B23B 29/02  
 U.S. Cl. 408—185



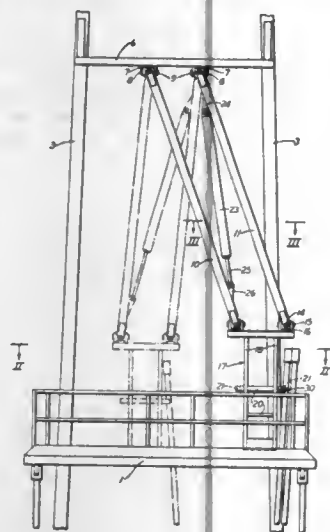
1. In a toolholder for recessing operations, in particular a boring bar, equipped with at least one recessing tool having a cutting body of hard metal, the recessing tool being arranged in a cylindrical receiving bore in the toolholder and being held by a retaining screw arranged in the toolholder perpendicularly to the receiving bore, comprising the improvement wherein the receiving bore is formed as a blind bore, wherein in the blind bore there is arranged a tool support with a substantially semi-cylindrical shank having in its plane supporting surface facing the retaining screw at least one groove extending parallel to its axis for receiving an exchangeable cutting body slidably mounted in the groove, wherein a clamping jaw for each cutting body is provided in the other remaining half of the blind bore and, under the action of the retaining screw, is supported by its front, outer, end on the top of the cutting body and by its rear end on the supporting surface of the tool support, and wherein the clamping jaw has at its front end a shoulder supporting the cutting body in the direction of sliding and is provided with a setscrew extending parallel to the groove, the rear end of the setscrew being supported on the base of the blind bore and its front end being accessible through a bore opening out in the outer end face of the clamping jaw.

4,163,625  
**MOVABLE WORKING PLATFORM FOR USE IN RACKING DRILL PIPE**  
 Cecil Jenkins, Tulsa, Okla., assignor to Lee C. Moore Corporation, Tulsa, Okla.  
 Filed Feb. 10, 1978, Ser. No. 876,668  
 Int. Cl.<sup>2</sup> E21B 19/14  
 U.S. Cl. 414—22

1. Apparatus for racking pipe stands in the racking platform of an oil well drilling mast or derrick structure, comprising a support adapted to project from the side of such a structure above its racking platform, suspension means extending downwardly from said support and suspended therefrom, a carriage suspended from the lower end of said suspension means and provided with a floor to support a derrick man inside the carriage, the suspension means being flexibly connected to said support and carriage, means for selectively swinging the lower end of said suspension means back and forth in a first vertical plane and back and forth in a second vertical plane at right



angles to said first plane to thereby move the carriage in the same directions, and pipe-receiving means projecting from the

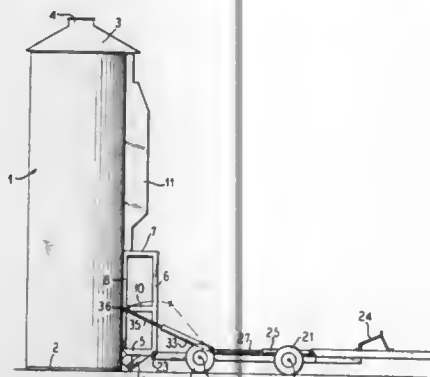


side of the carriage for engaging the side of the upper portion of a pipe and moving it with the carriage to another location.

**4,163,626**  
**ERECTION MEANS FOR A TRANSPORT TRAILER**  
Elmo L. Batterton, and Melvin J. Lonsdale, both of Morton, Ill., assignors to Meyer Morton Co., Morton, Ill.  
Filed Jan. 3, 1978, Ser. No. 866,215  
Int. Cl.<sup>2</sup> B60P 1/64

U.S. Cl. 414—469

7 Claims



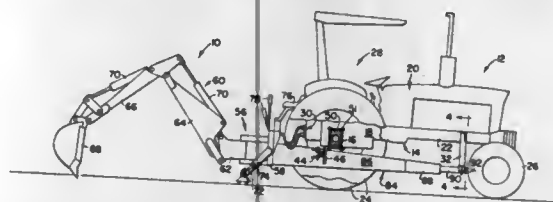
1. Erection means for a transport trailer of the type having a frame with side rails and a forwardly projecting tongue adapted to be connected to a tractor to support an elongated object of large cross section in horizontal position and deliver the object in upright position which comprises carriages slidable along the length of said side rails, a pair of forward hydraulic jacks arranged one on each side rail, a pair of rearward hydraulic jacks arranged in tandem with said forward pair to cooperate therewith in elevating and delivering the object on the trailer, said forward hydraulic jacks each having a piston rod connected to a carriage for propelling the carriages along the length of said side rails, said rearward pair of hydraulic jacks each having a cylinder pivoted to a carriage, said rearward pair of jacks each having a piston rod projecting from the free end of the cylinder, means for pivotally connecting the rear end of said trailer with said object, means for pivotally connecting the piston rods of said rearward pair of jacks to said object forwardly of and at a level above said means for pivotally connecting the object to said trailer, and means for energizing said forward and rearward pairs of jacks to propel said carriages rearwardly for increasing the angle of inclination of said rearward pair of jacks to apply a more direct lifting load

to the object and for propelling the piston rods out of the cylinders of the rearward pair of jacks to swing the object about the means for pivotally connecting the rear end of the trailer with said object to deposit the object in an upright position behind the trailer.

**4,163,627**  
**MOUNTING FOR AN IMPLEMENT ON A TRACTOR**  
Bradley J. Schnittjer, Delhi, and Michael J. O'Neill, Davenport, both of Iowa, assignors to Deere & Company, Moline, Ill.  
Filed Aug. 18, 1977, Ser. No. 825,624  
Int. Cl.<sup>2</sup> E02F 3/72

U.S. Cl. 414—686

12 Claims



1. In a tractor having a main frame, including a fore and aft body portion having a pair of fore and aft laterally spaced side frame members and a transverse rear axle housing, a source of fluid pressure having an associated reservoir, a pair of hydraulic outlets respectively connectable to the fluid pressure source and the reservoir, the combination therewith of improved means for mounting a material handling unit on the tractor wherein said unit includes a frame, a plurality of shiftable members, hydraulic motor means for shifting said members and control valve means for controlling the flow of fluid to and from said motors, said improved mounting means comprising:

- an upright, transverse U-shaped forward support member having its opposite ends connected to the opposite side frame members of the tractor main frame and including a first guide element disposed generally below and centrally of the body portion;
- a pair of first latch elements respectively connected to the axle housing adjacent the opposite sides of the tractor;
- a second guide element attached to the forward end of the unit frame and engageable with the first guide element;
- a pair of second latch elements attached to opposite sides of the unit frame rearwardly of the second guide element and respectively engageable with the first latch elements when the first and second guide elements are engaged and the unit is disposed in a predetermined position relative to the tractor, the tractor being moveable rearwardly relative to the material handling unit when the unit is separated from the tractor so the second guide element passes under the axle housing and engages the first guide element;
- means for locking the latch elements in their engaged position;
- and releasable connecting means for connecting the control valve means to the tractor outlets.

**4,163,628**  
**IMPLEMENT CIRCUIT FOR MOTOR WITH SLOW AND FAST DUMP**

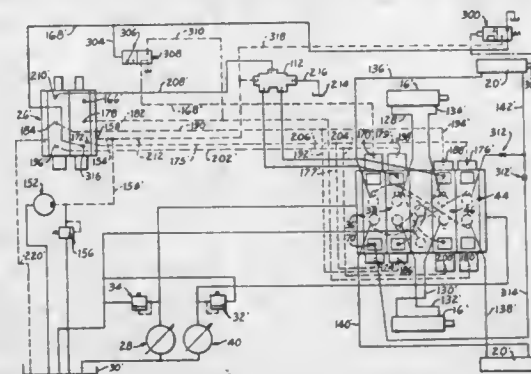
Gerald D. Hall, Joliet, and Lloyd D. Swayze, Yorkville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.  
Filed May 9, 1977, Ser. No. 795,036  
Int. Cl.<sup>2</sup> E02F 3/87

U.S. Cl. 414—699

7 Claims

1. In a vehicle having tilt cylinder means actuatable in one and the other directions to move a bucket to a dump position and to a rack-back position respectively, a hydraulic control system comprising fluid pump means, and means operatively interconnecting the fluid pump means and tilt cylinder means (i) for selectively providing a first, relatively lower speed of

movement of the bucket from the rack-back position toward the dump position through actuation of the tilt cylinder means, and for selectively providing a second, relatively higher speed of movement of the bucket from the rack-back position toward the dump position through the actuation of the tilt cylinder means, the means operatively interconnecting the fluid pump means and tilt cylinder means including means for automati-



cally choosing the speed of movement of the bucket such that (ii) upon initial selection of the second, relatively higher speed of movement of the bucket from the rack-back position toward the dump position, and upon a degree of said higher-speed movement taking place, the first, relatively lower speed of movement of the bucket from the rack-back position toward the dump position is automatically chosen.

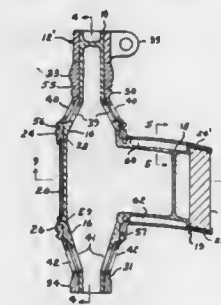
**4,163,629**  
**TURBINE VANE CONSTRUCTION**  
Edward C. McDonough, Lawrenceburg, Ind., and Eugene N. Tuley, Hamilton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1977, Ser. No. 864,049

Int. Cl.<sup>2</sup> F01D 25/12; F02C 7/18

U.S. Cl. 415—115

2 Claims



1. A turbine vane for use in high temperature gas turbines, comprising: a load carrying spar member including a vane airfoil support member; a heat shield member surrounding the vane airfoil support member; means for supporting the heat shield adjacent the vane airfoil support member; said means, for supporting the heat shield member, including means for permitting spanwise and cordwise thermal expansion of the heat shield member; means for providing an air cooling flow path through the vane airfoil support and the heat shield member; said means for supporting the heat shield member including a first boss supported on the load carrying spar member and a second boss supported on the load carrying spar member; said first boss having a projection extending along one end of the vane airfoil; said second boss having a projection extending along the other end of the vane airfoil; said means for permitting spanwise and cordwise thermal expansion of the heat shield member including slots formed between the vane airfoil support member and said first and said second bosses.

**4,163,630**  
**HELICOPTER ROTOR STRUCTURE**  
Emil Weiland, Hohenbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

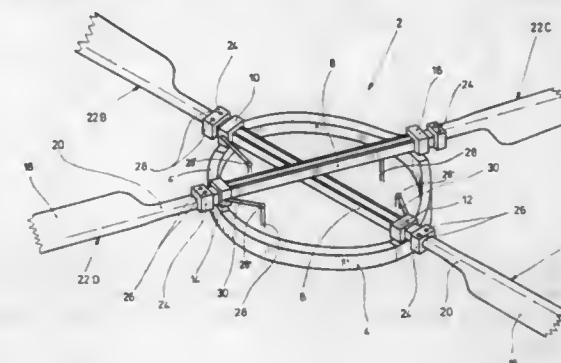
Filed Aug. 12, 1977, Ser. No. 824,241

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638148

Int. Cl.<sup>2</sup> B64C 27/38

U.S. Cl. 416—134 A

11 Claims



1. A rotor structure for a rotating wing aircraft having substantially rigid rotor head means and rotor blades or wing means arranged in at least one pair, comprising blade angle bearing means (10, 12, 14, 16) for each rotor blade means, tension bar means (6, 8) operatively interconnecting the rotor blade means of a pair which blade means are arranged diametrically opposite each other, said tension bar means having a high bending resistance, whereby transmission of bending moments from the rotor blades to the rotor head means is substantially prevented, each of said blade angle bearing means comprising a structure angularly movable in the wing flap direction and in the wing lead-lag direction, at least one of said blade angle bearing means of a pair comprising means permitting an axial motion of the respective tension bar means supported in said blade angle bearing means, and wherein said blade angle bearing means (10, 12, 14, 16) operatively support said tension bar means (6, 8) on said rotor head means (4) for pitch angle rotation of said tension bar means relative to said rotor head means (4), said rotor structure further comprising means (24) securing said rotor blade means (18) to said tension bar means (6, 8) in a manner rigid against rotation of the blade means about the longitudinal blade axis whereby the securing means prevent flapping, drag and lagging movements of the tension bar means, said tension bar means being constructed as torsion bars which are elastic relative to torsion about said longitudinal blade axis.

**4,163,631**  
**SURFACE AERATOR IMPELLER**  
John R. Connolly, Paoli; David E. Gibson, Ft. Washington; Edward L. Heimark, King of Prussia; Jerome B. Quinn, Kennett Square; Richard E. Speechley, Willow Grove, and Richard L. Winter, Berwyn, all of Pa., assignors to Philadelphia Gear Corporation, King of Prussia, Pa.

Filed Aug. 17, 1977, Ser. No. 825,486

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 416—185

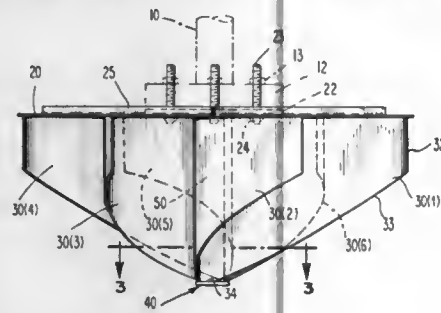
6 Claims

1. A surface aerator impeller for aeration of liquids, said impeller comprising:

- a. a large flat horizontal upper disc;
- b. means adapted for securing said disc to the lower end of a vertical rotatable drive shaft for rotation therewith about the center axis of said disc;
- c. a plurality of uniformly-shaped curved vertical impeller blades the upper edges of which are secured to the under-



- surface of said disc at uniformly angular spacings about the center axis of said disc;
- d. each of said blades having a curved major area surface extending, as viewed vertically, in a retreating direction relative to the direction of rotation of said disc;
- e. each of said blades being devoid of lateral flanges;



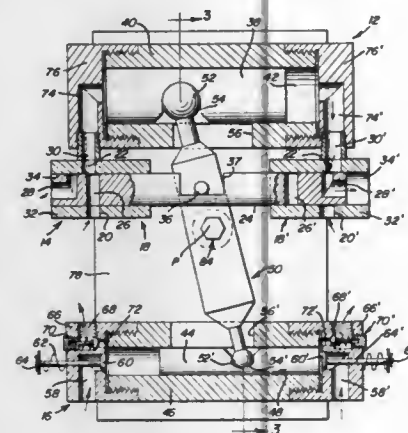
- f. each of said blades having inner and outer vertical edges, said inner vertical edge being located off and forward of the center axis of said disc and being substantially longer than said outer vertical edge;
- g. each of said blades having a bottom edge which extends upwardly along an inclined line toward said outer vertical edge.

#### 4,163,632 HYDRAULIC PUMP MECHANICALLY INTERCONNECTED WITH FLUID MOTOR DISTRIBUTORS

Leslie R. Hinchman, and Robert B. Hinchman, Sr., both of San Benito, Tex., assignors to Bessie L. Caldwell, San Benito, Tex., a part interest

Filed Aug. 10, 1977, Ser. No. 823,465  
Int. Cl.<sup>2</sup> F04B 17/00, 35/00  
U.S. Cl. 417—318

1 Claim



1. A hydraulic pump assembly, comprising, in combination:
- (a) motor means connected to a source of fluid under pressure for being actuated by the fluid;
- (b) valve means connected to the motor means for controlling operation of the motor means; and
- (c) pump means connected to the motor means for actuation thereby and for increasing the pressure of a fluid passed through the pump means, the valve means including, in combination:
- (1) a hollow housing provided with two sets of cooperating ports;
- (2) a valve element slidably disposed within the housing and provided with two sets of passages selectively communicating with the associated ports for controlling fluid flow to and from the motor means; and
- (3) coupler means attached to the valve element and to the motor means for reciprocating the valve element within

the housing of the valve means, the housing being divided into two separate, spaced parts, each of the parts having a set of the ports associated therewith, and each of the parts being mounted in spaced relation with respect to one another on the motor means, the valve element extending longitudinally, and the coupling means including a pin engaging the valve element substantially midway of the longitudinal extend of the valve element, an opening being provided in the valve element for receiving the pin in a lost-motion relationship, the motor means and pump means each including an elongated piston and cylinder, with the piston of one of the motor means and pump means being arranged for reciprocating motion within the associated cylinder thereof substantially parallel to the piston of the other of the pump means and motor means and within the associated cylinder thereof, and in spaced relationship with respect thereto, and a rocker pivotally mounted at a pivot point disposed between the motor means and the pump means and pivotally connected directly to the piston intermediate the elongation of each, the valve means being disposed between the motor means and the pivot point of the rocker, and the pin being affixed to the rocker between the motor means and the pivot point of the rocker for engaging the valve element of the valve means.

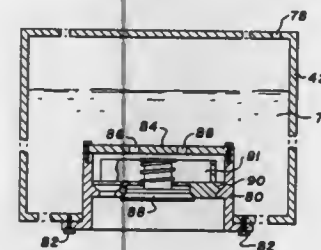
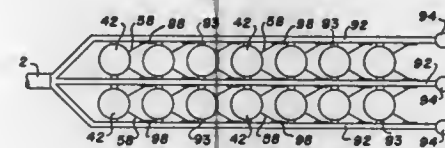
#### 4,163,633 APPARATUS FOR PRODUCING POWER FROM WATER WAVES

Joseph A. Vriend, P.O. Box 505, Squamish, British Columbia, Canada (V0N 3G0)

Filed Dec. 1, 1976, Ser. No. 746,402  
Int. Cl.<sup>2</sup> F04B 17/00, 35/00

U.S. Cl. 417—332

18 Claims



1. An apparatus for producing power from water waves comprising:
- a main pipe having at least one inlet and an outlet;
- a pump having an inlet to admit ambient water and an outlet communicating with the inlet of the pipe;
- a first valve controlling the inlet to the pump;
- a second valve controlling the outlet from the pump; and
- a buoyancy vessel attached to the pump, said buoyancy vessel having a slightly positive buoyancy to follow the motion of the wave, said buoyancy vessel containing water and air in order to establish the slightly positive buoyancy and having means to control the relative amounts of water and air in order to vary the buoyancy; an air inlet/outlet, a water inlet valve and a water outlet valve in said buoyancy vessel;

and an air line communicating with the air inlet/outlet in said buoyancy vessel whereby compressed air can be forced into the vessel to force water through the water outlet valve or air can be drawn from the vessel to permit the entry of additional water;

whereby reciprocation of the buoyancy vessel permits water to enter the pump, through the inlet, and then forces water from the outlet into the pipe.

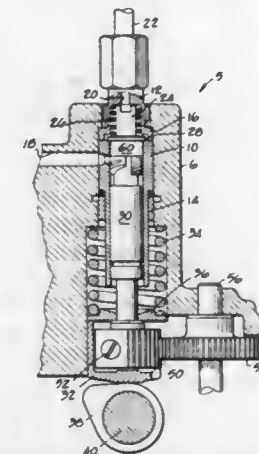
#### 4,163,634 FUEL PUMP PLUNGER

Harold C. Powers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 25, 1977, Ser. No. 854,851  
Int. Cl.<sup>2</sup> F04B 7/04; F02M 59/26

U.S. Cl. 417—499

7 Claims



1. In an injection pump having a cylinder with a fuel inlet, an injection pump-fuel pump plunger reciprocally mounted and axially rotatable in said cylinder from a first angular position to a second angular position, and said pump plunger having a circumscribed groove of varying axial width thereabout, the groove having a scroll edge proximate one end of said plunger, said scroll edge increasing in distance from its closest point of approach to the one end of said pump plunger for less than the circumference of said plunger and remaining at substantially equal distance from said one end for substantially the rest of the circumference, so that said fuel inlet is selectively blocked by said pump plunger for a first length of reciprocal travel of said pump plunger with said pump plunger at said first angular position and blocked for a proportionally longer length of reciprocal travel of said pump plunger with said pump plunger at angular positions between said first angular position and said second angular position whereby pressure may be developed in said cylinder at said one of said pump plunger upon reciprocation thereof, said pump plunger further defining an axial slot communicating said circumscribed groove with said one end, said axial slot positioned on the periphery of said pump plunger at the point of closest approach of said scroll edge to said one end; the improvement comprising a bleed-off groove formed in said pump plunger and selectively communicating said fuel inlet with said circumscribed groove at angular positions between a position at least greater than said first angular position and a position equal to said second angular position of said pump plunger; said bleed-off groove relatively shallower than said circumscribed groove and positioned between said scroll edge and said one end.

#### 4,163,635 VANE TYPE ROTARY FLUID PUMPS OR COMPRESSORS

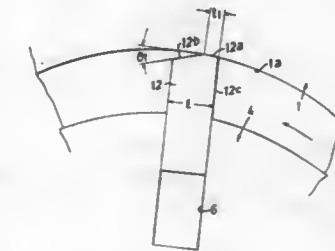
Hiroshi Sakamaki, Utsunomiya; Toshiyuki Maeda, Ageo; Toshimitsu Sakai, Okazaki, and Tadashi Saitou, Toyota, all of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha, Tokyo and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Continuation of Ser. No. 663,343, Mar. 6, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,272

Claims priority, application Japan, Jun. 24, 1975, 50-87809[U]  
Int. Cl.<sup>2</sup> F01C 1/00, 21/00; F04C 17/00, 29/00

U.S. Cl. 418—236

1 Claim



1. In a vane type rotary fluid pump or compressor comprising a stator housing having a cylindrical inner wall, end wall structures to define a pump cavity within said stator housing, a rotor eccentrically rotatably disposed within said pump cavity, and a plurality of vanes slidably disposed in said rotor; the improvement wherein:

each of said vanes has a front and a rear face and extends outwardly from the rotor at an angle relative to a radial plane in which the axial center line of the rotor is disposed and in a direction opposite to the direction of rotation of the rotor, and

the radially outermost end of each of said vanes comprises: a first flat surface in abutment with the inner wall of the stator housing, said first surface being substantially perpendicular to the rear face of said vane, extending from the rear face for a distance of 1/10 to 1/2 the distance between the front and rear faces of the vane and terminating in a front edge, and

a second flat tapered surface extending inwardly from said front edge to said front face at an angle relative to the first surface which is 5° to 10° larger than said first-mentioned angle and terminating at the front face of said vane.

#### 4,163,636 LIFTING DEVICE FOR WATER, WASTE WATER, SLUDGE AND THE LIKE

Bertram Botsch, Karlsruhe, and Werner Marzluf, Moersch, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Hellmut Geiger, Postfach, Fed. Rep. of Germany

Division of Ser. No. 493,778, Aug. 1, 1974, Pat. No. 3,994,616. This application Jul. 22, 1976, Ser. No. 707,776

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1973, 2339187; Jul. 15, 1974, 2433917

Int. Cl.<sup>2</sup> F04D 23/00

U.S. Cl. 415—6

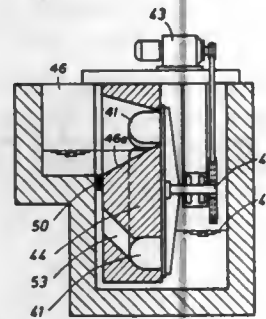
4 Claims

1. A conveying device for conveying liquid from a supply well, comprising in combination:

an upright wall having two sides and including an annular groove defined in one side dipping into said well;

conveying means at least partially disposed in said well, and comprising a disk rotatably mounted about a substantially horizontal axis and a plurality of separations connected to said disk about said axis along a mean diameter corresponding to that of said groove, said separations substantially corresponding in outline to and moving in said groove, said disk and said separations and the surfaces of said groove defining cells for conveying said liquid through at least a part of said groove; and

an output channel defined in said wall and intercommunicating with a top portion of said groove for emptying liquid from said cells;



whereby, when said disk is rotated, it will move said separations into said liquid and said cells substantially will retain their liquid content until they reach said output channel.

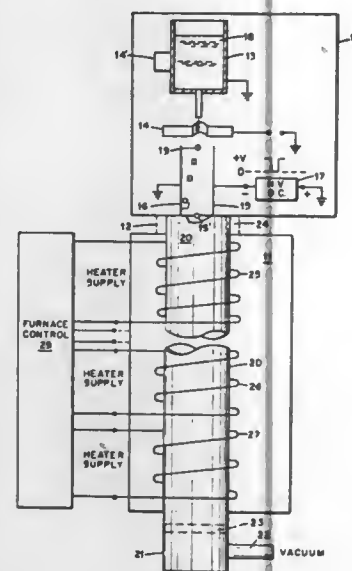
#### 4,163,637 METHOD AND APPARATUS FOR PRODUCING SMALL HOLLOW SPHERES

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Division of Ser. No. 807,108, Jun. 16, 1977, Pat. No. 4,133,854.  
This application Sep. 29, 1978, Ser. No. 947,665

U.S. Cl. 425—6

Int. Cl.<sup>2</sup> B22D 11/01

5 Claims



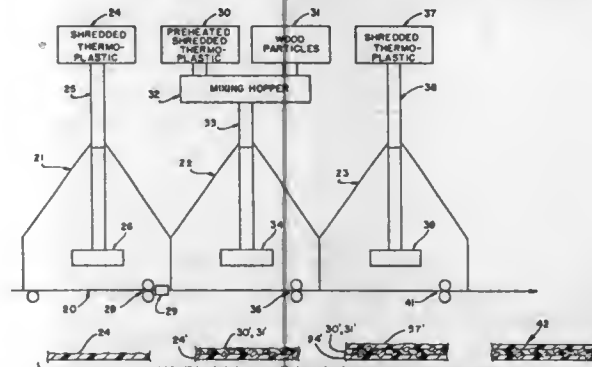
1. An apparatus for producing small hollow spheres of uniform diameter and wall thickness comprising a droplet generator and a multiple zone oven interconnected such that certain of the drops formed by said droplet generator pass through said multiple zone oven wherein said drops are dried and formed into hollow spheres, said droplet generator including means for forming drops of sphere forming material which are directed along a flow path to said multiple zone oven, means for electrically charging at least part of the drops, and means for deflecting said charged drops from along said flow path whereby only uncharged drops are directed into said oven; said multiple zone oven having means for controlling the temperature in each zone thereof such that each subsequent zone is of a high temperature.

#### 4,163,638 MATERIAL DISTRIBUTION APPARATUS FOR CONTINUOUS FLOW MATERIAL SOURCE

Teddy V. Smith, 13437 Kit La., Dallas, Tex. 75240  
Filed Aug. 22, 1977, Ser. No. 826,393  
Int. Cl.<sup>2</sup> B29C 3/06

U.S. Cl. 425—131.1

6 Claims



1. A material distribution apparatus for spreading an even layer of continuously flowing material bits on the working surface of a continuous conveyor means, which conveyor means is selectively advanceable in a predetermined direction, comprising a material flow-directing means, said material flow-directing means comprising a distribution head receiving said continuously flowing material bits; said distribution head being longitudinally, positionably, mounted on a mounting carriage, which carriage is transversely positionable over a predetermined expanse of said conveyor working surface, said distributor head having a dimension extending longitudinally along said conveyor working surface defined as one-third the distance defined by the longitudinal position extremes thereof on said mounting carriage; selectively reversible distributor carriage means connected to said distributor carriage, to continuously drive said carriage between respective transverse position extremes over said conveyor working surface; first control means effecting a reversal of said distributor carriage drive means upon each successive transverse position extreme of said carriage being effected; second control means effecting a longitudinal shift of said distributor head on said distributor head carriage, said longitudinal shift register being opposite the direction of advance of said conveyor means, and by a distance substantially equalling the longitudinal dimension of said distributor head; said longitudinal shift being effected upon said head being driven from an edge extreme home position to a first opposite transverse extreme, and upon said head being driven from said first opposite transverse extreme to a second opposite transverse extreme; and a third control means operable upon said distributor head being driven to a third opposite transverse extreme, to position a guide means into working relationship with said distributor head, to cause said head to follow a diagonal path back to said home position as said conveyor is advanced through a predetermined distance increment defined as four times the longitudinal dimension of said distributor head.

#### 4,163,639 SNOWBALL MAKER

Robert G. Stern, 8 Sylvia Rd., North Reading, Mass. 01864, and W. Thomas Wallace, 82 Louise Rd., Chestnut Hill, Mass. 02167

Filed Dec. 19, 1977, Ser. No. 861,618

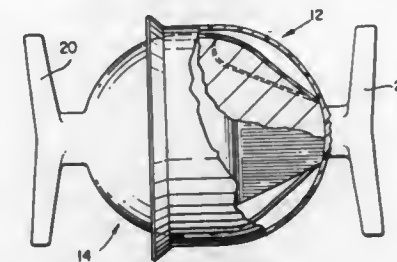
Int. Cl.<sup>2</sup> F25C 1/10; B28B 3/00

U.S. Cl. 425—318

11 Claims

1. A snowball maker comprising an outer shell and an inner shell, said shells being cup-like and being adapted to interfit in opposition with one another for compacting snow therein into a unitary mass, said inner shell having a hemispherical base portion conjoined and coaxial with a peripheral portion nor-

mally of tubular configuration and having an inner diameter which is non-diminishing upon progression from the closed end of the shell to the rim, and said inner shell peripheral portion having a plurality of circumferentially-spaced sections, said peripheral portion spaced sections being resiliently de-



formable radially inwardly to a closed abutting configuration upon telescopic interfitting of said peripheral portion within said outer shell for substantially encircling the snow within the two shells, said peripheral portion resiliently resuming said normal configuration thereof upon removal of the inner shell from the outer shell.

#### 4,163,640 APPARATUS FOR EXTRUDING A HONEYCOMB STRUCTURAL BODY

Noboru Higuchi, Nagoya, and Shoji Futamura, Kawasaki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya and Institute of Technology Precision Electrical Discharge Works, Kawasaki, both of Japan

Filed May 30, 1978, Ser. No. 910,528

Claims priority, application Japan, Jun. 10, 1977, 52-68711

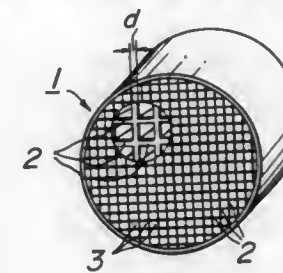
Int. Cl.<sup>2</sup> B29F 3/06

U.S. Cl. 425—466

2 Claims

1. In a die apparatus for extruding a honeycomb structural body comprising a second core block having discharge slits of a cross-sectional shape corresponding to the cross-section of the honeycomb, said slits having a given depth toward the rear surface of the die from the front surface of the die, and a first core block wherein a plurality of independent feed inlets are formed toward the front surface side of the die from the rear surface of the die and connect to the discharge slits, both said blocks being constituted integrally, an improvement comprising that the first core block being divided in the direction which cross-sections the feed inlets to provide a gas reservoir composed of a recess formed by remaining the periphery por-

tion of a plurality of feed inlets, and gas discharge apertures opening at the front surface of the die and perforating the



second block to flow gas from the gas reservoir through said gas discharge apertures.

#### 4,163,641 EXTRUSION TOOL

Jean-Pierre Hulin, and Michel de Vecchis, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

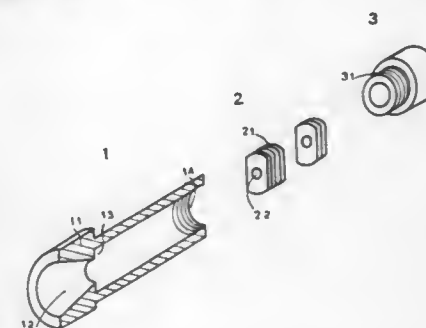
Filed Jun. 26, 1978, Ser. No. 919,268

Claims priority, application France, Sep. 20, 1977, 77 28253

Int. Cl.<sup>2</sup> B29C 23/00

U.S. Cl. 425—461

5 Claims



1. An extrusion tool consisting of a stack of a few tens of metal wafers a few tenths of millimeter thick made fast with one another, having apertures which are complementary to the profiles of the rods to be extruded said apertures being produced by chemical etching.



# CHEMICAL

4,163,642

## PROCESS FOR THE SUBLIMATION TRANSFER DYEING OF TEXTILE MATERIALS INCLUDING SUBSEQUENT CONDUCTIVE HEATING

Jackson Bauer, Croydon, Pa., assignor to Collins & Aikman Corporation, New York, N.Y.

Filed Jul. 7, 1977, Ser. No. 813,520

Int. Cl.<sup>2</sup> D06P 1/16, 5/02, 3/54

U.S. Cl. 8—2.5 A 9 Claims

1. An improved process for sublimation transfer printing a textile material having a face surface, a back surface and a given thickness, said process comprising the steps of:
  - (a) contacting the face surface of the textile material with a carrier sheet having printed on a first surface thereof a heat sublimable dyestuff, with said first surface being in contact with the face surface of the textile material,
  - (b) heating the carrier sheet to a temperature sufficient to cause at least a portion of said dyestuff to sublime to a volatilized state,
  - (c) transferring at least a portion of dyestuff in the volatilized state to the face surface and partially through the thickness of the textile material adjacent to the face surface,
  - (d) condensing the dyestuff on the face surface and partially through the thickness of the textile material adjacent to the face surface,
  - (e) removing the carrier sheet from the face of the textile material,
  - (f) conductively heating the resulting printed face surface of the textile material by contact with a heated member to a temperature at least sufficient to revolatilize the dyestuff in the absence of dynamic directional gaseous convective fluids and liquids other than those generated by the conductive heating of said textile material,
  - (g) transferring a portion of the dyestuff in the volatilized state from the face of the textile material in a direction substantially perpendicular to the face of the textile material towards the back surface, and
  - (h) condensing the resublimed dyestuff in the interior of the textile material,

whereby a transfer printed textile material is obtained having improved dyestuff distribution with resulting improved resistance to resublimation, 'crocking' and having improved wash fastness.

4,163,643

## AUTOMATION OF DISCRETE ANALYSIS SYSTEMS

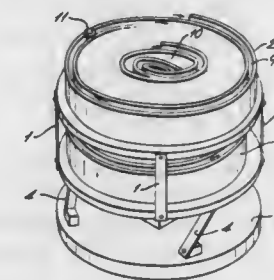
William M. Hunter, and John D. Lock, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

Filed Nov. 29, 1977, Ser. No. 855,768

Claims priority, application United Kingdom, Dec. 3, 1976, 50517/76

Int. Cl.<sup>2</sup> G01N 1/10

U.S. Cl. 23—230 R 23 Claims



1. A method of conveying samples in a discrete sample analysis apparatus wherein at least one discrete test sample is placed in at least one sample container, comprising: supporting the at least one sample container on a conveyor track; and,

vibrating the conveyor tracks such that the sample container is conveyed along the track.

4,163,644

## SUSPENSION OF COAL IN FUEL OILS

Wayne E. Bowers, Byram Township, Sussex County, N.J., assignor to The Rolfite Company, Stamford, Conn.

Filed Apr. 25, 1978, Ser. No. 899,799

Int. Cl.<sup>2</sup> C10L 1/32

U.S. Cl. 44—51 12 Claims

1. A method of stabilizing a suspension of coal particles in fuel oil comprising:
  - (a) mixing into fuel oil a predetermined amount of a polyfunctional amine selected from the group consisting of N-alkyl 1,3 diamino propanes and higher N-alkyl amines having more than two amino groups;
  - (b) adding to the amine-fuel oil mixture of (a) pulverized coal and agitating the resulting mixture to create a suspension of the coal in the fuel oil, said coal being in the form of at least about 70% by weight of particles which are capable of passing through a 200 Tyler mesh screen and containing no more than about 1.0% by weight of particles larger than 50 mesh;
  - (c) adding to the amine-fuel oil-coal mixture of (b) an amount of a polyfunctional carboxylic acid containing at least two carboxyl groups sufficient to react with the amine of (a) and thereby to stabilize the suspension of pulverized coal in fuel oil.

4,163,645

## ORGANIC LIQUIDS CONTAINING ANTI-STATIC AGENTS WHICH ARE COPOLYMERS OF ALPHA-OLEFINS AND MALEIC ANHYDRIDES REACTED WITH AMINES

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 344,420, Mar. 23, 1973. This application Jan. 23, 1978, Ser. No. 871,668

Int. Cl.<sup>2</sup> C10L 1/22; C11D 1/62; C08K 5/19; C08F 8/32

U.S. Cl. 44—62 15 Claims

1. An organic liquid containing a minor amount, sufficient to impart anti-static properties, of the product formed by reacting a copolymer of an alpha-olefin and maleic anhydride with a primary amine, a secondary amine or mixtures thereof in the presence of a Lewis acid, the molar ratio of amine to maleic anhydride in the copolymer being from about 0.25 to about 3.

4,163,646

## FUEL OILS CONTAINING N,N-SUBSTITUTED DIAMINES

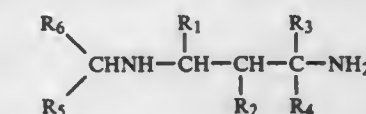
Bernardus A. Oode Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 597,564, Jul. 21, 1975, and Ser. No. 292,494, Sep. 27, 1972, Pat. No. 4,085,104. This application Dec. 30, 1976, Ser. No. 755,535

Int. Cl.<sup>2</sup> C10L 1/22

U.S. Cl. 44—73 14 Claims

1. Fuel oil containing a stabilizing amount of a stabilizer consisting of a compound of the formula



where R<sub>5</sub> and R<sub>6</sub> are groups selected from the group consisting of alkyl, aryl, cycloalkyl, alkaryl, and aralkyl and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are hydrogens or a group selected from the group consisting of alkyl, aryl, cycloalkyl, alkaryl and aralkyl.

4,163,647

**METHOD FOR PRODUCING COATED ABRASIVES**  
Henry J. Swiatek, Schenectady, N.Y., assignor to Norton Company, Worcester, Mass.

Continuation of Ser. No. 346,314, Apr. 5, 1973, abandoned, which is a continuation of Ser. No. 156,046, Jun. 23, 1971, abandoned, which is a continuation of Ser. No. 744,218, Jul. 11, 1968, abandoned. This application Oct. 21, 1974, Ser. No. 516,215

Int. Cl.<sup>2</sup> C09K 3/14

U.S. Cl. 51—295

5 Claims



4. A process for preparing a coated abrasive, including the steps of providing a cloth backing material having a plurality of warp and fill yarns intersecting with one another forming interstices there-between and said backing material having a front side and a back side, applying a maker adhesive coating on said front side, and depositing abrasive grains on said maker adhesive coating, wherein the improvement comprises:

- passing said cloth backing material to a liquid polymer coating means, the front side of said backing material contacting said coating means while facing in a downward position relative thereto;
- applying a coating of an aqueous solution of a heat-hardenable phenol-formaldehyde resin to said front side, said phenol-formaldehyde resin having a viscosity of from 1500 to 15,000 centipoises;
- spreading said coating of liquid resin and removing the excess thereof with a wiping motion, thereby forming a continuous layer of liquid resin on the surface of the front side in an amount of from 4.5 to 7.5 pounds per sandpaper makers ream, without substantial penetration of said interstices of the cloth backing material by said phenol-formaldehyde resin;
- heating the resin coated backing material to render the coating tack free;
- cooling the resin coated cloth to ambient temperature so as to prevent premature curing of the liquid resin.

4,163,648

**PROCESS FOR SEPARATION OF AMMONIA AND CARBON DIOXIDE**

Andreas J. Biermans, Urmond, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Nov. 1, 1977, Ser. No. 847,654

Claims priority, application Netherlands, Nov. 3, 1976, 7612163

Int. Cl.<sup>2</sup> B01D 53/14, 19/00

U.S. Cl. 55—70

24 Claims

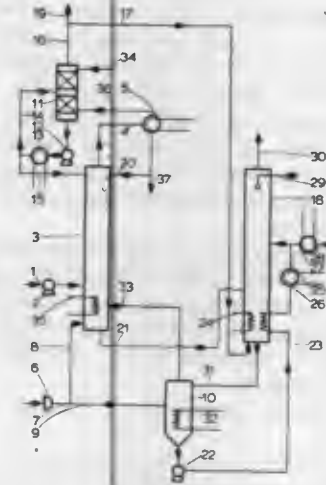
1. A process for the separate recovery of ammonia substantially free of carbon dioxide and water, and carbon dioxide substantially free of ammonia and water, from a mixture essentially containing ammonia and carbon dioxide, which mixture is rich with respect to ammonia, said process comprising the steps of:

introducing said mixture into an ammonia separation zone and separately removing therefrom an ammonia off-gas substantially free of carbon dioxide and water, and a residual liquid phase containing ammonia, carbon dioxide and water;

introducing said residual liquid phase from said ammonia separation zone into a carbon dioxide separation zone and separately removing therefrom a carbon dioxide off-gas substantially free of ammonia and water, and a residual

liquid phase containing ammonia, carbon dioxide and water;

introducing said residual liquid phase from said carbon dioxide separation zone into a desorption zone and separately removing therefrom a desorption zone off-gas containing ammonia, carbon dioxide and water vapor, and a liquid phase of desorption water substantially free of ammonia and carbon dioxide; and



introducing said desorption zone off-gas into said ammonia separation zone;

wherein the system pressure in said carbon dioxide separation zone is no greater than twice the system pressure in said ammonia separation zone, and diluting water is introduced into said carbon dioxide separation zone in an amount of between 0.2 and 6 times, by weight, the total weight of said residual liquid phase from said ammonia separation zone introduced into said carbon dioxide separation zone.

4,163,649

**COLLECTION OF FINE PARTICLES FROM A GAS STREAM BY MOVING THE GAS STREAM UPWARD THROUGH A SHALLOW BED OF SOLID GRANULES**

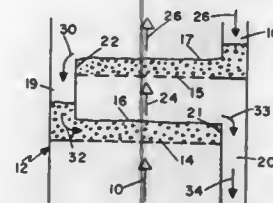
Seymour Calvert, San Diego, Calif., assignor to A.P.T., Inc., San Diego, Calif.

Filed Dec. 15, 1977, Ser. No. 857,441

Int. Cl.<sup>2</sup> B01D 46/32

U.S. Cl. 55—99

6 Claims



1. A method for collecting fine particles from a gas stream by inertial impaction and interception comprising the steps of:

- providing at least one plate having a plurality of perforations therethrough, each said plate having a bed of collector granules disposed over said perforations;
- moving said bed of collector granules across each said plate;
- directing said stream of gas containing said fine particles through said perforations so as to form gas jets; and
- impacting said gas jets on said collector granules, said gas jets having sufficient velocity such that said fine particles are collected by said collector granules by inertial impac-

tion and interception, and said bed of collector granules is only deep enough in relation to the velocity of said gas jets so as to prevent said gas jets from penetrating said bed without said fine particles being collected by said collection granules.

4,163,650

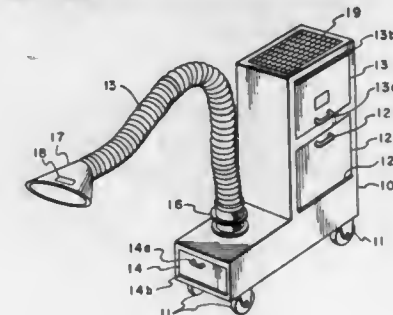
**PORTABLE ELECTRONIC PRECIPITATOR**  
Clifford A. Watson, and David W. Bonham, both of Garland, Tex., assignors to Tepco, Incorporated, Garland, Tex.

Filed Jul. 24, 1978, Ser. No. 927,541

Int. Cl.<sup>2</sup> B03C 3/01

U.S. Cl. 55—126

10 Claims



1. A portable electronic precipitator apparatus which comprises:

- a portable cabinet structure;
- An enlarged particle fallout chamber formed by the lower portion of said cabinet structure;
- a two-stage type electrostatic precipitator contained within said cabinet structure with the inlet of said electrostatic precipitator being in open communication with said particle fallout chamber and with the outlet of said electrostatic precipitator being oriented to direct a gas stream out of said cabinet structure;
- an adjustable freestanding arm assembly affixed to and supported by said cabinet structure;
- an elongated flexible duct means surrounding and supported by said adjustable arm assembly with one end of said duct means being in open communication with said particle fallout chamber; and
- means to direct a gas having particulate material suspended therein into the free end of said flexible duct means whereby said gas flows through duct means, into said particle fallout chamber, through said two-stage electrostatic precipitator for removal of at least a portion of the particulate material from said gas and then to direct the thus cleaned gas out of said cabinet structure.

4,163,651

**PAPER CHIP COLLECTING AND COMPACTING APPARATUS**

Joseph J. Dobnalik, Chicago, Ill., assignor to Garden City Envelope Company, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,108

Int. Cl.<sup>2</sup> B01D 45/00

U.S. Cl. 55—344

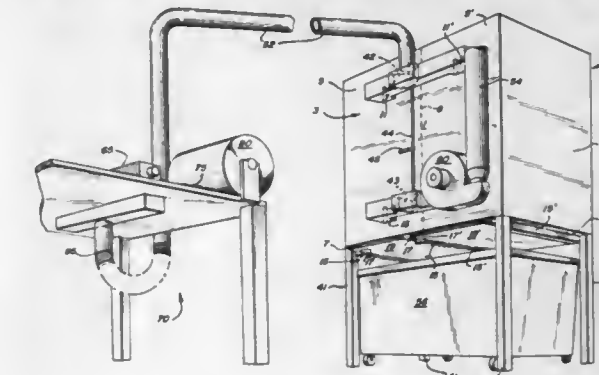
8 Claims

5. A waste bin for pneumatically collecting, storing and compacting paper chips comprising:

- a chamber for receiving, compacting and collecting said paper chips, said chamber having an upper portion and a lower portion in which said paper chips are stored and compacted, and having an inlet port in said upper portion for introducing into said upper portion of said chamber a stream of air containing said paper chips and an outlet port in said lower portion for withdrawing from said lower portion of said chamber a stream of air from which substantially all of said paper chips have been removed, said chamber also having a side member and a bottom member,

all of said separated paper chips being collected, stored and compacted on said bottom;

perforated screen means in the interior of said chamber for separating substantially all of said paper chips from said stream of air being introduced into said chamber, said perforated screen means having perforations dimensioned sufficiently large to permit the passage of air therethrough and sufficiently small to prevent the passage of said paper chips therethrough, and said perforated screen means being so constructed and positioned within said chamber as to permit free passage into said chamber of said stream of air containing said paper chips, to separate substantially all of said paper chips from said stream of air, to allow said separated paper chips to be collected, stored and compacted in said lower portion of said chamber, and to allow withdrawal from said lower portion of said chamber of a stream of air from which substantially all of said paper



chips have been removed, said perforated screen means comprising a substantially vertical container formed of perforated screen and having upper and lower portions and top and side members, being open at its bottom, and having an inlet port in said upper portion thereof for entry of said paper chips therein, said container extending from said upper portion of said chamber downward, and abutting said bottom member; and a tube having its ends attached to the inlet ports in said container and said chamber to provide a conduit for passage of said paper chips into said substantially vertical container;

said inlet and outlet ports so positioned in said chamber as to cause, in cooperation with said perforated screen means, all of said paper chips collected and stored therein to be compacted by the downward flow of air from said inlet port through said perforated screen means and to said outlet port of said chamber.

4,163,652

**REFRIGERATIVE FRACTIONATION OF CRACKING-GASES IN ETHYLENE PRODUCTION PLANTS**

Luigi Gazzi, Milan, and Oronzo Sguera, San Donato Milanese, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Mar. 24, 1977, Ser. No. 781,064

Claims priority, application Italy, Mar. 26, 1976, 21580 A/76

Int. Cl.<sup>2</sup> F25J 3/02

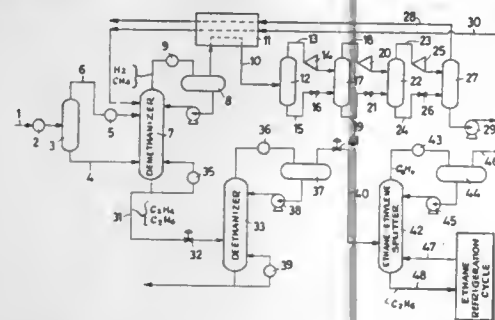
U.S. Cl. 62—28

7 Claims

1. A process for the refrigerative fractionation of the cracking gases containing hydrogen, methane, ethylene, ethane and higher molecular weight hydrocarbons in plants for the production of ethylene, which comprises refrigerating said cracking gases to form a liquid fraction and a gas fraction, separating the liquid fraction from the gas fraction, further refrigerating the gas fraction, feeding said liquid fraction and the further refrigerated gas fraction to a demethanizing stage, recovering hydrogen and methane together with relevant amounts of ethylene and ethane from said demethanizing stage as overhead and recovering ethylene and ethane together with higher



molecular weight products from said demethanizing stage as bottom product, condensing a part of said overhead product by refrigeration and feeding said condensed portion to a reflux storage tank, refluxing a condensed portion of the overhead from the reflux storage tank to said demethanizing stage, cooling the uncondensed portion of said overhead, subjecting said uncondensed portion of overhead to a series of expansion and separation stages in order to recover ethylene and ethane therefrom, recycling said recovered ethylene and ethane to said demethanizing stage, distilling said bottom product so that a stream of ethylene and ethane is separated therefrom, feeding said separated stream of ethylene and ethane to an ethylene-



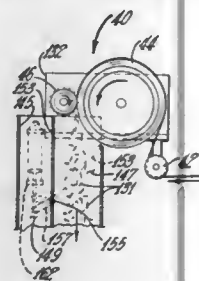
ethane splitter and then recovering ethylene from said splitter through an associated condenser as overhead and recovering ethane from said splitter as bottom product, and supplying refrigeration by subjecting a refrigerating fluid consisting of ethane recovered as bottom product from said splitter and fed to an ethane refrigerating cycle comprised of a series of compression and expansion stages, and condensing said refrigerating ethane after the last compression stage, so as to produce a refrigeration effect down to the boiling temperature of  $-88^{\circ}\text{C}$ . of ethane at atmospheric pressure, wherein cooling water having a temperature in the range of from  $0^{\circ}$  to  $25^{\circ}\text{C}$ . is utilized in condensing said refrigerating ethane.

4,163,653

**METHOD AND APPARATUS FOR FORMING AND COLLECTING DISCRETE FIBERS AND/OR STRANDS**  
Alex P. Symborski, Anderson; Ray M. Fulmer, Aiken, both of S.C., and David W. Thomas, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio  
Filed Aug. 28, 1978, Ser. No. 937,380  
Int. Cl.<sup>2</sup> C03B 37/02

U.S. Cl. 65—2

5 Claims



4. The method of forming and collecting discrete segments of fibrous glass comprising:  
supply a plurality of streams of molten glass;  
attenuating the streams into filaments and cutting the continuous filaments into discrete segments by an attenuation means;  
positioning a delivery means having a first collection zone and a second collection zone spaced from the first zone to receive said discrete fibers;

controlling said attenuation means to operate at a first speed or a second speed slower than the first speed; and directing the discrete segments to said first zone when said attenuation means is operated at said first speed and to said second zone when said forming means is operated at said second speed.

4,163,654

**METHOD OF MANUFACTURING GRADED INDEX OPTICAL FIBERS**

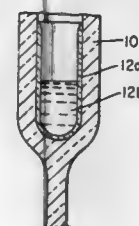
David A. Krohn, Hamden, and Seymour Merrin, Fairfield, both of Conn., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 21, 1978, Ser. No. 898,838

Int. Cl.<sup>2</sup> C03D 37/00

U.S. Cl. 65—3 A

1 Claim



1. A process for making a graded index optical fiber, comprising the steps of:  
introducing the batch material for a first core glass into a closed tube of fused silica having a refractive index less than that of the first core glass;  
melting said batch material to form a glassy liquid within the said tube;  
rotationally casting a layer of said glassy liquid on the inner wall of said tube;  
introducing the batch material for a second core glass into said coated tube, the refractive index of said second core glass being greater than that of said first core glass;  
melting the batch material for said second core glass to form a glassy liquid within said coated tube; and  
drawing said tube and said first and second glassy liquids into said optical fiber.

4,163,655

**METHOD OF MANUFACTURE OF MOLDS FOR RESIN OPHTHALMIC LENSES HAVING A SEGMENT WITH PRISMATIC OPTICAL EFFECT**

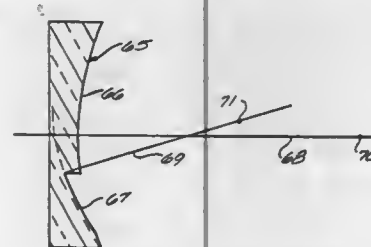
Charles D. Campbell, La Jolla, Calif., assignor to Signet Optical Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 881,131, Feb. 24, 1978, which is a continuation-in-part of Ser. No. 765,537, Feb. 4, 1977, abandoned, and a continuation-in-part of Ser. No. 876,323, Feb. 9, 1978, which is a continuation-in-part of Ser. No. 765,536, Feb. 4, 1977, abandoned. This application May 1, 1978, Ser. No. 901,411

Int. Cl.<sup>2</sup> C03B 23/20, 19/00, 11/08

U.S. Cl. 65—17

17 Claims



1. A method for making a mold for the casting of resin

4,163,657

**SOIL CONDITIONING COMPOSITION AND METHOD OF USING SAME**

Evan E. Koslow, Westport, Conn., and J. Samuel Batchelder, Katonah, N.Y., assignors to Koslow-Batchelder Technologies, New Haven, Conn.

Filed Jun. 23, 1978, Ser. No. 918,335

Int. Cl.<sup>2</sup> C05F 11/00

U.S. Cl. 71—27

29 Claims

15. The method of retarding the loss of water from a water-permeable soil comprising the steps of:

(A) contacting said soil with a soil conditioning composition comprising a substantially linear, substantially water-soluble hydrophilic polymer having a molecular weight greater than 50,000 and at least one functional group disposed along the polymer chain, said polymer chain comprising one or more polymer chain segments characterized by an absence of said functional groups therein and a minimum length, said minimum length of said polymer chain segment being at least one micrometer when said polymer chain segment is secured to one of said functional groups only at one end thereof and at least two micrometers when said polymer chain segment is secured to a respective one of said functional groups at each end thereof, said functional group being more capable of attaching said polymer to a solid soil phase than is said polymer chain segment; whereby said polymer includes at least one portion adapted to secure said polymer to a solid soil phase and at least one portion adapted to extend into an aqueous soil phase; and  
(B) thereafter irrigating said soil at periodic intervals as required to maintain the water content of said soil.

4,163,656

**METHOD OF MANUFACTURING A LEAD-THROUGH OF A METAL ELEMENT THROUGH A CERAMIC COMPONENT BY MEANS OF SEALING**

Marc A. Monneraye, Aubervilliers, and Michel J. C. Monnier, Montgeron, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

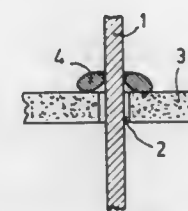
Filed Jun. 15, 1973, Ser. No. 370,400

Claims priority, application France, Jun. 21, 1972, 72.22323

Int. Cl.<sup>2</sup> C03C 27/04

U.S. Cl. 65—43

3 Claims



1. A method of manufacturing a lead-through of a metal element consisting of a ferric alloy through a component of ceramic material by means of sealing with the aid of a glass type based on zinc-borosilicate, comprising supplying a suspension of glass powder whose molar quantity percentage composition is between the following limits

SiO<sub>2</sub>:4-26B<sub>2</sub>O<sub>3</sub>:19-56

ZnO:29-57

Li<sub>2</sub>O:3.0-5.0Al<sub>2</sub>O<sub>3</sub>:0-6

depositing said suspension on the ceramic material at the area of the lead-through, heating the assembly for several minutes in a nitrogen atmosphere at a temperature near  $1000^{\circ}\text{C}$ . and cooling the assembly to room temperature.

in which

R<sub>1</sub> is hydrogen or alkyl of 1 to 5 carbon atoms;R<sub>2</sub> is hydrogen or alkyl of 1 to 5 carbon atoms which may be substituted like R<sub>3</sub> below

R<sub>3</sub> is a pyrimidine residue, which residue may also be substituted by one or more of the same or different substituents, the substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, nitro- and trifluoromethyl.

6. A method of causing growth retardation and defoliation in plants comprising applying to the plant or to the ground in which the plant is grown the composition of claim 4 in an amount of about 0.05 to 5 kg per about 2.5 acres of ground.

4,163,658

**1,2,3-THIAZOLE-5-YL-UREA DERIVATIVES, PROCESS FOR MAKING THE SAME AND PLANT RETARDATION AND DEFOLIATION COMPOSITION CONTAINING SAME**

Friedrich Arndt; Hans-Rudolf Krüger, and Reinhart Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany Division of Ser. No. 792,016, Apr. 28, 1977, Pat. No. 4,130,414. This application Aug. 16, 1978, Ser. No. 934,191

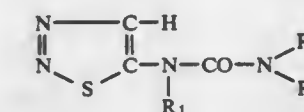
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619861

Int. Cl.<sup>2</sup> A01N 9/22; C07D 417/12

U.S. Cl. 71—73

6 Claims

1. A 1,2,3-thiazole-5-yl-urea compound of the formula





4,163,659

**STUNTING PLANT GROWTH WITH N-SUBSTITUTED PERFLUOROALKANESULFONAMIDES**

Joseph K. Harrington, Edina; Donald C. Kvam, North Oaks; Arthur Mendel, Vadnais Heights, and Jerry E. Robertson, North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 618,376, Oct. 1, 1975, Pat. No. 4,076,519, which is a division of Ser. No. 352,596, Apr. 19, 1973, Pat. No. 3,920,444, which is a continuation-in-part of Ser. No. 100,404, Dec. 21, 1970, abandoned, which is a division of Ser. No. 832,829, Jun. 12, 1969, Pat. No. 3,639,474, which is a continuation-in-part of Ser. No. 588,338, Oct. 21, 1966, abandoned. This application Jan. 3, 1978, Ser. No. 866,369 Int. Cl.<sup>2</sup> A01N 5/00

U.S. Cl. 71-76

2 Claims

1. A method for the control of grass growth rate by means of retardation which comprises contacting grass with an effective inhibiting amount of 5-acetamido-2-methyltrifluoromethanesulfonamide, or salt thereof.

4,163,660

**BIS-SUBSTITUTED SUCCINAMIDES AND THEIR UTILITY AS HERBICIDES**

Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

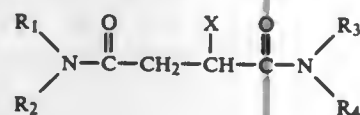
Division of Ser. No. 546,234, Feb. 3, 1975, Pat. No. 4,056,524, which is a continuation-in-part of Ser. No. 459,438, Apr. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,641, Nov. 12, 1973, abandoned. This application Aug. 4, 1977, Ser. No. 821,887

Int. Cl.<sup>2</sup> A01N 9/00, 9/22

U.S. Cl. 71-88

9 Claims

1. A method for controlling the growth of undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired, an herbicidally effective amount of a compound having the formula



in which X is chlorine or bromine; R<sub>1</sub> and R<sub>2</sub> taken together along with the nitrogen form a non-aromatic heterocyclic ring having from 2 to 8 carbon atoms, inclusive; R<sub>3</sub> and R<sub>4</sub> taken together along with the nitrogen form a non-aromatic heterocyclic ring having from 2 to 8 carbon atoms, inclusive.

4,163,661

**PHENOXYPHENOXY CROTONIC ACID DERIVATIVES AND HERBICIDAL COMPOSITION**

Kazuo Jikihara, Kakegawa; Shigekazu Itoh; Shuichi Takayama, both of Shimizu; Kōichi Sato; Ichiro Kimura, both of Shizuoka, and Isao Chiyomaru, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 919,272

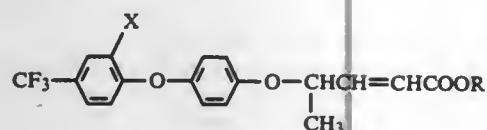
Claims priority, application Japan, Oct. 31, 1977, 52/130394; Feb. 14, 1978, 53/15654

Int. Cl.<sup>2</sup> C07C 69/76; A01N 9/24

U.S. Cl. 71-108

8 Claims

1. A trifluoromethylphenoxy phenoxy crotonic acid derivative having the formula



wherein X represents hydrogen or halogen atom, and R represents an alkyl, haloalkyl, alkenyl, haloalkenyl or alkynyl group.

4,163,662

**LIQUID FORMULATIONS OF 1-(3,4-DICHLOROPHENYL)-3-METHOXY-3-METHYLUREA AND SELECTED CHLOROACETAMIDES**

Harris M. Baker, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 665,328, Mar. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 581,952, May 29, 1975, abandoned, which is a continuation of Ser. No. 320,479, Jan. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 33,912, May 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 814,167, Apr. 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 781,597, Dec. 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 732,018, May 27, 1968, abandoned. This application Mar. 21, 1977, Ser. No. 779,825

Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 71-120

18 Claims

1. A solution concentrate of an herbicidal formulation comprising from 15-50% by weight of a mixture of 1-(3,4-dichlorophenyl)-3-methoxy-3-methylurea and a chloroacetanilide selected from the group consisting of 2-chloro-N-isopropyl acetanilide and 2-chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide, in which the weight ratio of said methylurea compound to said chloroacetanilide is 1:1 to 1:3, dissolved in a solvent system comprising (i) 100 to 60% by weight of at least one material selected from the group consisting of an aromatic hydrocarbon solvent, liquid aromatic halocarbon solvent and a liquid aliphatic halocarbon solvent and (ii) 0 to 40% by weight of a cosolvent; said aromatic hydrocarbon solvent having a distillation point in the range between about 132° and 371° C. at atmospheric pressure and a flash point above 26° C., comprising more than 80% by weight of aromatics selected from alkylated benzenes and alkylated naphthalenes; said aromatic halocarbon being selected from monochlorobenzene, o-dichlorobenzene, trichlorobenzene and bromobenzene; and said liquid aliphatic halocarbon being one containing from one to three carbon atoms, at least one hydrogen atom and two or more halogen atoms per molecule; said concentrate having a greater amount of said methylurea dissolved in said solvent system than would dissolve therein in the absence of said chloroacetanilide.

4,163,663

**REFINING PROCESS BASED ON TOP-BLOWING WITH OXYGEN**

Onni Pusa, Oxelösund, Sweden, assignor to Svenskt Stål Aktiebolag, Stockholm, Sweden

Filed Nov. 7, 1977, Ser. No. 849,005

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650978

Int. Cl.<sup>2</sup> C21C 5/32, 5/30

U.S. Cl. 75-60

13 Claims

1. A process for refining iron melts comprising blowing a stream of oxygen onto the upper surface of an iron melt for a predetermined blowing time, the quantity of the oxygen fed per unit of time being kept constant until the intensity of refinement begins to abate, reducing the flow of oxygen in a first stage by about 10 to 50%, continuing blowing oxygen at said reduced flow of oxygen until slag on the surface of the melt begins to sputter, removing the slag, further reducing the flow of oxygen in a second stage by about 20 to 80%, and completing the blowing process with said last-mentioned further reduced flow of oxygen.

4,163,664

**PROCESS FOR PRECIPITATING PRECIOUS METALS FROM SOLUTIONS WHICH CONTAIN THEM**

Renato Ugo, Cinisello Balsamo, Italy, assignor to PROTEC Processi e Tecnologie S.p.A., Milan, Italy

Continuation of Ser. No. 780,430, Mar. 22, 1977, abandoned, which is a continuation of Ser. No. 666,430, Mar. 12, 1976, abandoned.

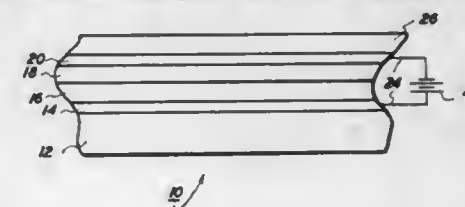
This application Jan. 4, 1978, Ser. No. 866,904

Claims priority, application Italy, Mar. 27, 1975, 21716 A/75 Int. Cl.<sup>2</sup> C22B 11/04

U.S. Cl. 75-108

6 Claims

1. A process for the substantially total precipitation of precious metal selected from the group consisting of platinum, palladium, gold, silver, ruthenium, rhodium, osmium and iridium from a solution containing the ions thereof in a concentration of less than 10 ppm, which comprises treating said solution with carbon monoxide at a pH between 0 and 7, at a temperature between 20° and 200° C. and at a carbon monoxide pressure between 1 and 100 atmospheres in the presence of a quantity of water or a primary or secondary alcohol at least equal in weight to the total quantity of precious metals present, until the amount of metals remaining in solution is less than 1 ppm.



ing to correspond to an electrical field pattern created by altering an electrical field across said elastomer layer by exposing the photoconductive material to electromagnetic radiation to which it is sensitive.

4,163,668

Patent Not Issued For This Number

4,163,669

**MULTILAYER SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL**

Elji Kanada; Noboru Itoh; Hiroshi Ikeda, and Tamotsu Iwata, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 30, 1978, Ser. No. 891,925

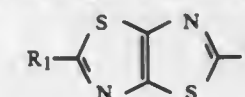
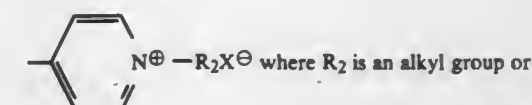
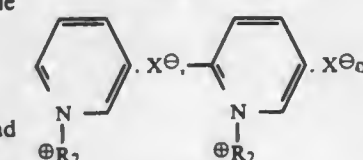
Claims priority, application Japan, Apr. 27, 1977, 52-48945 Int. Cl.<sup>2</sup> G03C 1/76, 1/06, 1/34, 1/30

U.S. Cl. 96-74

8 Claims

1. In a multilayer silver halide color photographic sensitive material to be bleached and fixed or to be subjected to one bath bleaching and fixing treatment after color developing step, the improvement characterized in that said material has in a support and on a support blue-sensitive, green-sensitive and red-sensitive silver halide emulsion layers and in at least one photographic layer a salt with a heavy metal ion of at least one compound selected from the group consisting of

- (1) mercaptotriazoles,
- (2) mercaptothiadiazoles,
- (3) mercaptoimidazoles,
- (4) mercaptoimidazolines,
- (5) mercaptotetrazoles,
- (6) mercaptopyrimidines,
- (7) mercaptopurines,
- (8) mercaptoquinolines,
- (9) compounds of the general formula

wherein, R<sub>1</sub> represents

R<sub>2</sub>X<sup>⊖</sup> is  $(-CH_2)_n-SO_3^{\oplus}$ , n being 3 or 4, and ⊖ is an anion;

- (10) monothioglycerol,
- (11) cystine,
- (12) cystamine,

4,163,665

**ALUMINUM ALLOY CONTAINING MANGANESE AND COPPER AND PRODUCTS MADE THEREFROM**

Kenneth R. Pearson, Riverside, Calif., assignor to Alumax Mill Products, Inc., Riverside, Calif.

Filed Jun. 19, 1978, Ser. No. 916,943

Int. Cl.<sup>2</sup> C22F 1/04

U.S. Cl. 75-143

2 Claims

1. An aluminum alloy sheet metal stock prepared from a continuously cast aluminum alloy casting consisting essentially of:

- A. Residual silicon up to 0.60 percent;
  - B. Residual iron up to 0.70 percent;
  - C. Residual zinc up to 0.30 percent;
  - D. 0.05 to 0.20 percent copper;
  - E. 0.40 to 0.90 percent manganese; and
  - F. Balance essentially aluminum
- said casting being homogenized by heating; said homogenized alloy being cold rolled to a desired gauge with a plurality of cold rolling passes including first and last cold rolling passes; and said cold rolled alloy being annealed at least once intermediate said first and last cold rolling passes.

4,163,666

**HYDROGEN CHARGED ALLOYS OF ZR(A<sub>1-x</sub>B<sub>x</sub>)<sub>2</sub> AND METHOD OF HYDROGEN STORAGE**

David Shaltiel, 29 Keren Hayesod St.; Dan Davidov, 18 Neve Shaanan, and Isaac Jacob, 14 Kedish Luz St., all of Jerusalem, Israel

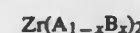
Filed Jan. 31, 1978, Ser. No. 873,946

Int. Cl.<sup>2</sup> F17C 11/00

U.S. Cl. 75-177

10 Claims

1. A compound comprising a hydride of an alloy of the general formula



wherein A designates Mn, V or Cr, B designates Fe or Co and x is a value between 0.25 and 0.75.

4,163,667

**DEFORMABLE IMAGING MEMBER USED IN ELECTRO-OPTIC IMAGING SYSTEM**

Joseph J. Wysocki, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 11, 1973, Ser. No. 405,364

Int. Cl.<sup>2</sup> G03G 5/04, 16/00; G11C 11/44; G02B 7/06

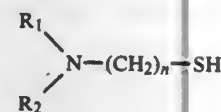
U.S. Cl. 96-1.5 N

28 Claims

1. An imaging member comprising a layer of photoconductive material, an electric field deformable elastomer layer

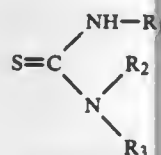


- (13) cysteine,  
(14) aminoalkylene thiols of the general formula



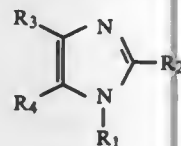
wherein  $R_1$  and  $R_2$  each represents hydrogen atom, methyl or ethyl group and  $n$  represents an integer from 1 to 3,

- (15) thiourea derivatives of the general formula



wherein  $R_1$  and  $R_2$  each represents an alkyl group, hydroxyalkyl group, phenyl group or allyl group,  $R_1$  and  $R_2$  may jointly form a hetero ring, and  $R_3$  represents an alkyl, hydroxyalkyl or allyl group when  $R_1$  and  $R_2$  do not form a hetero ring and an alkyl group or hydroxyalkyl group when  $R_1$  and  $R_2$  jointly form a hetero ring;

- (16) thioamide compounds of the general formula  $R-CSNH_2$ , wherein  $R$  represents hydrogen atom or an alkyl group having 1 to 16 carbon atoms; and  
(17) imidazole compounds having the general formula:



wherein  $R_1$ - $R_4$  each represents hydrogen atom, an alkyl group, a hydroxyalkyl group or an alkenyl group, and  
(18) thiazolidines.

4,163,670

## COLOR PHOTOGRAPHIC MATERIAL

Keisuke Shiba; Takeshi Hirose; Atsushi Arai; Akio Okumura, and Yukio Yokota, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

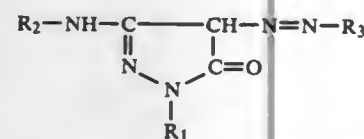
Filed Apr. 22, 1974, Ser. No. 462,842

Claims priority, application Japan, Apr. 21, 1973, 48/45971  
Int. Cl.<sup>2</sup> G03C 1/76, 1/40

U.S. Cl. 96-74

11 Claims

1. A color photographic material comprising a support having thereon at least one silver halide emulsion layer containing a colored coupler represented by the general formula (I)



wherein  $R_1$  represents a phenyl group or a 5- or 6-membered heterocyclic ring selected from the group consisting of a 2-thiazolyl ring, a 2-benzothiazolyl ring, a 2-benzoxazolyl ring, a 2-oxazolyl ring, a 2-imidazolyl ring, and a 2-benzimidazolyl ring;  $R_2$  represents a phenyl group having a halogen atom, an alkoxy group, or an aryloxy group at the ortho-position to the imino group bonded to the 3-position of the pyrazolone ring, and  $R_3$  represents a phenyl group having a hydroxyl group at the para-position to the azo group and at least one alkyl group

having 1 to 8 carbon atoms at one of the meta-positions to the azo group of the pyrazolone ring, said coupler molecule having a hydrophobic diffusion resisting group in the molecule.

4,163,671

## SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING ULTRAVIOLET LIGHT ABSORBING AGENT

Atsuo Inoue, and Takeshi Mikami, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

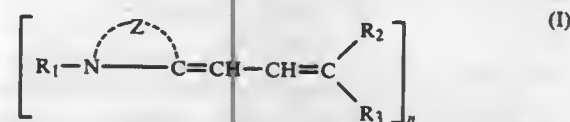
Filed Apr. 17, 1978, Ser. No. 896,871

Claims priority, application Japan, Apr. 25, 1977, 52-47620  
Int. Cl.<sup>2</sup> G03C 1/84, 1/72, 1/76

U.S. Cl. 96-74

20 Claims

1. A silver halide photographic material comprising a support having thereon at least one photosensitive silver halide emulsion layer with the silver halide photographic material containing at least one compound represented by the general formula (I)



wherein  $Z$  represents the atoms necessary for forming a pyrrolidine nucleus or a thiazolidine nucleus;  $R_1$  represents an alkyl group or an aryl group;  $R_2$  and  $R_3$ , which may be the same or different, each represents a cyano group or  $-COOR_4$ ;  $R_4$  represents an alkyl group or an aryl group; and  $n$  is 1 or 2, and when  $n$  is 2, one of  $R_1$  and  $R_4$  represents an alkylene group or an arylene group and the compound is a dimer.

4,163,672

## PHOTOSENSITIVE COMPOSITION

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany  
Filed Sep. 9, 1977, Ser. No. 831,819

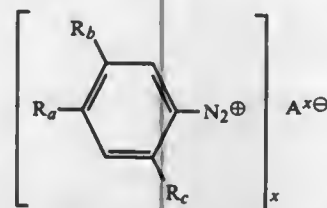
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641099

Int. Cl.<sup>2</sup> G03C 1/52, 1/68

U.S. Cl. 96-91 D

7 Claims

1. A photosensitive composition comprising an ester or an amide of an o-naphthoquinone diazide sulfonic or carboxylic acid and, based upon the amount of this compound, about 1 to 50 percent by weight of an organic dye capable of salt formation and being selected from the group consisting of a triphenylmethane, azine, or anthraquinone dye, and about 5 to 75 percent by weight of a photosensitive halogen-containing diazonium salt which releases acid upon exposure to light and having the general formula I



in which

$R_a$  is selected from the group consisting of hydrogen and halogen atoms, alkyl, alkoxy, aryl, arylmercapto, aryloxy, arylamino and benzoylamino groups,

$R_b$  and  $R_c$  are selected from the group consisting of hydrogen atoms, alkyl, alkoxy, aryloxy, alkylmercapto and arylmercapto groups,

$A$  is selected from the group consisting of  $PF_6$ ,  $BF_4$ ,  $AsF_6$ ,  $SbCl_6$ ,  $SnCl_6$ ,  $BiCl_6$ ,  $ZnCl_4$  and  $SbF_6$ , and  
 $x$  is 1 or 2,  
with  $R_a$  and  $R_c$  simultaneously not being hydrogen.

4,163,673

## FURNITURE POLISH EMULSION

Roberta S. Dechert, Mequon, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 6, 1977, Ser. No. 830,935

Int. Cl.<sup>2</sup> C09G 1/04, 1/08, 1/10, 1/12

U.S. Cl. 106-11

16 Claims

1. A surface-treating composition for furniture comprising a water-in-oil emulsion having:

from about 0.1-10% (by weight of the composition excluding any propellants) of a film-forming organic polysiloxane;

from 0 to about 5% of a surface-coating agent selected from the group consisting of film-forming wax and film-forming resin and combinations thereof;

from 0 to about 20% of a non-drying oil;

about 10-70% of a hydrocarbon solvent substantially the entire amount of which has a kauri-butanol value within the range of about 20-50 and boils within the range of about 80-200° C.;

about 0.05-3% of a cationic emulsifier which is soluble in said hydrocarbon solvent but insoluble and dispersible in water and has an HLB value of less than about 10;

from 0 to about 5% of a nonionic emulsifier at least in an amount sufficient to stabilize the emulsion; and  
at least about 20% water, said hydrocarbon solvent, water, film-forming materials and cationic emulsifier being selected in an amount to provide both high gloss properties and good cleaning of oil-borne deposits.

4,163,674

## PROCESS FOR MAKING A SYNTHETIC LIQUID ABSORBENT AND PRODUCTS RESULTING THEREFROM

Karl Been, Zuld, Netherlands, assignor to Oil-Dri Corporation of America, Chicago, Ill.

Division of Ser. No. 683,090, May 4, 1976. This application Apr. 1, 1977, Ser. No. 783,792

Int. Cl.<sup>2</sup> C09K 3/22

U.S. Cl. 106-15.05

4 Claims

1. Synthetic liquid absorbent material in a granule form and having absorbent properties substantially equivalent to those of absorbent clay granules, said synthetic granules adapted to be used for any one of different liquid absorption purposes including that as an oil and grease absorbent on floors or the like, that as an absorbent in toilet boxes for household pets, that as an absorbent to carry a chemical to be used as an insecticide, or herbicide, or fungicide for agriculture purposes, and that as a ground cover or a conditioner, said material comprising gypsum granules manufactured by crushing a combination of set and hardened materials derived from a mixture containing gypsum plaster and water in an amount of about 15 weight percent water and about 85 weight percent plaster to about 50 weight percent water and about 50 weight percent plaster to provide hardened granules having a bulk density of about 26.4 to about 51.8 lbs./ft<sup>3</sup>, water absorption of about 19 percent to about 88 percent, and oil absorption of about 34 percent to about 74 percent.

4,163,675

## AQUEOUS INK COMPOSITION FOR WRITING INSTRUMENTS

Katsumi Hirano, Kuwana; Takeshi Teranishi, Nagoya; Kunio Kosaki, Nagoya, and Kazuhiko Honda, Nagoya, all of Japan, assignors to Pilot Ink Co., Ltd., Nagoya, Japan

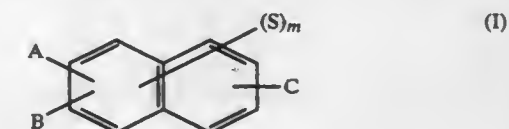
Filed Jun. 30, 1978, Ser. No. 921,151

Claims priority, application Japan, Jun. 30, 1977, 52-78188  
Int. Cl.<sup>2</sup> C09D 11/16, 11/18

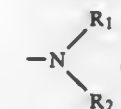
U.S. Cl. 106-22

8 Claims

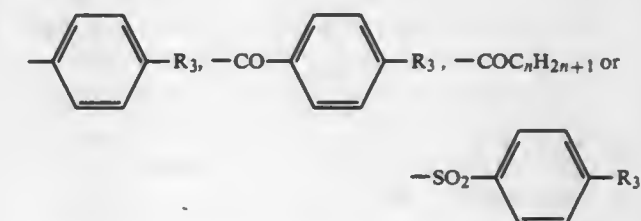
1. An aqueous ink composition for writing instruments consisting essentially of about 1 to about 15% by weight of a water-soluble dye, about 75 to about 99% by weight of an aqueous solvent of which at least about 50% by weight is water, and about 0.1 to about 10% by weight of a naphthalene derivative of the general formula (I):



wherein  $S$  represents  $-SO_3M$  or  $-COOM$  in which  $M$  represents  $H$ , an alkali metal atom or  $NH_4$ ;  $m$  is 1, 2, 3, or 4; and  $A$ ,  $B$  and  $C$ , which may be the same or different, each represents  $-H$ ,  $-OR_1$ ,



$-NO$ ,  $-NO_2$  or  $-N=N^+$  in which  $R_1$  and  $R_2$ , which may be the same or different, each represents  $-H$ ,  $-C_nH_{2n+1}$ ,



in which  $R_3$  represents  $-H$ ,  $-C_nH_{2n+1}$ ,  $-NO_2$ ,  $-NH_2$ ,  $-OH$  or  $-COOH$ , and  $n$  is a number of 1 to 9.

4,163,676

## ETHANOL-MODIFIED LECITHIN COOKWARE SPRAY COMPOSITION

Kurt S. Konigsbacher, Stamford, Conn., assignor to Blue Cross Laboratories, N. Hollywood, Calif.

Filed Apr. 3, 1978, Ser. No. 892,488

Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 106-243

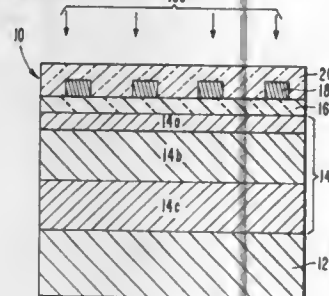
11 Claims

1. A pump dispensable lecithin-based pan spray composition consisting essentially of 2.5 to 65 parts of lecithin and the balance an essentially anhydrous vehicle free of mineral oil, providing a pump sprayable consistency in the composition and consisting essentially of 2.5 to 25 parts of monohydric alcohol having 2 to 3 carbon atoms and 10 to 95 parts of edible vegetable oil, per 100 parts by weight of the composition.

**4,163,677**  
**SCHOTTKY BARRIER AMORPHOUS SILICON SOLAR CELL WITH THIN DOPED REGION ADJACENT METAL SCHOTTKY BARRIER**  
 David E. Carlson, Yardley, Pa., and Christopher R. Wronski, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 901,256  
 Int. Cl.<sup>2</sup> H01L 31/06

U.S. Cl. 136—89 TF



- 12 Claims
1. A Schottky barrier amorphous silicon solar cell: a substrate which is electrically conductive; a body of hydrogenated amorphous silicon having three regions of hydrogenated amorphous silicon of differing conductivity type wherein a first region of n<sup>+</sup>-type hydrogenated amorphous silicon electrically contacts said substrate, a second region of intrinsic hydrogenated amorphous silicon contiguous to said first region and a third region of p-type hydrogenated amorphous silicon contiguous to said second region said third region having a thickness of from about 50 to about 100 angstroms and a p-type doping concentration incorporated during the deposition thereof of from about 5×10<sup>18</sup> to about 5×10<sup>20</sup> atoms/cm<sup>3</sup>, wherein the thickness of said p-type region and concentration of said p-type dopants in said p-type region are selected such that said p-type region is fully ionized by a Schottky barrier high work function metal; a high work function metal layer contiguous to said p-type region forming a Schottky barrier therewith on which solar radiation is incident; and means for electrically contacting said Schottky barrier.

**4,163,678**  
**SOLAR CELL WITH IMPROVED N-REGION CONTACT AND METHOD OF FORMING THE SAME**

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Kenneth R. Bube, Skillman, N.J.

Filed Jun. 30, 1978, Ser. No. 920,879  
 Int. Cl.<sup>2</sup> H01L 31/06

U.S. Cl. 136—89 CC

- 5 Claims
1. In a solar cell characterized by a semiconductor wafer of a P-type material having an N-type region including a group V dopant for establishing a P-N junction, an improved contact affixed to the N-type region at an outer surface of the cell comprising a sintered mixture of silver and metaphosphate.

**4,163,679**  
**ALUMINUM TREATMENT WITH ALKALINE SOLUTION AND TANNIN**  
 Yoshio Nagae, and Takashi Utsumi, both of Yokohama, Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Mar. 30, 1978, Ser. No. 891,971  
 Claims priority, application Japan, Mar. 31, 1977, 52-35498  
 Int. Cl.<sup>2</sup> C23F 7/00, 7/06

U.S. Cl. 148—6.27

- 3 Claims
1. A chromium-free process for imparting corrosion resistance to a surface of aluminum and its alloys, comprising: (a) contacting the surface with an aqueous alkaline solution having a pH value of at least 10 and comprising complexed iron ions in a concentration of at least 0.01 g/l iron; (b) rinsing the surface with water; and (c) contacting the surface with an aqueous acidic solution containing at least 0.01 g/l of an organic tannin.

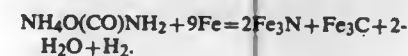
**4,163,680**  
**PROCESS FOR CARBONITRIDING STEEL AND CAST IRON ARTICLES**

Sergei A. Syrchikov, ulitsa Sverdlova, 180, kv. 33, and Vladimir L. Tulsy, Moskovsky prospekt, 96, kv. 143, both of Tolyatti Kulbyshevskoi oblasti, U.S.S.R.

Filed Nov. 17, 1976, Ser. No. 742,630  
 Claims priority, application U.S.S.R., Nov. 21, 1975, 2191966[I]

U.S. Cl. 148—16.5

- 5 Claims
1. A process for carbonitriding articles of steel and cast iron by saturating said articles with a carbonitriding medium of vaporous ammonium carbamate at a temperature of 550° to 650° C., said vaporous ammonium carbamate being produced by evaporating crystalline ammonium carbamate or by reacting ammonia with carbon dioxide at a temperature of 20° to 150° C., the stoichiometric ratio between ammonia and carbon dioxide being 2:1, and wherein the ammonium carbamate carbonitriding reaction occurs as follows:



**4,163,681**  
**DESENSITIZED EXPLOSIVES AND CASTABLE THERMALLY STABLE HIGH ENERGY EXPLOSIVE COMPOSITIONS THEREFROM**

Julius Rothenstein, Citrus Heights, and Samuel Goldhagen, Sacramento, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1970, Ser. No. 28,991  
 Int. Cl.<sup>2</sup> C06B 45/22

U.S. Cl. 149—11

- 14 Claims
1. A novel desensitized explosive comprising a normally sensitive solid explosive material coated with an effective desensitizing amount of a phlegmatizing agent which contains functional groups reactive with at least one ingredient conventionally used in forming a thermally stable, crosslinked solid composite explosive, and which is polyvinyl alcohol.

2. A novel desensitized explosive comprising a normally sensitive solid explosive material selected from the group consisting of RDX, HMX, perchlorates and mixtures thereof coated with an effective desensitizing amount of a phlegmatizing agent which contains functional groups reactive with at least one ingredient conventionally used in forming a thermally stable, crosslinked solid composite explosive, and which is selected from the group consisting of a polyoxyethylene glycol, polycarboxylic acids, glycerol monoricinoleate, polyvinyl alcohol and mixtures thereof.

**4,163,682**  
**METHOD FOR DISPOSING OF RED PHOSPHORUS COMPOSITION**

Francis E. Montgomery, Bloomfield; James E. Short, Jr., Switz City, and William J. Weaver, Washington, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1978, Ser. No. 948,737  
 Int. Cl.<sup>2</sup> C06B 25/02

U.S. Cl. 149—108.4

- 8 Claims
1. A method for disposing of pyrotechnic material comprised of at least fifty percent, by weight, of red phosphorus comprising, burning said pyrotechnic material in a first enclosed chamber and passing the products of combustion into a second enclosed chamber, then burning said products of combustion in said second enclosed chamber, then spraying the products of combustion from the second burning with water to produce phosphoric acid, then collecting said phosphoric acid, then spraying the ashes in said first enclosed chamber with water to produce phosphine, and then burning said phosphine in said first enclosed chamber.

**4,163,683**  
**FORMING A TIRE BEAD ASSEMBLY**

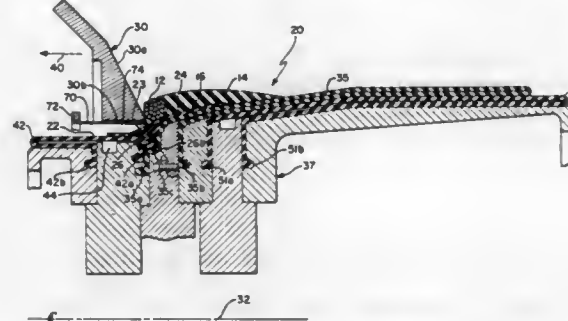
Robert A. Lammlein, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 27, 1977, Ser. No. 864,952

U.S. Cl. 156—136

Int. Cl.<sup>2</sup> B29H 17/32

4 Claims



2. A method of making a tire bead assembly which assembly includes an inextensible bead core, an apex, and a gum tie strip, said method comprising wrapping a gum tie strip of predetermined width circumferentially about support means, said support means being rotatable about an axis and comprising a cylindrical surface having a diameter less than the inside diameter of said bead core, said cylindrical surface being provided by an inflatable bladder, a conical surface having a tie strip supporting portion greater in diameter than the inside diameter of said bead core and sloping radially outwardly of said axis and axially away from said cylindrical surface, said conical surface being provided by an inflatable bag, and a third surface extending slopingly from said cylindrical surface to said conical surface at said portion, said third surface being provided by a non-inflatable elastically deformable circumferential member of triangular cross-section, said member having a fabric web extending therefrom and secured radially inwardly of and between the adjacent ends of said cylindrical surface and said conical surface, the width of said gum tie strip being sufficient to span said third surface and overlie portions of said conical and of said cylindrical surface respectively adjacent said third surface, urging said bead core coaxially of said support means to coaxial contact with said gum tie strip and sufficiently farther significantly to indent circumferentially and axially said third surface thereby to conform said surface and said gum tie strip in endless circumferential relation partially to wrap said gum tie strip about said bead core free of wrinkles or air pock-

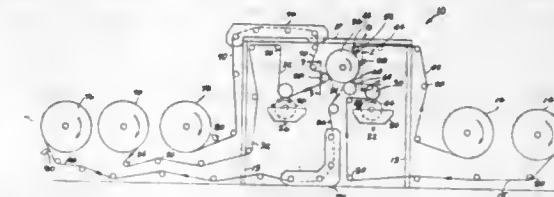
ets therebetween, wrapping said apex circumferentially about said gum tie strip on said conical surface such that the bead core engaging portion of the apex lies in a plane perpendicular to said axis and closely adjacent said bead core, inflating said bag and urging it axially toward said bead core thereby to rotate the major axial dimension of said apex strip and a first portion of said gum tie strip angularly about said bead core from an initial position on said conical surface to an angular position of at least 90 degrees with respect to said initial position to cohere said bead engaging portion of said apex and the radially outward surface of said bead core with said first part of the width of said gum tie strip overlying and cohering on said bead core and said apex, then inflating said bladder thereby to expand a portion of said non-inflatable member to wrap the other part of the width of said gum tie strip to overlie and cohere with said bead core and said apex, then removing said bead assembly from said support means for insertion in a tire.

**4,163,684**  
**METHOD AND APPARATUS FOR STRIP LAMINATING**  
 John M. Kartanson, Winston-Salem, N.C., assignor to RJR Archer, Inc., Winston-Salem, N.C.

Filed Jan. 27, 1978, Ser. No. 873,028  
 Int. Cl.<sup>2</sup> B32B 31/00

U.S. Cl. 156—259

10 Claims



1. A method for laminating longitudinal strips to a backing web comprising the steps of: (a) providing a first continuously moving web; (b) applying a selected pattern of transversely spaced, continuous, longitudinal, adhesive stripes on said first web; (c) providing a second continuously moving web; (d) moving said second web into contact with an anvil; (e) severing said second web, longitudinal to its direction of movement, into a plurality of continuous strips; (f) maintaining said plurality of continuous strips in contact with said anvil; and (g) contacting the continuous strips while on said anvil with said first web so that selected strips adhere to the continuous adhesive stripes on said first web to form a first composite web.

**4,163,685**  
**APPLICATION OF SIDEWALL TO A TIRE CARCASS**  
 Donald C. Kubinski, Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 23, 1978, Ser. No. 889,457  
 Int. Cl.<sup>2</sup> B29H 17/18

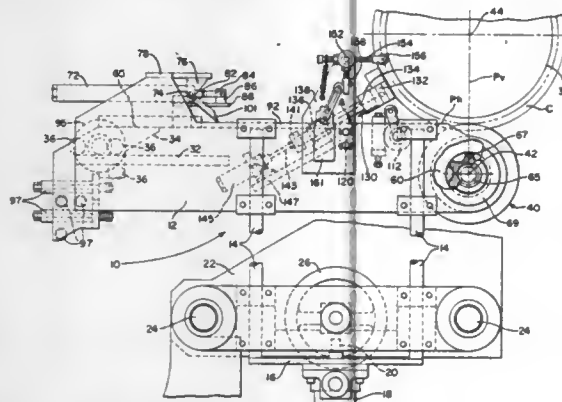
U.S. Cl. 156—405 R

6 Claims

1. A device for applying uncured gum sidewall directly on a tire carcass supported on a building drum rotatable about a drum axis, the device comprising a frame, roll means providing a cylindrical application surface rotatable about a roll axis parallel to said drum axis in response to rotation of said drum, said cylindrical application surface having a first axial portion provided by a plurality of annular discs spaced coaxially to provide annular slots therebetween and a second axial portion coaxially adjacent said first portion provided by a plurality of annular discs of equal diameter and of lesser axial thickness disposed in side-by-side contact coaxially of said roll axis, said drum axis and said roll axis defining a first reference plane, carrier means mounted on said frame for reciprocal movement parallel to a second reference plane which is perpendicular to said first reference plane.



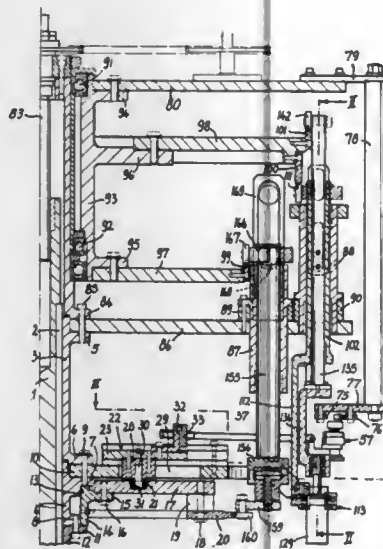
lar to said first reference plane and tangent to said cylindrical application surface, and air cylinder means mounted on said frame and connected to said carrier means to effect said reciprocating movement, said carrier means including a sub-frame having a sidewall supporting surface parallel to said second reference plane, at least part of said supporting surface comprising a plurality of fingers respectively aligned parallel to



said direction of reciprocating movement and respectively aligned with said annular slots, and cutoff means mounted on said frame operable to cut off a length of sidewall being wrapped about said carcass from a running length supply thereof at an acute angle with respect to said second reference plane, said cutoff means being mounted to effect such cutoff at a distance from said cylindrical application surface which is less than one-quarter of the circumference of said carcass.

**4,163,686**  
**LABELLING MACHINE FOR APPLYING A LABEL, IN PARTICULAR A SEALING BAND, TO A CONTAINER**  
Roberto Risi, Casalechio Di Reno, Italy, assignor to MA.CO S.a.s. di Saso Vittorio & C., Casalechio Di Reno, Italy  
Filed Jun. 2, 1977, Ser. No. 802,931  
Claims priority, application Italy, Jun. 11, 1976, 3462 A/76  
Int. Cl.<sup>2</sup> B65C 3/20  
U.S. Cl. 156-492

2 Claims

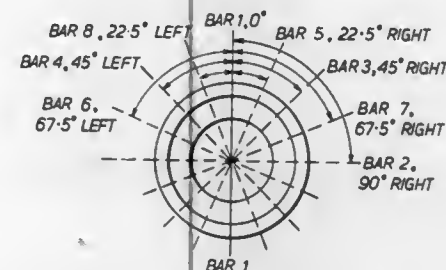


1. A labelling machine for applying a sealing label on the top of a bottle comprising a carousel rotating about a vertical axis and having pivotal bottle supporting plates, a plurality of clamp members mounted on said carousel and adapted to grip the opposite ends of a label delivered from a magazine, frame members supported on said carousel and each defining a cylindrical seat diametrically slotted to form an opening for the passage of a label, means for actuating said frame members so

as to bring said seats in engagement on the bottle tops, means for actuating said clamp members between a label pick up position and a position at which said label is placed on the top of the bottle, vertically movable press members controlled so as to penetrate said opening to clamp the label on the bottle top and to fold down the opposite ends of the label on the bottle neck, wherein each clamp member comprises a lever pivoted about a horizontal axis tangential with respect to the carousel axis of rotation, said lever supporting pivotally a pin carrying a finger, said pin being subjected to elastic means tending to hold said finger in contact with an abutment or detent in said lever such as to form a clamp and to cam means controlling the rotation of said pin in opposition to said elastic means for opening the clamp, said lever being controlled through a tie bar by a slide guided radially on said carousel and connected to cam means adapted to cause the lever to rotate from a label pick up position to a position at which said label is placed on top of a container.

**4,163,687**  
**METHOD AND APPARATUS FOR EXPLOSIVELY DEFIBRATING CELLULOSIC FIBER**  
Heikki Mamers, Seaford, and John E. Rowney, St. Albans, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia  
Filed Apr. 24, 1978, Ser. No. 899,148  
Claims priority, application Australia, Apr. 27, 1977, PC9894  
Int. Cl.<sup>2</sup> D21B 1/36  
U.S. Cl. 162-21

5 Claims



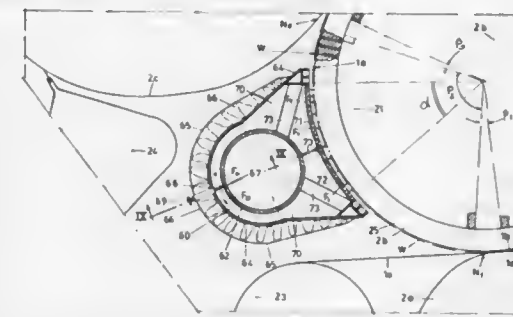
1. In a process for explosively defibrating cellulosic fibre from plant material wherein the plant material is subjected to a high pressure environment followed by rapid transfer to a lower pressure environment, the improvement comprising passing the material from the high to the low pressure environment by way of a discharge nozzle across which a plurality of bars spanning diametrically across the nozzle having rounded leading edges facing in the direction of flow are arranged in such a manner as to cause the plant material passing therethrough to be folded over, successive bars thereby subjecting the folded plant material to shear and tensile forces generated by the concomitant passage of highly turbulent fluids causing the material to be successively pulled apart into individual fibres and fibre bundles wherein said bars are disposed at varying angles relative to each other along the longitudinal axis of the nozzle and the minimum number of bars and their arrangement in the nozzle is such that when the nozzle is viewed in the direction of passage of the plant material no clear passage exists in the nozzle through which a fragment of the plant material may traverse without being folded over a bar.

2. A discharge nozzle having a passageway through which cellulosic material may be explosively defibrated from a high pressure pulping digester to a lower pressure reservoir, said nozzle having a plurality of bars spanning diametrically across the nozzle having rounded leading edges facing the direction of flow extending across said passageway at varying locations along the longitudinal axis thereof so as to provide a series of the bars which are arranged so that any passing plant material is successively folded over the bars and pulled apart into individual fibres and small fibre bundles wherein the angles at

which the axis of the bars are set relative to each other are randomized and the minimum number of bars and their arrangement in said passageway is such that when the passageway is viewed in the direction of passage of the plant material no clear passage exists in the passageway through which a fragment of the plant material may traverse without being folded over bar.

**4,163,688**  
**APPARATUS FOR DEWATERING IN A PAPER MACHINE**  
Matti Kankaanpää, Espoo, Finland, assignor to Valmet Oy, Helsinki, Finland  
Continuation-in-part of Ser. No. 310,805, Nov. 30, 1972, abandoned. This application Apr. 25, 1977, Ser. No. 790,421  
Claims priority, application Finland, May 18, 1976, 761398  
Int. Cl.<sup>2</sup> D21F 3/02  
U.S. Cl. 162-359

3 Claims



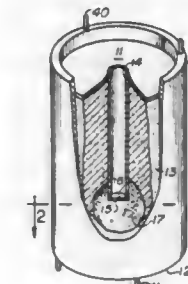
1. In an apparatus for dewatering a paper web in the press section of a paper machine of the type having a felted suction roll, at least one roll forming at least one nip with the suction roll, the web being passed around a sector of the suction roll, the improvement comprising steam supply means mounted adjacent said web, and means for conducting steam to said supply means, said supply means comprising

at least one steam supply box extending across the entire width of said web adjacent the suction roll, said box having an interior space and an open side opening toward said suction roll and conforming to the curvature of said roll over a substantial sector thereof to define a flow path for treatment steam onto said sector; an inner pipe in said steam box; a shell portion; and means for supporting said shell portion around said inner pipe; said shell portion comprising a concave wall adjacent said suction roll, said wall having means defining openings therethrough for the passage of steam, an inner wall defining, with said concave wall, a steam supply space, an outer wall spaced from said inner wall, thermal insulating means between said inner and outer walls, and means defining openings through a wall of said pipe for directing steam into said steam supply space in a direction away from the web,

said supply box further comprising steam quantity adjustment means operatively associated with said openings through said wall of said pipe for controlling the flow of steam into said space, a plurality of said openings and associated adjustment means being disposed in side-by-side relationship along said pipe.

**4,163,689**  
**VENTED NUCLEAR FUEL ELEMENT**  
Leonard N. Grossman, Livermore, and Alexis I. Kaznoff, Castro Valley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Dec. 3, 1965, Ser. No. 512,823  
Int. Cl.<sup>2</sup> G21C 3/02  
U.S. Cl. 176-68

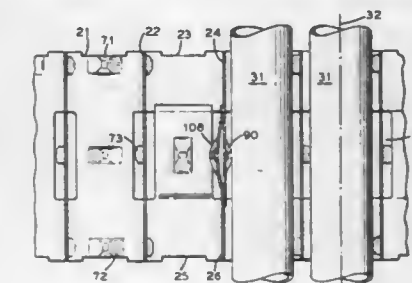
5 Claims



1. A vented nuclear fuel element for use in a nuclear reactor, comprising a fissile fuel body, means defining a cladding surrounding and containing said fissile fuel body, a conduit penetrating said fissile fuel body and affixed and sealed to said cladding and having one end opening proximate the center of gravity of said fissile fuel body with distal end of said conduit opening outside said cladding for conduction of volatile and gaseous fission products away from said fissile fuel body.

**4,163,690**  
**NUCLEAR REACTOR FUEL ASSEMBLY SPACER GRID**  
Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.  
Filed Jan. 7, 1977, Ser. No. 757,723  
Int. Cl.<sup>2</sup> G21C 3/30  
U.S. Cl. 176-78

8 Claims



1. A nuclear reactor fuel assembly spacer grid for supporting and spacing a plurality of elongated fuel elements with their longitudinal axes in parallel comprising: at least two generally rectangular first plates, second plates, and a plurality of substantially flat rectangular third plates, each having lengthwise edges disposed transversely with respect to the longitudinal axes of the fuel elements and widthwise edges disposed generally parallel to the longitudinal axes of the fuel elements, and oppositely disposed faces bound perimetrically by said lengthwise and widthwise edges; a peripheral band circumscribing the spacer grid; said peripheral band having an inner face and an outer face; said lengthwise edges of said first and second plates transversely cut by slots each along a respective lengthwise edge thereof for mutually interlocking said first and second plates as a pair with said third plates; one of said first and one of said second plates being generally disposed in longitudinally spaced and inverted relation with respect to each other so that said slots on said respective first and second plates are oriented in opposite directions to form a first set of paired

plates each having spaced cantilevered panels traversing the longitudinal space such that a portion of each panel is in transverse contact with the opposing plate of the pair; other first and second plates being relatively longitudinally spaced and inverted to form a second set of paired plates similar to said first set of paired plates; said first and second sets of paired plates being further disposed to perpendicularly intersect each other set and the third plates to mutually interlock therewith; said widthwise edges of the first, second, and third plates being in communication with the inner face of the peripheral band to form a plurality of cells having a substantially open cross-section through which the fuel elements protrude; a plurality of protrusions extending into the cells from one face of the first and second plates, from the inner face of the peripheral band, and from both faces of the third plates; said protrusions of the first and second plates being resilient; said protrusions of the inner face of the peripheral band being rigid; and said protrusions on one face of the third plate being rigid and the protrusions on the opposite face of the third plates being resilient.

4,163,691

**INSOLUBLE ENZYMATICALLY ACTIVE PARTICLES**  
Francis Devos, Patrick Leroy, and Michel Huchette, all of Lestrem, France, assignors to Roquette Freres, Lestrem, France

Filed Jun. 3, 1977, Ser. No. 803,244

Claims priority, application France, Jun. 4, 1976, 76 17155  
Int. Cl.<sup>2</sup> C07G 7/02; C12K 1/00

U.S. Cl. 435—174

9 Claims

1. A process for manufacturing insoluble enzymatically active particles comprising, successively:  
forming an intimate mixture of a slurry of microbial cells containing glucose-isomerase as an endocellular enzyme at a temperature of less than about 55° C. and 3 to 20% by weight of gelatin as a jellifying agent,  
dividing the intimate mixture thus obtained into threads by passing said mixture through a die and into cold water to jellify said threads, said die being selected so that the threads obtained have a diameter of about 0.2 to 5 mm, contacting said jellified threads with 0.5 to 5% by weight of a cross-linking agent for said gelatin, based on the starting mass of the slurry, to provide cross-linking thereof, and then  
cutting said cross-linked threads into pieces having a length greater than 0.2 mm and less than 10 mm.

4,163,692

**LOW PHOSPHATE GROWTH OF FUNGAL MYCELIA**  
Richard A. Yates, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 25, 1977, Ser. No. 790,855

Int. Cl.<sup>2</sup> C12B 1/08; C12D 13/06

U.S. Cl. 435—254

7 Claims

1. A process comprising growing an edible strain of *Fusarium* on a carbohydrate substrate under aerobic conditions in a culture medium containing essential growth-promoting nutrient substances to produce a mycelial mass, wherein the phosphate present in the medium is maintained at from the amount which is growth limiting up to 5 millimolar above the amount which is growth limiting, harvesting at least a portion of the grown fungal mycelial mass and reducing the ribonucleic acid content of the harvested fungal mycelial mass by means of enzyme activation.

# 4,163,693 FLUIDIZING A MIXTURE OF PARTICULATE COAL AND CHAR

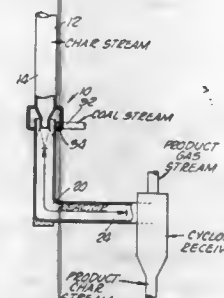
Norman W. Green, Pomona, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 449,073, Mar. 7, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,898

Int. Cl.<sup>2</sup> C10B 1/00

U.S. Cl. 201—22

11 Claims



1. A process for mixing particulate coal and heated particulate coal char comprising:  
a. introducing a particulate coal downwardly and in turbulent flow into a mixing zone;  
b. simultaneously and separately fluidizing a heated particulate coal char in a fluidizing zone with a fluidizing fluid and causing said heated particulate coal char to flow upwardly while being suspended in said fluidizing fluid and causing said heated particulate coal char to overflow a weir means within said fluidizing zone while in the fluidized state and to pass from said fluidizing zone to said mixing zone;  
c. introducing said heated particulate coal char into said mixing zone substantially completely around said particulate coal as said particulate coal is first introduced into said mixing zone; and  
d. mixing said particulate coal and said heated particulate coal char in said mixing zone.

4,163,694

# HEATING WALL FOR COKE OVENS

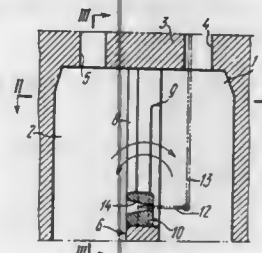
Alexandr N. Minasov, ulitsa Ivanova, 12/16, kv. 59; Evgeny P. Likhogub, ulitsa Slinka, 2, kv. 11, and Stanislav S. Sergeev, ulitsa Kosmonavtov, 3, kv. 114, all of Kharkov, U.S.S.R.

Filed Feb. 27, 1978, Ser. No. 882,207

Int. Cl.<sup>2</sup> C10B 5/04

U.S. Cl. 202—139

3 Claims



1. A heating wall for a coke oven with horizontal coking chambers comprising: vertical heating flues arranged in pairs; a partition separating the heating flues with each pair having an upper portion adjacent the top of each pair of heating flues; a flow port in the upper portion of said partition for combustion products to flow from one of said vertical flues into the other; vertical slot-like guides on opposite sides of said flow port; a slide gate whose vertical extent is less than that of the flow port and which is provided with projections to fit in a sliding manner into said slot-like guides; each slot-like guide having an upper portion on the same side in the form of a

stepped recess to enable receipt of said projections; said slide gate having a center of gravity being shifted with respect to the central longitudinal axis of said projections in a direction opposite to said stepped recesses, the vertical extent of said stepped recesses exceeding that of the slide gate projections to provide for gravity swinging and fixing of said slide gate in an uppermost position in the flow port in order to change the vertical position of said flow port without substantially changing the area of the flow port, in said uppermost position said slider plate being obliquely disposed with lower and upper portions of said projections respectively contacting said stepped recesses and said slot-like guides; means in said slide gate for receiving a hook therein to permit displacement of said slide gate in said flow port; and means in each heating flue for inserting a hook therethrough to permit slide plate movement by said hook.

4,163,695

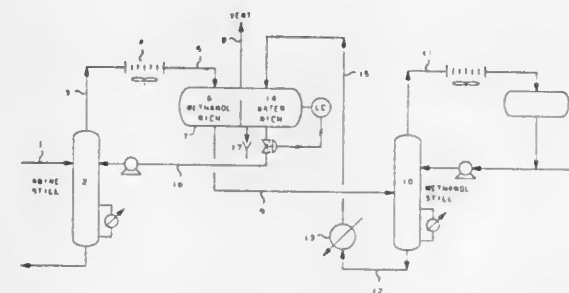
**FRACTIONATION PROCESS AND APPARATUS**  
Paul H. Archerd, Oklahoma City, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1977, Ser. No. 829,751

Int. Cl.<sup>2</sup> B01D 3/14

U.S. Cl. 203—18

14 Claims



1. A method for accumulating and distributing the fluid streams for two fractionators comprising:  
(a) feeding at least partially condensed overhead from a first fractionation column into a first chamber within an enclosed vessel divided internally into a first and second chamber by a baffle wherein said baffle allows overflowing from one chamber to the other;  
(b) passing that amount of liquid in the first chamber to the second chamber which accumulates in said first chamber in an amount sufficient to overflow into the second chamber;  
(c) passing liquid from said first chamber of said enclosed vessel as feed to a second fractionator;  
(d) feeding the bottoms liquid from the second fractionator into the second chamber of the enclosed vessel in (a);  
(e) passing liquid from said second chamber of enclosed vessel to said first fractionator of (a) as reflux; and  
(f) in the event that said second fractionator is shut down and the first fractionator continues operation, the overhead from the first fractionator accumulates in the first chamber of the enclosed vessel, overflows into the second chamber of the enclosed vessel, and is then returned to said first fractionator as reflux.

4,163,696

# DISTILLATION PROCESS FOR RECOVERY OF METHYL ISOBUTYL KETONE

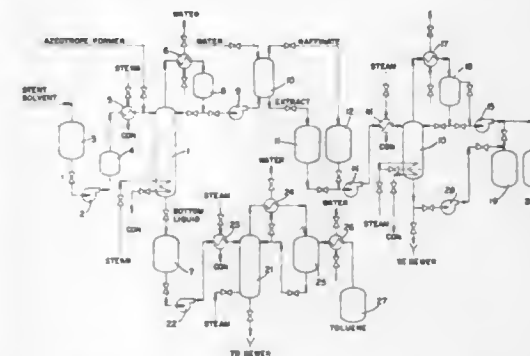
Wang-Mo Wong, Matteson, Ill., assignor to Arthur G. McKee & Company, Independence, Ohio

Filed Jun. 7, 1978, Ser. No. 913,530

Int. Cl.<sup>2</sup> B01D 3/36; C07C 49/06

U.S. Cl. 203—44

12 Claims



1. In a distillation process for separating a mixture of methyl isobutyl ketone (MIBK) and toluene, the improvement which comprises adding methanol to the mixture prior to distillation to form an azeotrope of toluene and methanol and then distilling the mixture to separate and recover one fraction of the MIBK and another fraction of said azeotrope.

4,163,697

**PROCESS FOR OBTAINING ISOBUTYLENE OF A PURITY HIGHER THAN 99.5 WEIGHT PERCENT**  
Jean-Pierre Michaux, Chatou, France, assignor to Compagnie Francaise de Raffinage, France

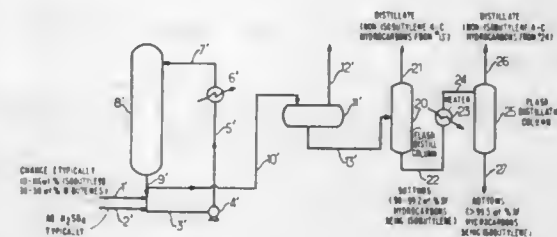
Filed Feb. 17, 1977, Ser. No. 769,738

Claims priority, application France, Feb. 27, 1976, 76 05649

Int. Cl.<sup>2</sup> B01D 1/14, 3/06; C07C 7/04, 7/10

U.S. Cl. 203—49

20 Claims



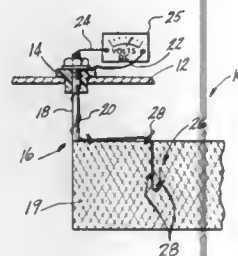
1. In a process for recovering isobutylene contained in a mixture of hydrocarbons having four carbon atoms, by selective liquid-liquid extraction with an aqueous solution of sulfuric acid of a concentration of about 50 wt. % to give an isobutylene-rich sulfuric acid extract which is then subjected to a flash distillation in a zone to further enrich the isobutylene content of said extract, the improvement for obtaining isobutylene of a purity of greater than 99.5 wt. % comprising removing the bottoms from said flash distillation zone, heating said separated bottoms to an effective distillation temperature and in a separate zone subjecting the heated bottoms to a further independent flashing step.



**4,163,698**  
**IN SITU REFERENCE ELECTRODE FOR DIAPHRAGM CELLS**  
 Han C. Kuo, Cleveland; George W. Geren, Georgetown; Thomas E. Corvin, and Byung K. Ahn, both of Cleveland, all of Tenn., assignors to Olin Corporation, New Haven, Conn.  
 Filed May 22, 1978, Ser. No. 908,434  
 Int. Cl.<sup>2</sup> G01N 27/30

U.S. Cl. 204—1 T

17 Claims



1. A method for directly measuring the overvoltage of a gas producing electrode of a chlor-alkali diaphragm cell during electrolysis and generation of gas, which comprises the step of positioning an exposed metal tip of a reference electrode, immersed in the same electrolyte as said gas producing electrode, at a location of from about 0.2 to about 1.0 mm away from said gas producing electrode within a stream of gas produced by said gas producing electrode during electrolysis and measuring the potential difference between said reference electrode and said gas producing electrode during electrolysis and generation of gas.

**4,163,699**

Patent Not Issued For This Number

**4,163,700**  
**METHOD FOR STABILIZING TIN OR TIN ALLOY ELECTROPLATING BATHS**  
 Shuji Igarashi; Yoshikazu Fujisawa, and Toshio Igarashi, all of Tokyo, Japan, assignors to Dipsol Chemicals Co., Ltd., Tokyo, Japan  
 Filed Oct. 17, 1978, Ser. No. 952,204  
 Claims priority, application Japan, Oct. 21, 1977, 52-125865  
 Int. Cl.<sup>2</sup> C25D 3/32, 3/60

U.S. Cl. 204—43 S

8 Claims

1. A method for stabilizing tin or tin alloy electroplating baths which contain citric acid or its salt and an ammonium salt, characterized by adding in the bath as a stabilizer at least one saturated hydrocarboxylic acid or its salt other than citric acid and citrate and/or at least one saturated dibasic carboxylic acid or its salt.

**4,163,701**  
**METHOD OF ELECTROCHEMICAL MACHINING OF POLYPHASE ALLOYS**  
 Charles Schepacz, Firminy, France, assignor to Centre Technique des Industries Mecaniques, Senlis, France  
 Filed Feb. 13, 1978, Ser. No. 877,110  
 Claims priority, application France, Feb. 24, 1977, 77 05448  
 Int. Cl.<sup>2</sup> C25F 3/00, 3/08

U.S. Cl. 204—129.75

7 Claims

1. A method of electrochemically machining two-phase alloys comprising at least one metallic carbide phase and one

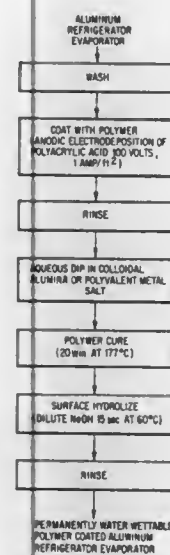
metallic phase, comprising the step of passing an electric current between an inert tool-electrode and the alloy to be machined to the shape of the tool-electrode within an electrolyte containing ammonium fluoride and/or ammonium fluoborate and having a pH value within the range of 6 to 8.

**4,163,702**  
**PROCESS FOR RENDERING SURFACES PERMANENTLY WATER WETTABLE AND NOVEL PRODUCT THUS-PRODUCED**

Milton E. Rickert, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.  
 Filed Mar. 29, 1978, Ser. No. 891,438

Int. Cl.<sup>2</sup> C23D 13/00; C25D 13/06; F25B 39/02  
 U.S. Cl. 204—181 T

36 Claims



1. A process for rendering permanently water wettable a surface of an article of manufacture which normally is not water wettable or which loses its water wettability upon exposure to air or water, which comprises the steps of:

- coating the surface with a continuous film of the free acid form of a film forming acidic polymer which forms water soluble salts and which is curable to water insolubility, said film containing a curing agent for the polymer;
- contacting the thus-coated surface, under aqueous conditions which retain the polymer coating on the surface, with colloidal alumina or a water soluble salt of a polyvalent metal;

(c) curing the thus-contacted polymer on the substrate surface to water insolubility; and, if required to render the cured polymer coating water wettable, thereafter hydrolyzing substantially only the surface portion of the cured polymer.

**4,163,703**  
**METHOD OF COATING THE INSIDE SURFACE OF A HOLLOW BODY**

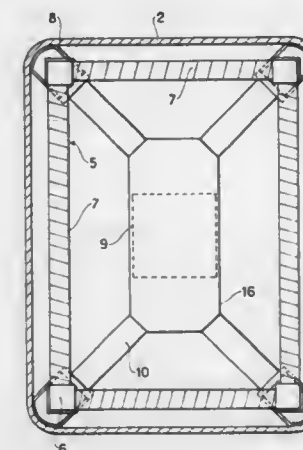
Alain Gernez, Saint Jean de la Ruelle, France, assignor to Compagnie Europeenne pour l'Equipeement Menager "CEPEM", Paris, France

Filed Jul. 31, 1978, Ser. No. 929,603

Claims priority, application France, Aug. 1, 1977, 77 23592  
 Int. Cl.<sup>2</sup> B01D 13/02; C25B 11/00; C25D 7/04, 13/14

U.S. Cl. 204—181 R

12 Claims



1. A method of coating the inside surface of a hollow body having a curved interior by means of an electric current established between the hollow body and an electrode inserted therein, said method comprising the steps of:

- expanding the electrode after insertion into the hollow body to bring it closer to the interior angles of the inside surface of the hollow body, said electrode comprising a drainage electrode including a part of substantially tubular shape, and wherein said method of coating further comprises the step of flowing fluid through said tubular shaped part during the application of electric current between said hollow body and said electrode.

**4,163,704**  
**APPARATUS FOR SELECTIVELY PLATING RECTANGULAR SHEET CONTINUOUSLY OR INTERMITTENTLY**

Yasuyuki Murata, Kamakura, Japan, assignor to Electroplating Engineers of Japan, Ltd., Tokyo, Japan  
 Division of Ser. No. 675,135, Apr. 8, 1976, Pat. No. 4,083,755.  
 This application Nov. 14, 1977, Ser. No. 850,966

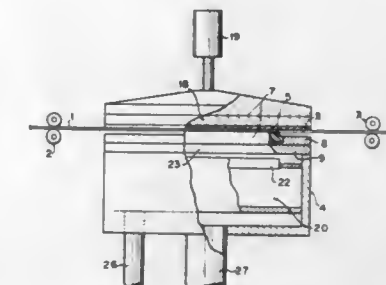
Claims priority, application Japan, Jun. 14, 1975, 50-80126  
 Int. Cl.<sup>2</sup> C25D 17/00

U.S. Cl. 204—206

8 Claims

1. An apparatus for selectively plating a sheet, comprising: a pair of inlet guide rollers and a pair of outlet pull rollers for moving the sheet;

a masking packing having a first contact surface adapted for contacting one surface of the sheet, said masking packing having opening means extending through said first contact surface, said opening means having the configuration of the plating deposit to be made on the sheet;  
 a pressure packing having a second contact surface adapted for contacting the second surface of the sheet, said pressure packing being disposed in opposing relationship to said first contact surface of said masking packing and adapted for pressing the sheet against said first contact surface of said masking packing while permitting movement of the sheet between said first and second contact surfaces;



a plating box associated with said masking packing and including nozzle means for directing one or more jets of plating solution into said opening means in said masking packing;  
 means for circulating and supplying plating solution to said nozzle means; and  
 a source of DC electroplating potential whose negative side is electrically connected to means adapted to contact the sheet and whose positive side is electrically connected to said nozzle means.

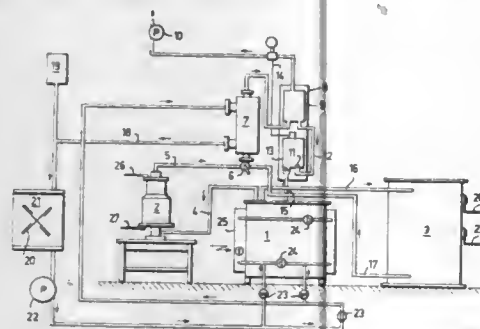
**4,163,705**  
**APPARATUS FOR CHEMICAL AND ELECTROCHEMICAL TREATMENT**  
 Teuvo T. Korpi, Kaarelahti 97A, 00420 Helsinki, 42, Finland  
 Division of Ser. No. 684,122, May 6, 1976, abandoned. This application May 24, 1977, Ser. No. 800,148  
 Claims priority, application Finland, May 6, 1975, 751337  
 Int. Cl.<sup>2</sup> C25D 17/02

U.S. Cl. 204—239

16 Claims

1. An electroplating apparatus for applying a protective metallic coating on the surface of an object, said apparatus comprising chamber means and liquid electrolyte solution in the chamber means, said chamber means including a process chamber which contains at least a part of said liquid electrolyte solution and in which said object may be submerged in the liquid electrolyte solution, and the apparatus further comprising means for leading an electric current to said object and to said solution, said process chamber being provided with means for effectively preventing atmospheric air from flowing

through said chamber, and a pneumatic pressure-reducing pump connected to the chamber means to maintain a reduced



pressure, which is substantially below atmospheric, above the electrolyte solution within at least a part of the chamber means.

4,163,706

$\text{Bi}_2[\text{M}_2-x\text{Bi}_x]\text{O}_{7-y}$  COMPOUNDS WHEREIN M IS RU, IR OR MIXTURES THEREOF, AND ELECTROCHEMICAL DEVICES CONTAINING SAME (BAT-24)

Harold S. Horowitz, Clark; John M. Longo, New Providence, and Joseph T. Lewandowski, Middlesex, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J. Filed Dec. 2, 1977, Ser. No. 856,628

Int. Cl.<sup>2</sup> C25B 9/00, 11/04; C01G 29/00; H01B 1/08

U.S. Cl. 204-242

34 Claims

1. A compound having the formula:



wherein M is selected from the group consisting of Ru, Ir and mixtures thereof, wherein x is greater than or equal to about 0.1 and less than or equal to about 1.0 and wherein y is greater than or equal to zero and less than or equal to about 1.0.

4,163,707

ASPHALT CONVERSION

Frans Goudriaan, and Jakob van Klinken, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex. Filed May 15, 1978, Ser. No. 905,838

Claims priority, application Netherlands, May 18, 1977, 7705482

Int. Cl.<sup>2</sup> C10G 3/00

U.S. Cl. 208-44

7 Claims

1. A process for catalytically hydroconverting asphalt which comprises: (a) contacting asphalt in a first reactor with a hydrogenated middle distillate, hydrogen and with a hydrogenation catalyst at an elevated temperature and pressure and under conditions effecting both hydroconversion of the asphalt and dehydrogenation of said middle distillate; (b) separating the product from said first reactor by fractionation distillation into at least one dehydrogenated distillate fraction having a lower hydrogen content than the hydrogenated middle distillate fraction feed to the first reactor, and a residue fraction having a sulphur content lower than said asphalt; (c) contacting said dehydrogenated middle distillate fraction from step (b) in a second reactor with hydrogen and a hydrotreating catalyst under hydrogenation conditions; (d) circulating at least part of the middle distillate fraction product from the second reactor, said product having a higher hydrogen content than the feed to the second reactor, as feed to said first reactor (e) circulating hydrogenation catalyst from said first reactor to said second reactor and from said second reactor to said first reactor, and (f) withdrawing the residue fraction from said first reactor.

4,163,708

PROCESS FOR THE REMOVAL OF THIOLS FROM HYDROCARBON OILS

Robert L. Jacobson, Pinole, and K. R. Gibson, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 788,041, Apr. 15, 1977, abandoned, which is a continuation of Ser. No. 591,090, Jun. 27, 1975, abandoned. This application Apr. 3, 1978, Ser. No. 892,544 Int. Cl.<sup>2</sup> C10G 29/06, 23/00

U.S. Cl. 208-89

10 Claims

1. In the production of a hydrocarbon reformat from a hydrocrackable hydrocarbon oil by steps, including hydrodesulfurizing said oil, subjecting the resulting hydrodesulfurized oil to ordinary hydrocracking conditions and reforming the resulting hydrocrackate under platinum catalyzed hydrocarbon reforming conditions, the improvement comprising producing an improved feed for said reforming by removing residual thiol sulfur from said hydrocrackate by contacting said hydrocrackate in the liquid phase with a thiol scavenger, said hydrocrackate having a total sulfur-containing impurity content, calculated as sulfur, in the range below 1000 ppm, including at least 0.2 ppm of thiol impurity, said contacting being in the substantial absence of molecular oxygen and at a temperature in the range of from about 120° C. to 400° C., said scavenger comprising an essentially oil-insoluble solid composite having (1) a copper component and (2) a porous carrier component, having a surface area in the range of from about 20 to 1000 square meters per gram, said copper component being at least one thiol absorbing material selected from the group consisting of copper metal and copper compounds; and said carrier component being at least one carrier selected from the group consisting of inorganic refractory metal oxides and carbon, said contacting being continued so long as the resulting effluent oil has a thiol-sulfur content, calculated as sulfur, in the range below about 0.2 ppm.

4,163,709

CATALYST DEMETALLIZATION BY OXIDATION IN A DEFINED TEMPERATURE RANGE

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

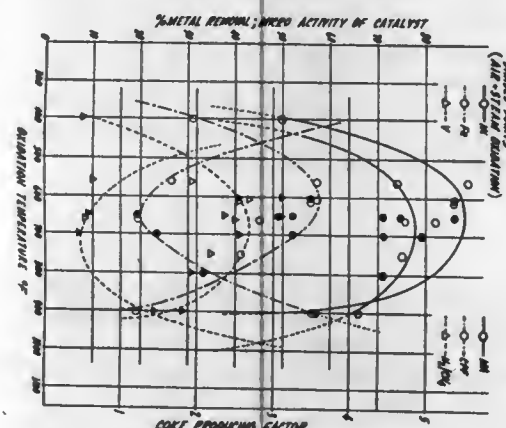
Division of Ser. No. 695,687, Jun. 14, 1976, Pat. No. 4,102,811.

This application Feb. 13, 1978, Ser. No. 877,438

Int. Cl.<sup>2</sup> B01J 29/28, 8/24; C10G 11/06

U.S. Cl. 208-120

17 Claims



1. In a catalytic cracking process for converting a metals contaminated hydrocarbon feedstock to more valuable, lower boiling hydrocarbon products in a cracking reaction zone wherein the cracking catalyst is poisoned and contaminated by

metals present in the feedstock, the improvement which comprises

- withdrawing at least a portion of said metal contaminated catalyst from the cracking reaction zone;
- contacting at least a portion of said metal contaminated catalyst with at least one sulfur containing compound to provide a catalyst containing sulfur and metal compounds;
- contacting said catalyst containing sulfur and metal compounds with an oxygen-containing gas at a temperature maintained within the range of from 550° C. to 725° C. for a time sufficient to promote subsequent metal compounds removal by converting at least a portion of said metal compounds on a promoted catalyst to a dispersible form;
- removing at least a portion of the metal compounds from the promoted catalyst;
- recovering a catalyst of reduced metal content and improved catalytic activity; and
- returning at least a portion of said catalyst of reduced metal content and improved catalytic activity to the catalytic cracking reaction zone.

4,163,710

CRACKING PROCESS EMPLOYING A COMBINATION OF REDUCTIVE AND OXIDATIVE WASHES

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa. Division of Ser. No. 695,662, Jun. 14, 1976, Pat. No. 4,101,444.

This application Feb. 13, 1978, Ser. No. 877,457

Int. Cl.<sup>2</sup> B01J 29/38, 8/24; C10G 11/06

U.S. Cl. 208-120

19 Claims

1. In a process for converting a metals contaminated hydrocarbon feedstock to more valuable, lower boiling hydrocarbon products in a cracking reaction zone wherein a cracking catalyst is poisoned and contaminated by metals present in the feedstock, the improvement which comprises:

- withdrawing at least a portion of said catalyst with contaminating metals from the cracking reaction zone;
- converting at least a portion of the contaminating metals to a dispersible form in a promoted catalyst;
- removing at least a portion of the contaminating metals from the promoted catalyst by (a) contacting the promoted catalyst with a liquid reductive wash medium, and (b) subsequently contacting the reductively washed catalyst with a liquid oxidative wash medium;
- recovering a catalyst of reduced metals content and improved catalytic activity; and
- returning at least a portion of said catalyst of reduced metals content to the cracking reaction zone.

4,163,711

CHEMICAL CONVERSION METHOD

Lloyd A. Baillie, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 660,207, Feb. 23, 1976, Pat. No. 4,081,249.

This application Jan. 5, 1978, Ser. No. 867,064

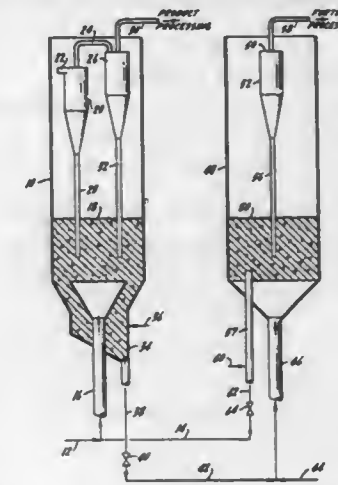
Int. Cl.<sup>2</sup> C10G 11/18

U.S. Cl. 208-161

10 Claims

1. In a method for hydrocarbon conversion wherein in a reaction zone hydrocarbon feedstock is contacted with solid particles capable of promoting said hydrocarbon conversion at hydrocarbon conversion conditions to form at least one hydrocarbon conversion product and a mixture of solid particles and vapor, the major portion by weight of said solid particles having diameters in the range from about 10 microns to about 500 microns, the improvement which comprises: contacting said hydrocarbon feedstock with said solid particles and separating at least a portion of said solid particles from said mixture in a separation means comprising a chamber defined by an interior cylindrical surface; an inlet means in fluid communication with both said reaction zone and said chamber to allow entry of said mixture to said chamber, said inlet means being

situated so that the movement of said mixture in said chamber causes solid particles to preferentially move toward said cylindrical surface; a fluid outlet means in fluid communication with said chamber to allow at least a portion of said vapor of said mixture to exit from said chamber; and a particle outlet means in fluid communication with said chamber to allow at least a



portion of said solid particles to exit from said chamber; the improvement which comprises:

arresting means located in spaced relation to said interior cylindrical surface to slow the velocity of at least a portion of said solid particles as said solid particles preferentially move toward said cylindrical surface, thereby inhibiting the attrition of said solid particles.

4,163,712

TREATMENT OF LIQUID

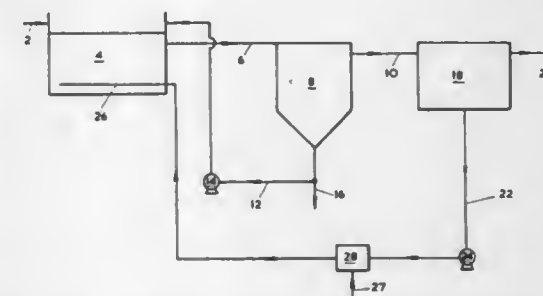
Kenneth C. Smith, Essex, England, assignor to BOC Limited, London, United Kingdom

Continuation-in-part of Ser. No. 430,260, Jan. 3, 1974, abandoned. This application Jun. 12, 1975, Ser. No. 586,390 Claims priority, application United Kingdom, Jan. 8, 1973, 1027/73; Mar. 1, 1973, 10082/73; Jun. 26, 1973, 30236/73

Int. Cl.<sup>2</sup> C02C 1/06

U.S. Cl. 210-7

20 Claims



1. In a process for providing a dissolving within a body of liquid at generally atmospheric pressure a gas which is sparingly soluble in the liquid by removing a portion of the liquid as a stream of liquid, and pressurizing the stream of liquid during introduction of the sparingly soluble gas into the stream of liquid prior to introduction of the pressurized stream of liquid back into the body of liquid, the improvement which comprises the steps of:

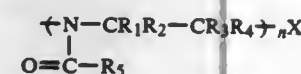
- passing the pressurized stream of liquid through a conduit and introducing the gas into the conduit under turbulent conditions as a substantially inner gas phase of undissolved gas bubbles at a rate to provide in the pressurized stream 100% to 1500% by weight of undissolved gas in excess of the equilibrium saturation value of said gas in said liquid at the pressure of said pressurized stream to establish a gas-



1. A method of complexing phenolics comprising contacting



a phenol with an acylated polyamine bearing a plurality of units corresponding to the formula



wherein: R<sub>1</sub>-R<sub>4</sub> are each independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl of from 1 to about 6 carbon atoms, with the proviso that at least 2 of R<sub>1</sub>-R<sub>4</sub> are hydrogen; R<sub>5</sub> is hydrogen, phenyl or alkyl of from 1 to about 24 carbon atoms; n is an integer of at least 1; and X is a terminal inorganic or organic group.

2. The method of claim 1 conducted in an aqueous medium.

4,163,719

## HYDROCYCLONE SEPARATOR ARRANGEMENT

Jacek J. Macierewicz; Johannes J. Richters, and James E. St. John, all of Calgary, Canada, assignors to Elast-O-Cor Products & Engineering Limited, Canada

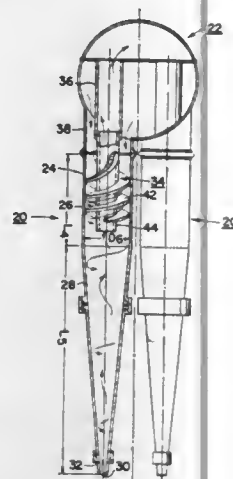
Filed Sep. 7, 1977, Ser. No. 831,283

Claims priority, application Canada, Jan. 26, 1977, 270494

Int. Cl.<sup>2</sup> B01D 21/26

U.S. Cl. 210-84

9 Claims



1. A hydrocyclone separator including a body having a wall defining an elongated chamber of generally circular cross-section and shaped such that it decreases in cross-sectional size from a large end to a smaller apex end, a reject outlet at the apex end and an accept outlet at the large end, both being located in axial alignment with said chamber, and means for feeding a liquid suspension generally tangentially into said chamber whereby to form a liquid vortex in said chamber surrounding a central air core extending longitudinally of the chamber, the feeding means including guide vane means defining channel means for the flow of said suspension there-through, and wherein said accept outlet comprises an elongated tubular member defining an annular region between itself and the wall of said chamber with said guide vane means being located in the annular region and extending between said tubular member and the wall of the chamber such that the channel means has a width determined by the distance from said tubular member to said wall of said chamber throughout the length thereof, said guide vane means defining:

(a) a transition section wherein the guide vane means are disposed at a shallow angle to the longitudinal axis of the chamber at the large end thereof to initially receive the feed suspension in a path of travel directed generally longitudinally of the chamber with such angle gradually increasing so as to gradually swing said suspension from motion in the generally longitudinal direction to motion in the form of a spiral around the longitudinal axis of said chamber, said channel means also being of gradually decreasing cross-sectional area along the length thereof to

effect gradual acceleration of the suspension in said transition section, and

(b) a helical section of constant lead smoothly connected to said transition section, wherein said channel means defined by the guide vane means in said helical section is of substantially constant cross-sectional area along the length thereof, to cause the accelerated suspension to rotate around the chamber axis to impart centrifugal and shear forces thereto and to effect partial separation of the suspension prior to entry of the suspension into the separation chamber across substantially the full width of the annular region between said tubular member and the wall of the chamber.

8. A method of separating suspensions in a hydrocyclone separator including a body having a wall defining an elongated chamber of generally circular cross-section and shaped such that it decreases in cross-sectional size from a large end to a smaller apex end with a reject outlet for heavier portions of the suspension at the apex end and a tubular accept outlet for lighter portions of the suspension at the large end, both being located in axial alignment with said chamber, the accept outlet defining an annular region between itself and the chamber wall and having guide vane means in said annular region defining a transition section wherein the guide vane means are initially at a shallow angle to the longitudinal axis of the chamber and a helical section of constant lead smoothly connected to said transition section, the method including feeding a liquid suspension into said chamber whereby to form a liquid vortex in said chamber surrounding a central air core extending longitudinally of the chamber, said step of feeding the liquid suspension including passing the feed suspension into the separator via the full area of the annular region defined between the accept outlet and the chamber wall and in a path of travel initially directed generally longitudinally of the chamber in the transition section and then gradually swinging said suspension from motion in the generally longitudinal direction to motion in the form of a spiral path around the longitudinal axis of the chamber while gradually accelerating the suspension by way of a gradual reduction in the cross-sectional area of the flow path of the suspension along its length as it travels along the transition section, the width of said path being at all times equal to the distance between the tubular accept outlet and the chamber outlet and the chamber wall, and then causing the suspension to enter the helical section and to rotate around the chamber axis while travelling in a flow path of substantially constant cross-sectional area to impart centrifugal forces thereto so as to induce heavier particles in the suspension to move radially outwardly to the wall of the chamber before the suspension enters into the separation chamber and feeding the suspension generally tangentially into the separation chamber in a path whose width is defined by the distance between said tubular accept outlet and the chamber wall.

4,163,720

## APPARATUS FOR THE BIOLOGICAL PURIFICATION OF WASTE WATER

Hans Müller, Erlenbach, Switzerland, assignor to PEC Process Engineering Company SA, Maennedorf, Switzerland

Filed Mar. 6, 1978, Ser. No. 884,632

Claims priority, application Switzerland, Mar. 4, 1977, 2715/77

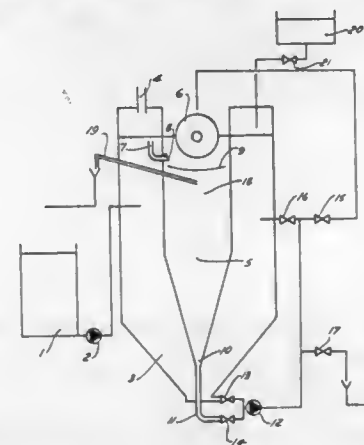
Int. Cl.<sup>2</sup> C02C 1/26

U.S. Cl. 210-197

9 Claims

1. An apparatus for the multistage biological purification of waste water containing organic substances including carbohydrates and proteins, the apparatus comprising in combination an at least substantially closed first tank having a first inlet for waste water and a first outlet for withdrawing sludge produced by an aerobic degradation in said first tank, the latter being operative for holding the waste water at least substantially free from contact with air so as to prevent further oxygen from becoming dissolved in the waste water; means communicating

with said first tank for admitting a pH regulating substance into the same; a second tank located inside said first tank and including an aerator in a top portion of said second tank for dissolving oxygen in the waste water contained in said second tank, said second tank having a second outlet for withdrawing sludge produced by aerobic degradation of the waste water in said second tank; at least one conduit connecting said first tank with said second tank for conducting the waste water from said first tank into said second tank, said conduit having a first end within said first tank and a second end within said second tank above the level of said second outlet; means for recycling some of said sludge to the respective tanks; guide means including a



baffle plate in said second tank located below said second end of said conduit and operative for guiding the sludge produced by aerobic degradation alongside the walls of said second tank towards said second outlet thereof; first means for withdrawing purified water from said second tank, including a conduit having one end portion in said second tank below said guide means and another end portion extending outwardly away from and beyond said first and second tanks second withdrawing means connected to the respective first and second outlets and leading away from said first and second tanks for withdrawing sludge therefrom; and regulating means connected to said second withdrawing means for regulating withdrawal of sludge from said first and second tanks.

4,163,721

## EDGE SEALED PLEATED MEMBRANE

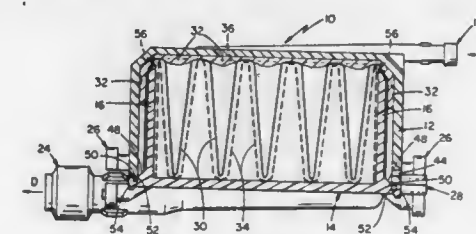
Donn D. Loddell, Golden, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Continuation of Ser. No. 784,362, Apr. 4, 1977, abandoned. This application May 15, 1978, Ser. No. 906,064

Int. Cl.<sup>2</sup> B01D 31/00, 13/00

U.S. Cl. 210-232

6 Claims



1. A fluid flow transfer apparatus comprising: a housing,

a pleated membrane within said housing, said housing including first and second interfitted casings, said first and second casings each having a base and a pair of sidewalls in a generally U-shaped cross section, the sidewalls of said second casing fitting between the sidewalls of said first casing to define a fluid chamber between said bases, said sidewalls of said second casing being spaced along

their outer surfaces from the inner surfaces of the respective sidewalls of said first casing, to define a pair of membrane sealing compartments, said membrane being contained in said fluid chamber but having a pair of opposed outermost flaps extending into but not beyond said membrane sealing compartments, where said membrane flaps are sealed to said housing, said sealing compartments being wide enough to allow introduction of adhesive into said sealing compartments after said casings are interfitted whereby adhesive can be placed on both surfaces of each of said outermost membrane flaps to bond each of them to said sidewalls defining each of said sealing compartments, said base of said second casing includes a pair of shelf portions, one of said pair extending outwardly beyond each of the sidewalls of said second casing for contacting each of said sidewalls of said first casing thereby to close said sealing compartments and fully enclose the ends of said outermost membrane flaps, said sidewalls of said second casing having tops that are spaced sufficiently from the inner surface of the base of said first casing along portions of the length of said sidewalls when said casings are interfitted so that said tops and said inner surface do not pinch said membrane along said sidewall length portions, and said housing further including means for connecting said first casing sidewalls to said second casing shelf portions to prevent adhesive in said sealing compartments from going to the outside of said housing.

4,163,722

## UNIVERSAL DIALYZER END CAP

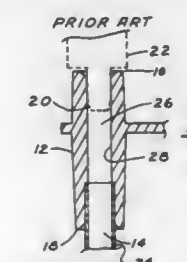
Louis C. Cosentino, Wayzata; Louis Sella, Minneapolis, and Richard A. Helms, Elk River, all of Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed Feb. 14, 1978, Ser. No. 877,620

Int. Cl.<sup>2</sup> B01D 31/00

U.S. Cl. 210-236

6 Claims



1. A universal dialyzer end cap comprising: a member having an elongated opening passing completely therethrough, one end of said opening adapted to receive a nipple of a kidney dialyzer and the other end of said opening adapted to have permanently secured therein a blood tubing line; said one end of said opening having a cross-sectional diameter which is smaller than the cross-sectional diameter of said other end, said one end of said opening having a narrowing taper of approximately 5° extending partially toward said other end of said opening such that when said one end is secured on a nipple of a dialyzer and said other end has a blood tubing line secured therein, the nipple will be firmly force fitted into the blood line to provide a tight connection and such that blood flowing between the dialyzer and the blood line is not able to contact the inner surface of said member.



1. A process of preparing a stable, fluid magnesium-containing dispersion which consists essentially of decomposing magnesium carboxylate to MgO in a non-volatile process fluid capable of being heated to the decomposition temperature of the magnesium carboxylate also containing a dispersant capable of retaining the magnesium oxide formed by the decomposition in stable suspension at a temperature greater than about 230° C., said process containing less than a stoichiometric amount of carboxylate, based on  $Mg(OH)_2$  or equivalent.

4,163,729

# SYNERGISTIC COMBINATIONS OF HYDRATED POTASSIUM BORATE, ANTIWEAR AGENTS, AND ORGANIC SULFIDE ANTIOXIDANTS

John H. Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 636,386, Nov. 28, 1975, Pat. No. 4,089,790. This application Mar. 29, 1978, Ser. No. 891,415. The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C10M 3/18, 5/14, 7/20, 7/24

U.S. Cl. 252—18

16 Claims

1. A lubricating oil composition containing dispersed therein (1) from 0.1 to 60 weight percent of a particulate hydrated potassium borate having a mean particle size less than 1 micron and having a boron-to-potassium ratio of 2.5 to 4.5 and containing from 0.01 to 5 waters of hydration, (2) from 0.01 to 5 weight percent of an antiwear agent selected from (a) a zinc dihydrocarbyl dithiophosphate having from 4 to 20 carbons in each hydrocarbyl group, (b) a C<sub>1</sub> to C<sub>20</sub> ester, C<sub>1</sub> to C<sub>20</sub> amide, or C<sub>1</sub> to C<sub>20</sub> amine salt of a dihydrocarbyl dithiophosphoric acid having from 4 to 20 carbons in each hydrocarbyl group, (c) a zinc alkyl aryl sulfonate; and (d) mixtures thereof, and (3) from 0.1 to 5 weight percent of an oil-soluble antioxidant organic sulfur compound containing from 3 to 40 weight percent sulfur, which sulfur is present as an organic sulfide or polysulfide or mixtures thereof.

4,163,730

# HYDROXYALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS LUBRICANT ADDITIVES

Charles P. Bryant, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

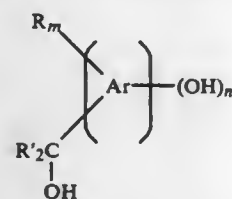
Division of Ser. No. 678,101, Apr. 19, 1976, Pat. No. 4,108,784, which is a continuation-in-part of Ser. No. 459,750, Apr. 9, 1974, abandoned. This application Apr. 28, 1978, Ser. No. 901,173

Int. Cl.<sup>2</sup> C10M 1/32

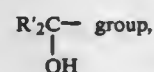
U.S. Cl. 252—34.7

16 Claims

1. A lubricant composition comprising a major amount of at least one lubricating oil and a minor, but engine sludge dispersing, amount of a product made by the process comprising reacting at a temperature ranging from about 50° C. to about 300° C. (A) at least one alpha hydroxyalkyl hydroxy aromatic compound of the general formula



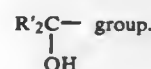
wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, said aromatic nucleus substituted with 1 to 3 lower alkoxy, lower alkylthio, chloro, or nitro substituents, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, each R' is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in the R' groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a



with

(B) at least one hydrocarbyl, alpha-beta olefinically unsaturated compound selected from the group consisting of C<sub>2-40</sub> nitriles, and ammonium and metal salts of C<sub>2-40</sub>

carboxylic acids; the ratio of (A) to (B) is between about 0.5:1 to about 2:1, and the reaction of (A) with (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one



4,163,731

# FIRE RESISTANT FUNCTIONAL FLUID COMPOSITIONS BASED ON PHOSPHATE ESTERS AND SUBSTITUTED AROMATIC COMPOUNDS

Donald R. Randell, Stockport; Thomas G. Hyde, Sale; Frank Lamb, Bury; Brian G. Clubley, Sale, and William D. Phillips, Stockport, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 26, 1977, Ser. No. 846,223

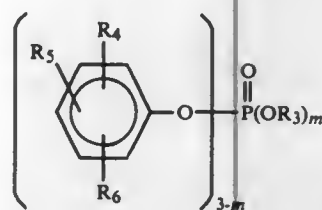
Claims priority, application United Kingdom, Oct. 28, 1976, 44752/76

Int. Cl.<sup>2</sup> C10M 3/40

U.S. Cl. 252—78.5

16 Claims

1. A functional fluid composition comprising (a) a phosphorus acid ester of formula II



in which

m is an integer from 0 to 3,

R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub>, which may be the same or different, are hydrogen, alkyl having 1 to 9 carbon atoms, cycloalkyl having 6 to 12 carbon atoms, haloalkyl having 1 to 9 carbon atoms, but excluding halomethyl, said haloalkyl groups containing one or more chlorine atoms, chloro, aryl having 6 to 10 carbon atoms or aralkyl having 7 to 12 carbon atoms, and

R<sub>3</sub> is alkyl having 1 to 16 carbon atoms or haloalkyl containing one or more chlorine atoms; and

(b) a compound of formula I



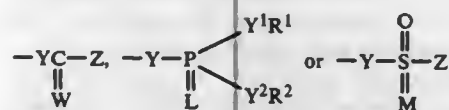
(I)

in which

R represents an aromatic hydrocarbon or aromatic heterocyclic containing residue,

n is an integer of at least 2, and

each X is the same or different and represents halo, OH, SH, NH<sub>2</sub>, COOH, PO<sub>3</sub>H<sub>2</sub>, OB(OH)<sub>2</sub>, OR<sup>1</sup>, SR<sup>1</sup>, NHR<sup>1</sup>, NR<sup>1</sup>R<sup>2</sup>, OB(OR<sup>1</sup>)(OR<sup>2</sup>),



where Y, Y<sup>1</sup> and Y<sup>2</sup> are independently —O—, —NH—, —NR<sup>1</sup>—, —S— or a direct bond,

Z is hydrogen, R<sup>1</sup>, OR<sup>1</sup>, SR<sup>1</sup>, NH<sub>2</sub>, NHR<sup>1</sup>, NR<sup>1</sup>R<sup>2</sup> or a direct bond linking



to R or to a CH<sub>2</sub> attached to R,

W is O, S, NH or NR<sup>1</sup>,

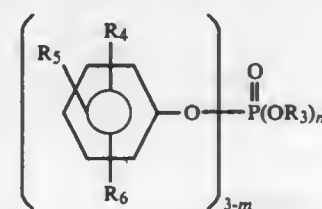
L is O, S or is absent,

M is O, S or is absent, and

R<sup>1</sup> and R<sup>2</sup> are independently a straight or branched chain alkyl having 1 to 12 carbon atoms, alkenyl having 2 to 12 carbon atoms, alkynyl having 2 to 12 carbon atoms, cycloalkenyl having 5 to 12 carbon atoms, cycloalkenyl having 5 to 12 carbon atoms, aralkyl having 7 to 12 carbon atoms, aralkenyl having 7 to 12 carbon atom or alkaryl having 7 to 12 carbon atoms.

11. A functional fluid composition comprising

(a) a phosphorus acid ester of formula II



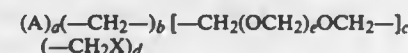
in which

m is an integer from 0 to 3.

R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub>, which may be the same or different, are hydrogen, alkyl having 1 to 9 carbon atoms, cycloalkyl having 6 to 12 carbon atoms, haloalkyl having 1 to 9 carbon atoms, but excluding halomethyl, said haloalkyl groups containing one or more chlorine atoms, chloro, aryl having 6 to 10 carbon atoms or aralkyl having 7 to 12 carbon atoms, and

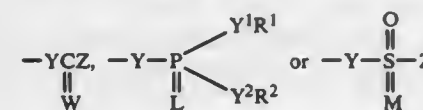
R<sub>3</sub> is alkyl having 1 to 16 carbon atoms or haloalkyl containing one or more chlorine atoms; and

(b) an oligomer of the formula



wherein

A is at least one aromatic hydrocarbon or aromatic heterocyclic residue, X is OH, OB(OH)<sub>2</sub>, OR<sup>1</sup>, OB(OR<sup>1</sup>)(OR<sup>2</sup>),



where Y, Y<sup>1</sup> and Y<sup>2</sup> are O,

Z is hydrogen, R<sup>1</sup>, OR<sup>1</sup>, SR<sup>1</sup>, NH<sub>2</sub>, NHR<sup>1</sup>, NR<sup>1</sup>R<sup>2</sup> or a direct bond linking



to A or to a CH<sub>2</sub> attached to A,

W is O, S, NH or NR<sup>1</sup>,

L is O, S or is absent,

M is O or is absent, and

R<sup>1</sup> and R<sup>2</sup> are independently a straight or branched chain alkyl having 1 to 12 carbon atoms, alkynyl having 2 to 12 carbon atoms, cycloalkenyl having 5 to 12 carbon atoms, aralkyl having 7 to 12 carbon atoms, aralkenyl

having 7 to 12 carbon atoms or aralkyl having 7 to 12 carbon atoms,

a is 2 to 20, but equals b+c+1,

b is 0 to 19,

c is 0 to 19,

e is 0 to 10, and

d is 0 to 2a, but with the proviso that when c is 0, d must be at least 2, and when c is 1, d must be at least 1, so that there are at least two (—CHX) groups per molecule, the (—CH<sub>2</sub>OCH<sub>2</sub>—) group counting as (—CH<sub>2</sub>X) for this purpose.

4,163,732

# DETERGENT COMPOSITION CONTAINING WATER-INSOLUBLE PHOSPHORUS-CONTAINING ALUMINOSILICATE BUILDERS

Fumio Sai, Funabashi, and Moriyasu Murata, Chiba, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,245

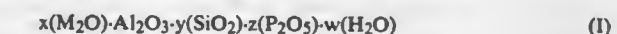
Claims priority, application Japan, Dec. 6, 1976, 51-146727

Int. Cl.<sup>2</sup> C11D 3/36, 3/08, 7/36

U.S. Cl. 252—99

9 Claims

1. A detergent composition consisting essentially of 3 to 95% by weight of a water-insoluble, phosphorus-containing alkali metal aluminosilicate having the formula (I):



wherein M is an alkali metal selected from the group consisting of sodium and potassium, x, y, z and w are the mole numbers of the respective components, wherein x, y and z satisfy the following relationships:

$$0.50 \leq x \leq 1.10,$$

$$0.80 \leq y \leq 2.50, \text{ and}$$

$$0.05 \leq z \leq 0.80,$$

and w is zero or an optional positive number, from 1 to 50% by weight of water-soluble organic surfactant selected from the group consisting of anionic, nonionic and amphoteric water-soluble organic surfactants, and mixtures thereof; from zero to 50% by weight of water-soluble alkali metal builder salt and mixtures thereof, and from 1 to 50% by weight of water-soluble substance selected from the group consisting of alkali metal silicates, alkali metal carbonates, alkali metal sulphates and mixtures thereof.

4,163,733

# SYNERGISTIC COMPOSITIONS FOR CORROSION AND SCALE CONTROL

John D. Buckman; Gerald D. Mercer, and John D. Pera, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

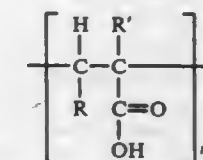
Filed Oct. 25, 1977, Ser. No. 845,011

Int. Cl.<sup>2</sup> C02B 5/06

U.S. Cl. 252—180

20 Claims

1. A corrosion and scale inhibiting composition consisting essentially of on a weight basis: about 10 to about 90% dimethylaminoethylenebis-(phosphonic acid) or a water-soluble salt thereof, a water-soluble polymer having a linear hydrocarbon structure with side chain carboxylic groups exemplified by the structure:

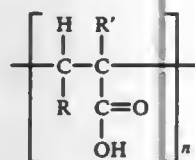




wherein R is hydrogen or —COOH and R' is hydrogen or methyl in an amount varying from about 10 to about 90% and one or more of the following:

- A. Water
- B. about 0 to 25% of an aqueous solution of phosphorous acid or an alkali metal salt thereof, or
- C. about 1.5 to about 13.5% of an aqueous solution of a water soluble zinc salt.

11. A process for inhibiting corrosion and scaling of metal surfaces in water systems consisting essentially in adding to water in said systems an effective amount of a composition consisting essentially of on a weight basis: about 10 to about 90% dimethylaminomethylenebis (phosphonic acid) or a water-soluble salt thereof, a water-soluble polymer having a linear hydrocarbon structure with side chain carboxylic acid groups exemplified by the structure:



wherein R is hydrogen or —COOH and R' is hydrogen or methyl in an amount varying from about 10 to about 90% and one or more of the following:

- A. Water
- B. about 0 to 25% of an aqueous solution of phosphorous acid or an alkali metal salt thereof, or
- C. about 1.5 to about 13.5% of an aqueous solution of a water-soluble zinc salt.

4,163,734

**REFERENCE LIQUID FOR BLOOD GAS EQUIPMENT**  
Søren K. Sørensen, Glostrup, and Carl C. Holbek, Allerød, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Continuation of Ser. No. 652,817, Jan. 27, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 866,951

Claims priority, application Denmark, May 30, 1975, 2449/75  
Int. Cl.<sup>2</sup> C09K 3/00

U.S. Cl. 252—408

9 Claims

1. A stable synthetic water based reference liquid for quality control and/or calibration of blood gas measuring equipment, said liquid being enclosed in a gas-tight container and containing HCO<sub>3</sub><sup>-</sup> ions, H<sup>+</sup> ions, CO<sub>2</sub> gas, and O<sub>2</sub> gas plus an additional pH buffer system different from the pH buffer system constituted by the HCO<sub>3</sub><sup>-</sup> ions and the CO<sub>2</sub> gas, said liquid showing, at a fixed temperature, known pH, pCO<sub>2</sub> and pO<sub>2</sub> values, said liquid additionally containing oxygen reversibly contained in a dispersed non-proteinaceous organic substance which shows higher solubility for oxygen than does water, and, optionally, a coloring component showing maximum or significant absorption at about 500 nm, said organic substance being

(a) a water-insoluble organic substance in which O<sub>2</sub> is soluble to an extent of at least 12% by volume at 1 atmosphere oxygen pressure and 25° C., said water-insoluble substance being a liquid of lipid character emulsified in a liquid-in-water type emulsion, in the water base of the reference liquid, or a solid suspended in the water base of the reference liquid, or

(b) an oxygen complex-forming metal organic compound of a transition group metal dissolved in the water base of the reference liquid, the stability constant of the oxygen complex of which metal organic compound is in the range of 1×10<sup>3</sup> to 10<sup>5.5</sup>.

4,163,735

# CATALYST PREPARATION METHOD

John A. Fetchin, and William F. Marzluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 25, 1977, Ser. No. 818,775

Int. Cl.<sup>2</sup> B01J 27/20; C01B 31/24, 33/24

U.S. Cl. 252—443

5 Claims

1. A process for the preparation of copper-magnesium silicate-carbonate catalyst containing about three to five parts by wt copper per part magnesium for the hydration reaction of a nitrile with water comprising:

- A. Preparing a precipitate of insoluble carbonates and silicates of magnesium and copper by addition of soluble magnesium and copper salts in aqueous solution to soluble silicate and carbonate compounds in aqueous solution,
- B. Separating the precipitated solids from the mother liquor, drying the filtered solids at drying temperatures in the range from 170° to 200° C., and powdering the dry solids,
- C. Tableting the dry powdered solids with added tableting lubricants to make the powder into catalyst pellets, and
- D. Activating the catalyst pellets by reducing copper compounds therein to copper metal and calcining at 300° C. to 400° C. to strengthen the catalyst.

3. Hydration catalyst made by the process defined by claim 1.

4,163,736

# METHOD OF PRODUCING PLATINUM-CLAD ARTICLES

Gary J. K. Acres, and Alan S. Darling, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 558,689, Mar. 17, 1975, abandoned, which is a division of Ser. No. 263,169, Jun. 15, 1972, abandoned. This application Feb. 28, 1977, Ser. No. 772,739

Claims priority, application United Kingdom, Jun. 16, 1971, 28315/71

Int. Cl.<sup>2</sup> B01J 21/04, 23/40, 35/02

U.S. Cl. 252—466 PT

3 Claims

1. A method of producing an article operative at high temperatures and under non-oxidizing or reducing conditions comprising a core made from a refractory compound, a sheath of a platinum group metal or of an alloy based on at least one metal of the platinum group enclosing the core and a barrier layer intermediate the core and the sheath, comprising flame spraying onto the core a mixture of magnesia and a small amount of alumina to form said barrier layer and subsequently applying the platinum group metal or alloy over said barrier layer, the refractory core being selected from the group consisting of refractory oxides, carbides, nitrides, sulphides, silicides and ceramic materials and the amount of alumina in said mixture being such that it facilitates spraying while retaining the chemical characteristics of magnesia rather than alumina in the resultant deposit.

4,163,737

# SUBSTITUTED BICYCLOCTENEMETHANOLS, PROCESS FOR PRODUCING SAME AND USES OF SAME FOR AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF TOBACCOS, PERFUMES AND PERFUMED ARTICLES

James M. Sanders, Eatontown; Joaquin F. Vinals, Red Bank, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

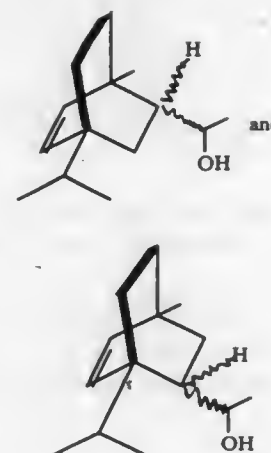
Division of Ser. No. 780,685, Mar. 23, 1977. This application Jun. 8, 1978, Ser. No. 913,735

Int. Cl.<sup>2</sup> C11B 9/00

U.S. Cl. 252—522

4 Claims

1. A fragrance modifying composition comprising at least one bicyclo[2.2.2]octene derivative having a formula selected from the group consisting of:



or a mixture thereof wherein the wavy lines represent exo and endo configurations of the ethanol moiety with respect to the carbon-carbon double bond of the bicyclo[2.2.2]octene moiety, and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, other alcohols, aldehydes, ketones, esters, nitriles and lactones.

4,163,738

# WASHABLE NON-SPLATTER INK

William C. Corwin, La Grange, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 14, 1978, Ser. No. 886,363

Int. Cl.<sup>2</sup> C08L 33/24

U.S. Cl. 260—29.6 ME

6 Claims

1. An ink for use in oscillographic pen recorders comprising:

- (a) a water based solvent;
- (b) about 10 mgm of polyacrylamide for every 100 ml of said solvent;
- (c) about 20 mgm of an antibacterial agent for every 100 ml of said solvent;
- (d) about 20 mgm of an antioxidant for every 100 ml of said solvent; and
- (e) about 7 gm of dye for every 100 ml of said solvent.

4,163,739

# COPOLYMER SOLUTION CONSISTING OF ACRYLIC RESIN, PROCESS FOR ITS MANUFACTURE AND THE USE THEREOF IN REACTIVE LACQUERS

Horst Döllbor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,661

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618809

Int. Cl.<sup>2</sup> C08K 5/00, 5/01, 5/04; C08F 220/62

U.S. Cl. 260—31.2 R

10 Claims

1. Copolymer solution consisting of A) 10 to 30% by weight of inert organic solvent and B) 70 to 90% by weight of copolymers which have been manufactured by heating to 150° to 180° C., in the presence of mixtures of diacyl peroxides or peresters and alkyl hydroperoxides or dialkyl peroxides as the polymerization initiators, a mixture of inert solvents having a boiling range of 150° to 180° C. and the component to be esterified, that is to say a) 5–24% by weight of glycidyl esters of  $\alpha$ -alkylalkanemonocarboxylic acids and/or  $\alpha$ , $\alpha$ -dialkylalkanemonocarboxylic acids of the following empirical formula C<sub>12–14</sub>H<sub>20–26</sub>O<sub>3</sub>, or a mixture of glycidyl esters of  $\alpha$ ,  $\alpha$ -dialkylalkanemonocarboxylic acids having a content up to about 10 percent by weight of the mixture of glycidyl esters of  $\alpha$ -alkylalkanemonocarboxylic acids of the said empirical formula, the mixture having an epoxide equivalent of 240 to 250, with the slow, uniform addition of b) 12–30% by weight of hydroxyethyl acrylate and/or hydroxyethyl methacrylate, c) 1–10% by weight of acrylic acid, d) 20–50% by weight of

styrene and d<sub>2</sub>) 5–35% by weight of methyl methacrylate, the components a, b, c, d<sub>1</sub> and d<sub>2</sub> having been employed in such quantities that their sum adds up to 100% by weight and the polymerisation and condensation reactions proceeding simultaneously and jointly and the additional condition applying that the components a, b and c have been employed in such quantities that the copolymers have a hydroxyl group content of 3.5 to 6.5% by weight, it being necessary that the components A and B add up to 100% by weight.

4,163,740

# PROCESS FOR THE PREPARATION OF POLYSTYRYLPIRIDINE

Bernard P. Malassine, Vert le Petit; Jean-Claude C. Gautier, Ablon sur Seine; Sammy H. Chevalier, Paris, and Gérard R. Bertelean, Ris Orangis, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jan. 19, 1978, Ser. No. 870,854

Claims priority, application France, Jan. 25, 1977, 77 01955

Int. Cl.<sup>2</sup> C08G 12/26

U.S. Cl. 260—31.2 N

10 Claims

1. A process for the preparation of a resin solution for use in the preparation of a composite material by impregnation which consists of carrying out the polycondensation of at least an aromatic dialdehyde and at least one pyridinic derivative substituted by at least two reactive methyl groups at a temperature between 150° C. and 200° C. with an excess of the pyridinic derivative, stopping the reaction after the extent of condensation is equal to 50–63%, essentially totally eliminating the excess of the pyridinic derivative and dissolving the polycondensate so obtained in a solvent which is (1) ethyl acetate, (2) methylene chloride, (3) trichloroethylene, (4) chlorobenzene, (5) ethanol, (6) n-propanol or (7) a mixture of n-propanol and a solvent which is a member selected from the group consisting of (a) methylethylketone (b) ethyl acetate (c) methylene chloride (d) trichloroethylene (3) chlorobenzene (f) ethanol.

4,163,741

# SAND MOLD COMPOSITIONS CONTAINING AS CATALYST, METHYL ALCOHOL SOLUTIONS OF BENZENESULPHONIC ACID

Sergie S. Zhukovsky, Profsojuznaya ulitsa, 17, korpus 1, kv. 15, Moscow; Nikolai I. Shadrin, Leninsky prospekt, 5, kv. 15, Donetsk; Sergei D. Teplyakov, Seleznevskaya ulitsa, 13, kv. 3, Moscow, all of U.S.S.R.; Abram M. Lyass, deceased, late of Moscow, U.S.S.R., and by Inna E. Lyass, administrator, Sharikopodshipnikovskaya ulitsa, 2, kv. 42, Moscow, U.S.S.R.

Filed Apr. 15, 1977, Ser. No. 787,764

Int. Cl.<sup>2</sup> C08K 3/36, 5/05, 5/42

U.S. Cl. 260—33.4 R

10 Claims

1. A cold setting composition for making cores and molds consisting essentially of 100 parts by weight of a refractory filler, between 1.0 and 3.0 parts by weight of a resol phenol-formaldehyde resin binder and between 0.4 and 2.0 parts by weight of a crystal hydrate benzenesulphonic acid catalyst in the form of an 80- to 92-percent solution in methyl alcohol, whereby said cores and molds have compression strength of at least 60 N/cm<sup>2</sup>.

4,163,742

# PROCESS AND PRODUCT PREPARED FROM TETRAFLUOROETHYLENE RESIN AND GRAPHITE FIBERS

Jacob F. Mansure, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 9, 1978, Ser. No. 876,339

Int. Cl.<sup>2</sup> C08K 3/04, 7/06

U.S. Cl. 260—42.17

7 Claims

1. Process for preparing a blend of a melt-fabricable tetrafluoroethylene resin and graphite fibers which comprises mixing (a) melt-fabricable tetrafluoroethylene resin particles having an

average size by weight of less than 400  $\mu\text{m}$  in an amount sufficient to result in 50%-90% by weight of the blend being resin particles and (b) graphite fibers, in a mixture of water and a water-miscible organic solvent in which the amount of organic



solvent in the mixture of water and solvent is between about 1 and 90 percent by weight of solvent and water, and then separating the blend of resin and graphite fibers from the mixture of water and solvent.

4,163,743

# BETA-LACTAMS, THEIR PRODUCTION FROM AZETIDINE CARBOXYLIC ACIDS, INTERMEDIATES THERETO AND DERIVATIVES THEREOF

Harry H. Wasserman, and Alan W. Tremper, both of New Haven, Conn., assignors to Research Corporation, New York, N.Y.

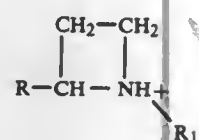
Filed Sep. 8, 1977, Ser. No. 831,441

Int. Cl.<sup>2</sup> C07D 205/08, 407/06, 403/06, 405/06

U.S. Cl. 260-239 A

9 Claims

1. A process for preparing a lactam which comprises reacting an ammonium salt, the anionic portion of which is the anion of an acid which is capable of forming iminium salts by oxidative decarboxylation of a corresponding tertiary amine and the cationic portion of which is a cation of the formula

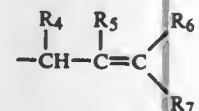


wherein

R is the residue of a hydrocarbon aryl peracid, alkyl peracid or alkyl hydroperoxide formed by removal of a single hydrogen atom therefrom; and

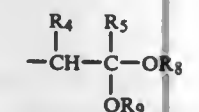
R<sub>1</sub> is selected from the group consisting of:

(a) an alkenyl group of the formula

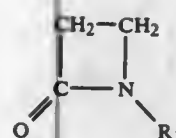


wherein R<sub>4</sub> is p-alkoxyphenyl or p-benzyloxyphenyl and R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> are each hydrogen or alkyl of 1-3 carbon atoms; and

(b) an acetal of the formula



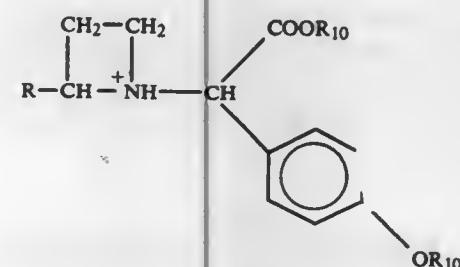
wherein R<sub>4</sub> and R<sub>5</sub> have the above-indicated values while R<sub>8</sub> and R<sub>9</sub> are each alkyl of 1-6 carbon atoms or together form alkylenedioxy of 2-4 carbon atoms; with a strong base having a pK<sub>b</sub> of at least 10<sup>-5</sup> to form a corresponding cyclic lactam of the formula:



wherein R<sub>1</sub> has the above-indicated values.

8. A method for synthesizing 3-amino-nocardinic acid, which comprises:

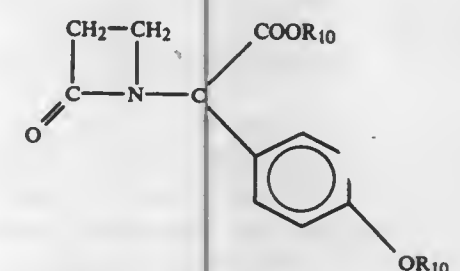
(a) reacting an ammonium salt, the anionic portion of which is the anion of an acid which is capable of forming iminium salts by oxidative decarboxylation of a corresponding tertiary amine and the cationic portion of which is a cation of the formula



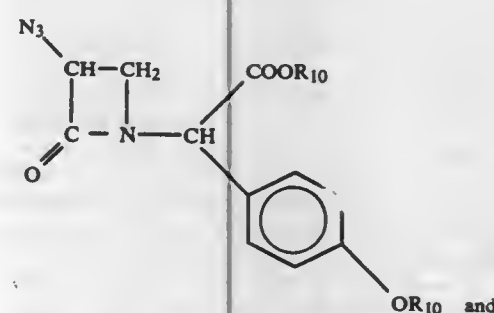
wherein

R is the residue of a hydrocarbon aryl peracid, alkyl peracid or alkyl hydroperoxide formed by removal of a single hydrogen atom therefrom; and

R<sub>10</sub> is alkyl of 1-4 carbon atoms, benzyl or benzhydryl with a strong base having a pK<sub>b</sub> of at least 10<sup>-5</sup> to form a corresponding beta-lactam of the formula:



(b) introducing an azide group -N<sub>3</sub> into the 3-position of said beta-lactam to form a corresponding beta-lactam azide of the formula



(c) reducing the azide group to a primary amino group -NH<sub>2</sub> and cleaving the hydroxyl masking groups R<sub>10</sub> to form said 3-aminonocardinic acid.

4,163,744

# SYNTHESIS OF STEROIDS

Emil T. Kaiser, 5634 S. Woodlawn Ave., Chicago, Ill. 60637

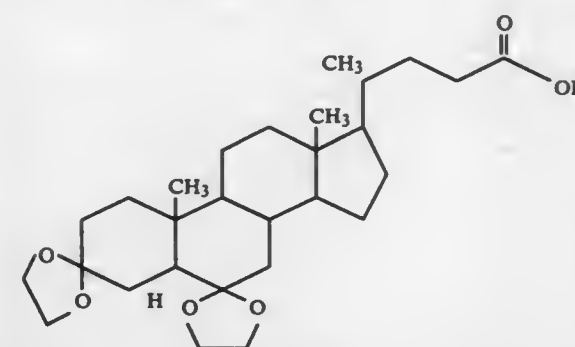
Filed Feb. 10, 1978, Ser. No. 876,753

Int. Cl.<sup>2</sup> C07J 21/00

U.S. Cl. 260-239.55 C

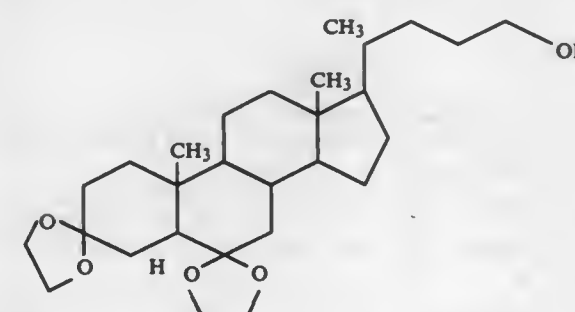
10 Claims

1. A steroid compound having the structure

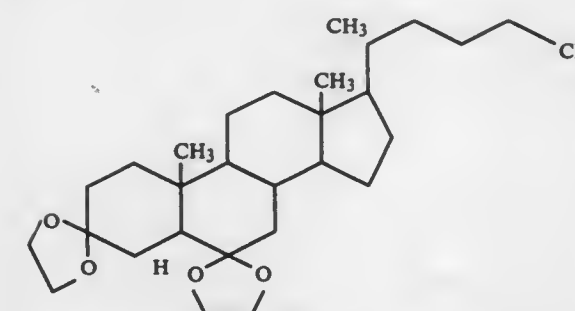


in which R is a lower alkyl group.

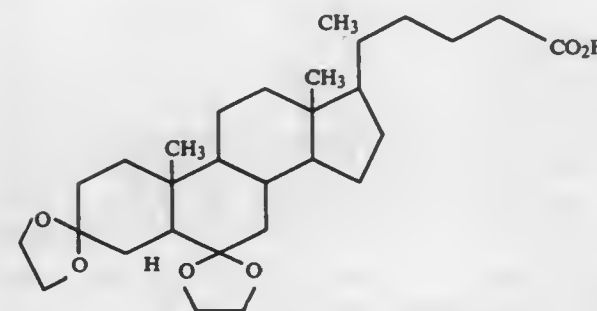
3. A steroid compound having the structure



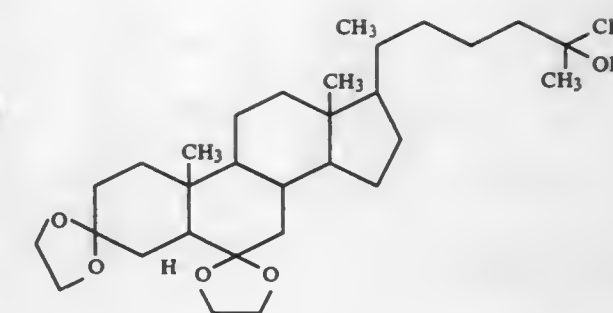
6. A steroid compound having the structure



7. A steroid compound having the structure



10. A steroid compound having the structure



4,163,745

# IMIDAZO[1,5-A]QUINOLINIUM AND IMIDAZO[1,5-A]PYRIDINIUM COMPOUNDS

Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

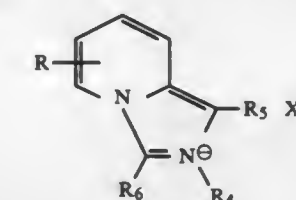
Division of Ser. No. 712,204, Aug. 6, 1976, Pat. No. 4,044,015, which is a continuation-in-part of Ser. No. 609,914, Sep. 3, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,414

Int. Cl.<sup>2</sup> C07D 471/04

U.S. Cl. 546-84

11 Claims

1. A compound selected from the group consisting of:



wherein R is hydrogen or the carbon and hydrogen atoms completing a fused 6,7-benzo moiety; R<sub>4</sub> is selected from the group consisting of alkyl having one to three carbon atoms, benzyl and substituted benzyl wherein said substituent is selected from the group consisting of chloro and dichloro; R<sub>5</sub> and R<sub>6</sub> are each selected from the group consisting of phenyl and hydrogen, provided that when R<sub>5</sub> and R<sub>6</sub> are each hydrogen, R<sub>4</sub> is selected from the group consisting of benzyl and substituted benzyl wherein said substituent is selected from the group consisting of chloro and dichloro; and X is a pharmaceutically acceptable anion.

4,163,746

# METABOLIC 5-METHYL-ISOFILAVONE-DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND COMPOSITIONS CONTAINING THE SAME

László Fener; Lóránd Farkas; Mihály Nógrádi; Borbala Vermeš; Agnes Gottsegen, and András Wolfner, all of Budapest, Hungary, assignors to Chinoin Gyógyszer és Vegyszeti Termékek Gyára Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 486,513, Jul. 8, 1974, abandoned.

Filed Oct. 26, 1977, Ser. No. 845,680

Claims priority, application Hungary, Jul. 9, 1973, CI 1396

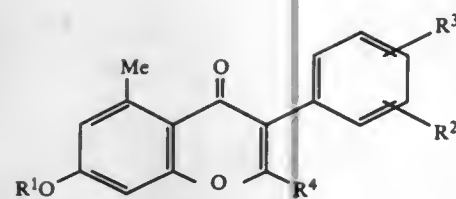
Int. Cl.<sup>2</sup> C07D 311/02

U.S. Cl. 260-345.2

5 Claims

1. An anabolically effective compound for use as a pharmaceutical or a feed additive of the formula





wherein R' is methyl, ethyl, isopropyl or hydroxyethyl; and R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are hydrogen.

4,163,747

# PROCESS FOR THE PREPARATION OF 1-ALKYLAMINO-ANTHRAQUINONES

Bernd Schroeder, Odenthal; Rudolf Braden, Odenthal-Scheuren; Wolfgang Auge; Karl-Werner Thiem, both of Cologne, and Rütger Neeff, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 806,406, Jun. 14, 1977, abandoned.

This application Sep. 22, 1978, Ser. No. 944,935

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629524

Int. Cl.<sup>2</sup> C07C 97/24

U.S. Cl. 260—378

10 Claims

1. Process for the preparation of a 1-alkylamino-anthraquinone, which comprises reacting 1-nitroanthraquinone with a monoalkylamine in molar ratios of alkylamine to 1-nitroanthraquinone of at least 2:1 at 150°–220° C. in the presence of an ether or of a hydrocarbon or of a mixture of these compounds and separating the 1-alkylamino-anthraquinone from the reaction mixture.

4,163,748

# PROPANE-1,3-DIOL PHOSPHATIDES AND METHOD OF PREPARING THE SAME

Hansjörg Eibl, Bovenden, and Alfur Nicksch, Goettingen-Nikolausberg, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften E.V., Goettingen, Fed. Rep. of Germany

Continuation of Ser. No. 689,538, May 24, 1976, abandoned, which is a continuation of Ser. No. 501,135, Aug. 28, 1974, abandoned. This application Oct. 31, 1977, Ser. No. 846,717

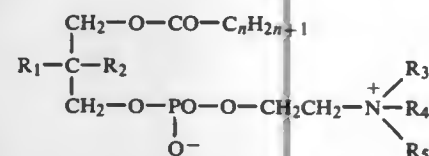
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1973, 2345057

Int. Cl.<sup>2</sup> A23J 7/00; C07F 9/02

U.S. Cl. 260—403

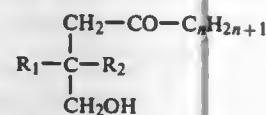
6 Claims

1. A method of preparing a phosphatide of the formula



which comprises:

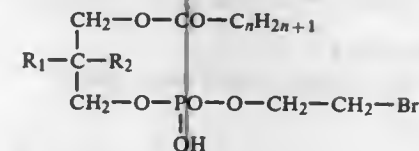
(a) reacting an alkanoyl derivative of propane-1,3-diol of the formula



with β-bromoethylphosphoric acid dichloride of the formula

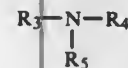


until an intermediate of the formula



is formed; and

(b) reacting said intermediate in a liquid medium essentially consisting of chloroform and a member of the group consisting of acetonitrile and nitromethane with an aminating agent of the formula



until said phosphatide is formed;

in said formulas, n being an integer between 9 and 25, R<sub>1</sub> and R<sub>2</sub> being hydrogen or alkyl having one to six carbon atoms, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> having hydrogen or methyl, at least one of said R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> being hydrogen.

4,163,749

# DISPERSING AGENTS

Frank Hauxwell; James F. Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, United Kingdom

Continuation-in-part of Ser. No. 330,882, Feb. 8, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,918

Claims priority, application United Kingdom, Feb. 28, 1972, 9033/72

Int. Cl.<sup>2</sup> B01F 17/28

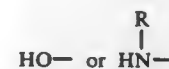
U.S. Cl. 260—404.5

6 Claims

1. A dispersant formed by reacting a polymethylene glycol having from 5 to 10 carbon atoms and an ester of the formula



wherein Z is



wherein R is alkyl

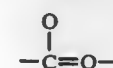
X is alkylene or a halogeno derivative thereof

T is alkylene

n is an integer from 1 to 8

Q is alkyl or hydroxyalkyl

and E and D are



provided that only one of E and D is connected to T via the carbon atom of the carbonyl group present in E or D and at least one of the groups represented by X, T, Q and R contains a carbon chain having more than four carbon atoms,

simultaneously or consecutively with an organic diisocyanate selected from hexamethylene diisocyanate, isophorone diisocyanate, 4,4'-diisocyanato-diphenylamine, 2:4-diisocyanatotoluene and 2:6-diisocyanatotoluene in the presence of an inert

organic solvent at a temperature up to the boiling point of the reaction medium.

4,163,750

# PROCESS FOR THE HYDROGENATION OF A VEGETABLE OIL

Alfred J. Bird, Hounslow; Timothy M. Priestley, Twickenham, and John M. Winterbottom, Solihull, all of England, assignors to Johnson, Matthey & Co., Limited, London, England Filed Feb. 10, 1977, Ser. No. 767,483

Claims priority, application United Kingdom, Feb. 11, 1976, 5385/76

Int. Cl.<sup>2</sup> C11C 3/12; B01J 21/18

U.S. Cl. 260—409

8 Claims

1. A process for the hydrogenation of a vegetable oil comprising a mixture of linolenic acid, linoleic acid, oleic acid and stearic acid so as selectively to hydrogenate the triply unsaturated linolenic acid within the oil to the doubly unsaturated linoleic acid, comprising contacting the oil with hydrogen gas in the presence of a catalytically effective amount of a supported metallic catalyst containing one or more of the platinum group metals under kinetic control to obtain a product in which the triply unsaturated fatty acid is substantially completely converted to only the doubly unsaturated fatty acid with substantially no trans isomerization so as to produce a product of substantially cis form, said product being predominantly linoleic and oleic acid and having an iodine content of not less than about 100–110.

4,163,751

# THIN FILM REACTION PROCESS

John E. Van der Mey, Stirling, N.J., and Frank J. Kremers, Elbridge, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 387,844, Aug. 13, 1973, Pat. No. 3,902,857. This application May 16, 1975, Ser. No. 578,245

Int. Cl.<sup>2</sup> C07C 141/00

U.S. Cl. 260—457

6 Claims

1. A process for reacting a thin film of an organic liquid with a gaseous medium comprising the steps of:

- introducing said organic liquid onto two oppositely facing reacting surfaces of a spinning disc rotatable in a substantially vertical plane;
- rotating said disc at a velocity such that said organic liquid is continuously formed into a thin film on each reacting surface and is continuously moved as a thin film towards the periphery of each reacting surface by centrifugal force;
- depositing over each thin film a substantially undiluted stream of said gaseous medium;
- reacting said organic liquid and said gaseous medium under subatmospheric pressure on said rotating reacting surfaces while cooling said surfaces;
- moving the resulting reaction products in a radially outward direction along each reacting surface; and
- collecting said reaction products.

4,163,752

# PROCESS FOR THE PREPARATION OF AMINONAPHTHALENESULPHONIC ACIDS

Otto Barth, Bergisch-Gladbach; Hans-Joachim Becker, Leverkusen; Horst Behre, Odenthal; Reinhard Kaiser, Cologne; Guido Steffan, Odenthal, and Jürgen Zander, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,558

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703076; Oct. 25, 1977, 2747714

Int. Cl.<sup>2</sup> C07C 143/56

U.S. Cl. 260—508

18 Claims

1. Process for the preparation of an aminonaphthalene-sulphonic acid by the catalytic hydrogenation of salts of nitronaphthalene-sulphonic acids, with hydrogen in the presence

of a Raney nickel catalyst at elevated temperature and under elevated pressure, characterized in that a mixture of Raney nickel catalyst which has already been used in the hydrogenation and fresh Raney nickel catalyst is initially suspended in water and/or an aqueous solution of hydrogenated product, this suspension is heated to a temperature of about 100° to 180° C. under a hydrogen pressure of about 100 to 300 bars and an aqueous solution or suspension of nitronaphthalene-sulphonic acid salts with a pH value in the range from 6 to 9 is metered into the suspension containing water at this temperature in a manner such that the content of nitronaphthalene-sulphonic acid in the reaction mixture does not exceed 3%, relative to the total weight of the reaction mixture and such that the concentration of aminonaphthalene-sulphonic acids which is finally reached is about 5 to 40% relative to the total weight of the reaction mixture.

4,163,753

# PROCESS FOR THE SIMULTANEOUS PREPARATION OF AROMATIC ACID CHLORIDES AND ALIPHATIC ACID CHLORIDES

Philip M. Pivawer, Hamden, Conn., assignor to Diaz Chemical Corporation, Holley, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,330

Int. Cl.<sup>2</sup> C07C 51/00, 53/14, 63/10

U.S. Cl. 260—544 D

19 Claims

1. A process for preparing an aromatic acid chloride and an aliphatic acid chloride comprising the following steps:

A. mixing an aliphatic carboxylic acid anhydride having the structure



where R is an aliphatic carbon chain having between one and six carbon atoms, with an aromatic compound having one or more trichloromethyl groups bonded to non-adjacent carbon atoms of the aromatic ring;

B. heating the mixture in the presence of a strong acid catalyst selected from the group consisting sulfuric and phosphoric acid, until the aliphatic carboxylic acid chloride begins to distill;

C. distilling the aliphatic carboxylic acid chloride; and

D. recovering the aromatic acid chloride from the reaction mixture.

4,163,754

# FLUORINATED SULFONAMIDES

Jean S. Y. Lew, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

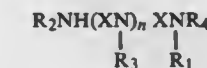
Continuation of Ser. No. 772,513, Feb. 28, 1977, abandoned, which is a division of Ser. No. 664,741, Mar. 8, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,577

Int. Cl.<sup>2</sup> C07C 143/72

U.S. Cl. 428—378

11 Claims

1. A fluorinated sulfonamide compound having formula:



wherein

X is C<sub>2-10</sub> alkylene optionally interrupted by one or more oxygen groups,

R<sub>1</sub> is hydrogen,

n is an integer from zero to four,

R<sub>2</sub> and R<sub>4</sub> are a C<sub>12-30</sub> acyl radical or a radical having the formula



in which  $R_f$  is a linear or branched  $C_{2-16}$  perfluoro alkenyl radical and in which Y is a  $C_{2-10}$  alkylene optionally interrupted with one or more oxygen atoms or an arylene radical, where  $R_8$  is independently hydrogen, a  $C_{12-30}$  acyl radical or a radical having the formula



wherein  $R_f$  and Y have the aforesaid meanings with the proviso that amongst the values of  $R_2$ ,  $R_3$  and  $R_4$  there must be at least one  $C_{12-30}$  acyl radical and at least one radical having the formula



in which  $R_f$  and Y have the aforesaid meanings.

4,163,755

**PROCESSING OF ACRYLAMIDE SOLUTIONS; CONCENTRATION WITHOUT POLYMER FORMATION**  
Ken Matsuda, Martin S. Butensky, both of Stamford; Kin H. Tsu, Norwalk, and Robert J. Munch, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.  
Continuation of Ser. No. 604,379, Aug. 13, 1975, which is a continuation of Ser. No. 410,456, Oct. 29, 1973, abandoned. This application Jan. 13, 1977, Ser. No. 759,318

Int. Cl.<sup>2</sup> C07C 103/133, 103/00, B01D 1/00, 1/16  
U.S. Cl. 260—561 N 5 Claims

1. In a process of concentrating acrylamide aqueous solution from less than 50% acrylamide to more concentrated liquid aqueous solution by flash evaporation of water from the solution at reduced pressure below atmospheric in evaporation apparatus having stainless steel surfaces contacting the concentrated solution, the improvement wherein cupric ion is in the concentrated liquid solution in the range from 5 to 200 parts copper per million parts acrylamide present as cupric salt dissolved in said concentrated solution and the pH value in said concentrated solution is maintained at pH5 or less.

4,163,756

**DIRECT OXIMATION OF KETONES**  
John N. Armor, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 11, 1978, Ser. No. 895,325

Int. Cl.<sup>2</sup> C07C 131/04, 131/00

U.S. Cl. 260—566 A 8 Claims

1. Direct process for production of oxime which comprises passing a mixture consisting essentially of a ketone, ammonia and oxygen in contact with a solid catalyst said catalyst having surface area of at least one and up to 900 square meters per gram, at temperature in the range of 50° C.—500° C., thereby producing oxime in recoverable form as a reaction product wherein the solid catalyst comprises silica, alumina, boron nitride, magnesia, zirconia, zinc oxide, or an oxide of a transition metal of Group 3-8 of the Periodic Table or mixtures thereof.

4,163,757

**BASE MODIFIED CATALYSIS IN THE STYRENEATION OF DIPHENYLAMINE**

Richard M. D'Sidocky, Ravenna, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 840,440, Oct. 7, 1977, abandoned.

Filed Nov. 13, 1978, Ser. No. 960,145

Int. Cl.<sup>2</sup> C07C 85/18

U.S. Cl. 260—570 R 7 Claims

1. An improved process for producing a styrenated diphenylamine comprising reacting diphenylamine and styrene in the presence of an acidic clay catalyst, wherein the improvement comprises modifying the acidic clay catalyst by the addition of a base to the system.

4,163,758  
**2-NITROETHYLCYCLOPENTANE COMPOUNDS AND PROCESS FOR PREPARING THE SAME**

Kiyosi Kondo, Yamato; Daiji Tunemoto, and Teruo Umemoto, both of Sagami, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

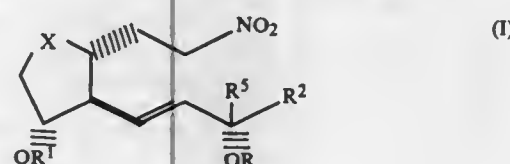
Filed Sep. 6, 1978, Ser. No. 939,937

Claims priority, application Japan, Sep. 9, 1977, 52-107863; Feb. 8, 1978, 53-12327

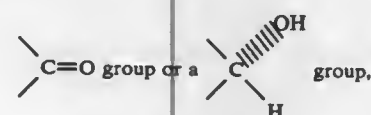
Int. Cl.<sup>2</sup> C07C 49/46

U.S. Cl. 260—586 R 3 Claims

1. A 2-nitroethylcyclopentane compound represented by the formula (I)



wherein X represents a



R and R<sup>1</sup> each represents a hydrogen atom or a conventional protective group for a hydroxy group, R<sup>2</sup> represents an unsubstituted or substituted alkyl group having 1 to 8 carbon atoms where the substituents are —O— alkyl of 1-4 carbon atoms, —S— alkyl of 1-4 carbon atoms, phenoxy optionally substituted with a halogen atom or an alkyl group having 1-4 carbon atoms and R<sup>5</sup> represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

4,163,759

**PROCESS FOR PREPARING AROMATIC HYDROXYALDEHYDES**

Kurt Bauer, and Werner Steuer, both of Holzminden, Fed. Rep. of Germany, assignors to Haarmann & Reimer Gesellschaft mit beschränkter Haftung, Holzminden, Fed. Rep. of Germany

Continuation of Ser. No. 234,653, Mar. 14, 1972, abandoned.

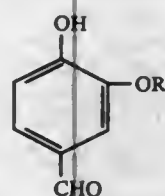
This application May 9, 1977, Ser. No. 795,359

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1971, 2115551

Int. Cl.<sup>2</sup> C07C 45/18

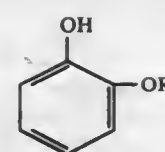
U.S. Cl. 260—600 A 12 Claims

1. The process for the preparation of an aromatic hydroxylaldehyde of the formula

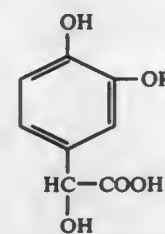


wherein

R is methyl or ethyl, which comprises condensing a phenol of the formula



with glyoxylic acid to produce a substituted glyoxylic acid of the formula



and oxidizing said substituted glyoxylic in aqueous acid at a pH at most 5 with an oxidizing agent having a redox potential in the range of from E = +0.17 to +1.84 volts wherein the oxidizing agent is potassium chlorate or sodium chlorate in admixture with copper, iron, cobalt or nickel sulphate or chloride, whereby the aromatic hydroxylaldehyde is produced in high yield based on starting phenol.

4,163,760

**CONTINUOUS PRODUCTION OF ORGANIC PHOSPHINES**

Georg Elsner, Hürth; Gero Heymer, Erftstadt, and Hans-Werner Stephan, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Hürth Knapsack, Fed. Rep. of Germany

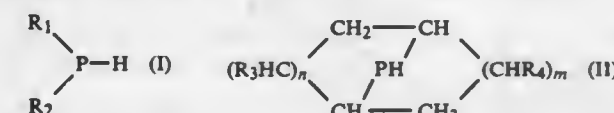
Filed Jan. 25, 1978, Ser. No. 872,250

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703802

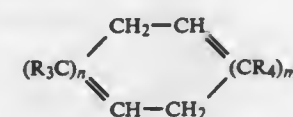
Int. Cl.<sup>2</sup> C07F 9/54

U.S. Cl. 260—606.5 P 12 Claims

1. In a process for the continuous production of organic phosphines of the following general formula (I) or (II)



in which formula (I) R<sub>1</sub> and R<sub>2</sub> each are selected from the group consisting of an alkyl-, cycloalkyl- or aralkyl group having 2 to 18 carbon atoms, or one of the substituents R<sub>1</sub> and R<sub>2</sub> is a hydrogen atom and the other is one of the said groups, and in which formula (II) m and n each are 1, 2 or 3, the sum of m+n being at most 5, and R<sub>3</sub> and R<sub>4</sub>, being identical or different, each are a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, wherein the formula (I) compound is made by reacting an alkylene, cycloalkylene or aralkylene having 2 to 18 carbon atoms with hydrogen phosphide, or the formula (II) compound is made by reacting a compound of the following general formula (III)



in which m, n, R<sub>3</sub> and R<sub>4</sub> have the meanings given above, with hydrogen phosphide at elevated temperature and under elevated pressure in the presence of a free radical-yielding catalyst solution in an inert solvent, terminating the reaction and

4,163,761

**STYRENE PROCESS**

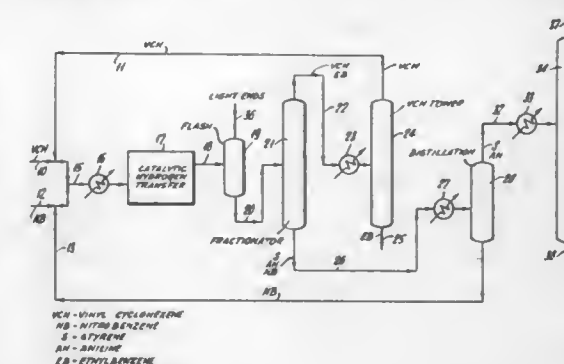
John A. Patterson, Fishkill, N.Y.; Wheeler C. Crawford, Houston, and James R. Wilson, Missouri City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,763

Int. Cl.<sup>2</sup> C07C 15/00

U.S. Cl. 585—431

6 Claims



1. The method for preparing product stream containing styrene which comprises:  
passing a charge stream containing vinyl cyclohexene and R'NO<sub>2</sub>, wherein R' is alkyl, cycloalkyl, aralkyl, aryl, or alkaryl, into contact at 170°-360° C. with a catalytic amount of copper chromite as catalyst, thereby forming product stream containing styrene; and  
withdrawing said product stream containing styrene.

4,163,762

**BLENDS OF PHENOLPHTHALEIN POLYCARBONATES WITH RUBBER-MODIFIED MONOVINYLDENE AROMATIC COPOLYMERS**

John F. Rudd, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 16, 1977, Ser. No. 806,990

Int. Cl.<sup>2</sup> C08L 67/00

U.S. Cl. 525—67 9 Claims

1. A heterogeneous blend comprising (1) from about 40 to about 90 weight percent of a copolycarbonate of from about 10 to about 60 weight percent of phenolphthalein and from about 90 to about 40 weight percent of a bis(hydroxyphenyl)alkyldiene and (2) from about 60 to about 10 weight percent of a rubber-modified copolymer which comprises (a) a random copolymer containing copolymerized therein from about 50 to about 95 weight percent of styrene and from about 50 to about



5 weight percent of acrylonitrile, said random copolymer having a solubility parameter in the range from about 9.2 to about 11.2, and (b) a rubber containing sufficient conjugated diene to enable the rubber to form a graft copolymer with said random copolymer and (c) a graft copolymer containing the rubber grafted with a copolymerized mixture of the styrene and the acrylonitrile wherein the weight ratio of the rubber being grafted to the copolymerized mixture is from about 9:1 to about 0.2:1 and the ratio of styrene to acrylonitrile in the copolymerized mixture is from about 1:1 to about 19:1.

4,163,763

# METHOD FOR PRODUCING CURABLE RESIN AND CURABLE COATING COMPOSITION

Shozo Tsuchiya, Tokyo; Hideo Hayashi; Makoto Sasaki, both of Yokohama; Kiyoshi Goto, and Toru Matsubara, both of Kyobashi, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,198

Claims priority, application Japan, Dec. 23, 1976, 51-154210  
Int. Cl.<sup>2</sup> C08F 279/02

U.S. Cl. 525—290

2 Claims

1. A curable coating composition comprising 30–80% by weight of a curable resin product of hydroxyl group-containing resin (I) esterified with acrylic acid and/or methacrylic acid, said resin (I) being a copolymerization product of a five-member cyclic compound having an unsaturated conjugated double bond represented by the general formula (A) given below;

GENERAL FORMULA (A):



(Wherein R is an organic residue having from 1 to 3 carbon atoms; m and n are integers and are in the relation of  $m+n=6$ ) or the Diels-Alder addition product thereof (A) with a compound (B) having both reactive carbon-carbon double bond or bonds and two or more hydroxy groups within one and the same molecule, 5–30% by weight of pigment and 3–30% by weight of sensitizer and less than 40% by weight of a solvent based on the total weight of the composition, said solvent comprising one or a mixture of two or more of reactive monomers having double bond or bonds.

4,163,764

# COUPLED BLOCK COPOLYMERS WITH IMPROVED TACK FOR ADHESIVES

Larry L. Nash, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 23, 1977, Ser. No. 809,360

Int. Cl.<sup>2</sup> C08F 297/04

U.S. Cl. 525—2

28 Claims

1. The process for the preparation of a coupled block copolymer which comprises the steps of polymerizing a first monomer selected from monovinyl aromatic hydrocarbons under solution polymerization conditions employing a hydrocarbon diluent, a first effective increment of a hydrocarbyl-lithium initiator, at effective conditions of temperature, pressure, and time,

adding to the still-living polymerization admixture resulting therefrom at least one second monomer selected from conjugated dienes, together with a second effective increment of a hydrocarbyllithium initiator, provided that said second initiator increment is greater than said first initiator increment, and continuing said polymerization, and thereafter treating the resulting polymerization admixture with an effective amount of a coupling agent which is at least difunctional, thereby producing a mixture of cou-

pled block copolymers exhibiting effective properties in adhesive formulations.

4,163,765

# POLYMERIC COMPOSITIONS

George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

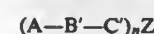
Filed Nov. 28, 1977, Ser. No. 855,490

Int. Cl.<sup>2</sup> C08F 297/04

U.S. Cl. 525—314

12 Claims

1. A composition of matter which comprises a block polymer having the general configuration



wherein A is a block of a polymerized monovinylarene monomer having 8 to 16 carbon atoms per monomer unit, B' is a hydrogenated block of polymerized conjugated diene having 4 to 12 carbon atoms per monomer unit wherein said polymerized block has on the average at least one hydrocarbyl side chain branch for about every 10 carbon atoms of the polymeric backbone, C' is a hydrogenated block of low vinyl polybutadiene wherein said hydrogenated block of low vinyl polybutadiene is produced from a non-hydrogenated low vinyl polybutadiene block with a vinyl content of no more than about 15 mol percent, n is an integer of from 2 to 4, and Z is the residue of a polyfunctional initiator when  $n=2$  to 4, or the residue of a polyfunctional coupling agent when  $n=2$  to 4, or a covalent chemical bond when  $n=2$  and wherein said polymonovinylarene block A is 10 to 60 weight percent of the total polymer, said hydrogenated branched conjugated diene block B' is 10 to 80 weight percent of the total polymer, and said hydrogenated low vinyl polybutadiene block C' is 5 to 60 weight percent of the total polymer and wherein said hydrogenated polymer has a weight average molecular weight ranging from about 5,000 to about 1,000,000 and wherein from about 10 percent to about 100 percent of the unsaturation in each of the blocks B' and C' has been removed by hydrogenation.

4,163,766

# IMPACT-RESISTANT OLEFINIC-NITRILE OLEFINIC-ESTER COPOLYMERS PREPARED IN THE PRESENCE OF AN OLEFINIC-ESTER COPOLYMER ELASTOMER

June T. Duke, Chagrin Falls, and Dorothy C. Prem, Warrensville Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

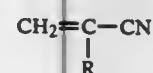
Continuation of Ser. No. 709,536, Jul. 28, 1976, Pat. No. 4,127,614, which is a continuation-in-part of Ser. No. 361,170, May 17, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,978

Int. Cl.<sup>2</sup> C08L 33/00

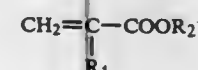
U.S. Cl. 525—230

9 Claims

1. The polymer resulting from the polymerization of 100 parts by weight of (A) at least 70% by weight of at least one nitrile monomer having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and (B) up to 30% by weight based on the combined weights of (A) and (B) of an ester having the structure



wherein R<sub>1</sub> is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R<sub>2</sub> is an alkyl group having from 1 to 6 carbon atoms or an epoxy or oxirane group having from 2 to 6 carbon atoms

in the presence of from 1 to 40 parts by weight of

(C) an elastomer selected from the group consisting of a copolymer of ethyl acrylate and acrylonitrile, a copolymer of ethyl acrylate and styrene, and a copolymer of n-butyl acrylate and styrene.

4,163,767

# POLYALKYLENE GLYCOL ALKYL POLYPHOSPHITES

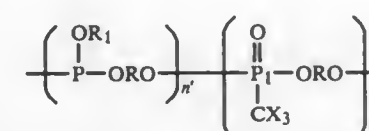
Silvio L. Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 611,469, Sep. 8, 1975, abandoned, which is a continuation of Ser. No. 483,606, Jun. 27, 1974, Pat. No. 3,986,990, which is a continuation of Ser. No. 322,595, Jan. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,295, Jul. 26, 1971, abandoned. This application Jan. 30, 1978, Ser. No. 873,468  
Int. Cl.<sup>2</sup> C07F 9/08; C08J 9/00

U.S. Cl. 260—929

4 Claims

1. A polyphosphorous mixed phosphite-phosphonate polymer flame retardant having an OH number less than one and containing both alkyl phosphite and haloalkyl phosphonate linkages, said polyphosphorous polymer represented by the formula:



where R<sub>1</sub> is alkyl; R is a polyalkylene glycol residue defined as that portion derived from a polyalkylene glycol having the formula:



wherein R' is an alkylene group of from 2 to about 20 carbon atoms, and m designates the number of repeating alkylene ether units and is from 2 to 20; X is a halogen; and n' and n'' are numbers such that the sum of n' and n'' is an integer in the range from about 4 to about 50.

4,163,768

# METHOD OF MANUFACTURING MOLDED TOP STOP

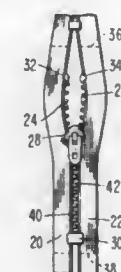
Milton L. Stephens, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 599,516, Jul. 28, 1975, Pat. No. 4,034,445. This application May 27, 1977, Ser. No. 801,309

Int. Cl.<sup>2</sup> B29D 5/00; B06B 3/00

U.S. Cl. 264—23

3 Claims



1. A method of forming a top stop on a slide fastener comprising the steps of placing the slide fastener upon an anvil surface on top of a die having a channel for receiving and positioning a beaded portion and a fastening element portion of the slide

fastener and below a horn tip having a channel for receiving and positioning the beaded portion and fastening element portion,

severing a block of thermoplastic material from a strip of thermoplastic material,

moving the severed block of thermoplastic material into engagement with one side of at least one top fastening element and an inner edge of one tape of the slide fastener, said severing and moving steps including the utilization of a punch and mating opening in the die for severing the block of thermoplastic material and for moving the block through the opening into engagement with the one side of the one top fastening element and tape inner edge, engaging the opposite side of the top fastening element and the inner edge of the one tape with a horn tip, molding the severed and moved block of thermoplastic material around the one fastening element and on the one side of the one tape,

trimming extra fastening elements extending above the one fastening element simultaneously with said molding by means of a trimming edge on the horn tip, said molding and trimming steps including the utilization of a trimming edge on the horn tip contoured to trim fastening elements from the one tape above the one fastening element,

said molding and trimming steps also including applying ultrasonic energy to the horn tip, and guiding the beaded portion and fastening element portion into said channels during said engaging step by means of a beveled side surface on the trimming edge.

4,163,769

# HIGH THERMAL CONDUCTIVITY SUBSTRATE

Bill J. Pope; M. Duane Horton, and H. Tracy Hall, all of Provo, Utah, assignors to Brigham Young University, Provo, Utah

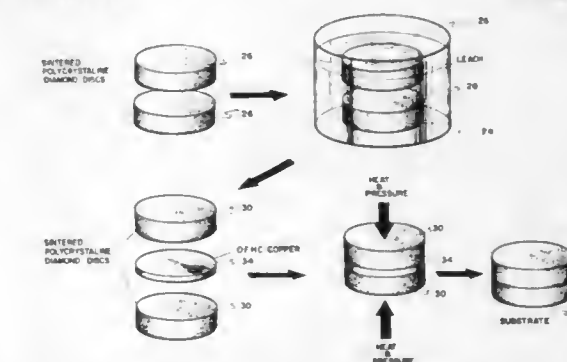
Continuation of Ser. No. 612,603, Sep. 12, 1975, Pat. No. 4,104,344. This application Apr. 3, 1978, Ser. No. 892,727

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C04B 35/52

U.S. Cl. 264—42

2 Claims



1. A method of making a high thermal conductivity substrate for use as a heat sink comprising the steps of:

combining diamond particles with at least one diamond flat in a sample chamber and orienting the flat parallel to the longitudinal axis of the chamber so as to increase the thermal conductivity of the resulting substrate; sintering the combination of diamond particles and the diamond flat under elevated temperature and pressure conditions until a unitary polycrystalline diamond composite is formed; and leaching the graphite from the diamond composite so as to remove undesirable electrical conductivity properties of the composite.



4,163,770

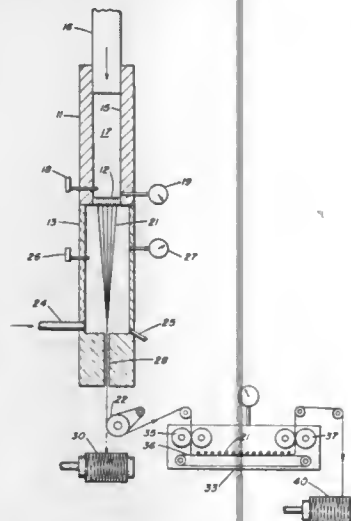
**MELT-SPINNING ACRYLONITRILE POLYMER FIBERS**  
Harold Porosoff, Scarsdale, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 803,005, Jun. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 698,566, Jun. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 349,877, Apr. 10, 1973, abandoned, which is a division of Ser. No. 344,463, Mar. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 337,506, Mar. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 329,479, Feb. 5, 1973, abandoned. This application Aug. 30, 1978, Ser. No. 938,200

Int. Cl.<sup>2</sup> D01F 7/00

U.S. Cl. 264—210.3

6 Claims



1. A process for preparing an acrylonitrile polymer fiber which comprises: extruding a single phase fusion melt of an acrylonitrile copolymer and water through a spinnerette directly into a steam-pressurized solidification zone wherein the temperature, pressure, and saturation of steam are maintained so that the nascent extrudate solidifies, remains in a stretchable state sufficient to achieve a total stretch ratio of at least about 25, relative to the linear flow of said fusion melt through said spinnerette, and the amount of water retained in said extrudate is sufficient to maintain the nascent extrudate in a plastic state; stretching said nascent extrudate while in said solidification zone at a total stretch ratio of at least about 25 relative to the linear flow of said fusion melt through said spinnerette; and thereafter drying the resulting extrudate.

4,163,771

**HYDROXYALKYLAMINOALKYLAMIDES AS CORROSION INHIBITORS FOR METALS IN AN AQUEOUS BRINE ENVIRONMENT**

Derek Redmore, Ballwin, and Benjamin T. Outlaw, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

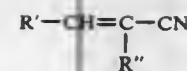
Division of Ser. No. 684,711, May 10, 1976, Pat. No. 4,060,553. This application Jul. 11, 1977, Ser. No. 814,253

Int. Cl.<sup>2</sup> C23F 11/10, 11/14

U.S. Cl. 422—16

19 Claims

1. A process of inhibiting corrosion of metals in a corrosive aqueous medium containing brine which comprises incorporating into said corrosive medium from about 10 p.p.m. to about 10,000 p.p.m. of (1) the products produced by reacting about 1 mole of an unsaturated nitrile of the formula



wherein R' and R'' are hydrogen or alkyl, aryl, cycloalkyl, alkaryl, and aralkyl with about 3 moles of an alkanolamine which comprises mixing said nitrile and alkanolamine and then heating said mixture at a temperature and for a time so that one mole of the alkanolamine reacts with the unsaturated group to form an N-alkanol group and the other 2 moles of the alkanolamine react with the nitrile group to form an hydroxyalkylaminoalkylamide group, or (2) quaternaries thereof.

4,163,772

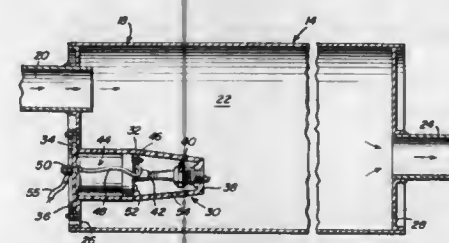
**AIR CHARGER**

William R. Brown, 1018 W. Jackson St., Muncie, Ind. 47305  
Filed Aug. 2, 1977, Ser. No. 821,324

Int. Cl.<sup>2</sup> F01N 3/14; F23G 7/06

U.S. Cl. 422—108

8 Claims



1. In combination with a non-conductive enclosure having a chamber through which a flow of electrically grounded combustion products is conducted to atmosphere, exhaust treating means connected to said enclosure, comprising d.c. voltage means, a spark plug mounted on said enclosure and projecting into the chamber, an ignition coil device connecting the d.c. voltage means to the spark plug, means responsive to said flow of said combustion products through the chamber for inducing a restricted inflow of moisture laden externally ambient air into the chamber to produce a gaseous mixture therein of varying electrical conductivity, and terminal means connected to said ignition coil device for inducing a spark generating voltage in the ignition coil device as a result of said varying electrical conductivity causing discharges from the spark plug within the chamber, said ignition coil device including primary and secondary windings connected to the d.c. voltage means, said primary winding having a low voltage terminal connected to the terminal means, said terminal means being exposed to the grounded combustion products in the chamber, said secondary winding having a high voltage terminal connected to the spark plug.

4,163,773

**SELF-CLINKERING BURNING RATE MODIFIER FOR SOLID PROPELLANT NF<sub>3</sub>-F<sub>2</sub> GAS GENERATORS FOR CHEMICAL HF-DF LASERS**

Karl O. Christe, Calabasas, and Carl J. Schack, Chatsworth, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 18, 1978, Ser. No. 970,775

Int. Cl.<sup>2</sup> C01B 21/18

U.S. Cl. 423—351

2 Claims

1. N<sub>2</sub>F<sub>3</sub>SnF<sub>5</sub>.  
2. A method for preparing N<sub>2</sub>F<sub>3</sub>SnF<sub>5</sub> comprising the steps of:  
forming a solution of N<sub>2</sub>F<sub>3</sub>SbF<sub>6</sub> salt and Cs<sub>2</sub>SnF<sub>6</sub> salt in HF; allowing the salts to react.

4,163,774

**N<sub>2</sub>F<sub>3</sub>SbF<sub>6</sub> AND ITS PREPARATION**

Carl J. Schack, Chatsworth, and Karl O. Christe, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1978, Ser. No. 964,025

Int. Cl.<sup>2</sup> C01B 21/18

U.S. Cl. 423—351

3 Claims

1. The salt having the formula:



2. A method for preparing the salt having the formula N<sub>2</sub>F<sub>3</sub>SbF<sub>6</sub> comprising the steps of:  
forming a solution of N<sub>2</sub>F<sub>4</sub> and SbF<sub>5</sub> in anhydrous HF; and reacting the N<sub>2</sub>F<sub>4</sub> and SbF<sub>5</sub> at room temperature.

4,163,775

**PROCESS FOR THE SYNTHESIS OF AMMONIA USING CATALYSTS SUPPORTED ON GRAPHITE CONTAINING CARBON**

Alan I. Foster, Ashford; Peter G. James, Sunbury-on-Thames; John J. McCarroll, Camberley, and Stephen R. Tennison, Weybridge, all of England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Oct. 31, 1977, Ser. No. 847,075

Claims priority, application United Kingdom, Nov. 3, 1976, 45711/76

Int. Cl.<sup>2</sup> C01C 1/04; B01J 23/58, 21/18

U.S. Cl. 423—363

2 Claims

1. A process for the production of ammonia which process comprises passing a feedstock containing nitrogen and hydrogen over a catalyst at a temperature, pressure and space velocity such that conversion to ammonia is effected, said temperature being in the range 250°–600° C.; said pressure being in the range atmospheric to 300 bars(ga); and, said space velocity being in the range 1,000 to 100,000 v/v/hr, said catalyst comprising (i) as support a graphite-containing carbon having (a) a basal plane surface area of at least 100 m<sup>2</sup>/g, (b) a ratio of BET surface area to basal plane surface area of not more than 8:1 and (c) a ratio of basal plane surface area to edge surface area of at least 2:1 and (ii) as active component (a) 0.1 to 50% by weight of a transition metal of the 4th, 5th and 6th horizontal Periods of Groups VB, VIB, VIIB and VIII of the Periodic Table, and (b) 0.1 to 4 times by weight of (a) of a modifying metal ion selected from Groups IA or IIA of the Periodic Table of the lanthanides or actinides, the modifying metal ion being actively associated with the transition metal rather than the support.

4,163,776

**PROCESS FOR STACK GAS DESULFURIZATION**

Metro D. Kulik, Pittsburgh, Pa., and Everett Gorin, San Rafael, Calif., assignors to Continental Oil Company, Stamford, Conn.

Filed Dec. 5, 1978, Ser. No. 966,687

Int. Cl.<sup>2</sup> C01B 17/04

U.S. Cl. 423—567

8 Claims

1. A method for removing sulfur oxides from a gaseous mixture, said method comprising:  
(a) contacting said gaseous mixture in a first zone with an aqueous solution containing (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>3</sub> at a pH below about 5.5 to produce at least one compound selected from the group consisting of (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>6</sub> and H<sub>2</sub>S<sub>2</sub>O<sub>6</sub>;  
(b) contacting said gaseous mixture in a second zone with an aqueous solution containing at least one compound selected from the group consisting of ammonia and ammonium thiosulfate at a pH from about 5.5 to about 8.0 to produce at least one compound selected from the group consisting of (NH<sub>4</sub>)<sub>2</sub>SO<sub>3</sub> and (NH<sub>4</sub>)HSO<sub>3</sub> and remove sulfur oxides from said gaseous mixture;  
(c) contacting said gaseous stream in a third zone with an aqueous stream containing at least one compound selected

from the group consisting of (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>6</sub> and H<sub>2</sub>S<sub>2</sub>O<sub>6</sub> at a pH below about 5.5 to recover NH<sub>3</sub> from said gaseous stream;

(d) withdrawing a stream of said aqueous solution containing at least one compound selected from the group consisting of (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>6</sub> and H<sub>2</sub>S<sub>2</sub>O<sub>6</sub> from said first zone;

(e) passing at least a portion of said stream from said first zone to said third zone;

(f) passing at least a portion of said stream from said first zone to sulfur recovery;

(g) withdrawing at least a portion of said aqueous solution containing at least one compound selected from the group consisting of (NH<sub>4</sub>)<sub>2</sub>SO<sub>3</sub> and (NH<sub>4</sub>)HSO<sub>3</sub> from a lower portion of said second zone;

(h) adding NH<sub>3</sub> and at least one sulfide compound selected from the group consisting of (NH<sub>4</sub>)<sub>2</sub>S, (NH<sub>4</sub>)HS, ammonium polysulfide, and H<sub>2</sub>S to said portion of said aqueous solution withdrawn from said second zone to produce said aqueous solution containing at least one compound selected from the group consisting of ammonia and ammonium thiosulfate;

(i) passing said aqueous solution containing at least one compound selected from the group consisting of ammonia and ammonium thiosulfate to an upper portion of said second zone.

4,163,777

**CONTROLLED ANTACID DELIVERY FORM AND METHOD OF TREATMENT THEREWITH**

Arun K. Mitra, St. Louis, Mo., assignor to Lewis/Howe Company, St. Louis, Mo.

Filed Apr. 29, 1977, Ser. No. 792,101

Int. Cl.<sup>2</sup> A61K 9/24, 9/22

U.S. Cl. 424—21

4 Claims

1. A noncariogenic controlled antacid delivery composition compressed into lozenges having a hardness of at least 15 kg/in<sup>2</sup>, including a mixture of a magnesium antacid salt and an aluminum antacid salt, said salts having different rates of reaction with hydrochloric acid, in a matrix including in combination mannitol, a gel-forming swelling agent selected from the group consisting of sodium carboxymethyl cellulose and xanthum gum, and a hydrophobic magnesium, calcium or aluminum salt of a fatty acid selected from the group consisting of stearic, palmitic, oleic and lauric acids, the mannitol being present in an amount from about 25 to 60 percent by weight, the gel forming agent being present in an amount from about 3 to 10 percent by weight, and the hydrophobic magnesium, calcium or aluminum salt of a fatty acid being present in an amount from about 1 to 5 percent by weight, to provide a lozenge which dissolves in about 15 to 60 minutes in a user's mouth, each of said lozenges containing an effective amount of antacid salts to maintain the pH of the user's gastric juice above 3.5.

4,163,778

**ASTHMA IMMUNOTHERAPY**

John L. Ohman, Natick, and Francis C. Lowell, Concord, both of Mass., assignors to The Foundation for the Study of Asthma and Related Diseases, Boston, Mass.

Filed May 4, 1978, Ser. No. 903,025

Int. Cl.<sup>2</sup> A61K 35/36, 39/00

U.S. Cl. 424—91

5 Claims

1. A process for reducing the bronchial sensitivity to cat dander exposure of a patient who experiences asthmatic symptoms on exposure to cat, said process comprising the steps of subcutaneously injecting the patient with an extract of cat dander and repeating the injection with extracts of increasing cat allergen content for a sufficient number of times to reduce bronchial sensitivity, wherein the improvement comprises employing as an extract a preparation made from cat pelts having a total nondialyzable solids content comprising at



least 10% by weight cat allergen I, and containing at least 300 micrograms per milliliter of cat allergen I, said cat allergen I consisting essentially of a protein having a molecular weight between 30,000 and 60,000 daltons and being identifiable by its ability to form a precipitin line with allergen I antiserum purified by absorption with cat albumin.

**4,163,779**  
**TEST FOR QUANTITATION OF IMMUNOGLOBULIN AND IDENTIFICATION OF ABNORMAL IMMUNOGLOBULIN**

Richard A. Harte, Redwood City, and Fred H. Deindoerfer, Santa Clara, both of Calif., assignors to International Diagnostic Technology, Inc., Santa Clara, Calif.

Filed Jan. 9, 1978, Ser. No. 868,189

Int. Cl.<sup>2</sup> G01N 33/16; A61K 39/00, 43/00

U.S. Cl. 424—1

5 Claims

1. The method of determining the presence of clinically significant quantities of abnormal homogeneous immunoglobulin in liquid human serum sample which comprises

- I. (a) sorbing immunoglobulin from a first fraction of said serum onto an immunological unreactive solid sorptive surface, and then
  - (b) contacting said sorptive surface with an aqueous reagent containing an excess of labeled antibody specifically reactive with sample immunoglobulin,
  - (c) washing said sorptive surface,
  - (d) measuring the quantity of labeled antibody held on said surface,
- II. (a) sorbing normal heterogeneous immunoglobulin onto a second immunologically unreactive solid sorptive surface,
  - (b) mixing an excess of labeled antibody specifically reactive with sample immunoglobulin with a second fraction of said serum,
  - (c) contacting the solid support surface from IIa with a mixture of IIb, then
  - (d) washing said second surface,
  - (e) measuring the quantity of labeled antibody held on said second surface;
  - (f) determining the ratio of the measurements obtained in steps IIe and Id, a ratio in excess of 2:1 being indicative of the presence of clinically significant quantities of abnormal immunoglobulin in the serum sample.

**4,163,780**  
**KS-2-A**  
Nakao Ishida; Fujio Suzuki, both of Sendai; Hiroshi Maeda, Kumamoto; Toshikatsu Fujii, Gotenba, and Ituro Mizutani, Numazu, all of Japan, assignors to Kirin-Seagram Limited, Tokyo, Japan

Filed Mar. 30, 1978, Ser. No. 891,767

Claims priority, application Japan, Mar. 30, 1977, 52/35944; Sep. 6, 1977, 52/106321

Int. Cl.<sup>2</sup> A61K 35/00

U.S. Cl. 424—116

4 Claims

1. KS-2-A having the following physicochemical properties:
  - (1) Elemental analysis  
C: 39.5%, H: 6.5%, N: 1.1%,  
Ash: trace (0.4%);
  - (2) Molecular weight  
9,000±3,000 (by ultra-filtration),  
7,000 to 9,000 (by equilibrium density gradient centrifugation),  
8,000±3,000 (by fluorescein polarization method);
  - (3) Appearance  
amorphous white powder;
  - (4) Decomposition point  
185° C. (based upon measurement of the browning temperature by capillary method using "Silicone Oil WF-30");
  - (5) UV spectrum

No particular maximal absorption is observed as shown in FIG. 1;

(6) IR spectrum

The spectrum is shown in FIG. 2;

(7) The pH of the aqueous solution of this substance is 7.25;

(8) Solubility

Soluble in water, insoluble in ethanol, acetone, n-hexane, n-butanol, phenol and other organic solvents;

(9) Specific optical rotation

$[\alpha]_D^{25} = +67.5 \pm 2.0^\circ$  (in H<sub>2</sub>O), (C=0.452%);

(10) Homogeneity

a. The result of centrifugation in a linear gradient of 5 to 20% of CsCl in 0.1 M Tris-CHI buffer (pH 7.2) at 38,000 r.p.m., at 4° C. for 15 hours is shown in FIG. 3, the substance being homogeneous as is apparent from the Figure; comparative sedimentation experiments with viral nucleic acids show that the substance does not contain viral particles, RNA or DNA;

b. The substance is electrophoretically homogeneous as is shown in FIG. 4 which shows the results of electrophoresis on cellulose acetate using 0.1 M acetic acid/pyridine buffer (pH 3.5), chondroitin sulfate being used as control; after 30 minutes of electrophoresis at 0.6 mA/cm and 160 V, chondroitin sulfate moves to the cathode, giving a mobility of 4 cm per 30 minutes, whereas KS-2-A moves slightly to the anode in 90 minutes (a mobility of 1 cm per 90 minutes); the substance is also shown to be homogeneous by electrophoresis conducted under the same conditions as above except using 1 M pyridine/acetic acid buffer (pH 7.0);

(11) Color reaction

Phenol-H<sub>2</sub>SO<sub>4</sub> reaction: Positive

Anthrone reaction: Positive

Molisch's reaction: Positive

Elson-Morgen reaction: Negative

Carbazole-H<sub>2</sub>SO<sub>4</sub> reaction: Positive

Reaction with Folin-Ciocalteu reagent: Positive

Biuret reaction: Positive

Reaction with FITC (fluorescein isothiocyanate): Positive

Toluidin blue O staining: Negative

Ninhydrin reaction: Positive;

(12) Sugar composition

FIG. 5 shows the results of subjecting the substance to acid hydrolysis, followed by alditation and then acetylation, and then determining the sugar composition by gas chromatography; the substance is mainly composed of mannose and contains small quantities of glucose and galactose and also minute quantities of arabinose and xylose, the proportions of these components by weight being 74:12:12:1:1; and

(13) Amino acid composition

Amino acid analysis, made in an automatic amino acid analyzer after closing 10 mg of the substance in vacuo together with 3 ml of 6 N HCl, subjecting it to acid hydrolysis at 110° C. for 22 hours and then removing by a rotary evaporator shows that the amino acids contained are mainly threonine, serine, glutamic acid, alanine and ammonia, and further slight quantities of aspartic acid, proline, glycine, valine and lysine are contained; further, sometimes trace amounts of methionine, isoleucine leucine, tyrosine, phenylalanine, histidine, arginine and cystine are recognized.

**4,163,781**  
**3-AMINO-N-[(PHOSPHONOAMINO)IMINOMETHYL]-6-HALOPYRAZINECARBOXAMIDE COMPOUNDS, COMPOSITIONS AND METHODS OF USE**

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

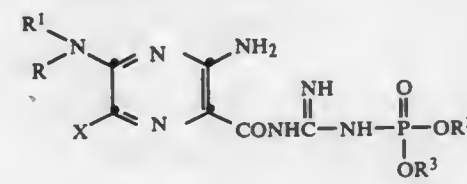
Filed Apr. 17, 1978, Ser. No. 896,876

Int. Cl.<sup>2</sup> A61K 31/675; C07D 241/32

U.S. Cl. 424—200

9 Claims

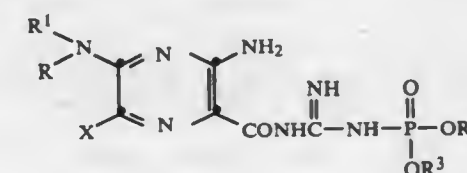
1. A compound of the formula



wherein

R is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;  
R<sup>1</sup> is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;  
R<sup>2</sup> is hydrogen, lower alkyl, benzyl or alkali metal;  
R<sup>3</sup> is hydrogen, lower alkyl, benzyl or alkali metal; and  
X is halogen.

8. A method of treating edema and/or hypertension which comprises administering to a patient a pharmacologically acceptable dose of a compound of the formula:



wherein

R is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;  
R<sup>1</sup> is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;  
R<sup>2</sup> is hydrogen, lower alkyl, benzyl or alkali metal;  
R<sup>3</sup> is hydrogen, lower alkyl, benzyl or alkali metal; and  
X is halogen.

**4,163,782**  
**FUNGICIDAL COMPOSITIONS CONTAINING DISUBSTITUTED PHOSPHONATES**

André Thizy, Ecully, and Jean-Claude Debourge, Lyon, both of France, assignors to Phylagro, France

Continuation of Ser. No. 799,784, May 23, 1977, abandoned, which is a continuation of Ser. No. 555,293, Mar. 4, 1975, abandoned. This application Sep. 12, 1978, Ser. No. 941,377

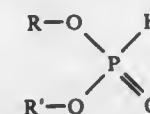
Claims priority, application France, Mar. 8, 1974, 74 08995

Int. Cl.<sup>2</sup> A01N 9/00, 9/36

U.S. Cl. 424—217

10 Claims

1. A method of controlling plant fungus which comprises applying to said fungus a fungicidally effective amount of a composition containing as an active fungicidal ingredient at least one compound of the formula



in which R and R' may be the same or different and each represents a linear or branched alkyl radical of 1 to 4 carbon atoms, optionally interrupted by an oxygen atom; phenyl; tetrahydrofurfuryl or cyclohexyl radical, in combination with an agriculturally acceptable vehicle.

**4,163,783**  
**SYNERGISTIC COMPOSITIONS AND METHOD OF USE TO TREAT INFLAMMATION**

Robert W. Klein, 1013 Union Meeting Rd., Blue Bell, Pa. 19422, and George W. Nuss, Jr., 1505 Taylor Rd., Lansdale, Pa. 19446

Continuation-in-part of Ser. No. 835,595, Sep. 22, 1977. This application May 1, 1978, Ser. No. 901,573

The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 31/44, 31/555

U.S. Cl. 424—245

2 Claims

1. A method of treating inflammation in warm blooded animals which comprises topically administering to a warm blooded animal in need of such treatment an effective amount of a non-steroidal agent having anti-inflammatory activity selected from the group consisting of 1-(p-chlorobenzoyl)-5-methoxy-2-methylindole-3-acetic acid, d-2-(6-methoxy-2-naphthyl)propionic acid, 1-methyl-5-(4-methylbenzoyl-1)H-pyrrole-2-acetic acid, α-methyl-4-(2-methylpropyl)benzeneacetic acid, 4-(2-methylpropyl)benzeneacetic acid, α-methyl-3-phenoxybenzeneacetic acid, α,3-dichloro-4-cyclohexyl-phenylacetic acid, 2',4'-difluoro-4-hydroxy-3-biphenylcarboxylic acid and bis-(2-pyridyl-1-oxide) disulfide, said non-steroidal agent being present in the amount of 1-40% by weight of said bis-(2-pyridyl-1-oxide) disulfide.

**4,163,784**  
**HETEROCYCLIC CARBONYL DERIVATIVES OF UREA, AGENTS FOR DISSOLUTION OF GALLSTONES**

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

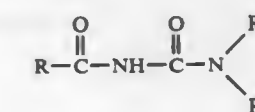
Filed Mar. 9, 1978, Ser. No. 884,858

Int. Cl.<sup>2</sup> A61K 31/54, 31/535, 31/44

U.S. Cl. 424—246

10 Claims

1. A method of dissolving cholesterol gallstones in a mammal which comprises administering to the mammal a cholesterol gallstone dissolving amount of a compound having the formula



wherein R is selected from the group consisting of

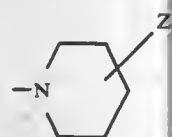
pyridyl,  
chloro substituted pyridyl,  
quinolyl,  
furyl,  
5-methyl-3-isoxazolyl,  
3-methyl-5-isoxazolyl,  
3-methyl-5-isothiazolyl,  
4-methyl-5-thiazolyl,  
4-methyl-5-oxazolyl,  
5-methyl-3-phenyl-4-isoxazolyl,  
isothiazolyl,  
3-(1,2,5-thiadiazolyl),  
4-(1,2,3-thiadiazolyl),  
3-(1,2-benzisothiazolyl) and  
thiazolyl;

R<sub>1</sub> is selected from the group consisting of hydrogen, alkyl having from one to ten carbon atoms and phenyl;

R<sub>2</sub> is selected from the group consisting of R<sub>1</sub>, 1-naphthyl and phenylalkyl wherein the alkyl has from one to four carbon atoms;

R<sub>1</sub> and R<sub>2</sub> when taken together with the nitrogen to which they are attached are selected from the group consisting of morpholino,  
thiomorpholino,  
1-(1,2,3,6-tetrahydropyridyl),  
1-azacycloheptyl,

1-azacyclooctyl,  
3-(2,3,4,5-tetrahydro-3,1-benzazepinyl) and



wherein Z is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, chloro and phenylalkyl having from one to four carbon atoms in the alkyl group, and the pharmaceutically acceptable acid addition salts of those compounds wherein R is a basic group.

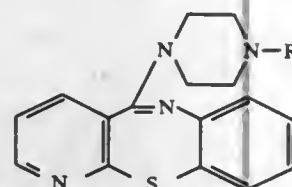
#### 4,163,785 BENZOTHIAZEPINE COMPOUNDS AND COMPOSITIONS

Charles Hoffmann, Fourqueux, and Etienne Bouley, Franconville, both of France, assignors to Hexachimie, Malmaison, France

Filed Apr. 3, 1978, Ser. No. 892,647  
Claims priority, application United Kingdom, Apr. 7, 1978, 14692/78

Int. Cl.<sup>2</sup> A61K 31/495; C07D 513/14  
U.S. Cl. 424-250

1. A compound of the formula



in which R is a hydrogen atom or alkyl of 1 to 5 carbon atoms, or a non-toxic acid addition salt thereof.

3. A therapeutic composition having antihistaminic, orexigenic and antianaphylactic activity, comprising an effective amount of a compound as claimed in claim 1 and a carrier therefor.

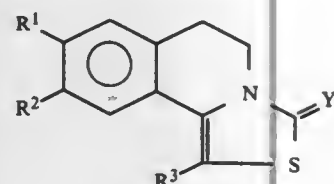
#### 4,163,786 THIAZOLOISOQUINOLINES WITH CORONARY AND RESPIRATORY EFFECTS

Kalmán Harsanyi; Kalmán Takacs; Pál Kiss, all of Budapest; László Szekeres; Gyula Papp, both of Szeged, and Eva Benedek, Győr, all of Hungary, assignors to Chinoín Pharmaceutical and Chemical Works Ltd., Budapest, Hungary  
Continuation of Ser. No. 701,084, Jun. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 473,918, May 28, 1974, Pat. No. 3,979,397. This application Jan. 16, 1978, Ser. No. 869,791

Claims priority, application Hungary, May 30, 1973, CI 1381  
Int. Cl.<sup>2</sup> C07D 513/04; A61K 31/47

U.S. Cl. 421-258

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein R<sup>1</sup> and R<sup>2</sup> are methoxy;

R<sup>3</sup> is hydrogen, methyl, nitro, phenyl, carboxy or carbox-amido; and

Y is imino, oxo, sulfo, N-p-chlorophenylimino, acetimino, benzoylimino, or N-2-hydroxyethylimino.

2. The compound defined in claim 1 selected from the group consisting of:

- 3-imino-8,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo (4,3a)-isoquinoline, or its rhodanide and hydrochloride;
- 1-carboxamido-3-imino-3,4,5,6-tetrahydro-3,9-dimethoxy-1,3-thiazolo(4,3a)isoquinoline;
- 1-methyl-3-imino-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo(4,3a)isoquinoline and its rhodanide;
- 1-phenyl-3-imino-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo(4,3a)isoquinoline and its rhodanide or hydrochloride;
- 1-carboxy-e-imino-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo(4,3a)isoquinoline; and
- 1-carboxamido-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo(4,3a)isoquinoline-3-one.

6. An antianginal composition for human or veterinary therapeutics containing as active ingredient an effective amount of the compound defined in claim 2 or a pharmaceutically acceptable salt thereof.

#### 4,163,787 SUBSTITUTED PYRIDINE METHYL ESTERS OF CYCLOPROPANE CARBOXYLIC ACIDS AND THEIR USE AS INSECTICIDES

Sudarshan K. Malhotra, Walnut Creek, and Michael J. Ricks, Oakland, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

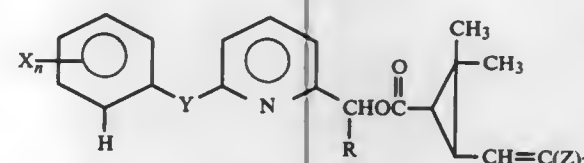
Continuation-in-part of Ser. No. 777,188, Mar. 14, 1977, abandoned. This application Dec. 12, 1977, Ser. No. 859,908

Int. Cl.<sup>2</sup> A61K 31/44; C07D 213/70, 213/64

U.S. Cl. 424-263

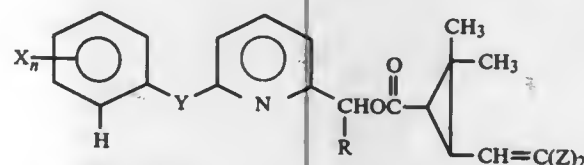
45 Claims

1. A compound corresponding to the formula



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, 3,4-methylenedioxy, chloro, fluoro or bromo; n represents an integer of 0 to 2; Y represents oxygen or sulfur; R represents hydrogen, cyano or ethynyl and Z represents chloro, fluoro or bromo.

31. A method for the kill and control of insects which comprises contacting said insects or their habitat with a composition containing as the active ingredient, an insecticidally effective amount of a compound corresponding to the formula



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, 3,4-methylenedioxy, chloro, fluoro or bromo; n represents an integer of 0 to 2; Y represents oxygen or sulfur; R represents hydrogen, cyano or ethynyl and Z represents chloro, fluoro or bromo, in intimate admixture with an inert carrier therefor.

#### 4,163,788 TERTIARY AMINOACIDS

Richard W. J. Carney, New Providence, and George de Stevens, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 307,293, Nov. 16, 1972, which is a continuation-in-part of Ser. No. 181,564, Sep. 17, 1971, Pat. No. 3,767,805, which is a continuation-in-part of Ser. No. 40,436, May 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 8,406, Feb. 3, 1970, abandoned, which is a

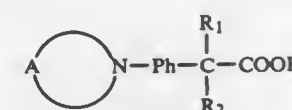
continuation-in-part of Ser. No. 856,154, Sep. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 843,244, Jul. 18, 1969, Pat. No. 3,641,040, which is a continuation-in-part of Ser. No. 808,343, Mar. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 790,863, Jan. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 757,136, Sep. 3, 1968, Pat. No. 3,657,230, which is a continuation-in-part of Ser. No. 716,347, Mar. 27, 1968, abandoned. This application Nov. 7, 1977, Ser. No. 849,144

Int. Cl.<sup>2</sup> C07D 209/48, 217/24; A61K 31/47, 31/40

U.S. Cl. 424-267

13 Claims

1. An α-(cyclic tert.aminophenyl)aliphatic acid corresponding to the formula



in which R<sub>1</sub> is hydrogen or lower alkyl, R<sub>2</sub> is hydrogen, lower alkyl, lower alkenyl, cycloalkyl, cycloalkenyl, cycloalkyl-lower alkyl or cycloalkenyl-lower alkyl having 3 to 7 ring-members each, Ph is phenylene unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro, amino, di-lower alkyl-amino, lower alkanoylamino, cyano, carbamoyl, di-lower alkyl-carbamoyl, carboxy, lower alkylsulfonyl, sulfo, sulfamoyl and di-lower alkyl-sulfamoyl, and



is 4,5,6,7-tetrahydrophthalimido or -homophthalimido, 4,7-dihydrophthalimido or -homophthalimido, phthalimido or homophthalimido unsubstituted or substituted in the aromatic portion by one or two members selected from the group consisting of lower alkyl, lower alkoxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro, amino and di-lower alkyl-amino; or a lower alkyl ester, loweralkenyl ester, 3 or 7 ring-membered cycloalkyl ester, cycloalkenyl ester, cycloalkyl-lower alkyl ester cycloalkenyl-lower alkyl ester, HPh-ester, HPh-lower alkyl ester, hydroxy-lower alkyl ester, lower alkoxy-lower alkyl ester, di-lower alkylamino-lower alkyl ester, lower alkyleneimino-lower alkyl ester or



lower alkyl ester in which esters any hetero atom is separated from the carboxy-oxygen atom by at least 2 carbon atoms, the amide, a mono- or di-lower alkylamide, lower alkyleneamide, HPh-amide, HPh-lower alkylamide, or N-hydroxyamide, or a therapeutically acceptable salt thereof.

2. An anti-inflammatory pharmaceutical composition comprising an anti-inflammatory effective amount of the compound as claimed in claim 1, together with a pharmaceutical excipient.

4,163,789  
ANTI-PSYCHOTIC  
(CYCLOALKENYLALKYLPIPERIDINO) BENZAMIDES  
Jacinto M. Mauri; Armando Vega-Noverola, and Robert G. W. Spickett, all of Barcelona, Spain, assignors to Anphar, S.A., Madrid, Spain

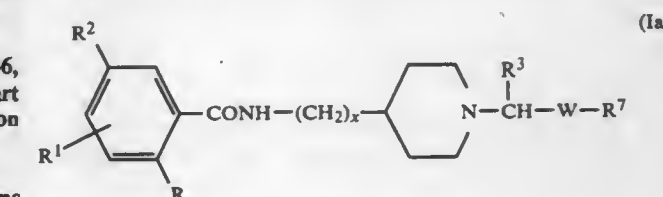
Filed Feb. 17, 1977, Ser. No. 769,529  
Claims priority, application United Kingdom, Feb. 17, 1976, 6207/76; Jan. 24, 1977, 2728/77

Int. Cl.<sup>2</sup> A61K 31/445; C07D 211/58, 211/26

U.S. Cl. 424-267

36 Claims

1. A piperidine derivative of the general formula



wherein R represents a lower alkoxy or lower alkenyloxy group; R<sup>1</sup> and R<sup>2</sup>, which may be the same or different, each represent a hydrogen or halogen atom, or a sulphonamido, amino, lower alkylamino, di(lower)alkylamino, lower alkylsulphonyl, or lower alkylsulphonamido group, or a lower acyl-amino group in which the acyl moiety is derived from a carboxylic acid, the halogen atom or group represented by the symbol R<sup>1</sup> being in the 3- or 4-position of the phenyl ring, with the proviso that R<sup>1</sup> and R<sup>2</sup> do not both represent hydrogen atoms; R<sup>3</sup> represents a hydrogen atom or a lower alkyl, lower alkenyl, or phenyl group, or a cycloalkyl or cycloalkenyl group having from 3 to 7 carbon atoms in the ring; R<sup>7</sup> represents a cycloalkenyl group having from 3 to 7 carbon atoms in the ring, unsubstituted or substituted by an alkyl group containing from 1 to 3 carbon atoms or a hydroxy(lower)alkyl or lower alkenyl group; x represents zero or 1, and W represents a single bond or a lower alkylene or lower alkenylene group, or a pharmaceutically acceptable acid addition salt or a quaternary ammonium derivative or an N-oxide thereof.

33. A method for treating psychoses and allied conditions in which neuroleptic therapy is beneficial, which comprises administering a compound of claim 1 to a mammalian host, said compound being administered in an amount effective to prevent or ameliorate psychotic states.

#### 4,163,790 METHOD FOR INCREASING CORONARY BLOOD FLOW IN MAMMALS

Bernard V. Franko, and Anthony G. Proakis, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.  
Continuation-in-part of Ser. No. 795,846, May 11, 1977, abandoned. This application Mar. 14, 1978, Ser. No. 886,486

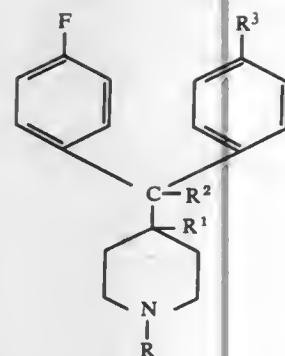
Int. Cl.<sup>2</sup> A61K 31/445, 31/535

U.S. Cl. 424-267

7 Claims

1. The method for increasing coronary arterial blood flow in mammals which comprises administering to mammals in need of such treatment a coronary arterial blood flow increasing amount of a compound having the formula:





wherein:

R is hydrogen, acetyl, p-fluorobenzoylpropyl, carbamoyl, N-methylcarbamoyl, N,N-dimethylcarbamoyl, phenylcarbamoyl, or N-(ω-morpholinoethyl)carbamoyl;  
R<sup>1</sup> is hydrogen;  
R<sup>2</sup> is hydrogen or hydroxy, or  
R<sup>1</sup> and R<sup>2</sup> taken together form a second bond between the carbon atoms bearing R<sup>1</sup> and R<sup>2</sup>;  
R<sup>3</sup> is hydrogen or fluorine, and  
pharmaceutically acceptable acid addition salts thereof.

#### 4,163,791 2-PHENYLIMINOTHIAZOLINE COMPOUNDS

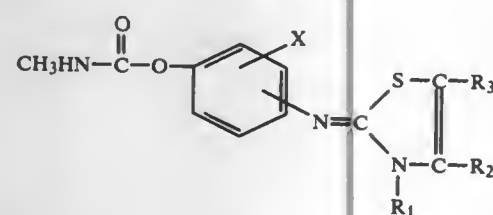
Dieter Dürr, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,753  
Claims priority, application Switzerland, Sep. 17, 1976, 11815/76; Aug. 9, 1977, 9735/77

Int. Cl.<sup>2</sup> C07D 277/08

U.S. Cl. 424—270

1. A thiazoline compound of the formula



wherein

x is hydrogen, halogen or C<sub>1</sub>-C<sub>4</sub>-alkyl,  
R<sub>1</sub> is C<sub>1</sub>-C<sub>4</sub>-alkyl, and  
R<sub>2</sub> and R<sub>3</sub> are each hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl, and salts thereof with inorganic acids selected from the group consisting of hydrochloric, sulfuric, hydrobromic and phosphoric acids, and with organic acids, selected from the group consisting of formic, acetic, oxalic, phthalic, succinic and citric acids.

11. An insecticidal and acaricidal composition comprising an insecticidally and acaricidally effective amount of a compound according to claim 1, together with a suitable carrier therefor.

#### 4,163,792 INSECTICIDAL OXADIAZOLE ESTERS

Willy Meyer, Riehen; Jozef Drabek, Oberwil; Laurenz Gsell, Füllinsdorf, and Friedrich Karrer, Zofingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

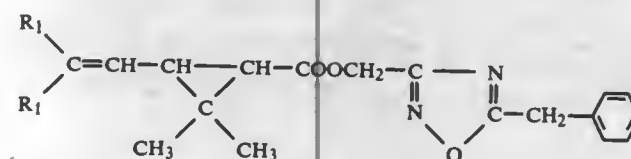
Continuation-in-part of Ser. No. 684,691, May 10, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 849,744  
Claims priority, application Switzerland, May 13, 1975, 6157/75; Apr. 6, 1976, 4300/76

Int. Cl.<sup>2</sup> A01N 9/22, 9/28; C07D 271/06

U.S. Cl. 424—272

7 Claims

1. A 2,2-dimethyl-3-vinyl-cyclopropanecarboxylic acid ester of the formula



wherein R<sub>1</sub> represents fluorine, chlorine or bromine.

6. A method of combatting insects of the family Muscidae at a locus, which method comprises applying to the locus an insecticidally effective amount of a compound as claimed in claim 1.

#### 4,163,793 USE OF CERTAIN THIOPHENECARBALDEHYDE PHENYLHYDRAZONES AS FUNGICIDES

Michael T. Clark, Sittingbourne, and Pieter Ten Haken, Herne Bay, both of England, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 838,772, Oct. 3, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,651

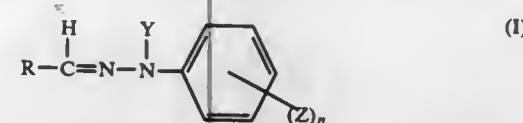
Claims priority, application United Kingdom, Oct. 5, 1976, 41300/76

Int. Cl.<sup>2</sup> A01N 9/12

U.S. Cl. 424—275

3 Claims

1. A method for killing unwanted fungi which comprises subjecting such fungi to the effect of one of twenty hydrazones of the formula:



the twenty being the individual species wherein the substituent moieties are as follows, the numbers preceding the moieties, Z, indicating the position of each of such moieties on the phenyl ring:

R	Y	n	Z
2-thienyl	H	1	4-Cl
2-thienyl	H	1	4-Cl
2-thienyl	H	1	4-F
2-thienyl	H	0	—
2-thienyl	H	1	4-methyl
2-thienyl	—CHO	0	—
5-methyl-2-thienyl	—CHO	1	4-F
5-methyl-2-thienyl	—CHO	0	—
2-thienyl	H	1	2-Cl
5-bromo-2-thienyl	H	0	—
2-thienyl	H	1	4-Br
3-thienyl	—CHO	0	—
3-thienyl	—CHO	1	4-F
3-thienyl	—CHO	1	4-Cl
3-thienyl	—CHO	1	4-F
5-bromo-2-thienyl	—CHO	1	4-F
3-methyl-2-thienyl	—CHO	0	—
5-bromo-2-thienyl	—CHO	0	—
5-chloro-2-thienyl	H	1	4-F

R	Y	n	Z
5-chloro-2-thienyl	—CHO	1	4-F
5-chloro-2-thienyl	—CHO	1	4-Cl

#### 4,163,794 2,3-DIHYDRO-6,7-DISUBSTITUTED-5-FUROYL BENZOFURAN-2-CARBOXYLIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

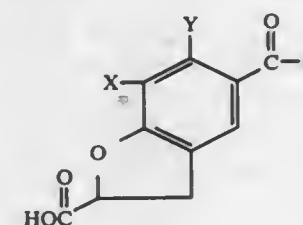
Division of Ser. No. 678,529, Apr. 20, 1976, Pat. No. 4,087,542, which is a continuation-in-part of Ser. No. 594,839, Jul. 9, 1975, abandoned. This application Jan. 27, 1978, Ser. No. 873,023

Int. Cl.<sup>2</sup> A61K 31/34; C07D 307/83

U.S. Cl. 424—285

6 Claims

1. A compound of the formula



wherein

X is halo, methyl or hydrogen;

Y is halo or methyl;

X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;

R is selected from the group consisting of 2-furyl, 3-furyl or 5-methyl-2-furyl, and

the non-toxic pharmaceutically acceptable salt, ester and amide derivative thereof.

#### 4,163,795 STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,540

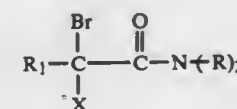
Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 424—304

17 Claims

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial compound of the formula:

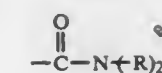


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R<sub>1</sub> is a cyano radical or an amido radical of the formula:



wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being a normally liquid polyalkylene glycol of the ethylene, trimethylene or tetramethylene series or a mono- or di-saturated hydrocarbyl ether thereof;

(c) water; and

(d) a stabilizing amount of an azine or a nitrile stabilizer which is different from the halogenated amide antimicrobial, said stabilizing amount being an amount sufficient to measurably reduce the decomposition of the halogenated amide antimicrobial in the aqueous composition and said azine or nitrile stabilizer being a saturated aliphatic or a saturated alicyclic compound containing a moiety of the formula >C=N—, a moiety of the formula —C=N, or a combination thereof.

#### 4,163,796 STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,543

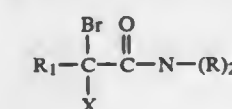
Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 424—304

19 Claims

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial of the formula:

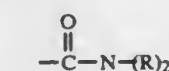


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R<sub>1</sub> is a cyano radical or an amido radical of the formula:

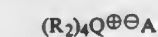


wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being selected from the group consisting of normally liquid polyalkylene glycols of the ethylene, trimethylene, or tetramethylene series and the mono- and di-saturated hydrocarbyl ethers thereof;

(c) water; and

(d) a stabilizing amount of a quaternary ammonium or phosphonium stabilizer of the formula:



wherein:

Q<sup>+</sup> is a quaternized atom of nitrogen or phosphorus;

each R<sub>2</sub> group is independently a monovalent saturated hydrocarbon radical; and A<sup>−</sup> is a neutralizing anion,

said stabilizing amount being an amount of the stabilizer sufficient to measurably reduce the decomposition rate of the halogenated amide antimicrobial in the aqueous antimicrobial composition.

#### 4,163,797 STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

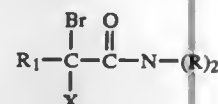
George A. Burk, Bay City, and Charles E. Reineke, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,541  
Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 424—304 20 Claims

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

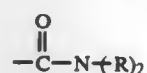
(a) an alpha-halogenated amide antimicrobial compound of the formula:



wherein:

X is hydrogen, halogen or a cyano radical;  
each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R<sub>1</sub> is a cyano radical or an amido radical of the formula:



wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being a normally liquid straight chain polyalkylene glycol of the ethylene, trimethylene or tetramethylene series or a mono- or di-saturated hydrocarbyl ether thereof;

(c) water; and

(d) a stabilizing amount of a carbamoyl or sulfamoyl stabilizer wherein said stabilizing amount is an amount of the carbamoyl or sulfamoyl stabilizer which is sufficient to measurably reduce the decomposition rate of the halogenated amide in the aqueous antimicrobial composition and wherein said carbamoyl or sulfamoyl stabilizer corresponds to the formula:



in which:

Q is a carbonyl radical or a sulfonyl radical;  
R<sub>2</sub> is a radical selected from the group consisting of: R<sub>4</sub>, —N(R<sub>4</sub>)<sub>2</sub>, —C(O)N(R<sub>4</sub>)<sub>2</sub>, and —NHC(O)N(R<sub>4</sub>)<sub>2</sub> wherein each R<sub>4</sub> independently is hydrogen or lower alkyl; and each R<sub>3</sub> radical is independently selected from the group consisting of hydrogen and lower alkyl; or one of the R<sub>3</sub> groups and the R<sub>2</sub> group, in combination, jointly form a divalent radical selected from the group consisting of —CH<sub>2</sub>—<sub>3</sub>, —CH<sub>2</sub>—<sub>4</sub>, —CH<sub>2</sub>—<sub>5</sub>, —C(O)CH<sub>2</sub>CH<sub>2</sub>— and —C(O)C(R<sub>4</sub>)<sub>2</sub>N(R<sub>4</sub>)— wherein R<sub>4</sub> is as hereinbefore defined.

#### 4,163,798 STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City; Charles A. Wilson, and Charles E. Reineke, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

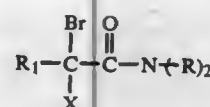
Filed Dec. 14, 1977, Ser. No. 860,642  
Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 424—304

19 Claims

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial compound of the formula:



wherein:

X is hydrogen, halogen or a cyano radical;  
each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R<sub>1</sub> is a cyano radical or an amido radical of the formula:



wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said water-miscible organic solvent being selected from normally liquid, polyalkylene glycols of the ethylene, trimethylene or tetramethylene series and the mono- or di-saturated hydrocarbyl ethers thereof;

(c) water; and

(d) a stabilizing amount of an aldehyde stabilizer selected from the group consisting of saturated aliphatic aldehydes, saturated alicyclic aldehydes and carbocyclic aromatic aldehydes, said stabilizing amount being an amount of the stabilizer sufficient to measurably reduce the decomposition rate of the halogenated amide antimicrobial in the aqueous antimicrobial composition.

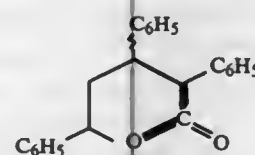
4,163,799  
PSYCHOSTIMULANT COMPOUNDS  
Pierre Simon, Sevres, France, assignor to Union Chimique Continentale U.C.C., Puteaux, France  
Continuation-in-part of Ser. No. 695,751, Jun. 14, 1976, Pat. No. 4,113,742. This application Apr. 8, 1977, Ser. No. 786,485  
Claims priority, application France, Jun. 13, 1975, 75 18491; Dec. 8, 1976, 76 36942

Int. Cl.<sup>2</sup> C07D 309/10

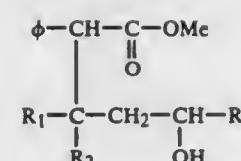
U.S. Cl. 424—317

7 Claims

1. A tetrahydro-α-pyrone of the formula:



2. A compound of the formula



wherein R<sub>1</sub> is phenyl and R<sub>2</sub> is H; R' is alkyl of 1-4 carbon atoms, and Me is a pharmaceutically acceptable alkali metal.

#### 4,163,800 TOPICAL COMPOSITION AND TREATMENT OF SKIN LESIONS THEREWITH

Richard R. Wickett, Hamilton, and William R. Kock, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 17, 1977, Ser. No. 825,363  
Int. Cl.<sup>2</sup> A61K 31/085, 31/155

U.S. Cl. 424—326

2 Claims

1. A dermatological composition for treating skin lesions comprising a keratolytically effective amount of benzoyl peroxide and an amount for reducing the skin irritation thereof of a compound selected from the group consisting of guanidine hydrochloride, guanidine sulfate, guanidine carbonate, and guanidine phosphate.

#### 4,163,801 TREATMENT OF ANIMALS WITH 2,6-BIS(2-HYDROXYBENZYL)PHENOLS TO ERADICATE TREMATODES

Errol J. McGarry, Bundoora, and Bruce A. Forsyth, Croydon, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

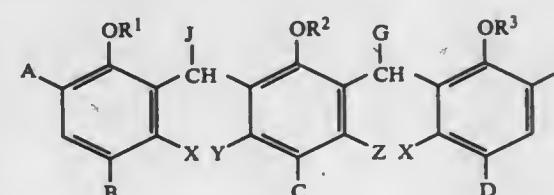
Filed Jul. 5, 1977, Ser. No. 812,471

Claims priority, application Australia, Jul. 7, 1976, 6576/76  
Int. Cl.<sup>2</sup> A61K 31/055, 31/05, 31/275

U.S. Cl. 424—347

19 Claims

1. A method of treating warm blooded animals to eradicate trematodes; which method comprises administering to the animal an effective amount of a composition comprising as active ingredient a compound of formula I:



wherein

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are independently chosen from the group consisting of hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl and C<sub>2</sub> to C<sub>6</sub> alkenyl;

B, C and D are independently chosen from the group consisting of halogen, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>2</sub> to C<sub>6</sub> alkenyl, C<sub>2</sub> to C<sub>6</sub> alkoxy, hydroxy, cyano, nitro and the group COR<sup>5</sup> wherein R<sup>5</sup> is hydroxy or C<sub>1</sub> to C<sub>6</sub> alkoxy;

A, E, X, Y and Z are independently chosen from the group consisting of hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>2</sub> to C<sub>6</sub> alkenyl, C<sub>2</sub> to C<sub>6</sub> alkoxy, hydroxy, cyano, nitro and the group COR<sup>5</sup> wherein R<sup>5</sup> is hydroxy or C<sub>1</sub> to C<sub>6</sub> alkoxy;

J and G are independently chosen from the group consisting of hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl, trichloromethyl and, together with the geminal hydrogen, the group =CCl<sub>2</sub>; or an optical isomer thereof; or a salt thereof.

4,163,802  
PREPARATION OF YOGURT  
Robert B. Redfern, and Samir F. Rizk, both of Raleigh, N.C., assignors to Pine State Creamery Company, Raleigh, N.C.  
Filed Mar. 4, 1977, Ser. No. 774,415  
Int. Cl.<sup>2</sup> A23C 9/12

U.S. Cl. 426—43

7 Claims

2. The process of preparing a yogurt base and combining it with a sweetener base to form an improved yogurt food product comprising: blending approximately 4.9% by weight dried skim milk powder with approximately 41.3% by weight fresh skim milk; adding said blend to approximately 46% by weight whole milk; blending approximately 0.5% by weight stabilizer with approximately 7.3% by weight liquid cane sugar; combining said second mentioned blend with said mixture; pasteurizing and homogenizing said combined mixture; cooling the combined mixture to between 110° and 114° Fahrenheit; adding a yogurt culture at the rate of between 1.5% and 2.5%; allowing the combined mixture to stand between 2.5 and 4 hours until a pH of between 4.2 and 4.4 is obtained; cooling said combined mixture to between 40° and 45° Fahrenheit to provide said yogurt base; and adding to said yogurt base a sweetener base including in approximate proportions by weight, 21.4% whole milk containing approximately 3.3% butterfat, 3% cream, 6.7% skim milk powder, 3% dried whey, 55.8% liquid cane sugar having approximately 67.5% solids, 3.9% stabilizer, and 6.2% water whereby an improved yogurt is provided.

#### 4,163,803 TURMERIC COLORING PROCESS AND COMPOSITION FOR FOODS AND BEVERAGES

Kenneth J. Goldscher, 600 Red Lion Rd., Apt. E12, Philadelphia, Pa. 19115

Filed Jul. 19, 1978, Ser. No. 926,226  
Int. Cl.<sup>2</sup> A23L 1/22, 1/275

U.S. Cl. 426—250

16 Claims

1. An edible composition for coloring or flavoring a food or beverage, said composition comprising

(a) turmeric or a derivative of turmeric containing curcumin, wherein said turmeric or turmeric derivative have a bitter taste; and

(b) a glycine in an amount sufficient to substantially reduce or eliminate said bitter taste.

#### 4,163,804 THERMOPLASTIC COMPOSITION DERIVED FROM ANIMAL PARTS AND METHODS FOR PRODUCTION THEREOF

Robert H. Meyer; Charles I. Graham; John E. Rudolph, and Robert E. Haas, all of Lima, Ohio, assignors to Beatrice Foods Co., Chicago, Ill.

Filed Feb. 8, 1978, Ser. No. 876,124  
Int. Cl.<sup>2</sup> A23L 1/31; A23J 3/00

U.S. Cl. 426—315

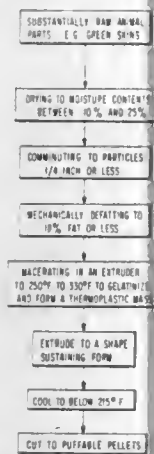
25 Claims

1. A method for producing a puffable, thermoplastic composition derived from animal parts comprising:

(1) drying substantially raw animal parts which contain no more than 25% hot oil rendered parts to moisture contents between 10% and 25%;  
(2) comminuting the dried parts to particles having dimensions no greater than ¼ inch;  
(3) mechanically defatting the comminuted particles at temperatures below 200° F. to an average fat content of less than 18% whereby protein contained in the particles is not substantially denatured and wherein mechanical means are used for said defatting;  
(4) macerating the defatted particles in an extruder barrel at temperatures between 250° F. and 330° F. and under sufficient pressure to cause mastication and gelatinization of the particles and to form a thermoplastic moldable mass;



- (5) extruding the moldable mass into a shape sustaining extruded form;



- (6) cooling the extruded form to below 215° F.; and  
(7) cutting the cooled form into puffed pellets.

4,163,805

## RECONSTITUTED FOOD PRODUCT

Richard A. Mueller, Donnellson, Iowa, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 644,108, Dec. 24, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 753,805  
Int. Cl.<sup>2</sup> A23L 1/04

U.S. Cl. 426—575

9 Claims

1. A process for making a reconstituted food product containing a semi-crisp natural food item which offers essentially the same semi-crisp texture and taste as said natural semi-crisp food item prepared by the steps of

- (a) blending said food item in comminuted, unsalted form with a formulation containing water, water-soluble alginate binder and a carbohydrate comprising at least one sugar having a low sweetness level selected from the group consisting of monosaccharides and disaccharides; said formulation consisting essentially of on a weight basis;
  - (1) about 30% to about 75% of finely-divided, unsalted food product;
  - (2) an effective amount of said water-soluble alginate binder;
  - (3) said carbohydrate in the proportion of about 97.5–80 parts carbohydrate to about 24–20 parts alginate, the alginate and carbohydrate together comprising about 6% to about 24% of the formulation; and
  - (4) water;
- (b) subjecting said formulation to mixing;
- (c) forming said formulation following mixing into a desired shape without substantial preliminary gelling;
- (d) contacting said shape with a gelling solution containing calcium ion for a sufficient time period to harden the alginate and to produce said semi-crisp texture; and
- (e) cutting said shape into pieces of predetermined size.

4,163,806

## CHEESE CAKE

Dennis M. Callen, and Margo A. Callen, both of 4066 Montrose, Flint, Mich. 48504

Filed Apr. 21, 1977, Ser. No. 789,685  
Int. Cl.<sup>2</sup> A23C 19/12

U.S. Cl. 426—582

7 Claims

1. A process for preparing an unbaked cheese cake which comprises: (a) forming a mixture consisting essentially of cream cheese, non-dairy whipped topping and powdered sugar, the mixture containing from about ten to twenty-five weight percent of topping, from about fifteen to forty weight percent of sugar and the balance being cheese and (b) refriger-

ating said mixture for a period of time until firm to produce said cheese cake in final form without baking.

4,163,807

## CITRUS FRUIT JUICE AND DRINK

Kristina R. Jackman, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1978, Ser. No. 886,717  
Int. Cl.<sup>2</sup> A23L 2/02

U.S. Cl. 426—599

6 Claims

1. A citrus fruit product containing fruit pulp consisting of citrus fruit juice or fruit drink containing a citrus fruit juice having incorporated therein a combination of gums consisting essentially of from about 0.01 to about 0.1 weight % of xanthan gum, and from about 0.01 to about 0.14 weight % of sodium carboxymethyl cellulose having a degree of substitution of at least about 0.7 wherein the weight % is based on the total weight of the citrus fruit product whereby the citrus fruit product has enhanced stability and homogeneity and the fruit pulp remains substantially suspended on standing.

4,163,808

## PROCESS FOR PREPARING AN IMITATION MAYONNAISE AND SALAD DRESSING

Potito U. DePaolis, 131 Groverton Pl., Los Angeles, Calif. 90024

Filed Mar. 10, 1978, Ser. No. 885,309  
Int. Cl.<sup>2</sup> A23L 1/24

U.S. Cl. 426—613

1 Claim

1. A method of manufacture of an imitation dressing selected from the group consisting of an imitation mayonnaise and an imitation salad dressing, which comprises the steps of:

- first admixing an amount of at least 3% but not in excess of 10% isolated soy protein by weight with 20% to 60% water by weight, spices and seasonings, and not more than about 10% of the total salad oil content in the finished dressing, by weight, for at least a five (5) minute period at ambient room temperature to produce a first admixture;
- secondly blending, into said first admixture, from about 0.1% to 2.0%, by weight, vinegar; and
- thereafter adding an additional amount of salad oil to bring the total salad oil content in the finished dressing to from 40% to 80% by weight, under high shearing action, to produce the final dressing.

4,163,809

## RADIATION POLYMERIZATION OF POLYMERIC BINDER COATING COMPOSITIONS

Vincent D. McGinniss, Valley City; Vincent W. Ting, Brunswick, and Ann F. Kah, Macedonia, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 619,747, Oct. 6, 1975, abandoned. This application Sep. 29, 1977, Ser. No. 837,855  
Int. Cl.<sup>2</sup> B05D 3/06; C08F 8/00

U.S. Cl. 427—44

3 Claims

1. In a process for radiation curing a coating applied onto a metal substrate and subjected to a source of radiation wherein said coating composition comprises an ethylenically unsaturated polymerizable binder pigment, and 0 to 10% by weight of a photoinitiator, the improvement comprising:

incorporating in said coating composition a high  $T_g$  polymer additive having a glass transition temperature ( $T_g$ ) greater than ambient curing temperature and added to the coating in the range of 10% to 40% by weight based on the weight of said coating, said high  $T_g$  polymer additive being substantially a linear polymer having a free end chain and pendant double bond and having a molecular weight of between about 1,000 and 50,000 whereby said high  $T_g$  polymer additive crosslinks with said binder upon exposure to said radiation and provides adhesion of said coating composition to the metal substrate.

4,163,810

## ULTRAVIOLET CURABLE POWDER PAINTS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 739,526, Nov. 8, 1976, Pat. No. 4,129,488. This application Sep. 15, 1978, Ser. No. 942,762  
Int. Cl.<sup>2</sup> C08G 18/00, 63/00

U.S. Cl. 427—54

2 Claims

1. In a process for producing dry powder paint composition having an average particle size of less than about 325 mesh and a melting point of at least about 80° C., the powder paint composition containing a film-forming binder, the improvement comprising:

providing a spatial epoxy polyester polymer by co-reacting a preformed epoxy adduct having a molecular weight of at least about 100 and a preformed polyester adduct having a molecular weight of at least about 100 with an intervening linear polymer chain to produce a spatially arranged epoxy-polyester polymer having a molecular weight of between about 1,000 and 10,000, said epoxy polyester spatial polymer having an ultraviolet sensitizer connected to said polymer, and said polymer being an ethylenically unsaturated polymer and reactive to ultraviolet energy to cross-link the ethylenic unsaturation; applying the powder paint composition to substrate; heating to cause flow out of the powder paint onto the substrate to form a continuous film; exposing the film to ultraviolet energy to cross-link and cure the film.

4,163,811

## METHOD OF FABRICATING A FUEL CELL ELECTRODE

Gerda M. Kohlmayr, Glastonbury, and Paul Stonehart, Madison, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 809,838, Jun. 24, 1977, abandoned, which is a continuation of Ser. No. 696,334, Jun. 15, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 895,162

Int. Cl.<sup>2</sup> H01M 4/88, 4/92, 4/96; B01J 23/40

U.S. Cl. 427—115

15 Claims

1. The method of constructing a fuel cell electrode comprising the steps of: forming an aqueous suspension of electrocatalyst particles; adding a sol of a polyvalent metal oxide or solution of a salt of a polyvalent metal to said aqueous suspension, the valency of the metal of said sol or solution of said salt being 3 or greater, and the concentration of the metal oxide in the sol or the concentration of the metal cation in the salt solution is on the order of  $10^{-2}$  to  $10^{-7}$  M; forming a separate aqueous suspension of colloidal hydrophobic polymer particles; combining said aqueous suspensions forming a uniform aqueous suspension of electrocatalyst particles and hydrophobic polymer particles; and fabricating said electrocatalyst particles and polymer particles into a fuel cell electrode.

4,163,812

## CONTAINER COATING METHOD

Robert G. Couchner, Salt Lake City, Utah, assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 502,811, Sep. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 140,838, May 6, 1971, abandoned, Ser. No. 223,969, Feb. 7, 1972, Pat. No. 3,987,937, and Ser. No. 337,005, Mar. 1, 1973, Pat. No. 3,851,140. This application Nov. 30, 1977, Ser. No. 855,960  
Int. Cl.<sup>2</sup> B05D 7/22

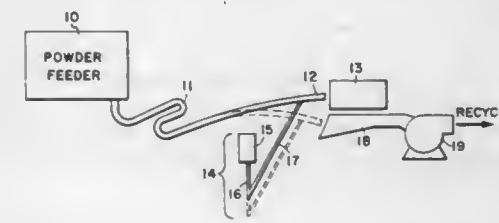
U.S. Cl. 427—183

9 Claims

1. A process of coating the interior of a cylindrical two-piece tin can container having an open end and a closed end with an

ultra-thin, continuous, pore-free comestible coating comprising:

- (a) pneumatically conveying a finely divided thermosetting resinous powder from a powder feeding device to a spraying device at a substantially constant rate which deviates from the average less than about five percent by weight,
- (b) heating said container to a temperature above the softening point of the resin, and then,



- (c) pneumatically spraying into the interior of said container from a point external to said container a discrete quantum of said powder at a velocity of about 20 feet/min. to about 1600 ft./min.
- (d) heating said coating to cause said resinous particles to form a continuous uniform film of resin on the interior of said container.

4,163,813

## METHOD OF PREPARING AND APPLYING ARTISTIC DECORATIVE COMPOSITIONS

Nancy S. Sheets, and James R. Sheets, both of 268 Foster Knoll, Joppa, Md. 21085

Continuation-in-part of Ser. No. 679,927, Apr. 26, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,728  
Int. Cl.<sup>2</sup> B05D 5/00

U.S. Cl. 427—198

7 Claims

1. In a process for the coating of a surface with a decorative coating which comprises the steps of mixing a farinaceous material with water in a ratio of one cup of water to one and one-half cups of farinaceous material to form an adhesive, said adhesive consisting essentially of farinaceous material and water, applying said adhesive to a backing material in irregular depth with suitable means; embedding inert material in a random pattern in the coating; the improvement of controlled drying at a temperature of 65 degrees F. for a period of 48 to 72 hours to produce a cracked surface, followed by the steps of coating the surface with a stain and a varnish.

4,163,814

## METHOD OF COATING GLASS BOTTLE WITH AQUEOUS DISPERSED URETHANE COMPOSITION

Kiyotsugu Asai, Yokohama; Kazunori Takaguchi, Kawasaki; Toshihiko Kawabata, Fujisawa; Shigeru Yatsugi, Kawasaki, and Toshiyuki Ichikawa, Tokyo, all of Japan, assignors to Mitsui-Nisso Corporation, Tokyo, Japan

Division of Ser. No. 740,756, Nov. 10, 1976, abandoned. This application May 10, 1978, Ser. No. 904,419

Claims priority, application Japan, Nov. 13, 1975, 50-135645  
Int. Cl.<sup>2</sup> B05D 3/02, 1/02

U.S. Cl. 427—372 R

5 Claims

1. A method for coating a glass bottle with a single protective layer comprising applying an aqueous dispersed urethane composition on the outside surface of the glass bottle, said aqueous dispersed urethane composition comprising:

- (a) a urethane oligomer obtained by interacting a mixture of two bifunctional active hydrogen-containing compounds and a monofunctional active hydrogen-containing isocyanate-blocking agent, and a diisocyanate under such conditions that an equivalent ratio of the active hydrogen contained in said mixture to the isocyanate group of said diisocyanate is about 1.0,
- (b) a hardener mixed with said urethane oligomer in an



equivalent ratio of the blocked isocyanate of said urethane oligomer to the active hydrogen of said hardener in the range of 1:0.8 to 1.2 whereby a thermosetting urethane composition is obtained,

- (c) water in an amount of 100 to 250 parts by weight per 100 parts by weight of said urethane oligomer, and  
(d) a surface active agent for dispersing said thermosetting urethane composition in said water, the amount of said surface active agent being in the range of 4 to 25 parts by weight per 100 parts by weight of said urethane oligomer, said bifunctional active hydrogen-containing compounds being composed of a polyoxyalkylene glycol having a molecular weight in the range of 1,200 to 5,000, the amount of said polyoxyalkylene glycol being in the range of 10 to 35 parts by weight per 100 parts by weight of said urethane oligomer, and a low molecular weight chain-elongating agent having a molecular weight below 500, and wherein

$$\frac{A+G}{E+F+G} \times 100 = 15 - 35\%$$

where

A is the weight of said polyoxyalkylene glycol in the aqueous dispersed urethane composition,  
G is the weight of said surface active agent in the aqueous dispersed urethane composition,  
E is the weight of said urethane oligomer in the aqueous dispersed urethane composition, and  
F is the weight of said hardener in the aqueous dispersed urethane composition,  
and then drying and curing the composition under temperature and time conditions to form a film on said bottle.

4,163,815

#### CATALYZED POLYISOCYANATE COATING COMPOSITIONS

Mo-fung Cheung, Warren, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 19, 1977, Ser. No. 834,859  
Int. Cl.<sup>2</sup> B05D 3/02

U.S. Cl. 427—385 R

9 Claims

1. A method for making high solid isocyanate coating compositions and curing them into continuous polymeric coatings, which comprises:

- (I) admixing in film forming amount in the coating composition: (A) a major amount by weight organic polyisocyanate and (B) a minor amount by weight of reaction product made by reacting (1) organic secondary amine comprising monoamine and (2) epoxy terminated compound wherein the equivalent ratio of (1) to (2) is about 1:1 and the reaction product adduct has:  
(i) hydroxy functionality;  
(ii) tertiary amino functionality; and  
(iii) a number average molecular weight in excess of about 150, wherein (B) is at least about 2.5% by weight of (A);  
(II) applying the coating composition of (I) that comprises (A) and (B) to a substrate; and  
(III) exposing the coating composition that is applied to the substrate to elevated temperature to yield the continuous polymer coating.

4,163,816

#### NOVEL METHOD FOR FORMING SILVER DIFFUSION TRANSFER IMAGE RECEIVING LAYERS

Robert D. Eckert, Lexington; Boris Levy, Wayland, and John B. Mahoney, Tewksbury, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 27, 1977, Ser. No. 846,157  
Int. Cl.<sup>2</sup> B05D 1/34, 1/36, 3/10

U.S. Cl. 427—401

12 Claims

1. A method for forming an image-receiving element for use in a silver diffusion transfer process which comprises the steps of acid hydrolyzing a solution of cellulose ester, coating a

support with said hydrolyzed cellulose ester and disposing silver precipitating nuclei in said hydrolyzed cellulose ester.

4,163,817

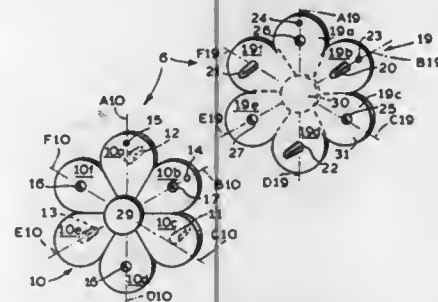
#### DECORATIVE PATCH

Norman L. DiCarlantonio, 8224 Raymond La., Potomac, Md. 20854, and Jerome F. Thiel, 2412 Nottingham Dr., Falls Church, Va. 22043

Filed Dec. 9, 1977, Ser. No. 859,197

Int. Cl.<sup>2</sup> F16B 5/07, 2/06; B32B 3/10; F16B 17/00  
U.S. Cl. 428—33

6 Claims



1. A patch for attachment to a thin material for repairing and decorating thin materials comprising a first ornamental or decorative member and a second ornamental or decorative member; said first ornamental or decorative member having a substantially flat surface adapted to contact one side of said thin material, said second ornamental or decorative member having a substantially flat surface adapted to contact the opposite side of said thin material, said first and said second ornamental or decorative members each having a plurality of spaced projections projecting from the substantially flat surface of said ornamental or decorative member, said plurality of spaced projections being adapted to pierce said thin material, said first and said second ornamental or decorative members each having a plurality of spaced apertures spaced to receive the plurality of spaced projections of the other ornamental or decorative member, each of said apertures extending completely through said ornamental or decorative members and being tapered with the larger opening thereof being located near the point of entry for the corresponding projection of the other ornamental or decorative member and the smaller opening thereof being located near the point of exit for said projection, the spaced apertures and spaced projections of each of said first and second ornamental or decorative members being located to permit said first and said second ornamental or decorative members to be oriented with respect to each other in order that the projections fit into different apertures, each of said projections having a plurality of substantially equally spaced raised portions extending from the outer surface thereof, said raised portions being compressible as said projections are forced into said apertures and being sufficiently oversized with respect to said apertures to achieve an interference fit.

4,163,818

#### ANTI-SLIP SERVING TRAY AND THE METHOD OF MANUFACTURING THEREOF

Pierre Wernli, Turmweg 3, 2560 Nidan, Switzerland

Filed Feb. 15, 1978, Ser. No. 877,966  
Int. Cl.<sup>2</sup> B29D 9/00; B29C 27/14

U.S. Cl. 428—138

3 Claims

1. A method of manufacturing an anti-slip laminate suitable for making a tray, comprising:

stacking sheets of paper impregnated with melamine sheets alternately with sheets of paper impregnated with phenolic resins, the last mentioned sheets having a greater density of impregnated resins than the first-mentioned sheets,

placing on the stack a loosely woven cloth covered on its upper face with a layer of porous PVC, said cloth having from eight to ten perforations per square centimeter, the perforations having a diameter of 0.1 to 0.2 mm. pressing the stack in a tray mold with said cloth thereon under a temperature of about 140° C. and at a pressure of about 60 kg./cm.<sup>2</sup> for about ten minutes, and removing a molded laminate from said mold.

4,163,819

#### DRAPEABLE NONWOVEN FABRICS

Kai-Lim W. Yung, and Bernard Silverman, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,883

Int. Cl.<sup>2</sup> B05D 1/14; B32B 7/14

U.S. Cl. 428—198

20 Claims

1. A process for bonding fibers to produce nonwoven fabrics comprising forming fibers from a melt blend comprising a polyamide and a lactam-polyol-polyacyl lactam or acyl poly-lactam terpolymer wherein the melt blend has at least about 0.1 weight % polyol based on the weight of the melt blend and contacting the said fibers at a temperature of from 20° C. to 250° C.

4,163,820

#### FLAME-RETARDANT PARTICLEBOARD

Hans A. Corver, and Allan J. Robertson, both of St. Catharines, Canada, assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 18, 1974, Ser. No. 524,697

Claims priority, application Canada, Jul. 29, 1974, 205863

Int. Cl.<sup>2</sup> B32B 7/02, 21/08

U.S. Cl. 428—212

5 Claims

1. A flame-retardant particleboard comprising (1) a core of wood particles having a size of from about 8 Tyler mesh to about 14 Tyler mesh, (2) at least one outer layer on said core of wood particles having a size of from about 15 Tyler mesh to about 150 Tyler mesh, only said outer layer wood particles having (3) water-insoluble ammonium polyphosphate of from about 25–175 Tyler mesh added thereto, all of said wood particles having been glued with resin and pressure consolidated into said particleboard, wherein the pH of said ammonium polyphosphate at 5% aqueous slurry ranges from about 4.5 to about 6.5 and the pH values of said resin, said wood particles and said ammonium polyphosphate match to within about 0.5 unit.

4,163,821

#### ADHESIVE BONDING OF METALLIC GLASS FABRIC

Louis F. Nienart, Bloomsbury; Gregory J. Sellers, Morristown; Gerald R. Bretts, Livingston, and Dirk A. Tilman, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 29, 1977, Ser. No. 865,453

Int. Cl.<sup>2</sup> B32B 7/00

U.S. Cl. 428—245

22 Claims

1. A method for adhesively bonding together the stands of a fabric composed of a glassy metal alloy which comprises applying a liquid polymeric adhesive curable to the solid state to the fabric, followed by curing the liquid adhesive to form a polymeric coating on the fabric.

4,163,822

#### PRESSURE SENSITIVE ADHESIVE MATERIAL AND METHOD OF PREPARATION

Brian W. Walter, Bishop's Stortford, England, assignor to Smith & Nephew Research Limited, Harlow, England

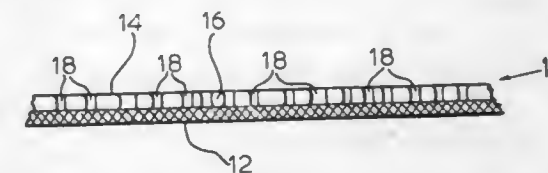
Filed Jul. 26, 1976, Ser. No. 708,775

Claims priority, application United Kingdom, Jul. 29, 1975, 31616/75

Int. Cl.<sup>2</sup> B32B 3/26, 5/18

U.S. Cl. 428—304

14 Claims



1. A process for making a water vapor permeable pressure sensitive adhesive material, which comprises

- (A) forming on a surface, which is poorly wettable (or non-wettable) by water, a continuous coating of an aqueous emulsion based pressure sensitive adhesive having dispersed therein a water immiscible organic liquid, which is more volatile than water and which does not break the emulsion;  
(B) leaving the coating at room temperature until pores develop and reach an average diameter of at least 100 microns;  
(C) drying the coating at a higher temperature of at least 60° C.; and  
(D) transferring the adhesive mass to a water vapor permeable backing material; wherein said water immiscible organic liquid is a petroleum ether mixture.

4,163,823

#### MAGNETIC RECORDING ELEMENTS AND PROCESS OF PREPARATION

Jean-Pierre Legras, Clichy-sous-Bois, and Claude M. Maréchal, Paris, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

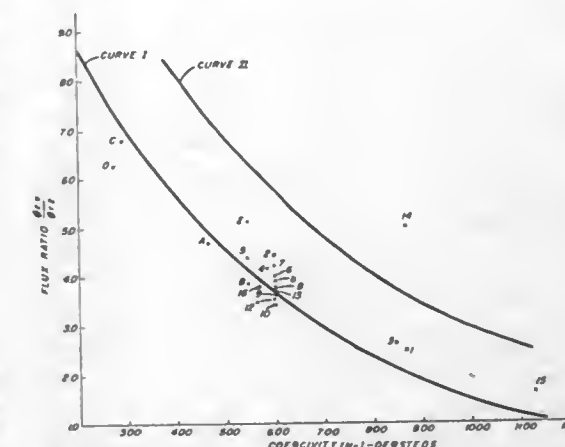
Filed Mar. 7, 1977, Ser. No. 775,118

Claims priority, application France, Mar. 12, 1976, 76 07073

Int. Cl.<sup>2</sup> H01F 10/02

U.S. Cl. 428—304

23 Claims



1. A magnetic recording element comprising a support having a surface with a peak-to-peak roughness up to about 0.5 micron which surface is coated with a magnetic recording medium having a thickness in the range of 4 to about 20 microns; said medium comprising (1) about 8 to 30 percent, by volume, of discrete, non-solid, nonmagnetizable voids substantially homogeneously dispersed therein and (2) aligned and oriented acicular magnetizable particles dispersed in a mag-



netic recording layer which layer forms a surface of said element and has a surface smoothness, determined as percent contact area, of at least 86 percent, the ratio of said thickness to said peak-to-peak roughness (t/r) being at least about 10.

14. A process for the manufacture of a magnetic recording element having both low modulation noise and high magnetic particle alignment and orientation which process comprises the steps of:

- forming a dispersion of acicular magnetizable particles in a solution of binder in solvent,
- coating a support having a peak-to-peak roughness up to about 0.5 micron with a magnetic medium comprising a layer of said dispersion as the outermost layer with respect to said support,
- applying a magnetic field to said medium while it still contains solvent to align said magnetic particles, in the plane of said layer,
- removing substantially all solvent within said medium while forming at least 10 percent, by volume, of substantially homogeneously dispersed, discrete, gaseous non-magnetizable voids, and
- compacting said medium to reduce the volume of said voids by at least 15 percent to a final volume of about 8 to 30 percent and to obtain a ratio of said thickness to said peak-to-peak roughness of at least about 10 while imparting a surface smoothness, determined as percent contact area, of at least 86 percent to said layer.

4,163,824

## FIBER FOAM AND PROCESS

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research & Engineering Co., Florham Park, N.J.  
Division of Ser. No. 565,949, Apr. 7, 1975, Pat. No. 4,073,840, which is a continuation-in-part of Ser. No. 407,829, Oct. 19, 1973, abandoned. This application Sep. 23, 1977, Ser. No. 836,042

Int. Cl.<sup>2</sup> B32B 5/18, 5/26

U.S. Cl. 428—313

3 Claims

1. A fiber-reinforced structural foamed article comprising: a foamed resin and from about 1 wt. % to about 50 wt. % of discrete glass fiber filaments of staple length, said article having a low density core and a high density integral skin and said fiber filaments being randomly oriented and distributed throughout the foamed article, the weight ratio of fiber to foamed resin and integral skin being substantially uniform throughout.

4,163,825

## THREADS OR FIBERS OF POLYTETRAFLUORETHYLENE

Adalbert Wimmer, Vöcklabruck, Austria, assignor to Chemiefaser Lenzing Aktiengesellschaft, Lenzing, Austria  
Filed Dec. 7, 1977, Ser. No. 858,390

Claims priority, application Austria, Dec. 7, 1976, 9037/76

Int. Cl.<sup>2</sup> B65D 53/06; F16C 33/20; F16J 15/20, 15/22

U.S. Cl. 428—368

34 Claims

1. Threads or fibres of polytetrafluorethylene having an improved heat conductivity, comprising thread or fibre cores having a certain weight, and envelopes having a certain weight and enclosing said thread or fibre cores, said envelopes having a certain content of fine-particle polytetrafluorethylene, a certain content of a heat conducting pigment and a certain content of a binder.

9. A sealing package using said threads or fibres as set forth in claim 1, wherein said threads or fibres are interlaced.

10. A method of producing threads or fibres of polytetrafluorethylene having an improved heat conductivity, comprising

providing a filament or yarn core of polytetrafluorethylene and having a certain weight,

providing an aqueous dispersion containing between 30 and 70% by weight of solids, said solids including between 30 and 90% by weight of conducting pigment, between 10

and 70% by weight of fine-particle polytetrafluorethylene, and maximally 5% by weight of emulsifying agent, said 5% by weight of the emulsifying agent being based on the amount of solids,

immersing said filament or yarn core into said aqueous dispersion so as to avive said filament or yarn core with an envelope of said aqueous dispersion, squeezing off excessive aqueous dispersion from said avived filament or yarn core, drying said avived filament or yarn core, treating said avived filament or yarn core with an antifric-tion agent, and quilling said avived filament or yarn core.

4,163,826

## SELF-BONDING MAGNET WIRES AND COILS MADE THEREFROM

Munetaka Kawaguchi, and Masayoshi Miyake, both of Nagoya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

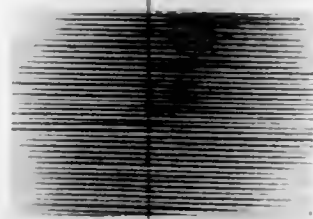
Filed Feb. 28, 1978, Ser. No. 881,940

Claims priority, application Japan, Feb. 28, 1977, 52/21844

Int. Cl.<sup>2</sup> H01B 3/30; H01F 5/06

U.S. Cl. 428—371

16 Claims



1. A self-bonding magnet wire comprising an electrical conductor having directly thereon or on an electrical insulation layer thereon a coated and baked layer of an enamel comprising a polymer solution containing the reaction product obtained on heating to at least 120° C. two or more copolyamides, at least one of which is a copolyamide having a nylon-12 unit in the molecule thereof, in a solvent containing at least one compound with a phenolic hydroxyl group in the molecule thereof.

4,163,827

## METHOD OF MAKING A WRAPPED INNOCULATION ROD SUITABLE FOR MODIFYING THE COMPOSITION OF MOLTEN METALS

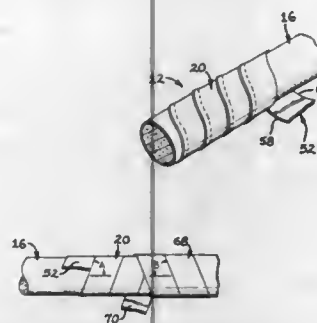
John R. Nieman, and S. David Sanders, both of Pekin, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1978, Ser. No. 871,722

Int. Cl.<sup>2</sup> B31C 13/00; B65H 81/06, 81/08; C22C 33/00

U.S. Cl. 428—377

9 Claims



1. A filled tubular inoculation rod (12) for controlled insertion into a molten metal for altering same, comprising: an extruded elongated core element means (16) for treating

the molten metal, said core element means (16) including a particulate mixture of a treating agent (28) and a binding agent (30) consolidated in a preselected range of about 85% to 95% theoretical density, said treating agent (28) comprising about 90% or more of the total weight of said core element means (16) and said binding agent (30) comprising about 1% to not more than 10% of the total weight of said core element means (16); and casing means (20) for substantially covering the entire exterior surface of said core element means (16) and containing said core element means (16), said casing means (20) being intimately and helically wrapped about said core element means (16).

6. A method of making a filled tubular inoculation rod (12) for controlled insertion into a molten metal for altering same, comprising:

- mixing a particulate treating agent (28) and a binding agent (30) and forming a treating material (24);
- extruding the treating material (24) from an extruding apparatus (14) and forming a continuously elongating core element (16); and
- helically wrapping said elongating core element (16) in a protective casing as the core element (16) extends from the extruding apparatus (14).

4,163,828

## PARYLENE STABILIZATION

Dennis M. Mahoney, Long Valley, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,145

Int. Cl.<sup>2</sup> B32B 9/04

U.S. Cl. 428—411

5 Claims

1. An article comprising:

- a solid substrate; and
- a coating on said substrate, said coating comprising parylene admixed with (i) a sterically hindered phenol vaporizable at a temperature in the range of about 20° C. to about 150° C. (ii) pyrogallol wherein the amount of phenol or pyrogallol admixed with the parylene is about 0.1 to about 15 percent by weight based on the weight of the parylene.

4,163,829

## METALLIC REDUCING ADDITIVES FOR SOLID CATHODES FOR USE IN NONAQUEOUS CELLS

Marvin L. Kronenberg, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

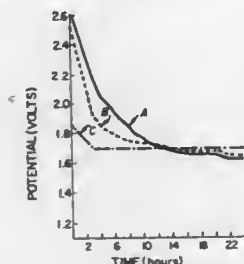
Filed Nov. 14, 1977, Ser. No. 851,192

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H01M 6/14

U.S. Cl. 429—194

15 Claims



1. A nonaqueous cell having an anode, an electrolyte comprising an organic solvent and a solute, and a solid cathode, said solid cathode comprising a major amount of solid active material, a minor amount of graphite and/or carbon, and a minor amount of a metallic reducing agent, said metallic reducing agent being sufficient to reduce any materials in the cell which are more cathodic than the active cathode material with respect to the anode.

4,163,830

## PROCESS FOR THE PRODUCTION OF NEW POLYSILOXANE-POLYOXYALKYLENE COPOLYMERS WITH REDUCED BURNING PROPERTIES

Erwin Windemuth, Bad Sooden-Allendorf; Manfred Dahm, Leverkusen; Manfred Dietrich, Leverkusen, and Peter Müller, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Division of Ser. No. 748,029, Dec. 6, 1976, Pat. No. 4,096,162.

This application Mar. 13, 1978, Ser. No. 885,424

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558523

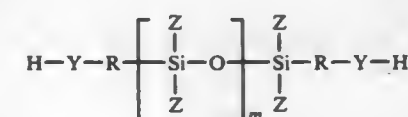
Int. Cl.<sup>2</sup> C08J 9/00

U.S. Cl. 521—111

3 Claims

1. In a polyurethane foam made from isocyanates, compounds with two or more isocyanate reactive hydrogen atoms, stabilizers, blowing agents and optionally catalysts, the improvement wherein said stabilizer is one produced by

(a) reacting organopolysiloxanes corresponding to the general formula:



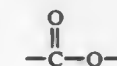
wherein

m represents an integer from 1 to 100,

Z, which may be the same or different, represents a C<sub>1</sub>-C<sub>5</sub> alkyl radical, a C<sub>6</sub>-C<sub>15</sub> aryl radical, a siloxyl or a siloxanyl radical or the group —R—Y—H,

R represents a C<sub>1</sub>-C<sub>6</sub> alkylene radical which may contain one or more hetero atoms,

Y represents —NR'—, —O—,



or —S— and

R' represents a hydrogen atom or C<sub>1</sub>-C<sub>6</sub> alkyl or C<sub>5</sub>-C<sub>9</sub> cycloalkyl radical, with polyisocyanates in an NCO:YH equivalent ratio of at least 2,

(b) heating the NCO-containing addition products thus obtained at from 110° to 160° C. to cause branching and,

(c) reacting the resulting branched NCO-containing addition products of relatively high molecular weight with a monofunctional polyether corresponding to the formula:



wherein

n represents an integer from 2 to 4,

x represents an integer from 1 to 100 and

R'' represents a monofunctional C<sub>1</sub>-C<sub>20</sub> hydrocarbon radical optionally containing oxygen or nitrogen as hetero atoms, in an NCO:OH ratio of from 0.8 to 1.2.

4,163,831

## HIGH EFFICIENCY TITANATE CATALYST FOR POLYMERIZING OLEFINS

Donald E. Gessell, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 581,293, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 463,213, Apr. 22, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,481

Int. Cl.<sup>2</sup> C08F 4/66, 10/02

U.S. Cl. 526—153

9 Claims

1. A process for polymerization of an α-olefin under conditions characteristic of Ziegler polymerization at a temperature in the range from about 0° to about 95° C. and in the presence



of a catalyst consisting essentially of (I) catalytic reaction product of (A) an ester of tetravalent or trivalent titanium with (B) an intermediate reaction product of (a) an organomagnesium component selected from an organomagnesium compound or a hydrocarbon soluble complex of the organomagnesium compound and an organometallic compound which solubilizes the organomagnesium compound in hydrocarbon and (b) a metallic halide provided that during the formation of the intermediate product the concentration of the organomagnesium component is at least 0.1 molar with respect to the magnesium up to the maximum concentrations at which the intermediate reaction product in slurry form is still stirrable, said metallic halide corresponding to the empirical formula  $MR_3-aX_a$  wherein N is a metal of Group 3a, R is alkyl, alkoxy, aryl or aryloxy; X is halogen; and a is in the range from 1 to 3 provided that wherein the organomagnesium component is an organomagnesium compound, a is in the range from 1 to 2.1, the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:Ti is within the range from about 20:1 up to about 200:1, the atomic ratio of M:Ti is within the range from about 60:1 to about 150:1, the atomic ratio of Mg:X is within the range from about 0.1:1 to about 0.1:1, said catalytic reaction product being the sole catalyst of the polymerization process.

4,163,832

# POLYTHIOETHERS FORMED BY ANIONIC RING OPENING OF EPISULFIDES

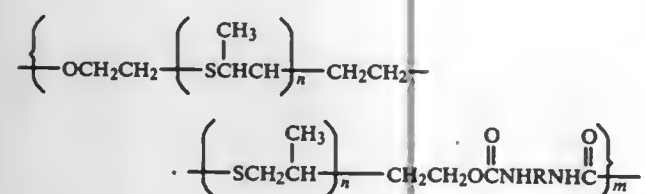
Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.  
Continuation-in-part of Ser. No. 618,777, Oct. 2, 1975, which is a continuation of Ser. No. 397,944, Sep. 17, 1973, abandoned, which is a continuation of Ser. No. 23,001, Mar. 26, 1970, abandoned. This application Nov. 21, 1977, Ser. No. 853,523

Int. Cl.<sup>2</sup> C08G 18/00

U.S. Cl. 528—76

56 Claims

55. A polythioether dithiol hydrocarbyl diisocyanate polyadduct compound of the general formula:



wherein n is an integer of 3 to 1000 and m is an integer of 1 to about 10, R is a  $C_{12}$  to  $C_{200,000}$  divalent hydrocarbon radical.

4,163,833

# METHOD FOR MAKING AROMATIC CYCLIC POLYFORMAL

Donald S. Johnson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 15, 1978, Ser. No. 905,635

Int. Cl.<sup>2</sup> C08G 65/40

U.S. Cl. 528—205

5 Claims

1. A method for making aromatic cyclic polyformal which comprises

- (A) refluxing a plural phase mixture comprising  
(a) a bisphenol of the formula,



- (b) alkali metal hydroxide,  
(c) water,  
(d) methylene halide and  
(e) a phase transfer catalyst,

where in the plural phase mixture, the concentration of bisphenol does not exceed 3% by weight of the aqueous phase, there is utilized per mole of the bisphenol, more than 2 moles of

alkali metal hydroxide and more than 1 mole of methylene halide, and there is present by volume at least 0.5 part of organic phase, per part of aqueous phase,

(B) recovering aromatic cyclic polyformal from the mixture of (A), by effecting the separation of the aromatic cyclic polyformal by the use of methanol or by effecting the evaporation of organic solvent therefrom,

where R is selected from  $C_{6-25}$  divalent aromatic radicals.

4,163,834

# POLYETHERS OF TETRAHALOBISPHENOL A

Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

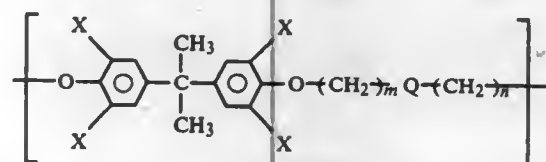
Filed Jan. 2, 1976, Ser. No. 645,957

Int. Cl.<sup>2</sup> C08G 65/40

U.S. Cl. 525—534

14 Claims

1. A linear, polyether containing recurring units of the formula



wherein X is a halogen selected from Br and Cl, m and n are each integers of 1 to 4 and each Q is selected from  $-\text{CH}_2-$ , and



wherein not more than 75 mole percent of the Q groups are



said polyether having a weight average degree of polymerization of at least 50 and an inherent viscosity of at least 0.2 when measured in a 1 percent by weight solution of said polyether in 1,1,2,2-tetrachloroethane at 30° C.

4,163,835

# PREPARATION OF ELECTROLYTE-FREE AMINOPLAST RESINS

Steffen Piesch, Oberursel, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 19, 1977, Ser. No. 760,651

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603768

Int. Cl.<sup>2</sup> C08G 12/30, 12/32

U.S. Cl. 528—254

12 Claims

1. A process for the manufacture of an electrolyte-free etherified methylolaminotriazine, wherein in the absence of electrolyte the aminotriazine is condensed with from about 1.3 mols to 2 n mols of formaldehyde per mol of aminotriazine where n is the number of amino groups in the aminotriazine, in an excess of etherifying alcohol having the formula



R denoting an alkyl group with 1 to 4 C atoms and m repre-

4,163,838

# PROCESS FOR THE PRODUCTION OF POLYVINYL CHLORIDE BASED POWDERS SUITABLE FOR PLASTISOL PREPARATION

Josef Kalka, Herten, Fed. Rep. of Germany, assignor to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 948,259

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650331

Int. Cl.<sup>2</sup> C08J 3/12

U.S. Cl. 528—501

6 Claims

1. In a process for the production of polyvinyl chloride based powders suitable for plastisol preparation, wherein such powders are obtained by:

- polymerization of vinyl chloride in (a) a dispersion comprising an aqueous emulsion in the presence of water-soluble catalysts or (b) a microdispersion in the presence of oil-soluble catalysts;  
addition of at least one additive material; and  
spray-drying the dispersion;  
an improvement comprising separately spray-drying at least one such additive in the liquid phase concurrently with the dispersion while simultaneously intimately intermixing the additive spray and the dispersion spray;  
wherein the additive is immiscible with the polyvinyl chloride dispersion and is a material which improves at least one of the thermostability of the powder, the rheological properties of the plastisol to be prepared from the powder or the foam characteristics of the foam to be produced from the plastisol.

4,163,839

# ISOCOFORMYCIN AND A PROCESS FOR THE PRODUCTION THEREOF

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama, and Masami Shimazaki, Kokunbunji, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

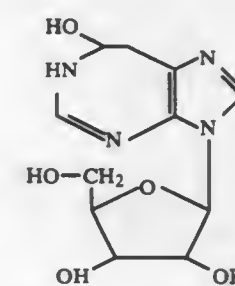
Filed Dec. 9, 1977, Ser. No. 858,928

Int. Cl.<sup>2</sup> C07H 19/04; A61K 31/70

U.S. Cl. 536—24

1 Claim

1. The compound, designated isocoformycin, having the formula



4,163,840

# PROCESS AND APPARATUS FOR MAKING ALKALI CELLULOSE IN SHEET FORM

Charles J. Geyer, Jr., Berwyn, and Ben E. White, Wayne, both of Pa., assignors to Fiber Associates, Inc., Berwyn, Pa.

Filed May 9, 1975, Ser. No. 576,200

Int. Cl.<sup>2</sup> C08B 1/08, 1/10

U.S. Cl. 536—101

10 Claims

1. Process for continuously making alkali cellulose and depolymerizing it to a desired degree of polymerization comprising first contacting a cellulose sheet of indefinite length with 17–25% alkali hydroxide solution, removing said sheet from said solution and pressing out caustic soda solution followed by a rapid depolymerization process to bring about desired depo-

senting an integer from 1 to 4, by heating such a condensation mixture having a water content of not over about 10% by weight to from about 50° to about 180° C. until the condensation has taken place and the degree of etherification is at least about 33%.

4,163,836

# PROCESS FOR THE MANUFACTURE OF SOLUBLE COPOLYMERS WHICH CONTAIN HYDROXYL GROUPS AND CAN BE CROSSLINKED WITH ORGANIC POLYISOCYANATES

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 19, 1977, Ser. No. 760,360

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603259

Int. Cl.<sup>2</sup> C08F 212/08

U.S. Cl. 528—366

4 Claims

1. Process for the manufacture of a soluble copolymer, which contains hydroxyl groups, and which copolymer can be crosslinked with organic polyisocyanates which comprises heating in an inert organic solvent in the presence of a polymerization initiator and optional chain stoppers, simultaneous esterification and polymerization taking place, a mixture which consists of

- (a) 26–28% by weight of styrene,  
(b) 20–22% by weight of methyl methacrylate,  
(c) 18–20% by weight of hydroxyethyl methacrylate,  
(d) 7.5–8.5% by weight of acrylic acid, and  
(e) 25.0–27.0% by weight of glycidyl esters, of  $\alpha$ -alkylalk-anemonocarboxylic acids and/or  $\alpha,\alpha$ -dialkylalk-anemonocarboxylic acids, having the empirical formula  $C_{13}H_{24}O_3$  and in which the amounts of the compounds (a) to (e) must add up to 100% by weight, said components (c), (d), and (e) being employed in amounts such that the reaction product has a content of hydroxyl groups of 4.0 to 5.0% by weight, based on the weight of the starting monomers, and the components (d) and (e) are employed in a molar ratio of (d):(e) of 1.01 up to 1.1 to 1.0, until the reaction mixture has acid numbers of between 6 and 12.

4,163,837

# MULTIPLE LOCI COUNTER-CURRENT WASHING

Elton E. Rush, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 16, 1977, Ser. No. 852,140

Int. Cl.<sup>2</sup> C08F 6/00

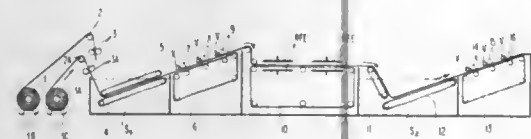
U.S. Cl. 528—498

8 Claims

1. A method for removing undesired components from a solid which consists essentially of introducing a slurry of solids into one end of a treating zone, moving said solid as a slurry through said treating zone countercurrently to a flowing treating agent introduced into said zone and moved through said zone characterized in that regions of turbulent mixing are formed separated by at least two temperature interfaces by introducing several portions of a treating agent to loci spaced at different distances away from said one end, a portion introduced farthest from the place of slurry introduction being at a substantially different temperature from that of the slurry and a portion of treating agent introduced intermediate the introduction of the slurry and the first introduced agent being at a temperature intermediate the temperature of the slurry and said first portion of introduced agent, the densities and temperatures of the solids and the treating agent being different and differing to an extent, rendering possible the countercurrent flow of the solids and the treating agent and the formation of regions of turbulent mixing separated by at least two temperatures interfaces.



lymerization of cellulose, said depolymerization process consisting of exposing said cellulose to RF energy for a period of



time and at an energy input level sufficient to accomplish said depolymerization.

4,163,841

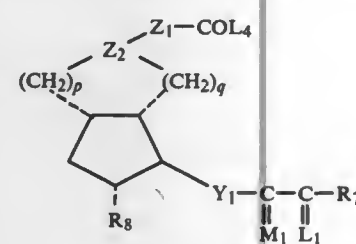
## PYRIDYLAMIDES OF NITRILLOPROSTACYCLINS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

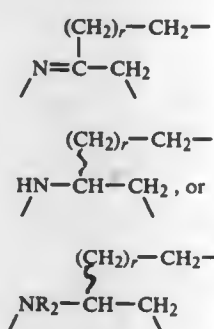
Continuation-in-part of Ser. No. 807,514, Jnn. 17, 1977, Pat. No. 4,097,489. This application Apr. 5, 1978, Ser. No. 893,587 Int. Cl.<sup>2</sup> C07D 213/50

U.S. Cl. 542-421

1. A prostacyclin analog of the formula



wherein  $R_8$  is hydrogen, hydroxy, or hydroxymethyl  
wherein  $Z_2$  is

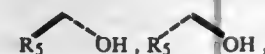


wherein  $R_2$  is alkyl of one to 4 carbon atoms, inclusive, or alkylcarbonyl of one to 4 carbon atoms, inclusive;  
wherein one of  $p$ ,  $q$ , and  $r$  is the integer one and the other two are the integer zero;

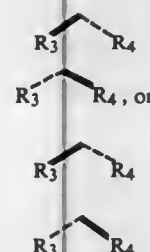
wherein  $Z_1$  is

- (1)  $-(CH_2)_g-CH_2-CH_2-$ ,
  - (2)  $-(CH_2)_g-CH_2-CF_2-$ , or
  - (3)  $trans-(CH_2)_g-CH=CH-$ ,
- wherein  $g$  is the integer zero, one, or 2;  
wherein  $R_4$  is hydrogen, hydroxy, or hydroxymethyl;  
wherein  $Y_1$  is
- (1)  $trans-CH=CH-$ ,
  - (2)  $cis-CH=CH-$ ,
  - (3)  $-CH_2CH_2-$ ,
  - (4)  $trans-CH=C(Hal)-$ , or
  - (5)  $-C=C-$

wherein  $Hal$  is chloro or bromo;  
wherein  $M_1$  is



wherein  $R_5$  is hydrogen or alkyl with one to 4 carbon atoms, inclusive  
wherein  $L_1$  is



a mixture of

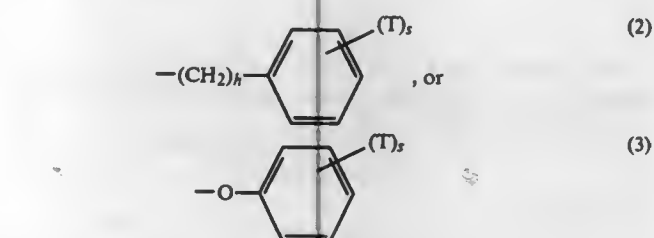
and

wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro;  
wherein  $L_4$  is amino of the formula  $-NR_{21}R_{22}$ , wherein one of  $R_{21}$  and  $R_{22}$  is

- (i) pyridyl;
  - (ii) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
  - (iii) pyridylalkyl of one to 4 carbon atoms, inclusive; or
  - (iv) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive;
- and the other of  $R_{21}$  and  $R_{22}$  is hydrogen or alkyl of one to 12 carbon atoms, inclusive;

wherein  $R_7$  is

- (1)  $-(CH_2)_m-CH_3$ ,



wherein  $m$  is the integer one to 5, inclusive,  $h$  is the integer zero to 3, inclusive;  $s$  is the integer zero, one, 2, or 3, and  $T$  is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, or with the proviso that not more than two  $T$ 's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when  $R_2$  is not alkylcarbonyl.

4,163,842

5-HYDROXY-PGI<sub>1</sub> PIPERIDYLAMIDES

Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

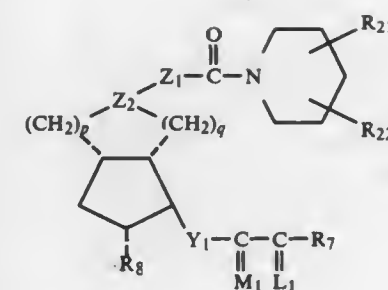
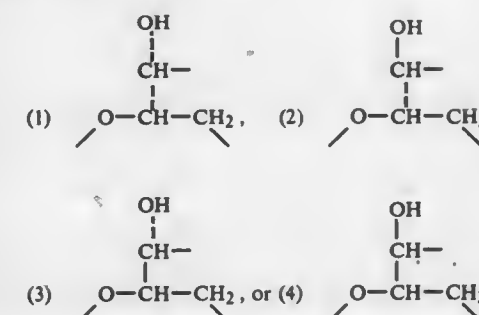
Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,199 Int. Cl.<sup>2</sup> C07D 405/06, 405/02

U.S. Cl. 542-426

1. A prostacyclin analog of the formula

47 Claims

wherein  $R_7$  is  
(1)  $-(CH_2)_3-CH_3$ ,

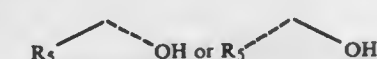
wherein  $Z_2$  is

wherein one of  $p$  or  $q$  is the integer zero or one and the other is the integer zero;

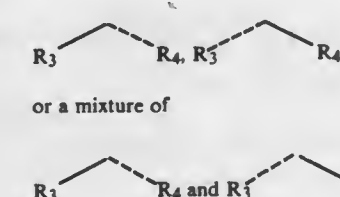
wherein  $Z_1$  is

- (1)  $-(CH_2)_g-CH_2-$ ,
  - (2)  $-(CH_2)_g-CH_2-CF_2-$ , or
  - (3)  $trans-(CH_2)_g-CH=CH-$ ,
- wherein  $g$  is the integer one, 2, or 3 when  $q$  is zero and zero, one, or 2 when  $q$  is one;  
wherein  $R_8$  is hydrogen, hydroxy, or hydroxymethyl;  
wherein  $Y_1$  is
- (1)  $trans-CH=CH-$ ,
  - (2)  $cis-CH=CH-$ ,
  - (3)  $-CH_2CH_2-$ ,
  - (4)  $trans-CH=C(Hal)-$ , or
  - (5)  $-C=C-$

wherein  $Hal$  is chloro or bromo;  
wherein  $M_1$  is

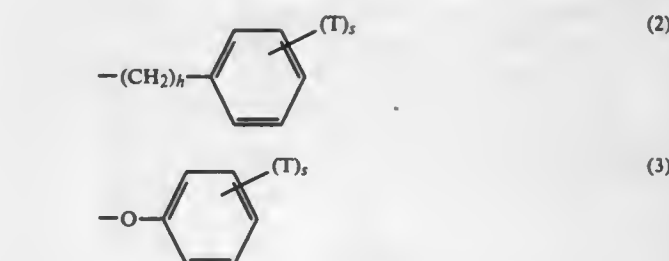


wherein  $R_5$  is hydrogen or alkyl with one to 4 carbon atoms, inclusive;  
wherein  $L_1$  is



wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro;  
wherein  $R_{21}$  and  $R_{22}$  are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxy carbonyl of one to 4 carbon atoms, inclusive; and

985 O.G. 7



wherein  $h$  is the integer zero or one;  $s$  is the integer zero, one, 2, or 3; and  $T$  is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two  $T$ 's are other than alkyl.

4,163,843

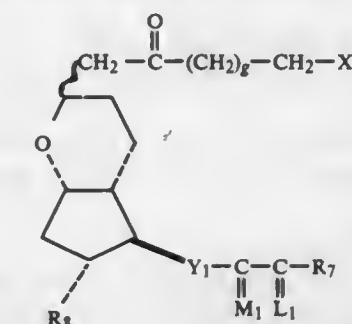
7A-HOMO-4-OXO-PGI<sub>1</sub> COMPOUNDS

Donald E. Ayer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 857,106, Dec. 5, 1977, Pat. No. 4,126,744. This application May 8, 1978, Ser. No. 904,188 Int. Cl.<sup>2</sup> C07D 307/93

U.S. Cl. 542-426

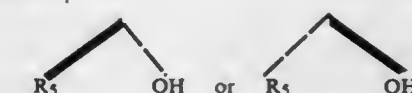
1. A prostacyclin analog of the formula



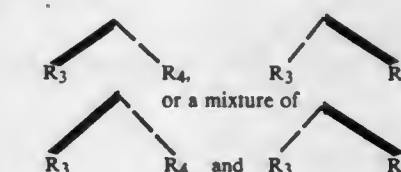
wherein  $\sim$  represents attachment of the side chain in the alpha or beta configuration or a mixture of alpha and beta configurations;

wherein  $g$  is the integer one, 2, or 3;  
where  $R_8$  is hydrogen, hydroxy, or hydroxymethyl;  
wherein  $Y_1$  is

- (1)  $trans-CH=CH-$ ,
  - (2)  $cis-CH=CH-$ ,
  - (3)  $-CH_2CH_2-$ , or
  - (4)  $-C=C-$ ,
- wherein  $M_1$  is



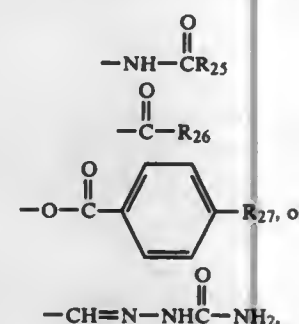
wherein  $R_5$  is hydrogen or alkyl with one to 4 carbon atoms, inclusive,  
wherein  $L_1$  is



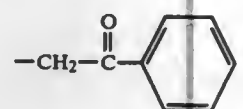
wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the

same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro; wherein Z<sub>1</sub> is

- (1) —COOR<sub>1</sub> wherein R<sub>1</sub> is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; hydrocarbylalkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



wherein R<sub>25</sub> is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH<sub>2</sub>; R<sub>26</sub> is methyl, phenyl, —NH<sub>2</sub>, or methoxy; and R<sub>27</sub> is hydrogen or acetamido; inclusive, phenacyl, i.e.,



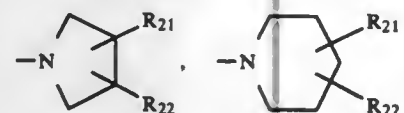
phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; of a pharmacologically acceptable cation;

- (2) —CH<sub>2</sub>OH; or

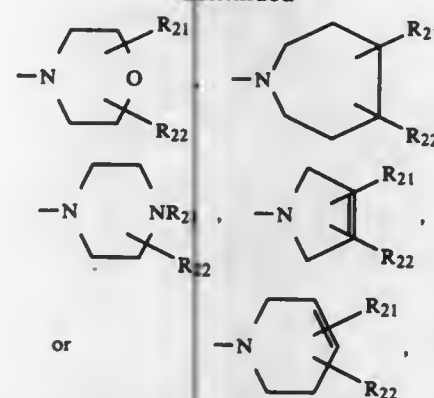
- (3) —COL<sub>4</sub>, wherein L<sub>4</sub> is

- (a) amino of the formula —NR<sub>21</sub>R<sub>22</sub>; wherein R<sub>21</sub> and R<sub>22</sub> are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxy, carbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to 4 carbon atoms, inclusive; carbamoylalkyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive; acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxy, carbonyl of one to 4 carbon atoms, inclusive, or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms, inclusive, and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R<sub>21</sub> and R<sub>22</sub> is other than hydrogen or alkyl;

- (b) cycloamino selected from the group consisting of

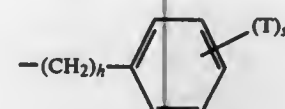


—continued



- wherein R<sub>21</sub> and R<sub>22</sub> are as defined above;  
(c) carbonylamino of the formula —NR<sub>23</sub>COR<sub>21</sub>, wherein R<sub>23</sub> is hydrogen or alkyl of one to 4 carbon atoms and R<sub>21</sub> is as defined above;  
(d) sulfonylamino of the formula —NR<sub>23</sub>SO<sub>2</sub>R<sub>21</sub>, wherein R<sub>21</sub> and R<sub>23</sub> are as defined above; or  
(e) hydrazino of the formula —NR<sub>23</sub>R<sub>24</sub>, wherein R<sub>23</sub> is as defined above and R<sub>24</sub> is amino of the formula —NR<sub>21</sub>R<sub>22</sub>, as defined above, or cycloamino, as defined above; and wherein R<sub>7</sub> is

- (1) —(CH<sub>2</sub>)<sub>m</sub>—CH<sub>3</sub>,



wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

4,163,844

#### NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS

Kazuo Kubo, Urawa; Noriki Ito, Iwatsuki; Isao Souza, Urawa; Yasuo Isomura, Yokohama, and Hiroshige Homma, Omiya, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 861,980

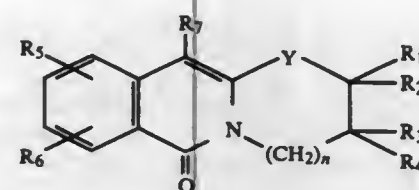
Claims priority, application Japan, Dec. 28, 1976, 52/157867; Oct. 11, 1977, 52/121666

Int. Cl.<sup>2</sup> C07D 279/08

U.S. Cl. 544—32

12 Claims

1. Nitrogen-containing heterocyclic compounds represented by the formula



wherein Y represents a sulfur atom, or a group shown by

(O)<sub>m</sub>  
—S—

wherein m is 1 or 2; n represents 1; R<sub>1</sub> and R<sub>4</sub>, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, or a lower alkenyl group; R<sub>2</sub> and R<sub>3</sub>, which may be the same or different, each represents a hydrogen atom, a hydroxyl group, a lower alkanoyloxy group, a lower alkyl group or a lower alkenyl group; said R<sub>2</sub> and R<sub>3</sub> may further form together a double bond; R<sub>5</sub> and R<sub>6</sub>, which may be the same or different, each represents a hydrogen atom, a halogen atom, a hydroxyl group, a nitro group, an amino group, a lower alkoxy group, a mono or di lower alkylamino group, or a lower alkyl group; said R<sub>5</sub> and R<sub>6</sub> may further form together a lower alkenedioxy group; and R<sub>7</sub> represents a hydrogen atom, a halogen atom, a lower alkanoyl group, a phenyl group, a phenyl lower alkyl group, a lower alkyl group, a hydroxy lower alkyl group, a di-lower alkylamino lower alkyl group, a pyrrolidino lower alkyl group, a piperidino lower alkyl group, a morpholine lower alkyl group, or a 4-lower alkylpiperazino lower alkyl group; and the pharmacologically acceptable non-toxic salts thereof.

4,163,846

#### SUBSTITUTED PYRAZOLOPYRIMIDINE COMPOUNDS

Albert Percival, and Philip N. Judson, both of Cambridge, England, assignors to Fisons Limited, London, England  
Filed May 13, 1977, Ser. No. 796,827

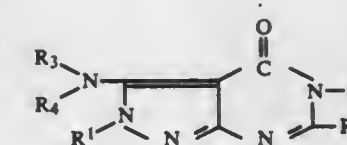
Claims priority, application United Kingdom, May 15, 1976, 20147/76

Int. Cl.<sup>2</sup> C07D 487/04; A01N 9/22

U.S. Cl. 544—262

10 Claims

1. A substituted pyrazolopyrimidine selected from the group consisting of (1) a compound of the formula



wherein

R<sup>1</sup> represents hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>3</sub> to C<sub>7</sub> cycloalkyl or phenyl,  
R<sup>2</sup> represents hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> haloalkyl or phenyl,  
R<sup>3</sup> and R<sup>4</sup> are the same or different and represent hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> alkanoyl, or together represent benzylidene, and  
R<sup>6</sup> represents hydrogen or C<sub>1</sub> to C<sub>6</sub> alkyl, (2) a salt of a compound of (1) with a base and (3) an acid addition salt of a compound of (1).

4,163,847

Patent Not Issued For This Number

4,163,845

#### RECYCLE OF SPENT ACID IN NITROLYSIS OF HEXAMINE TO RDX

Charles D. Brumley, Greenville, and John M. Staples, Kingsport, both of Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,212  
Int. Cl.<sup>2</sup> C07D 251/06

U.S. Cl. 544—215

6 Claims

1. A process for producing 1,3,5-trinitro-1,3,5-triazacyclohexane, by nitrolysis of hexamine, which comprises:

- introducing a solution of hexamine in acetic acid, a solution of ammonium nitrate in nitric acid, and acetic anhydride in stoichiometric excess over the proportions required to form 1,3,5-trinitro-1,3,5-triazacyclohexane, into a heel consisting essentially of acetic acid;
- heating the mixture under anhydrous conditions to effect nitrolysis and production of 1,3,5-trinitro-1,3,5-triazacyclohexane and a spent acid containing acetic acid, acetic anhydride, and nitric acid;
- adding water to said spent acid-1,3,5-trinitro-1,3,5-triazacyclohexane mixture sufficient to eliminate the acetic anhydride contained therein and adjust the water content of between 0% and about 2%;
- simmering the mixture to destroy linear nitramines;
- separating the 1,3,5-trinitro-1,3,5-triazacyclohexane from the spent acid; and
- recycling at least part of said spent acid containing nitric acid and 0-2% water to dissolve the hexamine reactant.

4,163,848

#### PROCESS FOR THE PRODUCTION OF 2-ALKYL- OR CYCLOALKYL-4-METHYL-6-HYDROXYPYRIMIDINES

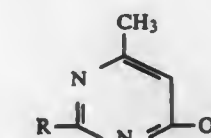
Joseph T. Blackwell, III, Greensboro; John T. Gupton, Jamestown; Teruko U. Miyazaki, Greensboro, all of N.C.; James B. Nabors, Baton Rouge, La., and Joseph R. Pociask, Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 8, 1978, Ser. No. 932,087  
Int. Cl.<sup>2</sup> C07D 239/36

U.S. Cl. 544—319

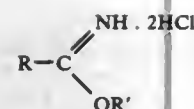
18 Claims

1. A method for the preparation of 2-alkyl-4-methyl-6-hydroxypyrimidine of the formula

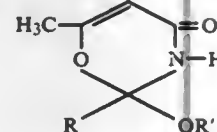


where R represents an alkyl of 1-4 carbon atoms or a cycloalkyl of 3 to 6 carbon atoms which comprises the steps of:  
(a) neutralizing an imidate hydrochloride of the formula



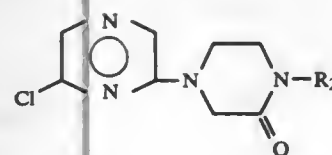
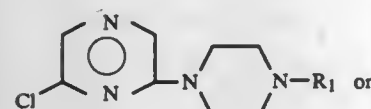


- where R' is an alkyl of 1-4 carbon atoms, with a strong acid-accepting base in aqueous solution in the presence of a water-immiscible solvent to form the free imide;
- (b) removing the aqueous phase and any residual water from the solvent/imide solution phase;
- (c) adding a molar equivalent of a solution of diketene in the presence of a Lewis-base or Lewis-acid as catalyst to form an oxazinone of the formula



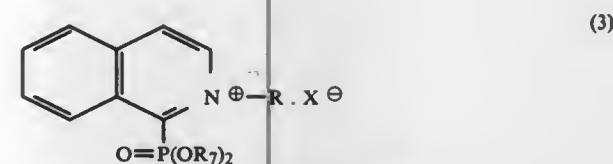
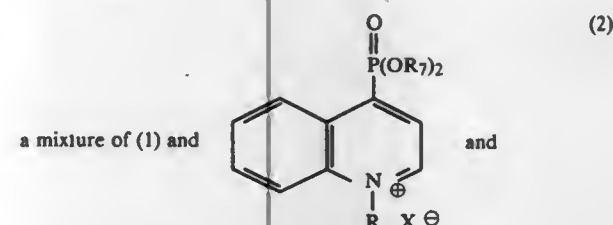
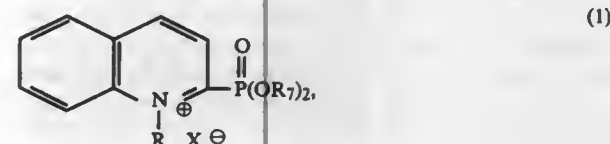
- (d) adding gaseous ammonia to said oxazinone solution to form said hydroxypyrimidine;
- (e) removing any water formed in step (d); and
- (f) removing said solvent and recovering the 2-alkyl-4-methyl-6-hydroxypyrimidine.

**4,163,849**  
**PIPERAZINYLPIRAZINES**  
 William C. Lumma, Jr., Pennsburg; Walfred S. Saari, Lansdale, and Anthony G. Zacchei, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.  
 Filed Mar. 17, 1978, Ser. No. 887,693  
 Int. Cl.<sup>2</sup> A61K 31/495; C07D 403/04  
 U.S. Cl. 544-357  
 1. A compound of the formula:



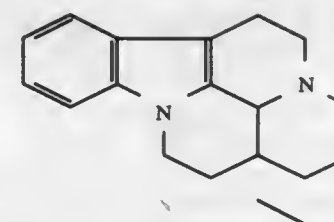
wherein R<sub>1</sub> is allyl, cyclopropyl, cyclopropylalkyl of 4-6 carbon atoms or propaniminoxycarbonyl and R<sub>2</sub> is alkyl of 1-4 carbon atoms and the pharmaceutically acceptable salts thereof.

**4,163,850**  
**POLYCYCLIC FULL QUATERNARY NITROGEN-HETEROCYCLIC PHOSPHONATES**  
 Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.  
 Continuation of Ser. No. 380,605, Jul. 19, 1973, abandoned, which is a division of Ser. No. 117,082, Feb. 19, 1971, Pat. No. 3,770,750. This application Dec. 15, 1977, Ser. No. 860,820  
 Int. Cl.<sup>2</sup> C07F 9/60, 9/62  
 U.S. Cl. 546-21  
 1. A full quaternary nitrogen-heterocyclic phosphonate selected from the group consisting of

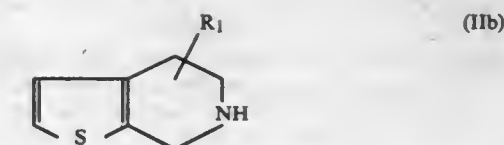


where R and R<sub>7</sub> are each alkyl and X is an anion.

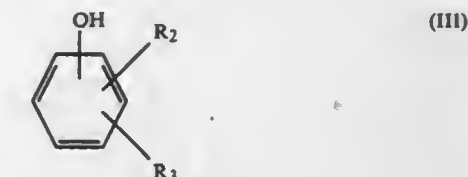
**4,163,851**  
**3α,16α-14,15-DIHYDROEBURNAMENINE**  
 Otto Clauder, Árpád Király, József Kókósi, Egon Kárpáti, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary  
 Filed Jul. 6, 1977, Ser. No. 813,227  
 Claims priority, application Hungary, Jul. 21, 1976, RI 592  
 Int. Cl.<sup>2</sup> C07D 519/04  
 U.S. Cl. 546-51  
 1. Vincane of the formula:



or a pharmaceutically acceptable acid-addition or quaternary salt thereof.

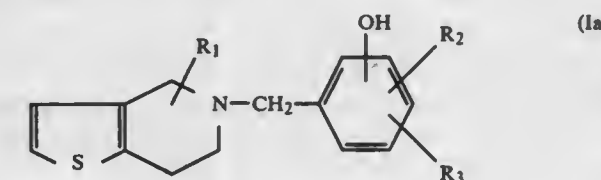


in which R<sub>1</sub> is hydrogen, with formaldehyde and a phenol of the formula:

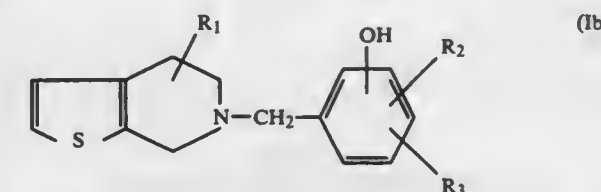


in which R<sub>2</sub> and R<sub>3</sub> have the above-defined meanings, to give the desired derivative selected from the pyridine derivatives of the formulae (Ia) and (Ib).

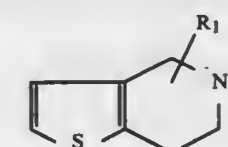
**4,163,852**  
**PROCESS FOR THE PREPARATION OF TETRAHYDRO-THIENO[3,2-c]- AND [2,3-c]PYRIDINE DERIVATIVES**  
 Gérard Ferrand, and Jean-Pierre Maffrand, both of Toulouse, France, assignors to Parcor, Paris, France  
 Continuation of Ser. No. 689,928, May 25, 1976, abandoned.  
 This application Dec. 13, 1977, Ser. No. 860,188  
 Claims priority, application France, Jul. 9, 1975, 75 21549  
 Int. Cl.<sup>2</sup> C07D 495/04  
 U.S. Cl. 546-114  
 1. Process for the preparation of derivatives selected from the group consisting of the tetrahydro-thieno(3,2-c)pyridine derivatives of the formula:



and their isomeric pyridine derivatives of the formula:

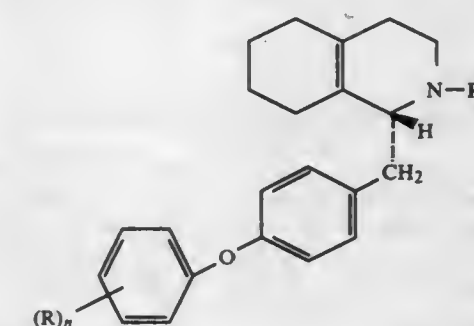


in which the hydroxyl radical is at the 2-position; R<sub>1</sub> is hydrogen; R<sub>2</sub> is hydrogen; and R<sub>3</sub> is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and nitro; comprising reacting in an organic solvent at a temperature between 50° C. and the boiling temperature of the solvent a derivative selected from the group consisting of the tetrahydro-thieno(3,2-c)pyridine derivatives of the formula:

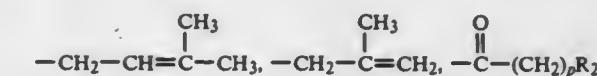


and their isomeric tetrahydro-thieno(2,3-c)pyridine derivatives of the formula:

**4,163,853**  
**1-(P-PHENOXY)BENZYL-1,2,3,4,5,6,7,8-OCTAHYDROISOQUINOLINES**  
 Ernest Mohacsi, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.  
 Division of Ser. No. 811,233, Jul. 29, 1977, Pat. No. 4,113,729, which is a continuation-in-part of Ser. No. 748,022, Dec. 6, 1976, abandoned. This application May 5, 1978, Ser. No. 903,273  
 Int. Cl.<sup>2</sup> C07D 217/20  
 U.S. Cl. 546-149  
 1. The compound of the formula:



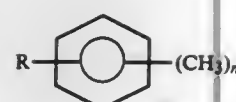
wherein R is halo, hydroxy nitro, methyl, ethyl, n-propyl, methoxy, ethoxy or hydrogen, R<sub>1</sub> is hydrogen, methyl, ethyl, n-propyl, vinyl, -CH<sub>2</sub>-CH=CH<sub>2</sub>,



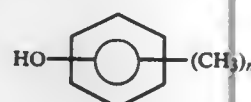
and -CH<sub>2</sub>(CH<sub>2</sub>)<sub>p</sub>R<sub>2</sub>; R<sub>2</sub> is phenyl or cyclo-lower alkyl having from 3 to 6 carbon atoms; p is an integer from 0 to 3; n is an integer of from 1 to 3.







where R is a secondary alkyl group having from three to four carbon atoms and n is an integer from one to three, inclusive, by contacting the alkylbenzene with molecular oxygen to provide an oxidation product solution containing tertiary hydroperoxide and primary hydroperoxide; acid-decomposing from 84 to 90 percent of the hydroperoxides in the presence of catalytic quantities of a mineral acid catalyst and terminating the acid decomposition by removing the acid catalyst with an alkali neutralizer or an ion-exchange resin when the aforesaid percentage of hydroperoxides is decomposed to provide a neutralized acid decomposition product; hydrogenating the acid decomposition product so obtained at a temperature of 50° to 200° C. under a pressure of 0 to 50 kg/cm<sup>2</sup> (gauge) for 0.2 to ten hours in the presence of a hydrogenation catalyst which is copper, chromium or a metal from Group VIII of the Periodic Table of Elements to reduce the quantity of hydroperoxides; and recovering from the hydrogenation product methylphenol of the formula (II):



where n is as set forth above.

**4,163,864**  
**PROCESS FOR PREPARING**  
**2-METHYL-3-PRENYL-4,5,6-TRIMETHOXYPHENOL**  
Eiichi Morita; Hirosaburo Ejiri, both of Saitama; Keizo Takayanagi, Isezaki; Yukio Morita; Yasuhide Tanaka, both of Saitama; Shizumasa Kijima, Tokyo; Kimio Hamamura, Chiba, and Isao Yamatsu, Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

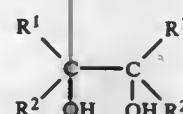
Filed Feb. 16, 1978, Ser. No. 878,470  
Claims priority, application Japan, Mar. 7, 1977, 52-23901  
Int. Cl.<sup>2</sup> C07C 41/00

U.S. Cl. 568—628 **2 Claims**  
1. A process for synthesizing 2-methyl-3-decaprenyl-4,5,6-trimethoxyphenol, which comprises reacting 6-methyl-2,3,4-trimethoxyphenol with decaprenol, in a solvent, at a temperature of from 0° to 50° C., in the presence of a complex catalyst comprising boron trifluoride ether complex mixed with silica alumina.

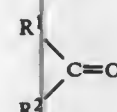
**4,163,865**  
**PROCESS FOR THE PREPARATION OF PINACOLS**  
Heinrich Wolfers, Rheurdt; Hans Rudolph, and Hans-Jürgen Rosenkranz, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 893,097  
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2718104

Int. Cl.<sup>2</sup> C07C 29/00  
U.S. Cl. 568—640 **15 Claims**  
1. An improvement in a process for the preparation of a pinacol of the formula



wherein  
R<sup>1</sup> and R<sup>2</sup> are identical or different and represent optionally substituted aliphatic, cycloaliphatic, araliphatic or an aromatic hydrocarbon radical  
by reducing a ketone of the formula

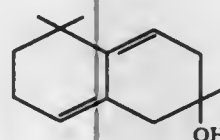


wherein  
R<sup>1</sup> and R<sup>2</sup> have the abovementioned meanings with a base metal, the improvement comprising carrying out the reduction in the presence of an organic halogen compound and in the presence of a phosphoric acid amide, phosphoric acid ester and/or carboxylic acid amide.

**4,163,866**  
**PROCESS FOR THE PREPARATION OF A BICYCLIC ALCOHOL**  
Hugo Strickler, Dardagny, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Jul. 12, 1977, Ser. No. 814,860  
Claims priority, application Switzerland, Jul. 28, 1976, 9634/76

Int. Cl.<sup>2</sup> C07C 29/00, 33/02  
U.S. Cl. 568—819 **4 Claims**  
1. Process for the preparation of α-ambrinol which comprises the steps of:  
(a) subjecting β-ionone to a thermal treatment at a temperature of between about 300° to 500° C. to give a dehydroambrinol of formula



(b) subsequently catalytically hydrogenating the said dehydroambrinol to form α-ambrinol.

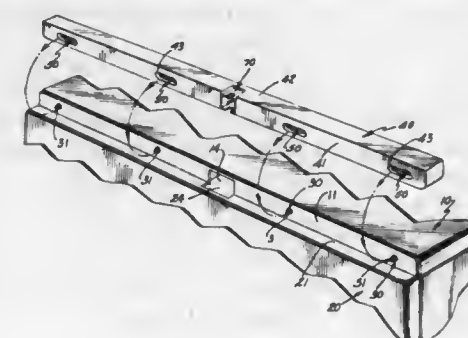
## ELECTRICAL

**4,163,867**  
**WIRING ACCESS SYSTEM FOR DESKS AND THE LIKE**  
James H. Breidenbach, Sturgis, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 20, 1977, Ser. No. 807,901  
Int. Cl.<sup>2</sup> A47B 13/00

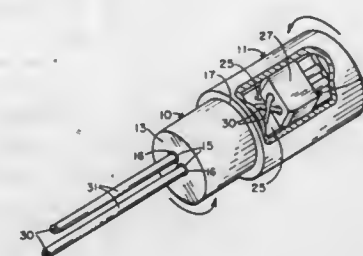
U.S. Cl. 174—48

**13 Claims**



5. In a desk, table or the like with a top having an exterior surface, an interior surface and an edge, and with a side panel having an exterior surface, an interior surface and an edge, an improved wiring access system comprising; said side panel being oriented with respect to said top such that said top edge and said side panel edges are both exposed and adjacent one another; an edge trim piece for locating at the juncture of said top and side panel, said edge trim piece having a first inside surface for aligning with and facing said top edge and a second inside surface for aligning with and facing said side panel edge whereby when said edge trim piece is in position at the juncture of said top and side panel, said top edge and said side panel edge are concealed from view; releasable securing means on said edge trim piece and on at least one of said top and side panel for releasably securing said edge trim piece thereto; a large access opening through at least one of said top and side panel, said large access opening extending from said edge through to said interior surface of said one of said top and side panel, but not extending through said exterior surface of said one of said top and side panel whereby said large access opening is normally covered by said trim piece; said large access opening being large enough to allow a user to readily feed wiring with large connectors therethrough; said edge trim piece including a relatively smaller access opening for allowing wiring to pass therethrough, said relatively smaller access opening being much less noticeable than said large access opening would be, and said relatively smaller access opening including an open side facing said large access opening whereby it can be fitted over wiring or the like without the necessity of feeding large connectors or the like therethrough.

**4,163,868**  
**WIRE CONNECTOR**  
Hugh D. Stotts, NE. 305 Ash St., Pullman, Wash. 99163  
Filed Jun. 2, 1978, Ser. No. 912,036  
Int. Cl.<sup>2</sup> H01R 5/08; B21F 7/00, 15/04  
U.S. Cl. 174—87 **4 Claims**



1. A permanent wire connector that automatically removes

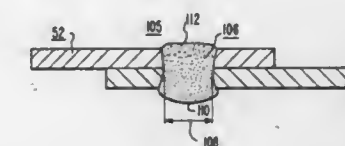
insulation from an insulated wire type conductor during the connecting process, comprising, in combination:

a base having means of unidirectional rotatable communication with a cap and defining at least two spaced conductor holes having axes substantially parallel to and at a spaced distance from the axis of rotation of the base relative to a cap; and  
a cap carried by the base for unidirectional rotatable motion relative thereto, said cap defining an insulation cutter chamber communicating with the conductor holes defined in the base and irrotatable carrying therein for slidable motion in the insulation cutter chamber an insulation cutter defining at least two spaced conductor holes axially alignable with the conductor holes defined in the base, said insulation cutter conductor holes each having an annular, inwardly extending cutter structure to cut and strip insulation from conductors carried therein upon rotary motion of the cap relative the base.

**4,163,869**  
**ELECTRICAL CONNECTION BETWEEN ALUMINUM CONDUCTORS**

John Z. Almand, III, Marietta; Henry F. Benner, Athens, both of Ga., and William J. Relchenecker, Penn Hills Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 2, 1977, Ser. No. 847,865  
Int. Cl.<sup>2</sup> H01R 5/04  
U.S. Cl. 174—94 R **2 Claims**



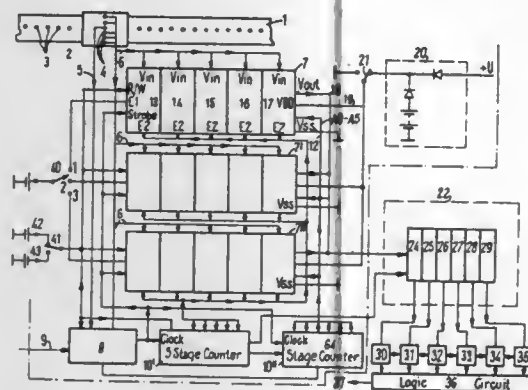
1. An electrical conductor connection, comprising:  
first and second aluminum conductor members each having first and second major opposed flat surfaces, and each having a thickness dimension of at least 0.100 inch, said first and second metallic conductor members being lapped with at least a portion of their second and first major flat surfaces, respectively, in contact with one another,  
and a fusion of aluminum joining said lapped first and second aluminum conductor members,  
said fusion of aluminum having a central portion fused to both said first and second metallic conductor members, and first and second end portions, with the diameter of the fusion of aluminum at the interface between the first and second aluminum conductor members being at least 0.375 inch,  
said first and second end portions being convexly cupped and extending outwardly past the first and second major flat surfaces of said first and second metallic conductor members, respectively,  
said at least 0.375 inch diameter of the connecting central portion of the fusion of aluminum at said interface being the minimum diameter of the fusion of aluminum measured at any point between the first and second major flat surfaces of the first and second metallic conductor members, in a direction parallel with their major flat surfaces.

4,163,870

**CIRCUIT FOR PRODUCING A PULSE SUCCESSION**  
Siegfried Krell, Stockdorf; Achim Zech, Weldach, and Reinhard Hergert, Neuried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 22, 1972, Ser. No. 293,664  
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1971, 2156635

Int. Cl.<sup>2</sup> H04L 17/02  
U.S. Cl. 178—26 R 10 Claims



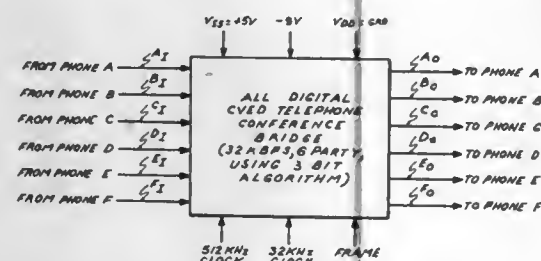
1. A circuit for producing a pulse succession of long duration from several mutually independently produced synchronous pulse successions of shorter duration, comprising: a plurality of separate generators for producing the respective mutually independent synchronous pulse successions; a logic circuit connected to said generators for logically combining the outputs thereof to provide said pulse succession of long duration; a common information carrier storing respective pulse succession programs for each of said generators; a sensing device for serially and contemporaneously reading the respective programs from said information carrier; means for storing the programs; means for sequentially reading the stored programs on a bit per program basis as a serial composite program; a series-parallel converter connected to said sequential reading means for converting said series composite program to parallel codes; said converter including means for storing said parallel codes; and means for reading the stored parallel codes and adjusting the operation of said plurality of generators in response thereto.

4,163,871

**DIGITAL CVSD TELEPHONE CONFERENCE CIRCUIT**  
Charles R. Maggi, Morris Plains, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 22, 1977, Ser. No. 863,377

Int. Cl.<sup>2</sup> H04M 3/36  
U.S. Cl. 179—1 CN 37 Claims



1. An all digital delta modulation telephone conference circuit comprising:  
first digital means to separately store in succession a plurality of sequential bits in each of a plurality of input delta modulation bit streams each originating from a different one of a plurality of phones, each of said plurality of bits being

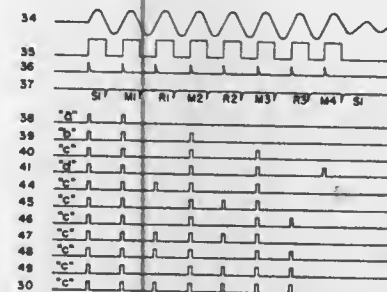
capable of having a plurality of different bit combinations, each of said plurality of different bit combinations being assigned a predetermined slope number, wherein said slope number indicates slope information of an analog signal represented by each of said plurality of streams; and second digital means coupled to said first means for sequentially receiving each of said plurality of bits, for adding from each bit stream correspondingly-occurring first binary bit combinations determined by said slope number assigned to each of said received plurality of bits to produce a sum digital signal including information from each of said phones, and for subtracting second binary bit combinations determined by said slope number assigned to each of said received plurality of bits from said sum digital signal to produce a plurality of output conference delta modulation bit streams each for a different one of said plurality of phones and each including information from all of said plurality of phones minus information from the associated one of said plurality of phones.

4,163,872

**SECRET PULSE SIGNALING SYSTEM**  
Ernst H. Krause, Cheverly, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1945, Ser. No. 602,148

Int. Cl.<sup>2</sup> H04K 1/10  
U.S. Cl. 179—1.5 R 3 Claims



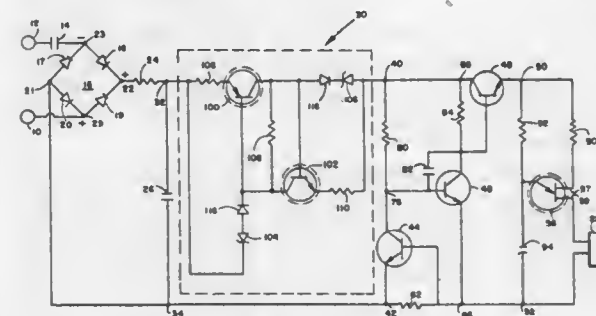
1. A radio pulse signalling system comprising, oscillator means generating a first timing wave which is comprised of a controlled number of cycles, means transmitting a pulse signal at the start of said timing wave, means transmitting a selectable number of pulse signals in response to only certain of said cycles in said timing wave so as to thereby convey the intelligence of transmission, means transmitting a pulse signal in response to a random number of the remaining cycles in said timing wave so as to thereby dissemble the intelligence of transmission, means receiving said pulse signals at a remote point, pulse generator means producing in response to the first received pulse signal a controlled number of regularly recurrent pulses the periodicity of which is harmonically related to said timing wave, vacuum tube means responsive to the first of said recurrent pulses holding said receiving means operative only prior to the production of said first recurrent pulse, counter means responsive to said regularly recurrent pulses generating a second time wave harmonically related to said first timing wave and comprised of a controlled number of cycles, said counter means adapted to render said receiving means operative only in response to those of said cycles of said second timing wave defined by the arrival of said pulse signals which convey the intelligence of transmission and inoperative in response to the remaining cycles of said second timing wave, vacuum tube means counting the number of pulse signals conveying the intelligence of transmission, and means recording the count of last said vacuum tube means whereby the intelligence of transmission is reproduced.

4,163,873

**TELEPHONE SOLID STATE RINGER**  
Robert J. Phelps, Fountain Valley, Calif., assignor to Telephonic Equipment Corporation, Santa Ana, Calif.

Filed Aug. 9, 1977, Ser. No. 823,118

Int. Cl.<sup>2</sup> H04M 1/26  
U.S. Cl. 179—84 T 9 Claims



9. A solid state ringer comprising:  
a terminal connecting point for connection to a telephone line including capacitance means for isolating direct current from said telephone line;  
voltage storage means electrically connected to said terminal connecting point;  
switching means connected to said voltage storage means comprising a plurality of transistors wherein one of said transistors is in the off condition and is changed to an on condition when the voltage across a resistor reaches a certain limit within a loop including said voltage storage means;  
a unijunction transistor connected to said switching means; and  
for emanating an audible tone when said switch means allows current to flow from said voltage storage means to said unijunction transistor.

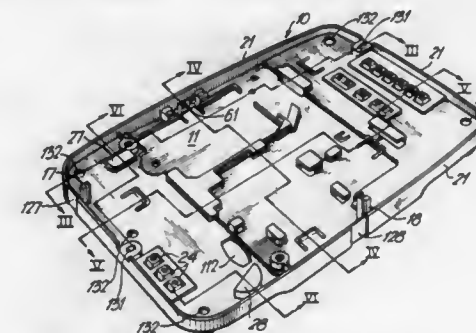
4,163,874

**MOLDED PLASTIC BASE PLATE FOR A TELEPHONE SET**

George V. Lenaerts, and Algirdas J. Dragunavicius, both of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 11, 1978, Ser. No. 904,739

Int. Cl.<sup>2</sup> H04M 1/02  
U.S. Cl. 179—100 R 9 Claims



1. A base plate for a telephone set, comprising:  
a molded plastic member having a base web and an upwardly extending rim around the periphery of the base web;  
a plurality of integrally molded projections extending upwardly from said base web each projection including a top portion spaced from and extending parallel to a surface of said base web to form an undercut;  
a plurality of integrally molded cantilevered deflectable

members in said base web, each member including a rib at a free end thereof, said rib extending above said surface of said base web;  
said projections and said deflectable members defining a plurality of mounting positions for mounting telephone set items, each position including at least two of said projections and at least one of said deflectable members;  
the arrangement such that a telephone set item can be mounted at each said position by a sequential sliding and downward movement to engage a part of said item under said undercuts and to initially deflect said deflectable member by pressing down on said rib whereby said item slides over the rib, said deflectable member returning to an initial undeflected position with said rib engaging with said item when said item is in a final position to maintain said item in said final position; and  
alternative locating and mounting means at at least one of said positions for mounting an alternate form of item at said position by separate attachment members.

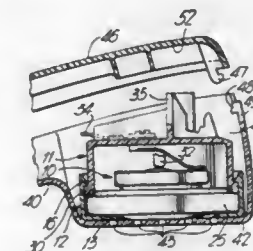
4,163,875

**TELEPHONE HANDSET WITH TRANSMITTER HAVING A ONE PIECE GASKET FOR SEALING AND HOLDING OF TRANSMITTER MEMBERS**

Fredrick T. Cogan, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 9, 1978, Ser. No. 876,262

Int. Cl.<sup>2</sup> H04M 1/04  
U.S. Cl. 179—103 7 Claims



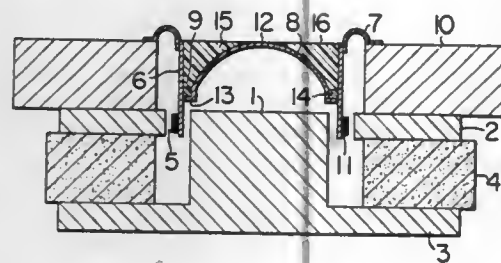
1. A telephone handset having an elongate top part and an elongate lower part, each part of hollow concave form and adapted to fit together at their peripheries, said lower part housing a receiver and a transmitter, said lower part formed at one end to define a circular recess having a perforated base and a side wall extending upward from said base, and a transmitter assembly in said recess, said transmitter assembly comprising: a transmitter having a front face facing towards and in close proximity to said base, a cup-shaped member positioned on the back of the transmitter and including an outwardly projecting rim at a front end, and a resilient tubular member surrounding the transmitter and the lower part of the cup-shaped member, said tubular member including a first radially inward projecting rim at a forward end extending over the periphery of the front face of the transmitter and having a front face in contact with said perforated base, at least one projection extending upward from a top surface of said cup-shaped member, said top part of said handset in pressure contact with an upper end of said projection whereby said front face of said first radially inward projecting rim is in deformed acoustically sealing pressure contact between said front face of said transmitter and said perforated base, and a second radially inward extending rim at a rear end engaging over said outwardly projecting rim of the cup-shaped member, to retain said transmitter and said cup-shaped member together and acoustically sealing between said transmitter and said cup-shaped member.



**4,163,876**  
**ELECTRO-ACOUSTIC TRANSDUCER WITH VARIABLE THICKNESS FOAM SURFACED DIAPHRAGM**  
 Nobutaka Ohnuki, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 5, 1978, Ser. No. 921,907  
 Claims priority, application Japan, Jul. 6, 1977, 52-79849  
 Int. Cl.<sup>2</sup> H04R 7/02, 9/02  
 U.S. Cl. 179—115.5 R

5 Claims

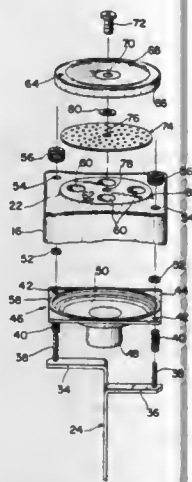


1. An electro-acoustic transducer comprising: an inner pole piece, an outer pole piece disposed concentrically to said inner pole piece to define a ring-shaped air gap between itself and said inner pole piece, a magnet magnetically coupled to said inner pole piece and said outer pole piece for supplying magnetic flux to said air gap, a cylindrical voice coil bobbin having a voice coil wound around an outer circumference thereof and inserted in said air gap, a support member for supporting said voice coil bobbin such that said voice coil bobbin can be axially vibrated in said air gap, a dome-shaped diaphragm inserted in and fixed to said voice coil bobbin, a front chamber surrounded by an inner circumferential surface of said voice coil bobbin and an outer circumferential surface of said diaphragm, and foamed synthetic resin filled throughout a space in said front chamber.

**4,163,877**  
**HOUSING FOR CIRCUITRY AND LOUDSPEAKER OF A MAGNETIC LOCATOR SHIELDS AND RESILIENTLY MOUNTS THE LOUDSPEAKER**  
 Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Jan. 11, 1978, Ser. No. 868,723  
 Int. Cl.<sup>2</sup> H04R 1/102  
 U.S. Cl. 179—146 E

9 Claims



1. In magnetic detector apparatus of the type having mag-

netic sensor means, having circuit means for producing an electrical output from said sensor means, and having a housing for said circuit means, the improvement comprising means supporting a loudspeaker in said housing adjacent to a wall of said housing for producing an audible signal from said electrical output, opening means in said wall for transmitting sound from said loudspeaker to the exterior of said housing, and a shield covering said opening means but providing space for the radiation of sound waves from said loudspeaker, said wall being one end wall of a cover part of said housing that mates with another end wall of said housing having a frame fixed thereto, and said loudspeaker being resiliently supported on said frame by spring means biasing the loudspeaker against the interior of said one end wall.

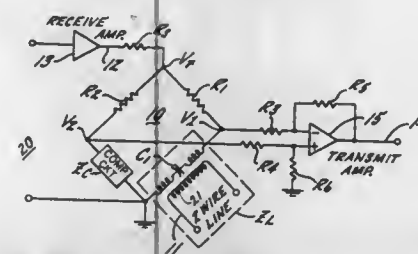
4. In magnetic detector apparatus of the type having magnetic sensor means, having circuit means for producing an electrical output from said sensor means, and having a housing for said circuit means, the improvement comprising means supporting a loudspeaker in said housing adjacent to a wall of said housing for producing an audible signal from said electrical output, opening means in said wall for transmitting sound from said loudspeaker to the exterior of said housing, and a shield covering said opening means but providing space for the radiation of sound waves from said loudspeaker, said shield comprising a disk with a circumferential lip turned toward said wall, said wall having an external plateau surrounded by and spaced from said lip, the main body of said shield being depressed toward said plateau and the central portion of said shield being fastened to said plateau, said shield and said plateau defining therebetween a space that expands outwardly from the central portion of the shield to an annular opening between said lip and the periphery of the plateau.

7. In magnetic detector apparatus of the type having magnetic sensor means, having circuit means for producing an electrical output from said sensor means, and having a housing for said circuit means, the improvement comprising a loudspeaker in said housing adjacent to a wall of said housing for producing an audible signal from said electrical output, said loudspeaker being resiliently supported on a frame by spring means biasing the loudspeaker against the interior of said wall, said wall being one end wall of a cover part of said housing that mates with another end wall of said housing to which said frame is fixed, and means for transmitting sound from said loudspeaker to the exterior of said housing.

**4,163,878**  
**ELECTRONIC HYBRID AND HYBRID REPEATER WITH BRIDGE CIRCUIT**  
 Mike A. Hashemi, Bolingbrook, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Sep. 7, 1977, Ser. No. 831,157  
 Int. Cl.<sup>2</sup> H04B 1/58  
 U.S. Cl. 179—170 NC

22 Claims



1. A hybrid bridge circuit comprising: a two-wire port circuit and a compensating network in one pair of adjacent legs of the bridge on opposite sides of an a-c. ground, said compensating network having a frequency dependent impedance which approximates the impedance characteristic presented by the two-wire line to the bridge,

balancing resistors R1 and R2 in the other pair of adjacent legs,

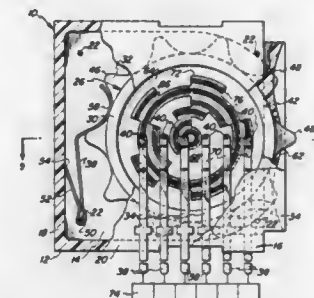
a receive amplifier and an auxiliary resistor Rs connected in series with the output of the receive amplifier between the amplifier and the node between the resistors R1 and R2 for presenting an impedance to both positive-going and negative-going signals from the two-wire line so that all signals from the two-wire line are transmitted to both the node V1 between said two-wire line and the adjacent resistor R1 and the node V2 between said compensating network and the adjacent resistor R2, with signals from the receive amplifier being transmitted to the two-wire line through said auxiliary resistor Rs and the resistor R1 in the bridge, and

a differential transmit amplifier differentially receiving inputs from said nodes V1 and V2 so that the differential amplifier produces a partially equalized output signal corresponding to the differences between the voltages at said nodes V1 and V2.

**4,163,879**  
**SELECTOR SWITCH**  
 Robert W. Mayer, Hackettstown, and Adam Smorzaniuk, West Millington, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,728  
 Int. Cl.<sup>2</sup> H01H 19/58  
 U.S. Cl. 200—11 TW

19 Claims



1. A selector switch for selecting any one of a plurality of interconnections among external circuits to be connected to the switch, the interconnections being made in accordance with a predetermined code, said selector switch comprising:

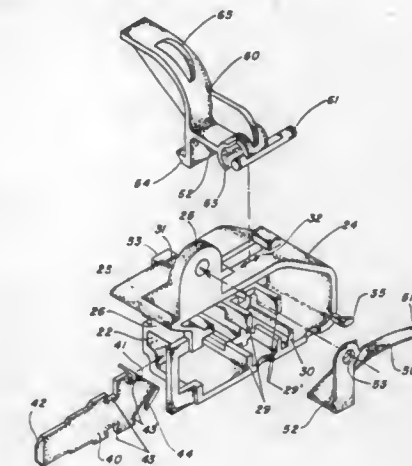
a frame;  
 a selector mounted for movement relative to the frame to any one of a plurality of fixed relative positions;  
 the selector including a first part of dielectric material and a second part of non-metallic electrically conductive material, the selector having a contact face and the second part including a pattern extending along the contact face of the selector, the pattern being configured in accordance with the predetermined code; and

a plurality of electrical contacts affixed to the frame, the contacts having circuit connection portions for connection to the external circuits, and contact surfaces juxtaposed with the contact face of the selector such that movement of the selector relative to the frame to one of said fixed positions will electrically connect and disconnect the contacts in accordance with the pattern of the conductive material at the contact face of the selector to close and open the interconnections among the external circuits.

**4,163,880**  
**WEB-SENSITIVE SWITCH ASSEMBLY**  
 Robert L. Stephenson, Sterling Heights; William R. Fox, Warren, and James A. Gavagan, Center Line, all of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 7, 1977, Ser. No. 858,132  
 Int. Cl.<sup>2</sup> H01H 3/16; A62B 35/00  
 U.S. Cl. 200—61.58 B

9 Claims



1. A switch assembly for use in sensing a seat belt spool condition in a seat belt retractor assembly comprising:

a. a switch housing;  
 b. a conductive member mounted in said housing, one end of said conductive member forming a fixed contact and the opposite end forming a male terminal for electrical connection;  
 c. aperture means provided in said housing permitting access to said opposite end of said conductive member;  
 d. a movable contact element, said movable contact element being supported for selective wiping contact with said one end of said conductive member;  
 e. actuating means, said actuating means having access to said movable contact element through said housing, said actuating means moving said movable contact element into wiping contact with said one end of said conductive member in response to a predetermined amount of seat belt webbing being stored on the spool of said seat belt retractor, said actuating means permitting said movable contact element to move out of wiping contact with said one end of said conductive member in response to a predetermined amount of seat belt webbing being removed from said seat belt retractor said actuating means comprising a lever arm, said lever arm being pivotally connected to said housing and in contact with the outer surface of a roll of seat belt webbing rolled on the spool of a seat belt retractor assembly; and  
 f. means for mounting said switch housing on said seat belt retractor assembly.

**4,163,881**  
**CIRCUIT BREAKER WITH THRUST TRANSMITTING SPRING**  
 Russell T. Borona, Bridgeport, and Kenneth R. Coley, Fairfield, both of Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

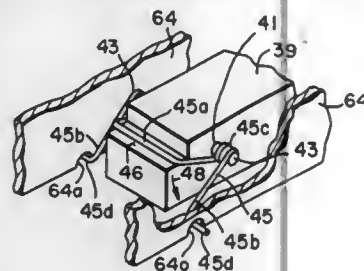
Filed Sep. 29, 1977, Ser. No. 837,656  
 Int. Cl.<sup>2</sup> H01H 3/00  
 U.S. Cl. 200—153 G

2 Claims

1. In a circuit breaker having a stationary contact, a movable contact, a contact arm carrying said movable contact, a trip structure, a toggle comprising a first link pivotally connected to said contact arm and a second link pivotally connected to said trip structure, a knee pivot pivotally connecting said first

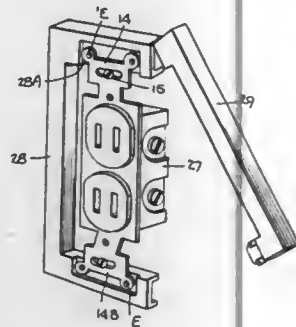


and second links, a manually operable operating member, a thrust-transmitting link between the said operating member and said knee pivot, said operating member being manually movable to a closed position to operate through said thrust-transmitting link to cause said toggle to thrust said contact arm to the closed position, the improvement wherein the contact arm is pivotally mounted on a pinhole axis, bias means for



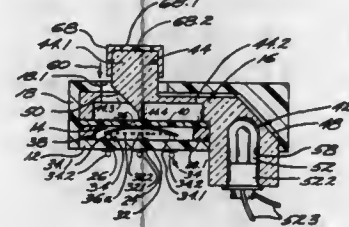
biasing the contact arm to the open position to effect increased separation of the contacts and comprising a wire spring pivoted on the pinhole axis and having first and second end portions, the movable contact being mounted on one side surface of the contact arm, the first end portion of the wire spring bearing against the opposite side surface of the arm, and the second end portion of the spring being fixedly mounted.

**4,163,882**  
**ADAPTER FOR STANDARD ELECTRICAL WALL FIXTURES**  
Floyd M. Baslow, 100 Lafayette St., New Bethlehem, Pa. 16242  
Filed Dec. 5, 1977, Ser. No. 857,599  
Int. Cl.<sup>2</sup> H01H 9/02; H02G 3/08  
U.S. Cl. 200—296



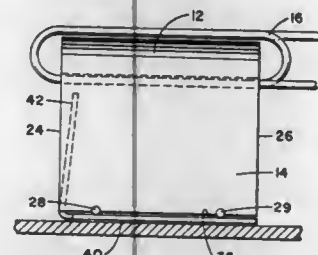
1. An adapter for a standard electrical wall fixture constituted by a light switch or power outlet normally nested within a power line outlet box embedded in the wall, the adapter serving to protrude the fixture outside of the outlet box to displace the face of the fixture relative to the wall, said fixture including a pair of mounting wings on either end of the face, each wing having a slot therein for attaching the wing to the outlet box by a primary screw going through the slot, the length of the screw being sufficient to effect attachment at the displaced position, said adapter comprising spacer means restable against the wall in the area surrounding the box, said spacer means being interposed between said wings and said wall whereby when the primary screws are tightened, the fixture is secured to the box at the displaced position, said spacer means being constituted by a partible rectangular frame which surrounds the box, the wings resting against the ends of the frame, said partible frame being formed of a complementary pair of half-sections which are interconnectable.

**4,163,883**  
**KEYBOARD WITH ILLUMINATED KEYS**  
Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Filed Dec. 30, 1977, Ser. No. 866,105  
Int. Cl.<sup>2</sup> H01H 9/18  
U.S. Cl. 200—314



1. In a keyboard system having control means mounted on a base and a member overlying the control means, said member having a frame mounted the member relative to the base and having a key with a button portion integrally joined to the frame by a self-hinge portion of the key movable for selectively actuating the control means, the improvement in which the key member is formed of a light-transmitting material, and light source means direct light into the material of the frame to be conducted at least partly by internal reflection within the member material into the button portion of the key for illuminating the button portion of the key.

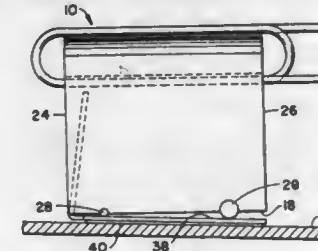
**4,163,884**  
**INDUCTION HEATING CORE FOR ADHESIVE FASTENING SYSTEMS**  
Robert G. Kobetsky, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.  
Filed Sep. 28, 1977, Ser. No. 837,064  
Int. Cl.<sup>2</sup> H05B 5/08  
U.S. Cl. 219—10.49 R



1. An adhesive fastening system comprising, in combination, a pressure-applying U-shaped core means having inductor windings wrapped around a region thereof, a discrete, ferromagnetic article having a plate-like portion with an upper and lower surface carrying a layer of heat-activable adhesive on said bottom surface adapted to be adhesively secured to a support surface, the discrete article completing a magnetic circuit between the legs of the U-shaped core, the end faces of the legs of the core and laterally spaced predetermined side marginal regions of said upper surface of the article configured to form pairs of opposing substantially flat surfaces creating the juncture regions between the core and article facilitating the formation of a closed magnetic flux path, rod-like members of rigid, electrically insulating, force-transmitting material, embedded in each of the end faces of the core transversing the end faces in a direction from an inner leg surface to an outer leg surface, at least two spaced rod-like members being embedded in one end face to stabilize the core when compressingly associated with the article, the rod-like members serving to maintain said opposing surfaces in carefully controlled, slightly spaced relationship to each other and prevent heat generated in

the discrete article from being conducted back into the core while therefore permitting the magnetic flux generated in said article to generate heat sufficient to activate the adhesive for securement to the support surface.

**4,163,885**  
**INDUCTION HEATING CORE AND HEATING SYSTEM FOR ADHESIVE FASTENERS**  
Robert G. Kobetsky, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.  
Filed Sep. 28, 1977, Ser. No. 837,350  
Int. Cl.<sup>2</sup> H05B 5/08  
U.S. Cl. 219—10.49 R



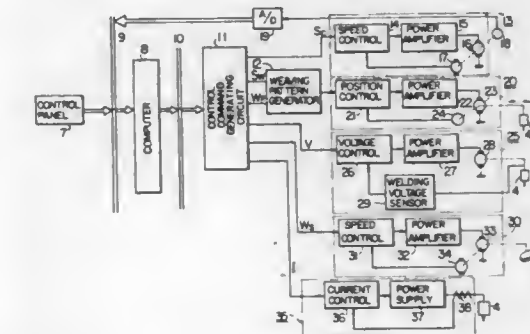
1. An induction heating system comprising in combination, an irregular shaped, discrete metal article, a support surface upon which said article is to be accurately secured, a pressure-applying core structure for use in efficiently heating, by induction, said irregular shaped discrete metal article, said article including a primary attachment section carrying a layer of activable adhesive there beneath and a second nonadhesive carrying secondary attachment section extending generally upwardly from adjacent a perimeter region of said first section the core structure comprising a U-shaped core with end surfaces at the extremities of each leg adapted to be associated with laterally spaced side marginal upper surface regions of said adhesive carrying section so that the adhesive carrying section completes a closed magnetic flux circuit beneath the core, the legs defining front and rear surfaces in planes generally parallel to the plane of the right portion of the U-shaped core, the flat end surfaces of each leg being coplanar and intersecting the planes of the front and rear leg surfaces, said end surfaces of the core carrying nonconductive means to abut said spaced surface regions of the metal article and nonconductively position the end surfaces in spaced juxtaposed relationship to the associated spaced surface regions with the extremity of said end surfaces located adjacent the nonadhesive carrying section being spaced from the metal article a distance less than the distance of spacing between the other extremity of the end surfaces from its associated upper surface regions on the adhesive carrying section, to tilt the flat end surfaces of the legs out of coplanar relationship with the upper surface regions of the adhesive carrying section of the metal article, the spacing means thereby compensating for the heat dissipated into the nonadhesive carrying section so that the adhesive layer will be uniformly heated between the discrete metal article and support surface.

**4,163,886**  
**CONTROL APPARATUS FOR AN AUTOMATIC PIPE WELDER**  
Tsutomu Omae, and Keiziro Sakai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan  
Filed Sep. 15, 1977, Ser. No. 833,561  
Claims priority, application Japan, Sep. 16, 1976, 51-109926; Nov. 19, 1976, 51-138429  
Int. Cl.<sup>2</sup> B23K 9/12  
U.S. Cl. 219—60 A

1. A control apparatus for controlling an automatic pipe welder which effects continuous welding along a welding line on a periphery of a pipe, in accordance with predetermined welding conditions previously set to each of a plurality of

welding areas sectioned along said welding line, said control apparatus comprising:

- a plurality of control units provided respectively for said welding conditions and receiving respective control commands representative of the welding conditions to control the operation of said welder in accordance with the received control commands;
- a first digital storage device for storing the welding conditions relating to one of said welding areas at which said welder is present;
- a position sensing device for producing a position signal corresponding to the position of said welder;



a second digital storage device for storing all of the welding conditions for said welding areas and for changing the welding conditions stored in said first digital storage device when the second digital storage device receives the position signal indicative of the position of the welder at which the welding conditions are to be changed;

at least one digital-analog converter for converting digital signals produced from said first digital storage device indicative of said welding conditions stored in said first digital storage device, into analog signals; and

a plurality of sample and hold circuits provided respectively for said welding conditions for holding respective analog signals for a predetermined time period and delivering said analog signals as said control commands.

**4,163,887**  
**PULSE GENERATOR FOR ELECTROEROSIVE PROCESSING**  
Ernst Bühler, Tenero, and Costantino Tadini, Locarno, both of Switzerland, assignors to A.G. für industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland  
Filed Aug. 16, 1977, Ser. No. 825,036  
Claims priority, application Switzerland, Mar. 18, 1977, 3435/77  
Int. Cl.<sup>2</sup> B23P 1/08  
U.S. Cl. 219—69 P

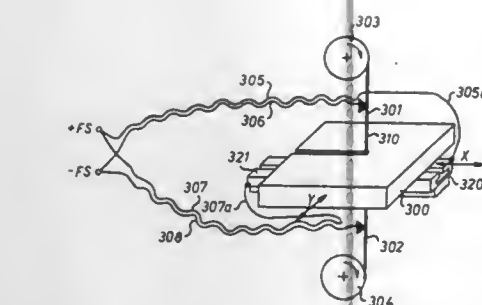
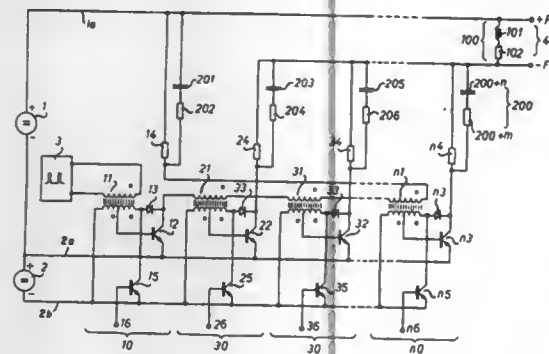
1. A pulse generator for electroerosive processing by means of electrical discharges between a tool electrode and a workpiece electrode, consisting of a main voltage source connected with two output terminals of the generator between the tool electrode and the workpiece electrode through a switching circuit which is activated by an adjustable oscillator, the improved switching circuit therein comprising:

- an auxiliary voltage source,
- at least two identical impulse amplification stages, each comprising:
- an impulse transformer having a primary winding and also having first and second secondary windings,
- said first secondary winding being connected between the first side of said auxiliary voltage source and a base of a power transistor, and said second secondary winding being connected between said base and through a diode to a collector of said power transistor,
- an emitter of said power transistor being connected to the other side of said auxiliary voltage source and also to



one side of said main voltage source, the other side of said main voltage source being connected to one of said output terminals.

said primary winding of said transformer being for the first of said stages connected to said oscillator, and said primary winding for all additional said stages being con-



ected in series between said collector of said power transistor of said first stage and through a current-limiting resistor to said other side of said main voltage source, the collector of said power transistor of all additional said stages being connected through current-limiting resistors to the other of said output terminals.

4,163,888

## STUD WELDING TOOL

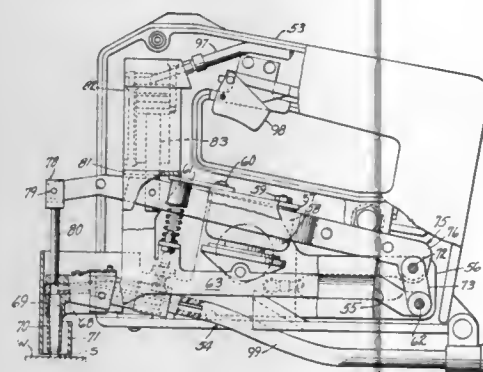
Donald H. Ettinger, Royal Oak, Mich., assignor to USM Corporation, Farmington, Conn.

Filed Oct. 4, 1977, Ser. No. 839,397

Int. Cl.<sup>2</sup> B23K 9/20

U.S. Cl. 219—98

14 Claims



1. An arc welding device comprising a main body having a work engaging end, means connecting the device to a power source for providing a stud welding arc, means for gripping a stud disposed at said work engaging end of said device, said stud gripping means being attached to a lever arm having its longitudinal axis in non-alignment with a stud axis when dis-

posed in said stud gripping means, means for feeding studs seriatim to said stud gripping means including a rod mounted for reciprocating movement from a first position remote from said stud gripping means to a second position within said stud gripping means, means mounted on said lever arm for moving said rod between said first and second positions, means for moving said lever arm in a direction transverse to its longitudinal axis to retract stud gripping means relative to a work surface, and means to thereafter thrust said stud gripping means toward the work surface to fix a stud retained therein onto the surface.

13. In a device for arc welding headed studs to a work surface wherein the studs are fed seriatim to a stud retaining collet, a receiver block having a first cylindrical bore formed therein through which a stud is fed axially in a downward direction to said collet, and a second bore formed in said block and having an internal cross section substantially T-shaped to accommodate a headed stud fed therethrough in a direction normal to the stud axis, said second bore being directed downwardly to intersect with said first bore to form an angle in the range of 0.5 degree to 5 degrees.

4,163,889

## DEVICE FOR THE SIMULTANEOUS OPERATION OF A NUMBER OF GAS DISCHARGE ELECTRON GUNS

Theodorus M. B. Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

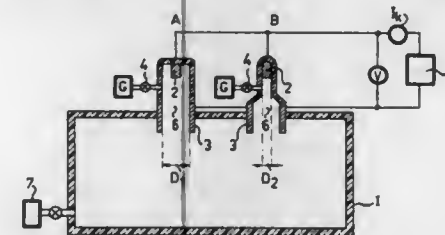
Continuation of Ser. No. 575,723, May 8, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,488

Claims priority, application Netherlands, May 27, 1974, 7407058

Int. Cl.<sup>2</sup> B23K 15/00

U.S. Cl. 219—121 EB

6 Claims



1. A low pressure high voltage glow discharge device for simultaneously generating at least two beams of charged particles having different current intensities, comprising an envelope, a plurality of electron gun assemblies each including an anode and a cathode arranged at a distance from one another, the anodes and cathodes defining separate discharge spaces which communicate with said envelope, said discharge spaces having different volumes, means for maintaining substantially equal pressures in said discharge spaces and means for applying the same voltage to at least two of said electron gun assemblies, said two electron gun assemblies having substantially the same electrode geometry.

4,163,890

## METHOD AND APPARATUS FOR ELECTRON BEAM WELDING

Kiyohide Terai, Ashiya, and Hiroyoshi Nagai, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Sep. 23, 1977, Ser. No. 835,860

Claims priority, application Japan, Sep. 24, 1976, 51-114850; Mar. 18, 1977, 52-29293

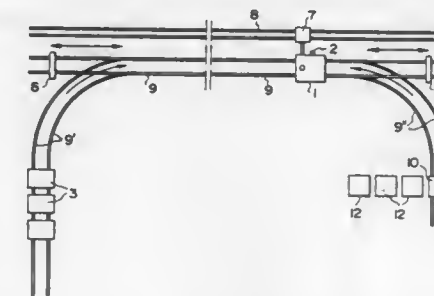
Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—121 EB

3 Claims

1. Means for electron beam welding which includes vacuum chamber means comprising a primary chamber unit having at

least one open end and provided with adaptor means for accommodating electron beam welding gun means and second adaptor means for accommodating evacuating means, at least one auxiliary chamber unit having opposite open ends, one of said open ends of the auxiliary chamber unit being adapted to



be connected to the open end of the primary chamber unit to form a single chamber, closure means for closing the other end of the auxiliary chamber unit, means for lifting and turning the chamber unit, and means for introducing a workpiece into the thus turned chamber unit.

4,163,891

## ACTIVE GAS PLASMA ARC TORCH AND A METHOD OF OPERATING THE SAME

Akio Komatsu, and Masaharu Inaba, both of Tokyo, Japan, assignors to Origin Electric Co., Ltd., Tokyo, Japan

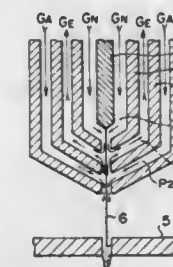
Filed May 16, 1978, Ser. No. 906,652

Claims priority, application Japan, May 20, 1977, 52/58508

Int. Cl.<sup>2</sup> B23K 5/00

U.S. Cl. 219—121 P

2 Claims



1. An active gas plasma arc torch including a rod-shaped cathode, a first gas passage formed around said cathode to feed a shielding gas, a second gas passage formed around said first gas passage to feed a plasma gas and a constricted port for discharging the plasma gas, said cathode and first and second gas passages being arranged in concentric relation with each other, said torch comprising a gas discharge passage formed between said first gas passage and said second gas passage whereby the shielding gas flowing out from said first gas passage is discharged through said gas discharge passage to the outside of the torch.

4,163,892

## FIXING APPARATUS

Toshiyuki Komatsu, Kawasaki; Yoshio Takasu; Motoharu Fujii, both of Tokyo, and Susumu Sugiura, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,479

Claims priority, application Japan, Dec. 15, 1975, 50-150023; Feb. 25, 1976, 51-19610; Jun. 3, 1976, 51-64916; Jun. 24, 1976, 51-74661

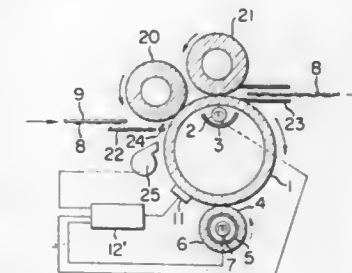
Int. Cl.<sup>2</sup> H05B 1/00; G03G 15/20

U.S. Cl. 219—216

16 Claims

1. A fixing apparatus comprising: first heating means, having a heatable surface which is con-

tactable with a toner image bearing member, for heating a toner image on said toner image bearing member; urging means for press-contacting the toner image bearing member to said surface; second heating means for applying radiant heat to the toner image on the toner image bearing member at least at an area where it is press contacted with said first heating means;



detecting means for detecting the temperature of said surface; and

control means, associated with said detecting means, for controlling said second heating means in response to the temperature of said surface;

wherein said surface of said first heating means is a surface of a rotatable cylinder formed of a material capable of passing said radiation heat therethrough, and said second heating means is disposed within said cylinder.

4,163,893

## TONER FIXING ARRANGEMENT IN ELECTROSTATIC PRINTERS AND COPIERS

Gerhard Turini, Maisach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

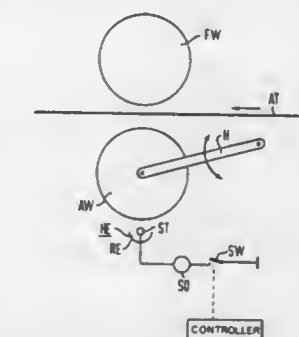
Filed Oct. 25, 1977, Ser. No. 845,395

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705893

Int. Cl.<sup>2</sup> H05B 1/00; G03G 15/20

U.S. Cl. 219—216

9 Claims



1. In a fixing device for fixing a toner image applied to a data carrier in electrostatic copying device wherein the fixing device includes a heated fixing cylinder and an opposed pressure cylinder biasing the data carrier into contact with the fixing cylinder to fuse a toner image on the data carrier by application of heat, the improvement of a preheating device positioned adjacent a rest position of the pressure cylinder, activating control means for the preheating device effective to pre-heat the pressure cylinder upon start up of the copier device, the preheat device being deactivated during a toner fusing operation.

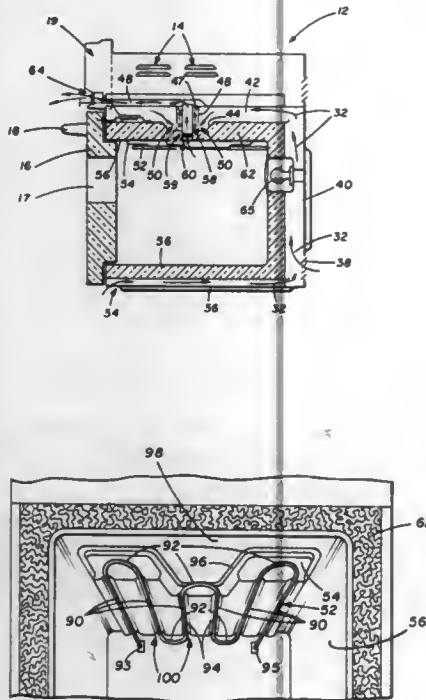
4,163,894

**OVEN HAVING A DILUTING VENTILATION SYSTEM**  
Richard M. Scherer, Oxford, Miss., assignor to Chambers Corporation, Oxford, Miss.

Filed Dec. 8, 1977, Ser. No. 858,641  
Int. Cl.<sup>2</sup> F24C 15/32, 15/20

U.S. Cl. 219—391

15 Claims



1. In an oven including a housing and an oven liner, a ventilation system comprising:
  - a discharge duct defining an enclosed volume within the oven housing and including at least one discharge passageway communicating with the exterior of the oven for discharging air and gases from said discharge duct;
  - an intake duct disposed below said discharge duct and including at least one intake passageway communicating with the exterior of the oven for receiving air into said intake duct, said intake duct including a first surface disposed above the oven liner and including a second surface disposed below said discharge duct and above said first surface;
  - a vent tube extending from the oven liner through said first and second surfaces of said intake duct and into said discharge duct for transmitting hot air and gases from the oven liner to said discharge duct, said vent tube being heated by the hot air and gases from the oven liner;
  - A diluter tube extending between said first and second surfaces of said intake duct and encompassing said vent tube in a spaced apart relationship;
  - a diluter intake passageway communicating between the interior of said intake duct and the interior of said diluter tube for receiving air into said diluter tube; and
  - a diluter discharge passageway communicating between the interior of said diluter tube and the interior of said discharge duct, whereby air from the exterior of the oven is transmitted through said intake duct, through said diluter intake passageway, through said diluter tube while being heated by said vent tube, through said diluter discharge passageway and into said discharge duct for being mixed with hot air and gases from said vent tube and discharged from the oven through said discharge passageway.

4,163,895

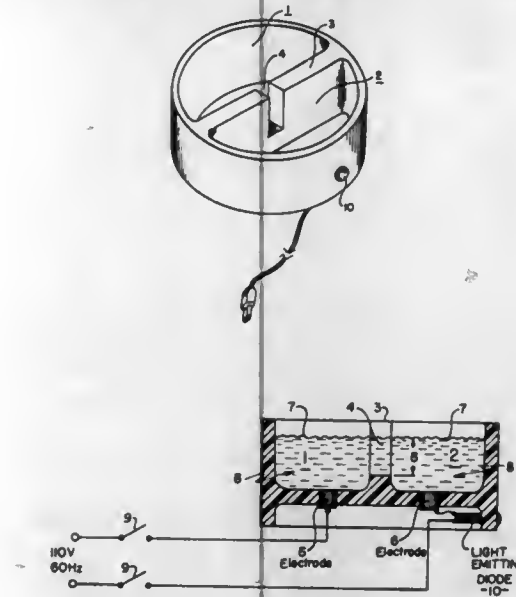
**ELECTROLYTIC WATER HEATER**

Stephen G. Hauser, 6267 Varrel Ave., Woodland Hills, Calif. 91364, and John G. Bowen, 11521 Heathcliff Dr., Santa Ana, Calif. 92705

Filed Jun. 25, 1975, Ser. No. 590,050  
Int. Cl.<sup>2</sup> H05B 3/60; H01C 10/02

U.S. Cl. 219—290

4 Claims



1. An electrolytic heater for an electrically conductive solution comprising: a housing formed of electrically insulating material having an open top and a closed bottom for receiving the solution through its open top; a wall extending across the interior of the housing for separating the interior into two chambers, said wall having an opening therein in the form of a channel in the upper edge of the wall intermediate the ends thereof, said channel extending downwardly from the upper edge to a plane displaced up from the bottom of the two chambers, said opening having reduced dimensions with respect to the dimensions of the individual chambers for receiving the solution from the two chambers thereto to intercouple the solution in the two chambers; first and second electrodes mounted in said housing and extending through said bottom thereof into respective ones of said two chambers in position to establish respective electric contact with the solution in the two chambers; and means for connecting the electrodes to a source of electrical power.

4,163,896

**WET DRESSING HEATING SYSTEM**

James D. McAvinn, Chicago, and Harish A. Patel, Crystal Lake, both of Ill., assignors to The Kendall Company, Boston, Mass.

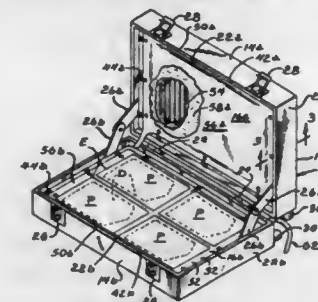
Filed Jun. 29, 1977, Ser. No. 811,026  
Int. Cl.<sup>2</sup> H05B 3/58

U.S. Cl. 219—525

15 Claims

1. A heating system for dressings, comprising:
  - a housing having a pair of first and second closure shells, each of said shells having a back wall and sidewalls extending around the periphery of the associated back wall, with said back wall and sidewalls defining a cavity in each of said shells;
  - hinge means connecting a sidewall of said first and second shells and permitting movement of said shells between a first open position of the housing and a second closed position of the housing with the sidewalls of said shells mating and with said shells defining a closed chamber;
  - first and second elongated heating elements;
  - means for supporting said heating elements in the housing with said first heating element being located adjacent

outer edges of the sidewalls in said first shell and substantially closing the cavity in the first shell, and with said second heating element being located adjacent outer edges of the sidewalls in said second shell and substantially closing the cavity in the second shell, said heating elements being closely facing each other in said second housing position to define a heating space intermediate the heating elements of the closed housing, and being widely spaced in said first housing position for receipt of the dressings intermediate the heating elements, said heating elements being at least partially free of attachment and defining an access opening adjacent an outer end of the respective shell relative said hinge means; and



first and second insulation members in the housing, said first insulation member being located intermediate the first heating element and the back wall of said first shell and defining a narrow storage space intermediate the first heating element and first insulation member for placement of heated dressings through the associated access opening into the storage space, and said second insulation member being located intermediate the second heating element and the back wall of said second shell and defining a narrow storage space intermediate the second heating element and second insulation member for placement of heated dressings through the associated access opening into the respective storage space.

4,163,897

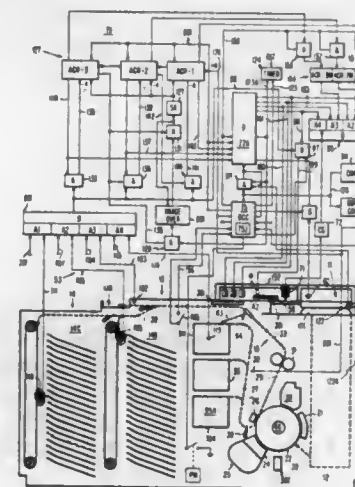
**AUTOMATIC COPY RECOVERY**

James H. Hubbard, Boulder, and Wallace L. Hubert, Broomfield, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,384  
Int. Cl.<sup>2</sup> G06B 27/06

U.S. Cl. 235—92 SB

23 Claims



1. The method of operating a copy production machine for

identifying images copied onto copy sheets said machine having a copy production portion, an output portion, and copy sheet path means extending through said copy production portion to said output portion, a plurality of image bearing copy sheets being simultaneously transportable serially through said path means, said sheets carrying diverse images, comprising the steps of:

- establishing a plurality of separate counts of copy sheets respectively for each of said images on said copy sheets currently being transported in said path means,
- subtracting one from a respective one of said separate counts as a given sheet bearing an image reaches a predetermined point in said path means with respect to said output portion, and
- adding one to a given one of said counts to indicate that said copy production portion will produce a given one of said images on a copy sheet.

4,163,898

**METHOD OF FORMING RADIOGRAPHIC IMAGES**  
Tetsuo Ishii, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1977, Ser. No. 850,318  
Int. Cl.<sup>2</sup> G03G 13/00

U.S. Cl. 250—315 R

2 Claims



1. A method of forming a radiographic image comprising the steps of:
  - irradiating X-rays through a subject, which is to be inspected, to an exoelectron emitting member composed of a conductive substrate and an exoelectron emitting substance thereon;
  - subsequently, coating the surface of the exoelectron emitting member with a charge injection liquid;
  - then placing an insulating sheet in intimate contact with the charge injection liquid;
  - further coating an electroconductive liquid over said insulating sheet and laying an electroconductive electrode thereover; and
  - then effecting heating while applying a voltage between said conductive substrate and said electroconductive electrode thereby forming an electrostatic latent image on said insulating sheet.

4,163,899

**METHOD AND APPARATUS FOR GAS ANALYSIS**  
Irvin G. Burrough, Walnut Creek, Calif., assignor to Andros, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 855,895, Nov. 30, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,609  
Int. Cl.<sup>2</sup> G01J 1/00

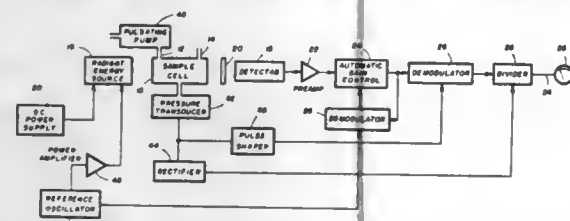
U.S. Cl. 250—343

9 Claims

1. A method for detecting the concentration of a selected gas in an unknown gas sample, comprising, directing from a radiant energy source radiant energy having a wave length spectrum including a characteristic absorption wave length of the selected gas through a sample volume of the unknown gas, modulating the power output of the radiant energy source at a first frequency, simultaneously modulating absorption of the radiant energy within the sample volume by varying gas density therein at a second frequency, detecting the radiant energy passing through the sample volume and producing a composite



signal corresponding to said detected radiant energy having first and second components at said first and second frequencies, respectively, producing a reference signal proportional to the amplitude of gas density variation at said second frequency, and processing said composite signal and said reference signal



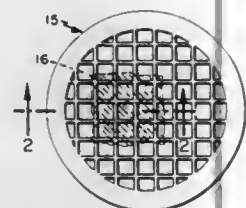
to produce an output signal proportional to the amplitude of the second signal component divided by the product of the amplitude of the first signal and the reference signal, said output signal being proportional to the concentration of the selected gas in the sample.

**4,163,900**  
**COMPOSITE ELECTRON MICROSCOPE GRID**  
**SUITABLE FOR ENERGY DISPERSIVE X-RAY**  
**ANALYSIS, PROCESS FOR PRODUCING THE SAME**  
**AND OTHER MICRO-COMPONENTS**  
John B. Warren, Westport, and Michael R. Kundrath, Fairfield, both of Conn., assignors to Connecticut Research Institute, Inc., Fairfield, Conn.

Filed Aug. 17, 1977, Ser. No. 825,243  
Int. Cl.<sup>2</sup> G01N 23/00

U.S. Cl. 250-439 R

19 Claims



1. A specimen support, for use with an electron microscope having an energy dispersive X-ray device for receiving spectral X-rays produced from the electron bombardment of the specimen and the specimens support, said support

- (A) being responsive to electron bombardment to produce spectral X-ray peaks ranging between the X-ray energy of hydrogen and the X-ray energy of oxygen;
- (B) being electrically conductive; and
- (C) comprising a composition essentially of a homogeneous blend of
  - (a) between about 10% and 90% by weight of a hydrocarbon polymer, and
  - (b) between about 10% and 90% by weight of elemental carbon,

whereby the X-ray energy of the specimen support produced by the electron bombardment never exceeds the X-ray energy of oxygen, thereby providing a specimen support that substantially eliminates spectral X-ray peaks which could interfere with the X-ray peaks of the specimen.

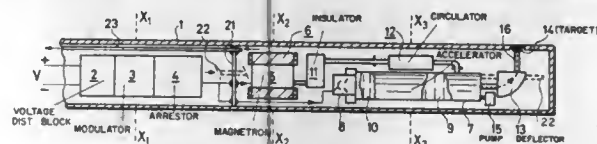
**4,163,901**  
**COMPACT IRRADIATION APPARATUS USING A**  
**LINEAR CHARGED-PARTICLE ACCELERATOR**  
Guy Azam; André Bensussan; Jean-Baptiste Gallet, and Duc Tien Tran, all of Buc, France, assignors to CGR-MeV, Buc, France

Filed Apr. 5, 1978, Ser. No. 893,780

Claims priority, application France, Apr. 6, 1977, 77 10394  
Int. Cl.<sup>2</sup> H05G 1/26; G21G 4/00

U.S. Cl. 250-401

14 Claims



1. A compact irradiation apparatus comprising a fluid-tight enclosure in which are located at least the following elements: a linear charged-particle accelerator capable of emitting an irradiation beam, this accelerator comprising an electron gun, a magnetic focussing system for the beam of electrons, an accelerating structure formed by an accelerating section and a complementary section with resonant cavities; a high frequency generator supplying a high frequency signal; means for injecting this high frequency signal into said accelerating structure; means for supplying high voltage to the high frequency generator and to the accelerator; means enabling a predetermined vacuum to be maintained in the accelerator during its operation; a cooling system for cooling at least some of the elements is included in the enclosure, this cooling system enabling the heat generated by these elements to be dissipated into the wall of said enclosure, said high frequency generator being a magnetron associated with permanent magnets, the magnetron and its permanent magnets being cooled by an auxiliary cooling circuit disposed along their walls, this cooling circuit comprising a first tubular ring and a second tubular ring arranged on either side of the pole pieces of the magnetron and in contact therewith, these two rings being connected by a first helical tube placed against the inner walls of the permanent magnets, in that a second helical tube is placed against the outer wall of said magnetron, the two helical tubes being connected to one another by the second tubular ring in such a way that a cooling fluid is able to circulate in the second helical tube after having passed through the first tubular ring, the first helical tube and the second tubular ring.

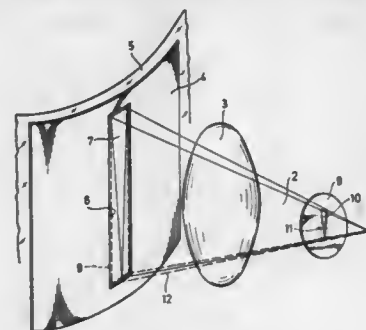
**4,163,902**  
**X-RAY APPARATUS COMPRISING BEAM SHAPING**  
**RESTRICTOR PLATE HAVING KEY-SHAPED GAP**  
Freddy W. Musaph, Tellazamäntle, 04320 Riikilä, Finland  
Filed Nov. 14, 1977, Ser. No. 851,059  
Claims priority, application Finland, Dec. 17, 1976, 763628  
Int. Cl.<sup>2</sup> A61B 6/00

U.S. Cl. 250-482

4 Claims

1. Apparatus for an X-ray device adapted for use with an X-ray tube, a radiation-sensitive film, and an object to be radiated disposed intermediate the tube and the film comprising a

restrictor plate of radiation-opaque material comprising a key-shaped gap configured and dimensioned to shape a beam of

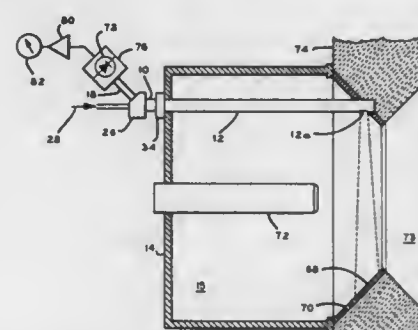


radiation passing therethrough from the tube to the object to obtain an advantageous darkness distribution on the film.

**4,163,903**  
**FLAME MONITORING APPARATUS**  
Donald Robertson, Ambler, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.  
Filed Oct. 27, 1977, Ser. No. 845,985  
Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 250-554

5 Claims



1. Flame monitoring apparatus capable of signalling the loss of flame from a single burner of a multiple burner installation in which each burner is individually mounted in a recess in a boiler wall comprising:

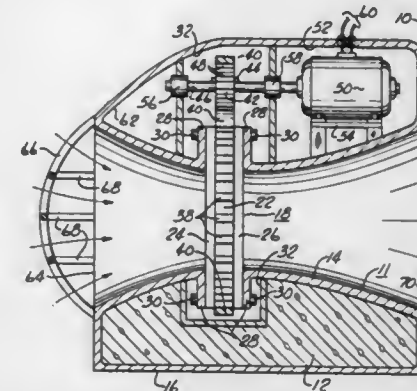
radiation collecting means mounted for collecting radiation from a limited optical path extending across the opening of said recess and terminating on a wall of said recess to collect radiation from the flame of an individual burner in said path when said flame is present and for collecting radiation from only a portion of the wall of said recess associated with said burner when said flame is out, and means connected to said radiation collecting means for producing an output signal indicative of the presence or absence of flame at said burner in response to the level of radiation collected by said radiation collecting means.

**4,163,904**  
**UNDERSTREAM TURBINE PLANT**  
Lawrence Skendrovic, 402 Glencoe Dr., West Mifflin, Pa. 15122  
Continuation-in-part of Ser. No. 663,868, Mar. 4, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,382  
Int. Cl.<sup>2</sup> F03B 13/10; F01D 13/00; F16J 15/34, 15/40  
U.S. Cl. 290-54

8 Claims

1. An understream turbine plant for generating electrical power by means of the flow of a large understream effluent comprising a large housing having a large water flow passage therethrough, a single impeller mounted within said passage in a plane transverse thereto and adapted to drive an electrical generator mounted in said housing and sealed from exterior liquid contact, said impeller including a plurality of impeller

blades mounted at their inner ends to a hub and radially extending therefrom in said plane and secured at their outer ends to the inner surface of a ring member, said ring member rotatably mounted in bearings and in bearing seal means sealing the interior of said housing from said exterior liquid, drive coupling means engaged with said ring member and said generator to drive said generator by means of understream effluent passing through said opening, means to mount said housing in an ocean understream effluent such as the Gulf Stream with said passage aligned with the flow of said understream, insulated conductor means connected to said generator and passing in a

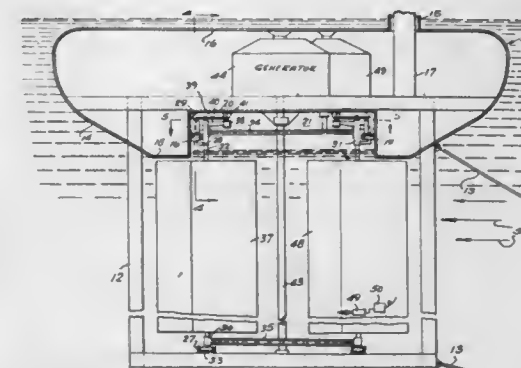


sealed through said housing to conduct electricity from said generator to a location above an ocean surface, said bearing seal means including a smooth annular bearing surface on each side of said ring member, a pair of annular bearing rings respectively annularly engaging said bearing surfaces, support means annularly supporting each of said bearing rings to said housing, and annular resilient seal means annularly disposed under compression between said housing and at least one of said support means to provide a liquid seal therebetween and continuously urging said bearing rings into sealed bearing engagement with said bearing surfaces.

**4,163,905**  
**ELECTRIC GENERATING WATER POWER DEVICE**  
Fred E. Davison, Highwood, Mont. 59450  
Continuation of Ser. No. 609,008, Aug. 29, 1975, abandoned.  
This application May 5, 1978, Ser. No. 905,523  
Int. Cl.<sup>2</sup> F01D 23/00

U.S. Cl. 290-54

15 Claims

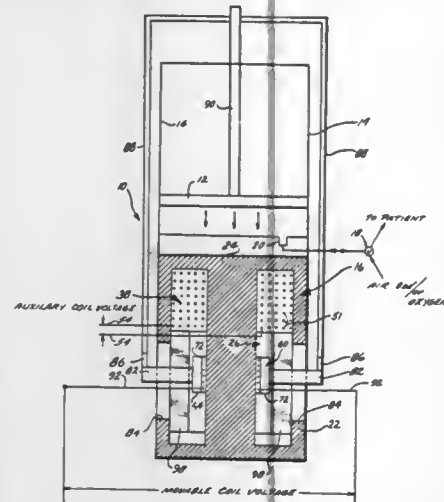


1. A water power machine comprising a generally horizontally elongated frame submerged in the water, means to anchor the frame in a substantially fixed position, a flotation chamber secured on the top portion of the frame and having an inverted cup-like bottom wall portion, air pump means connected to said cup-like bottom portion to pressurize same and form an air compression chamber, respective parallel top and bottom





- wall with a pair of closed ends forming an enclosed hollow interior of the shell,
- (c) an elongated core extending through the hollow interior of the shell between the closed ends thereof,
- (d) permanent magnet means in the hollow interior surrounding a predetermined length of the core, the permanent magnet means being spaced from the core to form a narrow working air gap surrounding the core and extending laterally from the outer surface of the core to the permanent magnet means, whereby a magnetic field is established across the narrow working air gap,



- (e) a movable drive coil surrounding the portion of the core located in the working air gap, the drive coil being movable along the length of the core in the magnetic field in response to changes in electric current passing through the drive coil, the working air gap being substantially void between the outer surface of the core and the permanent magnet means so as to be as narrow as possible but still accommodate the movable drive coil, and
- (f) drive means extending outwardly from the drive coil through corresponding openings in the shell outer wall and connecting the piston to the drive coil to apply reciprocating translational motion to the piston in response to movement of the drive coil.

**4,163,912**  
**ELECTRICAL INSULATING SHEET MATERIAL AND ELECTRIC WINDING MADE THEREFROM**  
 William H. Gottung, Ballston Lake, and Kevork A. Torossian, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

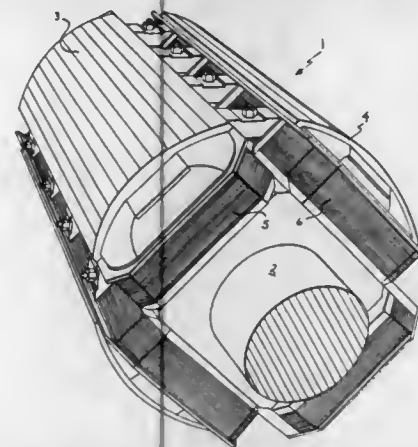
Filed Sep. 23, 1977, Ser. No. 836,095  
 Int. Cl.<sup>2</sup> H02K 15/12

U.S. Cl. 310—45

9 Claims

1. An insulated dynamoelectric machine winding comprising a plurality of generally flat-sided turns of electrically conductive metal stacked with respective flat sides in facing relationship, a plurality of sheets of electrical insulating material each positioned, respectively, between facing sides of said turns to electrically insulate the turns from each other, each of said sheets of insulating sheet material comprising a sheet of aramid paper, a coating of thermosetting resinous adhesive material in a solid but heat bondable state and substantially uniformly distributed over at least one side of the aramid paper sheet, and a pressure sensitive adhesive material applied in a pattern to at least one side of the resin-coated aramid paper sheet, said pattern being of predetermined configuration to limit to a predetermined maximum distance the spacing between any point on the sheet not covered with pressure sensitive adhesive material and the closest point in the pattern of pressure sensitive adhesive material, said pressure sensitive adhesive material having a predetermined peel strength suffi-

cient to hold the paper to a surface before the thermosetting adhesive is bonded thereto, the thermosetting resinous adhesive material on each sheet of aramid paper being cured to form a bond having a minimum strength of 50 p.s.i. at 155° C. with the turn juxtaposed therewith.

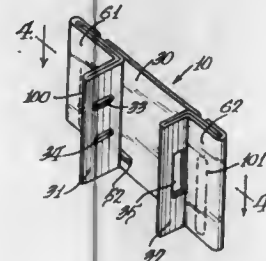


**4,163,913**  
**MOTOR PROTECTOR MOUNT**  
 Thomas R. Barratt, Bristol, Tenn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 5, 1977, Ser. No. 857,401  
 Int. Cl.<sup>2</sup> H02K 5/00

U.S. Cl. 310—91

12 Claims



1. A motor protector mount for a motor protector having a body with a central primary section, a thinner end section and a pair of terminal prongs at the opposite end comprising, a base of insulation material, a pair of spaced-apart tabs extending outwardly from said base and spaced apart a distance less than the length of the motor protector, and means defining openings in said tabs with an opening in one tab being of a size to receive said thinner end section but not said central primary section to permit extension of the end section beyond said one tab and a pair of openings in the other tab to permit extension of said terminal prongs therethrough for engagement with lead wire terminals.

**4,163,914**  
**INFINITELY VARIABLE RATIO PERMANENT MAGNET TRANSMISSION**  
 John H. Keyes, P.O. Box 474, Nederland, Colo. 80466

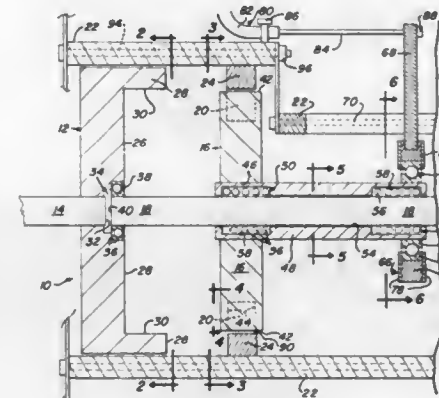
Filed Apr. 11, 1977, Ser. No. 786,545  
 Int. Cl.<sup>2</sup> H02K 7/114

U.S. Cl. 310—103

10 Claims

1. An infinitely variable ratio power transmission and brake assembly, comprising:  
 power input means;  
 drive disc means operatively connected to said power input means for rotation about an axis of rotation and for rotation when power is supplied to said power input means;  
 driven disc means operatively connected in spaced apart

and non-contacting relation with said drive disc means for rotation about the axis of rotation;  
 power output means operatively connected to rotate with said driven disc means when said driven disc means is rotated;  
 magnetic braking means positioned in spaced apart and non-contacting relation with respect to both said disc means;  
 permanent magnet means, positioned on at least one of said disc means or said braking means, for producing magnetic flux adapted to be selectively coupled through the space between said drive and driven disc means and



through the space between said driven disc means and said braking means to create a predetermined driving interaction force between said drive and driven disc means and to create a predetermined restraining interaction force between said driven disc means and said braking means, respectively; and  
 control means, operatively associated with said drive disc means and driven disc means and said braking means, for selectively varying the predetermined quantity of magnetic flux coupled between said drive and driven disc means and for varying the predetermined quantity of magnetic flux coupled between said driven disc means and said braking means.

**4,163,915**  
**ELECTRIC MOTORS OR GENERATORS**  
 William Fong, Bristol, England, assignor to National Research Development Corporation, London, England

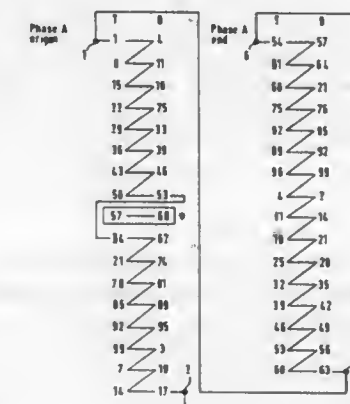
Filed Jul. 21, 1977, Ser. No. 817,924

Claims priority, application United Kingdom, Jul. 26, 1976, 31008/76

Int. Cl.<sup>2</sup> H02K 3/00

U.S. Cl. 310—198

9 Claims



tric machine having three double-layer wave-sound stator phase-windings, each said phase-winding comprising an even number of similar but not identical phase-winding parts, the odd-numbered ones of said phase-winding parts differing from the even-numbered ones thereof by the presence of a dummy coil in said odd-numbered ones of said phase-winding parts, said phase-winding parts being connected together alternatively for alternative voltage operation, one alternative connection comprising parallel connection of all the phase-winding parts for each phase-winding.

**4,163,916**  
**MOTOR BRUSH**  
 Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

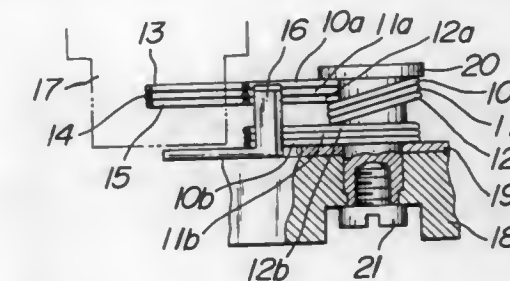
Filed Oct. 20, 1977, Ser. No. 844,128

Claims priority, application Japan, Oct. 22, 1976, 51/142168[U]

Int. Cl.<sup>2</sup> H02K 13/00

U.S. Cl. 310—246

3 Claims



1. A brush assembly for an electric motor including a commutator and a motor case comprising: a spring assembly formed of a plurality of individual spring wire members wound together in a helical configuration and having first and second ends extending together tangentially outwardly of said helical configuration, said spring wire members being mounted together in generally parallel extending relationship to form said spring assembly as a composite spring unit having a central coil portion with first and second extended portions defined, respectively, by said first and second ends of said spring wire members; electrical contact means affixed to said first extended portion of said composite spring unit; support means comprising a support column affixed to said motor case and stop means arranged for engagement with said second extended portion of said composite spring unit; said composite spring unit being loosely mounted on said support column with said central coil portion thereof extending completely around said support column, with said electrical contact means in engagement with said commutator and with said second extended portion engaged against said stop means; said stop means being arranged to engage said second extended portion of said composite spring unit to hold said spring unit in spring compression between said commutator and said stop means with said composite spring unit being thereby held in place upon said support column to effect commutation of said motor.

**4,163,917**  
**ULTRASONIC TRANSDUCER WITH TEMPERATURE STABILITY DUE TO SELECTED DAMPING MATERIALS AND/OR ASSEMBLY METHODS**  
 Walter E. Levine, Port Huron, Mich., assignor to Bindicator Company, Birmingham, Mich.

Division of Ser. No. 741,310, Nov. 12, 1976, Pat. No. 4,081,889, which is a division of Ser. No. 560,245, Mar. 20, 1975, Pat. No. 4,015,319. This application Nov. 25, 1977, Ser. No. 854,788

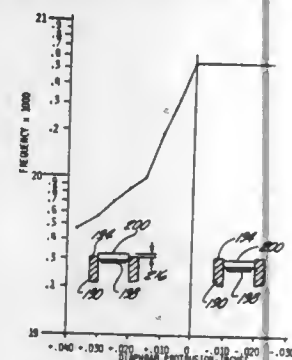
Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—327

18 Claims

1. A transducer having a preselected resonant frequency comprising an open hollow shell and a vibratory element

having an element peripheral thickness and including a piezo-electric crystal, said element being received axially into an open end of said shell by interference press-fit to a depth in said

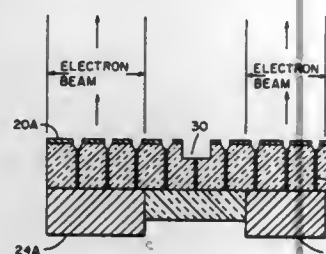


shell less than said peripheral thickness, said preselected resonant frequency being a function of said depth of interference press-fit.

**4,163,918**  
**ELECTRON BEAM FORMING DEVICE**  
Joe Shelton, 700 Tatom St., NW., Huntsville, Ala. 35805  
Filed Dec. 27, 1977, Ser. No. 864,348  
Int. Cl.<sup>2</sup> H01J 1/02

U.S. Cl. 313-309

7 Claims



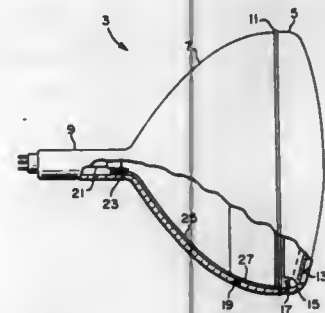
1. An electron beam forming device for use in electron tubes, comprising a field effect electron emitter having first and second parallel surfaces, said first surface being a planar emitting surface for emitting electrons therefrom, said emitter having at least a million emitting fibers per square centimeter of emitting surface, said fibers being disposed in parallel; an insulating oxide matrix encompassing, supporting, and separating said fibers, respective first ends of said fibers terminating in said emitting surface below the surface plane of said oxide matrix; an accelerating electrode deposited on the surface plane of said oxide matrix in a plane substantially parallel with said surface plane for enhancing electron flow from said emitter; and a backing plate disposed on the second surface of said emitter adjoining respective second ends of said emitting fibers, said backing plate having selected conductor portions thereof for conducting an electrical potential to selective ones of said emitting fibers and thereby providing a selectively shaped electron beam when said accelerating electrode and said conductor portions are subjected to an electric field.

**4,163,919**  
**CATHODE RAY TUBE INTERNAL RESISTIVE COATING AND METHOD OF MANUFACTURE**  
Kenneth Speigel, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.  
Filed May 8, 1978, Ser. No. 903,427  
Int. Cl.<sup>2</sup> H01J 31/08; H01B 1/08  
U.S. Cl. 313-479

6 Claims

1. In a cathode ray tube having an envelope with an apertured mask assembly therein and interconnected funnel and

neck portions wherein the funnel portion has an anode button sealed therein and the neck portion has a mount assembly with affixed snubbers sealed therein, an improved resistive coating disposed on the internal surface of said envelope and contacting said snubbers of said mount assembly, said resistive coating derived from a suspension consisting essentially of electrically





1. A control apparatus for controlling the sequences of

operations executed at successive work stations on a machine, the path between the work stations being subdivided into a number of steps, said control apparatus comprising at each work station:

- detecting means arranged for detecting the correct completion of an operation and generating a fault signal when the operation is not correctly completed,
- shift register means connected for accepting the fault signal from the detecting means in response to a timed control signal and advancing said fault signal step by step under control of said control signal,
- comparator means connected for comparing the successive states of the shift register means with a reference signal representing the number of travel steps between the present work station and the next, this comparator means being arranged for producing an inhibit signal in response to a state of the shift register means being coincident with the reference signal, said inhibit signal serving to inhibit the operation at at least one next work station.

4,163,931

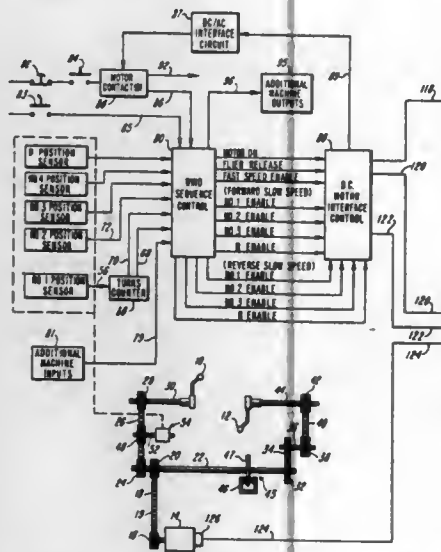
## ARMATURE WINDING MACHINE

David R. Seltz, Dayton, and Mark T. Heaton, Springfield, both of Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Nov. 1, 1976, Ser. No. 737,284  
Int. Cl.<sup>2</sup> G05B 19/18

U.S. Cl. 318—569

18 Claims



1. In an armature winding machine of the type having a flier for winding wire onto an armature core; a direct current servo motor for driving said flier; sequence control means for directing movements of said flier and generating digital command signals for each of said movements;
- motor interface control means for generating motor commands in response to said command signals from said sequence control means; and
- means for connecting said motor to a source of direct current voltage, said connecting means including high frequency switching mode operated servo controller means for causing said source to drive said motor in response to said motor commands.

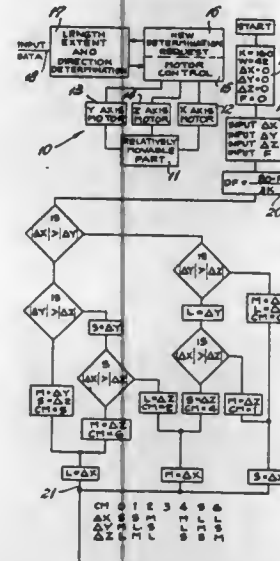
### 4,163,932 NUMERICAL CONTROL SYSTEM AND METHOD FOR A THREE AXES MOVEMENT

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 7, 1974, Ser. No. 512,665  
Int. Cl.<sup>2</sup> G05B 19/24

U.S. Cl. 318—573

17 Claims



1. The method of producing relative actual movement along three coordinate axes in accordance with a commanded path defined by the distance along each of the three axes with the movement consisting of steps along each axis comprising the steps of subdividing the movement into a plurality of successive lengths, selecting the extent of each length along each axis normally from a plurality of different possible lengths with each possible length normally having a plurality of steps along each axis with the number of steps of each possible length on each axis being no greater than an absolute numerical value of one from the number of steps in the immediately prior length on the same axis and producing a relative movement essentially simultaneously along each axis equal to their respective extents in the selected length with the movement for each length occurring in the same constant time interval.

4,163,933

## AUTOMATIC ELECTRIC BATTERY CHARGING APPARATUS

George W. Foster, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Nov. 21, 1977, Ser. No. 853,425  
Claims priority, application United Kingdom, Nov. 24, 1976, 49001/76

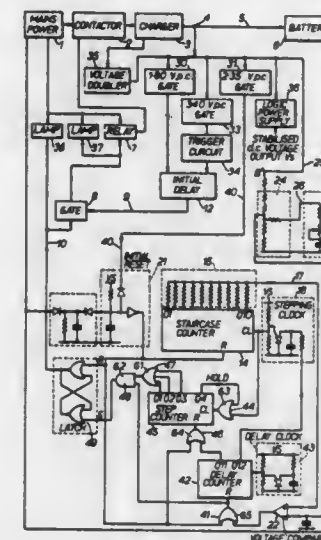
Int. Cl.<sup>2</sup> H02J 7/04

U.S. Cl. 320—20

12 Claims

1. Automatic electric battery charging apparatus comprising at least one timer, a voltage comparator arranged to compare a reference voltage, referred to herein as a staircase voltage, with a control signal varying with battery voltage, jacking means rendered operative by the timer when a first predetermined time interval has elapsed and serving to repeatedly increase the staircase voltage step-by-step relatively to the control signal, by equal steps, so long as the control signal

exceeds the reference voltage, and terminating means for initiating the termination if the staircase voltage exceeds the con-



trol signal before the jacking means have exceeded a predetermined number of steps from the start of their operation.

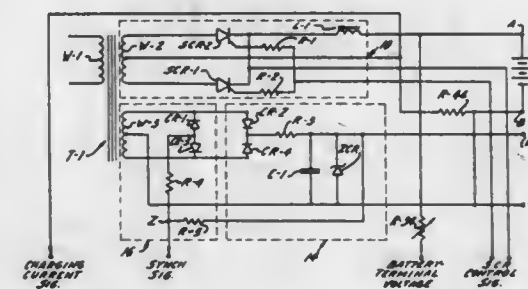
### 4,163,934 METHODS AND APPARATUS FOR CHARGING BATTERIES

Francis Lawn, 378 W. Park Ave., Oakhurst, N.J. 07755  
Filed Jul. 6, 1977, Ser. No. 813,265

Int. Cl.<sup>2</sup> H02J 7/04

U.S. Cl. 320—23

19 Claims



1. The method of charging a battery whose charging cycle is characterized by a rising voltage-versus-time charging curve including a decreased-slope bend when it is fully charged, which includes the steps of supplying relatively high charging current to the battery during an initial phase and reduced charging current to the battery later in the charging cycle, periodically testing the slope of the voltage-versus-time charging curve during both said phases while continuing to supply charging current, deriving a representation of the charging current, smoothing and utilizing that representation in regulating the charging current within limits ensuring a minimum battery-voltage increment during each slope-testing interval for a sound battery that is not fully charged, and terminating the charging cycle after a slope test that shows less than a predetermined battery-voltage increment.

### 4,163,935 APPARATUS FOR CHECKING A BATTERY VOLTAGE

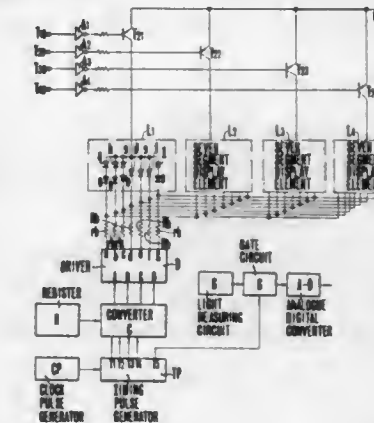
Nobuaki Sakurada, Yokohama; Yukio Mashimo, Tokyo; Tadashi Ito; Fumio Ito, both of Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 741,935, Nov. 15, 1976, abandoned, which is a continuation of Ser. No. 555,823, Mar. 6, 1975, abandoned. This application Feb. 17, 1978, Ser. No. 878,774

Int. Cl.<sup>2</sup> G01N 27/42

U.S. Cl. 324—29.5

7 Claims



1. An apparatus for checking the driving voltage of a battery in a digital display device comprising:

- (a) a digital display device including in addition to the battery whose output voltage is to be checked: (1) a first means for producing a control signal corresponding to a normal pattern to be displayed; (2) a plurality of series circuits connected in parallel with one another to said battery, each circuit having at least one light emitting diode which forms at least one part of said normal pattern and also having a driving means which controls illumination of the light emitting diode in response to the control signal from said first means; and
- (b) diode means connected in series between at least one of said light emitting diodes and said driving means for controlling the illumination of the light emitting diode provided in said circuit so as to assure that the output of said battery, when its terminal voltage is below a predetermined value, makes the pattern into a special symbol different from the normal pattern provided in accordance with the control signal.

4,163,936

## AUDIBLE TESTER FOR ALARM CIRCUITS

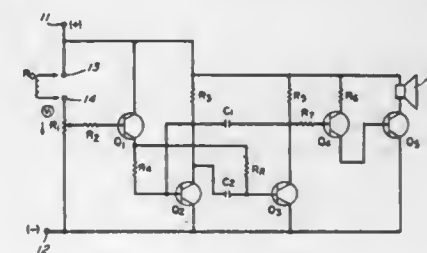
Richard B. Shufro, 20 Highland St., Sharon, Mass. 02067

Filed Sep. 19, 1977, Ser. No. 834,406

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324—51

1 Claim



1. A device for isolating or locating faults in a series alarm circuit by detecting slight changes in the resistance thereof, said device comprising a speaker, an amplifier connected to said speaker, a multivibrator, the output of which is connected



to said amplifier, a second amplifier connected to the input of said multivibrator for changing the frequency of said multivibrator, a pair of test terminals for connection to an alarm circuit and constituting input terminals to said device, means including a variable resistor coupling one of said terminals to the control element of said second amplifier, and a power supply connected across said test terminals and said means, the parameters of the components of said device being so selected that said variable resistance means can be adjusted to provide a continuous minimum frequency tone output from said speaker when said terminals are connected across said alarm circuit, whereby the frequency of said tone increases in response to either an increase or decrease in the resistance across said terminals.

4,163,937

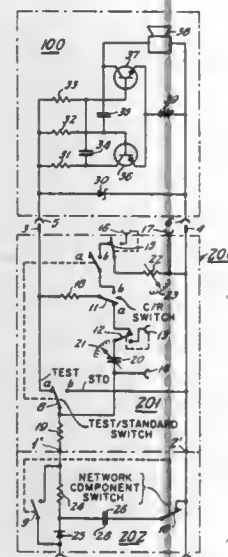
# MULTI-FUNCTION TEST APPARATUS TO TEST, SELECTIVELY AND AS DESIRED, ELECTRICAL CIRCUITS, CIRCUIT COMPONENTS AND TRANSISTORS

Heinz Laass, Pfungstadt, Fed. Rep. of Germany, assignor to TACO-Tafel GmbH, Esslingen, Fed. Rep. of Germany  
Filed Jan. 16, 1978, Ser. No. 869,778  
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703880

Int. Cl.<sup>2</sup> G01R 27/00

U.S. Cl. 324—57 R

37 Claims



1. Multi-function test apparatus to test, selectively and as desired, electrical circuits and circuit components comprising the combination of  
an acoustic output electrical tester (100) and a multi-function testing circuit (200) therefor,  
wherein said acoustic output electrical tester (100) comprises a local power source (39);  
an a-c - audible signal transducer (38);  
a multivibrator oscillator circuit having at least two transistors (36, 37) and R/C networks (31, 32, 33, 34, 35) interconnecting said transistors and said local power source (39) in a positive feedback oscillatory circuit, at least a portion of said R/C circuit and at least one of the transistors forming a frequency determining circuit to provide, upon energization by said source, an output tone from said transducer of predetermined pitch or frequency;  
and tester output terminals (5, 6) connected across at least a portion of said frequency determining circuit to modify the frequency of oscillation of said multivibrator circuit and hence the pitch of the tone reproduced by the transducer upon connection of impedances to said test terminals;  
and wherein, in accordance with the invention,

the multi-function testing circuit (200) comprises  
input terminals (3, 4) connectable with the acoustic tester output terminals (5, 6);  
output terminals (1', 1; 2', 2) selectively connectable with a circuit or electrical circuit component to be tested;  
a resistance standard circuit (22; 15, 16, 17);  
a reactive impedance standard circuit (20; 12, 13, 14);  
an impedance-resistance selector switch (11) selectively settable to test resistance components or reactive impedance components;  
a test-standard transfer switch means (7, 8) having switch terminals connected to at least one (1) of the output terminals (1, 2), at least one (3) of the input terminals (3, 4) and selectively connecting the resistance standard circuit, or the impedance standard circuit, as selected by said impedance-resistance selector switch (11) to permit establishing when said test-standard transfer switch means is  
(a) in the "standard" position, a closed circuit from the input terminals through the selected standard circuit while disconnecting the output terminals and cause generation of a tone in the transducer (38) of the tester (100); and when  
(b) in the "test" position, a closed circuit from the input terminals (3, 4) to the output terminals (1', 1; 2', 2), and thus permit comparison of the pitch of the tone from the transducer (38) of the tester (100) as the transfer switch is operated, and hence a judgment of deviation of the tone from the transducer when the connection is changed, respectively, between the standard circuit and a test component connected to the output terminals.

4,163,938

# CALIBRATING DEVICE FOR CONTROL STATIONS AND INDICATORS

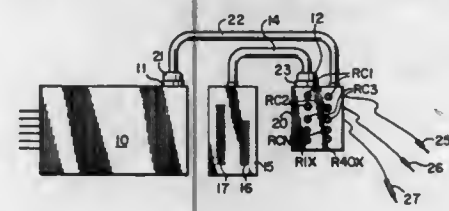
James O. Moore, Worcester, Pa., assignor to Moore Products Co., Spring House, Pa.

Filed May 1, 1978, Ser. No. 901,414

Int. Cl.<sup>2</sup> G01R 1/38, 1/02, 35/00

U.S. Cl. 324—74

4 Claims



1. Calibrating apparatus for use in connection with a control station which has separable voltage responsive indicating means,  
said control station and said indicating means each having separable connecting members to provide electrical connections between said control station and said indicating means,  
said calibrating apparatus comprising  
a housing for interposition between said control station and said indicating means said housing containing internal circuit means with accessible connectors to which said connecting members are respectively connected,  
said internal circuit means communicating with said indicating means through said connecting members,  
said internal circuit means including means for providing a plurality of sources of different reference voltages, said internal circuit means being powered by said control station, said internal circuit means having a plurality of terminals to which the plurality of sources of different reference voltages are applied said terminals being accessible through the housing, and  
test leads for selective connection to selected terminals for connection of said indicating means to selected ones of

said different reference voltages to determine the response of the indicating means thereto.

4,163,939

# ANTI-STATIC PLASTIC ENCLOSURE FOR ELECTRIC UTILITY METERS

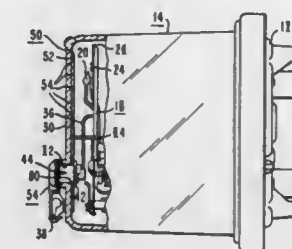
Kenneth G. Halstead, and James D. Hawfield, Jr., both of Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1978, Ser. No. 875,668

Int. Cl.<sup>2</sup> H02B 9/00

U.S. Cl. 324—104

6 Claims



1. An anti-static enclosure enclosing an electric utility meter including a chassis having conductive portions and carrying an elongated dial pointer at the front thereof, said enclosure comprising: a non-conductive base for carrying the meter chassis such that said chassis projects forwardly of said base; and a transparent cup-shaped plastic cover surrounding the forward projecting parts of the chassis carried by said base with said cover including a rear portion terminating at an open end detachably mounted to said base, and further including a closed end defining a cover front portion adjacently covering the chassis front and said dial pointer, said cover front portion including a separable static shielding plate having an electroconductive layer extending over the inside of said cover front portion at least throughout an area equal to the area of movement of said dial pointer, and said static shielding plate including a contact member projecting therefrom and terminating at a free end extending into the interior of said enclosure, said contact member having a predetermined projecting length and a predetermined position at said cover front portion, said contact member extending into electrical connection with a conductive portion of said chassis, whereby electrostatic electrical charges developed at said cover front portion are conducted therefrom by said static shielding plate and said contact member.

4,163,940

# ELECTRICAL MEASUREMENT AND NOISE SUPPRESSION

David Brewerton, Bracknell, England, assignor to Racal Instruments Limited, Bracknell, England

Filed Apr. 12, 1976, Ser. No. 675,863

Claims priority, application United Kingdom, Sep. 15, 1975, 37901/75

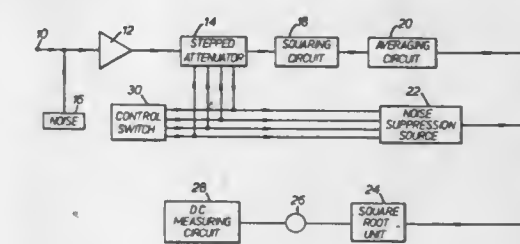
Int. Cl.<sup>2</sup> G01R 15/10; H04B 1/04

U.S. Cl. 324—132

5 Claims

2. Electrical measurement circuitry for measuring an input signal of undetermined frequency, comprising  
sampling means connected to periodically sample the input signal whereby to produce a succession of samples of the input signal,  
storage means connected to receive the samples and to temporarily store the level of each sample until the next sample is received whereby to derive a variable waveform dependent on the changes in level of the said samples,  
squaring means for taking the mean square value of the said variable signal and the noise thereon so as to produce an output including a mean square noise component,

a d.c. signal source settable to produce a d.c. signal, means subtracting the d.c. signal from the output of the



squaring means so as to offset the said mean square noise component thereof, and  
means for measuring the square root of the resultant signal.

4,163,941

# VIDEO SPEED ANALYZER OF GOLF CLUB SWING OR THE LIKE

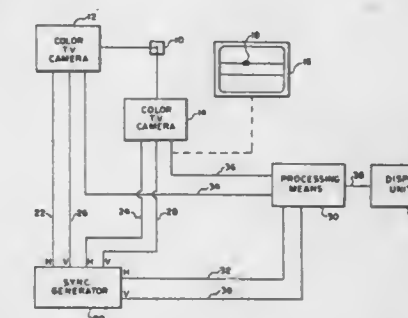
Roy N. Linn, Jr., 4 Laurel Dr., Danville, Ill. 61832

Filed Oct. 31, 1977, Ser. No. 846,801

Int. Cl.<sup>2</sup> G01P 3/68

U.S. Cl. 324—178

13 Claims



1. A method for measuring the velocity of an object such as the head of a swinging golf club moving within a field of view which comprises:  
A. coloring the object a single predetermined color;  
B. providing a television camera with scanning and color responsive video circuitry responsive primarily to said predetermined color;  
C. directing the camera to said field of view;  
D. scanning the image of the object and converting the resulting signals of the image of said object into pulses;  
E. Synthesizing an array of scanned lines and transforming said pulses onto said lines in timed relation to the generation of said lines;  
F. computing the pulse displacement when the pulse is displaced between repeated scanning lines on said array with due regard to the time interval between the generation of said scan lines;  
G. deriving a computation of the velocity determined by the pulse displacement and;  
H. providing a readout signal corresponding to said velocity.

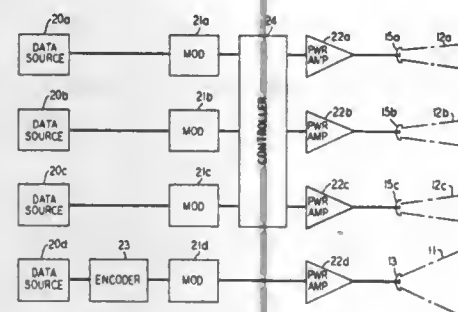
**4,163,942**  
**METHOD AND APPARATUS FOR EFFECTING COMMUNICATION WITH RECEIVERS DISPOSED IN BLACKOUT REGIONS FORMED BY CONCURRENTLY TRANSMITTED OVERLAPPING GLOBAL AND SPOT BEAMS**

Anthony Acampora, Freehold; Douglas O. Reudink, Sea Girt, and Yu S. Yeh, Freehold Township, Monmouth County., all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 17, 1977, Ser. No. 842,416  
 Int. Cl.<sup>2</sup> H04B 15/00, 1/00

U.S. Cl. 325—52

14 Claims



1. A method of effecting communication with a receiver disposed within a blackout region caused by interference between signals in a first and a second antenna radiated beam which use the same frequency spectrum and overlap each other in their respective receiver areas, the method comprising the steps of:

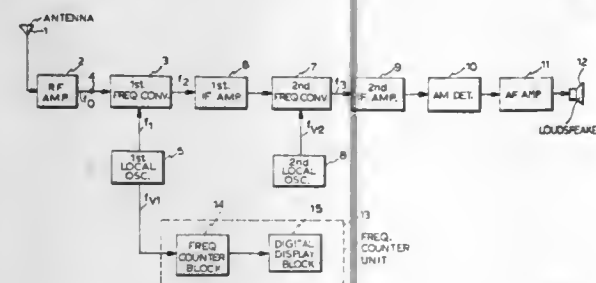
- concurrently transmitting the first and the second antenna radiated beams;
- selectively terminating transmission of the second beam during a predetermined interval of time while ensuring that the power level of the first beam in the blackout region substantially corresponds to the power level normally encountered across the majority of the first beam; and
- concurrent with step (b) transmitting signals in the first antenna radiated beam which are destined for the receiver disposed within the blackout region.

**4,163,943**  
**RADIO RECEIVER EMPLOYING PREMIXING AND DIGITAL DISPLAY**  
 Sukeichi Miki, Ikoma; Shuichi Ninomiya, Kodoma; Shin Fukuda, and Yukio Sugimoto, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 7, 1977, Ser. No. 804,461  
 Claims priority, application Japan, Jun. 14, 1976, 51/69947; Jul. 6, 1976, 51/80509; Jul. 6, 1976, 51/80510  
 Int. Cl.<sup>2</sup> H04B 1/16, 1/26

U.S. Cl. 325—433

3 Claims



1. A radio receiver comprising:

an input terminal to which a received signal having a frequency band centered about a frequency  $f_0$  is applied;  
 a variable frequency oscillator for producing a signal having an adjustable frequency  $f_1$ ;  
 a first reference oscillator for producing a signal having a fixed frequency  $f_{R1}$  which is higher than the upper limit of said frequency band of said received signal;  
 a first pre-mixer connected to said variable frequency oscillator and said first reference oscillator for mixing the signals of said variable frequency oscillator and said first reference oscillator;  
 a first band pass filter connected to said first pre-mixer for passing a frequency which is the algebraic sum of the frequency of said variable frequency oscillator and the frequency of said first reference oscillator;  
 a second reference oscillator for producing a signal having a fixed frequency  $f_{R2}$ ;  
 a second pre-mixer connected to said first band pass filter and said second reference oscillator for mixing the signals of said first band pass filter and said second reference oscillator;  
 a second band pass filter connected to said second pre-mixer for passing a frequency which is the algebraic sum of the frequency passed by said first band pass filter and the frequency of said second reference oscillator;  
 a frequency converter connected to said input terminal and said second band pass filter for mixing the signals of said input terminal and said second band pass filter and producing a signal at an intermediate frequency which is the difference of the frequency of said input terminal and the frequency of said second band pass filter;  
 an intermediate frequency amplifier connected to said frequency converter for amplifying the signal of said frequency converter at the intermediate frequency; and wherein:  
 said variable frequency oscillator has a variable tuning circuit having a range of frequencies equal to twice the intermediate frequency.

**4,163,944**  
**COMPENSATION CIRCUIT FOR AN ELECTRICAL SIGNAL MIXER**

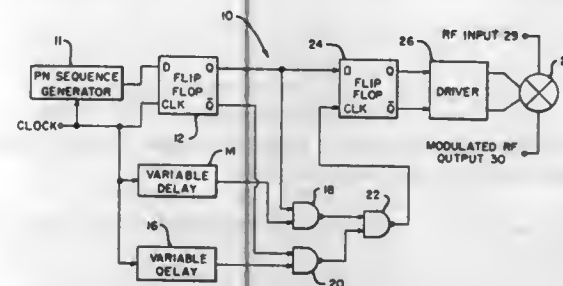
Ramon P. Chambers, Clearwater; Robert S. Gordy, Largo; David E. Sanders, and Cameron E. Morrison, both of St. Petersburg, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 22, 1976, Ser. No. 753,388

Int. Cl.<sup>2</sup> H04B 1/10

U.S. Cl. 325—446

8 Claims



1. A compensating circuit for an electrical mixer comprising:  
 a double-balanced mixer having first and second inputs, said first input adapted to receive an input signal;  
 a modulating signal source for providing a modulating signal having at least two states;  
 adjustable delay means responsive to a synchronizing component of said modulating signal for providing first and second adjustable delayed synchronizing signal components, corresponding to respective states of said modulating signal; and  
 means responsive to said provided delayed signal for operatively connecting said provided modulating signal to said

double-balanced mixer such that the electrical imbalance in said double-balanced mixer is minimized by adjusting said adjustable delay means.

**4,163,945**  
**SYSTEM FOR REMOVING INTERFERENCE DISTORTION IN THE DEMODULATED SIGNAL OF A FREQUENCY-MODULATED SIGNAL**

Yukinobu Ishigaki, Yamato, and Teruo Muraoka, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

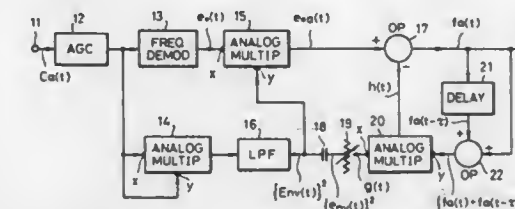
Filed Jun. 13, 1978, Ser. No. 915,212

Claims priority, application Japan, Jun. 14, 1977, 52-70255

Int. Cl.<sup>2</sup> H04B 1/10

U.S. Cl. 325—473

6 Claims



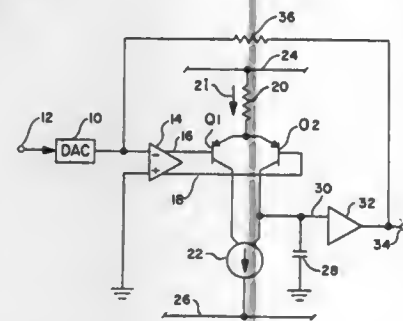


the differential amplifier during the integrating period; and means for charging the integrating capacitor to a voltage equal to the input offset voltage in the differential amplifier.

4,163,948

**FILTER FOR DIGITAL-TO-ANALOG CONVERTER**  
Michael L. Rieger, Tigard, and Martin D. Singer, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg. Continuation of Ser. No. 786,166, Apr. 11, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,557

U.S. Cl. 328—167



1. A non-linear filter for attenuating spurious electronic signals, the filter comprising:

circuit input means for receiving the signals to be attenuated; first amplifier means coupled to said circuit input means for amplifying the signals to be attenuated and including means for providing the amplified signals as double-ended signals;

second amplifier means coupled to receive said double-ended signals for providing a single ended output signal, said second amplifier means including constant current source means for providing a constant current; current mirror means coupled to receive said single-ended output signal for sinking said constant current;

a capacitor coupled to receive at least a portion of said constant current for producing a terminal voltage thereacross in accordance with said constant current received; buffer amplifier means responsive to said terminal voltage for applying said terminal voltage to a circuit output means; and

feedback means coupled between said circuit input means and said circuit output means for feeding at least a portion of said terminal voltage to said first amplifier means for controlling the amplitude of said terminal voltage.

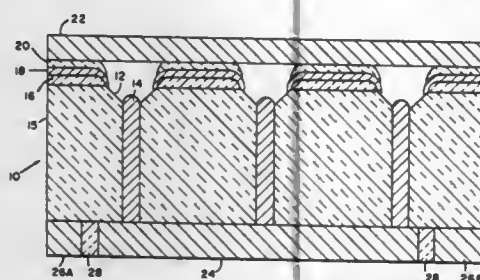
4,163,949

TUBISTOR

Joe Shelton, 700 Tatom St., NW., Huntsville, Ala. 35805  
Filed Dec. 27, 1977, Ser. No. 864,349  
Int. Cl.<sup>2</sup> H01J 29/00, 1/02

U.S. Cl. 328—254

9 Claims



1. A field effect electron device for providing selectively controlled electron emission comprising a metal-oxide field

effect electron emitter, said emitter being a plurality of metal rods in a non-conducting oxide having first and second parallel surfaces, said metal rods disposed therein at a density in excess of one million emitting rods per square centimeter of surface area, said rods being uniformly spaced in parallel for field emission of electrons from a first end thereof, each of said rods having emitting ends conically recessed below the first surface of the emitter oxide parallel surfaces; a thin film insulating layer deposited on the first surface of said emitter oxide; a thin film conductive layer deposited on said insulating layer; and said emitter rod ends and said conductive layer being disposed in respective planes separated by not more than a micron for providing rapid electron transport between said planes when a potential is applied between the emitter and the conductive layer.

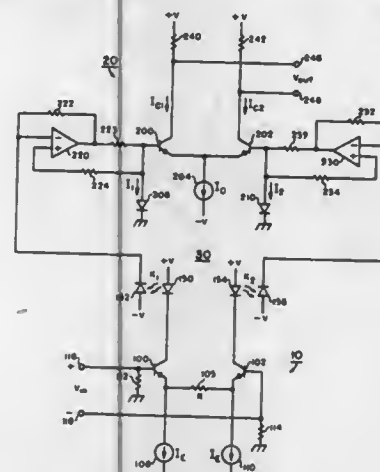
4,163,950

ISOLATING DIFFERENTIAL AMPLIFIER

Wendell W. Damm, and Choong R. Kim, both of Aloha, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.  
Filed Mar. 1, 1978, Ser. No. 882,532  
Int. Cl.<sup>2</sup> H03F 17/00, 3/45

U.S. Cl. 330—252

4 Claims



1. An isolating differential amplifier, comprising:

an input differential amplifier stage comprising a first pair of emitter coupled transistors, a resistor having a predetermined resistance value connected between the emitters of said transistors, and a pair of constant current sinks, each of which is connected to a respective emitter, said input differential amplifier stage for receiving an input signal at the bases of said first pair of transistors and producing a differential signal therefrom;

an output differential stage comprising a second pair of emitter-coupled transistors and a constant current sink connected to both emitters of said second pair of transistors, said output differential amplifier stage being responsive to said differential signal for producing an output signal; and

optical coupling means for coupling said differential signal from the collectors of said first pair of emitter coupled transistors to the bases of said second pair of emitter coupled transistors.

# 4,163,951 FREQUENCY DISCRIMINATOR PRODUCING AT LEAST ONE OF TWO PULSE SEQUENCES REPRESENTING IN AVERAGE THE RESULT OF FREQUENCY DISCRIMINATION

Shigenobu Aihara; Isao Haga, and Motoo Mizumura, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

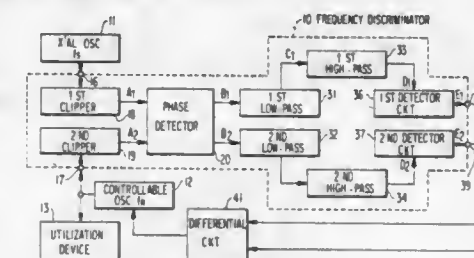
Filed Mar. 15, 1978, Ser. No. 886,699

Claims priority, application Japan, Mar. 15, 1977, 52-27571

Int. Cl.<sup>2</sup> H03B 3/04; H03K 5/20

U.S. Cl. 331—1 A

6 Claims



1. A frequency discriminator responsive to a first input signal of a first frequency and a first phase and a second input signal of a second frequency and a second phase for producing a discriminator output signal representative of the difference between said first and said second frequencies in a predetermined one of two cases where said first frequency is either greater than or lower than said second frequency, said first and said second frequencies being greater than a predetermined frequency, said frequency discriminator comprising:

phase detector means responsive to said first and said second input signals for producing first and second substantially rectangular pulse sequences, said first substantially rectangular pulse sequence taking a predetermined peak value with an instantaneous frequency corresponding to the difference between said first and said second phases while said second substantially rectangular pulse sequence continuously has said peak value if said first phase leads said second phase by 0° through 180°, said second substantially rectangular pulse sequence taking said peak value with said instantaneous frequency while said first substantially rectangular pulse sequence continuously has said peak value if said first phase lags behind said second phase by 0° through 180°;

a low-pass filter having a prescribed high-cutoff frequency less than said predetermined frequency for producing a low-pass second output signal in response to a prescribed one of said first and said second substantially rectangular pulse sequences;

a high-pass filter having a prescribed low-cutoff frequency lower than said high-cutoff frequency for producing a high-pass output signal in response to said low-pass output signal; and

output means responsive to said high-pass output signal for producing said discriminator output signal.

4,163,952

INJECTION LASERS

George H. B. Thompson, and David F. Lovelace, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 734,687, Oct. 22, 1976, abandoned, which is a division of Ser. No. 646,115, Jan. 2, 1976, Pat. No. 4,011,113. This application Feb. 21, 1978, Ser. No. 879,334  
Claims priority, application United Kingdom, Jan. 9, 1975, 928/75

Int. Cl.<sup>2</sup> H01S 3/19

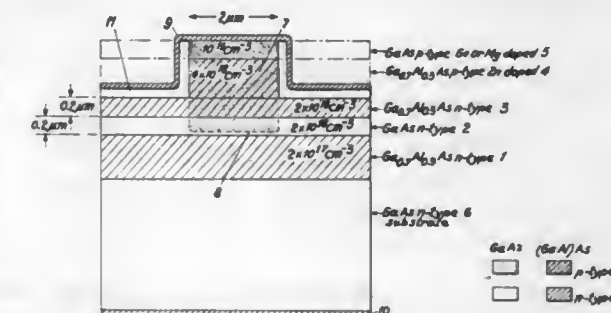
U.S. Cl. 331—94.5 H

3 Claims

1. In a double heterostructure injection laser said double heterostructure comprising an active layer of high refractive index semiconductor material bounded by a first and second

layer of low refractive index semiconductor material, wherein the improvement comprises:

a rib of semiconductor material formed on said second layer overlying said active region, a third layer of material disposed adjacent said rib on the surface of said second layer, said rib extending from said second layer and pro-



truding through said third layer, said rib having a higher refractive index than the refractive index of said third layer;

said second layer having a thickness not large compared with the wavelength of the laser radiation in said second layer, said thickness being about 0.2 micron.

4,163,953

DOUBLE HETEROSTRUCTURE LASER FOR DIRECT COUPLING TO AN OPTICAL FIBER

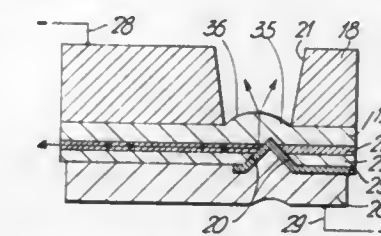
Anthony J. Springthorpe, Richmond, and John C. Dymont, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 7, 1977, Ser. No. 813,678

Int. Cl.<sup>2</sup> H01S 3/19

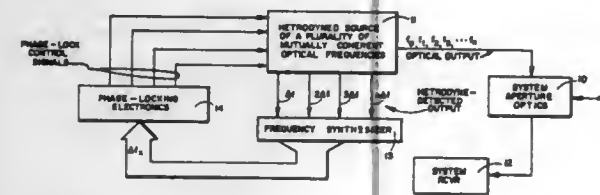
U.S. Cl. 331—94.5 H

7 Claims



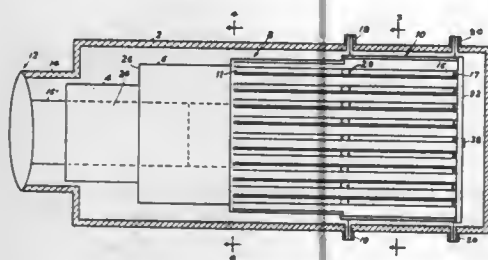
1. A laser having a semiconductor substrate and a double heterostructure on a surface of said substrate, said structure comprising: a first confining layer of semiconductor material on said surface of said substrate, an active layer of semiconductor material on said first confining layer and a second confining layer on said active layer, said first confining layer being of the same conductivity type as said substrate; said second confining layer being of the opposite conductivity type as said first confining layer and said active layer being of the same conductivity type as one of said confining layers to form a p-n junction between said active layer and one of said confining layers; a cleaved end surface on said structure, said end surface extending normal to the plane of said active layer; a reflecting surface extending through said second confining layer and said active layer and inclined relative to the plane of said active layer to form a resonant cavity between said end surface and a further surface at said substrate surface; a hole through said substrate to said first confining layer, said hole aligned with said reflecting surface for emission of light therethrough; and electrical contact means for applying a forward bias to said active layer.

**4,163,954**  
**HIGH ENERGY COHERENT PULSE SOURCE FOR LASER SYSTEM**  
 Cecil L. Hayes, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.  
 Continuation-in-part of Ser. No. 776,675, Mar. 11, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,888  
 Int. Cl.<sup>2</sup> H01S 3/23, 3/10  
 U.S. Cl. 332—7.51 7 Claims



1. A pulse train source of mutually coherent laser pulses, said source comprising a plurality of laser oscillators each phase locked to a mutually exclusive one of a plurality of periodically mutually coherent frequencies, said plurality of laser oscillators comprising a reference laser oscillator of frequency  $f_0$ , and a plurality (n) of slaved laser oscillators of frequencies  $(f_0 + n\Delta f)$  and in which there is further provided a like number of phase-locking means as slaved oscillators, each said phase-locking means responsive to said reference oscillator and to a mutually exclusive one of said slaved oscillators for maintaining the frequency  $f_n$  and phase of said one to a frequency  $(f_0 + n\Delta f)$  different from and mutually coherent with that of said reference laser oscillator by an integer multiple (n) of a spacing frequency  $\Delta f$  which is a radio-frequency substantially less than the laser frequency of the reference oscillator.

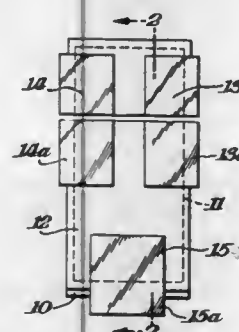
**4,163,955**  
**CYLINDRICAL MODE POWER DIVIDER/COMBINER WITH ISOLATION**  
 Floyd W. Iden, Pompton Plains, and George P. Scherer, Wayne, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.  
 Filed Jan. 16, 1978, Ser. No. 869,725  
 Int. Cl.<sup>2</sup> H01P 5/12  
 U.S. Cl. 333—127 12 Claims



1. A cylindrical mode power divider/combiner with isolation comprising:  
 an outer conductor having a longitudinal axis;  
 an impedance transformer means disposed coaxial of said axis and within said outer conductor;  
 an input/output coaxial transmission line coupled to said transformer means and said outer conductor;  
 first N-discrete, spaced transmission lines supported by a first dielectric cylinder disposed coaxial of said axis and within said outer conductor, each of said first transmission lines being coupled to said transformer means, where N is an integer greater than one;  
 second N-discrete, spaced transmission lines disposed coaxial of and transverse to said axis remote from said transformer means, each of said second transmission lines being coupled to a different one of said first transmission lines

and terminating in a common metallic disc coaxial of and adjacent said axis;  
 N-output/input ports each coupled to a different one of said first transmission lines adjacent said transformer means; and  
 N-load ports each coupled to a different one of said first transmission lines adjacent said second transmission lines.

**4,163,956**  
**WOUND MULTI-CAPACITOR FILTER**  
 Frank E. Garlington, Williamstown, and Carl J. Famiano, Clarksburg, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.  
 Filed Oct. 17, 1977, Ser. No. 842,780  
 Int. Cl.<sup>2</sup> H03H 7/04, 7/42; H01G 4/32, 4/42  
 U.S. Cl. 333—12 12 Claims

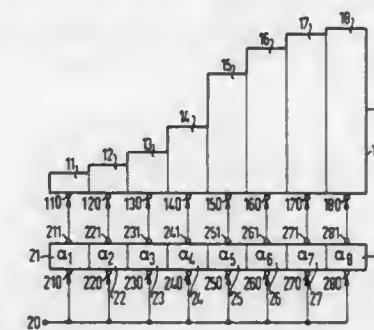


1. A wound multiple-capacitor filter for suppressing R.F. interference signals on power lines comprising:  
 (a) a floating sheet electrode;  
 (b) two dielectric layers being disposed over the two major faces of said floating electrode respectively;  
 (c) a pair of spaced sheet electrodes being disposed against said layers, each of said pair having substantially the same surface area in capacitive relationship with said floating electrode as the other, said pair of electrodes extending axially beyond the opposite edges of said floating electrode, respectively;  
 (d) another sheet electrode lying in contact with said layers, being spaced from said pair and having a surface area in capacitive relationship with said floating electrode that is from 0.2 to 0.001 times that of each of said pair, an outer turns portion of said floating electrode extending beyond the ends of said pair, said surface area of said another electrode having said capacitive relationship with the end region of said outer turns portion; and  
 (e) first, second, and third electrical access means for providing electrical access to each of said another and said pair of spaced electrodes, respectively.

**4,163,957**  
**TRANSVERSAL FILTER WITH AT LEAST ONE ANALOGUE SHIFT REGISTER, AND PROCESS FOR THE OPERATION THEREOF**  
 Karl Knauer, Gauting; Max Schlichte, Munich, and Hans-Joerg Pfeleiderer, Zorneding, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
 Filed Sep. 12, 1977, Ser. No. 832,232  
 Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643704  
 Int. Cl.<sup>2</sup> H03H 7/28; H01L 29/76; H03K 5/156; G11C 19/28  
 U.S. Cl. 333—165 17 Claims

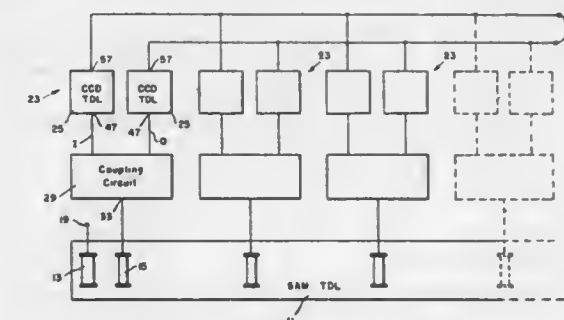
1. A transversal filter comprising analogue shift register means having successive storage positions, said shift register means having a number of parallel inputs and comprising input charge receiving storage positions having the respective parallel inputs assigned thereto, and said shift register means having

a common output, a further number of individual predetermined evaluating circuit means each having at least one signal input for the input of the signal which is to be filtered, and at least one output, each evaluating circuit means being arranged to weight the input signal thereto in accordance with an individual evaluation factor for producing at its output a weighted charge for supply to an associated input charge receiving storage position, switching element means controlling coupling of the outputs of the evaluating circuit means with the respective assigned parallel inputs for supplying the weighted charges to respective input charge receiving storage positions via the respective assigned parallel inputs, each storage position of the shift register being at least such that it is always able to accommodate the maximum quantity of charge supplied by a preceding storage position, and each input charge receiving



storage position being such that it is always able to accommodate the maximum quantity of charge supplied by a preceding storage position and additionally able to accommodate the maximum quantity of charge supplied via its assigned parallel input, and said filter being further characterized in that the evaluating circuit means comprises first evaluating circuits (21-24, FIG. 7) having first signal inputs thereto, and comprises second evaluating circuits (25-28, FIG. 7) having respective second signal inputs for receiving an input signal to be filtered, and in that the first signal input of every first evaluating circuit is preceded by a time delay element (800) which delays the input signal thereto relative to the input signal received by said second signal inputs by the length of time required for a quantity of charge to pass through the shift register means during the shift process.

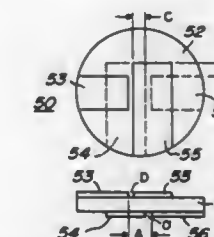
**4,163,958**  
**HYBRID TRANSVERSAL FILTER**  
 Henry M. Gerard, Capistrano Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.  
 Filed Nov. 2, 1977, Ser. No. 847,966  
 Int. Cl.<sup>2</sup> H03H 7/28, 9/26, 9/30; G11C 19/28  
 U.S. Cl. 333—165 10 Claims



1. A hybrid transversal filter, comprising:  
 a surface acoustic wave tapped delay line having an input signal terminal and producing at separate output terminals a plurality of respective SAW output signals in response

to an input signal, each of said SAW output signals having a different and relatively long time delay;  
 charge coupled device means including an array of charge coupled device tapped delay lines each having an input coupled to a different one of said surface acoustic wave tapped delay line output terminals and responsive to said SAW output signals, each of said charge coupled device tapped delay lines generating at respective outputs a plurality of relatively short time delay signals; and  
 component signal coupling circuit means including a different coupling circuit responsive to each of said SAW output signals for providing at each of said coupling circuits a pair of component signals associated with a respective SAW output signal, and wherein each of said component signals is coupled by different ones of said charge coupled device tapped delay lines, for producing collectively a relatively broad bandwidth analog processed transversal filter output signal.

**4,163,959**  
**MONOLITHIC CRYSTAL FILTER DEVICE**  
 James L. Dalling, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.  
 Filed Dec. 15, 1977, Ser. No. 860,918  
 Int. Cl.<sup>2</sup> H03H 9/02, 9/26, 9/32; H01L 41/04  
 U.S. Cl. 333—191 6 Claims



1. An improved monolithic crystal filter device comprising in combination:  
 a monolithic wafer body of piezoelectric material;  
 an essentially rectangular input electrode deposited on one side of said wafer body and an essentially rectangular output electrode deposited on the other side of said wafer body in substantial alignment longitudinally with said input electrode and with a gap provided between the inboard ends of said input and output electrodes;  
 a pair of essentially rectangular ground electrodes, each deposited on alternate sides of said wafer body in association with a respective one of said input and output electrodes, said ground electrodes being deposited with the longitudinal axis thereof substantially perpendicular to the longitudinal axis of said input and output electrodes, said ground electrodes being positioned on said wafer body to overlie and extend beyond the extremities of an inboard end of a respective one of said input and output electrode and so that a lateral portion of each of said ground electrodes extends into said gap formed by said inboard ends of said input and output electrodes to provide a shielding effect therebetween.



4,163,960

**ELECTROMECHANICAL FILTER STRUCTURE**

Herbert Erney, and Etienne Langlois, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

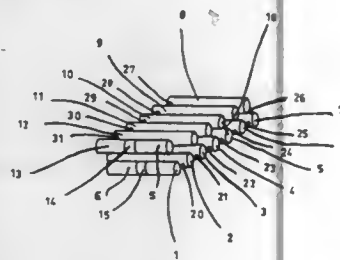
Filed Dec. 21, 1977, Ser. No. 862,906

Claims priority, application France, Dec. 30, 1976, 76 39576; Apr. 25, 1977, 77 12410

Int. Cl.<sup>2</sup> 333 197; H03H 9/26, 9/24, 9/04

U.S. Cl. 333—198

4 Claims



1. An electromechanical band pass filter having a central frequency  $f_0$  comprising:
  - a plurality of cylindrical resonators  $\frac{1}{4}\lambda$  long at the fundamental longitudinal vibration arranged in spaced first and second rows with their longitudinal axes parallel;
  - first coupling means coupling adjacent resonators in said first row;
  - second coupling means coupling adjacent resonators in said second row;
  - third coupling means coupling the last resonators at the same end of said first and second rows, said first, second and third coupling means being  $\frac{1}{4}\lambda$  at the fundamental bending vibration;
  - an input transducer connected to that resonator in one of said rows which is at the end opposite said third coupling means;
  - an output transducer connected to that resonator in the other of said rows which is at the end opposite said third coupling means;
  - at least one bridge coupling two nonadjacent resonators such that said bridge spans a number of intercoupled resonators which number is a multiple of four; and
  - means biasing said transducers through one part of said resonators.

4,163,961

**ROTARY JOINT**

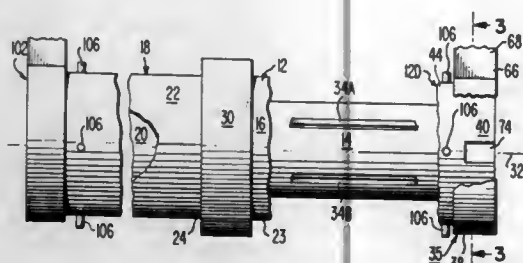
Oakley M. Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,103

Int. Cl.<sup>2</sup> H01P 1/06, 1/16, 5/12

U.S. Cl. 333—261

9 Claims



1. A rotary joint wherein a coupling assembly has non-contacting overlapping sleeves that are electrically coupled to each other at microwave frequencies and are relatively rotatable about an axis, comprising:
  - first and second outer tubular conductors;
  - first and second inner tubular conductors coaxially disposed within said first and second outer conductors, respec-

tively, thereby forming input and output waveguides having respective cavities between said first and second conductors, the proximal ends of said waveguides being connected to said sleeves to provide a non-contacting electrical coupling of said waveguides through said sleeves;

mode exciter means for generating a wave at the distal end of said input waveguide in response to an input excitation signal, the electric field of said wave having a field strength that is a sinusoidal function of at least twice the angular displacement about said axis from a datum;

discontinuity means for causing said field strength to be substantially uniform at said proximal ends;

means for causing said field strength to substantially be said function of said angular displacement at the distal end of said output waveguide; and

means for providing an output signal in response to said wave at the distal end of said output waveguide.

4,163,962

**UNIVERSAL IMPEDANCE POWER APPARATUS**

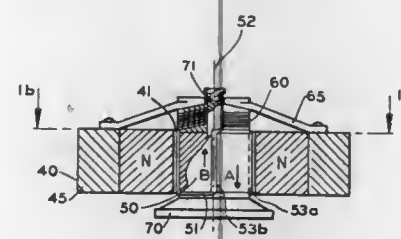
Nick D. Diamantides, 2517 14th St., Cuyahoga Falls, Ohio 44223

Filed Feb. 17, 1977, Ser. No. 769,311

Int. Cl.<sup>2</sup> H01F 7/08

U.S. Cl. 335—222

3 Claims



1. A multipeder as described comprising in combination an electromagnet having opposite magnetic poles separated by an air gap, said air gap being of cylindrical shape and traversed by the magnetic field created by said magnetic poles, said magnetic field being substantially orthogonal to the face of said poles,
- an armature positioned within said air gap and immovably attached to rigid supports, said armature being equipped with a main coil capable of carrying an alternating current, said main coil being within said magnetic field,
- a torsion spring connecting said main electromagnet to said rigid supports,
- said electromagnet being capable of rotational oscillatory motion about said armature, said motion being resiliently opposed by said torsion spring,
- said electromagnet having an inertia, and said spring having a compliance,
- said inertia and said compliance being selected as to cause said electromagnet spring system to be maintained at a desired level of vibratory state at the frequency of said alternating current,
- said electromagnet having base magnetic coils fed by direct current, the magnitude of said direct current supplying the bulk of said magnetic field,
- said electromagnet having, additionally, control magnetic coils arranged in a manner similar to said base magnetic coils, said control magnetic coils being capable of varying said magnetic field in both intensity and polarity.

4,163,963

**PROBE CONTROL**

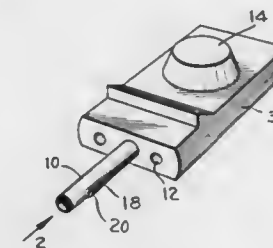
William D. Ryckman, Jr., Asheboro, N.C., assignor to General Electric Company, New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,608

Int. Cl.<sup>2</sup> H01C 7/04

U.S. Cl. 338—28

7 Claims



1. A detachable probe control for an electrically heated utensil with a hollow tubular finger snugly fitting a matching recess in the utensil for good heat conduction therebetween for control of temperature of said utensil, the improvement comprising:

transducer means supported in said finger and connected to control current to the utensil for governing the heat thereto,

said transducer support including electrical insulating sleeve means between the transducer and finger,

a pair of separate complementary and electrically conductive members within and biased against said sleeve for good thermal conductivity through the sleeve,

said sleeve electrically insulating said members from each other and said finger,

said transducer being supported between the complementary members, and

means connecting each terminal of the transducer with respective complementary members and said members with said current control for rapid response to temperature changes for accurate heat control of said utensil.

4,163,964

**PNEUMATIC OR HYDRAULIC PRESSURE SENSORS WITH SEVERAL THRESHOLDS OF RESPONSE**

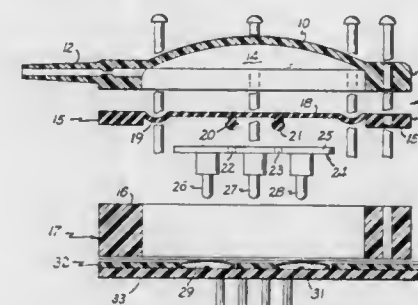
Giangrazio De Filippis, Naples, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 21, 1978, Ser. No. 879,317

Int. Cl.<sup>2</sup> H01H 35/34

U.S. Cl. 338—215

4 Claims



1. A pressure sensing device having a plurality of thresholds of response comprising
  - a membrane movable in response to pressure applied thereto,
  - an actuator movable with the membrane, said actuator having a plurality of actuating portions thereon,
  - electrical contact means,
  - and a plurality of electromechanical control means each of which is movable with snap action to engage or disengage said electrical contact means to perform a selected control

function in response to the application of predetermined force thereto and each of which resiliently resists such movement with a predetermined force, said control means normally engaging the respective actuating portions of the actuator so they cooperate in resiliently resisting movement of the membrane and actuator in response to pressure applied to the membrane but so that respective different numbers of said control means are permitted to move to perform their control functions in response to the application of selected different levels of pressure to the membrane.

4,163,965

**ELECTRICAL DIMMER PLUG**

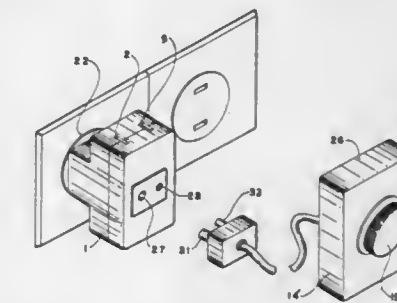
Peter D. Misinchuk, 15 Ballantyne Ct., Islington, Ontario, Canada (M9A 1W8)

Continuation of Ser. No. 763,651, Jan. 28, 1977, abandoned. This application Jun. 30, 1978, Ser. No. 920,727

Int. Cl.<sup>2</sup> H01C 13/00

U.S. Cl. 338—220

1 Claim



1. In combination, an electrical connector device having a first housing of electrically insulative material having a plurality of spaced pairs of spaced parallel slots formed therethrough for accommodating the electrically conductive prongs of a plurality of electrical connector plugs inserted in the slots, electrically conductive terminals at all the slots in the housing for electrically contacting the prongs of electrical connector plugs inserted in the slots, and a pair of electrically conductive primary prongs extending through one of the pair of slots with parts thereof inside the housing and parts thereof outside the housing;

an additional housing;

dimmer means comprising a pair of spaced parallel dimmer slots extending into the first housing, a pair of electrically conductive jackets in the dimmer slots, an independent manually variable electrical resistance unit in the additional housing and a pair of electrically conductive dimmer prongs insertable in the dimmer slots and electrically connected to the variable electrical resistance unit and extending from said additional housing, said additional housing having a manual dial outside the housing and coupled to the independent manually variable electrical resistance in the additional housing via a bore through the housing; and

circuit means having electrical conductors in the first housing electrically connecting the terminals of all the slots, the prongs and the electrically conductive jackets of the dimmer means in circuit in a manner whereby when said primary prongs are placed in electrical contact with a source of electrical energy, current supplied by the source of electrical energy is supplied to all of said terminals via said dimmer means whereby the current supplied to said terminals is manually variable via said dimmer means.

4,163,966

RODENT REPELLOR

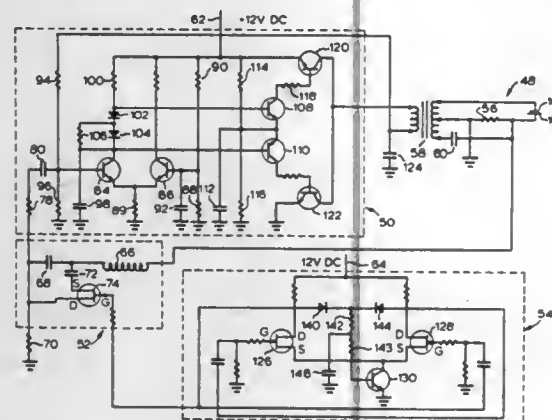
George R. Mounce, 18 Bridle Path, Willowdale, Ontario, Canada (M2L 1C8)

Filed Apr. 4, 1978, Ser. No. 893,475

Int. Cl.<sup>2</sup> H04B 11/00

U.S. Cl. 340—15

8 Claims



1. A vibratory device for generating sonic energy at a frequency adapted for the purpose of pest control comprising: a sonic resonator having a plurality of modes of vibration each at a frequency suitable for pest control; a driving element coupled to said resonator to vibrate said resonator to radiate sonic energy; an oscillatory electronic circuit including a drive amplifier, said driving element, means for providing a feedback signal to said drive amplifier which is a function of the amplitude of vibration of said resonator, a plurality of frequency-selective means, each capable of controlling the gain vs frequency response of said electronic circuit to the frequency of a different mode of vibration of said resonator and switching means for connecting said frequency-selective means one at a time into said electronic circuit; said driving element being in the output of said drive amplifier and said drive amplifier having a power gain sufficient to maintain the resonator in vibrating condition for pest control.

4,163,967

REVERSIBLE CODE COMPRESSOR

Jozsef Denes, and Mihaly Szokolay, both of Budapest, Hungary, assignors to Szamitastechnikai Koordinacios Intezet, Budapest, Hungary

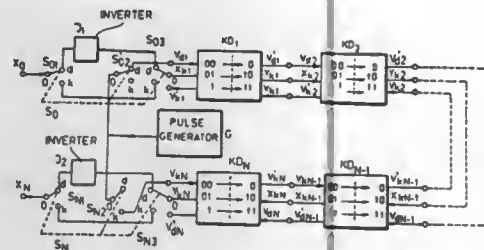
Continuation of Ser. No. 468,548, May 9, 1974, Pat. No. 4,030,093, which is a continuation-in-part of Ser. No. 281,016, Aug. 16, 1972, abandoned. This application Jan. 14, 1977, Ser. No. 759,377

The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H03K 13/00

U.S. Cl. 340—347 DD

2 Claims



1. A system for the condensation of a binary signal sequence and for the reproduction of the condensed signal sequence

comprising, in combination an input terminal for applying thereto the uncondensed signal sequence; an output terminal for applying thereto the condensed signal sequence; an input switch connected to said input terminal; an output switch connected to said output terminal; encoder means having an input connected to said input switch, said input switch being connected between said input terminal and the input of said encoder means, said encoder means having an output connected to said output switch, said output switch being connected between said output terminal and the output of said encoder means, said input and output switches connecting said encoder means to said input and output terminals when in a mode of operation for condensing said sequence; a first inverter connected between the input of said encoder means and said input terminal when in a mode of operation for reproducing the original signal sequence prior to condensing; and a second inverter connected between the output of said encoder means and said output terminal in said mode of operation for reproducing the original signal sequence prior to condensing; said input and output switches being operable in the condensing mode of operation to connect said encoder means directly between said input and output terminals, said switches connecting said encoder means in series with said first and second inverters and said output and input terminals, respectively, when in the reproduction mode of operation, said encoder means together with said inverters reproducing the original signal sequence at said input terminal from the encoded condensed signal sequence applied to said output terminal; said encoder means comprising a plurality of encoder stages connected in series, said stages performing the same transformation function; each of said encoder stages comprising shift registers shiftable both to the right and to the left and connected in series; a control circuit producing first shifting pulses for each of said shift registers synchronous with signal pulses applied to the input of the corresponding encoder stage and producing second shifting pulses between each subsequent one of said first shifting pulses for shifting said shift registers a predetermined number of times in opposite direction to that corresponding to said first shifting pulses; said control circuit comprising gating circuits checking the logical state of each of said shift registers at every shifting step and stopping said second shifting pulses at predetermined logical conditions of said shift registers.

4,163,968

SUPERVISED LOOP ALARM RADIO TRANSMITTER SYSTEM

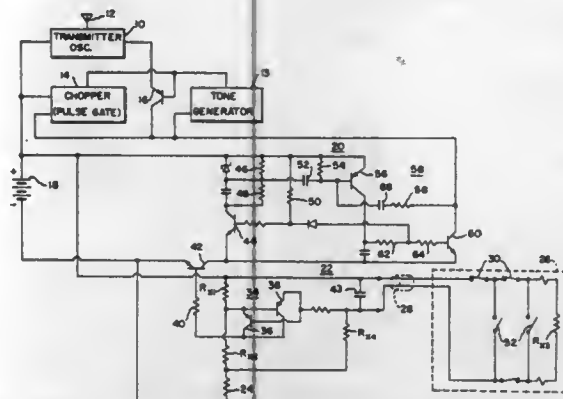
Manfred Davis, Riverdale, N.Y., assignor to Transcience Industries, Inc., Stamford, Conn.

Filed Mar. 9, 1978, Ser. No. 884,934

Int. Cl.<sup>2</sup> G08B 25/00

U.S. Cl. 340—539

10 Claims



1. An alarm radio transmitter system which comprises radio transmitter means for transmitting an alarm signal when energized,

detector loop means for sensing alarm conditions, means defining a bridge circuit including said detector loop means in at least one arm thereof for unbalancing said bridge circuit when an alarm condition is sensed, and an electronic switch means for disconnecting operating power from said transmitter means and coupled to said bridge circuit means to energize said transmitter means only when said alarm condition is sensed.

4,163,969

VARIABLE FREQUENCY LIGHT PULSER FOR SMOKE DETECTORS

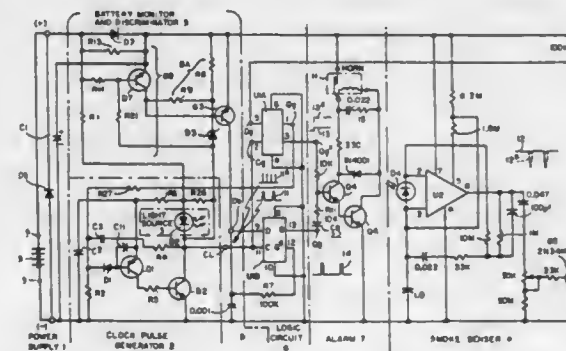
Robert B. Enemark, Duxbury, Mass., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Jun. 20, 1977, Ser. No. 808,055

Int. Cl.<sup>2</sup> G08B 17/10; G01N 21/26

U.S. Cl. 340—630

6 Claims



1. A smoke detector comprising: clock means periodically producing electrical pulses including means determining the clock period, a light source connected to and operated by the clock means to produce pulsed light at the clock period, photoelectric alarm control means actuated by smoke alteration of the pulsed light to produce an alarm signal output recurrently maintained at the period of the clock means, and means responsive to actuation of the control means for controlling the means determining clock period.

4,163,970

PNEUMATIC SPRINGS AND OTHER TELESCOPIC SYSTEMS

Fernand M. Allinquant, 53, Avenue Le Notre, and Jacques G. Allinquant, 12, Avenue Arouet, both of 92-Sceaux, France

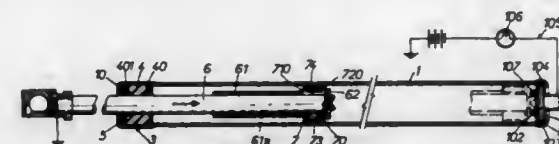
Division of Ser. No. 689,603, May 24, 1976, Pat. No. 4,089,512. This application Jan. 31, 1978, Ser. No. 873,888

Claims priority, application France, May 23, 1975, 75 16138; Dec. 15, 1975, 75 38295

Int. Cl.<sup>2</sup> H01H 3/16; G08B 21/00

U.S. Cl. 340—686

4 Claims



1. An extreme-position detector device for a telescopic pneumatic spring of the kind comprising a gas filled hermetic cylinder having a sealed bottom closure at one end thereof, and an assembly which is movable with respect to said cylinder and which includes a plunger rod extending gas tightly and slidably through the other end of said cylinder and into the same, and a damper piston fitted at the inner end of said plunger rod and presenting a restricted passage formed therethrough, said piston dividing said cylinder into two pressure chambers which

communicate with one another through said restricted passage,

wherein the improvement comprises:

means for electrically insulating said rod-and-piston assembly and said bottom closure from each other and maintaining the same in electrical out-of-contact relationship when said plunger rod is in its extreme extended position as well as throughout substantially the whole stroke of said piston in said cylinder from said extreme extended position, a source of electric current, means for electrically connecting said rod-and-piston assembly to one terminal of said source, means for electrically connecting said bottom closure to the other terminal of said source, and an electrically actuatable signalling means fitted in series with said source in the electric circuit connecting the same to said rod-and-piston assembly and bottom closure,

whereby said signalling means is actuated to indicate upon electric contact engagement between said piston and said bottom closure occurring only when said plunger rod is in its extreme retracted position within said cylinder.

4,163,971

SYSTEMS FOR DISPLAYING ANALOG VALUES

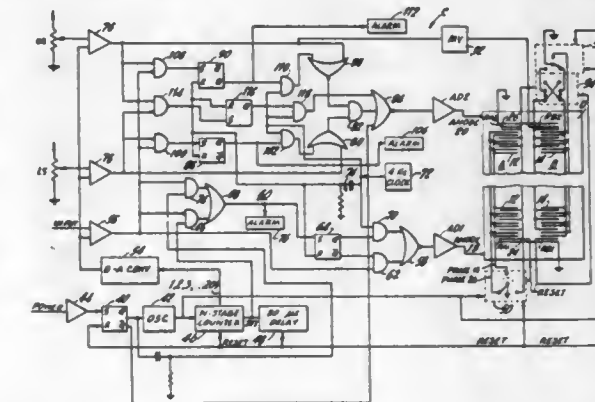
John O. Morin, Bedford, and Joseph R. Mini, Abington, both of Mass., assignors to Sigma Instruments Inc., Braintree, Mass.

Filed May 5, 1975, Ser. No. 574,446

Int. Cl.<sup>2</sup> G01D 7/00

U.S. Cl. 340—754

54 Claims



a display and a circuit coupled to the display; said display including an envelope containing an ionizable gas, a plurality of aligned electrodes within the envelope and forming a band, an electrode arrangement spaced from the electrodes within the envelope, and an analog device for displaying the test value;

each of said electrodes forming a gap with a portion of the arrangement, each gap forming a discharge path for a visible electric discharge of a given intensity when both the electrode at the gap and the arrangement are simultaneously subject to an enabling condition, an electrode and the arrangement both being subject to an enabling condition by application of respective potentials which produce the discharge voltage, an electrode and the arrangement both being subject to a non-enabling condition by application of potentials which produce a voltage less than the predetermined discharge voltage;

said circuit including electrode operating means coupled to said electrodes for applying an enabling condition to sequential ones of the electrodes in sequence, arrangement operating means coupled to said arrangement for applying the enabling condition to said arrangement;

said circuit including control means responsive to the two settable limit values and coupled to said electrode operat-





second filter means connected to said second demodulator for smoothing short-term variations of said signal voltage, thereby producing a resulting voltage varying with said operating frequencies;  
validating means connected to said second filter means for detecting an extreme value of said resulting voltage; and output means connected to said first filter means and to said validating means for passing said error signal upon the occurrence of said extreme value.

4,163,976

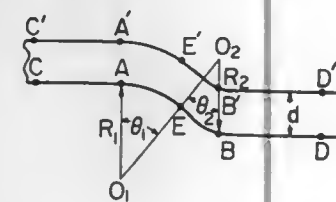
## SEMICONDUCTOR LASER DEVICE

Nobuo Matsumoto, Tokorozawa, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan  
Filed Jan. 5, 1978, Ser. No. 866,959

Claims priority, application Japan, Jan. 21, 1977, 52-5008  
Int. Cl.<sup>2</sup> H01S 3/19

U.S. Cl. 331-94.5 H

1 Claim



1. A semiconductor laser device having a bent stripe, comprising: an epitaxial wafer having an active layer and a light confinement layer formed on a substrate with group III - V semiconductors in a double heterostructure, a stripe for converting a conduction type of a surface epitaxial layer of said wafer into a reverse conduction type formed by diffusing an impurity element in said light confinement layer to a depth not reaching said active layer and ohmic electrodes formed respectively on said surface epitaxial layer including said stripe and on the reverse surface of the substrate, said substrate having cleavage planes parallel with each other to form a resonator of the device,

said stripe comprising two straight parts perpendicular to said cleavage planes and a bent part disposed between said straight parts which has the same width as said two straight parts and comprises two arcs smoothly continuously connected with said straight parts and satisfying the conditions

$$R_1(1 - \cos \theta_1) < d,$$

$$R_2(1 - \cos \theta_2) < d,$$

$$R_1 \sin \theta_1 = R_2 \sin \theta_2 < L \text{ and}$$

$$\theta_1/R_1 = \theta_2/R_2 < 0.16,$$

where d is the width of the stripe,  $R_1$  and  $R_2$  are radii of curvature of the arcs,  $\theta_1$  and  $\theta_2$  are anticipated angles for the arcs, and L is the distance between the cleavage planes.

4,163,977

## DOUBLE LOOP RECEIVER-TRANSMITTER COMBINATION

Jürgen K. Polstorff, 702 Drake Ave., Huntsville, Ala. 35802  
Filed Dec. 21, 1977, Ser. No. 862,905

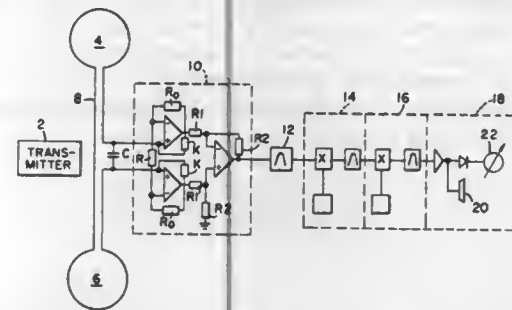
Int. Cl.<sup>2</sup> G01S 5/16; H04B 5/00, 15/00

U.S. Cl. 343-112 R

6 Claims

1. A communication link comprising:  
(a) a transmitter buried beneath the surface of the earth, said transmitter producing a magnetic field having vertical dipoles; and  
(b) a receiver upon the surface of the earth for receiving the signals produced by said transmitter including an identical

double loop antenna connected in a resonant circuit, said double loop antenna rotatable around a horizontal axis perpendicular to the connecting line between said loops,



said magnetic field produced by said transmitter reaching both of said loops at substantially the same time, whereby opposing atmospheric noise emf's are eliminated and an optimum signal/noise ratio is produced.

4,163,978

## RADIO DIRECTION FINDING

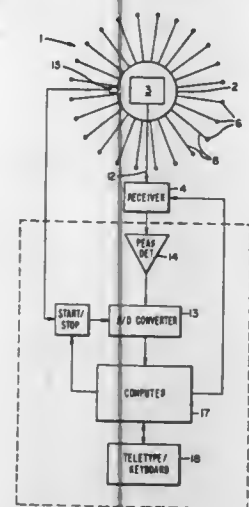
Eric G. Shepherd, and Roger D. Spragg, both of Cheltenham, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England  
Filed Nov. 29, 1977, Ser. No. 855,584

Claims priority, application United Kingdom, Dec. 2, 1976, 50368/76

Int. Cl.<sup>2</sup> G01S 5/04

U.S. Cl. 343-120

25 Claims



1. A method of determining the direction of arrival of radio wave received by directional receiving means of the kind comprising, a wide aperture directional aerial system having a directional pattern of reception in a given plane, substantially symmetrical about the direction of maximum sensitivity thereof in said plane, and a receiver coupled to the aerial system; the method comprising varying the direction of maximum sensitivity of the aerial system; detecting the amplitude of the receiver output signal during variations in said direction of maximum sensitivity of the aerial system, whereby to produce a representation of the amplitude distribution of the receiver output signal as a function of the direction of maximum sensitivity of the aerial system; and computing the point about which said amplitude distribution is most symmetrical, whereby to provide an estimate of the direction of arrival of the radio wave.

4,163,979

## METHOD AND APPARATUS FOR RECORDING LATENT IMAGES ON A MAGNETIC MEDIUM IN MAGNETOGRAPHY

Norio Kokaji, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Japan

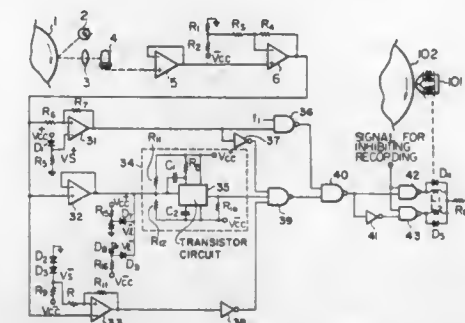
Filed Jul. 25, 1977, Ser. No. 818,453

Claims priority, application Japan, Jul. 28, 1976, 51-90006; Mar. 14, 1977, 52-27845

Int. Cl.<sup>2</sup> G03G 19/00; G01D 15/12

U.S. Cl. 346-74.1

3 Claims



1. An apparatus for recording magnetic latent images, utilizing magnetography, on a medium for recording, including: means for discriminating the magnitude of the input signal, means, responsive to said discriminating means, for generating pulses, whose frequency is of a predetermined value, when said discriminating means detects an input signal greater than a predetermined value indicative of a black color, a voltage-to-frequency converter which produces pulses of different frequencies in accordance with the voltage of the input picture signal, whereby the value of the frequency changes in accordance with a change in the input signal corresponding to a change of color shading between black and white; and means for applying the pulses produced by either said pulse generating means or said voltage-to-frequency converter to the recording head.

4,163,980

## RECORDING ELECTRODE ASSEMBLY FOR USE IN ELECTROSTATIC REPRODUCTION

Rolf Angelbeck, Kiel; Reinhard Gesell, Schonkirchen, and Rüdiger Sommer, Raisdorf, all of Fed. Rep. of Germany, assignors to Firma Dr. -Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,609

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648298

Int. Cl.<sup>2</sup> G03G 15/048

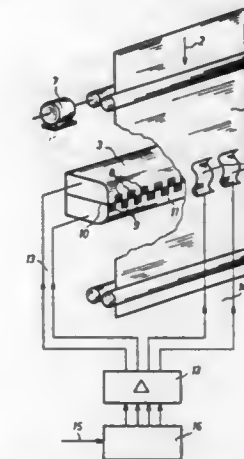
U.S. Cl. 346-155

5 Claims

1. A recording device for use in electrostatic reproduction of an image on a recording medium including an electrode arrangement comprising in combination:

at least two insulating carrier plates, each carrying on one surface thereof a plurality of separate electrodes arranged in a row, and on the opposite surface thereof a plurality of electrical leads, said rows being substantially parallel to one another, and extending in a predetermined direction, at least one end of each of said electrical leads being constructed as a contact tongue for plug-in connection, said electrical leads being formed as a control matrix for coincidence control of said electrodes, so that the number of said contact tongues is smaller than the number of said electrodes, said plurality of electrodes being connected to said control matrix through a corresponding one of said carrier plates, an insulating layer disposed between said carrier plates, a cover plate for each of said carrier plates, said carrier

plates, said insulating layer and said cover plates being connected to one another, a plurality of counter-electrodes, arranged along said predetermined direction, spaced apart from said electrodes, and defining therewith a gap adapted for the passage of the recording medium, a support for said counter-electrodes, and an additional carrier plate mounted on said support, said counter-electrodes being formed as conductive tracks on



said additional carrier plate, each of said counter-electrodes including a contact surface adapted to contact said recording medium, a strip electrically connected to said contact surface, a supporting surface electrically connected to said strip, an electrical supply lead connected with one end thereof to said supporting surface, and a further contact tongue connected to the other end of said electrical supply lead.

4,163,981

## SPRING TUNABLE HELICAL WHIP ANTENNA

Thomas J. Wilson, 1055 N. First Pl., Hermiston, Oreg. 97838  
Filed Mar. 27, 1978, Ser. No. 890,420

Int. Cl.<sup>2</sup> H01Q 1/36, 1/32

U.S. Cl. 343-715

2 Claims



1. A spring tunable antenna mountable on the frame of a vehicle or the like comprising, a base mountable on the vehicle,



a flexible rod mounted at one of its ends on said base, said rod having a tip region opposite said one end, and a body region intermediate said base and said tip region, a low-resistance conductor attached to said base and wound helically about said rod to form a plurality of helical windings encircling said rod, said windings encircling said body region having substantially fixed positions relative thereto, and said windings encircling said tip region forming a coiled spring which is adjustable selectively between compressed and extended position, wherein said spring encircles lesser and greater portions of said tip region, respectively, and

means for securing said spring at a preselected position between said compressed and extended positions, said means including a tape which is securable about said spring to encase the same in a plurality of helical wrappings, and which is releasable selectively to permit adjustment of said spring.

**4,163,982**  
**SOLID STATE ELECTRICAL SWITCH EMPLOYING ELECTROCHROMIC MATERIAL**

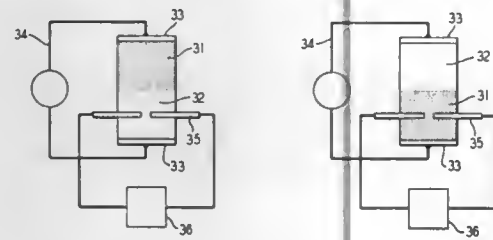
Mauro Di Domenico, Jr., Basking Ridge; Shobha Singh, Summit, and Legrand G. Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 29, 1977, Ser. No. 792,192

Int. Cl.<sup>2</sup> H01L 45/00

U.S. Cl. 357-2

5 Claims



1. A solid state electrical switch which switches a load circuit on and off under the influence of a control circuit comprising

- (a) an insulating base;
- (b) a first control conducting electrode on top of the insulating base;
- (c) an electrochromic material on top of the first conducting electrode, said electrochromic material capable of undergoing a transformation from insulator to metallic conductor on the injection of ions under the influence of an electrical field established by the control circuit;
- (d) an electrolytic material on top of the electrochromic material said electrolytic material capable of injecting positive ions into the electrochromic material, said positive ions selected from the group consisting of  $H^+$ ,  $Li^+$ ,  $Na^+$  and  $K^+$ ;
- (e) a second control conducting electrode on top of the electrolytic material which on connecting said first and second control conducting electrode to a control device becomes the control circuit;
- (f) two load electrodes, embedded in the electrochromic material which on electrically connecting the two load electrodes to a load device becomes the load circuit.

**4,163,983**

**SOLID STATE NEURON**

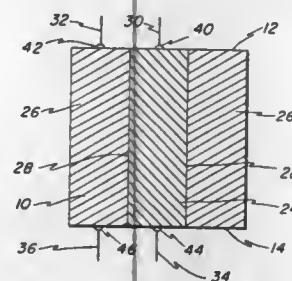
Harvey E. Cline; Thomas R. Anthony, and Ivar Glaever, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,609

Int. Cl.<sup>2</sup> H01L 29/88

U.S. Cl. 357-12

10 Claims



1. A semiconductor neuron comprising

a body of single crystal semiconductor material having two opposed major surfaces, at least one of the major surfaces having a preferred crystal planar orientation, a predetermined level of resistivity and a first type conductivity; at least one first region of degenerative semiconductor material disposed in the body, extending entirely through the body and terminating in the opposed major surface of the body and having two opposed end surfaces, each end surface being coextensive with a respective one of the two major surfaces of the body;

each first region having a predetermined level of concentration of dopant impurity material and a second type conductivity;

at least one second region of degenerative semiconductor material coaxially disposed in each first region, extending entirely through the body and terminating in the opposed end surfaces of the first region and having two opposed end surfaces, each end surface of the second region being coextensive with a respective end surface of the first region;

each second region having a predetermined level of concentration of dopant impurity material and a third type conductivity which is opposite to that type conductivity of the first region;

a P-N junction formed by the abutting surfaces of each pair of first and second regions of opposite type conductivity, the P-N junction extending between and terminating in the opposed major surfaces of the body;

the predetermined level of concentration of impurity material in each pair of abutting first and second regions of degenerative semiconductor material being of a sufficient value to impart to the P-N junction formed therebetween electrical characteristics of a tunnel diode;

a first ohmic electrical contact affixed to one of the two opposed end surfaces of a first region;

a second ohmic electrical contact affixed to one of the two opposed end surfaces of an abutting second region which is coextensive with the one end surface of the first region;

a third ohmic electrical contact affixed to the other of the two opposed end surfaces of the first region;

a fourth ohmic electrical contact affixed to the other of the two opposed end surfaces of the second region, and the semiconductor neuron functions in a manner similar to a biological neuron when a voltage pulse is applied across the P-N junction between the first and second electrical contacts and after a predetermined time delay the applied voltage pulse appears across the P-N junction between the third and the fourth electrical contacts.

**4,163,984**

**FIELD EFFECT TRANSISTOR**

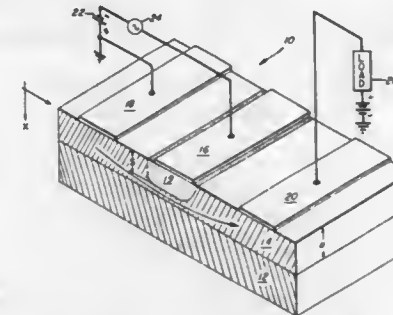
Robert A. Pucel, Needham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 27, 1978, Ser. No. 873,189

Int. Cl.<sup>2</sup> H01L 29/80

U.S. Cl. 357-22

8 Claims



1. A field effect transistor comprising:

- (a) a semiconductor layer formed over a substrate;
- (b) a gate electrode disposed between a source electrode and a drain electrode, such gate, source and drain electrodes being disposed over a portion of a surface of the semiconductor layer, such gate electrode being adapted to produce a depletion zone in a portion of such semiconductor layer in response to an electrical voltage between the source and gate electrodes;
- (c) such semiconductor layer having a dopant in the semiconductor layer beneath the gate electrode, such dopant having a doping concentration profile selected to linearize the relationship between the transconductance and the level of the electrical voltage fed to the gate electrode to such transistor over the operating range of such electrical voltage.

**4,163,985**

**NONVOLATILE PUNCH THROUGH MEMORY CELL WITH BURIED N+ REGION IN CHANNEL**

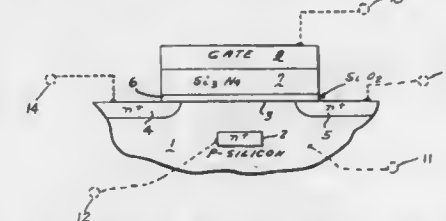
Fritz L. Schuermeyer, Yellow Springs, and Charles R. Young, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 30, 1977, Ser. No. 838,437

Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357-23

3 Claims



1. A five terminal nonvolatile punch through memory cell comprising:

- a p type substrate having a surface;
- a first and a second n+ region positioned in spaced apart relationship in the said substrate providing a source and a drain, respectively;
- a very thin oxide layer positioned over a portion of said substrate surface in contacting relationship;
- a nitride layer positioned over the said oxide layer in contacting relationship;
- a gate layer positioned over the said nitride layer; and
- an n+ layer buried in the said p type substrate below the said surface of the substrate and substantially between and in spaced apart relationship to the said first and second n+ regions.

**4,163,986**

**TWIN CHANNEL LORENTZ COUPLED DEPLETION WIDTH MODULATION EFFECT MAGNETIC FIELD SENSOR**

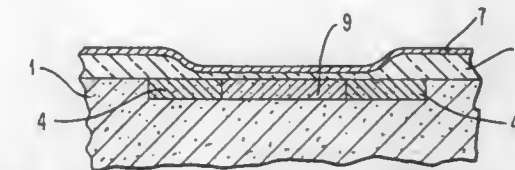
Albert W. Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1978, Ser. No. 902,327

Int. Cl.<sup>2</sup> H01L 27/22, 29/82, 29/96

U.S. Cl. 357-27

11 Claims



1. In a semiconductive, channel conduction, field sensor device having a substrate of semiconductive material, a source region and at least two separated drain regions in said substrate, the improvement comprising:

- at least two first conductive channels in said substrate connecting said source and said drains, there being one said drain connected to each said channel;
- said first channels of conducting material each have a filamentary form defined by having a Vindhall width to channel width ratio in the vicinity of said source that is greater than 0 and less than 0.98; and
- a Lorentz voltage generating conductive channel in said substrate between said two first conductive channels and electrically coupling said two first channels together for applying a Lorentz voltage thereto in a direction at right angles to the flow of carriers in said two first channels.

**4,163,987**

**GAAS-GAALAS SOLAR CELLS**

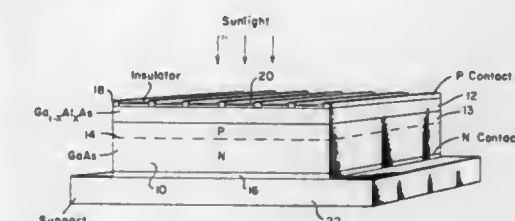
G. Sanjiv Kamath, Malibu, and Carl L. Anderson, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 2, 1977, Ser. No. 792,839

Int. Cl.<sup>2</sup> H01L 27/14

U.S. Cl. 357-30

2 Claims



1. A solar cell structure comprising in combination:

- (a) an N-type gallium arsenide substrate,
- (b) a P-type gallium aluminum arsenide epitaxial layer on said substrate,
- (c) a P-type region of gallium arsenide within said substrate and beneath said epitaxial layer and defining a PN junction in said substrate, said epitaxial layer grown from a solution having beryllium therein at a concentration level sufficient to establish a beryllium-to-gallium ratio in said growth solution on the order of about 1:100,000 by weight to thereby minimize the resistivity on each side of said PN junction to a value which is substantially independent of the aluminum concentration in said P-type gallium aluminum arsenide epitaxial layer, and
- (d) electrical contact means on both said substrate and said epitaxial layer, respectively, for conducting current from said solar cell at power conversion efficiencies in excess of 16%.

4,163,988

## SPLIT GATE V GROOVE FET

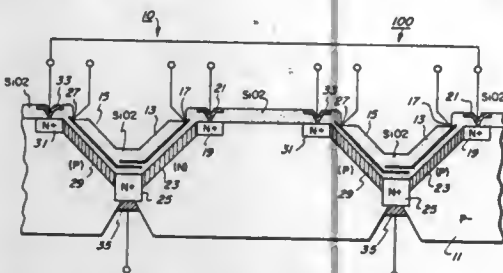
Keming W. Yeh, Westchester, and James L. Reuter, Rancho Palos Verdes, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,333

Int. Cl.<sup>2</sup> H01L 29/06

U.S. Cl. 357—55

21 Claims



1. A split gate V groove FET device mounted in a substrate with a first terminal comprising a body of a first conductive material in the apex of said V groove, said first terminal connected to a first conductive channel in a first side of said V groove to form a first transistor and said first terminal connected to a second conductive channel in a second side of said V groove to form a second transistor, said V groove is mounted in a substrate of a body of conductive material of a second type, said first and second channels being connected to respective second and third terminals of conductive material of said first type and at ends opposite from the apex of said V groove.

4,163,989

## DETECTOR CIRCUIT FOR COLOR TELEVISION RECEIVERS

Susumu Akazawa, Ichikawa; Kyoichi Murakami, Chigasaki; Kiyoshi Ishihata, Fujisawa, and Takao Tsuchiya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

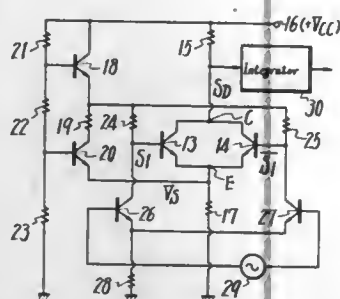
Filed May 4, 1978, Ser. No. 903,003

Claims priority, application Japan, May 17, 1977, 52-63109[U]

Int. Cl.<sup>2</sup> H04N 9/535; H03D 1/02

U.S. Cl. 358—27

6 Claims



1. A detector circuit for a color television receiver, comprising a pair of transistors each having first and second current-carrying electrodes and a control electrode, and circuits defined by the first and second current-carrying electrodes of said transistors and being connected in parallel with each other; circuit means receiving an input signal for supplying a corresponding differential input signal to each of the control electrodes of said pair of transistors; reference voltage means supplying a reference voltage to the second current-carrying electrodes of said pair of transistors; a source of a supply voltage; an impedance element coupled between the first current-car-

rying electrodes of said pair of transistors and supply voltage source; and integrating means for integrating a detected signal from the first current-carrying electrodes of said pair of transistors and thereby providing an output signal.

4,163,990

## COLOR TELEVISION PROJECTION SYSTEM

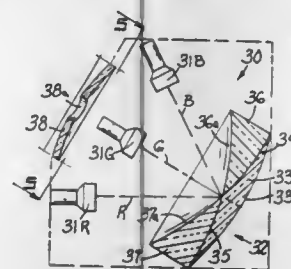
Marvin P. Hodges, 4801 Del Moreno Dr., Woodland Hills, Calif. 91364

Filed Apr. 24, 1978, Ser. No. 899,361

Int. Cl.<sup>2</sup> H04N 9/16, 5/74

U.S. Cl. 358—64

12 Claims



1. A system for projecting a color television image comprising a plurality (n) of cathode ray tubes of different monochromatic colors, each tube having an image display screen, an optic having a plurality of successive reflective surfaces equal in number to the number of tubes, said reflective surfaces being selectively reflective to at least n-1 colors, said tubes and said surfaces positioned such that each surface reflects an image appearing on the screen of one tube, and a lens disposed behind said tubes to transmit a composite color image of the images reflected from said surface.

4,163,991

## ARRANGEMENT FOR EXAMINING OBJECTS

Thomas Burrig, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

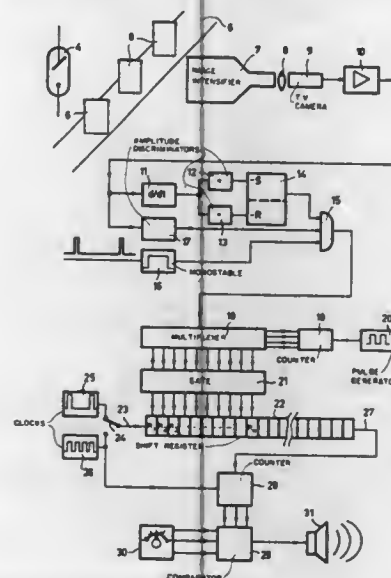
Filed May 8, 1978, Ser. No. 903,546

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720865

Int. Cl.<sup>2</sup> H04N 7/18

U.S. Cl. 358—111

5 Claims



1. A device for examining objects for regions whose emission, absorption or reflection deviates from that of the surrounding regions, comprising:

4,163,993

## CONTINUOUS SLOW MOTION AUTOMATIC TRACKING SYSTEM

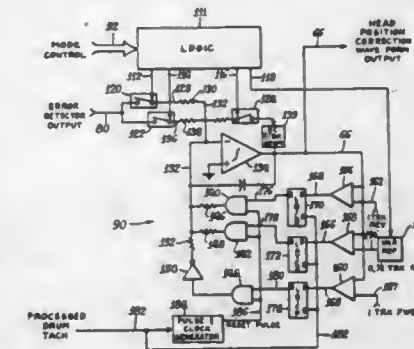
Raymond F. Ravizza, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 23, 1978, Ser. No. 889,451

Int. Cl.<sup>2</sup> H04N 5/78; G11B 21/10, 15/18

U.S. Cl. 360—10

26 Claims



scanning means which scan the object, line-by-line, and supply a scanning signal depending on the emission, absorption or reflection;  
means for generating a binary identification signal when a region whose emission, absorption or reflection considerably deviates from that of the surrounding regions is scanned;  
coding means which produce binary sample signals corresponding to samples of said identification signal at a plurality of discrete positions on said scan lines, the logic level of said sample signals assuming a first value when the identification signal is present and a second value when the identification signal is not present;  
a store connected to receive the sample signals;  
a gate means which produce a relative shift of at least one discrete position between sample signals associated with successive lines and which combine said shifted sample signals by ORing logic levels of said first value; and  
evaluation means which process the result of said combination and which activate a signal upon the occurrence therein of several consecutive logic levels associated with the identification signal.

4,163,992

## DIGITAL VIDEO EFFECTS SYSTEM EMPLOYING A CHROMA-KEY TRACKING TECHNIQUE

Masao Inaba, and Kazuo Kashigi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

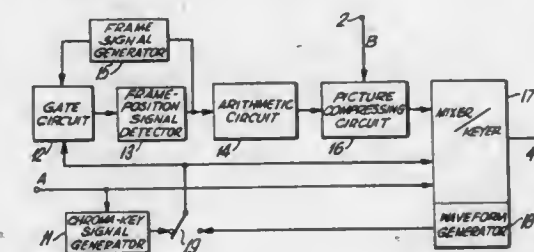
Filed Aug. 15, 1978, Ser. No. 933,815

Claims priority, application Japan, Aug. 17, 1977, 52-98938

Int. Cl.<sup>2</sup> H04N 5/22

U.S. Cl. 358—183

5 Claims



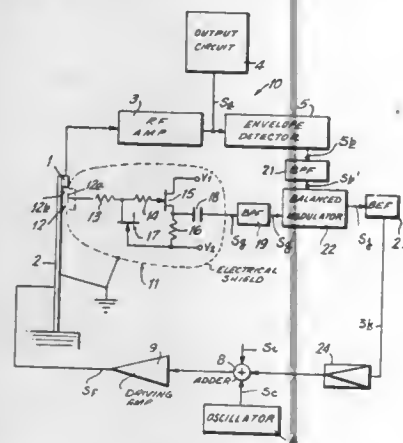
1. A tracking system for producing special effects on a television picture said television picture comprised of a first picture and a second picture inserted into said first picture, said first and second pictures being represented by first and second video signals, respectively, wherein said first and second video signals have a predetermined aspect ratio, said system comprising:  
means for producing a key signal representing a key frame to be positioned on said first picture;  
means responsive to said key signal for producing a position signal representing a position of a circumscribed frame of said key frame;  
means responsive to said position signal for producing an imaginary-frame position signal, said imaginary-frame position signal representing an imaginary frame and said imaginary frame having said predetermined aspect ratio;  
means responsive to said second video signal and said imaginary-frame position signal for producing a compressed second video signal representing a compressed second picture, said compressed second picture being identical in size to said imaginary frame; and  
means responsive to said key signal for selectively combining said first video signal and said compressed second video signal, whereby said special effects are produced.

1. Apparatus for providing generally continuous and noise free transfers of signal information with respect to a magnetic tape during transitions between operating modes, including the transition from a first mode wherein the tape is transported slower than normal speed and a second mode wherein the tape is transported at the normal speed in a rotary scan magnetic tape recording and/or reproducing apparatus of the type which has transducing means operatively supported by rotation means for scanning a magnetic tape along a plurality of adjacent discrete tracks oriented at an angle relative to the lengthwise direction of the tape, the rotation means including movable means carrying the transducing means and effecting movement of the transducing means in opposite directions relative to a nominal position along a path generally transverse to the direction of said tracks in response to signals being applied thereto, said apparatus comprising:  
means for generating first positioning signals and applying same to said movable means to have said transducing means accurately follow a subject track;  
means for moving the tape past the transducing means;  
means for controlling said tape moving means to move the tape at a normal tape speed when said apparatus is transferring signal information in said second mode and to move the tape at a slower than normal tape speed when said apparatus is transferring signal information in said first mode, said controlling means accelerating said tape to a first predetermined speed that approaches said normal tape speed in response to switching said apparatus from said first to said second signal transfer mode, said controlling means accelerating said tape to said normal tape speed in response to relatively synchronizing the tape moving means and the rotation means for signal transfers at the normal tape speed;  
means for applying second positioning signals to said movable means following the end of a scan of a track by the transducing means to position the movable means so that the transducing means scans the next desired track, said second positioning signals being effective to move said transducing means one or more predetermined distances in either direction relative to a nominal position;  
means for determining whether second positioning signals are to be applied to said movable means by said second positioning signal applying means, said determining means including means for generating decision levels indicative of the requirement for the application of second positioning signals that change in relation to the mode of operation of said apparatus and means for monitoring a signal that is proportional to the position of said movable means relative to said nominal portion for effecting the application of



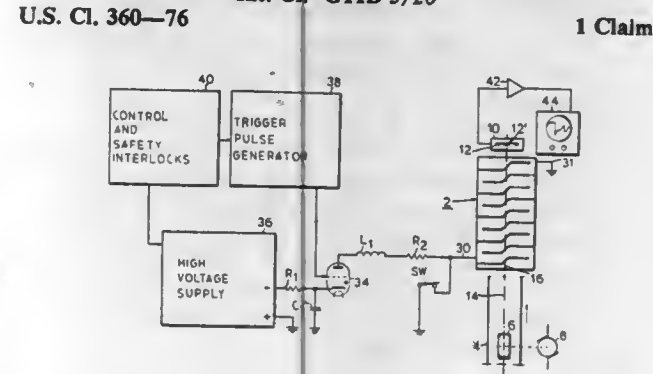
second positioning signals in accordance with the monitored signal and generated decision levels.

**4,163,994**  
**AUTOMATIC HEAD TRACKING SYSTEM UTILIZING TRANSDUCER DEFLECTING MEANS AND SYNCHRONOUS DEMODULATION OF THE ENVELOPE SIGNAL**  
 Hitoshi Sakamoto, Zama, and Yoshiaki Wakisaka, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed Jun. 2, 1978, Ser. No. 911,833  
 Claims priority, application Japan, Jun. 4, 1977, 52-72050[U]  
 Int. Cl.<sup>2</sup> H04N 5/78; G11B 21/04, 21/10  
 U.S. Cl. 360—70



1. An apparatus for reproducing information signals recorded in a track on a record medium; comprising a transducer movable along said track for reproducing the information signal recorded therein; transducer deflecting means mounting said transducer and being operative in response to the reception of an electrical drive signal for deflecting said transducer in a direction which is transverse in respect to the direction along said track; deflection responsive signal generating means for generating a deflection responsive signal in correspondence to the deflection of said transducer in said transverse direction from a rest position; and control circuit means including oscillating means for providing a dither oscillation signal to said transducer deflection means which causes said transducer to oscillate in said transverse direction about a null position, envelope detecting means for detecting the envelope of the output of said transducer as the latter moves along the track and oscillates in said transverse direction, means connected with said envelope detecting means and said deflection responsive signal generating means for synchronously demodulating the detected envelope from said envelope detecting means by means of said deflection responsive signal so as to obtain a tracking error signal representative of the deviation of said null position of the transducer from the center of the track considered in said transverse direction, and means for adding said tracking error signal to said dither oscillation signal so as to provide therefrom said electrical drive signal for said transducer deflecting means and by which said null position of the transducer is aligned with said center of the track.

**4,163,995**  
**APPARATUS AND METHOD FOR DETECTING NON-ALIGNMENT OF A MAGNETIC HEAD WITH RESPECT TO A RECORDING TRACK ON A RECORD MEDIUM**  
 William R. Nayland, Ripley, England, assignor to Burroughs Corporation, Detroit, Mich.  
 Continuation of Ser. No. 792,294, Apr. 29, 1977, abandoned.  
 This application Sep. 27, 1978, Ser. No. 946,297  
 Int. Cl.<sup>2</sup> G11B 5/20  
 U.S. Cl. 360—76



1. In a system for detecting lateral offset and skew misalignment of a gap-type magnetic head with respect to the center line of a recording track on a record medium, a test pattern generating member for writing a distinctive magnetic image on the record medium, said test pattern generating member comprising:

A. continuous sinusoidal conductor means, having an elongated rectangular shape, having a plurality of adjacent first and second transverse sinusoid segments, having a longitudinally-extending center line, and having longitudinal edges,

1. said sinusoidal conductor means for carrying a flux-inducing electrical current pulse through the length of the sinusoidal array, and

2. said sinusoidal conductor means for producing flux reversals between said adjacent sinusoid segments so that the recorded image contains periodically-occurring flux reversals;

B. discontinuous nonconductive compressed gap means, formed periodically within said sinusoidal conductor means,

1. said compressed gap means for narrowly separating said adjacent sinusoid segments, so as to produce a high-density flux concentration between said segments when an electrical current pulse is passed through said sinusoidal conductor means, so that as a magnetic head reads the resulting recorded image on a record medium, a single, sharply-defined pulse is generated each time the head moves across from the flux pattern produced by one sinusoid segment to the pattern produced by the next adjacent segment,

2. said compressed gap means having first and second center-straddling portions on opposite sides of said conductor means centerline, said first portions extending to said longitudinal edges of said sinusoidal conductor means and said second portions terminating short of said longitudinal edges,

C. said discontinuous nonconductive compressed gap means further having gap angle means connecting said first and second portions and traversing said conductor means centerline,

said gap angle means for mutually and longitudinally displacing said center-straddling first and second gap portions,

so that the sharply-defined unitary pulses, produced when a magnetic head reads the recorded images generated by said displaced first and second gap portions, are distinguishably separated in a manner which enables a comparison to be made of both the amplitudes of adja-

cent common-polarity pulses as well as the periods between adjacent opposite-polarity pulse groups, so as to indicate lateral offset and skew misalignment of the magnetic head with respect to the recorded image centerline corresponding to the centerline of said sinusoidal conductor means; and  
 D. nonconductive substrate means, for supporting said sinusoidal conductor means.

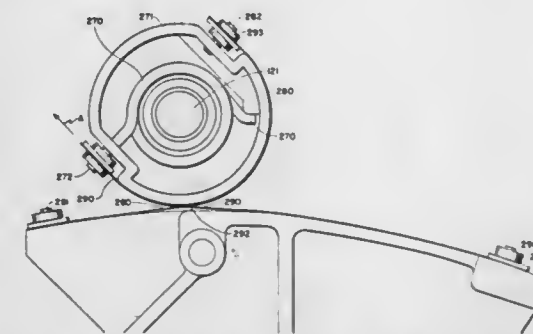
**4,163,996**  
**RIGID MAGNETIC DISC MEMORY APPARATUS EMPLOYING STEPPER MOTOR DRIVE AND PIVOTABLE HEAD SUPPORT WITH TEMPERATURE COMPENSATION**

Robert G. Kaseta, Stow; Lenn Daugherty, Northboro; Sigmund Hinlein; Michael Feldstein, both of Sudbury; Harold Thackaberry, Franklin, and Robert E. Barrows, Hopdale, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 24, 1978, Ser. No. 899,047  
 Int. Cl.<sup>2</sup> G11B 5/54, 17/00, 5/48

U.S. Cl. 360—97

4 Claims



1. In memory apparatus including at least one spinable and non-flexible magnetic disc, said apparatus supported by a base and intended for use in a digital computer system, rotary means for accurately positioning magnetic heads relative to tracks on at least one surface of said disc, said rotary means comprising: pivotable means pivotably mounted on said base with pivot axis of said pivotable means substantially parallel to spin axis of said spinable magnetic disc, for supporting said magnetic heads;

stepper motor means, including a rotational stepper motor mounted on said base with rotation axis of the shaft of said rotational stepper motor substantially parallel to said spin axis, for receiving electrical signals from said computer system and for step-rotating said shaft in response to said signals;

taut-biased and flexible band means substantially inelastic in the taut-biased directions for coupling rotational motion of said shaft to said pivotable means in a manner to cause hysteresis-free motion of said pivotable means about said pivotable axis whereby said magnetic heads are positioned along said disc surface;

said pivotable means, said band means, and said magnetic disc together including temperature compensation means for minimizing displacement of said heads relative to said tracks when ambient temperature changes.

**4,163,997**  
**CASSETTE ACCEPTING AND EJECTING DEVICE**  
 Masanori Sugihara, Tokyo, Japan, assignor to Beltek Corporation, Japan

Filed Mar. 17, 1978, Ser. No. 887,529

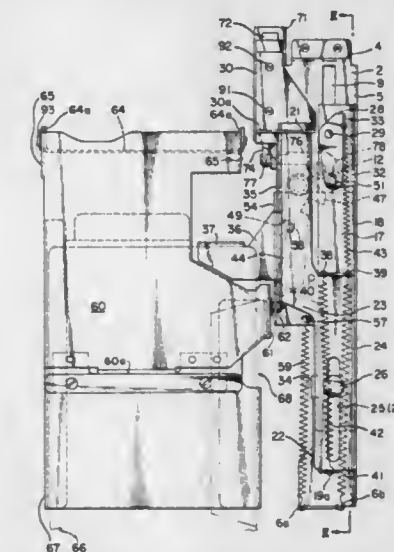
Claims priority, application Japan, Mar. 18, 1977, 52/30081  
 Int. Cl.<sup>2</sup> G11B 15/24, 15/66

U.S. Cl. 360—137

6 Claims

1. A cassette loading and unloading device comprising: a container (67) adapted to hold a cassette; a movable plate (23)

adapted to be moved loading a spring (41) as said cassette is inserted; a container driving plate (50) engaging said container and adapted to move said container to a playing position by the force of a spring (59); a locking plate (44) pivotally mounted adjacent said container driving plate, said movable plate and said container driving plate being adapted to be selectively retained by a pivoting of said locking plate, one of said movable plate and container driving plate being released from said locking plate; and a slide plate (17) adapted to be prevented from moving when held through a retaining member (28) upon energization of a solenoid (69) and to be allowed to move when said solenoid is deenergized, said slide plate being biased by a spring (42) so as to cooperate with said container driving plate



when moved forwardly and with said movable plate when moved backwardly, said locking plate being pivotally supported for free rocking movement, and provided at its one end with a projection (47) and a notch (48) leading from said projection and at the other end with a notch (49), said notch (49) being adapted to stably arrest and hold a pin 58 of said container driving plate biased by said spring (59), said projection (47) being adapted to be pressed by a pin (40) provided on said movable plate when said movable plate is moved as a result of the insertion of the cassette, said locking plate (44) being adapted to be further rotated when the cassette is released from the insertion force, so as to release said container driving plate and so as to hold said movable plate.

**4,163,998**  
**LAMPSHADE HAVING PICTURE DISPLAY WINDOW**  
 Robert L. Anderson, and Jeannette M. Anderson, both of P.O. Box No. 209, Chesterstown, Md. 21620  
 Filed Dec. 16, 1977, Ser. No. 861,427  
 Int. Cl.<sup>2</sup> T21V 1/04

U.S. Cl. 362—358

8 Claims

1. A lampshade assembly having a window opening formed therein, an inner at least partially transparent sheet located within said lampshade at said opening, said sheet being secured to said lampshade along only an upper marginal portion of said sheet and forming a carrier for a picture to be displayed through the window opening, a lower marginal portion of said inner sheet being separable from said lampshade to receive the picture to be displayed, and a semi-rigid wire, picture retaining member having a configuration conforming to a horizontal cross section of the lampshade; said retaining member being removably located within said lampshade and biased radially



outwardly into contact with the inner surface of the lower, marginal portion of said inner sheet to maintain said inner sheet



in contact with said lampshade and thereby retain the picture in position for display through said window opening.

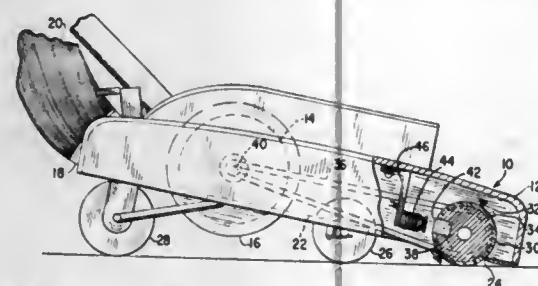
#### 4,163,999 ELECTRONIC CUTOFF CIRCUIT FOR VACUUM CLEANERS

Bradley C. Eaton, Pompton Plains, and Thomas M. Taylor, Flanders, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,998  
Int. Cl.<sup>2</sup> H02H 7/08

U.S. Cl. 361-23

3 Claims



1. In a vacuum cleaner having a chassis, an electric motor mounted in the chassis, means for connecting said cleaner to a source of electric power including switch means in circuit with the motor, said switch means being selectively manually operable to a first position for denying electric power to said motor and to a second position for supplying electric power to said motor, an aperture formed in the chassis providing an air inlet, means driven by the motor for drawing dirt laden air into the inlet, a brush roller assembly rotatably mounted in the chassis and extending through the inlet, and means including a belt for rotatably driving the brush roller assembly from the motor, the improvement comprising sensing means responsive to rotation of the brush roller assembly below a predetermined speed when the motor is supplied with electric power for providing an output signal at a predetermined level, control means coupled to receive the output signal and responsive to the predetermined level of the output signal for removing power from said motor, and means responsive to the supplying of power to the motor by the switch means for delaying operation to the sensing means for a sufficient period to allow the motor to initially come up to speed.

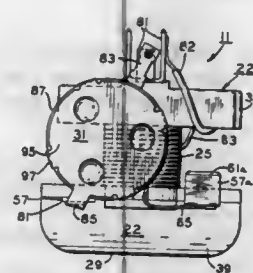
#### 4,164,000 RELAY-STARTER ELECTRICAL DEVICE FOR A PRIME MOVER

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Aug. 31, 1977, Ser. No. 829,276  
Int. Cl.<sup>2</sup> H02H 7/08

U.S. Cl. 361-27

27 Claims



1. An electrical device adapted to be removably mounted in plug-on circuit relation with a pair of male terminals of an electrically energized apparatus, the electrical device comprising:

- a housing having a receptacle portion;
- a pair of female terminals disposed in said receptacle portion and adapted for receiving the male terminal pair in the plug-on circuit relation;
- a pair of switch means terminals disposed in said housing including a first pair of contacts on said switch means terminals within said housing, and a pair of exterior portions on said switch means terminals extending exteriorly of said housing, respectively;
- a dummy terminal on said housing and connected in circuit relation with one of said female terminals;
- coil means associated with said housing and connected in circuit relation between the other of said female terminals and one of said exterior portions of one of said switch means terminals;
- switch means in said housing including means movable for bridging between said switch means terminals, a second pair of contacts on said bridging means for circuit making engagement with and breaking disengagement from said first contact pair, respectively, and armature means disposed in said housing in magnetic coupling relation with said coil means and operatively associated with said bridging means, said armature means being magnetically operable generally upon the energization of the coil means for moving said bridging means between positions respectively engaging and disengaging said second contact pair and said first contact pair;

- a casing disposed at least closely adjacent said housing and including at least a base wall and a sidewall interconnected with said base wall, a generally open-ended recess in said casing between said sidewall and said base wall, and an aperture in said casing extending through at least said sidewall;
- a PTCR disposed in said recess and having a pair of opposite contact sides;
- a first contact plate disposed in said recess adjacent said base wall so as to be in electrical contacting engagement with one of said opposite contact sides of said PTCR, said first contact plate including a first integral terminal extending therefrom through said aperture exteriorly of said casing with said first integral terminal being mounted to one of said dummy terminal and the other of said exterior portions of the other of said switch means terminals in circuit relation therewith;
- a second contact plate arranged with said casing exteriorly thereof so as to close at least in part said recess and so as to be in electrical contacting engagement with the other of said opposite contact sides of said PTCR, said second contact plate including a second integral terminal exteriorly of said casing and mounted to the other of said

dummy terminal and said other exterior portion of said other switch means terminal in circuit relation therewith, and a plurality of means integral with said second contact plate and extending therefrom exteriorly of said casing across said sidewall into releasable securing engagement with said base wall for maintaining said second contact plate generally against displacement from said casing; and means associated with said first contact plate and said base wall for resiliently urging said first contact plate toward its electrical contacting engagement with said one opposite contact side of said PTCR and said other opposite contact side of said PTCR toward the electrical contacting engagement thereof with said second contact plate.

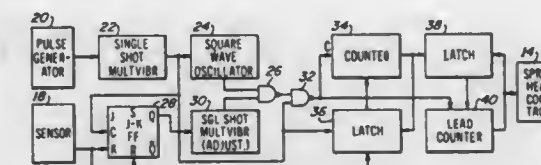
4,164,001

SPEED COMPENSATING CONTROL SYSTEM  
Edmond J. Patnaude, 1240 Lorraine Rd., Apt. 3D, Wheaton, Ill. 60187

Filed Apr. 4, 1978, Ser. No. 893,211  
Int. Cl.<sup>2</sup> H01H 47/00

U.S. Cl. 361-236

5 Claims



1. A system for providing control signals in response to the movement of articles past a sensor, comprising pulse generating means for producing a train of constant width pulses, each pulse being produced in response to a predetermined incremental movement of said articles, oscillator means for producing a predetermined number of high frequency pulses during each constant width pulse sensor means for sensing each of said articles and for producing an initiating signal in response thereto, counter means for producing a control signal when a predetermined number of pulses have been applied thereto following the occurrence of said initiating signal, and means for coupling said high frequency pulses to said counter means only during the occurrence of said constant width pulses for a predetermined period after the occurrence of said initiating signal and for thereafter coupling said constant width pulses to said counter means, whereby the distance through which said articles move between the time they are sensed and the production of the corresponding control signals is proportional to the velocity of said articles.

4,164,002

CONNECTION ASSEMBLY FOR INTERCONNECTING A CIRCUIT BOARD AND A FRAME

Jacques Francois, Vincennes, and Georges Guillaumot, Antony, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 21, 1977, Ser. No. 862,805

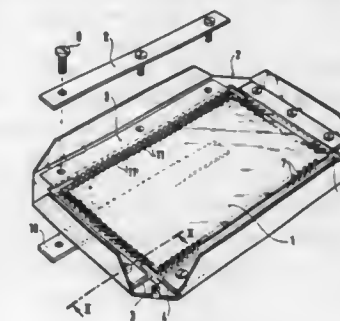
Claims priority, application France, Dec. 28, 1976, 76 39283  
Int. Cl.<sup>2</sup> H05K 1/04

U.S. Cl. 361-399

9 Claims

1. A connection assembly for connecting an electric circuit support board to a surrounding frame, said frame being formed by a plate provided with an inner cut-out for accommodating said board without said board contacting the inside edges of said frame, said connection assembly comprising a plurality of electrically conductive combs, said combs each having teeth disposed between an inside edge of the frame and the facing edge of the board, said frame and board edges and said teeth being coplanar, the teeth of each comb being inclined to the edges of the frame and the board in contact therewith, the

spine of each comb being disposed along an inside margin of the frame, means for fixing the spine of each comb along an



inside margin of said frame, and the ends of the teeth being soldered to the periphery of the board.

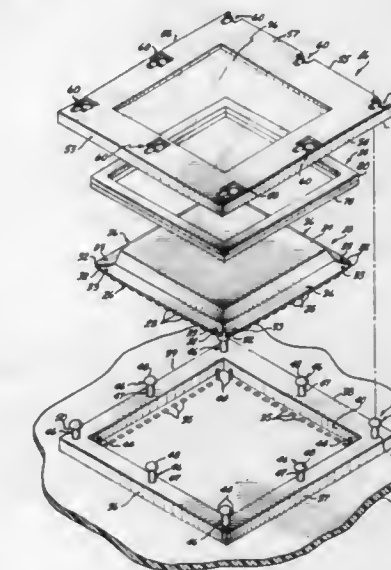
4,164,003

INTEGRATED CIRCUIT PACKAGE AND CONNECTOR THEREFOR

John M. Cutchaw, 7333 E. Virginia, Scottsdale, Ariz. 85257  
Continuation-in-part of Ser. No. 754,365, Dec. 27, 1976, Pat. No. 4,063,791. This application Dec. 20, 1977, Ser. No. 862,582  
Int. Cl.<sup>2</sup> H05K 1/04

U.S. Cl. 361-403

8 Claims



1. A connector for removably mounting an integrated circuit package having laterally extending conductive leads on a backpanel and electrically coupling the conductive leads thereof to the terminal pads provided on the backpanel, said connector comprising:

- (a) a housing for mounting on the backpanel, said housing having endless upstanding side walls which form the perimeter of an open chamber into which the integrated circuit package is nestingly positionable with the conductive leads thereof in aligned engagement with the terminal pads of the backpanel;
- (b) pressure pads means mountable in the open chamber of said housing so as to rest on the conductive leads of the circuit package when that package is positioned in said housing, said pressure pad disposed to extend above the side walls of said housing;
- (c) a plurality of stud means mounted on said housing in substantially evenly spaced increments so as to be upstanding from the side walls thereof in an array which surrounds the open chamber of said housing; and
- (d) a cover positionable above said housing in overlaying



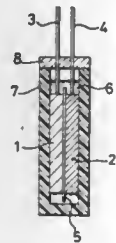
relationship with respect to the sidewalls thereof and in engagement with that portion of said pressure pad means which extends above the side walls of said housing when said pressure pad means is mounted in said housing, said cover being laterally and downwardly movable relative to said housing for exerting a downwardly directed force on said pressure pad means when that pressure pad means is mounted in the open chamber of said housing, said cover having a plurality of apertured inclined plane means formed therein for receiving said stud means when said cover is positioned above said housing and which move into engagement with said stud means upon lateral movement of said cover to cause downward deflection thereof.

**4,164,004**  
**ELECTROCHEMICAL POTENTIAL MEMORY DEVICE USING LIQUID ELECTROLYTE**

Satoshi Salto, Kyoto, Japan, assignor to Japan Storage Battery Company Limited, Kyoto, Japan  
Filed Jul. 1, 1977, Ser. No. 812,302  
Int. Cl.<sup>2</sup> H01G 9/00

U.S. Cl. 361-433

16 Claims



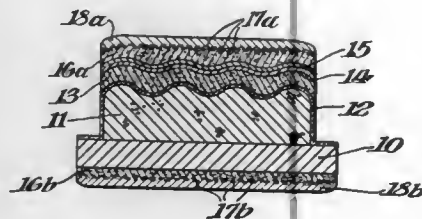
1. An electrochemical potential memory device comprising (a) an electrolyte containing  $Ag^+$  ion and (b) two electrodes spaced apart and disposed within said electrolyte and containing an  $Ag_2Se-Ag_3PO_4$  solid solution.

**4,164,005**  
**SOLID ELECTROLYTE CAPACITOR, SOLDERABLE TERMINATIONS THEREFOR AND METHOD FOR MAKING**

David M. Cheseldine, Bennington, Vt., assignor to Sprague Electric Company, North Adams, Mass.  
Filed Sep. 2, 1977, Ser. No. 830,310  
Int. Cl.<sup>2</sup> H01G 9/00; B01J 17/00

U.S. Cl. 361-433

27 Claims



12. In a solid electrolyte capacitor of the kind having a porous valve metal pad sinter-bonded to one surface of a substrate, which surface is of said valve metal, and including an oxide film grown over said valve metal, a solid electrolyte layer overlying said film, and a layer of graphite covering said solid electrolyte at a region thereof that overlies the surface of said pad remotest from said substrate, the improvement comprising: a conductive resin layer that is rendered conductive by having a matrix of conductive particles dispersed therein, said resin layer overlying said graphite layer, and a layer consisting of distinct solderable particles which is directly bound by and

only partially embedded in the outer surface of said conductive resin layer.

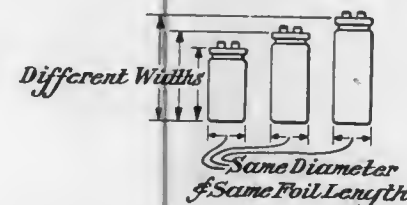
**4,164,006**  
**CAPACITORS WITH MINIMUM ESR**  
James J. Kolkowski, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Division of Ser. No. 752,585, Dec. 20, 1976, Pat. No. 4,107,834.  
This application Mar. 13, 1978, Ser. No. 886,189

Int. Cl.<sup>2</sup> H01G 9/00

U.S. Cl. 361-433

2 Claims



1. A plurality of electrolytic capacitors of a voltage rating and having a minimum ESR at a standard frequency and for the rating and the capacitor capacitance, each capacitor comprising an anode foil, a cathode foil, a spacer positioned between said foils, an electrolyte in contact with said foils and tab electrical connections to the foils, the foils, electrolyte, spacer and tabs being assembled into capacitor bodies and encased in an enclosure, the foils, spacer, tabs and electrolyte of each capacitor body being so constructed and arranged that the respective capacitance of each capacitor is related to a respective foil width and each capacitor having capacitance in accordance with the foil width, and the foil length for said plurality of capacitors is constant, whereby a correlated plurality of capacitors are formed in which plurality there are at least two capacitors having different capacitances, and being of a uniform voltage rating, all of which plurality of capacitors are related to each other in having a constant foil length and a minimum ESR at said standard frequency so that each capacitor is capable of operation at said standard frequency at an ESR which is not appreciably in excess of its lowest ESR at said standard frequency.

**4,164,007**  
**MULTILAMP PHOTOFLASH UNIT**  
Emery G. Audesse, Beverly, Mass., and Donald W. Hartman, Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 7, 1977, Ser. No. 840,497

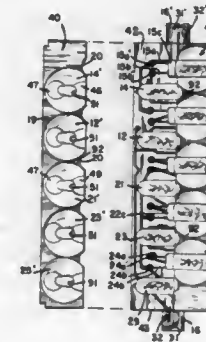
Int. Cl.<sup>2</sup> G03B 15/02

U.S. Cl. 362-13

8 Claims

1. A multilamp photoflash unit of elongated shape comprising in combination: circuit means for connecting firing pulses to the lamps of said unit; two parallel columns of horizontally disposed tubular photoflash lamps arranged in a planar array and having respective bases from which lead-in wires emerge and are connected to said circuit means, the lamps of one column being staggered relative to the lamps of the other column with the bases interdigitated and facing the adjacent column; and a multiple reflector system comprising a pair of adjacent strip-like reflector panels each associated with a respective one of said columns of lamps and having a column of side-by-side lamp-receiving cavities on its front side formed with reflecting surfaces defining individual lamp reflectors which respectively are aligned behind the lamps associated therewith, the individual reflector cavities of one panel being staggered relative to the individual reflector cavities of the

other panel, and each reflector panel being foreshortened with respect to the lamps associated therewith but covering the lead-in wires and substantial portions of the bases of lamps



associated with the adjacent reflector panel, whereby the lead-in wires and base portions associated with one panel underlie the adjacent panel to be hidden thereby.

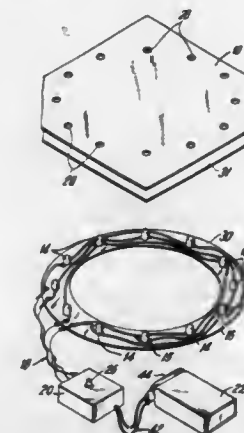
**4,164,008**  
**ILLUMINATED ARTICLE OF CLOTHING**  
Garry E. Miller, Los Angeles, and Michael Dalke, Shaster, both of Calif., assignors to Stanley M. Meyer, Merrick and Barbara Schwartz, Floral Park, both of N.Y., part interest to each

Filed Feb. 24, 1977, Ser. No. 771,750

Int. Cl.<sup>2</sup> F21V 33/00; A47G 33/16; D06C 15/00

U.S. Cl. 362-103

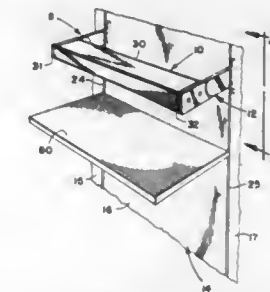
14 Claims



1. An article of clothing comprising:  
(a) a garment material having front and rear surfaces;  
(b) a single thin supple, printed circuit sheet, said printed circuit sheet being a film of insulating material providing mounting pads and electrical interconnections therebetween;  
(c) a plurality of light emitting devices electrically connected directly to said mounting pads and supported by said printed circuit sheet;  
(d) adhesive means integrally coupling said printed circuit sheet to the rear of said garment material with only said light emitting devices protruding through said garment material to the front surface thereof whereby said garment material will retain its flexible characteristics, and  
(e) circuit means separate from and electrically connected to said printed circuit sheet and adapted to interconnect to a source of energy for illuminating said light emitting devices.

**4,164,009**  
**LIGHT FIXTURE**  
Justin M. Maguire, Jr., Cleveland Heights, and Thomas M. Edwards, Broadview Heights, both of Ohio, assignors to Hauserman, Inc., Cleveland, Ohio  
Filed Mar. 30, 1977, Ser. No. 782,991  
Int. Cl.<sup>2</sup> F21V 33/00; F21S 3/02; F21V 21/00  
U.S. Cl. 362-127

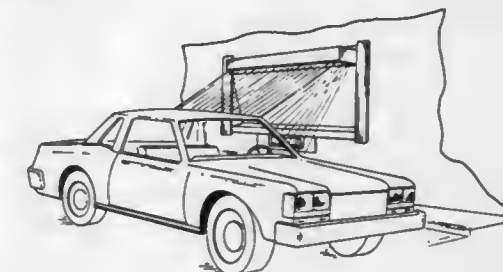
21 Claims



1. In combination, an interior partition including panels having vertical rows of slots therein, a light fixture having an elongated housing, and bracket means at each end of said housing, each said bracket means at each end of said housing including two pivotally connected plates for angular adjustment of said housing, and means releasably to secure each said bracket means to one of said rows of slots whereby said fixture may be supported on said partition at substantially any elevation as determined by the slots of said rows.

**4,164,010**  
**ILLUMINATED BANK WINDOW**  
David H. Finch, 5205 Quail Meadows Dr., Raleigh, N.C. 27609  
Filed Dec. 22, 1977, Ser. No. 863,076  
Int. Cl.<sup>2</sup> F21S 1/02  
U.S. Cl. 362-147

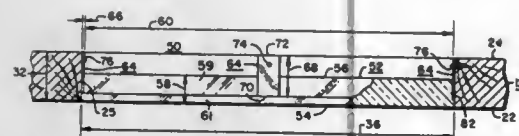
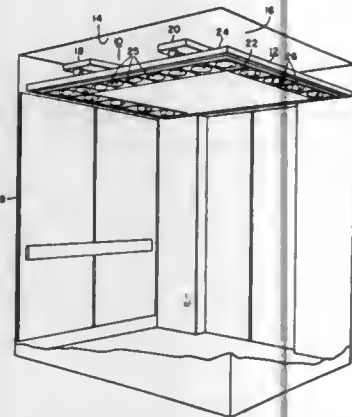
3 Claims



1. In combination with a bank window construction of the type mounted in a building wall and including a frame having an upper horizontal member and a window so mounted in said wall that automobiles may stop therealong and transact business with a teller on the other side of the window, a lighting apparatus comprising:  
(a) a light housing extending generally parallel to said upper horizontal member of said frame and having means associated therewith for mounting the housing adjacent the upper frame member;  
(b) said light housing including opaque front, rear, top and side walls, and a light transmitting bottom wall, an elongated light source mounted in said housing parallel to the front wall and substantially in the forward portion of said housing;  
(c) said light housing further including an elongated reflector means extending substantially the entire length of said housing and positioned above and behind said light source;  
(d) said light transmitting bottom wall being provided with at least a prismatic surface portion;

(e) said light source, reflector, and prismatic surface so arranged with relation to each other that the major portion of the light from said light source, when activated, is directed from said apparatus along an asymmetric path having a forwardly directed vector, while only a minor portion of the light is directed along the path having a rearwardly directed vector.

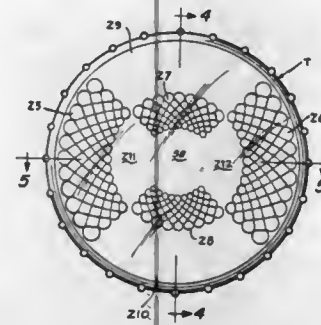
**4,164,011**  
**DECORATIVE DROP CEILING**  
Edward F. Sherwood, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Nov. 11, 1977, Ser. No. 850,564  
Int. Cl.<sup>2</sup> F21V 21/00, 21/04; F21S 1/02, 1/14, 3/02, 3/14; F21V 5/04, 17/00  
U.S. Cl. 362—148



1. A decorative drop ceiling, comprising:
  - a source of light;
  - a panel disposed between said source of light and an area to be illuminated;
  - said panel having a predetermined thickness dimension between first and second surfaces which face said area to be illuminated, and said source of light, respectively;
  - said panel defining at least one opening having a surface which extends between said first and second surfaces, with the opening having a predetermined configuration and dimensions;
  - a light transmissive lens in said at least one opening having first and second surfaces which face said area to be illuminated and said source of light, respectively, with the first surface of said lens being substantially co-planar with the first surface of said panel;
  - said lens having a thickness dimension between its first and second surfaces which is less than the thickness dimension of said panel;
  - the first surface of said lens having substantially the same configuration and dimensions as said opening;
  - the outer periphery of said lens being recessed, starting a predetermined dimension from the first surface of the lens and extending to the second surface, to provide a first outer surface which snugly fits the opening in said panel, and a second outer surface which is spaced from the surface of the opening to provide a predetermined space between the lens and panel;
  - and fastener means in said predetermined space which secure the lens in the opening;
  - said fastener means including light transmissive means hav-

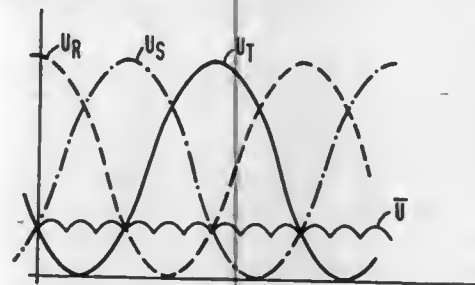
ing a first portion in said predetermined space, and a second portion which extends out of said space, adjacent to the surface of the opening, means joining said first portion to the second outer surface of said lens, and means fixing said second portion to the surface of the opening in the panel.

**4,164,012**  
**LUMINAIRE APPARATUS FOR REFLECTING RADIANT ENERGY AND METHODS OF CONTROLLING CHARACTERISTICS OF REFLECTED RADIANT ENERGY**  
John E. Gulliksen, Shrewsbury, Mass., assignor to Koehler Manufacturing Company, Marlborough, Mass.  
Filed Jun. 17, 1977, Ser. No. 807,372  
Int. Cl.<sup>2</sup> F21V 21/28  
U.S. Cl. 362—282



1. Luminaire apparatus comprising a source of radiant energy, reflector means located in spaced relation to the source of radiant energy, said reflector means presenting a plurality of reflecting surfaces derived from the parabolic, said surfaces having a common focal point and differing focal lengths and being arranged to reflect radiant energy from the said source in substantially parallel rays, radiation transmitting means supported in the paths of travel of the substantially parallel rays and having a plurality of radiation control zones the planar projections of which are related in size and shape to the planar projections of paraboloidal reflecting surfaces for selectively controlling characteristics of the rays of radiant energy transmitted therethrough, and said reflector means and radiant energy transmitting means being mounted for rotary displacement of one relative to the other.

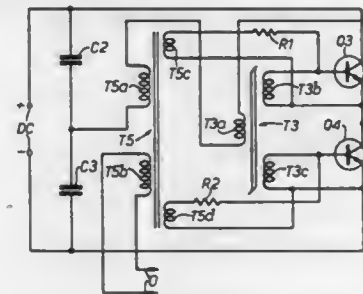
**4,164,013**  
**SIX-PULSE RECTIFIER CIRCUIT**  
Wolfgang Kaufhold, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Filed Dec. 15, 1977, Ser. No. 860,967  
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659564  
Int. Cl.<sup>2</sup> H02M 1/12  
U.S. Cl. 363—45



1. In a six pulse rectifier circuit, having a rectifier bridge with six valves arranged in the secondary circuit of a three

phase transformer and shunted by a load resistor arrangement for sensing the actual voltage value for a fast control device, the improvement comprising the internal resistance of the transformer being increased to the extent that the transformer produces a three phase output in the secondary circuit having wave forms with a trapezoidal shape, and the resistance of the load resistor arrangement matched to the internal resistance of the transformer, such that at least three, but no more than four of the total six valves of the rectifier bridge are always commutating.

**4,164,014**  
**CONVERTER POWER SUPPLY APPARATUS**  
John E. Crowe, and John J. Shanley, both of Bishop's Stortford, England, assignors to Gould Advance Limited, Essex, England  
Filed Jun. 12, 1978, Ser. No. 914,897  
Int. Cl.<sup>2</sup> H02M 7/00, 1/18  
U.S. Cl. 363—49



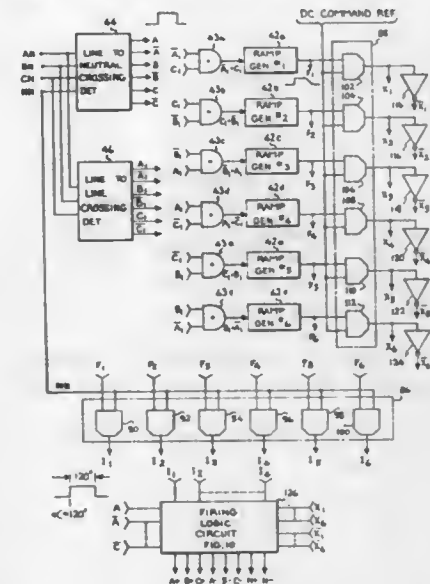
1. In a power supply apparatus including a direct-current source, oscillator circuit means including a feedback transformer having primary and secondary winding means, and a pair of semiconductor switching devices alternately operable to couple said source to a load circuit via said primary winding means, thereby to produce alternating current in said load circuit and in said primary winding means, said secondary winding means being coupled to supply to said switching devices control currents for ensuring a constant relation between said load current and said control currents, and circuit means coupled between said load circuit and said secondary winding means for augmenting said control currents, thereby to assist in commencing oscillation of said oscillator circuit means;
- the improvement wherein said oscillator circuit means further includes pulse generator means for generating a starter pulse for initiating oscillation of said oscillator circuit means.

**4,164,015**  
**CONTROL CIRCUIT FOR POWER CONVERTER**  
Paul M. Espelage, Ballston Lake, N.Y., and Loren H. Walker, Salem, Va., assignors to General Electric Company, Salem, Va.  
Filed Apr. 10, 1978, Ser. No. 895,188  
Int. Cl.<sup>2</sup> H02P 13/24; H02M 7/155  
U.S. Cl. 363—87

1. In a power conversion system for transferring electrical power over a full rectifying and inverting range of operation between a polyphase a.c. source, having a neutral point, and a load by means of a converter having at least one controlled rectifier commonly coupled between each phase leg of the a.c. source and the load and at least one additional controlled rectifier coupled between the neutral point and the load, a firing control circuit responsive to a command signal for rendering each of said controlled rectifiers individually conductive at prescribed firing angles with respect to the phase voltage crossings of said a.c. source for plural operating modes, comprising in combination:
  - (a) first circuit means coupled to and responsive to said a.c. source and generating plural time related logic signals

whose relative time relations are fixed in relation to the phase voltages of the polyphase a.c. source;

- (b) a plurality of waveform generators, equal in number to the phase leg controlled rectifiers, coupled to said first circuit means, being responsive to a predetermined number of said time related fixed logic signals and generating respective firing reference waveforms having periodically repetitive amplitude varying characteristics which vary in a single direction for a period greater than one half cycle of each phase voltage, with successive waveforms having mutually overlapping period portions where the amplitude characteristic varies whereby any of said controlled rectifiers are adapted to be fired in response to two adjacent firing reference waveforms;



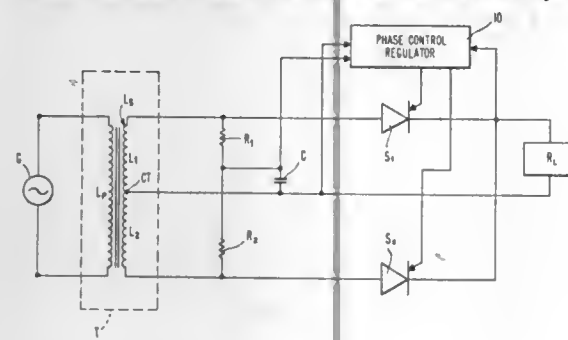
- (c) second circuit means coupled to said plurality of waveform generators and said a.c. source and generating other plural time related logic signals whose relative time relations are fixed in relation to a comparison of said firing reference waveforms with zero voltage;
- (d) third circuit means coupled to said plurality of waveform generators and said command signal and generating plural time related logic signals whose relative time relations are variable in response to a comparison of said firing reference waveforms with said command signal; and
- (e) digital logic circuit means coupled to said circuit means and being responsive to said fixed and time variable logic signals to combine said logic signals in accordance with a predetermined logic control algorithm to generate and apply firing signals to said controlled rectifiers in response to the magnitude of said command signal.

**4,164,016**  
**CURRENT SENSING SYSTEM**  
Walter F. Schuchard, Hingham, Mass., assignor to ESB Incorporated, Philadelphia, Pa.  
Filed Nov. 13, 1978, Ser. No. 960,075  
Int. Cl.<sup>2</sup> H02M 7/155

1. In a system receiving a power signal through a transformer having a center tapped secondary winding and having control means for adjusting the power signal to produce an output having a predetermined output current characteristic, a current sensing system comprising:
  - (a) two resistors connected in series across the secondary winding;
  - (b) a capacitor connected between the common junction of the resistors and the center tapped terminal; and
  - (c) means for detecting the voltage between the common



junction of the impedances and the center tap, said voltage being provided to said control means so that the system



output current is varied until it reaches a predetermined level.

4,164,017

## COMPUTER SYSTEMS

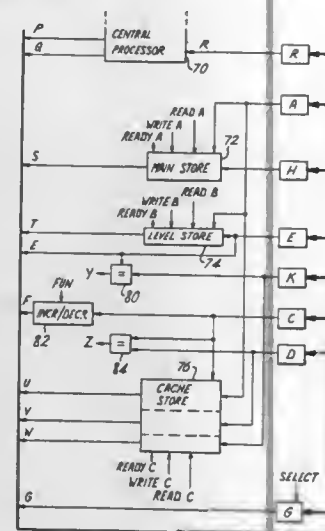
Brian Randell, Newcastle-upon-Tyne; Ronald Kerr, Whitley Bay; Peter M. Melliar-Smith, Heddon Banks; Hugh C. Lauer, Newcastle-upon-Tyne, all of England, and James J. Horning, Willowdale, Canada, assignors to National Research Development Corporation, London, England

Filed Apr. 16, 1975, Ser. No. 568,683

Claims priority, application United Kingdom, Apr. 17, 1974, 16766/74

Int. Cl.<sup>2</sup> G06F 9/20; G06E 9/19; G06F 11/00, 13/00  
U.S. Cl. 364—200

8 Claims



1. Data processing apparatus for use in data processes which utilize a nested set of program blocks, each program block being followed by an acceptance test before entry into a succeeding block or return to an outer enclosing block, said apparatus being operative to preserve the states that have been taken up by each of a plurality of items of information immediately prior to the beginning of each block where said items of information change state during such block so that the states of such items of information prevailing at the beginning of the block can be restored if required, said apparatus comprising:

first memory means for storing the current states of items of information;  
means for storing indicators which distinguish successive program blocks and indicate entry into and exit from a program block;  
second memory means for storing previous states of items of information including storing of indicators of the program blocks in which such states occurred;

means for generating a "pass" signal or a "fail" signal on completion of an acceptance test;

means for restoring the states of the memory means to that pertaining immediately prior to entry into a current program block if a "fail" signal is generated, said restoring means including means for discarding from the first memory means the items of information stored during the current program block, and means for transferring from the second memory means to the first memory means the states stored in the second memory means for the immediately preceding program block of those items of information which are discarded from the first memory means; and

means for progressing the states of the memory means if a "pass" signal is generated, said progressing means including means for discarding from the second memory means at least those items of information local to the immediately preceding program block and those items of information for which entries already exist in second memory means in the immediately preceding program block.

4,164,018

## METHOD AND APPARATUS FOR STEERING A SPACECRAFT AND REGULATING ITS ONBOARD SUPPLY VOLTAGE

Francis Legrand, Le Chesnay, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

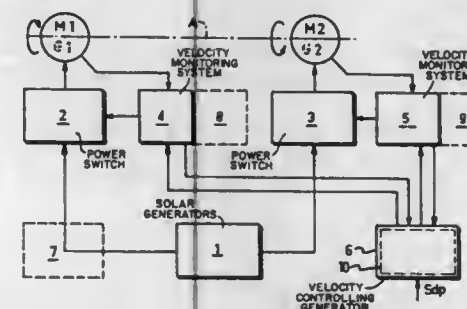
Filed Apr. 14, 1977, Ser. No. 787,653

Claims priority, application France, Apr. 14, 1976, 76 11087; Nov. 12, 1976, 76 34217

Int. Cl.<sup>2</sup> G05D 1/00; G05F 7/00

U.S. Cl. 364—424

7 Claims



1. An inertial device for regulating the on-board voltage of a spacecraft and for steering said spacecraft comprising at least two contra-rotating dynamo-electric machines with alternating magnetic fields and having motor and generator modes of operation,

solar generator means to power said machines,

power switching means connected to said machines to connect said solar generator means to said machines during said motor mode of said machines,

velocity control means also connected to said machines during said motor mode,

said power switching means also connected to said machines to connect an on-board electrical load of the spacecraft to said machines during said generator mode of said machines,

and control means for determining the time of opening of said power switching means.

4,164,019

## PROGRAMMABLE CALCULATOR INCLUDING ALPHANUMERIC DISPLAY MEANS

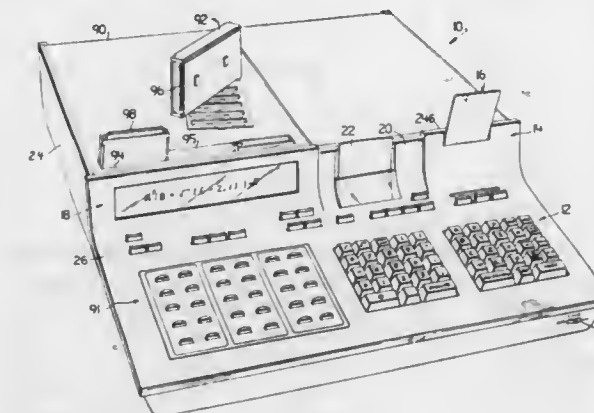
Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,295

Int. Cl.<sup>2</sup> G06F 3/12, 3/14; G06K 15/02, 15/18

U.S. Cl. 364—710

2 Claims



1. An electronic calculator comprising:

keyboard input means having a plurality of keys for entering one or more lines of alphanumeric information, including algebraic expressions and selected commands, into the calculator;

memory means for storing each line of alphanumeric information as it is being entered into the calculator from said keyboard input means and for storing a program comprising a plurality of lines of alphanumeric information entered into the calculator;

processing means, coupled to said keyboard input means and memory means, for selectively processing a single line of alphanumeric information entered into the calculator and a program comprising a plurality of lines of alphanumeric information previously stored in said memory means to perform selected commands and to compute the results of selected algebraic expressions;

display means, coupled to said processing means, for visually displaying alphanumeric information; and

printer means, coupled to said processing means, for printing alphanumeric information;

said memory means including a plurality of data storage registers for storing data entered into the calculator from said keyboard input means;

said keyboard input means being operative for entering a data entry command, including specification of an alphanumeric message and one or more of said data storage registers into which subsequently entered data is to be stored;

said keyboard input means being further operative for entering a print command, including specification of the one or more of said data storage registers specified in said data entry command;

said processing means being responsive to a data entry command and a print command, sequentially encountered during processing of a line of alphanumeric information, for causing said display means to display the alphanumeric message specified in said data entry command, for permitting entry by the user of an amount of data corresponding to the number of data storage registers specified in said data entry command, for storing that entered data in the corresponding data storage registers, and for causing said

printer means to print the contents of the data storage registers specified in said data entry and print commands.

4,164,020

## PROGRAMMABLE SOUND SYNTHESIZER

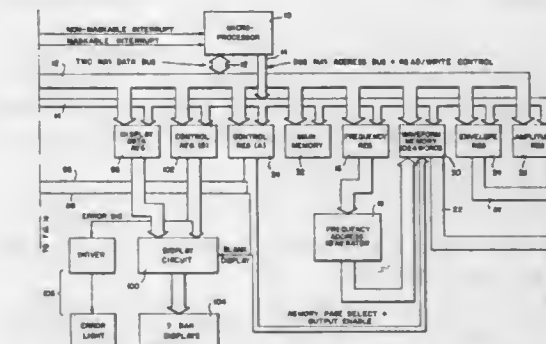
Robert C. Griffith, Encino, Calif., assignor to Dynamic Sciences International, Inc., Woodland Hills, Calif.

Filed Apr. 28, 1978, Ser. No. 900,883

Int. Cl.<sup>2</sup> G06F 1/02

U.S. Cl. 364—718

10 Claims



1. A circuit having an input means for receiving instructions, an output data bus, and output means for generating an audible tone, said circuit for the synthesization of a plurality of audible tones comprising:

a central processor coupled to said input means for transferring and manipulating digital information in a selectively controlled and timed sequence;

a frequency register coupled to said central processor for storing a tone number indicative of one of said plurality of audible tones;

frequency/address generator means for generating a plurality of addresses at a rate in response to said tone number, said frequency/address generator means including digital integrating means for generating an increment in address by integrating said tone number over time and generating said increment when integration of said tone number equals a predetermined magnitude, said frequency/address generator means being coupled to said frequency register;

waveform memory means for storing and writing a plurality of binary numbers indicative of waveform on said output data bus, said frequency address generator means being coupled to said waveform memory means, said waveform memory means writing said plurality of binary numbers in response to said plurality of addresses, said data bus being coupled to said output means, said output means generating one of said plurality of audible tones in response to said plurality of binary numbers coupled thereto, whereby tone frequency is determined by the rate at which said waveform memory means is collectively read and waveshape is determined by the stored contents of said waveform memory means.

4,164,021

## 2M-POINT DISCRETE FOURIER TRANSFORM CALCULATOR COMPRISING A PRE-PROCESSOR FOR TWICE PERFORMING EXTRACTION OF CONJUGATE SYMMETRIC AND/OR ANTISYMMETRIC COMPONENTS

Takao Nishitani, and Rikio Maruta, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1977, Ser. No. 839,537

Claims priority, application Japan, Oct. 6, 1976, 51-120630

Int. Cl.<sup>2</sup> G06F 15/34

U.S. Cl. 364—726

3 Claims

1. A discrete Fourier transform calculator responsive to a sequence of N-point discrete complex input data, where N is



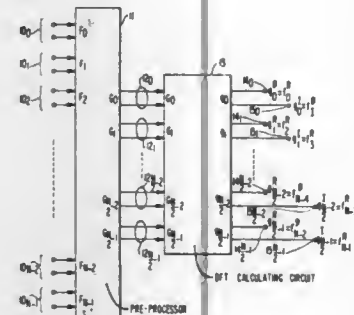
representative of an even number, for producing a prescribed one of a sequence of real parts of  $N$ -point discrete Fourier transforms of said input data, a sequence of imaginary parts of said Fourier transforms, a sequence of real parts of  $N$ -point inverse discrete Fourier transforms of said input data, and a sequence of imaginary parts of said inverse discrete Fourier transforms, said calculator comprising:

a pre-processor responsive to said input data for producing a sequence of  $N/2$ -point complex intermediate data, said pre-processor comprising, in turn:

first means for extracting from said input data a truncated sequence of first conjugate components of one of symmetry and antisymmetry that is selected according as said real parts of said discrete Fourier transforms and said inverse discrete Fourier transforms are to be produced and said imaginary parts of said discrete Fourier transforms and said inverse discrete Fourier transforms are to be produced, respectively;

second means for extracting from said first conjugate components a symmetric sequence of second conjugate components and an antisymmetric sequence of second conjugate components; and

third means for calculating complex products of factors selected according as said real and imaginary parts of said



discrete Fourier transforms and said real and imaginary parts of said inverse discrete Fourier transforms are to be produced and the second conjugate components of one of said symmetric and antisymmetric sequences that is selected according as said real parts of said discrete Fourier transforms and said inverse discrete Fourier transforms are to be produced, respectively, first algebraic sums of said complex products and the respective second conjugate components of the other of said symmetric and antisymmetric sequences, second algebraic sums of said complex products and the respective second conjugate components of said other sequence, and conjugate complex data of said second algebraic sums, said first algebraic sums and said conjugate complex data providing said  $N/2$ -point complex intermediate data; and

an  $N/2$ -point discrete Fourier transform calculating circuit having real output terminals  $N/2$  in number, and imaginary output terminals, also  $N/2$  in number, responsive to said  $N/2$ -point complex intermediate data supplied thereto as  $N/2$ -point complex input data for supplying said real and imaginary output terminals with the transforms of said prescribed sequence.

#### 4,164,022 ELECTRONIC DIGITAL ARCTANGENT COMPUTATIONAL APPARATUS

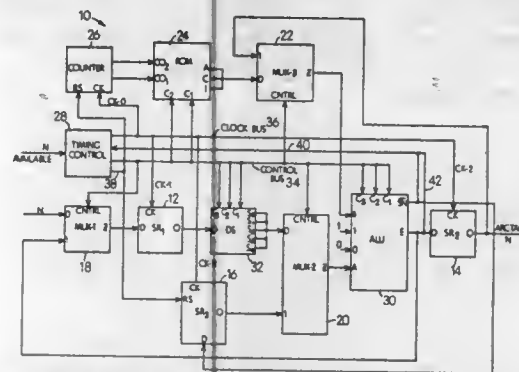
Glen D. Rattlingourd, Salt Lake City, and John W. Zscheile, Jr., Murray, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 5, 1978, Ser. No. 903,278

Int. Cl.<sup>2</sup> G06F 15/34

U.S. Cl. 364-729

5 Claims



1. Electronic digital apparatus for computing an approximation of the arctangent of a given tangent number,  $N$ , being in the range of 0 to 1 and in binary form, comprising:

first electronic digital means storing in binary form (a) a first plurality ( $2^n$ ) of tangent numbers,  $I_1, I_2, I_3, \dots, I_{2^n}$ , each representing one of a plurality ( $2^n$ ) of equal increments in the range of 0 to 1, (b) a second plurality ( $2^n$ ) of tangent numbers,  $C_1, C_2, C_3, \dots, C_{2^n}$ , each representing the center of a corresponding one of said increments, and (c) a third plurality ( $2^n$ ) of numbers,  $A_1, A_2, A_3, \dots, A_{2^n}$ , each representing the arctangent of one of said second plurality of center numbers  $C_k$ , where  $n=1, 2, 3, \dots$ ;

second electronic digital means operable in a first condition for receiving and storing in binary form the number  $N$ ;

third electronic digital means operable in a first condition for receiving the number  $N$  from said second means and for successively receiving said increment number  $I_j$  from said first means and comparing the same with said number  $N$  to determine in which one of said plurality of equal increments said number  $N$  is located;

fourth electronic digital means for receiving the number  $N$  from said second means and successively forming a product number,  $C_k(N)$ , for each center number corresponding to the increment number  $I_j$  being compared to  $N$ ;

fifth electronic digital means operable in a first condition for receiving and storing in binary form the product number  $C_k(N)$ ;

transmission means for transmitting signals among said electronic digital means;

control means progressing through successive states during the computation of said approximation and operable in a first state for conditioning said second and third means to said first conditions and for enabling said transmission means to (a) transmit the number  $N$  from said second means to said third means, (b) simultaneously and successively transmit said increment numbers  $I_j$  from said first means to said third means, (c) transmit the number  $N$  from said second means to said fourth means as each increment number  $I_j$  is compared in said third means, (d) transmit a number  $C_k$  from said first means to said fourth means as each increment number  $I_j$  is compared in said third means and (e) transmit the product number  $C_k(N)$  from said fourth means to said fifth means;

said third means, after said comparison determines in which one of said plurality of equal increments the number  $N$  is located, operable in a second condition for receiving said center number  $C_k$  of the one of said increments in which said number  $N$  is located and for receiving again said

number,  $N$ , to form a dividend number,  $N - C_k$ , from said received numbers;

said control means operable in a second state for conditioning said third means to a second condition and for enabling said transmission means to (a) transmit the center number  $C_k$  of the one of said increments in which said number  $N$  is located from said first to said third means and (b) transmit the number  $N$  from said second to said third means;

said second means operable in a second condition for then receiving said dividend number,  $N - C_k$ , and storing the same in place of the number,  $N$ ;

said third means operable in a third condition for receiving said product number,  $C_k(N)$ , from said fifth means and adding one thereto to form a divisor number,  $1 + C_k(N)$ ; said fifth means operable in a second condition for then receiving said divisor number,  $1 + C_k(N)$ , and storing the same in place of said product number,  $C_k(N)$ ;

said control means operable in a third state for conditioning said second and fifth means to said second condition and said third means to said third condition and for enabling said transmission means to (a) transmit said dividend number from said third means to replace the number  $N$  in said second means, (b) transmit said product number,  $C_k(N)$ , from said fifth means to said third means and (c) transmit the formed divisor number from said third means to said fifth means to replace therein the product number,  $C_k(N)$ ; said third means operable in a fourth condition then for receiving said dividend number,  $N - C_k$ , from said second means and said divisor number,  $1 + C_k(N)$ , from said fifth means to form a quotient number,  $(N - C_k)/(1 + C_k(N))$ , therefrom;

sixth electronic digital means for receiving said quotient number from said third means and storing the same in binary form;

said control means operable in a fourth state for conditioning said third means to said fourth condition and for enabling said transmission means to transmit said quotient number from said third means to said sixth means;

said control means operable in a fifth state for conditioning said third means to a fifth state and for enabling said transmission means to (a) transmit a number,  $A_k$ , from said first means to said third means and (b) transmit said quotient number from said sixth means to said third means;

said third means operable in a fifth condition thereafter for receiving the number,  $A_k$ , from said first means which represents the arctangent of said one of said plurality of center numbers,  $C_k$ , used in forming the quotient number and for receiving said quotient number from said sixth means to form the sum thereof,  $A_k + (N - C_k)/(1 + C_k(N))$ , which approximately equals the arctangent of the known tangent number,  $N$ .

4,164,023

#### PERMUTATION MEMORIES

Harper J. Whitehouse, and Jeffrey M. Spelser, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C. Division of Ser. No. 747,148, Dec. 3, 1976. This application Sep. 22, 1977, Ser. No. 835,765

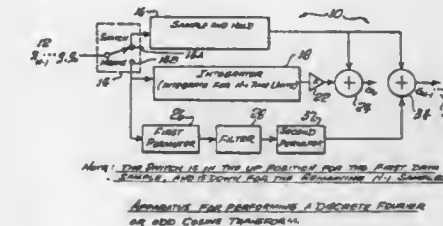
Int. Cl.<sup>2</sup> G11C 11/40; G06G 7/19

U.S. Cl. 364-862

9 Claims

1. A permutation memory comprising: an input control means for decoding, having a plurality  $L$  of inputs for an  $L$ -bit binary number,  $B_1, B_2, \dots, B_L$ , and a plurality  $2^L$  of outputs; means, connected to the decoding means, for initiating the read-in of the  $L$ -bit number; means for applying an input signal, a first plurality  $2^L$  of switching means, connected to the  $2^L$  outputs of the decoding means and to the signal applying means, each of the switching means being in a normally open condition; a plurality  $2^L$  of means, connected to the switching means,

for storing a charge when a specific switching means, connected to a corresponding charge storing means, is in a closed condition; a second plurality  $2^L$  of switching means, connected to the first plurality of switching means and to the charge storing means;



output control means, connected to the second plurality of switching means, for reading out the states of the  $2^L$  charge-storing means, as to the amount of charge in each; means, connected to the read-out means, for initiating the read-out; means, connected to the second plurality of switching means, for discharging the charge storing means.

4,164,024

#### INFORMATION RETRIEVAL SYSTEM FOR PROVIDING RETRIEVABLE UPDATEABLE DISPLAY OF A PERMANENT MICROFILM RECORD

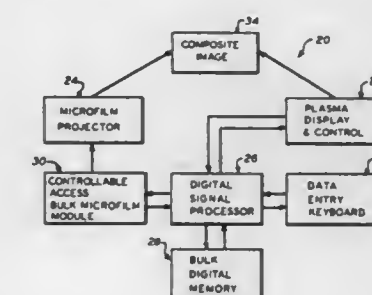
Eli Gilbert, 545 W. End Ave., New York, N.Y. 10024

Filed May 9, 1977, Ser. No. 794,756

Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 364-900

13 Claims



1. An information retrieval system for providing a retrievable updateable display of a permanent microfilm record comprising a gas panel display means capable of providing a composite visual display and having a gas panel portion, said gas panel display means having a front and a rear and a display control means for said gas panel portion thereof; microfilm record projection means capable of retrievably providing a static optical image of a selected permanent microfilm record to the rear of said gas panel display means from a plurality of such permanent microfilm records for selectably providing a projected visual display thereof visible through the front of said gas panel display means; updateable memory means capable of selectably retrievably providing both variable cursor position information and updateable stored information corresponding to selectable portions of said selectable permanent records, said memory means being operatively connected to said display control means, said display control means selectably providing an electronically produced gas panel visual display image on said gas panel display means of said corre-



sponding retrievable updateable stored information provided from said memory means in a variable operation selected position in said display dependent on said provided cursor position information said display control means including means for selectively superimposing said electronically produced gas panel visual display image over any portion of said static optical image; keyboard selection means operatively connected to said memory means for enabling both operator updating of the corresponding stored information content of said selectable portions of said selectable permanent records in said composite visual display and operator retrievable selection of said updated information content; and condition responsive process controller means operatively connected to said update and selection means, to said microfilm record projection means, to said display control means and to said memory means for controllably providing a selected retrievable updated composite visual display in response to a single operator selection of said permanent record on said selection means, said process controller means controllably providing said composite visual display in response to said single operator selection and including means for enabling a projection of said selected retrievable permanent microfilm record static optical image by said microfilm record projection means while substantially simultaneously enabling an electronically produced gas panel superimposable image of said corresponding updated stored information by said gas panel display means with said electronically produced gas panel display image visually supplanting said selectable portions of said selectively retrieved projected permanent microfilm record in said controllably provided composite visual display, whereby any portion of a display of a microfilm record, whether free from or formatted, may be visually altered.

4,164,025

# **SPELLED WORD INPUT DIRECTORY INFORMATION RETRIEVAL SYSTEM WITH INPUT WORD ERROR CORRECTIVE SEARCHING**

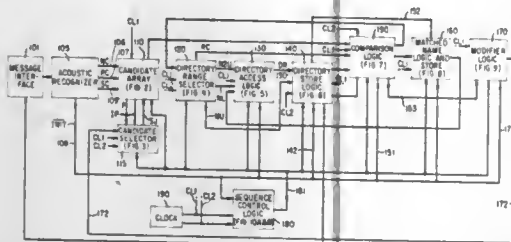
John J. Dubnowski, Bethlehem Township, Hunterdon County, and Aaron E. Rosenberg, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1977, Ser. No. 860,101

Int. Cl.<sup>2</sup> G06F 7/22

U.S. Cl. 364—900

31 Claims



1. A circuit for recognizing a sequence of spelled character signals comprising a directory store for storing a plurality of reference words each having a set of prescribed characters; means for receiving a sequence of spelled character signals; means connected to said receiving means responsive to each received spelled character signal for generating a set of probable characters; means connected to said probable character set generating means for storing a set of probable characters for each spelled character signal in a predetermined position of a position ordered array; means responsive to the storing of the final character signal probable character set of the sequence for generating a candidate word comprising a probable character from each spelled character position of the array; means for storing the generated candidate word; means responsive to the storing of said generated candidate word for generating a first signal; directory store search means responsive to said first signal for determining directory store reference words which correspond to the sequence of spelled character signals com-

prising means responsive to the stored candidate word for selecting a sequence of directory store reference words; means jointly responsive to said selected sequence of directory store reference words and said stored candidate word for comparing the characters of each word of said selected sequence of directory store reference words with the corresponding characters of said stored candidate word in left to right order to detect directory store reference words that match said stored candidate word; means responsive to the nonmatching directory store reference words of said selected sequence for detecting the rightmost first occurring mismatched position of all nonmatching directory store reference words of the selected sequence; means jointly responsive to the absence of matching directory store reference words in the selected sequence and said detected mismatched position of said selected sequence for generating a modified candidate word and for storing said modified candidate word in said candidate word storing means; means responsive to the storing of said modified candidate word for generating a first signal to initiate a succeeding directory store search; and means responsive to the detection of at least one directory store reference word that matches a stored candidate word in a directory store reference word sequence search for identifying the sequence of spelled character signals as said matching directory words.

4,164,026

# **CONTIGUOUS ELEMENT FIELD ACCESS BUBBLE LATTICE FILE**

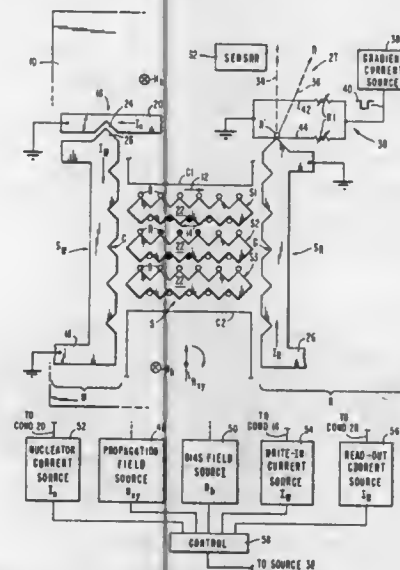
George S. Almasi, Katonah, and Yeong S. Lin, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,195

Int. Cl.<sup>2</sup> G11C 19/08

U.S. Cl. 365—3

28 Claims



8. A magnetic bubble domain lattice device, comprising: a magnetic film in which said bubble domains can be moved, a lattice of interacting bubble domains in said film, a plurality of contiguous element propagation patterns for moving bubble domains in said lattice in response to the reorientation of a magnetic field in the plane of said pattern there being magnetic charged walls magnetically coupled to each of said bubble domains in said lattice during movement of said bubble domains.

# **4,164,027 FAULT TOLERANT BUBBLE MEMORY WITH A SINGLE MAJOR LOOP HAVING AN INTEGRAL STATIONARY REGISTER**

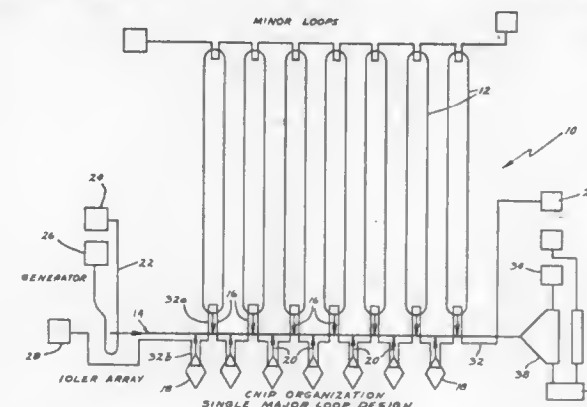
G. Patrick Bonnie, Minneapolis, and William J. McGinnis, Jr., Prior Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 7, 1978, Ser. No. 894,444

Int. Cl.<sup>2</sup> G11C 19/08

U.S. Cl. 365—15

3 Claims



1. A fault tolerant bubble memory device comprising, a field access type bubble memory employing the major loop minor loop configuration having additional redundant minor loops, all minor loops being associated with a major loop,

said major loop having a bubble access location for a magnetic bubble associated with each minor loop and at least one additional bubble access location between each of the access locations associated with minor loops,

a plurality of bubble idlers forming in combination with a propagation path portion of the major loop a stationary register having a position displaced relationship to the bubble access location of the associated minor loops, said stationary register being formed in part from a serial propagation track portion of said major loop whereby bubble elements move from one location to another in the presence of a rotating in-plane magnetic field and said bubble idlers being placed in an array form parallel and adjacent to said propagation track portion of said major loop, each idler being associated with one of said additional bubble access locations, and

electrical conductor means for activating a transfer of magnetic bubbles between major loop locations and minor loop locations and between major loop locations and bubble idler locations, said electrical conductor means generally following the path of said propagation track portion of said major loop and having associated with each idler element a current loop of said conductor means such that pulses of current in said conductor means may control transfer of bubbles into and out of said propagation track portion of said major loop.

4,164,028

# **CURRENT ACCESS BUBBLE MEMORY SYSTEM**

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,196

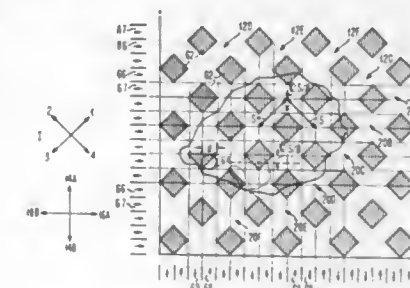
Int. Cl.<sup>2</sup> G11C 19/08

U.S. Cl. 365—20

27 Claims

1. A combination suitable for the propagation of bubbles in a bubble supporting material comprising  
a first array of regularly spaced parallel conductors connected in parallel to a first current source,  
a second array of regularly spaced parallel conductors being oriented substantially orthogonal to said conductors in said first array to form a region of intersections between

said first array conductors and said second array conductors and connected in parallel to a second current source, a plurality of first parallel channels in the bubble supporting material in said region adapted for the movement of bubbles therein, said first channels positioned at an angle of  $+45^\circ$  to said conductors in said first array to define a first propagation axis, and



a plurality of second parallel channels in the bubble supporting material in said region adapted for the movement of bubbles therein, said second channels positioned at an angle of  $-45^\circ$  to said conductors in said first array to define a second propagation axis orthogonal to said first propagation axis.

4,164,029

# **APPARATUS FOR HIGH DENSITY BUBBLE STORAGE**

George E. Keefe, Montrose, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

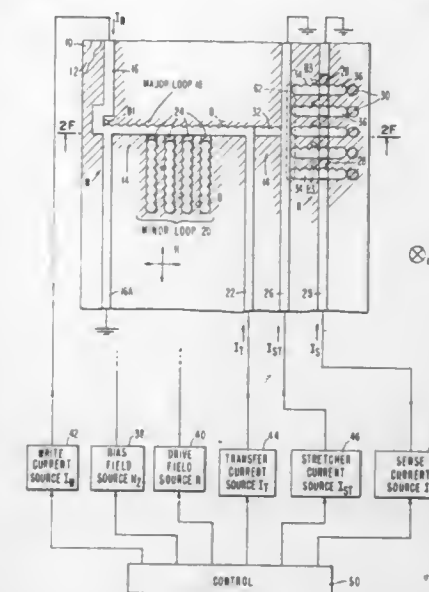
Continuation of Ser. No. 645,975, Dec. 31, 1975, abandoned.

This application Oct. 5, 1977, Ser. No. 839,720

Int. Cl.<sup>2</sup> G11C 19/08

U.S. Cl. 365—36

29 Claims



1. A magnetic bubble domain device for storing information represented by bubble domains in a magnetic medium, comprising:

a first shift register along which bubble domains propagate in response to a reorienting magnetic field in the plane of said magnetic medium,

at least one storage shift register separated from said first shift register for storing information represented by said bubble domains,

said first shift register and said at least one storage shift register being comprised of ion implanted regions of said magnetic medium along which said bubble domains prop-

agate in response to the reorientation of said magnetic field,  
transfer means for transferring said information between said first shift register and said at least one storage shift register, said transfer means including:  
a magnetic bridge which is comprised of a magnetically soft material bridging the separation between said first shift register and said at least one storage shift register, and an electrical conductor whose edges are substantially aligned with the edges of said ion implanted regions comprising said first shift register and which overlies non ion implanted regions of said magnetic medium, said electrical conductor being disposed along the length of said first shift register,  
wherein at least a portion of said magnetic medium in the area of separation between said first shift register and said storage shift register is ion implanted,  
write means for producing bubble domains for representation of said information,  
read means for reading said information.

4,164,030

## FILM CRYOTRON

Mikhail J. Kupriyanov, ulitsa Khlobystova, 10, korpus 2, kv. 30; Gennady M. Lapir, korpus 851, kv. 69; Konstantin K. Likharev, Leninsky prospekt, 93, kv. 200; Vasily K. Semenov, korpus 337, kv. 4, and Petr E. Kandyba, korpus 438, kv. 11, all of Moscow, U.S.S.R.

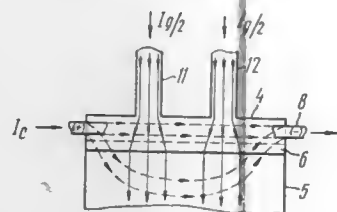
Filed Aug. 29, 1977, Ser. No. 828,766

Claims priority, application U.S.S.R., Sep. 9, 1976, 2392651; Apr. 18, 1977, 2468099

Int. Cl.<sup>2</sup> G11C 11/44

U.S. Cl. 365-162

4 Claims



1. A film cryotron comprising: a superconductive ground plane; a first superconductive electrode arranged on said ground plane and insulated therefrom; a second superconductive electrode arranged on said ground plane and insulated therefrom; an elongated distributed Josephson junction interconnecting said electrodes; as least the first electrode being shaped as a strip extending along the Josephson junction; a control line extending along the Josephson junction above said first electrode; an input line connected to said second electrode; an input line connected to said first electrode at a portion which is spaced from the points of intersection between said control line and the boundaries of said first electrode and from the ends of said junction by a distance which is greater than the width of said first electrode and the depth of penetration of the magnetic field into said junction, said input line having a width which is less than the width of said first electrode.

4,164,031

## MEMORY SYSTEM

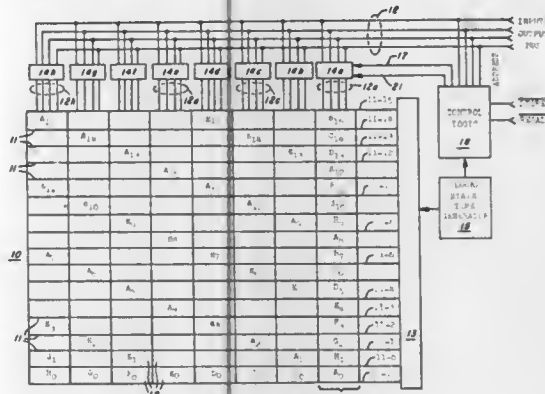
Perry W. Lou, Houston, Tex., and Charles P. Grant, Jr., deceased, late of Dallas, Tex. (by Charles P. Grant, administrator), assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 26, 1976, Ser. No. 745,157

Int. Cl.<sup>2</sup> G11C 11/40, 13/00

U.S. Cl. 365-233

22 Claims



1. A data storage system comprising:
  - (a) an array of memory cells arranged in rows and columns, the cells of each column having a common input/output conductor;
  - (b) first commutator means for successively strobing row conductors of said array for enabling the rows of cells associated with said row conductors to receive and to output data on said common input/output conductors;
  - (c) a bus for transmitting digital data to and from said array; and
  - (d) second commutator means for selectively interconnecting said columns of memory cells with said bus.

4,164,032

## COMPUTER CONTROL OF AN EXHAUST GAS RECIRCULATION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Mishima; Kiyoshi Kobashi, Susono, and Jiro Nakano, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

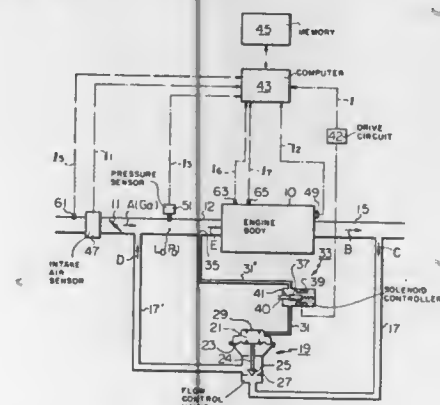
Filed Dec. 7, 1977, Ser. No. 858,533

Claims priority, application Japan, Sep. 27, 1977, 52-115103

Int. Cl.<sup>2</sup> F02M 25/06; G06F 15/46

U.S. Cl. 364-431

9 Claims



1. A method for controlling an exhaust gas recirculation device of an internal combustion engine, which device has a pressure-operated flow control valve located on a recirculation passageway connecting the engine exhaust system with

the engine intake system, and has an electrically-operated actuator means located on a pressure signal conduit connecting valve for controlling the opening of the flow control valve to control the amount of the exhaust gas to be recirculated, said method comprising the steps of:

- (a) initially storing in a memory unit of an electrical computer a set of first values corresponding to the amount of the exhaust gas to be recirculated, each of said first values being predetermined in accordance with a desired amount of exhaust gas to be recirculated when said engine is in a respective operating condition;
  - (b) initially storing in said memory unit at least one set of second values, each set of second values corresponding to temperature correction factors  $K_i$ , where  $0 \leq K_i \leq 1$ , for altering the amount of exhaust gas to be recirculated, each of said second values of each set being predetermined in accordance with a desired temperature correction factor corresponding to the temperature of a respective portion of said engine;
  - (c) generating a first electrical signal indicating a sensed engine condition during the time when said engine is being operated, by using a first sensor means mounted onto said engine;
  - (d) generating at least one second signal indicating a sensed temperature of a said respective portion of said engine during the time when said engine is being operated, by using a second sensor means mounted onto said engine;
  - (e) reading, by said computer, programmed to respond to said first and at least one of said second electrical signals, a first stored value corresponding to the sensed engine condition and at least one second stored value corresponding to the temperature correction factor  $K_i$  for a sensed temperature;
  - (f) calculating, by said computer programmed to respond to said read-out values, a third value corresponding to a desired opening of the pressure-operated flow control valve;
  - (g) forming, by using said calculated value, a third electrical signal which is transmitted to said electrically-operated actuator means for controlling the opening of said flow control valve; and
  - (h) repeating, at a predetermined interval, steps (c) through (g) during the time said engine is in operation.
8. An exhaust gas recirculating device of an internal combustion engine which comprises:

- a recirculation passageway connecting the engine exhaust system with the engine intake system;
- a pressure-operated flow control valve located on the recirculating passageway for controlling the amount of exhaust gas to be recirculated;
- a pressure signal conduit connecting a pressure signal port in the engine intake with the flow control valve;
- an electrically-operated actuator means located in the conduit for controlling the opening of the flow control valve;
- a memory device for storing a set of first values corresponding to the amount of the exhaust gas to be recirculated, said first values being predetermined in accordance with desired amounts of exhaust gas to be recirculated at respective engine operating conditions, and for storing at least one set of second values corresponding to temperature correction factors for the recirculated exhaust gas, each of said second values being predetermined in accordance with a desired temperature correction factor for respective temperatures of a respective portion of the engine;
- a first sensor means for providing, when the engine is operating, a first electrical signal indicating an engine operating condition;
- at least one second sensor means for providing, when the engine is operating, a second electrical signal indicating the temperatures of a respective portion of the engine; and
- a computer unit programmed, in response to the first and second electrical signals, to read a stored first value and at least one second value, to calculate a value corresponding

to opening of the pressure-operated flow control valve from said read-out first and second values, and to form an electrical signal corresponding to said calculated value which is transmitted to the electrically-operated actuator means for controlling the opening of the flow control valve.

4,164,033

## COMPRESSOR SURGE CONTROL WITH AIRFLOW MEASUREMENT

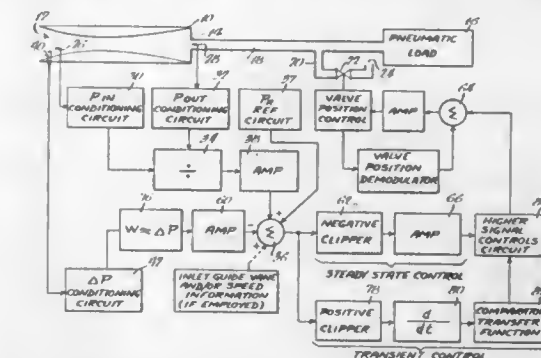
Timothy F. Glennon; Theodore E. Sarphie, and Dennis T. Faulkner, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 14, 1977, Ser. No. 833,031

Int. Cl.<sup>2</sup> F04D 27/02; F02C 9/14

U.S. Cl. 364-431

11 Claims



1. A surge control system for a compressor which provides air to a pneumatic load comprising:
  - means for generating a pressure ratio signal proportional to a ratio of the outlet pressure of the compressor to the inlet pressure of the compressor;
  - means for generating a signal proportional to the weight flow rate of the air through the compressor;
  - means for providing a vent valve command signal if the pressure ratio signal deviates from said weight flow rate signal by a predetermined amount; and
  - a vent valve position control responsive to said vent valve command signal for regulating the position of a valve which controls the flow of the air through the compressor.

4,164,034

## COMPRESSOR SURGE CONTROL WITH PRESSURE RATE OF CHANGE CONTROL

Timothy F. Glennon; Theodore E. Sarphie, and Dennis T. Faulkner, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 14, 1977, Ser. No. 833,032

Int. Cl.<sup>2</sup> F02C 9/14; F04D 27/02

U.S. Cl. 364-431

5 Claims

1. A control system for preventing surge in a compressor which supplies air to a pneumatic load comprising:
  - means for sensing the air pressure at the outlet of the compressor;
  - means for generating a signal proportional to the absolute value of the rate of change of the air pressure;
  - means for generating a first control signal if said signal proportional to the absolute value is greater than a first value;
  - means for generating a second control signal if said signal proportional to the absolute value is less than a second value;
  - means for summing said first control signal with said second control signal; and



1. In a portable electronic device having time keeping and calculating functions the combination comprising: first integrated circuit means having calculating and time keeping function; first control means for accessing said first integrated circuit means; first output means interconnected to said first integrated circuit means for displaying the output of said first integrated circuit means; first memory means having capacity to store information by specific address and cumulate said information; said control means including means for generating a time start and time stop signals; said first integrated circuit means including means for accumulating the time elapsed between the said time start and time stop signals; interconnecting means for conveying the accumulated elapsed time to said first memory means for storing said calculated elapsed time and keyboard means having a plurality of field keys and nu-

merical keys; said field keys including a "time start" key, a "time stop" key and an "account key"; and, said memory means comprises a plurality of addressable memories; said addressable memories adapted upon the actuation of one of said "account key" to add elapsed time to stored time.

4,164,039

# PROGRAMMABLE CALCULATOR INCLUDING A KEY FOR PERFORMING EITHER A SUBTRACTION OR A UNARY MINUS FUNCTION

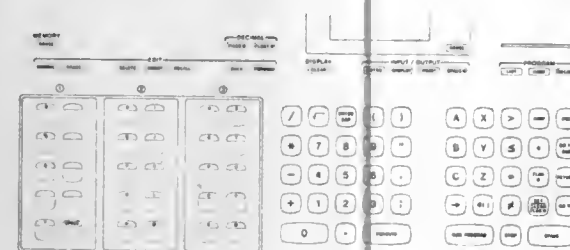
Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,833

Int. Cl.<sup>2</sup> G06F 7/50

U.S. Cl. 364—709

1 Claim



1. An electronic calculator comprising: keyboard input means including a plurality of operand and operator keys for entering a line of at least one algebraic statement into the calculator, one of said plurality of keys being operative for entering a minus arithmetic operator into the calculator; memory means for storing a line of at least one algebraic statement entered into the calculator from said keyboard input means; processing means, coupled to said keyboard input means and memory means, for processing a line of at least one algebraic statement entered into the calculator and stored in said memory means to perform the algebraic operations specified in that line of at least one algebraic statement; and output means, coupled to said processing means, for providing a visual indication of the results of algebraic statements processed by said processing means; said processing means being responsive to the combination of the minus arithmetic operator followed by an operand, encountered during processing of an algebraic statement, for negating that operand, said processing means being further responsive to the combination of a first operand followed by the minus arithmetic operator followed by a second operand, encountered during processing of an algebraic statement, for subtracting the second operand from the first operand.

4,164,040

# CCD STORAGE MODULE

Ernst Götter, Munich, and Otto Gräter, Krailling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,206

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704718

Int. Cl.<sup>2</sup> G11C 11/40

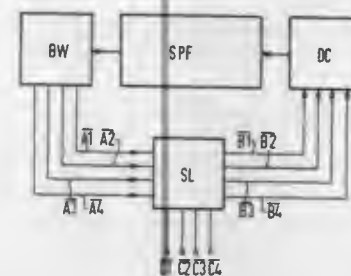
U.S. Cl. 365—183

5 Claims

1. In a charge coupled device storage module of the type

having storage positions which are arranged in cascade and which are produced by electrodes arranged in insulated fashion above a semiconductor substrate, and wherein, in respect of each storage position, an item of information incoming as a n-digit binary number is stored in that a quantity of charge consisting of i unit charges is stored in respect of each storage position, where i corresponds to the value of the binary number of the information, the improvement therein comprising:

- a decoder connected to said module and comprising n input circuits;
- each of said input circuits being assigned one bit position of the information composed of n bits and operable to pro-



- duce a charge corresponding to the digit value of the respective position;
- each of said input circuits including an output;
- an electrode common to all of said outputs of said inputs to form the next storage position of a storage field; and
- a plurality of surrender electrodes, each of said surrender electrodes arranged between a respective output of said input circuits and said common electrode for receiving a respective potential to determine whether or not charge produced by the respective input circuits reaches said common electrode.

4,164,041

# MEMORY ORGANIZATION TO DISTRIBUTE POWER DISSIPATION AND TO ALLOW SINGLE CIRCUIT PACK MEMORY GROWTH

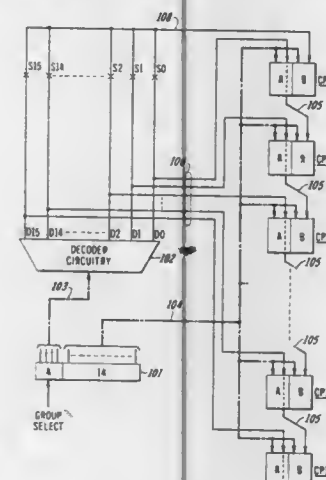
Walter T. Hartwell, St. Charles, Ill.; David L. Hinshaw, Longwood, Fla.; Charles W. Hoffner, II, Naperville, and Wing N. Toy, Glen Ellyn, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 27, 1977, Ser. No. 762,837

Int. Cl.<sup>2</sup> G11C 21/00, 13/00

U.S. Cl. 365—238

9 Claims



1. A word organized random access memory system wherein each word comprises n bits wherein n is an integer greater than 1, the system comprising:

a plurality of word segment organized random access memory modules wherein each word segment comprises n/x bits wherein x is an integer greater than 1 such that n/x is an integer;

a plurality of circuit packs which each contains x individually accessible memory modules and no two memory

modules of a circuit pack contain corresponding word segments; and

linkage means for interconnecting said memory modules to form a plurality of groups wherein each group comprises x memory modules and no two memory modules of a circuit pack are members of the same group of said plurality of groups.



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DESIGN PATENTS

GRANTED AUG. 7, 1979

ERRATA

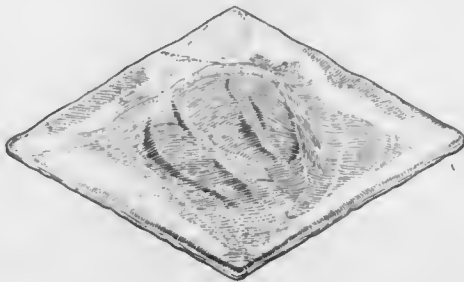
For	See
CLASS	PATENT NO.
D03-036 .....	252,595

# DESIGNS

AUGUST 7, 1979

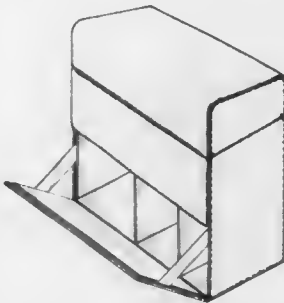
252,536  
**HOLLOW SANDWICH BREAD**  
Alexander Goglanian, and George Goglanian, both of 401 E.  
15th St., Newport Beach, Calif. 92660  
Filed May 19, 1977, Ser. No. 798,501  
Term of patent 14 years  
Int. Cl. D01—99

U.S. Cl. D1—24



252,539  
**CARRYING CASE FOR A CAMERA AND ACCESSORIES**  
Donald R. Cohee, Westlake Village, Calif., assignor to Vivitar  
Corporation, Santa Monica, Calif.  
Filed Jun. 27, 1977, Ser. No. 810,301  
Term of patent 14 years  
Int. Cl. D3—02

U.S. Cl. D3—33



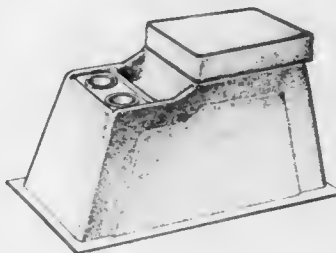
252,537  
**COMBINED APRON AND DETACHABLE TOWEL**  
Marion Stimpel, 109-10 Queens Blvd., Forest Hills, N.Y. 11375  
Filed Jun. 9, 1977, Ser. No. 805,107  
Term of patent 14 years  
Int. Cl. D2—02

U.S. Cl. D2—227



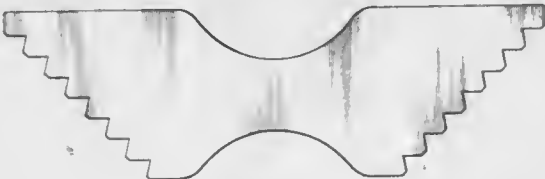
252,540  
**AUTOMOTIVE CONSOLE ICE CHEST AND COOLER**  
Cornelius J. Murphy, South Bend, Ind., assignor to Riblet Prod-  
ucts Corp., Elkhart, Ind.  
Filed Nov. 28, 1977, Ser. No. 855,474  
Term of patent 14 years  
Int. Cl. D12—16

U.S. Cl. D3—40



252,538  
**POM-POM MAKER OR THE LIKE**  
Hughlett Hollyday, Los Angeles, Calif., assignor to Not Sew,  
Ltd.  
Filed Sep. 2, 1977, Ser. No. 830,370  
Term of patent 14 years  
Int. Cl. D03—99

U.S. Cl. D3—26



252,541  
**KEY FOB**  
Margaret L. Harper, 9561 Port Clyde Dr., Huntington Beach,  
Calif. 92646  
Filed Sep. 12, 1977, Ser. No. 832,517  
Term of patent 3½ years  
Int. Cl. D3—01

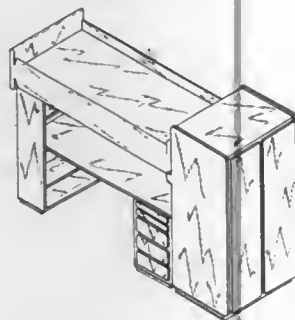
U.S. Cl. D3—65





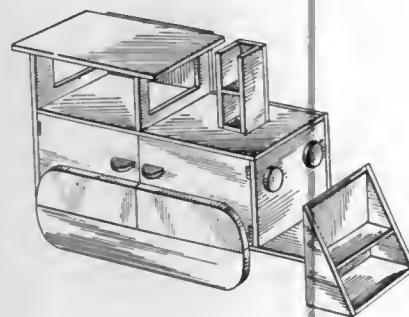
**252,542**  
**COMBINED DESK, LOCKER AND BUNK BED UNIT**  
 Charles M. Lewis, Blue Bell, Pa., assignor to Procurement Management Services, Inc., Bala Cynwyd, Pa.  
 Filed Jul. 15, 1977, Ser. No. 815,979  
 Term of patent 7 years  
 Int. Cl. D6—05

U.S. Cl. D6—4



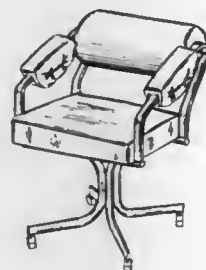
**252,543**  
**STORAGE CABINET OR SIMILAR ARTICLE**  
 Tad Taylor, 31 Byram Shore Rd., Byram, Conn. 06830  
 Filed Jun. 17, 1977, Ser. No. 807,419  
 Term of patent 14 years  
 Int. Cl. D6—04

U.S. Cl. D6—5



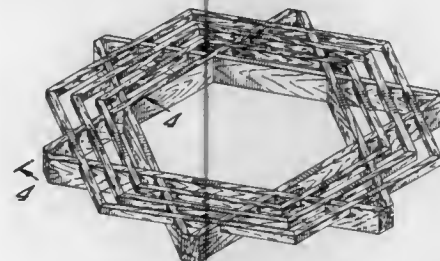
**252,544**  
**CHAIR OR SIMILAR ARTICLE**  
 Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division  
 Filed Aug. 29, 1977, Ser. No. 828,934  
 Term of patent 14 years  
 Int. Cl. D6—01

U.S. Cl. D6—31



**252,545**  
**SEAT FOR A SPA TANK**  
 Melvin B. Palmer, 13900 Jasperson Way, Westminster, Calif. 92683  
 Filed May 16, 1977, Ser. No. 796,872  
 Term of patent 14 years  
 Int. Cl. D6—01

U.S. Cl. D6—58



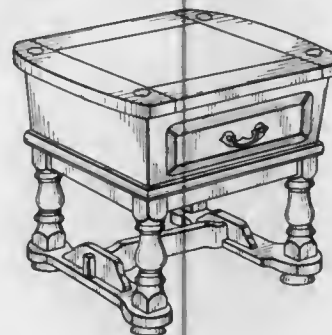
**252,546**  
**CHAIR OR SIMILAR ARTICLE**  
 Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division  
 Filed Sep. 19, 1977, Ser. No. 834,382  
 Term of patent 14 years  
 Int. Cl. D6—01

U.S. Cl. D6—73



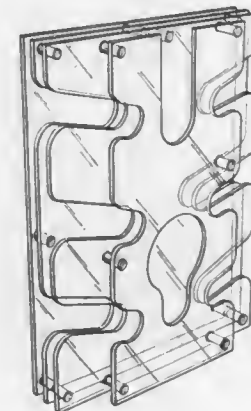
**252,547**  
**TABLE**  
 Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Delphi, Ind.  
 Filed Aug. 11, 1977, Ser. No. 823,813  
 Term of patent 14 years  
 Int. Cl. D6—03

U.S. Cl. D6—153



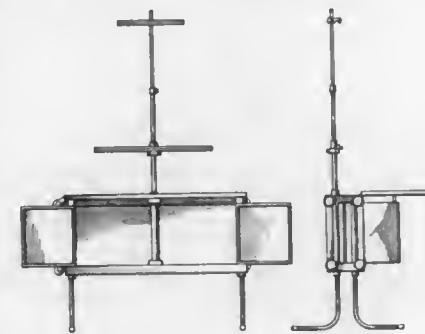
**252,548**  
**FOOD PROCESSOR TOOL HOLDER**  
 Paul R. Hoffman, Toronto, and Hans K. Wallenwein, Thornhill, both of Canada, assignors to Plasti-Fab Co. Ltd., Markham, Canada  
 Filed Dec. 5, 1977, Ser. No. 857,742  
 Claims priority, application Canada, Jun. 10, 1977, 10-06-77-7  
 Term of patent 14 years  
 Int. Cl. D6—04; D7—06

U.S. Cl. D6—157



**252,549**  
**COMBINED EASEL AND SUPPLY CABINET FOR AN ARTIST**  
 Robert K. Lee, 5242 5th St., Fallbrook, Calif. 92028  
 Filed Apr. 28, 1977, Ser. No. 792,064  
 Term of patent 14 years  
 Int. Cl. D6—05, 03

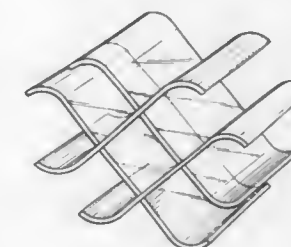
U.S. Cl. D6—179



985 O.G. 10

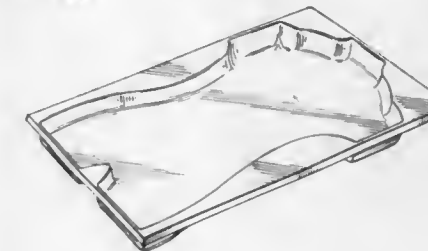
**252,550**  
**WINE RACK**  
 Rodger K. Johnson, 4687 Browndeer La., Rolling Hills Estates, Calif. 90274  
 Filed Jul. 18, 1977, Ser. No. 816,317  
 Term of patent 14 years  
 Int. Cl. D6—04

U.S. Cl. D6—190



**252,551**  
**CAKE PAN**  
 Ethel Keller, 13846 N. 41 Ave., Phoenix, Ariz. 85023  
 Filed Jun. 27, 1977, Ser. No. 810,547  
 Term of patent 14 years  
 Int. Cl. D7—02

U.S. Cl. D7—44

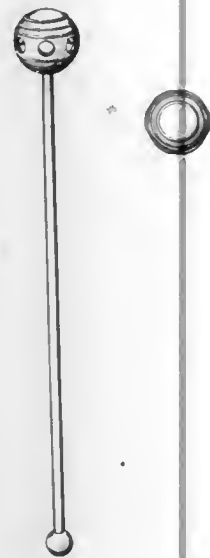


252,552

**DEVICE FOR TURNING LIGHT SWITCH ON AND OFF**  
 Norman B. Stoff, 182-37 Tudor Rd., Jamaica Estates, N.Y. 11432

Filed Apr. 26, 1977, Ser. No. 791,164  
 Term of patent 14 years  
 Int. Cl. D8-05

U.S. Cl. D8-14



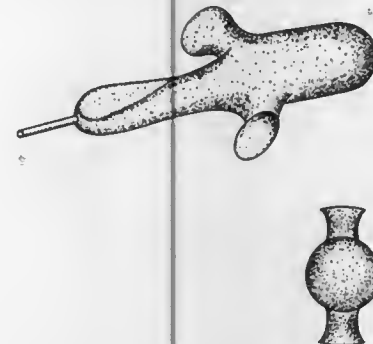
252,554

**TOOL HANDLE**

Robert W. Lancer, 3601 Kirby, Room 740, Houston, Tex. 77098  
 Filed Mar. 28, 1977, Ser. No. 782,305

Term of patent 14 years  
 Int. Cl. D8-04

U.S. Cl. D8-83



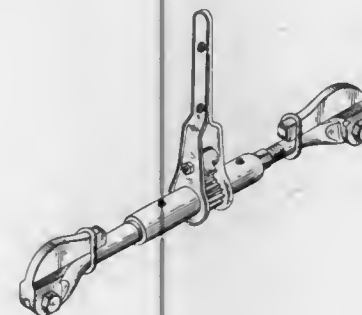
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**TELESCOPIC TURNBUCKLE**

Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Feb. 7, 1978, Ser. No. 875,781  
 Term of patent 14 years  
 Int. Cl. D8-08

U.S. Cl. D8-355



252,553

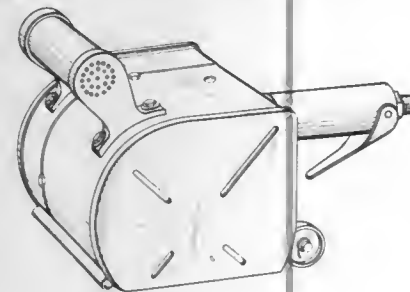
**SURFACE-CLEANING APPARATUS**

Paul Dummermuth, Zuzgen, Switzerland, assignor to Maschinenfabrik Von Arx AG, Sissach, Switzerland  
 Filed Jan. 14, 1977, Ser. No. 759,269

Claims priority, application Switzerland, Oct. 8, 1976, 63854/76

Term of patent 14 years  
 Int. Cl. D8-05; D15-09

U.S. Cl. D8-62



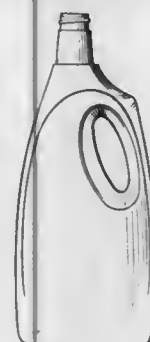
252,556

**BOTTLE**

Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.  
 Filed Apr. 14, 1977, Ser. No. 787,403

Term of patent 14 years  
 Int. Cl. D9-01

U.S. Cl. D9-42



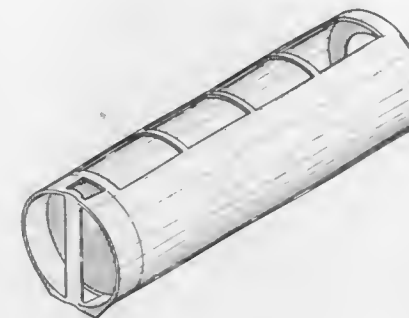
252,557

**TONER CONTAINER**

Marie E. Walker, Columbus, Ohio; John E. Forward, Penfield, N.Y.; Donald A. Robertson, Fairport, N.Y., and Frank Hacknauer, Palmyra, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1977, Ser. No. 821,389  
 Term of patent 14 years  
 Int. Cl. D9-01

U.S. Cl. D9-216



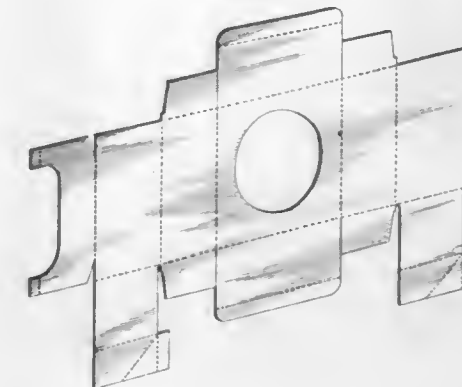
252,559

**CARTON BLANK**

Robert A. Bliss, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 22, 1977, Ser. No. 789,970  
 Term of patent 14 years  
 Int. Cl. D9-03

U.S. Cl. D9-245



252,560

**COMPASS-ROSE SCALE**

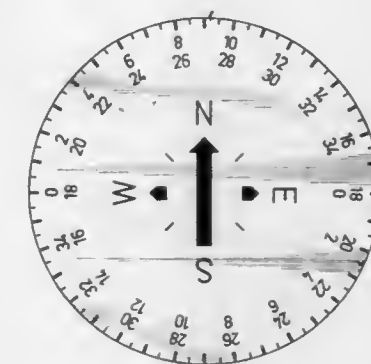
Jonas Lönnroth, Stockholm, Sweden, assignor to Aktiebolaget Instrument Verken, Sollentuna, Sweden

Filed Jun. 23, 1977, Ser. No. 809,275

Claims priority, application Sweden, Dec. 23, 1976, 2549/76

Term of patent 14 years  
 Int. Cl. D10-04

U.S. Cl. D10-74



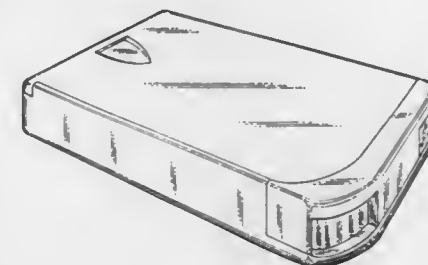
252,558

**CIGARETTE TROCHE HOLDER**

Larry Beck, 7 Elm Ave., Kentfield, Calif. 94904  
 Filed Sep. 9, 1976, Ser. No. 722,301

Term of patent 14 years  
 Int. Cl. D9-03

U.S. Cl. D9-224





252,561

## PENDANT

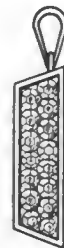
Alfred J. Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,073

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D11-79



252,562

## AMERICAN BEAVER SCULPTURE OR THE LIKE

John P. Van Koert, 190 E. 72nd St., New York, N.Y. 11209

Filed Sep. 23, 1977, Ser. No. 836,000

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-158



252,563

## BEVERAGE SERVING CART

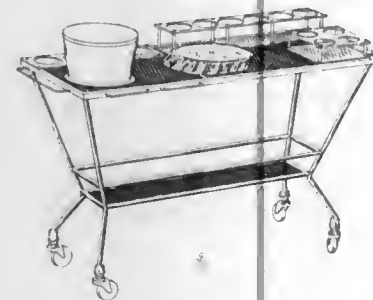
Edmund Vredenburg, Salt Lake City, Utah, assignor to Vredenburg Leisure Time Products, Salt Lake City, Utah

Filed Oct. 27, 1977, Ser. No. 846,274

Term of patent 14 years

Int. Cl. D12-02

U.S. Cl. D12-22



252,564

## WHEEL

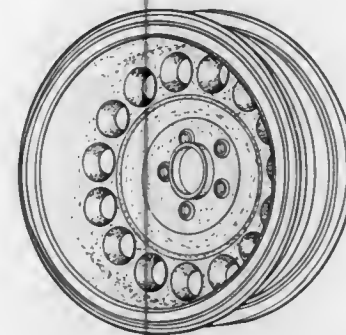
Millard F. Harty, Jr., 4881 Kensington Rd., Bloomfield Hills, Mich. 48013, assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 7, 1977, Ser. No. 840,310

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-210



252,565

## WHEEL

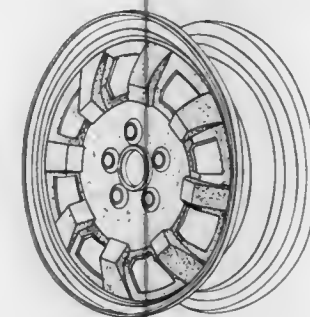
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 7, 1977, Ser. No. 840,306

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-211



252,566

## WHEEL

Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 7, 1977, Ser. No. 840,500

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-211



252,567

## PENDENT HOIST CONTROL

Robert P. Harbage, and Albert L. Leffler, Jr., both of Charlotte, N.C., assignors to Duff Norton Company, Inc., Charlotte, N.C.

Filed Sep. 1, 1977, Ser. No. 829,805

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-38



252,568

## HOUSING FOR ELECTRICAL CIRCUITS

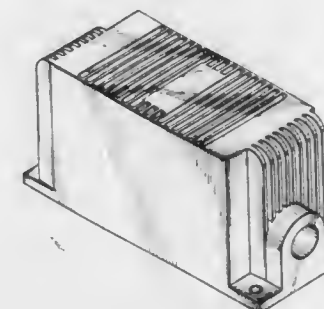
Wilford K. Comstock, 8152 S. Danish Rd., Sandy, Utah 84070

Filed Jun. 22, 1977, Ser. No. 808,882

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-40



252,569

## TELEPHONE STAND

Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 604,592, Aug. 14, 1975, which is a continuation-in-part of Ser. No. 469,855, May 14, 1974, Pat. No.

Des. 237,506, which is a continuation-in-part of Ser. No.

424,413, Dec. 13, 1973, abandoned, which is a

continuation-in-part of Ser. No. 364,704, May 29, 1973,

abandoned. This application Nov. 23, 1977, Ser. No. 854,469

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-60



252,570

## TELEPHONE STAND

Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 604,592, Aug. 14, 1975, which is a continuation-in-part of Ser. No. 469,855, May 14, 1974, Pat. No.

Des. 237,506, which is a continuation-in-part of Ser. No.

424,413, Dec. 13, 1973, abandoned, which is a

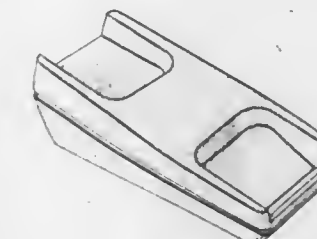
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abandoned. This application Nov. 23, 1977, Ser. No. 854,160

Term of patent 14 years

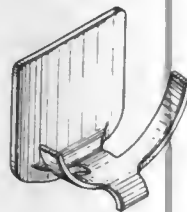
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U.S. Cl. D14-60



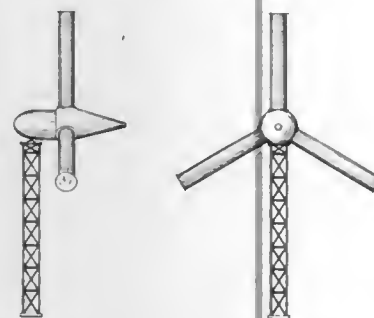
**252,571**  
**HANGER FOR TELEPHONE HANDSET**  
 Ernest T. Hancock, 11034 N. 43rd Dr., Glendale, Ariz. 85304  
 Filed Sep. 26, 1977, Ser. No. 836,592  
 Term of patent 14 years  
 Int. Cl. D14-03

U.S. Cl. D14-65



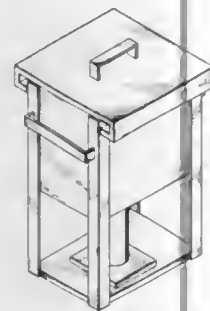
**252,572**  
**WIND TURBINE**  
 Thomas F. Hanson, 24204 Heritage La., Newhall, Calif. 91321  
 Filed Jan. 31, 1977, Ser. No. 764,187  
 Term of patent 14 years  
 Int. Cl. D25-03

U.S. Cl. D15-1



**252,573**  
**COMPACTOR**  
 Kurt H. Weger, Box 3621, Lawrence, Kans. 66044  
 Filed Apr. 4, 1977, Ser. No. 784,862  
 Term of patent 14 years  
 Int. Cl. D23-02; D15-99

U.S. Cl. D15-123



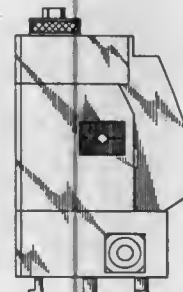
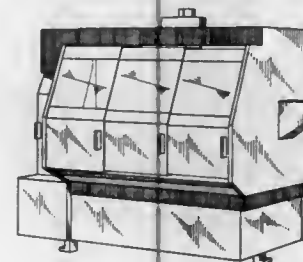
**252,574**  
**WEAR POINT FOR AGRICULTURAL FERTILIZER SHANK**  
 Charles J. Clark, N. 6609 Washington, Spokane, Wash. 99208  
 Filed Feb. 28, 1977, Ser. No. 772,511  
 Term of patent 14 years  
 Int. Cl. D15-03

U.S. Cl. D15-29



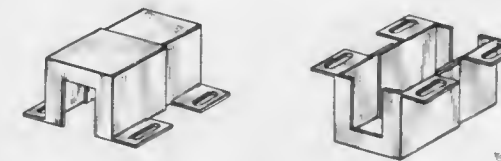
**252,575**  
**AUTOMATIC LATHE**  
 Henry T. Simmons, Warwick, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.  
 Filed Feb. 23, 1977, Ser. No. 771,154  
 Term of patent 14 years  
 Int. Cl. D15-05

U.S. Cl. D15-130



**252,576**  
**TELESCOPING GUARD FOR SHAFT COUPLING**  
 Max Frey, Portland, Oreg., assignor to Crystal Lite Manufacturing Co.  
 Filed Feb. 28, 1977, Ser. No. 772,979  
 Term of patent 14 years  
 Int. Cl. D15-99

U.S. Cl. D15-148



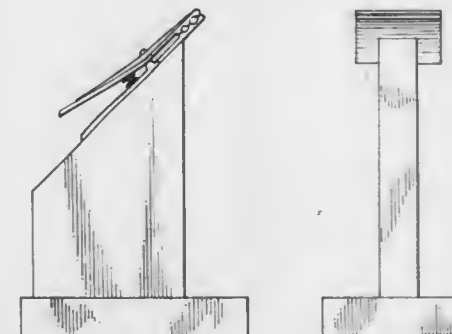
**252,577**  
**PEN**  
 Norbert Leopoldi, 4180 Marine Dr., Chicago, Ill. 60613  
 Filed Dec. 30, 1977, Ser. No. 866,465  
 Term of patent 14 years  
 Int. Cl. D19-06

U.S. Cl. D19-42



**252,578**  
**RECIPE CARD HOLDER OR SIMILAR ARTICLE**  
 William P. Charowhas, 1097 La Cresta Blvd., El Cajon, Calif. 92021  
 Filed Mar. 25, 1977, Ser. No. 781,073  
 Term of patent 14 years  
 Int. Cl. D19-02

U.S. Cl. D19-86



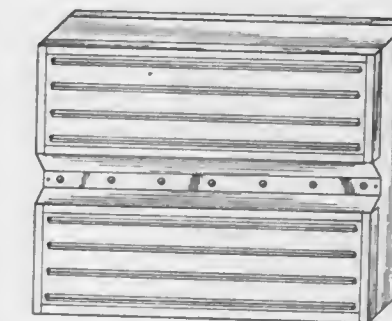
**252,579**  
**ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES**  
 Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211  
 Filed Nov. 15, 1977, Ser. No. 851,807  
 Term of patent 14 years  
 Int. Cl. D20-03

U.S. Cl. D20-10



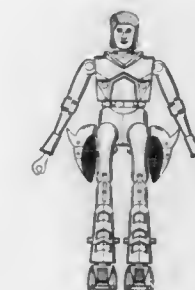
**252,580**  
**ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES**  
 Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211  
 Filed Jan. 10, 1978, Ser. No. 868,468  
 Term of patent 14 years  
 Int. Cl. D20-03

U.S. Cl. D20-10



**252,581**  
**ARTICULATED TOY FIGURE**  
 Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan  
 Filed Feb. 2, 1978, Ser. No. 874,542  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D21-177





252,582  
TENT

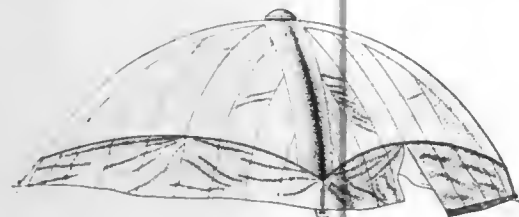
Lloyd H. Rain, Lexington, Ky., assignor to Irvin Industries Inc.,  
Stamford, Conn.

Filed Jun. 17, 1977, Ser. No. 807,700

Term of patent 14 years

Int. Cl. D21—04

U.S. Cl. D21—253



252,583  
FISHING PLUG

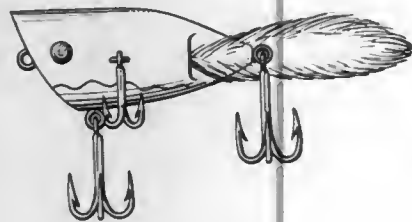
David R. Shelton, 212 Virginia Ave., Crewe, Va. 23930

Filed Aug. 31, 1977, Ser. No. 829,582

Term of patent 14 years

Int. Cl. D22—05

U.S. Cl. D22—27



252,584

TOILET FLUSH HANDLE

Zeev Raz, Keren Hayessod Str.17, Beer Sheva, Israel

Filed Jun. 29, 1977, Ser. No. 810,988

Term of patent 14 years

Int. Cl. D23—07

U.S. Cl. D23—29



252,585

COMBINED BATHTUB AND SHOWER STALL

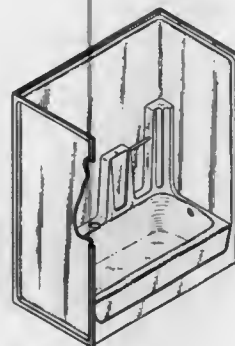
William E. Clow, Los Alamitos, Calif., assignor to Kimstock,  
Inc., Santa Ana, Calif.

Filed Oct. 28, 1977, Ser. No. 846,597

Term of patent 14 years

Int. Cl. D23—02

U.S. Cl. D23—49



252,586

SEROLOGICAL PIPETTE

Thomas L. Kovach, 51 Mimosa Dr., Centerville, Ohio 45459

Filed Jul. 5, 1977, Ser. No. 813,115

Term of patent 14 years

Int. Cl. D24—02

U.S. Cl. D24—55



252,587

GREENHOUSE

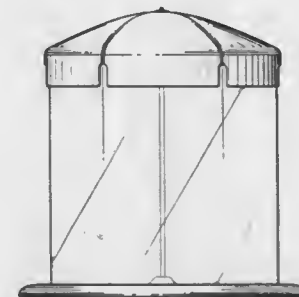
William B. Darwin, Colorado Springs, Colo., assignor to Plant  
Site, Inc.

Filed Oct. 17, 1977, Ser. No. 843,131

Term of patent 14 years

Int. Cl. D25—03

U.S. Cl. D25—15



252,588

AQUARIUM BUILDING

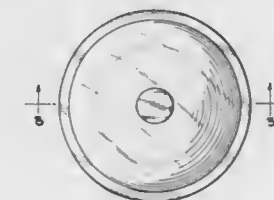
James F. Spinner, 2436 Irving St. SE., Washington, D.C. 20020

Filed Jul. 8, 1977, Ser. No. 813,964

Term of patent 14 years

Int. Cl. D25—03

U.S. Cl. D25—19



252,589

PAVING STONE

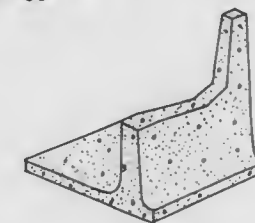
Keith Muller, 73 Bamoral Ave.; Michael Stewart, 79 South Dr.,  
and Stanley Kochen, 789 Queen St. West, all of Toronto,  
Ontario, Canada

Filed Jul. 14, 1977, Ser. No. 815,747

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—80



252,590

COSMETIC CONTAINER

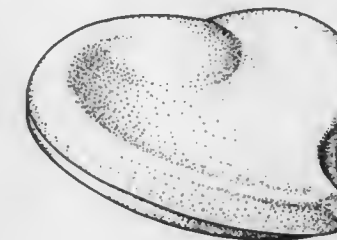
Elsa Peretti, Barcelona, Spain, and Max Factor & Co., legal  
representative, 1655 North McCadden Pl., Hollywood, Calif.  
90028

Filed Jul. 18, 1977, Ser. No. 816,304

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D28—80



252,591

BIRD FEEDER

Donald B. Hyde, Jr., Stow, Mass., assignor to Hyde Bird Feeder  
Company, Waltham, Mass.

Filed Aug. 23, 1978, Ser. No. 936,254

Term of patent 14 years

Int. Cl. D30—03

U.S. Cl. D30—1 A



252,592

PIG WATERER

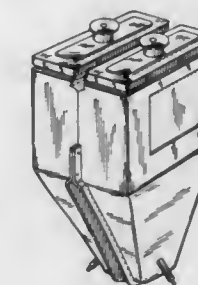
Lyle W. Lage, Gladbrook, Iowa 50635

Filed Sep. 1, 1978, Ser. No. 939,139

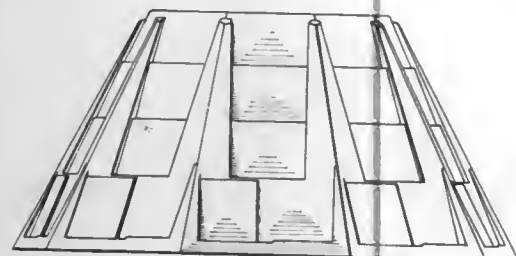
Term of patent 14 years

Int. Cl. D30—03

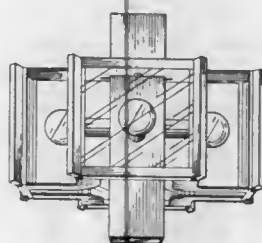
U.S. Cl. D30—15



252,593  
LAMP SHADE  
Paul Hilsdale, 1105 Armada Dr., Pasadena, Calif. 91103  
Filed Apr. 11, 1977, Ser. No. 786,288  
Term of patent 14 years  
Int. Cl. D26—05  
U.S. Cl. D48—16 R



252,594  
LIGHT FIXTURE  
Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605  
Filed Jun. 2, 1977, Ser. No. 802,986  
The portion of the term of this patent subsequent to Oct. 26, 1990, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D26—05  
U.S. Cl. D48—23 R



252,595  
CARRIER FOR A PAIR OF ICE SKATES  
Ronald G. Rogers, 4421 Hazelbrook Ave., Long Beach, Calif. 90808  
Filed Jun. 27, 1977, Ser. No. 810,062  
Term of patent 14 years  
Int. Cl. D21—02  
U.S. Cl. D3—36



## LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. H. Robins Company, Inc.: See—  
Franko, Bernard V.; and Proakis, Anthony G., 4,163,790, Cl. 424-267.000.
- A.P.T., Inc.: See—  
Calvert, Seymour, 4,163,649, Cl. 55-99.000.
- A. Rela s/a Industria e Comercio: See—  
Rella, Hermogenes, 4,163,492, Cl. 206-380.000.
- Abe, Akira, to Sony Corporation. Tape cassette. 4,163,533, Cl. 242-198.000.
- Acampora, Anthony; Reudink, Douglas O.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Method and apparatus for effecting communication with receivers disposed in blackout regions formed by concurrently transmitted overlapping global and spot beams. 4,163,942, Cl. 325-52.000.
- ACF Industries, Incorporated: See—  
Fowler, James M.; and Morrison, Bertram L., 4,163,544, Cl. 251-328.000.
- Hammonds, James C., 4,163,583, Cl. 406-198.000.
- Acme-Cleveland Corporation: See—  
Ramunas, Valdas S., 4,163,514, Cl. 226-141.000.
- Acres, Gary J. K.; and Darling, Alan S., to Johnson, Matthey & Co., Limited. Method of producing platinum-clad articles. 4,163,736, Cl. 252-466.0PT.
- Adams, John H., to Chevron Research Company. Synergistic combinations of hydrated potassium borate, antiwear agents, and organic sulfide antioxidants. 4,163,729, Cl. 252-18.000.
- Adcock, Gerald L. Self aligning impact rock drilling tool. 4,163,478, Cl. 175-92.000.
- AG fur Automatisierung: See—  
Meili, Max, 4,163,345, Cl. 51-33.00W.
- Agency of Industrial Science & Technology: See—  
Ikari, Yoshikatsu; Yokoyama, Shioichiro; and Katoh, Keisuke, 4,163,715, Cl. 210-28.000.
- Ahn, Byung K.: See—  
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.
- Aihara, Shigenobu; Haga, Isao; and Mizumura, Motoo, to Nippon Electric Co., Ltd. Frequency discriminator producing at least one of two pulse sequences representing in average the result of frequency discrimination. 4,163,951, Cl. 331-1.00A.
- Air Industrie: See—  
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- Aisin Seiki Kabushiki Kaisha: See—  
Kagata, Toyota, 4,163,486, Cl. 192-35.000.
- Akaba, Hayao; and Takeuchi, Takuzo, to Hoya Lens Corporation. Drilling machine. 4,163,622, Cl. 408-27.000.
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- Alexandrov, Vladimir A.: See—  
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- Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., 4,163,821, Cl. 428-245.000.
- Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., 4,163,880, Cl. 200-61.58B.
- Van der Mey, John E.; and Kremers, Frank J., 4,163,751, Cl. 260-457.000.
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- Almgren, Bertil: See—  
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- Alumax Mill Products, Inc.: See—  
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- Amerace Corporation: See—  
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- American Cyanamid Company: See—  
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- Fetchin, John A.; and Marzluff, William F., 4,163,735, Cl. 252-443.000.
- Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., 4,163,755, Cl. 260-561.00N.
- Porosoff, Harold, 4,163,770, Cl. 264-210.300.
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- American Flange & Manufacturing Co. Inc.: See—  
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- Analogic Corporation: See—  
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- Anderson, Carl L.: See—  
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- Anderson, Jeannette M.: See—  
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- Andros, Inc.: See—  
Borough, Irvin G., 4,163,899, Cl. 250-343.000.
- Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, to Dr.-Ing. Rudolf Hell GmbH, Firma. Recording electrode assembly for use in electrostatic reproduction. 4,163,980, Cl. 346-155.000.
- Angenieux CLB S.A.: See—  
Lauzier, Rene, 4,163,482, Cl. 188-24.000.
- Anphar, S.A.: See—  
Mauri, Jacinto M.; Vega-Noverola, Armando; and Spickett, Robert G. W., 4,163,789, Cl. 424-267.000.
- Anthony, Thomas R.: See—  
Cline, Harvey E.; Anthony, Thomas R.; and Giaever, Ivar, 4,163,983, Cl. 357-12.000.
- Anton Steinecker Maschinenfabrik GmbH: See—  
Wolfseder, Alfons, 4,163,417, Cl. 99-277.200.
- Aoyama, Tetsuo: See—  
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.
- Arai, Atsuki: See—  
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.
- Archerd, Paul H., to Phillips Petroleum Company. Fractionation process and apparatus. 4,163,695, Cl. 203-18.000.
- Argereu, William. Feed tube bushing. 4,163,403, Cl. 82-38.00A.
- Armor, John N., to Allied Chemical Corporation. Direct oxidation of ketones. 4,163,756, Cl. 260-566.00A.
- Armstrong, Joel D., to AM International, Inc. Pressure roller assembly. 4,163,550, Cl. 271-274.000.
- Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, to Schering Aktiengesellschaft. 1,2,3-Thiadiazole-5-yl-urea derivatives, process for making the same and plant retardation and defoliation composition containing same. 4,163,658, Cl. 71-73.000.
- Arthur G. McKee & Company: See—  
Wong, Wang-Mo, 4,163,696, Cl. 203-44.000.
- Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, to Mitsui-Nisso Corporation. Method of coating glass bottle with aqueous dispersed urethane composition. 4,163,814, Cl. 427-372.00R.



ASEA Aktiebolag: See—  
 Helligren, Keijo E., 4,163,378, Cl. 72-63.000.  
 Atlantic Richfield Company: See—  
 Baillie, Lloyd A., 4,163,711, Cl. 208-161.000.  
 Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,709, Cl. 208-120.000.  
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 Austin, Reginald G., to Westland Aircraft Limited. Unmanned multi-mode helicopter. 4,163,535, Cl. 244-17.230.  
 Auto Systems Limited: See—  
 Brook, Richard M., 4,163,488, Cl. 198-504.000.  
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 Kent, Peter, 4,163,366, Cl. 60-226.00R.  
 Averett, James E., Jr. Hip prosthesis. 4,163,292, Cl. 3-1.913.  
 Awofolu, Duke L. Reading table. 4,163,539, Cl. 248-452.000.  
 Ayer, Donald E., to Upjohn Company, The. 7a-Homo-4-oxo-PGI<sub>1</sub> compounds. 4,163,843, Cl. 542-426.000.  
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 Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, to CGR-MeV. Compact irradiation apparatus using a linear charged-particle accelerator. 4,163,901, Cl. 250-401.000.  
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 Baba, Takashi; Kawaguchi, Hiroshi; and Nishikawa, Kohji, to Toyota Jidosha Kogyo Kaishiki Kaisha. Automatic clearance adjusting mechanism in a brake. 4,163,483, Cl. 188-71.800.  
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 Jabsen, Felix S., 4,163,690, Cl. 176-78.000.  
 Johnsen, Arne A.; and Kakarala, Chandrasekhara R., 4,163,470, Cl. 165-70.000.  
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 Bachmann, Lothar. Device for sealing a conduit against the flow of liquid. 4,163,458, Cl. 137-240.000.  
 Baillie, Lloyd A., to Atlantic Richfield Company. Chemical conversion method. 4,163,711, Cl. 208-161.000.  
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 Barr-Mullin, Inc.: See—  
 Cunningham, John P., 4,163,321, Cl. 33-1.00S.  
 Barratt, Thomas R., to Sundstrand Corporation. Motor protector mount. 4,163,913, Cl. 310-91.000.  
 Barrows, Robert E.: See—  
 Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.  
 Bartel, William J.: See—  
 Cha, Chang Y.; and Bartel, William J., 4,163,475, Cl. 166-251.000.  
 Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of aminonaphthalenesulphonic acids. 4,163,752, Cl. 260-508.000.  
 BASF Wyandotte Corporation: See—  
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 Baslow, Floyd M. Adapter for standard electrical wall fixtures. 4,163,882, Cl. 200-296.000.  
 Basterfield, Ernest P. Flushing cistern. 4,163,293, Cl. 4-3.000.  
 Batchelder, J. Samuel: See—  
 Koslow, Evan E.; and Batchelder, J. Samuel, 4,163,657, Cl. 71-27.000.  
 Battelle Development Corporation: See—  
 Harmer, Alan L., 4,163,397, Cl. 73-800.000.  
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 Bauer, Jackson, to Collins & Aikman Corporation. Process for the sublimation transfer dyeing of textile materials including subsequent conductive heading. 4,163,642, Cl. 8-2.50A.  
 Bauer, Kurt; and Steuer, Werner, to Haarmann & Reimer Gesellschaft mit beschränkter Haftung. Process for preparing aromatic hydroxylaldehydes. 4,163,759, Cl. 260-600.00A.  
 Bayer Aktiengesellschaft: See—  
 Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.  
 Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,163,857, Cl. 548-318.000.  
 Schroeder, Bernd; Braden, Rudolf; Auge, Wolfgang; Thiem, Karl-Werner; and Neff, Rutger, 4,163,747, Cl. 260-378.000.  
 Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.

Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans-Jurgen, 4,163,865, Cl. 568-640.000.  
 BBC Brown, Boveri & Company Limited: See—  
 Fruttschi, Hansulrich, 4,163,365, Cl. 60-39.030.  
 Beatrice Foods Co.: See—  
 Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., 4,163,804, Cl. 426-315.000.  
 Beaufort Air Sea Equipment Limited: See—  
 Neumark, Otto W., 4,163,297, Cl. 5-446.000.  
 Becker, Hans-Joachim: See—  
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 Beckman Instruments, Inc.: See—  
 Corwin, William C., 4,163,738, Cl. 260-29.6ME.  
 Bedard, Victor. Load anchoring systems for flatbed. 4,163,425, Cl. 105-366.00C.  
 Been, Karl, to Oil-Dri Corporation of America. Process for making a synthetic liquid absorbent and products resulting therefrom. 4,163,674, Cl. 106-15.050.  
 Behre, Horst: See—  
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 Bell Telephone Laboratories, Incorporated: See—  
 Acampora, Anthony; Reudink, Douglas O.; and Yeh, Yu S., 4,163,942, Cl. 325-52.000.  
 Di Domenico, Mauro, Jr.; Singh, Shobha; and Van Uiter, Legrand G., 4,163,982, Cl. 357-2.000.  
 Dubnowski, John J.; and Rosenberg, Aaron E., 4,164,025, Cl. 364-900.000.  
 Hartwell, Walter T.; Hinshaw, David L.; Hoffner, Charles W., II; and Toy, Wing N., 4,164,041, Cl. 365-238.000.  
 Beltek Corporation: See—  
 Sugihara, Masanori, 4,163,997, Cl. 360-137.000.  
 Bendix Corporation, The: See—  
 Koenig, James P., 4,163,584, Cl. 303-7.000.  
 Benedek, Eva: See—  
 Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.  
 Benner, Henry F.: See—  
 Almand, John Z., III; Benner, Henry F.; and Reichenacker, William J., 4,163,869, Cl. 174-94.00R.  
 Benscoter, Richard D., to Textron Inc. Transition fitting. 4,163,572, Cl. 285-121.000.  
 Bensussan, Andre: See—  
 Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, 4,163,901, Cl. 250-401.000.  
 Bergwerksverband GmbH: See—  
 Voss, Kurt H., 4,163,582, Cl. 406-12.000.  
 Bernhardt, Floyd V. Golf putter. 4,163,554, Cl. 273-80.00C.  
 Berteau, Gerard R.: See—  
 Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteau, Gerard R., 4,163,740, Cl. 260-31.20N.  
 Bertin, George. Varied track advancement game mechanism. 4,163,556, Cl. 273-86.00H.  
 Beschke, Helmut; and Friedrich, Heinz, to Deutsche Gold- und Silber Scheideanstalt vormals Roessler. Process for the production of 3-methyl pyridine. 4,163,854, Cl. 546-251.000.  
 Betensky, Ellis I., to U.S. Precision Lens, Inc. Projection lens. 4,163,604, Cl. 350-226.000.  
 Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, to Jaeger. Device for checking the level of a liquid in a tank. 4,163,391, Cl. 73-295.000.  
 Bianchi, Edward A.; and Huber, John H., to AMP Incorporated. Point-to-point miniature coax connector. 4,163,598, Cl. 339-107.000.  
 Biermans, Andreas J., to Stamicarbon, B.V. Process for separation of ammonia and carbon dioxide. 4,163,648, Cl. 55-70.000.  
 Bindicator Company: See—  
 Levine, Walter E., 4,163,917, Cl. 310-327.000.  
 Bird, Alfred J.; Priestley, Timothy M.; and Winterbottom, John M., to Johnson, Matthey & Co., Limited. Process for the hydrogenation of a vegetable oil. 4,163,750, Cl. 260-409.000.  
 Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., to Ciba-Geigy Corporation. Process for the production of 2-alkyl- or cycloalkyl-4-methyl-6-hydroxypyrimidines. 4,163,848, Cl. 544-319.000.  
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 Blind, Roger A.; Saterbak, Robert T.; and Wolfe, Edward I., to Exxon Research & Engineering Co. Removal of silica from mixed bed demineralizer. 4,163,717, Cl. 210-31.00R.  
 Blue Cross Laboratories: See—  
 Konigsbacher, Kurt S., 4,163,676, Cl. 106-243.000.  
 BOC Limited: See—  
 Smith, Kenneth C., 4,163,712, Cl. 210-7.000.  
 Bohn, Jack R.: See—  
 Pearson, Durk J.; and Bohn, Jack R., 4,163,580, Cl. 299-5.000.  
 Bonham, David W.: See—  
 Watson, Clifford A.; and Bonham, David W., 4,163,650, Cl. 55-126.000.

Bonnie, G. Patrick; and McGinnis, William J., Jr., to Control Data Corporation. Fault tolerant bubble memory with a single major loop having an integral stationary register. 4,164,027, Cl. 365-15.000.  
 Borona, Russell T.; and Coley, Kenneth R., to Westinghouse Electric Corp. Circuit breaker with thrust transmitting spring. 4,163,881, Cl. 200-153.00G.  
 Botsch, Bertram; and Marzluf, Werner, to Maschinenfabrik Hellmut Geiger. Lifting device for water, waste water, sludge and the like. 4,163,636, Cl. 415-6.000.  
 Boulanger, Henry J., to Texas Instruments Incorporated. Keyboard with illuminated keys. 4,163,883, Cl. 200-314.000.  
 Bouley, Etienne: See—  
 Hoffmann, Charles; and Bouley, Etienne, 4,163,785, Cl. 424-250.000.  
 Bowen, John G.: See—  
 Hauser, Stephen G.; and Bowen, John G., 4,163,895, Cl. 219-290.000.  
 Bowers, Wayne E., to Rolfite Company, The. Suspension of coal in fuel oils. 4,163,644, Cl. 44-51.000.  
 Bozzuto, Carl R.: See—  
 Matthews, Francis T.; and Bozzuto, Carl R., 4,163,910, Cl. 310-11.000.  
 Braden, Rudolf: See—  
 Schroeder, Bernd; Braden, Rudolf; Auge, Wolfgang; Thiem, Karl-Werner; and Neff, Rutger, 4,163,747, Cl. 260-378.000.  
 Breidenbach, James H., to Steelcase Inc. Wiring access system for desks and the like. 4,163,867, Cl. 174-48.000.  
 Brenholts, Alfred R., to Stitt Spark Plug Company. Electrical connector for a spark plug. 4,163,597, Cl. 339-100.000.  
 Breslow, Jeffrey D.: See—  
 Jaworski, Eugene; and Breslow, Jeffrey D., 4,163,558, Cl. 273-115.000.  
 Bretts, Gerald R.: See—  
 Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timman, Dirk A., 4,163,821, Cl. 428-245.000.  
 Brewerton, David, to Racal Instruments Limited. Electrical measurement and noise suppression. 4,163,940, Cl. 324-132.000.  
 Brigham Young University: See—  
 Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,163,769, Cl. 264-42.000.  
 British-American Tobacco Company Limited: See—  
 Green, John D.; and Harris, Ian R., 4,163,452, Cl. 131-10.00A.  
 British Petroleum Company Limited: See—  
 Foster, Alan I.; James, Peter G.; McCarrall, John J.; and Tennison, Stephen R., 4,163,775, Cl. 423-363.000.  
 Brook, Richard M., to Auto Systems Limited. Conveyor systems. 4,163,488, Cl. 198-504.000.  
 Brown, William R. Air charger. 4,163,772, Cl. 422-108.000.  
 Bruckner Apparatebau GmbH: See—  
 Schuierer, Manfred, 4,163,298, Cl. 8-151.000.  
 Brumley, Charles D.; and Staples, John M., to United States of America, Army. Recycle of spent acid in nitrolysis of hexamine to RDx. 4,163,845, Cl. 544-215.000.  
 Bryant, Charles P., to Lubrizol Corporation. The. Hydroxyalkyl hydroxy-aromatic condensation products as lubricant additives. 4,163,730, Cl. 252-34.700.  
 Bschorr, Oskar, to Messerschmitt-Bolkow-Blohm GmbH. Noise absorbing device. 4,163,479, Cl. 181-286.000.  
 Bube, Kenneth R.: See—  
 United States of America, National Aeronautics and Space Administration; and Bube, Kenneth R., 4,163,678, Cl. 136-89.00C.  
 Buckman, John D.; Mercer, Gerald D.; and Pera, John D., to Buckman Laboratories, Inc. Synergistic compositions for corrosion and scale control. 4,163,733, Cl. 252-180.000.  
 Buckman Laboratories, Inc.: See—  
 Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,163,733, Cl. 252-180.000.  
 Bud, Hans. Length measuring devices. 4,163,323, Cl. 33-141.00R.  
 Buhler, Ernst; and Tadini, Costantino, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Pulse generator for electroerosive processing. 4,163,887, Cl. 219-69.00P.  
 Bundy, Gordon L., to Upjohn Company, The. Pyridylamides of nitriloprostacyclins. 4,163,841, Cl. 542-421.000.  
 Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, to Atlantic Richfield Company. Catalyst demetallization by oxidation in a defined temperature range. 4,163,709, Cl. 208-120.000.  
 Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, to Atlantic Richfield Company. Cracking process employing a combination of reductive and oxidative washes. 4,163,710, Cl. 208-120.000.  
 Burk, George A., to Dow Chemical Company, The. Stabilized aqueous amide antimicrobial composition. 4,163,795, Cl. 424-304.000.  
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 Burkhardt, L. Elkin; Fultz, Chester R.; and Maulden, Kerry A., to United States of America, Energy. Method for joining metal by solid-state bonding. 4,163,516, Cl. 228-114.000.  
 Burrough, Irvin G., to Andros, Inc. Method and apparatus for gas analysis. 4,163,899, Cl. 250-343.000.  
 Burridge, Thomas, to U.S. Philips Corporation. Arrangement for examining objects. 4,163,991, Cl. 358-111.000.

Burroughs Corporation: See—  
 Nayland, William R., 4,163,995, Cl. 360-76.000.  
 Butensky, Martin S.: See—  
 Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., 4,163,755, Cl. 260-561.00N.  
 Butler, Albert Q., to Dart Industries Inc. Fatigue resistant fittings and methods of fabrication. 4,163,561, Cl. 277-9.000.  
 Buzzi, Ugo, to Albe S.A. Apparatus for performing a working operation on the tip or point of a ball point pen. 4,163,379, Cl. 72-121.000.  
 B.V. Machinefabriek "Breda" voorheen Backer en Rueb: See—  
 Engelberts, Gerhardus A., 4,163,473, Cl. 165-157.000.  
 Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vasin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R. Method of machining workpieces after preheating. 4,163,402, Cl. 82-1.00C.  
 Cafarelli, Ralph J. Ejection of molded materials. 4,163,540, Cl. 249-67.000.  
 Caldwell, Bessie L.: See—  
 Hinchman, Leslie R.; and Hinchman, Robert B., Sr., 4,163,632, Cl. 417-318.000.  
 California R & D Center: See—  
 Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., 4,163,341, Cl. 46-262.000.  
 Callen, Dennis M.; and Callen, Margo A. Cheese cake. 4,163,806, Cl. 426-582.000.  
 Callen, Margo A.: See—  
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 Capano, David: See—  
 Capano, Philip S.; and Capano, David, 4,163,408, Cl. 84-454.000.  
 Capano, Philip S.; and Capano, David. Musical tuning device. 4,163,408, Cl. 84-454.000.  
 Carlson, David E.; and Wronski, Christopher R., to RCA Corporation. Schottky barrier amorphous silicon solar cell with thin doped region adjacent metal Schottky barrier. 4,163,677, Cl. 136-89.00F.  
 Carney, Richard W. J.; and de Stevens, George, to Ciba-Geigy Corporation. Tertiary aminoacids. 4,163,788, Cl. 424-267.000.  
 Carpenter, Roger C. Live bait insert apparatus. 4,163,336, Cl. 43-37.000.  
 Carrier Corporation: See—  
 Frye, Leonard V.; and Crossman, Robert F., 4,163,372, Cl. 62-259.000.  
 Carthage Cup Company: See—  
 Mannor, Arden, 4,163,508, Cl. 221-310.000.  
 Cassella Aktiengesellschaft: See—  
 Piesch, Steffen, 4,163,835, Cl. 528-254.000.  
 Caterpillar Tractor Co.: See—  
 Engel, William K., 4,163,368, Cl. 60-488.000.  
 Fisher, William F.; and Rosenberger, Paul C., 4,163,400, Cl. 74-710.000.  
 Fox, Lawrence E.; and Shuler, James R., 4,163,589, Cl. 305-14.000.  
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 Hall, Gerald D.; and Swayze, Lloyd D., 4,163,628, Cl. 414-699.000.  
 Johnston, James E., 4,163,398, Cl. 74-483.00K.  
 Kennicutt, Robert B., 4,163,413, Cl. 91-521.000.  
 Nieman, John R.; and Sanders, S. David, 4,163,827, Cl. 428-377.000.  
 Powers, Harold C., 4,163,634, Cl. 417-499.000.  
 Centre Technique des Industries Mecaniques: See—  
 Schepacz, Charles, 4,163,701, Cl. 204-129.750.  
 CGR-MeV: See—  
 Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, 4,163,901, Cl. 250-401.000.  
 Cha, Chang Y.; and Bartel, William J., to Occidental Oil Shale, Inc. Determining the locus of a processing zone in an in situ oil shale retort. 4,163,475, Cl. 166-251.000.  
 Chamberlin, Thomas A.; and Madison, Norman L., to Dow Chemical Company, The. Complexing agents for phenolics. 4,163,718, Cl. 210-54.000.  
 Chambers Corporation: See—  
 Scherer, Richard M., 4,163,344, Cl. 49-386.000.  
 Scherer, Richard M., 4,163,894, Cl. 219-391.000.  
 Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., to NCR Corporation. Compensation circuit for an electrical signal mixer. 4,163,944, Cl. 325-446.000.  
 Champion International Corporation: See—  
 Webber, George, 4,163,518, Cl. 229-8.000.  
 Chemap AG: See—  
 Muller, Hans; and Sotirianos, Konstantin, 4,163,724, Cl. 210-323.00T.



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Wimmer, Adalbert, 4,163,825, Cl. 428-368.000.  
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Kalka, Josef, 4,163,838, Cl. 528-501.000.  
Chen, Tung C. System for reclaiming heat in a furnace arrangement. 4,163,441, Cl. 126-116.00A.  
Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Organic liquids containing anti-static agents which are copolymers of alpha-olefins and maleic anhydrides reacted with amines. 4,163,645, Cl. 44-62.000.  
Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Preparation of magnesium-containing dispersions from magnesium carboxylates at low carboxylate stoichiometry. 4,163,728, Cl. 252-18.000.  
Chernov, Boris P.: See—  
Lapy, Viktor J.; Chernov, Boris P.; Georgizov, Evgeny B.; Koshchev, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.  
Cheseldine, David M., to Sprague Electric Company. Solid electrolyte capacitor, solderable terminations therefor and method for making. 4,164,005, Cl. 361-433.000.  
Cheung, Mo-fung, to Ford Motor Company. Catalyzed polyisocyanate coating compositions. 4,163,815, Cl. 427-385.00R.  
Chevalier, Sammy H.: See—  
Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Bertheleau, Gerard R., 4,163,740, Cl. 260-31.20N.  
Chevron Research Company: See—  
Adams, John H., 4,163,729, Cl. 252-18.000.  
Jacobson, Robert L.; and Gibson, K. R., 4,163,708, Cl. 208-89.000.  
Turner, James H., 4,163,306, Cl. 28-254.000.  
Chezek, Norman A.: See—  
Kappler, Hermann; and Chezek, Norman A., 4,163,517, Cl. 229-45.000.  
Chezem, Jimmie A. Door stop for inward opening door. 4,163,574, Cl. 292-338.000.  
Chiba, Kensuke, to Sharp Rifle Co., Ltd. Apparatus for opening a delivery valve in a gas reservoir chamber of a compressed gas operated gun. 4,163,439, Cl. 124-70.000.  
Chinoin Gyogyszer es Vegyeszeti Termekgyar Rt.: See—  
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.  
Chinoin Pharmaceutical and Chemical Works Ltd.: See—  
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.  
Chiyoda Tsusho K.K.: See—  
Yano, Kazuo, 4,163,573, Cl. 285-174.000.  
Chiyomaru, Isao: See—  
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.  
Chloride Group Limited: See—  
Foster, George W., 4,163,933, Cl. 320-20.000.  
Christe, Karl O.; and Schack, Carl J., to United States of America, Navy. Self-clinkering burning rate modifier for solid propellant NF<sub>3</sub>-F<sub>2</sub> gas generators for chemical HF-DF lasers. 4,163,773, Cl. 423-351.000.  
Christe, Karl O.: See—  
Schack, Carl J.; and Christe, Karl O., 4,163,774, Cl. 423-351.000.  
Ciba-Geigy AG: See—  
Keogh, Patrick J., 4,163,713, Cl. 210-22.00C.  
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.  
Ciba-Geigy Corporation: See—  
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.  
Carney, Richard W. J.; and de Stevens, George, 4,163,788, Cl. 424-267.000.  
Durr, Dieter, 4,163,791, Cl. 424-270.000.  
Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, 4,163,792, Cl. 424-272.000.  
Cincinnati Milacron Inc.: See—  
Matson, Charles B., 4,163,346, Cl. 51-165.770.  
Cincinnati Mine Machinery Co., The: See—  
Krekeler, Claude B., 4,163,581, Cl. 299-91.000.  
Clark, Michael T.; and Ten Haken, Pieter, to Shell Oil Company. Use of certain thiophenecarbaldehyde phenylhydrazones as fungicides. 4,163,793, Cl. 424-275.000.  
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar RT. 3a,16a-14,15-Dihydrocuburnamine. 4,163,851, Cl. 546-51.000.  
Claunch, C. Kenneth, to Finish Engineering Company, Inc. Top-to-bottom mixer. 4,163,616, Cl. 366-262.000.  
Cline, Harvey E.; Anthony, Thomas R.; and Giaevar, Ivar, to General Electric Company. Solid state neuron. 4,163,983, Cl. 357-12.000.  
Clubley, Brian G.: See—  
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.  
Cobe Laboratories, Inc.: See—  
Lobdell, Donn D., 4,163,721, Cl. 210-232.000.  
Cochran, Michael J.; and Grant, Charles P., Jr., deceased (by Grant, Charles P., Sr., executor), to Texas Instruments Incorporated. Elec-

tronic calculator or microprocessor system having combined data and flag bit storage system. 4,164,037, Cl. 364-700.000.  
Cogan, Fredrick T., to Northern Telecom Limited. Telephone handset with transmitter having a one piece gasket for sealing and holding of transmitter members. 4,163,875, Cl. 179-103.000.  
Cogger, Michel: See—  
Taylor, Frank, 4,163,472, Cl. 165-104.00R.  
Coley, Kenneth R.: See—  
Borona, Russell T.; and Coley, Kenneth R., 4,163,881, Cl. 200-153.00G.  
Collins & Aikman Corporation: See—  
Bauer, Jackson, 4,163,642, Cl. 8-2.50A.  
Combustion Engineering, Inc.: See—  
Matthews, Francis T.; and Bozzuto, Carl R., 4,163,910, Cl. 310-11.000.  
Commonwealth Scientific and Industrial Research Organization: See—  
Mamers, Heikki; and Rowney, John E., 4,163,687, Cl. 162-21.000.  
Compagnie Europeenne pour l'Equipeiment Manager "CEPEM": See—  
Gernez, Alain, 4,163,703, Cl. 204-181.00R.  
Compagnie Francaise de Raffinage: See—  
Michaux, Jean-Pierre, 4,163,697, Cl. 203-49.000.  
Compagnie Industrielle des Telecommunications Cit-Alcatel: See—  
Francois, Jacques; and Guillaumot, Georges, 4,164,002, Cl. 361-399.000.  
Connecticut Research Institute, Inc.: See—  
Warren, John B.; and Kundrath, Michael R., 4,163,900, Cl. 250-439.00R.  
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., to Philadelphia Gear Corporation. Surface aerator impeller. 4,163,631, Cl. 416-185.000.  
Consolidated Foods Corporation: See—  
Kosik, John, 4,163,593, Cl. 339-15.000.  
Continental Oil Company: See—  
Kulik, Metro D.; and Gorin, Everett, 4,163,776, Cl. 423-567.000.  
Contraves AG: See—  
Heller, Rudolf; and Schattmaier, Kurt, 4,163,536, Cl. 248-118.000.  
Control Data Corporation: See—  
Bonnie, G. Patrick; and McGinnis, William J., Jr., 4,164,027, Cl. 365-15.000.  
Cook, John E., to Fram Corporation. Air control valve. 4,163,543, Cl. 251-48.000.  
Cooperman, Isadore; and Salkind, Morton. Freeze-thaw indicator apparatus. 4,163,427, Cl. 116-217.000.  
Cordis Corporation: See—  
Lesnick, Alan F.; and Tarjan, Peter P., 4,163,451, Cl. 128-419.0PG.  
Corning Glass Works: See—  
Kurth, Thomas C., 4,163,370, Cl. 65-2.000.  
Olshansky, Robert, 4,163,601, Cl. 350-96.310.  
Corver, Hans A.; and Robertson, Allan J., to American Cyanamid Company. Flame-retardant particleboard. 4,163,820, Cl. 428-212.000.  
Corvin, Thomas E.: See—  
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.  
Corwin, William C., to Beckman Instruments, Inc. Washable non-splatter ink. 4,163,738, Cl. 260-29.6ME.  
Cosentino, Louis C.; Seiler, Louis; and Helms, Richard A., to Renal Systems, Inc. Universal dialyzer end cap. 4,163,722, Cl. 210-236.000.  
Coucher, Robert G., to W. R. Grace & Co. Container coating method. 4,163,812, Cl. 427-183.000.  
County Commercial Cars Limited: See—  
Tapp, Geoffrey E. E., 4,163,566, Cl. 280-91.000.  
Covington, Wayne F.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.  
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 3-Amino-N-[(phosphonoamino)iminomethyl]-6-halopyrazinecarboxamide compounds, compositions and methods of use. 4,163,781, Cl. 424-200.000.  
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-6,7-disubstituted-5-furoyl benzofuran-2-carboxylic acids. 4,163,794, Cl. 424-285.000.  
Cramp, Harvey E.: See—  
Kirk, Bryan W.; Raber, Monte B.; Hatch, Donald J.; and Cramp, Harvey E., 4,163,450, Cl. 128-145.800.  
Crawford, Lynn D., to Hanscom, Genevieve I.; and Genevieve I. Hanscom, Robert M. Magnuson, Lois J. Thomson, Trustees of the Estate of Roy M. Magnus. Centering device for feeding articles to a food slicer. 4,163,406, Cl. 83-424.000.  
Crawford, Wheeler C.: See—  
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,163,761, Cl. 585-431.000.  
Crisman, Thomas L.: See—  
Moore, Stanley R.; Crisman, Thomas L.; and Zivney, Donald R., 4,163,374, Cl. 62-457.000.  
Cromwell, Norman H.: See—  
Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., 4,163,856, Cl. 546-329.000.

Crossman, Robert F.: See—  
Frye, Leonard V.; and Crossman, Robert F., 4,163,372, Cl. 62-259.000.  
Crowe, John E.; and Shanley, John J., to Gould Advance Limited. Converter power supply apparatus. 4,164,014, Cl. 363-49.000.  
Crown Zellerbach Corporation: See—  
Stollberg, Ray H., 4,163,494, Cl. 206-423.000.  
Cunningham, John P., to Barr-Mullin, Inc. Method for sequencing the cutting of elongated stock. 4,163,321, Cl. 33-1.00S.  
Current, Wayne A., to Singer Company, The. Needle storage package. 4,163,493, Cl. 206-380.000.  
Cutchaw, John M. Integrated circuit package and connector therefor. 4,164,003, Cl. 361-403.000.  
Czirmai, Zoltan: See—  
Kecskemethy, Geza; Virag, Gyorgy; Tihanyi, Robert; and Czirmai, Zoltan, 4,163,511, Cl. 222-144.500.  
D/FW Plastics, Inc.: See—  
McKinnon, Robert M., 4,163,503, Cl. 220-18.000.  
Dahm, Manfred: See—  
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.  
Dailing, James L., to Motorola, Inc. Monolithic crystal filter device. 4,163,959, Cl. 333-191.000.  
Daiwa Seiko Inc.: See—  
Egasaki, Takashi; and Kawai, Hiroshi, 4,163,528, Cl. 242-84.21R.  
Dalibor, Horst, to Hoechst Aktiengesellschaft. Copolymer solution consisting of acrylic resin, process for its manufacture and the use thereof in reactive lacquers. 4,163,739, Cl. 260-31.20R.  
Dalibor, Horst, to Hoechst Aktiengesellschaft. Process for the manufacture of soluble copolymers which contain hydroxyl groups and can be crosslinked with organic polyisocyanates. 4,163,836, Cl. 528-366.000.  
Dalibout, Georges: See—  
Limozin, Henri; and Dalibout, Georges, 4,163,587, Cl. 303-22.00R.  
Dalke, Michael: See—  
Miller, Garry E.; and Dalke, Michael, 4,164,008, Cl. 362-103.000.  
Damm, Wendell W.; and Kim, Choong R., to Tektronix, Inc. Isolating differential amplifier. 4,163,950, Cl. 330-252.000.  
Dana Corporation: See—  
Guenther, William D.; and Mazzotti, Philip J., 4,163,438, Cl. 123-190.00A.  
Darling, Alan S.: See—  
Acres, Gary J. K.; and Darling, Alan S., 4,163,736, Cl. 252-466.0PT.  
Dart Industries Inc.: See—  
Butler, Albert Q., 4,163,561, Cl. 277-9.000.  
Data General Corporation: See—  
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.  
Daugherty, Lenn: See—  
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.  
Davidov, Dan: See—  
Shaltiel, David; Davidov, Dan; and Jacob, Isaac, 4,163,666, Cl. 75-177.000.  
Davis, Manfred, to Transcience Industries, Inc. Supervised loop alarm radio transmitter system. 4,163,968, Cl. 340-539.000.  
Davison, Fred E. Electric generating water power device. 4,163,905, Cl. 290-54.000.  
Debourge, Jean-Claude: See—  
Thizy, Andre; and Debourge, Jean-Claude, 4,163,782, Cl. 424-217.000.  
Dechert, Roberta S., to S. C. Johnson & Son, Inc. Furniture polish emulsion. 4,163,673, Cl. 106-11.000.  
Deeds, M. Rinley: See—  
Fleenor, Richard P.; and Deeds, M. Rinley, 4,163,392, Cl. 73-421.00B.  
Deere & Company: See—  
Schnittjer, Bradley J.; and O'Neill, Michael J., 4,163,627, Cl. 414-686.000.  
De Filippis, Giangrazio, to Texas Instruments Incorporated. Pneumatic or hydraulic pressure sensors with several thresholds of response. 4,163,964, Cl. 338-215.000.  
Deindoerfer, Fred H.: See—  
Harte, Richard A.; and Deindoerfer, Fred H., 4,163,779, Cl. 424-1.000.  
Delaney, John H. Combination luggage protector and spotter. 4,163,484, Cl. 190-18.00R.  
Delattre, Jacques; Raynaud, Roland; and Thomas, Claude, to Rhone-Poulenc-Textile. Process for obtaining dimethyl terephthalate from polyester scrap. 4,163,860, Cl. 560-96.000.  
del Castillo, Juan M.: See—  
Rumer, David O., Jr.; Findlay, Donald J.; Neumann, Arthur E.; and del Castillo, Juan M., 4,163,409, Cl. 84-484.000.  
Denes, Jozsef; and Szokolay, Mihaly, to Szamitastechnikai Koordinacios Intezet. Reversible code compressor. 4,163,967, Cl. 340-347.0DD.  
DePaolis, Potito U. Process for preparing an imitation mayonnaise and salad dressing. 4,163,808, Cl. 426-613.000.  
de Stevens, George: See—  
Carney, Richard W. J.; and de Stevens, George, 4,163,788, Cl. 424-267.000.  
Deutsche Gold- und Silber Scheideanstalt vormals Roessler: See—  
Beschke, Helmut; and Friedrich, Heinz, 4,163,854, Cl. 546-251.000.

de Vecchis, Michel: See—  
Hulin, Jean-Pierre; and de Vecchis, Michel, 4,163,641, Cl. 425-461.000.  
Devos, Francis; Leroy, Patrick; and Huchette, Michel, to Roquette Freres. Insoluble enzymatically active particles. 4,163,691, Cl. 435-174.000.  
Diamantides, Nick D. Universal impedance power apparatus. 4,163,962, Cl. 335-222.000.  
Diaz Chemical Corporation: See—  
Pivawer, Philip M., 4,163,753, Cl. 260-544.00D.  
DiCarantonio, Norman L.; and Thiel, Jerome F. Decorative patch. 4,163,817, Cl. 428-33.000.  
Di Domenico, Mauro, Jr.; Singh, Shobha; and Van Uiter, Legrand G., to Bell Telephone Laboratories, Incorporated. Solid state electrical switch employing electrochromic material. 4,163,982, Cl. 357-2.000.  
Diesch, Robert E.; and Strunc, Gerald R., to Pako Corporation. Paper feed control for automatic photographic paper cutter. 4,163,405, Cl. 83-371.000.  
Dietrich, Manfred: See—  
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.  
Dillon, Michael J. Shell reloading machine. 4,163,410, Cl. 86-23.000.  
Dipsol Chemicals Co., Ltd.: See—  
Igarashi, Shuji; Fujisawa, Yoshikazu; and Igarashi, Toshio, 4,163,700, Cl. 204-43.00S.  
Ditges, Gunter: See—  
Windelbandt, Herbert; and Ditges, Gunter, 4,163,363, Cl. 59-27.000.  
Dobson, Robert L., to Goodyear Tire & Rubber Company. The. Self-sealing pneumatic tire. 4,163,467, Cl. 152-347.000.  
Dr.-Ing. Rudolf Hell GmbH, Firma: See—  
Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, 4,163,980, Cl. 346-155.000.  
Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Container for dispensing small objects. 4,163,496, Cl. 206-538.000.  
Doguchi, Nobushige; and Hayashi, Moriyoshi, to Yoshida Kogyo K.K. Ceiling attachment apparatus. 4,163,350, Cl. 52-403.000.  
Dohnalik, Joseph J., to Garden City Envelope Company. Paper chip collecting and compacting apparatus. 4,163,651, Cl. 55-344.000.  
Dolhyj, Serge R.; and Milberger, Ernest C., to Standard Oil Company (Ohio). Preparation of unsaturated acids. 4,163,862, Cl. 562-534.000.  
Dow Chemical Company, The: See—  
Burk, George A., 4,163,795, Cl. 424-304.000.  
Burk, George A., 4,163,796, Cl. 424-304.000.  
Burk, George A.; and Reineke, Charles E., 4,163,797, Cl. 424-304.000.  
Burk, George A.; Wilson, Charles A.; and Reineke, Charles E., 4,163,798, Cl. 424-304.000.  
Chamberlin, Thomas A.; and Madison, Norman L., 4,163,718, Cl. 210-54.000.  
Gessell, Donald E., 4,163,831, Cl. 526-153.000.  
Groninger, Greg D., 4,163,371, Cl. 62-50.000.  
Malhotra, Sudarshan K.; and Ricks, Michael J., 4,163,787, Cl. 424-263.000.  
Rudd, John F., 4,163,762, Cl. 525-67.000.  
Drabek, Jozef: See—  
Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, 4,163,792, Cl. 424-272.000.  
Drader, Clarence H. Plastic bread carrier having folding end walls. 4,163,495, Cl. 206-506.000.  
Dragunovicus, Algirdas J.: See—  
Lenaerts, George V.; and Dragunovicus, Algirdas J., 4,163,874, Cl. 179-100.00R.  
Drouin, Claude, to Les Industries BFG Limitee. Door for pyrolytic range. 4,163,444, Cl. 126-198.000.  
D'Sidocky, Richard M., to Goodyear Tire & Rubber Company. The. Base modified catalysis in the styrenation of diphenylamine. 4,163,757, Cl. 260-570.00R.  
Dubnowski, John J.; and Rosenberg, Aaron E., to Bell Telephone Laboratories, Incorporated. Spelled word input directory information retrieval system with input word error corrective searching. 4,164,025, Cl. 364-900.000.  
Duda, Alex J. Portable golf ball washer. 4,163,299, Cl. 15-21.00A.  
Duke, June T.; and Prem, Dorothy C., to Standard Oil Company, The. Impact-resistant olefinic-nitrile olefinic-ester copolymers prepared in the presence of an olefinic-ester copolymer elastomer. 4,163,766, Cl. 525-230.000.  
Du Pont de Nemours, E. I., and Company: See—  
Baker, Harris M., Jr., 4,163,662, Cl. 71-120.000.  
Blakemore, Colin B., 4,163,384, Cl. 73-29.000.  
MacDonald, Robert D.; Rose, Robert K.; and Papsdorf, John W., 4,163,474, Cl. 165-179.000.  
Mansure, Jacob F., 4,163,742, Cl. 260-42.170.  
Schmidt, Gunter, 4,163,499, Cl. 414-411.000.  
Yates, Richard A., 4,163,692, Cl. 435-254.000.  
Dupuis, Jean M., to Northern Telecom Limited. Contact pin feeding and orienting apparatus. 4,163,487, Cl. 198-383.000.  
Durapipe Limited: See—  
Nash, David D., 4,163,571, Cl. 285-106.000.  
Durr, Dieter, to Ciba-Geigy Corporation. 2-Phenyliminothiazoline compounds. 4,163,791, Cl. 424-270.000.  
Dwinell, Davis B., to American Flange & Manufacturing Co. Inc. Single use pouring spout and combination. 4,163,512, Cl. 222-525.000.  
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- Dymont, John C.: See—  
Springthorpe, Anthony J.; and Dymont, John C., 4,163,953, Cl. 331-94.50H.
- Dynamic Sciences International, Inc.: See—  
Griffith, Robert C., 4,164,020, Cl. 364-718.000.
- Eastman Kodak Company: See—  
Legras, Jean-Pierre; and Marechal, Claude M., 4,163,823, Cl. 428-304.000.
- Smart, David C., 4,163,613, Cl. 354-198.000.
- Eaton, Bradley C.; and Taylor, Thomas M., to Singer Company, The. Electronic output circuit for vacuum cleaners. 4,163,999, Cl. 361-23.000.
- Eckert, Robert D.; Levy, Boris; and Mahoney, John B., to Polaroid Corporation. Novel method for forming silver diffusion transfer image receiving layers. 4,163,816, Cl. 427-401.000.
- Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Toolholder for recessing operations, in particular a boring bar. 4,163,624, Cl. 408-185.000.
- Edwards, John W., to Ginny Bee Harvester Corporation. Crop harvesting apparatus. 4,163,355, Cl. 56-328.00R.
- Edwards, Robert A. Remote indicating solid state compass. 4,163,326, Cl. 33-361.000.
- Edwards, Thomas M.: See—  
Maguire, Justin M., Jr.; and Edwards, Thomas M., 4,164,009, Cl. 362-127.000.
- Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., to Philip Morris Incorporated. Azetidine compounds and process for production. 4,163,856, Cl. 546-329.000.
- Edwards, William B., III: See—  
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- Egasaki, Takashi; and Kawai, Hiroshi, to Daiwa Seiko Inc. Spinning reel. 4,163,528, Cl. 242-84.21R.
- Eibl, Hansjorg; and Nicksch, Alf, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V. Propane-1,3-diol phosphatides and method of preparing the same. 4,163,748, Cl. 260-403.000.
- Eisai Co., Ltd.: See—  
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.
- Ejiri, Hirosaburo: See—  
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- Elast-O-Cor Products & Engineering Limited: See—  
Macierevich, Jack J.; Richters, Johannes J.; and St. John, James E., 4,163,719, Cl. 210-84.000.
- Electroplating Engineers of Japan, Ltd.: See—  
Murata, Yasuyuki, 4,163,704, Cl. 204-206.000.
- Elliott Bay Plywood Machines Co.: See—  
Rock, Vincent M.; and Severinsen, Arne R., 4,163,491, Cl. 198-836.000.
- Elsner, William F., to Owens-Illinois, Inc. Metal end having fluted end curl. 4,163,504, Cl. 220-66.000.
- Elsner, Georg; Heymer, Gero; and Stephan, Hans-Werner, to Hoechst Aktiengesellschaft. Continuous production of organic phosphines. 4,163,760, Cl. 260-606.50P.
- EMI Limited: See—  
Williams, Anthony M., 4,163,526, Cl. 242-54.00R.
- Enemark, Robert B., to American District Telegraph Company. Variable frequency light pulser for smoke detectors. 4,163,969, Cl. 340-630.000.
- Engel, William K., to Caterpillar Tractor Co. Centrifugal replenishing pump for a hydrostatic pump motor system. 4,163,368, Cl. 60-488.000.
- Engelberts, Gerhardus A., to B.V. Machinefabriek "Breda" voorheen Backer en Rueb. Heat exchanger. 4,163,473, Cl. 165-157.000.
- Enger, Phillip F.: See—  
Gutierrez, Manuel; and Enger, Phillip F., 4,163,393, Cl. 73-584.000.
- English, Alan, to Hanna Mining Company. Heat reclaim system. 4,163,469, Cl. 165-35.000.
- Ernyel, Herbert; and Langlois, Etienne, to Societe Lignes Telegraphiques et Telephoniques. Electromechanical filter structure. 4,163,960, Cl. 333-198.000.
- ESB Incorporated: See—  
Schuchard, Walter F., 4,164,016, Cl. 363-88.000.
- Espelage, Paul M.; and Walker, Loren H., to General Electric Company. Control circuit for power converter. 4,164,015, Cl. 363-87.000.
- Etablissements Lachaussee, Societe Anonyme: See—  
Lachaussee, Maurice, 4,163,930, Cl. 318-563.000.
- Ettinger, Donald H., to USM Corporation. Stud welding tool. 4,163,888, Cl. 219-98.000.
- Ex-Cell-O Corporation: See—  
Dwyer, Gregory J.; and Kauffman, Ivan L., 4,163,590, Cl. 308-300R.
- Exxon Research & Engineering Co.: See—  
Blind, Roger A.; Saterbak, Robert T.; and Wolfe, Edward L., 4,163,717, Cl. 210-31.00R.
- Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,163,706, Cl. 204-242.000.
- Oswald, Alexis A., 4,163,832, Cl. 528-76.000.
- Saidla, Glen E. W., 4,163,824, Cl. 428-313.000.
- Ezra C. Lundahl, Inc.: See—  
Lundahl, Ezra C.; and Wiser, J. Gordon, 4,163,524, Cl. 241-30.000.
- Faessler, Rene: See—  
Lafiquiere, Regis; Janousek, Rade; and Faessler, Rene, 4,163,304, Cl. 19-97.000.
- Fales, David E., to Rainer Isolierrohrfabrik Max Drossbach. Corrugated drainage tubing with helically arranged drainage openings. 4,163,619, Cl. 405-49.000.
- Famiano, Carl J.: See—  
Garlington, Frank E.; and Famiano, Carl J., 4,163,956, Cl. 333-12.000.
- Farkas, Lorand: See—  
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.
- Farrand Optical Co., Inc.: See—  
La Russa, Joseph A., 4,163,542, Cl. 350-3.720.
- Faulkner, Dennis T.: See—  
Glennon, Timothy F.; Sarphe, Theodore E.; and Faulkner, Dennis T., 4,164,033, Cl. 364-431.000.
- Glennon, Timothy F.; Sarphe, Theodore E.; and Faulkner, Dennis T., 4,164,034, Cl. 364-431.000.
- Federal Paper Board Company, Inc.: See—  
Ganz, Robert H., 4,163,352, Cl. 53-393.000.
- Feldstein, Michael: See—  
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.
- Feltex Limited: See—  
Turnbull, Roy H., 4,163,716, Cl. 210-28.000.
- Ferina, Ronald L. Orbital clock. 4,163,362, Cl. 58-126.00R.
- Ferrand, Gerard; and Maffrand, Jean-Pierre, to Parcor. Process for the preparation of tetrahydro-thieno[3,2-c]- and [2,3-c]pyridine derivatives. 4,163,852, Cl. 546-114.000.
- Fetchin, John A.; and Marzluff, William F., to American Cyanamid Company. Catalyst preparation method. 4,163,735, Cl. 252-443.000.
- Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, to Chino Gygyszer es Vegyeszeti Termekek Gyara Rt. Metabolic 5-methyl-isoflavone-derivatives, process for the preparation thereof and compositions containing the same. 4,163,746, Cl. 260-345.200.
- Fiber Associates, Inc.: See—  
Geyer, Charles J., Jr.; and White, Ben E., 4,163,840, Cl. 536-101.000.
- Fiber Controls Corporation: See—  
Grice, Karl R., Jr., 4,163,927, Cl. 318-68.000.
- Finch, David H. Illuminated bank window. 4,164,010, Cl. 362-147.000.
- Findlay, Donald J.: See—  
Rumer, David O., Jr.; Findlay, Donald J.; Neumann, Arthur E.; and del Castillo, Juan M., 4,163,409, Cl. 84-484.000.
- Finish Engineering Company, Inc.: See—  
Claunch, C. Kenneth, 4,163,616, Cl. 366-262.000.
- Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., to Owens-Corning Fiberglas Corporation. Method of packaging compressible fibrous batis. 4,163,353, Cl. 53-430.000.
- Firmenich SA: See—  
Strickler, Hugo, 4,163,866, Cl. 568-819.000.
- Fisher, William F.; and Rosenberger, Paul C., to Caterpillar Tractor Co. Thrust washer construction for differential. 4,163,400, Cl. 74-710.000.
- Fisons Limited: See—  
Percival, Albert; and Judson, Philip N., 4,163,846, Cl. 544-262.000.
- Fleener, Richard P.; and Deeds, M. Rinley, to Manning Environmental Corp. Sampler purge system. 4,163,392, Cl. 73-421.00B.
- Foedrowitz, Jurgen: See—  
Semjonow, Valentin; and Foedrowitz, Jurgen, 4,163,305, Cl. 19-299.000.
- Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., to General Electric Company. Controlled environment agriculture facility and method for its operation. 4,163,342, Cl. 47-58.000.
- Fomin, Eduard R.: See—  
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.
- Fong, William, to National Research Development Corporation. Electric motors or generators. 4,163,915, Cl. 310-198.000.
- Ford Motor Company: See—  
Cheung, Mo-fung, 4,163,815, Cl. 427-385.00R.
- Lambe, John J.; and McCarthy, Shaun L., 4,163,920, Cl. 313-503.000.
- Forsyth, Bruce A.: See—  
McGarry, Errol J.; and Forsyth, Bruce A., 4,163,801, Cl. 424-347.000.
- Foster, Alan I.; James, Peter G.; McCarrroll, John J.; and Tension, Stephen R., to British Petroleum Company Limited. The. Process for the synthesis of ammonia using catalysts supported on graphite containing carbon. 4,163,775, Cl. 423-363.000.
- Foster, George W., to Chloride Group Limited. Automatic electric battery charging apparatus. 4,163,933, Cl. 320-20.000.
- Foundation for the Study of Asthma and Related Diseases, The: See—  
Ohman, John L.; and Lowell, Francis C., 4,163,778, Cl. 424-91.000.
- Fowler, James M.; and Morrison, Bertram L., to ACF Industries, Incorporated. Two piece composite valve seal ring construction. 4,163,544, Cl. 251-328.000.
- Fox, Lawrence E.; and Shuler, James R., to Caterpillar Tractor Co. Hinge joint for track link assemblies. 4,163,589, Cl. 305-14.000.
- Fox, William R.: See—  
Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., 4,163,880, Cl. 200-61.58B.

- Fram Corporation: See—  
Cook, John E., 4,163,543, Cl. 251-48.000.
- Francois, Jacques; and Guillaumot, Georges, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Connection assembly for interconnecting a circuit board and a frame. 4,164,002, Cl. 361-399.000.
- Franko, Bernard V.; and Proakis, Anthony G., to A. H. Robins Company, Inc. Method for increasing coronary blood flow in mammals. 4,163,790, Cl. 424-267.000.
- Fraser, Douglas S.: See—  
Thompson, Taylor N.; and Fraser, Douglas S., 4,163,327, Cl. 34-5.000.
- Freeze Sleeves of America, Inc.: See—  
Moore, Stanley R.; Crisman, Thomas L.; and Zivney, Donald R., 4,163,374, Cl. 62-457.000.
- Freimuth, Lothar: See—  
Miller, Imrich; and Freimuth, Lothar, 4,163,531, Cl. 242-158.00R.
- Friedrich, Heinz: See—  
Beschke, Helmut; and Friedrich, Heinz, 4,163,854, Cl. 546-251.000.
- Fruttschi, Hansulrich, to BBC Brown, Boveri & Company Limited. Method for regulating a power plant containing a gas turbine assembly and apparatus for the performance of the aforesaid method. 4,163,365, Cl. 60-39.030.
- Frye, Leonard V.; and Crossman, Robert F., to Carrier Corporation. Capillary retainer clip. 4,163,372, Cl. 62-259.000.
- FTS Systems, Inc.: See—  
Thompson, Taylor N.; and Fraser, Douglas S., 4,163,327, Cl. 34-5.000.
- Fugett, Albert. Gasoline miser. 4,163,436, Cl. 123-141.000.
- Fuji Photo Film Co., Ltd.: See—  
Inoue, Atsuo; and Mikami, Takeshi, 4,163,671, Cl. 96-74.000.
- Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.
- Fuji Xerox Co., Ltd.: See—  
Ishii, Tetsuo, 4,163,898, Cl. 250-315.00R.
- Fujii, Motoharu: See—  
Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugura, Susumu, 4,163,892, Cl. 219-216.000.
- Fujii, Toshikatsu: See—  
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
- Fujisawa, Yoshikazu: See—  
Igarashi, Shuji; Fujisawa, Yoshikazu; and Igarashi, Toshio, 4,163,700, Cl. 204-43.00S.
- Fujishiro, Takeshi, to Nissan Motor Company, Limited. Air/fuel ratio control system for internal combustion engine having compensation means for variation in output characteristic of exhaust sensor. 4,163,433, Cl. 123-119.0EC.
- Fujitaki, Roy K., to VSI Corporation. Right angle lock. 4,163,375, Cl. 70-134.000.
- Fukuda, Shin: See—  
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.
- Fulmer, Ray M.: See—  
Symborski, Alex P.; Fulmer, Ray M.; and Thomas, David W., 4,163,653, Cl. 65-2.000.
- Fultz, Chester R.: See—  
Burkhart, L. Elkin; Fultz, Chester R.; and Maulden, Kerry A., 4,163,516, Cl. 228-114.000.
- Furukawa, Hiroshi: See—  
Tawa, Tutomu; and Furukawa, Hiroshi, 4,163,308, Cl. 29-25.190.
- Furukawa, Naotake: See—  
Takeuchi, Tatsu; Ono, Kazuyoshi; Furukawa, Naotake; Sugura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
- Futamura, Shoji: See—  
Higuchi, Noboru; and Futamura, Shoji, 4,163,640, Cl. 425-466.000.
- G. D. Hanna Incorporated: See—  
Hanna, Gary D., 4,163,303, Cl. 16-135.000.
- G. D. Searle & Co.: See—  
Sprenger, William K., deceased, 4,163,859, Cl. 560-53.000.
- G. S. Compactors Limited: See—  
Sercombe, Geoffrey, 4,163,420, Cl. 100-223.000.
- Gallone, Edward R. D., to W. Vinton Limited. Torsion counteracting pivots. 4,163,538, Cl. 248-278.000.
- Gallet, Jean-Baptiste: See—  
Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, 4,163,901, Cl. 250-401.000.
- Gallo, Mario; and Wirth, Johannes, to Wirth, Gallo & Co. Mass and force meter. 4,163,386, Cl. 73-141.00R.
- Ganz, Robert H., to Federal Paper Board Company, Inc. Bottle packaging machine. 4,163,352, Cl. 53-393.000.
- Garcin, Felix; and Weil, Marcel, to Air Industrie. Electrostatic liquid spraying nozzle. 4,163,520, Cl. 239-707.000.
- Garden City Envelope Company: See—  
Dohnalik, Joseph J., 4,163,651, Cl. 55-344.000.
- Garlington, Frank E.; and Famiano, Carl J., to Sprague Electric Company. Wound multi-capacitor filter. 4,163,956, Cl. 333-12.000.
- Gautier, Jean-Claude C.: See—  
Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteleau, Gerard R., 4,163,740, Cl. 260-31.20N.
- Gavagan, James A.: See—  
Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., 4,163,880, Cl. 200-61.58B.
- Gazzi, Luigi; and Sguera, Oronzo, to Snamprogetti S.p.A. Refrigerative fractionation of cracking-gases in ethylene production plants. 4,163,652, Cl. 62-28.000.
- Gebr. Happich GmbH: See—  
Mahler, Gert; Viertel, Lothar; and Meissner, Wolfgang, 4,163,579, Cl. 296-97.00H.
- Geery, Michael J.: See—  
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., 4,163,341, Cl. 46-262.000.
- General Electric Company: See—  
Cline, Harvey E.; Anthony, Thomas R.; and Giaever, Ivar, 4,163,983, Cl. 357-12.000.
- Espelage, Paul M.; and Walker, Loren H., 4,164,015, Cl. 363-87.000.
- Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.
- Gottung, William H.; and Torossian, Kevork A., 4,163,912, Cl. 310-45.000.
- Janu, Maria M.; and Wagner, Howard R., 4,163,929, Cl. 318-628.000.
- Johnson, Donald S., 4,163,833, Cl. 528-205.000.
- Plugge, Jay S.; and Hammer, Eugene S., 4,163,599, Cl. 339-115.00C.
- Rickert, Milton E., Jr., 4,163,702, Cl. 204-181.00T.
- Ryckman, William D., Jr., 4,163,963, Cl. 338-28.000.
- Woods, Lee O., 4,164,000, Cl. 361-27.000.
- Genevieve I. Hanscom, Robert M. Magnuson, Lois J. Thomson, Trustees of the Estate of Roy M. Magnus: See—  
Crawford, Lynn D., 4,163,406, Cl. 83-424.000.
- George Nelson & Company: See—  
Nelson, George H., 4,163,592, Cl. 312-194.000.
- Georgizon, Evgeny B.: See—  
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshchevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.
- Gerard, Henry M., to Hughes Aircraft Company. Hybrid transversal filter. 4,163,958, Cl. 333-165.000.
- Geren, George W.: See—  
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.
- Gernez, Alain, to Compagnie Europeenne pour l'Equipeement Menager "CEPEM". Method of coating the inside surface of a hollow body. 4,163,703, Cl. 204-181.00R.
- Gesell, Reinhard: See—  
Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, 4,163,980, Cl. 346-155.000.
- Gessell, Donald E., to Dow Chemical Company. The. High efficiency titanate catalyst for polymerizing olefins. 4,163,831, Cl. 526-153.000.
- Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Inc. Process and apparatus for making alkali cellulose in sheet form. 4,163,840, Cl. 536-101.000.
- Giaever, Ivar: See—  
Cline, Harvey E.; Anthony, Thomas R.; and Giaever, Ivar, 4,163,983, Cl. 357-12.000.
- Gibson, David E.: See—  
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.
- Gibson, K. R.: See—  
Jacobson, Robert L.; and Gibson, K. R., 4,163,708, Cl. 208-89.000.
- Gibson, William H.: See—  
Herbers, Dennis M.; and Gibson, William H., 4,163,923, Cl. 315-208.000.
- Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, to Bayer Aktiengesellschaft. Parabenic acid aminals. 4,163,857, Cl. 548-318.000.
- Gilbert, Eli. Information retrieval system for providing retrievable updateable display of a permanent microfilm record. 4,164,024, Cl. 364-900.000.
- Gillott, Donald H.: See—  
Simes, James G.; and Gillott, Donald H., 4,163,911, Cl. 310-27.000.
- Ginny Bee Harvester Corporation: See—  
Edwards, John W., 4,163,355, Cl. 56-328.00R.
- Ginther, George E., Sr.: See—  
Bachman, Joseph L., Jr.; Ginther, George E., Sr.; and Johnson, A. David, Jr., 4,163,414, Cl. 93-53.00M.
- Giolito, Silvio L., to Stauffer Chemical Company. Polyalkylene glycol alkyl polyphosphites. 4,163,767, Cl. 260-929.000.
- Giovannetti, Fiorello. Joint for furniture. 4,163,618, Cl. 403-245.000.
- Glaziev, Valentin I.: See—  
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshchevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.
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- Glennon, Timothy F.; and Sarphe, Theodore E., to Sundstrand Corporation. Surge control for variable speed-variable geometry compressors. 4,164,035, Cl. 364-431.000.
- Globe Tool and Engineering Company, The: See—  
Seitz, David R.; and Heaton, Mark T., 4,163,931, Cl. 318-569.000.
- Goettler, Ernst; and Grueter, Otto, to Siemens Aktiengesellschaft. CCD storage module. 4,164,040, Cl. 365-183.000.



- Goff, Dewain R.: See—  
Aysta, James E.; and Goff, Dewain R., 4,163,596, Cl. 339-97.00P.
- Goldhagen, Samuel: See—  
Rothenstein, Julius; and Goldhagen, Samuel, 4,163,681, Cl. 149-11.000.
- Goldscher, Kenneth J. Turmeric coloring process and composition for foods and beverages. 4,163,803, Cl. 426-250.000.
- Goodyear Tire & Rubber Company, The: See—  
Dobson, Robert L., 4,163,467, Cl. 152-347.000.  
D'Sidocky, Richard M., 4,163,757, Cl. 260-570.00R.  
Kubinski, Donald C., 4,163,685, Cl. 156-405.00R.  
Lammlein, Robert A., Jr., 4,163,683, Cl. 156-136.000.  
Watts, George T., 4,163,466, Cl. 152-158.000.
- Gordy, Robert S.: See—  
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.
- Gorin, Everett: See—  
Kulik, Metro D.; and Gorin, Everett, 4,163,776, Cl. 423-567.000.
- Goslin, Richard L.: See—  
Schroeder, James E.; and Goslin, Richard L., 4,163,907, Cl. 307-209.000.
- Goto, Kiyoshi: See—  
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.
- Goto, Mikio: See—  
Ikashii, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.
- Goto, Tetsuro: See—  
Hasegawa, Hiroshi; and Goto, Tetsuro, 4,163,924, Cl. 315-241.00P.
- Gottsegen, Agnes: See—  
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.
- Gottung, William H.; and Torossian, Kevork A., to General Electric Company. Electrical insulating sheet material and electric winding made therefrom. 4,163,912, Cl. 310-45.000.
- Goudriaan, Frans; and van Klinken, Jakob, to Shell Oil Company. Asphalt conversion. 4,163,707, Cl. 208-44.000.
- Gould Advance Limited: See—  
Crowe, John E.; and Shanley, John J., 4,164,014, Cl. 363-49.000.
- Graham, Charles I.: See—  
Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., 4,163,804, Cl. 426-315.000.
- Granno, Peter M. Hitch viewing trailer mirror with snap button connection. 4,163,606, Cl. 350-307.000.
- Grant, Charles P., administrator: See—  
Lou, Perry W.; and Grant, Charles P., Jr., deceased, 4,164,031, Cl. 365-233.000.
- Grant, Charles P., Jr., deceased: See—  
Cochran, Michael J.; and Grant, Charles P., Jr., deceased, 4,164,037, Cl. 364-700.000.  
Lou, Perry W.; and Grant, Charles P., Jr., deceased, 4,164,031, Cl. 365-233.000.
- Grant, Charles P., Sr., executor: See—  
Cochran, Michael J.; and Grant, Charles P., Jr., deceased, 4,164,037, Cl. 364-700.000.
- Green, John D.; and Harris, Ian R., to British-American Tobacco Company Limited. Tobacco-smoke filters. 4,163,452, Cl. 131-10.00A.
- Green, Norman W., to Occidental Petroleum Corporation. Fluidizing a mixture of particulate coal and char. 4,163,693, Cl. 201-22.000.
- Green, Robert B. Method and means for producing rolled metal products. 4,163,312, Cl. 29-527.700.
- Greenaway, David L., to LGZ Landis & Gyr Zug AG. Optically coded document and method of making same. 4,163,570, Cl. 283-8.00A.
- Greer Hydraulics, Inc.: See—  
Jacobellis, Alfonso A., 4,163,461, Cl. 138-30.000.
- Gregor, Harry P. Separating substances with pressure-driven affinity sorption membranes. 4,163,714, Cl. 210-23.00F.
- Greive, Aloys; and Horstmann, Aloys, to Hamel GmbH, Zwirnmashchinen. Apparatus for cable-twisting two yarns. 4,163,357, Cl. 57-58.360.
- Grice, Karl R., Jr., to Fiber Controls Corporation. Auto-leveler circuit. 4,163,927, Cl. 318-68.000.
- Griffin, Kenneth E. Tunnel or like wall cleaning machine. 4,163,301, Cl. 15-50.00R.
- Griffith, Robert C., to Dynamic Sciences International, Inc. Programmable sound synthesizer. 4,164,020, Cl. 364-718.000.
- Groninger, Greg D., to Dow Chemical Company, The. Vaporizer. 4,163,371, Cl. 62-50.000.
- Grooss, Frank A.; and Simmons, Gerald P., to Caterpillar Tractor Co. Tower assembly. 4,163,498, Cl. 414-697.000.
- Grossman, Leonard N.; and Kaznoff, Alexis I., to United States of America, Energy. Vented nuclear fuel element. 4,163,689, Cl. 176-68.000.
- Grouard, Gerard, to La Spirotechnique Industrielle et Commerciale. Breathing apparatus. 4,163,448, Cl. 128-142.200.
- Grueter, Otto: See—  
Goettler, Ernst; and Grueter, Otto, 4,164,040, Cl. 365-183.000.
- Gsell, Laurenz: See—  
Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, 4,163,792, Cl. 424-272.000.
- GTE Automatic Electric Laboratories Incorporated: See—  
Neese, Wayne E., 4,163,315, Cl. 29-620.000.
- GTE Sylvania Incorporated: See—  
Alberts, Steven L., 4,163,946, Cl. 328-63.000.
- Audesse, Emery G.; and Hartman, Donald W., 4,164,007, Cl. 362-13.000.
- Speigel, Kenneth, 4,163,919, Cl. 313-479.000.
- Guenther, William D.; and Mazzioti, Philip J., to Dana Corporation. Rotary valve timing apparatus. 4,163,438, Cl. 123-190.00A.
- Guilhem, Robert; Rivron, Maurice; and Weulersse, Bruno, to Thomson-CSF. Method of measuring the altitude of a target maneuvering at a very low elevation, and a tracking radar using same. 4,163,975, Cl. 343-16.00M.
- Guillaumot, Georges: See—  
Francois, Jacques; and Guillaumot, Georges, 4,164,002, Cl. 361-399.000.
- Gulden, George, Jr.: See—  
Hood, Walter J.; and Gulden, George, Jr., 4,163,527, Cl. 242-55.000.
- Gulliksen, John E., to Koehler Manufacturing Company. Luminaire apparatus for reflecting radiant energy and methods of controlling characteristics of reflected radiant energy. 4,164,012, Cl. 362-282.000.
- Gunne, Ingemar; and Almgren, Bertil, to Siemens Aktiengesellschaft. Bottle seal. 4,163,500, Cl. 215-260.000.
- Gunther, Arnold. Foldable liners for fluids holding storage tanks. 4,163,505, Cl. 220-85.00B.
- Gupton, John T.: See—  
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.
- Guthrie, David B.: See—  
Cheng, William J.; and Guthrie, David B., 4,163,645, Cl. 44-62.000.  
Cheng, William J.; and Guthrie, David B., 4,163,728, Cl. 252-18.000.
- Gutierrez, Manuel; and Enger, Phillip F., to United States of America, Interior. Void detector system. 4,163,393, Cl. 73-584.000.
- Gyursanszky, Zoltan L., to Honeywell Ltd. Two-wire ballast for fluorescent tube dimming. 4,163,925, Cl. 315-276.000.
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Bauer, Kurt; and Steuer, Werner, 4,163,759, Cl. 260-600.00A.
- Haas, Robert E.: See—  
Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., 4,163,804, Cl. 426-315.000.
- Haga, Isao: See—  
Aihara, Shigenobu; Haga, Isao; and Mizumura, Motoo, 4,163,951, Cl. 331-1.00A.
- Hagmann, Peter; and Muller, Ernst, to Morris AG. Safety razor. 4,163,316, Cl. 30-47.000.
- Hall, Gerald D.; and Swayze, Lloyd D., to Caterpillar Tractor Co. Implement circuit for motor with slow and fast dump. 4,163,628, Cl. 414-699.000.
- Hall, H. Tracy: See—  
Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,163,769, Cl. 264-42.000.
- Hall, Peter J., to MicroVue Products Inc. Microfiche reader. 4,163,611, Cl. 353-101.000.
- Halstead, Kenneth G.; and Hawfield, James D., Jr., to Westinghouse Electric Corp. Anti-static plastic enclosure for electric utility meters. 4,163,939, Cl. 324-104.000.
- Hamamura, Kimio: See—  
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.
- Hamane, Masumi: See—  
Yamada, Youji; Miyazaki, Kunio; and Hamane, Masumi, 4,163,399, Cl. 74-700.000.
- Hamel GmbH, Zwirnmashchinen: See—  
Greive, Aloys; and Horstmann, Aloys, 4,163,357, Cl. 57-58.360.
- Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Print head. 4,163,422, Cl. 101-111.000.
- Hammer, Eugene S.: See—  
Plugge, Jay S.; and Hammer, Eugene S., 4,163,599, Cl. 339-115.00C.
- Hammonds, James C., to ACF Industries, Incorporated. Pneumatic hopper outlet cap latch. 4,163,583, Cl. 406-198.000.
- Hanna, Gary D., to G. D. Hanna Incorporated. Hinge structure. 4,163,303, Cl. 16-135.000.
- Hanna Mining Company: See—  
English, Alan, 4,163,469, Cl. 165-35.000.
- Hanscom, Genevieve I.: See—  
Crawford, Lynn D., 4,163,406, Cl. 83-424.000.
- Hardy, Charles T., to Safe-T-Lawn, Inc. Oscillating mechanism. 4,163,522, Cl. 239-230.000.
- Harmer, Alan L., to Battelle Development Corporation. Optical strain gauge. 4,163,397, Cl. 73-800.000.
- Harr, Jerome D., to International Business Machines Corporation. Peak detecting circuitry and dual threshold circuitry therefor. 4,163,909, Cl. 307-351.000.
- Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., to Minnesota Mining and Manufacturing Company. Stunting plant growth with N-substituted perfluoroalkanesulfonamides. 4,163,659, Cl. 71-76.000.
- Harris Corporation: See—  
Schroeder, James E.; and Goslin, Richard L., 4,163,907, Cl. 307-209.000.
- Harris, Ian R.: See—  
Green, John D.; and Harris, Ian R., 4,163,452, Cl. 131-10.00A.
- Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, to Chinoin Pharmaceutical and Chemical

- Works Ltd. Thiazoloisoquinolines with coronary and respiratory effects. 4,163,786, Cl. 421-258.000.
- Harte, Richard A.; and Deindorfer, Fred H., to International Diagnostic Technology, Inc. Test for quantitation of immunoglobulin and identification of abnormal immunoglobulin. 4,163,779, Cl. 424-1.000.
- Hartman, Donald W.: See—  
Audesse, Emery G.; and Hartman, Donald W., 4,164,007, Cl. 362-13.000.
- Hartwell, Walter T.; Hinshaw, David L.; Hoffner, Charles W., II; and Toy, Wing N., to Bell Telephone Laboratories, Incorporated. Memory organization to distribute power dissipation and to allow single circuit pack memory growth. 4,164,041, Cl. 365-238.000.
- Hasegawa, Hiroshi; and Goto, Tetsuro, to Nippon Kogaku K.K. Circuit for turning on a charging-completion indicator separate from a flash unit. 4,163,924, Cl. 315-241.00P.
- Haselby, Robert D.: See—  
Patterson, Marvin L.; Haselby, Robert D.; and Kendig, Albert P., 4,163,928, Cl. 318-573.000.
- Hashemi, Mike A., to Wescom, Inc. Electronic hybrid and hybrid repeater with bridge circuit. 4,163,878, Cl. 179-170.0NC.
- Hatch, Donald J.: See—  
Kirk, Bryan W.; Raber, Monte B.; Hatch, Donald J.; and Cramp, Harvey E., 4,163,450, Cl. 128-145.800.
- Hauch, Dennis W.: See—  
Rickel, William; and Hauch, Dennis W., 4,163,457, Cl. 137-216.000.
- Hauser, Stephen G.; and Bowen, John G. Electrolytic water heater. 4,163,895, Cl. 219-290.000.
- Hauserman, Inc.: See—  
Maguire, Justin M., Jr.; and Edwards, Thomas M., 4,164,009, Cl. 362-127.000.
- Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersing agents. 4,163,749, Cl. 260-404.500.
- Hawfield, James D., Jr.: See—  
Halstead, Kenneth G.; and Hawfield, James D., Jr., 4,163,939, Cl. 324-104.000.
- Hayashi, Hideo: See—  
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.
- Hayashi, Moriyoishi: See—  
Doguchi, Nobushige; and Hayashi, Moriyoishi, 4,163,350, Cl. 52-403.000.
- Hayashi, Yoshimasa: See—  
Nakajima, Yasuo; Kuroda, Hiroshi; and Hayashi, Yoshimasa, 4,163,435, Cl. 123-119.00A.
- Hayes, Cecil L., to Rockwell International Corporation. High energy coherent pulse source for laser system. 4,163,954, Cl. 332-7.510.
- Heaton, Mark T.: See—  
Seitz, David R.; and Heaton, Mark T., 4,163,931, Cl. 318-569.000.
- Hebert, Chris J.; and Hollister, Ralph T. Cleaning apparatus for ship holds. 4,163,455, Cl. 134-167.00R.
- Hegemann, Kenneth J., to Rainmatic International, Ltd. Mobile pivot tower for irrigation system. 4,163,459, Cl. 137-344.000.
- Heimark, Edward L.: See—  
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.
- Helber, Holger: See—  
Schutz, Klaus; Helber, Holger; and Lange, Gerhard, 4,163,602, Cl. 358-113.000.
- Helesfai, Steven: See—  
Miller, Benson L.; and Helesfai, Steven, 4,163,376, Cl. 70-303.00A.
- Heller, Rudolf; and Schattaier, Kurt, to Contraves AG. Support device. 4,163,536, Cl. 248-118.000.
- Hellgren, Keijo E., to ASEA Aktiebolag. Hydraulic press. 4,163,378, Cl. 72-63.000.
- Helms, Richard A.: See—  
Cosentino, Louis C.; Seiler, Louis; and Helms, Richard A., 4,163,722, Cl. 210-236.000.
- Hendricks, Charles D., to United States of America, Energy. Method and apparatus for producing small hollow spheres. 4,163,637, Cl. 425-6.000.
- Hennig, Kurt; and Klein, Manfred. Flexible covering for power supply lines, guideways and the like. 4,163,591, Cl. 308-3.500.
- Herbers, Dennis M.; and Gibson, William H. Variable duty cycle lamp circuit. 4,163,923, Cl. 315-208.000.
- Hergert, Reinhard: See—  
Kreil, Siegmund; Zech, Achim; and Hergert, Reinhard, 4,163,870, Cl. 178-26.00R.
- Herron, Keith R. Air release valve. 4,163,456, Cl. 137-202.000.
- Hertfelder, Wilhelm, to Robert Bosch GmbH. Electrically motor driven and declutchable positioning device for a mechanical control. 4,163,432, Cl. 123-102.000.
- Hewlett-Packard Company: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Weninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.
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- Patterson, Marvin L.; Haselby, Robert D.; and Kendig, Albert P., 4,163,928, Cl. 318-573.000.
- Hexachimie: See—  
Hoffmann, Charles; and Bouley, Etienne, 4,163,785, Cl. 424-250.000.
- Heymer, Gero: See—  
Elsner, Georg; Heymer, Gero; and Stephan, Hans-Werner, 4,163,760, Cl. 260-606.50P.
- Hibbert, Edward R.: See—  
Norwalt, Robert H.; Hibbert, Edward R.; and Schiff, Vicki L., 4,163,555, Cl. 273-86.00B.
- Highland, Stanley E. Line travelling skips. 4,163,480, Cl. 182-14.000.
- Higuchi, Noboru; and Futamura, Shoji, to NGK Insulators, Ltd.; and Institute of Technology Precision Electrical Discharge Works. Apparatus for extruding a honeycomb structural body. 4,163,640, Cl. 425-466.000.
- Higuchi, Tadayasu. Method for forming a continuous footing with prefabricated footing blocks. 4,163,621, Cl. 405-255.000.
- Hinchman, Leslie R.; and Hinchman, Robert B., Sr., to Caldwell, Bessie L., a part interest. Hydraulic pump mechanically interconnected with fluid motor distributors. 4,163,632, Cl. 417-318.000.
- Hinchman, Robert B., Sr.: See—  
Hinchman, Leslie R.; and Hinchman, Robert B., Sr., 4,163,632, Cl. 417-318.000.
- Hinlein, Sigmund: See—  
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.
- Hinshaw, David L.: See—  
Hartwell, Walter T.; Hinshaw, David L.; Hoffner, Charles W., II; and Toy, Wing N., 4,164,041, Cl. 365-238.000.
- Hirakawa, Manabu: See—  
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.
- Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, to Pilot Ink Co., Ltd. Aqueous ink composition for writing instruments. 4,163,675, Cl. 106-22.000.
- Hirose, Takeshi: See—  
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.
- Hitachi, Ltd.: See—  
Ohnuki, Nobutaka, 4,163,876, Cl. 179-115.50R.  
Omae, Tsutomu; and Sakai, Keiziro, 4,163,886, Cl. 219-60.00A.  
Sakai, Masao, 4,163,922, Cl. 315-39.710.  
Tawa, Tutomu; and Furukawa, Hiroshi, 4,163,308, Cl. 29-25.190.
- Hocker, Jurgen: See—  
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,163,857, Cl. 548-318.000.
- Hodges, Marvin P. Color television projection system. 4,163,990, Cl. 358-64.000.
- Hodshon, Jack R. Method and apparatus for making a trophy column. 4,163,381, Cl. 72-477.000.
- Hoechst Aktiengesellschaft: See—  
Dalbor, Horst, 4,163,739, Cl. 260-31.20R.  
Dalbor, Horst, 4,163,836, Cl. 528-366.000.
- Elsner, Georg; Heymer, Gero; and Stephan, Hans-Werner, 4,163,760, Cl. 260-606.50P.
- Semjonow, Valentin; and Foedrowitz, Jurgen, 4,163,305, Cl. 19-299.000.
- Stahlhofen, Paul, 4,163,672, Cl. 96-91.00D.
- Hoffmann, Charles; and Bouley, Etienne, to Hexachimie. Benzothiazepine compounds and compositions. 4,163,785, Cl. 424-250.000.
- Hoffmann-La Roche Inc.: See—  
Mohacs, Ernest, 4,163,853, Cl. 546-149.000.
- Hoffner, Charles W., II: See—  
Hartwell, Walter T.; Hinshaw, David L.; Hoffner, Charles W., II; and Toy, Wing N., 4,164,041, Cl. 365-238.000.
- Holbek, Carl C.: See—  
Sorensen, Soren K.; and Holbek, Carl C., 4,163,734, Cl. 252-408.000.
- Holland, Gerald F., to Pfizer Inc. Heterocyclylcarbonyl derivatives of urea, agents for dissolution of gallstones. 4,163,784, Cl. 424-246.000.
- Hollister, Ralph T.: See—  
Hebert, Chris J.; and Hollister, Ralph T., 4,163,455, Cl. 134-167.00R.
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Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,163,844, Cl. 544-32.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Yamada, Youji; Miyazaki, Kunio; and Hamane, Masumi, 4,163,399, Cl. 74-700.000.
- Honda, Kazuhiko: See—  
Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, 4,163,675, Cl. 106-22.000.
- Honeywell Inc.: See—  
Medlar, Lewis A.; and Newbold, William F., 4,163,395, Cl. 73-708.000.
- Wax, David W., 4,164,036, Cl. 364-486.000.
- Honeywell Ltd.: See—  
Gyursanszky, Zoltan L., 4,163,925, Cl. 315-276.000.
- Honjo, Takeshige, to Murata Kikai Kabushiki Kaisha. Method and apparatus for driving and piecing-up open-end spinning units. 4,163,359, Cl. 57-93.000.
- Hood, Walter J.; and Gulden, George, Jr., to Kent Corporation. Coil depletion sensor. 4,163,527, Cl. 242-55.000.
- Hoop, James B. Means for suspending articles from a ceiling. 4,163,576, Cl. 294-19.00R.



Hoover Universal, Inc.: See—  
Kitchen, John P.; and Samuels, David W., 4,163,296, Cl. 5-255.000.  
Horie, Shigeru: See—  
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.  
Horn, Hans, to TMC Corporation: Ski brake. 4,163,569, Cl. 280-605.000.  
Horning, James J.: See—  
Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.  
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., to Exxon Research & Engineering Co.  $Bi_2[M_2-xBi_x]O_{7-y}$  compounds wherein M is Ru, Ir or mixtures thereof, and electrochemical devices containing same (Bat-24). 4,163,706, Cl. 204-242.000.  
Horstmann, Aloys: See—  
Greive, Aloys; and Horstmann, Aloys, 4,163,357, Cl. 57-58.360.  
Horton, M. Duane: See—  
Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,163,769, Cl. 264-42.000.  
Howden, Ashley G.: See—  
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., 4,163,341, Cl. 46-262.000.  
Howell, Alleyne C., Jr. Conducting rail hanger construction. 4,163,485, Cl. 191-40.000.  
Hoya Lens Corporation: See—  
Akaba, Hayao; and Takeuchi, Takuzo, 4,163,622, Cl. 408-27.000.  
Hubbard, James H.; and Hubert, Wallace L., to International Business Machines Corporation: Automatic copy recovery. 4,163,897, Cl. 235-92.0SB.  
Huber, John H.: See—  
Bianchi, Edward A.; and Huber, John H., 4,163,598, Cl. 339-107.000.  
Hubert, Wallace L.: See—  
Hubbard, James H.; and Hubert, Wallace L., 4,163,897, Cl. 235-92.0SB.  
Huchette, Michel: See—  
Devos, Francis; Leroy, Patrick; and Huchette, Michel, 4,163,691, Cl. 435-174.000.  
Hughart, Robert P.: See—  
Wilson, Peter C.; and Hughart, Robert P., 4,163,726, Cl. 210-512.00R.  
Hughes Aircraft Company: See—  
Gerard, Henry M., 4,163,958, Cl. 333-165.000.  
Kamath, G. Sanjiv; and Anderson, Carl L., 4,163,987, Cl. 357-30.000.  
Hughes, David, to Sperry Rand Limited: Verticality sensors. 4,163,325, Cl. 33-346.000.  
Hughes, Edward S.: See—  
Sherburne, Frederick B.; Pardes, Herman I.; and Hughes, Edward S., 4,163,328, Cl. 35-25.000.  
Hulin, Jean-Pierre; and de Vecchis, Michel, to Societe Lignes Telegraphiques et Telephoniques: Extrusion tool. 4,163,641, Cl. 425-461.000.  
Hunter, William M.; and Lock, John D., to National Research Development Corporation: Automation of discrete analysis systems. 4,163,643, Cl. 23-230.00R.  
Hyde, Thomas G.: See—  
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clublely, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.  
Iaboni, Vincent: Wall cleaning apparatus. 4,163,302, Cl. 15-50.00R.  
Ichikawa, Toshiyuki: See—  
Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, 4,163,814, Cl. 427-372.00R.  
ICI Americas Inc.: See—  
Lew, Jean S. Y., 4,163,754, Cl. 428-378.000.  
ICI Australia Limited: See—  
McGarry, Errol J.; and Forsyth, Bruce A., 4,163,801, Cl. 424-347.000.  
Iden, Floyd W.; and Scherer, George P., to International Telephone and Telegraph Corporation: Cylindrical mode power divider/combiner with isolation. 4,163,955, Cl. 333-127.000.  
Igarashi, Shuji; Fujisawa, Yoshikazu; and Igarashi, Toshio, to Dipsol Chemicals Co., Ltd. Method for stabilizing tin or tin alloy electroplating baths. 4,163,700, Cl. 204-43.00S.  
Igarashi, Toshio: See—  
Igarashi, Shuji; Fujisawa, Yoshikazu; and Igarashi, Toshio, 4,163,700, Cl. 204-43.00S.  
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, to Mitsubishi Gas Chemical Company, Inc. Process for preparing a methylphenol. 4,163,863, Cl. 568-798.000.  
Ikari, Yoshikatsu; Yokoyama, Shiyochiro; and Katoh, Keisuke, to Agency of Industrial Science & Technology; and Sumitomo Jukikai Envirotech, Inc. Method for treatment of waste water. 4,163,715, Cl. 210-28.000.  
Ikeda, Hiroshi: See—  
Kanada, Eiji; Itoh, Noboru; Ikeda, Hiroshi; and Iwata, Tamotsu, 4,163,669, Cl. 96-74.000.  
Illinois Tool Works Inc.: See—  
Kobetsky, Robert G., 4,163,884, Cl. 219-10.49R.  
Kobetsky, Robert G., 4,163,885, Cl. 219-10.49R.  
Illuminati, Gabriello; and Romano, Ugo, to Snamprogetti S.p.A. Process for the preparation of aromatic urethanes. 4,163,861, Cl. 560-132.000.

Imperial Chemical Industries Limited: See—  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,163,749, Cl. 260-404.500.  
Inaba, Masaharu: See—  
Komatsu, Akio; and Inaba, Masaharu, 4,163,891, Cl. 219-121.00P.  
Inaba, Masao; and Kashigi, Kazuo, to Nippon Electric Co., Ltd. Digital video effects system employing a chroma-key tracking technique. 4,163,992, Cl. 358-183.000.  
Inks, Clyde G., to BASF Wyandotte Corporation: Acidizing-gel composition. 4,163,727, Cl. 252-8.55C.  
Inoue, Atsuo; and Mikami, Takeshi, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing ultraviolet light absorbing agent. 4,163,671, Cl. 96-74.000.  
Institute of Technology Precision Electrical Discharge Works: See—  
Higuchi, Noboru; and Futamura, Shoji, 4,163,640, Cl. 425-466.000.  
International Business Machines Corporation: See—  
Almasi, George S.; and Lin, Yeong S., 4,164,026, Cl. 365-3.000.  
Harr, Jerome D., 4,163,909, Cl. 307-351.000.  
Hubbard, James H.; and Hubert, Wallace L., 4,163,897, Cl. 235-92.0SB.  
Keefe, George E., 4,164,029, Cl. 365-36.000.  
Vinal, Albert W., 4,163,986, Cl. 357-27.000.  
Voegeli, Otto, 4,164,028, Cl. 365-20.000.  
International Diagnostic Technology, Inc.: See—  
Harte, Richard A.; and Deindorfer, Fred H., 4,163,779, Cl. 424-1.000.  
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Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,163,737, Cl. 252-522.000.  
International Standard Electric Corporation: See—  
Thompson, George H. B.; and Lovelace, David F., 4,163,952, Cl. 331-94.50H.  
International Tapetronics Corporation: See—  
Bell, Dennis M., 4,163,507, Cl. 221-2.000.  
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Aujla, Sharanjit S., 4,163,594, Cl. 339-82.000.  
International Telephone and Telegraph Corporation: See—  
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November, Milton H., 4,163,388, Cl. 73-190.0CV.  
Intertech Zeichengerate Gunther, Partes KG: See—  
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Ishigaki, Yukinobu; and Muraoka, Teruo, to Victor Company of Japan, Ltd. System for removing interference distortion in the demodulated signal of a frequency-modulated signal. 4,163,945, Cl. 325-473.000.  
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Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, 4,163,989, Cl. 358-27.000.  
Ishii, Tetsuo, to Fuji Xerox Co., Ltd. Method of forming radiographic images. 4,163,898, Cl. 250-315.00R.  
Ishikawa, Masao, to Nissan Motor Company, Limited. Indicator gauge with illuminated pointer. 4,163,428, Cl. 116-288.000.  
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Ithaca Gun Company Incorporated: See—  
Tollinger, James, 4,163,334, Cl. 42-25.000.  
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Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.  
Ives, Robert K., to Michaels of Oregon Co. Black powder firing nipple. 4,163,335, Cl. 42-83.000.  
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Iwatsu Electric Co., Ltd.: See—  
Kokaji, Norio, 4,163,979, Cl. 346-74.100.  
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Jackman, Kristina R., to Merck & Co., Inc. Citrus fruit juice and drink. 4,163,807, Cl. 426-599.000.  
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Shaltiel, David; Davidov, Dan; and Jacob, Isaac, 4,163,666, Cl. 75-177.000.

Jacobellis, Alfonso A., to Greer Hydraulics, Inc. High frequency pulse dampener. 4,163,461, Cl. 138-30.000.  
Jacobs, Eli S.: See—  
Russell, James T., 4,163,600, Cl. 350-6.700.  
Jacobson, Robert E., Jr., to United States of America, Air Force. Means for developing a radar tracking error signal. 4,163,973, Cl. 343-16.00M.  
Jacobson, Robert L.; and Gibson, K. R., to Chevron Research Company. Process for the removal of thiols from hydrocarbon oils. 4,163,708, Cl. 208-89.000.  
Jaeger: See—  
Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, 4,163,391, Cl. 73-295.000.  
James, Peter G.: See—  
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,163,775, Cl. 423-363.000.  
James, Rex L.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.  
Jamshidi, Khosrow. Biopsy needle and removable pad therefor. 4,163,446, Cl. 128-754.000.  
Janousek, Rade: See—  
Lafiquiere, Regis; Janousek, Rade; and Faessler, Rene, 4,163,304, Cl. 19-97.000.  
Janu, Maria M.; and Wagner, Howard R., to General Electric Company. Handle apparatus for a power-assist device. 4,163,929, Cl. 318-628.000.  
Japan Storage Battery Company Limited: See—  
Saito, Satoshi, 4,164,004, Cl. 361-433.000.  
Jaworski, Eugene; and Breslow, Jeffrey D., to Marvin Glass & Associates. Vibratory game apparatus. 4,163,558, Cl. 273-115.000.  
Jenkins, Cecil, to Lee C. Moore Corporation. Movable working platform for use in racking drill pipe. 4,163,625, Cl. 414-22.000.  
Jerome, Henry M. Clamping apparatus for assembling picture frames. 4,163,547, Cl. 269-42.000.  
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, to Kumiai Chemical Industry Co., Ltd. Phenoxyphenoxy crotonic acid derivatives and herbicidal composition. 4,163,661, Cl. 71-108.000.  
Johnsen, Arne A.; and Kakarala, Chandrasekhara R., to Babcock & Wilcox Company, The. Industrial technique. 4,163,470, Cl. 165-70.000.  
Johnson, A. David, Jr.: See—  
Bachman, Joseph L., Jr.; Ginther, George E., Sr.; and Johnson, A. David, Jr., 4,163,414, Cl. 93-53.00M.  
Johnson, Donald S., to General Electric Company. Method for making aromatic cyclic polyformal. 4,163,833, Cl. 528-205.000.  
Johnson, John L.; and Vanzant, Billy W., to Sub Sea Research & Development Corp. Method and apparatus for closing underwater wells. 4,163,477, Cl. 166-362.000.  
Johnson, Matthew & Co., Limited: See—  
Acres, Gary J. K.; and Darling, Alan S., 4,163,736, Cl. 252-466.0PT.  
Bird, Alfred J.; Priestley, Timothy M.; and Winterbottom, John M., 4,163,750, Cl. 260-409.000.  
Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PGI<sub>1</sub> piperidylamides. 4,163,842, Cl. 542-426.000.  
Johnston, James E., to Caterpillar Tractor Co. Transmission shift control lock assembly. 4,163,398, Cl. 74-483.00K.  
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., to California R & D Center. Slotless steering assembly. 4,163,341, Cl. 46-262.000.  
Jourdain, Charles-Henri: See—  
Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, 4,163,391, Cl. 73-295.000.  
Judson, Philip N.: See—  
Percival, Albert; and Judson, Philip N., 4,163,846, Cl. 544-262.000.  
Kabushiki Kaisha Daini Seikosha: See—  
Tanaka, Kojiro; and Yoda, Kazuhiro, 4,163,360, Cl. 58-39.500.  
Kabushiki Kaisha Think Laboratory: See—  
Shigeta, Tatsuo, 4,163,454, Cl. 134-57.00R.  
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Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.  
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Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiyama, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.  
Kabushiki Kaisha Toyota Chuo Kenkyusho: See—  
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.  
Kagata, Toyota, to Aisin Seiki Kabushiki Kaisha. Free wheel hub. 4,163,486, Cl. 192-35.000.  
Kah, Ann F.: See—  
McGinniss, Vincent D.; Ting, Vincent W.; and Kah, Ann F., 4,163,809, Cl. 427-44.000.  
Kaiser, Emil T. Synthesis of steroids. 4,163,744, Cl. 260-239.55C.

Kaiser, Reinhard: See—  
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.  
Kakarala, Chandrasekhara R.: See—  
Johnsen, Arne A.; and Kakarala, Chandrasekhara R., 4,163,470, Cl. 165-70.000.  
Kalka, Josef, to Chemische Werke Huls Aktiengesellschaft. Process for the production of polyvinyl chloride based powders suitable for plastisol preparation. 4,163,838, Cl. 528-501.000.  
Kallianos, Andrew G.; and Simpson, Melvyn I., to Liggett Group Inc. 7-Alkoxy-1,2-benzopyrones as tobacco flavorants. 4,163,453, Cl. 131-17.00R.  
Kamath, G. Sanjiv; and Anderson, Carl L., to Hughes Aircraft Company. GaAs-GaAlAs solar cells. 4,163,987, Cl. 357-30.000.  
Kanada, Eiji; Itoh, Noboru; Ikeda, Hiroshi; and Iwata, Tamotsu, to Mitsubishi Paper Mills, Ltd. Multilayer silver halide color photographic material. 4,163,669, Cl. 96-74.000.  
Kandyba, Petr E.: See—  
Kupriyanov, Mikhail J.; Lapir, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E., 4,164,030, Cl. 365-162.000.  
Kankaanpaa, Matti, to Valmet Oy. Apparatus for dewatering in a paper machine. 4,163,688, Cl. 162-359.000.  
Kao Soap Co., Ltd.: See—  
Sai, Fumio; and Murata, Moriyasu, 4,163,732, Cl. 252-99.000.  
Kappler, Hermann; and Chezek, Norman A., to Niemand Bros., Inc. Tubular container. 4,163,517, Cl. 229-45.000.  
Kapusinski, Peter R. Disposable stapler apparatus and methods of constructing and utilizing same. 4,163,515, Cl. 227-120.000.  
Karch, John A.: See—  
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,709, Cl. 208-120.000.  
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,710, Cl. 208-120.000.  
Karpati, Egon: See—  
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.  
Karrer, Friedrich: See—  
Meyer, Willy; Drabek, Jozsef; Gsell, Laurenz; and Karrer, Friedrich, 4,163,792, Cl. 424-272.000.  
Kartanson, John M., to RJR Archer, Inc. Method and apparatus for strip laminating. 4,163,684, Cl. 156-259.000.  
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., to Data General Corporation. Rigid magnetic disc memory apparatus employing stepper motor drive and pivotable head support with temperature compensation. 4,163,996, Cl. 360-97.000.  
Kashigi, Kazuo: See—  
Inaba, Masao; and Kashigi, Kazuo, 4,163,992, Cl. 358-183.000.  
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, to Kabushiki Kaisha Toyota Chuo Kenkyusho; Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Engine knocking meter. 4,163,385, Cl. 73-35.000.  
Katoh, Keisuke: See—  
Ikari, Yoshikatsu; Yokoyama, Shiyochiro; and Katoh, Keisuke, 4,163,715, Cl. 210-28.000.  
Kauffman, Ivan L.: See—  
Dwyer, Gregory J.; and Kauffman, Ivan L., 4,163,590, Cl. 308-3.00R.  
Kaufhold, Wolfgang, to Siemens Aktiengesellschaft. Six-pulse rectifier circuit. 4,164,013, Cl. 363-45.000.  
Kawabata, Toshihiko: See—  
Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, 4,163,814, Cl. 427-372.00R.  
Kawaguchi, Hiroshi: See—  
Baba, Takashi; Kawaguchi, Hiroshi; and Nishikawa, Kohji, 4,163,483, Cl. 188-71.800.  
Kawaguchi, Munetaka; and Miyake, Masayoshi, to Sumitomo Electric Industries, Ltd. Self-bonding magnet wires and coils made therefrom. 4,163,826, Cl. 428-371.000.  
Kawai, Hiroshi: See—  
Egasaki, Takashi; and Kawai, Hiroshi, 4,163,528, Cl. 242-84.21R.  
Kawasaki Jukogyo Kabushiki Kaisha: See—  
Terai, Kiyohide; and Nagai, Hiroyoshi, 4,163,890, Cl. 219-121.0EB.  
Kaznoff, Alexis I.: See—  
Grossman, Leonard N.; and Kaznoff, Alexis I., 4,163,689, Cl. 176-68.000.  
Kecskemethy, Geza; Virag, Gyorgy; Tihanyi, Robert; and Czirmai, Zoltan, to Muanyagipari Kutato Intezet. Dispenser having manually operated air controlled valves. 4,163,511, Cl. 222-144.500.  
Keefe, George E., to International Business Machines Corporation. Apparatus for high density bubble storage. 4,164,029, Cl. 365-36.000.  
Kelly, Robert R.: See—  
Sheldon, Loren B.; and Kelly, Robert R., 4,163,401, Cl. 81-57.340.  
Kendall Company, The: See—  
McAvini, James D.; and Patel, Harish A., 4,163,896, Cl. 219-525.000.  
Kendig, Albert P.: See—  
Patterson, Marvin L.; Haselby, Robert D.; and Kendig, Albert P., 4,163,928, Cl. 318-573.000.  
Kennicutt, Robert B., to Caterpillar Tractor Co. Vehicle control system. 4,163,413, Cl. 91-521.000.



Kent Corporation: See—

Hood, Walter J.; and Gulden, George, Jr., 4,163,527, Cl. 242-55.000.

Kent, Peter, to Avco Corporation. Apparatus for disposal of leaking fluids in a turbofan engine. 4,163,366, Cl. 60-226.00R.

Keogh, Patrick J., to Ciba-Geigy AG. Recovery of color developer. 4,163,713, Cl. 210-22.00C.

Kerr, Ronald: See—

Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.

Keyes, John H. Infinitely variable ratio permanent magnet transmission. 4,163,914, Cl. 310-103.000.

Kijima, Shizumasa: See—

Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.

Kim, Choong R.: See—

Damm, Wendell W.; and Kim, Choong R., 4,163,950, Cl. 330-252.000.

Kimura, Ichiro: See—

Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.

Kiraly, Arpad: See—

Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.

Kirin-Seagram Limited: See—

Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.

Kirk, Bryan W.; Raber, Monte B.; Hatch, Donald J.; and Cramp, Harvey E. Method and apparatus for weaning patient from continuous mechanical ventilation. 4,163,450, Cl. 128-145.800.

Kiss, Pal: See—

Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.

Kitagawa, Toshikatsu, to Miyakawa Industry Company, Limited. Multiple spindle drilling machine for wide flange beams. 4,163,623, Cl. 408-46.000.

Kitchen, John P.; and Samuels, David W., to Hoover Universal, Inc. Mattress foundation employing springs and cooperating foam bodies. 4,163,296, Cl. 5-255.000.

Klein, Manfred: See—

Hennig, Kurt; and Klein, Manfred, 4,163,591, Cl. 308-3.500.

Klein, Robert W.; and Nuss, George W., Jr. Synergistic compositions and method of use to treat inflammation. 4,163,783, Cl. 424-245.000.

Knauer, Karl; Schlichte, Max; and Pfeiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Transversal filter with at least one analogue shift register, and process for the operation thereof. 4,163,957, Cl. 333-165.000.

Kobashi, Kiyoshi: See—

Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,164,032, Cl. 364-431.000.

Kobayashi, Minoru, to Olympus Optical Company Ltd. Motor brush. 4,163,916, Cl. 310-246.000.

Kobayashi, Takeshi: See—

Matsuno, Takeshi; Nishiyama, Fumiya; and Kobayashi, Takeshi, 4,163,313, Cl. 29-563.000.

Kobetsky, Robert G., to Illinois Tool Works Inc. Induction heating core for adhesive fastening systems. 4,163,884, Cl. 219-10.49R.

Kobetsky, Robert G., to Illinois Tool Works Inc. Induction heating core and heating system for adhesive fasteners. 4,163,885, Cl. 219-10.49R.

Kock, William R.: See—

Wickett, Richard R.; and Kock, William R., 4,163,800, Cl. 424-326.000.

Koehler Manufacturing Company: See—

Gulliksen, John E., 4,164,012, Cl. 362-282.000.

Koenig, James P., to Bendix Corporation. The fluid pressure braking system. 4,163,584, Cl. 303-7.000.

Kohler, Hans W., to United States of America, Army. Proximity fuze. 4,163,423, Cl. 102-211.000.

Kohlmaier, Gerda M.; and Stonehart, Paul, to United Technologies Corporation. Method of fabricating a fuel cell electrode. 4,163,811, Cl. 427-115.000.

Kokaji, Norio, to Iwatsu Electric Co., Ltd. Method and apparatus for recording latent images on a magnetic medium in magnetography. 4,163,979, Cl. 346-74.100.

Kokosi, Jozsef: See—

Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.

Kolkowski, James J., to Sprague Electric Company. Capacitors with minimum ESR. 4,164,006, Cl. 361-433.000.

Komatsu, Akio; and Inaba, Masaharu, to Origin Electric Co., Ltd. Active gas plasma arc torch and a method of operating the same. 4,163,891, Cl. 219-121.00P.

Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Fixing apparatus. 4,163,892, Cl. 219-216.000.

Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: See—

Eckle, Otto, 4,163,624, Cl. 408-185.000.

Kondo, Kiyosi; Tunemoto, Daiei; and Umemoto, Teruo, to Sagami Chemical Research Center. 2-Nitroethylcyclopentane compounds and process for preparing the same. 4,163,758, Cl. 260-586.00R.

Kondo, Shinichi: See—

Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; and Shimazaki, Masami, 4,163,839, Cl. 536-24.000.

Kondo, Yutaka; and Nishina, Shuho, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for preventing the drawing-out of a seat belt webbing at the lock of a retractor. 4,163,530, Cl. 242-107.100.

Konigsbacher, Kurt S., to Blue Cross Laboratories. Ethanol-modified lecithin cookware spray composition. 4,163,676, Cl. 106-243.000.

Konijn, Nicolaas G. Dredge cutter head having a volute compartment. 4,163,330, Cl. 37-64.000.

Korpi, Teuvo T. Apparatus for chemical and electrochemical treatment. 4,163,705, Cl. 204-239.000.

Korte, Heinrich. Sheet metal connection in elongated lamp housings. 4,163,502, Cl. 220-3.940.

Kosaki, Kunio: See—

Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, 4,163,675, Cl. 106-22.000.

Koshevoi, Anatoly A.: See—

Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.

Kosik, John, to Consolidated Foods Corporation. Separable hose coupling. 4,163,593, Cl. 339-15.000.

Koslow-Batchelder Technologies: See—

Koslow, Evan E.; and Batchelder, J. Samuel, 4,163,657, Cl. 71-27.000.

Koslow, Evan E.; and Batchelder, J. Samuel, to Koslow-Batchelder Technologies. Soil conditioning composition and method of using same. 4,163,657, Cl. 71-27.000.

Kramer, Ralph. Motorcycle saddlebox. 4,163,513, Cl. 224-32.00R.

Kramer, Walter. Shopping cart skis. 4,163,564, Cl. 280-10.000.

Krause, Ernst H., to United States of America, Navy. Secret pulse signaling system. 4,163,872, Cl. 179-1.50R.

Kreil, Siegmund; Zech, Achim; and Hergert, Reinhard, to Siemens Aktiengesellschaft. Circuit for producing a pulse succession. 4,163,870, Cl. 178-26.00R.

Krekeler, Claude B., to Cincinnati Mine Machinery Co., The. Retaining means for the connecting pin which joins a bit holder to a base member. 4,163,581, Cl. 299-91.000.

Kremers, Frank J.: See—

Van der Mey, John E.; and Kremers, Frank J., 4,163,751, Cl. 260-457.000.

Krenzer, Orville; Midden, William E.; and Schmid, Charles F. Non-rotating axially-paying-out ski-rope bobbin. 4,163,529, Cl. 242-85.100.

Kress, James H. Fishing lure. 4,163,337, Cl. 43-42.050.

Krohn, David A.; and Merrin, Seymour. Method of manufacturing graded index optical fibers. 4,163,654, Cl. 65-3.00A.

Kronenberg, Marvin L., to Union Carbide Corporation. Metallic reducing additives for solid cathodes for use in nonaqueous cells. 4,163,829, Cl. 429-194.000.

Kruger, Hans-Rudolf: See—

Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,163,658, Cl. 71-73.000.

Kubinski, Donald C., to Goodyear Tire & Rubber Company, The. Application of sidewall to a tire carcass. 4,163,685, Cl. 156-405.00R.

Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, to Yamanouchi Pharmaceutical Co., Ltd. Nitrogen-containing heterocyclic compounds. 4,163,844, Cl. 544-32.000.

Kuhla, Donald E., to Pfizer Inc. Imidazo[1,5-a]quinolinium and imidazo[1,5-a]pyridinium compounds. 4,163,745, Cl. 546-84.000.

Kulik, Metro D.; and Gorin, Everett, to Continental Oil Company. Process for stack gas desulfurization. 4,163,776, Cl. 423-567.000.

Kumiai Chemical Industry Co., Ltd.: See—

Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.

Kundrath, Michael R.: See—

Warren, John B.; and Kundrath, Michael R., 4,163,900, Cl. 250-439.00R.

Kunin, Viktor S.: See—

Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.

Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., to Olin Corporation. In situ reference electrode for diaphragm cells. 4,163,698, Cl. 204-1.00T.

Kupriyanov, Mikhail J.; Lapid, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E. Film cryotron. 4,164,030, Cl. 365-162.000.

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Kurrie, Hermann; and Muller, Gottfried, to Schako Metallwarenfabrik Ferdinand Schad GmbH. Slotted outlet for the ventilation of interior spaces. 4,163,416, Cl. 98-40.00R.

Kurth, Thomas C., to Corning Glass Works. Controlling the drawing rollers to produce diameter perturbations in an optical waveguide. 4,163,370, Cl. 65-2.000.

Kvam, Donald C.: See—

Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,163,659, Cl. 71-76.000.

Kwasman, Alan. Reader for hematocrit value. 4,163,615, Cl. 356-39.000.

Kwiatkowski, Joseph. Candle box. 4,163,333, Cl. 40-561.000.

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Grouard, Gerard, 4,163,448, Cl. 128-142.200.

Laass, Heinz, to TACO-Tafel GmbH. Multi-function test apparatus to test, selectively and as desired, electrical circuits, circuit components and transistors. 4,163,937, Cl. 324-57.00R.

Labaw, Clifford S.; Webb, Robert L.; and Wellman, George R., to SK&F Lab Co. Process for preparing new imidazolemethylphosphonium salts. 4,163,858, Cl. 548-342.000.

Lachaussee, Maurice, to Etalissements Lachaussee, Societe Anonyme. Automatic control apparatus for a machine having successive work stations. 4,163,930, Cl. 318-563.000.

Laflaquiere, Regis; Janousek, Rade; and Faessler, Rene, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Rotary cylinder fitted with needles or teeth for the treatment of slivers of textile fibers. 4,163,304, Cl. 19-97.000.

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Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, 4,163,391, Cl. 73-295.000.

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Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.

Lambe, John J.; and McCarthy, Shaun L., to Ford Motor Company. Solid state source of radiant energy having a controllable frequency spectra characteristic. 4,163,920, Cl. 313-503.000.

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Lange, Gerhard: See—

Schutz, Klaus; Helber, Holger; and Lange, Gerhard, 4,163,602, Cl. 358-113.000.

Langlois, Etienne: See—

Ernyei, Herbert; and Langlois, Etienne, 4,163,960, Cl. 333-198.000.

Lapir, Gennady M.: See—

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Lass, John L., to Square D Company. Electrical outlet box and wall mounting clamp therefor. 4,163,501, Cl. 220-3.600.

Lauer, Hugh C.: See—

Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.

Lauzier, Rene, to Angenieux CLB S.A. Center-pull calliper brakes for bicycles and the like. 4,163,482, Cl. 188-24.000.

Lavis, Leon J. Power saws. 4,163,404, Cl. 83-165.000.

Lawn, Francis. Methods and apparatus for charging batteries. 4,163,934, Cl. 320-23.000.

Leder, Frederic. Forced convection heat exchanger for warming articles. 4,163,471, Cl. 165-80.00E.

Lee C. Moore Corporation: See—

Jenkins, Cecil, 4,163,625, Cl. 414-22.000.

Leeds & Northrup Company: See—

Robertson, Donald, 4,163,903, Cl. 250-554.000.

Leenhouts, Albert C., to Superior Electric Company, The. Numerical control system and method for a three axes movement. 4,163,932, Cl. 318-573.000.

Legrand, Francis, to Societe Nationale Industrielle Aerospatiale. Method and apparatus for steering a spacecraft and regulating its onboard supply voltage. 4,164,018, Cl. 364-424.000.

Legras, Jean-Pierre; and Marechal, Claude M., to Eastman Kodak Company. Magnetic recording elements and process of preparation. 4,163,823, Cl. 428-304.000.

Lenaerts, George V.; and Dragunovic, Algirdas J., to Northern Telecom Limited. Molded plastic base plate for a telephone set. 4,163,874, Cl. 179-100.00R.

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Devos, Francis; Leroy, Patrick; and Huchette, Michel, 4,163,691, Cl. 435-174.000.

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Drouin, Claude, 4,163,444, Cl. 126-198.000.

Lesnick, Alan F.; and Tarjan, Peter P., to Cordis Corporation. Interactive method and digitally timed apparatus for cardiac pacing arrhythmia treatment. 4,163,451, Cl. 128-419.00P.

Levanti, August. Knife assembly. 4,163,317, Cl. 30-123.700.

Levine, Walter E., to Bindicator Company. Ultrasonic transducer with temperature stability due to selected damping materials and/or assembly methods. 4,163,917, Cl. 310-327.000.

Levy, Boris: See—

Eckert, Robert D.; Levy, Boris; and Mahoney, John B., 4,163,816, Cl. 427-401.000.

Lew, Jean S. Y., to ICI Americas Inc. Fluorinated sulfonamides. 4,163,754, Cl. 428-378.000.

Lewandowski, Joseph T.: See—

Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,163,706, Cl. 204-242.000.

Lewis/Howe Company: See—

Mitra, Arun K., 4,163,777, Cl. 424-21.000.

LGZ Landis & Gyr Zug AG: See—

Greenaway, David L., 4,163,570, Cl. 283-8.00A.

Lichtenberger, Gunter J., to Sun Oil Company, Ltd. Method and apparatus for increasing the vertical load bearing capacity of ice. 4,163,620, Cl. 405-217.000.

Liggett Group Inc.: See—

Kallianos, Andrew G.; and Simpson, Melvyn I., 4,163,453, Cl. 131-17.00R.

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Likhogub, Evgeny P.: See—

Minasov, Alexandr N.; Likhogub, Evgeny P.; and Sergeev, Stanislav S., 4,163,694, Cl. 202-139.000.

Limozin, Henri; and Dalibout, Georges, to WABCO Westinghouse. Pneumatic railway braking distributor. 4,163,587, Cl. 303-22.00R.

Lin, Yeong S.: See—

Almasi, George S.; and Lin, Yeong S., 4,164,026, Cl. 365-3.000.



- Mahoney, John B.: See—  
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- Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteau, Gerard R., to Societe Nationale des Poudres et Explosifs. Process for the preparation of polystyrylpyridine. 4,163,740, Cl. 260-31.20N.
- Malhotra, Sudarshan K.; and Ricks, Michael J., to Dow Chemical Company. The Substituted pyridine methyl esters of cyclopropane carboxylic acids and their use as insecticides. 4,163,787, Cl. 424-263.000.
- Malinski, S. W.: See—  
Mueller, Thomas L., 4,163,468, Cl. 157-1.170.
- Mamers, Heikki; and Rowney, John E., to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for explosively defibrating cellulosic fiber. 4,163,687, Cl. 162-21.000.
- Manning Environmental Corp.: See—  
Fleener, Richard P.; and Deeds, M. Rinley, 4,163,392, Cl. 73-421.00B.
- Mannor, Arden, to Carthage Cup Company. Disposable cup dispenser. 4,163,508, Cl. 221-310.000.
- Mansure, Jacob F., to Du Pont de Nemours, E. I., and Company. Process and product prepared from tetrafluoroethylene resin and graphite fibers. 4,163,742, Cl. 260-42.170.
- Marcmann, Emil. Method and apparatus for securing insulation panels to a structure to be insulated thereby. 4,163,347, Cl. 52-105.000.
- Marechal, Claude M.: See—  
Legras, Jean-Pierre; and Marechal, Claude M., 4,163,823, Cl. 428-304.000.
- Maruta, Rikio: See—  
Nishitani, Takao; and Maruta, Rikio, 4,164,021, Cl. 364-726.000.
- Marvin Glass & Associates: See—  
Jaworski, Eugene; and Breslow, Jeffrey D., 4,163,558, Cl. 273-115.000.
- Marzluf, Werner: See—  
Botsch, Bertram; and Marzluf, Werner, 4,163,636, Cl. 415-6.000.
- Marzluff, William F.: See—  
Fetchn, John A.; and Marzluff, William F., 4,163,735, Cl. 252-443.000.
- Maschinenfabrik Hellmut Geiger: See—  
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- Mashimo, Yukio: See—  
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- Masoner, Vernon W., to Lockheed Corporation. Forming of preconsolidated metal matrix composites. 4,163,380, Cl. 72-342.000.
- Matson, Charles B., to Cincinnati Milacron Inc. Grinding machine control. 4,163,346, Cl. 51-165.770.
- Matsubara, Toru: See—  
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.
- Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., to American Cyanamid Company. Processing of acrylamide solutions; concentration without polymer formation. 4,163,755, Cl. 260-561.00N.
- Matsumoto, Nobuo, to Nippon Telegraph and Telephone Public Corporation. Semiconductor laser device. 4,163,976, Cl. 331-94.50H.
- Matsuno, Takeshi; Nishiyama, Fumiya; and Kobayashi, Takeshi, to Seiko Seiki Kabushiki Kaisha. Transfer machine. 4,163,313, Cl. 29-563.000.
- Matsushita Electric Industrial Co., Ltd.: See—  
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.
- Matsushita Electric Works, Ltd.: See—  
Sauer, Hans, 4,163,314, Cl. 29-593.000.
- Matthews, Francis T.; and Bozzuto, Carl R., to Combustion Engineering, Inc. Vapor generator and MHD power plant. 4,163,910, Cl. 310-11.000.
- Maulden, Kerry A.: See—  
Burkhart, L. Elkin; Fultz, Chester R.; and Maulden, Kerry A., 4,163,516, Cl. 228-114.000.
- Mauri, Jacinto M.; Vega-Noverola, Armando; and Spickett, Robert G. W., to Anphar, S.A. Anti-psychotic (cycloalkenylalkylpiperidino) benzamides. 4,163,789, Cl. 424-267.000.
- Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.: See—  
Eibl, Hansjorg; and Nicksch, Alf, 4,163,748, Cl. 260-403.000.
- Mayer, Robert W.; and Smorzaniuk, Adam, to Amerace Corporation. Selector switch. 4,163,879, Cl. 200-11.0TW.
- Mazziotti, Philip J.: See—  
Guenther, William D.; and Mazziotti, Philip J., 4,163,438, Cl. 123-190.00A.
- McAvinn, James D.; and Patel, Harish A., to Kendall Company, The. Wet dressing heating system. 4,163,896, Cl. 219-525.000.
- McCarroll, John J.: See—  
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tension, Stephen R., 4,163,775, Cl. 423-363.000.
- McCartan, Daniel A.: See—  
Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,163,353, Cl. 53-430.000.
- McCarthy, Shaun L.: See—  
Lambe, John J.; and McCarthy, Shaun L., 4,163,920, Cl. 313-503.000.
- McCumber, Donald D. Pivotal trailer hitch. 4,163,568, Cl. 280-491.00B.
- McDonough, Edward C.; and Tuley, Eugene N., to United States of America, Air Force. Turbine vane construction. 4,163,629, Cl. 415-115.000.
- McEwen, William D. Pharmacist's prescription file holder. 4,163,497, Cl. 211-11.000.
- McGarry, Errol J.; and Forsyth, Bruce A., to ICI Australia Limited. Treatment of animals with 2,6-bis(2-hydroxybenzyl)phenols to eradicate trematodes. 4,163,801, Cl. 424-347.000.
- McGinnis, William J., Jr.: See—  
Bonnie, G. Patrick; and McGinnis, William J., Jr., 4,164,027, Cl. 365-15.000.
- McGinniss, Vincent D.; Ting, Vincent W.; and Kah, Ann F., to SCM Corporation. Radiation polymerization of polymeric binder coating compositions. 4,163,809, Cl. 427-44.000.
- McGinniss, Vincent D., to SCM Corporation. Ultraviolet curable powder paints. 4,163,810, Cl. 427-54.000.
- McKinnon, Robert M., to D/FW Plastics, Inc. Lid and housing. 4,163,503, Cl. 220-18.000.
- McLellan, Norvel J. Moving target practice range. 4,163,557, Cl. 273-101.100.
- Medlar, Lewis A.; and Newbold, William F., to Honeywell Inc. Pressure transmitter with simplified pressure sensing head. 4,163,395, Cl. 73-708.000.
- Meili, Max, to AG fur Automatisierung. Arrangement for the grinding of rotary profile cutters. 4,163,345, Cl. 51-33.00W.
- Meissner, Wolfgang: See—  
Mahler, Gert; Viertel, Lothar; and Meissner, Wolfgang, 4,163,579, Cl. 296-97.00H.
- Melliard-Smith, Peter M.: See—  
Randell, Brian; Kerr, Ronald; Melliard-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.
- Mendel, Arthur: See—  
Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,163,659, Cl. 71-76.000.
- Mercer, Gerald D.: See—  
Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,163,733, Cl. 252-180.000.
- Merck & Co., Inc.: See—  
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,163,781, Cl. 424-200.000.
- Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,163,794, Cl. 424-285.000.
- Jackman, Kristina R., 4,163,807, Cl. 426-599.000.
- Lumma, William C., Jr.; Saari, Walfrid S.; and Zaccchi, Anthony G., 4,163,849, Cl. 544-357.000.
- Merrin, Seymour: See—  
Krohn, David A.; and Merrin, Seymour, 4,163,654, Cl. 65-3.00A.
- Merten, Rudolf: See—  
Giesecke, Henning; Hoeker, Jurgen; and Merten, Rudolf, 4,163,857, Cl. 548-318.000.
- Messerschmitt-Bolkow-Blohm GmbH: See—  
Bschorr, Oskar, 4,163,479, Cl. 181-286.000.
- Weiland, Emil, 4,163,630, Cl. 416-134.00A.
- Metallgesellschaft Aktiengesellschaft: See—  
Papendick, Klaus; and Peter, Lothar, 4,163,307, Cl. 29-25.190.
- Meyer Morton Co.: See—  
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,163,626, Cl. 414-469.000.
- Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., to Beatrice Foods Co. Thermoplastic composition derived from animal parts and methods for production thereof. 4,163,804, Cl. 426-315.000.
- Meyer, Roth & Pastor Maschinenfabrik GmbH: See—  
Windelband, Herbert; and Ditzes, Gunter, 4,163,363, Cl. 59-27.000.
- Meyer, Stanley M.: See—  
Miller, Garry E.; and Dalke, Michael, 4,164,008, Cl. 362-103.000.
- Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, to Ciba-Geigy Corporation. Insecticidal oxadiazole esters. 4,163,792, Cl. 424-272.000.
- Michaels of Oregon Co.: See—  
Ives, Robert K., 4,163,335, Cl. 42-83.000.
- Michaux, Jean-Pierre, to Compagnie Francaise de Raffinage. Process for obtaining isobutylene of a purity higher than 99.5 weight percent. 4,163,697, Cl. 203-49.000.
- MicroVue Products Inc.: See—  
Hall, Peter J., 4,163,611, Cl. 353-101.000.
- Midden, William E.: See—  
Krenzer, Orville; Midden, William E.; and Schmid, Charles F., 4,163,529, Cl. 242-85.100.
- Mikado, Tsuneo, to Nippon Television Industry Corporation. Television time signal generator. 4,163,361, Cl. 58-50.00R.
- Mikami, Takeshi: See—  
Inoue, Atsuo; and Mikami, Takeshi, 4,163,671, Cl. 96-74.000.
- Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, to Matsushita Electric Industrial Co., Ltd. Radio receiver employing premixing and digital display. 4,163,943, Cl. 325-433.000.
- Milberger, Ernest C.: See—  
Dolhy, Serge R.; and Milberger, Ernest C., 4,163,862, Cl. 562-534.000.
- Miller, Benson L.; and Helesfai, Steven, to Sargent & Greenleaf, Inc. Tumbler wheel combination locks with torque adjuster means. 4,163,376, Cl. 70-303.00A.
- Miller, Garry E.; and Dalke, Michael, to Meyer, Stanley M.; and Schwartz, Barbara, part interest to each. Illuminated article of clothing. 4,164,008, Cl. 362-103.000.

- Miller, Imrich; and Freimuth, Lothar, to Universal Manufacturing Corporation. Coil winding apparatus. 4,163,531, Cl. 242-158.00R.
- Milo, August, to Universal Valve Co., Inc. Test plug. 4,163,462, Cl. 138-90.000.
- Minasov, Alexandr N.; Likhogub, Evgeny P.; and Sergeev, Stanislav S. Heating wall for coke ovens. 4,163,694, Cl. 202-139.000.
- Mini, Joseph R.: See—  
Morin, John O.; and Mini, Joseph R., 4,163,971, Cl. 340-754.000.
- Minnesota Mining and Manufacturing Company: See—  
Aysta, James E.; and Goff, Dewain R., 4,163,596, Cl. 339-97.00P.
- Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,163,659, Cl. 71-76.000.
- Patterson, Richard A., 4,163,506, Cl. 220-260.000.
- Wear, Robert L., 4,163,834, Cl. 525-534.000.
- Minolta Camera Kabushiki Kaisha: See—  
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,163,612, Cl. 354-152.000.
- Misinchuk, Peter D. Electrical dimmer plug. 4,163,965, Cl. 338-220.000.
- Mitra, Arun K., to Lewis/Howe Company. Controlled antacid delivery form and method of treatment therewith. 4,163,777, Cl. 424-21.000.
- Mitsubishi Gas Chemical Company, Inc.: See—  
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.
- Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—  
Tsukamoto, Yutaka; and Takamiya, Bonnosuke, 4,163,434, Cl. 123-119.00D.
- Mitsubishi Paper Mills, Ltd.: See—  
Kanada, Eiji; Itoh, Noboru; Ikeda, Hiroshi; and Iwata, Tamotsu, 4,163,669, Cl. 96-74.000.
- Mitsui Engineering & Shipbuilding Co., Ltd.: See—  
Shirato, Takeshi; and Teshima, Kiyomi, 4,163,364, Cl. 60-39.020.
- Mitsui-Nisso Corporation: See—  
Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, 4,163,814, Cl. 427-372.00R.
- Miyakawa Industry Company, Limited: See—  
Kitagawa, Toshikatsu, 4,163,623, Cl. 408-46.000.
- Miyake, Masayoshi: See—  
Kawaguchi, Munetaka; and Miyake, Masayoshi, 4,163,826, Cl. 428-371.000.
- Miyamoto, Takayoshi: See—  
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,163,612, Cl. 354-152.000.
- Miyashita, Masanori: See—  
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.
- Miyazaki, Kunio: See—  
Yamada, Youji; Miyazaki, Kunio; and Hamane, Masumi, 4,163,399, Cl. 74-700.000.
- Miyazaki, Teruko U.: See—  
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.
- Mizumura, Motoo: See—  
Aihara, Shigenobu; Haga, Isao; and Mizumura, Motoo, 4,163,951, Cl. 331-1.00A.
- Mizutani, Ituro: See—  
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
- Moczygomba, George A., to Phillips Petroleum Company. Polymeric compositions. 4,163,765, Cl. 525-314.000.
- Mohacsi, Ernest, to Hoffmann-La Roche Inc. 1-(P-phenoxy)benzyl-1,2,3,4,5,6,7,8-octahydroisoquinolines. 4,163,853, Cl. 546-149.000.
- Molitorisz, Joseph. Rotary compacting machine for fibrous material. 4,163,419, Cl. 100-89.000.
- Monarch Marking Systems, Inc.: See—  
Hamisch, Paul H., Jr., 4,163,422, Cl. 101-111.000.
- Monneraye, Marc A.; and Monnier, Michel J. C., to U.S. Philips Corporation. Method of manufacturing a lead-through of a metal element through a ceramic component by means of sealing. 4,163,656, Cl. 65-43.000.
- Monnier, Michel J. C.: See—  
Monneraye, Marc A.; and Monnier, Michel J. C., 4,163,656, Cl. 65-43.000.
- Monsanto Company: See—  
Yung, Kai-Lim W.; and Silverman, Bernard, 4,163,819, Cl. 428-198.000.
- Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., to United States of America, Navy. Method for disposing of red phosphorus composition. 4,163,682, Cl. 149-108.400.
- Moore, James O., to Moore Products Co. Calibrating device for control stations and indicators. 4,163,938, Cl. 324-74.000.
- Moore Products Co.: See—  
Moore, James O., 4,163,938, Cl. 324-74.000.
- Moore, Stanley R.; Crisman, Thomas L.; and Zivney, Donald R., to Freeze Sleeves of America, Inc. Refrigeratable beverage container holder. 4,163,374, Cl. 62-457.000.
- Moreau, Marc, to Trefimetaux. Continuous hydrostatic extrusion process and apparatus. 4,163,377, Cl. 72-60.000.
- Morin, John O.; and Mini, Joseph R., to Sigma Instruments Inc. Systems for displaying analog values. 4,163,971, Cl. 340-754.000.
- Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, to Eisai Co., Ltd. Process for preparing 2-methyl-2-prenyl-4,5,6-trimethoxyphenol. 4,163,864, Cl. 568-628.000.
- Morita, Yukio: See—  
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.
- Morris AG: See—  
Hagmann, Peter; and Muller, Ernst, 4,163,316, Cl. 30-47.000.
- Morris, John C.; Weidman, James K.; and Prior, Michael D. Apparatus for applying granular refractory material to surfaces. 4,163,546, Cl. 266-281.000.
- Morrison, Bertram L.: See—  
Fowler, James M.; and Morrison, Bertram L., 4,163,544, Cl. 251-328.000.
- Morrison, Cameron E.: See—  
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.
- Motor Wheel Corporation: See—  
Snyder, Robert C., 4,163,586, Cl. 303-20.000.
- Motorola, Inc.: See—  
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- Price, John J., 4,163,908, Cl. 307-296.00R.
- Mounce, George R. Rodent repellor. 4,163,966, Cl. 340-15.000.
- Mourgue, Pascal N., to Societe Anonyme des Ateliers Marcadet Mobilier. Bearer structure for assembling modular elements. 4,163,537, Cl. 248-188.100.
- Muanyagipari Kutato Intezet: See—  
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- Mueller, Hans, to PEC Process Engineering Company SA. Apparatus for the biological purification of waste water. 4,163,720, Cl. 210-197.000.
- Mueller, Richard A., to SCM Corporation. Reconstituted food product. 4,163,805, Cl. 426-575.000.
- Mueller, Thomas L., to Malinski, S. W. Pivoted suspension for linear actuators of tire changing apparatus and the like. 4,163,468, Cl. 157-1.170.
- Mullaney, John J., to Sealol, Inc. Rotary bellows seal with vibration-damping means. 4,163,563, Cl. 277-88.000.
- Muller, Ernst: See—  
Hagmann, Peter; and Muller, Ernst, 4,163,316, Cl. 30-47.000.
- Muller, Gottfried: See—  
Kurrle, Hermann; and Muller, Gottfried, 4,163,416, Cl. 98-40.00R.
- Muller, Hans; and Sotirianos, Konstantin, to Chemap AG. Pressure filter and process for cleaning it. 4,163,724, Cl. 210-323.00T.
- Muller, Peter: See—  
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.
- Multimould Enterprises Pty. Ltd.: See—  
Thelander, Keith, 4,163,418, Cl. 99-374.000.
- Munch, Robert J.: See—  
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- Murakami, Kyoichi: See—  
Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, 4,163,989, Cl. 358-27.000.
- Muraoka, Teruo: See—  
Ishigaki, Yukinobu; and Muraoka, Teruo, 4,163,945, Cl. 325-473.000.
- Murase, Ichiki: See—  
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- Murata Kikai Kabushiki Kaisha: See—  
Honjo, Takeshige, 4,163,359, Cl. 57-93.000.
- Murata, Moriyasu: See—  
Sai, Fumio; and Murata, Moriyasu, 4,163,732, Cl. 252-99.000.
- Murata, Yasuyuki, to Electroplating Engineers of Japan, Ltd. Apparatus for selectively plating rectangular sheet continuously or intermittently. 4,163,704, Cl. 204-206.000.
- Musaph, Freddy W. X-ray apparatus comprising beam shaping restrictor plate having key-shaped gap. 4,163,902, Cl. 250-482.000.
- Musashisemitsukoguo Kabushiki Kaisha: See—  
Nemoto, Akira, 4,163,617, Cl. 403-132.000.
- Myers, Herman L., to Raytheon Company. Internally vane tube construction. 4,163,921, Cl. 315-39.510.
- Nabors, James B.: See—  
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- Nachtigal, Paul. Combination calculator and time billing device. 4,164,038, Cl. 364-705.000.
- Nagae, Yoshio; and Utsumi, Takashi, to Oxy Metal Industries Corporation. Aluminum treatment with alkaline solution and tannin. 4,163,679, Cl. 148-6.270.
- Nagai, Hiroyoshi: See—  
Terai, Kiyohide; and Nagai, Hiroyoshi, 4,163,890, Cl. 219-121.0EB.
- Naito, Shouzo: See—  
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.
- Nakajima, Yasuo; Kuroda, Hiroshi; and Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,163,435, Cl. 123-119.00A.
- Nakano, Jiro: See—  
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,164,032, Cl. 364-431.000.
- Nannini, Giorgio. Auxiliary lenses unit for glasses. 4,163,607, Cl. 351-47.000.



- Nash, David D., to Durapipe Limited. Pipe couplings. 4,163,571, Cl. 285-106.000.
- Nash, Larry L., to Phillips Petroleum Company. Coupled block copolymers with improved tack for adhesives. 4,163,764, Cl. 525-2.000.
- National Petro Chemicals Corporation: See—  
Romano, Giuliano; and Rismondo, Michael A., 4,163,723, Cl. 210-319.000.
- National Research Development Corporation: See—  
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- Hunter, William M.; and Lock, John D., 4,163,643, Cl. 23-230.00R.
- Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.
- Nayland, William R., to Burroughs Corporation. Apparatus and method for detecting non-alignment of a magnetic head with respect to a recording track on a record medium. 4,163,995, Cl. 360-76.000.
- NCR Corporation: See—  
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.
- Neeffe, Charles W. Hydratable gas permeable methyl methacrylate copolymer. 4,163,608, Cl. 351-160.00H.
- Neeffe, Charles W. Self cleaning contact lens. 4,163,609, Cl. 351-160.00H.
- Neff, Rutger: See—  
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- Neese, Wayne E., to GTE Automatic Electric Laboratories Incorporated. Method for forming universal film resistors. 4,163,315, Cl. 29-620.000.
- Neff, Josef. Apparatus for resurfacing a snow layer. 4,163,329, Cl. 37-10.000.
- Nelson, George H., to George Nelson & Company. Furniture units with L-shaped panel supports. 4,163,592, Cl. 312-194.000.
- Nemoto, Akira, to Musashisemitsukoguo Kabushikikaisha. Ball joint. 4,163,617, Cl. 403-132.000.
- Nesterov, Valentin N.: See—  
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.
- Neumann, Arthur E.: See—  
Rumer, David O., Jr.; Findlay, Donald J.; Neumann, Arthur E.; and del Castillo, Juan M., 4,163,409, Cl. 84-484.000.
- Neumann, Siegmund R. Heat recovery and filter system and process for furnace exhaust gases. 4,163,430, Cl. 122-20.00B.
- Neumark, Otto W., to Beaufort Air Sea Equipment Limited. Mattress. 4,163,297, Cl. 5-446.000.
- Neveux, Rene E., to Societe Anonyme Francaise du Ferodo. Ventilation device. 4,163,415, Cl. 98-2.090.
- Newbold, William F.: See—  
Medlar, Lewis A.; and Newbold, William F., 4,163,395, Cl. 73-708.000.
- NGK Insulators, Ltd.: See—  
Higuchi, Noboru; and Futamura, Shoji, 4,163,640, Cl. 425-466.000.
- Nicksch, Alf: See—  
Eibl, Hansjorg; and Nicksch, Alf, 4,163,748, Cl. 260-403.000.
- Nieman, John R.; and Sanders, S. David, to Caterpillar Tractor Co. Method of making a wrapped inoculation rod suitable for modifying the composition of molten metals. 4,163,827, Cl. 428-377.000.
- Niemand Bros., Inc.: See—  
Kappler, Hermann; and Chezek, Norman A., 4,163,517, Cl. 229-45.000.
- Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., to Allied Chemical Corporation. Adhesive bonding of metallic glass fabric. 4,163,821, Cl. 428-245.000.
- Ninomiya, Shuichi: See—  
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.
- Nippon Electric Co., Ltd.: See—  
Aihara, Shigenobu; Haga, Isao; and Mizumura, Motoo, 4,163,951, Cl. 331-1.00A.
- Inaba, Masao; and Kashigi, Kazuo, 4,163,992, Cl. 358-183.000.
- Nishitani, Takao; and Maruta, Rikio, 4,164,021, Cl. 364-726.000.
- Nippon Electronics Memory Industry Co., Ltd.: See—  
Shimamura, Hironori, 4,163,906, Cl. 307-39.000.
- Nippon Kogaku K.K.: See—  
Hasegawa, Hiroshi; and Goto, Tetsuro, 4,163,924, Cl. 315-241.00P.
- Tsunashima, Teruyoshi, 4,163,603, Cl. 350-214.000.
- Nippon Oil Company, Limited: See—  
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.
- Nippon Piston Ring Kabushiki Kaisha: See—  
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.
- Nippon Telegraph and Telephone Public Corporation: See—  
Matsumoto, Nobuo, 4,163,976, Cl. 331-94.50H.
- Nippon Television Industry Corporation: See—  
Mikado, Tsuneo, 4,163,361, Cl. 58-50.00R.
- Nishikawa, Kohji: See—  
Baba, Takashi; Kawaguchi, Hiroshi; and Nishikawa, Kohji, 4,163,483, Cl. 188-71.800.
- Nishina, Shuho: See—  
Kondo, Yutaka; and Nishina, Shuho, 4,163,530, Cl. 242-107.100.
- Nishitani, Takao; and Maruta, Rikio, to Nippon Electric Co., Ltd. 2M-point discrete Fourier transform calculator comprising a pre-processor for twice performing extraction of conjugate symmetric and/or antisymmetric components. 4,164,021, Cl. 364-726.000.
- Nishiyama, Fumiya: See—  
Matsuno, Takeshi; Nishiyama, Fumiya; and Kobayashi, Takeshi, 4,163,313, Cl. 29-563.000.
- Nissan Motor Company, Limited: See—  
Fujishiro, Takeshi, 4,163,433, Cl. 123-119.0EC.
- Ishikawa, Masao, 4,163,428, Cl. 116-288.000.
- Nakajima, Yasuo; Kuroda, Hiroshi; and Hayashi, Yoshimasa, 4,163,435, Cl. 123-119.00A.
- Suzuki, Suzuo, 4,163,389, Cl. 73-194.00F.
- Niwa, Masatake: See—  
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,163,612, Cl. 354-152.000.
- Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control device for vehicle braking systems. 4,163,588, Cl. 303-24.00C.
- Nogradi, Mihaly: See—  
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.
- Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Computer control of an exhaust gas recirculation device for an internal combustion engine. 4,164,032, Cl. 364-431.000.
- Nomura, Osamu: See—  
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouto, 4,163,385, Cl. 73-35.000.
- Northern Telecom Limited: See—  
Cogan, Fredrick T., 4,163,875, Cl. 179-103.000.
- Dupuis, Jean M., 4,163,487, Cl. 198-383.000.
- Lenaerts, George V.; and Dragancic, Algirdas J., 4,163,874, Cl. 179-100.00R.
- Springthorpe, Anthony J.; and Dymont, John C., 4,163,953, Cl. 331-94.50H.
- Norton Company: See—  
Swiatek, Henry J., 4,163,647, Cl. 51-295.000.
- Norwalt, Robert H.; Hibbert, Edward R.; and Schiff, Vicki L., to Sega Corporation. Slot car game with spin-out recovery capability. 4,163,555, Cl. 273-86.00B.
- Notaras, Angelo L.: See—  
Notaras, John A.; Notaras, Angelo L.; and Williams, James P., 4,163,437, Cl. 123-148.00E.
- Notaras, John A.; Notaras, Angelo L.; and Williams, James P., to Solo Industries Pty. Limited. Transistor ignition circuit. 4,163,437, Cl. 123-148.00E.
- November, Milton H., to International Telephone and Telegraph Corporation. Calorimeter. 4,163,388, Cl. 73-190.0CV.
- Nuss, George W., Jr.: See—  
Klein, Robert W.; and Nuss, George W., Jr., 4,163,783, Cl. 424-245.000.
- Nystrand, Ernst D., to Paper Converting Machine Company. Method of lapping webs and product. 4,163,548, Cl. 270-39.000.
- O'Brien, Merrill N., Jr., to Teepak, Inc. Oxazoline wax impregnated sausage casing. 4,163,463, Cl. 138-118.100.
- Occidental Oil Shale, Inc.: See—  
Cha, Chang Y.; and Bartel, William J., 4,163,475, Cl. 166-251.000.
- Occidental Petroleum Corporation: See—  
Green, Norman W., 4,163,693, Cl. 201-22.000.
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- Ohnuki, Nobutaka, to Hitachi, Ltd. Electro-acoustic transducer with variable thickness foam surfaced diaphragm. 4,163,876, Cl. 179-115.50R.
- Oil-Dri Corporation of America: See—  
Been, Karl, 4,163,674, Cl. 106-15.050.
- Okumura, Akio: See—  
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.
- Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including alphanumeric display means. 4,164,019, Cl. 364-710.000.
- Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including a key for performing either a subtraction or a unary minus function. 4,164,039, Cl. 364-709.000.
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Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.
- Olshansky, Robert, to Corning Glass Works. Multimode waveguide with enhanced coupling with guided modes. 4,163,601, Cl. 350-96.310.
- Olympus Optical Company Ltd.: See—  
Kobayashi, Minoru, 4,163,916, Cl. 310-246.000.
- Omae, Tsutomu; and Sakai, Keiziro, to Hitachi, Ltd. Control apparatus for an automatic pipe welder. 4,163,886, Cl. 219-60.00A.
- O'Neill, Donald C. Highway safety device. 4,163,426, Cl. 116-28.00R.
- O'Neill, Michael J.: See—  
Schnittger, Bradley J.; and O'Neill, Michael J., 4,163,627, Cl. 414-686.000.

- Ono, Kazuyoshi: See—  
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
- Origin Electric Co., Ltd.: See—  
Komatsu, Akio; and Inaba, Masaharu, 4,163,891, Cl. 219-121.00P.
- Orr, Thomas. Heartbeat rate monitor. 4,163,447, Cl. 128-666.000.
- Osaki, Naoto: See—  
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- Ostermiller, Joseph. Cattle guard. 4,163,545, Cl. 256-17.000.
- Oswald, Alexis A., to Exxon Research & Engineering Co. Polythioethers formed by anionic ring opening of episulfides. 4,163,832, Cl. 528-76.000.
- Ouaknine, Gilbert. Dental occluder. 4,163,319, Cl. 32-32.000.
- Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Fuel oils containing N,N-substituted diamines. 4,163,646, Cl. 44-73.000.
- Outlaw, Benjamin T.: See—  
Redmore, Derek; and Outlaw, Benjamin T., 4,163,771, Cl. 422-16.000.
- Owen, Charles. Air-to-air heat pump. 4,163,369, Cl. 62-2.000.
- Owens-Corning Fiberglass Corporation: See—  
Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,163,353, Cl. 53-430.000.
- Symborski, Alex P.; Fulmer, Ray M.; and Thomas, David W., 4,163,653, Cl. 65-2.000.
- Owens-Illinois, Inc.: See—  
Elser, William F., 4,163,504, Cl. 220-66.000.
- Oxy Metal Industries Corporation: See—  
Nagae, Yoshio; and Utsumi, Takashi, 4,163,679, Cl. 148-6.270.
- P. Ferrero & C. S.p.A.: See—  
Dogliotti, Amleone, 4,163,496, Cl. 206-538.000.
- Pako Corporation: See—  
Diesch, Robert E.; and Strunc, Gerald R., 4,163,405, Cl. 83-371.000.
- Papendick, Klaus; and Peter, Lothar, to Metallgesellschaft Aktien-gesellschaft. Device for tensioning corona-discharge electrode elements. 4,163,307, Cl. 29-25.190.
- Paper Converting Machine Company: See—  
Nystrand, Ernst D., 4,163,548, Cl. 270-39.000.
- Papp, Gyula: See—  
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.
- Papsdorf, John W.: See—  
MacDonald, Robert D.; Rose, Robert K.; and Papsdorf, John W., 4,163,474, Cl. 165-179.000.
- Parcor: See—  
Ferrand, Gerard; and Maffrand, Jean-Pierre, 4,163,852, Cl. 546-114.000.
- Pardes, Herman I.: See—  
Sherburne, Frederick B.; Pardes, Herman I.; and Hughes, Edward S., 4,163,328, Cl. 35-25.000.
- Partes, Gunther, to Intertech Zeichengerate Gunther Partes KG. Compass with fine adjustment. 4,163,322, Cl. 33-27.00B.
- Patel, Harish A.: See—  
McAvin, James D.; and Patel, Harish A., 4,163,896, Cl. 219-525.000.
- Patnaude, Edmond J. Speed compensating control system. 4,164,001, Cl. 361-236.000.
- Patterson, David D. Toilet facility. 4,163,294, Cl. 4-111.000.
- Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., to Texaco Inc. Styrene process. 4,163,761, Cl. 585-431.000.
- Patterson, Marvin L.; Haselby, Robert D.; and Kendig, Albert P., to Hewlett-Packard Company. Open-loop electric drive with corrective controller. 4,163,928, Cl. 318-573.000.
- Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Closure assembly having a tear template. 4,163,506, Cl. 220-260.000.
- Pearson, Durk J.; and Bohn, Jack R., to TRW Inc. Pressure swing recovery system for mineral deposits. 4,163,580, Cl. 299-5.000.
- Pearson, Kenneth R., to Alumax Mill Products, Inc. Aluminum alloy containing manganese and copper and products made therefrom. 4,163,665, Cl. 75-143.000.
- PEC Process Engineering Company SA: See—  
Mueller, Hans, 4,163,720, Cl. 210-197.000.
- Pera, John D.: See—  
Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,163,733, Cl. 252-180.000.
- Percival, Albert; and Judson, Philip N., to Fisons Limited. Substituted pyrazolopyrimidine compounds. 4,163,846, Cl. 544-262.000.
- Peter, Lothar: See—  
Papendick, Klaus; and Peter, Lothar, 4,163,307, Cl. 29-25.190.
- Peterson, Stanley O., to Preway, Inc. Latch mechanism for an oven door. 4,163,443, Cl. 126-197.000.
- Petrolite Corporation: See—  
Cheng, William J.; and Guthrie, David B., 4,163,728, Cl. 252-18.000.
- Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,163,646, Cl. 44-73.000.
- Redmore, Derek; and Outlaw, Benjamin T., 4,163,771, Cl. 422-16.000.
- Redmore, Derek, 4,163,850, Cl. 546-21.000.
- Pfizer Inc.: See—  
Holland, Gerald F., 4,163,784, Cl. 424-246.000.
- Kuhla, Donald E., 4,163,745, Cl. 546-84.000.
- Pfleiderer, Hans-Joerg: See—  
Knauer, Karl; Schlichte, Max; and Pfeiderer, Hans-Joerg, 4,163,957, Cl. 333-165.000.
- Phelps, Robert J., to Telephonic Equipment Corporation. Telephone solid state ringer. 4,163,873, Cl. 179-84.00T.
- Philadelphia Gear Corporation: See—  
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.
- Philagro: See—  
Thizy, Andre; and Debourge, Jean-Claude, 4,163,782, Cl. 424-217.000.
- Philip Morris Incorporated: See—  
Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., 4,163,856, Cl. 546-329.000.
- Secor, Henry V.; and Edwards, William B., III, 4,163,855, Cl. 546-329.000.
- Phillips Petroleum Company: See—  
Archerd, Paul H., 4,163,695, Cl. 203-18.000.
- Moczygamba, George A., 4,163,765, Cl. 525-314.000.
- Nash, Larry L., 4,163,764, Cl. 525-2.000.
- Rush, Elton E., 4,163,837, Cl. 528-498.000.
- Phillips, William D.: See—  
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Cluble, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.
- Piesch, Steffen, to Cassella Aktiengesellschaft. Preparation of electrolyte-free aminoplast resins. 4,163,835, Cl. 528-254.000.
- Pilot Ink Co., Ltd.: See—  
Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, 4,163,675, Cl. 106-22.000.
- Pine State Creamery Company: See—  
Redfern, Robert B.; and Rizk, Samir F., 4,163,802, Cl. 426-43.000.
- Pivawer, Philip M., to Diaz Chemical Corporation. Process for the simultaneous preparation of aromatic acid chlorides and aliphatic acid chlorides. 4,163,753, Cl. 260-544.00D.
- Plugge, Jay S.; and Hammer, Eugene S., to General Electric Company. Detachable high voltage connection. 4,163,599, Cl. 339-115.00C.
- Pociask, Joseph R.: See—  
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.
- Polaroid Corporation: See—  
Eckert, Robert D.; Levy, Boris; and Mahoney, John B., 4,163,816, Cl. 427-401.000.
- Polstorff, Jurgen K. Double loop receiver-transmitter combination. 4,163,977, Cl. 343-112.00R.
- Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, to Brigham Young University. High thermal conductivity substrate. 4,163,769, Cl. 264-42.000.
- Porosoff, Harold, to American Cyanamid Company. Melt-spinning acrylonitrile polymer fibers. 4,163,770, Cl. 264-210.300.
- Porter, Ralph D., to Towmotor Corporation. Fluid cylinder control with precision stop action. 4,163,412, Cl. 91-451.000.
- Powers, Harold C., to Caterpillar Tractor Co. Fuel pump plunger. 4,163,634, Cl. 417-499.000.
- Prem, Dorothy C.: See—  
Duke, June T.; and Prem, Dorothy C., 4,163,766, Cl. 525-230.000.
- Preway, Inc.: See—  
Peterson, Stanley O., 4,163,443, Cl. 126-197.000.
- Price, John J., to Motorola, Inc. Bias circuit for complementary transistors. 4,163,908, Cl. 307-296.00R.
- Priestley, Timothy M.: See—  
Bird, Alfred J.; Priestley, Timothy M.; and Winterbottom, John M., 4,163,750, Cl. 260-409.000.
- Prior, Michael D.: See—  
Morris, John C.; Weidman, James K.; and Prior, Michael D., 4,163,546, Cl. 266-281.000.
- Proakis, Anthony G.: See—  
Franko, Bernard V.; and Proakis, Anthony G., 4,163,790, Cl. 424-267.000.
- Procter & Gamble Company, The: See—  
Amneus, John S., 4,163,509, Cl. 222-95.000.
- Wickett, Richard R.; and Kock, William R., 4,163,800, Cl. 424-326.000.
- Profera, Charles E., to RCA Corporation. Antenna feed system. 4,163,974, Cl. 343-16.00M.
- PROTEC Processi e Tecnologie S.p.A.: See—  
Ugo, Renato, 4,163,664, Cl. 75-108.000.
- Pucel, Robert A., to Raytheon Company. Field effect transistor. 4,163,984, Cl. 357-22.000.
- Pullman Inc.: See—  
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Brewerton, David, 4,163,940, Cl. 324-132.000.



- Race Research, Inc.: See—  
Wilkinson, Richard L., 4,163,431, Cl. 123-118.000.
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- Rainer Isolierrohrfabrik Max Drossbach: See—  
Fales, David E., 4,163,619, Cl. 405-49.000.
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Hegemann, Kenneth J., 4,163,459, Cl. 137-344.000.
- Ramunas, Valdas S., to Acme-Cleveland Corporation. Adjustable stock feed. 4,163,514, Cl. 226-141.000.
- Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., to National Research Development Corporation. Computer systems. 4,164,017, Cl. 364-200.000.
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Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.
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Delattre, Jacques; Raynaud, Roland; and Thomas, Claude, 4,163,860, Cl. 560-96.000.
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Myers, Herman L., 4,163,921, Cl. 315-39.510.
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Carlson, David E.; and Wronski, Christopher R., 4,163,677, Cl. 136-89.0TF.
- Profera, Charles E., 4,163,974, Cl. 343-16.00M.
- Willis, Donald H., 4,163,926, Cl. 315-408.000.
- Woodward, Oakley M., 4,163,961, Cl. 333-261.000.
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- Redmore, Derek; and Outlaw, Benjamin T., to Petrolite Corporation. Hydroxyalkylaminoalkylamides as corrosion inhibitors for metals in an aqueous brine environment. 4,163,771, Cl. 422-16.000.
- Redmore, Derek, to Petrolite Corporation. Polycyclic full quaternary nitrogen-heterocyclic phosphonates. 4,163,850, Cl. 546-21.000.
- Regal, Robert A. Enuresis treatment device. 4,163,449, Cl. 128-138.00A.
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Burk, George A.; and Reineke, Charles E., 4,163,797, Cl. 424-304.000.
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Wasserman, Harry H.; and Tremper, Alan W., 4,163,743, Cl. 260-239.00A.
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Acampora, Anthony; Reudink, Douglas O.; and Yeh, Yu S., 4,163,942, Cl. 325-52.000.
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Yeh, Keming W.; and Reuter, James L., 4,163,988, Cl. 357-55.000.
- Rexnord Inc.: See—  
Timm, Ulrich, 4,163,490, Cl. 198-531.000.
- Rheinische Braunkohlenwerke AG: See—  
Velling, Gunter; and Ruddeck, Wolfhard, 4,163,464, Cl. 141-198.000.
- Rhone-Poulenc-Textile: See—  
Delattre, Jacques; Raynaud, Roland; and Thomas, Claude, 4,163,860, Cl. 560-96.000.
- Richter Gedeon Vegyeszeti Gyar RT: See—  
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.
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Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,163,719, Cl. 210-84.000.
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- Rickert, Milton E., Jr., to General Electric Company. Process for rendering surfaces permanently water wettable and novel product thus-produced. 4,163,702, Cl. 204-181.00T.
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Malhotra, Sudarshan K.; and Ricks, Michael J., 4,163,787, Cl. 424-263.000.
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Romano, Giuliano; and Rismondo, Michael A., 4,163,723, Cl. 210-319.000.
- Rivkin, Boris S.: See—  
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshvoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.
- Rivron, Maurice: See—  
Guilhem, Robert; Rivron, Maurice; and Weulersse, Bruno, 4,163,975, Cl. 343-16.00M.
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Redfern, Robert B.; and Rizk, Samir F., 4,163,802, Cl. 426-43.000.
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Kartanson, John M., 4,163,684, Cl. 156-259.000.
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Robbins, Robert J.; and Robbins, Desmond W., 4,163,356, Cl. 56-328.00R.
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Hertfelder, Wilhelm, 4,163,432, Cl. 123-102.000.
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Corver, Hans A.; and Robertson, Allan J., 4,163,820, Cl. 428-212.000.
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Hayes, Cecil L., 4,163,954, Cl. 332-7.510.
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Bowers, Wayne E., 4,163,644, Cl. 44-51.000.
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Illuminati, Gabriello; and Romano, Ugo, 4,163,861, Cl. 560-132.000.
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Devos, Francis; Leroy, Patrick; and Huchette, Michel, 4,163,691, Cl. 435-174.000.
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MacDonald, Robert D.; Rose, Robert K.; and Papsdorf, John W., 4,163,474, Cl. 165-179.000.
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Dubnowski, John J.; and Rosenberg, Aaron E., 4,164,025, Cl. 364-900.000.
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Fisher, William F.; and Rosenberger, Paul C., 4,163,400, Cl. 74-710.000.
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Wolters, Heinrich; Rudolph, Hans; and Rosenkranz, Hans-Jurgen, 4,163,865, Cl. 568-640.000.
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Velling, Gunter; and Ruddeck, Wolfhard, 4,163,464, Cl. 141-198.000.
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Wolters, Heinrich; Rudolph, Hans; and Rosenkranz, Hans-Jurgen, 4,163,865, Cl. 568-640.000.
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Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., 4,163,804, Cl. 426-315.000.
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Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,163,658, Cl. 71-73.000.
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- Russell, Anthony W.: See—  
Russell, Michael K.; and Russell, Anthony W., 4,163,324, Cl. 33-313.000.
- Russell, Homer C.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.
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Dechert, Roberta S., 4,163,673, Cl. 106-11.000.
- Saari, Walfrid S.: See—  
Lumma, William C., Jr.; Saari, Walfrid S.; and Zacchei, Anthony G., 4,163,849, Cl. 544-357.000.
- Safe-T-Lawn, Inc.: See—  
Hardy, Charles T., 4,163,522, Cl. 239-230.000.
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Kondo, Kiyosi; Tunemoto, Daiei; and Umamoto, Teruo, 4,163,758, Cl. 260-586.00R.
- Sagara, Seiji: See—  
Ito, Yoshio; Tohyama, Yoshikuni; and Sagara, Seiji, 4,163,549, Cl. 271-174.000.
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Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,163,719, Cl. 210-84.000.
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Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.
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Omae, Tsutomu; and Sakai, Keiziro, 4,163,886, Cl. 219-60.00A.
- Sakai, Masao, to Hitachi, Ltd. Magnetrons. 4,163,922, Cl. 315-39.710.
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Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.
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Cooperman, Isadore; and Salkind, Morton, 4,163,427, Cl. 116-217.000.
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Kitchen, John P.; and Samuels, David W., 4,163,296, Cl. 5-255.000.
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Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.
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Nieman, John R.; and Sanders, S. David, 4,163,827, Cl. 428-377.000.
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Miller, Benson L.; and Helesfai, Steven, 4,163,376, Cl. 70-303.00A.
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Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,033, Cl. 364-431.000.
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Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.
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Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.
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Blind, Roger A.; Saterbak, Robert T.; and Wolfe, Edward I., 4,163,717, Cl. 210-31.00R.
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Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.
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Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.
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Christe, Karl O.; and Schack, Carl J., 4,163,773, Cl. 423-351.000.
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Kurrie, Hermann; and Muller, Gottfried, 4,163,416, Cl. 98-40.00R.
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Heller, Rudolf; and Schattmaier, Kurt, 4,163,536, Cl. 248-118.000.
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Iden, Floyd W.; and Scherer, George P., 4,163,955, Cl. 333-127.000.
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Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,163,658, Cl. 71-73.000.
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Norwalt, Robert H.; Hibbert, Edward R.; and Schiff, Vicki L., 4,163,555, Cl. 273-86.00B.
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Knauer, Karl; Schlichte, Max; and Pfleiderer, Hans-Joerg, 4,163,957, Cl. 333-165.000.
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Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,163,353, Cl. 53-430.000.
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Krenzer, Orville; Midden, William E.; and Schmid, Charles F., 4,163,529, Cl. 242-85.100.
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Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,163,737, Cl. 252-522.000.
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- Schoenmakers, Theodor M. B., to U.S. Philips Corporation. Device for the simultaneous operation of a number of gas discharge electron guns. 4,163,889, Cl. 219-121.00B.
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Schonstedt, Erick O., 4,163,877, Cl. 179-146.00E.
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- Schuchard, Walter F., to ESB Incorporated. Current sensing system. 4,164,016, Cl. 363-88.000.
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Miller, Garry E.; and Dalke, Michael, 4,164,008, Cl. 362-103.000.
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McGinniss, Vincent D.; Ting, Vincent W.; and Kah, Ann F., 4,163,809, Cl. 427-44.000.
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- Mueller, Richard A., 4,163,805, Cl. 426-575.000.
- Scott, Eion G.: See—  
Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.
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Mullaney, John J., 4,163,563, Cl. 277-48.000.
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Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., 4,163,856, Cl. 546-329.000.
- Seeger, Hans-Jochen, to Vereinigte Flugtechnische Werke-Fokker GmbH. Steering of an aerodynamic vehicle. 4,163,534, Cl. 244-3.220.
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Norwalt, Robert H.; Hibbert, Edward R.; and Schiff, Vicki L., 4,163,555, Cl. 273-86.000.
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Matsuno, Takeshi; Nishiyama, Fumiya, and Kobayashi, Takeshi, 4,163,313, Cl. 29-563.000.
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Cosentino, Louis C.; Seiler, Louis; and Helms, Richard A., 4,163,722, Cl. 210-236.000.
- Seitz, David R.; and Heaton, Mark T., to Globe Tool and Engineering Company. The. Armature winding machine. 4,163,931, Cl. 318-569.000.
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Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., 4,163,821, Cl. 428-245.000.
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Kupriyanov, Mikhail J.; Lapir, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E., 4,164,030, Cl. 365-162.000.
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Minasov, Alexandr N.; Likhogub, Evgeny P.; and Sergeev, Stanislav S., 4,163,694, Cl. 202-139.000.
- Severinsen, Arne R.: See—  
Rock, Vincent M.; and Severinsen, Arne R., 4,163,491, Cl. 198-836.000.
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Gazzi, Luigi; and Sguera, Oronzo, 4,163,652, Cl. 62-28.000.
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Zhukovsky, Sergie S.; Shadrin, Nikolai I.; Teplyakov, Sergei D.; Lyass, Abram M., deceased; and Lyass, Inna E., administrator, 4,163,741, Cl. 260-33.40R.
- Shaltiel, David; Davidov, Dan; and Jacob, Isaac. Hydrogen charged alloys of  $Zr(A_1-xB_x)_2$  and method of hydrogen storage. 4,163,666, Cl. 75-177.000.
- Shanley, John J.: See—  
Crowe, John E.; and Shanley, John J., 4,164,014, Cl. 363-49.000.
- Sharp Rifle Co., Ltd.: See—  
Chiba, Kensuke, 4,163,439, Cl. 124-70.000.
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Sheets, Nancy S.; and Sheets, James R., 4,163,813, Cl. 427-198.000.
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- Goudriaan, Frans; and van Klinken, Jakob, 4,163,707, Cl. 208-44.000.
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- Shelton, Joe. Tubistor. 4,163,949, Cl. 328-254.000.
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- Sherwood, Edward F., to Westinghouse Electric Corp. Decorative drop ceiling. 4,164,011, Cl. 362-148.000.
- Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuki; Okumura, Akio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Color photographic material. 4,163,670, Cl. 96-74.000.
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Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; and Shimazaki, Masami, 4,163,839, Cl. 536-24.000.
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Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
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Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.
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Sakurada, Nobuaki; Mashimo, Yukio; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,163,935, Cl. 324-29.500.
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- Shufro, Richard B. Audible tester for alarm circuits. 4,163,936, Cl. 324-51.000.
- Shuler, James R.: See—  
Fox, Lawrence E.; and Shuler, James R., 4,163,589, Cl. 305-14.000.
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Goettler, Ernst; and Grueter, Otto, 4,164,040, Cl. 365-183.000.
- Gunne, Ingemar; and Almgren, Bertil, 4,163,500, Cl. 215-260.000.
- Kaufhold, Wolfgang, 4,164,013, Cl. 363-45.000.
- Knauer, Karl; Schlichte, Max; and Pfeleiderer, Hans-Joerg, 4,163,957, Cl. 333-165.000.
- Kreil, Siegmund; Zech, Achim; and Hergert, Reinhard, 4,163,870, Cl. 178-26.00R.
- Soldner, Richard E., 4,163,394, Cl. 73-626.000.
- Turini, Gerhard, 4,163,893, Cl. 219-216.000.
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Morin, John O.; and Mini, Joseph R., 4,163,971, Cl. 340-754.000.
- Sigmund, Jerry A., to SPS Technologies, Inc. Tightening system. 4,163,310, Cl. 29-407.000.
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- Signet Optical Corporation: See—  
Campbell, Charles D., 4,163,541, Cl. 249-117.000.
- Campbell, Charles D., 4,163,655, Cl. 65-17.000.
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Johnson, Roy A.; and Sih, John C., 4,163,842, Cl. 542-426.000.
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- Silverman, Bernard: See—  
Yung, Kai-Lim W.; and Silverman, Bernard, 4,163,819, Cl. 428-198.000.
- Simes, James G.; and Gillott, Donald H., to Sutter Hospitals Medical Research Foundation. Permanent magnet translational motor for respirators. 4,163,911, Cl. 310-27.000.
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Grooss, Frank A.; and Simmons, Gerald P., 4,163,498, Cl. 414-697.000.
- Simon, Pierre, to Union Chimique Continentale U.C.C. Psychostimulant compounds. 4,163,799, Cl. 424-317.000.
- Simpson, Bruce A. Vaulting practice box. 4,163,551, Cl. 272-104.000.
- Simpson, Melvyn I.: See—  
Kallianos, Andrew G.; and Simpson, Melvyn I., 4,163,453, Cl. 131-17.00R.
- Sims, Anson: See—  
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., 4,163,341, Cl. 46-262.000.
- Singer Company, The: See—  
Current, Wayne A., 4,163,493, Cl. 206-380.000.
- Eaton, Bradley C.; and Taylor, Thomas M., 4,163,999, Cl. 361-23.000.
- Sanderson, William R., 4,163,610, Cl. 353-71.000.
- Waugh, John B. S., 4,163,396, Cl. 73-721.000.
- Singer, Martin D.: See—  
Rieger, Michael L.; and Singer, Martin D., 4,163,948, Cl. 328-167.000.
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Di Domenico, Mauro, Jr.; Singh, Shobha; and Van Uitert, Legrand G., 4,163,982, Cl. 357-2.000.
- Sireix, Georges. Device for applying adhesive to a plurality of strips. 4,163,429, Cl. 118-117.000.
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Labaw, Clifford S.; Webb, Robert L.; and Wellman, George R., 4,163,858, Cl. 548-342.000.
- Skendrovic, Lawrence. Understream turbine plant. 4,163,904, Cl. 290-54.000.
- Smart, David C., to Eastman Kodak Company. Camera focus or exposure adjustment mechanism. 4,163,613, Cl. 354-198.000.
- Smith, Glenn W. Insulated building panels. 4,163,349, Cl. 52-241.000.
- Smith, Kenneth C., to BOC Limited. Treatment of liquid. 4,163,712, Cl. 210-7.000.
- Smith & Nephew Research Limited: See—  
Walter, Brian W., 4,163,822, Cl. 428-304.000.
- Smith, Teddy V. Material distribution apparatus for continuous flow material source. 4,163,638, Cl. 425-131.100.
- Smorzaniuk, Adam: See—  
Mayer, Robert W.; and Smorzaniuk, Adam, 4,163,879, Cl. 200-11.0TW.

- Snamprogetti S.p.A.: See—  
Gazzi, Luigi; and Sguera, Oronzo, 4,163,652, Cl. 62-28.000.
- Illuminati, Gabriello; and Romano, Ugo, 4,163,861, Cl. 560-132.000.
- Snyder, Robert C., to Motor Wheel Corporation. Control system for double-actuator brakes. 4,163,586, Cl. 303-20.000.
- Societe Alsacienne de Constructions Mecaniques de Mulhouse: See—  
Lafiquiere, Regis; Janousek, Rade; and Faessler, Rene, 4,163,304, Cl. 19-97.000.
- Societe Anonyme des Ateliers Marcadet Mobilier: See—  
Mourgue, Pascal N., 4,163,537, Cl. 248-188.100.
- Societe Anonyme dite: LEMAIRE: See—  
Renaut, Henry, 4,163,331, Cl. 38-12.000.
- Societe Anonyme Francaise du Ferodo: See—  
Neveux, Rene E., 4,163,415, Cl. 98-2.090.
- Societe Lignes Telegraphiques et Telephoniques: See—  
Ernyet, Herbert; and Langlois, Etienne, 4,163,960, Cl. 333-198.000.
- Hulin, Jean-Pierre; and de Vecchis, Michel, 4,163,641, Cl. 425-461.000.
- Societe Nationale des Poudres et Explosifs: See—  
Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteau, Gerard R., 4,163,740, Cl. 260-31.20N.
- Societe Nationale Industrielle Aerospatiale: See—  
Legrand, Francis, 4,164,018, Cl. 364-424.000.
- Soldner, Richard E., to Siemens Aktiengesellschaft. Method of ultrasonic scanning of bodies. 4,163,394, Cl. 73-626.000.
- Solender, Peter E., to Wuritzer Company, The. Programmable rhythm unit. 4,163,407, Cl. 84-1.030.
- Solo Industries Pty. Limited: See—  
Notaras, John A.; Notaras, Angelo L.; and Williams, James P., 4,163,437, Cl. 123-148.00E.
- Solomon, Arich. Board game. 4,163,560, Cl. 273-273.000.
- Sommer, Rudiger: See—  
Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, 4,163,980, Cl. 346-155.000.
- Sony Corporation: See—  
Abe, Akira, 4,163,533, Cl. 242-198.000.
- Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, 4,163,989, Cl. 358-27.000.
- Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, 4,163,994, Cl. 360-70.000.
- Sorensen, Soren K.; and Holbek, Carl C., to Radiometer A/S. Reference liquid for blood gas equipment. 4,163,734, Cl. 252-408.000.
- Sotirianos, Konstantin: See—  
Muller, Hans; and Sotirianos, Konstantin, 4,163,724, Cl. 210-323.00T.
- Souzu, Isao: See—  
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,163,844, Cl. 544-32.000.
- Spector, George: See—  
Riedinger, Larry, Jr.; and Spector, George, 4,163,575, Cl. 294-5.000.
- Speechley, Richard E.: See—  
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.
- Speigl, Kenneth, to GTE Sylvania Incorporated. Cathode ray tube internal resistive coating and method of manufacture. 4,163,919, Cl. 313-479.000.
- Speiser, Jeffrey M.: See—  
Whitehouse, Harper J.; and Speiser, Jeffrey M., 4,164,023, Cl. 364-862.000.
- Sperry Rand Corporation: See—  
Rattingourd, Glen D.; and Zschile, John W., Jr., 4,164,022, Cl. 364-729.000.
- Sperry Rand Limited: See—  
Hughes, David, 4,163,325, Cl. 33-346.000.
- Spickett, Robert G. W.: See—  
Mauri, Jacinto M.; Vega-Noverola, Armando; and Spickett, Robert G. W., 4,163,789, Cl. 424-267.000.
- Spragg, Roger D.: See—  
Shepherd, Eric G.; and Spragg, Roger D., 4,163,978, Cl. 343-120.000.
- Sprague Electric Company: See—  
Cheseldine, David M., 4,164,005, Cl. 361-433.000.
- Garlington, Frank E.; and Famiano, Carl J., 4,163,956, Cl. 333-12.000.
- Kolkowski, James J., 4,164,006, Cl. 361-433.000.
- Sprenger, Barbara A., personal representative: See—  
Sprenger, William K., deceased, 4,163,859, Cl. 560-53.000.
- Sprenger, William K., deceased (by Sprenger, Barbara A., personal representative), to G. D. Searle & Co. Phenoxylalkyl acetic acids and esters. 4,163,859, Cl. 560-53.000.
- Springthorpe, Anthony J.; and Dymont, John C., to Northern Telecom Limited. Double heterostructure laser for direct coupling to an optical fiber. 4,163,953, Cl. 331-94.50H.
- SPS Technologies, Inc.: See—  
Sigmund, Jerry A., 4,163,310, Cl. 29-407.000.
- Sigmund, Jerry A., 4,163,311, Cl. 29-407.000.
- Square D Company: See—  
Lass, John L., 4,163,501, Cl. 220-3.600.
- Stabile, James, to Union Carbide Corporation. Compensating rotor. 4,163,519, Cl. 233-26.000.
- Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Photosensitive composition. 4,163,672, Cl. 96-91.00D.
- Stamcarbon, B.V.: See—  
Biermans, Andreas J., 4,163,648, Cl. 55-70.000.
- Stanadyne, Inc.: See—  
Roosa, Vernon D., 4,163,521, Cl. 239-86.000.
- Standard Oil Company, The: See—  
Duke, June T.; and Prem, Dorothy C., 4,163,766, Cl. 525-230.000.
- Standard Oil Company (Ohio): See—  
Dolhyj, Serge R.; and Milberger, Ernest C., 4,163,862, Cl. 562-534.000.
- Stanger, Colin N. Roofing panels. 4,163,445, Cl. 126-428.000.
- Stansfield, James F.: See—  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,163,749, Cl. 260-404.500.
- Staples, John M.: See—  
Brimley, Charles D.; and Staples, John M., 4,163,845, Cl. 544-215.000.
- Stauffer Chemical Company: See—  
Giulio, Silvio L., 4,163,767, Cl. 260-929.000.
- Walker, Francis H., 4,163,660, Cl. 71-88.000.
- Steelcase Inc.: See—  
Breidenbach, James H., 4,163,867, Cl. 174-48.000.
- Steffan, Guido: See—  
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.
- Stenstrom, Sadie M. Compartmented card game box with removable drawer. 4,163,559, Cl. 273-148.00A.
- Stephan, Hans-Werner: See—  
Elsner, Georg; Heymer, Gero; and Stephan, Hans-Werner, 4,163,760, Cl. 260-606.50P.
- Stephens, Milton L., to Textron Inc. Method of manufacturing molded top stop. 4,163,768, Cl. 264-23.000.
- Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., to Allied Chemical Corporation. Web-sensitive switch assembly. 4,163,880, Cl. 200-61.58B.
- Stern, Robert G.; and Wallace, W. Thomas. Snowball maker. 4,163,639, Cl. 425-318.000.
- Steuer, Werner: See—  
Bauer, Kurt; and Steuer, Werner, 4,163,759, Cl. 260-600.00A.
- Stitt Spark Plug Company: See—  
Brenholts, Alfred R., 4,163,597, Cl. 339-100.000.
- Stollberg, Ray H., to Crown Zellerbach Corporation. Shipping container. 4,163,494, Cl. 206-423.000.
- Stonefield Developments (Paisley) Limited: See—  
Watson, Norman F., 4,163,578, Cl. 296-204.000.
- Stonehart, Paul: See—  
Kohlmar, Gerda M.; and Stonehart, Paul, 4,163,811, Cl. 427-115.000.
- Stotts, Hugh D. Wire connector. 4,163,868, Cl. 174-87.000.
- Strenger, Marshall C. Method of and apparatus for dispensing a multi-constituent beverage. 4,163,510, Cl. 222-129.200.
- Strickler, Hugo, to Firmenich SA. Process for the preparation of a bicyclic alcohol. 4,163,866, Cl. 568-819.000.
- Strong, Donald. Apparatus for cutting dovetail joints. 4,163,465, Cl. 144-87.000.
- Strunc, Gerald R.: See—  
Diesch, Robert E.; and Strunc, Gerald R., 4,163,405, Cl. 83-371.000.
- Stuckler, Gerd. Arrangement for mounting components on a carrier board and method of indicating mounting locations. 4,163,309, Cl. 29-407.000.
- Stultz, Hubert F., to Suburban Manufacturing Company. Radiant heater. 4,163,440, Cl. 126-60.000.
- Sub Sea Research & Development Corp.: See—  
Johnson, John L.; and Vanzant, Billy W., 4,163,477, Cl. 166-362.000.
- Suburban Manufacturing Company: See—  
Stultz, Hubert F., 4,163,440, Cl. 126-60.000.
- Sugihara, Masanori, to Beltek Corporation. Cassette accepting and ejecting device. 4,163,997, Cl. 360-137.000.
- Sugimoto, Yukio: See—  
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.
- Sugiura, Katsuaki: See—  
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
- Sugiura, Susumu: See—  
Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugiura, Susumu, 4,163,892, Cl. 219-216.000.
- Sumi, Kazumasa: See—  
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.
- Sumitomo Chemical Company, Limited: See—  
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.
- Sumitomo Electric Industries, Ltd.: See—  
Kawaguchi, Munetaka; and Miyake, Masayoshi, 4,163,826, Cl. 428-371.000.
- Sumitomo Jukikai Envirotech, Inc.: See—  
Ikari, Yoshikatsu; Yokoyama, Shiyochiro; and Katoh, Keisuke, 4,163,715, Cl. 210-28.000.
- Sun, Jui-Yuan: See—  
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,709, Cl. 208-120.000.
- Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,710, Cl. 208-120.000.



- Sun Oil Company, Ltd.: See—  
Lichtenberger, Gunter J., 4,163,620, Cl. 405-217.000.
- Sundstrand Corporation: See—  
Barratt, Thomas R., 4,163,913, Cl. 310-91.000.  
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,033, Cl. 364-431.000.  
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,034, Cl. 364-431.000.  
Glennon, Timothy F.; and Sarphie, Theodore E., 4,164,035, Cl. 364-431.000.
- Superior Electric Company, The: See—  
Leenhouts, Albert C., 4,163,932, Cl. 318-573.000.
- Sutter Hospitals Medical Research Foundation: See—  
Simes, James G.; and Gillott, Donald H., 4,163,911, Cl. 310-27.000.
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Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
- Suzuki, Osamu: See—  
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
- Suzuki, Suzuo, to Nissan Motor Company, Limited. Method and apparatus for electrical measurement of fluid flow rate, 4,163,389, Cl. 73-194.00F.
- Svenskt Stal Aktiebolag: See—  
Pusa, Onni, 4,163,663, Cl. 75-60.000.
- Swayze, Lloyd D.: See—  
Hall, Gerald D.; and Swayze, Lloyd D., 4,163,628, Cl. 414-699.000.
- Swiatek, Henry J., to Norton Company. Method for producing coated abrasives, 4,163,647, Cl. 51-295.000.
- Symborski, Alex P.; Fulmer, Ray M.; and Thomas, David W., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming and collecting discrete fibers and/or strands, 4,163,653, Cl. 65-2.000.
- Syrchikov, Sergei A.; and Tulsy, Vladimir L. Process for carbonitriding steel and cast iron articles, 4,163,680, Cl. 148-16.500.
- Szamatatechnikai Koordinacios Intezet: See—  
Denes, Jozsef; and Szokolay, Mihaly, 4,163,967, Cl. 340-347.0DD.
- Szekeres, Laszlo: See—  
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.
- Szokolay, Mihaly: See—  
Denes, Jozsef; and Szokolay, Mihaly, 4,163,967, Cl. 340-347.0DD.
- Szporny, Laszlo: See—  
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.
- TACO-Tafel GmbH: See—  
Laass, Heinz, 4,163,937, Cl. 324-57.00R.
- Tadini, Costantino: See—  
Buhler, Ernst; and Tadini, Costantino, 4,163,887, Cl. 219-69.00P.
- Takacs, Kalman: See—  
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.
- Takaguchi, Kazunori: See—  
Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, 4,163,814, Cl. 427-372.00R.
- Takamiya, Bonnosuke: See—  
Tsukamoto, Yutaka; and Takamiya, Bonnosuke, 4,163,434, Cl. 123-119.00D.
- Takasu, Yoshio: See—  
Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugiura, Susumu, 4,163,892, Cl. 219-216.000.
- Takayama, Shuichi: See—  
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.
- Takayanagi, Keizo: See—  
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.
- Takeuchi, Takuzo: See—  
Akaba, Hayao; and Takeuchi, Takuzo, 4,163,622, Cl. 408-27.000.
- Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuki; Suzuki, Osamu; and Shimizu, Takeshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for controlling the driving of an open-end spinning machine, 4,163,358, Cl. 57-78.000.
- Takeuchi, Tomio: See—  
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; and Shimazaki, Masami, 4,163,839, Cl. 536-24.000.
- Tanaka, Kojiro; and Yoda, Kazuhiro, to Kabushiki Kaisha Daini Seikoshu. Timer device, 4,163,360, Cl. 58-39.500.
- Tanaka, Yasuhide: See—  
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.
- Tapp, Geoffrey E. E., to County Commercial Cars Limited. Steering mechanism, 4,163,566, Cl. 280-91.000.
- Tarjan, Peter P.: See—  
Lesnick, Alan F.; and Tarjan, Peter P., 4,163,451, Cl. 128-419.0PG.
- Tate, Jack F., to Texaco Inc. Secondary recovery process utilizing an acrylamido alkanesulfonic acid polymer, 4,163,476, Cl. 166-271.000.
- Tawa, Tutomuro; and Furukawa, Hiroshi, to Hitachi, Ltd. Deflection yoke assembly positioning device, 4,163,308, Cl. 29-25.190.
- Taylor, Frank, to Cogger, Michel. Yogurt maker, 4,163,472, Cl. 165-104.00R.
- Taylor, Thomas M.: See—  
Eaton, Bradley C.; and Taylor, Thomas M., 4,163,999, Cl. 361-23.000.
- Teac Corporation: See—  
Sakai, Yoshiaki, 4,163,532, Cl. 242-186.000.
- Teepak, Inc.: See—  
O'Brien, Merrill N., Jr., 4,163,463, Cl. 138-118.100.
- Tektronix, Inc.: See—  
Damm, Wendell W.; and Kim, Choong R., 4,163,950, Cl. 330-252.000.
- Rieger, Michael L.; and Singer, Martin D., 4,163,948, Cl. 328-167.000.
- Telephonic Equipment Corporation: See—  
Phelps, Robert J., 4,163,873, Cl. 179-84.00T.
- Teng, Robert N., to United States of America, Air Force. Breech closure mechanism, 4,163,411, Cl. 89-1.00H.
- Ten Haken, Pieter: See—  
Clark, Michael T.; and Ten Haken, Pieter, 4,163,793, Cl. 424-275.000.
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Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,163,775, Cl. 423-363.000.
- Tepeco, Incorporated: See—  
Watson, Clifford A.; and Bonham, David W., 4,163,650, Cl. 55-126.000.
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Zhukovsky, Sergie S.; Shadrin, Nikolai I.; Teplakov, Sergei D.; Lyass, Abram M., deceased; and Lyass, Inna E., administrator, 4,163,741, Cl. 260-33.40R.
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Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, 4,163,675, Cl. 106-22.000.
- Teshima, Kiyomi: See—  
Shirato, Takeshi; and Teshima, Kiyomi, 4,163,364, Cl. 60-39.020.
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Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,163,761, Cl. 585-431.000.
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- Texas Instruments Incorporated: See—  
Boulanger, Henry J., 4,163,843, Cl. 200-314.000.
- Cochran, Michael J.; and Grant, Charles P., Jr., deceased, 4,164,037, Cl. 364-700.000.
- De Filippis, Giangrazio, 4,163,964, Cl. 338-215.000.
- Loft, Perry W.; and Grant, Charles P., Jr., deceased, 4,164,031, Cl. 365-233.000.
- Textron Inc.: See—  
Benscoter, Richard D., 4,163,572, Cl. 285-121.000.
- Stephens, Milton L., 4,163,768, Cl. 264-23.000.
- Thackaberry, Harold: See—  
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.
- Thelander, Keith, to Multimould Enterprises Pty. Ltd. Cooking apparatus, 4,163,418, Cl. 99-374.000.
- Thiel, Jerome F.: See—  
DiCarantonio, Norman L.; and Thiel, Jerome F., 4,163,817, Cl. 428-33.000.
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- Thomas, Claude: See—  
Delattre, Jacques; Raynaud, Roland; and Thomas, Claude, 4,163,860, Cl. 560-96.000.
- Thomas, David W.: See—  
Symborski, Alex P.; Fulmer, Ray M.; and Thomas, David W., 4,163,653, Cl. 65-2.000.
- Thomas, Donald K., Jr. Partition having stabilizing bar and method, 4,163,348, Cl. 52-241.000.
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Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,163,646, Cl. 44-73.000.
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Guilhem, Robert; Rivron, Maurice; and Weulersse, Bruno, 4,163,975, Cl. 343-16.00M.
- Tigani, Pasquale. Device for replacing missing teeth in human dentition, 4,163,318, Cl. 32-5.000.
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- Timan, Dirk A.: See—  
Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., 4,163,821, Cl. 428-245.000.
- Timm, Ulrich, to Rexnord Inc. Loading seal for inclined conveyor, 4,163,490, Cl. 198-531.000.

- Ting, Vincent W.: See—  
McGinniss, Vincent D.; Ting, Vincent W.; and Kah, Ann F., 4,163,809, Cl. 427-44.000.
- Tiso, Marian. Apparatus for facilitating the practicing of tennis and like games, 4,163,552, Cl. 273-29.00A.
- TMC Corporation: See—  
Horn, Hans, 4,163,569, Cl. 280-605.000.
- Tohyama, Yoshikuni: See—  
Ito, Yoshio; Tohyama, Yoshikuni; and Sagara, Seiji, 4,163,549, Cl. 271-174.000.
- Tollinger, James, to Ithaca Gun Company Incorporated. Firearm shell extractor, 4,163,334, Cl. 42-25.000.
- Topham, Arthur: See—  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,163,749, Cl. 260-404.500.
- Torossian, Kevork A.: See—  
Gottung, William H.; and Torossian, Kevork A., 4,163,912, Cl. 310-45.000.
- Towmotor Corporation: See—  
Porter, Ralph D., 4,163,412, Cl. 91-451.000.
- Toy, Wing N.: See—  
Hartwell, Walter T.; Hinshaw, David L.; Hoffner, Charles W., II; and Toy, Wing N., 4,164,041, Cl. 365-238.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Baba, Takashi; Kawaguchi, Hiroshi; and Nishikawa, Kohji, 4,163,483, Cl. 188-71.800.
- Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.
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- Nogami, Tomoyuki, 4,163,588, Cl. 303-24.00C.
- Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,164,032, Cl. 364-431.000.
- Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.
- Tran, Duc Tien: See—  
Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, 4,163,901, Cl. 250-401.00N.
- Transcience Industries, Inc.: See—  
Davis, Manfred, 4,163,968, Cl. 340-539.000.
- Trefimetaux: See—  
Moreau, Marc, 4,163,377, Cl. 72-60.000.
- Tremper, Alan W.: See—  
Wasserman, Harry H.; and Tremper, Alan W., 4,163,743, Cl. 260-239.00A.
- TRW Inc.: See—  
Pearson, Durk J.; and Bohn, Jack R., 4,163,580, Cl. 299-5.000.
- Tsu, Kin H.: See—  
Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., 4,163,755, Cl. 260-561.00N.
- Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, to Nippon Oil Company, Limited. Method for producing curable resin and curable coating composition, 4,163,763, Cl. 525-290.000.
- Tsuchiya, Takao: See—  
Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, 4,163,989, Cl. 358-27.000.
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- Tsunashima, Teruyoshi, to Nippon Kogaku K.K. Wide-angle photographic objective, 4,163,603, Cl. 350-214.000.
- Tuley, Eugene N.: See—  
McDonough, Edward C.; and Tuley, Eugene N., 4,163,629, Cl. 415-115.000.
- Tulsky, Vladimir L.: See—  
Syrchikov, Sergei A.; and Tulsky, Vladimir L., 4,163,680, Cl. 148-16.500.
- Tunemoto, Daiei: See—  
Kondo, Kiyosi; Tunemoto, Daiei; and Umemoto, Teruo, 4,163,758, Cl. 260-586.00R.
- Turini, Gerhard, to Siemens Aktiengesellschaft. Toner fixing arrangement in electrostatic printers and copiers, 4,163,893, Cl. 219-216.000.
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- Ugo, Renato, to PROTEC Processi e Tecnologie S.p.A. Process for precipitating precious metals from solutions which contain them, 4,163,664, Cl. 75-108.000.
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Kondo, Kiyosi; Tunemoto, Daiei; and Umemoto, Teruo, 4,163,758, Cl. 260-586.00R.
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- Union Carbide Corporation: See—  
Kronenberg, Marvin L., 4,163,829, Cl. 429-194.000.
- Mahoney, Dennis M., 4,163,828, Cl. 428-411.000.
- Stabile, James, 4,163,519, Cl. 233-26.000.
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Simon, Pierre, 4,163,799, Cl. 424-317.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—  
Shepherd, Eric G.; and Spragg, Roger D., 4,163,978, Cl. 343-120.000.
- United States of America  
Air Force: See—  
Jacobson, Robert E., Jr., 4,163,973, Cl. 343-16.00M.
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- Schuermeier, Fritz L.; and Young, Charles R., 4,163,985, Cl. 357-23.000.
- Teng, Robert N., 4,163,411, Cl. 89-1.00H.
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Brumley, Charles D.; and Staples, John M., 4,163,845, Cl. 544-215.000.
- Kohler, Hans W., 4,163,423, Cl. 102-211.000.
- Sherburne, Frederick B.; Pardes, Herman I.; and Hughes, Edward S., 4,163,328, Cl. 35-25.000.
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Amer, Nabil M., 4,163,382, Cl. 73-24.000.
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- Grossman, Leonard N.; and Kaznoff, Alexis I., 4,163,689, Cl. 176-68.000.
- Hendricks, Charles D., 4,163,637, Cl. 425-6.000.
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Gutierrez, Manuel; and Enger, Phillip F., 4,163,393, Cl. 73-584.000.
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Bube, Kenneth R. Solar cell with improved N-region contact and method of forming the same, 4,163,678, Cl. 136-89.0CC.
- Navy: See—  
Christe, Karl O.; and Schack, Carl J., 4,163,773, Cl. 423-351.000.
- Krause, Ernst H., 4,163,872, Cl. 179-1.50R.
- Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., 4,163,682, Cl. 149-108.400.
- Rothenstein, Julius; and Goldhagen, Samuel, 4,163,681, Cl. 149-11.000.
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Burrig, Thomas, 4,163,991, Cl. 358-111.000.
- Monneraye, Marc A.; and Monnier, Michel J. C., 4,163,656, Cl. 65-43.000.
- Schoenmakers, Theodor M. B., 4,163,889, Cl. 219-121.0EB.
- Schutz, Klaus; Heiber, Holger; and Lange, Gerhard, 4,163,602, Cl. 358-113.000.
- van der Sluijs, Willem L. N., 4,163,373, Cl. 62-279.000.
- U.S. Precision Lens, Inc.: See—  
Betensky, Ellis I., 4,163,604, Cl. 350-226.000.
- United Technologies Corporation: See—  
Kohlmar, Gerda M.; and Stonehart, Paul, 4,163,811, Cl. 427-115.000.
- Universal Manufacturing Corporation: See—  
Miller, Imrich; and Freimuth, Lothar, 4,163,531, Cl. 242-158.00R.
- Universal Valve Co., Inc.: See—  
Milo, August, 4,163,462, Cl. 138-90.000.
- Upjohn Company, The: See—  
Ayer, Donald E., 4,163,843, Cl. 542-426.000.
- Bundy, Gordon L., 4,163,841, Cl. 542-421.000.
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- Ury, John M., to Wagner Electric Corporation. Service and emergency trailer valve, 4,163,585, Cl. 303-9.000.
- USM Corporation: See—  
Ettinger, Donald H., 4,163,888, Cl. 219-98.000.
- Utsumi, Takashi: See—  
Nagai, Yoshio; and Utsumi, Takashi, 4,163,679, Cl. 148-6.270.
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Kankaanpaa, Matti, 4,163,688, Cl. 162-359.000.
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- VanderSyde, Gary L.; and Warberg, John, to Alcohol Countermeasure Systems Inc. Breath testing system, 4,163,383, Cl. 73-27.00R.
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Goudriaan, Frans; and van Klinken, Jakob, 4,163,707, Cl. 208-44.000.
- Van Uiter, Legrand G.: See—  
Di Domenico, Mauro, Jr.; Singh, Shobha; and Van Uiter, Legrand G., 4,163,982, Cl. 357-2.000.
- Vanzant, Billy W.: See—  
Johnson, John L.; and Vanzant, Billy W., 4,163,477, Cl. 166-362.000.
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Vassin, Valery M.: See—  
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.  
Vega-Noverola, Armando: See—  
Mauri, Jacinto M.; Vega-Noverola, Armando; and Spickett, Robert G. W., 4,163,789, Cl. 424-267.000.  
Velling, Gunter; and Ruddeck, Wolfhard, to Rheinische Braunkohlenwerke AG. Arrangement for filling a vessel which is to be put under high pressure, with freely flowing solids. 4,163,464, Cl. 141-198.000.  
Vereinigte Flugtechnische Werke-Fokker GmbH: See—  
Seeger, Hans-Jochen, 4,163,534, Cl. 244-3.220.  
Vermes, Borbala: See—  
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.  
Vibrax/MCA, Inc.: See—  
Lucarini, Francois, 4,163,338, Cl. 43-42.170.  
Victor Company of Japan, Ltd.: See—  
Ishigaki, Yukinobu; and Muraoka, Teruo, 4,163,945, Cl. 325-473.000.  
Viertel, Lothar: See—  
Mahler, Gert; Viertel, Lothar; and Meissner, Wolfgang, 4,163,579, Cl. 296-97.00H.  
Vinal, Albert W., to International Business Machines Corporation. Twin channel Lorentz coupled depletion width modulation effect magnetic field sensor. 4,163,986, Cl. 357-27.000.  
Vinals, Joaquin F.: See—  
Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,163,737, Cl. 252-522.000.  
Vincent, Raymond A. Multicolor paint dispensing system having a pressure responsive color change valve. 4,163,523, Cl. 239-305.000.  
Virag, Gyorgy: See—  
Kecskemethy, Geza; Virag, Gyorgy; Tihanyi, Robert; and Czirmai, Zoltan, 4,163,511, Cl. 222-144.500.  
Vock, Richard C., to Xerox Corporation. Closed loop particle dispenser. 4,163,614, Cl. 355-3.0DD.  
Voegeli, Otto, to International Business Machines Corporation. Current access bubble memory system. 4,164,028, Cl. 365-20.000.  
Voss, Kurt H., to Bergwerksverband GmbH. Pneumatic stowing apparatus. 4,163,582, Cl. 406-12.000.  
Vriend, Joseph A. Apparatus for producing power from water waves. 4,163,633, Cl. 417-332.000.  
VSI Corporation: See—  
Fujitaki, Roy K., 4,163,375, Cl. 70-134.000.  
W. R. Grace & Co.: See—  
Coucher, Robert G., 4,163,812, Cl. 427-183.000.  
W. Vinten Limited: See—  
Gallone, Edward R. D., 4,163,538, Cl. 248-278.000.  
WABCO Westinghouse: See—  
Limozin, Henri; and Dalibout, Georges, 4,163,587, Cl. 303-22.00R.  
Wagner Electric Corporation: See—  
Ury, John M., 4,163,585, Cl. 303-9.000.  
Wagner, Howard R.: See—  
Janu, Maria M.; and Wagner, Howard R., 4,163,929, Cl. 318-628.000.  
Wahl, Eugene A. Feeder apparatus for fibrous materials. 4,163,489, Cl. 198-505.000.  
Wakisaka, Yoshiaki: See—  
Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, 4,163,994, Cl. 360-70.000.  
Walden, Jack M.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.  
Walker, Francis H., to Stauffer Chemical Company. Bis-substituted succinamides and their utility as herbicides. 4,163,660, Cl. 71-88.000.  
Walker, Loren H.: See—  
Espelage, Paul M.; and Walker, Loren H., 4,164,015, Cl. 363-87.000.  
Wallace, W. Thomas: See—  
Stern, Robert G.; and Wallace, W. Thomas, 4,163,639, Cl. 425-318.000.  
Walter, Brian W., to Smith & Nephew Research Limited. Pressure sensitive adhesive material and method of preparation. 4,163,822, Cl. 428-304.000.  
Warberg, John: See—  
VanderSyde, Gary L.; and Warberg, John, 4,163,383, Cl. 73-27.00R.  
Warren, John B.; and Kundrath, Michael R., to Connecticut Research Institute, Inc. Composite electron microscope grid suitable for energy dispersive X-ray analysis, process for producing the same and other micro-components. 4,163,900, Cl. 250-439.00R.  
Wasserman, Harry H.; and Tremper, Alan W., to Research Corporation. Beta-lactams, their production from azetidine carboxylic acids, intermediates thereto and derivatives thereof. 4,163,743, Cl. 260-239.00A.  
Watson, Clifford A.; and Bonham, David W., to Tepco, Incorporated. Portable electronic precipitator. 4,163,650, Cl. 55-126.000.  
Watson, Norman F., to Stonefield Developments (Paisley) Limited. Main frame assembly for road vehicles. 4,163,578, Cl. 296-204.000.

Watson, Robert E.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.  
Watts, George T., to Goodyear Tire & Rubber Company. The Tubeless tire, safety support and rim assembly. 4,163,466, Cl. 152-158.000.  
Waugh, John B. S., to Singer Company, The. Digital readout pressure sensor. 4,163,396, Cl. 73-721.000.  
Wax, David W., to Honeywell Inc. Quadrature correlation phase reversal pulse detector. 4,164,016, Cl. 364-486.000.  
Wayne Automation Corp.: See—  
Bachman, Joseph L., Jr.; Ginther, George E., Sr.; and Johnson, A. David, Jr., 4,163,414, Cl. 91-53.00M.  
Wear, Robert L., to Minnesota Mining and Manufacturing Company. Polyethers of tetrahalobisphenol A. 4,163,834, Cl. 525-534.000.  
Weaver, William J.: See—  
Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., 4,163,682, Cl. 149-108.400.  
Webb, Robert L.: See—  
Labaw, Clifford S.; Webb, Robert L.; and Wellman, George R., 4,163,858, Cl. 548-342.000.  
Weber, Robert C. Snow ski apparatus and method of making it. 4,163,565, Cl. 280-16.000.  
Webinger, George, to Champion International Corporation. Air freshener carton. 4,163,518, Cl. 229-1.000.  
Weedon, Hans J., to Analogic Corporation. Current and voltage autozeroing integrator. 4,163,947, Cl. 328-128.000.  
Weidman, James K.: See—  
Morris, John C.; Weidman, James K.; and Prior, Michael D., 4,163,546, Cl. 266-281.000.  
Weil, Marcel: See—  
Garcin, Felix; and Weil, Marcel, 4,163,520, Cl. 239-707.000.  
Weiland, Emil, to Messerschmitt-Bolkow-Blohm GmbH. Helicopter rotor structure. 4,163,630, Cl. 416-134.00A.  
Weinmann GmbH & Co. KG: See—  
Schoch, Robert, 4,163,481, Cl. 188-24.000.  
Wellman, George R.: See—  
Labaw, Clifford S.; Webb, Robert L.; and Wellman, George R., 4,163,858, Cl. 548-342.000.  
Welty, Robert O. Fireplace heat system. 4,163,442, Cl. 126-121.000.  
Wenninger, Fred, Jr.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.  
Wernli, Pierre. Anti-slip serving tray and the method of manufacturing thereof. 4,163,818, Cl. 428-138.000.  
Wescom, Inc.: See—  
Hashemi, Mike A., 4,163,878, Cl. 179-170.0NC.  
Westinghouse Electric Corp.: See—  
Almand, John Z., III; Benner, Henry F.; and Reichenacker, William J., 4,163,869, Cl. 174-94.00R.  
Borona, Russell T.; and Coley, Kenneth R., 4,163,881, Cl. 200-153.00G.  
Halstead, Kenneth G.; and Hawfield, James D., Jr., 4,163,939, Cl. 324-104.000.  
Sherwood, Edward F., 4,164,011, Cl. 362-148.000.  
Westland Aircraft Limited: See—  
Austin, Reginald G., 4,163,535, Cl. 244-17.230.  
Weulersse, Bruno: See—  
Guilhem, Robert; Rivron, Maurice; and Weulersse, Bruno, 4,163,975, Cl. 343-16.00M.  
Whirlpool Corporation: See—  
Rickel, William; and Hauch, Dennis W., 4,163,457, Cl. 137-216.000.  
White, Ben E.: See—  
Geyer, Charles J., Jr.; and White, Ben E., 4,163,840, Cl. 536-101.000.  
Whitehouse, Harper J.; and Speiser, Jeffrey M., to United States of America, Navy. Permutation memories. 4,164,023, Cl. 364-862.000.  
Wickett, Richard R.; and Kock, William R., to Procter & Gamble Company. The. Topical composition and treatment of skin lesions therewith. 4,163,800, Cl. 424-326.000.  
Wilkinson, Richard L., to Race Research, Inc. Zero-hysteresis engine rpm limiter. 4,163,431, Cl. 123-118.000.  
Williams, Anthony M., to EMI Limited. Cable storage assembly for scanning apparatus. 4,163,526, Cl. 242-54.00R.  
Williams, James P.: See—  
Notaras, John A.; Notaras, Angelo L.; and Williams, James P., 4,163,437, Cl. 123-148.00E.  
Willis, Donald H., to RCA Corporation. Switching regulator for a television apparatus. 4,163,926, Cl. 315-408.000.  
Wilson, Charles A.: See—  
Burk, George A.; Wilson, Charles A.; and Reineke, Charles E., 4,163,798, Cl. 424-304.000.  
Wilson, James R.: See—  
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,163,761, Cl. 585-431.000.

Wilson, Peter C.; and Hughart, Robert P. Valve assembly for cyclones or other abrasive applications. 4,163,726, Cl. 210-512.00R.  
Wilson, Thomas J. Spring tunable helical whip antenna. 4,163,981, Cl. 343-715.000.  
Wimmer, Adalbert, to Chemiefaser Lenzing Aktiengesellschaft. Threads or fibers of polytetrafluoroethylene. 4,163,825, Cl. 428-368.000.  
Windelbandt, Herbert; and Ditzes, Gunter, to Meyer, Roth & Pastor Maschinenfabrik GmbH. Chain link bending machine. 4,163,363, Cl. 59-27.000.  
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, to Bayer Aktiengesellschaft. Process for the production of new polysiloxane-polyoxyalkylene copolymers with reduced burning properties. 4,163,830, Cl. 521-111.000.  
Winter, Richard L.: See—  
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.  
Winterbottom, John M.: See—  
Bird, Alfred J.; Priestley, Timothy M.; and Winterbottom, John M., 4,163,750, Cl. 260-409.000.  
Wirth, Gallo & Co.: See—  
Gallo, Mario; and Wirth, Johannes, 4,163,386, Cl. 73-141.00R.  
Wirth, Johannes: See—  
Gallo, Mario; and Wirth, Johannes, 4,163,386, Cl. 73-141.00R.  
Wiser, J. Gordon: See—  
Lundahl, Ezra C.; and Wiser, J. Gordon, 4,163,524, Cl. 241-30.000.  
Wolfe, Edward I.: See—  
Blind, Roger A.; Saterbak, Robert T.; and Wolfe, Edward I., 4,163,717, Cl. 210-31.00R.  
Wolffers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans-Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of pinacols. 4,163,865, Cl. 568-640.000.  
Wolfner, Andras: See—  
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.  
Wolfseder, Alfons, to Anton Steinecker Maschinenfabrik GmbH. Mash and wort tub. 4,163,417, Cl. 99-277.200.  
Woltersdorf, Otto W., Jr.: See—  
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,163,781, Cl. 424-200.000.  
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,163,794, Cl. 424-285.000.  
Wong, Wang-Mo, to Arthur G. McKee & Company. Distillation process for recovery of methyl isobutyl ketone. 4,163,696, Cl. 203-44.000.  
Woods, Lee O., to General Electric Company. Relay-starter electrical device for a prime mover. 4,164,000, Cl. 361-27.000.  
Woodward, Oakley M., to RCA Corporation. Rotary joint. 4,163,961, Cl. 333-261.000.  
Worden, R.B. Fishing lure. 4,163,339, Cl. 43-44.400.  
Wronski, Christopher R.: See—  
Carlson, David E.; and Wronski, Christopher R., 4,163,677, Cl. 136-89.0TF.  
Wurlitzer Company, The: See—  
Solender, Peter E., 4,163,407, Cl. 84-1.030.  
Wysocki, Joseph J., to Xerox Corporation. Deformable imaging member used in electro-optic imaging system. 4,163,667, Cl. 96-1.50N.  
Xerox Corporation: See—  
Vock, Richard C., 4,163,614, Cl. 355-3.0DD.  
Wysocki, Joseph J., 4,163,667, Cl. 96-1.50N.  
Yeh, Keming W.; and Reuter, James L., 4,163,988, Cl. 357-55.000.  
Yakushenkov, Andrei A.: See—  
Lapy, Viktor J.; Chernov, Boris P.; Georgizov, Evgeny B.; Koshvoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.  
Yamada, Mitsuhiro. Method of picture reproduction with variable reproduction scale. 4,163,605, Cl. 358-287.000.  
Yamada, Youji, Miyazaki, Kunio; and Hamane, Masumi, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission with parallel crankshaft, input shaft and output shaft. 4,163,399, Cl. 74-700.000.  
Yamanouchi Pharmaceutical Co., Ltd.: See—  
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,163,844, Cl. 544-32.000.  
Yamatsu, Isao: See—  
Morita, Eiichi; Ejiri, Hiroshiro; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.  
Yano, Kazuo, to Chiyoda Tsusho K.K. Hose fitting. 4,163,573, Cl. 285-174.000.  
Yates, Richard A., to Du Pont de Nemours, E. I., and Company. Low phosphate growth of fungal mycelia. 4,163,692, Cl. 435-254.000.  
Yatsugi, Shigeru: See—  
Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, 4,163,814, Cl. 427-372.00R.  
Yavorsky, Gerald I.: See—  
Lapy, Viktor J.; Chernov, Boris P.; Georgizov, Evgeny B.; Koshvoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.  
Yeh, George C. Hybrid flywheel/compressed-fluid propulsion system for nonstationary applications. 4,163,367, Cl. 60-414.000.  
Yeh, Keming W.; and Reuter, James L., to Xerox Corporation. Split gate V groove FET. 4,163,988, Cl. 357-55.000.  
Yeh, Yu S.: See—  
Acampora, Anthony; Reudink, Douglas O.; and Yeh, Yu S., 4,163,942, Cl. 325-52.000.  
Yockey, Francis J.: See—  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.  
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.  
Yoda, Kazuhiro: See—  
Tanaka, Kojiro; and Yoda, Kazuhiro, 4,163,360, Cl. 58-39.500.  
Yokota, Seizo. Dental occluding instrument. 4,163,320, Cl. 32-32.000.  
Yokota, Yukio: See—  
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.  
Yokoyama, Shioichiro: See—  
Ikari, Yoshikatsu; Yokoyama, Shioichiro; and Katoh, Keisuke, 4,163,715, Cl. 210-28.000.  
Yoo, Jin S.: See—  
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,709, Cl. 208-120.000.  
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,710, Cl. 208-120.000.  
Yoshida Kogyo K.K.: See—  
Doguchi, Nobushige; and Hayashi, Moriyoichi, 4,163,350, Cl. 52-403.000.  
Young, Charles R.: See—  
Schuermeyer, Fritz L.; and Young, Charles R., 4,163,985, Cl. 357-23.000.  
Yung, Kai-Lim W.; and Silverman, Bernard, to Monsanto Company. Drapeable nonwoven fabrics. 4,163,819, Cl. 428-198.000.  
Zacchei, Anthony G.: See—  
Lumma, William C., Jr.; Saari, Walfred S.; and Zacchei, Anthony G., 4,163,849, Cl. 544-357.000.  
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: See—  
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; and Shimazaki, Masami, 4,163,839, Cl. 536-24.000.  
Zander, Jurgen: See—  
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.  
Zech, Achim: See—  
Kreil, Siegmund; Zech, Achim; and Hergert, Reinhard, 4,163,870, Cl. 178-26.00R.  
Zhukovsky, Sergie S.; Shadrin, Nikolai I.; Teplyakov, Sergei D.; Lyass, Abram M., deceased; and by Lyass, Inna E., administrator. Sand mold compositions containing as catalyst, methyl alcohol solutions of benzenesulphonic acid. 4,163,741, Cl. 260-33.40R.  
Zivney, Donald R.: See—  
Moore, Stanley R.; Crisman, Thomas L.; and Zivney, Donald R., 4,163,374, Cl. 62-457.000.  
Zscheile, John W., Jr.: See—  
Rattlingourd, Glen D.; and Zscheile, John W., Jr., 4,164,022, Cl. 364-729.000.  
Zucchetti, Mario, to Zucchetti Rubinetteria S.p.A. Single-control type of hot cold water mixer. 4,163,460, Cl. 137-625.400.  
Zucchetti Rubinetteria S.p.A.: See—  
Zucchetti, Mario, 4,163,460, Cl. 137-625.400.



## LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 7TH DAY OF AUGUST, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

- Allied Chemical Corporation: See—  
Stephenson, Robert L., T985,002, Cl. 242-107.40R.  
Bertozzi, Eugene R.; and Paul, Henry N., 3rd, to Thiokol Corporation. Synergistic light stabilizer blends for poly(vinyl chloride) polymers. T985,003, 8-7-79, Cl. 260-45.75S.  
Caterpillar Tractor Co.: See—  
Drochner, Erich E., T985,006, Cl. 403-163.000.  
Clarke, William: See—  
Reade, Grahame M.; Clarke, William; and Danby, Maurice, T985,001, Cl. 8-2.50R.  
Danby, Maurice: See—  
Reade, Grahame M.; Clarke, William; and Danby, Maurice, T985,001, Cl. 8-2.50R.  
Drochner, Erich E., to Caterpillar Tractor Co. Retaining means for pivot pin. T985,006, 8-7-79, Cl. 403-163.000.  
Goertzel, Gerald; and Mitchell, Joan L. Two-dimensional image data compression and decompression system. T985,005, 8-7-79, Cl. 364-515.000.  
Imperial Chemical Industries Limited: See—  
Reade, Grahame M.; Clarke, William; and Danby, Maurice, T985,001, Cl. 8-2.50R.  
Mitchell, Joan L.: See—  
Goertzel, Gerald; and Mitchell, Joan L., T985,005, Cl. 364-515.000.  
Paul, Henry N., 3rd. Synergistic ultraviolet light stabilizer mixtures for mono-olefin polymers. T985,004, 8-7-79, Cl. 260-45.70S.  
Paul, Henry N., 3rd: See—  
Bertozzi, Eugene R.; and Paul, Henry N., 3rd, T985,003, Cl. 260-45.75S.  
Reade, Grahame M.; Clarke, William; and Danby, Maurice, to Imperial Chemical Industries Limited. Coloration process. T985,001, 8-7-79, Cl. 8-2.50R.  
Stephenson, Robert L., to Allied Chemical Corporation. Seat belt retractor base and cover. T985,002, 8-7-79, Cl. 242-107.40R.  
Thiokol Corporation: See—  
Bertozzi, Eugene R.; and Paul, Henry N., 3rd, T985,003, Cl. 260-45.75S.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF AUGUST, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Anthony, Andrew J.; and Gruber, Edward A., to Combustion Engineering, Inc. Nuclear reactor. Re. 30,065, Cl. 176-76.000.  
Cessna Aircraft Corporation, The: See—  
Miller, Wayne L., Re. 30,069, Cl. 343-12.00R.  
Combustion Engineering, Inc.: See—  
Anthony, Andrew J.; and Gruber, Edward A., Re. 30,065, Cl. 176-76.000.  
Essex International, Inc.: See—  
Turner, Jesse H.; Hurd, Claud C.; and Fiedler, Frank, Jr., Re. 30,063, Cl. 137-116.500.  
Exxon Research & Engineering Co.: See—  
Patton, Tad L., Re. 30,067, Cl. 525-419.000.  
Fiedler, Frank, Jr.: See—  
Turner, Jesse H.; Hurd, Claud C.; and Fiedler, Frank, Jr., Re. 30,063, Cl. 137-116.500.  
Fuji Photo Film Co., Ltd.: See—  
Shimamura, Isao; and Ogawa, Junkiti, Re. 30,064, Cl. 96-66.500.  
Gruber, Edward A.: See—  
Anthony, Andrew J.; and Gruber, Edward A., Re. 30,065, Cl. 176-76.000.  
Hobart Corporation: See—  
Meyers, Theodore F., Re. 30,068, Cl. 318-744.000.  
Hurd, Claud C.: See—  
Turner, Jesse H.; Hurd, Claud C.; and Fiedler, Frank, Jr., Re. 30,063, Cl. 137-116.500.  
Meyers, Theodore F., to Hobart Corporation. Pulsating torque apparatus and method. Re. 30,068, Cl. 318-744.000.  
Miller, Wayne L., to Cessna Aircraft Corporation, The. Multiple ranging DME. Re. 30,069, Cl. 343-12.00R.  
Nalco Chemical Company: See—  
Oberhofer, Alfred W., Re. 30,066, Cl. 210-30.00R.  
Oberhofer, Alfred W., to Nalco Chemical Company. Method for selectively removing chromates. Re. 30,066, Cl. 210-30.00R.  
Ogawa, Junkiti: See—  
Shimamura, Isao; and Ogawa, Junkiti, Re. 30,064, Cl. 96-66.500.  
Patton, Tad L., to Exxon Research & Engineering Co. Iminoimidazolidinedione and parabenic acid polymers containing imide groups. Re. 30,067, Cl. 525-419.000.  
Sarkes Tarzian, Inc.: See—  
Valdettaro, Alarico A., Re. 30,062, Cl. 116-243.000.  
Shimamura, Isao; and Ogawa, Junkiti, to Fuji Photo Film Co., Ltd. Process for color photographic processing. Re. 30,064, Cl. 96-66.500.  
Turner, Jesse H.; Hurd, Claud C.; and Fiedler, Frank, Jr., to Essex International, Inc. High pressure safety valve. Re. 30,063, Cl. 137-116.500.  
Valdettaro, Alarico A., to Sarkes Tarzian, Inc. Elongated strip type indicator arrangement for UHF television tuner. Re. 30,062, Cl. 116-243.000.

## LIST OF PLANT PATENTEEES

- Allen, Douglas R., to Fort Caroline Orchids, Inc. Orchid plant. 4,446, 8-7-79, Cl. 68.000.  
Fort Caroline Orchids, Inc.: See—  
Allen, Douglas R., 4,446, Cl. 68.000.  
Moore, Ralph S. Miniature rose plant. 4,447, 8-7-79, Cl. 8.000.  
Ryan, John J. Impatiens plant—Seneca. 4,445, 8-7-79, Cl. 68.000.

PI 26

## LIST OF DESIGN PATENTEEES

- Aktiebolaget Instrument Verken: See—  
Lonnroth, Jonas, 252,560, Cl. D10-74.000.  
Beck, Larry. Cigarette troche holder. 252,558, 8-7-79, Cl. D9-224.000.  
Bell Telephone Laboratories, Incorporated: See—  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,569, Cl. D14-60.000.  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,570, Cl. D14-60.000.  
Blanchard, Russell O., to Motor Wheel Corporation. Wheel. 252,565, 8-7-79, Cl. D12-211.000.  
Blanchard, Russell O., to Motor Wheel Corporation. Wheel. 252,566, 8-7-79, Cl. D12-211.000.  
Bliss, Robert A., to Champion International Corporation. Carton blank. 252,559, 8-7-79, Cl. D9-245.000.  
Brown & Sharpe Manufacturing Company: See—  
Simmons, Henry T., 252,575, Cl. D15-130.000.  
Burd, Inc., Howell Division: See—  
Petersen, Warren D., 252,544, Cl. D6-31.000.  
Petersen, Warren D., 252,546, Cl. D6-73.000.  
Cartier, Inc.: See—  
Durante, Alfred J., 252,561, Cl. D11-79.000.  
Champion International Corporation: See—  
Bliss, Robert A., 252,559, Cl. D9-245.000.  
Charowhas, William P. Recipe card holder or similar article. 252,578, 8-7-79, Cl. D19-86.000.  
Clark, Charles J. Wear point for agricultural fertilizer shank. 252,574, 8-7-79, Cl. D15-29.000.  
Clow, William E., to Kimstock, Inc. Combined bathtub and shower stall. 252,585, 8-7-79, Cl. D23-49.000.  
Cohee, Donald R., to Vivitar Corporation. Carrying case for a camera and accessories. 252,539, 8-7-79, Cl. D3-33.000.  
Columbus McKinnon Corporation: See—  
Schreyer, Kenneth D., 252,555, Cl. D8-355.000.  
Comstock, Wilford K. Housing for electrical circuits. 252,568, 8-7-79, Cl. D13-40.000.  
Crystal Lite Manufacturing Co.: See—  
Frey, Max, 252,576, Cl. D15-148.000.  
Darwin, William B., to Plant Site, Inc. Greenhouse. 252,587, 8-7-79, Cl. D25-15.000.  
Duff Norton Company, Inc.: See—  
Harbage, Robert P.; and Leffler, Albert L., Jr., 252,567, Cl. D13-38.000.  
Dummermuth, Paul, to Maschinenfabrik Von Arx AG. Surface-cleaning apparatus. 252,553, 8-7-79, Cl. D8-62.000.  
Durante, Alfred J., to Cartier, Inc. Pendant. 252,561, 8-7-79, Cl. D11-79.000.  
Forward, John E.: See—  
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hacknauer, Frank, 252,557, Cl. D9-216.000.  
Frey, Max, to Crystal Lite Manufacturing Co. Telescoping guard for shaft coupling. 252,576, 8-7-79, Cl. D15-148.000.  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., to Bell Telephone Laboratories, Incorporated. Telephone stand. 252,569, 8-7-79, Cl. D14-60.000.  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., to Bell Telephone Laboratories, Incorporated. Telephone stand. 252,570, 8-7-79, Cl. D14-60.000.  
Glassman, Fredrick R. Light fixture. 252,594, 8-7-79, Cl. D48-23.00R.  
Goglanian, Alexander; and Goglanian, George. Hollow sandwich bread. 252,536, 8-7-79, Cl. D1-24.000.  
Goglanian, George: See—  
Goglanian, Alexander; and Goglanian, George, 252,536, Cl. D1-24.000.  
Hacknauer, Frank: See—  
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hacknauer, Frank, 252,557, Cl. D9-216.000.  
Hancock, Ernest T. Hanger for telephone handset. 252,571, 8-7-79, Cl. D14-65.000.  
Hanson, Thomas F. Wind turbine. 252,572, 8-7-79, Cl. D15-1.000.  
Harbage, Robert P.; and Leffler, Albert L., Jr., to Duff Norton Company, Inc. Pendant hoist control. 252,567, 8-7-79, Cl. D13-38.000.  
Harper, Margaret L. Key fob. 252,541, 8-7-79, Cl. D3-65.000.  
Harty, Millard F., Jr., to Motor Wheel Corporation. Wheel. 252,564, 8-7-79, Cl. D12-210.000.  
Hilsdale, Paul. Lamp shade. 252,593, 8-7-79, Cl. D48-16.00R.  
Hoffman, Paul R.; and Wallenwein, Hans K., to Plasti-Fab Co. Ltd. Food processor tool holder. 252,548, 8-7-79, Cl. D6-157.000.  
Hollyday, Hughlett, to Not Sew, Ltd. Pom-pom maker or the like. 252,538, 8-7-79, Cl. D3-26.000.  
Hyde Bird Feeder Company: See—  
Hyde, Donald B., Jr., 252,591, Cl. D30-1.00A.  
Hyde, Donald B., Jr., to Hyde Bird Feeder Company. Bird feeder. 252,591, 8-7-79, Cl. D30-1.00A.  
Irvin Industries Inc.: See—  
Rain, Lloyd H., 252,582, Cl. D21-253.000.  
Johnson, Roger K. Wine rack. 252,550, 8-7-79, Cl. D6-190.000.  
Keller, Ethel. Cake pan. 252,551, 8-7-79, Cl. D7-44.000.  
Kimstock, Inc.: See—  
Clow, William E., 252,585, Cl. D23-49.000.  
Kochen, Stanley: See—  
Muller, Keith; Stewart, Michael; and Kochen, Stanley, 252,589, Cl. D25-80.000.  
Kovach, Thomas L. Serological pipette. 252,586, 8-7-79, Cl. D24-55.000.  
Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 252,556, 8-7-79, Cl. D9-42.000.  
Kutschmende, Ralph. Illuminated sign with channels for moveable character plates. 252,579, 8-7-79, Cl. D20-10.000.  
Kutschmende, Ralph. Illuminated sign with channels for moveable character plates. 252,580, 8-7-79, Cl. D20-10.000.  
Lage, Lyle W. Pig waterer. 252,592, 8-7-79, Cl. D30-15.000.  
Lancer, Robert W. Tool handle. 252,554, 8-7-79, Cl. D8-83.000.  
Lee, Robert K. Combined easel and supply cabinet for an artist. 252,549, 8-7-79, Cl. D6-179.000.  
Leffler, Albert L., Jr.: See—  
Harbage, Robert P.; and Leffler, Albert L., Jr., 252,567, Cl. D13-38.000.  
Leopoldi, Norbert. Pen. 252,577, 8-7-79, Cl. D19-42.000.  
Lewis, Charles M., to Procurement Management Services, Inc. Combined desk, locker and bunk bed unit. 252,542, 8-7-79, Cl. D6-4.000.  
Lonnroth, Jonas, to Aktiebolaget Instrument Verken. Compass-rose scale. 252,560, 8-7-79, Cl. D10-74.000.  
Maschinenfabrik Von Arx AG: See—  
Dummermuth, Paul, 252,553, Cl. D8-62.000.  
Max Factor & Co., legal representative: See—  
Peretti, Elsa; and Max Factor & Co., legal representative, 252,590, Cl. D28-80.000.  
McGarvey, John N.: See—  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,569, Cl. D14-60.000.  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,570, Cl. D14-60.000.  
Motor Wheel Corporation: See—  
Blanchard, Russell O., 252,565, Cl. D12-211.000.  
Blanchard, Russell O., 252,566, Cl. D12-211.000.  
Harty, Millard F., Jr., 252,564, Cl. D12-210.000.  
Muller, Keith; Stewart, Michael; and Kochen, Stanley. Paving stone. 252,589, 8-7-79, Cl. D25-80.000.  
Murphy, Cornelius J., to Riblet Products Corp. Automotive console ice chest and cooler. 252,540, 8-7-79, Cl. D3-40.000.  
Not Sew, Ltd.: See—  
Hollyday, Hughlett, 252,538, Cl. D3-26.000.  
Ogawa, Iwakichi, to Takara Co., Ltd. Articulated toy figure. 252,581, 8-7-79, Cl. D21-177.000.  
Owens-Illinois, Inc.: See—  
Kretz, Edward J., 252,556, Cl. D9-42.000.  
Palmer, Melvin B. Seat for a spa tank. 252,545, 8-7-79, Cl. D6-58.000.  
Peretti, Elsa; and Max Factor & Co., legal representative. Cosmetic container. 252,590, 8-7-79, Cl. D28-80.000.  
Peters-Revington Corporation: See—  
Ungaro, Nicholas A., 252,547, Cl. D6-153.000.  
Petersen, Warren D., to Burd, Inc., Howell Division. Chair or similar article. 252,544, 8-7-79, Cl. D6-31.000.  
Petersen, Warren D., to Burd, Inc., Howell Division. Chair or similar article. 252,546, 8-7-79, Cl. D6-73.000.  
Plant Site, Inc.: See—  
Darwin, William B., 252,587, Cl. D25-15.000.  
Plasti-Fab Co. Ltd.: See—  
Hoffman, Paul R.; and Wallenwein, Hans K., 252,548, Cl. D6-157.000.  
Procurement Management Services, Inc.: See—  
Lewis, Charles M., 252,542, Cl. D6-4.000.  
Rain, Lloyd H., to Irvin Industries Inc. Tent. 252,582, 8-7-79, Cl. D21-253.000.  
Raz, Zeev. Toilet flush handle. 252,584, 8-7-79, Cl. D23-29.000.  
Riblet Products Corp.: See—  
Murphy, Cornelius J., 252,540, Cl. D3-40.000.  
Robertson, Donald A.: See—  
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hacknauer, Frank, 252,557, Cl. D9-216.000.  
Rogers, Ronald G. Carrier for a pair of ice skates. 252,595, 8-7-79, Cl. D3-36.000.  
Schreyer, Kenneth D., to Columbus McKinnon Corporation. Telescopic turnbuckle. 252,555, 8-7-79, Cl. D8-355.000.  
Shelton, David R. Fishing plug. 252,583, 8-7-79, Cl. D22-27.000.  
Simmons, Henry T., to Brown & Sharpe Manufacturing Company. Automatic lathe. 252,575, 8-7-79, Cl. D15-130.000.  
Spinner, James F. Aquarium building. 252,588, 8-7-79, Cl. D25-19.000.  
Stewart, Michael: See—  
Muller, Keith; Stewart, Michael; and Kochen, Stanley, 252,589, Cl. D25-80.000.  
Stimpel, Marion. Combined apron and detachable towel. 252,537, 8-7-79, Cl. D2-227.000.  
Stoff, Norman B. Device for turning light switch on and off. 252,552, 8-7-79, Cl. D8-14.000.  
Sylvester, Gordon E.: See—  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,569, Cl. D14-60.000.  
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,570, Cl. D14-60.000.  
Takara Co., Ltd.: See—  
Ogawa, Iwakichi, 252,581, Cl. D21-177.000.  
Taylor, Tad. Storage cabinet or similar article. 252,543, 8-7-79, Cl. D6-5.000.

PI 27

Ungaro, Nicholas A., to Peters-Revington Corporation. Table. 252,547, 8-7-79, Cl. D6-153.000.  
Van Koert, John P. American beaver sculpture or the like. 252,562, 8-7-79, Cl. D11-158.000.  
Vivitar Corporation: See—  
Cohoe, Donald R., 252,539, Cl. D3-33.000.  
Vredenburg, Edmund, to Vredenburg Leisure Time Products. Beverage serving cart. 252,563, 8-7-79, Cl. D12-22.000.  
Vredenburg Leisure Time Products: See—  
Vredenburg, Edmund, 252,563, Cl. D12-22.000.  
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hack-  
nauer, Frank, to Xerox Corporation. Toner container. 252,557, 8-7-79, Cl. D9-216.000.  
Wallenwein, Hans K.: See—  
Hoffman, Paul R.; and Wallenwein, Hans K., 252,548, Cl. D6-157.000.  
Weger, Kurt H. Compactor. 252,573, 8-7-79, Cl. D15-123.000.  
Xerox Corporation: See—  
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hacknauer, Frank, 252,557, Cl. D9-216.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 7, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3	CLASS 46	35	4,163,385	288	4,163,428	80 E	4,163,471	506	4,163,495
1.913	4,163,292	141 R	4,163,386	CLASS 118	4,163,429	104 R	4,163,472	538	4,163,496
CLASS 4	CLASS 47	178 R	4,163,387	117	4,163,429	157	4,163,473	CLASS 206	
3	4,163,293	190 CV	4,163,388	CLASS 122		179	4,163,474	44	4,163,707
111	4,163,294	194 F	4,163,389	20 B	4,163,430	CLASS 166		89	4,163,708
172.14	4,163,295	204	4,163,390	CLASS 123		251	4,163,475	120	4,163,709
CLASS 5	CLASS 49	421 B	4,163,391	102	4,163,432	271	4,163,476	161	4,163,710
255	4,163,344	584	4,163,392	118	4,163,431	362	4,163,477	CLASS 210	
446	CLASS 51	626	4,163,393	119 A	4,163,435	CLASS 174		7	4,163,712
CLASS 8	CLASS 52	708	4,163,394	119 D	4,163,434	48	4,163,867	22 C	4,163,713
2.5 A	33 W	721	4,163,395	119 EC	4,163,433	87	4,163,868	23 F	4,163,714
151	165.77	800	4,163,397	141	4,163,436	94 R	4,163,869	28	4,163,715
CLASS 15	295	CLASS 74		148 E	4,163,437	CLASS 175		30 R	4,163,716
21 A	105	483 K	4,163,398	190 A	4,163,438	92	4,163,478	31 R	Re.30,066
23	241	700	4,163,399	CLASS 124		68	4,163,479	34	4,163,717
50 R	403	710	4,163,400	CLASS 75	4,163,439	76	4,163,689	84	4,163,718
CLASS 16	542	60	4,163,663	CLASS 126		78	Re.30,065	197	4,163,719
135	CLASS 33	108	4,163,664	116 A	4,163,440	CLASS 178		232	4,163,720
CLASS 19	393	143	4,163,665	121	4,163,441	26 R	4,163,870	236	4,163,721
97	430	177	4,163,666	197	4,163,442	CLASS 179		319	4,163,722
299	436	57.34	4,163,401	198	4,163,443	1 CN	4,163,871	323 T	4,163,723
CLASS 23	CLASS 55	CLASS 82		428	4,163,445	1.5 R	4,163,872	490	4,163,724
230 R	70	1 C	4,163,402	CLASS 128		84 T	4,163,873	512 R	4,163,725
CLASS 28	99	38 A	4,163,403	138 A	4,163,449	100 R	4,163,874	CLASS 211	
254	126	CLASS 83		142.2	4,163,448	103	4,163,875	CLASS 215	
CLASS 29	344	165	4,163,404	145.8	4,163,450	115.5 R	4,163,876	260	4,163,500
25.19	CLASS 56	371	4,163,405	419 PG	4,163,451	146 E	4,163,877	CLASS 219	
407	328 R	424	4,163,406	754	4,163,446	170 NC	4,163,878	10.49 R	4,163,884
527.7	CLASS 57	CLASS 84		CLASS 131		286	4,163,479	60 A	4,163,885
563	58.36	1.03	4,163,407	10 A	4,163,452	CLASS 182		69 P	4,163,886
593	78	454	4,163,408	17 R	4,163,453	14	4,163,480	98	4,163,887
620	93	484	4,163,409	CLASS 134		CLASS 188		121 EB	4,163,888
CLASS 30	CLASS 58	23	4,163,410	57 R	4,163,454	24	4,163,481	121 P	4,163,890
123.7	39.5	CLASS 89		167 R	4,163,455	71.8	4,163,482	216	4,163,891
5	50 R	1 H	4,163,411	CLASS 136		89 CC	4,163,678	290	4,163,892
32	126 R	CLASS 91		89 TF	4,163,677	18 R	4,163,484	391	4,163,893
CLASS 33	CLASS 59	451	4,163,412	CLASS 137		CLASS 190		525	4,163,894
1 S	27	521	4,163,413	116.5	Re.30,063	18 R	4,163,484	CLASS 191	
27 B	39.02	CLASS 93		202	4,163,456	40	4,163,485	CLASS 220	
141 R	39.03	216	4,163,457	216	4,163,457	CLASS 192		3.6	4,163,501
313	226 R	53 M	4,163,414	240	4,163,458	35	4,163,486	3.94	4,163,502
346	414	CLASS 96		344	4,163,459	CLASS 198		18	4,163,503
361	488	1.5 N	4,163,667	625.4	4,163,460	383	4,163,487	66	4,163,504
CLASS 34	CLASS 62	66.5	Re.30,064	CLASS 138		504	4,163,488	85 B	4,163,505
5	2	74	4,163,669	30	4,163,461	505	4,163,489	260	4,163,506
CLASS 35	28	91 D	4,163,672	90	4,163,462	531	4,163,490	CLASS 221	
25	50	CLASS 98		118.1	4,163,463	836	4,163,491	2	4,163,507
CLASS 37	259	2.09	4,163,415	CLASS 141		CLASS 200		310	4,163,508
10	279	40 R	4,163,416	198	4,163,464	11 TW	4,163,879	95	4,163,509
64	457	CLASS 99		CLASS 144		61.58 B	4,163,880	129.2	4,163,510
CLASS 38	CLASS 65	277.2	4,163,417	87	4,163,465	153 G	4,163,881	144.5	4,163,511
12	3 A	374	4,163,418	CLASS 148		296	4,163,882	525	4,163,512
CLASS 40	17	CLASS 100		6.27	4,163,679	314	4,163,883	CLASS 224	
449	43	89	4,163,419	16.5	4,163,680	CLASS 201		32 R	4,163,513
561	134	223	4,163,420	CLASS 149		22	4,163,693	CLASS 226	
CLASS 42	303 A	41	4,163,421	11	4,163,681	139	4,163,694	141	4,163,514
25	CLASS 71	111	4,163,422	CLASS 152		CLASS 202		120	4,163,515
83	27	CLASS 102		158	4,163,466	18	4,163,695	CLASS 227	
CLASS 43	73	211	4,163,423	347	4,163,467	44	4,163,696	114	4,163,516
37	76	CLASS 105		CLASS 156		49	4,163,697	CLASS 228	
42.05	88	313	4,163,424	136	4,163,683	CLASS 204		8	4,163,518
42.17	108	366 C	4,163,425	259	4,163,684	1 T	4,163,698	45	4,163,517
44.4	120	CLASS 106		405 R	4,163,685	43 S	4,163,700	CLASS 233	
134	477	11	4,163,673	492	4,163,686	129.75	4,163,701	26	4,163,519
CLASS 44	60	15.05	4,163,674	CLASS 157		181 R	4,163,703	CLASS 235	
51	63	22	4,163,675	1.17	4,163,468	181 T	4,163,702	92 SB	4,163,897
62	121	243	4,163,676	CLASS 162		206	4,163,704	CLASS 239	
73	342	28 R	4,163,426	21	4,163,687	239	4,163,705	86	4,163,521
	477	35	4,163,427	359	4,163,688	242	4,163,706	230	4,163,522
	CLASS 73	70	4,163,470	CLASS 165		CLASS 206		305	4,163,523
	24					380	4,163,492	707	4,163,520
	27 R					423	4,163,494		
	29								



CLASS 241		408	4,163,926	226	4,163,604	CLASS 366	613	4,163,808
30	4,163,524	104	4,163,551	307	4,163,606	CLASS 367	CLASS 427	
247	4,163,525	CLASS 272		262	4,163,616	CLASS 403	44	4,163,809
CLASS 242		68	4,163,927	47	4,163,607	CLASS 404	54	4,163,810
54 R	4,163,526	29 A	4,163,552	132	4,163,617	CLASS 405	115	4,163,811
55	4,163,527	73 D	4,163,553	245	4,163,618	CLASS 406	183	4,163,812
84.21 R	4,163,528	80 C	4,163,554	71	4,163,610	CLASS 407	198	4,163,813
85.1	4,163,529	86 B	4,163,555	101	4,163,611	CLASS 408	372 R	4,163,814
107.1	4,163,530	86 H	4,163,556	152	4,163,612	CLASS 409	385 R	4,163,815
158 R	4,163,531	101.1	4,163,557	198	4,163,613	CLASS 410	401	4,163,816
186	4,163,532	115	4,163,558	12	4,163,582	CLASS 411	33	4,163,817
198	4,163,533	148 A	4,163,559	198	4,163,583	CLASS 412	138	4,163,818
CLASS 244		273	4,163,560	3	4,163,614	CLASS 413	198	4,163,819
3.22	4,163,534	29.5	4,163,935	27	4,163,622	CLASS 414	212	4,163,820
17.23	4,163,535	51	4,163,936	46	4,163,623	CLASS 415	245	4,163,821
CLASS 248		57 R	4,163,937	185	4,163,624	CLASS 416	304	4,163,822
118	4,163,536	74	4,163,938	2	4,163,982	CLASS 417	313	4,163,823
188.1	4,163,537	104	4,163,939	12	4,163,983	CLASS 418	368	4,163,824
278	4,163,538	132	4,163,940	22	4,163,984	CLASS 419	377	4,163,825
452	4,163,539	178	4,163,941	411	4,163,985	CLASS 420	378	4,163,826
CLASS 249		52	4,163,942	469	4,163,986	CLASS 421	411	4,163,827
67	4,163,540	433	4,163,943	686	4,163,987	CLASS 422	194	4,163,828
117	4,163,541	446	4,163,944	697	4,163,988	CLASS 423	174	4,163,829
CLASS 250		473	4,163,945	55	4,163,989	CLASS 424	254	4,163,830
315 R	4,163,898	CLASS 283		6	4,163,636	CLASS 425	111	4,163,831
343	4,163,899	8 A	4,163,570	115	4,163,637	CLASS 426	2	4,163,832
401	4,163,901	CLASS 285		64	4,163,638	CLASS 427	67	4,163,833
439 R	4,163,900	106	4,163,571	113	4,163,639	CLASS 428	230	4,163,834
452	4,163,902	121	4,163,572	183	4,163,640	CLASS 429	290	4,163,835
554	4,163,903	174	4,163,573	287	4,163,641	CLASS 430	314	4,163,836
CLASS 251		54	4,163,904	10	4,163,993	CLASS 431	419	4,163,837
48	4,163,543	CLASS 292		70	4,163,994	CLASS 432	534	4,163,838
328	4,163,544	94.5 H	4,163,951	76	4,163,995	CLASS 433	153	4,163,839
CLASS 252		5	4,163,952	137	4,163,997	CLASS 434	76	4,163,840
8.55 C	4,163,727	CLASS 294		23	4,163,999	CLASS 435	205	4,163,841
18	4,163,728	5	4,163,953	27	4,164,000	CLASS 436	254	4,163,842
34.7	4,163,729	19 R	4,163,954	236	4,164,001	CLASS 437	366	4,163,843
78.5	4,163,730	CLASS 296		351	4,164,002	CLASS 438	498	4,163,844
99	4,163,731	97 H	4,163,955	363	4,164,003	CLASS 439	501	4,163,845
180	4,163,732	164	4,163,956	567	4,164,004	CLASS 440	24	4,163,846
408	4,163,733	204	4,163,957	1	4,164,005	CLASS 441	101	4,163,847
443	4,163,734	CLASS 299		13	4,164,006	CLASS 442	32	4,163,848
466 PT	4,163,735	5	4,163,958	103	4,164,007	CLASS 443	215	4,163,849
522	4,163,736	91	4,163,959	127	4,164,008	CLASS 444	262	4,163,850
CLASS 256		261	4,163,961	147	4,164,009	CLASS 445	300	4,163,851
17	4,163,545	CLASS 303		282	4,164,010	CLASS 446	319	4,163,852
CLASS 260		7	4,163,962	358	4,164,011	CLASS 447	357	4,163,853
29.6 ME	4,163,738	9	4,163,963	116	4,164,012	CLASS 448	21	4,163,854
31.2 N	4,163,740	20	4,163,964	200	4,164,013	CLASS 449	51	4,163,855
31.2 R	4,163,739	22 R	4,163,965	217	4,164,014	CLASS 450	84	4,163,856
33.4 R	4,163,741	24 C	4,163,966	270	4,164,015	CLASS 451	114	4,163,857
42.17	4,163,742	CLASS 305		285	4,164,016	CLASS 452	149	4,163,858
239 A	4,163,743	14	4,163,967	304	4,164,017	CLASS 453	251	4,163,859
239.55 C	4,163,744	CLASS 307		351	4,164,018	CLASS 454	329	4,163,860
345.2	4,163,745	39	4,163,968	486	4,164,019	CLASS 455	318	4,163,861
378	4,163,746	88 R	4,163,969	700	4,164,020	CLASS 456	53	4,163,862
403	4,163,747	97 P	4,163,970	705	4,164,021	CLASS 457	96	4,163,863
404.5	4,163,748	100	4,163,971	709	4,164,022	CLASS 458	132	4,163,864
409	4,163,749	107	4,163,972	710	4,164,023	CLASS 459	534	4,163,865
457	4,163,750	115 C	4,163,973	718	4,164,024	CLASS 460	628	4,163,866
508	4,163,751	CLASS 340		726	4,164,025	CLASS 461	640	4,163,867
544 D	4,163,752	15	4,163,974	729	4,164,026	CLASS 462	798	4,163,868
561 N	4,163,753	347 DD	4,163,975	862	4,164,027	CLASS 463	819	4,163,869
566 A	4,163,754	539	4,163,976	900	4,164,028	CLASS 464	431	4,163,870
570 R	4,163,755	630	4,163,977	CLASS 343		CLASS 465		
586 R	4,163,756	686	4,163,978	7 A	4,163,972	CLASS 466		
600 A	4,163,757	754	4,163,979	12 R	4,163,973	CLASS 467		
606.5 P	4,163,758	CLASS 346		16 M	4,163,974	CLASS 468		
929	4,163,759	74.1	4,163,979	112 R	4,163,975	CLASS 469		
CLASS 264		155	4,163,980	120	4,163,976	CLASS 470		
23	4,163,768	CLASS 347		715	4,163,977	CLASS 471		
42	4,163,769	CLASS 348		CLASS 350		CLASS 472		
210.3	4,163,770	112 R	4,163,978	3.72	4,163,542	CLASS 473		
CLASS 266		120	4,163,979	6.7	4,163,600	CLASS 474		
281	4,163,546	CLASS 312		96.31	4,163,601	CLASS 475		
CLASS 269		194	4,163,980	214	4,163,603	CLASS 476		
42	4,163,547	CLASS 313		CLASS 351		CLASS 477		
CLASS 270		309	4,163,981	CLASS 352		CLASS 478		
39	4,163,548	479	4,163,982	CLASS 353		CLASS 479		
CLASS 271		503	4,163,983	CLASS 354		CLASS 480		
174	4,163,549	CLASS 315		CLASS 355		CLASS 481		
274	4,163,550	39.51	4,163,921	CLASS 356		CLASS 482		
		39.71	4,163,922	CLASS 357		CLASS 483		
		208	4,163,923	CLASS 358		CLASS 484		
		241 P	4,163,924	CLASS 359		CLASS 485		
		276	4,163,925	CLASS 360		CLASS 486		

D1—	24	252,536	58	252,545	D9—	355	252,555	211	252,565	130	252,575	D24—	49	252,585
D2—	227	252,537	73	252,546		42	252,556		252,566	148	252,576	D25—	55	252,586
D3—	26	252,538	153	252,547		216	252,557	D13—	38	252,567		42	252,577	
	33	252,539	157	252,548		224	252,558	D14—	40	252,568	D20—	10	252,578	
	36	252,540	179	252,549		245	252,559		60	252,569		86	252,579	
	40	252,541	190	252,550	D10—	74	252,560					10	252,580	
	65	252,542	D7—	44	252,551	D11—	79	252,561		65	252,571	D21—	177	252,581
D6—	4	252,543	D8—	14	252,552		158	252,562	D15—	1	252,572		253	252,582
	5	252,544		62	252,553	D12—	22	252,563		29	252,573	D22—	27	252,583
	31	252,545		83	252,554		210	252,564		123	252,574	D23—	29	252,584

## CLASSIFICATION OF PLANTS

P—	8	4,447	68	4,445	4,446				
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## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

8—	2.5 R	T985,001	242—107.4 R	T985,002	260—	45.7 S	T985,004	45.75 S	T985,003	364—	515	T985,005	403—	163	T985,006
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# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,163,546	4,163,689	4,163,907	18 : 4,164,041	4,163,795	4,163,531
4 : 4,163,474	4,163,944	4,163,944	Re.30,062	4,163,796	4,163,644
6 : 4,163,512	4,163,708	4,163,959	Re.30,063	4,163,797	4,163,678
4,163,343	4,163,729	4,163,424	4,163,424	4,163,798	4,163,706
4,163,348	4,163,779	4,163,369	4,163,436	4,163,806	4,163,714
4,163,406	4,163,787	4,163,380	4,163,438	4,163,815	4,163,717
4,163,411	4,163,807	4,163,539	4,163,554	4,163,841	4,163,723
4,163,461	4,163,808	4,163,869	4,163,629	4,163,842	4,163,737
4,163,499	4,163,909	4,163,459	4,163,682	4,163,843	4,163,751
4,163,655	4,163,911	4,163,478	4,163,772	4,163,867	4,163,756
4,163,773	4,163,928	4,163,553	4,163,926	4,163,880	4,163,788
4,163,774	4,163,954	4,163,315	4,163,627	4,163,888	4,163,821
4,163,895	4,163,973	4,163,368	4,163,805	4,163,917	4,163,828
4,163,899	4,163,993	4,163,383	4,163,387	4,163,920	4,163,832
4,163,958	4,164,008	4,163,398	4,163,296	4,163,936	4,163,853
4,163,987	4,164,023	4,163,400	4,163,376	4,163,405	4,163,871
4,163,988	4,163,993	4,163,409	4,163,702	4,163,442	4,163,879
4,164,020	4,163,721	4,163,413	4,163,455	4,163,446	4,163,934
4,164,028	4,163,726	4,163,463	4,163,831	4,163,506	4,163,942
8 : 4,164,019	4,163,897	4,163,498	4,163,458	4,163,518	4,163,955
9 : 4,163,366	4,163,654	4,163,501	4,163,306	4,163,596	4,163,961
4,163,784	4,163,914	4,163,507	4,163,565	4,163,659	4,163,974
4,163,900	4,163,977	4,163,813	4,163,813	4,163,722	4,163,982
01 : 4,163,918	4,164,039	4,163,510	4,163,817	4,163,834	4,163,999
4,163,949	Re.30,065	4,163,529	4,163,872	4,164,027	4,164,025
04 : 4,163,410	4,163,485	4,163,550	4,163,998	4,163,344	4,164,038
4,163,548	4,163,521	4,163,558	4,163,540	4,163,894	4,163,327
4,163,908	4,163,593	4,163,564	4,163,639	4,163,300	4,163,334
4,164,003	4,163,657	4,163,778	4,163,778	4,163,468	4,163,342
06 : 4,163,317	4,163,676	4,163,816	4,163,816	4,163,583	4,163,354
4,163,341	4,163,735	4,163,826	4,163,921	4,163,585	4,163,362
4,163,375	4,163,743	4,163,619	4,163,936	4,163,645	4,163,372
4,163,382	4,163,745	4,163,947	4,163,956	4,163,646	4,163,407
4,163,388	4,163,753	4,163,969	4,163,969	4,163,728	4,163,408
4,163,390	4,163,755	4,163,971	4,163,971	4,163,771	4,163,417
4,163,392	4,163,811	4,163,709	4,163,984	4,163,777	4,163,449
4,163,421	4,163,881	4,163,710	4,163,996	4,163,850	4,163,484
4,163,431	4,163,910	4,163,711	4,164,006	4,163,545	4,163,517
4,163,471	4,163,932	4,163,738	4,164,007	4,163,905	4,163,519
4,163,475	4,163,984	4,163,744	4,164,012	4,163,294	4,163,542
4,163,494	4,163,662	4,163,827	4,164,016	4,163,426	4,163,556
4,163,497	4,163,692	4,163,859	4,163,299	Re.30,069	4,163,575
4,163,541	4,163,742	4,163,878	4,163,371	4,163,326	4,163,592
4,163,555	4,163,754	4,163,884	4,163,457	4,163,347	4,163,601
4,163,580	4,163,885	4,163,896	4,163,465	4,163,352	4,163,610
4,163,615	4,163,423	4,163,896	4,163,515	4,163,396	4,163,613
4,163,637	4,163,337	4,163,941	4,163,523	4,163,427	4,163,614
4,163,649	4,163,353	4,164,000	4,163,559	4,163,462	4,163,647
4,163,660	4,163,356	4,164,001	4,163,590	4,163,489	4,163,667
4,163,665	4,163,381	4,164,033	4,163,718	4,163,493	4,163,761
4,163,681	4,163,451	4,164,034	4,163,727	4,163,505	4,163,767
	4,163,522	4,164,035	4,163,762	4,163,512	4,163,770

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 33

4,163,833	4,163,466	4,163,985	4,163,776	4,163,845	4,163,812
4,163,912	4,163,467	4,164,009	4,163,781	4,163,913	4,164,022
4,163,919	4,163,469	4,163,576	4,163,783	Re.30,067	50 : 4,164,005
4,163,968	4,163,470	4,163,625	4,163,794	4,163,374	51 : 4,163,690
4,163,983	4,163,504	4,163,695	4,163,803	4,163,401	4,163,790
4,164,015	4,163,509	4,163,765	4,163,840	4,163,476	4,163,855
4,164,024	4,163,513	4,163,837	4,163,849	4,163,477	4,163,856
4,164,026	4,163,514	4,163,335	4,163,858	4,163,503	4,163,877
4,164,029	4,163,527	4,163,606	4,163,882	4,163,508	53 : 4,163,301
4,163,321	4,163,581	4,163,948	4,163,903	4,163,544	4,163,333
4,163,453	4,163,584	4,163,950	4,163,904	4,163,557	4,163,339
4,163,684	4,163,683	4,163,981	4,163,938	4,163,561	4,163,419
4,163,802	4,163,685	4,163,310	4,164,011	4,163,562	4,163,491
4,163,819	4,163,730	4,163,311	4,163,403	4,163,597	4,163,525
4,163,848	4,163,757	4,163,328	4,163,563	4,163,608	4,163,600
4,163,939	4,163,766	4,163,367	4,163,883	4,163,609	4,163,868
4,163,963	4,163,800	4,163,395	4,163,370	4,163,620	4,163,946
4,163,986	4,163,804	4,163,414	4,163,567	4,163,632	4,164,036
4,164,010	4,163,809	4,163,441	4,163,653	4,163,638	54 : 4,163,572
Re.30,068	4,163,810	4,163,598	4,163,927	4,163,650	55 : 4,163,443
4,163,346	4,163,829	4,163,616	4,163,733	4,163,764	4,163,490
4,163,349	4,163,862	4,163,631	4,163,733	4,164,031	4,163,599
4,163,353	4,163,923	4,163,642	4,163,516	4,164,037	4,163,673
4,163,412	4,163,931	4,163,677	4,163,574	4,163,524	4,163,929
4,163,422	4,163,962	4,163,768	4,163,698	4,163,769	56 : 4,163,568

## DESIGN PATENTS

4 : 252,571	252,558	11 : 252,588	25 : 252,591	252,555	41 : 252,576
04 : 252,551	252,572	17 : 252,544	26 : 252,564	252,561	42 : 252,542
06 : 252,536	252,578	252,546	252,565	252,562	44 : 252,575
252,538	252,585	252,577	252,566	252,579	48 : 252,554
252,539	252,593	18 : 252,540	27 : 252,539	252,580	49 : 252,563
252,541	252,594	19 : 252,569	34 : 252,570	37 : 252,567	252,568
252,545	252,595	20 : 252,573	36 : 252,570	39 : 252,556	51 : 252,583
252,549	252,596	21 : 252,587	252,537	252,557	53 : 252,574
252,550	08 : 252,543	09 : 252,582	252,552	252,586	

## PLANT PATENTS

06 : 4,445	4,447	12 : 4,446		
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## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

19 : T985,006	26 : T985,002	36 : T985,005	42 : T985,003	T985,004
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**OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE**

August 14, 1979

Volume 985

Number 2

**C O N T E N T S**

	<b>Page</b>
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	985 OG 10
Patent Suits . . . . .	985 OG 10
Reissue Application Filed . . . . .	985 OG 11
Patent Notices	
Certificates of Correction for the Week of August 14, 1979 . . . . .	985 OG 12
National Technical Information Service . . . . .	985 OG 12
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	985 OG 14
Condition of Patent Applications . . . . .	985 OG 15
Reissue Patents Granted (30,070) . . . . .	267
Plant Patents Granted (4,448) . . . . .	271
Patents Granted	
General and Mechanical (4,164,042) . . . . .	273
Chemical (4,164,392) . . . . .	393
Electrical (4,164,617) . . . . .	453
Design Patents Granted (252,596) . . . . .	511
Index of Patentees . . . . .	PI 1
Indices of Reissues, Plants and Designs . . . . .	PI 26
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Plants . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Plants . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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## PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979. Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	\$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,  
Acting Commissioner of  
Patents and Trademarks.  
July 3, 1979.

## Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,236,679, Ransburg Electro-Coating Corp., ELECTRO-STATIC SPRAYING, filed June 8, 1979, D.C., N.D. Ohio (Cleveland) Doc. C79-1170, HSC Corporation v. American Chemical Products Co.

3,492,748, Armand D. Swenson, PISTOL SAFETY MECHANISM ADAPTED FOR RIGHT OR LEFT HAND OPERATION, filed May 25, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79-1925-RMT (Px), Armand D. Swenson v. M Bar S Safari Outfitters, Inc. et al. Temporary restraining order issued May 25, 1979 and set for hearing on June 4, 1979.

3,644,764, Mesur-Matic Electronics Corp., HARMONIC DRIVE FOR DIGITAL STEP MOTOR, filed June 16, 1978, D.C., M.D. Pa. (Scranton), Doc. C-78-573, Mesur-Matic Electronics Corp. v. Mergenthaler Linotype Company, Inc. Order of court accepting settlement agreement, and dismissing action filed on May 25, 1979.

3,661,144, Jensen and Jensen, SUCTION APPARATUS FOR BODY CAVITIES, filed June 6, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c2253, A/S Ferrosan v. Milax Products, Inc. et al.

3,692,208, Dart Industries, Inc., CLOSURE FOR OPEN-MOUTHED CONTAINERS FOR TUBULAR VESSELS; 3,756,480, same, THREE-PART PRESS TYPE SEAL; D. 226,576, same, CONTAINER CLOSURE OR THE LIKE, filed Apr. 17, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79-260, Dart Industries, Inc. v. Henriksen Imports, Inc. et al.

3,752,228, Escoa Fintube Corporation, I-TYPE SEGMENTED FINNED TUBE; 3,764,774, same, I-TYPE SEGMENTED FINNED TUBE AND ITS METHOD OF MANUFACTURE, filed Nov. 11, 1976, D.C., N.D. Okla. (Tulsa), Doc. 76-C-572, Escoa Fintube Corporation v. Tranter, Inc. Judgment entered in favor of defendant on Apr. 6, 1979.

3,756,480. (See 3,692,208.)

3,764,774. (See 3,752,228.)

3,786,734, Martin H. Long, UNDERWATER ELECTRONIC FLASH ACTUATOR, filed Apr. 10, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79-0824 LHB, Martin Long v. O. H. Brigham. Order to remand to Superior Court of California granted on June 15, 1979.

3,841,701, Vecta Group, Inc., CONNECTABLE LOUNGE CHAIRS, filed June 14, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c2459, Vecta Contract Inc. v. Cartwright Corp.

3,860,903, The Procter & Gamble Company, CONTRACTABLE SIDE PORTIONS FOR DISPOSABLE DIAPER; 4,081,301, same, METHOD AND APPARATUS FOR CONTINUOUSLY ATTACHING DISCRETE, STRETCHED ELASTIC STRANDS TO PREDETERMINED ISOLATED PORTIONS OF DISPOSABLE ABSORBENT PRODUCTS, filed June 19, 1979, D.C. Del. (Wilmington), Doc. 79-287, The Procter & Gamble Company v. Riegel Textile Corporation.

3,868,790, Roy A. Fricke, SPARK PLUG CLEANER; 4,028,851, same; 4,062,155, same, filed July 13, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-C-436, Wells Mfg. Corp. v. Roy A. Fricke and Elco International Limited.

3,885,552, Pacemaker Diagnostic Clinic of America, Inc., FUNCTION MONITORING SYSTEM AND METHOD FOR USE IN ASSOCIATION WITH CARDIAC PACER APPARATUS, filed June 5, 1979, D.C. Oreg. (Portland), Doc. C-79-601, Pacemaker Diagnostic Clinic of America, Inc. v. Instrumedix, Inc.

3,890,451, Julius L. Keszler, PROCESS OF MAKING A BACON-LIKE MEAT PRODUCT OF REDUCED FAT CONTENT; 4,057,650, same, BACON-LIKE MEAT PRODUCT OF REDUCED FAT CONTENT, filed June 5, 1979, D.C.N.J. (Newark), Doc. C-79-1678, Julius L. Keszler v. Swift & Co. et al.

3,920,852, Speck-Pumpen Daniel Speck & Soehne, PUMP WITH PLASTIC HOUSING, filed Mar. 12, 1979, D.C., E.D.N.Y. (Brooklyn), Doc. 79C650, Speck-Pumpen Daniel Speck & Soehne v. Lomart Industries, Inc.

3,937,882, The Vadco Corporation, FULL-DUPLEX COMMUNICATION SYSTEM ON A TWO WIRE LINE, filed Apr. 27, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79-1021 WHO, Western Electric Company, Inc. et al. v. Racal-Vadco, Inc.

3,994,097, Ralph W. Lamb, ABRASIVE OR SAND BLAST APPARATUS AND METHOD, filed June 5, 1979, D.C. Oreg. (Portland), Doc. 79-600, Ralph W. Lamb v. Mark K. Hagg et al.

4,028,851. (See 3,868,790.)

4,034,099, The Upjohn Company, COMPOSITIONS AND METHOD FOR TREATING MASTITIS IN MILK ANIMALS, filed May 30, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c2206, The Upjohn Company v. Beecham Inc. et al.

4,055,029, Collo GmbH, CLEANING, SCOURING AND/OR POLISHING PADS; 4,111,666, same, METHOD OF MAKING CLEANING, SCOURING AND/OR POLISHING PADS AND THE IMPROVED PADS PRODUCED THEREBY, filed Apr. 26, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79-286, Fedco Foam International, Inc. v. S. C. Johnson & Son, Inc.

4,057,650. (See 3,890,451.)

4,062,155. (See 3,868,790.)

4,081,301. (See 3,860,903.)

4,109,224, American Antenna Corporation, PRECISION INJECTION-MOLDED COIL FORM AND METHOD AND APPARATUS FOR MANUFACTURE, filed June 1, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c2246, American Antenna Corporation v. Ava Incorporated et al.

4,111,481, Edwin Lee Nix and Bobby E. Davenport, TRUCK BED LINER, filed Jan. 25, 1979, D.C., S.D. Tex. (Houston), Doc. C.A. H-79-175, Plastics Unlimited, Inc., Edwin Lee Nix and Bobby E. Davenport v. Fred Davis, doing business as Davis Distributors. Defendant permanently enjoined from infringing plaintiff's patent. Filed June 15, 1979.

4,111,666. (See 4,055,029.)

4,117,827, Preway, Inc., FIREPLACE CONSTRUCTION, filed May 4, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1817, Preway, Inc. v. The Edward George Company et al.

4,150,253, Inter-Technology Exchange, Ltd., SIGNAL DISTORTION CIRCUIT AND METHOD OF USE, filed May 4, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-71429, Inter-Technology Exchange, Ltd. v. EXR Corp. et al.

D. 226,576. (See 3,692,208.)

D. 240,064, Hydro-Spa, Inc., BATHING POOL; D. 245,541, same, filed Apr. 12, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79-1366-AAH (Tx), Hydro-Spa, Inc. v. Glas-Com, Inc. and William D. Gutierrez.

D. 245,541. (See D. 240,064.)

D. 245,542. (See D. 240,064.)

D. 247,419, David L. Mick, FIREPLACE GRATE, filed Dec. 21, 1978, D.C., M.D. Tenn. (Nashville), Doc. 78-3567-NA-CV, Mick Mechanisms, Inc. et al. v. Sears, Roebuck, & Co.

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,894,310, Re. S.N. 042,402, Filed May 25, 1979, Cl. 16/47, TWIN-WHEELED CASTOR, Stafford Thomas Screen, Owner of Record: British Castors Limited, West Bromwich, England, Attorney or Agent: Abraham Friedman, et al., Ex. Gp.: 353

4,035,197, Re. S.N. 033,615, Filed Apr. 26, 1979, Cl. 136/89 CD, CDTE BARRIER TYPE PHOTOVOLTAIC CELLS WITH ENHANCED OPEN-CIRCUIT VOLTAGE, AND PROCESS OF MANUFACTURE, Pranab K. Raychaudhuri, Owner of Record: Eastman Kodak Company, Rochester, N.Y., Attorney or Agent: Dana M. Schmidt, et al., Ex. Gp.: 114

4,068,036, Re. S.N. 039,748, Filed May 16, 1979, Cl. 428/296, FIBROUS PRODUCT, Harold Peter Stanistreet,

Owner of Record: AGFA Gevaert, Mortsel, Belgium, Attorney or Agent: John W. Malley, et al., Ex. Gp.: 164

4,080,335, Re. S.N. 038,737, Filed May 14, 1979, Cl. 260/345.2, ANOREXIC CHROMANS, Derek V. Gardner, Owner of Record: Beecham Group Limited, Brentford, Middlesex, England, Attorney or Agent: Alberk L. Jacobs, et al., Ex. Gp.: 126

4,118,071, Re. S.N. 034,420, Filed Apr. 30, 1979, Cl. 299/2, IN SITU OIL SHALE RETORT WITH A HORIZONTAL SILL PILLAR, Ned M. Hutchins, Owner of Record: Occidental Oil Shale, Inc., Grand Junction, Colo., Attorney or Agent: Robert I. Parker, et al., Ex. Gp.: 354

4,130,999, Re. S.N. 037,776, Filed May 7, 1979, Cl. 66/145 R, YARN BINDER APPARATUS, Roger L. Whittaker, et al., Owner of Record: Hanes Corporation, Winston-Salem, N.C., Attorney or Agent: Charles Y. Lackey, Ex. Gp.: 353

4,142,552, Re. S.N. 042,365, Filed May 25, 1979, Cl. 137/446, MAXIMUM LIQUID LEVEL CONTROL VALVE, Harley D. Brown, et al., Owner of Record: Inventar, Attorney or Agent: Harold R. Woodard, et al., Ex. Gp.: 341



# PATENT NOTICES

## Certificates of Correction for the Week of Aug. 14, 1979

Re. 29,707	4,124,555	4,142,045	4,149,954
4,040,755	4,126,154	4,144,082	4,150,295
4,066,583	4,126,898	4,144,109	4,150,724
4,071,512	4,129,734	4,144,389	4,150,923
4,079,410	4,130,089	4,144,635	4,151,079
4,081,336	4,131,553	4,144,735	4,151,716
4,082,750	4,133,430	4,144,926	4,152,078
4,094,751	4,138,596	4,145,164	4,152,406
4,094,865	4,134,705	4,145,556	4,152,438
4,097,636	4,134,983	4,146,338	4,152,588
4,097,797	4,137,361	4,146,552	4,152,735
4,102,858	4,137,881	4,146,844	4,152,761
4,105,821	4,138,709	4,146,900	4,152,974
4,110,099	4,138,928	4,146,905	4,153,816
4,111,963	4,140,183	4,147,007	4,153,862
4,112,421	4,140,297	4,147,333	4,153,933
4,114,870	4,141,149	4,147,371	4,154,487
4,118,565	4,141,237	4,147,558	4,154,636
4,118,843	4,141,317	4,148,639	4,155,978
4,122,370	4,141,990	4,148,772	4,156,469

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### DOUGLAS J. CAMPION, Patent Program Coordinator, National Technical Information Service.

### U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE National Institutes of Health, Chief, Patent Branch Westwood Building, Bethesda, Md. 20250

Patent application 749,093. Undercarboxylate and Tumour Assay. Filed Dec. 9, 1976.

### U.S. DEPARTMENT OF THE INTERIOR Branch of Patents, 18th and C Sts. NW. Washington, D.C. 20240

Patent 4,107,266. Production of Pure Alumina From Iron Contaminated Sulfate Liquors. Filed July 22, 1977. Patented Aug. 15, 1978. Not available NTIS.

### U.S. DEPARTMENT OF THE ARMY AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent 4,115,390. Method for the Preparation of 1-Alkyl Pyridinium Chlorides. Filed Aug. 19, 1977. Patented Sept. 19, 1978. Not available NTIS.

Patent 4,117,207. Molybdenum Chloride-Tetrachloraluminate Thermal Battery. Filed Oct. 14, 1977. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,131,461. Method and Apparatus for Use in the Extrusion of Billets. Filed June 21, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,131,625. 4,4 Feet Bis(3-Ethynylphenoxy)Diphenylsulfone. Filed Jan. 19, 1978. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,131,748. n-Terphenylene-Dicarboxylic Acids and Their Synthesis. Filed June 29, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,131,792. Fabry-Perot Dilexer. Filed Jan. 24, 1978. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,131,852. Single Dispersive Delay Line Compressive Receiver. Filed Sept. 28, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,132,660. Grease Compositions. Filed Mar. 1, 1978. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,135,548. Liquid Nitrogen Level Controller. Filed Aug. 11, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,136,234. Charge Sensing Electrode for a Primary Battery. Filed Apr. 17, 1978. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,137,370. Titanium and Titanium Alloys Ion Plated With Noble Metals and Their Alloys. Filed Aug. 16, 1977. Patented Jan. 30, 1979. Not available NTIS.

Patent 4,137,374. Method for State of Charge of Primary Battery. Filed May 2, 1978. Patented Jan. 30, 1979. Not available NTIS.

### U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent application 945,976. Inhibition of Lysinoalanine Formation by Lysine Acylation. Filed Sept. 26, 1978.

Patent 4,134,863. Highly Absorbent Graft Copolymers of Polyhydroxy Polymers, Acrylonitrile, and Acrylic Comonomers. Filed Dec. 6, 1976. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,136,131. Extraction of Rubber or Rubberlike Substances From Fibrous Plant Materials. Filed Mar. 31, 1978. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,136,509. Apparatus for Harvesting Vegetable Heads. Filed Apr. 20, 1977. Patented Jan. 30, 1979. Not available NTIS.

### U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents  
Washington, D.C. 20545

Patent application 822,971. Magnetohydrodynamic Generator Electrode. Filed Aug. 8, 1977.

Patent application 825,518. Distributed Electrical Leads for Thermionic Converter. Filed Aug. 17, 1977.

Patent application 847,996. Method for Producing Hydrocarbon Fuels From Heavy Polynuclear Hydrocarbons by Use of Molten Metal Halide Catalyst. Filed Nov. 2, 1977.

Patent application 850,335. Method for Recovering Amorphous Silica From Geothermal Solutions. Filed Nov. 10, 1977.

Patent 4,088,561. Apparatus for Electrophoresis Separation. Filed June 27, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,089,809. Regenerable Sorbent and Method for Removing Hydrogen Sulfide From Hot Gaseous Mixtures. Filed Mar. 1, 1976. Patented May 16, 1978. Not available NTIS.

### U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW.  
Washington, D.C. 20240

Patent application 958,578. Extensible Brattice and Cantilevered Roof Mounted Support System Therefor. Filed Nov. 7, 1978.

Patent application 958,594. Link-Loc Chainless Haulage System. Filed Nov. 7, 1978.

Patent application 968,046. Automated Feed and Rotational Speed Control System of a Hydraulic Motor Operated Drill. Filed Dec. 8, 1978.

Patent 3,980,081. Self-Rescue Breathing Apparatus. Filed June 25, 1975. Patented Sept. 14, 1976. Not available NTIS.

Patent 4,090,399. Load Measuring Gage. Filed July 31, 1974. Patented May 23, 1978. Not available NTIS.

Patent 4,090,736. Detachable Cab Construction for Mining Machines. Filed Feb. 24, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,098,956. Spectrally Selective Solar Absorbers. Filed Aug. 11, 1976. Patented July 4, 1978. Not available NTIS.

Patent 4,100,068. System for the Dielectrophoretic Separation of Particulate and Granular Material. Filed Jan. 13, 1977. Patented July 11, 1978. Not available NTIS.

Patent 4,110,107. Process for Reducing Molten Furnace Slags by Carbon Injection. Filed Nov. 7, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,113,314. Well Perforating Method for Solution Well Mining. Filed June 24, 1977. Patented Sept. 12, 1978. Not available NTIS.

Patent 4,126,133. Torquer/Thruster for Flexible Roofdrill. Filed May 7, 1976. Patented Dec. 5, 1978. Not available NTIS.

AUGUST 14, 1979

U. S. PATENT AND TRADEMARK OFFICE

985 OG 13

### U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research  
Code 302, Arlington, Va. 22217

Patent application 6,003,696. Device for Producing Extended Elongated Plasmas for X-Ray Lasers. Filed Jan. 1, 1979.

Patent application 945,984. Modular Containerized Firefighting System With Remote Standoff Capability. Filed Sept. 27, 1978.

Patent application 965,811. Method of LED Manufacture. Filed Dec. 4, 1978.

Patent application 966,674. Method for the Production of Hexanitrostilbene (HNS). Filed Dec. 5, 1978.

Patent 4,124,408. Method of Removing Deposits on Refrigeration System Surfaces. Filed June 2, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,128,301. Optical Waveguide Power Divider. Filed Mar. 29, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,131,392. Deployable Rotor. Filed Jan. 31, 1977. Patented Dec. 26, 1978. Not available NTIS.

### TENNESSEE VALLEY AUTHORITY

Division of Law, Muscle Shoals, Ala. 35660

Patent 4,134,750. Granular Ammonium Phosphate Sulfate and Urea-Ammonium Phosphate Sulfate Using a Common Pipe-Cross Reactor. Filed Dec. 19, 1977. Patented Jan. 16, 1979. Not available NTIS.

### U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW.  
Washington, D.C. 20240

Patent 4,116,368. Clog-Free Inorganic Grout Emplacement Gun. Filed Dec. 16, 1976. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,121,154. Alternating Current Potential Measuring Device. Filed Dec. 10, 1976. Patented Oct. 17, 1978. Not available NTIS.

### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA  
Code GP-2, Washington, D.C. 20546

Patent application 8,211. Double-Beam Optical Method and Apparatus for Measuring Thermal Diffusivity and

Other Molecular Dynamic Processes in Utilizing the Transient Thermal Lens Effect. Filed Jan. 31, 1979.

Patent application 8,212. Method of Mitigating Titanium Impurities Effects in n-Type Silicon Material for Solar Cells. Filed Jan. 31, 1979.

Patent application 969,757. Method and Technique for Installing Light-Weight Frangible, High-Temperature Fiber Insulation. Filed Dec. 15, 1978.

Patent 4,133,697. Solar Array Strips and a Method for Forming the Same. Filed June 24, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,133,941. Formulated Plastic Separators for Soluble Electrode Cells. Filed Mar. 10, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,134,447. Thermal Compensator for Closed-Cycle Helium Refrigerator. Filed Sept. 30, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,134,744. Fine Particulate Capture Device. Filed Nov. 8, 1973. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,134,786. Process for Purification of Waste Water Produced by a Kraft Process Pulp and Paper Mill. Filed Dec. 15, 1976. Patented Jan. 16, 1979. Not available NTIS.

### U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW.  
Washington, D.C. 20240

Patent application 950,761. Backwashing Reverse-Osmosis and Ultrafiltration Membrane. Filed Oct. 12, 1978.

Patent application 950,762. Method of and Apparatus for Detecting Escaping Leach Solution. Filed Oct. 12, 1978.

Patent 4,079,592. Method of and Apparatus for Feeding and Inserting Bolts in a Mine Roof. Filed Mar. 4, 1977. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,079,809. Muffler for Pneumatic Drill. Filed July 13, 1977. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,085,017. Recovery of Copper and Nickel From Alloys. Filed Sept. 6, 1977. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,133,967. Two-Stage Electric Arc-Electroslag Process and Apparatus for Continuous Steelmaking. Filed June 24, 1977. Patented Jan. 9, 1979. Not available NTIS.

# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table follow-

ing, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.

985 OG 14

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

### PATENT EXAMINING GROUPS

Actual  
Filing Date  
of Oldest  
New Case  
Awaiting  
Action

#### CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director	8-11-78
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director	5-2-78
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director	7-8-78
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director	3-20-78
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director	12-1-77
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	

#### ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director	11-2-77
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director	2-3-78
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Selsmic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director	6-1-78
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director	8-25-78
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director	8-25-77
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 290—C. D. QUARFORTH, Director	5-17-77
Industrial Arts; Household, Personal and Fine Arts.	

#### MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director	2-22-78
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director	5-11-78
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director	4-7-78
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director	1-30-78
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director	12-20-77
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,558 to 3,031,668, inclusive  
Plant Patents..... Numbers 2,135 to 2,142, inclusive

985 OG 15



# REISSUES

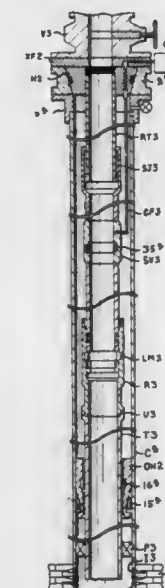
AUGUST 14, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,070  
**APPARATUS FOR TREATING WELLS**  
 Phillip S. Sizer, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.  
 Original No. 3,848,668, dated Nov. 19, 1974, Ser. No. 210,727, Dec. 22, 1971. Application for reissue Oct. 26, 1976, Ser. No. 735,584

Int. Cl.<sup>2</sup> E21B 23/00  
 U.S. Cl. 166—72

19 Claims



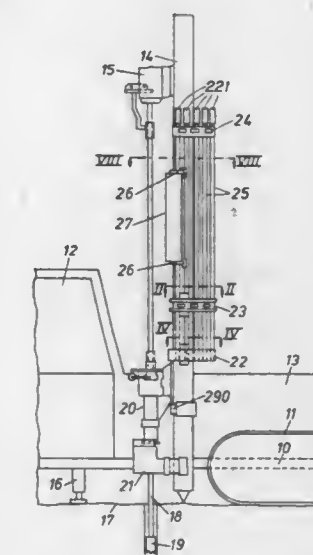
1. Apparatus for treating a well having one or more flow conductors therein to install a surface controlled subsurface safety valve in each such flow conductor of the well for controlling flow from the well therethrough which includes: guide and support means insertable through each well flow conductor to engage the flow conductor at a point below which it is desired to part said conductor for removal of the upper portion of said conductor thereabove leaving the lower portion of the conductor in place in the well; means for parting the upper portion of each original flow conductor from the remainder thereof left in place in the well at the selected point in the flow conductor for removal of the upper portion of the flow conductor from the well while leaving the lower portion engaged with and supported by the guide support means; means including replacement flow conductor means for each separate flow conductor of the well having surface controlled safety valve means therein insertable into the well telescoped over the guide and support means into engagement with the upper end of the lower portion of the flow conductor left in place in the well and having connecting means for connecting said replacement flow conductor means with the upper end of the original flow conductor left in the well engaged with and supported by the guide and support means over which said replacement flow conductor means is telescoped, said guide and support means being removable from within the replacement flow conductor means after said replacement flow conductor means has been connected to the upper end of said original low conductor left in place in the well for removal of said guide and support means from the well; and control means at the surface connected to each of the subsurface safety valve means and operative in response to predetermined conditions sensed in the well or at the surface for actuating each of said safety valve means to cause the same to move to closed position upon the occurrence of such predetermined sensed conditions, whereby wells may be provided with surface controlled subsurface safety

valve apparatus without disturbing the flow conductors below the point of parting and removing the upper portion thereof and without disturbing the remainder of the flow conductor and well apparatus left in place in the well therebelow.

Re. 30,071  
**DRILL STRING ELEMENT HANDLING APPARATUS**  
 Jonas O. A. Hilding, and Jan E. Persson, both of Nacka, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden  
 Original No. 3,986,569, dated Oct. 19, 1976, Ser. No. 533,134, Dec. 16, 1974. Application for reissue Jun. 24, 1977, Ser. No. 809,708  
 Claims priority, application Sweden, Dec. 21, 1973, 7317338  
 Int. Cl.<sup>2</sup> E21B 19/14

U.S. Cl. 175—52

22 Claims



21. An arrangement in drill rigs for connecting and disconnecting drill string elements movable to an fro between a drill string element magazine and a drill string axis, comprising an elongate support, a drilling machine (15) mounted to said support for reciprocal movement along said support, a plurality of drill string elements (25) for making up a drill string, an adapter in said drilling machine for the connection thereof to said drill string for rotating said drill string, detachable coupling sleeves (221) for interconnecting both said adapter and a first drill string element nearest to said drilling machine and two consecutive drill string elements, a brake (151) mounted on said drilling machine for movement in common with said drilling machine along said support, said brake non-rotatably holding a first coupling sleeve interconnecting said adapter and said first drill string element during a disassembly of said drill string, said brake (151) being movable between an inactive position where it is out of engagement with said first coupling sleeve and an active position where it cooperates with said first coupling sleeve, thereby insuring that said first coupling sleeve on said first drill string element remains on said first drill string element when said adapter is disconnected therefrom.

Re. 30,072  
SAFETY CLAMP

Richard A. Kleine, Peoria, Ill.; Warren J. Byers, Winsted, Minn., and Charles A. Wright, Columbus, Wis., assignors to Unarco Industries, Inc., Chicago, Ill.  
Original No. 3,908,791, dated Sep. 30, 1975, Ser. No. 412,169, Nov. 2, 1973. Application for reissue Sep. 16, 1977, Ser. No. 834,153

U.S. Cl. 182—8 Int. Cl.<sup>2</sup> E06C 5/36

19 Claims



1. A safety device comprising:  
a safety belt to be worn by a workman;  
gripping means comprising a gripping clamp having a body with an internally contoured body and a gripping brake arm pivotally mounted on the body, one end of the gripping brake arm being fastened to said safety belt;  
an opposite end of said gripping brake arm having a contoured end positioned inside said internally contoured body for clutching a cable to prevent a workman from falling;  
means comprising a web anchored at opposite ends to said belt and passing through said one end of the gripping arm attaching same to said belt; and  
clamp supporting means comprising an angular open shelf mounted on said safety belt for supporting said clamp in a horizontal carrying position along the periphery of the safety belt while not in use, said clamp being swingably mounted on the web so as to be alternatively movable into a position for attachment with a cable and movable onto engagement with said angular open shelf on the belt when not in use.

Re. 30,073  
CONTROLLABLE STUNT KITE HAVING A PAIR OF SYMMETRICAL BRIDLES  
Lynn M. Worsham, 1908 Arctic St., San Leandro, Calif. 94577  
Original No. 3,994,454, dated Nov. 30, 1976, Ser. No. 640,427, Dec. 15, 1975. Application for reissue Jun. 23, 1977, Ser. No. 809,405

U.S. Cl. 244—153 R Int. Cl.<sup>2</sup> B64C 31/06

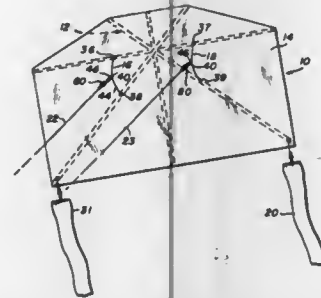
14 Claims

1. A stunt kite comprising:  
a first spar member having first and second ends, a second spline member disposed substantially normal to said first member, and third and fourth spar members disposed diagonally relative to said first and second members and intersecting at said second member, said members being formed into a fixed frame;  
a covering disposed on said frame and having an outer surface and a longitudinal axis in alignment with said second member, said outer surface being symmetrical in shape

about said longitudinal axis and having a lateral dimension which is greater than its dimension corresponding to its longitudinal axis;

[means forming said first member into a bowed shape, such that said covering is bowed into a generally convex configuration;]

[a first bridle connected to] bridle means consisting of a first and a second bridle, each bridle having only two connection points, said first bridle having one connection point on said first member at a location intermediate said longitudinal axis and said first end and [to] having another connection point below said first member on said fourth member, said first bridle extending outside said outer surface and having a midpoint that lies above the center of gravity and below said first member of the kite and serves as an attachment point;



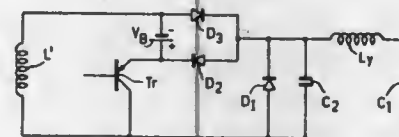
[a] said second bridle [connected to] having one connection point on said first member at a location intermediate said longitudinal axis and said second end and [to] having another connection point below said first member on said third member so as to be symmetrical about said longitudinal axis to said first bridle, said second bridle extending outside said outer surface and having a midpoint that lies above the center of gravity of the kite and serves as an attachment point; and  
tail means connected to said third and fourth members proximate the respective bottom ends thereof for providing substantially equal stabilizing drag forces at the bottom corners of said covering, such that when lengths of line are connected to said attachment points the flight pattern of the kite is capable of being precisely controlled.

Re. 30,074  
CIRCUIT ARRANGEMENT FOR PRODUCING A SAWTOOTH CURRENT THROUGH A LINE DEFLECTION COIL IN AN IMAGE DISPLAY APPARATUS

Johannes S. A. van Hattum, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Original No. 3,906,307, dated Sep. 16, 1975, Ser. No. 420,252, Nov. 29, 1973. Application for reissue Sep. 16, 1977, Ser. No. 834,152  
Claims priority, application Netherlands, Dec. 19, 1972, 7217254

U.S. Cl. 315—408 Int. Cl.<sup>2</sup> H01J 29/70, 29/76

6 Claims



1. Circuit arrangement for producing a sawtooth current through a line deflection coil, which coil is part of a resonance circuit comprising also a trace capacitor and a retrace capaci-

tor, switching means applying the voltage across the trace capacitor to the deflection coil at line frequency during the trace interval of the sawtooth current, which switching means comprise a first diode and a controlled switch connected in parallel with the said diode via a second diode, and an inductive element having a winding which is connected to the resonance circuit via a third diode, current flowing through the winding and the third diode during the cutoff period of the switch, characterized in that a current which is supplied to the controlled switch by a direct-voltage source connected between the winding and the switch also flows through the winding.



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PLANT PATENTS

GRANTED AUGUST 14, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,448  
IMPATIENS PLANT  
John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538  
Filed Feb. 6, 1978, Ser. No. 875,597  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—68 1 Claim  
1. A new and distinct form of Impatiens plant, as described and illustrated, known by the cultivar name Shoshoni, and particularly characterized by its orange flower; color breaks to a very light orange; a less succulent growth than Red Magic; and very floriferous as is Red Magic with a similar dark foliage.

4,449  
IMPATIENS PLANT  
John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538  
Filed Feb. 6, 1978, Ser. No. 875,600  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—68 1 Claim  
1. A new and distinct form of Impatiens plant as described

and illustrated, known by the cultivar name Cheyenne, and particularly characterized by dark green foliage with a tint of red; many flowers; a medium bright red flower with a distinctive light eye; three different commonly occurring color breaks on the flowers; and an upright growth habit with moderate stem size.

4,450  
IMPATIENS PLANT  
John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538  
Filed Jul. 3, 1978, Ser. No. 921,996  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—68 1 Claim  
1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name PAWNEE, and particularly characterized by many orange flowers, a distinctive yellow-green variegated foliage, a spreading growth habit, excellent breaking action, and a slightly cupped flower.

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# PATENTS

GRANTED AUG. 14, 1979

## ERRATA

For CLASS	See PATENT NO.
052-001 .....	4,164,095
280-735 .....	4,164,263
414-739 .....	4,164,290
414-136 .....	4,164,291
414-545 .....	4,164,292
414-525 .....	4,164,293
414-786 .....	4,164,294
414-786 .....	4,164,295
414-416 .....	4,164,296
414-481 .....	4,164,297
406-121 .....	4,164,359
435-092 .....	4,164,444
435-063 .....	4,164,446
435-193 .....	4,164,447
435-011 .....	4,164,448
435-030 .....	4,164,449
251-035 .....	4,164,478
521-093 .....	4,164,512
585-427 .....	4,164,518
585-622 .....	4,164,519
525-484 .....	4,164,520
525-187 .....	4,164,521
525-305 .....	4,164,522
261-041 B .....	4,164,525
315-241 R .....	4,164,679
357-041 .....	4,164,751



# PATENTS

GRANTED AUGUST 14, 1979

## GENERAL AND MECHANICAL

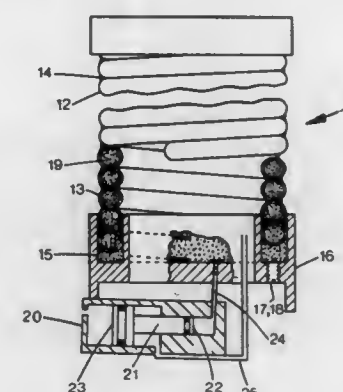
### 4,164,042 WALL STRUCTURES SUCH AS FOR USE IN DEEP DIVING APPARATUS

Alistair L. Carnegie, Yeovil, England, assignor to Normalair-Garrett (Holdings) Limited, Somerset, United Kingdom  
Filed Nov. 14, 1977, Ser. No. 851,416

Claims priority, application United Kingdom, Nov. 18, 1976, 48129/76

Int. Cl.<sup>2</sup> B63C 11/04

U.S. Cl. 2—2.1 R



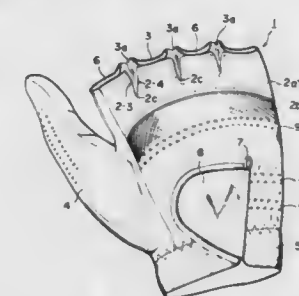
1. A wall structure for forming at least a part of an enclosure, said wall structure adapted to be subjected to a high pressure differential between an external environment existing outside the enclosure and an internal environment within the enclosure, said wall structure comprising tubing, said tubing being flattened over two diametrically opposed areas and being helically wound to be contiguous along the flattened areas, means sealing the wall structure along the continuous flattened areas of the tubing, and a substantially incompressible nonrigid medium filling the interior of the tubing, whereby when the enclosure is subjected to a substantial pressure differential between the internal and external environments, the substantially incompressible nonrigid medium is responsive to said pressure differential.

### 4,164,043 FINGERLESS GLOVE

Satoru Fujita, 8-6-1, Arakawa, Arakawa-ku, Tokyo, Japan  
Filed Jan. 4, 1978, Ser. No. 866,867

Int. Cl.<sup>2</sup> A41D 19/00

U.S. Cl. 2—161 A



1. A fingerless glove comprising a back portion having inwardly extending spaced apart slits along the upper portion thereof, a palm portion, a thumb portion secured to the palm portion, a plurality of gore tabs spaced from each other and extending from the upper edge of the palm portion, and a plurality of finger-insertion bores formed by sewing the gore

tabs to the back portion at the slits thereof with each tab secured to each side of one of the slits.

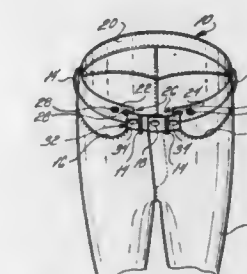
### 4,164,044 ADJUSTABLE WAIST BAND FOR JEANS

Marion D. Holmes, 9838 57th Ave., Rego Park, N.Y. 11368  
Filed Sep. 2, 1977, Ser. No. 830,056

Int. Cl.<sup>2</sup> A41F 9/02

8 Claims U.S. Cl. 2—237

5 Claims



1. For jeans and other trousers employing ornamental snap fastening members, an adjustable waistband comprising a waistband section affixed to the jeans partially encircling the wearer and terminating with a gap in the front, comprising at least a pair of horizontally spaced apart male snap members affixed to each side of said waistband section forming said gap, said jeans comprising western style slash pockets having the pocket opening in the front of the jeans with a front cut-away, said male snap members being affixed to the jeans in the proximity of the respective center front locations of the western pockets, and a front closing section formed of the same material as said jeans and bridging said gap and closing said waistband section to encircle said wearer comprising at least two horizontally spaced apart ornamental female members cooperating with a respective pair of male snap members to adjust the size of the waistband, each of said female member being positioned at the center termination of respective opposite slash pockets to be located in said waistband section whereby the ornamental snap members appear to be part of the normal ornamental decoration of said jeans in the front of the waistband section.

### 4,164,045 ARTIFICIAL VASCULAR AND PATCH GRAFTS

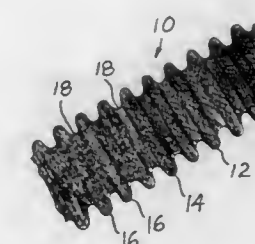
Jack C. Bokros; Hong S. Shim, and Axel D. Haubold, all of San Diego, Calif., assignors to CarboMedics, Inc., San Diego, Calif.

Filed Aug. 3, 1977, Ser. No. 821,602

Int. Cl.<sup>2</sup> A61F 1/00

U.S. Cl. 3—1.4

6 Claims



1. A flexible artificial fabric prosthesis for prolonged or permanent implantation in a living body, comprising a fiber substrate array of organopolymeric fibers having a tensile

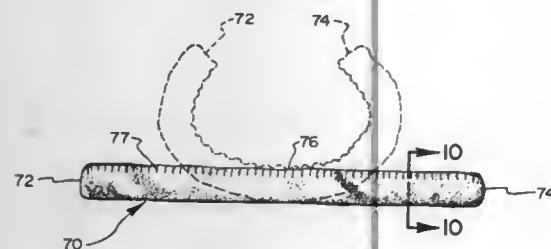
modulus of elasticity of at least about  $2 \times 10^6$  psi, a tensile strength of at least about 20,000 psi and a fiber diameter of less than about 25 microns, said fiber substrate being adapted to sustain the functional stresses encountered by the implanted prosthesis and to provide a desired high degree of prosthesis flexibility without straining more than about 5 percent, and a dense, adherent isotropic carbon coating on the fibers of at least one side of said fiber substrate array having a BAF of about 1.3 or less, a density in the range of from about 1.6 gm/cm<sup>3</sup> to about 2.0 gm/cm<sup>3</sup>, a thickness of less than about 7000 Angstroms, and a tensile fracture strain of at least about 5 percent, said fibers being individually provided with said adherent carbon coating and not substantially bonded together thereby, whereby said coated fibers are free to bend to a bending radius of about 0.025 cm or less and to glide over each other in the flexure of the prosthesis without substantial breaking of said carbon coating.

#### 4,164,046 VALVE PROSTHESIS

Denton A. Cooley, 3014 Del Monte, Houston, Tex. 77019  
Filed May 16, 1977, Ser. No. 797,107  
Int. Cl.<sup>2</sup> A61F 1/22

U.S. Cl. 3—1.5

3 Claims

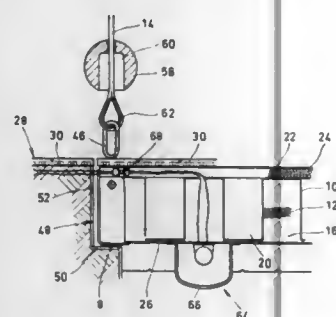


3. A heart valve prosthesis comprising a spine portion comprising:
- a flexible fabric, initially straight though bendable into an open ring configuration, the length of the spine portion approximating the arcuate distance between commissures of a selected heart valve leaflet; and
  - a velour sheath encapsulating the entire fabric spine portion.

4,164,047  
MULTIPURPOSE GYMNASIUM  
Janos Barothy, Eggenvil, Switzerland, assignor to Laszlo F. Arato, Buochs, Switzerland, a part interest  
Filed Jul. 14, 1977, Ser. No. 815,514  
Claims priority, application Switzerland, Jul. 16, 1976, 09121/76

Int. Cl.<sup>2</sup> E04H 3/19, 3/14  
U.S. Cl. 4—172.11

9 Claims



1. In combination for a multipurpose gymnasium having a ceiling, a swimming pool having at least two stepped edges located within a floor area,  
a swimming pool cover of the same general shape as the

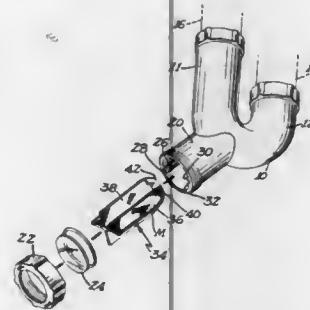
swimming pool and adapted to rest on said swimming pool stepped edges and be substantially flush with the floor area surrounding the pool, said cover including a top surface on a compound load support element, said load support element being of sheet metal material substantially about 0.5 mm thick which is undularly bent and formed of a generally rectangular shape to define cavities, the height of each section of said load support element being at least about 80% of the thickness of the cover, and foam plastic material filling said cavities and in contact with the sheet metal material to strengthen said load support element and prevent deformation of the load support, and means located on the ceiling for suspending the cover above the pool and for raising said cover from and lowering it to rest on said stepped edges of the pool.

#### 4,164,048 COMBINATION SINK TRAP ACCESS PORT FILTRATION DEVICE

John H. Kampfer, 2026 Bradley St., Apt. 1, St. Paul, Minn. 55117; Michael L. Kampfer, 2322 E. Cowern Pl., N. St. Paul, Minn. 55109, and Philip A. Martens, 6011 W. Bald Eagle Blvd., White Bear Lake, Minn. 55110  
Filed Dec. 30, 1977, Ser. No. 866,054

Int. Cl.<sup>2</sup> E03C 1/282, 1/26; F16L 55/24; B01D 35/16  
U.S. Cl. 4—292

2 Claims



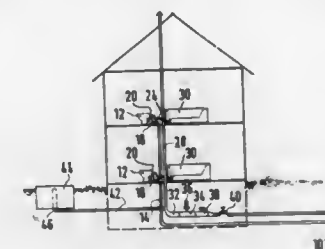
1. A combination sink trap access port filtration device comprising:
- (a) a trap pipe having a straight portion terminating in a curved portion underlying said straight portion,
  - (b) a downwardly extending tubular extension member connected to and communicating at its inner end with the trap pipe at the juncture of the straight portion and the curved portion,
  - (c) the longitudinal axis of said tubular extension member being at an angle of about 135° from the longitudinal axis of said straight portion,
  - (d) a screen extending the diameter and the length of the tubular extension and the diameter of the trap pipe at said juncture,
  - (e) means in said tubular extension member for releasably mounting said screen comprising opposed channel formations on the inner surface of said extension in which the opposed edges of the screen are positioned,
  - (f) said screen carrying a flat solid blocking member having the same formation and area of said screen,
  - (g) said blocking member extending at a right angle to said screen for alternative insertion into said opposed channel formations,
  - (h) said tubular extension, screen and blocking member forming a pocket wherein material caught by said screen and blocking member will build up in said tubular extension without interrupting fluid flow through said trap, and
  - (i) a cap for the outer end of said tubular extension.

4,164,049  
VACUUM-TYPE WATER REMOVAL SYSTEM FOR  
HOUSES, FACTORIES, SHIPS AND THE LIKE  
Harald R. Michael, Hamburg, Fed. Rep. of Germany, assignor to Electrolux GmbH, Fed. Rep. of Germany  
Filed Nov. 29, 1977, Ser. No. 855,672  
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654437

Int. Cl.<sup>2</sup> E03D 5/00

U.S. Cl. 4—300

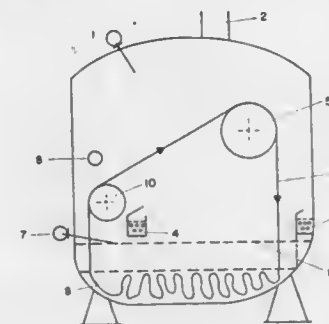
4 Claims U.S. Cl. 8—149.1



1. In a vacuum-type water removal system for houses, factories, ships and the like, wherein waste water collection devices such as sanitary facilities and other waste water producing and/or collection devices, are individually connected through a cut-off valve to a vacuum waste water removal line, the improvement wherein said waste water collection devices include an overflow opening, and supplementary connecting means are provided for connecting the overflow opening to a gravity feed conduit which feeds a collection chamber connected through a cut-off valve to the vacuum waste water removal line.

4,164,050  
TEXTILE TREATMENT PROCESS  
Hans-Peter Stakelbeck, Binzen, Fed. Rep. of Germany, assignor to Sandoz Ltd., Basel, Switzerland  
Filed Nov. 9, 1977, Ser. No. 849,838  
Claims priority, application Switzerland, Nov. 11, 1976, 14211/76; Aug. 22, 1977, 10252/77  
Int. Cl.<sup>2</sup> D06B 3/00, 21/02  
U.S. Cl. 8—149.1

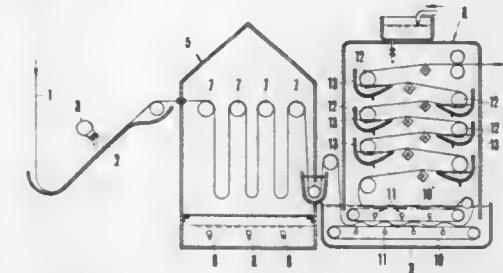
10 Claims



1. In a textile treatment process wherein the textile substrate to be treated is supported above a treatment liquor and is passed repeatedly through such liquor in such manner that at any given time part of said substrate is in contact with the liquor and part is supported out of the liquor, the improvement wherein the liquor to goods ratio is in the range of 5:1 to 15:1 and an envelope of heated air or steam is caused to surround and heat at least a part of that part of the substrate which is supported out of contact with the treatment liquor, said envelope of heated air or steam being maintained at a distance above the liquor at least until a substantially uniform temperature is achieved between the heated air or steam, the substrate and the liquor, said liquor being heated by passage there-through of the heated substrate.

4,164,051  
CONTINUOUS DYEING METHOD FOR THICK TEXTILE  
MATERIALS  
Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works, Co. Ltd., Wakayama, Japan  
Filed Aug. 23, 1978, Ser. No. 935,879  
Claims priority, application Japan, Sep. 5, 1977, 52-106517  
Int. Cl.<sup>2</sup> D06B 1/02, 21/00

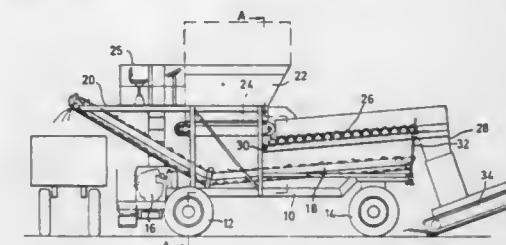
1 Claim



1. A method for continuously dyeing a thick textile material such as a blanket or carpet material or the like wherein the thick textile material is continuously pulled upward and guided over a slanting plate from a lower position to a higher position; spraying from a nozzle tube a dye solution at the thick textile material while it is being guided upward over said slanting plate; setting the spraying quantity of said dye solution discharged out of the nozzle tube such that the entire sprayed quantity of the dye solution is absorbed by the thick textile material without having any portion thereof flowing down off the textile material while ensuring sufficient and even impregnation of the textile material with the dye solution without necessitating provision of any wringing roll arrangement downstream of the nozzle tube; and then continuously passing the thick textile material thus impregnated with the dye solution through a hygro-thermic treatment chamber for dye fixation and then through a device for washing with water.

4,164,052  
SELF-PROPELLED APPARATUS FOR CLEANING  
BEETS  
Andre Robache, Feucherolles, France, assignor to Fives-Cail Babcock, Paris, France  
Filed Mar. 28, 1978, Ser. No. 890,994  
Int. Cl.<sup>2</sup> A23N 13/00  
U.S. Cl. 15—3.11

8 Claims



1. A self-propelled apparatus for cleaning beets in the field, comprising a longitudinally extending frame mounted on wheels and carrying a first hopper for receiving beets to be cleaned, a screen for cleaning the beets by scraping away the dirt therefrom and a discharge conveyor for dirt positioned beneath the screen, in which apparatus the hopper is mounted on a raised platform on the frame and is provided with a beet conveyor for conveying beets from the hopper to the screen, the screen extends longitudinally relative to the frame, on one side of the hopper, and the dirt-discharging conveyor is disposed longitudinally beneath the screen and the hopper, the



arrangement being such that, in use, the cleaned beets and the dirt are discharged at opposite ends of the frame.

4,164,053

## VEHICLE WASHING APPARATUS

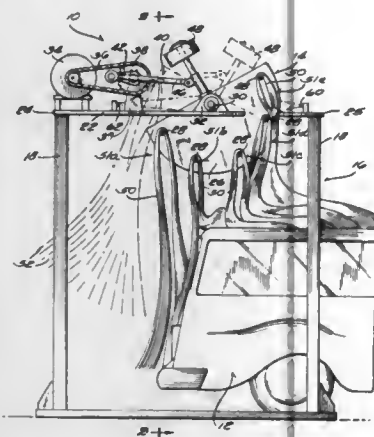
Richard J. Shelstad, 12711 N. Woodberry Dr., Mequon, Wis. 53092

Filed Apr. 12, 1974, Ser. No. 460,347

Int. Cl.<sup>2</sup> B60S 3/04

U.S. Cl. 15—97 B

13 Claims



1. An apparatus for washing a vehicle as it moves along a predetermined travel path comprising carriage means located above the height of the vehicle to be washed and extending transversely of and entirely across the width of the vehicle travel path, means supporting said carriage means for oscillatory, arcuate movement about a generally horizontal axis extending transversely of the vehicle travel path; at least one curtain member of a flexible, felt-like material suspended from a support means carried by said carriage means and having a free end extending below the upper portions of the vehicle and transversely of the vehicle travel path; means for wetting the upper portions of the vehicle; and drive means for oscillating said carriage means through an arcuate path about said axis to swing said curtain member back and forth relative to the vehicle in a direction generally parallel to the vehicle travel path so that said curtain member scrubs the upper portions of the vehicle as it moves along the travel path.

4,164,054

## DIPSTICK WIPER

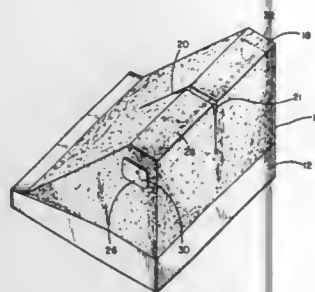
Cameron Hanson, and Benjamin Dixon, both of Osceola, Wis. 54020

Filed Jul. 25, 1977, Ser. No. 818,454

Int. Cl.<sup>2</sup> G01F 15/12, 23/04

U.S. Cl. 15—210 B

4 Claims



1. An oil dipstick wiper comprising in combination a box configured housing, said housing including a bottom wall

and opposite end and side walls and being open at the top a block of porous foam plastic, resilient material rising from the housing adhered to the inside thereof said block being tapered towards its top, said block having a slot, said slot being transverse to and extending through the tapered portion of said block, means on the bottom of said housing for affixing the same to a surface and a compressing means being positioned adjacent each end of said block and generally parallel thereto, said compressing means being interconnected by an inelastic flexible strand which extends through said block and traverses said slot, whereby the block is compressed by depression of said means.

4,164,055

## CLEANING AND DISINFECTING HARD SURFACES

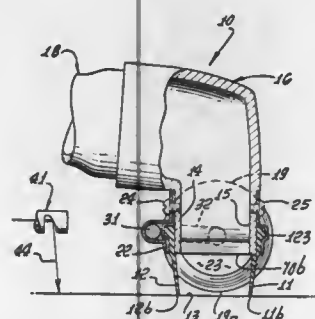
Robert L. Townsend, Irvine, Calif., assignor to Purex Corporation, Lakewood, Calif.

Division of Ser. No. 786,352, Apr. 11, 1977. This application Nov. 21, 1977, Ser. No. 853,747

Int. Cl.<sup>2</sup> A47L 7/00

U.S. Cl. 15—321

10 Claims



1. In apparatus for removing loose soils and bacteria from a hard floor surface, the combination comprising
  - (a) a head assembly including two upright, longitudinally spaced, resiliently flexible strips extending generally laterally horizontally in parallel relation; the strips projecting downwardly to engage the floor surface,
  - (b) means for applying suction to the space between the strips, said means including a suction source including a suction line extending to said head assembly,
  - (c) the head assembly including support means to engage the floor while the head assembly is bodily displaced longitudinally in one direction with the strips in such proximity to the floor surface that their lower edge portions are flexed in the opposite direction, whereby the leading strip in said one direction passes loose soils relatively therebeneath into the space between the strips for suction removal from said space, and
  - (d) means for applying cleaning liquid to the floor surface to wet said surface in such spaced relation to the strips that when the head assembly and strips are bodily displaced in the opposite longitudinal direction the lower portions of the strips flex relatively in said one direction and the leading strip in said opposite direction passes applied liquid relatively therebeneath into the space between the strips for suction removal from said space, said means including at least one spray nozzle and a source of said liquid including a valve controlled duct communicating with said nozzle,
  - (e) said nozzle located outside the space between said strips to spray said liquid in a fan-shaped spray pattern visibly and openly onto the floor surface in longitudinally spaced relation to said strips,
  - (f) there being an elongated handle carrying both said head assembly and said nozzle, said duct and suction line associated with said handle.

4,164,056

## LEG HOLDING MACHINE

Otto L. Hilgner, 1340 Fairground Rd., Hatfield, Pa. 19440, and

Donald Gouldley, 660 Clemens Rd., Telford, Pa. 18969

Filed Oct. 19, 1977, Ser. No. 843,582

Int. Cl.<sup>2</sup> A22B 5/16

U.S. Cl. 17—21

11 Claims



1. A machine for holding the legs of animal carcasses to support a carcass during a slaughtering operation such as hide stripping or up-pull skinning comprising:
  - jaw means for gripping individually a pair of legs of a carcass and holding the gripped legs in side-by-side relation,
  - means for moving said jaw means between open and closed positions, and
  - means for moving said jaw means to a desired elevated position to position the same for receiving the carcass legs to be gripped thereby,
  - said means for moving said jaw means to a desired elevated position including means for reciprocating said jaw means back and forth along a path of movement and means for pivoting said reciprocating means about an axis transverse to said path of movement.

4,164,057

## FOOD CASING STUFFING SIZING CONTROL METHOD

Paul H. Frey, La Grange, and Vytautas Kupcikevicius, Chicago, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

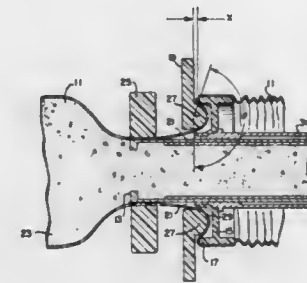
Division of Ser. No. 686,425, May 14, 1976, Pat. No. 4,077,090.

This application Oct. 5, 1977, Ser. No. 839,560

Int. Cl.<sup>2</sup> A22C 11/00

U.S. Cl. 17—49

3 Claims



1. In a method of sizing control in food casing stuffing wherein casing being stuffed is first expanded by interior circumferential contact and then contracted by exterior circum-

ferential contact, the distance between the locations of interior and exterior circumferential contact being variable, the improvement of increasing the area of exterior circumferential contact by changing the direction of progression of the casing from a first position wherein minimal exterior circumferential contact obtains, towards and into a second position wherein maximal exterior circumferential contact obtains, and wherein which second position the casing passes through a traverse in a direction opposite to its direction of progression.

4,164,058

## DECORATIVE RING-LIKE STRUCTURE AND METHOD OF MAKING SAME

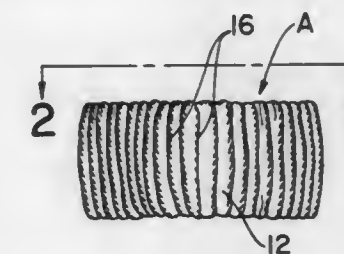
Ivan J. Barna, 4186 Colony, South Euclid, Ohio 44121

Filed Feb. 3, 1978, Ser. No. 874,808

Int. Cl.<sup>2</sup> A44B 21/00

U.S. Cl. 24—1

12 Claims



1. A ring-like structure comprising: a generally cylindrical sleeve of substantially rigid plastic material, said sleeve being generally longitudinally split to define a circumferential space between spaced-apart non-overlapping opposed circumferential ends; a fabric tube internally sized for close reception over said sleeve and having a length between opposite tube ends which is greater than the circumference of said sleeve; said tube being closely received over said sleeve with said tube ends abutting; and, said circumferential space having a circumferential width greater than the thickness of the material forming said tube when said sleeve is in an unstressed condition, whereby said tube is positioned on said sleeve by telescoping one said tube end over one said sleeve end and then circumferentially sliding said tube onto said sleeve.

4,164,059

## METHOD OF MANUFACTURING A COLOR DISPLAY TUBE AND COLOR DISPLAY TUBE MANUFACTURED BY SAID METHOD

Johannes Van Esdonk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

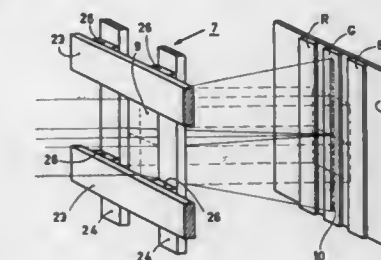
Continuation of Ser. No. 757,675, Jan. 7, 1977, abandoned. This application Apr. 19, 1978, Ser. No. 897,735

Claims priority, application Netherlands, Jan. 16, 1976, 7600421

Int. Cl.<sup>2</sup> H01J 9/02

U.S. Cl. 29—25.15

7 Claims



1. In the manufacture of a colour cathode ray tube having a focusing shadow mask, the method comprising the steps of:

forming on one surface of an electrically insulating sheet a first electrode affixed to said sheet and having a plurality of elongated metallic conductors spaced from each other to define a first plurality of openings therebetween; forming on the opposite surface of said sheet a second electrode affixed to said sheet and having a plurality of elongated metallic conductors spaced from each other to define a second plurality of openings therebetween such that a portion of each opening of said second plurality is aligned with a portion of one of said openings of said first plurality; etching through said sheet at regions thereof aligned with said aligned portions of said openings to form apertures for passing electrons therethrough, said conductors of said first and second electrodes defining an electron lens for producing electron focusing fields in said apertures and with said sheet forming said shadow mask; and mounting said shadow mask in an envelope of the cathode ray tube.

**4,164,060**  
**APPARATUS FOR ASSEMBLING A SHADOW MASK AND PANEL OF A PICTURE TUBE OF A TELEVISION RECEIVER**

Matti O. Hartta, Soormarkku, Finland, assignor to Oy. W. Rosenlew AB., Pori, Finland

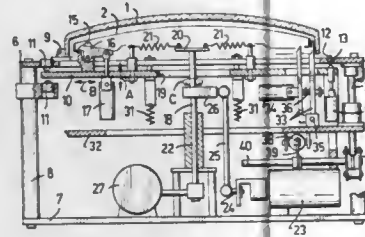
Filed Jul. 6, 1978, Ser. No. 922,391

Claims priority, application Finland, Jul. 6, 1977, 772124

Int. Cl.<sup>2</sup> H01J 9/18

U.S. Cl. 29—25.19

8 Claims



1. An apparatus for assembling a shadow mask (2) and panel (1) of a picture tube of a television receiver, said mask and panel being provided with fixing members (3,4) engaging each other in a fixed relative position of said mask and panel, said apparatus comprising separate supports (6,10) for said mask and panel, said supports being adjustable in relation to each other, characterized in that one (10) of said supports is made as a floating plate movable relative to the other support (6) parallel (B) to the plane of said plate and in the direction (A) of an axis transverse to said plane and rotatable (C) around said axis, and that operating means (10,23-30) are connected to said floating plate to move said plate mechanically in said plane as well as along and about said axis whereby a mask and panel on said supports are moved relative to each other to cause final engagement of said fixing members.

**4,164,061**  
**METHOD OF MAKING ROTOR BLADES OF RADIAL-AXIAL HYDRAULIC MACHINES**

Grigory A. Bronovsky, 7 Sovetskaya, 7, kv. 6; Mikhail O. Bukchin, Poljustrovsky prospekt, 7, kv. 34, and Alexandr I. Goldfarb, B. Okhtensky prospekt, 6, korpus 2, kv. 288, all of Leningrad, U.S.S.R.

Filed Aug. 24, 1977, Ser. No. 827,342

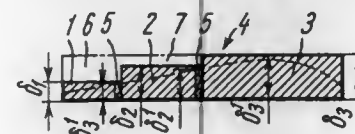
Int. Cl.<sup>2</sup> B23P 15/04

U.S. Cl. 29—156.8 B

1 Claim

1. A method of making blades comprising the steps of: rolling at least two flat metal sheets having rectangular cross-sections and different thicknesses; cutting from each sheet a piece of flat sheet stock; placing said pieces side-by-side, said pieces cooperating to comprise a plain blank of said blade in a desired direction of principal variation of the cross-sectional thickness thereof, said blank having the lateral dimensions defined by the developed contour of the blade to be made; the thickness of each of said pieces being at least equal to the maximum cross-sectional

thickness of said blank at the portion thereof defined by said piece; welding adjacent edges of said pieces together to obtain said plain sheet blank; machining said blank to obtain a



required contour of said blank for the blade to be made; and bending said machined plain blank into the desired shape of said blade.

**4,164,062**  
**BALL AND SOCKET LINKAGE AND BEARING ASSEMBLY AND METHOD OF FABRICATING**

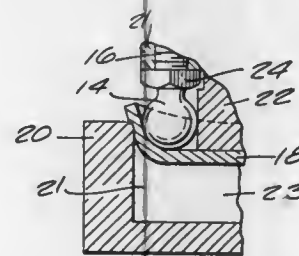
Jack W. Sullivan, 2236 Island Beach Rd., Oshkosh, Wis. 54901

Filed Dec. 12, 1977, Ser. No. 859,325

Int. Cl.<sup>2</sup> B21D 53/12

U.S. Cl. 29—148.4 A

6 Claims



1. The method of forming metal onto the exterior surface of a tool having a cross sectional area at progressive points along the line of motion of the tool relative to the metal which gradually increases and then decreases, comprising the steps of initially cupping the metal on said tool and then cold extruding the metal over the surface past its maximum cross sectional area whereby the metal is secured to the tool.

**4,164,063**  
**PROCESS FOR MAKING BEARING LOCKING COLLAR**

John Cenko, Huron, and Thomas C. Pechauer, Norwalk, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1978, Ser. No. 880,556

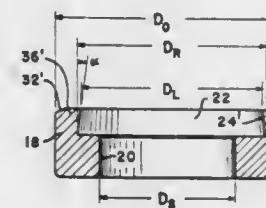
Int. Cl.<sup>2</sup> B22F 3/24

U.S. Cl. 29—420.5

3 Claims

1. A process of making a locking collar from powdered metal comprising the steps of: compacting powdered metal into the form of a collar having a central shaft receiving aperture concentric with the collar exterior circumferential surface, the collar further having a counterbore eccentric to the shaft receiving aperture and the collar exterior circumferential surface, the compacting simultaneously forming a 24°-26° chamfer on the collar exterior circumferential surface around the eccentric counterbore and concentric therewith; sintering

the compacted powdered metal; and swaging the end of said collar containing the eccentric counterbore forming a 6°-9°



back taper in the counterbore inside diameter while maintaining a straight outside diameter on the collar exterior circumferential surface around the counterbore.

**4,164,064**  
**SOLDER PREFORM LOADING METHOD AND APPARATUS**

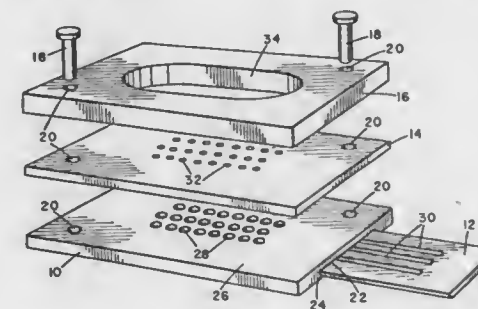
Joseph A. Reavill, Mira Loma, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Mar. 13, 1978, Ser. No. 886,215

Int. Cl.<sup>2</sup> H01R 43/02; B23K 37/04

U.S. Cl. 29—468

4 Claims



1. Apparatus for loading solder preforms on the pins of a multiple pin connector in which the pins are arranged in spaced rows, comprising:

a positioning plate having a plurality of sockets therein corresponding to the pattern of pins on the connector to be loaded, said positioning plate having an elongated channel into which said sockets open, with the rows of sockets longitudinal to the channel, a solder preform retainer slidably mounted in said channel and having slots open at one end and longitudinally aligned with the rows of sockets, said slots being narrower than said sockets but wide enough to receive connector pins therethrough, each of said sockets being dimensioned to hold a single substantially toroidal solder preform in axial alignment therein.

**4,164,065**  
**CRIMPING AND WIRE LEAD INSERTION MACHINE HAVING IMPROVED INSERTION MEANS**

Jack F. Funcik, Downers Grove, and Steven F. Wright, Glen Ellyn, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Mar. 13, 1978, Ser. No. 885,680

Int. Cl.<sup>2</sup> B23P 23/00, 19/02

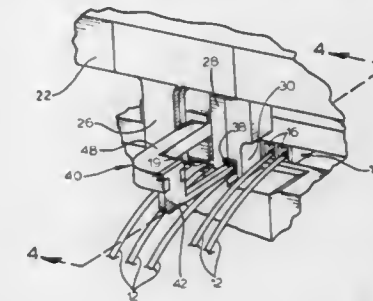
U.S. Cl. 29—564.6

3 Claims

1. In a machine for crimping a plurality of electrical terminals one at a time onto wire leads, said machine including a press actuable for up and down movement and a die assembly mounted on said press, said die assembly including a die shoe with a crimp station whereat a terminal is crimped onto a wire lead, an insertion station whereat a terminated wire lead is presented, and a housing indexing assembly for supporting at least one connector housing having a plurality of terminal

receiving recesses formed therein and indexing one of said recesses at the insertion station, an insertion assembly for inserting a terminated wire lead into a terminal receiving recess at the insertion station, a punch holder mounted on the press for movement therewith opposite and spaced from said die shoe having a crimp punch over the crimp station to crimp a terminal thereat, and a terminal feed assembly for supporting and feeding a strip of terminals one at a time to the crimp station in response to the movement of the press, the improvement comprising:

said insertion assembly including a push member for engag-



ing a terminal crimped on the end of a wire lead and inserting said terminal into the terminal receiving recess at the insertion station, said push member being mounted for programmed reciprocal movement in a direction substantially coincident with the longitudinal axis of said recess in response to the press between a preinsertion position not in contact with the terminal and an insertion position in engagement with the terminal inserted within the recess; and guide means mounted on the punch holder above the insertion station for guiding the terminal into a terminal receiving recess.

**4,164,066**  
**FABRICATION OF ANODES BY PLASMA SPRAY DEPOSITION**

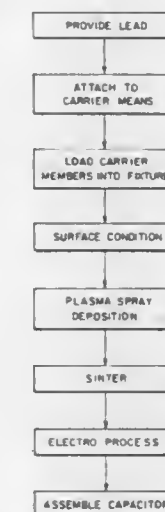
William F. Vierow, West Arden, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 381,835, Jul. 23, 1973, abandoned, which is a continuation of Ser. No. 198,306, Nov. 12, 1971, abandoned. This application Jun. 9, 1975, Ser. No. 582,337

Int. Cl.<sup>2</sup> H01G 9/00, 9/05, 9/06

U.S. Cl. 29—570

7 Claims



1. A method of making an anode means capable of performing an electrical function including the steps of forming a



plasma spray of film-forming metal particles, passing a headed portion of a dielectric film-forming metal means including the headed portion and an elongated portion thru the spray of dielectric film-forming metal particles, the headed portion including a section facing away from the elongated portion in a direction substantially parallel to the central longitudinal axis of the elongated portion, depositing sprayed film-forming metal particles over the section of the headed portion of the film-forming metal means, and sintering the film-forming metal means and the deposit to help bond the film-forming metal means and the deposit, the sintered deposit being porous and capable of acting as an anode means.

4,164,067

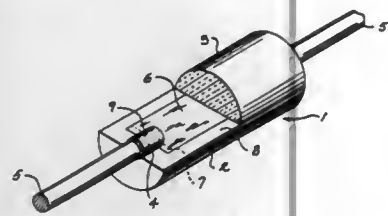
# METHOD OF MANUFACTURING ELECTRICAL RESISTOR ELEMENT

Ivan L. Brandt, Milwaukee; Theodor von Alten, Grafton, both of Wis.; Richard E. Voss, Succasunna, N.J., and Oscar L. Denes, Greendale, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 718,231, Aug. 27, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,411  
Int. Cl.<sup>2</sup> H01C 17/00, 7/00

U.S. Cl. 29—620

11 Claims



1. A method of forming a resistor element having a substrate member, a metallic termination layer and a resistive layer, said layers deposited on preselected areas of said substrate member, said method comprising the steps of:

- selecting a metallic, conductive termination material with a given softening temperature, said metallic material being dispersed in an organic vehicle;
- selecting a resistive composition comprising discrete electrically conductive particles, glass forming materials providing a matrix for supporting said conductive particles, and an organic binder material for temporarily supporting said particles and glass forming materials in the green state during deposition and prior to sintering, said resistive composition having a sintering temperature below the softening temperature of said conductive termination material;
- selecting an insulating substrate composition comprising a mixture of ceramic-glass forming materials having a sintering temperature below the softening temperature of said conductive termination material, and an organic binder material for temporarily supporting said ceramic-glass forming materials in the green state prior to sintering;

forming said insulating substrate member from said substrate material to provide a surface for receiving and supporting a layer of said termination material and a layer of said resistive composition;

depositing a layer of said metallic conductive termination material on at least a portion of said formed unfired substrate member;

depositing a layer of said resistive composition on a portion of the supporting surfaces of said unfired substrate member,

said termination layer and said resistive layer being in contact with one another and said termination layer adapted to connect said resistive layer to an electrical circuit; and

removing the said organic vehicle and binder materials from

said formed substrate member, said deposited termination layer and said resistive layer prior to co-firing said substrate member and said layers; and  
co-firing said formed substrate member and its deposited metallic termination and resistive layers to simultaneously sinter said resistive layer and said substrate member.

4,164,068

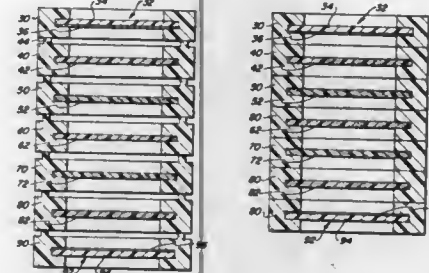
# METHOD OF MAKING BIPOLAR CARBON-PLASTIC ELECTRODE STRUCTURE-CONTAINING MULTICELL ELECTROCHEMICAL DEVICE

Joseph A. Shropshire, Westfield, and Hsue C. Tsien, Livingston, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 825,605, Aug. 18, 1977, Pat. No. 4,125,680. This application Dec. 19, 1977, Ser. No. 862,174  
Int. Cl.<sup>2</sup> H01M 6/48

U.S. Cl. 29—623.1

16 Claims



1. A method of making a multicell electrochemical device having a plurality of bipolar carbon-plastic electrode structures, comprising:

- (a) forming a plurality of bipolar carbon-plastic electrode structures, each of said structures being formed by:

- (i) molding a thin conductive carbon-plastic electrode sheet from a heated mixture of particulate conductive carbon and plastic material, said mixture having sufficient carbon therein so as to produce a sheet having an electrical conductivity of at least about 0.1 mho-cm, said carbon having an average particle size of about 10 millimicrons to about 100 microns;

- (ii) establishing a frame of dielectric plastic material around said thin conductive carbon-plastic electrode sheet so as to encompass a portion of both sides of said thin conductive carbon-plastic electrode sheet, said frame having inner borders defining an open central area into which said sheet is disposed, and said frame having a front surface and a back surface, at least one of said surfaces having a projection formed thereon; and
- (iii) sealing said frame to said sheet at the inner borders of said sheet so as to render the resulting structure liquid impermeable;

- (b) forming a plurality of electrochemical cell elements, each of said elements having an electrochemical cell-functional center portion circumscribed by a dielectric plastic frame having a front surface and a back surface, at least one of said surfaces having a projection formed thereon;

- (c) stacking said plurality of electrode structures and plurality of electrochemical cell elements with one another to form a group of items in an electrochemical cell-functional arrangement and in such a manner that the projection on the frame of each item contacts a frame surface of the next item in the stack; and

- (d) joining each of the items in the stack to one another by sealing each item to the next item at the point where its projection contacts the frame surface of the next item, said sealing being sufficiently established so as to form a continuous electrochemical device capable of holding liquid therein.

4,164,069

# METHOD OF PREPARING A POSITIVE ELECTRODE FOR AN ELECTROCHEMICAL CELL

Zygmunt Tomczuk, Orland Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 901,046  
Int. Cl.<sup>2</sup> H01M 6/14, 4/58

U.S. Cl. 29—623.1

7 Claims

1. A method of preparing a positive electrode for use in a secondary electrochemical cell also including a negative electrode having lithium or lithium-metalloid alloy as the negative electrode reactant and a molten salt including a lithium halide as electrolyte, said method comprising combining FeS with Li<sub>2</sub>S to form the compound Li<sub>2</sub>FeS<sub>2</sub>; incorporating said compound into an integral structure for use as a positive electrode; and assembling said positive electrode into said electrochemical cell.

4,164,070

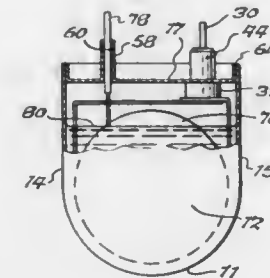
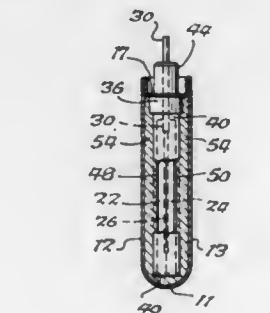
# METHOD OF MAKING A LITHIUM-BROMINE CELL

Wilson Greatbatch, Clarence; Ralph T. Mead, Kenmore; Robert L. McLean, Clarence; Frank W. Rudolph, Depew, and Norbert W. Frenz, North Tonawanda, all of N.Y., assignors to Eleanor & Wilson Greatbatch Foundation, Akron, N.Y.

Division of Ser. No. 722,653, Sep. 16, 1976, Pat. No. 4,105,833, which is a continuation-in-part of Ser. No. 617,280, Sep. 29, 1975, Pat. No. 3,994,747. This application Dec. 19, 1977, Ser. No. 861,527  
Int. Cl.<sup>2</sup> H01M 4/36

U.S. Cl. 29—623.2

14 Claims



1. A method of making a lithium-bromine cell comprising the steps of:

- (a) providing a casing of electrically conducting material;
- (b) placing lithium-anode means in said casing;
- (c) providing a filling element having a passage there-through;
- (d) fixing said filling element to said casing with one end of said passage in communication with the interior of said casing and the other end externally exposed;
- (e) sealing said casing;
- (f) introducing bromine cathode material through said passage in said filling element to the interior of said casing

into operative relationship with said lithium anode means to form a solid lithium bromide electrolyte between said lithium anode means and said bromine cathode material and into operative relationship with said casing to cause said casing to serve as a cathode current collector; and (g) closing said passage of said filling element.

4,164,071

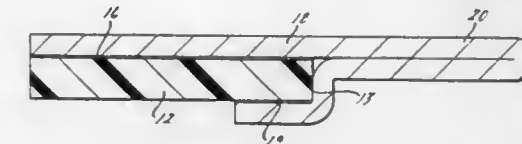
# METHOD OF FORMING A CIRCUIT BOARD WITH INTEGRAL TERMINALS

Joseph K. Kruzich, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1977, Ser. No. 865,035  
Int. Cl.<sup>2</sup> H05K 3/04, 3/22

U.S. Cl. 29—625

5 Claims



1. A method of integrally forming common electrically conductive blade terminals connected to opposite sides of a printed circuit board, including the steps of:

- providing a substrate board;
- providing a holder for said board having one exposed surface extending outward from at least one edge of said board;
- depositing a layer of uncured adhesive on the exposed surface of said board;
- depositing a layer of conductive material on said layer of uncured adhesive, so as to extend a portion of said material outward a predetermined distance from said edge over said exposed surface of said holder;
- die stamping said layer of conductive material to form a conductor pattern and linear terminals on said board and die stamping said portion of said conductive layer outward from said edge to form linear extensions of said linear terminals;
- depositing a second layer of uncured adhesive to a portion of the opposite surface of said board adjacent said edge;
- folding said linear extensions through 180°, at a first distance from said edge wherein said first distance being such that said fold is in a noncontacting relationship with said edge and said first distance is less than half said predetermined distance of linear extension from said edge, so as to overlap said second adhesive layer with the remainder of said folded linear extensions to integrally form said blade terminals; and
- curing said adhesive layers.

4,164,072

# AUTOMATIC PIERCING NUT ASSEMBLING ARRANGEMENT

Katsumi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo Seisakusho, Osaka, Japan

Filed Dec. 12, 1977, Ser. No. 859,596

Claims priority, application Japan, Dec. 11, 1976, 51/166296[U]

Int. Cl.<sup>2</sup> B23P 19/04; B23Q 17/02

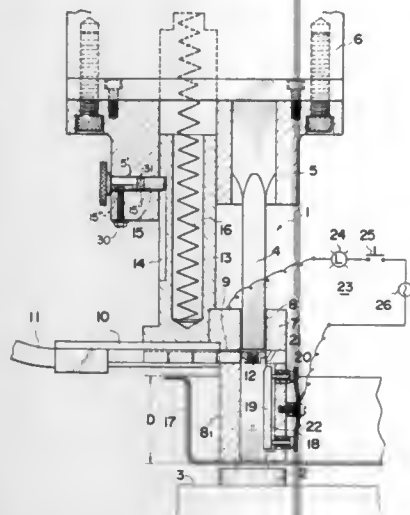
U.S. Cl. 29—720

28 Claims

1. An automatic piercing nut assembling arrangement, comprising:

- a punch means slidably supported in a punch holder connected to a press ram for pressing a piercing nut into a metal panel;
- a swaging die means arranged opposite said punch means and cooperating therewith for swaging metal from the

metal panel inwardly of the piercing nut to anchor the same in the metal panel;  
 means interposed between said punch means and said swaging die means for holding a piercing nut in a punching path of said punch means including a holding block having an extended leg portion and a bore means extending therethrough for receiving a piercing nut, said bore means having a sufficient diameter so as to permit said punch means to pass therethrough during a downward movement of the press ram, said extended leg portion having a predetermined axial length so as to permit the piercing nut to be anchored at a bottom wall of a deep drawn metal panel;  
 means for supplying piercing nuts to said holding means;  
 means operatively connected with said holding means for causing a monitoring of a presence of a piercing nut therein and for providing a signal of the presence of a piercing nut in a punching path of the punch means in-



cluding a nut detector means arranged in the bore means of said holding block, lamp means for providing a visible signal of a presence of a piercing nut in the bore means, circuit means for interconnecting said holding means to said detector means and said lamp means, and means for selectively actuating said circuit means so as to determine if a piercing nut is present in the bore means;  
 said nut detector means includes an electrical conductor arranged in said circuit means, and said bore means includes an axially extending recess means provided in at least a portion of said extended leg portion for accommodating said electrical conductor;  
 means for normally biasing said electrical conductor into said bore means;  
 at least two freely supported electrically insulated pin means for mounting said electrical conductor at said recess means of said extended leg portion; and  
 wherein said biasing means includes a leaf spring means engaging each of said insulated pin means.

4,164,073

# APPARATUS FOR FEEDING AND BENDING SEED PLATE LUG STRIPS

Pertti Tuominen, Sorkka, Finland, assignor to Lonnstrom OY, Finland

Filed Feb. 8, 1978, Ser. No. 876,129

Claims priority, application Finland, Feb. 8, 1977, 770417

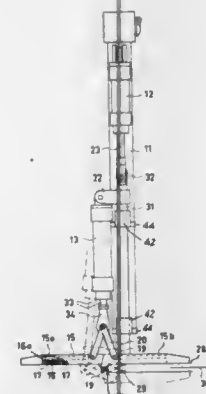
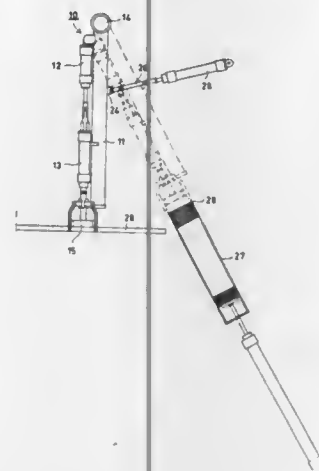
Int. Cl.<sup>2</sup> B23P 19/04; H01M 4/00

U.S. Cl. 29—731

15 Claims

1. In an apparatus for feeding a lug strip and bending the same around a supporting rod in preparation for fixing free ends of the bent lug strip to an edge region of a seed plate in an electrolytic refining plant, tool means for bending a lug strip around the supporting rod and including a holding means for

holding a lug strip initially in a flat condition against a supporting rod in preparation for bending the lug strip around the supporting rod and for picking up a lug strip from a supply means at a receiving station and holding the same during movement of the tool means from a receiving station to a working station, said tool means having a starting position where the lug strip is held by the holding means of the tool means at a working station in its initial flat condition and having an end position where the lug strip is bent around the supporting rod with said tool means being movable from said starting to said end position during bending of the lug strip and then being movable back from said end position to said starting position thereof in preparation for receiving the next lug strip, operating means operatively connected to said tool means for carrying the latter and for operating the tool means to move the same between its starting position where the holding means



holds the lug strip in its initial flat condition and its end position so that during movement between its starting and end positions the lug strip will be bent around a supporting rod, frame means carrying said operating means, moving means operatively connected to one of said operating or frame means for moving said tool means between a working station where said operating means operates said tool means to bend a lug strip around a supporting rod and a receiving station where said tool means receives a flat lug strip which is held at said tool means by said holding means thereof, and supply means at said receiving station for supplying a flat lug strip to said tool means when the latter is at said receiving station, said tool means after being operated by said operating means at said working station being moved by said moving means from said working station to said receiving station to receive the next lug strip from said supply means.

4,164,074

# DENTAL ARTICULATOR WITH INTERCHANGEABLE MOUNTS

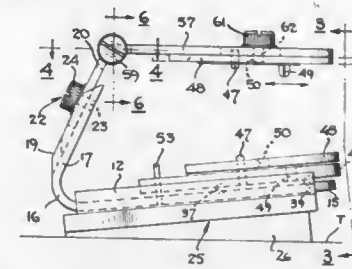
John K. Lawler, deceased, late of Gardena, Calif.; John W. Mitchell, Sr., Gardena, and Kenneth H. Oyama, Huntington Beach, both of Calif., assignors to Doris Gene Lawler, interest of John K. Lawler (deceased) passed as community property

Filed Nov. 5, 1976, Ser. No. 739,360

Int. Cl.<sup>2</sup> A61C 11/00

U.S. Cl. 32—32

8 Claims



1. A dental articulator having a base member and an overhanging member disposed generally parallel to each other and adjustably spaced apart vertically, each member having attachment means adapted to hold one of a pair of dentures between them in position to effect simulated functional engagement of the pair, at least one of such members having associated means for laterally moving its denture relative to the other denture to test the occlusion of the pair,

said attachment means comprising a pair of generally similar, planar and interchangeable mounts, each adapted to have an upper or lower denture transiently attached adjacent one face thereof, an opposite face of each mount having coupling means for its selective juxtaposition with its respective member, whereby a complementary pair of dentures may be thus disposed in mutual engagement and their occlusion tested by movement of one member and its coupled mount relative to the opposed member and coupled mount, and

a support frame having a longitudinal slideway upon which said base member may be slidably supported for selective retention between lateral guide means disposed along opposite sides of the slideway in position to abut adjacent edges of a mount coupled to the base member; thereby restraining such mount from lateral displacement.

4,164,075

# PHONOGRAPH RECORD ECCENTRICITY TESTER

Csaba K. Hunyar, Sunland, Calif., assignor to Capitol Records, Inc., Hollywood, Calif.

Continuation of Ser. No. 431,568, Jan. 7, 1974, abandoned. This application Sep. 15, 1975, Ser. No. 613,637

Int. Cl.<sup>2</sup> G01B 7/00

U.S. Cl. 33—174 Q

1 Claim

1. In combination, a turntable having a center pin, a phonograph record carried by the turntable with the pin received in the record center pin hole, and a device for measuring the eccentricity of grooving in said phonograph record relative to the record center pin hole, said grooving including spiral grooving and a circular groove extending substantially concentrically but eccentrically about said hole and radially inwardly of said spiral grooving, said device comprising

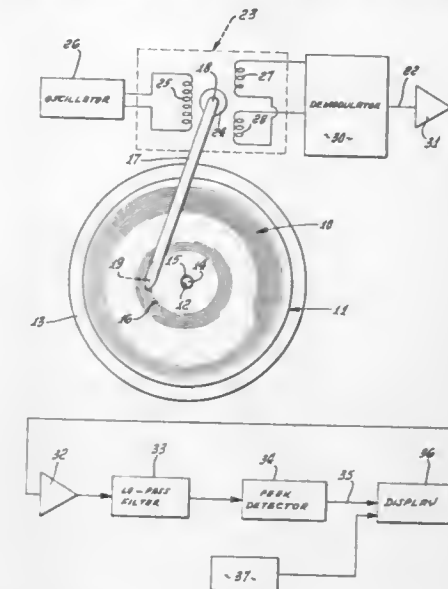
(a) a single arm having a pivot axis and carrying a stylus the tip of which is spaced from said axis and at all times confined only in said circular groove for tracking therein in response to rotation of the record on the turntable about a turntable axis in registration with said hole, the arm pivoting about said pivot axis to an extent determined by said eccentricity,

(b) sensor means responsive to pivoting of said single arm to produce an AC output signal having an amplitude corresponding to the amplitude of said pivoting, and

(c) circuit means including a digital display for processing

said signal to produce a digital read-out corresponding to the peak amplitude of said signal,

(d) said sensor means comprising a rotary variable differential transformer having a rotary core element coupled to said arm to pivot in response to said arm pivoting, said transformer having a primary coil receiving excitation at a carrier frequency and two secondary coils connected in series opposition so that the voltages induced therein are opposite in phase and said output signal represents the difference between said voltage induced in said secondary coils, said primary and secondary coils having fixed, non-



rotating position so that only the core of said sensor means is rotatable,

(e) said circuit means including a demodulator, amplifier, low-pass filter and high and low peak detector means electrically coupled in series relation between the output of said transformer and the input of said display, the detector means detecting high and low AC signal peaks and subtracting same to produce a difference voltage for display, and

(f) there being means connected with the display to hold the display output at an input value for a selected time interval.

4,164,076

# UNIVERSAL DIE MOUNTING PLATE SYSTEM

Robert J. Carrigan, Enfield, Conn., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 1, 1978, Ser. No. 882,399

Int. Cl.<sup>2</sup> B23Q 3/00

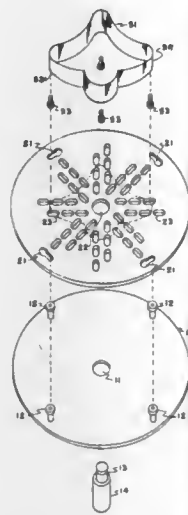
U.S. Cl. 33—181 R

5 Claims

1. A mounting plate for securing the position of a machine tool comprising a plurality of slot groupings extending radially from a plate center point, radial axes of each slot group being distributed substantially equiangularly about said centerpoint, each said slot grouping comprising at least two spaced lines of short, spaced slots extending parallel with the respective radial



axis, said slots and spaces being aligned in radial sequence along a respective line and laterally offset by the slot and space



sequence of said other line whereby a space of one line is laterally flanked by a slot in said other line.

4,164,077

## LEVEL INDICATING DEVICES

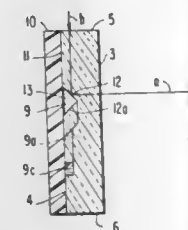
Robert R. Thomas, Hartford, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.

Filed Jul. 7, 1978, Ser. No. 922,763

Int. Cl.<sup>2</sup> G01C 9/32

U.S. Cl. 33—348

12 Claims



1. In a level indicating device including body means surrounding a generally arcuate fluid passage means; and level bubble means contained within said passage means, with said level bubble means including first liquid means, and second fluid means defining bubble means within said first liquid means; the improvement comprising: at least one surface means having a generally linear cross section and defining a side portion of said passage means; said surface means being operable to receive light and reflect light therefrom, with light reflected from said surface means having a generally linear cross section, adjacent said bubble means, defining a visually intensified bubble image.

4,164,078

## ELECTRONIC QUIZ APPARATUS

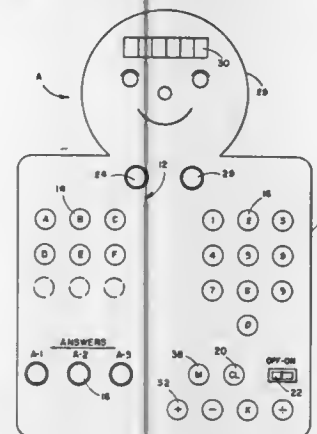
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356

Filed Feb. 21, 1978, Ser. No. 879,614

Int. Cl.<sup>2</sup> G09B 7/06

U.S. Cl. 35—9 B

35 Claims



1. A quiz apparatus comprising:
  - (a) sheet means having one or more questions and a plurality of answers to the question, said sheet means also having input indicia for an electronic device related to the question and input indicia for an electronic device related to each answer;
  - (b) a relatively small and portable electronically operable device having a housing;
  - (c) input means on said housing manually operable for introducing indicia representative of the question and of the answers so that the user may introduce the indicia from the sheet means representative of the question and of a selected one or more of a larger possible number of answers for that question;
  - (d) electronic processing means associated with the housing being operatively connected to said input means for processing the indicia for the question and for the selected answer in connection with an algorithm, to determine the relationship of the selected answer to the correct answer to the question, and where the correlation of the indicia for the question and the answers thereto are not readily discernible to the user of the apparatus; and
  - (e) response means to provide an indication to the user of the relationship of the answer selected by the user to the correct answer.

4,164,079

## SEAT CUSHION TO PROVIDE REALISTIC ACCELERATION CUES TO AIRCRAFT SIMULATOR PILOT

Billy R. Ashworth, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 829,314, Aug. 31, 1977, abandoned.

This application Jul. 26, 1978, Ser. No. 928,131

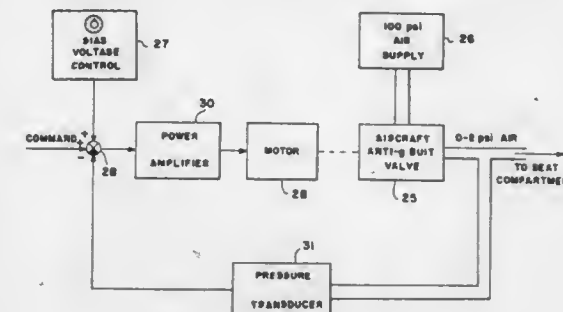
Int. Cl.<sup>2</sup> G09B 9/08

U.S. Cl. 35—12 E

3 Claims

2. A seat cushion for providing realistic acceleration cues for an aircraft simulator pilot comprising: a plurality of contiguous seat cushion compartments with each including an air cell having a top surface that is conformable to the pilot's buttocks and having a bottom surface in contact with a noncompressible surface; means for controlling air pressure changes in each of said air cells to simulate the events which occur in a seat cushion during an actual flight said means including a separate control means for each of said air cells and a computer

means for supplying a command voltage to each of said separate control means; each of said separate control means including a pressurized air supply with means for controlling the pressure from said air supply to the corresponding air cell said means for controlling the pressure to the air cell includes an aircraft anti-g-suit valve with its normal activating slug replaced



by a motor to provide linear actuation of the valve, the command voltage from said computer means applied to said motor, a pressure transducer means for producing a feedback voltage proportional to the pressure applied to said air cell and means for subtracting said feedback voltage from said command voltage before it is applied to said motor.

4,164,080

## BASIC SIMULATOR UNIT

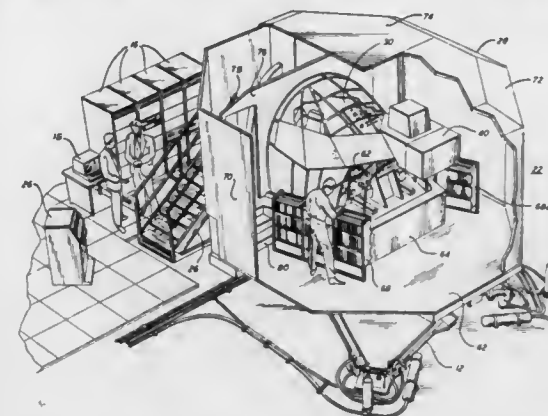
Gerald M. Kosydar, Vestal; Albert J. Rider, Binghamton, both of N.Y., and Alan A. Trussler, Worthing, England, assignors to The Singer Company, Binghamton, N.Y.

Filed May 10, 1977, Ser. No. 795,519

Int. Cl.<sup>2</sup> G09B 9/08

U.S. Cl. 35—12 P

21 Claims



1. A basic simulator unit for vehicle simulation comprising: a simulated crew station, the interior of said simulated crew station comprising an enclosed replica of the interior equipment of the crew station of the vehicle being simulated, and the exterior sides of said simulated crew station comprising an open framework which provides direct access to said replicated interior equipment from outside of said simulated crew station without interfering with the environmental fidelity of the interior; at least one electronics rack adjacent said open framework; a maintenance walkway bordering said simulated crew station; an enclosure completely enclosing said simulated crew station, electronics rack and maintenance walkway; and a motion system for supporting and moving said enclosed station, rack, walkway and enclosure.

4,164,081

## REMOTE TARGET HIT MONITORING SYSTEM

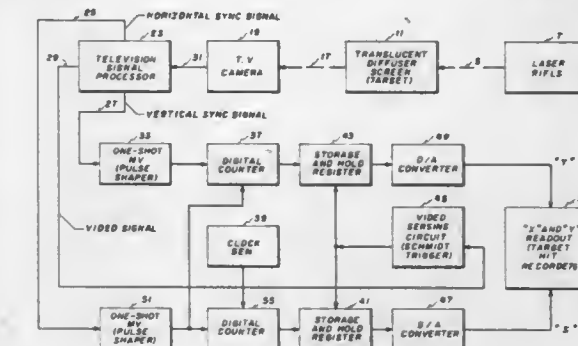
Herbert Berke, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1977, Ser. No. 850,313

Int. Cl.<sup>2</sup> F41J 5/08

U.S. Cl. 35—25

16 Claims



6. A target hit indicator comprising in combination: means for receiving the laser light from a laser weapon and for producing a light spot thereon in response thereto; means for scanning a predetermined frame of said laser light receiving means, having a horizontal sync signal output, a vertical sync signal output, and a video signal output, for producing a horizontal sync signal, a vertical sync signal, and a video signal in response to the presence of said light spot thereon; a first one-shot multivibrator having an input effectively connected to the vertical sync signal output of said predetermined frame scanning means, and an output; a second one-shot multivibrator having an input effectively connected to horizontal sync signal output of said predetermined frame scanning means, and an output; a first digital counter having a reset input, a clock input, and an output, with the reset input effectively connected to the output of said first one-shot multivibrator, and with the clock input effectively connected to the output of said second one-shot multivibrator; a second digital counter having a reset input, a clock input, and an output, with the reset input effectively connected to the output of said second one-shot multivibrator; a clock signal generator, having an output connected to the clock input of said second digital counter; a first storage and hold register having a data input, a gating and clearing input, and an output, with the data input effectively connected to the output of said first digital counter; a second storage and hold register having a data input, a gating and clearing input, and an output, with the data input effectively connected to the output of said second digital counter; a Schmitt trigger, having an input effectively connected to the video signal output of the predetermined frame scanning means, and an output effectively connected to the gating and clearing inputs of said first and second storage and hold registers; a first digital-to-analog converter having an input connected to the output of said first storage and hold register and an output; a second digital-to-analog converter having an input connected to the output of said second storage and hold register and an output; and means having a first input connected to the output of said first digital-to-analog converter, and a second input connected to the output of said second digital-to-analog converter, for reading out an "X" and a "Y" coordinate distance signal simultaneously as a composite combination

thereof which represents the position of said light spot within said predetermined frame.

4,164,082

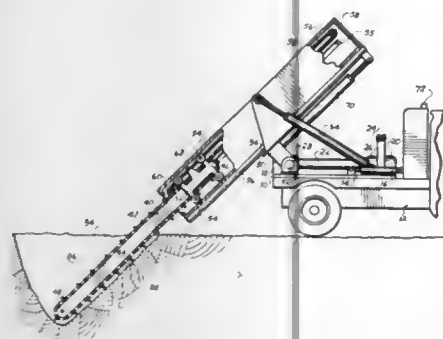
**EXCAVATOR FOR ANCHOR HOLES**

Gary Q. Watson, P.O. Box F, Del Rio, Tex. 78840

Filed Oct. 11, 1977, Ser. No. 840,972

Int. Cl.<sup>2</sup> E02F 5/06, 3/14

U.S. Cl. 37—83



1. In a machine for digging holes in the ground in which to bury anchors having a rod along a longitudinal anchor axis and an anchor plate projecting outwardly from the anchor rod for impeding longitudinal movement of said anchor when buried,

- said machine including a frame on a mobile platform carrying a digger,
- said digger including an endless chain-driven bucket rotary trencher;

the improved structure comprising in combination with the above:

- an intermediate member pivoted to the frame about a frame pivot axis,
- said digger pivoted to the intermediate member about a digger pivot axis which is transverse to said frame pivot axis,
- digger pivot means interconnecting the digger and the intermediate member for pivoting said digger about said digger pivot axis,
- frame pivot means interconnecting the intermediate member with said frame for pivoting the intermediate member about said frame pivot axis,
- said frame having
  - a front bearing mounted thereon, and
  - a rear bearing mounted thereon,
- said digger including
  - a digger housing,
  - said trencher being mounted therein,
  - a housing support arm having upper and lower ends and being connected to said digger housing,
- said intermediate member including
  - a shaft pivot arm,
  - a hydraulic arm,
  - a support pivot arm,
  - a pivot shaft, and
  - said pivot shaft extending through and rigidly connected to said shaft pivot arm, said hydraulic arm, and said support pivot arm,
- said pivot shaft being journaled within said front and rear bearings thus defining the frame pivot axis,
- said digger being pivoted to said intermediate member as defined above by a pivot pin extending through the lower end of said housing support arm and through said support pivot arm with said pivot pin defining the digger pivot axis,
- said digger pivot means interconnecting said hydraulic arm and the upper end of said housing arm,
- said frame pivot means interconnecting said frame with said shaft pivot arm, and

p. said digger providing means for digging an anchor hole whereby

- said anchor may be slidably placed within the anchor hole, with
- the anchor plate bearing against undisturbed earth.

4,164,083

**BELT-CONVEYOR IRONING MACHINE**

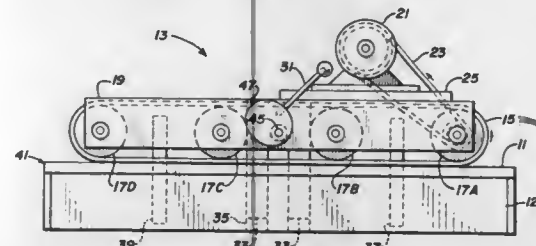
Aaron Glassman, Scranton, Pa., assignor to Pennsylvania Sewing Research Corp., Dunmore, Pa.

Filed Dec. 7, 1977, Ser. No. 858,094

Int. Cl.<sup>2</sup> D06F 69/02

U.S. Cl. 38—11

3 Claims



1. An ironing machine comprising a horizontal ironing plate, an endless-belt conveyor supported above said ironing plate, said conveyor comprising a frame, a plurality of rollers supported on said frame, a continuous belt supported on said rollers and means for driving at least one of said rollers supported on said frame, means on only one side of said conveyor for maintaining said conveyor and said ironing plate in substantially constant horizontal positions relative to one another, while permitting vertical movement of said conveyor with respect to said ironing plate, and means for positioning the endless belt of said conveyor into and out of contact with said ironing plate, said means leaving unobstructed access to the other side of said conveyor when said endless belt is positioned in contact with said plate by said positioning means.

4,164,084

**DISPLAY DEVICE**

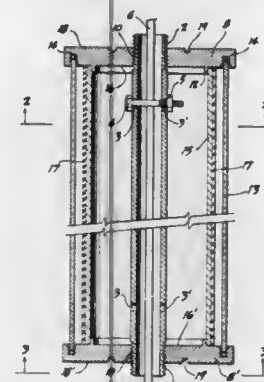
Charles Crockett, 1297 Logan Ave., Costa Mesa, Calif. 92626

Filed Aug. 5, 1977, Ser. No. 821,992

Int. Cl.<sup>2</sup> G09F 3/18

U.S. Cl. 40—19

8 Claims



1. A display device which comprises:

A transparent outer sleeve, a middle sleeve, an inner sleeve fitted with external screw threads on both ends and having at least one passage hole extending perpendicularly through both walls of the inner sleeve, a top and bottom end-plate cap, each having a centralized hole of the same diameter as the inner sleeve, the walls defining such hole being fitted with internal screw threads and each cap

having a groove extending circularly around the inner surface of the cap near the outer edge such that the middle sleeve fits around the inner sleeve and the outer sleeve fits around the middle sleeve and also fits into the groove on both the top and the bottom cap when the caps are screwed onto the threaded ends of the inner cylinder, intercolating and displaying a sheet of schedules, advertising, or other graphics inserted between the middle sleeve and the transparent outer sleeve.

4,164,086

**RECTILINEAR SLIDING PANEL DISPLAY FOR SUCCESSIVELY EXPOSING DIFFERENT PRINTED PICTURES**

Esther Azcarate de Morgan; David Morgan-Landa, both of Avenida 3 No. 182, Mexico 18, D. F., and José L. Becerra-López, M. Ocaranza No. 107, Mexico 19, D. F., all of Mexico

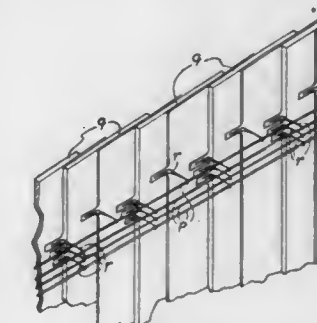
Continuation of Ser. No. 698,550, Jun. 22, 1976, abandoned, which is a continuation of Ser. No. 492,322, Jul. 26, 1974, abandoned. This application Mar. 20, 1978, Ser. No. 888,134

Claims priority, application Mexico, Jun. 6, 1976, 145143

Int. Cl.<sup>2</sup> G09F 11/20

U.S. Cl. 40—476

4 Claims



1. A rectilinear sliding panel display for displaying a plurality of pictures and/or messages, said display comprising:

- a plurality of plate assemblies, each comprising a plurality of plates positioned in parallel vertical planes, one behind the other, wherein said assemblies are positioned adjacent to each other;
- a plurality of links, said plurality of links corresponding in number to the plurality of plates, said links being positioned behind the rear face of said plate assemblies, wherein each of said links is coupled to one plate in each of said plate assemblies; and
- drive means for sequentially operating said links, said drive means comprising a plurality of stacked rings, each of said rings coupled to one of said links, shaft means for sequentially engaging each of said rings and for rotating said ring in response to the rotation of said shaft means, whereby the rotation of said shaft means rotates one of said rings, thereby linearly moving the link which is coupled thereto, whereby the plates coupled to said link are moved with respect to the other plates in said plate assemblies, the visible plates in said assemblies forming said picture and/or message.

4,164,085

**ALBUM HAVING PICTURE RECEIVING FRAME ASSEMBLY IN COVER**

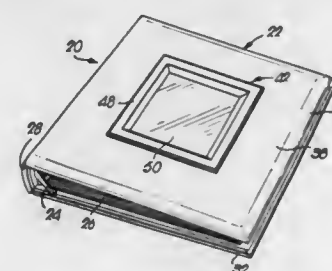
William R. Steeb; Robert W. LeVeau, both of Overland Park, Kans., and Michael J. Falck, Peculiar, Mo., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed Sep. 14, 1977, Ser. No. 833,239

Int. Cl.<sup>2</sup> G09F 1/12

U.S. Cl. 40—152

5 Claims



1. In a photo-album, the combination of a padded, bound cover and picture display frame assembly comprising:

- a substantially rigid, planar backing member generally conforming in configuration to that section of the cover receiving the picture display frame.
- a layer of resilient foam padding of predetermined thickness on one face of the backing member;
- a protective overlay panel secured to said member and extending over said padding in covering relationship thereto;
- a photograph receiving tray provided with a planar bottom, a sidewall projecting from said bottom of a height substantially equal to that of the layer and said overlay in combination, and a flange joined to the outer marginal portion of the sidewall and projecting outwardly therefrom, said overlay and the padding being provided with aligned, blind die cut opening therein of a shape conforming to that of the tray for complementally receiving the same therein and exposing a portion of the backing member, said tray being telescoped into said openings in the overlay and padding with the bottom engaging and supported by said one face of the backing member and said flange laying against the overlay around the opening therethrough, there being means for securing the bottom of the tray to said backing member and a decorative frame unit having a picture displaying opening therethrough and of a configuration to overlie the side wall of the tray in covering relationship to said flange and engage said overlay, said side wall of the tray and the frame unit being provided with releasably engageable latch elements for removably attaching the frame unit to the tray to permit ready insertion of a photograph in the tray for display thereof behind the frame unit while at the same time allowing easy removal of the photograph as desired by the album user.

4,164,087

**AUTOMOBILE ORNAMENT**

Frederick S. Crownover, Rte. 1, Box 27, Columbiana, Ala. 35051

Filed Jun. 9, 1977, Ser. No. 805,148

Int. Cl.<sup>2</sup> G09F 21/04

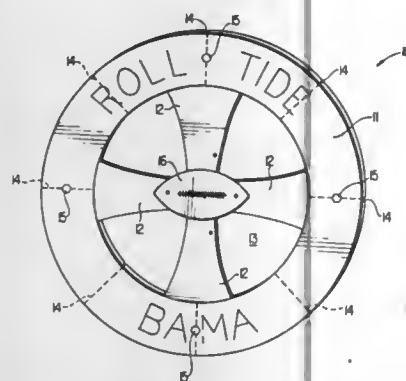
U.S. Cl. 40—492

6 Claims

1. A hoop-shaped device for displaying information in the form of words or other indicia, comprising: a hoop-shaped member having indicia provided thereon, a plurality of web members extending from said hoop-shaped member across the central open portion of the hoop to intersect at the midpoint of said open portion, a ball-shaped member having the silhouette of a game ball attached at the intersection of said web members, and a plurality of grooves provided at intervals around



the circumference of said hoop-shaped member, whereby pliability of the device is increased and the attachment to a



support means facilitated, said grooves extending diametrically across the width of said hoop-shaped member.

**4,164,088**  
**CARTRIDGE LOCKING DEVICE FOR AN AUTOMATIC GUN**

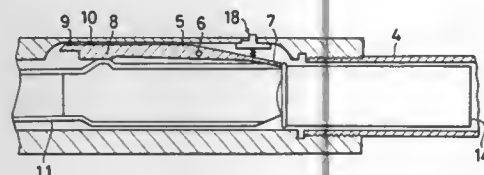
Hisao Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-ten, Tokyo, Japan

Filed Dec. 14, 1977, Ser. No. 860,603

Claims priority, application Japan, Dec. 29, 1976, 51-159848  
Int. Cl.<sup>2</sup> F41C 13/00

U.S. Cl. 42—17

1 Claim

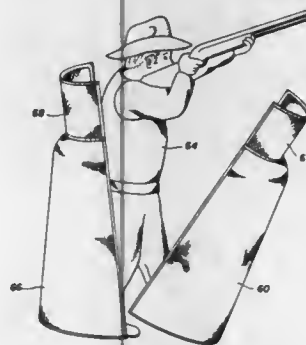


1. In an automatic gun loading operation including a receiver, a carrier pivotally mounted within said receiver, a magazine secured to said receiver for holding cartridges, a barrel chamber attached to said receiver, a breech block located within said receiver and movably displaceable forwardly and rearwardly therein relative to said barrel chamber, and arranged for removing a cartridge from the magazine into said carrier by releasing it from a locked state for firing the gun and for placing the cartridge into said barrel chamber by the upward sway of said carrier which takes place in response to the forward stroke of said breech block, the improvement comprising a cartridge/carrier locking device including a latch plate located within said receiver and having a first claw part at its forward end closer to said barrel chamber for locking the cartridge and a second claw part at its rear end more remote from said barrel chamber for locking said carrier, said latch plate pivotally attached to the inner wall of said receiver, said first and second claw parts serve, respectively, to lock the cartridge and the carrier as they alternately protrude into the interior of said receiver in a swaying fashion, a spring within said receiver arranged to push said second claw part of said latch plate into the interior of said receiver, a locking part arranged at the rear end of said latch plate to engage said breech block, carrier and cartridge to restrict the swaying motion of said second claw part protruding into the interior of the receiver so that the engagement is released to allow the second claw part to act and to release the first claw part from its action only when a retracting stroke of said breech block exceeds a preset value after the gun is fired, said receiver has a hole therethrough from the exterior to the interior thereof aligned with the first claw part of said latch plate, a latch button having a first engaging face and a second engaging face

formed in two stages in the axial direction of the hole for engagement with the inner wall of said receiver with said second engaging face located closer to the exterior of said receiver than said first engaging face, and an antirattling spring biasing said latch button toward the outside of said receiver, the swaying movement of said first claw part of said latch plate being mechanically locked when said latch button is pushed inwardly against the force of said antirattling spring and causing said second engaging face to engage with the inner wall of said receiver.

**4,164,089**  
**PORTABLE BLIND**  
Warren T. George, 1611 Clark Ave., Billings, Mont. 59102  
Filed Jul. 26, 1977, Ser. No. 819,048  
Int. Cl.<sup>2</sup> A01M 31/02; E04G 11/04  
U.S. Cl. 43—1

10 Claims



1. A blind of the type operable to the faciliely transported by a user comprising:  
a first frame means, having  
a first set of at least three legs extending generally upon an imaginary semicircle at the base thereof  
first semicircular frame means interconnecting the upper ends of said legs such that said legs may be self-supporting in an upright posture,  
second semicircular frame means positioned above said first semicircular frame means, and generally vertical frame means connected at the respective ends of said first and second semicircular frame means to form one-half of a generally cylindrical frame extension above said at least three legs forming one-half of a truncated conical frame;  
a second frame means, having  
a second set of at least three legs extending generally upon an imaginary semicircle at the base thereof,  
third semicircular means interconnecting the upper ends of said legs such that said legs may be self-supporting in an upright posture, where  
fourth semicircular frame means positioned above said third semicircular frame means, and  
generally vertical frame means connected at the respective ends of said third and fourth semicircular frame means to form one-half of a generally cylindrical frame extension above said at least three legs forming one-half of a truncated conical frame; where  
said first frame means and said second frame means may be operably positioned such that said first, second, third and fourth semicircular frame means form a cylinder and said first frame means and said second frame means forms a generally truncated conical structural shell;  
first flexible cover means connected to said first frame means for extending about and forming a first covering shell over said first frame means;  
second flexible cover means connected to said second frame means for extending about and forming a second covering shell over said second frame means;  
said first flexible means connected to said first frame means

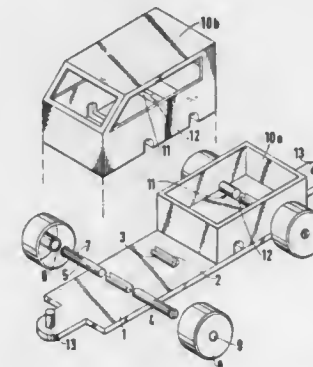
and said second flexible means connected to said second frame means operably serve to form a blind enclosure about a user when said first and second frame means are positioned to form an enclosed shell whereby one-half of said enclosed shell may be faciliely bumped away by a user.

**4,164,090**  
**ASSEMBLY KIT FOR ASSEMBLING A TOY VEHICLE**  
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany  
Filed Jul. 13, 1977, Ser. No. 815,410  
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 7622810

Int. Cl.<sup>2</sup> A63H 33/06

U.S. Cl. 46—17

7 Claims



1. An assembly kit for assembling a toy vehicle having tires, comprising a lower part including a body portion having an upper surface, a plurality of elongated undercut projections located on said upper surface of said body part and each extending in a first direction, each of said projections having a slot which cuts through and extends in the direction of elongation of a respective projection, and a plurality of pairs of elongated axle portions for mounting the tires thereon, said axle portions being mounted on said upper surface of said body portion and also extending in said first direction, said projections and said axle portions being of one piece with said body portion so as to form together a one-piece member defining said lower part; and a hollow body part including at least two hollow upper structural elements each having a shape corresponding to the shape of a toy vehicle to be assembled, each of said upper structural elements having a lower surface provided with elongated undercut grooves which extend in said first direction and each have two enlarged end portions spaced from one another in said first direction, each of said enlarged end portions having a length corresponding to a part of the length of a respective undercut groove, and a width corresponding to the largest cross-section of said undercut projections of said lower part, whereby each of said structural elements of said upper part can be connected with said lower part by movement of said structural element both in said first direction and in a direction transverse to said first direction so that the undercut projection of said lower part engages in the undercut groove of the structural element of said upper part.

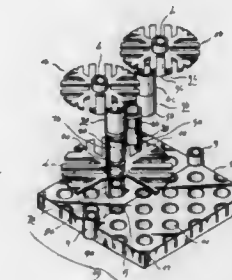
**4,164,091**  
**BUILDING BLOCKS SET**  
Wen-ping Lin, 30, Chien-Yung St., Taichung, Taiwan  
Filed Mar. 30, 1978, Ser. No. 891,717  
Int. Cl.<sup>2</sup> A63H 33/04

U.S. Cl. 46—26

2 Claims

1. A set of building blocks comprises a plurality of building elements including branching elements having a central hole therein, a twin plug and socket member, a single hollow plug and socket member, and a cylindrical connector; and several base boards having a plurality of socket-recesses countersunk into the top surface thereof and protrusions extending from the

bottom surface thereof, wherein said base boards are provided with several semi-annular recesses countersunk into the side walls of the top surface thereof so as to form correspondingly semi-annular protrusions extending from edges of the bottom surface thereof, and provided with four quarter-annular recesses countersunk respectively into each corner of the top sur-

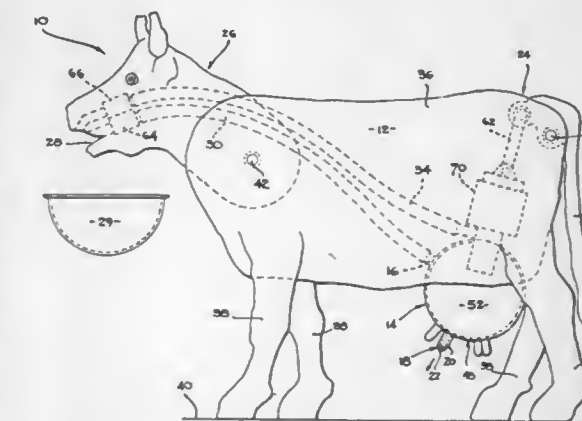


face thereof so as to form correspondingly four quarter-annular protrusions extending from corners of the bottom surface thereof, whereby the semi-annular recesses and the quarter-annular recesses of different base boards can cooperate each other to define suitable recess combinations, said cylindrical connector can be engaged into the recess combinations so as to couple said base boards side by side.

**4,164,092**  
**TOY MILKABLE ANIMAL FIGURE**  
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356; Erwin Benkoe, deceased, late of Encino, Calif. (by Elisabeth Benkoe, executrix), and Elonne Dantzer, Hermosa Beach, Calif., assignors to A. E. Goldfarb, Northridge, Calif.  
Filed Feb. 25, 1977, Ser. No. 772,012  
Int. Cl.<sup>2</sup> A63H 13/02

U.S. Cl. 46—123

19 Claims



1. A toy milkable animal figure comprising:  
(a) a frame representative of an animal figure,  
(b) a chamber for liquid supported on said frame and representing the udder of the animal,  
(c) means on said frame connected to and defining an inlet to said chamber for the introduction of liquid into said chamber,  
(d) means on said frame connected to and defining an outlet from said chamber, said outlet means defining an openable aperture,  
(e) said udder being flexible and manually squeezable to cause the release of liquid through said aperture,  
(f) and means providing a coloring agent in said chamber for changing the color of clear liquid such as water introduced into said chamber to a milky color.

19. A liquid drinking and discharging toy animal apparatus, said apparatus comprising:

- (a) a body having front and rear ends and a shape and design to characterize an animal;
- (b) a head mounted at the front end of said body and having a mouth opening for the intake of a liquid;
- (c) a liquid receiving chamber supported at the rear end of said body and having a portion extending outwardly from said body, said portion being representative of an udder of said animal and being flexible and manually squeezable to discharge liquid from said chamber through an openable aperture therein;
- (d) an inlet tube extending from said mouth opening to said chamber for introducing liquid into said chamber;
- (e) and separate pumping means operatively connected to said chamber and having an actuator member movably mounted on said body and having a portion located externally of said body, said portion externally of said body being manually movable relative to said body independently of movement of said body from externally of said body for pumping liquid through said mouth opening and inlet tube into said chamber.

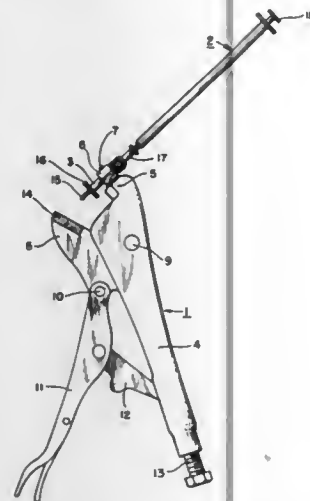
**4,164,093**  
**MINI-INJECTOR**

John P. Sterrett, Walkersville; Joseph P. Carroll, Frederick, and Richard A. Creager, Walkersville, all of Md., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,573  
Int. Cl.<sup>2</sup> A01G 29/00, 7/06

U.S. Cl. 47—57.5

1 Claim



1. An apparatus for wedging an injector barrel of a disposable syringe into a predrilled hole in the stem of a seedling or in a branch of a relatively small diameter woody plant for introducing under pressure growth regulators and other solutions into the stem or branch comprising:

- (a) a locking-type wrench having a handle member provided with a fixed jaw, a movable jaw pivotally attached to the handle member for coaction with the fixed jaw, means for adjusting the position of said fixed and movable jaws with respect to each other, and means for locking said fixed and movable jaws onto the foresaid stem or branch, the fixed jaw of said wrench being about one-half the length of the movable jaw and being provided with means for mounting an injector barrel;
- (b) an injector barrel for a disposable syringe mounted to said fixed jaw;
- (c) a tapered tip integrally joined to said injector barrel, said tip having a taper length of 2.4 mm and a taper angle of 40° to provide an effective pressure tight leakage preventative seal in a predrilled hole having a diameter of 5/64

inches, said seal being capable of preventing leakage at pressures up to 400 p.s.i.;  
(d) a disposable syringe mounted in the foresaid injector barrel.

**4,164,094**

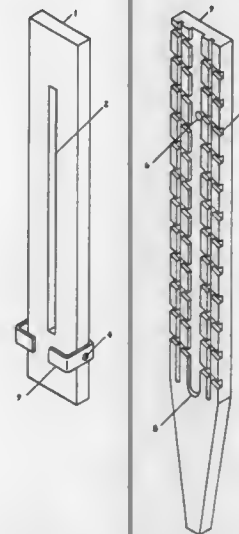
**ADJUSTABLE PLANT SUPPORT**

Dorothy E. Kempka, 28305 SE. 61st St., Issaquah, Wash. 98027  
Filed Jul. 7, 1977, Ser. No. 813,482

Int. Cl.<sup>2</sup> A01G 17/06

U.S. Cl. 47—47

2 Claims



1. An adjustable plant support, comprising first and second members adapted for abutment along respective inner faces, the first member including means for securely positioning the first member with respect to the ground and at least one of the members including channel means forming a plurality of transverse channels intersected by at least one longitudinal channel in such member's inner face for preventing moisture buildup and retention between the members; and adjustment means for securing the members in a plurality of relative, abutting positions such that the members are adjustable in position with respect to each other.

**4,164,095**

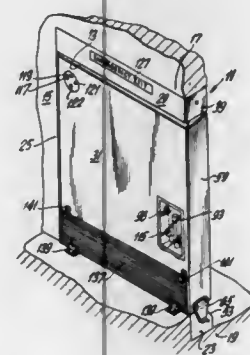
**EMERGENCY ESCAPE WALL STRUCTURE**  
John Musacchia, P.O. Box 452, Marathon, Fla. 33050

Filed May 1, 1978, Ser. No. 901,448

Int. Cl.<sup>2</sup> B24B 25/00

U.S. Cl. 52—1

10 Claims



1. An emergency escape wall structure situated between two side frames, a header frame and a sill frame, said structure comprising:  
a top panel rigidly mounted between the two side frames and

the head frame, said top panel having a bottom member with a recess therein;  
a bottom panel rigidly mounted between the two side frames and the sill frame;  
an escape panel having an inside sheet and having a top member with a slot therein, said slot being aligned with the recess in the bottom member of the top panel, said escape panel having a lower edge adjacent said bottom panel;  
hinge means mounted at the lower edge of the escape panel for pivotally mounting said escape panel between said side frames and said top panel and said bottom panel, said hinge means being adapted to permit said escape panel to pivot outwardly and downwardly;  
a plunger lock slidably mounted within said escape panel to move in and out through the slot in the top member of the escape panel into the recess of the bottom member of the top panel;  
spring means engaging said plunger lock and adapted to urge said plunger lock through said slot into said recess, said plunger lock having an inclined surface and said recess having a corresponding inclined surface whereby pressure on the inside sheet of the escape panel causes a downward force on the plunger lock opposed to the spring means; and  
means for releasing the force of said spring means to cause said plunger lock to drop out of said recess.

**4,164,096**

**RECIPRO-FINISHING METHODS AND MACHINES**

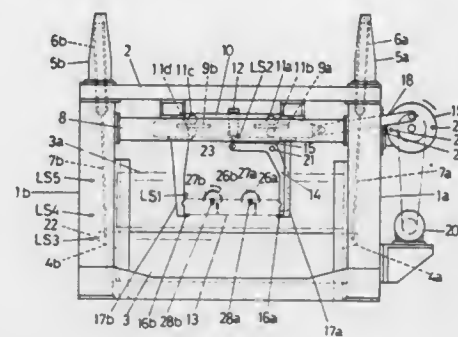
Hisamine Kobayashi, Nagoya, Japan, assignor to Kabushiki Kaisha Shikishima Tipton, Nagoya, Japan

Filed May 27, 1977, Ser. No. 801,406

Claims priority, application Japan, Jul. 22, 1976, 51/97785[U]  
Int. Cl.<sup>2</sup> B24C 31/00, 1/00

U.S. Cl. 51—7

10 Claims



1. A reciprocating method for finishing workpieces having a curved profile, comprising:  
mounting the workpieces on mounting members which are pivotable around axes substantially coincident with the centers of curvature of the workpieces;  
moving the mounting members and a mass of finishing medium relatively to each other for immersing the workpieces in the finishing medium; and  
linearly reciprocating the mounting members with the workpieces thereon in the finishing medium in a direction transverse to said axes and simultaneously rocking the mounting members back and forth around the pivoting axes thereof for moving the workpieces substantially along the curvature thereof.

4. A reciprocating apparatus for surface finishing workpieces having a curved profile, comprising:  
a carrying means having a plurality of workpiece mounting members thereon on which the workpieces can be mounted, said workpiece mounting members being mounted on said carrying means for pivotal movement around axes substantially coincident with the center of

curvature of the workpieces when they are mounted on said workpiece mounting members,  
reciprocating means connected to said carrying means for reciprocating said carrying means linearly in a direction transverse to said axes,  
rocking means connected to said workpiece mounting members for rocking said workpiece mounting members back and forth around said axes during the linear reciprocation of said carrying means, and  
a finishing medium container for holding a mass of finishing medium and moving means connected to said finishing medium container for moving said finishing medium container toward and away from said carrying means for immersing the workpieces carried by said carrying means in the finishing medium during reciprocation and rocking of the workpieces.

**4,164,097**

**OPTICAL LENS GRINDER DEVICE**

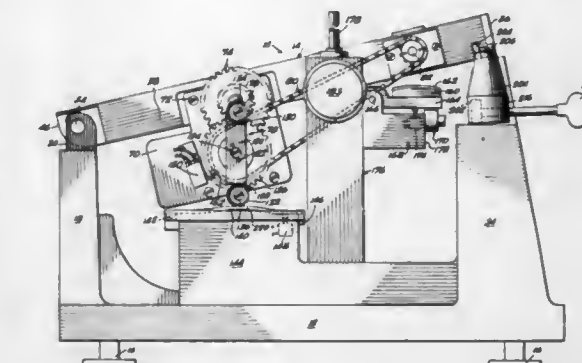
Walter Hernandez, 4650 E. 10 Ct., Hialeah, Fla. 33013

Filed May 8, 1978, Ser. No. 903,701

Int. Cl.<sup>2</sup> B24B 9/14

U.S. Cl. 51—101 LG

31 Claims



1. A cycling device for sequentially positioning a work carriage relative to a pair of work stations from a start position and returning to the start position at the end of each cycle comprising:  
a main base including a pivotal, sliding connection to the work carriage to permit said carriage to pivot up and down relative to said base and to reciprocate in directions at right angles to said pivot movement, a predetermined amount,  
an appropriately configured cam plate mounted to said base,  
a cam follower arm having oppositely extending ends positioned above said cam plate, and drive means centrally fixed thereto to rotatably drive said arm at a predetermined rate of speed, said drive means being fixed to said work carriage,  
first and second cam followers carried at the respective ends of said arm, each portion of said arm from said drive means connection being of a predetermined length so as to permit its associated cam follower to engage said cam plate for a predetermined portion of each revolution to cause an up and down pivotal movement of said carriage about said connection,  
said first cam follower being angled relative to a plane of rotation of said arm in a manner so as to permit it to track angularly across said cam plate in a first direction, when engaged therewith, to laterally slide said carriage into a position to align a piece of work carried by said work carriage with a first of said work stations at the beginning of said down movement,  
said second cam follower causing said up movement during a first portion of said cam plate engagement and being angled relative to the plane of rotation in a manner so as to cause it to track across said cam plate in a second direc-



tion, when engaged therewith, to laterally slide said carriage to align the piece of work with a second of said pair of work stations.

4,164,098

## GRINDING WHEEL

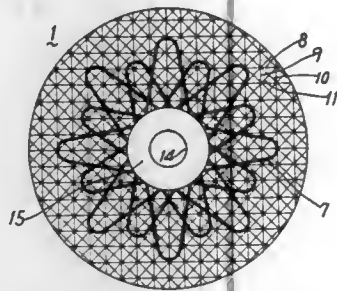
Hiroshi Akita, 549 Banchi, Oaza Nishi, Kamioka-cho, Yoshikigun, Gifu Prefecture, Japan

Filed Sep. 13, 1977, Ser. No. 832,913

Claims priority, application Japan, Sep. 13, 1976, 51-123883

Int. Cl.<sup>2</sup> B24D 7/04

U.S. Cl. 51—209 R



1. An offset grinding wheel for grinding on a radial face thereof comprising abrasive grains, at least one reinforcing core, said at least one reinforcing core comprising an open mesh fabric of fibreglass cord, a central opening, at least one reinforcing network, said abrasive grains and reinforcing core and reinforcing network all bonded in a resinous bonding material, and said reinforcing network comprising yarn of fibreglass, said network further comprising a symmetrical radial pattern of long segments and short segments, each said segment including an apex and arms, said arms tangent to the central opening of said grinding wheel, said arms being straight, the apices of said long segments and said short segments diametrically apposed, said long segments equal to approximately eighty percent of the radius of said grinding wheel, said short segments equal to approximately sixty percent of the radius of said grinding wheel.

4,164,099

## CONTACT LENS TOOL

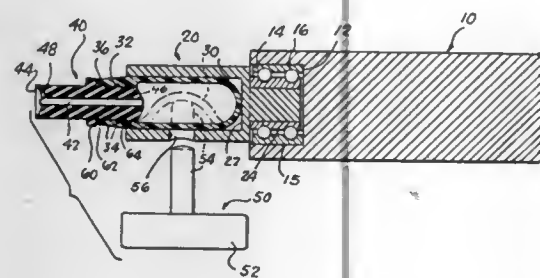
Alan H. Grant, 3208 Woodhollow Dr., Chevy Chase, Md. 20015

Filed Feb. 10, 1978, Ser. No. 876,985

Int. Cl.<sup>2</sup> B24B 41/06, 47/00

U.S. Cl. 51—216 LP

12 Claims



1. A tool for holding a contact lens during grinding or polishing, comprising a handle, a hollow rigid receptacle open at one end and having its other end rotatably mounted in the handle, an elastomeric fluid chamber having a deformable wall and being glove-fitted into said receptacle, said fluid chamber being completely closed except for an open end protruding from said open end of the receptacle, lens seating means on the open end of said fluid chamber for supporting a lens during grinding or polishing and provided with a passage for commu-

nicating the interior of said fluid chamber with the atmosphere, and an opening through the wall of said receptacle intermediate of its ends permitting the exercise of pressure against the deformable wall of said chamber to compress the fluid chamber and partially evacuate the same, thereby enabling suction securement of a lens against said lens seating means.

4,164,100

## DEVICE FOR GRINDING SPIRAL DRILLS

Robert Wolff, Im Kiesacker, 5466 Engeln, Fed. Rep. of Germany

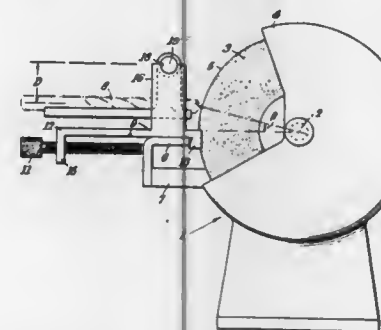
Filed Jul. 18, 1977, Ser. No. 816,676

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632034

Int. Cl.<sup>2</sup> B24B 3/30

U.S. Cl. 51—239

2 Claims



1. An auxiliary device to facilitate re-grinding of spiral drills on the surface of a grinding wheel of a grinding machine having a grinding table adjacent to the wheel comprising:

a supporting bracket having two upwardly directed prong parts which is adapted to be detachably mounted on said grinding table;

fastening means to attach said bracket to said grinding table; said bracket having supporting grooves in each of said prong parts for bearings;

said two prong parts of said supporting bracket facing each other to serve as aligned supports for axes of a swiveling part journalled in bearings in said prong parts;

said swiveling part having a U-shaped bottom and having attached thereto two wing parts, each of which has a U-shaped portion and an axle bearing, one bearing in each wing part in alignment with the other bearing;

said swiveling part further provided with a pair of axle journals, one in each of said axle bearings, and also provided with an elongated handle part lying below and between said axle journals;

a groove in said elongated handle part of said swiveling part being adapted for holding the drill workpiece to be ground so that the drill resting on the groove lies below said axle journal;

said groove in said handle part being slantingly directed towards the surface of the grinding wheel with the swiveling axis of said swiveling part lying in a horizontal plane; said swiveling axis of said swiveling part being inclined at a predetermined acute angle to the shaft of the grinding wheel, said acute angle being inclined in the same slanting direction as the axis of said groove in said swiveling part; said swiveling part being swivelable up and down to precisely align the drill in a resting position on the groove while being reground by the grinding wheel; and

a plurality of interchangeable swivelable parts being provided which differ from each other in the distance between the bottom of the receiving grooves and the height of the swiveling axis extending to the mid-point of the grooves in the prongs of the supporting bracket.

4,164,101

## SANDING HEAD INCLUDING A DUST EXTRACTING SHAFT CASING

Jean Robert, Paris, France, assignor to La Francaise Metallurgie, Paris, France

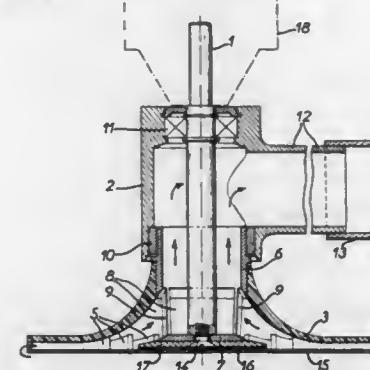
Filed Mar. 17, 1978, Ser. No. 887,598

Claims priority, application France, Mar. 18, 1977, 77 08135

Int. Cl.<sup>2</sup> B24B 55/06

U.S. Cl. 51—273

7 Claims



1. In a sanding head providing for the extraction of dust produced during sanding, and comprising a shaft casing, a shaft rotatably mounted in the casing and capable of being driven by motor means, a circular backing plate of a ventilated type which is connected to one end of the shaft, said circular backing plate being provided in its front face with ventilating grooves and having in its center a hollow cylindrical element, which has a closed front end and which is provided, adjacent its closed front end, with lateral windows communicating the inside of the hollow cylindrical element with the ventilating grooves, and means for detachably fixing an abrasive disk to the closed front end of the hollow cylindrical element, the improvement consisting in that: the hollow cylindrical element of the backing plate is rotatably mounted in the shaft casing at one end thereof, whereas the shaft is rotatably mounted only at the other end of the casing; the shaft, on the one hand, and the casing and the hollow cylindrical element of the backing plate, on the other hand, have respective diameters selected to provide a wide space therebetween; and the shaft casing comprises between its two ends a lateral dust outlet pipe for connection to a vacuum cleaner.

4,164,102

## PROCESS FOR THE MANUFACTURE OF A CERAMIC AXIAL TURBINE WHEEL

Walter Lohrum, Aichwald, and Eberhard Tiefenbacher, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

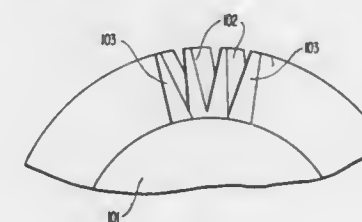
Filed Jan. 26, 1977, Ser. No. 762,520

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603226; Jun. 18, 1976, 2627309

Int. Cl.<sup>2</sup> B24B 1/00

U.S. Cl. 51—283 R

13 Claims



1. A method for the manufacture of a twisted blade ceramic turbine wheel having a hub and a plurality of blades by erosion of a single ceramic mass with the aid of profiling tool means matched to the desired profile shape, comprising the steps of

eroding the pressure and suction profile surfaces on the blade profile successively by tool means including the steps of aligning the tool means with respect to the ceramic mass so as to be in alignment with straight lines defining one of pressure and suction profile surfaces of a blade to be formed, moving a respective tool means initially along inclined straight lines with an orientation between the workpiece and the tool means corresponding to an inclination required to generate a desired first of said profile surfaces, realigning said tool means with respect to said ceramic mass so as to be in alignment with straight lines defining the other of said profile surfaces, and thereafter moving a respective tool means along other inclined straight lines with an orientation between the workpiece and the tool means corresponding to an inclination required to generate the other of the desired profile surfaces.

4,164,103

## DEVICE FOR DEBURRING WORKPIECES

Jürgen Hesse, Düsseldorf, and Peter Grund, Solingen, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

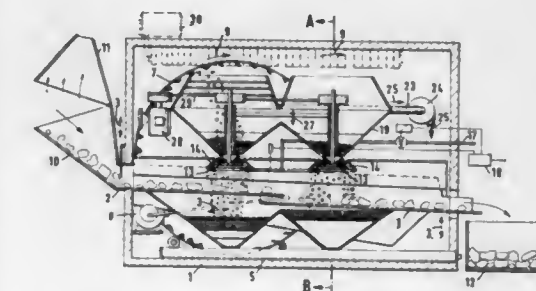
Filed Oct. 17, 1977, Ser. No. 842,512

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650202

Int. Cl.<sup>2</sup> B24B 3/14, 5/06

U.S. Cl. 51—417

1 Claim



1. In a device for deburring workpieces of rubber or plastic or the like wherein the workpieces traverse an insulated chamber on a transport arrangement and are struck by high kinetic energy blasted granulated material from a centrifugal fan blower, as well as made brittle by the addition of a low boiling liquefied gas, the improvement being said centrifugal fan blower having a vertical rotation axis and being mounted above the transport arrangement to blast the granulated material out in horizontal direction, a conical deflector collar ring having its cone angle opening facing downward being mounted about said centrifugal fan blower in a blasting plane, said transport arrangement comprising a vibratory trough mounted within said chamber, said low boiling liquefied gas being discharged through feed means mounted at said fan blower for the simultaneous cooling and blasting of the workpieces, and said gas feed means being a circular pipe mounted onto the lower edge of said deflector collar ring with spray nozzles for the liquefied gas which are aimed downward onto the workpieces.

4,164,104

## APPARATUS AND METHOD FOR OBTAINING A SHORTENED BLAST PATTERN WITH A CENTRIFUGAL THROWING WHEEL

James H. Carpenter, and Donald G. Corderman, both of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,302

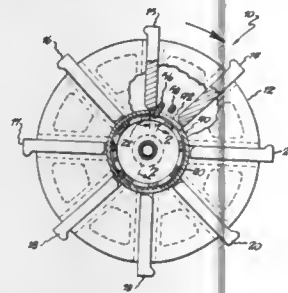
Int. Cl.<sup>2</sup> B24C 5/06

U.S. Cl. 51—432

4 Claims

1. In a centrifugal throwing wheel, the combination of a rotatable runnerhead, a plurality of throwing vanes carried by

said runnerhead, and an impeller having impeller vanes for causing blast media to be deposited on said throwing vanes during rotation of said runnerhead for causing said blast media to be thrown from said throwing vanes in a blast pattern, said impeller also having attachment means for attaching said impeller to said runnerhead, the improvement characterized by



said attachment means comprising means for attaching said impeller to said runnerhead in a preselected one of a plurality of positions for selectively varying the shape of said blast pattern, said attachment means including index means for locating said impeller vanes in a lagging position relative to the throwing vanes.

#### 4,164,105 FRAME STRUCTURE

Walter B. Herbst, Evanston, and Ralph M. Lazar, Skokie, both of Ill., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation of Ser. No. 534,876, Dec. 20, 1974, abandoned.

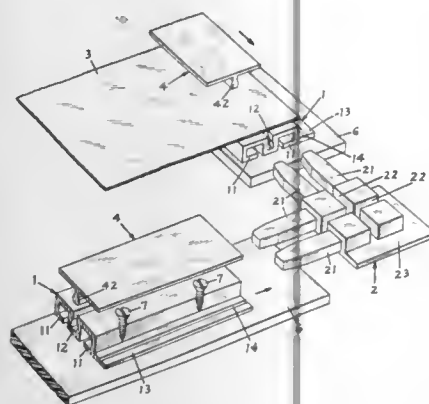
This application Aug. 19, 1976, Ser. No. 715,692

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> E06B 3/26

U.S. Cl. 52—202

10 Claims



1. In kit form for assembly as a rectilinear film supporting frame structure, component parts consisting of

(a) at least four extruded rigid frame members each having an upper open longitudinal channel extending the length thereof and communicating with the upper surface of the frame member, each frame member also having lower longitudinal channels communicating with both ends thereof;

(b) four corner brackets for joining the frame members, each corner bracket having prongs projecting from two sides thereof at right angles and designed to securely mate with the lower longitudinal channel opening in the frame member components, the upper surface of each corner bracket having intersecting upper open channels extending across said surface, and aligned with the upper open longitudinal channels of the frame members when mated;

(c) a thin flexible film of dimensions which are at least coex-

tensive with those of the mated corner brackets and frame members; and

(d) at least four extruded rigid interlocking tee-members for securing the edges of said thin flexible film within the upper open longitudinal channels of the frame member and the corner bracket components in the mated position.

#### 4,164,106 SKYLIGHT

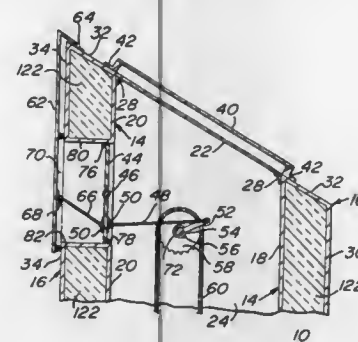
Gustav Klosz, 1112 Griffith St., Philadelphia, Pa. 19111

Filed Sep. 26, 1977, Ser. No. 836,263

Int. Cl.<sup>2</sup> E04B 7/16; E05F 17/00

U.S. Cl. 52—72

8 Claims



1. A ventilating structure for covering a skylight opening in a building roof or the like, comprising:

inner and outer substantially co-extensive frames forming spaced, paired walls, each of said frames having four vertical walls and a window panel secured to top edges of the inner walls, and having substantially co-extensive openings in at least one pair of said spaced walls;

inner and outer doors hingeably mounted on said at least one pair of spaced walls respectively to close said openings or to provide ventilation therethrough;

means for opening and closing said inner door from within said building;

linkage means for operably connecting said outer door to said inner door, so that said doors open together and close together;

means for sealing said inner and outer doors against said at least one pair of spaced walls when said doors are closed; and

insulation substantially filling all spaces between said inner and outer frames, except between said openings and between said window panels.

#### 4,164,107 FIRE-PROOF WINDOW

Franz Kraemling, Aachen; Norbert Bartonitschek, Stolberg; Günther Mattes, Richterich, and Jakob Nieven, Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed May 22, 1978, Ser. No. 908,017

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746243

Int. Cl.<sup>2</sup> E04B 1/94; E04C 2/02

U.S. Cl. 52—232

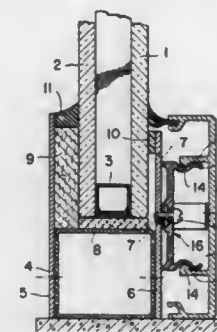
15 Claims

1. In a fire-resistant window having at least one glass sheet mounted in a main frame disposed about the peripheral edge of the glass sheet with the edge region of the sheet on the side thereof to be exposed to the heating effect of fire being at least partially exposed and free of frame structure, the improvement comprising:

(a) cushion frame means disposed over said edge region and connected to said main frame and having openings there-through exposing the edge region of the sheet;

(b) listel means disposed over said cushion frame means and covering said openings;

(c) connection means for attaching said listel means to said cushion frame means, said connection means being disposed between said cushion frame means and said listel



means; and being responsive to the heat of fire to soften and lose its attaching function; and

(d) ejection means disposed between said listel means and cushion frame means for detaching and removing said listel means from said cushion frame means when said connection means loses its attaching function.

#### 4,164,108 FIRE-PROOF WINDOW

Günther Ortman, Aachen, Fed. Rep. of Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

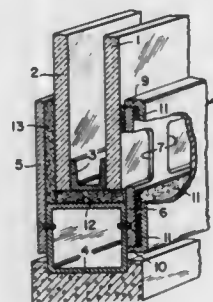
Filed May 22, 1978, Ser. No. 908,018

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2731979

Int. Cl.<sup>2</sup> E04C 2/02; E04B 1/94

U.S. Cl. 52—232

9 Claims



1. In a fire-resistant window having at least one glass sheet mounted in a main frame disposed about the peripheral edge of the glass sheet with the edge region of the sheet on the side thereof to be exposed to the heating effect of fire being at least partially exposed and free of frame structure, the improvement comprising:

(a) cushion frame means disposed over said edge region and connected to said main frame and having openings there-through exposing the edge region of the sheet;

(b) listel means attached over said cushion frame means and covering said openings; and

(c) ejection means disposed between said listel means and cushion frame means, said ejection means being responsive to the heat of fire to detach and remove said listel means from said cushion frame means.

#### 4,164,109 METHOD AND DEVICE FOR A TIGHT PACKING UNDER A THERMOPLASTIC AND THERMOFORMABLE FILM OF PRODUCTS REQUIRING AN ABSOLUTE PROTECTION

Jacques R. N. Dubois, 31, rue Jouvenet, 75016 Paris, France

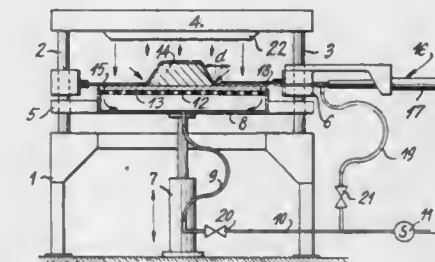
Filed Dec. 27, 1977, Ser. No. 864,628

Claims priority, application France, Oct. 24, 1977, 77 31938

Int. Cl.<sup>2</sup> B65B 31/04

U.S. Cl. 53—427

6 Claims



1. A method for tight packaging an article under a thermoplastic and thermoformable film comprising the steps of: placing an air-tight support on an apertured plate of a chamber and evacuating the chamber whereby the support is firmly applied onto the plate, positioning the article to be packaged on the support, placing a thermoplastic and thermoformable film in an upright sliding position in proximity to the top of the article, providing at least one suction nozzle between the support and the film, connecting said suction nozzle to a vacuum source, heating the film while simultaneously causing the film and the nozzle to be displaced in unison parallel to the support towards the article until the film engages the article and tightly wrap the article and the suction nozzle on the support, removing said suction nozzle from between the support and the film, and disconnecting said nozzle from the vacuum source.

#### 4,164,110 METHOD FOR FIXING PROTECTIVE SHEETS ABOUT ROLLS OF MATERIAL

Michel Soubeyrat, Residence Duplessis, 38300 Bourgoin-Jallieu, France

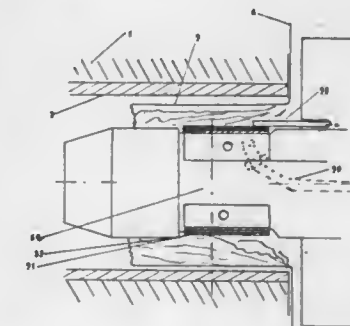
Filed May 19, 1977, Ser. No. 798,630

Claims priority, application France, May 19, 1976, 76 15858

Int. Cl.<sup>2</sup> B65B 25/24

U.S. Cl. 53—409

5 Claims

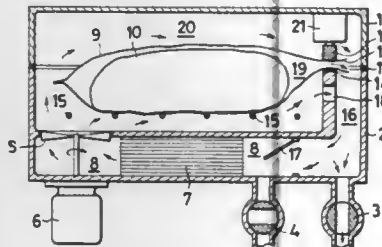


1. In a method of fixing a protective cover sheet around a roll of material such as carpet, fabric, or the like, where such roll is formed around a carrier tube having a longitudinal bore and wherein the cover sheet has a width sufficient that the marginal end portions thereof cover the ends of the roll, the improvement comprising the steps of:



inserting the marginal end portions of the cover sheet into the bore;  
 introducing into the bore expansion means carrying a gripping element, the gripping element comprising a metal strip having first and second ends and being wound in at least two successive turns to form a spiral having a substantially circular cross-section, the gripping element being radially expandable by application of an internal force thereto to any size within a range of diameters ranging from a first chosen diameter to a second diameter equal to the diameter of the bore, the gripping element being at the first diameter when introduced into the bore; and  
 expanding said expansion means from engagement with the gripping element at the first diameter to engagement at a diameter approximately equal to the second diameter whereby the gripping element firmly urges and holds the marginal end portions of the material against the inner wall of the bore.

**4,164,111**  
**VACUUM-PACKING METHOD AND APPARATUS**  
 Pietro Di Bernardo, via Falk 3, Milan, Italy  
 Filed Nov. 17, 1977, Ser. No. 852,578  
 Claims priority, application Italy, Nov. 19, 1976, 29595 A/76  
 Int. Cl.<sup>2</sup> B65B 31/02  
 U.S. Cl. 53—434 7 Claims



1. A method for packaging under vacuum a product inside a bag comprising the following steps:  
 (a) arranging the bag made of heat-sealable material containing the product inside a treatment chamber that can be closed in an airtight manner;  
 (b) closing said treatment chamber;  
 (c) causing preheated hot air to circulate in said chamber under forced draft, said air being heated by means in said chamber;  
 (d) evacuating said hot air to outside the chamber and thus outside the bag so as to create an environment under vacuum;  
 (e) sealing the aperture of the bag;  
 (f) re-establishing pressure in the treatment chamber by the introduction of outside air over the heating means thereby heating the introduced air; and  
 (g) opening the chamber and removing the vacuum-packed pack obtained.

**4,164,112**  
**BLADE ASSEMBLY FOR LAWN MOWERS**  
 Harold P. Jackson, McDonough, and Clifford H. Boylston, Conyers, both of Ga., assignors to McDonough Power Equipment, Inc., McDonough, Ga.  
 Filed Nov. 25, 1977, Ser. No. 854,539  
 Int. Cl.<sup>2</sup> A01D 55/18  
 U.S. Cl. 56—295 16 Claims

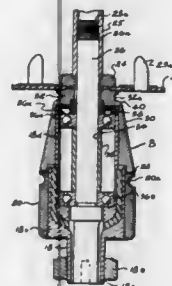
1. In a lawn mower having a blade assembly including a cutting blade and a blade mounting means for mounting and rotating the blade in a generally horizontal plane; the improvement comprising means mounted on the blade assembly for

applying a force to the blade in a direction generally normal to the general horizontal plane of the blade for prestressing the



blade and for deforming the blade to adjust the position of the blade relative to the blade mounting means.

**4,164,113**  
**SPINDLE DRIVE ADAPTER**  
 N. H. Thompson, Anderson, S.C., assignor to Superior Bands, Inc., Anderson, S.C.  
 Filed Aug. 28, 1978, Ser. No. 937,542  
 Int. Cl.<sup>2</sup> D01H 1/26, 7/04  
 U.S. Cl. 57—104 4 Claims



1. Textile twisting machine apparatus of the type having belt driven spindles mounted on a frame, each said spindle including a bearing block base adapted for affixation to said frame having a central bearing bore, a driven rotatable spindle shaft received in said central bearing bore and held therein in an upright manner relative to said frame, said bearing block base having a lower diameter portion about which an idler pulley is rotatably carried and an upper diameter portion extending above said idler pulley, wherein the improvement comprises:  
 an adapter drive pulley member for increasing the rotational drive speed of said spindle shaft including:  
 a central opening in the top portion of said adapter pulley member for receiving said spindle shaft,  
 a lower base portion corresponding in diameter generally to that of said idler pulley,  
 a reduced diameter drive pulley portion having a groove for receiving a drive belt of said machinery apparatus,  
 a tapered drive belt transfer surface extending upwardly from said lower base portion tapering inwardly terminating at said drive pulley portion facilitating transfer of said drive belt between said idler pulley and reduced drive pulley portion; and  
 said adapter pulley member being carried for unitary rotary motion with said spindle shaft and adapted for being disposed over said upper diameter portion of said bearing block base with lower base portion adjacent said idler pulley.

**4,164,114**  
**HIGH STRENGTH POLYESTER FIBROUS PRODUCTS**  
 Kazuyuki Yabuki, and Mitsuo Iwasaki, both of Otsu, Japan, assignors to Toyobo Petcord, Co., Ltd., Japan  
 Filed Apr. 18, 1978, Ser. No. 897,480  
 Claims priority, application Japan, Apr. 18, 1977, 52/44824  
 Int. Cl.<sup>2</sup> D02G 3/48  
 U.S. Cl. 57—236 12 Claims

1. A high strength polyester fibrous product reduced in heat build-up and improved in durability and useful for reinforcing

rubber materials, which is prepared by twisting drawn yarns obtained by melt spinning a polymeric composition comprising polyethylene terephthalate as the main polymer component and at least one methylene group-containing polyester in such an amount that the proportion of the total number of methylene groups to the total number of terephthalic acid residues in all the polymer components is more than 2.0 and less than 2.5, the polyester having a glass transition temperature lower than that of the polyethylene terephthalate and being selected from the group consisting of (i) polyalkylene terephthalates wherein the alkylene unit is a straight chain having 3 to 8 carbon atoms, (ii) polyalkylene isophthalates wherein the alkylene unit is a straight chain having 2 to 6 carbon atoms and (iii) aliphatic polyesters wherein the number of the methylene groups between two ester linkages is from 2 to 10,  
 and drawing the resulting as spun yarns, and having the following melting point (T<sub>m</sub>):

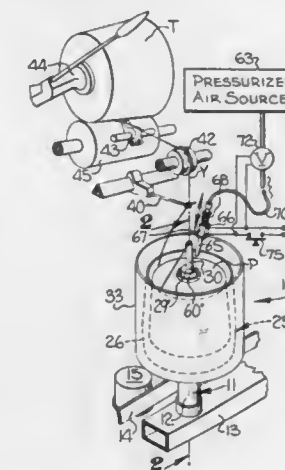
$$T_m \text{ pet} \geq T_m \geq T_m \text{ pet} - 10^\circ \text{ C.}$$

(wherein T<sub>m</sub> pet is the melting point of the polyethylene terephthalate) and the following peak temperature (T<sub>α</sub>) of the main absorption appearing in the temperature distribution of the mechanical loss tangent when heat treated in the air at 240° C. for 2 minutes while keeping a constant length after the drawing:

$$T_\alpha \text{ pet} - 2^\circ \text{ C.} \geq T_\alpha \geq T_\alpha \text{ pet} - 20^\circ \text{ C.}$$

(wherein T<sub>α</sub> pet is the peak temperature of the main absorption of the yarns made of polyethylene terephthalate alone drawn and heat treated under the same conditions as applied to the said as spun yarns made of the polymeric composition).

**4,164,115**  
**PNEUMATICALLY OPERATED YARN THREADING MECHANISMS FOR TEXTILE YARN PROCESSING MACHINES**  
 Gustav Franzen, Willich, Fed. Rep. of Germany, assignor to Palitex Project Company, GmbH, Krefeld, Fed. Rep. of Germany  
 Filed Jul. 19, 1978, Ser. No. 926,034  
 Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733318  
 Int. Cl.<sup>2</sup> D01H 7/86, 15/00  
 U.S. Cl. 57—279 4 Claims



1. In a textile yarn processing machine, such as a two-for-one twister or the like, having a plurality of spindle assemblies each including a driven rotor mechanism defining there-within an elongate yarn passageway extending initially along the axis of said spindle assembly and then radially out of said rotor mechanism, a stationary carrier mechanism for carrying a hollow supply package of yarn and including a hollow hub

portion extending through the hollow yarn supply package to the outer end thereof and defining therewithin an elongate yarn passageway extending along the axis of said spindle assembly and joining with said rotor mechanism yarn passageway, and pneumatically operated threading mechanisms for automatically threading yarn withdrawn from the supply package through said passageways during threading-up of said spindle assembly and including selectively-operated air injector nozzle means positioned at the juncture of said yarn passageways for creating an air suction through said carrier mechanism passageway and a jet of positive air flow through said rotor mechanism passageway and means for selectively supplying air under pressure to said injector nozzle means including an air duct extending through said stationary carrier mechanism from said air injector nozzle means to an outer end and an air supply connector member mounted for placement into and out of connecting engagement with said outer end of said air duct; the improvement of said air duct comprising:

an air duct extending from said injector nozzle means substantially parallel throughout its length with said yarn passageway through said carrier mechanism to said outer end located generally at the zone of the upper outer end of the yarn supply package.

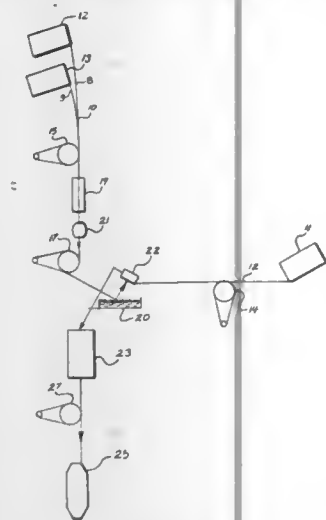
**4,164,116**  
**METHOD OF PRODUCING A POLYESTER FILAMENT YARN HAVING A HIGH LEVEL OF TWIST**  
 Akio Kimura, Ibaraki; Osamu Wada, Takatsuki; Michikage Matsui, and Kiyotaka Ozaki, both of Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan  
 Filed Feb. 22, 1978, Ser. No. 879,924  
 Claims priority, application Japan, Feb. 25, 1977, 52-19288  
 Int. Cl.<sup>2</sup> D02G 3/00 5 Claims

1. A method of producing a polyester filament yarn having a high level of twist which comprises imparting a high level of twist to a polyester filament yarn and subjecting said twisted yarn to a heat treatment in a hot fluid at a temperature from 70° C. to 130° C. to set the twisted yarn; said polyester filament yarn having the following properties:  
 (a) a boil-off shrinkage in boiling water being in a range of 0% to 5%  
 (b) a thermal shrinkage stress at 140° C. in hot air being more than 0.03 g/de  
 (c) a ratio of a thermal shrinkage stress at 180° C. in hot air to a thermal shrinkage stress at 140° C. in hot air being more than 1.0.

**4,164,117**  
**METHOD FOR MAKING SIMULATED SPUN-LIKE INGRAIN YARN**  
 James R. Talbot, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.  
 Continuation-in-part of Ser. No. 674,350, Apr. 7, 1976, Pat. No. 4,060,970. This application Oct. 6, 1977, Ser. No. 839,955  
 Int. Cl.<sup>2</sup> D02G 1/20, 3/04, 3/34  
 U.S. Cl. 57—289 10 Claims

1. A process for producing a continuous filament spun-like ingrain yarn comprising combining at least two differently dyeable synthetic continuous filament yarns, false twist textur-

ing said combined yarn to produce a torque lively yarn, over-feeding said textured yarn to a high velocity gaseous jet to



convolute individual filaments in the yarn to form a plurality of torque induced kinks and winding said yarn onto a package.

#### 4,164,118 APPARATUS FOR POSITIONING THE LINKS OF A LENGTH OF CHAIN

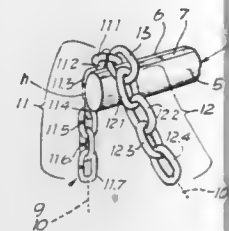
Gerhard Lange, Reutlingen, Fed. Rep. of Germany, assignor to Wafios, Maschinenfabrik, Wagner, Flicker & Schmid (GmbH & Co. KG), Fed. Rep. of Germany

Filed Aug. 3, 1977, Ser. No. 821,458

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636220

U.S. Cl. 59—31

Int. Cl.<sup>2</sup> B21L 3/02



1. In an apparatus for positioning the chain links of a length of chain having a longitudinal axis, said chain being movable step-by-step upwardly then downwardly over a vertex defined by a saddle, said vertex being located in a vertical median plane containing the longitudinal axis of said length of chain, the improvement comprising said saddle having a cylindrical supporting surface, said surface defined by a directrix extending vertically and lying in said vertical median plane and a generatrix extending horizontally and lying perpendicularly to said vertical median plane, and said saddle formed as an elongated bolt.

#### 4,164,119 HYDRAULIC PUMP UNLOADING SYSTEM

Donald J. Parquet, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

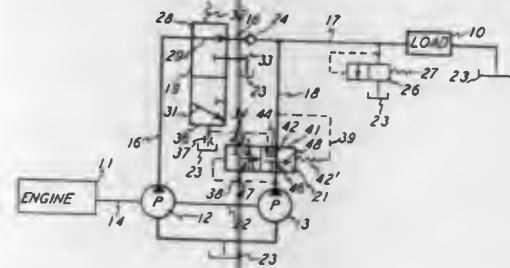
Filed Mar. 27, 1978, Ser. No. 890,037

U.S. Cl. 60—428

Int. Cl.<sup>2</sup> F15B 13/09

7. A hydraulic pump unloading system comprising a hydraulic reservoir, two hydraulic pumps, a power source connected with said pumps for driving said pumps, a driven load-supporting member, hydraulic lines connected with said pumps and

said load-supporting member for fluid-flow communication from said pumps to said load-supporting member, a valve means connected in fluid-flow communication in each of said hydraulic lines, a fluid pressure responsive movable flow diverter means in one of said valve means for the flow of fluid through the respective said hydraulic line in one operative position of said flow diverter means and for diverting the flow of fluid from the latter said hydraulic line in another operative



position of said flow diverter means, an additional hydraulic line fluid-flow connected between said one of said valve means and said reservoir for receiving the flow diverted by the latter said valve means and thereby diverting that flow to said reservoir, an additional hydraulic line connected between the two said valve means, and a fluid pressure responsive movable flow diverter means in the other of said valve means for diverting the flow to the latter said additional hydraulic line for fluid pressure actuating said one of said valve means.

#### 4,164,120 CONTROL DEVICE FOR COMBUSTION ENGINE

Norbert J. Funk, Grosswallstadt, and Siegfried Püschel, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

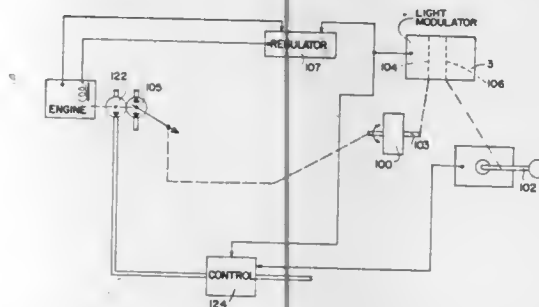
Filed Dec. 20, 1977, Ser. No. 862,503

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658698

U.S. Cl. 60—431

Int. Cl.<sup>2</sup> F15B 21/08; F02D 11/10

11 Claims



1. In a control system for an internal combustion engine for use with fork trucks and other vehicles, the engine having an electrical element for controlling the RPM of the engine, an operator control element movable to effect control of the RPM of the engine, electrical circuitry for variably energizing said electrical element for controlling the energization of said electrical element in response to the position of said operator element, said modulator comprising a light source for producing a stream of light, a photosensitive element connected into an output circuit to control the energization of said electrical element, and a shutter positioned between said light source and said photosensitive element and movable to vary the amount of light striking said photosensitive element from said light source, and means connecting said shutter to said operator control element to move the shutter to vary the light beam in accordance with movement of the operator control element.

#### 4,164,121 CONTROL APPARATUS FOR INDUSTRIAL TRUCKS

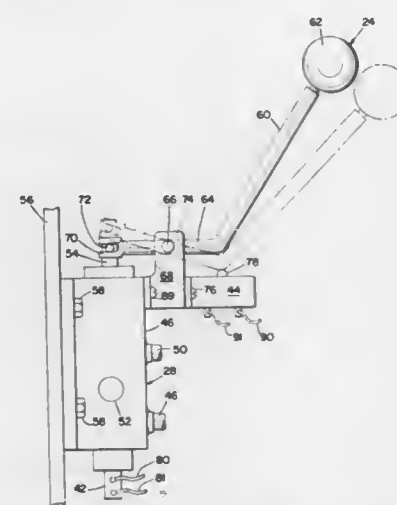
Henry J. Houseman, Fairless Hills, and Richard W. Nowicki, Pennel, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 17, 1978, Ser. No. 906,725

Int. Cl.<sup>2</sup> F15B 13/09; H01H 9/06

U.S. Cl. 60—486

7 Claims



1. In a hydraulic system for an industrial truck load carriage comprising a hydraulic motor operatively connected to said load carriage; a first pump having an outlet connected to said hydraulic motor; a control valve connected between said first pump outlet and said hydraulic motor, said control valve including a valve spool movable between a first position permitting no oil flow from said first pump outlet to said hydraulic motor and a second position permitting maximum oil flow from said first pump outlet to said hydraulic motor; and a second pump having an outlet connected to said hydraulic motor in parallel with the outlet of said first pump; the improvement comprising control means for activating said second pump when said valve spool is in said second position, said control means comprising a control rod operatively connected to said valve spool and movable between a first position corresponding to the first position of said valve spool and a second position corresponding to the second position of said valve spool, and switching means operatively connected to said second pump and including an operating element movable in response to movement of said control rod to activate said second pump, said operating element being moved by said control rod of sufficient magnitude to deflect said control rod a predetermined amount.

#### 4,164,122 CYLINDER CONSTRUCTION AFFORDING AUTOMATIC RE-PHASING OF MASTER AND SLAVE CYLINDERS

Gerald G. Ward, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sep. 19, 1977, Ser. No. 834,628

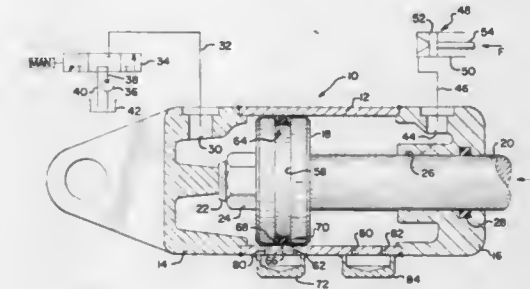
Int. Cl.<sup>2</sup> B60T 13/00

U.S. Cl. 60—547 R

6 Claims

1. In a master cylinder construction for use with a slave cylinder, said master cylinder having: a tubular central member; a head end member secured to said central member and having a first port for selectively communicating with a fluid pressure source or a fluid reservoir; a rod end member secured to said central member and having a second port communicating with the slave cylinder; a piston having a seal assembly reciprocally mounted within said central member; and a piston rod secured to said piston and extending through

said rod end member; the improvement affording automatic rephasing of said master and slave cylinder consisting essentially of: a first pair of orifices extending through said central member and positioned longitudinally along said central member



so that said first orifices are adjacent to and on either side of said seal assembly when said piston is fully retracted, and first means carried on the exterior of said central member to provide direct and unobstructed fluid communication between said first pair of orifices.

#### 4,164,123 SOLAR THERMAL ELECTRIC POWER PLANT

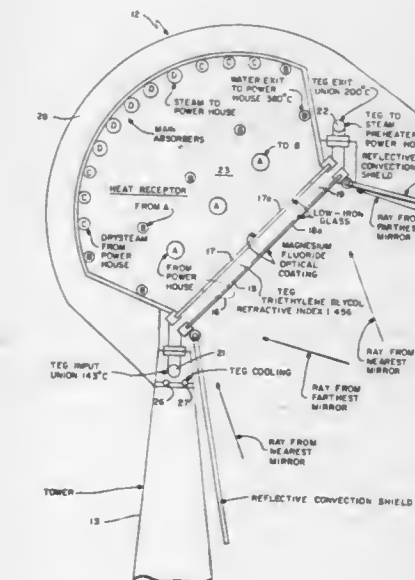
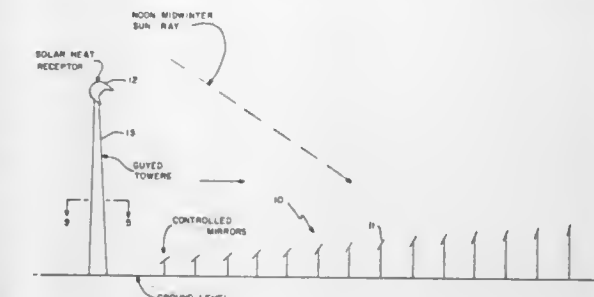
Otto J. M. Smith, 612 Euclid Ave., Berkeley, Calif. 94708

Filed Aug. 25, 1976, Ser. No. 717,641

Int. Cl.<sup>2</sup> F03G 7/02

U.S. Cl. 60—641

42 Claims



1. A solar energy system comprising solar collector means



consisting of a plurality of controllable mirrors, solar receptor means including thermally insulated cavity forming means with a light entrance facing downward and away from the equator and including double paned window means across said entrance, where the outermost pane is exposed to the environment, with a flow space between major surfaces of said panes and positioned to receive solar energy from said solar collector means means for providing for the flow of a cooling liquid in thermal contact with substantially all of one major surface of each of said panes said flow providing a significant transfer of thermal energy from said panes to said liquid for minimizing heat loss from said outermost pane to the environment, antireflection means consisting of a transparent antireflection coating on each air-to-pane interface of said panes, tube means consisting of a plurality of fluid carrying tubes within said cavity heated by the solar energy passing through said entrance, a power plant with a working fluid driving a thermodynamic prime mover, means for pumping said cooling liquid to said power plant and through heat exchanger means to deliver thermal energy to said working fluid, and means for pumping a heat transfer fluid through said tubes and to said power plant and through second heat exchanger means to deliver thermal energy to said working fluid.

4,164,124

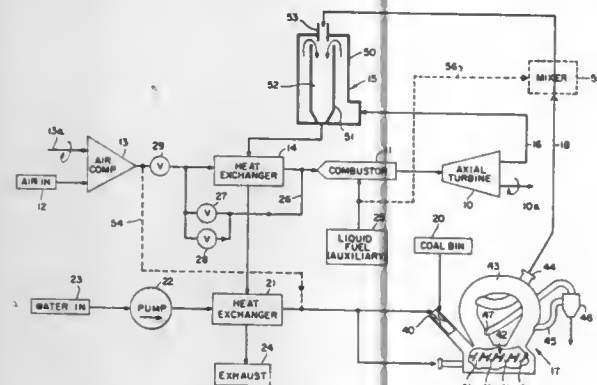
## TURBINE SYSTEM USING UNCLEAN FUEL

David W. Taylor, Edgemont, and Garland L. Fulton, Wayne, both of Pa., assignors to Combustion Turbine Power, Inc., Bala Cynwyd, Pa.

Continuation-in-part of Ser. No. 586,078, Jun. 11, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,911  
Int. Cl.<sup>2</sup> F02C 1/06

U.S. Cl. 60—683

13 Claims



1. A turbine system which includes a compressor and means for supplying the output from the compressor to the turbine as its operating gas, the system comprising:

means including a fluid energy attrition mill for providing unclean particulate fuel with particle sizes substantially 100% passing 200 mesh, the attrition mill including a toroidal loop;

means for removing from the unclean fuel a substantial proportion of pyrites contained in the fuel, the removing means being a by-pass circuit coupled to the attrition mill, the by-pass circuit including a tap-off from a high pressure region of the toroidal loop and return tap to the low pressure region;

means for combusting the fuel with pyrites removed in exhaust gas from the turbine at a flame temperature not in excess of 2600° F.;

means for utilizing the output of the combustion means to indirectly heat turbine operating gas; and  
means for supplying mill operating gas to the attrition mill, the mill operating gas being steam produced by an indirect heating means supplied with the output of the combustion means after utilization in the utilizing means.

4,164,125  
SOLAR ENERGY ASSISTED AIR-CONDITIONING  
APPARATUS AND METHOD

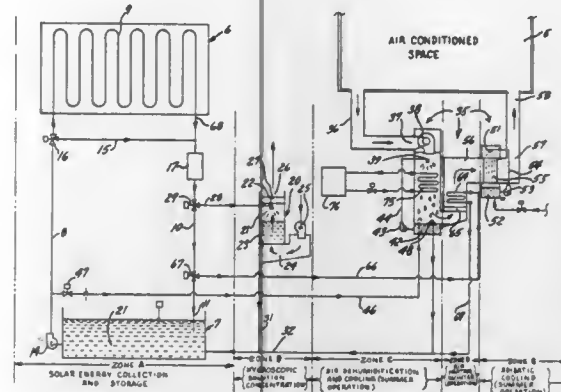
William C. Griffiths, Lebanon, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 17, 1977, Ser. No. 842,679

Int. Cl.<sup>2</sup> F25B 27/00

U.S. Cl. 62—2

15 Claims



1. Air-conditioning apparatus for utilizing solar energy comprising:

a solar heat collector having liquid conducting means;  
a reservoir and a body of hygroscopic liquid contained therein having a predetermined heat capacity;  
connecting means and pumping means for connecting the collector and the reservoir in a circuit for circulating the hygroscopic liquid therethrough;

solution-concentrating means for withdrawing liquid from one portion of the circuit and returning it in more concentrated condition to another downstream portion of the circuit;

an enclosure for an air-conditioned space;  
an air-processing assembly connected with said enclosure to withdraw air from one portion and return it to another portion, said assembly having means for advancing a stream of air from said one enclosure portion along a path through the assembly to said other portion and further comprising in the order as follows:

first liquid-dispersing means for dispersing a stream of said liquid in finely divided condition for contact with essentially all air passing traversing a portion of said path, said dispersing means being connected with one portion of said circuit for withdrawing a liquid therefrom;

liquid collecting means connected with a portion of said circuit downstream from its connection with said dispersing means for returning liquid to said circuit;

liquid-conducting heat exchange means in heat exchange relation with said air connected with one portion of said circuit for withdrawing heated liquid therefrom and returning the liquid to a portion of said circuit further downstream;

adiabatic cooling means comprising a second liquid-dispersing means for placing said air in contact with finely divided water; and  
means for supplying water to said second liquid-dispersing means; and

control means for selectively operating said heat exchange means and said first and second liquid dispersing means.

4,164,126  
SELF-REGULATING TRANSPORT MECHANISM FOR  
SUPERCONDUCTIVE ROTOR REFRIGERANT

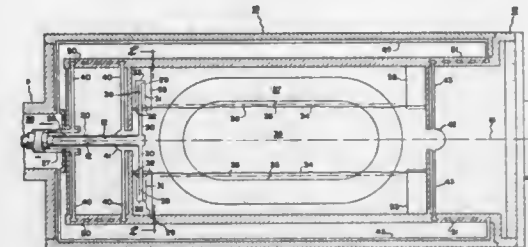
Evangelos T. Laskaris, Schenectady; Bruce B. Gamble, Elnora, and Burton D. Hatch, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 573,168, Apr. 30, 1975, Pat. No. 4,123,677.  
This application Feb. 17, 1978, Ser. No. 878,790

Int. Cl.<sup>2</sup> F17C 7/02

U.S. Cl. 62—55

7 Claims



1. A self-regulating transport mechanism for regulating depth of liquid refrigerant centrifugally forced against the interior surface of a rotating container and evaporating at a varying rate, said mechanism comprising:

a conduit extending axially into the interior of said rotating container and carrying a flow of said refrigerant at constant pressure, said conduit rotating in unison with said container;

refrigerant dispensing means attached to, and extending radially outward from, said conduit, so as to maintain a layer of liquid refrigerant of predetermined depth extending radially inward from the interior surface of said container and surrounding a central core of evaporated refrigerant in said container during rotation of said container, said dispensing means comprising a hollow tube opening into said conduit and being open-ended at its outermost radial location, and an enclosure affixed to, and spaced apart from, said tube and surrounding the open-ended region of said hollow tube, said enclosure being open at its outermost radial location and having at least one opening close to its innermost radial location; and  
tubing means in gaseous communication with said central core of evaporated refrigerant for conducting said evaporated coolant out of the interior of said rotating container, said tubing means rotating in unison with said container.

4,164,127

## PROCESS AND DEVICE FOR ROOM COOLING

Klaus Baumgärtner, Düsseldorf-Wittlaer, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,717

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 2626644

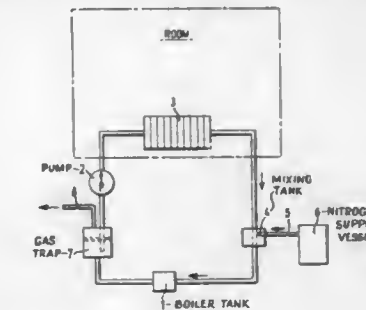
Int. Cl.<sup>2</sup> F25D 17/02; F25B 27/02, 19/00

U.S. Cl. 62—98

4 Claims

1. In a process for periodically cooling a room and the like having a radiator therein as part of a central heating system which supplies water to the radiator through a water circuit in the form of a continuous loop which flow communicates with the radiator, the improvement being injecting liquid nitrogen into a mixing device in flow communication with the water circuit, utilizing the injection of liquid nitrogen in the water circuit to lower the temperature of the water to a temperature

at least slightly above its freezing point, and discharging the gaseous form of the nitrogen from the water circuit through a



gas trap which is downstream from the mixing device and which communicates with the water circuit.

4,164,128

## ABSORPTION REFRIGERATION SYSTEM AND CONTROL

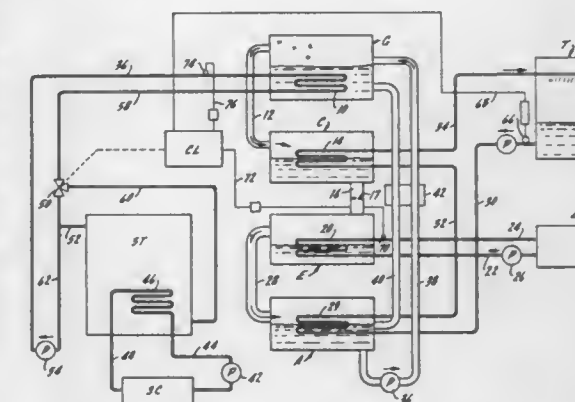
Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 4, 1977, Ser. No. 839,478

Int. Cl.<sup>2</sup> F25B 15/00

U.S. Cl. 62—105

6 Claims



5. A method of operating a closed circuit, continuous cycle absorption refrigeration machine of the type including a generator, a condenser, an absorber, an evaporator through which chilled water is circulated, means for supplying a heated fluid to said generator, and means for supplying a cooled fluid to said absorber and to said condenser comprising the steps of:

sensing the temperature of the heated fluid supplied to said generator;

sensing the temperature of said cooled fluid being supplied to said absorber and to said condenser;

adjusting a three-way proportional control valve to modify the maximum energizing temperature of the heated fluid supplied to said generator in response to changes as sensed in the step of sensing the temperature of said cooled fluid; sensing the temperature of the chilled water circulated through the evaporator; and

adjusting further the control valve for modifying the maximum energizing temperature of the heated fluid in response to changes as sensed in the step of sensing the temperature of the chilled water.

4,164,129

## VARIABLE MODE FREEZER

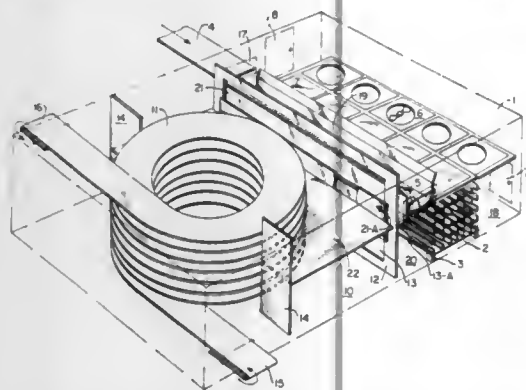
Harry K. Stueber, P.O. Box 421, Gambrills, Md. 21054

Filed Sep. 1, 1977, Ser. No. 829,882

Int. Cl.<sup>2</sup> F25B 27/00; F25D 13/06

U.S. Cl. 62—326

10 Claims



1. An apparatus for freezing articles which is adaptable to variable modes of operation, said apparatus having plural compartments on upper and lower levels and comprising air moving means, refrigeration means and first and second means for receiving and maintaining the articles being frozen while they are in said device; said refrigeration means being disposed in a first compartment on said lower level and having second and third compartments disposed on either side thereof; said air moving means being disposed on the upper level over said second compartment; said first means for receiving and maintaining said articles being disposed in a fourth compartment adjacent said third compartment and in a position to receive refrigerated air passing through said third compartment from said refrigeration means; said second means for receiving and maintaining said articles being disposed in a fifth compartment on said upper level over said third compartment and also in a position to receive refrigerated air passing through said third compartment from said refrigeration means; and means for selectively regulating and controlling the flow of refrigerated air into and out of said fourth and fifth compartments.

4,164,130

## ONE-WAY CLUTCH FOR DOUBLE-ACTING AGITATOR

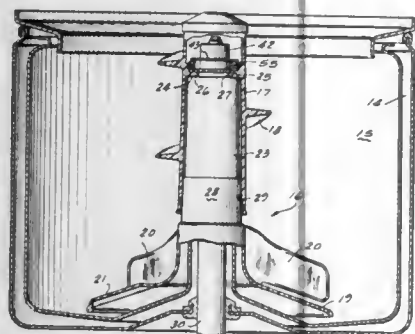
Richard G. Hammer, Kansas, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 30, 1978, Ser. No. 891,533

Int. Cl.<sup>2</sup> D06F 13/06; F16D 11/00

U.S. Cl. 68—133

10 Claims



1. A clutch for imparting a unidirectional rotation to an auger portion of an agitator in an automatic washing machine of the vertical-axis type, the clutch being driven by alternating oscillations of a lower portion of said agitator, the clutch comprising:  
a centrally splined cap member attached irrotatably to the lower portion of the agitator and including a cam having

a cam lobe with a generally radially outward, spiral first camming surface and a second camming surface extending generally in a radial direction;  
a cylindrical, driven inner surface on said auger portion spaced radially outwardly of the cam lobe;  
a clutch shoe carried radially between the cam lobe and the driven surface, the shoe comprising:  
an outer surface engageable with the driven inner surface of the auger portion of the agitator,  
an inner spiral surface engageable with the first camming surface of the cam lobe, the inner spiral surface and the cooperating first camming surface of the cam lobe extending radially inwardly toward the axis in the circumferential direction of corotation of the auger and lower agitator portions, and  
an end surface formed at the radially outermost portion of the inner spiral surface, engageable with the second camming surface of the cam lobe upon rotation of the lower agitator in the non-auger driving direction, the end surface and the second camming surface of the cam lobe being inclined forwardly of a line radial thereto in a direction of non-driving rotation of the lower agitator portion.

4,164,131

## AUTOMOBILE ANTI-THEFT DEVICE

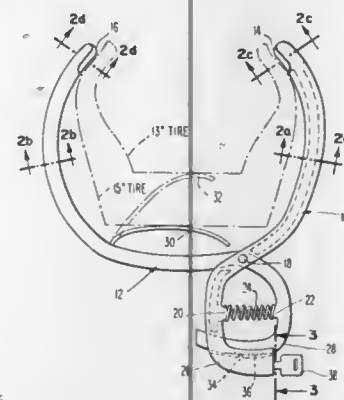
John W. Desmond, 104 Walter Dr., Media, Pa. 19063, and Frank DiFerdinando, 1200 West Chester Pike, West Chester, Pa. 19380

Filed May 15, 1978, Ser. No. 905,952

Int. Cl.<sup>2</sup> E05B 73/00

U.S. Cl. 70—14

11 Claims



1. A vehicle anti-theft device for lockably gripping a vehicle tire from either side thereof in order to hinder or prevent the rotation of said tire, comprising:  
first and second clamping arms, each arm having a larger curved section and a smaller curved section, said smaller section being curved in a direction opposite to said larger section;  
one of said arms having an aperture formed between the larger and smaller sections thereof, the other of said arms extending through said aperture;  
pivot means extending through said aperture and through both of said arms to allow said arms to pivot relative to one another;  
the distal end of one of said smaller sections defining a channel;  
the distal end of the other of said smaller sections having an edge slidably disposed in said channel, whereby said last-named distal end slides in said channel when said arms pivot with respect to one another; and  
means adjacent said channel to enable the locking of said last-named lower end in said channel.

4,164,132

## KEY RETAINER

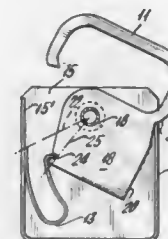
George Loman, Orange, Conn., assignor to The W. E. Bassett Company, Derby, Conn.

Filed Jun. 7, 1978, Ser. No. 913,388

Int. Cl.<sup>2</sup> A47G 29/10

U.S. Cl. 70—456 R

9 Claims



1. In a key retainer or the like, a case defined by and between spaced edge-fitted front and back panel members, with an opening at one end, a bail member including a body portion essentially contained within the space between and pivotally connected to said panel members, said bail member also including a C-shaped bail portion integrally connected at one end to said body portion and extending essentially outside said panel members via the end opening, said panel members and said body portion having aligned pivot apertures, rivet means through the aligned apertures and serving to retain said panel members in assembled relation to each other and to said body portion while also supporting said bail member for a limited angular range of pivoted bail-portion movement external to and with respect to said case, the other end of said bail portion being spaced from said body portion such that (a) in one limiting pivoted position the said other end of said bail portion coacts with the adjacent region of said case to define an effectively closed key-retaining bail loop and (b) in a second limiting pivoted position said other end of said bail portion is spaced from said case to an extent permitting selective key application to or removal from said bail, and spring means coacting between said bail-member body portion and said case and resiliently urging said bail member in the direction of said one position.

4,164,133

## APPARATUS FOR FORMING CIRCULARLY BENT ARTICLES FROM A STRAIGHT METAL PROFILED STRIP

Cornelis C. Damman, Diemen, Netherlands, assignor to Holland Mechanics B.V., Diemen, Netherlands

Division of Ser. No. 742,679, Nov. 17, 1976, Pat. No. 4,054,982.

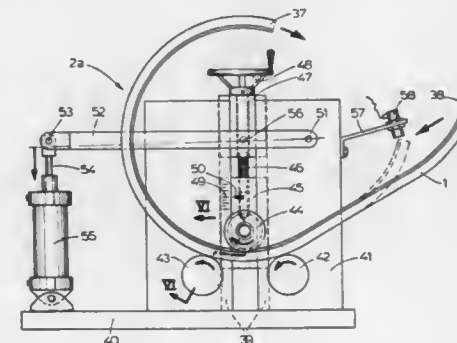
This application Aug. 4, 1977, Ser. No. 821,965

Claims priority, application Netherlands, Nov. 21, 1975, 7513654; Mar. 12, 1976, 7602645

Int. Cl.<sup>2</sup> B21D 5/14

U.S. Cl. 72—12

8 Claims



1. A three-roll ring rolling machine for forming a piece of

metal strip material having curved end portions into a closed circular ring, comprising  
a frame;  
two outer forming rolls rotatably mounted in said frame;  
a middle forming roll;  
mounting means rotatably supporting said middle forming roll, said mounting means being movable in said frame along a path extending perpendicularly to a line connecting the centers of said two outer forming rolls and intersecting said line midway between said centers;  
adjusting means for setting said mounting means and middle forming roll with respect to said outer forming rolls;  
means for driving said forming rolls;  
means associated with said adjusting means for shifting said mounting means and middle forming roll through a selected distance from said set position in a direction towards said outer forming rolls; and  
operating means for operating said associated roll shifting means.

4,164,134

## METHOD OF MANUFACTURING A METALLIC BELT OF HIGH STRENGTH, AND APPARATUS FOR USE IN SAID METHOD

Evert J. Vollers, Haaren, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

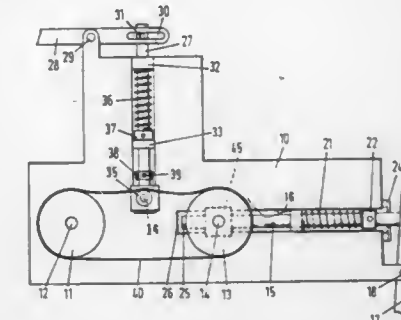
Filed Aug. 11, 1977, Ser. No. 823,721

Claims priority, application Netherlands, Aug. 20, 1976, 7609297

Int. Cl.<sup>2</sup> B21D 53/14

U.S. Cl. 72—183

5 Claims



1. A method for improving the cyclical bending strength of an endless metallic belt, said method comprising:  
subjecting said belt to tensile stress by applying a predetermined tensile force in the longitudinal direction; then  
applying a lateral force to said belt in the radially outward direction by means having such a radius as to introduce a radial stress gradient and produce a plastic deformation in said belt; and  
maintaining said tensile force on said belt while applying said lateral force, the tensile stress being such that no plastic deformation occurs at the radially inner side of said belt.

4,164,135

## ROTARY INTERNAL PIPE BENDING MANDREL

Edward A. Clavin, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Dec. 2, 1977, Ser. No. 856,850

Int. Cl.<sup>2</sup> B21D 9/00

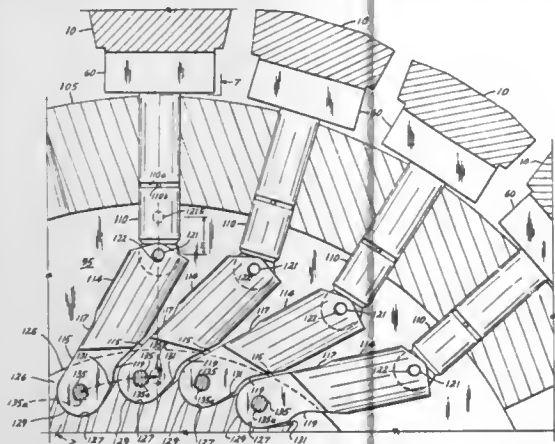
U.S. Cl. 72—466

14 Claims

1. Internal pipe bending mandrel comprising a plurality of toggle means disposed spaced outwardly about an axis and being pivotally movable in planes transverse to said axis between retracted positions angular to radial and substantially radial extended positions, the outer ends of said toggle means each being pivotally connected to radially movable slide means each having outwardly facing means for engagement with the



interior side of a pipe wall, said slide means and toggle means being disposed in plural axially spaced groups of circularly spaced slide means each having a toggle means connected thereto, separate means associated with each group of toggle means supported about said axis having plural radial openings through which said slide means are slidably disposed, the inner ends of said toggle means of each group thereof being pivotally connected to a separate rotative means rotatably disposed about said axis, each said rotative means having a peripheral slot into which said inner ends of said toggle means are disposed, said inner end of each said toggle means being arcuately rounded and said slot having concavely rounded surfaces for engaging said inner end of each said toggle means pin means engaged through an opening through the inner end of each said



toggle means and through openings at opposite sides of said slot, one of said toggle opening and said slot openings being enlarged to permit movement of said inner end of the toggle means so that said inner end of the toggle means may bear flushly against said concavely rounded surface of said slot without imposition of force in the toggle direction against said pin means, and a separate drive means connected to each said rotative means capable of reciprocally rotating the rotative means in both rotative directions to simultaneously move said toggle means of a group thereof between said retracted and extended positions whereby said slide means of said group are simultaneously moved between radially inward retracted positions and radially outward extended positions wherein said outwardly facing means associated with said group may be forcefully engaged with the interior side of a pipe wall.

**4,164,136**  
**METHOD AND APPARATUS FOR INVESTIGATING THE MOBILITY OF A SUBSTANCE**  
Brian H. Wiggins, Oxford, and Harold D. Williams, Denham, both of England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 18, 1977, Ser. No. 816,803  
Claims priority, application United Kingdom, Jul. 16, 1976, 29708/76

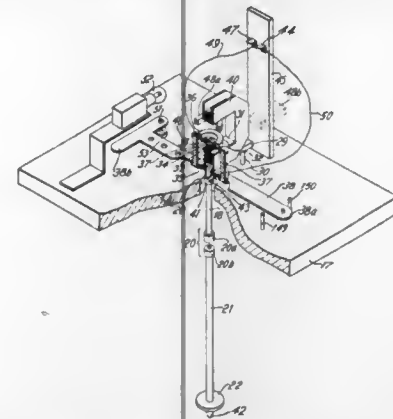
Int. Cl.<sup>2</sup> G01N 25/04

U.S. Cl. 73—17 R

19 Claims

1. Apparatus for use in determining the pour point of a substance, comprising: a displaceable elongated rigid member suspended freely from a support member at its upper end and having its longitudinal axis extending substantially vertical; shearing means at the lower end of said displaceable elongated member for suspension in the substance; displacing means connected for applying a rotary turning force to said displaceable elongated member in a substantially symmetrical relationship about said longitudinal axis thereof for urging said displaceable member to turn at least a limited amount about said longitudinal axis; means for connecting said displaceable member with said displacing means such that said displaceable member is constrained to only substantially concentric turning movement about said longitudinal axis such that there is no

substantial angular movement of said displaceable member relative to the longitudinal axis thereof; means for preventing complete rotation of said displaceable member about said longitudinal axis and permitting movement in only a predetermined range; means for causing said displaceable member to



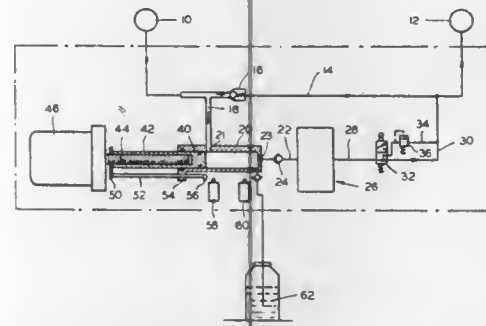
return to the same datum position after each determination of said pour point; means for causing said displacing means to operate at predetermined selected intervals for actuating said turning of said displaceable member; and means for monitoring the temperature of said substance.

**4,164,137**  
**METHOD OF MEASURING VOLUME OF AIR ENTRAINED IN HYDRAULIC FLUIDS**  
William A. Williamson, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jun. 2, 1978, Ser. No. 911,730  
Int. Cl.<sup>2</sup> G01N 7/00

U.S. Cl. 73—19

6 Claims



1. A method of counting entrained air bubbles in a liquid comprising the steps of discharging through a particle counter a measured liquid sample at a pressure which dissolves the air bubbles in the liquid or so reduces the size thereof that the counter substantially counts particulate matter only, discharging through said particle counter the same or a second liquid sample of substantially equal measured volume at a pressure which permits the air entrained to form bubbles discernible for counting by the counter, and subtracting from the total count of particles and air bubbles a count of particles.

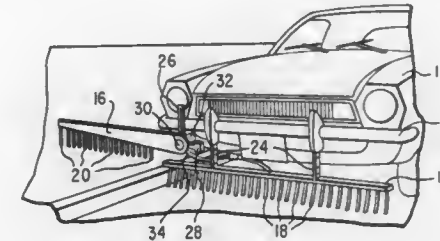
**4,164,138**  
**HIGH SENSITIVITY GAS LEAK DETECTION SYSTEM**  
William H. Burkhart, Los Altos, Calif., assignor to Smith & Denison, Los Altos, Calif.

Filed Oct. 27, 1977, Ser. No. 845,954

Int. Cl.<sup>2</sup> G01N 31/00

U.S. Cl. 73—23

21 Claims



2. A portable, high sensitivity gas leak detection system comprising:  
means including at least twelve pendant tubes having their open ends substantially aligned for continuously sampling air close to the surface of the earth;  
means including a pump for drawing air from said tubes for analysis;  
manifold means for connecting said tubes to said pump with substantially equal path lengths from the end of each tube; and  
wherein the total internal capacity of said system to the analysis point including said pump, manifold means, and tubes is less than 125 cubic centimeters.

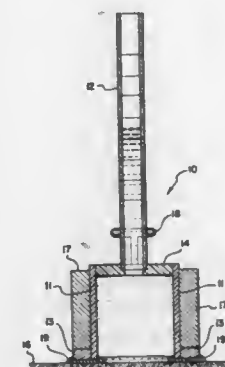
**4,164,139**  
**ASPHALT PENETRATION INDICATOR**  
George M. Jones, Salt Lake City, Utah, assignor to The Gil-sabnd Company, Mack, Colo.

Filed Aug. 9, 1978, Ser. No. 932,225

Int. Cl.<sup>2</sup> G01N 15/08

U.S. Cl. 73—38

6 Claims



1. An apparatus for measuring water penetration into a bituminous pavement which comprises  
(a) an integral conduit open at both ends consisting of a lower cylindrical tube portion of a given diameter containing an outwardly extending annular flange at the end thereof and an upper cylindrical tube portion of a lesser diameter, and  
(b) an annular weight adapted to fit around said lower cylindrical tube portion of said conduit and rest on the upper surface of the outwardly extending flange wherein the annular weight is sufficiently heavy that when a sealant is placed on the bottom surface the flange and the conduit is placed with the flange resting on a bituminous pavement the pressure exerted on the sealant by the annular weight is sufficient to seal the conduit to the bituminous pavement

in a watertight relationship defining a watertight unit area such that water placed in said conduit will penetrate the pavement with the amount of penetration per unit area being determined by the change in water volume in the upper cylindrical tube portion of the conduit over a given period of time.

**4,164,140**  
**METHOD AND APPARATUS FOR MEASURING MATERIAL PROPERTIES RELATED TO STRENGTH**  
Brenton E. Jones, and Robert E. Reusser, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 30, 1978, Ser. No. 873,645

Int. Cl.<sup>2</sup> G01N 3/24

U.S. Cl. 73—54

14 Claims



1. A method for measuring strength properties of a material, the improvement comprising:  
(a) placing a testing device in contact with said material when said material is in a molten state, said testing device  
1. being essentially nondistortable during the test;  
2. having a shape through at least a part of which said molten material can flow; and  
3. having means for associating therewith a force measuring device; and  
(b) measuring the force required to pull said testing device from said material.

**4,164,141**  
**BRINELL TESTING APPARATUS**  
Louis Sandor, Hammond, Ind., and Albert T. Wendt, Keokuk, Iowa, assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jul. 3, 1978, Ser. No. 921,556

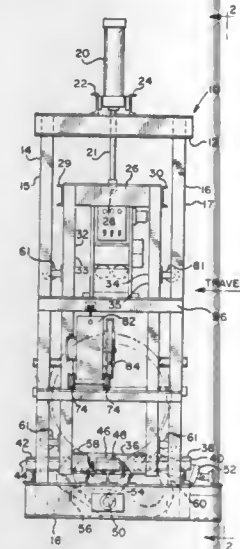
Int. Cl.<sup>2</sup> G01N 3/48

U.S. Cl. 73—81

10 Claims

1. An improved apparatus for determining the Brinell hardness of railway vehicle wheels comprising receiving means acting to accept and retain said wheel in a substantially vertical plane; elevator means positioned with respect to said receiving means so as to raise or lower said receiving means in a substantially vertical plane as desired; polishing means located in proximity to the travel path of said elevator means so as to polish at least a portion of said wheel being retained by said receiving means as said wheel is moved in a substantially verti-

cal plane by said elevator means; and Brinell testing means located in proximity to the travel path of said elevator means



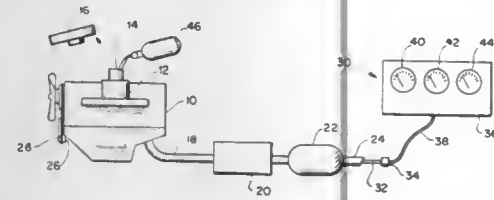
so as to determine the Brinell hardness of said wheel at one or more points on said wheel polished by said polishing means.

#### 4,164,142 METHOD FOR SETTING SIDE TO SIDE CARBURETOR BALANCE

John D. Blanke, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.  
Division of Ser. No. 824,897, Aug. 15, 1977, Pat. No. 4,116,053.  
This application May 8, 1978, Ser. No. 904,106  
Int. Cl.<sup>2</sup> G01M 19/00

U.S. Cl. 73-118

2 Claims



1. The method of setting the side to side balance of a carburetor on an engine which is running smoothly with no misfiring cylinders and set to factory specifications for curb idle speed and timing comprising the steps of:

- (a) disabling the air injection means;
- (b) reading the CO and HC emissions and verifying the engine is running properly;
- (c) turning both idle mixture screws to the maximum rich stop of the limiter caps whereupon the tailpipe O<sub>2</sub> level should be less than 1% and stable, if not, checking for vacuum leaks;
- (d) reading the oxygen level;
- (e) turning the left barrel mixture screw 1/2 turn leaner;
- (f) reading the increase in oxygen when stabilized;
- (g) turning the left barrel mixture screw back to the rich limiter stop;
- (h) turning the right barrel mixture screw 1/2 turn leaner;
- (i) reading the increase in oxygen when stabilized;
- (j) turning the right barrel mixture screw to the rich limiter stop;
- (k) establishing the side that had O<sub>2</sub> increase the most with a 1/2 turn of the mixture screw as the leaner side and the other side as the richer side;
- (l) turning the rich side mixture screw until the O<sub>2</sub> level reads the same as the lean side was when it was 1/2 turn leaner;

- (m) turning the rich side mixture screw back 1/2 turn richer whereby the carburetor is now balanced;
- (n) turning each mixture screw leaner 1/2 turn at a time until the oxygen level in the tailpipe is between 1% to 1 1/2%, if the oxygen reading is unstable, turning both mixture screws richer 1/2 turn;
- (o) continuing to equally enrich the mixture until the oxygen meter is stable; and,
- (p) re-enabling the air injection means.

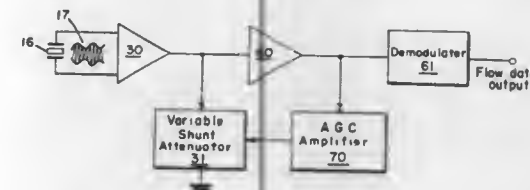
#### 4,164,143 ULTRASONIC AMPLIFIER DETECTOR

Ralph A. Anderson, Chino, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Jul. 3, 1978, Ser. No. 921,935  
Int. Cl.<sup>2</sup> G01F 1/32

U.S. Cl. 73-194 VS

8 Claims



1. An ultrasonic fluid flow measurement system comprising: means for generating a Karman vortex street in a flowing fluid; means for propagating an acoustic carrier signal normal to said Karman vortex street; means to amplitude-modulate said acoustic carrier signal in accordance with modulating properties of said Karman vortex street so as to produce a composite amplitude-modulated acoustic signal comprising frequency components of said acoustic carrier signal and of said modulating properties of said Karman vortex street; means for converting said composite amplitude-modulated acoustic signal to a composite electrical signal; first carrier amplifier means for amplifying said composite electrical signal so as to obtain an amplified composite electrical signal; variable-shunt attenuator means responsive to said amplified composite electrical signal so as to obtain an amplitude-conditioned, composite electrical output signal; second carrier amplifier means responsive to said amplitude-conditioned, composite, electrical output signal and furnishing a second-amplifier, output signal; automatic gain control means responsive to said second-amplifier, output signal, furnishing control signal for said variable-shunt attenuator means so as to maintain constant signal amplitude of said second-amplifier, output signal; means within said automatic gain control means for generating a disconnect signal when said electromagnetic carrier signal drops to zero level; and demodulator means for separating said frequency components of said electromagnetic carrier signal and said modulating properties of said Karman vortex street.

#### 4,164,144 FLUID FLOWMETER

Hermann Kaiser, Utica, Mich.; Richard A. Nellums, Kirkwood, Mo., and Jerry A. Olson, Dearborn, Mich., assignors to Eaton Corporation, Cleveland, Ohio

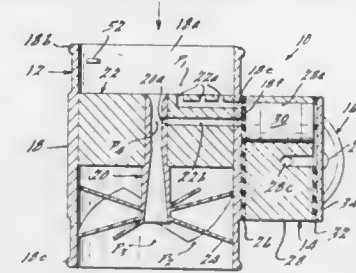
Filed Oct. 26, 1977, Ser. No. 845,751  
Int. Cl.<sup>2</sup> G01F 1/44

U.S. Cl. 73-213

22 Claims

1. In a device including a main passage for the flow of a fluid therethrough; a secondary passage disposed within and extending substantially parallel to an axis defined by said main passage, the secondary passage including a converging inlet for

receiving a portion of the fluid flowing in said main passage and an outlet for discharging the portion back into the main passage; means for sensing the stagnation pressure of the fluid; and means for sensing the static pressure of the fluid in the secondary passage; wherein the improvement comprises:



means operative to receive at least a portion of the remaining fluid in said main passage and impart a velocity vector thereto tangential to said axis for creating a reduced pressure area at the outlet of said secondary passage, thereby reducing the static pressure of the fluid in the secondary passage.

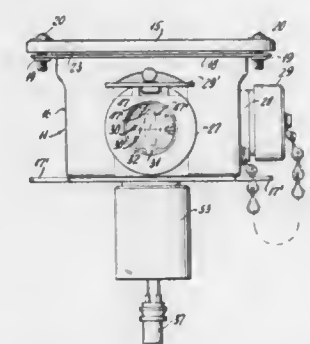
#### 4,164,145 SELF-POWERED ELECTRICAL METER FOR DISPLAY OF A LIQUID-LEVEL OR THE LIKE MEASUREMENT

Milton Aron, Newington, Conn., assignor to De Laval Turbine Inc., Princeton, N.J.

Filed Mar. 20, 1978, Ser. No. 888,467  
Int. Cl.<sup>2</sup> G01F 23/00; F21V 5/08

U.S. Cl. 73-293

15 Claims



8. A self-contained and self-powered meter having an external-circuit connection and for monitoring the electrical condition of an external circuit connected thereto, comprising a housing having a first window opening at a read-out face and having a second window opening at a location offset from said read-out face, a meter assembly mounted within said housing and having a display face visually exposed at said first window opening, a solar-cell assembly producing an electrical-voltage output in response to incident light and mounted within said housing for light exposure at said second window opening, measuring-circuit means connecting the voltage output of said cell assembly to said meter assembly and to said external-circuit connection, whereby when connected to an external circuit and in the presence of light at said second window opening the electrical condition of the connected external circuit may be observed at said first window opening, and an optical fiber element positioned within said housing with a light pick-up end at the second window opening and with its other end oriented for illumination of at least part of the display face of said meter assembly.

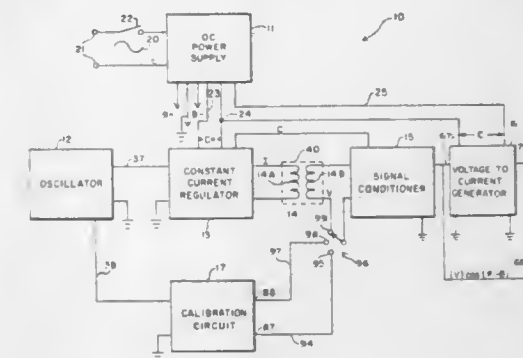
#### 4,164,146 APPARATUS AND METHOD FOR MONITORING THE PRESENCE OF A CONDUCTIVE MEDIA

Bruce W. DuVall, James W. Valentine, and Kenneth O. Morey, all of Colorado Springs, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 2, 1976, Ser. No. 738,180  
Int. Cl.<sup>2</sup> G01F 23/26

U.S. Cl. 73-304 R

12 Claims



1. In a conductive media detecting apparatus of the type in which primary and secondary windings are inductively coupled together and the presence of and the proportion thereof immersed in surrounding liquid metal varies the coupling and hence mutual inductance parameter between said coils, the improvement in combination therewith of:

means for exciting said primary winding with an AC signal of substantially constant current and selectively settable frequency  $f$  to induce an AC voltage signal of frequency  $f$  on said secondary winding; and, means responsive to said induced voltage signal for generating an output signal which is a measure of the presence of a conductive media being monitored, said output signal generating means being operable to generate said output signal as a function of the product of the magnitude of said induced voltage signal and the cosine of the angle of phase difference between said constant current signal and induced voltage signal.

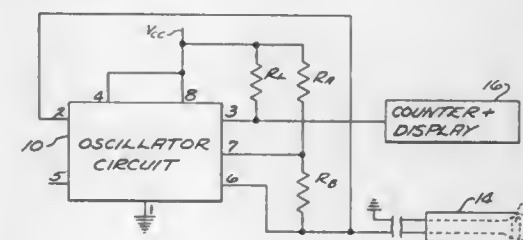
#### 4,164,147 TEMPERATURE SENSING APPARATUS

Bernard M. Kulwicki, Foxboro, Mass.; George Trenkler, East Providence, R.I., and David C. Hill, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1977, Ser. No. 866,107  
Int. Cl.<sup>2</sup> G01K 7/34

U.S. Cl. 73-362 R

11 Claims



1. A temperature control system comprises oscillator circuit means having an output frequency dependent upon the first power of capacitance and a sensor having a linear output over a wide temperature range coupled to the circuit means, the sensor being formed of ferroelectric material selected such that the operating temperature of the environment in which the



sensor is employed is above the Curie temperature of the ferro-electric material.

4,164,148

# METHOD FOR DETERMINING SULFUR CONTENT OF CAST IRON

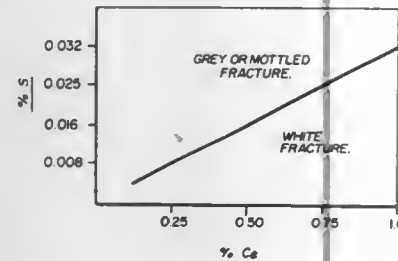
Henry A. Laforet, 3903 Scenic Dr., North Muskegon, Mich. 49445

Filed May 1, 1978, Ser. No. 901,370

Int. Cl.<sup>2</sup> G01N 33/20

U.S. Cl. 73—432 R

9 Claims



1. The method of determining the sulfur content of cast iron by the steps of

- (1) adding to a sample of molten cast iron an amount of cerium ranging from 0.25% to about 1.0% by weight of the sample,
- (2) casting the sample into a test bar having a cross section in the form of a 60°, 30°, right triangle,
- (3) fracturing the test bar,
- (4) observing the location and amount of any white areas in the test bar to determine the sulfur content of the metal constituting the test bar.

4,164,149

# METHOD AND SYSTEM FOR MONITORING THE ANGULAR DEFORMATION OF STRUCTURAL ELEMENTS

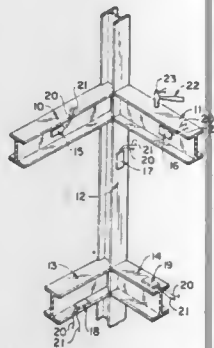
Shigeo Okubo, 350 Sharon Park Dr., Apt. E24, Menlo Park, Calif. 94025

Filed May 9, 1978, Ser. No. 904,153

Int. Cl.<sup>2</sup> G01N 29/00

U.S. Cl. 73—594

15 Claims



1. A method of monitoring the angular deformation of structural elements in a composite structure in response to mechanical vibrations, said method comprising the steps of:

- (a) providing a plurality of angular motion signal generating sensors at different selected locations in said composite structure, each sensor being associated to a corresponding structural element;
- (b) detecting the signals output from said signal generating sensors in response to vibrations propagated within said composite structure;

- (c) establishing a vibration signature for said composite structure from the signals detected in step (b);
- (d) subsequently detecting the signals output from said signal generating sensors; and
- (e) comparing the subsequently detected signals with said vibration signature to detect differences therebetween.

4,164,150

# SYSTEM FOR INSPECTING TUBES OR PIPES BY MEANS FOR ULTRASONICS

Karl Ries, Mülheim; Kurt Hannoschöck, Sonsbeck, and Gunter Simonelt, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,362

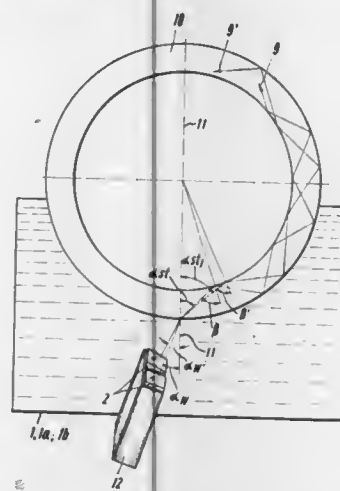
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2625311

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—644

5 Claims



1. In a system for ultrasonic inspection of tubes or pipes using transducer means for providing ultrasonic radiation through a fluid coupler medium towards the surface of a pipe or tube to be refracted at the surface upon entering material of the tube or pipe under a particular test angle of refraction, comprising:

the transducer means being a plurality of transducers having different orientations to an axial plane normal through the surface of a pipe so that radiation launched by the transducers of the plurality have different angles of incidence upon the surface;

tank means in which said transducers are disposed and holding said coupler medium for establishing a refracting interface for ultrasonic radiation with the pipe as directed by the transducers at said orientations; and

means for providing coupler fluid to said tank means at adjustable temperatures, so that for each of said transducers and for a similar range of adjustable temperatures, different ranges for the set of refraction result in the pipe, only one transducer of the plurality being used for a particular pipe of particular dimensions to obtain a particular test angle of refraction in one of said ranges of angles.

4,164,151

# RANDOM VIBRATION GENERATOR

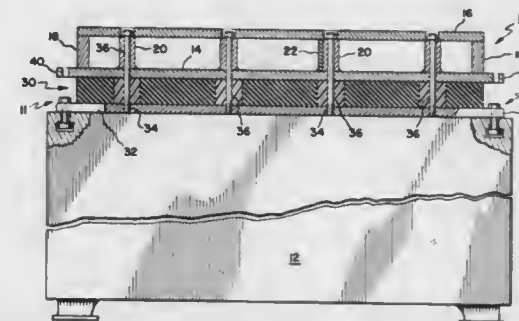
Douglas C. Nolan, Syracuse, and Joseph T. Hubbard, Skaneateles, both of N.Y., assignors to Mechanical Technology, Inc., Latham, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,225

Int. Cl.<sup>2</sup> B06B 1/10

U.S. Cl. 73—663

10 Claims



1. A random vibration generator for generating and transmitting to a test object, shocks over a wide band of frequency, amplitude and G-level, on a vibration machine, comprising: a housing including floor, ceiling and walls defining a hollow enclosed chamber;

means for connecting together a test object and said housing; partition means within said housing extending between said floor and ceiling, for dividing said chamber into a plurality of separate compartments;

a plurality of loose projectiles within said chamber and distributed among said compartments; and

whereby when said vibration machine oscillates with a component transverse to said floor and said ceiling, it will cause said projectiles to bounce about within said compartments, impacting with said floor and ceiling, to generate shocks over a wide bandwidth of frequency, amplitude and G-level, which shocks are transmitted to the test object.

4,164,152

# BIAXIAL VIBRATION-TESTING INSTALLATION

Robert Lemonde, Paris, and Bernard Dussetour, Maurepas, both of France, assignors to Societe pour le Perfectionnement des Matériels et Equipements Aérospatiaux S.O.P.M.E.A., Velizy-Villacoublay, France

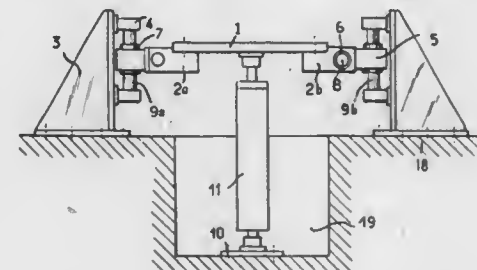
Filed Dec. 20, 1977, Ser. No. 862,758

Claims priority, application France, Jan. 6, 1977, 77 00212

Int. Cl.<sup>2</sup> G01M 7/00

U.S. Cl. 73—665

3 Claims



1. A seismic test apparatus comprising: vibration means for subjecting a specimen holder table to vibrations with respect to a massive support structure in two perpendicular directions; at least two guiding units each defined by at least one first shaft parallel to the first of said directions, at least one second shaft parallel to a second of said directions, and connecting means provided with at least two bores at right angles to each other; said first shaft being mounted in bearings of the table and

slidably mounted in at least a first bore of said connecting means, and said second shaft being mounted in bearings of the massive support structure and slidably mounted in at least a second of said bores of said connecting means being perpendicular to said first bore.

4,164,153

# DEVICE FOR USE IN MECHANICAL POWER TRANSMISSION SYSTEM

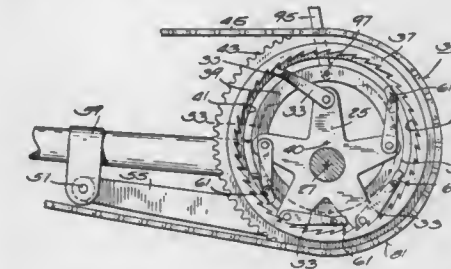
Denis J. Moritsch, 8205 Woodland Ave., Wauwatosa, Wis. 53213, and Fred A. Moritsch, 171 Las Flores, Nipomo, Calif. 93444

Filed Dec. 9, 1977, Ser. No. 859,053

Int. Cl.<sup>2</sup> F16H 11/02, 11/06; B62M 9/00, 25/00

U.S. Cl. 74—217 B

19 Claims



8. A bicycle comprising a frame, a pair of wheels supporting said frame, a first sprocket fixed to one of said wheels, a drive member rotatably carried by the frame, a pair of pedals connected to said drive member, a plurality of links carried by said drive member for common rotation therewith and for pivotal movement relative thereto, each of said links having, at the outer end thereof, a guide post and a pivotally mounted pawl member, an outer ring having an annular internal surface engaging said guide posts and fixedly including a second sprocket and an internally projecting ratchet wheel, an inner ring, means supporting said inner ring on said frame for transverse movement relative to the rotary axis of said drive member, said inner ring having an outer annular surface engaging said guide posts and including a cam surface, each of said pawl members including a pawl part movable into engagement with said ratchet wheel to effect rotation of said outer ring in response to rotation of said drive member, and a cam part engageable with said cam surface to displace said pawl part out of engagement with said ratchet wheel, means biasing said pawl members toward positions of engagement of said pawl parts with said ratchet wheel, means on said frame for displacing said inner ring relative to the rotary axis of said drive member to vary the rate of rotation of said outer ring relative to said drive member, and a sprocket chain trained around said first and second sprockets.

4,164,154

# TRANSMISSION FOR TWO-WORM PRESS WITH COUNTER RUNNING WORMS

Heinrich Schäfer, Vellmar, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,480

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 7630036[U]

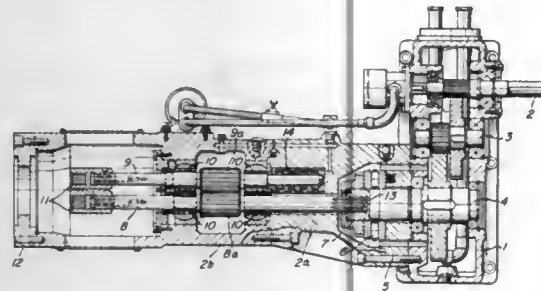
Int. Cl.<sup>2</sup> F16H 37/06, 1/18

U.S. Cl. 74—665 GD

6 Claims

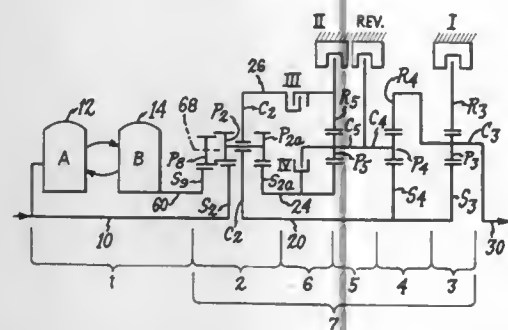
1. A transmission for a two-worm press having counter running worms in a worm housing, which includes: a transmission housing, an additional housing connected to said transmission housing and detachably connectable to the worm housing of a worm press, only a first transmission output shaft and a second transmission output shaft rotatably journaled in said additional housing respectively having one end drivingly connectable to two worms of a worm press, only one additional

output shaft rotatably arranged in said transmission housing and forming part of a transmission and being drivingly connected to one of said first and second transmission output



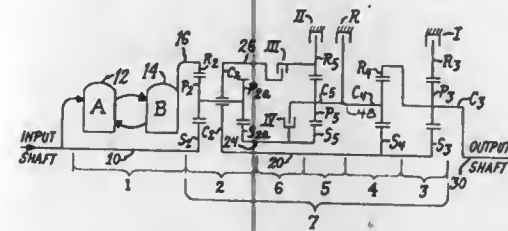
shafts, and an axial bearing unit located in said additional housing and externally journalling the free end of the other one of said first and second transmission output shafts.

**4,164,155**  
**ALL CONCENTRIC MULTI-RANGE SYNCHRONOUS SHIFTING HYDROMECHANICAL TRANSMISSION INCLUDING A MULTI-RANGE CONCENTRIC GEAR TRAIN PACKAGE**  
 Bradley O. Reed, and John M. Nolan, both of Pittsfield, Mass., assignors to General Electric Company, New York, N.Y.  
 Filed Jan. 25, 1978, Ser. No. 872,252  
 Int. Cl.<sup>2</sup> F16H 47/04, 37/06, 57/10  
 U.S. Cl. 74—687 **20 Claims**



18. In a transmission having concentric shafts interconnecting gear elements, the improvement comprising:  
 a compound planetary gear set (2, 22) including:  
 two concentric sun gears,  
 a planetary carrier having a first crank arm extending between said sun gears for attachment to a shaft (20, 21), planetary gears supported by said carrier each having a bearing portion journaled through said carrier to permit said planetary gears to rotate independently of said carrier and having gear engaging surfaces on each side of said bearing portion with said gear engaging surface on each side meshing with one of said sun gears,  
 a second crank arm portion attached to said carrier and extending outwardly from the axis about which said carrier rotates for attachment to a shaft (26, 27); and  
 at least three concentric shafts (10, 24, 20, 39, 25, 21) of which at least one is a hollow shaft including:  
 a first and a second sun gear shaft, each supporting one said sun gear,  
 a third shaft attached to said first crank arm portion of said carrier for supporting said carrier and permitting rotation of said carrier about the axis of rotation of said shaft;  
 whereby the rotational motion of said first sun gear shaft (10, 39) can be passed through said third concentric shaft (20, 21) to said second sun gear shaft (24, 25).

**4,164,156**  
**FULL REVERSING HYDROMECHANICAL STEERING TRANSMISSION WITH MULTI-RANGE SYNCHRONOUS SHIFTING CONCENTRIC GEAR TRAIN PACKAGE**  
 Bradley O. Reed, Pittsfield, Mass., assignor to General Electric Company  
 Filed Jan. 25, 1978, Ser. No. 872,255  
 Int. Cl.<sup>2</sup> F16H 47/04, 37/06, 57/10  
 U.S. Cl. 74—687 **10 Claims**



1. A concentric multi-range gear train (7, 71) for transmissions comprising:  
 two concentric input shafts (10, 16, 10, 60, 36, 39);  
 an output shaft (30, 40) concentric with said input shafts;  
 a first gear train component (2, 22) connected to said two concentric input shafts for receiving two rotational input movements, for mixing those two movements to provide a third movement which is a weighted sum of the two input movements and for driving a set of three shafts (20, 24, 26, 21, 25, 27) with two outputs one of which is said third movement and the other of which is directly proportional to one of said two input movements, said three shafts also being concentric with said output shaft (30, 40) and said two concentric input shafts (10, 16, 10, 60, 36, 39), one said output driving the intermediate (24, 25) of the said three concentric shafts and the other said output driving the other two shafts (20, 26, 21, 27) of the said set of three concentric shafts;  
 an additional range gear train component (5, 6, 55) attached to the said intermediate (24) and to one of said other two (20, 26) of said set of three concentric shafts and to an additional range shaft (48, 49) which is also concentric with said other concentric shafts, said additional range gear train component comprising a three-element differential device (5, 55) having a first element connected to said intermediate shaft (24, 25) of said set of three shafts, a second element attached to said additional range shaft (48, 49) and a third element, a brake (II) for selectively securing said third element against rotation, a clutch (III) for selectively securing said third element to one of said other two shafts of the said set of three shafts and a clutch (IV) for selectively locking said first and second elements together to cause said additional range shaft (48, 49) to be driven by said intermediate shaft (24, 25) at the same speed as said intermediate shaft;  
 a low range and output gear train component (3, 4) including two (3, 4, 33, 44) three-element differential devices wherein a first element of each said device is attached to the one (20, 21) of said other two of said set of three concentric shafts which is not attached to said additional range gear train (5, 6), a second element of one said device (4, 44) is connected to said additional range shaft (48), the second element of the other (3, 33) said device is connected to the said output shaft (30, 41) and to the third element of said one device (4, 44), and the third element of said other said device is attached to a brake (I);  
 whereby engagement of the brake (I) of said low range and output gear train component causes said output shaft (30, 41) to be driven in a distinct first range which is a function of said third movement and whereby said additional range shaft and said second element of said other device of said three-element differential devices of said low range and output gear train component can be driven in three dis-

tinctly different speed ranges derived from the two said outputs of said first gear train component to provide said output shaft to be selectively driven in three distinct forward ranges in addition to said distinct first range.

9. In a multi-range transmission having concentric gear elements for combining the inputs available from two concentric input shafts into one or more intermediate rotational speeds and a final stage having concentric gear elements for the further combining of said intermediate speeds with the inputs from one of said two concentric shafts, the improvement of an intermediate range gear package comprising:

first and second concentric input shafts (10, 39, 16, 60, 36);  
 a compound planetary gear set (2, 22) including:

a first sun gear  $S_2, S_{22}, S_{72}$  attached to said first input shaft,  
 a second sun gear  $S_{2a}, S_{22a}, S_{72a}$  attached to a first hollow shaft (24, 25, 76a),

a planetary carrier having a first crank arm extending between said sun gears to an attachment to a core shaft (20, 21, 75) extending through said hollow shaft to said final stage, said core shaft being concentric with said input shafts and said sun gears,

compound planetary gears each rotatably mounted on said carrier with gear engaging surfaces on each side of said carrier intermeshing with both said sun gears,  
 a second crank arm attached to said carrier and extending away from said core shaft;

said second crank arm (74,  $C_2, C_{22}$ ) being attached to a second hollow shaft (26, 27, 78) which is concentric with the other said shafts;

a second planetary gear set (5, 55) concentric with said surrounding said core shaft including a sun gear attached to said first hollow shaft, a ring gear and a carrier attached to and supporting a third concentric hollow shaft for interconnecting said second planetary gear set with said final stage;

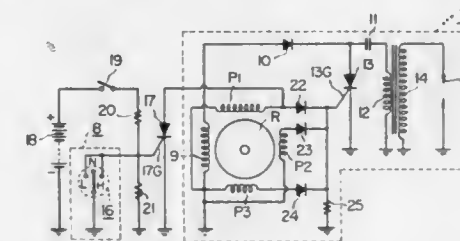
brake means for selectively immobilizing said ring gear of said second planetary set;

clutch means for selectively attaching said second hollow shaft to said ring gear of said second planetary set; and

clutch means for selectively attaching said first hollow shaft to said carrier of said second planetary set;

whereby said intermediate range gear package provides three distinct rotational speeds which are derived from said two inputs.

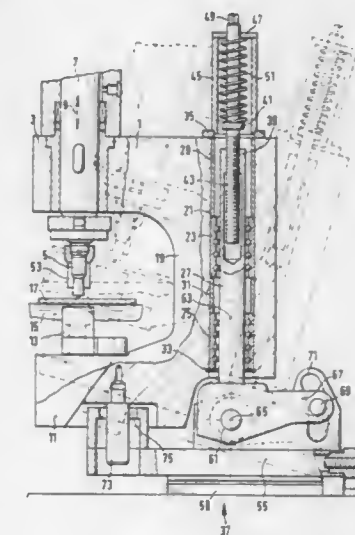
**4,164,157**  
**DEVICE FOR ADJUSTING IGNITION TIMING IN A MOTOR-CYCLE PROVIDED WITH FLUID COUPLING**  
 Masayuki Kudo, 3-16-13, Saiwai-Cho, Shiki-Shi, Saitama-Ken; Nobuo Miura, 915, Shimo-Niikura, Wako-Shi, Saitama-Ken, and Shigetaka Hada, 29-47, Hon-Machi, Wako-Shi, Saitama-Ken, all of Japan  
 Filed Oct. 25, 1977, Ser. No. 844,893  
 Claims priority, application Japan, Oct. 29, 1976, 51-146758[U]  
 Int. Cl.<sup>2</sup> B60K 41/18; F02P 5/04; H05B 41/392  
 U.S. Cl. 74—860 **1 Claim**



1. In a device for adjusting ignition timing for an engine mounted on a motor-cycle which includes an engine; an ignition circuit having at the primary side thereof a thyristor as a switching means, a diode, a capacitor, a primary ignition winding and a rotor of a.c. electric power generator, and at the

secondary side thereof a secondary ignition coil and ignition plugs; a fluid coupling connected to said engine; a power transmission mechanism which receives driving force from said fluid coupling and has at least two-stage speed changing function of a low speed drive and a high speed drive; and shift indicating switch means which changes over in association with shifting of said power transmission mechanism to indicate the shift position of the low speed drive, the high speed drive, or the neutral position, the improvement comprising first, second and third ignition signal emitters in said ignition circuit arranged in parallel relative to the gate of said thyristor and to produce output signals by rotation of said rotor of said a.c. electric power generator, the output signal being forwarded to the gate of said thyristor to connect and disconnect the same, said first ignition signal emitter forwarding its output signal to the gate of said thyristor when the shift mechanism is shifted to the low speed drive range or high speed drive range, said second ignition signal emitter forwarding its output signal to the gate of said thyristor when the shift mechanism is shifted to the neutral position, and said third ignition signal emitter forwarding its output signal to the gate of said thyristor when the shift mechanism is shifted to the low speed drive range or high speed drive range and the motor-cycle is in the state of running, said first ignition signal emitter being advanced from said second ignition signal emitter, and said third ignition signal emitter being advanced from said first ignition signal emitter when the motor-cycle is running; and another thyristor for short-circuiting said ignition signal emitters, which is provided in parallel with said first ignition signal emitter, the gate of said thyristor being connected to said shift indicating switch means, and said thyristor being made conductive when said shift indicating switch means has been changed over to the neutral position so that the advanced signal emitter may be short-circuited.

**4,164,158**  
**PUNCHING APPARATUS**  
 Rolf Peddinghaus, Deterbergerstrasse 25, Ennepetal, BRD, Fed. Rep. of Germany (5828)  
 Filed Mar. 27, 1978, Ser. No. 890,480  
 Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 7709876[U]  
 Int. Cl.<sup>2</sup> B26F 1/02  
 U.S. Cl. 83—191 **7 Claims**



1. A punching apparatus comprising a frame that is generally C-shaped in that it defines two outwardly extending limbs, a first movable punch disposed in one of said limbs and a second fixed punch disposed in the other of said limbs, a supporting base, guide means for supporting said frame in the direction of thrust of one of said punches, means for pivotally mounting



said guide means on said base about an axis extending at right angles to the direction of thrust of the frame, said guide means comprising a cylindrical column mounted in a bore defined by said frame and extending parallel to the direction of thrust of one of the punches, means for pivotally mounting the column relative to said base and means for guiding the frame relative to the supporting base including a slot defined by said supporting base and a stud secured to said frame, the faces of said stud and slot extending along planes at right angles to the pivot axis of said column.

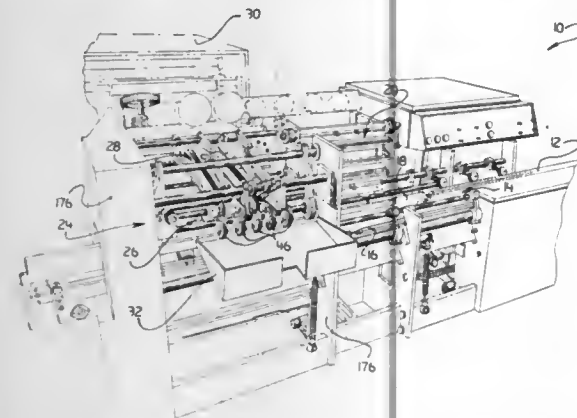
**4,164,159**  
**APPARATUS FOR FEEDING SIGNATURES FROM A SADDLE TO A TRIMMER**

John J. Marciniak, Berea, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 22, 1977, Ser. No. 863,315  
Int. Cl.<sup>2</sup> B65H 5/00

U.S. Cl. 83—280

10 Claims



1. Apparatus for use in handling signatures, said apparatus comprising a saddle extending through a delivery station, means for sequentially moving signatures along said saddle to said delivery station, trimmer means for sequentially trimming signatures, said trimmer means being spaced from said delivery station, conveyor means for transporting signatures to said trimmer means at a first speed, said conveyor means including a plurality of pusher means for sequentially engaging trailing edge portions of the signatures to effect movement and registration of the signatures, elongated flexible drive means for moving each of said plurality of pusher means in turn along an upper run extending from said delivery station toward said trimmer means, a lower run extending away from said trimmer means to said delivery station and a connector run extending between said upper and lower runs, at least a portion of said connector run being disposed directly above said saddle, and transfer means for engaging opposite sides of a signature and transferring the signature at a second speed greater than the first speed away from said saddle to a position where one pusher on said conveyor means may engage same, said transfer means accelerating the signature upwardly at said second speed to a position where the trailing edge portion of the signature is ahead of said one pusher means, said one pusher means engaging the trailing edge of a signature at said position for effecting movement of the signature along said conveyor means.

**4,164,160**

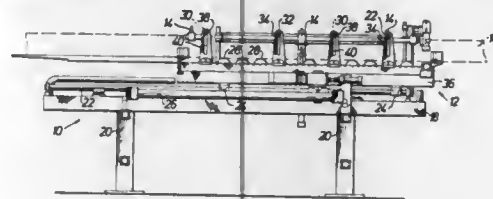
**TRANSVERSE CUTTER**

Jan-Olof Johansson, Hoganas; Heikki Korpela, Helsingborg, and Karel Spacek, Morarp, all of Sweden, assignors to Gullfiber AB, Billsholm, Sweden

Continuation-in-part of Ser. No. 755,019, Dec. 28, 1976, Pat. No. 4,117,754, This application Mar. 24, 1978, Ser. No. 889,907  
Claims priority, application Sweden, Mar. 25, 1977, 7703474  
Int. Cl.<sup>2</sup> B23D 25/04; B26D 1/56

U.S. Cl. 83—307.2

3 Claims



1. An apparatus for transverse cutting of a web of cellular plastic fed continuously out of a forming machine comprising: a support stand; a carriage means disposed in a plane and mounted for reciprocating motion on said support stand; a plurality of cutting devices comprising mutually spaced hot filaments reciprocally mounted on and extending transversely across said carriage means; means for moving said carriage means in successive synchronized traverses with said web and simultaneously moving said plurality of cutting devices perpendicular to the plane of said carriage; said means for moving said carriage means in successive synchronized traverses with said web moves said plurality of cutting devices towards said carriage means from above said web and alternately moves said plurality of cutting devices away from said carriage means from below said web during successive synchronized traverses of said carriage means in the direction of motion of said web to divide said web transversely into separate lengths by means of said cutting devices; and means for moving said plurality of cutting devices in a horizontal motion in the plane of said carriage means to cut profiles in said separate lengths of said web.

**4,164,161**

**MODIFIED STAPLE CUTTER**

Philip T. Slack, Halifax, England, assignor to Plasticisers Limited, Near Bradford, England

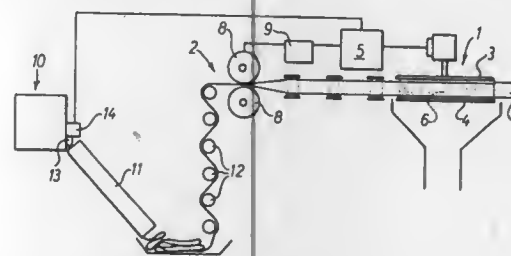
Filed Jan. 30, 1978, Ser. No. 873,703

Claims priority, application United Kingdom, Jan. 22, 1977, 2677/77

Int. Cl.<sup>2</sup> D01G 1/04

U.S. Cl. 83—346

5 Claims



1. An apparatus for cutting elongate material into predetermined lengths comprising a cutting assembly including a number of spaced apart knife edges secured to a mounting member, winding means for winding successive layers of material to be cut in contact with the knife edges, means for forcing the material onto the knife edges to thereby sever the material,

press nip rollers arranged to feed the material to the cutting assembly, common motor means having an operative connection with both the winding means and the press nip rollers, and variable transmission means in said operative connection for varying the relative speeds of the winding means and the press nip rollers,

**4,164,162**

**METHOD OF AND DEVICE FOR CUTTING BLOCKS OF FOAMED MATERIAL**

Gunter Eiselt, Schopenhauerweg, and Rudolf Hossbach, Am Kreuzbuechel, both of 5463 Unkel, Fed. Rep. of Germany

Division of Ser. No. 537,964, Jan. 2, 1975, Pat. No. 4,033,213.

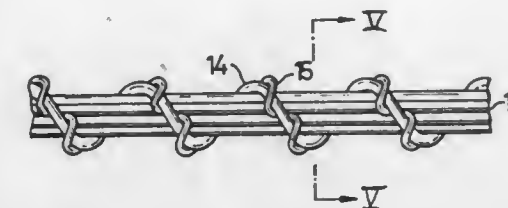
This application Apr. 18, 1977, Ser. No. 788,230

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1974, 2400204; Feb. 6, 1974, 2405554; Sep. 4, 1974, 2442353

Int. Cl.<sup>2</sup> B23D 61/16

U.S. Cl. 83—651.1

2 Claims



1. A device for clean cutting of blocks of foamed synthetic material having individual pores especially foamed polyethylene linearly in an easily controlled manner, which includes in combination: an endless cable including a core of elastic wear resistant material adapted to withstand a maximum preload of from 5 to 30 kp and having a small diameter within the range of from 0.5 to 2 mm, and at least one wire of wear resistant material having a small diameter of from 0.1 to 0.3 mm and wound around said cable in a predetermined helical path, said endless cable having a physique whereby individual pores of the foam material are torn open by said wire wound around the core of the cable so that a clean and linear cut is achieved and also for attaining a separation cutting speed as high as possible due to the preload with simultaneously satisfactory quality of separation.

**4,164,163**

**ELECTRIC GUITAR CIRCUITRY**

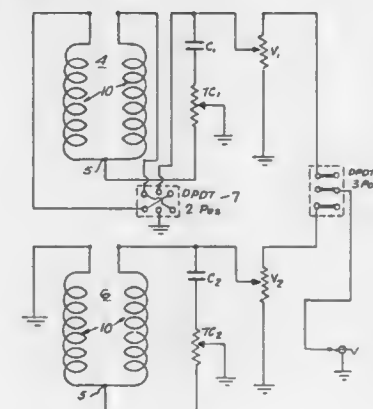
Orville J. Rhodes, Van Nuys, Calif., assignor to Peavey Electronics Corp., Meridian, Miss.

Filed Jun. 22, 1977, Ser. No. 808,790

Int. Cl.<sup>2</sup> G10H 3/08

U.S. Cl. 84—1.15

4 Claims



1. A pickup circuit for a guitar or the like comprising, in combination, a pair of coils, connected together at one end in

series to provide a connection point, the opposite end of one of said coils connected to ground, said pair of coils being disposed in closely adjacent humbucking relationship as a single unit for positioning at a selected location on the guitar in close proximity to the strings, an output conductor connected to the opposite end of the other of said coils, a capacitor and a first potentiometer connected in series between said output conductor and said connection point forming a RC network, said potentiometer having a wiper connected to ground whereby the wiper serves as a signal input element, said wiper being movable progressively between one position for operation of the circuit as a full double coil humbucking pickup and a second position in which said one coil is grounded out and said other coil forms a single coil pickup.

**4,164,164**

**BOLT TENSION INDICATING MEANS**

Emanuel H. Trungold, 14B Broun Place, Bronx, N.Y. 10475

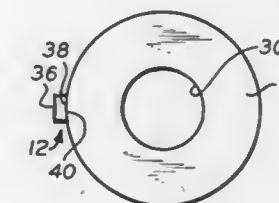
Continuation-in-part of Ser. No. 704,768, Jul. 13, 1976,

abandoned. This application Aug. 18, 1977, Ser. No. 825,558

Int. Cl.<sup>2</sup> F16B 31/02

U.S. Cl. 85—62

18 Claims



1. In a bolt assembly of the type including as assembly components a bolt having a bolt head and stem, and a nut threadably engageable with said bolt stem, an improvement which comprises means for indicating that the stress on the bolt has reached a preselected level, said indicating means comprising an element located on one of said assembly components with one surface of the element coplanar with a bearing surface on said one component, the element being joined to said one component by adhesive having a predetermined stress failure which is reached when the bolt achieves said preselected stress level, whereby when the bolt is stressed to said preselected level, the adhesive joint fails thereby effecting movement of the element relative to said one component.

**4,164,165**

**SAFETY APPARATUS FOR FIRING EQUIPMENT**

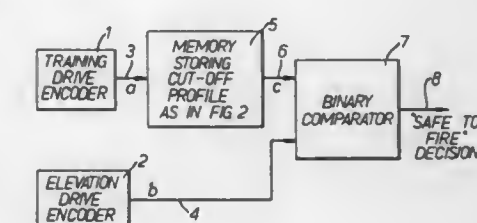
Mervyn L. Bean, Darlington, and Samuel Price, Barrow-in-Furness, both of England, assignors to Vickers Limited, United Kingdom

Filed Aug. 9, 1977, Ser. No. 823,114

Int. Cl.<sup>2</sup> F41D 11/02

U.S. Cl. 89—134

2 Claims



1. Safety apparatus for firing equipment which has a trainable and elevatable projectile guide, the safety apparatus comprising:

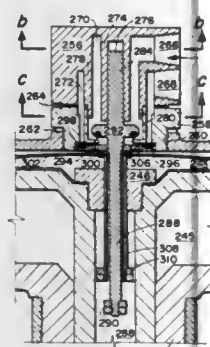
first and second angular position transducers for defining training and elevation angles of the projectile guide of the

firing equipment and for generating first and second binary numbers in accordance therewith;  
 an electrically readable memory for storing a set of values which indicate directions of firing which are safe with respect to mounting location the equipment;  
 a comparator means for, in use of the apparatus, addressing said memory with said first binary number derived from one of said first and second transducers and for comparing said second binary number derived from the other of said first and second transducers with a third binary number stored in the memory at the address corresponding to the first binary number so as to effect a determination of whether or not it is safe to fire at the particular training angle and the particular elevation angle of the projectile guide;  
 at least one further of pair transducers, at least one further electrically readable memory, and at least one further comparator means for effecting at least one further determination, simultaneously with the first-mentioned determination, as to whether or not it is safe to fire; and  
 fault checking circuit means for verifying the correct operation of the apparatus and for, responsive to the said comparator means, preventing firing of the equipment unless at least the first mentioned comparator means and said further comparator means both effect a determination that it is safe to fire, said apparatus further comprising a subsidiary comparator circuit associated with the transducers, and correction circuits for ensuring that the binary numbers derived from each of the transducers for defining the training angle are the same and for ensuring that the binary numbers derived from each of the transducers for defining the elevation angle are the same.

#### 4,164,166 SOLAR ENERGY DEVICE

Harvard P. Stubbs, Chihuahua, Mexico, assignor to Solar Pump Corporation, Las Vegas, Nev.  
 Division of Ser. No. 751,105, Dec. 16, 1976. This application Mar. 9, 1978, Ser. No. 884,740  
 Int. Cl.<sup>2</sup> F01L 23/00, 31/02  
 U.S. Cl. 91—342

4 Claims



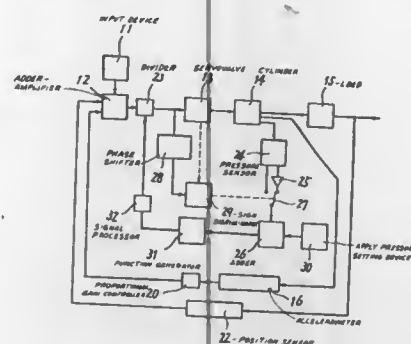
1. A reciprocating motor operable by pressurized vapor comprising:  
 a housing;  
 a movable diaphragm within said housing that forms upper and lower chambers therein;  
 a piston having a head portion fixed to said diaphragm;  
 a control means having an inlet for receiving a vaporized fluid under pressure within said upper chamber and an outlet for releasing the vaporized fluid after movement of said piston;  
 said control means including a valve housing for a movable valve member;  
 spring means for biasing said valve member to close said outlet and open said inlet so as to cause vaporized fluid under pressure to fill said upper chamber and act on said diaphragm to move said piston in a power stroke of a

cycle, said spring means being located within said upper chamber and comprising a relatively thin sheet of elastically flexible metal fixed to said valve member at a central location on said sheet and fixed to the inside of said housing at the edges of said sheet;  
 means responsive to a predetermined amount of piston movement during said power stroke for shifting the position of said valve member and of said spring means to close said inlet and open said outlet to release vapor pressure in said chamber, thereafter allowing said spring means to again bias said valve member to a closed position and  
 a tubular member fixed to and extending downwardly from said spring means adjacent said movable valve member, said tubular member having a flanged portion near its lower end for engaging a stop member on said valve member, thereby limiting the movement of said spring means.

#### 4,164,167 HYDRAULIC SERVOMECHANISM

Isao Imai, and Mitsuru Muto, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan  
 Filed Nov. 22, 1976, Ser. No. 744,106  
 Claims priority, application Japan, Nov. 21, 1975, 50-140076; Oct. 23, 1976, 51-127455  
 Int. Cl.<sup>2</sup> F15B 9/03, 9/09, 13/16  
 U.S. Cl. 91—363 R

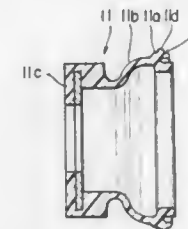
3 Claims



1. A hydraulic servomechanism wherein an input device, an adder-amplifier, a divider, a servovalve, a piston within a cylinder and a load are operatively coupled in the order named; a position sensor for detecting a displacement of said load operatively connected to said adder-amplifier; means for detecting an acceleration of said piston operatively connected to said adder-amplifier, an adder, a supply pressure setting device having its output terminal connected to one of two input terminals of said adder, a pressure sensor with two output terminals for detecting a pressure difference across said piston in said cylinder having one of said two output terminals connected directly to one of two stationary contacts of a switching means and the other output terminals connected to the other stationary contact through an inverter, a movable contact of said switching means being connected to the other input terminal of said adder, the output of the adder being connected through a function generator to said divider, an output terminal of said divider being connected to said switching means through a sign discriminator so that in response to an output signal from said sign discriminator said movable contact of said switching means closes either of said two stationary contacts thereof.

4,164,168  
**VACUUM BOOSTER DEVICE**  
 Kiyoshi Tateoka, Fujisawa, Japan, assignor to Tokico Ltd., Kawasaki, Japan  
 Filed Mar. 30, 1977, Ser. No. 782,783  
 Claims priority, application Japan, Apr. 13, 1976, 51-45727[U]  
 Int. Cl.<sup>2</sup> F15B 9/10  
 U.S. Cl. 91—376 R

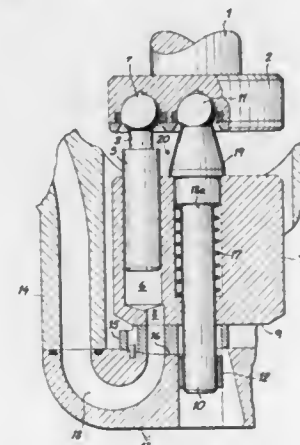
2 Claims



1. A vacuum booster device comprising a casing having two chambers therein a diaphragm in said casing between said chambers and separating them, a valve body slidably and sealingly disposed in the casing and connected to the diaphragm, a plunger slidably and sealingly disposed in the valve body, an input rod connected to said plunger, two valve seats respectively on the plunger and the valve body, and a resilient poppet valve for engaging or disengaging with the valve seats for connecting the two chambers with one another or disconnecting them and for connecting one of the chambers with or disconnecting it from the atmosphere, one end portion of the poppet valve being shaped as a generally cylindrical seal portion and being sealingly fitted and retained in the inner periphery of the valve body, and an annular projection on the outer periphery of the seal portion having a base with a dimension less than the axial dimension of said seal portion and in sealingly engaging contact with the inner periphery of the valve body.

4,164,169  
**AXIAL-PISTON MACHINE HAVING A CYLINDER DRUM AND A REVERSING DEVICE**  
 Wilfried Tragl, Aschaffenburg, and Franz Forster, Muhlbach, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany  
 Filed Sep. 26, 1977, Ser. No. 836,852  
 Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642901  
 Int. Cl.<sup>2</sup> F01B 13/04  
 U.S. Cl. 91—504

11 Claims

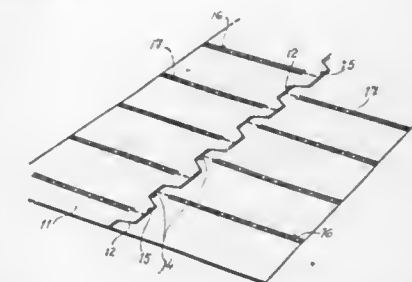


1. An axial-piston machine which comprises:  
 a housing;  
 a cylinder drum rotatable in said housing and provided with

a plurality of angularly spaced cylinder bores each of which receives a respective reciprocable piston;  
 a reaction surface inclinable relative to the axis of said drum and engaging said pistons, said drum having an end face opposite said reaction surface;  
 an intermediate disk between said face of said drum and said housing and formed at least on its side turned toward said housing with a spherical contact surface engaging a counter surface of said housing; and  
 means for pressurizing only one side of said drum through at least one passage formed in said disk, said contact surface having its center of curvature offset from the axis of said drum to the side thereof maintained under high pressure, said face of said drum overhanging beyond said disk at the side of said drum opposite said side maintained at high pressure whereby said cylinder bores discharge freely from the overhanging face of said drum into or draws fluid freely from a space provided in said housing around said drum.

4,164,170  
**METHOD OF MAKING BAGS**  
 Kent A. R. Nordin, Rimbo, Sweden, assignor to Rimbo Tekniska Fabrik Rimpac AB, Rimbo, Sweden  
 Filed Feb. 16, 1978, Ser. No. 878,533  
 Claims priority, application Sweden, Feb. 17, 1977, 7701781; Mar. 30, 1977, 7703719  
 Int. Cl.<sup>2</sup> B31B 49/04  
 U.S. Cl. 93—35 H

10 Claims



1. A method of making a string of bags from a blank comprising two layers of material joined together along at least three edges thereof, said method comprising the steps of cutting the layers of material along a line of wave-shape extending parallel to a pair of opposed edges, substantially centrally therebetween, the wave-tops and wave-bottoms of said wave-shape being uniformly spaced apart; displacing the thus obtained blank halves axially relative to one another in a manner such that a wave-bottom coincides with an adjacent wave-top to form an opening of regular geometric shape; welding the material along a line extending centrally between adjacent openings to form bag handles; welding the material along further lines extending perpendicularly to said firstmentioned line and being uniformly spaced apart by a distance equal to the desired width of the bag; and providing separation lines adjacent to and parallel with said further lines.

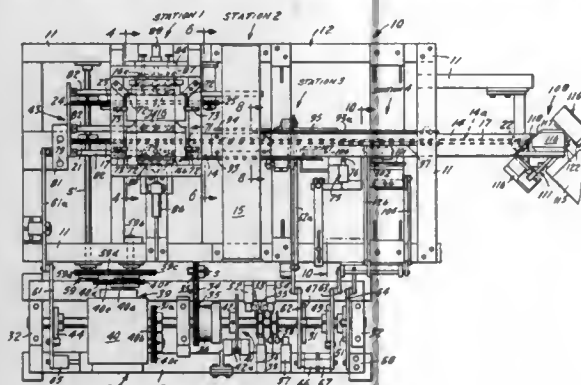
4,164,171  
**CARTON FORMING APPARATUS**  
 George L. Meyers, Menasha, and Thomas M. Gorshe, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.  
 Filed Oct. 25, 1977, Ser. No. 845,224  
 Int. Cl.<sup>2</sup> B31B 1/26  
 U.S. Cl. 93—49 R

7 Claims

1. Apparatus for forming carton blanks into tubular carton shells each having at least one shell sealing flap on a lateral portion thereof, comprising:

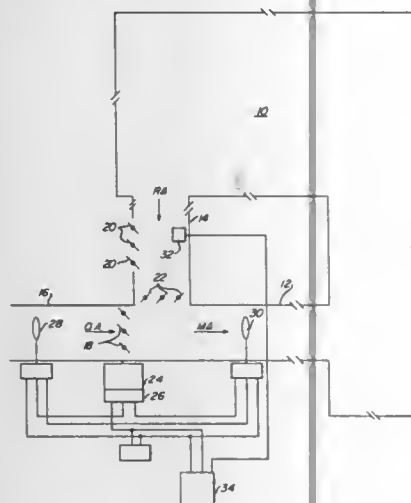


means defining serially disposed stations through which said carton blanks sequentially may be moved; incrementally driven conveyor means for moving said carton blanks through said stations with a pause at each said station; means defining a mandrel extending along the path of movement of said conveyor means, and on which said carton blanks are formed into carton shells; means for sequentially forming shells on said mandrel as said carton blanks are moved by said conveyor means; and carton blank feeding means for delivering individual carton



blanks to said conveyor means upon incremental drive thereof; said conveyor means comprising first and second sections extending in substantially parallel, mutually spaced relation in the direction of the recited path of travel, said first section extending between said blank feeding means and the upstream end of said mandrel, said second section extending between said blank feeding means and the downstream end of said mandrel; and means disposed along the path of travel of said conveyor means for adhering said sealing flaps to seal said carton shells.

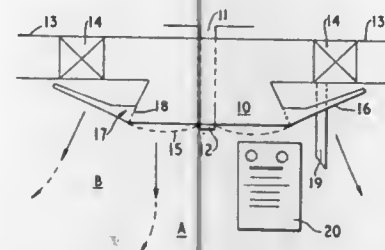
**4,164,172**  
**METHOD AND APPARATUS FOR VENTILATING AN OCCUPIED SPACE**  
John R. Anderten, Denver, and Glen O. Peter, Northglenn, both of Colo., assignors to Energy Controls, Inc., Denver, Colo.  
Filed Feb. 23, 1978, Ser. No. 880,841  
Int. Cl.<sup>2</sup> F24F 11/02  
U.S. Cl. 98—33 R 4 Claims



1. In a heating, ventilating and cooling system for an occupied space, the air for such a space being supplied through an inlet duct, the air removed from the space flowing through a return air duct, an outdoor air damper for admitting outside air

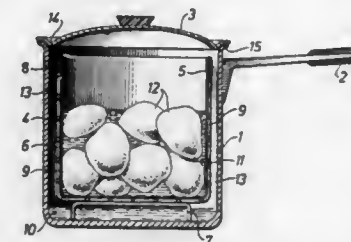
into the inlet duct when open; an exit air damper for permitting return air to be exhausted to the atmosphere when open; a return air damper for permitting return air to flow into the inlet duct when open; a damper motor connected to the outdoor, the exit and the return air dampers to position the dampers to control the amount of outside air introduced into the inlet duct; and damper motor control means for causing the damper motor to position the dampers, the improvements comprising: means for sensing the partial pressure of the oxygen in said space and for producing an electrical signal which is a function of the partial pressure of the oxygen; control means to which the electrical signal from the means for sensing oxygen is applied for producing a first signal when the partial pressure of the oxygen decreases below a certain predetermined minimum value and a second signal when the partial pressure of the oxygen increases above a second predetermined maximum value; and means for applying said signals produced by said control means to said motor control means, said motor control means in response to said first signal being produced causing said damper motor to position the dampers to increase the amount of outside air introduced and in response to said second signal being produced causing said damper motor to position the dampers to decrease the amount of outside air introduced to maintain the partial pressure of the oxygen of the air in the occupied space substantially between the maximum and minimum predetermined values.

**4,164,173**  
**AIR SUPPLY SYSTEMS FOR OPERATING THEATRES**  
Andrew S. M. Douglas, "The Hollies", Hollin La., Styal, Cheshire, England  
Continuation of Ser. No. 772,957, Feb. 28, 1977, abandoned.  
This application Apr. 5, 1978, Ser. No. 893,249  
Int. Cl.<sup>2</sup> F24F 9/00  
U.S. Cl. 98—36 5 Claims



1. An air supply system for an operating theatre which includes a primary chamber to which filtered air is supplied under pressure, a first membrane extending across the lower surface of the primary chamber and through which, in use, a relatively high velocity downward airflow is obtained, a secondary chamber surrounding the primary chamber with a second membrane separating the primary chamber from the secondary chamber, said secondary chamber having a downwardly facing diffuser surface surrounding the lower surface of the primary chamber and through which, in use, a further downward airflow is obtained which surrounds the airflow issuing from the primary chamber, the relative values of the porosities of the first and second membranes being so chosen that the velocity of the further airflow issuing from the secondary chamber is at least as great as the velocity of the airflow issuing from the primary chamber, and the downwardly facing diffuser surface being inclined upwardly as it extends radially outwardly from the lower surface of the primary chamber, so that said further airflow through the diffuser surface has a radially outward component.

**4,164,174**  
**METHOD OF PREPARING FOODSTUFFS BY MEANS OF BOILING OR STEAMING AND MEANS FOR PERFORMING THE METHOD**  
Hans I. Wallstén, Chemin de la Lisère 6, CH-1018 Lausanne, Switzerland  
Filed May 19, 1976, Ser. No. 687,707  
Claims priority, application Switzerland, Nov. 12, 1975, 126888/75  
Int. Cl.<sup>2</sup> A47J 37/12  
U.S. Cl. 99—415 14 Claims

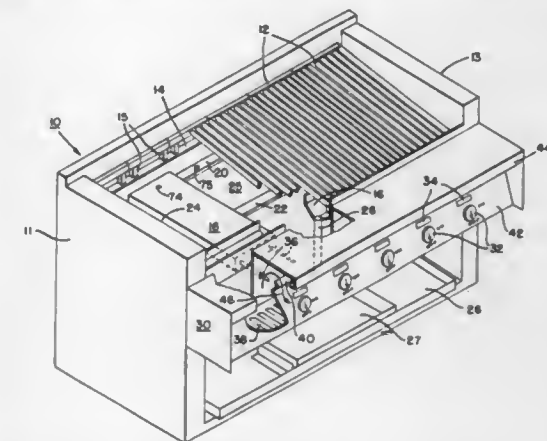


1. Apparatus for use with a cooking vessel and including a removable lid for heating solid and liquid foodstuffs either separately or together while spacing the foodstuff from the bottom and walls of the cooking vessel used to heat the foodstuff comprising:  
said vessel having an upper open end for receiving the removable lid and adapted to receive and contain water for heating;  
a holder received by said vessel and having a bowl-shaped perforated portion and an upper portion for supporting the holder in said vessel so that the side wall and bottom of the bowl-shaped perforated portion are respectively spaced from the side wall and bottom of said vessel;  
an insert positioned in said holder;  
said insert being a liquid-tight bowl-shaped disposable plastic member thermoformed so as to have a thin bowl-shaped body defined by a continuous side-wall and an integral bottom;  
the upper part of said bowl-shaped body being formed with an integral annular flange disposed generally outward and away from said insert wall and shaped to at least partially engage the upper edge of said holder, said flange being semi-rigid and sufficiently strong such that it cooperates with said thin bowl-shaped body to support and hold said insert upon the holder without the need for any additional holding means when said flange is in engagement with the upper edge of said holder;  
the continuous side-wall and integral bottom of the insert bowl-shaped body conforming respectively to the side wall and bottom of the holder to smoothly and substantially intimately engage the inner surface of the holder without having to be folded, enabling the heated fluid in the vessel and located between the vessel and the holder to intimately engage substantially the entire exterior bowl-shaped surface of the insert, the thickness of the insert being chosen to maximize heat transfer to the foodstuff through the insert.

**4,164,175**  
**BROILERS AND ELECTRIC HEATERS THEREFOR**  
Norman Burstein, Cherry Hill, and Richard C. Ditzler, Glenora, both of N.J., assignors to Ultra-Heat Corporation, Cinnaminson, N.J.  
Filed Dec. 1, 1977, Ser. No. 856,606  
Int. Cl.<sup>2</sup> A47J 27/00; H05B 3/30  
U.S. Cl. 99—446 18 Claims

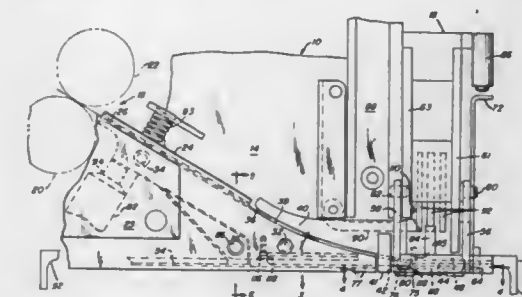
1. An electric cooker for flare broiling of meats containing fats, said cooker comprising a housing, a grate mounted within said housing for supporting meats to be broiled; a high temper-

ature heater block mounted under said grate; and means for energizing said heater block;  
said heater block including:  
a plurality of ferrous bodies having mating clamping faces, said face of one of the bodies having a small groove therein,  
and a heater element including a ferrous sheath and a high resistance heater wire in said sheath, said sheath having linear and cross-sectional shapes substantially similar to corresponding shapes of said groove,  
said one body having a large outer surface extending under said grate to receive melted fats dripping from the broiling meat,



and said heater element sheath being mounted in said groove and the high temperature portions thereof clamped between said bodies to be fully enclosed thereby and isolated from contamination by dripping fats and so that heat developed in said heater element is transferred over the large outer surface of said one body;  
and said heater block energizing means including means for electrically energizing said heater wire to operate said outer surface of the heater block at a temperature above 1200° F., so that dripping fats falling on said outer surface flare up and, in the burning thereof, contribute heat to the broiling of the meat,  
whereby said cooker tends to be energy efficient and to avoid deterioration of said heater element by contaminants in the cooking environment.

**4,164,176**  
**STRAPPING MACHINE WITH STRAP STOP BARRIER, PIVOTABLE CLAMP AND ADJUSTABLE SHEAR ANVIL**  
S. Bernard Brouse, Orland Park, and John Wiedel, Chicago, both of Ill., assignors to United States Steel Corporation, Pittsburgh, Pa.  
Filed Feb. 21, 1978, Ser. No. 879,645  
Int. Cl.<sup>2</sup> B65B 13/04  
U.S. Cl. 100—4 5 Claims



1. In a strapping machine including feed means for longitudinally feeding a free end of strap to form a loop about an article

so that a portion of said strap is overlapping, clamping means for holding the strap near the free end, tensioning means for tightening the loop, sealing means for securing the overlapped strap portions, and shearing means for cutting the formed loop from the remaining strap, said machine having an entry guide, a loop track, and a re-entry guide,

the improvement in said machine which further comprises: a barrier for stopping travel of the strap within the sealing means as received from the re-entry guide so as to control the extent of overlapping strap portions therein, a sensor activated by said barrier for terminating operation of the feed means, and, a guideplate having separate parallel tracks in overlying relationship running longitudinally therethrough for conducting the strap through the sealing means as received from the entry and re-entry guides respectively, said tracks enclosing about one half of the cross section of said strap along the longitudinal direction of said guideplate and being open on the opposite half cross section, a guide means spaced from the open side of said tracks so as to guide the strap therealong, said guideplate being pivotally mounted to the sealing means for rotation about an axis parallel to the longitudinal axis of the strap therein; and means for pivoting the guideplate so as to release the strap from the tracks in preparation for sealing.

#### 4,164,177 METHODS AND APPARATUS FOR ROLLING MATERIAL INTO A PACKAGE

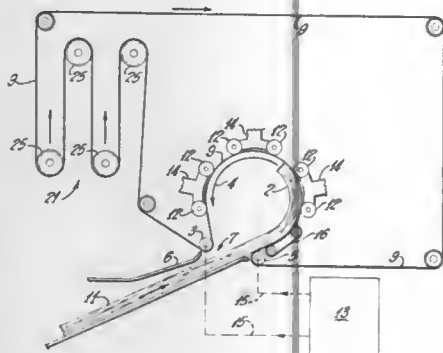
Sheldon A. Canfield, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Sep. 7, 1978, Ser. No. 940,225

Int. Cl.<sup>2</sup> B30B 13/00, 5/06

U.S. Cl. 100—40

32 Claims



1. A method for controlling the diameter of a rolled package of compressible mat material comprising the steps of feeding said material into engagement with a belt moving along a path defined by its length, said belt defining a roll-confining collection region for rolling said material into a package and from which said package is subsequently released, controlling the rate of said belt upon engagement of the said material with the belt and upon disengagement from said belt at the collection region, controllably altering the said rates of engagement and disengagement of said belt with the said material from the time of engagement of the said material with the said belt, determining when the said rolled package has reached a predetermined size and releasing the said package from the said collection region whereby a desired size rolled package is produced.

#### 4,164,178 CONTAINER, CLOSABLE BY A LID, FOR RECEIVING AND COMPRESSING WASTE

Manfred Baumann, and Walter Besserer, both of Diepoldsau, Switzerland, assignors to Apura GmbH, Mainz-Kostheim, Fed. Rep. of Germany

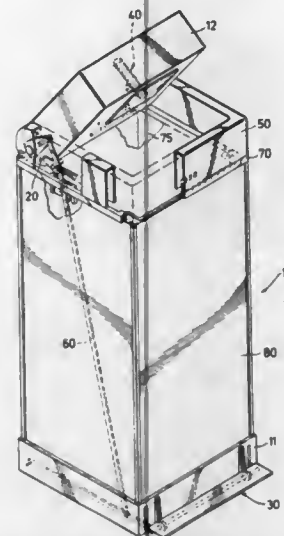
Filed Apr. 18, 1978, Ser. No. 897,452

Claims priority, application Switzerland, Apr. 19, 1977, 004858/77

Int. Cl.<sup>2</sup> B30B 1/04

U.S. Cl. 100—99

25 Claims



1. A container for waste material such as paper or the like, comprising,  
a casing forming a stationary container for waste material and including a top structure defining an opening for entry into the container,  
a lid pivotally mounted at one end on the casing adjacent the opening for movement between an open position allowing waste to be put into the stationary container through the top structure, and a closed position closing the opening of the container,  
the lid being integrally formed with a downwardly projecting portion that, in the closed position, extends into the stationary container beyond the upper extremity of said top structure to compressively occupy a volume within the container at least equal to that of an item of waste for which the container is intended, and means for releasably retaining the lid in its closed position.

#### 4,164,179 DEPOSITORY SYSTEM

Richard S. McLaughlin, Dallas; Walter Plaski, Irving, and Robert F. Swartzendruber, Plano, all of Tex., assignors to Docutel Corporation, Dallas, Tex.

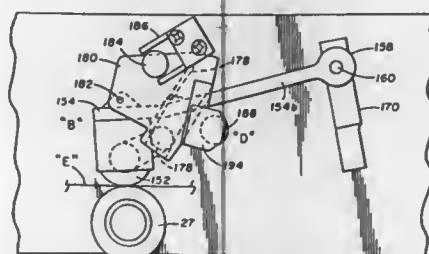
Division of Ser. No. 516,592, Oct. 21, 1974, Pat. No. 4,067,267.

This application Jul. 1, 1977, Ser. No. 812,258

Int. Cl.<sup>2</sup> B41J 1/44

U.S. Cl. 101—76

3 Claims



1. A character printer in an automatic document depository

having a supporting frame and wherein transport means moves the document to a print station, comprising:

A printhead assembly having one end rotatably mounted to the supporting frame of said document depository,  
a printing machine having sequentially varying characters and attached to the printhead assembly at a position displaced from one end,  
a carrier housing pivotally mounted to said printhead assembly and having at least one side (end plate) extending past (one side of) said printing machine, said carrier housing including a cam roller as a part thereof,  
a first cam follower attached to the supporting frame in a fixed position relative to the rotatably mounted one end of said printhead assembly and in engagement with said cam roller,  
a second cam follower as an integral part of the one side (plate) of said carrier housing at a position displaced from (the one side of) said printing machine, an indexing lever connected to said printing machine and in engagement with the second cam follower, said indexing lever to be actuated by the cooperation of said indexing lever with said second cam follower to sequentially vary the character arrangement of said printing machine, and means for rotating said printhead assembly from a first position to a second position to move said printing machine into (in) contact with a document at the print station, and to pivot said carrier housing by cooperation of the cam roller with said first cam follower thereby indexing said printing machine by actuating said indexing lever through cooperation with the second cam follower.

#### 4,164,180 IMPACT PRINTER INCLUDING HAMMER BANK ASSEMBLY

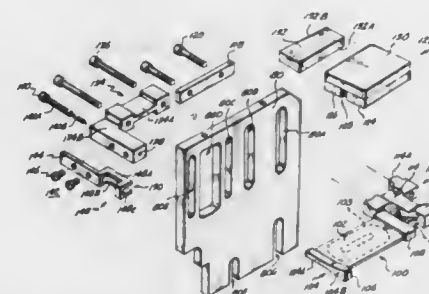
Larry P. Ellefson, Seattle; Robert J. Brooks, Woodinville; Kenneth G. Real, Redmond, and John A. Manthey, Kirkland, all of Wash., assignors to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Sep. 29, 1977, Ser. No. 837,829

Int. Cl.<sup>2</sup> B41J 9/30

U.S. Cl. 101—93.34

10 Claims



1. An improved hammer bank assembly for use in impact printers, said hammer bank assembly comprising:  
(a) a plurality *n* of magnet modules, each of said plurality of magnet modules including at least one substantially flat permanent magnet;  
(b) an assembly support member;  
(c) first means securing said plurality of magnet modules to said assembly support member in a spaced-apart manner so that said permanent magnets are parallel to each other and define a plurality of air gaps, each said air gap being located between adjacent ones of said plurality of permanent magnets;  
(d) a plurality of *n*-1 of hammer modules, each of said plurality of hammer modules including  
a substantially flat body containing an electrical coil, said body having first and second ends,  
a hammer head attached to said first end and coplanar with said body, said hammer head having a first portion, of substantially elongated, rectangular configuration, and a

second portion integral with and tapering outwardly from said first portion, and a hammer face projecting from said second portion;  
a base attached to said second end, and a pair of electrically-conductive spring members secured to and extending from said base, said pair of electrically-conductive spring members being interconnected with said electrical coil;  
(e) a plurality of *n*-1 of hammer support members, each of said plurality of hammer support members receiving a corresponding said pair of electrically-conductive spring members thereby support one of said plurality of hammer modules for pivotal movement in a predetermined plane;  
(f) second means securing said plurality of hammer support members to said assembly support member in a spaced-apart manner so that said bodies of said plurality of hammer modules are parallel to each other and so that said bodies are located in corresponding ones of said plurality of air gaps, whereby each of said hammer modules is free to pivot in its predetermined plane upon application of an electrical signal to said electrical coil via said pair of electrically-conductive spring members;  
(g) a plurality *n*-1 of hammer guide members, each of said plurality of hammer guide members defining therein an elongated, substantially rectangular groove complementary to said first portion of each said hammer head; and  
(h) third means securing said plurality of hammer guide members to said assembly support member in a spaced-apart manner so that said first portion of said head of each of said plurality of hammer modules is received in a corresponding one of said grooves, the dimension of each said groove in a direction transverse to the predetermined plane of hammer movement being larger than a corresponding dimension of said first portion but small enough so that said first portion contacts said hammer support member upon deflection of said hammer module in directions transverse to its predetermined plane before the associated body contacts either of said adjacent ones of said plurality of permanent magnets.

#### 4,164,181 PRINTER

Seiji Hanaoka, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

Continuation-in-part of Ser. No. 575,814, May 9, 1975, Pat. No. 4,033,256. This application Jul. 1, 1977, Ser. No. 812,301

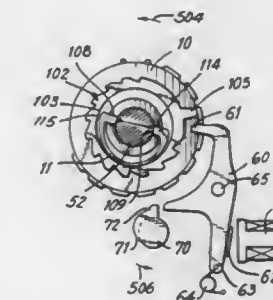
Claims priority, application Japan, May 9, 1974, 49-51470

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> B41J 1/44

U.S. Cl. 101—99

7 Claims



1. An improved printer for printing a web of paper comprising rotatable drive shaft means, at least one character ring having a plurality of characters on the periphery thereof, each said character ring being supported on said drive shaft means, spring coupling means having a pair of opposed ends that are resilient with respect to each other, said spring coupling means



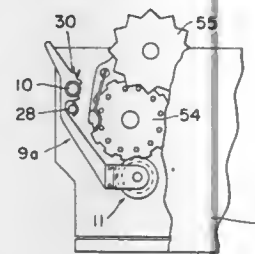
being mounted to each said character ring for engaging said drive shaft means, each said character ring having a ratchet wheel disposed thereon, pawl means associated with each said character ring, each said pawl means being coordinately displaceable between a rest position and a print position, means for coordinately displacing each of said pawl means between said rest and print positions, each said pawl means being adapted to engage said ratchet wheel on said associated character ring when said character ring is stopped, and including a projection on each of said opposed ends of said spring coupling means for engaging said drive shaft means, the distance between said first and second projection being  $\alpha$ , said diameter of said drive shaft means being  $\beta$ , and  $\alpha \leq \beta$ .

4,164,182

### CARTRIDGE-TYPE INK SUPPLY DEVICE FOR LABELING MACHINES

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan  
Division of Ser. No. 663,693, Mar. 4, 1976, Pat. No. 4,083,300, which is a continuation-in-part of Ser. No. 539,842, Jan. 9, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,228  
Claims priority, application Japan, Mar. 6, 1975, 50-26525  
Int. Cl.<sup>2</sup> B41F 1/46, 1/02

U.S. Cl. 101-103



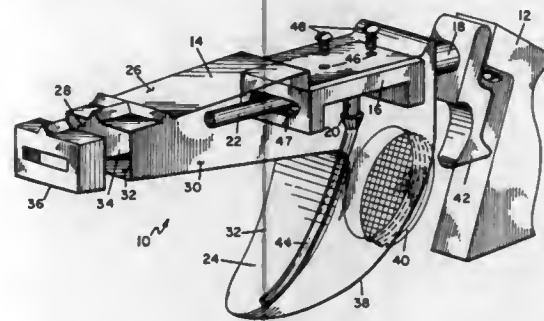
1. In an ink supply device for supplying ink onto a type surface of a printing mechanism of a labeling machine, said printing mechanism being used for printing inscriptions on each of a series of labels fed by indexed movement along a travel path thereof within the machine, said ink supply device comprising an ink roller cartridge holder provided at one end thereof with a part adapted for supporting and attaching detachably the ink supply device onto the labeling machine and at the other end with a U-shaped inking roller support adapted for detachably engagement with an inking roller cartridge having therein at least one inking roller: an improvement wherein said cartridge holder comprises a traverse pin fixedly supported adjacent said printing mechanism parallel to the axis thereof and between the opposed side walls of the labeling machine frame, a fingerhold tab formed at one end thereof and at least a pair of gripping jaws adjacent said fingerhold tab which are integrally made of plastic material for relatively loose gripping or clamping engagement with said transverse pin; and spring means adapted for urging said jaw part against said transverse pin; said cartridge holder being easily and securely mountable on and easily dismountable from said transverse pin as said gripping jaws are manipulated into and out of gripping engagement with said transverse pin by grasping said fingerhold tab.

### 4,164,183 STENCILING APPARATUS HAVING IMPROVED CASING STRUCTURE

Gregory G. A. Peck, 165 Evergreen Dr., Gorham, Me. 04038  
Continuation-in-part of Ser. No. 629,650, Nov. 6, 1975, Pat. No. 4,048,918. This application Sep. 19, 1977, Ser. No. 834,708  
Int. Cl.<sup>2</sup> B41F 15/36

U.S. Cl. 101-114

5 Claims



1. An improved casing for a stenciling apparatus of the type containing a stenciling medium therein to be delivered by means of a compressed air stream to a surface to be marked having the upper rear portion of the casing adapted to accommodate therein a housing incorporating the convergence of means for compressed air supply delivery, means for stencil medium pickup and means for stencil medium delivery to said surface, said casing having a forward portion formed by an upper surface sidewall, a bottom surface sidewall and a pair of sidewalls all forming at said forward portion a substantially rectangular aperture aligned to oppose said rear portion of said casing and the stenciling medium delivery means wherein the improvement comprises:

- said bottom surface sidewall extending from said rectangular aperture rearward at an incline and at a position below said housing curving abruptly downward and then forward at its lower extent;
- a lower rear sidewall extending from the upper rear portion of said casing downward in a forwardly bowed curve meeting said bottom surface sidewall; and
- said pair of surface sidewalls extending downward meeting said bottom surface sidewall and said lower surface sidewall forming an improved stenciling medium recycling and holding area in the shape of a forwardly extending cusp in order to better retain said stenciling medium in said holding and recycling area when the stenciling apparatus is used in a vertical position.

4,164,184

### COMPENSATING ROTARY SCREEN SUPPORTS

Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands  
Continuation of Ser. No. 633,154, Nov. 18, 1975, abandoned.  
This application Mar. 28, 1977, Ser. No. 782,291  
Claims priority, application Netherlands, Dec. 2, 1974, 7415717

Int. Cl.<sup>2</sup> B41F 15/38

U.S. Cl. 101-127.1

5 Claims



1. Improvement in a rotary screen printing machine with a supporting structure mounted on a frame of the machine for

supporting at least one cylindrical stencil having two end rings each being mounted to a respective end of the stencil via a circular connecting area, the supporting structure comprising:

- two stationary members supported by said frame, said stationary members being arranged so as to be positioned on opposite sides of a supported stencil;

two sleeves, each coupled to a respective one of said stationary members and connected with a respective end ring of the stencil;

the improvement comprising the combination of: self-aligning bearings between each stationary member and each sleeve for rotatably supporting the stencil; and universal coupling means between the end rings of the stencil and said sleeves so as to allow the end rings to undergo a universal tilting movement about a central point in the connecting area of the stencil with each of its end rings so that the centre line of the stencil is free of lateral displacement,

said universal coupling means formed by the provision of complementary cooperating spherical surfaces on each of said sleeves and the corresponding said end ring of said stencil in the area of the connection between said sleeve and said end ring.

4,164,185

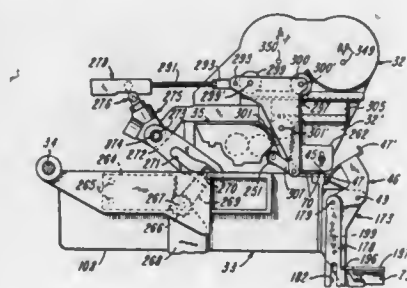
### INKING MECHANISM

Raymond L. Kirby, Jr., Vandalia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio  
Continuation of Ser. No. 396,932, Sep. 13, 1973, abandoned.  
Continuation-in-part of Ser. No. 215,783, Jan. 6, 1972. This application Jul. 11, 1977, Ser. No. 814,612

Int. Cl.<sup>2</sup> B41F 1/50, 31/08

U.S. Cl. 101-348

7 Claims



1. An inking mechanism, comprising: a shaft, an ink roll secured to the shaft, means for driving the shaft, a pump for supplying ink to the ink roll, the pump including a pump body having a bore and an ink inlet opening into the bore, a curved tube communicating with the pump body, a helical spring secured to the shaft, rotatable in the tube and having a portion extending into the bore, a straight rod disposed substantially only within the portion of the spring in the pump body, the outside diameter of the rod being greater than the internal diameter of the spring before the rod is inserted into the spring so that when the rod is inserted into the spring the spring grips the rod and the rod and the spring are rotatable as a unit, and means for driving the spring and the rod as a unit, there being only slight clearance between the spring and the bore so that as the spring and the rod rotate, ink between the rod and the bore and between the coils of the spring is conveyed upwardly.

4,164,186

### SUBMARINE SIGNAL FUZE

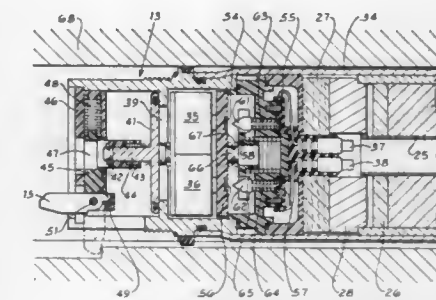
Bobby D. Beatty, Bloomfield; Russell D. Daniel, Bloomington, and Billy J. Humerickhouse, Odon, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1977, Ser. No. 844,328

Int. Cl.<sup>2</sup> F42B 4/26

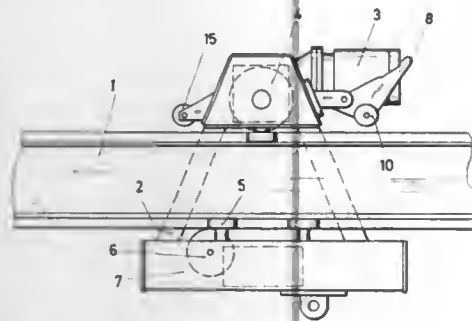
U.S. Cl. 102-37.8

3 Claims



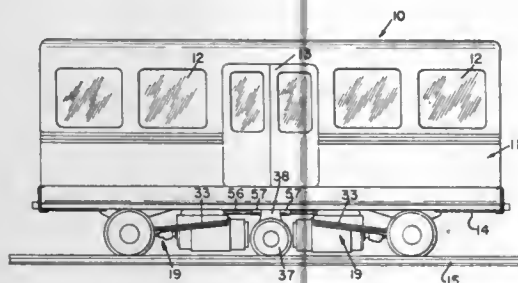
1. A signaling device adapted to be launched in a body of sea water beneath the surface thereof comprising, a fuze body having an inner chamber, and an aperture communicating therewith, a projectile shell attached to said fuze body and containing a pyrotechnic composition therein, at least one electrical squib having first and second leads for igniting said pyrotechnic composition when said squib is energized, at least one sea water battery having output terminals and being positioned in said inner chamber, valve means in said fuze body normally closing said aperture communicating with said inner chamber of said fuze body from said body of sea water, a latching assembly for locking said valve means in a closed position prior to launching said signaling device, first and second spaced apart stationary electrical contacts, a movable breaker plate, at least one contact attached to said movable breaker plate, first circuit means connecting one battery output with said first stationary electrical contact and second circuit means connecting the other battery output with said second stationary electrical contact, third circuit means connecting one squib lead to said second stationary electrical contact and fourth circuit means connecting the other squib lead with said contact attached to said movable breaker plate, means for moving said movable breaker plate whereby said at least one contact attached to said movable breaker plate is engageable with said first stationary electrical contact to connect said sea water battery with said squib, stop means for preventing movement of said circuit breaker plate when said valve means is closing said aperture, and a coil spring engageable with said second stationary contact and with said contact on said movable breaker plate for shorting said first and second squib leads, said coil spring being insufficient in length to contact both said second stationary contact and said contact on said movable breaker plate when said contact on said movable breaker plate engages said first stationary contact.

4,164,187  
**MOTORIZED OVERHEAD TROLLEY**  
 Karl E. Kaufmann, Wetter, Fed. Rep. of Germany, assignor to  
 DeMag Aktiengesellschaft, Duisburg, Fed. Rep. of Germany  
 Filed Apr. 1, 1977, Ser. No. 783,609  
 Claims priority, application Fed. Rep. of Germany, Apr. 28,  
 1976, 2618516  
 Int. Cl.<sup>2</sup> B61B 3/02; B61C 3/00, 13/06; B61F 11/00  
 U.S. Cl. 104—93 9 Claims



1. An overhead trolley comprising
  - (a) a rail;
  - (b) a trolley body for travel on said rail;
  - (c) a drive wheel on said trolley body engaging said rail;
  - (d) a drive motor connected to said drive wheel; the improvement characterized by
  - (e) a rocker arm pivotally mounted on said trolley body;
  - (f) an auxiliary wheel mounted on said rocker arm;
  - (g) said auxiliary wheel pivotal on said arm from a position away from said rail to a position engaging said rail;
  - (h) the pivot axis of said rocker arm being at a distance from said rail less than the pivot axis of said drive wheel;
  - (i) whereby said rail engaging position of said auxiliary wheel raises said body with said drive wheel away from said rail; and
  - (j) support means on said trolley body and spaced from said auxiliary wheel;
  - (k) said support means engaging said rail in the raised position of said drive wheel;
  - (l) whereby the auxiliary wheel and support means hold the drive wheel in elevated position when said auxiliary wheel and support means engage the rail.

**4,164,188**  
**SELF STEERING RAILWAY CAR**  
 Keith J. Hallam, Merrillville, Ind., and Willis H. Knippel, Palos  
 Park, Ill., assignors to Pullman Incorporated, Chicago, Ill.  
 Filed May 26, 1977, Ser. No. 800,687  
 Int. Cl.<sup>2</sup> B61C 3/00; B61F 3/04, 5/22, 5/46  
 U.S. Cl. 105—166 26 Claims

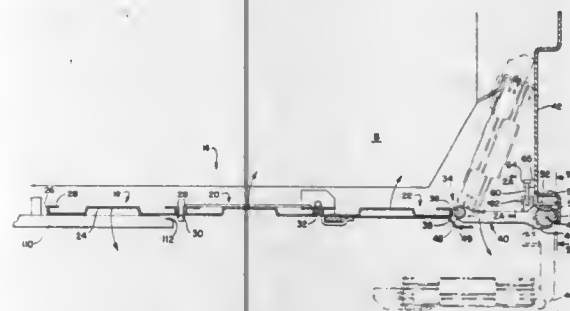


1. A railway car having a body,  
an under frame for supporting said body including a chassis,  
a sub-frame assembly at each end of the chassis,

each sub-frame including a first axle and drive wheels supporting the chassis, means connecting each sub-frame assembly for turning movement relative to said chassis for guided engagement with associated tracks, a second axle and wheel assembly positioned between said sub-frames, guide means slidably guiding said second axle and wheel assembly for transverse movement relative to said chassis, said guide means including a guide element extending transversely of said chassis, and said second axle and wheel assembly including a guided yoke member supported by said second axle with means on said guided yoke member engaging said guide member in slidably guided relation during relative transverse movement whereby positive engagement of said second axle and wheel assembly with associated tracks is assured, and a steering beam assembly directly connected to said second axle and wheel assembly and longitudinally projecting therefrom toward respective sub-frame assemblies and directly operatively connected to each of said sub-frames and movable in a substantially constant horizontal plane with said second axle and wheel assembly transversely relative of the car in response to track curvature and turning said sub-frames for steering said drive wheels.

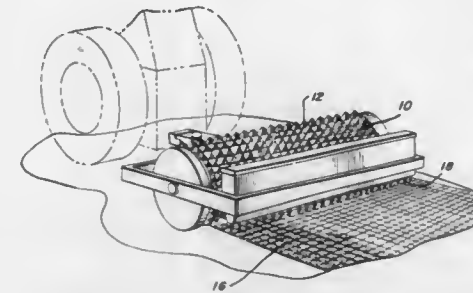
4,164,189  
DOOR ASSEMBLIES FOR CLOSING RAIL CAR END  
OPENING

William E. Fritz, Longwood, Fla.; Mark L. Graves, Munster, Ind., and Robert F. Seitz, Mentor, Ohio, assignors to The Youngstown Steel Door Company, Cleveland, Ohio  
Filed Mar. 8, 1976, Ser. No. 664,913  
Int. Cl. 2 B61D 19/00; E05B 65/14



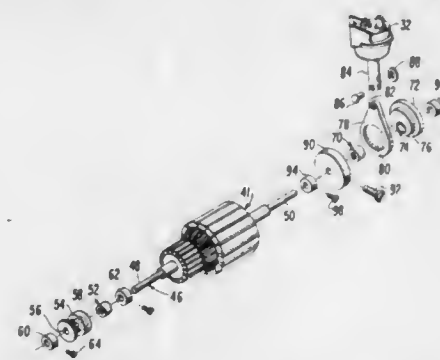
1. In a rail car having an interior cavity and an end opening for loading and unloading lading:  
a door assembly including a plurality of panels each pivotally movable with respect to the other for closing at least a portion of said opening.  
lock means,  
mounting means including a double vertical pivot means in addition to the pivot means making the panels each pivotally movable with respect to the other, for moving said door assembly between a stored position with the panels folded back upon one another as a unit at least partially within said cavity and a closed position in which said panels may be locked in substantially co-planer relationship,  
said double vertical pivot means are cranks journaled at both ends, the first portion of said double vertical pivot means operable for pivoting of the door assembly about a first vertical axis adjacent the opening defining the end edge of the car side wall and the second portion of said double vertical pivot means operable for pivoting of the door about a second vertical axis laterally spaced from the first and located adjacent the outmost edge of the outermost panel.

**4,164,190**  
**SEED PLANTING METHOD FOR CEREAL GRAINS AND GRASSES**  
**Dwight C. Newman, R.R. 1, Culver, Ind. 46511**  
**Filed Oct. 29, 1976, Ser. No. 736,894**  
**Int. Cl.<sup>2</sup> A01C 5/00; A01B 29/00**  
**U.S. Cl. 111—1** **18 Claims**



1. The method of planting seeds of cereal grains in a pattern comprising a plurality of longitudinal and transverse rows of seed planting sites, the transverse rows crossing the longitudinal rows, the improvement comprising, in combination: impressing a series of separate depressions in the ground in which each depression defines a generally variable depth, tapering to an apex area of maximum depth, in which the depressions have essentially common base sides at the ground surface with each adjacent depression along both the transverse rows and longitudinal rows, said apexes of the depressions being positioned in said longitudinal and transverse rows, and being spaced from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches apart along said longitudinal rows and  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches apart along said transverse rows so as to be essentially equally spaced in both directions along said longitudinal and transverse rows; and thereafter placing cereal grain seed into said depressions, whereby said cereal grain seeds tend to be positioned adjacent the apexes of the depressions, to be spaced from each other in a manner corresponding to the spacing of said apexes.

**4,164,191**  
**SEWING MACHINE MOTOR ACTUATED PNEUMATIC  
PUMP FOR NEEDLE THREADING**  
**Wesley R. Peterson, Bound Brook, N.J., assignor to The Singer  
Company, New York, N.Y.**  
**Filed Oct. 17, 1978, Ser. No. 952,509**  
**Int. Cl.<sup>2</sup> D05B 69/10, 69/18, 87/00**  
**U.S. Cl. 112—225** **3 Claims**



1. In a sewing machine having a main drive for imparting motion to stitch forming instrumentalities, including a needle bar arranged for reciprocatory motion having a thread carrying needle attached to one end thereof, an electric motor having a rotational drive shaft, and operative connections with said motor drive shaft for imparting rotation to said main drive; a pneumatic needle threading assist, a pneumatic pump for providing a flow of air through said pneumatic needle

threading assist, and a pump actuating mechanism including operative connections with said motor drive shaft including:

- a first overriding clutch means arranged in said operative connections for operating said sewing machine main drive, said first overrunning clutch means being arranged to engage said motor with said main drive when said motor is operated in a first direction compatible with the operation of said sewing machine instrumentalities, and to disengage said motor from said main drive when said motor is operated in a second direction, oppositely from said first direction;
- a second overriding clutch means arranged in said operative connections included in said pump actuating mechanism, said second overrunning clutch means being arranged to disengage said motor from said pump actuating mechanism when said motor is operated in said first direction, and to engage said motor with said pump actuating mechanism when said motor is operated in said second direction; and

means for selectively changing the direction of rotation of said motor.

**4,164,192**

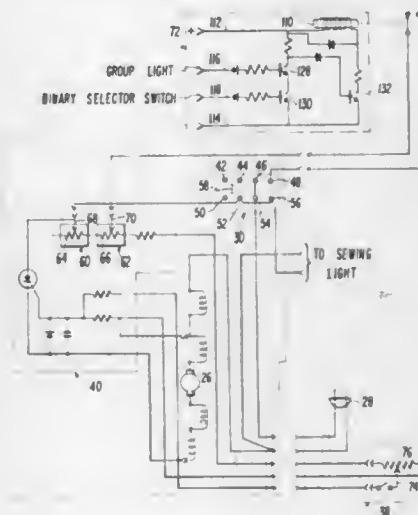
**SEWING MACHINE MOTOR SPEED LIMITING BY  
PATTERN SELECTION**

**John A. Herr, Garwood; Jack Brown, Union; Wesley R. Peterson, Bound Brook, and Wolfgang Jaffe, Roselle Park, all of N.J., assignors to The Singer Company, New York, N.Y.**

**Filed Nov. 30, 1978, Ser. No. 965,220**

**Int. Cl. D05B 3/02, 69/18**

**U.S. Cl. 112—158 E** **5 Claims**

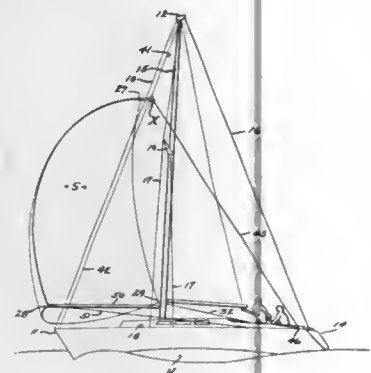


1. In a zig-zag sewing machine having stitch forming instrumentalities, including a thread carrying needle and a work feeding mechanism, a motor for driving said stitch forming instrumentalities; electronic means for selectively controlling said stitch forming instrumentalities in accordance with pre-programmed stitch patterns, and a motor speed control having at least a high speed range and a slow speed range, a switch for selecting between said high speed range and said slow speed range, means for automatically limiting the maximum speed of said sewing machine motor to said slow speed range with certain of said selected stitch patterns comprising:
- means for sensing the selected stitch pattern;
  - means for determining whether speed limiting is necessary, and
  - means for selecting said slow speed range.



**4,164,193**  
**ADJUSTABLE SPINNAKER HEADER AND RIG THEREFOR**  
 Milton B. Smith, 1253 N. Bundy, Los Angeles, Calif. 90049  
 Filed Oct. 31, 1977, Ser. No. 847,003  
 Int. Cl.<sup>2</sup> B63H 9/10  
 U.S. Cl. 114—111

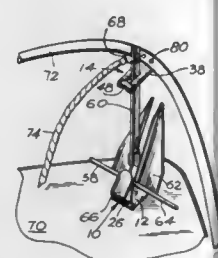
30 Claims



1. A spinnaker header for supporting a spinnaker sail and adjustable as to height along a forestay extending to a mast projecting aloft from a sailboat hull, and including; centering means guiding the header along the forestay, spinnaker coupling means securing the head of the spinnaker to the header and receiving the pulling force from said spinnaker, halyard coupling means securing a halyard line to the header to raise the header, downhaul coupling means securing a downhaul line to the header to lower the header, the said halyard line and said downhaul line cooperating to position the said header as to height along the forestay, and a backhaul coupling means securing the header to the boat hull to transfer pulling force from the header to said hull.

**4,164,194**  
**ANCHOR BRACKET**  
 John C. Kurz, 1250 Grant Ave., Philadelphia, Pa. 19115  
 Filed Aug. 11, 1977, Ser. No. 823,743  
 Int. Cl.<sup>2</sup> B63B 21/22  
 U.S. Cl. 114—210

5 Claims

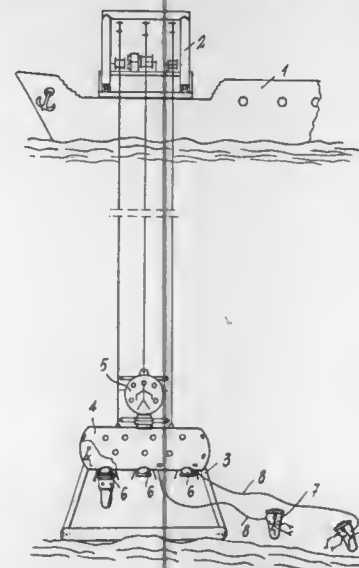


1. In an anchor bracket for supporting an anchor including a shank, a pivot bar and flukes above the deck of a boat, the combination of  
 base support means to support the anchor,  
 said base support means comprising at least one support leg adapted to receive a first part of the anchor,  
 said support leg including a body extending above the deck, said body being upwardly formed to provide a cradle,  
 said cradle being spaced above the deck and being configured to receive and support the anchor pivot bar in spaced relationship above the deck; and  
 lock means affixed above the base support means to engage the shank part of the anchor,  
 said lock means being adapted to support the shank in substantially vertical position,  
 at least a part of the lock means being affixed in substantial

vertical registry above at least a part of the base support means,  
 the lock means comprising a body having a base and a pair of lock legs extending from the base, the lock legs defining a slot therebetween, the slot being adapted to receive and retain a portion of the anchor shank there-within to support the shank in substantially vertical relationship above the deck,  
 the lock means further comprising a movable closure to selectively enclose the slot, said movable closure being adapted to lock the anchor shank within the said slot, whereby the anchor can be secured above the deck.

**4,164,195**  
**IMMERSION APPARATUS CARRYING DETACHABLE AND SELF-CONTAINED PROSPECTING AND SUBMARINE WORK UNITS**  
 Gianfranco Frigeni, Via Portadipinta, 38 - Bergamo, Italy  
 Filed Jun. 23, 1978, Ser. No. 918,435  
 Claims priority, application Italy, Jul. 29, 1977, 2923 A/77  
 Int. Cl.<sup>2</sup> B63G 8/24  
 U.S. Cl. 114—322

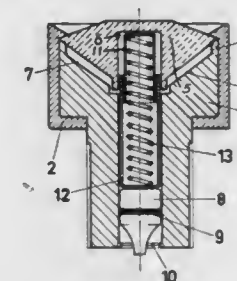
5 Claims



1. An immersion apparatus for carrying out submarine works, associated with a surface unit with sea lowering systems on said surface unit and connected through cables to the immersion apparatus, comprising a master chamber guided and driven by means of tensioned constant force cables to the proximity of operation site or location, on said master chamber a coupling and transfer assembly at the bottom thereof with at least one coupling chamber designed to form a watertight chamber, each of which is provided with a pump for sea water inlet and outlet, with removable closure means, at least two movable units for prospecting and work on the sea bottom, each of the movable units being capable of communication with the master chamber through the watertight chamber of said coupling and transfer assembly and forming the bottom of the watertight chamber for said transfer, assembly wherein each of said movable units comprise an internally hollow cylinder-like body closed at the lower end and having a removable closure at the upper end, provided with work and inspection portholes with work iron hands in the form of arms projecting from outside and controllable from inside said movable unit, as well as propelling means also controllable from inside said movable unit by a pedal system, each of said movable units being connected by an umbilical cord with the master chamber and comprising a detachable ballast, the iron hand arms and the umbilical cord being rapidly detachable in case of fast emergency ascent.

**4,164,196**  
**PRESSURE GAUGE OR PRESSURE INDICATOR HAVING AXIALLY-OPERATING INTERNAL MEMBERS WITH VISUAL INDICATION**  
 Fabio Stradella, and Cinzia Stradella, both of Piazza S. Giovanni Bono, 39/12, Recco, Genoa, Italy  
 Filed Nov. 2, 1977, Ser. No. 847,700  
 Claims priority, application Italy, Mar. 25, 1977, 12527 A/77; Jun. 13, 1977, 12637 A/77  
 Int. Cl.<sup>2</sup> G01L 7/16  
 U.S. Cl. 116—272

9 Claims



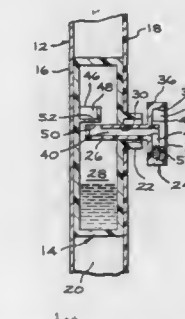
1. A pressure indicator comprising a hollow main body, said main body defining a lower neck portion having a circular channel centrally defined therein and means operable for pressure-tight attachment of said indicator to a vessel, and an upper portion, an upper rim portion of said upper portion defining a seat;  
 a circular transparent member having an upper surface and a convex conical lower surface with a blind hole centrally opening on said lower surface so as to define a closed axial chamber in said transparent member, said chamber registering with said neck portion channel, at least a portion of said lower conical surface being seated on said main body seat;  
 an outer casing disposed about the upper portion of said main body and operable to retain said transparent member in seated, pressure-tight relationship with said main body; and  
 pressure indicating means disposed in said channel and said chamber, said pressure indicating means comprising an upper cup-shaped plunger, the closed end of which is disposed in said transparent member chamber, an opposed lower cup-shaped plunger telescopically mounted over said upper plunger and slidably disposed in said main body channel, the outer surface of said lower plunger being visually distinctive from that of said upper plunger, and spring means disposed between said plungers and opposing pressure forces communicated to said lower plunger.

**4,164,197**  
**LIQUID LEVEL INDICATING DEVICE**  
 Thomas E. Nelson, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.  
 Filed Nov. 16, 1977, Ser. No. 852,137  
 Int. Cl.<sup>2</sup> G01F 23/02  
 U.S. Cl. 116—227

14 Claims

1. In combination with a dishwashing machine of the type having a door movable between an open and closed position; a liquid dispenser tank mounted to said door, the dispenser tank including an opening formed in a filler spout extending through the inside of said door allowing refilling of said dispenser tank with liquid dispensed therefrom;  
 a liquid level indicator device providing a visual indication of the level of liquid in said dispenser tank whenever said level is at or above a predetermined level;  
 said indicator device comprising an indicator knob having a stem portion extending vertically into said dispenser tank with said door in said open position and disposed in said tank with said door in said open position and disposed in

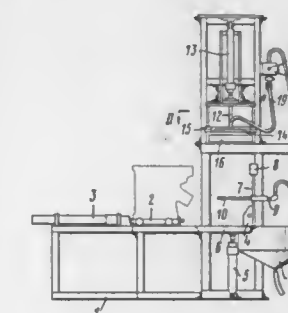
said fill opening providing a closure for said dispenser tank fill opening;  
 a viewing chamber formed by a recess within said indicator knob;  
 a sight window covering said viewing chamber in said indicator knob;  
 feed means for causing a predetermined quantity of liquid to flow from said dispenser tank into said viewing chamber upon closing of said door only when the level of liquid in said dispenser tank is at or above said predetermined level; and means retaining a portion of said liquid in said viewing chamber upon opening of said door, whereby the presence of the liquid in said viewing chamber provides a visual



indication that the level of said liquid in said tank is above said predetermined level, wherein said feed means includes at least one feed passage extending within said stem portion and further includes an opening at an end portion of said stem in communication with said feed passage, wherein said feed means further comprises a feed reservoir located in said dispenser tank to capture a quantity of liquid as said dispenser tank is repositioned and the liquid redistributes itself upon opening of said door, whenever said liquid level in said tank is above said predetermined level and further including means causing flow of said captured quantity of liquid into said opening in said end of said stem portion.

**4,164,198**  
**INSTALLATION FOR APPLYING A COAT TO THE ENTIRE INNER SURFACE OF A SECTIONALIZED HOLLOW ITEM**  
 Evgeny I. Shelnin, Moscow; Nell S. Belostotskaya, Reutovo, and Lev N. Yakovlev, Zhelezodorozhny, all of U.S.S.R., assignors to Gosudarstvenny Nauchno-Issle-Dovatel'sky Institut Stroitel'noi Keramiki Niistroi'keramika, U.S.S.R.  
 Filed Oct. 28, 1977, Ser. No. 846,565  
 Int. Cl.<sup>2</sup> B05C 7/04  
 U.S. Cl. 118—315

2 Claims



1. Apparatus for applying a coating on inner surfaces of a cavity in an article of manufacture comprising, a carriage movable to a spray station and retractable therefrom selectively, means for moving said carriage to said station and retracting it therefrom, said carriage comprising means for mounting and releasably holding an article of manufacture

having a cavity open on a top end of the cavity and closed at the bottom thereof and a lateral opening into said cavity intermediate the open top of the cavity and closed bottom thereof, a tiltable device at said spray station comprising means for receiving said carriage with said article thereon and releasably holding said carriage in a tilted position, means for selectively tilting said tiltable device to a tilted position for tilting said article for draining excess coating material therefrom through said lateral opening, spray mechanism comprising a first spray device insertable into said cavity of said article through said lateral opening for spraying upwardly a coating material in said cavity and allowing coating material to drain to the bottom of the cavity, a second spray device in said spray mechanism insertable into said cavity through said top opening and spraying coating material along upper peripheral interior edges of said cavity and allowing coating material to drain to said closed bottom, said spray mechanism including a closure device movable into position overlying said top opening and closing said cavity during spraying of said coating material, means for automatically moving and actuating said first and second spray device and said closure in timed relationship, and receptacle means disposed for receiving excess coating material drained from the bottom and interior of said cavity through said lateral opening upon cessation of spraying in said cavity and said article is tilted to drain said excess coating material.

4,164,199

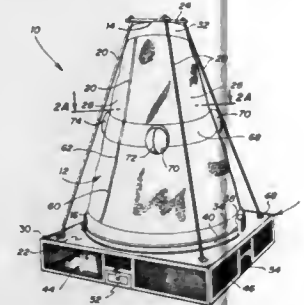
**BENTHIC AQUATIC BIOTAL MONITOR**

Willis E. Pequegnat, College Station, Tex., assignor to TerEco Corporation, College Station, Tex.

Filed Aug. 19, 1977, Ser. No. 826,052

Int. Cl.<sup>2</sup> A01K 61/00, 69/04

U.S. Cl. 119—2



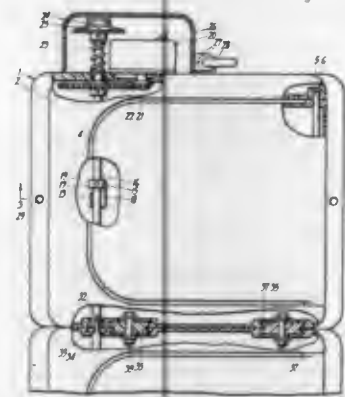
1. A benthic monitoring device for monitoring in situ samples of benthos in a body of water comprising:
  - a base portion including means for retaining benthic samples and having a horizontal top wall, a horizontal water permeable bottom wall and water permeable vertical side walls,
  - a water permeable mesh attached to and extending above said base portion to form a conical-shaped enclosure decreasing in cross-sectional area from one end to the other end, the larger end thereof being secured to said base portion and opening thereinto, the smaller end thereof being closed;
  - means attached to said base portion for supporting said conical-shaped enclosure above said base portion;
  - means for attaching said larger end of said conical-shaped enclosure to said base portion;
  - said conical-shaped enclosure including means for retaining benthic samples; and
  - said conical-shaped enclosure and said base portion having apertures therethrough with dimensions for retaining benthic samples while permitting the free exchange of ambient water between the outside of said conical-shaped enclosure and the inside of said conical-shaped enclosure to monitor the impact of changing aquatic environments on the benthic sample.

**4,164,200**  
**FEEDING DEVICE**  
Kenneth H. Gambling, Rosanna, Australia, assignor to Set 'N' Forget Products Pty. Ltd., Australia  
Filed Sep. 23, 1977, Ser. No. 836,079  
Claims priority, application Australia, Sep. 24, 1976, PC7498; Jul. 6, 1977, PP0725

Int. Cl.<sup>2</sup> A01K 5/02

U.S. Cl. 119—51.12

10 Claims



1. An animal feeder driving module including a food container, a housing for said food container, a lid hingedly attached to said food container housing, biasing means associated with said food container housing which urges said lid toward an open position, latch means on said lid, means cooperating with said latch means to normally maintain said lid in a closed position, a timing device mounted to said housing and turning a shaft extending through said housing, a trip collar located on said shaft and adapted to release said cooperating means to allow said lid to open, a free end of said shaft extending outward from said housing and including longitudinal coupling means for coupling said shaft longitudinally with a shaft of a similar animal feeder slave module, only said master module including said timing device.

4,164,201

**GROUND-SUPPORTED POULTRY DRINKING FOUNTAIN**

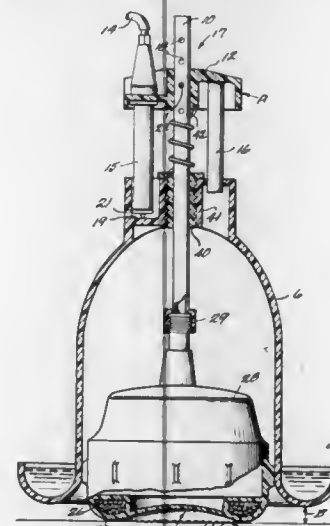
Robert A. Vanderhye, Springfield, Va., assignor to Interfarm Corporation, McLean, Va.

Filed Oct. 17, 1977, Ser. No. 843,055

Int. Cl.<sup>2</sup> A01K 39/02, 7/02

U.S. Cl. 119—81

7 Claims



7. A poultry drinking fountain comprising:

a generally bell-shaped member with a generally annular trough portion at the lower end thereof, and a hollow interior;

a ground-engaging support member adapted to have sufficient mass to support said bell-shaped member in an upright position so that poultry may drink out of said trough portion without tip-over, said support member disposed within the hollow interior of said bell-shaped member;

a valve member for supplying water from a source to said trough portion, said valve member movable between open and closed positions;

a valve support member for said valve for mounting said valve member;

connection means extending from said support member through said bell-shaped member to said valve support member for rigidly attaching said support member to said valve support member and including a single rod concentric with said support member and said bell-shaped member and said connecting means further including adjustment means for providing adjustment of the vertical spacing of said valve support member, and thus said generally annular trough, from the bottom of said support member; means associated with said bell-shaped member for operatively engaging said valve member to move it from one position to another;

spring means for suspending said bell-shaped member from said valve support member independent of said connection means so that said annular trough will reciprocate vertically under the influence of said spring means with varying amounts of water disposed in said trough, causing said valve member to open to allow flow of water into said trough when the amount of water in said trough is below a predetermined level; and

said valve member being supported by said valve support member radially displaced from said rod, and a guide rod being provided parallel to said rod and said valve member radially spaced from said rod opposite said valve member; said valve member being rotatable with respect to said bell-shaped member upon lifting of said valve member against the bias of said spring means to a position whereat said valve member and said guide member clear interfering surfaces on said bell-shaped member, to allow ready access to and replacement of said valve member.

4,164,202

**STEAM GENERATION**

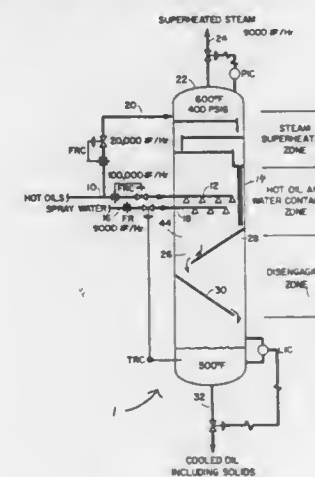
William Lockett, Jr., Basking Ridge, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 3, 1978, Ser. No. 893,064

Int. Cl.<sup>2</sup> F22B 1/16

U.S. Cl. 122—31 R

13 Claims



1. A process for controlling the rate of production of steam, which comprises: contacting a spray of liquid water drops with a spray of hot substantially non-volatile liquid drops in a con-

tacting zone to produce steam by direct heat exchange of said hot liquid and said water, said water drops having a mean average diameter of about one half the size of the mean average diameter of said hot liquid drops.

4,164,203

**FUEL PUMP INJECTOR**

Eric J. Cavanagh, Surbiton, England, assignor to Lucas Industries Limited, Birmingham, England

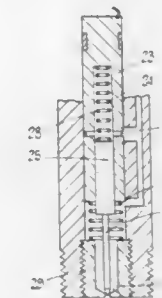
Filed Jan. 19, 1977, Ser. No. 760,582

Claims priority, application United Kingdom, Jan. 20, 1976, 2105/76

Int. Cl.<sup>2</sup> F02M 51/06

U.S. Cl. 123—32 JV

6 Claims



1. A fuel pump injector for mounting on an internal combustion engine so as to deliver fuel to a combustion space of the engine, the injector comprising in combination a housing, a bore defined in the housing, a plunger slidable within the bore, an outlet at one end of the bore, a valve for controlling fuel flow through said outlet, a fuel supply port opening into the bore at a position so that it is covered by the plunger during movement thereof towards said one end of the bore and an electromagnetic device for urging the plunger towards said one end of the bore whereby when said port is covered fuel is discharged through said outlet, said injector including a return spring for said plunger, said outlet comprised of an insert which is retained in said bore at said one end thereof, said insert defining a valve seat, said valve cooperating with said seat, said valve comprising an extension which is mounted on a cylindrical port slidable within a bore formed in said plunger, said bore being a blind bore and housing a spring action to urge said extension into contact with said seat, wherein said blind bore communicates with a further port formed in the wall of the bore mounting the plunger, said port and further port communicating with a fuel supply passage in the housing.

4,164,204

**SIMPLIFIED METHOD AND APPARATUS FOR ASSURING PERIODIC CONTROL OF THE TIMING OF AN INTERNAL COMBUSTION ENGINE**

Serge Guipaud, Castelnau-d'Aud, France, assignor to Societe Anonyme pour L'Equipelement Electrique des Vehicules S.E.V. MARCHAL, Issy les Moulineaux, France

Filed Aug. 13, 1976, Ser. No. 714,138

Claims priority, application France, Aug. 18, 1975, 75 25468

Int. Cl.<sup>2</sup> F02P 5/08, 3/02

U.S. Cl. 123—117 R

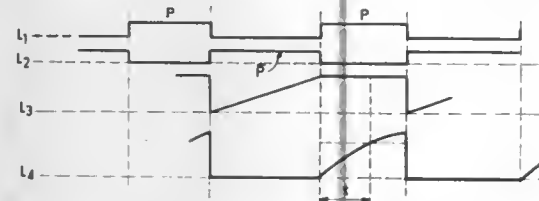
14 Claims

1. In a method of periodically controlling at least one function responsive to the speed of rotation of a shaft, which control must be exercised with angular phase displacement with respect to the instant at which a point turning with the shaft passes a stationary point, said phase displacement being a function of the speed of rotation of the shaft, said method comprising the steps of
  - generating a signal P the duration of q of which corresponds to the period during which a rotating sector having a constant angle  $\phi$  passes said stationary point,



generating a complementary signal P throughout the period q corresponding to the absence of the signal q, generating during one of the succeeding periods q and q a first voltage of the form  $aq + b + ce^{-\gamma q}$  where a and b are constants  $c=0$ , and which varies as a function of q, generating during a succeeding period q a second voltage which is a function of the time t from the beginning of said period q in which said signal P is generated, said second voltage being in the form  $d + ge^{-\alpha t}$ , where d and g are constants and  $\alpha$  is a positive constant, said second voltage being independent of shaft speed, and generating a control signal when the second of said voltages becomes equal to the first.

8. In a device for controlling the ignition advance of a reciprocating internal combustion motor with respect to the top dead point of the stroke of each piston, said device comprising



a stationary detector which cooperates with a rotating sector, associated with the motor shaft, which sector subtends an angle  $\phi$ , and the speed of rotation of which shaft determines the ignition advance, said detector furnishing during the passage of said sector, a signal P having a duration q, and furnishing a signal P in the absence of the signal P, the improvement according to which said device comprises first circuit means for generating a first voltage of the form  $aq + b + ce^{-\gamma q}$ , in which a and b may be any constant, and  $c=0$ ; second circuit means for generating a second voltage independent of motor speed and of the form  $d + ge^{-\alpha t}$ , in which formula d and g may be any constants,  $\alpha$  is a positive constant, and t represents the time counted from the beginning of said signal P; and comparator means supplied by said first and second circuit means for generating a control signal when the second voltage becomes equal to the first voltage.

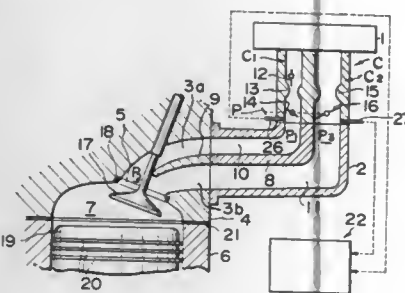
**4,164,205**  
**INTERNAL COMBUSTION ENGINE HAVING A DUAL INDUCTION TYPE INTAKE SYSTEM**  
Koji Asanomi; Yasunori Takemoto, and Kazuo Kobayashi, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 5, 1977, Ser. No. 857,515  
Claims priority, application Japan, Dec. 10, 1976, 51/149282; Dec. 10, 1976, 51/149283

Int. Cl.<sup>2</sup> F02P 5/04

U.S. Cl. 123—117 R

6 Claims



1. Internal combustion engine comprising cylinder means, piston means disposed in said cylinder means for defining therein combustion chamber means of variable volume, intake

port means provided in said cylinder means and opening to said combustion chamber means, first and second intake passage means connected with said intake port means, first and second throttle valve means respectively provided in said first and second intake passage means, means for actuating said first and second throttle valve means so that the second throttle valve means starts to open after the first throttle valve means has been substantially fully opened, means for increasing engine output on demand, means for sensing that the first throttle valve means is in the vicinity of a substantially full open position and producing a transient signal, means for receiving said transient signal and actuating the engine output increasing means.

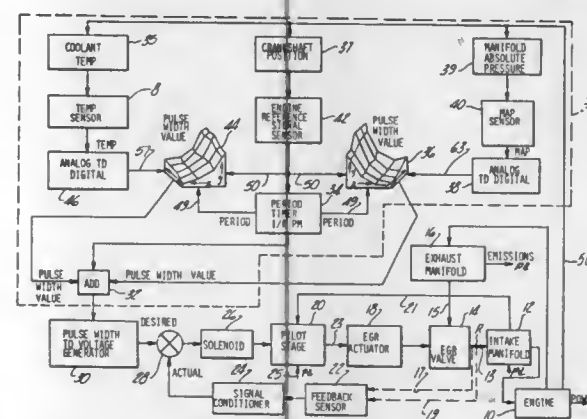
**4,164,206**  
**CLOSED LOOP PROGRAMMABLE EGR WITH COOLANT TEMPERATURE SENSITIVITY**  
Alvin D. Toelle, Fenton, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 19, 1978, Ser. No. 870,966

Int. Cl.<sup>2</sup> F02M 25/06

U.S. Cl. 123—119 A

13 Claims



1. An EGR system for an internal combustion engine comprising:  
an electronic processor means for generating a desired EGR value as a function of the operating parameters of the internal combustion engine;  
a sensor means for generating an actual EGR value by sensing the actual flow of exhaust gas through a recirculation loop;  
a variable EGR valve means disposed in said recirculation loop, said valve means operable to vary the amount of exhaust gas passing through said recirculation loop;  
control means for comparing said desired EGR value to said actual EGR value, said control means generating an increase signal when said actual EGR value is less than said desired EGR value as a result of the comparison and generating a decrease signal when said actual EGR value is greater than said desired EGR value as a result of said comparison, the control means further regulating the EGR valve in response to the increase and decrease signals to decrease EGR flow at a controllable rate in the event of a decrease signal and to increase EGR flow at a controllable rate in the event of an increase signal.

**4,164,207**  
**EXHAUST GAS RECIRCULATION MEANS**  
Kingo Okitsu; Koji Asanomi; Setsuo Harada, and Yasunori Takemoto, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

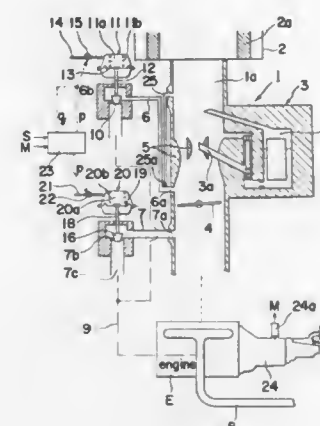
Filed Jun. 20, 1977, Ser. No. 808,355

Claims priority, application Japan, Jun. 19, 1976, 51/72329; Jun. 22, 1976, 51/75050

Int. Cl.<sup>2</sup> F02N 25/06

U.S. Cl. 123—119 A

4 Claims



1. In an internal combustion engine having a carburetor including at least a venturi section, a fuel introduction system for introduction of fuel into air passing through said venturi section, and a throttle valve provided downstream of said venturi section, at least one combustion chamber to which the air-fuel mixture is supplied from said carburetor and in which the air-fuel mixture is burned, and exhaust pipe means for exhausting the gases of combustion from said combustion chamber, exhaust gas recirculation means comprising:

- a take-off line from said exhaust pipe for taking off of a portion of said exhaust gas flowing in said exhaust pipe means;
- a first recirculation line into which exhaust gas is supplied by said take-off line having a delivery end connected to a portion of said carburetor which is intermediate said venturi section and said throttle valve;
- a second recirculation line into which exhaust gas is supplied by said take-off line and having a delivery end connected to a portion of said carburetor which is downstream of said throttle valve;
- a first recirculation line closure means in said first recirculation line;
- a second recirculation line closure means in said second recirculation line;
- means for generating a first signal indicative of a vehicle transmission set to operate in a high speed range;
- control means connected to said means for generating said first signal for receiving as an input said signal and for causing said first recirculation line closure means to close said first recirculation line upon receipt of said signal for interrupting the supply of exhaust gases in the first recirculation line; and
- a supplementary air duct having an inlet end communicating with a portion of said carburetor which is upstream of said venturi section and an outlet end communicating with the interior of said first recirculation line.

**4,164,208**  
**EXHAUST GAS RECIRCULATION MEANS**  
Kingo Okitsu; Koji Asanomi; Setsuo Harada, and Yasunori Takemoto, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

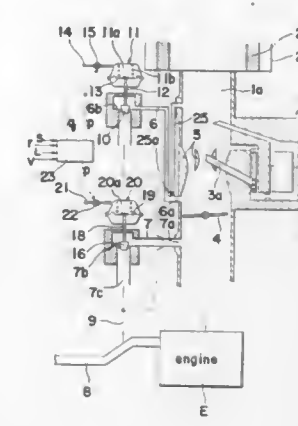
Filed Jun. 20, 1977, Ser. No. 808,354

Claims priority, application Japan, Jun. 19, 1976, 51-72328; Jun. 22, 1976, 51-75050

Int. Cl.<sup>2</sup> F02M 25/06

4 Claims

4 Claims

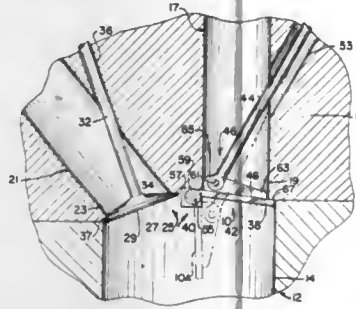


1. In an internal combustion engine having a carburetor including at least a venturi section, a fuel introduction system for introduction of fuel into air passing through said venturi section, and a throttle valve provided downstream of said venturi section, at least one combustion chamber to which the air-fuel mixture is supplied from said carburetor and in which the air-fuel mixture is burned, and exhaust pipe means for exhausting the gases of combustion from said combustion chamber, exhaust gas recirculation means comprising:

- a take-off line from said exhaust pipe for taking off of a portion of said exhaust gas flowing in said exhaust pipe means;
- a first recirculation line into which exhaust gas is supplied by said take-off line having a delivery end connected to a portion of said carburetor which is intermediate said venturi section and said throttle valve;
- a second recirculation line into which exhaust gas is supplied by said take-off line and having a delivery end connected to a portion of said carburetor which is downstream of said throttle valve;
- a first recirculation line closure means in said first recirculation line;
- a second recirculation line closure means in said second recirculation line;
- control means connected to the respective closure means and for receiving as an input at least one signal from among a first signal indicating that the vehicle speed is above a certain value, a second signal indicating that the engine load is above a certain value, a third signal indicating that the engine speed is above a certain value, and for causing said first recirculation line closure means to close said first recirculation line upon receipt of any one of said signals; and
- a supplementary air duct having an inlet end communicating with a portion of said carburetor which is upstream of said venturi section and an outlet end communicating with the interior of said first recirculation line.

**4,164,209**  
**INTERNAL COMBUSTION ENGINE CYLINDER VALVE ASSEMBLY**  
 William V. Grants, 1244 Sunnyside Dr., Berkeley, Ill. 60163  
 Filed Jun. 8, 1977, Ser. No. 804,672  
 Int. Cl.<sup>2</sup> F01L 3/10  
 U.S. Cl. 123—188 AP

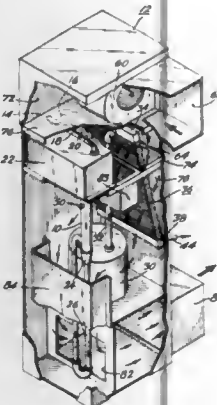
10 Claims



1. In an internal combustion engine, a cylinder head including a combustion chamber and induction passage terminating at a valve seat defining an inlet port to the combustion chamber in the combustion side of the cylinder head, a stem guide bore in the cylinder head opening into the induction passage, a substantially flat valve head fitting over and engaging sealingly the valve seat; mounting means disposed inside said combustion chamber in the combustion side of the cylinder head for connecting swingably said valve head to the cylinder block between a closed position in sealing engagement with the valve seat in a plane substantially perpendicular to the axis of the combustion chamber and a downwardly depending open position substantially parallel to the axis of the combustion chamber substantially out of alignment with said plane within said combustion chamber; and a valve stem reciprocally journaled in said stem guide bore with one end of the valve stem extending from the cylinder head and its other end connected to said valve head for moving generally extensively reciprocally within said stem guide bore toward and away from the combustion chamber.

**4,164,210**  
**PULSE COMBUSTION SYSTEM FOR HEATING OF AIR**  
 George T. Hollowell, Mayfields Heights, Ohio, assignor to Gas Research Institute, Chicago, Ill.  
 Filed Aug. 30, 1977, Ser. No. 828,996  
 Int. Cl.<sup>2</sup> F24H 3/08  
 U.S. Cl. 126—110 R

7 Claims



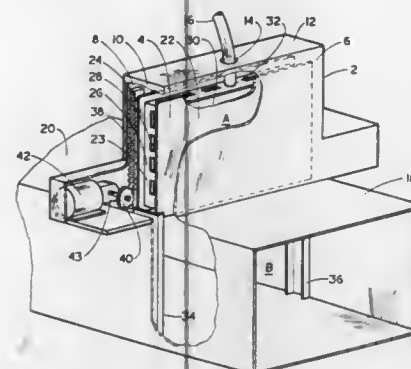
1. In an air-heating pulse combustion furnace system comprising a pulse combustion chamber, means for feeding combustion air and combustible gas into said chamber to form a combustible mixture, an exhaust expansion chamber connected

to receive hot exhaust gases from the outlet of said combustion chamber, a tail pipe connected to said combustion chamber and supplying hot exhaust gases from said combustion chamber to said expansion chamber, a flue gas outlet, an exhaust pipe line connecting said expansion chamber to said flue gas outlet gas, means for igniting said combustible mixture to produce pulse combustion in said chamber, and means for directing a flow of air to be heated over the exterior surfaces of said combustion chamber to heat said air;

the improvement comprising a secondary heat exchanger connected in said exhaust pipe line between said expansion chamber and said flue gas outlet so as to be heated by said exhaust gases flowing therein; and means for directing the flow of said air to be heated over the exterior surfaces of said secondary heat exchanger prior to said flow thereof over the exterior surfaces of said combustion chamber.

**4,164,211**  
**DAMPER ASSEMBLY**  
 James H. Onnen, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.  
 Filed Oct. 3, 1977, Ser. No. 838,821  
 Int. Cl.<sup>2</sup> F23L 13/06  
 U.S. Cl. 126—285 A

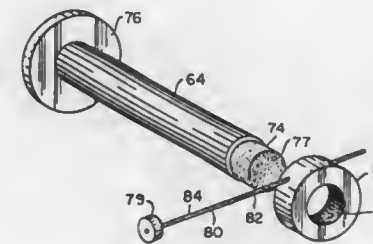
5 Claims



1. A damper assembly comprising: a casing having a flow-through inlet and a flow-through outlet; a movable damper blade disposed within said casing, said damper blade including a pair of parallel spaced plates spaced apart by a spacing member extending around the periphery of said plates and defining a cavity for receiving a fluid therein, said spacing member being spaced inwardly from the outer edges of said plates defining a peripheral channel along the outer edge of said damper plate; a plurality of openings in said blade in flow communication with said cavity; means to add a fluid to said damper blade cavity; said spacing member having an opening therein in communication with said means to add a fluid to said cavity; and means to move said damper blade within said casing from an open to a closed position.

**4,164,212**  
**DEVICES FOR MENSTRUAL CYCLE PHASE DETERMINATION**  
 Samuel R. Schuster, Wellesley, Mass., assignor to Ovutime, Inc., Brookline, Mass.  
 Division of Ser. No. 629,700, Nov. 7, 1975, Pat. No. 4,013,066, which is a continuation-in-part of Ser. No. 472,611, May 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,187, Oct. 24, 1972, abandoned. This application Mar. 18, 1977, Ser. No. 779,150  
 Int. Cl.<sup>2</sup> A61B 10/00; G01N 33/16  
 U.S. Cl. 128—759

1 Claim



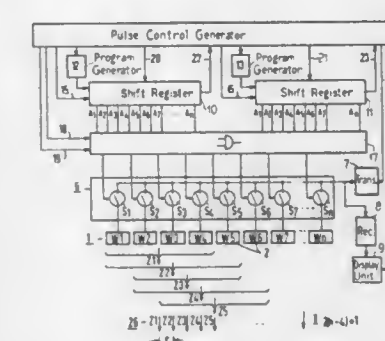
1. Apparatus for menstrual cycle phase determination, said apparatus comprising:  
 (a) rod means including forward tip means and rearward handle means;  
 (b) ring means for receiving said forward tip means and bias means for causing rotation of said ring means with respect to said tip means;  
 (c) said rod means being operative for insertion into the vaginal cavity in order to cause said forward tip means to contact the uterus and to retrieve a mucus specimen;  
 (d) said forward tip means being characterized by a first cylindrical bearing surface;  
 (e) said ring means being characterized by a second cylindrical bearing surface;  
 (f) said forward tip means and said ring means being operative to mate with said mucus specimen between said first cylindrical bearing surface and said second cylindrical bearing surface;  
 (g) said bias means being operative to exert force between said forward tip means and said ring means when said first cylindrical bearing surface and said second cylindrical bearing surface are mated;  
 (h) and indicia means for indicating the degree of such force as a function of the physical character of said specimen;  
 (i) said forward tip means and said ring means being readily separable and readily matable;  
 (j) said bias means being an adjustable eccentric weight.

**4,164,213**  
**APPARATUS FOR EXAMINING BODIES THROUGH SCANNING BY MEANS OF ULTRASOUND**  
 Georg Huelzler, Moehrendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
 Filed May 24, 1977, Ser. No. 799,970  
 Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628492  
 Int. Cl.<sup>2</sup> A61B 10/00

10 Claims

1. Apparatus for examining bodies through scanning by means of ultrasound, comprising an ultrasonic applicator with at least one row of adjacent ultrasonic transducer elements, and an actuating mechanism for group-actuation of the transducer elements, characterized in that the actuating mechanism for actuating the transducer elements of the ultrasonic applicator comprises means for actuating different symmetric configurations of transducer elements having different types of symmetry axes in a predetermined sequence during a complete scanning cycle, the different symmetric configurations of si-

multaneously energized transducer elements comprising first configurations each with a first type of symmetry axis where the symmetry axis is positioned between two adjacent trans-

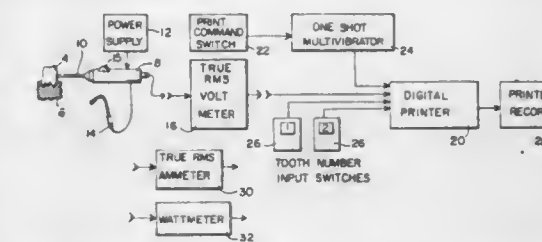


ducer elements, and comprising second configurations of simultaneously energized transducer elements with a second type of symmetry axis where the symmetry axis is positioned at the center of a transducer element.

**4,164,214**  
**METHOD AND APPARATUS FOR MEASURING THE SENSITIVITY OF TEETH**  
 Marvin M. Stark, Los Altos Hills; Jack B. Rosenfeld, San Francisco; Roger B. Pelzner, San Mateo, and Kenneth B. Soelberg, Menlo Park, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.  
 Filed Jul. 25, 1977, Ser. No. 818,508  
 Int. Cl.<sup>2</sup> A61B 5/05

11 Claims

U.S. Cl. 128—741



1. Apparatus for measuring the sensitivity of teeth in oral tissue, comprising:  
 (a) an electrode probe adapted for electronically contacting a tooth;  
 (b) a power supply connected to the electrode probe for applying electrical energy to said probe;  
 (c) an electrical lead connected to the power supply and adapted for making electrical contact with negligible contact resistance with oral tissue around the tooth being measured;  
 (d) means within the probe for varying the rate of electrical energy passing through the tooth from the probe; and  
 (e) means connected to the varying means for measuring the rate of effective electrical energy delivered to the tooth by the probe.



# 4,164,215 ELECTRODE SWITCHING MEANS FOR USE IN A DEFIBRILLATOR

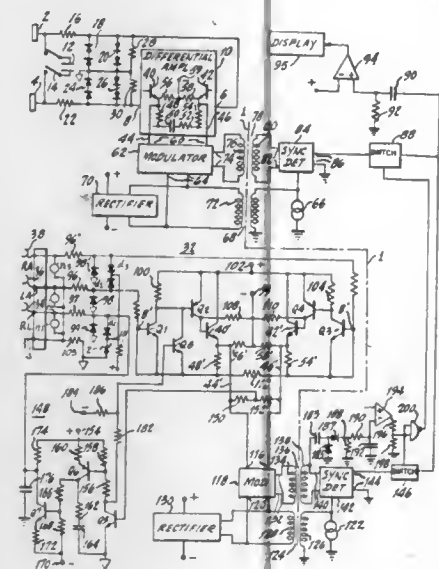
Dana C. Finlayson, Natick; Ronald D. Gatzke, and Robert L. Stettiner, both of Lexington, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 10, 1977, Ser. No. 805,552

Int. Cl.<sup>2</sup> A61B 5/04

U.S. Cl. 128—696

8 Claims



1. Apparatus for use in a defibrillator comprising the combination of  
an output for coupling to a monitor;  
a first pair of inputs adapted for connection to a pair of paddle electrodes,  
means including a first switch for coupling the signals appearing between said first pair of inputs to said output, said switch being normally open,  
a second pair of inputs adapted for connection to a pair of ECG electrodes,  
means including a second switch for coupling signals appearing between said second pair of inputs to said output, said switch being normally closed, and  
means responsive to a given change in the impedance at said second pair of inputs for opening said second switch and closing said first switch.

# 4,164,216 THROAT OBSTRUCTION EXPULSION DEVICE

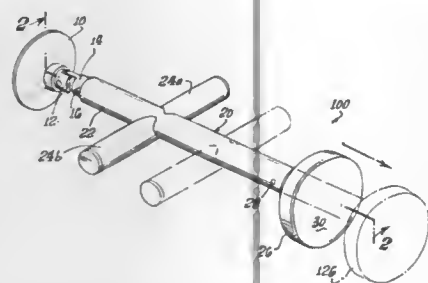
Orville W. Person, 7612 202 Place SW., Edmonds, Wash. 98020

Filed Jan. 26, 1978, Ser. No. 872,642

Int. Cl.<sup>2</sup> A61H 31/00

U.S. Cl. 128—28

8 Claims



1. A device for expelling an object lodged in the larynx of a person through the compression of the upper diaphragm, comprising:

anchor means adapted to be secured to a planar surface; an elongated track member;  
hinge means affixed at either end to said anchor means and said track member, respectively, and allowing for rotational freedom therebetween in at least one plane; a slide reciprocable along said track member;  
handgrip means affixed to said slide for manually imparting reciprocal motion thereto;  
an impact pad affixed at the end said slide remote from said hinge means; and  
retention means for preventing the disengagement of said track member from said slide.

# 4,164,217 PREVENTIVE APRON

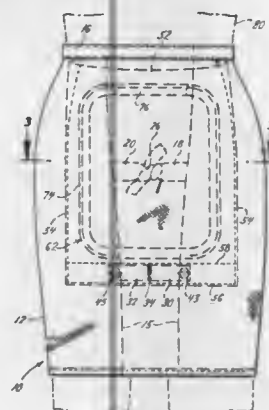
Rudy J. Schrock, Box 245, Rte. 2, Hartsville, Mo. 65667

Filed Nov. 16, 1977, Ser. No. 851,851

Int. Cl.<sup>2</sup> A61B 19/00

U.S. Cl. 128—138 R

11 Claims



1. A protective device for control of sexual conduct of a person comprising:

- (a) a flexible front main apron section of a length extending from above the persons genital area to beneath the persons genital area and extending in front of the persons genital area;
- (b) a shielding member associated with the main section, the shielding member extending from a position above the genital area to a position beneath the genital area;
- (c) means for securing the main section to wrap around the thighs of the users lower body between the waist and the middle of the thighs.

# 4,164,218 PERSONAL ESCAPE BREATHING APPARATUS

Frank E. Martin, Chester, Md., assignor to Midori Anzen Company, Ltd., Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 859,224

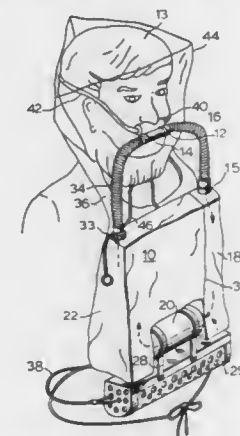
Int. Cl.<sup>2</sup> A62B 7/00

U.S. Cl. 128—142.7

5 Claims

1. A breathing apparatus comprising:  
an elongated, flexible, gas-impermeable exhalation bag for receiving and storing exhaled gas from a user;  
a substantially cylindrical carbon dioxide absorption canister for removing carbon dioxide from said exhaled gas within said exhalation bag and providing a breathable gas, said canister having two relatively large opposing open ends one of which is directly connected to a side of said exhalation bag, the longitudinal axis of said canister being substantially perpendicular to the length of said exhalation bag;  
a chemical oxygen generator connected to said exhalation bag for supplying oxygen into said exhalation bag, said oxygen generator being supported from and thermally insulated from said carbon dioxide absorption canister and

being in a substantially parallel and side-by-side relationship with respect to said canister;  
a flexible, gas-impermeable inhalation bag for receiving and storing the breathable gas from said carbon dioxide absorption canister, said inhalation bag being larger in volume than said exhalation bag and directly connected to the other open end of said canister to support said canister between said inhalation and exhalation bags, said inhalation bag being directly attached to said side of said exhalation bag;  
a transparent, flexible and gas-impermeable hood for defining a substantially closed space around the head of a user;  
means, including a mouthpiece connected to said exhalation bag and said inhalation bag, for receiving the exhaled gas from the user and introducing the exhaled gas into said exhalation bag, and for supplying the breathable gas



stored within said inhalation bag to the user, said mouthpiece being open to said closed space defined by said hood;  
nose blocking means attached to said hood for blocking the gas inflow into the nostrils of the user, said nose blocking means comprising a frame supported on the inner surface of said hood so that said frame is positioned in front of the user's nostrils when said hood is worn, and a film of a soft, flexible and gas-impermeable material stretched over said frame to extend over an area effective for covering and contacting the user's nostrils; and  
support means, made of a flexible, gas-impermeable sheet material and having a hole through which the user's head can be passed, for integrally supporting said exhalation and inhalation bags and the breathing apparatus from the user's neck on the user's chest, said support means forming a part of said exhalation and inhalation bags.

# 4,164,219 VENTILATOR

Forrest M. Bird, Palm Springs, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 8, 1976, Ser. No. 730,722

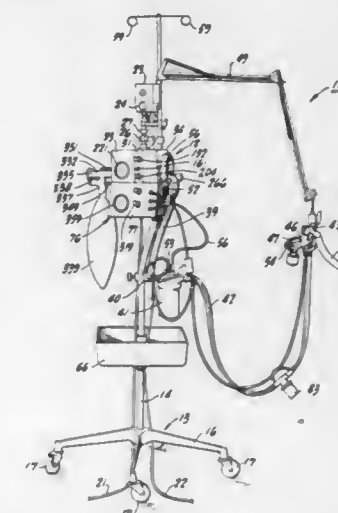
Int. Cl.<sup>2</sup> A61M 16/00

U.S. Cl. 128—145.8

5 Claims

1. A ventilator providing an inhalation phase and an exhalation phase in its operative cycle comprising a gas inlet line (83) adapted to be coupled to a source of gas under pressure;  
a patient adapter (48) having a through opening terminating at an outlet opening adapted to communicate with a patient;  
a sequencing switch assembly (94) comprising control valve means (96,99) having an inlet opening (97) coupled to said gas inlet line (83), an outlet opening (98), and a spindle (99) movable between open and closed positions for controlling the flow of gas between said openings (97,98), and control means including means for defining a control chamber including a diaphragm (101) coupled to said spindle (99) for moving said spindle (99) from said closed

to said open position in response to gas pressure in said control chamber below a first predetermined pressure and for moving said spindle (99) from said open to said closed position upon gas pressure in said control chamber above a second predetermined pressure which is higher than said first predetermined pressure;  
means for connecting the outlet opening (98) of said control valve means with said through opening of said patient adapter (48) to provide a main flow of gas thereto;  
means for connecting said control chamber with said through opening of said patient adapter (48) to communicate gas pressures in said through opening with said control chamber so that said spindle (99) will be moved to said open position in response to gas pressure in said through opening below said first predetermined pressure and will be moved to said closed position in response to gas pressure in said through opening above said second predetermined pressure;  
exhalation valve means (47) coupled to the through opening of said patient adapter (48), having an operating chamber, and having a portion (377) movable from a normal open position permitting gas flow to the atmosphere from the patient adapter to a closed position preventing gas flow to the atmosphere from the patient adapter when the gas pressure in said operating chamber is above a third predetermined pressure;



conduit means (52,53,54) for directing a secondary flow of gas at above said third predetermined pressure to said patient adapter (48) and to the operating chamber of said exhalation valve means (47);  
apneustic hold means (91) having an inlet line (90) coupled to said gas inlet line (83) and an outlet line (238) and including means for supplying gas from said inlet line (90) to said outlet line (238) while said spindle (99) is in said open position and for a predetermined time after said spindle (99) is moved from said open position to said closed position;  
mode selector means (161) including first and second inlets and an outlet, means connecting the outlet opening (98) of said control valve means to said first inlet of said mode selector means, means connecting the outlet line (238) of said apneustic hold means to the second inlet of said mode selector means, means connecting the outlet of said mode selector means to said conduit means, said mode selector means including a portion (162,163,164) manually movable between a first position for connecting the first inlet of said mode selector means to its outlet, and a second position connecting its second inlet to its outlet whereby, when said portion (162,163,164) is positioned in its first position, gas is directed to said patient adapter (48) and said exhalation valve means (47) from the outlet opening (98) of said control valve means via said conduit means

(52,53,54) only when said spindle (99) is in said open position; and when said portion (162,163,164) is positioned in its second position gas is directed to said patient adapter (48) and said exhalation valve means (47) from said gas inlet line (83) via said pneumatic hold means (91) and said conduit means (52,53,54) when said spindle (99) is in its open position and for a predetermined time after said spindle (99) moves to its closed position.

4,164,220

## ELECTRONIC TEMPERATURE SENSORS

Christopher G. Brickell, and Derek A. Hodson, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, New Zealand

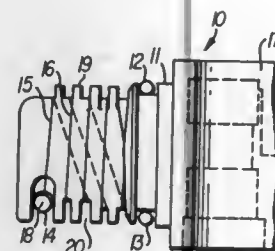
Filed Jul. 22, 1976, Ser. No. 707,481

Claims priority, application New Zealand, Jul. 23, 1975, 178193; Sep. 2, 1975, 178557

Int. Cl.<sup>2</sup> A61M 15/00

U.S. Cl. 128—185

2 Claims



1. A mounted electronic device comprising, a mounting body, a temperature sensor carried by said mounting body, insulated connecting wires connected to said sensor, parts of which wires are of considerable length mounted externally of said mounting body and a thin metallic coating over at least some outer surfaces of said mounting body and over said parts of said connecting wires exposed externally of said mounting body with said thin metallic coating in intimate contact with said insulated connective wires.

4,164,221

## ATRAUMATIC BLOOD ACCESS DEVICE VALVE

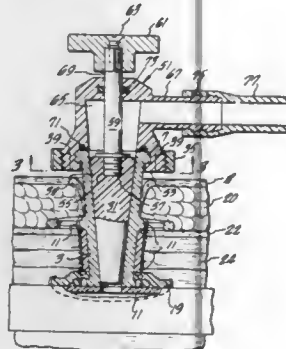
Donald J. Bentley, Newport Beach, and Donald A. Raible, Orange, both of Calif., assignors to Bentley Laboratories, Inc., Irvine, Calif.

Filed Jul. 28, 1977, Ser. No. 813,527

Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—214 R

6 Claims



1. An atraumatic method of valving for a blood passageway of a blood access device, said blood passageway connecting a blood vessel with a body to the body exterior, said blood passageway having a plugging means restrained in a sealing

relationship therein preventing flow through said blood passageway, said method comprising:

removing said plugging means restraint;

connecting a valve chamber means to the portion of said blood access device blood passageway at said body exterior, said valve chamber means including a blood outlet and a portion adapted to receive at least a portion of said plugging means;

connecting a reciprocable stem member to said plugging means, said removable stem member passing through said valve chamber means;

pulling said reciprocable stem member and thereby pulling at least a portion of said connected plugging means from said blood passageway into said valve chamber means, and allowing for the passing of blood through said blood passageway and said valve chamber blood outlet;

pushing said reciprocable stem member and thereby pushing said connected plugging means from said valve chamber and into said blood passageway thereby allowing for the expelling of blood from said valve chamber means and said blood passageway and preventing further blood flow therethrough;

disconnecting said stem member from said plugging means; disconnecting said valving chamber means from said blood access device; and

restraining said plugging means within said blood passageway.

3. An atraumatic valving mechanism for operation within a blood passageway of a blood access device, said blood passageway adapted to connect a blood vessel within a body to the body exterior, said valving mechanism comprising:

a plugging means for sealing said blood passageway;

a reciprocable stem member means for connection to said plugging means;

a valve chamber means adapted to be secured to the portion of said blood access device blood passageway at said body exterior, said valve chamber including a blood outlet and an aperture through which said reciprocable stem member means for connection to said plugging means may be passed and;

a retaining ring for securing said valve chamber means to said blood access device, wherein said valve chamber means is further defined as including a plurality of slits, at the portion of said valve chamber means adapted to be secured to the portion of said blood access device, in order to facilitate connection and disconnection of said valve chamber means.

4,164,222

## LASER OPHTHALMOLOGICAL UNIT

Alexandr M. Prokhorov, Alexandr L. Vinogradov, both of Moscow; Jury K. Danileiko, Troitsk Moskovskoi oblasti Podolskogo raiona; Alexandr A. Manenkov, Moscow; Mikhail M. Krasnov, Moscow, and Leonid P. Naumldi, Moscow, all of U.S.S.R., assignors to Fizichesky Institut Imeni P.N. Lebedeva Akademii Nauk SSSU of USSR and Vsesojuzny Nauchno-Issledovatel'skiy Institut Glaznykh Boleznel, both of Moscow, U.S.S.R.

Filed Jul. 6, 1977, Ser. No. 813,278

Claims priority, application U.S.S.R., Jul. 12, 1976, 2373635

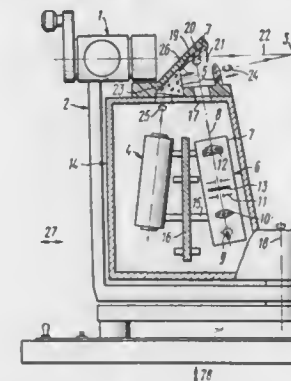
Int. Cl.<sup>2</sup> A61B 17/36

U.S. Cl. 128—303.1

5 Claims

1. A laser ophthalmological unit comprising a laser producing a powerful light emission in order to exert the action upon the patient's eye; an optical system for supplying and focusing the laser emission to a specified point of the patient's eye; an optical system for illumination of the surgery field, comprising a slit source provided with a light-transmitting element with a marker for guiding the laser beam to a specified point of said patient's eye; an optical deflecting element for directing the slit source beam to the patient's eye; a casing wherein said laser source and said slit illumination source are housed and rigidly secured together, the optical elements of the system for supply-

ing the powerful laser beam and said deflecting optical element mounted outside said casing are rigidly secured to said casing but can be moved for alignment so that optical axes of both systems can coincide in a specified point where the patient's eye is located; a microscope having an axis of rotation for observation of the surgery field; a hinge securing said casing



for rotation around the axis of rotation of the microscope, which lies in the focal plane of both said systems and the microscope, and as a result irrespective of the angle between the optical axes of said microscope and said slit illumination source, the marker is always in the focal plane of said microscope.

4,164,223

## SURGICAL INSTRUMENT

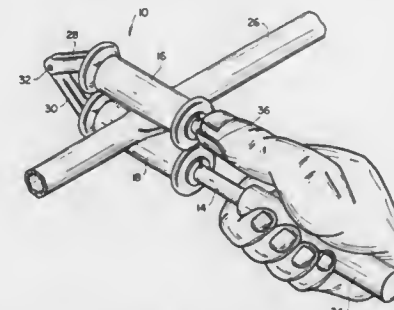
Hamza I. Munib, 131 Liberty St., Petaluma, Calif. 94952

Filed Aug. 4, 1977, Ser. No. 821,795

Int. Cl.<sup>2</sup> A61B 17/28

U.S. Cl. 128—321

1 Claim



1. A surgical instrument for use with resilient tubing such as chest tubing, catheters, common duct T-tubing and IV tubing, comprising the combination of a pair of parallel elongated shafts each having first and second ends, said first ends of said shafts being pivotally mounted together for pivotal movement about an axis, a pair of cylindrical rollers mounted for rotation on each shaft, respectively and lying in a plane perpendicular to said pivot axis, said rollers being oriented in parallel, spaced-apart relationship for movement into and out of engagement with opposite sides of the tubing, an elongate first handle mounted on and extending coaxially from a second end of said shafts and the rollers in a direction remote from the hinge, and a thumb rest mounted on and extending coaxially from a second end of the other shaft and roller, said thumb rest being disposed in spaced relationship with the handle whereby the user's hand can simultaneously grasp the handle and thumb rest for moving the rollers at right angles to and against the tubing while also moving the rollers along the length of the tubing.

4,164,224

## DISPOSABLE EARLOBE PIERCING DEVICE AND METHOD FOR USING THE SAME

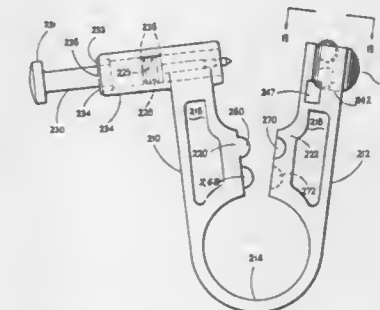
John A. Hastings, 31 Main St., Bass River, Mass. 02664

Continuation-in-part of Ser. No. 553,671, Feb. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 457,551, Apr. 13, 1974, abandoned. This application Jan. 14, 1977, Ser. No. 759,384

Int. Cl.<sup>2</sup> A61B 17/00

U.S. Cl. 128—330

60 Claims



57. In an earlobe piercing apparatus the arrangement comprising a barrel having a bore, an ear stud mounted within the barrel, the ear stud having a head portion mounted within the bore and having a shaft portion substantially contained within said barrel and extending forward from the head portion through the bore and out of the barrel and terminating in a point extending axially outward from the transparent barrel a distance of substantially 1/16th of an inch.

4,164,225

## SURGICAL SUTURING INSTRUMENT

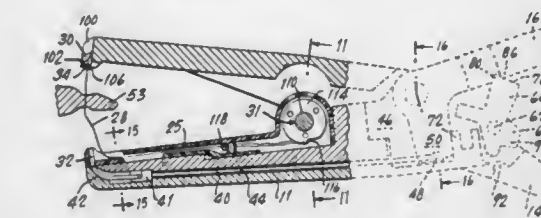
Alfred A. Johnson, New York, and Arthur Zimmet, Huntington, both of N.Y., assignors to Johnson & Lorenz, Inc., New York, N.Y.

Filed Dec. 28, 1977, Ser. No. 865,221

Int. Cl.<sup>2</sup> A01B 17/04

U.S. Cl. 128—334 R

12 Claims



1. A surgical suturing instrument comprising  
(a) a first jaw;  
(b) a second jaw for cooperating with the first jaw to clamp tissue to be sutured, said second jaw having a handle;  
(c) an actuator arm manipulable jointly with the handle;  
(d) means for pivotally interconnecting said jaws and said arm for angular movement relative to each other about a common axis from which said jaws extend forwardly and said handle and said arm extend rearwardly;  
(e) means, carried by said first jaw and operable by angular movement of said arm relative to said first jaw, for applying a suture to tissue clamped between the jaws; and  
(f) latch means for selectively interlocking said first jaw with said arm and with said second jaw in succession during progressive angular movement of said arm in a closing direction toward said handle, such that movement of said arm in said direction initially moves said first jaw to a tissue-clamping, closed position relative to said second jaw and thereafter operates said suture-applying means while the jaws are interlocked;



wherein the improvement comprises:

- (g) said latch means comprising a latch member pivotally mounted on said first jaw and including
- (i) a first portion for engaging said arm when said first jaw is away from said closed position to interlock said arm and said first jaw and thereby to transmit, to said first jaw, angular motion of said arm in said closing direction, and
- (ii) a second portion engageable by said second jaw for pivotally moving said latch member in a given direction to displace said first portion out of interlocking engagement with said arm as said first jaw arrives at said closed position.

#### 4,164,226 IONTOPHORETIC BURN-PROTECTION ELECTRODE STRUCTURE

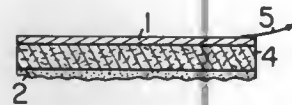
Robert Tapper, c/o General Medical Co., 1935 Armacost Ave., Los Angeles, Calif. 90025

Division of Ser. No. 717,791, Aug. 25, 1976. This application Jun. 13, 1977, Ser. No. 806,393

Int. Cl.<sup>2</sup> A61N 1/20

U.S. Cl. 128—419 R

14 Claims



1. An electrode structure for applying an essentially unidirectional electric current through the skin of a living body, comprising:

- (a) a first electrically conductive electrode having a porous material with a thickness in excess of three millimeters upon one side thereof adapted to be interposed between said electrode and said skin,
- (b) a second electrically conductive electrode adapted to contact said skin at a location thereon spaced from said first electrode,
- (c) a controlled source of unidirectional electric current having a positive pole and a negative pole, and
- (d) means for connecting said first electrode to said negative pole and said second electrode to said positive pole, whereby iontophoretic burn is minimized.

#### 4,164,227 RATE FAILURE INDICATOR

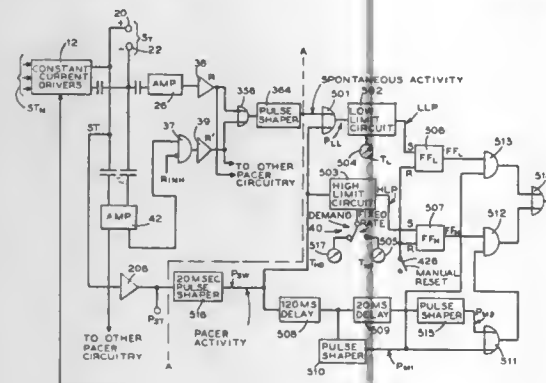
Albert A. Auerbach, New York, N.Y., assignor to Medalert Corporation, New York, N.Y.

Filed Sep. 27, 1978, Ser. No. 946,079

Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 PT

15 Claims



1. An improvement for automatically indicating a rate failure condition in a pacer for pacing monitoring, comprising monitoring means for monitoring the rate of spontaneous and

pacer activity of said pacer, first limit means preset at a low level of combined spontaneous and pacer activity coupled to said monitoring means, second limit means preset at a high level of pacer activity coupled to said monitoring means, first switch means connected to said first limit means, second switch means connected to said second limit means, said first limit means responsive to said rate of combined spontaneous and pacer activity falling below said preset low level for placing said first switch means in a switched condition, said second limit means responsive to said rate of activity exceeding said preset high level of pacer activity for placing said second switch means in a switched condition, and indicating means coupled to said first and second switch means for converting said switched conditions to distinguishable marking pulse signals for later clinical electrocardiogram detection.

#### 4,164,228 PAD FOR NURSING BRASSIERES

Georg Weber-Unger, Am Brand 2, 8201 Nussdorf/Inn, Fed. Rep. of Germany

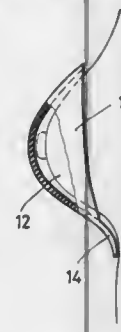
Filed Oct. 28, 1977, Ser. No. 846,558

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 7635406[U]

Int. Cl.<sup>2</sup> A41C 3/00

U.S. Cl. 128—461

5 Claims



1. An absorbing pad for nursing brassieres, said absorbing pad being formed of absorbent material, said absorbing pad including a cap-shaped portion proportioned to fit the contour of the breast and being so positioned in said nursing brassier that it is adjacent to the breast of the wearer, said absorbing pad further including an extension affixed to the lower periphery of said cap-shaped portion and extending downwardly therefrom, characterized therein that said extension forms an absorbing apron being positioned adjacent to the body of the wearer, said absorbing apron being formed of such material so that it generally conforms to the contour of the body of the wearer and is capable of absorbing discharged fluids, whereby the absorbing area of said nursing brassier is increased by the presence of said absorbing apron.

#### 4,164,229 PORTABLE CIGARETTE MAKING MACHINE

James S. Hurt, P.O. Box 131, Hanover, Va. 23069

Filed Mar. 18, 1977, Ser. No. 779,027

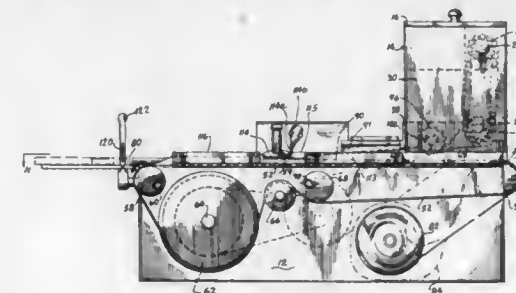
Int. Cl.<sup>2</sup> A24C 5/08, 5/44

U.S. Cl. 131—55

7 Claims

5. A cigarette making machine comprising:
- (a) a conveyor belt;
- (b) first means for feeding cigarette paper onto said conveyor belt;
- (c) second means for feeding tobacco onto cigarette paper on said conveyor belt;
- (d) third means for forming a cigarette rod from the tobacco and the cigarette paper, said means including a rotary compactor in position to engage the tobacco on said cigarette paper and to compact it into a substantially cylindrical rod; and

(e) fourth means for connecting said rotary compactor to said conveyor belt to compact the tobacco rod in synchro-



nization with the travel of the cigarette paper through the machine.

#### 4,164,230 AUTOMATIC SMOKING DEVICE

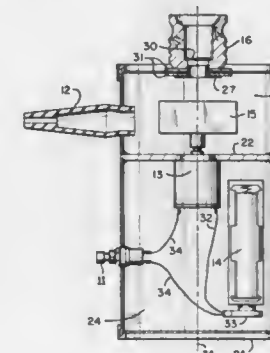
Walter Pearlman, 4 Eliot St., Somerville, Mass. 02143

Filed Jul. 13, 1977, Ser. No. 815,223

Int. Cl.<sup>2</sup> A24F 1/10, 47/00

U.S. Cl. 131—171 R

8 Claims



1. Automatic smoking apparatus comprising, means defining a generally circular cylindrical container divided into an upper fan chamber for accommodating a fan and an electrical chamber for accommodating an electrical drive motor, bowl means for accommodating smoking material supported above said fan chamber with means defining a passage for communicating between said bowl means and said fan chamber, stem means for carrying smoke ejected from said fan chamber having an opening communicating with said fan chamber, an electric motor in said electrical chamber having a spindle, a flat fan blade having its length perpendicular to the container axis of said cylindrical container being greater than its height along said container axis, means for connecting said fan blade to the electric motor spindle, and means for selectively providing electrical energy to said electrical motor to rotate said fan blade, the axis of rotation of said fan blade, the axis of said spindle and the axis of said bowl means coinciding, the stem axis of said stem means coincident with a diameter of said container embraced by said blade so that rotation of said blade produces a decrease in pressure in said fan chamber along said container axis for drawing smoke from said bowl means into said fan chamber and an increase in pressure adjacent the opening of said stem means for ejecting smoke from said fan chamber through said stem means.

#### 4,164,231 APPARATUS FOR CONTROLLING THE LENGTH OF CIGARETTE TO BE SMOKED

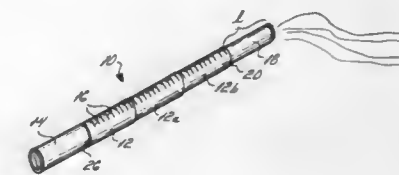
Jonas Greenwald, 1 Prospect Park SW., Brooklyn, N.Y. 11215

Filed Jul. 14, 1977, Ser. No. 815,563

Int. Cl.<sup>2</sup> A24F 13/02

U.S. Cl. 131—192

6 Claims



1. Apparatus for controlling the length of a cigarette to be smoked comprising a generally cylindrical sheath comprising movable concentric telescoped members adapted to closely fit around a standard cigarette, said sheath having a fixed end and a telescoped end, a mouthpiece attached to the fixed end of said sheath, receptacle means fixedly formed within said sheath and mouthpiece for receiving and holding said cigarette within said sheath, and means for adjustably fixing the length of said sheath by moving the telescoped end to expose a controlled length of cigarette to be smoked.

#### 4,164,232 CONSTANT COIN FLOW RATE COIN PROCESSING APPARATUS

Shiro Nakai, Kazuto Asami, and Hirokuni Matono, all of Hi-meji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

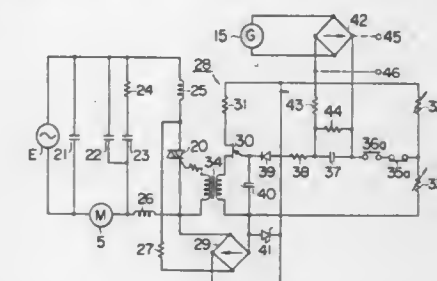
Filed Aug. 12, 1977, Ser. No. 824,302

Claims priority, application Japan, Aug. 18, 1976, 51/10539[U]

Int. Cl.<sup>2</sup> G07D 9/04

U.S. Cl. 133—8 R

5 Claims



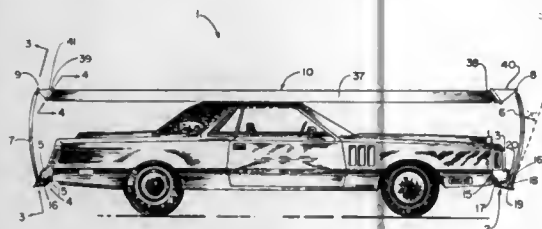
1. A constant coin flow rate coin processing apparatus comprising: a rotary disc for feeding coins by centrifugal force; a coin passage receiving coins fed from said rotary disc for aligning and conveying said coins; a coin counting means connected to said coin passage for counting said coins conveyed by said coin passage; and a speed control means connected to said rotary disc and said coin counting means for controlling the speed of said rotary disc according to the number of coins counted by said coin counting means in a predetermined period for changing the speed of said rotary disc for keeping the rate of coins fed from said rotary disc constant.

4,164,233  
**VEHICLE COVERING APPARATUS**  
 James R. McAndrew, 3960 Government St., Baton Rouge, La. 70806

Filed Mar. 7, 1978, Ser. No. 884,281  
 Int. Cl.<sup>2</sup> A45F 1/14

U.S. Cl. 135—5 A

5 Claims



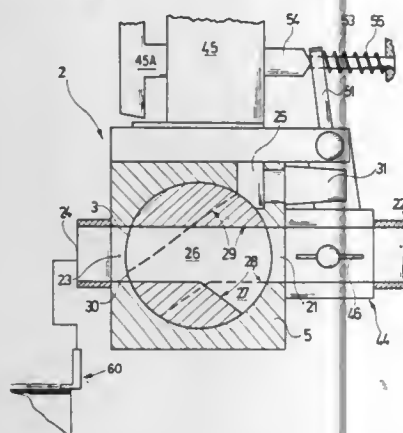
1. A portable device for covering vehicles comprising:
  - (a) attaching clamps connected to front and rear bumpers of said vehicle,
  - (b) rods attached to each of said clamps and extending above said vehicle, and
  - (c) an opaque covering assembly attached at each end of said rods above said vehicle, said covering assembly comprising an opaque, waterproof covering attached at each end to extension bars, said extension bars comprising a center brace having a central hollow cavity extending through said brace, blocking rings attached at each end of said brace and extending into said central hollow cavity, end braces fitting into each end of said central hollow cavity and extendable out therefrom, each end brace having stop means contactable to said blocking rings to prevent said end braces from being pulled from said central hollow cavity.

4,164,234  
**METERING DEVICE**  
 Rudolf Liepert, Augsburg, Fed. Rep. of Germany, assignor to Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany  
 Filed Sep. 19, 1977, Ser. No. 834,225  
 Claims priority, application Fed. Rep. of Germany, Sep. 27, 1976, 2643381

Int. Cl.<sup>2</sup> B65H 3/08

U.S. Cl. 137—51

13 Claims



1. An arrangement for metering a blast of air delivered to a driven machine, particularly a sheet separation device of a sheet feeder, comprising: a pressure source; a control element connected via an air intake opening to said pressure source; said control element having a first air discharge opening connected to the driven machine and a second air discharge opening leading into the open; said control element actuated as a function of machine speed; said first air discharge opening being controlled or disconnected during upward movement or stoppage of said sheet feeder by said control element; said

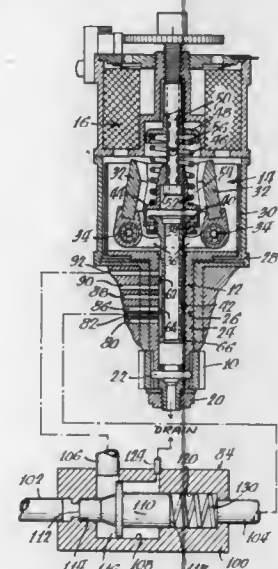
control element comprising a rotary valve plug with a through-bore, said through-bore being aligned coaxially with said air intake opening and with said first air discharge opening facing each other diametrically, said first air discharge opening leading to said sheet separation device; said second air discharge opening leading to the outside being offset relative to said air intake opening in the direction of rotation of said valve plug corresponding to speed reduction, said through-bore of said valve plug having expansion means, said expansion means enlarging a region adjacent to said air intake opening in a direction opposite to the direction of rotation associated with speed reduction.

4,164,235  
**GOVERNOR FOR CONTROLLING HYDRAULIC TRANSMISSION**  
 Victor N. Benson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 23, 1977, Ser. No. 799,551  
 Int. Cl.<sup>2</sup> G05D 13/30

U.S. Cl. 137—52

11 Claims



1. A governor for controlling a hydraulic transmission comprising:
  - a housing;
  - a flyweight assembly rotatable within said housing;
  - an axially movable hydraulic transmission control valve within said housing, said valve being connected to said flyweight assembly for axial movement in one direction within said housing in response to rotation of said flyweight assembly within the housing;
  - a spring axially biasing said valve for axial movement in the other direction within said housing;
  - means for sensing an underspeed condition of the governor; and
  - hydraulic means responsive to said sensing means and the sensing of an underspeed condition in excess of a predetermined amount, for axially shifting said valve in said other direction.

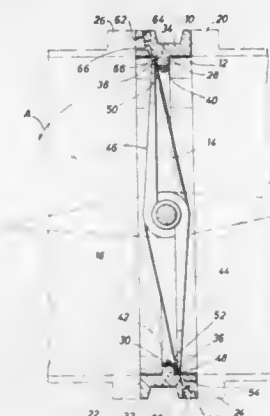
4,164,236  
**VALVE ASSEMBLY WITH SEAT CLEANING SYSTEM**  
 Marler W. Owen, 5503 Valkeith, Houston, Tex. 77096, and Ray E. Morris, 803 Holton, Bellaire, Tex. 77401  
 Filed Jul. 21, 1977, Ser. No. 817,549  
 Int. Cl.<sup>2</sup> F16K 1/226

U.S. Cl. 137—240

8 Claims

1. A valve assembly comprising:
  - a valve body having a flowway therethrough and including

oppositely axially directed end surfaces adapted to be engaged by respective mounting fittings; means defining a seating surface extending generally radially into said flowway from said valve body; a disc-like valve element having a sealing area engageable with said seating surface and mounted in said flowway for movement of said seating area toward and away from said seating surface;

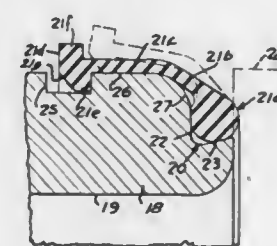


and means defining a fluid passageway through said valve body and including an arcuate recess extending axially into one of said end surfaces and positioned to be covered by one of said mounting fittings, inlet means opening externally of said valve body and communicating with said recess, and outlet means communicating with said recess and opening internally of said valve body and generally radially into said flowway and positioned such that a fluid may be directed against said seating surface through said fluid passageway.

4,164,237  
**FUEL PRESSURE REGULATOR ASSEMBLY**  
 Arnold Amey, Otisville, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.  
 Filed Feb. 24, 1978, Ser. No. 881,063  
 Int. Cl.<sup>2</sup> F16K 31/12

U.S. Cl. 137—510

5 Claims

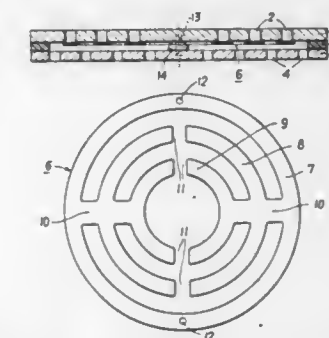


1. A fuel pressure regulator assembly comprising,
  - a housing,
  - a diaphragm separating said housing into a first and second chamber,
  - said housing having a radial inlet extending to said first chamber,
  - a connector mounted in said housing and extending axially into said first chamber,
  - said connector having an axial outlet,
  - a sealing member of resilient material,
  - an annular groove adjacent its inner end,
  - said groove facing radially outwardly,
  - said sealing member having an O-ring portion positioned in said groove, such that a portion of said sealing ring projects axially beyond said connector,

said sealing member including an integral tubular portion extending from said ring position, said connector having another annular groove spaced from the end of said connector, said sealing member having a radially inwardly extending rib extending from said tubular portion into said last mentioned groove of said connector, said diaphragm having a valve member adapted to engage said O-ring portion, and spring means in said second chamber urging said valve member against said O-ring portion.

4,164,238  
**CLOSING PLATE FOR A RING VALVE**  
 Albert F. Riedel, Schongau, Fed. Rep. of Germany, assignor to Hoerbiger & Co., Schongau, Fed. Rep. of Germany  
 Continuation of Ser. No. 738,269, Nov. 2, 1976, abandoned. This application Jun. 6, 1978, Ser. No. 913,101  
 Claims priority, application Austria, Nov. 3, 1975, 8357/75  
 Int. Cl.<sup>2</sup> F16K 15/14  
 U.S. Cl. 137—512.15

9 Claims



1. A closing plate for a ring valve mountable on a valve seat with through-flow passages, comprising:
  - at least one concentric plate ring and at least one radially spaced concentric sectioned plate ring for controlling the through-flow passages;
  - radially extending arms interconnecting said at least one concentric ring and said at least one radially spaced concentric sectioned plate ring;
  - one of said at least one concentric plate ring being continuous and said at least one sectioned ring being separated by radial slits;
  - said at least one continuous ring including spaced points for mounting on said valve seat with the ring portions between said spaced points being flexible;
  - said radial arms extending from a flexible portion of said at least one continuous ring and passing between said spaced points, said radial arms supporting the ring sections of said at least one sectioned ring separated by slits.

4,164,239  
**HOT AND COLD WATER RATIO AND VOLUME MANUAL DEVICE**  
 Dominic V. DeCesare, 223 Center St., Elizabeth, N.J. 07202  
 Filed Dec. 10, 1976, Ser. No. 749,231  
 Int. Cl.<sup>2</sup> F16K 11/22

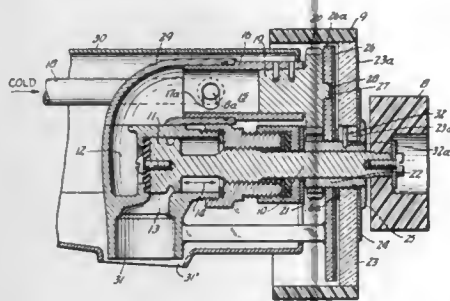
U.S. Cl. 137—553

1 Claim

1. A manual water faucet temperature control device consisting essentially of a single-chamber-defining structure substantially forming common first-flow space and valve-seating space and having a first inlet orifice and a second inlet orifice in communication with said first flow space, having an outlet orifice, and having a valve-seating port; a single unitary valve structure sealably seated within said valve-seating port, the single unitary valve structure having a first plate portion sealably seated in juxtaposition to the first inlet orifice and adapted to move to and from alternate blocking position and non-



blocking position relative to said first inlet orifice as the single unitary valve structure is rotated either clockwise or counter-clockwise within said valve-seating port, and said single unitary valve structure further having a second plate portion sealably seated in juxtaposition to the second inlet orifice and adapted to move to and from alternate blocking position and non-blocking position relative to said second inlet orifice as the single unitary valve structure is rotated either clockwise or counter-clockwise within said valve-seating port, the first plate portion and the second plate portion each being mounted in positions adapted for the first and second plate portions to slide over the respective first and second inlet orifices to and from respective said blocking positions and respective said non-blocking positions and each of the first and second plate portions being of predetermined size dimensions and positioned relative to one-another, adapted such that while one is not blocking the inlet orifice associated therewith the other one thereof may range from substantially complete blocking to substantially complete absence of blocking of the inlet orifice associated therewith, and further adapted such that while the other is not blocking the inlet orifice associated therewith the said one thereof may range from substantially complete blocking to substantially complete absence of blocking of the inlet orifice associated therewith, whereby when a hot water conduit is connected to one and a cold water conduit is connected to the other of the first and second inlet orifices relative proportions of hot and cold water may be varied from full pressure hot-flow to full pressure cold flow into said valve-seating space within the single-chamber-defining structure and out-of the outlet orifice thereof; and lever means for moving the single



unitary valve structure in alternate opposite directions within the valve-seating port; said single unitary valve being located within said valve-seating space within the single-chamber-defining structure, said single-chamber-defining structure being substantially cylindrical in shape with the valve-seating port at one end thereof and with the outlet orifice at an opposite end thereof, and having said first and second inlet orifices positioned within cylindrically-shaped walls thereof, and said single unitary valve structure and the first and second plate portions thereof each having a flow-blocking surface convexly shaped and seated within cylindrically-concave walls of the single-chamber-defining structure, said single unitary valve structure being rotatable; and a gauge means for providing a visually discernable scale indicative of from time-to-time positioning of the single unitary valve structure, including at least one of a scale and a pointer mounted on said single-chamber-defining structure and said lever means, and a remaining one of the scale and the pointer mounted on a remaining other of said single-chamber-defining structure, with the pointer and scale being in juxtaposition to one-another and indicative of degree to which said first and second inlet orifices respectively are blocked by the single unitary valve structure; said lever means comprising an annular handle; and a volume control means for regulating volume of flow from said said first flow space, the volume control means including a shaft extending and movable axially and sealably through a central opening of said annular handle, and said shaft having a volume-control valve mounted on a distal end thereof, said single-chamber-defining structure forming a common second flow space and volume-control seating space, said volume-control valve being seated sealably

within said volume-control seating space positioned to be moved alternately axially in opposite directions to open and close flow and regulate rate of flow through said orifice responsive to movement axially of said shaft in intermittently opposite directions.

4,164,240

# DEVICE FOR LOW-LOSS VARIATION OF FLOW FROM A POSITIVE DISPLACEMENT PUMP BY PERIODIC INTERRUPTION OF THE FLOW

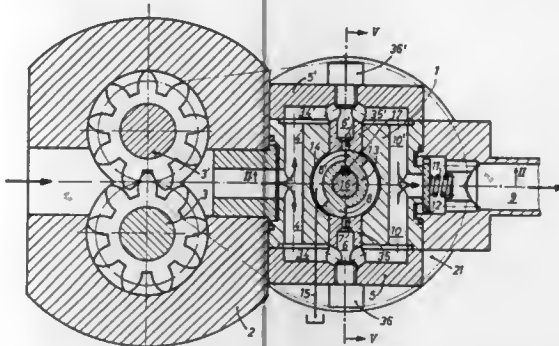
Ivan J. Cyphelly, Neuhaus, 8128 Hinteregg, Switzerland  
Filed Jan. 26, 1977, Ser. No. 762,570

Claims priority, application Switzerland, Jan. 27, 1976, 994/76

Int. Cl.<sup>2</sup> F16K 11/02

U.S. Cl. 137—887

6 Claims



1. A valve arrangement for use in a system having an inlet line from a positive displacement pump, a first outlet line directed to a load and a second outlet line directed to a zero-pressure pump reservoir, comprising:
  - a fixed valve housing having a bore therein;
  - two nozzles passing through said valve housing and extending into opposite sides of said bore, the openings of said nozzles being directed into said bore diametrically toward one another;
  - means for directing flow from said inlet line to said two nozzles;
  - rotary shutter means coaxially positioned within said bore for periodically and alternately, as said rotary shutter means continuously rotates, closing both of said nozzles, simultaneously, and opening said nozzles to allow flow into said second outlet line, whereby the necessity for a sealing relationship of said shutter with said valve housing is eliminated; and
  - means permitting flow from said inlet line into said first outlet line only when said nozzles are closed.

4,164,241

# BLEED SCREW CAP

Takaaki Kubo, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Nov. 18, 1977, Ser. No. 852,968

Claims priority, application Japan, Nov. 27, 1976, 51-158681[U]; Nov. 30, 1976, 51-160213[U]

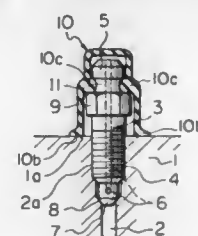
Int. Cl.<sup>2</sup> F16K 27/12

U.S. Cl. 137—377

5 Claims

1. A hydraulic bleeding assembly comprising:
  - a hydraulic component having therein an air bleed passage;
  - a bleed screw mounted on and extending from said hydraulic component, said bleed screw including an inner screw threaded portion threaded into said air bleed passage, a polygonal tool engaging portion extending outwardly and spaced from an outer surface of said hydraulic component and having a size larger than the diameter of said screw threaded portion, an outer head portion, and a neck portion between said tool engaging portion and said head

portion, said neck portion having a diameter smaller than said head portion and said tool engaging portion; and a cap of resilient material such as rubber completely covering all portions of said bleed screw which extend outwardly from said hydraulic component, said cap including a generally cup-shaped closed outer end portion covering



said head portion of said bleed screw, a generally cylindrical leg portion integral with and depending from said outer end portion and loosely covering said tool engaging portion, an inwardly extending annular projection tightly engaging said neck portion of said bleed screw, and said leg portion having an open inner end which resiliently engages said outer surface of said hydraulic component.

4,164,242

# VALVE FOR A PRESSURE TANK

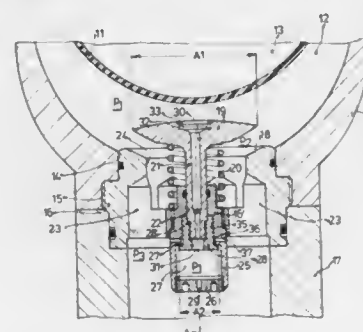
Hartmut Sandau, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Mar. 30, 1978, Ser. No. 891,858

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715424

Int. Cl.<sup>2</sup> F16L 55/04

U.S. Cl. 138—30

5 Claims



1. A pressure device, comprising a hollow container having an outlet for discharging fluid therefrom, said outlet being provided with a valve seat; a valve member slidably mounted in said container above said valve seat for respective movement between an open position to thereby permit fluid to discharge through said outlet and a closed position to thereby prevent fluid from discharging out of the container, said valve member being provided with a portion facing towards and corresponding to said valve seat and operative for fittingly engaging said valve seat when the valve member is in said closed position; resilient means for urging the valve member into said open position; a flexible partition in said container subdividing an interior thereof into a gas-containing compartment and into a liquid-containing compartment at said outlet, said partition being displaceable on expansion of gas in said gas compartment into an extended position immediately adjacent said outlet; and means connected to said valve member for preventing movement of the same into said closed position until the container is empty, and including a stationary barrel having one open end communicating with said liquid-containing compartment only when the container is substantially full and another open end for predetermined discharge of fluid from said barrel, said one open end becoming closed by said

4,164,243

# WELDED JOINT IN SEGMENTED SHEATH FOR COMPRESSED GAS INSULATED TRANSMISSION LINES

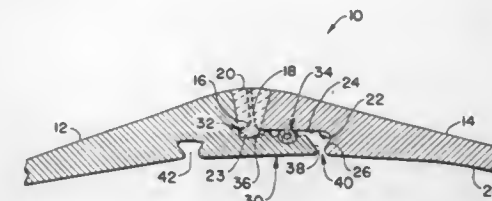
Alan H. Cookson, Southborough, and Philip C. Bolin, Northborough, both of Mass., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 18, 1977, Ser. No. 779,124

Int. Cl.<sup>2</sup> F16L 9/02

U.S. Cl. 138—162

7 Claims



1. A weld joint in an arcuate segmented sheath of a compressed gas insulated transmission line for joining first and second sheath sections having interior and exterior walls along confronting longitudinal edges, said joint comprising:
  - a first longitudinal margin adjacent said exterior wall of said first second having a face generally parallel with a radial line through a longitudinal axis at the center of curvature of said segmented sheath;
  - a longitudinal recess offset from said first margin along said interior wall, said recess including a circumferential base wall;
  - a second longitudinal margin adjacent said exterior wall of said second section having a face generally parallel with a radial line through a longitudinal axis at the center of curvature of said segmented sheath to abut to said first margin;
  - a tongue extending circumferentially from said second section and having one face to confront to said face wall;
  - sealing means comprising a tubular elastomeric sealing gasket longitudinally disposed between said recess and said tongue; and,
  - a longitudinal ridge adjacent said sealing gasket for preventing the flattening of said sealing gasket between said tongue and said recess.

4,164,244

# APPARATUS FOR DOSING BULK GOODS

Siegfried Meier, Neuhausen am Rheinfell, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfell, Switzerland

Filed Oct. 5, 1977, Ser. No. 839,745

Claims priority, application Switzerland, Oct. 5, 1976, 12580/76

Int. Cl.<sup>2</sup> B65B 3/08

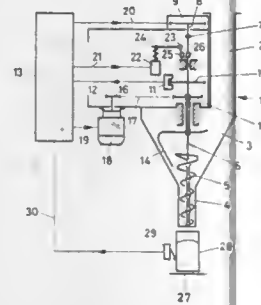
U.S. Cl. 141—156

4 Claims

1. In an apparatus for cyclically dosing bulk goods for filling receptacles in a filling position into which they are sequentially advanced, including a dosing auger; an electric motor connected to the auger to rotate the same; braking means for braking the electric motor shortly prior to the termination of a dosing cycle; the improvement wherein the electric motor is a disc rotor motor and said braking means is an electric braking means; further comprising a blocking device having an actuated state in which it prevents rotation of said auger and an idle



state in which it permits rotation of said auger; control means for setting said blocking device in the actuated state after said auger has been brought at least approximately to a standstill by said electric braking means and maintaining said blocking device in the actuated state until the beginning of a successive dosing cycle; and a sensor means associated with the filling position and connected with an input of said control means for



applying a signal thereto in response to sensing the arrival of a receptacle in the filling position; said control means including means for energizing said disc rotor motor for starting a dosing cycle in response to the receipt of said signal, means for energizing said electric braking means shortly before termination of the dosing cycle and means for setting said blocking device in said actuated state subsequent to the energization of said electric braking means.

4,164,245

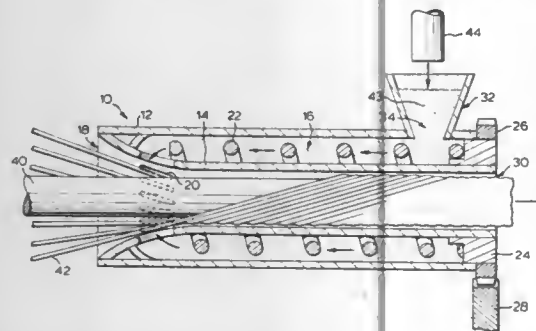
**POWDER PUSHING DEVICE FOR FILLING CABLE**  
Jorg-Hein Walling, St. Hubert, and Jean Bouffard, Lachine, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1978, Ser. No. 876,875

Int. Cl.<sup>2</sup> B65B 37/10

U.S. Cl. 141—250

10 Claims



1. A device for filling the interstices of multi-stranded cable with powder, comprising:  
a cylindrical housing;  
a tube within the housing for receiving the multistranded cable, the tube being concentric with the housing and spaced inwardly therefrom to form an annular chamber between said housing and tube, the tube further being flared outwardly at the inlet end thereof, and having openings annularly disposed therein adjacent said inlet end, the chamber being closed at each end thereof and opening annularly into the tube via said slots;  
powder feeding means opening into the housing; and  
means intermediate the housing and tube to move powder from the powder feeding means through the chamber and into the tube through said openings, to the interstices of the multistranded cable.

4,164,246

# **TREE PROCESSING MACHINE**

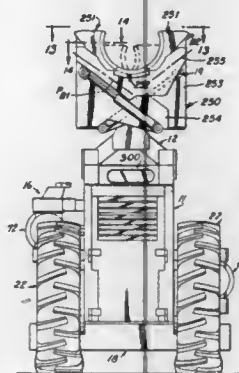
Donald D. Savage; Robert V. Chambers, and Maurice T. Mills, all of Marietta, Ga., assignors to B. J. Powell, Atlanta, Ga., a part interest

Division of Ser. No. 552,318, Feb. 24, 1975, Pat. No. 4,044,806, which is a continuation-in-part of Ser. No. 293,482, Sep. 29, 1972, Pat. No. 3,881,533. This application Aug. 29, 1977, Ser. No. 828,892

Int. Cl.<sup>2</sup> A01G 23/08; B27L 1/00

U.S. Cl. 144—2 Z

6 Claims



6. A tree delimbing mechanism for removing branches from a tree trunk at the sockets joining the branches with the tree trunk where the tree trunk has a tree central axis comprising:  
a housing defining an arcuate opening therethrough about an opening central axis adapted to receive the tree trunk therein;

traversing means for locating the tree trunk in the arcuate opening through said housing so that the tree central axis is generally parallel to the opening central axis and for effecting relative movement between the tree and the housing along the tree central axis so that the tree trunk is effectively moved through said housing opening in a first direction;

a first delimbing blade carried by said housing and fixed with respect to said housing both laterally of and axially of the opening central axis, said fixed delimbing blade a first arcuate cutting edge thereon facing in a direction generally opposite to the first direction in which the tree trunk is effectively moved through said housing opening and positioned so that the tree trunk passes closely adjacent said first cutting edge as the tree trunk is effectively moved through said housing opening, said first delimbing blade further defining a first abutting shoulder thereon spaced outboard of said first cutting edge with respect to the tree central axis and extending along the length of said first cutting edge so that said first cutting edge effectively passes along the tree trunk facing the oncoming branches to make an initial cut in each branch in alignment with said first cutting edge at a position adjacent the branch socket and so that said first abutting shoulder on said first cutting blade strikes the branch outboard of the initial cut made by said first cutting edge to cause the branch to first split down from the initial cut into the socket and then cause the socket to separate so that the branch is removed from the tree trunk;

a pair of second movable delimber blades movably mounted in said housing on opposite sides of said fixed blade for movement toward and away from said fixed blade in a plane generally perpendicular to the tree central axis and axially fixed with respect to the housing opening axis, each of said second movable blades defining a second arcuate cutting edge thereon facing in the direction generally opposite to the first direction in which the tree trunk is effectively moved through said housing opening and positioned so that the tree trunk passes closely adjacent

said second cutting edge as the tree trunk is effectively moved through said housing opening, each of said second movable delimbing blades further defining a second abutting shoulder thereon spaced outboard of said second cutting edge with respect to the tree central axis and extending along the length of said second cutting edge so that said second cutting edge effectively passes along the tree trunk facing the oncoming branches to make an initial cut in each branch in alignment with said second cutting edge at a position adjacent the branch socket and so that said second abutting shoulder on each of said second cutting blades strikes the branch outboard of the initial cut made by said second cutting edge to cause the branch to first split down from the initial cut into the socket and then cause the socket to separate so that the branch is removed from the tree trunk; and,

positioning means for selectively moving said movable blades toward and away from each other to cause said cutting edges of said second movable blades to pass closely adjacent the tree trunk and for maintaining substantially constant force on said movable blades toward the tree trunk while allowing limited movement of said movable blades with respect to the tree central axis.

4,164,247

# **TREE AND STUMP SPLITTER**

Robert H. Wolf, 408 S. Willow St., Flora, Ind. 46929

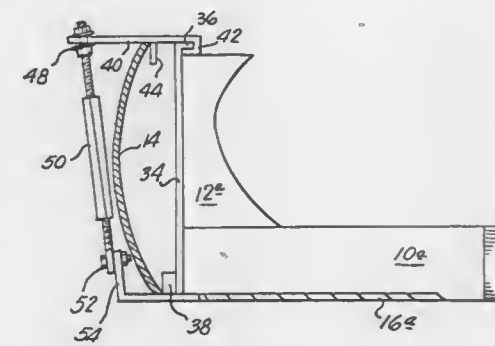
Division of Ser. No. 743,487, Nov. 19, 1976, Pat. No. 4,094,348.

This application Jan. 26, 1978, Ser. No. 872,621

Int. Cl.<sup>2</sup> A01G 23/08

U.S. Cl. 144—34 F

3 Claims



1. A stump splitter attachment for a bulldozer having a bulldozer blade, said attachment comprising a vertical sharp edged stump splitting blade extending forwardly of said attachment, at least one horizontally extending generally triangular cut off blade secured to said splitting blade from a position near the forward end of said splitting blade and having a rear edge lying in a plane normal to said splitting blade, and means to secure said attachment to the bulldozer blade in which said means to secure said attachment to the bulldozer blade includes back plate means secured to said cut off blade and extending in a plane normal to said splitting blade and rear edge of said cut off blade, said back plate being provided with a forwardly extending flange, a top plate formed with a hook portion to receive said forwardly extending flange, said top plate being provided with a stop means to engage a top edge of the bulldozer blade, a turnbuckle and means on the rear edges of said cut off blade and on said top plate to operatively engage ends of said turnbuckle, whereby said attachment may be securely clamped to said bulldozer blade by operation of said turnbuckle.

4,164,248

# **METHOD AND APPARATUS FOR CUTTING OFF DEFECTIVE PORTIONS OF LENGTHS OF TIMBER**

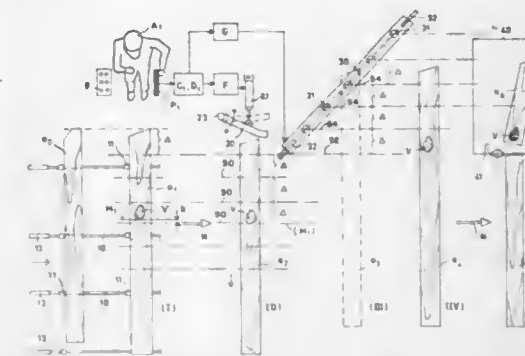
Alpo Rysti, Frisansintie 22, 02240 Espoo 24, Finland

Filed Dec. 30, 1977, Ser. No. 866,391

Int. Cl.<sup>2</sup> B27B 1/00

U.S. Cl. 144—312

10 Claims



1. In a method for removing, from lengths of timber, pieces thereof which have defects therein, the steps of continuously conveying the lengths of timber along a predetermined path with the lengths of timber arranged in succession along said path extending transversely thereof, determining an aligning distance for a given one of said lengths of timber which has a defect therein, as said given length of timber approaches a given location along said path, said aligning distance being defined by the distance between a cutting line extending across said given length of timber next to said defect and one of a series of second lines nearest to said cutting line on one side thereof and all extending parallel to each other in the direction of said path and situated at predetermined equal incremental distances from each other, transmitting to an adjustable pusher when said given length of timber reaches said given location, a first signal at a selected magnitude corresponding to said aligning distance, said adjustable pusher being situated in the path of movement of an end of said given length of timber at a second location located along said path subsequent to said given location for adjusting said pusher to push said given length of timber transversely of said path through said aligning distance, so that upon reaching said second location said given length of timber will be shifted transversely of said path to align said cutting line with said one of said second lines, and also transmitting a second signal to an incremental moving means situated at a third location along said path subsequent to said second location for actuating said incremental moving means in response to said second signal to move said given length of timber when it reaches said third location through a given number of incremental distances transversely of said path equal to the incremental distances between said second lines and sufficient to situate said cutting line in alignment with a predetermined one of said second lines with which a cutting means is aligned at a fourth location along said path subsequent to said third location, cutting said given length at said fourth location with said cutting means to separate the given length of timber into a pair of pieces only one of which will have said defect.

4,164,249

# **METHOD AND APPARATUS FOR MACHINING COMPONENTS FOR STAIRS**

Robert D. Strub, 817 S. Capitol, Iowa City, Iowa 52240

Filed Feb. 8, 1978, Ser. No. 876,146

Int. Cl.<sup>2</sup> B27C 5/10

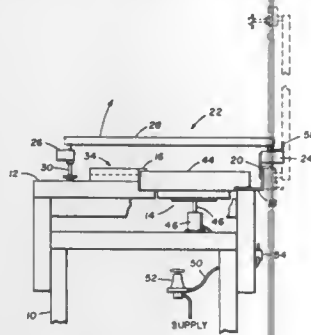
U.S. Cl. 144—326 R

7 Claims

7. The method of machining grooves in stringers for stairs which grooves are adapted to receive the ends of treads and risers therein when said stairs are assembled, said method comprising: providing a jig having a plurality of parallel spaced-apart guide members corresponding to the number of



treads in the stairs; positioning said jig with said guide members over the surface of the stringer into which said grooves are to be machined; moving said guide members to a first position in which they are at the desired angle relative to said stringer; locking said guide members in position relative to said stringer; passing a tool along each of said guide members to form the grooves for said treads in said stringer; unlocking said



guide members so that they can be moved relative to said stringer; moving said guide members to a second position in which they are at right angles to their first position; locking said guide members in said second position relative to said stringers; passing said tool along each of said guide members to form the grooves for said risers in said stringer; and unlocking said guide members so as to allow said machined stringer to be removed from beneath said jig.

#### 4,164,250 NAIL-DEFLECTING, INNER-TUBE ASSEMBLY FOR RUN-FLAT TIRES

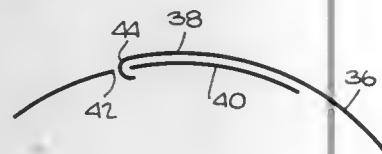
Daniel Shichman, Trumbull, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,918

Int. Cl.<sup>2</sup> B60C 17/00

U.S. Cl. 152—205

14 Claims



1. A pneumatic tire, comprising a substantially toroidal-shaped carcass having a pair of bead-reinforced sidewall regions, a crown region annularly bridging said sidewall regions, and nail-deflecting means disposed internally of said carcass between said sidewall regions for deflecting a nail that punctures said crown region, said nail-deflecting means including an annular, inflatable inner-tube capable of being inflated to a volume sufficient to engage with its exterior surface substantially the entire interior surface of said carcass and a puncture-proof, circumferentially expandible, but inextensible, pliable band disposed between said inner tube and said crown region, said band having overlapping opposite end portions and being expandible by movement of said end portions with respect to each other from a releasably constrained normal circumferential condition, wherein said band is annularly spaced from the interior of said crown region, to an expanded circumferential condition, wherein said band makes substantial circumferential contact with the interior of said crown region, said band having restraining means with a predetermined yield level for maintaining said band in said releasably constrained normal circumferential condition while said tire is puncture-free with at least a first predetermined pressure level being maintained in the space between the carcass and the exterior of said inner tube, said inner tube being circumferentially self-expandible upon puncture of the crown region by a nail with consequent loss of pressure in said space below the first predetermined

pressure, the puncture-caused expansion of said tube against said band establishing a tensile stress in said band in excess of the predetermined yield level of said restraining means, causing the restraining means to yield and enable the end portions of said band to slidably move with respect to each other to place said band in said circumferentially expanded condition, and wherein said restraining means comprise at least one slot formed in said band a predetermined distance from one of said end portions, said other end portion including at least one tab having a bent portion receivable in said one slot, the engagement of said tab in said slot defining the normal circumferential condition of said band, and wherein the bent portion of said tab is of arcuate U-shape with concave and convex surface portions, said slot having a sidewall bearing against the concave surface portion of said tab when said band is in said constrained normal circumferential condition.

#### 4,164,251 POLYURETHANE TIRE AND WHEEL ASSEMBLY

Daniel A. Chung, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 570,155, Apr. 21, 1975, abandoned.

This application Nov. 14, 1977, Ser. No. 851,246

Int. Cl.<sup>2</sup> B60C 1/00; C08G 18/76; C08K 5/36

U.S. Cl. 152—323

1 Claim

1. In an industrial tire/wheel assembly comprised of a solid, resilient polyurethane ground contacting tire molded and adhered to a centered rigid core adapted to fit to an axle of an industrial vehicle the combination of improvements wherein (i) said polyurethane is characterized by having a slit tear strength according to ASTM D-1938 in the range of about 15 to about 30 pounds, a compression set in the range of 25 to 35 percent according to ASTM D-395(B), a Goodrich flex life of at least about 15 minutes according to ASTM D-623 modified by using a 437 psi load, a starting temperature of about 38° C. and a stroke of 0.15 inch, and a 300 percent modulus in the range of about 1500 to about 2000; and (ii) said polyurethane is prepared by the method which comprises reacting as a fluid mixture in a mold cavity in contact with said rigid core at a temperature in the range of about 80° C. to about 150° C., 2,2'-dithiodianiline with a prepolymer, or reaction product of (A) 3,3'-dimethyldiphenylmethane-4,4'-diisocyanate, and (B) at least one polymeric polyol having an average molecular weight in the range of about 800 to about 3200 comprised of about 50 to about 100 weight percent polyester polyol and, correspondingly, about 50 to about zero weight percent polyether polyol, said polyols having a hydroxyl functionality of about 2, where said polyester polymeric polyols are selected from at least one of (1) the product of ε-caprolactone with diethylene glycol, (2) the condensation of low molecular weight saturated hydrocarbon diols containing 2 to 10 carbon atoms with an organic polycarboxylic acid selected from succinic acid, adipic acid and azelaic acid, and (3) polyethylene adipate and where said polyether polymeric polyols are selected from the type prepared by (1) polymerizing or copolymerizing alkylene oxides selected from ethylene oxide, propylene oxide and butylene oxide, (2) polymerizing or copolymerizing low molecular weight glycols selected from ethylene glycol, 1,3-propane diol and 1,4-butane diol, or (3) by the reaction of one or more of said alkylene oxides with said glycols and, optionally, with a small amount of trimethylol propane; where the ratio of isocyanate groups to polyol hydroxyl groups is in the range of about 1.7/1 to about 2.3/1 and the ratio of amino groups to excess isocyanate groups over hydroxyl groups is in the range of about 0.8/1 to about 1.1/1.

#### 4,164,252 STRAND GUIDING ROLLER FOR A CONTINUOUS CASTING PLANT

Werner Scheurecker, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

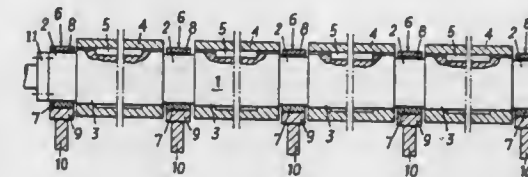
Filed Dec. 5, 1977, Ser. No. 857,259

Claims priority, application Austria, Dec. 10, 1976, 9125/76

Int. Cl.<sup>2</sup> B22D 11/12; B65G 13/00

U.S. Cl. 164—448

3 Claims



1. In a strand guiding roller to be used in a continuous casting plant for supporting, bending, straightening and deforming a continuously cast strand, in particular steel slab, wherein said strand guiding roller has a plurality of roller bodies and a plurality of bearings distributed over the length of said strand guiding roller, the improvement which is characterized in that a drivable shaft is provided, said plurality of roller bodies being designed as exchangeable wear sleeves and being arranged on said drivable shaft at a distance from each other, catch connections being provided to fasten said exchangeable wear sleeves on said drivable shaft so as to secure said exchangeable wear sleeves against rotation with respect to said shaft, and said bearings being provided intermediate said exchangeable wear sleeve to rotatably accommodate said drivable shaft therein and to support said shaft at a number of places along its longitudinal extension.

#### 4,164,253 METHOD FOR REDUCING THERMAL DEGRADATION OF A HEAT EXCHANGE FLUID

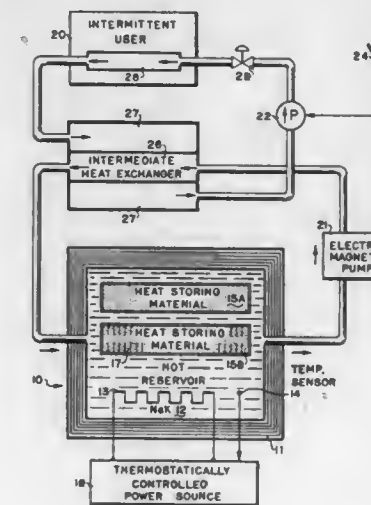
Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 575,414, May 7, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,392

Int. Cl.<sup>2</sup> H05B 1/00; F28D 15/00; F24H 7/04

U.S. Cl. 165—1

4 Claims



1. A method for reducing thermal degradation of a degradable thermal exchange fluid in a heat transfer system comprising the steps of

- maintaining a heat source comprising a high temperature heat store at least at a temperature which is the maximum working temperature of an intermittent user, said maxi-

- providing a control means for permitting operation of said user during working periods of temperatures up to and including said maximum working temperature and during non-working periods permitting operation of the user at a lower idle temperature for a prolonged period, said lower idle temperature not degrading the thermal exchange fluid at a significant rate,
- regulating transfer of heat from the heat source to the user during working periods to attain said maximum working temperature thereof by transferring heat from the heat source to a stable heat exchange fluid, transferring heat from the heat exchange fluid to a thermal exchange fluid which is thermally degradable at a significant rate at said maximum working temperature, and transferring heat from the thermal exchange fluid to the user, said transfer of heat to the heat exchange fluid and the thermal exchange fluid raising temperature of the fluids to the maximum working temperature of the user, and
- reducing transfer of heat from the heat source to the user during non-working periods thereof to attain said lower idle temperature by limiting the transfer of heat from said heat source to said thermally degradable thermal exchange fluid by said thermally stable heat exchange fluid to a level whereby the thermally degradable thermal exchange fluid is maintained at said lower idle temperature during said non-working period to reduce degradation of the thermal exchange fluid to a not significant rate.

#### 4,164,254 HEAT EXCHANGE DEVICE

Hans Hucke, Essigweg 6, CH-4133 Pratteln-Basel, Switzerland

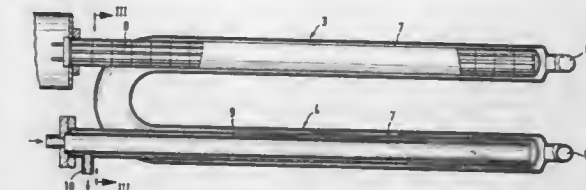
Filed Jun. 3, 1977, Ser. No. 803,285

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1976, 7618150[U]

Int. Cl.<sup>2</sup> F25B 29/00

U.S. Cl. 165—65

7 Claims



1. A heat exchange device for a heat transmission apparatus utilizing a heat carrier liquid, the heat exchange device comprising: a U-shaped tube provided with an inlet at one end and with an outlet at the other end thereof for the passage of the heat carrier liquid; a tubular casing extending into each arm of the U-shaped tube, said casing being closed at one end to prevent heat carrier liquid entering the casing and forming an annular flow passage between the casing and the arm of the tube; and a heat transfer means replaceably mounted within each casing for selective heating up or cooling off the heat carrier liquid flowing through the annular flow passage, wherein the heat transfer means is mounted from the U-side of the U-shaped tube in each tubular casing.

#### 4,164,255 HEAT EXCHANGER

Raymond Binet, Hellemmes; Alain Chelens, Marcq en Baroeul, and Maurice Lebegue, Hellemmes, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Nov. 14, 1977, Ser. No. 851,219

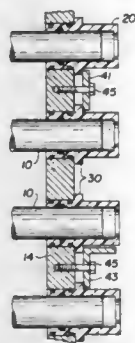
Int. Cl.<sup>2</sup> F28F 9/04

U.S. Cl. 165—82

10 Claims

1. In a heat exchanger which comprises an array of tubes having an outer diameter, a perforated end plate having an

outer face and defining a plurality of holes each having a diameter exceeding the outer diameter of the tubes, a support sleeve in each of the holes for holding an end of a respective one of the tubes in a respective one of the holes, an exterior surface of each support sleeve fitting the respective hole and an interior surface of each support sleeve being in contact with the respective tube, the exterior and interior surfaces extending along the hole and each defining a groove, and a toroidal gasket in each of the grooves whereby a fluid-tight joint is



formed between the respective hole and the support sleeve as well as the support sleeve and the respective tube: a clamping portion on each support sleeve, the clamping portion being affixed to the outer face of the perforated end plate and having an end projecting beyond the outer end plate face and the end of the respective tube held in the support sleeve, and an inwardly extending abutment at the projecting end of the clamping portion for limiting any movement of the tube beyond the abutment.

4,164,256

#### COOLING TOWER WITH FORCED VENTILATION AND NATURAL DRAFT

Fritz Kelp, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

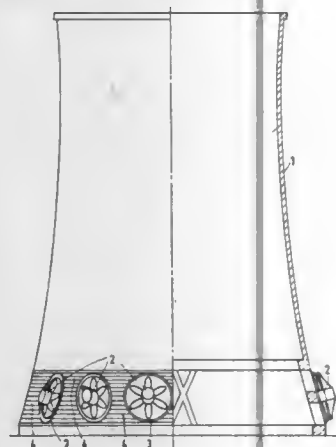
Filed Aug. 12, 1977, Ser. No. 824,099

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1976, 2636807

Int. Cl.<sup>2</sup> F28F 9/24; F28B 9/00

U.S. Cl. 165—125

3 Claims



1. Cooling tower for cooling by concurrent cooling with both natural draft and blower draft, by cooling solely with natural draft or by cooling solely with blower draft,
  - (a) having an outer peripheral wall provided with blowers spaced about the periphery thereof at a lower region thereof,
  - (b) the blowers being formed with annular inlet openings for cooling air,
  - (c) the cooling tower further comprising means defining

closable openings for cooling with natural draft disposed between the annular inlet openings.

- (d) the closable openings shaped to surround the annular inlet openings and to form the peripheral wall of the cooling tower as a peripheral ring in the region of the annular inlet openings, and
- (e) deflecting inserts mounted within the cooling tower wall between the annular inlet openings and said means defining said closable openings, said deflecting inserts projecting into the interior of the cooling tower for guiding the flows of coolant air through the annular openings and through said closable openings independently of one another for a given distance into the cooling tower whereby the flow of cooling air through the annular openings is prevented from mixing with the flow of cooling air through said closable openings directly behind said closable openings, thereby permitting concurrent cooling with blower draft air flowing through the annular inlet openings and with natural draft air flowing through the closable openings.

4,164,257

#### INTERNAL PROTECTION OF WELL CASING

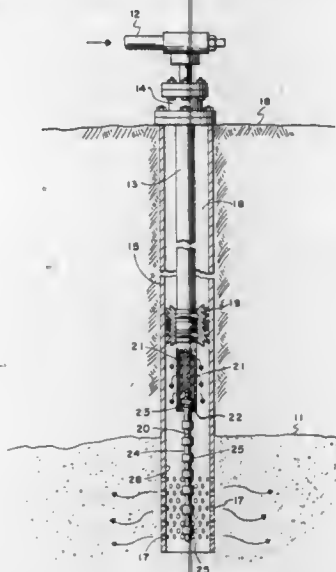
Donald R. Anthony, Dallas; Lee Bone, III, Plano, and William G. Price, Midland, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 15, 1977, Ser. No. 860,939

Int. Cl.<sup>2</sup> E21B 43/00

U.S. Cl. 166—113

14 Claims



1. A water injection well system for protecting the internal surface of a downhole section of casing from internal corrosion comprising:
  - a. a well casing extending downward from the surface to a first point in a subsurface formation;
  - b. injection well tubing extending downward from the surface inside said casing to a second point, said second point being at a higher elevation than said first point, said tubing having a lower end at said second point;
  - c. a metal member extending downward from said lower end of said tubing to said first point, said metal member being electrically connected to said casing through a metallic conductive path, said metal member having an outer surface spaced laterally from said internal surface of the section of said casing between said first and said second point; and
  - d. at least one galvanic sacrificial anode attached to said outer surface of said metal member between said metal member and said internal surface of said section of said

casing, said at least one anode being electrically connected to said metal member through a metallic conductive path.

4,164,258

#### SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Jul. 17, 1975, Ser. No. 596,828

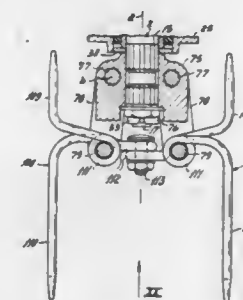
Claims priority, application Netherlands, Jul. 18, 1974, 7409705

The portion of the term of this patent subsequent to Jan. 14, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> A01B 33/14

U.S. Cl. 172—59

12 Claims



4. A soil cultivating or rotary harrow comprising a plurality of tined soil working members arranged in a transverse row, said members being rotatable about upwardly extending axes defined by corresponding shafts journaled in a frame portion and driving means connected to said shafts, said soil working members each comprising a support and at least one tine on said support, said tine having at least one downwardly extending operative end and being pivotally connected to said support by a fastening portion, said fastening portion being freely pivotable about pivot connection means that defines an axis inclined to the axis of rotation of the corresponding soil working member, said fastening portion being connected to said support with upper and lower pivots and said pivots being spaced apart from each other.

4,164,259

#### SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

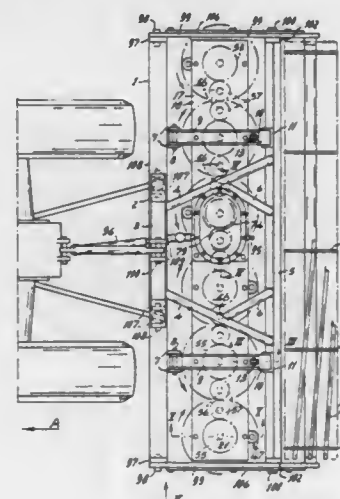
Filed Nov. 23, 1977, Ser. No. 854,372

Claims priority, application Netherlands, Nov. 29, 1976, 7613259

Int. Cl.<sup>2</sup> A01B 33/06

U.S. Cl. 172—59

10 Claims



1. A soil cultivating implement comprising at least one soil cultivating member that is rotatable about an upwardly extend-

ing axis defined by a respective shaft and driving means connected to rotate said member about said axis, said member comprising a support and downwardly extending tine means fastened to a plurality of pairs of resilient, interengaging strips of said support, said tine means including at least one tine having an upper fastening portion, inner limbs of said pairs of strips being shorter in length than outer limbs of the corresponding strips of the same pairs, said outer limbs being bent over towards one another at outer ends thereof to comprise respective parts of holders for said tines, further parts of said holders being plate means clamping said outer ends to secure said strips in position, said plate means cooperating with said fastening portion of the tine.

4,164,260

#### METHOD AND APPARATUS FOR CONTROLLING THE AVERAGE WEIGHTS OF COMMODITIES IN PACKAGE FORM

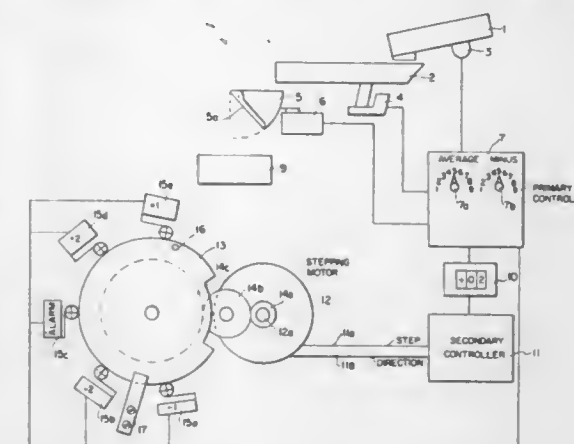
Stewart B. Blodgett, Houston, Tex., assignor to Mira-Pak, Inc., Houston, Tex.

Filed Jan. 23, 1978, Ser. No. 871,335

Int. Cl.<sup>2</sup> G01G 19/52

U.S. Cl. 177—1

16 Claims



1. A method for controlling the minimum weight and the average weight of charges of product prior to packaging said product so as to assure that no charges are below a given minimum weight and to maintain the average weights of the charges within predetermined limits over the operating period of the machine producing the product charges, said method comprising:
  - establishing an average weight and minimum weight for said charges;
  - weighing each of said charges;
  - determining whether the weight of each of the weighed charges is less than said minimum weight and modifying the charges whose weights are below said minimum weight so that the final weight of all charges is above said minimum weight;
  - determining the deviation of the final weight of each of said charges from said average weight so as to provide an indication of the amount and direction of the deviation from the average for each said charge;
  - summing algebraically all of the indications of the deviation from the average for each of said charges so as to produce, after each charge has been finally weighed, a running algebraic summation representative of the total net deviation from the average up through the charge which has just been weighed;
  - correctively controlling the production of the charges whenever the said algebraic summation exceeds a preselected level in either a positive or negative direction while continuing the summing process such that the each determination of whether said preselected level has been ex-



ceeded is based on the total number of charges produced up through the most recent charge.

4,164,261

**IGNITION APPARATUS FOR ROTARY PISTON ENGINE**  
Toshihiko Igashira, Toyokawa; Shunzo Yamaguchi, Okazaki; Hisasi Kawal, Toyohashi; Seiji Morino, and Naoki Umeda, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

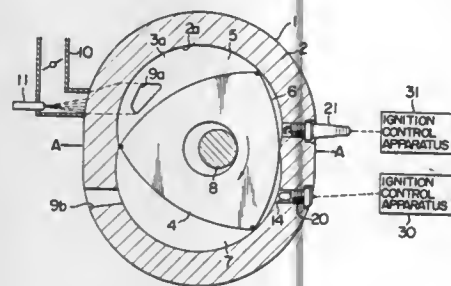
Filed Nov. 22, 1977, Ser. No. 854,038

Claims priority, application Japan, Jun. 13, 1977, 52-69625; Sep. 2, 1977, 52-106017

Int. Cl.<sup>2</sup> F02B 53/12

U.S. Cl. 180—54 R

8 Claims



1. An ignition apparatus for a rotary piston engine comprising:
  - a glow plug mounted in an engine housing of epitrochoid shape on a leading side of the trochoid minor axis as viewed in the direction of engine rotation;
  - means for energizing said glow plug in response to a trigger pulse signal of fixed frequency; and
  - ignition control means for sensing the temperature of said glow plug and for stopping power to said glow plug when the sensed temperature exceeds a present temperature in a temperature range within which air-fuel mixture can be ignited,
  - said ignition control means including means for sensing a change in a resistance of a heater coil of said glow plug to intermittently power said heater coil.

4,164,262

**MOTOR VEHICLE**

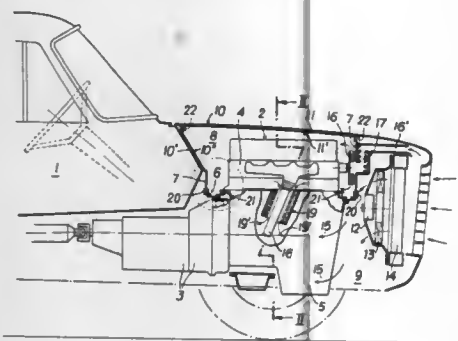
Othmar Skatsche; Heinz Fachbach; Gerhard Thien; Hans List, and Josef Greier, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Sep. 23, 1977, Ser. No. 836,216

Int. Cl.<sup>2</sup> B60K 11/00

U.S. Cl. 180—54 A

7 Claims



1. A motor vehicle, comprising a frame, an engine compartment defined by vehicle body components including side walls, a front wall and a rear end wall and containing an engine having an engine block mounted on said frame, said engine having an exhaust manifold, a water radiator and a fan associ-

ated therewith for cooling same, said engine having an oil sump, means dividing said compartment into an upper and a lower space, said oil sump being secured in a body-sound-insulating manner to said engine block, said dividing means comprising an elastic membrane disposed between said oil sump and said body components and completely surrounding said oil sump at an upper edge thereof, said upper space defining a closed sound-suppressing encapsulation which comprises said side walls, said front wall and said rear end wall, said encapsulation further comprising a substantially horizontal frame extending from said upper edge of said oil sump and in contact with said elastic membrane, a detachable cover at an upper side of said encapsulation, said radiator and said fan being located outside said encapsulation, and said radiator having a hot air exhaust path which by-passes said encapsulation.

4,164,263

**VIBRATION REJECTING IMPACT SENSOR, PARTICULARLY TO TRIGGER A VEHICULAR COLLISION SAFETY SYSTEM**

Frieder Heintz, Stutensee, and Walter Jansche, Durmersheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

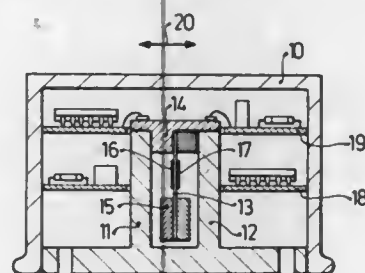
Filed Nov. 11, 1977, Ser. No. 850,558

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655604

Int. Cl.<sup>2</sup> B60R 21/00

U.S. Cl. 280—735

9 Claims



1. For installation in a vehicle having a vehicular collision safety restraint system, a vibration rejection, impact sensing unit comprising
  - a common housing (10, 11, 12) and
  - the combination of an impact sensor effectively immune to vibration or concussion, but sensing a collision impact of the vehicle, and providing a sensor signal, with an electric evaluation circuit providing a collision safety restraint output signal;
  - wherein the sensor comprises
    - a resilient spring-mass system including a movable mass (15) and a spring (13) secured in the housing at an attachment portion at a freely movable portion of the spring (13), and at least one strain gauge (16, 17) secured to the spring (13) and providing said sensor signal;
    - and the electric evaluation circuit is connected to said at least one strain gauge (16, 17) and comprises
      - means rejecting signals having a frequency above a predetermined limit,
      - an amplifier (22),
      - and a threshold circuit (24) providing the collision safety restraint output signal if the threshold level of the threshold circuit is exceeded,
    - the circuit components of said evaluation circuit being located within said common housing for closely adjacent physical association of said circuit components with said at least one strain gauge.

4,164,264

**HIGH PRESSURE SEALING APPARATUS**

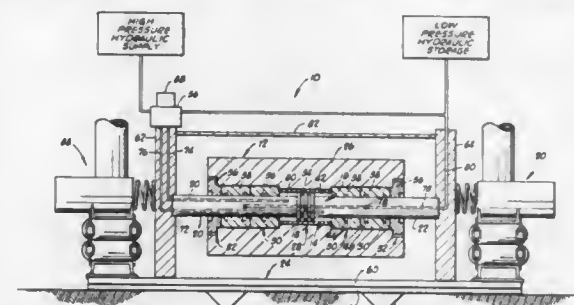
Delbert W. Fair, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 3, 1977, Ser. No. 848,164

Int. Cl.<sup>2</sup> G01V 1/04; F01B 15/00

U.S. Cl. 181—119

4 Claims



2. A transducer for inducing waves in an elastic medium such as the earth including a hydraulic fluid system having a high pressure side and a low pressure side, said transducer comprising:
  - a reaction mass member having a plurality of cylinder bores extending therethrough;
  - a piston member having a piston and oppositely extending piston rods reciprocally disposed in each of said cylinder bores;
  - means disposed within each of said piston members for introducing fluid under pressure from said high pressure side into cylinder bores alternately on opposite sides of each of said pistons for reciprocating said piston members relative to said mass member;
  - fluid bleed-back means disposed within the piston member for continuously returning the fluid which flows between said cylinder bore and the piston rods to said low pressure side of said hydraulic fluid system; and
  - a frame interconnecting the ends of the oppositely extending piston rods, said frame having a surface thereon for engaging a surface of the elastic medium.

4,164,266

**EXHAUST GAS MUFFLER**

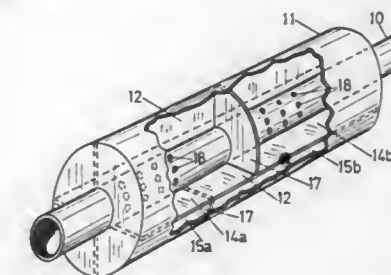
Lars Collin, Vasterbergsgatan 3, Molndal, Sweden (43139), and Henrik Landal, Attehogsgatan 10a, Goteborg, Sweden (41674)

Filed Aug. 8, 1977, Ser. No. 822,907

Claims priority, application Sweden, Aug. 19, 1976, 7609215 Int. Cl.<sup>2</sup> F01N 1/08, 3/06

U.S. Cl. 181—250

16 Claims



1. In a muffler for dampening exhaust noise composed of sound waves having various frequencies:
  - an axially extending tube adapted to be connected to an exhaust pipe,
  - a casing surrounding said tube, and being devoid of dampening material,
  - first axial wall means extending longitudinally of said tube to subdivide said casing into at least two mutually separate spaces,
  - second transverse wall means extending radially from said tube to subdivide at least one of said spaces into at least two mutually separate chambers, and
  - openings in the wall of said tube for individually communicating the interior of said tube with said at least one subdivided space and said two chambers,
  - the openings communicating said tube with said at least one sub-divided space being located along part of the axial extension of said tube, to form said space into a resonator compatible with the lowest frequency to be dampened.

4,164,267

**EXHAUST MUFFLER**

Sam W. Meineke, and Harold Nedell, both of 6330 W. Loop South, Suite 103, Bellaire, Tex. 77401

Continuation of Ser. No. 598,709, Jul. 24, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,158

Int. Cl.<sup>2</sup> F01N 1/00

U.S. Cl. 181—255

4 Claims



1. A muffler comprising:
  - an elongate body portion having a housing and end walls at opposite ends of said housing, each of said end walls defining an opening;
  - gas passage means interior said elongate body portion;
  - a first pipe fabricated from killed steel and connected at one end to said opening in a first of said end walls, the other end of said first pipe being operable to provide a first region of enlarged diameter with respect to a diameter of a remaining length of said first pipe, said first enlarged region having a diameter enlarged up to about 125% of the diameter of said remaining length of said first pipe.

4,164,265

**BAFFLE**

Eckhard Kucharczyk, Netphen, Fed. Rep. of Germany, assignor to Siegenia-Frank KG., Siegen, Fed. Rep. of Germany

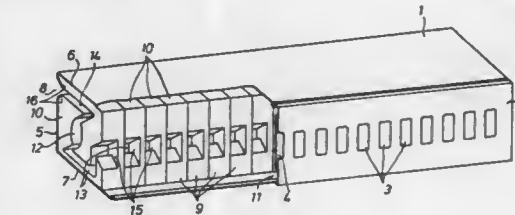
Filed Apr. 17, 1978, Ser. No. 897,152

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716957

Int. Cl.<sup>2</sup> E04F 17/04; F24F 7/00

U.S. Cl. 181—224

13 Claims



1. A baffle liner of molded shapes made from elastomeric material for lining the interiors of housings of sound absorbing ventilator devices comprising a plurality of plates, each having two broad sides and a transverse aperture through the plate thickness and at least two grooves in the broad sides of the plate leading from said aperture to opposite narrow sides of the plate and forming exit openings in said respective sides.

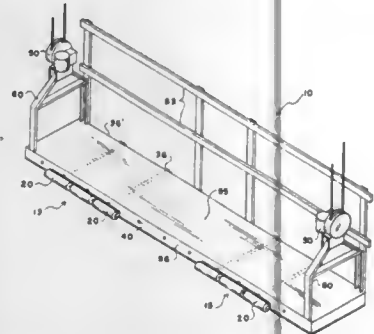
**4,164,268**  
**ADJUSTABLE PROTECTIVE ROLLERS FOR**  
**SUSPENDED SCAFFOLDING**

Paul Jones, and John H. Scheffer, both of Greensboro, N.C.,  
 assignors to Clear Day, Inc., Greensboro, N.C.  
 Filed Mar. 20, 1978, Ser. No. 890,629

Int. Cl.<sup>2</sup> E04G 3/10

U.S. Cl. 182—150

2 Claims



1. A suspended scaffold for use in transporting equipment and/or personnel along the vertical wall of a building or structure, said suspended scaffold comprising:

- (a) a load bearing platform including a forward edge, an opposite rear edge, and a plurality of passageways extending through said platform between said front and rear edges;
- (b) suspension means operably connected to said platform for moving said platform along the vertical building wall while maintaining said platform horizontal with said front edge facing said building wall;
- (c) a plurality of roller assemblies; each including:
  - (i) a mounting bracket carrying at least one force absorbing elongated roller formed of a resilient material;
  - (ii) at least two support rods secured to said mounting bracket and extending rearwardly therefrom, said support rods, when assembled, extending entirely through selected ones of said passageways from said front through said rear edge for detachably mounting said roller assembly at one of various selected points along said forward side of said platform;
- (d) means for retaining said support rods in assembled relation through said platform; whereby said roller assemblies may be positioned on said platform at spaced points corresponding to the spaces between solid building portions extending between the windows thereof so that said rollers move along the building wall preventing damage thereto by said scaffold.

**4,164,269**  
**SAFETY BRACKET FOR SECURING LADDER IN PLACE**  
 Charles E. Jackson, Newton, N.C., assignor to E. L. Hilts & Company, Charlotte, N.C.

Filed Oct. 23, 1978, Ser. No. 953,962

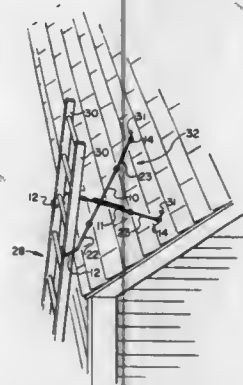
Int. Cl.<sup>2</sup> E06C 7/48

U.S. Cl. 182—229

7 Claims

1. A safety bracket for securing a ladder in place against a building structure, said safety bracket comprising two extending arm members, and interconnection means disposed intermediate the respective ends of said arm members to connect such arm members in crossing relation with each said arm member being slidable with respect to the other, each of said arm members having first attachment means at one end thereof

for attaching said arm member to said ladder, and each said arm member having second attachment means at the other end



thereof for receiving a projecting member secured to said building structure.

**4,164,270**  
**MAST SUPPORT CONSTRUCTION FOR FORK LIFT**  
**TRUCK**

Hiroshi Osada, Tokyo, and Kazuo Murata, Tachikawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

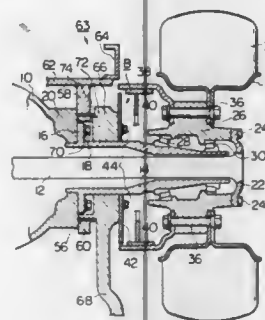
Filed Apr. 14, 1978, Ser. No. 896,620

Claims priority, application Japan, Apr. 27, 1977, 52-52649[U]

Int. Cl.<sup>2</sup> B66B 9/20

U.S. Cl. 187—9 R

3 Claims



1. A mast support construction for a fork lift truck having a body proper, a mast assembly located at one end of said body, a pair of driving road wheels located near said mast, and a differential housing positioned between said driving road wheels, said differential housing containing therein a differential gear mechanism which transmits a driving force from an engine to said driving road wheels through respective axle shafts, said mast support construction comprising:

- an axle shaft housing spacedly receiving therein each of said axle shafts and having thereon a radially outwardly extending flange portion which abuts a base portion of said differential housing, said flange portion being secured to said differential housing by fastening means;
- an axle mount bracket having a through bore through which said axle shaft housing is fittingly inserted so that said axle shaft housing is supported via said bracket by said body proper, said bracket being formed at a portion thereof facing said base portion of said differential housing with a circular recess defined within a cylindrical wall portion encircling said circular recess, said flange portion of said axle shaft housing being wholly received in said circular recess of said first bracket; and
- an arm member having a first portion thereof slidably disposed about said cylindrical wall portion and a second

portion thereof to which said mast assembly is firmly fixed.

**4,164,271**  
**SYSTEM FOR INDICATING STOP LEVELS FOR AN**  
**ELEVATOR**

Gunnar Bergström, Skellefteå, Sweden, assignor to Linden-Alimak AB, Skellefteå, Sweden

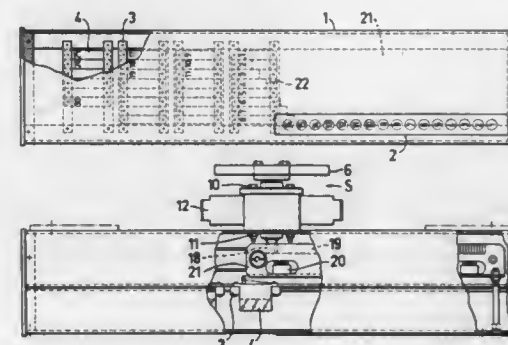
Filed Dec. 13, 1977, Ser. No. 860,240

Claims priority, application Sweden, Dec. 14, 1976, 7614047

Int. Cl.<sup>2</sup> B66B 1/36, 1/50

U.S. Cl. 187—32

7 Claims



1. A system for indicating the stop levels for an elevator car traveling in a hoist shaft, said system comprising:

- a rotatable control element comprising a horizontal shaft journaled on the elevator car and a plurality of uniformly spaced, radial arms extending from said control element shaft into the hoist shaft;
- a linearly movable slide mounted on said elevator car; transmission means connecting said control element and said slide for moving said slide linearly in response to rotation of the control element;
- a plurality of projections disposed in said hoist shaft, at least one projection being associated with each stop level for the elevator car, said projections extending into the path of the arms of the control element such that as the elevator car moves past each projection, the projection will engage one of said arms and cause the control element to rotate through an angle equal to the angle between adjacent arms, and
- at least one line of switches positioned in the path of said slide, each line of switches forming an angle with a line generally defined by the adjacent end of the slide such that the switches are successively actuated as the slide moves; whereby each rotation of the control element in response to engagement of one of said arms by one of said projections will move the slide member one step and actuate one of the switches to indicate the stop location associated with the engaged projection.

**4,164,272**  
**CLEARANCE SENSING BRAKE ADJUSTER**  
 Richard F. Neuman, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 3, 1978, Ser. No. 874,732

Int. Cl.<sup>2</sup> F16D 65/56

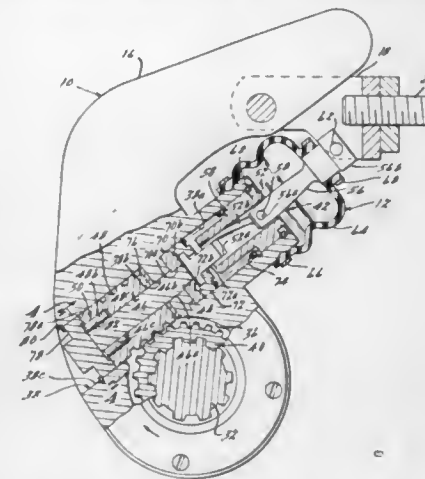
U.S. Cl. 188—196 D

9 Claims

1. A brake clearance adjuster including a lever housing having first and second intermeshed gears disposed therein, said second gear operative to rotate said first gear with said housing for applying and releasing said brake in response to pivotal reciprocating movement of said housing, and said second gear rotatable relative to said housing for rotating said first gear relative to said housing and adjusting the brake clearance, wherein the improvement comprises:

- a torque limiting clutch reciprocally rotatable relative to said housing in response to said pivotal reciprocation of

said housing for effecting rotation of said second gear relative to said housing; and  
 a one-way clutch interposed between said torque limiting clutch and said second gear, said one-way clutch operative to drivingly connect said torque limiting clutch to



said second gear in response to rotation of said torque limiting clutch in one direction and operative to drivingly disconnect said torque limiting clutch from said second gear in response to rotation of said torque limiting clutch in said other direction.

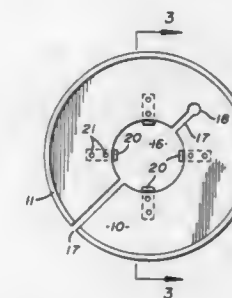
**4,164,273**  
**RESILIENT SHIELD FOR VEHICLE WHEEL BRAKE**  
**ASSEMBLIES**  
 Eugene L. McElroy, Enon Valley, Pa., assignor to Enon Valley Industries, Inc., Enon Valley, Pa.

Filed Oct. 27, 1977, Ser. No. 846,253

Int. Cl.<sup>2</sup> F16D 65/00

U.S. Cl. 188—218 A

6 Claims



1. A resilient non-metallic shield for vehicle wheel brake assemblies comprising a unitary flexible and resilient plastic disc having a flange on its peripheral edge and a central aperture, means on said disc partially within the aperture for engagement about an axle of a vehicle to which the shield is applied, said means spacing the edge of the disc about the aperture from said axle, said disc having a continuously open slot defined therein on a transverse diametrical line extending partially thereacross so as to permit the same to be distorted and positioned over said axle, said slot extending through said disc peripheral edge on one side of said aperture, along said diametrical line into said central aperture and continuing along said diametrical line a distance beyond said aperture to a terminal point of said slot located between said aperture and said disc peripheral edge on the other side of said aperture, said disc being unitary and unsplit in the area thereof which is located between said terminal point and said disc peripheral edge.



4,164,274

## ADJUSTABLE SHOCK ABSORBER

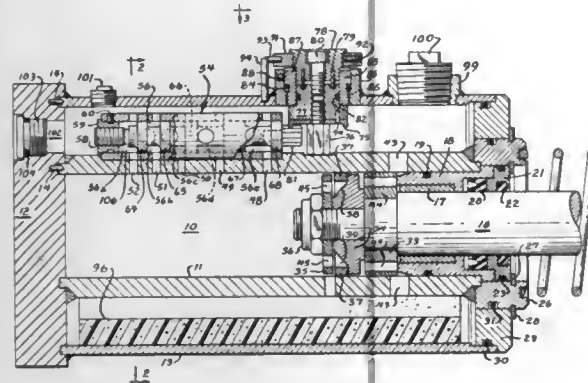
Willard J. Schupner, Palatine, Ill., assignor to Efdyn Corporation, Geneva, Ill.

Filed Feb. 9, 1978, Ser. No. 876,348

Int. Cl.<sup>2</sup> F16F 9/44

U.S. Cl. 188—285

3 Claims



1. A shock absorber including a cylinder part defining a cylinder, a piston in said cylinder, a housing about said cylinder part and defining a space therebetween to serve as a hydraulic fluid reservoir, said cylinder part defining an axis along which said piston moves, said cylinder part having at least one port therethrough which port forms part of a fluid passage between the cylinder and the reservoir to permit hydraulic fluid to flow through said passage from the cylinder to the reservoir when the piston is forced in one direction in said cylinder by an externally applied force to be absorbed, and valve means in said space and in the fluid passage to permit adjustment of the rate of flow of the hydraulic fluid from the cylinder to the reservoir, said valve means including an external adjustment handle, said shock absorber being characterized by said valve means comprising:

- a valve body member fixedly mounted in the reservoir and having an internal chamber and a pair of openings from the chamber to the outside of the body member, one of said openings communicating with said port and the other opening communicating with said reservoir;
- an annular spool member within said chamber and having an annular land sealingly contacting the valve body member, said spool member being rotatable in said chamber;
- said body member defining an axis along which said spool member moves in said chamber, the latter axis being parallel to said cylinder part axis, said chamber being cylindrical, whereby as the spool member moves the extent to which said land covers the chamber end of at least one of said openings is varied, despite the rotational portion of the spool member; and
- an adjustment device connected to the spool member for so moving said spool member, said device including said handle, said device including thread means interconnecting said body member and said spool member whereby rotation of the spool member moves it axially with respect to the body member, shaft means extending through said housing, normal to said body member axis and rotatable with respect to said housing, said shaft means having external and internal ends with said handle being secured to said external end, and
- gear means interconnecting the internal end of the shaft means and said spool member for rotating the spool member in response to rotation of the handle.

4,164,275

## UTILITY BAG—BEACH MAT

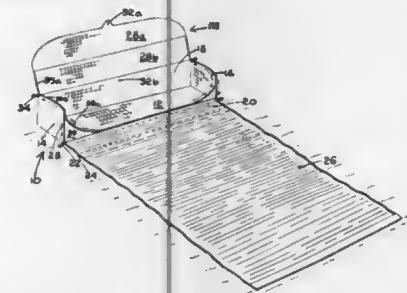
Yvette L. Davis, 105 Oak Ave., Kentfield, Calif.

Filed Jun. 15, 1978, Ser. No. 915,659

Int. Cl.<sup>2</sup> A45C 9/00

U.S. Cl. 190—2

9 Claims



1. A utility bag comprising bottom, back and two side panels of unitary construction; a front panel; first means (23, 24) for releasably securing the sides of said front panel to said side panels; a lid hinged to said back panel; second means (35a, 35b) for releasably securing said lid to close against said front panel; and a mat of a size to accommodate a person thereon; one end of said mat being secured to one of said front and bottom panels.

4,164,276

## CLUTCH-BRAKE STEERING MECHANISM FOR TRACTORS

Daniel B. Shore, Niles, and Probir K. Chatterjee, Mount Prospect, both of Ill., assignors to International Harvester Company, Chicago, Ill.

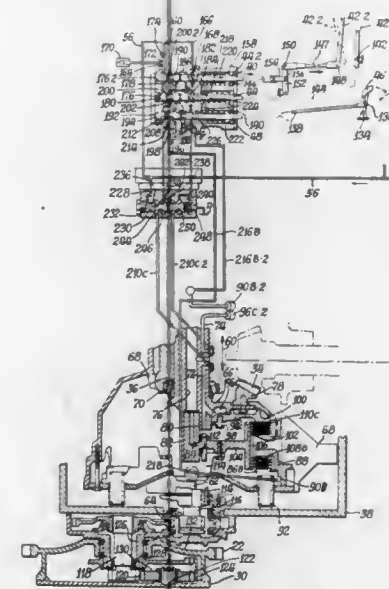
Division of Ser. No. 561,119, Mar. 24, 1975, Pat. No. 4,015,619.

This application Jul. 26, 1976, Ser. No. 708,956

Int. Cl.<sup>2</sup> F16D 67/04

U.S. Cl. 192—13 R

7 Claims



1. Steering-by-driving system for a common output member which is rotatable including: clutch-brake mechanism for controlling rotation of the common output member, said clutch-brake mechanism including actuatable clutch and brake cylinders which, when actuated at the same pressure, act primarily in alteration to

one another to engage the brake and release the clutch under low pressure on both, and to release the brake and engage the clutch under high pressure on both; steering valve mechanism having an inlet in the inlet one of its inlet and outlet sides and having a metering valve on the inlet side; clutch and brake conduit connected at one end to the outlet side of the steering valve mechanism and connected at the other end to the respective clutch and brake cylinders, said metering valve effective to supply fluid at the same pressure through the clutch and brake conduit to the clutch and brake cylinders; a tow valve reposing in the clutch conduit for blocking same, and having a pressure chamber with pressure movable means therein to cause operation of the tow valve to a valve-open condition; and pressure-fitting means connected to the inlet of the steering valve mechanism for communicating, in an emergency, pressure fluid controlled by the metering valve which is transmitted therefrom through the brake conduit to the brake cylinder and blocked in the clutch conduit by the reposing tow valve therein, whereby the brake cylinder is actuated under pressure to release the brake on the common output member whilst the clutch cylinder is being blocked from pressure and effectively keeping the clutch released.

4,164,277

## SYSTEM FOR CHARGING A PLURALITY OF PROCESSING MACHINES

René Fluck, Schleitheim, and Franz Rüegg, Neuhausen am Rheinfall, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

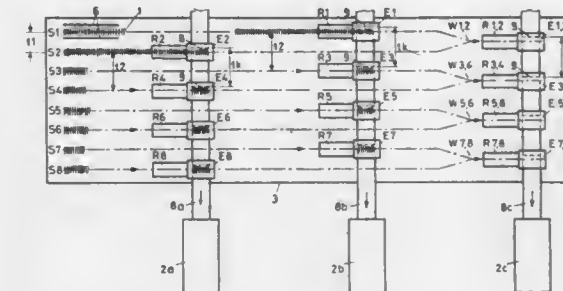
Filed Jan. 30, 1978, Ser. No. 873,538

Claims priority, application Switzerland, Jan. 28, 1977, 1090/77

Int. Cl.<sup>2</sup> B65G 47/51

U.S. Cl. 198—369

9 Claims



1. In a conveyor system for charging at least two processing machines with flat items, including a trunk conveyor belt; means defining at least eight parallel, spaced channels oriented in the conveying direction of the trunk conveyor belt for guiding the items on the trunk conveyor belt in at least eight rows; a separate feeder aligned with each channel for receiving the items from the associated channel and for depositing identical groups of items on at least two conveyor tracks arranged above and transversely to the trunk conveyor belt for advancing the item groups to the processing machines arranged at a respective discharge end of the conveyor tracks, the improvement wherein with each said feeder there is associated a separate ramp; each ramp having an inlet end adjoining the trunk conveyor belt for receiving the items from the associated channel and an outlet end operatively coupled with the associated feeder for introducing the items thereinto from the associated ramp; each ramp including movable means for setting the ramp into an operative position in which the items advancing in the respective channel are transferred to the ramp from the trunk conveyor belt and an inoperative position in which the items advancing in the respective channel pass by the ramp

without being transferred thereto; the improvement further comprising a standby conveyor track arranged above and transversely to the trunk conveyor belt and downstream of said conveyor tracks as viewed in the direction of item feed on said trunk conveyor belt; a plurality of standby feeders coupled to said standby conveyor track; a separate standby ramp associated with each standby feeder; each standby ramp having an inlet end operatively connected to the trunk conveyor belt and an outlet end operatively connected to the associated standby feeder; and a separate diverter coupled to the inlet end of each standby ramp; each said diverter having means for selectively advancing, to the standby ramp associated therewith, items forwarded on said trunk conveyor belt in a plurality of said channels beyond the respective said ramps for charging a standby processing machine arranged at a discharge end of said standby conveyor track.

4,164,278

## CONTINUOUS PUSHER DEVICE FOR CIGARETTE PACKING MACHINES

Pasquino Gurioli, Bologna, Italy, assignor to CIR-S.p.A.-Divisione SASIB, Bologna, Italy

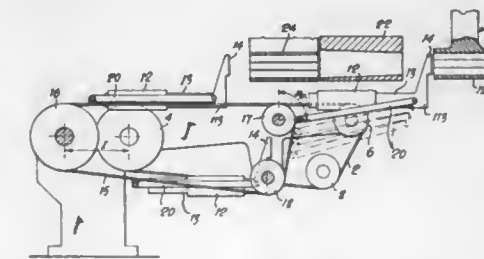
Filed Apr. 20, 1978, Ser. No. 898,192

Claims priority, application Italy, May 10, 1977, 12599 A/77

Int. Cl.<sup>2</sup> B65G 65/42, 19/10

U.S. Cl. 198—487

3 Claims



1. In a cigarette packing machine a pusher device for the ejection of cigarette groups formed in a composition chamber from the said composition chamber into a receiving pocket comprising a first continuous endless conveyor provided with pushers mounted thereon, said pushers sequentially engaging the said composition chamber in the direction of the axis of the cigarette and thus ejecting from the said chamber the formed cigarette group, wherein the improvement consists in that each pusher is carried by a supporting rod which is telescopically slidable in a tubular carrier element rotatably mounted on said first conveyor and that the telescopically slidable supporting rod is connected through a crank linkage to a second endless conveyor parallel to the said first conveyor, while the tubular carrier element is mounted on a pin rotatable on a support provided on the first conveyor and is connected through another crank linkage a third endless conveyor parallel to the first conveyor, the first conveyor being located forwardly with respect to the other two conveyors, all the said three conveyors rotating synchronously and in the same direction.

4,164,279

## ASSEMBLY FOR FEEDING OBJECTS FROM A CONVEYOR TO A PRINTING STATION AND A PRINTING MACHINE HAVING SUCH A FEEDING ASSEMBLY

Jean-Louis Dubuit, 74, Boulevard Voltaire, 75011 Paris, France

Filed Oct. 11, 1977, Ser. No. 840,786

Claims priority, application France, Oct. 15, 1976, 76 31017

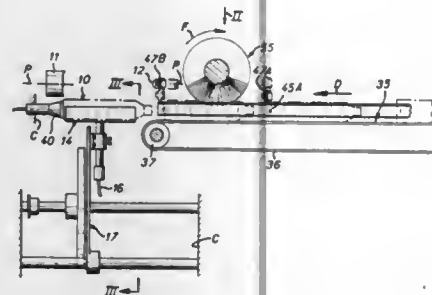
Int. Cl.<sup>2</sup> B65G 37/00

U.S. Cl. 198—492

14 Claims

1. A transfer assembly comprising a supply conveyor carrying objects in continuous motion in a first direction, a first

selector finger operative to allow one object to be introduced to an ejection location at the discharge end of the conveyor and holding back following objects momentarily, and a second selector finger for retaining the object at the ejection location momentarily, means for exerting a component of force against said last mentioned object parallel to said first direction for propelling it beyond the discharge end to a waiting transfer



carriage, stop means aligned with and spaced from said supply conveyor for stopping a propelled object in alignment with said transfer carriage, and means for mounting said transfer carriage for reciprocating curvilinear transitory movement in a plane perpendicular to the first direction from its position for receiving the object to a delivery position in plane parallel to said position for receiving.

#### 4,164,280 ROLLER CONVEYOR

Walter Duttine, Offenbach; Helmut Kratz, Rodgau; Harald Bosch, Hausen, and Gerhard Steigerwald, Mainhausen, all of Fed. Rep. of Germany, assignors to DeMag Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

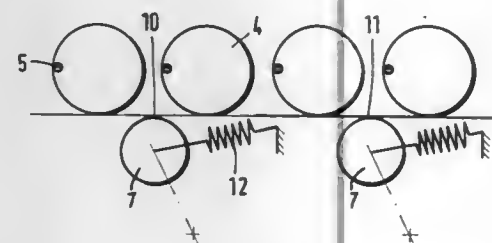
Filed Mar. 31, 1978, Ser. No. 892,340

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714862

Int. Cl.<sup>2</sup> B65G 13/06

U.S. Cl. 198—781

7 Claims



1. A material hesitation system for a roller conveyor line, comprising

- (a) a plurality of spaced rollers defining a hesitation area;
- (b) an endless drive belt frictionally engaging said plurality of rollers; the improvement characterized by
- (c) an unbalancing weight disposed in each of said plurality of rollers adjacent the periphery thereof;
- (d) the surface of said drive belt facing said rollers having alternating areas of high and low coefficients of friction;

- (e) the power transferred from said low frictional coefficient areas to said rollers being below that required for the return momentum of said unbalancing weights, but sufficient to maintain momentum of already revolving rollers; and
- (f) the power transferred from said high frictional characteristic areas being greater than the return momentum of said unbalancing weights.

#### 4,164,281 SPOTTING MACHINE

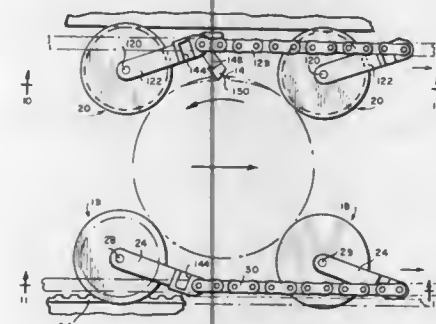
Edward A. Schnier, Hubbardston, Mass., assignor to A-T-O, Inc., Cleveland, Ohio

Filed Apr. 27, 1977, Ser. No. 791,230

Int. Cl.<sup>2</sup> B65G 47/24

U.S. Cl. 198—394

24 Claims



15. Apparatus for rotating containers traveling along a predetermined path to a predetermined position of orientation, said containers being of the kind having spotting devices on their side surfaces comprising means at opposite sides of the path having engagement with the containers at quadrilaterally-spaced points on their peripheral surfaces, said means at one side of the path of movement constituting drive rolls and at the other side idler rolls, said drive rolls and idler rolls having tangential rolling engagement with the containers, means for rotating the drive rolls at the one side to impart rotation to the containers, said drive rolls comprising wheels provided with friction-engendering tires for engagement with the containers, said wheels having hubs, drivers rotatably mounted on the hubs and means holding the drivers on the hubs, friction disks mounted between the drivers and the faces of the wheels and spring means rotatable with the drivers yieldably pressing the friction disks against the faces of the wheels, said idler rolls at the other side being freely rotatable as the containers turn and supporting the containers against overturn and a positioning dog at one side operable by engagement with the spotting means on the containers to stop rotation of the containers at said predetermined position of orientation.

#### 4,164,282

Patent Not Issued For This Number

#### 4,164,283

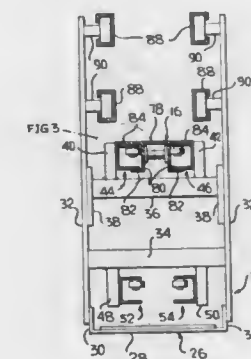
FRICION-REDUCING HIGH SPEED CHAIN GUIDES  
Lonis Flajnik, Berwyn, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,189

Int. Cl.<sup>2</sup> B65G 15/62, 17/06, 21/20

U.S. Cl. 198—840

10 Claims



1. A guide for guiding a link conveyor around a curved path, said guide having a curvature in accordance with the desired curved path, said guide being in the form of a structural section and including a conveyor supporting rail presenting a wide and flat substantially horizontal supporting surface, for directly supporting said link conveyor and a plurality of roller elements carried by said rail in partially vertically overlapping relation and projecting radially beyond said rail for engagement with a link conveyor to determine the curved path of said conveyor.

#### 4,164,284

LIQUID CONTAINER NOVELTY

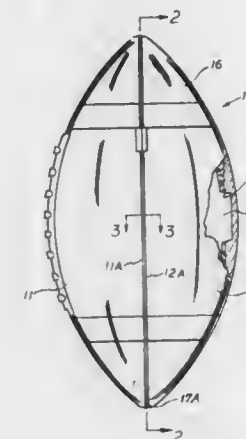
Frank Witt, 57 Poplar St., Trumbull, Conn. 06611, and Stephen Semanchik, 9-D Fairfield Condominiums, Bridgeport, Conn. 06606

Filed Nov. 28, 1977, Ser. No. 855,187

Int. Cl.<sup>2</sup> B65D 11/16

U.S. Cl. 206—217

7 Claims



1. A liquid container comprising:  
a pair of complementary outer rigid shells defining a major portion of a predetermined simulated ball shape,

#### 4,164,285

THERMOMETER SHEATH

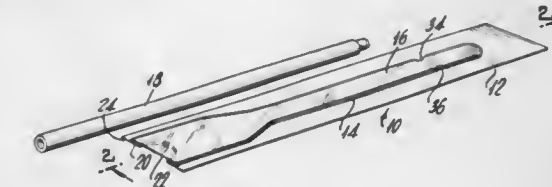
Henry P. Dorman, Arlington, Tex., assignor to Arbrook, Inc., Arlington, Tex.

Filed Apr. 26, 1978, Ser. No. 900,209

Int. Cl.<sup>2</sup> G01K 1/08

U.S. Cl. 206—306

3 Claims



1. A thermometer probe sheath assembly, comprising: a paper backing sheet; a first plastic sheet releasably secured to said backing sheet; a second plastic sheet overlying said first plastic sheet and sealed around its periphery to the periphery of said first plastic sheet, except for an insertion opening at one end of said sheets, the edges of said plastic sheets at said one end being coterminous with each other and with one edge of said backing sheet; and said coterminous edges of said backing sheet and said first plastic sheet having notches formed therein to facilitate the insertion of a probe into said sheath.

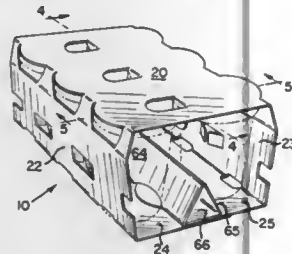


4,164,286

## TAPERED CUP PACKAGE

Robert L. Sutherland, Sloatsburg, N.Y., assignor to Federal Paper Board Company, Inc., Montvale, N.J.  
 Filed Feb. 10, 1978, Ser. No. 876,667  
 Int. Cl.<sup>2</sup> B65D 5/04, 85/62  
 U.S. Cl. 206—434

4 Claims



1. A package comprising a double row of articles having the form of cups with upwardly and outwardly tapered sidewalls, said articles being arranged in transversely aligned pairs, and a wrapper formed from a blank of paperboard or similar foldable sheet material enclosing said articles so as to provide a level top wall forming panel, sidewall panels depending from opposite outboard edges of said top wall panel, and a pair of bottom wall forming panels extending in integrally hinged relation inwardly from the bottom edges of said sidewall panels, with inboard portions overlying each other and interengaging locking elements in said overlying portions, said sidewall panels having apertures at the top edges for engaging therein portions of top edges of the articles so as to restrain movement of the top portions of said articles relative to said sidewall panels, and a separator structure upstanding from said bottom wall forming panels which extends between the rows of articles, which separator structure comprises integrally hinged panels of substantial width extending from an inboard edge of one of said pair of bottom wall forming panels, said separator panels being folded into wedge forming relation with the terminal panel thereof being disposed in overlying relation with the inboard marginal portion of the other one of said bottom wall forming panels and adjoining panels in upstanding relation from opposite edges thereof and having apertures in which bottom portions of said articles engage with the bottom portions a sufficient distance apart to position the vertical axes of the articles in substantially upright relation while top edge portions of the articles in the rows are positioned in closely adjacent relation above said bottom separator structure, said interengaging locking elements in said overlying portions of said bottom panels comprising apertures in the innermost panel portion and locking and latching tabs in the outermost panel portion which are engaged in said apertures, and said terminal panel of said separator structure having portions overlying at least in part said apertures and the locking and latching tabs therein.

4,164,287

## DISPLAY STAND AND ARRANGEMENT THEREOF

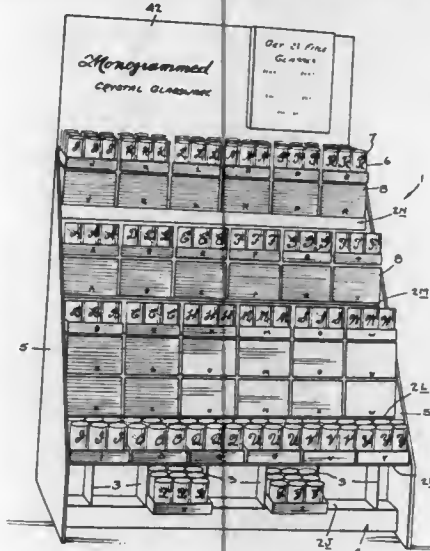
Jean A. Muller, and Ray A. Shilling, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio  
 Division of Ser. No. 709,101, Jul. 26, 1976. This application Nov. 14, 1977, Ser. No. 851,442  
 Int. Cl.<sup>2</sup> A47F 5/11

U.S. Cl. 211—134

13 Claims

1. A display stand comprising a plurality of shelves and upstanding standards, floor supports interfitting with said standards, said standards having slots which interfit with slots in said floor supports, said standards having a plurality of steps, at least one of said shelves being formed by mounting a panel on to a step of the standard, said floor supports having a plurality of flaps which have slots therein, the slots interfitting with slots in the bottoms and sides of the standards, said floor supports having inner flaps and outer flaps, said floor supports having vertical slots and horizontal slots, inner flaps of the

floor supports interfitting with the vertical slots, and the horizontal slots interfitting with the end flaps, and the outer flaps of



the floor supports interfitting with slots in the front of the standards to form a lower shelf member.

4,164,288

## COAT HANGER STAND

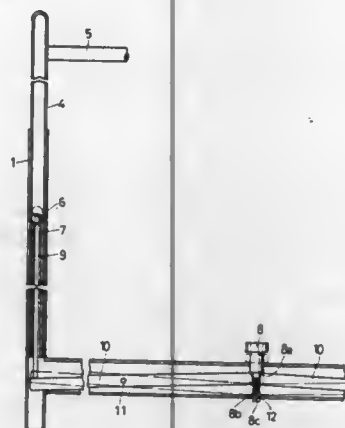
Hiroshi Okazaki, 1-12, Shimojugo 5-chome, Kita-ku, Tokyo, Japan (114)

Filed Jan. 3, 1978, Ser. No. 866,234

Claims priority, application Japan, Jun. 17, 1977, 52-79347[U]  
 Int. Cl.<sup>2</sup> A47F 5/13

U.S. Cl. 211—207

3 Claims



1. A coat hanger stand comprising a base means, a pair of spaced tubular uprights on said base means, a pair of inner-tube members telescopically received in the respective uprights, a cross bar attached to said inner-tube members for carrying coat hangers and a height adjusting means for releasably locking the inner-tube members at selected heights within said uprights, said height adjusting means comprising in each upright a pressure tube within said inner-tube, said pressure tube being fixed relative to said upright and terminating in a sloping upper end and a ball in said inner-tube above said pressure tube, the weight of said inner-tube and cross bar urging said ball downwardly into arcuate pressure contact on one side of the ball with an internal surface portion of the inner-tube and on the other side of the ball into arcuate pressure contact with an internal surface portion of said sloping upper end of the pressure tube to lock the inner-tube in position with respect to said pressure tube and a striker rod within said pressure tube for lifting the ball to release said pressure contact and free the

inner-tube for vertical movement relative to the upright and base means.

4,164,289

## LOGGING CARRIAGE

Emil Halliewicz, Rte. 1, Box 1407, Hermiston, Oreg. 97838

Filed Jul. 25, 1977, Ser. No. 818,550

Int. Cl.<sup>2</sup> B66C 21/00; B61B 7/00; F01B 25/14

U.S. Cl. 212—122

11 Claims



1. A carriage for elevated travel along a length of supporting cable, said carriage operable in conjunction with remote powered means to transport a carriage suspended load from an on-loading point to an off-loading point, said carriage comprising in combination,

- a main carriage body,
- rotatable sheaves on said carriage body for entrainment on said supporting cable,
- a clamp assembly on said carriage body including cable clamping members connected by actuating links to pneumatic cylinders and operable to temporarily immobilize the carriage body on the supporting cable,
- a carriage electrical system including a radio receiver with switch means actuable upon reception of certain radio frequencies,
- solenoid valves in circuit with said switch means and operable to control said clamp assembly and a brake means,
- a drum assembly including a drum shaft carried by said carriage body, said drum assembly including,
- a rotatable drum structure,
- a first sheave area on said drum structure about which an in-haul cable is wound, said in-haul cable having its remote end spooled about a powered drum on said remote powered means,
- a second sheave area on said drum structure about which a load attachable drop line is wound,
- a spring case with multiple springs, said case coupled to said drum structure and operable to rotate the latter to pay out the drum carried drop line for load attachment purposes while simultaneously retrieving said in-haul line,
- said drum structure rotatable by the in-haul line powered by the remote powered means during the retrieval of the load attached drop line during a side-haul pulling of the load to carriage proximity, said in-haul cable thereafter operable to retrieve the load supporting carriage to the powered means for off-loading purposes, and
- said brake means operable intermediate the carriage main body and the drum structure to selectively brake said drum structure against rotation during carriage travel.

4,164,290

## AUTOMATIC TOOL CHANGER FOR MACHINE TOOLS

Frank Zankl, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Sep. 15, 1977, Ser. No. 833,508

Int. Cl.<sup>2</sup> B65G 47/90

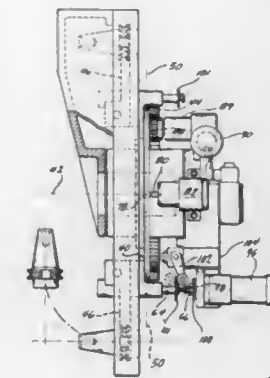
U.S. Cl. 414—739

13 Claims

13. A tool changer for automatically changing the tools in the rotary spindle of a machine tool which includes a stationary bed and a frame rigidly attached to said bed comprising:

- a rotary drum storing a plurality of tools for use in said rotary spindle, said rotary drum being rotatably mounted on said frame for rotation about a horizontal axis;
- a ready station at the bottom of said rotary drum for receiving

ing one of said tools in position to be transferred to said rotary spindle and for receiving a previously used tool from said rotary spindle for return to said drum; means for indexing said drum to locate a selected tool at said ready station;



a separate tool change arm for each of said tools carried by said drum for rotation therewith; and each of said tool change arms being adapted to swing upwardly to transfer its associated tool between said ready station and said rotary spindle.

4,164,291

## SORTING APPARATUS

Charles A. Carlow, Edinburgh, Scotland, assignor to National Research Development Corporation, London, England

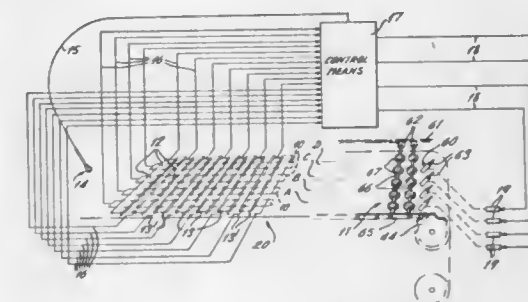
Filed Jul. 13, 1977, Ser. No. 815,304

Claims priority, application United Kingdom, Jul. 16, 1976, 29770/76

Int. Cl.<sup>2</sup> B07C 9/00

U.S. Cl. 414—136

22 Claims



1. Sorting apparatus comprising locating means for defining an array of selectable sites and for generating for each site when selected a signal or signals identifying that site, conveying means for conveying past the array of sites objects to be sorted by selection by an operator, separating means for separating selected and unselected objects, the locating means including a movable selector member for selecting objects as they pass the array of sites by causing site-identifying signals to be generated in respect of sites corresponding to the objects selected, the separating means being connected to an output of the locating means for actuating the separating means in dependence upon site-identifying signals generated by the locating means.

4,164,292

**AUTOMATIC LIFT ASSEMBLY**

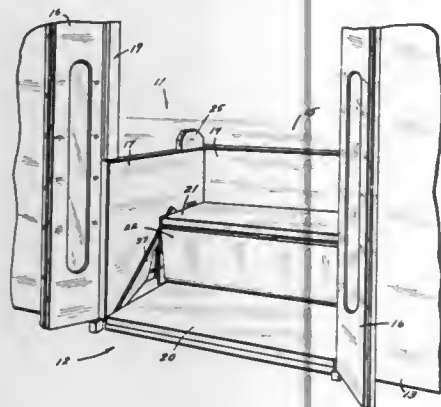
Lawrence E. Karkau, Lansing, Mich., assignor to Karphen Lift Company, Lansing, Mich.

Filed Nov. 28, 1977, Ser. No. 855,288

Int. Cl.<sup>2</sup> B60P 1/46

U.S. Cl. 414—545

9 Claims



1. In an automatic lift assembly for use in vehicle or building doorways comprising:

- a lift carriage movably positioned within a doorway opening, said lift carriage having a substantially U-shaped configuration wherein the base of the lift carriage is adapted to form a lower step portion;
- a movable upper step pivotally positioned within said lift carriage in a normally retracted stowed step use position above and to the rear of said lower step portion, said upper step selectively extendable forwardly and downwardly so as to form a co-planar platform extension of said lower step portion;
- a movable riser provided in pivotal engagement with said upper step so as to selectively extend downwardly to said lower step portion when said upper step is in its retracted stowed step use position within the lift carriage, said riser selectively extendable upwardly and outwardly to form a ramp extension from said extended upper step;
- upper step and riser actuating means to selectively extend said upper step forwardly and downwardly so as to form a co-planar platform extension of said lower step portion and to selectively pivotally extend said riser upwardly and outwardly to form a ramp extension from said extended upper step; and
- lift carriage actuating means to selectively lower said lift carriage to a lowered ground level position and to selectively raise said lift carriage to a raised interior floor level position.

4,164,293

**PACKER AND LOADER UNIT FOR A MOTOR VEHICLE**

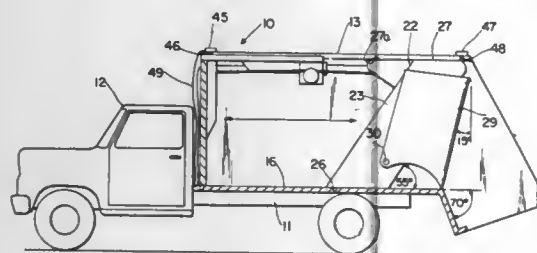
George R. Oelberg, 1515 Ray Rd., Hyattsville, Md. 20782

Filed Dec. 1, 1977, Ser. No. 856,684

Int. Cl.<sup>2</sup> B65F 3/00

U.S. Cl. 414—525

13 Claims



1. A packer and loader unit for a vehicle comprising a con-

tainer having a floor and a rear end opening, a rear support assembly displaceable horizontally within said container and positionable at said rear end opening, a tail gate pivotally mounted to said rear support assembly and pivotable between a down-ramp position and an up-position, and means connected to said rear support assembly for displacing said rear support assembly horizontally to allow said tail gate to pivot.

4,164,294

**METHOD FOR FILLING A POTATO STORAGE FACILITY**

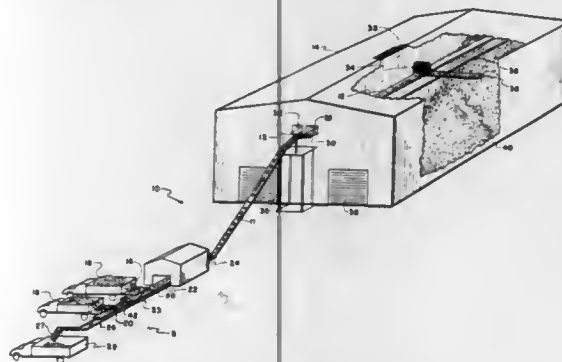
Lynn F. Johnson, 431 Calder, American Falls, Id. 83211

Filed Aug. 24, 1976, Ser. No. 717,291

Int. Cl.<sup>2</sup> B65G 3/10; A01F 25/00

U.S. Cl. 414—786

2 Claims



1. A method of effectively placing the potatoes in storage without damage comprising the steps of:

- delivering a stream of potatoes to an elevated relatively small ingress site of a substantially unencumbered potato storage enclosure;
- continually conveying the stream of potatoes through the ingress site into the enclosure and substantially linearly on an interior conveyor a selected distance along an elevated part of the enclosure to a predetermined variable diversion site;
- continually diverting the stream of potatoes at said diversion site angularly from the conveyor to a repositionable conveyor, the two conveyors being disposed at an angle to each other, the continually diverting step comprising gently brushing the stream of potatoes counter to the displacement of said stream laterally from the interior conveyor at a predetermined site along the length thereof onto the repositionable conveyor;
- dumping said stream of potatoes from the repositionable conveyor using at least in part the force of gravity onto an enlarging pile of stored potatoes, an exposed face of which is a very short distance beneath the repositionable conveyor; and
- repositioning the diversion site and the repositionable conveyor from time to time commensurate with the enlarging size and expanse of the pile of stored potatoes.

4,164,295

**METHOD FOR LAYING SOD**

John M. White, 5309 NW. 26th St., Des Moines, Iowa 50313

Division of Ser. No. 693,335, Jun. 7, 1976. This application Jun. 12, 1978, Ser. No. 914,675

Int. Cl.<sup>2</sup> B60P 1/36, 3/00

U.S. Cl. 414—786

9 Claims

- 1. A method for laying a plurality of sod pieces each having opposite end and side edges, a grass surface and an opposite root surface, said method comprising:
- stacking said pieces of sod in a vertical stack with said grass surfaces and said root surfaces in horizontal orientation;
- turning said stack on its side and placing it on a wheeled

4,164,297

**FOLDING GOOSENECK FOR TRAILER**

John J. Dorwin, Hiawatha, Iowa, assignor to Barnard &amp; Leas

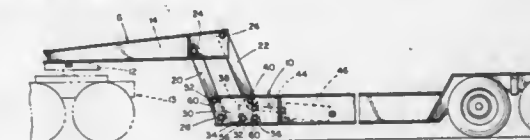
Mfg. Co., Cedar Rapids, Iowa

Filed Jul. 11, 1977, Ser. No. 814,163

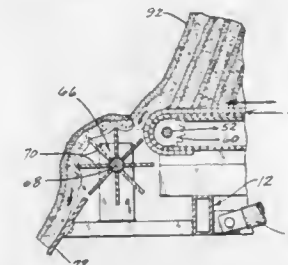
Int. Cl.<sup>2</sup> B60P 1/14

U.S. Cl. 414—481

9 Claims



platform in a position wherein said grass surfaces and said root surfaces are in an upstanding position; propelling said wheeled platform over the area to be sodded; removing said pieces of sod one at a time from one end of said stack;



reorienting each piece of sod from an upstanding position to an approximate horizontal position during removal of said piece of sod from said stack; depositing said piece of sod on the area to be sodded with said root surface presented downwardly.

4,164,296

**APPARATUS FOR TRANSFERRING AND ROTATING ARTICLES**

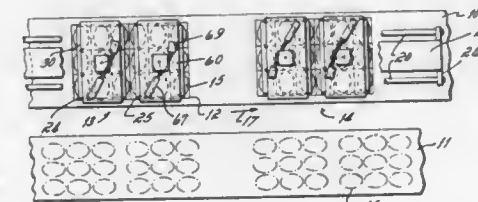
Carl I. Trees, Moscow, Ohio, assignor to The Lodge &amp; Shipley Company, Cincinnati, Ohio

Filed May 11, 1977, Ser. No. 795,814

Int. Cl.<sup>2</sup> B65G 47/91

U.S. Cl. 414—416

2 Claims



2. In apparatus including an elongated case conveyor, an elongated bottle conveyor parallel to and spaced from said case conveyor, apparatus for removing from a single case oval-shaped bottles having axes in a horizontal plane which are perpendicular to said conveyors and depositing said bottles on said bottle conveyor with their axes parallel to said case conveyor comprising,

- a support movable between said case conveyor and said bottle conveyor,
- two lifting plates mounted side-by-side on said support, each lifting plate having a plurality of article gripping devices depending from it, the combined lifting devices of said two plates matching the pattern of bottles in a single case, means for moving said support to shift said plates from a position overlying said case conveyor to a position overlying said bottle conveyor,
- means for shifting at least one of said plates away from the other,
- means for rotating said plates through an angle of 90°, and control means for effecting the following motions as said support moves:
- (a) spread said plates apart;
- (b) rotate said plates 90°.

4,164,298

**FROSTED BOTTLE OF SATURATED POLYESTER**

Masanori Nishikawa, Tochigi, and Masao Hattori, Hatano, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

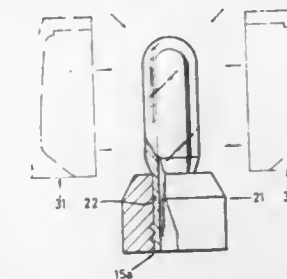
Filed Mar. 21, 1977, Ser. No. 779,473

Claims priority, application Japan, Mar. 31, 1976, 51/36636

Int. Cl.<sup>2</sup> B65D 23/00; B29C 17/07; B29B 3/00

U.S. Cl. 215—1 C

3 Claims

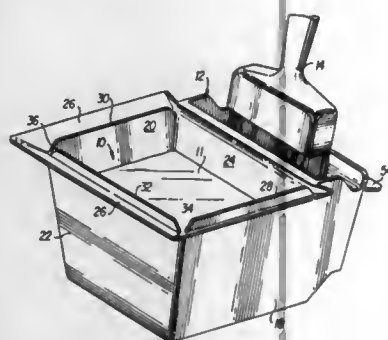


- 1. A blow-molded bottle of saturated polyester resin having a bottom wall, a trunk portion, and a neck portion, wherein at least a part of the trunk portion has a cross section which exhibits a gradual change from a crystallized opaque state at the exterior surface to a transparent state at the inner surface obtained by a process which comprises the steps of,
- providing a parison of saturated polyester resin for blow-molding into said bottle,
- heat-treating from the outside that portion of said parison from which at least a part of said trunk portion is to be formed, to a predetermined temperature above the glass



transition temperature and below the crystallization temperature, maintaining said heat-treating step for a predetermined period of time to provide on said part of said trunk portion a gradual change of said structural state, in cross section, from a crystallized state at the exterior surface to a transparent uncrystallized state at the inner surface which can be inflated or expanded by biaxial orientation and so that the parison maintains its elasticity to be able to form a bottle by blow moulding, and blow-molding said heat-treated parison into a bottle having a bottom wall, a trunk portion with an opaque exterior on at least a part thereof and a neck portion.

**4,164,299**  
**TRAY FOR PAINT AND BRUSHES**  
Patti S. Fuhr, Rte. 2, Box 119C, Mantachie, Miss. 38855  
Filed Oct. 14, 1977, Ser. No. 842,302  
Int. Cl.<sup>2</sup> B44D 3/00; B65D 1/36, 5/28  
U.S. Cl. 220—20



1. A hand held tray for paint and brushes comprising:
  - (a) a first open receptacle having a bottom wall, a front wall and a rear wall each having an upper and lower edge, said lower edge being secured to said bottom wall to form said first open receptacle for holding a quantity of paint,
  - (b) a second open receptacle having a bottom wall, a front wall and a rear wall located adjacent said first open receptacle for holding at least one paint brush, said rear wall of said second receptacle being opposite to and spaced apart from said rear wall of said first open receptacle to form a recess for the fingers of the user's hand, and
  - (c) two outwardly extending, spaced apart tab means adjacent the upper edge of the front wall of said second open receptacle, one of said tab means serving to be engaged by the bottom end portion of the thumb and said other tab means serving to be engaged by the top portion of the thumb of said hands of said user to enable said tray to be held firmly by said user by engaging said tabs between said top and bottom portions of said thumb and said fingers of said hand engaging said recess.

**4,164,300**  
**DETACHABLE HANDLES AND DRUM ASSEMBLIES**  
Michael E. Raczynski, and William G. Streiff, both of Holland, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

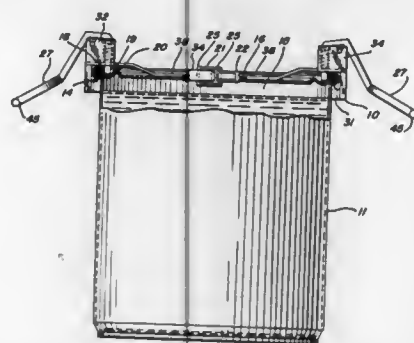
Filed Feb. 13, 1978, Ser. No. 877,176  
Int. Cl.<sup>2</sup> B65D 25/28

U.S. Cl. 220—94 R

7. A detachable handle assembly adapted for connection to a drum having a chine and a cover attached to the chine and closing the drum, the cover having an annular downwardly extending groove adjacent the chine, said handle assembly comprising:

- (a) a bracket having a pair of spaced supports adapted for engaging the underside of the chine, said bracket also

- having an upper, elongated portion adapted to contact and extend along the upper surface of the cover;
- (b) a handle pivotally mounted on said bracket; and

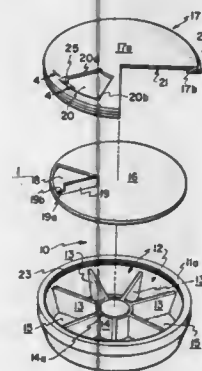


7 Claims

- (c) a plunger movably mounted on said bracket and adapted to travel into the cover groove between said supports to secure the handle assembly to the drum and cover, said elongated portion preventing rotation of the handle assembly about the chine during lifting of the drum.

**4,164,301**  
**SAFETY LOCKING DISPENSER**  
Arnold A. Thayer, 1415 Highland Dr., Logan, Utah 84321  
Filed Jul. 25, 1977, Ser. No. 818,517  
Int. Cl.<sup>2</sup> B65D 85/56  
U.S. Cl. 220—253

4 Claims



1. A safety locking dispenser comprising,
  - a cylindrical housing that is closed across the bottom thereof;
  - a plurality of upstanding walls within said cylindrical housing, separating the interior thereof into compartments;
  - an upper disk means fitted at the edge thereof in a track formed in said cylindrical housing, for closing off the top thereof, so as to rotate therein, having an opening formed therethrough;
  - a lower disk means arranged within said cylindrical housing, below said upper disk, for closing off the top thereof so as to rotate independently of said upper disk, and having an opening formed therethrough that is similar to said opening formed through said upper disk;
  - means for releasably locking said upper and lower disks together consisting of,
    - a tab secured at one end thereof to the upper disk so as to extend in the plane thereof and to be capable of upward flexure therefrom; said tab having a notch removed therefrom, proximate to its opposite end facing oppositely to the top of said upper disk; and
    - a bar attached to said lower disk, arranged to extend upwardly therefrom extending through the opening in said

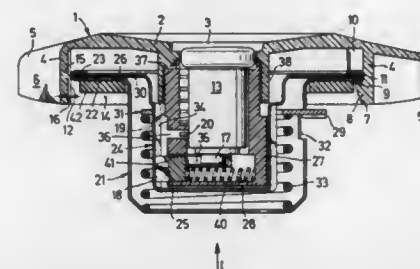
upper disk, which bar has a notch removed therefrom leaving a ridge that receives said tab notch thereover.

**4,164,302**  
**CLOSURE CAP HAVING LOCKING MEANS**  
Theodor Gerdes, Langenfeld, Fed. Rep. of Germany, assignor to Blau KG Fabrik für Kraftfahrzeugeile, Langenfeld, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,335  
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734394

Int. Cl.<sup>2</sup> B65D 55/14  
U.S. Cl. 220—210

9 Claims



1. A closure cover consisting of an inner cover member having a substantially cup-shaped capable of engaging with the aperture to be closed, the cover member including a sealing flange adapted to co-operate with the edge of the opening, an overlapping outer cap member rotatably mounted on the circumference of the edge, which cap member has a centrally located, firmly seated hollow support member for a cylinder lock, the lock being rotatably mounted therein, the cap member being axially supported by a radially displaceable bolt, movement of said bolt being effected by an eccentric, whereby the cover is coupled to the inner cover component, and provided with a sleeve-shaped surrounding component with base closure at the bottom for sealing against the exterior, for a freely rotatable outer cap secured by a key when the inner cover component is firmly tightened on the socket opening wherein an inner cover member has a first cup-shaped member having a radially directed edge flange including a revertive free end portion and has further a cup-shaped member including a base portion mounted therein, said further cup-shaped member having a radially outwardly directed edge flange locatable between the two portions of the flange of the first cup member, whereby the two cup members are firmly interconnected, are rotatable within the outer cap and are sealed to the exterior, and a cylinder lock centrally rotatably mounted within the outer cap which is key-actuated, the cylinder lock including radially displaceable coupling bolt which engages between ribs distributed at equally spaced intervals around the wall surface of the further cup-shaped component, which ribs project in a direction perpendicular to the axis of the component adapted to the size and shape of the bolt.

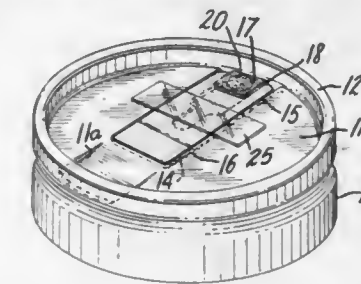
**4,164,303**  
**VENDABLE RECLOSABLE CONTAINER**  
Nelson J. Waterbury, 211 E. 70th St., New York, N.Y. 10021  
Filed May 22, 1978, Ser. No. 908,141  
Int. Cl.<sup>2</sup> B65D 41/00

U.S. Cl. 220—359

19 Claims

1. In a container having a lid and an opening in the lid for the discharge of the contents of the container, a three element articulated closure for the opening comprising a mounting element on the lid adjacent the inner end of the opening, a relatively rigid closure element hinged to the mounting element along a preestablished line near the inner end of the opening for overlying the opening to seal the contents within the container and a lift element hinged to the closure element along a preestablished line adjacent the outer end of the opening and the outer end of the lid and normally folded back to overlie the closure element when the latter is in the sealing

condition on the lid of the container, but liftable at the hinge connection to upright position to break the seal and lift the



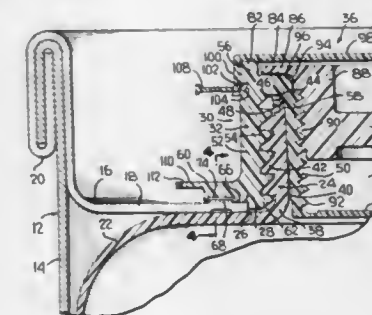
closure element away from the lid along the hinge connection between the mounting and the closure elements.

**4,164,304**  
**CLOSURE FOR STEEL DRUMS WITH BLOW MOLDED LINERS**

Carl Roberson, Park Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed May 30, 1978, Ser. No. 910,519  
Int. Cl.<sup>2</sup> B65D 25/20, 51/20, 55/02, 41/04  
U.S. Cl. 220—465

13 Claims



1. In combination with a drum having a molded liner, a closure assembly, said drum having a wall with an opening therethrough, said liner having a neck portion extending through said opening, and said closure assembly being disposed externally of said drum and engaging said liner neck portion, said closure assembly comprising a retainer and a closure element, said retainer having inner and outer radially spaced concentric walls joined at outer ends thereof by a bridging portion, said neck being telescoped between said inner and outer walls, complementary threads on said neck and said outer wall securing said retainer on said drum and said liner, said inner wall being internally threaded, and said closure element being removably threadedly engaged within said inner wall, said outer wall having a radially outwardly directed annular flange remote from said bridging portion and opposing said drum wall surrounding said opening, said drum wall having upstanding projections arranged in spaced relation in a circular pattern around said opening, said projections being struck from said drum wall and having sloping upper surfaces terminating in shoulders, said drum wall being imperforate in the area of said projections and said drum wall having an inner surface with indentations therein generally corresponding to said projections, and said flange having an underside provided with recesses arranged in similar spaced relation in a like diameter circular pattern with said recesses receiving said projections to lock said retainer against releasing rotation relative to said drum wall.

4,164,305

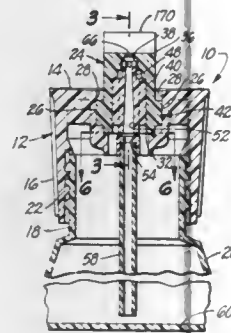
## SPRAY TYPE DISPENSING CLOSURE

Dennis A. Haggerty, Woonsocket, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Jul. 25, 1977, Ser. No. 818,537

Int. Cl.<sup>2</sup> B05B 7/24

U.S. Cl. 222—4



1. A closure for use in dispensing a spray of liquid and air from a container, said closure being adapted to be secured to the top of said container so as to close off the interior of said container, said closure having an interior and an exterior, an internal air-liquid mixing chamber, an orifice leading from said chamber to said exterior, and separate gas and liquid passage means extending from said interior into said chamber for conveying air and liquid into said chamber, in which the improvement comprises:

said closure being a dispensing closure having a cap and a spout rotatably mounted on said cap, said spout having a base and a discharge end, a portion of said cap being located adjacent to said base, said spout including an internal elongated cavity extending from said base toward said discharge end, said mixing chamber being located at an extremity of said cavity adjacent to said discharge end, said orifice being located in said discharge end,

a fitment located within said cavity, said fitment fitting closely within said cavity so as to be secured in place by engagement with the interior of said cavity,

said gas passage means including a plurality of elongated groove-like spaces between the exterior of said fitment and the interior of said cavity and holes extending through said portion of said cap,

said liquid passage means including an elongated hole extending within the center of said fitment from said base of said spout to said chamber and a hole leading through said portion of said cap,

said spout being capable of being rotated between an open position in which said holes of said gas passage means are aligned with said spaces and in which said holes of said liquid passage means are aligned with one another and a closed position in which said holes of both of said passage means in said cap are covered by said base of said spout, sealing means for preventing leakage between said spout and said cap located on said cap and engaging said spout in both said opened and said closed positions so as to form a seal therewith, said sealing means serving to form a seal between individual of said passage means when said spout is in said open position,

said mixing passage means comprising a groove leading from the extremity of each of said groove-like spaces to said elongated hole adjacent to said mixing chamber,

said orifice being smaller than the interior of said mixing chamber,

a liquid tube attached to said cap so as to extend therefrom, said tube being in communication with said part of said liquid passage means within said cap.

# SOAP DISPENSER INCLUDING REMOVABLE SOAP SUPPLY CONTAINER POSITIONER AND STABILIZER

Jack L. Perrin, Los Angeles, Calif., assignor to Towlsaver, Inc., City of Industry, Calif.

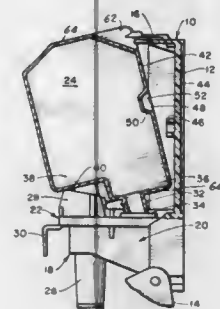
Filed Apr. 3, 1978, Ser. No. 892,882

Int. Cl.<sup>2</sup> B67D 5/06

U.S. Cl. 222—181

Int. Cl.<sup>2</sup> B67D 5/06

7 Claims



1. In a dispenser for dispensing flowable soap and the like, said dispenser being of the type having a frame mounting a dispensing mechanism operable for dispensing soap therefrom and a container in communication with said dispensing mechanism in a soap supplying position adjacent a generally vertical frame part directing a soap supply to said dispensing mechanism, said container being selectively vertically pivotally removable from and oppositely vertically pivotally insertable into said soap supplying position and said communication with said dispensing mechanism for removal of said container upon exhaustion of said soap supply therein and insertion replacement in said soap supplying position with a container having a replenished soap supply; the combination of: upper extremity clearance recess means on said container and opening upwardly for providing clearance for forwardly extending portions of said dispenser frame during said container vertical pivoting to and from said soap supplying position; a generally horizontal projection on said dispenser generally vertical frame part projecting forwardly of a rear vertical part of said frame part; generally horizontal positioning recess means on a generally vertical back wall of said container spaced from all of said clearance recess means and vertical and horizontal extremities of said container, said positioning recess means being located for receiving said frame part projection therein during said pivotal insertion of said container into said soap supplying position and permitting said pivotal removal of said frame part projection therefrom during removal of said container from said soap supplying position, thereby locating said container in said soap supplying position, said container positioning recess means having horizontally spaced and generally vertically extending surfaces therein facing said dispenser horizontal projection to aid in said container locating in said soap supplying position.

4,164,307

## CAP WITH SUPPLY STOPPER FOR USE WITH CONTAINERS

Masanaga Imamura, Hisashi Sakai, Hiroaki Sugiyama, and Seiji Ozawa, all of Tokyo, Japan, assignors to Ricoh Company Limited, Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,323

Claims priority, application Japan, May 4, 1976, 51-54953[U]

Int. Cl.<sup>2</sup> B65D 47/12

U.S. Cl. 222—182

4 Claims

1. A closure for a container, comprising: an inner cap having attachment means for releasably attaching said inner cap to a container, said inner cap having centrally located supply opening means and a valve seat located at the inner end of said supply opening means; a reciprocable valve element sealingly engageable with said

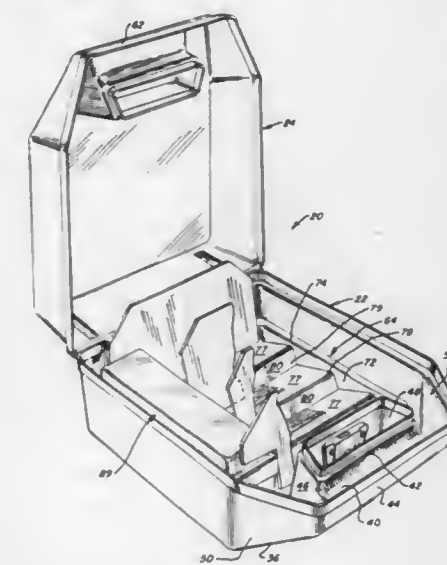
4,164,309

## DOCUMENT STORAGE AND ACCESS CASE

David K. Staats, 124 Mohawk, Clarendon Hills, Ill. 60514  
Continuation-in-part of Ser. No. 595,487, Jul. 14, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,718Int. Cl.<sup>2</sup> B65D 71/00

U.S. Cl. 224—45 R

65 Claims



1. A document storage and access case for a plurality of groups of documents comprising:

a housing having bottom wall means, sidewall means an open top;

a plurality of inclined ramp means extending forwardly up from said bottom wall means at a shallow angle relative thereto, each of said ramp means being adapted to support a group of documents thereon;

document support means cooperating with at least one of said ramp means for supporting groups of rearwardly leaning documents resting on said ramp means, the angle of said ramp means permitting each document of a group to be supported with one edge resting thereon in a position so that when the documents within each group are of uniform height dimension the top edge of selected document in the group is higher than the documents disposed rearwardly thereof permitting each said selected document to be individually gripped and tilted to a stable forwardly leaning position to provide access to the remaining documents of the group; means for supporting said selected documents in said stable forwardly leaning position.

4,164,310

## SYSTEM, APPARATUS AND METHOD FOR ASSEMBLING INDUSTRIAL LEAD-ACID STORAGE BATTERIES

Hector L. Di Giacomo, Lafayette Hill, and John A. Sacco, Wernersville, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Division of Ser. No. 695,858, Jun. 14, 1976, Pat. No. 4,074,423, which is a continuation-in-part of Ser. No. 652,715, Jan. 27, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,743

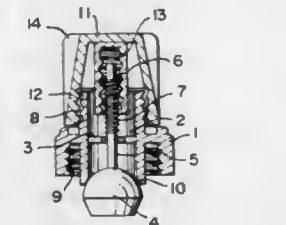
Int. Cl.<sup>2</sup> B23K 1/12

U.S. Cl. 228—58

9 Claims

1. In an industrial battery assembly system, said system including a burning station for forming battery straps, an improvement wherein said burning station includes comb means for selectively forming a molding cavity around at least a portion of the lugs and terminal posts to be fused, said comb means further comprising a plurality of uniformly spaced fingers adapted to extend between the spaces formed between

valve seat, an operating rod extending outwardly from said valve element through said supply opening means and resilient means located in said supply opening means outwardly from said valve element for urging said rod outwardly to urge said valve element into sealing engagement with said valve seat, said operating rod being movable against the urging of said resilient means to move said valve element away from said valve seat whereby to permit dispensing of the contents of said container;



an outer cap mounted on said inner cap for closing the outer end thereof, said outer cap having first interengaging means rotatably engaged with corresponding means on said inner cap for releasably retaining said outer cap in position on said inner cap, said outer cap also having second interengaging means separate from said first interengaging means and interengaged with said operating rod for positively mechanically moving said operating rod outwardly in response to rotation of said outer cap relative to said inner cap whereby to move said valve element into tighter sealing engagement with said valve seat.

4,164,308

## LADY'S HANDBAG

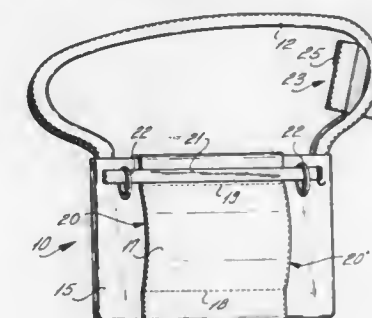
Francisco Gautier, c/o University Club, 1 W. 54th St., New York, N.Y. 10019

Filed Oct. 20, 1978, Ser. No. 953,290

Int. Cl.<sup>2</sup> A45C 1/04

U.S. Cl. 224—45 R

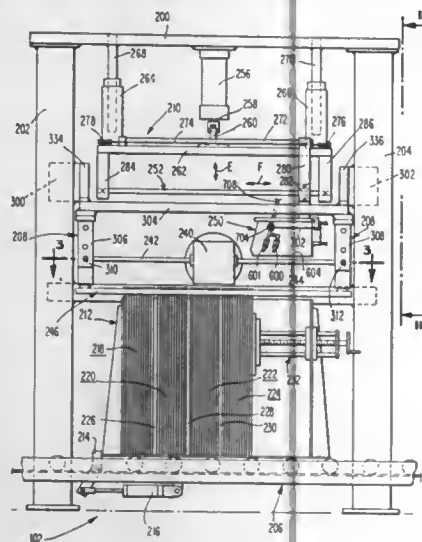
4 Claims



1. A lady's handbag adapted to be carried with improved security, comprising a main article-carrying bag-shaped portion, secured to said main portion near corners thereof a strap adapted to be carried over the back of the wearer's neck, the main portion having an exterior face adapted to face the front of the wearer's torso when the handbag is carried with the strap over the back of the wearer's neck, means forming pockets on said face for receiving both of the wearer's hands when the handbag is carried with the strap over the back of the wearer's neck, a pair of loops, and means fastening said loops in front of said face, said loops being adapted to receive a belt worn by said wearer.



adjacent lugs, said comb means further providing a plurality of interchangeable template means recessed in said comb means, said template means having appropriately spaced projections



thereon for overlaying a plurality of said fingers, whereby said projection means define said molding cavity to comprise a preselected number of lugs to be welded into said strap.

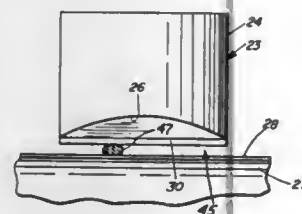
4,164,311

#### METHOD FOR WELDING A METAL COUPLING TO A TUBE

Calvin C. Swisher, Sr., Genesee Depot, Wis., assignor to Wisconsin Centrifugal, Inc., Waukesha, Wis.  
Division of Ser. No. 779,286, Mar. 18, 1977, Pat. No. 4,115,019.  
This application May 25, 1978, Ser. No. 909,541  
Int. Cl.<sup>2</sup> B23K 9/00, 28/02

U.S. Cl. 228—161

13 Claims



4,164,312

#### DUAL PURPOSE DIVIDER

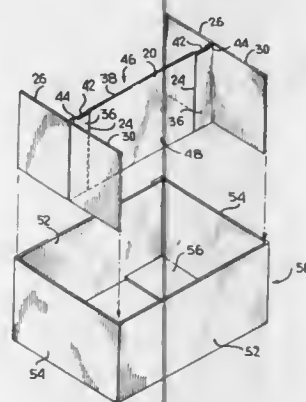
Frederick G. Harned, Martinez, Ga., assignor to The Continental Group, Inc., New York, N.Y.

Filed May 30, 1978, Ser. No. 910,977

Int. Cl.<sup>2</sup> B65D 5/48

U.S. Cl. 229—15

7 Claims



1. The method of welding to the external surface of a metal pipe or tube having a longitudinal axis, a metallic attachment which includes a metal body having a beveled base providing a weld surface area and having a divider portion depending therefrom and extending thereacross and dividing the said weld surface area of the said beveled base into first and second component weld surface areas on opposite sides of the said divider portion, the said method comprising the steps of

- positioning the said metallic attachment at a preselected point on the said external peripheral surface of the said metal pipe or tube to which it is to be welded with the longitudinal axis of the said metallic pipe or tube disposed in a generally horizontal plane and with the said metallic attachment extending upwardly in a generally vertical orientation from the said external peripheral wall surface of the said metal pipe or tube and with the said divider portion extending generally parallel to the said longitudinal axis of the said metal pipe or tube;
- preliminarily or tack-welding the said metal body at the said divider portion to the said external peripheral wall surface of the said metal pipe or tube;
- rotating the said metal pipe or tube with the said metallic attachment preliminarily welded thereto through an arc of

rotation to position the said first component weld surface area of the said beveled base of the said metallic attachment upwardly and in a generally vertical plane and with the said divider portion extending in a generally horizontal plane and parallel to the said longitudinal axis of the said metal pipe or tube;

- depositing a first increment of weld metal between the said first component weld surface area of the said beveled base and the said external peripheral wall surface of the said metal pipe or tube with the said divider portion extending parallel to the longitudinal axis of the said metal pipe or tube and in a generally horizontal plane;
- rotating the said metal pipe or tube with the said metallic attachment thus partially welded thereto through an arc of rotation to position the said metallic attachment with the said second component weld surface area of the said beveled base thereof extending upwardly in a generally vertical plane and with the said divider portion extending in a generally horizontal plane and parallel to the said longitudinal axis of the said metal pipe or tube;
- depositing a first increment of additional weld metal to the said second component weld surface area of the said beveled base of the said metallic attachment and to the said external surface of the said metal pipe or tube;
- rotating the said metal pipe or tube with the said metallic attachment thus partially welded thereto to position the said first component weld surface area upwardly in a generally vertical plane;
- applying additional weld metal to the said first component weld surface area and to the said external peripheral wall surface of the said metal pipe or tube;
- rotating the said metal pipe or tube with the said metallic attachment thus partially welded thereto to position the second component weld surface area upwardly in a generally vertical plane; and
- applying additional weld metal in successive increments to the said second weld surface area of the said metal pipe or tube.

1. A new article of manufacture comprising a blank for a dual purpose divider of the type including a divider wall having at the opposite ends thereof oppositely extending end walls, said divider blank being rectangular in outline, a longitudinally extending divider line dividing said blank into similar halves; each of said halves having central panels defined by inner transverse fold lines, outer panels defined by outer trans-

verse fold lines, and a single intermediate panel between each adjacent pair of said inner and outer fold lines; said longitudinally extending divider line being in the form of a fold line between said outer transverse fold lines and in the form of cuts outwardly of said outer transverse fold lines.

4,164,313

#### CONTAINER

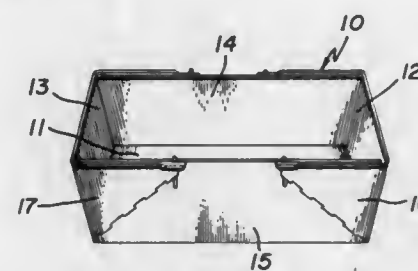
Edward G. Hewitt, Auburn, Mass., assignor to New England Envelope Manufacturing Co., Worcester, Mass.

Filed Feb. 28, 1978, Ser. No. 882,146

Int. Cl.<sup>2</sup> B65D 5/24

U.S. Cl. 229—31 R

6 Claims



1. Container, comprising:

- a rectangular bottom wall,
- two opposed end walls, each hingedly connected to the bottom wall at an end edge thereof,
- two opposed side walls, each hingedly connected to the bottom wall at a side edge thereof,
- two gussets integrally formed with the bottom, side, and end walls from corrugated paper board, each gusset joining an end edge of one of the side walls to the adjacent end edge of one of the end walls, each gusset consisting of a first triangular portion hingedly connected to the said end edge of the end wall and lying against the outside vertical surface of the side wall and a second triangular portion hingedly connected to the said end edge of the side wall, the first and second triangular portions and side wall having upper edges that lie together with exposed vertical corrugation passages opening on the said upper edges, and
- a resilient U-shaped clip joining each gusset to the side wall at a position substantially spaced from the hinged connection thereto.

4,164,314

#### SINGLE USE DISPOSABLE CAT LITTER PACKAGE

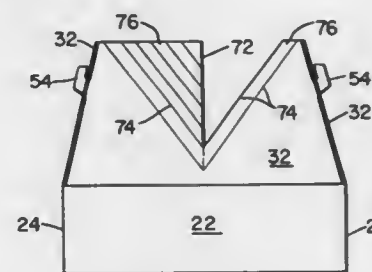
Allen C. Edgar, Gainesville, Fla., assignor to Mid-Florida Mining Company, Lowell, Fla.

Filed May 23, 1978, Ser. No. 908,719

Int. Cl.<sup>2</sup> B65D 5/22

U.S. Cl. 229—33

4 Claims



1. A disposable package formed from a paperboard blank having at least a part of one surface coated with a moisture-resistant coating made into a six-sided box for containing cat litter, said package comprising:

- A horizontal rectangular base having four edges,
- Two pairs of opposite vertical sides each extending up-

ward from one edge of the horizontal rectangular base, each vertical side having two vertical side edges and a horizontal top edge.

- Rectangular corner flaps, extending from each vertical side edge of a first pair of said opposite vertical sides, said rectangular corner flaps being folded and adhered to a second pair of said opposite vertical sides to form the box,
- Top sections extending from the horizontal top edge of each of said vertical sides, scored to fold inwards from the vertical sides forming a horizontal top to the box parallel to said base, at least one pair of opposite top sections having abutting edges on top of the box, and wherein each top section of a first pair of opposite top sections further comprise perforations outlining a pair of tabs, and wherein a second pair of opposite top sections further comprise perforations outlining slots near the edges of said second pair of top sections, said tabs and slots being engagable one with the other, and wherein one top section of the box further comprises at least one vertical perforation and horizontal or diagonal scoring to enable a part of said top section to be folded downwards and inwards when the box is in an open position to make an adjustable-sized opening to facilitate the entry and exit of a cat,
- Adhesive means for securing the top sections, closing the box, said adhesive means comprising a strip of adhesive paper having a pull-cord secured to the adhesive under the strip, along the length of the strip, securing said pair of opposite top sections having abutting edges on top of the box, wherein at least one of the ends of said pull-cord is unsecured and visible on the outside of the package, and
- A flexible bag containing the cat litter.

4,164,315

#### BLANK FOR BOXES

Paavo Pennanen, Inkeroinen, Finland, assignor to Oy Tampella AB

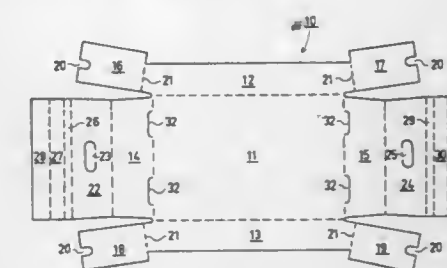
Filed Jun. 8, 1978, Ser. No. 914,742

Claims priority, application Finland, Aug. 12, 1977, 773713

Int. Cl.<sup>2</sup> B65D 5/22

U.S. Cl. 229—34 R

8 Claims



1. A blank for forming a stackable box formed of cardboard, corrugated board or the like comprising:

- a bottom wall forming portion having side and end edges;
- a pair of side wall forming portions integrally formed with and extending from the side edges of said bottom wall forming portion, said side wall forming portions being longer than the bottom wall forming portion;
- a pair of side wall extensions extending from the ends of each of said sidewall forming portions, each of said side wall extensions being joined to a respective side wall forming portion by a crease extending obliquely with respect to the side wall forming portions;
- a pair of end wall forming portions integrally formed with and extending from the edges of said bottom wall forming portion, said end wall forming portions being broader than the side wall forming portions;
- a pair of first end wall extensions, each extending from and integrally formed with a respective end wall forming

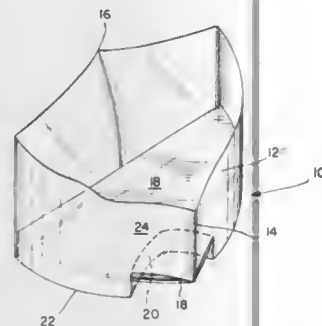
portion, said first end wall extensions being broader than the side wall forming portions;  
 a pair of second end wall extensions, each extending from and integrally formed with a respective first end wall extension; and  
 a pair of third end wall extensions, each extending from and integrally formed with a respective second end wall extension;  
 whereby said end wall forming portions are folded upwardly, said side wall extensions are folded along said oblique creases to the back of said end wall forming portions and said first end wall extensions are folded downwardly to the back of said side wall extensions thereby forming the ends of the box, said side wall forming portions, said end wall forming portions and said first end wall extensions defining upwardly extending wedgelike stacking structures, said second and third end wall extensions are folded and locked into the upwardly converging spaces formed by said end wall forming portions and said first end wall extensions thereby forming upwardly extending wedgelike stacking grooves at the end edges of the bottom wall forming portion.

**4,164,316**  
**FOLDABLE DISPLAY CONTAINER**  
 David O. Gooding, 199 Gregory Blvd., East Norwalk, Conn. 06855

Filed Oct. 20, 1977, Ser. No. 843,837  
 Int. Cl.<sup>2</sup> B65D 5/36

U.S. Cl. 229—41 R

7 Claims



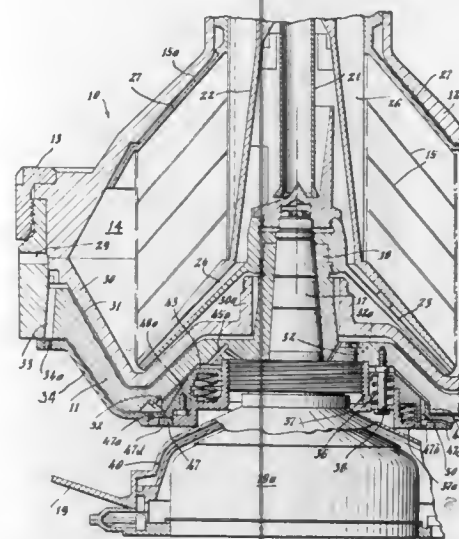
1. A foldable display container containing small articles, said container adapted to sit on check-out type counters, said container comprising:

a wall formed of stiff thin plastic sheet material,  
 a base member hingedly connected with said wall and comprising hinge means for folding said base member upwardly within said wall for storage and downwardly to form a bottom of said container,  
 said wall comprising pre-scored regions permitting said wall to fold substantially flat with said base member folded therewithin,  
 said base member being folded downwardly to form a horizontal support base with said wall conforming to the shape of said base member,  
 support rib means integrally formed of said wall and formed in the lower front portion thereof being separable from the front wall to extend across the front area of said base member thereunder for the base member to rest thereon, whereby said small articles to be sold are placed in said display container,  
 said wall and said support rib means comprising a uniform bottom edge to sit on a flat surface of said counter, and comprising biasing means for said base member to be biased upwardly at said hinge means, so that when opened said base member rests on said support bar and the upper surface of the front edge of the base member bears against the lower edge of the wall to form a rigid container area in which said small articles are placed.

**4,164,317**  
**CENTRIFUGE WITH AUTOMATIC SLUDGE DISCHARGE**  
 Kurt Nelson, Pleasant Valley, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.  
 Filed Apr. 24, 1978, Ser. No. 899,212  
 Int. Cl.<sup>2</sup> B04B 1/18

U.S. Cl. 233—20 A

6 Claims

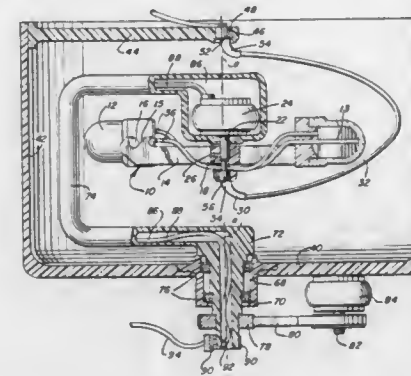


1. A sludge centrifuge comprising a hollow rotor mounted for rotation about an axis and having a separating space provided with an inlet for a sludge-containing liquid and with an outlet for separated liquid, the rotor also having a peripheral outlet for discharge of sludge separated in said space, a piston valve located in the rotor and movable axially thereof to open and close the sludge outlet, said valve forming with the rotor a closing chamber having at its radially outer portion a normally closed drain opening for an operating liquid, means for supplying operating liquid to said closing chamber to substantially fill the same when said drain opening is closed, whereby the operating liquid holds the piston valve in position to close the sludge outlet, a main slide valve biased to a normal position for closing said drain opening but movable axially of the rotor to a second position for opening said drain opening, thereby causing axial movement of the piston valve to open the sludge outlet, said slide valve forming with the rotor an opening chamber having at its radially outer portion a drain passage and at its radially intermediate portion an overflow passage, and a second slide valve mounted on the rotor and movable relative thereto and relative to said main slide, valve said second and main slide valves forming a third chamber to which said passages lead, said second slide valve having a normal position in which it closes said drain passage while said overflow passage communicates with the third chamber, the rotor forming a third passage for supplying operating liquid to said opening chamber to force the main slide valve to its said second position, said overflow passage being positioned to supply overflow liquid from said opening chamber to said third chamber to displace the second slide valve from its said normal position and thereby open said drain passage, whereby operating liquid is drained from said opening chamber and the main slide valve is returned to its said normal position.

**4,164,318**  
**CENTRIFUGAL PROCESSING APPARATUS WITH REDUCED-LOAD TUBING**  
 Daniel R. Boggs, Vernon Hills, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.  
 Filed Oct. 12, 1977, Ser. No. 841,288  
 Int. Cl.<sup>2</sup> B04B 5/02

U.S. Cl. 233—26

5 Claims

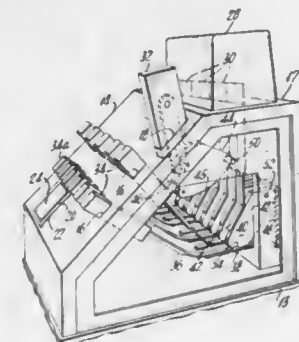


1. Centrifugal processing apparatus, including:  
 a stationary base;  
 a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;  
 a flexible umbilical cable segment for establishing communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of the processing chamber, the other end of the cable segment being attached substantially on said axis in rotationally locked engagement to the processing chamber, the improvement comprising, in combination:  
 said cable segment comprising flexible tubing which defines a plurality of parallel longitudinal channels, and  
 said cable segment having a first cross-sectional area dimension adjacent both ends thereof and a second cross-sectional area dimension in the central portion thereof, said second cross-sectional area dimension being smaller than said first cross-sectional area dimension with the corresponding dimensions within the cross-sectional planes of said first and second cross-sectional areas being in substantial proportion to each other.

**4,164,319**  
**TOY CASH REGISTER**  
 Ira Wallach, New York, N.Y., assignor to Durham Industries, Inc., New York, N.Y.  
 Filed Aug. 28, 1978, Ser. No. 937,346  
 Int. Cl.<sup>2</sup> G06C 27/00

U.S. Cl. 235—1 E

8 Claims



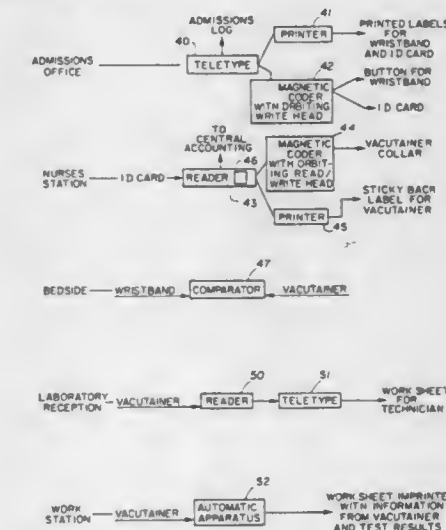
1. A toy cash register for displaying sales amount indicia comprising a cash register frame, a display panel defining panel

amount openings and a panel charging opening, indicia legs extending through said panel amount openings and including upper and lower leg portions, hold pawls upwardly extending from each of said lower leg portions, a display indicia arm for each of said legs with each arm defining an indicia of an amount corresponding to indicia on the corresponding indicia leg and displayed through its said panel amount opening, a charging button extending through said panel charging opening, a rotatable charging cam pivoted on said frame and movable by motion of said charging button, a plurality of rotatable holding cams each defining a cam opening for mating with one of said hold pawls and a spring biasing each of said holding cams in a clockwise rotation all constructed and arranged whereby depression of the upper portion of one of said indicia legs releases its said lower portion by lowering its pawl from its corresponding said cam opening and said spring causes clockwise rotation of said holding cam, each of said display indicia arms contacting one of said holding cams so that a clockwise rotation of a holding cam lifts one of said arms to display an indicia of an amount corresponding to indicia on the corresponding, depressed indicia leg.

**4,164,320**  
**PATIENT AND SPECIMEN IDENTIFICATION MEANS AND SYSTEM EMPLOYING SAME**  
 Carlos A. Irazoqui, New York, and Emil A. Scordato, Bronxville, both of N.Y., assignors to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.  
 Continuation of Ser. No. 509,413, Sep. 26, 1974, abandoned. This application Jul. 28, 1976, Ser. No. 709,321  
 Int. Cl.<sup>2</sup> G06F 15/20; G06K 5/00, 7/08, 19/06

U.S. Cl. 235—375

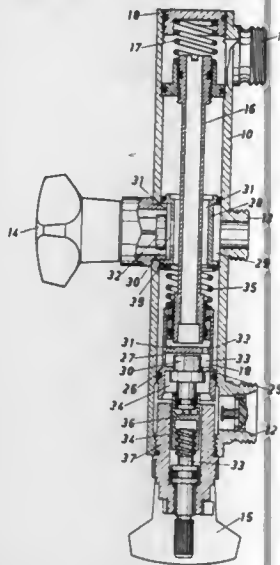
8 Claims





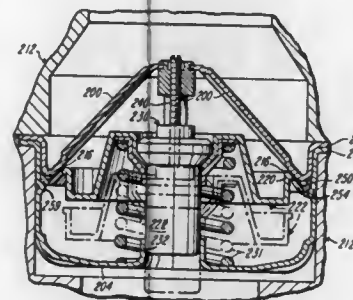
nism means for printing man readable labels for attachment to said patient identification card means; data receiving means to be attached to a patient related item, said means having a magnetizable coating thereon disposed on a flat surface so that machine readable patient identification data can be coded thereon along an annular track; magnetic read/write means for a patient service ordering station having orbiting magnetic head means for reading patient identification coded data from said patient identification card means and writing said coded data onto said data receiving means, and means associated with said magnetic read/write means for printing man readable labels for attachment to said data means; and comparator means for comparing patient identification data coded onto said data receiving means with patient identification data coded on said wristband member.

**4,164,321**  
**THERMOSTATIC MIXING VALVE FOR TWO FLUIDS**  
 Voldemar Riis, Värghårda, Sweden, assignor to AB Värghårda Armaturfabrik, Sweden  
 Filed Nov. 23, 1977, Ser. No. 854,202  
 Int. Cl.<sup>2</sup> G05D 23/13  
 U.S. Cl. 236—12 R 6 Claims



1. A thermostatic mixing valve for two liquids, e.g. hot and cold water, and comprising an elongated housing provided with an outlet and an inlet each for the liquids, at which a first control knob is arranged for adjustment of the outflow of mixed liquid and a second control knob is arranged for adjustment of the temperature of the mixed liquid by means of a temperature responsive element placed at a control member in such a way that a change of the extension length of the temperature responsive element causes an axial displacement of the control member in the housing and thus causes a changed ratio between the inflow areas of the two liquids, at which one of the liquids is supplied to the control member through a tubular feed pipe centrally placed in the housing, wherein said control member is displaceably mounted around the end of the feed pipe remote from the inlet and the control member comprises a sleeve member axially displaceable in the housing and provided with a partition wall between the outlet of the feed pipe and the temperature responsive element, the partition wall limiting the flow of liquid from the outlet of the feed pipe in response to a sensed increase in temperature of the mixed liquid by the temperature responsive element, a number of small apertures for the first liquid flowing to the control member being arranged in said partition wall, at which the first liquid is mixed with the second liquid in front of and/or around the temperature responsive element.

**4,164,322**  
**THERMOSTATIC VALVE DEVICE HAVING NON-LINEAR FLOW CHARACTERISTICS**  
 Backman Wong, Wayland, and Earl L. Wilson, Wellesley, both of Mass., assignors to Standard-Thomson Corporation, Waltham, Mass.  
 Division of Ser. No. 587,915, Jun. 18, 1975, Pat. No. 4,053,105, which is a continuation-in-part of Ser. No. 384,519, Aug. 1, 1973, Pat. No. 3,893,618. This application Sep. 22, 1977, Ser. No. 835,652  
 Int. Cl.<sup>2</sup> G05D 23/02  
 U.S. Cl. 236—34.5 4 Claims

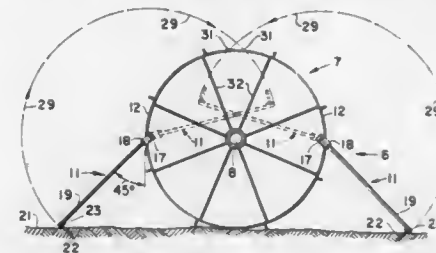


1. A thermally responsive fluid flow control valve device for elimination of temperature fluctuations in the fluid in an internal combustion engine cooling system during initial valve opening operation comprising:  
 a stationary valve member having an annular valve seat portion forming a fluid port and an inclined wall surface leading from the annular valve seat portion, a part of the inclined wall surface having a notch therein for fluid flow therethrough, the notch having a smaller dimension part adjacent the valve seat portion and a greater dimension part spaced from the valve seat portion,  
 a movable valve member having a closure portion engageable with the annular valve seat portion to close the fluid port, the movable valve member being movable toward and away from the valve seat portion of the stationary valve member, the movable valve member closing the notch when the closure portion thereof is in engagement with the valve seat portion, initial movement of the movable valve member in a direction from the valve seat portion opening the smaller dimension part of the notch and creating a small fluid flow passage in the smaller dimension part of the notch to meter the fluid flow, and increased movement of the movable valve member in a direction from the valve seat portion opening the greater dimension part of the notch and creating a greater fluid flow passage in the notch, increased movement of the movable valve member in a direction from the valve seat portion creating an annular fluid flow passage between the movable valve member and the annular valve seat portion of the stationary valve member for fluid flow therethrough,  
 thermally responsive actuator means,  
 means joining the thermally responsive actuator means to the movable valve member for movement thereof in accordance with the temperature sensed by the thermally responsive actuator means.

**4,164,323**  
**BRACING ATTACHMENT FOR WHEELED SPRINKLER SYSTEM**  
 Manuel Ellison, Star Route, Milford, Calif. 96121  
 Filed Jul. 8, 1977, Ser. No. 814,265  
 Int. Cl.<sup>2</sup> B05B 15/06  
 U.S. Cl. 239—212 2 Claims

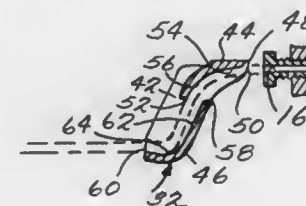
1. A bracing attachment for an agricultural sprinkler system including a water pipe and a ground-supported wheel mounted thereon, said attachment comprising:

a pair of arms pivotally mounted at one end on the periphery of the wheel 180° apart on axes substantially parallel to the wheel axis, each of said arms including a tube extending from said one end to the other end a distance less than the diameter of the wheel and such that each of said arms



subtends approximately a 45° angle with the vertical when said one ends of said arms are in a horizontal plane and said arms extend toward the ground, each of said arms further including a pair of spikes mounted on said other end capable of penetrating the ground under foot pressure exerted on said other end.

**4,164,324**  
**SPRINKLER HEAD WITH IMPROVED INTEGRAL IMPACT ARM AND ANTI-BACKSPASH DRIVE SPOON**  
 Kenneth J. Bruninga, Mapleton, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.  
 Filed Feb. 22, 1978, Ser. No. 880,275  
 Int. Cl.<sup>2</sup> B05B 3/14  
 U.S. Cl. 239—230 10 Claims



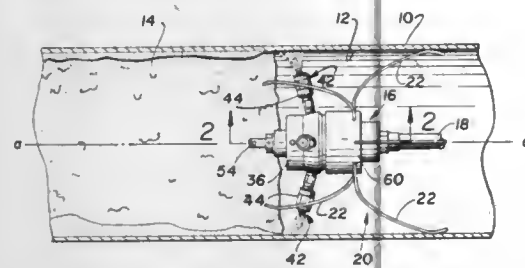
1. A part-circle step-by-step rotary sprinkler head comprising:  
 a sprinkler body including an inlet and an outlet having a longitudinal axis,  
 means adapted to be fixedly secured in communicating relation with a source of water under pressure mounting said sprinkler body for rotational movement about a generally vertical axis with the longitudinal axis of said outlet extending upwardly and outwardly at an angle with respect to the axis of rotation and said inlet in communicating relation to the source of water under pressure so that the latter will issue as a stream along the longitudinal axis of said outlet,  
 impact arm means mounted on said sprinkler body for oscillating movement toward and away from an impact limiting position,  
 said impact arm means having a drive spoon thereon engageable with the stream when said impact arm means is near and in said impact limiting position operable in response to the engagement of the stream therewith to move said impact arm means in a direction away from said impact limiting position and to direct the portion of the stream engaged thereby in a direction generally parallel with the longitudinal axis of said outlet,  
 means for biasing said impact arm means in a direction toward said limiting position so as to move the same in said direction through an impact stroke following the movement of said impact arm means in the opposite direction under the operation of said drive spoon to thereby

effect a step-by-step rotary movement of said sprinkler body in one direction, and  
 means operable when said sprinkler body reaches a first predetermined position of rotational movement for causing the movement of said impact arm means in a direction away from said impact limiting position to effect a rapid step-by-step rotary movement of said sprinkler body in the opposite direction until the latter reaches a second predetermined position of rotational movement,  
 the improvement which comprises said drive spoon being integrally formed as a part of said impact arm means and having a construction related to the longitudinal axis of said outlet when said impact arm means is in said impact limiting position which comprises upper and lower walls in a position to receive said stream therebetween, an initial stream engaging wall extending between said upper and lower walls and a final stream engaging wall extending between said upper and lower walls spaced with respect to said initial stream engaging wall in a position (1) with all portions thereof disposed outwardly of all portions of said initial wall in a transverse direction corresponding to the direction of movement of said spoon away from said impact position, (2) with a longitudinally inward portion thereof disposed in longitudinally lapped relation with a longitudinally outward portion of said initial wall and (3) with a longitudinally outward portion thereof disposed longitudinally outwardly of the longitudinally outward portion of said initial wall,  
 said initial stream engaging wall having an initial leading edge disposed within said stream, an initial terminal edge spaced longitudinally and transversely outwardly therefrom and a pull-in water contacting surface extending between said initial leading and terminal edges including an initial stream receiving portion extending generally longitudinally outwardly from said initial leading edge with a slight transversely outward extent and a transversely outwardly directing stream portion extending from said initial stream receiving portion in a generally concavely arcuate configuration,  
 said final wall including a final leading edge disposed longitudinally between said initial leading and terminal edges and transversely outwardly from said initial leading edge a distance at least as great as the distance said initial terminal edge is transversely outwardly spaced therefrom, a final terminal edge spaced longitudinally and transversely outwardly from said final leading edge, and a reactant water contacting surface extending between said final leading and terminal edges including a final stream receiving portion extending generally transversely outwardly from said final leading edge with a slight longitudinally outward extent and a longitudinally outwardly directing stream portion extending from said final stream receiving portion in a generally concavely arcuate configuration,  
 the reactant water contacting surface of said final wall being disposed substantially entirely transversely outwardly of a plane passing through the leading edges of said initial and final walls.

**4,164,325**  
**HIGH-PRESSURE-ROTARY-NOZZLE APPARATUS**  
 John D. Watson, 906 E. Harmony La., Fullerton, Calif. 92631  
 Filed Nov. 21, 1977, Ser. No. 853,254  
 Int. Cl.<sup>2</sup> B05B 3/06  
 U.S. Cl. 239—252 9 Claims

1. A high-pressure rotary-nozzle apparatus comprising:  
 a central support shaft having a central passage with an open end and a closed end, including a plurality of radially disposed passages adjacent said closed end through which fluid is passed under high pressure from a hose affixed to said open end thereof, said shaft having an enlarged boss member formed thereon;  
 a main rotor body having a longitudinal bore including a central cavity disposed so as to allow said radial passages

to be located in said cavity, said body including a plurality of radial discharge ports, said discharge ports being angularly canted relative to the longitudinal axis of said body; bearing means positioned at each end of said rotor body to provide free rotation thereof about said shaft; means for securing said bearing means and said rotor body for rotational movement on said shaft; means for controlling the rotational speed of said body, said means being mounted between said body and said shaft;



guide means to coaxially position said apparatus along the longitudinal axis of a pipe; and spray-nozzle means mounted to said discharge ports so as to extend radially and outwardly from said rotor body, whereby said fluid is directed against the wall of said pipe to dislodge foreign debris therefrom as said spray-nozzle means is rotated with said rotor body.

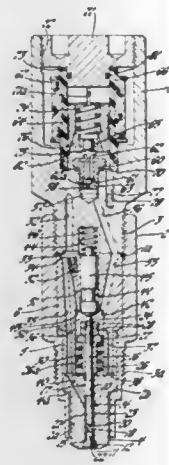
#### 4,164,326 ELECTROMAGNETIC FUEL INJECTOR NOZZLE ASSEMBLY

John I. Deckard, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 6, 1978, Ser. No. 894,099

Int. Cl.<sup>2</sup> F02M 41/16

U.S. Cl. 239—585



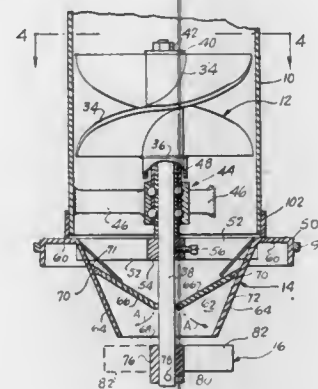
1. An electromagnetic fuel injector nozzle assembly including a housing means with a cylinder means therein and an axial bore passage interconnected at one end with said cylinder means and terminating at its opposite end at a spray outlet port at one end of said housing means, a poppet valve positioned in said bore passage for movement between a closed position and an open position relative to said spray outlet port for controlling fuel injection therefrom, an actuator plunger reciprocally journaled in said cylinder means in position to abut against one end of said poppet valve, a first spring means positioned in one end of said cylinder means to normally bias said actuator plunger into abutment with said poppet valve, a second spring means positioned in the opposite end of said cylinder means and operatively connected to said poppet valve for normally biasing said poppet valve to said closed position against the force of said first spring means, fuel supply passage means

operatively connectable at one end to a source of high pressure fuel and connected in flow communication with said bore passage whereby to supply fuel for flow out through said spray outlet port, the fuel supply passage means also being in fluid flow communication with said one end of said cylinder means for continually supplying high pressure fuel against said one end of said actuator plunger, a throttle control orifice passage connected to said fuel supply passage means and to said opposite end of said cylinder means for supplying at a control flow rate fuel at high pressure to said opposite end of said cylinder means, a normally closed solenoid valve controlled drain passage means connectable at one end to a reservoir for fuel at substantially atmospheric pressure and connected at its opposite end to said opposite end of said cylinder means for the drain flow of fuel therefrom as controlled by said solenoid valve whereby the pressure of fuel in said opposite end of said cylinder means can be modulated between a low pressure and a high pressure to thereby vary the differential pressure across said actuator plunger between a high differential pressure when said solenoid valve is energized so as to effect movement of said actuator plunger in a direction to move said poppet valve to said open position and, a low differential pressure when said solenoid valve is de-energized whereby to provide a substantial force balance across said actuator plunger so that said second spring means is operative to move said poppet valve to said closed position.

4,164,327  
GRAIN SPREADER  
Donald Y. Clark, Rte. 1, Central City, Nebr. 68826  
Filed Apr. 7, 1978, Ser. No. 894,391  
Int. Cl.<sup>2</sup> B65G 65/32

U.S. Cl. 239—669

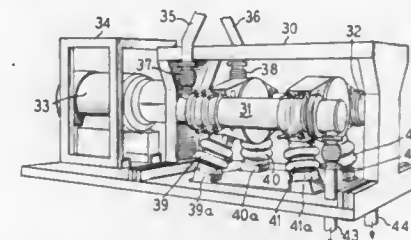
17 Claims



1. A grain spreader comprising, a hopper having a grain inlet and a grain outlet, a power driven auger mounted within the hopper for spreading incoming grain evenly and for propelling the grain toward the outlet, a discharge chute rotatably mounted next to the hopper outlet, said chute having a grain entrance end and a grain exit end and including at least one spring pressed closure plate normally tending to prevent passage of grain through the chute, an axle for said chute, motor means for driving said chute and axle, and a thrower member mounted on said axle adjacent the exit end of the chute, whereby pressure of grain movement caused by rotation of the auger will cause said closure plate to open, allowing grain to pass uniformly through the hopper and discharge chute and to be spread evenly by the chute and the thrower member.

4,164,328  
VIBRATORY BALL OR TUBE MILL  
Ernst Kausel, Lima, Peru, and Helmut Haas, Cologne, Fed. Rep. of Germany, assignors to Klöckner Humboldt Deutz Aktiengesellschaft, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 702,056, Jul. 2, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,249  
Int. Cl.<sup>2</sup> B02C 17/14  
U.S. Cl. 241—175

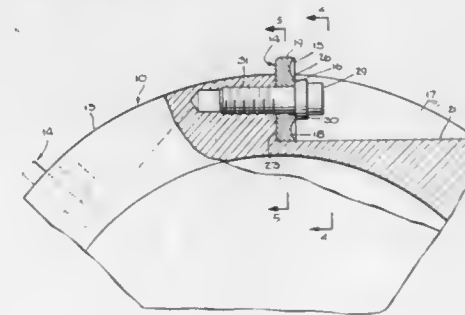
2 Claims



1. A vibrating ball or tube mill which pulverizes a continuous flow of crushable material, said mill comprising: a base, at least one grinding tube, a mounting means for mounting said grinding tube, drive means for eccentrically driving said grinding tube, four selectively pressurizable inflatable bellows each attached to and extending upwardly and inwardly from said base to said mounting means, each said bellows having a central axis, said bellows being inclined with respect to each other such that their central axes intersect an apex above a central portion of said mill, said bellows stressed in both the axial and transverse directions, said mill in operation generating an oscillation radius greater than 15 mm; and a means for selectively adjusting the pressure within each of the bellows, such that the height of each of the bellows above the base may be selectively individually varied to adjust the position of the mounting means and the grinding tube mounted thereon.

4,164,329  
CHIPPER ROLLER AND KNIVES THEREFOR  
Philip J. Higby, Towaco, N.J., assignor to Lee Heydenreich, Essex Fells, N.J.  
Continuation of Ser. No. 747,218, Dec. 3, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,534  
Int. Cl.<sup>2</sup> B02C 18/06, 18/18  
U.S. Cl. 241—294

7 Claims



1. A chipper roller, for use in a two-stage machine for granulating bodies of plastic and like material, having a cylindrical surface from which projects an axially and circumferentially spaced array of replaceable knives, characterized in that each of said knives consists of a circular disc having a cutting edge on one side at its periphery and a circumferential groove in said one side adjacent said cutting edge providing a rake at an angle

greater than 40° which cooperates with the walls of said groove such that said knives cut curls from said bodies of material, the cross-section of said groove having a smoothly curving contour free from slope discontinuities and reversals, and said discs are each removably mounted in respective recesses on said roller with a portion of said disc projecting beyond said surface and with said one side of said disc facing at least generally in the direction of intended rotation of said roller.

#### 4,164,330 DEVICE FOR TRANSFERRING A THREAD TO AN UNWOUND COIL CORE

Wilhelm Maassen; Hans Raasch, and Heinz-Georg Wassenhoven, all of Mönchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

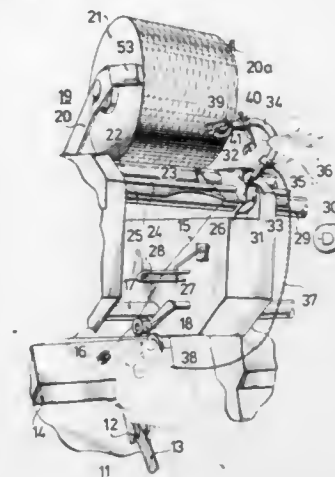
Filed Dec. 20, 1977, Ser. No. 862,492

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657798

Int. Cl.<sup>2</sup> B65H 54/02, 65/00

U.S. Cl. 242—18 PW

7 Claims



1. Device for transferring to an empty coil core a thread continuously fed to the take-up coil of a rotor spinning machine, comprising a thread guide traversible along a reciprocating path between the ends of a coil core for guiding a thread onto the coil core, a thread pickup assembly having means for picking up the thread under tension before transfer thereof to an empty coil core, said thread pickup assembly being pivotable from a first location on said reciprocating path to a second location at one of the ends of the coil core, said thread pickup assembly comprising a thread capturing device as well as a pair of thread severing devices respectively disposed in front of and behind said pickup means in travel direction of the thread, said thread severing devices being activatable in time sequence by movement of said thread pickup assembly so that in said first location thereof said thread severing device disposed behind said pickup means is activatable, after capture of the thread by said capturing device, in time coordination with the pickup of the thread, and at said second location of said thread pickup assembly said thread severing device disposed in front of said pickup means is activatable at an instant within the period during and shortly after transfer of the thread to the empty coil core.

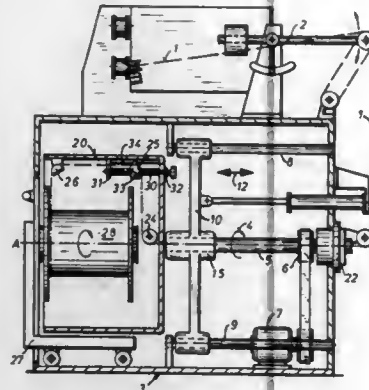


**4,164,331**  
**SLIDE GUIDE DEVICE FOR MOVING WIRE AND THE LIKE**

Werner Henrich, Hörbach, Fed. Rep. of Germany, assignor to Firma Henrich KG, Hörbach, Fed. Rep. of Germany  
 Filed Feb. 2, 1977, Ser. No. 764,843

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2604012

Int. Cl.<sup>2</sup> B65H 54/02, 57/04  
 U.S. Cl. 242—25 R

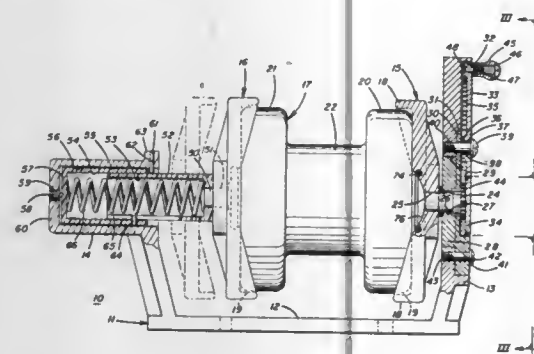


1. An apparatus for winding at a high speed a strand such as wire and the like upon a spool comprising means for supporting therein a spool upon which a strand is to be wound, a rotatably mounted flyer movable around the spool to wind the strand therein, said flyer having outer wall means surrounding said spool, means for reciprocating said flyer relative to said spool, guide means within and fixed relative to said flyer for introducing a moving strand into the rotatable flyer along its axis of rotation, means mounted on the inner surface of the wall means of the flyer and spaced from the axis of rotation of the flyer for slidably supporting and guiding the strand moving within the rotatable flyer from its introduction at the axis of rotation to a path substantially parallel to said axis, said slide support means having an arcuate groove therein to define a path for the wire, and means within said flyer for selectively adjusting the position of said slide support means relative to said flyer and along a generatrix of the flyer so that the arc of the strand along said path is variable.

**4,164,332**  
**LINE WIND-UP MECHANISM FOR MARKER BUOYS**

Paul H. Insch, P.O. Box 2818, Hickory, N.C. 28601  
 Filed Jul. 11, 1978, Ser. No. 923,541

Int. Cl.<sup>2</sup> B65H 75/00  
 U.S. Cl. 242—54 R



1. A line wind-up mechanism for fisherman's marker buoys comprising a support frame having two coaxially spaced pedestals, a pair of holding cups rotarily mounted on said pedestals respectively for holding a marker buoy therebetween for rotation coaxially with said cups, speed-amplifying gear mechanism

comprising an annular driving gear wheel having internal teeth therein and a pinion gear engaging said internal teeth and driven thereby, said pinion gear being connected to one of said cups, and means for manually rotating said annular driving gear wheel.

**4,164,333**  
**ENDOSCOPE FILM FEEDING DEVICE**

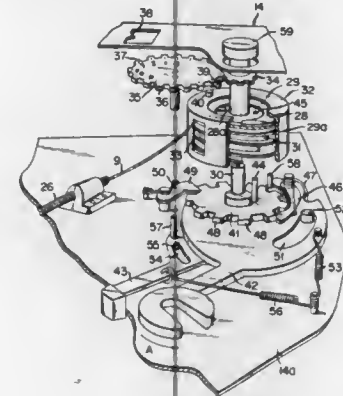
Kiyokazu Hosaka, Tami, Japan, assignor to Olympus Optical Company, Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,346

Claims priority, application Japan, Feb. 28, 1977, 52/23761[U]

Int. Cl.<sup>2</sup> G03B 1/04, 15/14; A61B 1/06  
 U.S. Cl. 242—71.2

4 Claims



1. A film feeding device used in an endoscope for pulling a film take-up wire wound around a film take-up pulley of a film cassette placed in a distal end of the endoscope comprising:  
 a shaft rotatably mounted on a body of an operation section of the endoscope;  
 a generally frustoconical drum portion fixedly mounted on the shaft;  
 a helical blade member formed on an outer periphery of the drum portion;  
 a casing covering the drum portion and having an inner surface complementary to a shape defined by the outer periphery of the blade member, said casing having an axially elongated opening formed in a lateral wall thereof;  
 an operating wire connected at one end to the larger diameter end of the drum portion and that portion succeeding to said one end which is engaged with a groove defined by the outer periphery of the drum portion and the blade member, said operating wire having an intermediate portion passing through the opening which extends through the endoscope, with the other end of the operating wire detachably connected by the film take-up wire; and  
 a knob fixed on a free end of the shaft for rotating the drum portion in either direction.

**4,164,334**  
**TAPE MEASURE HOOK AND HOOK STORAGE RECEPTACLE**

Richard H. Rathbun, Oakdale, and William J. Hildebrandt, Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Jan. 16, 1978, Ser. No. 869,841

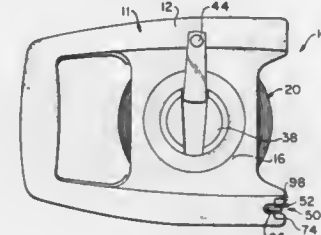
Int. Cl.<sup>2</sup> G01B 3/10

U.S. Cl. 242—84.8

8 Claims

1. In a tape measure having a molded plastic casing with separate casing sides with opposed laterally spaced sidewalls respectively, providing a measuring tape storage compartment therebetween and an edgewall extending at least partly around the edge of the spaced sidewalls to at least partly enclose the

measuring tape storage compartment, a rotatable measuring tape reel extending between the spaced sidewalls for storing a coiled measuring tape blade within the storage compartment, an elongated measuring tape blade adapted to be manually withdrawn from the casing and having an inner end connected to the reel for coiling the tape blade onto the reel by rotation of the reel in one angular direction, and an enlarged measuring tape end grip at the outer end of the measuring tape blade, the tape measure having a measuring tape blade delivery throat with an outer opening in the casing edgewall for delivering the measuring tape blade to and withdrawing it from the reel, the improvement wherein the tape delivery throat comprises opposed laterally spaced elongated channels in the opposed sidewalls respectively, extending inwardly from said outer throat



opening and forming a storage receptacle for slidably receiving the enlarged end grip laterally between the sidewalls of the casing and inwardly of said outer opening, the opposed channels being inclined inwardly laterally toward each other to define an end grip receptacle of laterally decreasing width and the enlarged end grip having an inwardly laterally decreasing width generally conforming to the inwardly decreasing width of the storage receptacle, the opposed sidewalls having laterally spaced outwardly facing abutment shoulders at the inner ends of the opposed channels respectively and the enlarged end grip having at the inner end thereof laterally spaced inwardly facing abutment shoulders laterally outwardly of the measuring tape engageable with the outwardly facing abutment shoulder of the casing respectively for seating the enlarged end grip in the storage receptacle.

**4,164,335**  
**AUTOMATIC LOCKING RETRACTOR WITH LOCK-UP DELAY**

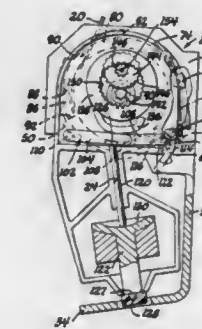
Joseph D. Kondziola, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 17, 1978, Ser. No. 896,982

Int. Cl.<sup>2</sup> B65H 75/48; A32B 35/02

U.S. Cl. 242—107.4 A

3 Claims



1. In a vehicle seat belt retractor having a rotatable reel for winding and unwinding a belt, spring means biasing the reel in the belt winding direction, a pawl, ratchet means on the reel engageable by the pawl, said pawl being selectively movable between a position disengaged from the ratchet means to permit belt unwinding and an engaged position locking the belt against belt unwinding rotation, the improvement comprising:

spring means biasing the pawl to the engaged position;  
 a toggle linkage having an extended position of engagement with the pawl to block engagement of the pawl with the reel and a collapsed position to unblock the pawl for movement to the reel engaging position;  
 means responsive to rotation of the reel and adapted to establish and maintain the toggle linkage in the extended position when the belt is in a fully wound condition and permit movement of the toggle linkage to the collapsed position when the belt is unwound from the fully wound position;  
 means responsive to a sensed condition of vehicle acceleration or attitude for moving the toggle linkage to the collapsed position to unblock the pawl for movement to the reel engaging position;  
 a control disc clutched to the reel for limited rotation therewith and carrying an abutment rotating to a blocking position in alignment with the pawl in response to unwinding rotation of the reel to block movement of the pawl to the engaged position when the responsive means moves the toggle linkage to the collapsed position unblocking the pawl prior to initiation of winding rotation of the reel carrying the control disc abutment to an unblocking position allowing pawl movement to the reel engaging position.

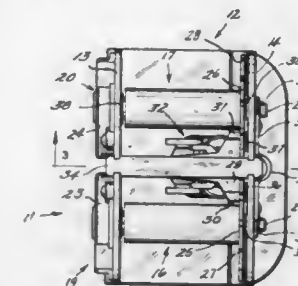
**4,164,336**  
**DUAL SPOOL POSITIVE DRIVE RETRACTOR**  
 Wallace C. Higbee, Romeo, and Robert J. Rumpf, Grosse Pointe, both of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 17, 1978, Ser. No. 896,928

Int. Cl.<sup>2</sup> A62B 35/02; B65H 75/48

U.S. Cl. 242—107.4 A

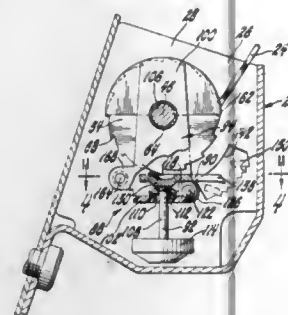
5 Claims



1. A dual spool retractor structure comprising:

a frame;  
 a pair of spaced-apart parallel adjacent spools having seat belt webbing wound thereon and having rewind motors operably connected thereto and journaled in said frame, each said spool having ratchet flanges with ratchet teeth lockable in opposite directions of rotation;  
 a pawl element in said frame beneath and between said spools and having a pair of extensions at one end, said extensions displaceably supported in a pair of cam openings defined in said frame, said cam openings configured for guiding lift and displacement of said pawl toward interference engagement with said ratchet teeth; and  
 a sensor secured to said frame and beneath said pawl element operably contacting said pawl and selectively movable to lift said pawl guidably toward interference engagement with movable of said ratchet teeth of one of said spools.

**4,164,337**  
**SEAT BELT RETRACTOR WITH PIVOTED LOCKING MECHANISM**  
 Hubert P. Blom, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.  
 Filed Mar. 16, 1978, Ser. No. 887,050  
 Int. Cl.<sup>2</sup> A62B 35/02; B65H 75/48  
 U.S. Cl. 242—107.4 A 2 Claims

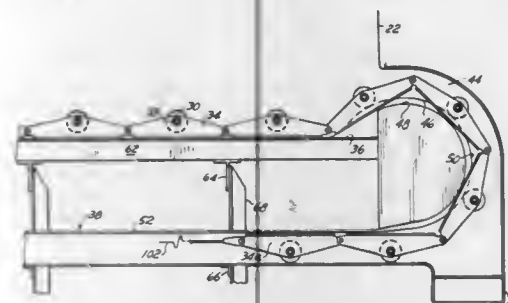


1. A motor vehicle seat belt retractor comprising:  
 a housing adapted for mounting on a motor vehicle;  
 a belt reel having a restraint belt attached thereto;  
 a reel shaft mounting the reel on the housing and defining an axis of reel rotation for winding and unwinding the belt;  
 a support member encircling the reel shaft to define an axis of support member rotation coincident with the axis of reel rotation;  
 bearing means interposed between the support member and the reel shaft to isolate the support member from the shaft and the reel and thereby prevent frictional transmission of a rotation inducing torque to the support member during rotation of the reel;  
 a lock bar pivotally mounted on the support member and having a first locking portion normally spaced from the reel and a second locking portion normally spaced from the housing;  
 an inertia sensing member mounted on the support member and operable under a predetermined inertia stimulus to move the lock bar to a locked condition wherein the first locking portion engages the reel and the second locking portion engages the housing to block unwinding rotation of the reel relative to the housing;  
 and counterweight means associated with the support member adapted to situate the combined center of gravity of the support member, lock bar and inertia sensing member at a point spaced from the axis of reel rotation and to establish the magnitude of their combined mass unbalanced with respect to the axis of rotation so that gravitational force causes rotation of the support member about the axis of reel rotation to establish the inertia sensing member in a precise operative orientation wherein a predictable sensitivity of inertia stimulus is obtained irrespective of the mounting orientation of the housing relative to the axis of reel rotation.

**4,164,338**  
**FLEXIBLE RAIL ROLLER SYSTEM**  
 Clayton E. Myron, Seattle, Wash., assignor to Brooks & Perkins, Incorporated, Southfield, Mich.  
 Filed Feb. 23, 1978, Ser. No. 880,659  
 Int. Cl.<sup>2</sup> B64C 1/20; B64D 9/00  
 U.S. Cl. 244—118 R 8 Claims

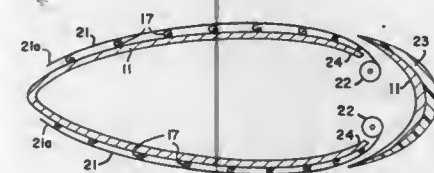
8. In an aircraft, an elongated cargo carrying space having a deck, an elongated flexible roller construction comprising flexible rails, formed by pairs of laterally spaced opposed links each pivotally connected at its ends to adjacent links, roller supporting shafts extending between corresponding links in said rails, rollers on said shafts, said roller construction having an operating position in which said roller construction rests on said deck and a stowed position in which said roller construc-

tion is received in inverted position beneath said deck, and guide means of generally semi-circular cross-section adjacent one end of said deck around which said roller construction is drawn in moving between the aforesaid operating and stowed



positions, said guide means comprising a generally semi-cylindrical guide surface with which only the rollers of said roller construction contact, and arcuate channels at the edges of said guide surface to receive said links.

**4,164,339**  
**ENVIRONMENTAL PROTECTION SYSTEM**  
 Carl O. McClenny, 6154 Willer's Way, Houston, Tex. 77057  
 Continuation of Ser. No. 367,321, Jun. 6, 1973, abandoned. This application Nov. 25, 1977, Ser. No. 854,753  
 Int. Cl.<sup>2</sup> B64G 1/10  
 U.S. Cl. 244—163 4 Claims

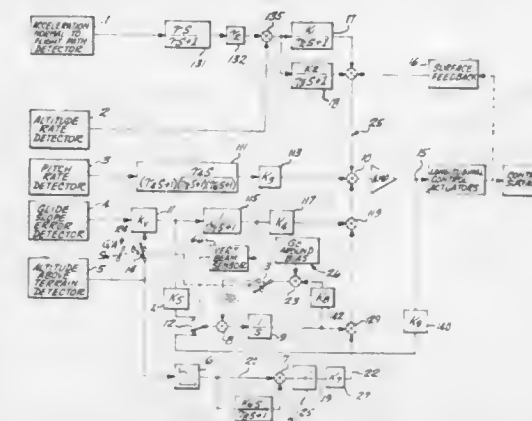


1. An environmental protection system for protecting a spacecraft surface from a hostile environment, comprising:  
 a. a spacecraft exterior surface to be protected;  
 b. a layer of insulating material adapted to be rolled up in a compact roll when not in use; and  
 c. means for deploying said insulating material between said spacecraft surface to be protected and said hostile environment.

**4,164,340**  
**METHOD AND APPARATUS FOR DETERMINING WHEN A GLIDE SLOPE SIGNAL EXCEEDS A PREDETERMINED LEVEL**  
 Robert D. Simpson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.  
 Continuation of Ser. No. 714,214, Aug. 13, 1976, abandoned, which is a continuation of Ser. No. 553,371, Feb. 26, 1975, Pat. No. 3,994,455, which is a continuation of Ser. No. 342,343, Mar. 19, 1973, abandoned, which is a division of Ser. No. 221,958, Jan. 31, 1972, Pat. No. 3,801,049. This application Oct. 21, 1977, Ser. No. 844,408  
 The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.  
 Int. Cl.<sup>2</sup> G05D 1/12 8 Claims

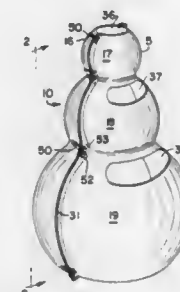
1. In combination in a system for detecting when a glide slope signal exceeds a predetermined level:  
 first means for generating a first signal representative of said glide slope signal;  
 second means for producing a second signal representative of the altitude of an aircraft above the terrain;

third means for combining said first and second signals to produce a third signal;



fourth means for detecting a predetermined signal level of said third signal to produce a logic level representative of a condition corresponding to said glide slope signal exceeding a predetermined level.

**4,164,341**  
**SNOWMAN MOLD**  
 Tiney M. McComb, Rte. #3, Box 43-A, Orient, Ohio 43146  
 Filed Feb. 23, 1978, Ser. No. 880,597  
 Int. Cl.<sup>2</sup> B28B 7/24  
 U.S. Cl. 249—126 5 Claims

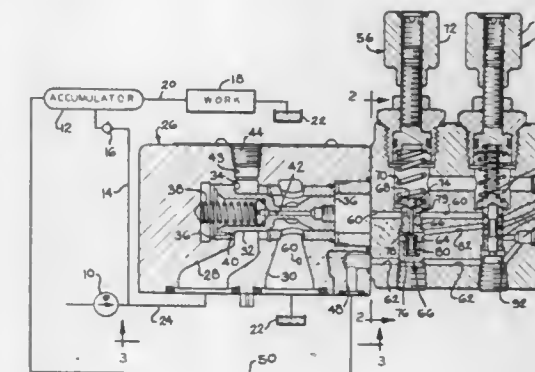


1. A hollow mold assembly for the forming of large figures from snow comprising at least two mold sections, each of said mold sections being substantially a mirror image of the other and extending in one piece from the top of the figure to be formed to the bottom, said mold sections being mateable to form a hollow figure, said figure being formed of successively smaller substantially spherical portions, including a base portion, a body portion and a head portion, and at least three large openings formed in said mold sections for the admission and packing of snow to the entire interior of said mold, each of said openings being associated with one of said spherical portions for the easy admission of snow to each respective spherical portion.

**4,164,342**  
**VARIABLE DIFFERENTIAL PRESSURE UNLOADING VALVE APPARATUS**  
 Charles E. Johnson, Santa Ana, Calif., assignor to Double A Products Company, Manchester, Mich.  
 Division of Ser. No. 752,103, Dec. 20, 1976, Pat. No. 4,114,637. This application Mar. 2, 1978, Ser. No. 882,598  
 Int. Cl.<sup>2</sup> G05D 16/10; F16K 31/122 3 Claims

1. A differential pressure control apparatus comprising a valve body having a first passageway for receiving hydraulic fluid under pressure from a primary source for discharge to tank, a normally closed first spring-actuated valve member in

said first passageway spring biased to a closed position to block communication from the primary source to tank and responsive to a preselected pressure acting against its spring action to move to an open position to vent said passageway to tank, a second passageway for receiving hydraulic fluid under pressure from a pilot source, a balancing chamber adjacent to said first passageway in communication with said second passageway and containing a balancing piston operably connected to said first valve member and movable between a first position when said first valve member is closed and a second position when the piston in response to pressure from said pilot source and in cooperation with pressurized fluid from said primary source urges said first valve member to its open position, a third passageway in communication with said first passageway upstream from said first valve member and communicating



with said balancing chamber on the side of said balancing piston opposite from the communication of the balancing chamber with said second passageway, a valve chamber providing said communication between said first and said third passageways and communication between said second and said third passageways, and a second spring-actuated valve member in a first position in said valve chamber normally closing communication between said first and third passageways and allowing communication between said second and third passageways and responsive to a preselected pressure in said second passageway acting against the spring-action of said second valve member to move to a second position closing communication between said second and third passageways and allowing communication between said first and third passageways.

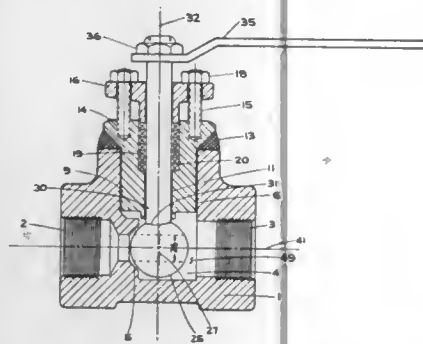
**4,164,343**  
**ECCENTRIC BALL TYPE VALVE**  
 Heinz Graebner, Jeffersonville, Ind., assignor to Henry Voyt Machine Co. Inc., Louisville, Ky.  
 Filed Sep. 12, 1977, Ser. No. 832,167  
 Int. Cl.<sup>2</sup> F16K 5/06 6 Claims

1. A valve comprising:  
 A. a casing, having aligned inlet and outlet passages, a bonnet opening, at right angles to the axis of said inlet and outlet passages, a valve chamber for provision of a valve member to effect closure, an annular valve seat surrounding one of said passages;  
 B. a bonnet for said casing, said bonnet having a bore axially aligned parallel to the centerline of said bonnet opening;  
 C. a valve stem rotatably journaled in the bore of said bonnet and extending into said casing at one end and projecting out of said casing at the other;  
 D. packing surrounding said valve stem;  
 E. a spherical valve member, having a cylindrical fluid passage therethrough and mounted on said valve stem for movement between an open position in which said cylindrical fluid passage is in parallel axial alignment with said axis of said inlet and outlet passages and a closed position



in which said cylindrical fluid passage is disposed transversely across said valve chamber, normal to said axis of said aligned inlet and outlet passages, and  
 F. means to rotate said valve stem;  
 G. said spherical valve member being mounted so that its centerline is offset relative to the centerline of said stem;  
 H. the improvement wherein:

1. the centerline of said bonnet opening is offset from the axis of said inlet and outlet passages, and
2. said stem is mounted so that its centerline is offset from the centerline of said bonnet, and
3. the spherical valve member moves in an arc between



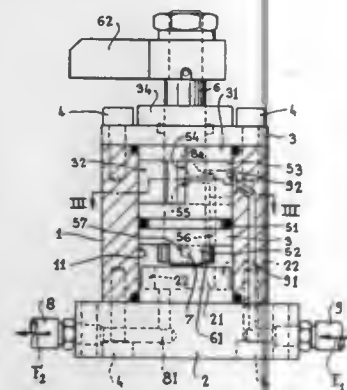
open and closed positions, so as to engage the valve seat tangentially with a wiping action and defines an angle of approach to said valve seat of greater than 0° so as to be self-locking;

1. the further combination therewith of:  
 1. movement means including the co-action of the bore of said bonnet and the stem of said valve member responsive to the rotation of said bonnet for moving said spherical valve member in an effective straight line into seating and engagement with said seat during assembly; and  
 2. means for permanently securing said bonnet in fixed position.

**4,164,344**  
**HYDRAULIC CLAMPING APPARATUS**  
 Maurice M. Deragne, 30 Rue Chazière, Lyons, France (69004)  
 Filed Dec. 27, 1977, Ser. No. 864,904  
 Claims priority, application France, Dec. 30, 1976, 76 39850  
 Int. Cl.<sup>2</sup> B23Q 3/08

U.S. Cl. 269—27

7 Claims



1. Hydraulically controlled apparatus for selectively clamping a work piece having a body; a clamping element associated with a piston movable in the body, the piston having transverse and longitudinal surfaces adapted to be subjected to hydraulic pressure causing axial and angular displacement of the piston to clamp or unclamp a said work piece; and a mechanical locking mechanism interposed between the piston and the

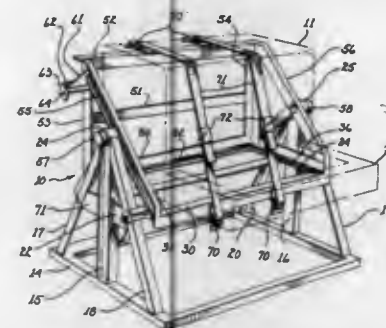
body, the mechanism comprising dogs and recesses formed on the piston and body, mutual engagement of which locks the piston in a given angular orientation with respect to the body at one of the end points of the axial travel of the piston.

**4,164,345**  
**SAFETY CRADLE FOR TRANSFORMER REPAIR**  
 William L. Arnold, 6131 W. Avalon Dr., Phoenix, Ariz. 85033,  
 and Harry M. Wilson, Jr., 2222 W. Sierra, Phoenix, Ariz. 85029

Filed Feb. 3, 1978, Ser. No. 874,851  
 Int. Cl.<sup>2</sup> B23Q 3/18

U.S. Cl. 269—69

14 Claims



1. A transformer safety cradle which comprises:  
 (a) first support means adapted to receive and support the base of a transformer, said means having first and second edges;  
 (b) second support means adapted to receive and support one surface of the transformer, said second means having first and second edges with said first edge being connected to the second edge of said first means;  
 (c) first and second connectors, each of said connectors being located at one side of said first and second support means and extending between regions thereon proximate to the first edge of said first means and the second edge of said second means;  
 (d) a frame adapted for placement on a support surface, said frame including first and second upright members spaced to receive said support means and connectors therebetween;  
 (e) first and second pivot means for rotatably connecting each upright member to the adjacent connector whereby said first and second support means and the transformer received thereby can rotate relative to said frame; and  
 (f) limit means affixed to at least one of said connectors for limiting rotation of said support means to between first and second positions, said first position corresponding to a loading position wherein the transformer is supported by said first support means and said second position corresponding to a work position wherein the transformer is supported by said second support means.

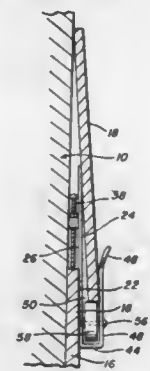
**4,164,346**  
**LAP SIDING TOOL**  
 Jack R. Sickler, P.O. Box 20803, Billings, Mont. 59104  
 Filed May 18, 1978, Ser. No. 907,287  
 Int. Cl.<sup>2</sup> B23Q 3/02

U.S. Cl. 269—321 S

15 Claims

1. A tool for use in pairs to assist in properly positioning successive courses of siding members whereby to maintain the desired overlap of successive pairs of adjacent courses of siding members, said tool including an upstanding body having front and rear sides, the upper end portion of said body having upper downwardly facing abutment surface means spaced slightly outwardly of said rear side and the lower end portion of said body including lower upwardly facing support roller means

journalled from said body for rotation about a generally horizontal front-to-rear extending axis and with said support roller means spaced outwardly of the front side of said body, said tool being free of portions thereof blocking vertical downward

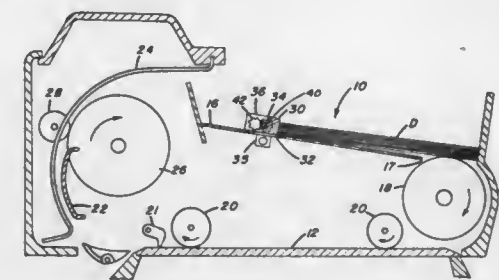


**4,164,347**  
**SEPARATOR MEMBER DRIVE MECHANISM**  
 Thomas M. McGrain, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,400  
 Int. Cl.<sup>2</sup> B65H 5/22

U.S. Cl. 271—3.1

8 Claims



1. In an apparatus for circulating discrete pages of a document from a document support to the platen of a copier for copying and then back to said document support, said apparatus having a rotatably mounted separator member engageable with the last page to be copied for distinguishing pages yet to be copied during a document copying cycle from those returned to said document support after copying, means for drivingly engaging said separator member, after said last page has been fed from said document support, to move said separator member toward a position overlying said last page upon return of said last page to said document support and then terminating engagement with said separator member, said means comprising:

- a rotatable member mounted for coaxial rotation with said separator member;
- means for initiating rotation of said rotatable member in timed relation to the feeding of said last page from said document support to the platen and terminating rotation of said rotatable member in timed relation to the feeding of said last page from the platen to said document support; and
- a plurality of pawls on said rotatable member mounted for movement between a first position in which the pawls are disposed to drive the separator member into engagement and a second position in which the pawls are disengaged from said separator member, one of said pawls being movable to said first position to rotate said separator member upon

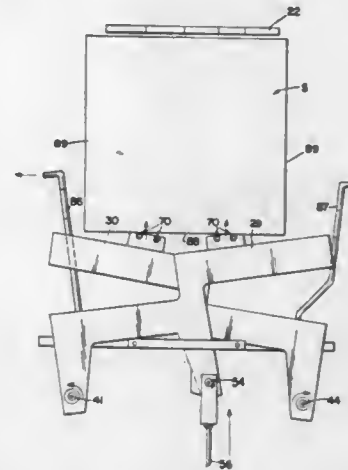
rotation of said rotatable member and to said second position to disengage said separator member upon the termination of rotation of said rotatable member.

**4,164,348**  
**JOGGING APPARATUS**  
 Joseph J. Doria, Easton, Pa., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 26, 1977, Ser. No. 836,391  
 Int. Cl.<sup>2</sup> B65H 31/38

U.S. Cl. 271—221

10 Claims



10. In a sheet handling system of the type in which sheet material articles are deposited in a hopper, apparatus for jogging the sheet material articles in the hopper, said apparatus comprising a pair of first jogger members for engaging respective opposite sides of the sheet material articles, a pair of second jogger members for engaging a third side of the sheet material articles which extends between the first and second sides, a first movable support member, means for fixedly securing one of said first jogger members and one of said second jogger members to said first movable support member for movement therewith, a second movable support member, means for fixedly securing the other of said first jogger members and the other of said second jogger members to said second movable support member for movement therewith, means supporting said first and second support members for simultaneous movement in first directions to effect engagement of the said first jogger members with the respective opposite sides of said articles and in opposite second directions to move said first jogger members away from said respective opposite sides while effecting movement of said second jogger members into engagement with said third side of said sheet material articles, and an actuator member connected to said first and second support members to effect said movement of said first and second support members in said first directions and then in said second directions.

**4,164,349**  
**SHEET FEEDER WITH A SIDE PULLING MARK**  
 Josef Marass, Seehausen, Fed. Rep. of Germany, assignor to Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany  
 Filed Oct. 17, 1977, Ser. No. 842,940  
 Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647795

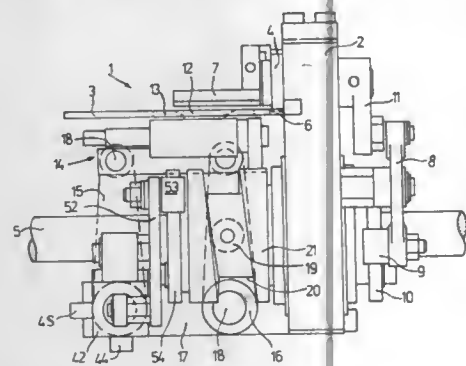
U.S. Cl. 271—250

Int. Cl.<sup>2</sup> B65H 9/16

20 Claims

1. A sheet feeding arrangement with a device for lateral sheet alignment, comprising: a sheet stop strip; a pulling member actuated cyclically with said sheet feeding arrangement and moving back and forth transversely to the direction of sheet movement, said pulling member being arranged underneath a sheet to be aligned, said pulling member grasping the bottom of the sheet and pushing the sheet against said sheet

stop strip; a bearing member moving back and forth transversely to the direction of sheet movement; said pulling mem-



ber comprising a suction grip displaceably mounted on said bearing member; and adjustable spring means for actuating said suction grip in pull direction.

4,164,350

# APPARATUS FOR SUPPORTING THE BODY OF A PERSON IN AN UPRIGHT POSITION, IN PARTICULAR FOR THERAPEUTIC WALKING EXERCISES

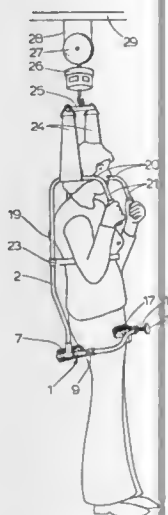
August-Eden Zeijdel, The Hague, and Rudolf B. Teunissen, Noordwijk, both of Netherlands, assignors to N.V. Verenigde Instrumentenfabrieken Enraf-Nonius, Delft, Netherlands  
Filed Apr. 20, 1978, Ser. No. 898,117

Claims priority, application Netherlands, Apr. 21, 1977, 7704344

Int. Cl.<sup>2</sup> A61H 3/04

U.S. Cl. 272-70

12 Claims



1. Apparatus for supporting the body of a person in an upright position to relieve the load on the person's legs, in particular for therapeutic walking exercises, including means for receiving and supporting the lower part of the person's body and a suspension assembly for movably supporting said body receiving means, said body receiving means comprising a rigid seat ring member adapted to receive and freely surround the pelvis of the body with ample room for lateral play, said seat ring member having a rear section and a front section, said rear section being provided with an inwardly projecting body support member shaped to engage below the tuber ischii of the body, a pressure pad member adjustably mounted on said seat ring front section and projecting inwardly therefrom in opposite relation to said body support member, and means for adjusting the spacing between said body support member and said pressure pad member to allow said pressure pad member

to be pressed against the symphysis of the pubic bones of the person's body resting on said body support member.

4,164,351

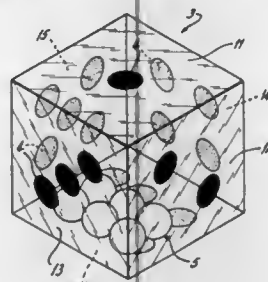
# DIE-RESEMBLING GAME CUBE

Exzelon F. Baker, 3933 Cedarwood Pl., Cincinnati, Ohio 45213  
Filed May 11, 1978, Ser. No. 904,786

Int. Cl.<sup>2</sup> A63F 9/04

U.S. Cl. 273-144 B

6 Claims



1. A game device comprising:

a hollow, transparent cube, the interior faces of said cube having from one to six ball-receiving pockets therein so disposed that the cube resembles a die when viewed from the exterior thereof, one of said faces providing the bottom face of the cube when it is resting on a playing surface, and

a plurality of balls in said cube, each said ball being adapted to fall at random and be captured by one of said ball-receiving pockets in said bottom face of the cube when the cube comes to rest after having been thrown on a playing surface.

4,164,352

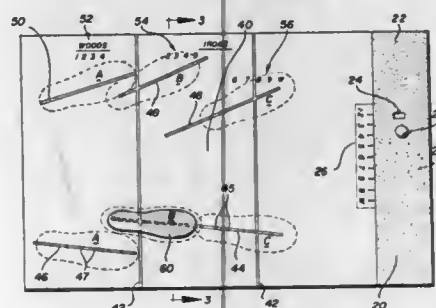
# GOLF SWING PRACTICE MAT

John P. O'Brien, 175 E. Delaware Pl., Chicago, Ill. 60611  
Continuation-in-part of Ser. No. 834,293, Sep. 19, 1977, Ser. No. 780,271, Mar. 23, 1977, Ser. No. 753,927, Dec. 23, 1976, and Ser. No. 735,761, Oct. 26, 1976, Pat. No. 4,081,918, said Ser. No. 834,293, is a continuation-in-part of Ser. No. 661,779, Feb. 26, 1977, abandoned, said Ser. No. 753,927, is a continuation-in-part of Ser. No. 683,898, May 6, 1976, abandoned. This application  
Jan. 26, 1978, Ser. No. 872,377

Int. Cl.<sup>2</sup> A63B 69/36

U.S. Cl. 273-187 A

8 Claims



1. A golf training device enabling a golfer to learn and practice a proper golf swing, said device comprising:

a mat including a hitting area and a foot placement area; said hitting area including a teeing area and an artificial grass area surrounding said teeing area, said foot placement area including at least one line of flight indicator line; and a right (or rear) foot placement indicia, said line of flight indicator line being parallel with the intended line of flight of a golf ball to be struck, said right foot placement indicia comprising a plurality of

holes in said mat, said holes arranged in a line approximately normal to or to the right of normal of said line of flight indicator at spaced distances from said hitting area; a foot supporting wedge-shaped device, a centrally mounted pin dependent from said wedge-shaped device, said pin adapted to engage and cooperate with said holes comprising a portion of the right foot indicia in said mat, said wedge-shaped device adapted to cant a golfer's right foot toward the intended target.

4,164,353

# TOY PHONOGRAPH APPARATUS

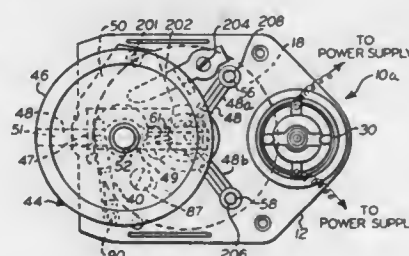
Alexander W. Hughes, Jr., Oceanport, N.J., assignor to Janex Corporation, Eatontown, N.J.

Filed Jan. 6, 1978, Ser. No. 867,331

Int. Cl.<sup>2</sup> G11B 17/06, 3/00

U.S. Cl. 274-1 A

25 Claims



1. In a toy phonograph comprising a housing, said housing comprising a base, a turntable rotatably mounted on said base for rotation about an axis of rotation, a first phonograph record rotatably mounted to one side of said turntable for rotation therewith, said phonograph record having a periphery and a center, a first pickup arm pivoted at one end and having a needle means engageable with a playing surface of said first phonograph record, a first spring means, said first pickup arm being constantly placed under a force of said first spring means which urges said first pickup arm toward the periphery of said first phonograph record and a first speaker cone means resiliently mounted on said housing above said first pickup arm, said first speaker cone means comprising a first lift bar means removably engageable with said first pickup arm in sound reproducing contact; the improvement comprising means for resiliently pressing said first pickup arm needle means into engagement with said first phonograph record for reproducing recorded sound from said first phonograph record playing surface during rotation of said turntable, said pickup arm needle means circumscribing a path of travel across said first phonograph record playing surface from said periphery toward said center during said sound reproducing engagement, said pressing means comprising second spring means, said second spring means comprising a bifurcated spring member resiliently pressing against said lift bar means at a pair of spaced apart positions therealong, one of said positions being located substantially adjacent said phonograph record periphery and the other of said positions being located substantially adjacent said center, whereby said bifurcated spring member presses against said lift bar means substantially adjacent the limits of said path of travel of said pickup arm needle means for substantially uniformly resiliently biasing said lift bar means against said first pickup arm with a substantially uniform biasing force for exerting substantially uniform pressure on said needle means throughout said entire path of travel circumscribed by said needle means.

4,164,354

# NARROW FRAME WHEELCHAIR

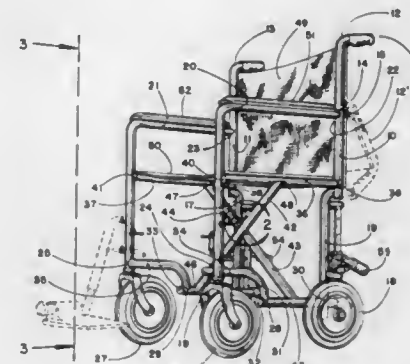
Keith S. Rodaway, Santa Monica, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.

Filed Mar. 6, 1978, Ser. No. 883,573

Int. Cl.<sup>2</sup> B62B 11/00

U.S. Cl. 280-42

3 Claims



1. A narrow frame wheelchair having a seat, left rear and front wheels and right rear and front wheels, including in combination:

(a) left and right seat support frame tubes defining therebetween the width of said seat when said wheelchair is in unfolded position;

(b) left and right lower frame tube means connected between the left rear and front wheels and right rear and front wheels respectively, such that the left rear wheel and left front wheel are in the same vertical plane as the left seat support tube and the right rear wheel and right front wheel are in the same vertical plane as the right seat support frame tube;

(c) first and second crossing tubes having their opposite ends respectively connected to the left lower frame tube means and right seat support frame tube and the right lower frame tube means and left seat support tube; and

(d) pivot means connected to said crossing tubes to pivot the tubes about a pivot axis spaced vertically above the crossover point of said tubes a given distance, said given distance being such that said crossing tubes can be pivoted towards a vertical parallel relationship by moving said seat support frame tubes towards each other and lower frame tube means simultaneously towards each other until said lower frame tube means are in side-by-side engaging relationship to fold said wheelchair, and whereby said left rear and left front wheels are still in the same vertical plane as said left seat support tube and said right rear and right front wheels are still in the same vertical plane at said right seat support tube when said wheelchair is folded to result in a minimum overall width for the folded wheelchair for a given seat width when the wheelchair is unfolded.

4,164,355

# CADAVER TRANSPORT

Russell K. Eaton, and Ronald A. Elenbaas, both of Kalamazoo Township, Kalamazoo County, Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Dec. 8, 1977, Ser. No. 858,623

Int. Cl.<sup>2</sup> A61G 1/02

U.S. Cl. 296-20

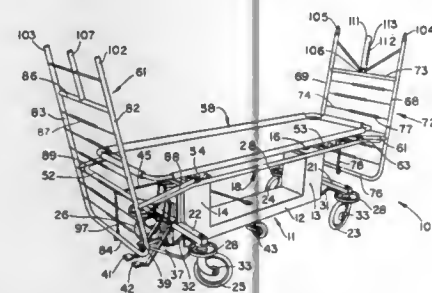
11 Claims

1. In a wheeled transport having a compartment for concealing a cadaver, comprising an undercarriage having four wheels substantially arranged in a rectangle and for engagement with a substantially flat supporting surface;

a substantially flat, rectangular and elongated frame means; a pair of spaced, upright means mounted upon said undercar-



riage and connected to said frame means for supporting same in a substantially horizontal position;  
 an elongated and substantially flat cadaver support means mounted upon said frame means;  
 an elongated substantially flat and rectangular canopy support means consisting of two similar and flat support members releasably connectible at adjacent edges, each of said support members being rigidly secured to corresponding ends of a pair of rigid elements which are substantially perpendicular to said support members, the other ends of which elements are pivotally connected to said frame means whereby said support members can be

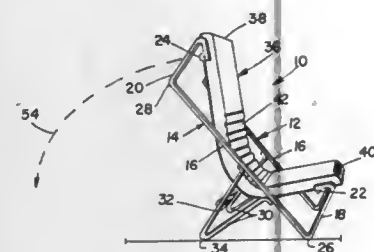


pivoted between coplanar horizontal positions and substantially upright positions at the opposite ends of said frame means;  
 means for positively limiting movement of said support members toward and away from each other, said movement limiting means comprising flexible elements extending between and secured to the remote ends of said support members and the corresponding ends of said frame means, and tubular lock means at the adjacent ends of said support members; and  
 a flexible canopy adapted to be draped over the canopy support means so as to conceal the space between said frame means and said canopy support means.

#### 4,164,356 CHAIR

Richard G. Knight, 155 Wembleton, Birmingham, Mich. 48008  
 Filed Dec. 19, 1977, Ser. No. 861,995  
 Int. Cl.<sup>2</sup> A47C 3/00

U.S. Cl. 297—1



#### 1. A chair comprising:

- a pair of multi-angled, C-shaped frame members disposed substantially parallel to and laterally spaced from each other, one end section of each of said frame members defining a leg which cooperates to form a first pair of legs for supporting the frame members in an upright position; the other end of each of said frame members defining a second leg which cooperates to form a second pair of legs longitudinally spaced from said first pair of legs and adapted to support said frame members in a second position;
- an intermediate pair of legs carried by said frame members at a position between said first pair of legs and said second pair of legs and at a position closer to said first pair of legs such that said chair may be positioned on said first pair of

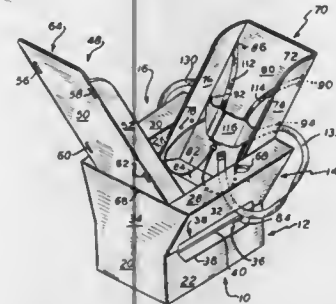
legs and said intermediate pair of legs in a first position to receive and support a person, said chair being rotatable about said intermediate legs to said second position wherein said chair is supported on said second pair of legs;  
 a base member rigidly connecting said intermediate pair of legs;  
 a pair of hinge members extending between the opposite ends of said C-shaped frame members and supported thereby, said hinge members maintaining said frame members in said spaced relationship;  
 a flexible cushion having a first end section pivotally supported by one of said hinge members and a second end section pivotally supported by the other of said hinge members, the distance between said hinge members being less than the distance between said cushion end sections such that said cushion is disposed along a curved path to define a seat, said cushion comprising said first and second end sections and a plurality of cushioned, intermediate, rigid sections interconnected by a flexible material to permit relative, pivotal movement between said intermediate sections and said end sections;  
 said cushion being disposed along different curved paths when said chair is supported in said two positions, said cushion further comprising:  
 an elongated, flexible member extending from said first and second end sections;  
 a plurality of rigid sections carried on one side of said flexible members at spaced locations;  
 a plurality of cushion members carried by said rigid members;  
 a laminate enclosing said rigid sections and said cushion sections, the intermediate sections between said first and second end sections having a length which is substantially less than the length of said end sections such that there is relative pivotal movement between said intermediate sections and said end sections so as to permit said cushion member to be shaped along a curved path; and  
 means restraining relative pivotal movement between said frame members and said end sections.

#### 4,164,357 COMBINATION INFANT AND CHILD SEAT

Eileen Conachey, 14 Cherry La., Pomona, N.Y. 10970  
 Filed Jun. 26, 1978, Ser. No. 918,916  
 Int. Cl.<sup>2</sup> A47C 1/08

U.S. Cl. 297—250

11 Claims



#### 1. A combination infant and child seat of the type intended to be used in combination with an auto seat, said infant seat comprising:

- (a) a base housing for being disposed upon the auto seat and having a front, back, and seat portion;
- (b) a first back rest secured to said back of said base housing;
- (c) a second back rest removably secured to said front of said base housing; said first and second back rests being so dimensioned such that, with said second back rest in position, the infant may be received and, with said second back rest removed from said base, said first back rest, in combination with said base, being so dimensioned as to receive the child; and

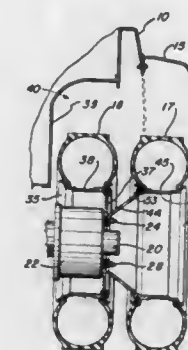
(d) means for securing the infant or child to said seat and securing said infant and child seat to the auto seat.

#### 4,164,358 DUAL WHEEL CONVERSION ASSEMBLY FOR VEHICLES

Robert N. Entrup, Wheatridge, Colo., assignor to Design Automotive Distributing, Denver, Colo.  
 Continuation of Ser. No. 617,284, Sep. 20, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,964  
 Int. Cl.<sup>2</sup> B60B 11/00

U.S. Cl. 301—36 R

3 Claims



1. In a vehicle which has a wheel well provided with an inner wall and an axle terminating in a mounting hub assembly including a cylindrical brake housing and a plurality of stud bolt attachment means arranged in parallel relation to the axis of the axle with the stud bolt attachment means extending outwardly from the brake housing at the outer end of the assembly wherein said hub assembly is spaced but a limited distance outwardly from the inner wall of the wheel well, apparatus for accommodating dual wheel mounting to the axle within the wheel well comprising in combination:

a first wheel including a first cylindrical rim having an outer end, a first radially outwardly opening circumferential channel for receiving a tire and a first support web in its entirety in the shape of a flat annular plate with a circular perimeter corresponding in diameter with said outer end of said first rim, said annular plate attached at its perimeter directly to the outer end of said first rim in radial alignment thereto, said first support web having a plurality of bores therethrough in radially spaced relation to the central axis of said first wheel for alignably receiving the axle stud bolt attachment means, said first cylindrical rim and said first support web being dimensioned and arranged such that said first rim is positioned to extend inwardly from said first support web in axially co-extensive and concentric radially outward spaced relation to the brake housing and in axially outward spaced relation to the inner wall of the wheel well in which the axle terminating assembly is located, and

a second wheel including a second cylindrical rim having a second radially outwardly opening circumferential channel for receiving a tire, said second channel having a bottom surface portion, an outer sidewall portion and an inner sidewall portion, said bottom surface portion having an inner edge formed as a reverse curved flange, said reverse curved flange attached to said inner sidewall portion in over and under configuration, and a second support web attached to and extending axially from said reverse curved flange and converging inwardly from said reverse curved flange toward the central axis of said second wheel to the perimeter of and terminating in a flat, annular flange portion concentric with the axis of said second wheel and laying in a plane perpendicular to said axis of said second wheel in axially spaced, outwardly extending relation to said one end of said second wheel, said annular flange portion having a plurality of bores

therethrough in parallel, radially spaced relation to said central axis of said second wheel for alignably receiving the axle stud bolt attachment means, the distance of axial extension of said second support web from said one end of said second wheel to said annular flange portion being sufficient to retain tires positioned on said first and second rim channels, respectively, in axially spaced, non-interfering orientation with each other when said annular flange portion is disposed in flush contacting relation to said first support web.

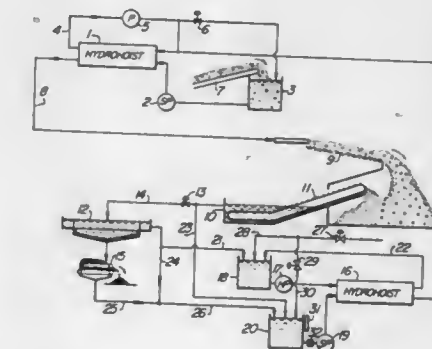
#### 4,164,359 HYDRAULIC TRANSPORTATION APPARATUS FOR SOLID MATERIALS

Masakatsu Sakamoto, Matsudo; Kenji Uchida, Kashiwa, and Takafumi Karino, Nishibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 11, 1978, Ser. No. 868,663  
 Claims priority, application Japan, Jan. 17, 1977, 52/2870  
 Int. Cl.<sup>2</sup> B65G 53/30

U.S. Cl. 406—121

3 Claims



#### 1. Apparatus for hydraulically transporting particulate solid material having a wide range of particle-size distribution, comprising:

- a first tank receiving therein a first slurry, said first slurry being a mixture of said particulate solid material and a liquid as a transporting medium;
- a first hydrohoist connected to said first tank and operated by a driving liquid for forcing said first slurry from said first tank;
- a transporting line having one end thereof connected to said first hydrohoist, said first slurry forced by said first hydrohoist being transported through said transporting pipe; coarse particle separating means located at the other end of said transporting line and receiving said first slurry transported through said transporting line for removing relatively coarse particles from said first slurry to produce a second slurry containing relatively fine particles;
- solid-liquid separating means connected to said coarse particle separating means and receiving said second slurry from said coarse particle separating means for removing fine particles from said second slurry to produce a substantially particle-free liquid;
- a second tank;
- conduit means connecting said coarse particle separating means and said solid-liquid separating means to said second tank for introducing therein heavy media including said second slurry from said coarse particle separating means and said substantially particle-free liquid from said solid-liquid separating means;
- means associated with said second tank for adjusting the concentration of said heavy media in said second tank;
- a second hydrohoist positioned between said second tank and said first hydrohoist for returning said heavy media from said second tank to said first hydrohoist as said driving liquid therefor;
- second conduit means having one end connected to said

second hydrohoist and another end connected to said first hydrohoist;  
means for returning a part of the driving liquid discharged from said first hydrohoist to the second conduit means for reuse as a driving liquid for the first hydrohoist and feeding the remaining driving liquid into said first tank as said transporting medium.

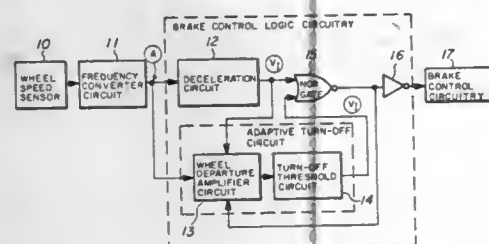
**4,164,360**  
**CONTROL CIRCUIT HAVING ADAPTIVE TURN-OFF**  
**FEATURE FOR A VEHICLE SKID CONTROL SYSTEM**  
James J. Jones, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 21, 1977, Ser. No. 853,365

Int. Cl.<sup>2</sup> B60T 8/08

U.S. Cl. 303—110

7 Claims



1. In a vehicle skid control system for selectively controlling the engagement and disengagement of the vehicle brakes in accordance with selected braking conditions, control circuit means for producing a brake inhibiting control signal disengaging the vehicle brakes in response to an occurrence indicative of an imminent skid condition and terminating the brake inhibiting control signal to re-engage the vehicle brakes in response to a compensating operation of the vehicle wheels, wherein the brake inhibiting control signal is produced and terminated in a continuing sequence to automatically effect pumping of the vehicle brakes, said control circuit means comprising:

- a wheel speed deceleration circuit having a predetermined deceleration rate threshold;
- an adaptive turn-off circuit connected in parallel with said deceleration circuit;
- each of said deceleration circuit and said adaptive turn-off circuit having respective inputs for receiving a signal proportional to vehicle wheel speed;
- said deceleration circuit being responsive to a negative slope of said wheel speed signal attaining said predetermined deceleration rate threshold for providing a first brake inhibiting control signal as an output;
- said adaptive turn-off circuit being responsive to the coefficient of friction of the surface over which the vehicle is travelling and the degree to which vehicle wheel speed falls below vehicle speed for providing a second brake inhibiting control signal as an output, said adaptive turn-off circuit including
- wheel departure amplifier means for inverting said wheel speed signal, referencing said inverted wheel speed signal to a reference voltage, and effectively shifting said inverted wheel speed signal in time an amount proportional to the coefficient of friction of the surface over which the vehicle is travelling, and
- turn-off threshold means connected to the output of said wheel departure amplifier means and having a threshold value incorporated therein for terminating said second brake inhibiting control signal when the output of said wheel departure amplifier means falls below said threshold value; and
- brake control means operably connected to said deceleration circuit and said adaptive turn-off circuit and being responsive to said first and second brake inhibiting control signals for disengaging the vehicle brakes during deceleration when a wheel speed deceleration rate corresponding to the predetermined deceleration rate threshold is at-

tained to produce said first brake inhibiting control signal from said deceleration circuit and sequentially engaging and disengaging the vehicle brakes during acceleration upon termination of said first brake inhibiting control signal from said deceleration circuit and upon subsequent reception of said second brake inhibiting control signal from said adaptive turn-off circuit.

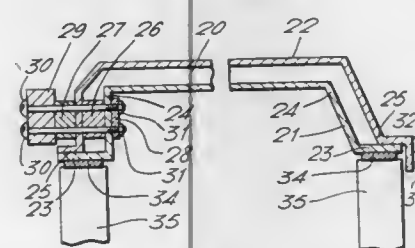
**4,164,361**  
**DEEP-FREEZE CABINET WITH TRANSPARENT**  
**CLOSURE**  
Brian J. Grimbale, Baldock, and Michael R. Rouse, Dunstable, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 747,382, Dec. 3, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,606 Claims priority, application United Kingdom, Sep. 17, 1976, 38586/76

Int. Cl.<sup>2</sup> A47B 77/08; A47F 3/04

U.S. Cl. 312—236

9 Claims



1. A deep freeze cabinet having a closure formed from inner and outer transparent rigid sheets of a thermoplastic material, the inner sheet being accommodated in the space formed by the outer sheet and the sheets being bonded together at their perimeters to form a flat peripheral flange bounding a double-walled enclosure in which the walls of the enclosure are essentially parallel to each other over a major proportion of their area and are separated by a distance of at least 10 mm and less than 40 mm, said flange sealing contacting an upper surface of the wall of the deep freeze cabinet so that the inner shaped sheet is positioned outside the interior of the deep freeze cabinet.

**4,164,362**  
**MODULAR CARD CAGE WITH MULTIPLE POWER BUS**  
**BAR MEANS**  
Robert F. Cabaugh, Elizabethtown, and Donald J. Doty, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 11, 1977, Ser. No. 777,279

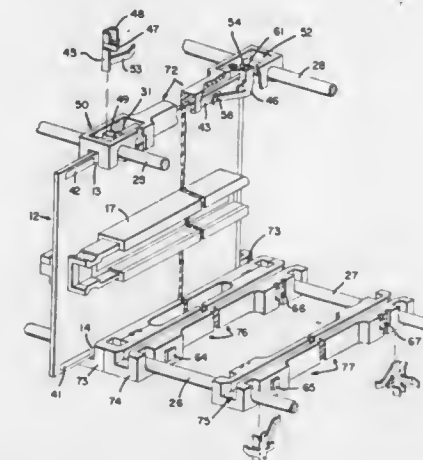
Int. Cl.<sup>2</sup> H05K 1/12, 1/14

U.S. Cl. 339—17 M

5 Claims

1. In an interconnection system having multiple cards with opposite side edges of said cards slidably mounted in slotted card guides and with electrical connectors mounted on said cards and electrically interconnecting adjacent cards, the improvement comprising:  
elongated conductors passing through said card guides, said card guides being distributed along said conductors, and electrical contacts in said card guides engaged with said conductors and frictionally engaging circuit paths on said

cards without passing through said cards or entering said connectors,



said cards being disengaged from said contacts upon slidable removal from said card guides.

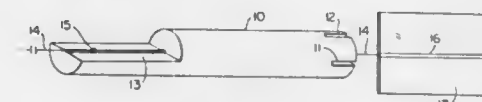
**4,164,363**  
**SINGLE MODE FIBER-TO-CHANNEL WAVEGUIDE**  
**THROUGH-LINE COUPLER**  
Hui-pin Hsu, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 19, 1978, Ser. No. 870,774

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.17

7 Claims



1. A coupler for securely coupling an optical fiber to an optical channel waveguide laid down on a plate-like substrate comprising:

- a capillary tube, said optical fiber extending through the center and out both ends thereof, one end of the tube being slotted diametrically and the other end being cut diametrically so that it is semicircular in shape and exposes the fiber at that end,
- the plate-like substrate, after the end of the fiber is properly aligned with the end of the channel waveguide, being pushed into the slot to mate snugly and form a secure mechanical joint therewith.

**4,164,364**  
**INPUT/OUTPUT COUPLER FOR MULTI-MODE**  
**OPTICAL FIBERS**  
Hans H. Witte, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,398

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625855

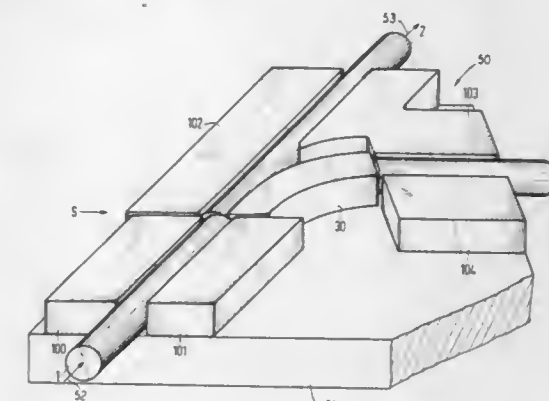
Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.17

10 Claims

1. A coupler for use with multi-mode light conducting fibers to couple-out and couple-in a light signal to the fibers comprising a substrate, a first light conductor being disposed on the substrate and having an end face forming a coupling surface, a main light conducting fiber being disposed on the substrate with its end face at the coupling surface and the center of the end face being offset by a distance from the center of the coupling surface, a strip waveguide being disposed on the substrate and having a face in contact with a portion of the

coupling surface of the first light conductor, said strip waveguide extending to a branch light conducting fiber so that a portion of a signal entering the coupler in the first light con-



ductor is applied to both the main and branch light conducting fibers and signals entering the coupler in the branch and main light conducting fibers are applied to the first light conductor.

**4,164,365**  
**LIGHT VALVE FOR CONTROLLING THE**  
**TRANSMISSION OF RADIATION COMPRISING A CELL**  
**AND A STABILIZED LIQUID SUSPENSION**  
Robert L. Saxe, New York, N.Y., assignor to Research Frontiers Incorporated, Plainview, N.Y.

Division of Ser. No. 596,198, Jul. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 476,106, Jun. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 276,769, Jul. 31, 1972, abandoned. This application Aug. 10, 1978, Ser. No. 932,512

Int. Cl.<sup>2</sup> G02F 1/00

U.S. Cl. 350—362

25 Claims

1. A light valve for controlling the transmission of radiation, which comprises a cell and a liquid suspension in said cell; said liquid suspension comprising:

- an electrically resistive liquid suspending medium;
- a plurality of small, anisometrically shaped, light-polarizing, halogen-containing particles suspended in said suspending medium; and
- a copolymer of at least two different monomers;
- at least one of said monomers having a sterically unhindered functional group selected from the group consisting of an OH group and an acidic group, and at least one of said monomers having a branched group, the distance from the backbone of the copolymer to said sterically unhindered functional group most distant from the backbone being less than the distance from the backbone to the terminal group of said branched group, the branched groups in said copolymer being sufficiently soluble so that the copolymer as a whole is substantially dissolved in said liquid suspending medium.

**4,164,366**  
**VARIABLE OUTPUT COUPLED RESONATOR**  
Edward A. Sziklas, and Robert J. Freiberg, both of N. Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 4, 1977, Ser. No. 848,792

Int. Cl.<sup>2</sup> H01S 3/05

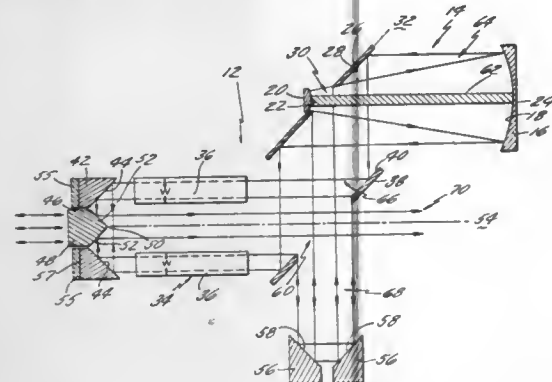
U.S. Cl. 350—299

15 Claims

1. A resonator comprising:  
a mode control cavity defined at one end by a first mirror having a concave reflective surface and at the other end by a second mirror having a convex reflective surface wherein the first and second mirrors are positioned on and



symmetrically about an axis through a centerline of the mode control cavity;  
 a power extraction cavity defined at one end by a first retro-reflector and at the other end by a first reflector wherein the first retroreflector and the first reflector are positioned on and symmetrically about a beam axis wherein the beam axis does not superpose the axis through the centerline of the mode control cavity;



means for optically coupling the mode control cavity and the power extraction cavity; and  
 a cone having a conical reflective surface centrally located within an aperture in the first retroreflector and adapted for coupling the radiation out of the resonator as an output beam having a continuous cross section.

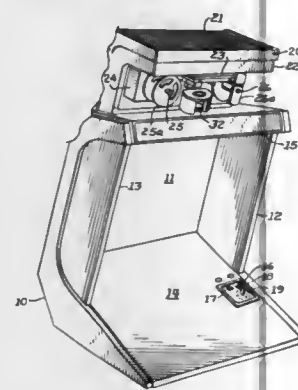
#### 4,164,367 FILM TRANSPORT SYSTEM FOR MICROFILM READER

Edward R. Wadleigh, Hemet, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jul. 12, 1977, Ser. No. 814,933  
 Int. Cl.<sup>2</sup> G03B 23/12

U.S. Cl. 353—26 R

7 Claims



1. A microfilm reading apparatus comprising:
  - (a) a housing having an image projection means near the top and a large-size inclined image receiving portion inside the base at the bottom;
  - (b) means mounted near the top of said housing for transporting image-bearing film past said image projection means to cast an image from said film vertically downwardly onto said portion of said housing which is in a generally horizontal orientation, whereby said image receiving portion may be used as a desk when it is desirable to make notes from said projected image; and
  - (c) said film transport mechanism comprising:
    - (i) an electrically driven means including film supply and take-up reels mounted on said housing with means for providing limited lateral movement of said reel mount with respect to said housing, said lateral movement

- occurring in response to first or second electrical signals;
- (ii) variable speed means for operating said film supply drive means responsive to a third electrical signal;
- (iii) variable speed means for operating said film take-up drive means responsive to a fourth electrical signal;
- (iv) film gate means disposed between said supply and take-up drive means and located in the path of said image projection means, said film gate means including an actuator to move said film gate between a first relatively closed position to a second relatively open position; and
- (d) means responsive to a single multi-position control mechanism mounted on said image-receiving portion
  - (i) to selectively supply any of said electrical signals for controlling the speed of said film supply responsive to said third signal and said film take-up drive means responsive to said fourth signal;
  - (ii) to control the actuator which moves said film gate between said relatively closed and relatively open positions responsive to either said third or said fourth signals; and
  - (iii) to control the lateral movement of said film transport mechanism relative to said housing responsive to either said first or said second signals, whereby movement of said multi-position control mechanism causes movement of said image in the direction in which said control mechanism moves.

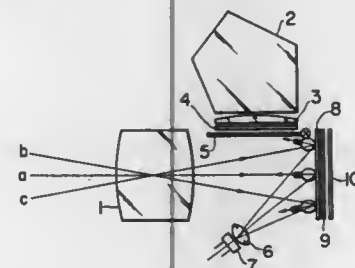
#### 4,164,368 ROUGHENED SHUTTER CURTAIN(S) FOR SINGLE LENS REFLEX CAMERA

Katsuhiko Miyata, Omiya, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1977, Ser. No. 814,951  
 Claims priority, application Japan, Jul. 14, 1976, 52-93727[U]  
 Int. Cl.<sup>2</sup> G03B 7/08, 9/28

U.S. Cl. 354—23 R

8 Claims



1. In a single reflex camera operable in a through-the-lens light measuring mode and including a reflex mirror box, a lens mounted on a front side of the box, at least one shutter curtain mounted in the box proximate the opposite, rear side thereof, and a light sensing element mounted in the box and oriented to sense light flux entering through the lens and reflected thereon by the surface of the shutter curtain facing the lens, the improvement characterized by:
 

said shutter curtain being metallic and its surface being bare, uncoated and directly roughened over its entirety to provide more uniform light diffusion and reflective scattering characteristics, whereby the output of the light sensing element provides a more accurate measure of the integrated or averaged light intensity distribution over the entire picture or viewing frame.

#### 4,164,369 DIOPTER-ADJUSTING DEVICE FOR USE IN FINDER-INTERCHANGEABLE TYPE SINGLE LENS REFLEX CAMERA

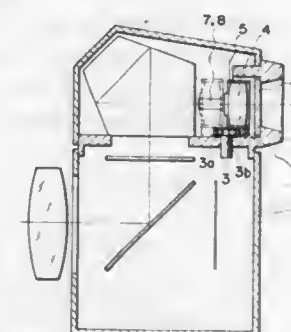
Fumio Urano, Omiya, and Norimichi Takahashi, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 912,145

Claims priority, application Japan, Jun. 2, 1977, 52-65049  
 Int. Cl.<sup>2</sup> G03B 13/06

U.S. Cl. 354—219

2 Claims



1. A diopter adjusting device in an interchangeable-finder type single lens reflex camera for adjusting the position of an eyepiece along the optical axis thereof, the improvement characterized in that said adjusting device comprises:
  - an eyepiece holder for holding said eyepiece and slidably mounted within said finder along the optical axis of said eyepiece; and
  - an operating means for sliding said eyepiece holder, said operating means being concealed from the exterior of said camera when said finder is mounted on said camera.

#### 4,164,370 SHUTTER DEVICE IN A CAMERA

Shuji Kimura, Yokohama; Shigeo Akasaka, Kodaira; Koichi Daitoku, Tokyo; Hiroshi Hasegawa, Tokyo, and Makoto Kimura, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

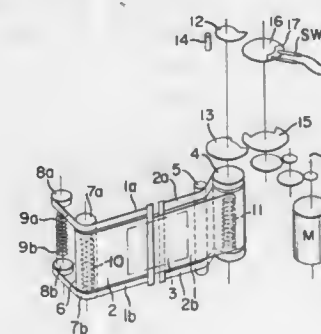
Filed Oct. 18, 1977, Ser. No. 843,317

Claims priority, application Japan, Oct. 21, 1976, 51-140167[U]; Oct. 29, 1976, 51-129365; Nov. 16, 1976, 51-157760[U]

Int. Cl.<sup>2</sup> G03B 9/28, 9/58

U.S. Cl. 354—243

5 Claims



1. A shutter device in a camera which effects photography with shutter curtains maintained open for a predetermined time, comprising:
  - a rotatable member; spring means biasing said rotatable member for normal rotation;
  - shutter opening formation means operatively associated with said rotatable member to move in a direction to form a shutter opening upon normal rotation of said rotatable

985 O.G. 16

member and to move in a direction to close the shutter opening upon reverse rotation of said rotatable member; drive means;

control means operatively associated with said drive means for displacement to a first position to block normal rotation of said rotatable member and to maintain the shutter in closed position, a second position in which it permits the normal rotation of said rotatable member by the bias force of said spring immediately after said drive means becomes operative, and a third position for transmission of the drive of drive means to said rotatable member to reverse the rotation of said rotatable member after the normal rotation thereof;

means for stopping normal rotation of said rotatable member; and control means for starting said drive means in response to an extraneous operating signal for starting photography, for stopping said drive means after the normal rotation of said rotatable member by the bias force of said spring is started, for starting said drive means in response to an extraneous signal for terminating the photography, and for stopping said drive means when said shutter has reached its closed position.

#### 4,164,371 PHOTOGRAPHIC DEVELOPING MACHINE

Wolfgang Viehriig, and Werner Sperber, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gavaert, A.G., Leverkusen, Fed. Rep. of Germany

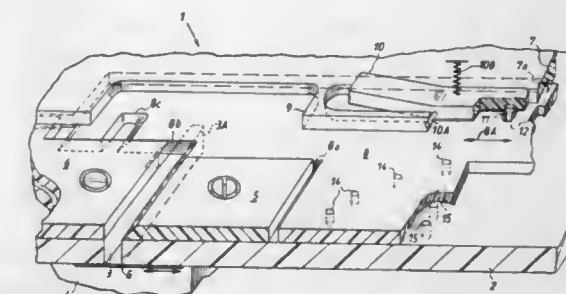
Filed Oct. 23, 1978, Ser. No. 953,758

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748506

Int. Cl.<sup>2</sup> G03D 3/13

U.S. Cl. 354—312

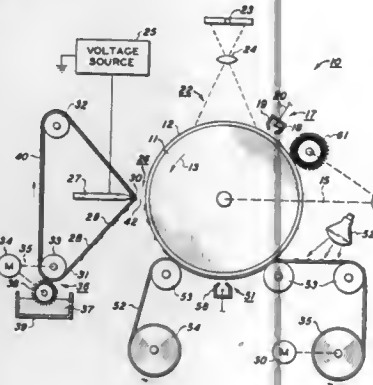
13 Claims



1. In a photographic developing machine, particularly for developing webs of exposed photographic paper which have different widths and are confined in cassettes, an apparatus for positioning cassettes preparatory to withdrawal of webs from their interior, said apparatus comprising a feed table having at least one channel; means defining a chamber disposed at one side of said table and communicating with said channel; and a substantially plate-like selector adjacent to the other side of said table and having a plurality of differently dimensioned apertures, said selector being movable between a plurality of positions in each of which a different aperture registers with said channel to define therewith a passage through which a web having one of several different widths can be advanced from the interior of a cassette into said chamber.

**4,164,372**  
**METHOD AND APPARATUS FOR DEVELOPING AN ELECTRICAL IMAGE**  
 Robert W. Gundlach, Victor, N.Y., and David H. Perry, deceased, late of Webster, N.Y. (by Joyce Perry Province, administratrix), assignors to Xerox Corporation, Stamford, Conn.

Filed May 31, 1974, Ser. No. 474,998  
 Int. Cl.<sup>2</sup> G03G 15/00  
 U.S. Cl. 355—3 DD



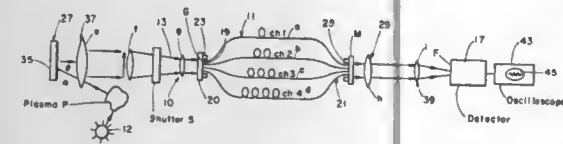
1. Apparatus for developing an electrostatic latent image provided on a charged surface of a photoconductive member, comprising:

- a non-conductive donor sheet;
- a means for placing on one side of the donor sheet a layer of electrostatically charged marking material;
- means for supporting the sheet with the layer of marking material spaced from but facing the image bearing surface;
- a conductor having an edge;
- means for electrically coupling the conductor to ground;
- means for sliding the edge and the other side of the donor sheet with respect to each other; and
- means for moving, during said sliding, the edge and the photoconductive member with respect to each other to bring different parts of the image bearing surface within a predetermined distance from the edge, the image bearing surface of the photoconductive member being kept out of contact with the layer of marking material on the donor, whereby during said sliding and relative motion the electrical field developed between the image bearing surface and the conductor drives marking material from the layer to the photoconductive member and the driven material develops the latent image.

**4,164,373**  
**SPECTROMETER EMPLOYING OPTICAL FIBER TIME DELAYS FOR FREQUENCY RESOLUTION**

Jack J. Schuss, Providence, R.I., and Larry C. Johnson, Princeton, N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 12, 1978, Ser. No. 868,952  
 Int. Cl.<sup>2</sup> G01J 3/30; G01N 21/52  
 U.S. Cl. 356—316



1. In a Thomson scattering system for diagnosing a time varying plasma with a short incident chromatic light pulse of below 100 nanoseconds duration for the selective spatial and

13 Claims

frequency analysis of the light with a single light detector, the improvement for providing a broad range of optical time delays for incident light passing through the plasma that is Thomson scattered by the plasma and contains a variety of frequencies that are dispersed in space as spectral lines according to a specific system of stepping for the selective frequency analysis of the scattered light with a single light detector, comprising:

- a. single light detector means;
- b. light source means of a short incident light pulse that is Thomson scattered by the plasma to contain a variety of frequencies for the selective frequency analysis of the Thomson scattered light image by the single light detector means;
- c. A plurality of uniform diameter, low-loss, glass fibers having transparent cores of one index of refraction, annual sleeves of another index of refraction, and flat polished ends normal to their respective fiber axes for receiving and transporting the scattered light image along the fiber areas from end to end with time delays that correspond with the individual lengths of the fibers;
- d. a plurality of frequency channels formed from said fibers having different lengths and a plurality of continuous, equal length fibers in each channel for providing a specific system of stepping that transmits the scattered light image with equal time delays in each of the plurality of fibers in each channel;
- e. spaced apart, picture-frame-shaped terminal means for holding the respective outer, adjacent, terminal diameters of the annual sleeves at the opposite ends of the fibers in each channel in contact with each other in longitudinally extending arrays having correction means for nullifying the imperfections in the polish of the ends and continuously holding the respective ends in spaced apart planes according to a specific system of stepping that is fixed for the different length frequency channels;
- f. matching means adjacent to one terminal means having means for continuously and fixedly dispersing the incident light frequencies in space and orientating the frequencies continuously and fixedly in space as a function of the specific system of stepping provided by the orientation and location in space of the respective different length frequency channels in the one terminal means; and
- g. means adjacent to the other terminal means for continuously and fixedly matching the outgoing light from the respective different length frequency channels of the other terminal means for the detection of the outgoing light by the single light detector means in accordance with the time delays produced by the channels for determining the effects on the light by its being scattered by the time varying plasma; and
- h. shutter means between the light source means and the plurality of channels for selecting a portion of the pulse that is shorter than the successive time delays between channels and transmitting the spatially dispersed frequencies to the channels for detection by the detection means as temporally dispersed frequencies, the detector means being a photomultiplier light detection means for detection of the temporally dispersed frequencies for a time that is long compared to the successive time delays produced.

6 Claims

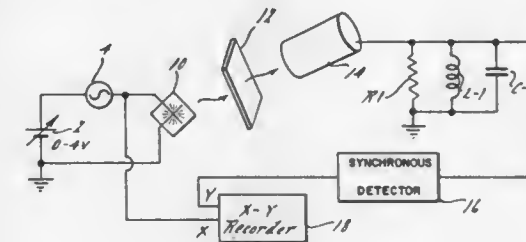
**4,164,374**  
**SPECTROPHOTOMETER UTILIZING A SOLID STATE SOURCE OF RADIANT ENERGY HAVING A CONTROLLABLE FREQUENCY SPECTRA CHARACTERISTIC**

John J. Lambe, Birmingham, and Shaun L. McCarthy, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 836,624, Sep. 26, 1977. This application Sep. 30, 1977, Ser. No. 838,338  
 Int. Cl.<sup>2</sup> G01J 3/10, 3/12

U.S. Cl. 356—402

16 Claims



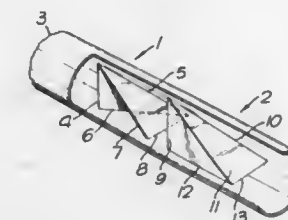
1. A solid state source of visible radiant energy comprising: a first electrode element; an insulating layer overlying said first electrode element; and a counter-electrode overlying said insulating layer to form a tunnel junction which generates surface plasmon modes in response to voltage applied between said first electrode and said counter-electrode, wherein said counter-electrode includes means for providing optical output coupling of said surface plasmon modes in a visible light spectra having a high frequency cutoff  $\nu_{co} = |eV|/h$ , wherein  $h$  is the Planck constant,  $e$  is the electron charge and  $V$  is the value of the applied voltage, employed in a spectrophotometer apparatus comprising: a modulating power supply connected to said source; a sample located to receive radiation from said source; means for detecting the radiation transmitted through said sample; and means connected to said detecting means for indicating the transmittance characteristics of said sample.

**4,164,375**  
**IN-LINE MIXER**  
 David J. Allen, Stockport, England, assignor to E. T. Oakes Limited, Macclesfield, England

Filed May 20, 1977, Ser. No. 798,873  
 Claims priority, application United Kingdom, May 21, 1976, 21210/76; Nov. 24, 1976, 49007/76  
 Int. Cl.<sup>2</sup> B01F 5/06

U.S. Cl. 366—337

15 Claims



1. An in-line mixer comprising a tube, a plurality of mixing elements arranged in series longitudinally along said tube, each mixing element comprising a one piece plate member having four edges meeting in four corners, said plate being folded along a fold line extending between two opposite corners of the plate, to form two substantially planar triangular shaped portions angled with respect to one another, the triangular shape being defined by a base edge, an edge formed by said

fold line and a free edge, the base edge extending across the tube, substantially centrally thereof from one side to the other of the tube.

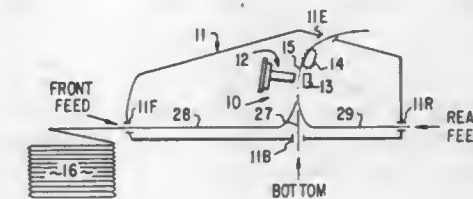
**4,164,376**  
**MULTIPLE PATH PAPER FEED SYSTEM FOR A PRINTER**

Russel E. Yarp, Mt. View, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Filed Dec. 15, 1977, Ser. No. 860,750  
 Int. Cl.<sup>2</sup> B41J 15/04

U.S. Cl. 400—642

4 Claims



1. A data printer for a computer or data processing system having a housing with front, rear and bottom openings for optional entry of paper, the improvement for facilitating paper feed to said printer from optional alternate locations, comprising:

- a first paper guideway extending downwardly from the front of the platen of said printer, said first guideway allowing unimpeded entry of paper from below said printer to said platen, and
- at least one arcuate paper guideway extending from a location external to said printer and lateral of said platen, said arcuate guideway curving upwardly and opening into said downwardly extending guideway so as to allow unimpeded entry of paper from said external location via said arcuate guideway and the upper portion of said downwardly extending guideway to said platen, said arcuate guideway comprising first and second spaced generally parallel arcuate rear guide members defining a rear arcuate guideway for directing paper fed through said rear opening to the front of said platen, third and fourth spaced arcuate front guide members defining a front arcuate guideway for directing paper fed through said front opening to said platen, the forward end portions of said first and second guide members being spaced from the rearward end portions of said third and fourth guide members so as to define therebetween said downwardly extending first guideway, said bottom opening leading to said first guideway.

**4,164,377**  
**DUAL-SEAL, BALL-TYPE DISPENSING PACKAGE**  
 Richard D. Lohrman, and George V. Mumford, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 17, 1977, Ser. No. 842,717  
 Int. Cl.<sup>2</sup> B05C 17/02; B43K 9/00

U.S. Cl. 401—213

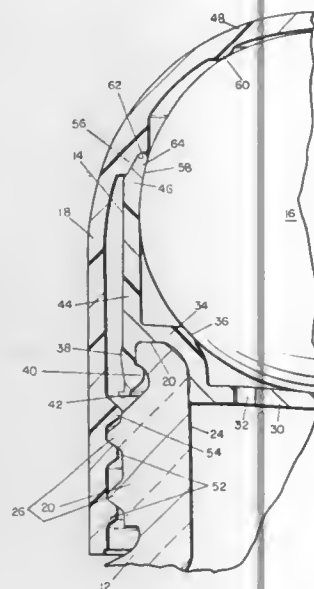
3 Claims

1. In a ball-applicator dispensing package comprised of a container having a neck portion including an annular rim defining an end opening for dispensing the contents and external screw thread, and an annular groove above said thread and adjacent said rim, an annular ball-retaining fitment having an annular shoulder with a container-engaging skirt provided with inwardly directed bead engaged in said neck groove, and an axially extending, annular ball-retaining fitment having an annular shoulder with a container-engaging skirt provided with inwardly directed bead engaged in said neck groove, and an axially extending, annular ball-retaining socket member



above said neck rim, a dispensing ball rotatably held by said socket of the fitment, a minor surface portion of the ball extending outwardly above said socket to define a dispensing surface, the improvement therein comprising

- a resilient annular flange portion on said socket member at the axial outer end thereof engageable with said ball above the maximum diameter thereof, and an annular surface portion on the shoulder thereof engageable with said ball below the maximum lateral diameter thereof,
- said flange portion and said annular surface on the shoulder of the fitment being operable, respectively, for substantially simultaneously, sealingly engaging the ball against leakage,
- a radially outwardly extending flange on said annular shoulder skirt of the fitment disposed opposite the inwardly directed retaining bead thereon, said skirt flange having an external diametrical dimension slightly greater than that of the ball-retaining socket member of the fitment,
- said fitment including a generally circular diaphragm connected with said annular shoulder and adapted to fit in the



1. A fitting in a rope providing for connection of said rope to marine gear, said fitting comprising
  - a recurving portion with a crown formed in said rope,
  - a load-distributing structure positioned within said recurving portion, said distributing structure having an aperture therethrough passing within said recurving portion in a direction perpendicular to the plane thereof for insertion of a shackle bolt, said load-distributing structure providing a bearing surface for a shackle bolt and distributing a force applied by a shackle bolt to said bearing surface to the crown of said recurving portion, and
  - a mass of tough, wear-resistant material encapsulating said crown and said load-distributing structure to form an integral plug, said plug being shaped to be inserted into and mate with a protective shroud of predetermined interior shape, said plug being non-adhering to said shroud to permit easy removal therefrom.

4,164,379

## OFFSHORE PIPE LAYING

Lee R. Denman, P.O. Box 52891, Houston, Tex. 77052

Filed Nov. 14, 1977, Ser. No. 851,193

Claims priority, application United Kingdom, Nov. 15, 1976, 47582/76

Int. Cl.<sup>2</sup> F16L 1/00

U.S. Cl. 405—158

10 Claims



1. A method of laying pipeline offshore comprising the steps of guiding a pipe laying barge along, or parallel with, a predetermined right of way, feeding a continuous length of pipe from the barge to the sea bed so that the pipe is laid in the right of way, driving, by control from a surface vessel, a remotely controlled submersible along the track of the pipe as laid, determining the position of the submersible relative to the surface vessel, ascertaining, by means of sonic location appa-

end opening of the container, said diaphragm having at least one aperture for dispensing content of the container, and

- a screw closure member closed at a dome-shaped end having an interiorly threaded skirt engageable with the thread on said neck of the container and including a radially inwardly extending annular bead on said skirt above the threads thereof, the internal diameter of said bead being slightly less than the diameter of the radial flange on said fitment skirt, whereby the fitment is adapted for preassembly with the screw closure prior to assembly on the container, and an inwardly-directed annular bead on the interior of said closure member for exteriorly engaging said flange portion of the fitment during screw application thereof on said container, the engagement of said annular bead of the closure with the annular resilient flange of the fitment wedging said flange against said ball to form a first seal therebetween in the dispensing package, and simultaneously downwardly loading the socket member and ball to form a second seal between the annular shoulder of the fitment and the ball.

4,164,378

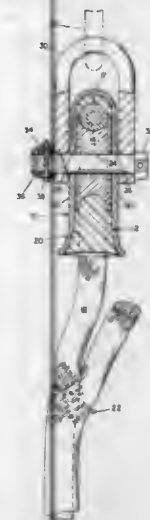
## ROPE FITTING

Joseph J. Linehan, Arlington, Mass., assignor to Samson Ocean Systems, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 830,325, Sep. 2, 1977, abandoned. This application Jun. 30, 1978, Ser. No. 920,774 Int. Cl.<sup>2</sup> F16G 11/00

U.S. Cl. 403—210

9 Claims



tus on the submersible, the position of the touch down point of the pipeline, computing lateral deviation of the touch down point from the desired predetermined track of laid pipe within the right of way, and controlling lateral displacement of the pipe laying barge in accordance with the computed deviation of the touch down point so as to reduce the aforementioned deviation.

4,164,380

## MILLING CUTTER WITH ADJUSTMENT FOR FACE RUNOUT

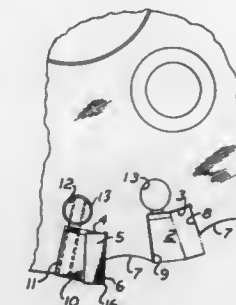
Robert W. Peters, Saegertown, Pa., assignor to Greenleaf Corporation, Saegertown, Pa.

Filed Feb. 27, 1978, Ser. No. 881,400

Int. Cl.<sup>2</sup> B26D 1/12

U.S. Cl. 407—36

2 Claims



1. A milling cutter body having a bit receiving slot, an indexable bit in said slot, said body having a seat parallel to said one side of the slot for receiving one edge of the bit, a wedge in said slot movable toward and away from the bottom of the slot to clamp and unclamp the bit against one side of the slot, the wedge having a seat for another edge of the bit, a pin slidable in said body below the bottom of the slot, a differential screw having one end screwed into the wedge and the other end screwed into the pin for moving the wedge toward and away from the bottom of the slot.

2. A milling cutter body having a rim and a bit receiving slot extending axially through the rim, an indexable bit in said slot, a seat in the bottom of the slot for one edge of the bit, a wedge extending toward the bottom of the slot, said wedge having a seat for another edge of the bit locating the bit on the wedge, a pin slidable in said body below the bottom of the slot, a differential screw having one end screwed into the wedge and the other end screwed into the pin for moving the wedge toward and away from the bottom of the slot, a clearance hole in the body for the screw whereby the wedge can be moved forward and backward in said slot when the screw is loosened.

4,164,381

## FACING AND GROOVING TOOL

Norman H. Lovendahl, 814 Clinton, River Forest, Ill. 60305

Filed Aug. 15, 1977, Ser. No. 824,726

Int. Cl.<sup>2</sup> B27C 9/00

U.S. Cl. 408—20

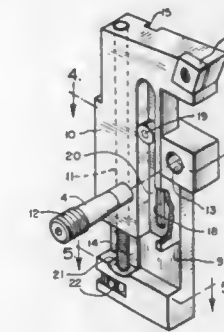
4 Claims

1. A facing and grooving tool for use with a rotatable general purpose boring bar having at least one tool slot capable of receiving interchangeable tool blocks comprising:

- a feed-out tool block compatible with the tool slot of the boring bar, the tool block including a fixed section securely fastenable in the tool slot of the boring bar by suitable means and a moveable tool section having a cutting tip, the moveable section being slideably mounted on the fixed section;
- guide means restricting the moveable tool section to radial feed motion;
- a feed-out actuator housing mountable on the boring bar, the housing having a circumferentially-disposed guideway;

an actuating rider retained by the circumferentially-disposed guideway;

- an actuating member mounted on the rider;
- a lever attached to the rider for holding it stationary while the bar and the rest of the tool rotate;
- a drive screw threadably engaging the moveable tool section



for feed-out, the drive screw being rotatably connected to the fixed section; and

- a drive gear attached to the end of the drive screw and extending into the circumferentially disposed guideway, the gear being engaged by the actuating member and being turned by it when the actuating rider is held stationary, whereby the moveable section is fed out.

4,164,382

## WIND DRIVEN POWER APPARATUS

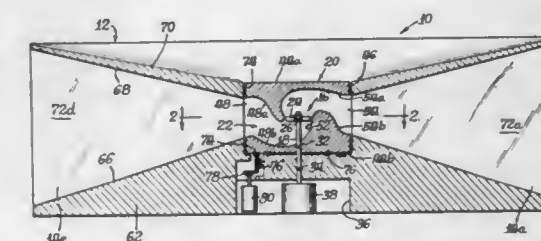
Karol J. Mysels, LaJolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jul. 27, 1977, Ser. No. 819,363

Int. Cl.<sup>2</sup> F01D 1/08

U.S. Cl. 415—2

24 Claims



1. Apparatus for converting wind to mechanical energy comprising, in combination, fixed air guide means defining a plurality of outer air passages each of which is adapted to receive an air stream therein coming from a limited range of directions relative to said fixed air guide means, said air passages being adapted to increase the velocity of the air streams received therein and direct the increased velocity air streams to a predetermined location, converter means supported at said predetermined location for rotation about a fixed axis internally of said fixed air guide means, said converter means being adapted to receive said high velocity air streams from said outer air passages and convert said high velocity air to mechanical rotation, and means operatively associated with said fixed air guide means and adapted to selectively direct air from said outer air passages to said converter means so as to effect said conversion of high velocity air to mechanical rotation.

**4,164,383**  
**WATER WAVE ENERGY CONVERSION DEVICE USING FLEXIBLE MEMBRANES**

Michael J. French, United Kingdom Atomic Energy Authority,  
 11 Charles II St., London, United Kingdom (S.W.1)

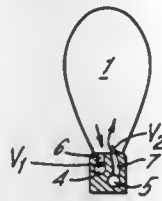
Filed May 23, 1977, Ser. No. 799,524

Claims priority, application United Kingdom, May 26, 1976,  
 21768/76

Int. Cl.<sup>2</sup> F04B 35/00

U.S. Cl. 417—330

3 Claims



1. A device for conversion of energy from water waves comprising an elongated flexible enclosure of impermeable material divided into compartments each containing gas, a high pressure gas conduit and a low pressure gas conduit, means for connecting each compartment to the gas conduits through non-return valves arranged to permit one way passage of gas from the compartment into the high pressure gas conduit and to permit one way passage of gas from the low pressure gas conduit into the compartment, a rigid elongated support structure to which the flexible enclosure material is attached with the enclosure extending upwards, in operation, from the line of attachment thereof to the rigid support with at least one side wall of the enclosure being free to flex laterally, the device being located for operation in water with the top of the flexible enclosure at or just below the surface such that each compartment is subjected in turn to an external pressure alternation as water waves pass along the device, and the pressures in the gases in the high pressure gas conduit and the low pressure gas conduit being respectively such that, for operation in response to the said external pressure alternation, gas is pumped when the external pressure is high from the compartment into the high pressure gas conduit by lateral collapse of the compartment and gas is pumped when external pressure is low from the low pressure gas conduit into the compartment.

**4,164,384**  
**ROTARY VANE VACUUM PUMP WITH FILTER MEANS FOR INLET**

Siegfried Hertell, Radevormwald, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

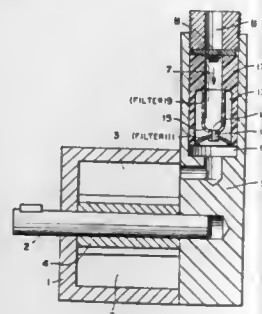
Filed Jun. 13, 1977, Ser. No. 806,191

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 7618891[U]; Jun. 30, 1976, 2629337; Mar. 22, 1977, 2712480

Int. Cl.<sup>2</sup> F04C 29/02; B01D 27/00, 35/00, 50/00

U.S. Cl. 418—47

7 Claims



1. In a rotary vane-type vacuum pump having a driven rotor

element with vanes mounted thereon located within a casing which is sealed at one end by a cover plate, wherein the improvement comprises:

- an inlet port formed in the front face of said cover plate which is divided into upper and lower connected chambers of differing capacities,
- a first filter located at the connecting point between said chambers and extending across the cross-sectional area thereof,
- a second cup-shaped filter suspension mounted in said upper chamber which is located, in an intake direction, ahead of said lower chamber, and
- a check valve located in said upper chamber.

**4,164,385**  
**EXTRUDER WITH MIXING CHAMBERS**

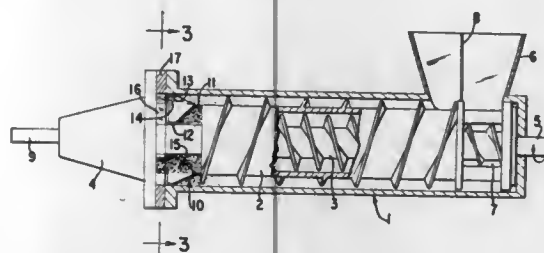
Friedhelm Finkenslep, Krefeld-Uerdingen, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,533

Int. Cl.<sup>2</sup> B29F 3/02

U.S. Cl. 425—204

3 Claims



1. A single extruder provided with a hopper at one end and a restricted nozzle at the opposite end and two press-screws arranged coaxially in one another within an outer jacket, each of said screws being provided with a male thread for feeding in the direction of said nozzle, said male threads extending into an outer annular space between said jacket and the outer press-screw and extending into an inner annular space between said two press-screws, said threads being oppositely oriented, means to rotate the outer of said press-screws and means maintaining the inner of said two press-screws stationary, said outer press-screw being provided with window-like openings communicating with said inner press-screw in the area of said hopper and separate feed means in said hopper to separately feed to said outer annular space and to said inner annular space through said window-like openings, the improvement consisting in that a rotating mixing element is positioned between said nozzle and said press-screws and attached to said rotating outer press-screw and having outer bearing support means in sliding contact with said outer jacket and inner bearing support means in sliding contact with said inner stationary press-screw, said outer and said inner bearing means being supported from said attachment to said outer press-screw by radial walls, said mixing element being provided with a series of open conical chambers between said radial walls, the inlets of said open conical chambers alternately opened to said inner annular space and said outer annular space and the outlets of said open conical chambers opened to said restricted nozzle.

**4,164,386**  
**APPARATUS FOR PRODUCING SHEET MATERIAL**  
 Gerhard Stäbler, Murr Kreis Ludwigsburg, Fed. Rep. of Germany, assignor to Sandvik Conveyor GmbH, Fellbach, Fed. Rep. of Germany

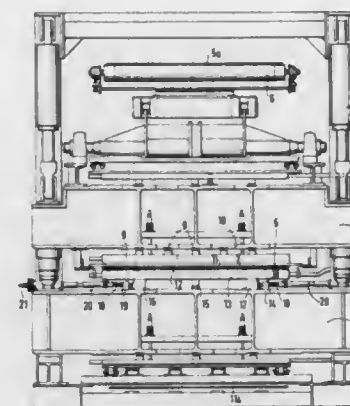
Filed Jun. 19, 1978, Ser. No. 916,542

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2729938

Int. Cl.<sup>2</sup> B29C 3/00

U.S. Cl. 425—371

7 Claims



1. In a twin-belt press which has two endless steel belts with coextensive belt runs which form a treatment zone therebetween, means to support said belt runs in predetermined spaced relationship including, a pressure plate structure which presents a surface which determines the position and contour of one of said belt runs, a second pressure plate structure which presents a surface which determines the position and contour of the other of said belt runs, means to provide rigid support for the longitudinal central portion of one of said pressure plate structures, and adjustable means to provide support for the respective longitudinal edge portions of said one of said pressure plate structures which includes means forming a wedge ramp extending toward said longitudinal central portion from adjacent one of said edge portions at an angle to a plane parallel to the desired plane of said belt runs and wedge means upon which a portion of said one of said pressure plate structure rests, said wedge means having a surface resting upon said ramp surface and mating therewith and means to adjust the position of said wedge means on said ramp surface whereby said portion of said one of said pressure plate structure is moved transversely of said desired plane.

**4,164,387**  
**APPARATUS FOR PRODUCING SHEET MATERIAL**  
 Konrad Schermutzki, Remseck am Neckar, and Gerhard Stäbler, Murr Kreis Ludwigsburg, both of Fed. Rep. of Germany, assignors to Sandvik Conveyor GmbH, Fellbach, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 916,543

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729559

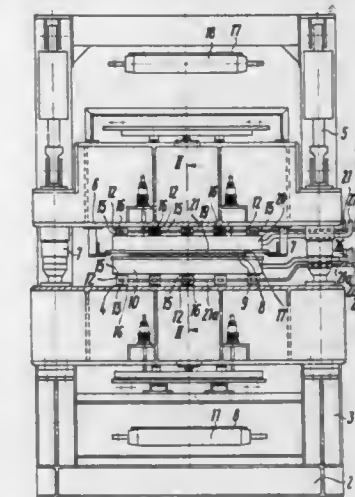
Int. Cl.<sup>2</sup> B29C 3/00

U.S. Cl. 425—371

7 Claims

1. In a twin-belt press wherein two endless belts are mounted to provide parallel belt runs which present coextensive belt surfaces between which there is a press-gap which comprises a treatment zone within which the material is compressed by opposing forces exerted on the material by said belt surfaces, and wherein it is desirable to control the dimension of said press-gap transversely of said coextensive belt surfaces, that improvement which comprises means to control said dimension of said press-gap including, pressure means positioned upon the opposite sides of said belt runs to exert said opposing forces urging said coextensive surfaces toward each other with a predetermined spaced relationship therebetween, thermal

responsive means which changes in its dimension in the direction of said forces in response to changes in its temperature, and



means to control said temperature whereby increases and decreases in said temperature vary said dimension of said press-gap.

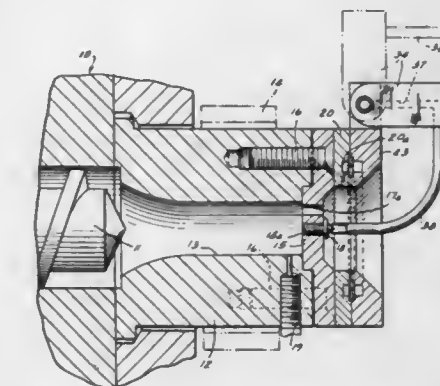
**4,164,388**  
**EXTRUSION DIE ASSEMBLY**  
 Richard B. Inman, Dunwoody, Ga., and Ivan C. McCarty, Paris, Ky., assignors to International Spike, Inc., Lexington, Ky.

Filed Jun. 16, 1978, Ser. No. 916,291

Int. Cl.<sup>2</sup> B29C 23/00

U.S. Cl. 425—378 R

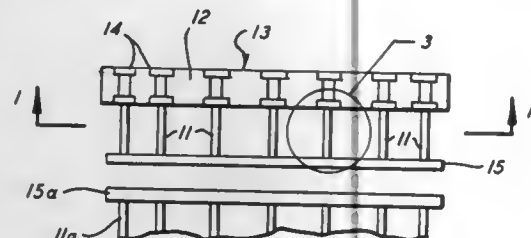
7 Claims



1. An extrusion apparatus for extruding a pliable material comprising:  
 means defining an extrusion chamber,  
 means for introducing said pliable material into said extrusion chamber,  
 a die plate defining a plurality of circumferentially spaced extrusion orifices at one end of said extrusion chamber, and  
 air injection means for injecting air radially outwardly from the center of said die plate against the extruded materials issuing from said orifices.



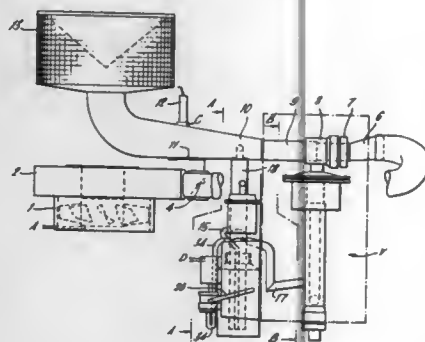
**4,164,389**  
**APPARATUS FOR FORMING EXPANDED PANELS**  
 Donald R. Beasley, Bronxville, N.Y., assignor to Norfield Corporation, Danbury, Conn.  
 Division of Ser. No. 763,097, Jan. 27, 1977, Pat. No. 4,113,909.  
 This application Jul. 5, 1978, Ser. No. 922,198  
 Int. Cl.<sup>2</sup> B29C 1/00, 17/00; B30B 15/00  
 U.S. Cl. 425—406



1. In a device for expanding the cross section of a blank of thermoformable material which includes a machine having first and second opposed press platens; means for controlling the spacing of the press platens, first and second molding plates; and means attaching the mold plates to the press plates, the improvement comprising the means attaching the press platens comprising:

- a plurality of elongated studs distributed over the area of the molding plates the length of said studs being such as to satisfy the equation:  $D = C - \sqrt{C^2 - X^2}$  where D equals one-half the maximum deviation permissible in panel thickness, C the length of the bolts and X the amount of thermal expansion in one half of the mold based on the mold material used and the temperature differential to be employed;
- means for attaching one end of each of said studs to a press platen; and
- means for attaching the other end of said studs to a mold plate.

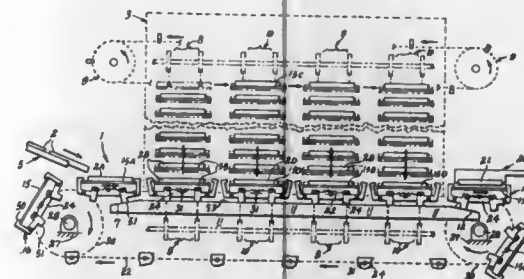
**4,164,390**  
**BURNER FOR LIQUID FUEL**  
 Jacques Bouvin, Saint Martin du Vivier, France, assignor to Esso Societe Anonyme Francaise, Paris, France  
 Filed May 11, 1977, Ser. No. 795,832  
 Claims priority, application France, May 11, 1976, 76 14155  
 Int. Cl.<sup>2</sup> F23D 5/00  
 U.S. Cl. 431—75



1. A burner for burning liquid fuel comprising: a burner head

at which the fuel is burned with air in a substantially stable flame; air supply means operable to supply a stream of combustion air at substantially atmospheric pressure; an air supply conduit comprising a mixing region and a divergent diffuser for conducting said stream of combustion air from said air supply means to the burner head during operation of said air supply means; means for supplying liquid fuel to said burner; a vaporizer for receiving said liquid fuel and converting said liquid fuel to fuel vapour remote from and out of contact with said combustion air stream and at a pressure at least equal to the operating pressure at said selected mixing region of the conduit, the vaporizer comprising liquid fuel heating means operable to vaporize said liquid fuel substantially at atmospheric pressure independently of the presence of any flame at the burner head; and a tube for conducting fuel vapour from the vaporizer to said selected mixing region of the conduit, being constructed and arranged relative to said conduit such that during operation the fuel vapour passes into said mixing region and is swept from said mixing region by said combustion air stream with which said fuel vapour mixes to form a substantially uniform mixture of air and fuel vapour in said conduit for subsequent burning at said burner head.

**4,164,391**  
**CONVEYOR FOR PROCESSING**  
 Walter D. Howard, and David I. McDonald, both of Cincinnati, Ohio, assignors to Cincinnati Millacron Inc., Cincinnati, Ohio  
 Filed Mar. 17, 1978, Ser. No. 887,752  
 Int. Cl.<sup>2</sup> F27B 9/14  
 U.S. Cl. 432—124



8. A conveyor of the endless type having means for clamping and releasing carrier trays that comprises a pair of parallel and spaced apart endless chains; a plurality of annular rectangular frames connected to said chains at equally spaced-apart distances along each and having substantially flat upwardly facing support surfaces; at least one clamping means mounted on each said frame to clamp and release a carrier tray means thereto; a machine base from which said chains are supported to run longitudinally each in an endless path; and a clamp actuator in the form of a fixed cam mounted on said base at a position to engage each of said clamping means seriatim to cause it to unclamp its tray at one position and to clamp its respective tray at another position; said clamping means and clamp actuators coacting to hold the clamping means in an unclamped position over a certain part of the path of said chains and to cause said clamping means to move to an unclamped position during the other part of the path.

## CHEMICAL

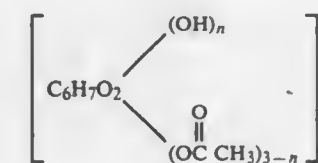
**4,164,392**  
**TEXTILE MATERIALS HAVING DURABLE SOIL RELEASE AND MOISTURE TRANSPORT CHARACTERISTICS AND PROCESS FOR PRODUCING SAME**

Peter J. Hauser, Spartanburg, and Francis W. Marco, Pauline, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 22, 1977, Ser. No. 863,281  
 Int. Cl.<sup>2</sup> D06P 5/00

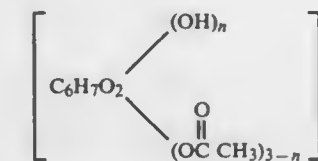
U.S. Cl. 8—18 R

1. A process for imparting improved, durable soil release and moisture transport characteristics to a textile material formed of polyester or nylon fibers which comprises applying an effective amount of a liquid admixture consisting essentially of from about 0.001 to about 10 weight percent of a cellulose acetate polymeric constituent and a solvent constituent capable of solubilizing said cellulose acetate polymeric constituent, to provide a resulting wet textile material containing at least about 0.001 weight percent of said cellulose acetate polymeric constituent, said cellulose acetate polymeric constituent being characterized as having a degree of substitution of the acetyl moiety of from about 0.9 to about 2.3 and represented by the formula



wherein x is an integer of at least about 50, n is an integer of from about 2.1 to about 0.7 and the expression 3-n is the degree of substitution of the acetyl moiety, and drying the resulting wet textile material for a period of time effective to remove substantially all of the solvent constituent and provide a dry textile material containing said cellulose acetate polymeric constituent.

9. A process for imparting improved, durable soil release and moisture transport characteristics to a textile material formed of polyester fibers during a dyeing operation wherein the textile material is contacted with an aqueous dye admixture containing water, a dispersed dye stuff, a minor amount of acetic acid and a leveling agent which comprises incorporating into said aqueous dye admixture a minor effective amount of a cellulose acetate polymeric constituent so as to provide at least about 0.001 weight percent of said polymeric constituent on said textile material, said cellulose acetate polymeric constituent being characterized as having a degree of substitution of the acetyl moiety of from about 0.9 to about 2.3 and represented by the formula



wherein x is an integer of from about 100 to about 200, n is an integer of from about 2.1 to about 0.7 and the expression 3-n is the degree of substitution of the acetyl moiety; maintaining said textile material in contact with the dye admixture containing said cellulose acetate polymeric constituent under dyeing condition for a period of time effective to allow exhaustion of said dye stuff and said cellulose acetate polymeric constituent onto the textile material; removing the dyed textile material from said dye admixture; rinsing the dyed textile material; and drying the dyed textile material containing the cellulose acetate polymeric constituent.

**4,164,393**  
**PRESERVATIVE FOR HIDES**  
 Emma-Jane E. Drury, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.  
 Filed Apr. 17, 1978, Ser. No. 897,064  
 Int. Cl.<sup>2</sup> C14C 1/00

U.S. Cl. 8—94.18

1. A composition for preserving animal hides in aqueous float comprising, based on the weight of hides, from about 1.0 to about 2.0% propionic acid, and from about 0.4% to about 1.0% sorbic acid.

5. A composition for preserving animal hides in aqueous float comprising, based on the weight of hides, from about 1.0 to about 1.5% propionic acid, and from about 0.4% to about 1.0% of a substance comprising about 40 to about 100 parts sorbic acid, about 1 to about 60 parts dehydroacetic acid, and about 1 to about 47 parts methyl paraben.

**4,164,394**  
**PEROXYGEN BLEACHING AND COMPOSITIONS THEREFOR**

Gaylen R. Brubaker, Lawrenceville, and Fred R. Scholer, Cranbury, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 10, 1978, Ser. No. 949,837  
 Int. Cl.<sup>2</sup> D06L 3/00

U.S. Cl. 8—107

1. A process for the low temperature bleaching of stained and/or soiled fabrics characterized by treating them with an aqueous peroxygen bleaching solution having a pH of 6 to 12 and containing as a peroxygen activator therefor, an effective amount of an acylphosphonate.

**4,164,395**  
**PEROXYGEN BLEACHING AND COMPOSITIONS THEREFOR**

Joseph H. Finley, Metuchen, and John H. Blumbers, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 16, 1978, Ser. No. 952,026  
 Int. Cl.<sup>2</sup> D06L 3/02; C11D 7/18

U.S. Cl. 8—111

1. A process for the low temperature bleaching of stained and/or soiled fabrics characterized by treating them with an aqueous peroxygen bleaching solution having a pH of 6 to 12 and containing as a peroxygen activator therefor, an effective amount of a sulfonyloxime.

**4,164,396**  
**PRODUCTION OF COMBUSTIBLE PRODUCTS FROM WASTE MATERIALS**

Brian Jones, Over Hulton near Bolton, England, assignor to The General Engineering Company (Radcliffe) Limited, Manchester, United Kingdom

Continuation-in-part of Ser. No. 711,548, Aug. 4, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,556  
 Claims priority, application United Kingdom, Apr. 28, 1976, 17169/76

Int. Cl.<sup>2</sup> C10L 5/46, 5/22

U.S. Cl. 44—1 D

1. A method of producing a fuel derived from waste material including the steps of: combining refuse containing fibrous material of low wet strength and of a primarily combustible nature and also containing material of greater strength and density, including non-combustible material, with liquid combustible material to enhance the calorific value of the refuse, feeding the refuse and the liquid combustible material into a rotary drum in which the refuse is tumbled gradually to reduce the refuse to particulate form and in which the resistance to breakdown of at least the fibrous material is reduced by the dispersal thereover of the liquid combustible material; regulating the quantity of the refuse fed to the drum so that free space

exists in the drum to ensure that the refuse can tumble freely therein as the drum is rotated, rotating the drum so that reduction to particulate form of the fibrous material of low wet strength of the refuse is assisted by collision and intermingling thereof with said pieces of non-combustible materials of greater strength and density thereby to produce a homogenized, discrete particulate mass, removing the mass from the drum, and removing from the mass at least large pieces of non-combustible material which are contained in the originally supplied refuse thereby to produce an air permeable, particulate fuel of substantially constant density, particle size and calorific value.

6. A method as set forth in claim 1 including the step of passing said mass removed from said drum through a separator, separating a granulated fraction from a non-granulated fraction, passing said granulated fraction to a classifier, blowing air through said classifier and separating low density particles from higher density particles thereby to produce two grades of fuel.

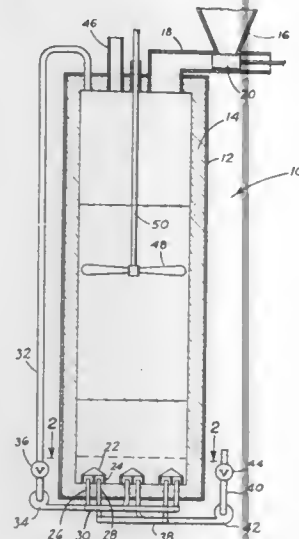
#### 4,164,397 FUEL GAS PRODUCTION

Herbert H. Hunt, 3608 Vine Maple, Eugene, Oreg. 97405, and Harold S. Worcester, 91040 Hill Rd., Springfield, Oreg. 97417

Continuation-in-part of Ser. No. 733,429, Oct. 18, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,422  
Int. Cl.<sup>2</sup> C10J 3/16

U.S. Cl. 48—209

3 Claims



1. A process for making combustible gas from lignocellulose material which comprises

establishing a descending bed of such material in a descending bed reactor, newly introduced material being dropped onto the top of such bed and such newly introduced material having a moisture content within the range of 20% to 80% by weight,

said descending bed having adjacent the top thereof a drying zone wherein the material is dried with the production of water vapor, and progressing downwardly from the drying zone a distillation zone where the material is converted to gaseous hydrocarbons and char, and below the distillation zone a combustion zone where the char is reacted with the production of additional gas and residual ash,

channeling the ash and all of the gas as such is produced in said bed upwardly through and thence out the top of the bed with the sensible heat of such gas being transferred directly to the material in the bed,

dividing gas flowing upwardly from the top of said bed into one fraction which is the gas manufactured and another fraction which is reflow gas, said reflow gas comprising

the water vapor, gaseous hydrocarbons, and said additional gas produced in the combustion zone, forming a cavity within said bed in the combustion zone thereof, and

contacting the material in said bed in said combustion zone with the reflow gas together with air for the support of combustion, the air and reflow gas before contacting such material initially being mixed in said cavity to produce a mixture comprising air, water vapor and gaseous hydrocarbons,

the combustion zone being maintained at a temperature above about 1300° F. and below the fusion temperature of the ash of said material, said additional gas produced in said combustion zone comprising the gas combustion product produced by the exothermic reaction of char with oxygen supplied by the air and water gas produced by the endothermic reaction of char with water vapor in a water-gas reaction, the top of said bed being maintained at a temperature no higher than the boiling point of water at the pressure condition existing in the reactor.

#### 4,164,398

#### ENTRAINMENT SEPARATOR

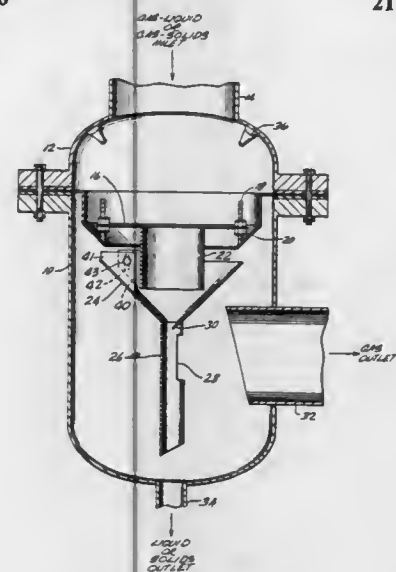
Michael B. Caesar, Lake City, Fla., assignor to Occidental Research Corporation, Irvine, Calif.

Filed May 26, 1978, Ser. No. 909,898

Int. Cl.<sup>2</sup> B01D 45/08

U.S. Cl. 55—186

21 Claims



1. An entrainment separator for separating liquids from gases and solids from gases comprising:

- a housing providing an inlet at one end, an outlet at the opposed end and an outlet disposed along the side;
- an adjustable planar surface providing a face facing the inlet and an opposed face;
- an annular deflector beneath the planar surface, attached to the housing and extending inward of the housing and positioned relative to the planar surface to provide an opening between the planar surface and annular deflector;
- means to adjust the position of the planar surface relative to the annular deflector;
- a tube attached to the opposed face of the planar surface and extending downward of the inlet;
- a funnel providing a downward extending spout positioned below the tube; and
- means providing flow of liquid in the funnel past the tube and to the spout.

#### 4,164,399

#### WET SCRUBBING DEVICE

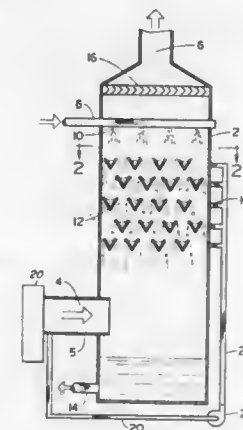
David H. Kannapell, Prospect, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sep. 28, 1977, Ser. No. 837,359

Int. Cl.<sup>2</sup> B01D 47/06, 47/12

U.S. Cl. 55—223

6 Claims



1. A wet scrubbing apparatus for cleaning a waste gas comprising:

a scrubber housing having a flow-through inlet and a flow-through outlet; a plurality of transversely extending troughs mounted within said housing between said flow-through inlet and said flow-through outlet, said plurality of troughs equally spaced in a plurality of horizontally aligned rows with alternating rows being vertically aligned and said troughs in adjacent rows being spaced equidistant between said troughs of adjacent rows; means to add a scrubbing solution to said troughs; and, means to force said scrubbing solution out of said troughs including a first conduit disposed along the bottom of each of said troughs with spaced preselected openings therein in fluid communication with a pressurized fluid source so that the scrubbing solution overflowing from row to row of said troughs creates fluid sheets caught by said troughs in rows adjacently below overflowing troughs, whereby the waste gas to be cleaned must pass through the liquid sheets of scrubbing solution as the waste gas to be cleaned passes through said housing from said flow-through inlet to said flow-through outlet.

#### 4,164,400

#### FILTERS

Stephen A. Wald, Winston-Salem, N.C., assignor to Scott/Chatham Company, Hamptonville, N.C.

Filed Dec. 21, 1976, Ser. No. 752,884

Int. Cl.<sup>2</sup> B01D 46/00

U.S. Cl. 55—382

42 Claims

1. A filter for separating solid particulate matter from a suspending gas, comprising:

- (1) an enclosure means for enclosing a volume of gas suspended solid particulate matter;
- (2) an intake means associated with the enclosure means for passing gas suspended solid particulate matter into the enclosure means; and
- (3) a filter means associated with the enclosure discharge means for passing gas from the enclosure means; said filter means comprising a non-woven needled textile filter fabric having at least 5000 needle punches per square inch on an all-fiber basis:
  - (a) a face surface associated with the intake means and a back surface associated with the discharge means;
  - (b) an overall bulk density of at least 6 pounds per cubic foot;
  - (c) a bulk density gradient such that the bulk density at the

face surface is at least 50% greater than the bulk density at the back surface;

(d) a filtering gradient such that the fineness of filtration at the face surface is greater than the fineness of filtration at the back surface;



(e) a gas permeability of at least 3 CFM per square foot at a pressure drop of 0.5 inch of water; and

(f) a fineness of filtration such that the dynamic leakage is 7.0% or less.

#### 4,164,401

#### CURVED ORIFICE PLATE FOR FORMING GLASS FIBERS

Toshio Noji; Hiroaki Shono, and Isao Wakasa, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation of Ser. No. 808,948, Jun. 22, 1977, abandoned.

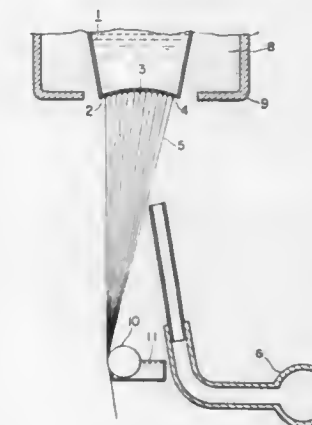
This application Sep. 21, 1978, Ser. No. 944,535

Claims priority, application Japan, Jun. 30, 1976, 51/77420

Int. Cl.<sup>2</sup> C03B 37/02

U.S. Cl. 65—1

6 Claims



1. In a glass filament forming bushing including a molten glass container having a bottom plate provided with a plurality of closely spaced filament withdrawal non-tip orifices, and means to direct a flow of cooling air to the outer surface of the bottom plate, the improvement characterized by:

the bottom plate being inwardly curved in a concave manner to increase its resistance to outward deformation as a consequence of the loading thereon from the weight of molten glass in the container and the tension resulting from the withdrawn filaments, said bottom plate having a uniform radius of curvature in the range of 35 mm to 200 mm and the angle between the axis of an outermost orifice therein and the direction of withdrawal of a filament drawn therethrough is less than 15°.



**4,164,402**  
**STRENGTHENING OF THIN-WALLED, LIGHT GLASS CONTAINERS**

Muneo Watanabe, Nishinomiya, Japan, assignor to Yamamura Glass Co., Ltd., Nishinomiya, Japan  
 Filed Feb. 27, 1978, Ser. No. 881,257  
 Int. Cl.<sup>2</sup> C03C 15/00, 17/00, 21/00  
 U.S. Cl. 65—30 E

6 Claims

1. In a process for strengthening thin-walled, light containers made of soda-lime glass comprising the steps of molding said containers by the press-and-blow process, annealing the glass containers and thereafter exchanging sodium ions present in the surface portion of the external surface and the internal surface of said containers with potassium ions to form a compressive stress layer in said surface portion, the improvement which comprises the pretreatment step of placing a compound selected from the group consisting of elemental sulfur, sulfur dioxide, ammonium chloride, ammonium sulfate, aluminum chloride, water, a fluorine-containing substance and a mixture thereof into the interior of said containers immediately after the molding step but before the annealing step at an elevated temperature so that only said internal surface of said containers reacts with the gas generated from said compound at said elevated temperature to decrease the amount of extractable alkali on said internal surface.

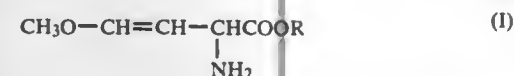
**4,164,403**  
**METHOD FOR INHIBITING PLANT GROWTH**  
 Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 6, 1978, Ser. No. 912,916  
 Claims priority, application Switzerland, Jun. 9, 1976, 7252/76; Jun. 10, 1977, 7172/77  
 Int. Cl.<sup>2</sup> A01N 5/00

U.S. Cl. 71—76

4 Claims

1. A method for inhibiting vegetative plant growth which comprises treating emerged plants with a non-phytotoxic effective amount of an active substance of the formula I



wherein R represents hydrogen or a plant physiologically acceptable salt thereof.

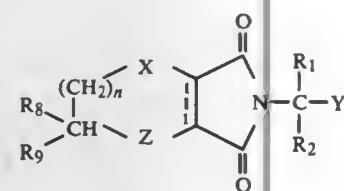
**4,164,404**  
**DITHIINDICARBOXIMIDE, DITHIOLANEDICARBOXIMIDE, THIAPYRANEDICARBOXIMIDE AND PYRANEDICARBOXIMIDE DERIVATIVES AS PLANT GROWTH REGULANTS**

Marinus Los, and Bryant L. Walworth, both of Pennington, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 373,556, Jun. 25, 1973, abandoned. This application May 30, 1974, Ser. No. 474,760  
 Int. Cl.<sup>2</sup> A01N 5/00, 21/02; C07D 495/04, 493/04; A01N 21/00  
 U.S. Cl. 71—77

49 Claims

1. A compound of the formula:



wherein

X is CH<sub>2</sub> or S;

Z is S, O, or SO, provided that when Z is O, X cannot be S;  
 Y is —COOR<sub>3</sub>, —CONR<sub>4</sub>R<sub>5</sub>, —CONHOH, —CONHNR<sub>6</sub>R<sub>7</sub>, —CONHN<sup>+</sup>R<sub>6</sub>R<sub>7</sub>halide<sup>-</sup>, CN or —COR<sub>10</sub>;

n is 0 or 1; R<sub>1</sub> and R<sub>2</sub> each represent alkyl C<sub>1</sub>–C<sub>4</sub>, or when taken together with the carbon to which they are attached form cycloalkyl C<sub>4</sub>–C<sub>8</sub> or methyl-substituted cycloalkyl C<sub>4</sub>–C<sub>9</sub>;

R<sub>3</sub> is hydrogen or alkyl C<sub>1</sub>–C<sub>4</sub>;

R<sub>4</sub> and R<sub>5</sub> each represent hydrogen, alkyl C<sub>1</sub>–C<sub>4</sub>, phenyl, monohalophenyl, monoalkyl(C<sub>1</sub>–C<sub>4</sub>)phenyl, or monoalkoxy(C<sub>1</sub>–C<sub>4</sub>)phenyl;

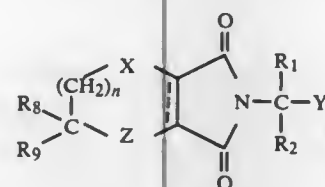
R<sub>6</sub> and R<sub>7</sub> are alkyl C<sub>1</sub>–C<sub>2</sub>;

R<sub>8</sub> is mononitrophenyl hydrogen, alkyl C<sub>1</sub>–C<sub>4</sub>, phenyl, monohalophenyl, monoalkyl(C<sub>1</sub>–C<sub>4</sub>)phenyl, monoalkoxy(C<sub>1</sub>–C<sub>4</sub>)phenyl or trifluoromethylphenyl;

R<sub>9</sub> is hydrogen or alkyl C<sub>1</sub>–C<sub>4</sub>;

R<sub>10</sub> is halogen, and represents a single or double bond.

18. A method for regulating the growth of plants comprising, applying to the foliage, roots, stems, seeds seed pieces or to soil in which the plants are grown, an effective plant growth regulating amount of a compound of the formula:



wherein

X is CH<sub>2</sub> or S;

Z is S, O, or SO, provided that when Z is O, X cannot be S;  
 Y is COOR<sub>3</sub>, —CONR<sub>4</sub>R<sub>5</sub>, —CONHOH, —CONHNR<sub>6</sub>R<sub>7</sub>, —CONHN<sup>+</sup>R<sub>6</sub>R<sub>7</sub>halide<sup>-</sup>, or CN; n is 0 or 1;

R<sub>1</sub> and R<sub>2</sub> each represent alkyl C<sub>1</sub>–C<sub>4</sub>, or when taken together with the carbon to which they are attached form cycloalkyl C<sub>4</sub>–C<sub>8</sub> or methyl-substituted cycloalkyl C<sub>4</sub>–C<sub>9</sub>;

R<sub>3</sub> is alkyl C<sub>1</sub>–C<sub>4</sub>;

R<sub>4</sub> and R<sub>5</sub> each represent hydrogen, alkyl C<sub>1</sub>–C<sub>4</sub>, phenyl, monohalophenyl, monoalkyl(C<sub>1</sub>–C<sub>4</sub>)phenyl, or monoalkoxy(C<sub>1</sub>–C<sub>4</sub>)phenyl;

R<sub>6</sub> and R<sub>7</sub> are alkyl C<sub>1</sub>–C<sub>2</sub>;

R<sub>8</sub> is hydrogen, alkyl C<sub>1</sub>–C<sub>4</sub>, phenyl, monohalophenyl, monoalkyl(C<sub>1</sub>–C<sub>4</sub>)phenyl, monoalkoxy(C<sub>1</sub>–C<sub>4</sub>)phenyl or trifluoromethylphenyl;

R<sub>9</sub> is hydrogen or alkyl C<sub>1</sub>–C<sub>4</sub>;

and represents a single or double bond.

**4,164,405**  
**METHOD OF CONTROLLING THE RATE OF DAMPING-OFF OF PLANT SEEDLINGS AND IMPROVING THE RATE OF TREE GROWTH WITH TREATED COTTON GIN WASTE**

Joseph A. Pinckard, Inglis, Fla., assignor to The Ekol Corporation, Ocala, Fla.

Continuation-in-part of Ser. No. 544,669, Jan. 27, 1975, abandoned. This application Mar. 20, 1978, Ser. No. 887,963  
 Int. Cl.<sup>2</sup> A01N 9/08

U.S. Cl. 71—79

15 Claims

8. A method for improving the rate of tree growth which comprises placing about the locus of a tree a horticultural medium in an amount effective to improve the rate of growth of said tree, said horticultural medium having been produced by the process of aerobically fermenting cotton gin waste to biodegrade the waste at a temperature of at least 125° F. with water in an amount ranging from 1 to 5 times the dry weight of the gin waste, said gin waste being in a pile at least 10 feet wide and 8 feet high to conserve self-generated heat in the interior of the pile, and systematically turning the exterior of the pile to the interior so that all particles of the gin waste are heated to

a temperature of from 125° to 180° F. for at least several hours, whereby the gin waste is freed of any soil borne plant diseases, weed seeds, insects or nematodes present therein.

**4,164,406**  
**PHOSPHINYLPHTHALIMIDINES AND THEIR USE AS PLANT GROWTH REGULANTS**

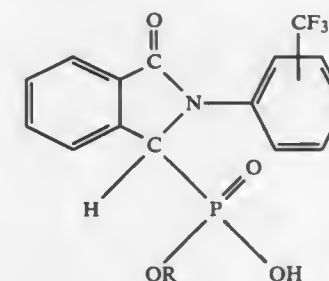
Wendel G. Phillips, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 11, 1975, Ser. No. 596,027  
 Int. Cl.<sup>2</sup> A01N 9/36, 9/00; C07D 209/34

U.S. Cl. 71—86

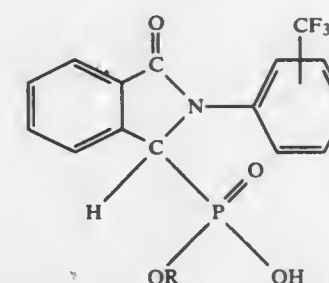
15 Claims

1. A compound having the formula



wherein R is hydrogen or lower alkyl.

7. A method of regulating the growth of dicotyledanous plants which comprises treating said plant with an effective non-lethal amount of a compound having the formula



wherein R is hydrogen or lower alkyl.

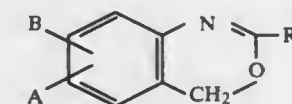
**4,164,407**  
**BENZOXAZINE HERBICIDES**  
 Stewart W. Myers, Morristown, and Homer K. Spencer, Randolph, both of N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Filed Oct. 7, 1977, Ser. No. 840,227  
 Int. Cl.<sup>2</sup> A01N 9/22; C07D 265/18

U.S. Cl. 71—88

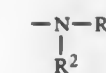
20 Claims

1. A method of combating plants in a plant locus, which comprises applying to the locus a herbicidally effective amount of a compound which is a free base of the formula:



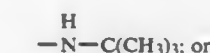
wherein each of A and B, is independently, a hydrogen atom or halo having an atomic weight of from about 34 to 80, provided that A and B are not both hydrogen atoms; and R<sup>0</sup> is a member of the class consisting of either:

(A) tertiary-amino of the formula:



wherein each of R<sup>1</sup> and R<sup>2</sup>, independently, is alkyl having from 1 to 6 carbon atoms, or alkenyl having from 3 to 6 carbon atoms, provided that the ethylenically unsaturated bond is not on the carbon atom adjacent to the nitrogen atom; or

(B) secondary amino of the formula:



an acid addition salt thereof.

**4,164,408**  
**SALTS OF SUBSTITUTED PHENOXYBENZOIC ACIDS, COMPOSITIONS OF THE SAME AND HERBICIDAL USE THEREOF**

Robert J. Theissen, Bridgewater, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Continuation of Ser. No. 702,367, Jul. 2, 1976, which is a continuation-in-part of Ser. No. 617,569, Sep. 29, 1975, Pat. No. 3,979,437, which is a continuation of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830, which is a continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a

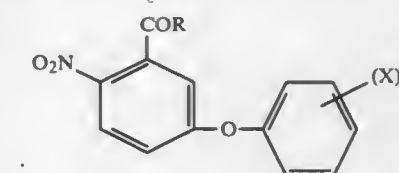
continuation-in-part of Ser. No. 819,412, Apr. 25, 1969, Pat. No. 3,652,645, said Ser. No. 702,367, is a continuation-in-part of Ser. No. 545,232, Jan. 29, 1975, Pat. No. 4,002,662, which is a continuation-in-part of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830. This application Sep. 26, 1977, Ser. No. 836,885 The portion of the term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

Int. Cl.<sup>2</sup> A01N 9/12, 9/14; C07C 121/64, 65/00

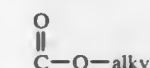
U.S. Cl. 71—98

3 Claims

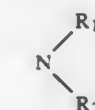
1. Herbicidal compounds having the formula:



wherein X is a member selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, COOH,



(alkyl of 1 to 4 carbon atoms), hydroxy, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms,



SH, SR<sub>1</sub>, SOR<sub>1</sub>, SO<sub>2</sub>R<sub>1</sub>, SO<sub>2</sub>NH<sub>2</sub> and combinations thereof, R<sub>1</sub> and R<sub>2</sub> are selected from the group consisting of alkyl of 1 to 4 carbon atoms, R is OM in which M is an alkali metal (lithium, sodium and potassium), alkylammonium of 1 to 4 carbon atoms or alkanolammonium of 1 to 4 carbon atoms, n is an integer of 1 to 5.

2. The method for controlling plant growth that comprises applying an herbicidal amount of a compound defined in claim 1.

- (a) providing a reaction zone;
- (b) introducing said sulfide ore containing from about 20 to 85 wt % of the selected metal, a carbonaceous material, an alkali metal carbonate and gaseous oxygen into said reaction zone to form a molten reaction mixture, said alkali metal carbonate and sulfide ore being introduced in amounts to provide a molar ratio of carbonate to metal sulfide of at least 1.2:1;
- (c) said carbonaceous material being introduced in an amount sufficient to reduce substantially all of the selected metal sulfide to the elemental form of the metal and in a



- sufficient excess so that there is generated in situ substantially all the heat required to maintain the reaction zone at a selected temperature between 600° and 1350° C;
- (d) maintaining the reaction zone at said selected temperature for a time sufficient for a reaction to occur in the mixture between the selected metal sulfide, the carbonaceous material and the alkali metal carbonate to form a desired amount of the selected metal in its elemental form in the molten state in a single stage, said molten metal settling to the bottom of the reaction zone; and
- (e) withdrawing the formed molten metal from the reaction zone as a flowable liquid substantially free of impurities.

4,164,417

# PROCESS FOR RECOVERY OF NIOBIUM VALUES FOR USE IN PREPARING NIOBIUM ALLOY PRODUCTS

Robert A. Gustison, Reading, Pa., assignor to Kawecky Berylo Industries, Inc., Boyertown, Pa.

Filed Apr. 28, 1978, Ser. No. 901,069  
Int. Cl.<sup>2</sup> C22B 34/24; C22C 27/02

U.S. Cl. 75—84

10 Claims

1. A process which comprises reducing niobium oxyfluoride in the presence of iron, chromium or nickel with aluminum and recovering the resulting niobium alloys.
3. The process according to claim 1 wherein oxides of calcium, strontium, barium, magnesium and lithium are added to react with essentially all the fluorine contained in the niobium oxyfluoride.

4,164,418

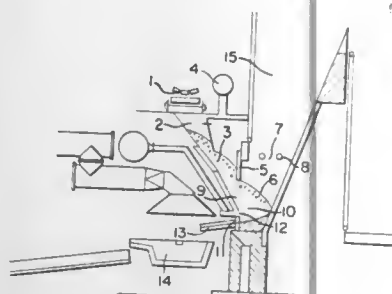
# METHOD OF RECOVERING VALUABLE METALS FROM ZINC BEARING MATERIALS AND BLAST FURNACE RELEVANT THERETO

Hiroshi Tokunaga, Tokyo; Yoshikazu Tatehana, and Akira Umekawa, both of Ohmuta, all of Japan, assignors to Mitsui Mining &amp; Smelting Co., Ltd., Tokyo, Japan

Division of Ser. No. 710,465, Aug. 2, 1976, Pat. No. 4,071,228.  
This application Sep. 21, 1977, Ser. No. 835,338Int. Cl.<sup>2</sup> C22B 19/08

U.S. Cl. 75—88

10 Claims



1. A method for separating and recovering volatile valuable metals including zinc and non-volatile valuable metals from zinc-bearing materials, utilizing a blast furnace comprising a horizontally elongated hearth whose upper surface is inclined downwardly relative to the horizontal in the lengthwise direction of said hearth toward tap hole means and an array of tuyeres disposed in horizontally spaced-apart relation along the lengthwise extent of said hearth and disposed closely above said upper surface of said hearth, said array of tuyeres being inclined relative to the horizontal at substantially the same angle as said upper surface of said hearth, which comprises the steps of: feeding briquettes of said zinc-bearing material containing carbonaceous material admixed therewith through a coking zone which communicates with said blast furnace and in said coking zone heating the briquettes by contact with hot
- (A) a photocurable composition containing a member selected from the group consisting of
- (a) a polymer selected from the group consisting of poly-

waste gas flowing upwardly from said blast furnace; then flowing a thin layer of the coked briquettes downwardly from the coking zone into the blast furnace toward the hearth to form a bed of said briquettes in a reaction zone above said hearth, said layer being of substantially uniform thickness along the lengthwise extent of said hearth, and simultaneously blowing preheated air through said tuyeres into said blast furnace in a lateral direction above the upper surface of said hearth so that the zinc in said zinc-bearing material is reduced to zinc metal and is evaporated and non-volatile materials present in said zinc-bearing material become molten and collect on said hearth and flow toward said tap hole means and simultaneously are contacted by the preheated air supplied through said tuyeres to form an agitated melt from which volatile metals are evaporated; flowing the vaporized volatile metals upwardly through said blast furnace and recovering said metals outside said furnace.

4,164,419

# POWDERED ALLOY FOR DENTAL AMALGAM

Hiroyuki Kaji, and Narishige Suzuki, both of Kyoto, Japan, assignors to Shofu Dental Manufacturing Company, Limited, Kyoto, Japan

Continuation of Ser. No. 742,454, Nov. 17, 1976, abandoned.  
This application Mar. 27, 1978, Ser. No. 890,307Claims priority, application Japan, Dec. 22, 1975, 50-153664  
Int. Cl.<sup>2</sup> C22C 7/00, 5/06

U.S. Cl. 75—169

4 Claims

1. An amalgamable alloy for a dental amalgam consisting essentially, by weight, of at least 50% silver, 20 to 30% tin, 3 to 6% indium and 11 to 20% copper, said copper being present in an amount sufficient to form the intermetallic compound Cu<sub>6</sub>Sn<sub>5</sub> with the tin and to provide only minimal amounts of unalloyed tin to form the gamma-II phase upon amalgamation.

4,164,420

# MASTER ALLOY FOR THE PREPARATION OF ZIRCONIUM ALLOYS

Marcel Armand, and Daniel Charquet, both of Albertville, France, assignors to Ugine Aciers, Paris, France  
Filed Dec. 8, 1977, Ser. No. 858,645Claims priority, application France, Jan. 7, 1977, 77 00944  
Int. Cl.<sup>2</sup> C22C 13/00

U.S. Cl. 75—175 R

5 Claims

1. A zirconium containing master alloy for producing zirconium-based alloys, said master alloy comprising by weight alloying elements of a percentage by weight generally greater than that of the zirconium-based alloys to be produced, and consisting essentially of by weight about:
- Sn 50 to 85%
- Zr 5 to 30%
- Fe 0 to 20%
- Cr 0 to 20%
- the combined Fe+Cr content of which is between about 3 and about 30%.

4,164,421

# PHOTOCURABLE COMPOSITION CONTAINING AN O-QUINONODIAZIDE FOR PRINTING PLATE

Fumiaki Shinozaki, and Tomoaki Ikeda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 531,125, Dec. 9, 1972, abandoned. This application Dec. 29, 1976, Ser. No. 755,308

Claims priority, application Japan, Dec. 7, 1973, 48/139233  
Int. Cl.<sup>2</sup> G03G 5/18

U.S. Cl. 96—33

9 Claims

1. A process for preparing a printing plate which comprises:
- (1) imagewise exposing to such an exposure amount so that a positive working image can be obtained with actinic light in the visible to ultraviolet range a positive type photosensitive material comprising a support having thereon a photosensitive layer comprising an admixture of:

- $\beta$ -cinnamoyloxyethyl methacrylate, copolymers of  $\beta$ -cinnamoyloxyethyl methacrylate and methacrylic acid, and condensation products of p-phenylenediacrylic acid and 1,4-bis( $\beta$ -hydroxyethoxy)cyclohexane,
- (b) pentaerythritol tetraacrylate
- (c) a mixture of said polymer (a) and said pentaerythritol tetraacrylate, and

- (B) a photosensitive o-quinonediazide compound selected from the group consisting of esters of polyhydroxyphenyl comprising the polycondensation product of acetone and pyrogallol, and o-naphthoquinonediazide sulfonic acid in an amount of about 0.05 to about 4 parts by weight per part by weight of said photocurable composition (A),
- (2) developing with a developer comprising an alkaline aqueous solution, and
- (3) exposing said developed printing plate overall with actinic light in the visible to ultraviolet range to cure the formed image of said photo-curable composition (A).

4,164,422

# WATER DEVELOPABLE, PHOTOPOLYMER PRINTING PLATES HAVING INK-REPUISIVE NON-IMAGE AREAS

Sakuo Okai, Carlsbad, and Koichi Kimoto, Oceanside, both of Calif., assignors to Napp Systems (USA), Inc., San Marcos, Calif.

Filed Sep. 19, 1977, Ser. No. 834,086  
Int. Cl.<sup>2</sup> G03C 1/76, 1/94; G03F 7/02

U.S. Cl. 96—67

7 Claims

1. A water-developable photopolymer printing plate comprising a substrate having applied thereto at least three additional layers of material disposed in a superimposed relation to one another, said layers comprising:
- (a) a first ink-repulsive layer of silicon rubber material substantially covering said substrate,
- (b) a water-developable photopolymer layer, and
- (c) a second ink-repulsive and adhesive layer joining said first ink-repulsive and said photopolymer layers, said second layer comprising a silicon rubber material, polyvinyl acetate saponified to a degree of about 65 to 99 mole percent, and a water-soluble polymeric resin selected from the group consisting of water-soluble melamines, water-soluble polyesters, polyethylene glycol and cellulose, said second layer being further characterized in that the ratio of water soluble resin to silicon rubber material is between about 0.1 to 1 part by weight resin to each part by weight silicon rubber material, the ratio of polyvinyl acetate to silicon rubber material between about 0.1 to 2 parts by weight polyvinyl acetate to 1 part by weight silicon rubber material and the ratio of water-soluble resin to polyvinyl acetate is between about 0.1 to 2 parts by weight resin to 1 part by weight polyvinyl acetate.

4,164,423

# BLACK PIGMENTED UV HARDENING PRINTING INK

Wilhelm Schumacher, Hanau; Lothar Rothbühr, Hürth-Hermülheim, and Joachim Armster, Bruchköbel, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,539  
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2738819Int. Cl.<sup>2</sup> C09D 11/02

U.S. Cl. 106—20

11 Claims

1. In a UV-drying printing ink having a black pigment therein the improvement comprising employing as the black pigment a carbon black having the following physical and chemical properties:
- |                       |                   |        |
|-----------------------|-------------------|--------|
| BET surface area      | m <sup>2</sup> /g | 20-50  |
| Particle diameter     | nm                | 30-80  |
| DBP adsorption        | ml/100g           | 30-100 |
| Volatile constituents | %                 | 3-10   |
| pH                    |                   | 3-6    |

4,164,424

# ALUMINA CORE HAVING A HIGH DEGREE OF POROSITY AND CRUSHABILITY CHARACTERISTICS

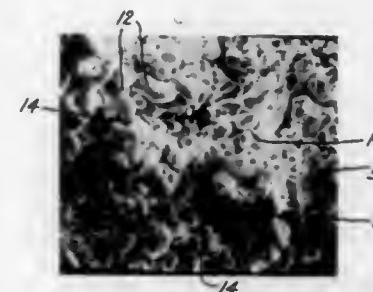
Frederic J. Klug, Amsterdam; Wayne D. Pasco, and Svante Prochazka, both of Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1977, Ser. No. 840,022

Int. Cl.<sup>2</sup> B22D 29/00; B28B 7/34

U.S. Cl. 106—38.9

6 Claims



1. A fired ceramic article suitable for use as a core in the investment casting of directionally solidified eutectic and superalloy materials consisting essentially of
- a porous body of ceramic material having a predetermined configuration and a porosity content of greater than about 20 percent by volume;
- the body having a porous microstructure in which the grain morphology is characteristic of grains which have undergone vapor phase transport action.

4,164,425

# CEMENT AND PROCESS FOR PRODUCING SAME

Boris I. Nudelman, Chilanar, kvartal 8, 27, kv. 48; Alexandr S. Svetslitsky, Severo-Vostok-2, 50, kv. 64; Marsel Y. Bikbaev, massiv Junus-Abad, B-2, 21, kv. 58; Isaak M. Bun, Chilanar, kvartal 8, 6a, kv. 19, and Arnold A. Kevvai, massiv Kara-Kamysh 1/3, 51, kv. 42, all of Tashkent, U.S.S.R.

Filed Jun. 14, 1977, Ser. No. 806,510

Claims priority, application U.S.S.R., Aug. 20, 1976, 2397380

Int. Cl.<sup>2</sup> C04B 7/02

U.S. Cl. 106—89

5 Claims

1. Cement consisting of a highly-basic calcium chlorosilicate, calcium chloro-orthosilicate, calcium chloroaluminate and calcium chloroalumoferrite, the components being present in the following proportions, percent by weight:
- highly-basic calcium chlorosilicate: 20 to 75
- calcium chloro-orthosilicate: 10 to 55
- calcium chloroaluminate: 0.5 to 30
- calcium chloroalumoferrite: 2 to 20.

4,164,426

# CONCRETE HAVING IMPROVED COMPRESSIVE STRENGTH

Joseph V. Sinka, Mendham, and Jose L. Villa, Hightstown, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 909,305, May 24, 1978, abandoned. This application Jul. 17, 1978, Ser. No. 925,031

Int. Cl.<sup>2</sup> C04B 7/35

U.S. Cl. 106—90

20 Claims

11. A process for production of hardened concrete characterized by enhanced compressive strength comprising adding an effective amount of zinc naphthaleneformaldehyde sulfonate sufficient to enhance compressive strength of the hardened concrete to a concrete mix containing 100 parts by weight of cement, from about 140 to about 260 parts by weight of sand, from about 100 to about 200 parts by weight of gravel and from about 35 to about 60 parts by weight of water.



# 4,164,427

## STABILIZED HYDROCARBON TACKIFYING COMPOSITIONS

Darryl A. Godfrey, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,187

Int. Cl.<sup>2</sup> C08K 5/13, 5/36; C08L 93/04

U.S. Cl. 106—218

8 Claims

1. Tackifying resin having improved oxidative stability consisting essentially of a tackifying resin and about 0.1 to about 5 weight percent of the stabilizing combination comprising 2,2'-methylenebis-(4-methyl-6-tertiarybutylphenol) and at least one dialkylthiodipropionate.

# 4,164,428

## PLASTICIZED SULFUR COMPOSITION

Milutin Simic, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 2, 1978, Ser. No. 882,686

Int. Cl.<sup>2</sup> C01B 17/00; C09K 3/00

U.S. Cl. 106—287.13

9 Claims

1. A plasticized sulfur composition comprising at least 50% by weight sulfur, a sulfur plasticizer, a finely divided particulate mineral suspending agent and an organosilane stabilizing agent having the formula  $R-Si(OR')_3$  wherein R is an organic radical having at least one functional group selected from the group consisting of amino, epoxy, vinyl, methacryloxy and mercapto groups, and wherein R' is a low molecular weight alkyl group.

# 4,164,429

## PROCESS AND INSTALLATION FOR THE PRODUCTION OF SELECTED CRYSTALLIZATION SEEDS FOR USE IN A SUGAR REFINERY

André Mercier, La Madeleine, France, assignor to Fives-Cail Babcock, Paris, France

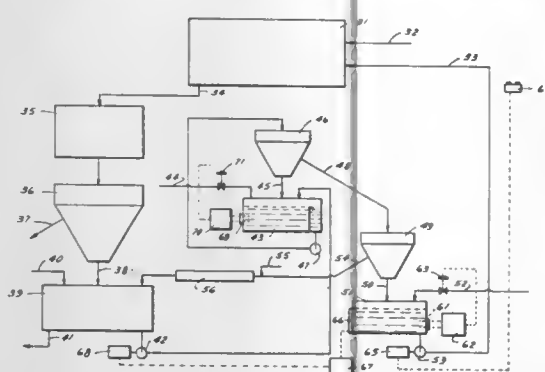
Filed Dec. 13, 1977, Ser. No. 860,043

Claims priority, application France, Dec. 14, 1976, 76 37581

Int. Cl.<sup>2</sup> C13F 1/02, 1/06

U.S. Cl. 127—15

10 Claims



1. Process of producing crystallization seeds for seeding a solution of a crystallizable product, which comprises forming a suspension of crystals produced from the seeded solution in a fraction of the said solution, subjecting the said suspension to a first centrifugal separation wherein crystals whose size is superior to a predetermined maximal dimension are separated from the said suspension, subjecting the said suspension to a second centrifugal separation wherein crystals whose size is inferior to a minimal predetermined dimension are removed with the suspension, and seeding the said solution with the crystals separated from the suspension in the course of the second separation.

# 4,164,430

## METHOD OF WASHING MATERIALS WHILE REVERSIBLY CIRCULATING WASH LIQUID THROUGH A CATION EXCHANGE RESIN

Elmar Reinwald, Dusseldorf; Heinz Smolka, Langenfeld, and Milan J. Schwuger, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

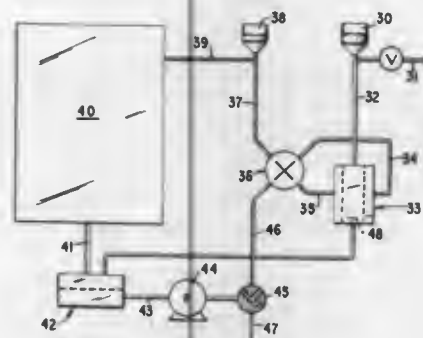
Filed Nov. 16, 1977, Ser. No. 852,029

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654353

Int. Cl.<sup>2</sup> B08B 7/04

U.S. Cl. 134—13

9 Claims



1. A method for machine washing and cleaning of solid soiled materials with aqueous wash liquor in the presence of water-insoluble cation exchange agents which are capable of binding the hardness components of the water and the soil, comprising withdrawing and recycling the wash liquor in contact with said solid soiled materials in a washing area through a water-insoluble cation exchange copolymer in particulate state having a swelled average particle size of between  $10\mu$  and  $2000\mu$  and having a calcium binding power of at least 2 mVal/gm, said copolymer being a copolymer or graft polymer derived from mono-olefinically-unsaturated carboxylic acids, said cation exchange copolymer being maintained completely out of contact with said solid soiled materials in a counter-current filter separate from the washing area, said wash liquor being passed through a lint filter before passing through said counter-current filter and then recycled to the washing area and said wash liquor at some time during said recycling containing soluble washing and cleaning compounds and washing said solid materials with the wash liquor while continuing the recycling of the wash liquor through said cation exchange copolymer, wherein the total amount of washing liquor is continuously or intermittently cyclically circulated from the washing area through the separate counter-current filter with the cation exchange copolymer and then back to the washing area at least five times during the washing process, and during said recycling of the wash liquor the direction of flow of said wash liquor through said cation exchange copolymer is reversed repeatedly during a wash period of 30 to 90 minutes, the direction of flow is reversed at intervals of 2 to 15 minutes, and where the amount of the cation exchange copolymer is sufficient to substantially soften the washing liquor, and said washing liquor contains from 0.2 to 10 gm per liter of other soluble washing and cleaning compounds including from 0.05 to 2 gm per liter of a water-soluble calcium-binding sequestrant, whereby said cation exchange copolymer is never in contact with said solid materials.

# 4,164,431

## MULTILAYER ORGANIC PHOTOVOLTAIC ELEMENTS

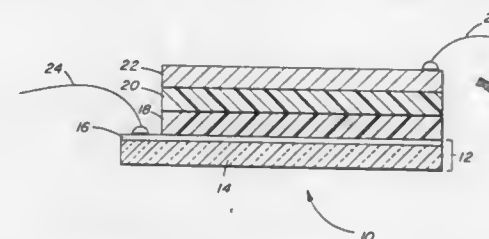
Ching W. Tang, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 821,115, Aug. 2, 1977, abandoned. This application May 18, 1978, Ser. No. 907,361

Int. Cl.<sup>2</sup> H01L 31/06

U.S. Cl. 136—89 NB

17 Claims



1. In a photovoltaic element including a first layer of an organic electron donor material, a second layer of an organic electron acceptor material in contact with said first layer, at least one of said materials being capable of absorbing light at wavelengths between about 350 and about 1000 nm and both of said materials forming a rectifying junction between them, and electrodes in operative ohmic contact with at least part of said layers,

the improvement wherein said materials each comprise a compound containing a generally planar polycyclic nucleus, and when laminated together, said layers produce a total combined thickness no greater than about 0.5 micron and a conversion efficiency for said element of at least about 0.02% when exposed to an AM2 light source.

# 4,164,432

## LUMINESCENT SOLAR COLLECTOR STRUCTURE

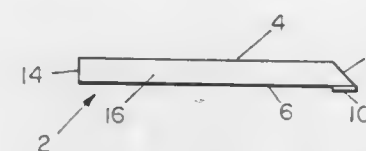
Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 9, 1978, Ser. No. 932,241

Int. Cl.<sup>2</sup> H01L 31/04

U.S. Cl. 136—89 PC

10 Claims



1. A luminescent solar collector having a beveled edge meeting an extended face surface thereof at an angle of 40 to 50 degrees, and physically attached and optically coupled to a relatively small area of said surface at least one photovoltaic cell adjacent to and parallel to said edge, said beveled edge having a highly reflective coating thereon.

# 4,164,433

## TUBE SKIN THERMOCOUPLES AND METHOD OF MAKING SAME

Edward A. Granahan, Richmond, and Carrol H. Paulson, Jr., Palatine, both of Ill., assignors to Pneumo Corporation, Boston, Mass.

Filed May 5, 1978, Ser. No. 903,168

Int. Cl.<sup>2</sup> H01L 35/02

U.S. Cl. 136—229

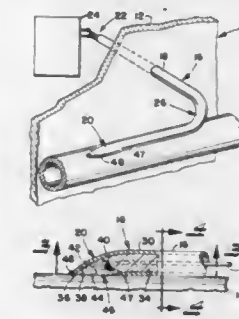
20 Claims

1. A thermocouple assembly comprising: a sheathed thermocouple cable including an elongate tubular metallic sheath having an axial portion, a pair of axially extending thermocouple conductors in said sheath, and electrically insulating means in said sheath supporting said

conductors in electrically insulated spaced relation from each other and from said sheath, said cable having an angularly disposed sensing end, said sheath terminating at said sensing end in an open end face and having an end cavity substantially free of insulating means and opening to said end face, said end face being substantially parallel to the axis of the adjacent axial portion of said sheath; a measuring junction of said conductors in said cavity; and an end closure of filler metal substantially filling said cavity embedding said measuring junction therein, said end closure having an exposed face substantially flush with said end face and forming therewith a contact face adapted for contiguous intimate contact with a surface whose temperature is to be sensed when mounted thereon.

14. A method of fabricating a thermocouple assembly comprising the steps of:

(a) bending one end of an axially extending sheathed thermocouple cable portion including an elongate tubular metallic sheath, a pair of axially extending thermocouple con-



ductors in said sheath, and electrical insulation in said sheath to support and space apart said conductors from each other and from said sheath;  
(b) terminating the bent end along a plane substantially parallel to the axis of the adjacent unbent portion of the sheath;  
(c) removing the insulation from the end of the bent end to form an end cavity substantially free of insulation and open at the end thereof to expose the ends of the thermocouple conductors;  
(d) forming a measuring junction to the conductors in the cavity;  
(e) filling the cavity with filler metal to form an end closure with the measuring junction embedded therein; and  
(f) forming the exposed portions of the end closure and sheath at the terminal end of the bent end to provide a substantially flat contact face adapted for contiguous intimate contact with a surface whose temperature is to be sensed.

# 4,164,434

## ALUMINUM ALLOY CAPACITOR FOIL AND METHOD OF MAKING

Julius C. Fister, Jr., Hamden, and John F. Breedis, Trumbull, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 2, 1977, Ser. No. 847,782

Int. Cl.<sup>2</sup> C22F 1/04; C22C 21/00

U.S. Cl. 148—2

33 Claims

1. An aluminum alloy foil having a significant increase in capacitance properties which is particularly useful as foil material in electrical capacitors, said alloy consisting essentially of from 0.005 to 0.03% by weight titanium, balance aluminum.

9. A process for producing aluminum alloy foil which exhibits high capacitance levels in cold worked tempers, said process comprising the steps of:

(a) casting an ingot of an aluminum alloy consisting essentially of from 0.005 to 0.03% by weight titanium, balance aluminum;



- (b) cleaning and scalping said ingot to remove any visible impurities;  
 (c) homogenizing said ingot at a temperature ranging from 850° to 1175° F. for at least  $\frac{1}{2}$  hour;  
 (d) hot working said ingot at 450° to 1100° F.;  
 (e) cooling said ingot at a minimum cooling rate of 50° F. per hour; and  
 (f) cold working said ingot to foil with a minimum reduction of 80% to a final gage.

4,164,435

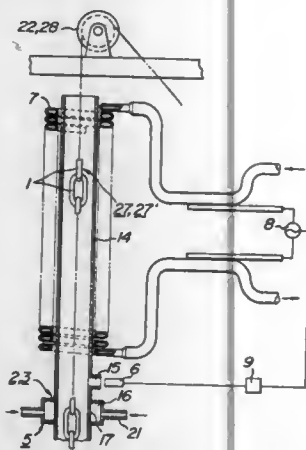
**METHOD FOR HEAT TREATMENT OF LINK CHAINS**  
 Norio Kanetake, Tokyo, Japan, assignor to Kabushiki Kaisha Kito, Kawasaki, Japan

Filed May 31, 1977, Ser. No. 801,976

Claims priority, application Japan, Jun. 16, 1976, 51-69666  
 Int. Cl.<sup>2</sup> C21D 9/00

U.S. Cl. 148—153

10 Claims



1. A method of heat treating link chains of iron or steel wherein the link chain is continuously subjected to a high frequency induction heating, each link element of the link chain being heated such that the temperature at the curved portions of the link element is higher than at the parallel portions thereof, and the link chain thus heated is cooled to quench it, characterized in that the conditions of the high frequency induction heating and the speed of movement of the link chain are selected so that the austenitizing temperature  $T_{\gamma-K}$  at the curved portions, the austenitizing temperature  $T_{\gamma-H}$  at the parallel portions of the link chain and the temperature  $T_{AC3}$  of the  $AC_3$  transformation point satisfy the relationship

$$T_{\gamma-K} > T_{\gamma-H} \geq T_{AC3}$$

and that during the heat treatment the temperature changes smoothly and continuously thereby to avoid a sudden temperature transition between the curved and parallel portions of the link element.

4,164,436

**PROCESS FOR PREPARATION OF SEMICONDUCTOR DEVICES UTILIZING A TWO-STEP POLYCRYSTALLINE DEPOSITION TECHNIQUE TO FORM A DIFFUSION SOURCE**

Mitsuru Ura; Kenji Miyata; Takaya Suzuki, and Takuzo Ogawa, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Jul. 18, 1978, Ser. No. 925,792

Claims priority, application Japan, Jul. 22, 1977, 52-87437

Int. Cl.<sup>2</sup> H01L 21/205, 21/225

U.S. Cl. 148—174

8 Claims

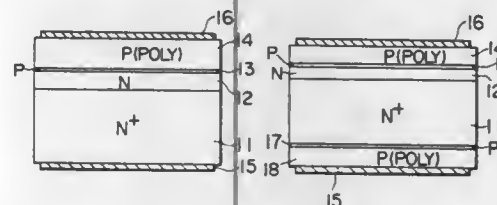
1. A process for the preparation of semiconductor devices, which comprises the steps of:

- (a) maintaining a semiconductor substrate having a semiconductor single crystal region of one conductivity type exposed on one main surface thereof, at a temperature

lower than the temperature causing substantial precipitation of a semiconductor from the gas phase,

- (b) initiating supply of a gaseous mixture comprising a gas of a starting substance of a semiconductor, a gas of impurities capable of providing a semiconductor of the other conductivity type and a carrier gas therefor to said main surface of the semiconductor substrate,

- (c) heating said semiconductor substrate to grow from the gas phase an amorphous or polycrystalline semiconductor layer of the other conductor type on said one main surface



of the semiconductor substrate and diffuse the impurities deciding the conductor type of the amorphous or polycrystalline semiconductor layer of the other conductivity type, into said semiconductor single crystal region of one conductivity type, whereby a semiconductor single crystal region of the other conductivity type is formed in said semiconductor single crystal region of one conductivity type, and

- (d) forming electrodes at predetermined positions including said amorphous or polycrystalline semiconductor layer.

4,164,437

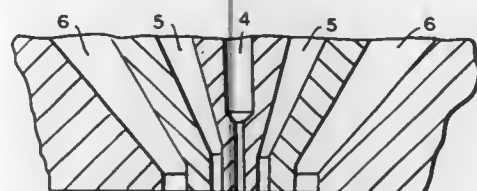
**METHOD OF PRODUCING DIALYZING MEMBRANE**  
 Werner Henne; Gustav Dünweg; Werner Schmitz; Raimund Pohle, and Friedrich Lawitzki, all of Wuppertal, Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands  
 Filed Jun. 23, 1977, Ser. No. 809,486

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627858; Feb. 11, 1977, 2705734

Int. Cl.<sup>2</sup> D01F 1/08; B32B 5/00

U.S. Cl. 156—167

10 Claims



1. A method of producing a multilayer dialyzing membrane composed of two or more firmly adhered cellulosic layers formed by regeneration of cellulose from a cuprammonium solution, including at least one layer consisting essentially of a semipermeable regenerated cellulose and at least one other layer consisting essentially of a regenerated cellulose containing embedded therein fine particles of an adsorbent material, which method comprises:

- spinning at least two cuprammonium spinning solutions from adjacent slots of a spinning head for immediate layer to layer contact and conducting the spun contacting layers over an air gap of not more than 50 times the spacing of the adjacent slots to pass into a precipitating bath, one of said at least two cuprammonium spinning solutions having suspended therein said fine particles of an adsorbent material in an amount of up to 95% by weight and another of said at least two cuprammonium spinning solutions being free of adsorbent particles;

coagulating the layers of spinning solutions in said precipitating bath to firmly adhere to each other and to entrap the fine particles of adsorbent material substantially completely in the spun layer in which said adsorbent material was originally suspended.

4,164,438

**METHOD OF MAKING TRANSVERSE FLOW OF CIGARETTE FILTERS**

Jean-Pierre Lebet, Montreux, Switzerland, assignor to Baumgartner Papiers S.A., Switzerland

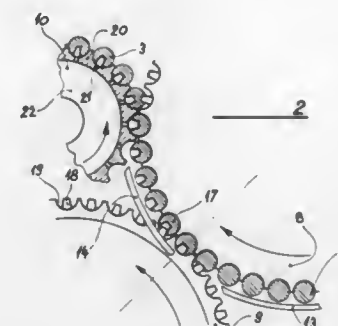
Filed Oct. 5, 1977, Ser. No. 839,607

Claims priority, application Switzerland, Oct. 5, 1976, 12568/76

Int. Cl.<sup>2</sup> B29C 17/00; A24C 5/50

U.S. Cl. 156—180

13 Claims



1. A method of making transverse-flow cigarette filters which comprises:

- forming cellulose acetate previously impregnated with a plasticizing agent into a rod having a porous covering, cutting said rod at a cutting station into sections each having the length of several filters,  
 forming indentations in opposite sides of said rod sections while conveying said rod sections from said cutting station and positioning said rod sections by means engaging ends of said rod sections, and  
 cutting said rod sections into individual filter lengths.

4,164,439

**APPARATUS FOR FABRICATING CONTINUOUS FIBER REINFORCED PLASTIC GRATING ARTICLES**

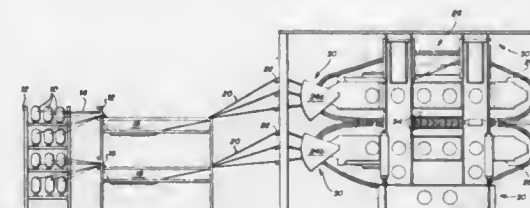
William C. Coonrod, Richardson, Tex., assignor to Fibergate Corporation, Dallas, Tex.

Filed Mar. 23, 1978, Ser. No. 889,392

Int. Cl.<sup>2</sup> B65H 81/00

U.S. Cl. 156—441

20 Claims



1. An apparatus for the production of fiber reinforced plastic grating articles comprising:

- (a) upper and lower continuous molding tracks having molding teeth, said tracks rotatable about a path such that said molding teeth close to form a molding cavity along a portion thereof;  
 (b) winder means for guiding plastic resin coated reinforcing fibers into said continuous mold tracks and weaving said fibers back and forth transversely across said tracks between said molding teeth.

4,164,440

**DEVICE FOR VULCANIZING CONVEYOR BELTS AND SIMILAR ARTICLES**

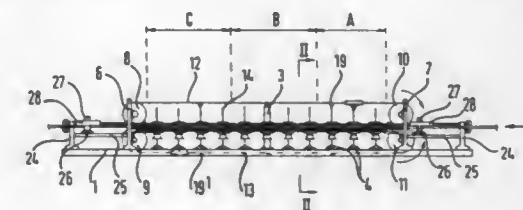
Augusto Prevati, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

Filed Nov. 14, 1977, Ser. No. 851,379

Claims priority, application Italy, Dec. 13, 1976, 30336 A/76  
 Int. Cl.<sup>2</sup> B30B 15/34

U.S. Cl. 156—583.1

8 Claims



1. In a device for vulcanizing conveyor belts consisting essentially of an improved flat platen press comprising two platens which are parallel to each other and superimposed, a plurality of frames, resting on carriages, each provided with a central aperture, the platens being inserted in the frame apertures, one of the platens being attached to the rim of the frame apertures and the other platen being supported by the pistons of cylinder/piston systems attached to the rim of the frame apertures, clamps for clamping, moving and tensioning the conveyor belt up-line and down-line of the platens, and two metal strips subtended by cylinders, one metal strip surrounding the upper platen in the longitudinal direction and the other metal strip surrounding the lower platen in the longitudinal direction, means for heating each of the platens and means for substantially reducing the coefficient of sliding friction between each platen and the corresponding metal strip surrounding it, the improvement consisting in that the means for substantially reducing the coefficient of sliding friction comprises a layer of sintered metallic material impregnated with a substance having a low coefficient of friction disposed between each platen and the metal strip surrounding it.

4,164,441

**PROCESS AND APPARATUS FOR CONCENTRATING CORROSIVE LIQUID USING RADIANT HEAT**

Hans L. Kühnlein, Fuellinsdorf, Switzerland, and Wolfgang-Dieter Müller, Leverkusen, Fed. Rep. of Germany, assignors to Hch. Bertrams Aktiengesellschaft, Basel, Switzerland and Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
 Filed May 31, 1977, Ser. No. 802,103

Claims priority, application Switzerland, Jun. 18, 1976, 007805/76

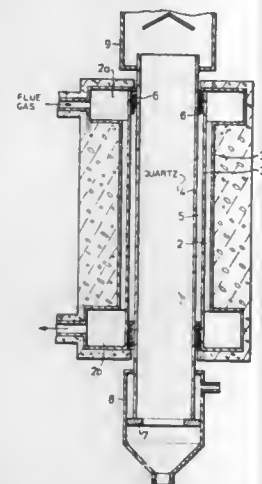
Int. Cl.<sup>2</sup> B01D 1/22

U.S. Cl. 159—13 A

7 Claims

1. A process for the separation of corrosive liquid mixtures by evaporating at least one component thereof, comprising establishing a downwardly flowing film of said liquid mixture on the first surface of a first member having first and second surfaces and which is permeable to radiation, supplying heat to the first surface of a second member having first and second surfaces and spaced from the second surface of said first member by a gas space, the heat being supplied to said first surface of said second member by direct contact with hot flue gases supplied to a space of which said second member constitutes

one bounding element, the second surface of said second member transferring heat by radiation to the second surface of the



first member, thereby evaporating at least one component of said liquid mixture, and withdrawing the evaporated material.

4,164,442

## ABRASION-RESISTANT PLATE

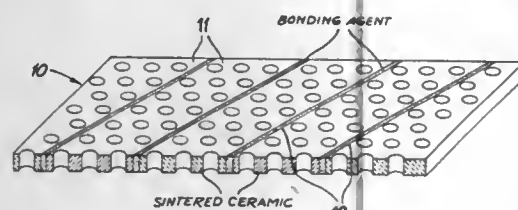
Heinrich Bartelmuss, A-8833 Teufenbach 63., Steiermark, Austria

Division of Ser. No. 631,618, Nov. 13, 1975, Pat. No. 4,047,993.  
This application Jun. 16, 1977, Ser. No. 807,330

Int. Cl.<sup>2</sup> C04B 35/00; D21F 1/52

U.S. Cl. 162—352

8 Claims



1. An abrasion-resistant plate divided into a multiplicity of flat, coplanar and closely juxtaposed sections of like width and thickness consisting of sintered refractory material with a predominant ceramic component including at least one silicate in a proportion of up to 3% by weight, said sections having confronting coextensive edges forming narrow gaps therebetween, and a bonding agent of silicon carbide completely filling said gaps while uniting said sections into a continuous body.

7. In paper-making machinery, in combination, an endless screen with an upper run forming a carrier for a slurry of wood pulp and paper, and a support for said upper run comprising at least one abrasion-resistant plate perpendicular to said screen subdivided into a multiplicity of flat, coplanar and closely juxtaposed sections of like width and thickness consisting of sintered refractory material with a predominant ceramic component including at least one silicate as a minor component in a proportion of up to 3% by weight, said sections having confronting coextensive edges generally parallel to the direction of screen motion forming narrow gaps therebetween, and a bonding agent of silicon carbide completely filling said gaps while uniting said sections into a continuous body.

4,164,443

## HYDRAULIC FUEL HOLD DOWN

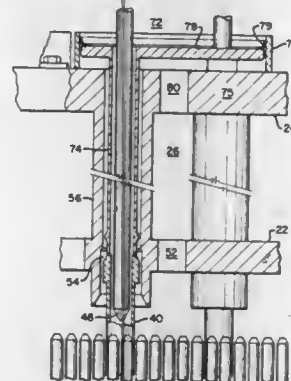
John F. Gibbons, Windsor, and Robert L. Hellens, West Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 4, 1977, Ser. No. 793,585

Int. Cl.<sup>2</sup> G21C 3/12

U.S. Cl. 176—50

7 Claims



1. In a nuclear reactor having; a reactor vessel having an inlet and an outlet; a core supported within said reactor vessel, and formed of a plurality of vertically elongated fuel assemblies; a mass flow of coolant from the inlet, upwardly through said core, and to the outlet, whereby a high pressure is established at the inlet, an intermediate pressure at the core inlet, and a low pressure at the outlet; a horizontal seal plate structure within said reactor vessel dividing said reactor vessel into a high pressure plenum above said seal plate and a low pressure plenum below said seal plate, said high pressure plenum being in direct fluid communication with the reactor vessel inlet, and said low pressure plenum being in direct fluid communication with the reactor vessel outlet; a fuel assembly hold down apparatus comprising: a push rod in vertical alignment with a fuel assembly and in contact with the upper end thereof; a piston attached to the upper portion of said push rod, said push rod restraining relative downward movement of said piston; vertical surface of said seal plate structure surrounding an opening therein and in sliding sealing relationship with said piston, whereby the upper surface of said piston is exposed to the high pressure plenum and the lower surface of said piston is exposed to the low pressure plenum.

4,164,444

## METHOD FOR PREPARING ADENOSINE TRIPHOSPHATE

George M. Whitesides, Newton; Patricia E. Garrett, Somerville, both of Mass., and Merrell G. Siegel, Houston, Tex., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 666,995, Mar. 15, 1976, Pat. No. 4,088,675.

This application Jan. 31, 1977, Ser. No. 764,516

Int. Cl.<sup>2</sup> C12D 13/06; C07H 19/20

U.S. Cl. 435—92

10 Claims

1. A method of preparing adenosine triphosphate in an enzyme-catalyzed reaction, said method comprising the step of reacting adenosine diphosphate in the presence of a phosphotransferase with an acetyl phosphate salt in which the cation is derived from the group of ammonia and primary, secondary and tertiary amines.

4,164,445

## ETHANOL AS THE MAJOR SOURCE OF CARBON AND ENERGY IN PENICILLIN PRODUCTION

Brian T. Sheehan; Judith Baymiller, and Robert W. Eltz, all of Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 27, 1975, Ser. No. 562,540

Int. Cl.<sup>2</sup> C12D 9/10

U.S. Cl. 435—46

5 Claims

1. In a fermentative process of producing penicillin by aerobically culturing a penicillin producing microorganism of the Penicillium genus in a medium containing a source of carbon and energy, a source of nitrogen, inorganic salts, and side-chain precursor followed by the step of recovering the penicillin from the medium, wherein the improvement comprises employing ethanol as the major source of carbon and chemical energy.

4,164,446

## PROSTAGLANDIN DERIVATIVES

Arthur F. Marx, Delft, and Jean Doodewaard, Schipluiden, both of Netherlands, assignors to Gist Brocades N.V., Netherlands

Division of Ser. No. 561,895, Mar. 25, 1975, Pat. No. 4,054,595.

This application Sep. 9, 1977, Ser. No. 831,950

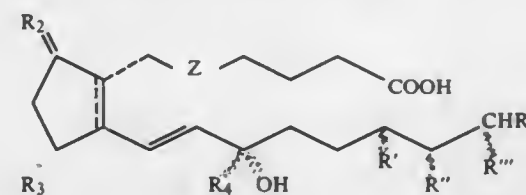
Claims priority, application United Kingdom, Mar. 26, 1974, 13399/74; Mar. 26, 1974, 13400/74

Int. Cl.<sup>2</sup> C12D 1/02

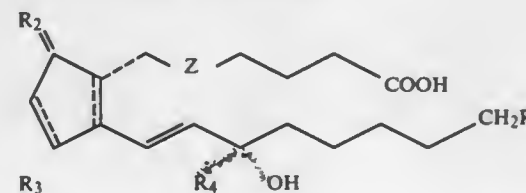
U.S. Cl. 435—63

6 Claims

1. Process for the preparation of 18 $\xi$ -, 19 $\xi$ - or 20 $\xi$ -hydroxy-prostaglandin compounds of the formula:



wherein the dotted line in the position 8-12 indicates the optional presence of a double bond and the waved lines indicate that the substituents at the represented bonds are either in the  $\alpha$  or  $\beta$  position; Z represents  $-\text{CH}_2\text{CH}_2-$  or  $\text{cis}-\text{CH}=\text{CH}-$ ; R<sub>1</sub> represents a hydrogen atom or a methyl or ethyl group; R<sub>2</sub> represents either an oxygen atom or a hydrogen atom and an  $\alpha$  or  $\beta$  hydroxy group; R<sub>3</sub> represents a hydrogen atom or a hydroxyl group; R<sub>4</sub> represents a hydrogen atom or a methyl group; one of R', R'' and R''' represents a hydroxyl group and the others a hydrogen atom, which comprises subjecting a compound of the formula:



wherein the dotted line in the position 10-11 indicates the optional presence of a double bond in case the 8-12 position is saturated and the other symbols are as defined hereinabove, to the hydroxylating activity of microorganisms or the enzymes thereof of the class Oomycetes, Coelomycetes, Hyphomycetes, Gasteromycetes, Hymenomycetes, Pyrenomycetes, Loculoascomycetes or Zygomycetes or, as far as the introduction of a hydroxyl group in position 18 or 19 is concerned, of the genus Streptomyces.

4,164,447

## O-TRANSCARBAMOYLASE

Ian D. Fleming, Chalfont St. Peter; Michael K. Turner, Wembley, and Stephen J. Brewer, High Wycombe, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Division of Ser. No. 768,945, Feb. 15, 1977, Pat. No. 4,075,061.

This application Nov. 22, 1977, Ser. No. 854,032

Claims priority, application United Kingdom, Feb. 19, 1976, 6623/76

Int. Cl.<sup>2</sup> C12D 13/10

U.S. Cl. 435—173

6 Claims

1. An O-transcarbomoylase of microbial origin which is capable of transferring a carbamoyl group to a 3-hydroxymethyl cephalosporin to produce a 3-carbamoyloxymethyl cephalosporin, and which is partially or completely free from deleterious enzymes.

4,164,448

## ACTIVATION OF CHOLESTEROL OXIDASE FOR CHOLESTEROL ASSAY

Peter Roeschlau; Gunter Lang; Klaus Beaucamp, all of Tutzing; Erich Bernt, Munich, and Wolfgang Gruber, Tutzing-Unterzeisinger Am Oberanger, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Continuation of Ser. No. 529,669, Dec. 4, 1974, abandoned. This application Feb. 14, 1977, Ser. No. 768,530

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1973, 2361169; Aug. 16, 1974, 2439348

Int. Cl.<sup>2</sup> C07G 7/02; G01N 31/14

U.S. Cl. 435—11

23 Claims

1. Process for the activation of analytically pure, detergent-free, storage-stable cholesterol oxidase, recovered from a micro-organism by extraction with a surfactant, for the analytic determination of cholesterol which process comprises removing all traces of said surfactant from said cholesterol oxidase to produce a surfactant-free cholesterol oxidase and then adding to an aqueous solution of the surfactant-free cholesterol oxidase between 0.005% to 0.1% by weight, based on the weight of the aqueous cholesterol oxidase solution, of at least one surface-active compound with lipophilic and hydrophilic properties before use of said cholesterol oxidase.

17. Diagnostic agent in solid form for the detection and determination of cholesterol and cholesterol esters in body fluids which comprises a solid carrier having impregnated or embedded therein cholesterol oxidase, a system for the detection of hydrogen peroxide, buffer and from 2 to 30%, based on the total solid diagnostic agent of at least one surface-active compound with lipophilic and hydrophilic properties.

4,164,449

## SURFACE SEPARATION TECHNIQUE FOR THE DETECTION OF MICROBIAL PATHOGENS

Gordon L. Dorn, Dallas, Tex., and John R. Haynes, Florissant, Mo., assignors to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Nov. 3, 1977, Ser. No. 848,337

Int. Cl.<sup>2</sup> C12K 1/04

U.S. Cl. 435—30

10 Claims

1. In a method of detecting the presence of microbial pathogens in a lysed blood sample wherein blood is mixed with a lysing reagent, the improvement consisting of: concentrating said microbial pathogens and separating said microbial pathogens from the residual of said lysed blood sample by; depositing said lysed blood sample on a continuous smooth surface within a confined sterile zone; subjecting said confined sterile zone containing said lysed blood sample to centrifugation thereby causing said microbial pathogens to pass out of suspension in said lysed blood sample and concentrate on said continuous smooth surface; and



separating said concentrated microbial pathogens from contact with the residual portion of said lysed blood sample.

4,164,450

# CONTROL SYSTEM FOR A FURFURAL REFINING UNIT RECEIVING LIGHT SOUR CHARGE OIL

Avilino Sequeira, Jr.; John D. Begnaud, and Frank L. Barger, all of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

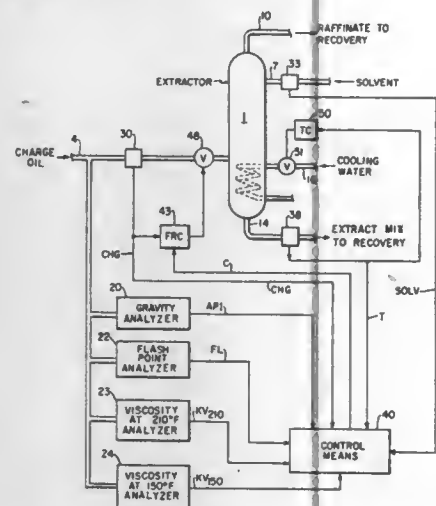
Continuation of Ser. No. 851,994, Nov. 16, 1977, abandoned.

This application Jun. 5, 1978, Ser. No. 912,911

Int. Cl.<sup>2</sup> C10G 21/00; G06G 7/58

U.S. Cl. 196—14.52

9 Claims



1. A control system for a furfural refining unit receiving light sour charge oil and furfural one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control system, treats the received light sour charge oil with the received furfural to yield extract mix and raffinate, comprising gravity analyzer means for sampling the charge oil and providing a signal API corresponding to the API gravity of the charge oil, flash point analyzer means for sampling the charge oil and providing a signal FL corresponding to the flash point temperature of the charge oil, viscosity analyzer means for sampling the charge oil and providing signals KV<sub>150</sub> and KV<sub>210</sub> corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, flow rate sensing means for sensing the flow rates of the charge oil and of the furfural and providing signals CHG and SOLV corresponding to the charge oil flow rate and the furfural flow rate, respectively, temperature sensing means for sensing the temperature of the extract-mix and providing a corresponding signal T, and control means connected to all of the analyzer means, and to all the sensing means for controlling the other flow rate of the charge oil and the furfural flow rates in accordance with signals API, FL, KV<sub>210</sub>, KV<sub>150</sub>, T, CHG and SOLV.

4,164,451

# PRESSURE RESPONSIVE FRACTIONATION CONTROL

Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 5, 1978, Ser. No. 912,690

Int. Cl.<sup>2</sup> F25J 3/02

U.S. Cl. 203—2

30 Claims

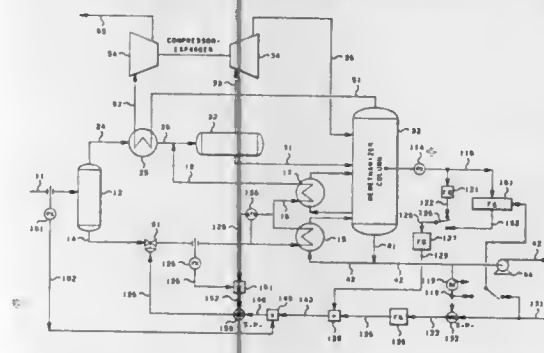
1. Apparatus comprising: fractionation column means for receiving at least one feed material stream and delivering an overhead product stream from the top portion thereof and a bottom product stream from the bottom portion thereof; heating means for providing heat to said bottom portion of said fractionation column means; pressure transducer means for sensing the pressure at a

preselected location within said fractionation column means and delivering a column pressure signal representative of the thus sensed pressure;

a first signal conversion means for accepting said column pressure signal and delivering in response thereto a temperature requirement signal representative of the value of a column bottom temperature for said fractionation column means required to provide a preselected value of a constituent ratio in said bottom product stream at the column pressure represented by said column pressure signal;

a second signal conversion means for accepting said temperature requirement signal and delivering in response thereto a heat requirement signal representative of the direction and magnitude of the change in heat input to said fractionation column means required to provide the column bottom temperature for said fractionation column means required to provide said preselected value of said constituent ratio in said bottom product stream at the column pressure represented by said column pressure signal;

analyzer means for analyzing said bottom product stream and delivering an analysis signal representative of the



analyzed value of said constituent ratio in said bottom product stream;

analysis controller means for delivering, in response to a comparison of said analysis signal with a constituent ratio set point signal, a temperature requirement adjustment signal representative of the adjustment of said temperature requirement signal necessary to compensate for the difference between said preselected value of said constituent ratio and the analyzed value of said constituent ratio;

a third signal conversion means for accepting said temperature requirement adjustment signal and delivering in response thereto a required heat correction signal representative of the adjustment of said required heat signal necessary to compensate for the difference between said preselected value of said constituent ratio and the analyzed value of said constituent ratio;

a correction means for applying said required heat correction signal to said required heat signal to produce a corrected required heat signal; and means for controlling the amount of heat flow delivered to said bottom portion of said fractionation column means by said heating means in response to said corrected required heat signal.

4,164,452

# PRESSURE RESPONSIVE FRACTIONATION CONTROL

Gary L. Funk, and Dexter E. Smith, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 5, 1978, Ser. No. 912,701

Int. Cl.<sup>2</sup> F25J 3/02

U.S. Cl. 203—2

29 Claims

1. Apparatus comprising: fractionation column means for receiving at least one feed material stream and delivering an overhead product

4,164,453

# METHOD FOR REGENERATING ZINC

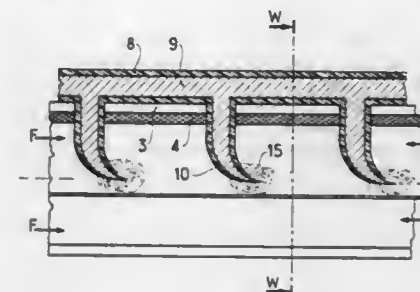
Jean Jacquelin, Limours, France, assignor to Compagnie Generale d'Electricite, Paris, France

Division of Ser. No. 857,832, Dec. 5, 1977. This application Jun. 26, 1978, Ser. No. 919,102

Claims priority, application France, Dec. 3, 1976, 76 36512 Int. Cl.<sup>2</sup> C25C 5/02

U.S. Cl. 204—10

3 Claims



stream from the top portion thereof and a bottom product stream from the bottom portion thereof;

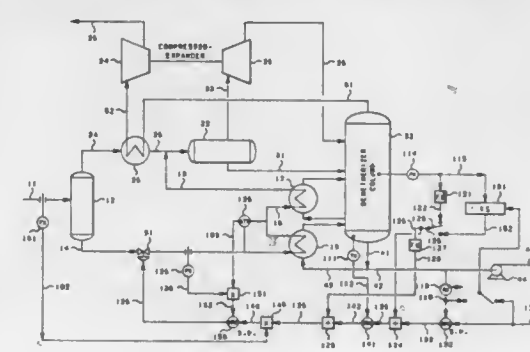
heating means for providing heat to said bottom portion of said fractionation column means;

pressure transducer means for sensing the pressure at a preselected location within said fractionation column means and delivering a column pressure signal representative of the thus sensed pressure;

a first signal conversion means for accepting said column pressure signal and delivering in response thereto a temperature requirement signal representative of the value of a column bottom temperature for said fractionation column means required to provide a preselected value of a constituent ratio in said bottom product stream at the column pressure represented by said column pressure signal;

a second signal conversion means for accepting said temperature requirement signal and delivering in response thereto a required heat signal representative of the direction and magnitude of the change in heat input to said fractionation column means required to provide the column bottom temperature required to provide said preselected value of said constituent ratio in said bottom product stream at the column pressure represented by said column pressure signal;

temperature transducer means for sensing a column bottom temperature within said fractionation column means adja-



cent the bottom thereof and delivering a bottom temperature signal representative of the thus sensed temperature; temperature controller means for delivering a required heat correction signal in response to a comparison of said bottom temperature signal with a bottom temperature set point signal;

analyzer means for analyzing said bottom product stream and delivering an analysis signal representative of the analyzed value of said constituent ratio within said bottom product stream;

analysis controller means for delivering, in response to comparison of said analysis signal with a constituent ratio set point signal, a temperature requirement adjustment signal representative of the adjustment of said temperature requirement signal necessary to compensate for the difference between said preselected value of said constituent ratio and the analyzed value of said constituent ratio;

a first correction means for applying said temperature requirement adjustment signal to said temperature requirement signal to produce said bottom temperature set point signal;

a second correction means for applying said required heat correction signal to said required heat signal to produce a corrected required heat signal; and

means for controlling the amount of heat flow delivered to said bottom portion of said fractionation column means by said heating means in response to said corrected required heat signal.

1. A method of regenerating zinc from an alkaline zincate solution which is in contact with at least two electrodes connected to a D.C. generator so that zinc particles are deposited on the negative electrode and oxygen is evolved at the positive electrode; said method comprising alternating period steps including a deposition step in which the solution is conveyed past the negative electrode in a first direction at a speed which is sufficiently low for the zinc particles to be deposited thereon, and a detachment step in which the solution is conveyed past the negative electrode in the opposite direction at a speed which is sufficiently high for the previously-deposited zinc particles to be detached from the negative electrode.

4,164,454

# CONTINUOUS LINE FOR PLATING ON METAL STRIP MATERIAL

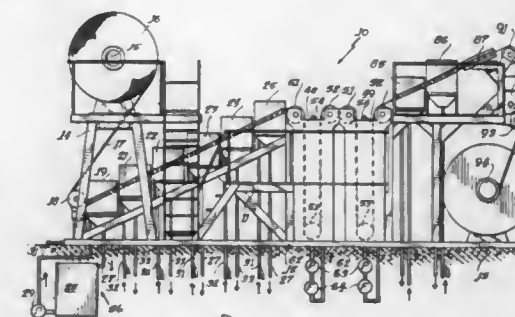
Michael A. Schober, Stuttgart, Fed. Rep. of Germany, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 1, 1977, Ser. No. 847,636

Int. Cl.<sup>2</sup> C25D 7/06

U.S. Cl. 204—28

17 Claims



1. A process for the continuous electroplating of a metallic strip comprising the steps of feeding a strip on a continuous upward incline through a series of plating preparation baths contained in a series of tanks arranged on an upward incline substantially the same as the moving strip, each of said tanks having an entrance slit in one wall and an exit slit in the opposite wall but positioned higher than the entrance slit to provide said incline for the strip passing therethrough, moving the strip through one or more plating baths, rinsing the plated strip and drying the strip, wherein the strip is passed over rollers in the plating bath and between spaced anodes therein, causing the strip to become the cathode, and pumping plating solution through the anodes toward the center of the moving strip.

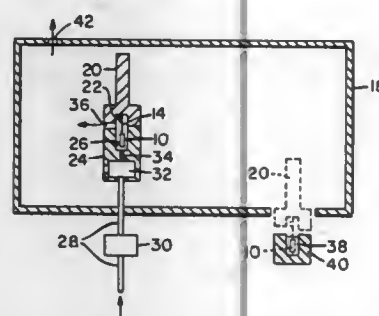
# 4,164,455 PROCESS OF FORMING A SOLID TANTALUM CAPACITOR

Bernard S. Aronson, Elmira; Andrew Herczog, and James A. Murphy, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,659  
Int. Cl.<sup>2</sup> H01G 9/24

U.S. Cl. 204—38 A

11 Claims



1. In the method of forming a solid tantalum capacitor including anodizing the surface of a porous tantalum pellet to form a dielectric layer thereon and depositing a coating of manganese nitrate over said dielectric layer, the improvement comprising heating the composite so formed to a temperature of between about 170° C. and about 250° C. within an enclosed in a nitrogen dioxide containing atmosphere for a period of time sufficient to convert said manganese nitrate to a layer of manganese dioxide, said enclosure being semiclosed and in communication with the surrounding atmosphere exclusively through at least one vent formed therein, said nitrogen dioxide atmosphere being immediately adjacent to the surface of said pellet and comprising at least about 10% by volume nitrogen dioxide and the remainder being water vapor and gas inert in the conversion process, whereby scale formation on said layer of manganese dioxide is eliminated or takes place to an insignificant degree eliminating the need for sizing the capacitor pellet.

# 4,164,456 ELECTROLYTIC PROCESS

Theodore F. Korenowski, Branford, Conn., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 15, 1978, Ser. No. 916,328

Int. Cl.<sup>2</sup> C25D 3/38, 3/12, 3/22; H01M 4/04

U.S. Cl. 204—52 R

12 Claims

1. In a metal electrodeposition process employing cathode and insoluble anode means immersed in a common electrolyte wherein metal is deposited onto a cathode surface from the electrolyte consisting essentially of water, free sulfuric acid and a dissolved metal sulfate, which dissolved metal sulfate provides the metal ions to be deposited on the cathode surface, the improvement of increasing the limiting current density without detrimentally affecting the quality of the metal deposit which improvement comprises:

adding sufficient quantities of the metal sulfate in a particulate state to maintain a solids concentration of the particulate metal sulfate in the electrolyte during the electrodeposition, providing agitation to suspend said metal sulfate solids in the electrolyte and to provide intimate contact of the resulting suspension with the cathode surface, and maintaining the free sulfuric acid concentration in the liquid phase of the electrolyte suspension between about 50 and about 500 grams per liter.

# 4,164,457 METHOD OF RECOVERING HYDROGEN AND OXYGEN FROM WATER

Heiko Barnert; Mieczyslaw Percec, both of Jülich, and Bernd D. Struck, Langerwehe, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 917,842

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728171

Int. Cl.<sup>2</sup> C25B 1/04; C01B 13/00

U.S. Cl. 204—129

4 Claims

1. A method of recovering hydrogen and oxygen from water in a galvanic or electrolytic cell having an anode, made of a material selected from the group consisting of carbon and graphite, and a cathode, said anode and said cathode being separated from one another by a membrane to form an anode and cathode chamber respectively, which method includes the steps of:

adding water, sulfur dioxide, and very small quantities of hydriodic acid to said anode chamber of said cell; electrochemically liberating hydrogen ions by anodic oxidation of said sulfur dioxide in the anolyte; decomposing said water to form sulfuric acid in said anolyte; electrolytically generating hydrogen gas at the cathode from said hydrogen ions; removing electrolytic solution from said anode chamber; evaporating water and hydriodic acid still present in said removed electrolytic solution to form an anhydride of said sulfuric acid; heating said sulfuric acid anhydride to decompose same; and returning said evaporated water and hydriodic acid to said anode chamber.

# 4,164,458 PRODUCTION OF RADIATION CROSSLINKED POLYMERIC COMPOSITIONS USING DIACETYLENES

Gordhanbhai N. Patel, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 7, 1977, Ser. No. 775,150

Int. Cl.<sup>2</sup> C08F 255/00; B01J 1/10

U.S. Cl. 204—159.17

13 Claims

1. A method for producing a crosslinked polymeric composition which comprises the steps of admixing a diacetylene monomer, oligomer, polymer or mixture thereof, wherein the monomer has the formula,  $RNHCO-O-CH_2-C \equiv C-C \equiv C-CH_2-O-OCNHR'$ , in which R and R' are the same or different and are alkyl containing 1 to 20 carbon atoms, with a thermoplastic crosslinkable polymer and then subjecting the resulting mixture to actinic radiation or high energy ionizing radiation.

# 4,164,459 U.V.-CURABLE COATING COMPOSITION

Arie Noomen, Voorhout, and Egbert Wolters, Amsterdam, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Oct. 11, 1978, Ser. No. 950,444

Claims priority, application Netherlands, Oct. 11, 1977, 7711121

Int. Cl.<sup>2</sup> C08F 8/18, 8/34

U.S. Cl. 204—159.18

10 Claims

1. In a coating composition which is curable under the influence of ultraviolet light and is based on a U.V.-curable binder, a photoinitiator and a nitrogen-containing accelerator, the improved composition which comprises as an accelerator a tetrahydro-1,3-oxazine compound or an oxazolidine compound.

# 4,164,460 SYSTEM FOR THE DIELECTROPHORETIC SEPARATION OF PARTICULATE AND GRANULAR MATERIALS

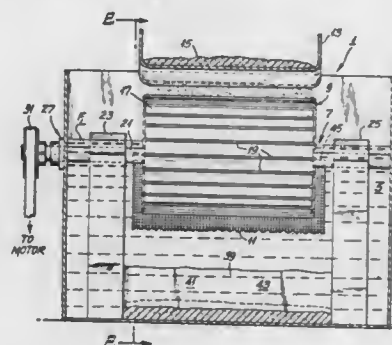
Cy E. Jordan, and Casimir P. Weaver, both of Tuscaloosa, Ala., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 759,202, Jan. 13, 1977. This application Apr. 17, 1978, Ser. No. 896,873

Int. Cl.<sup>2</sup> B03C 5/00, 7/06

U.S. Cl. 204—180 R

8 Claims



1. A process for separating particulate and granular materials by dielectrophoresis wherein the materials are separated by a divergent electric field produced within a liquid dielectric medium, which process comprises:

a. providing a contact zone defined by the space between a cylindrical-shaped rotatable electrode having a non-uniform conductor surface and an arcuate-shaped perforate electrode, b. applying a voltage to the electrodes to create a divergent electric field in the contact zone, c. passing the materials to be separated into the contact zone during rotation of the rotatable electrode, d. collecting the materials having dielectric constants lower than that of the liquid dielectric medium through the perforate electrode, and e. separating by attraction to the non-uniform conductor surface of the rotatable electrode those materials having dielectric constants higher than that of the liquid dielectric medium.

# 4,164,461 SEMICONDUCTOR INTEGRATED CIRCUIT STRUCTURES AND MANUFACTURING METHODS

Hartmut Schilling, Boxboro, Mass., assignor to Raytheon Company, Lexington, Mass.

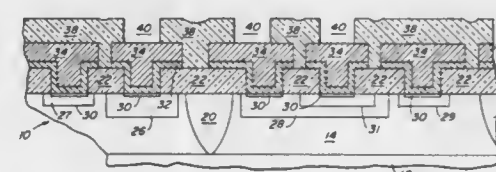
Division of Ser. No. 756,508, Jan. 3, 1977, Pat. No. 4,107,726.

This application May 12, 1978, Ser. No. 905,264

Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—192 EC

7 Claims



1. A method of forming a multiple layer interconnecting system for a semiconductor integrated circuit comprising the steps of:

forming a first aluminum lead metal layer into a first interconnecting system on a semiconductor body; depositing an insulating layer on the first interconnecting system; forming apertures in selected regions of such insulating layer

to expose portions of the first aluminum lead metal layer of the first interconnecting system; depositing a refractory metal layer over the insulating layer and through the apertures onto selected regions of the first aluminum lead metal layer of the first interconnecting system; and depositing a second aluminum lead metal layer over the refractory metal layer, and removing selected portions of the refractory metal layer and the second aluminum lead metal layer to form a second interconnecting system.

2. The method recited in claim 1 wherein the aperture forming step comprises the step of sputter cleaning the portions of the first aluminum lead metal layer and wherein the refractory metal depositing step includes the step of sputter depositing said refractory metal on said sputter cleaned portions of said first aluminum lead metal layer.

# 4,164,462 OXYGEN SENSOR

Norio Ichikawa, Mito; Kanemasa Sato, and Sadayasu Ueno, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

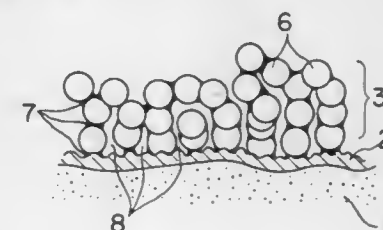
Filed Nov. 28, 1977, Ser. No. 855,325

Claims priority, application Japan, Nov. 29, 1976, 51-142250

Int. Cl.<sup>2</sup> G01N 27/58

U.S. Cl. 204—195 S

5 Claims



1. An oxygen sensor, which comprises a zirconia layer for transmitting oxygen ions therethrough, provided to separate a gas whose oxygen concentration is to be detected from a reference gas; a first electron-conducting layer having a catalytic action, provided on a surface of the zirconia layer on the side of the gas whose oxygen concentration is to be detected; a second electron-conducting layer for ionizing oxygen molecules in the reference gas and taking the oxygen ions into the zirconia layer, provided on a surface of the zirconia layer on the side of the reference gas; and a protective layer of zirconia particles provided on the outer surface of the first electron-conducting layer, said zirconia particles being bonded to one another and to the first electron-conducting layer by a high melting point adhesive comprising a powder of borosilicate glass, water glass having a melting point of 900° C. or higher, a phosphate, or cement, whereby an electrical signal is generated between the first and the second electron-conducting layers in accordance with the difference in oxygen concentrations between the gas whose oxygen concentration is to be detected and the reference gas.

# 4,164,463

## HYDROPHILIC FLUOROPOLYMERS

James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 699,302, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,099, May 20, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,472

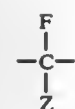
Int. Cl.<sup>2</sup> C25B 13/08, 1/46

U.S. Cl. 204—296

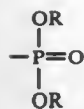
3 Claims

1. A diaphragm for a chlor-alkali cell comprising a hydrophilic fluoropolymer and a fibrous material resistant to attack by the cell liquor, wherein the hydrophilic fluoropolymer is provided as a hydrophilic fluoropolymer containing nonterminal units represented by the structure





where Z is



where

R is an alkyl radical of 1-12 carbon atoms or a cycloalkyl radical of 3-12 carbon atoms, the hydrophilic fluoropolymer having a phosphorus content of about 0.1-10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C.

4,164,464

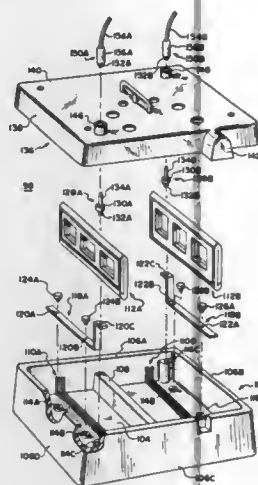
## SAMPLE CONCENTRATOR

William B. Allington, deceased, late of Lincoln, Nebr. (by Richard T. Emery, executor); James W. Nelson, Spring, Tex.; Arthur L. Cordry, Lincoln, Nebr.; Gail A. McCullough, Lawndale, Calif., and Don E. Mitchell, Lincoln, Nebr., assignors to Instrumentation Specialties Company, Lincoln, Nebr. Division of Ser. No. 781,176, Mar. 25, 1977. This application Apr. 14, 1978, Ser. No. 896,370

Int. Cl.<sup>2</sup> G01N 27/26, 27/28

U.S. Cl. 204-299 R

29 Claims



1. Apparatus for separating at least one molecular species from a sample, comprising: a sample concentrating cell; said sample concentrating cell having first and second sections; said first section including a member adapted to receive a sample; said second section including a membrane having pores sufficiently small to permit the membrane to hold said one molecular species and being adapted to receive at least one of the separated molecular species; wall means for at least partly confining said first and second sections and adapted to support a buffer solution; means for establishing an electrical potential between the side of the sample and the side of said membrane farthest from each other.

# 4,164,465 HYDROCARBON CRACKING WITH CATALYST CONTAINING A CO OXIDATION PROMOTER IN ULTRA-STABLE ZEOLITE PARTICLES

Elroy M. Gladrow, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J. Division of Ser. No. 698,902, Jun. 23, 1976, Pat. No. 4,097,410. This application Feb. 3, 1978, Ser. No. 875,175

Int. Cl.<sup>2</sup> C10G 11/04; B01J 29/12, 23/56

U.S. Cl. 208-120

10 Claims

1. A catalytic cracking operation comprising: (a) contacting hydrocarbon feedstock at cracking conditions with a hydrocarbon conversion catalyst which comprises particles of crystalline aluminosilicate zeolite containing rare earth metal and particles of an ultra-stable Y zeolite containing a CO oxidation promoter, which particles are dispersed on a porous oxide matrix to produce a catalyst containing 0.8 to 4.5 wt. % of a rare earth metal (as oxides) and 2 to 100 ppm of a CO oxidation promoter comprising a metal or a compound of a metal selected from Periods 5 and 6 of Group VIII of the Periodic Table, rhenium, chromium, manganese and combinations thereof, thereby forming cracked products and producing a spent catalyst having carbon deposited thereon, and (b) regenerating said spent catalyst in contact with oxygen at elevated temperature to substantially burn the deposited coke to CO<sub>2</sub>.

4,164,466

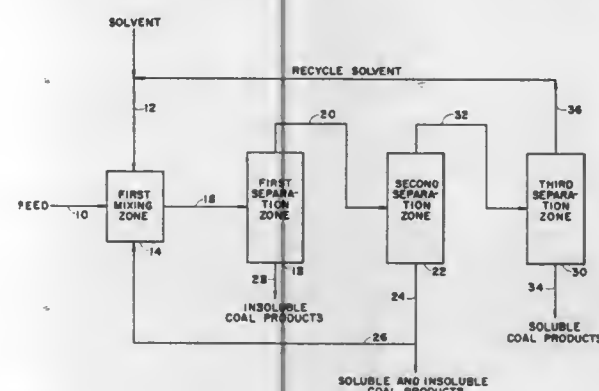
# METHOD OF IMPROVING YIELD IN A COAL LIQUEFACTION PRODUCT DEASHING PROCESS

Roger A. Baldwin, Warr Acres; Robert E. Davis, Oklahoma City; Robert E. Leonard, Oklahoma City, and Donald E. Rhodes, Oklahoma City, all of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla. Filed Mar. 20, 1978, Ser. No. 888,284

Int. Cl.<sup>2</sup> C10G 1/04, 29/20

U.S. Cl. 208-177

20 Claims



1. A coal liquefaction product deashing process comprising: providing a coal liquefaction product feed comprising soluble coal products and insoluble coal products; providing a solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di-, and tri-open chain amines containing from about 2-8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6-9 carbon atoms, heterocyclic amines containing from about 5-9 carbon atoms, and phenols

containing from about 6-9 carbon atoms and their homologs; admixing said feed with said solvent in a mixing zone to provide a feed mixture; introducing said feed mixture into a first separation zone maintained at an elevated temperature and pressure; separating said feed mixture in said first separation zone into a first heavy phase and a first light phase comprising soluble coal products, solvent and some insoluble coal products; withdrawing said first light phase from said first separation zone; introducing said withdrawn first light phase into a second separation zone maintained at a temperature level higher than the temperature level in said first separation zone and at an elevated pressure; separating said first light phase in said second separation zone into a second heavy phase comprising insoluble coal products, soluble coal products and some solvent and a second light phase comprising soluble coal products and solvent as said deashed coal liquefaction product; withdrawing said second heavy phase from said second separation zone; recycling at least a portion of said withdrawn second heavy phase to said first separation zone in admixture with said feed mixture to recover soluble coal products therefrom; and withdrawing said first heavy phase from the first separation zone, said first heavy phase having an increased mineral matter content effected through recycle of said portion of the second heavy phase.

4,164,467

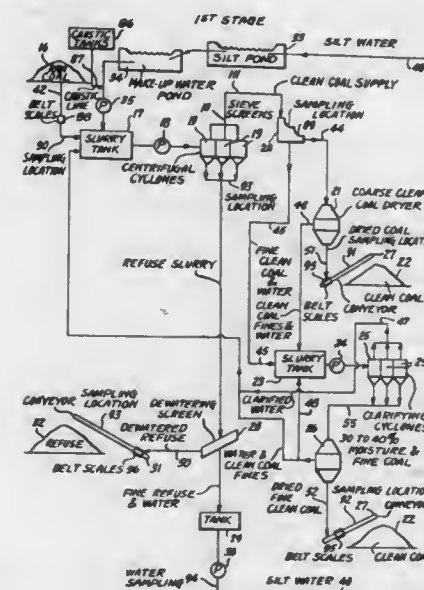
# COAL WASHING PLANT EMPLOYING A FEED EQUALIZER AND A CRITICALLY DIMENSIONED DEFLECTOR SURFACE IN THE INLET PIPES OF A PLURALITY OF CYCLONES

Delbert I. Liller, Rte. 4, Box 64, Deer Park, Md. 21550 Division of Ser. No. 860,330, Dec. 14, 1977. This application Jul. 19, 1978, Ser. No. 926,058

Int. Cl.<sup>2</sup> B03B 7/00

U.S. Cl. 209-10

6 Claims



1. A continuously operating centrifugal separating cyclone coal washing plant for raw crushed coal having a make up water reservoir, a crushed coal supply, a slurry tank for mixing raw crushed coal from said supply and water in a water line from said reservoir and a pump for pumping water in said water line from said reservoir into said slurry tank and into an inlet pipe of circular cross section at the top of the cyclone, the

cyclone having a clean coal outlet at the top and a refuse outlet at the bottom, that improvement comprising:

a plurality of centrifugal separating cyclones fed by a pump delivering slurry of high solids content at fixed pressure and a bowl velocity of about 8 to 28 linear feet per second, each of the cyclones operating at a pressure difference between the inlet and outlet due to said pumping velocity under deflected streamlined flow conditions from said slurry tank by means of a flat generally bodied deflector having a truncated spherical triangle cap portion to separate the coal into a clean coal fraction at the top of each cyclone and refuse which is withdrawn at the bottom of each cyclone; said flat deflector having a center angle of 114° to 148°, deflector angle of 8° to 12° and an included angle of 120° to 170°; a dewatering screen to separate clean coal particles from water; a centrifugal dryer for said clean coal particles; a silt pond which receives the water separated from the refuse; the supernatant liquid from said silt pond feeding water into said make up reservoir; and a caustic soda tank to dose aqueous sodium hydroxide into the water line between the pump and the make up water reservoir to adjust the pH to about 6-7 and compensate for acidity developed during continuous operation.

4,164,468

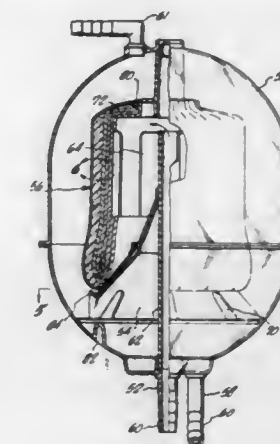
# BLOOD TREATING DEVICE AND METHOD OF OPERATION

Donald A. Raible, Orange, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif. Division of Ser. No. 644,451, Dec. 29, 1975, which is a continuation-in-part of Ser. No. 542,593, Jan. 20, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,531

Int. Cl.<sup>2</sup> B01D 19/02

U.S. Cl. 210-23 R

4 Claims



3. A method for treating gas containing blood comprising: receiving blood into a blood receiving and treating housing lower portion; passing said blood along a predetermined blood flow path including passing said blood upwardly through an extended hollow column and discharging said blood from said hollow column into an upper portion of said receiving and treating housing; removing gases and other foreign matter from the blood with a defoamer means spaced apart from said hollow column; deflecting blood and uniformly distributing blood with a distribution plate positioned about the exterior of said hollow column; and removing said treated blood from said blood receiving and treating housing lower portion.

to 40% by weight of organic, water-soluble, anionic, synthetic surface active agent, from 4 to 20% by weight of water-soluble alkali metal silicate and from 2 to 40% by weight of water-soluble alkali metal carbonate, so that reaction between said alkali metal silicate and carbon dioxide in the ambient atmosphere is inhibited, which comprises: mixing with the preformed detergent granules from 0.3 to 5 parts by weight, per 100 parts by weight of said detergent granules, of a powder of water-insoluble agent selected from the group consisting of magnesium oxide, aluminum hydroxide, calcium carbonate, heavy white carbon and titanium oxide, said agent having an average particle diameter of less than 1.5 microns, and thereby adhering said powder to the surfaces of said granules in the form of an external covering thereon.



**4,164,479**  
**METHOD FOR CALCINING NUCLEAR WASTE SOLUTIONS CONTAINING ZIRCONIUM AND HALIDES**  
 Billie J. Newby, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 12, 1978, Ser. No. 868,953

Int. Cl.<sup>2</sup> G21F 9/14

U.S. Cl. 252—301.1 W

6 Claims

1. In the method of solidifying aqueous nuclear fuel reprocessing waste solutions containing zirconium, fluoride and chloride for long-term storage by adding calcium nitrate to the solution in an amount sufficient to establish a calcium to fluoride mole ratio of at least 0.55, and heating the resulting solution to calcining temperature, thereby calcining the waste solution to form a calcine, the calcium nitrate being present to suppress the volatility of the fluoride during calcination, the improvement wherein aluminum is added to the waste solution before the addition of calcium nitrate, the aluminum being added as a soluble, compatible compound in an amount sufficient to establish an aluminum to fluoride mole ratio of from 0.27 to 0.40 whereby the aluminum reduces the amount of gelatinous solid formed in the solution due to the presence of calcium nitrate and suppresses the volatility of the chloride during calcination of the waste solution.

**4,164,480**  
**POLYCHROMOPHORIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS**  
 Gether Irick, Jr., James C. Ownby, and Richard H. S. Wang, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

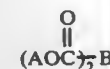
Filed Jan. 9, 1978, Ser. No. 868,086

Int. Cl.<sup>2</sup> C07D 211/46; C08K 5/34, 5/35, 5/47

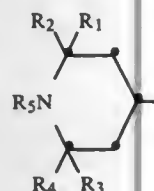
U.S. Cl. 252—402

24 Claims

13. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amount of compounds having the formula:



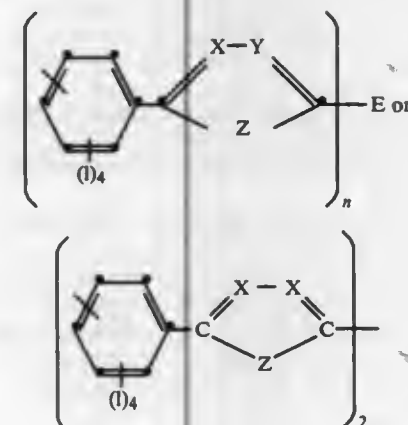
wherein A is a group having the structure



wherein

R<sub>1</sub> and R<sub>2</sub> and R<sub>3</sub> and R<sub>4</sub> are each alkyl having 1-6 carbons; R<sub>1</sub> and R<sub>2</sub> and R<sub>3</sub> and R<sub>4</sub>, together with the carbon to which they are bound, form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group; and R<sub>5</sub> is hydrogen, oxyl, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl or alkyl substituted benzyl;

B is a heterocyclic group having the structures



wherein

X and Y are a carbon atom, a carbon atom containing an alkyl group having 1 to 12 carbon atoms, a carbon atom containing an aryl group having 6 to 10 carbon atoms or a nitrogen atom; Z is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12 carbon atoms; I is hydrogen, chloro, bromo, fluoro, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, aryloxy, substituted amino or cyano, said I being present on all positions of the benzenoid rings, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the carbonyloxy group, E is a substituted or unsubstituted branched or unbranched alkylene group containing 1 to 12 carbon atoms or arylene group containing 6 to 18 carbon atoms and n is 1 or 2.

**4,164,481**  
**PROCESS OF REGENERATING A NOBLE METAL CATALYST USED IN THE REDUCTION OF ORGANIC NITRO COMPOUNDS**  
 King W. Ma; Irvin W. Potts, and Russell A. Malek, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 27, 1978, Ser. No. 872,986

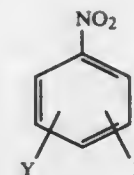
Int. Cl.<sup>2</sup> B01J 23/96, 21/20

U.S. Cl. 252—412

10 Claims

1. A process for regenerating the activity of a noble metal catalyst which has become deactivated in the reduction of organic compounds with nitro moieties to the corresponding aminated derivative, comprising the sequential steps of: (a) contacting said deactivated catalyst with a liquid, polar organic solvent having from 1 to 10 carbon atoms; (b) contacting the catalyst with a liquid, aqueous solution of an alkali metal hydroxide at a temperature from about 20° C. to about 150° C.; (c) contacting the catalyst with an oxygen-containing gas at a temperature from about 20° C. to about 150° C. prior to or following Step (b); and (d) contacting said catalyst once again with a liquid, polar organic solvent having from 1 to 10 carbon atoms, so as to effect regeneration of the deactivated catalyst.

10. A process for regenerating the activity of a palladium catalyst supported on carbon with a concentration from about 0.5 percent to about 2 percent palladium by weight, where said catalyst has become deactivated to a level of activity less than 50 percent of that of a broken in, new catalyst in the reduction of compounds of the formula



wherein X and Y are, independently, hydrogen, hydroxyl, nitro, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, hydroxyalkyl of 1 to 3 carbon atoms, amino, or hydroxy-amino moieties and at least one of the X and Y substituents is located in an ortho or para position relative to the nitro group, said process comprising the sequential steps of: (a) contacting said deactivated catalyst with a liquid, polar organic solvent having from 1 to 10 carbon atoms; (b) contacting the catalyst under a substantially inert atmosphere slightly above atmospheric pressure with a liquid, aqueous solution of sodium hydroxide with a concentration of at least about 0.1 normal and at a temperature from about 50° C. to about 150° C.; (c) washing the hydroxide-treated catalyst with water until the wash water is substantially neutral; (d) contacting the water-washed catalyst with an oxygen-containing gas at a temperature from about 75° C. to about 150° C.; and (e) contacting said oxygen-treated catalyst once again with a liquid, polar organic solvent having from 1 to 10 carbon atoms, so as to effect regeneration of the deactivated catalyst to a level of activity at least 70 percent of the level of activity of a broken in, new catalyst.

**4,164,482**  
**ABSORBENT FOR WATER PURIFICATION AND PROCESS FOR PREPARING SAME**  
 Harald Berger; Karl-Ernst Quentin, both of Kelkheim, and Ludwig Weil, Munich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 806,273

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626732

Int. Cl.<sup>2</sup> B01J 21/18, 29/06, 31/02

U.S. Cl. 252—428

8 Claims

1. Absorbent for water purification consisting essentially of organic polymer and inorganic absorbing matter, wherein the two components are linked with each other epitactically.

3. Absorbent as claimed in claim 1, wherein the inorganic absorbing matter is aluminum oxide, silica gel, a zeolite, active carbon, bleaching earth, bentonite, fuller's earth, activated bauxite, or activated kieselguhr.

**4,164,483**  
**RARE EARTH EXCHANGE X ZEOLITES, CATALYST EMPLOYING THE SAME AND METHOD FOR PRODUCING THE SAME**  
 Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 718,167, Sep. 9, 1976, Pat. No. 4,058,484. This application Jun. 20, 1977, Ser. No. 808,268

Int. Cl.<sup>2</sup> B01J 29/06

U.S. Cl. 252—455 Z

9 Claims

1. An X type faujasite zeolite having in excess of 0.9 equivalents of rare earth cations per gram atom of aluminum in the zeolite and less than 0.1 equivalents of Na per gram atom of aluminum in the zeolite, the cation density composed of Na and rare earth being substantially equal to one equivalent per gram atom of the aluminum in the exchanged zeolite.

7. The process of exchanging a sodium X type zeolite which comprises forming a water slurry of rare earth salts and sodium X the ratio of the equivalents of rare earth cations per gram atom of aluminum in the zeolite being above about 1 and adjusting the pH of the mixture to be at a pH of about 5 to about 6 to form a reaction mixture and heated at a superatmospheric

pressure and at a temperature of about 250° F. to 400° F. to introduce into the zeolite in excess of 0.9 equivalents of rare earth cation per gram atom of aluminum in the exchanged zeolite and washing the exchanged zeolite.

**4,164,484**  
**PROCESS FOR RECOVERING POLYOLEFIN AND POLYSTYRENE MATERIALS BY DISSOLVING, VACUUM-EVAPORATING AND PRECIPITATING**  
 Masahiro Tokuda; Tadaaki Tamura; Hikokusu Kajimoto; Takafumi Shimada, all of Hiroshima; Toshiya Oyamoto, Mihara, and Setsumi Ochial, Fukuyama, all of Japan, assignors to Director-General, Masao Kubota of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 4, 1978, Ser. No. 866,857

Int. Cl.<sup>2</sup> C08J 11/04

U.S. Cl. 260—2.3

4 Claims

1. A process for recovering polyolefin and polystyrene from plastic wastes which comprises: dissolving a mixture of plastics containing polyolefin plastics using a hydrocarbon solvent; vacuum-evaporating the solvent of the solution to thereby cause precipitation of the polyolefin plastics contained in the solution; separating and collecting the major portion of the plastics thus precipitated; dividing further the resulting separated solution into a concentrated solution of the precipitate yet remaining admixed therein and the phase of a solution not substantially containing the precipitate; recycling and using again the concentrated solution of the precipitate as a solution for dissolving said mixture of plastics; and removing the solvent from the phase of a solution not substantially containing the precipitate to thereby recover polystyrene plastics.

**4,164,485**  
**GLASS FIBER COATING COMPOSITION FOR GLASS FIBER FILAMENT BUNDLES TO PRODUCE REINFORCING MEMBERS FOR ELASTOMERIC ARTICLES**  
 Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 762,538, Jan. 26, 1977, abandoned, which is a division of Ser. No. 604,367, Aug. 13, 1975, which is a continuation-in-part of Ser. No. 535,389, Dec. 23, 1974, abandoned. This application Feb. 10, 1978, Ser. No. 876,588

Int. Cl.<sup>2</sup> C08L 7/02, 25/10, 61/12

U.S. Cl. 260—5

8 Claims

1. A glass fiber aqueous coating composition, said glass fibers being useful for reinforcing elastomers, comprising in part by weight on a dry solids basis, and also the latex on the basis of 100 parts of total elastomer:

- 10-30 neoprene latex
- 70-90 styrene-butadiene-vinylpyridine latex
- 4-20 resorcinol formaldehyde resin
- 2-6 resorcinol
- 1-3 formaldehyde
- up to 1.5 hexamethylene tetraamine.

**4,164,486**  
**RADIATION-CURABLE PREPOLYMER**  
 Kin-ichi Kudo, Chiba; Katsuyoshi Nakamura, and Takatoshi Tazawa, both of Ichihara, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Jan. 3, 1978, Ser. No. 866,343

Int. Cl.<sup>2</sup> C09D 3/64, 3/66, 3/68

U.S. Cl. 260—22 TN

6 Claims

1. A substantially NCO-free radiation-curable prepolymer which is the reaction product of (A) an organic diisocyanate

with (B) a low-molecular weight hydroxyl-containing unsaturated monomer having both a hydroxyl group and a polymerizable double bond and (C) a polyester polyol containing 2 to 8 hydroxyl groups per molecule, the polyester polyol (C) having a number average molecular weight of 400 to 6,000 and a hydroxyl equivalent weight of 200 to 3,000 and containing a dimer acid residue derived from 9 to 70% based on the weight of the total weight of the starting materials, of dimer acid and an alcohol residue derived from 20 to 75%, based on the total weight of the starting materials, of an ethylene oxide or propylene oxide adduct of bisphenol A with the proportion of the oxide added being 2 to 4 moles per mole of bisphenol A.

**4,164,487**  
**WATER-THINNABLE MIXTURES OF**  
**BASE-NEUTRALIZED PRODUCTS OF REACTION OF**  
**H<sub>3</sub>PO<sub>4</sub> WITH POLYETHER EPOXIDES AND WITH**  
**OTHER TYPE EPOXIDES**

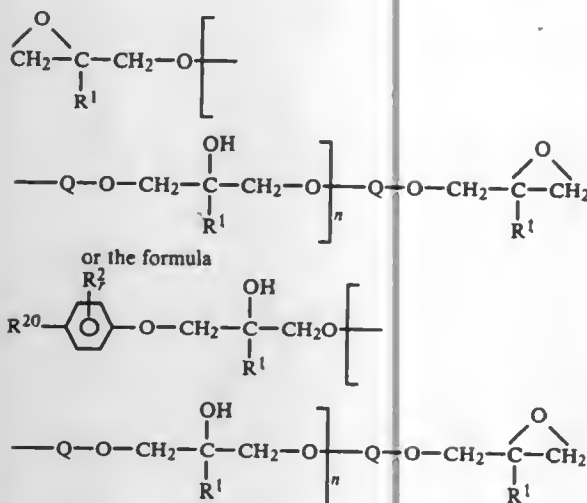
Patrick H. Martin, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 753,765, Dec. 23, 1976, abandoned, and a continuation-in-part of Ser. No. 753,763, Dec. 23, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,167

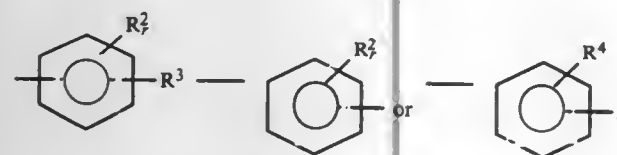
Int. Cl.<sup>2</sup> C08L 63/00  
 U.S. Cl. 260—29.2 EP 33 Claims

1. The process for preparing water-thinnable, base-salified reaction products of orthophosphoric acid and polyether epoxides which comprises:

(I) reacting orthophosphoric acid with  
 (1) a polyether epoxide resin E<sup>1</sup> consisting essentially of molecules, each of which is of the formula



wherein Q, independently, in each occurrence, is



n is an integer of from 0 to 40, r is zero, 1 or 2 and, independently in each occurrence;

R<sup>1</sup> is H, methyl or ethyl,  
 R<sup>2</sup> is —Br, —Cl or a C<sub>1</sub> to C<sub>4</sub> alkyl or alkenyl group,  
 R<sup>3</sup> is a C<sub>1</sub>–C<sub>4</sub> alkylene or alkenylene group, >C(CF<sub>3</sub>)<sub>2</sub>,  
 —CO, —SO<sub>2</sub>—, —S—, —O— or a valence bond, and  
 R<sup>4</sup> is —Br, —Cl or a C<sub>1</sub> to C<sub>4</sub> alkyl or alkenyl group,  
 R<sup>20</sup> is H or alkyl of 1 to 12 carbons; and

(2) E<sup>2</sup>, a vicinal epoxide, other than one of formula (a) or (q), which has an EEW (epoxide equivalent weight) within

the range of from about 90 to about 2000 and is convertible to a water-dispersible material by reaction with orthophosphoric acid and neutralization with a base, said reaction being carried out by contacting E<sup>1</sup> and E<sup>2</sup> with an orthophosphoric acid source material and from 0 to 25 molecular proportions of water per molecular proportion of H<sub>3</sub>PO<sub>4</sub> provided by said source material until the fraction of the oxirane groups in E<sup>1</sup> and E<sup>2</sup> converted is at least sufficient to render the resulting mixed product water-thinnable when contacted with a base, the amount of orthophosphoric acid included as such in said source material, or obtainable therefrom by hydrolysis, being such as to provide at least 0.3 P—OH groups per oxirane group, and the mole ratio of E<sup>1</sup> to E<sup>2</sup> epoxides being within the range of from about 0.1 to about 100, and

(II) contacting the resulting mixed reaction product with at least enough of a base to render it water-thinnable.

**4,164,488**  
**AQUEOUS THERMOSETTING ACRYLIC ENAMEL**  
 Basil V. Gregorovich, and James J. Sanderson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 641,374, Dec. 17, 1975, abandoned, which is a continuation of Ser. No. 456,142, Mar. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 307,004, Nov. 16, 1972, abandoned. This application Jan. 3, 1978, Ser. No. 866,649

Int. Cl.<sup>2</sup> C08L 61/28, 33/12  
 U.S. Cl. 260—29.4 UA 8 Claims

1. An aqueous thermosetting acrylic enamel coating composition free of external surfactants which comprises 10–60% by weight of film-forming constituents and correspondingly

(a) 90–40% by weight of water and up to 20% by weight of a solvent for the film-forming constituents; wherein the film-forming constituents consist essentially of

(1) 60–90% by weight, based on the weight of the film-forming constituents, of an acrylic polymer having a uniformity factor of 80–95% and consists essentially of polymerized monomers of about

(a) 50–60% by weight, based on the weight of the acrylic polymer, of methyl methacrylate;

(b) 30–40% by weight, based on the weight of the acrylic polymer, of butyl acrylate;

(c) 5–10% by weight, based on the weight of the acrylic polymer, of hydroxyethyl acrylate;

(d) 4–12% by weight, based on the weight of the acrylic polymer, of acrylic acid or methacrylic acid;

(q) wherein 30–50% by weight of the acrylic polymer is dispersed and has a particle size of 0.01–0.10 microns and the remaining 50–70% is soluble and dissolved and the polymer has a carboxyl to hydroxyl ratio of 1:0.3 to 1:1.5, an acid number of about 35–80 and a weight average molecular weight of 10,000–50,000, and

(2) 10–40% by weight, based on the weight of the film-forming constituent, of a hexakis (methoxymethyl) melamine; and the composition contains sufficient amine to provide a pH of about 6–9.

**4,164,489**  
**CONTINUOUS EMULSION POLYMERIZATION OF**  
**VINYL ACETATE AND ETHYLENE**

Wiley E. Daniels, Easton, Pa., and William E. Lenney, Middlesex, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 24, 1978, Ser. No. 899,421  
 Int. Cl.<sup>2</sup> C08F 210/02; C08L 23/04

U.S. Cl. 260—29.6 R 12 Claims

1. In a continuous process for forming a latex comprising the steps of polymerizing a reaction mixture comprising vinyl acetate, ethylene, water, a free radical initiator, and a protective colloid under pressure to form a latex containing a copoly-

mer consisting essentially of vinyl acetate, ethylene and 0–10% of other vinyl monomer, the improvement which comprises:

(a) continuously charging said reaction mixture to a polymerization vessel;

(b) conducting an initial polymerization of said reaction mixture in said polymerization vessel in the presence of a seed latex for a sufficient time and sufficient temperature to form a vinyl acetate ethylene copolymer, said copolymer having a glass transition temperature of from minus 20° C. to plus 10° C.; and

(c) continuously removing latex formed in (b) from the polymerization vessel at a rate commensurate with that of step (a) when the unreacted vinyl acetate content by weight of the latex is from 5–20% of said latex formed in (b) and then effecting post-polymerization of the unreacted vinyl acetate in the removed latex at an ethylene pressure of not more than about 300 psia until the unreacted vinyl acetate in the removed latex is not more than 1% by weight.

**4,164,490**  
**BITUMEN COMPOSITIONS CONTAINING POLYMERS**  
 Germain Hagenbach, Vernalson, and Pierre Cazaux, Communay, both of France, assignors to Elf Union, Paris, France  
 Filed Oct. 7, 1977, Ser. No. 840,326

Claims priority, application France, Oct. 8, 1976, 76 30316  
 Int. Cl.<sup>2</sup> C08K 5/01; C08L 95/00

U.S. Cl. 260—33.6 UA 9 Claims

1. Bitumen compositions comprising 90 to 99.9% by weight of a bitumen, the softening point of which is between 2° and 120° C., and 0.1 to 10% by weight of a norbornene homopolymer having an average molecular weight between 1,000,000 and 3,000,000.

**4,164,491**  
**THERMALLY CURABLE SILICONE RUBBER**  
**COMPOSITIONS**

Kunio Itoh, and Takeshi Fukuda, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1978, Ser. No. 871,849  
 Claims priority, application Japan, Jan. 27, 1977, 52-7308  
 Int. Cl.<sup>2</sup> C08L 83/04

U.S. Cl. 260—37 SB 9 Claims

1. A thermally curable silicone rubber composition consisting essentially of

(a) 100 parts by weight of a diorganopolysiloxane gum,  
 (b) from 10 to 200 parts by weight of a polyurethane elastomer having a softening point not lower than 100° C.,  
 (c) from 10 to 400 parts by weight of a reinforcing filler, and  
 (d) from 0.1 to 10 parts by weight of an organic peroxide.

**4,164,492**  
**NOVEL CATALYST FOR CURING POLYESTER RESINS**  
**AND METHOD FOR DETERMINING THE DEGREE OF**  
**CURE IN POLYESTER AND EPOXY RESIN SYSTEMS**  
 Troy L. Cooper, Canal Fulton, Ohio, assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Mar. 14, 1978, Ser. No. 886,535  
 Int. Cl.<sup>2</sup> C08K 5/23

U.S. Cl. 260—40 R 8 Claims

1. A novel pigmented organic peroxide catalyst for the polymerization of polyester resins comprising:

from about 48–50% by weight of benzoyl peroxide;  
 a suitable plasticizer; and

from about 0.03 to about 0.16 percent by weight of a pigment capable of imparting a uniform color to said catalyst and to a polyester resin with which said catalyst is mixed and of substantially losing said color when the catalyst-resin mixture has cured.

**4,164,493**  
**POLYPHENYLENE ETHER RESIN COMPOSITIONS**  
**CONTAINING POLYPENTENAMER**

Glenn D. Cooper, Arthur Katchman, both of Delmar, and Charles P. Shank, Averill Park, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Sep. 5, 1978, Ser. No. 939,205  
 Int. Cl.<sup>2</sup> C08L 71/04

U.S. Cl. 260—42.18 38 Claims

1. A thermoplastic composition which, after molding has good impact strength, said composition comprising:

(a) from about 1 to 99 parts by weight of a polyphenylene ether resin, and

(b) from about 1 to 99 parts by weight of polypentenamer, based on the total weight of the composition.

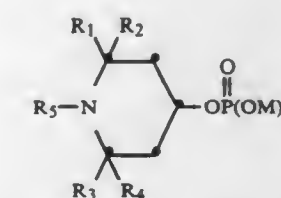
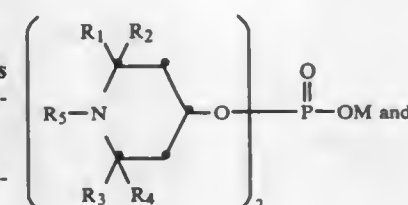
**4,164,494**  
**PIPERIDINYL PHOSPHATE ULTRAVIOLET**  
**STABILIZERS FOR ORGANIC COMPOSITIONS**

Gether Irick, Jr., and Richard H. S. Wang, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 16, 1978, Ser. No. 906,398  
 Int. Cl.<sup>2</sup> C08K 5/52

U.S. Cl. 260—45.75 R 15 Claims

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of a mixture of piperidinyl phosphates having the formula:



R<sub>1</sub> and R<sub>2</sub> are each alkyl having 1–6 carbons; R<sub>3</sub> and R<sub>4</sub> are each alkyl having 1–6 carbons or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group; and R<sub>5</sub> is hydrogen, oxy, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl or alkyl substituted benzyl, and M is either hydrogen or a metal ion selected from the group consisting of Li, Na, K, Mg, Ca, Ba, Mn, Co, Ni, Sn, Zn, and Ce, wherein at least one M radical is one of said metal ions and when the valence of M is greater than one, the available valency requirements of M are filled by a suitable anion selected from the group consisting of acetoxy, benzoyloxy, and chloro.



4,164,495

# METHOD OF RECOVERING IMMUNOGLOBULIN USING A POLYOL AND AN ALKANOIC ACID

Jorgen F. Hansen, Rodovre, Denmark, assignor to Nordisk Insulinlaboratorium, Gentofte, Denmark

Continuation of Ser. No. 782,255, Mar. 28, 1977, abandoned.

This application Jun. 12, 1978, Ser. No. 914,456

Claims priority, application Denmark, Apr. 6, 1976, 1628/76  
Int. Cl.<sup>2</sup> A61K 37/04, 37/06; C07G 7/00

U.S. Cl. 260—112 B

6 Claims

1. A method of recovering purified immunoglobulin suitable for intravenous administration wherein blood plasma, serum or a fraction thereof is subjected to a fractionated precipitation using a combination of polycondensed polyol and a mono or polyalkanoic acid having from 4 to 12 carbon atoms as a precipitant, the fractionating process being performed at approximately room temperature.

4,164,496

# PREPARATION OF ALBUMIN USING PEG AND EDTA

Yu L. Hao, Potomac, Md., assignor to American National Red Cross, Washington, D.C.

Filed Aug. 23, 1978, Ser. No. 935,922

Int. Cl.<sup>2</sup> C07G 7/00

U.S. Cl. 260—122

2 Claims

1. A method for the preparation of albumin comprising:  
(a) diluting plasma in liquid form with an equal volume of a NaCl solution containing disodium ethylene dinitrilo tetraacetate and a stabilizer;  
(b) adjusting the pH of the plasma solution resulting from step (a) to about 6.2;  
(c) heating the plasma solution from step (b) at a temperature of approximately 60° C. for about 1½ hours;  
(d) cooling the plasma solution to about 10° C.;  
(e) precipitating impurities from the solution with polyethylene glycol at a concentration of about 18–20% with the albumin remaining in the supernatant;  
(f) isoelectrically precipitating albumin from said supernatant at a pH of about 4.6; and  
(g) recovering the albumin product.

4,164,497

# 2-SUBSTITUTED PENAM DERIVATIVES

Takashi Kamiya, Suita; Tsutomu Teraji; Masashi Hashimoto, both of Toyonaka; Osamu Nakaguti, Osaka, and Teruo Oku, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 648,491, Jan. 12, 1976, Pat. No. 4,084,409, which is a division of Ser. No. 407,962, Oct. 19, 1973, Pat. No. 3,954,732. This application Jan. 6, 1978, Ser. No. 867,623

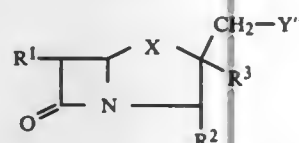
Claims priority, application Japan, Nov. 8, 1972, 47-112348; Dec. 12, 1972, 47-1201; Dec. 12, 1972, 47-128657; Dec. 20, 1972, 47-128659; Dec. 22, 1972, 47-2270; Aug. 1, 1973, 48-87108

Int. Cl.<sup>2</sup> C07D 499/44

U.S. Cl. 260—239.1

12 Claims

1. A compound of the general formula:



wherein R<sup>1</sup> is a conventional, pharmaceutically acceptable penicillin acylamino, R<sup>2</sup> is carboxy or a conventionally protected carboxy, X is —S— or

R<sup>3</sup> is lower alkyl and Y'' is a residue of a strong nucleophile selected from the group consisting of thiocyanato, lower alkylthio and piperidinothiocarbonylthio.

4,164,498

# 4H-S-TRIAZOLO[4,3-a][1,5]BENZODIAZEPIN-5-ONES

B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

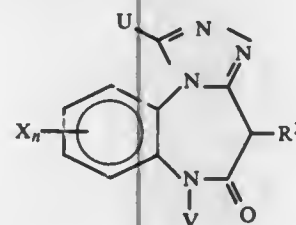
Division of Ser. No. 778,823, Mar. 17, 1977, Pat. No. 4,133,809, which is a division of Ser. No. 365,012, May 29, 1973, abandoned. This application Sep. 21, 1978, Ser. No. 944,531

Int. Cl.<sup>2</sup> C07D 487/14

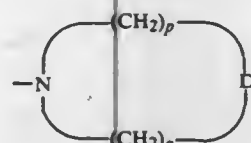
U.S. Cl. 260—239.3 T

5 Claims

1. A compound of the formula



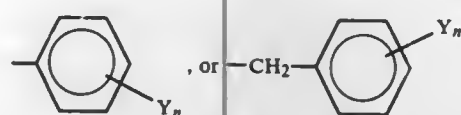
wherein R<sup>2</sup> is H; alkyl of 1–4 carbons optionally substituted by amino, mono-lower alkyl amino, di-lower alkyl amino, cyclic imines of formula



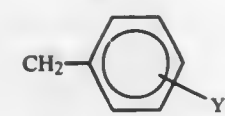
where D is methylene, oxygen or N—R<sup>10</sup> and where p and q are the same or different and are the integers 1, 2, and 3 provided that p+q is at least 1; hydroxy; alkoxy of 1–6 carbons or



where R<sup>5</sup> is alkyl of 1–5 carbons optionally substituted by phenyl or X-substituted phenyl; or R<sup>5</sup> is phenyl optionally substituted by 1 or more X-substituents; R<sup>10</sup> is hydrogen, alkyl of 1–4 carbons or phenyl optionally substituted by X, V is hydrogen,



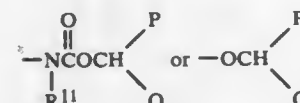
X and Y are the same or different and are hydrogen, F, Cl, Br, trifluoromethyl, alkyl of from 1–6 carbons, alkoxy of from 1–6 carbons, nitro, cyano, amino, alkanoylamino of 1–4 carbons, alkylthio of 1–6 carbons, alkylsulfinyl of 1–6 carbons or alkyl sulfonyl of 1–6 carbons; n is 0, 1 or 2; and when V is hydrogen or



U is H; phenyl; X-substituted phenyl wherein X is as defined below; 2, 3- or 4-pyridyl, or cycloalkyl of 3–5 carbons; alkyl of 1 to 4 carbons or phenyl-alkyl, and when V is



U is alkyl of from 1 to 4 carbons substituted by the groups,



where P and Q are the same or different and are hydrogen, phenyl, X-substituted phenyl, naphthyl or X-substituted naphthyl, with the proviso that at least one of P and Q is one of the foregoing aryl radicals, and R<sup>11</sup> is hydrogen or alkyl of from 1 to 4 carbons.

4,164,499

# RIFAMYCIN COMPOUNDS

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to Archifar Laboratori Chimico Farmacologici S.p.A., Rovereto, Italy

Filed Aug. 12, 1977, Ser. No. 825,165

Claims priority, application Italy, Sep. 30, 1976, 5209 A/76

The portion of the term of this patent subsequent to Apr. 25,

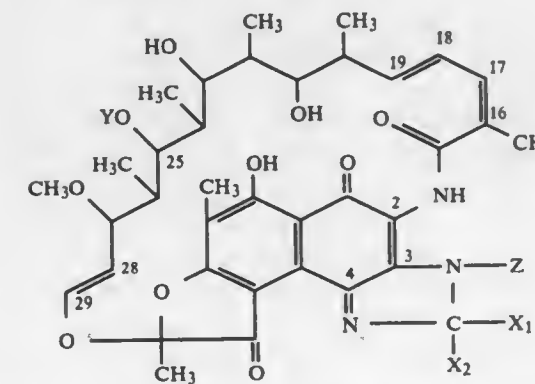
1995, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 498/18

U.S. Cl. 260—239.3 P

1 Claim

1. A rifamycin compound having the formula



and 16, 17, 18, 19 tetrahydroderivatives and 16, 17, 18, 19, 28, 29 hexahydroderivatives thereof, wherein:

Y is selected from the group consisting of —H and —COCH<sub>3</sub>;

Z is selected from the group consisting of alkyl having 1–3 carbon atoms, cycloalkyl having 3–6 carbon atoms and phenyl substituted with one radical selected from the group consisting of halogen and methyl;

X<sub>1</sub> is methyl;

X<sub>2</sub> is selected from the group consisting of alkyl having 1–3 carbon atoms, carboxyalkyl having 3 or 4 carbon atoms, and halomethyl; or

X<sub>1</sub> and X<sub>2</sub>, when taken with the atom of carbon to which they are attached, form a ring selected from the group

consisting of a cycloalkyl ring having 5 or 6 carbon atoms, a piperidine ring and an N-substituted piperidine ring, the nitrogen atom being in the 4-position of said unsubstituted or N-substituted piperidine ring with respect to the spiro C-atom, said substituent selected from the group consisting of alkyl having 1–4 carbon atoms, cycloalkyl having 6 carbon atoms and benzyl.

4,164,500

# PYRAZOLINE COMPOUNDS

Manfred Patsch, and Albert Hettche, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 702,975, Jul. 6, 1976, Pat. No. 4,129,563.

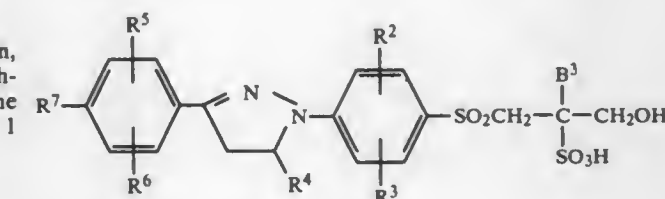
This application Apr. 21, 1978, Ser. No. 898,629

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534180; Aug. 6, 1975, 2535095; Nov. 11, 1975, 2550548  
Int. Cl.<sup>2</sup> C07D 231/06

U.S. Cl. 260—239.9

3 Claims

1. A compound which in the form of the free acid corresponds to the formula



in which

B<sup>3</sup> is hydrogen or C<sub>1</sub> to C<sub>4</sub> alkyl, R<sup>2</sup>, R<sup>3</sup>, R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> are independently hydrogen, chlorine, bromine, fluorine, methyl, ethyl, methoxy or ethoxy and R<sup>4</sup> is hydrogen, C<sub>1</sub> to C<sub>4</sub> alkyl, benzyl, phenylethyl, phenyl or phenyl substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy, cyano or hydroxysulfonyl.

4,164,501

# 2-DECARBOXY-2-HYDROXYMETHYL-TRANS-4,5,13,14-TETRAHYDRO-PGI<sub>1</sub> COMPOUNDS

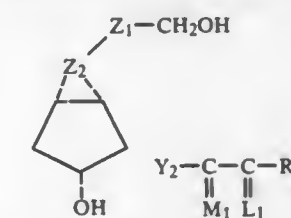
(III) Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich. Continuation-in-part of Ser. No. 821,536, Aug. 3, 1977. This application Jun. 14, 1978, Ser. No. 915,431

Int. Cl.<sup>2</sup> C07D 307/93

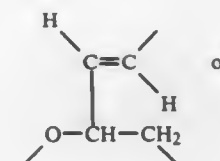
U.S. Cl. 260—346.22

27 Claims

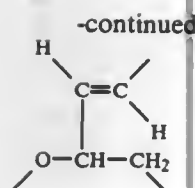
1. A prostacyclin analog of the formula



wherein Y<sub>2</sub> is —C≡C—; wherein Z<sub>2</sub> is

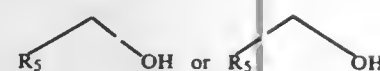


(1)

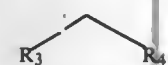


wherein  $Z_1$  is

- (1)  $-(CH_2)_g-CH_2-CH_2-$ , or  
 (2)  $-(CH_2)_g-CH_2-CF_2-$ ,  
 wherein  $g$  is the integer zero, one, or 2;  
 wherein  $M_1$  is



wherein  $R_5$  is hydrogen or alkyl with one to 4 carbon atoms, inclusive; and  
 wherein  $L_1$  is



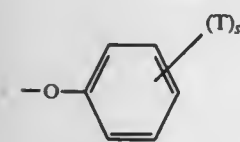
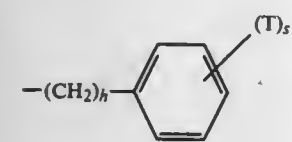
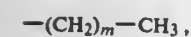
or a mixture of



and



wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro; and  
 wherein  $R_7$  is



wherein  $m$  is the integer one to 5, inclusive,  $h$  is the integer zero to 3, inclusive,  $s$  is the integer zero, one, 2 or 3, and  $T$  is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two  $T$ 's are other than alkyl.

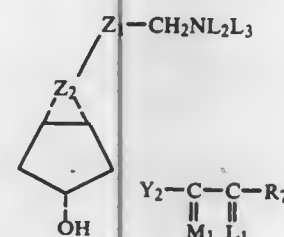
4,164,502  
 2-DECARBOXY-2-AMINOMETHYL-TRANS-4,5,13,14-TETRADEHYDRO-PGI<sub>1</sub> COMPOUNDS  
 (2) Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
 Continuation-in-part of Ser. No. 821,536, Aug. 3, 1977. This application Jun. 14, 1978, Ser. No. 915,429

Int. Cl.<sup>2</sup> C07D 307/93

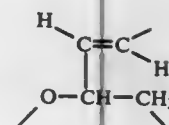
U.S. Cl. 260-346.73

27 Claims

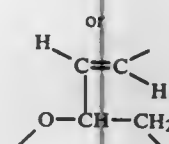
1. A prostacyclin analog of the formula



wherein  $Y_2$  is  $-C=C-$ ;  
 wherein  $Z_2$  is

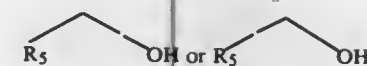


(1)



(2)

wherein  $Z_1$  is  
 (1)  $-(CH_2)_g-CH_2-CH_2-$ , or  
 (2)  $-(CH_2)_g-CH_2-CF_2-$ ,  
 wherein  $g$  is the integer zero, one, or 2;  
 wherein  $M_1$  is



wherein  $R_5$  is hydrogen or alkyl with one to 4 carbon atoms, inclusive; and  
 wherein  $L_1$  is



(1)



(2)

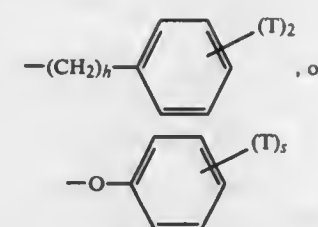
or a mixture of



(3)



wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro;  
 wherein  $L_2$  and  $L_3$  are hydrogen or alkyl of one to 4 carbon atoms, inclusive; and  
 wherein  $R_7$  is



wherein  $m$  is the integer one to 5, inclusive,  $h$  is the integer zero to 3, inclusive;  $s$  is the integer zero, one, 2, or 3, and  $T$  is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two  $T$ 's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof.

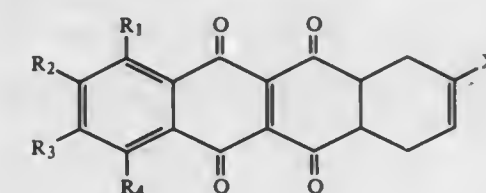
4,164,503  
 QUINONOID INTERMEDIATES FROM CHLOROPRENE  
 Andrew S. Kende, Pittsford, N.Y.; Yuh-Geng Tsay, San Jose, Calif., and Takuya Furuta, Rochester, N.Y., assignors to Research Corporation, New York, N.Y.  
 Filed Oct. 10, 1978, Ser. No. 949,511

Int. Cl.<sup>2</sup> C07C 49/72, 49/74, 49/80; C09B 3/82

U.S. Cl. 260-365

28 Claims

1. A compound of the formula



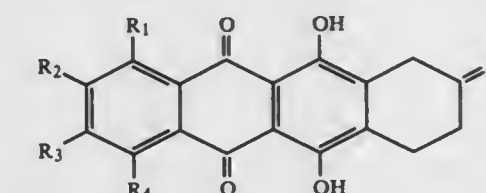
wherein:

$X$  is halo,

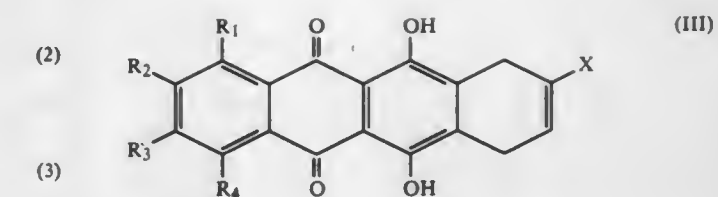
$R_1$ ,  $R_2$ ,  $R_3$ , and  $R_4$  are the same or different,  $R_1$  and  $R_4$  are selected from the group consisting of hydrogen, hydroxy, lower alkyl, phenyl or substituted phenyl-lower alkyl wherein the substituent groups are lower alkyl lower alkoxy or halo, lower alkoxy, phenyl or substituted phenyl-lower alkoxy wherein the substituent groups are lower alkyl lower alkoxy or halo, wherein lower alk signifies a branched chain or straight chain hydrocarbon moiety of 1 to 5 carbon atoms,

$R_2$  and  $R_3$  are selected from the group consisting of the hydrogen, lower alkyl, phenyl or substituted phenyl-lower alkyl wherein the substituent groups are lower alkyl, lower alkoxy or halo wherein lower alk signifies a branched or straight chain hydrocarbon moiety of 1 to 5 carbon atoms.

25. A process for the preparation of a compound having the formula



which comprises treating a compound having the formula



wherein:

$R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ , and  $X$  are as in claim 1 with substantially anhydrous strong mineral acid at a temperature of between  $-5^\circ\text{C}$ . and  $+25^\circ\text{C}$ .

4,164,504  
 STEROIDAL[16 $\alpha$ ,17-b]NAPHTHALENO-21-CARBOXYLIC ACID ESTERS  
 Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

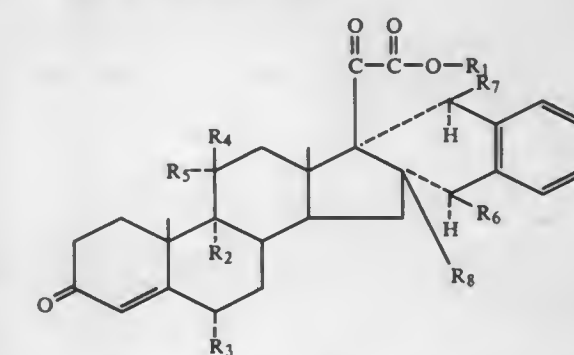
Filed Jun. 26, 1978, Ser. No. 919,020

Int. Cl.<sup>2</sup> C07J 5/00

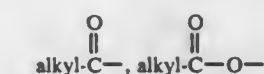
U.S. Cl. 260-397.1

19 Claims

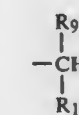
1. A steroid having the formula



or the 1,2-dehydro derivative thereof, wherein  $R_1$  is alkyl of 1 to 10 carbon atoms, aryl or arylalkyl;  $R_2$  is hydrogen or halo;  $R_3$  is hydrogen, fluorine or methyl;  $R_4$  is chlorine, fluorine or hydroxy and  $R_5$  is hydrogen or  $R_4$  and  $R_5$  together are  $=O$ ;  $R_6$  and  $R_7$  are the same or different and are hydrogen, alkyl, alkoxy, carboalkoxy, formyl,



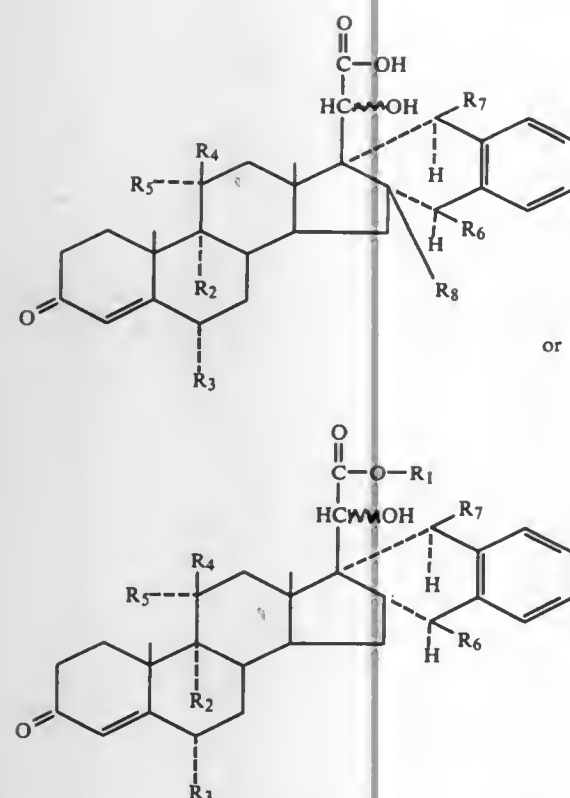
hydroxy, halogen, phenyl or cyano with the proviso that when  $R_6$  and  $R_7$  are different, one of  $R_6$  and  $R_7$  is hydrogen;  $R_8$  is hydrogen or



wherein  $R_9$  and  $R_{10}$  are the same or different and are hydrogen or alkyl.

19. A steroid having the formula

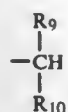




or the 1,2-dehydro derivative thereof, wherein  $R_1$  is alkyl of 1 to 10 carbon atoms, aryl or arylalkyl;  $R_2$  is hydrogen or halogen;  $R_3$  is hydrogen, fluorine or methyl;  $R_4$  is chlorine, fluorine or hydroxy and  $R_5$  is hydrogen or  $R_4$  and  $R_5$  together are  $=O$ ;  $R_6$  and  $R_7$  are the same or different and are hydrogen, alkyl, alkoxy, carboalkoxy, formyl,



hydroxy, halogen, phenyl or cyano with the proviso that when  $R_6$  and  $R_7$  are different, one of  $R_6$  and  $R_7$  is hydrogen;  $R_8$  is hydrogen or



wherein  $R_9$  and  $R_{10}$  are the same or different and are hydrogen or alkyl.

4,164,505

**FLOW PROCESS FOR CONJUGATING UNCONJUGATED UNSATURATION OF FATTY ACIDS**  
Kenneth E. Krajca, Lynn Haven, Fla., assignor to Sylvachem Corporation, Jacksonville, Fla.

Filed Jul. 8, 1977, Ser. No. 814,139

Int. Cl.<sup>2</sup> C09F 7/08; C11C 3/14

U.S. Cl. 260—405.6

19 Claims

1. A flow process for conjugating unconjugated unsaturation of fatty acids in feedstock containing same and controlling the cis/trans to trans/trans ratio of the resulting conjugated fatty acid product in the presence of requisite aqueous alkali metal hydroxide for providing a minor proportion of free alkali in the resulting reaction mixture, and the dissolution of the resulting alkali metal soap in the aqueous phase of said reaction mixture which comprises:

continuously charging said feedstock, said alkali metal hy-

droxide, and water into a flow reaction zone maintained under at least autogenous pressure; therein heating the resulting reaction mixture to a temperature of about 200° to 370° C.;

continuously withdrawing from said zone the crude product stream when the unconjugated fatty acid value therein has been reduced to practically zero and the cis/trans to trans/trans fatty acid ratio of said crude product stream is between about 50:1 and 0.1:1;

acidulating the crude product stream, thereby springing crude fatty acid product; and recovering said crude fatty acid product.

4,164,506

**PROCESS FOR PRODUCING LOWER ALCOHOL ESTERS OF FATTY ACIDS**

Yoshiharu Kawahara, Osaka, and Toshio Ono, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan  
Filed Mar. 9, 1978, Ser. No. 884,835

Claims priority, application Japan, Mar. 17, 1977, 52-29709

Int. Cl.<sup>2</sup> C11C 3/02; C09F 5/08

U.S. Cl. 260—410.9 R

13 Claims

1. A process for producing lower alcohol esters of fatty acids from an unrefined fat containing impurities including free fatty acids, polypeptides and phospholipids, which comprises the steps of:

(1) reacting the free fatty acids of said unrefined fat with a lower alcohol, in the presence of an acid catalyst, to esterify said free fatty acids, the amount of said lower alcohol present in the reaction mixture at the end of the esterification reaction being an amount greater than the amount of said lower alcohol that can be dissolved in said fat whereby, at the end of the esterification reaction, the reaction mixture contains a fat phase and a lower alcohol phase, said lower alcohol phase containing impurities dissolved therein;

(2) then separating said reaction mixture into a fat layer and a lower alcohol layer, removing said lower alcohol layer and thereby obtaining refined fat;

(3) then adding a lower alcohol and an alkali catalyst to said refined fat and effecting an interesterification reaction to form lower alcohol esters of the fatty acids in said refined fat, and then recovering said lower alcohol esters.

4. A process as claimed in claim 1, in which said lower alcohol is methyl alcohol.

4,164,507

**PROCESS FOR SEPARATION OF SALT FROM HEAVY ENDS WASTES OF GLYCERINE MANUFACTURE**

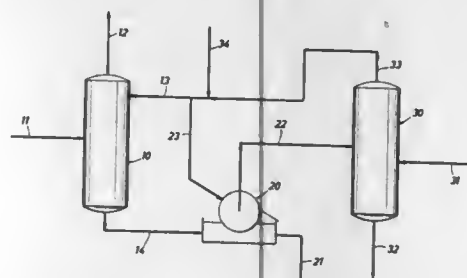
George C. Blytas, and Carl H. Deal, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 13, 1978, Ser. No. 924,412

Int. Cl.<sup>2</sup> C02B 1/20

U.S. Cl. 260—412.5

7 Claims



1. A process for separating sodium chloride salt from a glycerine foots still bottoms made up principally of salt and an organic polyglyceride phase containing less than about 6% by weight water which comprises:

(a) mixing the still bottoms with n-butanol in a n-butanol:still

bottoms weight ratio of from about 0.8:1 to about 3:1 at a temperature in the range of 90° to 120° C. thereby precipitating substantially all of the salt present in the still bottoms;

(b) separating the precipitated salt from the still bottoms to afford a substantially salt-free polyglyceride phase containing the n-butanol and a solid salt phase substantially free of polyglycerides;

(c) cooling the substantially salt-free polyglyceride phase to a temperature below about 65° C. thereby phase separating the n-butanol from the polyglyceride phase without further precipitation of salt;

(d) separating the phase separated n-butanol obtained in step (c) and recycling said separated n-butanol to step (a) to effect further salt precipitation from the still bottoms.

4,164,508

**FORMYL ALKENOIC ACIDS**

Francesco Siclari, Barlassina Milan, and Pietro P. Rossi, Garlasco Pavia, both of Italy, assignors to Snia Viscosa Società Nazionale Industria Viscosa S.p.A., Italy

Division of Ser. No. 486,992, Jul. 10, 1974, Pat. No. 4,085,127.

This application Mar. 13, 1978, Ser. No. 885,475

Claims priority, application Italy, Jul. 11, 1973, 26479 A/73

Int. Cl.<sup>2</sup> C11C 1/00

U.S. Cl. 260—413

2 Claims

1. An omega-formyl alkenoic acid containing 8, 10 or 12 carbon atoms and selected from the group consisting of 11-formyl-4,8-undecadienoic acid, 11 formyl-4-undecenoic acid, 11-formyl-8-undecenoic acid, 7-formyl-4-heptenoic acid, 9-formyl-4-nonenic acid, 9-formyl-6-nonenic acid, and mixtures thereof.

4,164,509

**PROCESS FOR PREPARING FINELY DIVIDED HYDROPHOBIC OXIDE PARTICLES**

Siegmar Läufer, Rheinfelden, Fed. Rep. of Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 496,676, Aug. 12, 1974, Pat. No. 4,068,024,

which is a continuation of Ser. No. 261,320, Nov. 23, 1971,

abandoned. This application Nov. 1, 1977, Ser. No. 847,508

Claims priority, application Fed. Rep. of Germany, Dec. 24,

1970, 2057730

The portion of the term of this patent subsequent to Jan. 10,

1995, has been disclaimed.

Int. Cl.<sup>2</sup> C07F 7/04, 7/18

U.S. Cl. 260—448.8 R

1 Claim

1. A finely divided hydrophobic and lipophilic silicon dioxide particle practically free of silanol groups on its surface, said particle having chemically bonded thereto alkoxy or aryloxy groups sufficient to render said particle practically incapable of being wetted with water at standard temperature, said particle having proton affinity sufficient to result in said particle being wetted after extended contact with boiling water.

4,164,510

**PROCESS FOR THE AUTOXIDATION OF AN ISOPROPYLPHENYL ESTER**

Sheng-Hong A. Dai, Wallingford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 818,233, Jul. 22, 1977,

abandoned. This application Feb. 21, 1978, Ser. No. 879,788

Int. Cl.<sup>2</sup> C07C 68/00

U.S. Cl. 260—463

13 Claims

1. In a process for the autoxidation of an isopropylphenyl ester to the hydroperoxyisopropylphenyl ester in the presence of oxygen the improvement which comprises carrying out said autoxidation at a temperature of from about 80° C. to about 130° C. in the presence of a catalyst combination consisting essentially of at least two members of the group consisting of (i) a metal phthalocyanine wherein the metal is selected from the group consisting of copper, zinc, palladium, platinum,

silver, and mercury; (ii) a di-tertiary alkyl peroxide; and (iii) a tertiary alkyl hydroperoxide.

4,164,511

**MANUFACTURE OF N-ARYLGLYCINONITRILES**

Harry Distler, Bobenheim; Helmut Schlecht, and Erwin Hartert, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Filed May 2, 1977, Ser. No. 792,696

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621450; May 15, 1976, 2621728

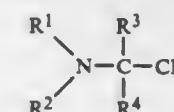
The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> C07C 120/00, 121/78

U.S. Cl. 260—465 E

15 Claims

1. A process for the manufacture of an N-arylglycinonitrile of the formula

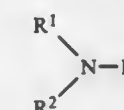


wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  each is an aromatic radical selected from the group consisting of phenyl and naphthyl,  $R^3$  and  $R^4$  may also each be selected from the group consisting of hydrogen, alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms, cycloalkyl of 5 to 8 carbon atoms and aralkyl of 7 to 12 carbon atoms, and  $R^2$  may also be hydrogen, with the proviso that each of  $R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  other than hydrogen may also be further substituted by a group or atom which is inert under the reaction conditions,

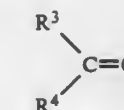
which process comprises:

reacting an N-arylamine of the formula



where

$R^1$  and  $R^2$  have the above meaning, with a carbonyl compound of the formula



where

$R^3$  and  $R^4$  have the above meaning, and with hydrogen cyanide in the presence of water for from 0.1 to 4 hours at from 0° to 80° C., the concentration of hydrogen cyanide during the reaction being not more than 0.9% by weight, based on the reaction mixture.

4,164,512

**FOAMABLE THERMOELASTIC IONOMER COMPOSITION**

Douglas Brenner, Livingston, and Robert D. Lundberg, Bridge-water, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 839,172, Oct. 4, 1977. This application Nov. 29, 1977, Ser. No. 855,727

Int. Cl.<sup>2</sup> C08J 9/00

U.S. Cl. 521—93

3 Claims

1. An injection or compression moldable or extrudable elastomeric composition which consists essentially of:

- (a) a neutralized sulfonated EPDM terpolymer, said sulfonated EPDM terpolymer having about 10 to about 1000 meq. of neutralized sulfonate groups per 100 grams of said sulfonated EPDM terpolymer, said neutralized sulfonate groups containing metallic cations;
- (b) less than about 100 parts by weight of a non polar process oil per 100 parts by weight of said neutralized sulfonated EPDM terpolymer, said oil having less than 2 wt. % polar type compounds;
- (c) less than about 200 parts by weight of an inorganic filler per 100 parts by weight of said neutralized sulfonated EPDM terpolymer, said filler being selected from the group consisting of carbon black, silicates, talcs, clays and calcium carbonates and mixtures thereof;
- (d) a solid non-volatile preferential ionic plasticizer at about at least 8 parts by weight per 100 parts by weight of said neutralized sulfonated EPDM terpolymer, said preferential plasticizer plasticizing said sulfonate groups, said preferential plasticizer being selected from the group consisting of ureas, thioureas, fatty acids having about 12 to about 40 carbon atoms and metal salts of said fatty acids thereof; and
- (e) a chemical foaming agent at a concentration level of about 0.25 to about 5 parts by weight per 100 parts by weight of said neutralized sulfonated EPDM terpolymer.

4,164,513

## AMINO-SUBSTITUTED GUANIDINE SALTS OF DECAHYDRODECABORIC ACID

Terrence P. Goddard, Aptos, Calif., assignor to Teledyne McCormick Selph, an operating div. of Teledyne Ind., Inc., Hollister, Calif.

Filed Nov. 22, 1977, Ser. No. 853,918

Int. Cl.<sup>2</sup> C07C 123/00

U.S. Cl. 260—564 D

4 Claims

1. The monoaminoguanidinium salt of decahydrodecaboric acid, having the formula  $(\text{CNHNH}_2(\text{NH}_2)_2)_2\text{B}_{10}\text{H}_{10}$ .

4,164,514

## 2-AMINOMETHYLENEINDANONE ANALGESIC AGENTS

Philip D. Hammen, East Lyme, and George M. Milne, Jr., Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

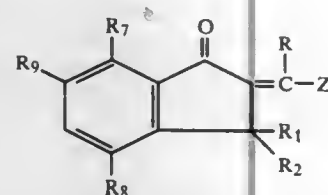
Division of Ser. No. 829,818, Sep. 1, 1977, Pat. No. 4,117,012, which is a division of Ser. No. 763,241, Jan. 27, 1977, Pat. No. 4,064,272, which is a division of Ser. No. 312,693, Dec. 6, 1972, Pat. No. 4,022,836. This application Jul. 17, 1978, Ser. No. 925,631

Int. Cl.<sup>2</sup> C07C 87/28

U.S. Cl. 260—570.5 P

2 Claims

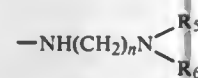
1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein

R is chosen from the group consisting of hydrogen, lower alkyl and phenyl;

Z is



wherein

R<sub>5</sub> and R<sub>6</sub> are each lower alkyl and n is an integer of from 1 to 5;

R<sub>1</sub> and R<sub>2</sub> are each selected from the group consisting of hydrogen and lower alkyl;

R<sub>7</sub> and R<sub>8</sub> are each selected from the group consisting of hydrogen, fluoro and chloro; and

R<sub>9</sub> is selected from the group consisting of hydrogen and fluoro.

4,164,515

## PRODUCTION OF CYCLOHEXANONE

Jan F. Van Peppen, and William B. Fisher, both of Chester, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 21, 1977, Ser. No. 853,720

Int. Cl.<sup>2</sup> C07C 27/00, 29/20, 45/00

U.S. Cl. 260—586 P

12 Claims

1. A computer controlled process for producing cyclohexanone by liquid phase hydrogenation of phenol in the presence of a sodium-promoted palladium-on-carbon catalyst, including a control system for controlling the ratio of phenol to cyclohexanone in the reaction mixture and limiting the maximum reaction temperature during hydrogenation reaction stages in three or more reactors in series, comprising:

(a) generating and storing in the computer sampled data inputs from each reactor of analog representations of reactor hydrogen pressure, temperature, phenol concentration, cyclohexanone concentration, catalyst concentration, hydrogen feed rate, phenol feed rate and cyclohexanone flash rate;

(b) processing said sampled inputs in the computer by relating them to a stored anticipatory control program to provide output data for controlling the ratio of phenol to cyclohexanone and limiting the maximum reaction temperature during the hydrogenation reaction stages; and

(c) controlling the ratio of phenol to cyclohexanone and limiting the maximum reaction temperature during said hydrogenation reaction stages in response to said output data from the computer, the process being further characterized in that the reaction temperature is maintained at or below the atmospheric boiling point of the reaction mixture in each reactor.

4,164,516

## PREPARATION OF 4-HYDROXY-2,4,6-TRIMETHYL-CYCLOHEXA-2,5-DIENE-1-ONE

Michel Costantini, Lyons, and Michel Jouffret, Francheville Le Bas, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 17, 1977, Ser. No. 843,075

Claims priority, application France, Oct. 25, 1976, 76 33025

Int. Cl.<sup>2</sup> C07C 45/16

U.S. Cl. 260—586 P

23 Claims

1. A process for the preparation of 4-hydroxy-2,4,6-trimethyl-cyclohexa-2,5-dien-1-one, which comprises oxidizing 2,4,6-trimethyl-phenol with molecular oxygen or an oxygen containing gas, said oxidation being conducted under a partial pressure of oxygen of about 1 bar or less and in the simultaneous presence of a catalytic amount of (i) a cobalt/Schiff base complex, and (ii) a co-catalyst selected from the group consisting of an amine, a phosphine, an organic phosphite, and mixtures thereof.

4,164,517

## PREPARATION OF FLUORONITROBENZENE

George Fuller, Portishead, England, assignor to I.S.C. Chemicals Limited, London, United Kingdom

Filed Dec. 30, 1977, Ser. No. 866,007

Int. Cl.<sup>2</sup> C07C 79/12

U.S. Cl. 260—646

7 Claims

1. A method of preparing a fluoronitrobenzene containing a fluorine atom in the para position with respect to the nitro group, comprising heating a dichloronitrobenzene selected from the group consisting of (a) a dichloronitrobenzene containing chlorine atoms in the ortho and para positions with respect to the nitro group and (b) a dichloronitrobenzene containing chlorine atoms in the meta and para positions with respect to the nitro group, with potassium fluoride in the presence of a sulfolane at a temperature of about from 180° C. to 250° C., and wherein the mole ratio of sulfolane to said dichloronitrobenzene is from 0.1:1 to 3.0:1.

4,164,518

## PROCESS FOR PRODUCING DIPHENYLS

Yataro Ichikawa, and Tetsu Yamaji, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 326,454, Jan. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 60,945, Aug. 4, 1970, abandoned. This application Oct. 14, 1977, Ser. No. 842,312

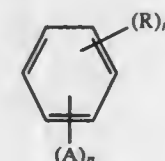
Claims priority, application Japan, Apr. 4, 1969, 44/26046

Int. Cl.<sup>2</sup> C07C 15/14, 25/18, 43/20

U.S. Cl. 585—427

6 Claims

1. A process for producing diphenyls which comprises contacting benzene or a benzene derivative expressed by the following formula



wherein

R's may be same or different and represent alkyl having 1 to 4 carbon atoms;

m is a positive integer of 0 to 4;

A's may be the same or different and represent alkoxy having 1 to 4 carbon atoms or a halogen atom;

n is a positive integer of 0 to 2; and

the sum of m and n does not exceed 4 and when m is 0 or n is 0, —(R)m or —(A)n respectively represents a hydrogen atom,

with molecular oxygen, in the absence of a solvent and in the presence of a β-diketo complex of palladium as a catalyst in an amount of 0.001 to 0.1 gram-atom calculated as metallic palladium, for each gram-mole of benzene or its derivative, thereby to dimerize the benzene or benzene derivative oxidatively wherein the oxidation coupling is carried out at a pressure of at least 2.5 atmospheres calculated as the partial pressure of oxygen at a temperature of 100° to 300° C.

4,164,519

## OXIDATIVE DEHYDROGENATION PROCESSES

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 451,476, Mar. 15, 1974, Pat. No. 3,933,933, which is a division of Ser. No. 245,382, Apr. 19, 1972, Pat. No. 3,821,324. This application Sep. 25, 1975, Ser. No. 616,719

Int. Cl.<sup>2</sup> C07C 11/12

U.S. Cl. 585—622

4 Claims

1. A process for the oxidative dehydrogenation of a dehydrogenatable hydrocarbon having from 4 to 12 carbon atoms which comprises contacting said feedstock under dehydrogenation conditions in the presence of molecular oxygen with a catalyst consisting essentially of titanium, molybdenum, phos-

phorus and combined oxygen, said catalyst being characterized by the expression



wherein x and y are numbers in the approximate range of 0.01 to 5 and z is a number determined by the valence requirements of said titanium, molybdenum and phosphorus.

4,164,520

## ACCELERATED CURE OF EPOXY RESINS

Harold G. Waddill, Austin, and Howard P. Klein, Houston, both of Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 865,053, Dec. 27, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,260

Int. Cl.<sup>2</sup> C08L 63/00

U.S. Cl. 525—484

8 Claims

1. A process for curing epoxy resins comprising: mixing an epoxy resin with about a stoichiometric amount of a condensation product of phenol, formaldehyde and an aminoalkylene derivative of a polyoxyalkylenepolyamine made by reacting a polyoxyalkylene polyamine with acrylonitrile followed by hydrogenation.

4,164,521

## MIXTURES OF POLYCATIONIC AND POLYANIONIC POLYMERS FOR SCALE CONTROL

Richard M. Goodman, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 7, 1977, Ser. No. 766,329

Int. Cl.<sup>2</sup> C08L 33/02

U.S. Cl. 525—187

7 Claims

1. A magnesium scale inhibiting composition comprising (1) a polyanionic polymer containing at least about 50 mole percent of repeating units derived from an acrylic acid and any balance of repeating units derived from one or more monomers compatible therewith, the acid units being in the form of at least one member selected from the group consisting of free acid radical, ammonium salts, and alkali metal salts, and (2) a polycationic polymer constituting the reaction product of dimethylamine-polyamine-epichlorohydrin wherein the amount of said polyamine is from 0 to about 15 mole percent of the total amine content and the amount of said epichlorohydrin is from at least the molar equivalent of the total amine content up to the full functional equivalent of said amine content, said polyanionic polymer having a molecular weight in the range of about 500 and 50,000, said polycationic polymer having a molecular weight in the range of about 1,500 to about 500,000, and the molar ratio of said polycationic polymer to said polyanionic polymer based on the average molecular weight of the repeating units therein being in the range of about 2:1 to 25:1.

4,164,522

## VINYLIDENE CHLORIDE POLYMER MICROGEL POWDERS AND ACRYLIC FIBERS CONTAINING SAME

Dale S. Gibbs, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 15, 1978, Ser. No. 942,257

Int. Cl.<sup>2</sup> C08L 33/20

U.S. Cl. 525—305

13 Claims

1. A crosslinked vinylidene chloride polymer microgel powder which can be incorporated in acrylic fibers as a flame-retardant additive, said powders being recovered from a latex obtained by emulsion polymerizing in sequence

(a) a first monomer mixture comprising about 85 to about 95 parts by weight of vinylidene chloride, about 5 to about 15 parts by weight of a copolymerizable ethylenically unsaturated comonomer and a minor amount of a copolymerizable crosslinking polyfunctional comonomer, wherein the polymer resulting from the polymerization of the first



monomer mixture has a gel content in the range of about 1 to about 50 percent;

(b) a minor amount of a polyfunctional comonomer for providing graft sites on the product of (a); and

(c) about 10 to about 25 weight percent, based on the weight of the first monomer mixture, of a second monomer mixture comprising about 85 to about 95 weight percent acrylonitrile and about 5 to about 15 weight percent of an ethylenically unsaturated comonomer copolymerizable with acrylonitrile;

wherein the microgels in the resulting latex have a diameter less than about 1 micron.

4,164,523

# METHOD OF INJECTION-MOLDING AND COOLING OF SHAPED SYNTHETIC-RESIN BODIES

Robert Hanning, Via Marco 47, Campione d'Italia (TI), Switzerland (CH-6911)

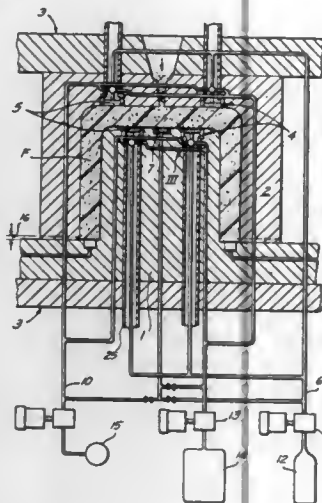
Division of Ser. No. 801,013, May 26, 1977. This application Apr. 5, 1978, Ser. No. 893,775

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640607

Int. Cl.<sup>2</sup> B29C 25/00

U.S. Cl. 264—28

7 Claims



1. A process for making a shaped body of synthetic-resin material in a mold cavity formed by separable mold parts, said method comprising the steps of:

injecting a mass of said synthetic-resin material into said mold cavity in a plastically deformable heated state to fill said mold cavity;

immediately upon filling said mold cavity, introducing a liquefied-gas coolant between the synthetic resin in the mold cavity and the walls of said mold cavity;

conducting said coolant along surfaces of the synthetic resin in said mold cavity to substantially uniformly distribute said coolant along said surfaces with a controllable contact time therewith;

discharging coolant upon the flowing thereof in contact with said surfaces from at least one opening formed in the mold; and

opening said mold to eject a molded body formed from said synthetic resin from said mold cavity upon the contact of said coolant therewith.

4,164,524

# TREATMENT OF BLOOD CONTAINING VESSELS

Charles A. Ward, 25 Borden St., Toronto, Canada (M5S 2M8), and Walter Zingg, 92 Highbourne Rd., Toronto, Canada (M5P 2J6)

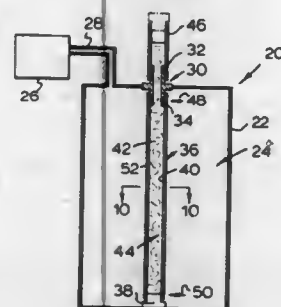
Continuation of Ser. No. 581,336, May 27, 1975, abandoned. This application Jul. 11, 1977, Ser. No. 814,610

Claims priority, application Canada, May 31, 1974, 201409

Int. Cl.<sup>2</sup> B29C 25/00

U.S. Cl. 264—39

5 Claims



1. A method of treating at least a portion of a first surface of a gas permeable wall of the type used in gas permeable medical tubing, vessels and the like, the surface having small irregularities containing gas nuclei and the method comprising the steps:

bringing a solution which is compatible with blood into contact with said first surface at least to the extent that the solution is in contact with all of said portion of the first surface; and

applying a partial vacuum to a second side of the wall to thereby create a pressure gradient from said first side to said second side of the wall for a predetermined time period to enhance permeation of the gas nuclei trapped in said irregularities so that these gas nuclei pass through the wall and so that priming solution is drawn at least partly into said irregularities whereby a new first surface is created consisting partly of said portion of said first surface and partly of solution trapped in said irregularities, the new first surface being substantially free of gas nuclei so that when the main body of priming solution is displaced by blood the number of blood to gas nuclei interfaces is limited to thereby significantly diminish the possibility of platelet adhesion.

4,164,525

# DEVICE FOR SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE

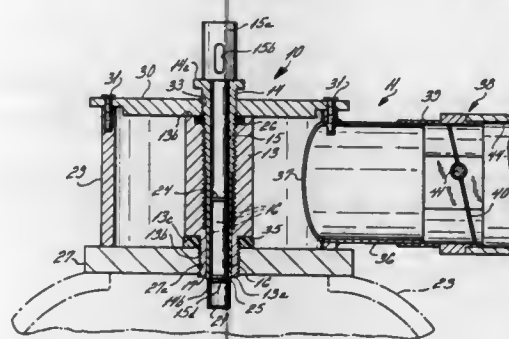
Gunther Bernecker, Montvale, N.J., assignor to G.M.C. Research, Inc., Orange, N.J.

Filed Oct. 13, 1977, Ser. No. 841,872

Int. Cl.<sup>2</sup> F02M 11/00

U.S. Cl. 261—41 B

6 Claims



1. A carburetor for supplying a fuel/air mixture to an inter-

nal combustion engine including a fuel ejecting device comprising a shell, a tube received in the shell and a rod received in the tube with a sliding fit, a plurality of orifices in the tube at intervals along at least a portion of the length of the tube, the rod being insertable in the tube to an extent sufficient to block the orifices and retractable to an extent sufficient to leave the orifices unobstructed, the number of orifices left unobstructed increasing in proportion to the extent to which the rod is retracted, the rod including means for connection to a linkage from a motor vehicle throttle for effecting axial movement of the rod, an annular space defined between the exterior wall of the portion of the length of the tube having orifices and the portion of the length of the interior wall of the shell facing said orifices, and means defining passages for admitting liquid fuel into the annular space, whereby the fuel is ejected from the device solely through the annular space when the rod is inserted in the tube to an extent sufficient to block the orifices and some of the fuel also passes from the annular space through the orifices to the interior of the tube from whence the fuel is ejected from the device when the rod is retracted to an extent sufficient to leave orifices unobstructed, the volumetric flow rate of the fuel into and through the tube increasing as the number of orifices left unobstructed is increased by increasing the retraction of the rod, and air admitting means for admitting air into admixture with the ejected fuel.

4,164,526

# NATURAL SANDWICH OF FILLED POLYURETHANE FOAM

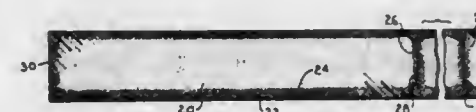
Edward L. Clay, 9113 Park, Lenexa, Kans. 66215, and Jerry L. Baker, Kansas City, Mo., assignors to T. R. Baker; F. Walter McCarty, Jr.; Norman E. Jacobs; Edward N. Ludwikowski; C. Alex McBurney; Lawrence F. Steffen; The Cooper Corporation; H & K Sales Company, Inc.; Phoenix Royalty Associates, Inc. and Edward L. Clay

Continuation of Ser. No. 599,653, Jul. 28, 1975, abandoned, which is a continuation of Ser. No. 346,912, Apr. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 247,029, Apr. 24, 1972, abandoned. This application Oct. 20, 1977, Ser. No. 844,131

Int. Cl.<sup>2</sup> B29D 27/04; C08G 18/14, 18/00, 18/08

U.S. Cl. 264—45.3

4 Claims



1. A process of preparing a molded, integral-skin, filled foam product comprising the steps of:

providing a mold presenting an enclosed molding cavity; charging said cavity with a foamable molding composition which comprises

a polyurethane composition designed to yield rigid and products and which comprises an isocyanate, a polyol, and a blowing agent;

an inorganic, particulate filler material which is substantially chemically unreactive with said isocyanate and polyol, the major proportion by weight of said filler material having a diameter of at least about 10 microns; and

a density distribution control agent which is liquid at room temperature, substantially chemically unreactive with said isocyanate and polyol and soluble in said foamable composition, does not significantly accelerate or decelerate the reaction between the components of said foamable composition, and serves to reduce the viscosity of said foamable composition with said filler material therein,

said density distribution control agent being selected from the group consisting of carbon tetrachloride, trichloro-

ethylene, chloroform, methylchloroform, perchloroethylene and ethyl acetate,

said foamable composition including from about 20 to 75 parts by weight of said polyurethane composition, from about 25 to 80 parts by weight of said filler, and from about 3 to 12 parts by weight of said density distribution control agent,

the ratio by weight of filler material to polyurethane molding composition being in the range of approximately 1:3 to 4:1;

causing said foamable composition to react within said mold to create a hardened product,

said filler and density distribution control agent serving, during said reaction, to cooperatively reduce the temperature of reaction to a level for preventing an excessive increase in the pressure within said mold over that provided by the blowing agent,

the reduced viscosity of said foamable composition derived from the use of said density distribution control agent therein serving, during said reaction, to reduce the thickness of cell walls formed just prior to gelation, in order to cause a greater expansion in the central area of the mold cavity and a corresponding concentration of material in the regions of said cavity adjacent the mold walls,

said reaction being carried out such that said product has a rigid, closed cellular core, a rigid, closed cellular outer portion, at least a pair of opposed outer layers, and a very thin, rigid, essentially void-free outer surface,

said core having a first density, a first average cell size, and respective first concentrations of polyurethane material and filler material,

said outer portion having a second density which is at least about three to ten times as great as said first density, a second average cell size less than said first average cell size, and respective second concentrations of polyurethane material and filler material which are substantially greater than the corresponding first concentrations,

the percent by weight of said filler material in said product being substantially the same in both said core and outer portion,

the ratio of the thickness of said core to the combined thicknesses of said opposed layers being in the range of approximately 10:1 to 1:2,

said outer surface having a durometer hardness value of at least approximately 50 throughout its area.

4,164,527

# METHOD OF MAKING SUPERHARD ARTICLES

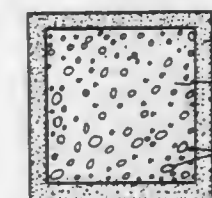
Valentin N. Bakul, ulitsa Kirova, 34a, kv. 12; Ivan F. Vorchanovsky, Bulvar Lesi Ukrainki, 5, kv. 119, and Nekhemian V. Tsylin, ulitsa Dorogzhitskaya, 26, kv. 59, all of Kiev, U.S.S.R.

Continuation of Ser. No. 612,921, Sep. 12, 1975, abandoned, which is a continuation of Ser. No. 520,212, Nov. 1, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,684

Int. Cl.<sup>2</sup> C04B 35/52

U.S. Cl. 264—60

4 Claims



1. A method of making a superhard article comprising the steps of: preparing a briquette from a homogeneous mixture of a powdered hard-alloy matrix material and diamond grains uniformly distributed throughout the matrix material; providing the briquette with an external envelope formed from the

same powdered hard-alloy matrix material of the briquette and having a thickness over the entire area thereof exceeding by at least 3-4 times the maximum space between any two adjacent diamond grains within the briquette; and sintering the briquette in the envelope in a free condition without any external mechanical loads being applied to the briquette, whereby the envelope having a higher contraction coefficient than the briquette compresses the briquette.

4,164,528

# METHOD FOR PRODUCING METAL NITRIDE SINTERED MOLDINGS

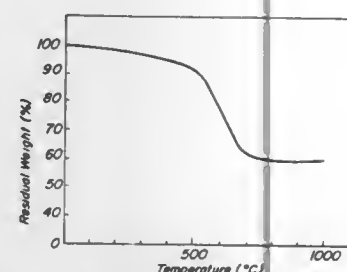
Seishi Yajima; Josaburo Hayashi; Mamoru Omori; Hideo Kayano, and Masaaki Hamano, all of Ohara, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Filed Oct. 8, 1976, Ser. No. 730,881

Claims priority, application Japan, Oct. 18, 1975, 50/124878

Int. Cl.<sup>2</sup> C04B 35/56

U.S. Cl. 264-62



1. A method for producing metal nitride sintered moldings, which comprises mixing metal nitride powders with 0.3-45 percent by weight of a binder consisting essentially of organo-silicon high molecular weight compounds having silicon and carbon as the main skeleton components, which have been produced through polycondensation reaction of polydimethylsilanes, molding the resulting mixture into a desired shape and heating the molding at a temperature of 800°-2200° C. under at least one atmosphere selected from the group consisting of vacuum, inert gas, CO gas and hydrogen gas to form metal nitride sintered molding.

4,164,529

# PROCESS FOR PREPARING TUBULAR FILM OF HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMER

Yukio Fujita, Otsu; Teruo Iwanami, Takatsuki, and Yoshimi Akamatsu, Amagasaki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1977, Ser. No. 839,260

Int. Cl.<sup>2</sup> B29D 23/04

U.S. Cl. 264-565

4 Claims

1. In a process for preparing a continuous tubular film of hydrolyzed ethylene-vinyl acetate copolymers by melt-extruding the hydrolyzed copolymer through a circular die in the form of tube, expanding the tube to a bubble by the pressure of internal air admitted through a mandrel, collapsing the bubble and winding up the film through nip rolls, the improvement which comprises employing hydrolyzed ethylene-vinyl acetate copolymers having an ethylene content of 15 to 50% by mole and a degree of hydrolysis in the vinyl acetate units of not less than 90% by mole and maintaining the surface temperature of the film at the nip rolls within the range of 50° to 100° C.

# METHOD OF MAKING MONOFILAMENT FROM THERMOPLASTIC RESIN TAPES

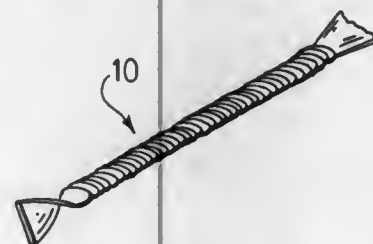
Armen Renjilian, Albany; Donald S. Nichols, and Richard J. Hartigan, Jr., both of Delmar, all of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,141

Int. Cl.<sup>2</sup> B29C 17/02

U.S. Cl. 264-103

5 Claims



1. A method of preparing a monofilament of a thermoplastic polymeric resin, which comprises; providing the thermoplastic polymeric resin in the form of a tape, the molecular structure of the tape being directionally unoriented; twisting the tape to form a generally cylindrical cross-section; heating the twisted tape at or above its glass transition temperature; drawing the twisted tape whereby the pressure of drawing orients the molecular structure of the tape along its lengthwise axis and whereby the twisted tape is fused to form a monofilament with a round cross-section; cooling the fused tape to a temperature below its glass transition temperature.

4,164,531

# INJECTION MOLDING OF ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

Takeshi Shiraki, Yamaguchi; Shozo Hieda, Otake, and Tomokazu Ninomiya, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 645,437, Dec. 30, 1975, abandoned.

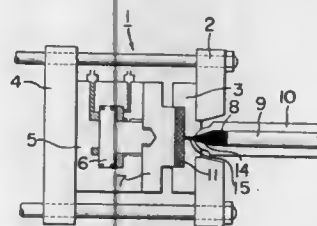
This application Dec. 8, 1977, Ser. No. 858,834

Claims priority, application Japan, Jan. 13, 1975, 50-5611

Int. Cl.<sup>2</sup> B29C 5/02; B29F 1/00, 5/00

U.S. Cl. 264-115

6 Claims



1. A process for injection molding of ultra high molecular weight polyethylene having an intrinsic viscosity of 10 to 30 when measured in decalin at 135° C. and a melt index of up to 0.01 which comprises injecting the polyethylene into a mold cavity having a volume of 1.7 to 2.5 times that of the injected polyethylene at a shear rate of from 200,000 to 500,000 sec<sup>-1</sup> measured at the gate of the injection nozzle at a temperature of from 150° C. to 300° C. to form powder particles and reducing the mold cavity volume to less than 1.5 times that of the injected polyethylene to compress and unite the powder particles and form a coherent molded product.

4,164,532

# PROCESS AND APPARATUS FOR UNIFORMLY DISTRIBUTING GLASS FIBERS

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.

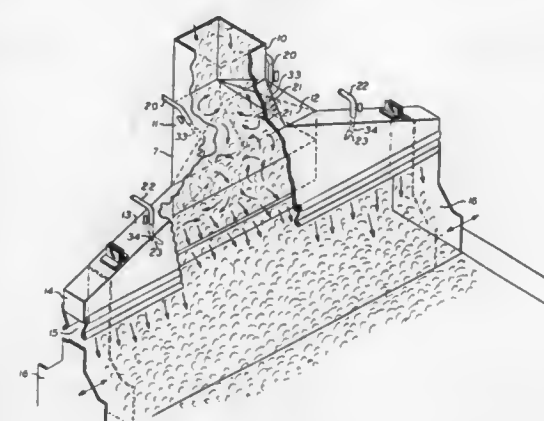
Division of Ser. No. 810,451, Jun. 27, 1977, Pat. No. 4,123,212.

This application Jun. 19, 1978, Ser. No. 918,171

Int. Cl.<sup>2</sup> D04H 3/16

U.S. Cl. 264-115

5 Claims



1. A process for substantially uniformly distributing glass fibers onto a forming bed, the process comprising the steps of: chopping glass fibers into desired lengths; providing a first zone downstream of the chopping and dropping the chopped fibers therein; providing a second zone in communication with the first zone and downstream thereof and dispersing the glass fibers received from the first zone therein to effect a random uniform matrix thereof along the width of the bed by creating a turbulence therein; substantially isolating the fibers in the random uniform matrix from the turbulence in the second zone by providing a third zone having an adjustable length elongated outlet aperture extending across a desired width of the bed and disposed downstream of the second zone and receptive of the dispersed glass fibers in the random uniform matrix; and substantially uniformly distributing the glass fibers in the third zone on the desired width of the bed by dropping same through the aperture and moving the third zone relative to the bed along the length thereof.

4,164,533

# CARBON BLACK PELLET AND METHOD AND APPARATUS FOR PRODUCING SAME

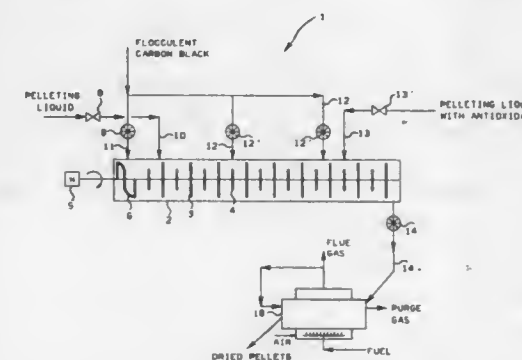
Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 21, 1977, Ser. No. 853,715

Int. Cl.<sup>2</sup> B01J 2/12

U.S. Cl. 264-117

12 Claims



1. A method for producing carbon black pellets comprising:

- wetting flocculent carbon black with a pelleting liquid in a pelleting means;
- agitating the thus wetted flocculent carbon black in the pelleting means to form pellets;
- adding antioxidant during the agitating of step (b) after the pellets have been at least substantially formed so that the antioxidant is contained substantially only in an outer portion of the pellet surrounding a core portion; and
- drying the thus produced pellets containing said antioxidant.

4,164,534

# METHOD OF PRODUCING LUMPS OF TANGLED FIBERS

Kiyoshi Ogino, Matsusaka, Japan, assignor to Central Glass Company, Limited, Ube, Japan

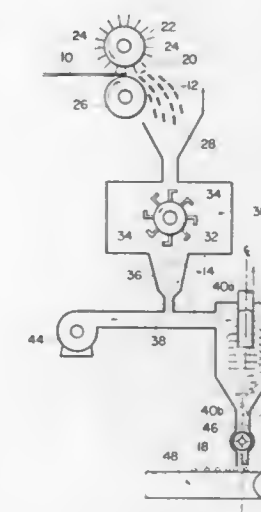
Filed Mar. 13, 1978, Ser. No. 886,111

Claims priority, application Japan, Mar. 14, 1977, 52/27073

Int. Cl.<sup>2</sup> B01J 2/16

U.S. Cl. 264-117

11 Claims



1. A method of producing lumps of tangled fibers, comprising the steps of: continuously whirling a gas around in a vessel; and introducing short fibers which are substantially in an untwisted state into said vessel so as to be involved and dispersed in the whirling gas, whereby said short fibers, absent an added binder, are subjected to sufficient individual tangling with each other to form individual fiber lumps which fall towards the bottom of said vessel.

4,164,535

# ANTISTATIC TEXTILE MATERIALS

Georges Veaute, Ozouers en Touraine, France, assignor to Manufacture de Produits Chimiques Protex S.A., Paris, France

Filed Oct. 18, 1977, Ser. No. 843,217

Claims priority, application France, Oct. 19, 1976, 76 32033

Int. Cl.<sup>2</sup> B29G 5/00; C08L 7/02, 61/20

U.S. Cl. 264-136

7 Claims

1. In a method of making a textile material wherein textile fibers are bonded by a thermally activatable binder, the improvement which comprises rendering the textile material antistatic by adding to the binder an alkylene-urethane thermosensitive copolymer of the formula:



wherein

R is an aliphatic or aromatic moiety which contains a biuret, urethane or isocyanate group;



R' is hydrogen, C<sub>1</sub> to c<sub>8</sub> straight or branched chain alkyl, aryl or alkylaryl;  
x is between 0 and 1 inclusive;  
y is greater than 2;  
n has a value of 1 to 4 inclusive; and  
p is greater than 5; and  
controlling the pH of the binder upon thermal activation thereof so as to be at most 5.5.

#### 4,164,536 METHOD AND APPARATUS FOR THE MANUFACTURE OF FIBROUS CASING

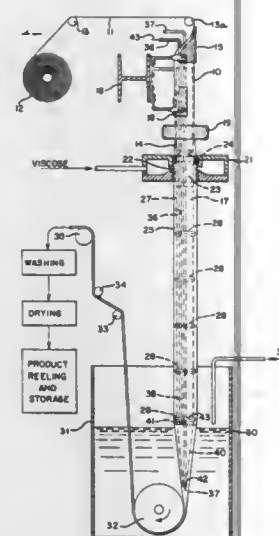
James G. Bentley, Veedersburg, Ind., assignor to Teepak, Inc., Chicago, Ill.

Filed Apr. 18, 1978, Ser. No. 897,327

Int. Cl.<sup>2</sup> B29F 3/10; D01F 1/08

U.S. Cl. 264—173

9 Claims



1. A process for the manufacture of fibrous casing from a fibrous tube having interior and exterior surfaces, which process comprises

- sleeving the tube over a mandrel and providing a space therebetween;
- advancing the tube over a mandrel;
- impregnating the tube with viscose while the tube is advanced over the mandrel;
- regenerating cellulose from the viscose impregnated tube by applying a coagulating liquid to the interior and exterior surfaces of the tube;
- withdrawing the liquid from within the tube by imposing a pressure differential on the liquid;
- introducing a gas at a point above the liquid level as the liquid is being withdrawn from within the tube to cause the gas to be entrained in the liquid to form a fluid mixture having a specific gravity less than that of the liquid so as to prevent air from being withdrawn from the space in order that the tube remain in spaced relation to the mandrel; and then
- collecting the fibrous casing.

#### 4,164,537 BRICK PRESS AND ASSOCIATED EQUIPMENT FOR MAKING BRICKS

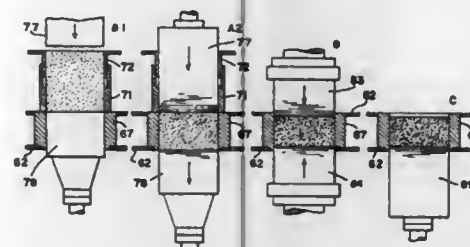
Frede H. Drostholm, 2950 Vedbaek; Harry Jensen, Begonlavej 9a, 2820 Gentofte, and Per Willadsen, Mollebakkevej 10, 3370 Melby, all of Denmark

Division of Ser. No. 721,867, Sep. 9, 1976, Pat. No. 4,050,865, which is a continuation-in-part of Ser. No. 510,145, Sep. 30, 1974, Pat. No. 4,035,128. This application Mar. 7, 1977, Ser. No. 775,182

Int. Cl.<sup>2</sup> B28B 3/08

U.S. Cl. 264—333

3 Claims



1. A method for making a brick from a charge of particulate material in an open ended brick mold, which method comprises measuring a charge of the particulate material externally of the mold, introducing the measured charge into the mold, effecting compression of the charge in two stages, the first stage being accomplished by applying pressure to the charge through both ends of the mold and concurrently shifting the position of the entire charge in the mold in a direction from one end of the mold toward the other end thereof, and the second stage being accomplished by applying pressure to the charge through both ends of the mold while maintaining a given mean position of the charge in the mold.

2. A method for compressing a charge of particulate material in an open ended brick mold, which method comprises effecting said compression in two stages, the first stage being accomplished by applying pressure to the charge through both ends of the mold and concurrently shifting the position of the entire charge in the mold in a direction from one end of the mold toward the other end thereof, and the second stage being accomplished by applying pressure to the charge through both ends of the mold while maintaining a given mean position of the charge in the mold.

#### 4,164,538 LOAD CONDITIONING CONTROL METHOD FOR STEAM STERILIZATION

Jack H. Young, Cambridge Springs, and Frank E. Halleck, Erie, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Nov. 11, 1977, Ser. No. 850,845

Int. Cl.<sup>2</sup> A61L 5/00, 1/00, 3/00

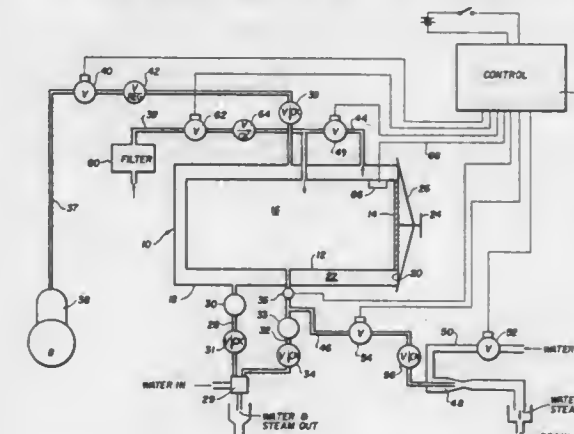
U.S. Cl. 422—26

18 Claims

1. A method of conditioning and steam sterilizing materials within a sealable chamber capable of operation at other than atmospheric pressure, such materials forming a load without requiring preselection of load size or material characteristics, such conditioning including removal of air from the load and heating the load to a desired temperature related to sterilizing temperature without requiring sensor contact with load materials, the method comprising the steps of

- loading such materials into the chamber and sealing the chamber,
- subjecting the chamber and the materials therein to a plurality of cyclic pressure pulses below an upper pressure level related to the desired sterilization temperature by injecting a condensable vapor having transferable latent heat into the chamber and evacuating the chamber, each cyclic pressure pulse including an evacuating phase during

which pressure in the chamber is decreasing and a vapor injecting phase during which the pressure is increasing, measuring the change of chamber pressure in relation to time lapse during at least a portion of the evacuating phase and employing the measured change as an indication of chamber evacuation rate during the evacuating phase, employing the indicated chamber evacuation rate of the evacuation phase to automatically control the termination



of that evacuation phase and initiate the succeeding cyclic pressure pulse pressurization phase to complete load conditioning by removing air from the load and heating the load to the desired temperature, and then introducing and maintaining sterilizing steam in the chamber at a pressure level to maintain the desired temperature for a time sufficient to affect desired sterilization of the material in the chamber.

#### 4,164,539 CATALYTIC GAS DETECTOR

James S. Johnston, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, Great Britain

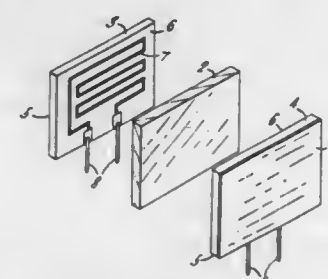
Filed Aug. 29, 1977, Ser. No. 828,662

Claims priority, application United Kingdom, Aug. 31, 1976, 36068/76

Int. Cl.<sup>2</sup> G01N 27/16

U.S. Cl. 422—96

9 Claims



1. A catalytic gas detector formed as a sandwich comprising two resistance thermometer sensor bodies, the bodies being formed as substantially equally sized flat plates and being disposed in spaced substantially parallel planes, and a thermally insulating member sandwiched between the two plates such that the surface area of the sandwich is less than the combined surface area of the two sensor bodies, each said sensor body comprising a substrate of electrically insulating material and having thereon in thermal contact therewith a conducting path of material having a temperature dependent co-efficient of resistance, said thermally insulating member having a lower thermal conductivity than the material of said substrates and one of said sensor bodies having a catalytic coating on an exposed surface portion thereof.

#### 4,164,540 CARBON BLACK REACTOR

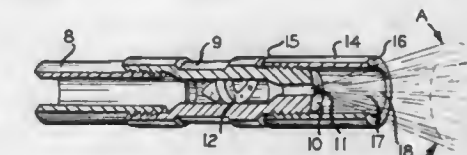
John E. Slagel, and Jack W. Brock, both of Orange, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 29, 1977, Ser. No. 782,607

Int. Cl.<sup>2</sup> C09C 1/48; F23D 15/04

U.S. Cl. 422—158

6 Claims



1. A carbon black reactor having an improved make oil dispensing nozzle wherein said carbon black reactor includes: (a) a housing defining a precombustion zone and reaction zone therein, said reaction zone being in downstream flow communication with the precombustion zone; (b) inlet means communicating with said precombustion zone operable for introducing combustion gases therinto; (c) a conduit extending into said precombustion zone; (d) a nozzle mounted on said conduit for receiving make oil therefrom and positioned in one of said reaction zone and said precombustion zone, said nozzle having a discharge orifice opening on a free end thereof operable for discharge of a generally cone-shaped stream of make oil; and (e) a tubular member positioned in one of said precombustion zone and said reaction zone, said nozzle being positioned within said tubular member, said tubular member having an open end directed generally in a downstream direction with respect to the direction of discharge of make oil from said nozzle and extending in said downstream direction beyond the free end of the nozzle, the other end of said tubular member being closed about one of said conduit and said nozzle to prevent the flow of combustion gases between said tubular member and said nozzle from said other end, said tubular member having a size such that at least a portion of the coneshaped stream of make oil will contact an interior surface of said tubular member.

#### 4,164,541 VENTURI MIXER

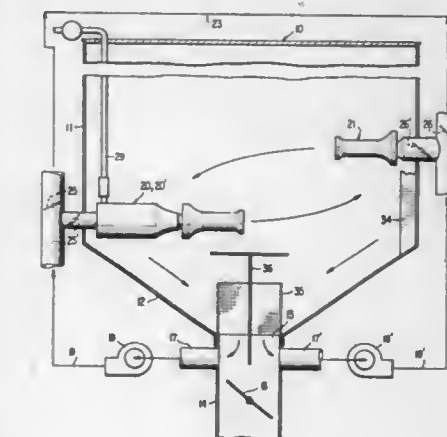
Edward A. Platz, deceased, late of Belle Mead, N.J.; by Zelma H. Platz, executor, Opossum Rd., R.R. #2, and by William Lubas, executor, Kildee Rd., R.R. #2, both of Belle Mead, N.J. 08502

Filed Nov. 22, 1976, Ser. No. 743,949

Int. Cl.<sup>2</sup> C05B 7/00; B01F 5/00; B01J 1/00

U.S. Cl. 422—198

14 Claims



1. An apparatus for reacting an acid reactant and base reactant

tant and mixing the reaction product with said reactants, whereby the acid and base reactants are reacted and partially neutralized to salts, wherein lumping of the salts is avoided, said apparatus comprising:

- a mixing tank; and
- a venturi pump mounted in said mixing tank and comprising: a venturi tube having inlet and outlet ends; a reactor upstream of said venturi tube and comprising: a reaction chamber having a central wall portion which is cylindrical in cross-section and inlet and outlet ends which are smaller in diameter than the cylindrical portion and joined thereto, respectively, by first and second concave frusto-conical wall sections, said outlet ends of said reaction chamber forming a nozzle projecting into the inlet end of the venturi tube and a plurality of holes in said first concave frusto-conical wall section; and an induction chamber upstream from and adjacent said reaction chamber and overlying at least a portion of the first concave frusto-conical wall section and registering with the holes in the first concave frusto-conical wall section;

first inlet means for introducing one of said reactants into said induction chamber, whereby said reactant may pass through the holes in said first concave frusto-conical wall section into said reaction chamber; and second inlet means for introducing the other reactant and the contents from the mixing tank directly into said reaction chamber through the inlet end of said reaction chamber without being introduced into said induction chamber; whereby the reaction between the acid and base reactants may take place in said reaction chamber to release energy which powers said venturi tube by expanding through said outlet end of said reaction chamber into said inlet end of said venturi tube.

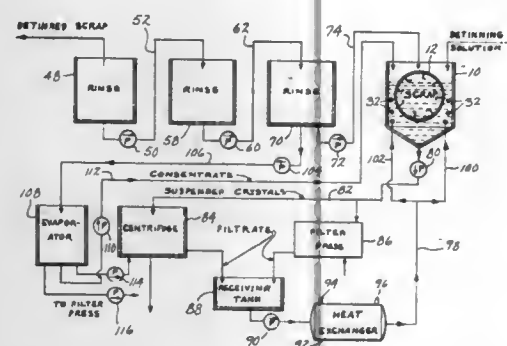
4,164,542

## DETINNING PROCESS

Pincus Deren, 712 E. Hampton Rd., Milwaukee, Wis. 53217  
Continuation of Ser. No. 458,085, Apr. 5, 1974, abandoned,  
which is a continuation of Ser. No. 251,408, May 8, 1973,  
abandoned. This application Dec. 5, 1974, Ser. No. 529,611  
Int. Cl.<sup>2</sup> C01G 19/00

U.S. Cl. 423—90

2 Claims



1. A process for rapidly detinning a tin-plated scrap metal to produce a detinned base metal having a shiny metallic surface comprising the steps of

immersing the scrap metal into a vessel containing an aqueous detinning solution including essentially 18-30% sodium hydroxide and 2-10% sodium nitrate or sodium nitrite for a time period up to about 20 minutes so as to completely dissolve the tin-plating from the base metal, said detinning solution being preconditioned at the start up of an operation to increase its initial effectiveness to dissolve the tin-plating by temporarily raising the temperature thereof to a level substantially above 236° F. and a sufficient amount of water thereafter is added to the aqueous detinning solution to lower the temperature thereof to between 226 and 236° F. so as to exceed the saturation

point of the sodium stannate formed therein and cause precipitation of said sodium stannate; and continuously removing said precipitated sodium stannate from said detinning solution while the scrap metal is immersed therein.

4,164,543

## PROCESS FOR REGENERATING BRINES CONTAINING SODIUM SULFITES AND SULFATES

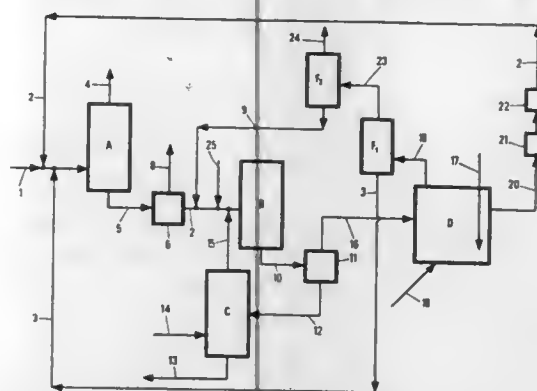
Claude Dezael, Maisons Laffitte; André Deschamps, Noisy le Roi, and Sigismund Franckowiak, Ruell Malmaison, all of France, assignors to Institut Français du Pétrole, Ruell-Malmaison, France

Filed Dec. 28, 1977, Ser. No. 865,287

Claims priority, application France, Dec. 28, 1976, 76 39519  
Int. Cl.<sup>2</sup> C01D 7/00

U.S. Cl. 423—189

12 Claims



1. A process for treating brine containing simultaneously sodium sulfate and at least one of sodium sulfite and sodium bisulfite so as to obtain sulfur dioxide, said process comprising the steps of

(a) contacting the brine with ammonium bisulfate, sodium bisulfate and at least one of ammonium sulfite and ammonium bisulfite to produce gaseous sulfur dioxide and an enriched solution of sodium sulfate and ammonium sulfate, and separating said gaseous sulfur dioxide from said enriched solution,

(b) reacting the solution from step (a) with carbon dioxide from step (h) and ammonia from step (f) so as to obtain sodium bicarbonate in a solid state and a solution enriched with ammonium sulfate and containing dissolved ammonium bicarbonate, and residual sodium sulfate, and separating the sodium bicarbonate in the solid state from said solution,

(c) decomposing a bicarbonate from step (b) to form carbon dioxide,

(d) heating the solution from step (b) at 150°-450° C. with an agent for reducing ammonium bisulfate and sodium bisulfate to sulfur dioxide, said agent being in insufficient amounts to convert all of said ammonium bisulfate and sodium bisulfate to sulfur dioxide, and recovering a mixture of unconverted ammonium bisulfate and sodium bisulfate, and a gas comprising sulfur dioxide, ammonia and water,

(e) separating the gas recovered from step (d) and subjecting said gas to stepwise cooling to recover a first condensate comprising an aqueous ammonium sulfite solution and then a second condensate comprising an aqueous ammonia solution,

(f) feeding the first condensate to step (a) to supply an ammonium sulfite, and the second condensate to step (b) to supply ammonia,

(g) feeding step (a) with ammonium bisulfate and sodium bisulfate recovered from step (d),

- (h) feeding step (b) with carbon dioxide recovered from step (c), and
- (i) discharging gaseous sulfur dioxide from step (a).

4,164,544

## DESULFURIZATION OF HOT REDUCING GAS

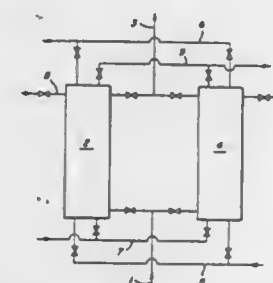
Robert G. Olsson, Edgewood Borough, and Ethem T. Turkdogan, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 718,257, Aug. 27, 1976. This application Sep. 30, 1976, Ser. No. 728,329

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—230

22 Claims



1. In a process for desulfurizing hot reducing gas by contacting said gas with a desulfurizing agent, then regenerating the spent desulfurizing agent, and then reusing the regenerated desulfurizing agent for desulfurizing hot reducing gas, the improvement wherein the desulfurizing agent comprises a bed of sintered, porous pellets comprising manganese oxide and non-reactive metal oxide comprising finely divided aluminum oxide, wherein the spent desulfurizing agent is regenerated by heating said bed in the presence of an oxidizing gaseous atmosphere, wherein the temperature of the bed is maintained at a temperature between about 500° C. and about 1300° C. in both the desulfurization and the regeneration steps wherein said pellets comprise more than about 50% by weight manganese oxide and less than about 50% by weight of aluminum oxide and wherein said pellets were sintered by heating to a temperature between about 1000° C. and about 1400° C.

4,164,545

## USE OF MANGANESE DIOXIDE ABSORBENT IN TREATING WASTE GASES

Richard L. Scott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 3, 1978, Ser. No. 948,132

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—239

6 Claims

1. In a system for treating waste gas with an absorbent which contains MnO<sub>2</sub> a method for recovering manganese from the spent absorbent said method comprising:

- (1) contacting spent absorbent with water or aqueous solution to solubilize salts of manganese;
- (2) contacting solubilized salts of manganese with an acidic ion exchange resin that retains manganese and passes acids formed from manganese salts;
- (3) contacting ion exchange resin and contained manganese with dilute HNO<sub>3</sub> to obtain Mn(NO<sub>3</sub>)<sub>2</sub> solution; and
- (4) precipitating MnO<sub>2</sub> from said Mn(NO<sub>3</sub>)<sub>2</sub> solution.

4,164,546

## METHOD OF REMOVING NITROGEN OXIDES FROM GASEOUS MIXTURES

Albert B. Welty, Jr., deceased, late of Westfield, N.J., and by Doris M. Prescott, executrix, Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 534,283, Dec. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 285,818, Sep. 1, 1972, abandoned. This application Oct. 31, 1977, Ser. No. 847,038

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—239

13 Claims

1. A process for treating a gaseous mixture comprising nitrogen oxide, sulfur dioxide and oxygen in order to reduce selectively the nitrogen oxide content thereof by conversion of the nitrogen oxide to nitrogen which comprises:

- (1) adding ammonia to said gaseous mixture;
- (2) contacting said gaseous mixture and said ammonia under oxidizing conditions at a gas inlet temperature of about 600° F. to about 900° F. with a non-noble metal containing catalyst comprising copper oxide or vanadium pentoxide supported on a refractory carrier, said copper oxide or vanadium pentoxide being converted during the course of contact with said gaseous mixture and ammonia to copper sulfate or vanadium sulfate while remaining effective for promoting the conversion of nitrogen oxide to nitrogen; and
- (3) discontinuing contacting said catalyst with said gaseous mixture and ammonia, contacting said catalyst with a reducing gas at a gas inlet temperature of about 600° F. to about 900° F. and thereafter continuing contacting said catalyst with said gaseous mixture and ammonia as in steps (1) and (2).

4,164,547

## PROCESS FOR REMOVING SULFUR DIOXIDE IN A WET SCRUBBER

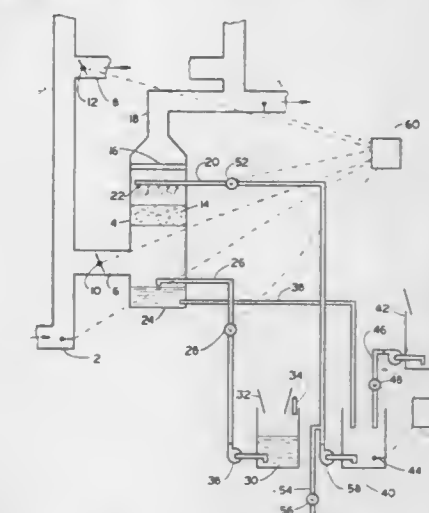
Alexander P. Simko, Anchorage, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 6, 1977, Ser. No. 794,553

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—242

2 Claims



1. A process for the removal of oxides of sulfur from a flue gas stream comprising the steps of:

- (a) introducing flue gas containing SO<sub>2</sub> to a wet scrubbing device;
- (b) introducing simultaneously with said flue-gas stream a controlled amount of SO<sub>2</sub> reactant scrubbing solution and a controlled amount of fly-ash solution to said scrubber to form a resulting solution;
- (c) monitoring the amount of SO<sub>2</sub> to said scrubbing device by establishing a signal to an analog computer, said computer being provided with preselected operating condi-



tions of said process, said computer signalling first flow control means for said SO<sub>2</sub> reactant scrubbing solution and second flow control means for said fly-ash solution whereby the amount of SO<sub>2</sub> reactant scrubbing solution and the amount of fly-ash solution added to the wet scrubber is determined by said signals from said computer;

(d) removing a controlled amount of said resulting solution from said wet scrubbing device; and,

(e) introducing said resulting solution to a recycle tank, reading the pH of said resulting solution in said resulting tank, and adding a controlled amount of an alkali solution to said recycle tank, said control amount being determined by the pH reading, to maintain a preselected pH in said recycle tank at from four to eight, the resulting mixture being said SO<sub>2</sub> reactant scrubbing solution; and,

(f) establishing a signal from the pH reading to said computer, said computer signalling said first and second flow means based on said pH reading and comparing said pH reading with said preselected operating conditions.

4,164,548

PROCESS FOR REMOVING SO<sub>2</sub> FROM GASES

Roberto Vitali, Sergio Villa, both of Milan, and Costante Lotti, Bresso, all of Italy, assignors to "Il Gas Interale" S.p.A., Milan, Italy

Continuation of Ser. No. 701,877, Jul. 1, 1976, abandoned, which is a continuation of Ser. No. 476,035, Jun. 3, 1974, abandoned.

This application Jan. 20, 1978, Ser. No. 871,185

Claims priority, application Italy, June 1, 1973, 24945 A/73; Feb. 20, 1974, 48586 A/74

Int. Cl.<sup>2</sup> C01B 17/00

U.S. Cl. 423—242

6 Claims

1. A process for removal of sulphur dioxide from an effluent gas comprising treating said gas in at least two successive stages with an absorbing solution selected from the group consisting of an alkali sulphite solution and an alkali sulphite and bisulphite solution, part of said absorbing solution having been pretreated with air or with a gas that is inert with respect to the solution to reduce the SO<sub>2</sub> partial pressure of said absorbing solution, wherein said pretreatment of part of the absorbing solution is accomplished as a partial solution regeneration step in a cyclic process in which the pretreated absorbing solution is repeatedly circulated through an absorption stage and a regeneration stage, SO<sub>2</sub> absorbed by the solution in the absorption stage being partially stripped from the solution in the regeneration stage and reabsorbed by the solution concurrently with the absorption by the solution of SO<sub>2</sub> from the SO<sub>2</sub>-containing gas, whereby the SO<sub>2</sub> content in the effluent gas is reduced to 50 ppm or less.

4,164,549

## LIME SCRUBBING PROCESS FOR SULFUR DIOXIDE REMOVAL FROM GASES

Joseph G. Selmeczi, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1978, Ser. No. 873,280

Int. Cl.<sup>2</sup> C01B 17/00

U.S. Cl. 423—242

5 Claims

1. In a lime scrubbing process for the removal of oxides of sulfur from a gaseous stream, wherein a calcium salt-containing liquor containing 250–5000 parts per million by weight of the liquor of magnesium ion is present within the scrubber, with at least a portion of the effluent from the scrubber clarified and aqueous liquor from said clarifier is returned to the scrubber, and wherein the pH of the effluent from the scrubber is maintained above 5.3 while the pH of the inlet liquor to the scrubber is maintained below 9.8, and wherein interruption of flow of said gaseous stream through the scrubber occurs, the improvement comprising:

adjusting the pH of said liquor to a value between 9.8–12.0 during interruption of flow of the gaseous stream through the scrubber to convert sulfite and bisulfite ions in said

liquor to precipitated solids and prevent oxidation of the same during said interruption of flow; and

upon resuming flow of said gaseous stream through the scrubber, adding magnesium-containing lime after said inlet pH has reacted a value below 9.8.

4,164,550

## PRODUCTION OF STABILIZED WET PROCESS PHOSPHORIC ACID

Richard N. Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.

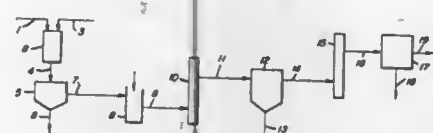
Continuation-in-part of Ser. No. 812,319, Jul. 1, 1977, Pat. No. 4,110,422, which is a continuation-in-part of Ser. No. 683,756, May 6, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,381

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C01B 25/16

U.S. Cl. 423—321 R

15 Claims



1. The method of preparing a wet process phosphoric acid substantially free from post-precipitation that includes the steps:

- a) to a wet process phosphoric acid having a P<sub>2</sub>O<sub>5</sub> content of 36 to 46 weight percent from which the suspended solids have been removed, adding 0.05 to 2.0 weight percent of an aluminum silicate material based on the contained weight of P<sub>2</sub>O<sub>5</sub> in the acid to provide an aluminum silicate material-acid mix; said aluminum silicate material being finely divided so as to be soluble in the phosphoric acid as the concentration of the acid is increased from 36–46 weight percent P<sub>2</sub>O<sub>5</sub> to an increased P<sub>2</sub>O<sub>5</sub> within the range of 42–52 weight percent;
- (b) concentrating the aluminum silicate material-acid mix to said 42–52 weight percent P<sub>2</sub>O<sub>5</sub> in an evaporation zone thereby to provide an aluminum silicate material/acid solution;
- (c) transferring the concentrated solution to a crystallizing zone having an overflow stream and an underflow stream;
- (d) recovering the overflow stream and subsequently evaporating to a concentration of up to 63% P<sub>2</sub>O<sub>5</sub> to provide wet-process phosphoric acid substantially free of post-precipitation.

4,164,551

## PREPARATION OF ZEOLITE

Curtis H. Elliott, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,031

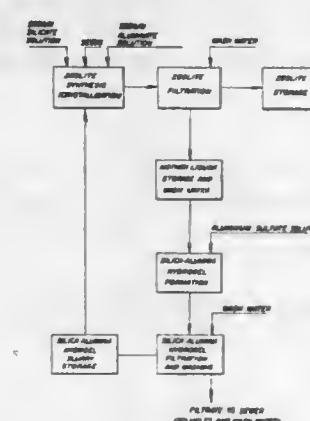
Int. Cl.<sup>2</sup> C01B 33/28

U.S. Cl. 423—330

4 Claims

1. A process for preparing Type Y zeolite which comprises:
- (a) preparing a reaction mixture containing the following mol ratio of reactants:  
3 to 6 Na<sub>2</sub>O: 8 to 12 SiO<sub>2</sub>:Al<sub>2</sub>O<sub>3</sub>:120 to 200 H<sub>2</sub>O;
  - (b) including in said reaction mixture zeolite nucleation centers having the following mol composition:  
15 to 17 Na<sub>2</sub>O: 14 to 16 SiO<sub>2</sub>:Al<sub>2</sub>O<sub>3</sub>:285 to 357 H<sub>2</sub>O;
  - (c) heating said mixture to obtain Type Y zeolite and mother liquor which contains silicate;
  - (d) separating said Type Y zeolite from the mother liquor, and reacting said mother liquor with sufficient aluminum sulfate to precipitate substantially all the silicate as silica-alumina hydrogel;

(e) recovering and washing said hydrogel to remove sodium sulfate therefrom; and



(f) including said hydrogel as part of the reaction mixture prepared in step (a).

4,164,552

## PREPARATION OF HYDROGEN CYANIDE

Frank J. Weigert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1978, Ser. No. 905,970

Int. Cl.<sup>2</sup> C01C 3/02

U.S. Cl. 423—376

10 Claims

1. The process of preparing HCN by reacting NH<sub>3</sub> in a nonoxidative atmosphere at 650°–950° C. with a hydrocarbon having at least 3 carbon atoms, in the presence of a catalytically effective amount of a catalyst of the formula



wherein

M is Pd, Ir or Pt;

M' is Ag, Ce, Rare Earths, Cr, Cu, La, Mg, Ti, V, W, Zn, Zr;

d=1

a=0 or up to 5% of weight of oxides (b+c+d)

b=0 to 0.2

c=0 to 100;

and recovering HCN.

4,164,553

## PLASMA ARC PROCESS FOR THE PRODUCTION OF CHEMICAL PRODUCTS IN POWER FORM

Glancarlo Perugini, Novara, and Enzo Marcaccioli, Perugia, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 14, 1977, Ser. No. 768,572

Claims priority, application Italy, Feb. 17, 1976, 20241 A/76  
Int. Cl.<sup>2</sup> C01B 31/30; C04B 31/16

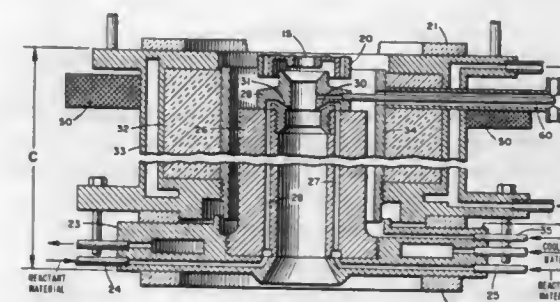
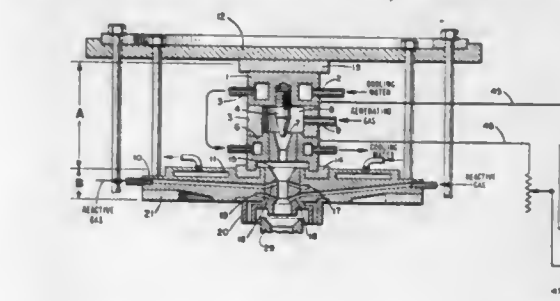
U.S. Cl. 423—440

8 Claims

1. In a plasma-arc process for the production of a carbide powder, according to endothermic reactions the improvement comprising carrying out, in a furnace with an anodic function without dissipative cooling, a series of steps comprising:

- (a) forming a chemically reactive fluidodynamic mass having a high thermal content and a high concentration of the desired reactive species, by injecting into the electronic column of a noble gas plasma-arc at least one metal or metalloid halide and a hydrocarbon, the injection taking place, with mixing, through a choker-injector-mixer nozzle which is electrically insulated;
- (b) causing the electronic condensation of said mass inside a main nozzle anode made of tungsten or graphite, without dissipative cooling;
- (c) injecting into said electronically condensed mass the residual part of said reactants necessary to bring about the desired main chemical reaction for producing the carbide powder; and wherein the total volume of the reactants is

equal to or greater than 20% of the total aeriform volume formed by the total volume of the reactants plus the vol-



ume of noble gas that pilots and stabilizes the plasma-arc itself.

4,164,554

## METHOD FOR CONVERTING CALCIUM SULFOXY COMPOUNDS INTO CALCIUM CARBONATE COMPOUNDS

Metro D. Kulik, Pittsburgh, Pa., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 5, 1978, Ser. No. 966,543

Int. Cl.<sup>2</sup> C01B 17/04

U.S. Cl. 423—567 A

7 Claims

1. A method for converting calcium sulfoxy compounds selected from the group consisting of CaSO<sub>x</sub> and Ca(HSO<sub>x</sub>)<sub>2</sub> wherein x is 3 or 4 into calcium carbonate, said method consisting essentially of:

- (a) converting said Ca(HSO<sub>x</sub>)<sub>2</sub> compounds into said CaSO<sub>x</sub> compounds by reacting said Ca(HSO<sub>x</sub>)<sub>2</sub> compounds with CaCO<sub>3</sub> in the presence of water;
- (b) reacting said CaSO<sub>x</sub> compounds with NH<sub>3</sub> and CO<sub>2</sub> in the presence of water to produce NH<sub>4</sub>HSO<sub>x</sub> wherein x is 3 or 4 and CaCO<sub>3</sub>;
- (c) separating said NH<sub>4</sub>HSO<sub>x</sub> and said CaCO<sub>3</sub>;
- (d) reacting said NH<sub>4</sub>HSO<sub>x</sub> with H<sub>2</sub>S to produce ammonium polysulfide;
- (e) decomposing said ammonium polysulfide to produce NH<sub>3</sub>, H<sub>2</sub>S, sulfur and water; and
- (f) recovering said sulfur from said NH<sub>3</sub>, H<sub>2</sub>S and water.

4,164,555

## POLLUTION CONTROL SYSTEM AND METHOD FOR THE REMOVAL OF SULFUR OXIDES

Peter Steiner, Edison, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 12, 1977, Ser. No. 832,506

Int. Cl.<sup>2</sup> C01B 17/04

U.S. Cl. 423—569

13 Claims

1. A method for treating a sulfur oxides-saturated carbonaceous adsorbent char comprising the steps of:

- passing said char to a vessel;
- introducing combustion-supporting air into said vessel;
- introducing a quantity of coal into said vessel; and
- simultaneously burning a portion of said quantity of coal as



a fuel to provide heat to desorb said char of said sulfur oxides and reacting said sulfur oxides with the remaining portion of said coal to produce gaseous elemental sulfur, the adsorbent characteristics of said remaining coal portion being enhanced such that said remaining coal portion constitutes a carbonaceous adsorbent material after said reacting.

4,164,556

# METHOD OF PRODUCING SULFUR FROM SULFUR DIOXIDE

Frederic Leder, South Orange, and Robert P. Cahn, Millburn, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 14, 1974, Ser. No. 523,705

Int. Cl.<sup>2</sup> C01B 17/04

U.S. Cl. 423—569

29 Claims

1. A method for producing sulfur from sulfur dioxide comprising the step of contacting a gas stream comprising sulfur dioxide with a reducing gas comprising methanol under conditions such that at least a portion of the sulfur dioxide is converted to sulfur thermally.

4,164,557

# PROCESS FOR THE PRODUCTION OF $\beta$ -LITHIUM ALUMINATE AND NEEDLE-SHAPED PRODUCT

Martin Feldmann, Hanau, Fed. Rep. of Germany; Edgar Koberstein, Alzenau, Austria, and Klaus Seibold, Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,365

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711420

Int. Cl.<sup>2</sup> C01F 7/02

U.S. Cl. 423—600

14 Claims

1. A process for the production of  $\beta$ -lithium aluminate which has the formula:  $\text{LiAlO}_2$ , comprising forming an aqueous solution containing lithium ions and aluminum in ionogenic or elementary form, precipitating a lithium hydroxoaluminate of the composition  $\text{Li}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot n\text{H}_2\text{O}$  wherein  $n$  is at least 1 from said aqueous solution at a pH value above 7 and at concentrations of the two metal components of at least 0.1 g-atoms/liter, at most 6 g-atoms per liter, wherein Li and Al are present in equimolar ratios or wherein there is an excess of Li present, washing the product obtained by said precipitating and converting said product by annealing in the temperature range between 200° C. and 800° C. into  $\beta$ -lithium aluminate.

4,164,558

# METHOD FOR OPTIMIZING REAGENTS FOR AGGLUTINATION REACTIONS

Gustav K. von Schulthess; Richard J. Cohen, both of Brookline, and George B. Benedek, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 22, 1976, Ser. No. 743,678

Int. Cl.<sup>2</sup> G01N 31/00, 33/16

U.S. Cl. 424—12

6 Claims

1. The process for forming a composition comprising an aqueous suspension of antigen-coated or antibody-coated particles to maximize sensitivity for determining the concentration of the agglutinator for the composition which comprises

- coating carrier particles with the antigen or antibody,
- suspending the coated particles in a liquid having a pH as far as possible from the isoelectric point of the particle coating without significantly reducing the binding capacity of the coating, to maximize particle charge,
- increasing the ionic strength of the composition obtained by (B) to reduce the range of coulomb interaction until nonspecific agglutination occurs and

(D) reducing the ionic strength of the composition by (C) to just below that where nonspecific agglutination occurs so that coulomb effect and the van der Waals forces on and exerted by the particles are balanced to effect determination of a minimum concentration of the agglutinator.

4,164,559

# COLLAGEN DRUG DELIVERY DEVICE

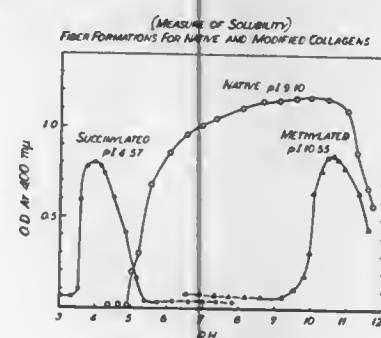
Teruo Miyata, Tokyo, Japan; Albert L. Rubin; Kurt H. Stenzel, both of Englewood, N.J., and Michael W. Dunn, New Rochelle, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,302

Int. Cl.<sup>2</sup> A61K 9/00, 47/00, 37/12

U.S. Cl. 424—14

9 Claims



1. An ophthalmic drug delivery system comprising (a) an enzyme-extracted, chemically-modified collagen thin membrane carrier selected from the group consisting of esterified collagen and acylated collagen and having a pH in the range of 5.5–9.0 whereby the carrier is soluble in the tear fluid under physiologic conditions, and (b) an ophthalmically active drug incorporated into said carrier.

4,164,560

# SYSTEMS FOR THE CONTROLLED RELEASE OF MACROMOLECULES

Moses J. Folkman, 18 Chatham Cir., Brookline, Mass. 02146, and Robert S. Langer, Jr., 1200 Commonwealth, Apt. 2, Allston, Mass. 02134

Filed Jan. 5, 1977, Ser. No. 756,892

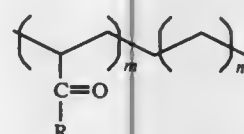
Int. Cl.<sup>2</sup> A61K 9/26, 37/26

U.S. Cl. 424—22

12 Claims

1. A therapeutic system for the continuous and controlled administration of insulin, said system being in the form of a body which is sized and shaped for placement in the environment of use, comprising a two-phase composition of:

- a first phase comprising a biocompatible, plastically deformable, hydrophobic matrix having an aqueous fluid sorptivity not greater than 50% by weight, of ethylene-vinyl ester copolymer of the general formula:



wherein R is a member selected from the group consisting of hydrogen, lower alkyl of 1 to 7 carbons and phenyl, the polymer being insoluble in the environment of use, substantially impermeable to diffusion therethrough of insulin, and containing in admixture therewith;

- a second phase comprising from about 3 to 90 parts by weight of agglomerated particles of insulin.

4,164,561

# INSECT REPELLENT

Horst Hautmann, Johann-Strasse-Strasse 9, D-8858 Neuburg, Fed. Rep. of Germany

Filed Apr. 26, 1977, Ser. No. 791,110

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618975

Int. Cl.<sup>2</sup> A01N 9/02, 9/08, 9/24, 9/20

U.S. Cl. 424—29

8 Claims

- A housefly repellent which consists essentially of:
  - about 85.70% by weight of perfume which contains 30% by weight of citral;
  - about 7.15% by weight of citronella oil; and
  - about 7.15% by weight of diethyltoluamide.
- A cellulose porous carrier impregnated with the housefly repellent of claim 1.
- An asbestos porous carrier impregnated with the housefly repellent of claim 1.

4,164,562

# AEROSOL HAIR SPRAY CONTAINING AN ETHYL OR BUTYL MONOESTER OF A COPOLYMER OF MALEIC ACID AND A VINYL MONOMER

Arun Nandagiri, Lake Hiawatha; Uma Tripathi, Oakland, and LeRoy Hunter, Randolph, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 21, 1977, Ser. No. 844,241

Int. Cl.<sup>2</sup> A61K 7/11

U.S. Cl. 424—47

5 Claims

1. A hair spray composition consisting essentially of (a) about 65 to 80 percent by weight of a liquid concentrate phase and (b) about 20 to 35 percent by weight of a lighter hydrocarbon propellant phase comprising propane, n-butane, isobutane, or mixtures thereof; said liquid concentrate phase comprising, based on the total weight of (a) and (b), from about 2 to 5 percent by weight of a film-forming carboxylic acid containing polymeric material which is a copolymer of an alkyl vinyl ether and the monoethyl- or monobutyl ester of maleic acid; from about 2 to 12 percent by weight water; from about 0.1 to 0.3 weight percent of an organic base neutralizer for said carboxylic acid-containing polymeric material; and sufficient amount of a material selected from the group consisting of ethanol, isopropanol, or mixtures thereof, to total 100 percent.

4,164,563

# NON-GREASY COMPOSITIONS

Robert W. H. Chang, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 24, 1975, Ser. No. 561,421

Int. Cl.<sup>2</sup> A61K 31/745

U.S. Cl. 424—83

17 Claims

1. A non-greasy occlusive composition for topical application to the skin comprising from about 40 to 90 percent by weight of a greasy viscous base, and from about 10 to 60 percent by weight of a solid, non irritating ointment-forming powder; wherein said viscous base is selected from the group consisting of solid petrolatum, animal oils, mineral oils, and synthetic oils, wherein said oils have been thickened by an agent selected from the group consisting of waxes and hydrocarbon polymers; and wherein said ointment forming powder comprises a polyolefin having from 2 to 6 carbon atoms in the recurring unit, a molecular weight of from about 3,000 to 150,000 and a number average maximum dimension of less than about 30 microns, said viscous base being substantially non-absorbed by said ointment-forming powder below about 50° C., and wherein said greasy viscous base is mixed with said ointment-forming powder at a temperature of less than about 50° C.

4,164,564

# ointment AND CREAM BASES CAPABLE OF WITHSTANDING ELEVATED TEMPERATURES

James L. Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 753,968, Dec. 23, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 930,848

Int. Cl.<sup>2</sup> A61K 31/745, 9/10, 9/00, 47/00

U.S. Cl. 424—83

11 Claims

1. A gelled mineral oil vehicle for medicinals said vehicle having improved high temperature stability and water-absorption properties, comprising a gelled mineral oil and containing a water absorption promoter comprising an oily liquid at room temperature and free of unsaturated fatty acid moiety, and which is a member selected from the group consisting of triglyceryl diisostearate, sorbitan sesqui-isostearate, sorbitan trisostearate, polyethylene glycol isostearyl ether, polyethylene glycol diisostearyl ether, and mixtures thereof, said vehicle being stable at temperatures of 80° C. or higher, without becoming rancid, and being capable of absorbing 2 to 10 times its weight in water.

4,164,565

# VACCINE FOR ACTIVE IMMUNIZATION CONTAINING HEPATITIS B SURFACE ANTIGEN AND ASSOCIATED ANTIGEN

Alfred M. Prince, Stamford, Conn.; John Vnek, Bronx; Robert A. Neurath, New York, both of N.Y., and Christian Trepo, Bron, France, assignors to New York Blood Center, Inc., New York, N.Y.

Continuation of Ser. No. 631,961, Nov. 17, 1975, Pat. No. 4,118,479. This application Sep. 7, 1977, Ser. No. 831,327

Claims priority, application France, Mar. 14, 1975, 75 08046

Int. Cl.<sup>2</sup> A61K 39/12

U.S. Cl. 424—89

1 Claim

1. An antigenic mass effective against viral hepatitis comprising a solution of a physiologically acceptable medium substantially free of human serum proteins, said solution containing e-antigen, dissolved in said medium, said antigen being present in an amount sufficient, when introduced into a host animal, to effect formation of antibodies corresponding thereto, said antigenic mass obtained from the serum of a chronic HBsAg carrier whose serum contains e-antigen, said antigenic mass being substantially free of combined anti-antibody.

4,164,566

# HEPATITIS A VIRUS CELL CULTURE IN VITRO

Philip J. Provost, Harleysville, and Maurice R. Hilleman, Lafayette Hill, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 17, 1978, Ser. No. 934,293

Int. Cl.<sup>2</sup> A61K 39/12; C12K 7/00

U.S. Cl. 424—89

9 Claims

1. A method of growing hepatitis A virus in cell culture comprising modification of the virus by carrying out at least one passage of the virus in a susceptible sub-human primate, removing the infected liver, inoculating an in vitro cell culture with the infected liver, incubating the cell culture until hepatitis A antigen is detectable in the culture cells or fluid, and carrying out at least one additional in vitro passage of the virus in cell culture.

8. A live attenuated hepatitis A virus vaccine comprising an antigenic and immunogenic hepatitis A virus which has been modified by at least one passage in the liver of a sub-human primate susceptible to hepatitis A virus disease and by at least two serial in vitro passages in cell culture.



4,164,567

**PROCESS FOR RECOVERING MACROMOMYCIN**  
Hamao Umezawa, and Tomio Takeuchi, both of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,492  
Int. Cl.<sup>2</sup> A61K 35/00

U.S. Cl. 424—123

3 Claims

1. A process for forming a precipitate containing macromycin from a macromycin culture which comprises, adding a neutralizer to a culture filtrate of macromycin in a saturated solution of ammonium sulfate which is maintained at a temperature of about 5° C., said neutralizer (a) being added in an amount in the range of from 0.25 percent to 1.0 percent based on the weight of said macromycin culture and (b) being selected from the group consisting of sodium carbonate, calcium carbonate, sodium bicarbonate, dibasic sodium phosphate, dibasic potassium phosphate, monobasic sodium phosphate and monobasic potassium phosphate, immediately thereafter, adding a coagulant to said macromycin culture that is neutralized by said neutralizer, said coagulant, (a) being added in an amount of from 0.25 percent to 1.0 percent, based on the weight of said macromycin culture, to provide a mixture having a pH in the range of 5.0 to 7.5, and (b) being selected from a group consisting of ferrous sulfate, ferrous chloride, ferric sulfate, ferric chloride, sodium aluminate, aluminum sulfate, and recovering a precipitate containing a high concentration of macromycin therefrom.

4,164,568

**ORAL SCOUR FORMULATIONS WITH CITRATE**  
Robert J. Bywater, Tadworth, England, assignor to Beecham-group Limited, Great Britain

Filed Mar. 11, 1977, Ser. No. 776,536  
Claims priority, application United Kingdom, Mar. 27, 1976, 12417/76; Mar. 27, 1976, 12418/76

Int. Cl.<sup>2</sup> A61K 33/14, 31/70, 31/19, 31/195

U.S. Cl. 424—153

23 Claims

1. A veterinary composition useful for treating diarrhoea in animals which comprises 40–80% of an actively absorbed monosaccharide, 7.5–30% of an actively absorbed, naturally occurring amino acid, 0.5–5% of citric acid and 0.1–5% of a non-toxic salt of citric acid.

4,164,569

**STABILIZED SOFT GELATIN CAPSULE COMPOSITION OF 1 α-HYDROXY-VITAMIN D**

Heizi Ikushima, Kawaguchi; Hiroto Nakano, Kodaira; Kazuo Igusa, Tokorozawa, and Sadao Bessho, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1977, Ser. No. 786,483  
Claims priority, application Japan, Apr. 19, 1976, 51-43615  
Int. Cl.<sup>2</sup> A61K 31/00, 31/59, 31/195

U.S. Cl. 424—174

11 Claims

1. A method for stabilizing 1α-hydroxy-vitamin D, encapsulated in a soft gelatin capsule, against deactivation caused by ultraviolet light, comprising: incorporating an ultraviolet light deactivation preventive amount of sorbic acid, its salt or a combination thereof in the gelatin of said capsule or with the vitamin D encapsulated by said capsule.

4,164,570

**STABILIZED AQUEOUS CATECHOLAMINE SOLUTIONS**

David Clough, 39, The Stewarts, Bishops Stortford, Hertfordshire CM21 2NU, and Gary C. F. Ruder, 57 Greygoose Park, Harlow, Essex, both of England

Continuation of Ser. No. 507,593, Sep. 20, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 744,045

Claims priority, application United Kingdom, Sep. 24, 1973, 44660/73; Sep. 24, 1973, 44661/73

Int. Cl.<sup>2</sup> A61K 31/00, 47/00, 31/195, 31/135

U.S. Cl. 424—175

6 Claims

1. A borate-free aqueous solution for the topical application to the eyes in the treatment of open-angle glaucoma, said solution comprising from 0.1 to 2.0 percent of epinephrine, said epinephrine containing less than 1 part per million of heavy metal calculated as ferric ion, from 0.5 to 2.0 percent of N-acetyl cysteine, said N-acetyl cysteine being present in at least equimolar proportion to the epinephrine whereby it solubilizes the epinephrine as well as stabilized the solution, ammonium hydroxide in an amount sufficient to give a pH of less than 7.5 and an ammonium buffer, said solution having a pH in the range of from 6.0 to 7.5.

4,164,571

**MEDICAMENT WHICH ANTAGONIZES THE ACTION OF GASTRIN AND RELATED POLYPEPTIDES**

Serge J. E. Bonfils; Juliette M. Dubrasquet, both of Paris; Pierre Fromageot, Versailles; Jean P. Girma, Gif sur Yvette; Miguel Lewin, Asnieres, and Jean L. Morgat, Paris, all of France, assignors to Commissariat a l'Energie Atomique and Institut National de la Sante et de la Recherche Medicale, both of Paris, France

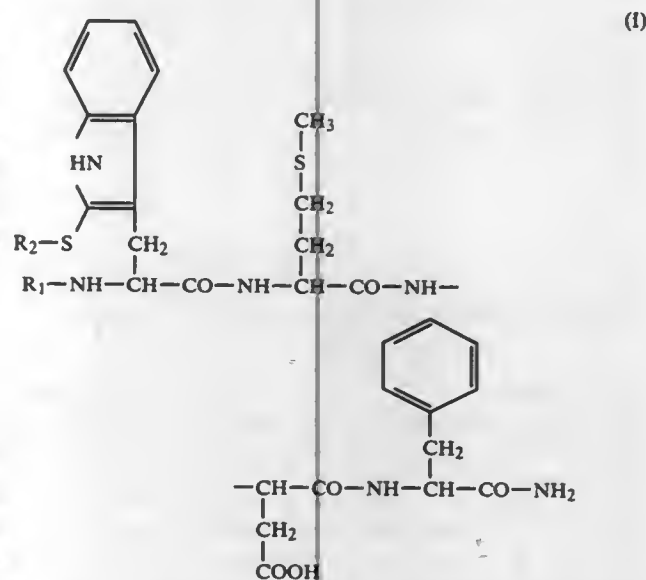
Filed Sep. 21, 1977, Ser. No. 835,394  
Claims priority, application France, Sep. 21, 1976, 76 2833

Int. Cl.<sup>2</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177

22 Claims

1. A medicament, which comprises as active substance a polypeptide amide derivative of general formula:



in which R<sub>1</sub> represents a hydrogen atom, an amino acid radical, a N-t-butyloxycarbonyl-L-amino acid radical, a N-benzoyloxycarbonyl amino acid radical or a N-benzoyl amino acid radical, wherein the term amino acid radical means an amino acid radical selected from the group consisting of β-alanyl, glycyl, pyroglutamyl, N-benzoyl glycyl, N-t-butyloxycarbonyl-L-glycyl, N-t-butyloxycarbonyl-L-alanyl, lysile and N-benzoyloxycarbonyl-L-propyl or a peptide radical selected from the group consisting of:

L-pyroglutamyl-L-glycyl-L-prolyl-L-tryptophanyl-L-leu-

cyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-alanyl-L-tyrosyl-L-glycyl, L-pyroglutamyl-L-glycyl-L-propyl-L-typtophanyl L-leucyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-alanyl-L-tyrosyl-(oxysulphonic in the 4-position of the phenyl nucleus), L-pyroglutamyl-L-glutamyl-L-aspartyl-L-tyrosyl-L-threonyl-L-glucyl, N-t-butyloxycarbonyl-L-aspartyl-L-tyrosyl-L-methionyl-L-glycyl, L-pyroglutamyl-L-leucyl-L-glycyl-L-prolyl-L-glutamyl-L-glycyl-L-histidyl-L-prolyl-L-seryl-L-leucyl-L-valyl-L-alanyl-L-aspartyl-L-prolyl-L-seryl-L-lysyl-L-lysyl-L-glutamyl-L-glycyl-L-propyl-L-tryptophanyl-L-leucyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-alanyl-L-tyrosyl-L-glycyl, L-leucyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-alanyl-L-tyrosyl-L-glycyl, and L-leucyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-glutamyl-L-alanyl-L-tyrosyl-(oxysulphonic in the 4-position of the phenyl nucleus)-L-glycyl, and R<sub>2</sub> represents 2-nitrophenyl or 2,4-dinitrophenyl.

4,164,572

**ZINC BACITRACIN COMPOSITION FOR USE AS A FEED SUPPLEMENT AND METHOD FOR MAKING THE SAME**

Brigt Oystese, Haslum, Norway, assignor to A/S Apothekernes Laboratorium for Specialpraeparater, Norway

Continuation-in-part of Ser. No. 730,092, Oct. 6, 1976, Pat. No. 4,096,246. This application Apr. 26, 1978, Ser. No. 899,907  
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177

26 Claims

1. A process for the production of a zinc bacitracin composition with enhanced stability suitable for use in animal feeds which includes precipitating zinc bacitracin from a fermentation broth to form a slurry, adjusting the pH of the fermentation broth with alkali to within the range of 6.0 to 7.0, adding about 50 to 100 weight percent based on the dry matter of the slurry of a finely divided carrier in which 80 weight percent of the particles making up the carrier have a dimension of below 40 microns, blending the mixture to uniformly disperse the carrier particles, spray drying such uniform dispersion at a temperature of between about 300° to 450° C. so that the water is rapidly removed to produce finely divided substantially spherical particles containing the zinc bacitracin in intimate contact with the carrier.

4,164,573

**COMPOSITION AND METHOD FOR MAKING A SUPPOSITORY FOR INTRODUCING A HYPOGLYCEMIC AGENT INTO A MAMMAL**

Alvin M. Gallinsky, 5518 Covode St., Pittsburgh, Pa. 15217

Filed Jun. 13, 1975, Ser. No. 586,638

Int. Cl.<sup>2</sup> A61K 37/26

U.S. Cl. 424—178

9 Claims

1. An article of manufacture for the introduction of hypoglycemic agents into the bloodstream for the treatment of diabetes in mammals by a rectally administered suppository comprising:

- a suppository base consisting of a wax-like substance of partially hydrogenated cottonseed oil 16.7 percent by weight of the suppository and completely hydrogenated peanut oil 30.0 percent by weight of the suppository;
- a synthetic surface active agent having polyoxyethylene stearates with a hydrophile-lipophile balance of 12.73 on the Griffin HLB scale;
- a physiological surface active agent 0.8 percent by weight of the suppository selected from the group consisting of salts of cholic acid, salts of glycocholic acid, salts of taurocholic acid, salts of glycotaurcholic acid, salts of deoxycholic acid, salts of glycodeoxycholic acid, salts of taurodeoxycholic acid, salts of glycodehydrocholic acid, salts of taurodehydrocholic acid, salts of glycolithocholic

acid, salts of tauroolithocholic acid, salts of glycodeoxycholic acid, salts of taurochenodeoxycholic acid, synthetic lecithin and lysolecithin; and (d) insulin which is 7.5 percent by weight of the suppository.

4,164,574

**USE OF POLYQUATERNARY AMMONIUM METHYLENE PHOSPHONATES AS MICROBIOCIDES**

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

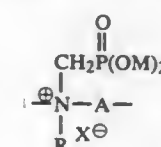
Division of Ser. No. 414,946, Nov. 12, 1973, Pat. No. 4,084,950, which is a division of Ser. No. 237,883, Mar. 24, 1972, Pat. No. 3,792,084. This application Oct. 14, 1977, Ser. No. 842,147

Int. Cl.<sup>2</sup> A01N 9/36

U.S. Cl. 424—199

10 Claims

1. The process of controlling microbiological growth in an aqueous system which comprises adding to said system a microbiologically effective amount of a polyquaternary compound having the repeating unit of the formula



where R is



alkyl, aryl, alkenyl, alkaryl, aralkyl or cycloalkyl, A is alkylene having 2 to 10 carbon atoms, alkaralkylene having 8 to 20 carbon atoms, dialkylene ether wherein each alkylene group has 1 to 10 carbon atoms, alkenylene, or alkynylene; M is hydrogen, ammonium, an alkali metal or alkaline earth metal; X is Br, I or Cl.

4,164,575

**COMBATING PESTS WITH O-ALKYL-O-TRIFLUOROMETHYLSULPHINYLPHENYL-THIONO(THIOL)-PHOSPHORIC ACID ESTERS**

Helmut Hoffmann, Wuppertal; Erich Klauke, Odenthal; Ingeborg Hamann, Cologne; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

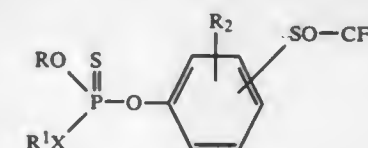
Filed Mar. 3, 1978, Ser. No. 883,001  
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709932

Int. Cl.<sup>2</sup> A01N 9/36; C07F 9/17

U.S. Cl. 424—216

10 Claims

1. An O-alkyl-O-trifluoromethylsulphinylphenylthiono(thiol)-phosphoric acid ester of the formula



wherein

R and R<sup>1</sup> each independently is alkyl, R<sup>2</sup> is hydrogen, halogen or alkyl, and X is oxygen or sulphur.

2. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes, or to a habitat thereof, an arthropodically or nematodically effective amount of an ester according to claim 1.

4,164,576

## BENZOXAZINE CARBOXAMIDES

John B. Carr, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

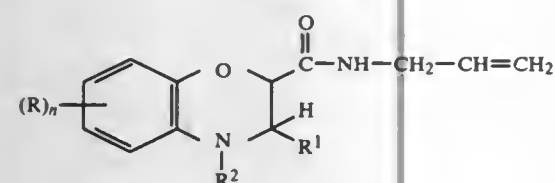
Continuation-in-part of Ser. No. 889,759, Mar. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 778,816, Mar. 17, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,336

Int. Cl.<sup>2</sup> C07D 265/36; A61K 31/35

U.S. Cl. 424—248.54

4 Claims

1. A compound of the formula



wherein n is zero, one or two, R is lower halogen, amino, methylsulfonylamino, trifluoromethyl, alkyl or alkoxy of from one to six carbon atoms, or phenyl; R<sup>1</sup> is hydrogen or alkyl of from one to four carbon atoms, and R<sup>2</sup> is hydrogen, or alkyl of from one to four carbon atoms, and hydrohalic acid salts thereof, with the proviso that when n is 2, the two moieties, R, are substituted on the carbon atoms at the 6- and 7-positions in the molecule.

3. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally an effective amount of a compound of claim 1.

4,164,577

## 6-(2-ACYLAMINO-2-ARYLACETAMIDO)PENICILLANIC ACIDS

Yoshiharu Morita, Yokohama; Junichi Ohya, Zama, and Tadashi Shirasaka, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,132

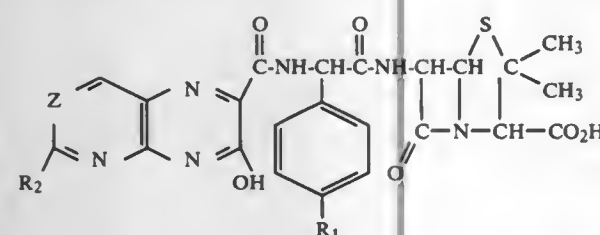
Claims priority, application Japan, Apr. 4, 1977, 52-38227

Int. Cl.<sup>2</sup> A61K 31/43, 31/165; C07D 499/68

U.S. Cl. 424—251

16 Claims

1. A compound having the formula:



wherein R<sub>1</sub> is hydrogen or hydroxy; R<sub>2</sub> is hydrogen, methyl or ethyl; and Z is —CH=, —N= or —CX= wherein X is chloro or bromo, or the non-toxic, pharmaceutically acceptable salt thereof.

4,164,578

## PYRAZOLO[1,5-C]QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

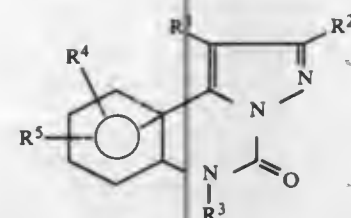
Division of Ser. No. 820,289, Jul. 29, 1977, Pat. No. 4,128,644. This application Jul. 19, 1978, Ser. No. 925,738

Int. Cl.<sup>2</sup> A61K 31/505; C07D 403/14

U.S. Cl. 424—251

12 Claims

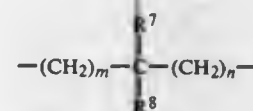
1. A compound of the structure



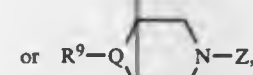
(I) wherein R<sup>1</sup> represents hydrogen lower alkyl, phenyl optionally monosubstituted with R<sup>4</sup>, R<sup>2</sup> is



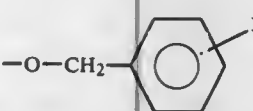
wherein Z is a single bond or



and R<sup>6</sup> is amino, lower alkylamino; dilower alkylamino; halo-lower alkyl; phenylamino wherein phenyl may be optionally monosubstituted with lower alkyl, dilower alkyl or halo; or



(wherein R<sup>9</sup> is hydrogen or lower alkyl, Q is CH or N), R<sup>3</sup> is hydrogen, lower alkyl, benzyl or phenyl optionally monosubstituted by an R<sup>4</sup> radical as defined below; R<sup>4</sup> and R<sup>5</sup> may be the same or different and are hydrogen, lower alkyl, lower alkoxy, hydroxy, lower alkanoyloxy, or



(X<sub>1</sub> is hydrogen, lower alkoxy, or NO<sub>2</sub>); R<sup>7</sup> and R<sup>8</sup> may be the same or different and represent hydrogen, lower alkyl, phenyl optionally substituted with X<sub>1</sub> or benzyl optionally substituted with X<sub>1</sub>, (CH<sub>2</sub>)<sub>m</sub> and (CH<sub>2</sub>)<sub>n</sub> represent a single bond or straight or branched chain alkylene radicals; and m and n represent the number of carbons in the longest normal chain and may be the same or different and are 0 to 10, but m plus n is 10 or less, and physiologically acceptable salts thereof.

11. A pharmaceutical composition for use in treating allergic conditions comprising an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,164,579

## HYDROXYTHIAZOLIDINE-2-THIONES

Jean D. Bourzat, Paris; Daniel Farge, Thiais; André Léger, Paris, and Gérard Ponsinet, Sucy-en-Brie, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 16, 1978, Ser. No. 906,599

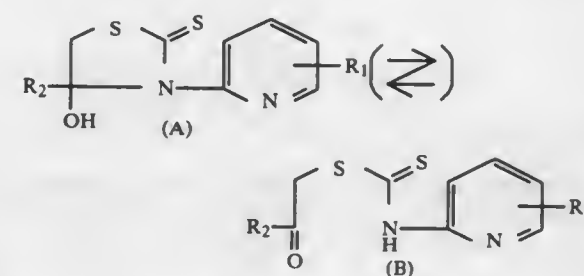
Claims priority, application France, May 17, 1977, 77 15072; Apr. 25, 1978, 78 12187

Int. Cl.<sup>2</sup> C07D 213/71, 409/04; A61K 31/44

U.S. Cl. 424—263

18 Claims

1. A compound of the formula:



wherein R<sub>1</sub> represents alkyl of 1 through 4 carbon atoms in the 4-, 5- or 6-position of the pyridyl radical, and R<sub>2</sub> represents hydrogen or alkyl of 1 through 4 carbon atoms.

18. A method for the treatment of gastric, duodenal, and peptic ulcers which comprises administering orally to an adult patient between 50 and 1000 mg. per day of a compound claimed in claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16.

4,164,580

## 4H-S-TRIAZOLO[4,3-A][1,5]BENZODIAZEPIN-5-ONES AS TRANQUILIZERS

B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

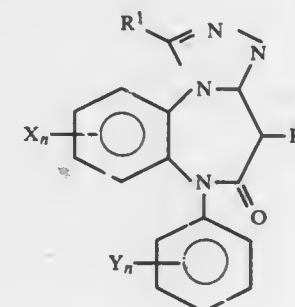
Division of Ser. No. 778,823, Mar. 17, 1977, Pat. No. 4,133,809, which is a division of Ser. No. 365,012, May 29, 1973, abandoned. This application Sep. 21, 1978, Ser. No. 944,663

Int. Cl.<sup>2</sup> A61K 31/44

U.S. Cl. 424—263

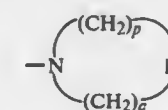
5 Claims

1. A pharmaceutical composition for obtaining a tranquilizing effect comprising a tranquilizing amount of a compound of the formula



wherein

R<sup>1</sup> is 2-, 3- or 4-pyridyl, R<sup>2</sup> is H; alkyl of 1-4 carbons optionally substituted by amino, mono-lower alkyl amino, di-lower alkyl amino, cyclic imines of formula



where D is methylene, oxygen or N-R<sup>10</sup> and where p and q are

the same or different and are the integers 1, 2, and 3 provided that p+q is at least 1; hydroxy; alkoxy of 1-6 carbons or



where R<sup>5</sup> is alkyl of 1-5 carbons optionally substituted by phenyl or X-substituted phenyl; or R<sup>5</sup> is phenyl optionally substituted by 1 or more X-substituents,

X and Y are the same or different and are hydrogen, F, Cl, Br, trifluoromethyl, alkyl of from 1-6 carbons, alkoxy of from 1-6 carbons, nitro, cyano, amino, alkanoylamino of 1-4 carbons, alkylthio of 1-6 carbons, alkylsulfinyl of 1-6 carbons or alkyl sulfonyl of 1-6 carbons;

R<sup>10</sup> is hydrogen, alkyl of 1-4 carbons or phenyl optionally substituted by X, wherein X is as defined above; and n is 0, 1 or 2,

in combination with a pharmaceutically acceptable carrier.

5. A method of obtaining a tranquilizing effect in a mammalian species which comprises administering systemically to said mammalian species a tranquilizingly effective amount of a composition as defined in claim 1.

4,164,581

## 1-(2,6-DICHLOROBENZOYL)-3-(4-TRIFLUOROMETHYL-2-THIAZOLYL)UREA AND USE AS INSECTICIDE

Charles G. Gibbs, Prairie Village, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sep. 5, 1978, Ser. No. 939,534

Int. Cl.<sup>2</sup> A01N 9/12; C07D 277/38

U.S. Cl. 424—270

5 Claims

1. The method of killing insect pests on plants which comprises applying to the infested plants an effective amount of 1-(2,6-dichlorobenzoyl)-3-(4-trifluoromethyl-2-thiazolyl)urea.

5. The insecticidal compound, 1-(2,6-dichlorobenzoyl)-3-(4-trifluoromethyl-2-thiazolyl)urea.

4,164,582

## SYNERGISTIC FUNGICIDAL COMPOSITIONS

Pontus A. Harju-Jeanty, Sepänkylä, Finland, assignor to Kemira Oy, Helsinki, Finland

Filed Mar. 31, 1977, Ser. No. 783,441

Claims priority, application Finland, Apr. 13, 1976, 761002

Int. Cl.<sup>2</sup> A01N 9/22, 9/00, 9/12

U.S. Cl. 424—273 R

2 Claims

1. A fungicidal composition comprising 2-90% by weight of active ingredients, said active ingredients consisting of A methylbenzimidazole-2-ylcarbamate or one of its salts, and B 1-[β-(allyloxy)2,4-dichlorophenethyl]imidazole or one of its salts wherein said ingredients A and B are in the proportion within the range between 2:1 and 1:2 and an agriculturally acceptable carrier.

4,164,583

## BENZ[F]ISOINDOLINE COMPOUNDS

Roland Achl, Therwil; Wolfgang Oppolzer, Vandoeuvres, and Emil Pfenninger, Allschwil, all of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

Filed Jun. 22, 1978, Ser. No. 917,948

Claims priority, application Switzerland, Jun. 28, 1977, 7916/77; Jun. 28, 1977, 7917/77

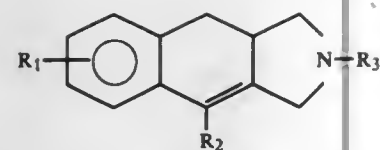
Int. Cl.<sup>2</sup> A61K 31/40; C07D 209/62

U.S. Cl. 424—274

14 Claims

1. A compound of formula I,





wherein

R<sub>1</sub> is hydrogen, fluorine, chlorine, bromine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,  
R<sub>2</sub> is hydrogen or alkyl of 1 to 4 carbon atoms, and  
R<sub>3</sub> is hydrogen or alkyl of 1 or 2 carbon atoms,  
in free base form or in pharmaceutically acceptable acid addition salt form.

3. A pharmaceutical composition comprising a compound of claim 1, in association with a pharmaceutically acceptable diluent or carrier.

4,164,584

## ANTI-LEUKEMIC TRICHOCECENE EPOXIDES

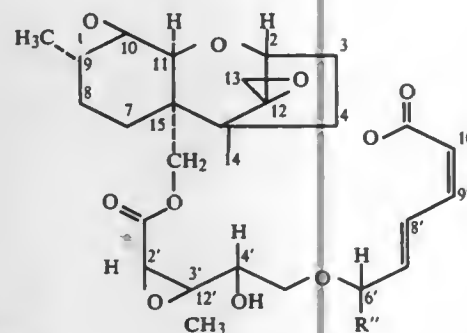
S. Morris Kupchan, deceased, late of Cambridge, Mass. (by Nancy Slater Kupchan, executrix and trustee); Bruce B. Jarvis, University Park, Md., and Richard G. Dailey, Jr., Virginia Beach, Va., assignors to Research Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,234

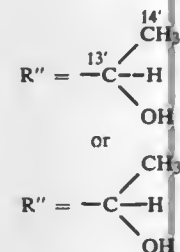
Int. Cl.<sup>2</sup> C07D 493/22; A61K 31/365

U.S. Cl. 424—279

1. A compound of the formula:



wherein:



12. A sterile aqueous solution or aqueous dispersment of the compound of claim 1.

4,164,585

## ANTI-THROMBOTIC COMPOUND AND METHOD OF MAKING AND USING THE SAME FOR PHARMACEUTICAL PURPOSES

Philip N. Sawyer, Brooklyn, N.Y., and Leon D. Freeman, Corte Madera, Calif., assignors to Cardioquest Corporation

Filed Jul. 1, 1976, Ser. No. 701,874

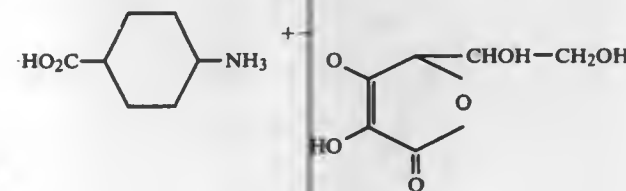
Int. Cl.<sup>2</sup> A61K 31/375, 31/245; C07D 307/62

U.S. Cl. 424—280

7 Claims

1. A method of reducing thrombotic tendencies in a host which comprises administering to the host an amount effective therefor of a compound derived from two organic acids, one of

said acids being L-ascorbic acid, the other of said acids being para amino benzoic acid, said compound being:



4,164,586

## THERAPEUTIC AGENT FOR IMPROVING CARDIOVASCULAR FUNCTION

John Westley, Mountain Lakes, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 647,850, Jan. 9, 1976, abandoned, which is a division of Ser. No. 489,978, Jul. 19, 1974, abandoned. This application Jan. 20, 1978, Ser. No. 871,046

Int. Cl.<sup>2</sup> A61K 31/34

U.S. Cl. 424—285

1 Claim

1. A method for producing myocardial stimulation in a patient requiring said effect which comprises administering to the patient an amount of the compound Iso-lasalocid A which is effective for producing myocardial stimulation.

4,164,587

## WATER-BORNE BONDABLE BASE COAT AND SIZE COAT FOR THREE PIECE, TIN-FREE STEEL BEVERAGE CONTAINERS

Robert F. Borman, Delaware, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 608,370, Aug. 27, 1975, Pat. No. 4,098,745.

This application Mar. 13, 1978, Ser. No. 885,849

Int. Cl.<sup>2</sup> A21D 10/02; B65D 85/00; B32B 15/08

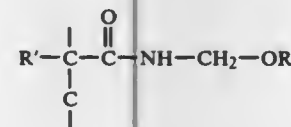
U.S. Cl. 426—131

9 Claims

1. A three piece metal beverage container having an adhesively bonded side seam and having as a base coat or size coat thereon a cured layer of an aqueous coating composition, said composition comprising a blend of an interpolymer and an aldehyde condensation resin wherein:

A. said interpolymer is an aqueous dispersion of an amine-neutralized or partially-neutralized interpolymer formed in the presence of a vinyl polymerization catalyst and in the absence of mercaptan, external surfactant and dispersion stabilizer, said interpolymer consisting essentially of:

(1) from about 5 percent to about 50 percent of a substituted carboxylic acid amide formed in units of the structure:



where R' is methyl or hydrogen and R is hydrogen or lower alkyl with at least 50 percent of the groups represented by R being lower alkyl;

(2) from about 3 percent to about 30 percent of units formed by vinyl polymerization of ethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid and maleic acid and half esters of maleic and fumaric acids;

(3) from about 5 percent to about 75 percent of units derived by vinyl polymerization of hardening monomer selected from the group consisting of styrene, vinyl

4,164,589

## MEAT PUMPING PROCESS

Victor V. Kadane, Langen, Fed. Rep. of Germany; Edwin W. Meyer, Chicago, and Robert W. Whitney, Mundelein, both of Ill., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 761,424, Jan. 21, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,240

Int. Cl.<sup>2</sup> A23L 1/31

U.S. Cl. 426—281

3 Claims

1. A method of brine pumping meat comprising forming a brine with soy protein isolate and water, said isolate having at least 90% protein and being non-gellable upon heating a 10% dispersion of said isolate in water to 100° C. for 30 minutes whereby the thus-heated isolate has, after cooling to 25° C., a viscosity less than 1,000 poise, said isolate having up to about 2% polar lipid material on the surface thereof, and stitch injecting said brine into said meat.

4,164,588

## PACKAGE LINER AND FRAGILE SNACK CHIP COMBINATION

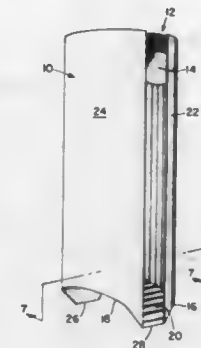
Charles L. Johnson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 6, 1977, Ser. No. 857,942

Int. Cl.<sup>2</sup> B65B 23/00

U.S. Cl. 426—135

1 Claim



1. A liner for a package said liner containing a stack of uniformly sized and shaped, fragile, generally elliptical, non-planar, snack food chips, the chips having a lower surface which is transversely concave as viewed along its major axis, said stack being arranged with corresponding surfaces of the chips similarly oriented and having the transversely concave surfaces thereof facing downwardly to thereby provide a stack support point at each end of the minor axis of the lowermost chip, said liner being formed from an elongated, generally rectangular sheet of material the width of which is less than one half the periphery of the stack as measured along a plane at right angles to the axis of the stack, said sheet having longitudinally extending corrugations to provide stiffness lengthwise and flexibility widthwise, said sheet having a pair of oppositely disposed, centrally located, outwardly bowed, lines of weakness impressed therein and extending across its width, said lines of weakness defining therebetween a support surface of a generally elliptical shape slightly larger than said chips, said support surface being bowed widthwise of the sheet into a downwardly concave condition and the portions of the sheet on each side of the support surface being folded upwardly and formed into a U-shaped, generally tubular conformation receiving the stack, with the support points on the lowermost chip bearing on said support surface at locations closely adjacent the lines of weakness at the central portions thereof such that upon dropping, the momentum of the stack can cause the support points to exert sufficient force on the central portions of the lines of weakness to fracture them, thus absorbing energy which would otherwise damage the stack.

4,164,590

## LOW LIQUID VOLUME RETORT METHOD

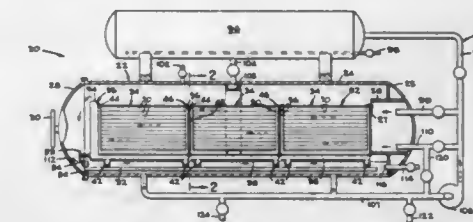
Samuel A. Mencacci, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 751,923, Dec. 16, 1976. This application Apr. 17, 1978, Ser. No. 896,659

Int. Cl.<sup>2</sup> A23L 1/00, 3/10; B65B 55/00

U.S. Cl. 426—407

8 Claims



1. A method of cooking and cooling food product filled containers within a pressure vessel having a tunnel therein which is arranged to receive the containers and which includes an inlet end and an overflow port at its outlet end that is disposed above the level of the containers in the tunnel, said tunnel also including external surfaces including an upper surface, said method requiring a minimum of heat treatment liquid comprising the steps of: loading the containers into the tunnel, closing the pressure vessel, directing a heated liquid at cooking temperature into the inlet end of said tunnel for flow through said tunnel and discharge from said overflow port during a cooking cycle, collecting the heated liquid overflowing from said port in a shallow pool within the lower portion of the pressure vessel externally of the tunnel and near the lower portion of the tunnel, directing a gaseous medium at superatmospheric pressure into said vessel to raise the pressure therein to a superatmospheric pressure in a manner so as to apply the gaseous medium at superatmospheric pressure directly against the upper surfaces of said shallow pool and said tunnel and directly against the external surfaces of the tunnel between the level of said overflow port and the upper surface of said shallow pool during the cooking cycle, continuously reheating and recirculating the heated liquid through the tunnel during the cooking cycle to maintain the amount of heated liquid in the shallow pool at a minimum until the cooking cycle is completed, discharging the heated liquid from the shallow pool and from the tunnel at the completion of the cooking cycle, directing a cooling liquid into the tunnel to cool the containers to a temperature below the boiling point of the heated liquid at atmospheric pressure during a cooling cycle, and thereafter removing the processed containers from the pressure vessel.

- (a) an elongate base strip;
- (b) a first row, extending longitudinally along the base strip, of individual first fibers free to move relative to each other;
- (c) a second row, extending longitudinally along the base strip, of second fibers bonded together to provide a wind-break;
- (d) the first fibers exhibiting no significant measure of external adhesiveness in the presence of a selected application of energy;
- (e) the second fibers exhibiting a significant measure of external adhesiveness in the presence of said selected application of energy; and,
- (f) the second fibers being bonded together as the result of said selected application of energy.



4,164,600

**THERMAL BONDING OF POLYESTER POLYBLENDS**  
Kai-Lim W. Yung; Bernard Silverman, both of Raleigh, and Virginia C. Menikheim, Chapel Hill, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,882  
Int. Cl.<sup>2</sup> B05D 1/14; B32B 7/14

U.S. Cl. 428—198 12 Claims  
1. A process for thermally bonding fibers comprising forming fibers from a melt blend comprising a polyester and a terpolymer selected from the class consisting of lactam-polyol-polyacyl lactam and acyl-polyol-polyester terpolymers, said fibers having present a crystallization inhibiting amount of the said terpolymer, contacting the fibers with one another, heating the contacted fibers to a temperature which is below the bonding temperature of either the said polyester or the said terpolymer, resulting in a permanent bonding of the melt blended fibers as a fabric, and thereafter annealing the contacted fibers to at least partially crystallize the same.

4,164,601

**COATING FOR FIBROUS CARBON MATERIAL IN BORON CONTAINING COMPOSITES**

Robert C. Shaffer, Playa del Rey, Calif., assignor to Hitco, Irvine, Calif.

Division of Ser. No. 701,597, Jul. 1, 1976, Pat. No. 4,101,354.  
This application Apr. 24, 1978, Ser. No. 899,398

Int. Cl.<sup>2</sup> B32B 9/00

U.S. Cl. 428—284 6 Claims  
1. A carbon-carbon composite comprising a plurality of layers of fibrous material, the fibrous material being comprised of fibers of substantially carbon or graphite composition, and a resin binder of substantially carbon composition, the composite having an interlaminar tensile strength of not substantially less than 727 psi and a tensile strength in the directions of the fibers of not substantially less than 6800 psi.

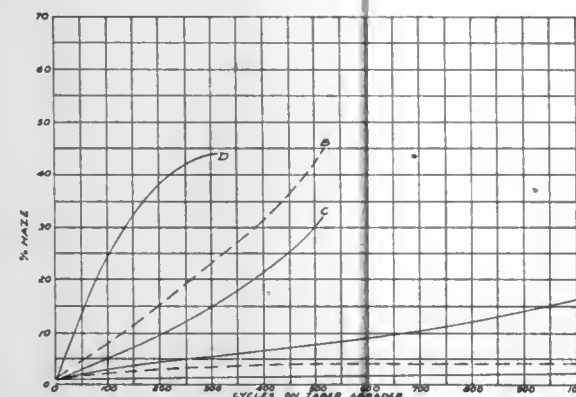
4,164,602

**ABRASION RESISTANT POLYVINYL ACETAL COATED ARTICLE**

David A. Fabel, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 7, 1977, Ser. No. 840,344  
Int. Cl.<sup>2</sup> B32B 27/36

U.S. Cl. 428—334 7 Claims



1. A coated article comprising a substrate coated with a coating composition comprising a polyvinyl acetal resin and polysilicic acid in which the ratio by weight of polysilicic acid, calculated as SiO<sub>2</sub>, to resin is from 2.0 to 4.0:1 and in which the resin comprises from 35 to 50 percent by weight of hydroxyl groups, calculated as polyvinyl alcohol.

6. A glazing unit which comprises a sheet selected from polyethylene terephthalate, and acrylonitrile polymers containing 55-90 percent of acrylonitrile coated with a layer from 5 to 10 microns in thickness of a composition comprising a polyvinyl butyral resin and polysilicic acid wherein the ratio of

polysilicic acid, calculated as SiO<sub>2</sub>, to resin is from 2.5 to 3.5:1 and the polyvinyl butyral has from 35 to 45 percent by weight of hydroxyl groups, calculated as polyvinyl alcohol.

4,164,603

**FILAMENTS AND FIBERS HAVING DISCONTINUOUS CAVITIES**

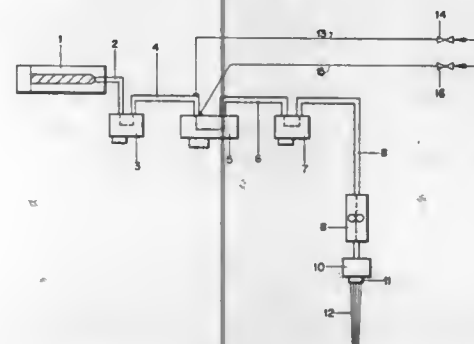
Erhard Siggel, Lutzbach; Gerhard Wick, Obernburg; Heinz Linhart, Erlenbach, and Erich Kessler, Höchst, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 4, 1976, Ser. No. 738,985

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550080

Int. Cl.<sup>2</sup> C08J 9/30; B29D 27/00

U.S. Cl. 428—398 19 Claims



1. A process for the manufacture of filaments or fibers from a thermoplastic synthetic polymer having a plurality of adjacent, separate, discontinuous needle-shaped cavities of substantially uniform size which comprises melting the synthetic polymer, having the resulting melt with from 0.1% up to and including 1% by weight of a dimethylpolysiloxane having a viscosity of from 3-400 cP based on the weight of the melt, and 10% or less by volume, based on the gas volume of the melt, of a gas or its equivalent of a gas-forming substance which is substantially inert to the melt under conditions whereby the gas or gas-forming substance is dissolved or finely dispersed in the melt, and extruding the resulting mixture through spinnerets to form filaments wherein said cavities comprise 5-50% of the volume of said filaments.

4,164,604

**LEADER OR TRAILER TAPE FOR A MAGNETIC RECORDING MEDIUM**

Yasuo Tamai; Masaaki Fujiyama, and Hiroshi Amari, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 8, 1977, Ser. No. 831,498

Claims priority, application Japan, Sep. 13, 1976, 51-108895

Int. Cl.<sup>2</sup> B32B 27/36, 23/12, 31/28

U.S. Cl. 428—409 16 Claims



1. A leader or trailer tape for a magnetic recording medium comprising a transparent non-magnetic flexible support film of a material from the group consisting of a polymeric cellulose esters, polystyrene, polyesters, polyolefins, polyvinyl resins, and polycarbonates, said film having a surface roughness of

4,164,607

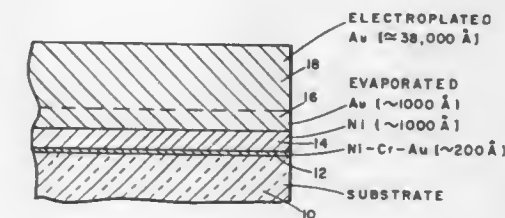
**THIN FILM RESISTOR HAVING A THIN LAYER OF RESISTIVE METAL OF A NICKEL, CHROMIUM, GOLD ALLOY**

Ronald A. Thiel, and Edward H. Maurer, both of San Diego, Calif., assignors to General Dynamics Corporation Electronics Division, San Diego, Calif.

Filed Apr. 4, 1977, Ser. No. 784,052

Int. Cl.<sup>2</sup> H01C 7/00, 7/02, 7/04

U.S. Cl. 428—621 15 Claims



1. A thin film resistor comprising:  
a substrate of insulating material defining a support surface, and  
a thin layer of resistive metal comprising an alloy consisting of nickel, chromium, and gold of predetermined weight percentages wherein the percentage of gold is not greater than the combined percentage of nickel and chromium.

4,164,605

**LAMINATED THERMAL INSULATION SHEETING**

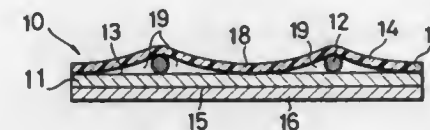
Yuuki Okawa, and Sumiharu Suzuki, both of Yokohama, Japan, assignors to Tokai Metals Co., Ltd., Japan

Filed Dec. 28, 1977, Ser. No. 865,203

Claims priority, application Japan, Nov. 7, 1977, 52/149234[U]

Int. Cl.<sup>2</sup> C04B 43/02

U.S. Cl. 428—593 8 Claims



1. A laminated thermal insulation sheeting, comprising:  
(a) an aluminum sheet;  
(b) a metal wire network disposed on and over one surface of said aluminum sheet and having interstices therein; and  
(c) a substantially transparent film of synthetic resin placed on said metal wire network and having portions bonded to said one surface of the aluminum sheet through said interstices in the metal wire network.

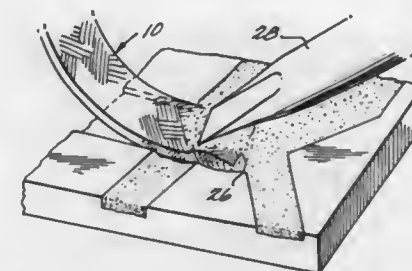
4,164,606

**TINNED COPPER BRAIDS FOR SOLDER REMOVING**  
Ernst Spirig, Movenstrasse 37, CH-8640, Rapperswil, Switzerland

Filed Nov. 8, 1977, Ser. No. 849,616

Int. Cl.<sup>2</sup> B23K 1/00

U.S. Cl. 428—605 12 Claims



1. A device for removing a solder alloy from a solid soldered joint comprising a multiplicity of metallic strands formed into an elongated wick operable to effect said solder removal through the application of an end portion thereof to the joint in heat exchange relation to a heat source so that when the solder alloy is rendered molten by the heat source it will flow by capillary action from the joint into the applied end portion of the wick, the improvement which comprises each metallic strand of said wick having its exterior surface coated with solidified solder alloy having a melting point substantially below the melting point of tin prior to being formed into said wick so that when the end portion thereof is applied to said joint in heat exchange relation with the heat source as aforesaid the solid solder alloy of the coating on the strands of the applied end portion when rendered molten by the heat source mixes with the molten solder alloy from the joint flowing by capillary action into the applied end portion of the wick.

985 O.G. 18

4,164,608

**CATHODE, AND A CELL INCORPORATING SUCH A CATHODE**

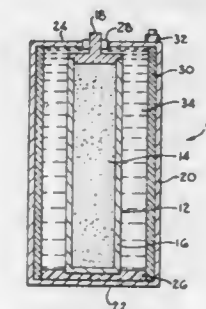
Johan Coetzer, Pretoria, South Africa, assignor to The South African Inventions Development Corporation, Pretoria, South Africa

Filed Mar. 6, 1978, Ser. No. 884,069

Claims priority, application South Africa, Mar. 9, 1977, 77/1433

Int. Cl.<sup>2</sup> H01M 10/44

U.S. Cl. 429—50 39 Claims



1. A cathode for a high temperature cell, the cathode comprising an electronegative element selected from the group consisting of sulphur and selenium, and a molecular sieve carrier comprising dehydrated zeolite crystals wherein the electronegative element is sorbed and wherein the electronegative element is held captive during use of the cathode in a cell.

4,164,609

## BATTERY POST SEAL

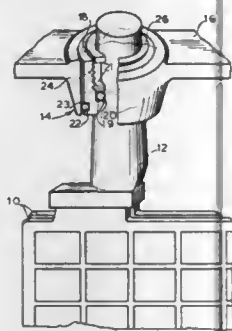
Henry E. Jensen, Lafayette Hill, Pa., assignor to Eltra Corporation, Toledo, Ohio

Filed May 8, 1978, Ser. No. 904,074

Int. Cl.<sup>2</sup> H01M 2/06

U.S. Cl. 429—183

4 Claims



1. In an electric storage battery having a cover and a terminal post which extends upwardly through an aperture in the cover, an improved terminal post seal which permits upward movement of the terminal post through the aperture comprising a first stuffing box carried by the terminal post, a second stuffing box which is integral with the cover and receives said first stuffing box, a first O-ring seal disposed between the terminal post and said first stuffing box and a second O-ring seal disposed between said first and second stuffing boxes which permits relative movement between said stuffing boxes.

4,164,610

## GLASSES EXHIBITING HIGH LITHIUM ION MOBILITY

George H. Beall, Big Flats, and Richard F. Reade, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 799,190, May 23, 1977, abandoned. This application May 8, 1978, Ser. No. 903,553

Int. Cl.<sup>2</sup> C03C 3/14, 3/18; H01M 6/18

U.S. Cl. 429—193

1 Claim

1. Solid membrane electrolyte-separators for use in liquid lithium-sulfur batteries which membranes are glass compositions exhibiting an electrical resistivity in terms of log  $\rho$  measured at 25° C. of less than 10, good chemical durability, low temperature melting capability, and excellent glass stability, said glasses being essentially free from silica, alkaline earth metal oxides, and alkali metal oxides other than Li<sub>2</sub>O and being selected from the following groups wherein the compositions consist essentially of the stated proportions expressed in terms of weight percent on the oxide basis as calculated from the batch of:

- (a) 0-9.1% Li<sub>2</sub>O, 14.4-27.1% LiF, 18-29.5% Li<sub>2</sub>O+LiF, 0-12.7% LiCl, and 69.3-77.3% B<sub>2</sub>O<sub>3</sub>; and  
 (b) 0-26.0% Li<sub>2</sub>O, 0-16.9% LiF, 0-13.9% LiCl, 17.2-36.3% Li<sub>2</sub>O+LiF+LiCl, 0-18.6% Al<sub>2</sub>O<sub>3</sub>, but <10% Al<sub>2</sub>O<sub>3</sub> when F and/or Cl are absent and Li<sub>2</sub>O is no more than 20%, 0-14.8% AlF<sub>3</sub>, 6.2-18.6% Al<sub>2</sub>O<sub>3</sub>+AlF<sub>3</sub>, and 54.3-74.1% B<sub>2</sub>O<sub>3</sub>.

4,164,611

## AROMATIC SULFONYL HYDRAZIDES AND SEMICARBAZIDES AS CHEMICAL BLOWING AGENTS

Andreas Schmidt; Hugo Illy, both of Reinach; Rudolf Kirchmayr, Aesch, all of Switzerland, and André Schmitter, Hégenheim, France, assignors to Ciba-Gelby Corporation, Ardsley, N.Y.

Filed Jul. 9, 1976, Ser. No. 703,878

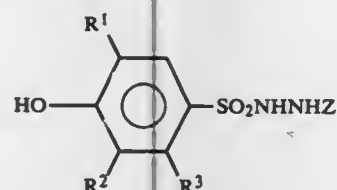
Claims priority, application Switzerland, Jul. 10, 1975, 9024/75

Int. Cl.<sup>2</sup> C07C 133/02, 143/825; C08J 9/10

U.S. Cl. 521—89

18 Claims

1. A compound of the formula I



in which R<sup>1</sup> and R<sup>2</sup> independently of one another denote hydrogen or alkyl with 1-4 C atoms, but at least one of the two substituents denotes alkyl, R<sup>3</sup> denotes hydrogen or alkyl with 1-4 C atoms and Z denotes hydrogen or —CONH<sub>2</sub>.

8. In a process for foaming a plastic with a foaming agent, the improvement wherein said foaming agent, which at the same time functions as a stabilizer against the thermo-oxidative degradation of the plastic, is the compound of claim 1.

4,164,612

## PROCESS FOR PRODUCING WATER-SOLUBLE CATIONIC POLYMERS

Naoyuki Suzuki, Yoji Wada, and Akihisa Furuno, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Oct. 31, 1977, Ser. No. 847,025

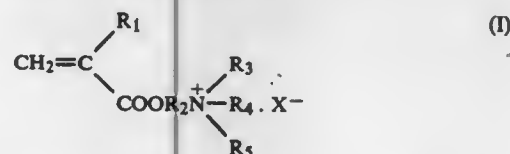
Claims priority, application Japan, Nov. 4, 1976, 51-131686

Int. Cl.<sup>2</sup> C08F 2/00, 2/10, 18/22, 126/06

U.S. Cl. 526—62

10 Claims

1. A process for producing a cationic polymer, which comprises subjecting to aqueous solution polymerization a vinyl monomer represented by the formula,



wherein R<sub>1</sub> represents —H or —CH<sub>3</sub>; R<sub>2</sub> represents —CH<sub>2</sub>CH<sub>2</sub>— or —CH<sub>2</sub>CH(OH)CH<sub>2</sub>—; R<sub>3</sub> and R<sub>4</sub> represent —CH<sub>3</sub> or —CH<sub>2</sub>CH<sub>3</sub>; R<sub>5</sub> represents —C<sub>n</sub>H<sub>2n+1</sub> in which n is an integer from 0 to 4, —CH<sub>2</sub>C<sub>6</sub>H<sub>5</sub> or —CH<sub>2</sub>COOH; and X<sup>-</sup> represents Cl<sup>-</sup>, CH<sub>3</sub>SO<sub>4</sub><sup>-</sup>, CH<sub>3</sub>SO<sub>3</sub><sup>-</sup> or {SO<sub>4</sub>}<sup>-</sup>, either alone or in admixture with up to 25% by weight, based on the total weight of the monomers, of other polymerizable vinyl monomers by use of a polymerization initiator in the presence of 7 to 18% by weight, based on the total weight of the monomer and water, of water and about 10 to about 40% by weight, based on the total weight of the polymerization system, of a powdery water-soluble salt selected from the group consisting of alkali metal salts, alkaline earth metal salts and ammonium salts which is dispersed in the polymerization system, in the absence of other media, thereby obtaining the water-soluble cationic polymer in the form of a solid mass.

4,164,613

## MANUFACTURE OF POLYMERS IN BEAD FORM FROM WATER-SOLUBLE, ETHYLENICALLY UNSATURATED MONOMERS

Richard Hoene, Heidelberg; Dietmar Jung, Ludwigshafen; Hans-Uwe Schenck, Wachenheim, and Herbert Spoor, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,254

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710372

Int. Cl.<sup>2</sup> C08F 2/16, 2/32

U.S. Cl. 526—201

3 Claims

1. In a process for the production of polymers, in bead form, of water-soluble ethylenically unsaturated monomers by forming a water-in-oil suspension of an aqueous solution containing at least one water-soluble ethylenically unsaturated monomer in an inert hydrophobic liquid organic dispersion medium and polymerizing the suspended monomer in the presence of a protective colloid and a polymerization initiator, the improvement which comprises using as a protective colloid a polymer obtained by polymerizing a mixture of

- (A) 60 to 99.9% by weight of dicyclopentadiene, and  
 (B) 0 to 30% by weight of styrene and 0.1 to 10% by weight of maleic anhydride, said protective colloid polymer being soluble in the inert hydrophobic liquid organic dispersion medium, said protective colloid polymer further having a number-average molecular weight of from 400 to 5,000 and an iodine number of from 30 to 200.

2. In a process for the production of polymers, in bead form, of water-soluble ethylenically unsaturated monomers by forming a water-in-oil suspension of an aqueous solution containing at least one water-soluble ethylenically unsaturated monomer in an inert hydrophobic liquid organic dispersion medium and polymerizing the suspended monomer in the presence of a protective colloid and a polymerization initiator, the improvement which comprises using as a protective colloid a homopolymer of dicyclopentadiene, said protective colloid polymer being soluble in the inert hydrophobic liquid organic dispersion medium, said protective colloid polymer further having a number-average molecular weight of from 400 to 5,000 and an iodine number of from 30 to 200.

4,164,614

## TERPOLYMER COMPOSITIONS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

William A. Ames, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1978, Ser. No. 917,778

Int. Cl.<sup>2</sup> C08F 212/08

U.S. Cl. 526—264

8 Claims

1. A pressure-sensitive adhesive comprising a polymerized terpolymeric composition comprising about 80 to 60 weight percent 2-ethylhexyl acrylate, about 25 to 15 weight percent N-vinyl-2-pyrrolidinone, and about 15 to 5 weight percent

styrene and having a melt viscosity of about 25,000 to 200,000 and has good peel adhesion and shear adhesion.

4,164,615

## CONVERSION OF CONJUGATED DIENES TO DIACYLOXY OLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1977, Ser. No. 827,632

Int. Cl.<sup>2</sup> C07C 67/05

U.S. Cl. 560—246

28 Claims

1. A process for the production of diacyloxy olefins from conjugated diolefins which comprises:

reacting at least one conjugated diolefin with oxygen and a carboxylic acid reactant media employing a catalyst system consisting essentially of (A) a titanium compound, (B) an alkali metal compound, and (C) a halide-source, and optionally (D) a dihalobutene adjuvant;

and wherein said conjugated diolefin is selected from substituted or unsubstituted diolefins, and where substituted the substituents thereof are selected from halogen, cyano, —COOR', or hydrocarbyl, where R' is hydrogen, alkyl, or aryl;

wherein said carboxylic acid reactant media is selected from the group consisting of aliphatic and aromatic mono- and dicarboxylic acids and mixtures thereof with acid anhydrides, of 2 to 18 carbon atoms per molecule;

said (A) titanium compound is a hydrocarbyl titanium compound, hydrocarbyl titanium halide, titanium halide, or mixture;

said (B) alkali metal compound is at least one halide, nitrate, carboxylate, oxide, or hydroxide of lithium, sodium, potassium, rubidium, or cesium;

and said (C) halide-source is a said (A) or (B) where said (A) or (B) is the halide, or alkaline earth metal halide, or mixture, wherein the halide is chloride, bromide, iodide, or mixture.

4,164,616

## PRODUCTION OF DIHYDROXY ALKANE

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1978, Ser. No. 870,157

Int. Cl.<sup>2</sup> C07C 31/20

U.S. Cl. 568—858

5 Claims

1. The production of an alkanediol which comprises bringing together in a reaction zone in vapor phase a conjugated diene and a halogen selected from chlorine and bromine, then immediately reacting in said reaction zone the reaction product thus obtained with a liquid mixture of an alkali metal acetate and an organic acid solvent under conditions to form a 1,4-diacetoxyalkene, hydrogenating said 1,4-diacetoxyalkene to the corresponding alkane and hydrolyzing said alkane to the corresponding 1,4-alkanediol; the vapor phase reaction being effected above the liquid level of said mixture of said acetate and said acid in said reaction zone.

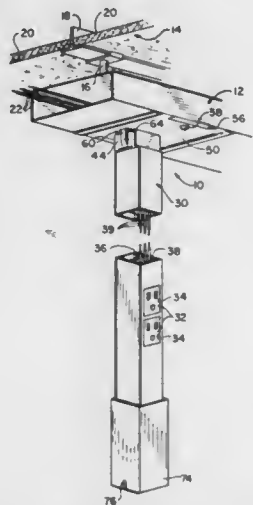


ELECTRICAL

4,164,617  
**LONG WATERTIGHT CABLE AND SLEEVE JOINT**  
Jacobus P. I. Van Kesteren, Lelidshendam, Netherlands, assignor to N.K.F. Groep B.V., Netherlands  
Filed May 9, 1978, Ser. No. 904,201  
Claims priority, application Netherlands, May 27, 1977, 7705840

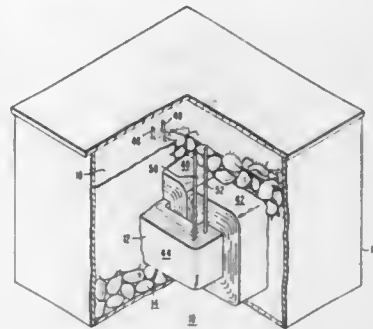
Int. Cl.<sup>2</sup> H01B 7/28  
U.S. Cl. 174—23 C 9 Claims  
1. In a method of manufacturing a longitudinally watertight cable or cable joint comprising a number of conductors situated within an outer sheath, in which a liquid or semi-solid sealing mixture comprising a vulcanizable silicone rubber and a diluent is provided in the space between the conductors mutually and between the conductors and the outer sheath, which mixture, after vulcanization of the silicone rubber, constitutes a watertight seal, the improvement wherein a cycloalkyl benzene is used as a diluent the cycloalkyl group of which contains 8-15 carbon atoms and the benzene group of which may be fully or partly chlorinated.  
9. A long watertight cable or cable joint obtained by the method of claim 1.

4,164,618  
**PLUG-IN SERVICE POLE ASSEMBLY**  
Salvatore J. Casasanta, Farmington, Conn., assignor to The Wiremold Company, West Hartford, Conn.  
Filed Jun. 15, 1977, Ser. No. 806,766  
Int. Cl.<sup>2</sup> H02G 3/04  
U.S. Cl. 174—48 4 Claims



1. In a service pole assembly for distributing electrical power to a room from an overhead raceway and including a hollow elongated pole having outlet receptacles and internal wiring connected thereto, an improvement comprising an adaptor plug means on top of the pole having raceway receptacle plug-in blades connected to the internal wiring, the adaptor plug means including a supporting clamp fixed to the top of the pole and a plug-in blade mounting adaptor cap having an insulating body releasably assembled in snap-fitting relation to the clamp, the clamp having an upwardly extending spring finger and offset locking jaw movable into releasable locking engagement with the overhead raceway upon being inserted therein to resist a force tending to detach the plug-in connection.

4,164,619  
**POROUS ENCAPSULATING COMPOSITION FOR ELECTRICAL APPARATUS**  
Gerhard R. Sprengling, Derry Township, Westmorland County, and Louis A. Cargnel, Unity Township, Westmorland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Jan. 19, 1978, Ser. No. 870,896  
Int. Cl.<sup>2</sup> H01F 27/22  
U.S. Cl. 174—52 PE 5 Claims

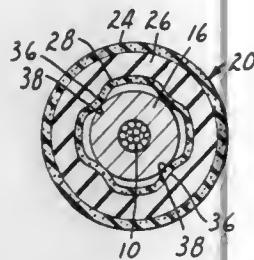
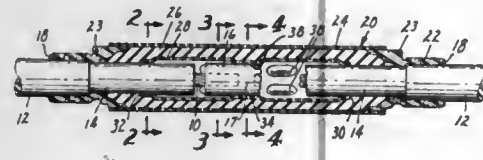


1. Electrical apparatus comprising:  
a case;  
an electrical member disposed within said case; and  
a cured, porous composition in said case surrounding said electrical member, said composition being formed of at least one particulate filler material and a cured binder material;  
the particles of said at least one particulate filler which are adjacent to said electrical member and to said case having points of direct contact therewith, and the particles of said at least one particulate filler which are contiguous having points of direct contact, providing multiple heat transfer paths devoid of said cured binder material, from said electrical member to said case through the at least one particulate filler material;  
said cured binder material forming beads around said points of direct contact to provide a high strength cohesive assembly, notwithstanding the multiple heat transfer paths which are devoid of said cured binder material.

4,164,620  
**INSULATIVE CORONA DISCHARGE SUPPRESSING SHEATH FOR HIGH VOLTAGE CABLE SPLICES**  
Harold C. Hervig, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Sep. 7, 1978, Ser. No. 940,356  
Int. Cl.<sup>2</sup> H02G 15/08  
U.S. Cl. 174—73 R 2 Claims

1. An insulative corona discharge suppressing shield for positioning over and along a splice in a high voltage cable of generally circular cross section having semiconductive covering, insulating covering and inner conductor and having an electrical connector electrically joining two bare ends of said conductor, said shield comprising two end caps of generally elongated tubular form having outer and inner ends and having outer termination segments of uniform internal and external diameter and inner enlarged segments having variable external diameter and internal diameter varying from being equal to the internal diameter of said terminal segment to being greater than the external diameter of said terminal segment, said end caps being adapted to engage said semiconductive covering electrically, annular inner and outer semiconductive sections and an insulative section having inwardly directed bosses over at least a portion thereof extending inward, said insulative section being integrally bonded at least to said inner semiconductive section and said end caps, said inner semiconductive

section having a wall of substantially uniform thickness and further being urged inwardly by said bosses into electrical



contact with said electrical connector when said shield is positioned on a high voltage cable splice.

4,164,621

## CABLE SHIELD CONNECTING DEVICE

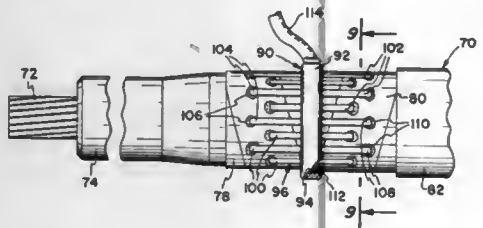
Frank A. Silva, Basking Ridge, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,947

Int. Cl.<sup>2</sup> H01R 5/00

U.S. Cl. 174-78

16 Claims



1. A connecting device in combination with a high voltage power cable of the type having an inner conductor, insulation surrounding the conductor, and a shielding system including a metallic shield with a layer of overlying wire strands thereon surrounding the insulation, said connecting device comprising:

- (a) an electrically conductive bar circumferentially around a portion of the shielding system in a manner to establish a radial gap between the portion of the shielding system and the bar, the gap being of a size to permit the wire strands to extend therethrough such that the wire strands are enabled to be bent back over an external surface of the bar for electrical connection thereto; and
- (b) a plurality of electrically conductive fingers, all circumferentially spaced and projecting from the bar in a manner to allow the fingers to extend axially along the shielding system when the bar is placed circumferentially thereabout, a first set of the plurality of fingers being of a first axial length and a second set of the plurality of fingers being of a second different axial length, each finger having a portion located remote from the bar and being attached to the shielding system, and each space between the fingers being of a size to allow different ones of the wire strands which extend through the gap to pass between adjacent fingers and be bent back over an external surface of the bar for electrical connection to the bar.

4,164,622  
GRAPHICAL INPUT APPARATUS FOR ELECTRICAL EQUIPMENT

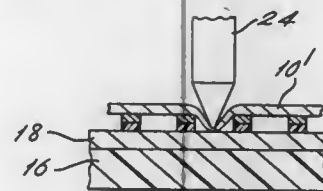
Peter J. Pobgee, Surbiton, England, assignor to National Research Development Corporation, London, England  
Filed Mar. 8, 1978, Ser. No. 884,549

Claims priority, application United Kingdom, Mar. 9, 1977, 09945/77

Int. Cl.<sup>2</sup> G08C 21/00

U.S. Cl. 178-18

5 Claims



1. Apparatus for obtaining signals representative of the co-ordinates of a point indicated in a working area, including a sheet of electrically conductive or resistive material held in position across the surface of a fixed member, the said surface comprising a plurality of parallel conductors spaced apart from each other and supported on a resistive layer by means of insulating supports, resistive means for so connecting with the parallel conductors that when a current is passed between two terminals of the resistive means a voltage gradient is set up from conductor to conductor in the direction at right angles to the conductors, the sheet being held in position adjacent to the said surface, and the sheet being of such material and/or so mounted that when pressed towards the surface by means indicating the position of a point it bridges any of the parallel conductors in the locality of the point to the resistive layer, changeover means for causing current supplied to the apparatus to flow alternately in two paths, a first path in which the current flowing in the resistive means sets up a voltage gradient across the parallel conductors and at right angles thereto, and a second path in which the current flowing in the resistive layer sets up a voltage gradient in a direction parallel to the conductors, and means for deriving first and second signals when the sheet is pressed at a relatively small area to bridge at least one of the parallel conductors to the resistive layer, the first signal being dependent on the voltage of the parallel conductors when current flows in the resistive layer, and the second signal being dependent on the voltage of the resistive layer when current flows in the resistive means, and the first and second signals being representative of first and second co-ordinates of the said small area, respectively.

4,164,623

AM STEREO RECEIVER WITH IMPROVED CORRECTION SIGNALS

Francis H. Hilbert, Addison, and Norman W. Parker, Wheaton, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Nov. 17, 1977, Ser. No. 852,272

Int. Cl.<sup>2</sup> H04H 5/00

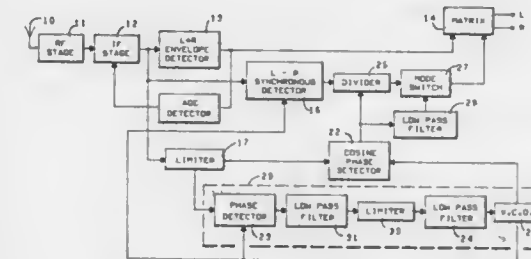
U.S. Cl. 179-1 GS

7 Claims

1. An AM receiver for receiving compatible stereo signals and requiring dynamic correction for restoring the stereo information, comprising in combination:

- input means for receiving the stereo signals and translating the carrier frequency to an intermediate frequency;
- correction factor circuitry coupled to the input means and including:
  - first limiter means coupled to the input means for removing amplitude modulation from the received signal;
  - phase locked loop means coupled to the limiter means for deriving from the amplitude limited signal a frequency reference signal related to the carrier frequency, the phase locked loop means including a local oscillator;

and first phase detector circuitry coupled to the outputs of the first limiter circuitry and of the phase locked loop means for providing a stereo correction factor signal representative of the phase difference therebetween; and



circuitry coupled to the phase locked loop means for preventing a false control voltage from being applied to the local oscillator.

4,164,624

DEMODULATION CIRCUITS OF FM STEREOHONIC RECEIVERS

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

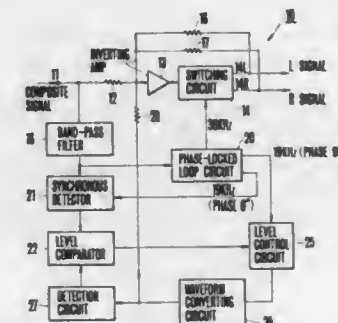
Filed Dec. 19, 1977, Ser. No. 861,606

Claims priority, application Japan, Dec. 20, 1976, 51-153260

Int. Cl.<sup>2</sup> H04H 5/00

U.S. Cl. 179-1 GD

7 Claims





portion of said changeover relay, the contacts on said first side of said central contact being connected together and the contacts on the other side of said central contact being interconnected with resistors;

said car stereo amplifier having a left channel output connected to the normally closed contact of said second switch portion of said relay, a right channel output connected to the normally closed contact of said third switch portion of said relay, and a common output connected to said left and right speaker means;

said car radio amplifier having a first output lead connected to the normally open contact of said first switch portion of said relay and a second output lead connected to both normally open contacts of said second and third switch portions of said relay; and

said car radio speaker means having an input connected to the arm of said first switch portion of said relay, whereby in said first position of said changeover switch said car stereo amplifier is energized and is connected to said left and right speaker means and to said car radio speaker means through said first and second damping circuits such that as said wiper arms are moved to said first side of said central contacts the resistors are placed in the circuits of said left and said right speakers and said car radio speaker is directly connected to said car stereo amplifier, and when said wiper arms are moved to the other side of said central contacts said resistors are placed in the circuit of said car radio speaker means, and whereby in said second position of said changeover switch said relay coil portion is energized and the arms of said first, second, and third switch portions are actuated and said car radio is energized and is connected to said left and right speaker means and to said car radio speaker through said first and second damping circuits.

4,164,626

## PITCH DETECTOR AND METHOD THEREOF

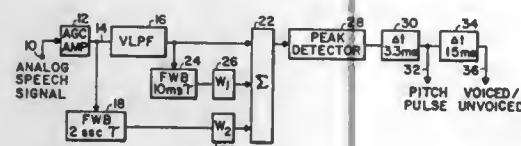
Bruce A. Fette, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 5, 1978, Ser. No. 903,264

Int. Cl.<sup>2</sup> G10L 1/00

U.S. Cl. 179-1 SC

26 Claims



1. A pitch detector for extracting pitch information from an audio signal comprising:

- (a) low pass filter means coupled to receive the audio signal and for attenuating speech components in the audio signal generally higher than human pitch frequencies for producing a filtered audio signal; and
- (b) DC shifting means coupled to said low pass filter means and to receive the audio signal for causing the pitch peaks of said filtered audio signal to be above a reference voltage such that crossovers of said reference voltage occur substantially at a rate of twice the pitch frequency.

11. A pitch detector comprising:

- (a) input amplitude adjustment means for receiving an audio signal and for producing a regulated audio signal having a constant average power; and
- (b) variable cutoff frequency low pass filter means coupled to said input amplitude adjustment means for extracting low frequency components of said audio signal which provide a fraction of said constant average power of said regulated audio signal, said low frequency components being substantially comprised of the pitch signal of said audio signal.

4,164,627

## TIME DIVISION SWITCHING NETWORK USING TIME SLOT INTERCHANGERS

Manfred Langenbach-Belz, Stuttgart; Kurt Strunk, Sachsenheim, both of Fed. Rep. of Germany, and Marcel Vervloet, Berchem, Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

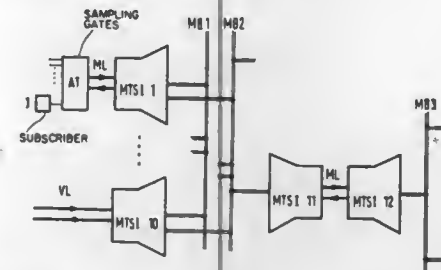
Filed Nov. 18, 1977, Ser. No. 852,843

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652920

Int. Cl.<sup>2</sup> H04Q 11/04

U.S. Cl. 179-15 AQ

7 Claims



1. A multiple stage switching network for time-division telecommunications switching, comprising a plurality of identical time slot interchanger switches, each of said switches including buffer stores for the temporary storing of time slot addresses and data to permit connections to be set up via a plurality of time-multiplex-division highways in which a connection may include different channels in each highway, each of said interchanger switches including means for coupling from one end serving a smaller number of time-division channels to its other end serving a greater number of channels, said switches adapted for grouping in parallel between highways having a number of channels equal to the smaller number of channels and a common highway having at least said greater number of channels, said switches adapted for connection with the one end of a first switch coupled to the like end of a second switch and the other end of each of said first and second switches respectively coupled to highways having an identical number of channels for setting up a connection serially through said first and second switches.

4,164,628

## PROCESSOR FOR MULTIPLE, CONTINUOUS, SPREAD SPECTRUM SIGNALS

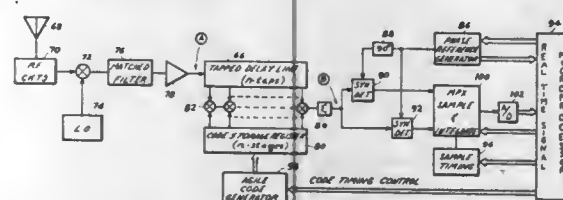
Charles R. Ward, Passaic, and Robert A. Reilly, North Caldwell, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation-in-part of Ser. No. 803,830, Jun. 6, 1977, abandoned. This application Mar. 17, 1978, Ser. No. 887,708

Int. Cl.<sup>2</sup> H04J 13/00

U.S. Cl. 179-15 BA

4 Claims



1. An apparatus for decoding N spread spectrum pseudo randomly coded signals in the form of a single composite CW signal to form a plurality of pulses each containing all the information in one of said N signal, comprising:

- means for adjusting the bandwidth of said composite signal to a predetermined bandwidth;
- a tapped delay line for serially receiving said CW signal of said predetermined bandwidth;
- means for storing a pseudo random reference code corre-

sponding to a preselected code segment of one of said N spread spectrum signals;

comparison means for detecting correlation between said reference code and said one of said N signals;

means for generating a pulse containing all the information in a segment of one of said N signals, said segment corresponding to the total delay time of said tapped delay line, the position of said pulse indicative of the degree of synchronization between said reference code and said first signal; and

means for changing said reference code to one associated with another of said N signals;

4,164,629

## TIME BASE FOR SYNCHRONOUS GENERATION OF FRAME AND CLOCK PULSES

Yves Ollivier, Perros Guirec; and Michel Jacob, Lannion, both of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

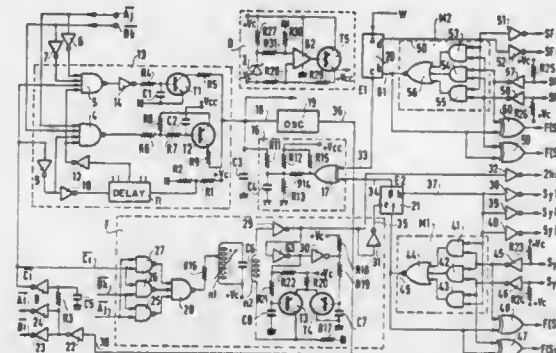
Filed May 5, 1978, Ser. No. 903,334

Claims priority, application France, May 10, 1977, 77 14184

Int. Cl.<sup>2</sup> H04J 3/06

U.S. Cl. 179-15 BS

6 Claims



1. A time base for generating clock pulses and frame synchronizing pulses, said time base comprising three identical generators each of which includes a base oscillator for generating a basic signal proper to the generator and a phase comparator means for applying the basic signals of all three base oscillators to a phase comparator in each generator, said phase comparators being arranged to apply a frequency control signal to their respective oscillators to generate their basic signals in synchronism with each other, each of the generators further including a clock signal generating circuit comprising a majority circuit connected to receive all three basic signals and driving a filter circuit tuned to the clock pulse frequency, the output of the filter circuit being delivered via an amplifier to provide the clock pulses with a pulse waveform and the clock signal generating circuit including a differential amplifier responsive to the marks and the spaces of the clock pulse waveform to bias the output of the filter to achieve a desired mark/space ratio, each of the generators also including means for generating and synchronizing the frame synchronizing pulses, said generating and synchronizing means comprising an internal-frequency divider connected to receive the clock pulses and to produce the frame synchronizing pulses therefrom, a first frame synchronizing majority circuit connected to receive frame synchronizing pulses from all three generators to derive a reset signal for the internal-frequency divider, and a feedback circuit for modifying the frequency control of the base oscillator in response to the synchronization of the frame synchronizing signals.

4,164,630

## COMBINED TELEPHONE INDEX AND KEYBOARD FOR DIALER

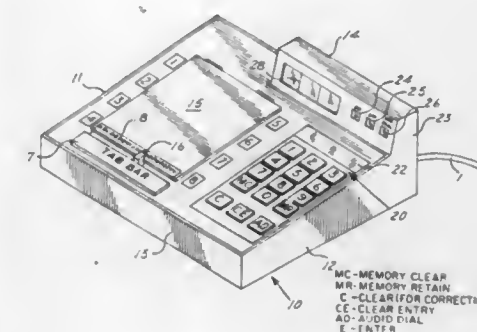
Robert M. Brodbeck, P.O. Box 806, Littleton, Colo. 80120

Filed Nov. 14, 1977, Ser. No. 851,149

Int. Cl.<sup>2</sup> H04M 1/51

U.S. Cl. 179-90 B

1 Claim



1. Telephone index and combined switch arrangement for memory stored dialing data for automatic dialing telephones comprising:

- (a) a housing having an entry keyboard switch means thereon for entering numbers to be stored and display means for displaying the number entered by said entry keyboard;
- (b) multiple card index means for a visual listing of names and telephone numbers, each card including individual lines for individual numbers arranged in the same position on the cards, wherein said card and lines are divided into a plurality of left-hand lines and a plurality of right-hand lines, said left-hand and right-hand lines being substantially equal in number, and further including a cover positioned over said cards and finding means on said cover for positioning an individual card for visual display of the card's content;
- (c) card switch means including an individual contract associated with each card index and activated by positioning said finding means to display the particular card to thereby close said card switch means completing a circuit for said card including a common lead and a common bus bar associated with said finding means and an individual lead for each card, said card switch means being initially energized when said cover is closed;
- (d) selector switch means including a left-hand and a right-hand series of push buttons with one button in said left-hand series for and adjacent to each of said left-hand lines and one button in said right-hand series for and adjacent to each of said right-hand lines so that said selector switch means is activated by a push button to close a circuit for a particular line positioned on an individual card to thereby complete a first circuit associated with the card contained data and close a second circuit associated with a particular line on a card to retrieve and automatically dial a telephone number stored at a location in the memory associated with said particular line; and
- (e) a visual display panel means on said housing adjacent said cover for displaying the number dialed by actuating said card switch and selector switch.



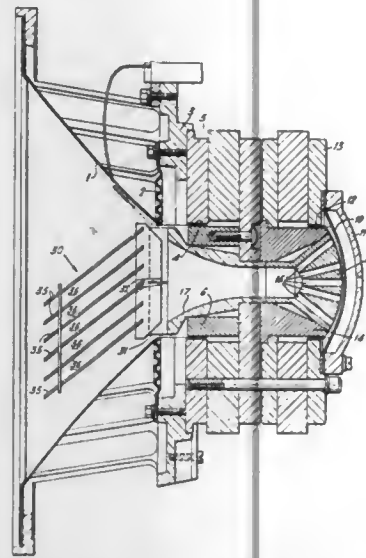
4,164,631

**HORN LOUDSPEAKER WITH ACOUSTIC LENS**  
Alex V. Garner, High Wycombe, and Graham Townsend, Chinnor, both of England, assignors to Tannoy Products Limited, Buckinghamshire, England

Filed May 3, 1978, Ser. No. 902,519  
Claims priority, application United Kingdom, May 6, 1977, 19135/77

Int. Cl.<sup>2</sup> H04R 1/20, 9/06  
U.S. Cl. 179—115.5 H

5 Claims



1. In a moving coil loudspeaker of the type including a pair of co-axial speech coils, one of which drives a high frequency diaphragm at the rear of the loudspeaker to provide an output along a horn and the other of which drives a cone forming a continuation of the horn and reproducing the lower frequencies, the improvement which comprises an acoustic lens fitted in the region where the horn contour is taken over by said cone, said lens having an external surface shaped so as to conform snugly with the contour of said cone and being effective to increase the divergence of the beam of acoustic radiation from said horn in the operative plane of said lens.

4,164,632

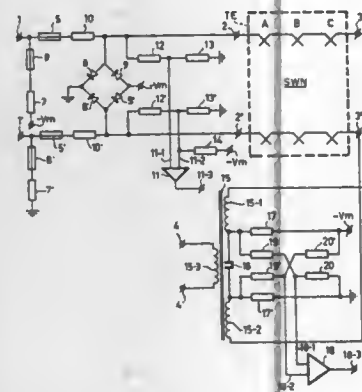
**SIGNALLING SYSTEM FOR OVERVOLTAGE PROTECTORS**

Einar A. Aagaard, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,775  
Claims priority, application Netherlands, Dec. 17, 1976, 7614000

Int. Cl.<sup>2</sup> H04B 3/46  
U.S. Cl. 179—175.3 R

3 Claims



1. A signalling system for a telephone device comprising a

central battery, telephone lines of a subscriber loop, rest supply resistors connected in series with said battery and connected to said telephone lines, over-voltage protection means connected in series with the battery and rest supply resistors for providing an open circuit in response to over-voltage conditions, a supply bridge means for selectively providing an alternate connection between said central battery and said telephone lines, sensing means for providing a loop detection signal in response to a closed-loop condition of said subscriber loop and for providing a bridge signal in response to said alternate connection only if said subscriber loop is in the closed-loop condition, said sensing means further providing said loop detection signal in response to an open circuit of said voltage protection means, and switching network means for initiating the alternate connection in response to said loop detection signal and for removing said alternate connection if said alternate connection is initiated and said bridge signal is not provided, said switching means maintaining said alternate connection in response to a bridge signal following said loop detection signal, whereby in response to the open circuit of the over-voltage protection means said sensing means alternately provides and removes said loop detection signal thereby signalling the open circuit condition of said over-voltage protection means.

4,164,633

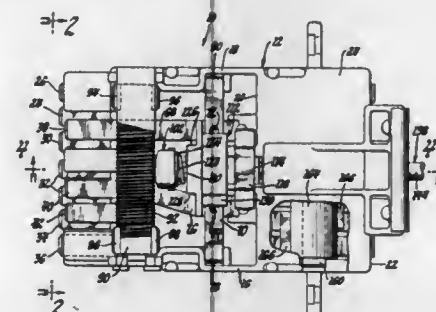
**PUSH-PULL ROTARY SYSTEM**

John J. Sheridan, Middletown; Willard E. Graddy, and Willis H. Anderson, both of Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1978, Ser. No. 874,490  
Int. Cl.<sup>2</sup> H01H 9/00

U.S. Cl. 200—4

7 Claims



1. A push-pull rotary switch for controlling a plurality of lighting circuits on a motor vehicle that includes a rotatable actuator rod longitudinally movable for moving a first switch means for controlling a first lighting circuit and a second switch means operated when said rod is rotated to a predetermined position irrespective of the longitudinal position of the rod for controlling a second lighting circuit, the improvement wherein said first and second switch means are mounted in a housing and said first switch means comprises a socket member made of insulating material and connected to said rod between the ends thereof by a ball and socket connection, a detent engaging said socket member for providing at least two distinct positions of said socket member, a cylindrical contactor fixed with said socket member, said socket member having portions integrally formed therewith connected to said housing for supporting the socket member for rotation about an axis substantially perpendicular to the longitudinal axis of the rod upon longitudinal movement of the latter for causing said cylindrical contactor to selectively connect a first pair of terminals and thereby provide said first lighting circuit, said second switch means including a rotor member and a contact bar member, said rotor member being connected to one end of said rod and being rotatable thereby, said rotor member having a radially extending tab formed therewith for depressing said contact bar member when said rod is at said predetermined

position so as to close said second lighting circuit by connecting a second pair of terminals.

4,164,634

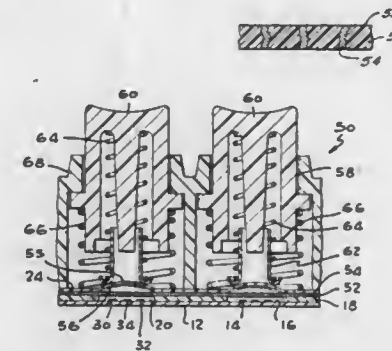
**KEYBOARD SWITCH ASSEMBLY WITH MULTIPLE ISOLATED ELECTRICAL ENGAGEMENT REGIONS**

Michael N. Gilano, Newport Beach, Calif., assignor to Telaris Telecommunications, Inc., Irvine, Calif.

Filed Jun. 10, 1977, Ser. No. 805,346  
Int. Cl.<sup>2</sup> H01H 13/70

U.S. Cl. 200—5 A

10 Claims



1. A switch assembly comprising:

- a substrate having a conductive circuit pattern on a surface thereof, the circuit pattern defining switch contacts at switch contact regions of the substrate;
- a generally planar, non-conductive spacer disposed adjacent the surface of the substrate in fixed, nonmoving relationship thereto, the spacer having apertures therethrough at locations opposite the switch contact regions of the substrate to provide communication through the spacer to the switch contacts;
- a generally planar layer of resilient, multiple conductive contact material having a plurality of electrically isolated conductors extending between planar surfaces thereof, the layer having a resiliency in the plane thereof providing all of the return bias force tending to maintain the contacts at each switch region in an open condition and disposed adjacent the spacer on a side thereof opposite the substrate, the planar layer of multiple conductive contact material electrically engaging each of the switch contacts of each switch contact region at a large number of separate and isolated electrical engagement regions and providing switch closure electrical coupling between engaged switch contacts when forced through an aperture of the separator into engagement with the switch contacts of a switch contact region, the resiliency of the multiple conductive contact material providing an only source of positional bias tending to oppose engagement of the multiple conductive contact material with the switch contacts of a switch contact region;
- a conductive layer disposed in opposed relationship to the switch contacts at each switch contact region between the planar layer and an actuator on a side of the planar layer opposite the spacer to provide electrical coupling between planar layer conductors during switch closure; and
- an actuator disposed in opposed relationship to the conductive layer of each spacer aperture to force the conductive layer into engagement with the conductors of the planar layer and to force the multiple conductive contact material through an aperture of the spacer, each actuator being biased toward a nonactuated, open contact position, and being coupled to force the multiple conductive contact material into switch closure engagement with the switch contacts to electrically close the switch contacts of a switch contact region in response to operator actuation.

4,164,635

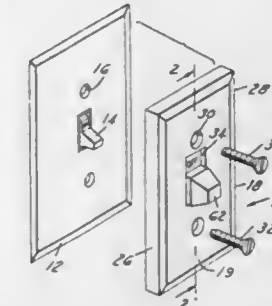
**WALL SWITCH TIMER**

David A. Finch, Ann Arbor, and Charles M. Smillie, III, Orchard Lake, both of Mich., assignors to Time Systems, Inc., Ferndale, Mich.

Filed Mar. 22, 1978, Ser. No. 888,888  
Int. Cl.<sup>2</sup> H01H 7/00, 43/00

U.S. Cl. 200—33 R

23 Claims



1. A timing device intended for operating an electrical toggle type wall switch having an operating arm projecting outwardly from a standard type electrical switch plate, said timing device comprising a body having a front wall provided with a first opening, a back wall provided with a second opening, and a peripheral wall connecting said front and back walls, internal wall means located in the interior of said body and defining a cavity, said timing device being adapted to overlie the switch plate, with said back wall in engagement with the switch plate and the outwardly projecting arm of the toggle switch extending into said cavity through said second opening provided in said back wall, a trip slide mounted in said cavity and movable in opposite directions between first and second limiting positions, said trip slide having means for receiving and engaging the outwardly projecting arm of the toggle switch for operating and tripping same as a result of the movement of said trip slide, spring means in said cavity engageable with said trip slide for urging same towards said first limiting position, said spring means being compressed by said trip slide when the latter is moved to said second limiting position, said trip slide including an arm portion projecting outwardly from said body through said first opening provided in said front wall and through which a force may be applied to the trip slide to move same relative to said spring means to one or the other of the limiting positions, a latch carried by said trip slide and engageable with said internal wall means to maintain the trip slide in said second limiting position with said spring means compressed, and fluid responsive timing means located within the interior of said body and engageable with said latch to operate and release said latch from engagement with said internal wall means after the expiration of a predetermined time interval thereby permitting said compressed spring means to move said trip slide to said first limiting position thus tripping the operating arm of said toggle switch.

4,164,636

**INTEGRAL ELECTRICAL SHORTING SWITCH AND CONNECTOR ASSEMBLY**

David A. Gallagher, Romeoville, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 10, 1977, Ser. No. 823,226  
Int. Cl.<sup>2</sup> H01R 13/70

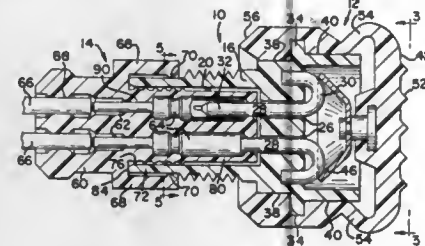
U.S. Cl. 200—51 R

4 Claims

- 1. A switch and connector assembly, comprising:
- a switch body having a cavity formed in one end and a recess formed in the other mating end;
- a plurality of switch terminals rigidly mounted in said switch body, each of said terminals including a respective switch portion extending into said cavity and a contact portion in or adjacent said recess, said switch recess having a plug orienting portion of non-circular cross-section remote



- from the mating end of said switch body and a cylindrical portion adjacent the mating end of said switch body and bounded by a cylindrical recess wall;
- a flexible boot sealed to said switch body to isolate said switch portions of said switch terminals in said cavity from the environment, said boot supporting a conductive member to engage said switch portions during selective operation of said switch;
  - a connector plug having a plurality of contacts for mating with said contact portions of said switch terminals, said connector plug including a forward portion of non-circular cross-section complementary to the non-circular cross-sectional shape of said recess orienting portion for cooperative insertion within said recess orienting portion to facilitate mating of said plug and body and insure mating of said plug contacts with said contact portions of said



switch terminals, and a rearward base portion dimensioned for cooperative insertion within said recess cylindrical portion;

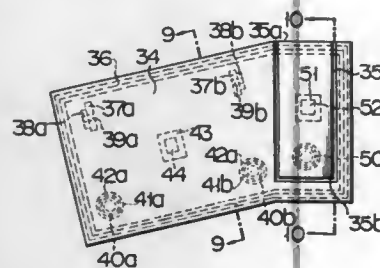
said connector plug also including primary and secondary sealing means to isolate the interior of the mated connector assembly from the environment; said primary sealing means comprising a completely circumferential sealing lip engaging the exterior of said recess wall and said secondary sealing means comprising a plurality of completely circumferential sealing ridges engaging the interior of said recess wall;

said forward portion of said connector plug extending longitudinally beyond said primary and secondary sealing means to permit alignment within said recess orienting portion prior to engagement of said switch recess wall by said primary or secondary sealing means.

**4,164,637**  
**DUAL TREAD PLATE FOOT SWITCH**  
 Kazumi Miyazi, Fuchu, and Hiroki Ichikawa, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
 Filed Mar. 6, 1978, Ser. No. 883,797  
 Claims priority, application Japan, Mar. 10, 1977, 52-29255[U]; Mar. 15, 1977, 52-31647[U]; Mar. 18, 1977, 52-34177[U]

Int. Cl.<sup>2</sup> H01H 13/16  
 U.S. Cl. 200—86.5

14 Claims



1. A dual tread plate foot switch comprising:
  - a lower case made of a synthetic resin and having an integrally formed first engagement means;
  - a first tread plate made of a synthetic resin, the first tread plate being mounted to the lower case so as to be movable up and down with respect to the lower case, the first tread

- plate having an integrally formed second engagement means which is engageable with the first engagement means to prevent the first tread plate from disengaging from the lower case;
- a first urging means for urging the first tread plate upwardly from the lower case;
- a second tread plate cut out from the first tread plate and rockably hinged to the first tread plate;
- a second urging means for urging the second tread plate upwardly from the lower case;
- the first and second urging means being substantially independent of each other and both the first and second tread plates being moved downwardly against the upward urging force of both of the urging means when the second tread plate is pushed downward;
- a first microswitch disposed between the first tread plate and the lower case and adapted to close when actuated by the first tread plate when the first tread plate is pushed downwardly relative to the lower case against the upward urging force of the first urging means; and
- a second microswitch adapted to close when actuated by the second tread plate when the second tread plate is pushed downwardly relative to the lower case against the upward urging force of the second urging means;
- the first and second tread plates and their associated urging means and microswitches being arranged such that the second microswitch is prevented from being closed by the second tread plate when the first microswitch is closed by pushing only the first tread plate downwardly.

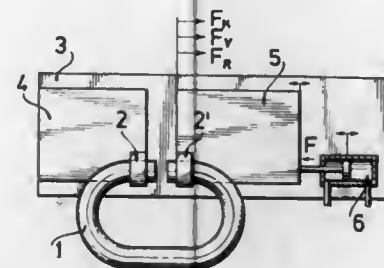
**4,164,638**  
**METHOD FOR FLASH BUTT WELDING OF ANNULAR WORKPIECES**

Klaus Ulmer, Dortmund, Fed. Rep. of Germany, assignor to Hugo Miebach GmbH, Dortmund, Fed. Rep. of Germany  
 Filed Jul. 19, 1978, Ser. No. 926,158  
 Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733559

Int. Cl.<sup>2</sup> B23K 11/04

U.S. Cl. 219—100

6 Claims

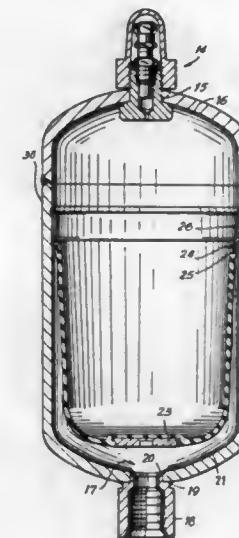


1. A method for flash butt welding of annular workpieces, particularly chain type of links, comprising the steps of: preheating workpiece ends to be welded before flashing and upsetting; applying successive preheat time cycles; controlling a feeding force for an upsetting slide during said successive preheat time cycles; minimizing said feeding force during the first preheat time cycle; increasing the feeding force progressively during advancing preheat time cycles depending on the increase in force required for workpiece deformation; flash welding and upsetting said workpiece ends to be welded.

**4,164,639**  
**METHOD OF FORMING A PRESSURE ACCUMULATOR**  
 Abdur Zahid, 2424 Jupiter Dr., Los Angeles, Calif. 90046  
 Division of Ser. No. 685,315, May 11, 1976, Pat. No. 4,098,297.  
 This application Feb. 16, 1978, Ser. No. 878,281  
 Int. Cl.<sup>2</sup> B23K 11/08

U.S. Cl. 219—117.1

5 Claims



1. The method of manufacturing a pressure accumulator device having a casing which is circular in section, said casing being formed of two metal shells, each having an open end and a closed end for the reception of a fluid inlet port and a gas charging valve, respectively, the steps of forming in an internal wall portion of one said shell section, in spaced relation below the open end thereof, an annular groove lying in a plane normal to the longitudinal axis of said shell section to define, at the junction of said wall portion and groove, an inwardly directed shoulder portion, positioning in said shell section having said groove a resilient cylindrical metal sleeve member having an annular first end portion and a second end portion supporting a bladder at a position within said shell whereat said first end portion is disposed immediately adjacent said shoulder portion, positioning an electrode against an interior increment of said first end portion of said sleeve, and causing said electrode progressively to scan the inner circumference of said first end portion while simultaneously inducing a current flow through said electrode, first end portion, and shell, thereby to form an annular fused connection between said first end portion and portions of said sleeve defining said groove, providing a continuous annular seal, and thereafter connecting said open end portions of said shells.

**4,164,640**  
**METHOD AND APPARATUS FOR POSITIONING A CHARGED PARTICLE BEAM**  
 Wilhelm Scheffels, Puchheim, Fed. Rep. of Germany, assignor to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,326

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634341

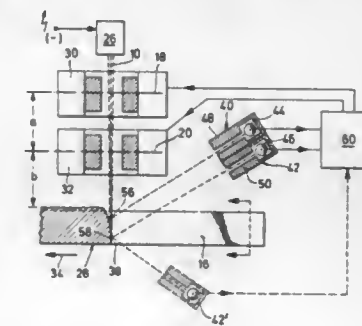
Int. Cl.<sup>2</sup> B23K 9/03

U.S. Cl. 219—121 EM

17 Claims

1. A method for aligning a charge carrier beam of an industrial charge carrier beam device with respect to an elongated gap between two workpiece parts, characterized in that the position of the charge carrier beam with respect to the gap is determined at two positions, which are spaced in the direction of propagation of the charge carrier beam and in that the charge carrier beam is then deflected in accordance with the

result of the position determination at two deflection positions placed at some distant short of the gap in the direction of



propagation in such a manner that it has a pre-determined course with the gap.

**4,164,641**  
**METHOD AND APPARATUS FOR ENERGY BEAM WELDING WITH FILLING MATERIAL**  
 Wilhelm Scheffels, Puchheim; Johannes Koy, Germering; Franz Rappold; Walther Hiller, both of Munich, and Karl H. Steigerwald, Starnberg, all of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

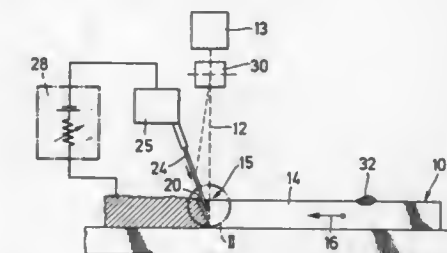
Filed Aug. 3, 1977, Ser. No. 821,476

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634833

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—121 EM

13 Claims



1. Method of welding a joint between two parts by means of an energy beam extending along a beam axis, the energy beam being directed into the joint to produce a welding zone containing molten material, and moved along the joint relative to the parts of the work, and additive material being introduced in the welding zone continuously or discontinuously to fill a gap present at the joint and/or influence the welding zone metallurgically, characterized in that the additive material is introduced into the melt at an acute angle to and at a point which is spaced alongside the central beam axis whereby said additive material penetrates deeply into said molten material.

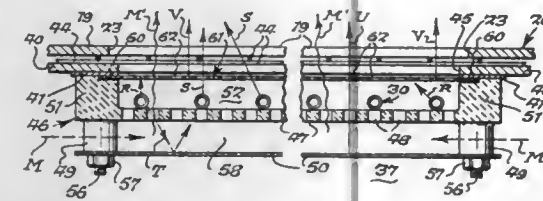
**4,164,642**  
**RADIANT-HOT AIR HEATER**  
 Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226  
 Filed Dec. 20, 1976, Ser. No. 752,610  
 Int. Cl.<sup>2</sup> H05B 1/02; H01H 37/46, 37/52  
 U.S. Cl. 219—358

18 Claims

1. A radiant hot air heater comprising:
  - a primary radiant heat generator;
  - a perforate secondary radiator in close relationship to said generator;
  - switch means responsive to said secondary radiator but controlling said primary generator;
  - wherein said primary generator heats said secondary radiator to cause it to emit radiation at a longer wavelength



than radiation emitted from said generator and whereby both longer and shorter wavelength emission can radiate an article alongside of said secondary radiator;  
a generator mount for support of said generator, said generator mount having an open top, side walls and a perforate bottom wall, and;



a generator reflector outside of but facing said perforate bottom wall;  
whereby radiation from said bottom wall and radiation from said primary generator passing through said perforations in said bottom wall are reflected back toward said bottom wall.

4,164,643

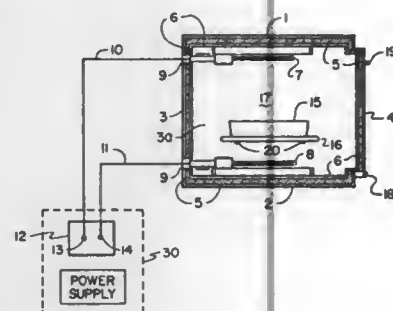
## ENERGY-EFFICIENT BI-RADIANT OVEN SYSTEM

M. Virginia Peart, 1974 Indian Trail Dr., David P. DeWitt, 3303 Georgetown Rd., both of West Lafayette, Ind. 47906, and Susan T. Kern, 102 Turner Hall, Illinois State University, Normal, Ill. 61761

Filed Mar. 6, 1978, Ser. No. 883,469  
Int. Cl.<sup>2</sup> H05B 9/00

U.S. Cl. 219-411

12 Claims



1. An oven system comprising an oven cavity having inner top, bottom and side walls forming said cavity, one of said side walls having a door therein, a horizontal food product supporting rack member mounted within said cavity, wherein the improvement comprises:

an upper infrared radiant heat element mounted to one of said walls, said upper element being located above said food product supporting rack member;  
a lower infrared radiant heat element mounted to one of said walls, said lower element being located below said food product supporting rack member;  
said oven cavity walls having a low emissivity  $E$  and thus being highly reflective of infrared radiant heat energy;  
a baking pan member within said oven cavity and positioned upon said food supporting rack member, the lower portion of said baking pan member having a high emissivity  $E$  and thus being highly absorptive of infrared radiant heat energy;  
wherein said oven system has means for supplying infrared radiant energy directly to said baking pan member and a food product within said oven cavity from said upper and lower infrared radiant heat elements;  
said oven system including control means for independently and simultaneously supplying power to said upper and lower infrared radiant heat elements and for adjusting said

upper element to a first power setting and said lower element to a second power setting;  
said upper infrared radiant heat element having a higher wattage rating than said lower infrared radiant heat element thus supplying more infrared radiant power to the top of a food product to counter the effect of evaporative heat losses during the baking process.

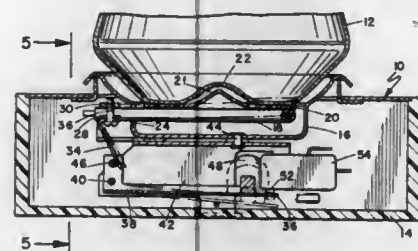
4,164,644  
PORTABLE ELECTRICAL HEATING UNIT WITH  
AUTOMATIC CUTOFF

Duane C. Remsnyder, La Jolla, and Clarence C. Haynes, Escondido, both of Calif., assignors to Courtesy Interstate Corporation, San Diego, Calif.

Filed Aug. 7, 1978, Ser. No. 931,470  
Int. Cl.<sup>2</sup> F27D 11/02

U.S. Cl. 219-433

6 Claims



1. A portable electrical heating unit for heating a predetermined minimum quantity of material in a container, comprising:

a stationary housing,  
an electrical heating element including an annular planar support surface surrounding an upwardly extending protrusion, for supporting a predetermined container,  
pivot means pivotally supporting said heating element on said housing,  
an electric circuit for connecting a source of electrical power to said heating element, said circuit including a weight responsive switch responsive to a predetermined minimum weight on said support surface of said heating element for closing said switch, and a thermal switch in said circuit in series with said weight responsive switch and responsive to a predetermined temperature for interrupting said circuit,  
a counterweight pivotally mounted below said heating element and connected to oppose weight supported on said heating element, said weight responsive switch being positioned to be actuated by movement of said counterweight in opposition to said predetermined minimum weight on said heating element, and  
a container having a depression in the bottom for accommodating said upwardly extending protrusion.

4,164,645

DEVICE FOR HEATING LIQUIDS CONTAINED IN  
SEALED PLASTICS CONTAINERS

Amilcare Dogliotti, Alba, Italy, assignor to P. Ferrero C. S.p.A., Alba, Italy

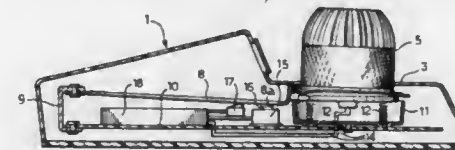
Filed Jan. 16, 1978, Ser. No. 869,964  
Claims priority, application Italy, Oct. 14, 1977, 69296 A/77  
Int. Cl.<sup>2</sup> H05B 3/68

U.S. Cl. 219-452

15 Claims

1. A device for heating a liquid in a container of thermoplastics material hermetically sealed by means of a metal cover, the device comprising in combination:  
support means for the container adapted to accommodate the container in an inverted position;  
an electrical resistive heater positioned in relation to the container support means to be in thermal contact substantially with the whole surface of the metal cover of the

inverted container during heating of the liquid therein, said heater being of nominal power rating sufficient to heat the liquid in a short time while having the electro-thermal characteristics of a positive temperature coefficient of resistance;  
support means for the heater adapted to keep the heater in contact with the cover of the container accommodated in the support means during the period of the heating of the liquid,  
a general switch, and  
an electronic control unit connectable to a power supply through said general switch, the control unit comprising:  
(a) input terminals for connection to a power supply,  
(b) a Wheatstone bridge having four arms a supply diagonal and a measuring diagonal, the supply diagonal being connected to the input terminals, and the resistive heater



being included in one arm of said bridge, the measuring diagonal of which provides signal indicative of the temperature reached by the said resistive heater,  
(c) a regulator circuit arranged to regulate the current supply to supply diagonal of said Wheatstone bridge in dependence upon the said signal on the measuring diagonal of the bridge so that, after an initial transient phase, the temperature of the heater remains substantially within a predetermined range for the whole duration of the heating of the liquid, and  
(d) a timer arranged, after a predetermined interval timed from the moment of commencement of the heating, to switch off, by means of the regulator circuit, the current supply to the Wheatstone bridge and to open the general switch, disconnecting the control unit from the power supply.

4,164,646

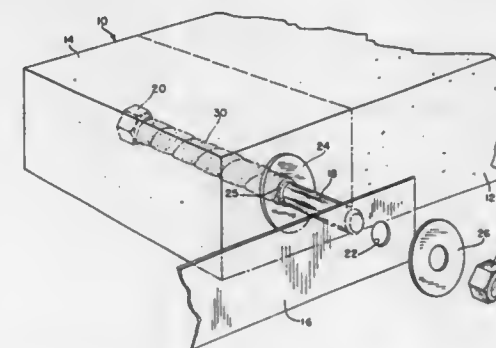
SOLID CURRENT CARRYING AND HEATABLE  
MEMBER WITH ELECTRIC CONNECTION

Frederick G. J. Grise, 87 Main St., Osterville, Mass. 02655  
Filed Apr. 24, 1978, Ser. No. 899,482

Int. Cl.<sup>2</sup> H05B 3/08

U.S. Cl. 219-541

10 Claims



1. In a solid current carrying and heatable member, said member comprising a bonded brick of discrete material including graphitic current carrying paths therethrough, said paths having a relationship to the brick so that the latter heats upon the passage of electric current through it,  
electrical terminal means to apply electricity to the brick and the graphitic paths therein, said means comprising an elongated, substantially cylindrical, current carrying element embedded in the brick, the element and the brick

being of different coefficients of expansion under conditions of heat, and the composition of the brick presenting a relatively rough surface to the element whereby the electric contact between element and brick may be relatively poor,  
said current carrying element extending outwardly from said heatable brick, an electrode being connected to the current carrying element exteriorly of the heatable brick,  
and an inaprevention that comprises a wrapping sheet tightly wrapping the current carrying element, said wrapping sheet being flexible and composed of graphite and forming a positive electric connection between heatable brick and the current carrying element.

4,164,647

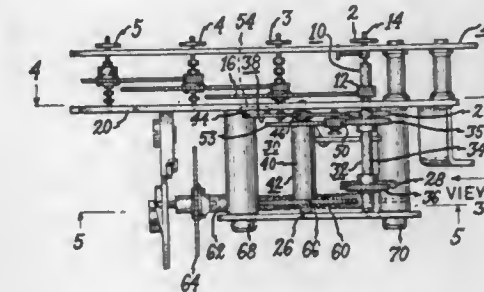
UNIDIRECTIONAL REGISTER HAVING DIFFERENT  
GEAR RATIOS FOR NORMAL AND REVERSE INPUT  
DRIVE ROTATION

Donald M. Ham, Rochester, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Feb. 13, 1978, Ser. No. 877,244  
Int. Cl.<sup>2</sup> G06M 1/00

U.S. Cl. 235-91 R

5 Claims



1. In a meter of the type having a gear driven register, a unidirectional drive assembly for driving a register dial on said register comprising:

(a) a frame assembly including supporting members for the retention of gear assemblies rotatably mounted therebetween;  
(b) an idler assembly including first and second coaxially mounted idler gears;  
(c) a register drive assembly for driving a register dial including, first and second coaxially mounted dial drive gears, with said second dial drive gear being in continuous meshing engagement with said second idler gear;  
(d) an input drive assembly capable of being rotated in either of first and second directions, including a coaxially mounted input gear and a gear shift assembly mounted in frictional contact with said input drive assembly for coaxial rotation therewith, said gear shift assembly having first and second rotatably mounted pinions in continuous meshing engagement with said input gear, said first pinion being positioned adjacent said first dial drive gear and said second pinion being positioned adjacent said first idler gear, with the ratios of said input gear, said first dial drive gear and said first idler gear being substantially the same, said gear shift assembly being operable to bring said first pinion into meshing engagement with said first dial drive gear when said input drive assembly is rotated in said first direction to drive said register dial up-scale at a first rate determined by the ratio of said input gear and said first dial drive gear, and further being operable to bring said second pinion into meshing engagement with said first idler gear when said input drive assembly is driven in said second direction to drive said register dial up-scale at a second rate determined by the ratio of said second idler gear and said second dial drive gear.



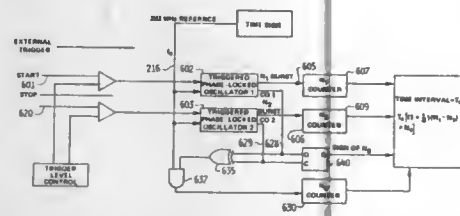
**4,164,648**  
**DOUBLE VERNIER TIME INTERVAL MEASUREMENT USING TRIGGERED PHASE-LOCKED OSCILLATORS**  
 David C. Chu, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 23, 1978, Ser. No. 918,632

Int. Cl.<sup>2</sup> G01R 23/02

U.S. Cl. 235—92 FQ

9 Claims



1. A method for measuring a time interval between a start and stop event, said method comprising the steps of: providing a time base signal having a predetermined period,  $T_0$ ; providing a start oscillator signal in response to and phase coherent with the detection of the start event; providing a stop channel oscillator signal in response to and phase coherent with the stop event; accumulating an indication of the recurrences of the start channel oscillator signal from the time the start event is detected until a coincident point between the start oscillator signal and the time base signal is detected, said indications comprising an integer  $N_1$ ; accumulating an indication of the recurrences of the stop channel oscillator signal between the detection of the stop event and a coincident point between said stop channel oscillator signal and said time base signal, said indications comprising an integer  $N_2$ ; and accumulating an indication of the recurrences of the time base signal between the detection of a coincident point between said start channel oscillator signal and said time base signal and the detection of a coincident point between said stop channel oscillator signal and said time base signal, said indication comprising an integer,  $N_0$ .

**4,164,649**  
**METHOD AND APPARATUS FOR SHEET TRANSPORT IN AUTOMATIC READING EQUIPMENT**  
 Max Anderegg, and Kurt Rütimann, both of Forch, Switzerland, assignors to Feller AG, Horgen, Switzerland

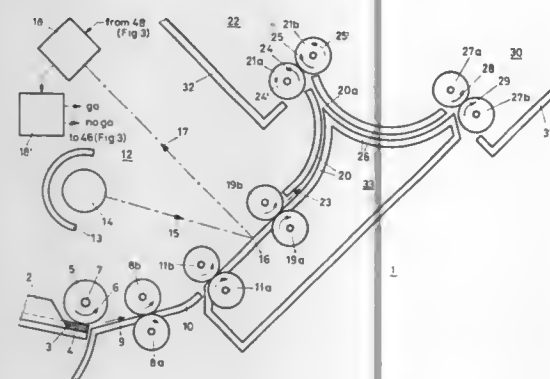
Filed Jul. 31, 1978, Ser. No. 929,409

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734371

Int. Cl.<sup>2</sup> G06K 13/12; B65H 5/22; B07C 5/34

U.S. Cl. 235—480

5 Claims



1. A method for sheet transport in an automatic reading equipment in which individual sheets to be read are removed

from a stack, transported to a reading position and thereafter transported away from said position, comprising: introducing a sheet transported away from the reading position initially only partially into a first collection space for successfully read sheets, introducing the partially introduced sheet completely into said collection space upon occurrence of a "go" decision from the reading, again withdrawing the partially introduced sheet from the collection space for successfully read sheets by an oppositely directed movement upon occurrence of a "no go" decision, and supplying the withdrawn sheet to a second collection space for unsuccessfully read sheets.

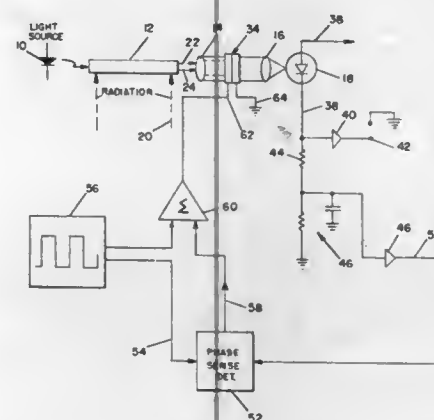
**4,164,650**  
**MEANS FOR REDUCING NUCLEAR RADIATION-INDUCED FLUORESCENCE NOISE IN FIBER-OPTICS COMMUNICATIONS SYSTEMS**  
 James C. Blackburn, Adelphi, and Alan Bromborsky, Beltsville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 8, 1977, Ser. No. 814,019

Int. Cl.<sup>2</sup> H04B 9/00

U.S. Cl. 250—199

6 Claims



1. An optical filtering apparatus for a light communication system comprising: a light source having a center communication frequency subject to frequency drift; optical fiber means having a first end thereof located adjacent the light source, the length of the optical fiber means being subjected to externally impinging energy which generates noise in the fiber means; a tunable optical filter located at the second end of the optical fiber means for filtering a light source signal and rejecting the noise, the filter having electrical input means for varying a center frequency of the filter; photodetection means located at an output of the filtering means for converting the filtered light signal to an electrical signal; and tuning circuit means responsive to the center frequency of the light source for shifting the center frequency of the filter to coincide with that of the center frequency of the light source, the tuning circuit means having an input connected to the photodetection means and having an output connected to the electrical input means.

**4,164,651**  
**APPARATUS FOR PREVENTING INCORRECT COLLATING OF SIGNATURES**  
 Masahiro Oikawa, Hachioji, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

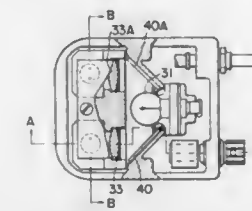
Filed Aug. 19, 1977, Ser. No. 826,068

Claims priority, application Japan, Aug. 20, 1976, 51-110773[U]; Aug. 20, 1976, 51-110774[U]; Jul. 18, 1977, 52-85873

Int. Cl.<sup>2</sup> H01J 3/14

U.S. Cl. 250—216

5 Claims



1. An apparatus including a photoelectric detector assembly for preventing incorrect collating signatures, said assembly having a first optical system and a second optical system each of which comprises:
  - (a) a common light source for said first and second optical systems;
  - (b) a condenser lens for converting light beams emitted from said light source into parallel light beams; and
  - (c) optical means for introducing said parallel beams through a focusing lens to a surface of each signature and for introducing substantially all light beams reflected by said surface of each signature to a photoelectric element.

**4,164,652**  
**PROCESS AND ARRANGEMENT FOR REGISTRATION OF ION-, ELECTRON- AND LIGHT-SPECTRA**  
 Hermann Wollnik, Fernwald, Fed. Rep. of Germany, assignor to Varian Mat GmbH, Bremen, Fed. Rep. of Germany

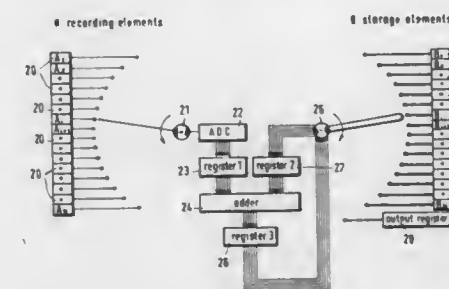
Filed Jul. 7, 1978, Ser. No. 922,696

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731129

Int. Cl.<sup>2</sup> B01D 59/44

U.S. Cl. 250—281

12 Claims



1. A method for obtaining data representing the intensity spectrum of a light, electron or ion spectrum comprising: moving the spectrum past a detector arrangement of  $N$  side-by-side detectors  $A_1$  through  $A_N$ , whereby each said detectors registers a content dependent upon the part of the spectrum at a corresponding position; reading the contents of all said detectors once each period

corresponding to the period said spectrum moves the width of one of said side-by-side detectors; and adding the content read from each detector  $A_i$  with the contents read from  $A_{i-1}$  through  $A_1$  during the previous  $i-1$  periods, respectively, to obtain summation over  $N$  periods of each spectrum part of a width equal to the detector width.

**4,164,653**  
**SOLVENT FOR THE EXTRACTION OF OIL FRACTION IN WATER**

Syozo Matumoto, Kyoto, and Mitsuhiro Okamoto, Neyagawa, both of Japan, assignors to Horiba, Ltd., Kyoto and Dalkin Kogyo Co., Ltd., Osaka, both of, Japan

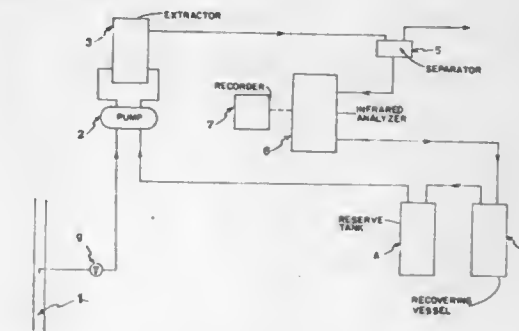
Filed Nov. 29, 1977, Ser. No. 855,906

Claims priority, application Japan, Dec. 8, 1976, 51-148085

Int. Cl.<sup>2</sup> G01T 1/167

U.S. Cl. 250—301

6 Claims



1. In a method for extracting and measuring the concentration of an oil fraction in water which comprises extracting the oil from a water sample with a solvent and analyzing the concentration of oil in the solvent by means of an infrared analyzer, the improvement wherein the solvent utilized to extract the oil from the water sample consists essentially of a low polymer of chlorotrifluoroethylene.

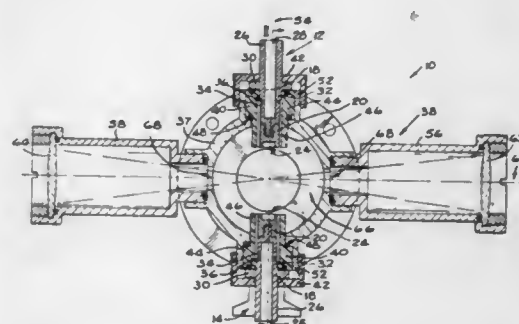
**4,164,654**  
**DEVICE FOR GENERATING AN ATOMIC CLOUD**  
 Louis R. P. Butler, and Hendrik G. C. Human, both of Pretoria, South Africa, assignors to The South African Inventions Development Corporation, Pretoria, South Africa

Filed Feb. 14, 1978, Ser. No. 877,657

Int. Cl.<sup>2</sup> H01J 27/00

U.S. Cl. 250—426

32 Claims



1. A device for generating an atomic cloud comprising, a housing having an inlet and an outlet port through which a gas may be introduced into and removed from the housing; a cathode having a discharge surface located within the housing;

an anode also located within the housing, spaced from and electrically insulated from the cathode and located such that a discharge may occur between the discharge surface of the cathode and the anode;

means for connecting a suitable potential across the anode and cathode for causing a glow discharge between the anode and cathode discharge surface thereby to eject atoms from the cathode discharge surface; and

gas flow directing means for directing a flow of the gas from the inlet port outwardly away from or past the cathode discharge surface, said gas flow directing means comprising means for causing the ejected atoms to move away from the cathode discharge surface to a region beyond the cathode glow region.

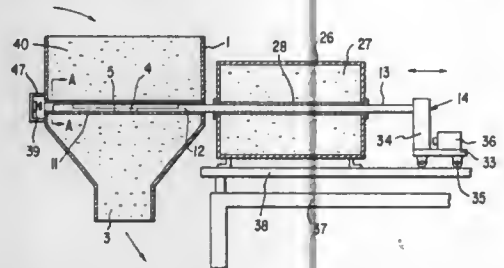
4,164,655

**APPARATUS FOR MEASURING QUANTITY OF ASPHALT INGREDIENT IN AN ASPHALT COMPOUND**  
Ichiro Noma, Osaka, and Kazuo Taniguchi, Hirakata, both of Japan, assignors to Noma Komuten Company Limited, Osaka, Japan

Filed Dec. 30, 1977, Ser. No. 865,964  
Int. Cl.<sup>2</sup> G01N 23/00

U.S. Cl. 250—436

12 Claims



1. An apparatus for measuring the quantity of asphalt ingredient in an asphalt compound in an apparatus for mixing asphalt ingredient and an aggregate to form the asphalt compound comprising:

- a container;
- a means for radiating a neutronic line provided within the container which reacts with a hydrogen atom of said asphalt ingredient in such a manner as to decrease the energy of the neutronic line;
- a detector provided in said container adjacent said radiating means for detecting changes in the energy of said neutronic line;
- a continuous conveying means for continuously supplying asphalt compound into said container; and
- a means responsive to the detector for automatically adjusting the amount of asphalt ingredient in said asphalt compound whereby the amount of asphalt ingredient in said asphalt compound is maintained at a standard value.

4,164,656

**PARALLEL SAFETY COUPLING FOR X-RAY TABLE TILT DRIVE**

Charles Z. Krasznai, Trumbull; Donald J. Meshkil, Milford, and Morris Krumholtz, Bridgeport, all of Conn., assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,992

Int. Cl.<sup>2</sup> G01N 21/00, 23/00; G21K 5/06, 5/08

U.S. Cl. 250—439 R

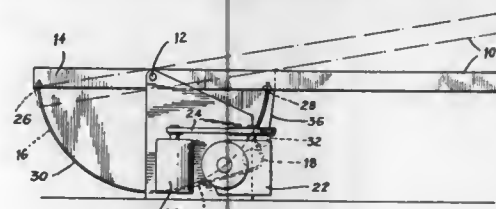
11 Claims

1. X-ray apparatus, comprising:

- a patient supporting table axially mounted for tilting movement about an axis of rotation, said axis of rotation being eccentric to said table such that gravity tends to return said table to a rest position;
- a drive motor;
- a main mechanical drive coupling means linking said motor

to said table for tilting said table about said axis of rotation as said motor rotates;

an auxiliary coupling means between said motor and said table in parallel with said main coupling means for preventing an abrupt falling of said table to the rest position upon a mechanical failure of said main mechanical drive coupling means, said auxiliary coupling means having a substantially constant amount of mechanical free play



over the entire operational tilt range of said table, said free play being sufficient to assure that said auxiliary coupling means carries no part of the drive force transferred from said motor to said table except in the event of mechanical failure of said main coupling means, in which event said auxiliary coupling means links said motor to said table after take up of said free play, said substantially constant free play being sufficiently small to prevent an unsafe amount of table drop during take up of said free play.

4,164,657

**APPARATUS FOR TOMOGRAPHY**

Simon Duinker, Bloemendaal, and Hendrik Mulder, Delft, both of Netherlands, assignors to N.V. Optische Industrie "De Oude Delft", Netherlands

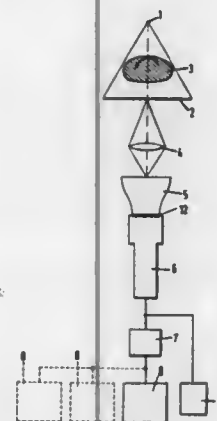
Filed May 9, 1977, Ser. No. 795,217

Claims priority, application Netherlands, May 17, 1976, 7605253

Int. Cl.<sup>2</sup> A61B 6/02

U.S. Cl. 250—445 T

19 Claims



1. An apparatus for tomography, comprising an X-ray or gamma-ray source, one detector body, and an image reconstruction apparatus,

wherein said detector body is a two-dimensional, continuous X-ray screen having dimensions selected in relation to the disposition of the object section to be examined and of the source of radiation relative to the detector body so that the projection of the object section, as far as its greatest cross-sectional dimension is concerned, is at least completely depicted on the detector body, and the dimension of the X-ray screen at right angles to said projection is sufficient to accommodate at least two such projections of adjacent object sections.

4,164,658

**CHARGED-PARTICLE BEAM OPTICAL APPARATUS FOR IMAGING A MASK ON A SPECIMEN**

Jürgen Frosien; Burkhard Lischke, and Andreas Oelmann, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

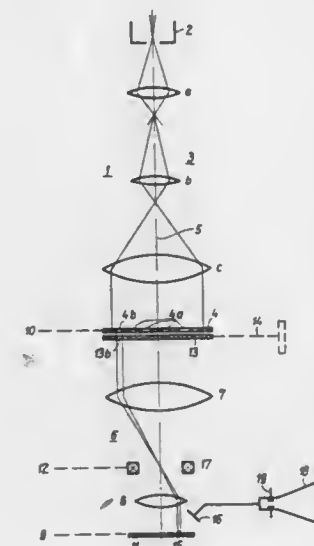
Filed Jan. 19, 1978, Ser. No. 870,637

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702444

Int. Cl.<sup>2</sup> H01J 37/00

U.S. Cl. 250—492 A

2 Claims



1. In a charged-particle beam optical apparatus for imaging a first mask including a plurality of apertures on a specimen to be irradiated, said mask being uniformly illuminated by a beam through a plurality of condenser lenses, said apparatus including means for adjusting the position of said mask relative to said specimen, a selected area of said specimen having an adjustment marking disposed thereon which is illuminated by a ray of charged particles from said beam passing through a test opening provided in said mask, said apparatus further including means for detecting radiation emanating from said specimen, the improvement comprising a second mask, having at least one aperture which is alignable with said test opening, mounted in said apparatus and movable into positions above and below said first mask, for aligning said test opening and said aperture in said first and second masks and covering said plurality of apertures in said first mask so as to permit charged particles from said beam to pass only through said test opening in said first mask and said aperture in said second mask, said condenser lenses being excited with the same excitation during an adjustment of the positions of images of said adjustment marking and said test opening on the screen of a monitor as during an operational imaging of said first mask on said specimen thereby eliminating optical errors caused by variations in the excitation of said condenser lenses during said adjustment of the positions of said adjustment marking and test opening and said imaging of said first mask on said specimen.

4,164,659

**METHOD OF MONITORING THE PHASE STATE OF MATERIAL IN PROCESSES INVOLVING CRYSTALLIZATION FROM MELT AND APPARATUS FOR PERFORMING SAME**

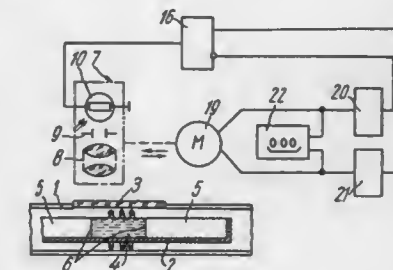
Ilya N. Munits, and Sergei E. Marsev, both of Leningrad, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatel'skiy I Proektny Institut Aluminievoy, Magnitovoy I Elektrodnoy Promyshlennosti, U.S.S.R.

Filed Dec. 16, 1976, Ser. No. 751,349

Int. Cl.<sup>2</sup> G01N 21/22; H01J 39/12

U.S. Cl. 250—561

12 Claims



1. A method of monitoring the phase state of a material in processes including crystallization from a melt, comprising the steps of receiving radiation issuing from the material being treated; detecting said radiation and generating a corresponding electric output signal; and continuously analyzing the amplitude-frequency spectrum of the electric output signal to determine the presence in this signal of a low-frequency component which is indicative of the state of the material.

4,164,660

**PLANT FOR THE PRODUCTION OF ELECTRICAL ENERGY AND HEAT**

Mario Palazzetti, Avigliana, Italy, assignor to Fiat Societa' per Azioni, Turin, Italy

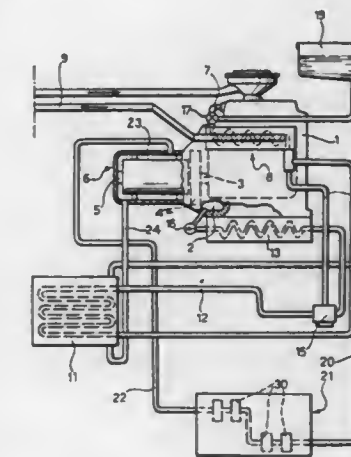
Filed Oct. 25, 1977, Ser. No. 845,082

Claims priority, application Italy, Oct. 26, 1976, 69573 A/76

Int. Cl.<sup>2</sup> F24D 3/02

U.S. Cl. 290—2

4 Claims



1. Plant for the production of electrical energy and heat of the type comprising:

- an internal combustion engine having a coolant jacket for the circulation of liquid coolant, and a coolant inlet and outlet communicating with said jacket;
- a primary liquid coolant circuit including said engine coolant jacket, a gas/liquid heat exchanger through which the engine exhaust gases flow to give up heat to coolant flowing out of the jacket outlet and a liquid/liquid heat ex-



changer disposed in said primary circuit between said gas/liquid heat exchanger and the jacket inlet; a secondary liquid circuit comprising said liquid/liquid heat exchanger and a heating unit, and an electrical generator driven by the engine, wherein the improvement consists in the electrical generator having a casing and a cooling jacket surrounding the casing, said generator cooling jacket being connected in said secondary circuit to receive a cooling flow of liquid therefrom.

4,164,661

## LOAD SHARING SYSTEM

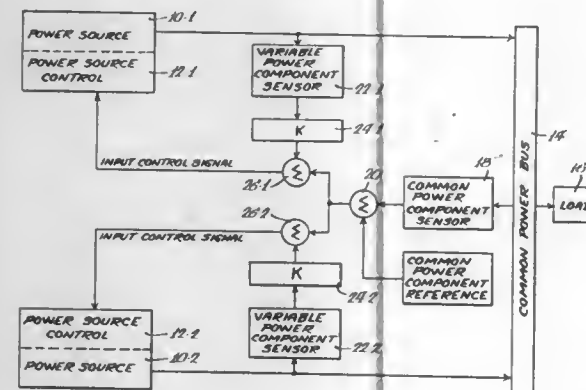
David J. Hucker, Rockford, Ill., and Richard W. Reynolds, Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 9, 1978, Ser. No. 868,402

Int. Cl.<sup>2</sup> H02J 3/46, 3/04, 1/10

U.S. Cl. 307—57

10 Claims



1. A system for controlling load division among plural power sources coupled in parallel, comprising: at least two power sources each providing output power having two power components wherein the output power from each source is responsive and proportional to an individual input control signal; means connecting the outputs of each power source together, with one of said two components common; means for sensing the magnitude of the power component common to the power sources; a source of reference for said common power component; means for comparing said reference with the common power component to provide a common error signal; means for sensing the magnitude of the other of the two power components for each of the power sources to provide signals representative thereof; means for summing the signal representative of the magnitude of the other component for each of the power sources with said common error signal to provide an individual input control signal for each power source; and means for each power source responsive to the individual input control signal therefor to control the output power from each said power source.

4,164,662

Patent Not Issued For This Number

4,164,663

## SEQUENTIAL CONTROL SIGNAL GENERATOR

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

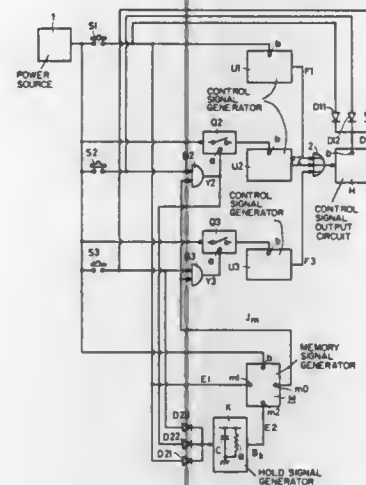
Filed Oct. 3, 1977, Ser. No. 839,008

Claims priority, application Japan, Oct. 1, 1976, 51-118386

Int. Cl.<sup>2</sup> H04M 11/00

U.S. Cl. 307—115

4 Claims



1. A sequential control signal generator comprising: at least first and second control signal generators, each having a power source input; a control signal output circuit responsive to signals from said control signal generators; at least first and second key switches; at least one switching circuit having a control input; a DC power source connected to said power source input of said first control signal generator via said first key switch; a hold signal generator having an input connected to said DC power source via said first key switch; a memory signal generator having first and second inputs respectively connected to (a) said DC power source via said first key switch and (b) the output of said hold signal generator; and at least one switching signal generator having first and second inputs respectively connected to (a) said DC power source via said second key switch and (b) the output of said memory signal generator and the output of said switching signal generator being connected to said control input of said switching circuit; wherein when connected at the power source input to the DC power source through the first key switch, the first control signal generator provides a first control signal; wherein when connected at the power source input to the DC power source through the switching circuit, the second control signal generator provides a second control signal; wherein when sequentially supplied at its input with the first and second control signals, the control signal output circuit provides a sequential control signal having a sequential arrangement of the first and second control signals; wherein when connected at the input to the DC power source through the first key switch, the hold signal generator provides a hold signal which lasts from the moment of connection of the input to the DC power source through the first key switch or a moment a little behind it to a predetermined moment after disconnection of the input from the DC power source through the first key switch;

wherein when connected at the first input to the DC power source through the first key switch and supplied at the second input with the hold signal, the memory signal generator generates a memory signal which lasts while the hold signal lasts; wherein when connected at the first input to the DC power source through the second key switch and supplied at the second input with the memory signal, the switching signal generator provides a switching signal while connected at the first input to the DC power source through the second key switch; and wherein when supplied at the control input with the switching signal, the switching signal connects the power source input of the second control signal generator to the DC power source while the switching signal lasts.

to receive the first and second output signals of the detector means without difference as to order, and which is responsive to the second signal condition to provide a second output signal for conditioning the operation of depressurizing means to decrease the pressure in the load-leveling device; and timing circuit means, intercoupled with said first and second control channels and responsive to the occurrence of a first or second output conditioning signal from the first or second logic gate means when said first and second output conditioning signal is continuous for a minimum predetermined time duration, for providing an enabling signal to the first and second control channels, which, in conjunction with the first or second output signal, enables the operation of the pressurizing or depressurizing means, respectively.

4,164,664

## CONTROL CIRCUIT FOR LOAD-LEVELING SHOCK ABSORBERS

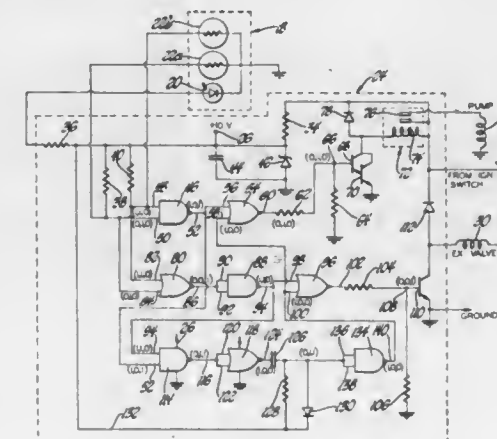
Stanley J. Kasiewicz, 29852 Springhill Dr., Southfield, Mich. 48076

Filed Dec. 13, 1977, Ser. No. 860,276

Int. Cl.<sup>2</sup> H01H 35/38

U.S. Cl. 307—118

4 Claims



1. A control circuit for use in the pressure regulation of a pressurized load-leveling device, the load-leveling device being equipped with detector means having first and second output signals for providing a first signal condition to represent underpressurization, a second signal condition to represent overpressurization, and a third signal condition to represent proper pressurization, the control circuit comprising: a first control channel including first logic gate means having first and second input terminals which are adapted to receive the first and second output signals of the detector means without difference as to order, and which is responsive to the first signal condition to provide a first output signal for conditioning the operation of pressurizing means to increase the pressure in the load-leveling device; a second control channel including second logic gate means having first and second input terminals which are adapted

4,164,665

## MANUALLY PROGRAMMABLE STORAGE DEVICE

Hans Berger, Schönaich, Fed. Rep. of Germany, assignor to Centra-Bürkle GmbH & Co., Schönaich, Fed. Rep. of Germany

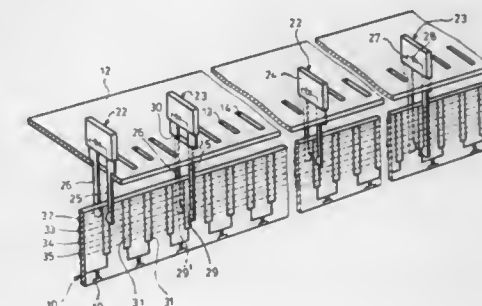
Filed Oct. 25, 1977, Ser. No. 844,846

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647829

Int. Cl.<sup>2</sup> H01H 7/00

U.S. Cl. 307—141

21 Claims



1. A program storage device which can be variably manually programmed, comprising: a housing; at least one elongated printed circuit board mounted within the housing, and having: a plurality of primary electrical contact surfaces arranged adjacently and in at least one row in the longitudinal direction of the circuit board; and at least one secondary contact surface that extends in the longitudinal direction of the circuit board; a transverse board serving as the top wall of the housing and having a row of slits formed therein for each circuit board, each row being longitudinally aligned with its respective circuit board; and a plurality of slide contacts each having interconnected electrical contacts, said slide contacts being constructed for insertion into the slits formed in the transverse board and for support by the transverse board, such that the interconnected electrical contacts electrically connect at

least one primary and at least one secondary contact surface of the printed circuit board, wherein the openings of the slits in at least one row of slits vary in a periodic fashion along the extent of said at least one row, and wherein each slide contact has a number of staggered step regions situated in the longitudinal direction of the slide contact, which number corresponds to the number of different slit openings of said slits, said step regions serving to limit the insertion depth of said slide contact.

#### 4,164,666 ELECTRONIC APPARATUS USING COMPLEMENTARY MOS TRANSISTOR DYNAMIC CLOCKED LOGIC CIRCUITS

Masataka Hirasawa, Kanagawa, Japan, assignor to Toyko Shibaura Electric Co., Ltd., Japan

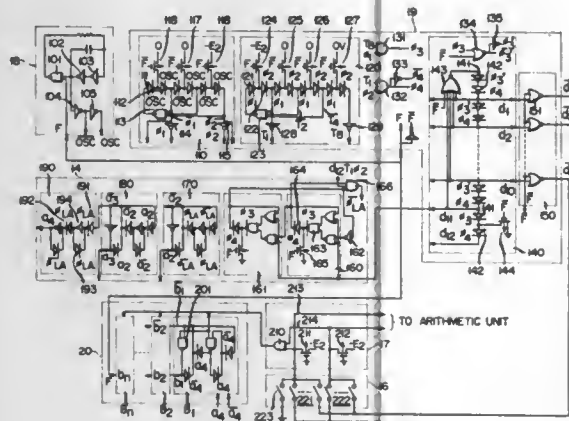
Filed Jun. 7, 1977, Ser. No. 804,440

Claims priority, application Japan, Jun. 8, 1976, 51-66704; Jun. 8, 1976, 51-66711; Jul. 31, 1976, 51-91649

Int. Cl.<sup>2</sup> H03K 21/30; G06F 1/04; H03K 19/08

U.S. Cl. 307—208

10 Claims



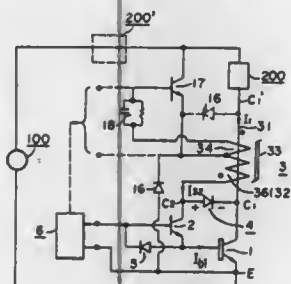
1. An electronic apparatus comprising: timer circuit means having enable and disable periods; timer circuit enabling means for initiating said enable period of said timer circuit means by applying a control signal to said timer circuit means to enable said timer circuit means to produce at the output thereof a fixed level voltage for a fixed time; dynamic clocked logic circuits each having at least one input, an output having a storage capacitance, and first and second clock inputs; each of said logic circuits being alternately enabled and disabled by a complementary pair of clock pulses applied to said first and second clock inputs, and while enabled each logic circuit producing output signals at said outputs whose voltage level depends upon the voltage level at said inputs and while disabled storing said output signals in said storage capacitance; and clock pulse supplying means coupled with said timer circuit means for supplying clock pulses to said first and second clock inputs of said dynamic clocked logic circuits during said enable periods of said timer circuit means, and for supplying disabling voltages with fixed levels to said first and second clock inputs of said dynamic clocked logic circuits during said disable periods of said timer circuit

4,164,667  
SEMICONDUCTOR SWITCH DEVICE  
Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 695,055, Jun. 11, 1976, abandoned.  
This application Oct. 21, 1977, Ser. No. 844,194  
Claims priority, application Japan, Jun. 23, 1975, 50-78321; Aug. 28, 1975, 50-104308

Int. Cl.<sup>2</sup> H03K 17/60

U.S. Cl. 307—253

9 Claims



1. A semiconductor switch device comprising: a semiconductor switch with a control electrode and a plurality of main electrodes disposed serially in a power path connecting a DC power source and a load; a current transformer having a core and having a primary conductor disposed serially in the power path for passing current in response to a turn-on of the semiconductor switch and a secondary winding connected to the control electrode of the semiconductor switch, current flowing in the primary conductor generating a magnetization; a magnetizing force applying means for magnetizing the core of the current transformer in a direction opposite to the magnetization generated by the current flowing in the primary conductor; the magnetizing force applying means comprising a loop circuit consisting of a series connection of the DC power source, a reset switch and the secondary winding of the current transformer, the loop circuit passing through the control electrode and one of the main electrodes of the semiconductor switch; and a detecting winding magnetically coupled to the core of the current transformer and a coupling circuit for receiving the output of the detecting winding and thereby causing the reset switch to conduct.

4,164,668  
METHOD OF CORRECTING THE VOLTAGE COEFFICIENT OF RESISTORS IMPLANTED OR DIFFUSED IN A SEMICONDUCTOR SUBSTRATE  
Francois X. Delaporte, Cagnes sur Mer; Robert M. Hornung, Evry; Anne-Marie Lamouroux, Prades; Gerard M. Lebesnerais, Ponthierry, and Jean-Paul J. Nuez, Mennecy, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1977, Ser. No. 796,266

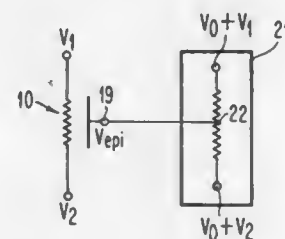
Int. Cl.<sup>2</sup> H01L 27/04

U.S. Cl. 307—303

4 Claims

4. A resistor structure comprising: a semiconductor body including a resistor region of a first conductivity type and located within an electrically isolated portion of a layer of opposite conductivity type, means for applying potentials to the opposite ends of said

resistor region so that the potential difference across said region varies, and



means for applying to said layer a potential which differs by a constant magnitude from the arithmetic mean value of the potentials applied to the ends of the resistor region.

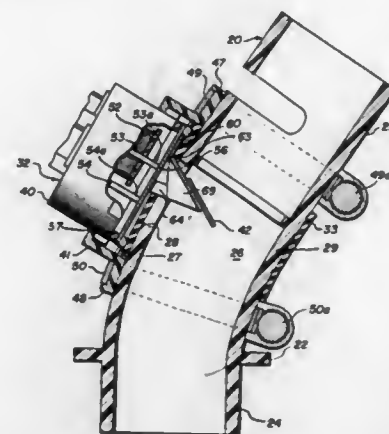
4,164,669  
SEED SENSOR  
John T. Knepler, Chatham, Ill., assignor to Dickey-John Corporation, Auburn, Ill.

Filed Sep. 10, 1975, Ser. No. 612,017

Int. Cl.<sup>2</sup> H02K 35/00

U.S. Cl. 310—15

12 Claims



1. A sensor comprising: means forming an article flow path, transducer means positioned adjacent to said flow path means, said transducer including a resiliently deflectable member having fixed opposite portions and a deflectable mid-portion, article engaging and transducer actuating means secured to said transducer, said article engaging means having a portion engageable with one of said fixed portions and a second portion engageable with said mid-portion for maximizing actuation of the deflectable member and extending partially into said flow path means so that articles passing along said flow path will strike said article engaging means to deflect the same and actuate said transducer means for producing an output signal in response to said deflection.

4,164,670  
SEALED MOTOR MOUNT FOR HAND HELD DEVICE  
William M. Maher, Churchville, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,673

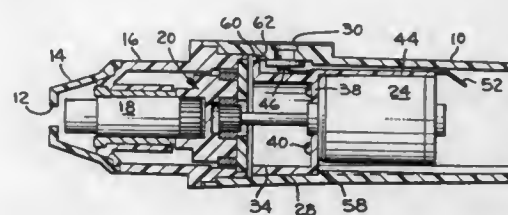
Int. Cl.<sup>2</sup> H02K 7/14

U.S. Cl. 310—50

5 Claims

1. A motor assembly for a tube mount comprising, a tube having one open end with a tapered inner surface and an opening therethrough downstream of said end facing said surface, a switch wiper movably mounted in said opening, a sized motor mount including a second tubular member

with an outer tapered surface for telescopic mating with said tapered inner surface, said member having an end vertical wall, a smaller sized motor secured to and cantilevered from said wall into said tube, positioning stop means between said member and tube and,



outwardly biased terminals on said member bridged by said wiper whereby said motor assembly is slid into the blind tube for sealed engagement therewith in a concentric mount with axial and radial alignment of the switch.

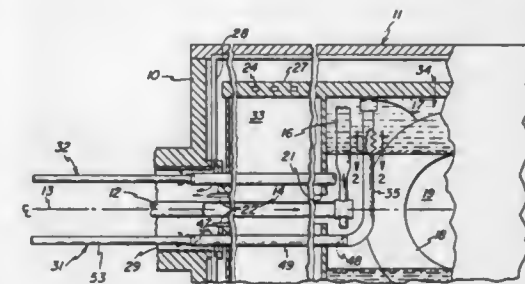
4,164,671  
RESISTOR-CONTAINING CRYOGENIC CURRENT LEAD  
Bruce B. Gamble, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 22, 1978, Ser. No. 908,535

Int. Cl.<sup>2</sup> H02K 9/00

U.S. Cl. 310—52

11 Claims



1. In a superconducting rotor comprising means connected to said rotor for rotation thereof, means in flow communication with the rotor winding chamber of said rotor for supplying liquefied gas thereto as coolant for maintaining rotor windings disposed therein submerged at least in part in a pool of liquefied gas and at cryogenic temperatures, means in flow communication with said chamber for withdrawing coolant vapor therefrom, and means electrically connected to said rotor windings for carrying current between a current distribution device at room temperature and said rotor windings at cryogenic temperatures, the improvement for adapting said rotor for intermittent operation with minimal coolant usage, wherein: (a) a portion of each current-carrying means includes means open at both ends for conducting a confined flow of coolant vapor along and in contact with said current-carrying means, (b) said vapor-conducting means being in flow communication at one open end thereof with a part of said vapor-withdrawing means, (c) said portion having a terminal length thereof extending into said rotor winding chamber, (d) said terminal length being disposed in the generally radial direction locating the other open end of said vapor-conducting means adjacent the wall of said rotor winding chamber, (e) said other open end being submerged below the surface





taneously to each of said power electrodes of said strobe lamp, the polarity of the trigger pulse applied to one of said pair of power electrodes being opposite to the polarity of the trigger pulse applied to the other of said pair of power electrodes, said trigger means including a pair of trigger input terminals,

a transformer having a primary winding, a first secondary winding and a second secondary winding, said primary winding being connected to said pair of trigger input terminals, and

means for connecting said first secondary winding between said first power output of said capacitor means and one of said pair of power electrodes of said strobe lamp, and for connecting said second secondary winding between said second power output of said capacitor means and the other of said power electrodes of said strobe lamp, said first and second secondary windings being connected such that said power electrodes of said strobe lamp will each receive simultaneously firing pulses of opposite polarity from said first secondary winding and said second secondary winding when said primary winding is energized, whereby said strobe lamp will fire upon application of said trigger pulses to said power electrodes and said capacitor means will provide electrical energy for discharge through said lamp.

4,164,680

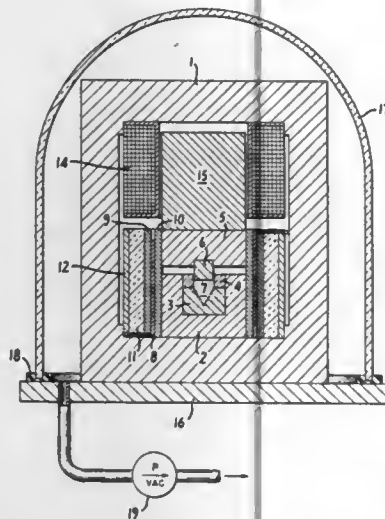
**POLYCRYSTALLINE DIAMOND EMITTER**

Humberto F. Villalobos, 55 Dartmouth Rd., Williams Bay, Wis. 53191

Continuation-in-part of Ser. No. 608,260, Aug. 27, 1975, Pat. No. 4,084,942. This application Nov. 16, 1977, Ser. No. 852,022 Int. Cl.<sup>2</sup> H01J 1/16, 1/14

U.S. Cl. 313—336

11 Claims



1. A polycrystalline diamond emitter having an ultrasharp edge or point, said emitter comprising a multiplicity of diamond particles molecularly bonded together with the cohesion of natural diamond, all of said diamond particles being of a size less than 100 angstroms and being uniform in size within a range of 50 angstroms, said diamond particles being uniformly oriented to present like faces to said edge or point to define a uniform edge or point having a radius of from 3 to 100 angstroms, said emitter having at least in the portion forming said edge or point uniform inclusions of low work function metal.

4,164,681

**IMAGE DISPLAY DEVICE WITH ION FEEDBACK CONTROL AND METHOD OF OPERATING THE SAME**

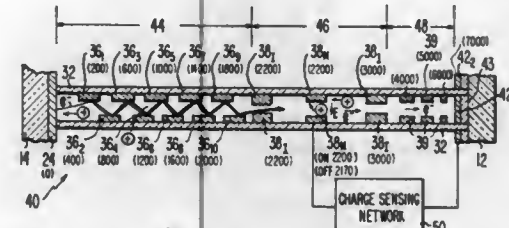
Carmen A. Catanese, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1976, Ser. No. 750,402

Int. Cl.<sup>2</sup> H01J 31/00, 43/00

U.S. Cl. 313—400

18 Claims



1. A cathode device employing regenerative ion feedback, which comprises:  
(a) an enclosure filled with inert gas;  
(b) a cathode in said enclosure;  
(c) an electron multiplier region in said enclosure, said electron multiplier region disposed to one side of said cathode;  
(d) an ion interaction region in said enclosure, said region being positioned to one side of said electron multiplier region to receive the electron output therefrom; and  
(e) means for dynamically controlling the magnitude of ion feedback to said cathode.

4,164,682

**SHADOW MASK SUSPENSION SYSTEM HAVING BRACKET MEANS INTEGRALLY FORMED FROM THE SHADOW MASK ASSEMBLY**

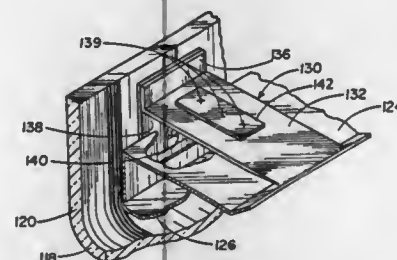
Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Division of Ser. No. 646,803, Jan. 5, 1976, abandoned. This application Sep. 28, 1977, Ser. No. 837,496

Int. Cl.<sup>2</sup> H01J 29/08

U.S. Cl. 313—404

2 Claims



1. For use in a rectangular color cathode ray tube, of a type having a front panel with a rearward flange which mates with a funnel, a system for suspending an approximately rectangular shadow mask assembly on the rearward flange of the front panel at a predetermined spacing from a screen-bearing faceplate portion of the front panel, said system comprising a plurality of mask suspension devices spaced around the assembly, each comprising:

a metal stud embedded in said flange of said front panel so as to extend inwardly therefrom; and  
mask-mounted means for retentively engaging said stud, comprising:  
sheet metal bracket means formed integrally from said mask assembly and extending radially outward from said assembly in a direction substantially perpendicular to the axis of said assembly, said bracket having at its distal end a leg extending substantially parallel to said axis; and  
a discrete metal leaf spring welded at one end to said leg

of said bracket means and having provision on its distal end for retentively engaging said stud;  
said mask-mounted means being characterized by having welded on said bracket means at least one flat strip composed of a material having a coefficient of thermal expansion which is significantly different from that of said bracket means and which is arranged on said bracket means and sized such that upon heating of said mask assembly, said bracket means bends out of its plane to effect a compensating adjustment in the spatial position of the mask assembly relative to the faceplate portion.

4,164,683

**FLUORESCENT DISPLAY TUBE**

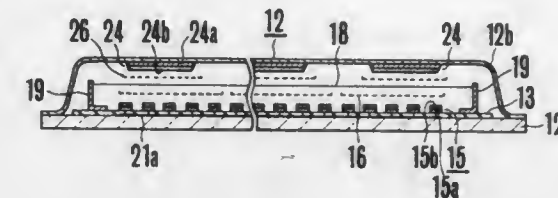
Tadashi Nakamura, Ise; Mitsuru Masuda, Matsuzaka, and Hiroshi Tanaka, Takarazuka, all of Japan, assignors to ISE Electronics Corporation and Fujitsu Ten Limited, both of Japan

Filed Jun. 21, 1978, Ser. No. 917,412

Claims priority, application Japan, Jun. 27, 1977, 52-76383 Int. Cl.<sup>2</sup> H01J 63/02, 63/04

U.S. Cl. 313—496

7 Claims



1. In a fluorescent display tube comprising a sealed envelope made up of spaced plates one of which being transparent, a first display unit formed on the inner surface of a plate opposing said transparent plates, said first display unit including a plurality of electrodes and phosphor films coated thereon, a cathode electrode for emitting thermal electrons, and drive means for selectively energizing said electrodes for causing said phosphor films to luminesce with said thermal electrons, the improvement which comprises a second display unit which includes a plurality of separately driven electrodes formed on the inner surface of said transparent plate and phosphor films coated on the last mentioned electrodes.

4,164,684

**MAGNETRONS**

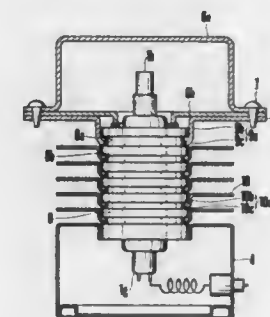
Tomokatsu Oguro, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 865,917

Claims priority, application Japan, Jan. 5, 1977, 52-61[U] Int. Cl.<sup>2</sup> H01J 25/50

U.S. Cl. 315—39.51

7 Claims



1. In a magnetron of the type comprising a cylindrical main body containing anode and cathode electrodes and permanent magnets, and component parts mounted on the periphery of said main body, the improvement wherein each of said compo-

nent parts is provided with an annular member press fitted on said main body and having an inner diameter equal to or a little smaller than the outer diameter of said main body and said main body is provided with at least one, annular, circumferential groove around the outer periphery thereof for engagement with a portion of said annular member.

4,164,685

**MAGNETRON DEVICE**

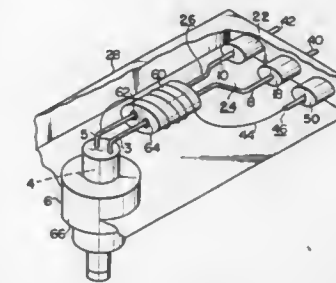
Hirokazu Takahashi, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 13, 1977, Ser. No. 832,952

Claims priority, application Japan, Sep. 14, 1976, 51-110076 Int. Cl.<sup>2</sup> H05B 39/00, 41/14

U.S. Cl. 315—105

12 Claims



1. A magnetron device comprising:  
a magnetron body including an anode and a filament provided with first and second filament terminals;  
first, second and third power supply terminals adapted to be connected to a power source;  
first and second filament power supply lines for supplying current to the filament, the first power supply line being connected between the first filament terminal and the first power supply terminal and the second power supply line being connected between the second filament terminal and the second power supply terminal;  
one anode power supply line connected between the third power supply terminal and one of the filament terminals for applying a predetermined voltage across the anode and the filament;  
a filter device including a choking element and connected to the anode power supply line for reducing noises transmitted from the filament terminals; and  
a shield box for receiving the filament terminals, the filter device and the power supply lines to shield electromagnetic waves which are emitted from the filament terminals and from the power supply lines, said power supply terminals being attached to said box.

4,164,686

**LOAD CURRENT PULSE CONTROL DEVICES**

Zoltan Vital, Uccle, and Jean Orban, Clabecq, both of Belgium, assignors to Ponder & Best Inc., Los Angeles, Calif.

Division of Ser. No. 389,200, Aug. 17, 1973, Pat. No. 3,992,643, which is a division of Ser. No. 275,886, Jul. 27, 1972, Pat. No. 3,818,266, which is a division of Ser. No. 244,279, Apr. 14, 1972, Pat. No. 3,857,064, which is a continuation of Ser. No. 799,554, Feb. 13, 1969, abandoned. This application Aug. 22, 1975, Ser. No. 606,921

Claims priority, application Belgium, Feb. 13, 1968, 54471; Nov. 21, 1968, 66425; Dec. 27, 1968, 68017; Jan. 20, 1969, 68982 Int. Cl.<sup>2</sup> H05B 37/00

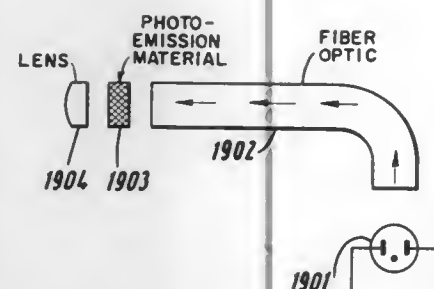
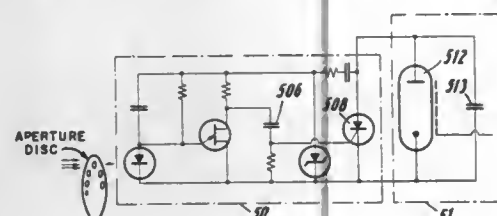
U.S. Cl. 315—241 P

6 Claims

1. In a device for controlling the delivery of discharge current pulses from a storage capacitor to a flash tube in an electronic photoflash member, the device including an electronic switch connected with the flash tube for terminating the deliv-



ery of current to the flash tube, the improvement wherein said device comprises an integrator circuit, including a light sensor disposed to receive light produced by said flash tube, said integrator circuit being connected to produce a signal proportional to the time integral of the energy delivered to said flash tube by each such current pulse and to operate said electronic

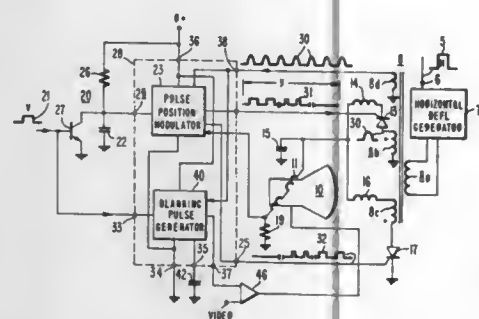


switch when such time integral reaches a predetermined value, and a manually adjustable optical element disposed in the path of light received by said sensor for varying the proportion of the light produced by said tube which is received by said sensor for causing the amplitude of the input signal delivered to said integrator circuit to be a predetermined proportion of the amplitude of the current delivered to said flash tube.

**4,164,687**  
**TELEVISION KINESCOPE PROTECTION CIRCUIT**  
Adel A. A. Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 895,227  
Int. Cl.<sup>2</sup> H01J 29/52  
U.S. Cl. 315—384

7 Claims



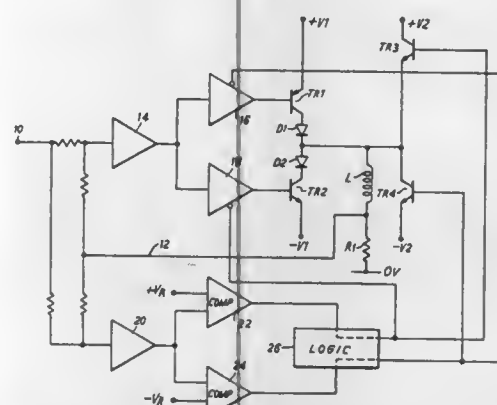
1. A kinescope protection circuit for a television deflection apparatus in which vertical deflection power is derived from horizontal deflection signals by integration, comprising: blanking generator means coupled to a source of vertical synchronizing signals and to said kinescope, said blanking generator means including a monostable multivibrator having its input coupled to said source of vertical synchronizing signals for assuming the unstable state at the inception of each of said synchronizing signals, the output of said multivibrator being coupled to said kinescope for

blanking during at least a portion of its unstable condition and for unblanking during its stable condition; and inhibiting means coupled to said source of horizontal deflection signals and to said multivibrator means for preventing said multivibrator from assuming its stable state except during the presence of said deflection signals.

**4,164,688**  
**DEFLECTION AMPLIFIER**  
Brian M. Cushing, Alton, England, assignor to The Solartron Electronic Group Limited, Farnborough, England  
Filed Sep. 21, 1977, Ser. No. 835,118  
Claims priority, application United Kingdom, Oct. 4, 1976, 41023/76

Int. Cl.<sup>2</sup> H01J 29/70, 29/72  
U.S. Cl. 315—389

4 Claims

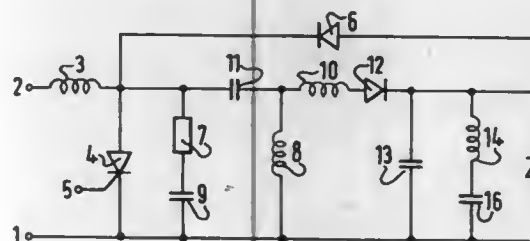


1. A deflection amplifier responsive to a command waveform and including a negative-feedback current control circuit operating between first voltage supply to supply current to and draw current from a deflection coil in dependence upon the command waveform, a feedback circuit for providing an error signal representing the difference between the commanded and actual currents, and a current switching circuit operating between second voltage supply rails having a higher potential difference therebetween than the first rails, and supplying current to and drawing current from the deflection coil, depending upon the sign of the error signal, when the magnitude of the error signal exceeds a threshold value.

**4,164,689**  
**SAW-TOOTH WAVE GENERATOR**  
Giuseppe Zappala, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Turin, Italy  
Filed Nov. 23, 1977, Ser. No. 854,278

Claims priority, application Italy, Dec. 7, 1976, 69912 A/76  
Int. Cl.<sup>2</sup> H01J 29/70, 29/76  
U.S. Cl. 315—408

13 Claims



1. A circuit arrangement for providing a deflection coil with a saw-tooth current having a cycle comprised of a trace and a retrace portion, comprising a first unidirectionally conductive

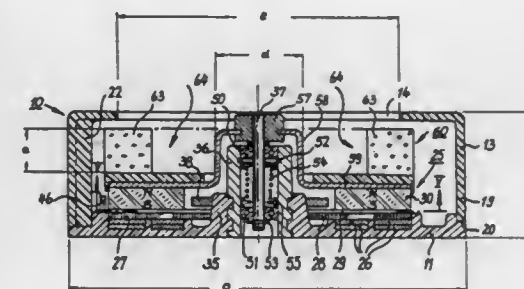
device connected parallel with said coil, a thyristor having a gate electrode operative to be connected to a source of pilot signals to render the thyristor conductive during a portion of each cycle of operation, a second unidirectionally conductive device connecting said coil and said first unidirectionally conductive device to the thyristor, a branch circuit connected in parallel with the second unidirectionally conductive device and comprising a third unidirectionally conductive device connected in series with a capacitor, the second and third unidirectionally conductive devices being coupled to said coil in opposite polarity and means comprising means for forming a series resonant circuit with the aforesaid capacitor for quenching said thyristor prior to the completion of the trace portion of the sawtooth current operating cycle.

**4,164,690**  
**COMPACT MINIATURE FAN**  
Rolf Müller, Ackerstrasse 13, St. Georgen, Schwarzw., and Günter Wrobel, Fürstenerberg 8, Villingen, both of Fed. Rep. of Germany

Filed Apr. 26, 1977, Ser. No. 790,928  
Claims priority, application Switzerland, Apr. 27, 1976, 005294/76

Int. Cl.<sup>2</sup> H02K 29/00  
U.S. Cl. 318—254

37 Claims



1. A compact miniature fan, comprising an air-guidance housing of rectangular parallelepiped configuration having two opposite end walls and side walls, one of the end walls being provided with an air inflow-opening, one of the side walls being provided with an air outflow opening, the other of the end walls being comprised of a base plate; an electric motor of flat overall shape mounted within the housing, the motor comprising a rotor and a stator together defining a planar air gap, the stator including a magnetically conductive flux-return structure mounted on the base plate and a stator winding comprised of a plurality of flat coils mounted on the flux-return structure, the rotation axis of the rotor extending in the direction from one to the other of the end walls of the housing; and a radial fan wheel within the housing mounted on and coaxial with the rotor of the motor.

**4,164,691**  
**MULTIPHASE BRUSHLESS DC MOTOR USING TWO HALL-EFFECT GENERATORS**

Kinzo Wada, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

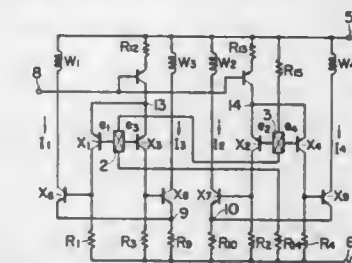
Filed Mar. 1, 1978, Ser. No. 882,084  
Claims priority, application Japan, Mar. 3, 1977, 52-23109; May 19, 1977, 52-57917

Int. Cl.<sup>2</sup> H02K 29/00  
U.S. Cl. 318—254

2 Claims

1. A multiphase brushless DC motor including a permanent magnet rotor; first, second, third and fourth mutually electrically displaced stator windings; first and second Hall-effect generators associated with the stator windings having a pair of first and second Hall voltage electrodes and a pair of current supply electrodes through which current is supplied to effect generation of a Hall voltage at said Hall voltage electrodes in response to variations in magnetic field intensity due to the

revolution of said rotor, said first and second Hall-effect generators being connected, in use, in a series circuit through said current supply electrodes between first and second terminals of voltage source; first, second, third and fourth switching transistors having their base electrodes respectively connected to the Hall-voltage electrodes of said Hall-effect generators to be responsive to the potential difference between the respective base and emitter electrodes; first, second, third and fourth power transistors of opposite conductivity type to that of said switching transistors for successively energizing said first, second, third and fourth windings respectively in response to the conduction of said first, second, third and fourth switching transistors; and means for supplying a current to said first, second, third and fourth switching transistors in response to a



control signal so as to control the currents supplied to said windings, said first and third switching transistors having their emitters connected together to define a first differential amplifier and said second and fourth transistors having their emitters connected together to define a second differential amplifier; said control current supplying means comprising a first and a second current control transistor of the same conductivity type as that of said switching transistors, said first current control transistor being connected in a series circuit with said first and third switching transistors, and said second current control transistor being connected in a series circuit with said second and fourth switching transistors, the base electrodes of said current control transistors being connected to be responsive to said control signal to respectively regulate the currents supplied to said differential amplifiers.

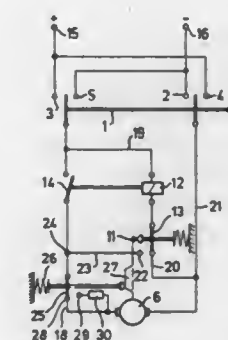
**4,164,692**  
**OPERATING MECHANISM FOR A PIVOTABLE SLIDING PANEL**

Erik Mitterer, Stockdorf, and Alfons Lutz, Emmering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,527  
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704899

Int. Cl.<sup>2</sup> H02P 5/06  
U.S. Cl. 318—266

12 Claims



1. Control apparatus for an electromechanically operated closure panel such as used for sunroofs of automobiles and the like; said control apparatus comprising: an electric motor,

1. A circuit for supplying a charging current to a battery in a current utilizing device, the circuit comprising:

- a solar cell for converting light energy into a charging current,
- means including a diode for coupling said charging current to said battery,
- a Zener diode for limiting the level of charging current coupled to said battery,
- a resistor in series with said Zener diode for limiting charging current drawn by said Zener diode during periods of low illumination, and



a switch in parallel with said resistor, whereby said switch is operative to selectively shunt said resistor during periods of high illumination.

4,164,699

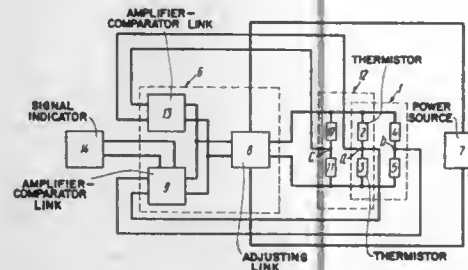
**THERMOCHEMICAL COMBUSTIBLE GAS DETECTOR**  
Alexandr T. Timoshenko, Makeevka Donetskoi oblasti; Vladimir I. Nazarenko, Donetsk; Felix E. Krigman, and Mikhail G. Gusev, both of Makeevka Donetskoi oblasti, all of U.S.S.R., assignors to Nauchno-Issledovatel'skiy Institut Po Bezopasnosti Rabot V Gornoj Promyshlennosti, Makeevka Donetskoi oblasti, U.S.S.R.

Filed Feb. 9, 1976, Ser. No. 656,826

Int. Cl.<sup>2</sup> G01N 25/32

U.S. Cl. 323—75 A

3 Claims



1. A thermochemical combustible gas detector comprising:
  - a resistor bridge having a first arm including a thermistor sensitive to combustible gases,
  - a second arm adjacent to said first arm, said second arm including a thermistor for compensating the effect of unmeasured parameters and components of the atmosphere upon said sensitive resistor,
  - a third arm and a fourth arm, each including a conventional resistor;
  - an additional resistor bridge having one arm including a conventional auxiliary resistor,
  - a second arm including another conventional auxiliary resistor,
  - the third and fourth arms of said additional bridge forming said sensitive and compensating thermistors of said first resistor bridge;
  - a compensating voltage stabilizer comprising:
    - an amplifier-comparator link with input connected to the measuring diagonal of said resistor bridge,
    - an auxiliary amplifier-comparator link with input connected to the measuring diagonal of said additional resistor bridge,
  - an adjusting link with input connected in parallel to each output of the amplifier-comparator links, an output of said adjusting link being connected to the supply diagonal of both of said bridges;
  - a signal indicator of impermissible concentrations of combustible gases in the atmosphere and having an input connected to the output of any of said amplifier-comparator links of said stabilizer;
  - a power source connected to said stabilizer and signal indicator.

4,164,700

**HIGH PRESSURE APPARATUS FOR MICROWAVE RESONANCE SPECTROSCOPY**  
Charles W. Christoe, Flanders, and Frank J. Owens, Little Falls, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1978, Ser. No. 903,630

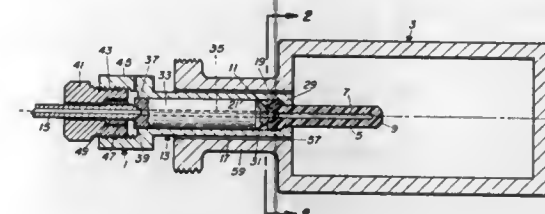
Int. Cl.<sup>2</sup> G01R 33/08

U.S. Cl. 324—0.5 AH

6 Claims

1. Apparatus for microwave resonance spectroscopy, comprising:
  - a microwave cavity resonator, adapted to be excited to

establish a microwave electric field in a given direction therein, and having an access opening in one side thereof; an elongated dielectric tube, closed at one end and open at the other end, and having an outer diameter at least equal to five times its inner diameter, partially disposed in said cavity resonator with its closed end portion extending through said access opening transverse to said field direction;



tion; said tube being capable of withstanding a high internal fluid pressure of at least 2000 atmospheres and having a dielectric constant not greater than 4;  
a sample material, having pressure-dependent spectral lines, filling said tube; and  
high pressure means for connecting said open end of said tube to a source of said high fluid pressure, for pressurizing said sample material.

4,164,701

**PORTABLE DEVICE FOR TESTING ELECTRICAL WIRING CIRCUITS AND POWER TOOLS AND EQUIPMENT**

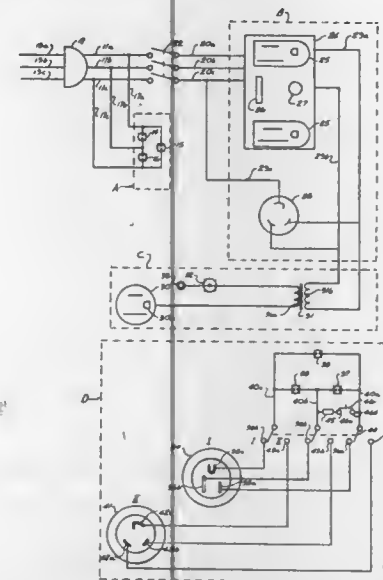
Charles P. Gullledge, Rte. 9, Box 254, Carrollton, Ga. 30117; Lloyd M. Austin, Rte. 6, Box 374, Carrollton, Ga. 30117, and James B. Stephens, 429 N. Main St., Greenville, S.C. 29602

Filed Sep. 6, 1977, Ser. No. 830,418

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324—51

6 Claims



1. A portable electrical testing device for testing electrical wiring circuits in power tools and equipment which operate from an outside electrical source supplied by a line, neutral, and ground conductor wire, said device comprising:
  - a three-conductor wire power cord having a three-prong plug for connecting said device to a three-socket receptacle of said outside electrical source;
  - a first test station having indicator means electrically connected to the conductors of said power cord for indicating the wiring polarity condition of said outside receptacle;
  - a second testing station electrically connected to said first station having a three-socket receptacle for receiving a

three-prong plug of a cable of the power tool and equipment being tested;  
said second station including a ground fault device having a test circuit connected to said receptacle which includes a fault indicator for indicating the existence of a defective circuit in said power tool and equipment;  
a third test station having a three-socket receptacle for receiving said plug of said power tool being tested, said third test station including circuit means connected to said third station receptacle for indicating the continuity of a ground circuit in said power tool;  
a fourth test station for testing the proper wiring of a three-wire extension power cable having a three-prong plug carried on one end and a three-socket receptacle carried on the other end thereof with line, neutral, and ground conductors connected therebetween;  
said fourth station including a testing circuit having a plug which includes a line wire prong, neutral wire prong, and a ground wire prong for receiving said power cable receptacle while said power cable plug is inserted into the receptacle of said second test station, said extension power cable being connected between said fourth and second stations during testing assuring proper line polarity and facilitating detecting of the reversal of conductors of said extension power cable, said test circuit including indicator means electrically connected to said prongs of said plug of said fourth station for indicating the wiring polarity condition of said power extension cable and  
said fourth test station including a second testing circuit for detecting reversal of the neutral and ground conductors in said power cable which includes an impedance load and switch means connected across said neutral and ground prongs, closure of said switch means producing a fault sufficient to cause said fault indicator to trip when said neutral and ground conductors are reversed.

4,164,702

**APPARATUS TO TEST PROPER WIRING OF ELECTRICAL WALL RECEPTACLES ESPECIALLY IF THE GROUND AND NEUTRAL WIRES ARE REVERSED WITH RESPECT TO THE HOT WIRE**

Eugene F. Pereda, 11621 Hughes NE., Albuquerque, N. Mex. 87112

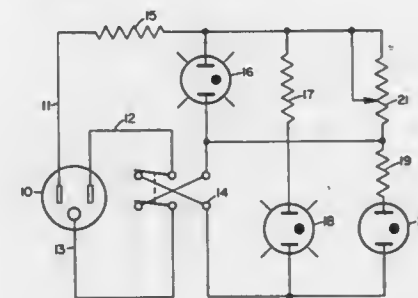
Continuation of Ser. No. 744,085, Nov. 22, 1976, abandoned.

This application Oct. 31, 1977, Ser. No. 841,071

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324—51

1 Claim



1. Apparatus for testing the correct wiring of a wall socket having hot, neutral and ground terminals, including testing for ground and neutral reversal, comprising: a male plug having three prongs for contact with the hot, neutral and ground terminals of said wall socket, respectively, a double-pole, double-throw reversing switch having first and second poles and first and second pairs of stationary contacts, said first pair of stationary contacts comprising first and second contacts constituting one side of said switch and engageable by said first and second poles respectively in a first switch position, said second pair of stationary contacts comprising third and fourth contacts constituting the opposite side of said switch and engageable by said first and second poles respectively in a sec-

ond, opposite position of said switch, said first contact being diagonally opposite the fourth contact and said second contact being diagonally opposite the third contact, a first conductor connecting together said first and fourth diagonally opposite contacts, a second conductor connecting together said second and third diagonally opposite contacts, the neutral prong of said plug being connected to the first pole of said switch and the ground prong being connected to the second pole of said switch; first neon lamp means; means connecting said first neon lamp means across the third and fourth stationary contacts; second neon lamp means; means connecting said second neon lamp means between the fourth stationary contact and a junction point; third neon lamp means; means connecting said third neon lamp means between the third stationary contact and the junction point; variable resistance means connected between said third stationary contact and said junction point; and means connecting said hot prong of the plug to said junction point; whereby when said plug is inserted into a three terminal wall socket having a higher resistance wire for the ground than for the neutral if correctly wired, in order to test for reversal of said neutral and ground wire connections, the double-pole, double-throw switch is placed in its first position connecting the first lamp across the hot and ground prongs and the second lamp across the hot and neutral prongs, the variable resistance is adjusted to bring the second lamp to a condition of energization just prior to extinction and the switch is then placed in its opposite position, thus reversing the neutral and ground prong connections, whereupon if the neutral and ground wire socket connections are not reversed the second lamp will be extinguished.

4,164,703

**METHODS OF AND APPARATUS FOR DETECTING OPENINGS IN CABLE JACKETS**

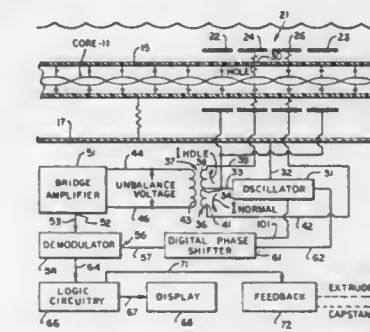
Luther M. Boggs, Dunwoody, and James A. Hudson, Jr., Atlanta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,252

Int. Cl.<sup>2</sup> G01R 31/14, 31/02

U.S. Cl. 324—54

12 Claims



1. A method of detecting openings in a cable jacket, which includes the steps of:
  - sensing conductance across a plastic jacket of each of a first pair of adjacent sections of a cable which includes a core having a plurality of individually insulated electrical conductors, said core being enclosed in the plastic jacket;
  - sensing conductance across the plastic jacket of each of a second pair of adjacent sections of the cable in which one of the adjacent sections of the second pair is common to the first pair;
  - detecting any conductance unbalance that exists between the first and second pairs of cable sections; and
  - measuring the magnitude of the conductance unbalance to determine the integrity of the cable jacket.



4,164,704

# PLURAL PROBE CIRCUIT CARD FIXTURE USING A VACUUM COLLAPSED MEMBRANE TO HOLD THE CARD AGAINST THE PROBES

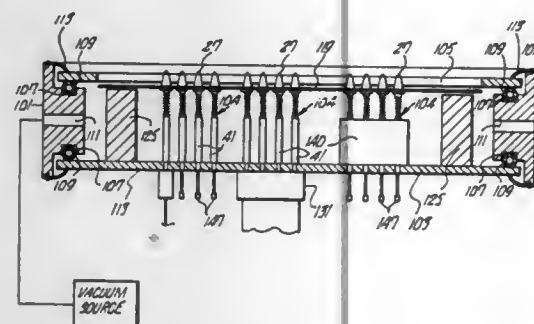
Makoto Kato, Santa Ana; Larry N. Velie, El Toro, and John L. Baverstock, Long Beach, all of Calif., assignors to Metropolitan Circuits, Inc., Costa Mesa, Calif.

Filed Nov. 1, 1976, Ser. No. 737,343

Int. Cl.<sup>2</sup> G01R 15/12, 31/02

U.S. Cl. 324—73 PC

4 Claims



1. In an electrical circuit card testing fixture including a chamber including a lower surface bearing a plurality of test probes, and an upper surface for bearing a circuit card under test, the structure comprising:

an opening in said upper surface located over the area of said test probes;

a thin, flexible plastic sheet located in said opening and having a plurality of apertures, each one of at least a majority of said test probes being inserted into and penetrating through one of said apertures whereby a positioning of said test probes is stabilized, and

a plastic sealing membrane for covering a circuit card under test placed over said opening and responsive to evacuation of said chamber to collapse around said circuit card to hold said circuit card in test position.

4,164,705

# BRUSHLESS EXCITER FAULT INDICATOR SYSTEM

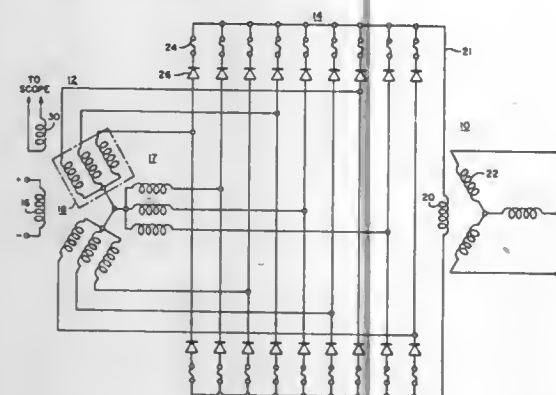
Eugene C. Whitney, Pittsburgh, and Dale I. Gorden, North Versailles, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1976, Ser. No. 680,658

Int. Cl.<sup>2</sup> G01R 31/22, 31/02; H02K 11/00

U.S. Cl. 324—158 MG

5 Claims



1. In a synchronous dynamoelectric machine with brushless excitation, the combination comprising: a main machine rotor member having field coils connected together to form a main rotor field winding, an alternating current exciter having a stator field member and a plurality of salient stator poles thereon, stator field coils disposed on said salient poles and

connected together to form a stator exciter field winding, an exciter armature member rotatable with said main rotor field winding and having an armature winding thereon, said exciter armature winding being coupled magnetically with said exciter stator field winding for developing an alternating current excitation signal within said armature winding, rectifier means interconnecting said exciter armature winding and said main rotor field winding to provide direct current excitation to said main rotor field winding, said rectifier means being rotatable with said armature, a sensing coil disposed around a selected one of said salient stator poles of said exciter for developing an alternating electrical signal in response to changes in the magnetic flux wave linking said rotating exciter armature member and the field coil of said selected salient pole, including changes due to faults in said armature winding and in said rectifier means, and means connected to said sensing coil to indicate variations in said alternating electrical signal.

4,164,706

# ROTATIONAL POSITION DETECTOR UTILIZING AN FET BLOCKING OSCILLATOR

Sigeyuki Akita, Aichi, and Junji Kitagawa, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

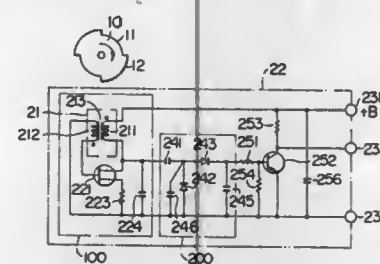
Filed Aug. 26, 1977, Ser. No. 828,106

Claims priority, application Japan, Oct. 18, 1976, 51-125285; Jan. 10, 1977, 52-1868[U]; Jan. 13, 1977, 52-2954[U]

Int. Cl.<sup>2</sup> G01B 7/00

U.S. Cl. 324—208

5 Claims





tuned high frequency signal, said coupling means including a plurality of inductance coil means and mechanical switching means for coupling a selected one of said inductive coil means into said coupling means,

local oscillating means for providing an oscillation frequency signal the frequency of which is different by a given frequency difference from said selectively withdrawn tuned high frequency signal,

mixing means responsive to said tuned high frequency signal from said tuned coupling means and said local oscillation frequency from said local oscillating means for providing an intermediate frequency signal,

said tuned coupling means comprising a  $\pi$  type single tuned coupling circuit means for preventing image interference and for reducing the effect of the stray capacitance of said amplifying transistor means, said coupling circuit means comprising said mechanically selected inductance coil means connected in series between the output of said high frequency amplifying transistor means and the input of said mixing means, first capacitor means connected to the input terminal of said inductance coil means in a shunt manner and a second capacitor means connected to the output terminal of said inductance coil means in a shunt manner, said stray capacitance of said high frequency amplifying transistor means being shunted by said first capacitor means.

4,164,711

# TUNING SYSTEM INCLUDING A MEMORY FOR STORING TUNING INFORMATION WITH USER CONTROLS ARRANGED TO FACILITATE ITS PROGRAMMING

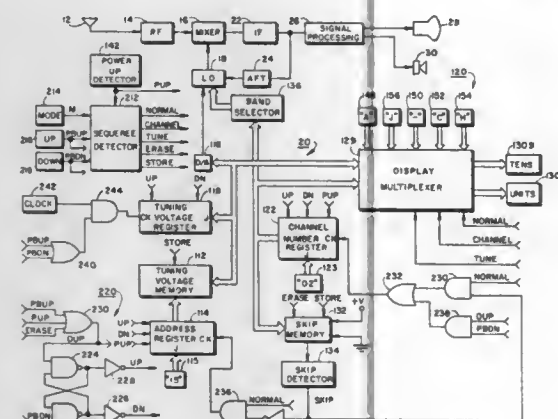
Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 31, 1977, Ser. No. 847,412

Int. Cl.<sup>2</sup> H04B 1/26

U.S. Cl. 325—464

8 Claims



1. In a tuning system for a receiver including a voltage variable tuning element for tuning the receiver to various tuning positions a user may select, apparatus comprising:

tuning voltage means for generating binary signals representing tuning voltages corresponding to said tuning positions for controlling said voltage variable tuning element;

first memory means including a plurality of memory locations for storing the binary signals representing said tuning voltages;

converter means for converting the binary signals representing said tuning voltages to said tuning voltages, said tuning voltages being coupled to said tuning element;

skip means for generating binary signals of first and second types representing preferred and nonpreferred conditions, respectively, of said tuning positions;

second memory means including a plurality of memory

locations for storing the binary signals generated by said skip means;

tuning position selection means including at least a first direction switch means for outputting the binary signals stored in the memory locations of said first and second memory locations, the binary signals stored in ones of said memory locations of said first memory means normally being outputted only when said first type of binary signal is stored in ones of said memory locations of said second memory means corresponding to the same tuning positions, the binary signals outputted from memory locations of said first memory means being coupled to said converter means;

mode switch means; and

sequence detection means coupled to said first direction switch and said mode switch for generating a tuning voltage programming signal to enable the operation of said tuning voltage means, a first tuning position programming signal to cause said skip means to generate said first type of binary signals, and a second tuning position programming signal to cause said skip means to generate said second type of binary signals in response to first, second and third operational sequences, respectively, of said mode switch and said first direction switch.

4,164,712

# CONTINUOUS COUNTING SYSTEM

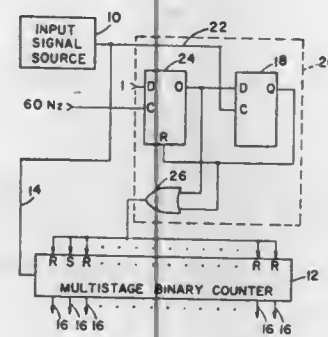
Johany Collins, Oak Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 14, 1977, Ser. No. 850,867

Int. Cl.<sup>2</sup> H03K 21/36

U.S. Cl. 328—48

7 Claims



1. In a continuous counting system of the type having a binary counter developing a count representing the number of cycles of an input signal occurring during each of a plurality of predetermined timing intervals, the improvement comprising:

a source of a periodically recurring timing reference signal;

control means responsive to said reference signal and to said input signal for developing during each period of said reference signal an output pulse defined by a predetermined relationship between said input and reference signals; and

means coupling said output pulses for presetting said binary counter to a count dependent upon said predetermined relationship.

4,164,713

# DUAL MODE TELEPHONE SUBSCRIBER LOOP CURRENT DETECTOR

Stephen J. Brolin, Livingston; Richard J. Lisco, Whippany, and Mark T. Manfred, Rockaway, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

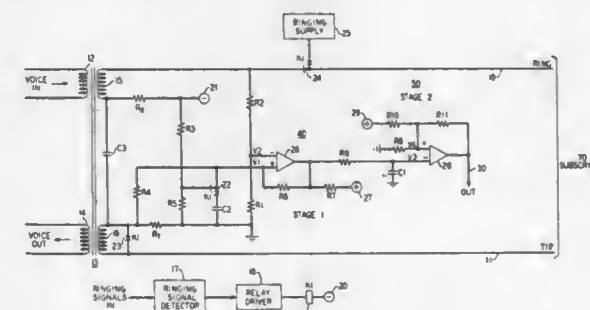
Division of Ser. No. 763,288, Jan. 28, 1977, Pat. No. 4,087,646.

This application Oct. 25, 1977, Ser. No. 845,069

Int. Cl.<sup>2</sup> H03K 5/153, 5/01

U.S. Cl. 328—111

2 Claims



1. A threshold detector comprising

a first voltage comparator including first and second input terminals and a first output terminal, said comparator being responsive to voltages at said first input terminal exceeding the voltage at said second input terminal for producing a first output voltage at said first output terminal,

said first voltage comparator including a first feedback circuit connected from said first output terminal to said second input terminal,

a capacitive timing circuit connected to said first output terminal of said first voltage comparator, and

a second voltage comparator including a third and a fourth input terminal and a second output terminal, said comparator being responsive to the output of said timing circuit connected to said third input terminal exceeding a second threshold voltage at said fourth input terminal for producing a second output voltage at said second output terminal,

said second voltage comparator including a second feedback circuit connected from said second output terminal to said fourth input terminal.

4,164,714

# POLYPHASE PDM AMPLIFIER

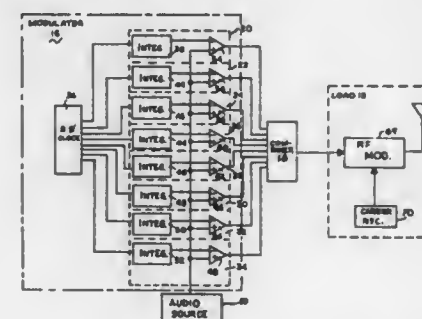
Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 26, 1977, Ser. No. 836,832

Int. Cl.<sup>2</sup> H03F 3/38

U.S. Cl. 330—10

25 Claims



1. An amplifier for providing high fidelity amplification of an amplitude and frequency varying input signal, comprising:

means for providing said amplitude and frequency varying input signal;

means responsive to said signal for converting said signal into a plurality of pulse trains of like polarity and frequency, but differing in phase from one another by a fixed amount, with the pulses of each said pulse train having a characteristic which varies in a like manner with variations in said input signal; and,

means for combining said plurality of pulse trains into a composite signal of increased magnitude and of substantially the same waveform as said amplitude and frequency varying input signal whereby high fidelity amplification of said amplitude and frequency varying input signal is provided.

4,164,715

# FEEDBACK ELIMINATION SYSTEM EMPLOYING NOTCH FILTER

George R. Thurmond, 4709 Shoalwood, Austin, Tex. 78756

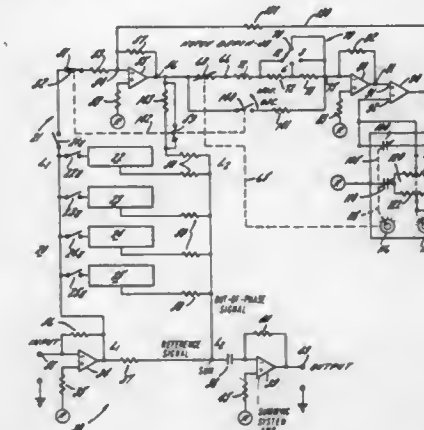
Division of Ser. No. 756,135, Jan. 3, 1977, Pat. No. 4,088,834.

This application Mar. 2, 1978, Ser. No. 882,638

Int. Cl.<sup>2</sup> H03F 1/34

U.S. Cl. 330—85

4 Claims



1. In a notch filter, the combination comprising a filter amplifier having a bridged T feedback path for providing a band-pass characteristic thereto, said feedback path having adjustment means for establishing the bandwidth and independent adjustment means for setting the center frequency of the pass band, a summing amplifier having an input signal coupled thereto and a negative feedback path for establishing the gain thereof, means connecting the output of the summing amplifier to the input of the filter amplifier, and means feeding a portion of the output signal of the filter amplifier to the input of the summing amplifier as positive feedback to increase the gain of the summing amplifier over a portion only of the bandwidth of the filter amplifier, said portion being on the order of 1/20 octave, thereby to establish a peak at the output of the summing amplifier sharper than the pass characteristic of the filter amplifier.

4,164,716

# CLOCK LEVEL SHIFTING CIRCUIT

George I. Dague, North Andover, Mass., and Lawrence E. Murphy, Matawan, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1978, Ser. No. 908,284

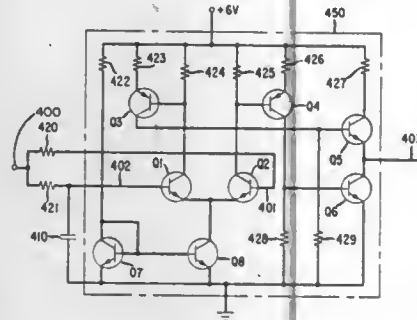
Int. Cl.<sup>2</sup> H03F 3/45

U.S. Cl. 330—252

7 Claims

1. In combination with a multistage differential amplifier, having a differential pair of NPN transistors (Q<sub>1</sub>, Q<sub>2</sub>) in the first stage and a pair of PNP current sources (Q<sub>3</sub>, Q<sub>4</sub>, Q<sub>5</sub>, Q<sub>6</sub>) in the second stage, for amplifying the voltage difference between two input terminals without feedback to either of the input terminals, a circuit characterized essentially by:

- a first impedance network connecting an input signal to one of the input terminals;  
a second impedance network, structurally identical to said first impedance network, connecting said input signal to

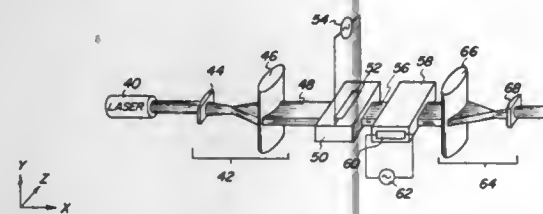


- the other input terminal in a manner identical to the first impedance network; and  
a capacitor connecting one of the input terminals to signal ground, said impedance networks and said capacitor comprising the sole connections to the input terminals.

**4,164,717**  
**ACOUSTOOPTIC MODULATION AND DEFLECTION**  
Richard N. Blazey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.  
Filed Nov. 7, 1977, Ser. No. 849,375  
Int. Cl.<sup>2</sup> H01S 3/10

U.S. Cl. 332-7.51

6 Claims



1. Apparatus for intensity-modulating and angularly-deflecting a beam of monochromatic radiation, said apparatus comprising:

- (a) optical means for spreading the beam to form a sheet beam having, in a plane normal to the beam, predetermined orthogonal major and minor axes;  
(b) first means for propagating an acoustic wave of varying amplitude through said sheet beam in a direction substantially parallel to said minor axis to intensity-modulate said sheet beam; and  
(c) second means for propagating a variable frequency acoustic wave through said sheet beam in a direction substantially parallel to said major axis to angularly deflect said sheet beam, said first and second propagating means being spaced apart without any beam-shaping optical elements positioned therebetween.

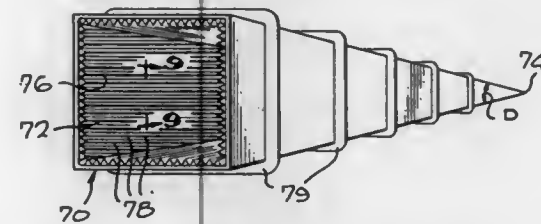
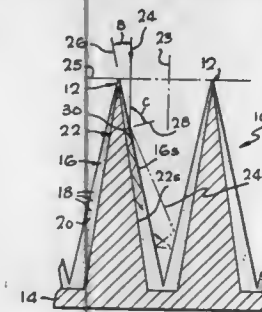
**4,164,718**  
**ELECTROMAGNETIC POWER ABSORBER**  
Richard S. Iwasaki, Los Angeles, Calif., assignor to California Institute of Technology, Pasadena, Calif.  
Continuation of Ser. No. 703,905, Jul. 9, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 834,257  
Int. Cl.<sup>2</sup> H01P 1/22

U.S. Cl. 333-81 R

8 Claims

1. A power absorber for absorbing electromagnetic radiation comprising:  
a plate-like structure having a face portion forming a plurality of ridges upstanding from the plane of the structure,

said face portion being formed of a suspension of particles of electromagnetic wave-absorbing material in a dielectric suspending material, each ridge forming steep surfaces oriented at an angle of less than 45° to an imaginary line that is normal to the plane of the plate-like structure;

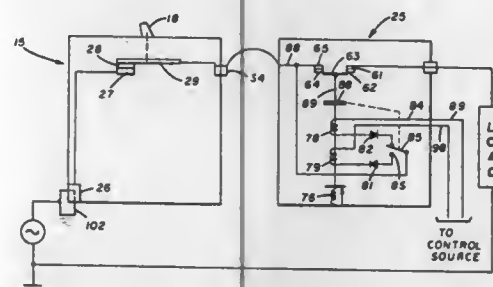


said structure including a backing plate of highly heat conductive material with a plurality of protrusions extending into said ridges, each protrusion forming a reflecting surface lying behind a surface of a corresponding ridge, with the reflecting surface of the protrusion oriented at a smaller angle than the corresponding ridge surface, to said normal line.

**4,164,719**  
**LOAD MANAGEMENT APPARATUS FOR RESIDENTIAL LOAD CENTERS**  
John Young, Lawrenceville; Jack Clavell, Lilburn, both of Ga., and George Gaskill, Hatboro, Pa., assignors to Gould Inc., Rolling Meadows, Ill.  
Filed Apr. 3, 1978, Ser. No. 893,208  
Int. Cl.<sup>2</sup> H01H 75/00, 77/00

U.S. Cl. 335-14

10 Claims



1. Load management apparatus including a manually operable switching section and a remotely operable management section; said switching section including interrupter contact means, a manually operable spring powered first mechanism connected to said interrupter contact means for opening and closing thereof, fault responsive trip means operatively connected to said first mechanism to operate the latter for opening of said interrupter contact means upon the occurrence of predetermined fault currents at said switching section; said management section including mechanical main contact means con-

nected in series circuit with said interrupter contact means and an electrical load energized through said apparatus, biasing means normally maintaining said main contact means closed, remotely controlled electrically powered operator means operatively connected to said main contact means for selectively operating the latter to open said main contact means; said switching section and said management section constituting first and second modules respectively; said first and second modules including respective first and second housings of substantially equal widths stacked side-by-side.

**4,164,720**  
**MERCURY-WETTED REED CONTACT RELAY**  
Romain F. Bollen, Hasselt, Belgium, assignor to C. P. Clare International N.V., Tongeren, Belgium  
Filed Apr. 28, 1978, Ser. No. 901,157  
Claims priority, application Belgium, Apr. 29, 1977, 177141  
Int. Cl.<sup>2</sup> H01H 29/00

U.S. Cl. 335-47

3 Claims



1. A mercury-wetted reed contact relay comprising at least two reed means having coating ends contained in a glass capsule; two tube means made of magnetic material, said tube means extending lengthwise within the capsule and around the reed means said tube means being aligned in spaced apart relation such that an axial gap is formed therebetween being situated at the lengthwise level of the coating ends of said reed means, the inner wall of said tubes and the surface of the reed means being wetted with mercury, and the tips of said reed means being provided with spots made of a material which can not be wetted with mercury.

**4,164,721**  
**MAGNETIC ACTUATOR FOR A SHUTTER MECHANISM**  
Tokuji Ishida, Daito, and Tetsuhiko Inagaki, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan  
Filed Dec. 9, 1976, Ser. No. 748,966

Claims priority, application Japan, Dec. 11, 1975, 50/148047; Feb. 2, 1976, 51/10750

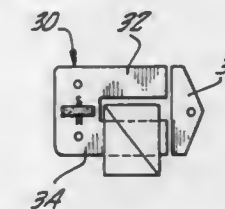
Int. Cl.<sup>2</sup> H01F 7/08, 7/04

U.S. Cl. 335-234

21 Claims

1. A magnetic actuator device for providing a controlled movement for use in cameras and the like comprising:  
a flat platelike magnetically conductive yoke member having an integral first magnetic pole portion terminating in a first contact face and an integral second magnetic pole portion terminating in a second contact face, said first and second magnetic pole portions being formed in one body;  
a relatively movable armature member having abutting surfaces capable of operatively contacting the first and second contact faces of the yoke, the armature member

when contacting the yoke member forming a magnetic circuit path for magnetic flux;  
a permanent magnet connected to one of the yoke and armature members and of such strength to generate sufficient magnetic flux to attract the yoke and armature members together;  
a permanent magnet housing portion for retaining the permanent magnet in the magnetic circuit, the permanent magnet housing portion consisting of a retaining portion for retaining said permanent magnet in such a manner as not to protrude beyond the contacting surfaces of either one of armature member and the yoke member, when the

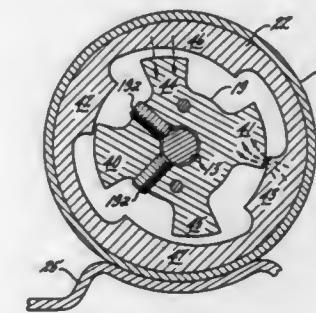


armature member and yoke member abut each other and a member portion having a high magnetic resistance and positioned adjacent the retaining portion, the member portion having a relatively small cross sectional area to suppress the amount of a magnetic flux running there through whereby a majority of the magnetic flux created by the permanent magnet will run through the magnetic circuit path; and  
an electrically conductive coil for generating in the yoke member a magnetic flux of a polarity opposite that of the permanent magnet to thereby release the armature from the attracting force of the permanent magnet.

**4,164,722**  
**ELECTROMAGNETIC ACTUATOR WITH TORQUE-COMPENSATING POLES**  
Daniel C. Garvey, Fort Collins, Colo., assignor to Woodward Governor Company, Rockford, Ill.  
Filed Jan. 9, 1978, Ser. No. 867,760  
Int. Cl.<sup>2</sup> H01F 7/08

U.S. Cl. 335-272

13 Claims



1. An electromagnetic actuator comprising  
a stator and a rotor both made of magnetically permeable material and each having a plurality of projecting poles spaced apart from each other, the rotor poles and stator poles cooperating with each other so that each pair of opposed pole faces of a rotor pole and a stator pole form a narrow working air gap for passing magnetic flux between the opposed pole faces,  
an electrically energizable coil for producing magnetic flux that passes through the poles of said rotor and stator and across the working air gaps between the opposed pole faces,  
at least one pair of the opposed rotor and stator poles forming an air gap that remains substantially constant to



produce an increasing magnetic torque on said armature as said pole faces move out of register with each other and a decreasing magnetic torque as said pole faces move toward register with each other, and at least one pair of the opposed rotor and stator poles forming an air gap that varies to produce a decreasing magnetic torque on said rotor as the poles forming the constant air gap move out of register with each other and increasing magnetic torque as the poles forming the constant air gap move toward register with each other, whereby the change in the magnetic torque produced by said poles forming the variable air gap at least partially compensates for the change in the magnetic torque produced by the poles forming the constant air gap.

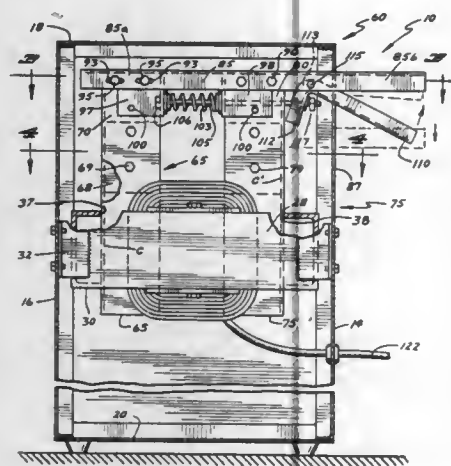
4,164,723

**SHUNT RELEASE AND LOCKING STRUCTURE**  
Leonard S. Smith, Eden Valley, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.

Filed Jun. 14, 1978, Ser. No. 915,174  
Int. Cl.<sup>2</sup> H01F 21/06

U.S. Cl. 336-133

8 Claims



1. A shunt release and locking structure for a moveable shunt welding machine, having in combination a core, a frame member supporting said core, a pair of shunt holding members containing shunts disposed between opposite sides of said core and the adjacent portions of said frame member, a handle member holding said shunt holding members in spaced relation, means normally causing said shunt holding members to bear against said adjacent portions of said frame member in locking engagement, a lever pivotally carried by said handle having said means connected thereto, whereby a hand closing action about said handle and said lever causes said means to release said shunt holding members from said locking engagement.

4,164,724

**BIMETALLIC THERMO-RELEASE, ESPECIALLY FOR PROTECTIVE MOTOR SWITCH**  
Franz Bogdansk, Springe, Fed. Rep. of Germany, assignor to Sprecher & Schuh AG, Switzerland

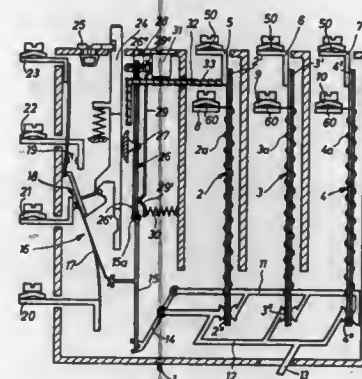
Filed May 2, 1978, Ser. No. 902,543  
Int. Cl.<sup>2</sup> H01H 61/00

U.S. Cl. 337-86

4 Claims

1. A bimetallic thermo-release, especially for a protective motor switch, comprising: at least one bimetallic release element;

connection means for the connection of electrical lines connected with said bimetallic release element; a bimetallic compensation element for temperature compensation; release means which can be actuated as a function of bending



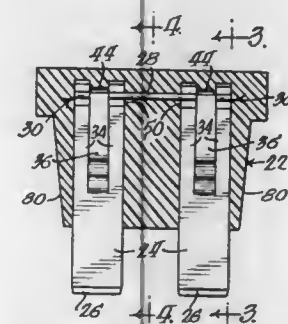
4,164,725

**THREE-PIECE SOLDERLESS PLUG-IN ELECTRICALLY CONDUCTING COMPONENT**  
Gerald L. Wiebe, 18 W. 077 Williamsburg La., Villa Park, Ill.

60181  
Filed Aug. 1, 1977, Ser. No. 820,555  
Int. Cl.<sup>2</sup> H01H 85/02

U.S. Cl. 337-198

33 Claims



1. An encapsulated, three-piece solderless plug-in fuse comprising: a pair of spaced-apart, generally parallel blades, each blade having at one end a terminal portion for being connected in an electrical circuit and at the other end a fusible link support spring clip; a fusible link disposed substantially perpendicular to each blade and clamped at one end by the spring clip of one of said pair of blades and at the other end by the spring clip of the other of said pair of blades; and a solid unitary body of electrically insulating material encapsulating said fusible link and the fusible link support spring clip of each of said blades, the external surfaces of said link and said blade spring clip portions being in intimate contact with said material.

4,164,726

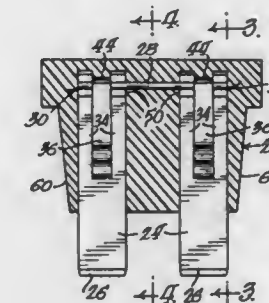
**ENCAPSULATED PLUG-IN ELECTRICALLY CONDUCTING COMPONENT**

Gerald L. Wiebe, 18 W. 077 Williamsburg Lane, Villa Park, Ill. 60181

Continuation-in-part of Ser. No. 820,627, Ang. 1, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 922,151  
Int. Cl.<sup>2</sup> H01H 85/60

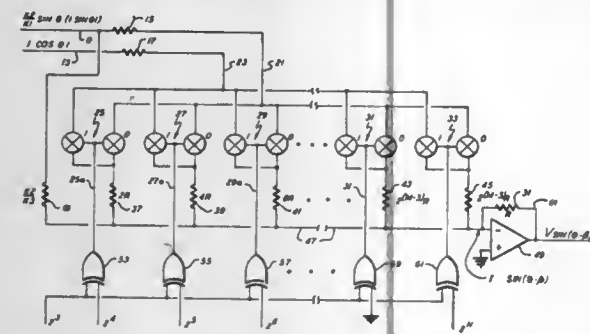
U.S. Cl. 337-215

25 Claims U.S. Cl. 340-146.3 Q



said counter and the actual angle to approach zero an improved sine-cosine circuit comprising:

- (a) a plurality of double pole single throw switches, each having two inputs and an output, the respective two inputs of each of said switches, being coupled to the sine and cosine outputs of the selection circuit and the outputs of said switches being coupled to a binary weighted resistor



ladder network, the sine input also being coupled through an additional resistor in common with said ladder network;

- (b) a summing amplifier having the output of said ladder network as an input; and  
(c) means for controlling said switches in dependence on the output of said counter.

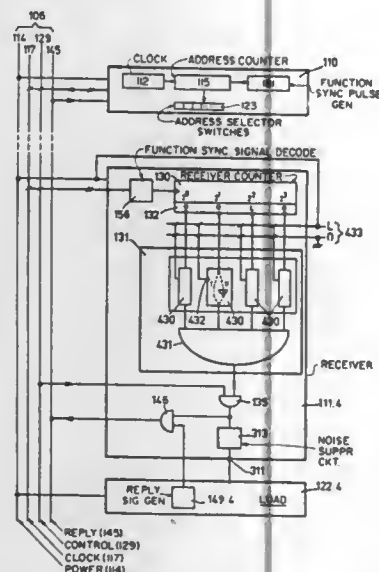
**4,164,730**  
**EXTERNALLY CONTROLLABLE BINARY INTERROGATION AND DECODING CIRCUIT, PARTICULARLY FOR A REMOTE CONTROL LOAD SELECTION SYSTEM**

Albert Weckenmann, Ahrensburg, and Georg Haubner, Berg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany.  
Filed Dec. 20, 1977, Ser. No. 862,440

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658753

Int. Cl.<sup>2</sup> H04Q 11/04  
U.S. Cl. 340—168 R

23 Claims



1. Remote control system for selection of at least one switchable load (122) from a central station (110) connected together by a ring bus system (106), wherein the bus system (106) includes a power bus, (114), a clock bus (117) and a control bus (129); wherein the central station includes a clock source (112),

load address means (123) to select connection of a selected load (122) to the power bus (114) and counter means (115) providing control signals corresponding to selected count states of the counter, in accordance with the addressing provided by the load addressing means, and synchronized with clock pulses from the clock source; and wherein at least one of the loads includes

a load control receiver (111) and a decoding stage (130, 131, 135, 431') forming part of the load control receiver (111) and being connected to both said clock bus (117) and said control bus (129) of the ring bus system (106) to decode address command signals appearing on the control bus (129) in synchronism with clock pulses appearing on the clock bus (117),

and wherein, in accordance with the invention the decoding stage includes a binary counter (130),

polarized power supply means (433) having two polarity terminals (433.I, L; 433.II, O),

a plurality of control gates (430) having transfer switch characteristics, each having one input connected to a selected binary output of the binary counter (130) and another input connected to a selected polarity terminal (L, O) of said polarized power supply means (433), said control gates providing an output (I, II) depending on the selected polarity of the power source connected to the other input thereof, as a function of the output from the counter,

and an AND-function gate (431, 431') having its input connected to and controlled by the output of the control gates (131; 430) and receiving signals from said control gates characteristic of the output from the counter in either direct, or inverted form as determined by the selected connection of the control gates to said source of polarized power supply (433).

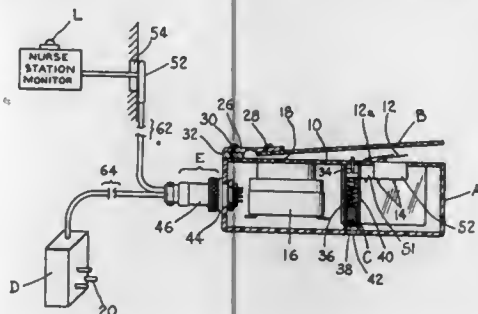
**4,164,731**  
**ELECTRICAL COMMUNICATION SIGNALLING DEVICE**

Harold R. King, Rt. 7, Box 223, Easley, S.C. 29640  
Filed Sep. 15, 1977, Ser. No. 833,431

Int. Cl.<sup>2</sup> G08B 25/00

U.S. Cl. 340—286 R

10 Claims



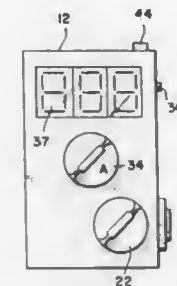
1. An electrical signalling device for use in an electrical communication system of the type wherein an attendant at a nurse station is called from a remote bed location by manual closure of a switch by a bed patient at the bed location which activates a call signal at said nurse station, wherein the improvement comprises:

a switch box having a face plate;  
switch means carried by said switch box adjacent said face plate for activating said call signal;  
a manually operable actuator plate member carried by said switch box in a generally superposed position relative to said face plate for activating said switch means;  
adjustable biasing means carried adjacent said actuator plate for adjusting the amount of force necessary for applying said actuator member to actuate said switch means; and

said actuator plate being carried on said switch box by means of a resilient hinge about which plate pivots, said resilient hinge biasing said actuator plate slightly out of contact with said switch means, said resiliently hinged plate and adjustable biasing means cooperating to provide highly sensitive switching actuatable by the most severely handicapped bed patient.

**4,164,732**  
**PACING DEVICE FOR RUNNERS AND THE LIKE**  
Enrico E. Fischler, 20 Bond La., Hicksville, N.Y. 11801  
Filed Jan. 31, 1978, Ser. No. 873,878  
Int. Cl.<sup>2</sup> G08B 3/10  
U.S. Cl. 340—323 R

5 Claims



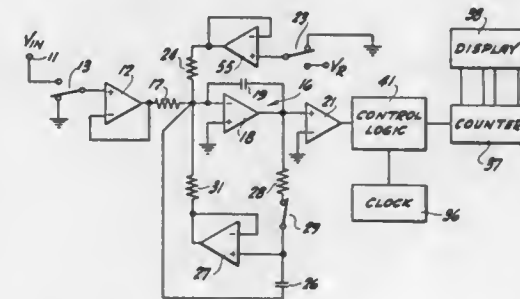
1. A pacing device comprising an Audio Frequency generator; a circuit for varying the pitch of the Audio Frequency signal produced, a gate connected to said generator; a variable pulse generator also connected to said gate for determining the periodicity of the tone bursts emitted thereby; a frequency counter display device connected to said pulse generator; an audio amplifier for amplifying said tone bursts from said gate; volume control means operatively associated with said amplifier and means for converting the audio signal to sound waves.

**4,164,733**  
**QUANTIZED FEEDBACK ANALOG TO DIGITAL CONVERTER WITH OFFSET VOLTAGE COMPENSATION**

George F. Landsburg, and Lorimer K. Hill, both of Cupertino, Calif., assignors to Siliconix Inc., Santa Clara, Calif.  
Filed Apr. 29, 1977, Ser. No. 792,351

Int. Cl.<sup>2</sup> H03K 13/02  
U.S. Cl. 340—347 NT

4 Claims



1. An analog-to-digital converter comprising: an integrator, a storage capacitor, a voltage source, means active during a first initializing period for connecting the capacitor to the output of the integrator and applying a current to the integrator from the source at a predetermined duty cycle to cause the integrator to operate about a predetermined level and establish a voltage corresponding to the predetermined level on the storage capacitor, a comparator having one input connected to the output of the integrator and a second input connected to a reference level intermediate the source voltage and the voltage

established on the capacitor, means for applying current from the voltage source and the storage capacitor to the integrator in phase with the comparator output to cause the integrator to operate about the reference level during a second initializing period, means for applying an analog input signal to the integrator during a measurement period, means responsive to the comparator for applying a balancing current to the integrator from the voltage source and the storage capacitor at either a first duty cycle greater than the predetermined duty cycle or a second duty cycle less than the predetermined duty cycle during successive intervals of the measurement period, means active during a period following the measurement period for supplying current to the integrator from the source and capacitor to return the integrator output to the reference level of the comparator, means for providing clock pulses, and means responsive to the comparator for counting the clock pulses during the measurement period and the period following the measurement period to provide a digital output signal.

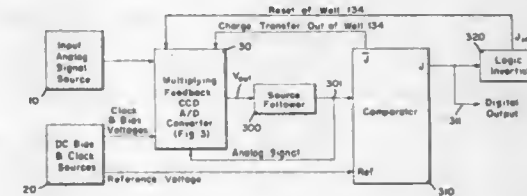
**4,164,734**  
**CHARGE TRANSFER MULTIPLYING FEEDBACK A/D CONVERTER**

William E. Jensen, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 26, 1978, Ser. No. 918,993  
Int. Cl.<sup>2</sup> H03K 13/02

U.S. Cl. 340—347 AD

11 Claims



1. An analog to digital converter comprising, in combination:

primary charge storage means having a charge storage capacity substantially corresponding to one-half of the full scale value of said converter;

means for periodically creating a charge indicative of the instantaneous value of an analog input signal in an initial charge storage area and including additional means for applying said charge to said primary charge storage means;

secondary charge storage means coupled to said primary charge storage means for temporarily storing excess charges which overflow said primary charge storage means and storing charges which are transferred from said primary charge storage means;

sensing means for sensing the amount of charge stored in said secondary charge storage means, and including further means for periodically creating an amount of charge which is proportional to twice said sensed charge, said further means including said additional means for applying the charge which is proportional to twice the sensed charge to said primary charge storage means;

barrier level changing means for draining the charge stored in said secondary charge storage means;

comparator means coupled to said sensing means for periodically determining whether or not the charge applied to said primary charge storage means exceeds its charge storage capacity and for providing a binary output signal indicative thereof; and

means responsive to said binary output signal for draining the charge in said primary charge storage means when overflow charges are sensed and for transferring the charge stored in said primary charge storage means to said secondary charge storage means when a overflow charge is not sensed;

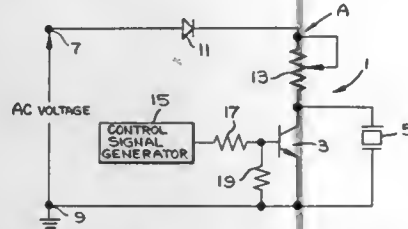


whereby said binary output signals are indicative of the value of the applied analog input signal.

**4,164,735**  
**PIEZOELECTRIC AUDIBLE INDICATOR CIRCUIT**  
Robert J. Salem, Danbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 17, 1977, Ser. No. 843,137  
Int. Cl.<sup>2</sup> G08B 3/00  
U.S. Cl. 340—384 E

5 Claims



1. A piezoelectric audible indicator circuit, comprising:
  - (a) a transistor device exhibiting a given collector to emitter breakdown voltage,  $V_{ceo}$ , and a given collector to emitter sustaining voltage,  $V_{sus}$ ,
  - (b) a two electrode piezoelectric crystal exhibiting a given internal capacitance coupled between the collector and emitter electrodes of said transistor,
  - (c) a collector resistance coupled to said collector electrode,
  - (d) a supply voltage having a magnitude exceeding  $V_{ceo}$  and supply means for coupling said supply voltage across the serial connection of said collector resistance and said collector and emitter electrodes, and
  - (e) control means coupled to the base electrode of said transistor for controlling the on-off operation of the circuit by applying during the "off" time a control signal that biases the transistor into its normal conductive state and prevents the circuit from oscillating, and by applying during the "on" time a control signal that biases the transistor so as to oppose normal conduction whereby circuit oscillations result from the internal capacitance of said piezoelectric crystal being sequentially charged through said collector resistance to  $V_{ceo}$  and discharged through the transistor conducting in its breakdown mode to  $V_{sus}$ , at which point the transistor once again ceases conduction, the process being cyclically repeated so as to cause said piezoelectric crystal to emit an audible signal.

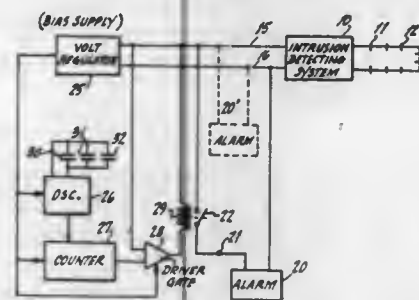
**4,164,736**  
**APPARATUS FOR DISABLING AN ALARM AFTER A PREDETERMINED OPERATING PERIOD**  
Roy Stockdale, Huntington, N.Y., assignor to NAPCO Security Systems, Inc., Copiague, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,254  
Int. Cl.<sup>2</sup> G08B 19/00

10 Claims

1. Apparatus for disabling an alarm after a predetermined operating period, comprising:
  - (a) an intrusion detection system operative to provide an output potential at a terminal upon detection of an intrusion,
  - (b) an oscillator responsive to said output potential for providing at an output, a series of pulses at a selectable frequency rate,
  - (c) a counter responsive to said output potential and operative to receive said pulses to provide an output signal for a predetermined number of pulses from said oscillator, said output signal manifesting said predetermined operating period,
  - (d) alarm indicating means having at least one input terminal for receiving a potential to cause said alarm to operate,
  - (e) switching means coupled to said alarm means and having

a first mode responsive to the presence of said output potential for operating said alarm and having a second



mode responsive to said output signal from said counter to disable said alarm after said predetermined number of pulses from said oscillator.

**4,164,737**  
**DIRECTIONAL TRAILER TURNING SIGNALING DEVICE**  
Robert H. Hunter, Mesquite, Tex., assignor to Trailer Eye, Inc., Dallas, Tex.

Filed Sep. 22, 1977, Ser. No. 835,658  
Int. Cl.<sup>2</sup> B60Q 1/00

U.S. Cl. 340—686

4 Claims

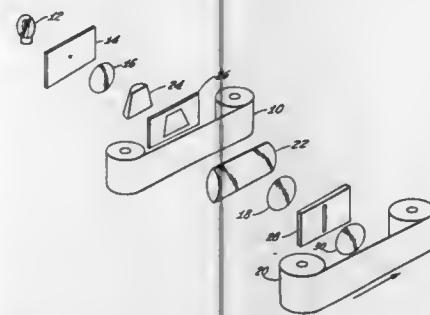
1. A directional turning signaling device mountable on a vehicle trailer hitch to determine a trailer's position behind the vehicle, said trailer being attached by a tongue to a ball of the trailer hitch which comprises:
  - (a) a frame assembly mounted on the hitch, said frame assembly comprising an L-shaped bar attached to the hitch and a top box hingedly attached to the bar to enable the box to tilt upward and away from the ball;
  - (b) a contact arm in contact with the tongue to pivot with the tongue about the ball and connected to a sensing means for determining the amount of pivoting by the contact arm, the sensing means being attached to the frame assembly; and
  - (c) an indicator gauge mounted in the vehicle and connected to the sensing means for providing visual indication of the trailer position behind the vehicle.

**4,164,738**  
**FOCUSED SYNTHETIC ARRAY**  
Peter Swerling, Pacific Palisades, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 23, 1966, Ser. No. 560,386  
Int. Cl.<sup>2</sup> G01S 9/42

U.S. Cl. 343—5 CM

12 Claims



11. A method of providing a moving target indication in a synthetic array radar system including the steps of forming a gain pattern from an antenna having two separate crossed beams, receiving information from each of the two crossed beams,

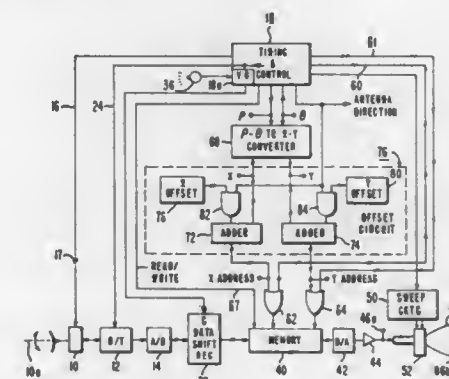
subtracting the information from one of the crossed beams from the information of the other of the crossed beams to produce a difference signal, converting the difference signal to a bipolar video signal, and processing the bipolar video signal to form a synthetic array.

**4,164,739**  
**REDUCTION OF TARGET SHIFT IN COORDINATE CONVERTER**  
Kazuo Katagi, Woodland Hills, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,833  
Int. Cl.<sup>2</sup> G01S 7/44, 9/60

U.S. Cl. 343—5 SC

5 Claims



1. In a system for producing from signals representing first addresses in a first coordinate system corresponding signals representing second addresses in a second coordinate system which has fewer addresses than has said first coordinate system comprising in combination:

means receptive of said signals representing successive ones of said first addresses in either a first sequence or a second different sequence for producing corresponding signals representing said second addresses in accordance with the relationship between said first coordinate system and said second coordinate system and for producing a signal representing a given second address for more than one first address;

means responsive to said signals representing said first addresses being received in said first sequence for producing a signal indicative thereof; and

means responsive to said sequence indicative signal for changing said corresponding signals representing said second addresses by a predetermined amount.

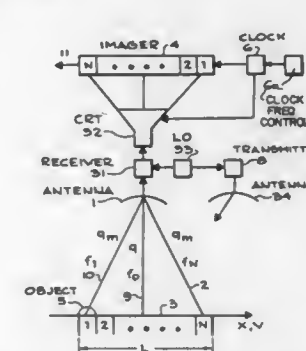
**4,164,740**  
**SYNTHETIC APERTURE USING IMAGE SCANNER**  
James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711  
Continuation of Ser. No. 663,847, Mar. 4, 1976, abandoned. This application Apr. 19, 1978, Ser. No. 897,907  
Int. Cl.<sup>2</sup> G01S 9/02

U.S. Cl. 343—5 CM

52 Claims

9. A method of generating a synthetic aperture comprising the steps of:
  - focusing an object scene through a focusing unit onto an image sensor having a plurality of photoelements each providing an electric charge signal in response to an input signal;
  - detecting in the image sensor, signals from objects in relative motion in the object scene of said focusing unit, said signals representing one of illuminations or radiations of said objects; and

shifting the image sensor at the rate of motion of objects in said object scene,



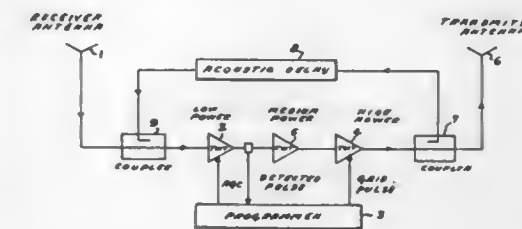
said shifting providing an output pulse for each object crossing the field of view of said focusing unit, said pulse representing the image of said object.

**4,164,741**  
**DECEPTION CIRCUITRY FOR AUTOMATIC RANGE GATE TRACKING IN FIRE CONTROL RADAR**  
Jerry D. Schmidt, Eagan, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 13, 1968, Ser. No. 761,891  
Int. Cl.<sup>2</sup> G01S 7/38

U.S. Cl. 343—18 E

4 Claims



1. The improvement in a traveling wave tube repeater chain of an ECM system for receiving a radar pulse of essentially predetermined time width from an opposing range gate tracking radar and providing a deceptive transmitted signal, the traveling wave tube repeater chain having a low power level traveling wave tube amplifier and a higher power level traveling wave tube amplifier, the said improvement comprising:
  - (a) feedback means cooperating with the higher power traveling wave tube amplifier and the low power traveling wave tube amplifier for feeding back a portion of the output signal of the higher power traveling wave tube amplifier to the low power traveling wave tube amplifier; and
  - (b) acoustic delay means cooperating with the said feed-back means for delaying the feed-back signal.

**4,164,742**  
**MULTIBEAM SLOT ARRAY**  
Jeffrey T. Nemt, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,614  
Int. Cl.<sup>2</sup> H01Q 13/10

1. A directive antenna arrangement comprising:
  - a slotted first rectangular waveguide forming a linear array to produce a first beam at a first angle in a first plane;
  - a second waveguide parallel to said first waveguide and having one common narrow wall with said first waveguide;
  - feed means for separately coupling between said first and

1. A stereoscopic color television transmission method comprising the steps of:

- photographing an object by M color television cameras, where M is an integer greater than two, provided with color signal outputs each divided into fields of horizontal line scans said cameras being horizontally arranged at equal intervals;
- generating a horizontal synchronization signal at the end of each horizontal scan, a vertical synchronization signal for each field, a stereoscopic synchronization signal for every  $M \times 2$  fields or M frames and a color subcarrier signal;
- switching the operation of said M color television cameras successively in response to the horizontal synchronization signal, vertical synchronization signal, stereoscopic synchronization signal and color subcarrier signal per period of said color subcarrier signal, while changing for each field the order in which the operation of said M color television cameras is switched over during every M periods of the color subcarrier signal; and
- sending forth output signals from said M color television cameras together with the horizontal synchronization signal, vertical synchronization signal, stereoscopic synchronization signal and color subcarrier signal.

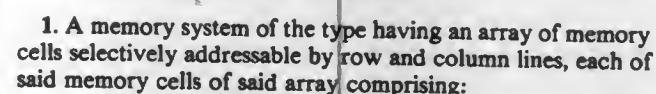


#### 4 Claims

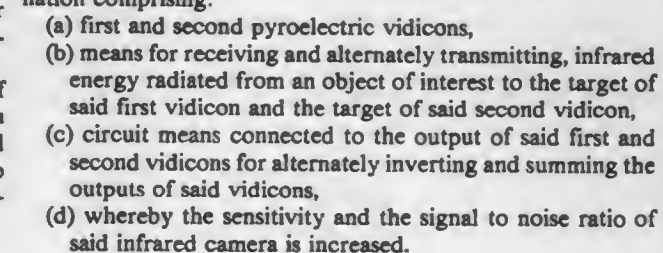


line pulse sampling means for generating pulses synchro-

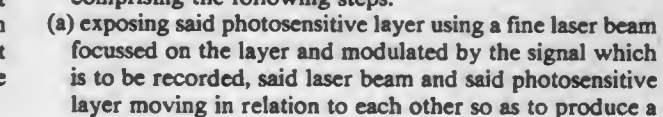
## 2 Claims



## 10 Claims



### 5 Claims





signal latent impression forming a spiral track onto the substrate;

- (b) developing said layer of photosensitive material, to lay bare small portions of said substrate along said spiral track; and
- (2) manufacturing a die which is a counterpart of the recording and presents a multiplicity of metal projections adhering to said bare portions of the substrate, the heights of said projections being equal to the depths of the cavities of said master impression, by a process comprising the following steps:
- (c) depositing a metal layer on said developed layer and on said bare portions of substrate, the thickness of said metal layer being substantially equal to the thickness of the initial photosensitive material; and
- (d) eliminating the non-exposed photosensitive material thereby carrying away the portions of the metal layer overlying the non-exposed photosensitive material by an agent which dissolves said non-exposed photosensitive material but not said metal, to form said metal projections.

4,164,755

## VIDEO DISC PICKUP APPARATUS

Yasushi Matsumoto, Narashino, Japan, assignor to RCA Corporation, New York, N.Y.

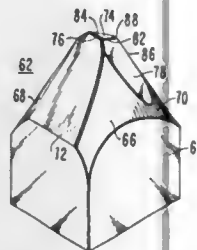
Filed Sep. 2, 1977, Ser. No. 830,029

Claims priority, application United Kingdom, Sep. 13, 1976, 37852/76

Int. Cl.<sup>2</sup> H04N 5/76

U.S. Cl. 358—128

12 Claims



1. A pickup stylus for playing back prerecorded signals from a disc record track of a given width when stylus/record relative motion is established; said pickup stylus comprising:
- a tapered stylus element having a plurality of conical portions in the region of its tip; said conical portions having a common axis;
- wherein two of said conical portions are separated by a substantially flat, non-record-engaging surface; wherein the angle subtended by said non-record-engaging surface with said axis is less than ninety degrees;
- wherein a substantially flat, record-engaging surface is disposed in the region of its tip substantially orthogonal to said non-record-engaging surface such that said surfaces intersect each other along a line substantially perpendicular to said axis and forming the base edge of said record-engaging surface; the dimension of said base edge being less than said given track width.

4,164,756

## DISC RECORD GROOVE SKIPPER

Minoru Toda; Susumu Osaka, both of Machida, and Yasushi Matsumoto, Narashino, all of Japan, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,973

Claims priority, application United Kingdom, Apr. 19, 1977, 16280/77

Int. Cl.<sup>2</sup> H04N 5/76; G11B 3/38, 17/00

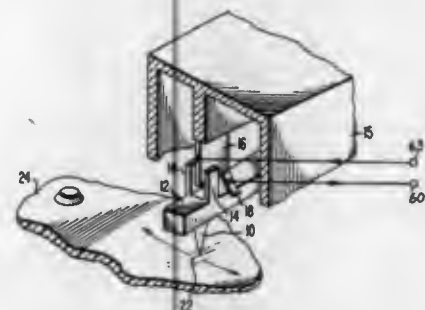
U.S. Cl. 358—128

11 Claims

1. In a system for playing back prerecorded signals from a

spiral track disposed on the surface of a disc record, apparatus comprising:

- (A) a signal pickup stylus;
- (B) a support arm;
- (C) a mounting structure secured to said support arm for positioning said stylus for engagement with said record track;
- (D) a driving element secured to said support arm;



- (E) means for sensing deviations of the relative positions of said mounting structure and said driving element from a predetermined relationship;
- (F) means responsive to the output of said sensing means for altering the position of said driving element in order to oppose said deviations; and
- (G) means for rendering said driving element additionally responsive to a command signal.

4,164,757

## SYSTEM FOR COMMUNICATING A PERIODIC SIGNAL BY MEANS OF COHERENT MODULATION

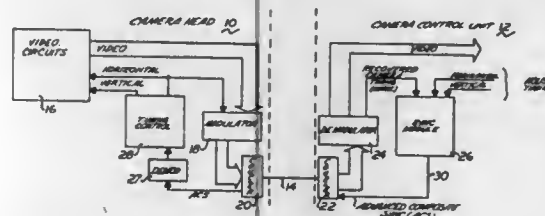
Charles F. Smiley, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 14, 1977, Ser. No. 850,930

Int. Cl.<sup>2</sup> H04N 5/04, 5/26

U.S. Cl. 358—149

12 Claims



1. Apparatus for generating a periodic signal and for communicating said signal from a first station to a second station, comprising means located at said first station for generating said periodic signal and a carrier signal such that said carrier signal has a frequency which is a fixed multiple of the frequency of said periodic signal, and that said carrier signal bears a substantially fixed phase relationship to said periodic signal, means for modulating said carrier signal in accordance with said periodic signal to provide a modulated carrier signal, means for communicating said modulated carrier signal from said first station to said second station, and means located at said second station for demodulating said modulated carrier signal so as to recover said periodic signal therefrom, whereby said recovered periodic signal has a reduced noise component due to the coherence of said carrier signal with said periodic signal.

8. In a television camera system wherein a camera head communicates video signals to a control station, apparatus for synchronizing the timing of said video signals with the timing of a video sync signal at said control station, comprising: phase detector means at said control station responsive to the timing of said video signals for comparing said timing of said video

signals to the timing of said video sync signal and for providing an output signal indicating the phase difference therebetween; signal generating means for generating a return video sync signal and for adjusting the phase of said signal in accordance with said phase detector output signal; modulating means at said control station for modulating said return video sync signal onto a carrier signal also generated by said signal generating means, so as to produce a modulated signal; means for communicating said modulated signal to said camera head from said control station; means at said camera head for demodulating said modulated signal so as to recover said return video sync signal therefrom; and, means at said camera head for synchronizing said video signals with said return video sync signal thus recovered; wherein said signal generating means generates said return video sync signal and said carrier signal so that said signals are in phase synchronism with one another, whereby said return video sync signal recovered by said demodulating means has a reduced noise component because of the coherence of said signals.

4,164,758

## NOISE SUPPRESSION APPARATUS

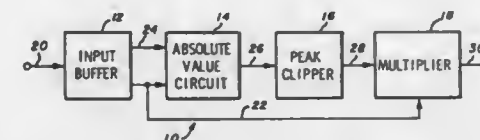
Leonard Kowal, 12647 Miller Ave., Saratoga, Calif. 95070

Filed Aug. 30, 1977, Ser. No. 829,186

Int. Cl.<sup>2</sup> H04N 5/21; H04B 1/10, 15/00

U.S. Cl. 358—167

9 Claims



1. A noise reducing apparatus for improving the signal-to-noise ratio of a noisy signal, comprising:

- first means for rectifying the noisy signal to develop a first signal having an instantaneous amplitude substantially equal to the absolute value of the instantaneous amplitude of said noisy signal;
- clipping means for clipping said first signal to generate a second signal having an instantaneous amplitude substantially equal to that of said first signal when said first signal is less than a predetermined value and having an instantaneous amplitude substantially equal to that of said predetermined level when the amplitude of said first signal is greater than said predetermined level; and
- multiplying means responsive to second signal and said noisy signal and operative to generate a noise reduced signal having an instantaneous amplitude proportional to the product of the amplitudes of said second signal and said noisy signal.

4,164,759

## VOLTAGE CONTROLLED OSCILLATOR

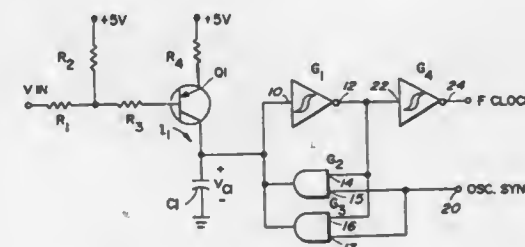
David R. Stubben, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Dec. 16, 1977, Ser. No. 861,189

Int. Cl.<sup>2</sup> H04N 3/22

U.S. Cl. 358—180

9 Claims



1. A voltage controlled oscillator for producing a periodic

output signal having a frequency determined by an analog input voltage comprising: a variable current source controlled by said analog input voltage and producing a current that is proportional to said analog voltage, capacitor means coupled to said current source for receiving said current and for storing a charge resulting in a stored voltage across said capacitor means, threshold means responsive to said stored voltage crossing high and low thresholds to produce said periodic output signal, and gate means connected to said capacitor means for sinking charge, said gate means varying said stored voltage by periodically draining charge from said capacitor means in response to said periodic output signal.

7. Apparatus for varying the size of objects displayed on a raster type video screen in proportion to an analog control voltage comprising: variable oscillator means for producing a size control signal having a frequency determined by said analog control voltage, said variable oscillator means including, a variable current source controlled by said analog control voltage, capacitor means for storing charge from said current source resulting in a stored voltage across said capacitor means, threshold means responsive to said stored voltage crossing high and low thresholds to produce said size control signal, and current sink means connected to said capacitor means for varying said stored voltage by periodically draining charge from said capacitor means in response to said size control signal, said apparatus further comprising picture memory means for storing addressable video resolution elements which form a video display, and counter means driven by said size control signal for generating addresses for said picture memory means whereby the frequency at which said video resolution elements are addressed determines the size of the objects displayed.

4,164,760

## STATIONARY-PICTURE TRANSMISSION SYSTEM UTILIZING A DIGITAL MEMORY TECHNIQUE

Masao Inaba; Kazumi Yuasa, and Michiaki Sonoda, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

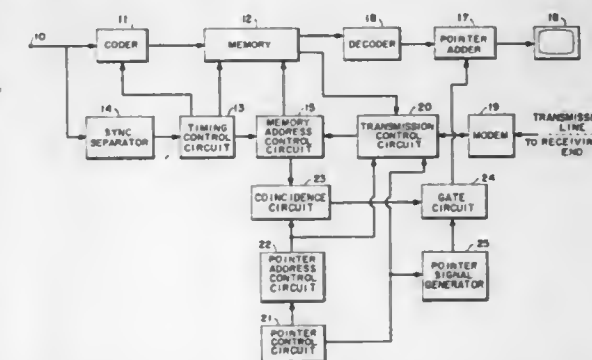
Filed Nov. 30, 1977, Ser. No. 856,036

Claims priority, application Japan, Nov. 30, 1976, 51-144205

Int. Cl.<sup>2</sup> H04N 5/22

U.S. Cl. 358—183

6 Claims



1. A stationary-picture transmission system for transmitting a stationary picture signal from a transmitter through a narrowband transmission line to a receiver positioned at a distance from said transmitter, said transmission system including, means for producing a digitized video signal representing said stationary picture;
- first memory means for storing at least one field of said digitized video signal,
- first read-out means for reading out the stored digitized video signal at a first scanning rate to produce a first read-out digitized video signal, said first read-out means including means for producing first read-out address data representing addresses of said first memory means from which said stored digitized video signal is read out,



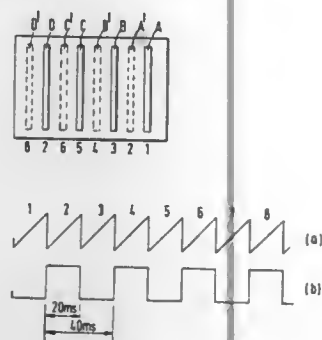
means for transmitting said first read-out digitized video signal through said narrowband transmission line;  
 means for receiving the digitized video signal transmitted over said transmission line;  
 second memory means for storing the received digitized video signal at said first scanning rate,  
 second read-out means for reading out the stored digitized video signal from said second memory means at a second scanning rate to produce a second read-out digitized video signal, said second read-out means including means for producing second read-out address data representing addresses of said second memory means from which said stored digitized video signal is read out,  
 means for decoding said second read-out digitized video signal to an analogue stationary-picture signal, and  
 means responsive to said analogue stationary-picture signal for displaying said stationary picture transmitted over said transmission line characterized in that said transmission system further includes,  
 pointer producing means for producing pointer data representing a pointer to be displayed on said stationary picture and pointer-position data representing the position of said pointer on said stationary picture, said pointer data and said pointer-position data being transmitted by said transmitting means through said narrowband transmission line after the completion of the transmission of said stationary picture,  
 means for detecting the presence of said pointer data and said pointer-position data on said transmission line,  
 means responsive to said pointer data for producing a first pointer video signal representing said pointer to be displayed on said stationary picture; and  
 means responsive to said pointer-position data and said second read-out address data for adding said first pointer video signal to said analogue stationary-picture signal.

**4,164,761**  
**TELECINE APPARATUS HAVING IMPROVED REPRODUCTION DURING PANNING AND TILTING SCENES**

Raymond Matchell, Braughing, Nr. Ware, England, assignor to The Rank Organisation Limited, London, England  
 Filed May 18, 1978, Ser. No. 907,193  
 Claims priority, application United Kingdom, May 18, 1977, 20903/77

Int. Cl.<sup>2</sup> H04N 5/88  
 U.S. Cl. 358—215

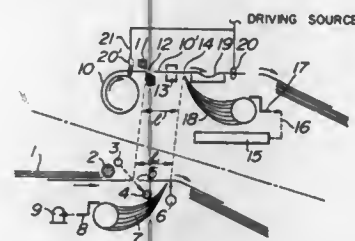
10 Claims



1. A method of improving the reproduction of a television picture derived from a cinema film by a telecine apparatus during a period of panning and/or tilting in the scene recorded on the cinema film, the method comprising shifting the scanning raster of the telecine apparatus in respect of at least selected television fields during said period in such manner that during a series of consecutive television fields an image of an object moving across the television picture is reproduced in the television picture in a greater number of positions along its direction of movement than the number of film frames from which the said series of consecutive television fields is derived.

**4,164,762**  
**FACSIMILE CONTROL APPARATUS**  
 Kenji Fukuoka, Fussa, and Takayuki Anami, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
 Filed Nov. 4, 1977, Ser. No. 849,115  
 Claims priority, application Japan, Nov. 12, 1976, 51-135265  
 Int. Cl.<sup>2</sup> H04L 13/04, 13/08  
 U.S. Cl. 358—304

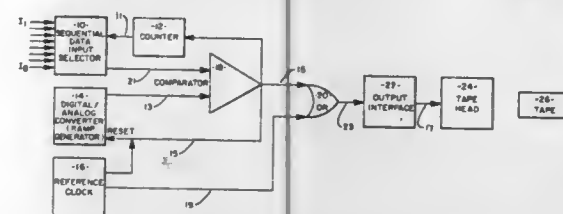
3 Claims



1. An improved control apparatus for use in a frequency band compression facsimile receiver adapted to generate a record signal and means for controlling and cutting of a web of material into a record sheet of a given length and means for advancement of said record sheet as cut; said receiver including: web roller means for advancing said web and cooperating with feed clutch means; said clutch means acting upon said roller means to control advancement of said web; means for cutting a sheet from said web record sheet feed signal means and record sheet roller means for advancing said cut record sheet in response to drive means; said improvement comprising: means for generating a halt signal for a given duration during actuation of said feed clutch, said halt signal acting to de-energizing advance of said web at the time of operation of a web sheet cutter; means for storing the record signal and record sheet feed signal received during generation of said halt signal; means associated with said receiver for interrupting reception of a record signal to said receiver and other signal means for transporting said record sheet.

**4,164,763**  
**TIME SEQUENCED MULTIPLEXING METHOD OF RECORDING AND TRANSLATING DATA**  
 Mario F. Briccetti, Syracuse, and Fredrick R. Eplett, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.  
 Filed Nov. 23, 1977, Ser. No. 854,179  
 Int. Cl.<sup>2</sup> G11B 5/00, 5/09  
 U.S. Cl. 360—32

18 Claims

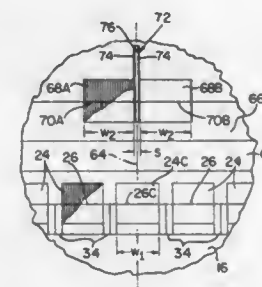


1. A method of recording and translating quantitative data for various events at predetermined periodic intervals over a time period which comprises the steps of:  
 (a) detecting the quantitative level of an event;  
 (b) creating an electric pulse for the event in response to a time dependent function of the quantitative level of the event and resetting the time dependent function;  
 (c) applying the pulse to a recording medium at a point on the medium a distance from a base reference point which distance is indicative of the quantitative level of the event;  
 (d) detecting the quantitative level of a different event;  
 (e) creating an electric pulse for the different event;  
 (f) applying the electric pulse to the recording medium at a point on the medium a distance from the point on the

medium created by the previous pulse which distance is indicative of the quantitative level of the different event;  
 (g) repeating steps (a) through (f) at predetermined periodic intervals; and  
 (h) translating the recording medium to indicate the quantitative level of the monitored events at the predetermined periodic intervals.

**4,164,764**  
**MAGNETIC HEAD POSITION REFERENCE SYSTEM**  
 Kyriacos Joannou, Wayland, Mass., assignor to Pericomp Corporation, Natick, Mass.  
 Filed Jul. 11, 1977, Ser. No. 814,294  
 Int. Cl.<sup>2</sup> G11B 5/43, 5/84  
 U.S. Cl. 360—77

32 Claims



1. In a system for recording a magnetic tracking medium adapted to serve as a position reference with respect to magnetic recording and readout apparatus; said system comprising:  
 a magnetic head including at least one read core having a read gap of width  $W_1$  positioned for presentation to said tracking medium, said read gap being disposed symmetrically athwart the center line of said head and at right angles thereto;  
 said head further comprising a pair of first and second substantially identical write cores corresponding to said read core, said write cores including respective first and second mutually aligned write gaps symmetrically positioned for presentation to said tracking medium on opposite sides of said head center line, said write gaps being parallel to said read gap and being spaced therefrom in a direction parallel to said head center line;  
 said write gaps each having a width  $W_2$  greater than  $W_1$  and a mutual spacing  $S$  such that  
 $S \leq 0.1W_1$ .

and winding means carried by said write core for providing a magnetic flux in said write gaps upon energization; whereby said read core is adapted to verify recording by said write cores on said tracking medium.

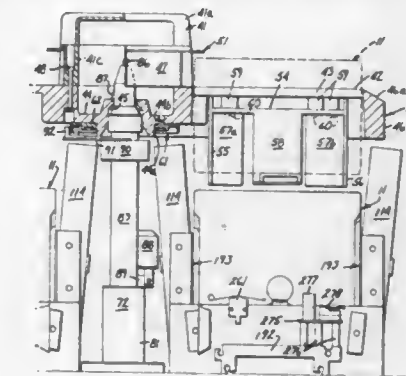
**4,164,765**  
**CAROUSEL TAPE SYSTEM**  
 Walter Gysling, Excelsior, Minn., assignor to National Computer Systems, Inc., Minneapolis, Minn.  
 Filed Dec. 7, 1977, Ser. No. 858,605  
 Int. Cl.<sup>2</sup> G11B 15/68

U.S. Cl. 360—92

61 Claims

1. Apparatus for storing and transferring electromagnetic information, comprising:  
 (a) carousel means for storing a plurality of electromagnetic tape cartridges in substantially vertical positions within an array of radial slots, the carousel means including a retaining gate for each slot that projects downwardly therefrom in cantilever fashion, each gate being laterally deflectable, each gate retaining the associated cartridge when in a non-deflected position and to release the associated cartridge when deflected;

(b) a control housing for rotatably carrying the carousel means, the control housing comprising  
 (i) at least one read/write station which has a read/write position;  
 (ii) indexing means for controllably rotating the carousel means to position a selected cartridge relative to the read/write station;  
 (iii) actuating means associated with the read/write station

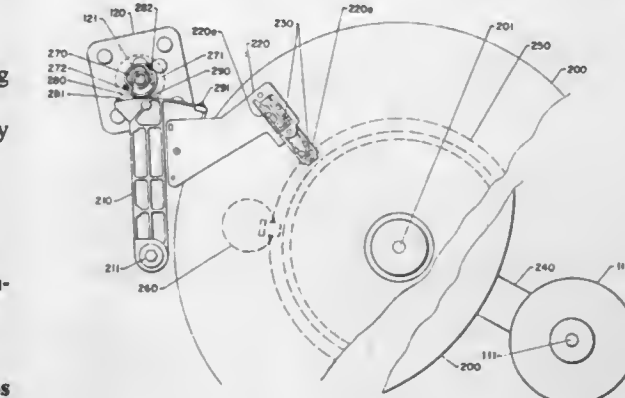


for laterally deflecting the retaining gate of a cartridge which has been selectively positioned with respect thereto to release the cartridge from its slot;  
 (iv) and transfer means associated with the read/write station and operable through cartridge load and unload cycles to retainably engage and move the released cartridge to the read/write position and permit the exchange of electromagnetic information, and to return the cartridge to its slot.

**4,164,766**  
**DISC MEMORY APPARATUS MAGNETIC HEAD CARRIAGE MANUAL CONTROL**  
 Robert Kaseta, Stow; Lenn Daugherty, Northboro; Sigmund Hinein; Michael Feldstein, both of Sudbury; Paul Otausky, Southboro; Harold Thackaberry, Franklin, and Robert E. Barrows, Hopdale, all of Mass., assignors to Data General Corporation, Westboro, Mass.  
 Filed Apr. 24, 1978, Ser. No. 899,043  
 Int. Cl.<sup>2</sup> G11B 5/48, 5/64, 17/00

U.S. Cl. 360—97

1 Claim



1. In memory apparatus supported by a base and intended for use in a digital computer system; said apparatus comprising at least one spinable and non-flexible magnetic disc for recording digital information, said magnetic disc having outer and inner concentric adjacent areas thereon defined as operating and landing zone areas respectively, a track in the landing zone area being defined as a zero reference track; rotary means for accurately positioning magnetic heads relative to tracks on at least one surface of said disc, said rotary means comprising:



pivotable means, pivotably mounted on said base with pivot axis of said pivotable means substantially parallel to spin axis of said spinable magnetic disc, for supporting said magnetic head;

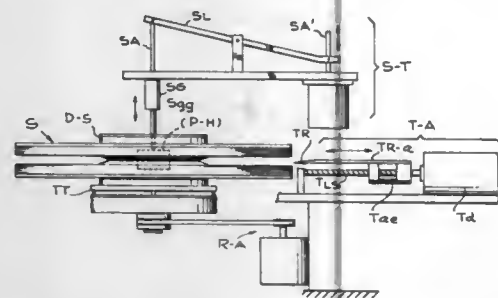
stepper motor means, including a rotational stepper motor mounted on said base with rotation axis of the shaft of said rotational stepper motor substantially parallel to said spin axis, for receiving electrical signals from said computer system and for step-rotating said shaft in response to said signals;

taut-biased and flexible inelastic band means substantially inelastic in the taut-biased directions for coupling rotational motion of said shaft to said pivotable means in a manner to cause motion of said pivotable means about said pivotable axis whereby said magnetic heads are positioned along said disc surface;

said pivotable means comprising a pivotable arm with said pivot axis near one end thereof and means for interacting with said coupling means at the other end thereof, a carriage arm cantilevered from said pivotable arm for holding said magnetic heads adjacent said disc, and two non-adjacent tabs extending from said carriage arm towards that portion of said base onto which said pivotable means is pivotably mounted; and

manually-adjustable, carriage arm control means rotatably mounted through said portion of said base and controllably engaging said tabs for permitting a human operator to (1) move said carriage arm to and lock said carriage arm in said landing zone position, (2) adjust said carriage arm to said zero reference track, and (3) establish travel-limits for said carriage arm during operation of said apparatus.

**4,164,767**  
**MASS STORAGE DEVICE**  
Ko K. Gyi, and Herbert U. Ragle, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.  
Continuation-in-part of Ser. No. 774,312, Mar. 4, 1977, Pat. No. 4,118,746. This application Dec. 23, 1977, Ser. No. 864,149  
Int. Cl.<sup>2</sup> G11B 5/012, 5/54, 17/00, 21/08  
U.S. Cl. 360—98

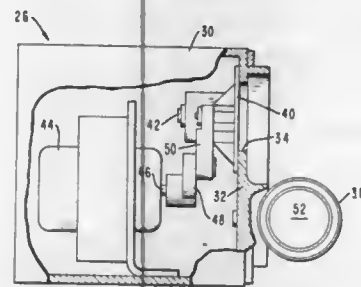


1. An improved mass store memory array comprising:  
a pair of flexible disk packs;  
a pair of like transducer assemblies, each assembly including transducer means and being arranged and adapted to position the transducer means both axially and laterally of either of said packs whereby the assemblies are "shared" by the two packs;  
each pack comprising a plurality of flexible recording disks and intermediate radially-vented separator means, these being assembled together and arranged to form a co-rotatable stack with a center-bore of prescribed length and diameter; and  
a pair of partition means, each operatively associated with a respective pack and being adapted for pneumatic disk separation and partition.

**4,164,768**  
**DUAL STAGE FLOW CONTROLLER FOR SELF-VENTILATING DISK PACK**  
Donovan M. Janssen, Boulder, Colo., and Anton J. Radman, Jr., Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Sep. 1, 1978, Ser. No. 939,155  
Int. Cl.<sup>2</sup> G11B 5/016

U.S. Cl. 360—99

11 Claims



1. In a disk pack drive having a plenum chamber communicating with a rotary self-ventilated flexible disk pack to supply air from the atmosphere for operation thereof, first means defining a primary flow passage extending between the atmosphere and said plenum chamber, a first valve member disposed in said primary flow passage and being cooperable with said first means to control the flow of air through said primary flow passage, said first valve member being selectively movable between open and closed positions, said first means and said first valve member being operative when said first valve member is in an open position to allow air to flow through said primary flow passage at a flow rate and pressure to maintain said disk pack in an above-bistable operating condition characterized by:

said first means and said first valve member being operative upon movement of said first valve member into said closed position to shut off the flow of air through said primary passage allowing said rotary disk pack to pump air from said plenum chamber and create a relatively high vacuum to cause an access opening to rapidly form between preselected disks;

second means defining a secondary flow passage parallel to said primary flow passage and communicating between said plenum chamber and the atmosphere, a second valve member disposed in said secondary flow passage and co-operable with said second means to control the flow of air through said secondary flow passage into said plenum chamber, said second valve member being movable between closed and open positions; said second valve member and said second means preventing the flow of air through said secondary flow passage when said second member is in said closed position, said second valve member and said second means restricting the flow of air through said secondary flow passage when said second valve member is in said open position so as to create in said plenum chamber a partial vacuum lower than said relatively high vacuum and within a range creating a bistable condition so as to maintain said access opening;

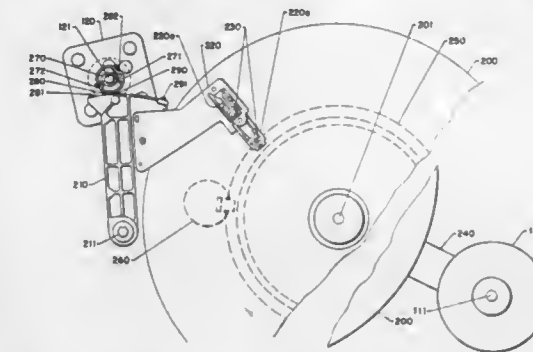
and third means responsive to the pressure within said plenum chamber for controlling movement of said second valve member, said third means being operative in response to closing of said first valve member to move said second valve member from said closed position to said open position in such a manner as to cause a time delay allowing said preselected disks to move to a fully open access opening while said relatively high vacuum is in said plenum chamber.

**4,164,769**  
**CROSS BAND COUPLING FOR STEPPER-MOTOR-DRIVEN, RIGID MAGNETIC DISC**  
Robert G. Kaseta, Stow; Leon Daugherty, Northboro; Sigmund Hinkle; Michael Feldstein, both of Sudbury; Paul Otavsky, Southboro; Harold Thackaberry, Franklin, and Robert E. Barrows, Hopedale, all of Mass., assignors to Data General Corporation, Westboro, Mass.  
Filed Apr. 24, 1978, Ser. No. 899,044  
Int. Cl.<sup>2</sup> G11B 5/48, 5/54, 17/00

U.S. Cl. 360—106

6 Claims U.S. Cl. 360—113

4 Claims



1. In memory apparatus including at least one spinable and non-flexible magnetic disc, said apparatus supported by a base and intended for use in a digital computer system, rotary means for accurately positioning magnetic heads relative to tracks on at least one surface of said disc, said rotary means comprising: pivotable means, pivotably mounted on said base with pivot axis of said pivotable means substantially parallel to spin axis of said spinable magnetic disc, for supporting said magnetic heads;

stepper motor means, including a rotational stepper motor mounted on said base with rotation axis of the shaft of said rotational stepper motor substantially parallel to said spin axis, for receiving electrical signals from said computer system and for step-rotating said shaft in response to said signals;

taut-biased and flexible band means substantially inelastic in the taut-biased directions for coupling rotational motion of said shaft to said pivotable means in a manner to cause hysteresis free motion of said pivotable means about said pivotable axis whereby said magnetic heads are positioned along said disc surface;

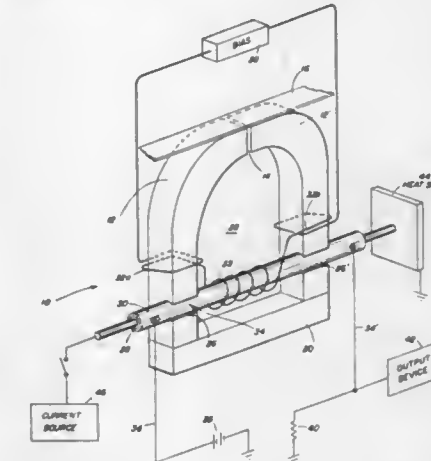
said pivotable means comprising a pivotable arm with said pivot axis near one end thereof and having means for interacting with said coupling means at the other end thereof, and a carriage arm cantilevered from said pivotable arm for holding said magnetic heads adjacent thereto; said stepper motor means further including pulley means, including a pulley fixedly mounted around said shaft and rotatable therewith, said pulley being formed from a circular disc-shaped member through which said shaft protrudes and from a circular wall having an aperture, said wall being connected at the periphery of said circular member and orthogonal to the plane of said member, for connecting to said band means;

said pulley means including a coil spring contained within said wall and encircling said shaft, one end of said spring being fixed to said pulley and the other end protruding unconstrained through said aperture; and

said band means comprising two separate crossed metal bands, both being connected near one of their respective ends at non-adjacent connecting points on said interacting means, one of said bands being connected near its other end to the outside surface of said wall and the other of said bands being connected near its other end to the protruding end of said spring, the bias on said spring being so oriented that it imposes a taut condition on said other of said bands

which in cooperation with said interacting means and said wall imposes a taut condition on said one of said bands.

**4,164,770**  
**THIN FILM MAGNETORESISTIVE HEAD**  
Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.  
Filed Sep. 21, 1977, Ser. No. 835,109  
Int. Cl.<sup>2</sup> G11B 5/30



1. In a magnetic playback head of the type having:  
(a) a pair of magnetic means for defining a transducer gap, and  
(b) means for producing a signal proportional to flux entering said gap,  
the improvement wherein said signal producing means comprises:

(a) an elongated element connected across said gap, said element being comprised of an electrically non-conductive support and a thin single domain magnetic film coextensively formed thereabout, the easy axis of said film being about the longitudinal axis of said element and in a plane that is perpendicular to said longitudinal axis,  
(b) means for applying a magnetic bias generally in the direction of the longitudinal axis of said element, so as to tilt the easy axis of said film in the direction of the hard axis of said film and  
(c) means for detecting resistance changes of said film due to changes in the degree of tilt, said tilt being a function of the flux entering said gap, whereby flux patterns in a magnetic medium with which said head cooperates are directly measurable by virtue of said changes in resistance.

**4,164,771**  
**WIRELESS EMERGENCY POWER INTERRUPTING SYSTEM FOR MULTIBRANCH CIRCUITS**  
Theodore M. Heinrich, Murrysville Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Dec. 9, 1977, Ser. No. 859,075  
Int. Cl.<sup>2</sup> H02H 3/16

U.S. Cl. 361—1

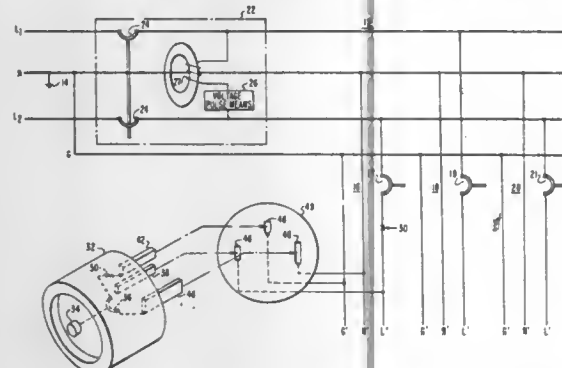
16 Claims

1. Apparatus for providing emergency power interruption on a multibranch electrical power distribution system having a main phase conductor and a main neutral conductor grounded upstream from the branch circuits, a plurality of branch circuit interrupters connected in the phase conductor of the branch circuits, and a plurality of receptacles for receiving power plugs of electrical equipment to be powered by the circuit, said apparatus comprising:

a main circuit interrupter connected in the electrical power distribution system downstream from the grounding point of the main neutral conductor, said main circuit inter-



rupter comprising means for deenergizing the electrical power distribution system if the neutral conductor of the system becomes grounded through a low-impedance path; and means located downstream from said main circuit interrupter for deliberately providing a low-impedance path between said neutral conductor and ground, said means



comprising a multi-pin plug adapted for insertion into any of the receptacles and comprising a switch disposed in said plug, said switch being connected to pins in contact with the neutral conductor and ground, whereby actuation of said switch is operable to establish a low impedance neutral-to-ground path and cause said main circuit interrupter to deenergize the system.

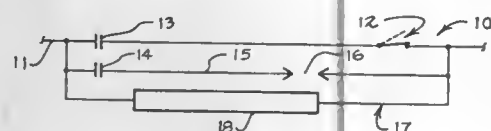
4,164,772

**AC FAULT CURRENT LIMITING CIRCUIT**  
Narain G. Hingorani, Los Altos Hills, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.  
Filed Apr. 17, 1978, Ser. No. 897,040

Int. Cl.<sup>2</sup> H02H 9/02

U.S. Cl. 361—58

7 Claims



1. An AC fault current limiting circuit for rapidly inserting sufficient impedance into a circuit in response to occurrence of a fault in the last named circuit for limiting instantaneous peak current to a maximum permissible value, said limiting circuit comprising first, second and third branches to be coupled in parallel, said first branch comprising a portion of the second named circuit, a first capacitor and a high speed circuit breaker switch disposed in series in said first branch, a second capacitor and means in series therewith in said second branch serving to inhibit current flow from a source of voltage thereacross below a predetermined threshold and to break down in response to application of a voltage thereto in excess of said predetermined threshold to transmit current via said second branch, and impedance means in said third branch serving to inhibit formation of a time constant in conjunction with said second capacitor as said first capacitor discharges into said second capacitor for quickly subjecting said circuit breaker switch to current zero.

4,164,773

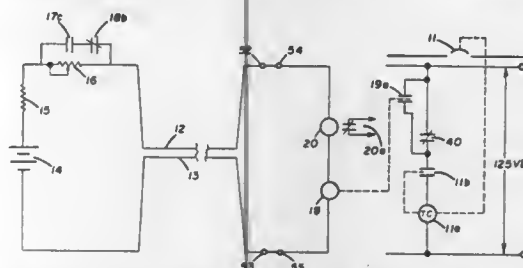
**TRANSFER TRIP CIRCUIT WITH PILOT WIRE MONITORING**  
James P. DeLacy, Havertown, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 3, 1978, Ser. No. 883,304

Int. Cl.<sup>2</sup> H02H 7/26

U.S. Cl. 361—69

8 Claims



1. A transfer trip system for tripping a remote circuit breaker in response to the tripping of a local circuit breaker due to a fault; said transfer tripping circuit comprising first contact means coupled to said local circuit breaker, and operable from an open position to a closed position in response to the opening of said local circuit breaker; a pair of parallel pilot wires having respective first ends disposed near said local circuit breaker, and respective second ends disposed near said remote circuit breaker; a series-connected pilot wire voltage source and resistor means connected in series with said first ends of said pair of pilot wires; said first contact means connected in parallel with said first resistor means; a first coil and second coil means connected in series with one another and with said second ends of said pair of pilot wires; said first coil being connected to alarm means, and operating said alarm means when the current in said first coil is lower than a first value; said second coil being coupled to said remote circuit breaker, and being operable to trip said remote circuit breaker when the current there-through exceeds a second current value; said pilot wires carrying a current which is above said first current value and below said second current value when said first contact means is open, and carrying a current which is above said second current value when said first contact means is closed.

4,164,774

**ELECTRODE FOR TELEPHONE PROTECTOR MODULES**  
William V. Carney, Valley Stream, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,774

Int. Cl.<sup>2</sup> H02H 3/22

U.S. Cl. 361—119

3 Claims



1. In a telephone line protective device including a pair of spaced electrodes and an insulating sleeve mounting one of said electrodes and forming an inner gap between said pair of electrodes, the improvement comprising: at least one of said opposed surfaces having a plurality of radially arranged grooves extending into the surface thereof to define a corresponding plurality of pie-shaped sectors therebetween; said electrode

having a principal longitudinal axis, there being an axially aligned through bore extending from one of said opposed surfaces, and communicating at one end thereof with said radially arranged grooves; whereby during arcing between said opposed surfaces, venting takes place in both axial and radial directions with respect to said principal axis.

4,164,775

**DEGAUSSING CIRCUIT IN A COLOR TELEVISION RECEIVER**

Frans Slegers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

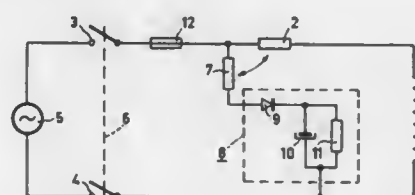
Filed Jun. 20, 1977, Ser. No. 808,043

Claims priority, application Netherlands, Jul. 14, 1976, 7607758; Dec. 24, 1976, 7614382

Int. Cl.<sup>2</sup> H01F 13/00

U.S. Cl. 361—150

9 Claims



1. A degaussing circuit for demagnetizing ferromagnetic components in a colour television receiver, said circuit comprising a rectifier circuit, the series arrangement of a degaussing coil and a first thermistor with a positive temperature coefficient, said series arrangement is connectable to at least one terminal of an alternating current voltage source, and furthermore comprising a resistance element means for contributing to heating of the first thermistor and for protecting said rectifier circuit comprising a second thermistor with a negative temperature coefficient which is connectable to a terminal of the alternating current voltage source and which is thermally coupled to the first thermistor with a positive temperature coefficient, the second thermistor being connected to said rectifier circuit in the receiver.

4,164,776

**ELECTRONIC COMBINATION CONTROLLED MEANS**  
Siegkazu Nagayama, Yokohama, Japan, assignor to Hisao Nakamura, Tokyo, Japan

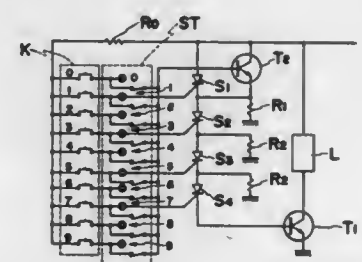
Filed Nov. 7, 1977, Ser. No. 849,517

Claims priority, application Japan, Nov. 10, 1976, 51-134148; Dec. 28, 1976, 51-157408

Int. Cl.<sup>2</sup> E05B 49/00; H01H 47/00

U.S. Cl. 361—172

3 Claims



1. An electronic combination controlled means comprising: a plurality of thyristors connected in series, with the cathode of each of said thyristors connected to the anode of the next succeeding thyristor; a plurality of self-holding resistors, each connected between a corresponding anode-cathode connection of said plurality of thyristors and ground and each having a resistance for conducting a current therethrough greater than the sustaining current of one of said thyristors; a current limiting resistor having a resistance for conducting

a current therethrough greater than the minimum gate turn-on current of one of said thyristors and less than twice said minimum gate turn-on current; a current actuated means connected to the cathode of the last of said plurality of thyristors for being actuated when said last thyristor is turned on; a thyristor turn-off means connected across the first of said thyristors for short circuiting the first of said thyristors when actuated thereby interrupting the current through and rendering nonconductive said first thyristor; and a plurality of key type switches including a first subset of key type switches equal in number to the number of said thyristors, each having a first terminal connected to said current limiting resistor and a second terminal connected to the gate of a corresponding one of said plurality of thyristors for turning on said corresponding thyristor when actuated and a second subset of key type switches connected to said thyristor turn-off means for actuating said thyristor turn-off means, whereby said current actuated means is actuated only when said first subset of key type switches are actuated in a predetermined order and none of said second subset of key type switches are actuated.

4,164,777

**SUPERCONDUCTING SWITCH INCORPORATING A STEERING DIODE**

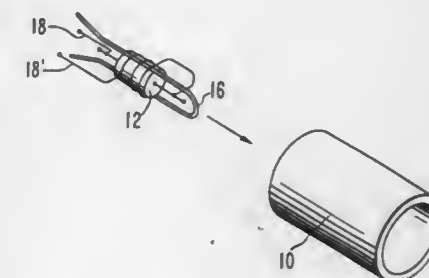
George D. Knelp, Jr., Menlo Park; Marvin H. Anderson, Mountain View, and Robert E. Gang, Sunnyvale, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 21, 1978, Ser. No. 879,294

Int. Cl.<sup>2</sup> H01H 1/02, 1/62

U.S. Cl. 361—331

5 Claims



1. A persistence switch for effecting the transition between persistence and non-persistent modes in a superconducting circuit comprising a diode having leads, a superconductive material disposed in thermal contact with said diode, said material forming two superconductive leads of said switch, and two other leads connected to the respective leads of said diode, said other leads formed of a material exhibiting lower thermal conductivity than the leads of said diode.

4,164,778

**PRINTED CIRCUIT BOARD**

Hiroshi Sawairi; Fuminori Hirose, and Kaoru Konishikawa, all of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 15, 1977, Ser. No. 816,197

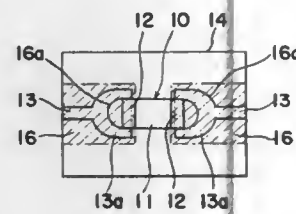
Claims priority, application Japan, Jul. 20, 1976, 51-97150[U]; Jul. 20, 1976, 51-97151[U]; Jul. 20, 1976, 51-97152[U]; Int. Cl.<sup>2</sup> H05K 5/00

U.S. Cl. 361—409

14 Claims

1. A printed circuit board comprising: an electrically insulative substrate of synthetic resin; at least one pair of spaced electroconductive layers on said insulative substrate; a wireless component bridging said spaced electroconduc-

tive layers, said component having at least one pair of spaced terminal electrodes, one terminal on each end of said component and each of said terminal electrodes being in contact with and soldered to one of said electroconductive layers; and



each of said electroconductive layers having a substantially rounded portion at the portion thereof soldered to said terminal electrodes, said rounded portion having a width and a surface area no larger than the surface area and width of said terminal electrode to which it is soldered.

**4,164,779**  
**ALUMINUM ELECTROLYTIC CAPACITOR FOR RATED VOLTAGES OF AT LEAST 160 V**

Wilhelm Lauer, Giengen, and Rudolf Soldner, Heidenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Aug. 15, 1977, Ser. No. 824,506

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 2641939

Int. Cl.<sup>2</sup> H01G 9/00

U.S. Cl. 361-433

1 Claim

1. An aluminum electrolytic capacitor for rated voltages of at least 160 volts, comprising:

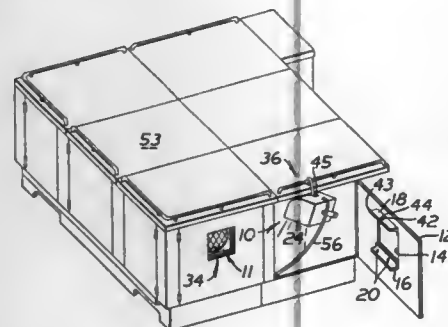
- at least one wound layer of an anode foil;
  - at least one wound layer of a cathode foil; and
  - at least one wound layer of a spacer foil positioned between said anode and cathode foils;
- said spacer foil being saturated with an operating electrolyte consisting, for each kilogram of electrolyte, 9.0 to 11.0 mols of ethylene glycol; 2.0 to 5.0 mols of boric acid; 0.1 to 0.5 mols of adipic acid; 0.9 to 1.5 mols of ammonia; 0.05 to 0.15 mols of phosphoric acid and 4.0 to 6.0 mols of water.

**4,164,780**  
**APPARATUS FOR A REMOVABLE LAMP**  
Thomas P. Muller, and Philip J. Blatner, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.  
Filed Jun. 16, 1978, Ser. No. 916,457

Int. Cl.<sup>2</sup> B60Q 1/00

U.S. Cl. 362-64

9 Claims



1. A housing assembly (10) for removably connecting a lamp (11) to a frame (12) having an opening (14) and a first flange

(16) having one of a mateable protrusion (20) and opening (22), comprising:

a lamp housing (24) having first and second opposed walls (28,30) and a front wall (32) and being of a size sufficient for substantially enclosing the lamp (11) and movable between a first position (34) at which the front wall (32) covers the opening (14) of the frame (12) and a second position (36) at which the front wall (32) is spaced from the opening (14) of the frame (12), said first wall (28) having the other of the mateable protrusion (20) and opening (22), said protrusion (20) and opening (22) being mated at the first position (34) of the lamp housing (24); and means (26) for removably connecting the lamp housing (24) to the frame (12) and maintaining said lamp housing (24) in the first position (34).

**4,164,781**  
**TRACK SERVOING SYSTEM USING SIGNALS FROM TUNNEL ERASE HEADS**

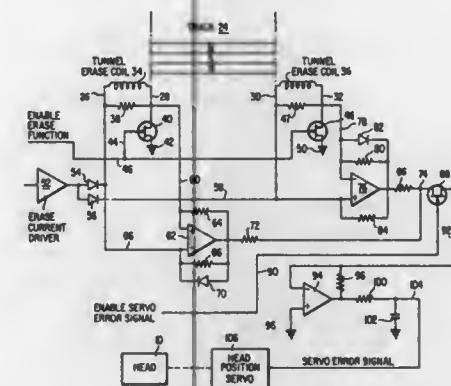
Timothy R. Brown, Westboro, Mass., assignor to Decitex, Worcester, Mass.

Filed Apr. 11, 1978, Ser. No. 895,393

Int. Cl.<sup>2</sup> G11B 5/02, 21/10, 5/27

U.S. Cl. 360-77

7 Claims



1. A position servo control system for a magnetic read/write head for maintaining said read/write head centered over a recorded information track comprising:

- erase head means positioned adjacent said read/write head for erasing spurious recorded signals on opposite sides of said information track when said read/write head is in a write mode;
- first electronic switching means coupled to said erase head means for switching said erase head means from an erasing mode to a track sensing mode, wherein said erase head means couples magnetic flux from said track; and,
- servo error signal generating means coupled to said erase head means for generating a signal proportional to the misalignment between said erase head means and said recorded information track based on the magnetic coupling between said erase head means and said track during the track sensing mode.

**4,164,782**  
**LOCKING MECHANISM FOR RECORD PACKAGE**  
Myron C. Stewart, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.  
Filed Aug. 21, 1978, Ser. No. 935,303

Int. Cl.<sup>2</sup> G11B 5/82, 25/04

U.S. Cl. 360-133

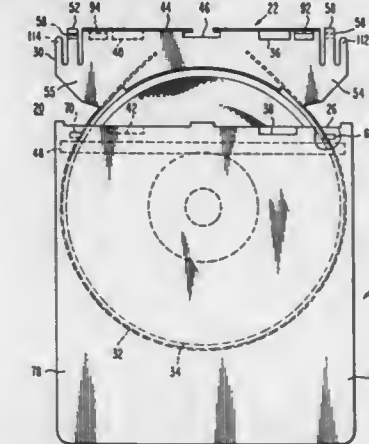
4 Claims

1. A protective cover for a disc record for use with a record player having an unlocking member; said cover comprising:  
(A) a jacket having an edge opening in communication with a record enclosing cavity; and  
(B) a record retainer removably received within said jacket and having a major surface; said retainer being adapted to

cooperate with the edge opening of said jacket to form a substantially sealed record enclosing cavity, and having a configuration for restraining planar movement of an enclosed record relative to said retainer;

said retainer being provided with an integrally molded, flexural locking member having a free end which is subject to deflection in a direction at right angles to said major surface of said retainer;

a protruding element being disposed on said flexural locking member near said free end thereof, and having an edge remote from said free end which is disposed obtusely relative to said major surface of said retainer such that engagement between said obtusely disposed edge and an interior surface of said jacket causes deflection of said flexural locking member to permit insertion of said retainer into said jacket;



said protruding element further having an edge adjacent to said free end of said flexural locking member, which is disposed substantially perpendicularly to said major surface of said retainer;

said jacket being provided with a portion defining a substantially perpendicular edge adjacent to said edge opening of said jacket for engagement with said perpendicularly disposed edge of said flexural locking member upon arrival of said retainer at a fully inserted position in said jacket to preclude removal of said retainer from said jacket during said engagement between said perpendicular edges of said retainer and said jacket;

said free end of said flexural locking member being adapted for arrival in the path of said player unlocking member during insertion of said cover into said player for causing disengagement between said retainer perpendicular edge and said jacket perpendicular edge to permit subsequent separation of said retainer from said jacket.

**4,164,783**  
**SPORT LIGHT AND BALLAST MODULE**  
Donald Wandler, South Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.  
Filed May 1, 1978, Ser. No. 901,811

Int. Cl.<sup>2</sup> H01R 33/00

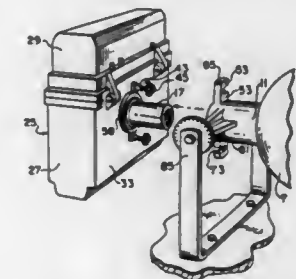
U.S. Cl. 362-226

6 Claims

1. A light fixture including in combination:  
a weather-proof housing enclosing electrical components including ballast means, said housing having a side wall;  
a lamp receptacle mounted on said side wall extending outwardly therefrom substantially at right angles thereto;  
a pair of elongated protrusions of predetermined length projecting outwardly from said side wall and located on opposite sides of said lamp receptacle, flat surface means surrounding said lamp receptacle;  
a reflector member having a reflector portion and a neck portion extending outwardly therefrom with the free end of said neck portion being opened;  
fastening means located adjacent the free end of said neck

portion, said fastening means including first and second arms extending radially outwardly therefrom in different directions, each arm defining a cavity opening in the same direction as the free end of said neck portion, and a slot communicating with said cavity, said slot for receiving an elongated fastener extending parallel to the axis of the neck, and the cavity for receiving a corresponding elongated protrusion mounted on said housing;

gasket means disposed between said flat surface means surrounding said lamp receptacle and said free end of said neck portion for providing a weather-proof seal;



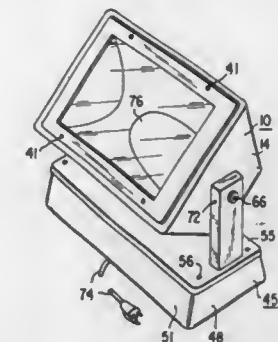
said flat surface means surrounding said lamp receptacle mating with the free end of said neck portion and said lamp receptacle being received in said neck portion upon joining said lamp housing and said reflector member, with said protrusions being received in said cavities formed in said fastening means, with said elongated fasteners being received in said slots subsequent to joining said ballast housing and reflector member relative to the other to secure the latter in a sealed condition.

**4,164,784**  
**ADJUSTABLE ILLUMINATING DEVICE**  
Milenko Jaksich, Burbank, Calif., assignor to Slight Lite, Inc., Los Angeles, Calif.  
Filed Aug. 1, 1977, Ser. No. 820,447

Int. Cl.<sup>2</sup> F21V 21/26; F21P 5/00; F21M 3/18

U.S. Cl. 362-282

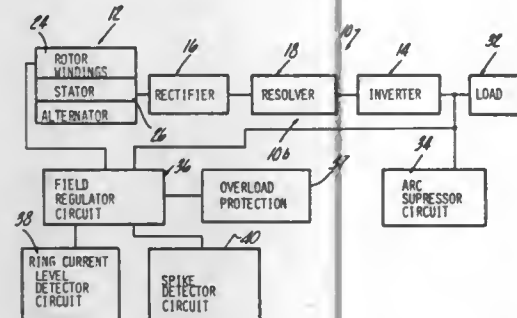
7 Claims



1. In an illuminating device, a lamp housing including an enclosure having end walls provided with axially aligned openings therethrough and a window opening on one side thereof, means for mounting said housing for rotation on an axis paralleling the plane of said window opening, said means comprising a pair of spaced support legs, a pair of cylindrical bearing posts coaxially mounted on said legs opposite and extending toward each other; said posts engaging the aligned openings in said lamp housing, a lamp mounting carried by one of said bearing posts interiorly of said housing, and means for restraining said one of said bearing posts against rotation with respect to the support leg on which it is mounted while permitting rotation of said housing on said bearing posts.



**4,164,785**  
**MULTIPHASE TO SINGLE PHASE AND FREQUENCY CONVERTER SYSTEM**  
 Thomas A. Young, Burton, and Jay W. Gustin, Mantua, both of Ohio, assignors to Tenna Power Corporation, Cleveland, Ohio  
 Continuation of Ser. No. 726,918, Sep. 27, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,888  
 Int. Cl.<sup>2</sup> H02H 7/10; H02P 9/10, 7/66  
 U.S. Cl. 363—50 31 Claims



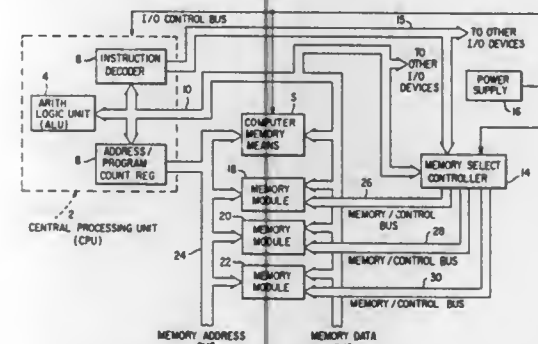
1. An energy conversion system for converting a high frequency alternating output potential from an alternator to a single phase, low frequency, alternating output for a load, including rectifying means connected to the output from the alternator to produce a unidirectional output, means connected with said rectifying means for controlling said rectifying means to provide a plurality of unidirectional waves, inverter means for inverting alternate ones of said waves whereby an alternating output wave is provided, arc suppressor circuit means connected to the load for providing a low impedance shunt path around said rectifying means and said inverter means at a preselected time after each of said unidirectional waves, and spike detector means connected to the load and responsive to a condition indicative of an excessive voltage condition for disabling the alternator, said spike detector means comprising a breakdown device connected across the load and having a bipolar breakdown characteristic for breaking down in response to potentials of a preselected high magnitude, a positive temperature coefficient resistor having a sharp resistance rise characteristic being physically connected to said breakdown device and responding to the temperature rise of said breakdown device during breakdown for providing a sharp change in resistance and actuating means responsive to said sharp change in resistance for opening said field and shutting down said alternator.

**4,164,786**  
**APPARATUS FOR EXPANDING MEMORY SIZE AND DIRECT MEMORY ADDRESSING CAPABILITIES OF DIGITAL COMPUTER MEANS**  
 Bernard P. Gollomp, Far Rockaway, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.  
 Filed Apr. 11, 1978, Ser. No. 895,167  
 Int. Cl.<sup>2</sup> G06F 1/00 5 Claims

U.S. Cl. 364—200 3. Digital computer means, comprising:  
 a central processing unit;  
 memory data signal transmitting means connected to the central processing unit;  
 memory address signal transmitting means connected to the central processing unit;  
 computer memory means actively connected to both of said signal transmitting means;  
 at least one memory module passively connected to both of said signal transmitting means;  
 a power supply;  
 input/output control signal transmitting means connected to the central processing unit;  
 controller means connected to the power supply, to the memory data signal transmitting means, to the input/out-

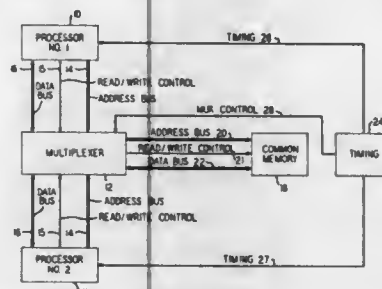
put control signal transmitting means and to the memory module, and responsive to signals transmitted by both of said signal transmitting means for being rendered in a control state whereby a power signal and a memory access control signal are transmitted from the controller to the memory module,

the controller means including a control register connected to the memory data signal transmitting means and to the input/output signal transmitting means, and responsive to the signals transmitted by both of said means for being rendered in a control state to provide a memory access control signal, switching means normally in a non-conductive state connected to the power supply and to the control register and responsive to the memory access



control signal for being rendered conductive and for passing a power signal, and the memory module connected to the control register and to the conductive switching means and responsive to the power signal and the memory access control signal for being actively connected to the memory address and memory data signal transmitting means; and the memory module responsive to the signals transmitted thereto for being actively connected to the memory address and memory data signal transmitting means in addition to the memory means being actively connected to both of said signal transmitting means for expanding the direct addressing range and memory size of the computer means.

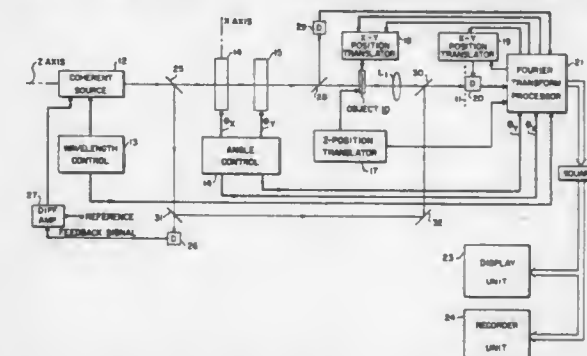
**4,164,787**  
**MULTIPLE MICROPROCESSOR INTERCOMMUNICATION ARRANGEMENT**  
 William L. Aranguren, Sayreville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Nov. 9, 1977, Ser. No. 849,894  
 Int. Cl.<sup>2</sup> G06F 13/06 9 Claims



1. A multiple microprocessor interconnection arrangement comprising  
 at least a first and a second microprocessor unit, each microprocessor unit being adapted to concurrently perform a

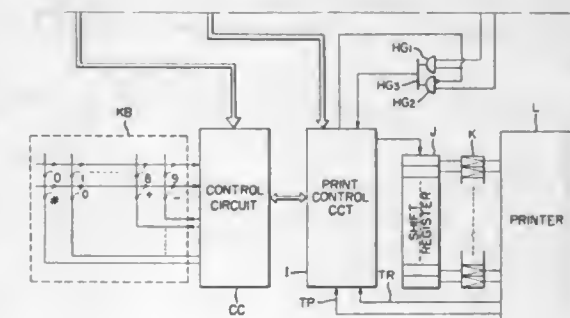
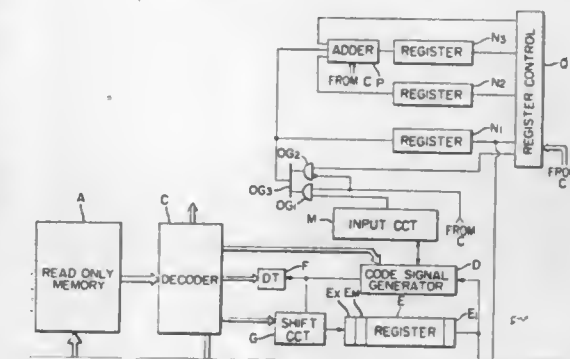
different function from that being performed by the other microprocessor units;  
 an interconnection channel comprising a memory unit connected to each of said at least first and second microprocessor units and a multiplexer disposed between each of said first and second microprocessor units and said memory unit, said memory unit including a plurality of memory locations accessible to each of said at least first and second microprocessor units; and  
 timing means connected to each of said at least first and second microprocessor units and said multiplexer of the interconnection channel, said timing means being capable of generating timing signals which both produce a normal operational timing cycle for each microprocessor unit which is offset by a predetermined amount from the timing cycle of each of the other microprocessor units and cause the multiplexer to sequentially connect each of said at least first and second microprocessor units to said memory unit for accessing and performing a read or write function in a desired memory location in said memory unit during a predetermined corresponding portion of each microprocessor unit's timing cycle which does not overlap the corresponding portion of another microprocessor unit's offset timing cycle.

**4,164,788**  
**SUPER-RESOLUTION IMAGING SYSTEM**  
 Atul Jain, 1545 E. Mendocino Rd., Altadena, Calif. 91001  
 Filed Oct. 13, 1976, Ser. No. 731,986  
 Int. Cl.<sup>2</sup> G06G 7/19; G02B 27/10  
 U.S. Cl. 364—515 30 Claims



4. A method for enhancing the creation of an image at a plane comprised of the steps of  
 radiating an object with a plane wave field from a coherent source at a selected angle  $\theta_x$  with respect to a Z axis normal to the object and in the direction to the object from said source in a plane defined by an X axis, where said X and said Z axes are perpendicular and perpendicular to a Y axis to define an X-Y plane parallel to said object and an X-Z plane of said angle,  $\theta_x$ ,  
 varying the spatial phase relationship of the radiating wave field by varying at least one parameter selected from the wave field frequency and the selected angle of radiation, detecting the wave field of radiation at said selected point as a function of the variable parameter selected while said selected angle  $\theta_x$  is being varied, and  
 computing a Fourier transform of the detected wave field or intensity of a selected point in said plane with respect to the variable parameter for synthesis of a high resolution image at said point.

**4,164,789**  
**ELECTRONIC APPARATUS FOR DEALING WITH NUMERICAL INFORMATION**  
 Sigeru Toyomura, Kawasaki, and Tsuyoshi Kawanabe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Continuation of Ser. No. 730,083, Oct. 6, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,503  
 Claims priority, application Japan, Oct. 23, 1975, 50-127770  
 Int. Cl.<sup>2</sup> G06F 3/00, 15/20  
 U.S. Cl. 364—710 9 Claims

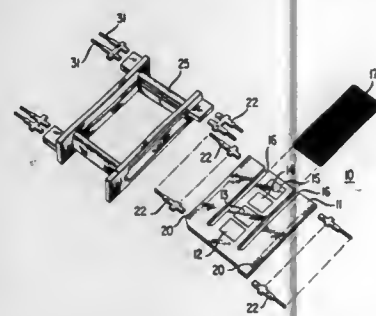


1. Electronic calculating apparatus for dealing with numerical information comprising:  
 a key input device provided with numerical keys for entering numerical data signals, a decimal point key for entering a decimal point signal and instruction keys for entering instruction signals;  
 a first memory for storing numerical data signals and data classification mark signals, wherein the data classification mark signals are represented by decimal point signals entered by said decimal point key;  
 a second memory for storing numerical data signals and a single decimal point signal;  
 control means for causing said first memory to store a plurality of data classification mark signals and for causing said second memory to store a single decimal point signal providing a distinction between the integer and decimal portions of the numerical data, when said decimal point key is depressed repeatedly; and  
 means, responsive to the operation of a specified one of said instruction keys, for reading out the signals stored in said first memory.

**4,164,790**  
**MAGNETIC BUBBLE PACKAGING ARRANGEMENT**  
 Paul C. Michaelis, Watchung, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Dec. 27, 1977, Ser. No. 864,311  
 Int. Cl.<sup>2</sup> G11C 19/08 10 Claims

U.S. Cl. 365—2 1. A magnetic bubble memory including a layer of material

in which magnetic bubbles can be moved, and means coupled to said layer for moving said bubbles therein, said means comprising a pattern of elements responsive to a magnetic field reorienting cyclically in the plane of said layer for generating moving magnetic pole patterns and field generating means for



generating said field, said field generating means comprising first and second coils and a bobbin about which said second coil is wound, said bobbin fitting closely about said first coil in the absence of a bobbin for said first coil in a manner to define the minimum geometry for said second coil.

4,164,791

# SEMICONDUCTOR MEMORY WITH EQUAL WORD LINE AND REFERENCE LINE VOLTAGE DROP

Noriyuki Homma, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 13, 1977, Ser. No. 860,092

Claims priority, application Japan, Dec. 17, 1976, 51/150943  
Int. Cl.<sup>2</sup> G11C 7/00, 11/40

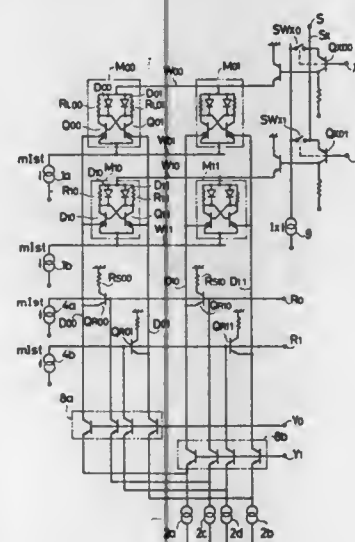
U.S. Cl. 365—190

10 Claims

1. A semiconductor memory comprising:  
a number of memory cells arranged in matrix form, each memory cell being connected between a word line pair and between a digit line pair;  
a sense circuit including a reference line to which a reference

voltage is applied, and sense elements connected to both the reference line and the digit line to produce an output in response to the potential on the reference line relative to the potential applied to the memory cell;

first current source means, each connected to one line of the word line pair, for providing a constant current flowing from one line of the word line pair through each of memory cells to the other line of the word line pair; and



second current source means, each connected to the reference line, for providing a constant current flowing there-through to produce along the reference line a voltage drop substantially equal to the voltage drop developed along the word line due to the current provided by means of the first current source.

## DESIGN PATENTS

GRANTED AUG. 14, 1979

### ERRATA

For CLASS	See PATENT NO.
D09-154 .....	252,603
D06-005 .....	252,608
D22-023 .....	252,639
D23-149 .....	252,640
D23-151 .....	252,641
D28-009 .....	252,642
D30-015 .....	252,643
D15-092 .....	252,655



## DESIGNS

AUGUST 14, 1979

252,596

### PURSE INSERT

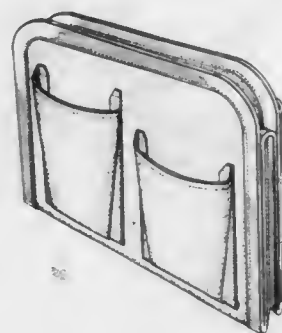
Emy Adler, 5400 Lindley Ave., Encino, Calif. 91316, and Phyllis Decker, 13934 Bora Bora Way, Marina del Rey, Calif. 90291

Filed Feb. 18, 1977, Ser. No. 769,938

Term of patent 14 years

Int. Cl. D3—99

U.S. Cl. D3—54



252,598

### CHILD'S BED

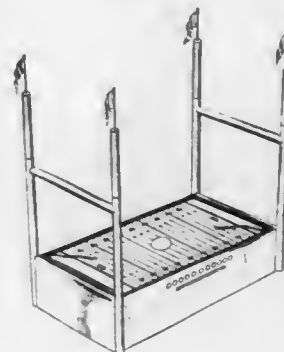
Virgil R. Carter, 505 N. Lakeshore Dr., Chicago, Ill. 60611

Filed Jun. 23, 1977, Ser. No. 809,178

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—5



252,597

### PLAQUE REMOVAL BRUSH

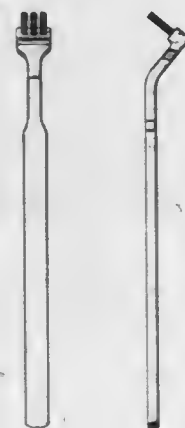
Henry A. Holzwarth, Bayside, and John D. Wark, Freeport, both of N.Y., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Sep. 30, 1977, Ser. No. 838,439

Term of patent 14 years

Int. Cl. D4—02

U.S. Cl. D4—25



252,599

### CHILD'S BED

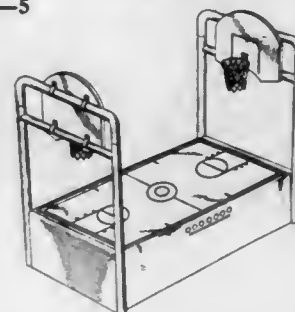
Virgil R. Carter, 505 N. Lakeshore Dr., Chicago, Ill. 60611

Filed Jun. 23, 1977, Ser. No. 809,180

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—5



252,600

## AUTOMOBILE TIRE DISPLAY STAND

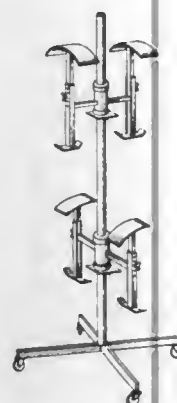
John Gibson, Long Island, N.Y., assignor to Central States Diversified, Inc., New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,439

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-23



252,601

## SOFA

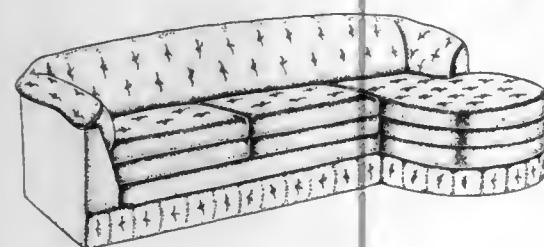
Michael A. Bick, Manhattan Beach, Calif., assignor to Shelly &amp; Anderson Furniture Mfg., Co., Inc., Compton, Calif.

Filed Feb. 3, 1978, Ser. No. 874,821

Term of patent 14 years

Int. Cl. D6-07

U.S. Cl. D6-63



252,602

## NOVELTY CHAIR

Umberto J. Cirrone, 1774 Turnpost La., Hacienda Heights, Calif. 91745

Filed Apr. 25, 1977, Ser. No. 790,283

The portion of the term of this patent subsequent to Aug. 14, 1993, has been disclaimed.

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-68



252,603

## CABINET

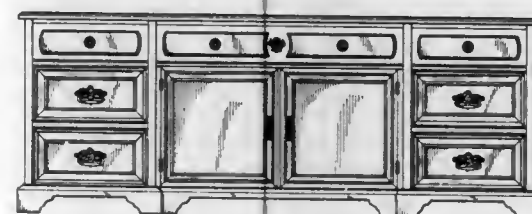
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015

Filed Jan. 12, 1977, Ser. No. 758,686

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-154



252,604

## BEVERAGE SERVER

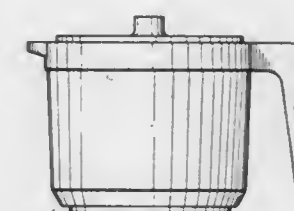
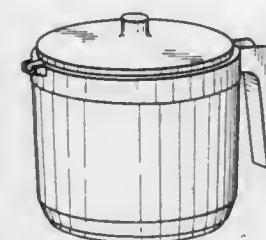
James E. Harris, Hermitage, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Jun. 10, 1977, Ser. No. 806,088

Term of patent 14 years

Int. Cl. D7-01

U.S. Cl. D7-65



252,606

## SPOON OR SIMILAR ARTICLE OF FLATWARE

Ben Seibel, New York, N.Y., assignor to Oxford Hall Silver-smiths, Ltd., New York, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,995

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D7-137



252,605

## PORTABLE TEMPERATURE CONTROLLED CONTAINER

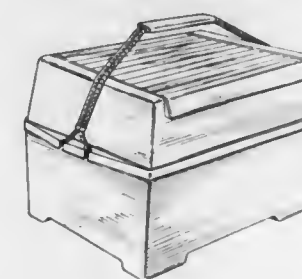
Louis J. Corini, Philadelphia, Pa., assignor to Fogel Commercial Refrigerator Company, Philadelphia, Pa.

Filed Mar. 2, 1978, Ser. No. 883,045

Term of patent 14 years

Int. Cl. D7-07

U.S. Cl. D7-77



252,607

## SPOON OR SIMILAR ARTICLE OF FLATWARE

Ben Seibel, New York, N.Y., assignor to Oxford Hall Silver-smiths, Ltd., New York, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,997

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D7-137



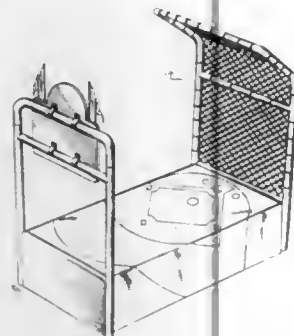


252,608

## CHILD'S BED

Virgil R. Carter, 505 N. Lakeshore Dr., Chicago, Ill. 60611  
Filed Jun. 23, 1977, Ser. No. 809,179Term of patent 14 years  
Int. Cl. D6—01

U.S. Cl. D6—5



252,609

## TOOL FOR HANDLING OF ELECTRICAL COMPONENTS

Olle P. M. Wolkert, Kungsvagen 1, Trangsund, Sweden  
Filed Apr. 20, 1977, Ser. No. 789,099Claims priority, application Sweden, Oct. 21, 1976, 762043  
Term of patent 14 years

Int. Cl. D8—02

U.S. Cl. D8—51



252,610

## HANGER OR THE LIKE

Frederick J. Miavitz, 7040 Shaner Rd., Walton Hills, Ohio 44146

Filed May 3, 1977, Ser. No. 793,443  
Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—373



252,611

## COVER FOR A PLIERS HANDLE

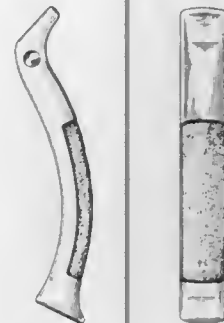
Carl-Arne Breger, Malmö, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Mar. 18, 1977, Ser. No. 779,240

Term of patent 14 years

Int. Cl. D8—05

U.S. Cl. D8—107



252,612

## CONTAINER FOR BLOOD SAMPLES OR THE LIKE

John D. Mull, Burlington, Canada, assignor to Starplex Inc., Mississauga, Canada

Filed Dec. 8, 1976, Ser. No. 748,848

Term of patent 14 years

Int. Cl. D9—03

U.S. Cl. D9—216



252,613

## CARTON BLANK

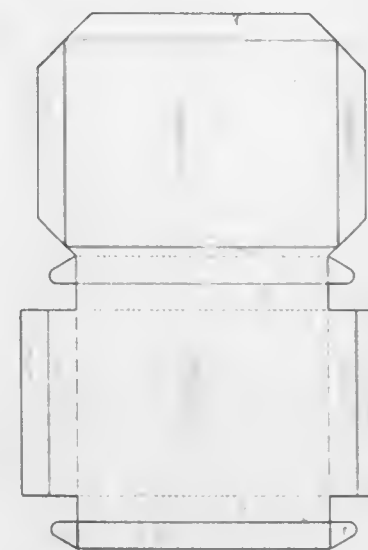
Joseph R. D'Alessio, Wilbraham, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 4, 1976, Ser. No. 738,653

Term of patent 14 years

Int. Cl. D9—99

U.S. Cl. D9—245



252,614

## PORTABLE TIMER

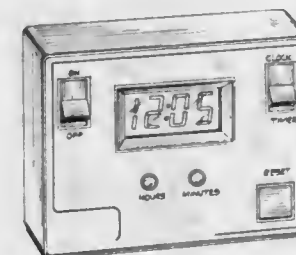
Jeffrey R. Thornberry, 23200 Chagrin Blvd., Beachwood, Ohio 44122

Filed Jun. 23, 1977, Ser. No. 809,174

Term of patent 3½ years

Int. Cl. D10—03

U.S. Cl. D10—40



252,615

## COMBINED PROTRACTOR, TRIANGLE, COMPASS AND BEAM COMPASS

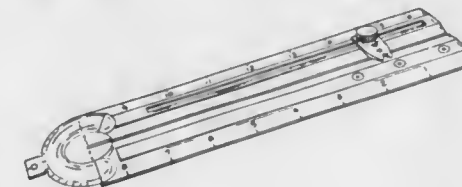
Gilbert T. Lopez, Boulder, Colo.

Filed Mar. 21, 1977, Ser. No. 779,943

Term of patent 14 years

Int. Cl. D10—04

U.S. Cl. D10—62



252,616

## LIGHTNING ARRESTER

Takeshi Hosokawa, Kawanishi; Hiroshi Oda, Hirakata, and Noboru Yoshida, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

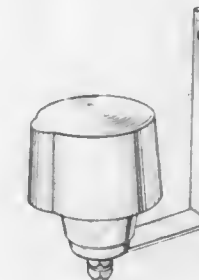
Filed Oct. 12, 1977, Ser. No. 841,633

Claims priority, application Japan, Apr. 20, 1977, 52-15043

Term of patent 14 years

Int. Cl. D10—05

U.S. Cl. D10—105



252,617

## IRRIGATION SIGNAL

Edward W. McCloskey, 439½ Riverside Dr., Burbank, Calif. 91506

Filed Oct. 25, 1977, Ser. No. 845,147

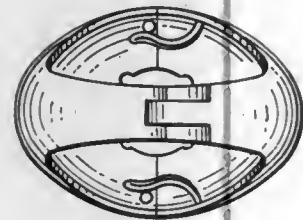
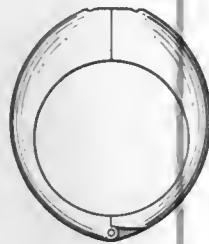
Term of patent 7 years

Int. Cl. D10—06

U.S. Cl. D10—114



252,618  
RING JACKET  
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480  
Filed Jan. 26, 1978, Ser. No. 872,740  
Term of patent 14 years  
Int. Cl. D11-01  
U.S. Cl. D11-86



252,619  
WIND DEFLECTOR  
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.  
Filed Sep. 26, 1977, Ser. No. 836,481  
Term of patent 14 years  
Int. Cl. D12-16  
U.S. Cl. D12-181



252,620  
WIND DEFLECTOR  
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.  
Filed Nov. 14, 1977, Ser. No. 851,524  
Term of patent 14 years  
Int. Cl. D12-16  
U.S. Cl. D12-181



252,621  
WIND DEFLECTOR  
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.  
Filed Nov. 18, 1977, Ser. No. 852,737  
Term of patent 14 years  
Int. Cl. D12-16  
U.S. Cl. D12-181



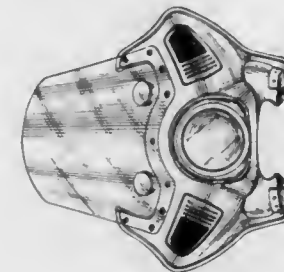
252,622  
WIND DEFLECTOR  
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.  
Filed Nov. 18, 1977, Ser. No. 852,738  
Term of patent 14 years  
Int. Cl. D12-16  
U.S. Cl. D12-181



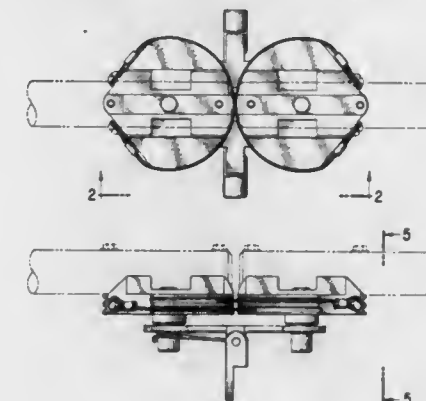
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WIND DEFLECTOR  
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.  
Filed Nov. 18, 1977, Ser. No. 852,957  
Term of patent 14 years  
Int. Cl. D12-16  
U.S. Cl. D12-181



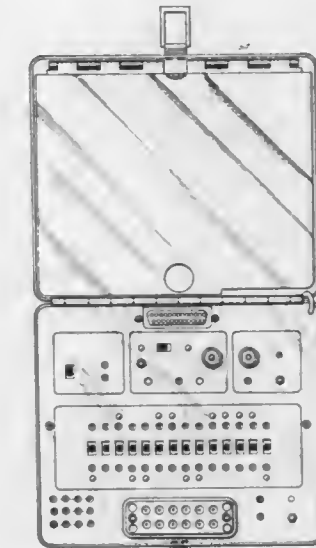
252,624  
MOTOR-CYCLE FAIRING  
Craig W. Vetter, Rantoul, Ill., assignor to Vetter Fairing Company, Rantoul, Ill.  
Continuation-in-part of Ser. No. 802,240, May 31, 1977, abandoned. This application Nov. 4, 1977, Ser. No. 848,776  
Term of patent 14 years  
Int. Cl. D12-11  
U.S. Cl. D12-182



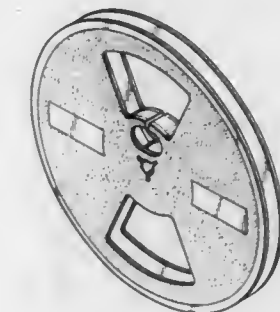
252,625  
ROWING OAR ARTICULATOR  
H. Warren White, 1104 S. Bayfront, Balboa Island, Calif. 92662  
Filed May 2, 1977, Ser. No. 793,107  
Term of patent 14 years  
Int. Cl. D12-99  
U.S. Cl. D12-215



252,626  
CURRENT INTERFACE BREAKOUT PANEL  
Renato A. D'Antonio, North Attleboro, Mass., assignor to International Data Sciences, Inc., Lincoln, R.I.  
Filed May 23, 1977, Ser. No. 799,753  
Term of patent 14 years  
Int. Cl. D13-03  
U.S. Cl. D13-12



252,627  
REEL FOR MAGNETIC RECORDING TAPE  
Stephen G. Belgin, Campbell, and Gary E. Hart, Los Gatos, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.  
Filed May 4, 1977, Ser. No. 793,798  
Term of patent 14 years  
Int. Cl. D14-99  
U.S. Cl. D14-11





252,628

## PHONOGRAPH STYLUS

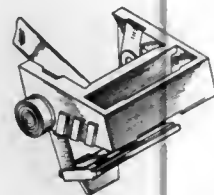
James Wellwood, Elmhurst, and Robert L. Deschamps, Wheaton, both of Ill., assignors to Shure Brothers Incorporated, Ill.

Filed Oct. 5, 1977, Ser. No. 839,786

Term of patent 14 years

Int. Cl. D14—01

U.S. Cl. D14—29



252,629

## CLOSED CIRCUIT VIDEO DISPLAY SYSTEM OR SIMILAR ARTICLE

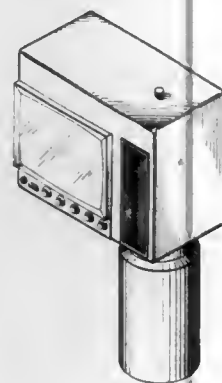
James D. Evans, Jr., Rte. 2, Box 281, Ponchatoula, La. 70454

Filed Nov. 12, 1976, Ser. No. 741,200

Term of patent 14 years

Int. Cl. D14—01

U.S. Cl. D14—79



252,630

## FUEL INJECTION NOZZLE

Peter Howes, Gerrards Cross, England, assignor to Lucas Industries Limited, Birmingham, England

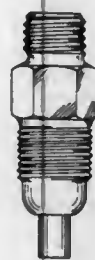
Filed Jul. 27, 1977, Ser. No. 819,656

Claims priority, application United Kingdom, Feb. 4, 1977, 978763/77

Term of patent 14 years

Int. Cl. D15—01

U.S. Cl. D15—5



252,631

## AUDIO-VISUAL PROJECTOR

Rolf Dieckhoff, Marienstr. 26, Waiblingen, Fed. Rep. of Germany (D-7050)

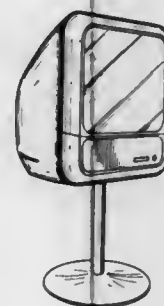
Filed Mar. 7, 1977, Ser. No. 775,012

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 650/76

Term of patent 14 years

Int. Cl. D16—02

U.S. Cl. D16—14



252,632

## SPECTACLE HOLDER

Thomas Drayson, C/- W.A.P.E.T. Camp, Barrow Island, Australia (6712)

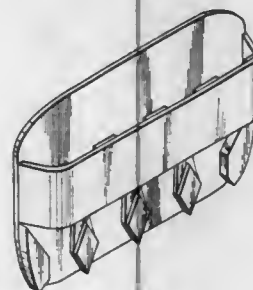
Filed Sep. 26, 1977, Ser. No. 836,913

Claims priority, application Australia, Aug. 3, 1977, 72488

Term of patent 14 years

Int. Cl. D16—06

U.S. Cl. D16—82



252,633

## STAND MOUNT FOR A GUITAR, OR THE LIKE

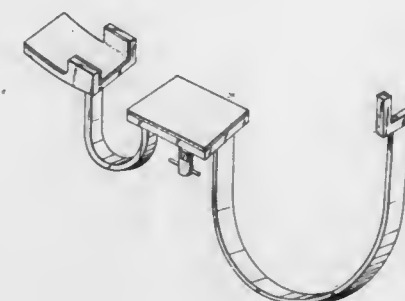
Floye K. Dreyer, 101 NE. 165th St., North Miami Beach, Fla. 33162

Filed Dec. 2, 1976, Ser. No. 746,931

Term of patent 14 years

Int. Cl. D17—99, 03; D6—06, 99

U.S. Cl. D17—20



252,636

## GAME CABINET

David M. Cook, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Jul. 11, 1977, Ser. No. 814,779

Term of patent 14 years

Int. Cl. D21—03

U.S. Cl. D21—13



252,637

## TOY GYROSCOPE, OR SIMILAR ARTICLE

Thomas B. Mackie, Kirkcaldy, Scotland, assignor to Thomas Salter Limited, Glenrothes, Scotland

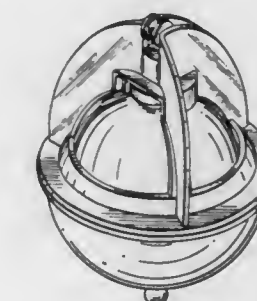
Filed Mar. 10, 1977, Ser. No. 776,125

Claims priority, application United Kingdom, Feb. 11, 1976, 977,785

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D21—96



252,634

## BARREL TIP ASSEMBLY FOR A BALL POINT PEN

Robert J. Fanella; Elmer D. Thompson, both of Janesville, and Martin E. Wacha, Beloit, all of Wis., assignors to The Parker Pen Company, Janesville, Wis.

Filed Dec. 5, 1977, Ser. No. 857,870

Term of patent 14 years

Int. Cl. D19—06

U.S. Cl. D19—54



252,635

## PORTABLE LEARNING UNIT

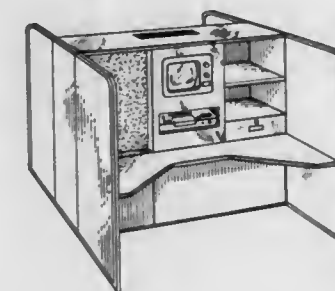
Eugene Richgels, West St. Paul, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 27, 1977, Ser. No. 791,459

Term of patent 14 years

Int. Cl. D14—01

U.S. Cl. D19—60



252,638

## TENT

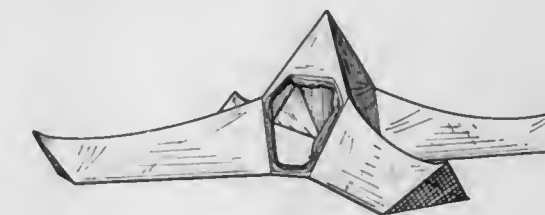
William Steinhardt, 10 Seneca Pl., Jericho, N.Y. 11753, and Kerry Nickerson, 210 Abington Dr., Atlanta, Ga. 30328

Filed Jan. 24, 1977, Ser. No. 761,998

Term of patent 14 years

Int. Cl. D21—04

U.S. Cl. D21—253



252,639

**HANDLE FOR FISHING ROD ASSEMBLY**

Ryuichi Ohmura, No. 19-3, Minami-cho, Shizuoka-shi, Shizuoka-ken, Japan

Filed Aug. 24, 1977, Ser. No. 827,386

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-23



252,640

**AIR FILTER**

Bill Nederman, Halalid 3, S-252 33 Helsingborg, Sweden

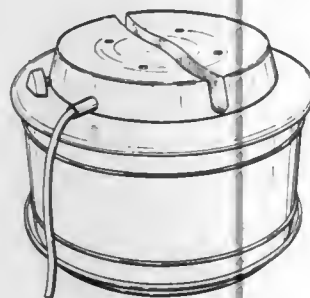
Filed Sep. 10, 1976, Ser. No. 722,212

Claims priority, application Sweden, Mar. 12, 1976, 760564

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-149



252,641

**HEAT RECIRCULATOR**

Ralph M. LaZar, Skokie, Ill., assignor to Broan Manufacturing Co., Inc., Hartford, Wis.

Filed Feb. 9, 1977, Ser. No. 766,914

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-151



252,642

**FACIAL TRAY**

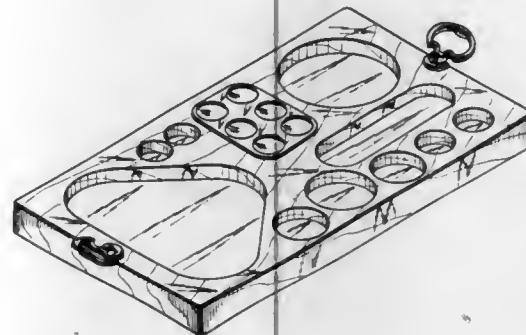
Elizabeth G. Davidson, 1046 Calle Mesita, Bonita, Calif. 92002

Filed Nov. 23, 1977, Ser. No. 854,465

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-9



252,643

**BIRD FEEDER**

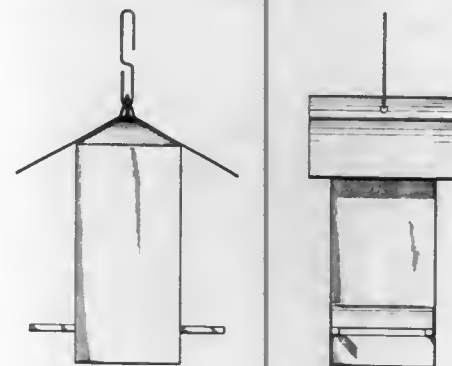
Meilyn Kreusser, 7750 W. 88th St., Indianapolis, Ind. 46278

Filed Oct. 30, 1978, Ser. No. 955,801

Term of patent 14 years

Int. Cl. D30-03

U.S. Cl. D30-15



252,644

**MARIONETTE TOY**

Steve Wagman, 67 Indian Road Cres., Toronto, Ontario, Canada

Filed May 4, 1977, Ser. No. 793,792

Claims priority, application Canada, Jan. 28, 1977, 28-01-77-1

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-152



252,645

**COMBINED SLIDE AND TUNNEL TOY**

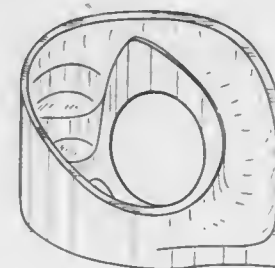
John A. Gale, 185 W. Lake St., Excelsior, Minn. 55331

Filed May 31, 1977, Ser. No. 802,244

Term of patent 14 years

Int. Cl. D21-04

U.S. Cl. D21-244



252,646

**GUN AMUSEMENT CABINET**

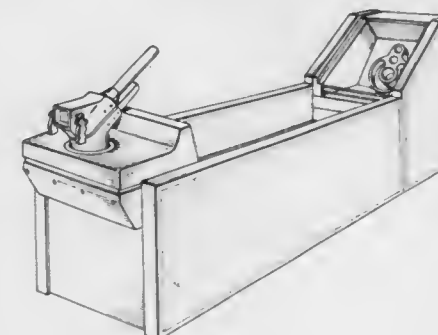
Vernon R. Natwick, Saratoga, Calif., assignor to Ramtek Corporation, Sunnyvale, Calif.

Filed Jul. 29, 1977, Ser. No. 820,142

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-5



252,647

**BOWLING GAME BOARD**

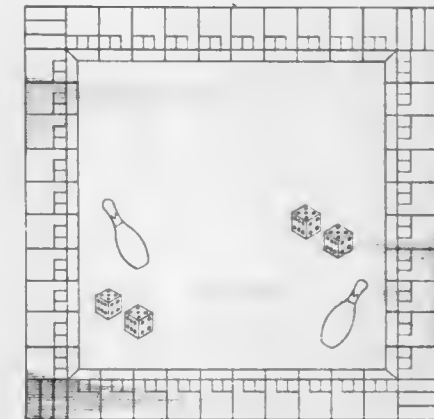
Henry C. Dehmer, 13361 Greentree Ave., Garden Grove, Calif. 92640

Filed Oct. 20, 1977, Ser. No. 844,071

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-27



252,648

**BAT IN WHICH A GAME PLAYER'S HAND IS INSERTED**

Nils O. S. Malm, Lupinvagen 12, and Carl G. Larsson, Lupinvagen 22, both of S-162 35 Vallingby, Sweden

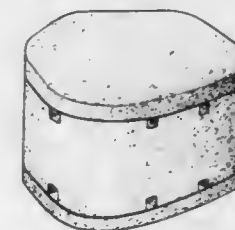
Filed Nov. 9, 1977, Ser. No. 850,054

Claims priority, application Sweden, May 26, 1977, 77-1200

Term of patent 14 years

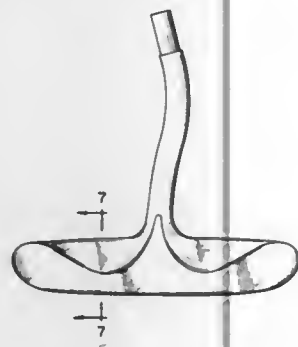
Int. Cl. D21-01

U.S. Cl. D21-212

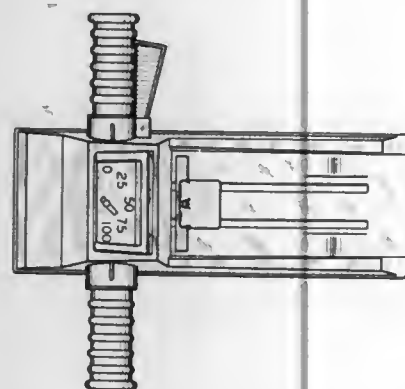




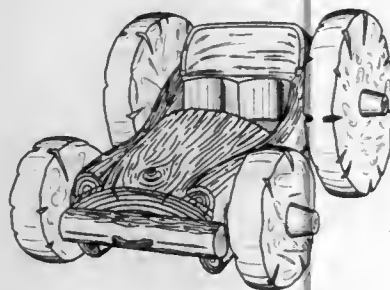
**252,649**  
**GOLF PUTTER HEAD**  
 Floyd V. Bernhardt, 5532 N. High School Rd., Indianapolis, Ind. 46254  
 Filed Nov. 25, 1977, Ser. No. 854,990  
 Term of patent 14 years  
 Int. Cl. D21—02  
 U.S. Cl. D21—217



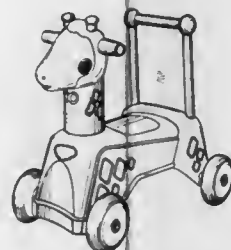
**252,650**  
**TOY RAMP**  
 Michael C. Cartabiano, Mamaroneck, N.Y., assignor to Child Guidance Playthings, Inc.  
 Filed Sep. 2, 1976, Ser. No. 720,223  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—91



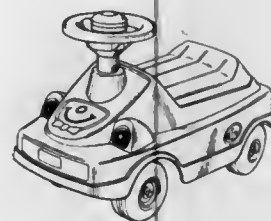
**252,651**  
**TOY CAR**  
 Sidney Tepper, 25 Edgewood Ter., Millburn, N.J. 07041  
 Filed Dec. 9, 1976, Ser. No. 749,151  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—73



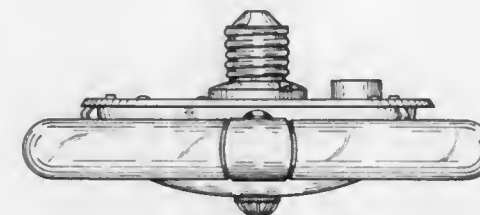
**252,652**  
**TOY VEHICLE WITH REMOVABLE HANDLE**  
 Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan  
 Filed Aug. 30, 1977, Ser. No. 829,108  
 Claims priority, application Japan, May 18, 1977, 52-18980  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—74



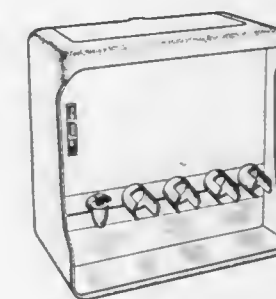
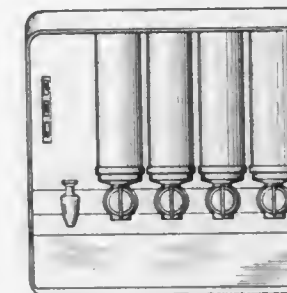
**252,653**  
**TOY VEHICLE**  
 Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan  
 Filed Sep. 27, 1977, Ser. No. 837,325  
 Claims priority, application Japan, May 25, 1977, 52-20130  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—74



**252,654**  
**FLUORESCENT FIXTURE**  
 Udo Fritsch, 18 Bridge St., Salem, N.H. 03079  
 Filed May 11, 1977, Ser. No. 796,044  
 Term of patent 14 years  
 Int. Cl. D26—05  
 U.S. Cl. D48—23 A



**252,655**  
**DISPENSER FOR DRIED FOODS OR THE LIKE**  
 Denis V. Dibling, Avenue Brugmann 197, 1180 Brussels, Belgium  
 Filed Dec. 29, 1976, Ser. No. 755,349  
 Claims priority, application Belgium, Jun. 29, 1976, 00641  
 Term of patent 14 years  
 Int. Cl. D15—08  
 U.S. Cl. D15—92



# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. O. Smith Corporation: See—  
Buckman, John B.; and Lykes, Robert E., 4,164,674, Cl. 310-90.000.  
A/S Apothekernes Laboratorium for Specialpraeparater: See—  
Oystese, Brigit, 4,164,572, Cl. 424-177.000.  
A-T-O, Inc.: See—  
Schnier, Edward A., 4,164,281, Cl. 198-394.000.  
Aagaard, Einar A., to U.S. Philips Corporation. Signalling system for overvoltage protectors. 4,164,632, Cl. 179-175.30R.  
AB Vargarda Armaturfabrik: See—  
Riis, Voldemar, 4,164,321, Cl. 236-12.00R.  
ACF Industries, Incorporated: See—  
Sato, Masaaki; and Kosaka, Shinya, 4,164,675, Cl. 310-268.000.  
Achini, Roland; Oppolzer, Wolfgang; and Pfenninger, Emil, to Sandoz Ltd. Benz[*f*]isoindoline compounds. 4,164,583, Cl. 424-274.000.  
Adams, James W.; and Reinke, Orville H., to American Can Company. Premoistened flushable wiper. 4,164,595, Cl. 427-341.000.  
Addor, Roger W.: See—  
Kamesaran, Venkataraman; and Addor, Roger W., 4,164,415, Cl. 71-114.000.  
AGFA-Gavaert, A.G.: See—  
Viehrig, Wolfgang; and Sperber, Werner, 4,164,371, Cl. 354-312.000.  
Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., to Paulucci, Jeno F. Method of heating food article. 4,164,591, Cl. 426-523.000.  
Ahmed, Adel A. A., to RCA Corporation. Television kinescope protection circuit. 4,164,687, Cl. 315-384.000.  
Air Products and Chemicals, Inc.: See—  
Daniels, Wiley E.; and Lenney, William E., 4,164,489, Cl. 260-29.60R.  
Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor switch device. 4,164,667, Cl. 307-253.000.  
Akamatsu, Yoshimi: See—  
Fujita, Yukio; Iwanami, Teruo; and Akamatsu, Yoshimi, 4,164,529, Cl. 264-565.000.  
Akasaka, Shigeo: See—  
Kimura, Shuji; Akasaka, Shigeo; Daitoku, Koichi; Hasegawa, Hiroshi; and Kimura, Makoto, 4,164,370, Cl. 354-243.000.  
Akita, Hiroshi. Grinding wheel. 4,164,098, Cl. 51-209.00R.  
Akita, Sigeyuki; and Kitagawa, Junji, to Nippon Soken, Inc. Rotational position detector utilizing an FET blocking oscillator. 4,164,706, Cl. 324-208.000.  
Akzo N.V.: See—  
Henne, Werner; Dunweg, Gustav; Schmitz, Werner; Pohle, Raimund; and Lawitzki, Friedrich, 4,164,437, Cl. 156-167.000.  
Noomen, Aric; and Wolters, Egbert, 4,164,459, Cl. 204-159.180.  
Akzona Incorporated: See—  
Siggel, Erhard; Wick, Gerhard; Linhart, Heinz; and Kessler, Erich, 4,164,603, Cl. 428-398.000.  
Alafandi, Hamid; and Stamires, Dennis, to Filtrol Corporation. Rare earth exchange X zeolites, catalyst employing the same and method for producing the same. 4,164,483, Cl. 252-455.00Z.  
Albany International Corp.: See—  
Renjilian, Armen; Nichols, Donald S.; and Hartigan, Richard J., Jr., 4,164,530, Cl. 264-103.000.  
Alco Standard Corporation: See—  
Cooper, Troy L., 4,164,492, Cl. 260-40.00R.  
Allen-Bradley Company: See—  
Brandt, Ivan L.; von Alten, Theodor; Voss, Richard E.; and Denes, Oscar L., 4,164,067, Cl. 29-620.000.  
Allen, David J., to E. T. Oakes Limited. In-line mixer. 4,164,375, Cl. 366-337.000.  
Allied Chemical Corporation: See—  
Patel, Gordhanbhai N., 4,164,458, Cl. 204-159.170.  
Van Peppen, Jan F.; and Fisher, William B., 4,164,515, Cl. 260-586.00P.  
Allington, William B., deceased (by Emery; executor, Richard T.); Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., to Instrumentation Specialties Company. Sample concentrator. 4,164,464, Cl. 204-299.00R.  
Amari, Hiroshi: See—  
Tamai, Yasuo; Fujiyama, Masaaki; and Amari, Hiroshi, 4,164,604, Cl. 428-409.000.  
Amerace Corporation: See—  
Silva, Frank A., 4,164,621, Cl. 174-78.000.  
American Air Filter Company, Inc.: See—  
Kannapell, David H., 4,164,399, Cl. 55-223.000.  
Onnen, James H., 4,164,211, Cl. 126-285.00A.  
Simko, Alexander P., 4,164,547, Cl. 423-242.000.  
American Can Company: See—  
Adams, James W.; and Reinke, Orville H., 4,164,595, Cl. 427-341.000.  
Meyers, George L.; and Gorshe, Thomas M., 4,164,171, Cl. 93-49.00R.  
American Cyanamid Company: See—  
Goodman, Richard M., 4,164,521, Cl. 525-187.000.  
Kamesaran, Venkataraman; and Addor, Roger W., 4,164,415, Cl. 71-114.000.  
Los, Marinus; and Walworth, Bryant L., 4,164,404, Cl. 71-77.000.  
Nandagiri, Arun; Tripathi, Uma; and Hunter, LeRoy, 4,164,562, Cl. 424-47.000.  
American National Red Cross: See—  
Hao, Yu L., 4,164,496, Cl. 260-122.000.  
American Sterilizer Company: See—  
Young, Jack H.; and Halleck, Frank E., 4,164,538, Cl. 422-26.000.  
Ames, William A., to Eastman Kodak Company. Terpolymer compositions useful as pressure-sensitive adhesives. 4,164,614, Cl. 526-264.000.  
Amey, Arnold, to Tom McGuane Industries, Inc. Fuel pressure regulator assembly. 4,164,237, Cl. 137-510.000.  
AMP Incorporated: See—  
Cobaugh, Robert F.; and Doty, Donald J., 4,164,362, Cl. 339-17.00M.  
Amsbury, Clifford R.; and Warren, Eric, to Rolls-Royce Limited. Means for indicating the profile of a workpiece. 4,164,694, Cl. 318-578.000.  
AMSTED Industries Incorporated: See—  
Sandor, Louis; and Wendt, Albert T., 4,164,141, Cl. 73-81.000.  
Anami, Takayuki: See—  
Fukuoka, Kenji; and Anami, Takayuki, 4,164,762, Cl. 358-304.000.  
Anchor Hocking Corporation: See—  
Muller, Jean A.; and Shilling, Ray A., 4,164,287, Cl. 211-134.000.  
Anderegg, Max; and Rutimann, Kurt, to Feller AG. Method and apparatus for sheet transport in automatic reading equipment. 4,164,649, Cl. 235-480.000.  
Anderson, Marvin H.: See—  
Kneip, George D., Jr.; Anderson, Marvin H.; and Gang, Robert E., 4,164,777, Cl. 361-331.000.  
Anderson, Ralph A., to Bourns, Inc. Ultrasonic amplifier detector. 4,164,143, Cl. 73-194.0VS.  
Anderson, Willis H.: See—  
Sheridan, John J.; Graddy, Willard E.; and Anderson, Willis H., 4,164,633, Cl. 200-4.000.  
Anderten, John R.; and Peter, Glen O., to Energy Controls, Inc. Method and apparatus for ventilating an occupied space. 4,164,172, Cl. 98-33.00R.  
Anselrode, Lodewijk, to Stork Brabant B.V. Apparatus for printing materials. 4,164,746, Cl. 346-140.00R.  
Anthony, Donald R.; Bone, Lee, III; and Price, William G., to Atlantic Richfield Company. Internal protection of well casing. 4,164,257, Cl. 166-113.000.  
Apura GmbH: See—  
Baumann, Manfred; and Besserer, Walter, 4,164,178, Cl. 100-99.000.  
Aranguren, William L., to Bell Telephone Laboratories, Incorporated. Multiple microprocessor intercommunication arrangement. 4,164,787, Cl. 364-200.000.  
Arato, Laszlo F.: See—  
Barothy, Janos, 4,164,047, Cl. 4-172.110.  
ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A.: See—  
Wagner, Armand, 4,164,469, Cl. 210-40.000.  
Arbrook, Inc.: See—  
Dorman, Henry P., 4,164,285, Cl. 206-306.000.  
Archifar Laboratori Chimico Farmacologici S.p.A.: See—  
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,164,499, Cl. 260-239.30P.  
Armand, Marcel; and Charquet, Daniel, to Ugine Aciers. Master alloy for the preparation of zirconium alloys. 4,164,420, Cl. 75-175.00R.  
Armster, Joachim: See—  
Schumacher, Wilhelm; Rothbuhl, Lothar; and Armster, Joachim, 4,164,423, Cl. 106-20.000.  
Arndt, Friedrich; and Boroschewski, Gerhard, to Schering Aktiengesellschaft. N-methylcarbanilic-[3-(ethoxycarbonylamino)-phenyl]-ester as a cotton herbicide. 4,164,414, Cl. 71-111.000.  
Arnold, William L.; and Wilson, Harry M., Jr. Safety cradle for transformer repair. 4,164,345, Cl. 269-69.000.  
Aron, Milton, to De Laval Turbine Inc. Self-powered electrical meter for display of a liquid-level or the like measurement. 4,164,145, Cl. 73-293.000.  
Armonson, Bernard S.; Herczog, Andrew; and Murphy, James A., to Corning Glass Works. Process of forming a solid tantalum capacitor. 4,164,455, Cl. 204-38.00A.  
Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Miyata, Katsuhiko, 4,164,368, Cl. 354-23.00R.



- Urano, Fumio; and Takahashi, Norimichi, 4,164,369, Cl. 354-219.000.
- Asami, Kazuto: See—  
Nakai, Shiro; Asami, Kazuto; and Matono, Hirokuni, 4,164,232, Cl. 133-8.00R.
- Asanomi, Koji; Takemoto, Yasunori; and Kobayashi, Kazuo, to Toyo Kogyo Co., Ltd. Internal combustion engine having a dual induction type intake system. 4,164,205, Cl. 123-117.00R.
- Asanomi, Koji: See—  
Okitsu, Kingo; Asanomi, Koji; Harada, Setsuo; and Takemoto, Yasunori, 4,164,207, Cl. 123-119.00A.  
Okitsu, Kingo; Asanomi, Koji; Harada, Setsuo; and Takemoto, Yasunori, 4,164,208, Cl. 123-119.00A.
- Ashworth, Billy R., to United States of America, National Aeronautics and Space Administration. Seat cushion to provide realistic acceleration cues to aircraft simulator pilot. 4,164,079, Cl. 35-12.00E.
- Atari, Inc.: See—  
Stubben, David R., 4,164,759, Cl. 358-180.000.
- Atlantic Richfield Company: See—  
Anthony, Donald R.; Bone, Lee, III; and Price, William G., 4,164,257, Cl. 166-113.000.
- Auerbach, Albert A., to Medalert Corporation. Rate failure indicator. 4,164,227, Cl. 128-419.0PT.
- Austin, Lloyd M.: See—  
Gulledge, Charles P.; Austin, Lloyd M.; and Stephens, James B., 4,164,701, Cl. 324-51.000.
- Azcarate de Morgan, Esther; Morgan-Landa, David; and Becerra-Lopez, Jose L. Rectilinear sliding panel display for successively exposing different printed pictures. 4,164,086, Cl. 40-476.000.
- Baker, Exzelon F. Die-resembling game cube. 4,164,351, Cl. 273-144.00B.
- Baker, Jerry L.: See—  
Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.
- Baker, T. R.: See—  
Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.
- Bakul, Valentin N.; Vovchanovsky, Ivan F.; and Tsybin, Nekhemian V. Method of making superhard articles. 4,164,527, Cl. 264-60.000.
- Balaban, Alvin R.: See—  
Steckler, Steven A.; and Balaban, Alvin R., 4,164,711, Cl. 325-464.000.
- Baldwin, Roger A.; Davis, Robert E.; Leonard, Robert E.; and Rhodes, Donald E., to Kerr-McGee Corporation. Method of improving yield in a coal liquefaction product deashing process. 4,164,466, Cl. 208-177.000.
- Barger, Frank L.: See—  
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,164,450, Cl. 196-14.520.
- Barmag Barmer Maschinenfabrik AG: See—  
Hertell, Siegfried, 4,164,384, Cl. 418-47.000.
- Barna, Ivan J. Decorative ring-like structure and method of making same. 4,164,058, Cl. 24-1.000.
- Barnard & Leas Mfg. Co.: See—  
Dorwin, John J., 4,164,297, Cl. 414-481.000.
- Barnert, Heiko; Perec, Mieczyslaw; and Struck, Bernd D., to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung. Method of recovering hydrogen and oxygen from water. 4,164,457, Cl. 204-129.000.
- Barnett, John S.: See—  
Birick, Vahram W.; Chun, Kang R.; Gresko, Laurence S.; and Barnett, John S., 4,164,677, Cl. 313-35.000.
- Barothy, Janos; to Arato, Laszlo F., a part interest. Multipurpose gymnasium. 4,164,047, Cl. 4-172.110.
- Barrows, Robert E.: See—  
Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Otausky, Paul; Thackaberry, Harold; and Barrows, Robert E., 4,164,766, Cl. 360-97.000.  
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Otausky, Paul; Thackaberry, Harold; and Barrows, Robert E., 4,164,769, Cl. 360-106.000.
- Barry, Veryl D.: See—  
Marnett, Lawrence F.; and Barry, Veryl D., 4,164,593, Cl. 426-653.000.
- Bartelmuss, Heinrich. Abrasion-resistant plate. 4,164,442, Cl. 162-352.000.
- Bartonitschek, Norbert: See—  
Kraemling, Franz; Bartonitschek, Norbert; Mattes, Gunther; and Nieven, Jakob, 4,164,107, Cl. 52-232.000.
- BASF Aktiengesellschaft: See—  
Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, 4,164,511, Cl. 260-465.00E.  
Hoene, Richard; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,164,613, Cl. 526-201.000.  
Patsch, Manfred; and Hettche, Albert, 4,164,500, Cl. 260-239.900.
- BASF Wyandotte Corporation: See—  
Raczynski, Michael E.; and Streiff, William G., 4,164,300, Cl. 220-94.00R.
- Baumann, Manfred; and Besserer, Walter, to Apura GmbH. Container, closable by a lid, for receiving and compressing waste. 4,164,178, Cl. 100-99.000.
- Baumgartner, Klaus, to Messer Griesheim GmbH. Process and device for room cooling. 4,164,127, Cl. 62-98.000.
- Baumgartner Papiers S.A.: See—  
Lebet, Jean-Pierre, 4,164,438, Cl. 156-180.000.
- Baverstock, John L.: See—  
Kato, Makoto; Velie, Larry N.; and Baverstock, John L., 4,164,704, Cl. 324-73.0PC.
- Baxter Travenol Laboratories, Inc.: See—  
Boggs, Daniel R., 4,164,318, Cl. 233-26.000.
- Bayer Aktiengesellschaft: See—  
Hoffmann, Hellmut; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,164,575, Cl. 424-216.000.  
Kuhnlein, Hans L.; and Muller, Wolfgang-Dieter, 4,164,441, Cl. 159-13.00A.
- Baymiller, Judith: See—  
Sheehan, Brian T.; Baymiller, Judith; and Elitz, Robert W., 4,164,445, Cl. 435-46.000.
- Beall, George H.; and Reade, Richard F., to Corning Glass Works. Glasses exhibiting high lithium ion mobility. 4,164,610, Cl. 429-193.000.
- Bean, Mervyn L.; and Price, Samuel, to Vickers Limited. Safety apparatus for firing equipment. 4,164,165, Cl. 89-134.000.
- Beasley, Donald R., to Norfield Corporation. Apparatus for forming expanded panels. 4,164,389, Cl. 425-406.000.
- Beatty, Bobby D.; Daniel, Russell D.; and Humerickhouse, Billy J., to United States of America, Navy. Submarine signal fuze. 4,164,186, Cl. 102-37.800.
- Beaucamp, Klaus: See—  
Roeschlau, Peter; Lang, Gunter; Beaucamp, Klaus; Berni, Erich; and Gruber, Wolfgang, 4,164,448, Cl. 435-11.000.
- Becerra-Lopez, Jose L.: See—  
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- Beckman Instruments, Inc.: See—  
Blanke, John D., 4,164,142, Cl. 73-118.000.
- Beechamgroup Limited: See—  
Bywater, Robert J., 4,164,568, Cl. 424-153.000.
- Begnaud, John D.: See—  
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Wadleigh, Edward R., 4,164,367, Cl. 353-26.00R.
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Biazzo, Martin R.; and Dick, George W., 4,164,678, Cl. 313-220.000.
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Sheinin, Evgeny I.; Belostotskaya, Nelli S.; and Yakovlev, Lev N., 4,164,198, Cl. 118-315.000.
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Gollomp, Bernard P., 4,164,786, Cl. 364-200.000.  
Toelle, Alvin D., 4,164,206, Cl. 123-119.00A.
- Benedek, George B.: See—  
von Schulthess, Gustav K.; Cohen, Richard J.; and Benedek, George B., 4,164,558, Cl. 424-12.000.
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Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Dantzer, Elionne, 4,164,092, Cl. 46-123.000.
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Baumann, Manfred; and Besserer, Walter, 4,164,178, Cl. 100-99.000.
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Ikushima, Heizi; Nakano, Hiroto; Igusa, Kazuo; and Bessho, Sadao, 4,164,569, Cl. 424-174.000.
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Gerdes, Theodor, 4,164,302, Cl. 220-210.000.
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- Blom, Hubert P., to General Motors Corporation. Seat belt retractor with pivoted locking mechanism. 4,164,337, Cl. 242-107.40A.
- Blumbers, John H.: See—  
Finley, Joseph H.; and Blumbers, John H., 4,164,395, Cl. 8-111.000.
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Simpson, Robert D., 4,164,340, Cl. 244-186.000.
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Arndt, Friedrich; and Boroschewski, Gerhard, 4,164,414, Cl. 71-111.000.
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Duttine, Walter; Kratz, Helmut; Bosch, Harald; and Steigerwald, Gerhard, 4,164,280, Cl. 198-781.000.
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Walling, Jorg-Hein; and Bouffard, Jean, 4,164,245, Cl. 141-250.000.
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Anderson, Ralph A., 4,164,143, Cl. 73-194.0VS.
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Blackburn, James C.; and Bromborsky, Alan, 4,164,650, Cl. 250-199.000.
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Myron, Clayton E., 4,164,338, Cl. 244-118.00R.
- Brooks, Robert J.: See—  
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Herr, John A.; Brown, Jack; Peterson, Wesley R.; and Jaffe, Wolfgang, 4,164,192, Cl. 112-158.00E.
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Nudelmann, Boris I.; Svetsitsky, Alexandr S.; Bikbau, Marsel Y.; Bun, Isaak M.; and Kevvai, Arnold A., 4,164,425, Cl. 106-89.000.
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Gallagher, David A., 4,164,636, Cl. 200-51.00R.
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Gyl, Ko K.; and Ragle, Herbert U., 4,164,767, Cl. 360-98.000.
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Marnett, Lawrence F.; and Barry, Veryl D., 4,164,593, Cl. 426-653.000.
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Bollen, Romain F., 4,164,720, Cl. 335-47.000.
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Leder, Frederic; and Cahn, Robert P., 4,164,556, Cl. 423-569.000.
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Iwasaki, Richard S., 4,164,718, Cl. 333-81.00R.
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Toyomura, Sigeru; and Kawanabe, Tsuyoshi, 4,164,789, Cl. 364-710.000.
- Capitol Records, Inc.: See—  
Hunyar, Csaba K., 4,164,075, Cl. 33-174.00Q.
- CarboMedics, Inc.: See—  
Bokros, Jack C.; Shim, Hong S.; and Haubold, Axel D., 4,164,045, Cl. 3-1.400.
- Carborundum Company, The: See—  
Carpenter, James H.; and Corderman, Donald G., 4,164,104, Cl. 51-432.000.
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Sawyer, Philip N.; and Freeman, Leon D., 4,164,585, Cl. 424-280.000.
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Sprengling, Gerhard R.; and Cargnel, Louis A., 4,164,619, Cl. 174-52.0PE.



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 Carrier Corporation: See—  
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 Carrigan, Robert J., to Westvaco Corporation. Universal die mounting plate system. 4,164,076, Cl. 33-181.00R.  
 Carroll, Joseph P.: See—  
 Sierrett, John P.; Carroll, Joseph P.; and Creager, Richard A., 4,164,093, Cl. 47-57.500.  
 Casasanta, Salvatore J., to Wiremold Company. The Plug-in service pole assembly. 4,164,618, Cl. 174-48.000.  
 Catanesi, Carmen A., to RCA Corporation. Image display device with ion feedback control and method of operating the same. 4,164,681, Cl. 313-400.000.  
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 Muller, Thomas P.; and Blatner, Philip J., 4,164,780, Cl. 362-64.000.  
 Cavanagh, Eric J., to Lucas Industries Limited. Fuel pump injector. 4,164,203, Cl. 123-32.0JV.  
 Cazaux, Pierre: See—  
 Hagenbach, Germain; and Cazaux, Pierre, 4,164,490, Cl. 260-33.6UA.  
 Cenko, John; and Pechauer, Thomas C., to General Motors Corporation. Process for forming bearing locking collar. 4,164,063, Cl. 29-420.500.  
 Centra-Burkle GmbH & Co.: See—  
 Berger, Hans, 4,164,665, Cl. 307-141.000.  
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 Ogino, Kiyoshi, 4,164,534, Cl. 264-117.000.  
 Central Soya Company, Inc.: See—  
 Kadane, Victor V.; Meyer, Edwin W.; and Whitney, Robert W., 4,164,589, Cl. 426-281.000.  
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 Smith, Leonard S., 4,164,723, Cl. 336-133.000.  
 Chambers, Robert V.: See—  
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 Charquet, Daniel: See—  
 Armand, Marcel; and Charquet, Daniel, 4,164,420, Cl. 75-175.00R.  
 Chatterjea, Probr K.: See—  
 Shore, Daniel B.; and Chatterjea, Probr K., 4,164,276, Cl. 192-13.00R.  
 Chem-X3, Inc.: See—  
 Whitley, Elmer E., 4,164,477, Cl. 252-99.000.  
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 Simic, Milutin, 4,164,428, Cl. 106-287.130.  
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 Binet, Raymond; Chielens, Alain; and Lebegue, Maurice, 4,164,255, Cl. 165-82.000.  
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 Ikushima, Heizi; Nakano, Hiroto; Igusa, Kazuo; and Bessho, Sadao, 4,164,569, Cl. 424-174.000.  
 Chun, Kang R.: See—  
 Birick, Vahram W.; Chun, Kang R.; Gresko, Laurence S.; and Barnett, John S., 4,164,677, Cl. 313-35.000.  
 Chung, Daniel A., to Goodyear Tire & Rubber Company. The Polyurethane tire and wheel assembly. 4,164,251, Cl. 152-323.000.  
 Ciba-Geigy Corporation: See—  
 Ehrenfreund, Josef, 4,164,403, Cl. 71-76.000.  
 Schmidt, Andreas; Illy, Hugo; Kirchmayr, Rudolf; and Schmitter, Andre, 4,164,611, Cl. 521-89.000.  
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 Cincinnati Milacron Inc.: See—  
 Howard, Walter D.; and McDonald, David I., 4,164,391, Cl. 432-124.000.

CIR-S.p.A-Divisione SASIB: See—  
 Gurioli, Pasquino, 4,164,278, Cl. 198-487.000.  
 Clark, Donald Y. Grain spreader. 4,164,327, Cl. 239-669.000.  
 Clark Equipment Company: See—  
 Williamson, William A., 4,164,137, Cl. 73-19.000.  
 Clavell, Jack: See—  
 Young, John; Clavell, Jack; and Gaskill, George, 4,164,719, Cl. 335-14.000.  
 Clavin, Edward A., to Midcon Pipeline Equipment Co. Rotary internal pipe bending mandrel. 4,164,135, Cl. 72-466.000.  
 Clay, Edward L.; and Baker, Jerry L., to Baker, T. R.; McCarty, F. Walter, Jr.; Jacobs, Norman E.; Ludwikowski, Edward N.; McBurney, C. Alex; Steffen, Lawrence F.; Cooper Corporation, The; H & K Sales Company, Inc.; Phoenix Royalty Associates, Inc.; and Clay, Edward L., by said Edward L. Clay and Jerry Lee Baker. Natural sandwich of filled polyurethane foam. 4,164,526, Cl. 264-45.300.  
 Clay, Edward L.: See—  
 Clay, Edward L.; and Baker, Jerry L. (said Edward L. Clay and Jerry Lee Baker assors. to), 4,164,526, Cl. 264-45.300.  
 Clear Day, Inc.: See—  
 Jones, Paul; and Scheffer, John H., 4,164,268, Cl. 182-150.000.  
 Clough, David; and Ruder, Gary C. F. Stabilized aqueous catecholamine solutions. 4,164,570, Cl. 424-175.000.  
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 Cohen, Richard J.: See—  
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 Collin, Lars; and Landalv, Henrik. Exhaust gas muffler. 4,164,266, Cl. 181-250.000.  
 Collins, Johnny, to Zenith Radio Corporation. Continuous counting system. 4,164,712, Cl. 328-48.000.  
 Combustion Engineering, Inc.: See—  
 Gibbons, John F.; and Hellens, Robert L., 4,164,443, Cl. 176-50.000.  
 Combustion Turbine Power, Inc.: See—  
 Taylor, David W.; and Fulton, Garland L., 4,164,124, Cl. 60-683.000.  
 Commissariat a l'Energie Atomique: See—  
 Bonfils, Serge J. E.; Dubrasquet, Juliette M.; Fromageot, Pierre; Girma, Jean P.; Lewin, Miguel; and Morgat, Jean L., 4,164,571, Cl. 424-177.000.  
 Compagnie Generale d'Electricite: See—  
 Jacquelin, Jean, 4,164,453, Cl. 204-10.000.  
 Compagnie Industrielle Des Telecommunications Cit-Alcatel: See—  
 Ollivier, Yves; and Jacob, Michel, 4,164,629, Cl. 179-15.0BS.  
 Conachev, Eileen. Combination infant and child seat. 4,164,357, Cl. 297-250.000.  
 Constant, James N. Synthetic aperture using image scanner. 4,164,740, Cl. 343-5.0CM.  
 Continental Group, Inc.: See—  
 Flajnik, Louis, 4,164,283, Cl. 198-840.000.  
 Harned, Frederick G., 4,164,312, Cl. 229-15.000.  
 Roberson, Carl, 4,164,304, Cl. 220-465.000.  
 Continental Oil Company: See—  
 Fair, Delbert W., 4,164,264, Cl. 181-119.000.  
 Kulik, Metro D., 4,164,554, Cl. 423-567.00A.  
 Cookson, Alan H.; and Bolin, Philip C., to Electric Power Research Institute, Inc. Welded joint in segmented sheath for compressed gas insulated transmission lines. 4,164,243, Cl. 138-162.000.  
 Cooley, Denton A. Valve prosthesis. 4,164,046, Cl. 3-1.500.  
 Coonrod, William C., to Fibergate Corporation. Apparatus for fabricating continuous fiber reinforced plastic grating articles. 4,164,439, Cl. 156-441.000.  
 Cooper Corporation, The: See—  
 Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.  
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 Corderman, Donald G.: See—  
 Carpenter, James H.; and Corderman, Donald G., 4,164,104, Cl. 51-432.000.  
 Cordry, Arthur L.: See—  
 Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,164,464, Cl. 204-299.00R.  
 Cornell Research Foundation, Inc.: See—  
 Miyata, Teruo; Rubin, Albert L.; Stenzel, Kurt H.; and Dunn, Michael W., 4,164,559, Cl. 424-14.000.  
 Corning Glass Works: See—  
 Aronson, Bernard S.; Herczog, Andrew; and Murphy, James A., 4,164,455, Cl. 204-38.00A.  
 Beall, George H.; and Reade, Richard F., 4,164,610, Cl. 429-193.000.  
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 Costello, Edward C.: See—  
 Simon, David J.; and Costello, Edward C., 4,164,729, Cl. 340-347.0SY.

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 Courtesy Interstate Corporation: See—  
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 Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Dantzer, Elonne, 4,164,092, Cl. 46-123.000.  
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 Korenowski, Theodore F., 4,164,456, Cl. 204-52.00R.  
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 Nelson, Kurt, 4,164,317, Cl. 233-20.00A.  
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 Kaufmann, Karl E., 4,164,187, Cl. 104-93.000.  
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 Feldmann, Martin; Koberstein, Edgar; and Seibold, Klaus, 4,164,557, Cl. 423-600.000.  
 Laufer, Siegmund, 4,164,509, Cl. 260-448.80R.  
 Schumacher, Wilhelm; Rothbuhr, Lothar; and Armster, Joachim, 4,164,423, Cl. 106-20.000.  
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 Freude, Paul, 4,164,744, Cl. 346-140.00A.  
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 Knepler, John T., 4,164,669, Cl. 310-15.000.  
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 Burstein, Norman; and Ditzler, Richard C., 4,164,175, Cl. 99-446.000.  
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 Hanson, Cameron; and Dixon, Benjamin, 4,164,054, Cl. 15-210.00B.  
 Docutel Corporation: See—  
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 Marx, Arthur F.; and Doodewaard, Jean, 4,164,446, Cl. 435-63.000.  
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 Johnson, Charles E., 4,164,342, Cl. 251-28.000.  
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 Selmecci, Joseph G., 4,164,549, Cl. 423-242.000.  
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- Dunweg, Gustav: See—  
Henne, Werner; Dunweg, Gustav; Schmitz, Werner; Pohle, Raimund; and Lawitzki, Friedrich, 4,164,437, Cl. 156-167.000.
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Fang, James C., 4,164,463, Cl. 204-296.000.
- Gregorovich, Basil V.; and Sanderson, James J., 4,164,488, Cl. 260-29.4UA.
- Weigert, Frank J., 4,164,552, Cl. 423-376.000.
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Wallach, Ira, 4,164,319, Cl. 235-1.00E.
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Jackson, Charles E., 4,164,269, Cl. 182-229.000.
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Chen, James L., 4,164,564, Cl. 424-83.000.
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Allen, David J., 4,164,375, Cl. 366-337.000.
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Ames, William A., 4,164,614, Cl. 526-264.000.
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- McGrain, Thomas M., 4,164,347, Cl. 271-3.100.
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Jeffers, Frederick J., 4,164,770, Cl. 360-113.000.
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Houseman, Henry J.; and Nowicki, Richard W., 4,164,121, Cl. 60-486.000.
- Kaiser, Hermann; Nellums, Richard A.; and Olson, Jerry A., 4,164,144, Cl. 73-213.000.
- Neuman, Richard F., 4,164,272, Cl. 188-196.00D.
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Cookson, Alan H.; and Bolin, Philip C., 4,164,243, Cl. 138-162.000.
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Michael, Harald R., 4,164,049, Cl. 4-300.000.
- Elenbaas, Ronald A.: See—  
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Hagenbach, Germain; and Cazaux, Pierre, 4,164,490, Cl. 260-33.6UA.
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Jensen, Henry E., 4,164,609, Cl. 429-183.000.
- Eltz, Robert W.: See—  
Sheehan, Brian T.; Baymiller, Judith; and Eltz, Robert W., 4,164,445, Cl. 435-46.000.
- Emery, executor, Richard T.: See—  
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,164,464, Cl. 204-299.00R.
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Marsh, Robin G., 4,164,724, Cl. 340-146.30Q.
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Anderten, John R.; and Peter, Glen O., 4,164,172, Cl. 98-33.00R.
- Enon Valley Industries, Inc.: See—  
McElroy, Eugene L., 4,164,273, Cl. 188-218.00A.
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Briccetti, Mario F.; and Eplett, Fredrick R., 4,164,763, Cl. 360-32.000.
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Bouvin, Jacques, 4,164,390, Cl. 431-75.000.
- Everest & Jennings, Inc.: See—  
Rodaway, Keith S., 4,164,354, Cl. 280-42.000.
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- Lockett, William, Jr., 4,164,202, Cl. 122-31.00R.
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- Fair, Delbert W., to Continental Oil Company. High pressure sealing apparatus. 4,164,264, Cl. 181-119.000.
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Steeb, William R.; LeVeau, Robert W.; and Falck, Michael J., 4,164,085, Cl. 40-152.000.
- Fang, James C., to Du Pont de Nemours, E. I., and Company. Hydrophilic fluoropolymers. 4,164,463, Cl. 204-296.000.
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Bourzat, Jean D.; Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, 4,164,579, Cl. 424-263.000.
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Sutherland, Robert L., 4,164,286, Cl. 206-434.000.
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Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Otausky, Paul; Thackaberry, Harold; and Barrows, Robert E., 4,164,766, Cl. 360-97.000.
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Anderegg, Max; and Rutimann, Kurt, 4,164,649, Cl. 235-480.000.
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Palazzetti, Mario, 4,164,660, Cl. 290-2.000.
- Fiber Industries, Inc.: See—  
Talbot, James R., 4,164,117, Cl. 57-289.000.
- Fibergate Corporation: See—  
Conrod, William C., 4,164,439, Cl. 156-441.000.
- Filtrol Corporation: See—  
Alafandi, Hamid; and Stamires, Dennis, 4,164,483, Cl. 252-455.00Z.
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- Fisher, William B.: See—  
Van Peppen, Jan F.; and Fisher, William B., 4,164,515, Cl. 260-586.00P.
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Brubaker, Gaylen R.; and Scholer, Fred R., 4,164,394, Cl. 8-107.000.
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- Forster, Franz: See—  
Tragl, Wilfried; and Forster, Franz, 4,164,169, Cl. 91-504.000.
- Foster Wheeler Energy Corporation: See—  
Steiner, Peter, 4,164,555, Cl. 423-569.000.
- Frankowiak, Sigismund: See—  
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Sawyer, Philip N.; and Freeman, Leon D., 4,164,585, Cl. 424-280.000.
- Freiberg, Robert J.: See—  
Sziklas, Edward A.; and Freiberg, Robert J., 4,164,366, Cl. 350-299.000.
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- Frenz, Norbert W.: See—  
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- Freude, Paul, to Dia-Nielsen GmbH Zubehor fur die Messtechnik. Disposable printing head for recording measuring instruments, and the like. 4,164,744, Cl. 346-140.00A.
- Frey, Paul H.; and Kupcikevicius, Vytautas, to Union Carbide Corporation. Food casing stuffing sizing control method. 4,164,057, Cl. 17-49.000.
- Frigeni, Gianfranco. Immersion apparatus carrying detachable and self-contained prospecting and submarine work units. 4,164,195, Cl. 114-322.000.
- Fritz, William E.; Graves, Mark L.; and Seitz, Robert F., to Youngstown Steel Door Company, The. Door assemblies for closing rail car end opening. 4,164,189, Cl. 105-378.000.
- Fromageot, Pierre: See—  
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- Frosien, Jurgen; Lischke, Burkhard; and Oelmann, Andreas, to Siemens Aktiengesellschaft. Charged-particle beam optical apparatus for imaging a mask on a specimen. 4,164,658, Cl. 250-492.00A.
- Fuhr, Patti S. Tray for paint and brushes. 4,164,299, Cl. 220-20.000.
- Fuji Photo Film Co., Ltd.: See—  
Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,164,421, Cl. 96-33.000.
- Tamai, Yasuo; Fujiyama, Masaaki; and Amari, Hiroshi, 4,164,604, Cl. 428-409.000.
- Fuji Photo Optical Co., Ltd.: See—  
Doi, Yoshikazu; Katagiri, Katsuo; and Yoshikawa, Kazuo, 4,164,752, Cl. 358-55.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—  
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,164,497, Cl. 260-239.100.
- Fujita, Satoru. Fingerless glove. 4,164,043, Cl. 2-161.00A.
- Fujita, Yukio; Iwanami, Teruo; and Akamatsu, Yoshimi, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing tubular film of hydrolyzed ethylene-vinyl acetate copolymer. 4,164,529, Cl. 264-565.000.
- Fujitsu Ten Limited: See—  
Nakamura, Tadashi; Masuda, Mitsuru; and Tanaka, Hiroshi, 4,164,683, Cl. 313-496.000.
- Fujiyama, Masaaki: See—  
Tamai, Yasuo; Fujiyama, Masaaki; and Amari, Hiroshi, 4,164,604, Cl. 428-409.000.
- Fukuda, Takeshi: See—  
Itoh, Kunio; and Fukuda, Takeshi, 4,164,491, Cl. 260-37.05B.
- Fukuoka, Kenji; and Anami, Takayuki, to Olympus Optical Co., Ltd. Facsimile control apparatus. 4,164,762, Cl. 358-304.000.
- Fuller, George, to I.S.C. Chemicals Limited. Preparation of fluoronitrobenzene. 4,164,517, Cl. 260-646.000.
- Fulton, Garland L.: See—  
Taylor, David W.; and Fulton, Garland L., 4,164,124, Cl. 60-683.000.
- Funcik, Jack F.; and Wright, Steven F., to Molex Incorporated. Crimping and wire lead insertion machine having improved insertion means. 4,164,065, Cl. 29-564.600.
- Funk, Gary L., to Phillips Petroleum Company. Pressure responsive fractionation control. 4,164,451, Cl. 203-2.000.
- Funk, Gary L.; and Smith, Dexter E., to Phillips Petroleum Company. Pressure responsive fractionation control. 4,164,452, Cl. 203-2.000.
- Funk, Norbert J.; and Puschel, Siegfried, to Linde Aktiengesellschaft. Control device for combustion engine. 4,164,120, Cl. 60-431.000.
- Furuno, Akihisa: See—  
Suzuki, Naoyuki; Wada, Yoji; and Furuno, Akihisa, 4,164,612, Cl. 526-62.000.
- Furuta, Takuya: See—  
Kende, Andrew S.; Tsay, Yuh-Geng; and Furuta, Takuya, 4,164,503, Cl. 260-365.000.
- G.M.C. Research, Inc.: See—  
Bernecker, Gunther, 4,164,525, Cl. 261-41.00B.
- Galinsky, Alvin M. Composition and method for making a suppository for introducing a hypoglycemic agent into a mammal. 4,164,573, Cl. 424-178.000.
- Gallacher, Lawrence V.; and King, Robert G., to King Industries, Inc. Process for producing metal salts of oil-soluble organosulfonic acids. 4,164,474, Cl. 252-33.000.
- Gallagher, David A., to Bunker Ramo Corporation. Integral electrical shorting switch and connector assembly. 4,164,636, Cl. 200-51.00R.
- Gamble, Bruce B., to General Electric Company. Resistor-containing cryogenic current lead. 4,164,671, Cl. 310-52.000.
- Gamble, Bruce B.: See—  
Laskaris, Evangelos T.; Gamble, Bruce B.; and Hatch, Burton D., 4,164,126, Cl. 62-55.000.
- Gambling, Kenneth H., to Set 'N' Forget Products Pty. Ltd. Feeding device. 4,164,200, Cl. 119-51.120.
- Gang, Robert E.: See—  
Kneip, George D., Jr.; Anderson, Marvin H.; and Gang, Robert E., 4,164,777, Cl. 361-331.000.
- Garner, Alex V.; and Townsend, Graham, to Tannoy Products Limited. Horn loudspeaker with acoustic lens. 4,164,631, Cl. 179-115.50H.
- Garrett, Patricia E.: See—  
Whitesides, George M.; Garrett, Patricia E.; and Siegel, Merrell G., 4,164,444, Cl. 435-92.00N.
- Garvey, Daniel C., to Woodward Governor Company. Electromagnetic actuator with torque-compensating poles. 4,164,722, Cl. 335-272.000.
- Gas Research Institute: See—  
Hollowell, George T., 4,164,210, Cl. 126-110.00R.
- Gaskill, George: See—  
Young, John; Clavell, Jack; and Gaskill, George, 4,164,719, Cl. 335-14.000.
- Gatzke, Ronald D.: See—  
Finlayson, Dana C.; Gatzke, Ronald D.; and Stettiner, Robert L., 4,164,215, Cl. 128-696.000.
- Gautier, Francisco. Lady's handbag. 4,164,308, Cl. 224-45.00R.
- Gehri, Dennis C., to Rockwell International Corporation. Metal recovery process. 4,164,416, Cl. 75-72.000.
- General Atomic Company: See—  
Mysels, Karol J., 4,164,382, Cl. 415-2.000.
- General Battery Corporation: See—  
Di Giacomo, Hector L.; and Sacco, John A., 4,164,310, Cl. 228-58.000.
- General Dynamics Corporation: See—  
Reavill, Joseph A., 4,164,064, Cl. 29-468.000.
- General Dynamics Corporation Electronics Division: See—  
Thiel, Ronald A.; and Maurer, Edward H., 4,164,607, Cl. 428-621.000.



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Cooper, Glenn D.; Katchman, Arthur; and Shank, Charles P., 4,164,493, Cl. 260-42.180.  
Gamble, Bruce B., 4,164,671, Cl. 310-52.000.  
Ham, Donald M., 4,164,647, Cl. 235-91.00R.  
Klug, Frederic J.; Pasco, Wayne D.; and Prochazka, Svante, 4,164,424, Cl. 106-38.900.  
Laskaris, Evangelos T.; Gamble, Bruce B.; and Hatch, Burton D., 4,164,126, Cl. 62-55.000.  
Maher, William M., 4,164,670, Cl. 310-50.000.  
Nelson, Thomas E., 4,164,197, Cl. 116-227.000.  
Reed, Bradley O.; and Nolan, John M., 4,164,155, Cl. 74-687.000.  
Reed, Bradley O., 4,164,156, Cl. 74-687.000.  
Salem, Robert J., 4,164,735, Cl. 340-384.00E.  
General Engineering Company (Radcliffe) Limited, The: See—  
Jones, Brian, 4,164,396, Cl. 44-1.00D.  
General Motors Corporation: See—  
Blom, Hubert P., 4,164,337, Cl. 242-107.40A.  
Cenko, John; and Pechauer, Thomas C., 4,164,063, Cl. 29-420.500.  
Deckard, John I., 4,164,326, Cl. 239-585.000.  
Kondziola, Joseph D., 4,164,335, Cl. 242-107.40A.  
Sheridan, John J.; Graddy, Willard E.; and Anderson, Willis H., 4,164,633, Cl. 200-4.000.  
Georg Spiess GmbH: See—  
Liepert, Rudolf, 4,164,234, Cl. 137-51.000.  
Marass, Josef, 4,164,349, Cl. 271-250.000.  
George, Warren T. Portable blind, 4,164,089, Cl. 43-1.000.  
Gerdes, Theodor, to Blau KG Fabrik für Kraftfahrzeugeile. Closure cap having locking means, 4,164,302, Cl. 220-210.000.  
Gerstner, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Semiconductor arrangement, 4,164,747, Cl. 357-46.000.  
Gibbons, John F.; and Hellens, Robert L., to Combustion Engineering, Inc. Hydraulic fuel hold down, 4,164,443, Cl. 176-50.000.  
Gibbs, Charles G., to Gulf Oil Corporation. 1-(2,6-Dichlorobenzoyl)-3-(4-trifluoromethyl-2-thiazolyl)urea and use as insecticide, 4,164,581, Cl. 424-270.000.  
Gibbs, Dale S., to Dow Chemical Company, The. Vinylidene chloride polymer microgel powders and acrylic fibers containing same, 4,164,522, Cl. 525-305.000.  
Gilano, Michael N., to Telaris Telecommunications, Inc. Keyboard switch assembly with multiple isolated electrical engagement regions, 4,164,634, Cl. 200-5.00A.  
Gilsabind Company, The: See—  
Jones, George M., 4,164,139, Cl. 73-38.000.  
Girgis, Mikhail M., to PPG Industries, Inc. Glass fiber coating composition for glass fiber filament bundles to produce reinforcing members for elastomeric articles, 4,164,485, Cl. 260-5.000.  
Girma, Jean P.: See—  
Bonfils, Serge J. E.; Dubrasquet, Juliette M.; Fromageot, Pierre; Girma, Jean P.; Lewin, Miguel; and Morgat, Jean L., 4,164,571, Cl. 424-177.000.  
Gist Brocades N.V.: See—  
Marx, Arthur F.; and Doodewaard, Jean, 4,164,446, Cl. 435-63.000.  
Gladrow, Elroy M., to Exxon Research & Engineering Co. Hydrocarbon cracking with catalyst containing a CO oxidation promoter in ultra-stable zeolite particles, 4,164,465, Cl. 208-120.000.  
Glassman, Aaron, to Pennsylvania Sewing Research Corp. Belt-conveyor ironing machine, 4,164,083, Cl. 38-11.000.  
Glaxo Laboratories Limited: See—  
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,164,447, Cl. 435-173.000.  
Global Pollution Control Co. (1975) Ltd.: See—  
Britz, Raymond P., 4,164,470, Cl. 210-523.000.  
Glory Kogyo Kabushiki Kaisha: See—  
Nakai, Shiro; Asami, Kazuto; and Makono, Hirokuni, 4,164,232, Cl. 133-8.00R.  
Goddard, Terrence P., to Teledyne McCormick Selph, an operating div. of Teledyne Ind., Inc. Amino-substituted guanidine salts of decahydrodecaboric acid, 4,164,513, Cl. 260-564.00D.  
Godfrey, Darryl A., to Eastman Kodak Company. Stabilized hydrocarbon tackifying compositions, 4,164,427, Cl. 106-218.000.  
Goldfarb, A. E.: See—  
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Dantzer, Elonne, 4,164,092, Cl. 46-123.000.  
Goldfarb, Adolph E. Electronic quiz apparatus, 4,164,078, Cl. 35-9.00B.  
Goldfarb, Adolph E.; Benkoe, Erwin, deceased (by Benkoe, Elisabeth, executrix); and Dantzer, Elonne, to Goldfarb, A. E. Toy milkable animal figure, 4,164,092, Cl. 46-123.000.  
Goldfarb, Alexander I.: See—  
Bronovsky, Grigory A.; Bukchin, Mikhail O.; and Goldfarb, Alexander I., 4,164,061, Cl. 29-156.80B.  
Gollomp, Bernard P., to Bendix Corporation, The. Apparatus for expanding memory size and direct memory addressing capabilities of digital computer means, 4,164,786, Cl. 364-200.000.  
Gooding, David O. Foldable display container, 4,164,316, Cl. 229-41.00R.  
Goodman, Richard M., to American Cyanamid Company. Mixtures of polycationic and polyanionic polymers for scale control, 4,164,521, Cl. 525-187.000.  
Goodyear Tire & Rubber Company, The: See—  
Chung, Daniel A., 4,164,251, Cl. 152-323.000.  
Gorden, Dale I.: See—  
Whitney, Eugene C.; and Gorden, Dale I., 4,164,705, Cl. 324-158.0MG.

Gorshe, Thomas M.: See—  
Meyers, George L.; and Gorshe, Thomas M., 4,164,171, Cl. 93-49.00R.  
Gosudarstvennyy Nauchno-Issle-Dovatel'sky Institut Stroitel'noi Keramiki Niistroi'keramika: See—  
Sheinin, Evgeny I.; Belostotskaya, Nelli S.; and Yakovlev, Lev N., 4,164,198, Cl. 118-315.000.  
Gould Inc.: See—  
DeLacy, James P., 4,164,773, Cl. 361-69.000.  
Young, John; Clavell, Jack; and Gaskill, George, 4,164,719, Cl. 335-14.000.  
Gould, Donald: See—  
Hilgner, Otto L.; and Gould, Donald, 4,164,056, Cl. 17-21.000.  
Graddy, Willard E.: See—  
Sheridan, John J.; Graddy, Willard E.; and Anderson, Willis H., 4,164,633, Cl. 200-4.000.  
Graebner, Heinz, to Henry Voigt Machine Co. Inc. Eccentric ball type valve, 4,164,343, Cl. 251-315.000.  
Granahan, Edward A.; and Paulson, Carrol H., Jr., to Pneumo Corporation. Tube skin thermocouples and method of making same, 4,164,433, Cl. 136-229.000.  
Grant, Alan H. Contact lens tool, 4,164,099, Cl. 51-216.0LP.  
Grants, William V. Internal combustion engine cylinder valve assembly, 4,164,209, Cl. 123-188.0AP.  
Graves, Mark L.: See—  
Fritz, William E.; Graves, Mark L.; and Seitz, Robert F., 4,164,189, Cl. 105-378.000.  
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., to Eleanor & Wilson Greatbatch Foundation. Method of making a lithium-bromine cell, 4,164,070, Cl. 29-623.200.  
Greenleaf Corporation: See—  
Peters, Robert W., 4,164,340, Cl. 407-36.000.  
Greenwald, Jonas. Apparatus for controlling the length of cigarette to be smoked, 4,164,231, Cl. 131-192.000.  
Gregorovich, Basil V.; and Sanderson, James J., to Du Pont de Nemours & Co., Inc. Aqueous thermosetting acrylic enamel, 4,164,488, Cl. 260-29.4UA.  
Greier, Josef: See—  
Skatsche, Othmar; Fachbach, Heinz; Thien, Gerhard; List, Hans; and Greier, Josef, 4,164,262, Cl. 180-54.00A.  
Gresko, Laurence S.: See—  
Biricic, Vahram W.; Chun, Kang R.; Gresko, Laurence S.; and Barnett, John S., 4,164,677, Cl. 313-35.000.  
Griffiths, William C., to Midland-Ross Corporation. Solar energy assisted air-conditioning apparatus and method, 4,164,125, Cl. 62-2.000.  
Grimble, Brian J.; and Rouse, Michael R., to Imperial Chemical Industries Limited. Deep-freeze cabinet with transparent closure, 4,164,361, Cl. 312-236.000.  
Grise, Frederick G. J. Solid current carrying and heatable member with electric connection, 4,164,646, Cl. 219-541.000.  
Gruber, Wolfgang: See—  
Roeschla, Peter; Lang, Gunter; Beaucamp, Klaus; Berni, Erich; and Gruber, Wolfgang, 4,164,448, Cl. 435-11.000.  
Grund, Peter: See—  
Hesse, Jürgen; and Grund, Peter, 4,164,103, Cl. 51-417.000.  
Guipaud, Serge, to Societe Anonyme pour L'Equipelement Electrique des Vehicules S.E.V. MARCHEL. Simplified method and apparatus for assuring periodic control of the timing of an internal combustion engine, 4,164,204, Cl. 123-117.00R.  
Gulf Oil Corporation: See—  
Gibbs, Charles G., 4,164,581, Cl. 424-270.000.  
Gulleed, Charles P.; Austin, Lloyd M.; and Stephens, James B. Portable device for testing electrical wiring circuits and power tools and equipment, 4,164,701, Cl. 324-51.000.  
Gullfiber AB: See—  
Johansson, Jan-Olof; Korpela, Heikki; and Spacek, Karel, 4,164,160, Cl. 83-307.200.  
Gundlach, Robert W.; and Perry, David H., deceased (by Province, Joyce Perry, administratrix), to Xerox Corporation. Method and apparatus for developing an electrical image, 4,164,372, Cl. 355-3.0DD.  
Gurioli, Pasquino, to CIR-S.p.A.-Divisione SASIB. Continuous pusher device for cigarette packing machines, 4,164,278, Cl. 198-487.000.  
Gusev, Mikhail G.: See—  
Timoshenko, Alexander T.; Nazarenko, Vladimir I.; Krigman, Felix E.; and Gusev, Mikhail G., 4,164,699, Cl. 323-75.00A.  
Gustin, Jay W.: See—  
Young, Thomas A.; and Gustin, Jay W., 4,164,785, Cl. 363-50.000.  
Gustison, Robert A., to Kawecki Berylo Industries, Inc. Process for recovery of niobium values for use in preparing niobium alloy products, 4,164,417, Cl. 75-84.000.  
Guthrie, David B.: See—  
Cheng, William J.; and Guthrie, David B., 4,164,472, Cl. 252-18.000.  
Gyi, Ko K.; and Ragle, Herbert U., to Burroughs Corporation. Mass storage device, 4,164,767, Cl. 360-98.000.  
Gysling, Walter, to National Computer Systems, Inc. Carousel tape system, 4,164,765, Cl. 360-92.000.  
H & K Sales Company, Inc.: See—  
Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.  
Haas, Helmut: See—  
Kausel, Ernst; and Haas, Helmut, 4,164,328, Cl. 241-175.000.

Hada, Shigetaka: See—  
Kudo, Masayuki; Miura, Nobuo; and Hada, Shigetaka, 4,164,157, Cl. 74-860.000.  
Hagenbach, Germain; and Cazaux, Pierre, to Elf Union. Bitumen compositions containing polymers, 4,164,490, Cl. 260-33.6UA.  
Haggerty, Dennis A., to Polytop Corporation. Spray type dispensing closure, 4,164,305, Cl. 222-4.000.  
Haliewicz, Emil. Logging carriage, 4,164,289, Cl. 212-122.000.  
Hallam, Keith J.; and Knippel, Willis H., to Pullman Incorporated. Self steering railway car, 4,164,188, Cl. 105-166.000.  
Halleck, Frank E.: See—  
Young, Jack H.; and Halleck, Frank E., 4,164,538, Cl. 422-26.000.  
Hallmark Cards, Incorporated: See—  
Steeb, William R.; LeVeau, Robert W.; and Falck, Michael J., 4,164,085, Cl. 40-152.000.  
Ham, Donald M., to General Electric Company. Unidirectional register having different gear ratios for normal and reverse input drive rotation, 4,164,647, Cl. 235-91.00R.  
Hamano, Masaaki: See—  
Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,164,528, Cl. 264-62.000.  
Hammann, Ingeborg: See—  
Hoffmann, Hellmut; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,164,575, Cl. 424-216.000.  
Hammen, Philip D.; and Milne, George M., Jr., to Pfizer Inc. 2-Aminomethyleneindanone analgesic agents, 4,164,514, Cl. 260-570.50P.  
Hammer, Richard G., to Whirlpool Corporation. One-way clutch for double-acting agitator, 4,164,130, Cl. 68-133.000.  
Hanaoka, Seiji, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Printer, 4,164,181, Cl. 101-99.000.  
Hannahs, Arnold E.; and Patrick, Michael D., to Midland-Ross Corporation. Strobe lamp series triggering circuit, 4,164,679, Cl. 315-241.00R.  
Hanning, Robert. Method of injection-molding and cooling of shaped synthetic-resin bodies, 4,164,523, Cl. 264-28.000.  
Hannoschock, Kurt: See—  
Ries, Karl; Hannoschock, Kurt; and Simoneit, Gunter, 4,164,150, Cl. 73-644.000.  
Hansen, Jorgen F., to Nordisk Insulinlaboratorium. Method of recovering immunoglobulin using a polyol and an alkanolic acid, 4,164,495, Cl. 260-112.00B.  
Hanson, Cameron; and Dixon, Benjamin. Dipstick wiper, 4,164,054, Cl. 15-210.00B.  
Hao, Yu L., to American National Red Cross. Preparation of albumin using PEG and EDTA, 4,164,496, Cl. 260-122.000.  
Harada, Setsuo: See—  
Okitsu, Kingo; Asanomi, Koji; Harada, Setsuo; and Takemoto, Yasunori, 4,164,207, Cl. 123-119.00A.  
Okitsu, Kingo; Asanomi, Koji; Harada, Setsuo; and Takemoto, Yasunori, 4,164,208, Cl. 123-119.00A.  
Harju-Jeanty, Pontus A., to Kemira Oy. Synergistic fungicidal compositions, 4,164,582, Cl. 424-273.00R.  
Harned, Frederick G., to Continental Group, Inc., The. Dual purpose divider, 4,164,312, Cl. 229-15.000.  
Harrington, Joseph K.: See—  
Moore, George G. I.; and Harrington, Joseph K., 4,164,412, Cl. 71-103.000.  
Harris Corporation: See—  
Doria, Joseph J., 4,164,348, Cl. 271-221.000.  
Marciniak, John J., 4,164,159, Cl. 83-280.000.  
Smiley, Charles F., 4,164,757, Cl. 358-149.000.  
Swanson, Hilmer I., 4,164,714, Cl. 330-10.000.  
Hartert, Erwin: See—  
Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, 4,164,511, Cl. 260-465.00E.  
Hartigan, Richard J., Jr.: See—  
Renjilian, Armen; Nichols, Donald S.; and Hartigan, Richard J., Jr., 4,164,530, Cl. 264-103.000.  
Hartia, Matti O., to Oy W. Rosenlew AB. Apparatus for assembling a shadow mask and panel of a picture tube of a television receiver, 4,164,060, Cl. 29-25.190.  
Hasegawa, Hiroshi: See—  
Kimura, Shuji; Akasaka, Shigeo; Daitoku, Koichi; Hasegawa, Hiroshi; and Kimura, Makoto, 4,164,370, Cl. 354-243.000.  
Hashimoto Corporation: See—  
Hashimoto, Kazuo, 4,164,663, Cl. 307-115.000.  
Hashimoto, Kazuo, to Hashimoto Corporation. Sequential control signal generator, 4,164,663, Cl. 307-115.000.  
Hashimoto, Masashi: See—  
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,164,497, Cl. 260-239.100.  
Hassell, David A.: See—  
Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., 4,164,591, Cl. 426-523.000.  
Hastings, John A. Disposable earlobe piercing device and method for using the same, 4,164,224, Cl. 128-330.000.  
Hatch, Burton D.: See—  
Laskaris, Evangelos T.; Gamble, Bruce B.; and Hatch, Burton D., 4,164,126, Cl. 62-55.000.  
Hattori, Masao: See—  
Nishikawa, Masanori; and Hattori, Masao, 4,164,298, Cl. 215-1.00C.  
Haubner, Georg: See—  
Weckenmann, Albert; and Haubner, Georg, 4,164,730, Cl. 340-168.00R.

Haubold, Axel D.: See—  
Bokros, Jack C.; Shim, Hong S.; and Haubold, Axel D., 4,164,045, Cl. 3-1.400.  
Hauser, Peter J.; and Marco, Francis W., to Milliken Research Corporation. Textile materials having durable soil release and moisture transport characteristics and process for producing same, 4,164,392, Cl. 8-18.00R.  
Hautmann, Horst. Insect repellent, 4,164,561, Cl. 424-29.000.  
Hayashi, Hisao, to Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-ten. Cartridge locking device for an automatic gun, 4,164,088, Cl. 42-17.000.  
Hayashi, Josaburo: See—  
Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,164,528, Cl. 264-62.000.  
Haynes, Clarence C.: See—  
Remsnyder, Duane C.; and Haynes, Clarence C., 4,164,644, Cl. 219-433.000.  
Haynes, John R.: See—  
Dorn, Gordon L.; and Haynes, John R., 4,164,449, Cl. 435-30.000.  
Hch. Bertrams Aktiengesellschaft: See—  
Kuhnlein, Hans L.; and Muller, Wolfgang-Dieter, 4,164,441, Cl. 159-13.00A.  
Heinrich, Theodore M., to Westinghouse Electric Corp. Wireless emergency power interrupting system for multibranch circuits, 4,164,771, Cl. 361-1.000.  
Heintz, Frieder; and Jansche, Walter, to Robert Bosch GmbH. Vibration rejecting impact sensor, particularly to trigger a vehicular collision safety system, 4,164,263, Cl. 280-735.000.  
Heitmann, Jürgen; and Maly, Hans-Peter, to Robert Bosch GmbH. Method and apparatus for digitally encoding color video signals having quadrature modulated subcarriers, 4,164,749, Cl. 358-13.000.  
Hellens, Robert L.: See—  
Gibbons, John F.; and Hellens, Robert L., 4,164,443, Cl. 176-50.000.  
Henkel Kommanditgesellschaft auf Aktien: See—  
Finkensiep, Friedhelm, 4,164,385, Cl. 425-204.000.  
Reinwald, Elmar; Smolka, Heinz; and Schwuger, Milan J., 4,164,430, Cl. 134-13.000.  
Henne, Werner; Dunweg, Gustav; Schmitz, Werner; Pohle, Raimund; and Lawitzki, Friedrich, to Akzo N.V. Method of producing dialyzing membrane, 4,164,437, Cl. 156-167.000.  
Henrich KG, Firma: See—  
Henrich, Werner, 4,164,331, Cl. 242-25.00R.  
Henrich, Werner, to Henrich KG, Firma. Slide guide device for moving wire and the like, 4,164,331, Cl. 242-25.00R.  
Henry Voigt Machine Co. Inc.: See—  
Graebner, Heinz, 4,164,343, Cl. 251-315.000.  
Herbst, Walter B.; and Lazar, Ralph M., to Tenneco Chemicals, Inc. Frame structure, 4,164,105, Cl. 52-202.000.  
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Herr, John A.; Brown, Jack; Peterson, Wesley R.; and Jaffe, Wolfgang, to Singer Company, The. Sewing machine motor speed limiting by pattern selection, 4,164,192, Cl. 112-158.00E.  
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Hervig, Harold C., to Minnesota Mining and Manufacturing Company. Insulative corona discharge suppressing sheath for high voltage cable splices, 4,164,620, Cl. 174-73.00R.  
Hesse, Jürgen; and Grund, Peter, to Messer Griesheim GmbH. Device for deburring workpieces, 4,164,103, Cl. 51-417.000.  
Hettche, Albert: See—  
Patsch, Manfred; and Hettche, Albert, 4,164,500, Cl. 260-239.900.  
Hewitt, Edward G., to New England Envelope Manufacturing Co. Container, 4,164,313, Cl. 229-31.00R.  
Hewlett-Packard Company: See—  
Chu, David C., 4,164,648, Cl. 235-92.0FQ.  
Finlayson, Dana C.; Gatzke, Ronald D.; and Stettiner, Robert L., 4,164,215, Cl. 128-696.000.  
Heydenreich, Lee: See—  
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Hieda, Shozo: See—  
Shiraki, Takeshi; Hieda, Shozo; and Ninomiya, Tomokazu, 4,164,531, Cl. 264-115.000.  
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Higby, Philip J., to Heydenreich, Lee. Chipper roller and knives therefor, 4,164,329, Cl. 241-294.000.  
Hilbert, Francis H.; and Parker, Norman W., to Motorola, Inc. AM stereo receiver with improved correction signals, 4,164,623, Cl. 179-1.0GS.  
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Hill, David C.: See—  
Kulwicki, Bernard M.; Trenkler, George; and Hill, David C., 4,164,147, Cl. 73-362.00R.  
Hill, Lorimer K.: See—  
Landsburg, George F.; and Hill, Lorimer K., 4,164,733, Cl. 340-347.0NT.



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 Hilleman, Maurice R.: See—  
 Provost, Philip J.; and Hilleman, Maurice R., 4,164,566, Cl. 424-89.000.  
 Hiller, Walther: See—  
 Scheffels, Wilhelm; Koy, Johannes; Rappold, Franz; Hiller, Walther; and Steigerwald, Karl H., 4,164,641, Cl. 219-121.0EM.  
 Hingorani, Narain G., to Electric Power Research Institute, Inc. AC fault current limiting circuit. 4,164,772, Cl. 361-58.000.  
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 Sawairi, Hitoshi; Hirose, Fuminori; and Konishikawa, Kaoru, 4,164,778, Cl. 361-409.000.  
 Hitachi, Ltd.: See—  
 Homma, Noriyuki, 4,164,791, Cl. 365-190.000.  
 Ichikawa, Norio; Sato, Kanemasa; and Ueno, Sadayasu, 4,164,462, Cl. 204-195.00S.  
 Oguro, Tomokatsu, 4,164,684, Cl. 315-39.510.  
 Sakamoto, Masakatsu; Uchida, Kenji; and Karino, Takafumi, 4,164,359, Cl. 406-121.000.  
 Ura, Mitsuru; Miyata, Kenji; Suzuki, Takaya; and Ogawa, Takuzo, 4,164,436, Cl. 148-174.000.  
 Hitco: See—  
 Shaffer, Robert C., 4,164,601, Cl. 428-284.000.  
 Hodson, Derek A.: See—  
 Brickell, Christopher G.; and Hodson, Derek A., 4,164,220, Cl. 128-185.00S.  
 Hoechst Aktiengesellschaft: See—  
 Berger, Harald; Quentin, Karl-Ernst; and Weil, Ludwig, 4,164,482, Cl. 252-428.000.  
 Hoelzler, Georg, to Siemens Aktiengesellschaft. Apparatus for examining bodies through scanning by means of ultrasound. 4,164,213, Cl. 128-660.000.  
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 Hoerbiger & Co.: See—  
 Riedel, Albert F., 4,164,238, Cl. 137-512.150.  
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 Hoffmann-La Roche Inc.: See—  
 Westley, John, 4,164,586, Cl. 424-285.000.  
 Holland Mechanics B.V.: See—  
 Damman, Cornelis C., 4,164,133, Cl. 72-12.000.  
 Hollowell, George T., to Gas Research Institute. Pulse combustion system for heating of air. 4,164,210, Cl. 126-110.00R.  
 Holmes, Marion D. Adjustable waist band for jeans. 4,164,044, Cl. 2-237.000.  
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 Hopkins Manufacturing Corporation: See—  
 Thomas, Robert R., 4,164,077, Cl. 33-348.000.  
 Horiba, Ltd.: See—  
 Matumoto, Syozo; and Okamoto, Mitsuhiro, 4,164,653, Cl. 250-301.000.  
 Hornung, Robert M.: See—  
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 Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. VIR killer signal generator for color television receiver. 4,164,750, Cl. 358-26.000.  
 Hossbach, Rudolf: See—  
 Eiselt, Gunter; and Hossbach, Rudolf, 4,164,162, Cl. 83-651.100.  
 Houseman, Henry J.; and Nowicki, Richard W., to Eaton Corporation. Control apparatus for industrial trucks. 4,164,121, Cl. 60-486.000.  
 Howard, Walter D.; and McDonald, David I., to Cincinnati Milacron Inc. Conveyor for processing. 4,164,391, Cl. 432-124.000.  
 Hrlie, Frank F.: See—  
 Tudor, Herbert E.; and Hrlie, Frank F., 4,164,709, Cl. 325-21.000.  
 Hsu, Hui-pin, to United States of America, Navy. Single mode fiber-to-channel waveguide through-line coupler. 4,164,363, Cl. 350-96.170.  
 Hubbard, Joseph T.: See—  
 Nolan, Douglas C.; and Hubbard, Joseph T., 4,164,151, Cl. 73-663.000.  
 Huecke, Hans. Heat exchange device. 4,164,254, Cl. 165-65.000.  
 Huecker, David J.; and Reynolds, Richard W., to Sundstrand Corporation. Load sharing system. 4,164,661, Cl. 307-57.000.

Hudson, James A., Jr.: See—  
 Boggs, Luther M.; and Hudson, James A., Jr., 4,164,703, Cl. 324-54.000.  
 Hughes Aircraft Company: See—  
 Jensen, William E., 4,164,734, Cl. 340-347.0AD.  
 Hughes, Alexander W., Jr., to Janex Corporation. Toy phonograph apparatus. 4,164,353, Cl. 274-100A.  
 Hugo Miebach GmbH: See—  
 Ulmer, Klaus, 4,164,638, Cl. 219-100.000.  
 Human, Hendrik G. C.: See—  
 Butler, Louis R. P.; and Human, Hendrik G. C., 4,164,654, Cl. 250-426.000.  
 Humerickhouse, Billy J.: See—  
 Beatty, Bobby D.; Daniel, Russell D.; and Humerickhouse, Billy J., 4,164,186, Cl. 102-37.800.  
 Hunt, Harold R., to Phillips Petroleum Company. Carbon black pellet and method and apparatus for producing same. 4,164,533, Cl. 264-117.000.  
 Hunt, Herbert H.; and Worcester, Harold S. Fuel gas production. 4,164,397, Cl. 48-209.000.  
 Hunter, LeRoy: See—  
 Nandagiri, Arun; Tripathi, Uma; and Hunter, LeRoy, 4,164,562, Cl. 424-47.000.  
 Hunter, Robert H., to Trailer Eye, Inc. Directional trailer turning signaling device. 4,164,737, Cl. 340-686.000.  
 Hunyar, Csaba K., to Capitol Records, Inc. Phonograph record eccentricity tester. 4,164,075, Cl. 33-174.00Q.  
 Hurt, James S. Portable cigarette making machine. 4,164,229, Cl. 131-55.000.  
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 Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,164,471, Cl. 252-1.000.  
 Hutchinson, William M., deceased; and by Hutchinson, Florence M., executrix, to Phillips Petroleum Company. Constant boiling admixtures. 4,164,471, Cl. 252-1.000.  
 I.S.C. Chemicals Limited: See—  
 Fuller, George, 4,164,517, Cl. 260-646.000.  
 Ichikawa, Hiroki: See—  
 Miyazi, Kazumi; and Ichikawa, Hiroki, 4,164,637, Cl. 200-86.500.  
 Ichikawa, Norio; Sato, Kanemasa; and Ueno, Sadayasu, to Hitachi, Ltd. Oxygen sensor. 4,164,462, Cl. 204-195.00S.  
 Ichikawa, Yataro; and Yamaji, Teizo, to Teijin Limited. Process for producing diphenyls. 4,164,518, Cl. 585-427.000.  
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 Igeta, Harutoshi. A/C Circuit for combining an automobile radio speaker with speakers of an automobile stereophonic system. 4,164,625, Cl. 179-1.0SW.  
 Igusa, Kazuo: See—  
 Ikushima, Heizi; Nakano, Hiroto; Igusa, Kazuo; and Bessho, Sadao, 4,164,569, Cl. 424-174.000.  
 Ikeda, Tomoaki: See—  
 Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,164,421, Cl. 96-33.000.  
 Ikeuchi, Takashi: See—  
 Nishio, Hiroshi; Nakagawa, Ryuichi; and Ikeuchi, Takashi, 4,164,478, Cl. 252-135.000.  
 Ikushima, Heizi; Nakano, Hiroto; Igusa, Kazuo; and Bessho, Sadao, to Chugai Seiyaku Kabushiki Kaisha. Stabilized soft gelatin capsule composition of 1  $\alpha$ -hydroxy-vitamin D. 4,164,569, Cl. 424-174.000.  
 "Il Gas Interale" S.p.A.: See—  
 Vitali, Roberto; Villa, Sergio; and Lotti, Costante, 4,164,548, Cl. 423-242.000.  
 Illy, Hugo: See—  
 Schmidt, Andreas; Illy, Hugo; Kirchmayr, Rudolf; and Schmitter, Andre, 4,164,611, Cl. 521-89.000.  
 Imai, Isao; and Muto, Mitsuru, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Hydraulic servomechanism. 4,164,167, Cl. 91-363.00R.  
 Imamura, Masanaga; Sakai, Hisashi; Sugiyama, Hiroaki; and Ozawa, Seiji, to Ricoh Company Limited. Cap with supply stopper for use with containers. 4,164,307, Cl. 222-182.000.  
 Imperial Chemical Industries Limited: See—  
 Grimble, Brian J.; and Rouse, Michael R., 4,164,361, Cl. 312-236.000.  
 Inaba, Masao; Yuasa, Kazumi; and Sonoda, Michiaki, to Nippon Electric Co., Ltd. Stationary-picture transmission system utilizing a digital memory technique. 4,164,760, Cl. 358-183.000.  
 Inagaki, Tetsuhiko: See—  
 Ishida, Tokuji; and Inagaki, Tetsuhiko, 4,164,721, Cl. 335-234.000.  
 Indesit Industria Elettrodomestici Italiana S.p.A.: See—  
 Zappala, Giuseppe, 4,164,689, Cl. 315-408.000.  
 Industrie Pirelli, S.p.A.: See—  
 Prevati, Augusto, 4,164,440, Cl. 156-583.100.  
 Inman, Richard B.; and McCarty, Ivan C., to International Spike, Inc. Extrusion die assembly. 4,164,388, Cl. 425-378.00R.  
 Insch, Paul H. Line wind-up mechanism for marker buoys. 4,164,332, Cl. 242-54.00R.  
 Institut Francais du Pétrole: See—  
 Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismond, 4,164,543, Cl. 423-189.000.  
 Institut National de la Santé et de la Recherche Médicale: See—  
 Bonfils, Serge J. E.; Dubrasquet, Juliette M.; Fromageot, Pierre; Girma, Jean P.; Lewin, Miguel; and Morgat, Jean L., 4,164,571, Cl. 424-177.000.

Instrumentation Specialist: Company: See—  
 Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,164,464, Cl. 204-299.00R.  
 Interface Mechanisms, Inc.: See—  
 Ellefson, Larry P.; Brooks, Robert J.; Real, Kenneth G.; and Manthey, John A., 4,164,180, Cl. 101-93.340.  
 Interfarm Corporation: See—  
 Vanderhye, Robert A., 4,164,201, Cl. 119-81.000.  
 Interior Brick Corporation: See—  
 Wilhelm, William D., 4,164,598, Cl. 428-48.000.  
 International Business Machines Corporation: See—  
 Delaporte, Francois X.; Hornung, Robert M.; Lamouroux, Anne-Marie; Lebesnerais, Gerard M.; and Nuez, Jean-Paul J., 4,164,668, Cl. 307-303.000.  
 Janssen, Donovan M.; and Radman, Anton J., Jr., 4,164,768, Cl. 360-99.000.  
 International Harvester Company: See—  
 Shore, Daniel B.; and Chatterjea, Probir K., 4,164,276, Cl. 192-13.00R.  
 Ward, Gerald G., 4,164,122, Cl. 60-547.00R.  
 International Spike, Inc.: See—  
 Inman, Richard B.; and McCarty, Ivan C., 4,164,388, Cl. 425-378.00R.  
 International Standard Electric Corporation: See—  
 Langenbach-Belz, Manfred; Strunk, Kurt; and Vervloet, Marcel, 4,164,627, Cl. 179-15.0AQ.  
 International Telephone and Telegraph Corporation: See—  
 Nemit, Jeffrey T., 4,164,742, Cl. 343-768.000.  
 Ward, Charles R.; and Reilly, Robert A., 4,164,628, Cl. 179-15.0BA.  
 Irazoqui, Carlos A.; and Scordato, Emil A., to Medical Laboratory Automation, Inc. Patient and specimen identification means and system employing same. 4,164,320, Cl. 235-375.000.  
 Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., to Eastman Kodak Company. Polychromophoric ultraviolet stabilizers and their use in organic compositions. 4,164,480, Cl. 252-402.000.  
 Irick, Gether, Jr.; and Wang, Richard H. S., to Eastman Kodak Company. Piperidinyl phosphate ultraviolet stabilizers for organic compositions. 4,164,494, Cl. 260-45.75R.  
 Isaoka, Shin-ichi: See—  
 Jinno, Naoyoshi; Satomi, Takeo; Kawakami, Shigenao; Shibata, Tatsumi; and Isaoka, Shin-ichi, 4,164,413, Cl. 71-103.000.  
 ISE Electronics Corporation: See—  
 Nakamura, Tadashi; Masuda, Mitsuru; and Tanaka, Hiroshi, 4,164,683, Cl. 313-496.000.  
 Ishida, Tokuji; and Inagaki, Tetsuhiko, to Minolta Camera Kabushiki Kaisha. Magnetic actuator for a shutter mechanism. 4,164,721, Cl. 335-234.000.  
 Ishidoshiro, Hiroshi: See—  
 Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,164,051, Cl. 8-149.100.  
 Ishikawajima-Harima Jukogyo Kabushiki Kaisha: See—  
 Imai, Isao; and Muto, Mitsuru, 4,164,167, Cl. 91-363.00R.  
 Itoh, Kunio; and Fukuda, Takeshi, to Shin-Etsu Chemical Co., Ltd. Thermally curable silicone rubber compositions. 4,164,491, Cl. 260-37.0SB.  
 Iwanami, Teruo: See—  
 Fujita, Yukio; Iwanami, Teruo; and Akamatsu, Yoshimi, 4,164,529, Cl. 264-565.000.  
 Iwasaki, Mitsuo: See—  
 Yabuki, Kazuyuki; and Iwasaki, Mitsuo, 4,164,114, Cl. 57-236.000.  
 Iwasaki, Richard S., to California Institute of Technology. Electromagnetic power absorber. 4,164,718, Cl. 333-81.00R.  
 J. I. Case Company: See—  
 Parquet, Donald J., 4,164,119, Cl. 60-428.000.  
 J. K. and Susie L. Wadley Research Institute and Blood Bank: See—  
 Dorn, Gordon L.; and Haynes, John R., 4,164,449, Cl. 435-30.000.  
 Jackson, Charles E., to E. L. Hiltz & Company. Safety bracket for securing ladder in place. 4,164,269, Cl. 182-229.000.  
 Jackson, Harold P.; and Boylston, Clifford H., to McDonough Power Equipment, Inc. Blade assembly for lawn mowers. 4,164,112, Cl. 56-295.000.  
 Jackson, William P.; and Warseck, Michael R., to Carnation Company. Lecithin based wetting agent. 4,164,594, Cl. 426-662.000.  
 Jacob, Michel: See—  
 Ollivier, Yves; and Jacob, Michel, 4,164,629, Cl. 179-15.0BS.  
 Jacobs, Norman E.: See—  
 Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.  
 Jacquelin, Jean, to Compagnie Generale d'Electricite. Method for regenerating zinc. 4,164,453, Cl. 204-10.000.  
 Jaffe, Wolfgang: See—  
 Herr, John A.; Brown, Jack; Peterson, Wesley R.; and Jaffe, Wolfgang, 4,164,192, Cl. 112-158.00E.  
 Jain, Atul. Super-resolution imaging system. 4,164,788, Cl. 364-515.000.  
 Jaksich, Milenko, to Sight Lite, Inc. Adjustable illuminating device. 4,164,784, Cl. 362-282.000.  
 Janex Corporation: See—  
 Hughes, Alexander W., Jr., 4,164,353, Cl. 274-1.00A.  
 Jansche, Walter: See—  
 Heintz, Frieder; and Jansche, Walter, 4,164,263, Cl. 280-735.000.  
 Janssen, Donovan M.; and Radman, Anton J., Jr., to International Business Machines Corporation. Dual stage flow controller for self-ventilating disk pack. 4,164,768, Cl. 360-99.000.

Jarvis, Bruce B.: See—  
 Kupchan, S. Morris, deceased; Jarvis, Bruce B.; and Dailey, Richard G., Jr., 4,164,584, Cl. 424-279.000.  
 Jeffers, Frederick J., to Eastman Technology, Inc. Thin film magnetoresistive head. 4,164,770, Cl. 360-113.000.  
 Jensen, Harry: See—  
 Drostholm, Frede H.; Jensen, Harry; and Willadsen, Per, 4,164,537, Cl. 264-333.000.  
 Jensen, Henry E., to Eltra Corporation. Battery post seal. 4,164,609, Cl. 429-183.000.  
 Jensen, William E., to Hughes Aircraft Company. Charge transfer multiplying feedback A/D converter. 4,164,734, Cl. 340-347.0AD.  
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 Joannou, Kyriacos, to Pericomp Corporation. Magnetic head position reference system. 4,164,764, Cl. 360-77.000.  
 Johansson, Jan-Olof; Korpela, Heikki; and Spacek, Karel, to Gullfiber AB. Transverse cutter. 4,164,160, Cl. 83-307.200.  
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 Johnson, Charles E., to Double A Products Company. Variable differential pressure unloading valve apparatus. 4,164,342, Cl. 251-28.000.  
 Johnson, Charles L., to Procter & Gamble Company. The Package liner and fragile snack chip combination. 4,164,588, Cl. 426-135.000.  
 Johnson, Larry C.: See—  
 Schuss, Jack J.; and Johnson, Larry C., 4,164,373, Cl. 356-316.000.  
 Johnson & Lorenz, Inc.: See—  
 Johnson, Alfred A.; and Zimmet, Arthur, 4,164,225, Cl. 128-334.00R.  
 Johnson, Lynn F. Method for filling a potato storage facility. 4,164,294, Cl. 414-786.000.  
 Johnston, James S., to Rosemount Engineering Company Limited. Catalytic gas detector. 4,164,539, Cl. 422-96.000.  
 Jones, Brenton E.; and Reusser, Robert E., to Phillips Petroleum Company. Method and apparatus for measuring material properties related to strength. 4,164,140, Cl. 73-54.000.  
 Jones, Brian, to General Engineering Company (Radcliffe) Limited. The Production of combustible products from waste materials. 4,164,396, Cl. 44-1.00D.  
 Jones, George M., to Gilsabind Company, The. Asphalt penetration indicator. 4,164,139, Cl. 73-38.000.  
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 Jordan, Cy E.; and Weaver, Casimir P., to United States of America, Interior. System for the dielectrophoretic separation of particulate and granular materials. 4,164,460, Cl. 204-180.00R.  
 Jouffret, Michel: See—  
 Costantini, Michel; and Jouffret, Michel, 4,164,516, Cl. 260-586.00P.  
 Jung, Dietmar: See—  
 Hoene, Richard; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,164,613, Cl. 526-201.000.  
 Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-ten: See—  
 Hayashi, Hisao, 4,164,088, Cl. 42-17.000.  
 Kabushiki Kaisha Kito: See—  
 Kanetake, Norio, 4,164,435, Cl. 148-153.000.  
 Kabushiki Kaisha Sato Kenkyusho: See—  
 Sato, Yo, 4,164,182, Cl. 101-103.000.  
 Kabushiki Kaisha Shikishima Tipton: See—  
 Kobayashi, Hisamine, 4,164,096, Cl. 51-7.000.  
 Kabushiki Kaisha Suwa Seikosha: See—  
 Hanaoka, Seiji, 4,164,181, Cl. 101-99.000.  
 Kadane, Victor V.; Meyer, Edwin W.; and Whitney, Robert W., to Central Soya Company, Inc. Meat pumping process. 4,164,589, Cl. 426-281.000.  
 Kaiser, Hermann; Nellums, Richard A.; and Olson, Jerry A., to Eaton Corporation. Fluid flowmeter. 4,164,144, Cl. 73-213.000.  
 Kaji, Hiroyuki; and Suzuki, Narishige, to Siofu Dental Manufacturing Company, Limited. Powdered alloy for dental amalgam. 4,164,419, Cl. 75-169.000.  
 Kajimoto, Hikokusu: See—  
 Tokuda, Masahiro; Tamura, Tadaaki; Kajimoto, Hikokusu; Shimada, Takafumi; Oyamoto, Toshiya; and Ochiai, Setsumi, 4,164,484, Cl. 260-2.300.  
 Kamada, Shuhei: See—  
 Minou, Shigemitsu; and Kamada, Shuhei, 4,164,710, Cl. 325-464.000.  
 Kamesaran, Venkataraman; and Addor, Roger W., to American Cyanamid Co. Branched alkyl-2-naphthaleneacetic acids as herbicides and insecticide intermediates. 4,164,415, Cl. 71-114.000.  
 Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, to Fujisawa Pharmaceutical Co., Ltd. 2-Substituted penam derivatives. 4,164,497, Cl. 260-239.100.  
 Kampfer, John H.; Kampfer, Michael L.; and Martens, Philip A. Combination sink trap access port filtration device. 4,164,048, Cl. 4-292.000.



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Kampfer, John H.; Kampfer, Michael L.; and Martens, Philip A., 4,164,048, Cl. 4-292.000.  
Kanetake, Norio, to Kabushiki Kaisha Kito. Method for heat treatment of link chains. 4,164,435, Cl. 148-153.000.  
Kannapell, David H., to American Air Filter Company, Inc. Wet scrubbing device. 4,164,399, Cl. 55-223.000.  
Kao Soap Co., Ltd.: See—  
Kawahara, Yoshiharu; and Ono, Toshio, 4,164,506, Cl. 260-410.90R.  
Karino, Takafumi: See—  
Sakamoto, Masakatsu; Uchida, Kenji; and Karino, Takafumi, 4,164,359, Cl. 406-121.000.  
Karkau, Lawrence E., to Karphen Lift Company. Automatic lift assembly. 4,164,292, Cl. 414-545.000.  
Karphen Lift Company: See—  
Karkau, Lawrence E., 4,164,292, Cl. 414-545.000.  
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Toyomura, Sigeru; and Kawanabe, Tsuyoshi, 4,164,789, Cl. 364-710.000.  
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Zankl, Frank, 4,164,290, Cl. 414-739.000.  
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Baldwin, Roger A.; Davis, Robert E.; Leonard, Robert E.; and Rhodes, Donald E., 4,164,466, Cl. 208-177.000.  
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Siggel, Erhard; Wick, Gerhard; Linhart, Heinz; and Kessler, Erich, 4,164,603, Cl. 428-398.000.  
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Okai, Sakuo; and Kimoto, Koichi, 4,164,422, Cl. 96-67.000.  
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Schmidt, Andreas; Illy, Hugo; Kirchmayr, Rudolf; and Schmitter, Andre, 4,164,611, Cl. 521-89.000.  
Kitagawa, Junji: See—  
Akita, Sigeoyuki; and Kitagawa, Junji, 4,164,706, Cl. 324-208.000.  
Klauke, Erich: See—  
Hoffmann, Hellmut; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,164,575, Cl. 424-216.000.  
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Waddill, Harold G.; and Klein, Howard P., 4,164,520, Cl. 525-484.000.  
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Hallam, Keith J.; and Knippel, Willis H., 4,164,188, Cl. 105-166.000.  
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Asanomi, Koji; Takemoto, Yasunori; and Kobayashi, Kazuo, 4,164,205, Cl. 123-117.00R.  
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Feldmann, Martin; Koberstein, Edgar; and Seibold, Klaus, 4,164,557, Cl. 423-600.000.  
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Sato, Masaaki; and Kosaka, Shinya, 4,164,675, Cl. 310-268.000.  
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Kowal, Leonard. Noise suppression apparatus. 4,164,758, Cl. 358-167.000.  
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Scheffels, Wilhelm; Koy, Johannes; Rappold, Franz; Hiller, Walter; and Steigerwald, Karl H., 4,164,641, Cl. 219-121.0EM.  
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Kelp, Fritz, 4,164,256, Cl. 165-125.000.  
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Kratz, Helmut: See—  
Duttine, Walter; Kratz, Helmut; Bosch, Harald; and Steigerwald, Gerhard, 4,164,280, Cl. 198-781.000.

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Timoshenko, Alexandr T.; Nazarenko, Vladimir I.; Krigman, Felix E.; and Gusev, Mikhail G., 4,164,699, Cl. 323-75.00A.  
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Kupchan, Nancy Slater, executrix and trustee: See—  
Kupchan, S. Morris, deceased; Jarvis, Bruce B.; and Dailey, Richard G., Jr., 4,164,584, Cl. 424-279.000.  
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Frey, Paul H.; and Kupcikevicius, Vytautas, 4,164,057, Cl. 17-49.000.  
Kurz, John C. Anchor bracket. 4,164,194, Cl. 114-210.000.  
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Bruninga, Kenneth J., 4,164,324, Cl. 239-230.000.  
La Francaise Metallurgie: See—  
Robert, Jean, 4,164,101, Cl. 51-273.000.  
Laforet, Henry A. Method for determining sulfur content of cast iron. 4,164,148, Cl. 73-432.00R.  
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Landalv, Henrik: See—  
Collin, Lars; and Landalv, Henrik, 4,164,266, Cl. 181-250.000.  
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Lang, Gunter: See—  
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Folkman, Moses J.; and Langer, Robert S., Jr., 4,164,560, Cl. 424-22.000.  
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Henne, Werner; Dunweg, Gustav; Schmitz, Werner; Pohle, Raimund; and Lawitzki, Friedrich, 4,164,437, Cl. 156-167.000.  
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Lawler, John K., deceased; Mitchell, John W., Sr.; and Oyama, Kenneth H., 4,164,074, Cl. 32-32.000.  
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Lazar, Ralph M.: See—  
Herbst, Walter B.; and Lazar, Ralph M., 4,164,105, Cl. 52-202.000.  
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Binet, Raymond; Chiens, Alain; and Lebegue, Maurice, 4,164,255, Cl. 165-82.000.

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Daniels, Wiley E.; and Lenney, William E., 4,164,489, Cl. 260-29.60R.  
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Baldwin, Roger A.; Davis, Robert E.; Leonard, Robert E.; and Rhodes, Donald E., 4,164,466, Cl. 208-177.000.  
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Steeb, William R.; LeVeau, Robert W.; and Falck, Michael J., 4,164,085, Cl. 40-152.000.  
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Bonfils, Serge J.E.; Dubrasquet, Juliette M.; Fromageot, Pierre; Girma, Jean P.; Lewin, Miguel; and Morgat, Jean L., 4,164,571, Cl. 424-177.000.  
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Tragl, Wilfried; and Forster, Franz, 4,164,169, Cl. 91-504.000.  
Linden-Alimak AB: See—  
Bergstrom, Gunnar, 4,164,271, Cl. 187-32.000.  
Linehan, Joseph J., to Samson Ocean Systems, Inc. Rope fitting. 4,164,378, Cl. 403-210.000.  
Linhart, Heinz: See—  
Siggel, Erhard; Wick, Gerhard; Linhart, Heinz; and Kessler, Erich, 4,164,603, Cl. 428-398.000.  
Lion Fat & Oil Co., Ltd., The: See—  
Nishio, Hiroshi; Nakagawa, Ryuichi; and Ikeuchi, Takashi, 4,164,478, Cl. 252-135.000.  
Lischke, Burkhard: See—  
Frosien, Jurgen; Lischke, Burkhard; and Oelmann, Andreas, 4,164,658, Cl. 250-492.00A.  
Lisco, Richard J.: See—  
Brolin, Stephen J.; Lisco, Richard J.; and Manfred, Mark T., 4,164,713, Cl. 328-111.000.  
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Skatsche, Othmar; Fachbach, Heinz; Thien, Gerhard; List, Hans; and Greier, Josef, 4,164,262, Cl. 180-54.00A.  
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Trees, Carl I., 4,164,296, Cl. 414-416.000.  
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Loman, George, to W. E. Bassett Company, The. Key retainer. 4,164,132, Cl. 70-456.00R.  
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Tuominen, Pertti, 4,164,073, Cl. 29-731.000.  
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Vitali, Roberto; Villa, Sergio; and Lotti, Costante, 4,164,548, Cl. 423-242.000.  
Lovendahl, Norman H. Facing and grooving tool. 4,164,381, Cl. 408-20.000.  
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Platz, Edward A., deceased; Platz, Zelma H., executor; and Lubas, William, executor, 4,164,541, Cl. 422-198.000.  
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Cavanagh, Eric J., 4,164,203, Cl. 123-32.0JV.  
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Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.



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Brenner, Douglas; and Lundberg, Robert D., 4,164,512, Cl. 521-93.000.  
Lutz, Alfons: See—  
Mitterer, Erik; and Lutz, Alfons, 4,164,692, Cl. 318-266.000.  
Lykes, Robert E.: See—  
Buckman, John B.; and Lykes, Robert E., 4,164,674, Cl. 310-90.000.  
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Malek, Russell A.: See—  
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Maly, Hans-Peter: See—  
Heitmann, Jürgen; and Maly, Hans-Peter, 4,164,749, Cl. 358-13.000.  
Manenkov, Alexandr A.: See—  
Prokhorov, Alexandr M.; Vinogradov, Alexandr L.; Danileiko, Jury K.; Manenkov, Alexandr A.; Krasnov, Mikhail M.; and Naumidi, Leonid P., 4,164,222, Cl. 128-303.000.  
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Brolin, Stephen J.; Lisco, Richard J.; and Manfred, Mark T., 4,164,713, Cl. 328-111.000.  
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Ries, Karl; Hannschock, Kurt; and Simoneit, Gunter, 4,164,150, Cl. 73-644.000.  
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Manufacture de Produits Chimiques Protex S.A.: See—  
Veaute, Georges, 4,164,535, Cl. 264-136.000.  
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Munits, Ilya N.; and Maraev, Sergei E., 4,164,659, Cl. 250-561.000.  
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Marcaccioli, Enzo: See—  
Perugini, Giancarlo; and Marcaccioli, Enzo, 4,164,553, Cl. 423-440.000.  
Marciniak, John J., to Harris Corporation. Apparatus for feeding signatures from a saddle to a trimmer, 4,164,139, Cl. 83-280.000.  
Marco, Francis W.: See—  
Hauser, Peter J.; and Marco, Francis W., 4,164,392, Cl. 8-18.00R.  
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Marsili, Leonardo: See—  
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,164,499, Cl. 260-239.30P.  
Martens, Philip A.: See—  
Kampfer, John H.; Kampfer, Michael L.; and Martens, Philip A., 4,164,048, Cl. 4-292.000.  
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Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,164,676, Cl. 310-360.000.  
Maso-Therm Corporation: See—  
Piazza, Matthew R., 4,164,532, Cl. 264-115.000.  
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von Schulthess, Gustav K.; Cohen, Richard J.; and Benedek, George B., 4,164,558, Cl. 424-12.000.  
Whitesides, George M.; Garrett, Patricia E.; and Siegel, Merrell G., 4,164,444, Cl. 435-92.00N.  
Masuda, Mitsuru: See—  
Nakamura, Tadashi; Masuda, Mitsuru; and Tanaka, Hiroshi, 4,164,683, Cl. 313-496.000.  
Matchell, Raymond, to Rank Organisation Limited, The. Telecine apparatus having improved reproduction during panning and tilting scenes, 4,164,761, Cl. 358-215.000.  
Matono, Hirokuni: See—  
Nakai, Shiro; Asami, Kazuto; and Matono, Hirokuni, 4,164,232, Cl. 133-8.00R.  
Matsui, Michikage: See—  
Kimura, Akio; Wada, Osamu; Matsui, Michikage; and Ozaki, Kiyotaka, 4,164,116, Cl. 57-282.000.  
Matsumoto, Yasushi, to RCA Corporation. Video disc pickup apparatus, 4,164,755, Cl. 358-128.000.  
Matsumoto, Yasushi: See—  
Toda, Minoru; Osaka, Susumu; and Matsumoto, Yasushi, 4,164,756, Cl. 358-128.000.

Matsushita Electric Industrial Co., Ltd.: See—  
Sawairi, Hitoshi; Hirose, Fuminori; and Konishikawa, Kaoru, 4,164,778, Cl. 361-409.000.  
Mattes, Gunther: See—  
Kraemling, Franz; Bartonitcheck, Norbert; Mattes, Gunther; and Nieven, Jakob, 4,164,107, Cl. 52-232.000.  
Matumoto, Syozo; and Okamoto, Mitsuhiro, to Horiba, Ltd.; and Dai-kin Kogyo Co., Ltd. Solvent for the extraction of oil fraction in water, 4,164,653, Cl. 250-301.000.  
Maurer, Edward H.: See—  
Thiel, Ronald A.; and Maurer, Edward H., 4,164,607, Cl. 428-621.000.  
Mazzorana, Alfred B., to Societe de Paris et du Rhone. Bearing made of stamped (embossed) sheet iron, 4,164,673, Cl. 310-89.000.  
McAndrew, James R. Vehicle covering apparatus, 4,164,233, Cl. 135-5.00A.  
McBurney, C. Alex.: See—  
Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.  
McCarthy, Shaun L.: See—  
Lambe, John J.; and McCarthy, Shaun L., 4,164,374, Cl. 356-402.000.  
McCarty, F. Walter, Jr.: See—  
Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.  
McCarty, Ivan C.: See—  
Inman, Richard B.; and McCarty, Ivan C., 4,164,388, Cl. 425-378.00R.  
McClenny, Carl O. Environmental protection system, 4,164,339, Cl. 244-163.000.  
McComb, Tiney M. Snowman mold, 4,164,341, Cl. 249-126.000.  
McCullough, Gail A.: See—  
Allington, William B.; deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,164,464, Cl. 204-299.00R.  
McDonald, David I.: See—  
Howard, Walter D.; and McDonald, David I., 4,164,391, Cl. 432-124.000.  
McDonnell Douglas Corporation: See—  
Swirling, Peter, 4,164,738, Cl. 343-5.0CM.  
McDonough Power Equipment, Inc.: See—  
Jackson, Harold P.; and Boylston, Clifford H., 4,164,112, Cl. 56-295.000.  
McElroy, Eugene L., to Enon Valley Industries, Inc. Resilient shield for vehicle wheel brake assemblies, 4,164,273, Cl. 188-218.00A.  
McGrain, Thomas M., to Eastman Kodak Company. Separator member drive mechanism, 4,164,347, Cl. 271-3.100.  
McGraw-Edison Company: See—  
Wandler, Donald, 4,164,783, Cl. 362-226.000.  
McLaughlin, Richard S.; Plaski, Walter; and Swartzendruber, Robert F., to Docutel Corporation. Depository System, 4,164,179, Cl. 101-76.000.  
McLean, Robert L.: See—  
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,164,070, Cl. 29-623.200.  
Mead, Ralph T.: See—  
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,164,070, Cl. 29-623.200.  
Mechanical Technology, Inc.: See—  
Nolan, Douglas C.; and Hubbard, Joseph T., 4,164,151, Cl. 73-663.000.  
Medalart Corporation: See—  
Auerbach, Albert A., 4,164,227, Cl. 128-419.0PT.  
Medical Laboratory Automation, Inc.: See—  
Irazoqui, Carlos A.; and Scordato, Emil A., 4,164,320, Cl. 235-375.000.  
Meier, Siegfried, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for dosing bulk goods, 4,164,244, Cl. 141-156.000.  
Meineke, Sam W.; and Nedell, Harold. Exhaust muffler, 4,164,267, Cl. 181-255.000.  
Meister, Frank X. Method for coating surfaces of tools with fire and heat resistant composition, 4,164,596, Cl. 427-372.00B.  
Mencacci, Samuel A., to FMC Corporation. Low liquid volume retort method, 4,164,590, Cl. 426-407.000.  
Menikheim, Virginia C.: See—  
Yung, Kai-Lim W.; Silverman, Bernard; and Menikheim, Virginia C., 4,164,600, Cl. 428-198.000.  
Mercier, Andre, to Fives-Cail Babcock. Process and installation for the production of selected crystallization seeds for use in a sugar refinery, 4,164,429, Cl. 127-15.000.  
Merck & Co., Inc.: See—  
Provost, Philip J.; and Hilleman, Maurice R., 4,164,566, Cl. 424-89.000.  
Meshkil, Donald J.: See—  
Krasznai, Charles Z.; Meshkil, Donald J.; and Krumholtz, Morris, 4,164,656, Cl. 250-439.00R.  
Messer Griesheim GmbH: See—  
Baumgartner, Klaus, 4,164,127, Cl. 62-98.000.  
Hesse, Jürgen; and Grund, Peter, 4,164,103, Cl. 51-417.000.  
Metcalf, Travis W., to United States of America, Navy. Dual pyroelectric vidicon infrared camera, 4,164,753, Cl. 358-113.000.  
Metropolitan Circuits, Inc.: See—  
Kato, Makoto; Velie, Larry N.; and Baverstock, John L., 4,164,704, Cl. 324-73.0PC.

Meyer, Edwin W.: See—  
Kadane, Victor V.; Meyer, Edwin W.; and Whitney, Robert W., 4,164,589, Cl. 426-281.000.  
Meyers, George L.; and Gorshe, Thomas M., to American Can Company. Carton forming apparatus, 4,164,171, Cl. 93-49.00R.  
Michael, Harald R., to Electrolux GmbH. Vacuum-type water removal system for houses, factories, ships and the like, 4,164,049, Cl. 4-300.000.  
Michaelis, Paul C., to Bell Telephone Laboratories, Incorporated. Magnetic bubble packaging arrangement, 4,164,790, Cl. 365-2.000.  
Mid-Florida Mining Company: See—  
Edgar, Allen C., 4,164,314, Cl. 229-33.000.  
Midcon Pipeline Equipment Co.: See—  
Clavin, Edward A., 4,164,135, Cl. 72-466.000.  
Smith, Carl K., 4,164,597, Cl. 427-425.000.  
Midland-Ross Corporation: See—  
Griffiths, William C., 4,164,125, Cl. 62-2.000.  
Hannahs, Arnold E.; and Patrick, Michael D., 4,164,679, Cl. 315-241.00R.  
Midori Anzen Company, Ltd.: See—  
Martin, Frank E., 4,164,218, Cl. 128-142.700.  
Milliken Research Corporation: See—  
Hauser, Peter J.; and Marco, Francis W., 4,164,392, Cl. 8-18.00R.  
Mills, Maurice T.: See—  
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,164,246, Cl. 144-2.00Z.  
Milne, George M., Jr.: See—  
Hammen, Philip D.; and Milne, George M., Jr., 4,164,514, Cl. 260-570.50P.  
Minnesota Mining and Manufacturing Company: See—  
Bird, Forrest M., 4,164,219, Cl. 128-145.800.  
Chang, Robert W. H., 4,164,563, Cl. 424-83.000.  
Hervig, Harold C., 4,164,620, Cl. 174-73.00R.  
Moore, George G. I.; and Harrington, Joseph K., 4,164,412, Cl. 71-103.000.  
Minolta Camera Kabushiki Kaisha: See—  
Ishida, Tokuji; and Inagaki, Tetsuhiko, 4,164,721, Cl. 335-234.000.  
Minou, Shigemitsu; and Kamada, Shuhei, to Sanyo Electric Co., Ltd. Very high frequency tuner for eliminating image interference and stray capacitance effects, 4,164,710, Cl. 325-464.000.  
Mira-Pak, Inc.: See—  
Blodgett, Stewart B., 4,164,260, Cl. 177-1.000.  
Mitchell, John W., Sr.: See—  
Allington, William B.; deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,164,464, Cl. 204-299.00R.  
Mitchell, John W., Sr.: See—  
Lawler, John K.; deceased; Mitchell, John W., Sr.; and Oyama, Kenneth H., 4,164,074, Cl. 32-32.000.  
Mitsubishi Chemical Industries, Ltd.: See—  
Morita, Yoshiharu; Ohya, Junichi; and Shirasaka, Tadashi, 4,164,577, Cl. 424-251.000.  
Mitsubishi Denki Kabushiki Kaisha: See—  
Akamatsu, Masahiko, 4,164,667, Cl. 307-253.000.  
Mitsubishi Rayon Co., Ltd.: See—  
Suzuki, Naoyuki; Wada, Yoji; and Furuno, Akihisa, 4,164,612, Cl. 526-62.000.  
Mitsui Mining & Smelting Co., Ltd.: See—  
Tokunaga, Hiroshi; Tatehana, Yoshikazu; and Umekawa, Akira, 4,164,418, Cl. 75-88.000.  
Mitsui Petrochemical Industries, Ltd.: See—  
Shiraki, Takeshi; Hieda, Shozo; and Ninomiya, Tomokazu, 4,164,531, Cl. 264-115.000.  
Mitterer, Erik; and Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Operating mechanism for a pivotable sliding panel, 4,164,692, Cl. 318-266.000.  
Miura, Nobuo: See—  
Kudo, Masayuki; Miura, Nobuo; and Hada, Shigetaka, 4,164,157, Cl. 74-860.000.  
Miyata, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Roughened shutter curtain(s) for single lens reflex camera, 4,164,368, Cl. 354-23.00R.  
Miyata, Kenji: See—  
Ura, Mitsuru; Miyata, Kenji; Suzuki, Takaya; and Ogawa, Takuzo, 4,164,436, Cl. 148-174.000.  
Miyata, Teruo; Rubin, Albert L.; Stenzel, Kurt H.; and Dunn, Michael W., to Cornell Research Foundation, Inc. Collagen drug delivery device, 4,164,559, Cl. 424-14.000.  
Miyazi, Kazumi; and Ichikawa, Hiroki, to Olympus Optical Co., Ltd. Dual tread plate foot switch, 4,164,637, Cl. 200-86.500.  
Mobil Oil Corp.: See—  
Theissen, Robert J., 4,164,408, Cl. 71-98.000.  
Theissen, Robert J., 4,164,409, Cl. 71-98.000.  
Theissen, Robert J., 4,164,410, Cl. 71-98.000.  
Molex Incorporated: See—  
Functik, Jack F.; and Wright, Steven F., 4,164,065, Cl. 29-564.600.  
Monarch Marking Systems, Inc.: See—  
Kirby, Raymond L., Jr., 4,164,185, Cl. 101-348.000.  
Monsanto Company: See—  
Fabel, David A., 4,164,602, Cl. 428-334.000.  
Phillips, Wendel G., 4,164,406, Cl. 71-86.000.  
Yung, Kai-Lim W.; Silverman, Bernard; and Menikheim, Virginia C., 4,164,600, Cl. 428-198.000.  
Montedison S.p.A.: See—  
Perugini, Giancarlo; and Marcaccioli, Enzo, 4,164,553, Cl. 423-440.000.

Moore, George G. I.; and Harrington, Joseph K., to Minnesota Mining and Manufacturing Company. Perfluoroalkylsulfonamidoaryl compounds, 4,164,412, Cl. 71-103.000.  
Morey, Kenneth O.: See—  
DuVall, Bruce W.; Valentine, James W.; and Morey, Kenneth O., 4,164,146, Cl. 73-304.00R.  
Morgan-Landa, David: See—  
Azcarate de Morgan, Esther; Morgan-Landa, David; and Becerra-Lopez, Jose L., 4,164,086, Cl. 40-476.000.  
Morgat, Jean L.: See—  
Bonfils, Serge J. E.; Dubrasquet, Juliette M.; Fromageot, Pierre; Girma, Jean P.; Lewin, Miguel; and Morgat, Jean L., 4,164,571, Cl. 424-177.000.  
Morino, Seiji: See—  
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,164,261, Cl. 180-54.00R.  
Morita, Yoshiharu; Ohya, Junichi; and Shirasaka, Tadashi, to Mitsubishi Chemical Industries, Ltd. 6-(2-Acylamino-2-arylacetoamido)penicillanic acids, 4,164,577, Cl. 424-251.000.  
Moritsch, Denis J.; and Moritsch, Fred A. Device for use in mechanical power transmission system, 4,164,153, Cl. 74-217.00B.  
Moritsch, Fred A.: See—  
Moritsch, Denis J.; and Moritsch, Fred A., 4,164,153, Cl. 74-217.00B.  
Morris, Ray E.: See—  
Owen, Marler W.; and Morris, Ray E., 4,164,236, Cl. 137-240.000.  
Morris, Ross E., to United States of America, Navy. Underwater acoustic absorber, 4,164,727, Cl. 340-5.00D.  
Motorola, Inc.: See—  
Fette, Bruce A., 4,164,626, Cl. 179-1.05C.  
Hilbert, Francis H.; and Parker, Norman W., 4,164,623, Cl. 179-1.0GS.  
Mulder, Hendrik: See—  
Duinker, Simon; and Mulder, Hendrik, 4,164,657, Cl. 250-445.00T.  
Muller, Jean A.; and Shilling, Ray A., to Anchor Hocking Corporation. Display stand and arrangement thereof, 4,164,287, Cl. 211-134.000.  
Muller, Rolf; and Wrobel, Gunter. Compact miniature fan, 4,164,690, Cl. 318-254.000.  
Muller, Thomas P.; and Blatner, Philip J., to Caterpillar Tractor Co. Apparatus for a removable lamp, 4,164,780, Cl. 362-64.000.  
Muller, Wolfgang-Dieter: See—  
Kuhnlein, Hans L.; and Muller, Wolfgang-Dieter, 4,164,441, Cl. 159-13.00A.  
Mumford, George V.: See—  
Lohman, Richard D.; and Mumford, George V., 4,164,377, Cl. 401-213.000.  
Munib, Hamza I. Surgical instrument, 4,164,223, Cl. 128-321.000.  
Munits, Ilya N.; and Maraev, Sergei E., to Vsesojuzny Nauchno-Issledovatel'sky I Proektny Institut Aljuminiovoi, Magniovoi I Elektronoi Promyshlennosti. Method of monitoring the phase state of material in processes involving crystallization from melt and apparatus for performing same, 4,164,659, Cl. 250-561.000.  
Murata, Kazuo: See—  
Osada, Hiroshi; and Murata, Kazuo, 4,164,270, Cl. 187-9.00R.  
Murata Manufacturing Co., Ltd.: See—  
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,164,676, Cl. 310-360.000.  
Murphy, James A.: See—  
Aronson, Bernard S.; Herczog, Andrew; and Murphy, James A., 4,164,455, Cl. 204-38.00A.  
Murphy, Lawrence E.: See—  
Dague, George I.; and Murphy, Lawrence E., 4,164,716, Cl. 330-252.000.  
Musacchia, John. Emergency escape wall structure, 4,164,095, Cl. 52-1.000.  
Muto, Mitsuru: See—  
Imai, Isao; and Muto, Mitsuru, 4,164,167, Cl. 91-363.00R.  
Myers, Stewart W.; and Spencer, Homer K., to Sandoz, Inc. Benzoxazine herbicides, 4,164,407, Cl. 71-88.000.  
Myron, Clayton E., to Brooks & Perkins, Incorporated. Flexible rail roller system, 4,164,338, Cl. 244-118.00R.  
Mysels, Karol J., to General Atomic Company. Wind driven power apparatus, 4,164,382, Cl. 415-2.000.  
N.K.F. Groep B.V.: See—  
Van Kesteren, Jacobus P. I., 4,164,617, Cl. 174-23.00C.  
Nagata, Kiyoshi. Stereoscopic color television system with lenticular screen, 4,164,748, Cl. 358-3.000.  
Nagayama, Shigekazu, to Nakamura, Hisao. Electronic combination controlled means, 4,164,776, Cl. 361-172.000.  
Nakagawa, Ryuichi: See—  
Nishio, Hiroshi; Nakagawa, Ryuichi; and Ikeuchi, Takashi, 4,164,478, Cl. 252-135.000.  
Nakaguti, Osamu: See—  
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,164,497, Cl. 260-239.100.  
Nakai, Shiro; Asami, Kazuto; and Matono, Hirokuni, to Glory Kogyo Kabushiki Kaisha. Constant coin flow rate coin processing apparatus, 4,164,232, Cl. 133-8.00R.  
Nakamura, Hisao: See—  
Nagayama, Shigekazu, 4,164,776, Cl. 361-172.000.  
Nakamura, Katsuyoshi: See—  
Kudo, Kin-ichi; Nakamura, Katsuyoshi; and Tazawa, Takatoshi, 4,164,486, Cl. 260-22.0TN.  
Nakamura, Tadashi; Masuda, Mitsuru; and Tanaka, Hiroshi, to ISE Electronics Corporation; and Fujitsu Ten Limited. Fluorescent display tube, 4,164,683, Cl. 313-496.000.



- Nakano, Hiroto: See—  
Ikushima, Heizi; Nakano, Hiroto; Igusa, Kazuo; and Bessho, Sadao, 4,164,569, Cl. 424-174.000.
- Nandagiri, Arun; Tripathi, Uma; and Hunter, LeRoy, to American Cyanamid Company. Aerosol hair spray containing an ethyl or butyl monoester of a copolymer of maleic acid and a vinyl monomer. 4,164,562, Cl. 424-47.000.
- NAPCO Security Systems, Inc.: See—  
Stockdale, Roy, 4,164,736, Cl. 340-530.000.
- Napp Systems (USA), Inc.: See—  
Okai, Sakuo; and Kimoto, Koichi, 4,164,422, Cl. 96-67.000.
- National Computer Systems, Inc.: See—  
Gysling, Walter, 4,164,765, Cl. 360-92.000.
- National Research Development Corporation: See—  
Carlow, Charles A., 4,164,291, Cl. 414-136.000.
- Pobgee, Peter J., 4,164,622, Cl. 178-18.000.
- Nauchno-Issledovatel'skiy Institut Po Bezopasnosti Rabot V Gornoi Promyshlennosti: See—  
Timoshenko, Alexander T.; Nazarenko, Vladimir I.; Krigman, Felix E.; and Gusev, Mikhail G., 4,164,699, Cl. 323-75.00A.
- Naumidi, Leonid P.: See—  
Prokhorov, Alexander M.; Vinogradov, Alexander L.; Danileiko, Jury K.; Manenkov, Alexander A.; Krasnov, Mikhail M.; and Naumidi, Leonid P., 4,164,222, Cl. 128-303.100.
- Nazarenko, Vladimir I.: See—  
Timoshenko, Alexander T.; Nazarenko, Vladimir I.; Krigman, Felix E.; and Gusev, Mikhail G., 4,164,699, Cl. 323-75.00A.
- Nedell, Harold: See—  
Meineke, Sam W.; and Nedell, Harold, 4,164,267, Cl. 181-255.000.
- Nellums, Richard A.: See—  
Kaiser, Hermann; Nellums, Richard A.; and Olson, Jerry A., 4,164,144, Cl. 73-213.000.
- Nelson, James W.: See—  
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,164,464, Cl. 204-299.000.
- Nelson, Kurt, to De Laval Separator Company, The. Centrifuge with automatic sludge discharge. 4,164,317, Cl. 233-20.00A.
- Nelson, Thomas E., to General Electric Company. Liquid level indicating device. 4,164,197, Cl. 116-227.000.
- Nemitt, Jeffrey T., to International Telephone and Telegraph Corporation. Multibeam slot array. 4,164,742, Cl. 343-768.000.
- Neuman, Richard F., to Eaton Corporation. Clearance sensing brake adjuster. 4,164,272, Cl. 188-196.00D.
- Neurath, Robert A.: See—  
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,164,565, Cl. 424-89.000.
- New England Envelope Manufacturing Co.: See—  
Hewitt, Edward G., 4,164,313, Cl. 229-31.00R.
- New York Blood Center, Inc.: See—  
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,164,565, Cl. 424-89.000.
- Newby, Billie J., to United States of America, Energy. Method for calcining nuclear waste solutions containing zirconium and halides. 4,164,479, Cl. 252-301.10W.
- Newman, Dwight C. Seed planting method for cereal grains and grasses. 4,164,190, Cl. 111-1.000.
- Newton, Alvin B., to Borg-Warner Corporation. Absorption refrigeration system and control. 4,164,128, Cl. 62-105.000.
- Nichols, Donald S.: See—  
Renjilian, Armen; Nichols, Donald S.; and Hartigan, Richard J., Jr., 4,164,530, Cl. 264-103.000.
- Nieven, Jakob: See—  
Kraemling, Franz; Bartonitschek, Norbert; Mattes, Gunther; and Nieven, Jakob, 4,164,107, Cl. 52-232.000.
- Ninomiya, Tomokazu: See—  
Shiraki, Takeshi; Hieda, Shozo; and Ninomiya, Tomokazu, 4,164,531, Cl. 264-115.000.
- Nippon Electric Co., Ltd.: See—  
Inaba, Masao; Yuasa, Kazumi; and Sonoda, Michiaki, 4,164,760, Cl. 358-183.000.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Ogita, Minoru, 4,164,624, Cl. 179-1.0GD.
- Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: See—  
Fujita, Yukio; Iwanami, Teruo; and Akamatsu, Yoshimi, 4,164,529, Cl. 264-565.000.
- Nippon Kogaku K.K.: See—  
Kimura, Shuji; Akasaka, Shigeo; Daitoku, Koichi; Hasegawa, Hiroshi; and Kimura, Makoto, 4,164,370, Cl. 354-243.000.
- Nippon Soken, Inc.: See—  
Akita, Sigeyuki; and Kitagawa, Junji, 4,164,706, Cl. 324-208.000.
- Nishikawa, Masanori; and Hattori, Masao, to Yoshino Kogyosho Co., Ltd. Frosted bottle of saturated polyester. 4,164,298, Cl. 215-1.00C.
- Nishio, Hiroshi; Nakagawa, Ryuchi; and Ikeuchi, Takashi, to Lion Fat & Oil Co., Ltd., The. Process for improving granular detergents. 4,164,478, Cl. 252-135.000.
- Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline film of zinc oxide containing additive elements. 4,164,676, Cl. 310-360.000.
- Nissan Motor Company, Limited: See—  
Osada, Hiroshi; and Murata, Kazuo, 4,164,270, Cl. 187-9.00R.
- Nitto Boseki Co., Ltd.: See—  
Noji, Toshio; Shono, Hiroaki; and Wakasa, Isao, 4,164,401, Cl. 65-1.000.
- Nitto Chemical Industry Co., Ltd.: See—  
Suzuki, Naoyuki; Wada, Yoji; and Furuno, Akihisa, 4,164,612, Cl. 526-62.000.
- Nix, Norbert. Magnetic thickness gauge of the magnet adhesion type using drive means with a governor to raise the magnet. 4,164,707, Cl. 324-230.000.
- Noji, Toshio; Shono, Hiroaki; and Wakasa, Isao, to Nitto Boseki Co., Ltd. Curved orifice plate for forming glass fibers. 4,164,401, Cl. 65-1.000.
- Nolan, Douglas C.; and Hubbard, Joseph T., to Mechanical Technology, Inc. Random vibration generator. 4,164,151, Cl. 73-663.000.
- Nolan, John M.: See—  
Reed, Bradley O.; and Nolan, John M., 4,164,155, Cl. 74-687.000.
- Noma, Ichiro; and Taniguchi, Kazuo, to Noma Komuten Company Limited. Apparatus for measuring quantity of asphalt ingredient in an asphalt compound. 4,164,655, Cl. 250-436.000.
- Noma Komuten Company Limited: See—  
Noma, Ichiro; and Taniguchi, Kazuo, 4,164,655, Cl. 250-436.000.
- Noonen, Arie; and Wolters, Egbert, to Akzo N.V. U.V.-curable coating composition. 4,164,459, Cl. 204-159.180.
- Nordin, Kent A. R., to Rimbo Tekniska Fabrik Rimpac AB. Method of making bags. 4,164,170, Cl. 93-35.00H.
- Nordisk Insulinalaboratorium: See—  
Hansen, Jorgen F., 4,164,495, Cl. 260-112.00B.
- Norfield Corporation: See—  
Beasley, Donald R., 4,164,389, Cl. 425-406.000.
- Normalair-Garrett (Holdings) Limited: See—  
Carnegie, Alistair L., 4,164,042, Cl. 2-2.10R.
- Northern Telecom Limited: See—  
Cielo, Paolo; and Westwood, William D., 4,164,745, Cl. 346-140.00R.
- Walling, Jorg-Hein; and Bouffard, Jean, 4,164,245, Cl. 141-250.000.
- Northrop Corporation: See—  
Biricik, Vahram W.; Chun, Kang R.; Gresko, Laurence S.; and Barnett, John S., 4,164,677, Cl. 313-35.000.
- Nowicki, Richard W.: See—  
Houseman, Henry J.; and Nowicki, Richard W., 4,164,121, Cl. 60-486.000.
- Nudelman, Boris I.; Svetsitsky, Alexander S.; Bikkau, Marsel Y.; Bun, Isaak M.; and Kevvai, Arnold A. Cement and process for producing same. 4,164,425, Cl. 106-89.000.
- Nuez, Jean-Paul J.: See—  
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- N.V. Optische Industrie "De Oude Delft": See—  
Duinker, Simon; and Mulder, Hendrik, 4,164,657, Cl. 250-445.00T.
- N.V. Verenigde Instrumentenfabrieken Enraf-Nonius: See—  
Zeijdel, August-Eden; and Teunissen, Rudolf B., 4,164,350, Cl. 272-70.000.
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- Ochiai, Setsumi: See—  
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- Oelberg, George R. Packer and loader unit for a motor vehicle. 4,164,293, Cl. 414-525.000.
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- Ogawa, Takuzo: See—  
Ura, Mitsuru; Miyata, Kenji; Suzuki, Takaya; and Ogawa, Takuzo, 4,164,436, Cl. 148-174.000.
- Ogawa, Toshio: See—  
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,164,676, Cl. 310-360.000.
- Ogino, Kiyoshi, to Central Glass Company, Limited. Method of producing lumps of tangled fibers. 4,164,534, Cl. 264-117.000.
- Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Demodulation circuits of FM stereophonic receivers. 4,164,624, Cl. 179-1.0GD.
- Oguro, Tomokatsu, to Hitachi, Ltd. Magnetrons. 4,164,684, Cl. 315-39.510.
- Ohya, Junichi: See—  
Morita, Yoshiharu; Ohya, Junichi; and Shirasaka, Tadashi, 4,164,577, Cl. 424-251.000.
- Oikawa, Masahiro, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for preventing incorrect collating of signatures. 4,164,651, Cl. 250-216.000.
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- Okamoto, Mitsuhiro: See—  
Matumoto, Syozo; and Okamoto, Mitsuhiro, 4,164,653, Cl. 250-301.000.
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- Okazaki, Hiroshi. Coat hanger stand. 4,164,288, Cl. 211-207.000.
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- Okubo, Shigeo. Method and system for monitoring the angular deformation of structural elements. 4,164,149, Cl. 73-594.000.
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- Olson, Jerry A.: See—  
Kaiser, Hermann; Nellums, Richard A.; and Olson, Jerry A., 4,164,144, Cl. 73-213.000.
- Olsson, Robert G.; and Turkdogan, Ethem T., to United States Steel Corporation. Desulfurization of hot reducing gas. 4,164,544, Cl. 423-230.000.
- Olympus Optical Company: See—  
Hosaka, Kiyokazu, 4,164,333, Cl. 242-71.200.
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Fukuoka, Kenji; and Anami, Takayuki, 4,164,762, Cl. 358-304.000.
- Miyazi, Kazumi; and Ichikawa, Hiroki, 4,164,637, Cl. 200-86.500.
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Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,164,528, Cl. 264-62.000.
- Onnen, James H., to American Air Filter Company, Inc. Damper assembly. 4,164,211, Cl. 126-285.00A.
- Ono, Toshio: See—  
Kawahara, Yoshiharu; and Ono, Toshio, 4,164,506, Cl. 260-410.90R.
- Oppolzer, Wolfgang: See—  
Achini, Roland; Oppolzer, Wolfgang; and Pfenninger, Emil, 4,164,583, Cl. 424-274.000.
- Orban, Jean: See—  
Vital, Zoltan; and Orban, Jean, 4,164,686, Cl. 315-241.00P.
- Ortmanns, Gunther, to Saint-Gobain Industries. Fire-proof window. 4,164,108, Cl. 52-232.000.
- Osada, Hiroshi; and Murata, Kazuo, to Nissan Motor Company, Limited. Mast support construction for fork lift truck. 4,164,270, Cl. 187-9.00R.
- Osaka, Susumu: See—  
Toda, Minoru; Osaka, Susumu; and Matsumoto, Yasushi, 4,164,756, Cl. 358-128.000.
- Otausky, Paul: See—  
Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Otausky, Paul; Thackaberry, Harold; and Barrows, Robert E., 4,164,766, Cl. 360-97.000.
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Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Otavsky, Paul; Thackaberry, Harold; and Barrows, Robert E., 4,164,769, Cl. 360-106.000.
- Ovtime, Inc.: See—  
Schuster, Samuel R., 4,164,212, Cl. 128-759.000.
- Owen, Marler W.; and Morris, Ray E. Valve assembly with seat cleaning system. 4,164,236, Cl. 137-240.000.
- Owens-Corning Fiberglas Corporation: See—  
Canfield, Sheldon A., 4,164,177, Cl. 100-40.000.
- Owens, Frank J.: See—  
Christoe, Charles W.; and Owens, Frank J., 4,164,700, Cl. 324-0.5AH.
- Owens-Illinois, Inc.: See—  
Boling, Norman L., 4,164,432, Cl. 136-89.0PC.
- Lohman, Richard D.; and Mumford, George V., 4,164,377, Cl. 401-213.000.
- Owby, James C.: See—  
Irck, Gether, Jr.; Owby, James C.; and Wang, Richard H. S., 4,164,480, Cl. 252-402.000.
- Oy Tampella AB: See—  
Pennanen, Paavo, 4,164,315, Cl. 229-34.00R.
- Oy. W. Rosenlew AB: See—  
Hartta, Matti O., 4,164,060, Cl. 29-25.190.
- Oyama, Kenneth H.: See—  
Lawler, John K., deceased; Mitchell, John W., Sr.; and Oyama, Kenneth H., 4,164,074, Cl. 32-32.000.
- Oyamoto, Toshiya: See—  
Tokuda, Masahiro; Tamura, Tadaaki; Kajimoto, Hikokusu; Shimada, Takafumi; Oyamoto, Toshiya; and Ochiai, Setsumi, 4,164,484, Cl. 260-2.300.
- Oystese, Brigit, to A/S Apothekernes Laboratorium for Specialpræparater. Zinc bacitracin composition for use as a feed supplement and method for making the same. 4,164,572, Cl. 424-177.000.
- Ozaki, Kiyotaka: See—  
Kimura, Akio; Wada, Osamu; Matsui, Michikage; and Ozaki, Kiyotaka, 4,164,116, Cl. 57-282.000.
- Ozawa, Seiji: See—  
Imamura, Masanaga; Sakai, Hisashi; Sugiyama, Hiroaki; and Ozawa, Seiji, 4,164,307, Cl. 222-182.000.
- P. Ferrero C. S.p.A.: See—  
Dogliotti, Amicare, 4,164,645, Cl. 219-452.000.
- P. R. Mallory & Co., Inc.: See—  
Viewor, William F., 4,164,066, Cl. 29-570.000.
- Palac, Kazimir, to Zenith Radio Corporation. Shadow mask suspension system having bracket means integrally formed from the shadow mask assembly. 4,164,682, Cl. 313-404.000.
- Palazzetti, Mario, to Fiat Societa' per Azioni. Plant for the production of electrical energy and heat. 4,164,660, Cl. 290-2.000.
- Palitex Project Company, GmbH: See—  
Franzen, Gustav, 4,164,115, Cl. 57-279.000.
- Parker, Norman W.: See—  
Hilbert, Francis H.; and Parker, Norman W., 4,164,623, Cl. 179-1.0GS.
- Parquet, Donald J., to J. I. Case Company. Hydraulic pump unloading system. 4,164,119, Cl. 60-428.000.
- Pasco, Wayne D.: See—  
Klug, Frederic J.; Pasco, Wayne D.; and Prochazka, Svante, 4,164,424, Cl. 106-38.900.
- Pasqualucci, Carmine: See—  
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,164,499, Cl. 260-239.30P.
- Patel, Gordhanbhai N., to Allied Chemical Corporation. Production of radiation crosslinked polymeric compositions using diacetylenes. 4,164,458, Cl. 204-159.170.
- Patrick, Michael D.: See—  
Hannahs, Arnold E.; and Patrick, Michael D., 4,164,679, Cl. 315-241.00R.
- Patsch, Manfred; and Hettche, Albert, to BASF Aktiengesellschaft. Pyrazoline compounds. 4,164,500, Cl. 260-239.900.
- Paulson, Carrol H., Jr.: See—  
Granahan, Edward A.; and Paulson, Carrol H., Jr., 4,164,433, Cl. 136-229.000.
- Paulucci, Jeno F.: See—  
Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., 4,164,591, Cl. 426-523.000.
- Pearlman, Walter. Automatic smoking device. 4,164,230, Cl. 131-171.00R.
- Pearl, M. Virginia; DeWitt, David P.; and Kern, Susan T. Energy-efficient bi-radiant oven system. 4,164,643, Cl. 219-411.000.
- Peavey Electronics Corp.: See—  
Rhodes, Orville J., 4,164,163, Cl. 84-1.150.
- Pechauer, Thomas C.: See—  
Cenko, John; and Pechauer, Thomas C., 4,164,063, Cl. 29-420.500.
- Peck, Gregory G. A. Stenciling apparatus having improved casing structure. 4,164,183, Cl. 101-114.000.
- Peddighaus, Rolf. Punching apparatus. 4,164,158, Cl. 83-191.000.
- Pelzner, Roger B.: See—  
Stark, Marvin M.; Rosenfeld, Jack B.; Pelzner, Roger B.; and Soelberg, Kenneth B., 4,164,214, Cl. 128-741.000.
- Pennanen, Paavo, to Oy Tampella AB. Blank for boxes. 4,164,315, Cl. 229-34.00R.
- Pennsylvania Sewing Research Corp.: See—  
Glassman, Aaron, 4,164,083, Cl. 38-11.000.
- Pequegnat, Willis E., to TerEco Corporation. Benthic aquatic biotal monitor. 4,164,199, Cl. 119-2.000.
- Perec, Mieczyslaw: See—  
Barnert, Heiko; Perec, Mieczyslaw; and Struck, Bernd D., 4,164,457, Cl. 204-129.000.
- Pereda, Eugene F. Apparatus to test proper wiring of electrical wall receptacles especially if the ground and neutral wires are reversed with respect to the hot wire. 4,164,702, Cl. 324-51.000.
- Pericomp Corporation: See—  
Joannou, Kyriacos, 4,164,764, Cl. 360-77.000.
- Perrin, Jack L., to Towlsaver, Inc. Soap dispenser including removable soap supply container positioner and stabilizer. 4,164,306, Cl. 222-181.000.
- Perry, David H., deceased: See—  
Gundlach, Robert W.; and Perry, David H., deceased, 4,164,372, Cl. 355-3.0DD.
- Person, Orville W. Throat obstruction expulsion device. 4,164,216, Cl. 128-28.000.
- Perugini, Giancarlo; and Marcaccioli, Enzo, to Montedison S.p.A. Plasma arc process for the production of chemical products in power form. 4,164,553, Cl. 423-440.000.
- Peter, Glen O.: See—  
Anderten, John R.; and Peter, Glen O., 4,164,172, Cl. 98-33.00R.
- Peters, Robert W., to Greenleaf Corporation. Milling cutter with adjustment for face runout. 4,164,380, Cl. 407-36.000.
- Peterson, Wesley R., to Singer Company, The. Sewing machine motor actuated pneumatic pump for needle threading. 4,164,191, Cl. 112-225.000.
- Peterson, Wesley R.: See—  
Herr, John A.; Brown, Jack; Peterson, Wesley R.; and Jaffe, Wolfgang, 4,164,192, Cl. 112-158.00E.
- Petrolite Corporation: See—  
Cheng, William J.; and Guthrie, David B., 4,164,472, Cl. 252-18.000.
- Quinlan, Patrick M., 4,164,574, Cl. 424-199.000.
- Pfenninger, Emil: See—  
Achini, Roland; Oppolzer, Wolfgang; and Pfenninger, Emil, 4,164,583, Cl. 424-274.000.
- Pfizer Inc.: See—  
Hammen, Philip D.; and Milne, George M., Jr., 4,164,514, Cl. 260-570.50P.
- Phillips Petroleum Company: See—  
Bertus, Brent J., 4,164,519, Cl. 585-622.000.
- Childs, William V., 4,164,616, Cl. 568-858.000.
- Funk, Gary L., 4,164,451, Cl. 203-2.000.
- Funk, Gary L.; and Smith, Dexter E., 4,164,452, Cl. 203-2.000.
- Hunt, Harold R., 4,164,533, Cl. 264-117.000.
- Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,164,471, Cl. 252-1.000.
- Jones, Brenton E.; and Reusser, Robert E., 4,164,140, Cl. 73-54.000.
- Scott, Richard L., 4,164,545, Cl. 423-239.000.
- Slagel, John E.; and Brock, Jack W., 4,164,540, Cl. 422-158.000.
- Stapp, Paul R., 4,164,615, Cl. 560-246.000.



Phillips, Wendel G., to Monsanto Company. Phosphorylphthalimides and their use as plant growth regulators. 4,164,406, Cl. 71-86.000.  
Phoenix Royalty Associates, Inc.: See—  
Clay, Edward L.; and Baker, Jerry L., 4,164,526, Cl. 264-45.300.  
Piazza, Matthew R., to Maso-Therm Corporation. Process and apparatus for uniformly distributing glass fibers. 4,164,532, Cl. 264-115.000.  
Pinckard, Joseph A., to Ekol Corporation. The Method of controlling the rate of damping-off of plant seedlings and improving the rate of tree growth with treated cotton gin waste. 4,164,405, Cl. 71-79.000.  
Pischiera, Enrico E. Pacing device for runners and the like. 4,164,732, Cl. 340-323.00R.  
Plaski, Walter: See—  
McLaughlin, Richard S.; Plaski, Walter; and Swartzendruber, Robert F., 4,164,179, Cl. 101-76.000.  
Plasticisers Limited: See—  
Slack, Philip T., 4,164,161, Cl. 83-346.000.  
Platz, Edward A., deceased; by Platz, Zelma H., executor; and by Lubas, William, executor. Venturi mixer. 4,164,541, Cl. 422-198.000.  
Platz, Zelma H., executor: See—  
Platz, Edward A., deceased; Platz, Zelma H., executor; and Lubas, William, executor. 4,164,541, Cl. 422-198.000.  
Pneumo Corporation: See—  
Granahan, Edward A.; and Paulson, Carrol H., Jr., 4,164,433, Cl. 136-229.000.  
Pobgee, Peter J., to National Research Development Corporation. Graphical input apparatus for electrical equipment. 4,164,622, Cl. 178-18.000.  
Pohle, Raimund: See—  
Henne, Werner; Dunweg, Gustav; Schmitz, Werner; Pohle, Raimund; and Lawitzki, Friedrich, 4,164,437, Cl. 156-167.000.  
Polytop Corporation: See—  
Haggerty, Dennis A., 4,164,305, Cl. 222-4.000.  
Ponder & Best Inc.: See—  
Vital, Zoltan; and Orban, Jean, 4,164,686, Cl. 315-241.00P.  
Ponsinet, Gerard: See—  
Bourzat, Jean D.; Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, 4,164,579, Cl. 424-263.000.  
Porta Systems Corp.: See—  
Carney, William V., 4,164,774, Cl. 361-19.000.  
Potts, Irvin W.: See—  
Ma, King W.; Potts, Irvin W.; and Malek, Russell A., 4,164,481, Cl. 252-412.000.  
Powell, B. J.: See—  
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,164,246, Cl. 144-2.00Z.  
PPG Industries, Inc.: See—  
Borman, Robert F., 4,164,587, Cl. 426-131.000.  
Girgis, Mikhail M., 4,164,485, Cl. 260-5.000.  
Prescott, Doris M., executrix: See—  
Welty, Albert B., Jr., deceased; and Prescott, Doris M., executrix, 4,164,546, Cl. 423-239.000.  
Previali, Augusto, to Industrie Pirelli, S.p.A. Device for vulcanizing conveyor belts and similar articles. 4,164,440, Cl. 156-583.100.  
Price, Samuel: See—  
Bean, Mervyn L.; and Price, Samuel, 4,164,165, Cl. 89-134.000.  
Price, William G.: See—  
Anthony, Donald R.; Bone, Lee, III; and Price, William G., 4,164,257, Cl. 166-113.000.  
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, to New York Blood Center, Inc. Vaccine for active immunization containing hepatitis B surface antigen and associated antigen. 4,164,565, Cl. 424-89.000.  
Prochazka, Svante: See—  
Klug, Frederic J.; Pasco, Wayne D.; and Prochazka, Svante, 4,164,424, Cl. 106-38.900.  
Procter & Gamble Company, The: See—  
Johnson, Charles L., 4,164,588, Cl. 426-135.000.  
Madison, Bryan L.; and Shulman, Joel I., 4,164,594, Cl. 426-547.000.  
Prokhorov, Alexandr M.; Vinogradov, Alexandr L.; Danileiko, Jury K.; Manenkov, Alexandr A.; Krasnov, Mikhail M.; and Naumidi, Leonid P., to Fizichesky Institut Imeni P.N. Lebedeva Akademii Nauk SSSU of USSR; and Vsesojuzny Nauchno-Issledovatel'skiy Institut Glaznykh Boleznei. Laser ophthalmological unit. 4,164,222, Cl. 128-303.100.  
Province, Joyce Perry, administratrix: See—  
Gundlach, Robert W.; and Perry, David H., deceased, 4,164,372, Cl. 355-3.00D.  
Provost, Philip J.; and Hilleman, Maurice R., to Merck & Co., Inc. Hepatitis A virus cell culture in vitro. 4,164,566, Cl. 424-89.000.  
Pullman Incorporated: See—  
Hallam, Keith J.; and Knippel, Willis H., 4,164,188, Cl. 105-166.000.  
Purcell Corporation: See—  
Townsend, Robert L., 4,164,055, Cl. 15-321.000.  
Puschel, Siegfried: See—  
Funk, Norbert J.; and Puschel, Siegfried, 4,164,120, Cl. 60-431.000.  
Quentin, Karl-Ernst: See—  
Berger, Harald; Quentin, Karl-Ernst; and Weil, Ludwig, 4,164,482, Cl. 252-428.000.  
Quinlan, Patrick M., to Petrolite Corporation. Use of polyquaternary ammonium methylene phosphonates as microbiocides. 4,164,574, Cl. 424-199.000.  
Raasch, Hans: See—  
Maassen, Wilhelm; Raasch, Hans; and Wassenhoven, Heinz-Georg, 4,164,330, Cl. 242-18.0PW.

Raczynski, Michael E.; and Streiff, William G., to BASF Wyandotte Corporation. Detachable handles and drum assemblies. 4,164,300, Cl. 220-94.00R.  
Radman, Anton J., Jr.: See—  
Janssen, Donovan M.; and Radman, Anton J., Jr., 4,164,768, Cl. 360-99.000.  
Ragle, Herbert U.: See—  
Gyi, Ko K.; and Ragle, Herbert U., 4,164,767, Cl. 360-98.000.  
Raible, Donald A., to Bentley Laboratories, Inc. Blood treating device and method of operation. 4,164,468, Cl. 210-23.00R.  
Raible, Donald A.: See—  
Bentley, Donald J.; and Raible, Donald A., 4,164,221, Cl. 128-214.00R.  
Rank Organisation Limited, The: See—  
Matchell, Raymond, 4,164,761, Cl. 358-215.000.  
Rappold, Franz: See—  
Scheffels, Wilhelm; Koy, Johannes; Rappold, Franz; Hiller, Walther; and Steigerwald, Karl H., 4,164,641, Cl. 219-121.0EM.  
Rathbun, Richard H.; and Hildebrandt, William J., to Stanley Works, The. Tape measure hook and hook storage receptacle. 4,164,334, Cl. 242-84.800.  
Raytheon Company: See—  
Schilling, Hartmut, 4,164,461, Cl. 204-192.0EC.  
RCA Corporation: See—  
Ahmed, Adel A. A., 4,164,687, Cl. 315-384.000.  
Catanese, Carmen A., 4,164,681, Cl. 313-400.000.  
Katagi, Kazuo, 4,164,739, Cl. 343-5.0SC.  
Matsumoto, Yasushi, 4,164,755, Cl. 358-128.000.  
Steckler, Steven A.; and Balaban, Alvin R., 4,164,711, Cl. 325-464.000.  
Stewart, Myron C., 4,164,782, Cl. 360-133.000.  
Toda, Minoru; Osaka, Susumu; and Matsumoto, Yasushi, 4,164,756, Cl. 358-128.000.  
Reade, Richard F.: See—  
Beall, George H.; and Reade, Richard F., 4,164,610, Cl. 429-193.000.  
Real, Kenneth G.: See—  
Ellefson, Larry P.; Brooks, Robert J.; Real, Kenneth G.; and Manthey, John A., 4,164,180, Cl. 101-93.340.  
Reavill, Joseph A., to General Dynamics Corporation. Solder preform loading method and apparatus. 4,164,064, Cl. 29-468.000.  
Reed, Bradley O.; and Nolan, John M., to General Electric Company. All concentric multi-range synchronous shifting hydromechanical transmission including a multi-range concentric gear train package. 4,164,155, Cl. 74-687.000.  
Reed, Bradley O., to General Electric Company. Full reversing hydromechanical steering transmission with multi-range synchronous shifting concentric gear train package. 4,164,156, Cl. 74-687.000.  
Reilly, Robert A.: See—  
Ward, Charles R.; and Reilly, Robert A., 4,164,628, Cl. 179-15.0BA.  
Reinke, Orville H.: See—  
Adams, James W.; and Reinke, Orville H., 4,164,595, Cl. 427-341.000.  
Reinwald, Elmar; Smolka, Heinz; and Schwuger, Milan J., to Henkel Kommanditgesellschaft auf Aktien. Method of washing materials while reversibly circulating wash liquid through a cation exchange resin. 4,164,430, Cl. 134-13.000.  
Remsynder, Duane C.; and Haynes, Clarence C., to Courtesy Interstate Corporation. Portable electrical heating unit with automatic cutoff. 4,164,644, Cl. 219-433.000.  
Renjilian, Armen; Nichols, Donald S.; and Hartigan, Richard J., Jr., to Albany International Corp. Method of making monofilament from thermoplastic resin tapes. 4,164,530, Cl. 264-103.000.  
Research Corporation: See—  
Kende, Andrew S.; Tsay, Yuh-Geng; and Furuta, Takuya, 4,164,503, Cl. 260-365.000.  
Kupchan, S. Morris, deceased; Jarvis, Bruce B.; and Dailey, Richard G., Jr., 4,164,584, Cl. 424-279.000.  
Research Frontiers Incorporated: See—  
Saxe, Robert L., 4,164,365, Cl. 350-362.000.  
Research Institute for Iron, Steel and Other Metals of the Tohoku University, The: See—  
Yajima, Seishi; Hayasini, Josaburo; Otori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,164,528, Cl. 264-62.000.  
Reusser, Robert E.: See—  
Jones, Brenton E.; and Reusser, Robert E., 4,164,140, Cl. 73-54.000.  
Reynolds, Richard W.: See—  
Hucker, David J.; and Reynolds, Richard W., 4,164,661, Cl. 307-57.000.  
Rhodes, Donald E.: See—  
Baldwin, Roger A.; Davis, Robert E.; Leonard, Robert E.; and Rhodes, Donald E., 4,164,466, Cl. 208-177.000.  
Rhodes, Orville J., to Peavey Electronics Corp. Electric guitar circuitry. 4,164,163, Cl. 84-1.150.  
Rhône-Poulenc Industries: See—  
Bourzat, Jean D.; Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, 4,164,579, Cl. 424-263.000.  
Costantini, Michel; and Joffret, Michel, 4,164,516, Cl. 260-586.00P.  
Ricoh Company Limited: See—  
Imamura, Masanaga; Sakai, Hisashi; Sugiyama, Hiroaki; and Ozawa, Seiji, 4,164,307, Cl. 222-182.000.  
Rider, Albert J.: See—  
Kosydar, Gerald M.; Rider, Albert J.; and Trussler, Alan A., 4,164,080, Cl. 35-12.00P.

Riedel, Albert F., to Hoerbiger & Co. Closing plate for a ring valve. 4,164,238, Cl. 137-512.150.  
Ries, Karl; Hannoschock, Kurt; and Simoneit, Gunter, to Mannesmann Aktiengesellschaft. System for inspecting tubes or pipes by means for ultrasonics. 4,164,150, Cl. 73-644.000.  
Riis, Voldemar, to AB Vargarda Armaturfabrik. Thermostatic mixing valve for two fluids. 4,164,321, Cl. 236-12.00R.  
Rimbo Tekniska Fabrik Rimpac AB: See—  
Nordin, Kent A. R., 4,164,170, Cl. 93-35.00H.  
Robache, Andre, to Fives-Cail Babcock. Self-propelled apparatus for cleaning beets. 4,164,052, Cl. 15-3.110.  
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Heintz, Frieder; and Jansche, Walter, 4,164,263, Cl. 280-735.000.  
Heitmann, Jürgen; and Maly, Hans-Peter, 4,164,749, Cl. 358-13.000.  
Sandau, Hartmut, 4,164,242, Cl. 138-30.000.  
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Robert, Jean, to La Francaise Metallurgie. Sanding head including a dust extracting shaft casing. 4,164,101, Cl. 51-273.000.  
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Gehri, Dennis C., 4,164,416, Cl. 75-72.000.  
Rodaway, Keith S., to Everest & Jennings, Inc. Narrow frame wheelchair. 4,164,354, Cl. 280-42.000.  
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Amsbury, Clifford R.; and Warren, Eric, 4,164,694, Cl. 318-578.000.  
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Johnston, James S., 4,164,539, Cl. 422-96.000.  
Rosenfeld, Jack B.: See—  
Stark, Marvin M.; Rosenfeld, Jack B.; Pelzner, Roger B.; and Soelberg, Kenneth B., 4,164,214, Cl. 128-741.000.  
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Sicari, Francesco; and Rossi, Pietro P., 4,164,508, Cl. 260-413.000.  
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Schumacher, Wilhelm; Rothbuhr, Lothar; and Armster, Joachim, 4,164,423, Cl. 106-20.000.  
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Grimble, Brian J.; and Rouse, Michael R., 4,164,361, Cl. 312-236.000.  
Rubin, Albert L.: See—  
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Ruder, Gary C. F.: See—  
Clough, David; and Ruder, Gary C. F., 4,164,570, Cl. 424-175.000.  
Rudolph, Frank W.: See—  
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Ruegg, Franz: See—  
Fluck, Rene; and Ruegg, Franz, 4,164,277, Cl. 198-369.000.  
Rumpf, Robert J.: See—  
Higbee, Wallace C.; and Rumpf, Robert J., 4,164,336, Cl. 242-107.04A.  
Rutimann, Kurt: See—  
Anderegg, Max; and Rutimann, Kurt, 4,164,649, Cl. 235-480.000.  
Rysti, Alpo. Method and apparatus for cutting off defective portions of lengths of timber. 4,164,248, Cl. 144-312.000.  
Sacco, John A.: See—  
Di Giacomo, Hector L.; and Sacco, John A., 4,164,310, Cl. 228-58.000.  
Sacre, Louis, to Societe D'Electricite Mors. Servo controlled tape indicating device. 4,164,695, Cl. 318-653.000.  
Saint-Gobain Industries: See—  
Kraemling, Franz; Bartonitschek, Norbert; Mattes, Gunther; and Nieven, Jakob, 4,164,107, Cl. 52-232.000.  
Ortmanns, Gunther, 4,164,108, Cl. 52-232.000.  
Sakai, Hisashi: See—  
Imamura, Masanaga; Sakai, Hisashi; Sugiyama, Hiroaki; and Ozawa, Seiji, 4,164,307, Cl. 222-182.000.  
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Salem, Robert J., to General Electric Company. Piezoelectric audible indicator circuit. 4,164,735, Cl. 340-384.00E.  
Samson Ocean Systems, Inc.: See—  
Linehan, Joseph J., 4,164,378, Cl. 403-210.000.  
Sandau, Hartmut, to Robert Bosch GmbH. Valve for a pressure tank. 4,164,242, Cl. 138-30.000.  
Sanderson, James J.: See—  
Gregorovich, Basil V.; and Sanderson, James J., 4,164,488, Cl. 260-29.4UA.  
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Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,164,051, Cl. 8-149.100.  
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Myers, Stewart W.; and Spencer, Homer K., 4,164,407, Cl. 71-88.000.  
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Stakelbeck, Hans-Peter, 4,164,050, Cl. 8-149.100.  
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Schermutzki, Konrad; and Stabler, Gerhard, 4,164,387, Cl. 425-371.000.  
Stabler, Gerhard, 4,164,386, Cl. 425-371.000.  
Sanyo Electric Co., Ltd.: See—  
Hosoya, Nobukazu, 4,164,750, Cl. 358-26.000.  
Minou, Shigemitsu; and Kamada, Shuhei, 4,164,710, Cl. 325-464.000.  
Sato, Kanemasa: See—  
Ichikawa, Norio; Sato, Kanemasa; and Ueno, Sadayasu, 4,164,462, Cl. 204-195.00S.  
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Saxe, Robert L., to Research Frontiers Incorporated. Light valve for controlling the transmission of radiation comprising a cell and a stabilized liquid suspension. 4,164,365, Cl. 350-362.000.  
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Scheffels, Wilhelm, to Steigerwald Strahltechnik GmbH. Method and apparatus for positioning a charged particle beam. 4,164,640, Cl. 219-121.0EM.  
Scheffels, Wilhelm; Koy, Johannes; Rappold, Franz; Hiller, Walther; and Steigerwald, Karl H., to Steigerwald Strahltechnik GmbH. Method and apparatus for energy beam welding with filling material. 4,164,641, Cl. 219-121.0EM.  
Scheffer, John H.: See—  
Jones, Paul; and Scheffer, John H., 4,164,268, Cl. 182-150.000.  
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Hoene, Richard; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,164,613, Cl. 526-201.000.  
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Arndt, Friedrich; and Bornschewski, Gerhard, 4,164,414, Cl. 71-111.000.  
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Schieman, Richard D., to Standard Oil Company, The. Multi-grade 80W-140 gear oil. 4,164,475, Cl. 252-46.700.  
Schilling, Hartmut, to Raytheon Company. Semiconductor integrated circuit structures and manufacturing methods. 4,164,461, Cl. 204-192.0EC.  
Schlecht, Helmut: See—  
Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, 4,164,511, Cl. 260-465.00E.  
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Henne, Werner; Dunweg, Gustav; Schmitz, Werner; Pohle, Raimund; and Lawitzki, Friedrich, 4,164,437, Cl. 156-167.000.  
Schnier, Edward A., to A-T-O, Inc. Spotting machine. 4,164,281, Cl. 260-394.000.  
Schober, Michael A., to Borg-Warner Corporation. Continuous line for plating on metal strip material. 4,164,454, Cl. 204-28.000.  
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Brubaker, Gaylen R.; and Scholer, Fred R., 4,164,394, Cl. 8-107.000.  
Schrock, Rudy J. Preventive apron. 4,164,217, Cl. 128-138.00R.



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Schwuger, Milan J.: See—  
Reinwald, Elmar; Smolka, Heinz; and Schwuger, Milan J., 4,164,430, Cl. 134-13.000.

Scordato, Emil A.: See—  
Irazoqui, Carlos A.; and Scordato, Emil A., 4,164,320, Cl. 235-375.000.

Scott/Chatham Company: See—  
Wald, Stephen A., 4,164,400, Cl. 55-382.000.

Scott, Richard L., to Phillips Petroleum Company. Use of manganese dioxide absorbent in treating waste gases. 4,164,545, Cl. 423-239.000.

Seibold, Klaus: See—  
Feldmann, Martin; Koberstein, Edgar; and Seibold, Klaus, 4,164,557, Cl. 423-600.000.

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Fritz, William E.; Graves, Mark L.; and Seitz, Robert F., 4,164,189, Cl. 105-378.000.

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Semanchik, Stephen: See—  
Witt, Frank; and Semanchik, Stephen, 4,164,284, Cl. 206-217.000.

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Gambling, Kenneth H., 4,164,200, Cl. 119-51.120.

Shaffer, Robert C., to Hitco. Coating for fibrous carbon material in boron containing composites. 4,164,601, Cl. 428-284.000.

Shank, Charles P.: See—  
Cooper, Glenn D.; Katchman, Arthur; and Shank, Charles P., 4,164,493, Cl. 260-42.180.

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Blytas, George C.; and Deal, Carl H., 4,164,507, Cl. 260-412.500.

Carr, John B., 4,164,576, Cl. 424-248.540.

Shelstad, Richard J. Vehicle washing apparatus. 4,164,053, Cl. 15-97.00B.

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Jinno, Naoyoshi; Satomi, Takeo; Kawakami, Shigenao; Shibata, Tatsumi; and Isaoka, Shin-ichi, 4,164,413, Cl. 71-103.000.

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Shilling, Ray A.: See—  
Muller, Jean A.; and Shilling, Ray A., 4,164,287, Cl. 211-134.000.

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Bokros, Jack C.; Shim, Hong S.; and Haubold, Axel D., 4,164,045, Cl. 3-1.400.

Shimada, Takafumi: See—  
Tokuda, Masahiro; Tamura, Tadaaki; Kajimoto, Hikokusu; Shimada, Takafumi; Oyamoto, Toshiya; and Ochiai, Setsumi, 4,164,484, Cl. 260-2.300.

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Itoh, Kunio; and Fukuda, Takeshi, 4,164,491, Cl. 260-37.05B.

Shinjo, Katsumi, to Yugenkaisha Shinjo Seisakusho. Automatic piercing nut assembling arrangement. 4,164,072, Cl. 29-720.000.

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Hanaoka, Seiji, 4,164,181, Cl. 101-99.000.

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Morita, Yoshiharu; Ohya, Junichi; and Shirasaka, Tadashi, 4,164,577, Cl. 424-251.000.

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Kaji, Hiroyuki; and Suzuki, Narishige, 4,164,419, Cl. 75-169.000.

Shono, Hiroaki: See—  
Noji, Toshio; Shono, Hiroaki; and Wakasa, Isao, 4,164,401, Cl. 65-1.000.

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structure-containing multicell electrochemical device. 4,164,068, Cl. 29-623.100.

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Madison, Bryan L.; and Shulman, Joel I., 4,164,592, Cl. 426-547.000.

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Whitesides, George M.; Garrett, Patricia E.; and Siegel, Merrell G., 4,164,444, Cl. 435-92.00N.

Siegenia-Frank KG.: See—  
Kucharczyk, Eckhard, 4,164,265, Cl. 181-224.000.

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Frosien, Jurgen; Lischke, Burkhard; and Oelmann, Andreas, 4,164,658, Cl. 250-492.00A.

Hoelzler, Georg, 4,164,213, Cl. 128-660.000.

Lauer, Wilhelm; and Soldner, Rudolf, 4,164,779, Cl. 361-433.000.

Witte, Hans H., 4,164,364, Cl. 350-96.170.

SIG Schweizerische Industrie-Gesellschaft: See—  
Fluck, Rene; and Ruegg, Franz, 4,164,277, Cl. 198-369.000.

Meier, Siegfried, 4,164,244, Cl. 141-156.000.

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Jaksich, Milenko, 4,164,784, Cl. 362-282.000.

Siliconix Inc.: See—  
Landsburg, George F.; and Hill, Lorimer K., 4,164,733, Cl. 340-347.0NT.

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Yung, Kai-Lim W.; Silverman, Bernard; and Menikheim, Virginia C., 4,164,600, Cl. 428-198.000.

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Ries, Karl; Hannoschock, Kurt; and Simoneit, Gunter, 4,164,150, Cl. 73-644.000.

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Singer Company, The: See—  
Herr, John A.; Brown, Jack; Peterson, Wesley R.; and Jaffe, Wolfgang, 4,164,192, Cl. 112-158.00E.

Kosydar, Gerald M.; Rider, Albert J.; and Trussler, Alan A., 4,164,080, Cl. 35-12.00P.

Peterson, Wesley R., 4,164,191, Cl. 112-225.000.

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Finch, David A.; and Smillie, Charles M., III, 4,164,635, Cl. 200-33.00R.

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Coupland, Keith; and Smith, Clinton R., 4,164,473, Cl. 252-32.70E.

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Burkhart, William H., 4,164,138, Cl. 73-23.000.

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Funk, Gary L.; and Smith, Dexter E., 4,164,452, Cl. 203-2.000.

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Smith, Milton B. Adjustable spinnaker header and rig therefor. 4,164,193, Cl. 114-111.000.

Smith, Otto J. M. Solar thermal electric power plant. 4,164,123, Cl. 60-641.000.

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Reinwald, Elmar; Smolka, Heinz; and Schwuger, Milan J., 4,164,430, Cl. 134-13.000.

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Sicliari, Francesco; and Rossi, Pietro P., 4,164,508, Cl. 260-413.000.

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Guipaud, Serge, 4,164,204, Cl. 123-117.00R.

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Mazzorana, Alfred B., 4,164,673, Cl. 310-89.000.

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Sacre, Louis, 4,164,695, Cl. 318-653.000.

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Lemonde, Robert; and Dussetour, Bernard, 4,164,152, Cl. 73-665.000.

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Stubbs, Harvard P., 4,164,166, Cl. 91-342.000.

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Cushing, Brian M., 4,164,688, Cl. 315-389.000.

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Lauer, Wilhelm; and Soldner, Rudolf, 4,164,779, Cl. 361-433.000.

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Inaba, Masao; Yuasa, Kazumi; and Sonoda, Michiaki, 4,164,760, Cl. 358-183.000.

Soubeyrat, Michel. Method for fixing protective sheets about rolls of material. 4,164,110, Cl. 53-409.000.

South African Inventions Development Corporation, The: See—  
Butler, Louis R. P.; and Human, Hendrik G. C., 4,164,654, Cl. 250-426.000.

Coezter, Johan, 4,164,608, Cl. 429-50.000.

Spacek, Karel: See—  
Johansson, Jan-Olof; Korpela, Heikki; and Spacek, Karel, 4,164,160, Cl. 83-307.200.

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Myers, Stewart W.; and Spencer, Homer K., 4,164,407, Cl. 71-88.000.

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Viehrig, Wolfgang; and Sperber, Werner, 4,164,371, Cl. 354-312.000.

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Hoene, Richard; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,164,613, Cl. 526-201.000.

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Bogdanski, Franz, 4,164,724, Cl. 337-86.000.

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Schermutzki, Konrad; and Stabler, Gerhard, 4,164,387, Cl. 425-371.000.

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Alafandi, Hamid; and Stamires, Dennis, 4,164,483, Cl. 252-455.00Z.

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Schieman, Richard D., 4,164,475, Cl. 252-46.700.

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Wong, Backman; and Wilson, Earl L., 4,164,322, Cl. 236-34.500.

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Rathbun, Richard H.; and Hildebrandt, William J., 4,164,334, Cl. 242-84.800.

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Anselrode, Lodewijk, 4,164,746, Cl. 346-140.00R.

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Strub, Robert D. Method and apparatus for machining components for stairs. 4,164,249, Cl. 144-326.00R.

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Barnert, Heiko; Perec, Mieczyslaw; and Struck, Bernd D., 4,164,457, Cl. 204-129.000.

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Langenbach-Belz, Manfred; Strunk, Kurt; and Vervloet, Marcel, 4,164,627, Cl. 179-15.0AQ.

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Eaton, Russell K.; and Elenbaas, Ronald A., 4,164,355, Cl. 296-20.000.

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Stubbs, Harvard P., to Solar Pump Corporation. Solar en.rgy device. 4,164,166, Cl. 91-342.000.

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Benson, Victor N., 4,164,235, Cl. 137-52.000.

Hucker, David J.; and Reynolds, Richard W., 4,164,661, Cl. 307-57.000.

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Thompson, N. H., 4,164,113, Cl. 57-104.000.

Superior Electric Company, The: See—  
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Kaji, Hiroyuki; and Suzuki, Narishige, 4,164,419, Cl. 75-169.000.

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Okawa, Yuuki; and Suzuki, Sumiharu, 4,164,605, Cl. 428-593.000.

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Ura, Mitsuru; Miyata, Kenji; Suzuki, Takaya; and Ogawa, Takuzo, 4,164,436, Cl. 148-174.000.

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Nudelman, Boris I.; Svetsitsky, Alexandr S.; Bikbau, Marsel Y.; Bun, Isaak M.; and Kevvai, Arnold A., 4,164,425, Cl. 106-89.000.

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Fister, Julius C., Jr.; and Breedis, John F., 4,164,434, Cl. 148-2.000.



- Sylvachem Corporation: See—  
Krajca, Kenneth E., 4,164,505, Cl. 260-405.600.
- Sziklas, Edward A.; and Freiberg, Robert J., to United Technologies Corporation. Variable output coupled resonator. 4,164,366, Cl. 350-299.000.
- Takahashi, Hirokazu, to Tokyo Shibaura Electric Co., Ltd. Magnetron device. 4,164,685, Cl. 315-105.000.
- Takahashi, Norimichi: See—  
Urano, Fumio; and Takahashi, Norimichi, 4,164,369, Cl. 354-219.000.
- Takemoto, Yasunori: See—  
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- Talbot, James R., to Fiber Industries, Inc. Method for making simulated spun-like ingrain yarn. 4,164,117, Cl. 57-289.000.
- Tamai, Yasuo; Fujiyama, Masaaki; and Amari, Hiroshi, to Fuji Photo Film Co., Ltd. Leader or trailer tape for a magnetic recording medium. 4,164,604, Cl. 428-409.000.
- Tamura, Tadaaki: See—  
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- Tanaka, Hiroshi: See—  
Nakamura, Tadashi; Masuda, Mitsuru; and Tanaka, Hiroshi, 4,164,683, Cl. 313-496.000.
- Tang, Ching W., to Eastman Kodak Company. Multilayer organic photovoltaic elements. 4,164,431, Cl. 136-89.0NB.
- Taniguchi, Kazuo: See—  
Noma, Ichiro; and Taniguchi, Kazuo, 4,164,655, Cl. 250-436.000.
- Tannoy Products Limited: See—  
Garner, Alex V.; and Townsend, Graham, 4,164,631, Cl. 179-115.50H.
- Tapper, Robert. Ionophoretic burn-protection electrode structure. 4,164,226, Cl. 128-419.00R.
- Tasch, Aloysius F., Jr., to Texas Instruments Incorporated. High capacity dynamic ram cell. 4,164,751, Cl. 357-41.000.
- Tatehana, Yoshikazu: See—  
Tokunaga, Hiroshi; Tatehana, Yoshikazu; and Umekawa, Akira, 4,164,418, Cl. 75-88.000.
- Tateoka, Kiyoshi, to Tokico Ltd. Vacuum booster device. 4,164,168, Cl. 91-376.00R.
- Taylor, David W.; and Fulton, Garland L., to Combustion Turbine Power, Inc. Turbine system using unclean fuel. 4,164,124, Cl. 60-683.000.
- Tazawa, Takatoshi: See—  
Kudo, Kin-ichi; Nakamura, Katsuyoshi; and Tazawa, Takatoshi, 4,164,486, Cl. 260-22.0TN.
- Teepak, Inc.: See—  
Bentley, James G., 4,164,536, Cl. 264-173.000.
- Teijin Limited: See—  
Ichikawa, Yataro; and Yamaji, Teizo, 4,164,518, Cl. 585-427.000.
- Kimura, Akio; Wada, Osamu; Matsui, Michikage; and Ozaki, Kiyotaka, 4,164,116, Cl. 57-282.000.
- Telaris Telecommunications, Inc.: See—  
Gillano, Michael N., 4,164,634, Cl. 200-5.00A.
- Teledyne McCormick Selph, an operating div. of Teledyne Ind., Inc.: See—  
Goddard, Terrence P., 4,164,513, Cl. 260-564.00D.
- Teletype Corporation: See—  
Kastilahn, William C.; and von Braun, Leopold, 4,164,696, Cl. 318-696.000.
- Tenna Power Corporation: See—  
Young, Thomas A.; and Gustin, Jay W., 4,164,785, Cl. 363-50.000.
- Tenneco Chemicals, Inc.: See—  
Herbst, Walter B.; and Lazar, Ralph M., 4,164,105, Cl. 52-202.000.
- Teraji, Tsutomu: See—  
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,164,497, Cl. 260-239.100.
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Pequegnat, Willis E., 4,164,199, Cl. 119-2.000.
- Teunissen, Rudolf B.: See—  
Zeijdel, August-Eden; and Teunissen, Rudolf B., 4,164,350, Cl. 272-70.000.
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Waddill, Harold G.; and Klein, Howard P., 4,164,520, Cl. 525-484.000.
- Texaco Inc.: See—  
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,164,450, Cl. 196-14.520.
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Everett, Mickey H., 4,164,697, Cl. 318-696.000.
- Jones, James J., 4,164,360, Cl. 303-110.000.
- Kulwicki, Bernard M.; Trenkler, George; and Hill, David C., 4,164,147, Cl. 73-362.00R.
- Tasch, Aloysius F., Jr., 4,164,751, Cl. 357-41.000.
- Thackaberry, Harold: See—  
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- Thayer, Arnold A. Safety locking dispenser. 4,164,301, Cl. 220-253.000.
- Theissen, Robert J., to Mobil Oil Corp. Salts of substituted phenoxybenzoic acids, compositions of the same and herbicidal use thereof. 4,164,408, Cl. 71-98.000.
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- Thien, Gerhard: See—  
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- Thomas, Robert R., to Hopkins Manufacturing Corporation. Level indicating devices. 4,164,077, Cl. 33-348.000.
- Thompson, N. H., to Superior Bands, Inc. Spindle drive adapter. 4,164,113, Cl. 57-104.000.
- Thomson-Brandt: See—  
Dubois, Jean-Claude, 4,164,754, Cl. 358-128.000.
- Thurmond, George R. Feedback elimination system employing notch filter. 4,164,715, Cl. 330-85.000.
- Thyssen Industrie Aktiengesellschaft: See—  
Schafer, Heinrich, 4,164,154, Cl. 74-665.0GD.
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Lohrum, Walter; and Tiefenbacher, Eberhard, 4,164,102, Cl. 51-283.00R.
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Finch, David A.; and Smillie, Charles M., III, 4,164,635, Cl. 200-33.00R.
- Timoshenko, Alexandr T.; Nazarenko, Vladimir I.; Krigman, Felix E.; and Gusev, Mikhail G., to Nauchno-Issledovatel'sky Institut Po Bezopasnosti Rabot V Gornoi Promyshlennosti. Thermochemical combustible gas detector. 4,164,699, Cl. 323-75.00A.
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- Toelle, Alvin D., to Bendix Corporation. The closed loop programmable EGR with coolant temperature sensitivity. 4,164,206, Cl. 123-119.00A.
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Okawa, Yuuki; and Suzuki, Sumiharu, 4,164,605, Cl. 428-593.000.
- Tokico Ltd.: See—  
Kubo, Takaaki, 4,164,241, Cl. 137-377.000.
- Tateoka, Kiyoshi, 4,164,168, Cl. 91-376.00R.
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- Tokyo Shibaura Electric Co., Ltd.: See—  
Takahashi, Hirokazu, 4,164,685, Cl. 315-105.000.
- Tom McGuane Industries, Inc.: See—  
Amey, Arnold, 4,164,237, Cl. 137-510.000.
- Tomczuk, Zygmunt, to United States of America, Energy. Method of preparing a positive electrode for an electrochemical cell. 4,164,069, Cl. 29-623.100.
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Perrin, Jack L., 4,164,306, Cl. 222-181.000.
- Townsend, Graham: See—  
Garner, Alex V.; and Townsend, Graham, 4,164,631, Cl. 179-115.50H.
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- Toyko Shibaura Electric Co., Ltd.: See—  
Hirasawa, Masataka, 4,164,666, Cl. 307-208.000.
- Toyo Kogyo Co., Ltd.: See—  
Asanomi, Koji; Takemoto, Yasunori; and Kobayashi, Kazuo, 4,164,205, Cl. 123-117.00R.
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- Toyobo Petcord Co., Ltd.: See—  
Yabuki, Kazuyuki; and Iwasaki, Mitsuo, 4,164,114, Cl. 57-236.000.
- Toyomura, Sigeru; and Kawanabe, Tsuyoshi, to Canon Kabushiki Kaisha. Electronic apparatus for dealing with numerical information. 4,164,789, Cl. 364-710.000.
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Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,164,261, Cl. 180-54.00R.
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Watanabe, Shotaro; Koizumi, Fumio; Tozawa, Katsutoshi; and Uetake, Shigeru, 4,164,476, Cl. 252-62.10P.

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- Trailer Eye, Inc.: See—  
Hunter, Robert H., 4,164,737, Cl. 340-686.000.
- Trees, Carl I., to Lodge & Shipley Company, The. Apparatus for transferring and rotating articles. 4,164,296, Cl. 414-416.000.
- Trenkler, George: See—  
Kulwicki, Bernard M.; Trenkler, George; and Hill, David C., 4,164,147, Cl. 73-362.00R.
- Trepo, Christian: See—  
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,164,565, Cl. 424-89.000.
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Nandagiri, Arun; Tripathi, Uma; and Hunter, LeRoy, 4,164,562, Cl. 424-47.000.
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Kleeberg, Heinz, 4,164,698, Cl. 320-2.000.
- Trungold, Emanuel H. Bolt tension indicating means. 4,164,164, Cl. 85-62.000.
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Kosydar, Gerald M.; Rider, Albert J.; and Trussler, Alan A., 4,164,080, Cl. 35-12.00P.
- Tsay, Yuh-Geng: See—  
Kende, Andrew S.; Tsay, Yuh-Geng; and Furuta, Takuya, 4,164,503, Cl. 260-365.000.
- Tsien, Hsue C.: See—  
Shropshire, Joseph A.; and Tsien, Hsue C., 4,164,068, Cl. 29-623.100.
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Bakul, Valentin N.; Vovchanovsky, Ivan F.; and Tsypin, Nekhemian V., 4,164,527, Cl. 264-60.000.
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Olsson, Robert G.; and Turkdogan, Ethem T., 4,164,544, Cl. 423-230.000.
- Turner, Michael K.: See—  
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,164,447, Cl. 435-173.000.
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Sakamoto, Masakatsu; Uchida, Kenji; and Karino, Takafumi, 4,164,359, Cl. 406-121.000.
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Ichikawa, Norio; Sato, Kanemasa; and Ueno, Sadayasu, 4,164,462, Cl. 204-195.00S.
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Watanabe, Shotaro; Koizumi, Fumio; Tozawa, Katsutoshi; and Uetake, Shigeru, 4,164,476, Cl. 252-62.10P.
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Armand, Marcel; and Charquet, Daniel, 4,164,420, Cl. 75-175.00R.
- Ulmer, Klaus, to Hugo Miebach GmbH. Method for flash butt welding of annular workpieces. 4,164,638, Cl. 219-100.000.
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Burstein, Norman; and Ditzler, Richard C., 4,164,175, Cl. 99-446.000.
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Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,164,261, Cl. 180-54.00R.
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Tokunaga, Hiroshi; Tatehana, Yoshikazu; and Umekawa, Akira, 4,164,418, Cl. 75-88.000.
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Frey, Paul H.; and Kupcivek, Vytutas, 4,164,057, Cl. 17-49.000.
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Shichman, Daniel, 4,164,250, Cl. 152-205.000.
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Agriculture: See—  
Sterrett, John P.; Carroll, Joseph P.; and Creager, Richard A., 4,164,093, Cl. 47-57.500.
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Schmidt, Jerry D., 4,164,741, Cl. 343-18.00E.
- Army: See—  
Blackburn, James C.; and Bromborsky, Alan, 4,164,650, Cl. 250-199.000.
- Christoe, Charles W.; and Owens, Frank J., 4,164,700, Cl. 324-0.5AH.
- Energy: See—  
DuVall, Bruce W.; Valentine, James W.; and Morey, Kenneth O., 4,164,146, Cl. 73-304.00R.
- Newby, Billie J., 4,164,479, Cl. 252-301.10W.
- Schuss, Jack J.; and Johnson, Larry C., 4,164,373, Cl. 356-316.000.
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Jordan, Cy E.; and Weaver, Casimir P., 4,164,460, Cl. 204-180.00R.
- National Aeronautics and Space Administration: See—  
Ashworth, Billy R., 4,164,079, Cl. 35-12.00E.
- Navy: See—  
Beatty, Bobby D.; Daniel, Russell D.; and Humerickhouse, Billy J., 4,164,186, Cl. 102-37.800.
- Berke, Herbert, 4,164,081, Cl. 35-25.000.
- Hsu, Hui-pin, 4,164,363, Cl. 350-96.170.
- Metcalf, Travis W., 4,164,753, Cl. 358-113.000.
- Morris, Ross E., 4,164,727, Cl. 340-5.00D.
- U.S. Philips Corporation: See—  
Aagaard, Einar A., 4,164,632, Cl. 179-175.30R.
- Krasznai, Charles Z.; Meshkil, Donald J.; and Krumholtz, Morris, 4,164,656, Cl. 250-439.00R.
- Slegers, Frans, 4,164,775, Cl. 361-150.000.
- Van Esdonk, Johannes, 4,164,059, Cl. 29-25.150.
- United States Steel Corporation: See—  
Brouse, S. B.; and Wiedel, John, 4,164,176, Cl. 100-4.000.
- Olsson, Robert G.; and Turkdogan, Ethem T., 4,164,544, Cl. 423-230.000.
- United Technologies Corporation: See—  
Sziklas, Edward A.; and Freiberg, Robert J., 4,164,366, Cl. 350-299.000.
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Stark, Marvin M.; Rosenfeld, Jack B.; Pelzner, Roger B.; and Soelberg, Kenneth B., 4,164,214, Cl. 128-741.000.
- University of Sydney: See—  
Lucas, James G.; and Young, Alan C., 4,164,743, Cl. 343-854.000.
- Upjohn Company, The: See—  
Dai, Sheng-Hong A., 4,164,510, Cl. 260-463.000.
- Smith, Herman W., 4,164,501, Cl. 260-346.220.
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- Ura, Mitsuru; Miyata, Kenji; Suzuki, Takaya; and Ogawa, Takuzo, to Hitachi, Ltd. Process for preparation of semiconductor devices utilizing a two-step polycrystalline deposition technique to form a diffusion source. 4,164,436, Cl. 148-174.000.
- Urano, Fumio; and Takahashi, Norimichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Diopter-adjusting device for use in finder-interchangeable type single lens reflex camera. 4,164,369, Cl. 354-219.000.
- Valentine, James W.: See—  
DuVall, Bruce W.; Valentine, James W.; and Morey, Kenneth O., 4,164,146, Cl. 73-304.00R.
- Van Doorne's Transmissie B.V.: See—  
Vollers, Evert J., 4,164,134, Cl. 72-183.000.
- Vanderhye, Robert A., to Interfarm Corporation. Ground-supported poultry drinking fountain. 4,164,201, Cl. 119-81.000.
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- van der Lely, Cornelis. Soil cultivating implements. 4,164,259, Cl. 172-59.000.
- Van Esdonk, Johannes, to U.S. Philips Corporation. Method of manufacturing a color display tube and color display tube manufactured by said method. 4,164,059, Cl. 29-25.150.
- Van Kesteren, Jacobus P. I., to N.K.F. Groep B.V. Long watertight cable and sleeve joint. 4,164,617, Cl. 174-23.00C.
- Van Peppen, Jan F.; and Fisher, William B., to Allied Chemical Corporation. Production of cyclohexanone. 4,164,515, Cl. 260-586.00P.
- Varian Associates, Inc.: See—  
Kneip, George D., Jr.; Anderson, Marvin H.; and Gang, Robert E., 4,164,777, Cl. 361-331.000.
- Varian Mat GmbH: See—  
Wollnik, Hermann, 4,164,652, Cl. 250-281.000.
- Varma, Ravi K., to E. R. Squibb & Sons, Inc. Steroidal[16a,17-b]naphthaleno-21-carboxylic acid esters. 4,164,504, Cl. 260-397.100.
- Veaute, Georges, to Manufacture de Produits Chimiques Protex S.A. Antistatic textile materials. 4,164,535, Cl. 264-136.000.
- Velie, Larry N.: See—  
Kato, Makoto; Velie, Larry N.; and Baverstock, John L., 4,164,704, Cl. 324-73.0PC.
- Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: See—  
Scheurecker, Werner, 4,164,252, Cl. 164-448.000.
- Vertegaal, Jacobus G., to Stork Brabant B.V. Compensating rotary screen supports. 4,164,184, Cl. 101-127.100.
- Vervloet, Marcel: See—  
Langenbach-Belz, Manfred; Strunk, Kurt; and Vervloet, Marcel, 4,164,627, Cl. 179-15.0AQ.
- Vickers Limited: See—  
Bean, Mervyn L.; and Price, Samuel, 4,164,165, Cl. 89-134.000.
- Victor Company of Japan, Limited: See—  
Wada, Kinzo, 4,164,691, Cl. 318-254.000.
- Viehig, Wolfgang; and Sperber, Werner, to AGFA-Gavaert, A.G. Photographic developing machine. 4,164,371, Cl. 354-312.000.
- Vierow, William F., to P. R. Mallory & Co., Inc. Fabrication of anodes by plasma spray deposition. 4,164,066, Cl. 29-570.000.
- Villa, Jose L.: See—  
Sinka, Joseph V.; and Villa, Jose L., 4,164,426, Cl. 106-90.000.
- Villa, Sergio: See—  
Vitali, Roberto; Villa, Sergio; and Lotti, Costante, 4,164,548, Cl. 423-242.000.
- Villalobos, Humberto F. Polycrystalline diamond emitter. 4,164,680, Cl. 313-336.000.
- Vinogradov, Alexandr L.: See—  
Prokhorov, Alexandr M.; Vinogradov, Alexandr L.; Danileiko, Jury K.; Manenkov, Alexandr A.; Krasnov, Mikhail M.; and Naumidi, Leonid P., 4,164,222, Cl. 128-303.100.
- Vital, Zoltan; and Orban, Jean, to Ponder & Best Inc. Load current pulse control devices. 4,164,686, Cl. 315-241.00P.



- Vitali, Roberto; Villa, Sergio; and Lotti, Costante, to "Il Gas Intereale" S.p.A. Process for removing SO<sub>2</sub> from gases. 4,164,548, Cl. 423-242.000.
- Vnek, John: See—  
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Treppe, Christian, 4,164,565, Cl. 424-89.000.
- Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 4H-s-triazolo[4,3-a][1,5]benzodiazepin-5-ones. 4,164,498, Cl. 260-239.30T.
- Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Pyrazolo[1,5-c]quinazoline derivatives and related compounds. 4,164,578, Cl. 424-251.000.
- Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 4H-s-Triazolo[4,3-a][1,5]benzodiazepin-5-ones as tranquilizers. 4,164,580, Cl. 424-263.000.
- Vollers, Evert J., to Van Doorne's Transmissie B.V. Method of manufacturing a metallic belt of high strength, and apparatus for use in said method. 4,164,134, Cl. 72-183.000.
- von Alten, Theodor: See—  
Brandt, Ivan L.; von Alten, Theodor; Voss, Richard E.; and Denes, Oscar L., 4,164,067, Cl. 29-620.000.
- von Braun, Leopold: See—  
Kastlahn, William C.; and von Braun, Leopold, 4,164,696, Cl. 318-696.000.
- von Schulthess, Gustav K.; Cohen, Richard J.; and Benedek, George B., to Massachusetts Institute of Technology. Method for optimizing reagents for agglutination reactions. 4,164,558, Cl. 424-12.000.
- Voss, Richard E.: See—  
Brandt, Ivan L.; von Alten, Theodor; Voss, Richard E.; and Denes, Oscar L., 4,164,067, Cl. 29-620.000.
- Vovchanovsky, Ivan F.: See—  
Bakul, Valentin N.; Vovchanovsky, Ivan F.; and Tsypin, Nekhemian V., 4,164,527, Cl. 264-60.000.
- Vsesojuzny Nauchno-Issledovatel'skiy I Proektny Institut Aluminiovoi, Magniovoi I Elektrodoi Promyshlennosti: See—  
Munits, Ilya N.; and Maraev, Sergei E., 4,164,659, Cl. 250-561.000.
- Vsesojuzny Nauchno-Issledovatel'skiy Institut Glaznykh Boleznei: See—  
Prokhorov, Alexandr M.; Vinogradov, Alexandr L.; Danileiko, Yuri K.; Manenkov, Alexandr A.; Krasnov, Mikhail M.; and Naumidi, Leonid P., 4,164,222, Cl. 128-303.100.
- W. E. Bassett Company, The: See—  
Loman, George, 4,164,132, Cl. 70-456.00R.
- W. R. Grace & Co.: See—  
Elliott, Curtis H., Jr., 4,164,551, Cl. 423-330.000.
- Hill, Richard N., 4,164,550, Cl. 423-321.00R.
- W. Schlafhorst & Co.: See—  
Maassen, Wilhelm; Raasch, Hans; and Wassenhoven, Heinz-Georg, 4,164,330, Cl. 242-18.0PW.
- Wada, Kinzo, to Victor Company of Japan, Limited. Multiphase brushless DC motor using two Hall-effect generators. 4,164,691, Cl. 318-254.000.
- Wada, Osamu: See—  
Kimura, Akio; Wada, Osamu; Matsui, Michikage; and Ozaki, Kiyotaka, 4,164,116, Cl. 57-282.000.
- Wada, Yoichi: See—  
Suzuki, Naoyuki; Wada, Yoichi; and Furuno, Akihisa, 4,164,612, Cl. 526-62.000.
- Waddill, Harold G.; and Klein, Howard P., to Texaco Development Corporation. Accelerated cure of epoxy resins. 4,164,520, Cl. 525-484.000.
- Wadleigh, Edward R., to Bell & Howell Company. Film transport system for microfilm reader. 4,164,367, Cl. 353-26.00R.
- Wafios, Maschinenfabrik, Wagner, Ficker & Schmid (GmbH & Co. KG): See—  
Lange, Gerhard, 4,164,118, Cl. 59-31.000.
- Wagner, Armand, to ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A. Method of cleaning phenol-containing waste waters. 4,164,469, Cl. 210-40.000.
- Wakasa, Isao: See—  
Noji, Toshio; Shono, Hiroaki; and Wakasa, Isao, 4,164,401, Cl. 65-1.000.
- Wald, Stephen A., to Scott/Chatham Company. Filters. 4,164,400, Cl. 55-382.000.
- Wallach, Ira, to Durham Industries, Inc. Toy cash register. 4,164,319, Cl. 235-1.00E.
- Walling, Jorg-Hein; and Bouffard, Jean, to Northern Telecom Limited. Powder pushing device for filling cable. 4,164,245, Cl. 141-250.000.
- Wallsten, Hans I. Method of preparing foodstuffs by means of boiling or steaming and means for performing the method. 4,164,174, Cl. 99-415.000.
- Walworth, Bryant L.: See—  
Los, Marinus; and Walworth, Bryant L., 4,164,404, Cl. 71-77.000.
- Wandler, Donald, to McGraw-Edison Company. Sport light and ballast module. 4,164,783, Cl. 362-226.000.
- Wang, Richard H. S.: See—  
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,164,480, Cl. 252-402.000.
- Irick, Gether, Jr.; and Wang, Richard H. S., 4,164,494, Cl. 260-45.75R.
- Ward, Charles A.; and Zingg, Walter. Treatment of blood containing vessels. 4,164,524, Cl. 264-39.000.
- Ward, Charles R.; and Reilly, Robert A., to International Telephone and Telegraph Corporation. Processor for multiple, continuous, spread spectrum signals. 4,164,628, Cl. 179-15.0BA.
- Ward, Gerald G., to International Harvester Company. Cylinder construction affording automatic re-phasing of master and slave cylinders. 4,164,122, Cl. 60-547.00R.
- Warren, Eric: See—  
Amsbury, Clifford R.; and Warren, Eric, 4,164,694, Cl. 318-578.000.
- Warseck, Michael R.: See—  
Jackson, William P.; and Warseck, Michael R., 4,164,594, Cl. 426-662.000.
- Wassenhoven, Heinz-Georg: See—  
Maassen, Wilhelm; Raasch, Hans; and Wassenhoven, Heinz-Georg, 4,164,330, Cl. 242-18.0PW.
- Watanabe, Muneco, to Yamamura Glass Co., Ltd. Strengthening of thin-walled, light glass containers. 4,164,402, Cl. 65-30.00E.
- Watanabe, Shotaro; Koizumi, Fumio; Tozawa, Katsutoshi; and Uetake, Shigeru, to Konishiroku Photo Industry Co. Ltd. Developer for latent electrostatic image and process for preparation thereof. 4,164,476, Cl. 252-62.10P.
- Waterbury, Nelson J. Vendable reclosable container. 4,164,303, Cl. 220-359.000.
- Watson, Gary Q. Excavator for anchor holes. 4,164,082, Cl. 37-83.000.
- Watson, John D. High-pressure-rotary-nozzle apparatus. 4,164,325, Cl. 239-252.000.
- Weaver, Casimir P.: See—  
Jordan, Cy E.; and Weaver, Casimir P., 4,164,460, Cl. 204-180.00R.
- Webasto-Werk W. Baier GmbH & Co.: See—  
Mitterer, Erik; and Lutz, Alfons, 4,164,692, Cl. 318-266.000.
- Weber-Unger, Georg. Pad for nursing brassieres. 4,164,228, Cl. 128-461.000.
- Weckenmann, Albert; and Haubner, Georg, to Robert Bosch GmbH. Externally controllable binary interrogation and decoding circuit, particularly for a remote control load selection system. 4,164,730, Cl. 340-168.00R.
- Weibe, Gerald L. Encapsulated plug-in electrically conducting component. 4,164,726, Cl. 337-215.000.
- Weigert, Frank J., to Du Pont de Nemours, E. I., and Company. Preparation of hydrogen cyanide. 4,164,552, Cl. 423-376.000.
- Weil, Ludwig: See—  
Berger, Harald; Quentin, Karl-Ernst; and Weil, Ludwig, 4,164,482, Cl. 252-428.000.
- Welty, Albert B., Jr., deceased; and by Prescott, Doris M., executrix, to Exxon Research & Engineering Co. Method of removing nitrogen oxides from gaseous mixtures. 4,164,546, Cl. 423-239.000.
- Wendt, Albert T.: See—  
Sandor, Louis; and Wendt, Albert T., 4,164,141, Cl. 73-81.000.
- Western Electric Company, Inc.: See—  
Boggs, Luther M.; and Hudson, James A., Jr., 4,164,703, Cl. 324-54.000.
- Westinghouse Electric Corp.: See—  
Heinrich, Theodore M., 4,164,771, Cl. 361-1.000.
- Sprengling, Gerhard R.; and Cargnel, Louis A., 4,164,619, Cl. 174-52.0PE.
- Whitney, Eugene C.; and Gorden, Dale I., 4,164,705, Cl. 324-158.0MG.
- Westley, John, to Hoffmann-La Roche Inc. Therapeutic agent for improving cardiovascular function. 4,164,586, Cl. 424-285.000.
- Westvaco Corporation: See—  
Carrigan, Robert J., 4,164,076, Cl. 33-181.00R.
- Westwood, William D.: See—  
Ciolo, Paolo; and Westwood, William D., 4,164,745, Cl. 346-140.00R.
- Whirlpool Corporation: See—  
Hammer, Richard G., 4,164,130, Cl. 68-133.000.
- White, John M. Method for laying sod. 4,164,295, Cl. 414-786.000.
- Whitesides, George M.; Garrett, Patricia E.; and Siegel, Merrell G., to Massachusetts Institute of Technology. Method for preparing adenosine triphosphate. 4,164,444, Cl. 435-92.00N.
- Whitley, Elmer E., to Chem-X3, Inc. Fungicidal detergent composition. 4,164,477, Cl. 252-99.000.
- Whitney, Eugene C.; and Gorden, Dale I., to Westinghouse Electric Corp. Brushless exciter fault indicator system. 4,164,705, Cl. 324-158.0MG.
- Whitney, Robert W.: See—  
Kadane, Victor V.; Meyer, Edwin W.; and Whitney, Robert W., 4,164,589, Cl. 426-281.000.
- Wick, Gerhard: See—  
Siggel, Erhard; Wick, Gerhard; Linhart, Heinz; and Kessler, Erich, 4,164,603, Cl. 428-398.000.
- Wiebe, Gerald L. Three-piece solderless plug-in electrically conducting component. 4,164,725, Cl. 337-198.000.
- Wiedel, John: See—  
Brouse, S. B.; and Wiedel, John, 4,164,176, Cl. 100-4.000.
- Wiggins, Brian H.; and Williams, Harold D., to Exxon Research & Engineering Co. Method and apparatus for investigating the mobility of a substance. 4,164,136, Cl. 73-17.00R.
- Wilhelm, William D., to Interior Brick Corporation. Veneer wall covering and method of assembly. 4,164,598, Cl. 428-48.000.
- Willadsen, Per: See—  
Drostholm, Frede H.; Jensen, Harry; and Willadsen, Per, 4,164,537, Cl. 264-333.000.
- Williams, Harold D.: See—  
Wiggins, Brian H.; and Williams, Harold D., 4,164,136, Cl. 73-17.00R.
- Williamson, William A., to Clark Equipment Company. Method of measuring volume of air entrained in hydraulic fluids. 4,164,137, Cl. 73-19.000.
- Wilson, Earl L.: See—  
Wong, Backman; and Wilson, Earl L., 4,164,322, Cl. 236-34.500.

- Wilson, Harry M., Jr.: See—  
Arnold, William L.; and Wilson, Harry M., Jr., 4,164,345, Cl. 269-69.000.
- Wiremold Company, The: See—  
Casasanta, Salvatore J., 4,164,618, Cl. 174-48.000.
- Wisconsin Centrifugal, Inc.: See—  
Swisher, Calvin C., Sr., 4,164,311, Cl. 228-161.000.
- Witt, Frank; and Semanchik, Stephen. Liquid container novelty. 4,164,284, Cl. 206-217.000.
- Witte, Hans H., to Siemens Aktiengesellschaft. Input/output coupler for multi-mode optical fibers. 4,164,364, Cl. 350-96.170.
- Wolf, Robert H. Tree and stump splitter. 4,164,247, Cl. 144-34.00F.
- Wolff, Robert. Device for grinding spiral drills. 4,164,100, Cl. 51-239.000.
- Wollnik, Hermann, to Varian Mat GmbH. Process and arrangement for registration of ion-, electron- and light-spectra. 4,164,652, Cl. 250-281.000.
- Wolters, Egbert: See—  
Noomen, Arie; and Wolters, Egbert, 4,164,459, Cl. 204-159.180.
- Wong, Backman; and Wilson, Earl L., to Standard-Thomson Corporation. Thermostatic valve device having non-linear flow characteristics. 4,164,322, Cl. 236-34.500.
- Woodward Governor Company: See—  
Garvey, Daniel C., 4,164,722, Cl. 335-272.000.
- Worcester, Harold S.: See—  
Hunt, Herbert H.; and Worcester, Harold S., 4,164,397, Cl. 48-209.000.
- Wright, Steven F.: See—  
Funicik, Jack F.; and Wright, Steven F., 4,164,065, Cl. 29-564.600.
- Wrobel, Gunter: See—  
Muller, Rolf; and Wrobel, Gunter, 4,164,690, Cl. 318-254.000.
- Xerox Corporation: See—  
Gundlach, Robert W.; and Perry, David H., deceased, 4,164,372, Cl. 355-3.0DD.
- Yabuki, Kazuyuki; and Iwasaki, Mitsuo, to Toyobo Petcord, Co., Ltd. High strength polyester fibrous products. 4,164,114, Cl. 57-236.000.
- Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, to Research Institute for Iron, Steel and Other Metals of the Tohoku University. The Method for producing metal nitride sintered moldings. 4,164,528, Cl. 264-62.000.
- Yakovlev, Lev N.: See—  
Sheinin, Evgeny I.; Belostotskaya, Nelli S.; and Yakovlev, Lev N., 4,164,198, Cl. 118-315.000.
- Yamaguchi, Shunzo: See—  
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,164,261, Cl. 180-54.00R.
- Yamaji, Teizo: See—  
Ichikawa, Yataro; and Yamaji, Teizo, 4,164,518, Cl. 585-427.000.
- Yamamura Glass Co., Ltd.: See—  
Watanabe, Muneco, 4,164,402, Cl. 65-30.00E.
- Yarp, Russel E., to Dataproducts Corporation. Multiple path paper feed system for a printer. 4,164,376, Cl. 400-642.000.
- Yoshikawa, Kazuo: See—  
Doi, Yoshikazu; Katagiri, Katsuo; and Yoshikawa, Kazuo, 4,164,752, Cl. 358-55.000.
- Yoshino Kogyosho Co., Ltd.: See—  
Nishikawa, Masanori; and Hattori, Masao, 4,164,298, Cl. 215-1.00C.
- Young, Alan C.: See—  
Lucas, James G.; and Young, Alan C., 4,164,743, Cl. 343-854.000.
- Young, Jack H.; and Halleck, Frank E., to American Sterilizer Company. Load conditioning control method for steam sterilization. 4,164,538, Cl. 422-26.000.
- Young, John; Clavell, Jack; and Gaskill, George, to Gould Inc. Load management apparatus for residential load centers. 4,164,719, Cl. 335-14.000.
- Young, Thomas A.; and Gustin, Jay W., to Tenna Power Corporation. Multiphase to single phase and frequency converter system. 4,164,785, Cl. 363-50.000.
- Youngstown Steel Door Company, The: See—  
Fritz, William E.; Graves, Mark L.; and Seitz, Robert F., 4,164,189, Cl. 105-378.000.
- Yuasa, Kazumi: See—  
Inaba, Masao; Yuasa, Kazumi; and Sonoda, Michiaki, 4,164,760, Cl. 358-183.000.
- Yugenkaisha Shinjo Seisakusho: See—  
Shinjo, Katsumi, 4,164,072, Cl. 29-720.000.
- Yung, Kai-Lim W.; Silverman, Bernard; and Menikheim, Virginia C., to Monsanto Company. Thermal bonding of polyester polyblends. 4,164,600, Cl. 428-198.000.
- Zahid, Abdul. Method of forming a pressure accumulator. 4,164,639, Cl. 219-117.100.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: See—  
Umezawa, Hamao; and Takeuchi, Tomio, 4,164,567, Cl. 424-123.000.
- Zankl, Frank, to Kearney & Trecker Corporation. Automatic tool changer for machine tools. 4,164,290, Cl. 414-739.000.
- Zappala, Giuseppe, to Indesit Industria Elettrodomestici Italiana S.p.A. Saw-tooth wave generator. 4,164,689, Cl. 315-408.000.
- Zeijdel, August-Eden; and Teunissen, Rudolf B., to N.V. Verenigde Instrumentenfabrieken Enraf-Nonius. Apparatus for supporting the body of a person in an upright position, in particular for therapeutic walking exercises. 4,164,350, Cl. 272-70.000.
- Zenith Radio Corporation: See—  
Collins, Johnny, 4,164,712, Cl. 328-48.000.
- Palac, Kazimir, 4,164,682, Cl. 313-404.000.
- Zimmer, Elvis S.: See—  
Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., 4,164,591, Cl. 426-523.000.
- Zimmet, Arthur: See—  
Johnson, Alfred A.; and Zimmet, Arthur, 4,164,225, Cl. 128-334.00R.
- Zingg, Walter: See—  
Ward, Charles A.; and Zingg, Walter, 4,164,524, Cl. 264-39.000.



# LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF AUGUST, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Atlas Copco Aktiebolag: See—  
Hilding, Jonas O. A.; and Persson, Jan E., Re. 30,071, Cl. 175-52.000.  
Byers, Warren J.: See—  
Kleine, Richard A.; Byers, Warren J.; and Wright, Charles A., Re. 30,072, Cl. 182-8.000.  
Hilding, Jonas O. A.; and Persson, Jan E., to Atlas Copco Aktiebolag. Drill string element handling apparatus. Re. 30,071, Cl. 175-52.000.  
Kleine, Richard A.; Byers, Warren J.; and Wright, Charles A., to Unarco Industries, Inc. Safety clamp. Re. 30,072, Cl. 182-8.000.  
Otis Engineering Corporation: See—  
Sizer, Phillip S.; and Young, Carter R., Re. 30,070, Cl. 166-72.000.  
Persson, Jan E.: See—  
Hilding, Jonas O. A.; and Persson, Jan E., Re. 30,071, Cl. 175-52.000.  
Sizer, Phillip S.; and Young, Carter R., to Otis Engineering Corporation. Apparatus for treating wells. Re. 30,070, Cl. 166-72.000.  
Unarco Industries, Inc.: See—  
Kleine, Richard A.; Byers, Warren J.; and Wright, Charles A., Re. 30,072, Cl. 182-8.000.  
U.S. Philips Corporation: See—  
van Hattum, Johannes S. A., Re. 30,074, Cl. 315-408.000.  
van Hattum, Johannes S. A., to U.S. Philips Corporation. Circuit arrangement for producing a sawtooth current through a line deflection coil in an image display apparatus. Re. 30,074, Cl. 315-408.000.  
Worsham, Lynn M. Controllable stunt kite having a pair of symmetrical bridle. Re. 30,073, Cl. 244-153.000.  
Wright, Charles A.: See—  
Kleine, Richard A.; Byers, Warren J.; and Wright, Charles A., Re. 30,072, Cl. 182-8.000.  
Young, Carter R.: See—  
Sizer, Phillip S.; and Young, Carter R., Re. 30,070, Cl. 166-72.000.

# LIST OF PLANT PATENTEEES

Ryan, John J. Impatiens plant. 4,448, 8-14-79, Cl. 68.000.  
Ryan, John J. Impatiens plant. 4,449, 8-14-79, Cl. 68.000.  
Ryan, John J. Impatiens plant. 4,450, 8-14-79, Cl. 68.000.

# LIST OF DESIGN PATENTEEES

Adkinson, Joseph E. Cabinet. 252,603, 8-14-79, Cl. D6-154.000.  
Adler, Emy; and Decker, Phyllis. Purse insert. 252,596, 8-14-79, Cl. D3-54.000.  
Aladdin Industries, Incorporated: See—  
Harris, James E., 252,604, Cl. D7-65.000.  
Atari, Inc.: See—  
Cook, David M., 252,636, Cl. D21-13.000.  
Barr, Josef J. Ring jacket. 252,618, 8-14-79, Cl. D11-86.000.  
Belgin, Stephen G.; and Hart, Gary E., to Memorex Corporation. Reel for magnetic recording tape. 252,627, 8-14-79, Cl. D14-11.000.  
Bernhardt, Floyd V. Golf putter head. 252,649, 8-14-79, Cl. D21-217.000.  
Bick, Michael A., to Shelly & Anderson Furniture Mfg., Co., Inc. Sofa. 252,601, 8-14-79, Cl. D6-63.000.  
Breger, Carl-Arne, to Sandvik Aktiebolag. Cover for a pliers handle. 252,611, 8-14-79, Cl. D8-107.000.  
Broan Manufacturing Co., Inc.: See—  
LaZar, Ralph M., 252,641, Cl. D23-151.000.  
Cartabiano, Michael C., to Child Guidance Playthings, Inc. Toy ramp. 252,650, 8-14-79, Cl. D21-91.000.  
Carter, Virgil R. Child's bed. 252,598, 8-14-79, Cl. D6-5.000.  
Carter, Virgil R. Child's bed. 252,599, 8-14-79, Cl. D6-5.000.  
Carter, Virgil R. Child's bed. 252,608, 8-14-79, Cl. D6-5.000.  
Central States Diversified, Inc.: See—  
Gibson, John, 252,600, Cl. D6-23.000.  
Champion International Corporation: See—  
D'Alessio, Joseph R., 252,613, Cl. D9-245.000.  
Child Guidance Playthings, Inc.: See—  
Cartabiano, Michael C., 252,650, Cl. D21-91.000.  
Cirrone, Umberto J. Novelty chair. 252,602, 8-14-79, Cl. D6-68.000.  
Combi Co., Ltd.: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 252,652, Cl. D21-74.000.  
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 252,653, Cl. D21-74.000.  
Control Data Corporation: See—  
Richgels, Eugene, 252,635, Cl. D19-60.000.  
Cook, David M., to Atari, Inc. Game cabinet. 252,636, 8-14-79, Cl. D21-13.000.  
Corini, Louis J., to Fogel Commercial Refrigerator Company. Portable temperature controlled container. 252,605, 8-14-79, Cl. D7-77.000.  
D'Alessio, Joseph R., to Champion International Corporation. Carton blank. 252,613, 8-14-79, Cl. D9-245.000.  
D'Antonio, Renato A., to International Data Sciences, Inc. Current interface breakout panel. 252,626, 8-14-79, Cl. D13-12.000.  
Davidson, Elizabeth G. Facial tray. 252,642, 8-14-79, Cl. D28-9.000.  
Decker, Phyllis: See—  
Adler, Emy; and Decker, Phyllis, 252,596, Cl. D3-54.000.  
Dehmer, Henry C. Bowling game board. 252,647, 8-14-79, Cl. D21-27.000.  
Deschamps, Robert L.: See—  
Wellwood, James; and Deschamps, Robert L., 252,628, Cl. D14-29.000.  
Dibling, Denis V. Dispenser for dried foods or the like. 252,655, 8-14-79, Cl. D15-92.000.  
Dieckhoff, Rolf. Audio-visual projector. 252,631, 8-14-79, Cl. D16-14.000.  
Drayson, Thomas. Spectacle holder. 252,632, 8-14-79, Cl. D16-82.000.  
Dreyer, Floye K. Stand mount for a guitar, or the like. 252,633, 8-14-79, Cl. D17-20.000.  
Evans, James D., Jr. Closed circuit video display system or similar article. 252,629, 8-14-79, Cl. D14-79.000.  
Fanella, Robert J.; Thompson, Elmer D.; and Wacha, Martin E., to Parker Pen Company, The. Barrel tip assembly for a ball point pen. 252,634, 8-14-79, Cl. D19-54.000.  
Fogel Commercial Refrigerator Company: See—  
Corini, Louis J., 252,605, Cl. D7-77.000.  
Fritsch, Udo. Fluorescent fixture. 252,654, 8-14-79, Cl. D48-23.00A.  
Gale, John A. Combined slide and tunnel toy. 252,645, 8-14-79, Cl. D21-244.000.  
Gibson, John, to Central States Diversified, Inc. Automobile tire display stand. 252,600, 8-14-79, Cl. D6-23.000.  
Hanashima, Taira: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 252,652, Cl. D21-74.000.  
Harris, James E., to Aladdin Industries, Incorporated. Beverage server. 252,604, 8-14-79, Cl. D7-65.000.  
Hart, Gary E.: See—  
Belgin, Stephen G.; and Hart, Gary E., 252,627, Cl. D14-11.000.  
Holzwarth, Henry A.; and Wark, John D., to Johnson & Johnson. Plaque removal brush. 252,597, 8-14-79, Cl. D4-25.000.  
Hosokawa, Takeshi; Oda, Hiroshi; and Yoshida, Noboru, to Matsushita Electric Industrial Co., Ltd. Lightning arrester. 252,616, 8-14-79, Cl. D10-105.000.  
Howes, Peter, to Lucas Industries Limited. Fuel injection nozzle. 252,630, 8-14-79, Cl. D15-5.000.

# LIST OF DESIGN PATENTEEES

PI 27

International Data Sciences, Inc.: See—  
D'Antonio, Renato A., 252,626, Cl. D13-12.000.  
Ishii, Yoshiyasu: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 252,652, Cl. D21-74.000.  
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 252,653, Cl. D21-74.000.  
Johnson & Johnson: See—  
Holzwarth, Henry A.; and Wark, John D., 252,597, Cl. D4-25.000.  
Kreusser, Meilyn. Bird feeder. 252,643, 8-14-79, Cl. D30-15.000.  
Larsson, Carl G.: See—  
Malm, Nils O. S.; and Larsson, Carl G., 252,648, Cl. D21-212.000.  
LaZar, Ralph M., to Broan Manufacturing Co., Inc. Heat recirculator. 252,641, 8-14-79, Cl. D23-151.000.  
Lopez, Gilbert T. Combined protractor, triangle, compass and beam compass. 252,615, 8-14-79, Cl. D10-62.000.  
Lucas Industries Limited: See—  
Howes, Peter, 252,630, Cl. D15-5.000.  
Mackie, Thomas B., to Thomas Salter Limited. Toy gyroscope, or similar article. 252,637, 8-14-79, Cl. D21-96.000.  
Malm, Nils O. S.; and Larsson, Carl G. Bat in which a game player's hand is inserted. 252,648, 8-14-79, Cl. D21-212.000.  
Matsushita Electric Industrial Co., Ltd.: See—  
Hosokawa, Takeshi; Oda, Hiroshi; and Yoshida, Noboru, 252,616, Cl. D10-105.000.  
McCloskey, Edward W. Irrigation signal. 252,617, 8-14-79, Cl. D10-114.000.  
Memorex Corporation: See—  
Belgin, Stephen G.; and Hart, Gary E., 252,627, Cl. D14-11.000.  
Miavitz, Frederick J. Hanger or the like. 252,610, 8-14-79, Cl. D8-373.000.  
Mull, John D., to Starplex Inc. Container for blood samples or the like. 252,612, 8-14-79, Cl. D9-216.000.  
Nagata, Kazuo: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 252,653, Cl. D21-74.000.  
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, to Combi Co., Ltd. Toy vehicle with removable handle. 252,652, 8-14-79, Cl. D21-74.000.  
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, to Combi Co., Ltd. Toy vehicle. 252,653, 8-14-79, Cl. D21-74.000.  
Natwick, Vernon R., to Ramtek Corporation. Gun amusement cabinet. 252,646, 8-14-79, Cl. D21-5.000.  
Nederman, Bill. Air filter. 252,640, 8-14-79, Cl. D23-149.000.  
Nickerson, Kerry: See—  
Steinhardt, William; and Nickerson, Kerry, 252,638, Cl. D21-253.000.  
Oda, Hiroshi: See—  
Hosokawa, Takeshi; Oda, Hiroshi; and Yoshida, Noboru, 252,616, Cl. D10-105.000.  
Ohmura, Ryuichi. Handle for fishing rod assembly. 252,639, 8-14-79, Cl. D22-23.000.  
Oxford Hall Silversmiths, Ltd.: See—  
Seibel, Ben, 252,606, Cl. D7-137.000.  
Seibel, Ben, 252,607, Cl. D7-137.000.  
Parker Pen Company, The: See—  
Fanella, Robert J.; Thompson, Elmer D.; and Wacha, Martin E., 252,634, Cl. D19-54.000.  
Ramtek Corporation: See—  
Natwick, Vernon R., 252,646, Cl. D21-5.000.  
Richgels, Eugene, to Control Data Corporation. Portable learning unit. 252,635, 8-14-79, Cl. D19-60.000.  
Rudkin-Wiley Corporation: See—  
Wiley, Nathaniel C., Jr., 252,619, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., 252,620, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., 252,621, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., 252,622, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., 252,623, Cl. D12-181.000.  
Sandvik Aktiebolag: See—  
Breger, Carl-Arne, 252,611, Cl. D8-107.000.  
Seibel, Ben, to Oxford Hall Silversmiths, Ltd. Spoon or similar article of flatware. 252,606, 8-14-79, Cl. D7-137.000.  
Seibel, Ben, to Oxford Hall Silversmiths, Ltd. Spoon or similar article of flatware. 252,607, 8-14-79, Cl. D7-137.000.  
Shelly & Anderson Furniture Mfg., Co., Inc.: See—  
Bick, Michael A., 252,601, Cl. D6-63.000.  
Shure Brothers Incorporated: See—  
Wellwood, James; and Deschamps, Robert L., 252,628, Cl. D14-29.000.  
Starplex Inc.: See—  
Mull, John D., 252,612, Cl. D9-216.000.  
Steinhardt, William; and Nickerson, Kerry. Tent. 252,638, 8-14-79, Cl. D21-253.000.  
Tepper, Sidney. Toy car. 252,651, 8-14-79, Cl. D21-73.000.  
Thomas Salter Limited: See—  
Mackie, Thomas B., 252,637, Cl. D21-96.000.  
Thompson, Elmer D.: See—  
Fanella, Robert J.; Thompson, Elmer D.; and Wacha, Martin E., 252,634, Cl. D19-54.000.  
Thornberry, Jeffrey R. Portable timer. 252,614, 8-14-79, Cl. D10-40.000.  
Vetter, Craig W., to Vetter Farning Company. Motor-cycle farning. 252,624, 8-14-79, Cl. D12-182.000.  
Vetter Farning Company: See—  
Vetter, Craig W., 252,624, Cl. D12-182.000.  
Wacha, Martin E.: See—  
Fanella, Robert J.; Thompson, Elmer D.; and Wacha, Martin E., 252,634, Cl. D19-54.000.  
Wagman, Steve. Marionette toy. 252,644, 8-14-79, Cl. D21-152.000.  
Wark, John D.: See—  
Holzwarth, Henry A.; and Wark, John D., 252,597, Cl. D4-25.000.  
Wellwood, James; and Deschamps, Robert L., to Shure Brothers Incorporated. Phonograph stylus. 252,628, 8-14-79, Cl. D14-29.000.  
White, H. Warren. Rowing oar articulator. 252,625, 8-14-79, Cl. D12-215.000.  
Wiley, Nathaniel C., Jr., to Rudkin-Wiley Corporation. Wind deflector. 252,619, 8-14-79, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., to Rudkin-Wiley Corporation. Wind deflector. 252,620, 8-14-79, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., to Rudkin-Wiley Corporation. Wind deflector. 252,621, 8-14-79, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., to Rudkin-Wiley Corporation. Wind deflector. 252,622, 8-14-79, Cl. D12-181.000.  
Wiley, Nathaniel C., Jr., to Rudkin-Wiley Corporation. Wind deflector. 252,623, 8-14-79, Cl. D12-181.000.  
Wolkert, Olle P. M. Tool for handling of electrical components. 252,609, 8-14-79, Cl. D8-51.000.  
Yoshida, Noboru: See—  
Hosokawa, Takeshi; Oda, Hiroshi; and Yoshida, Noboru, 252,616, Cl. D10-105.000.

# CLASSIFICATION OF PATENTS

ISSUED AUGUST 14, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2		57.5	4,164,093	54	4,164,140	218	4,164,427	162	4,164,243	CLASS 187	
2.1 R	4,164,042	CLASS 48		81	4,164,141	287.13	4,164,428	CLASS 141		9 R	4,164,270
161 A	4,164,043	209	4,164,397	194 VS	4,164,142	CLASS 111		156	4,164,244	32	4,164,271
237	4,164,044	CLASS 51		213	4,164,143	1	4,164,190	250	4,164,245	CLASS 188	
CLASS 3		7	4,164,096	293	4,164,145	CLASS 112		CLASS 144		196 D	4,164,272
1.4	4,164,045	101 LG	4,164,097	304 R	4,164,146	158 E	4,164,192	2 Z	4,164,246	218 A	4,164,273
1.5	4,164,046	209 R	4,164,098	362 R	4,164,147	225	4,164,191	34 F	4,164,247	285	4,164,274
CLASS 4		216 LP	4,164,099	432 R	4,164,148	CLASS 114		312	4,164,248	CLASS 190	
172.11	4,164,047	239	4,164,100	594	4,164,149	111	4,164,193	326 R	4,164,249	2	4,164,275
292	4,164,048	273	4,164,101	644	4,164,150	210	4,164,194	CLASS 148		CLASS 192	
300	4,164,049	283 R	4,164,102	663	4,164,151	322	4,164,195	2	4,164,434	13 R	4,164,276
CLASS 8		417	4,164,103	665	4,164,152	CLASS 116		153	4,164,435	CLASS 196	
18 R	4,164,392	432	4,164,104	CLASS 74		227	4,164,197	174	4,164,436	CLASS 198	
94.18	4,164,393	CLASS 52		217 B	4,164,153	272	4,164,196	CLASS 152		205	4,164,250
107	4,164,394	1	4,164,095	665 GD	4,164,154	272	4,164,196	323	4,164,251	CLASS 200	
111	4,164,395	72	4,164,106	687	4,164,155	CLASS 118		CLASS 156		369	4,164,277
149.1	4,164,050	202	4,164,105	860	4,164,156	315	4,164,198	167	4,164,437	394	4,164,281
CLASS 15		232	4,164,107	CLASS 75		CLASS 119		180	4,164,438	487	4,164,278
3.11	4,164,052	232	4,164,108	72	4,164,416	2	4,164,199	441	4,164,439	492	4,164,279
97 B	4,164,053	CLASS 53		84	4,164,417	51.12	4,164,201	583.1	4,164,440	781	4,164,280
210 B	4,164,054	409	4,164,110	88	4,164,418	81	4,164,201	CLASS 159		840	4,164,283
321	4,164,055	427	4,164,109	169	4,164,419	CLASS 122		13 A	4,164,441	CLASS 203	
CLASS 17		434	4,164,111	175 R	4,164,420	CLASS 123		352	4,164,442	4	4,164,633
21	4,164,056	CLASS 55		CLASS 83		32 JV	4,164,203	CLASS 162		5 A	4,164,634
49	4,164,057	186	4,164,398	191	4,164,158	117 R	4,164,204	448	4,164,252	33 R	4,164,635
CLASS 24		223	4,164,399	280	4,164,159	119 A	4,164,205	CLASS 164		51 R	4,164,636
1	4,164,058	382	4,164,400	307.2	4,164,160	188 AP	4,164,206	CLASS 165		86.5	4,164,637
CLASS 29		295	4,164,112	346	4,164,161	CLASS 126		1	4,164,253	CLASS 204	
25.15	4,164,059	CLASS 57		651.1	4,164,162	110 R	4,164,210	65	4,164,254	10	4,164,453
25.19	4,164,060	104	4,164,113	1.15	4,164,163	285 A	4,164,211	82	4,164,255	28	4,164,454
148.4 A	4,164,062	236	4,164,114	CLASS 85		CLASS 127		125	4,164,256	38 A	4,164,455
156.8 B	4,164,061	279	4,164,115	62	4,164,164	15	4,164,429	72	Re.30,070	52 R	4,164,456
420.5	4,164,063	282	4,164,116	CLASS 89		CLASS 128		113	4,164,257	129	4,164,457
468	4,164,064	289	4,164,117	134	4,164,165	28	4,164,216	59	4,164,258	159.17	4,164,458
564.6	4,164,065	CLASS 59		342	4,164,166	138 R	4,164,217	72	4,164,259	159.18	4,164,459
570	4,164,066	31	4,164,118	363 R	4,164,167	142.7	4,164,218	113	4,164,258	180 R	4,164,460
620	4,164,067	428	4,164,119	376 R	4,164,168	145.8	4,164,219	23 C	4,164,617	192 EC	4,164,461
623.1	4,164,068	431	4,164,120	504	4,164,169	185	4,164,220	48	4,164,618	195 S	4,164,462
623.2	4,164,069	486	4,164,121	CLASS 93		214 R	4,164,221	52 PE	4,164,619	296	4,164,463
625	4,164,071	547 R	4,164,122	CLASS 96		303.1	4,164,222	73 R	4,164,620	299 R	4,164,464
720	4,164,072	641	4,164,123	35 H	4,164,170	321	4,164,223	78 R	4,164,621	CLASS 206	
731	4,164,073	683	4,164,124	49 R	4,164,171	330	4,164,224	52	4,164,621	217	4,164,284
CLASS 32		2	4,164,125	CLASS 98		334 R	4,164,225	50	4,164,443	306	4,164,285
32	4,164,074	55	4,164,126	33	4,164,421	419 PT	4,164,227	52	Re.30,071	434	4,164,286
CLASS 33		98	4,164,127	CLASS 99		461	4,164,228	1	4,164,260	CLASS 208	
174 Q	4,164,075	105	4,164,128	33 R	4,164,172	660	4,164,213	50	4,164,443	120	4,164,465
181 R	4,164,076	326	4,164,129	36	4,164,173	696	4,164,215	1	4,164,260	177	4,164,466
348	4,164,077	CLASS 65		CLASS 100		741	4,164,214	CLASS 175		CLASS 209	
CLASS 35		1	4,164,401	415	4,164,174	759	4,164,212	52	4,164,260	10	4,164,467
9 B	4,164,078	30 E	4,164,402	446	4,164,175	CLASS 131		1	4,164,260	23 R	4,164,468
12 E	4,164,079	CLASS 68		CLASS 101		55	4,164,229	18	4,164,622	40	4,164,469
12 P	4,164,080	133	4,164,130	4	4,164,176	171 R	4,164,230	CLASS 177		523	4,164,470
25	4,164,081	CLASS 70		40	4,164,177	192	4,164,231	CLASS 178		CLASS 210	
83	4,164,082	14	4,164,131	99	4,164,178	CLASS 133		CLASS 179		23 R	4,164,468
CLASS 38		456 R	4,164,132	CLASS 102		8 R	4,164,232	1 GD	4,164,624	134	4,164,287
11	4,164,083	CLASS 71		76	4,164,179	CLASS 134		1 GS	4,164,623	207	4,164,288
CLASS 40		76	4,164,403	76	4,164,179	13	4,164,430	1 SC	4,164,626	CLASS 212	
19	4,164,084	77	4,164,404	93.34	4,164,180	CLASS 135		1 SW	4,164,625	122	4,164,289
152	4,164,085	79	4,164,405	99	4,164,181	5 A	4,164,233	15 AQ	4,164,627	CLASS 215	
476	4,164,086	86	4,164,406	103	4,164,182	CLASS 136		15 BA	4,164,628	1 C	4,164,298
492	4,164,087	88	4,164,407	109	4,164,183	89 NB	4,164,431	15 BS	4,164,629	CLASS 219	
CLASS 42		98	4,164,408	114	4,164,184	89 PC	4,164,432	90 B	4,164,630	100	4,164,638
17	4,164,088	CLASS 72		127.1	4,164,185	229	4,164,433	115.5 H	4,164,631	117.1	4,164,639
CLASS 43		103	4,164,412	348	4,164,186	CLASS 137		175.3 R	4,164,632	121 EM	4,164,640
1	4,164,089	111	4,164,413	CLASS 104		51	4,164,234	54 A	4,164,262	358	4,164,641
CLASS 44		114	4,164,414	93	4,164,187	52	4,164,235	54 R	4,164,261	411	4,164,642
1 D	4,164,396	CLASS 73		166	4,164,188	240	4,164,236	CLASS 180		433	4,164,643
CLASS 46		183	4,164,133	378	4,164,189	377	4,164,237	119	4,164,264	452	4,164,644
17	4,164,090	466	4,164,135	CLASS 106		512.15	4,164,238	224	4,164,265	541	4,164,645
26	4,164,091	CLASS 74		20	4,164,423	553	4,164,239	250	4,164,266	CLASS 220	
123	4,164,092	17 R	4,164,136	38.9	4,164,424	887	4,164,240	255	4,164,267	20	4,164,299
CLASS 47		19	4,164,137	89	4,164,425	CLASS 138		8	Re.30,072	94 R	4,164,300
47	4,164,094	23	4,164,138	90	4,164,426	30	4,164,242	150	4,164,268	210	4,164,302



253	4,164,301	428	4,164,482	CLASS 307	409	4,164,778	123	4,164,567	
359	4,164,303	455 Z	4,164,483	57	4,164,661	433	4,164,779	153	4,164,568
465	4,164,304	CLASS 260		115	4,164,663	CLASS 362		174	4,164,569
		2.3	4,164,484	118	4,164,664	64	4,164,780	175	4,164,570
4	4,164,305	5	4,164,485	141	4,164,665	226	4,164,783	177	4,164,571
181	4,164,306	22 TN	4,164,486	208	4,164,666	282	4,164,784	178	4,164,572
182	4,164,307	29.2 EP	4,164,487	253	4,164,667	50	4,164,785	199	4,164,573
		29.4 UA	4,164,488	303	4,164,668	CLASS 340		216	4,164,574
		29.6 R	4,164,489	CLASS 310		5 D	4,164,727	248.54	4,164,576
45 R	4,164,308	33.6 UA	4,164,490	15	4,164,669	146.3 Q	4,164,728	251	4,164,577
	4,164,309	37 SB	4,164,491	50	4,164,670	168 R	4,164,730	200	4,164,786
		40 R	4,164,492	52	4,164,671	286 R	4,164,731	515	4,164,787
58	4,164,310	42.18	4,164,493	54	4,164,672	323 R	4,164,732	710	4,164,788
161	4,164,311	45.75 R	4,164,494	89	4,164,673	347 AD	4,164,734	270	4,164,789
		112 B	4,164,495	90	4,164,674	347 NT	4,164,733	273 R	4,164,580
		122	4,164,496	268	4,164,675	347 SY	4,164,729	274	4,164,581
15	4,164,312	239.1	4,164,497	360	4,164,676	384 E	4,164,735	279	4,164,582
31 R	4,164,313	239.3 P	4,164,499	CLASS 312		530	4,164,736	280	4,164,583
33	4,164,314	239.3 T	4,164,498	236	4,164,361	686	4,164,737	285	4,164,584
34 R	4,164,315	239.9	4,164,500	CLASS 313		CLASS 343		CLASS 425	
41 R	4,164,316	346.22	4,164,501	35	4,164,677	5 CM	4,164,738	204	4,164,385
		346.73	4,164,502	220	4,164,678	5 SC	4,164,740	371	4,164,386
20 A	4,164,317	365	4,164,503	336	4,164,680	18 E	4,164,741	378 R	4,164,387
26	4,164,318	397.1	4,164,504	400	4,164,681	768	4,164,742	406	4,164,388
		405.6	4,164,505	404	4,164,682	854	4,164,743		4,164,389
CLASS 235		410.9 R	4,164,506	496	4,164,683	CLASS 346		CLASS 426	
1 E	4,164,319	412.5	4,164,507	CLASS 315		140 A	4,164,744	131	4,164,587
91 R	4,164,320	413	4,164,508	39.51	4,164,684	140 R	4,164,745	135	4,164,588
92 FQ	4,164,321	448.8 R	4,164,509	105	4,164,685	96.17	4,164,363	281	4,164,589
375	4,164,322	465 E	4,164,510	241 P	4,164,686	299	4,164,364	407	4,164,590
480	4,164,323	564 D	4,164,511	241 R	4,164,687	362	4,164,365	523	4,164,591
		570.5 P	4,164,512	389	4,164,688	CLASS 353		547	4,164,592
CLASS 236		586 P	4,164,513	408	4,164,689	26 R	4,164,367	653	4,164,593
12 R	4,164,321		4,164,514	CLASS 318		CLASS 354		662	4,164,594
34.5	4,164,322		4,164,515	254	4,164,690	23 R	4,164,368	CLASS 427	
		CLASS 261		266	4,164,691	219	4,164,369	341	4,164,595
CLASS 239		41 B	4,164,525	573	4,164,693	243	4,164,370	372 B	4,164,596
212	4,164,323		4,164,526	578	4,164,694	312	4,164,371	425	4,164,597
230	4,164,324		4,164,527	653	4,164,695	CLASS 355		CLASS 428	
252	4,164,325		4,164,528	696	4,164,696	3 DD	4,164,372	48	4,164,598
585	4,164,326		4,164,529	CLASS 320		CLASS 356		92	4,164,599
669	4,164,327		4,164,530	75 A	4,164,699	316	4,164,373	198	4,164,600
CLASS 241			4,164,531	CLASS 323		402	4,164,374	284	4,164,601
175	4,164,328		4,164,532	CLASS 324		41	4,164,751	325	4,164,602
294	4,164,329		4,164,533	0.5 AH	4,164,700	46	4,164,747	345	4,164,603
			4,164,534	51	4,164,701	CLASS 358		398	4,164,604
18 PW	4,164,330		4,164,535	54	4,164,702	3	4,164,748	409	4,164,605
25 R	4,164,331		4,164,536	73 PC	4,164,703	13	4,164,749	605	4,164,606
54 R	4,164,332		4,164,537	158 MG	4,164,705	26	4,164,750	621	4,164,607
71.2	4,164,333		4,164,538	208	4,164,706	96	4,164,752	CLASS 429	
84.8	4,164,334		4,164,539	230	4,164,707	113	4,164,753	50	4,164,608
107.4 A	4,164,335		4,164,540	CLASS 325		128	4,164,754	183	4,164,609
	4,164,336		4,164,541	21	4,164,709	CLASS 328		193	4,164,610
	4,164,337		4,164,542	464	4,164,710	180	4,164,757	75	4,164,390
CLASS 244			4,164,543	CLASS 328		183	4,164,760	CLASS 431	
118 R	4,164,338		4,164,544	48	4,164,712	215	4,164,761	124	4,164,391
153 R	4,164,339		4,164,545	111	4,164,713	304	4,164,762	CLASS 432	
163	4,164,339		4,164,546	CLASS 330		CLASS 360		CLASS 435	
186	4,164,340		4,164,547	10	4,164,714	32	4,164,763	11	4,164,448
CLASS 249			4,164,548	85	4,164,715	77	4,164,764	30	4,164,449
126	4,164,341		4,164,549	252	4,164,716	92	4,164,765	46	4,164,450
			4,164,550	CLASS 332		97	4,164,766	63	4,164,451
199	4,164,342		4,164,551	7.51	4,164,717	98	4,164,767	92 N	4,164,452
216	4,164,343		4,164,552	CLASS 333		99	4,164,768	173	4,164,453
281	4,164,344		4,164,553	81 R	4,164,718	106	4,164,769	CLASS 521	
301	4,164,345		4,164,554	CLASS 335		113	4,164,770	89	4,164,611
426	4,164,346		4,164,555	14	4,164,719	133	4,164,771	93	4,164,612
436	4,164,347		4,164,556	234	4,164,720	CLASS 361		CLASS 525	
439 R	4,164,348		4,164,557	272	4,164,721	1	4,164,772	187	4,164,521
445 T	4,164,349		4,164,558	CLASS 336		58	4,164,773	305	4,164,522
492 A	4,164,350		4,164,559	CLASS 337		69	4,164,774	484	4,164,523
561	4,164,351		4,164,560	CLASS 338		119	4,164,775	CLASS 526	
			4,164,561	CLASS 339		150	4,164,776	62	4,164,612
CLASS 251			4,164,562	CLASS 340		172	4,164,777	201	4,164,613
28	4,164,342		4,164,563	CLASS 341		331	4,164,778	264	4,164,614
315	4,164,343		4,164,564	CLASS 342		CLASS 362		CLASS 560	
			4,164,565	CLASS 343		12	4,164,558	246	4,164,615
CLASS 252			4,164,566	CLASS 344		14	4,164,559	CLASS 568	
1	4,164,471		4,164,567	CLASS 345		22	4,164,560	858	4,164,616
18	4,164,472		4,164,568	CLASS 346		29	4,164,561	427	4,164,518
32.7 E	4,164,473		4,164,569	CLASS 347		47	4,164,562	622	4,164,519
33	4,164,474		4,164,570	CLASS 348		83	4,164,563		
46.7	4,164,475		4,164,571	CLASS 349		89	4,164,564		
62.1 P	4,164,476		4,164,572	CLASS 350			4,164,565		
99	4,164,477		4,164,573	CLASS 351			4,164,566		
135	4,164,478		4,164,574	CLASS 352					
301.1 W	4,164,479		4,164,575	CLASS 353					
402	4,164,480		4,164,576	CLASS 354					
412	4,164,481		4,164,577	CLASS 355					

D3—	54	252,596	77	252,605	105	252,616	D13—	12	252,626	D21—	60	252,635	212	252,648
D4—	25	252,597	137	252,606	114	252,617	D14—	11	252,627	5	252,646	217	252,649	
D6—	5	252,598		252,607	86	252,618		29	252,628	13	252,636	244	252,645	
		252,599	D8—	51	252,609	252,619	D11—	86	252,620	27	252,647	253	252,638	
		252,608		107	252,611	252,621	D12—	181	252,622	73	252,651	D22—	23	252,639
23		252,600		373	252,610	252,622			252,623	74	252,652	D23—	149	252,640
63		252,601	D9—	216	252,612	252,624	D15—	5	252,630	91	252,653	D28—	9	252,641
68		252,602		245	252,613	252,625	D16—	14	252,631	96	252,654	D30—	15	252,642
154		252,603	D10—	40	252,614	252,626	D17—	20	252,633	152	252,644	D48—	23 A	252,654
D7—	65	252,604		62	252,615	252,627	D19—	54	252,634					

P.—	68	4,448	4,449	4,450					
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# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

4 : 4,164,345	4,164,634	13 : 4,164,112	4,164,782	4,164,137	4,164,408
4,164,626	4,164,639	4,164,246	4,164,249	4,164,144	4,164,409
6 : Re.30,073	4,164,648	4,164,312	4,164,295	4,164,148	4,164,410
4,164,074	4,164,704	4,164,388	4,164,297	4,164,206	4,164,426
4,164,123	4,164,718	4,164,701	4,164,077	4,164,237	4,164,445
4,164,143	4,164,727	4,164,703	4,164,085	4,164,272	4,164,458
4,164,163	4,164,733	4,164,719	4,164,526	4,164,292	4,164,504
4,164,223	4,164,734	4,164,119	4,164,581	4,164,300	4,164,512
4,164,226	4,164,738	4,164,294	4,164,593	4,164,326	4,164,525
4,164,342	4,164,739	4,164,479	4,164,197	4,164,335	4,164,541
4,164,416	4,164,740	Re.30,072	4,164,211	4,164,336	4,164,555
4,164,468	4,164,742	4,164,057	4,164,399	4,164,337	4,164,556
4,164,594	4,164,753	4,164,065	4,164,547	4,164,355	4,164,562
4,164,601	4,164,758	4,164,069	4,164,233	4,164,356	4,164,564
4,164,644	4,164,767	4,164,105	4,164,465	4,164,374	4,164,586
4,164,677	4,164,770	4,164,122	4,164,183	4,164,481	4,164,621
4,164,759	4,164,772	4,164,176	4,164,093	4,164,501	4,164,628
8 : 4,164,172	4,164,777	4,164,189	4,164,099	4,164,502	4,164,678
4,164,630	4,164,784	4,164,209	4,164,104	4,164,522	4,164,681
9 : 4,164,132	4,164,788	4,164,235	4,164,129	4,164,535	4,164,687
4,164,250	4,164,146	4,164,253	4,164,218	4,164,664	4,164,700
01 : 4,164,087	4,164,358	4,164,274	4,164,293	4,164,709	4,164,711
4,164,460	4,164,722	4,164,276	4,164,467	4,164,048	4,164,713
06 : 4,164,045	4,164,768	4,164,283	4,164,496	4,164,412	4,164,729
4,164,055	4,164,076	4,164,304	4,164,551	4,164,563	4,164,787
4,164,064	4,164,145	4,164,309	4,164,650	4,164,591	4,164,790
4,164,075	4,164,284	4,164,318	4,164,066	4,164,620	4,164,702
4,164,078	4,164,316	4,164,324	4,164,147	4,164,723	4,164,044
4,164,084	4,164,334	4,164,352	4,164,155	4,164,765	4,164,070
4,164,092	4,164,434	4,164,381	4,164,156	4,164,299	4,164,080
4,164,138	4,164,443	4,164,433	4,164,212	4,164,217	4,164,126
4,164,142	4,164,456	4,164,596	4,164,215	4,164,406	4,164,151
4,164,149	4,164,474	4,164,623	4,164,224	4,164,472	4,164,164
4,164,193	4,164,510	4,164,636	4,164,230	4,164,574	4,164,225
4,164,214	4,164,514	4,164,661	4,164,243	4,164,598	4,164,227
4,164,216	4,164,521	4,164,669	4,164,281	4,164,089	4,164,231
4,164,219	4,164,532	4,164,682	4,164,313	4,164,346	4,164,286
4,164,221	4,164,565	4,164,696	4,164,322	4,164,327	4,164,303
4,164,275	4,164,618	4,164,712	4,164,378	4,164,464	4,164,308
4,164,306	4,164,656	4,164,714	4,164,444	4,164,647	4,164,317
4,164,323	4,164,693	4,164,725	4,164,461	4,164,068	4,164,319
4,164,325	4,164,735	4,164,726	4,164,558	4,164,125	4,164,320
4,164,354	10 : 4,164,488	4,164,757	4,164,560	4,164,175	4,164,347
4,164,367	4,164,552	4,164,780	4,164,584	4,164,191	4,164,357
4,164,376	4,164,081	4,164,141	4,164,602	4,164,192	4,164,365
4,164,382	4,164,095	4,164,186	4,164,606	4,164,202	4,164,372
4,164,422	4,164,097	4,164,188	4,164,646	4,164,239	4,164,389
4,164,428	4,164,314	4,164,190	4,164,716	4,164,329	4,164,393
4,164,483	4,164,366	4,164,247	4,164,764	4,164,353	4,164,424
4,164,487	4,164,398	4,164,343	4,164,766	4,164,394	4,164,431
4,164,513	4,164,405	4,164,536	4,164,769	4,164,395	4,164,455
4,164,590	4,164,505	4,164,633	4,164,781	4,164,404	4,164,493
4,164,607	4,164,550	4,164,643	4,164,071	4,164,407	4,164,503

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,164,530	4,164,251	4,164,533	4,164,538	4,164,179	4,164,737
4,164,585	4,164,287	4,164,545	4,164,544	4,164,199	4,164,751
4,164,610	4,164,296	4,164,615	4,164,549	4,164,236	4,164,139
4,164,642	4,164,341	4,164,616	4,164,554	4,164,257	4,164,301
4,164,670	4,164,351	4,164,289	4,164,566	4,164,260	4,164,079
4,164,671	4,164,377	4,164,397	4,164,573	4,164,267	4,164,201
4,164,717	4,164,391	4,164,056	4,164,578	4,164,285	4,164,229
4,164,732	4,164,432	4,164,083	4,164,580	4,164,339	4,164,363
4,164,736	4,164,475	4,164,106	4,164,609	4,164,360	4,164,515
4,164,763	4,164,492	4,164,121	4,164,619	4,164,379	4,164,094
4,164,774	4,164,587	4,164,124	4,164,672	4,164,427	4,164,180
4,164,786	4,164,588	4,164,128	4,164,705	4,164,439	4,164,338
37 : 4,164,117	4,164,592	4,164,131	4,164,771	4,164,449	4,164,340
4,164,268	4,164,599	4,164,194	4,164,773	4,164,450	4,164,053
4,164,269	4,164,674	4,164,273	4,164,305	4,164,477	4,164,054
4,164,332	4,164,679	4,164,310	4,164,373	4,164,507	4,164,062
4,164,400	4,164,741	4,164,348	4,164,113	4,164,520	4,164,067
4,164,600	4,164,785	4,164,362	4,164,392	4,164,540	4,164,153
39 : 4,164,058	4,164,140	4,164,380	4,164,731	4,164,546	4,164,171
4,164,063	4,164,264	4,164,415	4,164,480	4,164,576	4,164,290
4,164,130	4,164,451	4,164,417	4,164,494	4,164,597	4,164,311
4,164,159	4,164,452	4,164,463	Re.30,070	4,164,614	4,164,542
4,164,177	4,164,466	4,164,485	4,164,046	4,164,614	4,164,595
4,164,185	4,164,471	4,164,489	4,164,082	4,164,697	4,164,680
4,164,210	4,164,519	4,164,498	4,164,135	4,164,715	4,164,783

## DESIGN PATENTS

06 : 252,596	252,646	12 : 252,623	18 : 252,643	252,645	252,638
252,601	252,647	252,618	252,649	252,654	252,650
252,602	252,599	252,633	252,629	252,651	252,610
252,617	252,615	17 : 252,598	24 : 252,603	252,597	252,614
252,625	252,619	252,608	25 : 252,613	252,600	42 : 252,605
252,627	252,620	252,624	252,626	252,606	47 : 252,604
252,636	252,621	252,628	252,635	252,607	55 : 252,634
252,642	252,622	252,641			

## PLANT PATENTS

6 : 4,449	06 : 4,448	4,450		
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Vol. 985 Number 3

# OFFICIAL GAZETTE

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PATENTS

August 21, 1979



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9  
U M I

OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE

August 21, 1979

Volume 985

Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	985 OG 18
Correction of Interference Rule . . . . .	985 OG 18
Public Advisory Committee for Trademark Affairs . . . . .	985 OG 18
Survey of Public Interest in Obtaining Classification Definitions in Microfiche . . . . .	985 OG 18
Reissue Applications Filed . . . . .	985 OG 19
Patent Notices	
Certificates of Correction for the Week of August 21, 1979 . . . . .	985 OG 20
Disclaimers . . . . .	985 OG 20
Disclaimer and Dedication . . . . .	985 OG 20
Patents Available for Licensing or Sale . . . . .	985 OG 20
National Technical Information Service . . . . .	985 OG 22
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	985 OG 24
Condition of Patent Applications . . . . .	985 OG 25
Reissue Patents Granted (30,070) . . . . .	525
Plant Patents Granted (4,451) . . . . .	529
Patents Granted	
General and Mechanical (4,164,792) . . . . .	531
Chemical (4,165,217) . . . . .	671
Electrical (4,165,442) . . . . .	735
Design Patents Granted (252,656) . . . . .	771
Index of Patentees . . . . .	PI 1
Indices of Reissues, Plants and Designs . . . . .	PI 27
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Plants . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Plants . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of Information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979. Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	\$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,  
Acting Commissioner of  
Patents and Trademarks.  
July 3, 1979.

### Correction of Interference Rule

37 CFR §1.217

The revised text of 37 CFR §1.217 relating to "Contents of the preliminary statement; invention made abroad," published in the OFFICIAL GAZETTE of August 1, 1978, 973 O.G. 19, contains an error in subparagraph (1). In the second sentence of subparagraph (1), the phrase "signed or sworn to" should read "signed and sworn to."

Notice of this correction was published in the Federal Register of December 11, 1978, 43 FR 57886, and was inadvertently not published in the OFFICIAL GAZETTE.

RENE D. TEGTMEYER,  
Acting Commissioner of  
Patents and Trademarks.  
July 19, 1979.

### Public Advisory Committee for Trademark Affairs

#### Notice of Open Meeting

In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92-463), announcement is made of the following Committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:30 a.m. until 4:30 p.m. on September 6, 1979 at the Watergate Hotel, 2650 Virginia Avenue, NW., Washington, D.C., 20037, in the Potomac Room.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the government in the field. The agenda for the meeting is as follows:

- (1) Introductory Remarks
- (2) Resource Problems
- (3) Goals of Trademark Operation
- (4) Quality of Office Actions
- (5) Filing Increases
- (6) Separating Trademark Mail
- (7) Use of Paralegals in the Trademark Operation
- (8) TRT Implementing Legislation and its Potential Effect on the Trademark Examining Operation
- (9) Proposed Trademark Rules Changes
- (10) Renewal of Committee Charter

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come, first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda will be allowed. To insure proper consideration at the meeting, any comments or suggestions relating to the agenda items should be submitted in writing before August 30. Further comments and suggestions will be accepted after the meeting on any of the matters discussed.

985 OG 18

Copies of the minutes will be available upon request. Inquiries may be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Please mark all correspondence to the attention of Committee Control Officer, Patricia M. Davis, Office of Trademark Program Control, Room CP3-11C17. Telephone: 703-557-3881.

RENE D. TEGTMEYER,  
Acting Commissioner of  
Patents and Trademarks.  
July 27, 1979.  
Approved: July 27, 1979.  
FRANCIS W. WOLEK,  
Acting Assistant Secretary for Science and Technology.

### Survey of Public Interest in Obtaining Classification Definitions in Microfiche

The Patent and Trademark Office is planning to offer patent "Classification Definitions" in microfiche for sale to the public through the Superintendent of Documents. Paper copies will continue to be available through the Patent and Trademark Office. Publication of this important and voluminous series of documents in such a microform will make it available at considerably less than the price now charged for the paper edition. Moreover, much of the work involved in maintaining the paper edition in current condition to reflect changes made by Classification Orders will be eliminated for subscribers to the microfiche edition.

#### Purpose of the Survey

The purpose of this survey is to determine (1) whether there is sufficient market interest to justify such an offering, and (2) how the definitions should be offered to best serve buyers; i.e., whether to offer them in complete sets by subscription, including updates over a period of time, or as individual items only.

#### Description of the Classification Definitions Microfiche

A Classification Definition microfiche is a sheet of film measuring 4" x 6" which has a capacity for recording 98 pages of information at a page size reduction of 24 to 1. Images are of the negative appearing type in a diazo film.

An entire set of Classification Definitions consisting of about 320 separate publications (one for each class) would be contained in an estimated 360 microfiche, as some of the publications are of such length as to require more than one microfiche.

The first microfiche edition of the Classification Definitions will incorporate all current and outstanding addenda into the definitions either by direct entry into the text or through annotations which direct the reader to the proper addenda. For some of the definitions, this will eliminate the need for referring to the addenda documents and, for those changes which are too voluminous to enter in the body of the definition, the annotations will facilitate reference to the separate addenda.

After initial publication of the entire set of Classification Definitions, further publication will occur about quarterly to offer definitions of new classes resulting from reclassification effort in the Patent and Trademark Office, and updated definitions which incorporate changes contained in newly published addenda. It is estimated that each quarterly update will consist of a mix of from 150 to 175 new or republished Classification Definitions. The republished definitions are intended to entirely replace earlier edition definitions.

Prices can only be estimated at this time. However, it is expected that a full set of the initial edition of Classification Definitions in microfiche and three following quarterly sets of new and updated (replacement) definitions in microfiche would be offered for sale at approximately \$170. This contrasts with the price of a full set of publications in paper, without updates, of about \$830. Prices for individual Classification Definitions in microfiche, if offered, are expected to be lower than for paper copies as well.

#### Survey Questions

If you or your organization are interested in obtaining the Classification Definitions in microfiche, please write to Mrs.

AUGUST 21, 1979

U. S. PATENT AND TRADEMARK OFFICE

985 OG 19

Sarah Wilson of the staff of the Superintendent of Documents at the address given below to express that interest. In your letter, please address the following questions:

- (1) Which of the following best describes you (or your organization)?
  - (a) Individual
  - (b) Law Firm
  - (c) Corporate patent department
  - (d) Foreign government or institution
  - (e) Other—please specify

- (2) How will you or your organization prefer to purchase Classification Definitions in microfiche?
  - (a) Subscribe to full set and all updates within one year, and on an annual basis thereafter (a multi-year subscription is an additional possibility).

You will receive in the initial shipment, a complete set of (the first edition of) the Classification Definitions on microfiche. Thereafter, on a quarterly basis for the balance of the year (or subscription, whichever is later), you will receive new microfiche for all class definitions which have been reclassified or updated and for newly created classes.

- (b) Purchase only those microfiche selected from periodically published lists of newly announced or updated definitions.

As new definitions are prepared or old ones changed through publication of new addenda, their publication will be announced in the OFFICIAL GAZETTE. Customers will order the desired definitions in microfiche as individual items. No subscriptions or "standing orders" could be accepted. Costs per unit of individually ordered microfiche will be somewhat higher than for subscriptions to sets.

- (3) If you prefer the second choice in item (2) above, approximately how many definitions would you expect to purchase each year? Remember that the "average" definition will be updated in some way about twice annually.

Representatives of government depository libraries are requested not to respond to this survey, as they will be canvassed separately and directly by the Government Printing Office.

Please send your replies by Sept. 21, 1979 to:

Mrs. Sarah Wilson  
Chief, Subscription Section  
Documents Control Branch SSMC  
Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20401

ALFRED C. MARMOR,  
Administrator for Documentation.  
July 23, 1979.

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,381,086, Re. S.N. 039,286, Filed May 15, 1979, Cl. 358/128, REPRODUCTION OF TELEVISION SIGNALS FROM PHOTOGRAPHIC DISC RECORDINGS, Dean L. Demoss, Owner of Record: Minnesota Mining and Manufacturing Company, St. Paul, Minn., Attorney or Agent: Cruzan Alexander, Ex. Gp.: 233

4,019,371, Re. S.N. 041,028, Filed May 21, 1979, Cl. 73/46, APPARATUS AND METHOD FOR EXTERNALLY TESTING CONDUIT CONNECTIONS, Gervase M. Chaplin, et al., Owner of Record: Exxon Production Research Co., Houston, Tex., Attorney or Agent: J. S. Schneider, Ex. Gp.: 224

4,025,895, Re. S.N. 041,542, Filed May 23, 1979, Cl. 340/3 R, NAVIGATION SYSTEM FOR MANEUVERING A STRUCTURE ABOUT A SUBMERGED OBJECT, Harry H. Shatto, Owner of Record: Santa Fe International Corporation, Orange, Calif., Attorney or Agent: Robert E. Leblanc, Ex. Gp.: 222

4,055,962, Re. S.N. 045,118, Filed Jun. 4, 1979, Cl. 62/102, HYDROGEN-HYDRIDE ABSORPTION SYSTEMS AND METHODS FOR REFRIGERATION AND MEAT PUMP CYCLES, Lynn E. Terry, Owner of Record: Inventor, Attorney or Agent: Francis J. Mulligan Jr., Ex. Gp.: 344

4,073,445, Re. S.N. 044,266, Filed May 31, 1979, Cl. 241/101.7, FEEDER CRUSHER, David Clonch, Owner of Record: S & S Corporation, Cedar Bluff, Va., Attorney or Agent: R. J. Falkowski, Ex. Gp.: 322

4,080,950, Re. S.N. 043,480, Filed May 29, 1979, Cl. 124/1, BALL THROWING DEVICE, John K. Paulson, et al., Owner of Record: Inventor, Attorney or Agent: M. H. Hartwell Jr., Ex. Gp.: 334

4,081,217, Re. S.N. 042,069, Filed May 24, 1979, Cl. 401/131, FOLDABLE PEN, Michael C. Klaber, Owner of Record: Inventor, Attorney or Agent: Henri J. A. Charmas, Ex. Gp.: 337

4,115,215, Re. S.N. 040,155, Filed May 17, 1979, Cl. 240/67, ALUMINUM PURIFICATION, Subodh K. Das, et al., Owner of Record: Aluminum Company of America, Pittsburgh, Pa., Attorney or Agent: Andrew Alexander, Ex. Gp.: 114

# PATENT NOTICES

## Certificates of Correction for the Week of Aug. 21, 1979

D. 251,502	4,132,634	4,146,489
3,960,961	4,134,112	4,146,657
4,011,373	4,134,954	4,146,699
4,088,486	4,137,695	4,147,085
4,092,594	4,138,385	4,147,512
4,094,308	4,139,741	4,147,720
4,112,030	4,141,887	4,148,771
4,112,080	4,142,920	4,148,835
4,114,608	4,143,066	4,149,745
4,115,232	4,143,727	4,150,052
4,116,212	4,144,580	4,150,104
4,122,465	4,145,522	4,150,107
4,122,492	4,145,714	4,150,237
4,123,123	4,145,741	4,150,285
4,126,476	4,146,029	4,150,382
4,130,646	4,146,088	4,150,726
4,132,338	4,146,246	4,150,766

## Disclaimers

3,231,107.—Milton Clar, Silver Spring, Md. APPARATUS FOR THE COMPACTION AND DISPOSAL OF REFUSE. Patent dated Jan. 25, 1966. Disclaimer filed Mar. 15, 1979, by the assignee, *Fitchbaugh Products, Inc.*

The term of this patent subsequent to Nov. 21, 1978, has been disclaimed.

3,819,153.—George H. Hurst, Huntingdon Valley and James F. Hobbins, Philadelphia, Pa. RESCUE TOOL. Patent dated June 25, 1974. Disclaimer filed June 8, 1979, by the assignee, *Hurst Performance, Inc.*

Hereby enters this disclaimer to claims 1-4, 11-16, 18, 20 and 23-29 of said patent.

4,108,840.—Charles B. Friedlander, Glenshaw, Pa. UREA-URETHANE-ACRYLATE RADIATION CURABLE COATING COMPOSITIONS AND METHODS OF MAKING SAME. Patent dated Aug. 22, 1978. Disclaimer filed June 13, 1979, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 6, 7, 9, 12, 14, 16, 17, 20, 21 and 23 of said patent.

4,153,708.—Wolfgang Krämer, Karl Heinz Büchel, and Manfred Plempe, Wuppertal, Germany. ACYLATED IMIDAZOLYL-O,N-ACETALS, THEIR PHARMACEUTICALLY ACCEPTABLE SALTS AND METAL COMPLEXES. Patent dated May 8, 1979. Disclaimer filed June 6, 1979, by the assignee, *Bayer Aktiengesellschaft.*

The term of this patent subsequent to Jan. 16, 1996, has been disclaimed.

## Disclaimer and Dedication

4,146,064.—John Farrell Hughes, Southampton, and John Michael Charles Roberts, Camberley, England. METHOD OF REDUCING THE FLAMMABILITY HAZARD OF HYDROCARBON AEROSOLS. Patent dated Mar. 27, 1979. Disclaimer and Dedication filed May 23, 1979, by the assignee, *S. C. Johnson & Son, Inc.*

Hereby disclaims and dedicates the entire term of said patent to the Public.

## Patents Available for Licensing or Sale

D. 247,777. HOUSING FOR AUDIO-VISUAL ENTERTAINMENT SYSTEM OR SIMILAR ARTICLE. Donald Roberson, 1801 East 12th St., Cleveland, Ohio 44114.

3,314,080. HUMIDIFYING SYSTEM. John Shilling, Jr., 16126 Spinning Ave., Torrance, Calif. 90504.

3,575,773. LIGHT REFLECTIVE DEVICE. L. B. Courtot, 5050 SOM Center Road, #308-2, Willoughby, Ohio 44094.

3,858,612. FLOOR DRAIN STOPPER. Arthur Van Steenburg, R. R. Box 9384, Spirit Lake, Iowa 51360.

3,882,824. GROOMING HORSES. W. F. Young, Incorporated, P.O. Box 14, Springfield, Mass. 01101.

3,927,709. OVERHEAD GARAGE DOOR. Wilbur R. Anderson, 2405 Nichol Ave., Anderson, Ind. 46011.

4,021,872. MATERNITY MATTRESS. Lee V. Powell, 4534 White Pine, Memphis, Tenn. 38109.

4,066,431. SYNTHETIC N-RELEASING SOIL CONDITIONER. Dr. D. M. Eanis, 13205 Court Ridge Road, Midlothian, Va. 23113.

4,072,337. TRAILER CONSTRUCTION. Joseph K. Barker, Correspondence to: Nathaniel A. Humphries, 1730 Rhode Island Ave., N.W., Washington, D.C. 20036.

4,078,643. TOKEN OPERATED CONTROL SYSTEM FOR A MULTITRACK TAPE CARTRIDGE PLAYER. David Benjamin Warthan, 668 E French Camp Road, French Camp, Calif. 95231.

4,150,624. BULLET IDENTIFICATION MEANS. Michael D. Hammond, 16 Dumbarton Oaks Place, Elgin, Ill. 60120.

The following three patents are offered by Silent Sentry Inc., P.O. Box 230, Springfield, Mo. 65801.

3,805,501. HEDGE TRIMMING CART.

3,968,337. DOOR ACTIVATED INTRUDER ALARM SWITCH.

4,060,704. DOOR ACTIVATED INTRUDER ALARM SWITCH.

General Foods Corporation is prepared to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Applications for licenses should be addressed to: Chief Patent Counsel, General Foods Corporation, 250 North St., White Plains, N.Y. 10625.

3,373,042. PROCESS FOR CONTINUOUSLY FREEZING COFFEE EXTRACT.

3,482,990. FREEZE-DRYING OF FOAMED AROMATIC MATERIAL.

3,619,204. PREPARATION OF PARTICULATE MATTER FOR FREEZE DRYING.

3,637,398. PREPARATION OF PARTICULATE MATTER FOR FREEZE DRYING.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

Re. 30,015. IMAGE DISPLAY EMPLOYING FILTER COATED PHOSPHOR PARTICLES.

4,152,045. OPTICAL WAVEGUIDE WITH PRISM COUPLER FOR PARALLEL LIGHT.

4,152,641. METHOD AND APPARATUS FOR THE DETERMINATION OF SIGNAL PICKUP QUALITIES OF A STYLUS OF A CAPACITIVE DISC VIDEO PLAYER.

4,153,343. LIQUID CRYSTAL DYESTUFFS AND ELECTRO-OPTIC DEVICES INCORPORATING SAME.

4,153,741. METHOD FOR FORMING A SURFACE RELIEF PATTERN IN A POLY (OLEFIN SULFONE) LAYER.

4,153,856. PROXIMITY FOCUSED ELEMENT SCALE IMAGE DISPLAY DEVICE.

4,153,862. SELF-REGULATING DEFLECTION CIRCUIT WITH RESISTIVE DIODE BIASING.

4,155,055. WAVE DEVICE HAVING A REVERSE DOMAIN GRATING.

4,155,076. CCD GRAY-TO-BINARY CODE GENERATOR.

4,155,098. GROOVE DEPTH ESTIMATION SYSTEM USING DIFFRACTIVE GROOVE EFFECTS.

4,155,618. BASE ASSEMBLY FOR AN ELECTRON TUBE.

4,155,627. COLOR DIFFRACTIVE SUBTRACTIVE FILTER MASTER RECORDING COMPRISING A PLURALITY OF SUPERPOSED TWO-LEVEL RELIEF PATTERNS ON THE SURFACE OF A SUBSTRATE.

4,155,633. CORRECTIVE OPTICAL DEVICE FOR HOMOXYMOUS HEMIANOPSIA.

AUGUST 21, 1979

U. S. PATENT AND TRADEMARK OFFICE

985 OG 21

4,156,243. PARABOLOID REFLECTOR ANTENNA.  
4,156,248. GATE TURN-OFF SEMICONDUCTOR CONTROLLED RECTIFIER DEVICE WITH HIGHLY DOPED BUFFER REGION PORTION.

4,156,264. HIGH POWER PROTECTION APPARATUS.  
4,156,826. MERCURY ARC LAMPS.

4,156,850. DISPLAY SYSTEM FOR FACILITATING THE SETUP OF A TUNING SYSTEM.

4,156,855. PHASE-LOCKED LOOP WITH VARIABLE GAIN AND BANDWIDTH.

4,156,940. MEMORY ARRAY WITH BIAS VOLTAGE GENERATOR.

The following patents are available for licensing at a reasonable royalty rate. Please direct all correspondence to: Patent Counsel, Texasgulf, Inc., High Ridge Park, Stamford, Conn. 06904.

3,191,783. GRANULAR PRODUCT STORAGE.

3,199,955. PROCESS OF REDUCING SULFUR DIOXIDE TO ELEMENTAL SULFUR.

3,332,744. RADIOMETRIC METHOD FOR PLANT STEAM CONTROL IN POTASH AND PHOSPHATE RECOVERY PROCESS.

3,427,145. METHOD OF AGGLOMERATING POTASSIUM CHLORIDE USING HYDROFLUORIC ACID OR METALLIC FLUORIDE.

3,442,553. SLURRY MINING OF CORNALLITE.

3,455,647. PROCESS FOR PRODUCING SODIUM SESQUICARBONATE AND SODA ASH FROM TRONA.

3,512,941. APPARATUS FOR PRODUCING NORMAL SULFURPHOSPHATE.

3,537,589. OUTSIDE DRIVE FOR A TILTING PAN FILTER.

3,595,624. METHOD AND APPARATUS FOR WASHING CRYSTALLIZERS.

3,655,538. PROCESS FOR ELECTROWINNING ZINC FROM SULFIDE CONCENTRATES.

3,674,442. CONTROL OF ORGANIC DEPOSITION IN SLURRY HEATERS IN POTASH CRYSTALLIZER CIRCUIT.

3,807,141. APPARATUS FOR REDUCING THE HYDROGEN SULFIDE AND HYDROGEN POLYSULFIDE CONTENT OF LIQUID SULFUR.

3,810,542. PROCESS FOR REMOVING CHROMIUM FROM COOLING TOWER BLOWDOWN STREAMS.

3,920,424. LIQUID SULFUR GAS SCRUBBER APPARATUS.

3,989,607. SOLVENT EXTRACTION AND ELECTROWINNING OF ZINC AND COPPER FROM SULFATE SOLUTION.

4,049,514. ZINC HYDROMETALLURGICAL PROCESS.

4,063,933. PROCESS FOR THE TREATMENT OF COMPLEX LEAD-ZINC CONCENTRATES.

4,083,034. PROCESS FOR OBTAINING PURE ORTHOPHOSPHORIC ACID FROM SUPERPHOSPHORIC ACID.

4,158,043. PROCESS FOR PRODUCING SODA ASH FROM NATURAL ALKALI METAL CARBONATE CONTAINING ORES.

The General Electric Company is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Application for license may be addressed to Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,142,976. AUTOMATIC WASHING MACHINE WITH IMPROVED CYCLE SELECTION MEANS.

3,362,082. AUTOMATIC DRYER CONTROL SYSTEM.

3,713,376. AIR-CONDITIONER AIR-DIRECTING MEANS.

4,023,419. MECHANISM FOR COIN-OPERATED TIMER RUN TIME ACCUMULATOR.

4,134,092. HEAT ACTIVATABLE ELECTRICAL SWITCH.

4,146,330. OPTICAL METHOD AND APPARATUS FOR SURFACE ROUGHNESS EVALUATION.

4,147,070. AUTOMATIC BELT TIGHTENER.

4,150,280. HIGH EFFICIENCY FREE EXPANSION FOIL HEATING ELEMENT.

4,151,681. ARRANGEMENT FOR MOUNTING HINGE PIN SOCKETS TO CABINET DOORS.

4,153,228. SELF-TIGHTENING CLAMP.

Application for license may be addressed to: General Electric Company, Re-Entry and Environmental Systems Division, 3198 Chestnut St., Philadelphia, Pa. 19101.

4,152,120. COAL DESULFURIZATION USING ALKALI METAL OR ALKALINE EARTH COMPOUNDS AND ELECTROMAGNETIC IRRADIATION.

Applications for license may be addressed to Manager, Patent Administration and Licensing, Electric Power Research Institute, P.O. Box 10412, Palo Alto, Calif. 94303.

4,103,646. APPARATUS AND METHOD FOR COMBUSTING CARBONACEOUS FUELS EMPLOYING IN TANDEM A FAST BED BOILER AND A SLOW BOILER.

4,115,929. GAS DISTRIBUTOR FOR FLUIDIZING BEDS.

4,023,921. OIL BURNER FOR NOX EMISSION CONTROL.

4,108,615. VANED ANODE FOR HIGH INTENSITY STAGE OF ELECTROSTATIC PRECIPITATOR.

4,021,328. REACTOR FOR SOLVENT REFINED COAL AND METHOD.

4,094,615. BLADE ATTACHMENT STRUCTURE FOR GAS TURBINE ROTOR.

4,142,831. DIMPLED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,090,810. PIN-FINNED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,093,399. TURBINE ROTOR WITH CERAMIC BLADES.

4,084,922. TURBINE ROTOR WITH PIN MOUNTED CERAMIC TURBINE BLADES.

4,113,242. RELEASABLE HIGH PRESSURE SEAL AND METHOD OF FORMING SAME.

4,058,396. RECOVERY OF LEAD FOR BATTERIES.

4,049,885. CONSTRUCTION FOR SOLID ELECTROLYTE IN SODIUM/SULFUR BATTERY.

4,053,689. CONTACT BETWEEN METAL CAN AND CARBON/GRAPHITE FIBERS IN SODIUM/SULFUR CELLS.

4,070,527. EFFICIENT SODIUM/SULFUR BATTERY.

3,359,022. METHOD FOR PRODUCING SODIUM-BETA-ALUMINA SOLID ELECTROLYTES.

4,012,562. MODULAR ELECTRICAL ENERGY STORAGE DEVICE.

4,048,390. NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING.

3,925,098. POSITIVE ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE.

4,146,683. SODIUM SULFUR CELL CONSTRUCTION AND METHOD.

4,110,516. SODIUM-SULFUR CELL CASINGS.

4,140,841. SULFUR ELECTRODE-SULFUR ELECTRODE CONTAINER AND METHODS OF MANUFACTURE.

4,102,175. RESPONSE TIME VERIFICATION OF IN SITU HYDRAULIC PRESSURE SENSORS IN A NUCLEAR REACTOR.

4,127,035. ELECTROMAGNETIC TRANSDUCER.

4,030,347. BIAXIAL CAPACITANCE STRAIN TRANSDUCER.

4,120,752. FUEL PELLETS FOR FUEL PIN OF NUCLEAR REACTOR CORE.

4,125,742. TIERED CONVOLUTED SHIELDED INSULATORS.

4,078,304. CUTTER FOR CORRUGATED PIPE FOR FLEXIBLE GAS INSULATED TRANSMISSION LINE.

4,063,355. CUTTER FOR HELICALLY CORRUGATED TUBE FOR FLEXIBLE GAS INSULATED CABLE.

4,091,230. EVAPORATION COOLED TRANSMISSION LINE SYSTEM.

4,110,551. EXTRUDED SHEATH SECTION FOR COMPRESSED GAS INSULATED TRANSMISSION LINES.

4,119,793. IMPROVED TRANSMISSION LINE BREAKDOWN VOLTAGE.

4,053,338. METHOD OF FABRICATING COMPRESSED INSULATED CABLE.

4,100,367. MULTIPLE PART INSULATOR FOR FLEXIBLE GAS-INSULATED TRANSMISSION LINE CABLE.

4,122,298. OFFSET CONSTANT THICKNESS WEB FOR INSULATOR SUPPORT DISK.

4,056,679. SODIUM FILLED FLEXIBLE TRANSMISSION CABLE.

4,101,730. TERMINATION FOR STRANDED CABLE.

4,097,682. MEANS FOR PROTECTING UNDERGROUND ELECTRICAL EQUIPMENT FROM THERMAL RUNAWAY.

4,140,337. HERMETIC QUICK CONNECTION AND SEAL FOR COUPLING LOW PRESSURE SYSTEMS.

4,126,808. HIGH VOLTAGE TWO STAGE TRIGGERED VACUUM GAP.



- 4,086,645. REPULSION COIL ACTUATOR FOR HIGH SPEED HIGH POWER CIRCUITS.
- 4,058,373. COMBUSTIBLE GAS-IN-OIL DETECTOR.
- 4,079,403. THYRISTOR DEVICE WITH SELF-PROTECTION AGAINST BREAKOVER TURN-ON FAILURE.
- 4,126,825. ELECTRONIC CURRENT TRANSDUCER FOR HIGH VOLTAGE TRANSMISSION LINES.
- 4,087,701. TRANSFORMER CASCADE FOR POWERING ELECTRONICS ON HIGH VOLTAGE TRANSMISSION LINES.
- 4,029,892. METHOD AND MEANS FOR TRAPPING PARTICLES IN ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.
- 4,029,890. PARTICLE TRAPPING ELBOW JOINT FOR ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.
- 4,029,891. PARTICLE TRAPPING SHEATH COUPLING FOR ENCLOSED ELECTRIC BUS APPARATUS.
- 4,054,835. RAPID RESPONSE GENERATING VOLT-METERS.
- 4,082,933. STAB CONNECTOR FOR ENCLOSED ELECTRIC BUS APPARATUS.
- 4,095,205. TRANSFORMER WITH IMPROVED INSULATOR.
- 4,117,525. OVERPRESSURE PROTECTION FOR VAPORIZATION COOLED ELECTRICAL APPARATUS.
- 4,145,679. VAPORIZATION COOLED AND INSULATED ELECTRICAL APPARATUS.
- 4,129,845. VAPORIZATION COOLED ELECTRICAL APPARATUS.
- 4,117,441. CURRENT LIMITING FUSE CONSTRUCTION AND METHOD.
- 4,109,228. CURRENT LIMITING FUSE WITH RESINOUS ARC-QUENCHING FILLER.
- 4,117,357. FLEXIBLE COUPLING FOR ROTOR ELEMENTS OF A SUPERCONDUCTING GENERATOR.
- 4,120,169. MULTIPHASE PUMP FOR ROTATING CRYOGENIC MACHINERY.
- 4,092,553. SLIDING SUPPORT FOR A SUPERCONDUCTING GENERATOR ROTOR.
- 4,151,433. SPIRAL PANCAKE WINDING FOR TWO-POLE ELECTRICAL MACHINE SPECIFICALLY TURBINE GENERATOR.
- 4,096,403. IMPROVED SUPERCONDUCTING HYBRID MAGNETIC FLUX PUMP.
- 4,112,705. FUEL FIRED SUPPLEMENTARY HEATER FOR HEAT PUMP.
- 4,042,012. HEAT PUMP SYSTEM AND IMPROVED HEAT TRANSFER.
- 4,137,798. TWO-SPEED DRIVE APPARATUS.
- 4,094,165. VARIABLE SPEED DRIVE UNIT FOR COMPRESSION OF HEAT PUMP.

## National Technical Information Service

## GOVERNMENT-OWNED INVENTIONS

## Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for \$.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for \$4.00 (\$8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,  
Patent Program Coordinator  
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE  
AF/JACP, 1900 Half St. SW,  
Washington, D.C. 20324

- Patent 4,126,862. Countermeasure for LORO Radar. Filed Apr. 23, 1968. Patented Nov. 21, 1978. Not available NTIS.
- Patent 4,130,011. Flared Sonic End Nozzle Velocity Coupling Test Burner. Filed June 14, 1977. Patented Dec. 19, 1978. Not available NTIS.
- Patent 4,130,872. Method and System of Controlling a Jet Engine for Avoiding Engine Surge. Filed Oct. 10, 1975. Patented Dec. 19, 1978. Not available NTIS.
- Patent 4,131,438. Degasser and Liquid Seal Reservoir. Filed Nov. 4, 1977. Patented Dec. 26, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR  
Branch of Patents, 18th and C Sts., NW,  
Washington, D.C. 20240

- Patent application 958,592. Ventilation System for Automated Mining Machines. Filed Nov. 7, 1978.
- Patent 4,087,920. Two-Fluid Tiltmeter. Filed Mar. 25, 1977. Patented May 9, 1978. Not available NTIS.
- Patent 4,091,990. Self-Contained Instrument for Measuring Subterranean Tunnel Wall Deflection. Filed Aug. 2, 1976. Patented May 30, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY  
Assistant Chief for Patents, Office of Naval Research  
Code 302, Arlington, Va. 22217

- Patent application 6-000,040. Elevation Simulation for Frequency Scan Three Dimensional Radar. Filed Jan. 2, 1979.
- Patent application 6-006,149. Fiber Optic Acoustic Sensor. Filed Jan. 24, 1979.
- Patent application 965,760. Covert Recovery or Signalling System. Filed Dec. 4, 1978.
- Patent 4,119,164. Stand-Aid Invalid Wheelchair. Filed Aug. 1, 1977. Patented Oct. 10, 1978. Not available NTIS.
- Patent 4,131,809. Silicon-Phthalocyanine-Siloxane Monomers. Filed Feb. 23, 1978. Patented Dec. 26, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Assistant General Counsel for Patent Matters—NASA  
Code GP-2, Washington, D.C. 20546

- Patent application 6-008,208. Phase-Angle Controller for Stirling Engines. Filed Jan. 31, 1979.
- Patent application 6-009,887. Atomic Hydrogen Storage Method and Apparatus. Filed Feb. 6, 1979.
- Patent application 6-015,983. Improved System for Use in Conducting Wake Investigation for a Wing in Flight. Filed Feb. 28, 1979.
- Patent application 6-017,884. Improved Solar Panel and Method for Fabricating the Same. Filed Mar. 6, 1979.
- Patent application 6-017,890. Method and Apparatus for Quadrature-Shift-Key and Linear Phase Modulation. Filed Mar. 6, 1979.
- Patent application 6-019,541. Aerodynamic Side-Force Alleviator Means. Filed Mar. 12, 1979.
- Patent application 964,009. Detection of the Transitional Layer Between Laminar and Turbulent Flow Areas on a Wing Surface. Filed Nov. 27, 1978.
- Patent 4,109,644. Miniature Implantable Ultrasonic Echo-nometer. Filed Jan. 12, 1977. Patented Aug. 29, 1978. Not available NTIS.
- Patent 4,135,290. Method for Fabricating Solar Cells Having Integrated Collector Grids. Filed Dec. 23, 1977. Patented Jan. 23, 1979. Not available NTIS.
- Patent 4,135,367. Thermal Energy Transformer. Filed Aug. 12, 1977. Patented Jan. 23, 1979. Not available NTIS.
- Patent 4,135,817. Apparatus for Measuring an Aircraft's Speed and Height. Filed Mar. 9, 1978. Patented Jan. 23, 1979. Not available NTIS.
- Patent 4,135,851. Composite Seal for Turbomachinery. Filed May 27, 1977. Patented Jan. 23, 1979. Not available NTIS.
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U.S. DEPARTMENT OF THE AIR FORCE  
AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

- Patent 4,140,291. Ramp Toe Stowage System. Filed Oct. 13, 1977. Patented Feb. 20, 1979. Not available NTIS.
- Patent 4,140,727. Fluoroalkyleneether Silicate Copolymers. Filed Jan. 10, 1978. Patented Feb. 20, 1979. Not available NTIS.
- Patent 4,141,014. Multiband High Frequency Communication Antenna With Adjustable Slot Aperture. Filed Aug. 19, 1977. Patented Feb. 20, 1979. Not available NTIS.
- Patent 4,141,076. Associative Bubble Memory Apparatus. Filed June 24, 1977. Patented Feb. 20, 1979. Not available NTIS.
- Patent 4,142,037. Readily Curable Fluorocarbon Ether Bibenzoxazole Polymers. Filed Dec. 21, 1977. Patented Feb. 27, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY  
Assistant General Counsel for Patents  
Washington, D.C. 20545

- Patent 4,088,737. Dry Method for Recycling Iodine-Loaded Silver Zeolite. Filed Nov. 2, 1976. Patented May 9, 1978. Not available NTIS.
- Patent 4,091,084. Purification of HgI<sub>2</sub> for Nuclear Detector Fabrication. Filed June 6, 1977. Patented May 23, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY  
Assistant Chief for Patents, Office of Naval Research  
Code 302, Arlington, Va. 22217

- Patent application 6-008,028. Flexible, Shapeable, Composite Acoustic Transducer. Filed Jan. 31, 1979.
- Patent application 6-011,834. Display Processor for Aircraft Landing System. Filed Feb. 13, 1979.
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- Patent application 937,634. Method for Preparing 2,3,7,8-Tetraazaspiro (4,4) Nonane, 2,3,7,8-Tetraazaspiro (4,4) Nona-2,7-Diene and Derivatives. Filed Aug. 28, 1978.
- Patent application 937,635. Method for Preparing 2,3,7,8-Tetraazaspiro (4,4) Nonane, 2,3,7,8-Tetraazaspiro (4,4) Nona-2,7-Diene and Derivatives. Filed Aug. 28, 1978.
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- Patent application 972,560. Sea Water Pressure Regulator Valve. Filed Dec. 22, 1978.
- Patent 4,087,063. Parachute Suspension Line Stowage Device. Filed June 6, 1977. Patented May 2, 1978. Not available NTIS.
- Patent 4,132,842. Silicon-Phthalocyanine-Siloxane Polymers. Filed Feb. 23, 1978. Patented Jan. 2, 1979. Not available NTIS.
- Patent 4,133,173. Ducted Rockets. Filed June 13, 1977. Patented Jan. 9, 1979. Not available NTIS.
- Patent 4,133,862. Method of Inhibiting and/or Eradicating Marine Fungal Growth With Obtusastrene. Filed June 6, 1977. Patented Jan. 9, 1979. Not available NTIS.
- Patent 4,133,935. Coated Electrodes for Underwater Metal Working. Filed Nov. 17, 1977. Patented Jan. 9, 1979. Not available NTIS.
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Assistant General Counsel for Patent Matters—NASA  
Code GP-2, Washington, D.C. 20546

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- Patent application 935,827. Cryogenic Container Compound Suspension Strap. Filed Aug. 22, 1978.
- Patent 4,136,211. Method of Making Bearing Materials. Filed Dec. 13, 1977. Patented Jan. 23, 1979. Not available NTIS.

- U.S. DEPARTMENT OF THE AIR FORCE  
AF/JACP, 1900 Half St. SW., Washington, D.C. 20324
- Patent application 913,188. Cabinet Lock Assembly. Filed June 8, 1978.
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- Patent 4,140,002. Impact Sound Stressing Holding Assembly. Filed May 2, 1978. Patented Feb. 20, 1979. Not available NTIS.
- Patent 3,986,138. Isothermal Gas Dynamic Laser Nozzle. Filed Mar. 29, 1974. Patented Oct. 12, 1976.

U.S. DEPARTMENT OF THE NAVY  
Assistant Chief for Patents, Office of Naval Research  
Code 302, Arlington, Va. 22217

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- Patent application 949,711. Ellipticized Lens Providing Balanced Astigmatism. Filed Oct. 10, 1978.
- Patent application 965,800. Free Gyro Motor Drive Circuit. Filed Dec. 4, 1978.
- Patent application 972,560. Sea Water Pressure Regulator Valve. Filed Dec. 22, 1978.
- Patent application 974,394. High Pressure Spherical Piston. Filed Dec. 29, 1978.
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- Patent 4,087,063. Parachute Suspension Line Stowage Device. Filed June 6, 1977. Patented May 2, 1978. Not available NTIS.
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- Patent 4,124,071. Method for Strengthening PZT Transducers. Filed Nov. 25, 1975. Patented Nov. 7, 1978. Not available NTIS.
- Patent 4,125,837. Dual Notch Fed Electric Microstrip Dipole Antennas. Filed Oct. 6, 1977. Patented Nov. 14, 1978. Not available NTIS.
- Patent 4,125,838. Dual Asymmetrically Fed Electric Microstrip Dipole Antennas. Filed Oct. 6, 1977. Patented Nov. 14, 1978. Not available NTIS.
- Patent 4,125,839. Dual Diagonally Fed Electric Microstrip Dipole Antennas. Filed Oct. 6, 1977. Patented Nov. 14, 1978. Not available NTIS.
- Patent 4,126,806. Intense Ion Beam Producing Reflex Triode. Filed Sept. 26, 1977. Patented Nov. 21, 1978. Not available NTIS.
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- Patent 4,134,843. Deuterated Lubricant. Filed Mar. 7, 1977. Patented Jan. 16, 1979. Not available NTIS.
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Assistant General Counsel for Patent Matters—NASA  
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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.

985 OG 24

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director.....	1-8-79
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....	8-18-78
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....	10-13-78
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....	6-21-78
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director.....	3-6-78
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director.....	12-19-77
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Retarders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....	4-10-78
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director.....	7-12-78
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing; Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director.....	6-7-78
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....	1-31-78
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 290—C. D. QUARFORTH, Director.....	6-21-77
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director.....	6-1-78
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Apparatuses; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....	0-25-78
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director.....	7-21-78
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director.....	6-9-78
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director.....	2-16-78
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	

**Expiration of patents:** The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,041,614 to 3,047,872, inclusive  
Plant Patents..... Numbers 2,155 to 2,159, inclusive

985 OG 25



# REISSUES

AUGUST 21, 1979

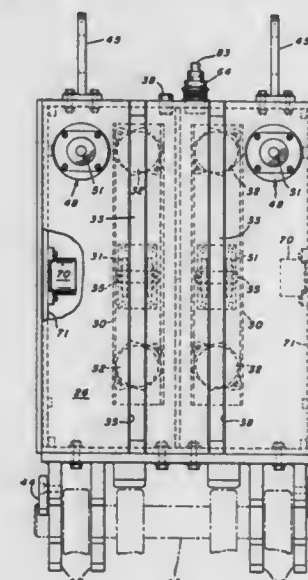
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,075  
**METHOD AND APPARATUS FOR LOCATING IMPROPERLY POSITIONED OR BENT ROLLS**  
 Michael G. Gonos, Monroeville Borough; Kenneth D. Ives, Plum Borough, and Ronald S. Vranka, Monroeville Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.  
 Original No. 3,939,568, dated Feb. 24, 1976, Ser. No. 503,147, Sep. 4, 1974. Application for reissue May 27, 1976, Ser. No. 690,743

Int. Cl.<sup>2</sup> G01B 5/00

U.S. Cl. 33—143 L

31 Claims



1. An apparatus for locating improperly positioned rolls among a set of rolls which are arranged in opposed pairs and have work-engaging faces defining a confined path of travel for a workpiece, said apparatus comprising a housing movable along said path, means carried by said housing at opposite faces thereof for abutting said work-engaging faces and guiding said housing, and a plurality of gap sensors carried by said housing and including heads supported for relative movement normal to the direction of movement of said housing along said path and adapted to contact the work-engaging faces of the individual roll-pairs successively at a plurality of locations along the length of the rolls, and transducer means operatively connected with said heads for transmitting signals representative of the measurements of the gaps between the work-engaging faces of each roll-pair contacted by said heads.

Re. 30,076  
**FOUR-WAY REVERSING VALVE WITH DIFFERENTIAL AREA OPERATOR**  
 James M. Thornbery, Milwaukee, Wis., assignor to The Singer Company, New York, N.Y.  
 Original No. 3,894,561, dated Jul. 15, 1975, Ser. No. 450,984, Mar. 14, 1974. Application for reissue Jul. 9, 1976, Ser. No. 703,840

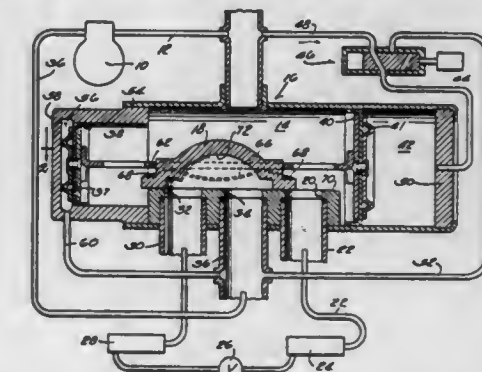
Int. Cl.<sup>2</sup> F16K 31/363

U.S. Cl. 137—625.29

3 Claims

1. A reversing valve comprising, a body including a valve chamber, a high pressure inlet to the chamber, a low pressure outlet from the chamber, and a pair of ports adjacent the outlet, a slide valve in the chamber movable between two positions in which it serves to connect either of said ports to said

outlet while the other port communicates with the chamber, said body including a large diameter cylinder and a small diameter cylinder, a piston in each cylinder, the pistons being interconnected and being connected to the slide valve, means supplying a constant pressure to the space between the pistons, one side of the smaller piston being exposed to the chamber pressure and the other side of the smaller piston being



[exposed to low pressure] connected to said low pressure outlet so there is always a pressure differential acting across the smaller piston, means [supplying high or low pressure to] for selectively connecting the space between the larger piston and the head of the larger cylinder to high pressure or to the low pressure outlet to cause the pistons and slide valve to move between said positions by reason of the pressure differential acting across the small piston area in one position and by reason of the pressure differential across the difference in piston areas in the other position.

Re. 30,077  
**SURFACE FOR BOILING LIQUIDS**  
 Leslie C. Kun, and Alfred M. Czikk, both of Williamsville, N.Y., assignors to Union Carbide Corporation, New York, N.Y.  
 Original No. 3,454,081, dated Jul. 8, 1969, Ser. No. 751,321, May 14, 1968. Continuation-in-part of Ser. No. 634,403, Apr. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 414,755, Nov. 30, 1964, abandoned. Application for reissue Dec. 19, 1977, Ser. No. 862,218

Int. Cl.<sup>2</sup> F28F 13/18, 19/02

U.S. Cl. 165—133

15 Claims



17. A thermally conductive metal wall for transferring heat to a boiling liquid in a heat exchange apparatus which comprises a boiling surface layer formed from the wall having a plurality of ridges in said wall separated by first grooves with outer sections of said ridges partially deformed into said first

grooves, and a plurality of second grooves superimposed on said ridges at an angle to the orientation of said ridges, said ridges and first and second grooves being shaped such that a plurality of sub-surface cavities are formed in said first grooves with at least some of the cavities adapted to entrap vapor bubbles to provide boiling nucleation sites, the nucleation site cavities opening to the outer surface of said boiling surface layer through restricted openings having smaller cross-sectional areas than the largest cross-sectional area of the cavity interiors providing communication between the interiors of said cavities and the surface of said boiling surface layer for vapor egress, and said first and second grooves and cavities being formed to provide sub-surface openings between said at least some adjacent cavities for communication between the interiors of said adjacent cavities and the outer surface of said boiling surface layer for liquid ingress to sustain growth of entrapped vapor bubbles as vapor is expelled from said restricted openings, with said first and second grooves each provided at density of from about 45 to about 225 grooves per inch.

Re. 30,078

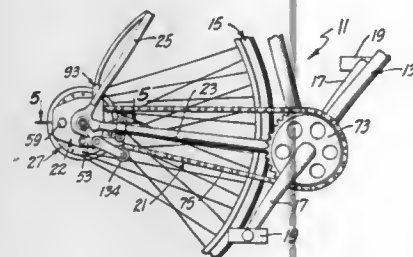
**VEHICLE WITH VARIABLE SPEED TRANSMISSION**  
Trevor L. Harris, Costa Mesa, Calif., assignor to Harris Dynamics, Costa Mesa, Calif.

Original No. 3,913,947, dated Oct. 21, 1975, Ser. No. 479,797, Jun. 17, 1974. Application for reissue May 8, 1978, Ser. No. 904,005

Int. Cl.<sup>2</sup> B62M 1/04

U.S. Cl. 280—236

32 Claims



1. A vehicle adapted to a move along a supporting surface comprising:  
a frame

at least one wheel, said wheel having a centrally located hub; first means cooperable with the hub for mounting the wheel on the frame for rotational movement relative to the frame about a first rotational axis, said wheel being adapted to roll along the supporting surface;

an inner rotatable member at least partially within said hub; second means for mounting said inner rotatable member for rotational movement about a second rotational axis, said inner rotatable member and said hub being relatively movable along a path having a radial component to permit adjustment in the relative radial position of the first and second rotational axes;

drive means including at least one one-way clutch and at least one drive element for drivably coupling said inner rotatable member to said hub, said one-way clutch and said drive element being within said hub, said drive element being drivable along a path which circumscribes the inner rotatable member;

means including a drive member outside said hub for imparting input motion to [at least one of said hub and] said inner rotatable member; and

means operable by the operator of the vehicle for [adjusting] moving said inner rotatable member and said drive member to adjust the relative radial position of said rotational axes whereby the drive ratio between said hub and said inner rotatable member can be varied by the operator.

Re. 30,079

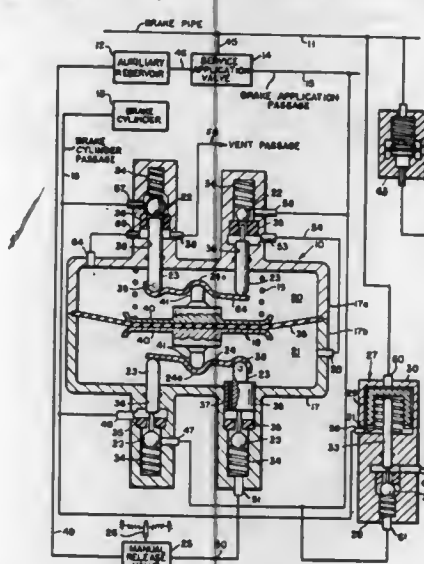
**FLUID BRAKE CONTROL SYSTEM**

Eugene D. McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.  
Original No. 3,966,271, dated Jun. 29, 1976, Ser. No. 604,405, Aug. 13, 1975. Application for reissue May 13, 1977, Ser. No. 796,792

Int. Cl.<sup>2</sup> B60T 15/32

U.S. Cl. 303—69

11 Claims



8. A fluid brake control system for a vehicle having a brake control pipe, a fluid reservoir, a brake cylinder, and a service valve governing flow of fluid from the reservoir through brake application and brake cylinder passages successively to the brake cylinder, wherein an improved brake cylinder release control device comprises:

a. a housing containing an abutment subject to actuation in response to the pressure of fluid in a chamber acting on said abutment in opposition to an opposing force acting also on said abutment,

b. at least one valve means disposed on each side of said abutment, each said valve means being of the poppet type and having relatively movable seat and closure elements, at least one of which is operatively connected to the associated side of said abutment,

c. said poppet valve means on one side of said abutment being opened by movement of said abutment in response to an increase in fluid pressure in said chamber in excess of a predetermined value to release fluid from said brake cylinder,

d. said poppet valve on the other side of said abutment being closed by movement of said abutment in response to an increase in fluid pressure in said chamber in excess of said predetermined value to prevent the flow of fluid from said brake application passage to said brake cylinder passage.

Re. 30,080

**TITANIUM-BERYLLIUM BASE AMORPHOUS ALLOYS**  
Lee E. Tanner, Summit; Ranjan Ray, Morristown, both of N.J., and Carl F. Cline, Walnut Creek, Calif., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Original No. 3,989,517, dated Nov. 2, 1976, Ser. No. 572,563, Apr. 28, 1975. Continuation-in-part of Ser. No. 519,394, Oct. 30, 1974, abandoned. Application for reissue Aug. 11, 1977, Ser. No. 823,802

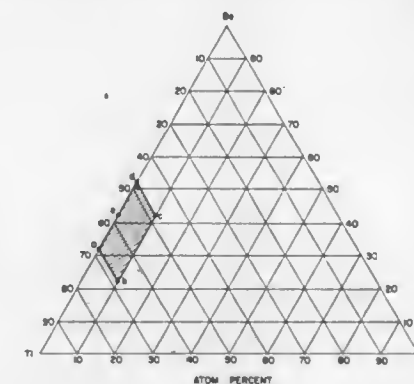
Int. Cl.<sup>2</sup> C22C 14/00

U.S. Cl. 75—175.5

6 Claims

1. A high strength, low density metal alloy that is substantially amorphous, characterized in that the alloy comprises about 48 to 68 atom percent titanium and about 32 to 52 atom percent beryllium, with a maximum of up to 10 atom percent of beryllium replaced by at least one additional alloying element

selected from the group consisting of the transition metals listed in Groups IB to VIIB and Group VIII, Rows 4, 5 and 6,



of the Periodic Table and of the metalloid elements—phosphorus, boron, carbon, aluminum, silicon, tin, germanium, indium and antimony.

Re. 30,081

**ION EXCHANGE CHROMATE REMOVAL**

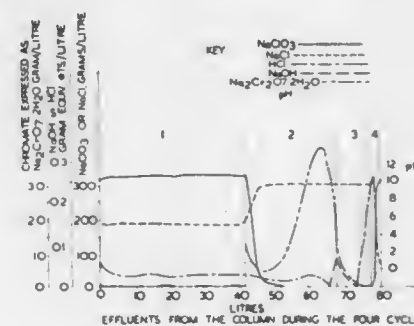
Frank R. Foulkes, Toronto, Canada, assignor to Huron Chemicals, Limited, Kingston, Canada  
Original No. 3,980,751, dated Sep. 14, 1976, Ser. No. 633,831, Nov. 20, 1975. Application for reissue May 25, 1978, Ser. No. 909,589

Claims priority, application Canada, Nov. 20, 1974, 214231

Int. Cl.<sup>2</sup> C01G 37/14; C01B 11/02

U.S. Cl. 423—54

13 Claims



1. A method of removing chromate from aqueous solutions of alkali metal chlorate and alkali metal chloride which comprises in an exhaustion stage (1) passing said aqueous solution of alkali metal chlorate and alkali metal chloride acidified with hydrochloric acid to a pH of not less than 0.5 through an anion exchange resin bed to remove chromate therefrom and produce an essentially chromate free aqueous solution containing alkali metal chlorate and alkali metal chloride, and in a regen-

eration stage (2) passing an aqueous solution of alkali metal hydroxide and alkali metal chloride through said resin bed to remove chromate therefrom, (3) passing an aqueous solution of alkali metal chloride acidified with hydrochloric acid to a low pH through said resin bed to convert said resin to acid form and (4) passing an aqueous solution of essentially chromate free alkali metal chlorate and alkali metal chloride acidified with hydrochloric acid to a pH value not less than 0.5, through said resin bed to saturate said resin bed with alkali metal chlorate.

11. A process as claimed in claim 1 in which the [anionic] anion exchange resin is a weakly basic resin.

13. A method as claimed in claim 1 in which the product effluent is fed to a chlorine dioxide generator for production of chlorine dioxide.

Re. 30,082

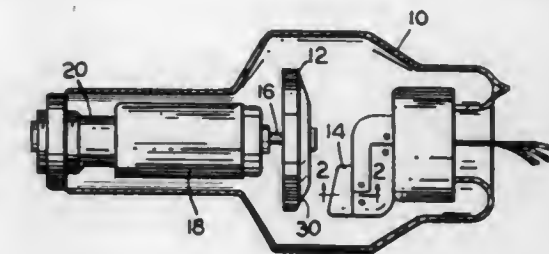
**X-RAY TUBE HAVING FOCUSING CUP WITH NON-EMITTING COATING**

Zed J. Atlee, Tigard, Oreg., and Roy F. Kasten, Jr., Elmhurst, Ill., assignors to Picker Corporation, Cleveland, Ohio  
Original No. 3,783,323, dated Jan. 1, 1974, Ser. No. 284,735, Aug. 30, 1972. Application for reissue Jan. 27, 1977, Ser. No. 645,835

Int. Cl.<sup>2</sup> H01J 35/00

U.S. Cl. 313—57

11 Claims



1. An x-ray tube in which the improvement comprises:

an anode;

a focusing electrode including a body having a focusing recess therein which defines a focusing surface;

a thermionic cathode mounted in said recess adjacent said focusing surface of said focusing electrode so that said focusing [electrode] surface focuses the electrons emitted by said cathode onto said anode to cause x-rays to be emitted from said anode;

an evacuated envelope containing said cathode, anode and focusing electrode; and

a layer of non-electron emissive material provided on at least a portion of said focusing surface of the focusing electrode and having a higher work function than the underlying base material of said focusing electrode [substantially] to prevent the field emission of electrons from said focusing electrode.



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## PLANT PATENTS

GRANTED AUGUST 21, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,451

### PEACH TREE WH215

J. Wilson Hughes, Monroeville, N.J., assignor to Hilltop Orchards & Nurseries, Inc., Hartford, Mich.

Filed Oct. 28, 1976, Ser. No. 736,576

Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—43

1. A new and distinct variety of peach tree substantially as shown and described.

1 Claim

4,453

### DISTINCT VARIETY OF BLUEGRASS PLANT

William H. Daniel, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed May 15, 1978, Ser. No. 905,850

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—88

1. A new and distinct variety of bluegrass plant, *Poa pratensis*, substantially as described and illustrated, and particularly characterized by a medium green color, vigorous rhizome spread, and good disease tolerance.

1 Claim

4,454

### MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jun. 21, 1978, Ser. No. 935,733

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—10

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a rich red color, being of a shade generally near Geranium Lake 20 or 20/1, the bud and flower resembling the variety Carol-Jean (U.S. Plant Pat. No. 4,254) in form and size but having less petals than Carol-Jean; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy foliage and an abundance of flowers borne usually in loose clusters of 3 to 5 or more.

529

4,452

### ROSE PLANT—GABRIELLA

Lars Berggren, Vällingby, Sweden, assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Dec. 12, 1977, Ser. No. 859,793

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—28

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the described difference in bud and bloom color set forth above on a plant otherwise identical to the variety Mercedes.

1 Claim

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# PATENTS

GRANTED AUG. 21, 1979

## ERRATA

For CLASS	See PATENT NO.
128-652.....	4,164,863
409-165.....	4,164,891
128-438.....	4,164,934
414-063.....	4,165,006
414-494.....	4,165,007
414-750.....	4,165,008
406-010.....	4,165,132
406-109.....	4,165,133
406-001.....	4,165,134
406-152.....	4,165,135
355-004.....	4,165,165
435-267.....	4,165,250
435-262.....	4,165,257
435-215.....	4,165,258
585-638.....	4,165,343
525-111.....	4,165,344
525-419.....	4,165,345
525-432.....	4,165,346
525-196.....	4,165,347
525-397.....	4,165,422
546-273.....	4,165,428
544-021.....	4,165,429
544-022.....	4,165,430
525-357.....	4,165,431

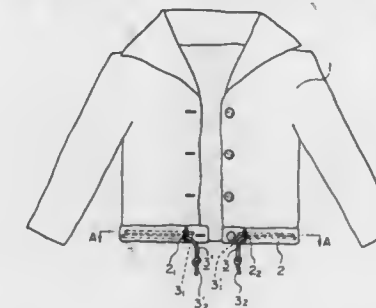


# PATENTS

GRANTED AUGUST 21, 1979

## GENERAL AND MECHANICAL

**4,164,792**  
**DEVICE FOR TIGHTENING THE WAIST OF A GARMENT**  
 Mitsuru Ito, 322 E. 55th St., Apt. 3B, New York, N.Y. 10022  
 Filed Jul. 25, 1977, Ser. No. 819,034  
 Claims priority, application Japan, Aug. 31, 1976, 51/115800[U]  
 Int. Cl.<sup>2</sup> A41D 1/02  
 U.S. Cl. 2—108 9 Claims



1. A device for tightening the waist of a garment which is separated and opened in the front of the wearer's body, comprising a sheath which is provided around the waist of the garment and terminates at its opposite ends in respective openings at either side of the garment opening, a first string which is secured to the sheath adjacent to one of the two openings thereof and which passes through the sheath and out of the sheath through the other opening thereof, and a second string which is secured to the sheath adjacent said other opening thereof and passes through the sheath and out of the sheath through said one opening thereof.

**4,164,793**  
**LUNATE IMPLANT**  
 Alfred B. Swanson, 2945 Bonnell, S.E., Grand Rapids, Mich. 49506  
 Filed Apr. 26, 1978, Ser. No. 900,188  
 Int. Cl.<sup>2</sup> A61F 1/24  
 U.S. Cl. 3—1.91 7 Claims



1. An implant for replacement of the lunate bone, said implant adapted to be surgically positioned adjacent the triquetrum bone, the scaphoid bone, the capitate bone and the radius bone, said implant comprising:  
 a one piece body of resilient material, said body defining:  
 a planar triquetrum face having a general U-shape in plan and including outwardly angled edges, a curvilinear proximal edge and a curvilinear distal edge, said distal edge having a radius of curvature greater than the radius of said proximal edge and a stabilizing stem extending outwardly from and perpendicular to said planar triquetrum face, said stem adapted to be inserted within the intramedullary canal of the triquetrum bone;  
 a planar scaphoid face having a general U-shape in plan and including outwardly angled edges lying in substantially

the same perpendicular plane as the lateral edges of the triquetrum face, said scaphoid face having a curvilinear proximal edge and a curvilinear distal edge, the radius of curvature of the distal edge being substantially the same as the radius of curvature of the distal edge of said triquetrum face, said scaphoid face having a length less than the length of said triquetrum face and being adapted to articulate with the scaphoid bone, said scaphoid face and said triquetrum face being angled outwardly with respect to each other from said distal edges to said proximal edges;  
 a cupped, concave, smooth distal surface adapted to articulate with the head of the capitate bone to stabilize said implant, said distal surface lateral edges being defined by said distal edges of said triquetrum and said scaphoid faces;  
 a proximal surface having a smooth convex shape joining said proximal edges of said triquetrum and said scaphoid faces;  
 a generally planar dorsal surface extending between the dorsal lateral edges of said triquetrum and scaphoid faces, said dorsal surface having a straight distal edge and a curved proximal edge smoothly joining with said proximal surface, said proximal edge having a decreasing radius from said scaphoid face to said triquetrum face; and  
 a generally planar palmar surface extending between the palmar lateral edges of said triquetrum and scaphoid faces, said palmar surface having a straight distal edge and a curved proximal edge smoothly joining with said proximal surface, said body being substantially symmetrical about a longitudinal centerline passing through said distal surface and said proximal surface and along the longitudinal centerlines of said scaphoid and said triquetrum faces.

**4,164,794**  
**PROSTHETIC DEVICES HAVING COATINGS OF SELECTED POROUS BIOENGINEERING THERMOPLASTICS**  
 Myron Spector, Charleston, S.C.; George T. Kwiatkowski, Greenbrook, N.J.; Walter H. Smarock, Somerville, N.J., and Michael J. Michno, Jr., Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.  
 Filed Apr. 14, 1977, Ser. No. 787,531  
 Int. Cl.<sup>2</sup> A61F 1/24; C08J 9/24, 5/00  
 U.S. Cl. 3—1.912 30 Claims



1. An efficacious prosthetic device comprised of a load

bearing functional component and, over at least a portion thereof, a porous coating of a bioengineering thermoplastic material which is compatible with, and conducive for, the ingrowth of bone spicules, said material being selected from the group consisting of polysulfones, polyphenylenesulfides, polyacetals, thermoplastic polyesters, polycarbonates, aromatic polyamides, aromatic polyamideimides, thermoplastic polyimides, polyaryletherketones, polyarylethernitriles and aromatic polyhydroxyethers, and having the following properties:

- (a) an average pore diameter of from about 90 to about 600 microns;
- (b) pore interconnections having average, diameters of greater than about 50 micron;
- (c) a modulus of elasticity from about 250,000 to about 500,000 pounds per square inch for non-reinforced, solid non-porous thermoplastic material, and from about 500,000 to about 3,000,000 pounds per square inch for reinforced, solid non-porous thermoplastic material;
- (d) a porosity of greater than about 40 percent; and
- (e) a total creep strain of said non-reinforced, solid, non-porous thermoplastic material of less than one percent at a constant stress of 1,000 pounds per square inch at ambient temperature; all of the properties being sufficient to enable stresses applied on the musculoskeletal system to be transferred to bone spicules within the pores of said material and maintain sufficient load and pore stability to promote irreversible ossification.

4,164,795

## PORTABLE URINAL

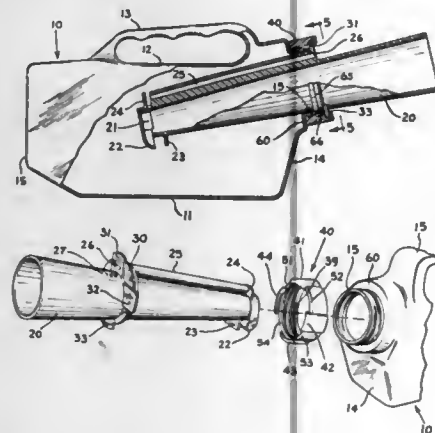
Ernest K. Johnson, 91119 Hill Rd., Springfield, Oreg. 97477

Filed Jul. 28, 1978, Ser. No. 929,031

Int. Cl.<sup>2</sup> A47K 11/00

U.S. Cl. 4-144.1

8 Claims



1. A urinal comprising a container having top and bottom sides and a circular opening in one end thereof, an approximately horizontal removable inlet tube having one end insertable into said opening, an eccentric circular flange on said inlet tube arranged to seal against the margin of said opening, a plurality of radial lugs outstanding from said flange, a plurality of axial projections mounted in fixed positions around the periphery of said opening, circumferential grooves in said projections to receive said lugs in rotary movement for mounting said inlet tube in the container, and circumferential spaces between said projections to admit said lugs into said grooves, the circumferential widths of said lugs, projections and spaces being non-uniformly arranged to admit said lugs into said grooves for connection of said inlet tube with said container in only one rotative position of the inlet tube.

6. A urinal comprising a container having top and bottom sides and a screw threaded neck on one end of the container, a coupling having a screw thread arranged to tighten in a predetermined orientation on said neck thread, circumferentially spaced axial projections on said coupling, a circumferential

groove in each of said projections, an inlet tube insertable into said neck, an air vent tube extending along one side of said inlet tube and integral therewith, a circular flange on said inlet tube having radial lugs insertable into the spaces between said projections for rotation into said grooves to mount said inlet tube in the container, and means to accept said inlet tube for said mounting in only one rotative position of said inlet tube.

4,164,796

## SINK STRAINER ASSEMBLY

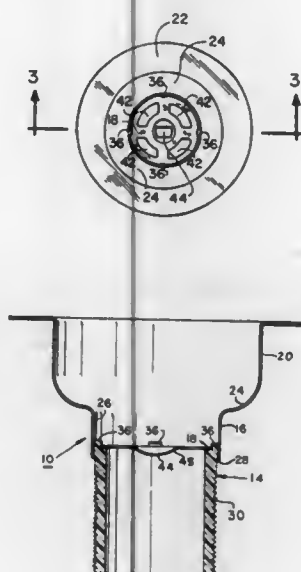
Lawrence Sakow, 2417 Delancy Pl., Philadelphia, Pa. 19103

Filed Oct. 5, 1977, Ser. No. 839,426

Int. Cl.<sup>2</sup> E03C 1/26; A47K 1/14

U.S. Cl. 4-288

9 Claims



1. A sink strainer assembly adapted to be fastened within a sink for passing materials through the sink to a drainage area, said assembly including:

- a hollow, metallic strainer body including a hollow hub section at its lower end;
- a hollow, plastic nipple having an upper head section and a lower threaded section, said nipple being in a force-fit, liquid-tight relationship within said hub section with the lower threaded section of the nipple extending beyond the end of the hub section for receiving a threaded coupling;
- a filtering screen having openings therethrough, said screen being positioned on the upper surface of the head section of the nipple to intercept the flow of solids through the assembly; and
- locking means for engaging said screen to retain it on the upper surface of the head of the nipple, the locking means including a plurality of tabs spaced about the periphery of the nipple and forming a part of said nipple, said tabs extending above the upper surface of the screen and being in contact with the screen.

4,164,797

## ZIPPER CONSTRUCTION FOR MATTRESSES AND THE LIKE

Gerald A. Golembeck, Lake Elmo, Minn., assignor to The United States Bedding Company, St. Paul, Minn.

Filed Apr. 6, 1978, Ser. No. 893,992

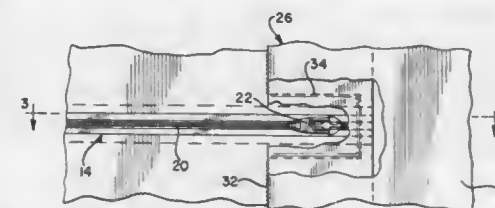
Int. Cl.<sup>2</sup> A47G 9/04; A47C 31/00

U.S. Cl. 5-470

3 Claims

1. In a mattress construction comprising a filler and a mattress cover, said cover defining an opening along at least one of its sides, and a zipper including a chain and closer for closing

said opening, the improvement comprising a fabric section connected to said cover and extending perpendicular to said zipper, said section comprising a double thickness of fabric extending in overlapping relationship with a portion of the cover supporting said zipper whereby the section overlaps one end of said zipper, said double thickness including a first layer comprising a continuation of the fabric on a side of the cover



and a second layer comprising a return portion of the first layer, a fold defined at the juncture of said layers, and a pocket defined by said section for receipt of said closer when said opening is closed, said fold being stitched to said portion of the fabric supporting the zipper, and wherein said stitching is interrupted at an intermediate position to provide the opening for said pocket.

4,164,798

## SEAT CUSHION

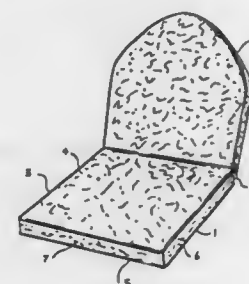
Joseph T. Weber, P.O. Box 26424, Charlotte, N.C. 28213

Filed Jul. 23, 1976, Ser. No. 708,132

Int. Cl.<sup>2</sup> A47C 27/08

U.S. Cl. 5-464

3 Claims



1. A seat cushion for preventing excessive pressure on the coccyx of a person sitting on said cushion, said cushion consisting essentially of a seat pad having a casing, said casing having positioned therein a resilient cushioning element, said cushioning element having a recessed portion therein, said recessed portion located in the rear center portion of said cushioning element so as to be in underlying relationship to the coccyx, said casing being free of a recessed portion and providing means for nominally supporting the coccyx, the surface of said casing which comes in contact with the person sitting on said seat cushion consisting essentially of a fluffy, moisture-absorbing fibrous material.

4,164,799

## MACHINE FOR CLEANING TUBES AND PIPES

Kenneth Jal, 3425 Durwood Dr., Beaumont, Tex. 77704

Filed Jun. 13, 1978, Ser. No. 915,004

Int. Cl.<sup>2</sup> F28G 3/10; B08B 9/02

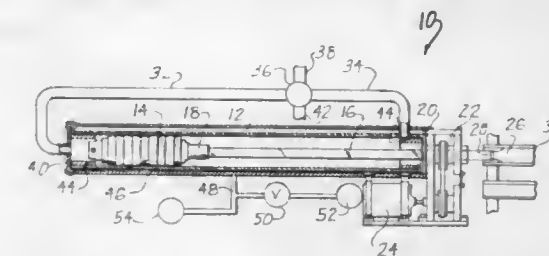
U.S. Cl. 15-104.1 R

8 Claims

1. A pipe cleaning machine including an enclosed, elongated cylinder, a piston located within said cylinder, a non-round piston rod attached to said piston so as to extend out of one end of said cylinder, control means for introducing a high pressure fluid into and out of the ends of said cylinder, rotary seal means for forming a seal around said piston at said end of said cylinder, and motion transmitting means for rotating said piston rod

during movement of said piston in which the improvement comprises:

- a second enclosed cylinder located concentrically around said first mentioned cylinder so as to provide an enclosed



space around said first mentioned cylinder throughout the length of said first mentioned cylinder, and discharge means for discharging any fluid within said space in the event of rupture of said first mentioned cylinder.

4,164,800

## COMBINATION MOP AND WRINGER

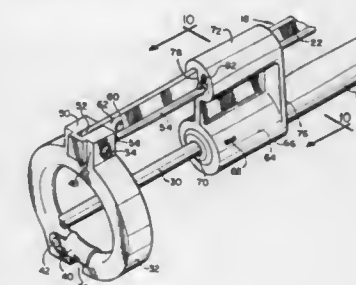
Martin P. Strahs, Lawrenceville, N.J., assignor to Quickie Manufacturing Corp., Cinnaminson, N.J.

Continuation-in-part of Ser. No. 732,054, Oct. 13, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 895,738

Int. Cl.<sup>2</sup> A47L 13/14

U.S. Cl. 15-119 R

9 Claims



6. In a combination mop and wringer of the type having a mop affixed at one end of a handle and a slide assembly which is reciprocal relative to the handle between an initial position and a mop wringing position to wring water from the mop comprising:

- guide block means secured to the handle to guide movement of the slide assembly relative to the handle;
- said guide block means comprising an opening which is positioned in spaced relationship from the handle;
- the slide assembly comprising a slide arm, a portion of which is always positioned within the opening as the slide assembly is reciprocated, the slide arm and said opening being so configured that the slide arm is limited to slidable movement and
- detent means projecting from the slide arm to hold the slide assembly in the initial position in stationary relationship relative to the guide block means; and
- resilient locking means formed in the opening of the guide block means to secure the detent means is a releasable engagement, whereby the slide assembly can be secured to the said initial position to prevent unintentional movement of the slide assembly toward the wringing position.



4,164,801

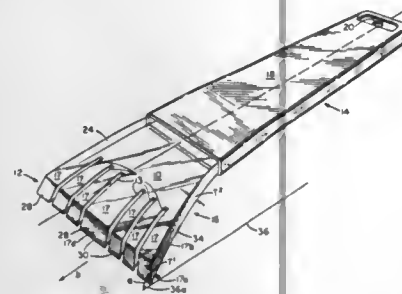
## BEAR CLAW ICE SCRAPER

Robert R. Thomas, Hartford, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.

Filed Nov. 2, 1977, Ser. No. 847,742

Int. Cl.<sup>2</sup> A47L 17/06; B60S 1/04; E01H 5/02  
U.S. Cl. 15—236 R

4 Claims



1. A hand-held scraper for removing ice from a smooth surface, said scraper comprising a one piece body defining: a handle section; an intermediate section extending from said handle section; and a blade region comprising a plurality of concave, resilient, independently flexible, scraping fingers, each extending from said intermediate section and terminating in a scraping edge, each said flexible scraping finger comprising flexible chisel means, terminating in a said scraping edge, and operable to engage an ice covered surface with an ice deflecting surface thereof being inclined at an obtuse angle in relation to a portion of said surface to be scraped, flexible curved beam means connected with said intermediate section, and concave joint means located spaced from said surface and interconnecting said flexible curved beam means and said chisel means, with said flexible chisel means being inclined in a forward facing, scraping direction, said joint means being operable to permit generally independent flexing of said flexible chisel means and said flexible, curved beam means on opposite ends of said joint means; and said flexible chisel means having an overall wedge shaped configuration inclined at an obtuse angle in relation to a portion of said surface to be scraped and having a median thickness less than the median thickness of said flexible, curved beam means; said scraping fingers being operable, when a user gripping the handle section applies forces generally longitudinally of an ice covered surface to be scraped, to independently flex so that said scraping, edges are operable to become independently wedged in ice to be scraped and ice fracturing energy is stored in said flexible, curved beam means, to exert force against the ice resulting from energy imparted to said handle by said user and said stored energy, said force being sufficient to cause fracturing of said ice, and to resiliently return to their original shape and therefore facilitate displacing of fractured ice away from the surface to be scraped; and at least some of said scraping fingers each having and end, merging with said intermediate section, and having a width, measured transversely of said direction of applied force and across said ice covered surface, which is less than the width of the scraping edge thereof, each such scraping finger being defined by lateral edges which converge longitudinally of said direction of applied force and away from the scraping edge thereof;

said fingers alternating transversely of said blade region with groove means, with said blade region including a plurality of said groove means, and said plurality of said groove means being generally mutually converging in a direction extending generally longitudinally of said scraper and away from said scraping edge; and said scraping fingers including central stabilizing finger means located generally centrally of said blade region and operable to tend to stabilize said blade region in a generally uniform scraping position with said flexible scraping fingers being generally uniformly inclined relative to said surface to be scraped.

4,164,802

## DETERGENT HOLDER ON WINDSHIELD WIPER ARM

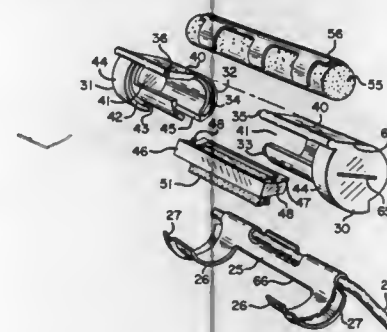
Donald E. Ronse, Gladstone, Oreg., assignor to Wiper-Mate, Inc., Milwaukie, Oreg.

Filed Sep. 8, 1978, Ser. No. 940,788

Int. Cl.<sup>2</sup> B60S 1/02

U.S. Cl. 15—250.03

9 Claims



1. A detergent holder for a windshield wiper comprising a rod, means for mounting one end of said rod on an oscillating arm which carries said wiper, with the other end of said rod extending alongside said wiper, a pair of arcuate cartridge track arms having free ends extending laterally from said other end of said rod, and a replaceable cartridge having rotatable engagement with said track arms, said cartridge comprising a generally cylindrical housing alongside said wiper and having a longitudinal outlet opening in its rear side which faces the windshield, said cartridge including arcuate means on the opposite ends of said housing for receiving said free ends of said cartridge track arms, a detergent stick in said housing, an inlet opening in one side of said housing for the entrance of water into said housing when a vehicle carrying said wiper and detergent holder is in forward motion with the wiper in operation, and a hood on said housing extending over said inlet opening when the wiper is in rest position to shield said inlet opening from falling rain when the wiper is not operating.

4,164,803

## PAINT PAN FOR APPLYING PAINT TO PADS AND ROLLERS

Adam Zurawin, New York, and Gaetano Riccluti, Bronx, both of N.Y., assignors to Adams Brush Manufacturing Co., Inc., Brooklyn, N.Y.

Filed Oct. 18, 1977, Ser. No. 843,212

Int. Cl.<sup>2</sup> B05C 1/02; B65D 1/36

U.S. Cl. 15—257.05

3 Claims

1. In a paint roller pan of the type having a front wall, two side walls, a rear wall and a bottom wall having a front portion angled downwardly from said front wall to a zone intermediate said front and rear walls to define a trough on which a paint roller may be rolled to distribute paint thereon, and a rear horizontal portion defining the bottom of a paint sump, the

4,164,805

## APPARATUS FOR DIVIDING WARPS WITH LEASES

Alois Altenweger, Uster, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

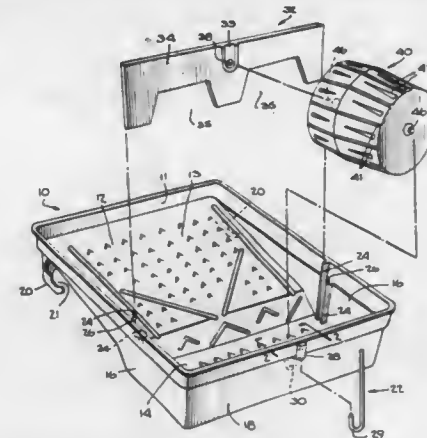
Filed Mar. 16, 1978, Ser. No. 887,437

Claims priority, application Switzerland, Jun. 24, 1977, 7762/77

Int. Cl.<sup>2</sup> D03G 1/16

U.S. Cl. 28—202

7 Claims



a cylindrical paint transfer roller; and means on the partition and rear wall for detachably mounting said roller between said partition wall and the interior of the rear wall of said tray, said roller being of diameter to dispose a portion thereof into said paint sump so that the roller is operative to transfer paint in said sump to a paint pad.

4,164,804

## LATCH DEVICE

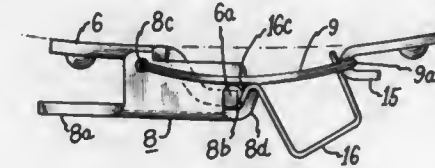
Thomas A. Fletcher, Dana, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,884

Int. Cl.<sup>2</sup> F16L 33/12

U.S. Cl. 24—273

5 Claims



1. A latch device comprising in combination, a base member adapted to be fixed to one of two parts to be detachably connected to each other, a lever member hingedly connected at one end to said base member for movement between a locked and an unlocked position, said lever member being formed with a lip projecting from said end, a generally U-shaped link member comprising elongated arms having free ends pivotally connected to said lever member intermediate the ends thereof and having a bight portion adapted to engage hook means on the other of said parts, and a channel-shaped spring catch having opposite sides resiliently compressible toward each other, said spring catch being loosely attached at one of said sides to said link member and being formed on the other of said sides with a flange engageable with said lip of said lever member, whereby when the latch device is in locked position with said link member engaging the hook means and said flange of said spring catch engaging said lip with said other side of said spring catch bearing against the hook means, said spring catch resiliently retains said link member in firm engagement with the hook means.

1. An apparatus for separating warp threads by means of leases, comprising: thread divider elements for separating an edge warp thread from a sheet of warp threads; thread feeder means, being a part of a movable divider rod, for delivering the separated warp thread to tying means; lease means provided for said warp threads; means for controlling operation of said divider elements such that said divider elements in conjunction with said lease means, following the separation of an edge warp thread, change their position relative to the sheet of warp threads in such a manner that all warp threads, following the separated edge warp thread, are displaced toward the sheet of warp threads; means for enabling said thread feeder means to only then move through its complete path needed for the feed of the separated warp thread to the tying means when there has been actually separated an edge warp thread; said means for controlling operation of said divider elements incorporating means for ensuring that said divider elements only then change their position relative to the sheet of warp threads when the thread feeder means has moved through said complete path; said movable divider rod being equipped with a blocking nose; said enabling means including locking means coacting with said blocking nose for blocking said divider rod; said divider rod separating the edge warp thread as soon as said locking means is out of engagement with said blocking nose; said ensuring means including a pawl and ratchet wheel cooperating with said divider rod; and said ratchet wheel being indexed by said pawl whenever said divider rod separates the edge warp thread.

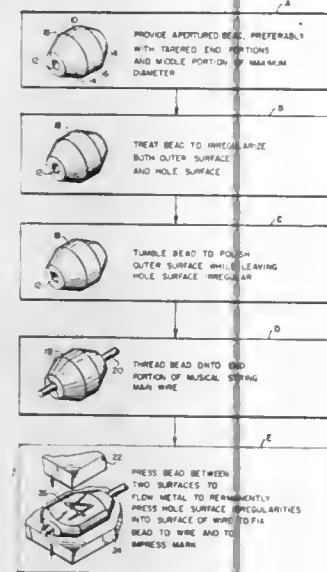
4,164,806

# METHOD FOR ATTACHING AN END BEAD TO A MUSICAL INSTRUMENT STRING

W. Norman Stone, Bloomfield, Conn., and Robert A. Alimansberger, Bridgewater, N.J., assignors to National Musical String Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 757,082, Jan. 5, 1977, abandoned. This application Oct. 18, 1977, Ser. No. 843,210  
Int. Cl.<sup>2</sup> B21D 39/00; B23P 11/00  
U.S. Cl. 29—517

11 Claims



1. The method of attaching a metal bead to the main wire of a musical instrument string, which method comprises the steps of: providing a metal bead having two ends and a hole extending therethrough between said ends and also having a middle portion of maximum thickness and two end portions on opposite sides of said middle portion each of which diminishes in thickness in going from said middle portion to the adjacent one of said two ends, said hole of said bead being defined by a hole surface having irregularities, threading said bead onto the end portion of a musical instrument main wire, and then plastically deforming said bead by pressing its middle portion between two generally flat and parallel surfaces to flow the metal of said bead and to permanently press said irregularities of said hole surface into the surface of said wire to fix said bead to said wire, whereby the deformation which occurs at said ends of said bead during said pressing step is substantially less than that which occurs in said middle portion.

4,164,807

# METHOD OF FORMING A COLDWORKED JOINT

John O. King, Jr., 3990 N. Ivy Rd., Atlanta, Ga. 30342  
Division of Ser. No. 501,487, Aug. 29, 1974, Pat. No. 3,949,535, which is a continuation-in-part of Ser. No. 324,485, Jan. 17, 1973, Pat. No. 3,835,688, which is a continuation-in-part of Ser. No. 268,478, Jul. 3, 1972, Pat. No. 3,835,615, which is a continuation-in-part of Ser. No. 33,281, Apr. 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 711,368, Mar. 7, 1968, abandoned. This application Mar. 19, 1976, Ser. No. 668,489

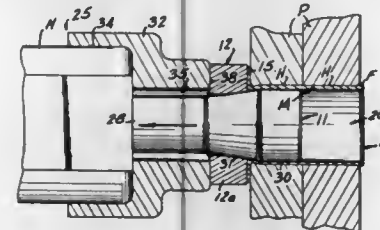
The portion of the term of this patent subsequent to Sep. 17, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> B21D 39/00; B23P 11/02  
U.S. Cl. 29—523

5 Claims

1. A method of coldworking a hole through a work piece comprising the steps of:  
placing a metal seamless cylindrical tubular member with a uniform wall thickness within the hole having a prescribed hoop strength sufficiently low to allow said seamless tubular member to be non-elastically radially and circumferentially expanded and a prescribed column

strength sufficient to substantially prevent axial movement of the outside of the tubular member as the tubular member is expanded within the hole;  
holding the tubular member within the hole so that the tubular member is substantially axially fixed with respect to the hole;  
passing an expansion mandrel having an expansion section thereon with a maximum diameter greater than the inside diameter of the tubular member axially through the inside of the tubular member in a first direction so that the expansion section slides completely through the length of the



tubular member to sequentially nonelastically expand the tubular member radially and circumferentially beyond its yield point as the expansion section passes therethrough sufficiently to force the outside of the tubular member into contact with the surface of the hole and to cause the tubular member to uniformly enlarge the hole along its length; and  
leaving the tubular member in the hole so that the tubular member maintains a first radially oriented compressive stress gradient of a prescribed magnitude within the material of the work piece substantially uniformly about the entire inside surface of the hole.

4,164,808

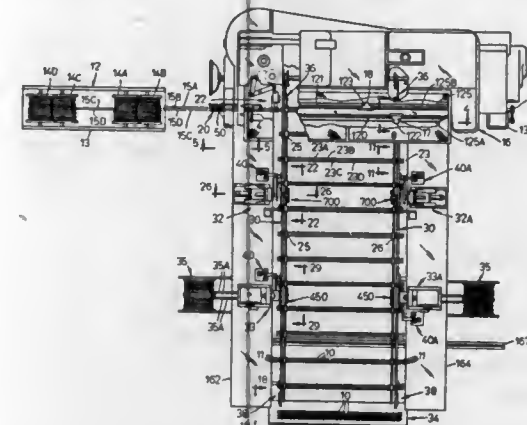
# APPARATUS FOR PRODUCING SETS OF ACCURATELY AND IDENTICALLY SIZED WIRE LEADS

Ragnar Gudmestad, West Allis, and Gerald E. Blaha, Waukesha, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 5, 1978, Ser. No. 912,719  
Int. Cl.<sup>2</sup> H01R 43/04; H02G 1/12

U.S. Cl. 29—564.4

5 Claims



1. Apparatus for high-speed production of sets of accurately and identically sized wire leads comprising:  
a feed mechanism having means for repeatedly drawing a plurality of separate strands of wire simultaneously from a plurality of wire reels;  
a mechanism having means for simultaneously straightening and arranging the strands as they are drawn therethrough

in parallel spaced apart relationship in a common generally horizontal plane;  
a severing mechanism having means for repeatedly severing sets of wire segments of predetermined length simultaneously from the strands;  
conveyor clamps for releasably gripping successive sets of wire segments received from the feed mechanism;  
and conveyor means for advancing the conveyor clamps.

4,164,809

# MACHINE TOOL WITH AUTOMATIC TOOL CHANGE APPARATUS

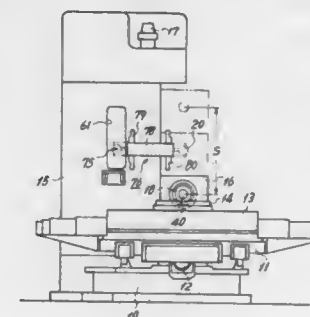
Akira Tsuboi, and Tetsuro Yamakage, both of Kariya, Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan  
Filed Dec. 6, 1977, Ser. No. 858,016

Claims priority, application Japan, Dec. 6, 1976, 51-146257; Feb. 16, 1977, 52-16484

Int. Cl.<sup>2</sup> B23Q 3/157

U.S. Cl. 29—568

5 Claims



1. A machine tool for machining a workpiece comprising:  
an upstanding column having a front wall and a side surface, said column being formed with an opening at its front wall;  
a spindle head slidably mounted upon the side surface of said spindle column and adapted to be positioned to a first predetermined position;  
a spindle rotatably supported by said spindle head;  
a magazine base extending within said column;  
a plurality of sprocket wheels rotatably supported on said magazine base;  
a flexible endless chain engaged by said sprocket wheels;  
a plurality of socket support members, each secured on said endless chain and formed with a pair of vertical plates, spaced apart a predetermined distance in the direction of movement of said endless chain;  
a plurality of tool sockets, each removably received between said pair of vertical plates for removably and vertically supporting a tool;  
drive means operatively connected to one of said sprocket wheels for driving said endless chain;  
means for selectively indexing said tool socket to a second predetermined position adjacent said opening inside said column;  
means for moving said tool socket, removably holding said tool, between said second predetermined position and a third predetermined position outside said column through said opening; and  
means for exchanging said tool held in said tool socket at a third predetermined position for said tool held by said spindle supported by said spindle head at said first predetermined position.

4,164,810

# AUTOMATIC TOOL CHANGER FOR MACHINE TOOL

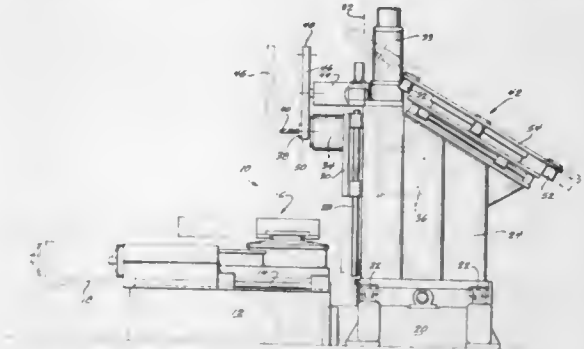
Charles B. Sipek, Hales Corners; Richard Johnstone, Brookfield, and Russell B. Clegg, Milwaukee, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Dec. 15, 1977, Ser. No. 860,705

Int. Cl.<sup>2</sup> B23Q 3/157

U.S. Cl. 29—568

11 Claims



5. A machine tool having a frame;  
a spindle rotatably supported by said frame and having means to receive different tools for use in machining operations;  
a tool storage magazine having a plurality of tool carriers with each carrier being adapted to carry one of the tools to be used in said spindle;  
a tool ready station at which said magazine is stopped to orient one of said tools in a predetermined position prior to a magazine shifting operation;  
means connected to such magazine to rotate the magazine for moving a selected one of said tool carriers into said tool ready station;  
tool change arm means having at least one grip for holding a tool and being movably supported by said frame for transferring tools between said spindle and said tool storage magazine;  
a tool exchange position laterally spaced from said tool ready station at which said tool change arm means can operatively grip a tool from said magazine for transfer to the spindle; and  
means connected to said magazine to shift the magazine laterally in a rectilinear movement for relocating said tool supported in the magazine from said tool ready station to the tool exchange position where the tool is aligned with the grip of said tool change arm means.

4,164,811

# PROCESS FOR MAKING A SEMICONDUCTOR COMPONENT WITH ELECTRICAL CONTACTS

Walter Heywang, Neukenferloh, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

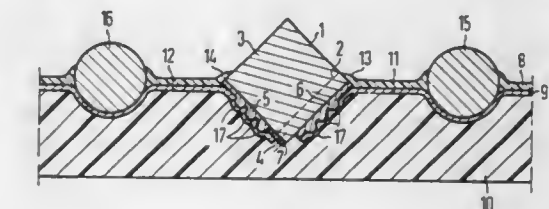
Filed Feb. 25, 1977, Ser. No. 771,848

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610539

Int. Cl.<sup>2</sup> H05K 3/00

U.S. Cl. 29—628

7 Claims



1. A process for the production of a semiconductor component with electric contacts in which a layer sequence com-



posed of upper and lower layers of thermoplastic material is formed with an intermediate layer of conductive material between said upper and lower layers, taking a semiconductor body having at least two sides with metal contact layers, respectively, on each of two sides, raising the temperature of the semiconductor body to a point which will soften the thermoplastic material, forcing said semiconductor body with its metal contact layers through one of said thermoplastic layers and into a portion of the other of said thermoplastic layers leaving said layer of conductive material divided into two intermediate layer parts being in direct electrical contact respectively with said metal contact layers of said semiconductor body, and forcing further electric supply lines through one of said thermoplastic layers into electric contact with said intermediate conductive layer.

4,164,812

# TERMINATION TOOL FOR ASSEMBLING ELECTRICAL CABLES TO CONNECTORS

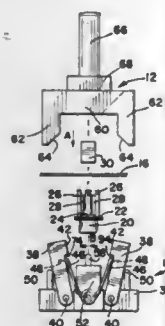
Joseph Dragisic, Cleero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sep. 11, 1978, Ser. No. 941,518

Int. Cl.<sup>2</sup> H01R 43/04

U.S. Cl. 29—749

26 Claims



1. A termination tool for assembling electrical cables, such as ribbon cables or the like, to an electrical connector which has receptacle means for receiving a cable in electrical termination with conductive contacts on the connector, comprising:  
a base having locator means for properly locating a connector in position for receiving an electrical cable;  
clamping means movably mounted on said base for engaging a properly positioned connector to hold the connector in position during a termination operation;  
stuffer means mounted on the tool for movement toward and away from said base and locator means to drive a cable into the receptacle means of the connector; and  
said stuffer means including means for effecting movement of said clamping means into engagement with the connector in response to the stuffer means being moved to drive the cable into the receptacle means of the connector.

4,164,813

# ELECTRICALLY POWERED KNIFE

Karl Dittert, Schwäbisch Gmünd, and Hans W. Hartkorn, Munich, both of Fed. Rep. of Germany, assignors to Ritterwerk GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 875,068

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705419

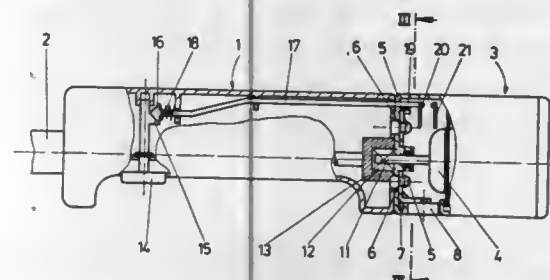
Int. Cl.<sup>2</sup> B26B 7/00

U.S. Cl. 30—272 A

10 Claims

1. An electrically powered knife device comprising first casing means, electric drive motor means in said first casing means, switch means in said casing means operable to control energization of said drive motor means, second casing means shaped as a handle,

knifeblade means, transmission means in said second casing means adapted to apply a drive from said electric drive motor means to drive said knifeblade means, switch control means on said second casing means, and



means releasably coupling said first casing means with said second casing means, said electric drive motor means with said transmission means, and said switch means with said switch control means.

4,164,814

# PERSONAL USE DEVICE FOR REMOVING TARTAR FROM THE INNER SIDE OF TEETH

Bernt Klostermark, Smedsbacksgatan 3B, 115 39 Stockholm, Sweden

Filed Jul. 28, 1977, Ser. No. 819,983

Claims priority, application Sweden, Aug. 6, 1976, 7608825

Int. Cl.<sup>2</sup> A61C 3/00, 15/00

U.S. Cl. 32—69

7 Claims



1. A combination mirror and tooth scraper for use as a personal dental care device for removing tartar from the inner side of a teeth row comprising a dentist mirror with mirror frame and handle, an elongate flat tooth scraper made from stiff and slight resilient material secured on the frame adjacent the edge of and projecting up above the plane of the mirror, said tooth scraper planar from being substantially perpendicular to the plane of the mirror.

4,164,815

# DEVICE FOR MEASURING A HUMAN FOOT

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed May 5, 1977, Ser. No. 793,935

Claims priority, application France, May 6, 1976, 76 13596

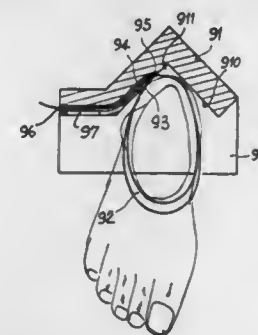
Int. Cl.<sup>2</sup> A43D 1/02

U.S. Cl. 33—3 A

12 Claims

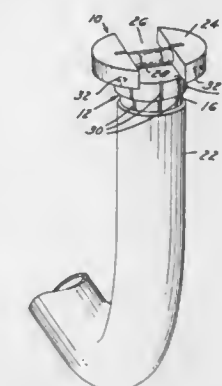
1. A device for obtaining information regarding at least one dimension of a human foot, more particularly for the purpose of selecting a boot suitable for said foot, comprising  
(a) a rigid trihedral support structure having a substantially horizontal and two substantially vertical planes forming reference faces for placement of the foot to be measured in a fixed position, said reference faces defining between them an interior face of said structure;  
(b) a passage within at least one of said faces of said structure adjacent to the position of the heel of said foot when in position to be measured, said passage opening in said interior space of said structure; and  
(c) means for connecting at least one measuring element to said structure by one of its ends adjacent the intersection of said three planes;

(d) the opening of said passage within the interior space of said structure being located adjacent the point of connection of said measuring element to said structure and the other end of said measuring element being free for sliding movement within said passage.

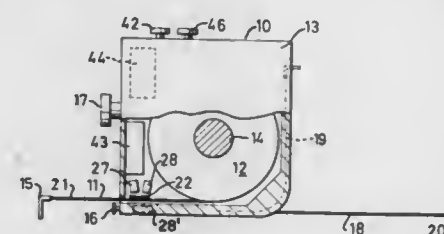


and said calculation and display means being coupled to the indication means and adapted to add the length measured by the measuring tongue to the length measured by the measuring tape.

4,164,817  
CONDUIT BENDING LEVEL  
Thomas G. Walker, E. Union Lake, Mich., assignor to JDS Products, Inc., Hartland, Mich.  
Filed May 4, 1978, Ser. No. 902,676  
Int. Cl.<sup>2</sup> G01C 9/34  
U.S. Cl. 33—371  
7 Claims



4,164,816  
ELECTRONIC MEASURING TAPE  
Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden  
Filed Oct. 11, 1977, Ser. No. 840,849  
Claims priority, application Sweden, Oct. 15, 1976, 7611512  
Int. Cl.<sup>2</sup> G01B 3/10  
U.S. Cl. 33—139  
9 Claims



1. An electronic measuring device for indicating the measured length between two fixed points, said device comprising, a housing, a flexible measuring tape retained in the housing coiled upon a spool and adapted for movement of a free end of the tape from a first position in the housing to a second position with the free end and a portion of the tape extended from the housing, the tape being extended between said two points when in said second position with the free end positioned adjacent one of said fixed points and the housing positioned adjacent the other of said fixed points, a first screen provided on the tape for movement therewith and a second stationary screen mounted in the housing overlying the first screen, said screens carrying a series of indicia lines to produce a moire interference pattern as the first screen is moved on the tape with respect to the second screen, means for reading the moire interference pattern including illumination means positioned adjacent the second screen for illuminating the moire pattern as it is produced by movement of the tape between said two points and a phototransistor positioned adjacent the second screen for detecting the moire pattern produced and generating an electrical signal in response thereto, calculator and display means positioned in the housing to receive the signal from the phototransistor and display the measured length defined by the tape as the free end thereof is moved between said two points, and a measuring tongue attached at one end to the housing and adapted for movement of a free end of the tongue from a first position adjacent the exterior of the housing to a second position with the free end extended from the housing, the tongue being extended for measuring a length between third and fourth fixed points when in the second position with the free end positioned adjacent the third fixed point and the housing positioned adjacent the fourth fixed point, means for indicating that the measuring tongue is in the second position,

1. A level for use in bending conduit having a conduit end opening within a preselected nominal dimension range comprising an axially tapering body of resilient material having a cross-sectional dimension at one axial end which is below said preselected range and a cross-sectional dimension at the other axial end which is above said range such that said body is constructed to be axially telescopically received and retained by force-fit within a conduit end opening at a point along the axial dimension of said body which corresponds to the dimension within said range of the said end opening, and a spirit level mounted in fixed position on said body adjacent said other axial end to be disposed externally of the said conduit end opening when said body is retained therein for indicating orientation of the conduit end during a conduit bending operation wherein upon engagement of said tapered body portion in a conduit, additional axial pressure will force the engaged body portion resiliently into said conduit to retain this position during conduit bending operations.

4,164,818  
METHOD FOR PREVENTING ADHESIVENESS OF A HYDROGEL OF A WATER-SOLUBLE ACRYLAMIDE-TYPE POLYMER  
Iwao Ohshima; Yukio Shibuya, and Hisao Otani, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan  
Filed Oct. 20, 1977, Ser. No. 843,913  
Claims priority, application Japan, Oct. 20, 1976, 51/125007  
Int. Cl.<sup>2</sup> F26B 7/00  
U.S. Cl. 34—12  
7 Claims

1. A method for preventing the surface of a hydrogel of a water-soluble acrylamide-type polymer from being tacky, which comprises coating the surface of said hydrogel with a member selected from the group consisting of a higher fatty acid, an alkali metal salt of a higher fatty acid and mixtures thereof.

4,164,819

## PAINT DRYING OVEN

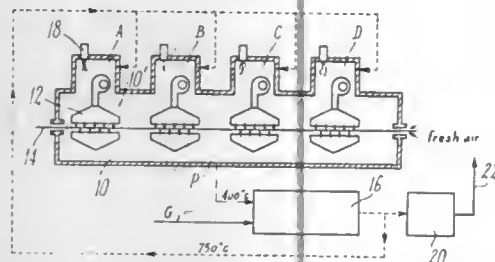
Roger Devillard, Paris, France, assignor to Heurtey Metallurgie, Paris, France

Filed Nov. 1, 1977, Ser. No. 847,620

Claims priority, application France, Nov. 5, 1976, 76 33392  
Int. Cl.<sup>2</sup> F26B 21/06

U.S. Cl. 34-72

6 Claims



1. An apparatus for drying paint on metal strips, said apparatus comprising:

an elongated oven having at opposite ends thereof inlet and outlet openings for the entrance and discharge, respectively, of a painted metal strip continuously moving through said oven;

the interior of said oven, between said opposite ends thereof, including plural heating sections through the volumes of which said painted metal strip sequentially passes;

each said heating section having therein a separate blower means for directing a gaseous mixture within the said volume of the respective said heating section against said painted metal strip, and for thereby drying said painted metal strip and evaporating solvents from the paint, whereby said solvents are released in gaseous form into said gaseous mixture in said volume;

means for withdrawing from said interior of said oven a portion of the gaseous mixture therein, including said gaseous solvents;

means for passing a first quantity of said withdrawn gaseous mixture, without any preliminary incineration thereof, directly to at least one first incinerator means directly mounted on said oven for thereby incinerating said gaseous solvents of said first quantity to form combustion gas, the discharge of said first incinerator means being in direct communication with at least one of said heating sections, to thereby discharge said combustion gas directly into the said volumes thereof, such that said gaseous mixture directed by the said blower means thereof includes said combustion gas;

means for passing a second quantity of said withdrawn gaseous mixture directly to a second incinerator means, located separate from and external of said oven, for thereby incinerating said gaseous solvents of said second quantity, whereafter said second quantity may be discharged to the atmosphere; and

means associated with said oven for introducing into said interior thereof a quantity of air to compensate for said second quantity discharged to the atmosphere.

4,164,820

## SNOW REMOVER AND VACUUM SWEEPER

Eli G. Krickovich, P.O. Box 106, Clinton, Iowa 52732

Filed Apr. 24, 1978, Ser. No. 899,513

Int. Cl.<sup>2</sup> E01H 5/10

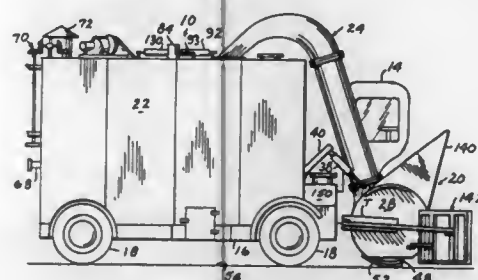
U.S. Cl. 37-12

9 Claims

1. In a roadway cleaning apparatus including an engine mounted on a vehicle chassis having an upright tank thereon, rotatable screw conveyor means including a horizontal conveyor housing having a snow pickup helical conveyor disposed horizontally within and journaled by the conveyor housing adjacent the surface of a roadway at the forward end of the chassis, tubing means connecting said screw conveyor

means with an inlet port in the top of the tank for discharging snow thereinto, an engine operated control means including an engine driven hydraulic fluid pump and a hydraulic conveyor driving motor drivably connected with said helical conveyor and an electric current generating means, the improvement comprising:

means for maintaining the interior of said tank at a desired temperature,



said means including a return bend tube having an intermediate portion and having end portions communicating with the interior of said tank through openings formed in one of its walls, means for forming a forced air draft of a portion of the air contained by said tank through said return bend, and means for heating the forced draft of air;

sliding panel means for opening and closing one said tube end portion; and,

means for moving said sliding panel means.

4,164,821

## SNOW PLOW BLADE ATTACHMENT SYSTEM

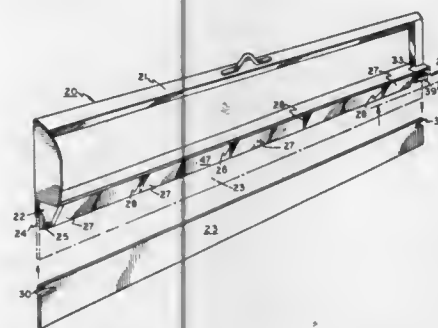
Andre H. Vanchot, 65 Marshall La., Derby, Conn. 06418

Filed Nov. 11, 1977, Ser. No. 850,688

Int. Cl.<sup>2</sup> E02F 3/76

U.S. Cl. 37-141 R

10 Claims



9. A snow plow blade support assembly for mounting to the mouldboard of a plow body and securely holding and supporting a snow plow blade installed therewith, comprising:

(A) a downwardly opening elongated blade nesting and engaging channel

(B) a blade camming and securing member

(a) mounted within and inwardly of one end of the channel in substantial planar alignment therewith, and

(b) incorporating a longitudinally, downwardly extending surface for cooperative sliding and upward camming and holding engagement with a portion of the plow blade; and

(c) a blade engaging and locking member mounted on the other end of the channel and incorporating

(1) a movable arm secured to said assembly positioned for cooperative locking engagement with the plow blade, and

(2) position securing means engageable with the mov-

able arm and the support assembly for securely locking the arm in its blade engagement position.

4,164,822

## PORTABLE MAP READING SYSTEM

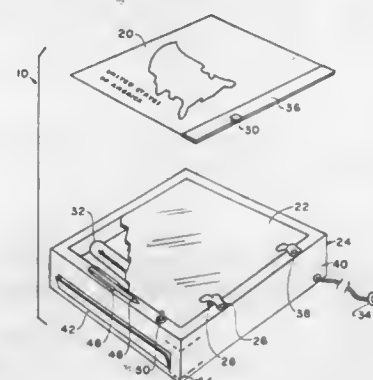
James L. Batton, 7101 Dunshire Way, Apt. 4C, Baltimore, Md. 21222

Filed Jan. 4, 1978, Ser. No. 866,860

Int. Cl.<sup>2</sup> G02B 27/02

U.S. Cl. 40-361

14 Claims



1. In a portable map display system having map structure, a light box with translucent panel and light source for illuminating the map structure, and, associated with the map structure, means for actuating the light source, the improvement comprising: the means for actuating including first and second electrodes in spaced locations on the light box proximate the translucent panel and a conductive strip on the map structure located in position for electrically connecting the first and second electrodes when the map structure is in viewing coincidence with the translucent table, and means for preventing mis-orientation of the map structure on the light box comprising: said first and second electrodes having asymmetrical location on the lightbox relative to the translucent panel, said map structure having a shape substantially corresponding to the translucent panel and the conductive strip having asymmetrical location on the map structure corresponding to the location of the electrodes relative to the translucent panel.

4,164,823

## LUMINOUS EFFECTS DEVICE

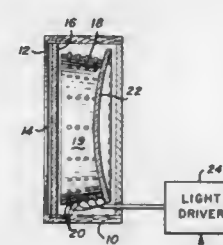
Joseph J. Marsico, 1229 Newberry Ave., LaGrange, Ill. 60525

Filed Mar. 22, 1976, Ser. No. 669,235

Int. Cl.<sup>2</sup> G09F 13/12, 19/16

U.S. Cl. 40-427

10 Claims



1. A luminous effects device comprising: means forming a housing closed on all but one side; a first reflector means disposed within said housing and having its reflective side facing the open side of said housing; a light means carrying member having a continuous inside wall forming a frusto-conical section circumscribing a

central region enclosed by said housing and having a first opening of a first diameter disposed adjacent said first reflector means, and a second opening of a second diameter which is larger than said first opening;

light means affixed to said carrying member and disposed proximate said inside wall; and

a partially silvered, partially transparent second reflector means disposed adjacent said second opening and serving to close the open side of said housing, whereby light from said light means reflected back and forth between said first reflector means and said second reflector means creates an illusion of depth when viewed through such second reflector means.

4,164,824

## CHANGEABLE CHARACTER SIGN STRUCTURE

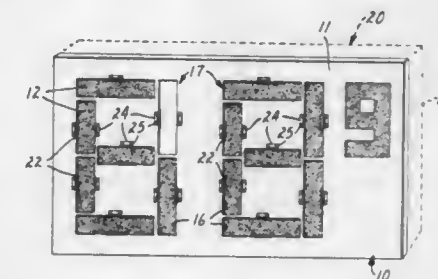
James G. Nidelkoff, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Division of Ser. No. 756,258, Jan. 3, 1977, Pat. No. 4,115,936.

This application Jul. 14, 1978, Ser. No. 924,624

Int. Cl.<sup>2</sup> G09F 9/32

U.S. Cl. 40-450

5 Claims



5. A sign structure having changeable characters, comprising:

a sign face of a predetermined color and having a patterned array of openings;

shutters mounted to said sign face, one to an opening, each of said shutters having a plate mounted for sliding movement between a first and second position, at least a first surface portion of each shutter being of a predetermined color which is the same as, or contrasts with, the sign face color, and each shutter being movable between said first position for displaying said first surface portion in said opening and said second position wherein said first surface portion is not visible at said opening; and latch means for securing said shutters in said first or second position.

4,164,825

## DEVICE FOR REDUCING FIREARM RECOIL

Louis C. Hutchison, 5860 W. Edna, Las Vegas, Nev. 89102

Filed Apr. 21, 1978, Ser. No. 898,847

Int. Cl.<sup>2</sup> F41C 27/00

U.S. Cl. 42-1 V

17 Claims



1. A firearm recoil reducing device comprising a case enclosing an elongated interior chamber, a piston received in said chamber having a plurality of vanes along the exterior surface thereof and supported between a front and a rear spring, and



a liquid substantially filling said chamber.

**4,164,826**  
**SALMON JIG**  
Phares H. Metzler, 11200 - 15th SW., Seattle, Wash. 98146, and  
Norman P. Metzler, 501 E. 10th St., Port Angeles, Wash.  
98362

Filed Jun. 26, 1978, Ser. No. 919,410  
Int. Cl.<sup>2</sup> A01K 85/00  
U.S. Cl. 43—42.05

6 Claims



1. A fishing jig comprising an elongated plate-like heavy-metal body of generally uniform body thickness and tapered in width from head end to tail end, with longitudinal edges convexly rounded, with head end width at least approximately twice tail end width and at least approximately a few times body thickness, with said body terminating at its head end in a transverse substantially flat head end face angled obliquely at approximately 45° both to the general body plane and to a longitudinal plane perpendicular to said body plane, a longitudinal line-receiving open bore in said body extending from a port in the tail end to an opposite port in the head end, the latter port being located transversely inwardly from the longer longitudinal edge of the body by approximately one-fourth to one-third the width of the body at the head end and at a position relatively closely adjacent to the intersection of the head end face and the side of the body adjacent the lagging edge of said head end face, said body having an arcuate bend therein of approximately 20° transverse to the body plane, said bend occurring at a location approximately one-third of the length of the body forwardly of its tail end.

**4,164,827**  
**ACTION TOY**  
Nunzio Palumbo, Hackensack, N.J., assignor to Kohner, Inc.,  
New York, N.Y.

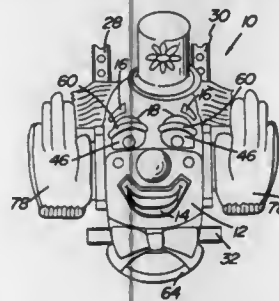
Filed Oct. 31, 1977, Ser. No. 846,968  
Int. Cl.<sup>2</sup> A63H 11/00

U.S. Cl. 46—119

15 Claims

1. An action toy, comprising:  
a housing having at least one eye-shaped opening,  
a member bearing an eye-shaped design, said member being disposed within said housing in juxtaposition with said opening,  
at least one hand-shaped member rotatably mounted on said housing, and  
motive means connected to said member bearing said eye-shaped design, said motive means being disposed in operative relation with said hand-shaped member for causing

simultaneous reciprocating rotational movement of said hand-shaped member and reciprocating translational



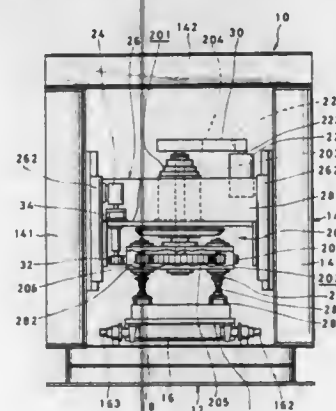
movement of said member bearing said eye-shaped design in a plane spaced from the housing.

**4,164,828**  
**ABRASIVE MACHINE FOR STONES**  
Hiroshi Ishizuka, 19-2 Ebara 6-chome, Shinagawa-ku, Tokyo,  
Japan

Continuation of Ser. No. 698,959, Jun. 23, 1976, abandoned.  
This application Dec. 14, 1977, Ser. No. 860,630  
Claims priority, application Japan, Jun. 26, 1975, 50/80234  
Int. Cl.<sup>2</sup> B24B 7/22

U.S. Cl. 51—110

3 Claims



1. An abrasive machine for grinding a work-piece comprising:

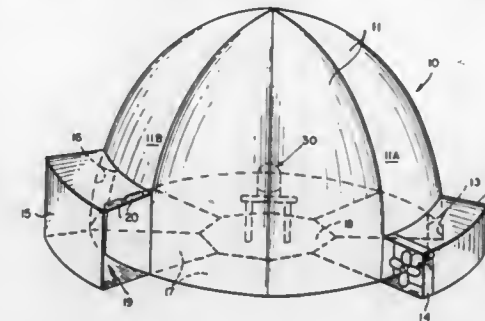
- a base member;
- a frame structure including a pair of vertical side members and a top member securely mounted on top ends of the vertical side members;
- said frame structure being mounted on said base member;
- means arranged above said base member for feeding a work-piece;
- at least one abrasion unit which is positioned above the feeding means and comprises:
  - (i) a first housing supported between the vertical side members and in sliding contact therewith for adjusting the height of the first housing;
  - (ii) a central axis member extending through the first housing and being substantially parallel to the vertical side members, having one end connected to an output shaft of a first motor through a transmission means and having the other end securely connected to a main gear;
  - (iii) said central axis, first motor and transmission means being mounted on said first housing;
  - (iv) a second housing which encases the main gear and a plurality of smaller gears arranged in mesh and concentric with the main gear, each of said plurality of smaller gears being rotatably mounted on an axle journaled in the second housing, said axles being restricted from

longitudinal movement and said second housing includes an annular rack in mesh with a pinion connected to an output shaft of a second motor for revolution of the smaller gears about the central axis of the main gear, each of said smaller gears carrying an abrasive tool with a grindstone detachably mounted thereto and said first and second housings being vertically adjustable as a unit.

**4,164,829**  
**INFLATABLE STRUCTURE**  
Philip M. Sadler, 93 Hammond St., Cambridge, Mass. 02138  
Filed Nov. 14, 1977, Ser. No. 851,432  
Int. Cl.<sup>2</sup> E04G 11/04

U.S. Cl. 52—2

14 Claims



1. A self-supporting flexible structure comprising a chamber-forming assembly including a plurality of flexible panels made substantially entirely of extensible material capable of deformation into a concave shape, said panels being attached in a manner such that, when inflated, said assembly is capable of assuming a generally hemispherical shape;
- a first one of said panels having a first opening therein;
- a first channel means made substantially entirely of extensible material and attached to said first one of said panels to permit the introduction of air under pressure greater than atmospheric pressure through said first opening so as to inflate said assembly and to form a generally hemispherical shaped chamber;
- a second one of said panels having a second opening therein;
- a second channel means made substantially entirely of extensible material and attached to said second one of said panels to permit the exit from said chamber through said second opening of a controllable volume of air that has been so introduced into said chamber and further, when inflated, providing entry and exit means for said chamber.

**4,164,830**  
**DOUBLE-GLAZED DOORS OR WINDOWS AND FRAME ASSEMBLIES THEREFOR**  
Johannes H. Bierlich, Oresundshøj 15, Charlottenlund, Denmark

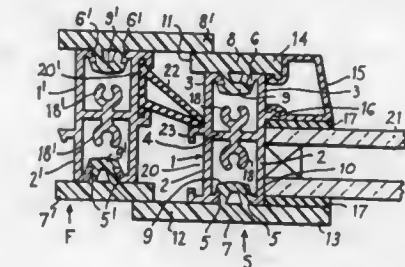
Filed Dec. 16, 1977, Ser. No. 861,494  
Int. Cl.<sup>2</sup> E04C 2/38

U.S. Cl. 52—398

8 Claims

1. A door or window comprising at least two panes of glass secured, with an air gap therebetween, in a generally rectangular frame constructed of a plurality of frame members which are joined together at the corners of the frame and are each assembled from metal and thermally insulating components to impede heat transference through the thickness of the frame member between its inner and outer surfaces, characterized in that each frame member assembly comprises a metal extrusion having a cross-section comprising spaced apart walls extending in the direction substantially perpendicular to the panes of glass for the major part of the thickness of the frame member, and defining at least one open channel having two integral side walls and an end wall and having oppositely facing abutments

along the inside surfaces of the opposing channel side walls adjacent the free edges thereof, and a facing strip extruded from a substantially rigid thermal-insulating material with a cross-section including front and rear surfaces and an integral substantially rigid rib which extends along said rear surface and which is profiled with oppositely facing recesses which fit between and interlock with the opposing pair of abutments of



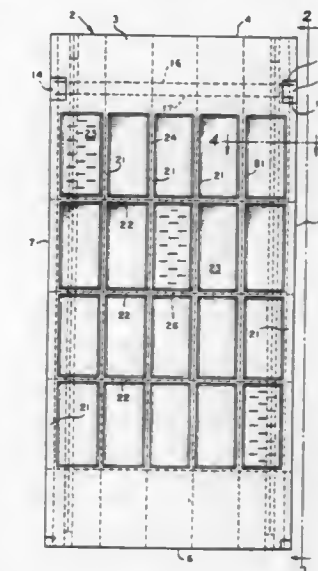
the channel to hold the facing strip bridging the free edges of the channel side walls with a marginal edge zone of the strip projecting laterally beyond a side wall of the channel, said recesses being of a width such that the free edges of the channel side walls abut against and directly support those portions of the rear surface of the facing strip which are adjacent opposite sides of the rib.

**4,164,831**  
**HEAT INSULATING AND SOUND ABSORBING CONCRETE WALL PANEL**  
William E. Messick, 1445 S. Bascom Ave. #53, San Jose, Calif. 95128, and Bernard L. Gabrielsen, 5858 Pilar Ct., San Jose, Calif. 95120

Filed Sep. 21, 1977, Ser. No. 835,318  
Int. Cl.<sup>2</sup> E04B 2/00

U.S. Cl. 52—405

6 Claims



1. A massive concrete wall panel having thermal insulating and sound absorbing characteristics, comprising:  
a first facing sheet formed of poured, molded concrete, said first sheet being generally rectangular in shape and having upper and lower surfaces defined by transversely extending top and bottom edges and longitudinally extending first and second lateral edges;  
first and second spaced longitudinal ribs integrally formed with said lower surface of said first facing sheet, said ribs being located adjacent said first and second lateral edges,

respectively, said ribs being formed to provide the vertical load-bearing strength of said wall panel;  
 truss-form reinforcing bars embedded within each of said first and second ribs;  
 reinforcing wire mat means embedded in said first facing sheet;  
 first and second typing recesses formed at said first and second lateral edges;  
 transversely extending reinforcing ties embedded in said first facing sheet, said ties having first and second ends terminating in said first and second typing recesses, respectively, to provide exposed tie ends for use in securing adjacent panels together;  
 a plurality of generally rectangular hollow recesses formed in said upper surface of said first facing sheet, said hollow recesses being spaced laterally and longitudinally over a major portion of said upper surface to define therebetween a plurality of longitudinally extending studs and a plurality of transversely extending rails, the side surfaces of said studs and rails being tapered to provide tapering side walls for said hollow recesses;  
 reinforcing bars embedded in said studs and said rails;  
 a first rectangular block of thermally insulative material secured in each said hollow recess;  
 a second rectangular block of sound absorbing material secured in each said hollow recess, said first and second blocks being coextensive with said recesses, with one block being superimposed on the other; and  
 cover means engaging said upper surface of said wall panel first facing sheet to retain said first and second blocks.

4,164,832

**TONGUE AND GROOVE STRUCTURE IN PREFORMED WALL SECTIONS**

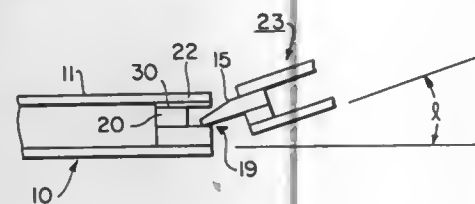
Alex Van Zandt, Rte. 5, Ada, Okla. 74820

Filed Mar. 31, 1978, Ser. No. 892,158

Int. Cl.<sup>2</sup> E04C 1/10

U.S. Cl. 52—593

3 Claims



1. The improved preformed wall section of the type having two outer panels separated from each other by a predetermined spacing distance with spacing members disposed between the panels on opposite panel edges wherein the spacers define tongue and groove edge joints on respective opposite panel edges which are offset between the panel spacing distance to lie adjacent one outer panel and including in the interlockable tongue and groove structure means for interfitting the tongue of one panel into the groove of an adjacent panel without damage to the outer panel edge at the groove if the panels are slightly misaligned during interfitting of the tongue into the groove, said means comprising a stiffener member located on the inner surface of the outer panel within said groove.

4,164,833

**SKIP-SEAL MECHANISM FOR PACKAGING MACHINE**

Henry E. Todd, Cedarburg, Wis., assignor to Pratt Manufacturing Corp., Milwaukee, Wis.

Filed Feb. 9, 1978, Ser. No. 876,392

Int. Cl.<sup>2</sup> B65B 9/02, 51/14, 51/16, 51/26

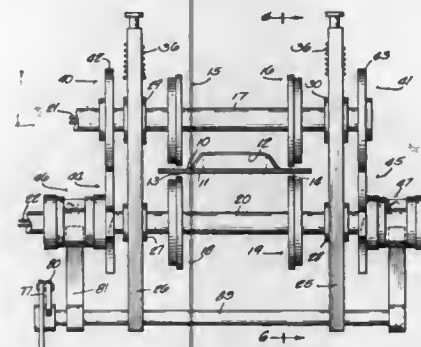
U.S. Cl. 53—545

11 Claims

3. A device for producing pressure effected longitudinally

extending seals and for periodically omitting seals between continuously longitudinally moving webs, comprising:

first and second shaft means having their rotational axes in parallel, at least one of said shaft means being movable toward and away from the other,  
 sealing wheel means on said respective shaft means for said webs to pass between them to effect a seal of predetermined length when the peripheries of said wheels are close to each other and to omit a seal when said peripheries are away from each other,  
 means for biasing said first shaft means toward said second shaft means,  
 a circular cam follower fixed coaxially on said first shaft means,  
 a cam on said second shaft means for cooperating with said follower, said cam having a plurality of angularly spaced



apart radially extending lobe means each of which has a circular peripheral surface having a radius from the axis of said second shaft means substantially equal to the radius of said follower means, said lobes defining angularly spaced apart recesses between them,

clutch means operative to couple said second shaft means in driving relation with said cam to thereby rotate said lobe means successively into contact with said cam follower to cause said first shaft means to move away from said second shaft means and separate said wheel means to effect omission of a seal and operative to uncouple said cam means from said second shaft means when said cam means has rotated to the angle of a recess to thereby permit said first shaft means to move toward the second shaft means to effect a seal, and  
 means for operating said clutch means.

4,164,834

**JUNIOR STIRRUPS ATTACHMENT FOR ADULT-SIZE SADDLE**

George L. Christensen, 624 N. 1st West, Tremonton, Utah 84337

Filed Oct. 4, 1976, Ser. No. 729,188

Int. Cl.<sup>2</sup> B68C 1/16

U.S. Cl. 54—46

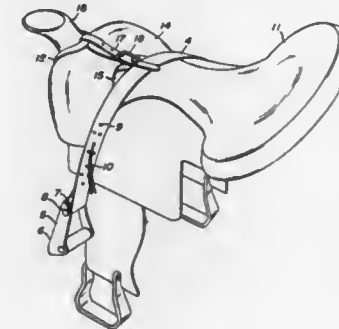
4 Claims

1. A junior stirrups attachment for an adult-size, stirrups-equipped, horse saddle, comprising:

a flexible main strap having the general form of a thin, flat, elongated rectangle;  
 a junior-size stirrup attached to each end portion of the main strap with a loop formed by doubling the end portion of the main strap upon itself to include the bolt of the stirrup within the loop and closing the loop by a fastening means; and

means for fastening the main strap to the forward portion of an adult-size saddle so that the main strap lies across the adult-size saddle at right angles thereto, with equal end portions of the main strap suspended from the saddle on either side thereof, whereby a child rider can sit on the seat of the adult-size saddle, together with an accompanying adult, and the need for a special, piggyback, junior-size, saddle seat is eliminated, said fastening means com-

prising a first loop formed by an elongated piece of strong, flexible material attached at each of its ends to the forward edge of the central portion of the main strap, a second strap fixed at one end to the same edge of the central portion of the main strap, and fastening means fixed adjacent the juncture of the second strap with the main strap so that the second strap can be fastened thereby into the



form of a second loop, the first loop being capable of fastening the main strap to the adult-size saddle by being passed through an opening under the pommel and over the saddle horn thereof, the first loop being capable of being secured to the saddle horn by the second strap being passed through the first loop and then being fastened by the fastening means adjacent the juncture of the second strap with the main strap to form a loop.

4,164,835

**GRASS CUTTER**

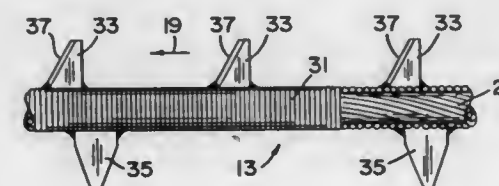
Joseph Conte, 3740 Davis Blvd., Sarasota, Fla. 33580

Filed Sep. 9, 1977, Ser. No. 831,766

Int. Cl.<sup>2</sup> A01D 55/24

U.S. Cl. 56—291

16 Claims



1. A cutting device comprising in combination, an endless cutting member, said endless cutting member comprising an endless inner cable means;  
 a helical outer coil means helically wound about the outer circumference of said inner cable means enabling limited movement therebetween;  
 a plurality of cutting element means secured only to said helical coil means;  
 said endless cutting member being disposed about a drive means; and  
 power means connected to said drive means for moving said endless cutting member with said limited movement between said inner cable means and said outer coil at least partially absorbing the shock produced by said cutting element means during the cutting action.

985 O.G. 24

4,164,836

**BULKY YARN PRODUCING APPARATUS**

Fumio Tanai, Iyo, and Hirokazu Matsuoka, Matsuyama, both of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan

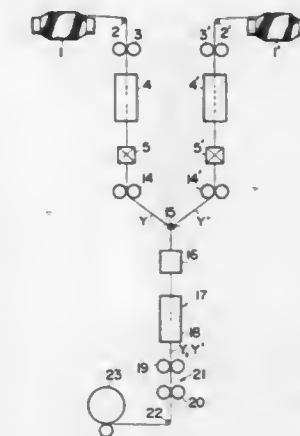
Filed May 31, 1978, Ser. No. 911,220

Claims priority, application Japan, Jun. 9, 1977, 52/68174; May 18, 1978, 53/59357

Int. Cl.<sup>2</sup> D02G 1/02, 3/00, 3/34

U.S. Cl. 57—2

7 Claims



1. A bulky yarn producing apparatus comprising in combination:

a twisting zone along a yarn travelling path, a twist mechanism in said twisting zone for twisting and untwisting a yarn; a rubbing mechanism located in said twisting zone and having a rough surface so as to rub filaments of the yarn for imparting scratches thereto, said rubbing mechanism being disposed relative to said twist mechanism so as to rub the yarn while the yarn is in a twisted state,

a stretching zone disposed along a portion of said yarn travelling path downstream of said twisting zone where the yarn is in an untwisted state, a stretching mechanism disposed in said stretching zone to stretch the yarn so that the filaments are severed at their scratches to produce a bulky yarn.

6. A bulky yarn producing apparatus comprising in combination:

a twist mechanism provided on a yarn travelling path for twisting and untwisting a yarn;

a rubbing mechanism provided on said yarn travelling path of said yarn which is twisted by said twist mechanism and having a rough surface so as to rub filaments constituting said yarn for imparting scratches thereto; and a stretching mechanism provided on the downstream of said rubbing mechanism along said yarn travelling path of said untwisted yarn to stretch said yarn so that said filaments are severed at their scratches to produce a bulky yarn;

said twist mechanism comprising three rotary shafts equispacedly arranged in parallel relation with each other and three friction discs each secured to each of said rotary shafts in such a manner that said friction discs are disposed in partly overlying and axially spaced relation with each other and extend in parallel planes different from each other; said rubbing mechanism comprising a rubbing disc secured to one of said rotary shafts to be disposed above said friction rollers and formed with said rough surface on its periphery.



4,164,837

**METHOD OF FORMING A WRAPPED YARN**  
Fritjof Maag, Kelkheim, and Friedrich Unger, Lorschbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Division of Ser. No. 585,607, Jun. 10, 1975, Pat. No. 4,018,042.  
This application Dec. 20, 1976, Ser. No. 752,436  
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1974, 2428483

Int. Cl.<sup>2</sup> D02G 3/38, 3/02

U.S. Cl. 57—3

9 Claims



1. A process for the manufacture of a wrapped yarn of the type in which a bundle of staple fibers is passed through the hollow shaft of a rotating bobbin carrying a filamentary yarn and the yarn is withdrawn from the bobbin and led to the longitudinally moving fiber bundle, whereby rotation of the bobbin causes the fiber bundle to be wrapped with the filamentary yarn in a helical configuration, said process comprising the steps of winding said fiber bundle with a filamentary yarn having (a) a denier of 1 to 50 dtex, (b) an elongation at break greater than the elongation at break of the fibers of said bundle, whereby when the yarn is stretched the winding yarn does not break until after the core fibers break and (c) a modulus such that a force of at least 10 grams is required to produce an elongation of 4% and maintaining a tension of no more than 5 grams on said winding yarn during said winding operation, whereby the core fibers are rapidly squeezed together by the winding yarn when wrapped yarn is stretched.

4,164,838

**PROCESS FOR THE PRODUCTION OF SYNTHETIC ENDLESS FILAMENTS WITH GOOD CRIMPING PROPERTIES**

Hans Bach, Dormagen; Karl-August Heinroth; Hans-Dieter Jurischka, both of Dormagen-Horrem; Hans Kaloff, Zons, Neuss; Rudolf J. Klee, and Herbert Schmidt, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Dec. 6, 1974, Ser. No. 530,445

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1973, 2360707

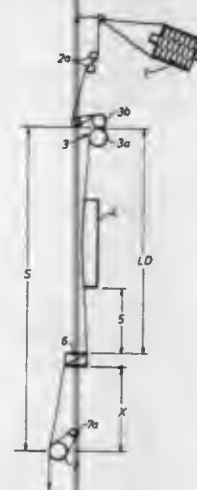
Int. Cl.<sup>2</sup> D02G 1/02

U.S. Cl. 57—247

6 Claims

1. A process for the stretch-texturing of high-molecular-weight, linear synthetic endless filaments travelling at speeds of from 300 to 1200 meters per minute at the stretching godet by the false-twist method by continuously guiding the filaments through a delivery zone, a heat-fixing zone, 30 to 70 cm. long between the delivery stage and the twister inlet, a false-twister and a stretching godet, wherein the filaments are passed through a stretching zone S 55 to 180 cm. long, defined by the distance between the delivery stage and the stretching godet, at a speed of from 300 to 1200 m/m, the distance between the delivery stage and the false-twister inlet amounting to S-X cm. and the distance X between the false-twister outlet and the stretching godet being from 5-30 cm.

5. Simultaneously stretched and textured polyamide filaments produced by the process of claim 1 with a snarl factor of



less than 0.1/kg for a strength of greater than 42 cN/tex and a deviation in cold-water shrinkage of at most 15%.

4,164,839

**YARN PROCESS**

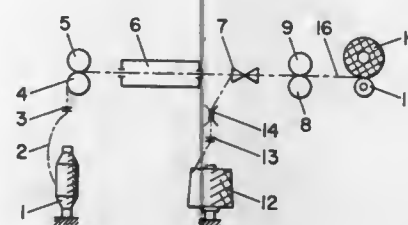
Udo P. Schweizer, Charlotte, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 30, 1978, Ser. No. 873,758

Int. Cl.<sup>2</sup> D02G 3/38

U.S. Cl. 57—293

7 Claims



1. A method of making a sheath/core yarn, wherein a sheath yarn is wrapped around the core yarn in alternating "S" and "Z" directions, comprising the steps of feeding the core yarn at a determined velocity rate to a false twisting device, feeding a sheath yarn to the false twist device at a velocity rate greater than the core yarn and at an angle to the core yarn of at least 15° to combine the yarns, reducing contact of the sheath and core yarns with the false twist device for short-time intervals to less than fifty percent of the normal contact level wherein the ratio of the number of reductions in contact with the false-twisting device per minute to the velocity of the core yarn in meters per minute is between about 10:1 and 350:1, removing the sheath and core yarns from the false-twist device and thereafter winding the combined yarns into a package.

4,164,840

**METHOD AND APPARATUS FOR TWISTING YARNS**  
Kurt C. Chilpan, Seneca, S.C., and William L. Lewis, Sanford, N.C., assignors to Roberts Company, Sanford, N.C.

Continuation of Ser. No. 490,580, Jul. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 326,006, Jan. 23, 1973, abandoned. This application Jan. 14, 1976, Ser. No. 648,771

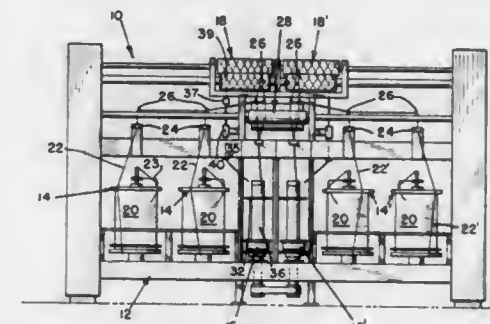
Int. Cl.<sup>2</sup> D01H 7/90, 1/10, 7/86

U.S. Cl. 57—313

8 Claims

1. A machine for twisting and plying yarns comprising: a support frame, a plurality of two-for-one spindle assemblies

mounted upon said support frame, a yarn supply package mounted upon each two-for-one spindle assembly, each two-for-one spindle assembly applying a twist to the yarn drawn therefrom, a plurality of spindle units, each including a driven bobbin mounted upon said support frame, means for directing the individually twisted yarns from said two-for-one spindle assemblies toward a bobbin positioned upon a first spindle unit,



said spindle unit plying and downtwisting the yarns onto said bobbin to form a package, a yarn winder assembly mounted upon said support frame, means for directing the yarns from said bobbin, upon completion of the formation of said package, to said yarn winder assembly, said driven bobbin applying additional twist to the yarn being unwound from the full package and being directed to said winder assembly.

4,164,841

**METHOD AND APPARATUS FOR CONTINUOUS FORMATION OF BULKED AND ENTANGLED MULTIFILAMENT YARN**

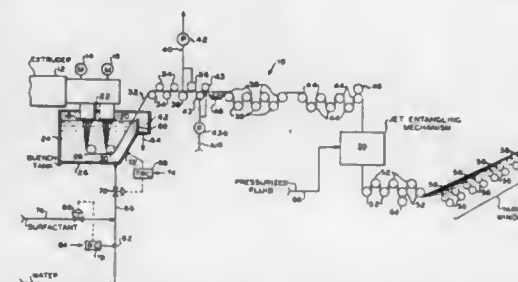
David E. Borenstein, Greenville, S.C., and Jack A. Banning, Rocky Mount, N.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 3, 1977, Ser. No. 838,799

Int. Cl.<sup>2</sup> D02G 1/16

U.S. Cl. 57—350

30 Claims



1. Apparatus for continuously forming bulked and entangled multifilament melt-spinnable plastic yarn, comprising: filament extrusion means for extruding a melt-spinnable plastic material in molten form through a plurality of spinning orifices in at least one spinneret die to form a plurality of filaments of a multifilament yarn; filament quench means disposed adjacent to said at least one spinneret die for quenching the molten filaments extruded therefrom, said filament quench means comprising a body of quench liquid disposed adjacent to said at least one spinneret die, the surface of said quench liquid and said spinneret die being spaced apart to define an air gap therebetween; means for passing the molten filaments from said at least one spinneret die into said filament quench means; feed roll means for engaging and withdrawing the quenched filaments of the multifilament yarn from said filament quench means at a first linear velocity; draw roll means for engaging and withdrawing the filaments of the multifilament yarn from said feed roll means at a

second linear velocity greater than said first linear velocity to draw the filaments of the multifilament yarn; filament entangler means disposed adjacent to said draw roll means for entangling the filaments of the multifilament yarn, said filament entangler means comprising: a source of pressurized fluid; a substantially cylindrically shaped passage having a longitudinal axis through which the multifilament yarn passes from said draw roll means; two fluid jets communicating with said passage with the axis of each of said fluid jets being aligned substantially perpendicular to the axis of said passage and with the axes of said fluid jets intersect at the axis of said passage and lying in a common plane which plane is substantially perpendicular to the axis of said passage, and wherein the axes of said fluid jets define an included angle selected from the group consisting of approximately 60 degrees and approximately 120 degrees; and fluid conduit means interconnecting said source of pressurized fluid and said fluid jets for conducting pressurized fluid to said fluid jets for impingement upon the multifilament yarn passing through said passage to entangle the filaments of the yarn and increase the bulk thereof; and

second feed roll means for engaging and withdrawing the multifilament yarn from said draw roll means and through said filament entangler means at a third linear velocity.

11. A continuous process for forming bulked and entangled yarn comprising the steps of:

- extruding a melt-spinnable plastic material in molten form through the spinning orifices of at least one spinneret die to form a plurality of filaments;
- quenching said filaments in a quenching liquid;
- drawing the quenched filaments;
- impinging two fluid streams on the quenched and drawn filaments as they pass through a longitudinal confining yarn passage having a longitudinal axis therethrough so as to entangle the quenched and drawn filaments to impart bulk and entanglement to the filaments and form a bulked and entangled yarn.

4,164,842

**BUFFER AMPLIFIER CIRCUIT**

Heihachiro Ebihara, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

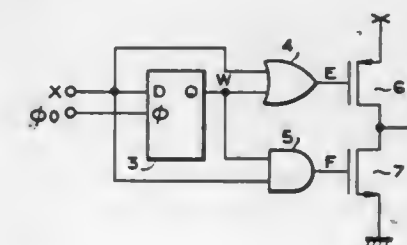
Filed Aug. 15, 1977, Ser. No. 824,603

Claims priority, application Japan, Aug. 20, 1976, 51-99419

Int. Cl.<sup>2</sup> G04C 3/00; H03K 19/08

U.S. Cl. 58—23 A

8 Claims



1. A buffer amplifier circuit comprising an electric power source having a high potential side and a low potential side, a P-channel MOS transistor having a gate, a drain and a source, said P-channel source connected to a high potential side of said electric power source, an N-channel MOS transistor having a gate, a drain and a source, said N-channel source connected to a low potential side of said electric power source, said drains of both said transistors being connected in common and constituting an output of said circuit, and a wave form shaping circuit comprising a data-type flipflop having a data input, a clock input and an output, first gate means having a first input con-

ected to said data input, a second input and an output connected to the gate of said P-channel MOS transistor, and second gate means having a first input connected to said data input and a second input, and an output connected to the gate of said N-channel MOS transistor, the second input of said first gate means and the second input of said second gate means being connected in common to said output of said flipflop, said flipflop being operated to change the level at said output thereof when supplied with each pulse of a clock signal at said clock input whereby said N-channel MOS transistor becomes OFF prior to a time at which said P-channel MOS transistor becomes ON and said P-channel MOS transistor becomes OFF prior to a time at which said N-channel MOS transistor becomes ON thus preventing both said transistors from becoming ON at the same time and eliminating any threading currents.

**4,164,843**  
**METALLIC LEAD PLATE AND CIRCUIT STRUCTURE FOR AN ELECTRONIC WATCH AND METHOD OF ASSEMBLY**

Motoyuki Fujimori, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

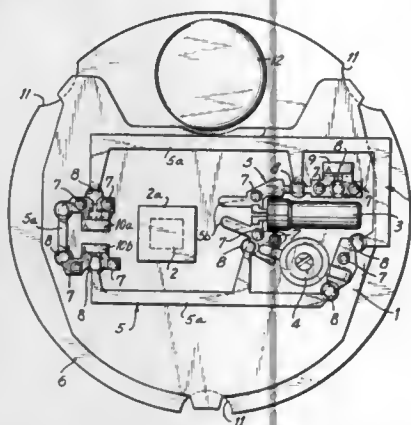
Filed Oct. 6, 1977, Ser. No. 839,866

Claims priority, application Japan, Oct. 6, 1976, 51/134475

Int. Cl.<sup>2</sup> G04B 37/00

U.S. Cl. 58—23 R

7 Claims



1. An electronic wristwatch comprising a watch case means formed with at least one opening, circuit structure means received in said watch case means, said circuit structure means comprising circuit base plate means having a thin film circuit deposited thereon and formed with at least one receiving opening and at least one cutting opening in a region of said circuit requiring electrical connection; lead plate means in registration with said circuit base plate means and adapted to provide said electrical connections, said lead plate means formed with at least one receiving opening to register with said circuit base plate means receiving opening and circuit case reinforcing means in registration with said circuit base plate means and formed with at least one projection in cooperation with said receiving openings formed in said circuit base plate means and lead plate means for securing said lead plate means and said circuit base plate means to said reinforcing means.

**4,164,844**  
**TIMEPIECE DISPLAY INDICATOR**  
Jean-Pierre Jaunin, Nidau, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Jul. 13, 1977, Ser. No. 815,398

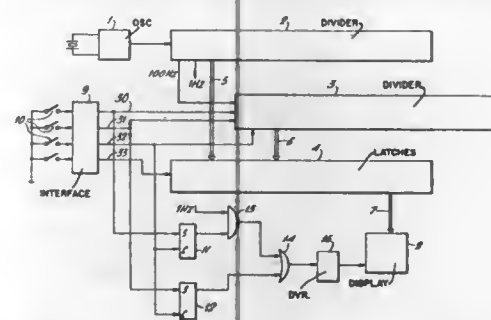
Int. Cl.<sup>2</sup> G04F 8/00, 7/04

U.S. Cl. 58—39.5

11 Claims

1. An electronic timepiece having control circuits arranged to drive a digital display so as to display selectively the passage of time (timepiece mode) or an interval of time (chronograph

mode) said control circuits including a time standard, dividing means and storage registers adapted to provide signals pertaining to each mode, decoder-driver means and a plurality of control switches, there being provided an indicator comprising signal emitting means coupled to the control circuits in a manner to indicate by a first output state that the chronograph



mode is disconnected and chronograph registers reset, by a second output state that counting in the chronograph mode is taking place and by a third output state that counting in the chronograph mode is stopped and that the registers remain set, the second and third output states being independent of which mode is being displayed.

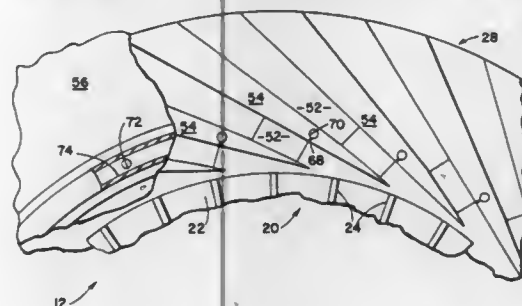
**4,164,845**  
**ROTARY COMPRESSORS**  
John T. Exley, Milford; Charles Kuintzle, Jr., Monroe, and David L. Tate, Stratford, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Continuation-in-part of Ser. No. 515,115, Oct. 16, 1974, abandoned. This application May 9, 1977, Ser. No. 795,058

Int. Cl.<sup>2</sup> F01D 1/06, 9/04

U.S. Cl. 60—39.29

4 Claims



1. A compressor stage for pressurizing compressible fluids, comprising:

a bladed radial flow impeller;  
an annular radial flow diffuser having its inner periphery closely surrounding the discharge end of said impeller, said diffuser including a vaneless annular entrance space for receiving the fluid discharged from said impeller, said entrance space being formed by spaced apart walls, said diffuser also including a plurality of intersecting passageways extending outwardly from said annular entrance space in a tangential direction from the inner periphery of said diffuser, said passageways being formed by wedge-shaped vanes symmetrically disposed between said spaced apart walls, each of said passageways having a rectangular cross section, including a convergent entrance portion followed by a throat section of constant cross section downstream of which is an area of expanding cross section extending toward the exhaust end of each of said passageways; and

flow equalizing means for stabilizing the flow of fluid through said diffuser passageways, said flow-equalizing means including elongated transverse slots formed in the

inward facing wall of each of said wedge-shaped vanes, said slot being located in the throat section of each of said passageways, the multiplicity of said slots being disposed along a line of equal pressure in said radial flow diffuser, a cavity in each of said vanes, each of said slots communicating with a respective one of said cavities, and a closed common manifold on one of said diffuser walls, each of said cavities communicating by means of openings through said wall with said common manifold, whereby all of the slots are placed in fluid communication with each other by way of the cavities and the common manifold thus serving to equalize the pressure in all of said passageway throat sections, thereby increasing the surge range of said compressor.

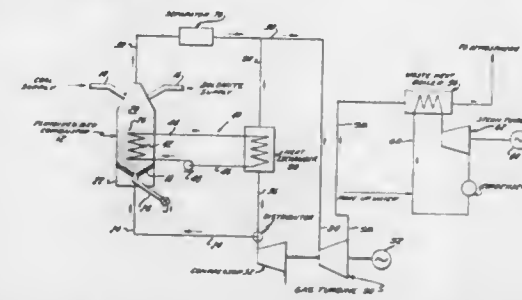
**4,164,846**  
**GAS TURBINE POWER PLANT UTILIZING A FLUIDIZED-BED COMBUSTOR**  
Seymour Moskowitz, Fort Lee, and Rossa W. Cole, E. Rutherford, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Nov. 23, 1977, Ser. No. 854,123

Int. Cl.<sup>2</sup> F02C 3/26

U.S. Cl. 60—39.46 S

5 Claims



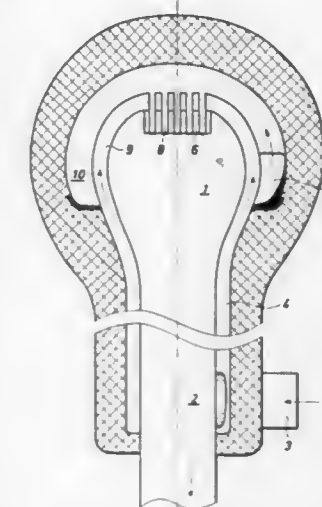
1. A gas turbine power system having a fluidized-bed combustor for the burning of coal therein, the system comprising:

- (a) a closed-loop, liquid-metal cooling system for the fluidized-bed combustor;
- (b) an air compressing means for compressing air to a high pressure;
- (c) conduit means for receiving the compressed air discharged from the air compressing means and for conducting such discharged compressed air in two streams, one stream thereof being conducted into said fluidized-bed combustor for fluidizing the bed and supporting combustion in the bed of the combustor and the other stream being conducted to the closed-loop cooling system;
- (d) a gas turbine for driving a power generating means;
- (e) discharge means connected to the fluidized-bed combustor for conducting the products of combustion from the fluidized-bed combustor to the gas turbine to drive the latter;
- (f) said closed-loop, cooling system having means for circulating liquid metal in indirect heat exchange relationship with the fluidized-bed combustor so as to absorb heat from the latter and the heated liquid metal in indirect heat exchange with said other stream of compressed air to surrender heat to the latter; and
- (g) a conduit means for conducting the heated compressed air from the closed-loop, liquid-metal cooling system to the discharge means and into admixture with the products of combustion at a point upstream from said gas turbine.

**4,164,847**  
**METHOD FOR COMBUSTION OF GASEOUS FUELS AND FLUE GASES**  
Svend B. Johansen, Calle Javier Vilanova 31, San Pedro de Premia, (Barcelona), Spain  
Continuation of Ser. No. 308,842, Nov. 22, 1972, abandoned.  
This application Mar. 4, 1976, Ser. No. 663,694  
Int. Cl.<sup>2</sup> F01N 3/10

U.S. Cl. 60—274

6 Claims



1. A method for the combustion of the exhaust gases from an internal combustion engine with air comprising feeding exhaust gas from an internal combustion engine and air along separate paths in heat exchange relation with one another towards a reaction chamber where combustion takes place and where heated products of combustion are conveyed for discharge, injecting said exhaust gas and said air into said reaction chamber to form a thin boundary layer therebetween, heating the exhaust gas and air in said separate paths by the heated products of combustion by heat exchange therewith such that the exhaust gas and air are each raised to a temperature of at least the ignition point of the gas-air mixture to cause a flameless surface combustion to take place in said thin boundary layer transmitting from said boundary layer additional combustion heat by respective heat exchange with the incoming gas and air immediately prior to and during their entry into the reaction chamber to insure that the gas and air are at least at the temperature of the ignition point, effecting a thermal reducing reaction of the exhaust gas in an inflow chamber in a first stage before combination of the exhaust gas with the air in the reaction chamber, and introducing said exhaust gas from the engine into said inflow chamber to produce rotation of the exhaust gas in said inflow chamber which draws the exhaust gas from the cylinders of the engine to effect dynamic scavenging thereof and serves as a flywheel with respect to evacuation of the exhaust gas from the engine, a predischage period and period of overlapping of the inlet and outlet valves of the engine being adapted to the flywheel effect of the rotating exhaust gas.

**4,164,848**  
**METHOD AND APPARATUS FOR PEAK-LOAD COVERAGE AND STOP-GAP RESERVE IN STEAM POWER PLANTS**  
Paul V. Gilli, Obere Teichstrasse 21/1, 8010 Graz, and Georg Beckmann, Vienna, both of Austria, assignors to Paul Viktor Gilli, Graz, Austria

Filed Dec. 21, 1976, Ser. No. 752,861

Int. Cl.<sup>2</sup> F01K 3/00

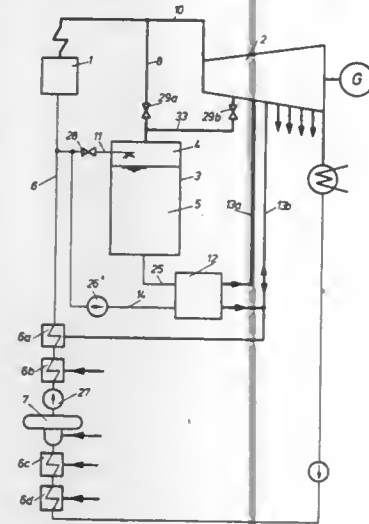
U.S. Cl. 60—652

29 Claims

1. An arrangement for energy storage for peak load cover-



age and reserve in a steam power plant, comprising: live steam generator means; a steam turbine connected to said live steam generator means by a live steam line; a storage vessel with steam cushion volume and water content volume; a secondary steam generator with at least one stage; means for connecting said water content volume of said storage vessel to said secondary steam generator; a working steam line connecting said secondary steam generator on the steam side to said steam



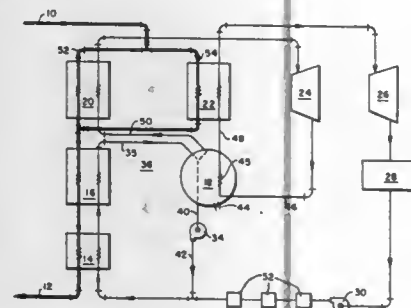
turbine; a feed water line; a cold water reservoir; a hot-water return line connecting said secondary steam generator on the water side to said feed water line and said cold water reservoir, said cold water reservoir being connected to said feed water line; a superheater; an auxiliary steam line connecting said steam cushion volume of said storage vessel to a point of the main steam cycle of the plant upstream of the entry point of said working steam line and to said live steam line following said superheater.

#### 4,164,849 METHOD AND APPARATUS FOR THERMAL POWER GENERATION

James D. Mangus, Hempfield Township, Westmoreland County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Sep. 30, 1976, Ser. No. 728,478  
Int. Cl.<sup>2</sup> F01K 7/22

U.S. Cl. 60—679

11 Claims



1. Apparatus for thermal power generation comprising:
  - a. a circulating vaporizable utilization fluid,
  - b. an evaporator wherein said fluid is vaporized,
  - c. a drum wherein liquid is separated from said vaporized fluid so as to form a liquified portion and a saturated vapor portion,
  - d. a superheater wherein said vapor portion is superheated,
  - e. a first expansion means wherein said superheated fluid is expanded,
  - f. heat exchange means wherein said expanded fluid is in heat

exchange relation with fluid from one of said evaporator, said drum, and said superheater, and is preheated, subsequent to said expansion.

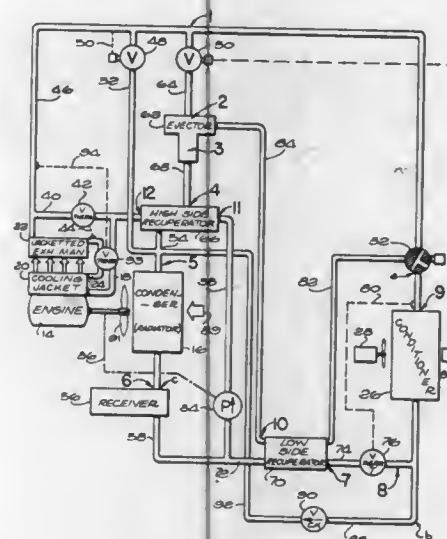
- g. a reheater wherein said preheated fluid is resuperheated,
- h. at least one second expansion means wherein said resuperheated fluid is expanded,
- i. a condenser wherein said last-named fluid is condensed, and
- j. means to combine liquid from said liquified portion and said condensed fluid prior to entry into said evaporator.

#### 4,164,850 COMBINED ENGINE COOLING SYSTEM AND WASTE-HEAT DRIVEN AUTOMOTIVE AIR CONDITIONING SYSTEM

Alvin Lowi, Jr., 2146 Toscanini Dr., San Pedro, Calif. 90732  
Filed Nov. 12, 1975, Ser. No. 631,023  
Int. Cl.<sup>2</sup> F25B 27/02, 14/04

U.S. Cl. 62—196 C

14 Claims



1. An automotive engine cooling and air conditioning cooling and heating system for utilizing otherwise wasted heat from an engine to vaporize refrigerant fluid, comprising:

a closed fluid circuit means;  
an automotive engine including a cooling jacket therefor; refrigerant engine cooling fluid in said circuit means;  
condenser means for condensing vaporized refrigerant fluid; means for delivering condensed refrigerant fluid from said condenser means to and through said engine cooling jacket whereby to cool said engine and vaporize said fluid; means including an aspirator for conveying vaporized refrigerant fluid from said engine to said condenser;  
conditioner means, comprising means for passing air in heat exchange relation with said refrigerant fluid to effect heating and cooling; and  
means for diverting at least a portion of said refrigerant fluid from said cooling jacket directly to said condenser means in response to a predetermined pressure level in said circuit means whereby to maintain the temperature of said cooling jacket below a predetermined temperature.

#### 4,164,851 BEVERAGE CONTAINER COOLER

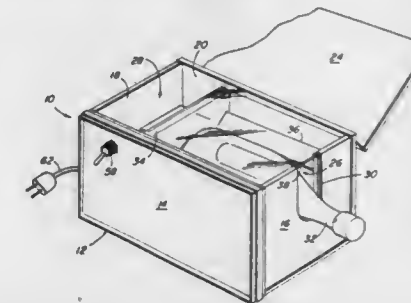
Jon A. Bryant, P.O. Box 3, Forestdale, Vt. 05745  
Filed Dec. 19, 1977, Ser. No. 846,484  
Int. Cl.<sup>2</sup> F25D 25/02

U.S. Cl. 62—381

3 Claims

1. A beverage container cooler for rapid chilling of beverages within containers comprising:

- a housing having four side walls, a base and a top hinged along one side wall;
- a cooling compartment within said housing having four transparent side walls, a base and a removable cover, said cooling compartment being watertight;
- a mechanical compartment within said housing adjacent to said cooling compartment;
- a pair of cylindrical rollers mounted near the base of the side walls of said cooling compartment such that the longitudinal axis of each of said roller is in the horizontal plane and such that each of said rollers can rotate freely within the cooling compartment;
- said rollers being spaced apart sufficiently to support a cylindrical container placed between them;
- said rollers having longitudinal drive shafts extending through a side wall separating said cooling compartment from said mechanical compartment;



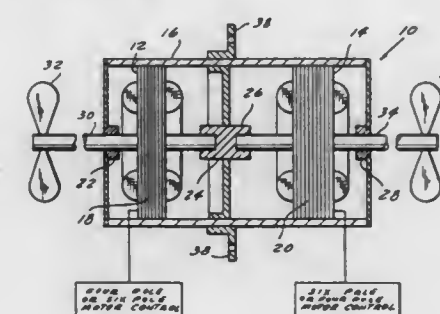
- an angularly disposed ice retaining strip mounted on the rear wall of said cooling compartment sloping downwardly and inwardly to retain a cooling substance in frictional contact with a cylindrical beverage container horizontally positioned on said rollers;
- an electrical motor mounted in said mechanical compartment;
- a drive shaft extending from said electrical motor;
- a drive gear mounted on said drive shaft;
- one gear mounted on the drive shaft of each of said roller shafts in said mechanical compartment;
- said gear on said motor shaft engaging said gears on said roller shafts;
- means for connecting said motor to a source of electrical energy;
- an on-off switch to control said motor.

#### 4,164,852 FAN MOTOR UNIT FOR ROOM AIR CONDITIONER

Carmen J. Anzalone, Old Bridge, N.J., assignor to Fedders Corporation, Edison, N.J.  
Filed Jan. 26, 1978, Ser. No. 872,365  
Int. Cl.<sup>2</sup> F25D 17/06

U.S. Cl. 62—429

13 Claims



1. In an improved air conditioning unit of the type having a compressor circuit including a condenser coil, an evaporator coil and a compressor and wherein air, from which heat is to be

removed, is forced over the evaporator coil by an evaporator coil fan driven by an evaporator coil fan motor, and air, which is to remove heat from the unit, is forced over the condenser coil by a condenser coil fan driven by a condenser coil fan motor, the improvement comprising:

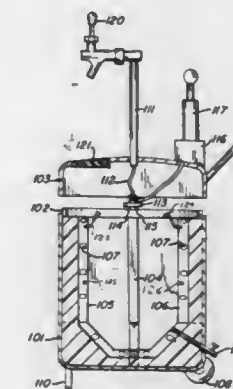
- a unitary motor housing adapted for mounting in said unit, said evaporator coil fan motor and said condenser coil fan motor being individually formed in said unitary motor housing whereby both said motors will be simultaneously mounted when the housing is mounted; and
- control means operable to maintain operation of the air conditioning unit under high ambient temperature conditions by reducing the load on the compressor circuit, said control means comprising separate motor controls for said evaporator coil fan motor and said condenser coil fan motor and being responsive to high ambient temperature conditions to reduce the speed of the evaporator coil fan motor independently of the control of the speed of the condenser coil fan motor.

#### 4,164,853 COOLER

John McDonough, 1820 Dagmar Ave., Pittsburgh, Pa. 15216  
Filed Mar. 30, 1977, Ser. No. 782,933  
Int. Cl.<sup>2</sup> F25D 3/08

U.S. Cl. 62—457

5 Claims



1. A cooler for barrels of beer comprising:
  - a container to support, and having sufficient volume to envelope, a barrel of beer and adapted to contain a cooling media, said container having separable top and bottom sections which are removably sealable to isolate the barrel of beer from the atmosphere;
  - means for thermally insulating the interior of said container from the outside atmosphere;
  - means for manually pressurizing the barrel of beer external to said container including an air holding chamber in communication with said barrel of beer;
  - pressure regulation means associated with said air holding tank which maintains the pressure within said barrel at a predetermined level;
  - means for withdrawing the beer external to said container, while said top and bottom sections are sealed; and
  - said cooler being self-contained and portable.

#### 4,164,854 DESALINATION METHOD WITH MERCURY REFRIGERANT

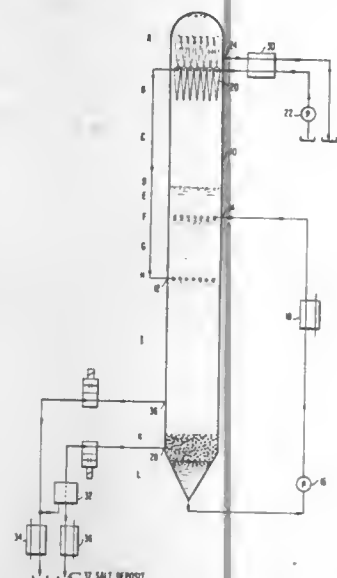
John K. Martin, Monterrey, Mexico, assignor to Fabricacion de Maquinas, S.A., Monterrey, Mexico  
Filed Nov. 23, 1977, Ser. No. 854,473  
Int. Cl.<sup>2</sup> B01D 9/04

U.S. Cl. 62—536

3 Claims

1. A freezing process for obtaining pure water from salt water comprising:

feeding salt water to a vertically arranged elongated closed tank to establish a column of salt water therein, the level of which is above the feed point; continuously cooling a body of mercury externally of said tank, and injecting said mercury in the form of finely atomized particles into the upper portion of said liquid column, withdrawing said mercury from the bottom of said tank and recirculating said mercury through said liquid column to maintain the column at a temperature which is subcooled with respect to the salt water infeed so that the infeed has ice crystals formed therein due to contact with the subcooled column;



permitting the ice crystals to accumulate and form a solid block of ice in the upper portion of said tank above the level of mercury injection; moving said block of ice upwardly in said tank by hydraulic pressure of incoming salt water and melting the upper portion of said block of ice by indirect heat exchange with the salt water feed prior to entry of said feed into said column and withdrawing pure water from the upper portion of the tank between the top of said tank and the top of said ice block; and withdrawing concentrated salt water and precipitated salts collected above the mercury from the lower portion of said tank.

4,164,855

## SEGMENTED DRIVING SHAFT

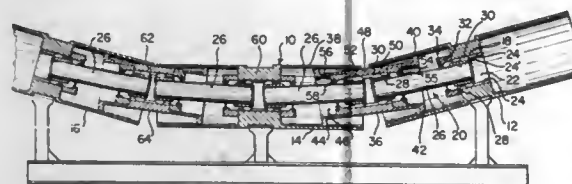
Michael M. Calistrat, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1978, Ser. No. 932,343

Int. Cl.<sup>2</sup> F16C 1/02

U.S. Cl. 64—2 P

2 Claims



1. An improved segmented driving shaft, said shaft driven by a powered prime mover, comprising:  
(a) a plurality of operably connected driven roll members, said rolls having an inner axial bore, the first of said driven roll members being operably connected to said prime mover.  
(b) a plurality of alignment tube members inserted in and in

contact with adjacent ends of said rolls to form a continuous segmented shaft, said tube members having an inner axial bore.

(c) internal gear teeth means formed within said axial bores of said roll members and said tube members.  
(d) a plurality of shaft means extending within said axial bores of said roll and tube members having external gear teeth thereon, said external gear teeth of said shafts adapted to mesh and coact with said internal gear teeth, of said roll and tube members said shafts means adapted to transmit torque from one of said roll members to the adjacent roll members.

4,164,856

## YARN END COLLECTION

Arthur R. Smith, Leicester, England, assignor to Wildt Mellor Bromley Ltd., Leicester, England

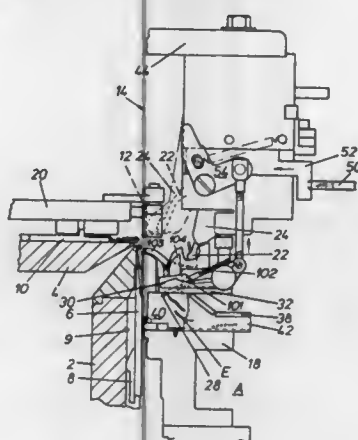
Filed Oct. 31, 1977, Ser. No. 846,905

Claims priority, application United Kingdom, Nov. 10, 1976, 46761/76

Int. Cl.<sup>2</sup> D04B 15/60

U.S. Cl. 66—140 R

9 Claims



7. A stripper for use in circular knitting machines of the type having a cylinder carrying needles and having an aperture for directing air outwardly from the cylinder, said stripper comprising a front and a rear, the front capable of being mounted in proximity to the cylinder of the circular knitting machine, a plurality of yarn feeding fingers moveable into and out of a feeding attitude, a trapping mechanism for entrapment of ends of yarn not being fed, a cutting mechanism for severing yarn previously fed to enable the yarn to be trapped and for severing yarn newly fed to the needles of the cylinder to free the yarn from entrapment, said stripper having a guide passage extending substantially from the front to the rear of the stripper, said passage having side and bottom surfaces and open at the top to receive yarn ends dropping from the cutting and trapping mechanisms, said passage open at the front and rear of the stripper to permit the removal of yarns from the guide passage by the flow of air from the aperture.

4,164,857

## PLUGLESS PIN TUMBLER CYLINDER

Joseph M. Genakis, 948 W. Boylston St., Worcester, Mass. 01606

Filed Apr. 7, 1977, Ser. No. 785,655

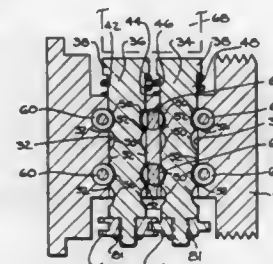
Int. Cl.<sup>2</sup> E05B 19/00, 21/00, 35/04

U.S. Cl. 70—352

7 Claims

1. A plugless cylinder lock comprising:  
a lock housing means defining a plurality of parallel pinways and a keyway communicating therewith;  
a locking selector rectilinearly movable in said housing between open and closed positions in a direction transverse to said pinways;

a pin disposed in each of said pinways and each movable from locking positions to a selective release position by engagement with a properly bitted key in said keyway, said housing means preventing movement of said pins in the direction of movement of said selector, and said pins and said selector being shaped and arranged to engage and prevent said movement of said selector with said pins in



said locking positions and to disengage so as to permit said movement of said selector with said pins in said release positions, said pins and said selector being further shaped and arranged to engage in response to movement of said selector out of said open position and thereby prevent said movement of said pins; and means for moving said selector into said open position upon insertion of a proper key in said keyway.

4,164,858

## ROLLING MILL WITH ROLL BENDING UNIT

Gordon D. Holmes, Worksop, England, assignor to Davy-Loewy Limited, Yorkshire, England

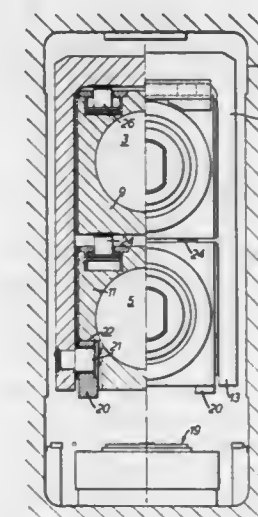
Filed Jun. 23, 1978, Ser. No. 918,543

Claims priority, application United Kingdom, Jun. 24, 1977, 26633/77

Int. Cl.<sup>2</sup> B21B 29/00

U.S. Cl. 72—237

6 Claims



1. An assembly for use in a rolling mill, said assembly comprising first and second rolls each having a roll barrel, a roll neck at each end having a first bearing chock inboard of said each end and a further bearing chock on an extended portion of each neck positioned outwardly of the first bearing chock, the rolls being arranged one above the other with their longitudinal axes parallel, each of the two further chocks on the first roll having a reaction member positioned on the side of the corresponding further chock of the second roll which is remote from the first roll, fluid operable means positioned between the corresponding further chocks of the two rolls and arranged so that on being actuated the separation of the further chocks is increased and fluid operable means positioned between the reaction member and the further chocks of the second roll and

arranged so that on being actuated the separation of the further chocks is reduced.

4,164,859

## WIRE ACCUMULATOR

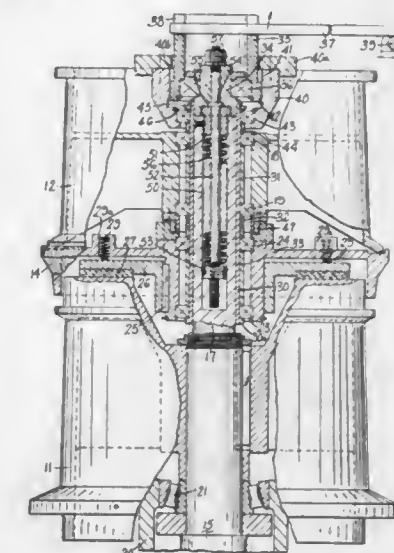
Wilhelm A. Steinhilber, Guilford, Conn., assignor to Orion Machinery and Engineering Corporation, Branford, Conn.

Filed Dec. 5, 1977, Ser. No. 857,572

Int. Cl.<sup>2</sup> B21C 1/14

U.S. Cl. 72—289

8 Claims



1. In a double block accumulator of the type comprising a driven lower block for drawing wire and an upper coaxial block rotatable relative to the lower block where the wire is first wound on the lower block and then wound on the upper block in the reverse direction, pressure responsive frictional coupling means disposed between said blocks, and means for varying the coupling pressure on said coupling means; said means for varying the pressure being effective to vary the pressure at a predetermined rate with movement thereof, and means for limiting the coupling pressure that can be applied to said coupling means by said varying means to a predetermined value while still permitting relative rotation between said upper and lower blocks.

4,164,860

## INTERNAL GASEOUS FLUID STRIPPER FOR CAN BODYMAKERS AND THE LIKE

Rimvydas A. Kaminskas, Palos Verdes Estates, Calif., assignor to Standun, Inc., Compton, Calif.

Filed Jun. 3, 1976, Ser. No. 692,505

Int. Cl.<sup>2</sup> B21D 45/00

U.S. Cl. 72—345

26 Claims

1. In an internal stripper for apparatus having a reciprocal ram for carrying an article positioned over a forward end portion and end surface of said ram through die means for shaping said article to form a cup-shaped article which in final form on said ram has a predetermined volume including a predetermined side wall axial length closely abuttingly conforming to said ram forward end portion and which is then stripped from said ram, and wherein said apparatus includes means for reciprocating said ram such that said forward end portion thereof is carried between a position spaced from the inlet end of said die means and a position spaced a predetermined distance from the outlet end of said die means at least equal to said predetermined side wall axial length of said cup-shaped article; the combination of:

a cavity in said ram having a permanent preset total volume, said cavity being constructed and arranged free of reduction of said preset volume and free of appreciable pressur-

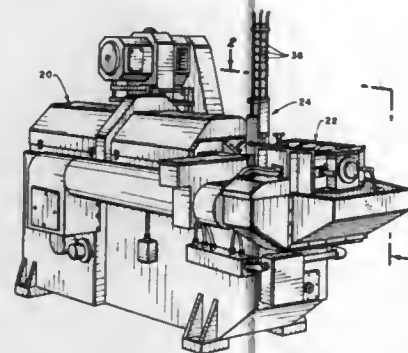


ized gas flow restriction forwardly of said ram within said cavity at least prior to and through stripping of said article from said ram;

opening means between said cavity and said ram end surface sized sufficiently to at all times permit a relatively free unobstructed flow of pressurized gas from said cavity through said ram end surface and internally against said article to subject said article internally to said cavity permanent preset total volume throughout said article stripping; and

a pressurized gas supply means operably connected to said cavity and including control means constructed and arranged to fill said cavity total volume with pressurized gas at a predetermined pressure above atmospheric pressure at least immediately prior to commencement of stripping of said article from said ram, said control means during article stripping also being constructed and arranged to effectively restrict any further pressurized gas flow into said cavity to a preset added amount;

said predetermined pressure of pressurized gas and said preset added amount of further pressurized gas flow in



said cavity as regulated by said control means being such that, during progressive stripping of said finally formed cup-shaped article of predetermined volume and side wall axial length from said ram progressively adding increasing parts of said article volume to said cavity volume for mutual containment of said gas while resultantly constantly progressively reducing pressure of said gas so contained, the progressively reducing gas pressure mutually contained in said cavity and article volumes during stripping of said cup-shaped article from said ram will be maintained above atmospheric pressure and against escape by said cup-shaped article predetermined side wall axial length throughout said article stripping and until said cup-shaped article is actually separating from said ram forward end portion, the regulation by said control means of said predetermined pressure of pressurized gas and preset added amount of further pressurized gas flow in said cavity being such that the progressively reduced gas pressure in said cavity volume and article volume is not less than atmospheric pressure at the time of complete stripping of said cup-shaped article from said ram.

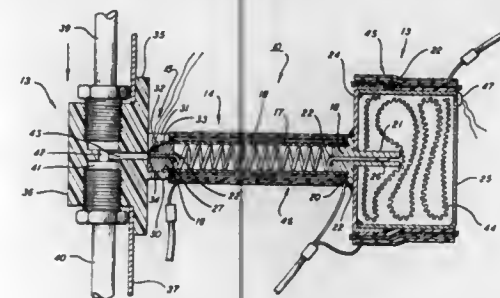
**4,164,861**  
**LEAK STANDARD GENERATOR**  
Fritz H. Schlereth, Baldwinsville, and Michael J. Morgan, Syracuse, both of N.Y., assignors to Inficon Leybold-Heraeus Inc., East Syracuse, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,768  
Int. Cl.<sup>2</sup> B01B 17/00

U.S. Cl. 73-1 G 16 Claims

1. A leak standard generator including a discharge head for passing a metered flow of diluent gas therethrough, a sealed reservoir containing a leak sample, a diffusion tube extending between the reservoir and the discharge head, said tube being of a predetermined length

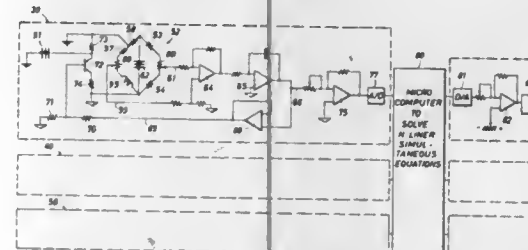
and a uniform cross sectional area such that the diluent gas being metered through the discharge head is allowed to pass freely into the tube to at least partially fill said tube, and heater means operatively associated with the reservoir for



maintaining the reservoir at a desired temperature level to at least partially vaporize said leak sample whereby the vapor of the sample generated in the reservoir diffuses through the diluent gas contained in said tube at a controlled rate and is discharged into the flow of diluent gas passing through said discharge head.

**4,164,862**  
**MULTICOMPONENT THERMAL CONDUCTIVITY ANALYZER**  
Milton L. Jackson, Drawer 90,000 G, Houston, Tex. 77090  
Filed Nov. 25, 1977, Ser. No. 854,817  
Int. Cl.<sup>2</sup> G01N 25/18

U.S. Cl. 73-27 R 13 Claims



1. A method of solving for the relative concentrations of constituents in a specimen where the constituents have different coefficients of thermal conductivity and the number of constituents is represented by N, the method comprising the steps of:

- (a) conducting a specified flow of the sample past a thermal conductivity detector means in a chamber which means is maintained at a specified temperature in a testing circuit which circuit forms an output signal  $V_N$  proportional to the rate at which heat in said detector means is varied with changes in thermal conductivity and which output signal is obtained during the flow of the specimen therepast;
- (b) obtaining a set of N calibration output signals  $C_N$  from pure constituents of the specimen flowing past the detector means;
- (c) operating a chamber and associated detector means at N different temperature levels to obtain therefrom  $N \times N$  calibration output signals  $C_{NN}$  on flowing the specified flow of sample therepast;
- (d) solving N simultaneous equations to obtain the relative measures of N constituents in the specimen by using the output signals and calibration signals in the following relationship:

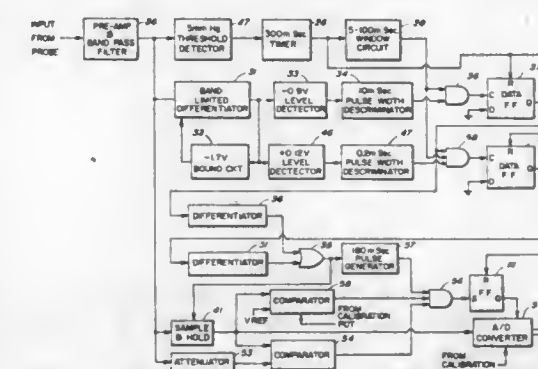
$$V_1 = C_{11}A + C_{12}B \dots$$

$$V_N = C_{N1}A + C_{N2}B \dots$$

**4,164,863**  
**SYSTEM AND METHOD FOR ANALYZING TONOSIGNALS**  
Charles W. Ragsdale, Garden Grove, Calif., assignor to Cavitron Corporation, New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,584  
Int. Cl.<sup>2</sup> A61B 3/16

U.S. Cl. 128-652 24 Claims



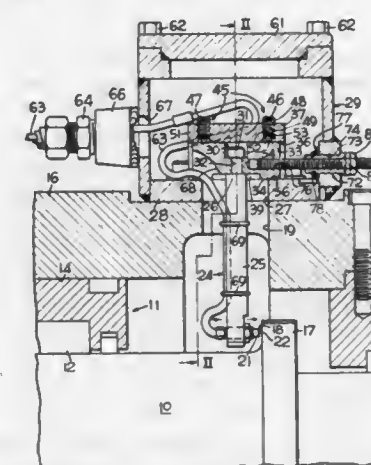
21. In a system for analyzing an electrical probe signal representative of force-displacement information from an applanating probe:

- A. Means for monitoring said probe signal to determine whether the following conditions are satisfied:
  1. Said probe signal reaches a predetermined threshold level at least a predetermined minimum time after any previous reaching of said level,
  2. The level of the probe signal changes at a positive rate which decreases within a predetermined time window which commences a predetermined time after said threshold level is reached,
  3. The decreased rate of change continues for a predetermined period of time within said time window; and
- B. Means active upon satisfaction of all of said conditions for providing an output signal corresponding to the level of said probe signal at the time said conditions are satisfied.

**4,164,864**  
**METHOD AND APPARATUS FOR SUPPORTING A SENSOR IN A NORMALLY INACCESSIBLE AREA OF A MACHINE**  
Thomas R. Feller, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 31, 1978, Ser. No. 929,649  
Int. Cl.<sup>2</sup> G01M 13/00

U.S. Cl. 73-118 8 Claims



1. In a method of supporting a sensor within a normally inaccessible area of an operative machine to pick-up the axial

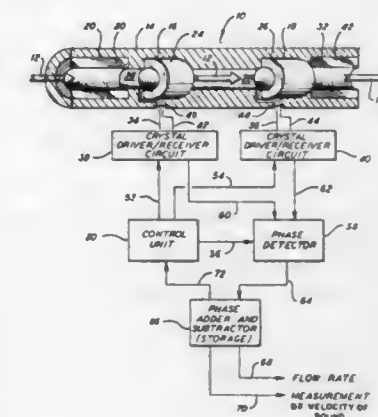
float of a rotating shaft, the axial end face of which cannot be sensed, comprising the steps of:

- suspending the sensor on the end of a support;
- inserting the support into the normally inaccessible area of the machine without displacing portions of the machine in position to locate the sensor adjacent to a portion of the shaft other than the axial end face thereof adaptable to continuous axial position monitoring;
- providing adjusting means external of the machine for adjusting the position of the sensor with respect to the shaft portion which it is monitoring.

**4,164,865**  
**ACOUSTICAL WAVE FLOWMETER**  
Lawrence G. Hall, and Robert S. Loveland, both of West Covina, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 770,677, Feb. 22, 1977, abandoned.  
This application Jul. 24, 1978, Ser. No. 927,270  
Int. Cl.<sup>2</sup> G01F 1/66

U.S. Cl. 73-194 A 30 Claims

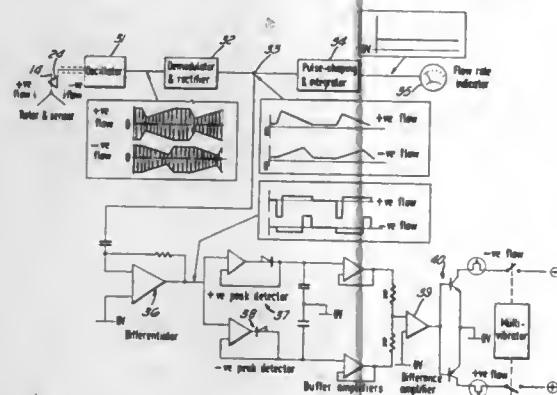


1. A meter for measuring the flow of a fluid along a path comprising, in combination:
  - transducer means for transmitting acoustic compression waves upstream and downstream in a fluid flowing in said path;
  - means for measuring the phase difference between two spaced points in the fluid flow path of the acoustic compression waves transmitted upstream and means for measuring the phase difference between two spaced points in the fluid flow path of the acoustic compression waves transmitted downstream;
  - means for producing a difference signal dependent on the difference between the two phase differences, the magnitude and sign of which being directly related to the instantaneous fluid flow rate and its direction;
  - means for automatically adjusting the frequency of the acoustic compression waves to a frequency where a fixed wavelength distance, in the fluid flow medium, occurs across the path of the transducer means, thereby maintaining operation at the acoustic resonance to maximize the magnitude of the received signal.

**4,164,866**  
**APPARATUS FOR MONITORING AMOUNT AND DIRECTIONS OF FLUID FLOW IN FLUID POWER SYSTEMS**  
Henry M. Mitchell, Alloway, Scotland; John Elias, Llanerchymedd, and John Moorcroft, Llanfairfechan, both of Wales, assignors to Mannin Industries Ltd., Castletown, Isle of Man  
Filed Apr. 5, 1978, Ser. No. 893,269  
Int. Cl.<sup>2</sup> G01F 1/10

- U.S. Cl. 73-231 R 3 Claims
1. A standard fitting for permanently connecting together an

appliance and a pipe in a fluid power system, the standard fitting comprising a tubular body having coupling portions at opposite ends thereof, an annulus fitted within said tubular body and carrying a rotor having blades, said tubular body and said annulus each having an opening therethrough which openings are aligned transversely of the axis of rotation of the rotor, an electrically-insulating sealing sleeve received within the pair of said aligned openings, and an electrically conductive plug fitted within said sleeve and presenting inner and outer end faces, the inner end face of said plug being triangular with one side arranged substantially parallel with the end face of each said blade of said rotor when such blade is in the



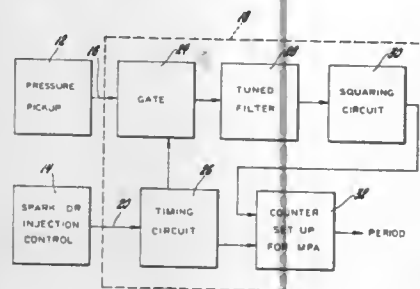
vicinity of said inner end face and the outer end face of said plug being provided for temporary contact with a probe terminal of a portable unit comprising the remainder of an electrical circuit in which said rotor and said plug together constitute a cyclically variable capacitor such that as each said blade of said rotor traverses the inner end face of said plug in one direction the capacity increases from a minimum value to a cut-off at a maximum value and as each said blade of said rotor traverses the inner end face of said plug in the opposite direction the capacity decreases from a cut-in at said maximum value to said minimum value, whereby the opposite direction of rotation of said rotor may be differentiated.

4,164,867

**METHOD OF MEASUREMENT OF BULK  
TEMPERATURES OF GAS IN ENGINE CYLINDERS**

Robert Hickling, Huntington Woods; James A. Hamburg, Southfield; Douglas A. Feldmaier, Birmingham, and Jing-yau Chung, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1978, Ser. No. 937,066  
Int. Cl.<sup>2</sup> G01K 1/02  
U.S. Cl. 73—346



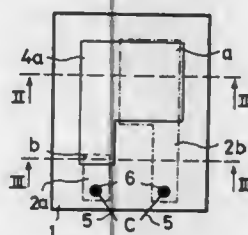
1. The method of measuring the bulk temperature of gas in the combustion chamber of an internal combustion piston engine during combustion comprising the steps of operating an internal combustion piston engine to produce knock, sensing the high frequency pressure oscillation occurring in

the combustion chamber during a knock event to provide an electrical signal representing such oscillation, detecting in the electrical signal frequencies representing the lowest mode resonance of the pressure oscillation, and measuring the frequencies of the lowest mode resonance signal whereby each such frequency constitutes a measure of the bulk temperature of the gas in the combustion chamber at a given time.

4,164,868  
CAPACITIVE HUMIDITY TRANSDUCER  
Tuomo S. Suntola, Espoo, Finland, assignor to Vaisala Oy,  
Finland

Continuation-in-part of Ser. No. 403,896, Oct. 5, 1973,  
abandoned. This application Jul. 22, 1975, Ser. No. 598,034  
Claims priority, application Finland, Oct. 12, 1972, 2831/72  
The portion of the term of this patent subsequent to Jun. 10,  
1994, has been disclaimed.

Int. Cl.<sup>2</sup> G01N 25/64; H01G 7/00  
U.S. Cl. 73—336.5

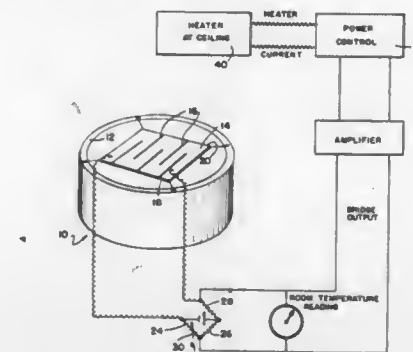


1. In a capacitive humidity transducer, electrically non-conductive base means having an outer supporting surface, at least a pair of electrically conductive coatings carried by said base means at said outer supporting surface thereof, said electrically conductive coatings being spaced from each other and being passive with respect to water absorption, dielectric film means also carried by said surface of said base means, said dielectric film means covering at least a portion of said electrically conductive coatings and being composed at least in part of a film which is active with respect to water absorption and which has a dielectric constant which changes as a function of the amount of water absorbed thereby, and an outer, thin, electrically conductive, water-permeable layer carried on the outer surface of said dielectric film means, said layer because of its water permeability permitting moisture in the atmosphere to reach said dielectric film means which is situated at least in part between said electrically conductive coatings and said electrically conductive water permeable layer, said dielectric film means maintaining said electrically conductive water permeable layer out of contact with at least a portion of one of said electrically conductive coatings to form a capacitor therebetween, another portion of said electrically conductive coatings and a portion of said electrically conductive water permeable layer being in contact with each other to form an electrical connection so that said capacitor can be connected to measuring means for indicating atmospheric humidity, said capacitor being supported in its entirety by said base means which provides a stable support for said capacitor enabling said dielectric film means to provide a rapid response to changes in humidity under a wide variety of atmospheric conditions.

4,164,869  
THERMOSTAT SYSTEM FOR RADIANT ROOM  
HEATING  
Theodor H. Benzinger, 6607 Broxburn Dr., Bethesda, Md.  
20014

Continuation-in-part of Ser. No. 808,936, Jun. 22, 1977,  
abandoned. This application Sep. 12, 1977, Ser. No. 832,759  
Int. Cl.<sup>2</sup> G01J 5/20, 5/24

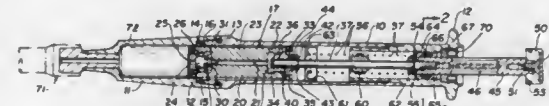
U.S. Cl. 73—355 R 12 Claims



1. A thermostat system for radiant room heater system comprising a receiver of thermal radiation constructed and arranged having means sensitive to air temperature and to air convection, said receiver consisting of a thin film deposit of material of a high temperature coefficient of electrical resistance and forming one arm of a Wheatstone bridge, the other arms of which being substantially insensitive to temperature, said materials being supported on a film of electrically insulating material, said deposit having a plane surface area of precisely defined size and absorptive for infrared radiation and facing a two-Pi hemispherical environment.

4,164,870  
PIPETTES  
Emil A. Scordato, Bronxville, and Hugh W. Pratt, Pelham  
Manor, both of N.Y., assignors to Medical Laboratory Auto-  
mation, Inc., Mount Vernon, N.Y.

Filed Apr. 10, 1978, Ser. No. 895,127  
Int. Cl.<sup>2</sup> B01L 3/02



1. A pipette comprising: barrel means having a nozzle end; piston means reciprocably movable in said barrel means, the periphery of said piston means being spaced from the internal wall of said barrel means to provide an air space around said piston means, said piston means being provided with an internal air passageway leading from said peripheral air space to the end of said piston means facing the nozzle end of said barrel means; valve means for closing said air passageway; first sealing means mounted on the end of said piston means remote from the nozzle end of said barrel means to provide an air-tight seal between said piston means and the internal wall of said barrel means, said first sealing means defining one end of an air chamber that includes the peripheral air space around said piston means; second sealing means mounted in said barrel means to cooperate with the end of said piston means proximate to the nozzle end of said barrel means and provide an air-tight seal between said piston means and said barrel means, said second sealing means defining a second end of the aforesaid air chamber; means connected to said piston means for reciprocating said piston means and said first sealing means within said barrel means between a first and a second limiting

position; and an air vent through the wall of said barrel means from said air chamber to the exterior of said barrel means, said air vent being located between said first and said second sealing means when said piston means is in its first limiting position, and being further located so that when said piston means is moved from its first to its second limiting position said first sealing means traverses the air vent to seal the aforesaid air chamber and thereafter compress the air therein.

4,164,871  
PUSH DRILL GUIDANCE INDICATION APPARATUS  
Charles F. Cole, and Jimmie H. Elenburg, both of Ponca City,  
Okla., assignors to Continental Oil Company, Ponca City,  
Okla.

Filed Mar. 30, 1978, Ser. No. 891,679  
Int. Cl.<sup>2</sup> E21B 7/08



1. A remote guidance indication system for push drills of the type that are continuously controllable as to pitch and roll of the longitudinal axis in order to determine directivity, comprising:

first sensing means in said push drill generating a first output signal indicative of the push drill pitch;  
second sensing means in said push drill generating a second output signal indicative of the push drill roll;  
radiation sensing means responsive to natural radioactivity emanating from space adjacent said push drill and generating a rate signal proportional to radiation count rate, said radiation sensing means including a gamma ray counter means providing count pulse output and means for amplifying and integrating said pulse output to provide a signal having an amplitude indicative of gamma ray count per unit time; and  
remote operating means connected to receive said first and second output signals and said rate signal to provide indication enabling remote guidance control of said push drill.

4,164,872  
METHOD FOR DETERMINING SPINNING OR  
SLIPPING OF THE WHEELS IN PROPULSION  
VEHICLES WITHOUT DEAD AXLES

Karlheinz Weigl, Erlangen, Fed. Rep. of Germany, assignor to  
Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Filed Feb. 2, 1978, Ser. No. 874,556  
Claims priority, application Fed. Rep. of Germany, Feb. 18,  
1977, 2707047

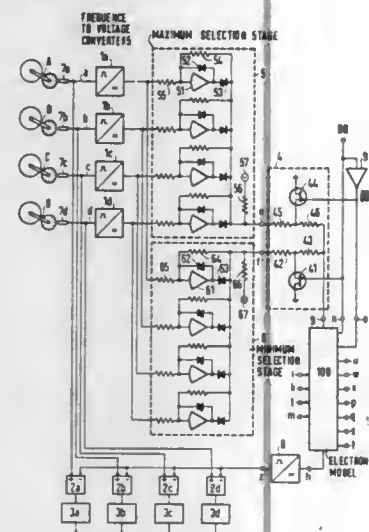
Int. Cl.<sup>2</sup> G01P 3/50; B61C 15/08  
U.S. Cl. 73—510

1. A method for determining spinning and slipping of the wheels in propulsion vehicles without dead axles, particularly rail propulsion vehicles, comprising:

- (a) measuring the wheel velocities of all axles;
- (b) determining the highest and the lowest wheel velocity of the measured wheel velocities of all axles;
- (c) in the presence of a braking command selecting the highest wheel velocity and otherwise selecting the lowest wheel velocity for further use;
- (d) determining a simulated vehicle velocity from the selected wheel velocity, taking into consideration influence variables which cause acceleration or deceleration of the vehicle;
- (e) comparing the simulated vehicle velocity with the mea-



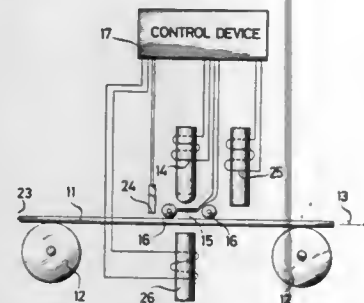
sured wheel velocities to determine the differences there-between; and



(f) converting the differences that occur into signals for influencing the drive or the braking device of the respective axle.

**4,164,873**  
**METHOD OF AND DEVICE FOR MATERIAL CHECKING BY ULTRA SOUND WHILE EMPLOYING AN ELECTRODYNAMIC SOUND CONVERTER**  
Wolfgang Böttcher, and Hermann-Josef Kopineck, both of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany  
Filed Sep. 27, 1977, Ser. No. 836,964  
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643601

Int. Cl.<sup>2</sup> G01N 29/04  
U.S. Cl. 73—643 7 Claims



1. A method of ultrasonically checking a moving workpiece utilizing an electrodynamic sound converter which includes an electromagnetic coil means for creating a magnetic field when energized and a high frequency coil for testing the workpiece magnetized by said electromagnetic coil means when energized by a current of varying amplitude, said method comprising: initiating operation of a control device when the amplitude of the current to said electromagnetic coil means reaches a given value to turn on energization of said high frequency coil for testing said workpiece and terminating operation of said high frequency coil when said amplitude falls below a given value.

**4,164,874**  
**FLAW GROWTH CORRELATOR**  
Gary G. Cassatt, and Richard J. Miller, both of Wichita, Kans., assignors to Boeing Wichita Company, Wichita, Kans.  
Filed Jan. 19, 1978, Ser. No. 870,616  
Int. Cl.<sup>2</sup> G01N 3/32

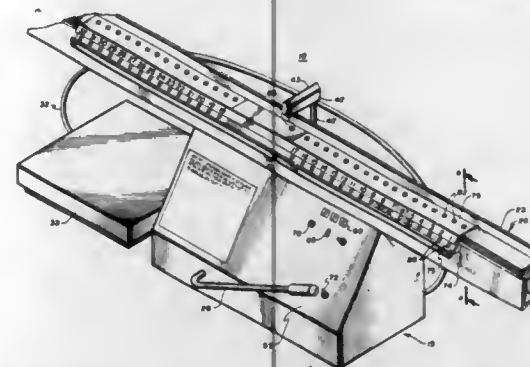
U.S. Cl. 73—799 15 Claims



1. A flaw growth correlator for monitoring flaw growth potential in a structural body, the correlator comprising:  
a flat metal gauge having a top, a bottom, sides, a first end portion, a second end portion, and a center portion, said gauge having a length (L), a width (W), and a thickness (T), the center portion including a necked down area across the width (W) of said gauge and having a thickness (X) less than (T); and  
a crack initiating stress raiser disposed in the necked down area of the center portion of said gauge; an aperture in the necked down area of the center portion of said gauge, said crack-initiating stress raiser extending outwardly from the side of said aperture.

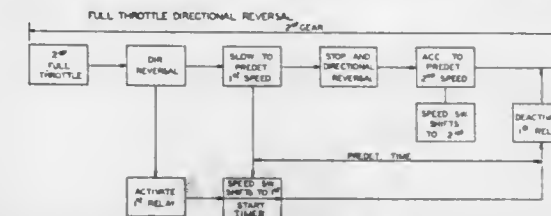
**4,164,875**  
**APPARATUS FOR MATCHING SKIS**  
Anthony M. Kantar, 6495 Barrie Rd., Minneapolis, Minn. 55435, and George E. Pribyl, 5106 W. 105th St., Minneapolis, Minn. 55437  
Filed Mar. 17, 1978, Ser. No. 887,484  
Int. Cl.<sup>2</sup> G01N 3/20

U.S. Cl. 73—812 16 Claims



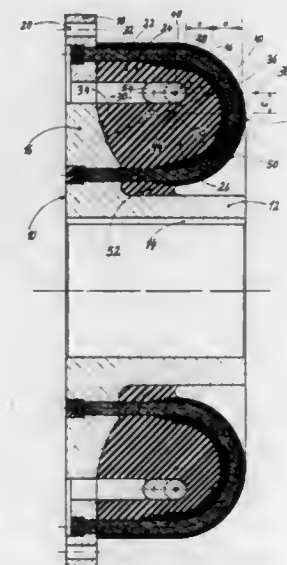
1. An apparatus for matching skis to the user and one of the pair of skis to the other, comprising: an elongated beam structure positioned on a frame and adapted to have a ski positioned thereon, pressure applying member movably mounted at a fixed location on the frame and movable toward and away from the beam structure to contact a ski thereon and flex the ski transversely while the ski is held against longitudinal movement relative to said frame, means including a pivoted lever mounted on the frame and connected to the pressure applying means to move the same, transducer means associated with said last named means to measure the force on the pressure applying member in flexing the ski at various positions along its length and means located along the length of the beam structure to indicate the extent of transverse flexure thereat while the ski is so held and flexed by said pressure applying member.

**4,164,876**  
**DOWNSHIFT INHIBITOR CIRCUIT**  
Jon H. Peppel, Horton, Mich., assignor to Clark Equipment Company, Buchanan, Mich.  
Filed May 9, 1977, Ser. No. 794,763  
Int. Cl.<sup>2</sup> B60K 41/18; F16H 3/08, 5/42, 5/68  
U.S. Cl. 74—336 R 10 Claims



1. In a transmission control system for a vehicle including a multiple speed ratio powershift transmission having a plurality of fluid pressure operated clutches, adapted to establish torque ratio changes; a source of pressurized fluid; a speed control cover including a manually-actuated control means and a speed control valve for controlling the flow of fluid to said clutches; an electronic speed sensing system; and downshift valve means, for automatically shifting said transmission from a higher speed ratio to a lower speed ratio at a first predetermined ground speed by diverting the fluid for pressurizing a higher speed ratio clutch to a lower speed ratio clutch and automatically shifting said transmission from said lower speed ratio back to said high speed ratio at a second predetermined ground speed by ceasing the diverting of said fluid, wherein the improvement comprises means for prohibiting automatic downshifts from said higher speed ratio to said lower speed ratio while said vehicle undergoes a rapid directional reversal.

**4,164,877**  
**COUPLING FOR THE VIBRATION-DAMPING TRANSMISSION OF TORQUES**  
Ilie Chivari, Berliner Strasse 1, 4690 Herne 2, Fed. Rep. of Germany  
Filed Jun. 6, 1977, Ser. No. 803,464  
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626414  
Int. Cl.<sup>2</sup> F16F 15/10; F16D 3/14  
U.S. Cl. 74—574 24 Claims

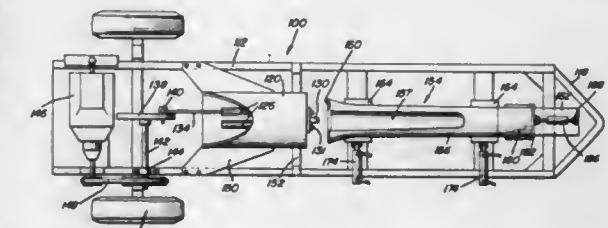


1. Coupling for the vibration-damping transmission of torques, comprising: an inner coupling member, which is provided with a substantially radial flange, and an annular outer coupling member, which surrounds the inner coupling member

substantially concentrically, an annular toroidal compression cushion of elastomeric material, which is U-shaped in longitudinal section and which is connected to the outer coupling member along its outer edge and with the flange of the inner coupling member along its inner edge, an annular chamber being defined inside the compression cushion, and a plurality of non-extensible ropes, which are each connected to the outer and to the inner coupling member, in uniform distribution along the periphery of the coupling members, and are arranged substantially in longitudinal planes forming rope loops around the annular toroidal compression cushion, the compression cushion being loaded and resiliently deformed by compression through the ropes under the action of a torque to be transmitted, when the coupling members are rotated relative to each other from a position of rest, characterized in that the compression cushion is a permanent shape rubber element having said annular, cylindrical chamber open towards one side in axial direction, said chamber being in communication with the atmosphere.

**4,164,878**  
**WELL DRILLING BIT DRESSING APPARATUS AND METHOD**  
John Herke, Rte. 5, Box 375, Yakima, Wash. 98902  
Continuation-in-part of Ser. No. 635,844, Nov. 28, 1975, abandoned. This application Dec. 29, 1977, Ser. No. 865,504  
Int. Cl.<sup>2</sup> B21K 5/02

U.S. Cl. 76—5 R 9 Claims



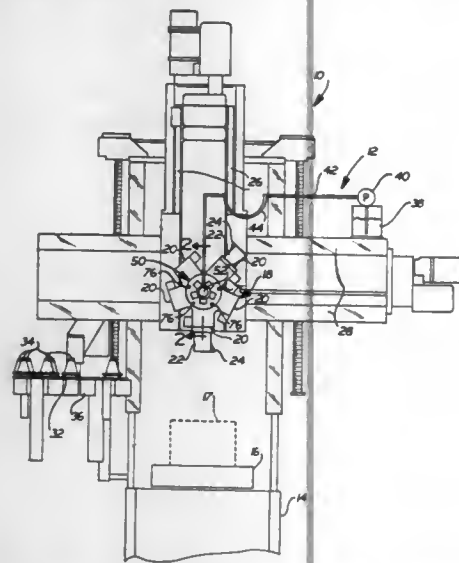
1. In a well drilling bit dressing apparatus comprising a frame, means supporting a well drilling bit longitudinally on the frame, a single reciprocal hammer mounted on the frame in opposed relation to the bit, said hammer having a die on the end thereof adjacent the bit for impact engagement with the face of the bit, means supporting and guiding the hammer from the frame, and means reciprocating the hammer for impact engagement of the die with the face of the bit, that improvement comprising said die and bit being disposed in the same horizontal plane with the die having a horizontal dimension substantially less than one half the horizontal width of the face of the bit and a vertical dimension generally equal to the vertical width of the face of the bit for impact engagement with only a small surface area of the face of the bit during each impact of the die with the bit face.

**4,164,879**  
**MACHINE TOOL COOLANT SYSTEM**  
Kenneth R. Martin, Cincinnati, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio  
Filed Dec. 14, 1977, Ser. No. 860,594  
Int. Cl.<sup>2</sup> B23B 3/20, 29/32, 25/00

U.S. Cl. 82—2 R 22 Claims

9. A machine tool assembly for receiving a variety of tools, some of which require coolant, comprising:  
a base;  
a rotatable turret supported from said base and having a plurality of recesses each of which is adapted to receive a portion of one of the tools;  
said turret being rotatable to selectively index each tool receiving recess to a working position;  
a coolant fluid inlet formed on said turret;

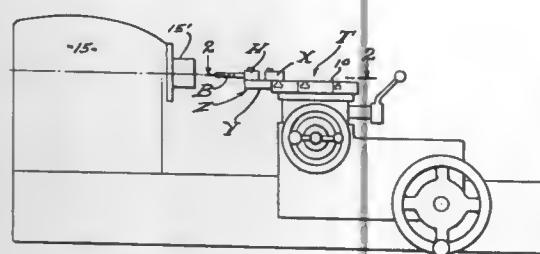
a source of pressurized coolant fluid connected to said inlet; coolant distributing means formed in said turret for providing a passage from said coolant inlet through said turret to the tool receiving recess in the working position; valve means, operable to an open position and a closed position and which is biased to the closed position, formed in the passage provided by the coolant distributing means for controlling coolant flow therethrough; and actuator means connected with the tools which require coolant for opening said valve means when one of the variety of tools which requires coolant is received in the recess of said turret.



**4,164,880**  
**TOOL HOLDER CARTRIDGE FOR CHUCKING LATHES**  
Joel E. Di Marco, 4288 Revere Pl., Culver City, Calif. 90230  
Filed Nov. 18, 1977, Ser. No. 852,805  
Int. Cl.<sup>2</sup> B23B 29/00

U.S. Cl. 82—36 R

18 Claims



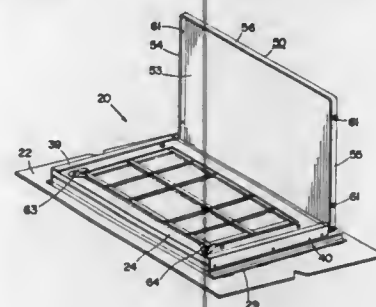
1. A production lathe adapter and setup arm for preserving setups to be reused on multi station turrets that sequentially index cutting tools into cutting position with respect to work turned by the lathe, the turret having a top face offset from and parallel with a turning axis, and including; at least one adapter

having a bottom face fixedly secured to the turret and cantilevered therefrom at one station thereof, a setup arm having a top face releasably engaged with the cantilevered bottom face of the adapter, and coupling means securing the setup arm to the adapter, the top face of the setup arm projecting radially from the turret coplanar with the top face thereof for receiving holder means to set up a cutting tool engageable with the work.

**4,164,881**  
**DIE CHASE APPARATUS**  
Henry H. Jenkins, 864 W. Hacienda Dr., Corona, Calif. 91720  
Filed May 8, 1978, Ser. No. 903,578  
Int. Cl.<sup>2</sup> B26F 1/38

U.S. Cl. 83—128

6 Claims



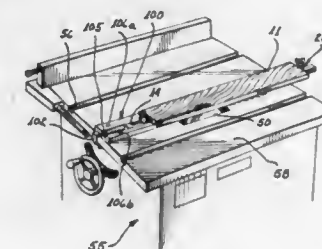
1. A die chase apparatus including in combination a generally rectangularly shaped metal base plate, a generally rectangularly shaped bottom plywood sheet flatly residing on said base plate and having first and second end portions, first and second die locators secured to said base plate and respectively abutting said first and second end portions of said bottom plywood sheet to locate the sheet on said plate, a generally rectangularly shaped top plywood sheet flatly residing on said bottom plywood sheet, a steel rule die having a base portion supported between said plywood sheets and having a portion extending through an opening in said top plywood sheet and terminating in a cutting edge located slightly above the top surface of said top plywood sheet, a plurality of rubber ejection members positioned on the top surface of said top plywood sheet and adjacent said cutting edge of said steel rule die to eject sheet material cut by said cutting edge, first and second hinges secured respectively to said first and second end portions of said top plywood sheet, each of said hinges comprising an angle shaped member with a first portion engaging the top of said top plywood sheet and a second portion engaging an end of said top plywood sheet with fasteners extending through said portions to secure said angle shaped member to said top plywood sheet, each of said hinges having an overhang portion which overlies the side of said top plywood sheet, a pivot member extending from each overhang portion of each hinge, each overhang portion of each hinge also having an abutment, a cover member having first and second downturned ends generally positioned at said first and second hinges, first and second elongated slots in said first and second downturned ends respectively, pivot members extending through said slots to pivotally connect said cover member to said first and second hinges, first and second side set screws in each of said first and second downturned ends of said cover member to engage said hinges and keep said cover aligned upon closing, first and second engaging portions on said cover member for engaging said abutments on said hinges in the open position of said cover, and a replaceable striker plate secured to the inside surface of said cover member.

**4,164,882**  
**SPACER FOR WORKPIECE SUPPORTING APPARATUS USED WITH POWER TOOLS HAVING HIGH SPEED CUTTING MEMBERS**

John E. Mericle, 2202 Torrey Pines, Tucson, Ariz. 85710  
Continuation-in-part of Ser. No. 842,500, Oct. 17, 1977. This application Jan. 9, 1978, Ser. No. 867,784  
Int. Cl.<sup>2</sup> B27B 27/02

U.S. Cl. 83—409

7 Claims



1. A workpiece supporting apparatus mountable upon the work surface of a power tool for translating a workpiece past the cutting member of the power tool to produce a straight precision cut in the workpiece, said apparatus comprising in combination:

- (a) an elongated keying member having an upper surface and a lower surface;
- (b) vertical slot means disposed in said keying member and extending intermediate the upper and lower surfaces thereof, said slot means including a laterally expanded portion having sidewalls and a shoulder;
- (c) first and second workpiece engaging means oriented upon said keying member in opposed relationship to one another for engaging opposed end surfaces of the workpiece, each of said first and second workpiece engaging means comprising:
  - i. means for retaining an end surface of the workpiece;
  - ii. a body for supporting said retaining means;
  - iii. post means extending upwardly through said slot means for securing said body to said keying member, said post means being slidable along said slot means to accommodate different length workpieces and including head means for engaging said side walls to prevent rotation of said post means and for engaging said shoulder to limit upward travel of said post means; and
  - iv. means for securing said body upon said post means and frictionally locking said head against said shoulder; and
- (d) means for slidably maintaining said keying member in parallel relationship to the cutting member, said maintaining means including a guide for receiving said keying member and means for fixedly appending said maintaining means to the work surface;

whereby, said maintaining means guides the keying member supported workpiece past the cutting member.

**4,164,883**  
**GUIDE FOR A SAWBLADE**  
Leopold Jägers, Rudolf-Diesel-Strasse 1, 5350 Euskirchen, Fed. Rep. of Germany  
Filed Oct. 12, 1977, Ser. No. 841,445  
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646515  
Int. Cl.<sup>2</sup> B23D 45/02

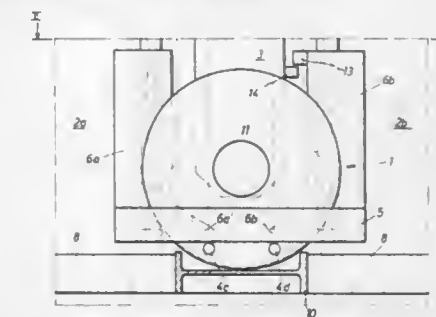
U.S. Cl. 83—488

8 Claims

1. A machine for cold sawing of workpieces, particularly metallic workpieces, comprising:

- a circular vertical saw blade;
- vertical feed means for feeding said saw blade;

gliding elements lying laterally against said saw blade for guiding said saw blade vertically;  
drive means for driving said saw blade;

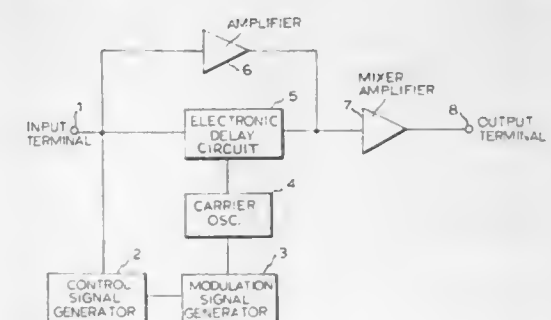


said gliding elements being guided movably relative to said saw blade and parallel to the plane of said saw blade.

**4,164,884**  
**DEVICE FOR PRODUCING A CHORUS EFFECT**  
Ikutaro Kakehashi, Osaka, Japan, assignor to Roland Corporation, Japan  
Continuation of Ser. No. 698,147, Jun. 21, 1976, abandoned.  
This application Feb. 1, 1978, Ser. No. 874,320  
Claims priority, application Japan, Jun. 24, 1975, 50/79153; Apr. 6, 1976, 51/38914  
Int. Cl.<sup>2</sup> G10H 1/04; H03H 7/30

U.S. Cl. 84—1.24

6 Claims



1. A device for producing a chorus effect in an electronic musical instrument, comprising an electronic delay circuit having an input terminal to which a musical tone signal is supplied and a clock terminal to which a carrier oscillator signal is supplied for producing a time delay in the musical tone signal according to the frequency of the carrier oscillator signal, a non-modulating amplifier means coupled in parallel with said electronic delay circuit, mixing amplifier means coupled to the outputs of said electronic delay circuit and said non-modulating amplifier means for mixing the outputs thereof, a carrier oscillator coupled to said clock terminal of said electronic delay circuit for generating a carrier oscillator signal and normally oscillating at a relatively high frequency, a modulation signal generating means coupled to said carrier oscillator and said electronic delay circuit for detecting the musical tone signal input to said electronic delay circuit and for frequency modulating the carrier oscillator signal generated by said carrier oscillator toward lower oscillator frequencies only when a musical tone signal input is detected, whereby the delay time of said electronic delay circuit is modulated only when a musical tone signal input exists and when no musical tone signal exists, the carrier oscillator signal is not subjected to frequency modulation, the noise in said electronic delay circuit is not time delay modulated and any jarring effect in the output thereof is substantially eliminated.



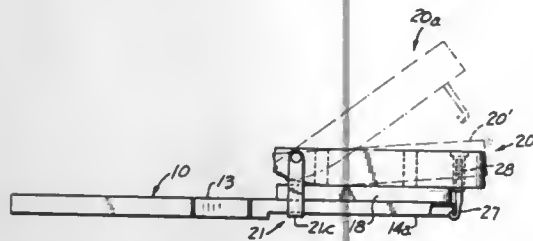
4,164,885

**LIFTS FOR PEDALS OF MUSICAL INSTRUMENTS**  
 Thomas P. Averette, 14277 Bochee Rd., Apple Valley, Calif.  
 92307

Filed Nov. 2, 1977, Ser. No. 847,839  
 Int. Cl.<sup>2</sup> G10C 3/26

U.S. Cl. 84—231

10 Claims



1. A lift for a depressable foot pedal of the type having an elongated member with a foot block on its upper surface, said lift comprising:

a body dimensioned to be positioned on the top of the block;  
 a U-shaped bracket having a base adapted to pass beneath the elongated member, and having a pair of side members adapted to extend upwardly from the base along opposite sides of the member and the block;  
 means adapted to attach the side members to a front part of the body, this means comprising bolt means; and  
 means adapted to tension the side members between the base and said front part of the body, thereby securing the body on the top of the block, this said means comprising a cam surface at the forward underside of the body adapted to cam on the upper surface of the block, and a J-hook attached to a rear part of the body and adapted to hook beneath the rear part of the elongated member.

4,164,886

**SEALING PROJECTILE**  
 Bobby J. Hallmark, Fort Worth, Tex., assignor to Gearhart-Owen Industries, Inc., Fort Worth, Tex.

Filed Sep. 21, 1977, Ser. No. 835,205  
 Int. Cl.<sup>2</sup> E21B 43/11

U.S. Cl. 89—1 C

4 Claims



1. An improved sealing projectile for use in a borehole perforating tool of a type wherein there is an explosive charge such as one or more shaped charge units disposed in each of a plurality of chambers that are located one above the other,

with a partition means between each two adjacent chambers and sealingly isolating the adjacent chambers but for a passageway in the partition means through which ignition wires are passed, with a sealing projectile driven into sealing relation with the lower end portion of the passageway upon detonation of the explosive charge in the lower one of the adjacent chambers; said improved sealing projectile comprising:

a. a guide portion having a cylindrical exterior surface adapted for mating with the interior surface of said passageway and having slot means extending longitudinally of the guide portion from its outer end inwardly a distance less than the length of said guide portion but sufficient to permit an end portion of the guide portion to be disposed within said passageway while permitting ignition wires to pass from said passageway through said slot means to the lower one of said adjacent chambers, and  
 b. a sealing portion merging with said guide portion.

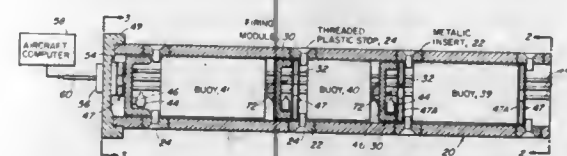
4,164,887

**MULTIPLE BUOY LAUNCHER**  
 Charles W. Ouellette, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1978, Ser. No. 866,209  
 Int. Cl.<sup>2</sup> F41F 5/02

U.S. Cl. 89—1.5 R

3 Claims



1. A launcher comprising:

a launching tube having longitudinal electrical conductors therein, said launching tube having longitudinal guides therein;

means positioned along a wall of said tube for locating buoys therein, each of said buoys having means for slidably contacting said guides for orienting said buoys about an axis of said tube, said contact making slidable electrical contact with one of said conductors; and

a set of firing modules positionable within said tube in alternating locations with said buoys, each of said firing modules being coupled to one of said contacts for contacting a specific one of said longitudinal conductors to permit individual activation of said firing modules in response to electrical signals coupled via said electrical conductors.

4,164,888

**ROCKET REMOTE ENGAGEMENT MECHANISM**  
 Lonnie L. Looger, Madison, and Bernie J. Cobb, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

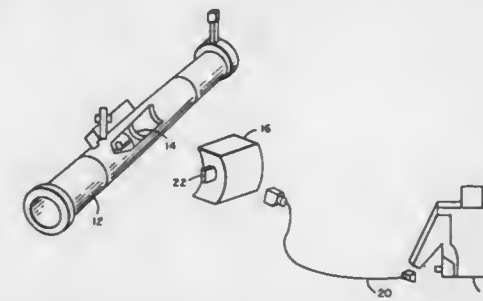
Filed Sep. 1, 1977, Ser. No. 829,852  
 Int. Cl.<sup>2</sup> F41F 3/04

U.S. Cl. 89—1.814

3 Claims

1. A rocket engagement mechanism for pre-aiming and remotely firing a rocket comprising: a rocket launcher provided with a firing element; a firing device disposed for actuating said firing element; said firing device including a squib provided with explosive means and a movable piston and a button for effecting launch of said rocket, said button being

depressed when said piston is moved by activation of said explosive means; means located remotely from said rocket for



generating an electrical signal and means for transmitting said signal to said firing device.

4,164,889

**LIQUID PROPELLANT MODULAR GUN INCORPORATING DUAL CAM OPERATION AND INTERNAL WATER COOLING**

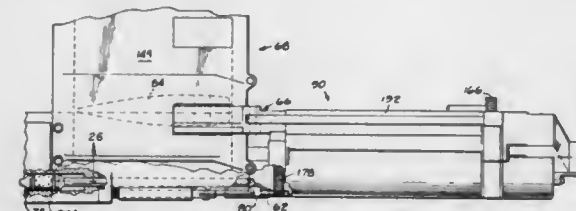
Lester C. Elmore, Portola Valley, Calif., and Thomas M. Broxholm, deceased, late of Palo Alto, Calif. (by Anne K. Broxholm, administratrix), assignors to Pulsepower Systems, Inc., San Carlos, Calif.

Division of Ser. No. 616,822, Sep. 25, 1975, Pat. No. 4,062,266.  
 This application Sep. 19, 1977, Ser. No. 834,336

Int. Cl.<sup>2</sup> F41F 1/04

U.S. Cl. 89—7

3 Claims



3. A method of stopping automatic operation of a liquid propellant gun of the kind having a cyclic mechanism which includes a rotatable, mechanical control element for automatically loading and firing individual projectiles one-by-one in sequence so long as the gun is operated in a trigger on condition, said method comprising,

detecting a misfire of a projectile during the automatic firing mode of operation, and  
 stopping operation of the cyclic mechanism, after detection of the misfire, by moving the rotatable, mechanical control element part of the cyclic mechanism out of operative engagement with the rest of the cyclic mechanism.

4,164,890

**LIQUID PROPELLANT MODULAR GUN INCORPORATING DUAL CAM OPERATION AND INTERNAL WATER COOLING**

Lester C. Elmore, Portola Valley, Calif., and Thomas M. Broxholm, deceased, late of Palo Alto, Calif. (by Anne K. Broxholm, administratrix), assignors to Pulsepower Systems, Inc., San Carlos, Calif.

Division of Ser. No. 616,822, Sep. 25, 1975, Pat. No. 4,062,266.  
 This application Sep. 19, 1977, Ser. No. 834,688

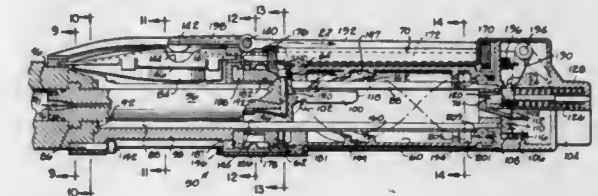
Int. Cl.<sup>2</sup> F41D 3/06; F41F 11/00

U.S. Cl. 89—185

5 Claims

1. A drive cam for reciprocating a bolt back and forth between a rearward, projectile loading position and a forward, projectile firing position in a gun, said drive cam comprising, a hollow cylindrical member having a longitudinal axis

disposed parallel to the axis of reciprocation of the bolt and mounted for rotation about said longitudinal axis, a first spiral cam track formed on the inside of the hollow cylindrical member and engageable with a cam follower on the bolt to drive the bolt forward, and



a second spiral cam track separate from the first spiral cam track and formed on the interior of the hollow cylindrical member and engageable with the cam follower of the bolt to drive the bolt rearward and wherein the hollow cylindrical member includes dwell area means at the front and rear for permitting rotation of the hollow cylindrical member without producing axial movement of the bolt.

4,164,891

**MACHINE FOR SIMULTANEOUSLY MILLING OF SEVERAL GROOVES IN ROTATING WORKPIECES**  
 Karl Lieser, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Werner GmbH & Co., Wuppertal, Fed. Rep. of Germany

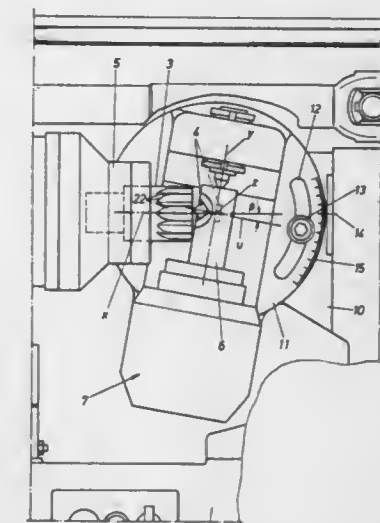
Filed Nov. 1, 1977, Ser. No. 847,547

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650955

Int. Cl.<sup>2</sup> B23C 3/28

U.S. Cl. 409—165

8 Claims

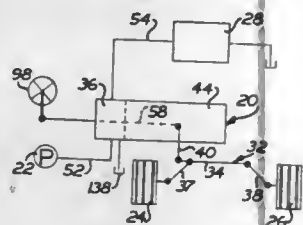


1. A machine for simultaneously milling several grooves in rotating workpieces by means of a rotating one-toothed milling tool, wherein the rotational speeds of the milling tool and the workpiece stand in a ratio determined by the number of grooves, wherein the milling tool in the longitudinal direction from the free end of the workpiece is plunged cuttingly in the workpiece which is advanced in a longitudinal movement, the workpiece defining a rotational axis, comprising

a tool carrier adapted to carry a cutter tool and operatively rotatably mounted about a first axis, a rotational plane of the cutter tool being defined by rotation of said tool carrier about said first axis, said tool carrier being additionally pivotably mounted about a second axis extending perpendicularly to the rotational axis of the workpiece such that said rotational plane of the

cutter tool is able to be brought in an acute angle relative to the rotational axis of the workpiece.

**4,164,892**  
**CONTROL APPARATUS**  
Raymon L. Goff, Wooster, Ohio, and Jim L. Rau, Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio  
Filed Dec. 22, 1976, Ser. No. 753,589  
Int. Cl.<sup>2</sup> F15B 9/10  
U.S. Cl. 91—375 A



1. Control apparatus for use in a vehicle having a single pump for supplying fluid to effect turning movement of steerable wheels and operation of an auxiliary apparatus, said control apparatus comprising a housing, a main chamber disposed within said housing, a movable piston disposed in said main chamber and dividing said main chamber into first and second variable volume chambers, a movable output member connected with said housing and steerable wheels, means disposed within said housing for transmitting drive forces from said piston to said output member to effect movement of said output member and turning of the steerable wheels upon movement of said piston, a generally cylindrical valve chamber disposed in said housing, a plurality of passage means for connecting said valve chamber in fluid communication with the pump, the auxiliary apparatus, said first variable volume chamber and said second variable volume chamber, a circular array of ports disposed about the central axis of and connected in fluid communication with the cylindrical valve chamber, said circular array of ports including a first plurality of ports connected in fluid communication with the one of said plurality of passage means connected in fluid communication with the pump, a second plurality of ports connected in fluid communication with the one of said plurality of passage means connected to fluid communication with the auxiliary apparatus, and a third plurality of ports connected in fluid communication with the one of said plurality of passage means connected in fluid communication with said first variable volume chamber, a rotatable valve member disposed in said valve chamber in a coaxial relationship with said circular array of ports, means for retaining said valve member against axial movement relative to said housing, a plurality of longitudinally extending land means formed on said valve member for cooperating with said circular array of ports to effect a variation in the fluid pressure in at least some of said passage means upon rotation of said valve member about the central axis of said valve chamber, said valve member being rotatable relative to said circular array of ports in a first direction from an initial position to a first actuated position relative to said circular array of ports and being rotatable relative to said circular array of ports in a second direction from the initial position to a second actuated position relative to said circular array of ports, said first plurality of ports being connected in fluid communication with said second plurality of ports when said valve member is in said initial position to enable fluid to flow from the pump to the auxiliary apparatus, said longitudinally extending land means on said valve member being effective to direct fluid flow from at least some of said first plurality of ports through said third plurality of ports to said passage means connected in fluid communication with said first variable volume chamber and to block fluid flow to said second plurality of ports upon rotation of said valve member to said first actuated position to provide fluid flow to said first variable volume chamber in preference to the

auxiliary apparatus upon rotation of said valve member to said first actuated position, said longitudinally extending land means on said valve member being effective to direct fluid flow from at least one of said first plurality of ports to said passage means connected in fluid communication with said second variable volume chamber and to block fluid flow to said second plurality of ports upon rotation of said valve member to said second actuated position to provide fluid flow to said second variable volume chamber in preference to the auxiliary apparatus upon rotation of said valve member to said second actuated position.

6 Claims

**4,164,893**  
**SEALING DEVICE AT PRESSURE FLUID CYLINDERS**  
Bo Granbom, 9 Frejgatan, and Gunnar Lundqvist, 7 Spinnaregatan, both of Stockholm, Sweden  
Filed Aug. 4, 1977, Ser. No. 821,722  
Int. Cl.<sup>2</sup> F01B 29/00  
U.S. Cl. 92—88

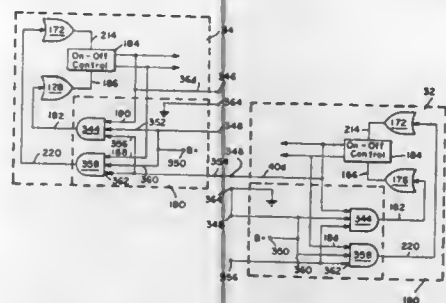


7 Claims

1. A pressure fluid cylinder device comprising a cylinder, a longitudinal slot in said cylinder, a sealing structure, and a driver attached to a piston movable in said cylinder, said driver extending through said slot, said sealing structure comprising a strip positioned to overlie said slot in sealing relation, said strip extending into sealing contact with the inside surface of said cylinder on opposite sides of said slot in that area of said slot through which said driver does not extend, that strip sealing inside surface area of said cylinder having a cross-sectional radius greater than the cross-sectional radius of that cylinder surface area never in contact with said strip, and said strip on the inside surface thereof being chamfered toward its edges so that the height of the opposed strip edges is no greater than 0.1 mm, and a sealing sleeve connected to said piston at each end thereof, said sealing sleeve being structured to cooperate with said strip to maintain a sealed relation therebetween.

**4,164,894**  
**SIMULTANEOUS STATE PREVENTION SYSTEM**  
Clarence T. Yamanaka, Carson, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.  
Filed Jun. 13, 1977, Ser. No. 806,111  
Int. Cl.<sup>2</sup> B64D 13/00  
U.S. Cl. 98—1.5

7 Claims



1. An aircraft cabin pressure control system comprising: first controller means selectively connectable in an on condition for controlling cabin pressure and an off condition not controlling cabin pressure; second controller means selectively connectable in an on

condition for controlling cabin pressure and an off condition not controlling cabin pressure; interconnect circuit means on said first controller means responsive to the conditions of said first and second controller means for changing the condition of the first controller means to the on condition when both of said controller means are in the off condition and for changing the condition of the first controller means to the off condition when both controller means are in the on condition; interconnect circuit means on said second controller means responsive to the conditions of said first and second controller means for changing the condition of the second controller means to the on condition when both of the controller means are in the off condition and changing the condition of the second controller means to the off condition when both of the controller means are in the on condition; and means for disabling operation of one of said first and second interconnect circuit means.

4. A method of controlling cabin pressure including a first controller means having an on condition and an off condition, a second controller means having an on condition and an off condition, an interconnect circuit means responsive to said on and off conditions of both controllers, said method including the steps of:

- producing a first signal in said interconnect circuit means corresponding to the on condition of said first controller means;
- producing a second signal in said interconnect circuit means corresponding to the on condition of said second controller means; and
- responsive to simultaneous existence of said first and second signals in said interconnect circuit means, changing said first controller to the off condition and maintaining the second controller in the on condition.

**4,164,895**  
**MODE INDICATION SYSTEM**  
Howard P. Aldrich, Rancho Palos Verdes; Glenn A. Burgess, Downey, and Clarence T. Yamanaka, Carson, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.  
Filed Jun. 13, 1977, Ser. No. 806,112  
Int. Cl.<sup>2</sup> B64D 13/00  
U.S. Cl. 98—1.5

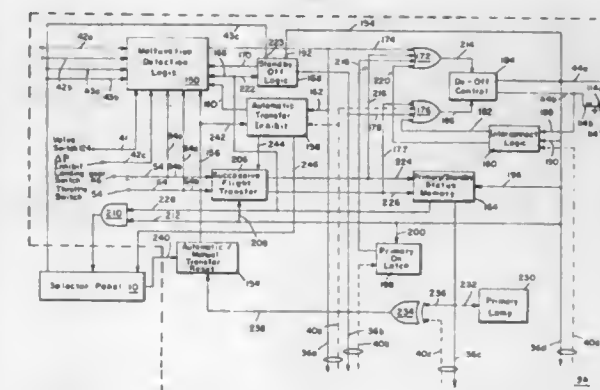
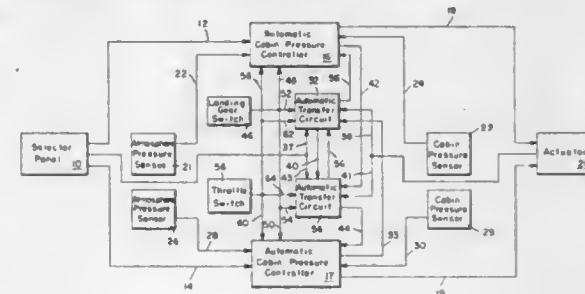
5 Claims

1. A system for controlling pressurization of an aircraft cabin from a source of pressurized air during successive flights of an aircraft, said system comprising:

- two cabin pressure controllers for controlling pressurization by said source;
- means for selectively connecting one of said controllers as primary controller for controlling cabin pressure during one flight of the aircraft;
- means for connecting the other of said controllers as primary controller for controlling cabin pressure during a successive flight of the aircraft; and
- annunciating means operably associated with each of said controllers for annunciating the identity of the primary controller.

4. A method for controlling cabin pressure in an aircraft including a source of pressurized air and two cabin pressure controller means, said method comprising the steps of: connecting one of said controller means as primary to control pressurization of said cabin from said source; producing a sensory detectable response to identify said one controller means as primary; connecting the other of said controller means as standby to monitor the performance of said primary controller means; connecting said standby controller means to control cabin pressure and disconnecting said primary controller means

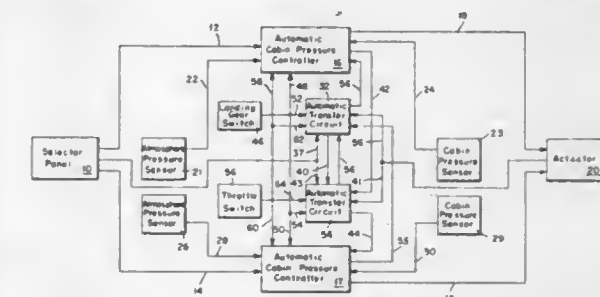
from cabin pressure control upon malfunction of said primary controller means; and



preventing change of designation of said one controller means as primary upon occurrence of said malfunction.

**4,164,896**  
**CONTROL ALTERNATING SYSTEM**  
Howard P. Aldrich, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.  
Filed Jun. 13, 1977, Ser. No. 806,113  
Int. Cl.<sup>2</sup> B64D 13/00  
U.S. Cl. 98—1.5

19 Claims



1. A system for controlling pressure in an aircraft cabin fed by a source of pressurized air, said system comprising: flow regulating means for regulating aircraft cabin pressurization resulting from inflow of pressurized air; first and second control means, each operably connectable to said flow regulating means for independently controlling regulation of said air pressure; and connecting means for selectively connecting said first control means for controlling said flow regulating means during one flight of said aircraft and connecting said second control means for controlling said flow regulating means during a successive flight of said aircraft.

15. A method for regulating cabin air pressure in an aircraft containing a source of pressurized air and a pair of cabin pressure controllers, said method comprising the steps of:



providing pressurized air from said source for pressurizing said cabin;  
connecting one of said pair of cabin pressure controllers for controlling pressurization of said cabin by said pressurized air for one flight; and  
connecting the other of said pair of cabin pressure controllers for controlling pressurization of said cabin by said pressurized air for a successive flight.

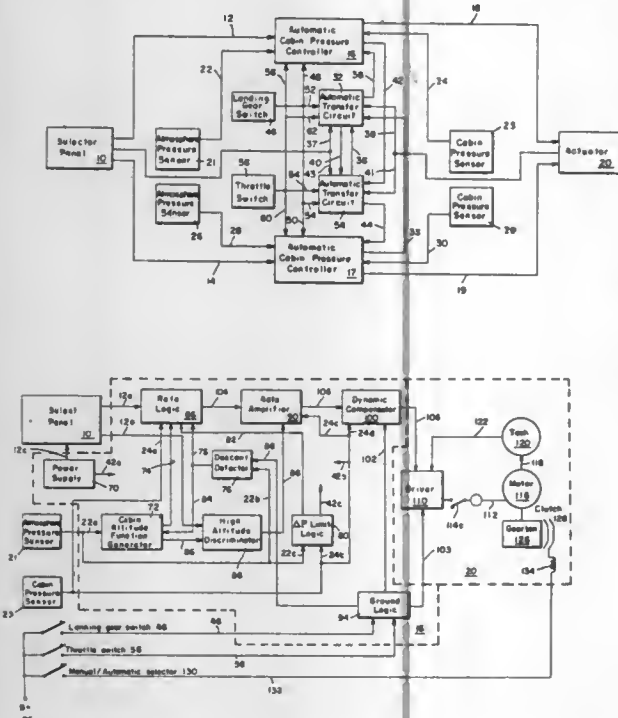
4,164,897

**CONTROL SCHEDULE LINEARIZATION SYSTEM**  
Howard P. Aldrich, Rancho Palos Verdes; Clarence T. Yamanaka, Carson, and Glenn A. Burgess, Downey, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,114  
Int. Cl.<sup>2</sup> B64D 13/00

U.S. Cl. 98—1.5

6 Claims



1. A cabin pressure control system for an aircraft comprising:  
atmospheric pressure means for generating a response to atmospheric pressure;  
means for generating a response to cabin pressure;  
command means responsive to said atmospheric pressure response and producing an output,  $P_c$ , in accordance with the equation

$$P_c = \frac{K_1}{K_2 + \frac{K_3}{P_a}}$$

wherein  $K_1$ ,  $K_2$  and  $K_3$  are constants and  $P_a$  is said atmospheric response; and  
means for comparing  $P_c$  with said cabin pressure response and producing a comparison response for controlling cabin pressure.

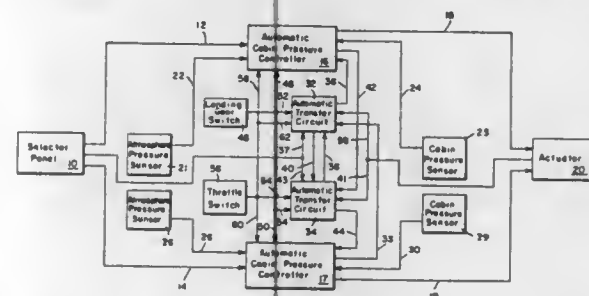
4,164,898

**EXCESSIVE RATE DETECTION SYSTEM**  
Glenn A. Burgess, Downey, and Clarence T. Yamanaka, Carson, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,115  
Int. Cl.<sup>2</sup> B64D 13/00

U.S. Cl. 98—1.5

8 Claims



1. A system for controlling cabin pressure in an aircraft, said system comprising:

controller means for regulating cabin pressure;  
means for selecting a maximum rate of pressure change for said controller; and  
monitoring means for detecting actual rate of cabin pressure change and producing a response when actual rate of cabin pressure change exceeds said maximum rate of cabin pressure change by a predetermined amount.

6. A method for controlling cabin pressure in an aircraft including a controller means for regulating cabin pressure, means for selecting a rate of cabin pressure change and monitoring means for detecting the actual rate of cabin pressure change, said method including the steps of:  
directing a maximum rate of cabin pressure change;  
comparing said actual rate of cabin pressure change with said directed rate of cabin pressure change; and  
producing a sensory detectable change whenever said actual rate exceeds said directed rate by a predetermined amount.

4,164,899

**PRESSURE DIFFERENTIAL SYSTEM**  
Glenn A. Burgess, Downey, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

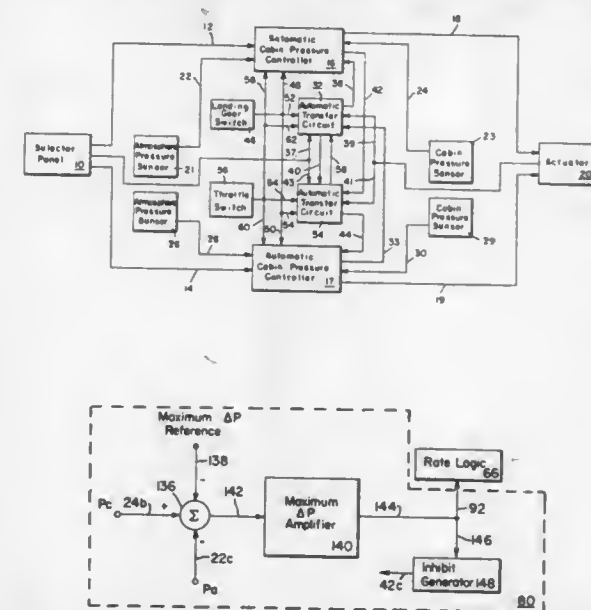
Filed Jun. 13, 1977, Ser. No. 806,119  
Int. Cl.<sup>2</sup> B64D 13/00

U.S. Cl. 98—1.5

8 Claims

1. A cabin pressure control system for aircraft, said system comprising:  
controller means for regulating cabin pressure rate of change in a predetermined manner;  
relationship means for producing an output representing a relation of cabin pressure and external pressure;  
means responsive to said output for incrementing said cabin pressure rate of change when said output exceeds a preselected value;  
standby controller means;  
transfer means for monitoring performance of said controller means and including means for disconnecting said controller means and connecting said standby controller means for regulating cabin pressure rate of change upon malfunction of said controller means; and

means responsive to said output for preventing disconnection of said controller means and connection of said



standby controller means when said output exceeds said preselected value.

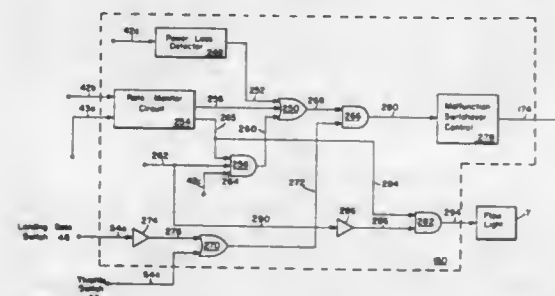
4,164,900

**FLOW ANNUNCIATION SYSTEM**  
Howard P. Aldrich, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 806,120  
Int. Cl.<sup>2</sup> B64D 13/04

U.S. Cl. 98—1.5

10 Claims



1. In an aircraft pressure control system having air flow control valve means and means for adjusting said valve means to provide a desired value of aircraft pressure, the improvement comprising:

means for generating a first signal whenever said air flow control valve means is in a position for providing maximum pressurization of said aircraft;  
means for generating a second signal whenever pressurization of said aircraft is decreasing; and  
flow response means responsive to simultaneous occurrence of said first and second signals for producing a flow response designating that maximum available air inflow is insufficient to provide said desired value of aircraft pressure.

7. In an aircraft pressure control system having air flow control valve means and means for adjusting said valve means to provide a desired value of aircraft pressure, the improvement comprising:

means for monitoring system performance and generating an error signal upon system malfunction;  
flow response means responsive to relation between air

inflow and air outflow for producing a flow response whenever available air inflow is insufficient to provide said desired value of aircraft pressure; and  
means for receiving said flow response and correspondingly preventing utilization of said error signal.

4,164,901

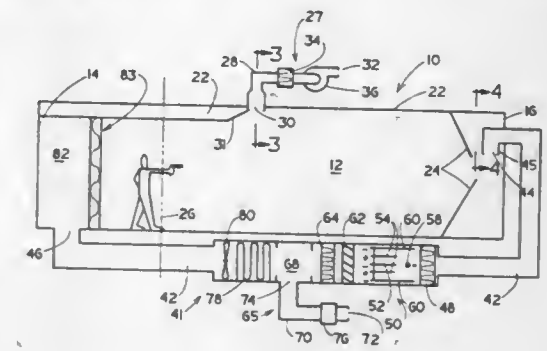
**INDOOR GUN FIRING RANGE ENCLOSURE HAVING A VENTILATION SYSTEM**

Robert W. Everett, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Jan. 16, 1978, Ser. No. 869,834  
Int. Cl.<sup>2</sup> F24F 13/00

U.S. Cl. 98—33 A

12 Claims



1. An indoor gun firing range comprising:  
an enclosure having an uprange end wall, a downrange end wall spaced from and generally parallel to the uprange end wall, two spaced apart side walls interconnecting the uprange end wall and downrange end wall, and a ceiling;  
gun shooting positions located a distance from the uprange end wall;

a bullet trap located proximate the downrange end wall;  
an air exhaust system for removing a portion of the air from the interior of the enclosure, cleaning the air so removed and exhausting the cleaned air to the out-of-doors comprising duct means having an inlet means open to the interior of the enclosure disposed at the ceiling of the enclosure at a location downrange from the gun shooting position for removing air from the enclosure; particulate matter separator means in communication with the duct means downstream of the inlet to the duct for separating particulate matter from the air being conveyed in the duct means from the enclosure; air moving means in communication with the duct means for causing a flow of air from the interior of the enclosure through the duct means; and, an outlet means from the duct means for releasing the air to the out-of-doors;

an air recirculation system for removing that portion of air from the interior of the enclosure not removed by the air exhaust system and re-introducing back into the interior of the enclosure, comprising duct means having inlet means open to the interior of the enclosure proximate the downrange end of the enclosure for removing air from the enclosure; particulate matter separation means in communication with the duct means downstream of the inlet means to the duct means for separating particulate matter from the air being conveyed in the duct means; air moving means in communication with the duct means for causing a flow of air from the interior of the enclosure through the duct means; and, an outlet means from the duct means open to the interior of the enclosure proximate the uprange wall of the enclosure for discharging air back into the enclosure; and,

an out-of-doors air make-up system in gaseous communication with the duct means of the air recirculation system for replacing at least a portion of the air removed from the

interior of the enclosure by the air exhaust system with out-of-doors air.

11. A method of ventilating air indoor gun firing range enclosure, which comprises:

- continuously removing approximately 30% of the supply air from the enclosure at a location downrange of persons using the firing range;
- removing particulate matter from this removed 30% of the air;
- exhausting this removed 30% of the supply air to the out-of-doors;
- continuously removing approximately 75% of the supply air from the enclosure at a location proximate the target area at which the persons using the range are shooting;
- removing particulate matter from this removed 75% of the air;
- removing particulate matter from a volume of out-of-doors air are substantially equal to 25% of the supply air in the enclosure;
- adding the out-of-doors air equal to 25% of the supply air in the enclosure to the removed 75% of the air;
- introducing the mixture of out-of-doors air equal to 25% of the air in the enclosure and removed 75% of the air into the enclosure at a location uprange of persons using the firing range; and,
- moving the introduction mixture of out-of-doors air equal to 25% of the air in the enclosure and removed 75% of the air past the persons using the firing range in a downstream direction at a substantially uniform velocity of approximately 75 feet per minute (plus or minus 8%) across the width and height of the enclosure.

4,164,902

## FERMENTATION TANK

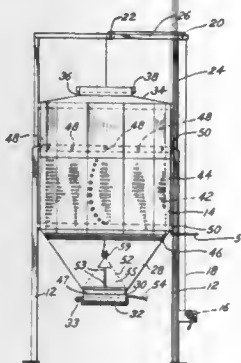
Adrianus Maarleveld, San Carlos, Calif., assignor to Fleming-Potter Company, Inc., Peoria, Ill.

Filed Sep. 6, 1978, Ser. No. 940,113

Int. Cl.<sup>2</sup> C12G 1/02

U.S. Cl. 99—277.1

10 Claims



1. An improved wine fermentation tank comprising, in combination:

- an outer tank having a generally cylindrical side wall, a top opening and a convergent bottom wall having a generally inverted frusto-conical shape defining a bottom discharge opening at the bottom of the tank;
- an inner screen concentric with the outer tank wall defining a cavity for receipt of crushed grapes, said inner screen forming a narrow annular channel between the inner screen and the tank, said inner screen being sealed at its lower end against the tank to define a region for receipt of juice from the crushed grapes;
- at least one side discharge opening in the tank side wall above the convergent bottom wall for receipt of juice from the annular channel; and
- a removable screen positioned over the bottom discharge opening, said bottom discharge opening including a fluid discharge outlet and a solids outlet door.

4,164,903  
SHOTGUN WAD FOR USE AS A PRACTICE PROJECTILE

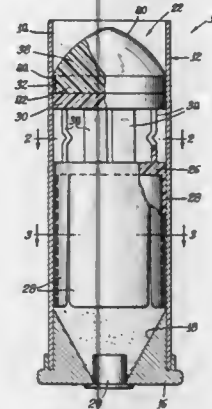
Gordon F. Bouza, 4433 Castlebar, Boise, Id. 83703

Filed Sep. 8, 1977, Ser. No. 831,594

Int. Cl.<sup>2</sup> F42B 5/22

U.S. Cl. 102—41

10 Claims



6. A wad for use in a practice shotgun cartridge having a tubular casing of predetermined longitudinal length with a closed end and an open opposite end, said wad including a first cup portion normally adapted to contain a shot loading and having a second cup portion normally adapted to contain a charge, said wad having a generally conically shaped flight end on second cup portion extending axially outwardly thereof in a direction opposite to said first cup portion to facilitate insertion of said wad into a cartridge casing with said first cup portion facing the closed end of said cartridge casing, said first cup portion including a plurality of longitudinal fingers extending in a direction opposite to said flight end, said wad having a longitudinal length such that said wad may be substantially fully received within said tubular casing with said flight end facing the open end of said cartridge case to facilitate projection of said wad from said cartridge casing with said generally conically shaped flight end thereof defining an aerodynamic flight surface for said wad.

4,164,904

## TUBULAR PROJECTILE

Maurice A. Laviolette, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

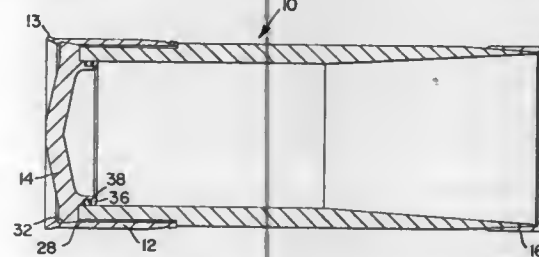
Continuation of Ser. No. 746,820, Dec. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 660,120, Feb. 23, 1976, abandoned, which is a continuation of Ser. No. 521,138, Nov. 5, 1974, abandoned. This application Aug. 24, 1978, Ser. No. 936,391

Claims priority, application Canada, Nov. 16, 1973, 185955; Aug. 30, 1974, 208146

Int. Cl.<sup>2</sup> F42B 13/20

U.S. Cl. 102—92.7

5 Claims



1. A range limited practice projectile adapted to be fired at supersonic velocity from a gun barrel, and comprising: a tubu-

lar body of substantially circular cross-section and 105 mm outside diameter, having a longitudinal axis, a leading inlet end and a trailing exit end and a central passageway extending therethrough, and wherein the leading end of the body is in the form of an annular wedge, the latter being a composite wedge comprising an inside wedge having an annular inner wall, and an outside wedge having an annular outer wall, said inside and outside wedges defining a leading edge of the projectile with the included angle between said inside and said outside annular walls being greater than about 5° and less than about 15° with the included angle between said inner wall and said longitudinal axis simultaneously therewith being greater than about 3° and less than about 10°, the leading edge being sufficiently sharp as to enable an oblique shock wave to attach itself to said leading edge after launching to assist in providing low aerodynamic drag on the projectile, the internal diameter of the central passageway decreasing from the leading inlet end along said annular inner wall to a throat region, the ratio of the cross-sectional area of said passageway in the throat region ( $A_t$ ) to the cross-sectional area of said passageway at the leading inlet end ( $A_i$ ) being sufficiently large and being so related to the projectile velocity at launch as to enable a normal shock wave to pass through the throat region to establish supersonic flow in said passageway and thus provide a relatively low aerodynamic drag after launching, with said ratio  $A_t/A_i$  also being a value less than 1.0 so that as the velocity of the projectile decreases to a predetermined flight Mach number, the shock wave is expelled from the passageway to establish choked flow conditions in said passageway and relatively high aerodynamic drag whereby to limit the range of the projectile, and wherein the wall thickness ratio of the projectile  $t/R$  is from about 0.197 to not greater than 0.45 where:

$t$  = maximum wall thickness

$R$  = maximum radial distance from projectile axis to outside surface of projectile.

4,164,905

## LUMPED NEUTRALIZATION COIL ARRANGEMENT FOR INDUCTANCE FUZE

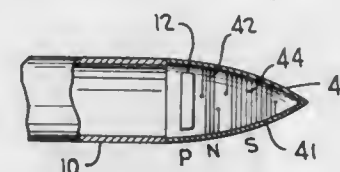
Hans W. Kohler, Sarasota, Fla., and Helmut Sommer, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1971, Ser. No. 211,140

Int. Cl.<sup>2</sup> F42C 13/08, 19/00

U.S. Cl. 102—212

5 Claims



1. An inductance proximity fuze comprising:

- (a) A primary coil;
- (b) Means for applying current to said primary coil to establish a magnetic field having an infinite number of field lines;
- (c) A passive secondary coil having a first number of turns and disposed relative to said primary coil such that said first number of turns are traversed by a first portion of said field lines;
- (d) A passive neutralizing coil having a second number of turns connected in series opposition to said secondary coil and disposed relative to said primary coil such that the second number of turns are traversed by a second portion of said field lines and such that under free space conditions the product of said first portion of field lines and said first number of turns is approximately equal to the product of said second portion of field lines and said second number of turns; said primary, secondary, and neutralizing coils

being wound symmetrically about a common axis which coincides with the longitudinal axis of said proximity fuze;

(e) Means connected to said secondary coil and said neutralizing coil for detecting any voltage differences induced therein by magnetic field disturbance of said free space magnetic conditions; and

(f) Means for initiating operation of a fuze in response to a predetermined voltage difference existent across said secondary coil and said neutralizing coil.

4,164,906

## SCHNABEL CAR BOGIE

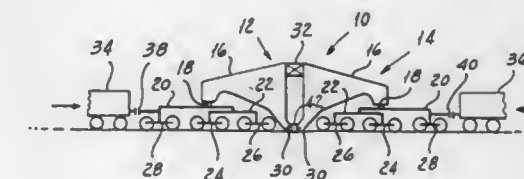
Leslav M. Nieviarovski, Yonkers, N.Y., assignor to Norca Corporation, Great Neck, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,700

Int. Cl.<sup>2</sup> B61D 3/12, 3/16, 15/02, 49/00

U.S. Cl. 105—367

20 Claims



1. In a multiple span bolster railway car adapted to be subjected to the effect of compressive forces when making up part of a train of cars traveling along a railway, apparatus including in combination an upper span bolster, a lower span bolster for pivotally supporting the inboard end of said upper span bolster, trucks for supporting said inboard lower span bolster on said railway, means for supporting the outboard end of said upper span bolster on said railway, first means for reducing the tendency of said inboard lower span bolster to move upwardly in response to compressive forces applied to said assembly and second means for restraining said upper span bolster against pivotal movement relative to said lower span bolster to inhibit misalignment of said upper and lower span bolsters in the directions of the length thereof in response to said forces.

4,164,907

## DEVICE FOR STORING VALUABLES

Michael Piatscheck, Eilenau 49, 2 Hamburg 76, and Dieter Sievers, Bernadottestr. 199, 2 Hamburg 52, both of Fed. Rep. of Germany (7834)

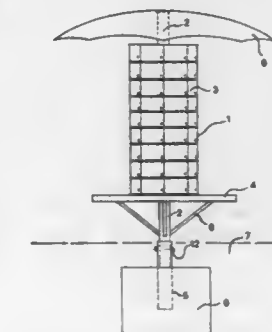
Filed Dec. 23, 1977, Ser. No. 863,975

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658920

Int. Cl.<sup>2</sup> E05G 1/08

U.S. Cl. 109—50

6 Claims



1. A device for storing valuables comprising:

- a hollow receiving jacket anchored in a ground support;
- a multiplicity of safe deposit boxes arranged in a transportable column, said column comprising a plurality of sets of vertically-superimposed deposit boxes, disposed adjacent



to one another, said sets being disposed side-by-side in a generally circular arrangement, said column including a centrally-arranged, single support element around which said sets of safe deposit boxes are disposed and to which said sets of safety boxes are rigidly secured, said support element having a lower portion which is receivable and releasably anchorable in said receiving jacket.

#### 4,164,908 CHAINSTITCH FORMING DEVICE FOR SEWING MACHINES

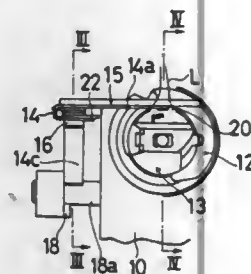
Yujiro Takikawa, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 19, 1978, Ser. No. 870,646

Claims priority, application Japan, Feb. 1, 1977, 52-11289[U]  
Int. Cl.<sup>2</sup> D05B 1/14

U.S. Cl. 112-168

3 Claims



1. A chain stitch forming device for a sewing machine which comprises:

- a machine frame;
- a needle reciprocally mounted on said machine frame;
- a loop taker rotatably mounted on the machine frame and having a loop seizing beak thereon;
- a bobbin case retainer disposed in said loop taker adapted to receive a bobbin case therein;
- restraining means fixed to the frame for restraining the bobbin case retainer from rotation with said loop taker; and,
- a loop retaining member swingably supported on the machine frame and including a first lever portion extending along and swingably supported on the under side of said restraining means, a loop retainer extending inwardly from a free end of said first lever portion into a gap provided between said bobbin case retainer and said bobbin case for serving as a guide passage of a thread loop released from said loop seizing beak of said loop taker and a second lever portion engageable with a cam means which is actuated by a lower shaft of the sewing machine, said loop retainer of said loop retaining member being movable to a loop retaining position for temporarily holding the loop having been released from said loop seizing beak to allow the loop held by said loop retainer to be moved off therefrom after the needle passes through the loop.

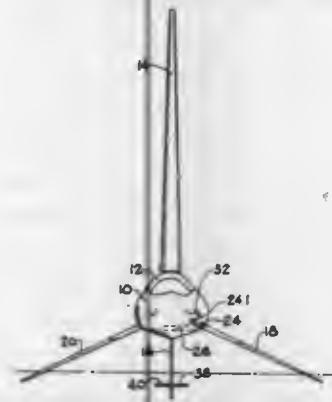
4,164,909  
WIND DRIVEN HYDROFOIL WATERCRAFT  
James S. Ballard, 59 Strathmore Rd., Camps Bay, Cape Town, Cape Province, South Africa  
Continuation of Ser. No. 740,115, Nov. 8, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,298  
Claims priority, application South Africa, Nov. 19, 1975, 75/7269

Int. Cl.<sup>2</sup> B63B 1/30  
U.S. Cl. 114-282

5 Claims

1. A wind driven watercraft comprising a buoyant hull having a fuselage frame and capable of floating on water when the craft is stationary, a singlebladed side-hydrofoil depending radially outwardly from each side of the hull in a continuously diverging direction relative to each other and at an angle below the horizontal when the craft is stationary whereby said side-hydrofoils form an inverted V-shaped configuration, said

side-hydrofoils being positioned forwardly of the center of gravity of the watercraft, a single blade front hydrofoil mounted centrally between said side-hydrofoils and depending vertically downwardly from said hull, said side-hydrofoils being pivotally mounted with respect to the frame on pivotal mountings to enable the ends of said hydrofoils to be movable towards the hull about the pivotal mountings and to enable said side-hydrofoils to be pivoted independently of each other about their longitudinal axes during wind driven operation of the watercraft, a rear hydrofoil depending downwardly from

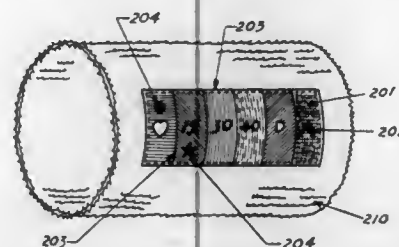


the hull, said rear hydrofoil being pivotally mounted with respect to the frame and capable of moving in a clockwise and anti-clockwise direction about its longitudinal axis to steer the craft, means for enabling wind to drive the hull forward, a cockpit towards an upper part of the hull and control means in the cockpit and linked to the side and rear hydrofoils for enabling the position of the side and rear hydrofoils about their pivotal mountings to be altered, said craft being capable of being supported and traveling on the hydrofoils when in motion.

4,164,910  
SCORE REGISTERING DEVICE  
Robert Feiler, 2 Oriole Pl., Port Chester, N.Y. 10573  
Filed Apr. 7, 1977, Ser. No. 785,316  
Int. Cl.<sup>2</sup> A63B 71/06

U.S. Cl. 116-225

4 Claims



1. An article of apparel comprising a sweatband to be worn on the wrist having mounted thereon a score registering device of flexible material comprising

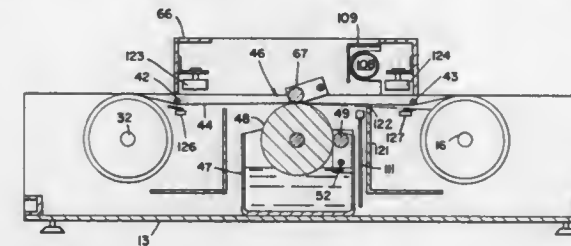
- a flexible scoreboard member bearing indicia of all possible point scores permanently attached to said sweatband;
- at least one score indicator marker; means on portions of said marker for detachably fastening said marker to selected indicia on said scoreboard member in association with any of said indicia;
- said means for detachably fastening said indicator markers to said scoreboard member comprising cooperating elements of a hook and loop type fastener wherein opposite edge portions of the said scoreboard member comprises one element of said hook and loop type fastener and the por-

tions of said score indicator marker comprises the cooperating element of said hook and loop type fastener.

4,164,911  
APPARATUS FOR RE-INKING PRINTING RIBBONS  
Albert N. Nicholson, Santa Clara, Calif., assignor to Engineering Systems Corporation, Santa Clara, Calif.  
Filed Sep. 19, 1977, Ser. No. 834,405  
Int. Cl.<sup>2</sup> B05C 1/08

U.S. Cl. 118-670

3 Claims

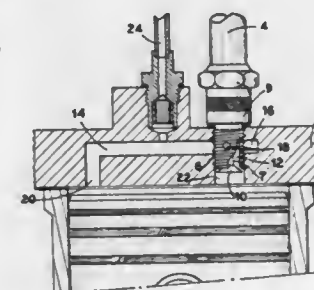


1. An apparatus for inking a printer ribbon extending between and wrapped about at least one of a pair of spools, comprising a base member; a pair of spool mechanisms secured to said base member in spaced apart relationship for supporting said spools; said spool mechanism including motor means for rotating said spools and transferring said printer ribbon therebetween; inking means, disposed between said spool mechanisms, for selectively inking said printer ribbon translating thereby; hole detector means, secured to said base member, for detecting holes in said printer ribbon, including a substantially planar transparent member having one edge adjacent to said printer ribbon and a parabolic edge extending from said one edge in convex fashion, said parabolic edge having an optical focus disposed proximate to a medial portion of said one edge, the planar surfaces and said parabolic edge being coated for total internal reflection, photoelectric pickup means disposed on said one edge proximate to said focus of said parabolic edge, means for illuminating said printer ribbon on the side thereof opposite said one edge, including a fixed light source extending the width of said printer ribbon opposite said one edge and directed thereto, and means responsive to said hole detector means, including electrical brake means for stopping said motor means with a detected hole adjacent to said hole detector means.

4,164,912  
METHOD FOR REDUCING POLLUTION DUE TO AN INTERNAL COMBUSTION ENGINE  
Roland R. C. Beyler, 61, Ave. du Maréchal Joffre, 94360 Bry-sur-Marne, France  
Filed Dec. 28, 1977, Ser. No. 865,124  
Claims priority, application France, Dec. 29, 1976, 76 39821  
Int. Cl.<sup>2</sup> F02P 1/00; F02B 3/00

U.S. Cl. 123-26

5 Claims



1. A method for reducing the polluting effect of an internal combustion engine which comprises a cylinder, a piston movable in the cylinder and defining with the cylinder a combustion

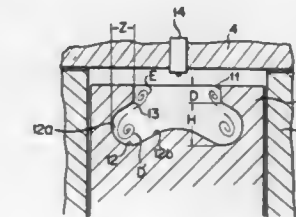
chamber, a spark plug and means supplying a mixture of fuel and air to the cylinder, said method comprising, after the end of the normal combustion of said mixture in the combustion chamber of the engine, establishing a post-combustion by maintaining a series of high-tension sparks during a long period and introducing turbulent additional air in the vicinity of said sparks so as to form a plasma which is propagated in a residue of said mixture in the chamber, the plasma being propagated by introducing said additional air into the chamber from a plurality of points, a part of said additional air being introduced from a point near to the spark and a part of said additional air being introduced from at least another point of the combustion chamber.

4,164,913  
COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE OF DIRECT INJECTION TYPE  
Kunihiko Komiyama; Seikichi Kanai, and Masaru Okada, all of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 2, 1977, Ser. No. 830,345  
Claims priority, application Japan, Sep. 2, 1976, 51/104309; Nov. 12, 1976, 51/151199[U]; Nov. 12, 1976, 51/151200[U]  
Int. Cl.<sup>2</sup> F02B 3/00

U.S. Cl. 123-30 C

7 Claims



1. In an internal combustion engine of the direct injection type including combustion chambers each defined by a cylinder head, a cylinder liner, and a piston head having a wall defining a cavity therein, means for producing air swirl in said cavity and fuel injection means each having a plurality of fuel injection nozzles, said fuel injection means being mounted substantially at the central part of said cavity, said nozzles being arranged to inject jets of fuel into said cavity radially against said cavity wall, the improvement wherein said cavity wall is constructed to define a generally equilateral polygonal cavity formed in the upper part thereof and a generally toroidal cavity formed in the lower part thereof, the ratio of the depth of said equilateral polygonal cavity to that of toroidal cavity being about 0.3 to about 1.2.

4,164,914  
AIR-FUEL RATIO CONTROLLING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 31, 1977, Ser. No. 783,429  
Claims priority, application Japan, May 13, 1976, 51-61051[U]; May 13, 1976, 51-61052[U]

Int. Cl.<sup>2</sup> F02M 7/00, 23/04  
U.S. Cl. 123-32 EE

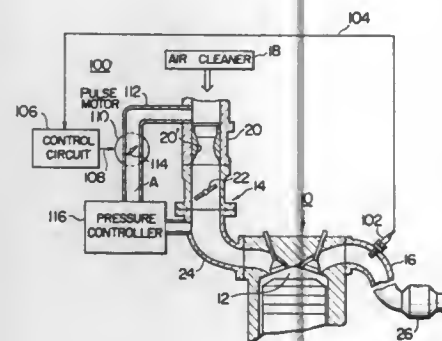
3 Claims

1. In an internal combustion engine including a combustion chamber, an intake duct for supplying an air-fuel mixture into said combustion chamber, an exhaust pipe for conveying combustion gases from said combustion chamber to the atmosphere, a carburetor in said intake duct for producing the air-fuel mixture, and a throttle valve pivotally mounted in said intake duct downstream of said carburetor for controlling the



flow of the air-fuel mixture through said intake duct into said combustion chamber; the improvement which comprises:

- an apparatus for controlling the air-fuel ratio of the air-fuel mixture supplied into said combustion chamber, said air-fuel ratio controlling apparatus including;
- an air-fuel ratio detecting means disposed in said exhaust pipe to detect the oxygen content of the combustion gases flowing therethrough for thereby detecting the air-fuel ratio of the air-fuel mixture supplied into said combustion chamber;
- a passage bypassing said carburetor and said throttle valve and having a downstream end connected to said intake duct downstream of said throttle valve for supplying an additional air into said intake duct;
- air valve means in said bypass passage for controlling the cross-sectional area of said bypass passage through which said additional air is permitted to flow to said intake duct downstream of said throttle valve;
- means drivingly connected to said air valve means and operatively associated with said air-fuel ratio detecting means for actuating said air valve means such that the airflow cross-sectional area of said bypass passage is increased when the detected air-fuel ratio is smaller than a predetermined value; and
- pressure control means for controlling the pressure in said



- bypass passage downstream of said air valve means, said pressure control means including;
- a valve seat disposed in said bypass passage downstream of said air valve means;
- means including a deformable diaphragm and defining first and second pressure chambers with said diaphragm;
- a multi-position valve having a first port pneumatically connected to said first pressure chamber, a second port pneumatically connected to said bypass passage at a first point between said air valve means and said valve seat and a third port pneumatically connected to said bypass passage at a second point downstream of said valve seat and upstream of said combustion chamber, said second pressure chamber being communicated with a venturi in said carburetor so that said second pressure chamber is supplied with venturi vacuum;
- means operatively associated said multi-position valve and responsive to variations in one of the operating conditions of the engine to actuate said valve for thereby selectively switching over the communication of said second and third ports with said first port so that said first pressure chamber is supplied with a pressure at one of said first and second points in said bypass passage; and
- a needle valve cooperative with said valve seat to define a variable orifice and drivingly connected to said diaphragm.

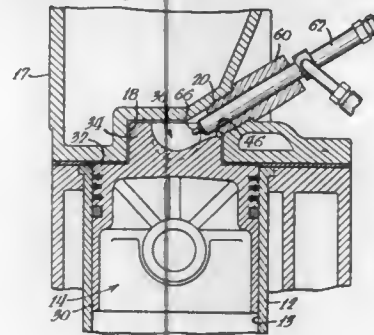
#### 4,164,915 CONVERSION OF GASOLINE TO DIESEL ENGINE

Joseph T. Kulhavy, Davenport, Iowa, and Donald G. Shelton, Burlington, Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Jun. 30, 1977, Ser. No. 811,784  
Int. Cl.<sup>2</sup> F02B 3/00

U.S. Cl. 123—32 R

15 Claims



1. A method of producing a diesel engine from a gasoline engine having a plurality of cylinder bores adapted to have pistons reciprocated therein between raised and lowered positions with a cylinder head closing upper ends of said bores and defining a reduced chamber at the upper end of each bore and a spark plug opening in communication with each reduced chamber, comprising the steps of producing a piston including a cylinder portion having a size corresponding to each of said cylinder bores and a dome corresponding to and adapted to be received into said reduced chamber, forming a combustion chamber in an upper surface of said dome and aligned to be in communication with said spark plug opening, inserting one of said pistons into each of said bores, and inserting a fuel injector into each of said spark plug openings in a position to be in continuous communication with a respective combustion chamber so that movement of said piston toward said reduced chamber will initially cause said dome to be received in said reduced chamber to close off the lower end thereof and continued movement of said piston will compress the gases into said combustion chamber whereby fuel injected into said combustion chamber will be ignited therein.

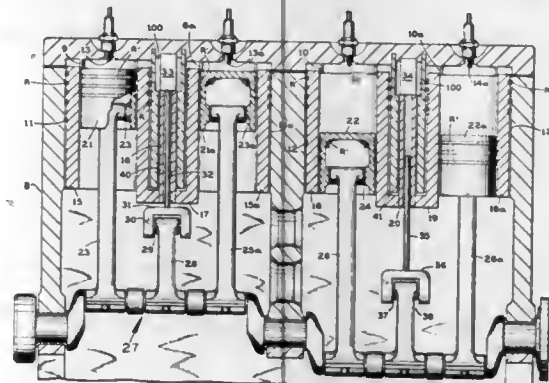
#### 4,164,916 VARIABLE DISPLACEMENT ARRANGEMENT IN FOUR CYCLE, RECIPROCATING, INTERNAL COMBUSTION ENGINE

Robert P. Wuerfel, 4620 NW. 45 Ct., Ft. Lauderdale, Fla. 33319  
Filed Aug. 7, 1978, Ser. No. 931,566

Int. Cl.<sup>2</sup> F02B 75/04

U.S. Cl. 123—78 C

15 Claims



1. In a four cycle, reciprocating, internal combustion engine having a cylinder, means for introducing a fuel mixture into the cylinder, means for igniting the fuel mixture, means for ex-

hausting the burned gasses from the cylinder, and an engine crankshaft, the improvement which comprises:

- a hollow outer piston reciprocable in said cylinder;
- an inner piston reciprocable in said outer piston and exposed thereto to pressure of the fuel mixture introduced into the cylinder, said inner piston being operatively connected to the engine crankshaft;
- yieldable means biasing said outer piston against movement in the cylinder in response to pressure of the fuel mixture, said yieldable means being operative to prevent such movement of the outer piston while the engine is under low load, said yieldable means being operative to permit movement of the outer piston in the cylinder in response to pressure of the fuel mixture while the engine is under substantial load;
- and means for coupling said outer piston to the engine crankshaft when the outer piston moves in the cylinder in response to ignition of the fuel mixture while the engine is under substantial load;
- said yieldable means comprising magnet means biasing said outer piston against movement in said cylinder under pressure of the fuel mixture.

#### 4,164,917 CONTROLLABLE VALVE TAPPET FOR USE WITH DUAL RAMP CAM

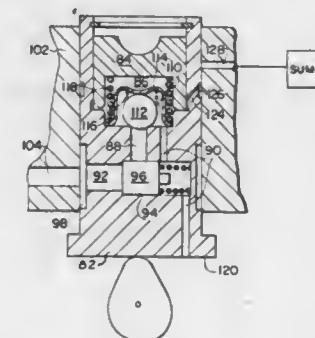
Richard E. Glasson, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 16, 1977, Ser. No. 825,178

Int. Cl.<sup>2</sup> F02D 13/04; F01L 3/24

U.S. Cl. 123—97 B

9 Claims



1. Valve opening control apparatus for limiting the fully open position of a valve in an internal combustion engine having at least one reciprocating piston and an associated valve operable in selectively variable timed relationship with the piston by means of a valve train connected with a rotatable cam having circumferential portions successively engaging the valve train including a primary base circle for causing valve closure, a raised portion for causing valve opening to a predetermined upper limit and a secondary base circle recessed below the primary base circle, said control apparatus comprising

- (a) extensible thrust conveying means installable within the valve train for transmitting opening and closing movement from the cam to the valve and for varying the timed relationship of valve and piston operation by varying the effective length of the valve train;
- (b) control means for selectively operating said extensible thrust conveying means either in a first mode in which said thrust conveying means extends in length when the valve train is engaged by the secondary base circle of the cam and collapses during each revolution of the cam as the point of engagement of the cam with the valve train shifts from the secondary base circle to the primary base circle or in a second mode in which said extensible thrust conveying means is extended in length when the valve train engages the secondary base circle of the cam and is locked in an extended position of sufficient length to cause partial opening of the valve when the valve train is en-

gaged by the primary base circle of the cam and in which said extensible thrust conveying means is unlocked and collapsed completely during each revolution of the cam before the valve train engages the outermost raised portion of the cam, said control means includes a position sensing means for sensing the predetermined upper limit of the valve and for causing said extensible thrust conveying means to collapse completely during the second mode whenever the valve attains this predetermined upper limit, whereby the valve may be selectively opened when the valve train is engaged by the primary base circle of the rotating cam without increasing the valve lift caused by the raised portion of the rotating cam to thereby insure proper valve piston clearance during all modes of operation.

#### 4,164,918 EXHAUST GAS RECIRCULATION CONTROL

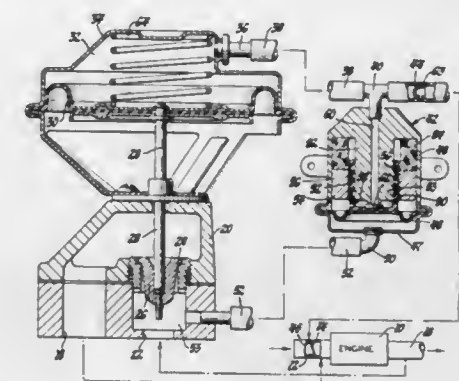
Raymond J. Haka, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1978, Ser. No. 879,781

Int. Cl.<sup>2</sup> F02M 25/06

U.S. Cl. 123—119 A

8 Claims



1. An exhaust gas recirculation control assembly for an engine having an induction passage for induction air flow, an exhaust passage, and an exhaust gas recirculation passage interconnecting said exhaust and induction passages, said assembly comprising a valve for controlling exhaust gas recirculation through said recirculation passage, a coil, a member electromagnetically responsive to current in said coil for creating a reference pressure, and means operating said valve to provide exhaust gas recirculation at rates which maintain a control pressure in said recirculation passage equal to said reference pressure and thus provide exhaust gas recirculation substantially proportional to induction air flow, and wherein current in said coil may be adjusted to change said reference pressure and thereby change said control pressure to effect a change in the proportion of exhaust gas recirculation to induction air flow.

#### 4,164,919 TANK VENT SYSTEM

Lewis K. Davis, Waterloo, and Kenneth J. Lowin, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 724,546, Sep. 20, 1976, abandoned. This application Apr. 18, 1978, Ser. No. 897,357

Int. Cl.<sup>2</sup> F02M 59/00

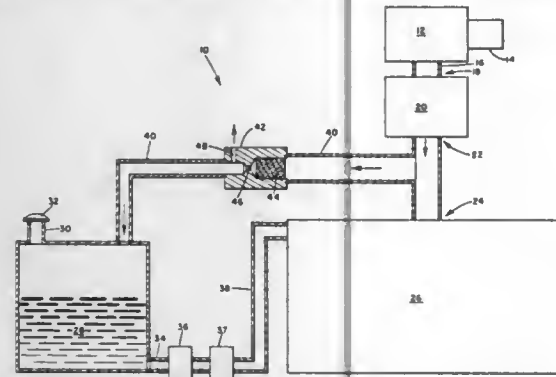
U.S. Cl. 123—136

6 Claims

1. A tank vent system comprising: an internal combustion engine; air filter means for providing filtered air to said engine; a turbocharger having an inlet side operatively connected to said air filter means and an outlet pressure side operatively connected to said engine for providing filtered and pressurized air to said engine; a fuel tank having a non-vented filler cap for



containing fuel for said engine; an air line connecting the outlet pressure side of said turbo-charger to said fuel tank to cause filtered and pressurized air to replace fuel supplied to said engine; first orifice means disposed in the air line between the



outlet pressure side of said turbocharger and said fuel tank restricting air flow therebetween and second orifice means connected to the air line between the first orifice means and the fuel tank to relieve air pressure in the air line whereby pressure in the fuel tank is relieved.

4,164,920

#### DEVICE FOR SUPPLYING FUEL TO A COMBUSTION ENGINE AND METHOD OF MANUFACTURING SAID DEVICE

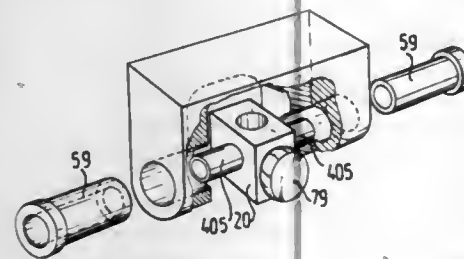
Willem Brinkman, Velp, Netherlands, assignor to Holec N.V., Hengelo, Netherlands

Filed Jan. 19, 1977, Ser. No. 760,718

Claims priority, application Netherlands, Jun. 28, 1976, 7607080

Int. Cl.<sup>2</sup> F02M 39/02; F02D 1/06; F04B 35/04  
U.S. Cl. 123—139 R

18 Claims



1. A device for delivering fuel to a combustion engine, in which the pump chambers of at least two fuel pumps are arranged coaxially at a distance from one another, are communicating each through an inlet valve with a fuel supply and through an outlet valve with a fuel delivery port to be connected with the combustion engine and are limited by a displacer body reciprocated by driving means, said two displacer bodies and the driving means being intercoupled by means of a coupling member arranged between the two fuel pumps, characterized in that the pump chambers are provided in coaxial bores in the two ends of a bridge piece, one end being located in the pump housing of one fuel pump and the other end in the pump housing of the other fuel pump, whilst at least one intermediate piece interconnects the two ends of the bridge piece.

4,164,921

#### FUEL INJECTION PUMP

Gerald Höfer, Weissach-Flacht, and Franz Eheim, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

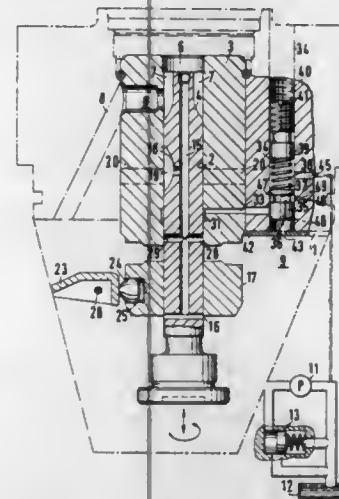
Filed Oct. 31, 1977, Ser. No. 847,300

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649893

Int. Cl.<sup>2</sup> F02M 39/00; F02D 1/06

U.S. Cl. 123—139 AF

7 Claims



1. A fuel injection pump for internal combustion engines having a housing, a supply pump that delivers fuel under rpm-dependent pressure into a suction chamber of said injection pump, a pumping chamber in communication with said suction chamber, at least one reciprocating pump piston and an associated discharge channel, said pump piston arranged to open said discharge channel of said pumping chamber that is adapted to be blocked at starting rpm, the improvement in which said discharge channel extends to a bore, a control piston in said bore arranged to be actuated by the fuel pressure of said supply pump and said control piston having an oppositely disposed face which is acted upon by a spring means.

4,164,922

#### TIMING CONTROL SYSTEM AFFORDING MAINTENANCE OF FUEL QUANTITY DELIVERED

Franz Eheim, Stuttgart, and Gerald Höfer, Weissach-Flacht, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

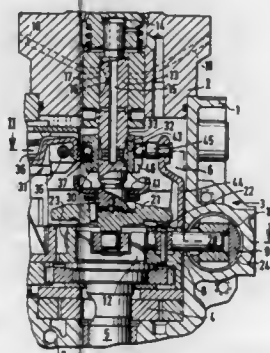
Filed Aug. 25, 1977, Ser. No. 827,640

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638670

Int. Cl.<sup>2</sup> F02M 39/00

U.S. Cl. 123—139 AQ

9 Claims



1. A fuel injection pump for supplying metered quantities of

fuel to an internal combustion engine, said pump including, in combination:

a housing;  
a cylinder and piston assembly within said housing;  
inlet and outlet means for said cylinder;  
cam actuator means for providing reciprocating motion to said piston in said cylinder;  
rotary drive means for said piston;  
rotating shaft means for powering said cam actuator means;  
means for actuating said rotating shaft means;  
adjustment means for changing and adjusting the angular position of said cam actuator means with respect to said rotating shaft means, thereby changing the fuel delivery timing;  
means for supplying fuel to said housing; and  
flow control means for controlling the flow of fuel from said housing to said cylinder; and wherein the improvement comprises:  
coupler means connected to said flow control means and to said cam actuator means for maintaining the relative angular position between said flow control means and said cam actuator means when the angular position of said cam actuator means is changed for the purpose of changing the fuel delivery timing.

4,164,923

#### FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Kel Kimata, Ama; Tsugito Nakazeki, and Saburo Oshima, both of Iwata, all of Japan, assignors to NTN Toyo Bearing Co. Ltd., Osaka, Japan

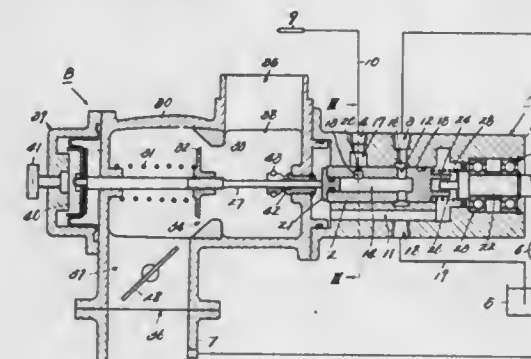
Filed Jul. 30, 1976, Ser. No. 710,128

Claims priority, application Japan, Jul. 31, 1975, 50/93970; Aug. 5, 1975, 50/95691

Int. Cl.<sup>2</sup> F02D 1/00, 3/04

U.S. Cl. 123—140 MC

18 Claims



1. A fuel injection device for use with an internal combustion engine having an air suction inlet comprising a main body having a longitudinally extending cylindrical bore, a fuel supply port and a plurality of fuel metering ports communicating with said bore; each of said metering ports having a configuration in the form of a substantially triangular window opening with one of its three sides extending circumferentially; a plurality of fuel distributing ports communicating with said fuel metering ports; a cylindrical rotor disposed in said cylindrical bore of said main body; said rotor having an inlet port communicating with said fuel supply port of said main body and a metering port communicating with said inlet port and associated with said metering port of said main body; drive means for rotating said rotor in synchronism with the rotation of the internal combustion engine; control means for longitudinally sliding said rotor in accordance with the amount of air supplied by the air suction inlet of the internal combustion engine; and fuel supply means for supplying the fuel supply portion of the main body with pressurized fuel whereby the lengths of time for communication between the individual metering ports of the main body and the metering port of the rotor are controlled

in connection with the r.p.m. of the engine and the amount of air supplied through the air suction inlet.

4,164,924

#### CENTRIFUGAL SPEED GOVERNOR FOR AN INTERNAL COMBUSTION ENGINE

Niro Makino, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

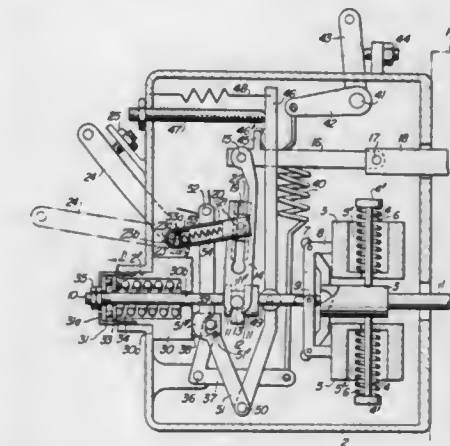
Filed Dec. 8, 1977, Ser. No. 858,816

Claims priority, application Japan, Dec. 16, 1976, 51-151702

Int. Cl.<sup>2</sup> F02D 1/04

U.S. Cl. 123—140 R

10 Claims



1. A centrifugal speed governor for an internal combustion engine of the type that has a fuel supply system including a fuel injection pump having a control rack movable to control the fuel pump discharge, said governor comprising fly weights rotatable about a first axis in timed relationship with the engine revolution and movable radially outwardly of said first axis with the increase in the centrifugal force produced by the rotation of said fly weights, a control shaft operatively connected to said fly weights and axially movable by the radial movement of said fly weights, a floating lever operatively connecting said control shaft with said control rack of said fuel injection pump, idle spring means yieldably acting in at least an idle operating range against the centrifugal force produced by the rotation of said fly weights, main spring means yieldably acting against said centrifugal force in a high speed engine operating range, compensating means operative to suppress undue increase of the fuel pump discharge which would otherwise occur with the increase of the engine speed, said compensating means including compensating spring means yieldably acting against said centrifugal force in a compensation engine operating range between said idle and high speed engine operating ranges, an adjusting lever rotatable about a second axis between idle and full load positions, a steering lever having one end operatively connected to said floating lever at a point between the ends thereof, the other end of said steering lever being operatively connected to said adjusting lever for relative angular movement, biasing spring means operatively associated with said steering lever and operable to yieldably hold said steering lever at a predetermined stable position relative to said adjusting lever and, when said steering lever is angularly displaced from said stable position, to return said steering lever to said stable position, the point of connection between said steering and floating levers being movable substantially longitudinally of said floating lever to provide the same with a variable fulcrum about which said floating lever is rotated by the axial movement of said control shaft to move said control rack, a maximum fuel lever operative to limit the movement of said control rack toward increasing the fuel pump discharge, said maximum fuel lever being rotatable about a pivot point adjacent to one end thereof and operatively associated with said control rack at a second point remote from said pivot

point, said maximum fuel lever having a third point operatively associated with said control shaft so that said maximum fuel lever is rotated about said pivot point particularly in said compensation engine operating range to allow said control rack to follow the rotational movement of said maximum fuel lever and thus move toward increasing the fuel pump discharge so far as said biasing spring means biases said steering lever to return to said stable position, the arrangement being such that when said adjusting lever is placed at said full load position said steering lever is adapted to be held at a position angularly displaced from said stable position at the beginning of said compensation engine operating range and such that, when said maximum fuel lever is rotated about said pivot point by the axial movement of said control shaft, said steering lever is rotated about said other end thereof to move said point of connection between said steering and floating levers longitudinally of said floating lever so that said control rack is caused to follow the movement of said maximum fuel lever and move toward increasing the fuel pump discharge, and a holding lever pivotable about a point adjacent to one end thereof and having a first part operatively associated with said control shaft so that said holding lever is rotated about said one end by the axial movement of said control shaft in said high speed engine operating range, said holding lever having a second part operatively associated with said maximum fuel lever at said pivot point so that, when said holding lever is rotated by said control shaft in said high speed engine operating range, said pivot point of said maximum fuel lever is moved in the same direction as the movement of said second part of said holding lever.

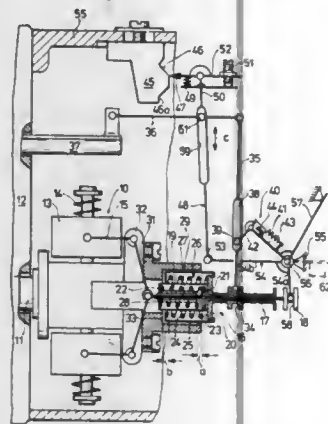
4,164,925  
CENTRIFUGAL RPM GOVERNOR FOR INTERNAL  
COMBUSTION ENGINES

Sieghart Maier, Stuttgart; Werner Lehmann, Gerlingen; Ernst Ritter, Stuttgart; Wolfgang Eckell, Gebersheim, and Reinhard Schwartz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Dec. 12, 1977, Ser. No. 859,510

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656261

U.S. Cl. 123—140 R      Int. Cl.<sup>2</sup> F02D 1/04

## 22 Claims



1. In a centrifugal rpm governor for a fuel injection pump of an internal combustion engine, said pump having a fuel supply control member and a drive shaft, the governor including: a housing; centrifugal weight means, including regulating springs, mounted within the housing to the drive shaft for rotation with the drive shaft; an adjusting member connected to the centrifugal weight means and displaceable by the centrifugal weight means as a function of the rpm of the drive shaft against the force of the regulating springs; an intermediate lever connected to the adjusting member and the fuel supply control member; a setting member mounted to the housing to arbitrarily move the fuel supply control member by the intermediate lever; adjustable stop means adjustable in the

direction of the longitudinal axis of the fuel supply control member, said adjustable stop means having a contoured stop surface and serving to determine the full load fuel supply quantity of the fuel pump; follower means connected at least indirectly to the intermediate lever for engagement with the contoured stop surface; and force accumulator means connected to the intermediate lever, the improvement in the governor comprising:

an angled shift lever, one arm of which is coupled to the adjusting member and the other arm of which is connected at least indirectly to the intermediate lever, said shift lever serving as a motion translating member and defining a pivot point for the follower means, wherein:

(i) the force accumulator means is stretched as soon as and as long as the intermediate lever is moved in a direction tending to move the fuel supply control member past the adjustable stop means; and

(ii) the follower means is shifted relative to the contoured stop surface by the adjusting member through the shift lever, when the adjusting member changes the position of the pivot point on the shift lever causing the follower means to engage the contoured stop surface, said shifting movement being proportional to the adapting control stroke of the adjusting member.

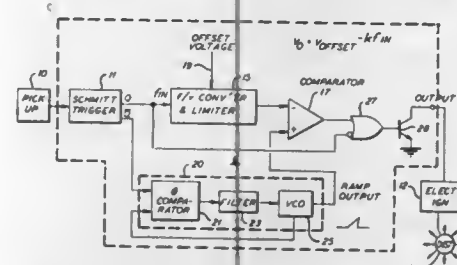
**4,164,926**  
**ELECTRONIC IGNITION ADVANCE CIRCUIT**

**Peter J. Kindlmann, Northford, Conn., assignor to The Echlin Manufacturing Company, Branford, Conn.**

Filed Dec. 13, 1976, Ser. No. 749,666

U.S. Cl. 123—148 E

## 43 Claims



1. In an internal combustion engine electronic ignition system which includes means for association with the engine having a timing pulse output representing crankshaft position and means for accepting said pulses and generating high voltage energy to be supplied to the spark plugs of the engine in response thereto, an electronic spark advance circuit comprising:

(a) means for developing a voltage proportioned to a desired amount of advance having an input for coupling to the timing pulse output from the engine;

(b) a phase locked loop including a phase comparator, a filter circuit and a voltage controlled oscillator having as inputs to its phase comparator a line adapted to be coupled to said timing pulse output, and the output of said voltage controlled oscillator, the output of said phase comparator coupled through said filter as the input to said voltage controlled oscillator, said phase locked loop thereby acting to adjust the output of said voltage controlled oscillator until the frequency thereof corresponds to the frequency of said timing pulse output, said phase locked loop delivering at its output a ramp voltage which is in phase with the input thereof; and

(c) a comparator having its inputs coupled respectively to the output of said means for developing a voltage proportioned to a desired amount of advance, and the ramp voltage output of said phase locked loop and providing at its output pulses which are advanced with respect to the output pulses of the distributor as a function of said pro-

4,164,927  
REINFORCED STAMPED VALVE COVER

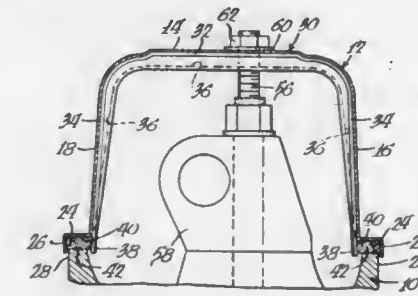
Sam R. Congram, Peoria, Ill., and George S. Cole, Laddonia, Mo., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,580

Int. Cl.<sup>2</sup> F01M 9/10

U.S. Cl. 123-195 C

## 2 Claims



section of sufficient width to fit about said firing rod and into one of said firing rod notches.

4,164,929  
PROJECTILE LOADER FOR GUN

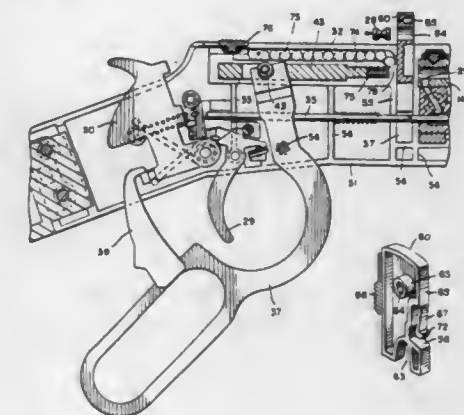
**Sigurds Liepins, Rushville, and James W. Crane, Fairport, both of N.Y., assignors to The Coleman Company, Inc., Wichita, Kans.**

**Filed Jul. 11, 1977, Ser. No. 814,438**

Int. Cl.<sup>2</sup> F41B 11/06; F41F 1/04

d U.S. Cl. 124-76

### 5 Claims



4,164,928  
BASKETBALL TOSSING DEVICE  
Hurshel Meares, 9877 Grand Teton, Baton Rouge, La. 70814  
Filed Nov. 1, 1976, Ser. No. 737,188

U.S. Cl. 124-16

## 2 Claims

1. A hand held device for tossing a basketball of standard size and shape and specific curvature radius up into the air a predetermined distance which comprises:

(a) a rest plate having a surface on which said basketball can sit, said surface having a curvature radius like said specific curvature radius of said basketball;

(b) a casing structure:

(c) a spring-loaded firing assembly attached to said rest plate and connected to said casing structure; said firing assembly having a firing rod provided with notches at pre-determined positions on said firing rod; and

4. In a gun having a frame, a barrel mounted on the frame, and means for discharging a projectile from the barrel, an improved projectile loader slidably mounted in a slot in the frame for sliding movement in a direction transverse to the axis of the barrel, the loader having a bore extending therethrough and being movable between a firing position in which the bore is axially aligned with the barrel and a loading position in which the bore is positioned outside of the frame, the loader being integrally molded from plastic and including a flexible and resilient arm portion which is engageable with a recess in the frame when the loader is in the loading position to restrain removal of the loader from the frame, a portion of the flexible and resilient arm of the loader being positioned outside of the frame when the loader is in its loading position whereby the arm can be pressed out of engagement with the recess to permit the loader to be removed from the frame.



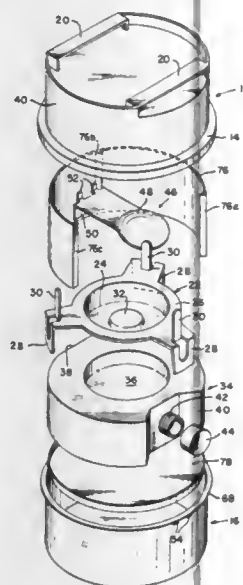
4,164,930

## COOKING STOVE

Harold E. Johnston, 8039 43rd Ave. NE., Seattle, Wash. 98115  
Continuation-in-part of Ser. No. 740,965, Nov. 11, 1976,  
abandoned. This application Apr. 22, 1977, Ser. No. 789,940  
Int. Cl.<sup>2</sup> F24C 5/20

U.S. Cl. 126—38

14 Claims



1. A liquid-fuel stove for heating the contents of a pan, comprising a heat-conductive burner plate having a recessed fuel dish adapted to contain a quantity of liquid fuel and a heat-collecting surface adjacent said fuel dish adapted to conduct heat radiated on said surface from said pan to said fuel dish such that heat from said pan vaporizes fuel in said fuel dish, said burner plate being housed within first and second cylindrical containers having their rims releasibly secured to each other to form an enclosed storage container, said first container having a rim surrounded by an annular slot having an inwardly inclined outer wall terminating in an annular groove, said second container having a rim curving outwardly such that the rim of said second container may be inserted in the slot of said first container and retained in said groove thereby releasibly locking said first and second containers to each other.

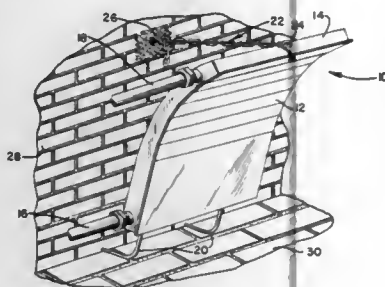
4,164,931

## THERMAL DEFLECTOR

James H. Jenkins, 6010 N. 26th St., Arlington, Va. 22207  
Filed Oct. 19, 1976, Ser. No. 733,872  
Int. Cl.<sup>2</sup> F24B 9/04

U.S. Cl. 126—132

1 Claim



1. A heat exchange and reflector device for use in a fireplace comprising: a heat exchange chamber having top, bottom, front, back and side panels, said chamber being forwardly curved such that the top panel is horizontally and vertically displaced from the bottom panel, at least one side panel having

inlet conduit means and exit conduit means for heat exchange medium to be heated by the fire in the fireplace, a reflector surface attached to and conforming to the shape of the front panel of the heat exchange chamber, a pair of L-shaped legs adjustably connected to the back panel of the heat exchange chamber, hook means attached to the reflector surface and chain means communicating with said hook means for supporting the device in the fireplace.

4,164,932

SOLAR HEAT COLLECTOR CONSTRUCTION  
Joseph G. Gavin, Huntington, N.Y., assignor to Grumman Corporation, Bethpage, N.Y.  
Division of Ser. No. 750,580, Dec. 15, 1976, Pat. No. 4,086,913.  
This application Jan. 16, 1978, Ser. No. 869,718  
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—448

1 Claim



1. A solar collector comprising: an array of spaced tubes for conducting heat exchange fluid; means to collect solar energy and transfer its heat to said array of spaced tubes for heating said heat exchange fluid, said means comprising a plurality of finplanks with each finplank of said plurality having a cooperating vertical lip radiating from a downwardly facing first contoured surface at one edge and at another edge a lateral flange inwardly of an upwardly facing second contoured surface, said first contoured surface and said second contoured surface being dimensioned so as to cooperate when about separate portions of a tube of said array of tubes in enclosing said tube, said vertical lip being deformable downwardly and outwardly by said lateral flange on assembly of said another edge to said one edge in joining one finplank edge to another finplank edge to unite a plurality of finplanks said lip engaging said flange such that residual forces tending to return it to its vertical attitude will draw the contoured edges toward each other with the tube interposed in compression as an integral member in joining one finplank edge to another finplank edge to thereby provide force contact that will provide good thermal conductivity between said array of spaced tubes and said plurality of finplanks.

4,164,933

## CONCRETE SOLAR COLLECTORS

Anthony C. Alosi, 5050 Tamarus, Apt. 159, Las Vegas, Nev. 89109

Filed Oct. 6, 1976, Ser. No. 729,963

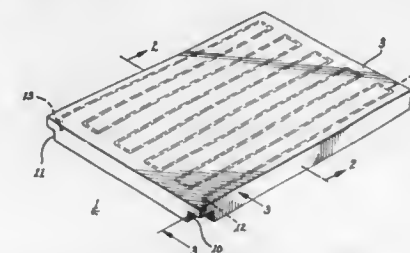
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—447

9 Claims

1. A monolithic precast solar collector roof panel, each said roof panel comprising in combination:  
a. reinforcement means contained in said roof panel for increasing the load bearing capability of each said roof panel to withstand the expected roof loads;  
b. a fluid conveying passageway formed within said roof panel and defined by the material of said roof panel, said passageway being disposed in proximity to the exterior surface of said roof panel for subjecting the conveyed fluid to the thermal influence of the exterior surface, said passageway having input and output ends;  
c. a source of fluid interconnected with the input end of said

passageway for supplying a flow of fluid through said passageway; and  
d. heat exchange unit interconnected with the output end of said passageway for receiving a flow of fluid from said passageway;



whereby, the increase in thermal energy of the exterior surface of said roof panel irradiated by the sun is transferred to the fluid flowing through said passageway and delivered to said heat exchange unit.

4,164,934

## ELLIPTICAL SOLAR REFLECTOR

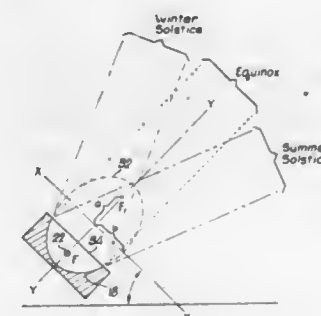
Robert V. Anderson, 3900 Summercrest Dr., Fort Worth, Tex. 76109

Filed Aug. 16, 1976, Ser. No. 714,497

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—438

11 Claims



1. A solar energy collection device, comprising: an elongated, trough-like elliptical reflector having the concave surface thereof reflectorized and which substantially coincides with a section of a focal end surface of an imaginary elliptical cylinder, said cylinder presenting and being defined in part by a pair of elongated, spaced focal lines; elongated, solar energy-receiving means adapted to receive and utilize solar energy; means mounting said solar energy-receiving means in spaced relationship to said concave reflectorized surface and substantially along the elongated focal line of said imaginary elliptical cylinder adjacent said focal end surface for maximum focusing of solar energy from the reflector onto said solar energy-receiving means; solar energy-conveying cover means disposed over said solar energy-receiving means and the open end of said reflector; and structure supporting said reflector and solar energy-receiving means for passage of at least certain of the sun's rays through or parallel to the remaining focal line of said cylinder and onto said reflectorized surface, in order to reflect and focus said rays onto said solar energy-receiving means.

4,164,935

## SOLAR HEATING PANELS

Kevin C. Marles, and Brian W. Spencer, both of Torquay, England, assignors to Solar Apparatus & Equipment Limited, London, England

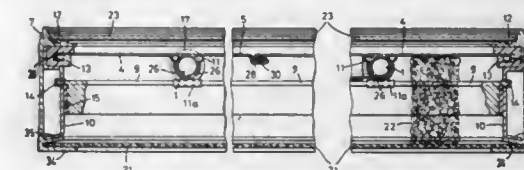
Filed Sep. 6, 1977, Ser. No. 830,997

Claims priority, application United Kingdom, Oct. 6, 1976, 41506/76

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—447

5 Claims



1. A solar heating panel comprising a plurality of cylindrical tubes for carrying a liquid to be heated and an absorber plate for absorbing solar radiation falling thereon, the absorber plate including a plurality of rigid plate sections each having at one edge an outwardly-facing concave substantially semi-cylindrical portion, the concave surface of the semi-cylindrical portion having the same radius of curvature as the outer circumferential surface of one of the cylindrical tubes, and clamping means engaging the convex outer surfaces of the semi-cylindrical portions on two adjacent plate sections and thereby clamping a cylindrical tube with its outer surface in heat-conducting contact with the concave surfaces of said semi-cylindrical portions, each of the plates of said plurality of plate sections being shaped at an opposite edge which is parallel to the said one edge such that the said opposite edge faces towards the said one edge thereby defining a channel in the plate section within which channel a similar opposite edge of another plate section is slidably engaged in a manner which detachably interlocks the said opposite edges but permits expansion of the plate sections relative to one another.

4,164,936

## DAMPER

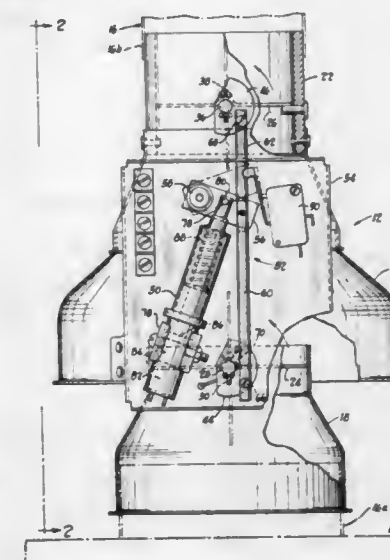
Nicholas J. Dottore, Jr., 34460 Parkview Dr., Willoughby Hills, Ohio 44094

Filed Aug. 18, 1977, Ser. No. 825,571

Int. Cl.<sup>2</sup> F23N 3/00

U.S. Cl. 126—285 R

8 Claims



1. A damper assembly comprising: a baffle pivotably supported for movement between two positions;

an actuator for pivoting the baffle, said actuator having a heater, an expansible fluid undergoing a fluid to vapor expansion phase change during heating and a vapor to fluid contraction phase change during cooling and a member movable in response to expansion and contraction of said fluid;

a linkage between said movable member and the baffle to pivot the baffle between said two positions in response to movement of said actuator member and

a switch located to be actuated in response to movement of said movable member, so its conductive condition is responsive to the position of the baffle.

4,164,937

# EQUIPMENT FOR DETECTING, MONITORING, MEASURING, DISPLAYING AND RECORDING PULSE AND HEARTBEAT

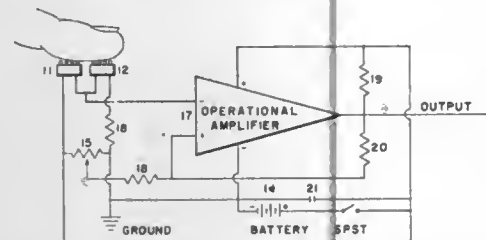
William E. Spencer, 3201 MacVicar Ct., Topeka, Kans. 66611

Filed Dec. 2, 1976, Ser. No. 748,153

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—666

3 Claims



1. Apparatus for detecting, monitoring and displaying the pulse and heartbeat of a human subject consisting of:

- a. a transducer for engaging the finger and other parts of the human body to form optically created pulse signals from pulsatile blood volume changes using ambient light sources wherein said transducer consists of two photocells and a potentiometer, means for positioning the photocells to allow the photocells to detect ambient light transmitted through an engaged finger or other body parts and the photocells and potentiometer being connected as arms of a Wheatstone bridge circuit with said photocells being connected in a differential configuration to reduce the effect of changing and unregulated light sources and provide a suitable low level analog signal from minute photocell resistance changes and permit simple adjustments of the Wheatstone bridge circuit by varying the position of subject's finger on the transducer, varying the effect of ambient light sources on the transducer and/or varying the potentiometer in the Wheatstone bridge circuit;
- b. comparator circuit means connected to the Wheatstone bridge circuit that senses the state of the Wheatstone bridge circuit and converts said low level analog signal to a high level digital output signal in response to the optically created pulse signals; and
- c. a light indicator connected to the comparator circuit means and operated by said comparator circuit means to produce a visual signal corresponding to the pulse and heartbeat.

4,164,938

# MEDICAL PRESSURE GAUGE AND INDICATOR DEVICE

William F. Patton, 1400 Edgewood, Ann Arbor, Mich. 48103

Filed Nov. 25, 1977, Ser. No. 854,870

Int. Cl.<sup>2</sup> A61B 10/00

U.S. Cl. 128—716

7 Claims

1. A medical pressure gauge and indicator device for diagnosing the presence of tension pneumothorax in the pleural cavity of a patient comprising a diaphragm having an interior surface for contact with the pressure of air within the pleural

cavity and having an exterior surface for contact with atmospheric air; a needle of sufficient length for puncturing the chest wall and for extending into the pleural cavity; an elongated rigid tubular sleeve having a pair of ends and mounting said needle and said diaphragm; means for fixedly securing a portion of said diaphragm to one end of said sleeve, with the remaining portion of said diaphragm extending into said sleeve; said diaphragm having an expanded position and a collapsed position; said diaphragm when in said collapsed position being generally located within the interior of said sleeve; said diaphragm when in said expanded position being located outside of said sleeve; adapter means mounting said needle on the other



end of said sleeve; said needle having a rear end inflow communication with the interior of said sleeve and the interior surface of said diaphragm and a sharpened chest wall-puncturing forward end; said needle being adapted to transmit the pressure of air within the pleural cavity to the interior of said sleeve where it acts upon the interior surface of said diaphragm, said diaphragm forming pressure means whereby, if a pressure greater than atmospheric pressure is present, the diaphragm will be urged out of said sleeve to said expanded position and will form a balloon-like shape which positively indicates the presence of greater than atmospheric air within the pleural cavity, thus indicating the treatment required for the patient.

4,164,939

# ORTHOGONAL ELECTROMAGNETIC FLOW AND DIAMETER SENSOR SYSTEM

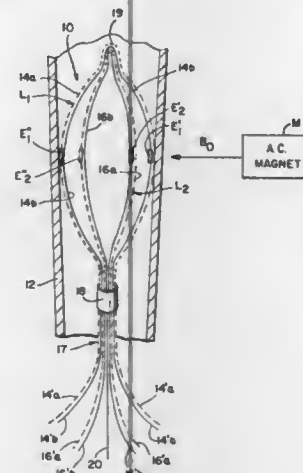
Alexander Kolin, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 24, 1977, Ser. No. 809,539

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—692

13 Claims



1. An intravascular loop probe comprising:
  - a first flat deformable wire loop disposed in a first plane;
  - a second flat deformable wire loop disposed in a second plane substantially perpendicular to and centrally intersecting said first plane, said first and second loops defining said probe, each of said loops being closed at one end and having terminals at the other end, said loops being collapsible to an elongated narrow configuration for insertion into a narrow conduit and expansible in a larger conduit; and

electrode means formed at a diametrically opposite sides of each of said loops for picking up electromagnetically induced signals corresponding to rate of fluid flow in said larger conduit and said loop terminals being connected to said electrode means for yielding an induced signal corresponding to the width of said larger conduit, whereby an externally applied magnetic field will cause induction of voltages in said flowing fluid and said loops in said larger conduit, said voltages corresponding to the rate of fluid flow in said larger conduit, and to the diameter of said larger conduit.

4,164,940

# DENTAL CLEANING AND MASSAGING APPARATUS

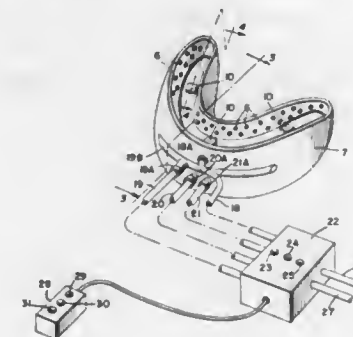
James D. Quinby, 1092 NE. Glass Dr., Jensen Beach, Fla. 33457

Filed Dec. 30, 1977, Ser. No. 865,867

Int. Cl.<sup>2</sup> A61H 7/00

U.S. Cl. 128—62 A

15 Claims



1. Dental hygiene apparatus comprising:
  - a mouthpiece having a generally U-shaped upper channel member open at the top and a generally U-shaped lower channel member open at the bottom;
  - a first membrane and a second membrane, said first and second membranes each being secured to said upper and lower channel members such that a closed area is formed between said first and second membranes;
  - a plurality of inflatable air-sacks located inside said closed area, adjacent to the bottom surface of said upper channel member and adjacent the upper surface of said lower channel member such that said plurality of air-sacks are located between said upper and lower channel members;
  - a first plurality of bite blocks located in said upper channel member, said first plurality of bite blocks being spaced apart in said upper channel member;
  - a second plurality of bite blocks equal in number to said first plurality of bite blocks, said second plurality of bite blocks being so located in said lower channel member such that each one of said second plurality of bite blocks is located directly opposite a different one of said first plurality of bite blocks;
  - a plurality of connecting posts equal in number to the number of said first and second plurality of bite blocks, one end of each of said connecting posts being secured to a different one of said first plurality of bite blocks and the other end of each one of said plurality of connecting posts being secured to a different one of said second plurality of bite blocks; and
  - means for periodically inflating said plurality of air-sacks such that said plurality of air-sacks are alternately inflated and deflated to cause said upper and lower channel members to alternately move away from and toward each other.

4,164,941

# DISPOSABLE DRAPE FOR SURGICAL TABLE

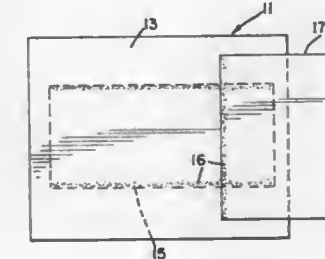
Robert A. Knopick, Downers Grove, and Allen B. Morlock, Naperville, both of Ill., assignors to Steraplast, Inc., Bensenville, Ill.

Filed Nov. 18, 1977, Ser. No. 852,692

Int. Cl.<sup>2</sup> A61B 19/06

U.S. Cl. 128—132 D

1 Claim



1. A disposable drape for covering a surgical table and providing drape coverage extending from the table to an operating surface, said drape comprising a compact package for transporting and handling thereof, said drape comprising a non-fenestrated base sheet adapted to lie directly over said table surface, a fluid impervious plastic film of smaller size than said base sheet bonded onto one surface of said base sheet and in a central portion of the base sheet for preventing fluid flow from penetrating said drape and coming into contact with the table surface, an extension sheet bonded along one edge of the said base sheet, said extension sheet overlapping at least approximately half its width over an end of said base sheet whereby a continuous and unbroken drape coverage is provided along the table to an operating surface, said extension sheet folded in a fan fold onto said base sheet and said base sheet folded into two fan fold groups from opposite edges of the sheet, one of said base sheet fan folds overlapping portion of the extension sheet fold, said one folded group then folded onto the second folded group to provide said compact package, whereby said fan fold groups are unfoldable from said compact package for first spreading the base sheet and subsequently unfolding said extension sheet.

4,164,942

# FACE MASK AND FACEPIECE THEREFOR

Michael A. Beard, Moseley, and Edward A. Williams, Warwick, both of England, assignors to DCA Design Consultants Limited, Warwick, England

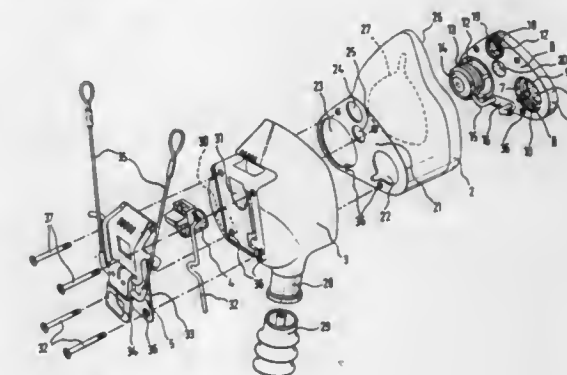
Filed Sep. 20, 1977, Ser. No. 835,007

Claims priority, application United Kingdom, Sep. 21, 1976, 39043/76

Int. Cl.<sup>2</sup> A62B 7/14

U.S. Cl. 128—146.5

5 Claims



1. A face mask comprising:



a substantially planar valve block having first and second apertures therethrough;  
 an inspiratory valve arranged in said first aperture;  
 an expiratory valve arranged in said second aperture;  
 a substantially flexible molded facepiece having a substantially planar face of substantially constant thickness, said planar face having two apertures therethrough;  
 said planar valve block being secured adjacent an inner surface of said planar face of said facepiece with said two apertures of said planar face being aligned with said first and second apertures of said valve block;  
 a support member having a portion thereof secured substantially adjacent the outer surface of said planar face of said facepiece opposite said valve block, with said substantially planar face of said facepiece acting as a gasket between said valve block and said support member;  
 said valve block having a third aperture therethrough;  
 an anti-suffocation valve being arranged in said third aperture; and  
 said substantially planar face having a third aperture therethrough aligned with said third aperture of said valve block.

4,164,943

## CATHETER ANCHOR

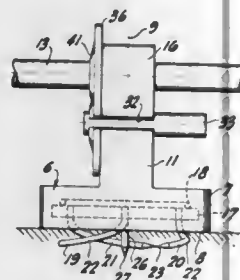
J. Donald Hill, San Francisco, and Gordon H. Fountain, Oakland, both of Calif., assignors to Thoratec Laboratories Corporation, Emeryville, Calif.

Filed Sep. 30, 1977, Ser. No. 838,320

Int. Cl.<sup>2</sup> A61M 25/02

U.S. Cl. 128—348

7 Claims



1. A catheter anchor comprising a base having a portion adapted to extend substantially parallel to subjacent skin, means including a plurality of needles fixed on said base and extending from said parallel portion in paths similarly helical with respect to said parallel portion for substantially simultaneously piercing and interengaging with said skin upon rotation of said base relative to said skin, and means on said base for holding a catheter.

4,164,944

## DIGITAL MEANS FOR NON-INVASIVELY CONTROLLING THE PARAMETERS OF AN IMPLANTABLE HEART PACER

Lawrence E. Alley, III, North Easton; Richard P. Lydick, Chelmsford, and Robert E. Stanley, Roslindale, all of Mass., assignors to ARCO Medical Products Company, Leeburg, Pa.

Filed May 9, 1977, Ser. No. 795,252

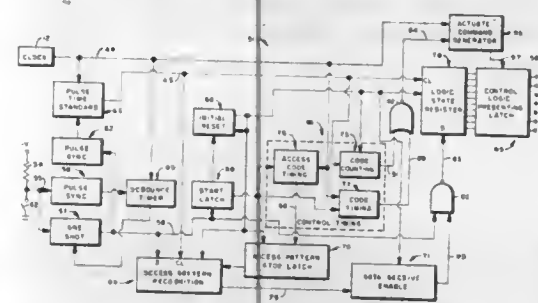
Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 PG

15 Claims

1. A heart pacer comprising:  
 a heart pacer having controllable parameters adapted to be implanted within a patient,  
 means for receiving a set of pulses of selected individual widths, applied externally of the patient, the individual widths of each of the received pulses representing a binary logic state of zero or one, the binary logic states of said set

of pulses representing a corresponding set of controllable parameters,  
 means for decoding the received pulses in accordance with the individual width of each of the received pulses including, a reference pulse generator for producing a series of pulses each in timed relation to a respective one of said received magnetic pulses, and pulse comparison means



operative to detect each received pulse as a zero or one in dependence upon the time of coincidence between the received pulse and its respective reference pulse, and means into which said decoded received pulses are registered for controlling the controllable parameters of said heart pacer in accordance with the logic states represented by said received pulses.

4,164,945

## DIGITAL CARDIAC PACEMAKER MEDICAL DEVICE

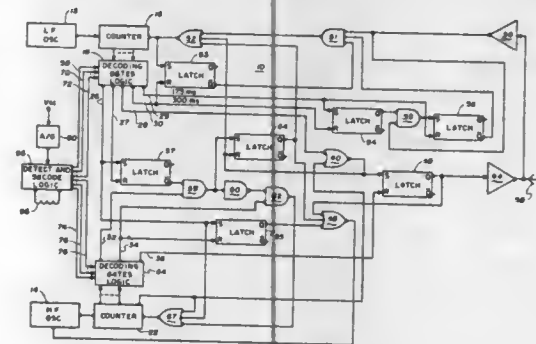
Jerome T. Hartlaub, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 13, 1977, Ser. No. 805,726

Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 PG

51 Claims



1. A digitally controlled medical device capable of providing output pulses of a certain duration at a determined rate, said device comprising:  
 a first oscillator for providing a first timing signal at a first periodic rate;  
 a second oscillator for providing a second timing signal at a second periodic rate; and  
 control means responsive to said first timing signal for controlling said predetermined rate and for enabling said second oscillator to provide said second timing signal and responsive to said second timing signal for controlling said certain duration and for disabling said second oscillator from providing said second timing signal at times other than said certain time.

4,164,946

## FAULT DETECTION CIRCUIT FOR PERMANENTLY IMPLANTED CARDIOVERTER

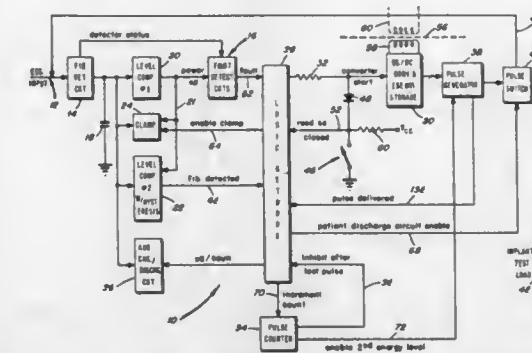
Alois A. Langer, Pittsburgh, Pa., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed May 27, 1977, Ser. No. 801,300

Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 D

13 Claims



1. A discrete fully implantable interrogation circuit for use with a fully implantable cardioverter having a discrete fibrillation detector circuit made up of a plurality of components, each of which produces a characteristic output signal when said fibrillation detector circuit is functioning properly, said detector circuit serving to monitor an ECG signal and to issue a fibrillation detected signal when predetermined characteristics of said ECG signal are detected, and further having an energy storage device, means for charging the energy storage device to a level capable of defibrillating a malfunctioning heart, and means for initiating the discharge of the energy storage device into the heart of a wearer, said discrete fully implantable interrogation circuit comprising: fault detector means for monitoring the output signal of a select number of said components to determine whether said output signal is not within prescribed limits so as to cause said fibrillation detector circuit to misinterpret said ECG signal; and disabling means associated with said fault detector means for inhibiting the discharge of said storage device into the heart of the wearer in the event that said fault detector means senses a malfunction in said fibrillation detector circuit by recognizing an output signal not within said prescribed limits.

4,164,947

## ROTOR FOR AN AXIAL FLOW ROTARY SEPARATOR

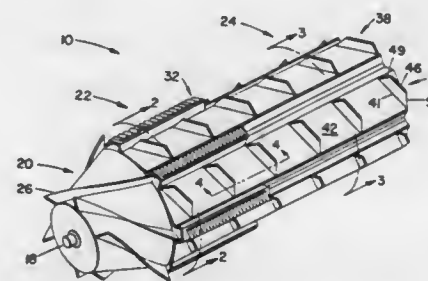
John E. Wilson, Colona, Ill., assignor to Deere & Company, Moline, Ill.

Filed Mar. 10, 1978, Ser. No. 885,305

Int. Cl.<sup>2</sup> A01F 12/20

U.S. Cl. 130—27 HA

14 Claims



1. In an axial flow rotary separator for processing crop material, including a housing having walls, said walls including a foraminous portion and an inlet for receiving crop material and an outlet axially spaced downstream from the inlet, and a rotor mounted for rotation in the housing and disposed so as to create in cooperation with the housing an annular space ex-

tending between the inlet and the outlet, said rotor having a frame and an upstream threshing portion and a downstream separating portion, said threshing portion having at least two circumferentially spaced threshing bars carried by the frame, each bar including a plurality of axially spaced raised ribs and said separating section having at least two circumferentially spaced separating bars carried by the frame, the improvement in the rotor comprising:

a plurality of axially spaced material mover blades carried by the frame circumferentially spaced from the threshing bars, each blade being of substantially greater radial extent than the threshing bar ribs and having a working surface and being disposed substantially athwart the direction of rotation and said working surface having with respect to the direction of rotation a leading portion and a trailing portion, said leading portion being disposed upstream of the trailing portion and the axial spacing of the blades being substantially greater than the axial spacing of the threshing bar ribs so that crop material in the annular space engaged by the working surface is deflected downstream.

4,164,948

## METHOD FOR MAKING ARTIFICIAL TOBACCO AND APPARATUS FOR PERFORMING SAID METHOD

Monique Beringer, Saint Louis, France, and Heinz Spörri, Zurich, Switzerland, assignors to Tamag Basel AG, Birsfelden, Switzerland

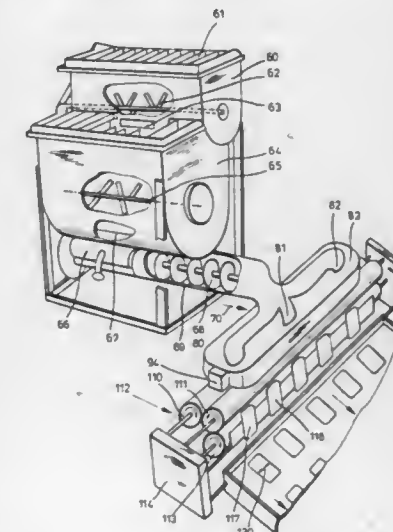
Filed Jan. 24, 1977, Ser. No. 762,129

Claims priority, application Luxembourg, Jan. 23, 1976, 74233

Int. Cl.<sup>2</sup> A24B 3/14

U.S. Cl. 131—140 C

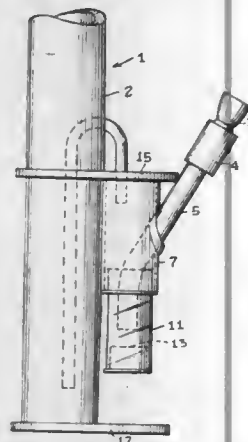
12 Claims



1. A method for making artificial tobacco comprising forming a substantially homogenous moist composition containing finely divided plant material and additives and having a moisture content of from about 20 to 50 percent by weight, kneading said composition at a pressure of about 50 to 150 atmospheres and extruding said composition through a die to form a substantially uniform strand, continuously dividing said strand immediately after formation thereof into strand sections of substantially equal length, the amount of finely divided plant material contained in said moist composition and the size of said strand sections being so selected that the amount of artificial tobacco contained in each strand section corresponds to a predetermined quantity of about 0.1 to 2.0 grams within a tolerance of  $\pm 10$  percent, immediately rolling down said strand sections by passing each of said sections between a pair of squeeze rollers rotating at different circumferential speeds and being urged out of mutual linear engagement of their circumferential surfaces by the strand section entering therebetween.

tween to thereby form a narrow nip of predetermined width, to thereby form individual rolled down artificial tobacco strips having a surface area of from about 8 to 100 sq. cm.

**4,164,949**  
**ASH TRAP FOR A BONG**  
Jeffrey K. Diven, Wheaton, Md., assignor to McCall Associates, Inc., Rockville, Md.  
Filed Jan. 25, 1978, Ser. No. 872,260  
Int. Cl.<sup>2</sup> A24F 1/30  
U.S. Cl. 131—173

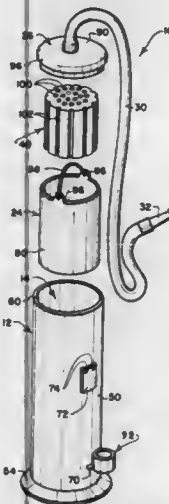


1. In a bong having a water chamber, the combination of a smoke chamber adjacent the water chamber, perforate means within said smoke chamber, a separate ash trap chamber removably secured below said smoke chamber and extending upwardly into it in abutment with said perforate means, a bowl for smoke materials connected to a smoke passage means which extends through a wall of the smoke chamber and through an opening in the perforate means into the ash trap chamber, removable means for collecting ashes in the lower portion of the ash trap chamber, and second smoke passage means connecting an upper portion of the smoke chamber to the water chamber whereby smoke and ashes will pass from the bowl to the lower portion of the ash chamber while smoke alone will pass through the perforate means surrounding said first smoke passage means into the smoke chamber and to the water chamber.

**4,164,950**  
**SMOKING APPLIANCE**  
Joseph A. Bechtold, 1048 Homestead Rd., South Euclid, Ohio 44121  
Filed Jan. 3, 1978, Ser. No. 866,790  
Int. Cl.<sup>2</sup> A24F 1/22  
U.S. Cl. 131—194

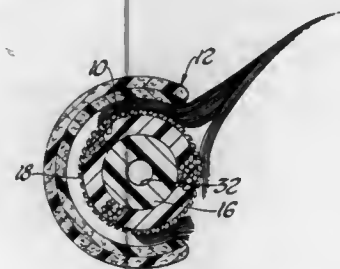
13 Claims  
1. A smoking appliance comprising:  
(a) housing means including structure defining a cooling chamber;  
(b) smoke introduction means for introducing smoke into the cooling chamber at a first location therein;  
(c) smoke withdrawal means for withdrawing smoke from the cooling chamber at a second location spaced from the first location; and  
(d) solid-phase cooling medium means including a sealed, reusable, freezable cartridge for positioning in the cooling

chamber and for defining a plurality of flow paths there-through for the travel of smoke as smoke moves from the



first location to the second location during use of the appliance.

**4,164,951**  
**HAIR CURLER SYSTEM**  
Amos J. Shaler, 705 W. Park Ave., State College, Pa. 16801, and Daniel C. McLean, 4029 Alicante, Fort Worth, Tex. 76133  
Filed Nov. 8, 1976, Ser. No. 739,925  
Int. Cl.<sup>2</sup> A45D 2/00  
U.S. Cl. 132—31 R



23 Claims  
1. A hair treating device adapted to receive a hank of hair, said device comprising a tubular body of desiccant and a heat storage core disposed within the tubular body, said heat storage core having a bulk density greater than that of the tubular body.

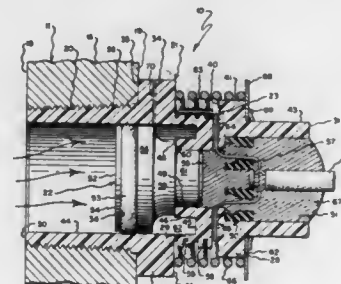
**4,164,952**  
**HAIR WAVING DEVICE**  
Edward D. Banks, Jr., 1312 Kansas Ave., Kansas City, Kans. 66105  
Filed Aug. 18, 1977, Ser. No. 825,653  
Int. Cl.<sup>2</sup> A45D 2/24  
U.S. Cl. 132—37 R



4 Claims  
1. A hair waving device comprising:  
a. a pair of plates similarly corrugated in rounded wave form to receive a lock of hair therebetween transversely to the corrugations thereof to impart a longitudinally sinuous form to said lock of hair, and

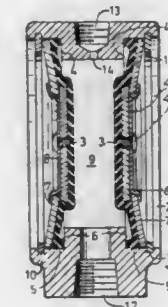
b. latch means operable to secure said plates releasably together whereby to clamp said lock of hair therebetween, said latch means being adjustable to clamp said plates together when the general planes of said plates are disposed in variably non-planar relation, either longitudinally or transversely of the corrugations thereof.

**4,164,953**  
**NORMALLY-CLOSED ELECTRO-THERMALLY OPERATED FLOOD VALVE**  
Carlton W. Naab, Williamsville, and Roman Jankowiak, Cheektowaga, both of N.Y., assignors to Conax Corporation, Buffalo, N.Y.  
Continuation-in-part of Ser. No. 750,241, Dec. 13, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 849,973  
Int. Cl.<sup>2</sup> F16K 13/04, 13/06, 17/40, 51/00  
U.S. Cl. 137—72



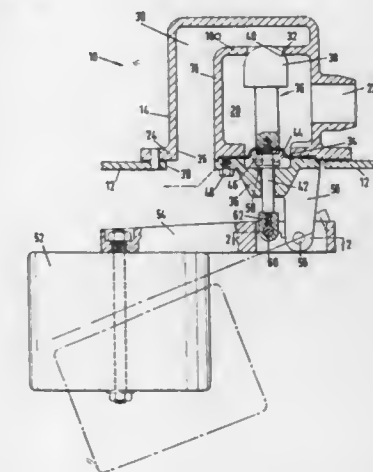
7 Claims  
1. A flood valve adapted to be mounted in an opening provided through a wall, said wall separating a pressurized fluid on one side thereof from an unpressurized space on the other side thereof, said flood valve comprising:  
a body member adapted to normally close said opening to sealingly separate said pressurized fluid from said unpressurized space, said body member having a forward portion adapted to be sealingly mounted in said opening and having a rearward portion arranged in said unpressurized space, said forward and rearward portions being joined by an intermediate thin-walled section, said forward portion having a cylindrical bore adapted to communicate one side of said rearward portion with said fluid;  
a piston assembly slidably mounted in said bore and arranged to engage said rearward portion, said piston assembly having one face exposed to said fluid and arranged to define a sealed chamber between its other face and said one side of said rearward portion, said sealed chamber being arranged proximate said thin-walled section; and  
an electrical heating element surrounding said thin-walled section and adapted to be selectively energized to melt said thin-walled section to permit said rearward portion to separate from said forward portion;  
whereby said flood valve may normally close said opening, and may be selectively operated to melt said thin-walled section to permit the pressure of said fluid to displace said piston assembly and rearward portion away from said forward portion and to permit fluid to enter said unpressurized space through the bore of said forward portion.

**4,164,954**  
**FLUID PRESSURE CONTROL MECHANISM**  
Allan Ballard, 1552 Balena Ave., Ottawa, Ontario, Canada (K1G 0X3)  
Continuation-in-part of Ser. No. 552,736, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 330,020, Jun. 2, 1973, Pat. No. 3,867,963. This application Nov. 26, 1976, Ser. No. 744,962  
The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.  
Int. Cl.<sup>2</sup> G05D 16/00; F15D 1/02; F17D 1/20  
U.S. Cl. 137—115



9 Claims  
1. A resilient wall structure for use in a pulsating fluid pressure control device comprising:  
at least one frusto-conical apertured Belleville spring, a plate means disposed in aperture covering load supporting relation against inner portions of the convex side of said Belleville spring,  
a resilient washer means in engagement with inner portions of the concave side of said Belleville spring, and  
connecting means interconnecting said plate means and said resilient washer means to resiliently hold said plate means and said resilient washer means together in generally concentric aperture covering relation against said Belleville spring to permit relative pivotal and radial movement between said plate means and said Belleville spring means on axial deflexion of said Belleville spring.

**4,164,955**  
**LIQUID LEVEL CONTROL VALVE**  
Ronald N. Allen, Sevenoaks, England, assignor to Millars Well-point International Ltd., Bishops Stortford, England  
Filed Oct. 18, 1977, Ser. No. 843,329  
Claims priority, application United Kingdom, Oct. 20, 1976, 43496/76  
Int. Cl.<sup>2</sup> F16K 31/26  
U.S. Cl. 137—202



6 Claims  
1. A liquid level control valve, utilized in combination with



air separation means and positioned between said air separation means and a vacuum source for preventing the passage of liquid from said air separation means to said vacuum source, comprising:

- casing means for mounting upon said air separation means, a suction chamber formed in said casing means,
- a source of vacuum communicating with said suction chamber,
- a port, formed in the wall of said chamber, adapted to be opened and closed by means of a valve member, and providing fluidic communication between said air separation means and said suction chamber,
- a flexible member fixedly connected to said valve member and sealingly engaged around its periphery with an aperture defined in a wall of said chamber so as to facilitate the definition of a flexible wall portion of said member, the effective surface area of said flexible wall portion of said flexible member being greater than the cross-sectional area of said port so as to bias said flexible wall portion of said flexible member, and said valve member connected thereto, toward said closed port position, and
- a liquid level controlled float connected to said valve member for effecting opening and closing movements thereof in response to the liquid level within said air separation means so as to permit the withdrawal of air from said air separation means to said vacuum source when said valve member is opened, and to prevent the passage of liquid from said air separation means to said vacuum source when said valve member is closed.

4,164,956

## SWITCHING VALVES

Akio Takahashi, Yokohama, and Hirokichi Saito, Shimizu, both of Japan, assignors to Ihara Chemical Industry Co. Ltd., Tokyo, Japan

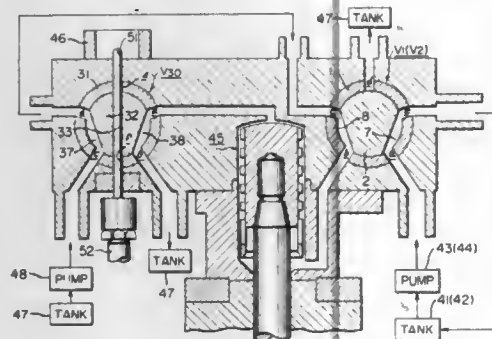
Filed Feb. 22, 1977, Ser. No. 770,932

Claims priority, application Japan, Feb. 20, 1976, 51/16922; Apr. 19, 1976, 51/48952; Aug. 5, 1976, 51/104062

Int. Cl.<sup>2</sup> F16K 11/07, 11/085

U.S. Cl. 137-242

1 Claim



1. A switching valve for a closed-type molding apparatus, comprising a valve sleeve (31) having therein five regular openings (a . . . e), and a switching member (32) rotatable relative to said sleeve and having two separate, non-communicating regular grooves (37, 38) formed therein; wherein said sleeve is cylindrical, and said switching member is in the form of a valve stem lodged within said sleeve and has said regular grooves in a substantially diametral arrangement therein; wherein said regular openings consist of two inlets (a, c) and three outlets (b, d, e), said inlets and said outlets alternating in their sequential arrangement with respect to said sleeve at substantially equal angular distances; one (b) of said outlets, between said two inlets, being a common outlet for those inlets; said two grooves having a total of four end ports for selectively making connection between pairs of adjacent ones of said regular openings, namely between an inlet and an outlet; and wherein said sleeve has therein an additional opening (f)

diametrically aligned with another one (e) of said regular openings, and further wherein said switching member has therein an additional groove (33) that is capable of linking said additional opening to said other opening; and a knock-out rod (51) removably insertable into said additional groove, for removing solidified material from the valve.

4,164,957

## OIL-COOLED ENGINE VALVE

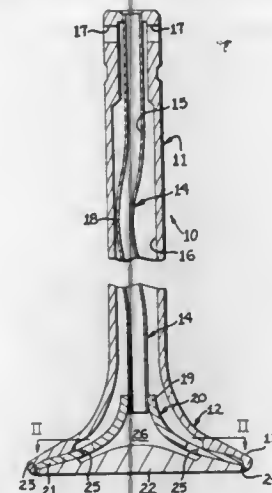
Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 23, 1977, Ser. No. 854,190

Int. Cl.<sup>2</sup> F01P 3/14; F16K 49/00; F01L 3/18

U.S. Cl. 137-340

11 Claims



1. A valve comprising an elongated hollow stem, a head secured to an end of said stem and defining an annular valve face thereon, circulating means in said valve for circulating a coolant therethrough, said circulating means comprising a tube disposed in said stem to terminate at said head and secured between said stem and said head to define a first passage means in said tube and a second passage means between said stem and said tube,

heat conduction means secured in said head and disposed in close proximity to said face for conducting heat away from said face and to said coolant, said conduction means comprises an annular member composed of a material having a thermal conductivity substantially higher than the material composing said stem and said head and secured in said head to substantially separate said first and second passage means from each other and wherein radial portions of said member are disposed in close proximity to the valve face formed on said head for conducting heat therefrom, said circulating means further comprising port means formed through said member for communicating said first and second passage means with each other, and an annular separate cap secured on an end of said head and wherein the radial portions of said member are secured in sandwiched relationship between said cap and an annular portion of said head having said valve face defined thereon.

4,164,958

## SWING CHECK VALVE

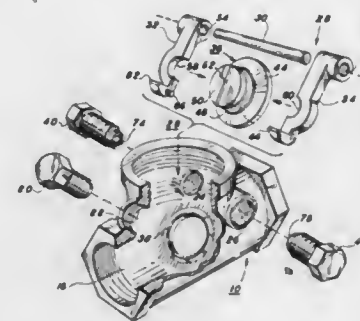
John J. Jaconette, Shelton, Conn., assignor to Jenkins Brothers, Bridgeport, Conn.

Filed Nov. 3, 1977, Ser. No. 848,113

Int. Cl.<sup>2</sup> F16K 15/03

U.S. Cl. 137-527

9 Claims



1. A swing-type check valve comprising:  
a. a hollow valve casing, defining an inlet port and an outlet port, and incorporating a transverse internal partition having an aperture encircled by a valve seat facing the outlet port;  
b. two juxtaposed hanger members, each independently pivotally mounted inside the valve casing on substantially coaxial pivot axes and defining between themselves a valve disc neck-embracing opening,  
c. a unitary valve clapper having:  
(1) a valve disc disposed between the inlet and outlet ports within the interior of the valve casing, cooperatively juxtaposed to the valve seat, and  
(2) a valve disc neck protruding from the valve disc, having a reduced hanger-engaging portion, shaped to interfit between and be embraced by the two juxtaposed pivoted hanger members, bounded by facing, hanger-embracing surfaces minimizing relative movement between the assembled valve clapper and the juxtaposed pivoted hanger members,  
whereby the valve clapper is carried by the two juxtaposed pivoted hanger members, pivotally responsive to check and block any return flow of fluid through the valve.

4,164,959

## METERING VALVE

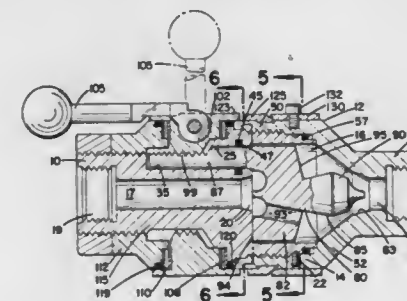
Paul D. Wurzbarger, deceased, late of Cleveland Heights, Ohio, and by Peter Reed, executor, Cleveland, Ohio, assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 15, 1977, Ser. No. 787,906

Int. Cl.<sup>2</sup> F16K 31/53

U.S. Cl. 137-553

23 Claims



1. An axial flow metering valve comprising a valve body having an inlet, an outlet and a valve chamber between said inlet and outlet, said valve body including first and second body parts, said first body part having a passage for fluid between said inlet and said valve chamber and at least two

axially extending guide slots spaced radially from said fluid passage, a valve seat in said valve chamber, said valve seat being formed in said second body part, a valve member in said valve chamber movable toward and away from said valve seat, said valve member having a body portion with at least two guide pins extending axially from said body portion through said guide slots, the number of said guide pins corresponding to the number of said guide slots, each guide pin having a continuing segment of an encompassing thread, and an actuating member surrounding and threadedly engaging said guide pins, whereby said actuating member while being axially restrained is rotatable to move said valve member toward and away from said valve seat.

4,164,960

## APPARATUS FOR MIXING FLUIDS

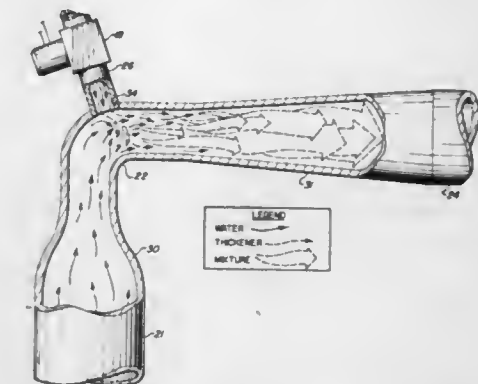
Charles W. Howard, San Dimas, Calif., assignor to Early California Industries Inc., Phoenix, Ariz.

Filed Feb. 13, 1978, Ser. No. 877,335

Int. Cl.<sup>2</sup> F16K 19/00

U.S. Cl. 137-604

1 Claim



1. A mixing system for intermittently mixing water with a relatively much more viscous liquid polymer thickening agent, to form a fire extinguishing and retarding composition of variable viscosity, said system including:  
(a) a reservoir for said polymer liquid;  
(b) a mixing conduit including an elbow section having an aperture formed in the wall of the outer radius thereof;  
(c) means for delivering water under pressure to said mixing conduit upstream of said elbow section;  
(d) means for injecting said polymer liquid under pressure through the aperture in said elbow section, such that said liquid exits said aperture at the inner surface of the outer radius of said elbow section and in a direction substantially perpendicular to said inner wall, to mix said polymer with said water under high hydraulic shear conditions; and  
(e) valve means intermediate said polymer reservoir and said aperture for controllably interrupting the injection of liquid polymer through said aperture and for preventing flow of water into said polymer reservoir when said polymer injection is interrupted.

4,164,961

## FLUIDIC PRESSURE/FLOW REGULATOR

Tadeusz M. Drzewiecki, Silver Spring, and Francis M. Manion, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1977, Ser. No. 819,786

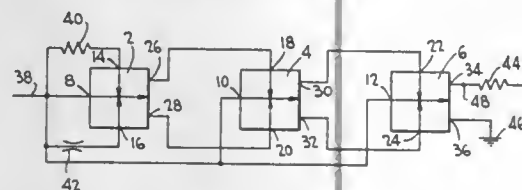
Int. Cl.<sup>2</sup> F15C 1/14

U.S. Cl. 137-823

7 Claims

1. A fluidic flow regulator comprising:  
a fluid inlet for connection to a source of unregulated fluid; power jet means comprising a plurality of channels commu-

nicating with said fluid inlet, said channels being oriented to issue streams of fluid that converge to form a jet of fluid, the flow resistance of the first of said channels having a generally linear flow rate versus pressure drop characteristic and the flow resistance of the second of said channels having a flow rate that varies approximately as the square root of the pressure drop, to provide a jet of



fluid whose direction varies solely as a function of the pressure of said unregulated fluid; and output means to divide said jet of fluid into a discharge stream and a regulated stream, said output means being positioned to increase the proportion of said jet of fluid going to said discharge stream as the pressure of said jet of fluid increases.

4,164,962

## CONTROL VALVE FOR PARALLEL FLOWS

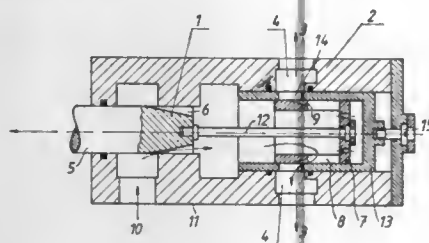
Nils-Erik Soderberg, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Oct. 19, 1977, Ser. No. 843,380

Claims priority, application Sweden, Oct. 20, 1976, 7611621 Int. Cl.<sup>2</sup> F16K 11/07

U.S. Cl. 137—862

7 Claims



1. Control valve for connecting a plurality of fluid demand locations having a total area to a common feed device, comprising

- a valve housing;
- a main regulating valve for the total flow to said demand locations;
- a second valve coupled to said main regulating valve and comprising a plurality of valve means corresponding to the respective said demand locations;
- each of said main regulating valve and said second valve being associated with slotted openings of such shape that opening of said control valve produces a steady increase in a well-defined opening area;
- said main regulating valve and said second valve being so coupled together that, at a first degree of opening of said control valve, the total throughflow areas of the respective valves are equal; at a second degree of opening less than said first degree, the throughflow area of said main regulating valve exceeds that of said second valve; and at a third degree of opening greater than said first degree, the throughflow area of said second valve exceeds that of said main regulating valve.

4,164,963

## APPARATUS FOR FORMING A NARROW WEAVE FROM BARE ELASTOMERIC THREADS

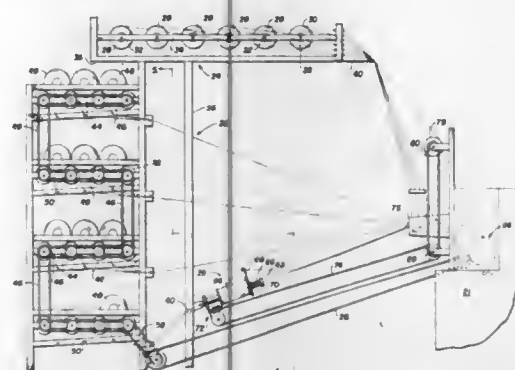
Thomas C. Black, Middletown, Canada, assignor to J. F. Stevens & Co., Inc., New York, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,457

Int. Cl.<sup>2</sup> D03D 41/00, 49/06

U.S. Cl. 139—11

9 Claims



1. A loom comprising:

- a weaving means having a drive means;
- a first plurality of elements supplying individual elastomeric warp threads;
- a means for supplying a plurality of non-elastomeric warp threads separating said elastomeric warp threads with the edge warp threads of the total warp being an elastomeric thread;
- first control means interconnected to said drive means for engaging said first supply elements and letting off all of said elastomeric warp threads in synchronization with each other and with the operation of said loom to provide uniform tension;
- a pair of wrapping means, one for each elastomeric edge warp thread, for wrapping yarn loosely around said elastomeric edge warp threads without modifying the diameter of the elastomeric edge warp threads; and
- second control means interconnecting said drive means and said pair of wrapping means for synchronous operations.

4,164,964

## FLUID DISPENSER FOR RECONSTITUTING BEVERAGES AND THE LIKE

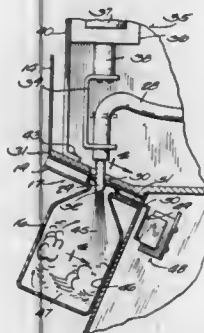
Paul J. Daniels, Sarasota, Fla., assignor to Shirley D. Alderman, Signal Mountain, Tenn. and Joyce D. Hendrix, South Wilmette, Ill., part interest to each

Filed Oct. 31, 1977, Ser. No. 847,181

Int. Cl.<sup>2</sup> B65B 3/34

U.S. Cl. 141—329

28 Claims



1. Apparatus for dispensing fluid into a material in a container for mixing with the contents thereof, comprising:

a valve having input means for pressurized fluid and having output means, means comprising a punch and a nozzle, said nozzle having input means and having output means for projecting a stream of fluid in a predetermined path, flexible tubular means for coupling the output means of said valve with the input means of said nozzle, first means for advancing and retracting said punch and nozzle relative to a container, holder means for holding a container in a position for being entered by said punch and nozzle output means when said nozzle is advanced, said holder means comprising elements disposed on opposite sides of the line of travel of said punch and nozzle for receiving and engaging a part of said container between them and for holding said container at an angle relative to said predetermined path of said fluid for projected fluid to deflect from an inner surface of said container in the direction of another inner surface thereof to thereby produce a turbulent circulating motion in said fluid for enhancing mixing with the contents of the container.

4,164,966

## METHOD AND APPARATUS FOR SELF-FEEDING AND SAWING WOODEN WORKPIECES

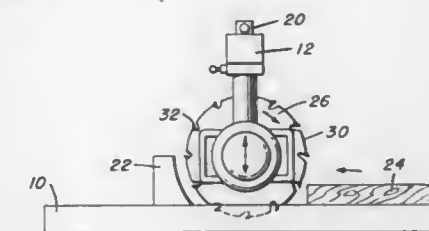
Charles H. Mason, 748 Rosewood, Nacogdoches, Tex. 75961

Continuation-in-part of Ser. No. 773,916, Mar. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 543,964, Jan. 24, 1975, abandoned. This application Mar. 24, 1978, Ser. No. 889,935

Int. Cl.<sup>2</sup> B27B 5/02

U.S. Cl. 144—312

3 Claims



1. The method of sawing wooden workpieces of varying thickness, degree of hardness and differing grain pattern positioned on a support surface comprising the steps of:

- positioning a circular safety-back toothed saw blade for rotation on an axis above said workpiece and said support surface, said blade including an advancing segment and a retreating segment, said advancing segment constituting that portion of said blade, the periphery of which is moving downwardly with respect to said support when said blade is rotating, and said retreating segment constituting that portion of said blade which is moving upwardly with respect to said support when said blade is rotated;
- rotating said blade relative to said support and said workpiece at a speed sufficient to saw said workpiece and wherein said teeth on said advancing segment simultaneously generate and apply to said workpiece a sufficient combination of horizontal and vertical thrust to selectively move said workpiece and said saw one with respect to the other at a rate compatible with the ability of said saw to simultaneously cut and feed said workpiece and said saw one with respect to the other;
- adjusting the position of said blade, said support and said workpiece relative to each other during initial contact between said blade and said workpiece and continuing the adjustment until a relative position is reached between positions of blade generated maximum vertical thrust and minimum horizontal thrust on the workpiece on the one hand and blade generated minimum vertical thrust and maximum horizontal thrust on the workpiece on the other hand sufficient to effect simultaneous cutting and feeding of said saw and said workpiece one with respect to the other; and
- permitting said workpiece and said saw to move one with respect to the other to complete said cutting and feeding function to a predetermined degree due solely to the rotation of the blade and the relative positions of the blade and workpiece.

4,164,967

## SCREWDRIVER

Konrad K. Breuers, P.O. Box 94441, Richmond, British Columbia, Canada

Filed Mar. 27, 1978, Ser. No. 890,344

Int. Cl.<sup>2</sup> B25B 15/00

U.S. Cl. 145—50 A

2 Claims

1. A screwdriver for screws having two spaced head recesses, the screwdriver comprising:

- a tang with two ends,
- a handle attached to a first end of the tang,
- two spaced driving prongs attached at a second end of the tang for fitting into the recesses of one said screw,

4,164,965

## COMBINATION LOG SAW AND SPLITTER MACHINE

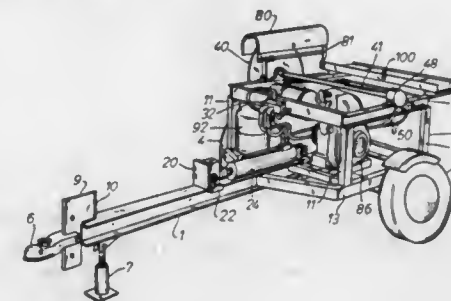
Ronald A. Bodart, Oconto Falls, Wis., assignor to Little Gem Manufacturing, Inc., Oconto Falls, Wis.

Filed Jun. 1, 1978, Ser. No. 911,352

Int. Cl.<sup>2</sup> B27L 7/00

U.S. Cl. 144—3 K

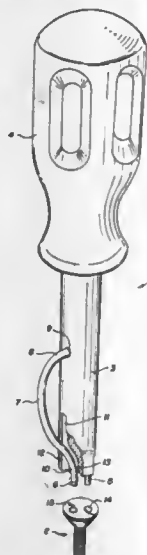
7 Claims



1. A combination log saw and splitter machine comprising: a mobile frame, a circular saw blade having a drive shaft rotatably mounted on said frame, a hydraulic motor connected to said drive shaft for rotatably driving said saw blade, fluid control means for said hydraulic motor, a log holding table slideably mounted on said frame for sliding movement thereon from a log loading position to a log cutting position whereby a log on said table and extending outwardly at one side of said frame is cut by said circular saw, a blade guard positioned over said blade and connected to said table for sliding movement therewith, and means for detachably securing said guard to said table and said frame, whereby said guard can be removed and mounted on said frame in a flat, storage position; a log splitting knife secured to said frame at a forward end thereof, a double acting hydraulic cylinder mounted on said frame, a pusher block slideably mounted on said frame and connected to and driven by said hydraulic cylinder for being urged toward and away from said knife whereby a log inserted between said pusher and said knife can be split by extension of said hydraulic cylinder, an internal combustion engine mounted on said frame, a hydraulic pump mounted on said frame and driven by said engine, another fluid control means for said hydraulic cylinder, both of said fluid control means separately connected to said hydraulic pump for receiving pressured fluid therefrom.



resilient means for varying the spacing between the prongs so the screwdriver can be used on screws having different spacings between the recesses, a first said prong being attached to the second end of the tang and a second said prong attached to said resilient means, a slot at the second end of the tang, the slot having two sides, the second prong being movable within the slot to vary



the spacing between the prongs and being supported by the two sides of the slot when the screwdriver is used for screwing a screw, said resilient means comprising a curved metal spring with two ends, a first end of the spring attached to the tang generally halfway between the ends of the tang, and a second end of the spring being between the sides of the slot and attached to the second prong.

4,164,968

## PORTABLE TENNIS LOCKER ORGANIZER

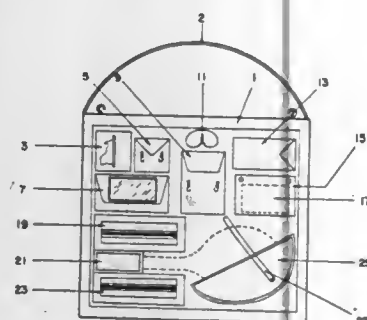
Joseph Esposito, Jr., and Andrew Peluso, Jr., both of 318 A St., Middlesex, N.J. 08846

Filed Jan. 26, 1978, Ser. No. 872,570

Int. Cl.<sup>2</sup> B65D 65/02

U.S. Cl. 150—1

6 Claims



1. A portable tennis locker-organizer comprising in combination:

- a foldable bag-like member;
- a plurality of pouches permanently affixed to the interior surface of said bag-like member;
- a plurality of pocket compartments affixed in similar fashion as (b) above;
- a half moon shape pocket with strap fastener means permanently affixed to the interior surfaces of said bag-like means and positioned whereby a tennis racket placed within said pocket will lie in a plane horizontally with

respect to the vertical plane of said bag-like member in its unfolded position;

- a cylindrical sleeve pocket affixed to said bag-like member's interior surface and located in juxtaposition to the pocket described in (b) above whereby the handle of a tennis racket may be inserted therein while said racket's head is contained within pocket (d);
- a plurality of pocket enclosures containing zipper closure means affixed adjacent to said cylindrical sleeve pocket;
- a plurality of hanging means attached to one end of bag-like means, whereby, said bag-like means can be hung while in its unfolded position from structures such as fences and the like;
- a fastening means attached to exterior ends of said bag-like means to permit securing said bag-like means in a folded position.

4,164,969

## GOLF CLUB HEAD COVERS IMPROVEMENT

Sam Dien, 156 Rockwood Pl., Englewood, N.J. 07613

Continuation of Ser. No. 819,179, Jul. 26, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,778

Int. Cl.<sup>2</sup> A63B 57/00

U.S. Cl. 150—1.5 R

4 Claims



1. A group of golf club covers for use in respectively covering a corresponding plurality of clubs each of which is identified by a different numeral and which are to be carried in a golf bag when the clubs are not in use, each of said covers comprising an enclosure for placement over the head of the associated golf club, and a first portion of Velcro material secured to the outer surface of each of said enclosures, a second portion of mating Velcro material being carried by one of an additional cover adapted to be carried by another of the golf clubs and a member secured to the golf bag, said first portion of Velcro material on one of said covers, when said one cover is removed from its associated club when the latter is in use, being capable of being releasably attached to said second portion of mating Velcro material, said first portion of mating Velcro material on each of said covers being formed in the shape of a different number respectively corresponding to the identifying number of the associated one of the golf clubs over which said cover is intended to be placed, when that club is not in use.

4,164,970

## INFLATABLE BAG

Charles P. Jordan, 203 Fairlane Dr., Joliet, Ill. 60435

Filed May 25, 1977, Ser. No. 800,326

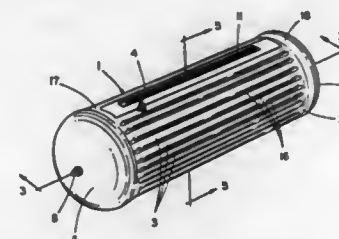
Int. Cl.<sup>2</sup> A45C 7/00

U.S. Cl. 150—3

4 Claims

2. An inflatable container, comprising an inflatable side wall of flexible sheet material, a plurality of inflatable cells in said peripheral side wall, and closure means to close at least one end of said peripheral side wall to form a container having a cavity bounded by said inflatable peripheral side wall and said closure means, wherein said inflatable peripheral side wall includes a first pair of opposite side edges which are substantially parallel

when said side wall is unflexed, a second pair of opposite side edges which are substantially parallel to each other and substantially normal to said first pair of side edges when said side wall is unflexed, said first pair of side edges being joined to encircle said cavity within said peripheral side wall, said closure means including a first inflatable end wall joined to one side edge of said second pair of side edges, and a second inflatable end wall joined to the other side edge of said second pair,



said inflatable cells in said peripheral side wall being closely adjacent to each other, said inflatable end walls being inflatable throughout their entire dimensional area, said end walls being directly joined in a watertight and airtight seal at each opposite end to respective edges of said peripheral side wall, said cavity being both watertight and insulated against heat transfer into and out of said cavity when said peripheral side wall and said end walls are inflated with air.

4,164,971

## THREADED FASTENER PRODUCT WITH ADHESIVE COATING

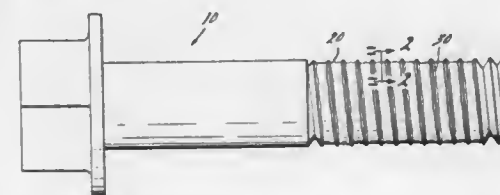
Norman S. Strand, Howell, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed Nov. 1, 1976, Ser. No. 737,558

Int. Cl.<sup>2</sup> F16B 39/00

U.S. Cl. 151—14.5

9 Claims



1. A fastener means having a thread connecting system for setting the fastener, wherein said fastener means includes an adhesive composition on said thread, said composition comprising in its uncured state, a solid epoxy particulate adhesive, a film forming carrier in which said adhesive is dispersed and which does not dissolve nor react with said adhesive, and a water resistant, non-reactive microencapsulated solvent dispersed in said film forming carrier, said solvent being operative upon release from its microencapsulated state to mix with and dissolve said adhesive and effect a cure of the adhesive composition.

4,164,972

## BOXED AWNING ASSEMBLY

J. Richard Bennett, Fullerton, Calif., assignor to A & E Plastik Pak Co., Inc., Industry, Calif.

Continuation of Ser. No. 661,100, Feb. 25, 1976, abandoned.

This application May 20, 1977, Ser. No. 798,785

Int. Cl.<sup>2</sup> F04F 10/06

U.S. Cl. 160—66

15 Claims

1. An awning assembly deployable from a stored position in proximity to a wall to an extended position extending from the wall, comprising:

- a flexible sheet member forming an awning and having stored and extended conditions;
- means including at least one main support arm and at least

one rafter arm for supporting the awning in the extended position;

a container assembly connectible to the wall for enclosing at least the awning in the stored position;

a first back member included in the container assembly and defining a first wall of the container assembly;

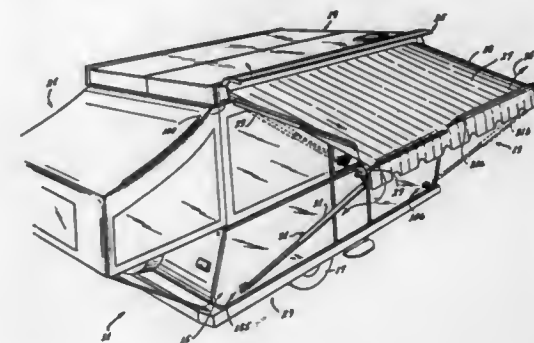
a second back member included in the container assembly and extending in a direction transverse to the first back member and defining a second wall of the container assembly;

a plurality of channels disposed at spaced positions in at least one of the first and second back members;

a bracket having a pair of beads constructed to fit removably in a pair of spaced channels to provide for a variable disposition of the container relative to the wall, the bracket having a first flange extending between the beads and having a further flange extending in a transverse direction from the first flange for support by the wall;

means coupled to the first back member and the second back member for bracing the container assembly to provide a rigid relationship between the first back member and the second back member;

a lid pivotable with respect to the first and second back



members of the container assembly to provide for the reception of the awning in the stored position in the container and the unrolling of the awning from the container; means including the bracing means for providing for a storage of the awning in the container in the stored condition on the bracing means;

means including the bracing means for providing for a storage of the rafter arm in the container in fixed relationship to the bracing means at a position below the awning and for providing for a pivotal movement of the rafter arm relative to the container to obtain the disposition of the awning in the extended condition; and

connector means including the bracing means, and having first and second ends, for providing for a storage of the main support arm in the container in a fixed relationship to the bracing means at a position above the awning and for providing a coupling of the main support arm to the awning at one end and for providing for a pivotal movement of the main support arm relative to the bracing means in a first plane about the second end of the connector means as a fulcrum in a second plane transverse to the first plane and independently of the movement of the main support arm relative to the rafter arm in the first plane.

4,164,973

## METHODS AND APPARATUS RELATING TO ELECTROSLAG DEPOSITION

Kenneth G. Hardwick, and Trevor Bagshaw, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed May 23, 1978, Ser. No. 908,622

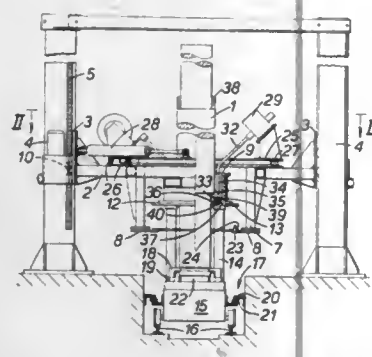
Int. Cl.<sup>2</sup> B22D 27/02, 19/00

U.S. Cl. 164—52

14 Claims

1. Electroslag casting apparatus for continuously depositing metal onto the surface of an elongate metal article comprising:

means for supporting the article with its axis substantially vertical, a vertically movable platform which is adapted to encompass the article, an open ended mould initially juxtaposed in selected spaced relation with the platform positioned around the article with an internal surface opposed to and spaced a predetermined distance away from the surface of the article to define a space between the surfaces, means carried by the platform for continuously feeding the metal in the form of a consumable electrode, which is to be deposited onto the surface of the article into the space defined between the opposed surfaces of the mould and the article, means for imparting vertical movement to the platform sufficient to enable a predetermined depth of solidified weld metal to be present in the mould and means for coupling the mould to the platform after a predetermined vertical movement of the platform relative to the mould, whereby the mould may be moved vertically by the platform.



9. A method of depositing metal about the surface of an elongate metal article by an electrosag casting process comprising the steps of: supporting the article with its axis substantially vertical, locating a mould about the perimeter of the article and providing a vertically movable means adjacent the mould, forming within the mould a bath of molten, electrically conductive slag, feeding into the molten slag at least one consumable electrode which carries electrical current to the slag and which progressively melts to produce weld metal which is to be deposited about the surface of the article, initially maintaining the mould stationary to enable a predetermined depth of solidified weld metal to be present in the mould and subsequently causing the mould to move vertically by coupling the vertically movable means with the mould after a predetermined vertical movement of the vertically movable means such that they progressively move over the surface of the article on which weld metal is to be deposited.

4,164,974

## LIQUID-COOLED ELECTROMAGNETIC CONTINUOUS CASTING MOLD

Jacques Ruer, 87 bis rue Georges Durocq, and Louis Vedda, 31 avenue de Strasbourg, both of Metz, France (57000)

Filed Nov. 17, 1977, Ser. No. 852,208

Claims priority, application France, Nov. 17, 1976, 76 34681

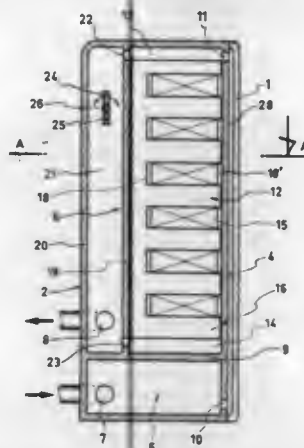
Int. Cl.<sup>2</sup> B22D 27/02, 11/124

U.S. Cl. 164—147

2 Claims

1. In a mold for the continuous casting of molten metal, which comprises a tubular mold element having two open ends and defining a passage for the casting between the open ends, a cooling casing surrounding and fastened to the tubular mold element, the casing having an outer wall and an interior wall defining therebetween an enclosed cooling space, and the interior wall defining with the tubular mold element an inner space, a transverse partition wall between the outer and interior walls at one end of the cooling casing to separate the enclosed cooling space into two superposed chambers, an inlet conduit means connected to one of the chambers for supplying a cooling liquid to the one chamber, a discharge conduit means connected to the other chamber for removing the cooling

liquid therefrom, the inner space being in communication with the one chamber at one end of the interior wall and with the other chamber at the other end of the interior wall whereby the cooling liquid flows from the one chamber through the inner space for cooling the tubular element and into the other chamber, and an electromagnetic inductor means arranged in the other chamber for moving the molten metal in the passage: the improvement of means dividing the other chamber into two separate liquid flow circuits, a first one of the circuits circulating the cooling liquid from the inner space through the entire electromagnetic inductor means to the discharge conduit means, and a second one of the circuits being arranged in parallel with the first circuit and directly removing the cooling liquid from the inner space to the discharge conduit means



4,164,975

## HEAT EXCHANGER HOLDER

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116

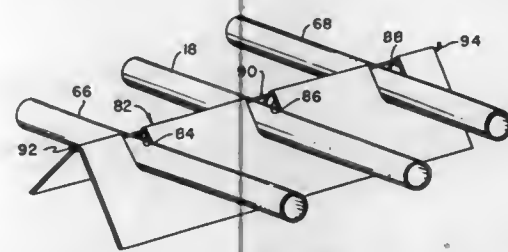
Division of Ser. No. 715,306, Aug. 18, 1976, Pat. No. 4,049,407.

This application Jul. 1, 1977, Ser. No. 812,137

Int. Cl.<sup>2</sup> F28F 1/32

U.S. Cl. 165—68

4 Claims



1. A heat exchanger holder for retaining at least two tubular coils in horizontal spaced apart heat exchange relationship comprising an elongated V-shaped member having an apex defining the upside thereof, said member being fabricated of

sheet-like heat conductive material, said member having at least two spaced apart slots extending transversely downwardly from the apex thereof, each slot for reception of a tubular coil, and means for securing the coils in place comprising an elongated rod-like element inserted beneath said apex and above said coils having ends extending out of the ends of the V-shaped member and being bent to retain said rod-like element in place.

4,164,976

## DAMPER ASSEMBLY

Walter C. Timmerman, Houston, Tex., assignor to Timmerman Engineers, Inc., Houston, Tex.

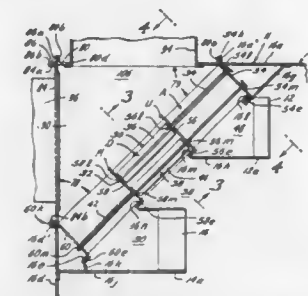
Continuation-in-part of Ser. No. 519,349, Oct. 30, 1974,

abandoned. This application Jan. 17, 1977, Ser. No. 759,920

Int. Cl.<sup>2</sup> F28F 27/02, 9/26; F24F 13/14

U.S. Cl. 165—101

15 Claims



1. A damper assembly adapted to be affixed to an air-handling unit at an installation site with the air handling unit being a multizone air conditioning-heating unit having a heated air chamber, a cooled air chamber, and a neutral zone for receiving ambient air, comprising:

a plurality of adjacent damper assembly units adapted to be mounted with and for regulating air flow from the air-handling unit, each of said damper assembly units having:

a first wall section;

a second wall section;

damper means adapted to be disposed between said first wall section and said second wall section for regulating

air flow exiting the air-handling unit; and,

mounting means for mounting said first wall section in a fixed spacial relation to said second wall section and for

mounting said damper means between said first wall section and said second wall section, said partition plates

for positioning said first wall section substantially parallel with said second wall section, said partition plates

being disposed between said first and second wall sections of said damper assembly unit for mounting said

damper means with said damper assembly unit;

interlocking means with said wall sections for interlocking said adjacent wall sections of said adjacent damper assembly units;

said damper assembly units including a first damper means and a second damper means;

said first damper means mounted with said heated air chamber and said neutral zone for simultaneously controlling relative mixing proportions of heated air and ambient air; and,

said second damper means mounted with said cooled air chamber and said neutral zone for simultaneously controlling relative mixing proportions of cooled air and ambient air, independent of said first damper means.

4,164,977

## WELL LATCH

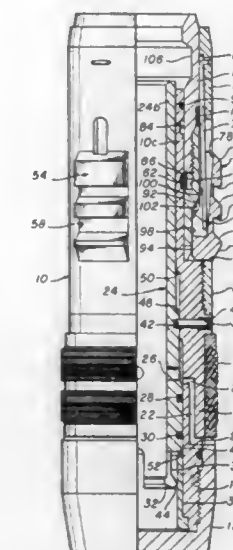
Henry P. Arendt; Thomas M. Deaton, both of Dallas, and Donald L. Dooley, Royse City, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 11, 1977, Ser. No. 786,380

Int. Cl.<sup>2</sup> E21B 23/06, 33/126, 33/129

U.S. Cl. 166—125

19 Claims



1. A well latch comprising:

a latch housing;

seal means on said housing for sealing between said latch housing and a landing nipple in a well;

said latch housing having equalizing passage means for extending between a first pressure region exterior of said latch housing and a second pressure region interior of said housing;

key means carried by said housing and adapted to move radially outwardly for locking the well latch in a landing nipple;

expander sleeve means axially movable with respect to said latch housing between a first position permitting retraction of said key means into said latch housing and a second position maintaining said key means in an expanded position;

fishing neck means associated with said expander sleeve means and movable in unison with said expander sleeve means with respect to said latch housing and including recess means for engagement by a fishing tool;

valve means disposed in said latch housing and movable independently of said expander sleeve means with respect to said latch housing between a first position permitting flow through said equalizing passage means and a second position preventing flow through said equalizing passage means, said valve means being adapted to be moved to its second position when the well latch is locked in a landing nipple;

releasable stop means for preventing unintentional movement of said valve means from its second position to its first position; and

means associated with said valve means for preventing a fishing tool from engaging said fishing neck recess means until said valve means is moved to its first position and including an extension on said valve means, said extension extending across said recess means and interfering with access to said recess means when said valve means is in its second position and said expander sleeve means is in its second position and not interfering with access to said recess means when said valve means is in its first position.



4,164,978

## OIL EXTRACTION METHOD

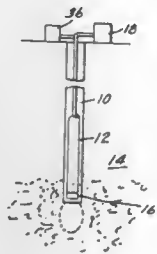
Harold W. Scott, Ridgefield, Conn., assignor to Winton Corporation, Ridgefield, Conn.

Filed Feb. 21, 1978, Ser. No. 879,484

Int. Cl.<sup>2</sup> E21B 43/25

U.S. Cl. 166—249

4 Claims



1. A method of recovering oil from a wellhole in an oil bearing earth formation comprising: generating an electrohydraulic shock wave in a liquid in said wellhole by capacitor discharge means; directing the generated shock wave outwardly through the liquid, from the wellhole and into the oil bearing formation to cause oil in said formation to be separated therefrom; generating an ultrasonic wave in said liquid in the region where the electrohydraulic shock wave was generated to further cause oil in said formation to be separated therefrom, and removing the separated oil through the wellhole.

4,164,979

## RESERVOIR STABILIZATION BY TREATING WATER SENSITIVE CLAYS

Daryl W. Nooner, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,882

Int. Cl.<sup>2</sup> E21B 43/22, 43/24

U.S. Cl. 166—288

7 Claims

1. A method of altering the matrix of a hydrocarbon-bearing formation having present therein montmorillonite clays, comprising the steps of introducing via a wellbore penetrating said formation a heated aqueous solution of a potassium salt of an organic acid, continuing injection of said solution until said matrix is heated to a minimum temperature of about 260° C. for a desired radial distance from said wellbore, whereby said matrix is stabilized by mineralogically altering said montmorillonite clays.

4,164,980

## WELL CEMENTING METHOD AND APPARATUS

John A. Duke, 418 Pamela St., Baytown, Tex. 77521

Filed Aug. 2, 1978, Ser. No. 930,138

Int. Cl.<sup>2</sup> E21B 33/05, 33/16

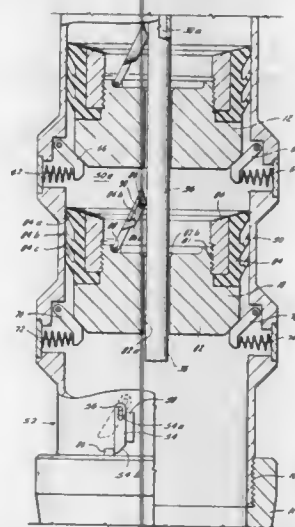
U.S. Cl. 166—291

6 Claims

1. A method of cementing a well conduit in a well bore comprising the steps of:  
forming a well conduit to be cemented in the well bore at a work surface disposed above the well bore;  
mounting a hanger with the well conduit for supporting the well conduit in the well; mounting a cementing plug container above the well conduit;  
connecting the cementing plug container with a tubular string for supporting the well conduit and the cementing plug container from the work surface;  
flowing a cement slurry through the tubular string to the cementing plug container;  
manipulating the tubular string to operate the cementing plug container to release a first cementing plug;  
moving the first cementing plug downwardly through the well conduit;

manipulating the tubular string to operate the cementing plug container to release a second cementing plug;  
moving the second cementing plug downwardly through the well conduit through the well conduit into engagement with the first cementing plug for internally clearing the well conduit of cement slurry while forcing the cement slurry into the well bore.

4. Well cementing plug apparatus, including:  
a tubular body forming a central passageway;  
means for connecting said tubular body with a well conductor to be cemented in a bore hole;  
means for connecting said tubular body with a tubular support for supporting said tubular body,



a plurality of cementing plugs releasably disposed in said central passageway, each of said cementing plugs having a flow passage formed therethrough and a movable closure element for closing each said flow passage; and means movably mounted with said tubular body for extending through said flow passage of each said cementing plug to form a circulation flow passage past said cementing plugs, said means being withdrawable from said central passageway to enable said movable closure element to close said flow passage through each said cementing plug in response to manipulation of the tubular support.

4,164,981

## AGRICULTURAL HARVESTING ASSEMBLY

Thomas E. Myers, Rte. 5, Box 428, Dade City, Fla. 33525

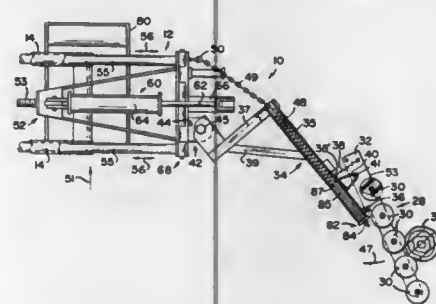
Filed Dec. 16, 1974, Ser. No. 533,000

The portion of the term of this patent subsequent to Aug. 21, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A01D 25/00

U.S. Cl. 171—50

15 Claims



1. An agricultural assembly primarily designed for removing vines and like growth extending from the ground and secured to the upper portion of a tree with the vine or like growth being spaced from the trunk of the tree, the agriculture assem-

bly normally operated in towed relation to a prime mover type vehicle; said agriculture assembly comprising: frame means movably connected in towed relation to the prime mover type vehicle, a gripping head movably mounted on said frame, orienting means connected to said gripping head and disposed to at least partially define the path of travel of said gripping head relative to said frame, biasing means connected to said orienting means and disposed to normally bias said head into a substantially predetermined position relative to the path of travel of said frame to remove the vines or like growth from the ground as said gripping head travels relative to the tree; and said biasing means disposed relative to said gripping head, orienting means and said frame means for absorbing the shock when said gripping head engages the tree and for enabling movement of said gripping head from said substantially predetermined position as the gripping head engages the tree and passes thereby.

4,164,982

## VIBRATORY CABLE PLOW ASSEMBLY

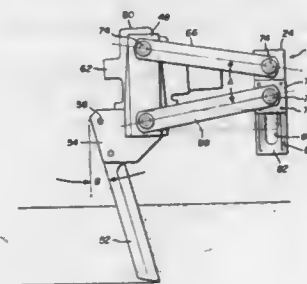
Robert G. Draney, Wichita, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 27, 1978, Ser. No. 881,219

Int. Cl.<sup>2</sup> E02F 5/02; F16L 1/00

U.S. Cl. 172—40

12 Claims



10. A vibratory plow assembly for laying an elongated element underground comprising, in combination, a resilient frame assembly to be mounted on a ground traversing vehicle, said frame assembly having a forward frame member mounted on said vehicle, side frame members on each side of said frame resiliently supported on pivotal connections on said forward frame member, a rearward frame member resiliently supported by said side frame members on resilient pivotal connections, a generally vertical plow blade and a vibrator shaker means supported on said rearward frame member, such that said plow blade is vibrated by said shaker means about said resilient pivotal connections, the improvement comprising: said side frame members each including two generally vertically spaced elongated links converging in spaced relation toward said forward frame member and said vehicle at an acute relative angle of about fifteen to twenty degrees, the forward and rearward ends of each link pivotally connected respectively to said forward and rearward frame members, said vibrator shaker means thereby generating an elliptical ground cleaving motion in said blade about said pivotal connections.

4,164,983

## WALK-BEHIND FILLER WITH COMBINED DRAG STAKE AND WHEEL

John J. Hoch, Beaver Dam, Wis., assignor to Deere &amp; Company, Moline, Ill.

Filed Feb. 21, 1978, Ser. No. 879,202

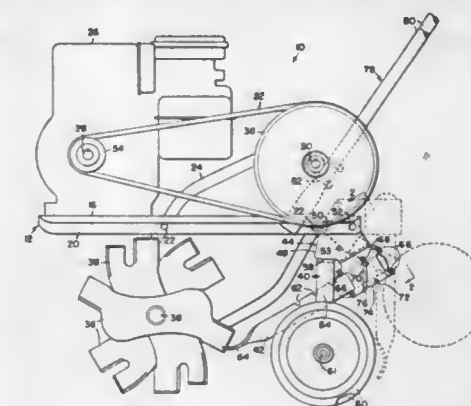
Int. Cl.<sup>2</sup> B62D 51/04; A01B 33/02

U.S. Cl. 172—43

10 Claims

1. In a walk-behind rotary tiller including a frame having a set of rotary tines, a pair of transversely spaced wheels and a drag stake secured thereto and disposed therebeneath, with the wheels and drag stake being located rearwardly of the tines and with the drag stake being mounted for pivoting between a

raised transport position and a lowered working position, wherein said drag stake has a lower end which moves rearwardly from said transport to said working position, the improvement comprising: said drag stake both extending between



4,164,984

## GARDEN IMPLEMENT

Harold Palmer, Rt. 2, Box 221-FF, Orland, Calif. 95963

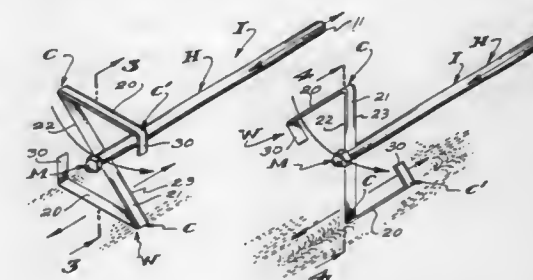
Continuation-in-part of Ser. No. 757,919, Jan. 10, 1977,

abandoned. This application Apr. 3, 1978, Ser. No. 892,683

Int. Cl.<sup>2</sup> A01B 1/10

U.S. Cl. 172—371

9 Claims



1. A garden implement including an elongate manually engageable handle with front and rear ends, a substantially Z-shaped working head and coupling means coupling the head with the front end of the handle, said head is a unitary part established of a single length of flat metal strap formed to establish a pair of flat, elongate, straight, parallel and laterally spaced blades, a flat, straight and elongate central member extending diagonally between and integrally joined with related ends of the blades at acute angle and cooperating therewith to define acute V-shaped corner portions; said head is on a plane normal to the longitudinal axis of the handle with the axis of the handle intersecting the member intermediate the ends thereof and with the planes of the blades and member parallel with the longitudinal axis of the handle, whereby said blades and member have straight, axially forwardly and rearwardly disposed work engaging edges.

4,164,985

**STRADDLING TRACTORS**

Charles E. Bobard, Gigny, France, assignor to ETS. Bobard Jeune S.A., Beaune, France

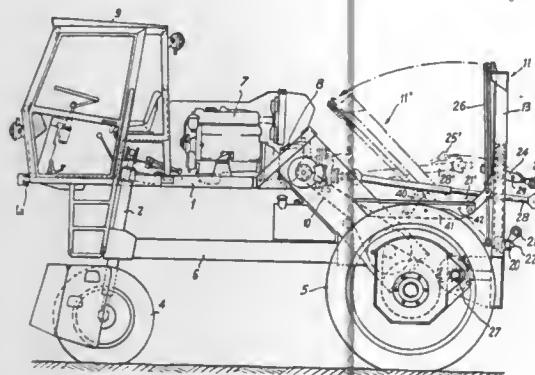
Filed Feb. 10, 1978, Ser. No. 876,635

Claims priority, application France, Feb. 11, 1977, 77 03873

Int. Cl.<sup>2</sup> B60D 1/00

U.S. Cl. 180—53 D

30 Claims



1. Apparatus for hitching implements to a stilt-type tractor having a body of a generally inverted U shape to permit crops to pass thereunder comprising:

first gantry means formed with an open bottom portion, means for attaching said first gantry means to said tractor, second gantry means formed with an open bottom portion, three point hitching means, means for mounting said hitching means to said second gantry means, and means for mounting said second gantry means to said first gantry means to provide relative movement between said two gantry means along at least a part of the lengths thereof.

26. The combination of a tractor of the straddling leg type and a hitching implement apparatus, said hitching implement apparatus comprising:

first gantry means, means for mounting said first gantry means to said tractor, means for tilting said first gantry means relative to the tractor,

second gantry means, hitching means, means for mounting said hitching means to said second gantry means, and means for mounting said second gantry means to said first gantry means to provide relative movement between said two gantry means along at least a part of the lengths thereof.

4,164,986

**DEVICE FOR FIXING A PANEL ON AN AUTOMOBILE DASHBOARD**

Jacques Eloy, Montbeliard, and Claude François, Audincourt, both of France, assignors to Automobiles Peugeot, Paris, France

Filed Aug. 22, 1977, Ser. No. 826,680

Claims priority, application France, Sep. 17, 1976, 76 28101

Int. Cl.<sup>2</sup> B60K 20/08; A44B 17/00

U.S. Cl. 180—90

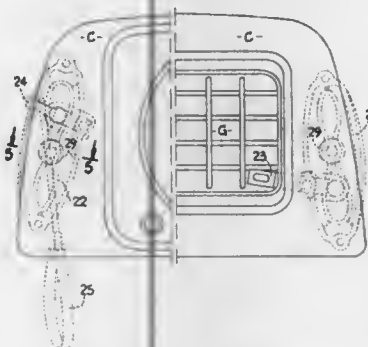
9 Claims

1. A device for removably fixing, by interlocking, a first element on a second element and comprising:

a pin provided with a shouldered head, securely fastened to said second element, a clip fastened to said first element and adapted to receive and removably grip the pin, wherein the clip is constituted by:

(a) a frame, (b) two resilient lips provided in said frame and integral

therewith, and defining a central recess adapted to receive said pin, and at least one lateral recess,



(c) a member for spacing said lips apart in order to release said pin, said lip-spacing member being rotatably mounted on said frame and comprising an angularly movable finger engaged within said lateral recess.

4,164,987

**CONTROL DEVICE FOR THE DECELERATION OF A HEAVY VEHICLE**

Roger Lagarde, Aulnay-Sous-Bois, France, assignor to Labavia S.G.E., Paris, France

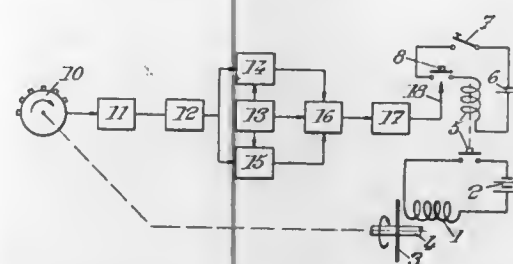
Filed Jan. 7, 1977, Ser. No. 757,513

Claims priority, application France, Jan. 13, 1976, 76 00716

Int. Cl.<sup>2</sup> B60T 8/04

U.S. Cl. 180—271

16 Claims



1. A device for controlling a vehicle having friction brakes, a decelerator, and means for selectively actuating said decelerator; said device comprising: means for automatically neutralizing said selectively actuating means in response to the deceleration of said vehicle exceeding a predetermined value, said predetermined value being a level of deceleration which would be likely to cause skidding of the vehicle in an empty or lightly loaded condition but not in a full or heavily loaded condition.

4,164,988

**FINE TUNED, COLUMN SPEAKER SYSTEM**

John J. Virva, Chicago, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed Aug. 25, 1976, Ser. No. 717,755

Int. Cl.<sup>2</sup> H05K 5/00

U.S. Cl. 181—156

4 Claims

1. A finely-tuned loudspeaker system capable of reproducing efficiently low frequency sounds, comprising:

(a) a high compliance loudspeaker having a specific in-air resonance frequency  $f_0$ , which may vary within a relatively wide range of possible frequencies;

(b) support means for said loudspeaker comprising a baffle board for receiving and supporting said loudspeaker, a support frame and a slideable board with an aperture in said board slideable in said support frame; and

(c) an adjustable air column tube connected at one end to the

4,164,990

**PASSENGER EVACUATION APPARATUS**

Christian Stiefel, Aachen, and Fritz Frederich, Krefeld, both of Fed. Rep. of Germany, assignors to Waggonfabrik Uerdingen Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 752,307, Dec. 30, 1976,

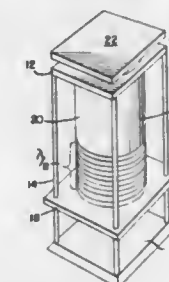
abandoned. This application Jan. 27, 1978, Ser. No. 872,795

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558225

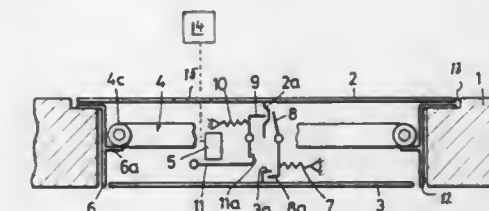
Int. Cl.<sup>2</sup> A62B 1/20

U.S. Cl. 182—48

11 Claims



ing to said range of possible frequencies to one-quarter of a wavelength of the specific frequency  $f_0$ , whereby said loud-speaker system may be finely tuned to tend to flatten the output of said speaker over the frequency range of said speaker.



1. A passenger evacuation apparatus for use in a passenger-carrying cabin having a floor suspended above the ground, comprising an upper plate engageable with and normally overlying the upper side of a vertical hole through said floor and normally lying generally level with said upper side; a lower plate engageable with the lower side of said hole; securing means including a linkage in said hole connected between said plates and an electromagnet operatively connected to said linkage for securing both of said plates to said floor at the respective sides in a normal position and for releasing both of said plates from each other in an emergency position for opening-up said hole from both sides and for dropping-away of said lower plate; means in said cabin and connected to said electromagnet for detecting fire and operating said electromagnet to place said linkage in said emergency position on detection of fire; and a tubular life-saving chute secured to said floor between said sides in said hole and folded up between said plates in said normal position and extensible down from said floor in said emergency position, said chute having a lower end portion remote from said cabin in said emergency position and being provided at said lower end portion with at least one elongated exit port and slide-fastener means normally closing said port and being adapted to be opened so that when said lower end portion is on or near the ground below said cabin said exit port can be opened to permit exiting of a person from said chute.

4,164,989

**MUFFLER, ESPECIALLY FOR PORTABLE INTERNAL COMBUSTION ENGINE**

Helmut Lux, Waiblingen, and Gütz Landwehr, Berglen, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

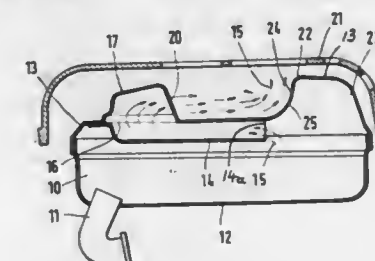
Filed Jun. 7, 1978, Ser. No. 913,030

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2725899

Int. Cl.<sup>2</sup> F01N 1/08

U.S. Cl. 181—265

17 Claims



1. A muffler, especially for a portable internal combustion engine of a motor chain saw, which includes an exhaust gas receiving container defined by a container wall having an aperture therethrough and by a pan-shaped housing wall having an inlet for admitting exhaust gas into said container, exhaust gas conveying means communicating with said exhaust gas container for receiving and deflecting an exhaust gas current and conveying the deflected exhaust gas current through said aperture, said exhaust gas conveying means comprising bend means arranged on the outside of said container wall and projecting from said container wall and being provided with an outlet for conveying the exhaust gas current through said outlet at least approximately parallel to a portion of said container wall, and turbulence creating means extending transverse to the outflow direction of the exhaust gas current through said outlet for creating turbulence in the last mentioned exhaust gas current.

4,164,991

**FIRE ESCAPE DEVICE**

Aldo Marra, 11 Wood St., San Francisco, Calif. 94118

Filed Apr. 3, 1978, Ser. No. 892,759

Int. Cl.<sup>2</sup> E06C 9/14, 1/36, 1/56

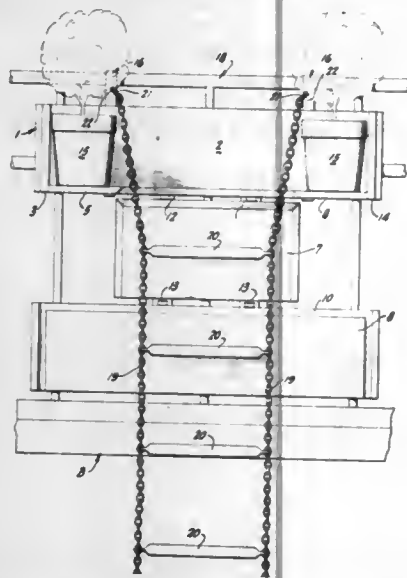
U.S. Cl. 182—70

7 Claims

1. A fire escape device for a building comprising a box having a back panel, a pair of bottom end panels fixed to said back panel, a bottom central panel, first hinges connecting said bottom central panel to said back panel, a front panel, second hinges connecting said front panel to said bottom central panel, means supporting said front panel on said bottom end panels and for releasing said front panel from said bottom end panels by outward swinging of said front panel about said second hinges, a top panel adapted to interengage the top of said back



panel and the top of said front panel, a ladder of chains and rungs adapted to be disposed largely within said box on said



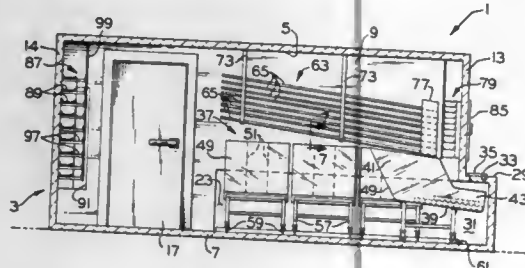
bottom central panel, and means associated with said box for transferring weight from said chains to said building.

#### 4,164,992 DISPENSING UNIT

Lawrence B. Luber, deceased, late of Sikeston, Mo., and Beulah Luber, Intestate Successor, 706 Hunter St., Sikeston, Mo. 63801, assignors to Beulah F. Luber, Sikeston, Mo.  
Filed Nov. 16, 1977, Ser. No. 851,811  
Int. Cl.<sup>2</sup> E04H 3/04

U.S. Cl. 186-1 R

10 Claims



1. A unit for dispensing chilled cans and bottles of beverage on a first-in, first-out basis, said unit comprising a walk-in cooler having a ceiling, a floor, and front, rear and side walls, the front wall having an offset portion extending generally horizontally forwardly and then vertically downwardly for providing an elongate generally horizontal counter at the front of the cooler outside the cooler and a recess below the counter inside the cooler, said counter having a plurality of openings therein spaced along the counter and doors for closing the openings, and a plurality of mobile receptacles, one for each opening, for holding a supply of chilled cans and bottles of beverage inside the cooler, each of said receptacles having a bottom, an inlet through which cans and bottles are loaded into the receptacle, and an outlet through which cans and bottles are removed from the receptacle, said receptacles being adapted to be positioned side-by-side in said recess below the counter with the outlet of each of the receptacles directly beneath and immediately adjacent one of the counter openings for removal of the cans and bottles from the receptacle and out of the cooler via said opening, the bottom of each of the receptacles being spaced a sufficient distance above the floor of the cooler and close enough to a respective counter opening for

convenient removal of cans and bottles on the bottom of the receptacle from the receptacle and out of the cooler via the opening, said receptacles presenting the cans and bottles for removal therefrom on a first-in, first-out basis.

#### 4,164,993

##### AIR COOLED BRAKE DISC

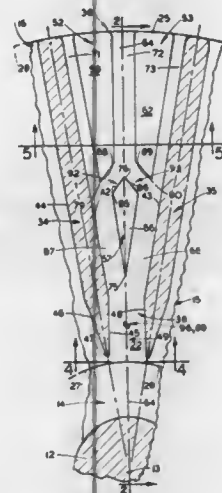
Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada (V6M 2W2)

Filed Feb. 21, 1978, Ser. No. 879,888

Int. Cl.<sup>2</sup> F16D 65/12, 65/847

U.S. Cl. 188-218 XL

10 Claims



1. An air cooled brake disc having first and second disc-shaped face portions, each face portion having an outer braking surface and an inner surface, at least one face portion having cooling air inlet means adjacent an inner portion of the disc, a plurality of radially disposed webs extending between the face portions from the inner portion of the disc to an outer portion of the disc, the webs defining with inner surfaces of the face portions a plurality of radially extending cooling passages within the disc, each cooling passage having a plurality of generally radially disposed cooling fins extending from opposite inner surfaces of each cooling passage, the cooling fins being further characterized by:

- at least one inner fin being adjacent an inner portion of the cooling passage to divide the cooling passage into at least two inner passage portions,
- at least two outer fins being adjacent an outer portion of the passage to divide the passage into at least three outer passage portions,
- the inner cooling fins being separated from the outer cooling fins to permit passage of air between the inner and outer passage portions.

#### 4,164,994

##### HYDRAULIC EDDY BRAKE

Hans-Walter Dodd, Darmstadt, and Dieter Kraft, Griesheim, both of Fed. Rep. of Germany, assignors to Firma Carl Schenck AG, Darmstadt, Fed. Rep. of Germany  
Continuation of Ser. No. 697,956, Jun. 21, 1976, abandoned.

This application Sep. 13, 1977, Ser. No. 832,908

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1975, 2536794

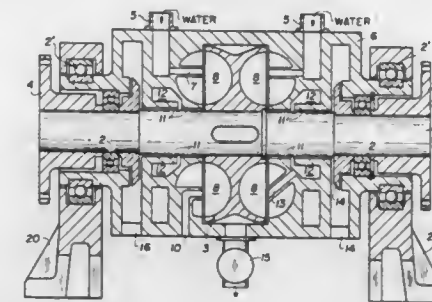
Int. Cl.<sup>2</sup> F16D 57/02

U.S. Cl. 188-296

10 Claims

1. A hydraulic eddy brake comprising stator means and rotor means including a rotor shaft, said stator means and said rotor means defining an eddy chamber having peripheral high pressure zones and a central low pressure zone, liquid supply means connected to supply liquid substantially centrally into said low pressure zone of said eddy chamber, said rotor shaft

(1) supporting said rotor means, bearing means rotatably supporting said rotor shaft relative to said stator means, a smooth axial bore having a given inner diameter extending through said stator means, said rotor shaft extending axially through said bore, gap means (11) located substantially between the rotor shaft (1) and said stator means (6), leakage liquid discharge means (16) operatively connected to said gap means (11) and liquid feed-back conduit means (12, 13: 5', 7) operatively and directly connecting said gap means (11) substantially centrally into said low pressure zone of said eddy chamber (8) whereby the pressure difference between the pressure in said central low pressure zone and the liquid leakage pressure in said gap means (11) is substantially minimized and a major



proportion of the leakage liquid is returned into said central low pressure zone so that elastic sealing means between the rotor shaft and the stator means are obviated, said hydraulic eddy brake further comprising means secured to said rotor shaft and rotating with the rotor shaft for avoiding gradual locking of the rotor shaft by boiler scale and corrosion products, said locking avoiding means comprising a plurality of closed rings (201) spaced by closed grooves (200), said closed rings and closed grooves being operatively interposed between said rotor shaft (1) and said stator means (6) in gap means (11), said closed rings having a saw tooth cross section and an outer diameter smaller than said given inner bore diameter so that a spacing is provided between the rotor shaft and the stator means to form said gap means (11).

#### 4,164,995

##### INERTIA CONTROLLED CONVEYOR CLUTCH

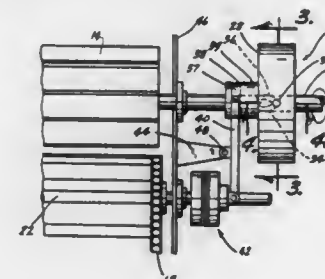
Douglas F. McFarland, Davis City, Iowa 50065

Filed May 19, 1977, Ser. No. 798,371

Int. Cl.<sup>2</sup> F16D 43/24

U.S. Cl. 192-103 C

7 Claims



1. In combination,  
a harvesting machine having a first drive shaft, a feeder conveyor chain assembly with a second drive shaft, and a friction drive clutch connected to said second drive shaft to disengage said feeder conveyor chain, and  
a governor control device comprising a flywheel having a center aperture slidably receiving said first drive shaft, means for connecting said flywheel to said first drive shaft so that the rotation of said first drive shaft rotates said flywheel and a decrease in the rotational speed of said first drive shaft relative to said flywheel causes said flywheel

to move along said first driveshaft, and means for connecting said flywheel to said friction drive clutch such that the movement of said flywheel along said first drive shaft disengages said feeder conveyor chain.

#### 4,164,996

##### TILE STACKING MACHINE AND METHOD

Robert K. Tomlinson, Woodville, Australia, assignor to Concrete Industries (Monier) Limited, Woodville, Australia

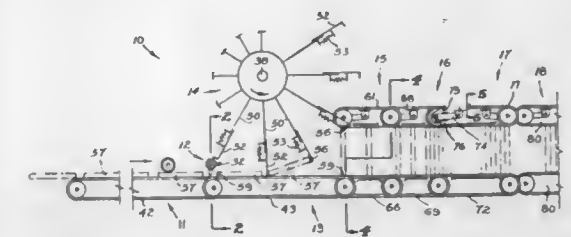
Filed Aug. 5, 1977, Ser. No. 822,336

Claims priority, application Australia, Aug. 6, 1976, PC6894

Int. Cl.<sup>2</sup> B65G 47/24

U.S. Cl. 198-415

11 Claims



1. A method of stacking tiles which are conveyed by a conveyor to travel edgewise, comprising:

- engaging the leading edge of each successive tile by a finger of a rotating tilting head and lifting upwardly so that each said tile is supported in turn on its then lower edge while the lower edge is being conveyed at high speed on a high speed conveyor,
- engaging said lower edge of each tile after it has been tilted with a lower belt and releasing the tilting head finger from the tile upper edge while simultaneously transferring the upper edge into engagement with an upper belt of a set of speed reducing belts thereby transferring each tile in turn from said high speed conveyor,
- driving the belts of said set of speed reducing belts at a lower speed than said high speed conveyor thereby conveying each said tile at a reduced speed in a face to back relationship, and
- removing said stack of tiles so formed from the speed reducing belts conveying it, and transferring to a packing locality.

#### 4,164,997

##### ARTICLE TRANSPORT DEVICE AND METHOD

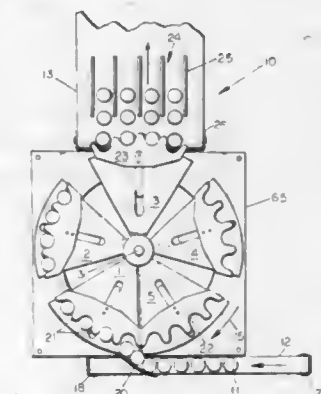
Martin Mueller, Wonderlake, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 2, 1977, Ser. No. 764,783

Int. Cl.<sup>2</sup> B65G 47/26

U.S. Cl. 198-427

14 Claims



1. An apparatus for conveying a plurality of containers

through an arcuate path including an articulated starwheel, said starwheel comprised of a plurality of sectors each pivoted for independent movement around a central point, drive means for supplying rotational power to a shaft, the axis of which coincides with said central point, means for coupling and uncoupling said rotational power to said sectors so that said sectors move at least through a portion of their arcuate travel at a constant angular velocity, auxiliary drive means coupled to said drive means for engaging said sectors and accelerating and decelerating said sectors in an arcuate direction and means coupled to said drive means for simultaneously ejecting all of the containers transported by each sector.

4,164,998

## ACCUMULATION LIVE ROLLER CONVEYOR

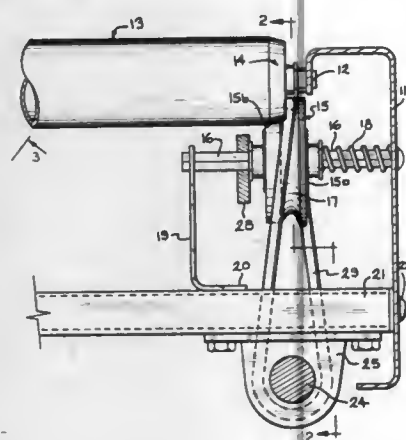
David A. DeGood, 3174 Hudson, Hudsonville, Mich. 49426, and David K. Stevens, Jenison, Mich., assignors to David A. DeGood, Hudsonville, Mich.

Filed Feb. 16, 1977, Ser. No. 768,980

Int. Cl.<sup>2</sup> B65G 13/06

U.S. Cl. 198—781

17 Claims



1. In a live roller conveyor apparatus including a frame, a plurality of live rollers mounted on longitudinal axes at both ends on the frame in spaced relation and defining a pass line along which articles supported on the rollers are transported, the improvement which comprises:

- (a) a tapered surface at one end of each of a plurality of the rollers which provide powered transport of the articles on the pass line;
- (b) a plurality of shafts mounted on the frame each having its longitudinal axis spaced from and approximately parallel to the longitudinal axis of a roller with the end surface to be powered;
- (c) a drive wheel rotatably mounted on each shaft with a radial frictional drive surface, wherein the drive wheel has an inner rim which is closely spaced from the roller and an outer rim larger in diameter than the inner rim with the drive surface between the rims, the drive wheel being mounted on the shaft and the shaft on the frame such that the drive surface can engage the tapered end surface of the roller from which the shaft is spaced to provide power and disengage therefrom;
- (d) means for rotating the drive wheel; and
- (e) means for selectively moving the drive wheel and thus the drive surface into and out of engagement with the end surface of the roller.

4,164,999

## CIGARETTE PACKAGE

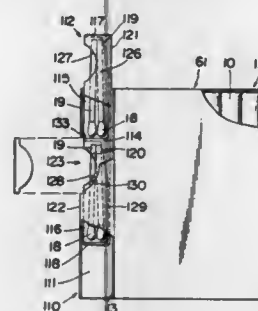
Tatumi Tsukamoto, 2570, Ohaza Mukaizima, Chiyodamachi, Kanzaigun, Sagaken, Chiyodamachi, Japan

Filed Mar. 14, 1978, Ser. No. 886,445

Int. Cl.<sup>2</sup> A24F 15/10

U.S. Cl. 206—91

4 Claims



1. A cigarette package comprising; a package body adapted for receiving cigarettes therein and including a front wall, a rear wall, opposite side walls, an upper wall and a lower wall; and a match box attached on one side wall of the package body, the match box including a rectangular outer frame having a back wall surface conforming to the shape of a side wall of said package body and a receptacle box adapted to be freely slidable in said outer frame and divided into upper and lower chambers by a partition, the upper and lower chambers adapted to receive matches therein, the outer frame having a detachable cover over an opening in the lower chamber, which cover is removable after unsealing of the cigarette package so that when the receptacle box is pushed upwardly the matches can be removed from both the upper and lower chambers thereof.

4,165,000

## TEAR-TAB STERILE THERMOMETER SHEATH

George W. Poncy, 12540 U.S. 1, North Palm Beach, Fla. 33408

Filed Feb. 14, 1975, Ser. No. 550,000

Int. Cl.<sup>2</sup> A61B 19/02; B65D 65/26

U.S. Cl. 206—306

13 Claims



1. A sheath-package comprising: two inner sheets disposed adjacent to each other and adapted to be sealed to each other, the outer surfaces of said inner sheets being sterilizable, two cover sheets, each of which is disposed adjacent to the outer surface of one of the inner sheets, the inner surface of each cover sheet being sterilizable and adapted to be sealed to its respective adjacent inner sheet, a sheath formed by joining the inner sheets together along a seal line in the form of a tear seal, the portions of the inner sheets outside of the tear seal forming waste portions, the seal line terminating at two end points to define a mouth adapted for insertion of an instrument into the sheath, said two end points being spaced from the ends of both of said inner sheets and both of said cover sheets to form a tab from the portions of the inner and outer sheets projecting beyond the mouth, the respective adjacent inner and cover sheets being sealed together at least along the seal line and between the two end points of the seal line;

said cover sheets each including a weakened portion across substantially the entire width thereof near the mouth so that the cover sheet can easily be separated along the weakened portion.

4,165,001

## BONDED STACKED SNAP RINGS

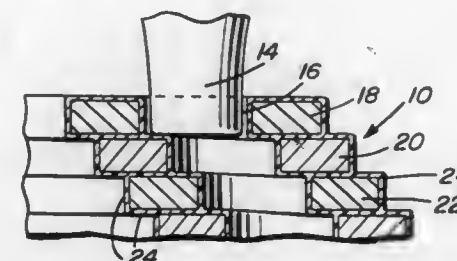
Thomas F. Cooper, 2203 Airport Rd., Opelika, Ala. 36801

Filed Jul. 10, 1978, Ser. No. 923,319

Int. Cl.<sup>2</sup> B65D 85/24

U.S. Cl. 206—343

11 Claims



1. An arrangement of a plurality of split retainer rings, adapted to be operated by a ring-withdrawing and assembling tool having tips, comprising a stack of said rings bonded together, each of said rings having retainer ring holes offset from retainer ring holes in adjacent rings comprising said stack whereby the tips can be inserted into the holes in only the endmost ring.

4,165,002

## PRODUCT AUTHENTICATION SYSTEM

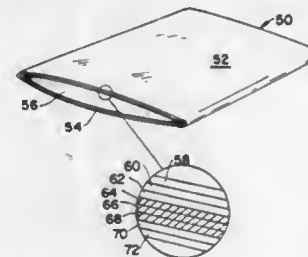
Richard R. Meagher, Toms River, N.J., assignor to The Rescon Corporation, Newark, N.J.

Filed Jun. 16, 1977, Ser. No. 807,222

Int. Cl.<sup>2</sup> B65D 75/28

U.S. Cl. 206—459

38 Claims



1. A device for authenticating a product contained in a package, comprising: a plurality of walls connected to form said package, at least one of said walls having two external surfaces and including a sheet of paperboard material having an exposed edge along said at least one wall, said sheet being formed from a plurality of plies of paperboard material to form an integral laminate, at least one ply of said plurality of plies being coded between said external surfaces of said at least one wall along at least a portion of a surface of said one ply covered by said other plies and along an exposed outer edge thereof to act as an indicator, and the exposed outer edge of said coded ply being visible along the exposed edge of said at least one wall to indicate the authenticity of said product.

4,165,003

## STACKABLE AND NESTABLE CONTAINERS

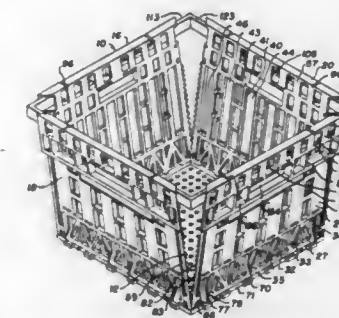
Clarence H. Drader, R.R. 2, South Edmonton, Alberta, Canada (T6C 4E6)

Filed Mar. 13, 1978, Ser. No. 885,742

Int. Cl.<sup>2</sup> B65D 21/06

U.S. Cl. 206—506

21 Claims



1. A container that can be quickly stacked and deeply nested, comprising: a rectangular bottom panel; side walls arranged in first and second opposed pairs and extending upwardly from edges of the bottom panel, each side wall having a top, a bottom, two vertical ends, and two mutually opposing side walls adjacent thereto, said side walls being mounted to swing between closed upright positions and outwardly inclined nesting positions relative to the bottom panel; two latch members movably mounted on each side wall near the top thereof, each latch member having an inner end and an outer end, the outer end being near one of the vertical ends of said each side wall, the outer end of each latch member being rigidly interconnected to the outer end of an adjacent said latch member of one of the adjacent side walls; latch means near the inner ends of the latch members for mutually and releasably interconnecting the inner ends of the latch members of each side wall to prevent movement thereof and thereby lock the two mutually opposing side walls adjacent said each side wall in the upright position, said latch means being operable to release the inner ends of the latch members interconnected thereby to free said two adjacent side walls for movement towards the nesting position; and spring means mounted for urging each side wall to swing automatically from said upstanding positions to said nesting positions when each side wall is free to move by the releasing of said latch members.

4,165,004

## INWARD EMBOSSED PANEL ADJACENT TO PUNCHED POUR HOLE IN TOP END UNIT

Herbert D. Bartels, Palos Heights, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,569

Int. Cl.<sup>2</sup> B65D 17/16

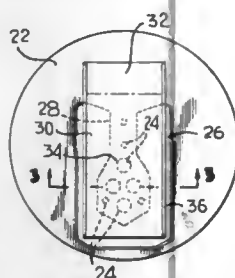
U.S. Cl. 206—631

11 Claims

1. In an easy opening container, a wall portion having a dispensing opening, a pull tape overlying said dispensing opening, and a peelable bond between said pull tape and said container wall portion, the improvement comprising said container wall portion having an area raised relative to a surrounding part of said wall portion, said raised area being of a size materially less than that of said wall portion and of a predeter-



mined pattern surrounding said dispensing opening, said raised area defining the configuration and area of said peelable bond



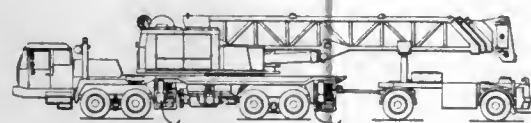
and forming means for controlling peel resistance of said peelable bond.

**4,165,005**  
**METHOD AND APPARATUS FOR THE INSTALLATION OF THE SUPPORT ELEMENT OF A CRANE**  
Olli Jokinen, Tampere, Finland, assignor to Rauma-Repola Oy, Tampere, Finland

Filed May 2, 1977, Ser. No. 792,999  
Claims priority, application Finland, May 6, 1976, 761269  
Int. Cl.<sup>2</sup> B66C 23/62

U.S. Cl. 212-145

21 Claims



1. Apparatus for raising and lowering a support element with respect to a wheeled vehicle such as a crane, comprising: a wheeled vehicle having a frame member; a vehicle support element having at least one extensible member, and having means for selectively supporting a portion of the weight of said wheeled vehicle; means for extending the extensible member with respect to the support element; suspension means for connecting the vehicle support element to the frame member, the suspension means being operatively connected both to the frame member and to the at least one extensible member, whereby extension of the extensible member causes the vehicle support element to move vertically with respect to the frame member, the vehicle support element being suspendable relative to the wheeled vehicle solely by the suspension means; and, fastening means for releasably attaching the vehicle support element to the frame member independently of the suspension means.

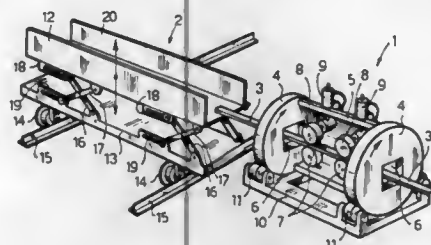
15. A method of raising and lowering a support element, which is selectively operable to support a portion of the weight of a wheeled vehicle, with respect to said wheeled vehicle such as a crane, comprising the steps of: fastening said support element to said wheeled vehicle; operatively connecting at least one suspension member both to a frame member of the wheeled vehicle and to an extensible member of the support element whereby extension of the extensible member relative to the support element results in a vertical movement of the support element relative to the frame; extending the extensible member relative to the support element to thereby move the support element vertically with respect to the frame; unfastening said support element from said wheeled vehicle; and, suspending and lowering the support element relative to the

frame member of the wheeled vehicle entirely by said at least one suspension member.

**4,165,006**  
**APPARATUS FOR GROUPING INTO BUNDLES ELONGATED OBJECTS, MORE PARTICULARLY SECTIONS OR FLAT ROLLED ELEMENTS**  
Ugo Brusa, Via Vagna, Domodossola, Italy  
Filed Dec. 20, 1977, Ser. No. 862,391  
Claims priority, application Italy, Dec. 22, 1976, 70062 A/76  
Int. Cl.<sup>2</sup> B65G 57/18

U.S. Cl. 414-63

5 Claims



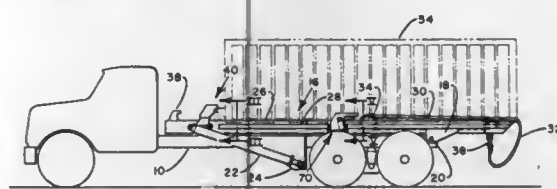
1. Apparatus for grouping elongated objects having longitudinal axes, particularly sections or flat rolled elements, into bundles, said apparatus comprising, a dragging member including means to individually drag the objects to be grouped in an axial direction and into a bundle and means to suitably orient said objects by individually rotating them in a controlled and predictable manner about said axes while dragging them in an axial direction, a bundle-forming carriage including means to receive the objects delivered by the dragging member onto a surface of said carriage, means for changing the level of said surface above the ground to allow the objects to be piled and means for moving said carriage transversely to the dragging direction of the objects to allow the objects to be placed side by side on said surface.

**4,165,007**  
**APPARATUS FOR SECURING REMOVABLE CONTAINERS TO VEHICLE PLATFORMS**  
Douglas S. Brown, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,057  
Int. Cl.<sup>2</sup> B65J 1/22

U.S. Cl. 414-494

5 Claims



1. In a vehicle of the type used to load and transport individual containers of various sizes by pivoting a longitudinally extending tilting frame upward about the rear of the vehicle, drawing a container onto the frame along guide rails which limit container movement transverse to the tilting frame, and pivoting the tilting frame downward whereby the container rests on the tilting frame, apparatus for securing containers to the tilting frame including, a securing member for engaging a container resting on the tilting frame and limiting container movement longitudinally along the tilting frame, means for pivotally connecting the securing member to the tilting frame for movement transverse thereto between an inoperative position, wherein the securing member is below the top of the tilting frame so that the securing

member does not interfere with the loading, transporting, and unloading of a container, and an operative position, wherein the securing member extends above the top of the tilting frame for engagement with a container resting on the tilting frame, and locking means for locking the securing member into the operative position, including a lock bar connected to the securing member for movement between a locked position and an unlocked position wherein the securing member is movable transverse to the tilting frame, the lock bar being connected to the securing member so that when the securing member is in the operative position, the lock bar will swing downward by its own weight into the locked position, and means for engaging the lock bar when the lock bar is in the locked position wherein contact between the lock bar and the engaging means prevents movement of the securing member transverse to the tilting frame.

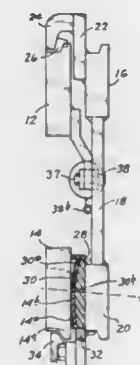
**4,165,008**  
**SLIDER ROLLER SIDE SHIFTER FOR USE ON A FORKLIFT TRUCK**

Donald M. Faust, Gresham, and Harry F. Weinert, Portland, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 638,079, Dec. 5, 1975. This application Aug. 1, 1977, Ser. No. 820,454  
Int. Cl.<sup>2</sup> B66F 9/06

U.S. Cl. 414-750

5 Claims



1. A side shifter adapted for mounting upon the front of a vertically movable lift truck carriage, of the type having a transverse mounting member adjacent the top of the carriage and a transverse forwardly-facing surface below said transverse mounting member, for mounting a load-handling attachment upon the carriage with the side shifter interposed structurally between the carriage and attachment so that the attachment is transversely movable with respect to the carriage, said side shifter comprising:

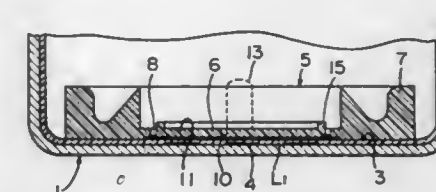
- (a) forwardly-facing front mounting means for mounting the load-handling attachment thereon;
- (b) first rearwardly-facing mounting means connected to said front mounting means for movably engaging the transverse mounting member of said carriage so as to vertically support said front mounting means and permit said front mounting means to move transversely with respect to said carriage;
- (c) second rearwardly-facing mounting means connected to said front mounting means, at a location below said first rearwardly-facing mounting means, for movably engaging the forwardly-facing surface of said carriage, said second rearwardly-facing mounting means comprising a substantially disc-shaped bearing having means defining a rearwardly-facing, generally spherical convex bearing surface on one side thereof for rollingly contacting the forwardly-facing surface of said carriage and having means defining a forwardly-facing surface on the side thereof opposite said convex bearing surface; and
- (d) bearing mounting means on said front mounting means,

for rotatably mounting said disc-shaped bearing upon said front mounting means, comprising rearwardly-facing surface means for rotatably engaging said forwardly-facing surface of said disc-shaped bearing over an area substantially coextensive with said convex surface of said bearing so as to transmit forces from said front mounting means through said area toward the forwardly-facing surface of said carriage said bearing mounting means including means for requiring said bearing to rotate about an axis of rotation which is inclined upwardly in a direction from front to rear.

**4,165,009**  
**BOTTLE CLOSURE FOR SALES PROMOTION**  
Kashiwa Murayama, Fujisawa, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan  
Filed Jan. 12, 1978, Ser. No. 868,874  
Int. Cl.<sup>2</sup> B65D 55/00

U.S. Cl. 215-230

10 Claims

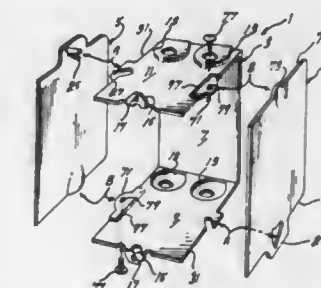


1. A closure for sales promotion comprising: a closure shell having an inner bottom surface; an indication of a prize offer positioned adjacent said inner bottom surface; and a sealing gasket including a peripheral sealing portion firmly adhered to said inner bottom surface and a central panel portion removably positioned on said inner bottom surface and separated from said peripheral sealing portion by a breakable line, such that said central panel portion can be stripped from said inner bottom surface while leaving said peripheral sealing portion firmly adhered thereto.

**4,165,010**  
**ELECTRICAL OUTLET BOX**  
William Nattel, Montreal, Canada, assignor to GTE Sylvania Canada Limited, Montreal, Canada  
Filed Jan. 24, 1977, Ser. No. 761,473  
Claims priority, application Canada, Dec. 17, 1976, 268114  
Int. Cl.<sup>2</sup> H02G 3/08

U.S. Cl. 220-3.94

3 Claims



1. An electrical outlet box comprising a spacer member and two side walls; the spacer member having a back wall and a pair of end walls; first connecting means for connecting one end of each side wall to an end wall; second connecting means for connecting the other end of each side wall to the opposite end wall; said first connecting means comprising first and second cooperating means on the side wall and end wall respectively for wedging the side wall against the end wall as the

side wall is relative to the spacer member about the first connecting means and in the plane of the side wall from a first initial mounting position where the side wall is at a slight angle to the spacer member, to a second final mounting position where the side wall is square with the spacer member and closes an open side; the first cooperating means comprising an opening in the side wall and a first wedging surface on the side wall defining the opening and facing toward the one end of, each side wall; the second cooperating means comprising a projection on the end wall insertable through the opening, the projection having a second wedging camming surface facing inwardly toward the edge of the end wall which is in contact with the sidewall.

4,165,011

**BONDED CAN TOP**

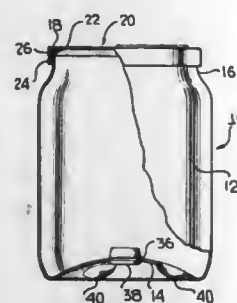
Albert J. Holk, Jr., Frankfort, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,981

Int. Cl.<sup>2</sup> B65D 7/42

U.S. Cl. 220—67

6 Claims



1. In a container, a metal container body having an end portion terminating in a terminal cut raw edge defining an open end of said body, and an end unit closing said body open end, said end unit being cup-shaped and including a generally planar end wall and a skirt directly intersecting in a substantially right angular peripheral corner, said skirt having an internal diameter materially greater than the external diameter of said container body end portion, a continuous band of adhesive being generally triangular in cross section and being disposed on an inner surface of said skirt and extending into said peripheral corner and on a portion of said end wall, said adhesive engaging two only adjacent surfaces of said end unit, and said body end portion being telescoped within said end unit with said terminal cut raw edge being embedded in said band, and said band being of sufficient axial thickness and radial width to provide positive spacing between said body end portion and both said end unit end wall and skirt while forming a seal therebetween.

4,165,012

**FILLER FOR PRESSURE VESSEL**

Robert E. Markwood, Chester, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 7, 1977, Ser. No. 858,230

Int. Cl.<sup>2</sup> B65D 7/42

U.S. Cl. 220—71

6 Claims

1. In a vessel for holding fluid under pressure, having an interior working space and having an exterior wall of the vessel defining a curved surface, an assembly for filling an interior portion of the vessel adjacent said surface, comprising a plurality of individual metal plates stacked together in parallel, slightly spaced relationship, said plates being relatively

thicker than the spaces between them so as to occupy substantially all of said interior portion in which they are located



thereby reducing the volume of fluid needed to fill the working space of said vessel.

4,165,013

**COVERED CUP**

Timothy J. Lutz, 116 Warwick Dr., Walnut Creek, Calif. 94598

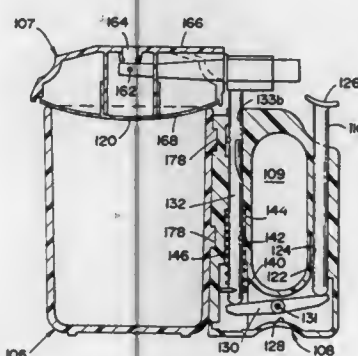
Continuation-in-part of Ser. No. 822,722, Aug. 8, 1977,

abandoned. This application Apr. 28, 1978, Ser. No. 900,912

Int. Cl.<sup>2</sup> A47G 19/22; B65D 43/26, 43/16

U.S. Cl. 220—215

9 Claims



1. A cup comprising:  
a cup member;  
a handle affixed to said cup member;  
cover means for covering said cup;  
rotating means cooperating with and disposed within said handle and responsive to manual pressure for raising and rotating said cover means so that said cup is uncovered;  
said rotating means having a portion extending upwardly above said handle;  
a socket connection between said cover means and said rotating means;  
said cover means comprising a cover and an arm member, said arm member having one end pivotally affixed to said cover generally at the midpoint of said cover and extending radially therefrom beyond said cover, said arm member detachably affixed to said socket connection at the other end of said arm member.

4,165,014

**CAPS HAVING FRANGIBLE OPENING MEANS**

Tomaso Ruscitti, Via Amedeo d'Aosta 11, Milan, Italy

Filed Feb. 14, 1978, Ser. No. 877,685

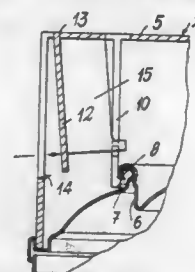
Int. Cl.<sup>2</sup> B65D 41/32

U.S. Cl. 220—266

2 Claims

1. Improvements in or relating to caps for containers, particularly aerosol containers, of the type comprising inner and outer skirt portions concentrically depending from a top disc

member, wherein said inner skirt portion is attached to the container through lugs, said inner skirt portion having a longitudinal discontinuity and a bridge-like member transversing



said discontinuity, said bridge-like member being breakable by rotation of a tab, which is an integral part of the cap and is joined at one end to said outer skirt portion by a readily breakable area.

4,165,015

**LANCED SCORED AND PUNCHED EASY OPENING PANEL ARRANGEMENTS**

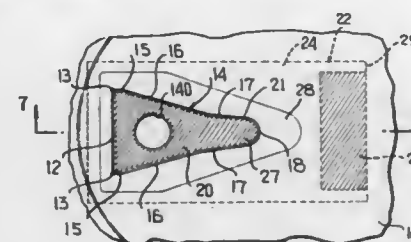
Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,955

Int. Cl.<sup>2</sup> B65D 41/32

U.S. Cl. 220—269

25 Claims



1. An easy opening container arrangement comprising a container panel, a removable panel portion defined in said container panel by the combination of at least one cut line and at least one score line, said cut line defining an initially opening part of said removable panel portion, a pull tape overlying a part of said container panel including said removable panel portion, said pull tape having a peelable bond with said container panel surrounding said removable panel portion and a permanent bond with said removable panel portion, said pull tape further having a permanent bond with said container panel adjacent said removable panel portion and remote from said cut line.

4,165,016

**EASY OPEN RECLOSABLE END UNIT**

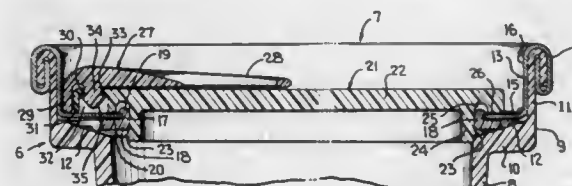
Jens L. Moller, Darien, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jul. 12, 1978, Ser. No. 923,887

Int. Cl.<sup>2</sup> B65D 41/32

U.S. Cl. 220—270

14 Claims



1. An easy opening end unit comprising an end panel, peripheral seam forming means on said end panel for securing said end panel to a container body, a dispensing opening in said

end panel, a closure element overlying said dispensing opening and engaging said end panel peripherally around said dispensing opening, a rupturable seal between said closure element and said end panel, and cam means carried by said closure element and engageable with said end panel radially outwardly of said rupturable seal for effecting rupture of said seal and the removal of said closure.

4,165,017

**CHILD RESISTANT PULL TAB**

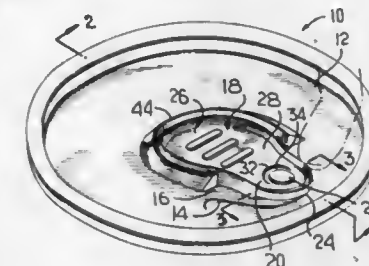
Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 29, 1978, Ser. No. 947,297

Int. Cl.<sup>2</sup> B65D 41/32

U.S. Cl. 220—273

8 Claims



1. A child resistant easy opening container comprising a container panel and a pull tab, said container panel having an outer surface, said pull tab including a tab body having an intermediate securing portion attached to said container panel, and a nose portion and lift portion at opposite ends thereof, said tab body having an underside lying in a general plane substantially coplanar with a major portion of said container panel outer surface, a peripheral hem around said tab body at least generally from said securing portion and around said lift portion, said hem having an outer lower edge substantially continuously touching said container panel outer surface and defining means for resisting initial lifting of said lift portion to actuate said pull tab.

4,165,018

**CHILD RESISTANT OVERCAP FOR EASY OPENING CONTAINER**

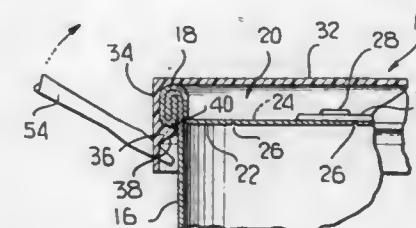
Earl D. Giggard, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,621

Int. Cl.<sup>2</sup> B65D 43/26

U.S. Cl. 220—284

9 Claims

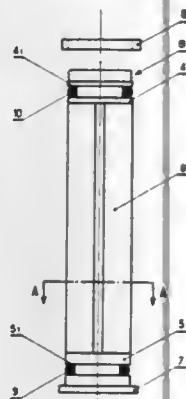


1. A child resistant overcap for use with containers having a peripheral projection, said overcap comprising an end panel having a continuous depending peripheral skirt, locking means on said skirt for snap interlocking engagement with a container peripheral projection to retain said overcap against removal, said skirt having a rupturable section defined by at least two weakening lines, and a tool receiving opening in said rupturable section for receiving a tool to effect rupture of said skirt along said weakening lines, said skirt having a free lower edge and at least one of said weakening lines extending generally in



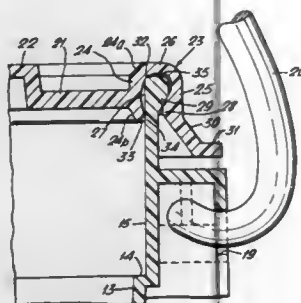
the height direction of said skirt and at least substantially to said skirt free lower edge.

**4,165,019**  
**TANK FOR FLUIDS UNDER PRESSURE**  
 Philippe Holder, Marnaz (Haute Savoie), France  
 Continuation-in-part of Ser. No. 719,521, Sep. 1, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,220  
 Claims priority, application France, Sep. 2, 1975, 75 26934  
 Int. Cl.<sup>2</sup> B65D 41/04  
 U.S. Cl. 220—288



1. A tank for storage of fluids under pressure comprising in combination,
  - (a) a cylindrical body open at both ends,
  - (b) said cylindrical body covered with a fibrous winding around the periphery thereof,
  - (c) two caps having a diameter equal to the interior diameter of the cylinder,
  - (d) said caps spaced apart the distance of the length of the cylinder and held in position by a stay rod integral with both caps,
  - (e) two pads having a diameter at least equal to the outside diameter of said cylinder,
  - (f) said pads attached in axial alignment to the outer side of said caps.

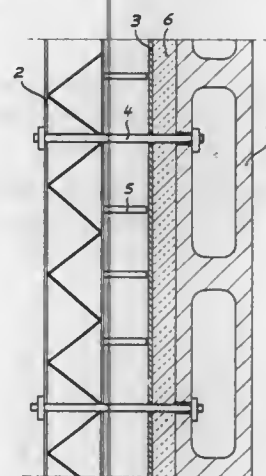
**4,165,020**  
**CLOSURES AND CONTAINER ASSEMBLIES**  
 Harry Hoselton, Wheeling, W. Va., assignor to Polysar Resins, Inc., Leominster, Mass.  
 Filed Jul. 17, 1978, Ser. No. 925,167  
 Int. Cl.<sup>2</sup> B65D 41/16  
 U.S. Cl. 220—306



1. A plastic closure for a container comprising a closure portion and an annular rim surrounding the closure portion, the rim being of inverted U-shape and having radially spaced inner and outer axially extending walls which are joined by a base and defined a downwardly facing annular recess, the inner wall having a portion extending upwardly from the closure portion to the base and a resiliently flexible portion extending

downwardly from the closure portion to terminate in a free end, the two portions having outer surfaces which increase in diameter as they extend from the closure portion, and the outer wall having a locking means facing into the recess to engage the annular wall of a container to hold the closure upon the container when the closure is fitted thereto.

**4,165,021**  
**HOT OR COLD OPERATING CAST PRESSURE CONTAINER**  
 Rolf Döring, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany  
 Filed Sep. 21, 1977, Ser. No. 835,045  
 Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2643011  
 Int. Cl.<sup>2</sup> B65D 7/42, 25/18  
 U.S. Cl. 220—468

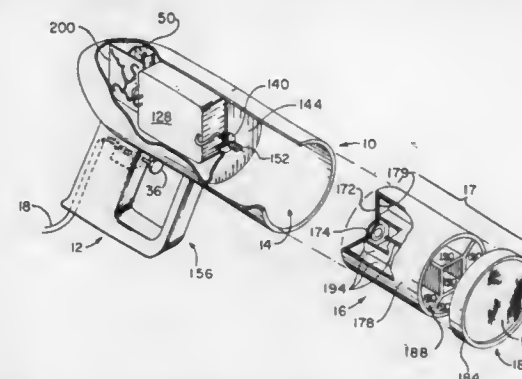


1. A pressure container comprising: a cast-iron container having an inner wall, a steel lining fixed inside said inner wall, means inside said lining to protect the lining and for stabilizing said lining against deformation and denting, said means being in the form of a framework spaced from said lining, spaced individual anchoring elements extending through said framework and said lining and connecting said framework to said container, and spacer elements fixed to said framework for spacing said framework from said steel lining, while closely abutting said steel lining.

**4,165,022**  
**HAND-HELD COATING-DISPENSING APPARATUS**  
 Stanley L. Bentley, and David G. Jessup, both of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.  
 Filed Mar. 2, 1977, Ser. No. 773,520  
 Int. Cl.<sup>2</sup> B05B 5/02  
 U.S. Cl. 222—76

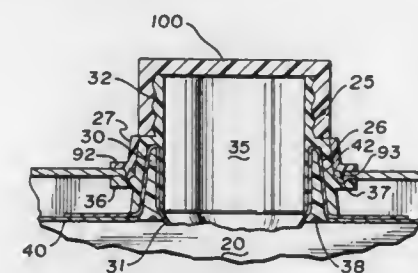
1. An electrostatic coating-dispensing apparatus comprising a hand-held housing, means for supplying coating to be dispensed to the housing, a source of low voltage direct current, the low voltage direct current source being housed in the housing, means coupled to the low voltage direct current source for providing control signals, said control signal providing means being responsive to the low voltage direct current, means coupled to the low voltage direct current source and control signal providing means for switching the low voltage direct current in response to such control signals, means coupled to the switching means for boosting the switched low voltage, means coupled to the boosting means for rectifying the boosted voltage, an electrode coupled to the rectifying means for supplying the rectified and boosted voltage to the coating to be dispensed, and means for supplying alternating current line voltage to the housing, the line voltage supply

means being coupled to the low voltage direct current source, the means for supplying coating to be dispensed comprising an interchangeable cartridge engageable with the electrode to



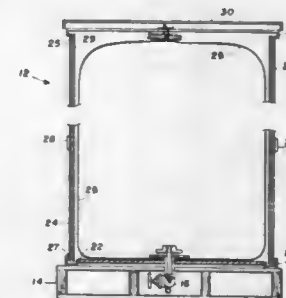
define a self-contained dispenser for the particles of coating, said cartridge having an end wall adjacent said electrode and said end wall including a semi-conductive material portion to transmit charge from said electrode to the particles of coating.

**4,165,023**  
**FLUID CONTAINING AND DISPENSING STRUCTURE HAVING A DEFORMABLE FLEXIBLE WALL PORTION**  
 Justin M. Schmit, 126 Sea Island La., Boca Raton, Fla. 33432  
 Filed Jul. 21, 1977, Ser. No. 817,816  
 The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.  
 Int. Cl.<sup>2</sup> B67B 7/28  
 U.S. Cl. 222—105



1. A container comprising: a fluid containing pouch having at least one flexible upper wall portion; a dispensing neck with a dispensing aperture extending therethrough positioned on one side of said flexible wall portion and connected thereto, said dispensing neck having an annular tapered recess surrounding said dispensing aperture at one end thereof and adjacent said flexible wall portion and a closure receiving surface on the other end thereof; a wedging collar having a corresponding tapered external surface positioned on the other side of the flexible wall portion and wedged into said annular recess of said dispensing neck with the flexible wall portion fixedly wedged therebetween and deformed around said collar in said recess so as to minimize any possible leakage path through the flexible upper wall portion around the dispensing neck, said flexible wall portion having an aperture therein communicating with the aperture in the dispensing neck, and an integral flange portion positioned on said dispensing neck and extending transversely to the aperture in said neck for mounting the pouch.

**4,165,024**  
**BULK SHIPPING CONTAINER**  
 Leon M. Oswalt, Guthrie, and Jimmie D. McClanahan, Oklahoma City, both of Okla., assignors to Cato Oil and Grease Co., Oklahoma City, Okla.  
 Filed Sep. 9, 1977, Ser. No. 831,867  
 Int. Cl.<sup>2</sup> B65D 77/06  
 U.S. Cl. 222—105

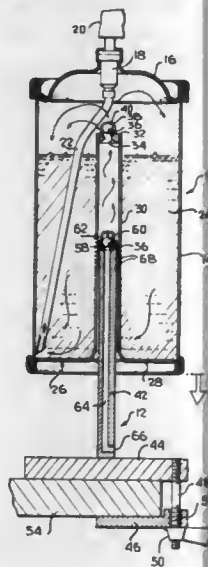


1. A bulk shipping container which comprises:
  - a base structure;
  - a side wall structure, at least a portion of which is removable, having a top edge and a bottom edge;
  - a side wall retainer structure located upon the base structure, said retainer structure adapted to receive the bottom edge of said side wall structure;
  - a disposable inner liner located within said side wall structure;
  - a drain conduit and flow regulation valve assembly positioned such that one end of said conduit is in sealed engagement with the interior of the disposable inner liner such that a product material to be contained therein can be removed therefrom;
  - a top cover structure removably mounted upon the top edge of the side wall structure to seal the container;
  - a liner support bar positioned in such manner as to extend substantially across the top of the side wall structure beneath the top cover structure to support the disposable inner liner; and
  - means for removably securing the assembled top cover structure, side wall structure and side wall retainer structure to the base structure.

**4,165,025**  
**PROPELLANTLESS AEROSOL WITH FLUID PRESSURE GENERATING PUMP**  
 Carmen T. Mascia, Clarendon Hills, and Gary K. Hawegawa, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.  
 Filed Sep. 21, 1977, Ser. No. 835,347  
 Int. Cl.<sup>2</sup> B65D 83/14

1. A product dispensing assembly comprising a container and a separately formed pump piston, support means connected to said pump piston for fixedly mounting said pump piston to a supporting object entirely independently of said container, said container being in the form of a can including a body having a top closure wall and carrying a dispensing valve, said can further including a separately formed bottom end unit secured to said body by a peripheral seam and including an end panel having an inlet opening therethrough, a cylinder of a size for cooperation with said independently fixed mounted pump piston, said cylinder being disposed internally of said can and being secured to said end panel surrounding

said inlet opening, said support means including a base plate, and clamp means carried by said base plate for clamping said



base plate to a support structure, said pump piston being fixedly secured to said base plate.

4,165,026

#### TUNDISH WITH EXPENDABLE LINING AND EASILY REMOVABLE NOZZLE

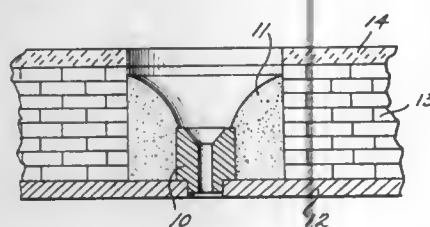
Ian J. Hazlehurst, and David C. Willard, both of Guelph, Canada, assignors to Fosco Trading A.G., Chur, Switzerland Division of Ser. No. 789,943, Apr. 22, 1977, which is a continuation of Ser. No. 312,274, Dec. 5, 1972, abandoned. This application Mar. 24, 1978, Ser. No. 889,843

Claims priority, application United Kingdom, Dec. 7, 1971, 56878/71; Oct. 19, 1972, 48249/72

Int. Cl.<sup>2</sup> B22D 41/02

U.S. Cl. 222—591

9 Claims



1. A tundish consisting essentially of an outer metal casing, a permanent lining of refractory material adjacent the casing, an expendable lining made up of a set of slabs of refractory heat insulating material, and at least one nozzle including a highly refractory nozzle ring set into the base of the tundish by means of a sealing compound which remains unhardened during the use of the tundish for continuous casting of molten metal.

4,165,027

#### SKI AND SKI POLE ASSEMBLY

Robert W. Briggs, 10421 Prado Woods, Villa Park, Calif. 92667 Filed Feb. 21, 1978, Ser. No. 879,125

Int. Cl.<sup>2</sup> B65D 71/00

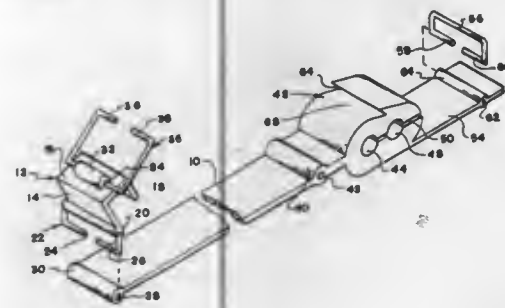
U.S. Cl. 224—45 S

8 Claims

1. A retainer for an assembly of a pair of skis and ski poles which comprises:

- a continuous first web band for encircling a pair of skis in bottom-to-bottom array;
- securing means to secure said first web band in encirclement about said pair of skis;
- an integrally formed clamp block carried at one end of

said first web band and comprising a block having a pair of parallel, coextensive through bores bearing an end slit opposite said first web band, parallel to and intersecting said through bores to receive said ski poles and thereby permit said ski poles to be secured at one end of said first web band;



(d) lock means comprising a second, integrally formed web band secured at one end to said clamp block to overlie said slit and a web band retainer means to secure said second web band in overlay of said slit, to secure said ski poles in said clamp block in parallel alignment to said pair of skis.

4,165,028

#### METHOD FOR CONTROLLING A WEB OF MATERIAL

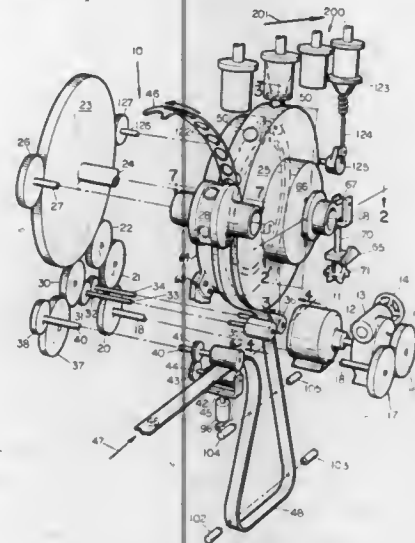
Thomas E. Doherty, Setauket, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 768,245, Feb. 14, 1977. This application Nov. 25, 1977, Ser. No. 854,579

Int. Cl.<sup>2</sup> B65H 23/22

U.S. Cl. 226—4

2 Claims



1. The method of maintaining a festoon of web material including the steps of;

- advancing a web of material into said festoon from a first side,
- stopping the movement of web material into said festoon from said first side,
- withdrawing web material from said festoon from a second side,
- stopping the withdrawal of the web material from said second side, and
- returning some of said withdrawn web of material to said festoon from said second side on an intermittent basis.

4,165,029

#### PAPER ADVANCE MECHANISM FOR AN INK JET PRINTER

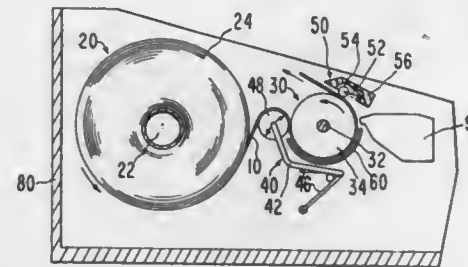
Charles S. Mitchell, Palo Alto, Calif., assignor to Silonics, Inc., Sunnyvale, Calif.

Filed Sep. 28, 1977, Ser. No. 837,555

Int. Cl.<sup>2</sup> B65H 17/22

U.S. Cl. 226—25

7 Claims



1. An apparatus for positioning and advancing a recording web for non-impact printing, comprising: means for holding a recording web in a manner that the web can be pulled therefrom in a preferred direction with some retarding force,

a cylinder held to be rotatable about a center axis perpendicular to said preferred direction, said cylinder having a portion along its length generally in its middle that has a coefficient of friction that is at least several times higher than that of remaining cylinder portions,

means resiliently urged against said cylinder in a position with respect to said cylinder and said web holding means for guiding said web in contact with said cylinder in a manner that said means withdraws from the cylinder in response to a sufficient tension on the web as the web is advanced, whereby tension is reduced and a constant tension is maintained on the web around the cylinder, and means urged against the cylinder for increasing the frictional engagement of the web with said high friction cylinder surface portion, said frictional increase means being placed at a position to contact the web after it has passed said guiding means, whereby sufficient force is applied to the web in response to the rotation of the cylinder to withdraw the web from its holding means.

4,165,030

#### TWO CELL BULK BOX

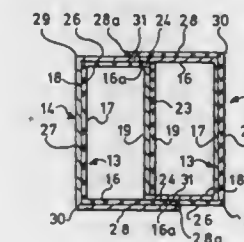
Arthur W. Bunker, Savannah, Ga., and Thorne C. Kitchell, Spartanburg, S.C., assignors to Union Camp Corporation, Wayne, N.J.

Filed Jun. 19, 1978, Ser. No. 916,512

Int. Cl.<sup>2</sup> B65D 3/24, 5/48

U.S. Cl. 229—15

4 Claims



1. A two cell bulk box body comprising:

a pair of tubes positioned adjacent to each other each formed from four serially interconnected panels to provide first side, end, second side, and center inner walls; the center inner walls of the tubes being interlocked and bonded inside face to inside face to provide a center strut for the box; the first side wall of each tube having an extended end which

overlaps and is bonded to the second side wall of the other tube and over the end of the said strut; a pair of members each encasing a tube and formed from three serially interconnected panels to provide first side, end, and second side outer walls; the first side wall of each member having its end meeting the extended end of the first wall of the opposite inner tube; the second side wall of each member having an extended end which overlaps and is bonded over the said meeting ends of the encased tube and the opposite member.

4,165,031

#### SHORT DEPTH RETURNABLE BOTTLE CONTAINER

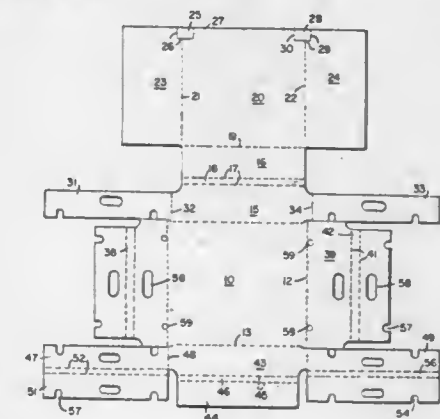
Edward L. Osborne, Kansas City, Kans., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 22, 1978, Ser. No. 888,835

Int. Cl.<sup>2</sup> B65D 5/22

U.S. Cl. 229—34 R

4 Claims



1. A returnable bottle container prepared from a single blank of corrugated paperboard or the like and having an open top comprising:

- a pair of spaced and parallel end walls, formed by a pair of panels foldably attached to each end of a first bottom panel, a second pair of panels foldably attached to the free ends of a side wall panel at one side of said first bottom panel and a single panel foldably attached to the free ends of a side wall panel at the other side of said first bottom panel, said end wall panels each containing a hand hole cut out and drainage openings, the plurality of which become superimposed upon one another at each end of the container when the panels are folded, wherein each of said end walls comprise a plurality of panels amounting to five thicknesses of paperboard;
- a pair of spaced and parallel side walls, formed by a pair of side wall panels foldably attached to each side of said first bottom panel, each of said side walls comprising a plurality of panels amounting to two thicknesses of paperboard;
- a plurality of shoulder panels, foldably attached between each pair of side wall panels, each pair of end wall panels foldably attached to the ends of said first bottom panel, and each pair of end wall panels foldably attached to the free ends of a side wall panel at one side of said first bottom panel;
- a bottom wall comprising a plurality of panels amounting to three thicknesses of paperboard; and,
- a reinforcing member in the form of a wire rim insert corresponding generally in size and configuration to the open top of the container positioned around the perimeter of the open top of said container in the vicinity of said shoulder panels.



4,165,032

**DISPOSABLE CENTRIFUGAL SEPARATOR WITH  
BAFFLE MEANS**

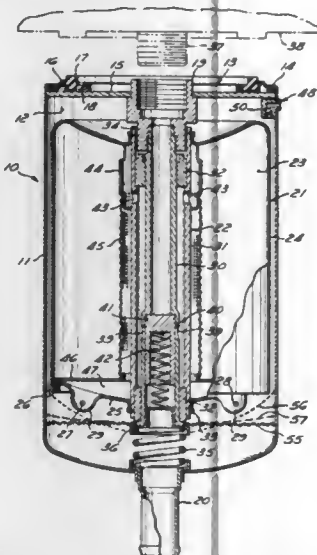
James C. Klingenberg, Palmsville, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Jun. 17, 1977, Ser. No. 807,388

Int. Cl.<sup>2</sup> B04B 9/00

U.S. Cl. 233—23 R

7 Claims



1. In a centrifugal separator for separating contaminants from contaminated fluids comprising shroud means including sidewalls and a bottom defining a first chamber, a vertically extending spindle within said shroud means and having a hollow rotor rotatably mounted thereon, said hollow rotor defining a second chamber for receiving contaminated fluids to be separated, passage means through said spindle to said second chamber, means to rotate said rotor about a vertical axis and thereby cause contaminants in contaminated fluids within said second chamber to migrate toward a sidewall of said second chamber under the influence of centrifugal force and to be separated from such contaminated fluids, said means to rotate said rotor comprising tangentially mounted outlet port means on said rotor in fluid communication with said second chamber and traveling in a circular path about said vertical axis to cause said rotor to rotate upon discharge of fluid from said second chamber to said first chamber, and outlet port means from said first chamber, in combination therewith the improvement wherein said outlet port means from said first chamber is disposed generally on the axis of the rotor at the bottom of said shroud means, said outlet port means from the first chamber being relatively small in relation to the size of the shroud means bottom, said shroud means bottom extending from said sidewalls generally radially inwardly substantially within a radial zone defined by said circular path of said tangentially mounted outlet port means to said outlet port means from the first chamber, and baffle means between said tangentially mounted outlet port means and the outlet port means from the first chamber to dissipate the buildup of fluid on the inner sidewalls and bottom of the first chamber which would tend to interfere with the rotation of the rotor.

4,165,033

**IDENTIFICATION SYSTEM**

Holger Nielsen, Allersø, and Per Salling, Birkerød, both of Denmark, assignors to A/S N. Foss Electric, Hillerød, Denmark

Filed Apr. 25, 1979, Ser. No. 899,994

Claims priority, application Denmark, Apr. 26, 1977, 1820/77

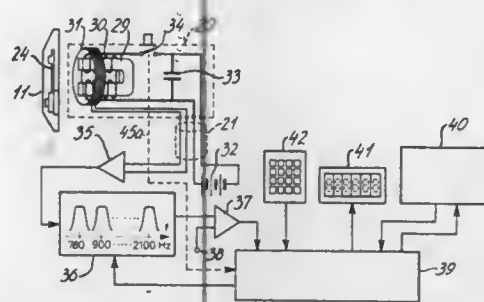
Int. Cl.<sup>2</sup> G06K 7/00, 7/08, 19/06; G01S 9/56

U.S. Cl. 235—439

20 Claims

16. A cow identification system comprising a plurality of differently frequency coded identification tags adapted to be

fastened to cows, a frequency detecting device associated with a milk sampling device for detecting and registering the frequency codes of said tags, and means for generating a magnetic field at a tag being detected, each identification tag including at



least one mechanical vibrating member having a certain natural frequency, and including ferro-magnetic material, and said detecting device including means for detecting vibrating changes in said magnetic field caused by said mechanical vibrating member.

4,165,034

**FLUID MIXING VALVE CONSTRUCTION AND  
METHOD OF MAKING THE SAME**

Arden D. Rogers, Jr., and Clifford E. Goff, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

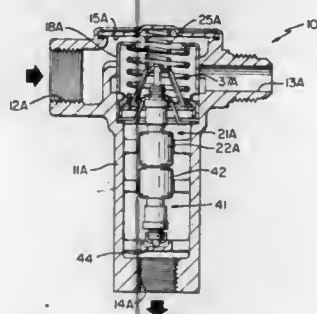
Division of Ser. No. 736,763, Oct. 29, 1976, Pat. No. 4,082,219.

This application Jan. 25, 1978, Ser. No. 872,065

Int. Cl.<sup>2</sup> G05D 23/12

U.S. Cl. 236—12 R

4 Claims



1. In a fluid mixing valve construction having a housing means provided with a pair of inlets respectively interconnected by a pair of valve seats to an outlet and with valve member means operated by condition responsive means for controlling said valve seats in accordance with the condition of the fluid passing to said outlet and sensed by said condition responsive means, a second condition responsive means being operatively interconnected to said valve member means to close one of said valve seats with said valve member means if the first-mentioned condition responsive means does not close the one valve seat with said valve member means even though the same is sensing a condition that would require the same to close said one valve seat, the improvement wherein said second condition responsive means acts directly on said first-mentioned condition responsive means to move said first-mentioned condition responsive means and said valve member means relative to said housing means to close said one valve seat if said first-mentioned condition responsive means does not close said one valve seat with said valve member means even though the same is sensing a condition that would require the same to close said one valve seat.

4,165,035

**THERMALLY ACTUATED VALVE FOR PLURAL FLUID  
SOURCES**

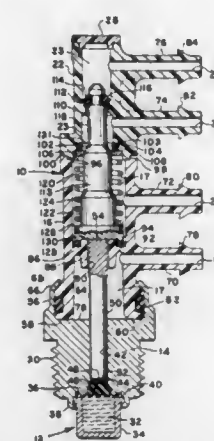
Edgar W. Maltby, Elgin, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 5, 1977, Ser. No. 839,723

Int. Cl.<sup>2</sup> G05D 23/12

U.S. Cl. 236—86

13 Claims



1. A thermally responsive device for valving a plurality of fluid ports, comprising:

(a) a housing means defining a fluid chamber, said housing means further defining first, second, third and fourth spaced fluid ports communicating with said fluid chamber;

(b) valve means disposed within said fluid chamber, said valve means including:

(i) means defining a first valve sealing surface in said housing means;

(ii) means defining a second valve sealing surface in said housing means and spaced from said first valve sealing surface, said second valve sealing surface comprising a resilient annular member mounted in said housing means;

(iii) means defining a third valve sealing surface in said housing means and spaced from said second and first sealing surfaces; and

(iv) a valve member disposed within said fluid chamber, said valve member being movable between a first and second position and having first, second, and third spaced seal means, thereon, said second seal means on said valve member includes means defining an annular surface for contacting the inner periphery of said second annular member and maintaining said sealing thereagainst during movement of said valve member in said second position, in which first position said first seal means seals against said first valve sealing surface for isolating said first and second fluid ports from each other, said second seal means is spaced from said second valve sealing surface for communicating said second fluid port with said third fluid port, and said third seal means seals against said third valve sealing surface for isolating said fourth fluid port from said third fluid port, and in said second position said first seal means is spaced from said first valve sealing surface for communicating said first fluid port with said second fluid port, said second seal means seals against said second valve seat for isolating said second fluid port from said third fluid port, and said third seal means is spaced from said third valve sealing surface for communicating said third fluid port with said fourth fluid port;

(c) means biasing said valve member to said first position; and

(c) thermally responsive means associated with said housing means and including means operative to move said valve

member between said first and second positions in response to predetermined temperatures.

4,165,036

**MULTI SOURCE HEAT PUMP AIR CONDITIONING  
SYSTEM**

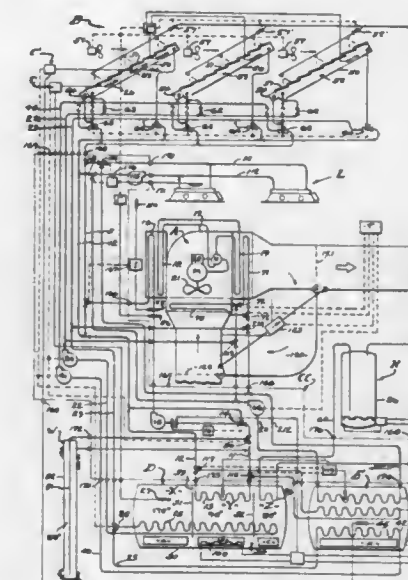
Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Filed Aug. 29, 1977, Ser. No. 828,773

Int. Cl.<sup>2</sup> G05D 23/00

U.S. Cl. 237—1 A

20 Claims



1. A multi source environmentally assisted air conditioning system wherein at least one water source mechanical refrigeration heat pump is operable to condition and to discharge return air from and into a zone to be air conditioned, and including; a convertible heat exchange means alternately operable for the collection of solar heat into a first liquid heat transfer media and for the radiation of internal heat from a second liquid heat transfer media, a thermal mass of high heat range and a thermal mass of low heat range, there being pump means circulating the liquid heat transfer media separately from the thermal mass of high heat range and from the thermal mass of low heat range respectively, and valve means for selective closed loop circulation of said liquid heat transfer media through the convertible heat exchange means and through either the thermal mass of high heat range or the thermal mass of low heat range, and there being water source pump means circulating the liquid heat transfer media separately for said closed loop circulation from the thermal mass of high heat range and from the thermal mass of low heat range and through heat exchanging means of the said water source mechanical refrigeration heat pump.

4,165,037

**APPARATUS AND METHOD FOR COMBINED SOLAR  
AND HEAT PUMP HEATING AND COOLING SYSTEM**

Donald M. McCarron, Rte. 1, Box 143, Pisgah Forest, N.C. 28768

Filed Jun. 21, 1976, Ser. No. 697,941

Int. Cl.<sup>2</sup> F25B 13/00, 25/00; F24J 3/02

U.S. Cl. 237—1 A

27 Claims

1. A heating system for delivering heat to the interior space of a building structure comprising:

a first heat exchanger coil disposed in heat exchange relationship with said interior space;

a second heat exchanger coil in heat exchange relationship with a main heat source;

a fluid refrigerant line connecting said first and second heat exchanger coils having a fluid refrigerant contained therein;



a compressor means connected in said refrigerant line between said first and second heat exchange coils having a suction side and a discharge side for compressing said refrigerant;

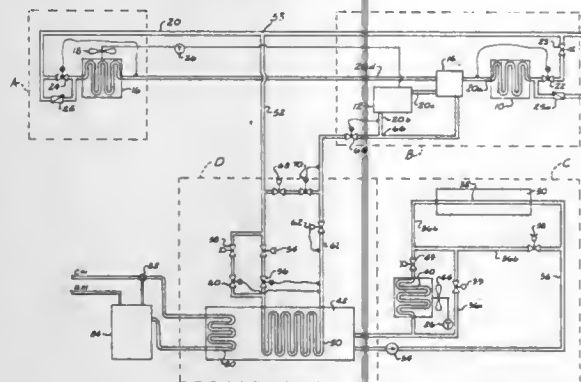
a third heat exchange coil connected in a parallel flow relationship with said second heat exchange coil in a parallel refrigerant line and in a series flow relationship with said compressor means, said third heat exchange coil being in heat exchange relationship with an auxiliary heat source; expansion means connected in said refrigerant line for evaporating refrigerant in said second heat exchange coil, said refrigerant vapor being condensed in said first heat exchange coil for transferring heat from said main heat source to said interior space;

valve means connected in said parallel refrigerant line for selectively by-passing and expanding at least a part of said refrigerant through said third heat exchange coil as required for satisfying the heating requirements of said interior space; and

means combining refrigerant flow from said second and third heat exchange coil prior to entering said suction side of said compressor means affording regulation of said flow from said second and third heat exchange coils so as to efficiently utilize the heat available from said main heat source in combination with heat from said auxiliary heat source.

whereby the heat capacity of the heating system is effectively maintained for low outdoor temperature conditions.

23. A method for heating an interior space of a building structure comprising the steps of:



- providing a solar collector for collecting and absorbing solar radiation and passing a heat transfer fluid in heat exchange relationship with said solar collector for absorbing the radiant heat therefrom to thereby heat said fluid;
- transferring heat from said heated fluid to said interior space when the temperature of said fluid is sufficient for satisfying the interior heating requirements;
- providing a first heat exchange coil in heat exchange relationship with said interior space and a second heat exchange coil in heat exchange relationship with a main heat source;
- providing a refrigerant flow line connecting said first and second heat exchange coils and providing a compressor having a suction side and a discharge side connected in said refrigerant flow line between said first and second coils for compressing a refrigerant contained in said refrigerant flow line;
- energizing said compressor when heat is required by said interior space and when the temperature of said heat transfer fluid is insufficient for heating said interior space;
- providing expansion means in said refrigerant flow line for expanding and evaporating refrigerant in said second heat exchange coil, said vaporized refrigerant being condensed in said first heat exchange coil for absorbing and transferring heat from said main heat source to said interior space when said compressor is energized;
- providing a third exchange heat exchange coil connected in parallel across said second heat exchange coil in a

parallel refrigerant line and disposing said third heat exchange coil in heat exchange relationship with an auxiliary heat source;

- by-passing at least a part of said refrigerant through said parallel refrigerant line and said third heat exchange coil in response to the heat exchange capacity of said second heat exchange coil being reduced below a predetermined level;
- providing an expansion means in said parallel refrigerant line for expanding and evaporating refrigerant through said third heat exchange coil to absorb heat from said auxiliary heat source (transferring said absorbed heat in combination with heat absorbed by said second heat exchange coil to be delivered to the suction side of said compressor.); and
- delivering said heat absorbed in said second heat exchange coil in combination with heat absorbed in said third heat exchange in common flow to said suction side of said compressor so as to afford efficient combination and utilization of heat available in said main and auxiliary heat sources in satisfying the heating requirements of said interior space.

4,165,038

**DEVICE FOR ATOMIZING AND DISPERSING A FLUID**  
Toshiharu Kumazawa, Fujisawa, Japan, assignor to Mitsubishi Precision Co., Ltd., Kamakura, Japan

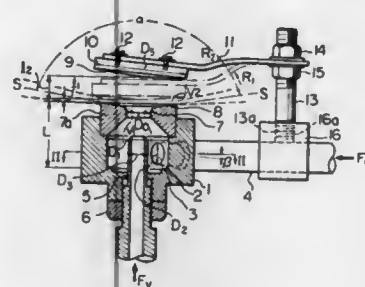
Filed Nov. 30, 1977, Ser. No. 856,128

Claims priority, application Japan, Dec. 3, 1976, 51-144616

Int. Cl.<sup>2</sup> B05B 1/26, 1/34

U.S. Cl. 239—405

16 Claims



- In a device for atomizing at least one fluid, including a cylindrical fluid barrel having a tangential fluid inlet port, a converging zone at the upper end of said barrel, and a conical fluid outlet with a fluid dispersing round member, wherein the improvement comprises a flexible support structure for holding said fluid dispersing round member so that said fluid dispersing round member is hydrodynamically moved toward said conical fluid outlet by a low pressure created by a high speed turning motion of the fluid in said cylindrical barrel, whereby the fluid is dispersed in the form of a high speed dispersion filmy stream toward the environment surrounding the device.

4,165,039

**GAS APPLIANCE RETROFIT ORIFICE**

John P. Zielinski, 9724 Laurence Ave., Allen Park, Mich. 48101

Filed Dec. 19, 1977, Ser. No. 862,018

Int. Cl.<sup>2</sup> F23C 5/00

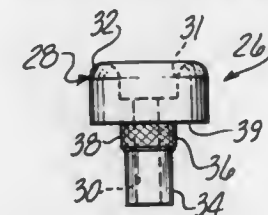
U.S. Cl. 239—600

3 Claims

- For use in conjunction with a gas appliance having a source of gas fluidly connected to burner means via an existing orifice in a manifold means, a retrofit orifice comprising: an elongated body, said body having an enlarged annular head formed on one axial end thereof; fluid passage means formed axially through said body, said fluid passage means comprising a throughbore formed axially through said body, said throughbore having an

enlarged diameter portion through the enlarged head of the body whereby distortion of the enlarged head will not fluidly restrict the fluid passage means; and

a cylindrical retention portion on said body axially adjacent said head, said retention portion having a diameter substantially the same or slightly larger than a hole formed in the existing orifice, the exterior surface of the retention



portion being knurled whereby said retrofit orifice is securely attached to the existing orifice by driving said retrofit orifice into said existing orifice hole so that the exterior knurled surface of said retention portion frictionally engages and bites into said existing orifice to thereby fixedly attach said retrofit orifice to said existing orifice and so that said fluid passage means fluidly communicates with said manifold means via the existing orifice.

4,165,040

NOZZLE

Bryan Beacham, Wokingham, and Gordon W. Sutton, Bisley, both of England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

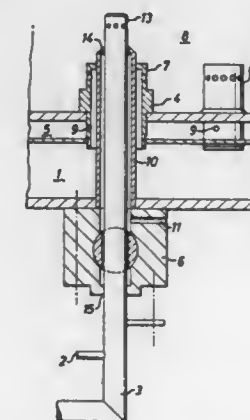
Filed Sep. 6, 1977, Ser. No. 830,832

Claims priority, application United Kingdom, Sep. 8, 1976, 37182/76

Int. Cl.<sup>2</sup> B05B 1/00

U.S. Cl. 239—600

10 Claims



- A nozzle arrangement for a fluidized bed furnace comprising, in combination: a fuel injection nozzle extending into said furnace; a sleeve surrounding and spaced apart from said fuel injection nozzle at the entry of said nozzle into said furnace; partition means in spaced relation between said fuel injection nozzle and said surrounding sleeve; means mounting said fuel injection nozzle for movement within said partition means; said partition means including means in sealing contact with said nozzle within said furnace; inlet means for supplying a pressurized gas to the space between said partition means and said nozzle, and valve means through which said nozzle may be withdrawn from said furnace while the furnace is under load and the bed is in a fluidized state.

4,165,041

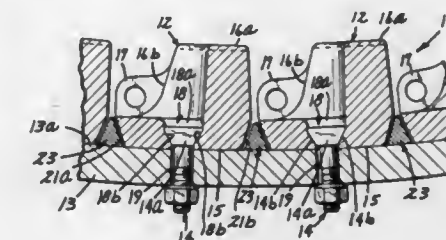
**SHELL LINER ASSEMBLY FOR ORE GRINDING MILLS**  
Darrell R. Larsen, Salt Lake City, Utah, assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Filed Feb. 2, 1978, Ser. No. 874,398

Int. Cl.<sup>2</sup> B02C 17/22

U.S. Cl. 241—182

16 Claims



- A removable liner assembly for the shell of an ore grinding machine, comprising:

- a plurality of liner segments, each of which comprises a segment body defining a mounting surface constructed for mounting engagement with the shell surface and a grinding surface for comminuting the ore, each segment body defining opposite sides that at least in part taper toward said mounting surface;
- means for connecting each liner segment to the shell of the ore grinding machine;
- the liner segments being mounted with tapered sides in side-by-side, opposed relation, defining a pocket between said opposed, tapered sides;
- and insert means disposed in each of said pockets for reducing the amount of particulate matter entering said pocket and protecting the inner surface of the shell, each insert means being so configured that it is loosely retained within the associated pocket without direct connection to the shell.

4,165,042

**ROTARY JAW CRUSHER**

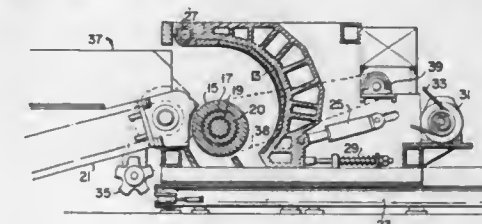
Carl R. Peterson, Boxford, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 12, 1978, Ser. No. 895,694

Int. Cl.<sup>2</sup> B02C 13/02

U.S. Cl. 241—198 A

6 Claims



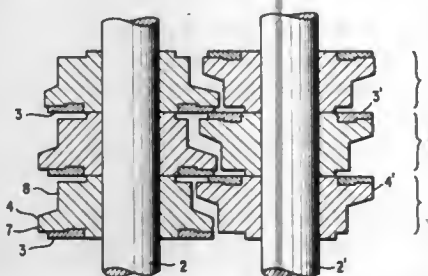
- A generally horizontally fed rotary jaw crusher assembly comprising:

- horizontal feed means for feeding the material to be crushed in a generally horizontal direction to the crusher;
- a large outer stationary jaw having a concave curved material engaging surface;
- a smaller inner rotatable jaw having an outer continuous material engaging curved surface and a hollow center portion adapted to receive a center driven shaft about which it can rotate, said inner and outer jaw being located with respect to each other such that at least along a portion of their two material engaging surfaces there is formed a passageway of progressively narrow width into the crusher.



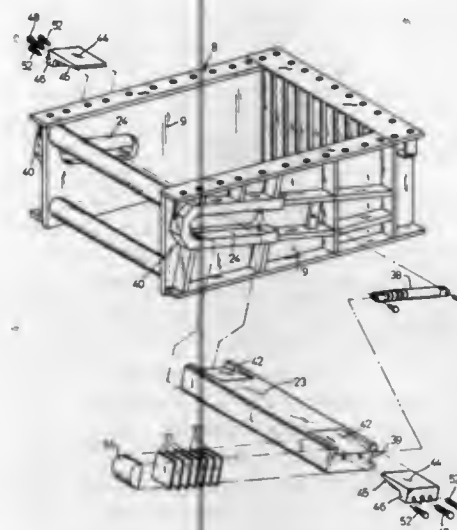
which all of the material to be crushed is fed from the horizontal feed means in a generally horizontal direction; the center driven shaft adapted for use with the inner jaw being rotatable about its own center axis and smaller in diameter than said inner jaw's hollow center portion and mounted therein; eccentric means connected to and moveable with said driven shaft for causing the eccentric motion of said inner jaw's material engaging surface about the center of said driven shaft; and means located between the eccentric means and inner jaw material engaging surface for allowing the inner jaw's material engaging surface to freely rotate about the center shaft whereby material fed between the inner jaw and the outer jaw is subjected to a peristaltic pumping crushing action.

**4,165,043**  
**CRUSHER APPARATUS**  
Kazo Higashi, and Kiyohiko Sawa, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan  
Filed Dec. 19, 1977, Ser. No. 862,164  
Claims priority, application Japan, Dec. 17, 1976, 51-152613  
Int. Cl.<sup>2</sup> B02C 18/18, 18/40  
U.S. Cl. 241-236 2 Claims



1. A crusher which comprises a plurality of paired cutter units mounted respectively on a pair of parallel shafts arranged to rotate in opposite directions to one another, wherein: each of said paired cutter units comprises a holder member consisting of a flange portion and a boss portion, and a disc-shaped cutter blade detachably secured to said holder member and divided circumferentially into several segments; each of said paired cutter units includes a first and second cutter unit mounted on the respective shafts such that respective cutter blades of said first and second cutter unit contact each other partly at their sides, and that the respective cutter blade and flange portion of said first and second cutter unit are opposed to the boss portion of cutter units mounted on said respective shafts adjacent said first and second cutter unit so as to form a space between their respective peripheries; and wherein each of said flange portions is provided with pawls along its outer periphery while each of said boss portions is also provided along its outer periphery with alternate ridges and recesses so as to maintain a substantially constant space between the periphery of the boss portion of each of said first and second cutter units and the corresponding periphery of the flange portion of each of said cutter units mounted on said respective shafts adjacent said first and second cutter unit.

**4,165,044**  
**JAW CRUSHER HAVING WEDGES FOR TOGGLE BEAM**  
Joseph Batch, Milwaukee, Wis., assignor to Barber-Greene Company, Aurora, Ill.  
Filed Apr. 10, 1978, Ser. No. 894,717  
Int. Cl.<sup>2</sup> B02C 1/04  
U.S. Cl. 241-264 16 Claims

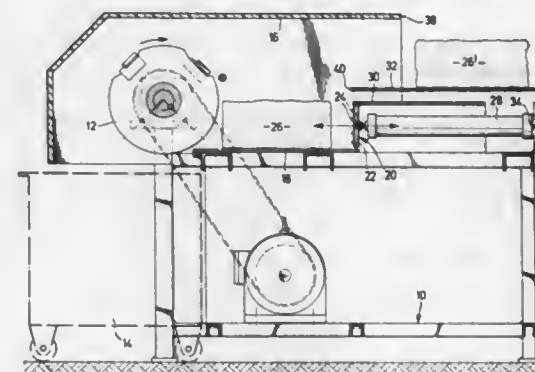


1. A jaw crusher comprising, a housing having two opposed, generally vertical side walls, means forming way slots in said walls, a movable jaw suspended within said housing, a toggle beam extending within and transversely across said housing and having a beam end projecting into each of the way slots, said beam ends having an upper surface, a toggle plate within said housing cooperating with said movable jaw and with said beam, a wedge shiftably mounted on said beam ends and in said way slots and located between said upper surfaces of said beam ends and each of said side walls, said wedges acting to wedge said beam ends downwardly in said way slots and against said side walls, and wedge shifting means connected between said wedges and said beam for forceably removing said wedge laterally outwardly from said way slots and also for forceably moving said wedge into said way slots.

**4,165,045**  
**DISINTEGRATING MACHINE FOR FOOD**  
Jürgen Hager, 5609 Hückeswagen-Oberdorf, and Walter Vieth, Arnzhäusen 7, 5679 Dabringhausen, both of Fed. Rep. of Germany  
Filed Aug. 3, 1977, Ser. No. 814,264  
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 7628629; Nov. 5, 1976, 2650690  
Int. Cl.<sup>2</sup> B02C 18/22  
U.S. Cl. 241-282 6 Claims

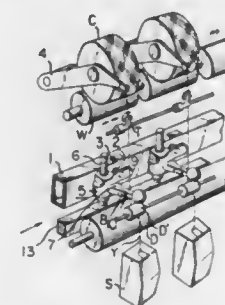
1. A machine for cutting blocks of frozen meat, the machine comprising a frame, a support mounted on said frame, cutting means mounted on said frame adjacent one end of said support, said cutting means being driven to a cutting motion of predetermined direction, a pusher member moveable across said support between a first position remote from said cutting means and a second position adjacent said cutting means, said pusher member having a front wall facing said cutting means and being spaced, in said first pusher member position, from said cutting means a predetermined distance for accommodating a block of meat to be cut, said pusher member having further plate means extending

from an upper edge of said front wall in a direction pointing away from said cutting means,



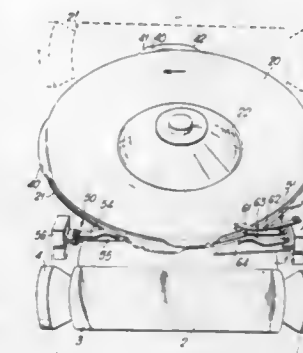
a stationary desk being mounted on said frame and covering said pusher member front wall and plate means in said first position thereof.

**4,165,046**  
**DOFFING APPARATUS IN SPINNING MACHINE**  
Yoshihisa Suzuki, Chiryu; Shozo Ueda; Toshinori Taniguchi, both of Kariya, and Keiji Onoue, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyota Jidoshokki Seisakusho, Kariya, Japan  
Filed Nov. 30, 1977, Ser. No. 856,157  
Int. Cl.<sup>2</sup> B65H 54/22, 67/00  
U.S. Cl. 242-35.5 A 18 Claims



1. In a spinning machine of the type including a spinning unit for spinning yarn, winding means for winding said yarn into a package, cutting means for cutting said yarn when a package is wound, and suction means positioned adjacent the position of cutting of said yarn for grasping the free end of the spun yarn upon the cutting of said yarn, the improvement comprising: an operating member positioned adjacent said suction means, said operating member being mounted for movement between an inoperative position and an operative position; said cutting means comprising a fixed cutter blade fixedly positioned at said cutting position and a movable cutter blade connected to said operating member in a manner such that movement of said operating member to said operative position thereof moves said movable cutter blade into cooperation with said fixed cutter blade to cut said yarn; and means for closing said suction means when said operating member is in said inoperative position thereof and operable by movement of said operating member toward said operative position thereof for opening said suction means such that said free end of the spun yarn can be grasped by said suction means upon the cutting of said yarn by said cutting means.

**4,165,047**  
**YARN WINDER**  
Gordon Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland  
Filed Feb. 27, 1978, Ser. No. 881,426  
Claims priority, application United Kingdom, Mar. 4, 1977, 9254/77  
Int. Cl.<sup>2</sup> B65H 54/28  
U.S. Cl. 242-43 A 15 Claims

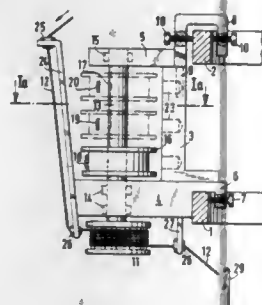


1. A yarn winder including a package support roller and traversing mechanism comprising slot-like guides on closely spaced driving members connected to a drive so as to move in opposite directions across a field of traverse, and a deflector arrangement at each end of the field of traverse for assisting the transfer of the yarn from a guide on one driving member at one end of the field and then back to a guide on the first driving member at the other end of the field, each of the deflector arrangements including a control surface which is engaged by the yarn between the two yarn guides and is located in a gap defined on each side by a driving member and its associated yarn guide, the control surface at one end of the field of traverse being arranged to deflect the yarn in a direction away from the guides when the yarn is being transferred from an outer to an inner guide, while at the opposite end of the field the control surface acts to depress the yarn toward the guides when the yarn is being transferred from an inner to an outer guide, the driving members being mounted for rotation in opposite directions and their peripheries being so shaped that each yarn guide is followed in the direction of motion by a cam-like compensating surface for temporarily increasing the yarn path by an amount sufficient to take up the slack which would otherwise be formed immediately after the yarn has been removed from one slot-like guide during transfer of the yarn from one slot-like guide to another.

**4,165,048**  
**POSITIVE FEED**  
Horst Paepke, Fasanenweg 30, 7407 Rottenburg, Fed. Rep. of Germany  
Filed Aug. 2, 1977, Ser. No. 821,309  
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636224; Apr. 7, 1977, 2715578  
Int. Cl.<sup>2</sup> B65H 51/20, 51/32; D04B 15/48  
U.S. Cl. 242-47.01 17 Claims

14. In a thread-supply arrangement for use in a textile manufacturing machine, a combination comprising at least one shaft; means for mounting said shaft on the machine for rotation; an accumulator drum mounted on said shaft for joint rotation therewith; means for leading at least one thread toward and away from said accumulator drum; means for rotating said shaft, including a pulley mounted on said shaft for joint rotation therewith and for displacement longitudinally thereof between a plurality of predetermined positions, to effect its

engagement with a selected one of a plurality of advancing elements; and means for disengaging said one advancing element



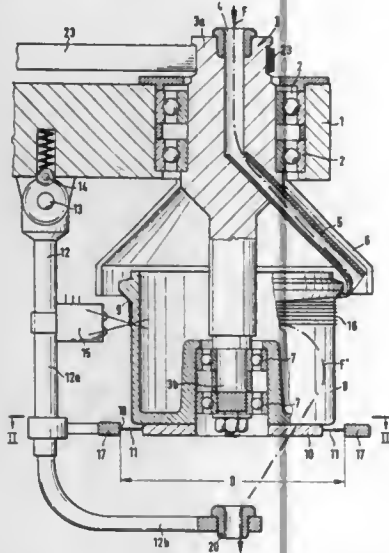
ment from said pulley to release the latter for displacement longitudinally of said shaft.

**4,165,049**  
**THREAD STORAGE AND DELIVERY APPARATUS**  
Karel Pejchal, Ulricehamn, and Lars H. G. Tholander, Huskvarna, both of Sweden, assignors to AB IRO, Ulricehamn, Sweden

Filed Jan. 16, 1978, Ser. No. 870,017  
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701718; Jun. 3, 1977, 2725185

Int. Cl.<sup>2</sup> B65H 51/20  
U.S. Cl. 242—47.01

10 Claims



1. Thread storage and delivery apparatus of the type comprising a shaft that is rotatable in a housing and is driven for rotation in one direction, a thread drum concentrically mounted on a portion of said shaft for rotation relative thereto and upon which thread is wound, and thread guide means so arranged in relation to the drum that thread wound around the drum has a drawn-in stretch extending substantially axially towards the drum from one end thereof and a drawn-off stretch extending substantially axially away from the other end of the drum, said thread guide means comprising a thread guiding part of a thread winding instrumentality that is carried by another portion of said shaft and is moved orbitally by shaft rotation to cause a thread guided thereby to be coiled around the thread drum, said apparatus further comprising braking means for restraining the three drum against rotation in said direction relative to the housing, which braking means is characterized by:

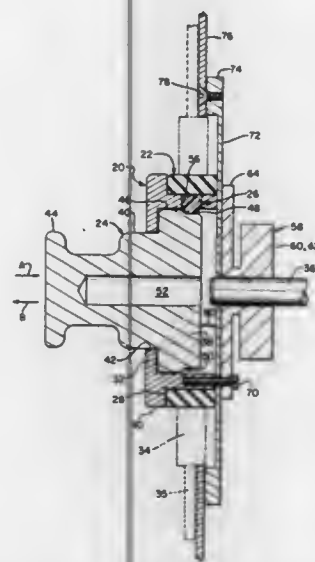
- A. a relatively movable brake element concentrically secured to one end of the drum;
- B. a relatively fixed brake element secured to the housing;
- C. one of said brake elements having a circumferential surface

face that is concentric to said shaft and is spaced from and substantially directly faces an annular portion of the other brake element;

- D. a plurality of elongated resilient fingers secured to said other brake element at circumferentially spaced locations around said annular portion of the same, said fingers projecting towards said surface on the one brake element and being of such lengths that each has its tip engaged against said surface;
- E. friction means on said surface, engageable by the tips of said fingers to hold the same against sliding along said surface in said direction of rotation; and
- F. said thread guide means being further so arranged that one of said stretches extends through the zone of the fingers, substantially transversely to the fingers.

**4,165,050**  
**REEL HOLDING HUB ASSEMBLY**  
Richard G. Berube, Marlboro, Mass., assignor to King Instrument Corporation, Westboro, Mass.  
Filed Mar. 20, 1978, Ser. No. 888,182  
Int. Cl.<sup>2</sup> B65H 19/02  
U.S. Cl. 242—68.3

12 Claims

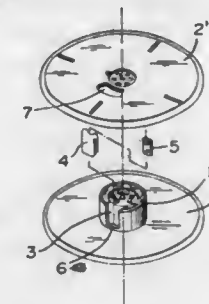


- 1. A hub assembly for releasably mounting a reel for rotation on a selected axis, said hub assembly comprising:
  - a hub member having a hollow cylindrical section with inner and outer surfaces, a flange section extending radially inward of said cylindrical section, and a plurality of circumferentially-spaced openings in said cylindrical section; means attached to said hub member for supporting said hub member for rotation on said selected axis;
  - a clamping element in the form of a resilient ring mounted on said hub member in surrounding and directly engaging relation with said outer surface;
  - a plurality of cam followers for applying an expansion force to said resilient ring so that said ring can exert pressure on a reel mounted on said hub, each of said cam followers being movably disposed in one of said circumferentially spaced openings and being sized so that a portion thereof always protrudes from at least one of said inner and outer surfaces; and
  - selectively operable actuator means for causing said cam-followers to apply an expansion force to said resilient ring, said actuator means comprising a cam member having a cam section and a neck section, said cam section comprising a first relatively small diameter cylindrical cam surface, a second relatively large diameter cylindrical cam surface spaced from said first cam surface along said axis, and a third frusto-conical cam surface connecting said first and second cylindrical cam surfaces, at least a portion of

said neck section having a smaller diameter than said cam surfaces, said cam member being disposed so that said cam section is surrounded by said hollow cylindrical section and said portion of said neck section is surrounded by said flange section, said cam member being slidable along said axis relative to said hub member between (1) a release position in which said cam followers are aligned with said first cam surface and said resilient ring is unexpanded relative to said outer surface, and (2) a lock position in which said cam followers are engaged by said second cam surface and displaced outwardly of said axis so as to apply an expansion force to said resilient ring.

**4,165,051**  
**TAPE REEL**  
Haruo Shiba, and Masatoshi Okamura, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan  
Filed Jul. 13, 1978, Ser. No. 924,359  
Claims priority, application Japan, Jul. 14, 1977, 52-93532[U]  
Int. Cl.<sup>2</sup> B63H 75/78  
U.S. Cl. 242—74.1

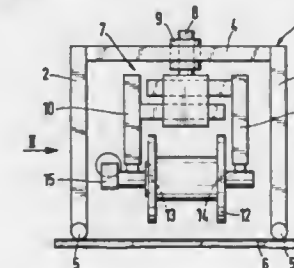
6 Claims



1. A video cassette tape reel which comprises at least one flange; a ring hub having a groove in parallel to an axis of the hub; a clamp fitted to the groove; and peripheral guides formed in said hub between which said clamp is fitted, whereby a tape clamped on the ring hub is not contacted with the flange in winding the tape.

**4,165,052**  
**APPARATUS FOR WINDING OR UNWINDING OF A CORD-SHAPED WINDING MATERIAL**  
Gerhard Seibert, Vienna, Austria, assignor to Rosendahl Industrie-Handels AG, Schonenwerd, Switzerland  
Filed Apr. 3, 1978, Ser. No. 892,962  
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752817  
Int. Cl.<sup>2</sup> B21C 47/02, 47/24  
U.S. Cl. 242—78.1

16 Claims

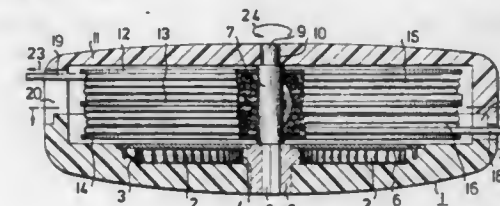


1. A device for winding and unwinding a cord-shaped material, such as a cable, on and off a spool, respectively, with a spool support unit having two adjustable sleeves for holding the spool and a drive mechanism for rotating the spool, and with a carrier on which the spool support unit is suspended, comprising

a carrier, at least one spool support unit mounted on said carrier and defining an operating position, means for rotating said spool support unit by at least 90° about a vertical axis out of said operating position.

**4,165,053**  
**CABLE DRUM FOR AUTOMATIC REWINDING OF A CABLE**  
Heinz Konig, Obentrautstrasse 33, D-1000 Berlin 61, Fed. Rep. of Germany  
Filed Jan. 25, 1978, Ser. No. 872,311  
Int. Cl.<sup>2</sup> B65H 75/48  
U.S. Cl. 242—107.1

9 Claims



1. A cable drum for automatically rewinding of a cable comprising: restoring spring; a housing holding said restoring spring; a shaft; three disc-shaped walls fastened to said shaft, said shaft extending perpendicular to said walls, said walls defining two winding area means, one of said disc-shaped separating walls being common to both winding areas and having a holding slot for fixing the cable in place; a bushing rotatably carried within a bottom portion of said housing and having a central opening of non-circular cross-section receiving an axially extending protrusion of said shaft having complementary cross-section, an upper portion of the housing being circumferentially connected to said bottom portion, said shaft having an upper trunnion rotatably held in a bore in said upper portion and which completes said bottom portion to form a cylindrically hollow body having a smooth surface; feed-out guide means located within marginal zones of said bottom portion and said upper portion of the housing, one end of said restoring spring being attached to said bottom portion and the other end of said spring being connected to said bushing; said disc-shaped walls comprising cable drum discs connected rigidly to said shaft, said cable drum being prepared for operation by separating the housing portions and removing said cable drum discs, a middle part of the cable to be wound being thereafter pressed into said slot so that a part of the cable is always received by one of said winding area means, one cable end projecting through one exit opening and the other cable end projecting through another exit opening when said cable is substantially wound on the drum so that said cable drum discs are inserted into said bottom portion of the housing, said cable drum being operative after said protrusion of said shaft is inserted into said opening of said bushing and said housing portions are connected.

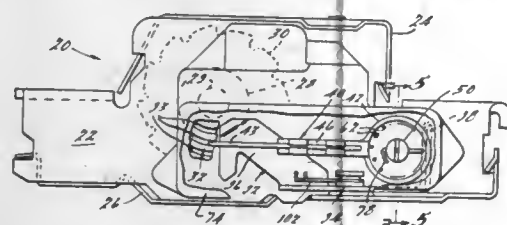
**4,165,054**  
**COMFORT LOCK MECHANISM**  
Cecil A. Collins, Pontiac, Mich., assignor to Fisher Corporation, Troy, Mich.  
Filed May 3, 1978, Ser. No. 902,732  
Int. Cl.<sup>2</sup> A62B 35/00; B65H 75/48  
U.S. Cl. 242—107.7

14 Claims

1. A safety belt retractor comprising a frame and a spool mounted on said frame, bias means for biasing said spool in a belt retraction direction, said spool having an end flange combined with control means for locking said spool against retraction to relieve tension in said belt, said control means including a disc attached to said end flange for rotation therewith and



having at least one track thereon, a stop-follower for mating with said track, said track adapted to receive said stop-follower positioned into said track and having means engagable by said stop-follower to prevent further retraction of said belt until



released by the wearer, a spring for urging said stop-follower into said track and radially inwardly toward the center of said spool, and a pin for pivotably mounting said stop-follower on said frame, said spring having a first end connected to said pin and a second end connected to said stop follower.

4,165,055

**BOBBIN WITH SNAP RING**

Rudolf Dee, Wuppertal, Fed. Rep. of Germany, assignor to Firma Hacoba Textilmaschinen GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

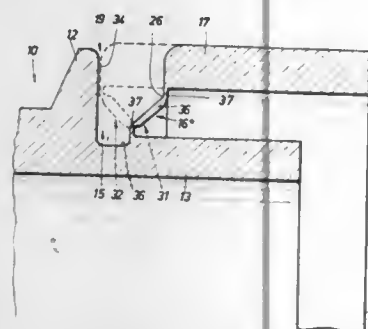
Filed Dec. 5, 1977, Ser. No. 857,747

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1976, 2656326; Jan. 24, 1977, 2702802

Int. Cl.<sup>2</sup> B65H 75/28

U.S. Cl. 242—125.2

8 Claims



1. A bobbin for a strand, comprising: an axially elongated axially symmetrical rigid tubular body adapted to define a thread-receiving slot at a location inwardly from an end of said body; a generally frustroconical snap ring connected to said body between said location and said end by a first flexible hinge formed unitarily with said body and with said snap ring but having a lesser thickness than said snap ring; a rigid generally cylindrical sleeve coaxial with said body and spacedly surrounding same while being dimensioned to be received between said location and said end; and a second flexible hinge formed unitarily with said snap ring and said sleeve but having a lesser thickness than said snap ring, said hinges and said snap ring being dimensioned to be displaceable between a first position wherein an axial end of said sleeve clamps a strand in said slot at said location and a second position wherein said end of said sleeve is spaced from said location to permit insertion and withdrawal of said strand into and out of said slot, the snap ring being displaced between said positions through a dead-center position by snap action.

4,165,056

**STRAND TENSIONING DEVICE AND METHOD**

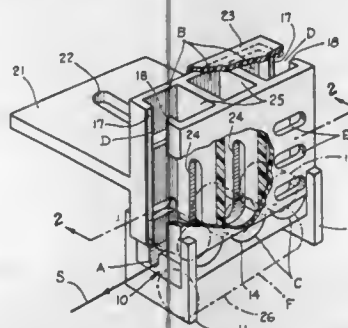
Hans S. Slinger, 191 Inglewood, Greenville, S.C. 29609

Filed Apr. 6, 1978, Ser. No. 894,167

Int. Cl.<sup>2</sup> B65H 59/24, 59/30

U.S. Cl. 242—151

15 Claims



1. A yarn tension device utilizing rollers comprising: a housing; an elongated yarn passageway within said housing; a plurality of spaced longitudinally aligned upright receptacles in said housing opening into said yarn passageway for carrying said rollers in stacked relation therein; means for positioning said rollers in rotating engagement with said yarn at spaced positions along said yarn passageway; and a vertical yarn passageway carried in at least one end of said housing opening into said elongated yarn passageway permitting a change in direction of the yarn to cause roller movement to compensate for changes in tension in the yarn.

4,165,057

**METHOD OF IMPROVING THE GUIDING OF REACTION DRIVEN FLYING BODIES FOR GROUND-TO-GROUND EMPLOYMENT**

Helmut Hausenblas, Kassel, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

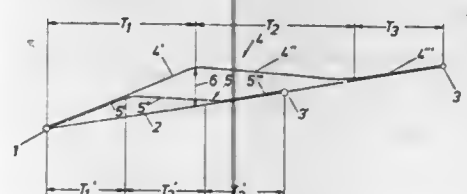
Filed Oct. 18, 1976, Ser. No. 733,072

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546592

Int. Cl.<sup>2</sup> F41G 7/14; F42B 15/02; F41B 9/00

U.S. Cl. 244—3.12

5 Claims



1. The method of guiding a reaction driven flying body such as a rocket having signal operable guiding means from a launching point to a target point, which comprises the steps of: determining the distance between said points, launching the body from the launching point toward the target point, detecting the instant of launching, continuously monitoring the changing instantaneous location of the body by detecting radiation emitted by the reaction driver thereof and developing predetermined flight path program guiding signals correlative to the detected instant of launching, and supplying the guiding signals to said guiding means to cause the flying body automatically to follow a flight path which diverges from a line joining said launching point and said target point during a first flying period following a launching of the flying body and which flight path approaches said line to a point of intersection during a second flying period of said body and then follows

said line to the target point during a third flying period of said body.

4,165,058

**TANDEM WING AIRPLANE**

Phillip C. Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

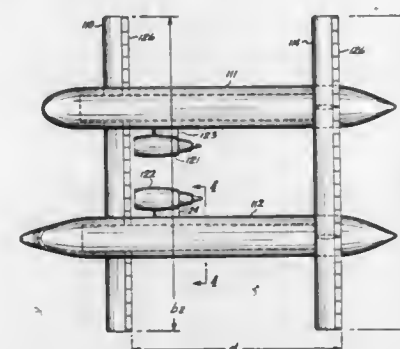
Division of Ser. No. 648,706, Jan. 13, 1976. This application

Nov. 26, 1976, Ser. No. 745,150

Int. Cl.<sup>2</sup> B64C 3/08

U.S. Cl. 244—45 R

3 Claims



1. In a tandem wing aircraft having fuselage structure and lifting surfaces, the improvement comprising in combination: two independent spaced apart fuselages; a lower forward wing and a higher aft wing, each of said wings having a lifting area ranging from 40% to 60% of the combined total lifting area of all of said lifting surfaces of said aircraft for producing a lift force and for providing aircraft pitch control without production of a downwardly acting load; said lower forward wing being attached to the forward region of each of said spaced apart fuselages; said higher aft wing being aerodynamically spaced apart from and located above the aft region of each of said spaced apart fuselages; and an aft strut member disposed between said aft wing and each of said spaced apart fuselages for attaching said aft wing to said spaced apart fuselages, said aft strut members having a length sufficient to cause the wing tips of said lower forward wing and said higher aft wing to be vertically spaced apart a distance of at least 25% of the span of either of said wings.

4,165,059

**FLOAT ASSEMBLY FOR A HELICOPTER OR THE LIKE**

James R. Summer, Miami, Fla., assignor to American Safety Equipment Corporation, Encino, Calif.

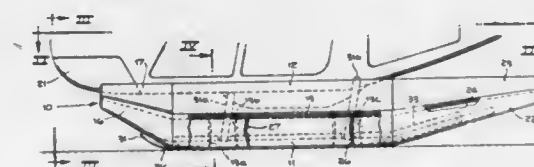
Continuation of Ser. No. 681,799, Apr. 30, 1976, abandoned.

This application Dec. 8, 1977, Ser. No. 858,699

Int. Cl.<sup>2</sup> B60V 3/08

U.S. Cl. 244—100 A

15 Claims



1. A float assembly for supporting a vehicle having a fuselage comprising: at least two float tubes contiguously secured together so that the centerline of the two float tubes are parallel and lie in a horizontal plane;

a pair of girths, each secured to its own one of said two float tubes; skid means connected to the fuselage; and means for securing said skid means to each of said girths, said means being positioned near the contiguous surfaces of said two float tubes so that the forces tending to separate the float tubes from each girth are substantially in the shear direction.

4,165,060

**PORTABLE DERAIL**

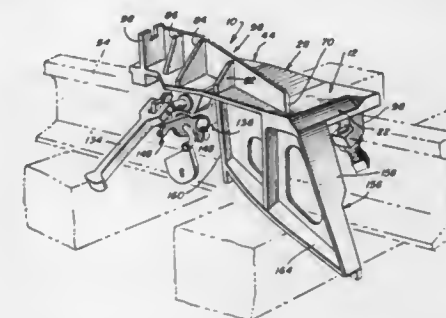
J. Joe Meyer, Williamsburg, Ind., assignor to Western-Cullen-Hayes, Inc., Chicago, Ill.

Filed Mar. 9, 1978, Ser. No. 884,843

Int. Cl.<sup>2</sup> B61L 19/02

U.S. Cl. 246—163

14 Claims



1. A portable derail of a type which may be releasably secured to a rail for derailing a railcar, said derail including a shoe member which overlies the rail, and a derail bar which forces a rail wheel off to one side of the rail, the improvement comprising, in combination, set screw means carried on one side of the derail for engagement under the rail head on the field side thereof, movable clamp means carried on the other side of the derail for engagement adjacent the gage side of the rail head, said clamp means including a clamp plate having a head member, a rotatable screw for moving said clamp plate to a clamped position, said screw being generally horizontally disposed above the height of said rail head, said clamp plate head member being mounted on said rotatable screw, a manually operable handle for rotating said screw, and releasable locking means which in its locked position prevents rotation of said screw.

4,165,061

**INTEGRALLY FORMED MOLDING UNIT FOR FREEZING A LIQUID WITH A PORTION OF THE UNIT SEVERABLE FOR FORMING A HANDLE FOR THE FROZEN PRODUCT**

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Continuation-in-part of Ser. No. 626,654, Oct. 29, 1975,

abandoned. This application Mar. 14, 1977, Ser. No. 777,325

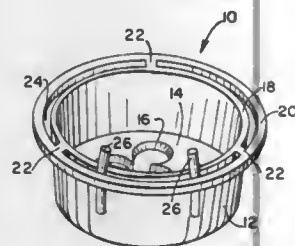
Int. Cl.<sup>2</sup> A23G 9/00; B22D 5/00

U.S. Cl. 249—92

1 Claim

1. A molding unit for forming a frozen product, said unit comprising a flexible cylindrical container having a bottom and upstanding side wall with the edge thereof defining an opening, spaced apart rods on said side wall extending beyond the edge thereof away from said bottom, the portion of said rods extending beyond the side wall being angularly inclined toward each other with the arcuate extent between said rods being less than 120°, and a flexible and resilient ring circular in plan view detachably connected to said side wall at the edge thereof positioned externally of said rods and connected to said side wall at no more than three distinct points, whereby said flexible and resilient ring upon detachment from said side wall and placement between said spaced apart rods is retained

thereby during freezing of liquid into the frozen product, deformation of said flexible container ejecting the frozen prod-



uct therefrom with said flexible and resilient ring retained therein forming a handle for said frozen product.

4,165,062

**MOLD WITH POROUS CAVITY VENT**

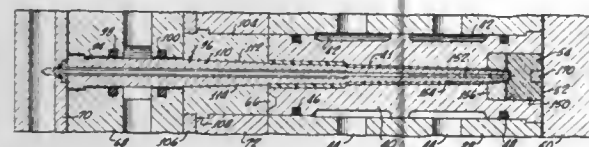
John G. Mitchell, Fountain Valley, Calif., assignor to California Injection Molding Co., Inc., Costa Mesa, Calif.

Filed Jan. 13, 1978, Ser. No. 869,059

Int. Cl.<sup>2</sup> B28B 17/00

U.S. Cl. 249—141

14 Claims



1. A mold for injection molding a long thin wall article comprising first and second mold parts mounted for relative motion between mold open and mold closed positions, said first mold part having a long slender cavity formed therein, said second part having a long slender core with an end extending into said cavity closely adjacent an end of said cavity, and a porous vent body mounted adjacent an end of said first mold part, said body having a portion with a recess that defines said end of said mold cavity and extends about said end of said cavity and at least partially about said core end.

4,165,063

**LINEAR RETRACTABLE SEAL VALVE**

Javed Qasim, Diamond Bar, and Robert W. McJones, Rancho Palos Verdes, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 5, 1978, Ser. No. 893,709

Int. Cl.<sup>2</sup> F16K 25/00

U.S. Cl. 251—168

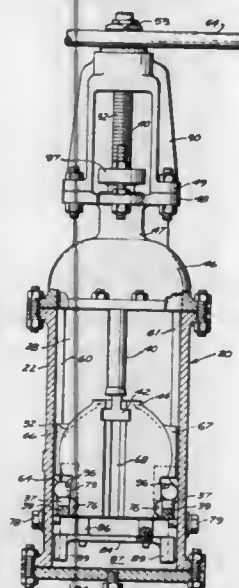
8 Claims

1. In a linear retractable seal valve having a body with an inlet port and an outlet port and a fluid passageway therebetween, said body having a lateral passageway perpendicular to the fluid passageway and a wedge-slip assembly having two closure slips with the respective inside faces slideably engaging separate tapering faces of the wedge located therebetween, said wedge-slip assembly moveable longitudinally from a valve open first location within the lateral passageway to a distant second location where the assembly is positioned in the fluid passageway between the two ports of the valve and where the two slips are restrained from further longitudinal movement and moveable in a perpendicular direction of the longitudinal assembly movement into closure engagement with the two ports of the valve, two diametrically-opposed guide rails extending longitudinally of the inside face of the lateral passageway and into the fluid passageway, said assembly being moveably held by grooves at opposite side edges of the wedge to the guide rails of the valve body, said guide rails lying in a plane paralleling the two valve ports, with the valve being returned

to its open position through a reverse sequential movement, the improvement:

wherein at least one of said rails terminates at the second location on the inside wall of the fluid passageway and with the end surface of the terminated rail providing a ramp;

each of the slips having on its inside face a lug which extends in a perpendicular direction of the longitudinal movement of the assembly with the lug of one of the slips overlying that of the other;



said wedge on at least one side edge thereof having a locking notch extending in a transverse direction to the longitudinal assembly movement; and a roller supported on the upper surface of the upper lug, said roller having a first position wherein the roller occupies the locking notch of the wedge and contacts the longitudinal edge of said terminating guide rail, and a second position wherein the roller has moved out of the locking notch of the wedge and out of contact with the longitudinal edge of the terminating rail and into engagement with the ramp at the end of said rail.

4,165,064

**GATE VALVE**

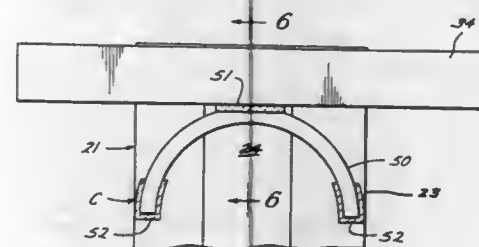
Madden T. Works, Houston, Tex., assignor to FIP, S.A. de C.V., Mexico

Filed Mar. 13, 1978, Ser. No. 886,259

Int. Cl.<sup>2</sup> F16K 27/04, 27/10

U.S. Cl. 251—329

6 Claims



1. A gate valve, comprising a body including an elongated, generally rectangular section whose front walls are longer than its side walls, and aligned pipe connecting hubs mounted on the front walls, a bonnet assembly on one end of the rectangular section, a gate having a stem cooperable with the bonnet assembly for moving the gate between opened and closed

positions with respect to the hubs, a hoop-like reinforcing flange having a rectangular opening therein disposed about the rectangular body section near the bonnet assembly and arranged perpendicularly thereto, welds securing the inner edges of the flange only to intermediate portions of the front walls of the body section, means connecting the bonnet assembly to the reinforcing flange, including a mounting flange near the end of the bonnet assembly and having an opening through which the stem extends, bolts for drawing together the mounting flange and the reinforcing flange, including portions thereof which are free of securement to said body section, and reinforcing means connecting the unsecured portions of the reinforcing flange to the front walls of the body section in such a manner as to have relatively high rigidity with respect to forces perpendicular to the reinforcing flange and relatively low rigidity with respect to forces which result from relative movement between the body and flange in directions generally parallel to the reinforcing flange.

4,165,065

**LIME REMOVAL FROM FURNACE SURFACES**

James J. Bowden, 399 Quarry La. NE., Warren, Ohio 44484

Filed Mar. 9, 1978, Ser. No. 884,904

Int. Cl.<sup>2</sup> C21B 7/00

U.S. Cl. 266—44

4 Claims

1. The method of removing lime buildup on the vessel bottom of a steel-making furnace, said lime having a melting point of about 2570 degrees Centigrade and which is higher than the temperature limits tolerated by the lining of said vessel, said method comprising:

charging into the furnace vessel and onto the built up lime, after the molten metal and slag have been drained from said vessel through its tap hole, a mineral which chemically combines with lime to form a combined mineral having a melting point lower than the melting point of lime and within the temperature limits tolerated by the furnace lining,

heating said combined mineral to a liquid state, and draining the liquified mineral from said vessel through the latter's tap hole.

4,165,066

**APPARATUS FOR ACTIVE REDUCTION OF VERTICAL VIBRATIONS OF A VIBRATING MASS**

Borut Horvat, Kmetljaska 3a, 62000 Maribor, Yugoslavia

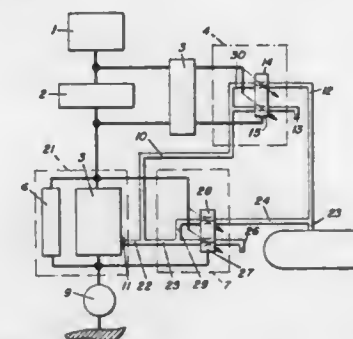
Filed Jul. 8, 1977, Ser. No. 813,979

Claims priority, application Yugoslavia, Jul. 12, 1976, 1704/76

Int. Cl.<sup>2</sup> F16F 9/02

U.S. Cl. 267—65 D

6 Claims



1. An apparatus using compressed air for active reduction of vertical vibrations of a mass exposed to a source of random vertical excitations comprising:

a base springing joint positioned between said mass and the source of excitations and including a compressed air springing unit, conduit means having a single pipe connected to said compressed air springing unit for connecting said compressed air springing unit to a source of com-

pressed air and the atmosphere, and a passive damper connected in parallel with said compressed air springing unit;

actuating means responsive to vertical excitations for actuating said compressed air springing unit to reduce the vertical vibrations of the mass and including sensing means positioned in vertical alignment with said base springing joint for sensing vertical excitations, amplification means mechanically connected with said sensing means for amplifying sensed excitations, and first valve means positioned between the source of compressed air and said conduit means of said base springing joint and responsive to said amplification means for selectively connecting the single pipe of said conduit means to the source of compressed air and to the atmosphere so that said compressed air springing unit actively damps sensed vertical excitations; and

second valve means positioned between the source of compressed air and said conduit means and responsive to a static load on said compressed air springing unit for selectively connecting the single pipe of said conduit means to the source of compressed air and the atmosphere so that said compressed air springing unit automatically adjusts for different static loads.

4,165,067

**APPARATUS FOR MAKING SUBSTANTIALLY IMPENETRABLE MEMBERS**

Emory J. Jernigan, P.O. Box 254, Chester, Va. 23831

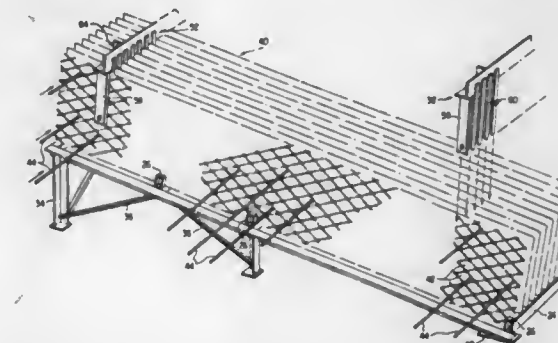
Division of Ser. No. 709,271, Jul. 28, 1976, Pat. No. 4,079,497.

This application Dec. 7, 1977, Ser. No. 858,342

Int. Cl.<sup>2</sup> B25B 1/20

U.S. Cl. 269—40

11 Claims



1. A fixture for use in making a core to facilitate the manufacture of substantially impenetrable members which comprises:

(a) a frame having longitudinal and lateral support members, (b) a plurality of lateral spacing members supported by the lateral support members of said frame,

(1) said lateral spacing members adapted to receive a plurality of expanded metal sheet members to establish a spaced stack thereof with rod members inserted through the openings in said expanded metal sheet members at least some of which extend beyond the sides of said spaced stack thereof,

(c) and means elevating one end of said longitudinal support members with respect to the other end thereof whereby said support rods may be secured to said expanded metal sheet members simultaneously in a number of different positions.

8. In an aligning device for use in connection with the manufacture of a core for a substantially impenetrable member, the construction which comprises:

(a) a main carrier member having bottom and sidewall mounting surfaces,

(b) a first plurality of plate members suspended from a bottom mounting surface of said main carrier member at least



some of which are intended to be inserted between a plurality of expanded sheet metal members to effect lateral spacing thereof,

(c) a second plurality of comb-like teeth members supported from a sidewall mounting surface of said main carrier member,

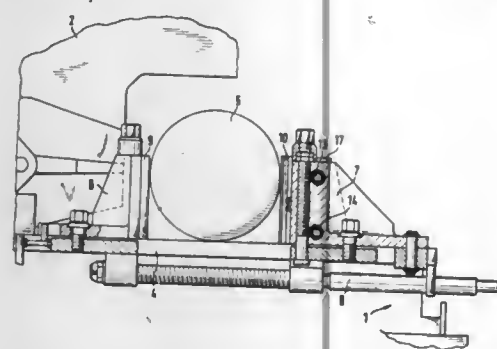
(d) and means to lock said aligning device to said expanded sheet metal members.

4,165,068

**DEVICE FOR CLAMPING A WORKPIECE**  
Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to Keuro GmbH & Co., KG., Achern, Fed. Rep. of Germany  
Filed Feb. 1, 1978, Ser. No. 874,292  
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 7702902[U]

Int. Cl.<sup>2</sup> B23Q 3/02

U.S. Cl. 269—136



1. A device for clamping a workpiece on a table of a machine tool by means of mutually opposed parallel clamping surfaces at least one of which is displaceable by a predetermined amount and in a direction toward the opposed clamping surface, further characterized wherein shaft means are rotatably journaled in said displaceable clamping surface, said shaft means arranged one above the other and include means cooperative with eccentric means for directive force application toward said opposed clamping surface and said table and spring loaded means associated with said displaceable clamping surface adapted to control clamping forces and release of said workpiece.

4,165,069

**COPIER HAVING REMOVABLE PAPER FEED MODULE**  
Donald F. Colglazier; Ernest P. Kollar, both of Longmont, and Fred R. Mares, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Aug. 1, 1977, Ser. No. 820,988  
Int. Cl.<sup>2</sup> B65H 1/00

U.S. Cl. 271—162

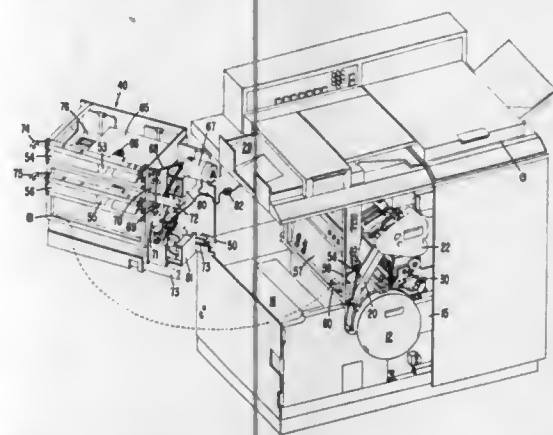
9 Claims

1. In a copier having cut-sheet-supply/sheet-feeding means operable to separate a border sheet from a stack and to feed the separated sheet for use in a copy process to make copies therefrom, the improvement comprising:

a frame member supporting the copier's copy process components, including said cut-sheet-supply/sheet-feeding means, in an operative copy process relationship; and movable mounting means connecting said cut-sheet-supply/sheet-feeding means to said frame such that said feeding means is movable between copier-operative and copier-inoperative positions;

said copier-operative position facilitating sheet feeding into

said copier for use in said copy process to produce copies on said sheets; and



said copier-inoperative position facilitating copier maintenance by sheet feeding while said feeding means is removed from the remaining copier components.

4,165,070

**TORSION AND GRIPPING TYPE EXERCISE DEVICE FOR TOTAL ARM DEVELOPMENT**  
Max Rice, 120 MacDougal St., New York, N.Y. 10012  
Filed Dec. 14, 1977, Ser. No. 860,293  
Int. Cl.<sup>2</sup> A63B 21/30

U.S. Cl. 272—68

1 Claim



1. A flange exercise device for strengthening the grip and arm muscles, comprising in combination, an elongated, straight, cylindrical hollow bar, a circular handhold at each end of the bar, a pair of parallel, short legs along a side of said bar, and a circular foot at the end of each said leg, said handholds and said feet each being of a size for being conveniently grasped within a hand; a peripheral edge of said handholds having an annular groove for receiving fingers and a thumb; said bar, handholds, legs and feet being of plastic and being made rigid respective to each other; and means including a circular hole on one side of said bar for receiving a thumb of a user and a crescent shaped slot on an opposite side thereof for fingers of a user to allow the thumb and fingers to squeeze, a resilient sponge positioned inside the center of said bar.

4,165,071

**TENNIS RACKET**

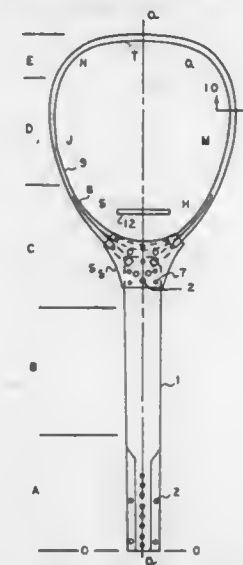
Jack L. Frolow, 2 Willow Dr., Apt. 3B, Oakhurst, N.J. 07712  
Filed Jan. 5, 1976, Ser. No. 646,848  
Int. Cl.<sup>2</sup> A63B 49/02

U.S. Cl. 273—73 C

82 Claims

1. A complete tennis racket comprising at least a frame having a head portion supporting a string netting in a plane, and a handle portion having a grip portion suitably adapted for the hand to grip; said netting having a length along the longitudinal axis of said frame greater than 9 inches and a width along an axis perpendicular to said longitudinal axis greater than 7.5 inches; said racket having a weight W in ounces; a center of percussion located at a distance C<sub>p</sub> in inches from the end of the grip portion, when tested in accordance with test 4 of FIG. 40 herein before defined, said center of percussion taken about a pivot located at the end of the grip portion, said pivot having

an axis perpendicular to the longitudinal axis of said frame and parallel to the plane of said string netting; said racket having a length L in inches from the end of the grip portion to the end of the head portion; said racket having a center of gravity located a distance C<sub>g</sub> in inches from the end of the grip portion; said racket having a first moment of inertia I<sub>1</sub> in ounce inches



squared about said pivot and I<sub>1</sub> is directly proportional to the product of C<sub>p</sub>, C<sub>g</sub>, W given by the formula  $I_1 = (C_p)(C_g)(W)$ ; said racket characterized in that the magnitude of C<sub>p</sub> divided by the magnitude of L given by the formula C<sub>p</sub>/L is greater than 0.71; and the magnitude of the weight W is less than 10.7 ounces.

4,165,072

**METHOD OF OPERATING A VIDEO GAME**

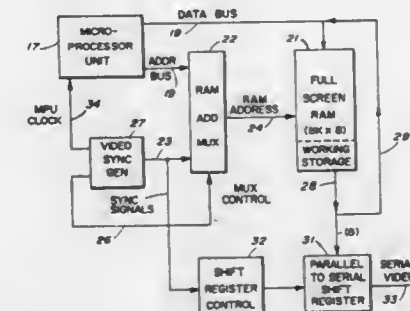
David R. Stubben, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Dec. 20, 1977, Ser. No. 862,338

Int. Cl.<sup>2</sup> A63F 9/00

U.S. Cl. 273—85 G

5 Claims



1. A method of operating a video game having a video display screen with a plurality of resolution elements scanned at a predetermined rate by television sync signals and a microprocessor unit (MPU) and also having a full screen random access memory (RAM) having a storage location for every resolution element of said video display screen, said method comprising the following steps: during a first time period under the control of said television sync signal accessing video data from said RAM and storing such data in serial format; during a second time period performing, by use of said MPU, updating of said RAM and other necessary game functions; during both of said time periods reading out said stored data to said display screen at said predetermined scan rate; and thereafter repeating said step of said first time period for additional video data.

4,165,073

**WATER GUN GAME WITH REVOLVABLE TARGET MOVABLE ALONG A LINE**

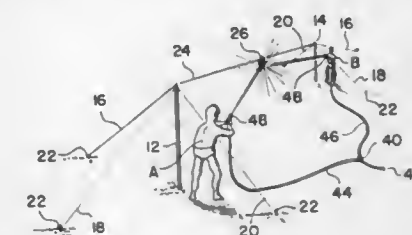
Donald L. Kellerstrass, 303 Daniel Pkwy., Washington, Ill. 61571

Filed Mar. 16, 1978, Ser. No. 887,019

Int. Cl.<sup>2</sup> A63B 63/06; A63H 23/00

U.S. Cl. 273—101

3 Claims



1. Water gun game apparatus, comprising, in combination, a pair of spaced apart vertical uprights; a line extending between said uprights above the ground; a target including a bracket having a pulley wheel suspended from said line in the upper part thereof and a hollow member revolvably mounted in the lower part thereof and a plurality of water guns associated with each player playing the game for directing a jet of water upon said target so as to move same toward the end opposite one of said players.

4,165,074

**MECHANICAL TARGET**

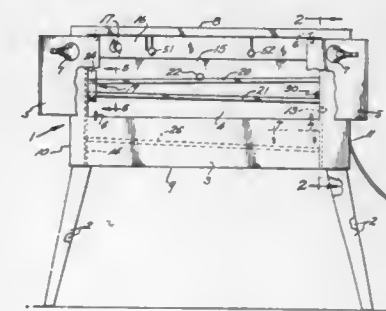
Norman L. Bonser, 2683 Oxford Ct., Eugene, Oreg. 97404

Continuation-in-part of Ser. No. 672,519, Mar. 31, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,485

Int. Cl.<sup>2</sup> F41J 9/00

U.S. Cl. 273—105.6

9 Claims



1. A mechanical target for target shooting, said target comprising, an enclosure, ball members, ball guide means including inclined rails within said enclosure during the traversing of which a ball member constitutes a target, said rails forwardly spatially offset from a projectile backstop of the enclosure and lengthwise orientated within said enclosure, said guide means additionally including ball transfer means between adjacent rails ends for transfer of gravitating ball members therebetween, said transfer means including a yieldable member guiding said ball members during their downward transition from one rail end to the other rail end, a ball lift mechanism including a belt having one run facing toward said rails and receiving gravitating ball members discharged from said guide means, said lift mechanism including ball member carriers each of which is secured to one segment of said belt, each of said carriers also in rested contact with another segment of said belt during ball member elevation, stationary restraining means acting on said ball members to

confine same against horizontal movement while on said lift mechanism, and  
ejector means acting on said ball members to unload same from said lift mechanism onto said rails, said ejector means including a spring biased discharge member movable between said one belt run and the stationary restraining means and gradually biased toward a cocked position adjacent said belt by a confined ball member during ball member upward travel on said lift mechanism.

4,165,075

## FISHING GAME DEVICE

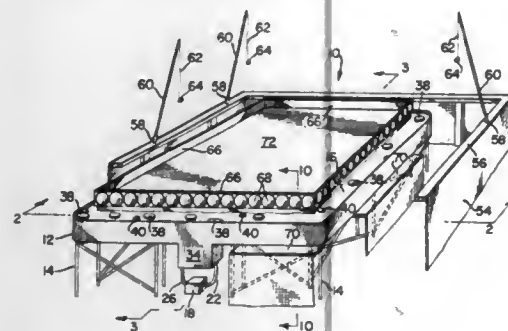
Mark Popovich, Ruskin, Fla., assignor to Fair Equipment Company, Inc., Arlington, Va.

Filed Jun. 30, 1977, Ser. No. 811,683

Int. Cl.<sup>2</sup> A63H 23/10

U.S. Cl. 273-140

19 Claims



1. A fishing game device, comprising:  
an open-top tank having a fluid therein;  
a plurality of floating units on said fluid's surface, each of said units having ferromagnetic material contained therein;  
means for causing a flow of said fluid in said tank whereby said units travel about said tank;  
means for a player positioned at a distance from said tank to retrieve said units individually from said fluid's surface, said retrieving means including a magnet to engage said ferromagnetic material;  
said units varying in size; and  
said ferromagnetic material varying in size among said units whereby the chance of retrieving units of different sizes by a player positioned at a distance from said tank varies among said units.

4,165,076

## GOLF PUTTER

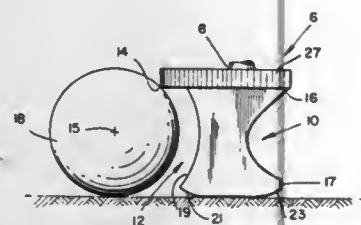
Richard T. Cella, 160 E. 46th St., New York, N.Y. 10017

Filed Feb. 7, 1977, Ser. No. 766,357

Int. Cl.<sup>2</sup> A63B 53/04

U.S. Cl. 273-168

2 Claims



1. An instrument for imparting roll to a spherical object comprising a shaft and an object contacting blade secured to the end thereof, said blade having a front face on which there is provided a top longitudinal projection having an exposed bottom striking edge, the top side edges of the face converging respectively to the ends of said projection, the rear face of said

blade having a curved surface there being provided a projection at the bottom thereof with a second striking edge.

4,165,077

## WORD GAME

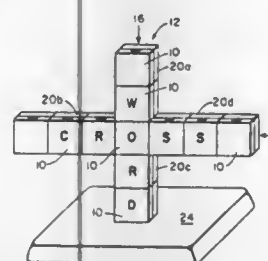
Ronald D. Falcione, 17 Old Pottery Ln., Norwell, Mass. 02061

Filed Apr. 6, 1977, Ser. No. 785,065

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273-239

7 Claims



1. A word game method associated with a plurality of tiles, the majority of said tiles having alphabetic characters displayed thereon and the remaining tiles being blank, and  
a plurality of tile support means having a plurality of tile receiving spaces for supporting the tiles in an intersecting pattern of at least one column and at least one row, whereby each tile can be supported so that its indicia bearing portion, if any, can be read, and one of said spaces being at an intersection of each row and column, and  
the rules of the game method comprising the following steps:  
each player chooses words which can be placed in each row and column of the tile support means thereby forming a word-cross combination,  
a first player asks a selected opposing player whether his word-cross combination has a specific symbol,  
if a particular selected player has that symbol in one or more heretofore unrevealed positions of his word-cross, he discloses one position by placing a tile bearing that symbol in a corresponding space in his tile support means,  
if a player guesses correctly he guesses again,  
if a player guesses incorrectly, the next successive player takes his turn, and  
play continues until the tile support means of one player only is not entirely covered with tiles.

4,165,078

## FLIP-UP STYLUS PROTECTOR FOR A PHONOGRAPH CARTRIDGE

John P. Kuehn, Danbury, Conn., assignor to Audio Dynamics Corporation, New Milford, Conn.

Filed Apr. 26, 1978, Ser. No. 900,053

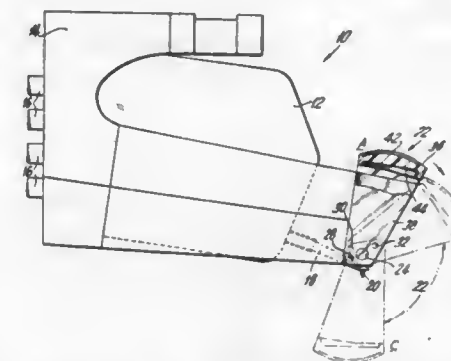
Int. Cl.<sup>2</sup> G11B 21/00

U.S. Cl. 274-1 R

7 Claims

1. A phonograph cartridge comprising: a cartridge body; a groove engaging stylus extending from said cartridge body, pivotal mounting means, a protective member pivotally mounted to said cartridge body by said pivotal mounting means; a magnifying lens disposed on said member, at least two detents on one of said member and said body; at least two projections on the other of said member and said body, said detents and said projections being selectively removably engageable to define at least two positions of said member with respect to said body; at said first position of said member said

stylus being at the focus of said magnifying lens to thereby provide a magnified image of the stylus; at said second position



of said member, said member being disposed beneath said stylus to prevent said stylus from engaging said groove.

4,165,079

## FLUID SEAL RING

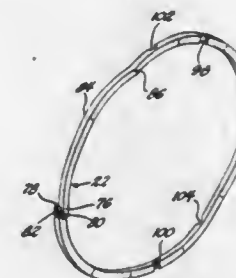
John A. Clements, The Hague, Netherlands, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1978, Ser. No. 930,144

Int. Cl.<sup>2</sup> F16J 9/20

U.S. Cl. 277-9.5

2 Claims



1. A seal assembly responsive to heated pressurized fluid: a first member having an outer cylindrical surface; a second member having an internal cylindrical surface; means to support said members for relative rotation with said cylindrical surfaces in concentric relation with a small clearance space between said surfaces; an annular groove in one of said members having an annular base located a predetermined groove depth substantially larger than said clearance space from the surface of said one of said members and parallel annular side walls spaced apart a predetermined groove width; a split annular seal ring made of flexible resilient material having an inner diameter annular surface and an outer diameter annular surface radially spaced apart a cross section height slightly less than said groove depth and side annular faces axially spaced apart a cross section width substantially less than said groove width and being axially undulated to provide undulations on said side annular faces having a total undulated free width sufficiently larger than said groove width so that on placing said seal ring in said groove said seal ring is partially flattened and prestressed with said undulated side faces engaging said side walls to hold said seal ring with one annular surface flush or slightly submerged in said groove and the other annular surface adjacent said base for assembly of one member into the other member without damaging said seal ring; said seal ring being responsive to the flow of heated fluid in said clearance space past said groove and seal ring to enter said groove between the undulations of said seal ring to flatten said seal ring and move said seal ring partially out of said groove and hold said one annular surface in sealing contact with the cylindrical surface on the other of said members.

4,165,080

## PACKING SEALER PLUG

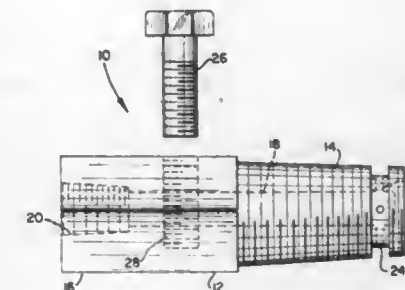
Harold R. Adams, Rte. 1, St. Francisville, Ill. 62460

Filed May 26, 1978, Ser. No. 910,133

Int. Cl.<sup>2</sup> F16L 55/10; F16J 15/40

U.S. Cl. 277-72 FM

2 Claims



1. A packing and sealer plug for entry of packing into a fitting and sealing the same, said plug comprised of a body having an externally threaded portion at one end adapted to engage an internally threaded fitting, said plug having an internally threaded opening at a second end adapted to receive a threaded nozzle of a packing gun or the like for admission of packing thereto, a passageway connecting said internally threaded opening with radial ports at the end of said externally threaded portion, said externally threaded end portion being provided with an external circumferential groove communicating with said radial ports for distribution of said packing uniformly around the end portion of said plug.

4,165,081

## CONSTANT FORCE FACE SEAL

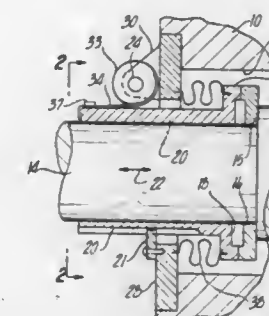
Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1978, Ser. No. 896,128

Int. Cl.<sup>2</sup> F16J 15/34

U.S. Cl. 277-88

6 Claims



1. In combination: a housing having an opening therein; a rotary shaft extending through said opening so that one section of the shaft is located within the housing and another section of the shaft is located outside the housing; means for sealing the annular clearance between the shaft and the housing; said sealing means including a first annular sealing disc carried by the shaft and having a smooth flat seal face extending radially relative to the shaft axis, a sleeve slidably encircling the shaft for axial movement therealong, and a second annular sealing disc carried by the sleeve, said second disc having a smooth flat seal face extending radially relative to the shaft axis in juxtaposition to the seal face on the first disc whereby fluid is prevented from passing across the annular joint defined by the seal faces; and zero rate spring means trained between the housing and sleeve for urging the sleeve in the direction that will press the second sealing disc against the first sealing disc; said spring



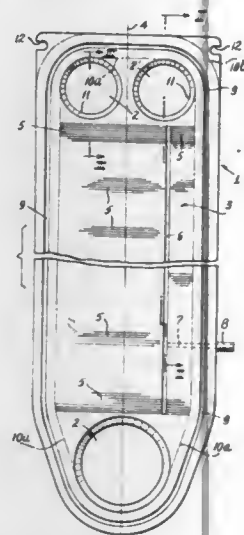
means comprising at least one rotary spool and a strip of spring stock coiled thereon, each spring strip being pre-stressed toward a condition of minimum radius of curvature so that the strip tightly encircles the spool; the spool being rotatably attached to one of said housing and sleeve, and the exposed end of the spring strip being anchored to the other of said housing and sleeve.

4,165,082

**LEAKPROOF SECURING MEANS FOR MOUNTING A SEMI-PERMEABLE MEMBRANE TO A SUPPORT**  
Jacques Foucras, Bron, and Georges Rodet, Communay, both of France, assignors to Rhone-Poulenc Industries, Paris, France  
Filed May 30, 1978, Ser. No. 910,765

Claims priority, application France, Jun. 2, 1977, 77 17472  
Int. Cl.<sup>2</sup> B01D 25/26; F16J 15/06  
U.S. Cl. 277-166

19 Claims



1. A device for the leaktight securing of semi-permeable membranes to opposite faces and around at least one orifice in a support plate, said orifice having a flared surface portion at the periphery of each of its ends at opposite faces of said support plate, the said device comprising two rings extending into said orifice from opposite ends thereof, the rings having flared surfaces which mate with the flared surface portions of the orifice peripheries and which press the edges of said membranes sealingly against said orifice periphery surface portions on the sides of said support plate, at least one of said rings having a lip thereon sealingly secured to the other ring at said lip to maintain sealing pressure on said membranes.

4,165,083

**ARRANGEMENTS FOR RETAINING AND SEALING WINDOW GLASS**

Johann Dochnahl, Willich, Fed. Rep. of Germany, assignor to Draftex Development AG, Switzerland  
Filed Mar. 8, 1978, Ser. No. 884,473

Claims priority, application United Kingdom, Mar. 11, 1977, 10337/77

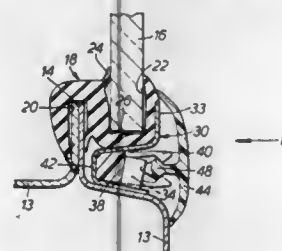
Int. Cl.<sup>2</sup> E06B 7/22; F16J 15/16  
U.S. Cl. 277-184

11 Claims

1. A sealing and retaining arrangement for sealing and retaining window glass in a window opening defined by a surround which supports a flange running around the opening, comprising

flexible sealing means mounted on the flange and defining a channel receiving an edge of the window glass and running along the length of at least a portion of the flange, a stiff retaining member defining a longitudinal channel the distal edge of one of whose side walls is extended to define a longitudinally extending lip, the retaining member being

positioned to run along the length of at least a portion of the said sealing means with the latter seating on an external wall of the channel of the retaining member so that the said lip makes contact with an external surface of the sealing means, pins extending through apertures in the retaining member at intervals along the said surround, and



4,165,084

**RECIPROCATING PUMP PACKING**

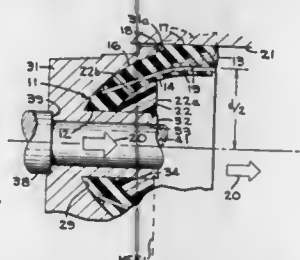
Dennis D. Kempf, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 31, 1978, Ser. No. 892,069

Int. Cl.<sup>2</sup> F16J 1/06, 15/16

U.S. Cl. 277-212 C

6 Claims



1. In a reciprocating pump, an improved piston assembly including a single packing adapted to be coupled to the pump rod for reciprocal motion within the cylinder of the reciprocating pump, said packing including

a resilient, generally cup-shaped body member of an elastomeric material adapted to be coupled to said pump rod, said body member including an inner annular portion and an outer annular lip,

said annular lip of said resilient body member having a forward edge defining the radially outer annular edge of said body member and a heel spaced rearwardly therefrom with a predetermined relaxed profile therebetween providing a maximum diameter at said forward edge, said forward edge being the leading edge when said pump rod is moved against the pressure of fluid in said pump, and means for coupling the inner annular portion of said body member to said pump rod, wherein the improvement comprises:

a plurality of circumferentially spaced cantilever spring members embedded in said resilient body member and extending therein from a fixed position within the inner annular portion of the cup-shaped body member through substantially the entire length of the lip to a position radially underlying said forward edge of said annular lip, said annular lip being disposed for engagement within the bore of the cylinder and said unstressed maximum diameter of said forward edge thereof being substantially

greater than the diameter of said bore so that said annular lip is compressed thereby so that the portions of said spring members within said lip are deflected and a predetermined pressure profile is induced by said spring members between said annular lip and the bore of the cylinder having a high pressure contact region extending from adjacent said forward edge a predetermined distance toward said heel and thereafter diminishing to substantially zero pressure at said heel, whereby a fluid-tight seal is formed at said high pressure contact region during the suction stroke of said piston assembly and foreign matter is precluded from entry between said forward edge on said annular lip and the cylinder wall during the pressure stroke of said piston assembly to thereby enhance the wear life of the packing.

4,165,085

**FOAMED PLASTIC LUBRICATING SEAL**

Stig Persson, Katrineholm, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

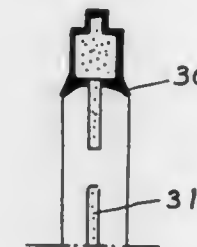
Filed Sep. 12, 1977, Ser. No. 832,458

Claims priority, application Sweden, Oct. 18, 1976, 7611517

Int. Cl.<sup>2</sup> F16J 15/20, 15/32

U.S. Cl. 277-228

11 Claims



1. A unitary, one piece seal for a gap between at least two surfaces comprising a single, one piece body member made of a foamed plastic material consisting of at least one homogeneous liquid impermeable hard and rigid peripheral surface portion and at least one porous portion of the same material, said porous portion filled with a lubricant, said porous portion being exposed through at least one section in said homogeneous peripheral surface portion to permit transfer of lubricant therethrough.

4,165,086

**CLEANABLE DRAIN FOR TANKER VEHICLE**

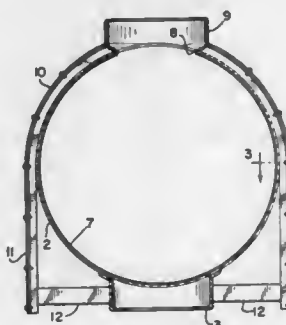
John J. Glassmeyer, Glenwood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 21, 1978, Ser. No. 898,755

Int. Cl.<sup>2</sup> B60P 3/22

U.S. Cl. 280-5 R

16 Claims



1. For a highway vehicle having a generally cylindrical tank assembly having a skin and including longitudinally spaced reinforcing members and a filling port arrangement in the

upper proximity of the tank skin having a reservoir about the periphery thereof to prevent run-off of fluent product onto the other surface of the tank skin, an improved reservoir drainage arrangement, comprising:

a drain tube having an upper end portion carried on the outer surface of the tank and opening into the reservoir and a lower end portion depending therefrom and extending beyond the lower proximity of the tank skin, said tube being longitudinally aligned with one of said reinforcing members and having an inner channel portion and an outer removable cover plate means coextensive therewith, said inner channel including an outwardly opening inner trough section and outer brim flange portions extending therefrom, and attachment means removably securing said plate means to the brim flange portions of the inner channel to form said drain tube and accommodate cleaning thereof.

4,165,087

**SNOW-SURFACE DRIVING VEHICLE**

Kunihiko Kagawa, Tokyo, Japan, assignor to Mas Co., Ltd., Tokyo, Japan

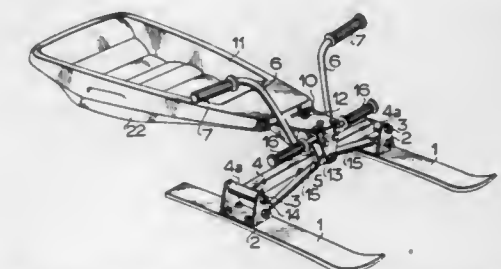
Filed Mar. 6, 1978, Ser. No. 883,676

Claims priority, application Japan, May 6, 1977, 52-051889

Int. Cl.<sup>2</sup> B62B 13/04

U.S. Cl. 280-16

5 Claims



1. A snow-surface driving vehicle characterized in the following; there are equipped a pair of skis, left and right, along the longitudinal direction of each of which is mounted a bracket; the left and right ends of a bridging member arranged between and transverse to said two skis are supported by means of said brackets; a handle supporting member is attached to the center of said bridging member and said handle supporting member is linked a little ahead of its center by means of a vertical shaft with a connecting member installed in front of the man seating portion; a handle is rigidly connected to said handle supporting member, between said connecting member and said brackets, control rods are mounted through the intermediary of universal joints being fixed at spots apart from the lines of axes of the brackets, whereby motion imparted to said handle causes a change in the orientation of said skis.

4,165,088

**COMBINATION CART**

Dale W. Nelson, 375 N. 400 East, Orem, Utah 84057

Filed Feb. 21, 1978, Ser. No. 879,070

Int. Cl.<sup>2</sup> B63B 3/02

U.S. Cl. 280-47.35

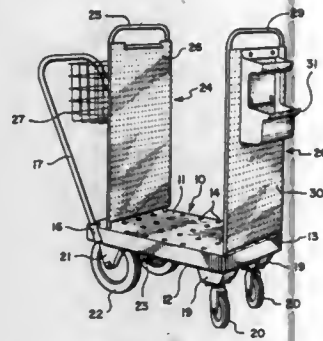
11 Claims

1. A cart for multiple use comprising;

(a) a deck having an upper and lower surface containing a series of walled apertures open at both ends extending between and continuous with the upper and lower surfaces, said apertures being in spaced relationship on the deck surfaces and being tapered such that the aperture diameter at the upper surface is greater than the diameter of the same aperture at the lower surface;

(b) a set of front swivel wheels mounted to means in the lower front surface of the deck and a set of rear wheels

mounted to means in the lower rear surface of the deck and,



(c) handle means extending upwardly and rearwardly from the rear portion of the deck.

4,165,089

## FLEXIBLE SKATEBOARD

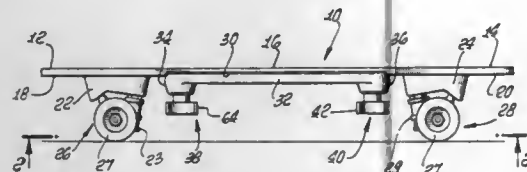
Myron G. Urdea, 1790 Panay Cir., Costa Mesa, Calif. 92626; Doyle Darch, 3130 Rita Wy., Santa Ana, Calif. 92704, and John N. Urdea, 21551 Brookhurst, Apt. 6, Huntington Beach, Calif. 92646

Continuation of Ser. No. 710,968, Aug. 2, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 865,032

Int. Cl.<sup>2</sup> A63C 17/02

U.S. Cl. 280—87.04 A

6 Claims



1. A selectively adjustable flexible skateboard comprising: an elongate board having a bottom surface and a top surface; a first wheel assembly mounted on said bottom surface adjacent one end of said board; a second wheel assembly mounted on said bottom surface adjacent the other end of said board; a strengthening member mounted between said first and second wheel assemblies; and means connected between said strengthening member and said board for adjusting the flexibility of said board having a specified load, said means comprising: a threaded shaft extending through an aperture in both said board and said strengthening member; and an adjusting member mounted on said threaded shaft and located beneath said strengthening member, said adjusting member movable between a first position and a second position, said adjusting member in said first position allowing relative movement between said board and said strengthening member to permit a specified deflection in said board from a weight placed on said board, said board not moving relative said strengthening member when said adjusting member is in said second position resulting in significantly less deflection in said board with said weight than said specified deflection.

4,165,090

## CURB SLIDER DEVICE FOR SKATEBOARDS

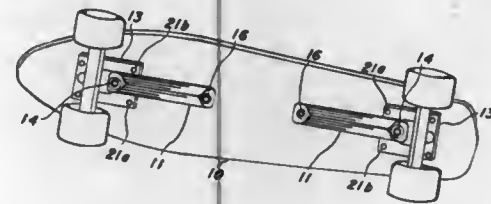
Richard C. Feddersohn, 249 Vista Del Monte, Anaheim, Calif. 92807, and William S. Schaffer, 1252 Richard Ave., Orange, Calif. 92669

Filed Jan. 31, 1978, Ser. No. 874,036

Int. Cl.<sup>2</sup> A63C 17/00

U.S. Cl. 280—87.04 A

3 Claims



1. For use in a skateboard device with two truck means, two slider means, attachment means at each end of the slider means, one end attachment means of each slider means connected with a portion of a truck means located furthest from the skateboard, at least one predrilled hole means central to the width through the skateboard located to interconnect with the other end of each slider means so as to form an angle of not less than 15° or greater than 45° between the skateboard and the slider means.

4,165,091

## SNOWBOARD

Daniel E. Chadwick, 43 Raymond Ave., Rutherford, N.J. 07070

Filed Jun. 21, 1977, Ser. No. 808,711

Int. Cl.<sup>2</sup> B62B 13/06

U.S. Cl. 280—12 H

2 Claims



1. In a snow surfboard comprising a single continuous elongated main body having secured thereto, on its underside at the front and rear thereof, a first and second pair of snow skis for contact with a snow-laden surface wherein each ski of each pair is parallel to the other, the improvement which comprises said first and second pair of skis secured to said main body by securing means wherein each securing means is comprised of an inverted angularly oriented T-shaped support means secured at its upper vertical end to a mounting bracket fastened to said main body and at its opposite end to a brace comprised of two H shaped members having transversely spaced members substantially vertical to said main body and interconnected at the midpoint of said transversely spaced members by members substantially horizontal to said main body thereby providing support and attachment for said T-shaped support means at their upper end and attached to said first or second pair of skis at their lower end wherein a solid member is coupled through resilient means between said main body and said inverted T-shaped support means, said solid means being attached substantially at the midpoint of the horizontal member of said inverted T-shaped member at one end and extending angularly upward and backward and attached to said main body at its other end.

4,165,092

## BRACKET FOR REMOVABLY MOUNTING A MUD FLAP ASSEMBLY

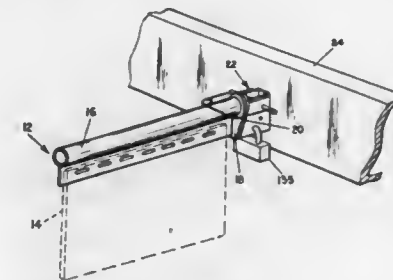
Daniel K. Herlein, Muskegon, Mich., assignor to Fleet Engineers, Inc., Muskegon Heights, Mich.

Filed Feb. 8, 1978, Ser. No. 876,033

Int. Cl.<sup>2</sup> B62B 9/16; B62D 25/16

U.S. Cl. 280—154.5 R

7 Claims



1. In a mud flap assembly for mounting a mud flap onto a motor vehicle frame, the mud flap assembly having a seat member, a face plate rotatably seated against the seat member, an arm attached at one end thereof to the face plate, and extending outwardly therefrom, a resilient tensioning means connecting the seat member and arm for retaining the face plate seated against the seat member, and a mud flap extending down along the arm, the improvement comprising: a first bracket member with substantially parallel flanges fixedly mountable to the frame of the vehicle; a second bracket member with substantially parallel flanges fixedly mountable to the seat member; and a hitch means for interlocking the first and second bracket members together so that the arm extends horizontally outward from the vehicle frame, and the mud flap assembly is removable from the frame as an assembled structure; the hitch means including a slot means in each parallel flange of one of the first and second bracket members and a rigidly connected projection extending between each parallel flange in the other of the first and second bracket members, the projection and slot means sized such that the slot means receives the projection; and a retainer means for retaining the projection within the slot means; the slot means includes a slot in each flange; the flanges of each bracket member are spaced apart such that when the projection engages the slots, the flanges of one bracket member abut the flanges of the other bracket member along facing surfaces of the flanges.

4,165,093

## OCCUPANT PROPELLED CAMBERING VEHICLE

Edward J. Biskup, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

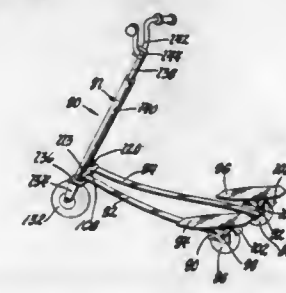
Division of Ser. No. 779,337, Mar. 21, 1977, Pat. No. 4,123,079.

This application May 24, 1978, Ser. No. 908,971

Int. Cl.<sup>2</sup> B60G 19/00; B62K 15/00; B62M 1/04

U.S. Cl. 280—220

2 Claims



1. A three-point surface contact cambering vehicle having a

longitudinally extending roll axis and comprising an upright steering column, an elongated steering shaft mounted in said steering column for turning movement about a substantially vertical axis, a steerable front surface contact means operatively connected to the lower end of said steering shaft for engagement with a support surface, a manual steering device operatively connected to the upper end of said steering shaft, a pair of elongated trailing arms extending rearwardly from said steering column, laterally spaced rear surface contact means operatively connected to the rear portions of said trailing arms for engagement with the support surface, foot support means for an operator of the vehicle mounted on each of said trailing arms adjacent to each of said rear surface contact means, said trailing arms taking the form of leaf springs the forward ends of which are fixed with said steering column for permitting said trailing arms to swing about a transverse axis and thereby allow the operator to roll said vehicle with respect to said roll axis and cause said trailing arms to move in opposite directions so that the rear surface contact means camber by an amount substantially equal to the vehicle roll.

4,165,094

## JUVENILE TOY VEHICLE

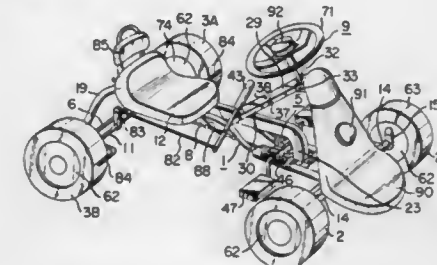
Isao Onda, Kitamoto, Japan, assignor to Ageo Industries Co., Ltd., Saitama, Japan

Filed Jun. 6, 1977, Ser. No. 803,953

Int. Cl.<sup>2</sup> B62M 1/02

U.S. Cl. 280—261

1 Claim



1. A juvenile toy vehicle comprising: a pipe frame body; front wheel axle means supported by said frame body and having a first pair of bilateral wheels mounted adjacent opposed ends, said front wheel axle means including a pair of front wheel axles each formed by a one-piece member having a horizontal and upstanding portion and a steering piece extending rearwardly from proximal end of said upstanding portion; rear wheel axle means supported by said frame body and having a rear pair of bilateral wheels mounted adjacent opposed ends, said rear wheel axle means including an axle, a wheel cap provided with a plurality of rotational force transmitting pawl means rigidly mounted laterally outside of the positions at which said rear wheel axle means is journaled, one of said first pair of bilateral wheels being provided with a central aperture for receiving the end of said axle and a plurality of apertures for receiving said plurality of rotational force transmitting pawl means, said one rear wheel being fitted on said end of said rear axle means with said apertures aligned and receiving said rotational force transmitting pawl means thereby to form a driving wheel making integral rotations with said rear wheel axle means, the other of said rear bilateral wheels being loosely fitted on the other end of said rear wheel axle means to form an idle wheel; a sprocket wheel rigidly carried by said rear axle means; a pedal crank shaft carried by said body frame, said pedal crank shaft being carried by a bearing device including a pair of complementary bushing half members rotatably receiving said shaft therebetween, a supporting plate carried by said body, and a bushing member retaining



device for removably attaching said bushing half members to said supporting plate;  
 a second sprocket wheel rigidly carried by said pedal crank shaft;  
 an endless chain linking said first sprocket wheel with said second sprocket wheel;  
 braking means including a brake rod having crank-like curved, laterally opposed ends carried by said body at the rear thereof, so that the distal end portions of said brake rod are placed frictionally in contact with the periphery of said rear wheels when said brake rod is manually rotated;  
 a saddle adjustably carried by said frame body; and,  
 a steering device operatively linked with said front wheel axle means, said steering device including a steering rod having a coplanar U-shaped curvature in the intermediate portion thereof and the vertical, laterally opposed ends thereof loosely received in an aperture in each of said steering pieces, a steering wheel support piece disposed in the intermediate portion of said body at the front thereof, a steering wheel rod having an upper portion rotatably extending through an aperture of said steering wheel support piece and a U-shaped distal end portion in which said U-shaped curvature of said steering rod is loosely engaged.

4,165,095

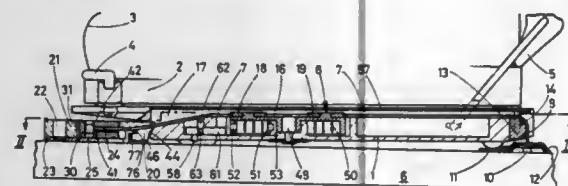
## SELF RESTORING SAFETY SKI BINDING

Alain Neau, Theyez, France, assignor to The Garcia Corporation, Teaneck, N.J.

Filed Dec. 22, 1977, Ser. No. 863,437  
 Int. Cl.<sup>2</sup> A63C 9/08

U.S. Cl. 280-613

6 Claims



1. In a ski binding comprising a sole plate, at least one flexible cable connecting an extremity of said sole plate to a ski and at least one elastic tension device housed within said sole plate and associated with said flexible cable to place a continuous tension thereon for releasable retaining said plate on said ski; an improved cable length adjustment which comprises:

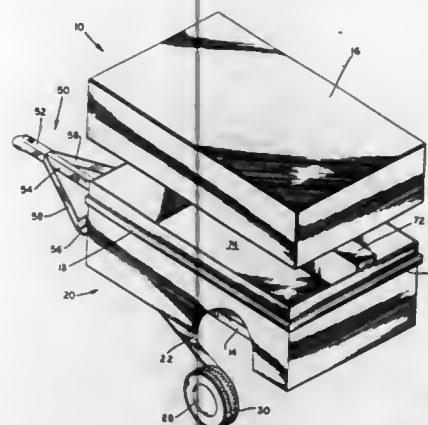
- means defining a housing secured to the surface of said ski adjacent an end of said sole plate;
- a support element rotatably mounted within said housing, said support including means for securing an end of said cable thereto off center in relation to the axis of rotation thereof, said support further including pawl means elastically urged toward the inner wall of said housing;
- a series of teeth arranged on said inner wall of said housing, said teeth being arcuately arranged for engagement by said pawl means; and
- means arranged on at least said pawl means for manually disengaging said pawl means from one of said teeth whereby said support may be manually rotated to alter the effective length of said cable.

4,165,096  
**STORABLE UTILITY TRAILER**  
 Thomas J. Lewis, Jr., 3085 E. Shadowlawn Ave., Atlanta, Ga. 30305, and Lester S. Hardwick, 400 Fulton Federal Bldg., Atlanta, Ga. 30303

Filed Mar. 20, 1978, Ser. No. 888,235  
 Int. Cl.<sup>2</sup> B62D 21/18

U.S. Cl. 280-641

7 Claims



1. Foldable utility trailer apparatus comprising:  
 body means defining an upwardly extending open area for receiving a load;  
 means located beneath said load receiving area for defining a pair of wheel receiving receptacles;  
 means mounted beneath said body means for supporting a pair of wheels either in lowered position in which said wheels are upright and engage the ground for traveling support of said body means, or in a raised position in which said wheels remain upright and occupy said wheel receptacles, thereby lowering the overall height of said trailer apparatus;  
 cover means configured to fit over said upwardly extending open area of said body means, so as to enclose loads received therein; and wherein  
 the underside of said body means is configured to fit within said cover means when said wheels are in said raised position, so that said trailer apparatus can be stored with the underside thereof enclosed by said cover means when not in use.

4,165,097

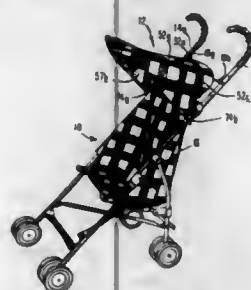
## STROLLER CANOPY

Robert J. Boudreau, and Joel C. Cunard, both of Bedford, Pa., assignors to Hedstrom Co., Bedford, Pa.

Filed Jan. 2, 1976, Ser. No. 646,331  
 Int. Cl.<sup>2</sup> B62B 11/00

U.S. Cl. 280-647

6 Claims



1. In a bi-directionally folding stroller having spaced apart, foldable pusher handles, a canopy comprising  
 A. a pair of spaced-apart side frame members having corre-

sponding first ends pivotally connected to the pusher handles;  
 B. means near the unpivoted ends of the frame members for holding said members apart;  
 C. a sheet of flexible fabric material extending between said side frame members, and  
 D. means for removably securing the fabric material to the side frame members at points near the opposite ends of said side frame members to maintain the fabric material under a two-way stretched condition, wherein the securing means comprise  
 (1) fingers extending laterally from opposite ends of said side frame members toward one another, and  
 (2) means defining pockets in said fabric material adjacent the opposite ends of said side frame members and for removably receiving said fingers.

4,165,099

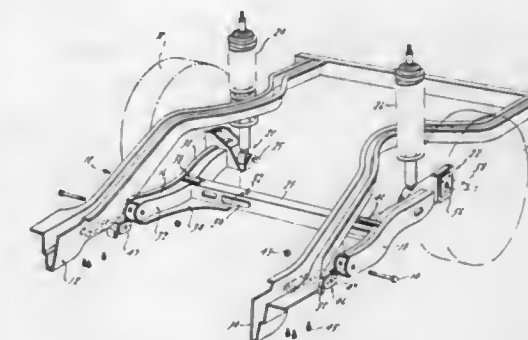
## REAR SUSPENSION APPARATUS FOR A MOTOR VEHICLE

David A. Wagner, Southfield; Daniel W. Doran, Troy, and Robert C. Emenaker, Mt. Clemens, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 28, 1977, Ser. No. 855,499  
 Int. Cl.<sup>2</sup> B60K 17/32

U.S. Cl. 280-708

6 Claims



1. A suspension apparatus for the rear wheels of a motor vehicle, the suspension apparatus comprising:  
 A. a pair of rearward extending control arms;  
 B. means for mounting one end of each said control arms for pivotal movement about an axis transverse to the longitudinal axis of said vehicle;  
 C. means for rotatively supporting said vehicle rear wheels at the other end of each of said control arms; and  
 D. a cross member extending transversely between said control arms, positioned longitudinally intermediate said ends, and defining a beam cross section so located with respect to said control arm pivotal axis and so configured that said cross member has a shear center positioned in a transverse plane located above said control arm pivotal axis.

4,165,098

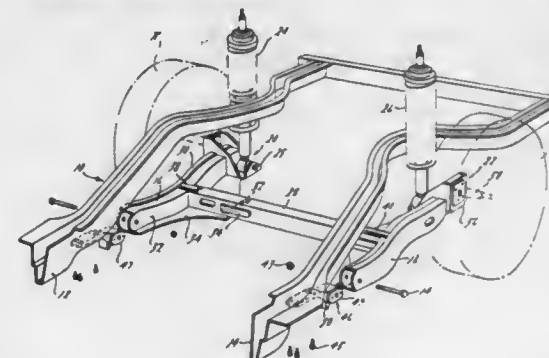
## REAR SUSPENSION APPARATUS FOR A MOTOR VEHICLE

David A. Wagner, Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 28, 1977, Ser. No. 855,521  
 Int. Cl.<sup>2</sup> B60K 17/32

U.S. Cl. 280-708

11 Claims



1. A suspension apparatus for the rear wheels of a motor vehicle, the suspension apparatus comprising:  
 A. a pair of rearward extending control arms;  
 B. means for mounting one end of each of said control arms for pivotal movement about an axis transverse the longitudinal axis of said vehicle;  
 C. means for rotatively supporting said vehicle rear wheels at the other end of said control arms;  
 D. a cross member of generally U-shaped, downward opening cross section having a generally horizontal base portion and a pair of side portions extending downwardly from said base portion, said cross member extending transversely between and fixedly secured to said control arms, positioned longitudinally intermediate said control arm ends;  
 E. means of defining a pair of gusset plates extending inwardly toward the longitudinal center line of said vehicle from said control arms and fixedly secured to the bottom edges of said cross member side portions; and  
 F. reinforcing means positioned within said U-shaped cross member to vary in a regular predetermined manner the torsional stiffness of said cross member along portions of the longitudinal axis of said cross member adjacent the inner edges of said gusset plates.

4,165,100

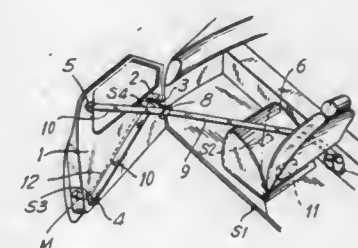
## SAFETY BELT APPLYING SYSTEM

Juichiro Takada, Shin'machi, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,390  
 Int. Cl.<sup>2</sup> B60R 21/10

U.S. Cl. 280-802

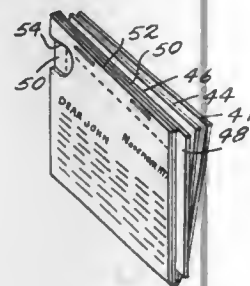
8 Claims



1. In a vehicle including a door swingable about its front end between open and closed positions and an adjacent seat, a safety belt seat system comprising a belt retractor disposed at the side of said seat opposite to said door, a retractor belt retractable by said retractor, a first belt belt guide carried by said retractor belt, a second belt guide mounted on said door and movable along an inclined path from the inner portion thereof downwardly toward the outer portion thereof, a continuous shoulder and waist restraint belt having a first end anchored to said door proximate the upper outer portion thereof and extending therefrom successively through said first and second belt guide and having its other end anchored to said door proximate the lower outer portion thereof, and means including a motor carried by said door and means for activat-

ing said motor in response to the closing of said door for advancing said second belt guide from the upper to the lower end of said path and in response to the opening of said door to retract said second belt guide from the lower to the upper part of the said path.

**4,165,101**  
**DUPLICATING POSTCARD FORM**  
Hans J. Sternberg, Box 3478, Baton Rouge, La. 70821  
Filed Dec. 30, 1977, Ser. No. 866,064  
Int. Cl.<sup>2</sup> B41L 1/16, 1/36; B41M 5/22  
U.S. Cl. 282—27.5



1. A duplicating form for obtaining two-sided copying of information comprising:

- a first post card sheet wherein one side of said first sheet is treated with a color developer of a two-component pressure sensitive chemical system;
- a second sheet wherein one side of said second sheet is treated with a color former of a two-component pressure sensitive chemical system, and with said one side of said second sheet facing said one treated side of said first sheet; and
- a carbon sheet removably disposed between said first sheet and said second sheet, said carbon sheet having an image-reproducing side facing said one side of said second sheet.

**4,165,102**  
**METHOD OF PREPARING ZINC-MODIFIED PHENOL-ALDEHYDE NOVOLAK RESINS AND USE AS A COLOR-DEVELOPER**  
Jerome R. Bodmer, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Filed May 31, 1978, Ser. No. 911,208  
Int. Cl.<sup>2</sup> B41L 1/36; B41M 5/16; C08G 8/28, 8/32  
U.S. Cl. 282—27.5

1. A method of making a zinc-modified phenol-aldehyde novolak resin which comprises mixing together and heating a solid particulate zinc compound selected from the group consisting of zinc oxide and zinc carbonate, ammonium benzoate in solid particulate form, and a phenol-aldehyde novolak resin material.

18. A pressure-sensitive record material comprising a first substrate having a coating of pressure rupturable capsules containing an oily solution of a substantially colorless chromogenic material and in face-to-face relationship therewith a second substrate having a coating comprising a zinc-modified phenol-aldehyde novolak resin prepared in accordance with the method of claim 1.

21. A manifold assembly comprising a plurality of coated first and second substrates as defined in claim 18.

**4,165,103**  
**METHOD OF PREPARING ZINC-MODIFIED PHENOL-ALDEHYDE NOVOLAK RESINS AND USE AS A COLOR-DEVELOPING AGENT**

Jerome R. Bodmer, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Filed May 31, 1978, Ser. No. 911,209  
Int. Cl.<sup>2</sup> B41L 1/36; B41M 5/16; C08G 8/28, 8/32  
U.S. Cl. 282—27.5

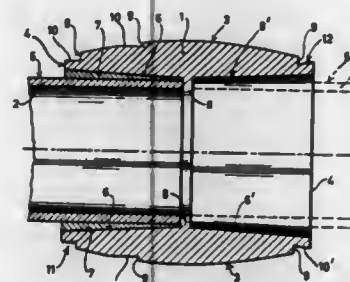
1. A method of making a zinc-modified phenol-aldehyde novolak resin which comprises mixing together and heating a solid particulate zinc compound selected from the group consisting of zinc oxide and zinc carbonate, ammonium formate in solid particulate form, and a phenol-aldehyde novolak resin material.

18. A pressure-sensitive record material comprising a first substrate having a coating of pressure rupturable capsules containing an oily solution of a substantially colorless chromogenic material and in face-to-face relationship therewith a second substrate having a coating comprising a zinc-modified phenol-aldehyde novolak resin prepared in accordance with the method of claim 1.

21. A manifold assembly comprising a plurality of coated first and second substrates as defined in claim 18.

**4,165,104**  
**SEALED JOINT PIPE CONNECTION**  
Paul C. H. van den Beld, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands  
Continuation-in-part of Ser. No. 464,685, Apr. 26, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,342  
Claims priority, application Netherlands, Apr. 27, 1973, 7305985

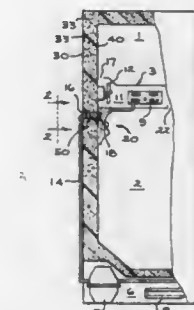
Int. Cl.<sup>2</sup> F16L 47/00  
U.S. Cl. 285—21



1. A heat sealed pipe connection for pipe parts of a synthetic thermoplastic material particularly polyethylene and polypropylene comprising at least one female pipe part and a male pipe part which is sealed to the inside of the female pipe part by pushing the male pipe part through an end opening into the female pipe part in a non-rotative way, said female pipe part having adjacent its ends annular centering abutment projections on its outside surface, the abutment surfaces of the centering projections being substantially perpendicular to the longitudinal axis of the female pipe part and each centering projection constituting a continuous abutment surface to facilitate gripping of the female pipe part to align the male and female pipe parts, said centering abutment projections adjoin cylindrical bearing surfaces extending in the longitudinal direction of the female pipe part and said cylindrical bearing surfaces extend as far as the nearest opening of the female pipe part, the end of said male pipe part sealed to the female pipe part being inwardly of said abutment projections with respect to the end opening.

**4,165,105**  
**CABINET TRANSITION SLEEVE**  
Thomas M. Hahn, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 27, 1977, Ser. No. 864,970  
Int. Cl.<sup>2</sup> F16L 35/00  
U.S. Cl. 285—19

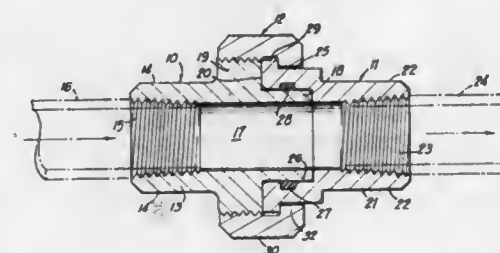


1. A transition sleeve for use in a refrigerator cabinet or the like having insulation contained in a cavity formed by first and second walls of said cabinet, the walls having first and second juxtaposed openings formed therein of dissimilar diameters through which tubing or the like may pass, said sleeve comprising:

- a unitary tubular body of a relatively rigid material; mounting means formed at one end of said body for securing the body to one of said openings in one of said walls, said mounting means including a plurality of locking tabs adapted to telescope through said opening for rotation thereabout;
- one end of said body including a first annular flange having a diameter less than said first opening but greater than said second opening and adapted to circumferentially seal said second opening on the cavity-side thereof;
- a second annular flange at the other end of said body having a diameter greater than said first opening and adapted to circumferentially seal said first opening on the non-cavity-side thereof when said body is secured to the walls by said mounting means, said second annular flange having a plurality of mounting tabs formed integrally therewith and projecting generally axially thereof to provide gripping means for rotational movement of the tubular body.

**4,165,106**  
**HOSE OR PIPE COUPLING**  
James B. Gladden, 1146 King Industrial Dr., Marietta, Ga. 30062

Filed Sep. 26, 1977, Ser. No. 836,491  
Int. Cl.<sup>2</sup> F16L 19/02  
U.S. Cl. 285—39

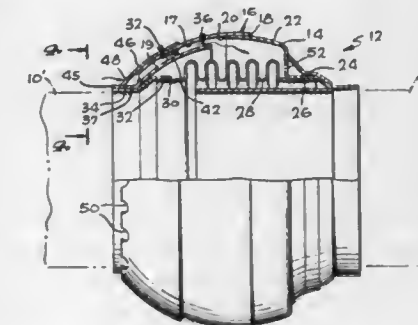


1. A leak-proof high pressure coupling for hoses or pipes comprising telescopically interfitting male and female coupling elements defining in assembled relationship a through passage for fluid, a compressed ring seal disposed between the telescopically interfitting parts of said male and female coupling elements, said telescopically interfitting parts having a sliding fit, abutment faces on said male and female coupling elements

arranged in positive engagement when said male and female coupling elements are fully engaged telescopically, thereby providing a sealing effect by at least four abutting faces free of any interposed gaps, screw-threads on the exterior of one of said coupling elements, and a threaded coupling collar engageable with said screw-threads and having a flange for abutment with the other coupling element to releasably hold said abutment faces in positive engagement, thereby providing an additional sealing effect by at least two more abutting faces free of any interposed gaps, said male coupling element having a leading cylindrical sleeve including a first annular end abutment face normal to said sleeve, the female coupling element also having a sleeve portion telescopically receiving said leading sleeve and having a second annular abutment face normal to said sleeve portion and extending from the internal surface of said sleeve portion to the bore of said female coupling element, said sleeve portion of the female coupling element having an internal annular groove receiving said ring seal, said compressed ring seal being disposed between said sleeve and sleeve portion, said ring seal being a rubber-like O-ring seal, said male coupling element having an enlarged threaded portion rearwardly of said sleeve defining a third annular abutment face normal to said sleeve, and an annular flange on said sleeve portion of the female coupling element having a fourth annular end abutment face normal to said sleeve portion and in opposing relationship to said third abutment face, said threaded coupling collar flange engaging rearwardly of the flange on the female coupling element to hold said additional abutting faces in positive sealing contact, the parts being so proportioned that when said flange on the female coupling element is so held, the said telescopically interfitting parts will be held in full telescoping relationship with said first and second faces and said third and fourth faces in positive sealing abutting engagement, and the bores of the male and female coupling elements having screw-threads to receive threaded pipe sections or threaded hose fittings.

**4,165,107**  
**FLEXIBLE BALL JOINT**  
Stephen N. Affa, Torrance, and Roy E. Yorke, Granada Hills, both of Calif., assignors to General Connectors Corporation, Burbank, Calif.

Filed Nov. 22, 1977, Ser. No. 853,855  
Int. Cl.<sup>2</sup> F16L 27/04  
U.S. Cl. 285—41



1. A flexible ball joint of the class described comprising a thin walled first portion adapted to be connected to a first duct and a thin walled second portion adapted to be connected to a second duct, said first and second portions connected together by a thin walled flexible bellows to prevent leakage between said first and second thin walled portions when hot gases flow through said first and second duct, said first portion being at least in part spherically concave and serving as a socket, said second portion being at least in part spherically convex and serving as a ball, said first and second portions disposed so said spherical ball nests inside said concave spherical socket so that the first and second thin walled portions can angulate freely, a thin walled ring shaped support, said support having a convex



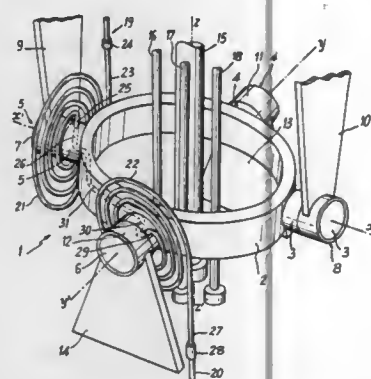
spherical outer surface and a concave spherical inner surface, said support rigidly secured to the concave surface of said first portion and in continuous engagement therewith to reinforce said first portion, a plurality of low friction buttons mounted on said support, said buttons being of the type whose coefficient of friction at least does not increase over the temperature range up to the melting point of steel, said buttons mounted on said support in such a way that a surface of the buttons bears against the convex ball to provide a low friction connection between the first and second portions to permit them to pivot freely with respect to each other over a wide range of temperatures up to the melting point of steel.

**4,165,108**  
**DEVICE FOR CONNECTING TUBES HAVING A SMALL CROSS-SECTION PERPENDICULARLY TO A UNIVERSAL COUPLING ELEMENT**

Jacques de Saint-Palais, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France  
Filed Jan. 12, 1978, Ser. No. 868,973  
Claims priority, application France, Jan. 14, 1977, 77 01095  
Int. Cl.<sup>2</sup> F16L 39/04

U.S. Cl. 285—45

7 Claims

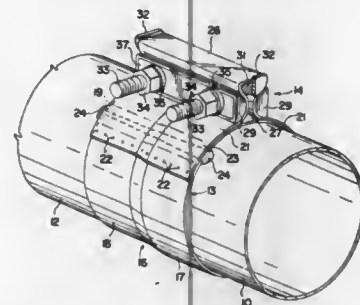


1. A device for connecting two tubes having a small cross-section perpendicularly to a universal coupling element which connects to each other a first component and a second component of an articulated marine structure, said tubes being associated respectively to said first and second structure, said universal coupling element being essentially constituted by a solid core provided with four cross-pins the respective axes of which extend in four respective radial directions any one of which is orthogonal to an adjacent one of said axes, two opposed ones of said cross-pins being supported in respective contact zones by bearing surfaces defined by one of said components of said structure, while the remaining two opposed cross-pins are supported in respective contact zones by bearing surfaces defined by the other component, said device further comprising two assemblies including each at least one tube element in the form of a planar spiral, the number of spiral tube elements of one of said assemblies being equal to the number of spiral tube elements of the other assembly, each one of said spiral tube elements being arranged centrically about the respective axes of two orthogonally disposed cross-pins of said universal coupling element, each spiral tube element having an inner end connected to the orifice of a conduit provided in the associated cross-pin, any two of the conduits provided in said cross-pins being connected to each other by a respective conduit integral with said core, said spiral tube elements further having each an outer end, the outer end of one spiral tube element being connected to the tube with said first component, while the outer end of the other spiral tube element is connected to the tube associated with the second component of said marine structure.

**4,165,109**  
**WIDE-BAND COMPRESSION COUPLING**  
Sam J. Foti, Lyndhurst, Ohio, assignor to Federal Hose Manufacturing Corp., Painesville, Ohio  
Filed Jan. 3, 1978, Ser. No. 866,217  
Int. Cl.<sup>2</sup> F16L 21/00

U.S. Cl. 285—177

7 Claims



1. A compression coupling for fitting around cylindrical objects, which comprises:  
a sleeve assembly extending circumferentially around the cylindrical objects, the assembly having a crown projecting radially outwardly and extending parallel to the longitudinal axis, a channel being formed within the crown;  
clamping means at the crown to tighten the sleeve assembly around the cylindrical objects, the clamping means comprising:  
a pair of opposed spacer members extending axially on each side of the crown, each of the spacer members having an inner camming surface,  
a center member within the channel of the crown interposed between the spacer members, the center member having a camming surface, the center member adapted to be forced radially outwardly by indirect engagement of the camming surface of the center member by the camming surfaces of the spacer members when the spacer members are drawn together, and  
fastener means inserted through the spacer members and the crown and positioned radially inwardly of the center member for drawing the spacer members together and for forcing the center members radially outwardly to tighten the sleeve around the cylindrical objects.

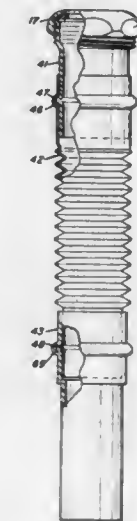
**4,165,110**  
**PLUMBING DEVICE**  
Daniel Itzler, 370 Chestnut Dr., Roslyn, N.Y. 11576  
Continuation of Ser. No. 668,964, Mar. 22, 1976, Pat. No. 4,081,190, which is a continuation-in-part of Ser. No. 551,294, Feb. 20, 1975, abandoned. This application Mar. 27, 1978, Ser. No. 890,336  
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> F16L 27/00

U.S. Cl. 285—226

2 Claims

1. A plumbing device for connecting a sink outlet to a trap out of alignment therewith but having an axis parallel to the axis of the sink outlet, said device including a tubular unitary member of plastic having an upper section for connection to said outlet, said member having a cylindrical lower section to be snugly received in the trap and having a pleated flexible blow-molded section connecting said upper and lower sections, said lower section being of substantial wall thickness and being rigid so that it can be cut with a hacksaw while said lower section is held in the hand and so that it can resist compression by seal-forming means of the trap, the wall thickness of said pleated section being a minor fraction of the wall thickness of the lower section, the wall of said blow-molded pleated section comprising substantially less material per inch along its axis in its molded condition than the amount of material per inch along the axis of said lower section for enhancing the

pliability of said pleated section, said upper section adjacent to said pleated section being cylindrical and having an external diameter of about 1½ inches to 1¾ inches said pleated section being about 2 to 5 inches long and being capable of being distorted so that said upper section and said lower section

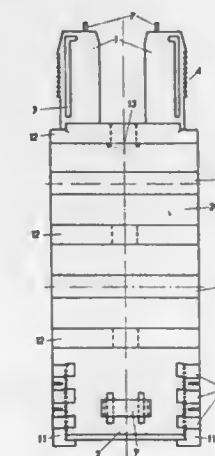


connected thereto may be maintained out of alignment but parallel, said lower section being about 4 to 8 inches long and being cylindrical and having an external diameter of about 1½ to 1¾ inches, said plastic member being of polyolefin resistant to alkaline drain cleaners.

**4,165,111**  
**COLLAR FOR GAS PIPELINES**  
Gianni Zanichelli, Milan, Italy, assignor to RACI S.p.A., Milan, Italy  
Continuation-in-part of Ser. No. 747,018, Dec. 3, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,445  
Claims priority, application Italy, Jul. 1, 1977, 25340 A/77  
Int. Cl.<sup>2</sup> E16L 21/06

U.S. Cl. 285—419

13 Claims

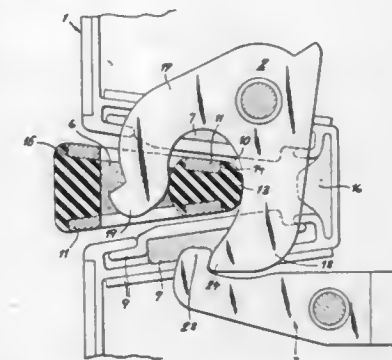


1. A collar for fitting onto a pipe in the form of a flexible band comprising:  
(a) a male end possessing two rows of teeth which lie parallel to the band axis and extend outwardly and laterally in respect to the band;  
(b) an opposite end which provides two individual rows of meshing teeth for accepting and securing the toothed male end; and  
centering ribs which traverse the width of the collar and which are positioned normal to the band axis.

**4,165,112**  
**MOTOR-VEHICLE DOOR LATCH**  
Frank Kleefeldt, Heiligenhaus, Fed. Rep. of Germany, assignor to Arn. Kiekert Söhne, Heiligenhaus, Fed. Rep. of Germany  
Filed Jun. 2, 1978, Ser. No. 911,949  
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725345  
Int. Cl.<sup>2</sup> E05C 3/26

U.S. Cl. 292—216

10 Claims

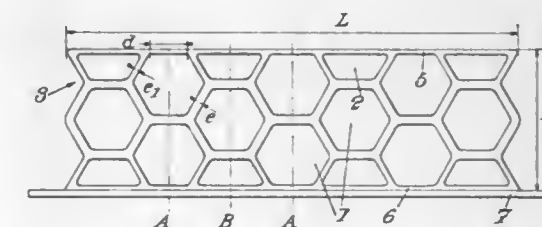


1. A motor-vehicle door latch comprising:  
a latch housing mountable on a motor-vehicle door;  
at least one elastomeric guide in said housing forming therein an outwardly opening and outwardly flared seat having a pair of relatively inclined sides;  
a locking fork pivotal in said housing between a freeing position clear of said seat and a locking position extending at least partially across said seat; and  
a bolt mountable on a motor-vehicle doorpost and formed of a U-section metal plate having a pair of legs inclined like said sides toward each other inwardly toward said housing and a bight joining said legs, said bolt being snugly fittable within said seat with said legs snugly engaging said sides, at least one of said sides being formed with a recess in which said fork is engageable in said locking position.

**4,165,113**  
**MULTICELLULAR ELASTOMERIC SHOCK-ABSORBING DEVICE**  
Christian Casse, Paris, France, assignor to Paulstra, France  
Continuation of Ser. No. 760,350, Jan. 18, 1977, abandoned. This application May 22, 1978, Ser. No. 908,140  
Claims priority, application France, Jan. 27, 1976, 76 02141  
Int. Cl.<sup>2</sup> B60R 19/06; F16F 1/36, 1/44

U.S. Cl. 293—121

10 Claims

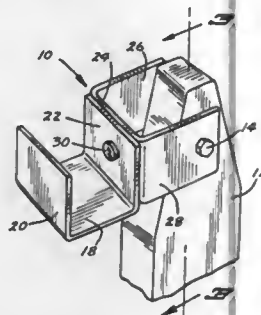


1. A multi-cellular shock absorbing device for absorbing shocks transmitted between first and second members in a given direction, said device having a top and a bottom and comprising a plurality of interdependent three-dimensional elastomeric cells arranged in a honeycomb pattern and affixed to one of said members, each said cell having a longitudinal axis, being polygonal in transverse cross section, having side walls, and being disposed such that, in use, the longitudinal axis thereof extends vertically, transversely to the direction of the shocks to be absorbed the side walls of the cells of said honey-

comb pattern being continuous from the top of the device to the bottom thereof so that, in use, said device, as viewed in the direction of the shocks to be absorbed, is formed by a single row of vertically extending cells, and the arrangement of said cells including at least two complete cells arranged serially in the direction of the shocks to be absorbed and at least one complete cell and two half cells arranged serially in said direction and formed integrally with, and disposed laterally of, said two complete cells.

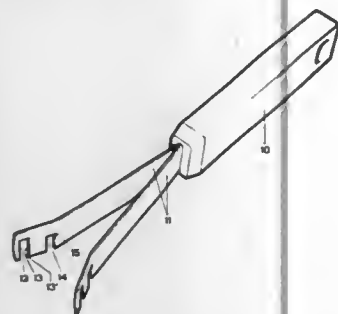
**4,165,114**  
**TRUSS HOIST**  
Larry L. Nutter, 6436 Fremont Ave., Brooklyn Center, Minn. 55430

Filed Mar. 16, 1978, Ser. No. 887,244  
Int. Cl.<sup>2</sup> B25J 1/00  
U.S. Cl. 294—19 R



1. A truss hoist for use in gripping, raising and supporting a prefabricated structural member comprising:
  - a. a first U-shaped means for gripping, raising, and positioning a prefabricated structural member;
  - b. a second U-shaped means having means rotatably mounting said second U-shaped means to a rectangular support member; and,
  - c. a swivel fastening means fastening one leg of said first U-shaped means to the base of said second U-shaped means whereby said first U-shaped means grips, raises, and positions said prefabricated structural member while said second U-shaped means is rotatably mounted to said rectangular member, and said rectangular member being held, raised and supported by an individual during construction of a building.

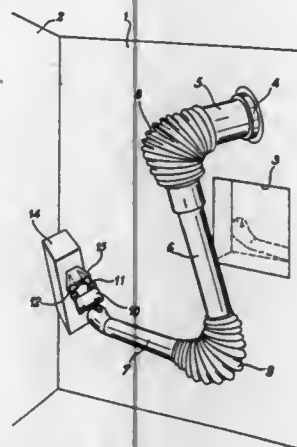
**4,165,115**  
**JAR HOLDER**  
Rune J. Olsson, Hällviksnäs, Sweden, assignor to Produnik AB, Malmö, Sweden  
Filed Dec. 7, 1977, Ser. No. 858,150  
Claims priority, application Sweden, Oct. 12, 1977, 7711455  
Int. Cl.<sup>2</sup> A47J 45/10  
U.S. Cl. 294—27 R



1. A container holder for handling containers having a peripheral outwardly-extending rim at an opening therein for

retaining a cap over the opening, comprising a handle, holder means carried at one end by the handle comprising two resilient elongated planar metal strips extending outwardly from the handle at a diverging angle to each other and resiliently resisting displacement towards each other sufficiently to be in contact with each other; each strip having formed therein at a lower edge portion thereof a notch shaped for receiving an external portion of the rim at the opening of the container at circumferentially spaced locations thereof; and a serration formed along one side edge of each notch for engagement with the external portion of the rim, when the strips are displaced towards each other to move said notches towards each other and then released.

**4,165,116**  
**GRIPPING APPARATUS FOR THE TONGS OF A REMOTE MANIPULATOR**  
Jean-Claude Baudoin, Paris, and Robert Oger, Antony, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France  
Filed Nov. 17, 1977, Ser. No. 852,467  
Claims priority, application France, Dec. 3, 1976, 76 36486  
Int. Cl.<sup>2</sup> B66C 1/66  
U.S. Cl. 294—86 R

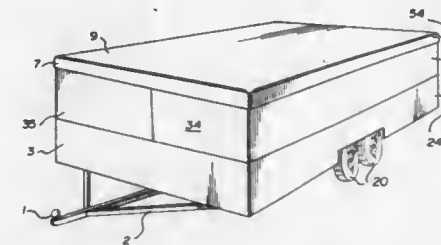


1. A gripping apparatus for the tongs of a remote manipulator having two generally triangular symmetrical elongated projections, each articulated to a tong body and having a rear end piece opposite to the end of the projection, wherein said apparatus comprises a detachable member which is fixed to each object to be manipulated by a fixing means and having a central portion which can be seized between the projections of the tongs, a supporting edge for the end piece of the projections projecting on either side of said central portion and two parallel flanges extending perpendicularly to the plane of said central portion on either side of the latter in order to cover the tong projections fastened to the central portion.

**4,165,117**  
**COLLAPSIBLE CAMPING TRAILER**  
Jarome Kaiser, Calgary, Canada, assignor to Gabor Nadhazy, Calgary, Canada  
Filed Oct. 22, 1974, Ser. No. 327,753  
Int. Cl.<sup>2</sup> B60P 3/34  
U.S. Cl. 296—27

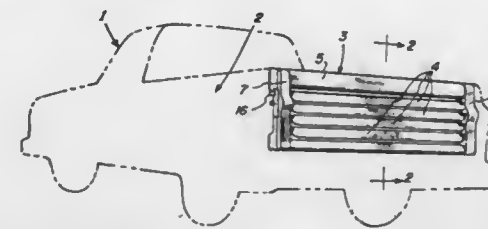
1. A collapsible camping trailer body for a wheeled trailer frame comprising:
  - (a) a lower box portion including a floor, two upstanding side walls, and two upstanding end walls, said walls being rigidly connected to said floor,
  - (b) outer wall members hingedly connected to the top edges of each of said side walls along substantially the entire length thereof,
  - (c) each of said outer wall members comprising a first panel

- joining the side wall at the hinge connection, a second panel fixed at substantially a right angle to said first panel, a pair of end panels rigidly secured to said first and second panels at the ends thereof and at right angles to each of said first and second panels, and a third panel hingedly connected to the upper longitudinal edge of said second panel,
- (d) a roof member of substantially the same length and width dimensions as said lower box portion said roof member including a substantially planar panel serving as the outer roof of said camping trailer both in expanded and collapsed positions,
- (e) the upper edge of said third panel being hingedly connected to said roof member along said edge,
- (f) triangular filler panels hingedly connected to each of the end edges of said third panels,
- (g) said outer wall members forming extension rooms wherein said first panel comprises the bottom, said second



- panel comprises a wall, and said third panel comprises a sloping roof, and said end panels and filler panels comprise front and rear walls of said extension rooms when opened,
- (h) front and rear trailer end walls hingedly connected to said roof member,
- (i) jack means for raising and lowering said roof member and thereby opening or collapsing said extension rooms and whereby said roof may be raised from a first, closed position to a second fully elevated position when said extension rooms are partially opened to a third partially elevated position when said extension rooms are fully opened,
- (j) said first panels forming vertical side walls, said second panels and third panels being in face-to-face juxtaposition and said end panels forming front and rear walls when said trailer is collapsed,
- (k) said front and rear trailer end walls being in face-to-face juxtaposition with said roof when said trailer is collapsed.

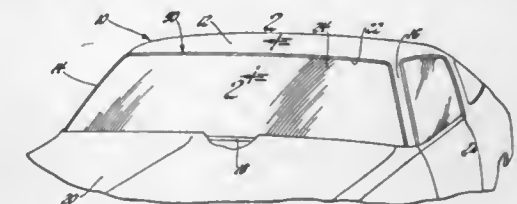
**4,165,118**  
**LOUVERED TAILGATE WITH AUTOMATICALLY ADJUSTABLE VANES**  
Edward A. Jensen, Salem, S. Dak., assignor to Jenerl, Inc., Salem, S. Dak.  
Filed Dec. 20, 1977, Ser. No. 862,657  
Int. Cl.<sup>2</sup> B62D 35/00  
U.S. Cl. 296—50



1. A drag reducing and vision augmenting device for a pickup truck comprising:
  - a tailgate for mounting at the rear of a pickup bed, said tailgate having a plurality of louvers, each of said louvers being pivotable about a horizontal axis between an open position and a closed position, said louvers being substan-

tially vertical when in said closed position and each of said louvers having more frontal area below its respective axis than above its respective axis such that when said truck is in motion, air pressure buildup in said bed will cause said louvers to move to said open position so as to relieve said pressure buildup in said pickup bed and such that when said truck is at rest, gravity will cause said louvers to assume said lowered position, said louvers being spaced so as to allow vision therebetween from the cab of said pickup when said louvers are in said closed position.

**4,165,119**  
**WINDOW REVEAL MOLDING**  
Carl E. Hedeon, Grosse Pointe Shores, and Richard D. Loose, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.  
Filed Nov. 23, 1977, Ser. No. 854,142  
Int. Cl.<sup>2</sup> B60J 1/02  
U.S. Cl. 296—93



1. In a motor vehicle body, a molding for concealing the space between a flange body panel and the edge of a window panel mounted on the body panel flange by a curable adhesive, said molding comprising:

- a decorative trim portion adapted to bridge the space between the window panel and the body panel in overlying engagement therewith;
- a resiliently yieldable stem extruded integral with the decorative trim portion and extending generally normal therefrom for insertion into the space between the window panel and body panel;
- a bulbous enlargement integral with the stem at the free end thereof and adapted to project into the curable adhesive to attach the molding to the vehicle body;
- a plurality of resiliently yieldable retrorse fins extending outwardly from both sides of the stem and angled toward the decorative trim portion, said fins being adapted for respective engagement with the edge of the window panel and the body panel flange to resiliently and yieldably center the stem between the window panel and the body panel flange, said resiliently yieldable stem and fins cooperating to permit tilting of the decorative trim portion into overlying engagement with the window panel and body panel irrespective of the mounting of the window panel in a plane disparate from the body panel, the fins on each side of the stem providing serially arranged dams, each successive pair of such fins cooperating with the stem and the respectively engaged panel to provide a reservoir for capture of adhesive overflowing the terminal fin of such successive pair to thereby prevent flow of the adhesive onto the molding and the panels upon insertion of the bulbous enlargement of the stem into the adhesive and displacement of such adhesive into the space between the panels.



4,165,120

## VEHICLE ROOF

Hans Jardin, Inning; Wolfgang Rottenfusser, Hanfeld, and Karl-Heinz Isleif, Percha, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

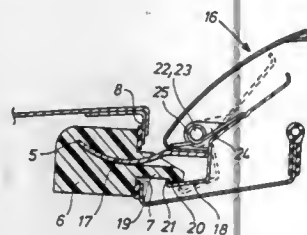
Filed Nov. 2, 1977, Ser. No. 847,910

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 7635933[U]

Int. Cl.<sup>2</sup> B60J 7/18

U.S. Cl. 296—137 J

12 Claims



1. Vehicle body apparatus comprising: vehicle body panel means, an opening formed in said body panel means, receiving element means disposed adjacent said opening, a cover member for selectively closing said opening, a wind deflector which is separate from said cover member and which is attachable at said body panel means adjacent said opening, wherein each of said cover member and said wind deflector is provided with similarly configured plug-in elements, said plug-in elements being releasably connectible with mating plug-in elements of said receiving element means to accommodate easy interchangeability and optional utilization of said cover member and said wind deflector in conjunction with said opening, and safety means secured to the underside of at least one of said cover member and wind deflector for preventing inadvertent detachment thereof, said safety means being detachably fastenable to said receiving element means in a manner enabling easy connection and disconnection thereof.

4,165,121

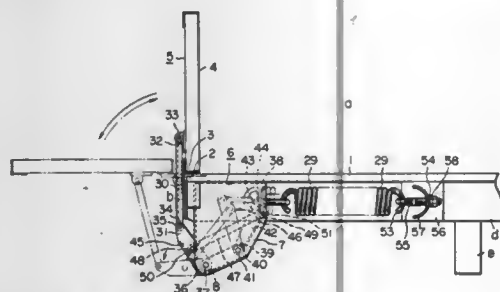
# DEVICE FOR OPENING AND CLOSING A SIDE PLATE OF A LOADING BOX ON A MOTOR TRUCK UNDER NO-LOAD CONDITION

Masaki Hori, Tokyo, and Hisashi Hori, Yokohama, both of Japan, assignors to Jidosha Seiko Co., Ltd., Tokyo, Japan Division of Ser. No. 672,308, Mar. 31, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,455

Int. Cl.<sup>2</sup> B60J 5/10

U.S. Cl. 296—57 A

3 Claims



1. A device for opening and closing a side plate of a loading box on a motor truck under no-load condition, the side plate being outwardly openably hinged at its bottom edge to the outer side edge of the floor plate of said loading box, said device comprising an interlocking mechanism consisting of

two upper and lower actuating connecting rods and twice-foldably articulated to a point on the outer surface of said side plate and to the lower portion of a support arm downwardly depending from the underside of said floor plate, said interlocking mechanism being resiliently pulled by a pull spring downwardly and sidewise of said floor plate to hold said side plate in equilibration, said upper actuating connecting rod having the upper end thereof articulated to said point on the outer surface of said side plate and having the lower end thereof articulated to the upper end of said lower actuating connecting rod, the lower end of said lower actuating connecting rod being articulated to the lower portion of said support arm, a flicking arm rod having the lower end thereof articulated to the upper portion of said support arm, the upper end of said flicking arm rod being engaged with the forward end pulling portion of said pull spring, and a control connecting rod having the opposite ends thereof articulated to intermediate portions of said lower actuating connecting rod and said flicking arm rod, respectively, the pull force of said pull spring being adjustable by changing the point of articulation between said flicking arm and said support arm or by changing the point of engagement of the base portion of said pull spring.

4,165,122

# MOTOR VEHICLE BODY WITH A RIGID SUNSHINE ROOF

Giuseppe Bertone, Turin, Italy, assignor to Carrozzeria Bertone S.p.A., Grugliasco, Italy

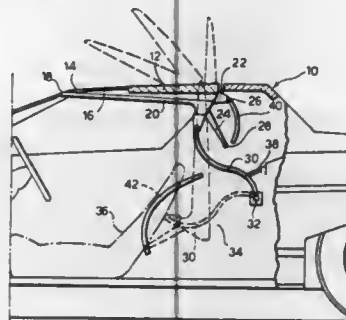
Filed Oct. 21, 1977, Ser. No. 844,169

Claims priority, application Italy, Nov. 2, 1976, 69625/76

Int. Cl.<sup>2</sup> B60J 7/24

U.S. Cl. 296—107

4 Claims



1. In a motor vehicle having a body, seats with back rests, a space behind said back rests and a sunshine roof including a separate rigid roof panel movable between a first closed position in which said panel is disposed in a substantially horizontal plane and a second open position in which said panel is disposed in the space behind said back rests, the improvement comprising supporting means pivotally connected both to the vehicle body and to the roof panel and guide means on said vehicle body and said roof panel for positively guiding the movement of said panel between its first and second positions for compelling said panel to be disposed in a substantially vertical position when said panel is disposed in its second open position; said supporting means is comprised of two lever arms disposed at opposite sides of said roof panel, each of said arms having one end pivotally connected to said panel and the opposite end thereof pivoted to said vehicle body for pivotal movement about a horizontal transverse axis located behind said back rests and said guide means is comprised of at least one curved guide rail fixed to the vehicle body at one side of the roof panel and a complementary guide engaging element on said panel adapted to operatively engage said guide rail.

4,165,123

## HIGH CHAIR APRON

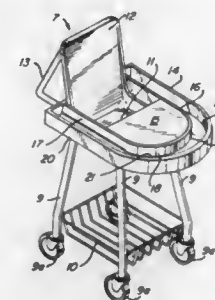
Howard A. Hutson, P.O. Box 1415, Denver, Colo. 80201

Filed Feb. 21, 1978, Ser. No. 879,137

Int. Cl.<sup>2</sup> A47D 15/00

U.S. Cl. 297—153

8 Claims



1. A disposable apron for a high chair, said high chair having a seat, chair back, and arms with a tray supported on said arms, said apron comprising

- a generally planar surface member which is positioned to overlie and be supported by said tray,
- a trough means positioned around at least three edges of said planar surface member and having a pair of ends, said trough means being arranged to catch and hold food or liquids which are dropped by a child sitting in the high chair,
- means for securing said apron to said high chair, said securing means being attached to the trough means at a location near the back of said chair and arranged to extend behind said back to secure the apron, and
- a narrow rim surface disposed between said planar surface member and said trough means, said narrow rim surface being elevated slightly above said surface member to form a ridge around at least three edges of the surface member.

4,165,124

## COMBINATION OF CHAIR AND APPAREL CABINETS

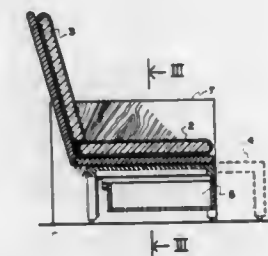
Jose A. Olan, La Quinta K-15 St. #5, Yauco, P.R. 00768

Filed May 15, 1978, Ser. No. 906,043

Int. Cl.<sup>2</sup> A47C 7/62

U.S. Cl. 297—190

4 Claims



1. A combination of chair and apparel cabinets, comprising a chair having a frame, an upholstered seat supported by the frame at a distance above a floor and an upholstered back rest supported by the frame in fixed position and extending substantially upright behind the seat; a footrest slidably mounted on the chair frame beneath the seat for movement to a stored position under the seat and to an extended position for supporting the feet of a person seated in the chair; an apparel container slidably mounted on the chair frame beneath the footrest for movement to a stored position under the footrest and the seat and to an extended position for exposing said container to access by a user; a first apparel cabinet extending along one side of the chair

and positioned substantially perpendicularly to the seat and back rest thereof; and

a second apparel cabinet extending along the opposite side of the chair and positioned substantially perpendicularly to the seat and back rest thereof in substantially parallel relation with said first apparel cabinet, at least one of said first and second apparel cabinets having a height dimension sufficient to form an arm of the chair, each of said first and second cabinets having a back panel abutting said seat and back rest, a front side panel extending to a height at least equal to that of an arm of the chair, a back side panel equal in height to the front side panel in spaced parallel relation with the front side panel and a substantially horizontal top panel.

4,165,125

## SLIPOVER HEADREST PILLOW ASSEMBLY

Hugh J. Owen, Mansfield, Ohio, assignor to National Seating Company, Mansfield, Ohio

Continuation-in-part of Ser. No. 805,590, Jun. 8, 1977,

abandoned. This application Aug. 8, 1978, Ser. No. 931,900

Int. Cl.<sup>2</sup> A61G 15/00

U.S. Cl. 297—220

10 Claims



1. In combination with a seat back, a slipover headrest pillow assembly comprising an invaginable, open bottom box-like cover having front, back, top and end walls relative to said seat back, a pillow insert, pocket means along the front wall of said cover having two positions, the first position being exposed on the outside of said cover to facilitate receipt of said pillow insert in said pocket, the second position being inside said cover after said pillow insert has been received and after the cover has been invaginated, and a support compartment formed by the cover between the pillow pocket, top, back and end walls of said cover after invagination, such compartment receiving the top of said seat back when the cover is slipped thereover to support such pillow assembly in a headrest position.

4,165,126

## ADJUSTABLE VEHICLE SEAT BOTTOM

Werner Strien, Stuttgart-Heumaden; Rudolph Zwanziger, Erkenbrechtsweller, and Ernst Kaufmann, Stuttgart, all of Fed. Rep. of Germany, assignors to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany

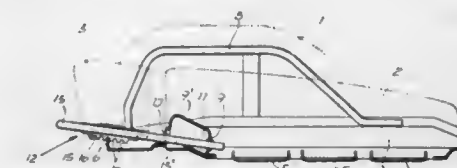
Filed Aug. 15, 1978, Ser. No. 933,952

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2739999

Int. Cl.<sup>2</sup> A47C 7/02

U.S. Cl. 297—284

6 Claims



1. In a vehicle seat including a seat bottom having upholstery which is divided transversely into front and rear sections,

said sections being supported by a front and rear upholstery support respectively, the upholstery supports being adjustably slidable relative to each other, means for latching the upholstery supports in selectable relative positions, the front upholstery support having two parallel rods for supporting the front upholstery section, means for guiding the rods so as to be longitudinally shiftable relative to the rear upholstery support, the improvement wherein said guiding means comprise bores formed in the rear upholstery support for receiving said rods, said bores having dimensions which permit limited upward pivotal motion of the rods, said front upholstery support including a plate, said two rods being attached to said plate, said plate having downwardly directed edge strips extending substantially parallel to the rods, said edge strips having a series of downwardly open notches, said rear upholstery support having a raised front edge, said notches and raised front edge defining said latching means.

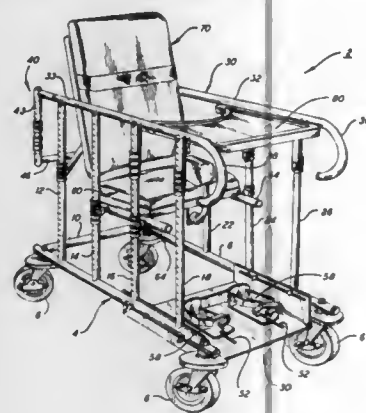
4,165,127

**THERAPEUTIC AND REHABILITATIVE CARRIAGE**  
Robert E. Vago, Manlius, N.Y., assignor to Diakinetics, Incorporated, East Syracuse, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,100  
Int. Cl.<sup>2</sup> A47C 1/027

U.S. Cl. 297—345

4 Claims



1. A therapeutic and rehabilitative carriage for receiving and transporting an invalid patient comprising a wheeled chassis having horizontal upper and lower framework and a plurality of upright stanchions running between the upper and lower framework to provide a generally cage like structure; a seat member for receiving and supporting the buttocks of a patient mounted on selected stanchions for horizontal, vertical, and angular movement; a back support member mounted independently of the seat member and positionable with respect to said seat in order to receive and support the back of said patient; a foot rest platform mounted on the lower framework below the seat member to receive and support the feet of said patient; said seat member, back support member, and foot rest platform being independently positionable within said chassis; and movable locking means on said stanchions vertically positionable to secure in selected relative positions said seat member, back rest member, and foot rest platform.

4,165,128

**INERTIALLY LOCKED HINGE FOR MOTOR-VEHICLE SEAT**

Willibald Strowick, Remscheid-Lennep, and Paul Werner, Remscheid, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

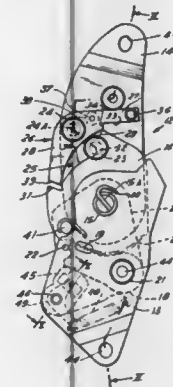
Filed Sep. 14, 1977, Ser. No. 833,336

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641587

Int. Cl.<sup>2</sup> A47C 1/025

U.S. Cl. 297—367

10 Claims



1. In a motor-vehicle seat having a seat part and a reclining back part adjustable in any of a plurality of angular positions relative to said seat part, a hinge comprising:  
a lower hinge element fixed to said seat part;  
an upper hinge element fixed to said back part;  
means for pivotably connecting said upper hinge element to said lower hinge element;  
a positioning element pivotal on said lower hinge element and formed with an outwardly open recess having one end forming a stop formation and another end forming an abutment engaging said upper hinge element in a rest position thereof;  
an inertial pawl in the form of a two-arm lever pivotal on said upper hinge between a blocking position and a freeing position, one arm of said lever being directed toward said stop formation on said positioning element and having a stop face engageable with said formation when said pawl is in said blocking position, the other arm of said lever being directed substantially horizontally and weighted so as normally to pivot by gravity in one rotational sense into said freeing position;  
said another end on said positioning element having a support surface adapted for engaging said other arm against the force of gravity to urge said pawl into said blocking position and for releasing said other arm into said freeing position only upon a slow forward pivoting of said back part; and  
means for locking said positioning means in any of a plurality of angularly offset positions for adjusting said rest position.

4,165,129

**SHIELD TUNNELING MACHINE AND METHOD**  
Yoshihito Sugimoto, Kokubunji; Konosuke Miyata, Matsudo; Kanehiro Ishihara, Tokyo; Sachio Fujimoto, Yachiyo, and Tsunehiro Kakutani, Kashiwa, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo and Sato Kogyo Kabushiki Kaisha, Toyama, both of Japan

Filed Nov. 17, 1977, Ser. No. 852,308

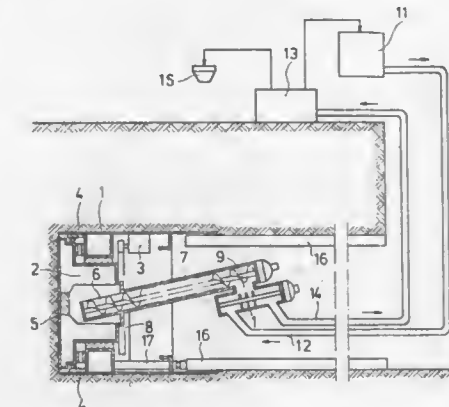
Int. Cl.<sup>2</sup> E21D 9/08

U.S. Cl. 299—11

11 Claims

1. A shield tunneling machine comprising  
(a) a cutter disposed for rotation by motors, maintained in

water-tight relationship with the inner surface of a shield frame with sealing members and formed integral with a water-tight cutter chamber,  
(b) a screw conveyor water-tightly connected to said cutter chamber in such a way that the loading opening of said screw conveyor is communicated with said cutter chamber, and



(c) a mucking adjuster for the mixture of muck and water disposed immediately below the unloading opening of said screw conveyor and connected at one end thereof with a water supply pipe and at the other end thereof with a discharge pipe.

4,165,130

**IMPACT TUNNELING MACHINE WITH CUTTERS SPACED FOR EQUAL WORK**

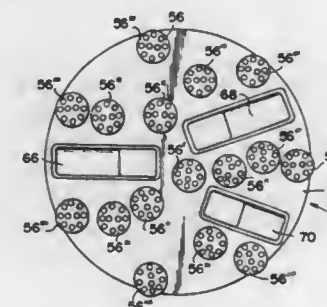
Warren S. Mason, R.R. 2, Box 179H, Chicago Heights, Ill. 60411

Filed Jan. 5, 1978, Ser. No. 867,024

Int. Cl.<sup>2</sup> E21D 9/10

U.S. Cl. 299—62

8 Claims



1. A workhead assembly for a tunneling machine comprising:  
a shroud means;  
a rotatably mounted circular plate adapted to form a closure at the inlet end of said shroud means;  
a plurality of cutting tool means arranged in radially spaced series about said plate and projecting forwardly therefrom, said tools being of such number and so arranged in series that the distance traveled by each tool upon rotation of said circular plate divided by the number of tools in that series is generally equal; and  
means mounted for rotation with said circular plate means for removing cuttings from the area of the tunnel face as they are formed.

985 O.G. 27

4,165,131

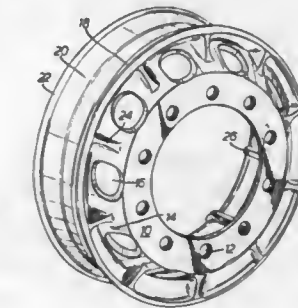
**CAST VEHICLE WHEELS**

Joseph A. Thompson, Stourbridge, England, assignor to GKN Kent Alloys Limited, England

Continuation-in-part of Ser. No. 628,961, Nov. 5, 1975, abandoned. This application Jul. 7, 1977, Ser. No. 813,571  
Int. Cl.<sup>2</sup> B60B 1/06

U.S. Cl. 301—65

4 Claims



1. A cast vehicle wheel comprising:  
a wheel centre comprising a nave having apertures to enable the wheel to be secured to a vehicle hub, and an inclined section extending generally outwardly from the nave and consisting essentially of T-section spokes separated by vent holes; and  
a rim portion having a well extending from the outer periphery of said inclined section and  
two tire bead seat portions spaced apart by the well;  
each said T-section spoke comprising a web extending between the outer face of said inclined section and the adjacent one of the said tyre bead seat portions, said web forming the stem of the T and, forming part of the cross-member of the T,  
an integral fillet located on the inner face of said inclined section so that the cross-member of the T is thicker at its middle than at its ends which are located at two adjacent vent holes.

4,165,132

**PNEUMATIC CONTROL OF THE MOTION OF OBJECTS SUSPENDED ON AN AIR FILM**

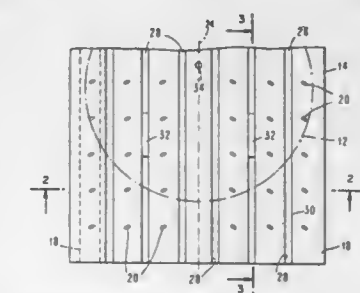
Javathu K. Hassan, Hopewell Junction, and John A. Palvanas, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,394

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> B65G 51/02

U.S. Cl. 406—10

3 Claims



1. Apparatus for stopping an object such as a semiconductor wafer as it moves relative to the surface of a track on a fluid film comprising:  
strings of openings in the surface of the track along the axis of movement of the wafer across the track to supply fluid for the fluid film,



an exhaust channel which is many times longer than the length of the object being transported and is oriented parallel to the strings of openings in the surface of the track to allow excess fluid from the film to be removed from the track to establish a film for transporting the wafer,

a nozzle emitting a fluid jet in at least one direction along the channel at a sufficient pressure so as to draw fluid from the film along with it into the channel to cause a perturbation in the film in the form of a vacuum around the nozzle that will stop the object on the track.

**4,165,133**  
**MATERIAL HANDLING SYSTEM FOR WIDE RANGE OF MATERIALS AND FLOW RATES**

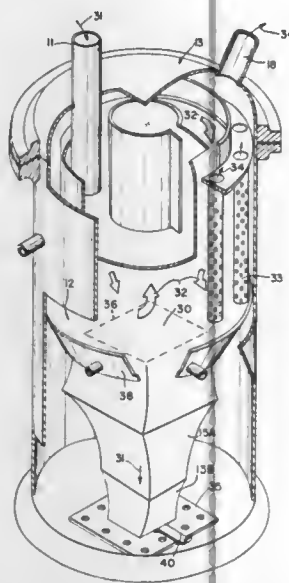
Albert O. Johnson, Rte. 8, Box 1052, Livingston, Tex. 77351

Filed Sep. 26, 1977, Ser. No. 836,895

Int. Cl.<sup>2</sup> B65G 53/28, 53/36

U.S. Cl. 406—109

10 Claims



1. A variable output pneumatic conveyor system for transporting a wide range of finely divided, granular and hygroscopic bulk materials through conveyor tubes by pneumatic flow, comprising in combination,

a pneumatic source, pneumatic tubing coupled with said source to transport by pneumatic flow in the tubing said materials, material storage means accumulating and introducing primarily by force of gravity at a constant uninterrupted flow rate into said tubing for transport a continuous flow of different materials of widely differing characteristics in said range and constituting a generally funnel shaped hopper comprising a two tiered funnel having two separate hyperbolic surfaces meeting in an outwardly directed intersection with the lowermost tier having a funnel shape terminating at an output throat, establishing constant flow rate gravity feed characteristics for said different materials,

variably selectable control means located in the funnel throat establishing different gravity induced flow rates out of said hopper into said tubing, and movable valve means between said hopper throat and said tubing for selectively gating upon command said flow of materials into said tubing for transport therein by means of said pneumatic source, said valve means comprising a gating valve which controls the batch flow time so that the flow of material can be metered.

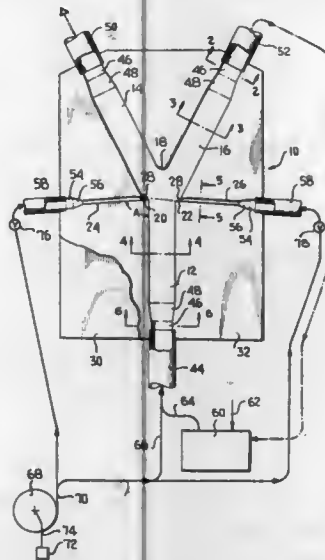
**4,165,134**  
**PNEUMATIC POWDER FLOW DIVERTING DEVICE**  
Robert D. Payne, Countryside, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 16, 1977, Ser. No. 825,240

Int. Cl.<sup>2</sup> B65G 53/16

U.S. Cl. 406—1

6 Claims



1. A pneumatic powder flow diverting device comprising a powder-gas admixture supply line, a delivery line and a return line for selectively receiving a powder-gas admixture from said supply line, said delivery line and said return line being arranged in a V pattern and in intersecting relation to define an intersection tapering towards said supply line; said supply line, said delivery line and said return line all being of substantially the same cross section adjacent said intersection, said supply line opening directly into said intersection at a point where the intersection is of a width greater than the width of said supply line with there being a shoulder at each side of said supply line, and diverter lines opening into said intersection on opposite sides of said supply line immediately adjacent said shoulders.

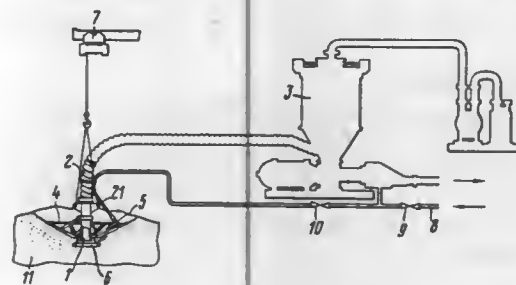
**4,165,135**  
**METHOD OF UNLOADING BULK MATERIALS FROM VESSELS AND DEVICE FOR IMPLEMENTING SAME**  
Max M. Shapunov, ulitsa Frunze, 16, kv. 15; Mikhail A. Koppel, ulitsa Vosstania, 22, kv. 18; Felix M. Frumkin, ulitsa Prazhskaya, 34, kv. 93; Evgeny I. Zvenigorodsky, Vladimirovsky prospekt, 11/10, kv. 15, all of Leningrad, U.S.S.R., and Antal Gabor, Ifjumunkash 9, Tatabanya U, Hungary

Filed Jan. 23, 1978, Ser. No. 871,394

Int. Cl.<sup>2</sup> B65G 53/42

U.S. Cl. 406—152

4 Claims



1. A device of unloading a bulk material from vessels, comprising:

a sucking nozzle for taking said bulk material to be transported;  
a bulk material transportation means connected to said sucking nozzle;  
a means for loosening said bulk material being attached to said sucking nozzle and embracing said sucking nozzle so that an inlet opening of said sucking nozzle is disposed below said loosening means;  
said loosening means being made as the frustum of a cone installed with its smaller base facing downwards, while the lateral surface of said cone is formed by a number of spaced-apart separate ribs;  
a means for supplying aerating air into said bulk material, being attached to said loosening means and installed under said sucking nozzle;  
said aerating air supply means being made as an annular tube having an inlet opening and provided with a plurality of outlet holes facing said sucking nozzle;  
a pneumatic vibrator attached to said loosening means and having an inlet branch pipe and an outlet branch pipe, said outlet branch pipe of said pneumatic vibrator being connected to said inlet opening of said aerating air supply means; and  
a pressure line connected to said inlet branch pipe of said pneumatic vibrator.

switch connected to said second air tank and held in its open position by the pressure in said second air tank, the pressure in said first air tank acting upon said differential switch in the closing direction thereof, a first delay having a first contact switch connected to said first differential switch and a second contact switch in series with said pressure switch, said first and second contact switches being open when said first relay is deenergized, a second relay having a third contact switch connected in series with said first contact switch and having an energizing circuit connected to said second contact switch, said second relay having a fourth contact switch connected to said solenoid valve, said third and fourth contact switches being open when said second relay is deenergized, and a normally closed condition responsive switch connected to an energizing circuit of said first relay so that opening of said condition responsive switch in response to a predetermined condition deenergizes said first relay to open said first and second contact switches and after a predetermined delay deenergizes said second relay whereupon said fourth contact switch is opened to actuate said solenoid valve to open the throttle connection to the atmosphere thereby decreasing pressure to said control input to actuate said brake valve to reduce pressure in said air line to effect a braking action.

**4,165,136**  
**CONTROL SYSTEM OF A RAILWAY VEHICLE AIR BRAKING SYSTEM**  
Hans Erlbeck, Unterzolling, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

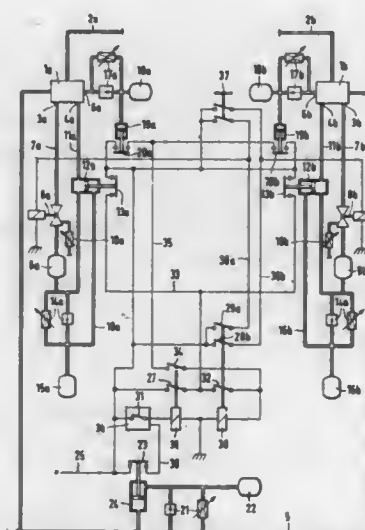
Filed Feb. 22, 1978, Ser. No. 880,281

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708273

Int. Cl.<sup>2</sup> B60T 7/14

U.S. Cl. 303—19

7 Claims



1. A control system for an air brake system of a railway vehicle comprising an operator's brake valve connected to an air line and having an operating lever, said brake valve having a control connection, a control output, a control input and pressure regulating means connected to said control output and means for controlling pressure in said air line connected to said control input, connecting means between said control output and said control input including means for establishing a first throttle connection to the atmosphere, a first air tank having a first throttle check valve connected to said control input and a first differential pressure switch one side of which is connected to said control input and the other side connected to said first air tank, said throttle connection establishing means comprising a solenoid valve having an energizing circuit, a second air tank connected through a second throttle check valve to said control connection on said brake valve, a pressure

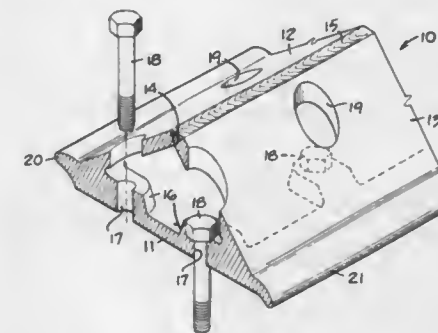
**4,165,137**  
**APEX TRACK SHOE AND METHOD FOR MAKING THE SAME**  
Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 26, 1977, Ser. No. 828,005

Int. Cl.<sup>2</sup> B62D 55/28

U.S. Cl. 305—54

17 Claims



1. A track shoe adapted for use in an endless track assembly comprising  
a base,  
a pair of laterally spaced sidewalls formed integrally with said base and extending away therefrom and towards each other in converging relationship to terminate at end portions thereof disposed in close proximity to each other to define a track shoe having a uniform triangular cross section at least substantially throughout the width thereof, and  
a lug formed on each lateral side of said base and extending outwardly therefrom.

**4,165,138**  
**DISPENSER CABINET FOR SHEET MATERIAL AND TRANSFER MECHANISM**  
Russell K. Hedge, Green Bay, and William S. Huss, Appleton, both of Wis., assignors to Mosinee Paper Company, Mosinee, Wis.

Continuation-in-part of Ser. No. 741,947, Nov. 15, 1976, abandoned. This application Apr. 15, 1977, Ser. No. 787,791

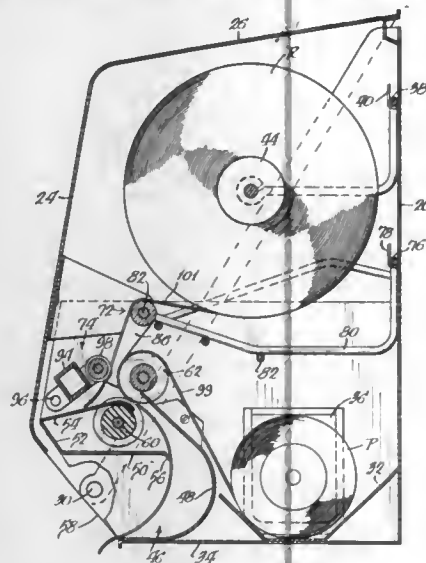
Int. Cl.<sup>2</sup> B65H 19/06

U.S. Cl. 312—39

25 Claims

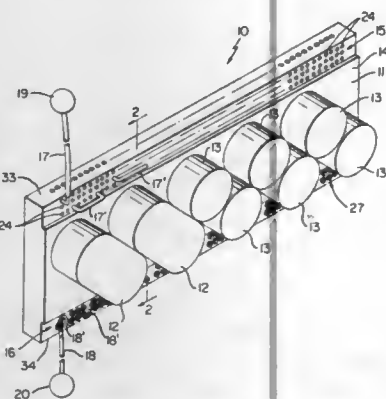
1. In a dispenser for sequentially dispensing sheet material

from first and second supplies thereof, a feed mechanism for receiving material from either of said supplies and for dispensing said material, and means for sensing the presence of said first supply material at said feed mechanism when feeding said first supply material and for transferring said second supply material to said feed mechanism upon sensing the absence of said first supply material at said feed mechanism, said feed mechanism including a pair of parallel and engaging feed rolls



at least one of which is rotatably driven to dispenser material, said material from said first supply extending around at least a portion of one of said rolls and between said rolls when said material is being fed, said sensing and transferring means including means for sensing the presence of said first supply material around said one of said rolls, and means for transferring said second supply material to between said rolls in response to said sensing means sensing the absence of said first supply material from around said one of said rolls.

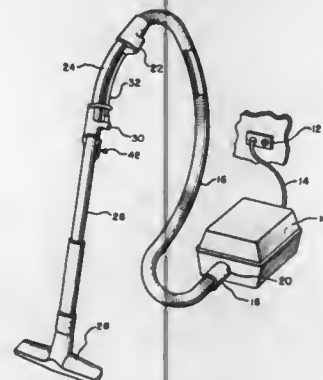
**4,165,139**  
**MANIFOLDING MEANS AND SYSTEM FOR ELECTRICAL AND/OR PNEUMATIC CONTROL DEVICES AND METHOD**  
Clarence M. Asbill, III, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.  
Division of Ser. No. 780,038, Mar. 22, 1977, Pat. No. 4,093,329.  
This application Feb. 7, 1978, Ser. No. 875,950  
Int. Cl.<sup>2</sup> H01R 3/04  
U.S. Cl. 339—15 10 Claims



1. In a combination of a manifold means detachably carrying on one side thereof a plurality of control units each of which is pneumatically and electrically operated and each of which is fluidly and electrically interconnected to pneumatic means and

electrical means of said manifold means, the improvement wherein said one side of said manifold means has external interconnection means for said pneumatic means and said electrical means whereby external pneumatic and electrical lines can be interconnected to said interconnection means and thereby be interconnected to the same side of said manifold means that said units are interconnected thereto.

**4,165,140**  
**VACUUM CLEANER ATTACHMENT WAND WITH DEMOUNTABLE ELECTRICAL CONNECTOR**  
John B. Lyman, Bloomington, and Bruce E. Stewart, Maplewood, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.  
Filed Feb. 17, 1978, Ser. No. 878,733  
Int. Cl.<sup>2</sup> H01R 3/04  
U.S. Cl. 339—15 14 Claims

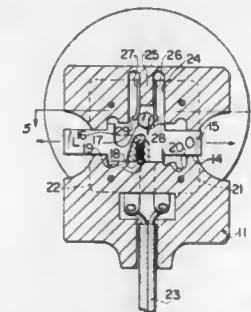


1. A floor tool wand for a floor tool of a vacuum cleaner comprising:  
a rigid hollow tube;  
an elongated slide having generally parallel sides on and spaced apart from the surface of the hollow tube, the axis of the slide being generally parallel to the axis of the hollow tube, the slide having outwardly extending stop means and notch means spaced apart from the stop means;  
a plug electrically coupled to the floor tool;  
a connector retaining the plug;  
the connector and the plug forming axially extending channels receiving the slide; and  
a movable lock for selectively retaining the connector against the stop means.

**4,165,141**  
**LOCKING ELECTRICAL CONNECTOR**  
Frank R. Williams, Utica, and William Abraham, New Hartford, both of N.Y., assignors to Consolidated Medical Equipment Inc., Utica, N.Y.  
Filed Dec. 16, 1977, Ser. No. 861,282  
Int. Cl.<sup>2</sup> H01R 7/06, 13/54  
U.S. Cl. 339—75 R 4 Claims

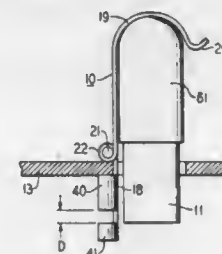
1. In combination, an electrode including a stud having an enlarged head thereon, an electrical connector comprising a base plate, a slot in said base plate, a slidable locking element disposed in said slot, a cam surface disposed on said locking element, a recess in said base extending normally with respect to said slot, a pair of electrical contact elements, one of said electrical contact elements being fixed to said base plate on each side of said recess in said base plate whereby edge surfaces of said contact elements are in spaced relation to receive the electrode stud therebetween, an enlarged spacing portion between the contact elements to receive the head of the stud and adjacent thereto a reduced spacing portion between the contact elements of insufficient width to pass the head of the stud therebetween whereby when the electrode and connector

are to be attached the headed stud is placed within the recess within the enlarged spacing portion between the contact element and the locking element is moved to bring the cam sur-



face into engagement with the headed stud to force the headed stud to a position within the recess within the reduced spacing portion between the contact elements and to maintain the headed stud in a locked position therein.

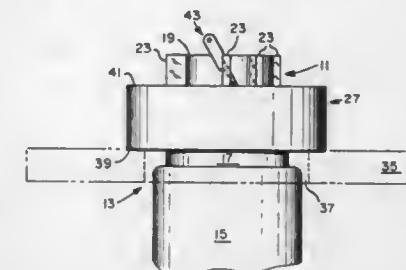
**4,165,142**  
**CONNECTOR CLIP**  
Edwin W. Grabau, Point Pleasant, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed May 18, 1978, Ser. No. 906,934  
Int. Cl.<sup>2</sup> H01R 13/54  
U.S. Cl. 339—75 R 4 Claims



1. A clip for securing in mated relationship a two-part connector having a first part mounted to a panel and a second part adapted for mating with said first part, characterized in that said clip comprises  
a first section having a lateral surface and a curved upper section folding forward over said lateral surface and shaped generally to extend over a top surface of a mated connector, said first section having a pair of fingers extending from a lower end of said lateral surface and separated by a first space, said fingers each rolled back over said lateral surface in a direction opposite the direction of said curved upper section, each said rolled finger forming an enclosed tubular passage,  
a second section having a lateral surface and a pair of tabs extending outward from each side of said lateral surface, said tabs curved back toward said lateral surface, said pair of tabs on each side of said lateral surface forming a first slot between them having a width adapted to accept said panel therebetween,  
said second section having a finger extending from a top edge of said lateral surface and disposed evenly about the center thereof, said finger rolled back on the same side of said second section lateral surface as are said other tabs of said second section, said second section rolled finger forming an enclosed tubular passage having a width adapted to fit within said first space between said first section enclosed tubular passages,  
a pin extending through said first section enclosed tubular passages and said second section enclosed tubular passage

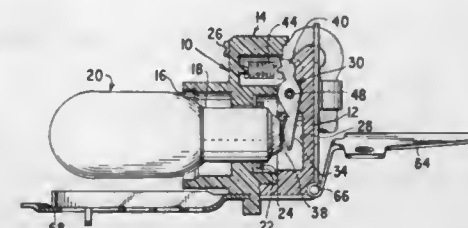
thereby joining said first and second sections in hinged relationship with each other,  
said pair of tabs of each side of said second section having an upper and a lower surface, said lower surface of the top tab on each side of said second section defining the top edge of said second section slot and said upper surface of the bottom tab on each side of said second section defining the lower edge of said second section slot, said lower edges of said upper tabs and said upper edges of said lower tabs forming bearing surfaces for supporting said retaining clip with respect to a panel inserted within said first slot.

**4,165,143**  
**ELECTRON TUBE SOCKET SECURING MEANS**  
Peter G. Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.  
Filed Aug. 3, 1978, Ser. No. 930,766  
Int. Cl.<sup>2</sup> H01J 5/60; H01R 13/54, 33/82  
U.S. Cl. 339—75 T 10 Claims



1. Means for releasably securing a socket member to the finned base of an electron tube, said socket having opposed surfaces and an opening formed therethrough dimensioned and configured to accommodate said base in an encompassing manner, said base being seated relative to one of said surfaces and having the terminal portion of at least one base fin egressing from an opposite surface of said socket, the improvement comprising: a bore formed in a slanted manner through the egressing portion of said base fin; and a substantially longitudinal locking pin having a length greater than that of said bore and formed of an integrated handle and shank, said shank having a proximal terminal portion and said handle an opposed distal terminal portion, said pin being slidably accommodated within said bore in a manner that the end surface of said proximal portion substantially abuts a surface of said socket, said pin having retention means associated with the proximal portion of said shank and formed to interact with the egressing portion of said fin to constrain the removal of said pin from said bore thereby releasably securing said base to said socket.

**4,165,144**  
**LIGHT SOCKET WITH LEVER CONTACTS**  
Albert N. Cook, Madison; Boleslaw Kornatowski, Elizabeth, and Raymond S. Tyburcy, Middletown, all of N.J., assignors to The Singer Company, New York, N.Y.  
Filed Feb. 24, 1978, Ser. No. 880,690  
Int. Cl.<sup>2</sup> H01R 13/54, 17/22  
U.S. Cl. 339—88 R 1 Claim



1. A light socket for bayonet-type lamps comprising:



a lamp receiving portion having an opening therethrough for receiving said lamp;  
 means for lockably retaining said lamp in said opening;  
 a base mountable to said lamp receiving portion for closing one end of said opening, said base having a recess formed therein, and said base formed with at least one hollow boss arranged alongside of said lamp receiving portion when said base is mounted to said lamp receiving portion, with said recess in registry with said opening;  
 lever means formed of an electrically conductive material having one end thereof extending into said base recess to engage an electrical contact on said lamp and an opposite end extending into said hollow boss, fulcrum means for said lever carried in said second housing between said recess and said hollow boss;  
 connecting means for providing electrical power to said lever means; and  
 compression spring means constrained in said hollow boss for engagement with the opposite end of said lever means for urging said contact engaging end of said lever means into said opening in said lamp receiving portion whereby, when said lamp is inserted into said opening, said contact engaging end of said lever means will physically engage an electrical contact on said lamp.

4,165,145

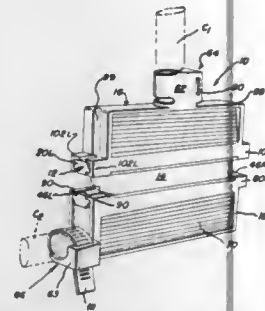
## RIBBON CONNECTOR CONSTRUCTIONS

Thomas M. Steinbach, Park Ridge, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 672,643, Apr. 1, 1976, Pat. No. 4,089,579. This application Dec. 27, 1977, Ser. No. 864,439

Int. Cl.<sup>2</sup> H01R 13/54, 13/58

U.S. Cl. 339—91 R



1. A hood construction for an electrical connector having projecting portions on opposed end portions; said hood comprising a body portion; first engagement portions at one end portion of said hood defining a slot with adjacent hood portions for snugly receiving the projecting portions of one end portion of such connector; portions of said hood at the other end portion thereof being readily flexible relative to said body; second engagement portions on said flexible portions for snap engagement with the projecting portions at the other end portion of such a connector having one end portion engaged in said slot whereby said hood is retained on such a connector.

4,165,146

## RETENTION MEANS FOR SNAP-IN SPRING

Charles A. Snyder, Holland, Pa., assignor to Circle F Industries, Inc., Trenton, N.J.

Filed Feb. 3, 1978, Ser. No. 874,738

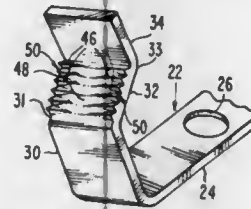
Int. Cl.<sup>2</sup> H01R 13/00; G12B 9/00

U.S. Cl. 339—128

3 Claims

1. In a mounting spring clip means for an electrical wiring device of the type adapted to snap into and grip opposed edges of a wiring-device-receiving mounting opening of a mounting plate, said clip means including divergent spring arms resiliently, yieldably opposing movement toward each other, convergent gripping portions on the divergent ends of the spring

arms, and transversely extending gripping means on said convergent portions, said spring arms being in embracing relation to the wiring device to be mounted, the improvement comprising serrations defining said gripping means, the serrations of each gripping portion being confined to opposed longitudinal edges of said gripping portion, the serrations extending along the opposite longitudinal edges of said gripping portion being



arranged in rows, the serrations of each row extending transversely of the length of the row, each serration of a row having its length aligned with a corresponding serration of the other row, said gripping portion having a shallowly dished, inwardly offset midwidth area intervening between the rows of serrations, the serrations of each row merging smoothly into and disappearing within said depressed area at the edge of said depressed area.

4,165,147

## PRINTED CIRCUIT BOARD JACK

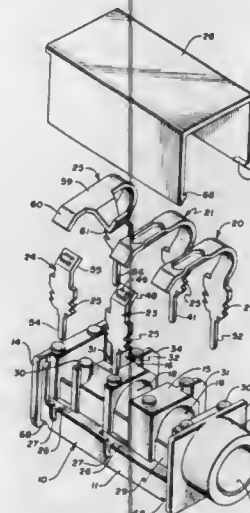
Josef J. Buck, Minneapolis, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Jun. 5, 1978, Ser. No. 912,196

Int. Cl.<sup>2</sup> H01R 17/18; H05K 1/10

U.S. Cl. 339—182 R

12 Claims



1. An electrical jack suitable for direct connection to a printed circuit board comprising:

an elongated nonconductive housing having a generally cylindrical opening therein along a longitudinal axis for insertion of a plug member;

at least two contact assemblies mounted in said housing extending generally transverse to said cylindrical opening, each of said contact assemblies including

a first contact element mounted in a cantilevered manner in said housing and having a portion extending transversely across said cylindrical opening for electrical engagement with a portion of said plug member when inserted therein, said first contact element further including a free end movable between a first and second

position in response to insertion and removal of said plug member, respectively,  
 a second contact element mounted in a cantilevered manner in said housing and having a free end, each of the free ends of said first and second contact elements including contact surfaces for electrical engagement with each other when the free end of said first contact element is in its second position, the contact surface of said second contact element being disposed at an angle of at least about 10°-15° but less than about 75°-80° relative to the generally linear movement of the free end of said first contact element between said first and second positions,  
 means for retaining said first and second contact elements in said housing, and  
 means electrically connected with each of said first and second contact elements for direct electrical connection with a printed circuit board.

4,165,148

## COMPRESSIBLE ELECTRICAL CONNECTOR WITH POSITIVE MECHANICAL LOCK

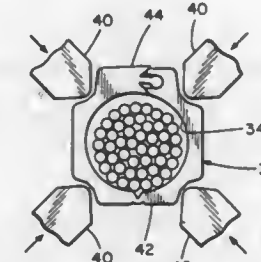
Paul K. Campbell, and Edward L. Nichols, III, both of Birmingham, Ala., assignors to Square D Company, Park Ridge, Ill.

Filed Jul. 19, 1978, Ser. No. 925,737

Int. Cl.<sup>2</sup> H01R 5/08

U.S. Cl. 339—276 R

8 Claims



1. A ductile metallic electrical and mechanical connector for attachment to one or more electrical cables and formable by a compressible process, said connector comprising:

at least one bifurcated body member having first and second leg portions initially connected by a reduced cross-sectional thickness portion of said body member to provide a plastically flowable hinge connection, said first and second leg portions defining an initial predetermined angle such that said body member can laterally engage an uninsulated section of an electrical cable;

said first leg having on the end opposite said reduced thickness portion an axially extending rib member and axially extending inner and outer ridges disposed on either side of said rib member;

said second leg having on the end opposite said reduced thickness portion axially extending inner and outer fingers, said rib member, said inner and outer ridges and said inner and outer fingers being oriented such that said outer finger lies between said outer ridge and said rib member, and said inner finger lies between said inner ridge and said rib member, when said body member is closed about an uninsulated section of an electrical cable, said enclosure occurring by pivoting of said leg members about said reduced thickness portion in response to hand applied external pressure; and

wherein said inner and outer fingers and said rib member are deformed to form a positive mechanical lock when an external crimping force is applied radially to said body member.

4,165,149

## DEVICE FOR SCANNING AN OBJECT WITH A LIGHT BEAM

Akiyoshi Suzuki, Tokyo, and Yoichi Hirabayashi, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

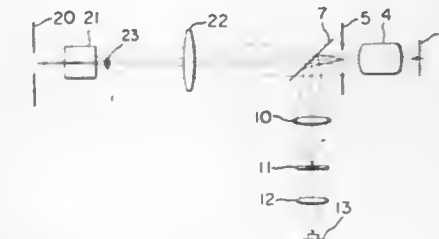
Filed Jan. 17, 1978, Ser. No. 870,081

Claims priority, application Japan, Jan. 21, 1977, 52/5503

Int. Cl.<sup>2</sup> G02B 27/17, 11/27

U.S. Cl. 350—6.1

3 Claims



1. A device for scanning with a light beam an object having a flat reflection surface and an inclined reflection surface with a certain inclination relative to the flat reflection surface, comprising:

(a) a deflector with the original point of deflection arranged to deflect the light beam from a light source, said deflector rotating at a constant angular velocity;

(b) an objective lens arranged to receive the light beam from said deflector, said objective lens being so disposed that said original point of deflection is positioned on the center of the focal plane of said objective;

(c) a light detector for detecting light which has been reflected at said object, and passed through said objective lens;

(d) a filter interposed between said objective lens and said light detector, said filter functioning to intercept light from said flat reflection surface, and to cause light from said inclined reflection surface to pass therethrough; and

(e) an optical element disposed between said deflector and said object, for converting the movement of the deflected light beam into a movement at a constant speed, over an area of the object to be scanned, which is proportional to said constant angular velocity.

4,165,150

## LOW LOSS DIRECTIONAL COUPLING FOR OPTICAL FIBRES

Gary S. Duck, Ottawa, and Frederick D. King, Smith Falls, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 10, 1978, Ser. No. 895,001

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.15

10 Claims



1. A low loss directional coupling for optical fibres comprising a first fibre and a second fibre, the second fibre wrapped round the first fibre a predetermined number of turns, any cladding layer on the fibres removed whereby the light transmitting cores of the fibres are in contact.

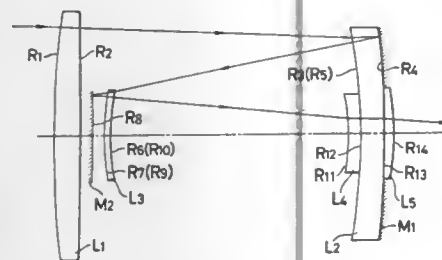
**4,165,151**  
**TWO-REFLECTING CATADIOPTIC OPTICAL SYSTEM**  
 Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1977, Ser. No. 806,507

Claims priority, application Japan, Jun. 19, 1976, 51/71696  
 Int. Cl.<sup>2</sup> G02B 17/00

U.S. Cl. 350—201

3 Claims



1. A two-reflecting catadioptric optical system including: a front positive lens having a front surface whose radius of curvature is smaller than that of a rear surface thereof; a negative meniscus lens positioned on the image side of said front positive lens in coaxial relation thereto, having a front surface concave toward the front and having a rear surface provided with a mirrored portion surrounding a light-permeable region; a positive meniscus lens of forward convexity positioned between said front positive lens and said negative meniscus lens; a convex mirror of rearward convexity positioned between said front positive lens and said positive meniscus lens, apart from said positive meniscus lens; and a negative lens cemented onto the front surface of said negative meniscus lens and a positive lens cemented onto the rear surface of said negative meniscus lens in the light-permeable region.

**4,165,152**  
**PROCESS FOR PRODUCING OPTICAL TRANSMISSION FIBER**

Satoshi Shiraishi, Kunio Fujiwara, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

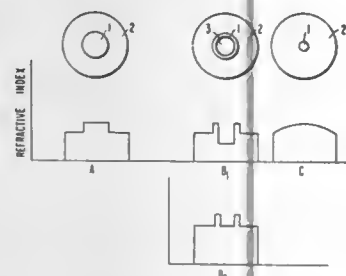
Division of Ser. No. 648,998, Jan. 14, 1976, Pat. No. 4,082,420, which is a continuation of Ser. No. 419,011, Nov. 26, 1978, abandoned. This application Aug. 22, 1977, Ser. No. 826,572

Claims priority, application Japan, Nov. 25, 1972, 47-118345; Nov. 25, 1972, 47-118346

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96.30

9 Claims



1. A tubular optical transmission fiber wherein the refractive index varies between the periphery and the central longitudinal axis of the fiber, said variation being symmetrical with respect to the central longitudinal axis of said fiber, said fiber comprising an inner cavity, an outer radial portion being a lower refractive index portion being made of dope fused silica

containing B<sub>2</sub>O<sub>3</sub>, said dope fused silica consisting essentially of SiO<sub>2</sub> and B<sub>2</sub>O<sub>3</sub> and an inner radial portion being a higher refractive index portion being made mainly of pure fused silica consisting essentially of SiO<sub>2</sub>.

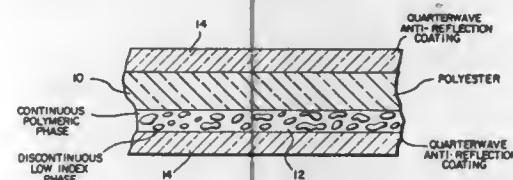
**4,165,153**  
**TRANSLUCENT SCREEN**  
 Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 25, 1978, Ser. No. 899,792

Int. Cl.<sup>2</sup> G03B 21/60

U.S. Cl. 350—126

15 Claims



1. A translucent screen comprising a dispersion of particles as a discontinuous phase in a polymeric continuous phase, said continuous phase having a higher index of refraction than said particles, said particles and said continuous phase having indices of refraction differing by at least 0.10, said particles having nonplanar surfaces and having overall diameters not exceeding about 5 microns.

**4,165,154**  
**PROJECTION SCREEN ASSEMBLY**  
 Yoshimasa Takahashi, Moriguchi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

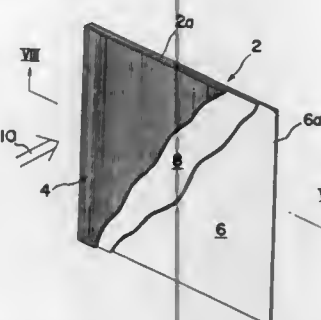
Filed Oct. 5, 1977, Ser. No. 839,597

Claims priority, application Japan, Oct. 5, 1976, 51-120504; Mar. 15, 1977, 52-33138[U]

Int. Cl.<sup>2</sup> G03B 21/60

U.S. Cl. 350—128

8 Claims



1. A screen assembly for projecting thereon light beam emitted from a source of light carrying an image, so as to form the image thereof, which comprises:

a transparent plate having on one side thereof a lenticulated surface means comprising a plurality of elongated cylindrical lens elements extending in a parallel relation to each other and on the other side thereof a mat-finished surface means, wherein said lenticulated surface means diffuses the incoming light in a horizontal direction which is perpendicular to the elongated cylindrical lens elements, and said mat-finished surface means diffuses the incoming light in all directions, relative to the direction of travel of the incoming light, whereby the light projected on the screen assembly diffuses at a first predetermined angle of diffusion which is small relative to the direction of the longitudinal axis of any one of said elongated cylindrical lens elements and at a second predetermined angle of diffusion which is great relative to the direction perpendicular to

the longitudinal axis of any one of said elongated cylindrical lens elements.

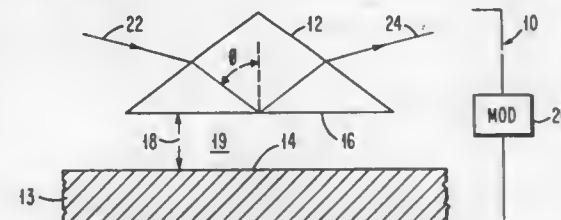
**4,165,155**  
**AMPLITUDE MODULATION OF LIGHT BEAM**  
 Joseph G. Gordon, II, and Glenn T. Sincerbox, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,171

Int. Cl.<sup>2</sup> G05D 25/00

U.S. Cl. 350—285

11 Claims



1. An optical device comprising: an optically transparent first material having a first plane surface, a second material having a second plane surface with a negative dielectric constant facing said first surface to form a gap therebetween, a medium filling said gap and having a dielectric constant whose magnitude is less than that of said first material, and means for changing the thickness of said gap wherein the optical thickness of the gap determines the reflectivity of a monochromatic linearly polarized light beam that is passed into said first material and that undergoes total internal reflection at the interface between said first surface and said medium.

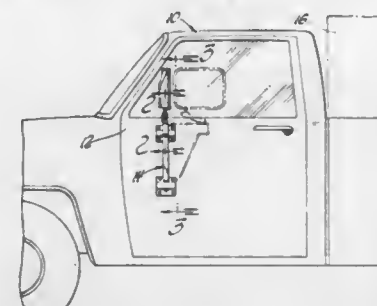
**4,165,156**  
**OUTSIDE MOUNTED VEHICLE MIRROR WITH MULTIPLE ROTATION AXES**  
 Lawrence E. O'Connell, Doylestown, Pa., assignor to Delmar Products, Inc., Perkasie, Pa.

Filed Jul. 3, 1978, Ser. No. 921,378

Int. Cl.<sup>2</sup> G02B 5/08; A47G 1/24

U.S. Cl. 350—307

17 Claims



1. A mirror assembly for mounting on an outside vehicle panel, said assembly including an integral bracket member having a laterally extending leg portion with an inner end disposed proximate said vehicle panel and a downwardly and inwardly inclined leg portion having an inner end disposed proximate said vehicle panel, a linear support arm having a first end supported proximate the laterally outer portion of said bracket member for rotation about a substantially vertical axis, said support arm including a second end upwardly inclined at an acute angle to the laterally extending leg portion of said bracket member, and a mirror head having a transverse mid-plane, said mirror head including a support shaft having an axis generally parallel to and laterally offset from said transverse mid-plane, said support shaft including an end projecting exte-

riorly of said mirror head and supported upon said other end of said support arm to permit rotation of the mirror head about the axis of said support shaft, first and second bracket means respectively pivotally connecting the inner ends of the bracket member to said vehicle panel whereby the bracket member may be positioned between a fully extended laterally outward position and a folded-back storage position generally parallel to the vehicle panel.

**4,165,157**  
**LIQUID CRYSTAL CELL HAVING A GLASS FIBER FRAME**

Manfred Kobale, Faistenhaar, and Hans Krlieger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 5, 1977, Ser. No. 822,205

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635942

Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350—343

1 Claim



1. A method of producing a liquid crystal cell comprising at least two plate members each having a surface with at least a portion thereof having electrical conductive coatings thereon, said plate members being spaced apart by a spacing frame means for maintaining the surfaces of the plates parallel to one another with the frame means and the two plates forming a chamber for receiving a liquid crystal material, said method comprising providing at least one glass fiber, drawing each glass fiber through a solution of synthetic adhesive material to produce a fiber having a synthetic adhesive casing, preliminarily cross-linking said material of the synthetic adhesive casing, positioning the glass fiber in the desired pattern of the spacing frame means on a surface of one of said plate members, pre-heating said one plate member to cause an attachment of the fiber to the surface thereof, assembling the second plate member on the spacing frame means formed by the glass fiber, and then securing the plate members together and to the glass fiber of the frame means by applying temperature and pressure so that the synthetic adhesive casing extrudes between the surfaces of the plate member and the fibers to enable each of said surfaces of the plate members to come in contact with the fiber and said synthetic material to adhesively connect said surfaces to said fiber.

**4,165,158**  
**CAST CONTACT LENSES AND METHOD FOR MAKING SAME**

Edward A. Travnicek, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jul. 25, 1977, Ser. No. 818,491

Int. Cl.<sup>2</sup> G02C 7/04

U.S. Cl. 351—160 H

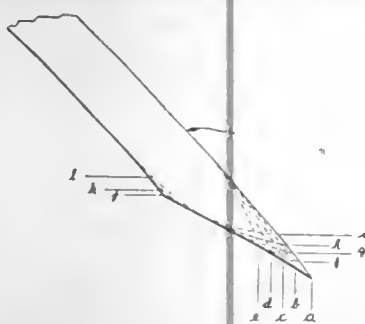
6 Claims

1. A cast and otherwise unworked finished corneal contact lens comprising:

a meniscus body of ophthalmic lens material having a vanishing thin edge without flashing, the inflection point of said edge being along a single line located intermediately of adjacent portions of oppositely disposed convex exterior and concave interior surfaces of said body, said inflec-



tion point specifically being in such position as to lie between the eyelid and cornea of an eye receiving the lens

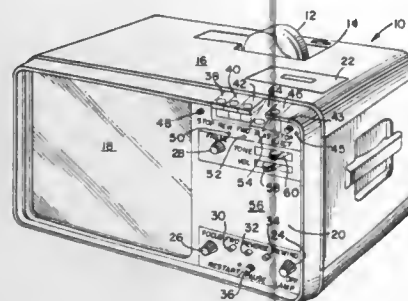


and out of engagement with either when the lens is worn and said lens requiring no further finishing.

#### 4,165,159 MICROPROCESSOR CONTROLLED FILMSTRIP PROJECTOR

John V. Landau, Mountain Lakes, N.J.; Marvin I. Mindell, Pittsford; William T. Daly, Rochester, both of N.Y.; J. David Garland, Passaic, N.J., and Arthur B. Price, Byron, N.Y., assignors to The Singer Company, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,889  
Int. Cl.<sup>2</sup> G11B 31/00; G09B 1/00; G03B 21/00  
U.S. Cl. 353—15 38 Claims



1. Apparatus for regaining synchronization between a series of image presentations and an audio accompaniment therefor recorded on a magnetic tape and having associated cue tones recorded thereon comprising:

- a projector for projecting a series of said images;
- said projector including image bearing means and means for moving said image bearing means through said projector in a forward and reverse direction to change the projected image;
- said projector including means for providing a pulse signal each time a projected image is changed by moving said image bearing means in a forward or reverse direction;
- tape transport means for said magnetic tape and including means for separating said cue tones from said audio accompaniment as said tape is moved in a fast forward or a fast reverse direction; and
- automatic processing means coupled between said projector and said tape transport means;
- said processing means including means for receiving the pulse signals indicative of said image changes and the cue tones from said fast moving tape for algebraically keeping a first count therein that is indicative of the synchronization, or distance and direction to synchronization, between said projected images and the audio accompaniment on said magnetic tape;
- said first count being indicative of the number of cue tones to be produced by moving said magnetic tape to regain synchronization between said projected images and said sound;
- said tape transport including means to enable said magnetic

tape to be moved in a fast forward direction to produce a number of cue tones equal to said first count to regain synchronization between said images and said sound;

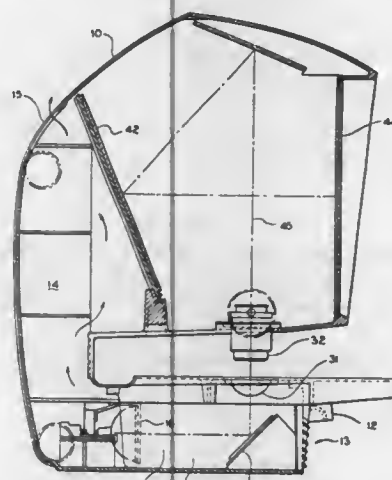
said tape transport and said processing means including means to enable said magnetic tape to be moved in a fast reverse direction to automatically produce a number of cue tones that is greater than said first count by a predetermined amount to regain synchronization between said images and said sound;

said processing means including means for automatically causing said tape transport to stop said magnetic tape when it is moved in the fast forward direction to produce said number of cue tones equal to said first count and for automatically causing said tape transport to stop said magnetic tape when it is moved in the fast reverse direction to produce said number of cue tones that is greater than said count.

#### 4,165,160 LAMP ASSEMBLY AND POWER MODULE FOR FANLESS MICROFICHE READER

Thomas J. Persha; Eino M. Lehto, both of Juneau; Richard Dueck, Hartford, and Nick Hechlmovich, Horicon, all of Wis., assignors to Bell & Howell Company, Chicago, Ill.

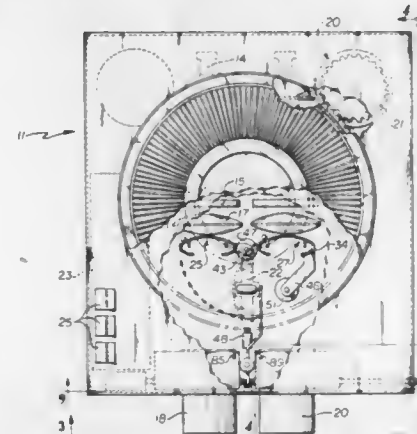
Continuation-in-part of Ser. No. 851,833, Nov. 16, 1977. This application May 15, 1978, Ser. No. 905,816  
Int. Cl.<sup>2</sup> G03B 21/16, 21/28  
U.S. Cl. 353—55 5 Claims



1. In a microform display apparatus having a lamp assembly, a power module operatively connected to the lamp assembly to provide power to illuminate the lamp, a mirror assembly and a lens system in a housing for projecting an image on a viewing surface, the housing including a base having a center line extending along a longitudinal axis from the front to the back of the housing, the improvement comprising:
- means defining a chamber at the base of the housing;
  - means for mounting the lamp assembly in said chamber at a point remote from the center line for projecting a beam of light at a predetermined acute angle with respect to the longitudinal axis toward the mirror assembly;
  - means for mounting the power module in said chamber on the other side of the longitudinal axis from said lamp assembly;
  - means for mounting the mirror assembly in said chamber so as to reflect light from the lamp assembly to the lens system;
  - means defining an air inlet at one end of said chamber;
  - a substantially vertically rising chimney in said housing and communicating with the end of said chamber opposite said air inlet and substantially over the lamp assembly and power module;
  - and dichroic reflector means disposed in said chamber so as

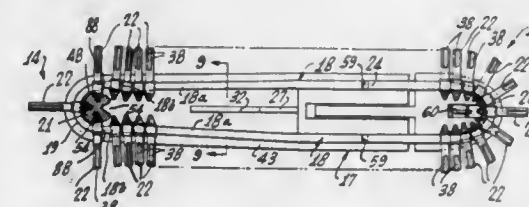
to selectively direct visible light from the lamp assembly to the mirror assembly and allow infra red radiation to pass in a direction toward the chimney, whereby cooling air flows from said air inlet, passes over the lamp assembly and the power module where heat is transferred to the cooling air, and then rises in said chimney where it escapes from the housing.

#### 4,165,161 MULTIPLE OPTICS SLIDE PROJECTOR Gideon A. Kramer, 2401 SW. 172nd, Seattle, Wash. 98166 Filed Apr. 24, 1978, Ser. No. 899,082 Int. Cl.<sup>2</sup> G03B 21/20, 21/26, 1/48 U.S. Cl. 353—86 27 Claims



1. In a multiple optics projection slide projector, an apparatus for moving slides stored in a slide receptacle into and out of either of at least two projection optics systems, comprising:
- first and second slide gate means for holding slides, each slide gate means being movable between a first position in which slides are acquired and released, and a second position in which acquired slides are projected onto a screen or the like; and
  - first and second means for rotating, respectively, said first and second slide gate means between said first and second positions about axes which are parallel to the plane of the slides in said second position.

#### 4,165,162 TRACK-TYPE SLIDE PROJECTOR MAGAZINE Gerald J. Frey, 1486 Cantera Ave., Santa Barbara, Calif. 93110 Filed Aug. 22, 1977, Ser. No. 826,551 Int. Cl.<sup>2</sup> G03B 23/08 U.S. Cl. 353—109 37 Claims



1. A magazine for use in a slide projector, comprising:
- an elongated plastic body having two elongated sidewalls disposed in substantially parallel first and second planes, and two arcuate endwalls connecting said sidewalls at the ends of said body and cooperating therewith to form a continuous rail having oppositely facing top and bottom edges disposed in parallel third and fourth planes;
  - a rib extending around the outer side of said body and having

a top side in an intermediate fifth plane parallel to said third and fourth planes;

said body being divided along said sidewalls into first and second relatively movable end sections for longitudinal expansion and contraction, said second end section being movably mounted on said first end section;

spring means yieldably urging said second end section toward said first end section;

a drive shaft rotatably mounted on said body inside the arcuate endwall of said first end section, said drive shaft having an outer surface coaxial with said arcuate surface of said first end section, and formed with four equally spaced longitudinal driving grooves of V-shaped cross-section therein;

a series of plastic slide holders mounted and stored on said rail in closely stacked, side-by-side relation to be advanced step by step thereon by said drive shaft, each of said holders having a base positioned along the outer side of said rail and slidably mounted thereon, and slide-holding means carried by said base to hold a slide in an outwardly projecting position for movement around said rail;

said bases having inner side portions formed with inwardly opening, dove-tail-like notches fitted over said rail, and the open inner sides of said notches being defined between upper and lower fingers projecting toward each other along the inner side of said rail and having outwardly facing edges sliding along the inner side of the rail;

said notches having top edge walls slidably engaging the top edge of the rail to ride thereon as the holders slide around the rail, and each notch having an abutment edge along its closed outer side slidable along the top side of said rib to resist tilting of the slide holder on the rail;

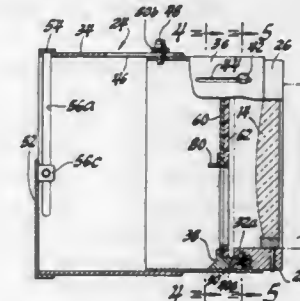
drive couplings of V-shaped cross-section on the inner sides of said fingers facing inwardly for engagement with said driving grooves in said drive shaft;

said slide holders filling said sidewalls and said second end section when said end sections are separated by a small gap, whereby said spring means urge the holders toward said drive shaft;

the sidewalls of said rail having diverging sections adjacent said shaft for tilting said holders to position said fingers for positive engagement in said grooves;

and spanning means on said body extending across said gap to maintain said slide holders in alignment with said rail during movement of the slide holders across said gap.

#### 4,165,163 CAMERA HAVING MULTIPLE IMAGE DEVICE Savarian F. Lemanski, 109 Taylor Ave., Detroit, Mich. 48202 Filed Nov. 25, 1977, Ser. No. 854,627 Int. Cl.<sup>2</sup> G03B 1/00 U.S. Cl. 354—122 5 Claims



1. In combination with a camera having a lens for transmitting light to expose film in the camera, a multiple image attachment comprising:
- a housing comprising a first tube and a second tube telescopically received in the first tube for longitudinal motion thereto, said housing having a first opening and a second opening for the transmission of light through said housing;

means for mounting said housing on the camera in a first position such that said first opening is adjacent the camera lens;

first mask means mounted in the first tube an adjusted distance with respect to the lens for partially blocking light being received into the housing;

second mask means mounted in the second tube in a position between the first mask means and the camera lens, the second mask means being cooperable with the first mask means to permit light to be transmitted through only a predetermined portion of the lens;

the distance between the first mask means and the second mask means being adjustable by adjusting the position of the first tube with respect to the second tube; and

said mounting means supporting said first mask means and said second mask means for motion toward a second position to permit light to be transmitted to a portion of the lens through which light was blocked in said first mask position.

4,165,164

## DIAL CLICK STOP APPARATUS

Shigeo Akasaka, Kodaira, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

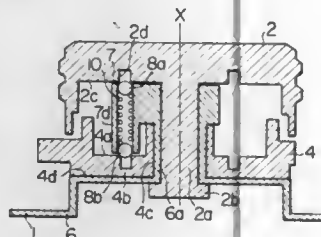
Filed May 18, 1978, Ser. No. 907,307

Claims priority, application Japan, May 24, 1977, 52-66577[U]

Int. Cl.<sup>2</sup> G03B 17/00; G01D 13/00

U.S. Cl. 354-289

4 Claims



## 1. A dial click stop apparatus comprising:

a first dial rotatably supported on a body and having on one surface thereof a plurality of bores distributed along a circle;

a second dial rotatable about the same rotation axis as that of said first dial but independently of it and having on one surface thereof a plurality of bores distributed along a circle;

an intermediate member interposed between said first and second dials and having a through bore passing through said member, one open end of said through bore being opposed to the locus of the circle along which the bores of said first dial are disposed and the other open end of said through bore being opposed to the locus of the circle along which the bores of said second dial are disposed, said intermediate member being fixed to said body;

detent means in said through bore; and

a biasing member also inserted in said through bore and adapted to bias one of said detent means against said first dial while biasing the other against second dial, whereby said first dial may be click stopped through engagement of one of said detent means with any one of the bores of said first dial and said second dial may be click stopped through engagement of the other of said detent means with any one of the bores of said second dial.

4,165,165

## COLOR IMAGE FORMATION APPARATUS

Naoki Iwami, Tokyo; Hidejiro Kadowaki, Yokohama; Takao Aoki, Abiko; Shunichi Kubo, Tokyo; Akihiro Tomosada, Yokohama; Tetsuji Tachika, Tokyo, and Eichi Kondo, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

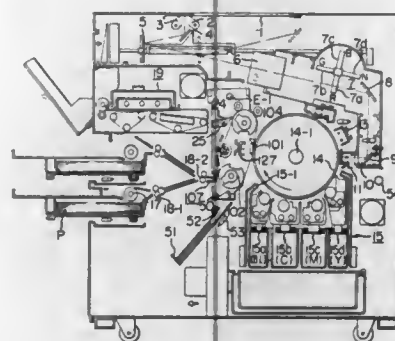
Filed Feb. 8, 1977, Ser. No. 766,681

Claims priority, application Japan, Feb. 12, 1976, 51/14274 Int. Cl.<sup>2</sup> G03G 15/01

U.S. Cl. 355-4

21 Claims

	FILTER			
	B	G	R	ND
DEVELOPER	SWO	SW1	SW2	SW3
	SW4	SW5	SW6	SW7
	SW8	SW9	SW10	SW11
	SW12	SW13	SW14	SW15



1. A color image forming apparatus which projects an optical image, having light components of an image original, upon a photosensitive medium for forming electrostatic latent images thereon, and which color-develops the latent images to form a color image, said apparatus comprising a photosensitive medium, optical image projecting means for exposing said photosensitive medium to the optical image, electrostatic latent image formation means for forming electrostatic latent images on said photosensitive medium in accordance with the exposure to the optical image effected by said optical image projecting means, color separating means having a plurality of color separating filters for selective disposition in the optical path of said optical image projecting means, developing means having a plurality of developing units for supplying different color developers to develop the electrostatic latent images formed on said photosensitive medium by said electrostatic latent image formation means, a plurality of process mode setting means each having a first element for setting a selected one of said color separating filters across the optical path, and a second element for setting a corresponding selected one of said developing units to be operated, wherein two of said process mode setting means may be identically set and control means coupled with each of said said process mode setting means, for actuating said separating filters and said developing means in a predetermined order and in accordance with the settings of said first and second elements.

4,165,166

## EXPOSURE CONTROLS FOR PHOTOGRAPHIC APPARATUS

Dieter Engelsmann, Unterhaching; Hubert Hackenberg, Munich, and Rolf Schröder, Baldham, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

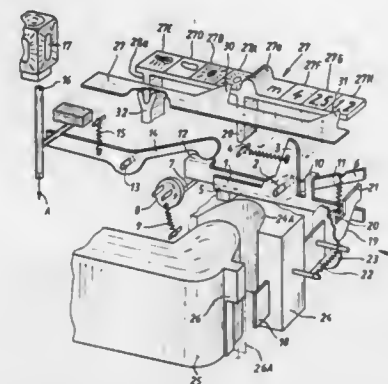
Filed Apr. 20, 1978, Ser. No. 898,339

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717736

Int. Cl.<sup>2</sup> G03B 7/00, 15/03, 17/00

U.S. Cl. 354-21

13 Claims



1. In a photographic apparatus which is convertible for the making of exposures in daylight and artificial light, the combination of

- (1) a housing having a chamber for containers provided with markers denoting the sensitivity of film therein;
- (2) a follower movably mounted in said housing and being displaceable by the marker of the inserted container to an extent which is a function of the sensitivity of film in such container;
- (3) selector means mounted in said housing and movable between a plurality of positions each of which denotes a different intensity of scene light;
- (4) control means movably mounted in said housing in the path of movement of said follower and also in the path of movement of said selector means so that the position of said control means is a function of the position of said selector means as well as a function of the sensitivity of film in the inserted container; and
- (5) exposure time selecting means including adjusting means movable between a plurality of positions each of which corresponds to a different exposure time, said adjusting means being located in the path of movement of said control means so that said control means can change the position of said adjusting means and hence the exposure time as a function of the sensitivity of film in the inserted container and/or as a function of the position of said selector means, and means for moving said adjusting means in response to conversion of said apparatus from the making of exposures in one type of light to the making of exposures in the other type of light.

4,165,167

## PHOTOGRAPHIC CAMERA

Rolf Jurenz, and Claus Becker, both of Dresden, Fed. Rep. of Germany, assignors to Veb Pentacon Dresden Kamera-Undkinowerke, Dresden, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,899

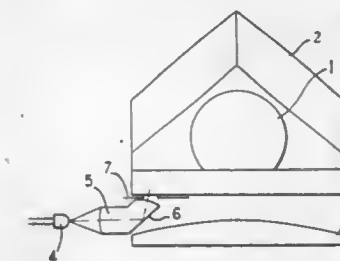
Int. Cl.<sup>2</sup> G03B 17/20, 19/12

U.S. Cl. 354-53

5 Claims

1. In a camera having a viewfinder and exposure factor indicator system and including a roof prism, a field lens, an eyepiece, an indicator panel carrying exposure factor markings, and a luminous element which illuminates the indicator panel uniformly, the provision of an image reproduction sys-

tem adjacent the indicator panel, the indicator panel being located between said system and the roof prism, which system transmits therethrough the light ray from the luminous element to the roof prism so as to reproduce the exposure factor mark-



ings and an image of the luminous element visible to the observer of the viewfinder, said reproduction system having a reflecting surface arranged to reflect the light from the luminous element into the roof prism.

4,165,168

## ELECTROPHOTOGRAPHIC DOCUMENT COPIER MACHINE WITH MODULAR PAPER PATH ASSEMBLY

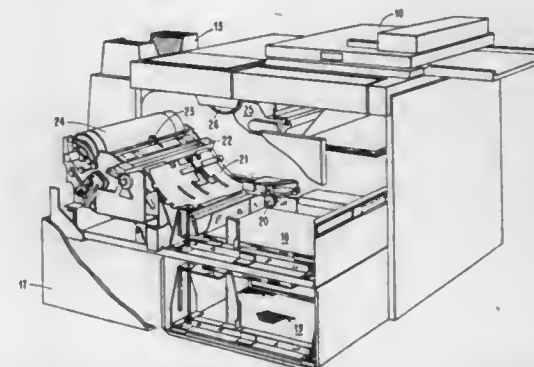
Gerald W. Baumann; Robert L. Burdick, both of Boulder, Colo.; Willie Goff, Jr., Austin, Tex., and Edwin L. Libby, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,058

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-3 R

2 Claims

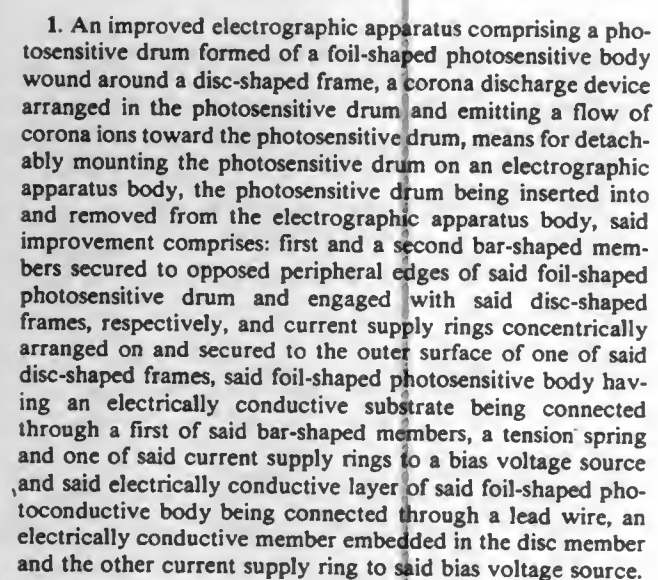


1. In an electrophotographic machine of the transfer type including a photoconductor material upon which images of documents to be copied are reproduced, a modular construction wherein a slide-out main drawer is provided upon which is mounted the copy paper path mechanisms, said main drawer including:

- at least one copy paper storage bin for holding a supply of copy paper;
- copy paper feed means for moving said paper out of said bins;
- transport means for receiving said paper from said feed means and moving said copy paper to a transfer station whereat said paper receives the image on said photoconductor;
- a transfer corona;
- fuser means for impressing said image on said copy paper, and
- wherein said storage bin is mounted in a mini-drawer separate from but within said main drawer whereby said storage bin is made accessible without opening said main drawer.



### 3 Claims

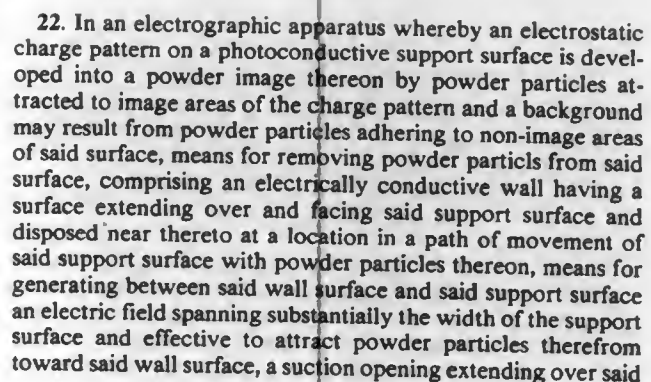


## 1 Claim

1. A method of controlling an electrostatographic reproducing system for producing copies on copy sheets, a path for said copy sheets, an imaging path, a plurality of actuatable stations positioned along said copy sheet and imaging paths for processing said copies including stations for forming and developing latent electrostatic images of an original in succession on a photoreceptor means driven along said imaging path, and transferring the developed images onto the copy sheets traversing along said copy sheet path in succession, wherein said system is designed to make copies at a given rate and wherein said imaging and copy sheet paths are divisible into zones so spaced that the images and copy sheets in transit traverse corresponding zones at said given rate, said method including the steps of:

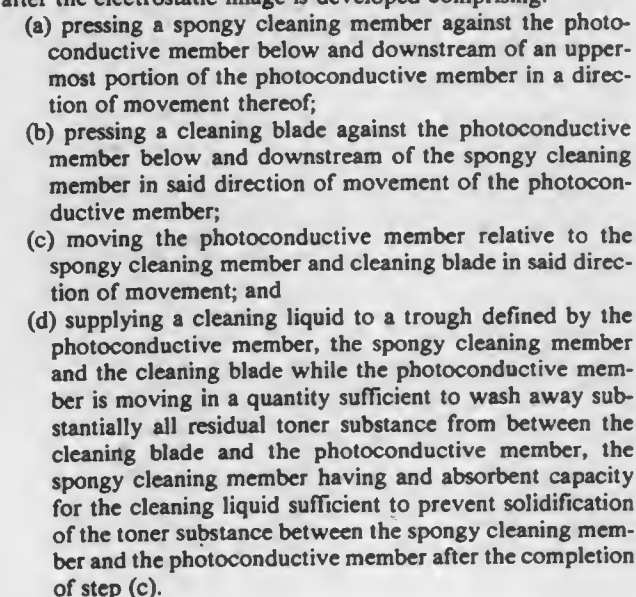
train of pulses for repetitively actuating selected ones of said plurality of actuatable stations in various ones of said zones in time sequence in successive pulse periods of said first train of pulses, and generating second control signals for actuating the remainder of said stations asynchronously for making copies in succession.

## 47 Claims

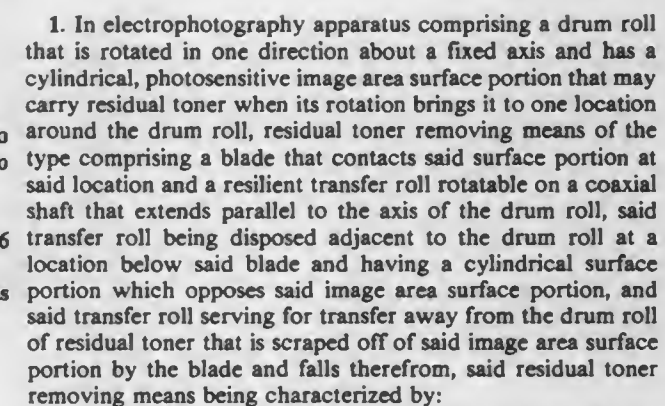


said wall surface having thereon a semi-conductive coating preventing arcing between said surfaces, said coating having a resistance of between  $10^5$  and  $10^{10}$  ohm cm.

U.S. Cl. 355—15



U.S. Cl. 355-15



A. each of said rolls having a coaxial end portion at each of its ends, axially outward of its said surface portion,

(1) said end portions on one roll being larger in diameter than the said cylindrical surface portion thereof, and

(2) said end portions on the other roll being at least as large in diameter as the said cylindrical surface portion thereof; and

B. means biasing said shaft laterally towards the axis of the drum roll with a force

(1) which maintains said end portions on each roll in frictional driving engagement with those on the other roll so that rotation is imparted to the transfer roll directly by the drum roll, and

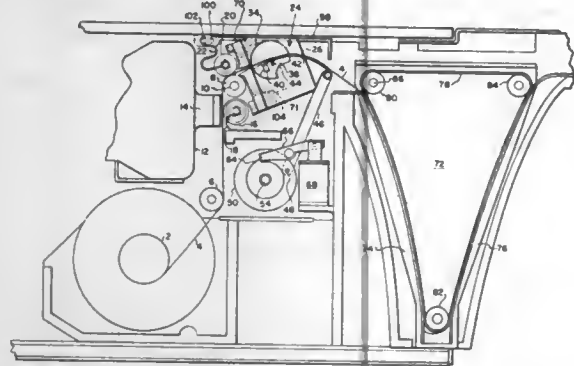
(2) which radially compresses the end portions of the resilient transfer roll to maintain its shaft no closer to the drum roll axis than to permit merely line contact between said cylindrical surface portions, but no farther therefrom than to permit a space between those surface portions which is narrower than the diameter of toner particles.

Int. Cl.

U.S. Cl. 355—29 8 Claims  
1. In a recording instrument, a record medium driving and shearing means comprising:

a cutter assembly including a fixed blade member and a rotary action blade member mounted eccentrically with respect to the rotary axis thereof, an actuator arm connected to said rotary blade member, selectively actuated drive means connected to said actuator arm for selectively actuating said rotary blade member, said rotary blade member being positioned adjacent to said

fixed blade member for cooperative shearing association therewith whenever said rotary blade member is actuated by said actuator arm, and



spring biased bearing means supporting the ends of said rotary blade member and urging said rotary blade member toward said fixed blade member.

**4,165,175**  
**APPARATUS FOR SAMPLING PRINTING LIGHT IN A PHOTOGRAPHIC ENLARGER FOR DETERMINING ITS COLOR COMPOSITION**

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate, Bozen, Italy

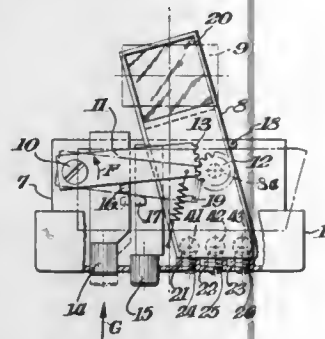
Filed Jun. 15, 1977, Ser. No. 806,625

Claims priority, application Italy, Jun. 25, 1976, 4836 A/76

Int. Cl.<sup>2</sup> G03B 27/78

U.S. Cl. 355—38

24 Claims



1. An apparatus for taking samples of the light projected in a photographic enlarger, having an image holder, an objective lens, a substantially planar space disposed therebetween and a color-determining device, and transmitting the samples to the color-determining device comprising an elongated sampling duct, movable support means mounting the sampling duct in the substantially planar space between the image holder and the objective lens, drive means for interposing the sampling duct in a position between the path of the printing light and the color-determining device for determining the color composition of the printing light and removing the sampling duct from the path of the printing light to obtain an exposure of the image in the photographic enlarger, and the sampling duct having a light entrance aperture disposed substantially parallel to the image holder when it is interposed between the path of the printing light and the color-determining device whereby the color content of the printing light is determined.

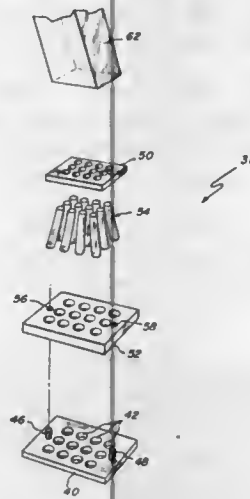
**4,165,176**  
**PHOTOGRAPHIC FILM MEASUREMENT WITH INTERCHANGEABLE LIGHT GUIDING MODULES**  
Ronald C. Laska, Minnetonka, and Wayne R. Pierce, Edina, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Mar. 30, 1978, Ser. No. 891,815

Int. Cl.<sup>2</sup> G03B 27/78

U.S. Cl. 355—68

9 Claims



1. In a photographic printer, an improved film measurement system comprising:

an array of light sensors, the light sensors disposed in a fixed pattern;

a plurality of interchangeable first light-guiding modules for use with different size films, each module having a first surface which is proximate the film and a second surface which is proximate the array of light sensors when the module is in position, and each module having a plurality of light-conducting channels having their first ends exposed at the first surface in a light-receiving pattern which depends upon the particular module and film size and having their second ends exposed at the second surface in a light-transmitting pattern corresponding to the fixed pattern of the array of light sensors, whereby the light sensors of the array receive light from different portions of the film through the light-conducting channels.

**4,165,177**  
**REAR PROJECTION MICROFILM READER/PRINTER**  
Paul M. James, 27, Portland Rd., London W.11., England  
Continuation of Ser. No. 665,451, Mar. 10, 1976, abandoned.  
This application Aug. 18, 1977, Ser. No. 825,835  
Claims priority, application United Kingdom, Mar. 12, 1975, 10231/75

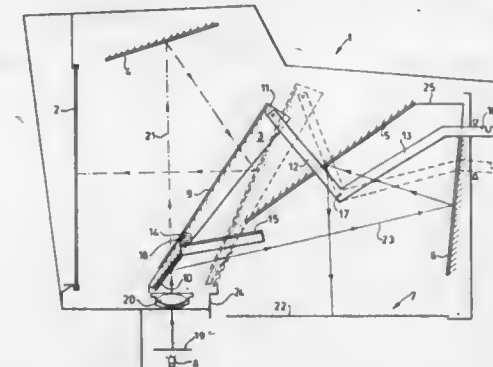
Int. Cl.<sup>2</sup> G03B 27/16

U.S. Cl. 355—45

3 Claims

1. A microfilm reader/printer comprising a housing, a translucent viewing screen forming part of the housing, a printing station within the housing having a horizontal printing plane, a first fixed reflecting surface, a moving member having two reflecting surfaces on opposite sides of said member, said surfaces reflecting light in opposite directions away from the moving member, means for supporting the moving member in a printing position and in a reading position and for moving said member between the reading position and the printing position, a substantially light-tight compartment within the housing having an opening thereto confronting said screen, said moving member obstructing the direct passage of daylight from said viewing screen to said opening and said printing plane when said moving member is in any position, said printing plane being located in said light-tight compartment, second and third fixed reflecting surface within said compartment, a

light source, and a support for a microfilm input; whereby light from the light source is transmitted to said viewing screen via said first fixed reflecting surface and one of said reflecting surfaces of said moving member when the latter is in its reading position, and is transmitted to said printing plane via said second and third fixed reflecting surfaces in said compartment and



the other of said reflecting surfaces of said moving member when the latter is in its printing position, said means for supporting and moving said moving member comprising a pivot and a mechanism attached to said member by said pivot to effect a combined translation and rotation of the moving member as the said means is actuated.

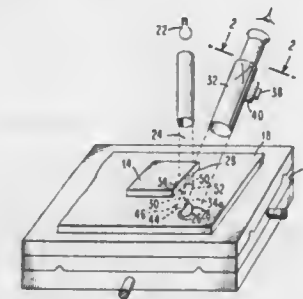
**4,165,178**  
**GAP MEASUREMENT TOOL**  
Salvatore R. Coumo, Jr., Wappingers Falls, and Thomas M. Ellington, Jr., Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,905

Int. Cl.<sup>2</sup> G01C 3/00

U.S. Cl. 356—1

10 Claims



9. A method of measuring the gap between the bottom surface of a component and the top surface of a board or the like comprising the steps of:

generating a beam of collimated light vertical to the board so as to produce a light spot on the board;  
moving the components so as to intercept the beam of light or right angles thereby producing a component edge shadow in the light spot;  
fixing a viewing device at a predetermined angle with respect to the vertical from said board and at a position to include the edge shadow in the light spot and the bottom edge of said component in the view;  
fixing the reticle of the sighting device tangent to one of the edge shadow in the light spot or the bottom edge of the component;  
moving the reticle of the sighting device horizontally from one of the edge shadow in the light spot or the bottom edge of the component to the other;  
measuring the distance the reticle moves in going from one

of the edge shadow in the light spot or the bottom edge of the component to the other;  
this distance representing the opposite side of a right triangle with the gap between the component and the board being the adjacent side and the hypotenuse extending from the end of the opposite side to the end of the adjacent side along the fixed angle of the viewing device;  
calculating the length of the adjacent side of the right triangle extending vertically from the top surface of the substrate to the bottom surface of the component from the fixed angle of the viewing device with the vertical from the substrate and the measured length of the opposite side.

**4,165,179**  
**DEVICE FOR WIPING OPTICAL WINDOW IN TURBIDIMETER OR SIMILAR OPTICAL INSTRUMENT FOR EXAMINING LIQUID SAMPLE**  
Ko Sato, Tokyo, Japan, assignor to Nippon Precision Optical Instrument Co., Ltd. and Nippon S R S, Inc., both of Tokyo, Japan

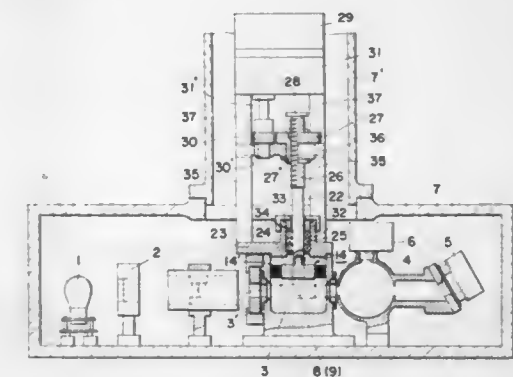
Filed Jul. 13, 1977, Ser. No. 815,088

Claims priority, application Japan, Aug. 19, 1976, 51-98159; Mar. 10, 1977, 52-25390

Int. Cl.<sup>2</sup> G01N 21/24

U.S. Cl. 356—246

2 Claims



1. A device for wiping an optical window of a sample cell of an optical instrument for examining a liquid sample in the sample cell, which comprises a shaft having a leading end inserted in said sample cell, a wiper attached to the leading shaft end, a motor arranged to operate said shaft, and means effective upon operation of said motor for linearly and non-rotatively moving said shaft and wiper between a waiting position remote from said optical window and a wiping position opposite said window, and for rotating said shaft and wiper only in said wiping position.

**4,165,180**  
**AUTOMATIC COMPUTING COLOR METER**  
Michael Failes, Mississauga, Canada, assignor to Canadian Instrumentation and Research Limited, Mississauga, Canada  
Filed Jun. 17, 1977, Ser. No. 807,435

Int. Cl.<sup>2</sup> G01J 3/42, 3/50

U.S. Cl. 356—310

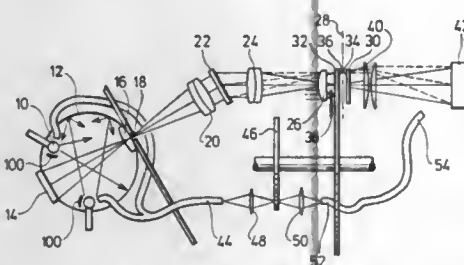
21 Claims

1. An apparatus for the measurement of colour of a sample which comprises:

(a) an illumination means for illumination of said sample with light, the sample reflecting a part of said light;  
(b) an electro-optical sensing head to receive the reflected light from said illuminated sample and to output electronic signals, said electro-optical sensing head comprising:  
(i) means for dispersing the reflected light from said sample to form a spectrum;  
(ii) a moving spatial filter to modulate said spectrum in time and space;



- (iii) a masking means to selectively mask the light from the modulated spectrum;
- (iv) means for transmitting pulses of light from said illumination means to a photodetector via a reference optical path which is independent of the sample thereby producing reference light pulses; and



- (v) a photodetector to detect the modulated spectrum and said reference light pulses and to transform said modulated spectrum and said reference light pulses into an electronic signal; and
- (c) an electronic processing unit to process said electronic signals from said electro-optical sensing head.

#### 4,165,181 OPTICAL ARRANGEMENT IN SPECTROPHOTOMETERS

Wolfgang W. F. Witte, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

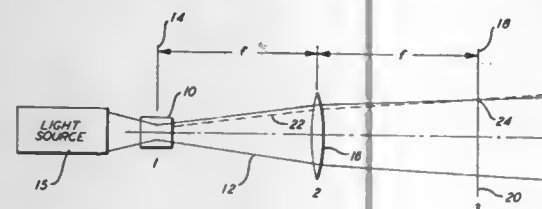
Filed May 16, 1977, Ser. No. 797,359

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623653

Int. Cl.<sup>2</sup> G01J 3/42

U.S. Cl. 356—319

3 Claims



1. A spectrophotometer comprising, a cuvette, a photoelectric detector having a photosensitive surface, a light source arranged for passing a light beam through said cuvette onto said photosensitive surface, an imaging optical system arranged between said cuvette and said photoelectric detector, said imaging optical system having a front principal focal plane and a rear principal focal plane having substantially equal focal lengths, said cuvette being located in the front focal plane and said photosensitive surface being located in the rear principal focal plane which is outside the image plane of said light source, so that deflection of a beam of light in the cuvette will not substantially change the location thereof on the photosensitive surface.

#### 4,165,182 SYSTEM FOR OBTAINING DISPLACEMENT-AMPLITUDE INFORMATION FROM A QUADRATURE-DUAL INTERFEROMETER

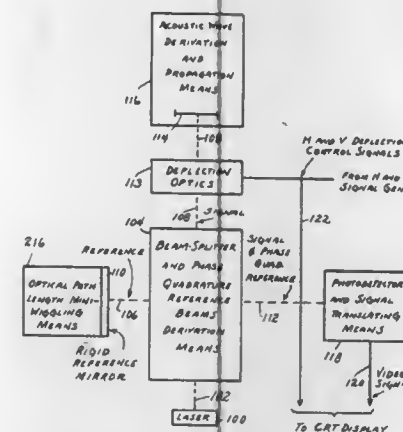
David H. R. Vilkomerson, 2 Carter Brook La., R.D. 4, Princeton, N.J. 08540, assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Dec. 9, 1977, Ser. No. 859,079

Int. Cl.<sup>2</sup> G01B 9/02

U.S. Cl. 356—349

10 Claims



1. In a system responsive to the intensity of radiated ultrasonic wave energy in a given frequency band, the combination comprising first means including photodetector and signal translating means, responsive to the simultaneous illumination thereof with respective first and second beams of coherent light of a predetermined wavelength each of which has an intensity component at a given frequency in said band, second means comprising an interferometer for simultaneously illuminating said photodetector and signal translating means with said first and second beams, said interferometer including a vibrating reference mirror, a displaceable signal mirror adapted to be insonified by said ultrasonic wave energy, and beam splitter and phase quadrature reference beam derivation means illuminated by said coherent light, said beam splitter and phase quadrature beam derivation means being cooperatively located with respect to said reference mirror and said signal mirror to derive as said first beam the interference between signal light reflected from an insonified spot of said signal mirror and first reference light reflected from said reference mirror that has a first temporal reference phase and to derive as said second beam the interference between said signal light and second reference light reflected from said reference mirror that has a second temporal reference phase substantially in quadrature with said first temporal reference phase, and means to directly derive an output signal having a magnitude in accordance with the displacement of said signal mirror comprising means to generate first and second intensity signals from said first and second beams, said intensity signals including respective quadrature modulation components derived from said vibrating reference mirror, means to derive from said intensity signals product terms representing respectively the signal mirror displacement multiplied by squared vibrating mirror quadrature components, and means to combine said last-derived terms so that the sum of the squared vibrating mirror quadrature components defines a constant-value coefficient for the signal mirror displacement magnitude.

#### 4,165,183 FRINGE COUNTING INTERFEROMETRIC SYSTEM FOR HIGH ACCURACY MEASUREMENTS

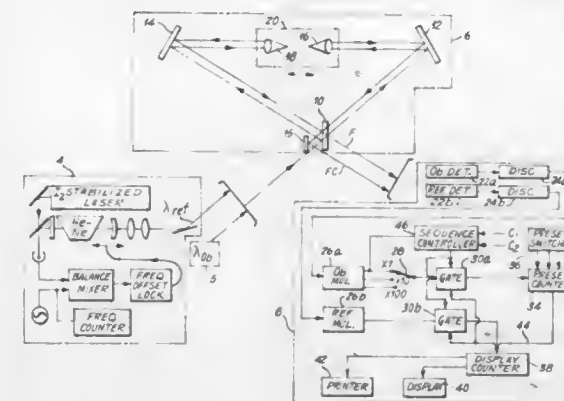
John L. Hall, and Siu Au Lee, both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 26, 1977, Ser. No. 827,996

Int. Cl.<sup>2</sup> G01B 9/02

U.S. Cl. 356—346

58 Claims



53. A method of measuring the wave number of an object beam of electromagnetic radiation using a reference beam in a Michelson-type interferometer comprising the steps of:

- directing said object and reference beams into said interferometer,
  - detecting intensity fringes of said object and reference beams leaving said interferometer to produce electrical fringe signals,
  - multiplying said electrical object fringe signals in a phase-lock loop multiplier to provide an L-fold multiplication thereof, thereby producing object submultiple signals, L being an integral number multiplier, and
  - counting said object submultiple signals while counting a given number of electrical fringe signals corresponding to said reference beam,
- whereby said counted number of object submultiple signals corresponds to the wave number of said object beam.

#### 4,165,184 APPARATUS FOR ASPHALTIC CONCRETE HOT MIX RECYCLING

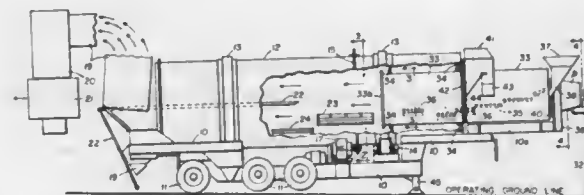
Philip J. Schlarmann, Scotch Grove, Iowa, assignor to Iowa Manufacturing Company of Cedar Rapids, Iowa, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 808,991, Jun. 21, 1977, abandoned. This application Sep. 7, 1977, Ser. No. 831,154

Int. Cl.<sup>2</sup> B28C 5/20, 5/38, 5/42

U.S. Cl. 366—12

25 Claims



1. In apparatus for use in hot mix recycling in which aged asphaltic concrete pavement is removed and sized to provide an aged mix, then heated to a temperature less than the destructive temperature of its old asphalt but sufficient to at least begin its rejuvenation, and thereafter combined with heated fresh aggregate and fresh asphalt, the apparatus including a first drum having upstream and downstream axial ends, means for supporting the first drum in an attitude inclining downwardly in a direction from its upstream to its downstream end, means

for rotating the first drum about its axis effective together with said inclination to move material introduced into the first drum adjacent its upstream end in said direction to adjacent the downstream end, means to assist retention of material introduced therein as aforesaid on and its elevation by the first drum interior walls during said material movement, and means disposed adjacent the downstream end of the first drum for removal of material therefrom, the improvement comprising: a second drum having corresponding upstream and downstream ends, a downstream portion of the second drum extending into an upstream portion of the first drum through the upstream end thereof, the downstream end of the second drum opening into the first drum, said upstream portion of the first drum spacedly enveloping said downstream portion of the second drum, material in the first drum being introduced into the space between said upstream and downstream portions of the first and second drums, the second drum being supported for rotation about its axis and for movement in said direction of material introduced into the second drum adjacent its upstream end to its downstream end and into the first drum for combination with material in the first drum; and means carried by the interior walls of the second drum effective to assist retention of material introduced therein as aforesaid on and its elevation by the second drum interior walls during said material movement.

#### 4,165,185 MIXER, PREFERABLY FOR THE MIXING OF CONCRETE

Bernhard V. Fejmert, Nordostpassagen 19, 413 11 Göteborg, Sweden

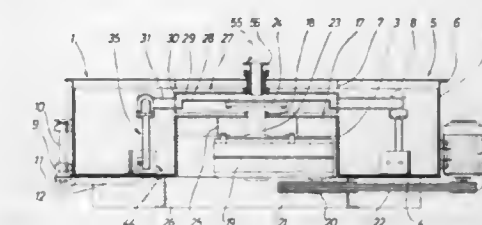
Filed Feb. 17, 1978, Ser. No. 878,908

Claims priority, application Sweden, Feb. 17, 1977, 7701748

Int. Cl.<sup>2</sup> B01F 7/18; B28C 5/16

U.S. Cl. 366—65

7 Claims



1. A mixer preferably for the mixing of concrete comprising an annular mixing tub having an outer wall and an inner wall defining a mixing space, a rotor means mounted above the center portion of said mixing tub, driving means operably connected to said rotor means for rotating said rotor means, agitating means having a number of agitators carried by said rotor means extending down into said mixing space of the mixing tub, said rotor means comprising a cylindrical case enclosing an inner space, said case extending substantially to said inner wall of said mixing tub and carrying on its periphery a plurality of hollow tubular arms each extending substantially in a radial direction and carrying one of said agitators, said arms being in communication with said inner space of said case, means for connection to a supply of liquid in communication with said inner space of said case, and means for feeding of liquid provided on said agitators, whereby liquid can be fed from said supply to the inner space of said case, to said tubular arms, to said agitators, and to a mixture in said mixing tub.

4,165,186

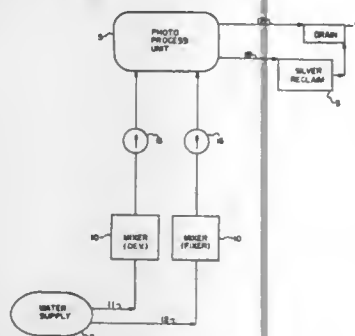
**PHOTOGRAPHIC CHEMICAL MIXING SYSTEM**

David J. Tortorich, New Orleans, La.; Lyle J. Bricker, 110 Gladys St., Fox River Grove, Ill. 60021, and John P. Yasenak, 832 Foxdale St., Winnetka, Ill. 60093, assignors to Lyle J. Bricker, Fox River Grove and John P. Yasenak, Winnetka, both of, Ill.

Filed Nov. 15, 1976, Ser. No. 741,628  
Int. Cl.<sup>2</sup> B01F 5/12, 15/00

U.S. Cl. 366—142

13 Claims



1. A photographic chemical mixer for supplying premixed chemical solution to a film processing unit, or the like, comprising: a fluid holding tank for said pre-mixed chemical solution; low level sensing means in said tank for detecting a preset low fluid level in said tank; high level sensing means in said tank for detecting a preset high fluid level in said tank; liquid supply means for adding diluting fluid to said tank which fluid is designed to be mixed with a concentrate to provide said pre-mixed chemical solution; control means associated with both said sensing means and said liquid supply means, and including indicating means operably connected with said low level sensing means for indicating the attainment of said low fluid level; means for selectively activating said liquid supply means; and means operably associated with said high level sensing means for deactivating said liquid supply means when said high fluid level in said tank is reached; and reservoir means adapted to contain a quantity of said pre-mixed chemical solution, said reservoir means being operably connected with said tank such that upon the liquid level in said tank reaching said low fluid level, said reservoir means will feed its premixed solution to continue the supply of said pre-mixed chemical solution to a processing unit without interruption, by maintaining the liquid level of said pre-mixed solution in said tank at said low fluid level for a period of time, with the retention of said low fluid level by said reservoir means serving to maintain a desired volumetric difference between said low and high fluid levels, to replenish said pre-mixed chemical solution, in said tank to said high fluid level said means for selectively activating said liquid supply means is operated to add said diluting fluid to the tank to be mixed with a pre-packaged concentrate added within said tank, said tank being filled to said high fluid level automatically to replenish the supply of pre-mixed chemical solution at the desired strength, said replenishing of the chemical solution being attained without the necessity of an operator having to measure said diluting fluid or commence the replenishing operation immediately upon attainment of said low fluid level.

4,165,187

**APPARATUS FOR MIXING AND DISPENSING REACTIVE FLUIDS**

James R. James, Plymouth, Mich., assignor to Accuratio Systems, Inc., Novi, Mich.

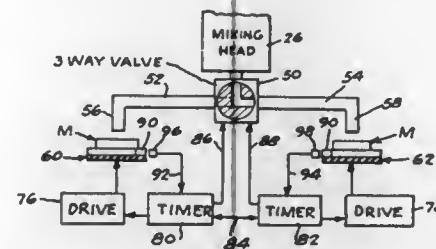
Filed Apr. 10, 1978, Ser. No. 894,992  
Int. Cl.<sup>2</sup> B01F 15/00

U.S. Cl. 366—150

27 Claims

1. Apparatus for mixing reactive fluids and dispensing the resulting mixture into molds which comprises,

a source of each of a plurality of fluids, a mixing head and means operable to furnish fluid thereto substantially continually from each of said sources for mixing, said mixing head having an outlet, valving and a plurality of dispensing nozzles downstream of said outlet, said valving being operable to direct a continuous flow of said mixture from said outlet to said nozzles in a predetermined sequence,



at least one mold for each of said nozzles, motor means operable to effect relative movement between said nozzles and their respective molds to, during, and from aligned relation, and means operable to synchronize operation of said valving with said relative movement so that substantially continually during operation of said apparatus said mixture is dispensed through at least one of said nozzles into a mold moving in alignment therewith.

4,165,188

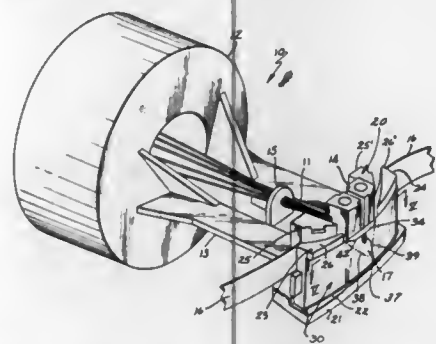
**RIBBON MASK AND GUIDE FOR DOT MATRIX IMPACT PRINTERS**

William D. Rempel, Howell, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Feb. 17, 1977, Ser. No. 769,437  
Int. Cl.<sup>2</sup> B41J 3/12, 31/12

U.S. Cl. 400—124

16 Claims



6. In a wire matrix print head of the type having a plurality of printing wires each with a first extremity coupled to an actuator for causing a printing motion of the wire and a second extremity for striking a printing ribbon positioned intermediate a printing surface and said second extremity, said second extremity of said plurality of print wires being disposed generally vertically relative to one another in an array which is higher than it is wide, the improvement comprising:

a ribbon mask having at least portions positioned intermediate the printing surface and the printing ribbon for protecting the printing surface from undesirable contact by the printing ribbon; said ribbon mask having a thin sheet-like main body and mounting means for securing said ribbon mask to said print head; and said main body having an opening therethrough providing a path for the printing wires of the print head to pass through said ribbon mask and impact the printing surface, said ribbon mask opening

4,165,190

**SERIAL PRINTING APPARATUS**

Takami Suzuki, and Nobuo Iwata, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan  
Division of Ser. No. 644,987, Dec. 29, 1975, Pat. No. 4,106,611.

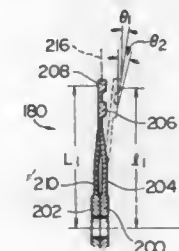
This application Nov. 16, 1977, Ser. No. 851,906

Claims priority, application Japan, Dec. 28, 1974, 50/1291; Aug. 6, 1975, 50/94954; Aug. 18, 1975, 50/99933

Int. Cl.<sup>2</sup> B41J 1/30

U.S. Cl. 400—144.2

3 Claims

**CHARACTERS CARRYING DISC FOR A PRINTING MACHINE**

Alfred Bauer, Neuchâtel, Switzerland, assignor to Caracteres S.A., Neuchâtel, Switzerland

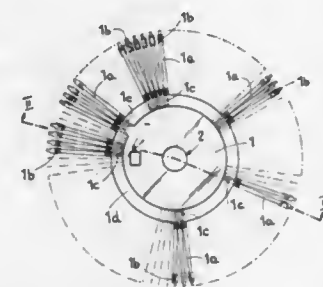
Filed Aug. 12, 1977, Ser. No. 823,946

Claims priority, application Switzerland, Jun. 8, 1977, 7087/77

Int. Cl.<sup>2</sup> B41J 1/30

U.S. Cl. 400—144.2

11 Claims



1. A character-bearing disc for operation in a printing machine, comprising:

a hub having a central disc-like body portion and a perimetric edge portion formed about the periphery of the body portion, the perimetric edge portion being reduced in thickness relative to the central body portion of the hub; resilient arm members formed integrally with the hub, the arm members extending radially from and connecting integrally to the perimetric edge portion of the hub; means for reinforcing the portion of each arm member nearest the hub, said means comprising at least one reinforcing rib disposed on an outward face of each arm member, the rib extending longitudinally of the arm member and being joined at an inner end to a facing portion of the central body portion adjacent the perimetric edge portion, the rib being joined along at least a portion of one edge thereof to a surface face of the perimetric edge portion, the rib extending radially of the perimetric edge portion beyond the periphery of said perimetric edge portion to contact and join to the arm member at a portion of said arm member adjacent the perimetric edge portion, the portion of the rib which extends beyond the outer periphery of the perimetric edge portion being of a radial length which is a minor portion of the radial length of the arm member; and, means disposed on outer portions of the arm members for producing a printing impression.

4,165,191

**WEB FEED, WEB CUTTING AND RIBBON FEED MEANS FOR A STATIONERY MOSAIC PRINTER**

Stanley J. Dickson, and Albert E. Castleton, both of Uxbridge, England, assignors to Control Systems Limited, Uxbridge, England

Filed Nov. 29, 1976, Ser. No. 745,827

Claims priority, application United Kingdom, Dec. 2, 1975, 49528/75

Int. Cl.<sup>2</sup> B41J 13/02

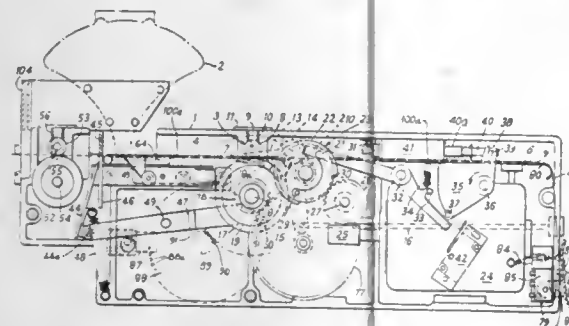
U.S. Cl. 400—636

6 Claims

1. A mosaic printer, comprising, stationary print head means including a plurality of needle print heads arranged in a row, means for feeding a ticket web one ticket length at a time to be printed with equispaced repeat ticket lengths in a direction orthogonal to the row of needle print heads, the print heads being arranged so that impact thereof causes visible dots to be formed on the surface of the web in a pattern which constitutes visual data, the web having holes therein spaced in the feed direction of the web, the feeding means comprising a drive motor, a rotatable drive member driven by the drive motor for engaging the web to thereby feed the web, said drive member comprising a rotatable drive disc having a flange extending radially of a portion of the periphery of the disc, and a one-revolution clutch connected between the motor and the drive member for driving the web for the one ticket length thereof,

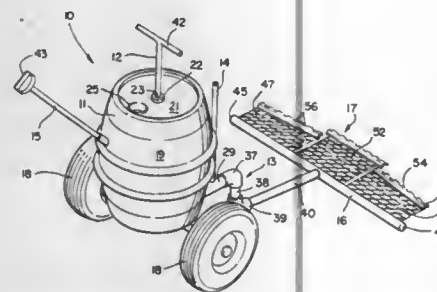


the clutch being arranged so that the drive disc feeds the web until one of the holes therein is located adjacent the drive disc



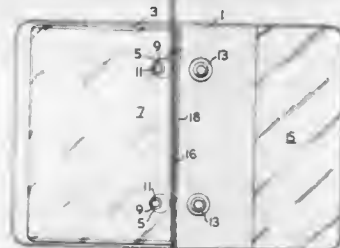
whereupon the feeding is halted until the flange engages the sides of the one hole to drive the web for the one ticket length thereof.

**4,165,192**  
**ASPHALT SPREADING MACHINE**  
Craig R. Mellen, 4243 S. 9th East, Salt Lake City, Utah 84117  
Filed Dec. 29, 1975, Ser. No. 644,976  
Int. Cl.<sup>2</sup> A46B 11/00, 17/02  
U.S. Cl. 401—48



1. An asphalt spreading machine for the pouring and spreading of hot asphalt in an even and uniform manner on roof surfaces, the machine comprising, in combination, an insulated cylindrical container securely mounted to an axle journaled in and supported by a pair of wheels, said container having two holes in the top end and one hole in the side near the bottom end, a funnel shaped aperture in one of the holes on the top end, a threaded flange in the other hole which is centered on the top end, a T-shaped handle which is threadably engaged to the flange on the top surface of the container and which is further provided on its bottom end with a pit-cock valve, a detachable handle for manually moving the asphalt spreading machine, a series of pipes and elbows extending outwardly of the container to permit the hot asphalt to pour through the system of pipes outwardly of the container, an air vent pipe affixed to the asphalt piping system to permit free flow of hot asphalt out of the pipes when the machine is turned off, a length of pipe with port holes on the bottom to permit hot asphalt to pour therethrough on to the roof surface, and a series of detachable screens and rakes for uniformly spreading the hot asphalt poured on the roof surface.

**4,165,193**  
**LOOSE-LEAF FOLDER**  
Alfred Gestetner, 2935 Brighton St., Montreal, Quebec, Canada,  
assignor to Alfred Gestetner, Canada  
Filed Jul. 1, 1977, Ser. No. 812,426  
Int. Cl.<sup>2</sup> B42F 13/12, 13/36  
U.S. Cl. 402—61



1. In a folder for the retention or protection of sheets of paper or similar material including:  
a folder having two sides and a fold line between the two sides,  
at least two spaced post portions of snap fasteners near the fold line of the folder and attached to and projecting inwardly from one side of the folder and adapted to pass through holes in the sheets of paper, and  
at least two spaced cap portions of the snap fasteners adapted to cooperate with said post portions and removable to permit removal or insertion of sheets of paper from said folder,  
the improvement wherein sheet retaining means are provided integral with the folder to retain the sheets of paper loosely in position on the post portions when the cap portions are removed from the post portions, said retaining means comprising a retaining sheet of resilient, flexible plastic or similar material of a size slightly smaller than one side of said folder, said retaining sheet being attached on one edge to the folder at or about the fold line and having a hole in register with each post portion whereby said retaining sheet normally overlies the side of the folder having said post portions and acts to retain a sheet of paper placed over the post portions prior to fastening the cap portions and said retaining sheet holds said sheets of paper in position while the side of the folder having the cap portions is uncapped.

**4,165,194**  
**FRICTIONAL COUPLINGS**  
Ralph F. J. Flower, "Littledean" Bath Rd., Devizes, Wiltshire, England  
Filed Oct. 14, 1977, Ser. No. 842,103  
Claims priority, application United Kingdom, Oct. 16, 1976, 43078/76

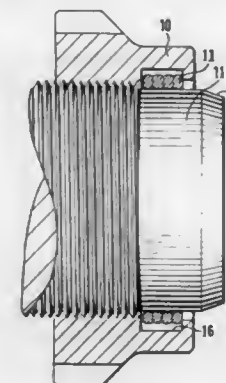
Int. Cl.<sup>2</sup> F16B 21/00  
U.S. Cl. 403—320

4. A coupling assembly which comprises in combination a female member including an axially-extending bore, a male member for coupling therewith positioned axially within the bore in said female member but spaced therefrom, overlapping parts of the male and female members defining an annular clearance of a tapering radial dimension, and a frictional coupling member comprising a strip of resilient material of generally rectangular cross-section pre-formed into a multi-turn coil having a series of adjacent flats with corners therebetween thereby defining a regular polygonal shape considered in the plane normal to the coil axis, a groove provided in the overlapping part of one of the external surface of the male member and the internal surface of the bore in the female member in which groove said coil is located, external corners of the polygonal multi-turn coil contacting the female member and the internal flats of the multi-turn coil contacting the male member

6 Claims

10 Claims

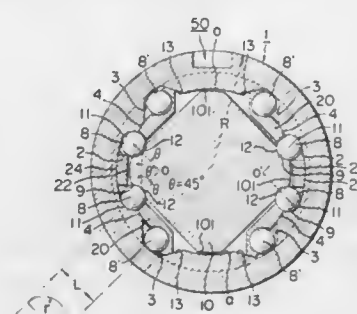
whereby the frictional coupling element frictionally connects the male member and the female member as the clearance



between the overlapping parts of the members is reduced by relative axial movement therebetween.

**4,165,195**  
**RECIRCULATING BALL BEARING SPLINE JOINT**  
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan (158)  
Filed Jul. 17, 1978, Ser. No. 924,893  
Claims priority, application Japan, Sep. 6, 1977, 52-118944[U]  
Int. Cl.<sup>2</sup> B25G 3/28; F16B 3/00, 7/00  
U.S. Cl. 403—359

5 Claims



1. A unit of a ball spline and a shaft having a polygonal cross section, the ball spline including an outer sleeve formed in its inner peripheral surface with ball-circulating grooves in vertically or horizontally symmetrical disposition, two separated holders each having an angle slightly larger than an angle  $\alpha$  when assembled in the outer sleeve and holding a desired number of balls, the holders assembled in the outer sleeve with being inflected inwardly, and a pair of holder retainers fitted to the opposite opening ends of the outer sleeve; and the shaft formed with four ball-circulating grooves in the opposite sides of its opposite two sides and inserted in the ball spline.

**4,165,196**  
**METHOD OF CONSTRUCTING A COLUMN FORMED FROM ANNULAR ELEMENTS AND ELEMENTS FOR THE APPLICATION OF SAID METHOD**  
Francisco de Assis M. Serrano, Issy-les-Moulineaux, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous Marines "C.G. Doris", Paris, France

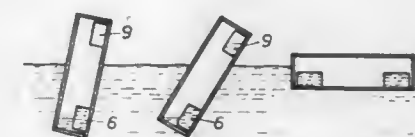
Filed Apr. 14, 1978, Ser. No. 896,610  
Claims priority, application France, Apr. 14, 1977, 77 11233  
Int. Cl.<sup>2</sup> E02D 21/00

U.S. Cl. 405—205

1. A method of constructing a hollow column from a plurality of annular elements, said column being intended more particularly to rest on a base bearing on a submarine bed and to

support a deck carrying production or research installations, comprising the following sequence of operations:

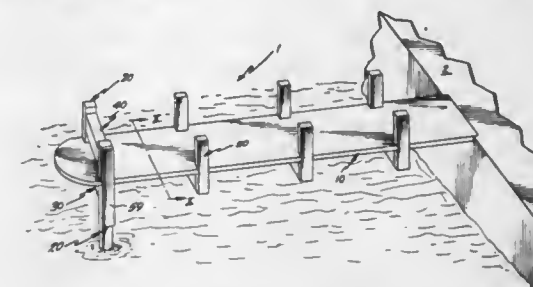
- simultaneously constructing at least one section of each of a number of annular elements from which the column is to be formed,
- forming an impervious closure at one end of each of said sections,
- placing a first impervious caisson inside each of said sections adjacent said one end thereof,
- causing said sections to float in water,
- simultaneously finishing the construction of said elements,



- placing a second impervious caisson inside each of said elements adjacent the other end thereof,
- forming an impervious closure at the other end of each of said elements,
- bringing the elements into the horizontal position by ballasting the caissons with water,
- assembling the elements and fixing them together to form the column, and
- dismantling those of the caissons and closures that are not required to be used when placing the column into position on a submarine bed.

**4,165,197**  
**METHOD AND APPARATUS FOR INSTALLING A DOCK**  
Randall F. Postma, 2570 Sun Valley, Jenison, Mich. 49428  
Division of Ser. No. 781,787, Mar. 28, 1977. This application  
Sep. 11, 1978, Ser. No. 940,972  
Int. Cl.<sup>2</sup> E02B 3/20; B63B 35/00  
U.S. Cl. 405—218

19 Claims



1. A method for installing a dock comprising: providing an elongated jig having a pair of legs adjustably secured thereto near one end thereof, said jig having a length at least as long as the distance which the pilings of the dock to be installed must be located from the next adjacent support means for the dock; placing said jig in position with one end supported on the next adjacent support means for the dock to be installed and with the other end out over the water with said legs extending down into the water; adjusting the level of said legs with respect to said jig until said jig is at the desired level and height; providing said jig with a piling guide comprising a frame for at least partially enclosing a piling located therein, said frame having dimensions closely approximating the lateral cross sectional dimensions of a piling whereby said frame will serve as a guide for a piling as it is sunk into the ground below the water; providing a piling and lifting said piling out over the water and placing it within said piling guide; providing means for sinking said piling and sinking said piling into the ground below the water until it reaches a predetermined desired height; removing said jig after said piling is set in place; securing one end of

a platform to said piling and the other end to the next adjacent support means to thereby create a dock.

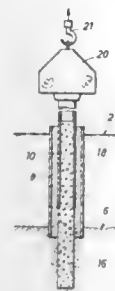
#### 4,165,198 METHOD FOR FORMING PIER FOUNDATION COLUMNS

Glyen D. Farmer, Houston, Tex., assignor to Farmer Foundation Company, Houston, Tex.

Continuation-in-part of Ser. No. 720,694, Sep. 7, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 845,857  
Int. Cl.<sup>2</sup> E02D 5/40

U.S. Cl. 405—243

12 Claims



1. A method of forming a concrete foundation column, comprising the steps of erecting an outer casing and the like at a preselected location, erecting an inner molding casing and the like at said location and substantially concentrically within said outer casing, depositing concrete in said inner casing, depositing an unconsolidated filler material within the annulus between said casings to a level sufficient to create viscous drag forces great enough to grippingly immobilize said inner casing within said outer casing, applying to said inner casing a lifting force greater than the weight of said inner casing and a vibratory force to cancel said viscous drag forces thereon to partially raise said inner casing within said outer casing, thereafter discontinuing said application of lifting and vibratory forces while repeating said step of depositing filler material in said annulus, and thereafter repeating said step of applying lifting and vibratory force to said inner casing.

#### 4,165,199 PROCESS AND APPARATUS FOR APPLYING AND COMPACTING CASTABLE MATERIAL IN STRIPS ON A SLOPED SURFACE

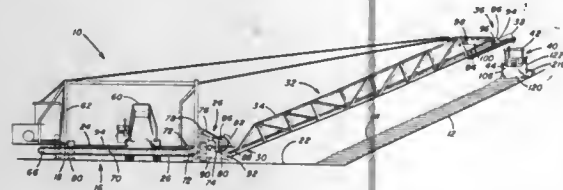
Perry J. Dick, Jr., Pittsburgh, Pa., assignor to Trumbull Corporation, Pittsburgh, Pa.

Division of Ser. No. 784,073, Apr. 4, 1977. This application May 19, 1978, Ser. No. 907,560

Int. Cl.<sup>2</sup> E01C 19/26; E02D 3/02

U.S. Cl. 405—271

5 Claims



1. Apparatus for compacting a strip of castable material comprising, roller means for compacting the strip to a preselected degree of compaction,

propelling means for advancing said roller means longitudinally on the strip, said roller means having a cylindrical body portion with one end portion having the configuration of a frustum of a cone, and forming means associated with said one end portion of said roller means body portion for engaging a longitudinal edge of the strip to shape the edge of the strip to form a curved edge thereon.

#### 4,165,200 DRILLING AND DEBURRING APPARATUS

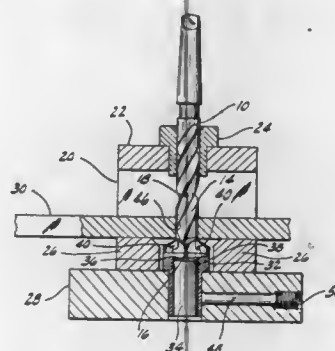
Lyle M. Taylor, 523 Lind St., Quincy, Ill. 62301

Filed Mar. 16, 1978, Ser. No. 887,028

Int. Cl.<sup>2</sup> B23B 41/00, 51/08

U.S. Cl. 408—118

9 Claims



1. A drilling and deburring apparatus including means for supporting a workpiece below a twist drill bit and above a deburring bit, said twist drill bit and said deburring bit axially aligned in opposition and rotatably mounted in said support means, said twist drill bit including at least two longitudinal flutes joined by a web and separated by an equal number of longitudinal lands, said deburring bit including at least two radially extending cutting means which are spaced to pass the web of the twist drill bit axially therebetween and to engage the flutes of the twist drill bit when the twist drill bit is rotated, each of said cutting means projecting radially outwardly from adjacent the bottom of the adjacent flute to substantially beyond the diameter of the twist drill bit.

#### 4,165,201 DEBURRING TOOL FOR DEBURRING BORES

Peter Heule, Grunstein, Balgach, Switzerland

Filed Oct. 27, 1976, Ser. No. 736,101

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1975, 2548214

Int. Cl.<sup>2</sup> B23D 77/00

U.S. Cl. 408—187

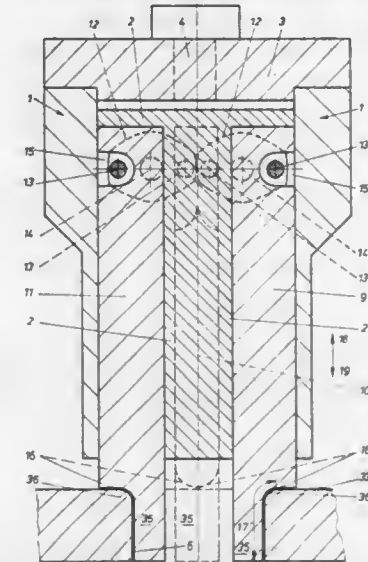
15 Claims

1. A deburring tool for deburring work pieces having bores, the tool comprising in combination:

a tool holder,  
a plurality of knives being mounted in the tool holder for longitudinal movement therein,  
the tool characterized by:

each knife having sensing means which senses the edge of the bore hole and a cutting edge adapted for entering the bore;  
interconnecting means joining all of the knives whereby the opposite knives act in unison with each other in longitudinal movement within the toolholder and opposite the action of the adjacent knives,

the sensing means of at least one knife adapted to engage the edge of the bore hole and automatically control the posi-



tion of the remaining knives by action of the interconnecting means.

#### 4,165,202 APPARATUS FOR EMPTYING BULK MATERIAL FROM A STORAGE CHAMBER

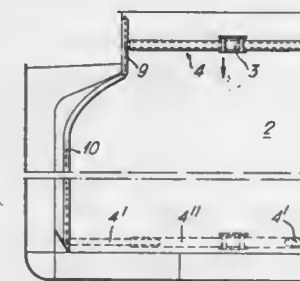
Kaare Haahjen, Vigra, Norway, assignor to Haahjem Mekaniske A/S, Vigra, Norway

Division of Ser. No. 870,253, Jan. 17, 1978. This application Apr. 21, 1978, Ser. No. 899,530

Claims priority, application Norway, Jan. 17, 1977, 770132  
Int. Cl.<sup>2</sup> B65G 65/38

U.S. Cl. 414—313

6 Claims



1. Apparatus for emptying bulk material from a storage chamber, said apparatus comprising rake means in said storage chamber for transporting material in the storage chamber in one direction therein for external discharge from said chamber, a guide beam in said chamber extending transversely with respect to said one direction, means supporting said rake means on said guide beam for slidable movement thereon, means supporting said guide beam for vertical movement thereof, said guide beam including means for varying the length thereof for adapting the length of the guide beam to varying width of the storage chamber.

4,165,203

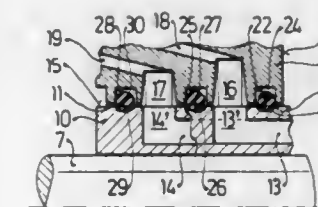
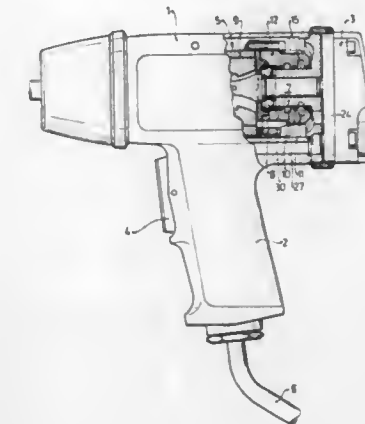
PRESSURIZED MEDIUM POWERED DEVICE  
Kurt Latzina, Waldenbuch; Hans Martin, Leinfelden, and Richard Wolf, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Sep. 30, 1976, Ser. No. 728,399

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1975, 7534297[U]

Int. Cl.<sup>2</sup> F03B 13/04

U.S. Cl. 415—113

20 Claims



1. A motor driven by pressurized fluid, the motor comprising an external rotor; at least two components including a first component connected to said external rotor for joint rotation therewith about an axis and relative to the second component, the first component defining with the second component a cylindrical gap extending longitudinally along the axis, each of the components having one channel for passage of a pressurized fluid therethrough, said channels of the components communicating with one another across the gap; and sealing means for sealing said channels from leakage of pressurized fluid through the gap, said sealing means comprising two annular sealing elements, one of the components having two annular grooves axially spaced from each other and communicating with the gap, said one component having four sidewalls each pair of which define a part of one of the annular grooves, each sidewall of each pair being at least substantially parallel to the other sidewall of the pair, each pair of sidewalls including an axially remote sidewall bounding the gap, said one respective channel of each component being axially intermediate said two annular grooves, and said two sealing elements each being receivable with axial and radial play within a respective one of said grooves and in the gap, said sealing elements each being pressed against the axially remote sidewall in such a manner as to block the gap and thereby prevent leakage of pressurized fluid as pressurized fluid passes through said communicating channels.

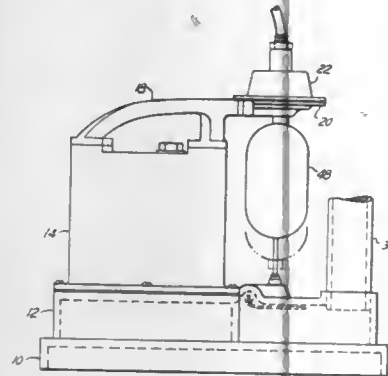


# 4,165,204 SUMP PUMP

Axel L. Nielsen, 1316 E. Elza, Hazel Park, Mich. 48030  
Filed Nov. 16, 1977, Ser. No. 851,842  
Int. Cl.<sup>2</sup> F04B 49/04

U.S. Cl. 417—40

7 Claims



1. A sump pump assembly comprising a pump, a discharge passage for pumped liquid connected to said pump, an electric motor operatively connected to said pump, a switch for controlling said motor, a float device comprising an element movable upwardly in response to rising liquid level in the sump and operable thereby to close said switch, and a leaf movably mounted in said discharge passage for movement by the flow of pumped liquid therein to a position in which it engages said element and prevents return of said element to switch opening position, said element comprising a vertical switch actuating rod, spaced abutments on said rod, a float slidable vertically on said rod between said abutments, the lower end of said rod being vertically movable within said discharge passage in position to be engaged by said leaf and retained in upper switch-closing position by said leaf.

# 4,165,205

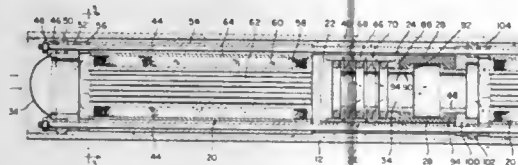
## MULTI-STAGE PUMP

Carl L. Otto, Jr., deceased, late of Lummi Island, Wash., and by  
Phyllis Lockwood, executrix, 2095 W. Shore Dr., Lummi  
Island, Wash. 98262

Filed May 19, 1977, Ser. No. 798,462  
Int. Cl.<sup>2</sup> F04B 3/00, 17/04, 21/02

U.S. Cl. 417—262

10 Claims



1. A multi-stage pump assembly comprising:

- housing means having an intake pumping chamber and a plurality of additional pumping chambers arranged in series for liquid flow into said intake pumping chamber and sequentially through the additional pumping chambers,
- a plurality of pumping elements, each having a downstream face exposed to pressurized fluid from an immediately adjacent downstream pumping chamber and an upstream face exposed to liquid pressure from an immediately adjacent upstream pumping chamber,
- a plurality of separately operable actuating means, one for

each of said pumping elements to move its related pumping element in a pumping cycle in a first direction on an intake stroke and to urge its related pumping element in a second direction on a discharge stroke,

- a plurality of check valves, one for each pumping chamber, each check valve permitting an inflow of fluid from an upstream pumping chamber to a downstream pumping chamber, but preventing reverse flow from a downstream pumping chamber to an upstream chamber,
- activating means operatively connected to each of said actuating means to cause each of said actuating means to operate in sequence so as to move said pumping elements sequentially through their pumping cycles.

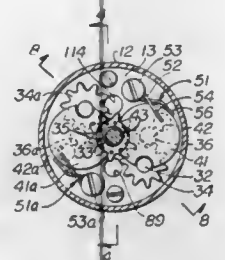
# 4,165,206

THREE GEAR PUMP WITH MODULE CONSTRUCTION  
Thomas B. Martin, Pleasant Hill, and Ferdinandus A. Pieters,  
Walnut Creek, both of Calif., assignors to Micropump Corporation, Concord, Calif.

Continuation-in-part of Ser. No. 763,523, Jan. 28, 1977, Pat. No. 4,127,365. This application Jun. 8, 1977, Ser. No. 804,766  
Int. Cl.<sup>2</sup> F04C 1/08, 15/00; F04B 49/02, 35/00

U.S. Cl. 417—310

17 Claims



1. A pump comprising a manifold having a parting surface formed with a discharge duct and an inlet duct and outlet and inlet ports, respectively, from the exterior of said manifold to said ducts, a modular plate having first and second faces, said first face being parallel to and communicating with said parting surface, at least one plate inlet port in said plate communicating with said inlet duct and a plate discharge port communicating with said discharge duct, a first gear, a first gear shaft fixed to and supported by said modular plate and mounting said first gear rotatable against said second face, a second gear meshing with said first gear, second gear mounting means fixed to and supported by said modular plate, said manifold being discrete from said first and second gear mounting means, said plate inlet and discharge ports being on opposite sides of the mesh point on said gears, pump chamber defining means sealing relative to said modular plate to enclose a space outward of said second face which includes said plate inlet port and at least that portion of said first and second gears that includes said mesh point and at least two teeth of each gear to either side of said mesh point, and drive means for rotating one of said gears, said pump chamber defining means comprising an imperforate shoe mounted on said modular plate overlying said plate inlet port and a portion of said gears opposite said modular plate to either side of said mesh point, said shoe mounted on said modular plate comprising a disk formed with a first recess for rotation of said gears and a second recess communicating with said first recess and with said plate inlet port.

# 4,165,207

## ACTUATION DEVICE FOR A TACHOMETER FOR AN ENGINE

Tetsuzo Fujikawa, Kobe, and Ryoji Uda, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

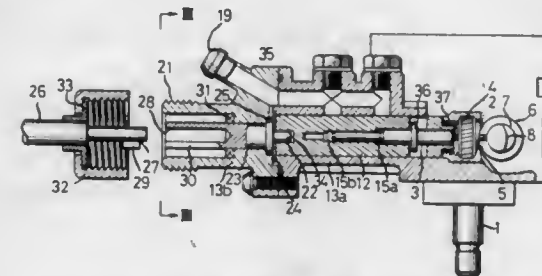
Continuation of Ser. No. 687,644, May 18, 1976, abandoned.

This application Jan. 11, 1978, Ser. No. 868,546

Int. Cl.<sup>2</sup> F16N 13/04

U.S. Cl. 417—313

2 Claims



1. Apparatus for actuating the tachometer of an engine comprising an oil pump assembly for supplying oil to said engine, said oil pump assembly including plunger means mounted for both rotative and reciprocal movement within said oil pump assembly, connection means for connecting said plunger means to the drive shaft of an engine to enable said plunger means to be rotatively driven by said engine drive shaft, said connection means including a speed reducing mechanism interposed between said plunger means and said engine drive shaft to effect rotative driving of said plunger means at a reduced speed relative to the speed of said engine drive shaft, cam means interposed between said plunger means and a throttle lever of said engine to enable said plunger means to be reciprocally moved by said throttle lever, and a cable connected to said plunger means and adapted to be connected to a tachometer for transmitting rotary motion from said plunger means of said oil pump assembly to said tachometer, said plunger means being formed with a pair of plunger members, one of said plunger members being reciprocally driven through said cam means and rotatively driven through said speed reducing mechanism, and the other of said plunger members being connected with said cable, said other plunger member being connected to said one plunger member to receive only rotary motion therefrom.

# 4,165,208

## INTRAVENOUS DELIVERY PUMP

Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

Continuation of Ser. No. 704,540, Jul. 12, 1976, abandoned, which is a continuation of Ser. No. 431,753, Jan. 8, 1974, Pat. No. 3,874,826, which is a continuation-in-part of Ser. No. 329,425, Feb. 5, 1973, abandoned. This application Dec. 15,

1977, Ser. No. 860,789

Int. Cl.<sup>2</sup> F04B 39/10

U.S. Cl. 417—565

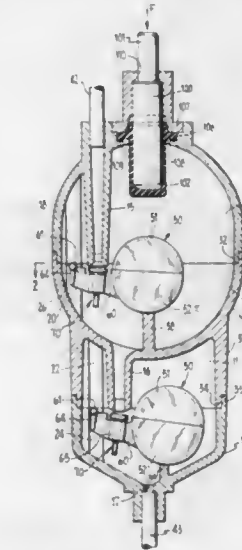
23 Claims

1. A pump for the precise metering of liquids for delivery to a patient comprising:

- a non-deformable inlet chamber having an inlet thereto and an outlet duct therefrom and means forming a flow passage in communication with the outlet duct and adapted to be connected to the patient;
- a one-way valve cooperating with said inlet;
- a substantially incompressible displacement piston having a first end portion always projecting inwardly through an opening in one wall of said inlet chamber and a second end portion which remains outside said inlet chamber, said second end portion always projecting outwardly through the opening in the wall and being adapted for engagement by piston means, said piston being adapted for reciprocating movement in a direction inwardly of the inlet chamber

from a first retracted position to a second projected position and then outwardly to said first position, the movement of said piston from said first position to said second position causing the discharge of a precise quantity of liquid from said inlet chamber through said outlet duct and the return movement of said piston from said second position to said first position causing further liquid to be drawn into said inlet chamber through said inlet so that said inlet chamber remains filled with liquid; and

(d) a flexible sheath of resilient material enclosing and in



tight-fitting engagement with the entire portion of said piston which is inside said inlet chamber, a portion of said sheath being in air-tight engagement with the adjacent portion of said one wall of said inlet chamber in contact therewith and having sealing means for preventing the admission of air between said sheath and that portion of said piston enclosed by and in contact therewith, said sheath remaining in continuous contact with the entire portion of said piston which is inside the inlet chamber during movement of said piston between said first and second positions.

# 4,165,209

## EXTERNAL AXLE ROTARY PISTON MACHINE

Dankwart Eiermann, Lindau, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

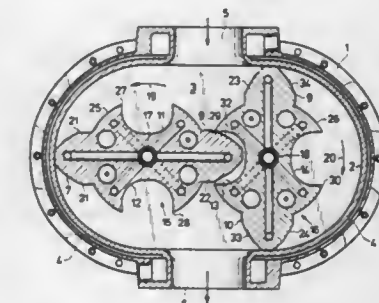
Filed Aug. 9, 1977, Ser. No. 823,137

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635972

Int. Cl.<sup>2</sup> F04C 29/00

U.S. Cl. 418—190

1 Claim



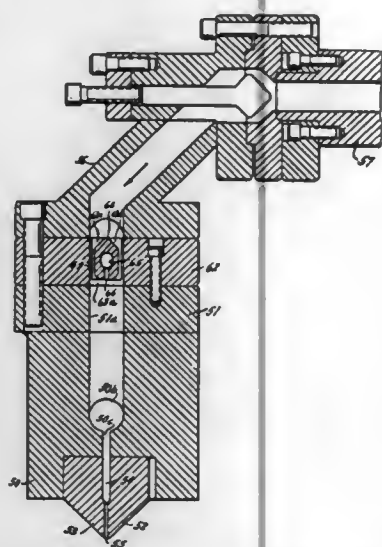
1. A 1:1 ratio external axle rotary piston machine which comprises in combination: pistons which intermesh with one another, each of said pistons having two respectively oppositely located truncated teeth with corners as well as a base and

two respectively oppositely located recesses with corners interposed between said teeth, said pistons being arranged in such a way that alternately one tooth of one piston engages one recess of another piston and vice versa, that entire flank of each tooth having a side which trails in the direction of rotation of the pertaining piston being provided with a contour and being set back with respect to the cycloidal path described by the trailing corner of the pertaining recess of the piston engaged by said tooth, each recess being deeper than the path of the corners of the pertaining engaging tooth, said contour of said set back trailing flank of each tooth being approximately parallel to said cycloidal path described by the trailing corner of the pertaining recess of the piston engaged by said tooth, said contour extending from the trailing corner of said tooth to the base of said tooth on said trailing side thereof, said base coinciding with said cycloidal path where the latter intersects with the piston.

4,165,210

**LAMINATED PRODUCTS, AND METHODS AND APPARATUS FOR PRODUCING THE SAME**  
Herbert O. Corbett, Bridgeport, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.  
Filed Apr. 9, 1964, Ser. No. 350,220  
Int. Cl.<sup>2</sup> B29F 3/01, 3/04  
U.S. Cl. 425—133.5

6 Claims



1. An apparatus for extruding laminated plastic products comprising an extrusion die defining a first passageway for fluid materials, said first passageway having a narrow, elongated discharge orifice, a first extruder, a second extruder, a first conduit having one end connected to said first extruder, a second conduit having one end connected to said second extruder, a flow dividing means comprising a solid diverter and two spaced channels, said diverter extending completely across said first passageway and having an internal passageway extending longitudinally therethrough, said channels each communicating at one end with said first passageway and at the other end with said first conduit, said diverter being positioned so as to direct fluid material from said first conduit into said channels, said internal passageway within said diverter communicating at one end with said second conduit and at its other end with a second longitudinal orifice situated intermediate and parallel to said channels, said second longitudinal orifice communicating with said first passageway at a point remote from said discharge orifice whereby fluid material from said first conduit is divided into two streams which are laminarily joined within said first passageway to either side of a central stream of fluid from said second elongated orifice, said first passageway merging into an intermediate portion of reduced width which communicates directly with the elongated discharge orifice whereby the laminated materials being ex-

truded through said first passageway will be laminarily reduced in thickness and extended longitudinally prior to entering into said elongated discharge orifice.

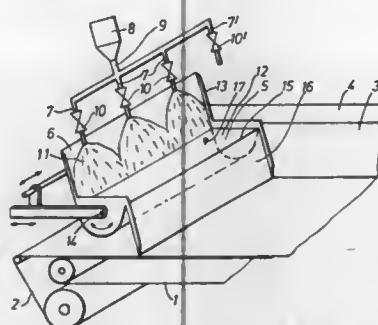
4,165,211

**APPARATUS FOR APPLYING A LAYER OF A LIQUID FOAMABLE REACTION MIXTURE TO A CONTINUOUSLY MOVING SUPPORT**  
Wilfried Ebeling, Cologne; Volker Onnenberg, Wief; Alberto C. Gonzalez-Dörner, Leverkusen; Bernd Lehmann, Cologne; Hansjürgen Rabe, and Klaus Schulte, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jul. 1, 1977, Ser. No. 812,011  
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631145

Int. Cl.<sup>2</sup> B29D 27/04

U.S. Cl. 425—224

9 Claims



1. An apparatus for the application of a layer of foamable liquid reaction mixture to a continuously moving support, comprising: a continuously moving support and at least one conduit with an outlet and a deflector plate for the preliminary distribution of the reaction mixture transversely to the direction of movement of the support, the outlet from said at least one conduit being arranged above a distributor channel which extends transversely of the direction of travel of the support and which functions as a place of intermediate storage, the arrangement being such that the reaction mixture enters the distributor channel in the form of a film, at least one side of which is exposed to the atmosphere, and said deflector plate is located between said outlet and said distributor channel.

4,165,212

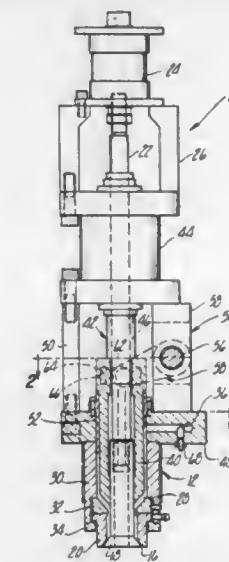
**MULTIPLE EXTRUSION HEAD ASSEMBLY**  
William E. Ziegler, Ann Arbor, Mich., assignor to Hoover Universal, Inc., Saline, Mich.  
Filed Mar. 2, 1978, Ser. No. 882,646  
Int. Cl.<sup>2</sup> B29D 23/04

U.S. Cl. 425—382 R

8 Claims

1. An extrusion head assembly comprising a plurality of extrusion heads for extruding tubes of plastics material, each extrusion head having an annular outlet orifice, an inlet passageway for receiving plastics material from a screw extruder, an accumulator chamber in communication with said outlet orifice and said inlet passageway for accumulating plastics material from said screw extruder, and discharge means for intermittently discharging the accumulated plastics material through said outlet orifice to form said tubes, and a mechanism connected to each of said discharge means synchronizing the operation of said discharge means so that the tubes of plastics material are discharged from each head synchronously, said mechanism interconnecting the plungers so that if the plastics material tends to flow to one accumulator chamber with greater ease than to a second accumulator chamber the plastics

material acting on the one plunger will then tend to move the second plunger also thereby increasing the back pressure of the

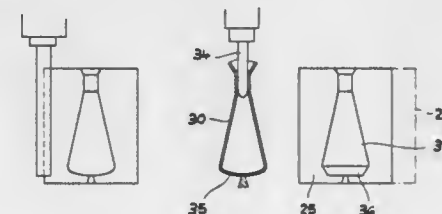


plastics material to said one accumulator chamber to balance the flow to the accumulator chambers.

4,165,213

**APPARATUS FOR MULTI-STAGE BLOW MOLDING OF HOLLOW SHAPED ARTICLES**  
Gottfried Mehnert, Messelstrasse 25, D-1000 Berlin 33, Fed. Rep. of Germany  
Division of Ser. No. 622,020, Oct. 14, 1975, Pat. No. 4,066,726, which is a continuation of Ser. No. 415,806, Nov. 14, 1973, abandoned. This application Jul. 1, 1977, Ser. No. 812,367  
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1972, 2256683; Oct. 30, 1973, 2354214  
Int. Cl.<sup>2</sup> B29D 23/03  
U.S. Cl. 425—530

8 Claims

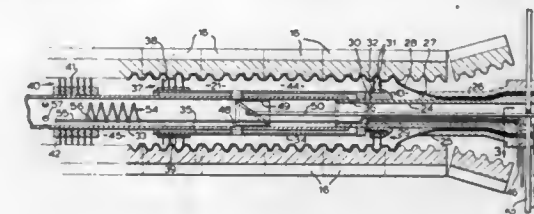


1. Apparatus for converting parisons into hollow shaped articles, comprising an extrusion machine arranged to extrude a succession of parisons substantially vertically downwardly; blowing means comprising at least one blowing mandrel; first mold means arranged to receive parisons and to cooperate with said blowing mandrel for conversion of parisons into hollow preforms; second mold means arranged to receive preforms while such preforms are supported by said blowing mandrel and to cooperate with said blowing mandrel for conversion of preforms into hollow shaped articles; means for effecting a relative movement between said first and second mold means and said blowing mandrel to transfer parisons into said first mold means and to transfer said preforms into said second mold means while the preforms are supported solely by said blowing mandrel, said second mold means and said blowing mandrel being out of register with said machine at all times; and means for opening and closing said first and second mold means independently of each other.

4,165,214

**APPARATUS FOR PRODUCING CORRUGATED THERMOPLASTIC TUBING**  
Gerd P. H. Lupke, 46 Stornoway Crescent, and Manfred A. A. Lupke, 35 Ironshield Crescent, both of Thornhill, Ontario, Canada  
Filed Dec. 21, 1977, Ser. No. 865,019  
Claims priority, application Canada, Sep. 13, 1977, 286652  
Int. Cl.<sup>2</sup> B29D 23/03  
U.S. Cl. 425—532

5 Claims

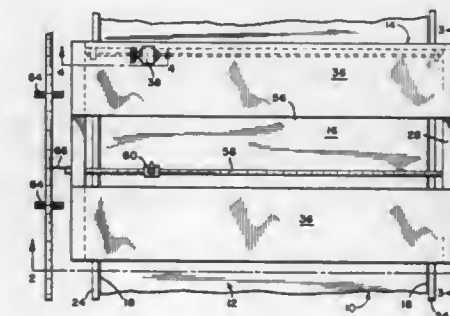


1. Apparatus for producing corrugated thermoplastic tubing, the apparatus comprising a pair of complementary mold assemblies each having an endless array of articulately interconnected mold blocks, drive means for driving the mold blocks in synchronism along a forward run in which the mold blocks of the mold assemblies are in cooperative interengagement to provide an axially extending tubular mold tunnel having a corrugated wall, and back along a return run, an extrusion head disposed at the entrance to the tubular mold tunnel for forming a tube of thermoplastic material, a plurality of gas sealing arrangements mounted within the tubular mold tunnel in axially spaced relationship, said gas sealing arrangements cooperating with said tube of thermoplastic material to define successive first, second and third pressurizable zones therein, gas supply means for supplying pressurized gas at a first pressure to the first zone for supporting the tube against the tunnel wall, and for supplying pressurized gas at different, successively greater, pressures to the second and third zones for urging the tube of thermoplastic material outwardly into the corrugations in the wall of the mold tunnel, means defining a gas leakage path between said second and third zones to permit leakage of gas from the third zone to the second zone, and vent means communicating with the second zone for controlling the exhaust of gas therefrom to maintain the gas pressure in the second zone less than the gas pressure in the third zone by a controlled amount.

4,165,215

**SLAB PREPARATION APPARATUS**  
Herman C. Himes, Akron, and John P. Koepnich, Cuyahoga Falls, both of Ohio, assignors to Price Brothers Company, Dayton, Ohio  
Filed Feb. 22, 1978, Ser. No. 880,195  
Int. Cl.<sup>2</sup> B28B 7/00  
U.S. Cl. 425—169

7 Claims



1. In apparatus for preparing a precast concrete slab includ-



ing a relatively long, narrow casting bed and tracks extending along opposite sides of said bed, the improvement comprising: a lay-out cart including a deck spanning said bed transversely thereof, means for moving said cart along said tracks, means defining an opening through said deck providing access from said deck to said bed, said opening having a width no less than the width of said bed, and indexing means associated with said cart for indicating positions relative to said bed.

4,165,216

## CONTINUOUS DRYING AND/OR HEATING APPARATUS

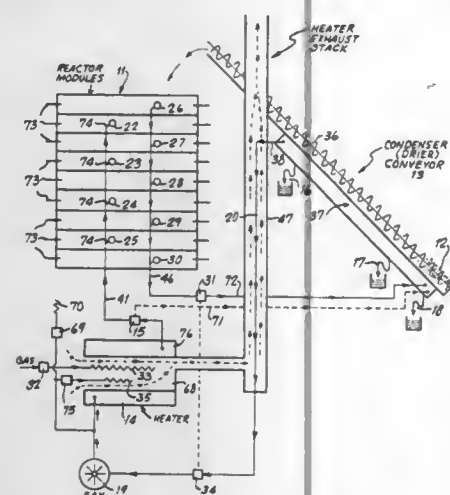
Eugene W. White, State College; Francis M. Gross, and Fred E. Knoffsinger, both of Pleasant Gap, all of Pa., assignors to Enerco, Inc., Langhorne, Pa.

Filed Mar. 23, 1977, Ser. No. 780,679

Int. Cl.<sup>2</sup> C10B 49/02, 1/04; F26B 3/14, 17/12

U.S. Cl. 432-102

2 Claims



1. A reactor for the heating or drying of powders, grains, chips, and other feed materials comprising:

a chamber for containing the feed material to be heated or dried;  
inlet means at the top of said chamber for depositing said feed material in said chamber;  
outlet means at the bottom of said chamber for removing feed material which has been heated or dried;  
a uniform array of input means vertically disposed within said chamber across substantially the entire length and extending horizontally across substantially the entire width of said chamber for introducing hot gases therein, said uniform array of input means extending through said feed material in direct contact therewith so that said hot gases introduced into said chamber uniformly contact said feed material;  
a uniform array of output means vertically disposed within said chamber across substantially the entire length and extending horizontally across substantially the entire width of said chamber for withdrawing said hot gases and any gases produced within said chamber, said uniform array of output means extending through said feed material in direct contact therewith so that said hot gases and gases produced within said chamber may be uniformly collected;  
means for regulating the flow of said hot gases introduced into said chamber through said uniform array of input means;  
means for pre-heating or drying said feed material prior to depositing said feed material in said chamber;  
means for conducting said hot gases and said gases produced within said chamber away from said chamber, said means for conducting being connected with said pre-heating or drying means so that heat derived from said hot gases and gases produced within said chamber is used to accomplish pre-heating or drying;  
means for regulating the flow of said hot gases and gases produced within said chamber and withdrawn therefrom through said uniform array of output means and conducted to said pre-heating and drying means through said conducting means; and  
means for burning combustible gases included within said hot gases and gases produced within said chamber, said means for burning communicating with said pre-heating or drying means so that gases enter said means for burning after passing through said pre-heating or drying means.

## CHEMICAL

4,165,217

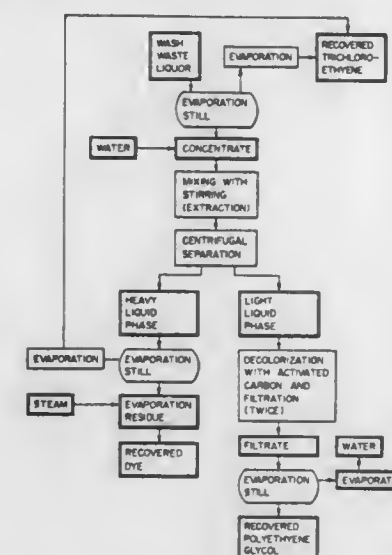
## HALOHYDROCARBON TREATMENT OF A GLYCOL AND WASTE DYE LIQUOR FOLLOWED BY WATER EXTRACTION OF THE GLYCOL

Kazuo Kitamura, Mukou; Fumiki Takabayashi, Takatsuki; Fumio Shibata, Uji; Kaname Watabe, Takatsuki, and Toshinori Azumi, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 357,896, May 7, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,307  
Claims priority, application Japan, May 9, 1972, 47-45052  
Int. Cl.<sup>2</sup> D06P 5/00

U.S. Cl. 8-81

5 Claims



1. A method for treating a wash waste liquor, which comprises (a) continuously treating fibers which have been dyed by applying a dye liquor containing a solution or dispersion of a non-ionic disperse or oil-soluble dye in a high boiling water-soluble organic medium selected from the group consisting of polyalkylene glycols and alkyl ether of polyalkylene glycols or a mixture of said polyalkylene glycol or alkyl ether of polyalkylene glycol with a low boiling medium selected from the group consisting of water and halogenated hydrocarbons, with a washing medium consisting essentially of a low boiling halogenated hydrocarbon capable of dissolving the high boiling water-soluble organic medium thereby to continuously wash out the unfixed dye and the high boiling water-soluble organic medium remaining on the surfaces of the fibers; (b) concentrating the wash waste liquor from step (a) comprised of the low boiling halogenated hydrocarbon and the unfixed dye and high boiling water-soluble organic medium dissolved therein by evaporating the low boiling halogenated hydrocarbon contained therein until the content of said halogenated hydrocarbon in the residual concentrate becomes substantially 30 to 90% by weight; (c) mixing the resulting concentrate consisting of the high boiling water-soluble organic medium, the dye and the low boiling halogenated hydrocarbon with 0.8 to 20 parts by weight of water, per part by weight of the high boiling water-soluble organic medium in the residual concentrate to extract the high boiling water-soluble organic medium, thereby to separate it into a phase consisting of an aqueous solution of the high boiling water-soluble organic medium and a phase consisting of the low boiling halogenated hydrocarbon and the dye dissolved or dispersed therein; (d) thereafter separating the two phases, recovering the low boiling halogenated hydrocarbon by evaporation and obtaining the dye as residue from the phase consisting of the low boiling halogenated hydrocarbon and the dye; and (e) removing the remaining low boiling halogenated hydrocarbon from the residue by blowing steam into the dye-containing residue and boiling the remaining low boiling halogenated hydrocarbon together with water.

4,165,218

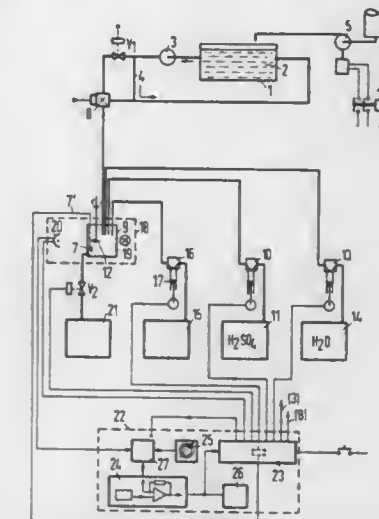
## MONITORING SURFACTANT IN ELECTROLYTE DURING METAL TREATMENT

Jacky Vanhumbecq, Brugge, and Christiaan Vandenbossche, Zwijnaarde, both of Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Oct. 25, 1977, Ser. No. 845,045

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650572

Int. Cl.<sup>2</sup> G01N 31/16, 21/02; C25D 3/30  
U.S. Cl. 23-230 R

4 Claims



1. In a method for the quantitative monitoring of a nonionic surfactant, in an acid tinning bath of the type employed for the production of shiny, pore-free coatings on component parts, in which method a measured sample of bath fluid is diluted with distilled water, mixed with an acid, and the resulting mixture is titrated with a tannic acid solution until opalescence persists, the improvement which comprises the steps of:

- (A) mixing with such a sample of bath fluid sulfuric acid as such acid,
- (B) then mixing therewith distilled water,
- (C) then automatically adding tannic acid to the resulting sample of bath fluid while concurrently monitoring such resulting sample photometrically, said tannic acid being so added as an aqueous solution to such resulting sample at a constant rate and at constant intervals of time, and the corresponding difference in the output voltage photometrically being measured in each interval of no tannic acid addition, and then, when a constant voltage difference is found between two successive such measurements,
- (D) calculating the proportionality factor between such voltage difference and the titration volume and determining the lowest value for the titration volume as representing the final titration point from such calculated values by retrogressive interpolation of the straight line passing through the points of constant voltage difference.

4,165,219

## ANALYSIS OF SOLUTIONS USING CHROMATOGRAPHIC COLUMN

Walter Huber, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Filed Jan. 27, 1977, Ser. No. 763,137

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604832

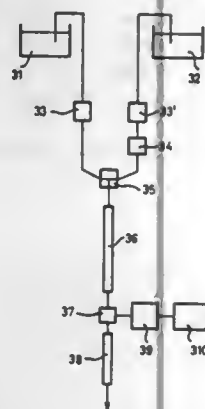
Int. Cl.<sup>2</sup> G01N 31/08

U.S. Cl. 23-230 R

4 Claims

1. A process for analysis of aqueous or non-aqueous liquid solutions which comprises combining a sample of said liquid solutions with a stream of a liquid color reagent and reacting the sample and reagent under pressure as they pass through a

chromatographic column which is filled with particles of inert, finely divided material with particle diameters in the range of



50 to 200  $\mu\text{m}$ , and measuring the liquid reaction product in a photometric detector cell.

#### 4,165,220 PROCESS FOR PRODUCING HARDENED SEMICOKE BRIQUETTES

Angelo Colletta, and Paolo Marini, both of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy  
Continuation-in-part of Ser. No. 817,919, Jul. 21, 1977, abandoned. This application May 22, 1978, Ser. No. 908,470  
Claims priority, application Italy, Aug. 4, 1976, 50766 A/76  
Int. Cl.<sup>2</sup> C10L 5/16, 5/40

U.S. Cl. 44—23

3 Claims

1. Process for producing hardened semicoke briquettes, comprising forming "green" briquettes by admixing semicoke that has been carbonized at a temperature between about 900° and 1000° C. for 5 to 45 minutes, with pitch as a binder, passing the admixed semicoke and pitch through a rolling operation in which the admixed semicoke and pitch is subjected to a pressure between 2 and 6 tons per centimeter width of the admixed material, and heating the "green" briquettes in a vertical oven at a bed depth of about 5 to 10 meters at a temperature between 300° C. and 400° C. and for a time interval between 35 and 50 minutes.

#### 4,165,221 FORMED CARBON FUEL BRIQUETTES, PROCESS FOR FORMING THE SAME AND PROCESS FOR UTILIZING THE SAME IN THE MANUFACTURE OF STEEL

Nicholas Valenti, Mayfield Heights, Ohio, assignor to Ohio & Penna. Fuels, Inc., Akron, Ohio

Filed Oct. 24, 1978, Ser. No. 954,379  
Int. Cl.<sup>2</sup> C10L 5/12, 5/40; C21B 5/00

U.S. Cl. 44—26

11 Claims

1. A fuel briquette formed from a composition comprising coke breeze, magnesia and an aqueous ammonium polyphosphate solution, said magnesia and aqueous ammonium polyphosphate solution being present in an amount effective to bind said coke breeze into said fuel briquette form.

#### 4,165,222 PROCESS FOR THE MANUFACTURE OF OPTICAL FIBERS WITH A RADIAL REFRACTIVE INDEX

Arnaud de Panafieu; Michel Villard; Christiane Baylac, and Michel Favre, all of Paris, France, assignors to Thomson-CSF, Paris, France

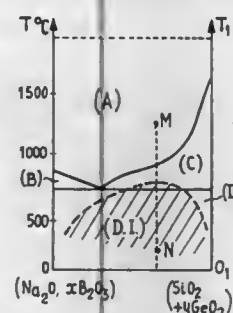
Filed Oct. 14, 1977, Ser. No. 842,218

Claims priority, application France, Dec. 19, 1976, 76 31355

Int. Cl.<sup>2</sup> C03B 37/00; C03C 15/00; C03B 32/00

U.S. Cl. 65—2

9 Claims



1. A process for the manufacture of a glass blank used in the preparation of self-focusing optical fibers having a radial refractive index gradient, wherein said glass blank has a larger diameter than said fibers, from starting oxides which are capable of entering into a glass composition showing the phenomenon of separation into two interconnected and continuous solid phases of different composition, said starting oxides comprising oxides of boron, silicon, sodium and at least one oxide selected from the group consisting of germanium, titanium, phosphorous and aluminum oxides, and said oxides having an impurity level of under  $10^{-5}$  calculated with molar proportions of oxides of transition metals taken into account, and which comprises the stages of

I. Mixing said oxides; followed by melting said oxides into a molten bath;

II. Drawing said glass blank at a rate from said molten bath through a cooling system having a decreasing temperature gradient wherein said rate and temperature gradient are sufficient to cause an incipient phase separation in said glass blank and a radial variation in the chemical composition of each phase as a result of the variation in the rate of cooling between the periphery and the core of the blank due to the passage of said glass blank through said cooling system; followed by thermally annealing said glass blank; and

III. Leaching said glass blank to eliminate most of the impurities; followed by heat consolidating said glass blank.

#### 4,165,223 METHOD OF MAKING DRY OPTICAL WAVEGUIDES

Dale R. Powers, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,927

Int. Cl.<sup>2</sup> C03C 25/02

U.S. Cl. 65—2

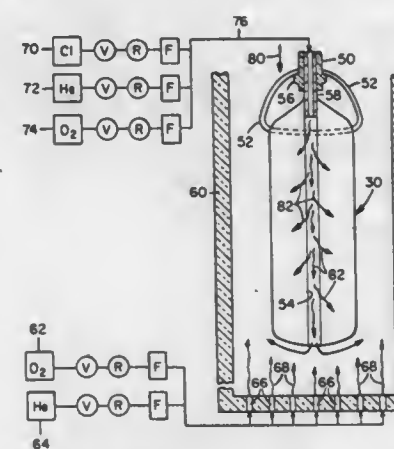
15 Claims

1. The method of forming a glass article comprising the steps of

depositing on a starting member a coating of flame hydrolysis-produced glass soot to form a porous soot preform, the refractive index at the inner portion of said preform being greater than that at the outer portion thereof, removing said starting member to form an aperture in said preform,

disposing said preform in a furnace, flowing into said aperture a stream of an atmosphere comprising chlorine and oxygen, the concentration of chlorine being between 0.1 vol.% and 9.0 vol.% and the ratio

(vol.% chlorine)<sup>2</sup>/(vol.% oxygen) being less than 1.0 vol.%, and



heating said soot preform to a temperature within the consolidation temperature range for a time sufficient to cause said soot particles to fuse and form a dense glass layer.

#### 4,165,224 METHOD OF MANUFACTURING OPTICAL FIBRE PREFORMS

John Irven, Harlow, and Andrew P. Harrison, Stansted, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

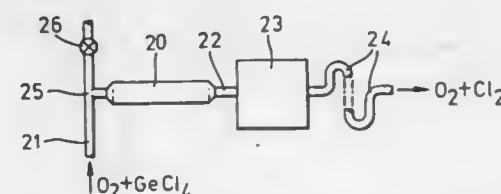
Filed Mar. 17, 1978, Ser. No. 888,050

Claims priority, application United Kingdom, Mar. 24, 1977, 12431/77

Int. Cl.<sup>2</sup> C03B 37/02; C03C 25/02

U.S. Cl. 65—3 A

9 Claims



1. A method of silica optical fiber preform manufacture wherein the material that is to form the core of the preform contains a volatile oxide and is provided as a layer of doped silica lining the bore of a silica tube, wherein the bore of the tube complete with its lining is first shrunk and then finally collapsed by repeatedly traversing a hot zone along the tube while it is rotated about its axis, wherein during said shrinking of the bore a slight overpressure is maintained in the bore by a gas mixture containing oxygen and a halide or oxy-halide of the element having said volatile oxide, passing said mixture halides of the volatile oxide through the tube, then through a reservoir, of a size sufficient to trap soot swept down from the hot zone and to overcome the problem of heat rise within the tube, by acting as a heat sink and finally through an unrestricted long pipe whose rheological conductance is small enough to provide the requisite overpressure within the tube to overcome the tendency for the tube to flatten during the shrinkage of its bore, and wherein the concentration of the halide or oxy-halide in relation to the oxygen is such as to compensate at least in part the volatile oxide loss by volatilization during bore shrinkage.

985 O.G. 28

#### 4,165,225 DISTRIBUTOR FOR OPTICAL SIGNALS

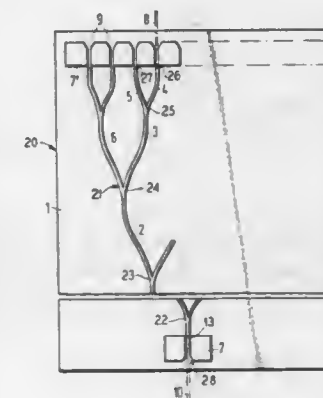
Franz Auracher, Munich, and Ralf Kersten, Rottach-Egern, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Division of Ser. No. 668,698, Mar. 19, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,526

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1975, 2516975

Int. Cl.<sup>2</sup> C03C 27/00

U.S. Cl. 65—4 B

4 Claims



1. A method of forming a distributor of optical signals comprising a substrate, a substantially planar waveguide structure provided on the substrate, said waveguide structure being a metallic hollow guide structure and having a single input end connected by a tree-like branching structure to a plurality of output ends, and means disposed on said substrate adjacent each of said input and output ends for locating an end of an optical fiber at each of the ends, said branching structure having at least one branching point interconnecting a segment of the waveguide structure with two curved branching sections extending therefrom, each of said curved branching sections having a radius of curvature great enough that the guiding of optical signal in the branching section is not impaired, said method comprising providing a substrate with a metallic surface; forming a waveguide structure on a surface of the substrate by applying a layer of light sensitive material on the metallic surface, exposing the light sensitive material through a mask to produce a core of each segment of the waveguide structure, developing the exposed photosensitive layer to leave the cores on the surface, metallizing the surfaces of the cores, and then removing the cores to leave the metallic hollow guide structure; and forming said means for locating on said substrate.

#### 4,165,226 PROCESS FOR PREPARING AN ELEMENT OF A DUAL-IN-LINE CERAMIC PACKAGE PROVIDED WITH A LAYER OF SEALING GLASS

Katsuhiko Kita, Nagoya, Japan, assignor to Narumi China Corporation, Aichi, Japan

Filed Mar. 29, 1978, Ser. No. 891,176

Claims priority, application Japan, Mar. 29, 1977, 52/35836; Aug. 11, 1977, 52/96840

Int. Cl.<sup>2</sup> C03C 27/00

U.S. Cl. 65—42

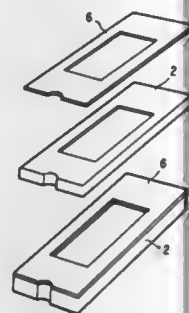
10 Claims

1. In a process for hermetically sealing together the substrate and cover of a ceramic dual-in-line package, the improvement comprising:

- (1) forming powdered low-melting sealing glass into a shape corresponding to the peripheral area of said substrate and/or cover,
- (2) compressing and sintering said shaped powdered sealing



glass, whereby a solid sintered sealing glass preform is produced,  
(3) positioning said preform together with a lead frame between said substrate and cover of said dual-in-line ce-

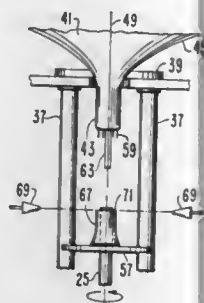


ramic package to be sealed, whereby an assembly of said substrate, lead frame, preform and cover is produced,  
(4) heating said assembly to fuse said sealing glass, whereby an hermetic seal is formed between said substrate and cover.

**4,165,227**  
**STEM-SEALING METHOD FOR ASSEMBLING ELECTRON TUBES INCLUDING IMPROVED CULLET COLLECTION**  
Jawdat I. Nubani, Clarks Summit, and Raymond L. Muenkel, Plains, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,827  
Int. Cl.<sup>2</sup> C03C 27/00  
U.S. Cl. 65—56

7 Claims

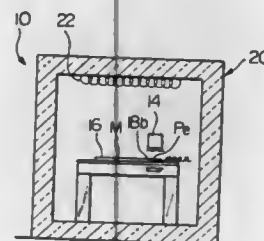


1. In a method for sealing a glass stem into the glass neck of an electron tube including positioning said glass stem on a mount pin in a desired position in said neck, said neck being longer than desired, heat-sealing said neck to said stem, heat severing the excess glass from said neck, whereby the molten portion of said excess glass attaches itself to said mount pin, and sliding said mount pin away from said stem with said excess glass attached around said mount pin, the additional steps comprising

(a) heating said excess glass until it releases from said mount pin without substantially fracturing said excess glass, and then (b) removing said released excess glass from the vicinity of said mount pin without substantially fracturing said glass.

**4,165,228**  
**PROCESS AND APPARATUS FOR HEAT TREATING EDGE OF PLATE GLASS**  
Yoshihiro Ebata, Kawanishi; Tsutomu Ueno, Ikeda; Nagamasa Kataoka, Kawanishi, and Akimasa Akao, Higashi-murayama, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Central Glass Company Limited, Ube, both of, Japan  
Filed May 25, 1978, Ser. No. 909,695  
Claims priority, application Japan, May 26, 1977, 52-62008  
Int. Cl.<sup>2</sup> C03B 29/00  
U.S. Cl. 65—111

18 Claims



1. A process for treating an edge of a flat plate glass, comprising:

heating the whole of the plate glass to a first temperature; heating only a straight and elongate edge portion of the plate glass including the edge to a second temperature higher than that in the other portion of the plate glass and lower than the softening temperature of the plate glass, said second temperature being higher than said first temperature, said heating the edge portion being carried out by using a straight and elongate heating unit disposed along the edge portion of the plate glass, said heating unit being located spaced apart from and near the surface of the edge portion;

applying electric current to the edge portion of the plate glass through a pair of electrodes which are contacted to both side surfaces of the edge portion, respectively, thereby to raise the temperature in the edge portion to the softening temperature of the plate glass.

7. An apparatus for treating an edge of a flat plate glass, comprising:

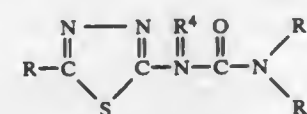
supporting means for supporting the plate glass;  
first heating means for heating the whole of the supported plate glass to a first temperature;

second heating means for heating only a straight and elongate edge portion of the plate glass including the edge to a second temperature which is higher than that of the other portion of the plate glass and lower than the softening temperature of the plate glass, said second temperature being higher than said first temperature, said second heating means including a straight and elongate heating unit secured to said supporting means along the edge portion of the supported plate glass, said heating unit being located spaced apart from and near the surface of the edge portion;

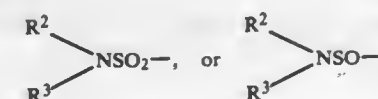
a pair of electrodes contacted to both side surfaces of the edge portion of the plate glass, respectively, which both side surfaces are opposite to each other, said electrodes being supplied with electric current to raise the temperature in the edge portion to the softening temperature of the plate glass.

**4,165,229**  
**HERBICIDAL METHOD**  
Wendell R. Arnold, Delray Beach, Fla., assignor to Eli Lilly and Company, Indianapolis, Ind.  
Continuation-in-part of Ser. No. 683,872, May 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 533,897, Dec. 18, 1974, Pat. No. 3,972,706, which is a continuation-in-part of Ser. No. 374,598, Jun. 28, 1973, abandoned. This application Aug. 29, 1977, Ser. No. 828,699  
Int. Cl.<sup>2</sup> A01N 9/12, 9/00

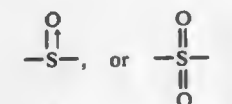
U.S. Cl. 71—90  
8 Claims  
1. A method for killing and preventing the growth of unwanted vegetation on fallow wheatland between the time of harvesting the wheat crop and the time of the next planting of winter or spring wheat which method comprises applying to the locus to be treated an herbicidally-effective amount of a compound of the formula:



wherein  
R is R<sup>1</sup>X—,



R<sup>1</sup> is lower alkyl or C<sub>3</sub>-C<sub>7</sub> cycloalkyl;  
X is —S—,



R<sup>2</sup> is hydrogen or a substituted or unsubstituted lower alkyl, the substituents being selected from the class consisting of halo, hydroxy, cyano, and lower alkoxy;  
R<sup>3</sup> is lower alkoxy, lower alkenyl, lower alkynyl, or a substituted or unsubstituted lower alkyl, the substituents being selected from the class consisting of halo, hydroxy, cyano, and lower alkoxy;  
R<sup>2</sup> and R<sup>3</sup>, when taken together with the nitrogen to which they are attached, form a morpholino, piperidino, or pyrrolidino group;  
R<sup>4</sup> is hydrogen or lower alkyl;  
R<sup>5</sup> is hydrogen, lower alkyl, lower alkenyl, or C<sub>3</sub>-C<sub>7</sub> cycloalkyl;  
R<sup>6</sup> is hydrogen, lower alkenyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, lower alkoxy, or a substituted or unsubstituted lower alkyl, the substituents being selected from the group consisting of halo, hydroxy, cyano, or lower alkoxy, except that R<sup>5</sup> and R<sup>6</sup> cannot both be hydrogen or a C<sub>3</sub>-C<sub>7</sub> cycloalkyl; and tautomers of (I) wherein R<sup>4</sup> is hydrogen; and when R<sup>4</sup> is hydrogen, the alkali metal, alkaline earth metal, and ammonium salts thereof.

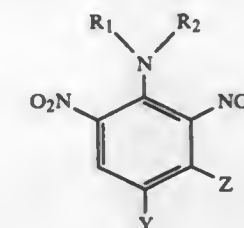
**4,165,230**  
**AGRICULTURAL SPRAY OILS CONTAINING ZINC DIALKYLDITHIOPHOSPHATES**  
Ralph E. Gravrok, Coral Gables, Fla., and Clarence A. L. Phillips, Ponte-a-Pierre, Trinidad and Tobago, assignors to Texaco Inc., White Plains, N.Y.  
Filed Jul. 21, 1978, Ser. No. 926,993  
Int. Cl.<sup>2</sup> A01N 17/08

U.S. Cl. 71—127  
3 Claims  
1. An agricultural spray oil composition having a minimum gravity API of 27, a viscosity at 40° C. of between 8 and 20

centi-Stokes and a boiling range of 85° to 775° F. and a minimum unsulfonated residue of 85% and containing from 0.1 to 0.25 weight volume percent thereof of at least one zinc dialkyl dithiophosphate wherein the alkyl groups have from 3 to 8 carbon atoms per molecule.

**4,165,231**  
**2,6-DINITROANILINE HERBICIDES**  
Albert W. Lutz, Princeton, and Robert E. Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.  
Continuation-in-part of Ser. No. 639,729, Dec. 11, 1975, abandoned, which is a division of Ser. No. 538,980, Jan. 6, 1975, Pat. No. 4,066,441, which is a division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, which is a continuation-in-part of Ser. No. 262,807, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Mar. 11, 1977, Ser. No. 777,271  
Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 71—121  
61 Claims  
1. A method for the preemergence control of undesirable plant species comprising applying to soil containing seeds of the undesirable plant species a herbicidally effective amount of a compound of the formula:



wherein:  
Y is halogen, alkyl C<sub>1</sub>-C<sub>4</sub>, alkenyl C<sub>2</sub>-C<sub>4</sub>, or CF<sub>3</sub>;  
Z is alkyl C<sub>1</sub>-C<sub>4</sub>, alkenyl C<sub>2</sub>-C<sub>4</sub> or monosubstituted alkyl C<sub>1</sub>-C<sub>4</sub> where the substituent is halogen, alkoxy C<sub>1</sub>-C<sub>4</sub> or —NR<sub>3</sub>R<sub>4</sub>;  
R<sub>1</sub> is hydrogen, alkyl C<sub>1</sub>-C<sub>6</sub>, alkenyl C<sub>2</sub>-C<sub>6</sub> or alkynyl C<sub>2</sub>-C<sub>6</sub>;  
R<sub>2</sub> is alkyl C<sub>2</sub>-C<sub>7</sub> (straight, branched or cyclo), alkenyl C<sub>2</sub>-C<sub>6</sub>, alkynyl C<sub>2</sub>-C<sub>6</sub>, or monosubstituted alkyl C<sub>1</sub>-C<sub>4</sub> where the substituent is halogen or alkoxy C<sub>1</sub>-C<sub>4</sub>; and  
R<sub>3</sub> and R<sub>4</sub> each represent hydrogen or alkyl C<sub>1</sub>-C<sub>4</sub>; with the proviso that when Y and Z are methyl and R<sub>1</sub> is hydrogen or ethyl, then R<sub>2</sub> cannot be ethyl; and that when R<sub>1</sub> is hydrogen and Y and Z are methyl, R<sub>2</sub> cannot be 1-ethylbutyl, 1-ethylpropyl, 1-methylbutyl or 1-methylpropyl.

**4,165,232**  
**MANUFACTURE OF FERROMAGNETIC METAL PARTICLES ESSENTIALLY CONSISTING OF IRON**  
Christof Jaechh, Heidelberg; Werner Steck, Mutterstadt; Rudolf Brodt, Hirschberg; Manfred Ohlinger, Frankenthal; Werner Loeser, Ludwigshafen, and Eberhard Koester, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Filed Sep. 15, 1978, Ser. No. 942,656  
Int. Cl.<sup>2</sup> C22C 1/04

U.S. Cl. 75—0.5 AA  
2 Claims  
1. A method of preparing acicular ferromagnetic metal particles consisting essentially of iron and suitable for magnetic recording, said particles being modified at the surface with 0.02 to 0.6% by weight of boron as borate, by reducing a finely divided acicular iron compound selected from the group consisting of iron oxide and iron oxide hydrate with a gaseous reducing agent at a temperature of from 250° to 500° C., wherein there are deposited on said iron oxide or iron oxide hydrate, prior to reduction, a substance selected from the group consisting of oxyacids of boron and their inorganic salts

in such an amount that 0.01 to 1% by weight of boron is present.

4,165,233

**TREATING MOLTEN METALLURGICAL SLAG**  
Francis Gagneraud, 6 Avenue des Tilleuls, Paris, France (75016)  
Filed Jul. 12, 1977, Ser. No. 815,029  
Claims priority, application France, Dec. 17, 1976, 76 38039  
Int. Cl.<sup>2</sup> C21B 3/04

U.S. Cl. 75—24

11 Claims

1. A process for treating metallurgical slags and cinders to modify their physical-chemical characteristics while conserving energy consumption, and to increase their fragmentability and crushability, consisting essentially of:

injecting into the slag a pulverulent mixture of carbonate products, which release non-polluting gases into the slag by endothermal reaction utilizing a part of the sensible heat of the molten mass of the slag; and free carbon products, said injecting taking place while the slag is at a temperature sufficiently low to permit the capture of the gases being evolved while the slag is solidifying, without creating substantial foaming, but still high enough to permit the endothermal reaction to take place, thus creating a porous solid.

4,165,234

**PROCESS FOR PRODUCING FERROVANADIUM ALLOYS**

Boris M. Kostyanov, ulitsa Kutuzova, 104-a, kv. 39; Anatoly I. Manokhin, ulitsa Metallurgov, 4, kv. 44; Alexei G. Zubarev, ulitsa Pervomaiskaya, 11, kv. 50; Gennady S. Kolganov, ulitsa Kalinina, 26, korpus 2, kv. 307; Stanislav S. Volkov, ulitsa Volodarskogo, 78, korpus 1, kv. 116; Igor A. Taldykin, Dovatora, 12, kv. 2; Viktor V. Kazansky, 2 prospekt Metallurgov, 5, kv. 29, and Evgeny N. Ivashina, ulitsa Kirova, 18/141, kv. 42, all of Tula, U.S.S.R.

Filed Mar. 14, 1978, Ser. No. 886,923

Int. Cl.<sup>2</sup> C22C 33/00, 33/04

U.S. Cl. 75—60

1 Claim

1. Method of producing ferrovanadium alloys, which comprises melting a charge of ferrovanadium slag, which charge contains iron and vanadium, substantially completely reducing said iron and vanadium to form a metal melt, blowing oxygen into said metal melt in a converter bottom at a rate of supply of oxygen and for a period sufficient to obtain a slag with a content of vanadium pentoxide of at least 35% by weight and a remaining metal melt, discharging the thus remaining metal melt from the converter, and reducing the vanadium and iron in the remaining slag by metal-thermal reduction to form a ferrovanadium alloy.

4,165,235

**METHOD FOR INLINE DEGASSING AND FILTRATION OF MOLTEN METAL**

Jonathan A. Dantzig, New Haven, and Derek E. Tyler, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 26, 1978, Ser. No. 900,065

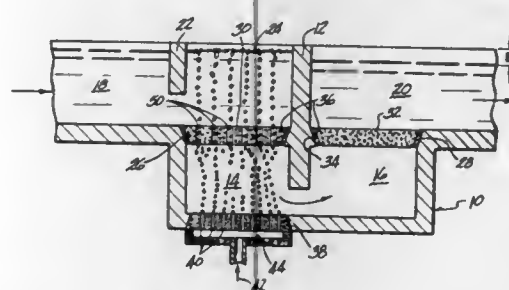
Int. Cl.<sup>2</sup> C22B 9/02

U.S. Cl. 75—93 E

21 Claims

1. A method for the filtration and degassing of molten metal by passing said molten metal through at least one filter-type medium and purging said molten metal with a fluxing gas by passing said fluxing gas through said molten metal in counter-current flow therewith, the improvement comprising positioning fluxing gas inlet means such that fluxing gas issuing from said fluxing gas inlet means passes through said at least one filter-type medium and providing said at least one filter-type

medium with a preferential path for passing said fluxing gas through said at least one filter-type medium wherein said preferential path is substantially larger than the pore size of said at least one filter-type medium.



4,165,236

**COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL**

Yasuo Aotsuka, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
Continuation of Ser. No. 523,176, Nov. 12, 1974, abandoned.  
This application Oct. 26, 1976, Ser. No. 735,654  
Claims priority, application Japan, Nov. 12, 1973, 48/127083  
Int. Cl.<sup>2</sup> G03C 1/76, 7/00, 7/04

U.S. Cl. 96—74

11 Claims

PC
BL
RL2
YF
GL
RL1
S

PC
RL2
GL2
BL
YF
GL1
RL1
S

1. A color photographic light-sensitive material comprising a support having coated on one surface thereof at least a first red-sensitized cyan-forming silver halide emulsion layer, at least a green sensitized magenta-forming silver halide emulsion layer, a first yellow filter layer, at least a blue-sensitive silver halide emulsion layer and an uppermost protective layer which optionally functions as a second yellow filter layer which contributes not more than 50 percent of the total yellow filter density, in this order from the support, and a second red-sensitized cyan-forming silver halide emulsion layer which is positioned between the first yellow filter layer and the blue-sensitive silver halide emulsion layer, where the sensitivity of the second red-sensitized silver halide emulsion layer is about 0.1 to 0.2 times the sensitivity of the first red-sensitized silver halide emulsion layer.

4,165,237

**SILVER HALIDE LIGHT-SENSITIVE MATERIAL**

Keisuke Shiba, Shizuoka; Tatsuya Tajima, Minami-ashigara, and Hirokazu Sakaki, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
Filed May 17, 1976, Ser. No. 687,424

Claims priority, application Japan, May 16, 1975, 50/59025

Int. Cl.<sup>2</sup> G03C 1/48, 1/84, 5/54

U.S. Cl. 96—76 R

15 Claims

1. A silver halide light-sensitive material in which a silver halide light-sensitive emulsion layer containing a binder in an amount of about 150 to about 700 g per 1 mol of silver halide is provided at a silver coverage of about 3.7 to about 20 millimol/1 m<sup>2</sup> on a support having a permanent spectral reflectance of about 25% or less in the light-sensitive wavelength region of the silver halide light-sensitive emulsion layer.

tance of about 25% or less in the light-sensitive wavelength region of the silver halide light-sensitive emulsion layer.

11. The silver halide light-sensitive material of claim 1, in combination with an image receiving element for use in diffusion transfer, wherein upon contact with a water soluble silver complex forming agent following exposure silver halide which has not been exposed forms a water soluble silver complex which transfers to said image receiving element.



sion transfer, wherein upon contact with a water soluble silver complex forming agent following exposure silver halide which has not been exposed forms a water soluble silver complex which transfers to said image receiving element.

4,165,238

**PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE PYRIDYLAZONAPHTHOL DYE-RELEASING COMPOUNDS**

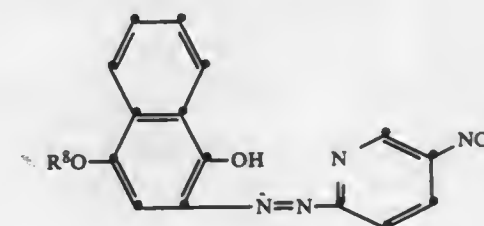
Richard B. Anderson; Elaine H. Hoffmeister, and Richard A. Landholm, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Division of Ser. No. 832,499, Sep. 12, 1977. This application Jul. 24, 1978, Ser. No. 927,190

Int. Cl.<sup>2</sup> G03C 1/84; C09B 45/00, 29/22, 29/36

U.S. Cl. 96—119 R

19 Claims

18. A photographic element comprising a support having thereon a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein:

R<sup>8</sup> is an alkyl or substituted alkyl group of 1 to about 8 carbon atoms.

4,165,239

**PROCESS FOR DISPERSING PIGMENTS AND FILLERS USING CARBOXYLIC ACID ESTERS OF TERTIARY ALKYLOLAMINES**

Heinrich Linden, and Hans Bornmann, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany  
Filed Jun. 19, 1978, Ser. No. 916,924

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728237

Int. Cl.<sup>2</sup> C09C 1/24, 1/36, 3/08

U.S. Cl. 106—300

10 Claims

1. In a process for treating titanium dioxide pigments and iron oxide pigments with a dispersing agent in order to improve their dispersibility in organic and aqueous media, the improvement comprising utilizing at least one ester of at least two moles of an aliphatic carboxylic acid having 6 to 18 carbon atoms in the molecule and selected from the group consisting of alkanic acids, alkenic acids, hydroxy substituted alkanic acids and hydroxy substituted alkenic acids with a mole of a tertiary alkylolamine selected from the group consisting of triethanolamine and an N-methyl-diethanolamine as the dispersing agent.

4,165,240

**STARCH HYDROLYSATE HAVING LESS THAN 5 PPM OF HEAVY METALS**

Shigehiro Enokizono, Ageo; Norio Kamata, Funabashi, and Sumiko Kanno, Sakado, all of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 618,090, Sep. 30, 1975, Pat. No.

4,100,025. This application Apr. 21, 1978, Ser. No. 898,585

Claims priority, application Japan, Oct. 4, 1974, 49-113998

Int. Cl.<sup>2</sup> C13K 1/08, 1/06, 11/00

U.S. Cl. 127—29

2 Claims

1. A starch hydrolysate containing less than five parts per million of total heavy metals.

4,165,241

**SOLAR CELL WITH IMPROVED PRINTED CONTACT AND METHOD OF MAKING THE SAME**

John W. Yerkes, Granada Hills, and James E. Avery, Burbank, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 804,688, Jun. 8, 1977, Pat. No. 4,105,471.

This application Mar. 27, 1978, Ser. No. 890,167

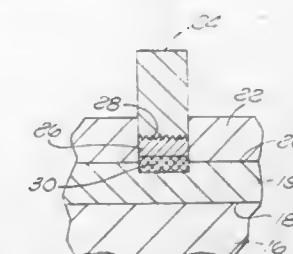
The portion of the term of this patent subsequent to Aug. 8, 1995,

has been disclaimed.

Int. Cl.<sup>2</sup> H01L 31/06

U.S. Cl. 136—89 CC

11 Claims



9. A silicon solar cell comprising:

- (A) a silicon semiconductor body including first and second surfaces with a P/N junction therebetween at a shallow depth from said first surface of less than approximately 0.5 microns and an ohmic contact pattern on said second surface of said body opposite said first surface;
- (B) an electrically conductive contact pattern on said first surface;
- (C) a tungsten dioxide antireflective coating on said first surface and coextensive therewith except under said contact pattern; and
- (D) a layer of tungsten under said contact pattern and forming a bond and an electrical connection with said contact pattern and with said first surface; the combination of said layer and said coating being continuous.

4,165,242

**TREATMENT OF METAL PARTS TO PROVIDE RUST-INHIBITING COATINGS BY PHOSPHATING AND ELECTROPHORETICALLY DEPOSITING A SICCATIVE ORGANIC COATING**

Roger A. Kelly, Euclid, and Howard G. Pekar, Mentor, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed Nov. 21, 1977, Ser. No. 853,238

Int. Cl.<sup>2</sup> C23F 7/10; C25D 13/06, 13/20

U.S. Cl. 148—6.15 Z

21 Claims

1. A method of treating metal parts to provide a durable rust-inhibiting coating comprising the steps of

- (a) phosphating the metal parts with an aqueous metal phosphating solution,
- (b) electrophoretically depositing a siccative organic coating



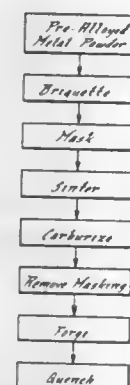
on the phosphated metal parts contained in a rotatable porous barrel, and  
(c) applying a corrosion inhibiting film of oil as a seal coat.

# 4,165,243 METHOD OF MAKING SELECTIVELY CARBURIZED FORGED POWDER METAL PARTS

Myron C. Sarnes, Northville, and Ramjee Pathak, Canton, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed May 31, 1978, Ser. No. 911,024  
Int. Cl.<sup>2</sup> C21D 1/48

U.S. Cl. 148—16.5



1. A process for obtaining a substantially fully dense, selectively and partially carburized, low-alloy ferrous, powder metal part comprising the sequential steps of:

- briquetting a low-alloy ferrous metal powder preform having a fixed uniform initial carbon content throughout both the case and inner core thereof, the briquetted preform having at least one first surface portion thereof which in the final forged form is required to be of a certain case depth and having at least a second surface portion which in final forged form is to be substantially uncarburized;
- sealing said at least one second surface portion from the carburizing atmosphere by applying masking means substantially completely enclosing in sealing engagement said at least one second surface portion, said masking means comprising a metal member having surfaces which interfittingly engage said preform to isolate selected regions thereof from its surroundings;
- sintering said preform;
- carburizing said preform to substantially increase the initial carbon content thereof in said case by providing a controlled carbon atmosphere of rich endothermic gas and maintaining said preform in said controlled atmosphere for a predetermined period of time sufficient to obtain a desired case depth of final carbon content at said at least one first surface portion substantially greater than said initial carbon content of the case as well as the final carbon content of said inner core and said at least one second surface portion;
- removing said masking means from said preform; and
- forging said preform.

# 4,165,244 SOLDERING FLUX AND METHOD OF USING SAME

Norman L. Jacobs, 3102 Milam St., Houston, Tex. 77006  
Filed Oct. 21, 1977, Ser. No. 844,224

Int. Cl.<sup>2</sup> B23K 35/34

U.S. Cl. 148—23

8 Claims

1. A soldering flux, consisting essentially of: an acid anhydride having a molecular weight of less than about 800 which does not produce water during soldering, selected from the group consisting of (a) carboxylic acid anhydrides having at least nine carbon atoms, and (b)

cyclic and substituted cyclic acid anhydrides and derivatives thereof wherein the ratio of the total number of carbonyl groups to carbon atoms is no greater than 1:4; a catalyst to promote the opening of the anhydride during soldering; and an anhydrous solvent which does not contain water as an impurity or react to form water during the soldering operation.

# 4,165,245 METHOD FOR THE FABRICATION OF INTERNALLY WELD-CLADDED PIPE ELBOWS

Alfred Ludwig, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

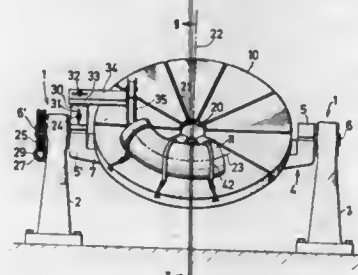
Filed Dec. 28, 1977, Ser. No. 865,155

Claims priority, application Switzerland, Jan. 10, 1977, 238/77

Int. Cl.<sup>2</sup> C21D 1/00

U.S. Cl. 148—127

2 Claims



1. A method of internally weld-cladding a toroidal body, said method comprising the steps of forming a pair of torus-sector half-shells; machining the edges of each half-shell; subsequently welding the half-shells together into a toroidal body; straightening and heat treating the toroidal body; thereafter applying a weld-clad along tangential generatrix lines on the inside of the toroidal body; and subsequently stress-annealing the weld-cladded toroidal body.

# 4,165,246 PROCESS FOR THE HEAT TREATMENT OF THICK WALLED STEEL PIPES

Friedhelm Reinke, Remscheid, and Friedhelm Emde, Hückeswagen, both of Fed. Rep. of Germany, assignors to Aeg-Elotherm, G.m.b.H., Remscheid-Hasten, Fed. Rep. of Germany

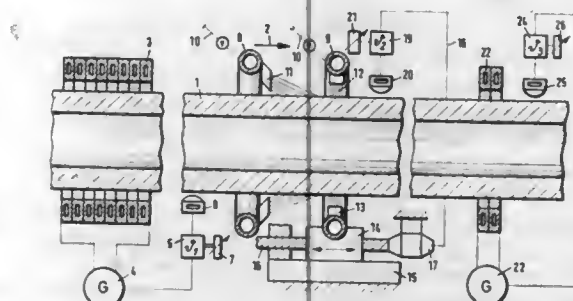
Filed Apr. 26, 1977, Ser. No. 790,909

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620377

Int. Cl.<sup>2</sup> C21D 9/08, 9/14

U.S. Cl. 148—150

2 Claims



1. In a process for the heat treatment of thick-walled steel

pipes in transit in their longitudinal direction through heat treatment stations at a predetermined transit speed, in case of which parts of the pipe jacket lying side by side in the direction of the longitudinal axis of the pipe and mutually displaced and in succession, are subjected to the same heat treatment, and in which the pipes are first heated over the entire cross section of the pipe wall, to the austenization temperature of the pipe material, the improvement wherein said pipes are then quenched only in one of the surface layers of the pipe material by supplying a coolant to the surface to form martensite in said one surface layer while martensite is not formed in the not-quenched wall parts, and are finally drawn automatically in the surface layer by the supply of heat stored in said not-quenched parts of the wall from said first heating to austenization temperature step, which not-quenched parts are left to cool to form an interstage structure.

# 4,165,247 POLYURETHANE SOLID PROPELLANT BINDER

William R. Brew, New York, N.Y., and Raymond M. Price, Applegate, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1966, Ser. No. 526,663

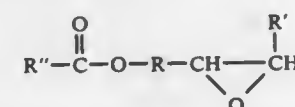
Int. Cl.<sup>2</sup> C06B 45/10

U.S. Cl. 149—19.4

16 Claims

1. A composition capable of being cast and cured into a solid propellant comprising:

- (a) an organic compound having as its sole reacting groups two isocyanate groups, and
- (b) the hydroxy terminated condensation product of a compound having the structure



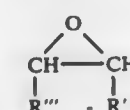
wherein

R is alkylene

R' is selected from the group consisting of hydrogen and alkyl

R'' is alkyl

and a compound having the structure



wherein R''' and R'' are selected from the group consisting of hydrogen and alkyl.

# 4,165,248 METHOD OF JOINING FLUOROCARBON MEMBRANE SHEETS WITH QUATERNARY AMMONIUM COMPOUNDS

William B. Darlington; John D. Driskill, and Donald W. Du Bois, all of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 746,271, Dec. 1, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,754

Int. Cl.<sup>2</sup> C09J 5/02

U.S. Cl. 156—308

8 Claims

1. A method of bonding first and second permionic membrane sheets fabricated of fluorocarbon polymers having pendant acid groups chosen from the group consisting of sulfonyl groups, carboxylic acid groups, phosphoric groups, phosphonic groups, and derivatives thereof, which method comprises the steps of:

contacting a strip fabricated of fluorocarbon polymers having pendant acid groups chosen from the group consisting

of sulfonyl groups, carboxylic acid groups, phosphoric groups, phosphonic groups, and derivatives thereof, with a quaternary ammonium compound chosen from the group consisting of quaternary ammonium hydroxide and quaternary ammonium salts, and having organic constituents chosen from the group consisting of methyl, ethyl, propyl, butyl, pentyl, and amyl groups;

forming a lap of said contacted first sheet, said second sheet, and said strip, the strip being interposed between the first and second sheets; and

heating said lap to above about 246° C. while imposing an elevated pressure thereon whereby to effect a bond between said first sheet, said strip, and said second sheet.

# 4,165,249 METHOD OF PURIFYING GERMANIUM BODIES

Walter Heywang, Neukeferloh, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

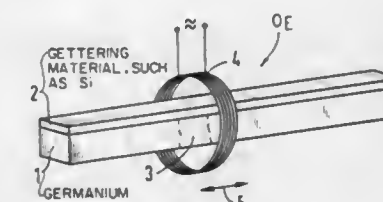
Filed Feb. 25, 1977, Ser. No. 772,100

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2607911

Int. Cl.<sup>2</sup> B01J 12/17

U.S. Cl. 156—605

13 Claims



1. A process of purifying a germanium body containing impurities therein which form complex compounds in liquid germanium and tend to segregate relatively poorly in such liquid germanium, comprising:

applying an extended continuous layer of a relatively pure gettering material which tends to prevent formation of complex impurity compounds onto a surface extending substantially the entire axial length of a germanium body to be purified;

melting and solidifying at least said germanium so that at least some impurities therein are bound to said gettering material and until a desired degree of germanium purity is attained; and

removing at least the layer of gettering material from the so-processed germanium body.

# 4,165,250 RIBOFLAVIN PURIFICATION

Albert Epstein, Edison; Glen Graham, Rocky Hill, and William A. Sklarz, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 669,139, Mar. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 609,132, Aug. 29, 1975, abandoned. This application Nov. 14, 1977, Ser. No. 850,991

Int. Cl.<sup>2</sup> C12D 5/04

U.S. Cl. 435—267

6 Claims

1. A process for the recovery of purified riboflavin from a riboflavin and cell containing fermentation broth comprising: heating the broth when the fermentation yield is at about the maximum to from about 50° to about 65° C. for from about 15 to about 45 minutes to lyse the cells and decrease broth viscosity;

adding to the heated fermentation broth a volume of water insufficient to dissolve suspended solids in said broth but sufficient to optimize separation by both diluting previ-

ously dissolved solids and permitting centrifugal separation of solid suspended particles having a density less than that of crystalline riboflavin, then centrifuging the treated fermentation broth containing the added quantity of water to produce a sludge, resuspending the sludge with a quantity of water insufficient to dissolve suspended solids but sufficient to optimize separation of solid particles having a density less than that of crystalline riboflavin, and centrifuging the resuspended sludge to obtain a purified riboflavin-containing centrifugate usable as such as an animal feed supplement.

4,165,251

## STRIPPING AND DEVELOPING DEVICE

Nobuo Matsumoto; Osami Tsuji; Yukio Kamiya, and Etsuo Shiozawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 22, 1977, Ser. No. 853,956

Claims priority, application Japan, Nov. 22, 1976, 51-140962; Dec. 17, 1976, 51-151639

Int. Cl.<sup>2</sup> B32B 31/00; G03B 17/50; G03D 9/02

U.S. Cl. 156—584

5 Claims



1. In a device for developing a photosensitive material by stripping a cover base from the photosensitive material consisting of the cover base laminated through the intermediary of a photosensitive layer to a support member, said stripping and developing device comprising:

- a stripping roller consisting of the combination of a plurality of cover-base separating rollers and a plurality of brush rollers larger in diameter than said separating rollers, said separating rollers and said brush rollers being arranged alternately in side by side relation; and
- a plurality of nip rollers contacting said separating rollers, said stripping roller being rotated in a direction opposite to the direction of transportation of the photosensitive material, with said brush rollers contacting the cover base surface of the photosensitive material, said brush rollers stripping the cover base at the leading end of the photosensitive material from said support member, and the cover base thus separated being held for transportation between said separating rollers and said nip rollers, whereby the cover base is completely separated from the support member.

4,165,252

## METHOD FOR CHEMICALLY TREATING A SINGLE SIDE OF A WORKPIECE

Stephen R. Gibbs, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 718,897, Aug. 30, 1976, abandoned.

This application Mar. 6, 1978, Ser. No. 883,747

Int. Cl.<sup>2</sup> H01L 21/312; C23F 1/02

U.S. Cl. 156—655

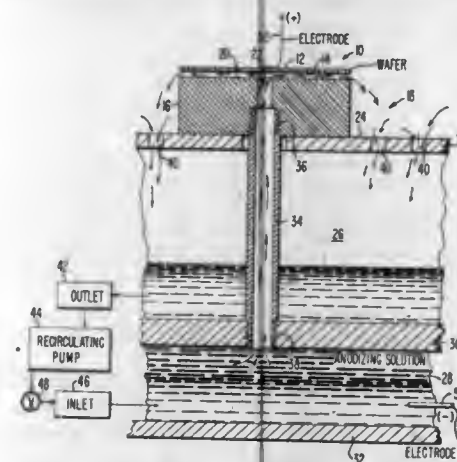
6 Claims

1. A method of chemically treating a workpiece on one surface only comprising the steps of:

placing the workpiece with a surface to be treated horizontally down on a horizontally disposed top surface of a table, said top surface having a centrally located aperture thereon and the workpiece and top surface being coextensive;

introducing liquid chemical in an upward direction through the aperture and across the top surface where said chemical flows between the top surface and the entire surface to

be treated with sufficient pressure to space the workpiece from the top surface so that liquid chemical performs the treatment on the entire surface of the workpiece and at the



same time utilizing said introduced fluid to alone maintain orientation of the workpiece relative to the top surface during this treatment.

4,165,253

## PROCESS FOR PRODUCING PULP

Mikhail A. Ivanov, Severny prospekt, 73, korpus 3, kv. 51; Vladimir G. Ushakov, Grazhdansky prospekt 104, korpus 1, kv. 210; Vitaly M. Krjukov, ulitsa Novosibirskaya, 21, kv. 13; Viktor I. Losik, Kondratievsky prospekt, 79, kv. 159; Vasily I. Sorokin, prospekt Morisa Toreza, 104, korpus 3, kv. 41, all of Leningrad; Avgust V. Osipov, Leninsky prospekt, 52, kv. 265, Moscow; Valery S. Gromov, ulitsa Gorkogo, 27/29, kv. 38; Jury S. Khrol, ulitsa Daugavgrivas, 13, kv. 4, both of Riga; Galina G. Bakina, Zavodskoi pereulok, 11, Lomonosov Leningradskoi oblasti; Semen I. Andabursky, ulitsa Lenina, 399, kv. 43, Riga; Valery G. Kenin, prospekt Junogo Lenintsa, 75, kv. 8, Lomonosov Leningradskoi oblasti; Tatyana K. Vasilevskaya, Izmailovsky prospekt, 12, kv. 11; Ljudmila I. Stolyarova, ulitsa Dvinskaya, 9, kv. 16, both of Leningrad, and Ella J. Beizer, ulitsa Zverinskaya, 17-b, kv. 25, Leningrad, all of U.S.S.R.

Filed Jul. 20, 1978, Ser. No. 927,592

Int. Cl.<sup>2</sup> D21C 3/16

U.S. Cl. 162—19

4 Claims

1. A process for producing pulp from a vegetable stock consisting in the subsequent steps of treating the vegetable stock with water at a temperature within the range of from 110° to 170° C. under a pressure of from 2 to 7 atm.g. for a period of from 0.3 to 4 hours at a weight ratio of the vegetable stock to water of 1:2-4 respectively; simultaneously impregnating and cooking said water treated vegetable stock in a solution of nitric acid at a temperature of from 70° to 90° C. for a period of from 0.5 to 3 hours; continuing said cooking at a temperature of from 100° to 130° C. under a pressure of from 1 to 4 atm.g. for 0.3-0.5 hour; extracting the cooked vegetable stock with alkali; decontaminating the gaseous cooking products by mixing said gaseous cooking products with air in a volumetric ratio of 1:0.5-1 respectively and passing the mixture of gaseous cooking products and air through the spent liquor resulting from the alkali extraction stage.

4,165,254

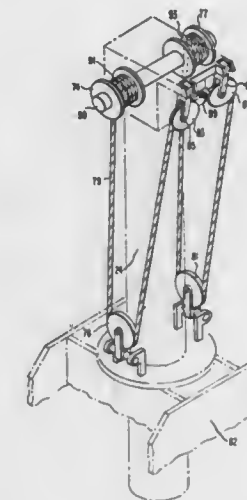
## PULLEY SYSTEM INCLUDING EMERGENCY LOCKING MEANS FOR NUCLEAR REACTOR VESSEL INSPECTION APPARATUS

Renato D. Reyes, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,390

Int. Cl.<sup>2</sup> G21C 17/00

U.S. Cl. 176—19 R



1. Apparatus for inspecting a nuclear reactor vessel; the vessel having an external flange and a plurality of guide studs thereon and extending upwardly therefrom defining a generally circular path; an internal circumferential vessel flange; an internal locating element disposed on said internal circumferential vessel flange the exact position of which is known; a support ring generally sized to relate to the path defined by the position of said guide studs; a plurality of guide stud bushings, equal in quantity to the number of said guide studs, said bushings being larger in internal diameter than the outer diameter of said guide studs; first clamping means for movably mounting said bushings on said support ring to enable, when loosened, alignment of each of said bushings with one of said guide studs; at least three support legs, all but one of said support legs including means for adapting said legs to contact and rest upon said internal circumferential vessel flange, the remaining support leg including means for adapting said leg to engage said internal locating element; a central column; a manipulator arm attached to said central column; and a mechanism for equalizing the forces applied to the manipulator arm, the forces causing vertical movement of the manipulator arm along said central column, said mechanism comprising:

- (a) drive pulley means, including take-up spools, adapted to be driven thereby, for causing a pulley cable to be displaced relative thereto and disposed adjacent to said central column and above the manipulator arm;
- (b) a first set of idler pulley means for accepting a first portion of the pulley cable from said drive pulley means, said first set of idler pulley means being secured to the manipulator arm; and
- (c) a second set of idler pulley means for accepting a second portion of the pulley cable to define a loop for equalizing any imbalance of forces in the pulley cable, said second set of idler pulley means being secured adjacent to said central column and above the manipulator arm.

4,165,255

## NUCLEAR FUEL RACK LATERAL SUPPORT AND PRELOAD DEVICE

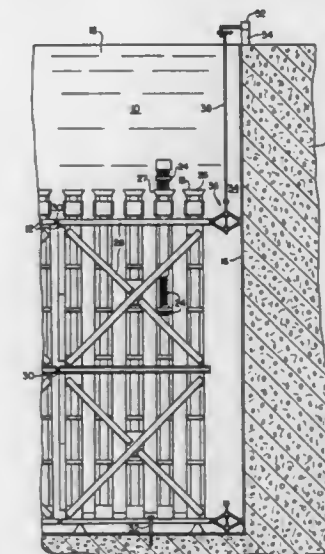
Charles B. Knight, deceased, late of Gulf Breeze, Fla. (by June S. Knight, personal representative), assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 22, 1977, Ser. No. 789,912

Int. Cl.<sup>2</sup> G21C 19/20, 19/00; B66F 3/22, 3/00

3 Claims U.S. Cl. 176—30

6 Claims



1. A lateral support and preload device for a nuclear fuel rack affixed within an enclosure having a vertical wall, said device comprising:

- a. a load pad;
- b. means for moving said pad predominantly horizontally and into contact with said vertical wall in response to an applied force;
- c. shock absorbing means for applying a preload to said pad subsequent to contact of said pad with said vertical wall in response to a further applied force, said shock absorbing means being of a material free from substantial degradation in the nuclear fuel rack environment; and
- d. means for mounting said horizontal moving means to said rack.

4,165,256

## FUEL ELEMENT GRID PLATE WITH CORRUGATION AND BOSSES

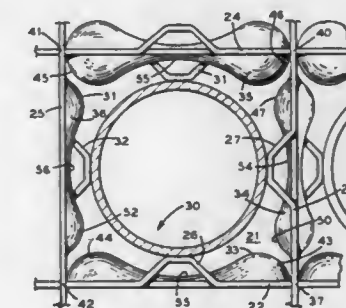
Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,874

Int. Cl.<sup>2</sup> G21C 3/02

U.S. Cl. 176—78

1 Claim



1. A fuel element grid plate for stabilizing elongated fuel rods having longitudinal axes comprising a generally flat sheet



of metal, said sheet having a midplane transverse to the longitudinal axes and a pair of generally parallel edges also transverse to the longitudinal axes, at least one boss on the sheet protruding from the surface thereof in order to engage the surface of one of the fuel rods, and at least one corrugation disposed in a direction that is generally parallel to the transverse midplane, said corrugation formed in the surface of the sheet and spaced from the boss, said corrugation being generally parallel to and intermediate of the transverse edges and protruding from the surface of the sheet over a portion thereof a distance that is less than the boss protrusion in order to space the corrugation from the fuel rod surface, said corrugation having bulbous protrusions extending from the surface of the plate at the extremities of the corrugation, and an intermediate corrugation portion connecting the bulbous protrusions, said bulbous protrusion extending from the surface of said plate through distances that are greater than the intermediate corrugation portion.

4,165,257

# BIOPOLYMER FILTERABILITY IMPROVEMENT BY CAUSTIC-ENZYME TREATMENT

Olaf M. Stokke, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 13, 1978, Ser. No. 886,021

Int. Cl.<sup>2</sup> C12D 13/04; E21B 43/22

U.S. Cl. 435—262

4 Claims

1. In an improved hydrocarbon recovery process wherein subterranean petroliferous formations are flooded with aqueous mixtures of biopolymers to increase hydrocarbon recovery, said polymer being treated with enzymes to solubilize cell debris prior to filtration, the improvement comprising treating the polymer, prior to filtration in use in a petroliferous formation with a specific bacillus enzyme at a pH of 12.5 to 13.0 to improve filterability, then filtering prior to use.

4,165,258

# PLASMINOGEN ACTIVATING ENZYME-SPECIFIC COMPETITIVE INHIBITOR

E. Kendall Pye, Media; Thomas Maciag; Michael K. Weibel, both of Philadelphia, and Mellicote R. Tyengar, Gladwyne, all of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Oct. 8, 1975, Ser. No. 620,792

Int. Cl.<sup>2</sup> C07G 7/02; C08C 103/20; C07C 103/28

U.S. Cl. 435—215

28 Claims

1. A plasminogen activating enzyme-specific competitive inhibitor selected from the group consisting of  $\alpha$ -N-benzylsulfonyl-p-aminophenylalanine and its acid derivatives in which the hydroxyl group of its carboxyl group has been replaced by a substituent hydrolyzable to said hydroxyl group.

4,165,259

# CONTROL SYSTEM FOR A FURFURAL REFINING UNIT RECEIVING HEAVY SOUR CHARGE OIL

Avilino Sequeira, Jr.; John D. Begnaud, and Frank L. Barger, all of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 851,991, Nov. 16, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,617

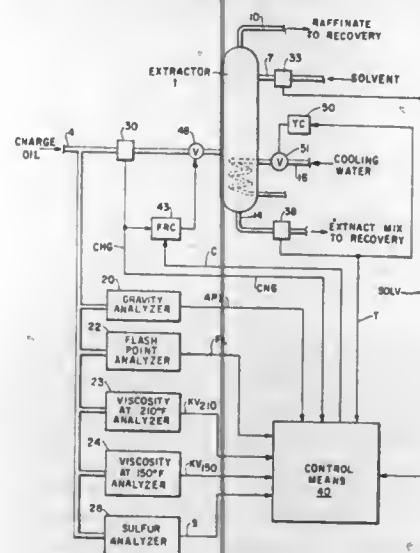
Int. Cl.<sup>2</sup> C10G 21/00; G06G 7/58

U.S. Cl. 196—14.52

8 Claims

1. A control system for a furfural refining unit receiving heavy sour charge oil and furfural solvent, one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control system, treats the received heavy sour charge oil with the received furfural to yield extract mix and raffinate, comprising gravity analyzer means for sampling the heavy sour charge oil and providing a signal API corresponding to the API gravity of the heavy sour charge oil, flash point analyzer means for sampling the heavy sour charge oil and providing a signal FL corresponding to the flash point temperature of the heavy sour charge oil, viscosity analyzer means for sampling the heavy sour charge oil and providing

signals KV<sub>150</sub> and KV<sub>210</sub> corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, sulfur analyzer for sampling the heavy sour charge oil and providing signal S corresponding to the sulfur content of the heavy sour charge oil, flow rate sensing means for sensing the flow rates of the heavy sour charge oil and of the furfural and providing signals CHG and SOLV, corresponding to the heavy sour charge oil flow rate and the furfural flow rate, temperature sensing means sensing the temperature of the extract mix and providing a corresponding signal T, and control means connected to all of the analyzer means, and to the sensing means for controlling the other flow rate of the charge oil and the furfural flow rates in accordance with signals API, FL, KV<sub>150</sub>, KV<sub>210</sub>, S, CHG and SOLV; said control means includes VI signal means connected to the viscosity analyzer means for providing a signal VI corresponding to the viscosity index of the heavy sour charge oil in accordance with the kinematic viscosity signals KV<sub>150</sub> and KV<sub>210</sub>; SUS<sub>210</sub> signal means connected to the viscosity analyzer means for providing a signal SUS<sub>210</sub> corresponding to the heavy sour charge oil viscosity in Saybolt Universal Seconds corrected to 210° F.; W signal means connected to the viscosity analyzer means, to the grav-



ity analyzer means and to the sulfur analyzer means for providing a signal W corresponding to the wax content of the heavy sour charge oil in accordance with signals KV<sub>210</sub>, API and S, A signal means connected to the gravity analyzer means, to the viscosity analyzer means, to the sulfur analyzer means, to the flash point temperature analyzer means and to the VI signal means for providing a signal A corresponding to an interim factor A in accordance with signals KV<sub>210</sub>, S, API, VI and FL;  $\Delta$ VI signal means connected to the viscosity analyzer means, to the gravity analyzer means, to the flash point temperature analyzer means, to the VI signal means, the W signal means and the SUS<sub>210</sub> signal means and receiving voltage V<sub>IRP</sub> for providing a signal  $\Delta$ VI corresponding to the change in viscosity index in accordance with signals KV<sub>210</sub>, API, VI, FL, W and SUS<sub>210</sub> and voltage V<sub>IRP</sub>, J signal means receiving direct current voltages corresponding to values of constants C<sup>64</sup> through C<sup>67</sup> and being connected to the  $\Delta$ VI signal means, to the A signal means, to the temperature sensing means for providing a J signal corresponding to a furfural dosage for heavy sour charge oil in accordance with the  $\Delta$ VI signal, signals A and T, the received voltages and the following equation:

$$J = \{ \{ -C_{84}(A) + \{ [C_{84}(A)]^2 - 4[C_{85}(A)(T)] \} \} - C_{86} + C_{87}(A)(V) - \Delta V \} / 2[C_{85}(A)(T)]^2$$

4,165,260

# PIPELINE CHARGING OF COAL INTO COKE OVEN

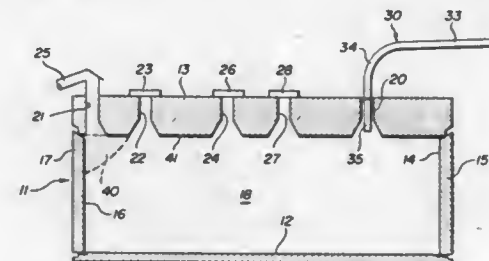
Frank H. Bugajski, South Holland, Ill., and Jitendra G. Patel, Munster, Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Dec. 29, 1976, Ser. No. 755,498

Int. Cl.<sup>2</sup> C10B 31/04

U.S. Cl. 201—40

8 Claims



1. A method for charging coal into an elongated coke oven in a battery of coke ovens, said coke oven having longitudinally-spaced first and second ends and a gas-exhaust opening adjacent said first end, said method comprising the steps of: heating a coke oven to a temperature at which coal volatilizes; transporting coal particles to said coke oven with steam, as a coal-steam mixture, along an enclosed path including a main enclosed path portion serving other coke ovens in said battery and a branch enclosed path portion between said main path portion and said coke oven; said transporting step comprising injecting steam at spaced intervals along said main enclosed path portion to convey said coal; charging said coal into said oven; exhausting gas from said oven, during said coal charging, only through said gas-exhaust opening adjacent said first end, to create a gas stream in said oven moving toward said gas-exhaust opening; said coal charging step comprising directing all of said coal-steam mixture downwardly as a single stream through the top of said oven, and spacing said downwardly directed mixture from said second end but closer to said second end than to said first end as the mixture enters the oven, to avoid imparting to said coal particles, by said directing step or by rebounding within said oven, a substantial directional component in the direction of movement of said gas stream toward said gas-exhaust opening; and avoiding the venting of steam from said mixture in said branch enclosed path portion.

4,165,261

# APPARATUS FOR CLEANING A COKE OVEN DOOR

Rauke Henstra; Tonny van der Kley, both of Heerhugowaard, and Johannes N. M. Rens, Velsen-Noord, all of Netherlands, assignors to Hoogovens IJmuiden, B.V., IJmuiden, Netherlands

Filed Aug. 23, 1977, Ser. No. 827,076

Claims priority, application Netherlands, Aug. 23, 1976, 7609329

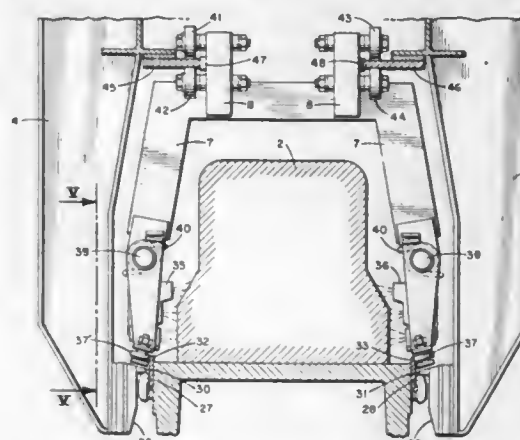
Int. Cl.<sup>2</sup> C10B 43/08

U.S. Cl. 202—241

6 Claims

1. Apparatus for cleaning a coke oven door, which has upper and lower closing surfaces and two side closing surfaces which are to be cleaned, the cleaning apparatus being relatively positionable in a position for cleaning when the door is open, comprising a mobile frame having positioning surfaces engageable with guide surfaces at the said upper, lower and two side surfaces of the door in order to locate the door and apparatus in the cleaning position, said frame including horizontally extending upper and lower guide elements and at least one vertically extending guide element, carriages movable along said guide elements, fluid jets adapted to spray high pressure water carried by said carriages directed in the cleaning position

tion at said closing surfaces, at least two jets on the carriage which moves along the vertically extending guide element being connected by resilient elements to that carriage and there being at least one follower member connected to each jet



which in use engages and is pressed by the said resilient element against a guide strip on said door so as to maintain each jet in a cleaning position relative to the side closing surfaces being cleaned by each jet.

4,165,262

# METHOD OF ELECTROWINNING TITANIUM

Paul R. Juckniess, and David R. Johnson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

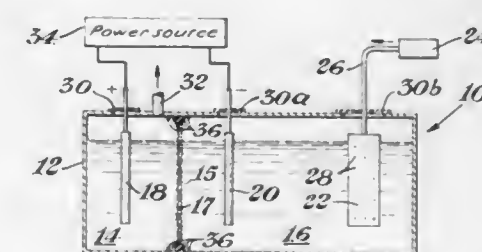
Continuation-in-part of Ser. No. 722,850, Sep. 13, 1976, Pat. No. 4,118,291, which is a continuation-in-part of Ser. No. 517,569, Oct. 24, 1974, abandoned. This application Aug. 7, 1978, Ser. No. 931,240

The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C25C 3/28, 3/22, 7/04

U.S. Cl. 204—64 T

15 Claims



1. A method to produce metallic titanium in an electrolytic cell having an anode, a cathode and a feed means comprising: inserting a foraminous diaphragm with at least a surface portion consisting essentially of cobalt into the cell to space apart an anode compartment from a cathode compartment, the surface portion being of a sufficient size to function as a diaphragm in the cell and having a diaphragm coefficient of greater than zero to about 0.5 and a flow coefficient within the range of from about 0.1 to about 25; introducing an ionizable titanium compound into a molten salt bath contained in the cathode compartment; and impressing an electromotive force between the anode and the cathode to form a gas at the anode and to deposit metallic titanium on the cathode.

# 4,165,263 METHOD OF PREPARING AN ELECTROLYTIC CELL FOR OPERATION

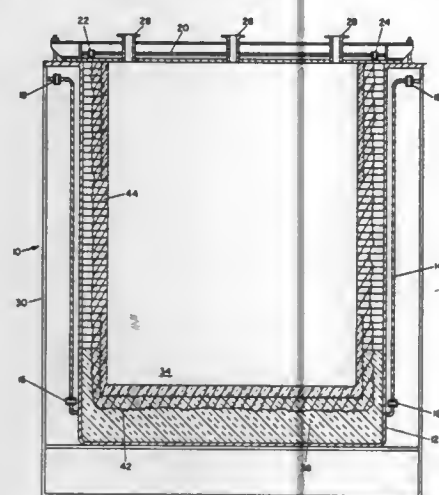
Donald L. Kinosz, Palestine, Tex.; Charles E. Jennings, Maryville, Tenn., and Stanley C. Jacobs, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 2, 1978, Ser. No. 947,847

Int. Cl.<sup>2</sup> C25C 3/06, 3/08

U.S. Cl. 204—67

5 Claims



1. A method of preparing for operation a cell having an outer shell and an inner lining, which is employed to produce metal by electrolysis of a compound of the metal in a molten production bath, which comprises placing in the cell an initial bath, having a solidus temperature higher than the solidus temperature of the production bath and higher than the temperature of the inside surface of the shell, for the purpose of establishing a freeze-line barrier for the initial bath within the lining of the cell, and subsequently providing in the cell the production bath.

# 4,165,264 AMMONIA LEACHING

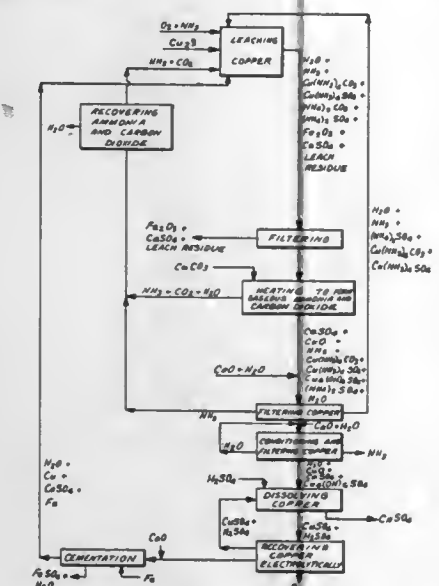
Donald P. Satchell, Jr., Clifton, Ariz., assignor to Phelps Dodge Corporation, New York, N.Y.

Filed Jun. 14, 1978, Ser. No. 915,176

Int. Cl.<sup>2</sup> C25C 1/12

U.S. Cl. 204—106

7 Claims



1. In a process for obtaining copper from a copper sulfide by the steps of: (1) treating the copper sulfide with oxygen and an

aqueous leaching solution of ammonium carbonate, to form a leach liquor containing ammonia complexes of copper sulfate and copper carbonate; (2) heating the leach liquor to form gaseous ammonia and carbon dioxide; (3) treating the leach liquor with a strongly alkaline material to precipitate sulfates and form additional gaseous ammonia; and (4) then recovering copper by electrowinning; the improvement comprising the steps of:

adding a metal carbonate to the leach liquor during the step (2) of heating the leach liquor; and recovering the gaseous carbon dioxide and ammonia, formed during the step (2) of heating the leach liquor; the amount of the metal carbonate added to the leach liquor in step (2) being about 5% to about 50% of the total moles of base used to precipitate sulfates from the leach liquor during the subsequent treatment of the leach liquor in step (3) with the strongly alkaline material.

# 4,165,265 MULTI-STAGE IRRADIATION METHOD OF CURING A PHOTOCURABLE COATING COMPOSITION

Seizi Nakabayashi, Itami; Tazuo Matsuura, Hirakata, and Tamio Iimure, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 667,031, Mar. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 506,193, Sep. 13, 1974, abandoned. This application Apr. 7, 1978, Ser. No. 894,505

Claims priority, application Japan, Sep. 17, 1973, 48-104726

Int. Cl.<sup>2</sup> C08G 18/00, 63/00

U.S. Cl. 204—159.14

11 Claims

1. In a method of curing a photocurable coating composition by irradiating the composition with actinic radiation therein, said composition containing as the principal component an unsaturated polyester resin, an unsaturated polyurethane resin, an unsaturated acrylic resin, and an unsaturated epoxy resin and a photosensitizer, the improvement wherein the coating composition is irradiated in air in two stages; (1) the first stage, wherein the photocurable coating composition is subjected to actinic radiation with a metal halide lamp emitting wavelengths in the range of about 185 to 500 millimicrons, having a dominant wavelength or wavelengths in the range of 380 to 420 millimicrons and (2) a second stage wherein the photocurable composition is further subjected to another actinic radiation with a medium or high pressure mercury lamp emitting wavelengths in the range of 185 to 500 millimicrons having a dominant wavelength or wavelengths shorter than that in the first stage and falling in the range of from about 360 to 380 millimicrons.

# 4,165,266 RADIATION CURABLE PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Kenneth C. Stueben, Bridgewater; Raymond G. Azrak, Whitehouse Station, and Michael F. Patrylow, Piscataway, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,957

Int. Cl.<sup>2</sup> C08F 8/00, 261/06

U.S. Cl. 204—159.15

15 Claims

1. A radiation curable pressure sensitive adhesive composition comprising:

- from 20 to 70 weight percent of a liquid monoacrylate monomer having an inherent viscosity of less than about 1850 cps. at 25° C.;
- from 30 to 80 weight percent of a poly(vinyl alkyl ether) having from 1 to 4 carbon atoms in the alkyl segment and having a reduced viscosity of from 0.1 to 0.8, measured at a concentration of 0.1 gram of resin per 100 ml. of benzene at 20° C.; and
- from 0 to 10 weight percent of a photoinitiator.

# 4,165,267 PHOTO-POLYMERIZABLE SYSTEMS CONTAINING 2-HALOACETOPHENONE DERIVATIVES AS PHOTOSENSITIZING AGENTS

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

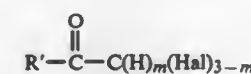
Continuation of Ser. No. 781,309, Mar. 25, 1977, abandoned, which is a continuation of Ser. No. 612,502, Sep. 11, 1975, abandoned. This application Mar. 6, 1973, Ser. No. 884,006

Claims priority, application Switzerland, Sep. 19, 1974, 12728/74

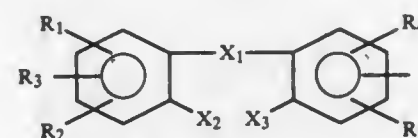
U.S. Cl. 204—159.15

15 Claims

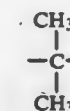
1. A photo-polymerizable composition which comprises (a) a photo-polymerizable system comprising at least one reactive unsaturated base prepolymer or long chain monomer in association with at least one unsaturated crosslinking monomer and (b) a photo-sensitizing amount of a compound of the formula



wherein R' is a radical of the formula

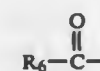


wherein X1 is a direct covalent bond or is —O—, —S—, —SO—, —SO2— or



and either

X2 and X3 are each hydrogen or, when X1 is a direct covalent bond, X2 and X3 together may also form one of the bridge members —O—, —S—, —SO— or —SO2—, R1, R2, R4 and R5 are, independently, hydrogen or alkyl (C1-C18) with up to 18 carbon atoms in the aggregate of all of the substituents R1, R2, R4 and R5 R3 is hydrogen, halogen or a radical



wherein

R6 is —C(H)m(Hal)3-m, furyl, thienyl, phenyl or phenyl substituted by 1 alkyl (C1-C4) or 1 or 2 halogen substituents,

Hal is chlorine or bromine, and m is 0, 1 or 2, any substituents on the radical of formula aa being such that the U.V. absorption maximum of the resulting compound lies in the range 250–400 nm.

# 4,165,268 PROCESS FOR THE PRODUCTION OF SUBSTITUTED TOLUENE COMPOUNDS

Franz Marti, Dornach; Tibor Somlo, Birsfelden, and Jacques Gosteli, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,876

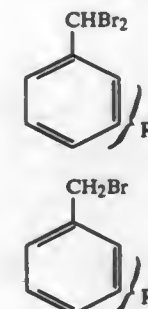
Claims priority, application Switzerland, Nov. 9, 1976, 14096/76

Int. Cl.<sup>2</sup> B07J 1/10

U.S. Cl. 204—163 R

11 Claims

1. A process for the production of benzal bromides which contain an electrophilic substituent in the ortho- or para-position of the formula (Ia), or of mixtures thereof with the corresponding benzyl bromides of the formula (Ib),



in which R represents an electrophilic substituent in the ortho- or para-position, by treating correspondingly substituted toluenes with elementary bromine under irradiation with visible light in a two-phase system which consists of an aqueous and an organic phase, which process comprises carrying out the reaction in the presence of a base.

# 4,165,269 METHOD OF MAKING HALOGENATED ACETYLENES

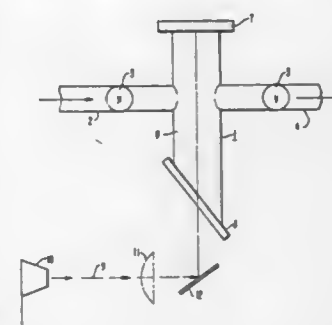
Peter M. Castle, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 5, 1978, Ser. No. 939,554

Int. Cl.<sup>2</sup> B01J 1/10

U.S. Cl. 204—163 R

10 Claims



1. A method of making halogenated acetylenic compounds comprising:

(A) forming a mixture of

- a reactant selected from the group consisting of compounds having the general formula R—C2H2X3 and R—C2HX2, where each X is independently selected from Cl, Br, and I, and R is H or a group which does not undergo a thermal process at an activation energy which is lower than the activation energy for HX elimination from said reactant;

(2) a sensitizer which:

- has a higher thermal activation energy for its lowest energy dissociation reaction than does any part of said reactant,



- (b) has a collisional relaxation time less than 500 microseconds;  
 (c) has an absorbing cross section at the wavelength such that complete absorption occurs at about 20 to about 50 torr and 10 cm path length;  
 (B) irradiating said mixture with coherent light at said wavelength.

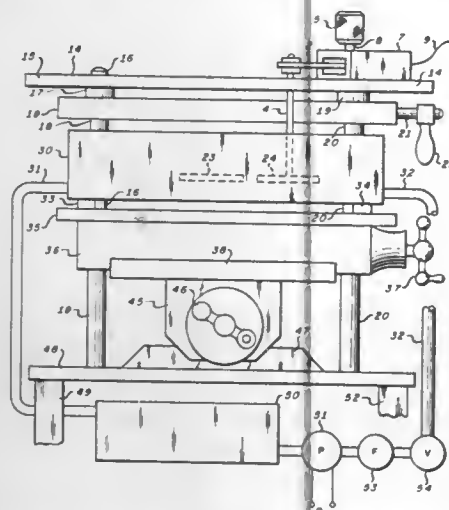
4,165,270

## CIRCUIT INTEGRITY TESTER

Robert J. Ost, Great Neck, and Robert F. Perry, Patchogue, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sep. 13, 1978, Ser. No. 942,099  
 Int. Cl.<sup>2</sup> G01N 27/00; G01R 31/08  
 U.S. Cl. 204—195 R

13 Claims



1. An apparatus for testing continuity of and detecting short circuits of the conductors of a plurality of identical circuit boards wherein the circuit boards are immersed in a liquid solution from which a constituent thereof may be induced to separate onto an electrical conductor immersed therein through the application of a voltage between the conductor and the solution, comprising:

- container means for containing the liquid solution, holding means for positioning a plurality of the circuit boards in the solution and aligned in fixed relation to each other, a plurality of electrodes, each for applying a voltage to a conductor of a respective one of the circuit boards, support means for supporting said electrodes in fixed relation to each other, adjustable means for effecting translational motion of said support means with respect to said holding means, and means for applying a voltage between the solution and said electrodes such that said electrodes may be simultaneously positioned to contact corresponding conductors of the circuit boards to indicate electrical continuity and to detect short circuits thereof through observation of the separation of the constituent onto the conductors so contacted.

4,165,271

## DIAPHRAGMS FOR USE IN THE ELECTROLYSIS OF ALKALI METAL CHLORIDES

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 3, 1977, Ser. No. 838,600  
 Int. Cl.<sup>2</sup> C25B 1/46, 13/08  
 U.S. Cl. 204—252

30 Claims

1. In an electrolytic diaphragm cell for the electrolysis of alkali metal chloride brines having an anode assembly contain-

ing a plurality of foraminous metal anodes, a cathode assembly containing a plurality of foraminous metal cathodes, a diaphragm covering said cathodes, and a cell body housing said anode assembly and said cathode assembly, the improvement which comprises a porous diaphragm comprising a substantially non-conducting support fabric impregnated with a non-fibric active component containing silica, said support fabric having on one side a non-continuous coating of an electroconductive metal selected from the group consisting of nickel, silver, gold, platinum group metals, alloys and mixtures thereof.

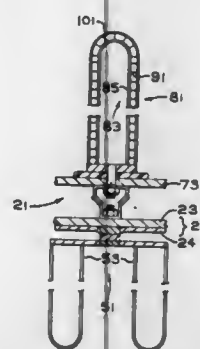
4,165,272

## HOLLOW CATHODE FOR AN ELECTROLYTIC CELL

Hugh Cunningham, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 27, 1978, Ser. No. 928,646  
 Int. Cl.<sup>2</sup> C25B 13/02, 11/03, 9/00  
 U.S. Cl. 204—282

16 Claims



1. A cathode element comprising:

- a hollow cathode finger having a pair of electrolyte permeable side walls substantially parallel to and spaced from each other, said side walls having extensions bonded thereto and extending outwardly therefrom; and a synthetic separator surrounding said cathode element, spaced from and substantially parallel to the side walls thereof, and resting upon the extensions.

4,165,273

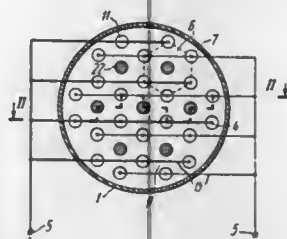
## DEVICE FOR PRODUCING DEEPLY DESALTED WATER

Nikolai N. Azarov, Leninsky prospekt, 108, kv. 26; Georgy A. Zelensky, Pionerskaya ulitsa, 29, kv. 2, and Igor V. Borisovsky, Leninsky prospekt, 153, kv. 49, all of Voronezh, U.S.S.R.

Filed Dec. 20, 1977, Ser. No. 864,141  
 Int. Cl.<sup>2</sup> B01D 13/02

U.S. Cl. 204—301

2 Claims



1. A device for producing deeply desalted water, comprising: a dielectric housing; an inlet for the water being treated located in said dielectric housing; an outlet for the water being treated, located in said dielectric housing; electrodes mounted in said dielectric housing adapted to be connected electrically with a current source, the electrodes being rods arranged in

parallel substantially in the vertexes of a regular hexagon, adjacent electrodes in each hexagon having alternating polarity; ion-exchange members located in said dielectric housing and made in the form of tubes; each of said ion-exchange membranes concentrically surrounding and having the same polarity as a corresponding one of said electrodes; desalinization chambers defined by said ion-exchange membranes and by the walls of said dielectric housing communicating with one another; said chambers being substantially filled with ion-exchange resins intended for the sorption of salt ions from the water being treated; brine chambers each of which is defined by a corresponding membrane; said brine chambers being adapted to have water passed therethrough for removing salt ions; and a means for cooling said electrodes.

4,165,274

## PROCESS FOR THE PREPARATION OF SYNTHETIC CRUDE OIL

Pieter B. Kwant, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1978, Ser. No. 915,332  
 Int. Cl.<sup>2</sup> C10G 37/04

U.S. Cl. 208—93

2 Claims

1. A process for treating tar sand oil comprising:  
 (a) separating the tar sand oil by vacuum distillation into a vacuum distillate and a vacuum residue,  
 (b) catalytically hydrocracking the vacuum distillate,  
 (c) separating the vacuum residue by deasphalting into a deasphalted oil and asphalt, and  
 (d) hydrometallizing the deasphalted oil and thereafter catalytically hydrodesulphurizing the deasphalted oil.

4,165,275

## LOWERING SULFUR OXIDE OUTPUT FROM CATALYST REGENERATION

William A. Blanton, Jr., San Anselmo, and Donald W. Blakely, Oakland, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 16, 1977, Ser. No. 861,319  
 Int. Cl.<sup>2</sup> C10G 11/04; B01J 21/20; C01B 17/60; B01J 29/12  
 U.S. Cl. 208—113

10 Claims

1. In a fluid catalyst cracking process including the steps of (a) cracking a sulfur-containing hydrocarbon stream in contact with a fluidized bed of a particulate cracking catalyst in a cracking zone at cracking conditions including a temperature in the range from 800° F. to 1300° F., whereby sulfur-containing coke is deposited on said catalyst, and removing a hydrocarbon effluent from said cracking zone, (b) passing catalyst with sulfur-containing coke deposited thereon from said cracking zone and an oxygen-containing gas into a cracking catalyst regeneration zone, burning off said sulfur-containing coke therein at a temperature in the range from 1000° F. to 1500° F. to form a flue gas containing sulfur oxides, and removing said flue gas from said catalyst regeneration zone; and (c) returning the resulting coke-depleted catalyst from said catalyst regeneration zone to contact with said hydrocarbon stream in said cracking zone; the method for decreasing the amount of sulfur oxides in said flue gas which comprises the steps of:

- (1) forming at least one sulfur-containing solid material by contacting said sulfur oxide-containing flue gas with a zeolitic crystalline aluminosilicate at a temperature in the range from 1000° F. to 1500° F., at least a majority of ion-exchangeable cationic sites in said aluminosilicate being filled by cations selected from sodium cations and potassium cations, whereby a substantial portion of sulfur in said sulfur oxides combines with said aluminosilicate to form said sulfur-containing solid material and separating the remaining flue gas from said sulfur-containing solid material; and  
 (2) forming fluid sulfur compounds by contacting said hydrocarbon stream with said sulfur-containing solid material at a temperature in the range from 800° F. to 1300° F.

4,165,276

## HYDROCARBON CONVERSION WITH A SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 14, 1977, Ser. No. 833,332  
 Int. Cl.<sup>2</sup> C10G 35/08

U.S. Cl. 208—139

18 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising the pyrolyzed reaction product of a catalytically effective amount of a rhenium carbonyl compound with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group metal maintained in the elemental metallic state.

4,165,277

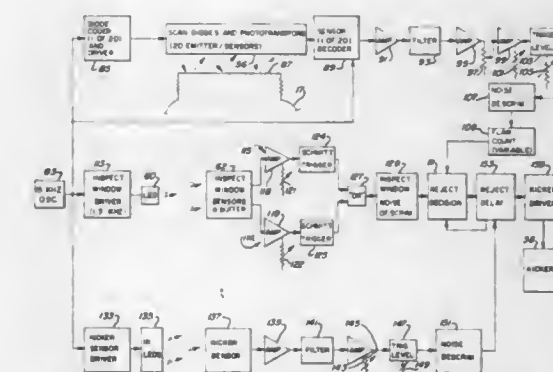
## ARTICLE MONITORING AND REJECT APPARATUS

Le Roy F. Frewin, Arvada, Colo., assignor to Inex, Incorporated, Denver, Colo.

Filed Feb. 25, 1977, Ser. No. 771,879  
 Int. Cl.<sup>2</sup> B07C 5/342

U.S. Cl. 209—3.3

26 Claims



1. An apparatus for monitoring articles for defects, said apparatus comprising:

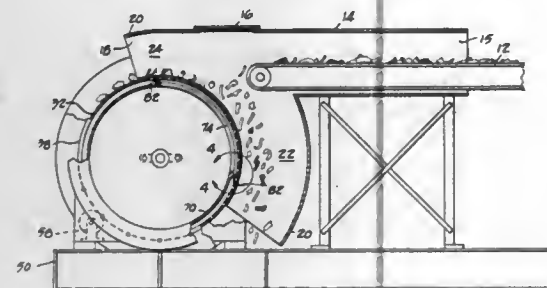
- a plurality of radiating means each of which emits a plurality of pulses when energized for producing radiation at a monitoring area capable for receiving at least a portion of an article to be monitored for defects;  
 pulsing means connected with said radiating means to cause each of said radiating means to emit a plurality of pulses of radiation at said monitoring area;  
 radiation sensing means at said monitoring area adjacent to an article when at said monitoring area to be monitored for defects, said radiation sensing means being connected with said pulsing means and responsive to received radiation indicative of a defect in said monitored article producing a plurality of electrical output pulses indicative of said sensed defect;  
 article presence sensing means for producing an output signal indicative of the sensed presence of an article at said monitoring area; and  
 signal processing means connected with said radiation sensing means and said article presence sensing means and producing a defect indicating output signal only if a predetermined number of pulses, wherein said number of pulses is greater than one, are received from said radiation sensing means indicative of a sensed fault while article presence is sensed at said monitoring area by said article presence sensing means.



4,165,278  
**SEPARATOR FOR SHREDDED MATERIALS**  
 Irving Jaffey, 85 Estabrook, San Leandro, Calif. 94577  
 Filed Oct. 4, 1977, Ser. No. 839,372  
 Int. Cl.<sup>2</sup> B07B 13/00

U.S. Cl. 209—45

19 Claims



1. A multi-component apparatus for separating the constituents of an admixture of materials comprising, in series: conveying means for conveying said materials from a source thereof to a first point of deposition, material separation means disposed proximate said first point of deposition for receiving said material from said conveying means and for separating out constituents of said admixture in accordance with the relative weights thereof, said separation means including means for directly mechanically contacting said admixture and adhering to a constituent of said admixture, said separation means further including a source of fluid under pressure and means for communicating said source of fluid under pressure to said means for contacting said admixture, said means for contacting said admixture being movable relative to said means for communicating said source of fluid pressure, said fluid pressure functioning in coordination with said movable contacting means to cause at least some of said constituents to adhere to said movable means and to be carried thereby from a first position proximate to said conveying means to a second position relatively remote from said first position, said movable contacting means including a perforate drum having a first axial length and being rotatable about a first axis, said fluid pressure being communicated to a hollow interior portion of said perforate rotatable drum, said pressure communicating means further including a relatively fixed drum coaxially disposed with respect to said rotatable drum, said relatively fixed drum having a cylindrical surface extending 360° about its axis, said relatively fixed drum having a second axial length, the outermost confines of said relatively fixed drum closely proximate to said perforate rotatable drum, said relatively fixed drum including passageway means extending axially along said cylindrical surface for transmitting fluid pressure to said interior of said rotatable perforate drum, said passageway means extending axially along said cylindrical surface a distance less than said second axial length, said seal means between said passageway means and said perforate rotatable drum.

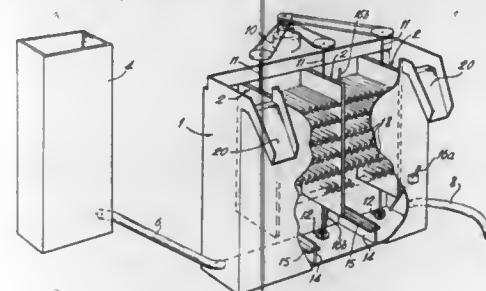
4,165,279  
**FROTH FLOTATION**  
 Christopher C. Dell, Leeds, England, assignor to National Research Development Corporation, London, England  
 Filed Dec. 27, 1977, Ser. No. 864,797  
 Int. Cl.<sup>2</sup> B03D 1/16

U.S. Cl. 209—169

11 Claims

1. An apparatus for use in froth flotation which comprises: a receptacle;  
 at least one upright partition wall defining flotation columns within the receptacle, said at least one upright partition wall comprising at least one pair of vertical partition walls with a spacing provided therebetween;  
 means for generating bubbles in said receptacle provided below each one of said at least one partition wall including air feed means, at least one vertical rod, an impeller connected to the lower end of said vertical rod, and means for

rotatably driving said vertical rod and impeller wherein said vertical rod is disposed within said spacing;  
 means for dividing each of said flotation columns to provide two or more flotation cells arranged one above the other comprising an upper layer of parallel rods disposed adjacent a lower layer of parallel rods, said upper layer rods being parallel to said lower layer rods;  
 apertured passage means in said dividing means for the passage of froth upwardly through said dividing means

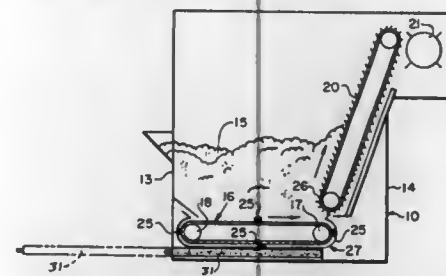


from each lower cell to the adjacent upper cell wherein said means for dividing each of said flotation columns includes control means for each lower cell, said control means being responsive to the changes in thickness of the froth layer in said lower cell and serving to maintain said thickness at a predetermined value and wherein said upper layer rods have a specific gravity of 0.9 to 1.1 and said lower rods have a specific gravity of about 0.5; and means for providing limited freedom of movement of each of said upper and lower layer rods.

4,165,280  
**METHOD AND MEANS FOR CLEANING FEED HOPPERS**  
 Jasper B. Holley, Rte. 1, Box 196, Johnston, S.C. 29832  
 Filed Apr. 12, 1978, Ser. No. 895,570  
 Int. Cl.<sup>2</sup> B07B 1/04, 1/52

U.S. Cl. 209—245

4 Claims



1. In a textile fiber feed hopper having a rotatable feed apron with a plurality of outwardly projecting spikes extending upwardly within the hopper and a horizontally movable conveyor in the lower portion of the hopper moving fibers toward the feed apron, the combination of spaced brush means fastened to the conveyor and projecting beyond the conveyor into sequential frictional engagement with spikes on the feed apron whereby spinnable fibers are transferred from said brush means to the feed apron.

2. A structure according to claim 1 wherein a plate is spaced beneath the conveyor, said plate having a plurality of apertures extending therethrough, and an imperforate end portion extending from the perforate portion of said plate beyond that portion of the conveyor adjacent the feed apron to guide waste beneath the conveyor.

4,165,281  
**METHOD AND UNIT FOR WASTEWATER TREATMENT BY MICROORGANISMS**

Kiyoshi Koriyama, Kyoto; Munetaka Sato; Tsuneo Matsuzaki, both of Yokohama; Masanori Honma, Yamato, and Seiji Shida, Chigasaki, all of Japan, assignors to Nilgata Engineering Co., Ltd., Tokyo, Japan

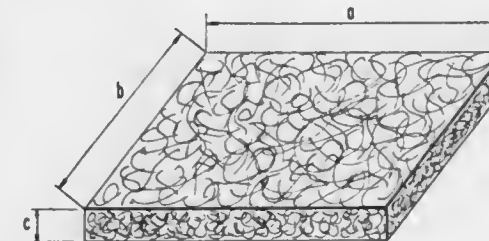
Filed Sep. 26, 1977, Ser. No. 836,921

Claims priority, application Japan, Sep. 24, 1976, 51-114457

Int. Cl.<sup>2</sup> C02C 1/04

U.S. Cl. 210—17

12 Claims

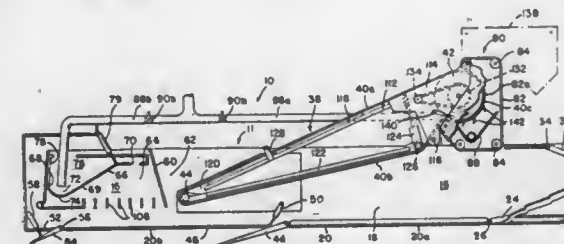


1. A method for wastewater treatment which comprises disposing in an aeration tank at least two non-woven fibrous mats, wherein the fibers are synthetic fibers having a thickness of about 50 to 4,000 denier, having a three dimensional network structure as supporting media having a bulk density of about 0.01 to about 0.40 g/cm<sup>3</sup>, wherein said supporting media have a thickness of about 15 to about 30 mm and wherein at least two said supporting media are disposed in parallel to each other at an interval of about 20 to about 100 mm in the aeration tank, causing microorganisms to be retained on the surfaces in the interstices of the non-woven mat, and oxidatively decomposing organic polluting matter in the wastewater using the microorganisms in the presence of oxygen.

4,165,282  
**OIL RECOVERY METHOD AND APPARATUS**  
 John A. Bennett, West Vancouver; Ian R. McAllister, Vancouver, and Howard Welsh, North Vancouver, all of Canada, assignors to Bennett Pollution Controls Ltd., North Vancouver, Canada  
 Division of Ser. No. 661,769, Feb. 26, 1976, Pat. No. 4,061,569, and a continuation-in-part of Ser. No. 567,426, Apr. 11, 1975, abandoned, which is a continuation of Ser. No. 464,540, Apr. 26, 1974, abandoned. This application Dec. 5, 1977, Ser. No. 857,513  
 Int. Cl.<sup>2</sup> F02B 15/04

U.S. Cl. 210—40

2 Claims



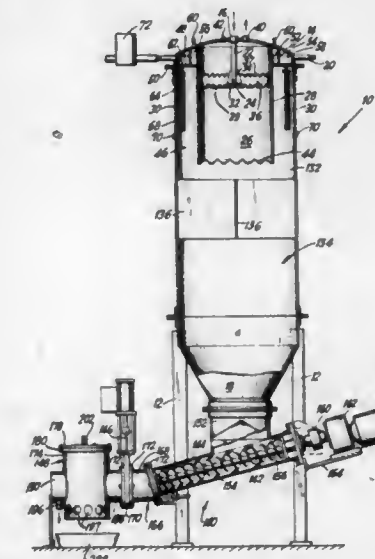
1. A method of collecting oil from a surface of a body of water, said method comprising:

- moving an oil absorptive belt into contact with an oil polluted surface layer on said body of water to collect oil in said belt from said surface layer,
- passing said belt over a roll having a curved circumferential contact surface over which the belt is arranged to travel in an arcuate path,
- engaging the oil absorbing belt with a foraminous squeeze belt having a contact surface which engages the recovery belt along its arcuate path of travel around said roll,
- moving said squeeze belt along a closed path and engaging

said oil recovery belt with adequate pressure to cause oil in the oil absorptive belt to pass from the oil absorptive belt through the squeeze belt, and  
 e. collecting the oil removed from the oil absorptive belt.

4,165,283  
**MULTI-STAGE PURIFICATION SYSTEM**  
 Roland E. Weber, Holyoke, and Carl J. Zimmermann, Ludlow, both of Mass., assignors to Industrial Pollution Control Corp., Ludlow, Mass.  
 Continuation-in-part of Ser. No. 736,550, Oct. 28, 1976, abandoned, which is a continuation of Ser. No. 411,248, Oct. 31, 1973, abandoned. This application Mar. 29, 1977, Ser. No. 782,435  
 Int. Cl.<sup>2</sup> B01D 21/26, 29/42  
 U.S. Cl. 210—111

19 Claims



1. A multi-stage, single vessel, liquid purification system, comprising:

- a tank having an inlet conduit for conveying liquid with solid contaminate into the tank,
- a deceleration chamber within said tank for receiving incoming liquid from said inlet conduit which is formed by a cylindrical tube centrally positioned within said tank and which depends from and about said inlet into the central portion thereof, wherein the breadth of said deceleration chamber as formed by said tube is substantially greater than the breadth of said inlet conduit for deceleration of incoming liquid and to allow lighter density solid particles in the contaminate to rise to the top of the liquid within the deceleration chamber for removal and the heavier density solid particles of the contaminate to settle downwardly through the deceleration chamber,
- a filter chamber within said tank and about said deceleration chamber which is formed by said tube and outer wall of said tank and within which depends septums for filtering out remaining solids from liquid which passes there-through and to thereby provide purified liquid,
- a terminus at the end of said tube in the central portion of said tank which has a saw tooth configuration that inhibits turbulence of liquid containing solid contaminates as it leaves said tube,
- a purified liquid chamber within said tank and above said septums for receiving the purified liquid therefrom having outlet means for removal of the purified liquid from said tank,
- a settling chamber with turbulence inhibitor below said deceleration and filtering chambers for forming a static column of liquid which changes direction of liquid flow from said deceleration chamber into said filtering chamber.

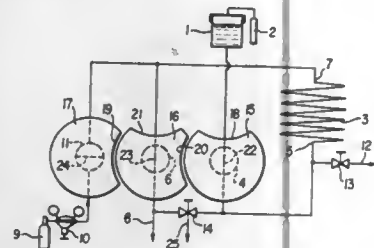


ber, and in so doing, causing solid particles in the liquid changing direction to settle downwardly, and compacting means open into the bottom of said tank for receiving solid contaminants from said deceleration and filtering chambers and from said column of static liquid and for compacting said contaminants.

#### 4,165,284 SAFETY DEVICE FOR CHROMATOGRAPHY APPARATUS

Claude Guillemain, Paris, and Christian Mayen, Cretell, both of France, assignors to Prolabo, Paris, France  
Filed Feb. 28, 1978, Ser. No. 881,918  
Claims priority, application France, May 2, 1977, 77 13999  
Int. Cl.<sup>2</sup> B01D 15/08  
U.S. Cl. 210—198 C

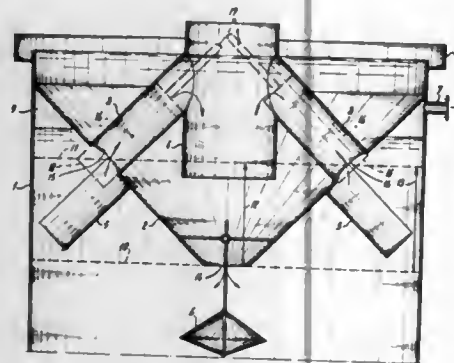
8 Claims



1. A safety device for a liquid-phase chromatography apparatus in which a carrier liquid is propelled by a carrier gas, said apparatus comprising a source of carrier liquid, a carrier liquid reservoir having an inlet and an outlet, an overflow conduit, a source of carrier gas, a first valve controlling a conduit connecting said source of carrier liquid to said inlet, a second valve controlling a conduit from said outlet to said overflow conduit, and a third valve controlling a conduit from said source of carrier gas to said outlet; the improvement comprising: said valves being separately operable valves; interlocking means between said first, second and third valves whereby operation of said valves is interdependent and wherein said interlocking means prevents operation of any selected valve when the other two valves are in other than predetermined positions.

4,165,285  
COMBINED ANAEROBIC REACTOR AND SETTLER  
Evert Wnd, Houten, and Robbert de Vletter, Huizen, both of Netherlands, assignors to N.V. Centrale Sulker Maatschappij, Amsterdam, Netherlands  
Filed Jun. 21, 1977, Ser. No. 808,644  
Claims priority, application Netherlands, Jun. 24, 1976, 7606904  
Int. Cl.<sup>2</sup> C02C 1/14  
U.S. Cl. 210—195.3

12 Claims



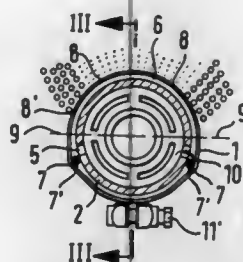
1. An installation for the anaerobic purification of a liquid

effluent which comprises a reactor tank, an after-settler compartment located in the top part for settling and separating the sludge and liquid, means for introducing the liquid effluent in the reactor tank and means for separating the gases from said sludge and liquid, said after-settler compartment comprising an inlet opening for the mixture of sludge and liquid from the reactor tank and an outlet opening to recycle said sludge and liquid to said reactor tank, said outlet opening being positioned at a level lower than said inlet opening, first deflecting means serving as shield for said inlet opening and second deflecting means for said outlet opening to and from said after-settling compartment respectively positioned in the reactor tank so that the upward flow of developed gases is kept away from said openings, separate interception compartment and outlet means for said gases, the bottom of the after-settling compartment being inclined downwardly towards said outlet opening to allow sludge settled therein to move to said outlet opening by its own weight, said first deflecting means being positioned at a level higher than said outlet opening to allow the gas generated by the anaerobic fermentation in the reactor tank to entrain liquid and sludge while rising in the reactor tank outside the after-settling compartment up to said first deflecting means.

#### 4,165,286 APPARATUS FOR THE INTERMITTENT AERATION OF SEWAGE

August Schreiber, Rahmofstrasse 45, 3001 Hannover-Vinnhorst, Fed. Rep. of Germany, and Siegfried Rudolph, Hannover, Fed. Rep. of Germany, assignors to August Schreiber, Hannover-Vinnhorst, Fed. Rep. of Germany  
Filed Jan. 16, 1978, Ser. No. 869,760  
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701656  
Int. Cl.<sup>2</sup> C02C 1/12; B01F 3/04  
U.S. Cl. 210—220

11 Claims



1. An apparatus for the intermittent aeration of sewage comprising a horizontal air distributor in the form of a pipe jacket of bend resistant material having a generally circular cross section, being closed on both ends except for an opening in the supply of air, and having air passage openings in the area in its two opposite lateral longitudinal edges below the horizontal middle plane of the pipe jacket, an elastic air distributor foil covering the air passage openings and the area of the pipe jacket located between the openings, the foil provided with air escape openings which are opened by a supply of air to the pipe jacket and closed upon interruption of the air supply and which is sealed against the pipe jacket outside the area of the air escape openings, and a distancing strip disposed along each of the two opposite lateral longitudinal edges of the pipe jacket, below the air passage openings and between the pipe jacket and the air distributor foil such that each distancing strip together with the section of the air distributor foil extending from the pipe jacket to the distancing strip and with the section of the pipe jacket not covered by the air distributor foil form a space whereby air may enter with little resistance and be distributed the length of the distancing strip and lift the air distributor foil so as to permit air to escape into sewage and whereby upon termination of air supply, the air escape openings of the air distributor foil are closed.

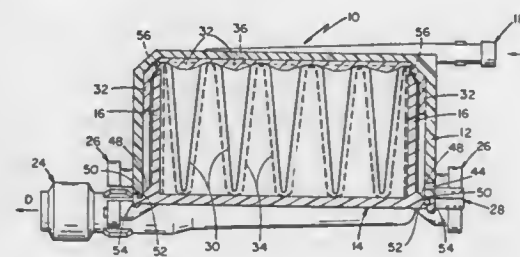
#### 4,165,287 POTTING PLEATED MEMBRANE

Thomas E. Goynne, Denver, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Apr. 4, 1977, Ser. No. 784,364  
Int. Cl.<sup>2</sup> B01D 31/00

U.S. Cl. 210—232

12 Claims



8. In a fluid flow transfer apparatus having a housing, wherein said housing has a central fluid chamber, and a compartment adjacent to said chamber, an inlet and an outlet, a first rib in said central chamber adjacent to said inlet and a second rib in said central chamber adjacent to said outlet, each said rib being between said inlet and outlet, and a pleated membrane positioned within said central chamber, the tips of which membrane on at least one side thereof are bonded to an inner surface in said central chamber of said housing, the improvement comprising:

a plurality of spaced apart ribs on said inner surface of said central chamber of said housing positioned between said first and second ribs and extending from said compartment across said central chamber, whereby said tips are spaced from said surface, and, together with said plurality of ribs and said surface, define a plurality of flow channels for flow of potting material placed in said compartment and flowing therefrom along said surface for bonding said tips to said surface.

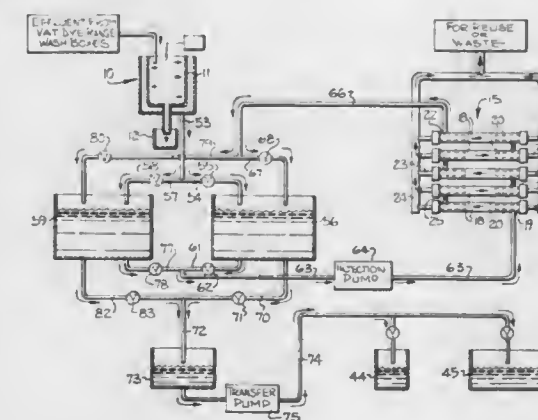
#### 4,165,288 PROCESS OF TREATING WASTE WATER FROM A TEXTILE VAT DYEING OPERATION TO PRODUCE A CONCENTRATE FOR REUSE

Richard K. Teed, Greenwood, and Ernest A. Freeman, Jr., Ware Shoals, both of S.C., assignors to Riegel Textile Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,911  
Int. Cl.<sup>2</sup> B01D 13/00, 31/00

U.S. Cl. 210—23 H

4 Claims





therefrom particulate matter entrained in the sewage, whereby the particulate matter adheres to the non-activated filter coal and eventually substantially saturates the coal with particulate matter;

flowing an effluent from the first filter through the second filter to remove from the effluent any remaining particulate matter and dissolved pollutants through adsorption by the activated filter coal of the second filter;

discharging usable water from the second filter;

placing solid waste into the lower container, and at least initially heating the lower container so that the solid waste therein reaches a temperature capable of maintaining the incineration of solid waste therein;

flowing into the lower container a limited amount of oxygen so as to sustain the incineration process, liberate heat energy, and generate a first combustible gas while heat liberated in the lower container causes a corresponding heating of gas in the housing and thereby heats the upper container;

periodically removing from the first filter, filter coal saturated with particulate matter;

placing saturated first filter coal into the upper container and maintaining the interior of the upper container substantially oxygen-free, whereby heat energy from the lower container heats the saturated first filter coal in the upper container and causes a degassing and a resulting carbonization of organic matter adhering to the first filter coal to thereby reconstitute the first filter coal and generate additional filter coal and a second combustible gas;

removing from the lower container ash formed therein and removing from the upper container reconstituted and additional filter coal;

discarding the ash and placing reconstituted and additional filter coal in the first filter to replenish saturated filter coal removed therefrom;

collecting the first and second combustible gases and heat treating the gases under a substantial exclusion of oxygen to a sufficient temperature so that relatively long chain hydrocarbons are transformed into relatively short chain hydrocarbons; and

utilizing energy contained in the heat treated gases before their final disposition.

4,165,290

## FABRIC CARE COMPOSITION CONTAINING STARCH AND QUATERNARY AMMONIUM COMPOUND

Samuel M. Johnson, and Emelyn L. Hiland, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 13, 1978, Ser. No. 885,937

Int. Cl.<sup>2</sup> D06M 13/36

U.S. Cl. 252-8,8

7 Claims

1. A liquid fabric care composition suitable for restoring body and softness to fabrics comprising:

- from about 1% to about 25% of a gelatinized and stabilized vegetable starch prepared by exposing a water dispersion of a gelatinized vegetable starch to a pH of from about 10 to about 13 to stabilize said starch and thereafter neutralizing any excess alkali to provide a pH of from about 4 to about 9;
- from about 0.25% to about 10% of a cationic quaternary ammonium antistatic and/or fabric softening agent;
- from about 25% to about 98% water.

4,165,291

## OVERBASING CALCIUM PETROLEUM SULFONATES IN LUBRICATING OILS EMPLOYING MONOALKYLBENZENE

James T. Gragson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 20, 1978, Ser. No. 917,441

Int. Cl.<sup>2</sup> C10M 1/40, 3/34, 5/22, 7/38

U.S. Cl. 252-33

21 Claims

1. A process for overbasing a calcium petroleum sulfonate containing oil to prepare a lubricating oil additive which comprises dissolving a diluent lubricating oil fraction and a calcium petroleum sulfonate in a monoalkylbenzene solvent and in the presence of a relatively small amount of a low-boiling alcohol, and lime, introducing carbon dioxide into the mixture thus obtained in a gradual manner to obtain a high TBN overbased product.

4,165,292

## LUBRICANT CORROSION INHIBITOR

Bryan T. Davis, West Bloomfield, Mich., and Nicholas W. Moat, Toronto, Canada, assignors to Edwin Cooper and Company Limited, Bracknell, England

Division of Ser. No. 688,680, May 21, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,165

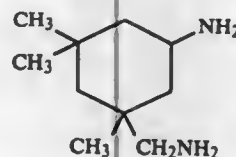
Claims priority, application United Kingdom, May 23, 1975, 22508/75

Int. Cl.<sup>2</sup> C10M 1/32

U.S. Cl. 252-51.5 A

13 Claims

1. A lubricating oil for internal combustion engines comprising a major amount of lubricating oil and a minor corrosion inhibiting amount of a combination of two additives, A and B, wherein A is an oil-soluble basic nitrogen compound selected from the group consisting of tetramethyl-1,3-diaminobutane; bis(benzal aminopropyl)piperazine; benzal aminopropyl dimethylamine; 2-propyl-3-methyl oxazolidine; and a diamine having the formula



and B is an alkyl or alkenyl succinic acid having from 12-22 carbon atoms and said A and B have a weight ratio A/B of 1/2 to 2/1.

4,165,293

## SOLID TRANSPARENT CLEANSER

Robert A. Gordon, Jenison, Mich., assignor to Amway Corporation, Ada, Mich.

Continuation-in-part of Ser. No. 797,048, May 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 700,788, Jun. 29, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,548

Int. Cl.<sup>2</sup> C11D 9/26, 9/60, 10/04, 17/00

U.S. Cl. 252-118

28 Claims

1. A transparent soap bar consisting essentially of about 25% to about 55% sodium soap based mainly on tallow or its corresponding fatty acids, where the tallow or corresponding fatty acid soap component alone is at least 25%; about 10% to about 40% of one of an anionic surfactant, an amphoteric surfactant and combinations and complexes thereof; about 15% to about 65% of a two to six carbon dihydric alcohol; said bar being substantially free of monohydric short chain alcohols.

4,165,294

## PHENOL-FREE AND CHLORINATED HYDROCARBON-FREE PHOTORESIST STRIPPER COMPRISING SURFACTANT AND HYDROTROPIC AROMATIC SULFONIC ACIDS

John E. Vander Mey, Stirling, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 740,154, Nov. 8, 1976, which is a continuation-in-part of Ser. No. 689,718, May 24, 1976, abandoned, which is a continuation of Ser. No. 601,574, Aug. 1, 1975, abandoned. This application May 22, 1978, Ser. No. 908,189

Int. Cl.<sup>2</sup> C11D 3/43; B08B 3/08; C23G 5/02

U.S. Cl. 252-143

25 Claims

1. A composition for stripping photoresist from an inorganic substrate comprising in combination:

- from about 5 to about 60 weight percent of a surfactant alkylarylsulfonic acid having 12-20 carbons;
- from about 15 to about 95 weight percent of a hydrotropic aromatic sulfonic acid having 6-9 carbons; and
- from 0 to about 40 weight percent of a halogen-free aromatic hydrocarbon solvent with a boiling point above 150° C.;

said composition being free of phenol compounds and chlorinated hydrocarbon compounds and being substantially clear water rinsable.

4,165,295

## ORGANIC STRIPPING COMPOSITIONS AND METHOD FOR USING SAME

John E. Vander Mey, Stirling, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 4, 1976, Ser. No. 729,515

Int. Cl.<sup>2</sup> C11D 7/08, 7/34; C23G 1/02

U.S. Cl. 252-143

13 Claims

1. An improved organic stripping composition capable of removing polymeric organic substances from aluminized silicon dioxide substrates without dulling or corrosion of the aluminum surface, whereon such polymeric substances are deposited as photoresist materials, comprising at least one organic sulfonic acid of the following formula: R-SO<sub>3</sub>H wherein R is an organic radical selected from the group consisting of alkyl containing 1 to 18 carbon atoms, monohydroxy-alkyl containing 1 to 18 carbon atoms, aryl containing 6 to 10 carbon atoms, monoalkylaryl wherein the alkyl group contains 1 to 14 carbon atoms, dialkylaryl wherein each alkyl group contains 1 to 4 carbon atoms, monohydroxyaryl containing 6 to 10 carbon atoms, monoalkylhydroxyaryl containing 7 to 11 carbon atoms and monochloro-hydroxyaryl containing 6 to 10 carbon atoms and at least one organic solvent, wherein the improvement comprises incorporating fluoride ion in an amount of about 5 to 250 ppm by weight of the composition.

4,165,296

## METHOD FOR REGENERATING AN OXIDATION CATALYST

Hiromichi Ishii; Hideo Matsuzawa; Masao Kobayashi, all of Otake, and Masaaki Kato, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1978, Ser. No. 887,802

Int. Cl.<sup>2</sup> B01J 27/28, 23/92; C07C 51/24, 45/02

U.S. Cl. 252-412

7 Claims

7. A method for regenerating a deactivated oxidation catalyst comprising phosphorus, molybdenum, and an alkali metal deactivated by the gas phase oxidation of an unsaturated aldehyde to an unsaturated carboxylic acid, which comprises: treating said deactivated catalyst with an aqueous solution containing ammonia and an oxidizing agent selected from the group consisting of hydrogen, peroxide, ozone, nitrogen tetroxide and organic peroxides; removing said solution from said treated catalyst; and drying the separated catalyst.

4,165,297

## CATALYST COMPLEX FOR THE PREPARATION OF CYANO-AZO DYESTUFFS

Gérard L. A. Belfort, Oissel, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Division of Ser. No. 784,384, Apr. 4, 1977, Pat. No. 4,126,610. This application Jul. 18, 1978, Ser. No. 925,657

Claims priority, application France, Apr. 9, 1976, 76 10421 Int. Cl.<sup>2</sup> B01J 31/22

U.S. Cl. 252-429 R

9 Claims

1. A catalyst complex of the formula:



in which R and R' are identical or different and represent alkyl-ene having from 1 to 6 carbons in a straight chain or in a branched chain and which may contain an —O— or —S— bridge; m is 0 or 1; and Hal is selected from the group consisting of fluorine, chlorine, bromine and iodine.

4,165,298

## CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Akinobu Shiga; Yoshiharu Fukui; Kazuhiro Matsumura; Toshio Sasaki, and Masahisa Okawa, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,630

Claims priority, application Japan, Sep. 8, 1976, 51/108276; Oct. 22, 1976, 51/127705

Int. Cl.<sup>2</sup> C08F 4/64

U.S. Cl. 252-429 B

34 Claims

1. A method for preparing a solid titanium trichloride catalyst, which comprises treating at about -30° to about 200° C. for about 5 minutes to about 5 hours a titanium trichloride composition or a pulverized product thereof with a mixture of (1) about 0.001 to about 2.0 moles per mole of titanium chloride in the titanium trichloride composition of at least one halogen or halogen compound selected from the group consisting of (a) a halogen expressed by the general formula



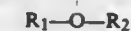
wherein X represents Cl, Br or I, (b) an interhalogen compound expressed by the general formula



wherein X and X', which are different, each represents Cl, Br or I, and a is 1 or 3, and (c) an iodinated hydrocarbon compound expressed by the general formula



wherein R<sub>3</sub> represents a straight-chain or branched-chain alkyl group containing 2 to 18 carbon atoms, and (2) about 0.001 to about 5.0 moles per mole of titanium trichloride in the titanium trichloride composition of an ether compound expressed by the general formula



wherein R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, each represents a straight-chain or branched-chain alkyl group containing 1 to 8 carbon atoms.



4,165,299

**PREPARATION OF A SINGLE PHASE VANADIUM (IV) BIS (METAPHOSPHATE) OXIDATION CATALYST WITH AN IMPROVED SURFACE AREA**

S. Erik Pedersen, Mentor, Ohio, assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 23, 1978, Ser. No. 908,869

Int. Cl.<sup>2</sup> B01J 27/14; C01B 15/16; B01J 27/02

U.S. Cl. 252-435

4 Claims

1. A method for the preparation of a single phase vanadium (IV) bis (metaphosphate) oxidation catalyst for preparing maleic anhydride by oxidation of unsaturated aliphatic hydrocarbons, which catalyst has an intrinsic surface area of from about 1.5 to 5.0 m<sup>2</sup>/gm., which comprises the steps of:

forming a solid state mixture of vanadyl sulfate and phosphorus pentoxide; introducing said mixture into a heating zone and maintaining said zone and mixture at a temperature of at least about 325° C. for a period sufficient for the liberation of gases and forming a vanadium phosphorus reaction product; cooling the reaction product and washing with water to essentially remove any soluble residue; drying the water washed product and calcining in air to obtain a single phase vanadium (IV) bis (metaphosphate) catalyst having an intrinsic surface area of from about 1.5 to 5.0 m<sup>2</sup>/gm.

4,165,300

**OXIDATION CATALYSTS**

Serge R. Dolhyj, Parma, and Ernest C. Millberger, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 640,997, Dec. 15, 1975, Pat. No. 4,021,427. This application Mar. 21, 1977, Ser. No. 779,425

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> B01J 23/10, 23/22

U.S. Cl. 252-462

12 Claims

1. A catalyst composition described by the formula:



wherein

Y is lithium, cerium or a mixture thereof;

Z is a metal selected from the group consisting of tungsten, magnesium, aluminum and nickel; and

wherein

a and d are numbers from about 0.01 to about 1.0;

b and c are numbers from about 1 to about 9;

e is a positive number from 0 to 1;

x is a number which satisfies the valence requirements of the other elements present; and wherein at least some of the molybdenum in the catalyst is present in a valence state below +6.

4,165,301

**USES OF TERPENE DIMERS IN PERFUMERY PROCESSES AND PRODUCTS**

Wilhelmus J. Wieggers, Red Bank; John B. Hall, Rumson; Ira D. Hill, Locust; Robert M. Novak, Fords; Frederick L. Schmitt; Braja D. Mookherjee, both of Holmdel; Chi-Kuen Shu, Cliffwood, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 3, 1978, Ser. No. 902,436

Int. Cl.<sup>2</sup> C11B 9/00

U.S. Cl. 252-522

10 Claims

1. A compounded single phase liquid perfumery composition which consists essentially of a perfumery product which is a natural perfume oil or a synthetic perfume oil or a synthetic perfume chemical or a mixture of two or more natural perfume oils or a mixture of two or more synthetic perfume oils or a mixture of two or more perfume chemicals or a mixture of one

or more natural perfume oils, synthetic perfume oils and perfume chemicals with which there is intimately admixed a reaction product selected from the group consisting of:

Dimerization products of alpha-pinene;

Dimerization products of beta-pinene;

Dimerization products of camphene;

Dimerization products of d-limonene;

Dimerization products of turpentine;

Hydrogenated dimerization products of alpha-pinene;

Hydrogenated dimerization products of beta-pinene;

Hydrogenated dimerization products of camphene;

Hydrogenated dimerization products of d-limonene;

Hydrogenated dimerization products of turpentine;

Mixtures of said dimerization products and mixtures of said hydrogenated dimerization products,

said reaction product being present in a concentration of from about 1 up to about 30 parts per weight per 100 parts by weight of said compounded single phase liquid perfumery composition, and said perfumery product being present in a concentration of from about 70 up to about 99 parts by weight per 100 parts by weight of said compounded single phase liquid perfumery composition.

4,165,302

**FILLED RESIN COMPOSITIONS CONTAINING ATACTIC POLYPROPYLENE**

Carmen F. Armenti, Trenton, N.J., and James V. De Juneas, Lake Charles, La., assignors to Cities Service Company, Tulsa, Okla.

Filed Aug. 22, 1978, Ser. No. 936,263

Int. Cl.<sup>2</sup> C08L 89/04

U.S. Cl. 260-8

5 Claims

1. A method of improving the melt index of a filled thermoplastic resin composition, said composition comprising (a) a basic resin selected from the group consisting of polyethylene, polypropylene (isotactic), polybutylene, copolymers of vinyl acetate and ethylene, polystyrene, and acrylic resins, and (b) a filler consisting from the group consisting of inorganic fillers and organic fillers, comprising adding a minor amount, based on the total finished composition, of atactic polypropylene.

4,165,303

**POLYMER COMPOSITIONS CONTAINING POLY (ALKYLENE ETHER) ESTERS OF POLYBASIC ACIDS**

Irwin S. Schlossman, Cincinnati, Ohio, and Robert E. Wiman, Marietta, Ga., assignors to Emery Industries, Inc., Cincinnati, Ohio

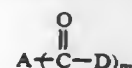
Continuation-in-part of Ser. No. 433,642, Jan. 16, 1974, abandoned, which is a division of Ser. No. 318,981, Dec. 27, 1972, abandoned, and a continuation-in-part of Ser. No. 183,266, Sep. 23, 1971, abandoned. This application Aug. 26, 1977, Ser. No. 828,001

Int. Cl.<sup>2</sup> C08L 91/00; C08G 63/76

U.S. Cl. 260-22 D

5 Claims

1. A fiber characterized by having improved and permanent antistatic properties consisting essentially of a polymer selected from the group consisting of nylon 6, nylon-6,6, poly(ethylene terephthalate) and poly(1,4-cyclohexylenedimethylene terephthalate) with about 0.1 to 20% by weight of a poly(alkylene ether) ester of a polybasic acid having the formula



wherein A is a hydrocarbon radical containing from 34 to 51 carbon atoms, m is 2 or 3, and D is a radical selected from the group consisting of hydroxyl,  $\text{-(OCHR'CH}_2\text{)-}_x\text{OH}$  or

4,165,306

**MASS-DYEING OF POLYESTER WITH ANTHRAQUINONE AND BENZANTHRONE DYES**

Rene Moissonnier, Rixheim, France, and Hans Seiler, Bubendorf, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Oct. 26, 1976, Ser. No. 735,798

Claims priority, application Switzerland, Oct. 28, 1975, 13937/75

Int. Cl.<sup>2</sup> C08K 5/18

U.S. Cl. 260-40 P

10 Claims

1. Mass-dyed linear, saturated, aromatic polyester, comprising, as dyestuff, a compound or mixture of compounds selected from

1-(4'-phenyl-benzoylamino)-anthraquinone,  
1-(4'-para-nitrophenyl-benzoylamino)-anthraquinone,  
1-(benzanthronyl-3'-amino)-anthraquinone, and  
1-(benzanthronyl-3'-amino)-6,7-dichloro-anthraquinone.

4,165,307

**PROCESS FOR PREPARATION OF MOLDING RESINS**

Shioji Mizuno, Osaka, and Toshinori Sugie, Takaishi, both of Japan, assignors to Dai Nippon Ink & Chemicals Incorporated, Japan

Filed Apr. 11, 1977, Ser. No. 786,217

Int. Cl.<sup>2</sup> C08K 3/34, 3/40

U.S. Cl. 260-40 TN

12 Claims

1. A process for the preparation of molding resins comprising heating and kneading an isocyanate prepolymer derived from a hydroxyl-terminated polymer and a polyfunctional isocyanate, with a hydroxyl-terminated low-molecular-weight polybutylene terephthalate having an inherent viscosity as herein defined of 0.15 to 0.55 dl/g in the presence of a reinforcing filler by means of an extruder, the amount of said isocyanate prepolymer and said low-molecular-weight polybutylene terephthalate being such as to satisfy the following relationship:

$$(A)/(B) = (A')/(0.1-3.0) \times (B')$$

wherein A is the amount of said low-molecular-weight polybutylene terephthalate, B is the amount of said isocyanate prepolymer, A' is the hydroxyl equivalent weight (the molecular weight of said low-molecular-weight polybutylene terephthalate per hydroxyl group) of said low molecular-weight-polybutylene terephthalate and B' is the isocyanate equivalent weight (the molecular weight of said isocyanate prepolymer per isocyanate group) of said isocyanate prepolymer.

4,165,308

**COATING COMPOSITIONS COMPRISING POLYMER BLENDS CONTAINING POLYSTYRENE OR POLY(α-METHYL STYRENE)**

Irving Serlin, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 26, 1978, Ser. No. 909,910

Int. Cl.<sup>2</sup> C08L 25/06, 25/14, 31/04

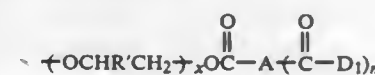
U.S. Cl. 260-42.52

7 Claims

1. A coating composition comprising an intimate polymer blend of from about 50 to about 90 parts by weight of a styrene interpolymer or a vinyl acetate polymer and from about 10 to about 50 parts by weight of a low molecular weight polystyrene or poly(α-methylstyrene) of relative viscosity in the range of about 1.04 to about 1.15 determined at 25° C. in ethyl acetate at a concentration of 2 grams per 100 ml of solution, wherein the styrene interpolymer comprises from about 30 to about 75 parts by weight of styrene, from about 69 to about 15 parts by weight of a monomer selected from the group consisting of alkyl acrylates and methacrylates containing from 4 to 15 carbon atoms and dialkyl maleates and fumarates containing from 6 to 28 carbon atoms and from about 1 to about 10 parts by weight of an unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid,



where R' is a hydrogen, a methyl or ethyl group, x is a number from about 4 to about 450, n is 1 or 2, D<sub>1</sub> is a radical as defined for D and A is a hydrocarbon radical as described above, provided that at least one of the D radicals is  $\text{-(OCHR'CH}_2\text{)-}_x\text{OH}$  or



said poly(alkylene ether) ester being chemically incorporated into said polymer so that at least a portion of said ester is reacted into and bound to the polymer.

4,165,304

**WATER-BASED COATING COMPOSITION CONTAINING POLYVINYL CHLORIDE**

Kenneth G. Davis, Pittsburgh, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 782,201, Mar. 28, 1977, Pat. No. 4,116,905, which is a continuation-in-part of Ser. No. 585,938, Jun. 11, 1975, abandoned. This application Nov. 16, 1977, Ser. No. 852,166

Int. Cl.<sup>2</sup> C08L 91/00, 27/06, 67/08

U.S. Cl. 260-22 CB

15 Claims

1. A substrate coated with a water-based coating formulation consisting essentially of powdered polyvinyl chloride dispersed in a solution of a water-dilutable resin, having functional carboxyl or hydroxy groups, selected from the group consisting of an alkyd resin, an acrylic resin; a mixture of an acrylic resin and an aminoplast, a mixture of an acrylic resin and a 1,2-epoxy resin, and a mixture of an acrylic resin, a 1,2-epoxy resin, and a phenolic resin, water-solubilized with ammonia, NH<sub>4</sub>OH or an amine solubilizer, in water, a mixture of water and an alcohol or ether alcohol, or a mixture of water, alcohol, and ether alcohol; the weight ratio of polyvinyl chloride to water-dilutable resin being between 15:1 and about 1:1.

4,165,305

**TWO-COMPONENT BINDER FOR EXTERIOR FIBERBOARD**

Richard D. Sundie, Montvale, and William R. Michael, West Orange, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 696,159, Jun. 14, 1976, abandoned.

This application Feb. 13, 1978, Ser. No. 877,590

Int. Cl.<sup>2</sup> C08L 61/28, 61/24

U.S. Cl. 260-29.4 R

12 Claims

1. A stable aqueous solution of urea, melamine and formaldehyde, which solution has a viscosity when formed of less than about 60 cps and which has a viscosity after about 7 days of less than 1,000 cps, the composition comprising, in percent by weight based upon the total weight of the composition, about 10 to 15 percent urea, about 30 to 40 percent formaldehyde, about 25 to 40 percent water, about 15 to 25 percent melamine, about 0.4 to 1.0 percent of a buffering agent which maintains the pH of the composition at a value ranging from about 6.5 to 7.0, and optionally up to about 6 percent of an alkanol of 1 to 6 carbon atoms.

crotonic acid, and monoalkyl maleates and fumarates containing from 5 to 8 carbon atoms and wherein the vinyl acetate polymer is selected from the group consisting of polyvinyl acetate and interpolymers of vinyl acetate comprising from about 60 to about 90 parts by weight of vinyl acetate, from about 9 to about 30 parts by weight of a monomer selected from the group consisting of alkyl acrylates containing from 4 to 7 carbon atoms, dialkyl maleates and fumarates containing from 6 to 12 carbon atoms, and vinyl esters of monocarboxylic acids containing from 5 to 20 carbon atoms, and from about 1 to 10 parts by weight of an unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid and monoalkyl maleates and fumarates containing from 5 to 8 carbon atoms.

4,165,309

## FLAME RETARDANT POLYMER COMPOSITION

Ivor R. Fielding, Naperville; Wassily Poppe, Lombard, and Francis J. Slama, Aurora, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 10, 1978, Ser. No. 949,655

Int. Cl.<sup>2</sup> C08K 5/02, 5/03, 5/09, 3/32

U.S. Cl. 260—45.8 A

7 Claims

1. A flame retardant composition comprising a resinous polymer chosen from the group consisting of a resinous polymer of propylene, a resinous polymer of styrene, and a resinous poly(alkylene terephthalate); a primary flame retardant comprising a chlorine or bromine containing organic compound; ammonium polyphosphate; and ammonium nitrate.

4,165,310

## SCORCH INHIBITED VULCANIZABLE RUBBER COMPOSITIONS CONTAINING CARBAMIC ACID ESTERS

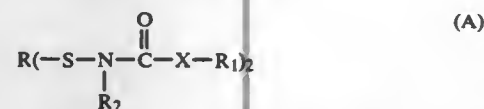
Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 929,621, Jul. 31, 1978, abandoned. This application Sep. 27, 1978, Ser. No. 946,257  
Int. Cl.<sup>2</sup> C08K 5/44; C07C 455/08, 155/09, 155/02

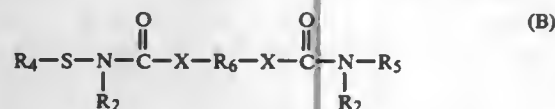
U.S. Cl. 260—45.85 A

46 Claims

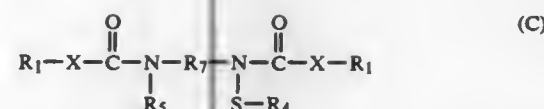
1. A vulcanizable rubber composition inhibited from premature vulcanization comprising sulfur-vulcanizable rubber, sulfur vulcanizing agent, organic vulcanization accelerating agent, and, in an amount effective to inhibit premature vulcanization, a compound of the formula



wherein X is oxygen or sulfur, R<sub>1</sub> is C<sub>1</sub>–C<sub>12</sub> alkyl, C<sub>7</sub>–C<sub>10</sub> aralkyl, C<sub>5</sub>–C<sub>12</sub> cycloalkyl, or R<sub>2</sub>; R<sub>2</sub> is phenyl, naphthyl and phenyl substituted by (–R<sub>3</sub>)<sub>n</sub> wherein n is 1, 2, 3 and R<sub>3</sub> is C<sub>1</sub>–C<sub>12</sub> alkyl, C<sub>1</sub>–C<sub>12</sub> alkoxy, C<sub>1</sub>–C<sub>12</sub> alkylthio, chloro, bromo, cyano or nitro, and R is C<sub>1</sub>–C<sub>12</sub> primary or secondary alkylene or phenylene di-C<sub>1</sub>–C<sub>6</sub>-primary or secondary alkylene;

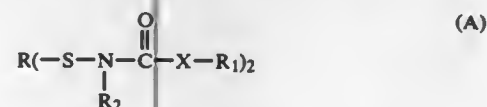


wherein X and R<sub>2</sub> are the same as before, and R<sub>4</sub> is C<sub>1</sub>–C<sub>12</sub> primary or secondary alkyl or said alkyl radical substituted by formyl or C<sub>2</sub>–C<sub>7</sub> acyl, C<sub>7</sub>–C<sub>10</sub> aralkyl, C<sub>5</sub>–C<sub>12</sub> cycloalkyl, or R<sub>2</sub>; R<sub>5</sub> is hydrogen or –SR<sub>4</sub> and R<sub>6</sub> is phenylene, mono- or di-C<sub>1</sub>–C<sub>6</sub>alkyl substituted phenylene, C<sub>2</sub>–C<sub>6</sub>alkylene, phenylene-methylene, or C<sub>1</sub>–C<sub>6</sub>alkylene diphenylene or C<sub>1</sub>–C<sub>6</sub>alkylene di(mono- or di-C<sub>1</sub>–C<sub>6</sub>alkyl substituted phenylene), or

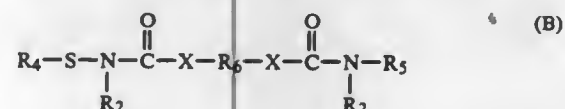


wherein X, R<sub>1</sub>, R<sub>4</sub> and R<sub>5</sub> are the same as before, and R<sub>7</sub> is phenylene, mono- or di-C<sub>1</sub>–C<sub>6</sub>alkyl substituted phenylene, or C<sub>1</sub>–C<sub>6</sub>alkylene diphenylene.

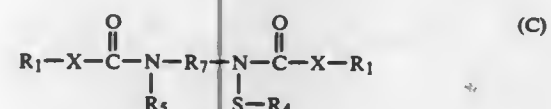
24. A method of inhibiting premature vulcanization of sulfur vulcanizable rubber containing a sulfur vulcanizing agent and organic vulcanization accelerating agent which comprises incorporating therein, in an amount effective to inhibit premature vulcanization, a compound of the formulas



wherein X is oxygen or sulfur, R<sub>1</sub> is C<sub>1</sub>–C<sub>12</sub> alkyl, C<sub>7</sub>–C<sub>10</sub> aralkyl, C<sub>5</sub>–C<sub>12</sub> cycloalkyl, or R<sub>2</sub>; R<sub>2</sub> is phenyl, naphthyl and phenyl substituted by (–R<sub>3</sub>)<sub>n</sub> wherein n is 1, 2, 3 and R<sub>3</sub> is C<sub>1</sub>–C<sub>12</sub> alkyl, C<sub>1</sub>–C<sub>12</sub> alkoxy, C<sub>1</sub>–C<sub>12</sub> alkylthio, chloro, bromo, cyano or nitro, and R is C<sub>1</sub>–C<sub>12</sub> primary or secondary alkylene or phenylene di-C<sub>1</sub>–C<sub>6</sub>-primary or secondary alkylene;



wherein X and R<sub>2</sub> are the same as before, and R<sub>4</sub> is C<sub>1</sub>–C<sub>12</sub> primary or secondary alkyl or said alkyl radical substituted by formyl or C<sub>2</sub>–C<sub>7</sub> acyl, C<sub>7</sub>–C<sub>10</sub> aralkyl, C<sub>5</sub>–C<sub>12</sub> cycloalkyl, or R<sub>2</sub>; R<sub>5</sub> is hydrogen or –SR<sub>4</sub> and R<sub>6</sub> is phenylene, mono- or di-C<sub>1</sub>–C<sub>6</sub>alkyl substituted phenylene, C<sub>2</sub>–C<sub>6</sub>alkylene, phenylene-methylene, or C<sub>1</sub>–C<sub>6</sub>alkylene diphenylene or C<sub>1</sub>–C<sub>6</sub>alkylene di(mono- or di-C<sub>1</sub>–C<sub>6</sub>alkyl substituted phenylene), or



wherein X, R<sub>1</sub>, R<sub>4</sub> and R<sub>5</sub> are the same as before, and R<sub>7</sub> is phenylene, mono- or di-C<sub>1</sub>–C<sub>6</sub>alkyl substituted phenylene, or C<sub>1</sub>–C<sub>6</sub>alkylene diphenylene.

4,165,311

## ADDITION COMPOUND OF DIPEPTIDE DERIVATIVE AND AMINO ACID DERIVATIVE

Yoshikazu Isowa; Muneki Ohmori, both of Tokyo; Kaoru Mori; Tetsuya Ichikawa, both of Sagami; Yuji Nonaka, Shin-nanyo; Keiichi Kihara, Shin-nanyo; Kiyotaka Oyama, Shin-nanyo; Heijiro Satoh, Shin-nanyo, and Shigeaki Nishimura, Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co. Ltd., Tokyo and (Zaidanhojin) Sagami Chemical Research Center, Yamaguchi, both of Japan

Filed Jan. 17, 1978, Ser. No. 870,108

Claims priority, application Japan, Jan. 27, 1977, 52-7279; May 19, 1977, 52-57036

Int. Cl.<sup>2</sup> C07C 103/52; C12B 1/00

U.S. Cl. 260—112.5 R

21 Claims

1. An addition compound having the formula

4,165,314

## MIXTURES OF 1:2 COBALT COMPLEXES OF MONOAZO COMPOUNDS HAVING AN ACETOACETANILIDE COUPLING COMPONENT RADICAL

Hanspeter Uehlinger, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jul. 5, 1977, Ser. No. 812,826

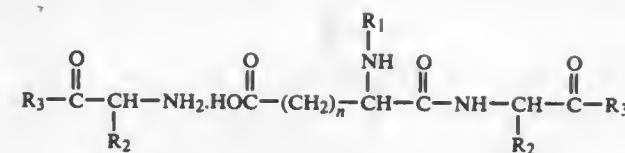
Claims priority, application Switzerland, Jul. 12, 1976, 8903/76

Int. Cl.<sup>2</sup> C09B 45/20

U.S. Cl. 260—145 A

28 Claims

1. A mixture of symmetrical and asymmetrical 1:2 cobalt complexes of a mixture of a compound of the formula



wherein R<sub>1</sub> represents an aliphatic oxycarbonyl group, benzyloxycarbonyl group which can have nuclear substituents, benzoyl, aromatic sulfonyl or aromatic sulfinyl group; R<sub>2</sub> represents methyl, isopropyl, isobutyl, isoamyl or benzyl group; R<sub>3</sub> represents a lower alkoxy, benzyloxy, or benzhydryloxy group and n represents 1 or 2.

4,165,312

## PHOSPHORYLATED NONAPEPTIDES, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Guido A. Schoenenberger, Reinach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 26, 1978, Ser. No. 919,046

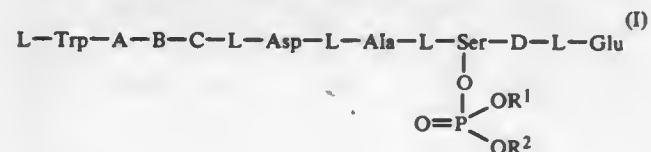
Claims priority, application Switzerland, Jun. 30, 1977, 8092/77

Int. Cl.<sup>2</sup> C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 R

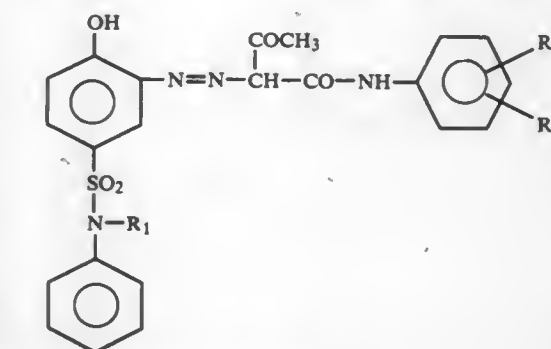
4 Claims

1. A phosphorylated nonapeptide of the formula

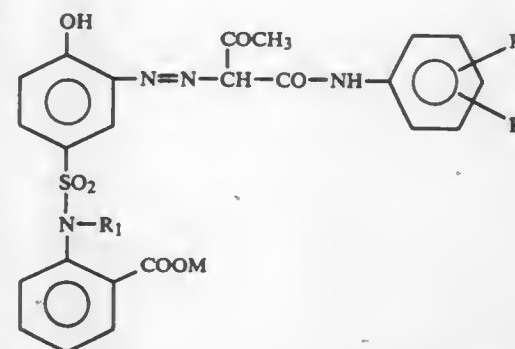


wherein

A represents L- or D-alanine,  
B, C and D represent Gly or D-alanine, and  
R<sup>1</sup> and R<sup>2</sup> represent hydrogen or alkyl.



and a compound of the formula



the molar ratio of the former to the latter being 4:1 to 1:4, wherein  
each R<sub>1</sub> is independently hydrogen or C<sub>1</sub>–C<sub>4</sub> alkyl,  
each R<sub>2</sub> and R<sub>3</sub> is independently hydrogen, halo, C<sub>1</sub>–C<sub>4</sub> alkyl or C<sub>1</sub>–C<sub>4</sub> alkoxy,  
M is hydrogen or a non-chromophoric cation, and  
the negative charge of the complex anion of each 1:2 cobalt complex is balanced by hydrogen or a non-chromophoric cation.

4,165,313

## PROCESS FOR DEODORIZING FOAMING AGENTS FOR THE MANUFACTURE OF AIR FOAMS

Albert Schlegel, Frankfurt am Main, and Peter Wirtz, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,909

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619088

Int. Cl.<sup>2</sup> A23J 1/10; C07G 7/06

U.S. Cl. 260—123.7

6 Claims

1. A process for making an aqueous solution of a keratin decomposition product free from pungent sulfur compounds which comprises hydrolyzing keratin in an aqueous medium at a temperature of 100° to 200° C. to form an aqueous solution of keratin hydrolysate and pungent sulfur-containing compounds, establishing a pH of 7 to 12 in said solution and adding to said solution an amount of epoxide sufficient to react with and substantially deodorize said pungent sulfur-containing compound.

4,165,315

## SULFINYL HALIDES AND THEIR PREPARATION FROM PENICILLIN SULFOXIDES

Stjepan Kukolja, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 673,017, Apr. 2, 1976, Pat. No. 4,081,440, which is a continuation-in-part of Ser. No. 632,732, Nov. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 536,273, Dec. 24, 1974, abandoned. This application Nov. 17, 1977, Ser. No. 852,251

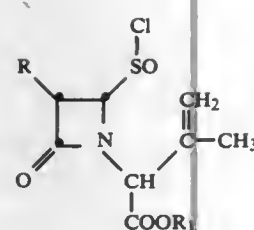
Int. Cl.<sup>2</sup> C07D 205/08, 501/10

U.S. Cl. 260—239 A

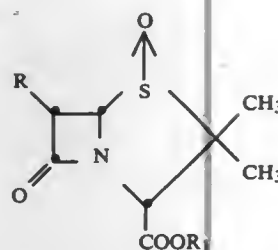
19 Claims

1. A process for preparing a cis sulfinyl chloride of the formula

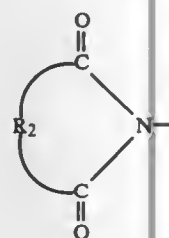




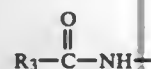
which comprises the step of reacting a penicillin sulfoxide of the formula



with an N-chloro halogenating agent at a temperature of from about 75° C. to about 135° C. in an inert solvent and under anhydrous conditions; in which, in the above formulae, R<sub>1</sub> is a carboxylic acid protecting group; and R is (1) an imido group of the formula

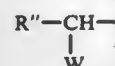


in which R<sub>2</sub> is C<sub>2</sub>-C<sub>4</sub> alkenylene or 1,2-phenylene; (2) an amido group of the formula

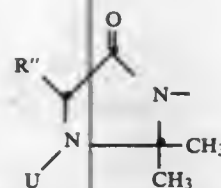


in which R<sub>3</sub> is

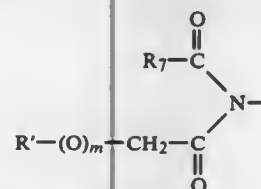
- hydrogen, C<sub>1</sub>-C<sub>3</sub> alkyl, halomethyl, cyanomethyl, benzoyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl;
- the group R' in which R' is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C<sub>1</sub>-C<sub>4</sub> alkyl, or C<sub>1</sub>-C<sub>4</sub> alkoxy;
- a group of the formula R''-(Q)<sub>m</sub>-CH<sub>2</sub>- in which R'' is R' as defined above, 1,4-cyclohexadienyl, 2-thienyl, or 3-thienyl; m is 0 or 1; and Q is O or S; subject to the limitation that when m is 1, R'' is R'; or
- a group of the formula



in which R'' is as defined above, and W is protected hydroxy or protected amino; (3) an imidazolidinyl group of the formula



in which R'' is as defined above and U is nitroso or acetyl; or R is (4) an imido group of the formula



in which R' is as defined above, m is 0 or 1, and R<sub>7</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, C<sub>1</sub>-C<sub>3</sub> haloalkyl, C<sub>1</sub>-C<sub>3</sub> alkoxy, or 2,2,2-trichloroethoxy.

4,165,316

#### PROCESS FOR PREPARING SULFINYL CHLORIDES FROM PENICILLIN SULFOXIDES

Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

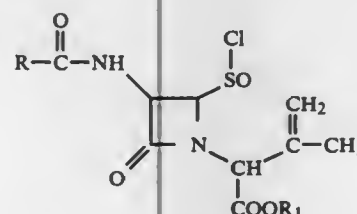
Division of Ser. No. 696,674, Jun. 16, 1976, Pat. No. 4,075,203. This application Dec. 8, 1977, Ser. No. 858,506

Int. Cl.<sup>2</sup> C07D 205/08, 501/10

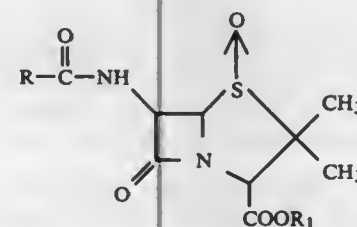
U.S. Cl. 260—239 A

18 Claims

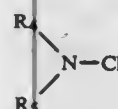
1. In a process for preparing a cis sulfinyl chloride of the formula



by reacting a penicillin sulfoxide of the formula

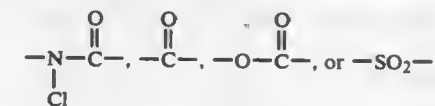


with an N-chloro halogenating agent of the formula

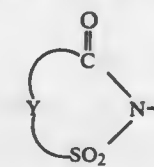


in which R<sub>4</sub> is hydrogen, chloro, C<sub>1</sub>-C<sub>3</sub> alkyl, cyclohexyl, phenyl, or phenyl substituted with chloro, bromo, methyl, or nitro, and R<sub>5</sub> is R<sub>6</sub>-X— in which R<sub>6</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, cyclo-

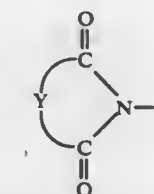
hexyl, phenyl, or phenyl substituted with chloro, bromo, methyl, or nitro, and X is



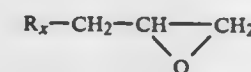
or R<sub>4</sub> and R<sub>5</sub> taken together with the nitrogen to which they are bonded define a heterocyclic structure of the formula



in which Y is o-phenylene or —(CH<sub>2</sub>)<sub>n</sub>— in which n is 2 or 3; or a structure of the formula

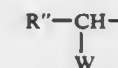


in which Y is as hereinbefore defined; at a temperature of from about 75° C. to about 135° C. in an inert solvent under anhydrous conditions and in the presence of an epoxide compound of the formula



in which R<sub>x</sub> is hydrogen or methyl, said epoxide compound being present in an amount at least sufficient to account for any hydrogen chloride which may be formed; in which, in the above formulae, R<sub>1</sub> is a carboxylic acid protecting group; and R is

- hydrogen, C<sub>1</sub>-C<sub>3</sub> alkyl, halomethyl, cyanomethyl, benzoyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl;
- the group R' in which R' is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C<sub>1</sub>-C<sub>4</sub> alkyl,
- a group of the formula R''-(Q)<sub>m</sub>-CH<sub>2</sub>- in which R'' is R' as defined above, 1,4-cyclohexadienyl, 2-thienyl, or 3-thienyl; m is 0 or 1; and Q is O or S; subject to the limitation that when m is 1, R'' is R'; or
- a group of the formula



in which R'' is as defined above, and W is protected hydroxy or protected amino; the improvement which comprises the step of carrying out the reaction in the presence of from about 100 grams to about 500 grams of calcium oxide per mole of the penicillin sulfoxide.

4,165,317

#### RIFAMYCIN COMPOUNDS

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to Archifar Laboratori Chimico Farmacologici S.p.A., Rovereto, Italy

Filed Aug. 12, 1977, Ser. No. 825,166

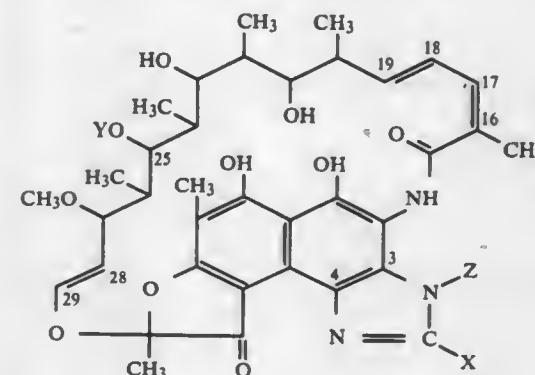
Claims priority, application Italy, Sep. 30, 1976, 5209 A/76

Int. Cl.<sup>2</sup> C07D 498/18

U.S. Cl. 260—239,3 P

1 Claim

1. A rifamycin compound of the formula



(III)

and 16, 17, 18, 19 tetrahydro derivatives and 16, 17, 18, 19, 28, 29 hexahydro derivatives thereof, wherein:

Y is —H or —COCH<sub>3</sub>;

Z is an alkyl having 1-4 carbon atoms, cycloalkyl having 3-6 carbon atoms, phenyl, phenyl substituted with at least one radical selected from the group consisting of halogen, methyl, and hydroxy;

X is selected from the group consisting of hydrogen, alkyl having 1-5 carbon atoms, carboxy, formyl, phenyl, aromatic hydrocarbonalkenyl having 8 carbon atoms, cycloalkyl having 6 carbon atoms, cycloalkenyl having 6 carbon atoms, alkenyl having 3 carbon atoms, a heterocyclo selected from the group consisting of thienyl, furyl, pyridyl and 5,6-dihydro-2H-pyran, and substitution products of the above specified radicals having 1 or 2 radicals different therefrom and selected from the group consisting of halogen, methyl, methoxyl, N,N-dimethylamino and carboxyl.

4,165,318

#### FORMALDEHYDE STABILIZED COATING COMPOSITIONS

Stanley A. Greenfield, Ambler, and John A. Dupont, Glenside, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 830,716, Sep. 6, 1977, Pat. No. 4,129,448, which is a continuation-in-part of Ser. No. 389,745, Aug. 20, 1973, abandoned. This application Sep. 18, 1978, Ser. No. 944,830

Int. Cl.<sup>2</sup> C07D 275/00, 277/00

U.S. Cl. 260—302 A

5 Claims

1. In a solution of a 3-isothiazolone in a polar organic solvent, the improvement wherein the solution further comprises a stabilizing amount of formaldehyde.

4,165,319

## ISOINDOLINE PIGMENTS

Jost von der Crone, Riehen, and Christoph Frey, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsey, N.Y.

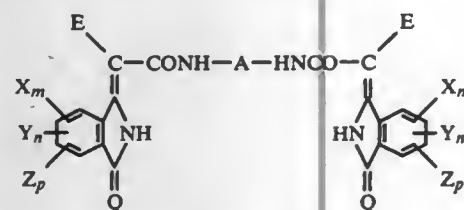
Filed Jul. 18, 1977, Ser. No. 816,839

Claims priority, application Switzerland, Jul. 26, 1976, 9621/76

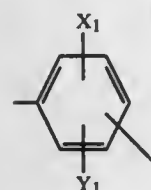
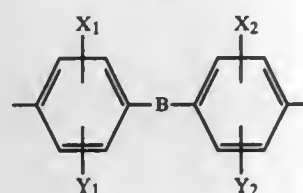
Int. Cl.<sup>2</sup> C07D 208/46, 209/50

U.S. Cl. 260—325 PH

1. A bis-isindoline pigment of the formula



wherein E is cyano and A is



or 1,5- or 2,6-naphthylene.

where B is a direct bond, —O—, —S—, —C<sub>1</sub>—C<sub>4</sub>-alkylene, —C<sub>1</sub>—C<sub>4</sub>-alkylenedioxy, phenylenedioxy, sulfonyl or —NHCO—; and X<sub>1</sub>, X<sub>2</sub>, Y<sub>1</sub> and Y<sub>2</sub> are independently hydrogen, chloro, C<sub>1</sub>—C<sub>4</sub> alkyl or C<sub>1</sub>—C<sub>4</sub> alkoxy;

Q is oxo or imino;

X is hydrogen;

Y is chloro or bromo;

m and n are integers from 0-4;

p is an integer from 0 to 1, with the proviso that the sum of m+n+p must be 4; and

Z is nitro or C<sub>2</sub>—C<sub>5</sub> alkoxy-carbonyl when p is 1 and m is 3; or is chloro or RW— where W is —O— or —S— when p is 1, and n is 3, where R is C<sub>1</sub>—C<sub>4</sub>-alkyl, phenyl, or phenyl substituted in the o-, p- or m- position by halo, C<sub>1</sub>—C<sub>4</sub>-alkyl or C<sub>1</sub>—C<sub>4</sub> alkoxy.

4,165,320

## AMINO ACID DERIVATIVES

Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

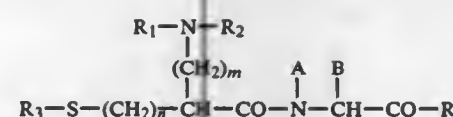
Division of Ser. No. 759,685, Jan. 17, 1977, Pat. No. 4,113,715.

This application Jun. 29, 1978, Ser. No. 920,426

Int. Cl.<sup>2</sup> C07D 209/10

U.S. Cl. 260—326.12 R

1. A compound of the formula



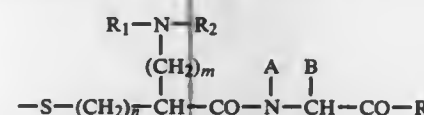
and salts thereof, wherein

R is hydroxy or lower alkoxy

R<sub>1</sub> is hydrogen, lower alkanoyl or amino (imino)methyl;

R<sub>2</sub> is hydrogen, lower alkyl or phenyl-lower alkylene;

R<sub>3</sub> is hydrogen, lower alkanoyl, benzoyl or



A is hydrogen, lower alkyl or hydroxy-lower alkylene;

B is indolyl-lower alkylene;

m is 1, 2, 3 or 4; and

n is 0 or 1.

4,165,321

## PROCESS FOR THE PRODUCTION OF HETEROCYCLIC COMPOUNDS

Eugene G. Harris, 7029 Sprucehill Cir., West Chester, Ohio 45069, and John F. White, 106 N. Pleasant St., Ridgewood, N.J. 07450

Filed Sep. 21, 1977, Ser. No. 835,253

Int. Cl.<sup>2</sup> C07D 323/00, 327/00, 321/00, 313/00

U.S. Cl. 260—340.2

13 Claims

1. In a process for the production of hetero-macrocyclic compounds selected from the group consisting of cyclic esters and lactones having 8 to 20 carbon atoms in the ring by depolymerization of a linear polyester and ring closure at an elevated temperature and reduced pressure and in the presence of a metal catalyst, the improvement comprising conducting the process as a continuous or semi-continuous operation in the presence of 0.75 to 10 mole percent monocarboxylate derived from an aliphatic monocarboxylic acid having 6 to 40 carbon atoms and with agitation which provides top-to-bottom mixing throughout essentially the total volume of the reaction mass in an inverted multiple-blade conical vessel wherein the blades have a helical configuration and are arranged to rotate throughout essentially the entire reaction mass and in close proximity to the interior surface of said conical vessel and in a direction which provides a downward flow within the reaction mixture.

4,165,322

## ALKYLATION OF ANILINE WITH A LACTONE IN THE PRESENCE OF WATER

Richard N. Reynolds, Jr., Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

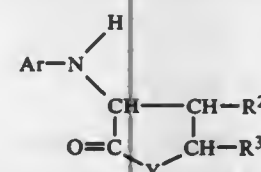
Filed Nov. 1, 1977, Ser. No. 847,503

Int. Cl.<sup>2</sup> C07D 307/32, 333/36

U.S. Cl. 260—343.6

9 Claims

1. A process for making a compound of the formula

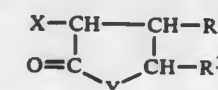


(I)

9 Claims wherein

Ar is phenyl or phenyl substituted with the same or different

substituents selected from 1 to 5 alkyl or alkoxy groups of 1 to 4 carbon atoms; 1 to 2 fluoro, chloro or bromo; and 1 nitro; R<sup>2</sup> and R<sup>3</sup> are hydrogen or alkyl of 1 to 4 carbon atoms; and Y is O or S which comprises: reacting a lactone or thiolactone compound of the formula



wherein X is chloro, iodo or bromo; Y is O or S; and R<sup>2</sup> and R<sup>3</sup> are as previously defined;

with an aniline compound, unsubstituted or substituted in the aromatic ring with the same or different substituents selected from 1 to 5 alkyl or alkoxy groups of 1 to 4 carbon atoms; 1 to 2 fluoro, chloro or bromo; and 1 nitro, in the presence of water and an inert organic solvent at a temperature between 80° and 160° to form the compound of Formula I in a reaction zone and wherein the lactone or thiolactone compound and the water are fed to the reaction zone in a ratio of 1 mol of the lactone or thiolactone per 1-40 mols of the water.

4,165,323

9-HYDROXYHEXAHYDRODIBENZO[B,D]PYRANS, 1-SUBSTITUTED-9-HYDROXYHEXAHYDRODIBENZO[b,d]PYRANS AND INTERMEDIATES THEREFOR

Michael R. Johnson, and Lawrence S. Melvin, Jr., both of Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 804,306, Jun. 7, 1977, Pat. No. 4,118,559.

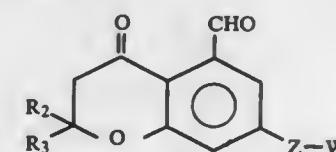
This application May 9, 1978, Ser. No. 904,192

Int. Cl.<sup>2</sup> C07D 311/42

U.S. Cl. 260—345.2

6 Claims

1. A compound having the formula

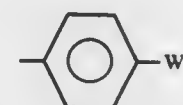


wherein each of R<sub>2</sub> and R<sub>3</sub> is selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of

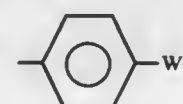
(a) alkylene having from one to ten carbon atoms;

(b) —(alk<sub>1</sub>)<sub>m</sub>—O—(alk<sub>2</sub>)<sub>n</sub>— wherein each of (alk<sub>1</sub>) and (alk<sub>2</sub>) is alkylene having from one to ten carbon atoms, with the proviso that the summation of carbon atoms in (alk<sub>1</sub>) plus (alk<sub>2</sub>) is not greater than ten; each of m and n is 0 or 1; and W is selected from the group consisting of hydrogen, pyridyl,



wherein W<sub>1</sub> is selected from the group consisting of hydrogen, fluoro and chloro.

2. A compound according to claim 1 wherein Z is —(alk<sub>1</sub>)<sub>m</sub>—O—(alk<sub>2</sub>)<sub>n</sub> and W is



4,165,324

## REMOVAL OF PHTHALIDE FROM IMPURE PHTHALIC ANHYDRIDE

Hobe Schroeder, Warrenville, and Stanley J. Kulpa, Chicago, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 898,930

Int. Cl.<sup>2</sup> C07D 307/89

U.S. Cl. 260—346.7

3 Claims

1. A method of decreasing the phthalide content of impure phthalic anhydride during its heat treatment in the liquid phase which comprises conducting said heat treatment at a temperature upward from 250° C. in the presence of a catalytic amount of an alkali metal hydroxide selected from the group consisting of potassium hydroxide, rubidium hydroxide or cesium hydroxide.

4,165,325

11-DEOXY-TRANS-4,5,13,14-TETRADEHYDRO-PGI<sub>1</sub> COMPOUNDS

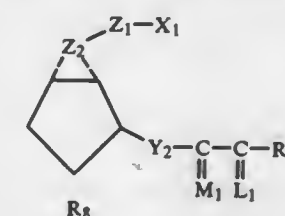
Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich. Continuation-in-part of Ser. No. 821,536, Aug. 3, 1977. This application Jun. 14, 1978, Ser. No. 915,348

Int. Cl.<sup>2</sup> C07D 307/93

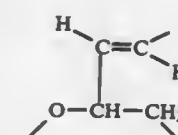
U.S. Cl. 260—346.22

72 Claims

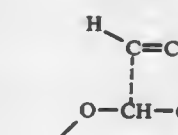
1. A prostacyclin analog of the formula



wherein Y<sub>2</sub> is —C=C—; wherein Z<sub>2</sub> is



(1)



(2)

wherein Z<sub>1</sub> is

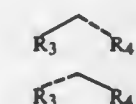
(1) —(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—CH<sub>2</sub>—, or

(2) —(CH<sub>2</sub>)<sub>g</sub>—CH<sub>2</sub>—CF<sub>2</sub>—,

wherein g is the integer zero, one, or 2; wherein R<sub>8</sub> is hydrogen or hydroxymethyl; wherein M<sub>1</sub> is



wherein R<sub>5</sub> is hydrogen or alkyl with one to 4 carbon atoms, inclusive, wherein L<sub>1</sub> is



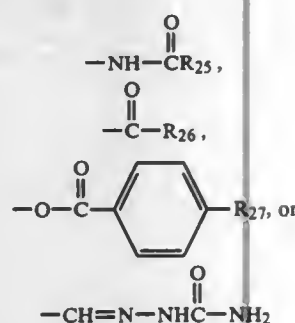


or a mixture of

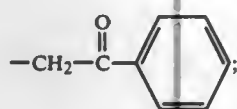
and

wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro; wherein  $X_1$  is

(1)  $-\text{COOR}_1$  wherein  $R_1$  is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



wherein  $R_{25}$  is methyl, phenyl, acetamidophenyl, benzamidophenyl, or  $-\text{NH}_2$ ;  $R_{26}$  is methyl, phenyl,  $-\text{NH}_2$ , or methoxy; and  $R_{27}$  is hydrogen or acetamido; inclusive, phenacyl, i.e.,



phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

(2)  $-\text{CH}_2\text{OH}$ ;

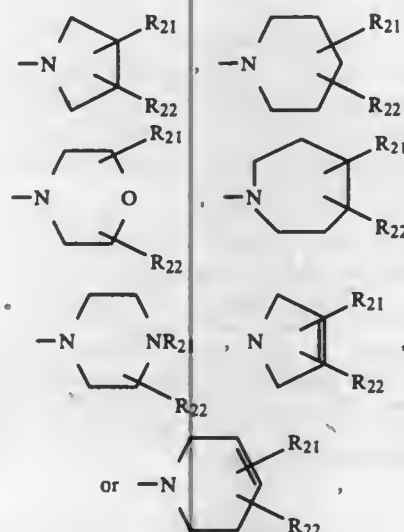
(3)  $-\text{CH}_2\text{NL}_2\text{L}_3$ , wherein  $L_2$  and  $L_3$  are hydrogen or alkyl of one to 4 carbon atoms inclusive or

(4)  $-\text{COL}_4$ , wherein  $L_4$  is

(a) amino of the formula  $-\text{NR}_{21}\text{R}_{22}$ ; wherein  $R_{21}$  and  $R_{22}$  are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive; acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive; or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon

atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms, and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of  $R_{21}$  and  $R_{22}$  is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



wherein  $R_{21}$  and  $R_{22}$  are as defined above;

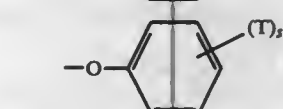
(c) carbonylamino of the formula  $-\text{NR}_{23}\text{COR}_{21}$ , wherein  $R_{23}$  is hydrogen or alkyl of one to 4 carbon atoms and  $R_{21}$  is as defined above;

(d) sulfonylamino of the formula  $-\text{NR}_{23}\text{SO}_2\text{R}_{21}$ , wherein  $R_{21}$  and  $R_{23}$  are as defined above; or

(e) hydrazino of the formula  $-\text{NR}_{23}\text{R}_{24}$ , wherein  $R_{23}$  is as defined above and  $R_{24}$  is amino of the formula  $-\text{NR}_{21}\text{R}_{22}$ , as defined above, or cycloamino, as defined above;

wherein  $R_7$  is

(1)  $-(\text{CH}_2)_m-\text{CH}_3$ ,



wherein  $m$  is the integer one to 5, inclusive,  $h$  is the integer zero to 3 inclusive;  $s$  is the integer zero, one, 2, or 3, and  $T$  is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two  $T$ 's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when  $Z_1$  is  $-\text{CH}_2\text{NL}_2\text{L}_3$ .

4,165,326

#### STERIODS AND THEIR PREPARATION

Roland Bardoneschi, Vaujours; Alain Jouquey, Paris, and Daniel Philibert, La Varenne Saint-Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

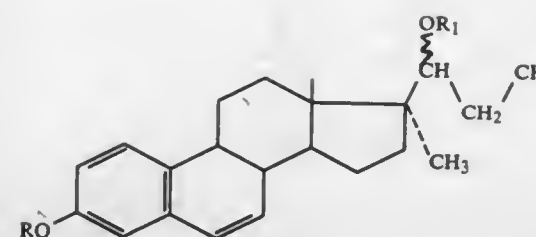
Filed Mar. 30, 1978, Ser. No. 891,722

Int. Cl. C07J 9/00

U.S. Cl. 260—397.5

1. A compound of the formula

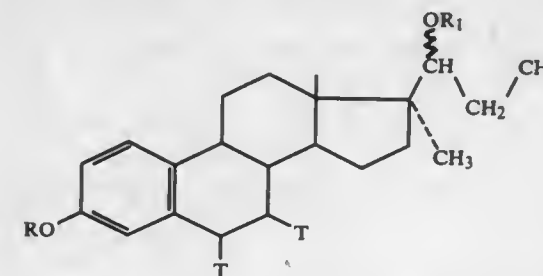
11 Claims



wherein  $R$  is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, tetrahydropyranyl, trityl and trimethylsilyl,  $R_1$  is selected from the group consisting of hydrogen, acyl of an alkanic acid of 1 to 5 carbon atoms and tetrahydropyranyl and the wavy line indicates that the  $\text{OR}_1$  group may be in either position about the carbon atoms.

6. A process for the preparation of a compound of claim 1 comprising reacting 3-methoxy-17 $\alpha$ -methyl-19-nor- $\Delta^{1,3,5(10)}$ -pregnatriene-20-one with a methyl halide to obtain 3-methoxy-17 $\alpha$ ,21-dimethyl-19-nor- $\Delta^{1,3,5(10)}$ -pregnatriene-20-one, reacting the latter with a reducing agent to form 3-methoxy-17 $\alpha$ ,21-dimethyl-19-nor- $\Delta^{1,3,5(10)}$ -pregnatriene-20 $\beta$ -ol, subjecting the latter to the Birch reaction with lithium in ammonia to form 17 $\alpha$ ,21-dimethyl-19-nor- $\Delta^{5(10)}$ -pregnene-20 $\beta$ -ol-3-one, isomerizing the latter with a strong acid to form 17 $\alpha$ ,21-dimethyl-19-nor- $\Delta^4$ -pregnene-20 $\beta$ -ol-3-one, reacting the latter with an etherification or esterification agent to obtain 17 $\alpha$ ,21-dimethyl-20 $\beta$ -OR $_1$ -19-nor- $\Delta^4$ -pregnene-3-one wherein  $R_1$  is acyl of an alkanic acid of 1 to 5 carbon atoms or tetrahydropyranyl, reacting the latter with a halogenation agent to form 2,6-dihalo-17 $\alpha$ ,21-dimethyl-20 $\beta$ -OR $_1$ -19-nor- $\Delta^4$ -pregnene-3-one, subjecting the latter to deshalohydration with an alkali metal halide in dimethylformamide to form 17 $\alpha$ ,21-dimethyl-20 $\beta$ -OR $_1$ -19-nor- $\Delta^{1,3,5(10)}$ -pregnatetraene-3-one, reacting the latter with an alkylation agent selected from the group consisting of dihydropyran, trityl chloride and trimethylsilyl chloride to obtain the corresponding compound of claim 1 wherein  $R$  and  $R_1$  are other than hydrogen and the latter may be reacted with an acid or a base to obtain the corresponding compound of claim 1 wherein  $R_1$  is hydrogen and then optionally with an acid to obtain the compound of claim 1 wherein  $R$  and  $R_1$  are both hydrogen.

9. A tritium compound of the formula



wherein  $R$  is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, tetrahydropyranyl, trityl and trimethylsilyl,  $R_1$  is selected from the group consisting of hydrogen, acyl of an alkanic acid of 1 to 5 carbon atoms and tetrahydropyranyl, the wavy line means that the  $\text{OR}_1$  group may be in either position about the carbon atoms.

11. A process for the preparation of (6,7- $\text{H}^3$ ) 3-OR-17 $\alpha$ ,21-dimethyl-20 $\beta$ -OR $_1$ -19-nor- $\Delta^{1,3,5(10)}$ -pregnatriene wherein  $R$  is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, tetrahydropyranyl, trityl and trimethylsilyl,  $R_1$  is selected from the group consisting of hydrogen, acyl of an alkanic acid of 1 to 5 carbon atoms, and tetrahydropyranyl, the wavy line means that the  $\text{OR}_1$  group may be in either position about the carbon atoms comprising reacting a compound of claim 1 with tritium hydrogen in the presence of a catalyst to form the corresponding (6,7- $\text{H}^3$ ) 3-OR-17 $\alpha$ ,21-dimethyl-20 $\beta$ -OR $_1$ -19-nor- $\Delta^{1,3,5(10)}$ -pregnatriene and when  $R$

is methyl, reacting the latter with lithium in ammonia in the presence of ethanol according to the Birch reaction to obtain when  $R_1$  is hydrogen or acyl of an alkanic acid of 1 to 5 carbon atoms (6,7- $\text{H}^3$ ) 3-methoxy-17 $\alpha$ ,21-dimethyl-19-nor- $\Delta^{2,5(10)}$ -pregnadiene-20 $\beta$ -ol or when  $R_1$  is tetrahydropyranyl (6,7- $\text{H}^3$ ) 3-methoxy-17 $\alpha$ ,21-dimethyl-20 $\beta$ -tetrahydropyranyloxy-19-nor- $\Delta^{2,5(10)}$ -pregnadiene or when  $R$  is other than methyl or hydrogen and  $R_1$  is other than hydrogen, reacting the said product with an acid such as acetic acid or a hydrogen halide such as hydrochloric acid to form (6,7- $\text{H}^3$ ) 17 $\alpha$ ,21-dimethyl-20 $\beta$ -OR $_1$ -19-nor- $\Delta^{1,3,5(10)}$ -pregnatriene-3-ol, treating the latter with a methylation agent such as dimethyl sulfate to obtain (6,7- $\text{H}^3$ ) 3-methoxy-17 $\alpha$ ,21-dimethyl-20 $\beta$ -OR $_1$ -19-nor- $\Delta^{1,3,5(10)}$ -pregnatriene and subjecting the latter to the Birch reaction with lithium in ammonia in the presence of ethanol to obtain when  $R_1$  is hydrogen or acyl of an alkanic acid (6,7- $\text{H}^3$ ) 3-methoxy-17 $\alpha$ ,21-dimethyl-19-nor- $\Delta^{2,5(10)}$ -pregnadiene-20 $\beta$ -ol or when  $R_1$  is tetrahydropyranyl (6,7- $\text{H}^3$ ) 3-methoxy-17 $\alpha$ ,21-dimethyl-20 $\beta$ -tetrahydropyranyloxy-19-nor- $\Delta^{2,5(10)}$ -pregadiene.

4,165,327

#### PROCESS FOR PRODUCING LOWER ALLERGENIC LANOLIN OR DERIVATIVES THEREOF

Makoto Yamanaka, Koganei; Satoshi Takano, Funabashi; Tsuruo Mikata, Kashiwa, and Kikuhiko Okamoto, Koshigaya, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,870

Claims priority, application Japan, Jul. 7, 1976, 51/80571

Int. Cl. C07J 9/00; C11C 1/08

U.S. Cl. 260—397.25

7 Claims

1. A process for producing a lower allergenic lanolin or derivative thereof, which comprises liquid-liquid extracting lanolin or derivative thereof with a non-polar hydrocarbon solvent and a mixed solvent comprising water and a lower alcohol, and then collecting the non-polar hydrocarbon solvent fraction, wherein said liquid-liquid extraction is carried out to an extent such that said lower allergenic lanolin contains substantially no component having an  $R_f$  value of less than 0.38 when subjected to thin layer chromatography on 0.25 mm thick magnesium silicate, with chloroform as the developing solvent.

4,165,328

#### PROCESS FOR SEPARATING 11-CYANOUNDECANOIC ACID, CYCLOHEXANONE AND $\epsilon$ -CAPROLACTAM

Kenji Nishimura; Haruhiko Miyazaki; Kenji Kuniyasu, and Satoru Ono, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Apr. 28, 1978, Ser. No. 901,089

Claims priority, application Japan, May 4, 1977, 52-50670; May 4, 1977, 52-50671

Int. Cl. C07C 121/407

U.S. Cl. 260—404

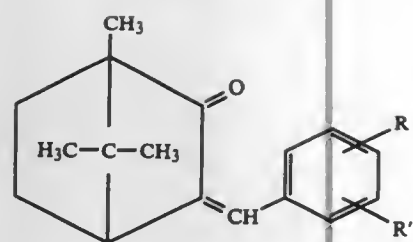
8 Claims

1. In a process for separating 11-cyanoundecanoic acid from the product obtained by pyrolyzing 1,1'-peroxydicyclohexylamine which product contains  $\epsilon$ -caprolactam in the presence of steam at a temperature in the range of from 300° C. to 1,000° C., the improvement which comprises the steps of:

- contacting the pyrolysis product with a mixture comprised of aqueous ammonia and at least one organic solvent selected from benzene, toluene and xylene;
- separating the so prepared liquid into an oily layer and an aqueous layer;
- acidifying said aqueous layer to a pH of below 4.0 with a mineral acid;
- maintaining the acidified liquid at a temperature in the range of from 40° to 100° C. so as to obtain crude 11-cyanoundecanoic acid in molten form;
- separating said crude 11-cyanoundecanoic acid from said liquid;







wherein R represents a member selected from the group consisting of hydrogen, halogen selected from the group consisting of chlorine and fluorine, and alkyl having 1-4 carbon atoms; R'' is SO<sub>3</sub>M wherein M represents a member selected from the group consisting of hydrogen, organic ammonium group and a metal, and R' is a substituent at the para or meta position relative to the bornylidene ring.

4,165,337

### PROCESS FOR PRODUCING PHTHALOYL DICHLORIDES OF HIGH PURITY

Shigeo Yoshinaka; Masaharu Doya; Seiji Uchiyama, and Sadao Nozaki, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,814

Claims priority, application Japan, Oct. 25, 1976, 51/127925  
Int. Cl.<sup>2</sup> C07C 51/58

U.S. Cl. 260—544 D

4 Claims

1. A batchwise or continuous process for producing isophthaloyl dichloride or terephthaloyl dichloride having a high purity which consists essentially of, in combination,

(I) a first step of producing  $\alpha,\alpha,\alpha',\alpha',\alpha',\alpha'$ -hexachloroxylene by reacting a xylene compound selected from the group consisting of (i) xylene selected from meta-xylene and para-xylene and (ii) compounds resulting from the partial chlorination of the side-chain methyl groups of the xylene, with chloride under the irradiation of ultraviolet-containing rays, the reaction being carried out in the presence of, as a solvent,  $\alpha,\alpha,\alpha',\alpha',\alpha',\alpha'$ -hexachloroxylene added at the outset of the reaction; (a) the solvent being added in an amount of (1) from 0.3 to 15 times the weight of the starting xylene compound when the process is carried out in a batchwise manner or (2) in an amount of from 40 to 99% by weight of the reaction mixture when the process is carried out in a continuous manner; (b) the reaction temperature being (1) 80°–160° C. when the xylene compound is m-xylene or the compound resulting from the partial chlorination of its methyl groups or (2) 110°–160° C. when the xylene compound is p-xylene or the compound resulting from the partial chlorination of its methyl groups;

(II) a second step of producing isophthaloyl dichloride or terephthaloyl dichloride by reacting the  $\alpha,\alpha,\alpha',\alpha',\alpha',\alpha'$ -hexachloroxylene obtained in the first step with isophthalic acid or terephthalic acid, the  $\alpha,\alpha,\alpha',\alpha',\alpha',\alpha'$ -hexachloroxylene obtained in the first step being in an amount of 0.90 to 1.10 moles per mole of the isophthalic acid or terephthalic acid; and

(III) a third step of purifying the isophthaloyl dichloride or terephthaloyl dichloride obtained in the second step by dissolving the isophthaloyl dichloride or terephthaloyl dichloride in 0.3 to 6 parts by weight, per part by weight of the phthaloyl dichloride, of a C<sub>6</sub>–C<sub>10</sub> aliphatic hydrocarbon solvent, and cooling the solution to a temperature within the range of –20° C. to +20° C. in the case of the isophthaloyl dichloride or to a temperature within the range of –20° C. to +50° C. in the case of the terephthaloyl dichloride thereby to recrystallize the phthaloyl dichloride.

4,165,338

### 2-HYDROXY-1,1,2,3,3-PENTAFLUOROALKYL DERIVATIVES, THEIR PRODUCTION AND USE

Atsuo Katsushima, Higashiosaka; Iwao Hisamoto, Suita; Shoshin Fukui, Toyonaka; Chiaki Maeda, Settsu; Akitoshi Iwatani, Yao; Takahisa Kato, Settsu; Masayuki Nagai, Settsu; Hiroyuki Shinkai, Settsu, and Masayuki Asaoka, Kyoto, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 538,507, Jan. 6, 1975, Pat. No. 4,084,059, which is a division of Ser. No. 299,741, Oct. 24, 1972, Pat. No. 3,870,748, which is a continuation-in-part of Ser. No. 877,497, Nov. 17, 1969, abandoned. This application Jun. 16, 1977, Ser. No. 807,164

Claims priority, application Japan, Nov. 18, 1968, 43-84276; Dec. 5, 1968, 43-89252; Dec. 19, 1968, 43-93513; Dec. 19, 1968, 43-93514; Feb. 7, 1969, 44-9524; Mar. 10, 1969, 44-18411

Int. Cl.<sup>2</sup> C07C 91/04, 91/06, 91/14, 91/26

U.S. Cl. 260—584 R

9 Claims

1. A compound of the formula:



wherein Q is a hydrogen atom,  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{R}_f$  or a hydrocarbon residue having a valence corresponding to m which may contain one or more of  $-\text{O}-$ ,  $-\text{COO}-$ ,  $-\text{NH}-$ ,  $-\text{N}=\text{N}=$  and



in the chain, R is a hydrogen atom, a hydrocarbon residue or  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{R}_f$  and m is an integer of not less than 1, R<sub>f</sub> being a perfluoroalkyl group, an  $\omega$ -hydro-perfluoroalkyl group or an  $\omega$ -chloro-perfluoroalkyl group having 4 to 20 carbon atoms.

4,165,339

### CATALYTIC ALDOL CONDENSATIONS

Walter T. Reichle, Warren, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 745,809, Nov. 29, 1976, Pat. No. 4,086,188, which is a continuation-in-part of Ser. No. 657,568, Feb. 12, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,175

Int. Cl.<sup>2</sup> C07C 45/00

U.S. Cl. 260—586 C

11 Claims

1. In the method for the aldol condensation of active hydrogen containing compounds the improvements comprising contacting said active hydrogen containing compounds containing 0 to about 20 percent by weight of water with a catalyst prepared by the steps of:

- interacting stoichiometric amounts of a water-soluble salt of a metal of the Group II of the Deming Periodic Table and a water-soluble aluminum salt with a stoichiometric amount of an alkali metal or alkaline earth metal, water-soluble hydroxide in water to precipitate a water-insoluble slurry of mixed hydroxides with the proviso that the ratio of gram atoms of aluminum metal to Group II metal is in the range of about 0.02 to about 0.3;
- washing the slurry from step (a) with water until substantially free from water-soluble salts;
- contacting the washed slurry from step (b) with a dilute aqueous solution of a lithium or zinc salt at ambient temperatures; and
- recovering and drying the product of step (c) at a temperature below about 400° C.

4,165,340

### PROCESS FOR PREPARING HEXAFLUOROPROPANONE-2

Takashi Tohzuka, and Yohnosuke Ohsaka, both of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 19, 1977, Ser. No. 826,248

Claims priority, application Japan, Aug. 23, 1976, 51-100831; May 23, 1977, 52-59590

Int. Cl.<sup>2</sup> C07C 45/04

U.S. Cl. 260—593 H

1 Claim

1. A process for preparing hexafluoropropanone by a one step reaction which comprises contacting hexafluoropropene and oxygen in a molar ratio of 1:10–0.1 at a temperature from about 80° to 300° C. and in the presence of water in an amount of from about 0.001 to 0.03 mole per mole of hexafluoropropene, with

- a fluorinated alumina catalyst, having a fluorine content from about 0.5 to 50% by weight, or
- a fluorinated silica-alumina catalyst having a fluorine content from about 0.5 to 50% by weight.

4,165,341

### PROCESS FOR PREPARING PROTOCATECHUALDEHYDE AND ITS DERIVATIVES

Sumio Umehara; Nagaaki Takamitsu; Takuji Enomiya; Hiroshi Shiraishi, and Takato Nakamura, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jan. 16, 1978, Ser. No. 869,608

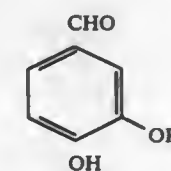
Claims priority, application Japan, Feb. 4, 1977, 52/10733; May 10, 1977, 52/52590

Int. Cl.<sup>2</sup> C07C 45/18

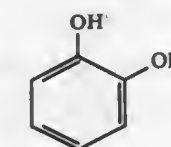
U.S. Cl. 260—600 R

8 Claims

1. An improved process for preparing protocatechualdehyde or a 3-alkoxy-4-hydroxybenzaldehyde represented by the formula



wherein R represents a methyl group or an ethyl group, which comprises reacting catechol or a 2-alkoxyphenol represented by the formula



with glyoxylic acid in a basic aqueous medium to form a reaction product, and then oxidizing said reaction product in a basic aqueous medium,

the improvement comprising reacting said catechol or said 2-alkoxyphenol with glyoxylic acid in the range of 0.5–2 moles per mole of catechol or a 2-alkoxyphenol, in an aqueous medium containing a strong inorganic base and at least one catalyst selected from the group consisting of aluminum oxide, silicon oxide and hydrated aluminum oxide in an amount of not less than 0.01 g. per 1 g. of the starting catechol or 2-alkoxyphenol at a temperature of 0° to 50° C. to form said reaction product.

4,165,342

### PREPARATION OF 3-ALKYL-BUTEN-1-ALS

Christian Dudeck, Limburgerhof; Hans Diehm, Mannheim; Fritz Brunnmueller, Ludwigshafen; Bernd Meissner, Heidelberg, and Werner Fliege, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

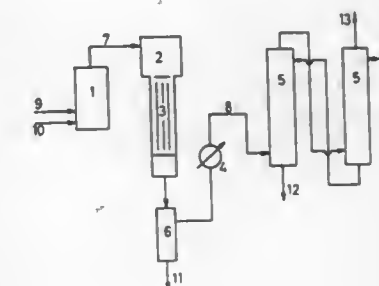
Filed Apr. 3, 1978, Ser. No. 892,785

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715209

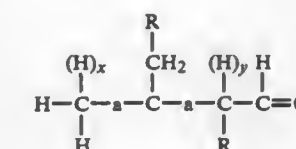
Int. Cl.<sup>2</sup> C07C 45/16

U.S. Cl. 260—603 C

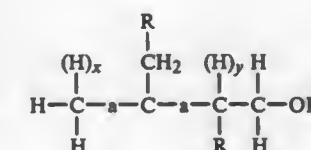
15 Claims



1. A process for the preparation of 3-alkyl-buten-1-als of the formula



where the individual radicals R may be identical or different and each is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and alkoxy of 1 to 5 carbon atoms substituted by alkyl or alkoxy each of 1 to 4 carbon atoms, one of the two radicals a is a double bond and the other is a single bond between the respective adjacent carbon atoms, and x and y are different and are each 0 when the adjacent symbol a is a double bond and 1 when the adjacent symbol a is a single bond, which comprises reacting at from 320° to 650° C. a 3-alkyl-buten-1-ol of the formula



where R, x, y and a have the above meanings, with oxygen in the presence of a catalyst of total thickness from 5 to 35 mm, said catalyst containing at least 2 layers of crystals selected from the group consisting of silver crystals, copper crystals and mixtures thereof, one part of the layers containing from 10 to 50 percent by weight of the catalyst and having particles of sizes from 0.75 to 2.5 mm, and the remaining part of the layers containing from 50 to 90 percent by weight of the catalyst and having particles of sizes from 0.2 to 0.75 mm.

4,165,343

**DEHYDRATION OF TERTIARY BUTYL ALCOHOL**  
Ralph Levine, Freehold, and Jerome R. Olechowski, Lawrenceville, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Jul. 28, 1978, Ser. No. 929,075  
Int. Cl.<sup>2</sup> C07C 5/22

U.S. Cl. 585—638

10 Claims

1. A process for dehydrating t-butyl alcohol to isobutylene which comprises contacting the t-butyl alcohol with a liquid sulfonic acid catalyst in the presence of a xylene at a temperature of 70°–200° C. in a reaction zone.

4,165,344

**CYCLOPENTADIENE RESIN AND ISOCYANATE CURED EPOXY RESIN COMPOSITIONS**  
Takao Okuda, Yokohama, and Akira Wada, Kamakura, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan  
Filed May 9, 1977, Ser. No. 795,370

Claims priority, application Japan, May 17, 1976, 51-56375  
Int. Cl.<sup>2</sup> C08L 63/00

U.S. Cl. 525—111

14 Claims

1. An epoxy resin composition comprising
  - (a) a cyclopentadiene or cyclopentadiene skeleton-containing hydrocarbon resin having a hydroxyl value of 100 to 300 obtained by copolymerizing cyclopentadiene or a cyclopentadiene skeleton-containing monomer and a hydroxyl-containing monolefinic monomer at elevated temperatures,
  - (b) a polyol selected from the group consisting of epoxy resins containing at least two hydroxyl groups in the molecule and epoxy resin derivatives containing at least two hydroxyl groups in the molecule and obtained by the reaction of epoxy resins with alkanolamines, and
  - (c) an isocyanate group containing polyol curing agent wherein the amounts of the cyclopentadiene hydrocarbon resin (a) and the polyol (b) are 90 to 5% by weight, and 10 to 95% by weight, respectively based on the total weight of the components (a) and (b).

4,165,345

**HIGH SOLIDS COATING COMPOSITIONS**  
Oliver W. Smith, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 690,185, May 26, 1976, Pat. No. 4,101,603.  
This application Apr. 20, 1978, Ser. No. 898,103  
Int. Cl.<sup>2</sup> C08L 61/32, 67/04; C08G 18/64

U.S. Cl. 525—419

17 Claims

1. A high solids composition comprising from (I) 20 to 80 weight percent of a polycaprolactone derivative and (II) from 80 to 20 weight percent of a combined mix; wherein said combined mix (II) is a mixture of a methylolated melamine and a non-volatile low molecular weight polyol having a molecular weight of from 62 to about 1000 and from 2 to 6 hydroxyl groups wherein the methylolated melamine comprises from 40 to 90 weight percent of said combined mix; and wherein said polycaprolactone derivative (I) is a carboxyl modified polycaprolactone urethane adduct reaction product mixture of (i) a polycaprolactone polyol, (ii) from 0.025 to 0.9 isocyanato equivalent for each initial hydroxyl equivalent present in the polycaprolactone of an organic polyisocyanate and (iii) from 0.1 to 1 carboxylic anhydride equivalent per each unreacted hydroxyl equivalent present of an intramolecular anhydride of a polycarboxylic acid.

4,165,346

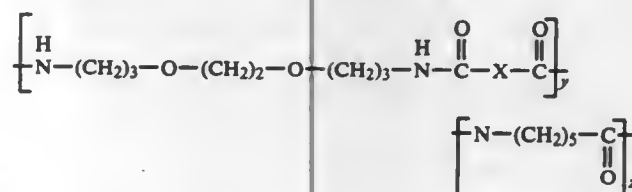
**COPOLYMER OF POLY(4,7-DIOXADECAMETHYLENE ADIPAMIDE)-POLYCAPROLACTAM CONTAINING TEREPHTHALIC ACID**

Robert M. Thompson, Wilmington, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.  
Continuation-in-part of Ser. No. 745,318, Nov. 26, 1976, abandoned. This application Sep. 25, 1978, Ser. No. 945,363  
Int. Cl.<sup>2</sup> C08L 77/00

U.S. Cl. 525—432

2 Claims

1. A block copolymer having a molecular weight of about 5000–100,000 and the following repeating structural formula:



wherein X consists essentially of the bivalent radical  $-(\text{CH}_2)_4-$  and the bivalent paraphenylene radical, the latter being present in minor amount sufficient to eliminate fiber fusion when the copolymer is scoured in boiling water, but not greater than about 13 weight percent of the total bivalent radical X and  
y=4–200  
z=4–200.

4,165,347

**THERMOPLASTIC IONIC POLYMER COMPOSITIONS**  
Richard G. Bauer, Kent, and Diego C. Rubio, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 29, 1978, Ser. No. 920,428  
Int. Cl.<sup>2</sup> C08L 9/00, 47/00

U.S. Cl. 525—69

5 Claims

1. A thermoplastic ionic polymer composition composed of 10 to 90 weight percent of a soft segment ionic polymer and 90 to 10 weight percent of a hard segment ionic polymer reacted with at least 10% to 100% of a metal ion based on the amount of free acid in said composition.

4,165,348

**APPARATUS FOR FUEL SUPPLY TO SPARK IGNITION TYPE INTERNAL COMBUSTION ENGINE**

Rinjiro Nakamura, Tokyo, Japan, assignor to Chiyoda Chemical Engineering and Construction Company Ltd., Yokohama, Japan

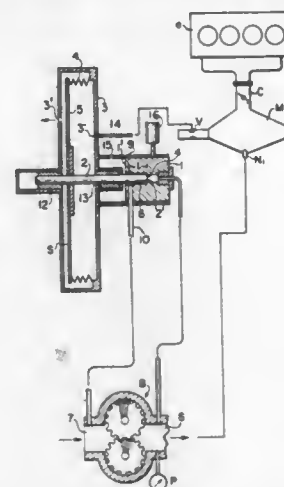
Filed Aug. 12, 1977, Ser. No. 824,307  
Claims priority, application Japan, Aug. 26, 1976, 51/101061  
Int. Cl.<sup>2</sup> F02M 7/20

U.S. Cl. 261—36 A

12 Claims

1. A pressure adjusting device for a fuel supply apparatus for a spark ignition type of internal combustion engine, said apparatus comprising: a cylinder, a piston slidable in said cylinder, said cylinder having an inlet opening into the inner end thereof for admitting liquid fuel from the discharge side of a fuel pump, said piston and cylinder having a small gap therebetween extending along a portion of the length thereof with the length of the gap being varied during motion of the piston in and out of the cylinder, said cylinder having an outlet therefrom at the end of the gap remote from the inlet for discharging liquid fuel passing through said gap to the intake side of a fuel pump, a bellows at the opposite end of said piston from said gap and having a bellows plate attached to the said opposite end of said

piston, the space outside of said bellows being open to the atmosphere, and means connected to said bellows for communicating the interior of the bellows with the static pressure of a Venturi throat in the air intake of the fuel supply apparatus.



indicating the interior of the bellows with the static pressure of a Venturi throat in the air intake of the fuel supply apparatus.

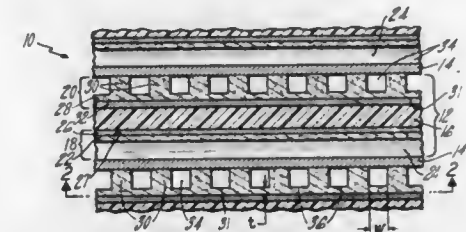
4,165,349

**METHOD FOR FABRICATING A RIBBED ELECTRODE SUBSTRATE**

Gregory J. Sandelli, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 15, 1977, Ser. No. 824,758  
Int. Cl.<sup>2</sup> B29C 25/00; C01B 31/02  
U.S. Cl. 264—29.1

1 Claim



1. A method for fabricating a porous one piece fuel cell electrode substrate having a flat surface on one side and ribs on the other side thereof, said ribs forming U-shaped channels therebetween extending across said substrate, comprising the steps of:

- preparing a uniform, dry mixture comprising about 20% phenolic resin, by weight, and about 80% carbon fibers, by weight, the fibers being less than 50 mils in length;
- loading a predetermined amount of the mixture into a molding die having the mirror image of the rib pattern desired in the substrate by sifting said mixture into said die through a screen, the amount of mixture being just sufficient to provide the finished part with a preselected porosity of at least 75% after pressing, and distributing the mixture uniformly throughout the die;
- simultaneously pressing the mixture in the die to the desired thickness of the substrate and heating the mixture to above the melt point of the resin but to less than the final cure temperature of the resin and holding the pressure and temperature at least until the resin cures to an extent such that it retains its pressed shape after release of the pressure; fully curing the pressed part;
- heat treating the fully cured part up to at least 2100° C. in an inert atmosphere to convert the resin to glassy carbon; and impregnating the entire flat surface of the heat treated part with a wetproofing material except at select locations uniformly distributed under the ribs, said impregnating

being to a depth of at least about the thickness of the substrate between the ribs.

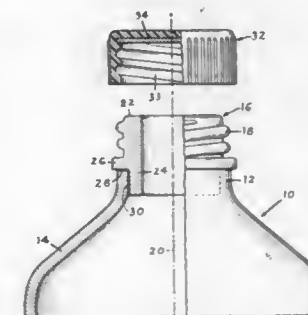
4,165,350

**FIRED CERAMIC BOTTLE HAVING THREADED NECK AND METHOD OF MAKING SAME**

Jerome S. Greenberg, Chicago, Ill., assignor to Regal China Corporation, Antioch, Ill.  
Division of Ser. No. 525,813, Nov. 21, 1974, Pat. No. 4,014,448.  
This application Dec. 23, 1976, Ser. No. 753,782  
Int. Cl.<sup>2</sup> C04B 33/34

U.S. Cl. 264—60

10 Claims



1. The method of making a fired ceramic bottle having a threaded neck comprising molding said bottle with an opening therein in plaster molds from a clay slip; separately forming an adaptor having an opening therethrough and external threads thereon by pressing a vitrifiable material under sufficient pressure in a mold to form a handleable piece, the outer sealing surface of said adaptor being in a plane substantially perpendicular to the axis of said threads, said perpendicular relationship between the plane of said outer surface of the axis of the said threads being sufficiently accurate to insure liquid tight sealing of said outer surface against the sealing element of a threaded cap; applying said adaptor to said bottle with the opening in said adaptor communicating with the opening in said bottle, and firing said adaptor and bottle to integrate them into a single unitary ceramic piece.

4,165,351

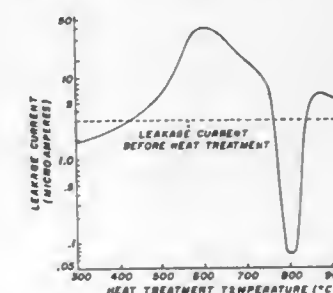
**METHOD OF MANUFACTURING A METAL OXIDE VARISTOR**

John E. May, Skaneateles, N.Y., assignor to General Electric Company, Auburn, N.Y.

Continuation of Ser. No. 616,855, Sep. 25, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,633  
Int. Cl.<sup>2</sup> C04B 33/32

U.S. Cl. 264—66

33 Claims



1. A method for making metal oxide varistor bodies comprising: combining a zinc oxide base material with a small amount of a plurality of preselected additives in particulate form to



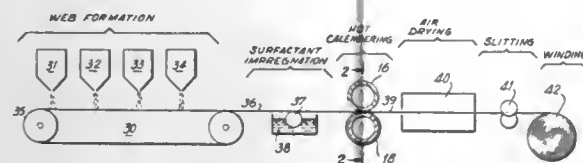
provide a final mixture, at least one of said additives being bismuth oxide;  
pressing and sintering a portion of such final mixture to provide a fused body;  
heat treating said fused body after said sintering by maintaining said body at a temperature of between about 750° C. and 1200° C. for a time of at about ten hours or more to significantly reduce the leakage current as well as to increase the alpha of said body.

**4,165,352**  
**METHOD OF PRODUCING SELF-BONDED,  
MELT-BLOWN BATTERY SEPARATORS, AND  
RESULTING PRODUCT**

Roy G. Volkman, Rariton Township, Hunterdon County, N.J., assignor to James River Corp., Richmond, Va.  
Continuation-in-part of Ser. No. 733,029, Oct. 18, 1976, abandoned, and a continuation-in-part of Ser. No. 267,420, Jun. 29, 1972, abandoned. This application Dec. 21, 1977, Ser. No. 862,843

Int. Cl.<sup>2</sup> B04H 1/16

U.S. Cl. 264—113



1. A method of producing battery separator web stock for cutting into battery separators having a wetability property, comprising

- forming a continuous, moving multi-ply web of at least three plies of melt-blown, randomly laid thermoplastic resin fibers, wherein said plies are each separately formed one upon the other as outer plies and a central ply, each ply during formation thereof being bonded to an adjacent ply to a degree by mechanical and thermal self-bonding, said central ply fibers having an average diameter of 2-10 microns, said outer ply fibers having an average diameter of 30-40 microns,
- saturating said moving web with a solution of a surfactant dissolved in a volatile solvent,
- passing said saturated web between rotating opposed heated calendaring rolls to reshape said web, to mechanically disperse said solution throughout said web and to heat and rapidly evaporate said solvent,
- passing said web through a drying means to remove any remaining solvent, and
- slitting said web to a size suitable for cutting into battery separators having a wetability property.

**4,165,353**  
**METHOD AND APPARATUS FOR MOLDING ARTICLES  
FROM AGGLOMERATED PARTICLES**

Pierre Sorbier, Pernes-les-Fontaines, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Jan. 3, 1977, Ser. No. 756,000

Claims priority, application France, Jan. 9, 1976, 76 00525

Int. Cl.<sup>2</sup> B29J 5/04

U.S. Cl. 264—120

4 Claims



1. In the method of manufacturing articles from agglomerated

particles which comprises the steps of preparing batches of particles, delivering the batches one by one to a press comprising a chamber having an open face against which one temporarily maintains the front face of one of a series of molds adapted to receive the article and having a rear face adapted to press a corresponding article received in another of said molds, carrying out the compression in said press, bringing the mold containing its article to the rear end of a row of molds, and maintaining the articles in the molds in the row under pressure during polymerization, the improvement according to which, in order to introduce said one mold into said row and to obtain and maintain said pressure, the row of molds is held in position, said one mold being introduced to the row is urged against the last mold already in the row in order to press the article in said one mold, and during said urging action the two last-mentioned molds are positively attached to each other to keep said article under pressure between the front face of said one mold and the rear face of the last mold already in the row.

**4,165,354**  
**PROCESS FOR PRODUCING PLASTIC PIPES HAVING  
OVAL CROSS-SECTIONAL SHAPE**

Noboru Iida, Ohtsu, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

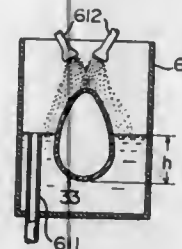
Filed Aug. 15, 1977, Ser. No. 824,953

Claims priority, application Japan, Aug. 19, 1976, 51-99403

Int. Cl.<sup>2</sup> D01D 5/08, 5/24

U.S. Cl. 264—178 R

6 Claims



1. A process for producing a plastic pipe having an oval cross-sectional shape with a high dimensional precision, which comprises conducting a roughly shaped plastic pipe having an oval cross-sectional shape, which is in the softened state and composed of a large-diameter portion, a small-diameter portion and transitional portions connecting them to each other, to a cooling tank while its shape is adjusted by being passed through a forming tube with its large-diameter portion down; cooling the form-adjusted plastic pipe in the cooling tank by dipping the large-diameter portion or both the large diameter portion and a part of the transitional portions contiguous thereto in a cooling bath; and subjecting that portion of the form-adjusted plastic pipe which is out of the cooling bath to a shower of a cooling liquid.

**4,165,355**  
**METHOD FOR MANUFACTURE OF A SUBSTANTIALLY  
MECHANICALLY ISOTROPIC CERAMIC COMPOSITE  
STRUCTURE**

Thomas Vasillos, Winthrop, Mass., assignor to Avco Corporation, Wilmington, Del.

Filed Apr. 28, 1978, Ser. No. 901,197

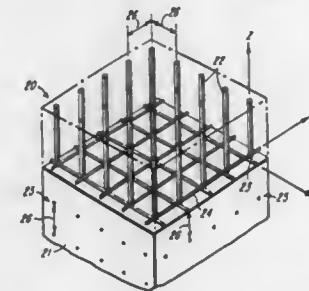
Int. Cl.<sup>2</sup> C04B 35/64

U.S. Cl. 264—255

10 Claims

1. A method of amking a substantially mechanically isotropic ceramic structure comprising the steps of, supporting a plurality of straight elongate rigid reinforcing Z members in parallel relation in a Z direction, providing a first controlled thickness of a sinterable powder material along said Z members, said powders being characterized as having a compres-

sion ratio of up to 5, disposing a plurality of substantially straight elongate reinforcing X members and Y members along said Z members and in contact with said powder material with each of said X and Y members being disposed along an associated one of an X and Y direction, providing a second controlled thickness of said powder material along said Z mem-



bers, and hot pressing said powder material and members in the temperature range of 1450° C. to 1600° C. and pressure exerting pressure parallel to said Z members to define a hot pressed structure consisting of said powder material which has been substantially pressed and sintered to define a matrix which has said reinforcing members embedded therein and thus define said structure.

**4,165,356**  
**METHOD OF FORMING TUBULAR PLASTIC  
MATERIAL HAVING A FLARE-TOP EDGE USING A  
BLOW HEAD**

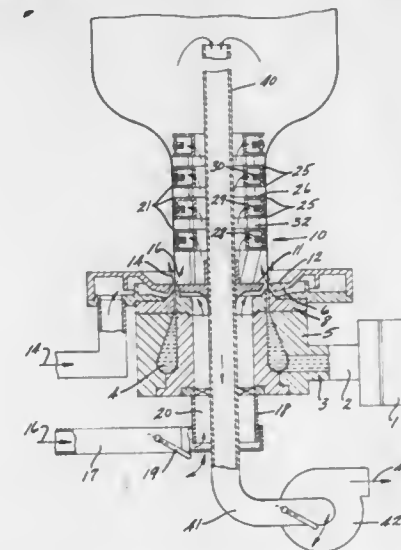
James E. Heider, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 15, 1978, Ser. No. 905,713

Int. Cl.<sup>2</sup> B29D 23/04

U.S. Cl. 264—519

6 Claims



1. In a method of forming extruded tubular thermoplastic film to create a permanent inherent flaring characteristic of the severed edges of the tubular film when flattened and lying in face-to-face two-ply relation, wherein a series of internal annular nozzles is employed to cool the film internal surface with a gaseous medium and form continuous skin layers thereon and wherein the film during formation by stretching is maintained out-of-contact with said internal annular nozzles, the improvement which comprises the steps of directing a plurality of radial streams of cooling gaseous medium from said series of internal annular nozzles forcefully against the interior surface of the extruded tubular film as formed closely adjacent the melt issuing extruder, controlling the removal of the internal

cooling gaseous medium from the interior of the extruded tubular film and through the extruder to thereby control the internal pressure and precise dimensions of the extruded tubular film as formed, directing one or more radial streams of heated gaseous medium forcefully against the exterior surface of the extruded tubular film as formed closely adjacent the melt issuing extruder, the cooling and heated gaseous mediums being juxtaposed at least in part and simultaneously applied in facing relation to create a substantial temperature differential between the interior and exterior surfaces of the extruded tubular film as formed to thereby establish different physical characteristics in said surfaces and a permanent flaring tendency at its edges when flattened and subsequently severed.

**4,165,357**  
**METHOD OF SHAPING PLASTICS FOILS**  
Arthur Vetter, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Wolfertschwenden, Fed. Rep. of Germany

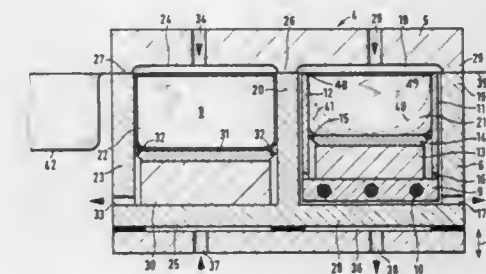
Filed Jun. 3, 1977, Ser. No. 803,104

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 7638759[U]

Int. Cl.<sup>2</sup> B29C 17/04

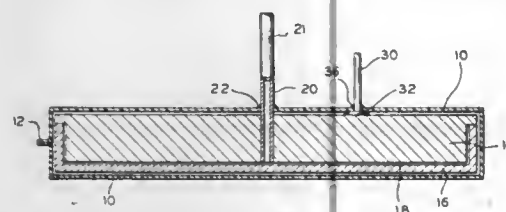
U.S. Cl. 264—548

6 Claims



1. A method for vacuum-forming from a thin-film thermoplastic material a container of the type having at least one sidewall which joins a bottom surface along at least one junction, said method comprising the steps of:  
providing a mould member having an edge portion, at least one sidewall portion, and a bottom portion which together define a mould cavity with a configuration complementary to that of the container,  
heating said mould member to a temperature above the deformation temperature of the thermoplastic material,  
placing a sheet of the thermoplastic material with a temperature less than its deformation temperature over the mould member cavity,  
and applying a pressure differential across the thermoplastic material to draw said thermoplastic material into said cavity to effect progressive contact between the heated mould member and the thermoplastic material starting at said edge portion of the mould member and extending downwardly along the sidewall thereof toward the bottom of said mould member,  
said pressure differential application step further resulting in the heating of a central part of the bottom portion of the container as it contacts the mating portion of the mould member, with further deformation of the thermoplastic material occurring outwardly from said central part toward said junction of said sidewall and bottom portions, whereby the thermoplastic material is progressively heated and deformed as it progressively contacts the surfaces of the mould member.

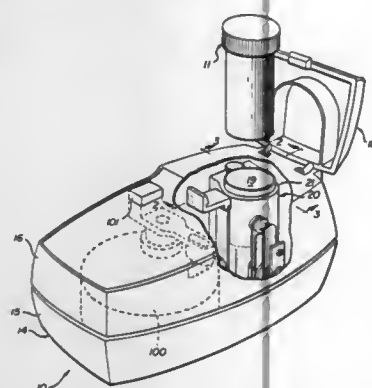
**4,165,358**  
**PROCESS FOR CLAMPING, SEALING, AND AIDING**  
**THE FILLING OF MATCHED MOLDS**  
 Jay Johnson, 3225 N. Verdugo, Glendale, Calif. 91208  
 Filed Apr. 12, 1978, Ser. No. 895,639  
 Int. Cl.<sup>2</sup> B29F 1/00  
 U.S. Cl. 264—571



1. A method of clamping, sealing, and aiding the filling of low pressure matched molds, said method comprising the steps of:

placing an air-impervious bag about the matched mold parts; sealing said bag about said molds; producing a vacuum within said bag in a manner such as to fix said molds firmly together; and injecting a predetermined amount of molding material within said molds.

**4,165,359**  
**AUTOClave ASEPTOR**  
 Michael D. Thomas, Elmhurst, and Francis E. Ryder, Barrington, both of Ill., assignors to Ryder International Corporation, Schaumburg, Ill.  
 Filed Dec. 4, 1975, Ser. No. 637,514  
 Int. Cl.<sup>2</sup> A61L 3/00  
 U.S. Cl. 422—105



1. An autoclave sterilizer for contact lenses, comprising in combination: a capsule of predetermined size and shape for housing said lenses and providing a vapor tight chamber in which said lenses and a sterilizing solution may be placed; a housing unit for receiving said capsule, said housing unit including: an exterior casing; a thermally conductive heat well structure disposed within said casing and including an interior well shaped to receive and to surround closely said capsule to maximize the transmission of heat from said heat well structure to said capsule; heater means for said heat well structure including a heating element engaged in an outer well structure wall portion at a first exterior location, said heating element being in abutting, heat transfer engagement with said heat well structure for the direct and conductive application of heat thereto; a thermostat device in operative engagement with said heat well structure at a second, exterior location, said thermostat device being operatively associated with said heater means to deactivate same once a predetermined temperature is reached at said second exterior location, which prede-

6 Claims

termined temperature is in excess of the boiling temperature of the sterilizing solution to be placed in said capsule, when at atmospheric pressure; timing means for controlling the length of the sterilizing operation; a cover member pivotally connected to said casing for overlying said interior well and said capsule disposed therein; thermally activated latch means including a bimetallic strip having an end portion mounted in direct heat conductive engagement with said heat well structure at a third exterior location; a latch member carried by the opposite end of said bimetallic strip for selective mechanical engagement with said cover to latch said cover in place and preclude access to the interior well and capsule when said heat well structure is above a second predetermined, lock activating temperature which is lower than said first mentioned predetermined temperature and at a level to insure the safety of the user; said second location at which said thermostat device is mounted being disposed on an opposite side of said interior well with respect to said first location at which said heater element is in engagement with said well thereby insuring the heating of said well to the first mentioned predetermined temperature prior to the operation of said thermostat device to deactivate said heater means, and said third location at which said bimetallic strip is mounted, being intermediate said first and second locations to provide for the rapid transfer of heat to said bimetallic strip to insure the engagement of said latch to said cover prior to any portion of said heat well structure reaching said first predetermined temperature.

**4,165,360**  
**MULTI-PHASE FLOW TUBE FOR MIXING, REACTING AND EVAPORATING COMPONENTS**  
 Clemens Casper, Krefeld; Axel Lippert, Krefeld-Verberg, and Johannes O. Sajben, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
 Filed Aug. 31, 1977, Ser. No. 829,367  
 Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719956  
 Int. Cl.<sup>2</sup> B01F 5/20; B01D 1/22; B01J 10/00; F28D 7/02  
 U.S. Cl. 422—202

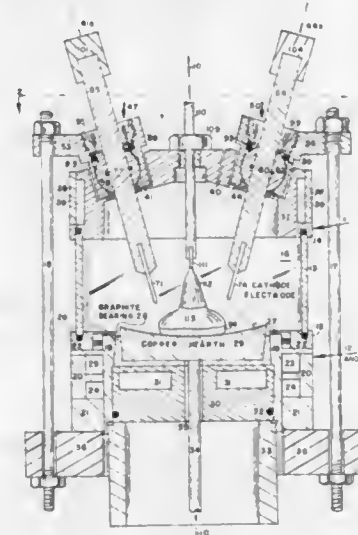
1 Claim



1. An apparatus for mixing, reacting and/or evaporating components in a multi-phase flow tube, comprising a helically wound tube having an entrance end and an exit end, having a feed pipe in the entrance end of the tube and a separation vessel at the exit end of the tube, the helically wound tube being surrounded by a tempering jacket divided into sections, and one or more conduits, said conduits opening in the tube and projecting through the tempering jacket, through the tube wall and beyond the internal surface of the tube wall, arranged along the axis of the helically wound tube.

3 Claims

**4,165,361**  
**PROCESS AND APPARATUS FOR PREPARATION OF SINGLE CRYSTALS AND TEXTURED POLYCRYSTALS**  
 Joseph B. Milstein, 1110 Downs Dr., Silver Spring, Md. 20904  
 Division of Ser. No. 635,421, Nov. 28, 1975, Pat. No. 4,087,313.  
 This application Feb. 15, 1978, Ser. No. 877,594  
 Int. Cl.<sup>2</sup> B01J 17/18  
 U.S. Cl. 422—249



1. In combination with an electric arc powered crystal growing apparatus, of the type wherein: a material is placed in an electrically conductive hearth, the material is then partially melted by the action of a plurality of electric arcs and plasma associated with each such arc to produce a molten region contained by the solid portion of said material, and then a crystal is grown by controlled withdrawal of material from the molten region, wherein the improvement comprises:

a replacement for the conductive hearth having as its parts: a hearth of copper metal, a graphite bearing in which the hearth is supported, which conducts electrical current and heat from the hearth to the unaltered portion of the apparatus, and in which the hearth is capable of rotation, and means for causing rotation of the hearth relative to the said electric arcs, during the operation of the apparatus such that the action of the arcs removes dross from the surface of the molten region.

**4,165,362**  
**HYDROMETALLURGICAL PROCESSING OF MOLYBDENITE ORE CONCENTRATES**  
 Victor R. Reynolds, Weston, Conn., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.  
 Continuation of Ser. No. 786,101, Apr. 8, 1977, abandoned. This application Apr. 13, 1978, Ser. No. 896,106  
 Int. Cl.<sup>2</sup> C01G 39/00  
 U.S. Cl. 423—53

11 Claims

1. In a process for the conversion in a reaction zone of a molybdenum disulfide to molybdenic trioxide by maintaining an agitated aqueous liquid slurry of particles of molybdenum disulfide-bearing material at a temperature in the range of from about 150° to about 230° C. in contact with gaseous molecular oxygen having a partial pressure in the reaction zone in the range of from about 50 to about 500 psi for a period of time sufficient to effect conversion of molybdenum disulfide to molybdenic trioxide and thereafter recovering product solid molybdenic trioxide from said slurry, the improvement of adding to said reaction zone in the range of from about 0.12 to about 1.68 mols of a strong hydroxide per mol of molybdenum disulfide and continuing said conversion reaction until the pH of said slurry is in the range of from about 0.05 to about 0.5 and

thereafter separating from said slurry a solids fraction containing predominantly molybdenic trioxide.

**4,165,363**  
**PROCESS FOR THE PRODUCTION OF CHLOROSILANES**

1 Claim Wolfgang Weigert, Offenbach; Eugen Meyer-Simon, Frankfurt, and Rudolf Schwarz, Wasserlos, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Schmelzeanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany  
 Filed Jan. 31, 1973, Ser. No. 328,362  
 Claims priority, application Fed. Rep. of Germany, Feb. 26, 1972, 2209267  
 Int. Cl.<sup>2</sup> C01B 33/08

U.S. Cl. 423—342

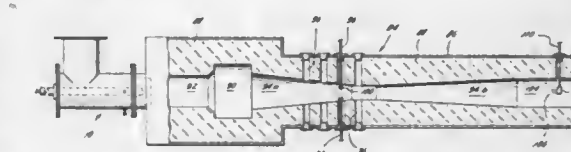
1. A process of producing hydrogen containing chlorosilanes in which silicochloroform is the predominant chlorosilane formed consisting essentially of reacting  $\text{SiCl}_4$  with  $\text{H}_2$  in the presence of activated carbon catalyst at 600° to 1200° C. with a residence time in the reaction zone of 0.5 to 20 seconds to form a reaction equilibrium mixture containing  $\text{SiCl}_4$ ,  $\text{H}_2$ ,  $\text{SiHCl}_3$  and  $\text{HCl}$  and activated carbon in which process the molar ratio of  $\text{SiCl}_4/\text{H}_2$  is between 1:1 and 1:50, then quenching the reaction mixture to below 300° C., in less than 1 second and then separating the  $\text{SiHCl}_3$  formed from the reaction mixture.

**4,165,364**  
**CARBON BLACK REACTOR WITH AXIAL FLOW BURNER**

Robert E. Dollinger, Bedford; Clinton M. Wright, Odessa, both of Tex., and Theodore A. Ruble, deceased, late of Fort Worth, Tex. (by Eulalia Berry Ruble, executrix), assignors to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.  
 Division of Ser. No. 711,443, Aug. 4, 1976, Pat. No. 4,077,761.  
 This application Oct. 31, 1977, Ser. No. 847,159  
 Int. Cl.<sup>2</sup> C01B 31/02

U.S. Cl. 423—456

1 Claim



1. A method for producing carbon black in a reactor having a longitudinally extending, generally cylindrical mixing zone, a combustion zone downstream thereof, a reaction zone downstream from said combustion zone, and a quench zone downstream from said reaction zone, said method comprising:

introducing an oxidant gas into said mixing zone and flowing said oxidant gas axially therethrough, flowing said oxidant gas around a centrally disposed bluff body in said mixing zone to generate turbulence in said oxidant gas stream downstream of said central bluff body, introducing gaseous fuel into said oxidant gas stream in the area of turbulence generated downstream of said central bluff body to partially admix said fuel and oxidant gas, flowing said partially admixed fuel and oxidant gas further downstream through said mixing zone and around a peripheral bluff body disposed about the periphery of said mixing zone and spaced axially from said central bluff body, whereby a second area of turbulence is generated downstream of said peripheral bluff body in which second area of turbulence admixture of said fuel and oxidant gas is completed, flowing said admixed fuel and oxidant gas into said combustion zone, for combustion therein,



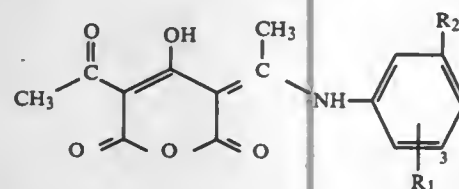
flowing the hot combustion product gases from said combustion zone into said reaction zone,  
introducing liquid hydrocarbon feedstock into said hot combustion product gases in said reaction zone,  
flowing said combustion product gases and feedstock through said reaction zone while said feedstock is reacted to produce carbon black and then into said quench zone, and  
introducing quench water into said quench zone to quench the reaction.

#### 4,165,365 SUBSTITUTED 2H-PYRAN-2,6(3H)-DIONE DERIVATIVES

Kenneth M. Snader, Hatboro, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

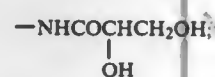
Continuation-in-part of Ser. No. 792,151, Apr. 29, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,143  
Int. Cl.<sup>2</sup> A61K 31/35; A61L 9/04; C07D 309/16  
U.S. Cl. 424-45 21 Claims

1. A compound represented by the formula:

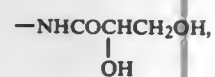


wherein:

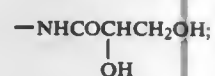
R<sub>1</sub> represents  $\text{—NHCOCH}_2\text{CH}_2\text{COOR}_3$ ,  $\text{—NHCOCOOH}$  or



R<sub>2</sub> represents hydrogen or, when R<sub>1</sub> is



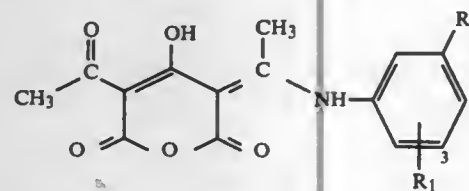
also represents amino or



and

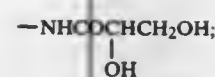
R<sub>3</sub> represents lower alkyl having one or two carbon atoms; or a mono- or di-alkali metal salt of said compound.

20. A method of inhibiting the symptoms of asthma which comprises administering to an animal in need of said inhibition a therapeutically effective amount for producing said inhibition of a compound represented by the formula:

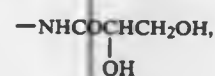


wherein:

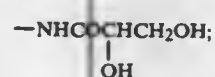
R<sub>1</sub> represents  $\text{—NHCOCH}_2\text{CH}_2\text{COOR}_3$ ,  $\text{—NHCOCOOH}$  or



R<sub>2</sub> represents hydrogen or, when R<sub>1</sub> is



also represents amino or



and

R<sub>3</sub> represents lower alkyl having one or two carbon atoms; or a mono- or di-alkali metal salt of said compound.

#### 4,165,366 DENTAL PROPHYLACTIC PASTE

James R. Mellberg, Pottersville, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,841  
Int. Cl.<sup>2</sup> A61K 7/16, 7/22

U.S. Cl. 424-49 11 Claims

1. A substantially non-aqueous dental prophylactic paste comprising about 40-60% by weight of an abrasive, a humectant, a soluble alkaline silicate and an acid-forming agent selected from the group consisting of anhydrides, amides and esters, the silicate being present in an amount of about 5-10% by weight and the acid forming agent in an amount of about 2-5% by weight.

#### 4,165,367

#### HAIR PREPARATIONS CONTAINING VINYL PYRROLIDONE COPOLYMER

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,396  
Int. Cl.<sup>2</sup> A61K 7/06, 7/11

U.S. Cl. 424-47 15 Claims

1. A hair setting and conditioning composition comprising, approximately by weight,

I. 0.1 to 35% of a film-forming copolymer having a molecular weight of about 15,000 to 1,500,000 and containing  
A. about 95 to 45 mole percent of units derived from vinyl pyrrolidone

B. 5 to 50 mole percent of units derived from a monomer of the formula



wherein

R<sup>1</sup> is H or CH<sub>3</sub>,

R<sup>2</sup> is C<sub>1-20</sub> alkylene, and

R<sup>3</sup> and R<sup>4</sup> are independently C<sub>1-4</sub> alkyl, and

C. 0 to about 50 mole percent of units derived from at least one ethylenically unsaturated copolymerizable monomer different from A and B,

II. 0.05 to 10% of at least one cosmetically acceptable member selected from the group consisting of organic surface active agents, thickening agents, plasticizers and sequestering agents, in

III. a solvent base selected from the group consisting of water, monohydric C<sub>2-3</sub> aliphatic alcohols, 1,1,1-trichloroethane, methylene chloride, and mixtures thereof.

#### 4,165,368

#### DENTAL PROPHYLACTIC PASTE

Maria C. Gaffar, Somerset, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 812,030, Jul. 1, 1977, Pat. No. 4,143,126. This application Dec. 11, 1978, Ser. No. 968,716  
Int. Cl.<sup>2</sup> A61K 7/18

U.S. Cl. 424-52 12 Claims

1. A dental prophylactic paste which is substantially non-spattering and has improved flowability through a nozzle under low pressure comprising an abrasive, a humectant and gelatin, the abrasive being present in an amount by weight of about 30-80% and the gelatin being present in an amount by weight of about 0.01 to 10.0%, which is sufficient to impart to said composition a viscosity of between 1200 and 150,000 centipoises at a temperature between 30° and 40° C.

#### 4,165,369

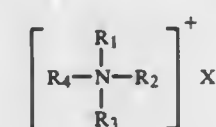
#### LIQUID HAIR RINSE CONTAINING QUATERNARY AMMONIUM SALTS AND A SYNTHETIC SECONDARY ALCOHOL

Hiroshi Watanabe; Toshihiro Shirose, and Eiji Iijima, all of Chiba, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 713,650, Aug. 12, 1976, abandoned.

This application Mar. 30, 1978, Ser. No. 891,755  
Claims priority, application Japan, Sep. 11, 1975, 50-110301  
Int. Cl.<sup>2</sup> A61K 7/08

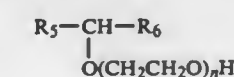
U.S. Cl. 424-70 10 Claims

1. A liquid hair rinse composition consisting essentially of  
(a) from 0.1 to 10 percent by weight of one or a mixture of quaternary ammonium salts having the formula

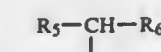


wherein each of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> is alkyl, hydroxyalkyl or benzyl, with the proviso that one or two of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> is alkyl having 8 to 20 carbon atoms and the remainder of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are alkyl having one to 3 carbon atoms, hydroxyalkyl having one to 3 carbon atoms or benzyl, and X is halide, methylsulfate or ethyl sulfate,

(b) from 0.1 to 10 percent by weight of a synthetic secondary alcohol prepared by oxidizing normal paraffin or an ethoxylate thereof, said alcohol having the formula



wherein n is a number from zero to 7 and



is alkyl having 12 to 18 carbon atoms, and  
(c) an amount of a water-miscible organic solvent effective to dissolve components (a) and (b), and  
(d) the balance consists essentially of water.

#### 4,165,370

#### INJECTABLE GAMMA GLOBULIN

Myer Louis Coval, 6241 Chelton Dr., Oakland, Calif. 94611  
Division of Ser. No. 688,621, May 21, 1976, Pat. No. 4,093,606, which is a continuation-in-part of Ser. No. 550,467, Feb. 18, 1975, abandoned. This application Apr. 27, 1978, Ser. No. 900,616

Int. Cl.<sup>2</sup> A61K 39/00, 39/42, 37/00; C07G 7/00  
U.S. Cl. 424-85 3 Claims

1. A gamma globulin suitable for intravenous administration prepared according to the following process:

a process for preparing a gamma globulin substantially devoid of anticomplementary activity and suitable for intravenous administration, from a material selected from the Fraction II+III plasma protein paste having a protein content of about 25-30% and Fraction II paste which comprises the steps:

a. suspending said paste in water to form a solution of low ionic strength having a conductance of about 300-10<sup>-6</sup>cm<sup>-1</sup>ohm<sup>-1</sup> at a pH of about 4.8 to 6.5 to produce a precipitate and a filtrate,  
b. fractionally precipitating impurities from said filtrate by adding polyethylene glycol to 4% weight/volume and then 5% weight/volume,  
c. precipitating the gamma globulin by adding polyethylene glycol to 12% weight/volume at a pH of about 8.0.

#### 4,165,371

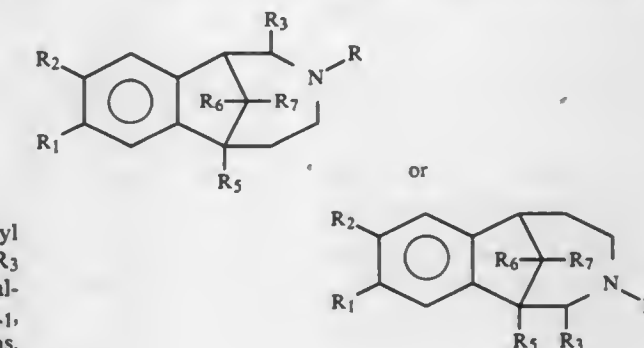
#### 1,2,3,4,5,6-HEXAHYDRO-1,6-METHANO-3-BENZAZO- CINES

Paul H. Mazzocchi, Lanham, Md., and Aline M. Harrison, Dallastown, Pa., assignors to Research Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,567  
Int. Cl.<sup>2</sup> A61K 31/55; C07D 223/32

U.S. Cl. 424-244 17 Claims

1. A compound having in the free base form the formula



wherein  
R<sub>1</sub> and R<sub>2</sub> are each hydrogen, halogen or non-sterically hindered alkyl of 1-6 carbon atoms, hydroxy, alkoxy of 1-6 carbon atoms, alkanoyl or alkanoyloxy of 2-7 carbon atoms, amino, mono- or dialkylamino wherein each alkyl is of up to 4 carbon atoms and each alkyl is unsubstituted or monosubstituted by hydroxy, chlorine, bromine, trifluoromethyl or amino; or R<sub>1</sub> and R<sub>2</sub> collectively are methylenedioxy or ethylenedioxy;

R<sub>3</sub> is hydrogen or alkoxy of 1-6 carbon atoms;  
R<sub>4</sub> is hydrogen, alkyl, alkenyl or alkynyl of up to 6 carbon atoms, cycloalkyl, cycloalkylalkyl, cycloalkylalkenyl, cycloalkenyl or cycloalkenylalkyl, with 3 or 4 carbon atoms in the cyclic group of each, phenyl alkyl or phenylalkenyl of up to 9 carbon atoms which is unsubstituted or monosubstituted by amino alkylamino or dialkylamino each of up to 8 carbon atoms, carbalkoxy, alkoxy, alkanoyl or alkanoyloxy of 1-4 carbon atoms, or by chlorine, bromine, trifluoromethyl cyano or hydroxy;

R<sub>5</sub> is hydrogen, alkyl, alkoxy, alkanoyl or alkanoyloxy of 1-6 carbon atoms, hydrocarbon aryl, alkaryl of 6 or 10 ring carbon atoms and 1-4 alkyl carbon atoms optionally monosubstituted by hydroxy, chlorine, bromine, trifluoromethyl or amino; and

one of R<sub>6</sub> and R<sub>7</sub> is hydrogen, hydroxy, alkyl or alkoxy of 1-4 carbon atoms and the other of R<sub>6</sub> and R<sub>7</sub> is hydrogen, hydroxy, alkyl or alkoxy of 1-6 carbon atoms, hydrocarbon aryl, alkaryl or aralkyl of 6 or 10 ring carbon atoms and 1-4 alkyl carbon atoms, each of which is optionally substituted by 1-3 of hydroxy, halogen or amino.

17. A process for alleviating pain in a living animal, which comprises administering a safe and analgesically effective amount of a compound according to claim 1 to a mammal afflicted therewith.

4,165,372

# 6-CARBOXY-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS AND USE AS DOPAMINERGIC AGENTS

Charles K. Brush, Malvern, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

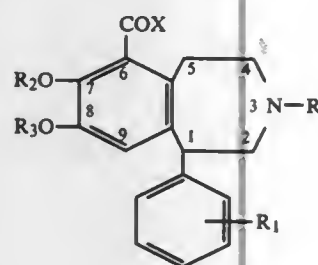
Filed Nov. 17, 1977, Ser. No. 852,404

Int. Cl.<sup>2</sup> A61K 31/55; C07D 233/16

U.S. Cl. 424-244

15 Claims

1. A chemical compound of the structural formula:



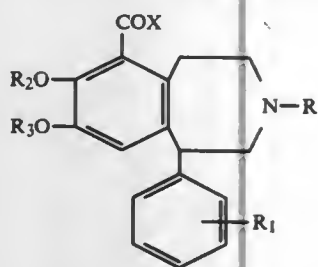
in which:

R is hydrogen, benzyl, phenethyl, lower alkanoyl of from 1-5 carbons, lower alkyl of from 1-5 carbons, lower alkenyl of 3-5 carbons, hydroxyethyl, propargyl or phenacyl; R<sub>1</sub> is hydrogen or one or two substituents from the group of trifluoromethyl, halo, methyl, methoxy, acetoxy, methylthio or hydroxy;

R<sub>2</sub> and R<sub>3</sub> are respectively hydrogen, benzyl, lower alkyl of 1-5 carbon atoms, lower alkanoyl of 2-5 carbon atoms, or when taken together, methylene; and X is hydroxy, amino, lower alkyl of 1-5 carbons or lower alkoxy of 1-5 carbons; together with pharmaceutically acceptable acid addition or alkali metal salts thereof.

14. The method of producing dopaminergic activity in a subject in need thereof comprising the step of administering orally or parenterally to said subjects a nontoxic amount of a compound of claim 1 which is effective therefor.

15. A chemical compound of the structural formula:



in which:

R is hydrogen, benzyl, phenethyl, lower alkanoyl of from

1-5 carbons, lower alkyl of from 1-5 carbons, lower alkenyl of 3-5 carbons, hydroxyethyl, propargyl or phenacyl; R<sub>1</sub> is hydrogen or one or two substituents from the group of trifluoromethyl, halo, methyl, methoxy, acetoxy, methylthio or hydroxy;

R<sub>2</sub> and R<sub>3</sub> are respectively hydrogen, benzyl, lower alkyl of 1-5 carbon atoms, lower alkanoyl of 2-5 carbon atoms, or when taken together, methylene; and

X is hydrogen, chloro or bromo; together with acid addition salts thereof suitable for chemical intermediate use.

4,165,373

# 7-(α-ACYLAMINO-α-PHENYL OR THIENYLACETAMIDO) CEPHALOSPORIN DERIVATIVES

Hirotada Yamada; Takenari Nakagome, both of Nishinomiya, and Toshiaki Komatsu, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 2, 1977, Ser. No. 773,729

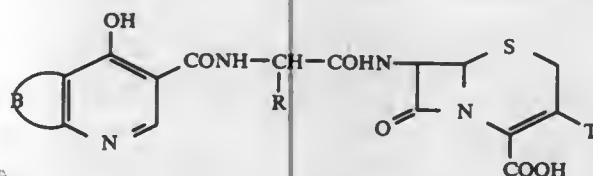
Claims priority, application Japan, Mar. 3, 1976, 51-23482; Mar. 3, 1976, 51-23483; Mar. 3, 1976, 51-23484; Mar. 3, 1976, 51-23485

Int. Cl.<sup>2</sup> C07D 501/20

U.S. Cl. 424-246

5 Claims

1. A compound of the formula:

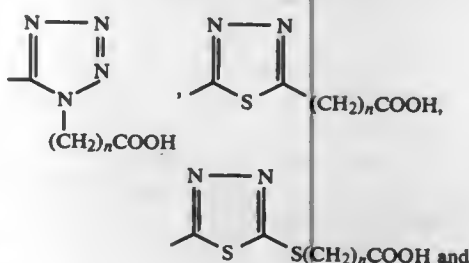


wherein

B represents the non-metallic atoms necessary to complete a pyridine ring, a pyrimidine ring or a pyrazoline ring, each of which may be unsubstituted or substituted with one or more substituents selected from the group consisting of a (C<sub>1</sub>-C<sub>4</sub>)alkyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkoxy group, a (C<sub>2</sub>-C<sub>5</sub>)alkanoyl group, a (C<sub>2</sub>-C<sub>5</sub>)alkoxycarbonyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkylthio group, a mercapto group, a hydroxyl group, a (C<sub>2</sub>-C<sub>6</sub>)alkoxymethyl group, a halogen atom, a cyano group, a nitro group, a (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonyl group, a phenylsulfonyl group, a pyridylsulfonyl group, a sulfamoyl group, a carbamoyl group, a phenoxycarbonylamino group, an acetoacetylaminogroup, a (C<sub>1</sub>-C<sub>4</sub>)alkylamino group, a di-(C<sub>1</sub>-C<sub>4</sub>)alkylamino group, a halo(C<sub>1</sub>-C<sub>4</sub>)alkyl group, a (C<sub>2</sub>-C<sub>6</sub>)alkenyl group, a phenyl group, a pyridyl group and a (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl group;

R is a phenyl group which can be unsubstituted or substituted with one or more substituents selected from the group consisting of a hydroxy group, an amino group, a hydroxymethyl group, a chlorine atom and a ureido group; or a thienyl group;

T is a -CH<sub>2</sub>S-D group in which D is a group selected from the group consisting of



-continued



where m and n each is 0 to 3; and the non-toxic, pharmaceutically acceptable, acid-addition salts thereof.

5. An antibacterial composition which comprises an antibacterially effective amount of a compound of claim 1 as an active ingredient and a pharmaceutically acceptable carrier or diluent.

4,165,374

# THIENO[3,2-c]PYRIDINES

Franz Troxler, and Erik Wiskott, both of Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 765,233, Feb. 3, 1977,

abandoned. This application Jul. 7, 1978, Ser. No. 922,519

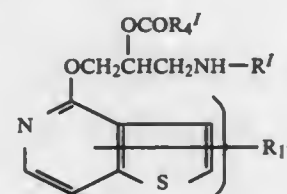
Claims priority, application Switzerland, Feb. 9, 1976, 1530/76; Jul. 29, 1977, 9419/77

Int. Cl.<sup>2</sup> C07D 495/04; A61K 31/44

U.S. Cl. 424-256

35 Claims

19. A compound of the formula



wherein

R<sub>1</sub>' is hydrogen or alkyl of 1 to 4 carbon atoms, bromine or cyano, in the 2 or 3 position,

R<sub>4</sub>' is alkyl of 4 to 9 carbon atoms, phenyl, phenyl monosubstituted by halogen of atomic number from 9 to 35, phenyl mono-, di- or trisubstituted by alkoxy of 1 to 4 carbon atoms, or a group D'-COOH, wherein D' is ethylene, and

R' is alkyl of 3 to 5 carbon atoms or cycloalkyl of 3, 5, or 6 carbon atoms monosubstituted by alkyl of 1 or 2 carbon atoms.

4,165,375

# LOW-FOAMING DISINFECTING AGENTS BASED ON QUATERNARY AMMONIUM COMPOUNDS

Hans-Jürgen Berger, Kalletal; Ferdinand Koch; Rolf Scharf, both of Düsseldorf, and Hans-Joachim Schlüssler, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 2, 1976, Ser. No. 702,230

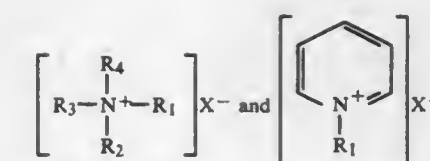
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530584

Int. Cl.<sup>2</sup> A01N 9/00, 9/20, 9/24

U.S. Cl. 424-263

8 Claims

1. A low-foaming disinfecting agent composition for spraying or sprinkling applications consisting essentially of a disinfecting amount of a quaternary ammonium compound having the formula selected from the group consisting of



wherein R<sub>1</sub> is an organic group having 8 to 20 carbon atoms R<sub>2</sub> and R<sub>3</sub> are members selected from the group consisting of alkyl having 1 to 3 carbon atoms and alkylol having 2 to 3 carbon atoms, R<sub>4</sub> is a member selected from the group consisting of alkyl having from 1 to 12 carbon atoms and an aromatic hydrocarbon substituted alkyl having 1 to 12 carbon atoms in the alkyl, optionally substituted in the aromatic hydrocarbon ring with halogen, lower alkyl or lower alkoxy, and X is an anion, from 0.1% to 20% by weight, based on the solids weight of said composition of an alkyl laurate having from 1 to 4 carbon atoms in the alkyl, as a foam inhibitor, and from 0 to 55% by weight, based on the solids weight of said composition, of a sequestering compound counteracting the hardness components of water selected from the group consisting of an alkali metal polymeric phosphate, a phosphonic acid, an alkali metal salt or an ammonium salt of a phosphonic acid, an aminopolycarboxylic acid, and an alkali metal salt or an ammonium salt of an aminopolycarboxylic acid.

4,165,376

# TREATMENT OF THE ACUTE AFTER-EFFECTS RESULTING FROM ALCOHOL INGESTION

Carl S. Rosenberg, Chicago, Ill., assignor to Lake Shore Roentgenology, Ltd., Chicago, Ill.

Continuation-in-part of Ser. No. 111,077, Jan. 29, 1971, abandoned. This application Aug. 27, 1975, Ser. No. 608,103

Int. Cl.<sup>2</sup> A61K 31/445

U.S. Cl. 424-267

1 Claim

1. A method for treating the acute after-effects of alcohol ingestion which comprises administering to a person who had ingested alcohol an effective amount of cyproheptadine to minimize an acute inflammatory reaction from alcohol ingestion.

4,165,377

# GUANIDINO IMIDAZOLES AND THIAZOLES

Derrick F. Jones, Wilmington, Del., and Tobias O. Yellin, Wallingford, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 19, 1978, Ser. No. 897,910

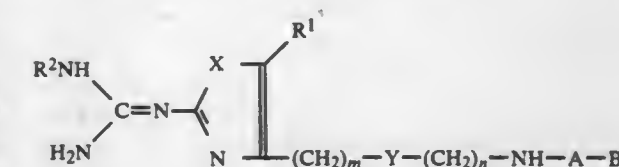
Claims priority, application United Kingdom, Apr. 20, 1977, 16389/77

Int. Cl.<sup>2</sup> C07D 277/38, 233/88; A61K 31/425, 31/415

U.S. Cl. 424-270

20 Claims

1. A guanidine derivative of the formula:



in which X is a sulphur atom or NH radical; Y is a direct bond, a methylene radical or a cis- or trans-vinylene radical; m is 0 to 4 and n is 1 to 4; R<sub>1</sub> is a hydrogen or halogen atom or an alkyl radical of 1 to 6 carbon atoms; R<sub>2</sub> is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms; A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C=Z in which Z is an oxygen or sulphur atom or a radical of the formula NCN, NNO<sub>2</sub>, CHNO<sub>2</sub>, NCONH<sub>2</sub>,



C(CN)<sub>2</sub>, NCOR<sup>3</sup>, NCO<sub>2</sub>R<sup>3</sup>, NSO<sub>2</sub>R<sup>3</sup> or NR<sup>4</sup> in which R<sup>3</sup> is an alkyl radical of 1 to 6 carbon atoms or an aryl radical of 6 to 12 carbon atoms and R<sup>4</sup> is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms; B is an alkoxy or alkylthio radical of 1 to 6 carbon atoms or a radical of the formula NR<sup>5</sup>R<sup>6</sup> in which R<sup>5</sup> and R<sup>6</sup>, which may be the same or different, are hydrogen atoms, alkyl radicals of 1 to 10 carbon atoms, alkenyl radicals of 3 to 10 carbon atoms in which the double bond is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least one carbon atom, cycloalkyl radicals of 3 to 8 carbon atoms, (primary hydroxy-)alkyl radicals of 2 to 6 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms, alkoxyalkyl radicals of 3 to 10 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms, alkylaminoalkyl radicals of 3 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms, or dialkylaminoalkyl radicals of 4 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms; and the pharmaceutically acceptable acid-addition salts thereof.

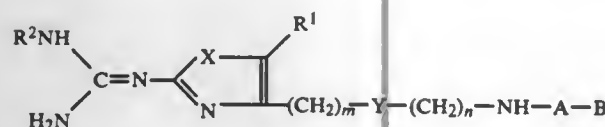
18. A pharmaceutical composition to inhibit gastric acid secretion comprising a therapeutically effective amount of a compound of claim 1 to inhibit said secretion in a pharmaceutical carrier.

#### 4,165,378 GUANIDINE DERIVATIVES OF IMIDAZOLES AND THIAZOLES

David J. Gilman, Macclesfield; James M. Wardleworth, Wilmslow, both of England, and Tobias O. Yellin, Wallingford, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 19, 1978, Ser. No. 897,912  
Int. Cl.<sup>2</sup> C07D 277/38, 233/88; A61K 31/425, 31/415  
U.S. Cl. 424-270 19 Claims

1. A guanidine derivative of the formula:



in which X is a sulphur atom or NH radical; Y is an oxygen or sulphur atom or a sulphonyl radical; m is 1 to 4 and n is 1 to 4, provided that when Y is an oxygen atom or a sulphonyl radical n is 2 to 4; R<sup>1</sup> is a hydrogen or halogen atom or an alkyl radical of 1 to 6 carbon atoms; R<sup>2</sup> is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms; A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C=Z in which Z is an oxygen or sulphur atom or a radical of the formula NCN, NNO<sub>2</sub>, CHNO<sub>2</sub>, NCONH<sub>2</sub>, C(CN)<sub>2</sub>, NCOR<sup>3</sup>, NCO<sub>2</sub>R<sup>3</sup>, NSO<sub>2</sub>R<sup>3</sup> or NR<sup>4</sup> in which R<sup>3</sup> is an alkyl radical of 1 to 6 carbon atoms or an aryl radical of 6 to 12 carbon atoms and R<sup>4</sup> is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms; B is an alkoxy or alkylthio radical of 1 to 6 carbon atoms or a radical of the formula NR<sup>5</sup>R<sup>6</sup> in which R<sup>5</sup> and R<sup>6</sup>, which may be the same or different, are hydrogen atoms, alkyl radicals of 1 to 10 carbon atoms, alkenyl radicals of 3 to 10 carbon atoms in which the double bond is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least one carbon atom, cycloalkyl radicals of 3 to 8 carbon atoms, (primary hydroxy-)alkyl radicals of 2 to 6 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms, alkoxyalkyl radicals of 3 to 10 carbon atoms in which the oxygen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms, alkylaminoalkyl radicals of 3 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms, or dialkylaminoalkyl radicals of 4 to 10 carbon atoms in which the nitrogen atom is separated from the nitrogen atom of NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms; and the pharmaceutically acceptable acid-addition salts thereof.

NR<sup>5</sup>R<sup>6</sup> by at least two carbon atoms; and the pharmaceutically acceptable acid-addition salts thereof.

17. A pharmaceutical composition to inhibit gastric acid secretion comprising a therapeutically effective amount of a compound of claim 1 to inhibit said secretion in a pharmaceutical carrier.

#### 4,165,379 N-ACETYL THIENAMYCIN

Jean S. Kahan; Frederick M. Kahan, both of Rahway; Robert T. Goegelman, Linden; Edward O. Stapley, Metuchen, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 634,301, Nov. 21, 1975, abandoned.  
This application Aug. 25, 1977, Ser. No. 827,503  
Int. Cl.<sup>2</sup> C07D 487/04; A61K 31/40

U.S. Cl. 424-274 2 Claims

1. N-Acetyl thienamycin and pharmaceutically acceptable salts thereof; said N-acetyl thienamycin exhibiting a 100 MHz nmr spectrum characterized by the following peaks: δ 1.27, d, 3H, J≈6.5; δ 1.98, s, 3H; δ 2.94 m, 2H; δ 3.17, m, 2H; δ 3.38, t, 2H, J≈6.5; δ 3.38, m, 1H; δ 4.20, m, 2H.

2. An antibiotic composition comprising an effective amount of a compound according to claim 1 and a non-toxic pharmaceutically acceptable carrier therefor.

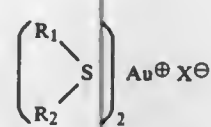
#### 4,165,380 BIS(SULFIDE)GOLD(1+) SALTS

David T. Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 772,034, Feb. 25, 1977, Pat. No. 4,112,113.  
This application Jun. 2, 1978, Ser. No. 912,137  
Int. Cl.<sup>2</sup> A61K 31/28; C07F 1/12

U.S. Cl. 424-290 4 Claims

1. A compound of the formula:



in which R<sub>1</sub> and R<sub>2</sub> are 2-hydroxyethyl and X is a weakly nucleophilic anion.

3. A pharmaceutical composition having antiarthritic activity, in dosage unit form, comprising a pharmaceutical carrier and in an amount sufficient to produce antiarthritic activity a compound of claim 1.

#### 4,165,381 MICROBICIDAL COMPOSITIONS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

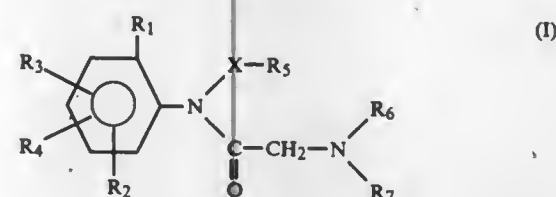
Division of Ser. No. 726,320, Sep. 24, 1976, Pat. No. 4,098,895.  
This application May 12, 1978, Ser. No. 905,312

Claims priority, application Switzerland, Sep. 30, 1975, 12650/75; Sep. 30, 1975, 12651/75

Int. Cl.<sup>2</sup> A61K 31/24; C07C 101/24

U.S. Cl. 424-309 12 Claims

1. A compound of the formula



wherein

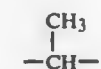
R<sub>1</sub> represents a C<sub>1</sub>-C<sub>4</sub>-alkyl group, a C<sub>1</sub>-C<sub>4</sub>-alkoxy group or a halogen atom,

R<sub>2</sub> represents a hydrogen atom, a C<sub>1</sub>-C<sub>3</sub>-alkyl group, a C<sub>1</sub>-C<sub>4</sub>-alkoxy group or a halogen atom,

R<sub>3</sub> represents a hydrogen atom, a C<sub>1</sub>-C<sub>3</sub>-alkyl group or a halogen atom,

R<sub>4</sub> represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> in the phenyl ring does not exceed 8, and

X represents -CH<sub>2</sub>- or



R<sub>5</sub> represents -COOR' or -COSR' wherein R' represents a methyl or ethyl group.

R<sub>6</sub> represents a hydrogen atom or has a meaning assigned to R<sub>7</sub>, albeit an independent one,

R<sub>7</sub> represents a C<sub>1</sub>-C<sub>6</sub>-alkyl group which is unsubstituted or substituted by cyano, hydroxyl or C<sub>1</sub>-C<sub>3</sub>-alkoxy, or a C<sub>3</sub>-C<sub>6</sub>-alkenyl group which is unsubstituted or substituted by halogen, or a C<sub>3</sub>-C<sub>6</sub>-alkinyl or C<sub>3</sub>-C<sub>7</sub>-cycloalkyl group, and salts of the compounds of the formula I with inorganic or organic acids.

11. A microbicidal composition which contains as active component a microbically effective amount of a compound of the formula I according to claim 1, together with a suitable carrier therefor.

12. A method of controlling phytopathogenic fungi or of preventing fungus attack, which comprises applying to said plants; part of plants or their environment a fungicidally effective amount of a compound of the formula I according to claim 1.

#### 4,165,382 METHOD OF PHARMACOLOGICALLY TREATING SCHIZOPHRENIA WITH ALPHA-METHYL-PARA-TYROSINE

Jose Pozuelo, 1463 Burlington, Cleveland Heights, Ohio 44118  
Filed Oct. 17, 1977, Ser. No. 842,665

The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 31/195 7 Claims

1. A pharmacological method of treating schizophrenia in human beings with alpha-methyl-para-tyrosine without causing the formation of alpha-methyl-para-tyrosine crystalluria said method comprising:

administering to a schizophrenic human being a therapeutically effective amount of alpha-methyl-para-tyrosine and an alkalinizing agent, said alkalinizing agent being present in an amount sufficient to cause the urine of said human being to have an alkaline pH.

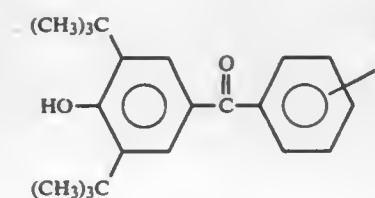
#### 4,165,383 ANTI-INFLAMMATORY METHOD

George G. I. Moore, Birchwood, Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 797,173, May 16, 1977, Pat. No. 4,124,725.  
This application Aug. 25, 1978, Ser. No. 936,763

Int. Cl.<sup>2</sup> A61K 31/12 6 Claims

1. A method for combatting inflammatory processes in a mammal which comprises administering to said mammal a dose less than the toxic amount but sufficient to inhibit inflammatory processes in said mammal of a compound of the formula



wherein R is hydrogen, 2- or 4-fluoro, alkoxy containing from 1 to 3 carbons, hydroxy or methylthio.

#### 4,165,384 AMIDE SUBSTITUTED PHENOXY PROPANOL AMINES

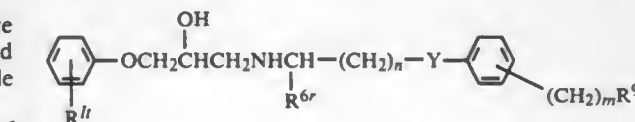
Enar I. Carlsson, Kungsbacka; Gustav B. R. Samuelsson, Mölnlycke, and Axel K. G. Aberg, Asa station, all of Sweden, assignors to Aktiebolaget Hässle, Gothenburg, Sweden

Continuation-in-part of Ser. No. 610,381, Sep. 4, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,290

Claims priority, application Sweden, Nov. 4, 1974, 7413789

Int. Cl.<sup>2</sup> C07C 103/78 6 Claims

1. A method for treating cardiovascular diseases comprising administering to mammals suffering therefrom a therapeutically effective amount of β receptor blocking agent of the general formula



wherein R<sub>11</sub> is selected from the group consisting of -OCH<sub>2</sub>CONHCH<sub>2</sub>CH<sub>2</sub>OH and -OCH<sub>2</sub>CONHCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>;

R<sub>6</sub> is selected from the group consisting of hydrogen and alkyl;

R<sub>9</sub> is selected from the group consisting of hydrogen and -CONH<sub>2</sub>;

Y is a divalent member selected from the group consisting of O and -CH<sub>2</sub>-;

n is an integer from 0 to 5 inclusive;

m is an integer from 0 to 2 inclusive;

when R<sub>9</sub> is hydrogen, m being at least 1; when Y is -CH<sub>2</sub>-, n is 1 or 2; and alkyl and alkoxy groups, when present, have from 1 to 7 carbon atoms; or a pharmaceutically acceptable salt thereof.

#### 4,165,385 WATER-IN-OIL EMULSION FOR SKIN MOISTURIZING

Elsa G. Lefebvre, Excelsior, Minn., assignor to Dianis Creations, Inc., Minnetonka, Minn.

Continuation of Ser. No. 364,868, May 29, 1973, abandoned.  
This application Jul. 16, 1975, Ser. No. 596,541

Int. Cl.<sup>2</sup> A61K 47/00 10 Claims

U.S. Cl. 424-365 10 Claims

1. A water-in-oil emulsion comprising water dispersed in an oil phase comprising the following ingredients:

purified cocoa butter,  
a liquid triglyceride vegetable oil,  
a C<sub>12</sub>-C<sub>26</sub> fatty acid ester wax, and mineral oil;  
the amounts of said ingredients being defined as follows:

% by Weight of Total Composition	Parts by Weight per 100 Parts by Weight of Cocoa Butter	Ingredient
5-25	—	cocoa butter
30-50	200-400	vegetable oil
3-15	25-100	ester wax
Same as wax	25-100	mineral oil

-continued

% by Weight of Total Composition	Parts by Weight per 100		Ingredient
	Parts by Weight of Cocoa	Butter	
5-25			water

4,165,386

**BREAD AND A METHOD OF PRODUCING THE SAME**  
Iwao Kikuhara, 1516-1, Furumitsu-cho, Matsuyama-shi; Ehime-ken, Japan

Continuation-in-part of Ser. No. 737,381, Nov. 1, 1976, abandoned. This application May 26, 1977, Ser. No. 800,856  
Claims priority, application Japan, Nov. 4, 1975, 50/132284  
Int. Cl.<sup>2</sup> A21D 2/08

U.S. Cl. 426—9

4 Claims

4. A method of producing bread, comprising adding at least one kind of rice vinegar containing at least 250 mg/l of free amino acid, said rice vinegar being prepared by mixing a vinegar seed and water with sake which is made by subjecting a mixture of Shubo, steamed rice and koji to alcoholic fermentation while being saccharified, to at least one bread-making powder selected from the group consisting of flour and rye in an amount of between 180 ml and 450 ml relative to 25 kg of the bread-making powder in the dough kneading step, followed by fermenting, and then baking the dough.

4,165,387

#### METHOD OF BREWING BEER OF IMPROVED STABILITY

Dietrich H. von Wettstein, Værløse; Bent Ahrenst-Larsen, Virum; Inga B. Jende-Strid, Allerød, and Jørgen A. Sørensen, Virum, all of Denmark, assignors to De Forenede Bryggerier A/S, Copenhagen, Denmark

Filed Oct. 12, 1976, Ser. No. 731,497  
Claims priority, application Denmark, Oct. 15, 1975, 4640/75  
Int. Cl.<sup>2</sup> C12C 1/00, 11/04

U.S. Cl. 426—16

3 Claims

1. In a method of manufacturing beer of acceptable stability and taste wherein wort extracted from barley or malted barley is fermented to produce beer, the improvement which comprises using a strain of barley having a content of less than 20 mg of anthocyanogens per 100 g of dry matter caused by an inherent genetical blocking of the anthocyanogen synthesis in the barley.

4,165,388

**TORREFIED BARLEY FOR BREWER'S MASHES**  
Paul R. Witt, Jr., Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation-in-part of Ser. No. 859,124, Dec. 9, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,719  
Int. Cl.<sup>2</sup> C12C 5/00, 7/00, 11/04

U.S. Cl. 426—16

5 Claims

1. A process for producing torrefied, unmalted barley for use as a malt substitute in a brewer's mash which is used to produce a non-distilled, fermented beverage which comprises heating unmalted barley having a protein content of at least 12% to a temperature sufficient to expand the unmalted barley to the extent that a given volume of barley before heating weighs about 1.4 to 1.75 times the weight of the same volume of barley after heating and recovering the heat-treated barley as said torrefied unmalted barley.

4,165,389

#### FERMENTATION PROCESS FOR THE PRODUCTION OF A PROTEIN RICH ANIMAL FEEDSTUFF FROM LIQUID DAIRY BY-PRODUCTS

Jean A. du Chaffaut, Neuilly; Claude R. Magnoux, and Patrick L. C. Oberio, both of Laverre, all of France, assignors to The British Petroleum Company Limited, Middlesex, England  
Filed Feb. 22, 1978, Ser. No. 880,138

Claims priority, application United Kingdom, Feb. 25, 1977, 08070/77

Int. Cl.<sup>2</sup> A23C 23/00

U.S. Cl. 426—42

18 Claims

1. A fermentation process for the production of a protein rich animal feedstuff from a liquid dairy by-product containing lactose and lactic acid which comprises cultivating a lactose and lactic acid utilizing strain of a yeast of the genus Kluyveromyces in the presence of a gas containing free oxygen in a broth comprising a nitrogen source, the liquid dairy by-product and added nicotinic acid in an amount to give in the broth a minimum of 10 micrograms per gram of lactose and a minimum of 5 micrograms per gram of lactic acid whereby the total quantity of nicotinic acid is present in the broth in a sufficient amount to permit substantial utilization by said yeast of the lactose and lactic acid present.

4,165,390

#### PROCESS FOR SOLUBILIZING FD&C RED #3 UNDER ACIDIC CONDITIONS AND COMPOSITION

Joseph J. Saladini, Dover, Del.; John V. Parnell, III, Larchmont, N.Y.; Wayne L. Steensen, Newark, and Harry H. Topalian, Dover, both of Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,570

Int. Cl.<sup>2</sup> A23L 1/27

U.S. Cl. 426—540

16 Claims

1. A process for solubilizing FD&C Red #3 under acidic conditions comprising:  
dispersing the Red #3 in a solvent having a pH above about 4.5 wherein at least a majority of the Red #3 by weight is dissolved in the solvent;  
then fixing the Red #3 with a substrate;  
solubilizing the fixed Red #3 into an aqueous solution in the presence of an amount of gelatin and for a period of time effective to stabilize the Red #3 when said Red #3 is in an aqueous solution below the pH of about 4.5 and provide a substantially cloud-free and precipitate free aqueous solution; and adjusting the pH of the aqueous solution to below about 4.5.

4,165,391

**AGENT FOR PROVIDING MEATY FLAVOR IN FOODS**  
Constance R. Corbett nee Rolison, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 694,116, Jun. 8, 1976, abandoned. This application Apr. 29, 1977, Ser. No. 791,342  
Int. Cl.<sup>2</sup> A23L 1/226

U.S. Cl. 426—580

18 Claims

1. A food flavoring agent consisting essentially of from about 50% to about 85% by weight hydrolyzed vegetable protein, from about 10% to about 25% by weight yeast autolyate and from about 5% to about 25% by weight on a dry solids basis of soluble modified whey solids selected from the group consisting of delactosed whey solids, the second fraction obtained by passing a liquid mixture of cheese whey solids through a bed of molecular sieve resin, and the permeate and the delactosed permeate resulting from the ultrafiltration of whey, said second fraction having the following composition:

Lactose, %	40-50
Minerals, %	20-35

-continued

Protein, (N × 6.38),	15-20
Lactic Acid, %	7-10
Citric Acid, %	3-6
Fat, %	less than 1
Moisture, %	less than 5
pH	6.6-7.2,

and said permeate having the following composition:

Lactose, %	80-83
Minerals, %	10-12
Protein, (N × 6.38),	4-6,

said delactosed permeate having the following composition:

Lactose, %	42-45
Minerals, %	30-35
Protein, (N × 6.38),	9-11.

4,165,392

#### PROCESS FOR PRODUCING FIBROUS HIGH-PROTEIN FOOD

Syuzi Kawai; Shuzo Ohyabu, both of Kurashiki; Takeo Akiya, Takatsuki; Shunichi Horio, Hirakata; Naoki Yagi, Suita; Kwang Y. Kim, Habikino, and Tarushige Nakaji, Yao, all of Japan, assignors to Kuraray Co., Ltd. and Minaminihon Rakuno Kyodo Kabushiki Kaisha, both of Japan  
Filed Jan. 17, 1977, Ser. No. 760,293

Claims priority, application Japan, Nov. 12, 1976, 51-136713  
Int. Cl.<sup>2</sup> A23J 3/00

U.S. Cl. 426—657

9 Claims

1. A process for producing a fibrous high protein product, which comprises the steps of (1) converting a solution comprising a milk protein into a fibrous product, (2) after or during the conversion step, prestabilizing the resulting fibrous product in an acidic bath of pH 0 to 5 containing 0.5 to 25% of an acidic compound selected from the group consisting of acetic acid, sulfuric acid, and phytic acid, or admixtures thereof for at least 10 seconds; and then (3) actually stabilizing the resultant fibrous product in a saline bath of pH 2.5 to 6.5 containing at least one salt, selected from the group consisting of a potassium salt, a sodium salt, and a calcium salt in an amount of 0.3 to 6 gram equivalents/L as the total cation concentration of the bath, at 90° to 130° C. for from 1 to 3 hours when acetic or sulfuric acid is used in step (2) and 0.5 to 3 hours when phytic acid is used in step (2).

4,165,393

#### MAGNETIC BRUSH DEVELOPING PROCESS FOR ELECTROSTATIC IMAGES

Kohji Suzuki; Manabu Mochizuki, both of Kawasaki; Hajime Oyama, Tokyo, and Teruyuki Ohnuma, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1976, Ser. No. 742,707

Claims priority, application Japan, Nov. 26, 1975, 50-141409  
Int. Cl.<sup>2</sup> G03G 13/09

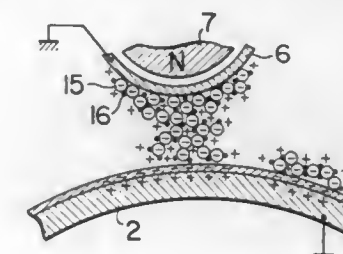
U.S. Cl. 427—18

6 Claims

1. In a magnetic toner brush developing process for electrostatic images of the type in which a developer containing a magnetic powder is attracted onto a sleeve of a non-magnetic material by means of a magnet disposed within the sleeve to thereby form a magnetic brush, which brush is brought into contact with an electrostatic latent image formed on a record member to provide a developing thereof, the improvement comprising the steps of:

providing as a developer a powder mixture of a low resistance toner having a volume resistance of not more than  $10^5 \Omega \text{ cm}$  and a high resistance toner having a volume

resistance of not less than  $10^{13} \Omega \text{ cm}$ , at least one of which comprises a magnetic toner for forming the magnetic brush;  
triboelectrically charging both toners;  
selecting the toner materials in accordance with their orders in the triboelectricity series, the high resistance toner being of a higher order and inducing an electrostatic



charge on the low resistance toner, so that the force of electrostatic attraction acting between the toners and the force of electrostatic attraction acting between both toners and the latent image are greater than the force of magnetic attraction exerted by the magnet on the magnetic toner; and  
causing a deposition of both toners onto the latent image to provide a developing thereof.

4,165,394

#### METHOD OF PREPARATION OF A SUBSTRATE MADE OF PLASTIC MATERIAL FOR ITS SUBSEQUENT METALLIZATION

Jean-Paul Ehrbar, La Chaux-de-Fonds, and Claude Ganguillet, Neuchâtel, both of Switzerland, assignors to Ebauches S.A., Neuchâtel, Switzerland

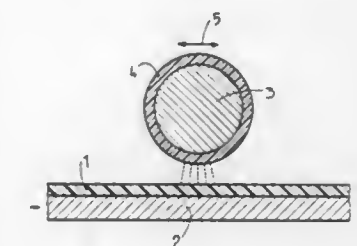
Filed Feb. 6, 1978, Ser. No. 875,563

Claims priority, application Switzerland, Feb. 16, 1977, 1887/77

Int. Cl.<sup>2</sup> B05D 3/06

U.S. Cl. 427—40

4 Claims



1. Method of preparation of a substrate made of plastic material for its subsequent metallization, characterized by the fact that one attacks the surface of the substrate to be metallized by brush discharge, the said brush discharge being realized by Corona discharges applied by successive passages with a density of current which is higher than 0.5 mA/cm<sup>2</sup>, the tension being lower than the break-down tension of the substrate, so as to prevent the deterioration of the latter, the density of total charge of energy thus applied being higher than 20 mC/cm<sup>2</sup> so as to render the said surface able to be metallized by chemical way.



4,165,395

# PROCESS FOR FORMING A HIGH ASPECT RATIO STRUCTURE BY SUCCESSIVE EXPOSURES WITH ELECTRON BEAM AND ACTINIC RADIATION

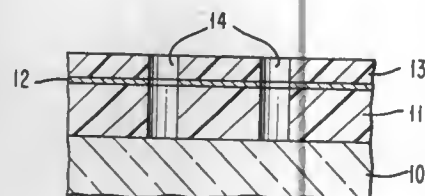
Tai Hon P. Chang, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1977, Ser. No. 811,757

Int. Cl.<sup>2</sup> B05D 3/06; B32B 3/10

U.S. Cl. 427—43

16 Claims



1. A method of forming a predetermined high aspect ratio thin film pattern of openings in a resist structure including coating a substrate with a first layer of resist, applying a coating of a second layer of resist, said first layer being relatively thick compared to the minimum dimensions of said pattern openings as measured parallel to the surface of said layer, employing radiation with electrons from an electron beam operating to write said predetermined pattern in said second layer of resist with said minimum dimensions in said second layer, forming a corresponding metallic film pattern on said first layer, employing said thin metallic film pattern as a mask for exposing said first resist to actinic radiation to expose said predetermined pattern therein, developing said first resist, whereby a high aspect ratio structure with said predetermined pattern is achieved.

4,165,396

# METHOD FOR SALVAGING THE LIGHT-ABSORBING MATRIX AND SUPPORT OF A LUMINESCENT SCREEN

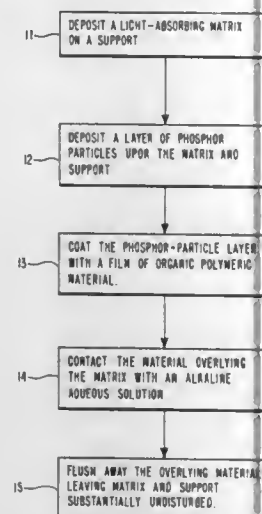
James A. Calamari, Jr., Marlon, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,104

Int. Cl.<sup>2</sup> B05D 3/10; 3/00; B08B 3/08

U.S. Cl. 427—64

7 Claims



1. In a method for preparing a luminescent viewing screen including depositing a light-absorbing matrix upon a support, depositing a layer of phosphor particles upon said matrix and support and coating said phosphor-particle layer with a film of

organic polymeric material, the steps for substantially entirely removing said phosphor-particle layer and film while leaving said matrix substantially undisturbed, said steps comprising:

- contacting said film with an alkaline aqueous solution until said film material is at least partially solubilized, said solution having a pH in the range of 8.0 to 13.0,
- and then flushing said support with an aqueous medium until said film and phosphor-particle layer are substantially removed.

4,165,397

# REPAIR OF GLASS LAMINATES

P. H. Ogden, and H. Pennicott, both of Harlow, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

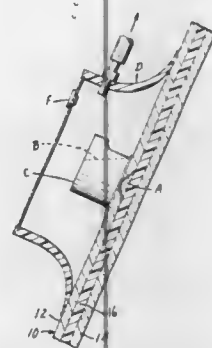
Filed Sep. 15, 1975, Ser. No. 613,522

Claims priority, application United Kingdom, Sep. 27, 1974, 42117/74; Apr. 18, 1975, 16166/75

Int. Cl.<sup>2</sup> B32B 35/00

U.S. Cl. 427—140

8 Claims



1. A method of repairing crack damage to a glass laminate which comprises subjecting the region of the laminate surface containing the crack to a reduced pressure of no greater than 0.5 mm Hg for at least 10 minutes to remove air from the crack, applying a low viscosity, liquid, curable resin composition to the laminate surface over the crack, removing the reduced pressure and curing the curable resin composition to a transparent polymer whose refractive index is sufficiently close to that of the glass to give a visibly non-obvious repair.

4,165,398

# PRESSURE-SENSITIVE COPYING PAPER

Paul R. Raine, Cardiff, and Lawrence Westcott, Bridgend, both of Wales, assignors to Wiggins Teape Limited, Hampshire, England

Filed Jan. 12, 1977, Ser. No. 758,857

Claims priority, application United Kingdom, Jan. 19, 1976, 2031/76

Int. Cl.<sup>2</sup> B41M 5/16

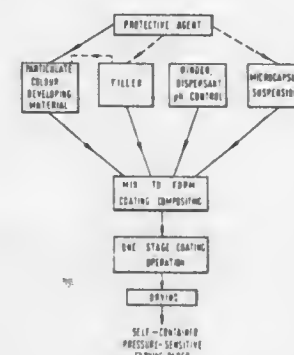
U.S. Cl. 427—150

27 Claims

1. A method of preparing pressure-sensitive copying material comprising the steps of:

- forming a coating composition comprised of
  - microcapsules containing a solution of a colourless colour former,
  - particulate mineral colour developing material which has been chemically treated with a protective agent in an amount which is less than about 10% based on the weight of the particulate mineral colour developing material and which is effective in inhibiting premature colour development, said protective agent being characterized by being compatible with said microcapsules and by being substantially non-interfering with the

colour developing properties of the colour developing material, and,



- (iii) binder; and
- (b) applying said coating composition to a substrate.

4,165,399

# BINDERLESS INK FOR JET PRINTING

Raymond L. Germonprez, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 634,507, Nov. 24, 1975, abandoned.

This application Oct. 10, 1978, Ser. No. 950,079

Int. Cl.<sup>2</sup> C09D 11/00

U.S. Cl. 427—264

12 Claims

9. In a method for depositing indicia on a plastic resin coated metal substrate by a jet ink technique, the improvement which comprises providing a binder-free ink composition capable of bonding to the plastic coating by penetration of the ink into the sub-surface structure of said resin, contacting said plastic surface with said jet ink composition whereby penetration into the sub-surface structure of said plastic is effected and said ink remains embedded in the plastic resin coating upon evaporation of the ink solvents,

said binder-free ink composition consisting essentially of

- between about 25 and 75 weight percent of an organic solvent selected from the group consisting of aliphatic ketones ranging in molecular structure from 2-butanone to 2-octanone, aliphatic esters and mixtures thereof;
  - between about 8 and about 25 percent by weight of an aliphatic monohydric alcohol of no more than three carbon atoms, the upper limit of said percent alcohol present in the composition being so selected as to prevent phase separation of the surfactant component;
  - between about 8 and 17 percent by weight of an anionic surfactant,
  - between about 12 and 35 percent by weight of water,
  - between 0.5 and 5.0 percent by weight of a dye selected from the group consisting of basic dyes and neutral dyes, and
  - between zero and 10 percent by weight of an aliphatic hydrocarbon having 8 to 12 carbon atoms,
- said ink composition having a viscosity at 68° F. of less than 10 cps., a specific resistivity of less than 1500 ohm-cm. and a surface tension at 68° F. of between 22 and 35 dyne cm.

4,165,400

# SELF-EMULSIFYING ANAEROBIC COMPOSITION

JoAnn DeMarco, Southington, Conn., assignor to Loctite Corporation, Newington, Conn.

Division of Ser. No. 697,165, Jun. 17, 1976, Pat. No. 4,069,378.

This application Sep. 19, 1977, Ser. No. 834,593

Int. Cl.<sup>2</sup> B05D 3/00, 3/02

U.S. Cl. 427—295

5 Claims

1. A process for impregnating and sealing a porous article comprising the steps of:

- impregnating the article with a self-emulsifiable anaerobic-curing composition which comprises:

- An anaerobically-curing acrylate monomer;
  - A peroxy initiator in sufficient concentration to initiate cure of the monomer upon exclusion of oxygen; and
  - about 0.25 to about 10.0% by weight of the total composition of an anionic or nonionic surfactant which is dissolved in the composition and which renders the composition self-emulsifying upon mixing with water;
- washing the surface of the article with water; and
  - permitting the anaerobic sealant to cure.

4,165,401

# RECOVERY OF SUSPENDED PARTICULATE METAL FROM QUENCH WATER

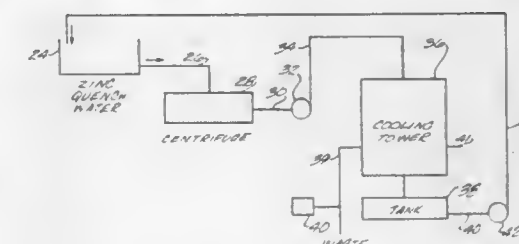
Zane L. Burke, Whittier, Calif., assignor to Davis Walker Corporation, Commerce, Calif.

Filed Aug. 29, 1977, Ser. No. 828,618

Int. Cl.<sup>2</sup> C23C 1/00

U.S. Cl. 427—398 B

19 Claims



1. In the method of treating articles in which the articles are passed through a bath of molten metal and then through a water quench bath for cooling and in which the water quench bath becomes contaminated with suspended, particulate metal carried over from the molten metal bath, the improvement which comprises removing suspended metal contaminant from quench water by centrifuging contaminated quench water.

4,165,402

# CHIP-REMOVING MACHINING METHOD AND APPARATUS FOR SEMICONDUCTING CRYSTALS, SPECIFICALLY SUITED FOR THE PRODUCTION OF FORCE AND PRESSURE MEASURING CELLS

Walter Dubs, Winterthur, and Georg Preiss, Wiesendangen, both of Switzerland, assignors to Kistler Instrumente AG, Switzerland

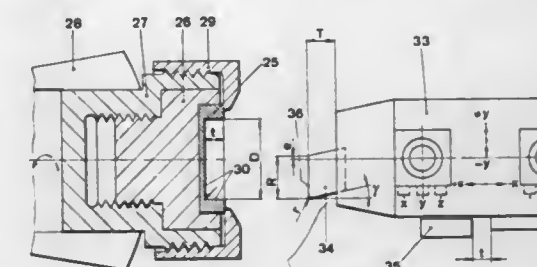
Filed May 17, 1976, Ser. No. 687,106

Claims priority, application Switzerland, May 16, 1975, 006481/75

Int. Cl.<sup>2</sup> B01J 17/00; B23B 1/00; H01L 21/461

U.S. Cl. 428—64

22 Claims



1. A method comprising the step of chip removing machining at least one surface portion of a semiconducting crystal member so as to provide a desired shape for the crystal member by utilizing a chip removing tool having a ground single crystal cutting element with a Mohs hardness greater than 9, providing the single crystal ground cutting element with a clearance angle  $\gamma$  of approximately 5°, a negative cutting angle  $\alpha$  of approximately 8° and an angle of incidence  $\beta$  of approxi-

mately 5°, the step of chip removing machining including shaping by rotating and contacting one of the semiconducting crystal member and the cutting element with respect to the other while feeding one of the semiconducting crystal member and the cutting element toward the other in only a single direction, penetrating the surface portion of the semiconducting crystal member, and forming at least one depression therein by chip removing machining.

18. A shaped semiconducting crystal member shaped by the method of claim 1.

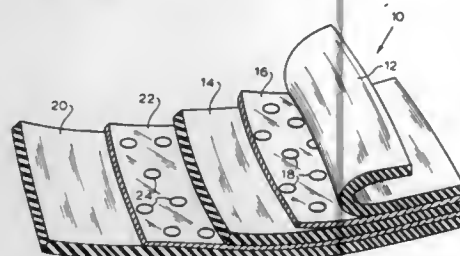
21. A machining tool for chip removal machining of at least one surface portion of a semiconducting crystal member, said machining tool being constructed as a shaping tool having a ground cutting member, said ground cutting member being a single crystal provided with a hardness greater than 9 Mohs and having a clearance angle  $\gamma$  of approximately 5°, a negative cutting angle  $\alpha$  of approximately 8° and an angle of incidence  $\beta$  of approximately 5°.

4,165,403

# ARTICLE EMPLOYING INTER-LEAVED ELASTIC LAYERS AND INELASTIC SHEETS

Clarence F. Alban, 197 Breezeway, Brighton, Mich. 48116  
Division of Ser. No. 360,771, May 16, 1973, Pat. No. 3,842,885.  
This application Aug. 1, 1974, Ser. No. 493,533  
Int. Cl.<sup>2</sup> B60C 11/00, 27/00, 5/00; B32B 3/10  
U.S. Cl. 428—140

16 Claims



1. An article of manufacture comprising:  
opposing elastic layers;

a sheet interposed between said layers, said sheet having a plurality of perforations therein and comprising a material having a relatively high modulus of elasticity with respect to said layers; and wherein  
the ratio of the thickness of said layers to the thickness of said sheet is given by

$$t_1/t_2 = \sqrt{E_2/E_1}$$

where:

$t_1$  = the composite thickness of said layers,  
 $t_2$  = the thickness of said sheet,  
 $E_1$  = modulus of elasticity for said layers,  
 $E_2$  = modulus of elasticity for said sheet.

4,165,404

# PROCESS FOR PRODUCING LAMINATES OF FABRIC AND FLUOROCARBON COPOLYMER

Henry E. Quehl, Norwalk, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 617,053, Sep. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 689,386, May 24, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,697

Int. Cl.<sup>2</sup> B32B 15/02, 27/06

U.S. Cl. 428—212

4 Claims

1. An improvement in a process for preparing a laminate comprising a fluorocarbon copolymer top sheet and a knitted glass fabric, the improvement comprising placing an interlayer between the knitted glass fabric and the top sheet, said interlayer consisting essentially of a sheet about 1-5 mils thick of a fluorocarbon copolymer having a specific melt viscosity from

5 to  $25 \times 10^4$  poises being sufficiently low to enable the copolymer to wet and penetrate the fabric at fabrication temperatures and lower than the specific melt viscosity of the fluorocarbon copolymer of the top sheet, said top sheet being about 5-100 mils thick and having a specific melt viscosity of  $30-60 \times 10^4$  poises, and then integrally bonding the laminate by means of heat and pressure; wherein the fluorocarbon copolymer of the interlayer is selected from the group consisting of a copolymer of tetrafluoroethylene/hexafluoropropylene consisting essentially of 93.25-73 percent by weight of tetrafluoroethylene and 6.75-27 percent by weight of hexafluoropropylene or a copolymer of tetrafluoroethylene/perfluoro(alkyl vinyl ether) having 2-3 carbon atoms in the alkyl group consisting essentially of 99-93 percent by weight of tetrafluoroethylene and 1-7 percent by weight of perfluoro(alkyl vinyl ether).

4. A laminate produced by the process of claim 1.

4,165,405

# FIBER LUBRICANTS BASED UPON FATTY ESTERS OF HETERIC POLYOXYALKYLATED ALCOHOLS

Robert B. Login, and David D. Newkirk, both of Woodhaven, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

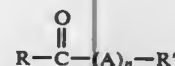
Continuation-in-part of Ser. No. 797,007, May 16, 1977, abandoned. This application Jun. 23, 1977, Ser. No. 809,159

Int. Cl.<sup>2</sup> B05D 1/28; C08K 5/10; D06M 3/38, 5/08

U.S. Cl. 428—395

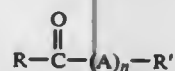
9 Claims

1. A lubricated thermoplastic, synthetic fiber comprising a polyester or nylon fiber having incorporated thereon a lubricating composition comprising a heteric polyoxyalkylene monoester capable of volatilizing at 200° C. having the formula:



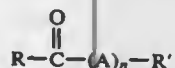
wherein R is an aliphatic radical having about 7 to about 22 carbon atoms; A is a mixture of oxyethylene and oxypropylene residues derived from the reaction of ethylene oxide and 1,2-propylene oxide in the respective ratio by weight of 3:7 to 4:1; n has a value to produce a molecular weight of from about 300 to about 3000 and R' is the residue of a monofunctional aryl alcohol or a monofunctional alkyl or arylalkyl alcohol having 1 to about 21 carbon atoms in the alkyl chain.

4. The process of lubricating thermoplastic, synthetic fibers comprising the application to said fibers of a heteric polyoxyalkylene monoester lubricant capable of volatilizing at 200° C. having the formula:



wherein R is an aliphatic radical having from 7 to 22 carbon atoms; A is a mixture of oxyethylene and oxypropylene residues derived from the reaction of ethylene oxide and 1,2-propylene oxide in the respective ratio by weight of 3:7 to 4:1; n has a value to produce a molecular weight of about 300 to about 3000 and R' is the residue of a monofunctional aryl alcohol or a mono-functional alkyl or arylalkyl alcohol having 1 to about 21 carbon atoms in the alkyl chain.

7. A synthetic fiber lubricating composition comprising a heteric polyoxyalkylene monoester condensation product capable of volatilizing at 200° C. having the formula:



wherein R is an aliphatic radical having about 7 to about 22 carbon atoms; A is a mixture of oxyethylene and oxypropylene residues derived from the reaction of ethylene oxide and 1,2-propylene oxide in the respective ratio by weight of 3:7 to 4:1; n has a value to produce a molecular weight of about 300 to about 3000 and R' is the residue of a monofunctional compound containing an OH group and having 1 to about 21 carbon atoms in the alkyl chain.

4,165,406

# POWDERY COATING COMPOSITION AND PROCESS FOR PREPARING THE SAME

Hideyoshi Tugukuni, Sakai, and Masafumi Kano, Nagaokakyo, both of Japan, assignors to Dai Nippon Toyo Co. Ltd., Osaka, Japan

Division of Ser. No. 683,508, May 5, 1976, Pat. No. 4,113,917, which is a division of Ser. No. 400,621, Sep. 25, 1973, Pat. No. 3,970,725. This application Jun. 23, 1978, Ser. No. 918,553

Claims priority, application Japan, Sep. 26, 1972, 47-96541; Oct. 28, 1972, 47-108306

Int. Cl.<sup>2</sup> B32B 23/08, 9/00

U.S. Cl. 428—407

5 Claims

1. A powdery coating composition comprising polymer particles having an average particle size within the range of 0.5 to 200 $\mu$  and composed of, as a core component, a polymer having a softening point not exceeding 90° C. and selected from the group consisting of epoxy resins and polyester resins, and, as an outer component, a polymer having a softening point of at least 100° C. and being selected from the group consisting of cellulosic plastics, wherein the weight ratio of the core component to the outer component is within the range from 50/50 to 100/1 and said outer component covers said core component.

4,165,407

# ADAMITE ROLL MATERIAL FOR A ROLLING MILL

Toru Endoh, Nishinomlya, and Masayuki Katoh, Amagasaki, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jun. 27, 1977, Ser. No. 810,472

Claims priority, application Japan, Jun. 25, 1976, 51/75906; Aug. 21, 1976, 51/99834

Int. Cl.<sup>2</sup> B32B 9/00

U.S. Cl. 428—408

6 Claims



1. Roll-mill roll material consisting of carbon in the range of from 1.4% to 3.0% by weight, silicon in the range of from 0.4% to 1.5% by weight, manganese in the range of from 0.4% to 2.0% by weight, nickel to an amount of 4.0% by weight or less, chromium to an amount of 0.8% by weight or less, molybdenum to an amount of 2.0% by weight or less, and one or more carbide forming elements selected from vanadium, niobium, titanium, zirconium, and tungsten to a total amount in the range of from 0.3% to 3.5% by weight, the remainder of said material being substantially iron, with the proviso that (1) the total amount of carbide forming elements is proportional to the combined total amount of carbon and chromium, and (2) the total amount of carbide forming elements increases with increasing combined total amounts of carbon and chromium.

4,165,408

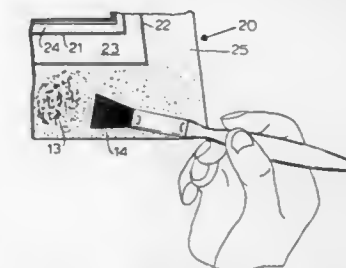
# CARDBOARD PICTURE MAT WITH COLORED SURFACE AREAS

Donald C. Pierce, 59 Reposa Vista, Novato, Calif. 94947  
Continuation of Ser. No. 760,356, Jan. 19, 1977, abandoned, which is a division of Ser. No. 588,965, Jun. 20, 1975, Pat. No. 4,025,666. This application Feb. 24, 1978, Ser. No. 881,028

Int. Cl.<sup>2</sup> B32B 9/06

U.S. Cl. 428—452

6 Claims



1. A picture mat for mounting pictures, including in combination:

a mat board of cardboard or paper having a dry surface free from adhesives and which accepts and retains finely divided powder, free from liquid medium, up to an amount which fills said surface, and  
a finely divided pigmented dry powder, different in color from said surface worked into a chosen area of said surface, filling and retained by said surface, said powder being free from liquid medium, residue of liquid medium, and adhesives,  
each particle of said dry powder filling said surface being in contact therewith and being non-smudgeable.

4,165,409

# METHOD OF FABRICATING WOOD COMPOSITE PANELS HAVING ENHANCED FIRE RETARDANCY

Jack Malne, Jefferson Apts., Saginaw, Mich. 48605

Filed Feb. 23, 1978, Ser. No. 880,378

Int. Cl.<sup>2</sup> B32B 31/12

U.S. Cl. 428—535

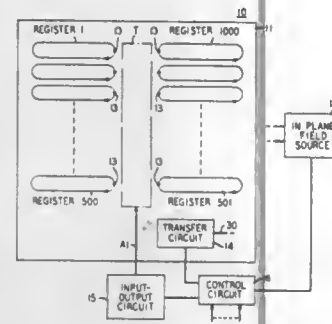
3 Claims

1. A method of enhancing the fire retardancy of fabricated wood panel systems which method consists of

(A) impregnating a first or outer wood member with an aqueous based fire retardant consisting of a mixture of polyethyleneimine and a mixture of monoammonium phosphate and diammonium phosphate;  
(B) impregnating the product of (A) with a material selected from the group consisting of  
(i) curable tertiary butylstyrene and  
(ii) mixtures of curable tertiary butylstyrene, a haloalkyl phosphate flame retardant different than the flame retardant in (A), a crosslinking agent for the tertiary butyl styrene and a catalyst for curing; and then curing said tertiary butylstyrene;  
(C) impregnating a second or core wood member with a fire retardant as in (A) and drying;  
(D) forming a composite structure from the product of (A) and (B) and the product of (C) by gluing the wood members together and,  
(E) attaching a third or balance wood member to the remaining core face opposite the first wood member, whereby a fire retardant composite fabricated wood panel is obtained.



4,165,410  
**MAGNETIC BUBBLE DEVICES WITH CONTROLLED TEMPERATURE CHARACTERISTICS**  
 Stuart L. Blank, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Jun. 3, 1977, Ser. No. 803,069  
 The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.  
 Int. Cl.<sup>2</sup> H01F 1/37; G11B 5/68; G11C 11/02  
 U.S. Cl. 428—539 3 Claims



1. A magnetic bubble device comprising (a) a substrate supporting at least a first layer of an iron containing garnet possessing an uniaxial magnetic anisotropy perpendicular to the layer, which layer is capable of supporting magnetic bubbles which are stable and of a characteristic diameter in a temperature varying bias field over a temperature range, which anisotropy is predominantly a growth induced anisotropy produced by dodecahedral site substitution, which bias field is produced by a magnet adapted for maintaining the layer in the bias field throughout the temperature range, which bias field is less than a bubble collapse field at each temperature within the temperature range and which bias field varies throughout the temperature range at an average variation rate (b) generating means for generating the bubbles; and (c) propagating means for moving the bubbles in order to produce information processing CHARACTERIZED IN THAT the iron garnet is of a composition represented by the atomic formula:  $R_3-(Ca,Sr)_2Ge_2Fe_3-O_{12}$ , where R is at least one member of the group consisting of yttrium and the rare earth elements, numbers 57 through 71 of the periodic table of the elements, which said iron garnet is epitaxially deposited from a solution of constituent oxides in a flux, which said flux consists essentially of  $PbO$  and  $B_2O_3$  in a weight ratio selected from the range extending from ten to infinity; wherein the weight ratio is selected to produce the first layer of a garnet whose bubble collapse field varies with temperature throughout the temperature range, at approximately the said variation rate.

4,165,411  
**FLAME RETARDANT URETHANE AND METHOD**  
 Nelson S. Marans; Clifton L. Kehr, both of Silver Spring, and Robert M. Murch, Ashton, all of Md., assignors to W. R. Grace & Co., New York, N.Y.  
 Continuation-in-part of Ser. No. 588,092, Jun. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 404,824, Oct. 9, 1973, abandoned. This application Sep. 20, 1977, Ser. No. 834,927  
 Int. Cl.<sup>2</sup> C08K 5/52, 5/53, 5/51  
 U.S. Cl. 521—107 27 Claims

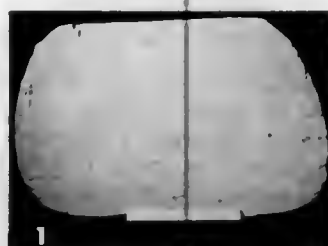
1. A flame retardant hydrophilic polyurethane foam comprising the reaction product of (a) a hydrophilic, NCO terminated, polyoxyalkylene urethane prepolymer wherein at least 40 mole percent of the oxyalkylene units in the prepolymer are oxyethylene units; and (b) water; wherein sufficient amounts of (b) are added to provide an  $H_2O$  Index Value of from about 1,300 to about 78,000 and said reaction product containing from about 45 to about 70 weight percent alumina hydrate and from about 2 to about 20 weight percent of a phosphorous

containing fire retardant material, said weight percent being based on the total dry weight of the foam.

4,165,412  
**DELAYED ACTION CATALYSTS FOR POLYURETHANES**  
 Ibrahim S. Bechara, Boothwyn, and Dewey G. Holland, Chadds Ford, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.  
 Division of Ser. No. 758,722, Jan. 12, 1977, abandoned, which is a division of Ser. No. 497,138, Aug. 15, 1974, abandoned, which is a division of Ser. No. 292,344, Sep. 26, 1972, Pat. No. 3,862,150. This application Aug. 28, 1978, Ser. No. 937,249  
 Int. Cl.<sup>2</sup> C08G 18/18, 18/20, 18/14  
 U.S. Cl. 521—121 2 Claims

1. A method for producing a polyurethane product which comprises polymerizing an organic polyisocyanate containing a plurality of isocyanato groups per molecule and an organic polyol containing a plurality of hydroxyl groups per molecule at a temperature in the range of about 70° C. to 200° C. in the presence of a delayed action catalyst comprising a tertiary amine salt of a carboxylic acid substituted in the alpha position selected from the group consisting of cyanoacetic acid, nitroacetic acid, acetone dicarboxylic acid, sulfonyl diacetic acid, thionyl diacetic acid, acetoacetic acid, and benzoylacetic acid, and said salt irreversibly decomposing to catalytically active tertiary amine selected from the group consisting of tetramethyl butane diamine, trimethyl aminoethyl piperazine, tetramethyl guanidine, azabicyclo heptanes, azabicyclooctanes, N-allyl piperidine, 2,2'-oxybis-(morpholino ethyl ether), amidines, N-alkyl imidazoles, and silyl morpholines with decomposition of the acid component at a temperature in the range of about 70° C. to 200° C.

4,165,413  
**PROCESS FOR PRODUCING PHENOLIC FOAMS WITH A UNIFORM APPEARANCE**  
 Robert H. Sefton, McMurray, and John D. Carlson, Bradford Woods, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.  
 Continuation-in-part of Ser. No. 886,895, Mar. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 825,772, Aug. 18, 1977. This application Sep. 20, 1978, Ser. No. 944,038  
 Int. Cl.<sup>2</sup> C08J 9/14  
 U.S. Cl. 521—128 4 Claims



1. A process for preparing phenolic foam comprising:  
 (a) preparing a foamable mixture comprising a foamable phenol-aldehyde resin, a blowing agent, and N-methyl-2-pyrrolidone;  
 (b) foaming the mixture by adding an acid catalyst; and  
 (c) curing the phenolic foam.

4,165,414  
**URETHANE-MODIFIED ISOCYANURATE FOAMS HAVING IMPROVED INSULATING AND FLAME RETARDANT PROPERTIES**  
 Thirumurti Narayan, Riverview; John T. Patton, Jr., Wyandotte; Moses Cenker, Trenton, all of Mich., and Harald P. Wulff, Baton Rouge, La., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.  
 Filed Jan. 23, 1978, Ser. No. 871,439  
 Int. Cl.<sup>2</sup> C08G 18/14, 18/20, 18/24, 18/16  
 U.S. Cl. 521—129 5 Claims

1. A urethane-modified isocyanurate foam prepared by catalytically condensing in the presence of a blowing agent and employing an NCO/OH ratio of from 3:1 to 100:1, (a) a polyol with an organic polyisocyanate in the presence of from 15 to 80 parts per 100 parts of organic polyisocyanate of 2,2,2-trichloroethanol or (b) a polyol with a modified polyisocyanate having a free isocyanate content of from 5 to 30 weight percent obtained by the reaction of an organic polyisocyanate with from 15 to 80 parts per 100 parts of organic polyisocyanate of said 2,2,2-trichloroethanol.

4,165,415  
**METHOD FOR PREPARATION OF A FOAM OF CHLORINATED VINYL CHLORIDE POLYMER EMPLOYING A LOWER ALIPHATIC ALCOHOL FOAMING AGENT**

Terufumi Adachi, and Michifumi Tanga, both of Shinnan'yo, Japan, assignors to Tokuyama Sekishi Kogyo Kabushiki Kaisha, Osaka, Japan

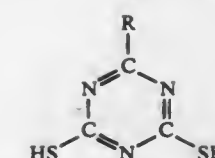
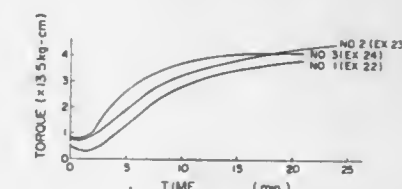
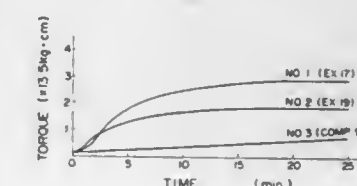
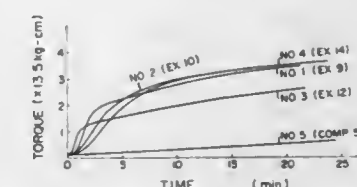
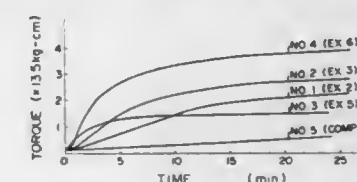
Filed Oct. 28, 1976, Ser. No. 736,595  
 Claims priority, application Japan, Nov. 5, 1975, 50-133401  
 Int. Cl.<sup>2</sup> C08J 9/00

U.S. Cl. 521—145 8 Claims  
 1. A method for preparing a foam of a chlorinated polymer of vinyl chloride which comprises mixing a chlorinated polymer of vinyl chloride with from 1 to 5 parts by weight per 100 parts by weight of the chlorinated polymer of a foaming agent consisting essentially of a lower aliphatic monohydric alcohol having 1 to 5 carbon atoms, said chlorinated polymer having an average degree of polymerization of from 100 to 2000 and a chlorine content of from 60 to 70% by weight; and heating the mixture of chlorinated polymer and alcohol to a temperature and for a time sufficient to cause it to foam.

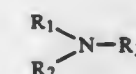
4,165,416  
**CURED OR UNCURED CHLORINATED POLYETHYLENE COMPOSITION AND PROCESS FOR CURING UNCURED CHLORINATED POLYETHYLENE**  
 Yasuo Matoba, Suita; Akira Hashimoto, Itami, and Mikio Sugahara, Kawanishi, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan  
 Filed Mar. 25, 1977, Ser. No. 781,300  
 Claims priority, application Japan, Aug. 2, 1976, 51/92638; Aug. 24, 1976, 51/101377; Aug. 24, 1976, 51/101378; Jan. 24, 1977, 52/6962  
 Int. Cl.<sup>2</sup> C08K 5/37; C08J 3/24  
 U.S. Cl. 525—346 5 Claims

1. A curable chlorinated polyethylene composition free from hexamethylphosphoric triamide complex consisting essentially of:

(A) chlorinated polyethylene having a chlorine content of about 20 to 50%, said polyethylene having a molecular weight of about 20,000 to 500,000;  
 (B) a mercaptotriazine cross-linking agent of the formula



wherein R is a member selected from the group consisting of a mercapto group, alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms, dialkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms, cycloalkylamino groups with the cycloalkyl moiety containing 6 to 8 carbon atoms, dicycloalkylamino groups with the alkyl moiety containing 6 to 8 carbon atoms, arylamino groups, N-aryl-N-alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms and alkoxy groups containing 1 to 8 carbon atoms;  
 (C) a cross-linking accelerator selected from the group consisting of secondary and tertiary amines of the formula



wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each a member selected from the group consisting of hydrogen atoms, C<sub>1</sub>-C<sub>12</sub> alkyl groups, C<sub>3</sub>-C<sub>12</sub> cycloalkyl groups and C<sub>7</sub>-C<sub>12</sub> aralkyl groups, at least two of which R<sub>1</sub>-R<sub>3</sub> are members other than hydrogen, which R<sub>1</sub> and R<sub>2</sub>, or R<sub>1</sub> and R<sub>2</sub>, and R<sub>2</sub> and R<sub>3</sub> may taken together form a C<sub>4</sub>-C<sub>6</sub> hydrocarbon ring, which hydrocarbon ring may also contain a hetero atom and form a heterocyclic ring; as well as the carboxylates, mercaptotriazole salts, dithiocarbamates and dithio-

phosphates of said secondary and tertiary amines and the benzothiazylsulfenamides of said secondary amines;  
(D) an acid acceptor of metal compounds; and  
(E) an additive selected from the group consisting of a plasticizer and a reinforcing agent, the amount of said additive being about 0.1 to about 100 parts by weight per 100 parts by weight of the chlorinated polyethylene.

4,165,417

### 3-(TERT-ALKYLTHIO)-1,3-THIAZOLIDIN-2,4-DIONE USED TO INHIBIT PREMATURE VULCANIZATION OF DIENE RUBBERS

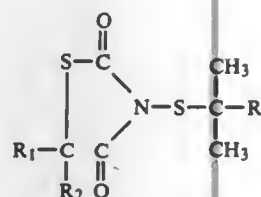
Mark D. Wolfinger, Chicago, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 23, 1977, Ser. No. 854,092  
Int. Cl.<sup>2</sup> C08C 1/00, 4/00; C07D 277/04

U.S. Cl. 525—3

6 Claims

1. A method of inhibiting premature vulcanization of sulfur vulcanizable diene rubber containing sulfur vulcanizing agent and an organic vulcanization accelerating agent which comprises incorporating therein, in an amount effective to inhibit premature vulcanization, a compound of the formula



in which R is alkyl of 1-9 carbon atoms, and R<sub>1</sub> and R<sub>2</sub> independently are hydrogen, alkyl of 1-8 carbon atoms or phenyl.

4,165,418

### PAINT MANUFACTURE

Derek N. A. Speakman, Ruislip, England, assignor to Imperial Chemical Industries Limited, London, England  
Division of Ser. No. 580,348, May 23, 1975, Pat. No. 4,059,547, which is a division of Ser. No. 242,803, Apr. 10, 1972, abandoned. This application Feb. 8, 1977, Ser. No. 766,594  
Claims priority, application United Kingdom, Apr. 15, 1971, 9494/71

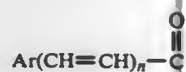
Int. Cl.<sup>2</sup> C08F 8/08, 8/30, 8/00

U.S. Cl. 525—377

9 Claims

1. A pigment dispersant suitable for use in making a series of paints, the dispersant being a copolymer comprising units derived from the following ethylenically unsaturated monomers in the stated proportions by weight based on the total weight of the copolymer;

- (a) 0-50% of a hydroxy group containing monomer, and/or
- (b) 0-20% of an amide group containing monomer, provided that there is always present at least 5% of (a) or (b);
- 20-80% of a monomer free from carboxyl groups and containing a straight or branched chain alkyl group of from 7 to 22 carbon atoms, and
- (d) a component containing one or more monomers free from the groups mentioned in (a), (b), or (c), said component including as an essential constituent up to 20% based on the total weight of the copolymer of a comonomer containing an epoxide group, said epoxide group having been reacted with a compound bearing a carboxyl group and a pigment dispersant group and having the formula



OH where AR is an aromatic group and n is 1 or 0, the total amount of said component (d) being up to 50% and the total of monomers being 100%.

4,165,419

### METAL SURFACES COATED WITH ALIPHATIC ACIDS CONTAINING 12 CARBON ATOMS OR MORE TO ELIMINATE POLYMER BUILD-UP ON REACTOR WALLS DURING THE POLYMERIZATION OF WATER-SOLUBLE CATIONIC POLYMERS

Naoyuki Suzuki; Yoji Wada; Akihisa Furuno; Iwao Ohshima, and Yukio Shibuya, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd.; Mitsubishi Rayon Co., Ltd. and Diafloc Co., Ltd., all of Tokyo, Japan  
Filed Jun. 5, 1978, Ser. No. 912,804

Claims priority, application Japan, Jun. 3, 1977, 52-65383  
Int. Cl.<sup>2</sup> C08F 2/00, 18/00

U.S. Cl. 526—62

12 Claims

1. In a method for producing a water-soluble cationic polymer by polymerizing, in the presence of water, a high concentration of (a) at least one vinyl monomer represented by the following general formula (I)



wherein R<sub>1</sub> is —H or —CH<sub>3</sub>; R<sub>2</sub> is —CH<sub>2</sub>CH<sub>2</sub>— or —CH<sub>2</sub>C—H(OH)CH<sub>2</sub>—; R<sub>3</sub> and R<sub>4</sub>, which may be the same or different, each is —CH<sub>3</sub> or —CH<sub>2</sub>CH<sub>3</sub>; R<sub>5</sub> is —C<sub>n</sub>H<sub>2n+1</sub> where n is 0 or an integer of 1 to 4, —CH<sub>2</sub>C<sub>6</sub>H<sub>5</sub>, or —CH<sub>2</sub>COOH; and X is Cl<sup>-</sup>, Br<sup>-</sup>,  $\frac{1}{2}\text{SO}_4^{2-}$  or CH<sub>3</sub>SO<sub>4</sub><sup>-</sup>,

or (b) a mixture of (i) at least one vinyl monomer represented by the general formula (I) and (ii) at least one other vinyl monomer copolymerizable therewith, wherein said vinyl monomer represented by the general formula (I) is present in said mixture in a predominant amount, and obtaining a polymer in a lump form, the improvement comprising performing the polymerization in a polymerization zone defined by a metal surface or surfaces, in which the metal surface(s) contacted during the polymerization have been coated with a layer of at least one of a higher aliphatic acid having 12 or more carbon atoms, an ammonium salt of a higher aliphatic acid having 12 or more carbon atoms and/or an alkali metal salt of a higher aliphatic acid having 12 or more carbon atoms.

4,165,420

### SOLID STATE POLYMERIZATION OF POLYESTER PREPOLYMER

Verne R. Rinehart, Bath, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 850,119, Nov. 10, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,161  
Int. Cl.<sup>2</sup> C08G 63/26

U.S. Cl. 526—63

8 Claims

1. In a solid state process for polymerizing low molecular weight particulate polyester prepolymer to high molecular weight polyester resin the improvement which comprises the use in said process of dry, crystalline polyester prepolymer having an intrinsic viscosity ranging from about 0.1 to about 0.35 and essentially in the form of discrete spherical beads ranging in size from about 100 to about 250 microns in diameter.

4,165,421

### HYDROXY TERMINATED POLYBUTADIENE BASED POLYURETHANE BOUND PROPELLANT GRAINS

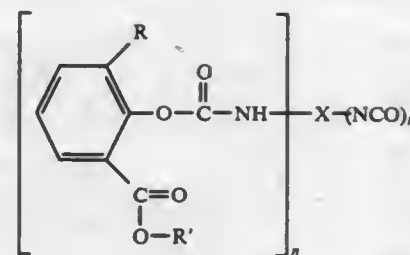
William H. Graham, and Inella G. Shepard, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.  
Division of Ser. No. 741,591, Nov. 15, 1976, Pat. No. 4,098,626.

This application Sep. 26, 1977, Ser. No. 836,925  
Int. Cl.<sup>2</sup> C08G 18/32, 18/62; C08G 18/69

U.S. Cl. 528—75

8 Claims

1. A curable composition comprising a hydroxy terminated polybutadiene and a compound of the formula:



wherein X is an n+m valent organic radical; R is hydrogen, or lower alkyl of from 1 to about 10 carbon atoms; R' is lower alkyl of from 1 to about 10 carbon atoms, or carbocyclic aryl of from 6 to about 10 carbon atoms; n is on the average at least 1; m is 1; and n+m must be at least 2.

4,165,422

### ACYL CAPPED QUINONE-COUPLED POLYPHENYLENE OXIDES

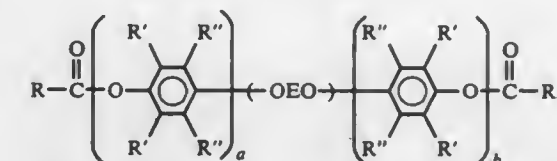
Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 26, 1977, Ser. No. 800,644  
Int. Cl.<sup>2</sup> C08G 65/44, 65/48

U.S. Cl. 525—397

12 Claims

1. An acyl capped quinone-coupled polyphenylene oxide of the formula:



wherein independently each —(OEO)— is a divalent quinone residue, E is a divalent arene radical, either a or b is at least equal to 1, R' is hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least 2 carbon atoms between the halogen atoms and phenol nucleus, a hydrocarbonoxy radical, or a halohydrocarbonoxy radical having at least two carbon atoms between the halogen atoms and phenol nucleus, R'' being the same as R' and, in addition, halogen, and R is an alkyl, cycloalkyl or aryl radical.

4,165,423

### POLY-(CARBONATE-URETHANE)-TRIOLS AND PREPARATION THEREOF

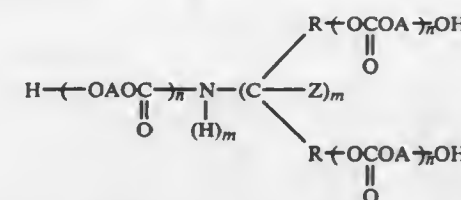
Claude G. Passagne, Champigny sur Marne; Jean-Pierre G. Senet, Melun; Remy R. Lippler, and Jacques Plazanet, both of Bergerac, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Nov. 30, 1977, Ser. No. 855,963  
Claims priority, application France, Dec. 23, 1976, 76 38823  
Int. Cl.<sup>2</sup> C08G 18/00

U.S. Cl. 528—370

5 Claims

1. A poly-(carbonate-urethane)-triol of the formula:



wherein A is an alkylene or cycloalkylene group, R is an alkylene group having up to 4 carbon atoms, Z is an alkyl group having up to 4 carbon atoms, n is a number representing

the degree of polymerisation, and m is an integer selected from 0 and 1, said poly-(carbonate-urethane)-triol having a molecular weight of less than 5000 and being liquid.

4,165,424

### BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768.

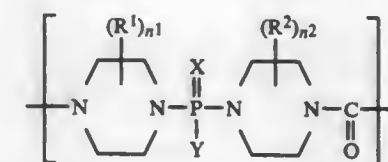
This application Jun. 15, 1978, Ser. No. 917,031  
Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.<sup>2</sup> C08G 69/42

U.S. Cl. 528—370

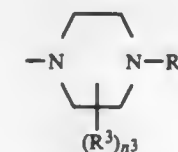
13 Claims

1. A solid polymer consisting essentially of repeating units of the formula



wherein

- (i) X is absent or represents oxygen or sulphur or —N—R;
- (ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group, or —OR or —NR<sub>2</sub>, or —NR<sub>2</sub> in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula



- wherein R, R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;
- (iii) R<sup>4</sup> represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group; and
- (iv) n<sup>1</sup>, n<sup>2</sup>, and n<sup>3</sup> each represent zero or an integer.

4,165,425

### ALKYL TIN OXIDE CURED POLYSULFIDE RUBBERS IN HOT MELT APPLICATIONS

Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Jun. 8, 1978, Ser. No. 913,626  
Int. Cl.<sup>2</sup> C08G 75/04

U.S. Cl. 528—374

6 Claims

1. A process for the preparation of a formed article of manufacture comprising a cured rubber based on a thiol terminated liquid polysulfide polymer cured with a dialkyl tin oxide which comprises:

- a. extruding said cured rubber through a die under heat and pressure; and
- b. allowing the extruded rubber of step (a) to cool and solidify.



4,165,426

ZINC OXIDE CURED POLYSULFIDE POLYMERS  
CONTAINING LEVULINIC ACID SUITABLE FOR HOT  
MELT APPLICATION

Henry N. Paul, III, Philadelphia, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Jun. 8, 1978, Ser. No. 913,627

Int. Cl.<sup>2</sup> C08G 75/04

U.S. Cl. 528—374

7 Claims

1. A cured rubbery composition based on a thiol terminated liquid polysulfide polymer which comprises the reaction product of a thiol terminated liquid polysulfide polymer, zinc oxide, and levulinic acid said zinc oxide being present at from about 1 part by weight to about 50 parts by weight per one hundred parts by weight of polysulfide polymer and said levulinic acid being present at about 0.5 parts by weight to about 5 parts by weight per one hundred parts by weight of polysulfide polymer.

4,165,427

## 1-METHYL-9β-D-RIBOFURANOSYL-ISOGUANINE

Richard P. Gregson, Narrabeena, and Ronald J. Quinn, Cromer, both of Australia, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 1, 1978, Ser. No. 930,100

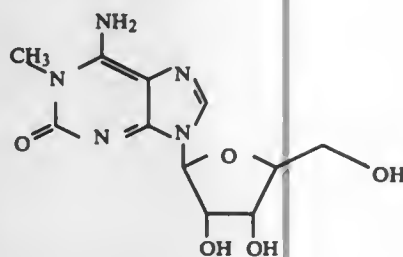
Claims priority, application Luxembourg, Apr. 3, 1977, 77910

Int. Cl.<sup>2</sup> C07H 17/00

U.S. Cl. 536—24

2 Claims

1. A compound of the formula



and the tautomeric forms thereof.

4,165,428

## INDOLEACETIC ACID ESTER DERIVATIVES

Kanji Noda, Chikushino; Akira Nakagawa; Satoru Miyata, both of Tosu; Yoichi Nakashima, Tachiarai, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Saga, Japan

Filed Jun. 7, 1977, Ser. No. 804,280

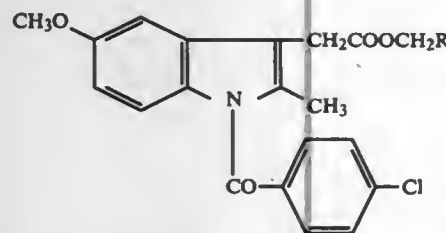
Claims priority, application Japan, Jun. 22, 1976, 51-74104

Int. Cl.<sup>2</sup> C07D 209/28, 213/79

U.S. Cl. 546—273

1 Claim

1. A compound of the following formula:



wherein R is pyridyl or phenyl substituted with one or two substituents at any position, said substituents being selected from the group consisting of fluorine, methyl and trifluoromethyl.

4,165,429

7α-METHOXY-CEPHALOSPORANIC ACID  
DERIVATIVES

Masaru Iwanami, Yokohama; Masuo Murakami, Tokyo; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo; Tetsuya Maeda, Urawa; Noriaki Nagano, Ages, and Atsuki Yamazaki, Ichikawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1977, Ser. No. 806,932

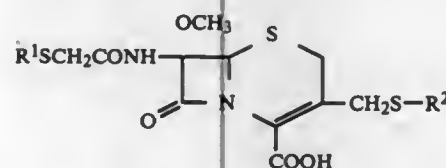
Claims priority, application Japan, Jun. 28, 1976, 51-76209; Jul. 7, 1976, 51-80659; Oct. 8, 1976, 51-121143; Oct. 15, 1976, 51-123601; Dec. 27, 1976, 51-159908; Mar. 11, 1977, 52-26835

Int. Cl.<sup>2</sup> C07D 501/56; A61K 31/545

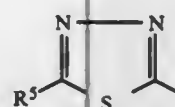
U.S. Cl. 544—21

3 Claims

1. The 7α-methoxy-7β-heterocyclic thioacetamido-3-heterocyclic thiomethyl-Δ<sup>3</sup>-cephem-4-carboxylic acid represented by the formula

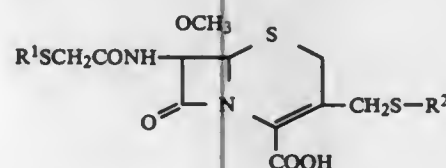


and the pharmaceutically acceptable salts thereof wherein R¹ is

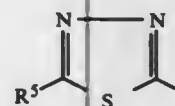


wherein R⁵ represents a hydroxy group, an amino group, a mercapto group, a lower alkylamino group having 1 to 4 carbon atoms, a lower alkanoylamino group having 1 to 4 carbon atoms, a lower alkoxyalkylamino group having 1 to 4 carbon atoms in the alkoxy moiety, a carboxy lower alkylthio group having 1 to 4 carbon atoms in the alkyl moiety, or a 3-lower alkylureido group having 1 to 4 carbon atoms in the alkyl moiety; and R² is a 5-lower alkyl-1,3,4-thiadiazol-2-yl group.

2. The 7α-methoxy-7β-heterocyclic thioacetamido-3-heterocyclic thiomethyl-Δ<sup>3</sup>-cephem-4-carboxylic acid represented by the formula



and the pharmaceutically acceptable salts thereof wherein R¹ is



wherein R⁵ represents a hydroxy group, an amino group, a mercapto group, a lower alkylamino group having 1 to 4 carbon atoms, a lower alkanoylamino group having 1 to 4 carbon atoms, a lower alkoxyalkylamino group having 1 to 4 carbon atoms in the alkoxy moiety, a carboxy lower alkylthio group having 1 to 4 carbon atoms in the alkyl moiety, or a 3-lower alkylureido group having 1 to 4 carbon atoms in the alkyl moiety; and R² is a 1-lower alkyl-tetrazol-5-yl group.

4,165,430

CEPHALOSPORINS HAVING A 7-CARBOXY  
SUBSTITUTED α-ETHERIFIED  
OXIMINOARYLACETAMIDO GROUP

Janice Bradshaw, Harrow; Martin C. Cook, Liverpool, and Gordon I. Gregory, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

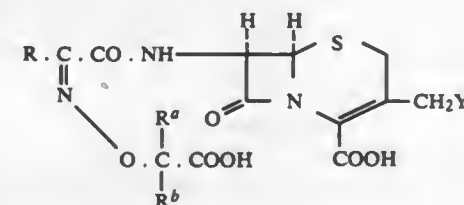
Continuation-in-part of Ser. No. 668,529, Mar. 19, 1976, Pat. No. 4,103,084, which is a continuation of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Jun. 15, 1976, Ser. No. 696,276

Int. Cl.<sup>2</sup> C07D 501/46; A61K 31/545

U.S. Cl. 544—22

15 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula:



wherein

R is thienyl or furyl;

Rᵃ is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

Rᵇ is hydrogen, carboxy, C₂-C₅ alkoxyalkyl, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

or Rᵃ and Rᵇ together with the carbon atom to which they are attached form a C₃-7 cycloalkylidene group;

Y is the residue of a nitrogen nucleophile which is a tri(C₁-6 alkyl) amine, or a heterocyclic tertiary amine which is a pyridine, pyrimidine, pyridazine, pyrazine, pyrazole, imidazole, triazole, thiazole, benzotriazole or purine, which may be substituted by a C₁-6 alkyl, phenyl, naphthyl, phenyl C₁-6 alkyl, (C₁-6 alkoxy) methyl, (C₂-7 alkoxyalkoxy)methyl, formyl, C₂-7 alkanoyl, C₂-7 alkanoyloxy, carboxy, C₂-7 alkoxyalkyl, carboxy (C₁-6 alkyl), sulfo, C₁-6 alkoxy, phenoxy, phenyl C₁-6 alkoxy, C₁-6 alkylthio, phenylthio, phenyl C₁-6 alkylthio, cyano, hydroxy, carbamoyl, N-(C₁-6 alkyl) carbamoyl, N,N-di(C₁-6 alkyl) carbamoyl, N-(hydroxy C₁-6 alkyl) carbamoyl or carbamoyl C₁-6 alkyl group; or azido, and a physiologically acceptable salt, ester or a 1-oxide thereof.

4,165,431

CHLORINATION OF POLYOLEFINS IN THE  
PRESENCE OF COMPLEX FORMERS

Franz Alfes, Krefeld; Dietz Heine, Leverkusen; Reinhard Kaiser, Cologne; Günter Kolb, Leverkusen; Joachim Probst, Cologne; and Franz Weider, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,675

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709689

Int. Cl.<sup>2</sup> C08F 8/20, 8/22

U.S. Cl. 525—357

7 Claims

1. A process for chlorinating a polyolefin which comprises chlorinating the polyolefin with chlorine in solution or suspension or first in one and then in the other in the presence of (1) an iron, titanium or antimony chlorine transfer agent, (2) a chlorination catalyst and (3) from 0.2 to 0.5% by weight, based on the polyolefin, of at least one compound of the formula H₂N—R—NH₂ wherein R is ethylene, propylene or butylene and n is from 1 to 6, at a temperature of from 40° to 60° C. up to a chlorine content of from 60 to 70% by weight.

4,165,432

## PEROXY DI-ESTER POLYOLS

Frank J. Preston, Meriden; Theodore C. Kraus, Cheshire, and Kiran B. Chandalia, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

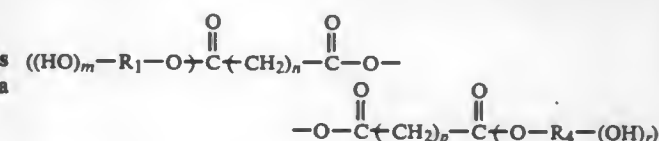
Filed Oct. 18, 1977, Ser. No. 843,103

Int. Cl.<sup>2</sup> C07C 69/34, 69/42

U.S. Cl. 536—4

3 Claims

1. A peroxy bis-ester polyol characterized by the formula:



wherein:

m and r are the same and represent the integer 2;

n and p are the same and represent an integer from 2 to 4;

and

((HO)-R₁-O- and -O-R₄-(OH)ₚ) are the same and represent residues of polyether polyols, R₁(OH)ₘ₊₁ and R₄(OH)ₚ₊₁, wherein R₁ and R₄ represent polyether chains having an average equivalent weight of from about 700 to 3000, after removal of one hydroxy hydrogen therefrom.

4,165,433

METHOD FOR CONVERTING DEXTRO TO LEVO  
ROTATORY CHITIN

Paul R. Austin, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Division of Ser. No. 728,257, Sep. 30, 1976, Pat. No. 4,059,457, which is a continuation-in-part of Ser. No. 659,280, Feb. 19, 1976, Pat. No. 4,062,921. This application Sep. 20, 1977, Ser. No. 834,938

Int. Cl.<sup>2</sup> C09J 3/04

U.S. Cl. 536—20

1 Claim

1. A method of converting dextro rotatory chitin to levo rotatory chitin by dissolving chitin in dimethylacetamide or N-methylpyrrolidone or mixtures of these amides, in conjunction with about 2% of lithium chloride.

4,165,434

LASER DYES COMPRISING FLUORESCENT AND  
LASER DYESTUFF RESIDUES

Fritz P. Schäfer, and Wolfgang Lüttke, both of Göttingen-Nikolausberg, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,337

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1976, 2655177

Int. Cl.<sup>2</sup> C07C 15/00; C07D 251/30, 251/54, 311/82

U.S. Cl. 544—197

9 Claims

1. Dyestuff comprising at least one laser dyestuff radical and at least one fluorescent dyestuff radical the fluorescent range of said fluorescent dyestuff radical overlapping the absorption range of the laser dyestuff radical and being linked with the laser dyestuff radical directly or via a bridge member having a length of at most 20 Å in such a manner that the π-electron systems of the individual laser dyestuff radical of fluorescent dyestuff radical are decoupled.

4,165,435

## FIRE RETARDANT S-TRIAZINE DERIVATIVES

Armin Hiestand, Binningen, and Peter Rohringer, Schönenbuch, both of Switzerland, assignors to Ciba-Gelgy Corporation, Ardsley, N.Y.

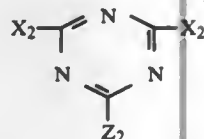
Filed Jun. 20, 1977, Ser. No. 808,009

Claims priority, application Switzerland, Jun. 25, 1976, 8156/76

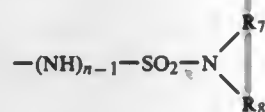
Int. Cl.<sup>2</sup> C07D 251/38, 251/52, 251/66

U.S. Cl. 544-197

1. s-Triazine of the formula



wherein X<sub>2</sub> is a radical of the formula



wherein n is 1 or 2, and R<sub>7</sub> and R<sub>8</sub> each are phenyl, benzyl, alkyl with 1 to 4 carbon atoms, or hydrogen, and Z<sub>2</sub> has the meanings given for X<sub>2</sub>, or is diethylamino or dimethylamino, and, if n in formula (3.1) is 2, Z<sub>2</sub> also is ethoxy, methoxy, phenoxy or benzyloxy.

4,165,436

## TRANS-2,3-DIDEHYDRO-9-DEOXY-9-METHYLENE-PGF COMPOUNDS

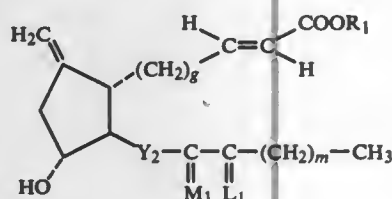
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 5, 1978, Ser. No. 893,771

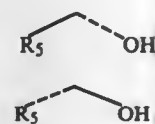
Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 560-121

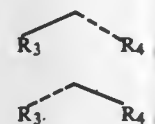
1. A prostaglandin analog of the formula



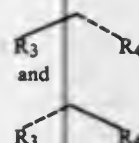
wherein m is one to 5, inclusive; wherein Y<sub>2</sub> is trans-CH=CH-, -CH<sub>2</sub>CH<sub>2</sub>-, or cis-CH=CH-; wherein M<sub>1</sub> is



wherein R<sub>5</sub> is hydrogen or methyl; wherein L<sub>1</sub> is



or a mixture of



2 Claims wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro; wherein g is 4, 5, or 6; wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,165,437

Δ<sup>3</sup>-PROSTAGLANDIN ANALOGS

Masaki Hayashi; Seiji Kori, both of Takatsuki; Yoshinobu Arai, Toyonaka; Takanori Okada, Osaka, and Yoshitaka Konishi, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Company, Ltd., Osaka, Japan

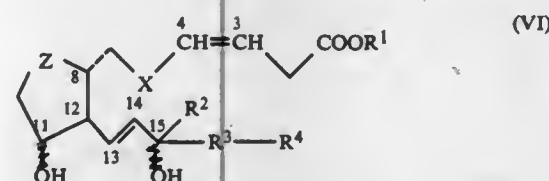
Division of Ser. No. 774,828, Mar. 7, 1977. This application Aug. 17, 1978, Ser. No. 934,444

Claims priority, application United Kingdom, Mar. 12, 1976, 10118/76; Aug. 9, 1976, 33154/76

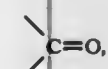
Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 560-121

1. Prostaglandin analogues of the general formula:



wherein X represents ethylene, Z represents



R<sup>1</sup> represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R<sup>2</sup> represents a hydrogen atom or a methyl group, R<sup>3</sup> and R<sup>4</sup> together represent a straight- or branched-chain alkyl group containing from 1 to 10 carbon atoms, and the double bond between C<sub>3</sub>-C<sub>4</sub> is trans or cis, or trans and cis, and the double bond between C<sub>13</sub>-C<sub>14</sub> is trans and cyclodextrin clathrates of such acids and esters, and when R<sup>1</sup> represents a hydrogen atom, non-toxic salts thereof.

4,165,438

## SYNTHESIS OF ACRYLIC ACIDS AND ESTERS

Ronald A. Schneider, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 356,887, May 3, 1973. This application Oct. 20, 1976, Ser. No. 734,065

Int. Cl.<sup>2</sup> C07C 69/54

U.S. Cl. 560-211

5 Claims

1. A process for producing acrylic acid and esters which comprises passing into a reaction zone the reactants formaldehyde and a lower alkanolic acid or lower alkyl ester thereof and therein reacting said reactants in the vapor phase at a tempera-

ture of about 300° C. to 500° C. in the presence of a catalyst consisting essentially of vanadium orthophosphate having an intrinsic surface area of from about 10 to about 50 m<sup>2</sup>/g and a P/V atomic ratio of 1:1 to 1.5:1.

4,165,439

## PROCESS FOR THE SELECTIVE ORTHO-ALKYLATION OF A PHENOL IN THE PRESENCE OF A COPPER-CHROMIUM CATALYST

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 676,503, Apr. 13, 1976, abandoned.

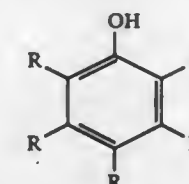
This application Nov. 21, 1977, Ser. No. 853,315

Int. Cl.<sup>2</sup> C07C 37/12, 39/06

U.S. Cl. 568-804

8 Claims

1. A process for the selective ortho-alkylation of a phenolic compound of the general formula:



wherein each R is a monovalent substituent selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms, aryl of 6 to 12 carbon atoms and alkaryl of 7 to 12 carbon atoms, the process comprising reacting at a temperature of at least 185° C. in the presence of copper chromite catalyst said phenolic compound with an alkanol of 1 to about 12 carbon atoms.

4,165,440

## CATALYTIC HYDRATION OF ETHYLENE OXIDE TO ETHYLENE GLYCOL

Leo Kim, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 730,049, Oct. 6, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,526

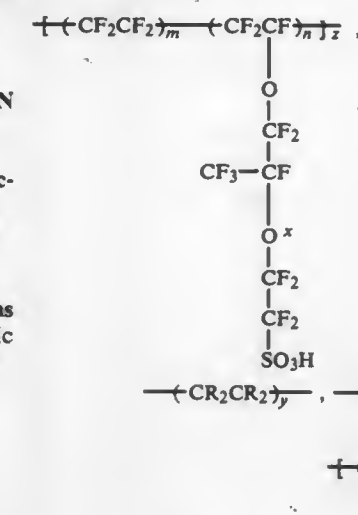
Int. Cl.<sup>2</sup> C07C 29/00

U.S. Cl. 568-867

4 Claims

1. In the process of adding water to ethylene oxide to produce ethylene glycol by contacting ethylene oxide with water in the presence of an acid ion exchange resin at an initial water to ethylene oxide weight ratio varying from about 1:1 to about 100:1 and a temperature between about 50° C. to about 110° C., the improvement which comprises using as the acid ion ex-

change resin a resin selected from the group consisting of resins having the formulas:



where n, m, x and z are integers such that the equivalent weight is less than 2000 and where R is individually a hydrogen, a fluorine and a -SO<sub>3</sub>H group, at least some of the carbons attached to greater than one R have both a fluorine and a -SO<sub>3</sub>H group attached thereto and where a, b, and c are integers the sum of which are such that the equivalent weight is less than 2000.

4,165,441

## PROCESS FOR THE PREPARATION OF STYRENE

Takeshi Okano; Tetsuo Masuyama, both of Machida, and Toshiharu Yokoyama, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed May 23, 1978, Ser. No. 908,817

Claims priority, application Japan, Jun. 6, 1977, 52-66507; Aug. 23, 1977, 52-100888; Nov. 8, 1977, 52-133686; Nov. 17, 1977, 52-138228

Int. Cl.<sup>2</sup> C07C 5/38

U.S. Cl. 585-444

15 Claims

1. A process for producing styrene from 4-vinylcyclohexene by contacting it with molecular oxygen in a gaseous phase and at an elevated temperature in the presence of a catalyst which contains tin, antimony and oxygen.

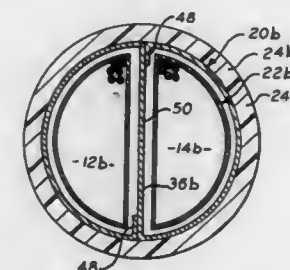


# ELECTRICAL

**4,165,442**  
**TELEPHONE CABLE WITH IMPROVED SHIELD COMBINATION**  
 Anthony P. Gabriel, Staten Island, N.Y., and Jimmy Justiss, Bonham, Tex., assignors to General Cable Corporation, Greenwich, Conn.

Filed Jun. 12, 1978, Ser. No. 914,505  
 Int. Cl.<sup>2</sup> H01B 11/06  
 U.S. Cl. 174—36

12 Claims

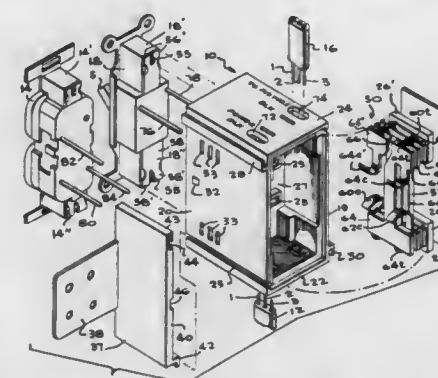


1. A communication cable including a core containing a plurality of conductors divided into groups along a generally diametral plane through the core, a metal screen, that is a conductor of electricity, having a middle panel that extends between said different groups at said diametral plane, the middle panel of the metal screen being bent in opposite circumferential directions at the opposite ends thereof and curving around the circumferential portions of the different groups of conductors and extending circumferentially around one-half of the circumference of the core to form a portion of the screen that is of semi-circular cross-section, and each of the portions of the screen that is of semi-circular cross-section having end portions, remote from its connection to the middle panel of the screen, said end portions being bent inward substantially parallel to the middle panel of the screen, and a layer of dielectric material on one side of the screen.

**4,165,443**  
**POWER DISTRIBUTION SYSTEM**  
 Earl C. Figart, 815 Flr Dr.; J. Kevin Kelly, 1036 Greenfield Cir., and Richard A. Di Marcello, 1312 Penfield Rd., all of State College, Pa. 16801

Filed Jul. 24, 1975, Ser. No. 598,644  
 Int. Cl.<sup>2</sup> H02G 3/18  
 U.S. Cl. 174—53

45 Claims



1. A multi-function box capable of being mounted in a wall for receiving electrical power from a power cable and distributing the power to a power distribution cable; a modular electric switch unit having first and second external terminals removably mounted in said multifunction box, said multi-function box including a distribution bus plate compartment and a function unit compartment in which said modular switch unit is mounted, a plurality of bus plates mounted in said bus plate compartment, automatic conductor retaining and clamping

means on said bus plates, a plurality of power-input openings in said box dimensioned and positioned for receiving the stripped conductor ends of the conductors of a power cable and guiding said conductors into contact with said automatic conductor retaining and clamping means on respective ones of said bus plates as the conductor ends of a power cable are inserted through said power-input openings, each of said automatic conductor retaining and clamping means including automatically operable means permitting ready insertion of a conductor end but resisting any withdrawal of said conductor end, power distribution output openings in said box dimensioned and positioned for receiving the stripped ends of the conductors of a power distribution cable and guiding said stripped conductor ends of said power distribution cable in contact with other automatic conductor receiving and clamping means on selected ones of said bus plates, and means for providing a selectively operable electrical flow path through said modular switch unit to said power distribution cable, said last-mentioned means comprising a first bus plate having a contact element engaging said first terminal of said modular electric switch unit, a second bus plate having a contact element engaging said second external terminal, said first bus plate having automatic conductor retaining and clamping means engageable with one conductor of a power cable, said second bus plate having an automatic conductor retaining and clamping means engageable with one conductor of a distribution cable and a third bus plate having automatic conductor retaining and clamping means engageable with a second conductor of a power cable and a second conductor of a distribution cable.

**4,165,444**  
**APPARATUS FOR ELECTRONIC ENCPHYMENT OF DIGITAL DATA**

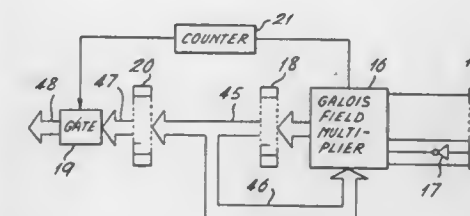
John A. Gordon, Hatfield, England, assignor to National Research Development Corporation, London, England  
 Filed Nov. 29, 1977, Ser. No. 855,685

Claims priority, application United Kingdom, Dec. 11, 1976, 51823/76

Int. Cl.<sup>2</sup> H04L 9/00

U.S. Cl. 178—22

14 Claims



14. Encyphering of decyphering apparatus comprising: a shift register having m stages where m is a positive integer and  $2^m - 1$  is prime, each stage having an associated respective tap connection where an output signal representative of the conduction state of that stage is, in operation, available,

first logic means, having a plurality of input terminals, for combining input signals applied to the terminals according to a first predetermined logical process,

selection means for automatically selecting tap connections and coupling the selected connections to respective inputs of the first logic means, the tap connections being so selected in accordance with the coefficients of a minimum polynomials in a Galois-field  $GF(2^m)$  that the position of the stage associated with each selected tap connection in the shift register corresponds to the position of a predetermined value of coefficient in one of the said polynomials, and

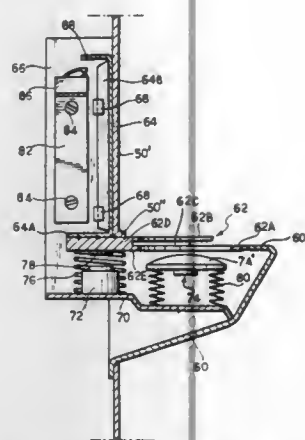
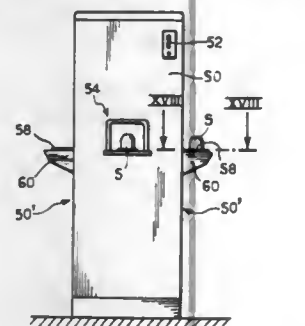
second logic means for combining digital signals which are to be encyphered or decyphered with other digital signals according to a second predetermined logical process,

985 O.G. 30



(i) a normally open electric switch,  
(ii) a yieldably supported heating plate having a heating face and a PTC heating resistor energizable via said switch.

- (iii) a spring-biased presser member formed with a container-receiving seat located above said heating face, said member being manually depressable against the action of its bias spring from a loading position spaced above said face to a working position to bring said wall portion of the container into forced pressure-engagement with the heating face,
- (iv) the said normally open electric switch being closable by displacement of the presser member to said working position,
- (v) a fixed electromagnet unit energizable by closure of the switch and a movable armature for said electromagnet unit carried by the presser member in a mutual relation such that the presser member is kept in its working position.



- tion by the electromagnet unit when the latter is energized,
- (vi) an electric control circuit controlling heating current supply to the PTC resistor from said switch when the latter is in closed condition, said control circuit comprising circuit means sensitive to the instantaneous resistance value of the PTC resistor in energized condition thereby to interrupt the said heating current supply each time the temperature of the resistor rises to a predetermined maximum value and to restore said current after a fraction of the total heating time,
- (vii) and a timer circuit triggerable by the closure of said switch, determining the total heating time and arranged to open said switch at the elapse of the total heating time.

#### 4,165,457 THERMOSTATICALLY CONTROLLED PRE-WELD HEATER

Gordon W. Turcotte, Gorham, Me., assignor to International Telephone & Telegraph Corp., Nutley, N.J.  
Filed Jan. 19, 1978, Ser. No. 870,892  
Int. Cl.<sup>2</sup> H05B 1/02

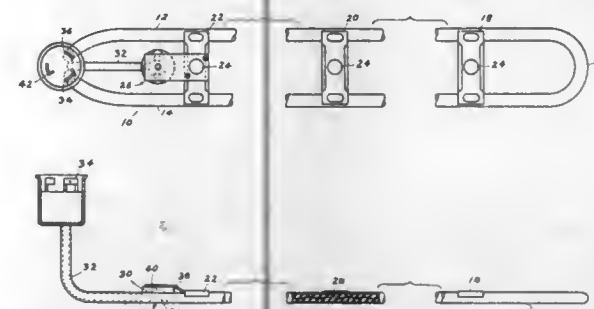
U.S. Cl. 219-516

2 Claims

1. An electrical heater for preheating a localized area to be welded of a parent metal comprising an electrical heating coil embedded in magnesium oxide and disposed within a metallic

sheath having electrical connections for connecting said coil to a source of electrical power, said sheath having a flattened bottom portion adapted to increase the amount of surface contact between said bottom portion of said sheath and said parent metal,

an integrally connected and mounted thermostatic control element positioned to contact said parent metal in the area where said weld is to be made, said thermostatic control element being connected to said electrical heating coil to



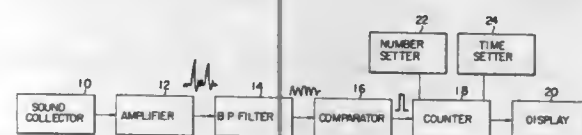
open and close the electrical connection to the heating coil about a preselected temperature; and mounting brackets for attaching said heater to said parent metal and further including a sensor mounting bracket attached to one of said mounting brackets, said thermostatic control element being attached to said sensor bracket to position said thermostatic control element in direct contact with said parent metal in said localized area where said weld is to be made.

#### 4,165,458 SIGNAL DECISION SYSTEM Takayuki Kotzum, and Tetsuo Usami, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,454  
Claims priority, application Japan, Apr. 23, 1976, 51-46845  
Int. Cl.<sup>2</sup> G06M 3/02

U.S. Cl. 235-92 PE

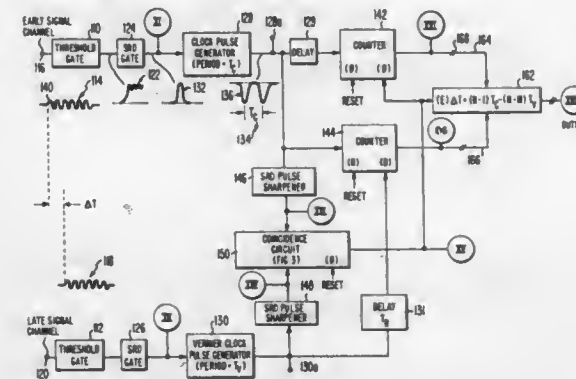
14 Claims



1. A signal decision system comprising, in combination, a detector means for detecting a signal from an object to be measured, a filter means connected to said detector means for filtering the output signal from said detector means, a comparison means connected to said filter means for comparing the output signal from said filter means with a reference signal for producing a pulsed signal when said output signal from said filter means has a level not less than a predetermined level, and a decision generation means connected to said comparison means for counting said pulsed signals successively produced from said comparison means for producing a decision signal when the counted number of said pulsed signals equals at least a predetermined value within a predetermined time interval.

#### 4,165,459 TIME INTERVAL MEASUREMENT Walter R. Curtice, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y. Filed Jan. 16, 1978, Ser. No. 869,643 Int. Cl.<sup>2</sup> G01R 23/02; H03K 21/30 U.S. Cl. 235-92 TF

7 Claims



1. An apparatus having first and second input terminals adapted to received thereat an early pulse and a late pulse, respectively, comprising in combination:

means responsive to the receipt of said early pulse at said first input terminal for producing a first series of said clock pulses of predetermined period  $T_C$ , the first pulse therefrom correlated to the occurrence of said early pulse at said first terminal;

first counting means responsive to said first series of pulses from said clock pulse means for counting said pulses of said first series and for producing a signal indicative of the count;

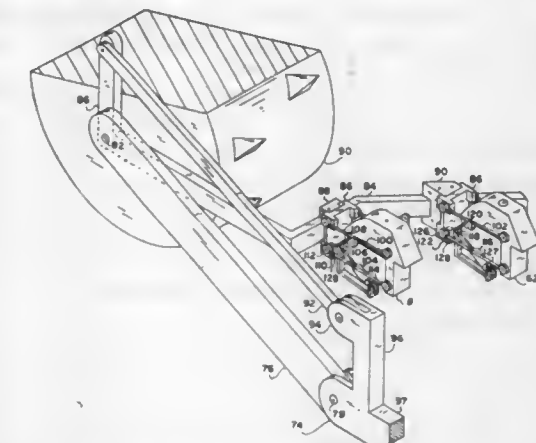
second counting means also responsive to said first series of pulse from said clock pulse means for counting said pulses of said first series and for producing a signal indicative of the count;

means responsive to the receipt of said late pulse at said second input terminal for producing a second series of clock pulses of predetermined period,  $T_V$ , where  $T_V < T_C$ , the first pulse therefrom occurring when a number,  $M$ , of said first series of clock pulses have been produced, said first pulse correlating to the occurrence of said late pulse at said second input terminal, said first counting means having a terminal receptive of said first pulse of said second series for becoming disabled from further counting while producing a signal representative of said number,  $M$ ; and

means responsive to pulses from said means producing said first and second series of pulses, respectively, for producing a pulse indicative of the first coincidence of a pulse in said first series and a pulse in said second series, said first coincidence occurring when a number  $N$ , of said first series of clock pulses have been produced and when said second means for counting is producing a signal representative of said number  $N$ , whereby the values of  $M$ ,  $N$ ,  $T_C$  and  $T_V$  may be utilized to measure the time interval between the arrival of the early pulse and late pulse.

#### 4,165,460 COAL-ROCK INTERFACE DETECTOR Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Stephen D. Rose; Charles E. Crouch, both of Huntsville, Ala., and Elborn W. Jones, Mississippi State, Miss. Filed Nov. 4, 1977, Ser. No. 848,793 Int. Cl.<sup>2</sup> G01V 5/00; G01N 23/20 U.S. Cl. 250-253

5 Claims

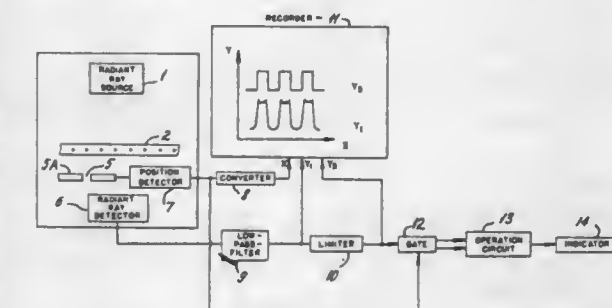


1. A coal-rock interface detector comprising:  
a source of gamma radiation;  
a radiation detector;  
a frame;

first support means mounted on said frame for independently, and vertically variably, positioning said source of gamma radiation adjacent to a coal surface as said frame is moved along the coal surface;  
second support means mounted on said frame, independent of said frame and independent of the position of said source of gamma radiation, for vertically variably, positioning said radiation detector adjacent to said coal surface as said frame is so moved along the coal surface.

#### 4,165,461 DETECTING APPARATUS FOR INSERTS, THICKNESS UNEVENNESS OR IMPURITIES Hiroshi Ishijima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan Filed Jun. 23, 1977, Ser. No. 809,437 Claims priority, application Japan, Jun. 23, 1976, 51-74162 Int. Cl.<sup>2</sup> G01N 23/00; G02B 5/00 U.S. Cl. 250-359

12 Claims



1. Apparatus for inspecting an object to detect inserts therein comprising:

a radiant ray source for directing a beam of radiant rays toward an object to be inspected,  
a radiant ray detector disposed at the opposite side of said object from said radiant ray source in position to receive radiant rays transmitted through said object,

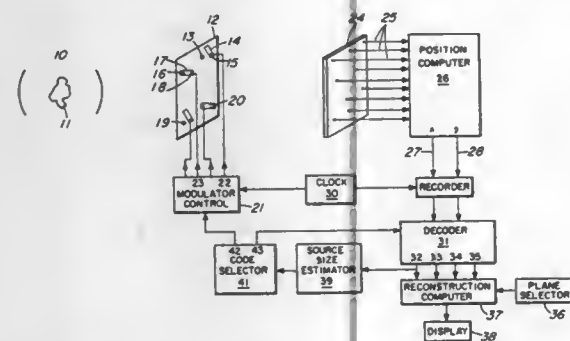


a low-pass filter for smoothing a pulse-form intensity signal from said radiant ray detector;  
 means interposed between said radiant ray source and said radiant ray detector to restrict said beam of radiant rays to a fine beam of parallel rays, said beam restricting means being movable relative to said object so as to scan said object whereby rays transmitted through different parts of said object are detected successively by said radiant ray detector;  
 means for detecting the position and for generating pulse signals in response to movement of said beam restricting means relative to said object; and  
 two-dimensional display means receiving a positional signal from said position detecting means and the output signal of said low-pass filter and displaying a curve of which the abscissa is determined by said signal from said position indicating means to indicate the portion of the object inspected and the ordinate is determined by said signal from said radiant ray detector as modified by said low-pass filter to indicate the presence or absence of an insert in said portion.

**4,165,462**  
**VARIABLE CODE GAMMA RAY IMAGING SYSTEM**  
 Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025, and Dov Rosenfeld, 260 San Jose Ave., San Francisco, Calif. 94110

Filed May 5, 1977, Ser. No. 794,117  
 Int. Cl.<sup>2</sup> G01T 1/20; G01N 21/34  
 U.S. Cl. 250—363 S

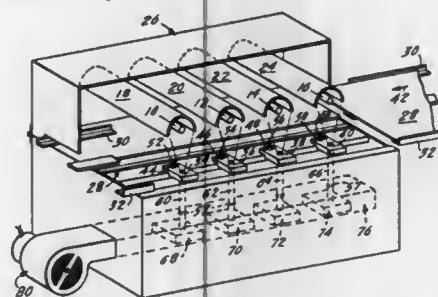
14 Claims



1. Apparatus for producing a three-dimensional tomographic image of a gamma-ray source comprising:  
 a detector array, producing an array of detector signals, for determining the position of each photon received from the source;  
 an aperture array positioned between the source and the detector array;  
 means for modulating the transmission of each of the apertures in the aperture array with an array of separable coding signals;  
 means for decoding the array of detector signals using an array of decoding signals which correspond to the separable coding signals to provide an array of projection signals representing the intensity of a projected image of the source through each aperture;  
 means for choosing the coding and decoding signals based on the intensity distribution of the source; and  
 means for utilizing the projection signals to produce a three-dimensional tomographic image of the source.

**4,165,463**  
**RADIATION MONITORS AND METHOD FOR POSITIONING**  
 William E. Bowen, Trenton, N.J., assignor to American Can Company, Greenwich, Conn.  
 Filed Sep. 27, 1977, Ser. No. 837,020  
 Int. Cl.<sup>2</sup> G01J 1/42; G01N 21/00  
 U.S. Cl. 250—372

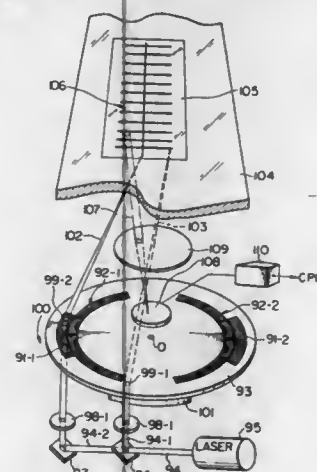
5 Claims



1. Apparatus for monitoring radiation intensity from an ultra violet radiation source in a chamber designed for curing discrete coated sheets, comprising:  
 (a) a box;  
 (b) an ultra violet intensity sensing means mounted on said box and in alignment with said ultra violet source;  
 (c) a conveying surface mounted on said box between said ultra violet source and said ultra violet sensor and wherein said surface is substantially normal to an axis aligning said ultra violet source with said ultra violet sensing means;  
 (d) an ultra violet receptor mounted beneath but proximate to said conveying surface; and in alignment with said ultra violet sensing means and said ultra violet source;  
 (e) an ultra violet transmitting means with a first end and a second end wherein said first end is received within said ultra violet receptor and said second end is in communication with said ultra violet sensing means; and  
 (f) means for cooling said ultra violet sensing means.

**4,165,464**  
**LIGHT SCANNING SYSTEM**  
 Hiroyuki Ikeda, Yokohama; Moritoshi Ando, Tokyo, and Takefumi Inagaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan  
 Filed Jun. 3, 1976, Ser. No. 692,350  
 Claims priority, application Japan, Jun. 10, 1975, 50/70378  
 Int. Cl.<sup>2</sup> G02B 21/38  
 U.S. Cl. 250—550

27 Claims

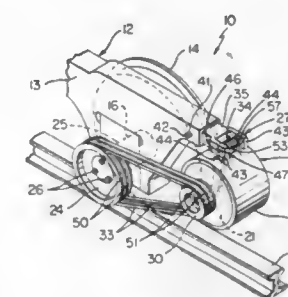


1. A light scanning apparatus comprising:  
 a circular disk having a plurality of first zone-type lenses and a plurality of second zone-type lenses, each of the first

zone-type lenses converging a first incoming light beam toward a corresponding first focal point and each of the second zone-type lenses converging a second incoming light beam toward a corresponding second focal point, light beam source means for providing both said first light beam and said second light beam, and for directing said first light beam and said second light beam, respectively, onto points different from each other on said circular disk so that said first and second light beams illuminate said first and second zone-type lenses, respectively, and motive means for providing relative motion between said light beam and both said first and second zone-type lenses, respectively, whereby each of said corresponding converged light beams scans an object to be scanned in a first scanning direction and in a second scanning direction, respectively, said second scanning direction intersecting the first scanning direction.

**4,165,466**  
**DRIVE APPARATUS FOR VEHICLE MOUNTED GENERATOR**  
 Tieme C. Stickers, Brookline Station, Mo., assignor to Dayco Corporation, Dayton, Ohio  
 Filed May 25, 1977, Ser. No. 800,490  
 Int. Cl.<sup>2</sup> F16H 7/10  
 U.S. Cl. 290—3

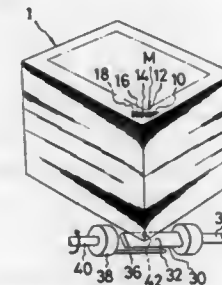
16 Claims



1. In a vehicle having a frame structure having wheels suitably rotatably mounted thereon; an axle extending between and fixed to an associated pair of wheels for rotation therewith, said axle serving as a rotatable driver shaft; an electrical generator provided with an outer housing and a rotor within said housing; and a drive apparatus for said generator comprising a driver sheave carried and driven by said driver shaft, a driven sheave fixed to said rotor, and belt means operatively connected between said drive sheave and said driven sheave; the improvement in said apparatus comprising, a telescoping member adapted to be received in telescoping relation within said frame structure; adjustable pivot support means supporting said generator on said vehicle, said adjustable pivot support means comprising a pin carried by said telescoping member, and lug means on said outer housing having opening means therein for receiving said pin therethrough; said adjustable pivot support means enabling alignment of said generator so that said driven sheave is precisely aligned with said driver sheave; and torsion spring means yieldingly moving said generator about its pivot support means thereby moving said driven sheave away from said driver sheave and placing a substantially constant yielding tension on said belt means to assure said driven sheave and generator are driven in an optimum manner.

**4,165,465**  
**SYSTEM FOR CHECKING PRINTED CONDITION OF PRINTED SHEET MATTERS**  
 Masataka Kanatani, Tokyo, and Daikichi Awamura, Kawasaki, both of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan  
 Filed Aug. 9, 1977, Ser. No. 823,108  
 Claims priority, application Japan, Aug. 10, 1976, 51/95182; Aug. 17, 1976, 51/97967; Aug. 27, 1976, 51/102235  
 Int. Cl.<sup>2</sup> G01N 21/30  
 U.S. Cl. 250—559

22 Claims



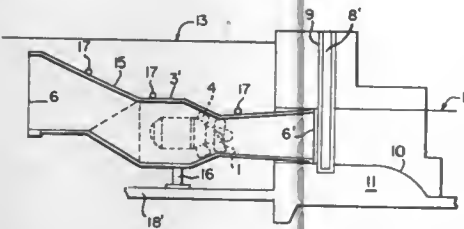
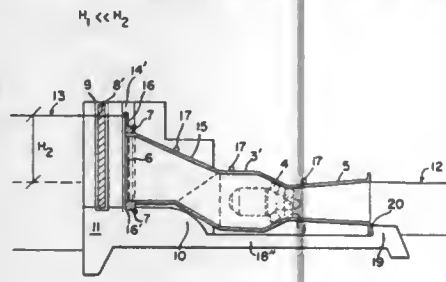
1. A system for checking printed condition of multicolor printed sheet matters, said system comprising:  
 a check mark on at least one corner of each of said sheet matters, said check mark including stripes corresponding to each color printed;  
 a counting machine for separating said sheet matters one by one and exposing said corner having said check mark;  
 a density signal generator comprising a photoelectric element which scans said check mark separated and exposed by said counting machine to provide as an output a density signal of the check mark;  
 a density signal processor which analyzes and processes said density signal from said density signal generator to generate a pulse output which indicates the position of said stripes;  
 a computer which is operative to inspect for presence of said pulse signal from said density signal processor to detect missing print; and  
 an indicator which indicates the printed sheet matter having the missing print detected by said computer.

**4,165,467**  
**DAM WITH TRANSFORMABLE HYDROELECTRIC STATION**  
 Francisco J. G. Atencio, Estafeta Dr. Garcia, Diamante Entre Rios, Argentina  
 Filed Apr. 29, 1977, Ser. No. 792,492  
 Int. Cl.<sup>2</sup> F01D 15/10

14 Claims

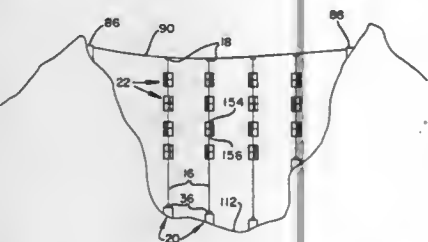
1. In a dammed engineered watershed having a water storing plurality of dams having means for directing a flow of water through them; the improvement comprising a removable hydromotive assembly having a water flow circulation path defined by a conduit having a lateral wall for directing water through an incorporated energy generation unit for causing actuation thereof; and having a first open end and a second open end for discharging the water entering the first open end, at least one of said open ends being adapted to be positioned coincidently against at least one end of said dams water directing means; and means for permitting said removable hydromotive assembly to be displaced away from one of the ends of one

dam of said plurality of water storing dams; to be positioned coincidentally in combination at another end of the same or



another dam of said plurality of water storing dams, for purposes of energy production.

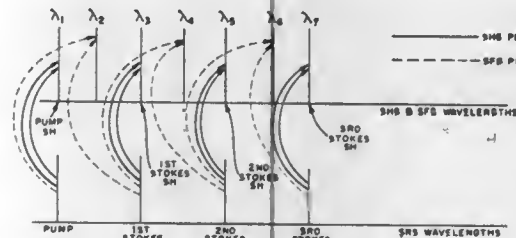
**4,165,468**  
**WIND DRIVEN, HIGH ALTITUDE POWER APPARATUS**  
Charles M. Fry, 17144 E. Brown Cir., Aurora, Colo. 80013, and Henry W. Hise, 2209 Hancock Dr., Austin, Tex. 78756  
Division of Ser. No. 650,186, Jan. 19, 1976, Pat. No. 4,084,102.  
This application Mar. 7, 1978, Ser. No. 884,134  
Int. Cl.<sup>2</sup> F03D 11/00  
U.S. Cl. 290-55



1. Apparatus for harvesting energy from high velocity winds found at great heights above the ground, comprising:  
an elongated, relatively flexible drive shaft having opposed ends, a ground supported energy conversion device for generating power, a plurality of wind driven vertical axis rotors for driving said shaft, each of said rotors having a plurality of blades circumferentially spaced about the vertical axis thereof for imparting rotational motion into each of said rotors, a shaft swivel means, and an aerial support means by which said swivel means can be supported within the atmosphere at great height above-said energy conversion device;  
means connecting one end of said shaft to said energy conversion device such that rotation of said shaft operatively actuates said energy conversion device to thereby generate power; means connecting each of said rotors to said shaft with said shaft being connected through the central axis of each of said rotors, thereby enabling the blades of each of said rotors to rotate about the vertical axis thereof while rotating said shaft; means by which said shaft is supported from said aerial support means by said shaft swivel means such that each of said rotors impart relative rotational motion into said shaft relative to said aerial support means in response to the winds aloft blowing

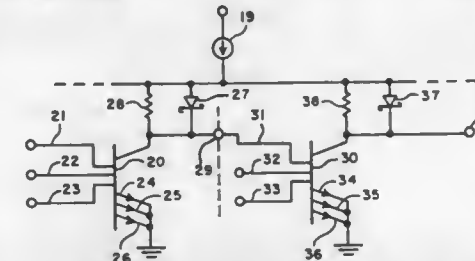
thereacross, said shaft being the sole means by which said wind driven vertical rotor rotors are supported from said aerial support means;  
said aerial support means includes an elongated suspension member having opposed ends which are anchored to spaced adjacent structure supported from the earth; said swivel means being supported by a midportion of said suspension member;  
said means connecting said rotors to said shaft includes a one-way clutch means which causes a relatively slow rotating one of said rotors to be disengaged from the shaft when the wind causes a relatively fast rotating one of said rotors to rotate said shaft at a rotational speed greater than the speed of said slow rotating one of said rotors.

**4,165,469**  
**APPARATUS AND METHOD FOR PRODUCING VISIBLE COHERENT LIGHT AT A PLURALITY OF WAVELENGTHS**  
Eugene O. Ammann, Los Altos, Calif., assignor to GTE Sylvania Incorporated, Stamford, Conn.  
Filed Aug. 21, 1978, Ser. No. 935,216  
Int. Cl.<sup>2</sup> H03F 7/00  
U.S. Cl. 307-426



1. Pulsed tunable laser apparatus having outputs in the visible optical wavelengths comprising  
a laser having  
a lasing medium,  
means to excite said lasing medium whereby to produce a pump beam of coherent light having a wavelength  $\lambda_p$  greater than 8000 Å (near infrared), and  
first and second laser mirrors spaced from opposite sides respectively of said medium and traversing said beam whereby to define the laser cavity,  
switch means in said laser cavity operative on said beam, means to activate and deactivate said switch means whereby to produce a succession of pulses of said coherent light, a non-centrosymmetric crystal between said lasing medium and said second mirror and positioned to be traversed by said light pulses whereby to cause stimulated Raman scattering (SRS) of the light and thereby to produce Stokes wavelengths, said crystal having an optic axis and an angle  $\theta$  with respect to the pulsed beam propagation direction within the crystal,  
means to adjustably support said crystal for movement relative to said pulsed beam whereby  $\theta$  is selectively changeable, and  
means to cause said Raman scattered light to oscillate through said crystal comprising at least one of said mirrors whereby to produce visible light outputs having a plurality of wavelengths corresponding to a like plurality of values of  $\theta$ ,  
said mirrors being non-transmissive at  $\lambda_p$  and at said Stokes wavelengths, at least one of said mirrors being transmissive at visible light wavelengths between 4000 and 7000 Å whereby coherent light in the latter wavelength range is outputted from said apparatus.

**4,165,470**  
**LOGIC GATES WITH FORWARD BIASED DIODE LOAD IMPEDANCES**  
David E. Fulkerson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.  
Filed Sep. 20, 1976, Ser. No. 724,791  
Int. Cl.<sup>2</sup> H03K 19/08; H01L 27/04  
U.S. Cl. 307-215





target surface and means by which to cool said target surface thereof,

a supply of liquid within said anode and adjacent said target surface, whereby heat that is applied to said target surface causes the liquid in said anode to vaporize, and means by which to remove the heat of vaporization from said anode, so that said target surface thereof is cooled by means of converting the liquid into vapor.

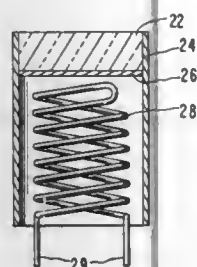
4,165,473

**ELECTRON TUBE WITH DISPENSER CATHODE**  
Louis R. Falce, Redwood City, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 697,905, Jun. 21, 1976, abandoned. This application May 27, 1977, Ser. No. 800,837  
Int. Cl.<sup>2</sup> H01J 1/14, 14/06

U.S. Cl. 313-346 R

11 Claims



1. An improved cathode for use in an electron tube for producing a high current density stream of electrons when heated, comprising a matrix of compacted metal particles formed with interstices therebetween which are substantially uniformly dispersed throughout the matrix and define therein an initial predetermined porosity, said matrix consisting of a mixture of metal particles of a first metal selected from the group of tungsten and molybdenum together with particles of a second metal selected from the group consisting of iridium, osmium, ruthenium and rhodium, said second metal particles comprising at least 10% to 90% by weight of said matrix, said matrix being compressed and treated to bring said particulate mixture into intimate particle-to-particle contact in which said particles are bonded together at regions of contact therein in which each metal component retains its discrete character and in which the interstices provide a substantial void volume throughout said matrix, and an electron emissive material comprising an alkaline earth aluminate including at least barium aluminate filling the interstices of said matrix to form therewith a solid cathode body of negligible porosity, said cathode body being formed with an electron emitting surface having a conformation which exposes the filled interstices and particulate matrix thereof to define, in operation, a plurality of exposed alkaline earth portions throughout the exposed surface of the mixture of matrix metal particles, said cathode being adapted for being heated to electron emitting temperature whereat the second metal and the alkaline earth aluminate interact during operation to reduce the work function for electron emission at said surface while the second metal is prevented from being sputtered away from said surface by its structural embodiment throughout the body of the cathode.

4,165,474

**OPTOELECTRONIC DISPLAYS USING UNIFORMLY SPACED ARRAYS OF SEMI-SPHERE LIGHT-EMITTING DIODES**

David J. Myers, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

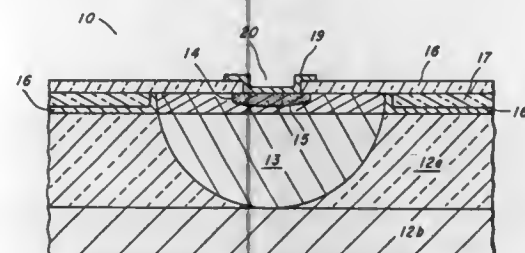
Filed Dec. 27, 1977, Ser. No. 865,037  
Int. Cl.<sup>2</sup> H01L 33/00; H05B 33/02, 33/20

U.S. Cl. 313-500

17 Claims

1. A light-emitting diode assembly comprising: substrate means;

a radiant semiconductor diode embedded within said substrate means, said semiconductor diode including a semi-spherical semiconductor body of a first conductivity type and having a substantially planar circular surface and a spherical surface merging with said planar circular surface, the spherical surface of said semi-spherical semiconductor body being disposed within said substrate means in embedded relationship and the planar circular surface of said semi-spherical semiconductor body being disposed in substantially flush co-planar relation with a corresponding surface of said substrate means;



a region of a second conductivity type opposite from the first conductivity type of said semi-spherical semiconductor body disposed in said semi-spherical semiconductor body and opening onto the planar circular surface thereof, said region and said semi-spherical semiconductor body defining a p-n junction therebetween;  
a first ohmic contact engaging said semi-spherical semiconductor body of the first conductivity type; and  
a second ohmic contact engaging said region of the second conductivity type.

4,165,475

**DISCHARGE LAMP WITH STARTER CIRCUIT**

John C. Pegg, and Clive R. Walker, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Apr. 17, 1978, Ser. No. 897,631

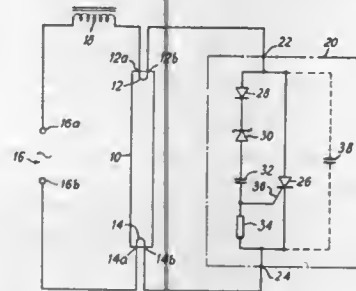
Claims priority, application United Kingdom, Apr. 18, 1977, 16044/77

Int. Cl.<sup>2</sup> H05B 41/18

U.S. Cl. 315-99

21 Claims

1. In a discharge lamp circuit comprising a discharge lamp having a pair of cathodes, a reactive ballast, and a cyclically-varying voltage supply for said lamp and ballast, a starter circuit, wherein said starter circuit comprises:  
two starter input terminals for connection to said lamp cathodes;



a controlled switch connected across said starter input terminals and having a control input; and  
a control circuit connected to said control input and adapted to render said switch conductive at a desired point during the cycle of the applied voltage, said control circuit in-

cluding a capacitor the charge upon which progressively varies with successive cycles of the applied voltage in such a manner as to cause a variation in the trigger points at which conduction occurs, whereby the instantaneous applied voltage which is required for conduction to occur increases with successive cycles of the applied voltage after switch-on of the circuit.

4,165,476

**LOW LOSS, RESETTABLE EXCITATION CONTROL FOR AN INDUCTIVE LOAD**

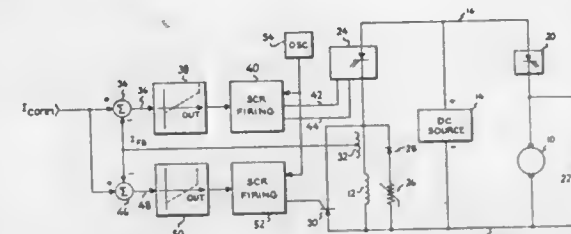
Ernest F. Weiser, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Dec. 12, 1977, Ser. No. 859,769

Int. Cl.<sup>2</sup> H02P 5/06

U.S. Cl. 318-493

8 Claims



1. In a power control system for a d-c electric traction motor having armature and field means and adapted to be energized from a source of d-c electric power, the improvement comprising:

- controllable switching means operatively positioned between said motor and said power source, said switching means having conducting and non-conducting states for repetitively interconnecting said source and said motor;
- first control means adapted for controlling the time ratio of conducting to non-conducting states of said switching means in a manner to regulate the magnitude of current in said motor to a desired value;
- impedance means connected in parallel circuit arrangement with said field means;
- controllable electric valve means connected in parallel circuit arrangement with said field means and poled to conduct current in a direction opposite to the direction of current flow through said field means; and
- second control means for controlling the conducting and non-conducting states of said electric valve means, said second means having a first mode of operation when said load current is less than or substantially equal to said desired value of current and having a second mode of operation when said load current is greater than said desired value of current, said second control means being operative in said first mode for gating said electric valve means conductive whenever said switching means becomes non-conductive and being further operative in said second mode for controllably delaying gating of said electric valve means to thereby vary the time constant of said field means and force a more rapid decay of field current.

4,165,477

**INSTRUMENT INTENDED TO BE CARRIED AT THE WRIST**

Pierre Comte, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed May 18, 1977, Ser. No. 798,075

Claims priority, application Switzerland, May 21, 1976, 6468/76

Int. Cl.<sup>2</sup> H02J 7/00

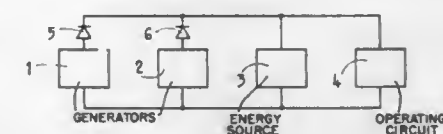
U.S. Cl. 320-61

3 Claims

1. An improved instrument adapted to be carried on the wrist of a user including a rechargeable electric source for

providing power for the instrument, said improvement comprising:

means for recharging said source, said recharging means including two generators, one generator generating a first charging current in response to a first physical phenomenon coupled to said source and a second generator generating a second charging current in response to a second different physical phenomenon coupled to said first generator and said source, the generators being connected in series one with another.



2. An improved instrument adapted to be carried on the wrist of a user, and including a rechargeable electric source for providing power for the instrument, the improvement comprising:

means for recharging said source, said recharging means including a photo-electric generator and a thermo-electric generator connected to provide either separately or in combination the current needed for recharging said source.

4,165,478

**REFERENCE VOLTAGE SOURCE WITH TEMPERATURE-STABLE MOSFET AMPLIFIER**

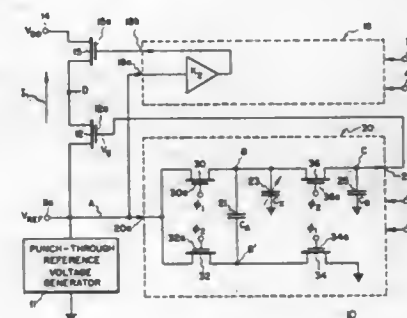
Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,067

Int. Cl.<sup>2</sup> G05F 1/58

U.S. Cl. 323-19

31 Claims



1. A temperature-stable reference voltage source, devoid of passive resistance elements, comprising:  
a power terminal;  
means for supplying an electrical potential of unknown amplitude stability to said power terminal;  
first and second output terminals;  
means connected between said output terminals for generating an essentially constant voltage responsive to a flow of an essentially constant current therethrough  
first means only in electrical series connection with said generating means for causing a current flow from said potential supplying means only through said generating means with a magnitude responsive to the magnitude of a signal supplied to said first means; and  
temperature-stable amplifier means for supplying, respon-

sive only to the magnitude of the voltage across said output terminals, said signal to said first means to cause the magnitude of said current flow to remain essentially constant.

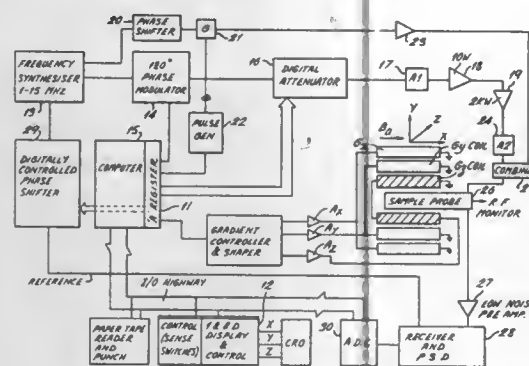
#### 4,165,479 NUCLEAR MAGNETIC RESONANCE APPARATUS AND METHODS

Peter Mansfield, Chilwell, England, assignor to National Research Development Corporation, London, England  
Filed Dec. 13, 1977, Ser. No. 860,217

Claims priority, application United Kingdom, Dec. 15, 1976, 52322/76

Int. Cl.<sup>2</sup> G01R 33/08  
U.S. Cl. 324—0.5 A

21 Claims



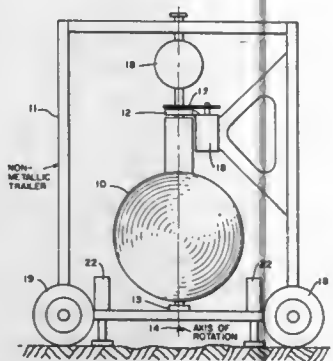
1. A method of obtaining signals representing the nuclear magnetic resonance spin density distribution in a sample which comprises maintaining a static magnetic field along one axis of a sample, applying an excitation pulse to the sample, applying at least one magnetic field gradient to said magnetic field which varies in a direction selected from directions orthogonal to and parallel to said one axis and repetitively reversing the direction of one or more of the said at least one magnetic field gradient at a rate which allows cyclic regrowth and decay of the free induction decay (FID) signal from the sample, and reading out the resulting FID signal.

#### 4,165,480 PROSPECTING SYSTEM USING ROTATING SUPERCONDUCTING ELECTROMAGNETIC DIPOLE

H. Frank Morrison, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.  
Filed Dec. 12, 1977, Ser. No. 859,477

Int. Cl.<sup>2</sup> G01V 3/08

U.S. Cl. 324—6  
1. A prospecting system comprising: a direct current superconducting electromagnet for producing a dipole field; means



for positioning such electromagnet close to a ground surface and continuously rotating said electromagnet and its resultant

dipole around a predetermined axis; sensing means spaced from said electromagnet and close to said ground surface for measuring a predetermined component of the field in said ground induced by said rotating electromagnet.

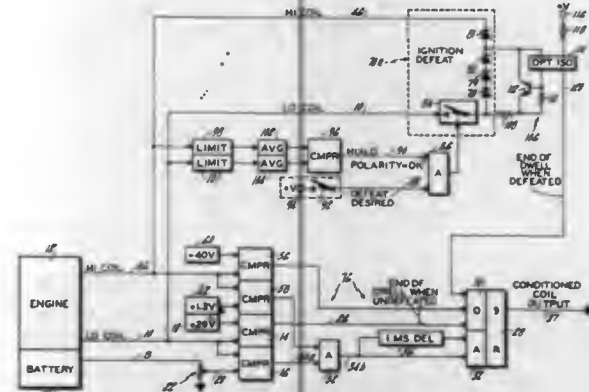
#### 4,165,481 VERSATILE IGNITION DEFEAT AND SIGNAL CONDITIONING

John C. Wells, Colchester, and Paul R. Back, Somersville, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 15, 1977, Ser. No. 833,631  
Int. Cl.<sup>2</sup> G01M 15/00

U.S. Cl. 324—16 T

7 Claims



1. An ignition defeat circuit for a spark ignition engine comprising a series combination including a selectively operable switch means in series with a unilaterally conductive impedance means, said series combination being adapted for connection between the high coil connection and the low coil connection of the spark ignition under test, said unilaterally conductive impedance means being poled to conduct current flowing from the primary of the ignition coil during firing time and to block current from the battery during dwell time.

2. Apparatus for selectively defeating the ignition of a spark ignition engine having an ignition cycle including alternate dwell period portion and firing time portion during diagnosis of the ignition system thereof, comprising:

- a high coil signal line adapted to be connected to the battery side of the primary of the ignition coil of the engine to be tested;
- a low coil signal line adapted to be connected to the ground side of the primary of the ignition coil of the engine to be tested;
- a selectively operable switch means and a unilaterally conductive impedance connected in series with each other between said high coil signal line and said low coil signal line, said unilaterally conductive impedance poled to block current induced by the battery during the dwell period of the ignition cycle in which current is built up in the primary of the coil and poled to conduct current of the primary coil during firing time of the ignition cycle; and means for selectively operating said switch means.

#### 4,165,482 CABLE FAULT LOCATION

Philip F. Gale, Clwyd, Wales, assignor to The Electricity Council, London, England

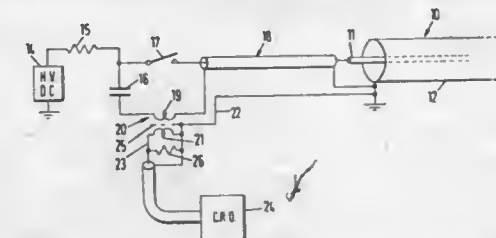
Continuation of Ser. No. 674,124, Apr. 6, 1976, abandoned. This application Jun. 13, 1978, Ser. No. 915,188

U.S. Cl. 324—52

19 Claims

1. A method of locating a fault in a cable comprising at least two conductors which method comprises the steps of applying from an impulse generator a single voltage impulse between

two conductors of the cable, passing the resultant current waveform through a primary winding of coupling means which comprises said primary winding and a secondary winding, the primary winding being connected in series between the impulse generator and one of said two conductors, which



coupling means obtains the derivative of said current waveform to give across the secondary winding a signal output which is a pulse of relatively short duration each time a reflection of the voltage impulse returns to the impulse generator, and displaying or recording said signal output.

#### 4,165,483 CAPACITIVE PICK-OFF CIRCUIT

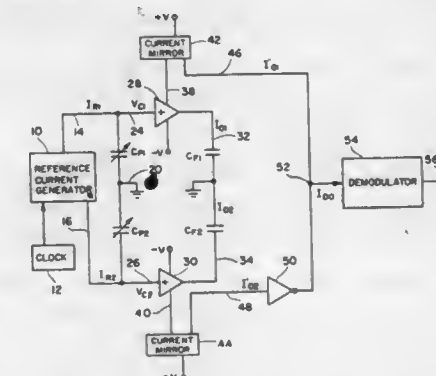
Fred V. Holdren; Rand H. Hulsing, II, both of Redmond, and Kurt E. Steinke, Bellevue, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 31, 1978, Ser. No. 874,000

Int. Cl.<sup>2</sup> G01R 27/02

U.S. Cl. 324—60 C

5 Claims



1. A differential capacitive pick-off circuit for measuring the difference in capacitance between a first and a second capacitor comprising:

- a reference current generator circuit operatively connected to the first and the second capacitors effective to apply a time varying current to each of the capacitors resulting in a time varying voltage across each of the capacitors;
- a first fixed capacitor;
- a second fixed capacitor;
- first means for connecting the first capacitor with said first fixed capacitor resulting in said time varying voltage across the first capacitor being applied to said first fixed capacitor resulting in a current through said first fixed capacitor;
- second means for connecting the second capacitor with said second fixed capacitor resulting in said time varying voltage across the second capacitor being applied to said second fixed capacitor resulting in a current through said second fixed capacitor;
- means, operatively connected to said first and second connecting means, for combining at least a function of said first fixed capacitor current with at least a function of said second fixed capacitor current; and
- means, operatively connected to said combining means, for converting said combined current into a signal representing the difference in capacitor gaps.

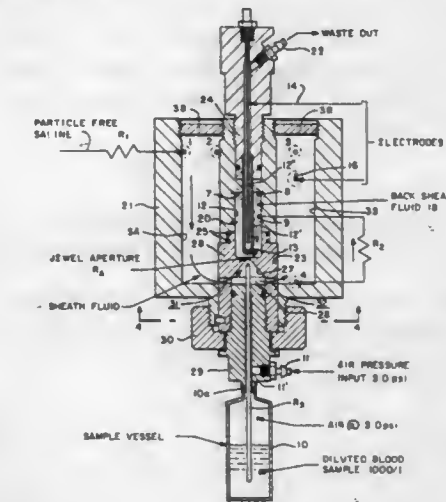
#### 4,165,484 PARTICLE COUNTING APPARATUS UTILIZING VARIOUS FLUID RESISTORS TO MAINTAIN PROPER PRESSURE DIFFERENTIALS

John L. Haynes, Redwood City, Calif., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Mar. 23, 1977, Ser. No. 780,402  
Int. Cl.<sup>2</sup> G01N 27/00; A61B 5/00

U.S. Cl. 324—71 CP

34 Claims



1. Apparatus for counting particles in a liquid suspension comprising: particle sensing means having a sensing aperture through which said particles pass; a vessel containing said liquid suspension; a source of particle free liquid; a small bore tube having one end immersed in said suspension and its other end juxtaposed with said aperture; means for forcing said suspension at a predetermined pressure through said tube and toward said aperture, said tube acting as a fluid resistor having a pressure drop across it such pressure drop being a significant fraction of said predetermined pressure; and hydrodynamic focusing means for directing a first flow of said particle free liquid through said aperture in cooperation with said liquid suspension said first flow being provided at substantially a pressure equal to said predetermined pressure minus said pressure drop.

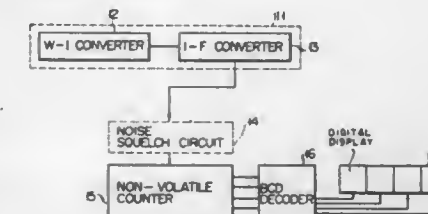
#### 4,165,485 ELECTRONIC WATT-HOUR METER

Haruo Takahashi, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 31, 1977, Ser. No. 829,573  
Claims priority, application Japan, Sep. 9, 1976, 51/107232

U.S. Cl. 324—142

4 Claims



1. An electronic watt-hour meter, comprising:  
a power measuring the power to be measured and generating pulses proportional to the power;  
a counter device counting each of the pulses generated by the power measuring circuit without frequency division; and  
a display device visually displaying the contents of the counter device;



the counter device being provided by an N-digit decimal counter having consecutive digit position counter sections and formed of non-volatile semiconductor elements, the pulses generated by the power measuring circuit being supplied to the lowest digit position counter section of the N-digit decimal counter, the n number of lowest digit position counter sections acting as a frequency divider and being disconnected from said display device to retain the lowest digits which are not displayed, and consecutive digit position counter sections including the counter section adjacent to the lowest digit position counter sections being connected to corresponding display units of the display device for visual display of the contents of said digit counter sections.

4,165,486

## SINGLE SIDEBAND TRANSCEIVER

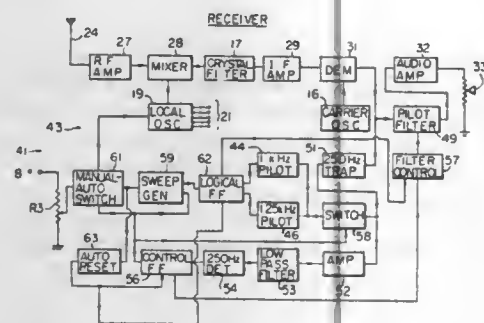
Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 826,408, Aug. 22, 1977. This application Dec. 15, 1977, Ser. No. 860,756

Claims priority, application Japan, Dec. 16, 1976, 51-151395; Dec. 16, 1976, 51-151396

Int. Cl.<sup>2</sup> H04B 1/40

U.S. Cl. 325-17



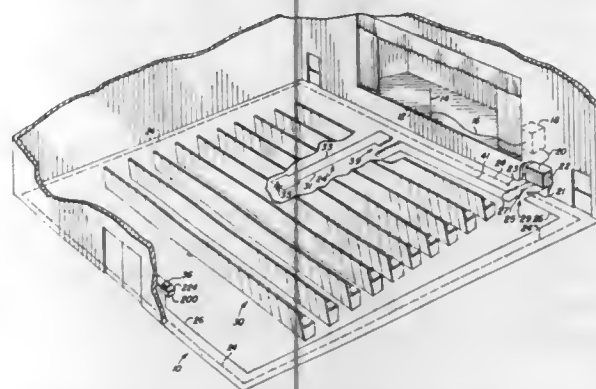
## I. A transceiver comprising:

- a transmitter unit; and
- a receiver unit for receiving a channel signal modulated with first and second pilot signals of first and second predetermined frequencies, respectively, the receiver unit including:
  - a voltage controlled local oscillator for generating a local oscillator signal;
  - a mixer means for mixing the local oscillator signal with the modulated channel signal;
  - a demodulator means for receiving the signal from said mixer means for demodulating it to obtain said pilot signals;
  - a voltage sweep generator and means for applying a control voltage from said generator to said local oscillator;
  - means including a first frequency detector responsive to the difference frequency of the demodulated pilot signals for applying a start signal to the sweep generator to initiate a control voltage sweep which causes a local oscillator signal frequency sweep;
  - means including a second frequency detector responsive to the demodulated pilot signals for producing a first control signal in response to the first predetermined frequency;
  - means including a third frequency detector responsive to the demodulated pilot signals for producing a second control signal in response to the second predetermined frequency; and
  - a sweep control means connected to the sweep generator for interrupting the voltage sweep and maintaining the control voltage constant in response to the first and second control signals in simultaneity.

4,165,487  
**LOW POWER SYSTEM AND METHOD FOR COMMUNICATING AUDIO INFORMATION TO PATRONS HAVING PORTABLE RADIO RECEIVERS**  
 Roy C. Corderman, 9209 Long Hills Dr., Sun City, Ariz. 85351  
 Filed Apr. 10, 1978, Ser. No. 895,005  
 Int. Cl.<sup>2</sup> H04B 1/00

U.S. Cl. 325-54

13 Claims



6 Claims

1. A system for communicating audio information to a plurality of patrons of an establishment, each of the patrons having a portable radio receiver, said system comprising in combination:

- (a) means for producing a radio frequency carrier signal;
- (b) means for producing audio frequency electrical signals representative of information to be communicated to the patrons;
- (c) means for amplifying said audio frequency electrical signals;
- (d) means for modulating the amplitude of said carrier signal by said amplified audio frequency electrical signals to produce an output signal;
- (e) means for amplifying said output signal;
- (f) means for transmitting said amplified output signal to said radio receivers by applying said amplified output signal to an antenna located proximately to the portion of the establishment wherein the patrons and their radio receivers are located during communication of said audio information;
- (g) conductor means for conducting said output signal to a tuning location in the establishment; and
- (h) tuning aid means connected to said conductor means at said tuning location for radiating a low power amplitude modulated radio frequency signal of the same carrier frequency as said output signal at substantially lower field intensity then said amplified output signal to enable the patrons of the establishment to conveniently tune their portable radio receivers to said carrier frequency by holding their portable radio receivers close to said tuning aid means and adjusting the tuning controls of their portable radio receivers to obtain maximum sound levels.

4,165,488

**DERANGEMENT DETECTOR IN A RECEIVER OF A SYSTEM FOR DATA TRANSMISSION BY MEANS OF PHASE MODULATION OF A CARRIER**

Loic B. Y. Guidoux, and Jean-Louis Renaudat, both of Le Plessis-Robinson, France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Sep. 20, 1977, Ser. No. 834,957

Claims priority, application France, Sep. 30, 1976, 76 29359

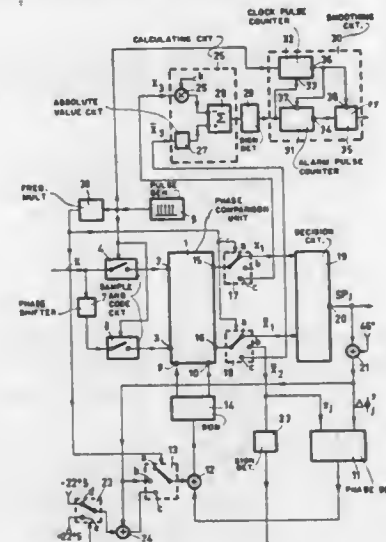
Int. Cl.<sup>2</sup> H04B 1/16; H04L 27/24, 27/22

U.S. Cl. 325-321

4 Claims

1. A derangement detector in a receiver of a system for data transmission by means of n-phase modulation of a carrier, the receiver comprising a phase discriminator including a calculating unit having input means for receiving digital signals having signal samples occurring at a rate equal to the data symbol rate, said digital signals being representative of the in-phase and

quadrature components of a received passband signal at each sampling instant and of the in-phase and quadrature components of a reference carrier at the preceding sampling instant, said calculating unit comprising means for calculating during a first interval of each period samples  $x_1$  and  $\bar{x}_1$  of signals representative of the in-phase and quadrature components of a signal derived from the passband signal by a phase rotation over an angle equal and opposite to the phase of the reference carrier at the preceding sampling instant, the phase discriminator reproducing the transmitted phase jumps from said signal samples  $x_1$  and  $\bar{x}_1$ , said phase discriminator further comprising means for increasing during a second interval of each sampling period the phase of the reference carrier by a first additional phase equal to the phase variation of the transmitted carrier corresponding to the phase jump reproduced during said first interval, the derangement detector further comprising



- (a) a circuit means coupled to said calculating unit for detecting the sign of one of the signal samples  $x_2$  and  $\bar{x}_2$  supplied by the calculating unit during said second interval;
- (b) means coupled to said calculating unit for increasing during a third interval of each sampling period the phase of the reference carrier by said first additional phase and also by a second additional phase whose magnitude is equal to  $\pi/n$  and whose sign is opposite to the sign detected by said sign detection circuit;
- (c) a calculating circuit means coupled to said calculating unit for producing a quantity  $|\bar{x}_3| - kx_3$  from the signal samples  $x_3$  and  $\bar{x}_3$  supplied by the calculating unit during said third interval, where k is a predetermined positive coefficient having a value smaller than  $\tan(\pi/p)$ , and
- (d) a circuit means coupled to said calculating circuit for supplying alarm pulses at a negative sign of said quantity  $|\bar{x}_3| - kx_3$ .

4,165,489

**CHANNEL CHANGE INDICATION CIRCUIT WITH DELAYED MEMORY ACTIVATION**

Thomas J. Zato, Wheeling, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 3, 1978, Ser. No. 921,290

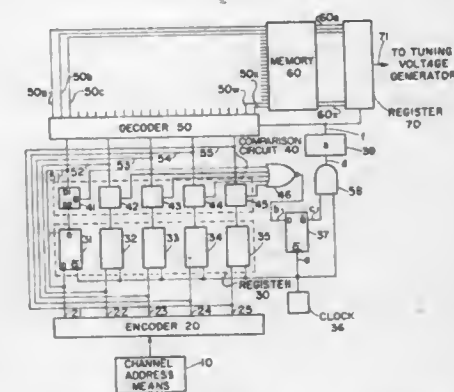
Int. Cl.<sup>2</sup> H04B 1/26

U.S. Cl. 325-464

4 Claims

1. A limited-channel tuning system for a television receiver comprising: channel address means generating channel address information; memory means having a plurality of locations each addressable by said channel address information and storing tuning information for different television channels, said

memory means having a useful service life which is dependent upon cumulative activation time; register means coupled to said channel address means for receiving therefrom and retaining desired channel address information; pulse means coupled to said memory means for producing pulses for activation thereof; comparator means having a first set of inputs coupled to said register means, a second set of inputs coupled to said



memory means and an output, said comparator means producing an enabling signal at said output, whenever a change occurs in said channel address information; delay means coupled between said output and said pulse means; and clock means periodically energizing said register means and said delay means, said delay means assuring that the memory location addressed corresponds to the new memory address information before permitting energization of said pulse means.

4,165,490

**CLOCK PULSE GENERATOR WITH SELECTIVE PULSE DELAY AND PULSE WIDTH CONTROL**

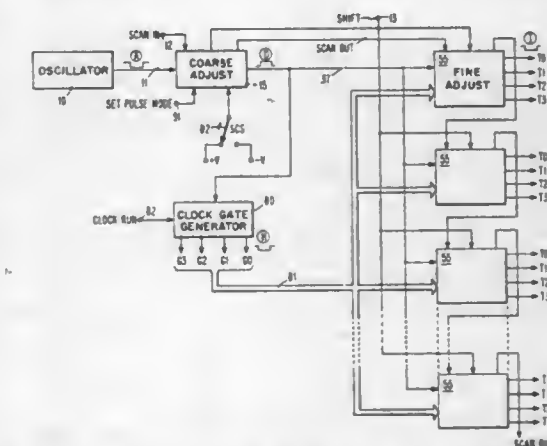
Leland D. Howe, Jr., Owego; Albert E. Paniccia, Binghamton, and Vincent A. Scotto, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,755

Int. Cl.<sup>2</sup> H03K 1/18

U.S. Cl. 328-60

11 Claims



1. Clock pulse generating apparatus for a computer system, including means for providing a series of repetitive clock pulses, the improvement comprising: delay circuit means for providing a set of delayed pulses from each pulse of said series of repetitive pulses, first selector means connected to said delay circuit means to receive said set of delayed pulses, and having a number of selectively operable control elements equal to the number

of delayed pulses in said set, each control element having an input connected to receive one delayed pulse of said set of delayed pulses, an output and a control input which upon being energized passes said one delayed pulse to said output, said output of each control element being commonly connected to an output of said first selector means, second selector means connected to said delay circuit means to receive said set of delayed pulses, and having a number of selectively operable control elements equal to the number of delayed pulses in said set, each control element having an input connected to receive one delayed pulse of said set of delayed pulses, an output and a control input which upon being energized passes said one delayed pulse to said output, said output of each control element being commonly connected to an output of said second selector means,

logic circuit means for generating pulses formed from pulses from said first and second selector means, and selectively settable means for energizing the input of one control element of said first selector means and the input of one control element of said second selector means, whereby the pulses generated by said logic circuit means depends upon which control elements of said first and second selector means are energized.

4,165,491

### CIRCUIT FOR DETECTING ZERO CROSSING POINTS FOR DATA SIGNAL

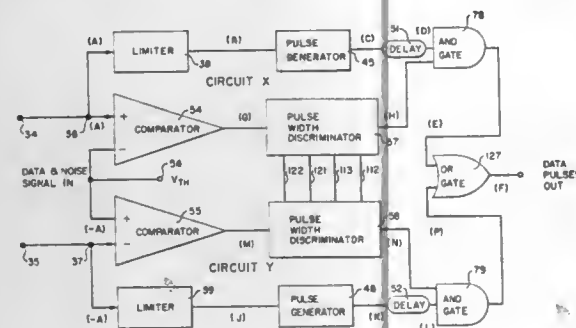
Arthur P. Geffon, Sunnyvale, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 739,832, Nov. 8, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,654

Int. Cl.<sup>2</sup> H03K 5/153

U.S. Cl. 328—150

4 Claims



1. A circuit for detecting the zero crossover point for data in a data modulated signal subject to noise and wherein the data has an amplitude and pulse width of a predetermined minimum magnitude and positive going and negative going modulations, said circuit comprising, in combination:

circuit means for generating an inverted signal by inverting the data modulated signal;

a first circuit including means for generating a first signal having pulses responsive to each zero crossover point of the data modulated signal;

a second circuit including means for receiving and deleting the noise from said data modulated signal and for generating a second signal having pulses responsive to each zero crossover point of the positive going modulations of the data modulated signal with noise deleted;

a third circuit including means for receiving and deleting the noise from said inverted signal and for generating a third signal having pulses responsive to all zero crossover points of the positive going modulations of the inverted signal with noise deleted; and

fourth circuit means for receiving said first, second and third signals and for generating an output signal having pulses responsive to the concurrent occurrence of pulses in the first signal and the second and third signals by comparing the pulses of the second and third signals in alternating

sequence with the pulses of said first signal and transmitting pulses in the output signal only when there are concurrent pulses in the first and second signals alternately with the concurrent occurrence of pulses in the first and third signals.

4,165,492

### RECIRCULATION CIRCUIT FOR REPETITION OF AN ANALOG PULSE SIGNAL

Marcel Motola, and Yves Besson, both of Paris, France, assignors to Thomson-CSF, Paris, France

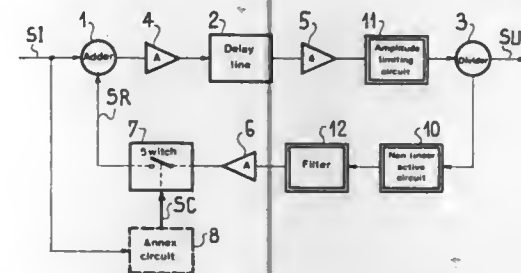
Filed Mar. 7, 1978, Ser. No. 884,213

Claims priority, application France, Mar. 11, 1977, 77 07332

Int. Cl.<sup>2</sup> H03B 1/04; G11B 13/00

U.S. Cl. 328—165

4 Claims



1. A recirculation circuit for the repetition of an analog pulse signal of the type comprising a loop formed by a delay circuit for producing a delay at least equal to the duration of the signal, and

a divider and an adder circuit respectively in connection with the output and input of said delay circuit for respectively taking off a fraction of said delayed signal and re-inserting it in the input of said delay circuit by means of said adder circuit, and

amplifying means having linear characteristic inserted in said loop for producing a predetermined loop gain and switch means for closing said loop during a predetermined time corresponding to the envisaged number of repetition, said loop further comprising,

an active circuit having a nonlinear gain characteristics such that the gain is less than unity for signals of amplitude lower than a threshold value and higher than unity for signals of amplitude higher than said threshold value, that is to say outside that defined by said threshold value, the latter being determined in relation with the amplitude of the useful signal to be repeated and of the signal to noise ratio presented by said input signal so as to substantially attenuate the parasitic noise signals, and an amplitude limiting circuit for repeating said signal with a constant amplitude.

4,165,493

### PROTECTED AMPLIFIER APPARATUS

Timothy A. Harrington, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 17, 1978, Ser. No. 896,650

Int. Cl.<sup>2</sup> H03G 3/20

U.S. Cl. 330—207 P

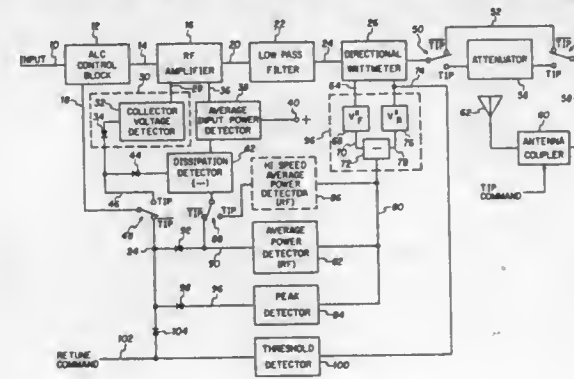
7 Claims

1. Amplifier apparatus for coupling to an antenna load comprising, in combination:

RF amplifier means including RF signal input means, gain control means and RF signal output means;

average power detection means, connected between said RF signal output means and said gain control means of said RF amplifier means, for controlling the level of said RF amplifier means during tuning in accordance with the

difference between the average power delivered to a load and the average DC input power supplied to the amplifier



to maintain dissipation in the output stage of said RF amplifier means within prescribed limits.

4,165,494

### BI-STATE LINEAR AMPLIFIER

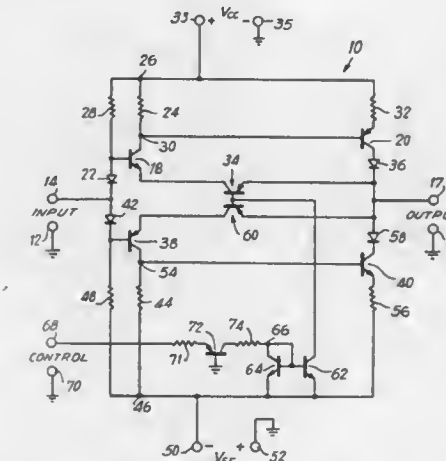
Barry E. Becker, Smithtown, N.Y., assignor to Circuit Technology Incorporated, Farmingdale, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,967

Int. Cl.<sup>2</sup> H03F 3/18

U.S. Cl. 330—267

6 Claims



1. A bi-state amplifier comprising an input; an output; amplifier circuit means connected between said input and output for substantially linear amplification and including at least one amplifier circuit path; means for selectively applying a control signal having at least first and second states; and control circuit means coupled to receive said control signal from said control signal means and coupled to said amplifier circuit means for maintaining closed said at least one amplifier circuit path when said control signal is in a first state and for opening said at least one amplifier circuit path when said control signal is in a second state, said amplifier circuit means being adapted to present a high output impedance when said at least one amplifier circuit path is opened and a low output impedance when said at least one amplifier circuit path is closed.

4,165,495

### CIRCUIT SYSTEM FOR REPRODUCING A SIGNAL FROM A MOVING RECORD CARRIER

Hiroo Takahashi, Chigasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

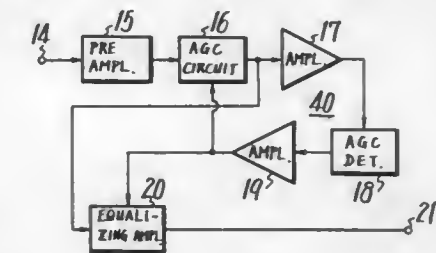
Filed Jun. 30, 1978, Ser. No. 920,676

Claims priority, application Japan, Jul. 20, 1977, 52-86999

Int. Cl.<sup>2</sup> H03G 9/26; G11B 7/00

U.S. Cl. 330—283

8 Claims



1. A circuit system for reproducing a signal from a moving record carrier comprising:

(a) a circuit input to which is supplied a signal read out from the moving record carrier with variations in the level introduced due to the shift of a reading out position on the carrier;

(b) an automatic gain control circuit loop connected to said input, said circuit loop including a gain control circuit supplied with said read out signal and a gain control signal generating circuit connected to an output of said gain control circuit for producing a gain control signal varying in response to the level of said read out signal supplied to said gain control circuit and supplying said gain control signal to said gain control circuit for automatically controlling the gain thereof;

(c) a variable gain amplifier circuit having a variable gain-frequency characteristic varying in correspondence with the frequency of a signal applied thereto to be amplified, said variable gain amplifier circuit being connected to the output of said gain control circuit and being supplied with said gain control signal produced in said automatic gain control circuit loop to be controlled in its variable gain-frequency characteristic in response to said gain control signal; and

(d) a circuit system output connected to the output of said variable gain amplifier circuit to derive thereat the read out signal compensated for said variations in the level.

4,165,496

### OPTICAL FIBER LIGHT TAP

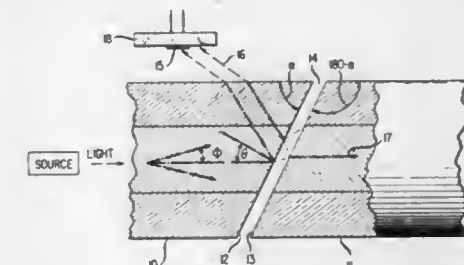
Mauro Di Domenico, Jr., Bernardsville; Michael A. Karr, III, New Providence, and Theodore C. Rich, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1977, Ser. No. 861,288

Int. Cl.<sup>2</sup> H01S 3/13; G02B 5/14

U.S. Cl. 331—94.5 S

10 Claims



1. A light tap for use in an optical communications system including a source of an optical signal and a first optical fiber to transmit said signal, said light tap comprising:



- (a) a segment of said first optical fiber having a first planar endface intersecting the longitudinal axis of said first fiber at an angle of  $\alpha$ ;
- (b) a second optical fiber in substantially coaxial alignment with said segment and having a second planar endface intersecting the longitudinal axis of said second fiber at an angle of  $(180 \text{ degrees} - \alpha)$ , said first and second endfaces being adjacent to each other and forming a gap therebetween;
- (c) a dielectric film filling said gap which has a different refractive index than said first and second fibers; and
- (d) means disposed between said source and said first endface for exciting a steady-state mode distribution of said signal.

4,165,497

## WIDEBAND RF SWITCHING MATRIX

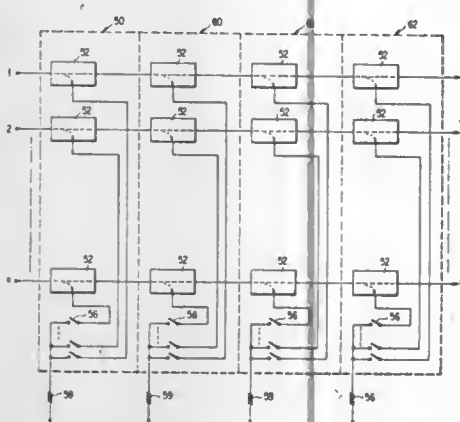
Ronald E. Irons, Fairfax, Va., assignor to Aiken Industries Inc., Alexandria, Va.

Filed Nov. 11, 1977, Ser. No. 850,500

Int. Cl.<sup>2</sup> H01P 1/10

U.S. Cl. 333—101

5 Claims



1. A wideband RF switching matrix comprising:
- a plurality of input conductors;
  - an output conductor;
  - an equal plurality of lumped element directional couplers associated respectively with the plurality of input conductors, each lumped element directional coupler having an input port connected to a respective input conductor for receiving signal power applied to the input conductor, and a coupled output port for tapping off part of the signal power; and
  - an equal plurality of switching means connected to respective coupled output ports of the plurality of lumped element directional couplers for providing selectively closable signal paths from the coupled output ports to the output conductor.

4,165,498

## VARIABLE DELAY DEVICE

Masayuki Hongu, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 24, 1978, Ser. No. 871,850

Claims priority, application Japan, Feb. 10, 1977, 52/13988

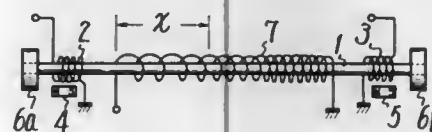
Int. Cl.<sup>2</sup> H03H 9/30, 9/00; H01L 41/12, 41/20

U.S. Cl. 333—144

6 Claims

1. A device for variably delaying an electrical signal, comprising: an elongated magnetostrictive member made of a material the Young's modulus of which is variable in response to variations in the intensity of a magnetic field applied thereto; an input transducer located at one end portion of said magnetostrictive member for converting the electrical signal to be delayed into a supersonic wave within said magnetostrictive member; an output transducer located at the other end portion

of said magnetostrictive member for converting supersonic waves within said magnetostrictive member into an electrical signal; and means for producing a magnetic field along said



magnetostrictive member between said input and output transducers, which magnetic field varies monotonically in intensity along the direction of elongation of said magnetostrictive member.

4,165,499

## CHANNEL-SELECTING, PRESETTABLE, ROTARY TYPE TUNING DEVICE

Tamaki Ohashi, and Susumu Sato, both of Tokyo, Japan, assignors to Nihon Technical Kabushiki Kaisha, Tokyo, Japan

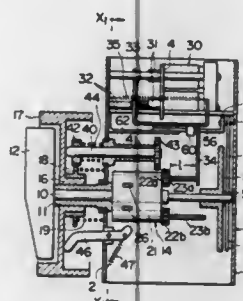
Filed Aug. 9, 1977, Ser. No. 823,165

Claims priority, application Japan, Aug. 13, 1976, 51-97286; Aug. 27, 1976, 51-102421; Nov. 25, 1976, 51-158044[U]

Int. Cl.<sup>2</sup> H03J 5/10

U.S. Cl. 334—47

10 Claims



1. A channel-selecting, presettable rotary type tuning device comprising:

- (a) a rotatable tuning unit having a plurality of tuning elements located at predetermined angular spacings along a circumferential end surface of said tuning unit; each said tuning element being movable in a direction parallel to the rotational axis of said tuning unit;
- (b) a channel selecting shaft parallel to the rotational axis of said tuning unit and adapted to be manually rotated in either a clockwise or counter-clockwise direction, the tuning unit being rotated in response to the rotation of the channel selecting shaft;
- (c) a slide member having one end coupled to a variable electrical tuning element and the other end adapted to selectively abut one of the tuning elements as said tuning unit is rotated in order to select a desired channel, the frequency of the selected channel being determined in accordance with the position of the tuning element abutting said slide member;
- (d) a tuning shaft having an operating knob and arranged in parallel relationship with said channel selecting shaft and adapted to be rotated when said knob is depressed, the depression of said knob causing the tuning shaft to slide axially and cause a first transmission member to operably engage a second transmission member associated with each said tuning element whereby rotation of said tuning shaft varies the position of the tuning element abutting said slide member to preset a desired channel frequency;
- (e) cam means adapted to rotate when said channel selecting shaft and said tuning unit are rotated; and
- (f) lever means cooperatively associated with said cam means and said slide member whereby the rotation of said

cam means causes the lever means to displace the slide member from its abutment with a preselected tuning element and maintain said displacement until the next channel is selected whereupon said slide member returns to a position abutting the tuning element corresponding to the next selected channel.

4,165,500

## TUNING INDICATING DEVICE HAVING A TWO-DIMENSIONAL DISPLAY OF TWO VALUES

Akira Misawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

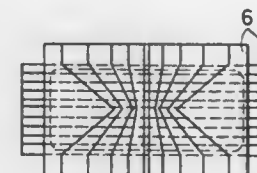
Filed Jan. 19, 1978, Ser. No. 870,964

Claims priority, application Japan, Jan. 24, 1977, 52-6626

Int. Cl.<sup>2</sup> H03J 1/04, 1/02; H01J 1/62

U.S. Cl. 334—86

7 Claims



1. A tuning indicating device in a radio tuner employing a first signal representing the strength of a selectively received signal and a second signal representing deviation of the frequency of said received signal from a predetermined central frequency, comprising:

- a display unit for displaying a two-dimensional pattern wherein each of the dimensions changes in response to a different drive signal; and
- drive means for converting said first and second signals into said drive signals.

4,165,501

## POSITION SENSING SYSTEM

Edgar A. Bongort, Southfield, and William T. Cruickshank, Pontiac, both of Mich., assignors to B/W Controls Inc., Birmingham, Mich.

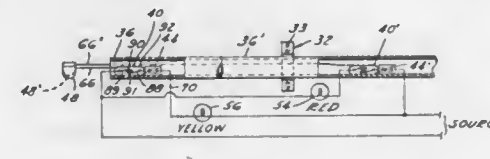
Filed Oct. 25, 1977, Ser. No. 845,294

The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H01H 36/00

U.S. Cl. 335—206.

14 Claims



1. In a position sensing system the combination comprising: a carrier whose position is to be sensed, means supporting the carrier for movement along a predetermined path, a reed switch disposed adjacent said predetermined path and having reeds extending substantially parallel thereto, means for establishing a magnetic bias field across the reeds with its field strength sufficient to hold the reeds closed but insufficient to close them, and magnet means movable with the carrier adjacent said predetermined path for magnetically influencing said reed switch, said magnet means establishing a magnetic field having leading and trailing field portions of opposite direction for sweeping the switch reeds and one field portion augmenting the bias field to close the reeds as the magnet means passes the switch moving in one direction

and the other field portion opposing the bias field opening the switch reeds as the magnet means passes the switch moving in the opposite direction at substantially the same point where the reeds were closed.

4,165,502

## CURRENT LIMITER ASSEMBLY FOR A CIRCUIT BREAKER

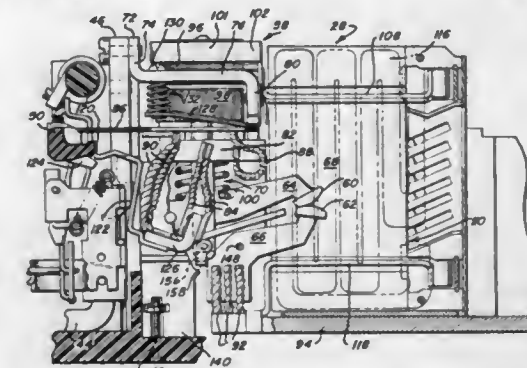
Paul R. Andersen, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed Jun. 8, 1977, Ser. No. 804,693

Int. Cl.<sup>2</sup> A01H 75/10

U.S. Cl. 335—39

19 Claims



1. A current limiting assembly for a circuit breaker having a pair of serially connected main circuit breaker contacts operable to an open position in response to the movement of a trip bar in response to either an overheat or overcurrent condition, the improvement comprising:

- a pair of current limiting contacts,
- an electromagnet assembly including a low resistance winding connected to said main contacts and operable in response to a high fault current for opening said current limiting contacts, and
- a bimetal serially connected between said winding and one of said current limiting contacts for responding to an overheat condition to move said trip bar for opening said main contacts.

4,165,503

## HYDROSTATIC SEISMIC SENSOR

Allen B. Holmes, Rockville, and Stacy E. Gehman, Takoma Park, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1977, Ser. No. 858,983

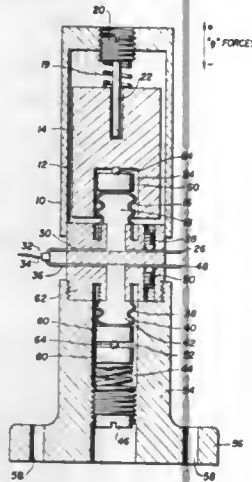
Int. Cl.<sup>2</sup> G01V 1/16

U.S. Cl. 340—17 R

5 Claims

1. A hydrostatic seismic accelerometer comprising:
- a housing including a first interior chamber;
  - a sensing mass in said first chamber, said sensing mass having first and second coaxial cavities;
  - an alignment pin attached to said housing and extending into said first cavity for maintaining the alignment of said sensing mass;
  - a first flexible closed reservoir, containing a sensing fluid, extending into said first chamber and into said second cavity to support said sensing mass;
  - a first spring encircling said alignment pin and biasing said sensing mass against said first reservoir;
  - a mounting base connected to said housing, said base having a second interior chamber;
  - a second flexible closed reservoir, containing a sensing fluid, extending into said second chamber;
  - a second spring biased against said second reservoir;

a differential pressure transducer having one side connected to said first reservoir and the other side connected to said



second reservoir; and valve means for venting said second reservoir to the atmosphere.

4,165,504

## CMOS DECODER

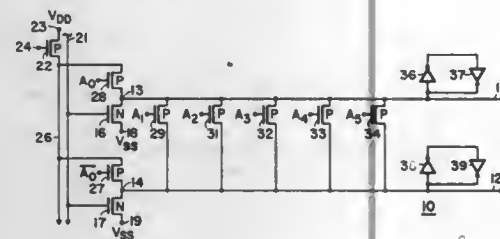
James J. Remedi, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1978, Ser. No. 895,849

Int. Cl.<sup>2</sup> H04Q 3/00

U.S. Cl. 340—167 R

10 Claims



1. A digital data decoder having a plurality of circuits comprising: a first and a second output; first means coupled to the first output to controllably precharge the first output; second means coupled to the second output to controllably precharge the second output; a first transistor having a first and a second current carrying electrode and having a control electrode, the first electrode being coupled to a first supply voltage, the control electrode being coupled to a timing signal to enable the first transistor at a predetermined time; a second and third transistor each having first and second electrodes and each having a control electrode, the first electrode of the second and third transistors being coupled to the second electrode of the first transistor, the second electrode of the second transistor being coupled to the first output, the second electrode of the third transistor being coupled to the second output, the control electrode of the second transistor being coupled to a least significant bit of a coded digital signal, the control electrode of the third transistor being coupled to the complement of the signal coupled to the control electrode of the second transistor; a first and a second pair of back-to-back inverters, the first pair of inverters being coupled to the first output and the second pair of inverters being coupled to the second output, the back-to-back inverters being capable of maintaining the outputs in a static state; and a plurality of transistors coupled between the first and second output, each of the plurality of transistors having a control electrode coupled to a different bit of the coded digital signal.

# 4,165,505 APPARATUS FOR REMOTELY DETERMINING THE ANGULAR ORIENTATION, SPEED, AND/OR DIRECTION OF ROTATION OF OBJECTS

Charles J. Cain, P.O. Box 991, Greenville, N.C. 27834, and Arthur T. Shankle, 5111 Falls of Neuse Rd., Raleigh, N.C. 27609

Division of Ser. No. 612,684, Sep. 12, 1975, Pat. No. 4,007,454.

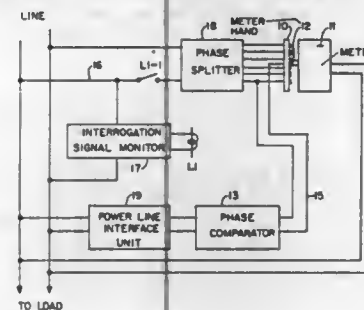
This application Jan. 3, 1977, Ser. No. 756,117

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> G08C 19/10

U.S. Cl. 340—200

5 Claims



1. A method for remotely monitoring the angular position of a meter hand as it rotates about an axis of rotation and defines a circular path, which meter hand has a dielectric constant different than that of the surrounding medium, comprising the steps of:

- generating a rotating electric field which defines a path parallel to the plane defined by the path of the rotating meter hand and which field includes therein, at least a portion of the meter hand, wherein the step of generating said rotating electric field comprises:
  - arranging a plurality of electrodes on a stationary body in a planar circular array around the center point aligned to said axis of rotation of said meter hand;
  - locating a reading electrode on said body at said center point whereby a rotating electric field extending between said plurality of said electrodes and said reading electrode will be generated; and
  - connecting successive electrodes in said array to successive phases of polyphase voltage;
- detecting voltage changes induced at said reading electrode caused by said electric field intersection of said meter hand.

4,165,506

# CONTROL UNIT FOR THE BRIGHTNESS OF VIDEO SIGNALS ON A RASTER SCAN DISPLAY

Antoon H. Brands, Borne, and Jouke Gietema, Hengelo (O), both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo (O), Netherlands

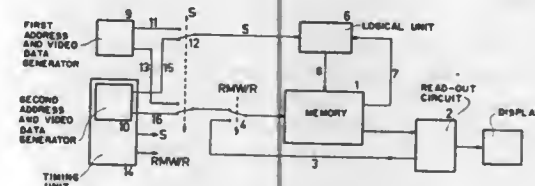
Filed Jun. 8, 1977, Ser. No. 804,720

Claims priority, application Netherlands, Jun. 26, 1976, 7606745

Int. Cl.<sup>2</sup> G06K 15/20

U.S. Cl. 340—706

10 Claims



1. A control unit for a raster scan display comprising: a random access memory comprising a plurality of elements

each containing only the brightness data associated with a video signal to be displayed at a predetermined position on the raster scan display corresponding to the memory address of said element;

a readout circuit connected to said memory which functions to provide a memory address to said memory and to read out said data at the corresponding one of said memory elements and present a corresponding video signal on the raster scan display;

switching means connected to said memory which function to alternately supply the memory with an address pertaining to data in one of said memory elements to be modified, and with an address provided by the readout circuit pertaining to data in one of said memory elements required to be read out of said memory; and

a logical unit connected to said switching means and said memory which functions to independently overwrite the data in ones of said elements of said memory.

4,165,507

# NON-LINEAR DIGITAL TO ANALOG CONVERSION BY INTERMEDIATE CONVERSION TO TIME INTERVAL

Kian K. Ong, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

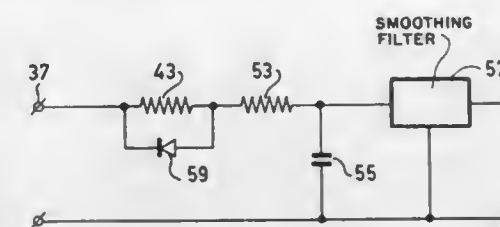
Filed Oct. 7, 1976, Ser. No. 730,674

Claims priority, application Netherlands, Oct. 9, 1975, 7511840

Int. Cl.<sup>2</sup> H03K 13/20

U.S. Cl. 340—347 DA

6 Claims



1. An improved digital-to-analog converter in which a digital signal is converted into a periodical pulse signal and then filtered to yield a direct current, said converter including an input means which converts a digital signal to a periodical pulse signal, a filter circuit including a filter for converting a pulse signal to direct current which serves as an input to an oscillator, wherein the improvement comprises:

an electrical network which receives as input a periodical pulse signal and outputs a signal to said filter having for said pulse signal a charge time constant differing from its discharge time constant such that a non-linear relation is obtained between the value of the input signal to said network and the amplitude of the output signal of said filter circuit;

said network serving as the input circuit to said filter, comprising: an input means to receive said periodical pulse signals; a first resistive means connected to said input means; a diode connected in parallel with said first resistive means; second resistive means connected in series to the output of said first resistive means and said diode; capacitive means connected in series to the output of said second resistive means and the input to said filter; said diode serving to shunt at least partially said resistive means; the output of said capacitive means being the output of said network and serving as input to said filter; said filter having an input means connected in series with the output of said network, said filter serving to smooth the signal applied to its input.

4,165,508

# METHOD AND APPARATUS FOR DETECTING A PEAK VALUE OF AN ANALOG SIGNAL

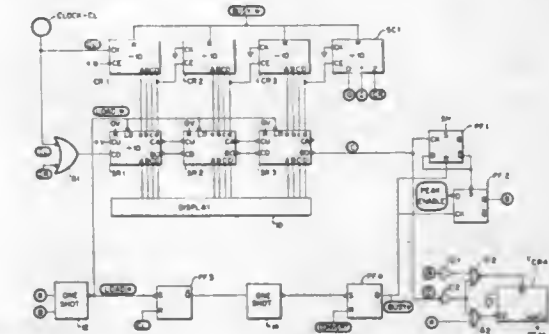
LeRoy D. Barter, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 28, 1978, Ser. No. 882,286

Int. Cl.<sup>2</sup> H03K 13/02

U.S. Cl. 340—347 AD

4 Claims



1. In combination with apparatus for measuring an analog signal of the type which includes converter means for sampling said analog signal at successive times having counting means for counting pulses from a source of digital pulses during time intervals following each sampling time to provide a digital pulse count of the amplitude value for each sample of said analog signal and for generating a first timing signal upon the completion of each digital pulse count, said counting means being adapted to continue to count beyond the value of said digital pulse count, apparatus for detecting peak values of said analog signal comprising:

register means for (1) storing a prior digital pulse count corresponding to an amplitude value of said analog signal at a prior sampling time, (2) recounting said prior count, and (3) generating a second timing signal when said recount is completed;

means responsive to a current sampling of said analog signal for enabling said register means to recount said prior digital pulse count simultaneous with said counting means counting toward the current digital pulse count for the current sample of said analog signal; and means responsive to the later occurring of said first and second timing signals for storing the digital pulse count then attained by said counting means in said register means, whereby the digital pulse count stored in said register means is always the greater of said prior digital pulse count and said current digital pulse count.

4,165,509

# DUAL LIQUID LEVEL MONITOR

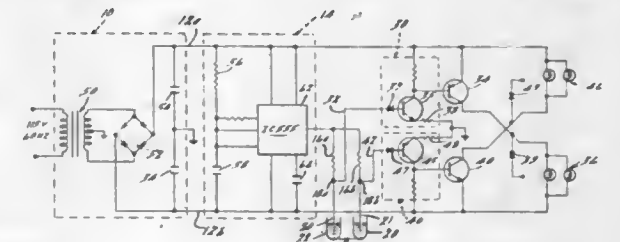
Donald J. Betts, St. Charles, and Martin W. Hamilton, Arlington Heights, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 24, 1977, Ser. No. 827,297

Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 340—620

9 Claims

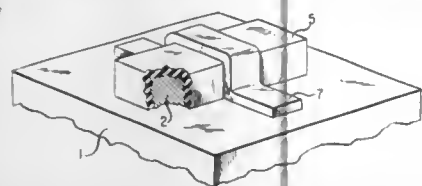


1. A device for sensing the liquid level in a plurality of





electrode at room temperature a continuous visible light emission is obtainable whereby when a voltage is applied across



said first and second electrode at room temperature a continuous visible light emission is obtainable.

**4,165,516**  
**SEMICONDUCTOR DEVICE COMPRISING TRANSISTOR WITH TWO-PART BASE AND COLLECTOR ZONES AND METHOD OF MANUFACTURING SAME**

Walter H. M. M. Smulders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

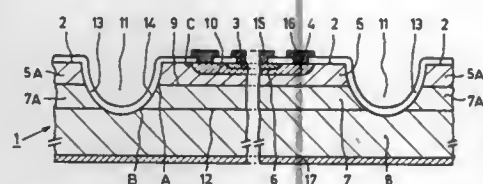
Continuation of Ser. No. 668,826, Mar. 22, 1976, abandoned.

This application Apr. 27, 1978, Ser. No. 900,816

Claims priority, application Netherlands, Apr. 28, 1975, 7504990

U.S. Cl. 357—34 Int. Cl.<sup>2</sup> H01L 29/72

19 Claims



1. A semiconductor device comprising:
  - (a) a semiconductor body having a substantially flat surface and comprising at least a transistor,
  - (b) said transistor having,
    - (i) an emitter zone of first conductivity type adjoining said flat surface,
    - (ii) a base zone of second conductivity type which adjoins said flat surface and surrounds said emitter zone entirely, said emitter and base zones forming a first p,n junction which terminates at said flat surface, and
    - (iii) a collector zone of said first conductivity type which adjoins said base zone, said collector zone forming with said base zone a second p,n junction which extends substantially parallel to said surface, said base zone comprising both a more highly doped first part which entirely surrounds and completely contacts the emitter zone to form therewith said first p,n junction, and a lower and substantially homogeneously doped second part which adjoins said collector zone and forms therewith said second p,n junction, said two parts of said base zone mutually forming a certain junction terminating at said flat surface,
  - (c) a groove provided in said flat surface, which groove surrounds said base zone entirely and intersects said second p,n junction, said flat surface extending at both sides of said groove,
  - (d) said collector zone comprising a substantially homogeneous, lower-doped first part which forms said second p,n junction with said second part of said base zone and a more highly-doped second part which forms another junction with said first part of said collector zone, said other junction extending substantially parallel to said surface, said groove being provided at a distance from said first part of said base zone and being coated with an electrically insulating material which is substantially free of negative electric charges, which groove intersects only

said second, lower-doped part of said base zone and extends down into said second, more highly doped part of said collector zone, the bottom of said groove having such a high doping that the formation therein of an inversion layer is avoided.

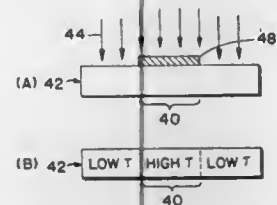
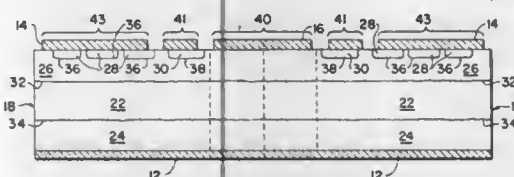
**4,165,517**  
**SELF-PROTECTION AGAINST BREAKOVER TURN-ON FAILURE IN THYRISTORS THROUGH SELECTIVE BASE LIFETIME CONTROL**

Victor A. K. Temple, Clifton Park, and B. Jayant Baliga, Schenectady, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 772,712, Feb. 28, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,832

U.S. Cl. 357—38 Int. Cl.<sup>2</sup> H01L 29/74

7 Claims



1. A thyristor semiconductor device protected against voltage breakover failure, said device for use in connection with means for applying voltage and for generating electrical currents, comprising a silicon substrate having on an obverse face an anode contact and on a reverse face a cathode contact and a gate contact, said gate contact being spaced laterally from said anode contact,
 

said substrate including a main thyristor region between the anode contact and the cathode contact, a gate subtransistor region between the anode contact and the gate contact and a gate emitter region substrate between the gate contact and the cathode contact establishing a pilot thyristor region, said pilot thyristor region being operatively coupled to said main thyristor region to turn on said main thyristor region when said pilot thyristor region is turned on, said gate subtransistor region being characterized by a locally longer minority carrier lifetime than the minority carrier lifetime in any area of the main thyristor region, such that excessive forward voltage causes currents initially to flow only in the gate subtransistor region and act to turn on said pilot thyristor region.

**4,165,518**  
**VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS**

Jun Hirai, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 18, 1977, Ser. No. 770,315

Claims priority, application Japan, Mar. 1, 1976, 51-21997

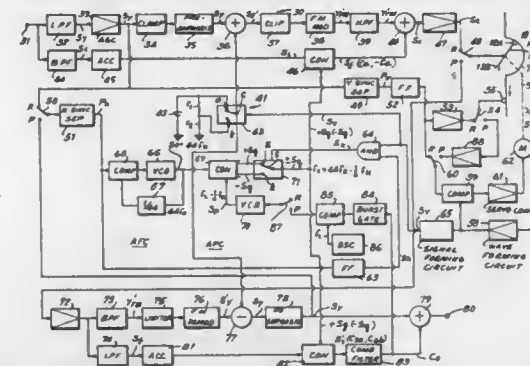
Int. Cl.<sup>2</sup> H04N 5/76; G11B 5/04; H04L 7/00

U.S. Cl. 358—8 68 Claims

1. Apparatus for recording video signals in successive parallel tracks on a record medium, comprising
 

modulating means for frequency modulating at least the luminance portion of said video signals on a carrier;

means for shifting the carrier frequency of the frequency modulated portion of the video signals between different first and second carrier frequencies which are in frequency interleaving relation to each other, said shifting means including a bias voltage generating means operative to alternatively provide first and second different bias



voltages by which said first and second carrier frequencies are respectively established; and means for controlling said shifting of the carrier frequency so as to record said frequency modulated portion of the video signals with said first and second carrier frequencies, respectively, in tracks which are next adjacent each other.

**4,165,519**  
**OPTICAL CONTROL SYSTEM FOR READ OUT FROM INFORMATION RECORDING MEDIUM**

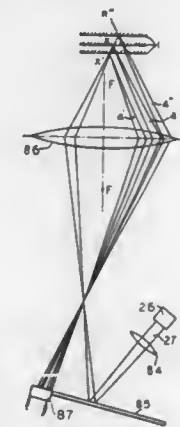
Kenjiro Goto, Urawa, Japan, assignor to Mansel Kogyo Kabushiki Kaisha, Saitama, Japan

Continuation-in-part of Ser. No. 492,531, Jul. 29, 1974, abandoned. This application Jan. 11, 1977, Ser. No. 758,464

Int. Cl.<sup>2</sup> H04N 5/76; G11B 7/12

U.S. Cl. 358—128

8 Claims



1. An optical control system for information read out of video and/or audio information optically recorded in a track on the surface of a disc-shaped information medium comprising:
 

light beam generating means for projecting a unitary light beam onto a single track on the information medium to read information,

means for focusing said unitary beam into a spot of predetermined transverse dimension at the locus of impingement thereof with the plane of said track and including an objective lens through which incident and reflected beams pass wherein the axes of said incident and reflected light beams deviate from the optical axis of said objective lens, means for selectively deflecting said unitary light beam transversely of the longitudinal axis of said track, photo-sensitive receptor means responsive to impingement of said reflected light beam after passing through said

objective lens and adapted to provide at least a first output signal component selectively indicative of the nature and magnitude of transversely directed departures of said spot from a predetermined desired positional relationship thereof relative to a predetermined edge of said track and a second output signal component selectively indicative of the nature and magnitude of departures of said spot from said predetermined transverse dimension thereof at the locus of impingement thereof with said plane of said track induced by variation in spacing between said track and said objective lens,

means responsive to said first signal component for selectively actuating said light beam deflecting means to return said spot into predetermined positional relation relative to the predetermined edge of said track, and

means responsive to said second signal component for selectively actuating said focusing means to refocus said light beam into said spot of predetermined transverse dimension in impinging relation with the plane of said track.

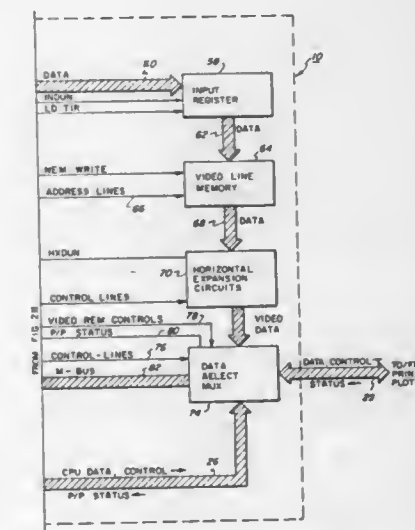
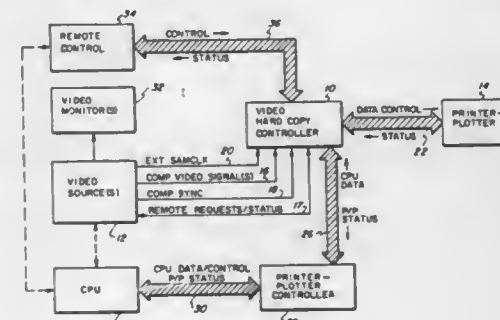
**4,165,520**  
**VIDEO HARD COPY CONTROLLER**  
Louis E. Wessler, Cupertino; Kenneth F. Koch, Mountain View, and Andrew J. Cleveland, Saratoga, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1977, Ser. No. 842,992

Int. Cl.<sup>2</sup> H04N 1/40

U.S. Cl. 358—280

27 Claims



1. A video hard copy controller comprising:
 

first means for receiving serial input video signals from a first source;

second means coupled to said first means for converting said serial input video signals into a first set of parallel digital signals; and

third means coupled to said second means for receiving said



first set of parallel digital signals, said third means including means for receiving a second set of parallel digital signals from a second source and means responsive to a control signal for selecting between said first and second sets of parallel digital signals for output to a hard copy generating device in order to produce a hard copy facsimile of the images represented by the selected set of parallel digital signals.

#### 4,165,521 VIDEO SIGNAL REPRODUCING SYSTEM WITH MOVEABLE HEAD FOR SLOW OR STOP TRACKING CONTROL

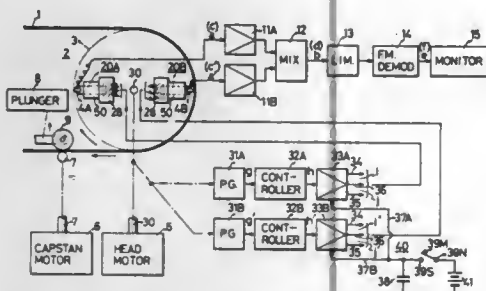
Yoshimi Watanabe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 731,763, Oct. 12, 1976. This application Jun. 2, 1978, Ser. No. 911,832

Claims priority, application Japan, Oct. 14, 1975, 50-123638 Int. Cl.<sup>2</sup> H04N 5/78; G11B 21/04, 21/10

U.S. Cl. 360-10

6 Claims



1. A system for reproducing a video signal recorded in successive parallel tracks on a recording medium, said system comprising:

transport means operative to transport said recording medium at a predetermined speed in a path to which said tracks are obliquely arranged;

mode-selecting means for selecting a normal signal reproducing mode in which said transport means is operative or a still signal reproducing mode in which said transport means is inoperative;

signal reproducing means for reproducing a video signal recorded in a respective one of said tracks by scanning along the respective track;

rotary support means which is rotated in both said normal and still signal reproducing modes;

bi-morph leaf means mounting said signal reproducing means on said rotary support means and having a rest condition in which said signal reproducing means scans said tracks in succession in response to the rotation of said rotary support means in said normal signal reproducing mode, said bi-morph leaf means being movable from said rest condition in either direction transverse to the direction of said tracks for correspondingly displacing said signal reproducing means relative to said rotary support means; and

control signal generating means to provide still mode control signals to said bi-morph leaf means by which the latter is moved from said rest condition for causing said signal reproducing means to repeatedly scan along a selected one of said tracks in said still signal reproducing mode, said control signal generating means including means for generating a saw-wave with the cycle thereof corresponding to the interval for scanning of one of said tracks by said signal reproducing means, an electric power source, drive circuit means receiving said saw-wave to correspondingly provide said still mode control signal to said bi-morph leaf means when said drive circuit means is powered by connection to said electric power source, switch means connecting said drive circuit means to said power source when said still signal reproducing mode is

selected and disconnecting said drive circuit means from said power source when said normal signal reproducing mode is selected, and a capacitor connected through said switch means to said electric power source, said capacitor being charged through said switch means in said still signal reproducing mode, and said capacitor being discharged to temporarily supply electric power to said drive circuit means when said switch means disconnects the drive circuit means from said power source in said normal signal reproducing mode.

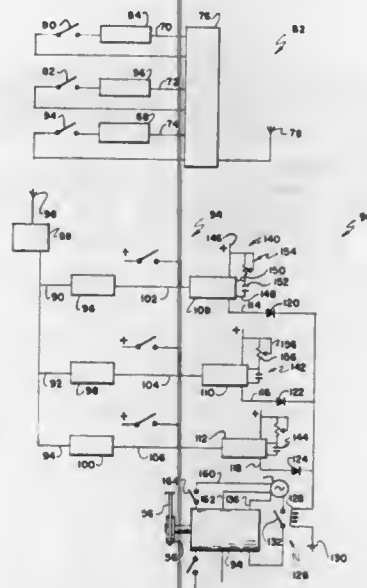
#### 4,165,522 VIDEO RECORDER AND PLAYBACK UNIT INCLUDING REMOTELY OPERABLE TIMED FAST FORWARD ADVANCE

Godfrey T. Moller, Guaranty Bank Plz., Corpus Christi, Tex. 78475

Filed May 9, 1978, Ser. No. 904,230  
Int. Cl.<sup>2</sup> G11B 15/46, 15/18

U.S. Cl. 360-73

12 Claims



1. A video recorder and playback unit, comprising;

a medium of substantially uniform recording characteristics between first and second locations, means for receiving transmitted audio and visual signals, and means for continuously encoding a signal representative of the transmitted audio signal and a signal representative of the transmitted video signal on the medium between the first and second locations;

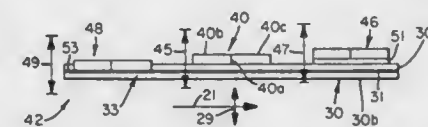
means for advancing the medium in a playback direction at a predetermined rate for playing back the encoded signals; means including a picture tube and a speaker operatively associated with the medium during advancement in the playback direction for displaying an image on the picture tube representative of the video signal and for creating sound energy representative of the audio signal; and means operable from a position remote from the picture tube during playback between the first and second locations for selectively advancing the medium in the playback direction a predetermined distance, independent of encoded signals, at a rate in excess of the predetermined rate.

#### 4,165,523 AUTOMATIC SCAN TRACKING USING AN ADDITIONAL SENSING MEANS ON A BIMORPH Richard A. Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,571  
Int. Cl.<sup>2</sup> G11B 5/52, 21/10, 21/18

U.S. Cl. 360-77

32 Claims



1. In a record/reproduce device having signal transducer means supported by mounting means for transducing data recorded along tracks on a record medium, comprising: an elongated positionable element extended between the mounting means and the transducing means for displacement of the transducing means in a generally transverse direction relative to the lengthwise direction of a subject track, sensing means mounted on said element adjacent the transducer means for continuously sensing two edges of one or more recorded tracks and developing a signal indicative of the lateral position of the transducer means with respect to said subject track during transduction of data with respect to said track for effecting transverse displacement of the transducer means with respect to said subject track during said transduction of data.

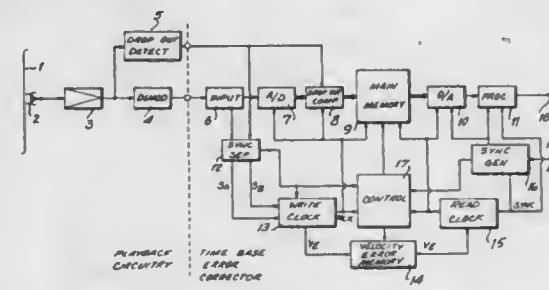
#### 4,165,524 VELOCITY ERROR CONTROL APPARATUS Takeshi Ninomiya, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,286

Claims priority, application Japan, May 31, 1977, 52/63727  
Int. Cl.<sup>2</sup> H04N 5/78

U.S. Cl. 360-36

11 Claims



1. Velocity error control apparatus for use in a video signal time base corrector of the type including a main memory having addressable storage locations for storing successive lines of video signals, write-in means including a write-in clock signal generator synchronized with time base errors in said video signal for writing successive lines of video signals into addressed storage locations at a write-in clock rate, and read-out means including a controllable read-out clock signal generator for reading out successive lines of video signals from addressed storage locations at a substantially constant read-out clock rate, said velocity error control apparatus comprising: velocity error detecting means for detecting velocity errors in successive lines of said video signals written into said main memory; velocity error storage means having a plurality of storage locations, each being operative to store a signal representing the velocity error of an associated line of video signals; velocity error read-out means for reading out from said velocity error storage means the velocity error signal associated with a line of video signals when said associ-

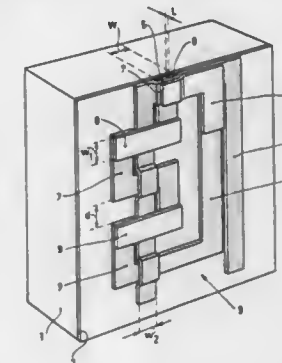
ated line of video signals is read out from said main memory; modifying means for modifying said read out velocity error signal with the velocity error signal associated with at least one adjacent line of video signals, said modifying means including means for defining a plurality of sections of a read out line of video signals and interpolating means for combining said read out velocity error signal with the velocity error signal associated with said at least one adjacent line of video signals to produce interpolated velocity error signals for respective ones of said sections of said read out line; and modulating means for modulating the read-out clock signals with said modified velocity error signal to compensate for the velocity errors in successive lines of said video signals.

#### 4,165,525 MAGNETIC HEAD HAVING A CORE PROVIDED ON A SUBSTRATE BY MEANS OF THIN-FILM TECHNOLOGY Gerrit J. Koel, and Willem F. Druyvesteyn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 15, 1978, Ser. No. 877,825  
Int. Cl.<sup>2</sup> G11B 5/12, 5/20

U.S. Cl. 360-125

3 Claims



1. A thin film magnetic transducing head which includes a non-magnetic substrate, a high permeability magnetic circuit structure of metallic ferromagnetic material disposed on said substrate and means for generating a magnetic flux in said magnetic circuit structure, said magnetic circuit structure having the form of a loop, said loop having two end portions which are positioned in spaced, overlapping relationship, said two end portions each being pole shoes which define a transducing gap between them, said flux generating means including an electrical conductor, a first portion of said conductor being located in said transducing gap, and wherein a portion of said loop forms a multiturn winding which is wound around a second portion of said electrical conductor.

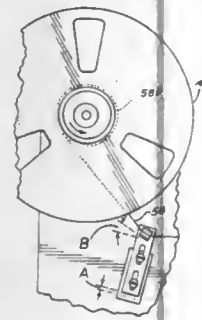
#### 4,165,526 MAGNETIC TAPE CLEANER Dennis R. Jones, 38250 SE, Lusted Rd., Boring, Oreg. 97009 Filed Jan. 23, 1978, Ser. No. 871,709 Int. Cl.<sup>2</sup> G11B 5/41, 23/50

U.S. Cl. 360-137

5 Claims

1. For use in a magnetic tape recorder having a recording head positioned between a pair of take-up reels, a tape cleaner comprising: cleaning means including opposed cleaning elements each having a planar surface for receiving a stretch of tape therebetween and for wiping the tape on both sides thereof as the tape is drawn therethrough; and mounting means for mounting said cleaning means on the recorder and for permitting said cleaning means to rotatably reorient in response to a change in the feed angle of the tape relative to said mounting means, said mounting

means also including a first member which is mounted on and shiftable relative to a second member, said first mem-



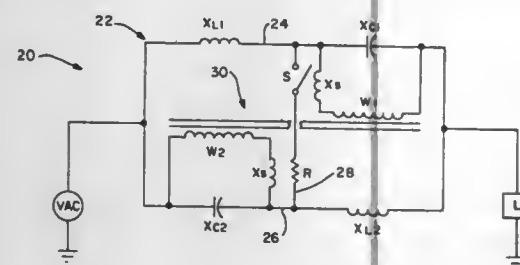
ber supporting said cleaning means and said second member being mounted on the recorder.

4,165,527

**CURRENT LIMITING CIRCUIT ARRANGEMENT**  
Derek A. Paice, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.  
Filed Jan. 11, 1978, Ser. No. 868,683  
Int. Cl.<sup>2</sup> H02H 9/04

U.S. Cl. 361-113

11 Claims

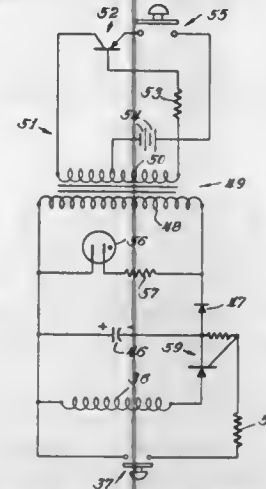


5. A current limiting circuit arrangement comprising:
- a first circuit including inductive reactance and capacitive reactance which are connected together in series and tuned to resonate at a given frequency;
  - a second circuit substantially identical to said first circuit and connected in parallel therewith during normal operation of the circuit arrangement;
  - a third circuit connected across said first and second circuits and including a resistor and means for opening said third circuit during said normal operation and closing said third circuit in response to predetermined abnormal operation conditions of the circuit arrangement; and
  - means for maintaining the voltage across the capacitive reactance in said first circuit and the voltage across the capacitive reactance in said second circuit equal to one another during said normal operation when said first and second circuits are in parallel whereby to maintain the current through said first and second circuits equal even though the capacitive reactances in the first and second circuits vary from one another, so long as these latter circuits remain parallel and their inductive reactances remain equal, said means including a voltage transformer having a pair of windings with a 1:1 turns ratio, one of said windings being connected across one of said capacitive reactances and the other winding being connected across the other capacitive reactance.

**4,165,528**  
**FAULT INDICATOR AND MEANS FOR RESETTING SAME**

Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60062  
Division of Ser. No. 708,549, Jul. 26, 1976, Pat. No. 4,086,529.  
This application Feb. 13, 1978, Ser. No. 877,470  
Int. Cl.<sup>2</sup> G01R 31/02  
U.S. Cl. 361-156

5 Claims



1. Means for resetting the pivoted target of a fault indicator of the type having a generally cylindrical housing, a target mounted for rotation in a plane generally perpendicular to the axis of said housing at one end thereof and including a target permanent magnet mounted for rotation with said target, a stationary permanent magnet within said housing for biasing said target magnet to position said target in a fault indicating position, and means including a pair of demagnetizable pole pieces extending longitudinally in parallel-shaped relationship within said housing for biasing said target magnet to position said target in a reset position, comprising in combination:
- a receptacle dimensioned for telescopic engagement with said housing;
  - a winding coaxially disposed within said receptacle for magnetic communication with said pole pieces when said housing is seated in said receptacle; and
  - means for energizing said winding from a source of direct current.

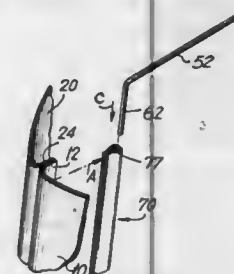
4,165,529

**LAMP SHADE AND KNOCK-DOWN KIT FOR FORMING SAME**

Allan Hagelthorn, 66 E. 80 St., New York, N.Y. 10021  
Filed Jan. 23, 1978, Ser. No. 871,555  
Int. Cl.<sup>2</sup> F21V 1/06

U.S. Cl. 362-352

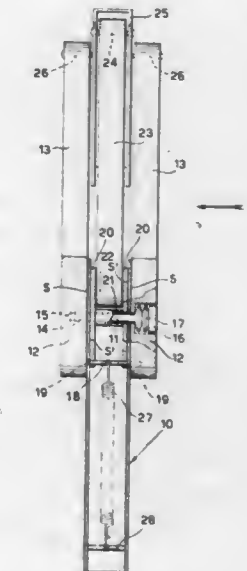
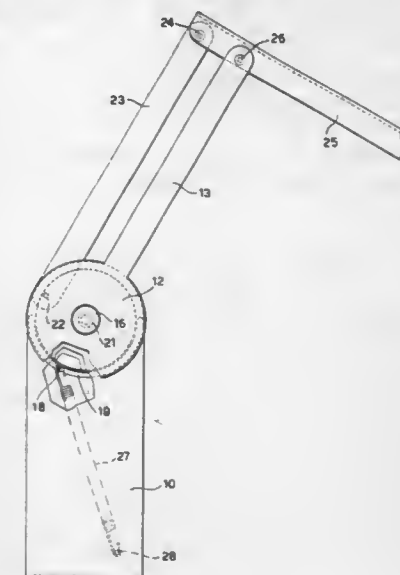
12 Claims



1. A knock-down kit for forming a lamp shade and analogous articles, comprising:
- a plurality of panels each having opposed longitudinally-extending side edge regions;
  - means for snappingly engaging adjacent side edge regions of each two adjacent panels, including
  - a plurality of longitudinally-extending ribs each having a

pair of wall portions bounding a generally U-shaped channel, at least one of said wall portions of each rib being resilient and movable away from the other of said wall portions of the respective pair, in response to insertion of a panel side edge region into an associated channel, between a non-clamped position, and a clamped position in which said wall portions of each pair receive therebetween with snap-type closure action a side edge region of one panel and a side edge region of another adjacent panel; and

- means for supporting said snappingly-engaged panels in a predetermined assembled orientation relative to each other, including
- a plurality of support elements each mountable on a respective rib to thereby form a lamp shade.



ing member and at least one of said pivoted heads to balance the arm assembly.

4,165,530

**ARTICULATED-ARM SUPPORTING MEMBER, ESPECIALLY FOR LAMPS**

George J. Sowden, Milan, Italy, assignor to I Guzzini S.P.A., Recanati, Italy  
Filed Jul. 25, 1978, Ser. No. 927,897  
Claims priority, application Italy, Jul. 28, 1977, 26262 A/77  
Int. Cl.<sup>2</sup> F21V 21/26

U.S. Cl. 362-401

5 Claims

1. An articulated-arm support device for lamps, comprising: a support member having an upper portion formed as a pair of parallel upwardly extending walls; a pair of side arms terminating at one end with disclike heads external with respect to said parallel walls of the supporting member and being coaxially pivoted to said parallel walls through a traverse pin; a central arm having one end eccentrically pivoted to a pair of mutually spaced lateral discs, coaxially and pivotally mounted on said pin internally to said walls of said supporting member; a further arm, pivoted to the other end of said central and side arms; first resilient means being associated with said pin adapted to resiliently force said heads, walls and discs along the axis of

4,165,531

**DATA GENERATOR FOR DISC FILE ADDRESSES**  
Peter L. Krause, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.  
Continuation of Ser. No. 220,397, Jan. 24, 1972, abandoned, which is a continuation of Ser. No. 866,502, Oct. 15, 1969, abandoned. This application Apr. 21, 1977, Ser. No. 789,395  
Int. Cl.<sup>2</sup> G06F 13/04

U.S. Cl. 364-200

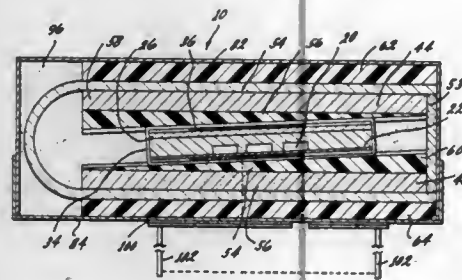
3 Claims

1. In an address writing system having address generating means responsive to applied clock signals for sequentially generating address data items to be written at spaced predetermined locations in an address track of a moving information storage medium, wherein the number of applied clock signals required by said address generating means for generating an address data item is variable, the improvement comprising: writing means responsive to said address generating means for sequentially writing address data items in said address track of said storage medium;





said printed circuit board means containing electrical conductor means for interchip communication and for communication to external devices, a plurality of drive coils for providing a magnetic field rotating in the plane of said chip means, means defining chamber means formed in part by said rigid portion of said circuit board for spacing said drive coils from said chip means,



yoke means with legs spaced from but juxtaposed said coils and having parallelepiped-shaped bias magnets located with respect to said drive coils and said chip means to provide a magnetic field normal to the plane of said chip means, and discrete wedge-shaped taper means disposed between said bias magnets and said coil means for positioning chip means with respect to said bias magnets to provide a magnetic gradient on said chip means.

4,165,537

**ANALOG CHARGE TRANSFER APPARATUS**

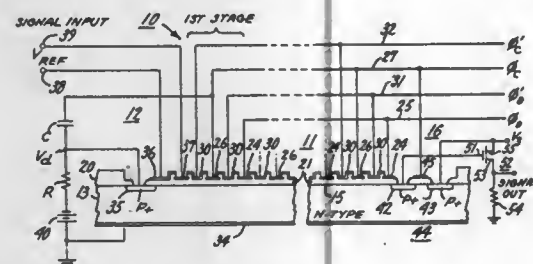
William E. Engeler, and Richard D. Baertsch, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,012

Int. Cl.<sup>2</sup> G11C 27/00, 19/28

U.S. Cl. 365—45

5 Claims



1. Charge transfer apparatus comprising a semiconductor substrate of one conductivity type having a major surface, a first electrode insulatingly overlying a first region of said substrate adjacent said major surface, a second electrode insulatingly overlying a second region of said substrate adjacent said major surface and contiguous to said first region, a region of opposite conductivity type in said major surface and coupled to said first region, means for applying a reference voltage to said first electrode to establish a surface potential in said first region corresponding to said reference voltage, means for applying a signal voltage to said second electrode to establish a surface potential in said second region corresponding to said signal, means for biasing said region of opposite conductivity type to provide a surface potential therein of a value unfavorable for the transfer of charge from said region of opposite conductivity type to said first region, a third electrode insulatingly overlying a third region of said

substrate adjacent said major surface and contiguous to said second region, a fourth electrode insulatingly overlying a fourth region of said substrate adjacent said major surface and contiguous to said third region, means for applying a first clock voltage to said third electrode to establish a surface potential in said third region corresponding to said first clock voltage, means for applying a second clock voltage to said fourth electrode to establish a surface potential in said fourth region corresponding to said second clock voltage, said second clock voltage having a first value over a first portion of a cycle thereof which is unfavorable for the transfer of charge from said second region to said fourth region and having a second value over a second portion of said cycle which is favorable for the transfer of charge from said second region to said fourth region, said first clock voltage having a first value during said first portion of said cycle of said second clock voltage which inhibits the transfer of charge from said second region to said fourth region and having a second value during said second portion of said cycle of said second clock voltage which enables the transfer of charge from said second region to said fourth region, passive circuit means responsive to the transition in level of said second clock voltage from said second value to said first value to develop and apply a transient voltage of a polarity, amplitude and duration to said region of opposite conductivity type to render the potential of said region of opposite conductivity type favorable for the transfer of charge from said region of opposite conductivity type into said first region and to said second region over an initial part of said first portion of said cycle of said second clock voltage and favorable for the transfer of charge from said first region to said region of opposite conductivity during the remaining part of said first portion of said cycle, said circuit means developing a voltage on said region of opposite conductivity type during said second portion of said cycle which is unfavorable for the transfer of charge from said region of opposite conductivity type to said first region, whereby during said first portion of said second clock voltage a packet of charge is developed in said second region, the magnitude of which is dependent on the separation in potential of said signal voltage from said reference voltage in the direction favorable to the transfer of charge from said first region to said second region, and during said second portion of said cycle of said second clock voltage said packet of charge is transferred from said second region to said fourth region.

4,165,538

**READ-ONLY MEMORY**

Yoshishige Kitamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,525

Claims priority, application Japan, Mar. 23, 1977, 52/32559

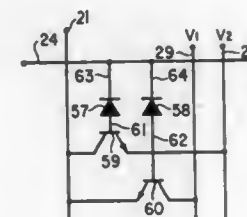
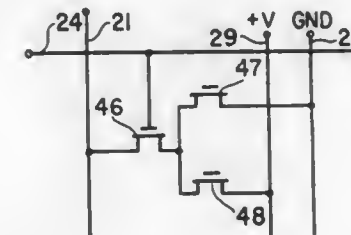
Int. Cl.<sup>2</sup> G11C 17/00, 17/06

U.S. Cl. 365—104

6 Claims

1. A read-only memory comprising a plurality of word lines, a plurality of bit lines, a first potential source, a second potential source, and a plurality of memory cells disposed at cross-points between said word lines and said bit lines, each of said memory cells including a pair of programmable nonvolatile first gating means, into which information is written to make said pair of programmable nonvolatile first gating means conductive and nonconductive, respectively, and second gating means for operatively coupling an associated one of said bit lines with one of said first and second potential sources in response to one of said pair of programmable nonvolatile

gating means being conductive, said second gating means having a control means and being operative at the time the



potential level of an associated one of said word lines is at a predetermined value.

4,165,539

**BIDIRECTIONAL SERIAL-PARALLEL-SERIAL CHARGE-COUPLED DEVICE**

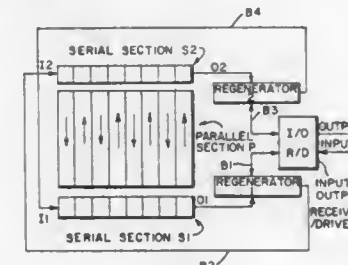
Frederick J. Alchermann, Jr., Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,922

Int. Cl.<sup>2</sup> G11C 11/34, 19/28

U.S. Cl. 365—183

10 Claims



2. In an interlaced SPS CCD memory, the improvement comprising: first and second serial registers; a parallel section; means for alternately transferring a serial data bit stream into said first and second serial registers; means for transferring data bits in parallel from each said first and second registers into said parallel section; means for propagating alternate rows of data bits within said parallel section in opposite directions until data is transferred in parallel from said parallel section into each said first and second serial registers; and means for alternately reading out data bits from said first and second serial registers.

985 O.G. 31

4,165,540

**METHOD FOR STORING A BINARY SIGNAL IN A HIGH SPEED FLIP FLOP MEMORY HAVING CONTROLLED MINIMUM CHANGE-OVER TIME AND APPARATUS THEREFOR**

Daniel Vinot, Sucy-en-Brie, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Société Anonyme), Paris, France

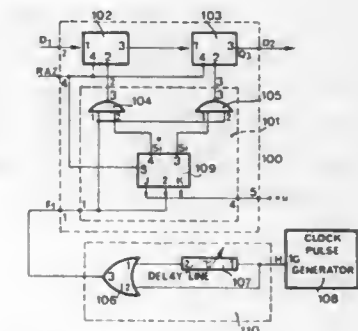
Filed Dec. 6, 1977, Ser. No. 857,911

Claims priority, application France, Dec. 28, 1976, 76 39314

Int. Cl.<sup>2</sup> G11C 7/00

U.S. Cl. 365—190

14 Claims



2. A high speed flip-flop memory device for storing a binary signal comprising a first and a second memory element connected in cascade, means for introducing the binary signal to be stored in the memory device into said first memory element under the control of a first control signal, means for transferring the binary signal from said first memory element to said second memory element under the control of a second control signal, means for generating, from a single pulse, a clock signal comprising two pulses which are displaced in time, means responsive to the time displaced pulses generated by the first means for generating said first and said second control signal and means for applying the first control signal and the second control signal to the said first and second memory elements respectively to thereby cause said binary signal to be stored in said memory device.

4,165,541

**SERIAL-PARALLEL-SERIAL CHARGE-COUPLED DEVICE MEMORY HAVING INTERLACING AND RIPPLE CLOCKING OF THE PARALLEL SHIFT REGISTERS**

Ramesh C. Varshney, Sunnyvale; Kalyanasundaram Venkateswaran, San Jose, and Gilbert F. Amelio, Saratoga, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 12, 1977, Ser. No. 860,001

Int. Cl.<sup>2</sup> G11C 7/00, 21/00

U.S. Cl. 365—219

13 Claims

1. A charge coupled device memory device having a data input terminal and a data output terminal comprising: a plurality of blocks of memory, each block including (1) an array of charge coupled memory cells for storing data in a serial-parallel-serial arrangement of shift registers, said array having an input terminal and an output terminal, (2) charge writing means connected to the input terminal for injecting a signal charge into the array, (3) sense amplifier means connected to the output terminal for detecting the signal charge at the output terminal and producing an output signal in response thereto, (4) input logic means connected to each of the charge writing means, the sense amplifier means, and the data input terminal and connected to receive first address signals to determine when the charge writing means is to be activated to inject charge into the array in re-



sponse to signals from one of the data input terminal and the sense amplifier means,

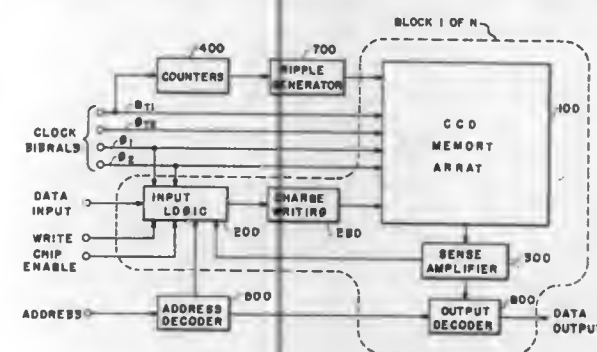
(5) output decoding means connected to the sense amplifier means and connected to receive second address signals to determine when the output signal from the sense amplifier means is to be supplied to the data output terminal,

means for generating the first and second address signals to thereby select any of the plurality of blocks of memory and connect said block to at least one of the data input terminal and data output terminal, and

clock means for controlling the operation of each of the blocks of memory,

wherein the charge writing means comprises a substrate of chosen conductivity, a first region of chosen conductivity formed in the substrate to which a fixed potential is applied, a second region in the substrate formed from the same conductivity material as the substrate and nowhere in contact with the first region, a first electrode disposed on an insulating layer formed on the substrate and said electrode extending from the first region to the second

region, and a second electrode disposed on the insulating layer above the second region and the substrate adjacent



the second region on the side of the second region opposite the first electrode.

## DESIGN PATENTS

GRANTED AUG. 21, 1979

### ERRATA

For CLASS	See PATENT NO.
D21-017 .....	252,711
D21-208 .....	252,712
D21-024 .....	252,713
D21-078 .....	252,714
D03-078 .....	252,715

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## DESIGNS

AUGUST 21, 1979

252,656

### BODY BRIEFER

Magnhild L. Bergh, Hamden, Conn., assignor to The Strouse, Adler Company, New Haven, Conn.

Filed Feb. 24, 1977, Ser. No. 772,899

Term of patent 14 years

Int. Cl. D2—01

U.S. Cl. D2—3



252,658

### PORTABLE SEAT

Richard H. Kressin, 16 Windsor Ave., Scarborough, Ontario, Canada (M1N 1A7)

Filed Jul. 26, 1977, Ser. No. 819,587

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—41



252,659

### PORTABLE FOLDABLE BAR

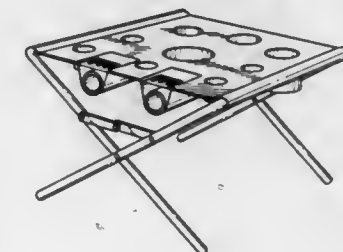
Harold Brickman, 2911 W. Catalpa, Chicago, Ill. 60625

Filed Jul. 5, 1977, Ser. No. 813,083

Term of patent 14 years

Int. Cl. D6—99

U.S. Cl. D6—144



252,657

### HANDLE FOR A HANDBAG

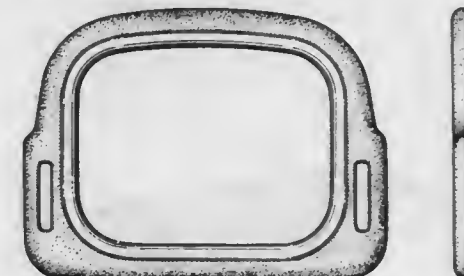
Helen Young, Roslyn, N.Y., assignor to N A S Import Corp., New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,200

Term of patent 14 years

Int. Cl. D3—01

U.S. Cl. D3—54



252,660

### DESK

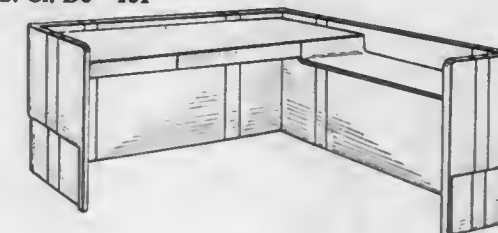
Lawrence Lerner, New York, N.Y., and Fred Schmitt, Nutley, N.J., assignors to Litton Business Systems, Inc.

Filed Feb. 22, 1977, Ser. No. 770,328

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—161





252,661

**SWIVEL POSTURE CHAIR CONTROL**

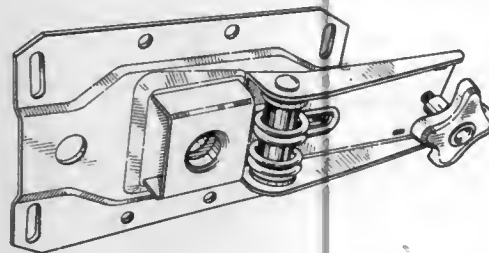
Vincent G. Bowman, Baden, Canada, assignor to Doerner Products Co. Limited, Waterloo, Canada

Filed Sep. 22, 1977, Ser. No. 835,769

Claims priority, application Canada, Mar. 30, 1977, 3003773  
Term of patent 14 years

Int. Cl. D6—06

U.S. Cl. D6—191



252,662

**COMBINED CHEESE GRATER AND CONTAINER**

William E. Bounds, 23790 Hawthorne Blvd., Torrance, Calif. 90505

Filed Apr. 21, 1977, Ser. No. 789,542

Term of patent 14 years

Int. Cl. D7—04

U.S. Cl. D7—47



252,663

**PORTABLE INSULATED FOOD CHEST OR THE LIKE**

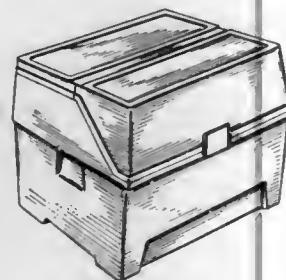
Louis J. Corini, Philadelphia, Pa., assignor to Fogel Commercial Refrigerator Company, Philadelphia, Pa.

Filed Feb. 7, 1977, Ser. No. 766,141

Term of patent 14 years

Int. Cl. D7—07

U.S. Cl. D7—77



252,664

**BARBECUE GRILL BODY**

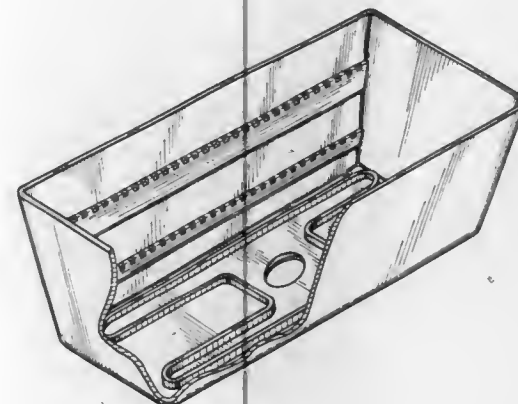
George W. Hall, Omaha, Nebr., assignor to Don Hall Company, Omaha, Nebr.

Filed Apr. 11, 1977, Ser. No. 786,629

Term of patent 14 years

Int. Cl. D7—02

U.S. Cl. D7—109



252,665

**ELECTRIC MINI-OVEN WITH REMOVABLE COVER**

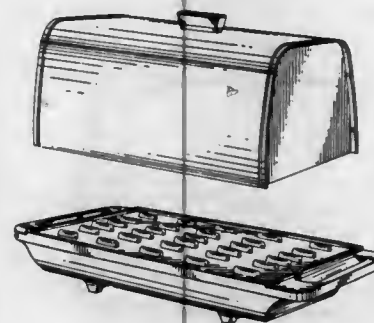
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and Francis J. Greb, Palatine, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Filed Mar. 7, 1977, Ser. No. 775,249

Term of patent 14 years

Int. Cl. D7—02

U.S. Cl. D7—126



252,666

**VINYL PIPE CUTTER**

Masaharu Sakamoto, Tsu, Japan, assignor to Matsuzaka Iron Works, Inc., Tsu, Japan

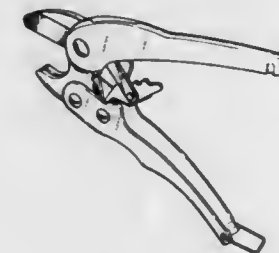
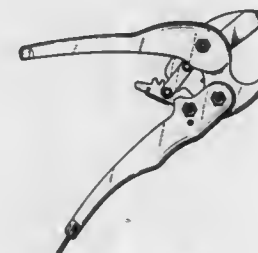
Filed Apr. 18, 1977, Ser. No. 788,635

Claims priority, application Japan, Oct. 20, 1976, 51-41516

Term of patent 14 years

Int. Cl. D8—05

U.S. Cl. D8—60



252,668

**DRAPERY ROD**

Robert S. Rudinski, 515 East St., Elkhart, Ind. 46514

Filed May 3, 1977, Ser. No. 793,441

Term of patent 14 years

Int. Cl. D8—09

U.S. Cl. D8—377



252,669

**TRACK STIRRUP**

Vincent H. Muttart, Placentia, Calif., assignor to Spring Crest Company, Brea, Calif.

Filed May 1, 1978, Ser. No. 901,724

Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—380



252,667

**FLOOR PULLEY CORD LOCK**

Vincent H. Muttart, Placentia, Calif., assignor to Spring Crest Company, Brea, Calif.

Filed May 1, 1978, Ser. No. 901,723

Term of patent 14 years

Int. Cl. D8—08, 09

U.S. Cl. D8—360



252,670

**BOTTLE OR SIMILAR ARTICLE**

Everett C. Beeman, Wallingford, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed May 25, 1977, Ser. No. 800,454

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—116



252,671  
BOTTLE  
Gordon A. Strand, 1513 Bradmore Dr., Toledo, Ohio  
Filed Apr. 14, 1977, Ser. No. 787,402  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-129



252,672  
BOTTLE  
Thomas B. Aldrich, III, Spring Valley, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Filed Mar. 8, 1977, Ser. No. 775,492  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-137



252,673  
BOTTLE OR SIMILAR ARTICLE  
Everett C. Beeman, Wallingford, Conn., assignor to Monsanto Company, St. Louis, Mo.  
Filed May 25, 1977, Ser. No. 800,456  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-143



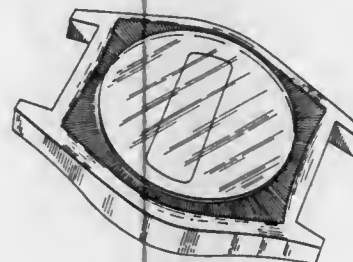
252,674  
COMBINED BOTTLE AND CLOSURE THEREFOR OR SIMILAR ARTICLE  
Everett C. Beeman, 26 Norman Ave., Wallingford, Conn. 06492  
Filed May 25, 1977, Ser. No. 800,455  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-144



252,675  
WRIST WATCH  
Eugene J. Sulek, Lubbock, Tex., and Walter S. Nakano, Burbank, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.  
Filed Sep. 6, 1977, Ser. No. 830,718  
Term of patent 14 years  
Int. Cl. D10-02

U.S. Cl. D10-38



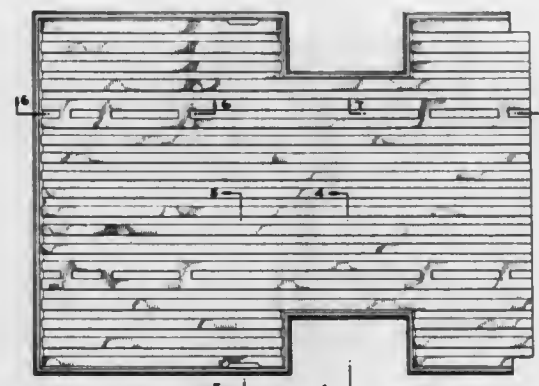
252,676  
PLAQUE  
Gaye L. Daugherty, 12643 Promenade, Dallas, Tex. 75238  
Filed Feb. 22, 1977, Ser. No. 770,401  
Term of patent 14 years  
Int. Cl. D11-02; D6-07, 08

U.S. Cl. D11-132



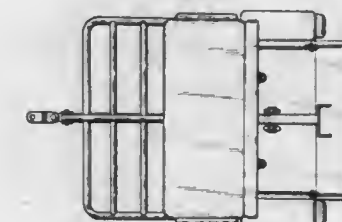
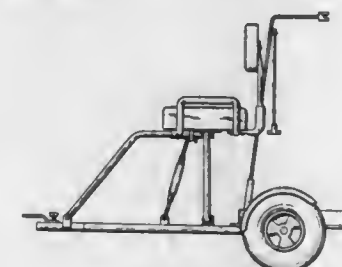
252,677  
TRUCK BED LINER  
Sam M. Richardson, III, c/o Viking Industries, Inc., P.O. Box 1582, Industrial Rd., El Dorado, Ark. 71730  
Filed Jun. 13, 1977, Ser. No. 806,099  
Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D12-98



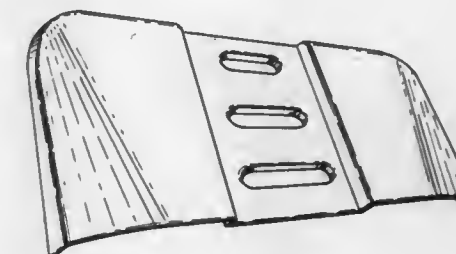
252,678  
GOLF CART TRAILER  
R. Kelley Jackson, 665 S. Alton Way, Denver, Colo. 80231  
Filed Jul. 21, 1977, Ser. No. 817,838  
Term of patent 14 years  
Int. Cl. D12-10

U.S. Cl. D12-101



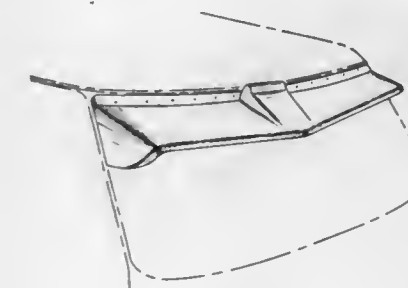
252,679  
AIR DEFLECTOR  
Ronald L. Welden, 5912 Mohawk Dr., San Jose, Calif. 95123, and Richard L. Short, Santa Cruz, Calif., assignors to Ronald L. Welden, San Jose, Calif.  
Filed Jul. 21, 1977, Ser. No. 817,544  
Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D12-181



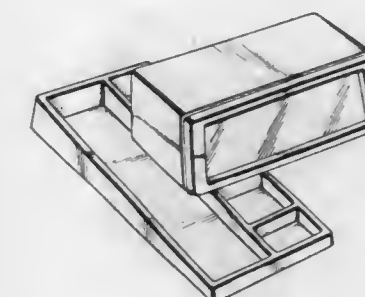
252,680  
EXTERIOR VISOR FOR VEHICLES  
Michael C. Kingsley, and Richard J. Kingsley, both of P.O. Box 44338, Tacoma, Wash. 98444  
Filed May 2, 1977, Ser. No. 793,174  
Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D12-191



252,681  
CONTROL CONSOLE  
Wayne A. Current, Holmdel, N.J., assignor to The Singer Company  
Filed Apr. 20, 1977, Ser. No. 789,167  
Term of patent 14 years  
Int. Cl. D13-03; D14-02

U.S. Cl. D13-12





252,682

**ELECTRICAL CONNECTOR**

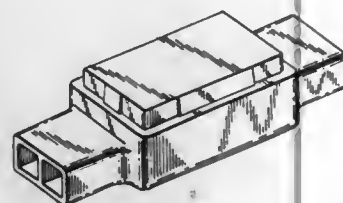
Sidney J. Berglund, Stillwater, and Dewain R. Goff, St. Paul Park, both of Minn., assignors to Minnesota Mining and Manufacturing Company

Filed May 19, 1977, Ser. No. 798,438

Term of patent 14 years

Int. Cl. D13—03

U.S. Cl. D13—24



252,683

**CARD READER HEAD ASSEMBLY**

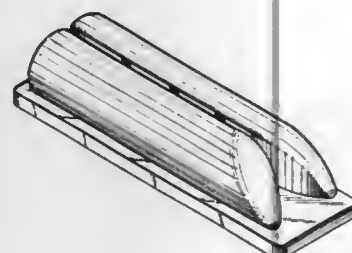
Edward P. Sheehan, Canton; John P. Connolly, Hingham, both of Mass., and James B. King, McLean, Va., assignors to Massachusetts Bay Transportation Authority

Filed Oct. 11, 1977, Ser. No. 840,844

Term of patent 14 years

Int. Cl. D14—02

U.S. Cl. D14—40



252,684

**COMBINED TELEVISION AND RADIO RECEIVER**

Yasusuke Seki, and Takeshi Abe, both of Tokyo, Japan, assignors to Hitachi, Ltd.

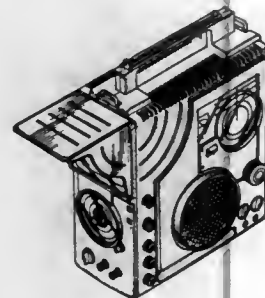
Filed Apr. 14, 1977, Ser. No. 787,504

Claims priority, application Japan, Jan. 31, 1977, 52-2551

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D14—72



252,685

**EVAPORATIVE COOLER PUMP**

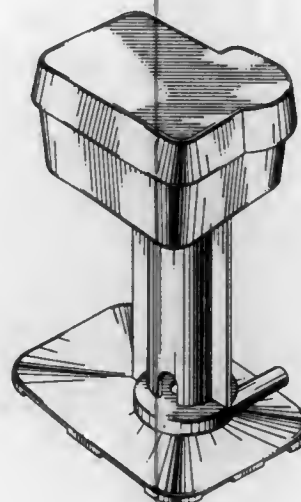
Duane K. Johnston, 9041 N. 33rd Way, Phoenix, Ariz. 85028

Filed Jun. 16, 1978, Ser. No. 916,239

Term of patent 14 years

Int. Cl. D15—02

U.S. Cl. D15—7



252,686

**TRANSPORTABLE CAMERA**

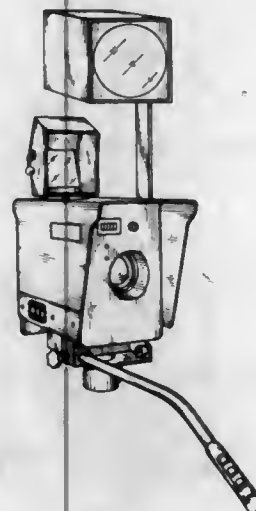
Rüdolf Viering, Cologne, Fed. Rep. of Germany, assignor to Pixyfoto GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 29, 1976, Ser. No. 736,903

Term of patent 14 years

Int. Cl. D16—01

U.S. Cl. D16—02



252,687

**COPYING MACHINE**

Norbert Schlagheck, and Herbert Schultes, both of Fuerstenfeldbruck, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

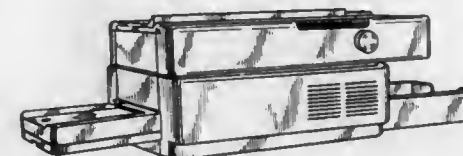
Filed Feb. 23, 1977, Ser. No. 771,253

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1976, 492

Term of patent 14 years

Int. Cl. D16—05

U.S. Cl. D16—31



252,688

**MUSIC BOX**

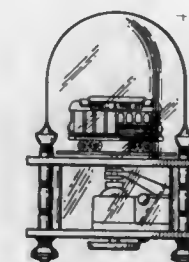
Chong T. Ahn, 923 Fulton Ave., San Leandro, Calif. 94577

Filed Mar. 13, 1978, Ser. No. 885,550

Term of patent 14 years

Int. Cl. D17—05

U.S. Cl. D17—24



252,689

**TYPEWRITER FOR WORD PROCESSOR**

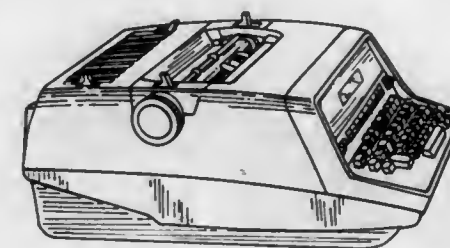
Farouk Arjani, Foster City; Thomas J. Kramer, San Jose; Richard E. Johnson, Los Altos; Ralph M. Swan, Sunnyvale; David C. Andersen, Cupertino, and David D. Pharmer, Gilroy, all of Calif., assignors to Artec International Corporation, Palo Alto, Calif.

Filed Mar. 14, 1977, Ser. No. 777,307

Term of patent 14 years

Int. Cl. D18—01

U.S. Cl. D18—2



252,690

**COMBINED HOROLOGICAL AND WRITING INSTRUMENT**

Hon Wai Wong, Lot 329, Section A, Ground Floor, Ting Kau, New Territories, Hong Kong

Filed Nov. 4, 1976, Ser. No. 738,971

Claims priority, application United Kingdom, Sep. 8, 1976, 977069

Term of patent 14 years

Int. Cl. D19—06

U.S. Cl. D19—36



252,691

**WRITING INSTRUMENT**

Curtis L. Malm, Quincy, Mass., and Clarence Zierhut, Richardson, Tex., assignors to The Gillette Company, Boston, Mass.

Filed Feb. 2, 1978, Ser. No. 874,566

Term of patent 14 years

Int. Cl. D19—06

U.S. Cl. D19—51



252,692

**SIMULATIVE TOY VEHICLE**

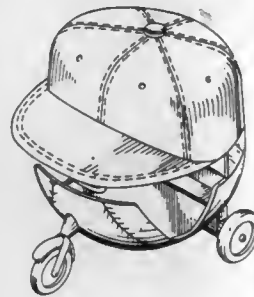
Joseph Petrisco, 673 Bend Dr., Sunnyvale, Calif. 94087

Filed Aug. 1, 1977, Ser. No. 821,290

Term of patent 14 years

Int. Cl. D21-07

U.S. Cl. D21-128



252,693

**SKATEBOARD TRUCK**

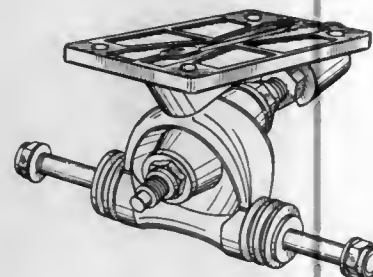
William H. Brawner, El Cajon, Calif., assignor to H.P.G. IV, Inc., El Cajon, Calif.

Filed Mar. 3, 1978, Ser. No. 883,345

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-226



252,694

**ONE PIECE HANDGUN GRIP OR SIMILAR ARTICLE**

Theodore L. Schiermeyer, P.O. Box 704, Twin Falls, Id. 83301

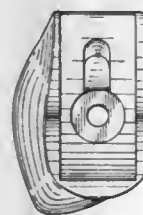
Filed Sep. 3, 1976, Ser. No. 720,232

The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.

Term of patent 14 years

Int. Cl. D22-07

U.S. Cl. D22-1



252,695

**CARTRIDGE BELT**

Ethiel L. Munz, P.O. Box 1383, Hawaiian Garden, Calif. 90716

Filed Jul. 14, 1977, Ser. No. 815,517

Term of patent 14 years

Int. Cl. D22-05; D2-07

U.S. Cl. D22-14



252,696

**SWITCH FOR KILLING INSECTS**

Nicholas M. Mushkin, 4755 E. Flamingo, Las Vegas, Nev. 89109

Filed Apr. 11, 1977, Ser. No. 786,086

Term of patent 14 years

Int. Cl. D22-06

U.S. Cl. D22-20



252,697

**HANDLE FOR FISHING ROD ASSEMBLY**

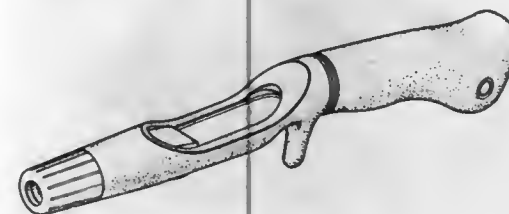
Ryuichi Ohmura, No. 19-3, Minami-cho, Shizuoka ken, Shizuoka-shi, Japan

Filed Sep. 30, 1977, Ser. No. 838,331

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-23



252,698

**FISHING JIG**

Harris C. Jackson, 2500 Pine St., Napa, Calif. 94558

Filed Aug. 31, 1977, Ser. No. 829,564

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-27



252,699

**FISHING PLUG**

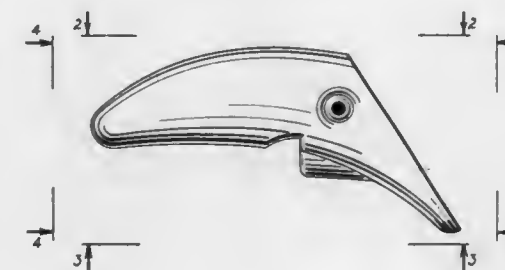
James D. Maxwell, P.O. Box 649, Vancouver, Wash. 98660

Filed Aug. 29, 1977, Ser. No. 828,327

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-28



252,700

**FISHING LURE**

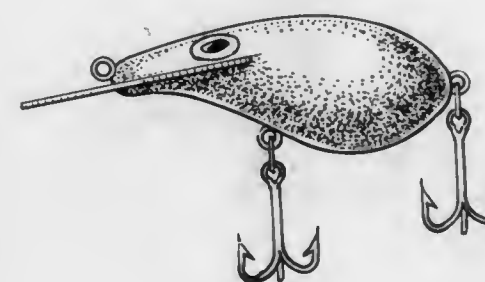
Fred C. Young, Oak Ridge, Tenn., assignor to Cordell Tackle, Inc., Hot Springs, Ark.

Filed Sep. 21, 1977, Ser. No. 835,429

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-28



252,701

**VALVE CORE**

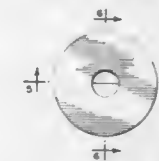
Jerry L. Caldwell, 1818 Fairfax, Carrollton, Tex. 75006

Filed May 18, 1977, Ser. No. 797,996

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-19



252,702

**SUBTERRANEAN WATER DRAIN**

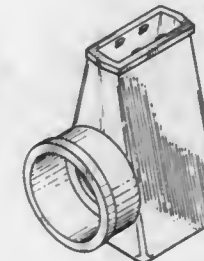
John A. Armistead, Charlotte, N.C., assignor to Polyphase Corporation, Charlotte, N.C.

Filed Mar. 14, 1977, Ser. No. 777,009

Term of patent 14 years

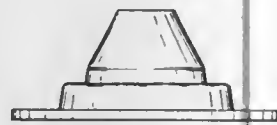
Int. Cl. D23-01

U.S. Cl. D23-40

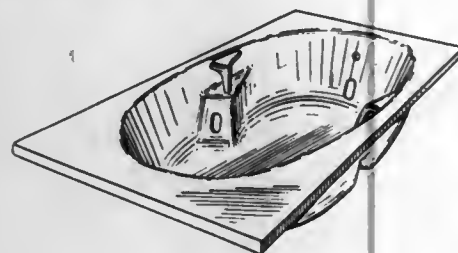




**252,703**  
**PIPE FLASHING**  
 George M. Cupit, 5 Waldheim Rd., Bayswater, Victoria, Australia  
 Filed Jul. 13, 1977, Ser. No. 815,271  
 Claims priority, application Australia, Jan. 14, 1977, 71012  
 Term of patent 14 years  
 Int. Cl. D23—01  
 U.S. Cl. D23—42



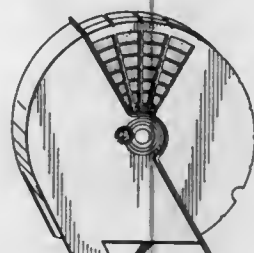
**252,704**  
**BATHTUB**  
 Ian R. Read, Reigate, England, assignor to Nordic Saunas Limited, Reigate, England  
 Filed Nov. 21, 1977, Ser. No. 853,564  
 Claims priority, application United Kingdom, Sep. 28, 1977, 981712  
 Term of patent 14 years  
 Int. Cl. D23—02  
 U.S. Cl. D23—55



**252,705**  
**ELECTRIC AIR CONDITIONER FOR ELECTRONIC ENCLOSURES**  
 Herman S. Fessler, Coon Rapids, Minn., assignor to McLean Engineering Midwest, Maple Grove, Minn.  
 Filed Mar. 10, 1977, Ser. No. 776,149  
 Term of patent 14 years  
 Int. Cl. D23—04  
 U.S. Cl. D23—144



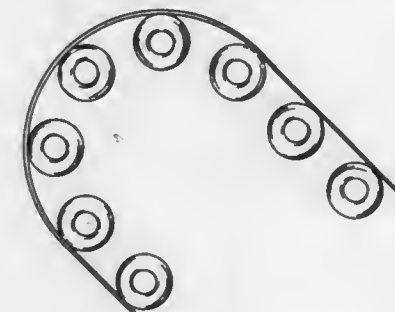
**252,706**  
**DISPENSER FOR AIR TREATING MATERIAL**  
 Georg Schimanski, Hagen, Fed. Rep. of Germany, assignor to Globol-Werk GmbH, Fed. Rep. of Germany  
 Filed Mar. 4, 1977, Ser. No. 774,346  
 Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 309  
 Term of patent 14 years  
 Int. Cl. D23—04  
 U.S. Cl. D23—150



**252,707**  
**INHALER**  
 Joel Besnard, 130 W. 47th St., #3D, New York, N.Y. 10036  
 Filed Jan. 3, 1977, Ser. No. 756,396  
 Term of patent 14 years  
 Int. Cl. D24—99; D27—99  
 U.S. Cl. D24—62



**252,708**  
**GO-CART GUARD RAIL**  
 Clarence K. Vincent, 3023 Tilden, Houston, Tex. 77025  
 Filed Jul. 20, 1977, Ser. No. 817,236  
 Term of patent 14 years  
 Int. Cl. D25—02  
 U.S. Cl. D25—38



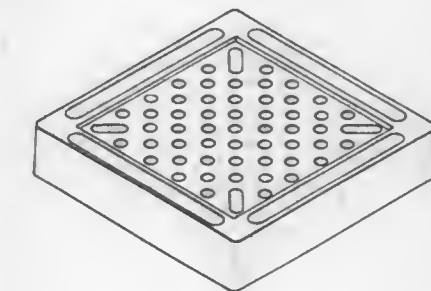
**252,709**  
**LOTION APPLICATOR**  
 Flora J. MacFadden, 6392 Santa Rita Ave., Garden Grove, Calif. 92645  
 Filed Nov. 16, 1978, Ser. No. 961,060  
 Term of patent 14 years  
 Int. Cl. D28—03  
 U.S. Cl. D28—7



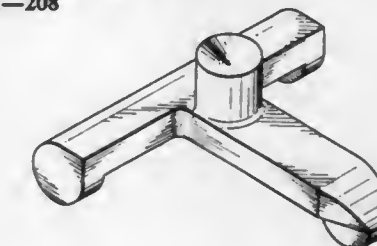
**252,710**  
**RAZOR**  
 John M. Picinic, 330 9th St., Palisade Park, N.J. 07650  
 Filed May 25, 1977, Ser. No. 800,102  
 Term of patent 14 years  
 Int. Cl. D28—03  
 U.S. Cl. D28—46



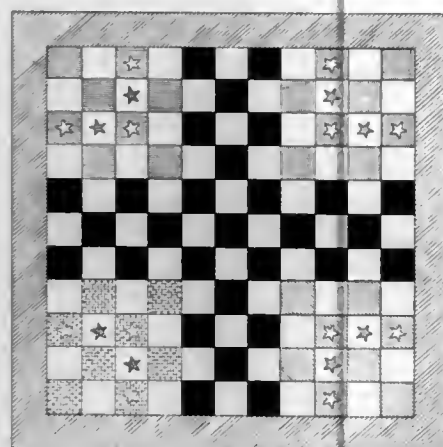
**252,711**  
**BASE MEMBER FOR PARLOR GAME**  
 David L. White, and Beverly A. White, both of 32560 Mason Ct., Westland, Mich. 48185  
 Filed Sep. 26, 1977, Ser. No. 836,695  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—17



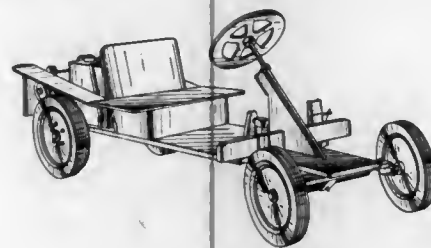
**252,712**  
**GOLF TEE**  
 Arthur S. Bradley, 342 N. 116th St., Wauwatosa, Wis. 53226  
 Filed Oct. 20, 1977, Ser. No. 844,072  
 Term of patent 14 years  
 Int. Cl. D21—02  
 U.S. Cl. D21—208



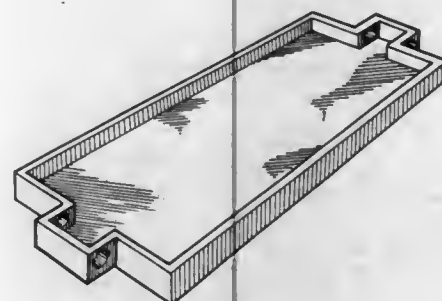
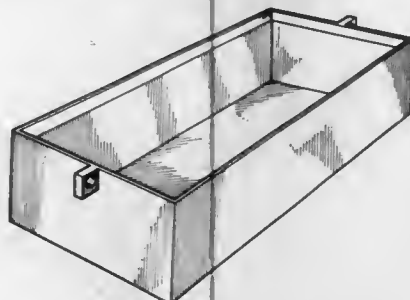
**252,713**  
**CHESS BOARD**  
 Gary D. Weiss, R.R. 1 - Box 324-C, Kapaa, Hi. 96746  
 Filed Dec. 14, 1977, Ser. No. 860,640  
 Term of patent 14 years  
 Int. Cl. D21-01  
 U.S. Cl. D21-24



**251,714**  
**TOY VEHICLE**  
 Harold D. Tidwell, 510 Rita Ln., Duncanville, Tex. 75116  
 Filed Jun. 27, 1977, Ser. No. 810,589  
 Term of patent 3½ years  
 Int. Cl. D21-01  
 U.S. Cl. D21-78



**252,715**  
**SMALL ARMS STORAGE CONTAINER**  
 David M. Cole, 4529 Royal Oak Dr., Roanoke, Va. 24014  
 Filed Nov. 26, 1976, Ser. No. 745,447  
 Term of patent 14 years  
 Int. Cl. D3-99  
 U.S. Cl. D3-78



## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF AUGUST, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A & E Plastik Pak Co., Inc.: See—  
 Bennett, J. Richard, 4,164,972, Cl. 160-66.000.  
 A/S N. Foss Electric: See—  
 Nielsen, Holger; and Salling, Per, 4,165,033, Cl. 235-439.000.  
 AB IRO: See—  
 Pejchal, Karel; and Tholander, Lars H. G., 4,165,049, Cl. 242-47.010.  
 Aberg, Axel K. G.: See—  
 Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., 4,165,384, Cl. 424-324.000.  
 Abraham, William: See—  
 Williams, Frank R.; and Abraham, William, 4,165,141, Cl. 339-75.00R.  
 Accuratio Systems, Inc.: See—  
 James, James R., 4,165,187, Cl. 366-150.000.  
 Adachi, Terufumi; and Tanga, Michifumi, to Tokuyama Sekishi Kogyo Kabushiki Kaisha. Method for preparation of a foam of chlorinated vinyl chloride polymer employing a lower aliphatic alcohol foaming agent. 4,165,415, Cl. 521-145.000.  
 Adams Brush Manufacturing Co., Inc.: See—  
 Zurawin, Adam; and Ricciuti, Gaetano, 4,164,803, Cl. 15-257.050.  
 Adams, Harold R. Packing sealer plug. 4,165,080, Cl. 277-72.0FM.  
 Admiral Corporation: See—  
 Virva, John J., 4,164,988, Cl. 181-156.000.  
 Aeg-Elotherm, G.m.b.H.: See—  
 Reinke, Friedhelm; and Emde, Friedhelm, 4,165,246, Cl. 148-150.000.  
 Aerojet-General Corporation: See—  
 Qasim, Javed; and McJones, Robert W., 4,165,063, Cl. 251-168.000.  
 Affa, Stephen N.; and Yorke, Roy E., to General Connectors Corporation. Flexible ball joint. 4,165,107, Cl. 285-41.000.  
 Agence Nationale de Valorisation de la Recherche (ANVAR): See—  
 Sorbier, Pierre, 4,165,353, Cl. 264-120.000.  
 Agency of Industrial Science and Technology: See—  
 Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.  
 Ageo Industries Co., Ltd.: See—  
 Onda, Isao, 4,165,094, Cl. 280-261.000.  
 AGFA-Gevaert A.G.: See—  
 Engelsmann, Dieter; Hackenberg, Hubert; and Schroder, Rolf, 4,165,166, Cl. 354-21.000.  
 Ahrenkeil, Richard K., to Eastman Kodak Company. Optical sensor apparatus. 4,165,471, Cl. 307-311.000.  
 Ahrenst-Larsen, Bent: See—  
 von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., 4,165,387, Cl. 426-16.000.  
 Aichelmann, Frederick J., Jr., to International Business Machines Corporation. Bidirectional serial-parallel-serial charge-coupled device. 4,165,539, Cl. 365-183.000.  
 Aiken Industries Inc.: See—  
 Irons, Ronald E., 4,165,497, Cl. 333-101.000.  
 Air Products and Chemicals, Inc.: See—  
 Bechara, Ibrahim S.; and Holland, Dewey G., 4,165,412, Cl. 521-121.000.  
 Aisin Seiki Kabushiki Kaisha: See—  
 Takikawa, Yujiro, 4,164,908, Cl. 112-168.000.  
 Akao, Akimasa: See—  
 Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.  
 Akasaka, Shigeo, to Nippon Kogaku K.K. Dial click stop apparatus. 4,165,164, Cl. 354-289.000.  
 Akiya, Takeo: See—  
 Kawai, Syuji; Ohyaibu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.  
 Aktiebolaget Hassle: See—  
 Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., 4,165,384, Cl. 424-324.000.  
 Akzona Incorporated: See—  
 Schweizer, Udo P., 4,164,839, Cl. 57-293.000.  
 Alban, Clarence F. Article employing inter-leaved elastic layers and inelastic sheets. 4,165,403, Cl. 428-140.000.  
 Alderman, Shirley D.: See—  
 Daniels, Paul J., 4,164,964, Cl. 141-329.000.  
 Aldrich, Howard P.; Burgess, Glenn A.; and Yamanaka, Clarence T., to Garrett Corporation. The Mode indication system. 4,164,895, Cl. 98-1.500.  
 Aldrich, Howard P., to Garrett Corporation. The Control alternating system. 4,164,896, Cl. 98-1.500.  
 Aldrich, Howard P.; Yamanaka, Clarence T.; and Burgess, Glenn A., to Garrett Corporation. The Control schedule linearization system. 4,164,897, Cl. 98-1.500.  
 Aldrich, Howard P., to Garrett Corporation. The Flow annunciation system. 4,164,900, Cl. 98-1.500.  
 Alfes, Franz; Heine, Diez; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, to Bayer Aktiengesellschaft. Chlorination of polyolefins in the presence of complex formers. 4,165,431, Cl. 525-357.000.  
 Allen-Bradley Company: See—  
 Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, 4,165,534, Cl. 364-900.000.  
 Allen, Ronald N., to Millars Wellpoint International Ltd. Liquid level control valve. 4,164,955, Cl. 137-202.000.  
 Alley, Lawrence E., III; Lydick, Richard P.; and Stanley, Robert E., to ARCO Medical Products Company. Digital means for non-invasively controlling the parameters of an implantable heart pacer. 4,164,944, Cl. 128-419.0PG.  
 Allied Chemical Corporation: See—  
 Sundie, Richard D.; and Michael, William R., 4,165,305, Cl. 260-29.40R.  
 Vander Mey, John E., 4,165,294, Cl. 252-143.000.  
 Vander Mey, John E., 4,165,295, Cl. 252-143.000.  
 Allis-Chalmers Corporation: See—  
 Feller, Thomas R., 4,164,864, Cl. 73-118.000.  
 Allmansberger, Robert A.: See—  
 Stone, W. Norman; and Allmansberger, Robert A., 4,164,806, Cl. 29-517.000.  
 Alosi, Anthony C. Concrete solar collectors. 4,164,933, Cl. 126-447.000.  
 Alps Electric Co., Ltd.: See—  
 Yoshisato, Akiyuki, 4,165,486, Cl. 325-17.000.  
 Altenweger, Alois, to Zellweger Uster Ltd. Apparatus for dividing warps with leases. 4,164,805, Cl. 28-202.000.  
 Aluminum Company of America: See—  
 Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., 4,165,263, Cl. 204-67.000.  
 Amelio, Gilbert F.: See—  
 Varshney, Ramesh C.; Venkateswaran, Kalyanasundaram; and Amelio, Gilbert F., 4,165,541, Cl. 365-219.000.  
 American Air Filter Company, Inc.: See—  
 Everett, Robert W., 4,164,901, Cl. 98-33.00A.  
 American Can Company: See—  
 Bowen, William E., 4,165,463, Cl. 250-372.000.  
 Germonprez, Raymond L., 4,165,399, Cl. 427-264.000.  
 American Cyanamid Company: See—  
 Lutz, Albert W.; and Diehl, Robert E., 4,165,231, Cl. 71-121.000.  
 Weiss, Martin J.; and Siuta, Gerald J., 4,165,331, Cl. 260-448.80R.  
 American Optical Corporation: See—  
 Travnicek, Edward A., 4,165,158, Cl. 351-160.00H.  
 American Safety Equipment Corporation: See—  
 Summer, James R., 4,165,059, Cl. 244-100.00A.  
 Ammann, Eugene O., to GTE Sylvania Incorporated. Apparatus and method for producing visible coherent light at a plurality of wavelengths. 4,165,469, Cl. 307-426.000.  
 Ampex Corporation: See—  
 Hathaway, Richard A., 4,165,523, Cl. 360-77.000.  
 Amway Corporation: See—  
 Gordon, Robert A., 4,165,293, Cl. 252-118.000.  
 Andabursky, Semen I.: See—  
 Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.  
 Andersen, Paul R., to Square D Company. Current limiter assembly for a circuit breaker. 4,165,502, Cl. 335-39.000.  
 Anderson, Richard B.; Hoffmeister, Elaine H.; and Landholm, Richard A., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible pyridylazonaphthol dye-releasing compounds. 4,165,238, Cl. 96-119.00R.  
 Anderson, Robert V. Elliptical solar reflector. 4,164,934, Cl. 126-438.000.  
 Ando, Moritoshi: See—  
 Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, 4,165,464, Cl. 250-550.000.  
 Andreas Stihl: See—  
 Lux, Helmut; and Landwehr, Gotz, 4,164,989, Cl. 181-265.000.  
 Antos, George J., to UOP Inc. Hydrocarbon conversion with a superactive multimetallic catalytic composite. 4,165,276, Cl. 208-139.000.  
 Anzalone, Carmen J., to Fedders Corporation. Fan motor unit for room air conditioner. 4,164,852, Cl. 62-429.000.



- Aoki, Takao: See—  
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.
- Aotsuka, Yasuo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,165,236, Cl. 96-74.000.
- Appelquist, Jan O.: See—  
Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., 4,165,454, Cl. 219-10.55F.
- Arai, Yoshinobu: See—  
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.
- Archifar Laboratori Chimico Farmacologici S.p.A.: See—  
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,165,317, Cl. 260-239.30P.
- ARCO Medical Products Company: See—  
Alley, Lawrence E., III; Lydick, Richard P.; and Stanley, Robert E., 4,164,944, Cl. 128-419.0PG.
- Arendt, Henry P.; Deaton, Thomas M.; and Dooley, Donald L., to Otis Engineering Corporation. Well latch. 4,164,977, Cl. 166-125.000.
- Armenti, Carmen F.; and De Juneas, James V., to Cities Service Company. Filled resin compositions containing atactic polypropylene. 4,165,302, Cl. 260-8.000.
- Arm. Kieckert Sohne: See—  
Kleeefeldt, Frank, 4,165,112, Cl. 292-216.000.
- Arnold, Wendell R., to Eli Lilly and Company. Herbicidal method. 4,165,229, Cl. 71-90.000.
- Artos Engineering Company: See—  
Gudmestad, Ragnar; and Blaha, Gerald E., 4,164,808, Cl. 29-564.400.
- Asaoka, Masayuki: See—  
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
- Asbill, Clarence M., III, to Robertshaw Controls Company. Manifolding means and system for electrical and/or pneumatic control devices and method. 4,165,139, Cl. 339-15.000.
- Astor, Ruth: See—  
Einstein, Irving, 4,165,451, Cl. 179-178.000.
- Atari, Inc.: See—  
Stubben, David R., 4,165,072, Cl. 273-85.00G.
- Atencio, Francisco J. G. Dam with transformable hydroelectric station. 4,165,467, Cl. 290-52.000.
- Atlantic Richfield Company: See—  
Pedersen, S. Erik, 4,165,299, Cl. 252-435.000.
- Yerkes, John W.; and Avery, James E., 4,165,241, Cl. 136-89.0CC.
- Audio Dynamics Corporation: See—  
Kuehn, John P., 4,165,078, Cl. 274-1.00R.
- Auracher, Franz; and Kersten, Ralf, to Siemens Aktiengesellschaft. Distributor for optical signals. 4,165,225, Cl. 65-4.00B.
- Austin, Paul R., to University of Delaware. Method for converting dextro to levo rotatory chitin. 4,165,433, Cl. 536-20.000.
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- B/W Controls Inc.: See—  
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- Baertsch, Richard D.: See—  
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- Baliga, B. Jayant: See—  
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- Ballard, Allan. Fluid pressure control mechanism. 4,164,954, Cl. 137-115.000.
- Ballard, James S. Wind driven hydrofoil watercraft. 4,164,909, Cl. 114-282.000.
- Banks, Edward D., Jr. Hair waving device. 4,164,952, Cl. 132-37.00R.
- Banning, Jack A.: See—  
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- Barber-Greene Company: See—  
Batch, Joseph, 4,165,044, Cl. 241-264.000.
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- Bartels, Herbert D., to Continental Group, Inc., The. Inward embossed panel adjacent to punched hole in top end unit. 4,165,004, Cl. 206-631.000.
- Barter, LeRoy D., to Beckman Instruments, Inc. Method and apparatus for detecting a peak value of an analog signal. 4,165,508, Cl. 340-347.0AD.
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- Huber, Walter, 4,165,219, Cl. 23-230.00R.
- Jaech, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.
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Login, Robert B.; and Newkirk, David D., 4,165,405, Cl. 428-395.000.
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- Baylac, Christiane: See—  
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- Beacham, Bryan; and Sutton, Gordon W., to British Petroleum Company Limited, The. Nozzle. 4,165,040, Cl. 239-600.000.
- Beard, Charles D.; and Baum, Kurt, to United States of America, Navy. Preparation of aliphatic perchlorates and of trifluoromethane sulfonates. 4,165,332, Cl. 260-453.00R.
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- Bechtold, Joseph A. Smoking appliance. 4,164,950, Cl. 131-194.000.
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- Beckman Instruments, Inc.: See—  
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- Beckmann, Georg: See—  
Gilli, Paul V.; and Beckmann, Georg, 4,164,848, Cl. 60-652.000.
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- Bell Telephone Laboratories, Incorporated: See—  
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- Grabau, Edwin W., 4,165,142, Cl. 339-75.00R.
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- Bentley, Stanley L.; and Jessup, David G., to Ransburg Corporation. Hand-held coating-dispensing apparatus. 4,165,022, Cl. 222-76.000.
- Benzing, Theodor H. Thermostat system for radiant room heating. 4,164,869, Cl. 73-355.00R.
- Berger, Hans-Jurgen; Koch, Ferdinand; Scharf, Rolf; and Schlusser, Hans-Joachim, to Henkel Kommanditgesellschaft auf Aktien. Low-foaming disinfecting agents based on quaternary ammonium compounds. 4,165,375, Cl. 424-263.000.
- Bergkvist, Lars A. Electronic measuring tape. 4,164,816, Cl. 33-139.000.
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- Beringer, Monique; and Sporri, Heinz, to Tamag Basel AG. Method for making artificial tobacco and apparatus for performing said method. 4,164,948, Cl. 131-140.00C.
- Bertoglio, Ottavio; De Micheli, Spiridione; and Tiribelli, Paolo, to CSELT — Centro Studi e Laboratori Telecomunicazioni. Centralized data-registration equipment for traffic supervision in telecommunication system. 4,165,447, Cl. 179-7.10R.
- Bertone, Giuseppe, to Carrozzeria Bertone S.p.A. Motor vehicle body with a rigid sunshine roof. 4,165,122, Cl. 296-107.000.
- Bertozzi, Eugene R., to Thiokol Corporation. Alkyl tin oxide cured polysulfide rubbers in hot melt applications. 4,165,425, Cl. 528-374.000.
- Berube, Richard G., to King Instrument Corporation. Reel holding hub assembly. 4,165,050, Cl. 242-68.300.
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Motola, Marcel; and Besson, Yves, 4,165,492, Cl. 328-165.000.
- Betts, Donald J.; and Hamilton, Martin W., to Eaton Corporation. Dual liquid level monitor. 4,165,509, Cl. 340-620.000.
- Beyler, Roland R. C. Method for reducing pollution due to an internal combustion engine. 4,164,912, Cl. 123-26.000.
- Bierlich, Johannes H. Double-glazed doors or windows and frame assemblies therefor. 4,164,830, Cl. 52-398.000.
- Biskup, Edward J., to General Motors Corporation. Occupant propelled cambering vehicle. 4,165,093, Cl. 280-220.000.
- Black, Thomas C., to J. F. Stevens & Co., Inc. Apparatus for forming a narrow weave from bare elastomeric threads. 4,164,963, Cl. 139-11.000.
- Blaha, Gerald E.: See—  
Gudmestad, Ragnar; and Blaha, Gerald E., 4,164,808, Cl. 29-564.400.
- Blakely, Donald W.: See—  
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Witte, Wolfgang W. F., 4,165,181, Cl. 356-319.000.
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Whitener, Philip C., 4,165,058, Cl. 244-45.00R.
- Boeing Wichita Company: See—  
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- Bonser, Norman L. Mechanical target. 4,165,074, Cl. 273-105.600.
- Borenstein, David E.; and Banning, Jack A., to Phillips Petroleum Company. Method and apparatus for continuous formation of bulked and entangled multifilament yarn. 4,164,841, Cl. 57-350.000.
- Borisovsky, Igor V.: See—  
Azarov, Nikolai N.; Zelensky, Georgy A.; and Borisovsky, Igor V., 4,165,273, Cl. 204-301.000.
- Bormann, Hans: See—  
Linden, Heinrich; and Bormann, Hans, 4,165,239, Cl. 106-300.000.
- Borst, Adolf H. System for the clarification of waste water and utilization of waste products. 4,165,289, Cl. 210-27.000.
- Botcher, Wolfgang; and Kopineck, Hermann-Josef, to Hoesch Werke Aktiengesellschaft. Method of and device for material checking by ultra sound while employing an electrodynamic sound converter. 4,164,873, Cl. 73-643.000.
- Bottom, Edward W. Heat exchanger holder. 4,164,975, Cl. 165-68.000.
- Boudreau, Robert J.; and Cunard, Joel C., to Hedstrom Co. Stroller canopy. 4,165,097, Cl. 280-647.000.
- Bouillon, Claude; Vayssie, Charles; and Richard, Françoise, to L'Oreal. (2-Oxo-3-bornylidene methyl)-benzene sulfonates and derivatives thereof. 4,165,336, Cl. 260-511.000.
- Bouza, Gordon F. Shotgun wad for use as a practice projectile. 4,164,903, Cl. 102-41.000.
- Bowden, James J. Lime removal from furnace surfaces. 4,165,065, Cl. 266-44.000.
- Bowen, William E., to American Can Company. Radiation monitors and method for positioning. 4,165,463, Cl. 250-372.000.
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- Brands, Antoon H.; and Gietema, Jouke, to Hollandse Signaalapparaten B.V. Control unit for the brightness of video signals on a raster scan display. 4,165,506, Cl. 340-706.000.
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- Briggs, Robert W. Ski and ski pole assembly. 4,165,027, Cl. 224-45.00S.
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Beacham, Bryan; and Sutton, Gordon W., 4,165,040, Cl. 239-600.000.
- du Chaffaut, Jean A.; Magnoux, Claude R.; and Oberto, Patrick L. C., 4,165,389, Cl. 426-42.000.
- British Steel Corporation: See—  
Hardwick, Kenneth G.; and Bagshaw, Trevor, 4,164,973, Cl. 164-52.000.
- Brodt, Rudolf: See—  
Jaech, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.
- Brosow, Jorgen, to Dasy Inter S.A. Circuit for preventing acoustic feedback. 4,165,445, Cl. 179-1.0HF.
- Brown, Douglas S., to Carrier Corporation. Apparatus for securing removable containers to vehicle platforms. 4,165,007, Cl. 414-494.000.
- Broxholm, Anne K., administratrix: See—  
Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,889, Cl. 89-7.000.
- Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,890, Cl. 89-185.000.
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- Brunnmüller, Fritz: See—  
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.
- Brusa, Ugo. Apparatus for grouping into bundles elongated objects, more particularly sections or flat rolled elements. 4,165,006, Cl. 414-63.000.
- Brush, Charles K.; and Weinstock, Joseph, to SmithKline Corporation. 6-Carboxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine compounds and use as dopaminergic agents. 4,165,372, Cl. 424-244.000.
- Bryant, Jon A. Beverage container cooler. 4,164,851, Cl. 62-381.000.
- Buck, Josef J., to Magnetic Controls Company. Printed circuit board jack. 4,165,147, Cl. 339-182.00R.



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- Bundy, Gordon L., to Upjohn Company. The Trans-2,3-didehydro-9-deoxy-9-methylene-PGF compounds. 4,165,436, Cl. 560-121.000.
- Bunger, Arthur W.; and Kitchell, Thorne C., to Union Camp Corporation. Two cell bulk box. 4,165,030, Cl. 229-15.000.
- Bunker Ramo Corporation: See—
- Dragisic, Joseph, 4,164,812, Cl. 29-749.000.
- Burdick, Robert L.: See—
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- Burgess, Glenn A.; and Yamanaka, Clarence T., to Garrett Corporation. The Excessive rate detection system. 4,164,898, Cl. 98-1.500.
- Burgess, Glenn A., to Garrett Corporation. The Pressure differential system. 4,164,899, Cl. 98-1.500.
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- Burroughs Corporation: See—
- Gibbs, Stephen R., 4,165,252, Cl. 156-655.000.
- Krause, Peter L., 4,165,531, Cl. 364-200.000.
- Layton, Wilbur T.; and Schwartz, Sidney J., 4,165,536, Cl. 365-2.000.
- Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. Reference voltage source with temperature-stable MOS-FET amplifier. 4,165,478, Cl. 323-19.000.
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- Calamari, James A., Jr., to RCA Corporation. Method for salvaging the light-absorbing matrix and support of a luminescent screen. 4,165,396, Cl. 427-64.000.
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- Mitchell, John G., 4,165,062, Cl. 249-141.000.
- Calistrat, Michael M., to Koppers Company, Inc. Segmented driving shaft. 4,164,855, Cl. 64-2.00P.
- Campbell, Paul K.; and Nichols, Edward L., III, to Square D Company. Compressible electrical connector with positive mechanical lock. 4,165,148, Cl. 339-276.00R.
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- Lavolette, Maurice A., 4,164,904, Cl. 102-92.700.
- Canadian Instrumentation and Research Limited: See—
- Failes, Michael, 4,165,180, Cl. 356-310.000.
- Canon Kabushiki Kaisha: See—
- Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.
- Momiyama, Kikuo, 4,165,151, Cl. 350-201.000.
- Suzuki, Akiyoshi; and Hirabayashi, Yoichi, 4,165,149, Cl. 350-6.100.
- Caracteres S.A.: See—
- Bauer, Alfred, 4,165,189, Cl. 400-144.200.
- Carl Schenck AG, Firma: See—
- Dodt, Hans-Walter; and Kraft, Dieter, 4,164,994, Cl. 188-296.000.
- Carlson, John D.: See—
- Sefton, Robert H.; and Carlson, John D., 4,165,413, Cl. 521-128.000.
- Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., to Aktiebolaget Hassle. Amide substituted phenoxy propanol amines. 4,165,384, Cl. 424-324.000.
- Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., to U.S. Philips Corporation. Microwave oven. 4,165,454, Cl. 219-10.55F.
- Carrier Corporation: See—
- Brown, Douglas S., 4,165,007, Cl. 414-494.000.
- Carrozzeria Bertone S.p.A.: See—
- Bertone, Giuseppe, 4,165,122, Cl. 296-107.000.
- Cascade Corporation: See—
- Faust, Donald M.; and Weinert, Harry F., 4,165,008, Cl. 414-750.000.
- Casper, Clemens; Lippert, Axel; and Sajben, Johannes O., to Bayer Aktiengesellschaft. Multi-phase flow tube for mixing, reacting and evaporating components. 4,165,360, Cl. 422-202.000.
- Cassatt, Gary G.; and Miller, Richard J., to Boeing Wichita Company. Flaw growth correlator. 4,164,874, Cl. 73-799.000.
- Casse, Christian, to Paulstra. Multicellular elastomeric shock-absorbing device. 4,165,113, Cl. 293-121.000.
- Castle, Peter M., to Westinghouse Electric Corp. Method of making halogenated acetylenes. 4,165,269, Cl. 204-163.00R.
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- Caterpillar Tractor Co.: See—
- Congram, Sam R.; and Cole, George S., 4,164,927, Cl. 123-195.00C.
- Goloff, Alexander, 4,164,957, Cl. 137-340.000.
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- Cato Oil and Grease Co.: See—
- Oswalt, Leon M.; and McClanahan, Jimmie D., 4,165,024, Cl. 222-105.000.
- Cavitron Corporation: See—
- Ragsdale, Charles W., 4,164,863, Cl. 128-652.000.
- Cella, Richard T. Golf putter. 4,165,076, Cl. 273-168.000.
- Cenker, Moses: See—
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- Central Glass Company Limited: See—
- Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.
- Centro Sperimentale Metallurgico S.p.A.: See—
- Colletta, Angelo; and Marini, Paolo, 4,165,220, Cl. 44-23.000.
- Chadwick, Daniel E. Snowboard. 4,165,091, Cl. 280-12.00H.
- Chakrabarti, Paritosh M., to GAF Corporation. Hair preparations containing vinyl pyrrolidone copolymer. 4,165,367, Cl. 424-47.000.
- Chandalia, Kiran B.: See—
- Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,165,432, Cl. 536-4.000.
- Chang, Tai Hon P., to International Business Machines Corporation. Process for forming a high aspect ratio structure by successive exposures with electron beam and actinic radiation. 4,165,395, Cl. 427-43.000.
- Chevron Research Company: See—
- Blanton, William A., Jr.; and Blakely, Donald W., 4,165,275, Cl. 208-113.000.
- Dreher, John L.; and Stanton, Garth M., 4,165,329, Cl. 260-404.500.
- Reynolds, Richard N., Jr., 4,165,322, Cl. 260-343.600.
- Schneider, Ronald A., 4,165,438, Cl. 560-211.000.
- Chilpan, Kurt C.; and Lewis, William L., to Roberts Company. Method and apparatus for twisting yarns. 4,164,840, Cl. 57-313.000.
- Chivari, Ilie. Coupling for the vibration-damping transmission of torques. 4,164,877, Cl. 74-574.000.
- Chiyoda Chemical Engineering and Construction Company Ltd.: See—
- Nakamura, Rinjiro, 4,165,348, Cl. 261-36.00A.
- Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing sulfinyl chlorides from penicillin sulfonides. 4,165,316, Cl. 260-239.00A.
- Christensen, George L. Junior stirrups attachment for adult-size saddle. 4,164,834, Cl. 54-46.000.
- Chrysler Corporation: See—
- Wagner, David A., 4,165,098, Cl. 280-708.000.
- Wagner, David A.; Doran, Daniel W.; and Emenaker, Robert C., 4,165,099, Cl. 280-708.000.
- Chung, Jing-yau: See—
- Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, 4,164,867, Cl. 73-346.000.
- Ciba-Geigy AG: See—
- Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, 4,165,268, Cl. 204-163.00R.
- Ciba-Geigy Corporation: See—
- Hiestand, Armin; and Rohringer, Peter, 4,165,435, Cl. 544-197.000.
- Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,165,381, Cl. 424-309.000.
- von der Crone, Jost; and Frey, Christoph, 4,165,319, Cl. 260-325.0PH.
- Circle F Industries, Inc.: See—
- Snyder, Charles A., 4,165,146, Cl. 339-128.000.
- Circuit Technology Incorporated: See—
- Becker, Barry E., 4,165,494, Cl. 330-267.000.
- Cities Service Company: See—
- Armenti, Carmen F.; and De Juneas, James V., 4,165,302, Cl. 260-8.000.
- Cities Service Company: See—
- Levine, Ralph; and Olechowski, Jerome R., 4,165,343, Cl. 585-638.000.
- Citizen Watch Co., Ltd.: See—
- Ebihara, Heihachiro, 4,164,842, Cl. 58-23.00A.
- Clark Equipment Company: See—
- Peppel, Jon H., 4,164,876, Cl. 74-336.00R.
- Clegg, Russell B.: See—
- Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,164,810, Cl. 29-568.000.
- Clements, John A., to General Motors Corporation. Fluid seal ring. 4,165,079, Cl. 277-9.500.
- Cleveland, Andrew J.: See—
- Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., 4,165,520, Cl. 358-280.000.
- Cobb, Bernie J.: See—
- Looger, Lonnie L.; and Cobb, Bernie J., 4,164,888, Cl. 89-1.814.
- Cobe Laboratories, Inc.: See—
- Goyne, Thomas E., 4,165,287, Cl. 210-232.000.
- Cole, Charles F.; and Elenburg, Jimmie H., to Continental Oil Company. Push drill guidance indication apparatus. 4,164,871, Cl. 73-432.00R.
- Cole, George S.: See—
- Congram, Sam R.; and Cole, George S., 4,164,927, Cl. 123-195.00C.
- Cole, Rossa W.: See—
- Moskowitz, Seymour; and Cole, Rossa W., 4,164,846, Cl. 60-39.46S.
- Coleman Company, Inc.: See—
- Liepins, Sigurds; and Crane, James W., 4,164,929, Cl. 124-76.000.
- Colgate Palmolive Company: See—
- Gaffar, Maria C., 4,165,368, Cl. 424-52.000.
- Mellberg, James R., 4,165,366, Cl. 424-49.000.
- Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., to International Business Machines Corporation. Copier having removable paper feed module. 4,165,069, Cl. 271-162.000.
- Colletta, Angelo; and Marini, Paolo, to Centro Sperimentale Metallurgico S.p.A. Process for producing hardened semicoke briquettes. 4,165,220, Cl. 44-23.000.

- Collins, Cecil A., to Fisher Corporation. Comfort lock mechanism. 4,165,054, Cl. 242-107.700.
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- Baudoin, Jean-Claude; and Oger, Robert, 4,165,116, Cl. 294-86.00R.
- Compagnie Generale pour les Developpements Operationnels des Richesses Sous Marines "C.G. Doris": See—
- Serrano, Francisco de Assis M., 4,165,196, Cl. 405-205.000.
- Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): See—
- Vinot, Daniel, 4,165,540, Cl. 365-190.000.
- Comte, Pierre, to Ebauches S.A. Instrument intended to be carried at the wrist. 4,165,477, Cl. 320-61.000.
- Conax Corporation: See—
- Naab, Carlton W.; and Jankowiak, Roman, 4,164,953, Cl. 137-72.000.
- Concrete Industries (Monier) Limited: See—
- Tomlinson, Robert K., 4,164,996, Cl. 198-415.000.
- Condon, Michael E.: See—
- Ondetti, Miguel A.; and Condon, Michael E., 4,165,320, Cl. 260-326.12R.
- Congram, Sam R.; and Cole, George S., to Caterpillar Tractor Co. Reinforced stamped valve cover. 4,164,927, Cl. 123-195.00C.
- Consolidated Medical Equipment Inc.: See—
- Williams, Frank R.; and Abraham, William, 4,165,141, Cl. 339-75.00R.
- Conte, Joseph. Grass cutter. 4,164,835, Cl. 56-291.000.
- Continental Group, Inc.: See—
- Bartels, Herbert D., 4,165,004, Cl. 206-631.000.
- Giggard, Earl D., 4,165,018, Cl. 220-284.000.
- Hasegawa, Gary K., 4,165,015, Cl. 220-269.000.
- Hasegawa, Gary K., 4,165,017, Cl. 220-273.000.
- Holk, Albert J., Jr., 4,165,011, Cl. 220-67.000.
- Mascia, Carmen T.; and Hawegawa, Gary K., 4,165,025, Cl. 222-401.000.
- Moller, Jens L., 4,165,016, Cl. 220-270.000.
- Payne, Robert D., 4,165,134, Cl. 406-1.000.
- Continental Oil Company: See—
- Cole, Charles F.; and Elenburg, Jimmie H., 4,164,871, Cl. 73-432.00R.
- Stokke, Olaf M., 4,165,257, Cl. 435-262.000.
- Control Systems Limited: See—
- Dickson, Stanley J.; and Castleton, Albert E., 4,165,191, Cl. 400-636.000.
- Cook, Albert N.; Kornatowski, Boleslaw; and Tyburcy, Raymond S., to Singer Company. The Light socket with lever contacts. 4,165,144, Cl. 339-88.00R.
- Cook, Martin C.: See—
- Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., 4,165,430, Cl. 544-22.000.
- Cooper, Thomas F. Bonded stacked snap rings. 4,165,001, Cl. 206-343.000.
- Corbett, Herbert O., to National Distillers and Chemical Corporation. Laminated products, and methods and apparatus for producing the same. 4,165,210, Cl. 425-133.500.
- Corbett nec Rolison, Constance R., to Stauffer Chemical Company. Agent for providing meaty flavor in foods. 4,165,391, Cl. 426-580.000.
- Corderman, Roy C. Low power system and method for communicating audio information to patrons having portable radio receivers. 4,165,487, Cl. 325-54.000.
- Corning Glass Works: See—
- Powers, Dale R., 4,165,223, Cl. 65-2.000.
- Coumo, Salvatore R., Jr.; and Ellington, Thomas M., Jr., to International Business Machines Corporation. Gap measurement tool. 4,165,178, Cl. 356-1.000.
- Coval, Myer Louis. Injectable gamma globulin. 4,165,370, Cl. 424-85.000.
- CPC International Inc.: See—
- Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, 4,165,240, Cl. 127-29.000.
- Crane, James W.: See—
- Liepins, Sigurds; and Crane, James W., 4,164,929, Cl. 124-76.000.
- Crouch, Charles E.: See—
- United States of America, National Aeronautics and Space Administration; Rose, Stephen D.; Crouch, Charles E.; and Jones, Elborn W., 4,165,460, Cl. 250-253.000.
- Cruickshank, William T.: See—
- Bongort, Edgar A.; and Cruickshank, William T., 4,165,501, Cl. 335-206.000.
- CSELT — Centro Studi e Laboratori Telecomunicazioni: See—
- Bertoglio, Ottavio; De Micheli, Spiridione; and Tiribelli, Paolo, 4,165,447, Cl. 179-7.10R.
- Cummins Engine Company, Inc.: See—
- Glasson, Richard E., 4,164,917, Cl. 123-97.00B.
- Cunard, Joel C.: See—
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- Cunningham, Hugh, to PPG Industries, Inc. Hollow cathode for an electrolytic cell. 4,165,272, Cl. 204-282.000.
- Curtice, Walter R., to RCA Corporation. Time interval measurement. 4,165,459, Cl. 235-92.0TF.
- Curtiss-Wright Corporation: See—
- Moskowitz, Seymour; and Cole, Rossa W., 4,164,846, Cl. 60-39.46S.
- Dai Nippon Ink & Chemicals Incorporated: See—
- Mizuno, Shioji; and Sugie, Toshinori, 4,165,307, Cl. 260-40.0TN.
- Dai Nippon Toyo Co. Ltd.: See—
- Tugukuni, Hideyoshi; and Kano, Masafumi, 4,165,406, Cl. 428-407.000.
- Daikin Kogyo Co., Ltd.: See—
- Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.
- Tohzuca, Takashi; and Ohsaka, Yohnosuke, 4,165,340, Cl. 260-593.00H.
- Daly, William T.: See—
- Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.
- Dana Corporation: See—
- Klingenberg, James C., 4,165,032, Cl. 233-23.00R.
- Daniels, Paul J., to Alderman, Shirley D.; and Hendrix, Joyce D., part interest to each. Fluid dispenser for reconstituting beverages and the like. 4,164,964, Cl. 141-329.000.
- Dantzig, Jonathan A.; and Tyler, Derek E., to Swiss Aluminium Ltd. Method for inline degassing and filtration of molten metal. 4,165,235, Cl. 75-93.00E.
- Darch, Doyle: See—
- Urdea, Myron G.; Darch, Doyle; and Urdea, John N., 4,165,089, Cl. 280-87.04A.
- Darlington, William B.; Driskill, John D.; and Du Bois, Donald W., to PPG Industries, Inc. Method of joining fluorocarbon membrane sheets with quaternary ammonium compounds. 4,165,248, Cl. 156-308.000.
- Dasy Inter S.A.: See—
- Brosow, Jorgen, 4,165,445, Cl. 179-1.0HF.
- Davis, Bryan T.; and Moat, Nicholas W., to Edwin Cooper and Company Limited. Lubricant corrosion inhibitor. 4,165,292, Cl. 252-51.50A.
- Davis, Kenneth G., to Mobil Oil Corporation. Water-based coating composition containing polyvinyl chloride. 4,165,304, Cl. 260-22.0CB.
- Davis, Lewis K.; and Lowin, Kenneth J., to Deere & Company. Tank vent system. 4,164,919, Cl. 123-136.000.
- Davis Walker Corporation: See—
- Burke, Zane L., 4,165,401, Cl. 427-398.00B.
- Davy-Loewy Limited: See—
- Holmes, Gordon D., 4,164,858, Cl. 72-237.000.
- Dayco Corporation: See—
- Stickers, Tieme C., 4,165,466, Cl. 290-3.000.
- DCA Design Consultants Limited: See—
- Beard, Michael A.; and Williams, Edward A., 4,164,942, Cl. 128-146.500.
- De Forenede Bryggerier A/S: See—
- von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., 4,165,387, Cl. 426-16.000.
- Deaton, Thomas M.: See—
- Arendt, Henry P.; Deaton, Thomas M.; and Dooley, Donald L., 4,164,977, Cl. 166-125.000.
- Dee, Rudolf, to Hacob Textilmashinen GmbH & Co. KG, Firma. Bobbin with snap ring. 4,165,055, Cl. 242-125.200.
- Deere & Company: See—
- Davis, Lewis K.; and Lowin, Kenneth J., 4,164,919, Cl. 123-136.000.
- Hoch, John J., 4,164,983, Cl. 172-43.000.
- Wilson, John E., 4,164,947, Cl. 130-27.0HA.
- DeGood, David A.; and Stevens, David K., to DeGood, David A. Accumulation live roller conveyor. 4,164,998, Cl. 198-781.000.
- De Juneas, James V.: See—
- Armenti, Carmen F.; and De Juneas, James V., 4,165,302, Cl. 260-8.000.
- Delbar Products, Inc.: See—
- O'Connell, Lawrence E., 4,165,156, Cl. 350-307.000.
- Dell, Christopher C., to National Research Development Corporation. Froth flotation. 4,165,279, Cl. 209-169.000.
- DeMarco, JoAnn, to Loctite Corporation. Self-emulsifying anaerobic composition. 4,165,400, Cl. 427-295.000.
- De Micheli, Spiridione: See—
- Bertoglio, Ottavio; De Micheli, Spiridione; and Tiribelli, Paolo, 4,165,447, Cl. 179-7.10R.
- de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, to Thomson-CSF. Process for the manufacture of optical fibers with a radial refractive index. 4,165,222, Cl. 65-2.000.
- de Ronde, Frans C.: See—
- Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., 4,165,454, Cl. 219-10.55F.
- de Saint-Palais, Jacques, to Societe Nationale Elf Aquitaine (Production). Device for connecting tubes having a small cross-section perpendicularly to a universal coupling element. 4,165,108, Cl. 285-45.000.
- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: See—
- Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,165,363, Cl. 423-342.000.
- Devillard, Roger, to Heurtey Metallurgie. Paint drying oven. 4,164,819, Cl. 34-72.000.
- de Vletter, Robbert: See—
- Wind, Evert; and de Vletter, Robbert, 4,165,285, Cl. 210-195.300.
- Diafloc Co., Ltd.: See—
- Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.
- Diakinetics, Incorporated: See—
- Vago, Robert E., 4,165,127, Cl. 297-345.000.



Dianis Creations, Inc.: See—  
Lefebvre, Elsa G., 4,165,385, Cl. 424-365.000.  
Dick, Perry J., Jr., to Trumbull Corporation. Process and apparatus for applying and compacting castable material in strips on a sloped surface. 4,165,199, Cl. 405-271.000.  
Dickson, Stanley J.; and Castleton, Albert E., to Control Systems Limited. Web feed, web cutting and ribbon feed means for a stationary mosaic printer. 4,165,191, Cl. 400-636.000.  
Di Domenico, Mauro, Jr.; Karr, Michael A., III; and Rich, Theodore C., to Bell Telephone Laboratories, Incorporated. Optical fiber light tap. 4,165,496, Cl. 331-94.50S.  
Diehl, Robert E.: See—  
Lutz, Albert W.; and Diehl, Robert E., 4,165,231, Cl. 71-121.000.  
Diehm, Hans: See—  
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Dien, Sam. Golf club head covers improvement. 4,164,969, Cl. 150-1.50R.  
Dietl, Ernst: See—  
Strehler, Hugo; Dietl, Ernst; and Pilz, Georg, 4,165,335, Cl. 260-501.200.  
Di Marcello, Richard A.: See—  
Figart, Earl C.; Kelly, J. Kevin; and Di Marcello, Richard A., 4,165,443, Cl. 174-53.000.  
Di Marco, Joel E. Tool holder cartridge for chucking lathes. 4,164,880, Cl. 82-36.00R.  
Dittert, Karl; and Hartkorn, Hans W., to Ritterwerk GmbH. Electrically powered knife. 4,164,813, Cl. 30-272.00A.  
Diven, Jeffrey K., to McCall Associates, Inc. Ash trap for a bong. 4,164,949, Cl. 131-173.000.  
Dochnahl, Johann, to Drahtex Development AG. Arrangements for retaining and sealing window glass. 4,165,083, Cl. 277-184.000.  
Dodt, Hans-Walter; and Kraft, Dieter, to Carl Schenck AG, Firma. Hydraulic eddy brake. 4,164,994, Cl. 188-296.000.  
Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Device for heating to consumption temperature a liquid commestible product sealed in a disposable container. 4,165,456, Cl. 219-449.000.  
Doherty, Thomas E., to Owens-Illinois, Inc. Method for controlling a web of material. 4,165,028, Cl. 226-4.000.  
Dolhyj, Serge R.; and Milberger, Ernest C., to Standard Oil Company, The. Oxidation catalysts. 4,165,300, Cl. 252-462.000.  
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased (by Ruble, Eulalia Berry, executrix), to Sid Richardson Carbon & Gasoline Co. Carbon black reactor with axial flow burner. 4,165,364, Cl. 423-456.000.  
Donohue, James M.; and Mueller, Daniel L., to Xerox Corporation. Control system. 4,165,170, Cl. 355-14.000.  
Dooley, Donald L.: See—  
Arendt, Henry P.; Deaton, Thomas M.; and Dooley, Donald L., 4,164,977, Cl. 166-125.000.  
Doran, Daniel W.: See—  
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Dorling, Rolf, to L. & C. Steinmuller GmbH. Hot or cold operating cast pressure container. 4,165,021, Cl. 220-468.000.  
Dottore, Nicholas J., Jr. Damper. 4,164,936, Cl. 126-285.00R.  
Dow Chemical Company, The: See—  
Juckness, Paul R.; and Johnson, David R., 4,165,262, Cl. 204-64.00T.  
Downing, Leo G.: See—  
Kendall, Thomas L.; Downing, Leo G.; and Ray, James A., 4,165,532, Cl. 364-420.000.  
Doya, Masaharu: See—  
Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, 4,165,337, Cl. 260-544.00D.  
Drader, Clarence H. Stackable and nestable containers. 4,165,003, Cl. 206-506.000.  
Drahtex Development AG: See—  
Dochnahl, Johann, 4,165,083, Cl. 277-184.000.  
Dragisic, Joseph, to Bunker Ramo Corporation. Termination tool for assembling electrical cables to connectors. 4,164,812, Cl. 29-749.000.  
Draney, Robert G., to J. I. Case Company. Vibratory cable plow assembly. 4,164,982, Cl. 172-40.000.  
Dreher, John L.; and Stanton, Garth M., to Chevron Research Company. Grease thickening agent. 4,165,329, Cl. 260-404.500.  
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Druyvesteyn, Willem F.: See—  
Koel, Gerrit J.; and Druyvesteyn, Willem F., 4,165,525, Cl. 360-125.000.  
Drzewiecki, Tadeusz M.; and Manion, Francis M., to United States of America, Army. Fluidic pressure/flow regulator. 4,164,961, Cl. 137-823.000.  
Du Bois, Donald W.: See—  
Darlington, William B.; Driskill, John D.; and Du Bois, Donald W., 4,165,248, Cl. 156-308.000.  
Dubs, Walter; and Preiss, Georg, to Kistler Instrumente AG. Chip-removing machining method and apparatus for semiconducting crystals, specifically suited for the production of force and pressure measuring cells. 4,165,402, Cl. 428-64.000.  
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Duck, Gary S.; and King, Frederick D., to Northern Telecom Limited. Low loss directional coupling for optical fibres. 4,165,150, Cl. 350-96.150.  
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, to BASF Aktiengesellschaft. Preparation of 3-alkyl-buten-1-als. 4,165,342, Cl. 260-603.00C.  
Duck, Richard: See—  
Persha, Thomas J.; Lehto, Eino M.; Duck, Richard; and Hechimovich, Nick, 4,165,160, Cl. 353-55.000.  
Duke, John A. Well cementing method and apparatus. 4,164,980, Cl. 166-291.000.  
Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, to Allen-Bradley Company. Digital control system with Boolean processor. 4,165,534, Cl. 364-900.000.  
Du Pont de Nemours, E. I., and Company: See—  
Quehl, Henry E., 4,165,404, Cl. 428-212.000.  
Dupont, John A.: See—  
Greenfield, Stanley A.; and Dupont, John A., 4,165,318, Cl. 260-302.00A.  
Durst AG. Fabrik Fototechnischer Apparate: See—  
Barbieri, Siegfried, 4,165,175, Cl. 355-38.000.  
E. R. Squibb & Sons, Inc.: See—  
Ondetti, Miguel A.; and Condon, Michael E., 4,165,320, Cl. 260-326.12R.  
Early California Industries Inc.: See—  
Howard, Charles W., 4,164,960, Cl. 137-604.000.  
Eastman Kodak Company: See—  
Ahrenkeil, Richard K., 4,165,471, Cl. 307-311.000.  
Anderson, Richard B.; Hoffmeister, Elaine H.; and Landholm, Richard A., 4,165,238, Cl. 96-119.00R.  
Eaton Corporation: See—  
Betts, Donald J.; and Hamilton, Martin W., 4,165,509, Cl. 340-620.000.  
Maltby, Edgar W., 4,165,035, Cl. 236-86.000.  
Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, to Agency of Industrial Science and Technology; and Central Glass Company Limited. Process and apparatus for heat treating edge of plate glass. 4,165,228, Cl. 65-111.000.  
Ebauches S.A.: See—  
Comte, Pierre, 4,165,477, Cl. 320-61.000.  
Ehrbar, Jean-Paul; and Ganguillet, Claude, 4,165,394, Cl. 427-40.000.  
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjürgen; and Schulte, Klaus, to Bayer Aktiengesellschaft. Apparatus for applying a layer of a liquid foamable reaction mixture to a continuously moving support. 4,165,211, Cl. 425-224.000.  
Ebihara, Heihachiro, to Citizen Watch Co., Ltd. Buffer amplifier circuit. 4,164,842, Cl. 58-23.00A.  
Echlin Manufacturing Company, The: See—  
Kindlmann, Peter J., 4,164,926, Cl. 123-148.00E.  
Eckell, Wolfgang: See—  
Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, 4,164,925, Cl. 123-140.00R.  
Eckhardt, Wolfgang: See—  
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,165,381, Cl. 424-309.000.  
Edwin Cooper and Company Limited: See—  
Davis, Bryan T.; and Moat, Nicholas W., 4,165,292, Cl. 252-51.50A.  
Eheim, Franz; and Hofer, Gerald, to Robert Bosch GmbH. Timing control system affording maintenance of fuel quantity delivered. 4,164,922, Cl. 123-139.00AQ.  
Eheim, Franz: See—  
Hofer, Gerald; and Eheim, Franz, 4,164,921, Cl. 123-139.00AF.  
Ehrbar, Jean-Paul; and Ganguillet, Claude, to Ebauches S.A. Method of preparation of a substrate made of plastic material for its subsequent metallization. 4,165,394, Cl. 427-40.000.  
Eichelberger, Charles W.: See—  
Butler, Walter J.; and Eichelberger, Charles W., 4,165,478, Cl. 323-19.000.  
Eiermann, Dankwart, to Wankel GmbH. External axle rotary piston machine. 4,165,209, Cl. 418-190.000.  
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Electric Power Research Institute, Inc.: See—  
Paice, Derek A., 4,165,527, Cl. 361-113.000.  
Temple, Victor A. K.; and Baliga, B. Jayant, 4,165,517, Cl. 357-38.000.  
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Gale, Philip F., 4,165,482, Cl. 324-52.000.  
Elenburg, Jimmie H.: See—  
Cole, Charles F.; and Elenburg, Jimmie H., 4,164,871, Cl. 73-432.00R.  
Eli Lilly and Company: See—  
Arnold, Wendell R., 4,165,229, Cl. 71-90.000.  
Chou, Ta-Sen, 4,165,316, Cl. 260-239.00A.  
Kukulja, Stjepan, 4,165,315, Cl. 260-239.00A.  
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Mitchell, Henry M.; Elias, John; and Moorcroft, John, 4,164,866, Cl. 73-231.00R.  
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Wagner, David A.; Doran, Daniel W.; and Emenaker, Robert C., 4,165,099, Cl. 280-708.000.  
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Schlossman, Irwin S.; and Wiman, Robert E., 4,165,303, Cl. 260-22.00D.  
Endoh, Toru; and Katoh, Masayuki, to Kubota, Ltd. Adamite roll material for a rolling mill. 4,165,407, Cl. 428-408.000.  
Enerco, Inc.: See—  
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,165,216, Cl. 432-102.000.  
Engeler, William E.; and Baertsch, Richard D., to General Electric Company. Analog charge transfer apparatus. 4,165,537, Cl. 365-45.000.  
Engelhard Minerals & Chemicals Corporation: See—  
Reynolds, Victor R., 4,165,362, Cl. 423-53.000.  
Engelsmann, Dieter; Hackenberg, Hubert; and Schroder, Rolf, to AGFA-Gevaert A.G. Exposure controls for photographic apparatus. 4,165,166, Cl. 354-21.000.  
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Nicholson, Albert N., 4,164,911, Cl. 118-670.000.  
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, to CPC International Inc. Starch hydrolysate having less than 5 ppm of heavy metals. 4,165,240, Cl. 127-29.000.  
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Salomon, Georges P. J., 4,164,815, Cl. 33-3.00A.  
ETS, Bobard Jeune S.A.: See—  
Bobard, Charles E., 4,164,985, Cl. 180-53.00D.  
Everett, Robert W., to American Air Filter Company, Inc. Indoor gun firing range enclosure having a ventilation system. 4,164,901, Cl. 98-33.00A.  
Exley, John T.; Kuintzle, Charles, Jr.; and Tate, David L., to Avco Corporation. Rotary compressors. 4,164,845, Cl. 60-39.290.  
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Whitney, Thomas A.; and Langer, Arthur W., Jr., 4,165,330, Cl. 260-448.20B.  
Fabrication de Maguinas, S.A.: See—  
Martin, John K., 4,164,854, Cl. 62-536.000.  
Faires, Michael, to Canadian Instrumentation and Research Limited. Automatic computing color meter. 4,165,180, Cl. 356-310.000.  
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Popovich, Mark, 4,165,075, Cl. 273-140.000.  
Fairchild Camera and Instrument Corporation: See—  
Varshney, Ramesh C.; Venkateswaran, Kalyanasundaram; and Amelio, Gilbert F., 4,165,541, Cl. 365-219.000.  
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Falcone, Ronald D. Word game. 4,165,077, Cl. 273-239.000.  
Farmer Foundation Company: See—  
Farmer, Glynn D., 4,165,198, Cl. 405-243.000.  
Farmer, Glynn D., to Farmer Foundation Company. Method for forming pier foundation columns. 4,165,198, Cl. 405-243.000.  
Faust, Donald M.; and Weinert, Harry F., to Cascade Corporation. Slider roller side shifter for use on a forklift truck. 4,165,008, Cl. 414-750.000.  
Favre, Michel: See—  
de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, 4,165,222, Cl. 65-2.000.  
Fedders Corporation: See—  
Anzalone, Carmen J., 4,164,852, Cl. 62-429.000.  
Feddersohn, Richard C.; and Schaffer, William S. Curb slider device for skateboards. 4,165,090, Cl. 280-87.00A.  
Federal Hose Manufacturing Corp.: See—  
Foti, Sam J., 4,165,109, Cl. 285-177.000.  
Federal-Mogul Corporation: See—  
Sarnes, Myron C.; and Pathak, Ramjee, 4,165,243, Cl. 148-16.500.  
Federal Screw Works: See—  
Strand, Norman S., 4,164,971, Cl. 151-14.500.  
Feiler, Robert. Score registering device. 4,164,910, Cl. 116-225.000.  
Fejmert, Bernhard V. Mixer, preferably for the mixing of concrete. 4,165,185, Cl. 366-65.000.  
Feldmaier, Douglas A.: See—  
Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, 4,164,867, Cl. 73-346.000.

Feller, Thomas R., to Allis-Chalmers Corporation. Method and apparatus for supporting a sensor in a normally inaccessible area of a machine. 4,164,864, Cl. 73-118.000.  
F'Geppert, Erwin, to United States of America, Army. Constant force face seal. 4,165,081, Cl. 277-88.000.  
Fielding, Ivor R.; Poppe, Wassily; and Slama, Francis J., to Standard Oil Company (Indiana). Flame retardant polymer composition. 4,165,309, Cl. 260-45.80A.  
Figart, Earl C.; Kelly, J. Kevin; and Di Marcello, Richard A. Power distribution system. 4,165,443, Cl. 174-53.000.  
FIP, S.A. de C.V.: See—  
Works, Madden T., 4,165,064, Cl. 251-329.000.  
Fisher Corporation: See—  
Collins, Cecil A., 4,165,054, Cl. 242-107.700.  
Fleet Engineers, Inc.: See—  
Herlein, Daniel K., 4,165,092, Cl. 280-154.50R.  
Fleming-Potter Company, Inc.: See—  
Maarleveld, Adrianus, 4,164,902, Cl. 99-277.100.  
Fletcher, Thomas A., to General Electric Company. Latch device. 4,164,804, Cl. 24-273.000.  
Fliege, Werner: See—  
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.  
Flory, Harold E. Signal-operated marking device. 4,165,513, Cl. 346-141.000.  
Flower, Ralph F. J. Frictional couplings. 4,165,194, Cl. 403-320.000.  
Flowers, Thomas E.; and MacDonnell, Gordon S. Data transmission systems (using internal systems equipment, services and procedures of telephone companies). 4,165,446, Cl. 179-2.00DP.  
FMC Corporation: See—  
Kempf, Dennis D., 4,165,084, Cl. 277-212.00C.  
Foseco Trading A.G.: See—  
Hazlehurst, Ian J.; and Willard, David C., 4,165,026, Cl. 222-591.000.  
Foti, Sam J., to Federal Hose Manufacturing Corp. Wide-band compression coupling. 4,165,109, Cl. 285-177.000.  
Foucares, Jacques; and Rodet, Georges, to Rhone-Poulenc Industries. Leakproof securing means for mounting a semi-permeable membrane to a support. 4,165,082, Cl. 277-166.000.  
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Hill, J. Donald; and Fountain, Gordon H., 4,164,943, Cl. 128-348.000.  
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Eloy, Jacques; and Francois, Claude, 4,164,986, Cl. 180-90.000.  
Frederich, Fritz: See—  
Stiefel, Christian; and Frederich, Fritz, 4,164,990, Cl. 182-48.000.  
Freeman, Ernest A., Jr.: See—  
Teed, Richard K.; and Freeman, Ernest A., Jr., 4,165,288, Cl. 210-23.00H.  
Frewin, Le Roy F., to Inex, Incorporated. Article monitoring and reject apparatus. 4,165,277, Cl. 209-3.300.  
Frey, Christoph: See—  
von der Crone, Jost; and Frey, Christoph, 4,165,319, Cl. 260-325.00PH.  
Frey, Gerald J. Track-type slide projector magazine. 4,165,162, Cl. 353-109.000.  
Frolow, Jack L. Tennis racket. 4,165,071, Cl. 273-73.00C.  
Frumkin, Felix M.: See—  
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.  
Fry, Charles M.; and Hise, Henry W. Wind driven, high altitude power apparatus. 4,165,468, Cl. 290-55.000.  
Fuji Photo Film Co., Ltd.: See—  
Aotsuka, Yasuo, 4,165,236, Cl. 96-74.000.  
Matsumoto, Nobuo; Tsuji, Osami; Kamiya, Yukio; and Shiozawa, Etsuo, 4,165,251, Cl. 156-584.000.  
Shiba, Keisuke; Tajima, Tatsuya; and Sakaki, Hirokazu, 4,165,237, Cl. 96-76.00R.  
Fujikawa, Tetsuzo; and Uda, Ryoji, to Kawai Jukogyo Kabushiki Kaisha. Actuation device for a tachometer for an engine. 4,165,207, Cl. 417-313.000.  
Fujimori, Motoyuki, to Kabushiki Kaisha Suwa Seikosha. Metallic lead plate and circuit structure for an electronic watch and method of assembly. 4,164,843, Cl. 58-23.00R.  
Fujimoto, Masaharu: See—  
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.  
Fujimoto, Sachio: See—  
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.  
Fujitsu Limited: See—  
Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, 4,165,464, Cl. 250-550.000.  
Fujiwara, Kunio: See—  
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,165,152, Cl. 350-96.300.  
Fukuda, Tamotsu: See—  
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.00EE.  
Fukui, Shoshin: See—  
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki;



Shinkai, Hiroyuki; and Asoka, Masayuki, 4,165,338, Cl. 260-584.00R.  
 Fukui, Yoshiharu: See—  
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 Fulkerson, David E., to Honeywell Inc. Logic gates with forward biased diode load impedances. 4,165,470, Cl. 307-215.000.  
 Furuno, Akihisa: See—  
 Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.  
 Gabor, Antal: See—  
 Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.  
 Gabor Nadhaz: See—  
 Kaiser, Jarome, 4,165,117, Cl. 296-27.000.  
 Gabriel, Anthony P.; and Justiss, Jimmy, to General Cable Corporation. Telephone cable with improved shield combination. 4,165,442, Cl. 174-36.000.  
 Gabrielsen, Bernard L.: See—  
 Messick, William E.; and Gabrielsen, Bernard L., 4,164,831, Cl. 52-405.000.  
 GAF Corporation: See—  
 Chakrabarti, Paritosh M., 4,165,367, Cl. 424-47.000.  
 Gaffar, Maria C., to Colgate Palmolive Company. Dental prophylactic paste. 4,165,368, Cl. 424-52.000.  
 Gagneraud, Francis. Treating molten metallurgical slag. 4,165,233, Cl. 75-24.000.  
 Gale, Philip F., to Electricity Council, The. Cable fault location. 4,165,482, Cl. 324-52.000.  
 Ganguillet, Claude: See—  
 Ehrbar, Jean-Paul; and Ganguillet, Claude, 4,165,394, Cl. 427-40.000.  
 Garcia Corporation, The: See—  
 Neau, Alain, 4,165,095, Cl. 280-613.000.  
 Garland, J. David: See—  
 Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.  
 Garrett Corporation, The: See—  
 Aldrich, Howard P.; Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,895, Cl. 98-1.500.  
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 Aldrich, Howard P., 4,164,900, Cl. 98-1.500.  
 Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,898, Cl. 98-1.500.  
 Burgess, Glenn A., 4,164,899, Cl. 98-1.500.  
 Yamanaka, Clarence T., 4,164,894, Cl. 98-1.500.  
 Gavin, Joseph G., to Grumman Corporation. Solar heat collector construction. 4,164,932, Cl. 126-448.000.  
 Gearhart-Owen Industries, Inc.: See—  
 Hallmark, Bobby J., 4,164,886, Cl. 89-1.00C.  
 Geffon, Arthur P., to Sperry Rand Corporation. Circuit for detecting zero crossing points for data signal. 4,165,491, Cl. 328-150.000.  
 Gehman, Stacy E.: See—  
 Holmes, Allen B.; and Gehman, Stacy E., 4,165,503, Cl. 340-170.00R.  
 Genakis, Joseph M. Plugless pin tumbler cylinder. 4,164,857, Cl. 70-352.000.  
 General Cable Corporation: See—  
 Gabriel, Anthony P.; and Justiss, Jimmy, 4,165,442, Cl. 174-36.000.  
 General Connectors Corporation: See—  
 Affa, Stephen N.; and Yorke, Roy E., 4,165,107, Cl. 285-41.000.  
 General Electric Company: See—  
 Butler, Walter J.; and Eichelberger, Charles W., 4,165,478, Cl. 323-19.000.  
 Engeler, William E.; and Baertsch, Richard D., 4,165,537, Cl. 365-45.000.  
 Fletcher, Thomas A., 4,164,804, Cl. 24-273.000.  
 Hahn, Thomas M., 4,165,105, Cl. 285-19.000.  
 May, John E., 4,165,351, Cl. 264-66.000.  
 Smith, William E., 4,165,439, Cl. 568-804.000.  
 Weiser, Ernest F., 4,165,476, Cl. 318-493.000.  
 White, Dwain M., 4,165,422, Cl. 525-397.000.  
 General Foods Corporation: See—  
 Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,165,390, Cl. 426-540.000.  
 General Motors Corporation: See—  
 Biskup, Edward J., 4,165,093, Cl. 280-220.000.  
 Clements, John A., 4,165,079, Cl. 277-9.500.  
 Haka, Raymond J., 4,164,918, Cl. 123-119.00A.  
 Hedeon, Carl E.; and Loose, Richard D., 4,165,119, Cl. 296-93.000.  
 Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, 4,164,867, Cl. 73-346.000.  
 Olander, William C.; Trabold, William G.; Harvey, Douglas J.; and Vest, Robert W., 4,165,452, Cl. 200-19.00R.  
 Geronprez, Raymond L., to American Can Company. Binderless ink for jet printing. 4,165,399, Cl. 427-264.000.  
 Gestetner, Alfred, to Gestetner, Alfred. Loose-leaf folder. 4,165,193, Cl. 402-61.000.  
 Gibbs, Stephen R., to Burroughs Corporation. Method for chemically treating a single side of a workpiece. 4,165,252, Cl. 156-655.000.  
 Gietema, Jouke: See—  
 Brands, Antoon H.; and Gietema, Jouke, 4,165,506, Cl. 340-706.000.

Giggard, Earl D., to Continental Group, Inc., The. Child resistant overcap for easy opening container. 4,165,018, Cl. 220-284.000.  
 Gilli, Paul V.; and Beckmann, Georg, to Gilli, Paul Viktor. Method and apparatus for peak-load coverage and stop-gap reserve in steam power plants. 4,164,848, Cl. 60-652.000.  
 Gilli, Paul Viktor: See—  
 Gilli, Paul V.; and Beckmann, Georg, 4,164,848, Cl. 60-652.000.  
 Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., to ICI Americas Inc. Guanidine derivatives of imidazoles and thiazoles. 4,165,378, Cl. 424-270.000.  
 GKN Kent Alloys Limited: See—  
 Thompson, Joseph A., 4,165,131, Cl. 301-65.000.  
 Gladden, James B. Hose or pipe coupling. 4,165,106, Cl. 285-39.000.  
 Glassmeyer, John J., to Pullman Incorporated. Cleanable drain for tanker vehicle. 4,165,086, Cl. 280-5.00R.  
 Glasson, Richard E., to Cummins Engine Company, Inc. Controllable valve tappet for use with dual ramp cam. 4,164,917, Cl. 123-97.00B.  
 Glaxo Laboratories Limited: See—  
 Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., 4,165,430, Cl. 544-22.000.  
 Goegelman, Robert T.: See—  
 Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.  
 Goff, Clifford E.: See—  
 Rogers, Arden D., Jr.; and Goff, Clifford E., 4,165,034, Cl. 236-12.00R.  
 Goff, Raymon L.; and Rau, Jim L., to TRW Inc. Control apparatus. 4,164,892, Cl. 91-375.00A.  
 Goff, Willie, Jr.: See—  
 Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., 4,165,168, Cl. 355-3.00R.  
 Goldberg, Estelle: See—  
 Einstein, Irving, 4,165,451, Cl. 179-178.000.  
 Golembeck, Gerald A., to United States Bedding Company, The. Zipper construction for mattresses and the like. 4,164,797, Cl. 5-470.000.  
 Golloff, Alexander, to Caterpillar Tractor Co. Oil-cooled engine valve. 4,164,957, Cl. 137-340.000.  
 Gonzalez-Dorner, Alberto C.: See—  
 Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjürgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.  
 Goodyear Tire & Rubber Company, The: See—  
 Bauer, Richard G.; and Rubio, Diego C., 4,165,347, Cl. 525-69.000.  
 Kline, Richard H., 4,165,333, Cl. 260-455.00R.  
 Rinehart, Verne R., 4,165,420, Cl. 526-63.000.  
 Gordon, John A., to National Research Development Corporation. Apparatus for electronic encipherment of digital data. 4,165,444, Cl. 178-22.000.  
 Gordon, Joseph G., II; and Sincerbox, Glenn T., to International Business Machines Corporation. Amplitude modulation of light beam. 4,165,155, Cl. 350-285.000.  
 Gordon, Robert A., to Amway Corporation. Solid transparent cleanser. 4,165,293, Cl. 252-118.000.  
 Gosselink, Eugene P.; Richmond, James M.; and Wentler, George E., to Procter & Gamble Company, The. Detergent compounds and compositions. 4,165,334, Cl. 260-458.00R.  
 Gosteli, Jacques: See—  
 Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, 4,165,268, Cl. 204-163.00R.  
 Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Optical control system for read out from information recording medium. 4,165,519, Cl. 358-128.000.  
 Goynne, Thomas E., to Cobe Laboratories, Inc. Potting pleated membrane. 4,165,287, Cl. 210-232.000.  
 Grabau, Edwin W., to Bell Telephone Laboratories, Incorporated. Connector clip. 4,165,142, Cl. 339-75.00R.  
 Gragson, James T., to Phillips Petroleum Company. Overbasing calcium petroleum sulfonates in lubricating oils employing monoalkylbenzene. 4,165,291, Cl. 252-33.000.  
 Graham, Glen: See—  
 Epstein, Albert; Graham, Glen; and Sklarz, William A., 4,165,250, Cl. 435-267.000.  
 Graham, William H.; and Shepard, Inella G., to Thiokol Corporation. Hydroxy terminated polybutadiene based polyurethane bound propellant grains. 4,165,421, Cl. 528-75.000.  
 Grain Processing Corporation: See—  
 Witt, Paul R., Jr., 4,165,388, Cl. 426-16.000.  
 Granbom, Bo; and Lundqvist, Gunnar. Sealing device at pressure fluid cylinders. 4,164,893, Cl. 92-88.000.  
 Grants, Valdis: See—  
 Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, 4,165,534, Cl. 364-900.000.  
 Gravrok, Ralph E.; and Phillips, Clarence A. L., to Texaco Inc. Agricultural spray oils containing zinc dialkylthiophosphates. 4,165,230, Cl. 71-127.000.  
 Greenberg, Jerome S., to Regal China Corporation. Fired ceramic bottle having threaded neck and method of making same. 4,165,350, Cl. 264-60.000.  
 Greenfield, Stanley A.; and Dupont, John A., to Rohm and Haas Company. Formaldehyde stabilized coating compositions. 4,165,318, Cl. 260-302.00A.  
 Gregory, Gordon I.: See—  
 Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., 4,165,430, Cl. 544-22.000.

Gregson, Richard P.; and Quinn, Ronald J., to Hoffmann-La Roche Inc. 1-Methyl-9 $\beta$ -D-ribofuranosyl-isoguanine. 4,165,427, Cl. 536-24.000.  
 Gromov, Valery S.: See—  
 Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.  
 Gross, Francis M.: See—  
 White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,165,216, Cl. 432-102.000.  
 Grudowski, Raymond A.: See—  
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 Grumman Corporation: See—  
 Gavin, Joseph G., 4,164,932, Cl. 126-448.000.  
 GTE Sylvania Canada Limited: See—  
 Nattel, William, 4,165,010, Cl. 220-3.940.  
 GTE Sylvania Incorporated: See—  
 Ammann, Eugene O., 4,165,469, Cl. 307-426.000.  
 Puhak, Peter G., 4,165,143, Cl. 339-75.00T.  
 Gudmestad, Ragnar; and Blaha, Gerald E., to Artos Engineering Company. Apparatus for producing sets of accurately and identically sized wire leads. 4,164,808, Cl. 29-564.400.  
 Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, to Telecommunications Radioelectriques et Telephoniques S.R.L. Derangement detector in a receiver of a system for data transmission by means of phase modulation of a carrier. 4,165,488, Cl. 325-321.000.  
 Guillemin, Claude; and Mayen, Christian, to Prolabo. Safety device for chromatography apparatus. 4,165,284, Cl. 210-198.00C.  
 Haahjem Mekanishe A/S: See—  
 Haahjen, Kaare, 4,165,202, Cl. 414-313.000.  
 Haahjen, Kaare, to Haahjem Mekanishe A/S. Apparatus for emptying bulk material from a storage chamber. 4,165,202, Cl. 414-313.000.  
 Hackenberg, Hubert: See—  
 Engelsmann, Dieter; Hackenberg, Hubert; and Schroder, Rolf, 4,165,166, Cl. 354-21.000.  
 HacoBa Textilmaschinen GmbH & Co. KG, Firma: See—  
 Dee, Rudolf, 4,165,055, Cl. 242-125.200.  
 Hagelthorn, Allan. Lamp shade and knock-down kit for forming same. 4,165,529, Cl. 362-352.000.  
 Hager, Jürgen; and Vieth, Walter. Disintegrating machine for food. 4,165,045, Cl. 241-282.000.  
 Hahn, Thomas M., to General Electric Company. Cabinet transition sleeve. 4,165,105, Cl. 285-19.000.  
 Haka, Raymond J., to General Motors Corporation. Exhaust gas recirculation control. 4,164,918, Cl. 123-119.00A.  
 Hall, John B.: See—  
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 Hall, John L.; and Lee, Siu Au, to United States of America, Commerce. Fringe counting interferometric system for high accuracy measurements. 4,165,183, Cl. 356-346.000.  
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 Hendrix, Joyce D.: See—  
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 Berger, Hans-Jürgen; Koch, Ferdinand; Scharf, Rolf; and Schlusser, Hans-Joachim, 4,165,375, Cl. 424-263.000.  
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 Hickling, Robert; Hamburg, James A.; Feldmaier, Douglas A.; and Chung, Jing-yau, to General Motors Corporation. Method of measurement of bulk temperatures of gas in engine cylinders. 4,164,867, Cl. 73-346.000.  
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 Johnson, Samuel M.; and Hiland, Emelyn L., 4,165,290, Cl. 252-8.800.  
 Hill, David T., to SmithKline Corporation. Bis(sulfide)gold(1+) salts. 4,165,380, Cl. 424-290.000.



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Hirai, Jun, to Sony Corporation. Video signal recording and/or reproducing apparatus. 4,165,518, Cl. 358-8.000.  
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Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.  
Hisamoto, Iwao: See—  
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Hise, Henry W.: See—  
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Hoch, John J., to Deere & Company. Walk-behind filler with combined drag stake and wheel. 4,164,983, Cl. 172-43.000.  
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Schlegel, Albert; and Wirtz, Peter, 4,165,313, Cl. 260-123.700.  
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Botcher, Wolfgang; and Kopineck, Hermann-Josef, 4,164,873, Cl. 73-643.000.  
Hofer, Gerald; and Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump. 4,164,921, Cl. 123-139.0AF.  
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Gregson, Richard P.; and Quinn, Ronald J., 4,165,427, Cl. 536-24.000.  
Schoenenberger, Guido A., 4,165,312, Cl. 260-112.50R.  
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Holder, Philippe. Tank for fluids under pressure. 4,165,019, Cl. 220-288.000.  
Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., to Sundstrand Data Control, Inc. Capacitive pick-off circuit. 4,165,483, Cl. 324-60.00C.  
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Brinkman, Willem, 4,164,920, Cl. 123-139.00R.  
Holk, Albert J., Jr., to Continental Group, Inc., The. Bonded can top. 4,165,011, Cl. 220-67.000.  
Holland, Dewey G.: See—  
Bechara, Ibrahim S.; and Holland, Dewey G., 4,165,412, Cl. 521-121.000.  
Hollandse Signaalapparaten B.V.: See—  
Brands, Antoon H.; and Gietema, Jouke, 4,165,506, Cl. 340-706.000.  
Holley, Jasper B. Method and means for cleaning feed hoppers. 4,165,280, Cl. 209-245.000.  
Holmes, Allen B.; and Gehman, Stacy E., to United States of America, Army. Hydrostatic seismic sensor. 4,165,503, Cl. 340-17.00R.  
Holmes, Gordon D., to Davy-Loewy Limited. Rolling mill with roll bending unit. 4,164,858, Cl. 72-237.000.  
Honeywell Inc.: See—  
Fulkerson, David E., 4,165,470, Cl. 307-215.000.  
Jenkins, Leonard E., Jr., 4,165,174, Cl. 355-29.000.  
Peterson, Dean M., 4,165,512, Cl. 346-24.000.  
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Honma, Masanori: See—  
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Hoover Universal, Inc.: See—  
Ziegler, William E., 4,165,212, Cl. 425-382.00R.  
Hopkins Manufacturing Corporation: See—  
Thomas, Robert R., 4,164,801, Cl. 15-236.00R.  
Hori, Hisashi: See—  
Hori, Masaki; and Hori, Hisashi, 4,165,121, Cl. 296-57.00A.  
Hori, Masaki; and Hori, Hisashi, to Jidosha Seiko Co., Ltd. Device for opening and closing a side plate of a loading box on a motor truck under no-load condition. 4,165,121, Cl. 296-57.00A.  
Horio, Shunichi: See—  
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Horvat, Borut. Apparatus for active reduction of vertical vibrations of a vibrating mass. 4,165,066, Cl. 267-65.00D.  
Hoselton, Harry, to Polysar Resins, Inc. Closures and container assemblies. 4,165,020, Cl. 220-306.000.  
Howard, Charles W., to Early California Industries Inc. Apparatus for mixing fluids. 4,164,960, Cl. 137-604.000.  
Howe, Leland D., Jr.; Paniccia, Albert E.; and Scotto, Vincent A., to International Business Machines Corporation. Clock pulse generator

with selective pulse delay and pulse width control. 4,165,490, Cl. 328-60.000.  
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Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., 4,165,483, Cl. 324-60.00C.  
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Hedge, Russell K.; and Huss, William S., 4,165,138, Cl. 312-39.000.  
Hutchison, Louis C. Device for reducing firearm recoil. 4,164,825, Cl. 42-1.00V.  
Hutson, Howard A. High chair apron. 4,165,123, Cl. 297-153.000.  
I Guzzini S.P.A.: See—  
Sowden, George J., 4,165,530, Cl. 362-401.000.  
Ichikawa, Tetsuya: See—  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heiji; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.  
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Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., 4,165,378, Cl. 424-270.000.  
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Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.  
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Takahashi, Akio; and Saito, Hirokichi, 4,164,956, Cl. 137-242.000.  
Iida, Noboru, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for producing plastic pipes having oval cross-sectional shape. 4,165,354, Cl. 264-178.00R.  
Iijima, Eiji: See—  
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,165,369, Cl. 424-70.000.  
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Nakabayashi, Seizi; Matsuura, Taizo; and Iimure, Tamio, 4,165,265, Cl. 204-159.140.  
Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, to Fujitsu Limited. Light scanning system. 4,165,464, Cl. 250-550.000.  
Imberg, Bengt U.: See—  
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Imperial Chemical Industries Limited: See—  
Speakman, Derek N. A., 4,165,418, Cl. 525-377.000.  
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Ikeda, Hiroyuki; Ando, Moritoshi; and Inagaki, Takefumi, 4,165,464, Cl. 250-550.000.  
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Weber, Roland E.; and Zimmermann, Carl J., 4,165,283, Cl. 210-111.000.  
Inex, Incorporated: See—  
Frewin, Le Roy F., 4,165,277, Cl. 209-3.300.  
Inficon Leybold-Heraeus Inc.: See—  
Schlereth, Fritz H.; and Morgan, Michael J., 4,164,861, Cl. 73-1.00G.  
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Bugajski, Frank H.; and Patel, Jitendra G., 4,165,260, Cl. 201-40.000.  
Inoue, Masaru: See—  
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.  
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Aichermann, Frederick J., Jr., 4,165,539, Cl. 365-183.000.  
Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., 4,165,168, Cl. 355-3.00R.  
Chang, Tai Hon P., 4,165,393, Cl. 427-43.000.  
Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., 4,165,069, Cl. 271-162.000.  
Coomo, Salvatore R., Jr.; and Ellington, Thomas M., Jr., 4,165,178, Cl. 356-1.000.  
Gordon, Joseph G., II; and Sincerbox, Glenn T., 4,165,155, Cl. 350-285.000.  
Hassan, Javathu K.; and Paivanas, John A., 4,165,132, Cl. 406-10.000.  
Howe, Leland D., Jr.; Paniccia, Albert E.; and Scotto, Vincent A., 4,165,490, Cl. 328-60.000.  
Mortelmans, Joost; and Voegeli, Otto, 4,165,535, Cl. 365-2.000.  
International Flavors & Fragrances Inc.: See—  
Wieggers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.  
International Standard Electric Corporation: See—  
Irven, John; and Harrison, Andrew P., 4,165,224, Cl. 65-3.00A.  
International Telephone & Telegraph Corp.: See—  
Turcotte, Gordon W., 4,165,457, Cl. 219-516.000.  
Iowa Manufacturing Company of Cedar Rapids, Iowa: See—  
Schlarman, Philip J., 4,165,184, Cl. 366-12.000.  
Irons, Ronald E., to Aiken Industries Inc. Wideband RF switching matrix. 4,165,497, Cl. 333-101.000.  
Irven, John; and Harrison, Andrew P., to International Standard Electric Corporation. Method of manufacturing optical fibre preforms. 4,165,224, Cl. 65-3.00A.

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Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.  
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, to Mitsubishi Rayon Co., Ltd. Method for regenerating an oxidation catalyst. 4,165,296, Cl. 252-412.000.  
Ishijima, Hiroshi, to Kabushiki Kaisha Daini Seikosha. Detecting apparatus for inserts, thickness unevenness or impurities. 4,165,461, Cl. 250-359.000.  
Ishikawa, Haruo. Loudspeaker with improved voice coil support. 4,165,448, Cl. 179-115.5VC.  
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Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.  
Ishima, Kazumi, to Ricoh Co., Ltd. Electrostatic recording multi-stylus electrode device. 4,165,514, Cl. 346-155.000.  
Ishizuka, Hiroshi. Abrasive machine for stones. 4,164,828, Cl. 51-110.000.  
Isleif, Karl-Heinz: See—  
Jardin, Hans; Rottenfusser, Wolfgang; and Isleif, Karl-Heinz, 4,165,120, Cl. 296-137.00J.  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heiji; and Nishimura, Shigeaki, to Toyo Soda Manufacturing Co. Ltd.; and (Zaidanhojin) Sagami Chemical Research Center. Addition compound of dipeptide derivative and amino acid derivative. 4,165,311, Cl. 260-112.50R.  
Ito, Mitsuru. Device for tightening the waist of a garment. 4,164,792, Cl. 2-108.000.  
Itzler, Daniel. Plumbing device. 4,165,110, Cl. 285-226.000.  
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina K.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J. Process for producing pulp. 4,165,253, Cl. 162-19.000.  
Ivashina, Evgeny N.: See—  
Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.  
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, to Konishiroku Photo Industry Co., Ltd. Toner removing means for photosensitive drums for electrophotography. 4,165,173, Cl. 355-15.000.  
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, to Canon Kabushiki Kaisha. Color image formation apparatus. 4,165,165, Cl. 355-4.000.  
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Iwata, Nobuo: See—  
Suzuki, Takami; and Iwata, Nobuo, 4,165,190, Cl. 400-144.200.  
Iwatani, Akitoshi: See—  
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.  
Iyengar, Melicote R.: See—  
Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., 4,165,258, Cl. 435-215.000.  
J. F. Stevens & Co., Inc.: See—  
Black, Thomas C., 4,164,963, Cl. 139-11.000.  
J. I. Case Company: See—  
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Kulhavy, Joseph T.; and Shelton, Donald G., 4,164,915, Cl. 123-32.00R.  
Jabsen, Felix S., to Babcock & Wilcox Company, The. Fuel element grid plate with corrugation and bosses. 4,165,256, Cl. 176-78.000.  
Jackson, Milton L. Multicomponent thermal conductivity analyzer. 4,164,862, Cl. 73-27.00R.  
Jacobs, Norman L. Soldering flux and method of using same. 4,165,244, Cl. 148-23.000.  
Jacobs, Stanley C.: See—  
Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., 4,165,263, Cl. 204-67.000.  
Jaconette, John J., to Jenkins Brothers. Swing check valve. 4,164,958, Cl. 137-527.000.  
Jaechh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, to BASF Aktiengesellschaft. Manufacture of ferromagnetic metal particles essentially consisting of iron. 4,165,232, Cl. 75-0.5AA.  
Jaffey, Irving. Separator for shredded materials. 4,165,278, Cl. 209-45.000.  
Jagers, Leopold. Guide for a sawblade. 4,164,883, Cl. 83-488.000.  
Jai, Kenneth. Machine for cleaning tubes and pipes. 4,164,799, Cl. 15-104.10R.  
Jain, Ravinder K.: See—  
Bergman, John G., Jr.; Jain, Ravinder K.; and Wagner, Sigurd, 4,165,515, Cl. 357-6.000.  
James, James R., to Accuratio Systems, Inc. Apparatus for mixing and dispensing reactive fluids. 4,165,187, Cl. 366-150.000.  
James Mackie & Sons Limited: See—  
Mackie, Gordon, 4,165,047, Cl. 242-43.00A.  
James, Paul M. Rear projection microfilm reader/printer. 4,165,177, Cl. 355-45.000.  
James River Corp.: See—  
Volkman, Roy G., 4,165,352, Cl. 264-113.000.  
Jankowiak, Roman: See—  
Naab, Carlton W.; and Jankowiak, Roman, 4,164,953, Cl. 137-72.000.  
Japan Crown Cork Co., Ltd.: See—  
Murayama, Kashiwa, 4,165,009, Cl. 215-230.000.  
Jardin, Hans; Rottenfusser, Wolfgang; and Isleif, Karl-Heinz, to Webasto-Werk W. Baier GmbH & Co. Vehicle roof. 4,165,120, Cl. 296-137.00J.  
Jaunin, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Timepiece display indicator. 4,164,844, Cl. 58-39.500.  
JDS Products, Inc.: See—  
Walker, Thomas G., 4,164,817, Cl. 33-371.000.  
Jende-Strid, Inga B.: See—  
von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., 4,165,387, Cl. 426-16.000.  
Jenerl, Inc.: See—  
Jensen, Edward A., 4,165,118, Cl. 296-50.000.  
Jenkins Brothers: See—  
Jaconette, John J., 4,164,958, Cl. 137-527.000.  
Jenkins, Henry H. Die chase apparatus. 4,164,881, Cl. 83-128.000.  
Jenkins, James H. Thermal deflector. 4,164,931, Cl. 126-132.000.  
Jenkins, Leonard E., Jr., to Honeywell Inc. Recording apparatus. 4,165,174, Cl. 355-29.000.  
Jennings, Charles E.: See—  
Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., 4,165,263, Cl. 204-67.000.  
Jensen, Edward A., to Jenerl, Inc. Louvered tailgate with automatically adjustable vanes. 4,165,118, Cl. 296-50.000.  
Jernigan, Emory J. Apparatus for making substantially impenetrable members. 4,165,067, Cl. 269-40.000.  
Jessup, David G.: See—  
Bentley, Stanley L.; and Jessup, David G., 4,165,022, Cl. 222-76.000.  
Jidosha Seiko Co., Ltd.: See—  
Hori, Masaki; and Hori, Hisashi, 4,165,121, Cl. 296-57.00A.  
Johansen, Svend B. Method for combustion of gaseous fuels and flue gases. 4,164,847, Cl. 60-274.000.  
Johnson, Albert O. Material handling system for wide range of materials and flow rates. 4,165,133, Cl. 406-109.000.  
Johnson, David R.: See—  
Juckniess, Paul R.; and Johnson, David R., 4,165,262, Cl. 204-64.00T.  
Johnson, Ernest K. Portable urinal. 4,164,795, Cl. 4-144.100.  
Johnson, Jay. Process for clamping, sealing, and aiding the filling of matched molds. 4,165,358, Cl. 264-571.000.  
Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. 9-Hydroxyhexahydrodibenzo[b,d]pyrans, 1-substituted-9-hydroxyhexahydrodibenzo[b,d]pyrans and intermediates therefor. 4,165,323, Cl. 260-345.200.  
Johnson, Samuel M.; and Hiland, Emelyn L., to Procter & Gamble Company, The. Fabric care composition containing starch and quaternary ammonium compound. 4,165,290, Cl. 252-8.800.  
Johnston, Harold E. Cooking stove. 4,164,930, Cl. 126-38.000.  
Johnstone, Richard: See—  
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,164,810, Cl. 29-568.000.  
Jokinen, Olli, to Rauma-Repol Oy. Method and apparatus for the installation of the support element of a crane. 4,165,005, Cl. 212-145.000.  
Jones, Dennis R. Magnetic tape cleaner. 4,165,526, Cl. 360-137.000.  
Jones, Derrick F.; and Yellin, Tobias O., to ICI Americas Inc. Guanidino imidazoles and thiazoles. 4,165,377, Cl. 424-270.000.  
Jones, Elborn W.: See—  
United States of America, National Aeronautics and Space Administration; Rose, Stephen D.; Crouch, Charles E.; and Jones, Elborn W., 4,165,460, Cl. 250-253.000.  
Jonsson, Bjorn E. R., to Telefonaktiebolaget L M Ericsson. Identification of a faulty address decoder in a function unit of a computer having a plurality of function units with redundant address decoders. 4,165,533, Cl. 364-900.000.  
Jordan, Charles P. Inflatable bag. 4,164,970, Cl. 150-3.000.  
Jouquey, Alain: See—  
Bardoneschi, Roland; Jouquey, Alain; and Philibert, Daniel, 4,165,326, Cl. 260-397.500.  
Juckniess, Paul R.; and Johnson, David R., to Dow Chemical Company, The. Method of electrowinning titanium. 4,165,262, Cl. 204-64.00T.  
Jurenz, Rolf; and Becker, Claus, to Veb Pentacon Dresden Kamera-Undkinowwerke. Photographic camera. 4,165,167, Cl. 354-53.000.  
Jurischka, Hans-Dieter: See—  
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kalloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.  
Justiss, Jimmy: See—  
Gabriel, Anthony P.; and Justiss, Jimmy, 4,165,442, Cl. 174-36.000.  
Kabushiki Kaisha Daini Seikosha: See—  
Ishijima, Hiroshi, 4,165,461, Cl. 250-359.000.



Kabushiki Kaisha Komatsu Seisakusho: See—  
Komiya, Kunihiro; Kanai, Seikichi; and Okada, Masaru, 4,164,913, Cl. 123-30.00C.

Kabushiki Kaisha Suwa Seikosha: See—  
Fujimori, Motoyuki, 4,164,843, Cl. 58-23.00R.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: See—  
Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, 4,165,046, Cl. 242-35.50A.

Kadija, Igor V., to Olin Corporation. Diaphragms for use in the electrolysis of alkali metal chlorides. 4,165,271, Cl. 204-252.000.

Kadowaki, Hidejiro: See—  
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.

Kagawa, Kunihiro, to Mas Co., Ltd. Snow-surface driving vehicle. 4,165,087, Cl. 280-16.000.

Kahan, Frederick M.: See—  
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.

Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, to Merck & Co., Inc. N-acetyl thienamycin. 4,165,379, Cl. 424-274.000.

Kaiser, Jarome, to Gabor Nadhazy. Collapsible camping trailer. 4,165,117, Cl. 296-27.000.

Kaiser, Reinhard: See—  
Alfes, Franz; Heine, Dietz; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.

Kakehashi, Ikutaro, to Roland Corporation. Device for producing a chorus effect. 4,164,884, Cl. 84-1.240.

Kakutani, Tsunehiro: See—  
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.

Kaloff, Hans: See—  
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.

Kamata, Norio: See—  
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, 4,165,240, Cl. 127-29.000.

Kaminskas, Rimvydas A., to Standun, Inc. Internal gaseous fluid stripper for can bodymakers and the like. 4,164,860, Cl. 72-345.000.

Kamiya, Yukio: See—  
Matsumoto, Nobuo; Tsuji, Osami; Kamiya, Yukio; and Shiozawa, Etsuo, 4,165,251, Cl. 156-584.000.

Kanai, Seikichi: See—  
Komiya, Kunihiro; Kanai, Seikichi; and Okada, Masaru, 4,164,913, Cl. 123-30.00C.

Kanatan, Masataka; and Awamura, Daikichi, to Toppan Printing Co., Ltd. System for checking printed condition of printed sheet matters. 4,165,465, Cl. 250-559.000.

Kanno, Sumiko: See—  
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sumiko, 4,165,240, Cl. 127-29.000.

Kano, Masafumi: See—  
Tugukuni, Hideyoshi; and Kano, Masafumi, 4,165,406, Cl. 428-407.000.

Kantar, Anthony M.; and Pribyl, George E. Apparatus for matching skis. 4,164,875, Cl. 73-812.000.

Kao Soap Co., Ltd.: See—  
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,165,369, Cl. 424-70.000.

Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.

Karr, Michael A., III: See—  
Di Domenico, Mauro, Jr.; Karr, Michael A., III; and Rich, Theodore C., 4,165,496, Cl. 331-94.50S.

Kataoka, Nagamasa: See—  
Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.

Kato, Masaaki: See—  
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.

Kato, Takahisa: See—  
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 4,165,338, Cl. 260-584.00R.

Katoh, Masayuki: See—  
Endoh, Toru; and Katoh, Masayuki, 4,165,407, Cl. 428-408.000.

Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, to Daikin Kogyo Co., Ltd. 2-Hydroxy-1,1,2,3,3-pentafluoro-perfluoroalkyl derivatives, their production and use. 4,165,338, Cl. 260-584.00R.

Kaufmann, Ernst: See—  
Strien, Werner; Zwanziger, Rudolph; and Kaufmann, Ernst, 4,165,126, Cl. 297-284.000.

Kawai, Syuji; Ohya, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, to Kuraray Co., Ltd.; and Minamihon Rakuno Kyodo Kabushiki Kaisha. Process for producing fibrous high-protein food. 4,165,392, Cl. 426-657.000.

Kawaki Jukogyo Kabushiki Kaisha: See—  
Fujikawa, Tetsuzo; and Uda, Ryoji, 4,165,207, Cl. 417-313.000.

Kazansky, Viktor V.: See—  
Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.

Kearney & Trecker Corporation: See—  
Sipek, Charles B.; Johnson, Richard; and Clegg, Russell B., 4,164,810, Cl. 29-568.000.

Kehr, Clifton L.: See—  
Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., 4,165,411, Cl. 521-107.000.

Keiper Automobiltechnik GmbH & Co. KG: See—  
Strowick, Willibald; and Werner, Paul, 4,165,128, Cl. 297-367.000.

Kellerstrass, Donald L. Water gun game with revolvable target movable along a line. 4,165,073, Cl. 273-101.000.

Kelly, J. Kevin: See—  
Figart, Earl C.; Kelly, J. Kevin; and Di Marcello, Richard A., 4,165,443, Cl. 174-53.000.

Kelly, Roger A.; and Pekar, Howard G., to R. O. Hull & Company, Inc. Treatment of metal parts to provide rust-inhibiting coatings by phosphating and electrophoretically depositing a siccative organic coating. 4,165,242, Cl. 148-6.15Z.

Kempf, Dennis D., to FMC Corporation. Reciprocating pump packing. 4,165,084, Cl. 277-212.00C.

Kendall, Thomas L.; Downing, Leo G.; and Ray, James A., to Toro Company, The. Automatic irrigation sprinkler system controller. 4,165,532, Cl. 364-420.000.

Kenin, Valery G.: See—  
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Kersten, Ralf: See—  
Auracher, Franz; and Kersten, Ralf, 4,165,225, Cl. 65-4.00B.

Keuro GmbH & Co., KG.: See—  
Stolzer, Paul, 4,165,068, Cl. 269-136.000.

Khrol, Jury S.: See—  
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Kihara, Keiichi: See—  
Iswa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tet-suya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heiji; and Nishimura, Shigeki, 4,165,311, Cl. 260-112.50R.

Kikuhara, Iwao. Bread and a method of producing the same. 4,165,386, Cl. 426-9.000.

Kim, Kwang Y.: See—  
Kawai, Syuji; Ohya, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.

Kim, Leo, to Shell Oil Company. Catalytic hydration of ethylene oxide to ethylene glycol. 4,165,440, Cl. 568-867.000.

Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, to NTN Toyo Bearing Co. Ltd. Fuel injection device for internal combustion engines. 4,164,923, Cl. 123-140.00C.

Kimura, Katsuhiko: See—  
Miyashita, Kiyoshi; and Kimura, Katsuhiko, 4,165,169, Cl. 355-3.00R.

Kindlmann, Peter J., to Echlin Manufacturing Company, The. Electronic ignition advance circuit. 4,164,926, Cl. 123-148.00E.

King, Frederick D.: See—  
Duck, Gary S.; and King, Frederick D., 4,165,150, Cl. 350-96.150.

King Instrument Corporation: See—  
Berube, Richard G., 4,165,050, Cl. 242-68.300.

King, John O., Jr. Method of forming a coldworked joint. 4,164,807, Cl. 29-523.000.

Kinosz, Donald L.; Jennings, Charles E.; and Jacobs, Stanley C., to Aluminum Company of America. Method of preparing an electrolytic cell for operation. 4,165,263, Cl. 204-67.000.

Kistler Instrumente AG: See—  
Dubs, Walter; and Preiss, Georg, 4,165,402, Cl. 428-64.000.

Kita, Katsuhiko, to Narumi China Corporation. Process for preparing an element of a dual-in-line ceramic package provided with a layer of sealing glass. 4,165,226, Cl. 65-42.000.

Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, to Teijin Limited. Halohydrocarbon treatment of a glycol and waste dye liquor followed by water extraction of the glycol. 4,165,217, Cl. 8-81.000.

Kitamura, Yoshishige, to Nippon Electric Co., Ltd. Read-only memory. 4,165,538, Cl. 365-104.000.

Kitchell, Thorne C.: See—  
Bunger, Arthur W.; and Kitchell, Thorne C., 4,165,030, Cl. 229-15.000.

Klee, Rudolf J.: See—  
Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.

Kleefeldt, Frank, to Arn. Kiekert Sohne. Motor-vehicle door latch. 4,165,112, Cl. 292-216.000.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. Antioxidants. 4,165,333, Cl. 260-455.00R.

Klingenberg, James C., to Dana Corporation. Disposable centrifugal separator with baffle means. 4,165,032, Cl. 233-23.00R.

Klostermark, Berni. Personal use device for removing tartar from the inner side of teeth. 4,164,814, Cl. 32-69.000.

Knight, Charles B., deceased (by Knight, June S., personal representative), to Westinghouse Electric Corp. Nuclear fuel rack lateral support and preload device. 4,165,255, Cl. 176-30.000.

Knight, June S., personal representative: See—  
Knight, Charles B., deceased, 4,165,255, Cl. 176-30.000.

Knoffsinger, Fred E.: See—  
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,165,216, Cl. 432-102.000.

Knopick, Robert A.; and Morlock, Allen B., to Steraplast, Inc. Disposable drape for surgical table. 4,164,941, Cl. 128-132.00D.

Knorr-Bremse GmbH: See—  
Erlbeck, Hans, 4,165,136, Cl. 303-19.000.

Kobale, Manfred; and Krueger, Hans, to Siemens Aktiengesellschaft. Liquid crystal cell having a glass fiber frame. 4,165,157, Cl. 350-343.000.

Kobayashi, Masao: See—  
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.

Kobe Steel, Ltd.: See—  
Higashi, Kazuo; and Sawa, Kiyohiko, 4,165,043, Cl. 241-236.000.

Kobelt, Jacob. Air cooled brake disc. 4,164,993, Cl. 188-218.0XL.

Koch, Ferdinand: See—  
Berger, Hans-Jurgen; Koch, Ferdinand; Scharf, Rolf; and Schlusser, Hans-Joachim, 4,165,375, Cl. 424-263.000.

Koch, Kenneth F.: See—  
Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., 4,165,520, Cl. 358-280.000.

Koel, Gerri J.; and Druyvesteyn, Willem F., to U.S. Philips Corporation. Magnetic head having a core provided on a substrate by means of thin-film technology. 4,165,525, Cl. 360-125.000.

Koepnich, John P.: See—  
Himes, Herman C.; and Koepnich, John P., 4,165,215, Cl. 425-169.000.

Koester, Eberhard: See—  
Jaech, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.

Kohler, Hans W.; and Sommer, Helmut, to United States of America, Army. Lumped neutralization coil arrangement for inductance fuse. 4,164,905, Cl. 102-212.000.

Kohner, Inc.: See—  
Palumbo, Nunzio, 4,164,827, Cl. 46-119.000.

Koiso, Junichi: See—  
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.

Koizumi, Takayuki; and Usami, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Signal decision system. 4,165,458, Cl. 235-92.0PE.

Kokiso, Masakazu: See—  
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.

Kolb, Gunter: See—  
Alfes, Franz; Heine, Dietz; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.

Koleske, Joseph V.: See—  
Smith, Oliver W.; and Koleske, Joseph V., 4,165,345, Cl. 525-419.000.

Kolganov, Gennady S.: See—  
Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.

Kolin, Alexander, to University of California, The Regents of the. Orthogonal electromagnetic flow and diameter sensor system. 4,164,939, Cl. 128-692.000.

Kollar, Ernest P.: See—  
Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., 4,165,069, Cl. 271-162.000.

Komatsu, Toshiaki: See—  
Yamada, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,165,373, Cl. 424-246.000.

Komiyama, Kunihiro; Kanai, Seikichi; and Okada, Masaru, to Kabushiki Kaisha Komatsu Seisakusho. Combustion chamber for an internal combustion engine of direct injection type. 4,164,913, Cl. 123-30.00C.

Kondo, Eiichi: See—  
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.

Konig, Heinz. Cable drum for automatic rewinding of a cable. 4,165,053, Cl. 242-107.100.

Konishi, Yoshitaka: See—  
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.

Konishiroku Photo Industry Co., Ltd.: See—  
Iwai, Fumio; Koiso, Junichi; Kokiso, Masakazu; and Inoue, Masaru, 4,165,173, Cl. 355-15.000.

Kopineck, Hermann-Josef: See—  
Botcher, Wolfgang; and Kopineck, Hermann-Josef, 4,164,873, Cl. 73-643.000.

Koppel, Mikhail A.: See—  
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.

Koppers Company, Inc.: See—  
Calistrat, Michael M., 4,164,855, Cl. 64-2.00P.

Sefton, Robert H.; and Carlson, John D., 4,165,413, Cl. 521-128.000.

Kori, Seiji: See—  
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.

Kornatowski, Boleslaw: See—  
Cook, Albert N.; Kornatowski, Boleslaw; and Tyburcy, Raymond S., 4,165,144, Cl. 339-88.00R.

Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N. Process for producing ferrovanadium alloys. 4,165,234, Cl. 75-60.000.

Kraft, Dieter: See—  
Dodt, Hans-Walter; and Kraft, Dieter, 4,164,994, Cl. 188-296.000.

Kramer, Gideon A. Multiple optics slide projector. 4,165,161, Cl. 353-86.000.

Kraus, Theodore C.: See—  
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,165,432, Cl. 536-4.000.

Krause, Peter L., to Burroughs Corporation. Data generator for disc file addresses. 4,165,531, Cl. 364-200.000.

Krickovich, Eli G. Snow remover and vacuum sweeper. 4,164,820, Cl. 37-12.000.

Krjukov, Vitaly M.: See—  
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Krueger, Hans: See—  
Kobale, Manfred; and Krueger, Hans, 4,165,157, Cl. 350-343.000.

Kubo, Shunichi: See—  
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.

Kubota, Ltd.: See—  
Endoh, Toru; and Katoh, Masayuki, 4,165,407, Cl. 428-408.000.

Kuehn, John P., to Audio Dynamics Corporation. Flip-up stylus projector for a phonograph cartridge. 4,165,078, Cl. 274-1.00R.

Kuintzle, Charles, Jr.: See—  
Exley, John T.; Kuintzle, Charles, Jr.; and Tate, David L., 4,164,845, Cl. 60-39.290.

Kukolja, Stjepan, to Eli Lilly and Company. Sulfanyl halides and their preparation from penicillin sulfoxides. 4,165,315, Cl. 260-239.00A.

Kulhavy, Joseph T.; and Shelton, Donald G., to J. I. Case Company. Conversion of gasoline to diesel engine. 4,164,915, Cl. 123-32.00R.

Kulpa, Stanley J.: See—  
Schroeder, Hobe; and Kulpa, Stanley J., 4,165,324, Cl. 260-346.700.

Kumazawa, Toshiharu, to Mitsubishi Precision Co., Ltd. Device for atomizing and dispersing a fluid. 4,165,038, Cl. 239-405.000.

Kuniyasu, Kenji: See—  
Nishimura, Kenji; Miyazaki, Haruhiko; Kuniyasu, Kenji; and Ono, Satoru, 4,165,328, Cl. 260-404.000.

Kunz, Walter: See—  
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,165,381, Cl. 424-309.000.

Kupperman, Dennis: See—  
Kupperman, Sam; and Kupperman, Dennis, 4,165,061, Cl. 249-92.000.

Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Integrally formed molding unit for freezing a liquid with a portion of the unit severable for forming a handle for the frozen product. 4,165,061, Cl. 249-92.000.

Kuraray Co., Ltd.: See—  
Kawai, Syuji; Ohya, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.

Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, to Niigata Engineering Co., Ltd. Method and unit for wastewater treatment by microorganisms. 4,165,281, Cl. 210-17.000.

Kurosaki, Shiro: See—  
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,165,152, Cl. 350-96.300.

Kwant, Pieter B., to Shell Oil Company. Process for the preparation of synthetic crude oil. 4,165,274, Cl. 208-93.000.

Kwiatkowski, George T.: See—  
Spector, Myron; Kwiatkowski, George T.; Smarock, Walter H.; and Michno, Michael J., Jr., 4,164,794, Cl. 3-1.912.

L. & C. Steinmuller GmbH: See—  
Dorling, Rolf, 4,165,021, Cl. 220-468.000.

Labavia - S.G.E.: See—  
Lagarde, Roger, 4,164,987, Cl. 180-271.000.

Lagarde, Roger, to Labavia - S.G.E. Control device for the deceleration of a heavy vehicle. 4,164,987, Cl. 180-271.000.

Lake Shore Roentgenology, Ltd.: See—  
Rosenberg, Carl S., 4,165,376, Cl. 424-267.000.

Land, Edwin H., to Polaroid Corporation. Translucent screen. 4,165,153, Cl. 350-126.000.



Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., to Singer Company, The. Microprocessor controlled filmstrip projector. 4,165,159, Cl. 353-15.000.

Landholm, Richard A.: See—  
Anderson, Richard B.; Hoffmeister, Elaine H.; and Landholm, Richard A., 4,165,238, Cl. 96-119.00R.

Landwehr, Gotz: See—  
Lux, Helmut; and Landwehr, Gotz, 4,164,989, Cl. 181-265.000.

Langer, Alois A., to Mirowski, Mieczyslaw. Fault detection circuit for permanently implanted cardioverter. 4,164,946, Cl. 128-419.00D.

Langer, Arthur W., Jr.: See—  
Whitney, Thomas A.; and Langer, Arthur W., Jr., 4,165,330, Cl. 260-448.20B.

Larsen, Darrell R., to Minneapolis Electric Steel Castings Company. Shell liner assembly for ore grinding mills. 4,165,041, Cl. 241-182.000.

Laska, Ronald C.; and Pierce, Wayne R., to Pako Corporation. Photographic film measurement with interchangeable light guiding modules. 4,165,176, Cl. 355-68.000.

Latzina, Kurt; Martin, Hans; and Wolf, Richard, to Robert Bosch GmbH. Pressurized medium powered device. 4,165,203, Cl. 415-113.000.

Laviolette, Maurice A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Tubular projectile. 4,164,904, Cl. 102-92.700.

Layton, Wilbur T.; and Schwartz, Sidney J., to Burroughs Corporation. Magnetic bubble package. 4,165,536, Cl. 365-2.000.

Lee, Siu Au: See—  
Hall, John L.; and Lee, Siu Au, 4,165,183, Cl. 356-346.000.

Lefebvre, Elsa G., to Dianis Creations, Inc. Water-in-oil emulsion for skin moisturizing. 4,165,385, Cl. 424-365.000.

Lehmann, Bernd: See—  
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjürgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.

Lehmann, Werner: See—  
Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, 4,164,925, Cl. 123-140.00R.

Lehto, Eino M.: See—  
Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, 4,165,160, Cl. 353-55.000.

Lemanski, Savarian F. Camera having multiple image device. 4,165,163, Cl. 354-122.000.

Lemmen, Conradus J. G., to Océ-van der Grinten N.V. Electrographic apparatus and process. 4,165,171, Cl. 355-15.000.

Levine, Ralph; and Olechowski, Jerome R., to Cities Service Company. Dehydration of tertiary butyl alcohol. 4,165,343, Cl. 585-638.000.

Lewis, Thomas J., Jr.; and Hardwick, Lester S. Storable utility trailer. 4,165,096, Cl. 280-641.000.

Lewis, William L.: See—  
Chilpan, Kurt C.; and Lewis, William L., 4,164,840, Cl. 57-313.000.

Libby, Edwin L.: See—  
Baumann, Gerald W.; Burdick, Robert L.; Goff, Willie, Jr.; and Libby, Edwin L., 4,165,168, Cl. 355-3.00R.

Liepins, Sigurd; and Crane, James W., to Coleman Company, Inc., The. Projectile loader for gun. 4,164,929, Cl. 124-76.000.

Lieser, Karl, to Hermann Werner GmbH & Co. Machine for simultaneously milling of several grooves in rotating workpieces. 4,164,891, Cl. 409-165.000.

Linden, Heinrich; and Bormann, Hans, to Henkel Kommanditgesellschaft auf Aktien. Process for dispersing pigments and fillers using carboxylic acid esters of tertiary alkylolamines. 4,165,239, Cl. 106-300.000.

Lippert, Axel: See—  
Casper, Clemens; Lippert, Axel; and Sajben, Johannes O., 4,165,360, Cl. 422-202.000.

Lippler, Remy R.: See—  
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,165,423, Cl. 528-370.000.

Little Gem Manufacturing, Inc.: See—  
Bodart, Ronald A., 4,164,965, Cl. 144-3.00K.

Lockwood, Phyllis, executrix: See—  
Otto, Carl L., Jr., deceased; and Lockwood, Phyllis, executrix, 4,165,205, Cl. 417-262.000.

Locite Corporation: See—  
DeMarco, JoAnn, 4,165,400, Cl. 427-295.000.

Loeser, Werner: See—  
Jacckh, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.

Login, Robert B.; and Newkirk, David D., to BASF Wyandotte Corporation. Fiber lubricants based upon fatty esters of heteric polyoxyalkylated alcohols. 4,165,405, Cl. 428-395.000.

Looger, Lonnie L.; and Cobb, Bernie J., to United States of America, Army. Rocket remote engagement mechanism. 4,164,888, Cl. 89-1.814.

Loose, Richard D.: See—  
Hedeen, Carl E.; and Loose, Richard D., 4,165,119, Cl. 296-93.000.

L'Oreal: See—  
Bouillon, Claude; Vayssie, Charles; and Richard, Françoise, 4,165,336, Cl. 260-511.000.

Losik, Viktor I.: See—  
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.;

Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.

Loveland, Robert S.: See—  
Hall, Lawrence G.; and Loveland, Robert S., 4,164,865, Cl. 73-194.00A.

Lowi, Alvin, Jr. Combined engine cooling system and waste-heat driven automotive air conditioning system. 4,164,850, Cl. 62-196.00C.

Lowin, Kenneth J.: See—  
Davis, Lewis K.; and Lowin, Kenneth J., 4,164,919, Cl. 123-136.000.

Luber, Beulah, Intestate Successor: See—  
Luber, Lawrence B., deceased; and Luber, Beulah, Intestate Successor, 4,164,992, Cl. 186-1.00R.

Luber, Beulah F.: See—  
Luber, Lawrence B., deceased; and Luber, Beulah, Intestate Successor, 4,164,992, Cl. 186-1.00R.

Luber, Lawrence B., deceased; and Luber, Beulah, Intestate Successor, to Luber, Beulah F. Dispensing unit. 4,164,992, Cl. 186-1.00R.

Ludwig, Alfred, to Sulzer Brothers Limited. Method for the fabrication of internally weld-clad pipe elbows. 4,165,245, Cl. 148-127.000.

Lundquist, Ingemar H., to Valleylab. Intravenous delivery pump. 4,165,208, Cl. 417-565.000.

Lundqvist, Gunnar: See—  
Granbom, Bo; and Lundqvist, Gunnar, 4,164,893, Cl. 92-88.000.

Lupke, Gerd P. H.; and Lupke, Manfred A. A. Apparatus for producing corrugated thermoplastic. 4,165,214, Cl. 425-532.000.

Lupke, Manfred A. A.: See—  
Lupke, Gerd P. H.; and Lupke, Manfred A. A., 4,165,214, Cl. 425-532.000.

Luttke, Wolfgang: See—  
Schafer, Fritz P.; and Luttke, Wolfgang, 4,165,434, Cl. 544-197.000.

Lutz, Albert W.; and Diehl, Robert E., to American Cyanamid Company. 2,6-Dinitroaniline herbicides. 4,165,231, Cl. 71-121.000.

Lutz, Timothy J. Covered cup. 4,165,013, Cl. 220-215.000.

Lux, Helmut; and Landwehr, Gotz, to Andreas Stihl. Muffler, especially for portable internal combustion engine. 4,164,989, Cl. 181-265.000.

Lydick, Richard P.: See—  
Alley, Lawrence E., III; Lydick, Richard P.; and Stanley, Robert E., 4,164,944, Cl. 128-419.00G.

Lyman, John B.; and Stewart, Bruce E., to Whirlpool Corporation. Vacuum cleaner attachment wand with demountable electrical connector. 4,165,140, Cl. 339-15.000.

Maag, Fritjof; and Unger, Friedrich, to Hoechst Aktiengesellschaft. Method of forming a wrapped yarn. 4,164,837, Cl. 57-3.000.

Maarleveld, Adrianus, to Fleming-Potter Company, Inc. Fermentation tank. 4,164,902, Cl. 99-277.100.

MacDonnell, Gordon S.: See—  
Flowers, Thomas E.; and MacDonnell, Gordon S., 4,165,446, Cl. 179-2.0DP.

Maciag, Thomas: See—  
Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., 4,165,258, Cl. 435-215.000.

Mackie, Gordon, to James Mackie & Sons Limited. Yarn winder. 4,165,047, Cl. 242-43.00A.

Macovski, Albert; and Rosenfeld, Dov. Variable code gamma ray imaging system. 4,165,462, Cl. 250-363.00S.

Maeda, Chiaki: See—  
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaka, Masayuki, 4,165,338, Cl. 260-584.00R.

Maeda, Tetsuya: See—  
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.

Magnetic Controls Company: See—  
Buck, Josef J., 4,165,147, Cl. 339-182.00R.

Magnoux, Claude R.: See—  
du Chaffaut, Jean A.; Magnoux, Claude R.; and Oberto, Patrick L. C., 4,165,389, Cl. 426-42.000.

Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, to Robert Bosch GmbH. Centrifugal rpm governor for internal combustion engines. 4,164,925, Cl. 123-140.00R.

Maine, Jack. Method of fabricating wood composite panels having enhanced fire retardancy. 4,165,409, Cl. 428-535.000.

Makino, Niro, to Nippondenso Co., Ltd. Centrifugal speed governor for an internal combustion engine. 4,164,924, Cl. 123-140.00R.

Maltby, Edgar W., to Eaton Corporation. Thermally actuated valve for plural fluid sources. 4,165,035, Cl. 236-86.000.

Mangus, James D., to United States of America, Energy. Method and apparatus for thermal power generation. 4,164,849, Cl. 60-679.000.

Manion, Francis M.: See—  
Drzewiecki, Tadeusz M.; and Manion, Francis M., 4,164,961, Cl. 137-823.000.

Mannin Industries Ltd.: See—  
Mitchell, Henry M.; Elias, John; and Moorcroft, John, 4,164,866, Cl. 73-231.00R.

Manokhin, Anatoly I.: See—  
Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.

Mansei Kogyo Kabushiki Kaisha: See—  
Goto, Kenjiro, 4,165,519, Cl. 358-128.000.

Mansfield, Peter, to National Research Development Corporation. Nuclear magnetic resonance apparatus and methods. 4,165,479, Cl. 324-0.50A.

Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., to W. R. Grace & Co. Flame retardant urethane and method. 4,165,411, Cl. 521-107.000.

Mares, Fred R.: See—  
Colglazier, Donald F.; Kollar, Ernest P.; and Mares, Fred R., 4,165,069, Cl. 271-162.000.

Marini, Paolo: See—  
Colletta, Angelo; and Marini, Paolo, 4,165,220, Cl. 44-23.000.

Markwood, Robert E., to Philip Morris Incorporated. Filler for pressure vessel. 4,165,012, Cl. 220-71.000.

Marles, Kevin C.; and Spencer, Brian W., to Solar Apparatus & Equipment Limited. Solar heating panels. 4,164,935, Cl. 126-447.000.

Marra, Aldo. Fire escape device. 4,164,991, Cl. 182-70.000.

Marsico, Joseph J. Luminous effects device. 4,164,823, Cl. 40-427.000.

Marsili, Leonardo: See—  
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,165,317, Cl. 260-239.30P.

Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, to Ciba-Geigy AG. Process for the production of substituted toluene compounds. 4,165,268, Cl. 204-163.00R.

Martin, Hans: See—  
Latzina, Kurt; Martin, Hans; and Wolf, Richard, 4,165,203, Cl. 415-113.000.

Martin, John K., to Fabrication de Maquinas, S.A. Desalination method with mercury refrigerant. 4,164,854, Cl. 62-536.000.

Martin, Kenneth R., to Warner & Swasey Company, The. Machine tool coolant system. 4,164,879, Cl. 82-2.00R.

Martin, Thomas B.; and Pieters, Ferdinandus A., to Micropump Corporation. Three gear pump with module construction. 4,165,206, Cl. 417-310.000.

Mas Co., Ltd.: See—  
Kagawa, Kunihiko, 4,165,087, Cl. 280-16.000.

Mascia, Carmen T.; and Hawegawa, Gary K., to Continental Group, Inc., The. Propellantless aerosol with fluid pressure generating pump. 4,165,025, Cl. 222-401.000.

Mason, Charles H. Method and apparatus for self-feeding and sawing wooden workpieces. 4,164,966, Cl. 144-312.000.

Mason, Warren S. Impact tunneling machine with cutters spaced for equal work. 4,165,130, Cl. 299-62.000.

Masuyama, Tetsuo: See—  
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,165,441, Cl. 585-444.000.

Matoba, Yasuo; Hashimoto, Akira; and Sugahara, Mikio, to Osaka Soda Co. Ltd. Cured or uncured chlorinated polyethylene composition and process for curing uncured chlorinated polyethylene. 4,165,416, Cl. 525-346.000.

Matsumoto, Nobuo; Tsuji, Osami; Kamiya, Yukio; and Shiozawa, Eisuo, to Fuji Photo Film Co., Ltd. Stripping and developing device. 4,165,251, Cl. 156-584.000.

Matsumura, Kazuhiro: See—  
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.

Matsuoka, Hirokazu: See—  
Tanae, Fumio; and Matsuoka, Hirokazu, 4,164,836, Cl. 57-2.000.

Matsuura, Taizo: See—  
Nakabayashi, Seizi; Matsuura, Taizo; and Imure, Tamio, 4,165,265, Cl. 204-159.140.

Matsuzaki, Tsuneo: See—  
Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, 4,165,281, Cl. 210-17.000.

Matsuzawa, Hideo: See—  
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.

Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V.: See—  
Schafer, Fritz P.; and Luttke, Wolfgang, 4,165,434, Cl. 544-197.000.

May, John E., to General Electric Company. Method of manufacturing a metal oxide varistor. 4,165,351, Cl. 264-66.000.

Mayen, Christian: See—  
Guillemin, Claude; and Mayen, Christian, 4,165,284, Cl. 210-198.00C.

Mayfield, Esther O. Steam or hot-water boiler. 4,165,455, Cl. 219-10.55A.

Mazzocchi, Paul H.; and Harrison, Aline M., to Research Corporation. 1,2,3,4,5,6-Hexahydro-1,6-methano-3-benzazocines. 4,165,371, Cl. 424-244.000.

McAllister, Ian R.: See—  
Bennett, John A.; McAllister, Ian R.; and Welsh, Howard, 4,165,282, Cl. 210-40.000.

McCall Associates, Inc.: See—  
Diven, Jeffrey K., 4,164,949, Cl. 131-173.000.

McCarson, Donald M. Apparatus and method for combined solar and heat pump heating and cooling system. 4,165,037, Cl. 237-1.00A.

McClanahan, Jimmie D.: See—  
Oswalt, Leon M.; and McClanahan, Jimmie D., 4,165,024, Cl. 222-105.000.

McDonough, John. Cooler. 4,164,853, Cl. 62-457.000.

McFarland, Douglas F. Inertia controlled conveyor clutch. 4,164,995, Cl. 192-103.00C.

McJones, Robert W.: See—  
Qasim, Javed; and McJones, Robert W., 4,165,063, Cl. 251-168.000.

McLean, Daniel C.: See—  
Shaler, Amos J.; and McLean, Daniel C., 4,164,951, Cl. 132-31.00R.

Meagher, Richard R., to Rescon Corporation, The. Product authentication system. 4,165,002, Cl. 206-459.000.

Mearns, Hurshel. Basketball tossing device. 4,164,928, Cl. 124-16.000.

Meckler, Milton. Multi source heat pump air conditioning system. 4,165,036, Cl. 237-1.00A.

Medical Laboratory Automation, Inc.: See—  
Scordato, Emil A.; and Pratt, Hugh W., 4,164,870, Cl. 73-425.600.

Medtronic, Inc.: See—  
Hartlaub, Jerome T., 4,164,945, Cl. 128-419.0PG.

Mehnert, Gottfried. Apparatus for multi-stage blow molding of hollow shaped articles. 4,165,213, Cl. 425-530.000.

Meissner, Bernd: See—  
Dudeck, Christian; Diehm, Hans; Brunnmueller, Fritz; Meissner, Bernd; and Fliege, Werner, 4,165,342, Cl. 260-603.00C.

Mellberg, James R., to Colgate Palmolive Company. Dental prophylactic paste. 4,165,366, Cl. 424-49.000.

Mellen, Craig R. Asphalt spreading machine. 4,165,192, Cl. 401-48.000.

Melvin, Lawrence S., Jr.: See—  
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,165,323, Cl. 260-345.200.

Merck & Co., Inc.: See—  
Epstein, Albert; Graham, Glen; and Sklarz, William A., 4,165,250, Cl. 435-267.000.

Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.

Mericle, John E. Spacer for workpiece supporting apparatus used with power tools having high speed cutting members. 4,164,882, Cl. 83-409.000.

Messick, William E.; and Gabrielsen, Bernard L. Heat insulating and sound absorbing concrete wall panel. 4,164,831, Cl. 52-405.000.

Metzler, Norman P.: See—  
Metzler, Phares H.; and Metzler, Norman P., 4,164,826, Cl. 43-42.050.

Metzler, Phares H.; and Metzler, Norman P. Salmon jig. 4,164,826, Cl. 43-42.050.

Meyer, J. Joe, to Western-Cullen-Hayes, Inc. Portable derail. 4,165,060, Cl. 246-163.000.

Meyer-Simon, Eugen: See—  
Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,165,363, Cl. 423-342.000.

Michael, William R.: See—  
Sundie, Richard D.; and Michael, William R., 4,165,305, Cl. 260-29.40R.

Michno, Michael J., Jr.: See—  
Spector, Myron; Kwiatkowski, George T.; Smarock, Walter H.; and Michno, Michael J., Jr., 4,164,794, Cl. 3-1.912.

Micropump Corporation: See—  
Martin, Thomas B.; and Pieters, Ferdinandus A., 4,165,206, Cl. 417-310.000.

Midorikawa, Akira: See—  
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.

Mikata, Tsuruo: See—  
Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.

Milberger, Ernest C.: See—  
Dolhy, Serge R.; and Milberger, Ernest C., 4,165,300, Cl. 252-462.000.

Millars Wellpoint International Ltd.: See—  
Allen, Ronald N., 4,164,955, Cl. 137-202.000.

Miller, Richard J.: See—  
Cassatt, Gary G.; and Miller, Richard J., 4,164,874, Cl. 73-799.000.

Milstein, Joseph B. Process and apparatus for preparation of single crystals and textured polycrystals. 4,165,361, Cl. 422-249.000.

Minaminihon Rakuno Kyodo Kabushiki Kaisha: See—  
Kawai, Suji; Ohya, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.

Mindell, Marvin I.: See—  
Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.

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Larsen, Darrell R., 4,165,041, Cl. 241-182.000.

Minnesota Mining and Manufacturing Company: See—  
Nidelkoff, James G., 4,164,824, Cl. 40-450.000.

Ogden, P. H.; and Pennicott, H., 4,165,397, Cl. 427-140.000.

Mirowski, Mieczyslaw: See—  
Langer, Alois A., 4,164,946, Cl. 128-419.00D.

Misawa, Akira, to Pioneer Electronic Corporation. Tuning indicating device having a two-dimensional display of two values. 4,165,500, Cl. 334-86.000.

Mitchell, Charles S., to Silonics, Inc. Paper advance mechanism for an ink jet printer. 4,165,029, Cl. 226-25.000.

Mitchell, Henry M.; Elias, John; and Moorcroft, John, to Mannin Industries Ltd. Apparatus for monitoring amount and directions of fluid flow in fluid power systems. 4,164,866, Cl. 73-231.00R.

Mitchell, John G., to California Injection Molding Co., Inc. Mold with porous cavity vent. 4,165,062, Cl. 249-141.000.

Mitsubishi Chemical Industries, Ltd.: See—  
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,165,441, Cl. 585-444.000.

Mitsubishi Denki Kabushiki Kaisha: See—  
Koizumi, Takayuki; and Usami, Teruo, 4,165,458, Cl. 235-92.0PE.



Mitsubishi Gas Chemical Company, Inc.: See—  
Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, 4,165,337, Cl. 260-544.00D.  
Mitsubishi Precision Co., Ltd.: See—  
Kumazawa, Toshiharu, 4,165,038, Cl. 239-405.000.  
Mitsubishi Rayon Co., Ltd.: See—  
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Kato, Masaaki, 4,165,296, Cl. 252-412.000.  
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.  
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.  
Miyakawa, Seiichi: See—  
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.  
Miyashita, Kiyoshi; and Kimura, Katsuhiko, to Olympus Optical Company Limited. Photosensitive drum for electrographic apparatus. 4,165,169, Cl. 355-3.00DR.  
Miyata, Konosuke: See—  
Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.  
Miyata, Satoru: See—  
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.  
Miyazaki, Haruhiko: See—  
Nishimura, Kenji; Miyazaki, Haruhiko; Kuniyasu, Kenji; and Ono, Satoru, 4,165,328, Cl. 260-404.000.  
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Davis, Kenneth G., 4,165,304, Cl. 260-22.0CB.  
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Moffett, Richard E.: See—  
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Moller, Godfrey T. Video recorder and playback unit including remotely operable timed fast forward advance. 4,165,522, Cl. 360-73.000.  
Moller, Jens L., to Continental Group, Inc., The. Easy open reclosable end unit. 4,165,016, Cl. 220-270.000.  
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Serlin, Irving, 4,165,308, Cl. 260-42.520.  
Wolfinger, Mark D., 4,165,417, Cl. 525-3.000.  
Mookherjee, Braja D.: See—  
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Mitchell, Henry M.; Elias, John; and Moorcroft, John, 4,164,866, Cl. 73-231.00R.  
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Morrison, H. Frank, to University of California, The Regents of the. Prospecting system using rotating superconducting electromagnetic dipole. 4,165,480, Cl. 324-6.000.  
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Hedge, Russell K.; and Huss, William S., 4,165,138, Cl. 312-39.000.  
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Motorola, Inc.: See—  
Remedi, James J., 4,165,504, Cl. 340-167.00R.  
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Donohue, James M.; and Mueller, Daniel L., 4,165,170, Cl. 355-14.000.  
Mueller, Martin, to Owens-Illinois, Inc. Article transport device and method. 4,164,997, Cl. 198-427.000.  
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Nubani, Jawdat I.; and Muenkel, Raymond L., 4,165,227, Cl. 65-56.000.  
Multivac Sepp Haggenmuller KG: See—  
Vetter, Arthur, 4,165,357, Cl. 264-548.000.  
Murakami, Masuo: See—  
Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.  
Murayama, Kashiwa, to Japan Crown Cork Co., Ltd. Bottle closure for sales promotion. 4,165,009, Cl. 215-230.000.  
Murch, Robert M.: See—  
Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., 4,165,411, Cl. 521-107.000.  
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Naab, Carlton W.; and Jankowiak, Roman, to Conax Corporation. Normally-closed electro-thermally operated flood valve. 4,164,953, Cl. 137-72.000.  
Nagai, Masayuki: See—  
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Nakagawa, Akira: See—  
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.  
Nakagome, Takenari: See—  
Yamada, Hirotsada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,165,373, Cl. 424-246.000.  
Nakaji, Tarushige: See—  
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.  
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Nakamura, Takato: See—  
Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraiishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.  
Nakase, Takamichi: See—  
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.  
Nakashima, Yoichi: See—  
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, 4,165,428, Cl. 546-273.000.  
Nakazeki, Tsugito: See—  
Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, 4,164,923, Cl. 123-140.0MC.  
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Narumi China Corporation: See—  
Kita, Katsuhiko, 4,165,226, Cl. 65-42.000.  
National Distillers and Chemical Corporation: See—  
Corbett, Herbert O., 4,165,210, Cl. 425-133.500.  
National Musical String Company: See—  
Stone, W. Norman; and Allmansberger, Robert A., 4,164,806, Cl. 29-517.000.  
National Research Development Corporation: See—  
Dell, Christopher C., 4,165,279, Cl. 209-169.000.  
Gordon, John A., 4,165,444, Cl. 178-22.000.  
Mansfield, Peter, 4,165,479, Cl. 324-0.50A.  
National Seating Company: See—  
Owen, Hugh J., 4,165,125, Cl. 297-220.000.  
Nattel, William, to GTE Sylvania Canada Limited. Electrical outlet box. 4,165,010, Cl. 220-3.940.  
NCR Corporation: See—  
Bodmer, Jerome R., 4,165,102, Cl. 282-27.500.  
Bodmer, Jerome R., 4,165,103, Cl. 282-27.500.  
Neau, Alain, to Garcia Corporation, The. Self restoring safety ski binding. 4,165,095, Cl. 280-613.000.  
Nelson, Dale W. Combination cart. 4,165,088, Cl. 280-47.350.  
Newkirk, David D.: See—  
Login, Robert B.; and Newkirk, David D., 4,165,405, Cl. 428-395.000.  
Nichols, Edward L., III: See—  
Campbell, Paul K.; and Nichols, Edward L., III, 4,165,148, Cl. 339-276.00R.

Nicholson, Albert N., to Engineering Systems Corporation. Apparatus for re-inking printing ribbons. 4,164,911, Cl. 118-670.000.  
Nidelkoff, James G., to Minnesota Mining and Manufacturing Company. Changeable character sign structure. 4,164,824, Cl. 40-450.000.  
Nielsen, Axel L. Sump pump. 4,165,204, Cl. 417-40.000.  
Nielsen, Holger; and Salling, Per, to A/S N. Foss Electric. Identification system. 4,165,033, Cl. 235-439.000.  
Nievarovski, Leslav M., to Norca Corporation. Schnabel car bogie. 4,164,906, Cl. 105-367.000.  
Nihon Technical Kabushiki Kaisha: See—  
Ohashi, Tamaki; and Sato, Susumu, 4,165,499, Cl. 334-47.000.  
Niigata Engineering Co., Ltd.: See—  
Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, 4,165,281, Cl. 210-17.000.  
Ninomiya, Takeshi, to Sony Corporation. Velocity error control apparatus. 4,165,524, Cl. 360-36.000.  
Nippon Electric Co., Ltd.: See—  
Kitamura, Yoshishige, 4,165,538, Cl. 365-104.000.  
Nippon Kogaku K.K.: See—  
Akasaka, Shigeo, 4,165,164, Cl. 354-289.000.  
Nippon Paint Co., Ltd.: See—  
Nakabayashi, Seizi; Matsuura, Taizo; and Iimure, Tamio, 4,165,265, Cl. 204-159.140.  
Nippon Precision Optical Instrument Co., Ltd.: See—  
Sato, Ko, 4,165,179, Cl. 356-246.000.  
Nippon S R S, Inc.: See—  
Sato, Ko, 4,165,179, Cl. 356-246.000.  
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Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.  
Nippon Zeon Co. Ltd.: See—  
Okuda, Takao; and Wada, Akira, 4,165,344, Cl. 525-111.000.  
Nippondenso Co., Ltd.: See—  
Makino, Niro, 4,164,924, Cl. 123-140.00R.  
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Nishimura, Shigeaki: See—  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.  
Nissim, Joseph, to Rockwell International Corporation. Motion simulating display apparatus. 4,165,510, Cl. 340-754.000.  
Nitro Chemical Industry Co., Ltd.: See—  
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.  
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.  
Noda, Kanji; Nakagawa, Akira; Miyata, Satoru; Nakashima, Yoichi; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Indoleacetic acid ester derivatives. 4,165,428, Cl. 546-273.000.  
Nonaka, Yuji: See—  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.  
Nooner, Daryl W., to Texaco Inc. Reservoir stabilization by treating water sensitive clays. 4,164,979, Cl. 166-288.000.  
Norca Corporation: See—  
Nievarovski, Leslav M., 4,164,906, Cl. 105-367.000.  
Northern Telecom Inc.: See—  
Throop, C. Terry; Moffett, Richard E.; Hemmert, John R.; and Sawyer, Robert E., Jr., 4,165,450, Cl. 179-175.20C.  
Northern Telecom Limited: See—  
Duck, Gary S.; and King, Frederick D., 4,165,150, Cl. 350-96.150.  
Novak, Robert M.: See—  
Wieggers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., 4,165,301, Cl. 252-522.000.  
Nozaki, Sadao: See—  
Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, 4,165,337, Cl. 260-544.00D.  
NTN Toyo Bearing Co. Ltd.: See—  
Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, 4,164,923, Cl. 123-140.0MC.  
Nubani, Jawdat I.; and Muenkel, Raymond L., to RCA Corporation. Stem-sealing method for assembling electron tubes including improved cullet collection. 4,165,227, Cl. 65-56.000.  
Nutter, Larry L. Truss hoist. 4,165,114, Cl. 294-19.00R.  
N.V. Centrale Suiker Maatschappij: See—  
Wind, Evert; and de Vletter, Robbert, 4,165,285, Cl. 210-195.300.  
Oberto, Patrick L. C.: See—  
du Chaffaut, Jean A.; Magnoux, Claude R.; and Oberto, Patrick L. C., 4,165,389, Cl. 426-42.000.  
Oce-van der Grinten N.V.: See—  
Lemmen, Conradus J. G., 4,165,171, Cl. 355-15.000.  
O'Connell, Lawrence E., to Delbar Products, Inc. Outside mounted vehicle mirror with multiple rotation axes. 4,165,156, Cl. 350-307.000.  
Ogden, P. H.; and Pennicott, H., to Minnesota Mining and Manufacturing Company. Repair of glass laminates. 4,165,397, Cl. 427-140.000.  
Oger, Robert: See—  
Baudoin, Jean-Claude; and Oger, Robert, 4,165,116, Cl. 294-86.00R.  
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Ohio & Penna. Fuels, Inc.: See—  
Valenti, Nicholas, 4,165,221, Cl. 44-26.000.  
Ohlinger, Manfred: See—  
Jaech, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.  
Ohmori, Muneki: See—  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.  
Ohnuma, Teruyuki: See—  
Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, 4,165,393, Cl. 427-18.000.  
Ohsaka, Yohnosuke: See—  
Tohzuka, Takashi; and Ohsaka, Yohnosuke, 4,165,340, Cl. 260-593.00H.  
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Ohshima, Iwao: See—  
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.  
Ohyabu, Shuzo: See—  
Kawai, Syuji; Ohyabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.  
Okada, Masaru: See—  
Komiya, Kunihiko; Kanai, Seikichi; and Okada, Masaru, 4,164,913, Cl. 123-30.00C.  
Okada, Takanori: See—  
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.  
Okamoto, Kikuhiko: See—  
Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.  
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Okamura, Masatoshi: See—  
Shiba, Haruo; and Okamura, Masatoshi, 4,165,051, Cl. 242-74.100.  
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, to Mitsubishi Chemical Industries, Ltd. Process for the preparation of styrene. 4,165,441, Cl. 585-444.000.  
Okawa, Masahisa: See—  
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.  
Okuda, Takao; and Wada, Akira, to Nippon Zeon Co. Ltd. Cyclopentadiene resin and isocyanate cured epoxy resin compositions. 4,165,344, Cl. 525-111.000.  
Olan, Jose A. Combination of chair and apparel cabinets. 4,165,124, Cl. 297-190.000.  
Olander, William C.; Trabold, William G.; Harvey, Douglas J.; and Vest, Robert W., to General Motors Corporation. Ignition distributor electrode for suppressing radio frequency interference. 4,165,452, Cl. 200-19.00DR.  
Olechowski, Jerome R.: See—  
Levine, Ralph; and Olechowski, Jerome R., 4,165,343, Cl. 585-638.000.  
Olin Corporation: See—  
Kadija, Igor V., 4,165,271, Cl. 204-252.000.  
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,165,432, Cl. 536-4.000.  
Olsson, Rune J., to Produnik AB. Jar holder. 4,165,115, Cl. 294-27.00R.  
Olympus Optical Company Limited: See—  
Miyashita, Kiyoshi; and Kimura, Katsuhiko, 4,165,169, Cl. 355-3.00DR.  
Onda, Isao, to Ageo Industries Co., Ltd. Juvenile toy vehicle. 4,165,094, Cl. 280-261.000.  
Ondetti, Miguel A.; and Condon, Michael E., to E. R. Squibb & Sons, Inc. Amino acid derivatives. 4,165,320, Cl. 260-326.12R.  
Ong, Kian K., to U.S. Philips Corporation. Non-linear digital to analog conversion by intermediate conversion to time interval. 4,165,507, Cl. 340-347.0DA.  
Onnenberg, Volker: See—  
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjürgen; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.  
Ono Pharmaceutical Company, Ltd.: See—  
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,165,437, Cl. 560-121.000.  
Ono, Satoru: See—  
Nishimura, Kenji; Miyazaki, Haruhiko; Kuniyasu, Kenji; and Ono, Satoru, 4,165,328, Cl. 260-404.000.  
Onoue, Keiji: See—  
Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, 4,165,046, Cl. 242-35.50A.  
Orion Machinery and Engineering Corporation: See—  
Steinhilber, Wilhelm A., 4,164,859, Cl. 72-289.000.  
Osaka Soda Co. Ltd.: See—  
Matoba, Yasuo; Hashimoto, Akira; and Sugahara, Mikio, 4,165,416, Cl. 525-346.000.  
Osborne, Edward L., to Westvaco Corporation. Short depth returnable bottle container. 4,165,031, Cl. 229-34.00R.



Oshima, Saburo: See—  
Kimata, Kei; Nakazeki, Tsugito; and Oshima, Saburo, 4,164,923, Cl. 123-140.0MC.  
Osipov, Avgust V.: See—  
Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.  
Ost, Robert J.; and Perry, Robert F., to Sperry Rand Corporation. Circuit integrity tester. 4,165,270, Cl. 204-195.00R.  
Oswalt, Leon M.; and McClanahan, Jimmie D., to Cato Oil and Grease Co. Bulk shipping container. 4,165,024, Cl. 222-105.000.  
Otani, Hisao: See—  
Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.  
Otis Engineering Corporation: See—  
Arendt, Henry P.; Deaton, Thomas M.; and Dooley, Donald L., 4,164,977, Cl. 166-125.000.  
Otto, Carl L., Jr., deceased; and by Lockwood, Phyllis, executrix. Multi-stage pump. 4,165,205, Cl. 417-262.000.  
Ouellette, Charles W., to Raytheon Company. Multiple buoy launcher. 4,164,887, Cl. 89-1.50R.  
Owen, Hugh J., to National Seating Company. Slipover headrest pillow assembly. 4,165,125, Cl. 297-220.000.  
Owens-Illinois, Inc.: See—  
Doherty, Thomas E., 4,165,028, Cl. 226-4.000.  
Heider, James E., 4,165,356, Cl. 264-519.000.  
Mueller, Martin, 4,164,997, Cl. 198-427.000.  
Oyama, Hajime: See—  
Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, 4,165,393, Cl. 427-18.000.  
Oyama, Kiyotaka: See—  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yui; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.  
P. Ferrero & C. S.p.A.: See—  
Dogliotti, Amilcare, 4,165,456, Cl. 219-449.000.  
Paepke, Horst. Positive feed. 4,165,048, Cl. 242-47.010.  
Paice, Derek A., to Electric Power Research Institute, Inc. Current limiting circuit arrangement. 4,165,527, Cl. 361-113.000.  
Paivanas, John A.: See—  
Hassan, Javathu K.; and Paivanas, John A., 4,165,132, Cl. 406-10.000.  
Pako Corporation: See—  
Laska, Ronald C.; and Pierce, Wayne R., 4,165,176, Cl. 355-68.000.  
Palmer, Harold. Garden implement. 4,164,984, Cl. 172-371.000.  
Palumbo, Nunzio, to Kohner, Inc. Action toy. 4,164,827, Cl. 46-119.000.  
Paniccia, Albert E.: See—  
Howe, Leland D., Jr.; Paniccia, Albert E.; and Scotto, Vincent A., 4,165,490, Cl. 328-60.000.  
Parnell, John V., III: See—  
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,165,390, Cl. 426-540.000.  
Pasqualucci, Carmine: See—  
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,165,317, Cl. 260-239.30P.  
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, to Societe Nationale des Poudres et Explosifs. Poly-(carbonate-urethane)-triols and preparation thereof. 4,165,423, Cl. 528-370.000.  
Patel, Jitendra G.: See—  
Bugajski, Frank H.; and Patel, Jitendra G., 4,165,260, Cl. 201-40.000.  
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Sarnes, Myron C.; and Pathak, Ramjee, 4,165,243, Cl. 148-16.500.  
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Stueben, Kenneth C.; Azrak, Raymond G.; and Petrylow, Michael F., 4,165,266, Cl. 204-159.150.  
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Casse, Christian, 4,165,113, Cl. 293-121.000.  
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Pfizer Inc.: See—  
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,165,323, Cl. 260-345.200.  
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Satchell, Donald P., Jr., 4,165,264, Cl. 204-106.000.  
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Bardoneschi, Roland; Jouquey, Alain; and Philibert, Daniel, 4,165,326, Cl. 260-397.500.  
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Borenstein, David E.; and Banning, Jack A., 4,164,841, Cl. 57-350.000.  
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Laska, Ronald C.; and Pierce, Wayne R., 4,165,176, Cl. 355-68.000.  
Pieters, Ferdinandus A.: See—  
Martin, Thomas B.; and Pieters, Ferdinandus A., 4,165,206, Cl. 417-310.000.  
Pilz, Georg: See—  
Strehler, Hugo; Dietl, Ernst; and Pilz, Georg, 4,165,335, Cl. 260-501.200.  
Pioneer Electronic Corporation: See—  
Misawa, Akira, 4,165,500, Cl. 334-86.000.  
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Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,165,423, Cl. 528-370.000.  
Polaroid Corporation: See—  
Land, Edwin H., 4,165,153, Cl. 350-126.000.  
Polysar Resins, Inc.: See—  
Hoselton, Harry, 4,165,020, Cl. 220-306.000.  
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Popovich, Mark, to Fair Equipment Company, Inc. Fishing game device. 4,165,075, Cl. 273-140.000.  
Poppe, Wassily: See—  
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Postma, Randall F. Method and apparatus for installing a dock. 4,165,197, Cl. 405-218.000.  
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PPG Industries, Inc.: See—  
Cunningham, Hugh, 4,165,272, Cl. 204-282.000.  
Darlington, William B.; Driskill, John D.; and Du Bois, Donald W., 4,165,248, Cl. 156-308.000.  
Pratt, Hugh W.: See—  
Scordato, Emil A.; and Pratt, Hugh W., 4,164,870, Cl. 73-425.600.  
Pratt Manufacturing Corp.: See—  
Todd, Henry E., 4,164,833, Cl. 53-545.000.  
Preiss, Georg: See—  
Dubs, Walter; and Preiss, Georg, 4,165,402, Cl. 428-64.000.  
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Pribyl, George E.: See—  
Kantar, Anthony M.; and Pribyl, George E., 4,164,875, Cl. 73-812.000.  
Price, Arthur B.: See—  
Landau, John V.; Mindell, Marvin I.; Daly, William T.; Garland, J. David; and Price, Arthur B., 4,165,159, Cl. 353-15.000.  
Price Brothers Company: See—  
Himes, Herman C.; and Koepnich, John P., 4,165,215, Cl. 425-169.000.

Price, Raymond M.: See—  
Brew, William R.; and Price, Raymond M., 4,165,247, Cl. 149-19.400.  
Probst, Joachim: See—  
Alfies, Franz; Heine, Diez; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.  
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Gosselink, Eugene P.; Richmond, James M.; and Wentler, George E., 4,165,334, Cl. 260-458.00R.  
Johnson, Samuel M.; and Hiland, Emelyn L., 4,165,290, Cl. 252-8.800.  
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Belfort, Gerard L. A., 4,165,297, Cl. 252-429.00R.  
Produnik AB: See—  
Olsson, Rune J., 4,165,115, Cl. 294-27.00R.  
Prolabo: See—  
Guillemin, Claude; and Mayen, Christian, 4,165,284, Cl. 210-198.00C.  
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Pullman Incorporated: See—  
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Pulsepower Systems, Inc.: See—  
Elmore, Lester C.; and Broxholm, Thomas M., deceased, 4,164,889, Cl. 89-7.000.  
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Strahs, Martin P., 4,164,800, Cl. 15-119.00R.  
Quinby, James D. Dental cleaning and massaging apparatus. 4,164,940, Cl. 128-62.00A.  
Quinn, Ronald J.: See—  
Gregson, Richard P.; and Quinn, Ronald J., 4,165,427, Cl. 536-24.000.  
R. O. Hull & Company, Inc.: See—  
Kelly, Roger A.; and Pekar, Howard G., 4,165,242, Cl. 148-6.15Z.  
Rabe, Hansjurg: See—  
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurg; and Schulte, Klaus, 4,165,211, Cl. 425-224.000.  
RACI S.p.A.: See—  
Zanichelli, Gianni, 4,165,111, Cl. 285-419.000.  
Ragsdale, Charles W., to Cavitron Corporation. System and method for analyzing tonosignals. 4,164,863, Cl. 128-652.000.  
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Ransburg Corporation: See—  
Bentley, Stanley L.; and Jessup, David G., 4,165,022, Cl. 222-76.000.  
Rau, Jim L.: See—  
Goff, Raymon L.; and Rau, Jim L., 4,164,892, Cl. 91-375.00A.  
Rauma-Repol Oy: See—  
Jokinen, Olli, 4,165,005, Cl. 212-145.000.  
Ray, James A.: See—  
Kendall, Thomas L.; Downing, Leo G.; and Ray, James A., 4,165,532, Cl. 364-420.000.  
Raytheon Company: See—  
Ouellette, Charles W., 4,164,887, Cl. 89-1.50R.  
RB Toy Development Co.: See—  
Kupperman, Sam; and Kupperman, Dennis, 4,165,061, Cl. 249-92.000.  
RCA Corporation: See—  
Calamari, James A., Jr., 4,165,396, Cl. 427-64.000.  
Curtice, Walter R., 4,165,459, Cl. 235-92.0TF.  
Nubani, Jawdat I.; and Muenkel, Raymond L., 4,165,227, Cl. 65-56.000.  
Recaro GmbH & Co.: See—  
Strien, Werner; Zwanziger, Rudolph; and Kaufmann, Ernst, 4,165,126, Cl. 297-284.000.  
Reed, Peter, executor: See—  
Wurzburger, Paul D., deceased; and Reed, Peter, executor, 4,164,959, Cl. 137-553.000.  
Regal China Corporation: See—  
Greenberg, Jerome S., 4,165,350, Cl. 264-60.000.  
Reichle, Walter T., to Union Carbide Corporation. Catalytic aldol condensations. 4,165,339, Cl. 260-586.00C.  
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Remedi, James J., to Motorola, Inc. CMOS Decoder. 4,165,504, Cl. 340-167.00R.  
Rempel, William D., to Sycor, Inc. Ribbon mask and guide for dot matrix impact printers. 4,165,188, Cl. 400-124.000.  
Renaudat, Jean-Louis: See—  
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,165,488, Cl. 325-321.000.

Rens, Johannes N. M.: See—  
Henstra, Rauke; van der Kley, Tonny; and Rens, Johannes N. M., 4,165,261, Cl. 202-241.000.  
Rescon Corporation, The: See—  
Meagher, Richard R., 4,165,002, Cl. 206-459.000.  
Research Corporation: See—  
Mazzocchi, Paul H.; and Harrison, Aline M., 4,165,371, Cl. 424-244.000.  
Reyes, Renato D., to Westinghouse Electric Corp. Pulley system including emergency locking means for nuclear reactor vessel inspection apparatus. 4,165,254, Cl. 176-19.00R.  
Reynolds, Richard N., Jr., to Chevron Research Company. Alkylation of aniline with a lactone in the presence of water. 4,165,322, Cl. 260-343.600.  
Reynolds, Victor R., to Engelhard Minerals & Chemicals Corporation. Hydrometallurgical processing of molybdenite ore concentrates. 4,165,362, Cl. 423-53.000.  
Rhône-Poulenc Industries: See—  
Foucras, Jacques; and Rodet, Georges, 4,165,082, Cl. 277-166.000.  
Ricciuti, Gaetano: See—  
Zurawin, Adam; and Ricciuti, Gaetano, 4,164,803, Cl. 15-257.050.  
Rice, Max. Torsion and gripping type exercise device for total arm development. 4,165,070, Cl. 272-68.000.  
Rich, Theodore C.: See—  
Di Domenico, Mauro, Jr.; Karr, Michael A., III; and Rich, Theodore C., 4,165,496, Cl. 331-94.50S.  
Richard, Francoise: See—  
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,165,336, Cl. 260-511.000.  
Richmond, James M.: See—  
Gosselink, Eugene P.; Richmond, James M.; and Wentler, George E., 4,165,334, Cl. 260-458.00R.  
Ricoh Co., Ltd.: See—  
Ishima, Kazumi, 4,165,514, Cl. 346-155.000.  
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.  
Suzuki, Kohji; Mochizuki, Manabu; Oyama, Hajime; and Ohnuma, Teruyuki, 4,165,393, Cl. 427-18.000.  
Suzuki, Takami; and Iwata, Nobuo, 4,165,190, Cl. 400-144.200.  
Riegel Textile Corporation: See—  
Teed, Richard K.; and Freeman, Ernest A., Jr., 4,165,288, Cl. 210-23.00H.  
Riker Laboratories, Inc.: See—  
Moore, George G. I.; and Sell, Donald M., 4,165,383, Cl. 424-331.000.  
Rinehart, Verne R., to Goodyear Tire & Rubber Company. The Solid state polymerization of polyester prepolymer. 4,165,420, Cl. 526-63.000.  
Ritter, Ernst: See—  
Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, 4,164,925, Cl. 123-140.00R.  
Ritterwerk GmbH: See—  
Dittert, Karl; and Hartkorn, Hans W., 4,164,813, Cl. 30-272.00A.  
Robert Bosch GmbH: See—  
Eheim, Franz; and Hofer, Gerald, 4,164,922, Cl. 123-139.0AQ.  
Hofer, Gerald; and Eheim, Franz, 4,164,921, Cl. 123-139.0AF.  
Latzina, Kurt; Martin, Hans; and Wolf, Richard, 4,165,203, Cl. 415-113.000.  
Maier, Sieghart; Lehmann, Werner; Ritter, Ernst; Eckell, Wolfgang; and Schwartz, Reinhard, 4,164,925, Cl. 123-140.00R.  
Wocher, Berthold; Pfitzmaier, Heinz; and Pfendler, Thomas, 4,165,511, Cl. 343-7.0VM.  
Roberts Company: See—  
Chilpan, Kurt C.; and Lewis, William L., 4,164,840, Cl. 57-313.000.  
Robertshaw Controls Company: See—  
Asbill, Clarence M., III, 4,165,139, Cl. 339-15.000.  
Rogers, Arden D., Jr.; and Goff, Clifford E., 4,165,034, Cl. 236-12.00R.  
Rockwell International Corporation: See—  
Harrington, Timothy A., 4,165,493, Cl. 330-207.00P.  
Nissim, Joseph, 4,165,510, Cl. 340-754.000.  
Wittry, David B., 4,165,472, Cl. 313-35.000.  
Rodet, Georges: See—  
Foucras, Jacques; and Rodet, Georges, 4,165,082, Cl. 277-166.000.  
Rogers, Arden D., Jr.; and Goff, Clifford E., to Robertshaw Controls Company. Fluid mixing valve construction and method of making the same. 4,165,034, Cl. 236-12.00R.  
Rohm and Haas Company: See—  
Greenfield, Stanley A.; and Dupont, John A., 4,165,318, Cl. 260-302.00A.  
Rohringer, Peter: See—  
Hiestand, Armin; and Rohringer, Peter, 4,165,435, Cl. 544-197.000.  
Roland Corporation: See—  
Kakehashi, Ikutaro, 4,164,884, Cl. 84-1.240.  
Rose, Stephen D.: See—  
United States of America, National Aeronautics and Space Administration; Rose, Stephen D.; Crouch, Charles E.; and Jones, Elborn W., 4,165,460, Cl. 250-253.000.  
Rosenberg, Carl S., to Lake Shore Roentgenology, Ltd. Treatment of the acute after-effects resulting from alcohol ingestion. 4,165,376, Cl. 424-267.000.  
Rosendahl Industrie-Handels AG: See—  
Seibert, Gerhard, 4,165,052, Cl. 242-78.100.  
Rosenfeld, Dov: See—  
Macovski, Albert; and Rosenfeld, Dov, 4,165,462, Cl. 250-363.00S.



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 Rottenfusser, Wolfgang: See—  
 Jardin, Hans; Rottenfusser, Wolfgang; and Isleif, Karl-Heinz, 4,165,120, Cl. 296-137.00J.  
 Rouse, Donald E., to Wiper-Mate, Inc. Detergent holder on windshield wiper arm. 4,164,802, Cl. 15-250.030.  
 Roussel Uclaf: See—  
 Bardoneschi, Roland; Jouquey, Alain; and Philibert, Daniel, 4,165,326, Cl. 260-397.500.  
 Rubio, Diego C.: See—  
 Bauer, Richard G.; and Rubio, Diego C., 4,165,347, Cl. 525-69.000.  
 Ruble, Eulalia Berry, executrix: See—  
 Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,165,364, Cl. 423-456.000.  
 Ruble, Theodore A., deceased: See—  
 Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,165,364, Cl. 423-456.000.  
 Rudolph, Siegfried: See—  
 Schreiber, August; and Rudolph, Siegfried, 4,165,286, Cl. 210-220.000.  
 Ruer, Jacques; and Vedda, Louis. Liquid-cooled electromagnetic continuous casting mold. 4,164,974, Cl. 164-147.000.  
 Ruscitti, Tomaso. Caps having frangible opening means. 4,165,014, Cl. 220-266.000.  
 Ryder, Francis E.: See—  
 Thomas, Michael D.; and Ryder, Francis E., 4,165,359, Cl. 422-105.000.  
 Ryder International Corporation: See—  
 Thomas, Michael D.; and Ryder, Francis E., 4,165,359, Cl. 422-105.000.  
 Sadler, Philip M. Inflatable structure. 4,164,829, Cl. 52-2.000.  
 Saito, Hirokichi: See—  
 Takahashi, Akio; and Saito, Hirokichi, 4,164,956, Cl. 137-242.000.  
 Sajben, Johannes O.: See—  
 Casper, Clemens; Lippert, Axel; and Sajben, Johannes O., 4,165,360, Cl. 422-202.000.  
 Sakaki, Hirokazu: See—  
 Shiba, Keisuke; Tajima, Tatsuya; and Sakaki, Hirokazu, 4,165,237, Cl. 96-76.00R.  
 Sakow, Lawrence. Sink strainer assembly. 4,164,796, Cl. 4-288.000.  
 Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., to General Foods Corporation. Process for solubilizing FD&C Red 3 under acidic conditions and composition. 4,165,390, Cl. 426-540.000.  
 Salk Institute for Biological Studies, The: See—  
 Wurzbarger, Paul D., deceased; and Reed, Peter, executor, 4,164,959, Cl. 137-553.000.  
 Salling, Per: See—  
 Nielsen, Holger; and Salling, Per, 4,165,033, Cl. 235-439.000.  
 Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Device for measuring a human foot. 4,164,815, Cl. 33-3.00A.  
 Samuelsson, Gustav B. R.: See—  
 Carlsson, Enar I.; Samuelsson, Gustav B. R.; and Aberg, Axel K. G., 4,165,384, Cl. 424-324.000.  
 Sandelli, Gregory J., to United Technologies Corporation. Method for fabricating a ribbed electrode substrate. 4,165,349, Cl. 264-29.100.  
 Sandoz Ltd.: See—  
 Avar, Lajos; and Hofer, Kurt, 4,165,267, Cl. 204-159.150.  
 Moissonnier, Rene; and Seiler, Hans, 4,165,306, Cl. 260-40.00P.  
 Troxler, Franz; and Wiskott, Erik, 4,165,374, Cl. 424-256.000.  
 Uehlinger, Hanspeter, 4,165,314, Cl. 260-145.00A.  
 Sanyo Electric Co., Ltd.: See—  
 Takahashi, Yoshimasa, 4,165,154, Cl. 350-128.000.  
 Sarnes, Myron C.; and Pathak, Ramjee, to Federal-Mogul Corporation. Method of making selectively carburized forged powder metal parts. 4,165,243, Cl. 148-16.500.  
 Sasaki, Toshio: See—  
 Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.  
 Satchell, Donald P., Jr., to Phelps Dodge Corporation. Ammonia leaching. 4,165,264, Cl. 204-106.000.  
 Sato, Ko, to Nippon Precision Optical Instrument Co., Ltd.; and Nippon S R S, Inc. Device for wiping optical window in turbidimeter or similar optical instrument for examining liquid sample. 4,165,179, Cl. 356-246.000.  
 Sato Kogyo Kabushiki Kaisha: See—  
 Sugimoto, Yoshihito; Miyata, Konosuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, 4,165,129, Cl. 299-11.000.  
 Sato, Munetaka: See—  
 Kuriyama, Kiyoshi; Sato, Munetaka; Matsuzaki, Tsuneo; Honma, Masanori; and Shida, Seiji, 4,165,281, Cl. 210-17.000.  
 Sato, Susumu: See—  
 Ohashi, Tamaki; and Sato, Susumu, 4,165,499, Cl. 334-47.000.  
 Satoh, Heiji: See—  
 Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heiji; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.  
 Sawa, Kiyohiko: See—  
 Higashi, Kazuo; and Sawa, Kiyohiko, 4,165,043, Cl. 241-236.000.  
 Sawyer, Robert E., Jr.: See—  
 Throop, C. Terry; Moffett, Richard E.; Hemmert, John R.; and Sawyer, Robert E., Jr., 4,165,450, Cl. 179-175.20C.

Schafer, Fritz P.; and Luttke, Wolfgang, to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V. Laser dyes comprising fluorescent and laser dyestuff residues. 4,165,434, Cl. 544-197.000.  
 Schaffer, William S.: See—  
 Feddersohn, Richard C.; and Schaffer, William S., 4,165,090, Cl. 280-87.04A.  
 Scharf, Rolf: See—  
 Berger, Hans-Jürgen; Koch, Ferdinand; Scharf, Rolf; and Schlusser, Hans-Joachim, 4,165,375, Cl. 424-263.000.  
 Schlarman, Philip J., to Iowa Manufacturing Company of Cedar Rapids, Iowa. Apparatus for asphaltic concrete hot mix recycling. 4,165,184, Cl. 366-12.000.  
 Schlegel, Albert; and Wirtz, Peter, to Hoechst Aktiengesellschaft. Process for deodorizing foaming agents for the manufacture of air foams. 4,165,313, Cl. 260-123.700.  
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 Schlossman, Irwin S.; and Wiman, Robert E., to Emery Industries, Inc. Polymer compositions containing poly (alkylene ether) esters of polybasic acids. 4,165,303, Cl. 260-22.00D.  
 Schlusser, Hans-Joachim: See—  
 Berger, Hans-Jürgen; Koch, Ferdinand; Scharf, Rolf; and Schlusser, Hans-Joachim, 4,165,375, Cl. 424-263.000.  
 Schmidt, Herbert: See—  
 Bach, Hans; Heinroth, Karl-August; Jurischka, Hans-Dieter; Kaloff, Hans; Klee, Rudolf J.; and Schmidt, Herbert, 4,164,838, Cl. 57-247.000.  
 Schmidt, Otomar: See—  
 Dummermuth, Ernst; Grudowski, Raymond A.; Grants, Valdis; and Schmidt, Otomar, 4,165,534, Cl. 364-900.000.  
 Schmit, Justin M. Fluid containing and dispensing structure having a deformable flexible wall portion. 4,165,023, Cl. 222-105.000.  
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 Ohshima, Iwao; Shibuya, Yukio; and Otani, Hisao, 4,164,818, Cl. 34-12.000.  
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 Shiozawa, Etsuo: See—  
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 Auracher, Franz; and Kersten, Ralf, 4,165,225, Cl. 65-4.00B.  
 Heywang, Walter, 4,164,811, Cl. 29-628.000.  
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 Piatscheck, Michael; and Sievers, Dieter, 4,164,907, Cl. 109-50.000.  
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 Mitchell, Charles S., 4,165,029, Cl. 226-25.000.  
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 Gordon, Joseph G., II; and Sincerbox, Glenn T., 4,165,155, Cl. 350-285.000.  
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 Cook, Albert N.; Kormatowski, Boleslaw; and Tyburey, Raymond S., 4,165,144, Cl. 339-88.00R.  
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 Weiss, Martin J.; and Siuta, Gerald J., 4,165,331, Cl. 260-448.80R.  
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 Persson, Stig, 4,165,085, Cl. 277-228.000.  
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 Fielding, Ivor R.; Poppe, Wassily; and Slama, Francis J., 4,165,309, Cl. 260-45.80A.  
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 Hill, David T., 4,165,380, Cl. 424-290.000.  
 Snader, Kenneth M., 4,165,365, Cl. 424-45.000.  
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 Hennemann, Jean, 4,165,453, Cl. 200-153.00G.  
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 Hermans, Johny C., 4,165,424, Cl. 528-370.000.  
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 Societe Nationale Elf Aquitaine (Production): See—  
 de Saint-Palais, Jacques, 4,165,108, Cl. 285-45.000.  
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 Jaunin, Jean-Pierre, 4,164,844, Cl. 58-39.500.  
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 Marles, Kevin C.; and Spencer, Brian W., 4,164,935, Cl. 126-447.000.  
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 Marti, Franz; Somlo, Tibor; and Gosteli, Jacques, 4,165,268, Cl. 204-163.00R.  
 Sommer, Helmut: See—  
 Kohler, Hans W.; and Sommer, Helmut, 4,164,905, Cl. 102-212.000.  
 Sony Corporation: See—  
 Hirai, Jun, 4,165,518, Cl. 358-8.000.  
 Hongu, Masayuki, 4,165,498, Cl. 333-144.000.  
 Ninomiya, Takeshi, 4,165,524, Cl. 360-36.000.  
 Takahashi, Hiroo, 4,165,495, Cl. 330-283.000.  
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 Geffon, Arthur P., 4,165,491, Cl. 328-150.000.  
 Ost, Robert J.; and Perry, Robert F., 4,165,270, Cl. 204-195.00R.



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Beringer, Monique; and Sporri, Heinz, 4,164,948, Cl. 131-140.00C.  
Square D Company: See—  
Andersen, Paul R., 4,165,502, Cl. 335-39.000.  
Campbell, Paul K.; and Nichols, Edward L., III, 4,165,148, Cl. 139-276.00R.  
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Soderberg, Nils-Eirik, 4,164,962, Cl. 137-862.000.  
Standard Oil Company, The: See—  
Dolhyj, Serge R.; and Milberger, Ernest C., 4,165,300, Cl. 252-462.000.  
Standard Oil Company (Indiana): See—  
Fielding, Ivor R.; Poppe, Wassily; and Slama, Francis J., 4,165,309, Cl. 260-45.80A.  
Schroeder, Hobe; and Kulpa, Stanley J., 4,165,324, Cl. 260-346.700.  
Standun, Inc.: See—  
Kaminskas, Rimvydas A., 4,164,860, Cl. 72-345.000.  
Stanley, Robert E.: See—  
Alley, Lawrence E., III; Lydick, Richard P.; and Stanley, Robert E., 4,164,944, Cl. 128-419.0PG.  
Stanton, Garth M.: See—  
Dreher, John L.; and Stanton, Garth M., 4,165,329, Cl. 260-404.500.  
Stapley, Edward O.: See—  
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,165,379, Cl. 424-274.000.  
Stauffer Chemical Company: See—  
Corbett nee Rolison, Constance R., 4,165,391, Cl. 426-580.000.  
Steck, Werner: See—  
Jaechk, Christof; Steck, Werner; Brodt, Rudolf; Ohlinger, Manfred; Loeser, Werner; and Koester, Eberhard, 4,165,232, Cl. 75-0.5AA.  
Stedman, Robert N., to Caterpillar Tractor Co. Apex track shoe and method for making the same. 4,165,137, Cl. 305-54.000.  
Steenen, Wayne L.: See—  
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,165,390, Cl. 426-540.000.  
Steinbach, Thomas M., to TRW Inc. Ribbon connector constructions. 4,165,145, Cl. 339-91.00R.  
Steinhilber, Wilhelm A., to Orion Machinery and Engineering Corporation. Wire accumulator. 4,164,859, Cl. 72-289.000.  
Steinke, Kurt E.: See—  
Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., 4,165,483, Cl. 324-60.00C.  
Steraplast, Inc.: See—  
Knopick, Robert A.; and Morlock, Allen B., 4,164,941, Cl. 128-132.00D.  
Sternberg, Hans J. Duplicating postcard form. 4,165,101, Cl. 282-27.500.  
Stevens, David K.: See—  
DeGood, David A.; and Stevens, David K., 4,164,998, Cl. 198-781.000.  
Stewart, Bruce E.: See—  
Lyman, John B.; and Stewart, Bruce E., 4,165,140, Cl. 339-15.000.  
Stiefel, Christian; and Frederich, Fritz, to Waggonfabrik Uerdingen Aktiengesellschaft. Passenger evacuation apparatus. 4,164,990, Cl. 182-48.000.  
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Stokke, Olaf M., to Continental Oil Company. Biopolymer filterability improvement by caustic-enzyme treatment. 4,165,257, Cl. 435-262.000.  
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Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.  
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Vachon, Patrick A., 4,165,449, Cl. 179-170.200.  
Strahs, Martin P., to Quicke Manufacturing Corp. Combination mop and wringer. 4,164,800, Cl. 15-119.00R.  
Strand, Norman S., to Federal Screw Works. Threaded fastener product with adhesive coating. 4,164,971, Cl. 151-14.500.  
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Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., to Union Carbide Corporation. Radiation curable pressure sensitive adhesive compositions. 4,165,266, Cl. 204-159.150.

Sugahara, Mikio: See—  
Matoba, Yasuo; Hashimoto, Akira; and Sugahara, Mikio, 4,165,416, Cl. 525-346.000.  
Sugie, Toshinori: See—  
Mizuno, Shioji; and Sugie, Toshinori, 4,165,307, Cl. 260-40.0TN.  
Sugimoto, Yoshihito; Miyata, Kousuke; Ishihara, Kanehiro; Fujimoto, Sachio; and Kakutani, Tsunehiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Sato Kogyo Kabushiki Kaisha. Shield tunneling machine and method. 4,165,129, Cl. 299-11.000.  
Sulzer Brothers Limited: See—  
Ludwig, Alfred, 4,165,245, Cl. 148-127.000.  
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Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,165,298, Cl. 252-429.00B.  
Yamada, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,165,373, Cl. 424-246.000.  
Sumitomo Electric Industries, Ltd.: See—  
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,165,152, Cl. 350-96.300.  
Summer, James R., to American Safety Equipment Corporation. Float assembly for a helicopter or the like. 4,165,059, Cl. 244-100.00A.  
Sun Oil Company of Pennsylvania: See—  
Thompson, Robert M., 4,165,346, Cl. 525-432.000.  
Sundie, Richard D.; and Michael, William R., to Allied Chemical Corporation. Two-component binder for exterior fiberboard. 4,165,305, Cl. 260-29.40R.  
Sundstrand Data Control, Inc.: See—  
Holdren, Fred V.; Hulsing, Rand H., II; and Steinke, Kurt E., 4,165,483, Cl. 324-60.00C.  
Suntola, Tuomo S., to Vaisala Oy. Capacitive humidity transducer. 4,164,868, Cl. 73-336.500.  
Sutton, Gordon W.: See—  
Beacham, Bryan; and Sutton, Gordon W., 4,165,040, Cl. 239-600.000.  
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Swanson, Alfred B. Lunate implant. 4,164,793, Cl. 3-1.910.  
Swiss Aluminium Ltd.: See—  
Dantzig, Jonathan A.; and Tyler, Derek E., 4,165,235, Cl. 75-93.00E.  
Sycor, Inc.: See—  
Rempel, William D., 4,165,188, Cl. 400-124.000.  
Tachika, Tetsuji: See—  
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.  
Tajima, Tatsuya: See—  
Shiba, Keisuke; Tajima, Tatsuya; and Sakaki, Hirokazu, 4,165,237, Cl. 96-76.00R.  
Takabayashi, Fumiki: See—  
Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, 4,165,217, Cl. 8-81.000.  
Takada, Juichiro, to Takata Kogyo Co., Ltd. Safety belt applying system. 4,165,100, Cl. 280-802.000.  
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Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.  
Takano, Satoshi: See—  
Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, 4,165,327, Cl. 260-397.250.  
Takata, Akira: See—  
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.  
Takata Kogyo Co., Ltd.: See—  
Takada, Juichiro, 4,165,100, Cl. 280-802.000.  
Tatikawa, Yujiro, to Aisin Seiki Kabushiki Kaisha. Chainstitch forming device for sewing machines. 4,164,908, Cl. 112-168.000.  
Taldykin, Igor A.: See—  
Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.

Tamag Basel AG: See—  
Beringer, Monique; and Sporri, Heinz, 4,164,948, Cl. 131-140.00C.  
Tanac, Fumio; and Matsuoka, Hirokazu, to Teijin Seiki Company Limited. Bulky yarn producing apparatus. 4,164,836, Cl. 57-2.000.  
Tanga, Michifumi: See—  
Adachi, Terufumi; and Tanga, Michifumi, 4,165,415, Cl. 521-145.000.  
Tani, Tatsuo: See—  
Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seiichi, 4,165,172, Cl. 355-15.000.  
Taniguchi, Toshinori: See—  
Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, 4,165,046, Cl. 242-35.50A.  
Tate, David L.: See—  
Exley, John T.; Kuintzle, Charles, Jr.; and Tate, David L., 4,164,845, Cl. 60-39.290.  
Taylor, Lyle M. Drilling and deburring apparatus. 4,165,200, Cl. 408-118.000.  
TDK Electronics Co., Ltd.: See—  
Shiba, Haruo; and Okamura, Masatoshi, 4,165,051, Cl. 242-74.100.  
Teed, Richard K.; and Freeman, Ernest A., Jr., to Riegel Textile Corporation. Process of treating waste water from a textile vat dyeing operation to produce a concentrate for reuse. 4,165,288, Cl. 210-23.00H.  
Teijin Limited: See—  
Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, 4,165,217, Cl. 8-81.000.  
Teijin Seiki Company Limited: See—  
Tanac, Fumio; and Matsuoka, Hirokazu, 4,164,836, Cl. 57-2.000.  
Telecommunications Radioelectriques et Telephoniques T.R.T.: See—  
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,165,488, Cl. 325-321.000.  
Telefonaktiebolaget L M Ericsson: See—  
Jonsson, Bjorn E. R., 4,165,533, Cl. 364-900.000.  
Temple, Victor A. K.; and Baliga, B. Jayant, to Electric Power Research Institute, Inc. Self-protection against breaker turn-on failure in thyristors through selective base lifetime control. 4,165,517, Cl. 357-38.000.  
Teramachi, Hiroshi. Recirculating ball bearing spline joint. 4,165,195, Cl. 403-359.000.  
Texaco Inc.: See—  
Gravrok, Ralph E.; and Phillips, Clarence A. L., 4,165,230, Cl. 71-127.000.  
Nooner, Daryl W., 4,164,979, Cl. 166-288.000.  
Sequeira, Avilino, Jr.; Begnaud, John D.; and Barger, Frank L., 4,165,259, Cl. 196-14.520.  
Texas Instruments Incorporated: See—  
Myers, David J., 4,165,474, Cl. 313-500.000.  
Thiokol Corporation: See—  
Bertozzi, Eugene R., 4,165,425, Cl. 528-374.000.  
Graham, William H.; and Shepard, Inella G., 4,165,421, Cl. 528-75.000.  
Paul, Henry N., III, 4,165,426, Cl. 528-374.000.  
Tholander, Lars H. G.: See—  
Pejchal, Karel; and Tholander, Lars H. G., 4,165,049, Cl. 242-47.010.  
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Autoclave aseptic. 4,165,359, Cl. 422-105.000.  
Thomas, Robert R., to Hopkins Manufacturing Corporation. Bear claw ice scraper. 4,164,801, Cl. 15-236.00R.  
Thompson, Joseph A., to GKN Kent Alloys Limited. Cast vehicle wheels. 4,165,131, Cl. 301-65.000.  
Thompson, Robert M., to Sun Oil Company of Pennsylvania. Copolymer of poly(4,7-dioxadecamethylene adipamide)-polycaprolactam containing terephthalic acid. 4,165,346, Cl. 525-432.000.  
Thomson-CSF: See—  
de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, 4,165,222, Cl. 65-2.000.  
Motola, Marcel; and Besson, Yves, 4,165,492, Cl. 328-165.000.  
Thoratec Laboratories Corporation: See—  
Hill, J. Donald; and Fountain, Gordon H., 4,164,943, Cl. 128-348.000.  
Thorn Electrical Industries Limited: See—  
Pegg, John C.; and Walker, Clive R., 4,165,475, Cl. 315-99.000.  
Throop, C. Terry; Moffett, Richard E.; Hemmert, John R.; and Sawyer, Robert E., Jr., to Northern Telecom Inc. Telephone signalling test system. 4,165,450, Cl. 179-175.20C.  
Thyssen Industrie Aktiengesellschaft: See—  
Hausenblas, Helmut, 4,165,057, Cl. 244-3.120.  
Timmerman Engineers, Inc.: See—  
Timmerman, Walter C., 4,164,976, Cl. 165-101.000.  
Timmerman, Walter C., to Timmerman Engineers, Inc. Damper assembly. 4,164,976, Cl. 165-101.000.  
Tiribelli, Paolo: See—  
Bertoglio, Ottavio; De Micheli, Spiridione; and Tiribelli, Paolo, 4,165,447, Cl. 179-7.10R.  
Todd, Henry E., to Pratt Manufacturing Corp. Skip-seal mechanism for packaging machine. 4,164,833, Cl. 53-545.000.  
Tohzu, Takashi; and Ohsaka, Yohnosuke, to Daikin Kogyo Co., Ltd. Process for preparing hexafluoropropanone-2. 4,165,340, Cl. 260-593.00H.  
Tokuyama Sekishi Kogyo Kabushiki Kaisha: See—  
Adachi, Terufumi; and Tanga, Michifumi, 4,165,415, Cl. 521-145.000.  
Tokyo Shibaura Electric Co., Ltd.: See—  
Takahashi, Haruo, 4,165,485, Cl. 324-142.000.

Tomlinson, Robert K., to Concrete Industries (Monier) Limited. Tile stacking machine and method. 4,164,996, Cl. 198-415.000.  
Tomosada, Akihiro: See—  
Iwami, Naoki; Kadowaki, Hidejiro; Aoki, Takao; Kubo, Shunichi; Tomosada, Akihiro; Tachika, Tetsuji; and Kondo, Eiichi, 4,165,165, Cl. 355-4.000.  
Topalian, Harry H.: See—  
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,165,390, Cl. 426-540.000.  
Toppan Printing Co., Ltd.: See—  
Kanatani, Masataka; and Awamura, Daikichi, 4,165,465, Cl. 250-559.000.  
Toro Company, The: See—  
Kendall, Thomas L.; Downing, Leo G.; and Ray, James A., 4,165,532, Cl. 364-420.000.  
Tortorich, David J.; Bricker, Lyle J.; and Yasenak, John P., to Bricker, Lyle J.; and Yasenak, John P. Photographic chemical mixing system. 4,165,186, Cl. 366-142.000.  
Toyo Soda Manufacturing Co. Ltd.: See—  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heiji; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.  
Toyoda-Koki Kabushiki Kaisha: See—  
Tsuboi, Akira; and Yamakage, Tetsuro, 4,164,809, Cl. 29-568.000.  
Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,164,914, Cl. 123-32.0EE.  
Trabold, William G.: See—  
Olander, William C.; Trabold, William G.; Harvey, Douglas J.; and Vest, Robert W., 4,165,452, Cl. 200-19.0DR.  
Travnicek, Edward A., to American Optical Corporation. Cast contact lenses and method for making same. 4,165,158, Cl. 351-160.00H.  
Troxler, Franz; and Wiskott, Erik, to Sandoz Ltd. Thieno[3,2-c]pyridines. 4,165,374, Cl. 424-256.000.  
Trumbull Corporation: See—  
Dick, Perry J., Jr., 4,165,199, Cl. 405-271.000.  
TRW Inc.: See—  
Goff, Raymon L.; and Rau, Jim L., 4,164,892, Cl. 91-375.00A.  
Steinbach, Thomas M., 4,165,145, Cl. 339-91.00R.  
Tsuboi, Akira; and Yamakage, Tetsuro, to Toyoda-Koki Kabushiki Kaisha. Machine tool with automatic tool change apparatus. 4,164,809, Cl. 29-568.000.  
Tsuiji, Osami: See—  
Matsumoto, Nobuo; Tsuiji, Osami; Kamiya, Yukio; and Shiozawa, Etsuo, 4,165,251, Cl. 156-584.000.  
Tsukamoto, Tatum. Cigarette package. 4,164,999, Cl. 206-91.000.  
Tugukuni, Hideyoshi; and Kano, Masafumi, to Dai Nippon Toyo Co. Ltd. Powdery coating composition and process for preparing the same. 4,165,406, Cl. 428-407.000.  
Turcotte, Gordon W., to International Telephone & Telegraph Corp. Thermostatically controlled pre-weld heater. 4,165,457, Cl. 219-516.000.  
Tyburcy, Raymond S.: See—  
Cook, Albert N.; Kornatowski, Boleslaw; and Tyburcy, Raymond S., 4,165,144, Cl. 339-88.00R.  
Tyler, Derek E.: See—  
Dantzig, Jonathan A.; and Tyler, Derek E., 4,165,235, Cl. 75-93.00E.  
Ube Industries, Ltd.: See—  
Nishimura, Kenji; Miyazaki, Haruhiko; Kuniyasu, Kenji; and Ono, Satoru, 4,165,328, Cl. 260-404.000.  
Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, 4,165,341, Cl. 260-600.00R.  
Uchiyama, Seiji: See—  
Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, 4,165,337, Cl. 260-544.00D.  
Uda, Ryoji: See—  
Fujikawa, Tetsuzo; and Uda, Ryoji, 4,165,207, Cl. 417-313.000.  
Ueda, Shozo: See—  
Suzuki, Yoshihisa; Ueda, Shozo; Taniguchi, Toshinori; and Onoue, Keiji, 4,165,046, Cl. 242-35.50A.  
Uehlinger, Hanspeter, to Sandoz Ltd. Mixtures of 1:2 cobalt complexes of monoazo compounds having an acetanilide coupling component radical. 4,165,314, Cl. 260-145.00A.  
Ueno, Tsutomu: See—  
Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,165,228, Cl. 65-111.000.  
Umemura, Sumio; Takamitsu, Nagaaki; Enomiya, Takuji; Shiraishi, Hiroshi; and Nakamura, Takato, to Ube Industries, Ltd. Process for preparing protocatechualdehyde and its derivatives. 4,165,341, Cl. 260-600.00R.  
Unger, Friedrich: See—  
Maag, Fritz; and Unger, Friedrich, 4,164,837, Cl. 57-3.000.  
Union Carbide Corporation: See—  
Reichle, Walter T., 4,165,339, Cl. 260-586.00C.  
Smith, Oliver W.; and Koleske, Joseph V., 4,165,345, Cl. 525-419.000.  
Spector, Myron; Kwiatkowski, George T.; Smarock, Walter H.; and Michno, Michael J., Jr., 4,164,794, Cl. 3-1.912.  
Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., 4,165,266, Cl. 204-159.150.  
United States Bedding Company, The: See—  
Golembeck, Gerald A., 4,164,797, Cl. 5-470.000.



## United States of America

Army: See—  
 Drzewiecki, Tadeusz M.; and Manion, Francis M., 4,164,961, Cl. 137-823.000.  
 F'Geppert, Erwin, 4,165,081, Cl. 277-88.000.  
 Holmes, Allen B.; and Gehman, Stacy E., 4,165,503, Cl. 340-17.00R.  
 Kohler, Hans W.; and Sommer, Helmut, 4,164,905, Cl. 102-212.000.  
 Looger, Lonnie L.; and Cobb, Bernie J., 4,164,888, Cl. 89-1.814.  
 United States of America as represented by the Department of Health, Education and Welfare, The: See—  
 Vilkomerson, David H. R., 4,165,182, Cl. 356-349.000.  
 Commerce: See—  
 Hall, John L.; and Lee, Siu Au, 4,165,183, Cl. 356-346.000.  
 Energy: See—  
 Mangus, James D., 4,164,849, Cl. 60-679.000.  
 Interior: See—  
 Peterson, Carl R., 4,165,042, Cl. 241-198.00A.  
 National Aeronautics and Space Administration; administrator; with respect to an invention of:  
 Rose, Stephen D.; Crouch, Charles E.; and Jones, Elborn W. Coal-rock interface detector, 4,165,460, Cl. 250-253.000.  
 Navy: See—  
 Beard, Charles D.; and Baum, Kurt, 4,165,332, Cl. 260-453.00R.  
 Brew, William R.; and Price, Raymond M., 4,165,247, Cl. 149-19.400.  
 U.S. Philips Corporation: See—  
 Carlsson, Kurt H.; Imberg, Bengt U.; de Ronde, Frans C.; and Appelquist, Jan O., 4,165,454, Cl. 219-10.55F.  
 Koel, Gerrit J.; and Druyvesteyn, Willem F., 4,165,525, Cl. 360-125.000.  
 Ong, Kian K., 4,165,507, Cl. 340-347.00A.  
 Smulders, Walter H. M. M., 4,165,516, Cl. 357-34.000.  
 United Technologies Corporation: See—  
 Sandelli, Gregory J., 4,165,349, Cl. 264-29.100.  
 Wells, John C.; and Back, Paul R., 4,165,481, Cl. 324-16.00T.  
 University of California, The Regents of the: See—  
 Kolin, Alexander, 4,164,939, Cl. 128-692.000.  
 Morrison, H. Frank, 4,165,480, Cl. 324-6.000.  
 University of Delaware: See—  
 Austin, Paul R., 4,165,433, Cl. 536-20.000.  
 University of Pennsylvania: See—  
 Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., 4,165,258, Cl. 435-215.000.  
 UOP Inc.: See—  
 Antos, George J., 4,165,276, Cl. 208-139.000.  
 Upjohn Company, The: See—  
 Bundy, Gordon L., 4,165,436, Cl. 560-121.000.  
 Smith, Herman W., 4,165,325, Cl. 260-346.220.  
 Urdea, John N.: See—  
 Urdea, John N.; Darch, Doyle; and Urdea, John N., 4,165,089, Cl. 280-87.04A.  
 Urdea, Myron G.; Darch, Doyle; and Urdea, John N. Flexible skateboard, 4,165,089, Cl. 280-87.04A.  
 Usami, Teruo: See—  
 Koizumi, Takayuki; and Usami, Teruo, 4,165,458, Cl. 235-92.00E.  
 Ushakov, Vladimir G.: See—  
 Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.  
 Vachon, Patrick A., to Storage Technology Corporation. Echo suppressor circuit, 4,165,449, Cl. 179-170.200.  
 Vago, Robert E., to Diakinetics, Incorporated. Therapeutic and rehabilitative carriage, 4,165,127, Cl. 297-345.000.  
 Vaisala Oy: See—  
 Suntola, Tuomo S., 4,164,868, Cl. 73-336.500.  
 Valenti, Nicholas, to Ohio & Penna. Fuels, Inc. Formed carbon fuel briquettes, process for forming the same and process for utilizing the same in the manufacture of steel, 4,165,221, Cl. 44-26.000.  
 Valleylab: See—  
 Lundquist, Ingemar H., 4,165,208, Cl. 417-565.000.  
 Vanchot, Andre H. Snow plow blade attachment system, 4,164,821, Cl. 37-141.00R.  
 van den Beld, Paul C. H., to Wavin B.V. Sealed joint pipe connection, 4,165,104, Cl. 285-21.000.  
 Vandenbossche, Christiaan: See—  
 Vanhumbecck, Jacky; and Vandenbossche, Christiaan, 4,165,218, Cl. 23-230.00R.  
 van der Kley, Tonny: See—  
 Henstra, Rauke; van der Kley, Tonny; and Rens, Johannes N. M., 4,165,261, Cl. 202-241.000.  
 Vander Mey, John E., to Allied Chemical Corporation. Phenol-free and chlorinated hydrocarbon-free photoresist stripper comprising surfactant and hydrotropic aromatic sulfonic acids, 4,165,294, Cl. 252-143.000.  
 Vander Mey, John E., to Allied Chemical Corporation. Organic stripping compositions and method for using same, 4,165,295, Cl. 252-143.000.  
 Vanhumbecck, Jacky; and Vandenbossche, Christiaan, to Siemens Aktiengesellschaft. Monitoring surfactant in electrolyte during metal treatment, 4,165,218, Cl. 23-230.00R.

Van Zandt, Alex. Tongue and groove structure in preformed wall sections, 4,164,832, Cl. 52-593.000.  
 Varian Associates, Inc.: See—  
 Falce, Louis R., 4,165,473, Cl. 313-346.00R.  
 Varshney, Ramesh C.; Venkateswaran, Kalyanasundaram; and Amelio, Gilbert F., to Fairchild Camera and Instrument Corporation. Serial-parallel-serial charge-coupled device memory having interlacing and ripple clocking of the parallel shift registers, 4,165,541, Cl. 365-219.000.  
 Vasilevskaya, Tatyana K.: See—  
 Ivanov, Mikhail A.; Ushakov, Vladimir G.; Krjukov, Vitaly M.; Losik, Viktor I.; Sorokin, Vasily I.; Osipov, Avgust V.; Gromov, Valery S.; Khrol, Jury S.; Bakina, Galina G.; Andabursky, Semen I.; Kenin, Valery G.; Vasilevskaya, Tatyana K.; Stolyarova, Ljudmila I.; and Beizer, Ella J., 4,165,253, Cl. 162-19.000.  
 Vasilos, Thomas, to Avco Corporation. Method for manufacture of a substantially mechanically isotropic ceramic composite structure, 4,165,355, Cl. 264-255.000.  
 Vayssie, Charles: See—  
 Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,165,336, Cl. 260-511.000.  
 Veb Pentacon Dresden Kamera-Undkinowerke: See—  
 Jurenz, Rolf; and Becker, Claus, 4,165,167, Cl. 354-53.000.  
 Vedda, Louis: See—  
 Ruer, Jacques; and Vedda, Louis, 4,164,974, Cl. 164-147.000.  
 Venkateswaran, Kalyanasundaram: See—  
 Varshney, Ramesh C.; Venkateswaran, Kalyanasundaram; and Amelio, Gilbert F., 4,165,541, Cl. 365-219.000.  
 Vest, Robert W.: See—  
 Olander, William C.; Trabold, William G.; Harvey, Douglas J.; and Vest, Robert W., 4,165,452, Cl. 200-19.00DR.  
 Vetter, Arthur, to Multivac Sepp Hagenmuller KG. Method of shaping plastics foils, 4,165,357, Cl. 264-548.000.  
 Vieth, Walter: See—  
 Hager, Jurgen; and Vieth, Walter, 4,165,045, Cl. 241-282.000.  
 Vilkomerson, David H. R., to United States of America as represented by the Department of Health, Education and Welfare, The. System for obtaining displacement-amplitude information from a quadrature-dual interferometer, 4,165,182, Cl. 356-349.000.  
 Villard, Michel: See—  
 de Panafieu, Arnaud; Villard, Michel; Baylac, Christiane; and Favre, Michel, 4,165,222, Cl. 65-2.000.  
 Vinot, Daniel, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Method for storing a binary signal in a high speed flip flop memory having controlled minimum changeover time and apparatus therefor, 4,165,540, Cl. 365-190.000.  
 Virva, John J., to Admiral Corporation. Fine tuned, column speaker system, 4,164,988, Cl. 181-156.000.  
 Voegeli, Otto: See—  
 Mortelmans, Joost; and Voegeli, Otto, 4,165,535, Cl. 365-2.000.  
 Volkman, Roy G., to James River Corp. Method of producing self-bonded, melt-blown battery separators, and resulting product, 4,165,352, Cl. 264-113.000.  
 Volkov, Stanislav S.: See—  
 Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.  
 von der Crone, Jost; and Frey, Christoph, to Ciba-Geigy Corporation. Isoindoline pigments, 4,165,319, Cl. 260-325.00PH.  
 von Wettstein, Dietrich H.; Ahrenst-Larsen, Bent; Jende-Strid, Inga B.; and Sorensen, Jorgen A., to De Forenede Bryggerier A/S. Method of brewing beer of improved stability, 4,165,387, Cl. 426-16.000.  
 W. R. Grace & Co.: See—  
 Marans, Nelson S.; Kehr, Clifton L.; and Murch, Robert M., 4,165,411, Cl. 521-107.000.  
 Wada, Akira: See—  
 Okuda, Takao; and Wada, Akira, 4,165,344, Cl. 525-111.000.  
 Wada, Yoiji: See—  
 Suzuki, Naoyuki; Wada, Yoiji; Furuno, Akihisa; Ohshima, Iwao; and Shibuya, Yukio, 4,165,419, Cl. 526-62.000.  
 Waggonfabrik Uerdingen Aktiengesellschaft: See—  
 Stiefel, Christian; and Frederich, Fritz, 4,164,990, Cl. 182-48.000.  
 Wagner, David A., to Chrysler Corporation. Rear suspension apparatus for a motor vehicle, 4,165,098, Cl. 280-708.000.  
 Wagner, David A.; Doran, Daniel W.; and Emenaker, Robert C., to Chrysler Corporation. Rear suspension apparatus for a motor vehicle, 4,165,099, Cl. 280-708.000.  
 Wagner, Sigurd: See—  
 Bergman, John G., Jr.; Jain, Ravinder K.; and Wagner, Sigurd, 4,165,515, Cl. 357-6.000.  
 Walker, Clive R.: See—  
 Pegg, John C.; and Walker, Clive R., 4,165,475, Cl. 315-99.000.  
 Walker, Thomas G., to JDS Products, Inc. Conduit bending level, 4,164,817, Cl. 33-371.000.  
 Wankel GmbH: See—  
 Eiermann, Dankwart, 4,165,209, Cl. 418-190.000.  
 Wardleworth, James M.: See—  
 Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., 4,165,378, Cl. 424-270.000.  
 Warner & Swasey Company, The: See—  
 Martin, Kenneth R., 4,164,879, Cl. 82-2.00R.  
 Watabe, Kaname: See—  
 Kitamura, Kazuo; Takabayashi, Fumiki; Shibata, Fumio; Watabe, Kaname; and Azumi, Toshinori, 4,165,217, Cl. 8-81.000.

Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, to Kao Soap Co., Ltd. Liquid hair rinse containing quaternary ammonium salts and a synthetic secondary alcohol, 4,165,369, Cl. 424-70.000.  
 Watanabe, Toshio: See—  
 Okamoto, Toyoo; Watanabe, Toshio; Midorikawa, Akira; Tani, Tatsuo; and Miyakawa, Seichi, 4,165,172, Cl. 355-15.000.  
 Watanabe, Yoshimi, to Sony Corporation. Video signal reproducing system with moveable head for slow or stop tracking control, 4,165,521, Cl. 360-10.000.  
 Wavin B.V.: See—  
 van den Beld, Paul C. H., 4,165,104, Cl. 285-21.000.  
 Webasto-Werk W. Baier GmbH & Co.: See—  
 Jardin, Hans; Rottenfusser, Wolfgang; and Isleif, Karl-Heinz, 4,165,120, Cl. 296-137.00J.  
 Weber, Joseph T. Seat cushion, 4,164,798, Cl. 5-464.000.  
 Weber, Roland E.; and Zimmermann, Carl J., to Industrial Pollution Control Corp. Multi-stage purification system, 4,165,283, Cl. 210-111.000.  
 Weibel, Michael K.: See—  
 Pye, E. Kendall; Maciag, Thomas; Weibel, Michael K.; and Iyengar, Melicote R., 4,165,258, Cl. 435-215.000.  
 Weider, Franz: See—  
 Alfes, Franz; Heine, Dietz; Kaiser, Reinhard; Kolb, Gunter; Probst, Joachim; and Weider, Franz, 4,165,431, Cl. 525-357.000.  
 Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of chlorosilanes, 4,165,363, Cl. 423-342.000.  
 Weigl, Karlheinz, to Siemens Aktiengesellschaft. Method for determining spinning or slipping of the wheels in propulsion vehicles without dead axles, 4,164,872, Cl. 73-510.000.  
 Weinert, Harry F.: See—  
 Faust, Donald M.; and Weinert, Harry F., 4,165,008, Cl. 414-750.000.  
 Weinstock, Joseph: See—  
 Brush, Charles K.; and Weinstock, Joseph, 4,165,372, Cl. 424-244.000.  
 Weiser, Ernest F., to General Electric Company. Low loss, resettable excitation control for an inductive load, 4,165,476, Cl. 318-493.000.  
 Weiss, Martin J.; and Siuta, Gerald J., to American Cyanamid Company, 11-(2-Hydroxyethylthio)prosteonic acid E series derivatives, 4,165,331, Cl. 260-448.80R.  
 Wells, John C.; and Back, Paul R., to United Technologies Corporation. Versatile ignition defeat and signal conditioning, 4,165,481, Cl. 324-16.00T.  
 Welsh, Howard: See—  
 Bennett, John A.; McAllister, Ian R.; and Welsh, Howard, 4,165,282, Cl. 210-40.000.  
 Wentler, George E.: See—  
 Gosselink, Eugene P.; Richmond, James M.; and Wentler, George E., 4,165,334, Cl. 260-458.00R.  
 Werner, Paul: See—  
 Strowick, Willibald; and Werner, Paul, 4,165,128, Cl. 297-367.000.  
 Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., to Xerox Corporation. Video hard copy controller, 4,165,520, Cl. 358-280.000.  
 Westcott, Lawrence: See—  
 Raine, Paul R.; and Westcott, Lawrence, 4,165,398, Cl. 427-150.000.  
 Western-Culllen-Hayes, Inc.: See—  
 Meyer, J. Joe, 4,165,060, Cl. 246-163.000.  
 Westinghouse Electric Corp.: See—  
 Castle, Peter M., 4,165,269, Cl. 204-163.00R.  
 Knight, Charles B., deceased, 4,165,255, Cl. 176-30.000.  
 Reyes, Renato D., 4,165,254, Cl. 176-19.00R.  
 Westvaco Corporation: See—  
 Osborne, Edward L., 4,165,031, Cl. 229-34.00R.  
 Whirlpool Corporation: See—  
 Lyman, John B.; and Stewart, Bruce E., 4,165,140, Cl. 339-15.000.  
 White, Dwain M., to General Electric Company. Acyl capped quinone-coupled polyphenylene oxides, 4,165,422, Cl. 525-397.000.  
 White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., to Enerco, Inc. Continuous drying and/or heating apparatus, 4,165,216, Cl. 432-102.000.  
 White, John F.: See—  
 Harris, Eugene G.; and White, John F., 4,165,321, Cl. 260-340.200.  
 Whitener, Philip C., to Boeing Company, The. Tandem wing airplane, 4,165,058, Cl. 244-45.00R.  
 Whitney, Thomas A.; and Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Asymmetric synthesis via optically active chelating agents, 4,165,330, Cl. 260-448.20B.  
 Wiegiers, Wilhelmus J.; Hall, John B.; Hill, Ira D.; Novak, Robert M.; Schmitt, Frederick L.; Mookherjee, Braja D.; Shu, Chi-Kuen; and Schreiber, William L., to International Flavors & Fragrances Inc. Uses of terpene dimers in perfumery processes and products, 4,165,301, Cl. 252-522.000.  
 Wiggins Teape Limited: See—  
 Raine, Paul R.; and Westcott, Lawrence, 4,165,398, Cl. 427-150.000.  
 Wildt Mellor Bromley Ltd.: See—  
 Smith, Arthur R., 4,164,856, Cl. 66-140.00R.  
 Willard, David C.: See—  
 Hazlehurst, Ian J.; and Willard, David C., 4,165,026, Cl. 222-591.000.  
 Williams, Edward A.: See—  
 Beard, Michael A.; and Williams, Edward A., 4,164,942, Cl. 128-146.500.

Williams, Frank R.; and Abraham, William, to Consolidated Medical Equipment Inc. Locking electrical connector, 4,165,141, Cl. 339-75.00R.  
 Wilson, John E., to Deere & Company. Rotor for an axial flow rotary separator, 4,164,947, Cl. 130-27.00A.  
 Wiman, Robert E.: See—  
 Schlossman, Irwin S.; and Wiman, Robert E., 4,165,303, Cl. 260-22.00D.  
 Wind, Evert; and de Vletter, Robbert, to N.V. Centrale Suiker Maatschappij. Combined anaerobic reactor and settler, 4,165,285, Cl. 210-195.300.  
 Winton Corporation: See—  
 Scott, Harold W., 4,164,978, Cl. 166-249.000.  
 Wiper-Mate, Inc.: See—  
 Rouse, Donald E., 4,164,802, Cl. 15-250.030.  
 Wirtz, Peter: See—  
 Schlegel, Albert; and Wirtz, Peter, 4,165,313, Cl. 260-123.700.  
 Wiskott, Erik: See—  
 Troxler, Franz; and Wiskott, Erik, 4,165,374, Cl. 424-256.000.  
 Witt, Paul R., Jr., to Grain Processing Corporation. Torrefied barley for brewer's mashes, 4,165,388, Cl. 426-16.000.  
 Witte, Wolfgang W. F., to Bodenseewerk Perkin-Elmer & Co., GmbH. Optical arrangement in spectrophotometers, 4,165,181, Cl. 356-319.000.  
 Wittry, David B., to Rockwell International Corporation. Rotating anode x-ray source and cooling technique therefor, 4,165,472, Cl. 313-35.000.  
 Woche, Berthold; Pfizmaier, Heinz; and Pfendler, Thomas, to Robert Bosch GmbH. Reduction of echoes of irrelevant targets in a vehicle anti-collision radar system, 4,165,511, Cl. 343-7.0VM.  
 Wolf, Richard: See—  
 Latzina, Kurt; Martin, Hans; and Wolf, Richard, 4,165,203, Cl. 415-113.000.  
 Wolfinger, Mark D., to Monsanto Company. 3-(Tert-alkylthio)-1,3-thiazolidin-2,4-dione used to inhibit premature vulcanization of diene rubbers, 4,165,417, Cl. 525-3.000.  
 Works, Madden T., to FIP, S.A. de C.V. Gate valve, 4,165,064, Cl. 251-329.000.  
 Wright, Clinton M.: See—  
 Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,165,364, Cl. 423-456.000.  
 Wuerfel, Robert P. Variable displacement arrangement in four cycle, reciprocating, internal combustion engine, 4,164,916, Cl. 123-78.00C.  
 Wulff, Harald P.: See—  
 Narayan, Thirumurti; Patton, John T., Jr.; Cenker, Moses; and Wulff, Harald P., 4,165,414, Cl. 521-129.000.  
 Wurzbarger, Paul D., deceased; and by Reed, Peter, executor, to Salk Institute for Biological Studies, The. Metering valve, 4,164,959, Cl. 137-553.000.  
 Xerox Corporation: See—  
 Donohue, James M.; and Mueller, Daniel L., 4,165,170, Cl. 355-14.000.  
 Wessler, Louis E.; Koch, Kenneth F.; and Cleveland, Andrew J., 4,165,520, Cl. 358-280.000.  
 Yagi, Naoki: See—  
 Kawai, Syuji; Ohayabu, Shuzo; Akiya, Takeo; Horio, Shunichiro; Yagi, Naoki; Kim, Kwang Y.; and Nakaji, Tarushige, 4,165,392, Cl. 426-657.000.  
 Yamada, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, to Sumitomo Chemical Company, Limited. 7-( $\alpha$ -Acylamino- $\alpha$ -phenyl or thienylacetamido) cephalosporin derivatives, 4,165,373, Cl. 424-246.000.  
 Yamakage, Tetsuro: See—  
 Tsuboi, Akira; and Yamakage, Tetsuro, 4,164,809, Cl. 29-568.000.  
 Yamanaka, Clarence T., to Garrett Corporation, The. Simultaneous state prevention system, 4,164,894, Cl. 98-1.500.  
 Yamanaka, Clarence T.: See—  
 Aldrich, Howard P.; Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,895, Cl. 98-1.500.  
 Aldrich, Howard P.; Yamanaka, Clarence T.; and Burgess, Glenn A., 4,164,897, Cl. 98-1.500.  
 Burgess, Glenn A.; and Yamanaka, Clarence T., 4,164,898, Cl. 98-1.500.  
 Yamanaka, Makoto; Takano, Satoshi; Mikata, Tsuruo; and Okamoto, Kikuhiko, to Kao Soap Co., Ltd. Process for producing lower allergenic lanolin or derivatives thereof, 4,165,327, Cl. 260-397.250.  
 Yamanouchi Pharmaceutical Co., Ltd.: See—  
 Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.  
 Yamazaki, Atsuki: See—  
 Iwanami, Masaru; Murakami, Masuo; Nagano, Yoshinobu; Fujimoto, Masaharu; Maeda, Tetsuya; Nagano, Noriaki; and Yamazaki, Atsuki, 4,165,429, Cl. 544-21.000.  
 Yassenak, John P.: See—  
 Tortorich, David J.; Bricker, Lyle J.; and Yassenak, John P., 4,165,186, Cl. 366-142.000.  
 Yellin, Tobias O.: See—  
 Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., 4,165,378, Cl. 424-270.000.  
 Jones, Derrick F.; and Yellin, Tobias O., 4,165,377, Cl. 424-270.000.  
 Yerkes, John W.; and Avery, James E., to Atlantic Richfield Company. Solar cell with improved printed contact and method of making the same, 4,165,241, Cl. 136-89.00C.



- Yokoyama, Toshiharu: *See—*  
Okano, Takeshi; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,165,441, Cl. 585-444.000.
- Yorke, Roy E.: *See—*  
Alfa, Stephen N.; and Yorke, Roy E., 4,165,107, Cl. 285-41.000.
- Yoshinaka, Shigeo; Doya, Masaharu; Uchiyama, Seiji; and Nozaki, Sadao, to Mitsubishi Gas Chemical Company, Inc. Process for producing phthaloyl dichlorides of high purity. 4,165,337, Cl. 260-544.00D.
- Yoshisato, Akiyuki, to Alps Electric Co., Ltd. Single sideband transceiver. 4,165,486, Cl. 325-17.000.
- (Zaidanhojin) Sagami Chemical Research Center: *See—*  
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tet-suya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,165,311, Cl. 260-112.50R.
- Zanichelli, Gianni, to RACI S.p.A. Collar for gas pipelines. 4,165,111, Cl. 285-419.000.
- Zato, Thomas J., to Zenith Radio Corporation. Channel change indication circuit with delayed memory activation. 4,165,489, Cl. 325-464.000.
- Zelensky, Georgy A.: *See—*  
Azarov, Nikolai N.; Zelensky, Georgy A.; and Borisovsky, Igor V., 4,165,273, Cl. 204-301.000.
- Zellweger Uster Ltd.: *See—*  
Altenweger, Alois, 4,164,805, Cl. 28-202.000.
- Zenith Radio Corporation: *See—*  
Zato, Thomas J., 4,165,489, Cl. 325-464.000.
- Ziegler, William E., to Hoover Universal, Inc. Multiple extrusion head assembly. 4,165,212, Cl. 425-382.00R.
- Zielinski, John P. Gas appliance retrofit orifice. 4,165,039, Cl. 239-600.000.
- Zimmermann, Carl J.: *See—*  
Weber, Roland E.; and Zimmermann, Carl J., 4,165,283, Cl. 210-111.000.
- Zubarev, Alexei G.: *See—*  
Kostyanov, Boris M.; Manokhin, Anatoly I.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Taldykin, Igor A.; Kazansky, Viktor V.; and Ivashina, Evgeny N., 4,165,234, Cl. 75-60.000.
- Zurawin, Adam; and Ricciuti, Gaetano, to Adams Brush Manufacturing Co., Inc. Paint pan for applying paint to pads and rollers. 4,164,803, Cl. 15-257.050.
- Zvenigorodsky, Evgeny I.: *See—*  
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,165,135, Cl. 406-152.000.
- Zwanziger, Rudolph: *See—*  
Strien, Werner; Zwanziger, Rudolph; and Kaufmann, Ernst, 4,165,126, Cl. 297-284.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Allied Chemical Corporation: *See—*  
Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., Re. 30,080, Cl. 75-175.500.
- Atlee, Zed J.; and Kasten, Roy F., Jr., to Picker Corporation. X-ray tube having focusing cup with non-emitting coating. Re. 30,082, Cl. 313-57.000.
- Cline, Carl F.: *See—*  
Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., Re. 30,080, Cl. 75-175.500.
- Czikk, Alfred M.: *See—*  
Kun, Leslie C.; and Czikk, Alfred M., Re. 30,077, Cl. 165-133.000.
- Foulkes, Frank R., to Huron Chemicals, Limited. Ion exchange chromate removal. Re. 30,081, Cl. 423-54.000.
- General Signal Corporation: *See—*  
McEathron, Eugene D., Re. 30,079, Cl. 303-69.000.
- Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., to United States Steel Corporation. Method and apparatus for locating improperly positioned or bent rolls. Re. 30,075, Cl. 33-143.00L.
- Harris Dynamics: *See—*  
Harris, Trevor L., Re. 30,078, Cl. 280-236.000.
- Harris, Trevor L., to Harris Dynamics. Vehicle with variable speed transmission. Re. 30,078, Cl. 280-236.000.
- Huron Chemicals, Limited: *See—*  
Foulkes, Frank R., Re. 30,081, Cl. 423-54.000.
- Ives, Kenneth D.: *See—*  
Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., Re. 30,075, Cl. 33-143.00L.
- Kasten, Roy F., Jr.: *See—*  
Atlee, Zed J.; and Kasten, Roy F., Jr., Re. 30,082, Cl. 313-57.000.
- Kun, Leslie C.; and Czikk, Alfred M., to Union Carbide Corporation. Surface for boiling liquids. Re. 30,077, Cl. 165-133.000.
- McEathron, Eugene D., to General Signal Corporation. Fluid brake control system. Re. 30,079, Cl. 303-69.000.
- Picker Corporation: *See—*  
Atlee, Zed J.; and Kasten, Roy F., Jr., Re. 30,082, Cl. 313-57.000.
- Ray, Ranjan: *See—*  
Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., Re. 30,080, Cl. 75-175.500.
- Singer Company, The: *See—*  
Thornbery, James M., Re. 30,076, Cl. 137-625.290.
- Tanner, Lee E.; Ray, Ranjan; and Cline, Carl F., to Allied Chemical Corporation. Titanium-beryllium base amorphous alloys. Re. 30,080, Cl. 75-175.500.
- Thornbery, James M., to Singer Company, The. Four-way reversing valve with differential area operator. Re. 30,076, Cl. 137-625.290.
- Union Carbide Corporation: *See—*  
Kun, Leslie C.; and Czikk, Alfred M., Re. 30,077, Cl. 165-133.000.
- United States Steel Corporation: *See—*  
Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., Re. 30,075, Cl. 33-143.00L.
- Vranka, Ronald S.: *See—*  
Gonos, Michael G.; Ives, Kenneth D.; and Vranka, Ronald S., Re. 30,075, Cl. 33-143.00L.

## LIST OF PLANT PATENTEEES

- Berggren, Lars, to Jackson & Perkins Co. Rose plant—Gabriella. 4,452, 8-21-79, Cl. 28.000.
- Daniel, William H., to Purdue Research Foundation. Distinct variety of bluegrass plant. 4,453, 8-21-79, Cl. 88.000.
- Hilltop Orchards & Nurseries, Inc.: *See—*  
Hughes, J. Wilson, 4,451, Cl. 43.000.
- Hughes, J. Wilson, to Hilltop Orchards & Nurseries, Inc. Peach tree WH215. 4,451, 8-21-79, Cl. 43.000.
- Jackson & Perkins Co.: *See—*  
Berggren, Lars, 4,452, Cl. 28.000.
- Moore, Ralph S. Miniature rose plant. 4,454, 8-21-79, Cl. 10.000.
- Purdue Research Foundation: *See—*  
Daniel, William H., 4,453, Cl. 88.000.

## LIST OF DESIGN PATENTEEES

- Abe, Takeshi: *See—*  
Seki, Yasusuke; and Abe, Takeshi, 252,684, Cl. D14-72.000.
- AGFA-Gevaert, A.G.: *See—*  
Schlagheck, Norbert; and Schultes, Herbert, 252,687, Cl. D16-31.000.
- Ahn, Chong T. Music box. 252,688, 8-21-79, Cl. D17-24.000.
- Aldrich, Thomas B., III, to Procter & Gamble Company, The. Bottle. 252,672, 8-21-79, Cl. D9-137.000.
- Andersen, David C.: *See—*  
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.
- Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., to Artec International Corporation. Typewriter for word processor. 252,689, 8-21-79, Cl. D18-2.000.
- Armistead, John A., to Polyphase Corporation. Subterranean water drain. 252,702, 8-21-79, Cl. D23-40.000.
- Artec International Corporation: *See—*  
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.
- Beeman, Everett C., to Monsanto Company. Bottle or similar article. 252,670, 8-21-79, Cl. D9-116.000.
- Beeman, Everett C., to Monsanto Company. Bottle or similar article. 252,673, 8-21-79, Cl. D9-143.000.
- Beeman, Everett C. Combined bottle and closure therefor or similar article. 252,674, 8-21-79, Cl. D9-144.000.
- Bergh, Magnild L., to Strouse, Adler Company, The. Body briefier. 252,656, 8-21-79, Cl. D2-3.000.
- Berglund, Sidney J.; and Goff, Dewain R., to Minnesota Mining and Manufacturing Company. Electrical connector. 252,682, 8-21-79, Cl. D13-24.000.
- Besnard, Joel. Inhaler. 252,707, 8-21-79, Cl. D24-62.000.
- Boldt, Melvin H.; Morrison, Thurber H.; and Greb, Francis J., to National Presto Industries, Inc. Electric mini-oven with removable cover. 252,665, 8-21-79, Cl. D7-126.000.
- Bounds, William E. Combined cheese grater and container. 252,662, 8-21-79, Cl. D7-47.000.
- Bowman, Vincent G., to Doerner Products Co. Limited. Swivel posture chair control. 252,661, 8-21-79, Cl. D6-191.000.
- Bradley, Arthur S. Golf tee. 252,712, 8-21-79, Cl. D21-208.000.
- Brawner, William H., to H.P.G. IV, Inc. Skateboard truck. 252,693, 8-21-79, Cl. D21-226.000.
- Brickman, Harold. Portable foldable bar. 252,659, 8-21-79, Cl. D6-144.000.
- Caldwell, Jerry L. Valve core. 252,701, 8-21-79, Cl. D23-19.000.
- Cole, David M. Small arms storage container. 252,715, 8-21-79, Cl. D3-78.000.
- Connolly, John P.: *See—*  
Sheehan, Edward P.; Connolly, John P.; and King, James B., 252,683, Cl. D14-40.000.

Cordell Tackle, Inc.: See—  
Young, Fred C., 252,700, Cl. D22-28.000.

Corini, Louis J., to Fogel Commercial Refrigerator Company. Portable insulated food chest or the like. 252,663, 8-21-79, Cl. D7-77.000.

Cupit, George M. Pipe flashing. 252,703, 8-21-79, Cl. D23-42.000.

Current, Wayne A., to Singer Company, The. Control console. 252,681, 8-21-79, Cl. D13-12.000.

Daugherty, Gaye L. Plaque. 252,676, 8-21-79, Cl. D11-132.000.

Doerner Products Co. Limited: See—  
Bowman, Vincent G., 252,661, Cl. D6-191.000.

Don Hall Company: See—  
Hall, George W., 252,664, Cl. D7-109.000.

Fessler, Herman S., to McLean Engineering Midwest. Electric air conditioner for electronic enclosures. 252,705, 8-21-79, Cl. D23-144.000.

Fogel Commercial Refrigerator Company: See—  
Corini, Louis J., 252,663, Cl. D7-77.000.

Gillette Company, The: See—  
Malm, Curtis L.; and Zierhut, Clarence, 252,691, Cl. D19-51.000.

Global-Werk GmbH: See—  
Schimanski, Georg, 252,706, Cl. D23-150.000.

Goff, Dewain R.: See—  
Berglund, Sidney J.; and Goff, Dewain R., 252,682, Cl. D13-24.000.

Greb, Francis J.: See—  
Boldt, Melvin H.; Morrison, Thurber H.; and Greb, Francis J., 252,665, Cl. D7-126.000.

H.P.G. IV, Inc.: See—  
Brawner, William H., 252,693, Cl. D21-226.000.

Hall, George W., to Don Hall Company. Barbecue grill body. 252,664, 8-21-79, Cl. D7-109.000.

Hitachi, Ltd.: See—  
Seki, Yasusuke; and Abe, Takeshi, 252,684, Cl. D14-72.000.

Jackson, Harris C. Fishing jig. 252,698, 8-21-79, Cl. D12-27.000.

Jackson, R. Kelley. Golf cart trailer. 252,678, 8-21-79, Cl. D12-101.000.

Johnson, Richard E.: See—  
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.

Johnston, Duane K. Evaporative cooler pump. 252,685, 8-21-79, Cl. D15-7.000.

King, James B.: See—  
Sheehan, Edward P.; Connolly, John P.; and King, James B., 252,683, Cl. D14-40.000.

Kingsley, Michael C.; and Kingsley, Richard J. Exterior visor for vehicles. 252,680, 8-21-79, Cl. D12-191.000.

Kingsley, Richard J.: See—  
Kingsley, Michael C.; and Kingsley, Richard J., 252,680, Cl. D12-191.000.

Kramer, Thomas J.: See—  
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.

Kressin, Richard H. Portable seat. 252,658, 8-21-79, Cl. D6-41.000.

Lerner, Lawrence; and Schmitt, Fred, to Litton Business Systems, Inc. Desk. 252,660, 8-21-79, Cl. D6-161.000.

Litton Business Systems, Inc.: See—  
Lerner, Lawrence; and Schmitt, Fred, 252,660, Cl. D6-161.000.

MacFadden, Flora J. Lotion applicator. 252,709, 8-21-79, Cl. D28-7.000.

Malm, Curtis L.; and Zierhut, Clarence, to Gillette Company, The. Writing instrument. 252,691, 8-21-79, Cl. D19-51.000.

Massachusetts Bay Transportation Authority: See—  
Sheehan, Edward P.; Connolly, John P.; and King, James B., 252,683, Cl. D14-40.000.

Matsuzaka Iron Works, Inc.: See—  
Sakamoto, Masaharu, 252,666, Cl. D8-60.000.

Maxwell, James D. Fishing plug. 252,699, 8-21-79, Cl. D22-28.000.

McLean Engineering Midwest: See—  
Fessler, Herman S., 252,705, Cl. D23-144.000.

Minnesota Mining and Manufacturing Company: See—  
Berglund, Sidney J.; and Goff, Dewain R., 252,682, Cl. D13-24.000.

Monsanto Company: See—  
Beeman, Everett C., 252,670, Cl. D9-116.000.

Morrison, Thurber H.: See—  
Boldt, Melvin H.; Morrison, Thurber H.; and Greb, Francis J., 252,665, Cl. D7-126.000.

Munz, Ethel L. Cartridge belt. 252,695, 8-21-79, Cl. D22-14.000.

Mushkin, Nicholas M. Switch for killing insects. 252,696, 8-21-79, Cl. D22-20.000.

Muttart, Vincent H., to Spring Crest Company. Floor pulley cord lock. 252,667, 8-21-79, Cl. D8-360.000.

Muttart, Vincent H., to Spring Crest Company. Track stirrup. 252,669, 8-21-79, Cl. D8-380.000.

N A S Import Corp.: See—  
Young, Helen, 252,657, Cl. D3-54.000.

Nakano, Walter S.: See—  
Sulek, Eugene J.; and Nakano, Walter S., 252,675, Cl. D10-38.000.

National Presto Industries, Inc.: See—  
Boldt, Melvin H.; Morrison, Thurber H.; and Greb, Francis J., 252,665, Cl. D7-126.000.

Nordic Saunas Limited: See—  
Read, Ian R., 252,704, Cl. D23-55.000.

Ohmura, Ryuichi. Handle for fishing rod assembly. 252,697, 8-21-79, Cl. D22-23.000.

Petrusco, Joseph. Simulative toy vehicle. 252,692, 8-21-79, Cl. D21-128.000.

Pharmer, David D.: See—  
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.

Picinic, John M. Razor. 252,710, 8-21-79, Cl. D28-46.000.

Pixyfoto GmbH: See—  
Viering, Rudolf, 252,686, Cl. D16-02.000.

Polyphase Corporation: See—  
Armistead, John A., 252,702, Cl. D23-40.000.

Procter & Gamble Company, The: See—  
Aldrich, Thomas B., III, 252,672, Cl. D9-137.000.

Read, Ian R., to Nordic Saunas Limited. Bath tub. 252,704, 8-21-79, Cl. D23-55.000.

Richardson, Sam M., III. Truck bed liner. 252,677, 8-21-79, Cl. D12-98.000.

Rudinski, Robert S. Drapery rod. 252,668, 8-21-79, Cl. D8-377.000.

Sakamoto, Masaharu, to Matsuzaka Iron Works, Inc. Vinyl pipe cutter. 252,666, 8-21-79, Cl. D8-60.000.

Schiermeier, Theodore L. One piece handgun grip or similar article. 252,694, 8-21-79, Cl. D22-1.000.

Schimanski, Georg, to Global-Werk GmbH. Dispenser for air treating material. 252,706, 8-21-79, Cl. D23-150.000.

Schlagheck, Norbert; and Schultes, Herbert, to AGFA-Gevaert, A.G. Copying machine. 252,687, 8-21-79, Cl. D16-31.000.

Schmitt, Fred: See—  
Lerner, Lawrence; and Schmitt, Fred, 252,660, Cl. D6-161.000.

Schultes, Herbert: See—  
Schlagheck, Norbert; and Schultes, Herbert, 252,687, Cl. D16-31.000.

Seki, Yasusuke; and Abe, Takeshi, to Hitachi, Ltd. Combined television and radio receiver. 252,684, 8-21-79, Cl. D14-72.000.

Sheehan, Edward P.; Connolly, John P.; and King, James B., to Massachusetts Bay Transportation Authority. Card reader head assembly. 252,683, 8-21-79, Cl. D14-40.000.

Short, Richard L.: See—  
Welden, Ronald L.; and Short, Richard L., 252,679, Cl. D12-181.000.

Singer Company, The: See—  
Current, Wayne A., 252,681, Cl. D13-12.000.

Spring Crest Company: See—  
Muttart, Vincent H., 252,667, Cl. D8-360.000.

Muttart, Vincent H., 252,669, Cl. D8-380.000.

Strand, Gordon A. Bottle. 252,671, 8-21-79, Cl. D9-129.000.

Strouse, Adler Company, The: See—  
Bergh, Magnhild L., 252,656, Cl. D2-3.000.

Sulek, Eugene J.; and Nakano, Walter S., to Texas Instruments Incorporated. Wrist watch. 252,675, 8-21-79, Cl. D10-38.000.

Swan, Ralph M.: See—  
Arjani, Farouk; Kramer, Thomas J.; Johnson, Richard E.; Swan, Ralph M.; Andersen, David C.; and Pharmer, David D., 252,689, Cl. D18-2.000.

Texas Instruments Incorporated: See—  
Sulek, Eugene J.; and Nakano, Walter S., 252,675, Cl. D10-38.000.

Tidwell, Harold D. Toy vehicle. 252,714, 8-21-79, Cl. D21-78.000.

Viering, Rudolf, to Pixyfoto GmbH. Transportable camera. 252,686, 8-21-79, Cl. D16-02.000.

Vincent, Clarence K. Go-cart guard rail. 252,708, 8-21-79, Cl. D25-38.000.

Weiss, Gary D. Chess board. 252,713, 8-21-79, Cl. D21-24.000.

Welden, Ronald L.; and Short, Richard L., to Welden, Ronald L. Air deflector. 252,679, 8-21-79, Cl. D12-181.000.

White, Beverly A.: See—  
White, David L.; and White, Beverly A., 252,711, Cl. D21-17.000.

White, David L.; and White, Beverly A. Base member for parlor game. 252,711, 8-21-79, Cl. D21-17.000.

Wong, Hon Wai. Combined horological and writing instrument. 252,690, 8-21-79, Cl. D19-36.000.

Young, Fred C., to Cordell Tackle, Inc. Fishing lure. 252,700, 8-21-79, Cl. D22-28.000.

Young, Helen, to N A S Import Corp. Handle for a handbag. 252,657, 8-21-79, Cl. D3-54.000.

Zierhut, Clarence: See—  
Malm, Curtis L.; and Zierhut, Clarence, 252,691, Cl. D19-51.000.

## CLASSIFICATION OF PATENTS

ISSUED AUGUST 21, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2		CLASS 54		CLASS 83		448		4,164,932		133		Re.30,077		459		4,165,002	
108	4,164,792	46	4,164,834	128	4,164,881	CLASS 127		CLASS 166		306		4,165,003		506		4,165,004	
CLASS 3		CLASS 56		488		29		4,165,240		125		4,164,977		631		4,165,004	
1.91	4,164,793	291	4,164,835	CLASS 84		CLASS 128		CLASS 168		249		4,164,978		CLASS 208			
1.912	4,164,794	CLASS 57		1.24		4,164,884		62 A		288		4,164,979		93		4,165,274	
CLASS 4		2		4,164,836		231		4,164,940		291		4,164,980		113		4,165,275	
144.1	4,164,795	3		4,164,837		CLASS 89		146.5		CLASS 171		4,164,981		139		4,165,276	
288	4,164,796	247		4,164,838		1 C		4,164,886		50		CLASS 172		CLASS 209			
CLASS 5		293		4,164,839		1.5 R		4,164,887		40		4,164,982		3.3		4,165,277	
464	4,164,798	313		4,164,840		1.814		4,164,888		30		4,164,983		45		4,165,278	
470	4,164,797	350		4,164,841		7		4,164,889		43		4,164,984		169		4,165,279	
CLASS 8		23 A		4,164,842		185		4,164,890		371		4,164,983		245		4,165,280	
81	4,165,217	23 R		4,164,843		CLASS 91		CLASS 130		36		4,165,442		CLASS 210			
CLASS 15		39.5		4,164,844		375 A		4,164,892		53		4,165,443		17		4,165,281	
104.1 R	4,164,799	CLASS 60		39.29		CLASS 92		27 HA		CLASS 176		4,165,444		23 H		4,165,288	
119 R	4,164,800	39.46 S		4,164,845		88		4,164,893		19 R		4,165,254		27		4,165,289	
236 R	4,164,801	274		4,164,846		CLASS 96		140 C		30		4,165,255		40		4,165,282	
250.03	4,164,802	652		4,164,848		74		4,165,236		78		4,165,256		111		4,165,283	
257.05	4,164,803	679		4,164,849		76 R		4,165,237		CLASS 178		4,165,444		195.3		4,165,284	
CLASS 23		CLASS 62		196 C		119 R		4,165,238		22		4,165,444		198 C		4,165,285	
230 R	4,165,218	4,164,850		429		CLASS 98		1.5		CLASS 179		4,165,445		220		4,165,286	
273	4,165,219	381		4,164,851		31 R		4,164,951		CLASS 199		4,165,446		232		4,165,287	
CLASS 24		429		4,164,852		37 R		4,164,952		1 HF		4,165,447		145		4,165,005	
273	4,164,804	457		4,164,853		89 CC		4,165,241		2 DP		4,165,448		230		4,165,009	
CLASS 28		536		4,164,854		CLASS 137		72		115.5 VC		4,165,449		CLASS 219			
202	4,164,805	CLASS 64		2 P		4,164,899		4,164,953		170.2		4,165,450		10.55 A		4,165,455	
CLASS 29		CLASS 65		2		4,164,900		4,164,954		175.2 C		4,165,451		10.55 F		4,165,454	
517	4,164,806	4,165,222		4,165,223		33 A		4,164,901		178		4,165,451		449		4,165,456	
523	4,164,807	4,165,224		4,165,225		CLASS 99		277.1		CLASS 180		4,164,985		516		4,165,457	
564.4	4,164,808	4,165,226		4,165,227		4,164,902		CLASS 102		53 D		4,164,986		CLASS 220			
568	4,164,809	4,165,228		4,165,229		41		4,164,903		90		4,164,987		3.94		4,165,010	
628	4,164,811	4,165,230		4,165,231		92.7		4,164,904		271		4,164,988		67		4,165,011	
749	4,164,812	4,165,232		4,165,233		212		4,164,905		156		4,164,989		71		4,165,012	
CLASS 30		CLASS 66		140 R		4,164,856		CLASS 105		265		4,164,990		215		4,165,013	
272 A	4,164,813	4,164,857		352		CLASS 70		367		CLASS 182		4,164,991		266		4,165,014	
CLASS 32		CLASS 71		90		4,165,229		300		CLASS 186		4,164,992		269		4,165,015	
69	4,164,814	121		4,165,231		127		4,165,230		1 R		4,164,993		270		4,165,016	
CLASS 33		127		4,165,232		CLASS 72		50		CLASS 188		4,164,994		273		4,165,017	
3 A	4,164,815	237		4,164,858		289		4,164,907		CLASS 192		4,164,995		284		4,165,018	
139	4,164,816	289		4,164,859		345		4,164,909		103 C		4,164,996		288		4,165,019	
143 L	Re.30,075	345		4,164,860		CLASS 73		CLASS 116		CLASS 196		4,165,259		306		4,165,020	
371	4,164,817	CLASS 74		1 G		237		4,164,910		CLASS 198		4,165,260		468		4,165,021	
CLASS 34		CLASS 75		27 R		4,164,861		CLASS 118		CLASS 200		4,165,261		CLASS 222			
12	4,164,818	118		4,164,862		4,164,863		670		CLASS 202		4,165,262		76		4,165,022	
72	4,164,819	194 A		4,164,864		4,164,865		CLASS 123		CLASS 204		4,165,263		105		4,165,023	
CLASS 37		231 R		4,164,866		4,164,867		CLASS 124		CLASS 206		4,165,264		491		4,165,024	
12	4,164,820	336.5		4,164,868		4,164,869		CLASS 126		CLASS 208		4,165,265		501		4,165,025	
141 R	4,164,821	346		4,164,869		4,164,870		CLASS 127		CLASS 210		4,165,266		591		4,165,026	
CLASS 40		355 R		4,164,871		4,164,872		CLASS 128		CLASS 212		4,165,267		45 S		4,165,027	
361	4,164,822	425.6		4,164,873		4,164,874		CLASS 129		CLASS 214		4,165,268		45		4,165,028	
427	4,164,823	432 R		4,164,875		4,164,876		CLASS 130		CLASS 216		4,165,269		2		4,165,029	
450	4,164,824	510		4,164,877		4,164,878		CLASS 131		CLASS 218		4,165,270		4		4,165,030	
CLASS 42		643		4,164,879		4,164,879		CLASS 132		CLASS 220		4,165,271		25		4,165,031	
1 V	4,164,825	799		4,164,880		4,164,880		CLASS 133		CLASS 222		4,165,272		439		4,165,032	
CLASS 43		812		4,164,881		4,164,881		CLASS 134		CLASS 224		4,165,273		4		4,165,033	
42.05	4,164,826	CLASS 74		336 R		4,164,876		CLASS 135		CLASS 226		4,165,274		12 R		4,165,034	
CLASS 44		CLASS 75		574		4,164,877		CLASS 136		CLASS 228		4,165,275		86		4,165,035	
23	4,165,220	0.5 AA		4,165,232		4,165,233		CLASS 137		CLASS 230		4,165,276		1 A		4,165,036	
26	4,165,221	24		4,165,234		4,165,235		CLASS 138		CLASS 232		4,165,277		92 PE		4,165,458	
CLASS 46		60		4,165,236		4,165,237		CLASS 139		CLASS 234		4,165,278		93 TF		4,165,459	
119	4,164,827	93 E		4,165,238		4,165,239		CLASS 140		CLASS 236		4,165,279		439		4,165,033	
CLASS 51		175.5		Re.30,080		4,165,240		CLASS 141		CLASS 238		4,165,280		600		4,165,040	
110	4,164,828	CLASS 76		4,164,878		4,164,879		CLASS 142		CLASS 240		4,165,281		CLASS 241			
2	4,164,829	CLASS 77		4,164,880		4,164,880		CLASS 143		CLASS 242		4,165,282		182		4,165,041	
398	4,164,830	CLASS 78		4,164,881		4,164,881		CLASS 144		CLASS 244		4,165,283		198 A		4,165,042	
405	4,164,831	CLASS 79		4,164,882		4,164,882		CLASS 145		CLASS 246		4,165,284		236		4,165,043	
593	4,164,832	CLASS 80		4,164,883		4,164,883		CLASS 146		CLASS 248		4,165,285					
CLASS 53		CLASS 81		4,164,884		4,164,884		CLASS 147		CLASS 250		4,165,286					
545	4,164,833	CLASS 82		4,164,885		4,164,885		CLASS 148		CLASS 252		4,165,287					



## CLASSIFICATION OF PATENTS

264	4,165,044		57 A	4,165,121	276 R	4,165,148		4,165,536	
282	4,165,045		93	4,165,119			45	4,165,537	CLASS 425
		CLASS 242	107	4,165,122	CLASS 340		104	4,165,538	133.5
35.5 A	4,165,046	29.1	137 J	4,165,120	17 R	4,165,503	183	4,165,539	169
43 A	4,165,047	60			167 R	4,165,504	190	4,165,540	224
47.01	4,165,048	66		CLASS 297	200	4,165,505	219	4,165,541	382 R
	4,165,049	113		153	347 AD	4,165,508			530
68.3	4,165,050	120		190	347 DA	4,165,507			532
74.1	4,165,051	178 R		220			CLASS 366		CLASS 426
78.1	4,165,052	255		190	620	4,165,509	12	4,165,184	
107.1	4,165,053	519		284	706	4,165,506	65	4,165,185	9
107.7	4,165,054	548		345	754	4,165,510	142	4,165,186	16
125.2	4,165,055	571		367			150	4,165,187	42
151	4,165,056				CLASS 343				4,165,386
		CLASS 266			7 VM	4,165,511			4,165,387
3.12	4,165,057	44		11			CLASS 400		4,165,388
45 R	4,165,058			62			124	4,165,188	540
100 A	4,165,059	CLASS 267			CLASS 346		144.2	4,165,189	580
		65 D		65			636	4,165,190	657
								4,165,191	CLASS 427
163	4,165,060	CLASS 269			CLASS 350				18
		40			6.1	4,165,149	48	4,165,192	40
92	4,165,061	136		19	96.15	4,165,150			43
141	4,165,062			69	96.30	4,165,152	61	4,165,193	64
		CLASS 271			126	4,165,153			140
CLASS 249		162		54	128	4,165,154			150
					201	4,165,151	320	4,165,194	264
CLASS 250		CLASS 272			285	4,165,155	359	4,165,195	295
253	4,165,460	68		215	307	4,165,156			398 B
359	4,165,461	73 C		311	343	4,165,157			CLASS 428
363 S	4,165,462	85 G		426			CLASS 405		64
372	4,165,463	101			CLASS 351		205	4,165,196	140
550	4,165,464	105.6		39	160 H	4,165,158	218	4,165,197	212
559	4,165,465	140.4			CLASS 353		243	4,165,198	395
		168		35			271	4,165,199	407
CLASS 251		239		57	15	4,165,159			408
				346 R	55	4,165,160	1	4,165,134	452
168	4,165,063	CLASS 274		500	86	4,165,161	10	4,165,132	535
329	4,165,064	1 R			109	4,165,162	109	4,165,133	539
		CLASS 277			CLASS 354		152	4,165,135	CLASS 432
8.8	4,165,290			99	21	4,165,166			102
33	4,165,291	9.5			53	4,165,167	CLASS 408		CLASS 435
51.5 A	4,165,292	72 FM			122	4,165,163	118	4,165,200	215
118	4,165,293	88		493	289	4,165,164	187	4,165,201	262
143	4,165,294	166					CLASS 409		267
	4,165,295	184			CLASS 355		165	4,164,891	CLASS 521
412	4,165,296	212 C		61	3 DR	4,165,169			107
429 B	4,165,298	228			3 R	4,165,168			121
429 R	4,165,297				4	4,165,165	63	4,165,006	128
435	4,165,299	CLASS 280		19	14	4,165,170	313	4,165,202	121
462	4,165,300	5 R			15	4,165,171	494	4,165,007	129
522	4,165,301	12 H		0.5 A		4,165,172	750	4,165,008	145
		16		6	29	4,165,173			CLASS 525
CLASS 260		47.35		16 T	38	4,165,174			3
8	4,165,302	87.04 A		52	45	4,165,177	113	4,165,203	69
22 CB	4,165,304			60 C	68	4,165,176			111
22 D	4,165,303			71 CP			40	4,165,204	346
29.4 R	4,165,305				CLASS 356		262	4,165,205	357
40 P	4,165,306				1	4,165,178	310	4,165,206	377
40 TN	4,165,307				246	4,165,179	313	4,165,207	397
42.52	4,165,308				310	4,165,180	565	4,165,208	419
45.8 A	4,165,309				319	4,165,181			432
45.85 A	4,165,310				346	4,165,183	CLASS 418		CLASS 526
112.5 R	4,165,311				349	4,165,182	190	4,165,209	62
	4,165,312								63
123.7	4,165,313				CLASS 357		CLASS 422		CLASS 528
145 A	4,165,314				6	4,165,515	105	4,165,359	75
239 A	4,165,315				34	4,165,516	202	4,165,360	370
	4,165,316				38	4,165,517	249	4,165,361	1,165,421
239.3 P	4,165,317								1,165,423
302 A	4,165,318				CLASS 358		CLASS 423		1,165,425
325 PH	4,165,319				8	4,165,518	53	4,165,362	1,165,426
326.12 R	4,165,320				128	4,165,519	54	Re.30,081	
340.2	4,165,321				280	4,165,520	342	4,165,363	CLASS 536
343.6	4,165,322						456	4,165,364	4
345.2	4,165,323				CLASS 360				20
346.22	4,165,325				10	4,165,521			24
346.7	4,165,324				36	4,165,524	45	4,165,365	CLASS 544
397.25	4,165,327				73	4,165,522	47	4,165,367	21
397.5	4,165,326				77	4,165,523	49	4,165,366	4,165,429
404	4,165,328				125	4,165,525	52	4,165,368	4,165,430
404.5	4,165,329				137	4,165,526	70	4,165,369	4,165,434
448.2 B	4,165,330						85	4,165,370	4,165,435
448.8 R	4,165,331				CLASS 361			4,165,371	CLASS 546
453 R	4,165,332				113	4,165,527	244	4,165,372	273
455 R	4,165,333				156	4,165,528		4,165,373	CLASS 560
458 R	4,165,334						246	4,165,374	121
501.2	4,165,335				CLASS 362		256	4,165,375	211
511	4,165,336				352	4,165,529	263	4,165,376	CLASS 568
544 D	4,165,337				401	4,165,530	270	4,165,377	4,165,436
584 R	4,165,338							4,165,378	4,165,437
586 C	4,165,339				CLASS 364			4,165,379	4,165,438
593 H	4,165,340				200	4,165,531	274	4,165,380	
600 R	4,165,341				420	4,165,532	290	4,165,381	804
603 C	4,165,342				900	4,165,533	309	4,165,382	867
		CLASS 296				4,165,534	319	4,165,383	CLASS 585
CLASS 261		27			CLASS 365		324	4,165,384	444
36 A	4,165,348	50			2	4,165,535	331	4,165,385	638

## CLASSIFICATION OF DESIGNS

D2—	3	252,656	D8—	126	252,665	D10—	38	252,675	D15—	7	252,685		128	252,692	D23—	19	252,701
D3—	54	252,657		60	252,666	D11—	132	252,676	D16—	02	252,686		208	252,712		40	252,702
	78	252,715		360	252,667	D12—	98	252,677		31	252,687		226	252,693		42	252,703
D6—	41	252,658		377	252,668		101	252,678	D17—	24	252,688					55	252,704
	144	252,659		380	252,669		181	252,679	D18—	2	252,689					144	252,705
	161	252,660		116	252,670		191	252,680	D19—	36	252,690					150	252,706
D7—	191	252,661		129	252,671		12	252,681		51	252,691					23	252,707
	47	252,662		137	252,672	D13—	12	252,682	D21—	17	252,711					27	252,708
	77	252,663		143	252,673	D14—	40	252,683		24	252,713					28	252,709
	109	252,664		144	252,674		72	252,684		78	252,714					46	252,710

## CLASSIFICATION OF PLANTS

P.—	10	4,454	28	4,452	43	4,451	88	4,453		
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# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,164,888	4,165,155	10 : 4,165,481	4,165,309	26 : 4,165,355	4,164,827
6 : 4,165,148	4,165,162	4,165,346	4,165,324	4,164,793	4,164,846
4,164,831	4,165,170	4,165,377	4,165,350	4,164,817	4,164,852
4,164,880	4,165,206	4,165,390	4,165,359	4,164,867	4,164,968
4,164,885	4,165,208	4,165,433	4,165,376	4,164,876	4,164,969
4,164,890	4,165,252	4,164,835	4,165,417	4,164,918	4,165,002
4,164,896	4,165,275	4,164,905	4,165,489	4,164,938	4,165,071
4,164,900	4,165,278	4,164,916	4,165,509	4,164,971	4,165,091
4,164,902	4,165,322	4,164,940	4,165,528	4,164,975	4,165,142
4,165,036	4,165,358	4,164,964	4,165,522	4,164,998	4,165,144
4,165,072	4,165,370	4,164,981	4,165,022	4,165,039	4,165,159
4,165,090	4,165,401	4,165,000	4,165,060	4,165,054	4,165,182
4,165,241	4,165,408	4,165,023	4,165,315	4,165,081	4,165,231
4,165,329	4,165,438	4,165,059	4,165,316	4,165,092	4,165,250
9 : 4,165,480	4,165,435	4,165,075	4,165,396	4,165,093	4,165,266
4,164,859	4,165,462	4,165,229	4,164,820	4,165,098	4,165,294
4,164,958	4,165,469	4,165,230	4,164,915	4,165,099	4,165,295
4,165,078	4,165,472	4,165,255	4,164,919	4,165,119	4,165,301
01 : 4,165,001	4,165,473	4,165,446	4,164,995	4,165,163	4,165,302
4,165,421	4,165,484	4,165,451	4,165,184	4,165,187	4,165,305
4,165,460	4,165,491	4,164,807	4,165,388	4,165,188	4,165,320
04 : 4,164,882	4,165,508	4,165,030	4,165,493	4,165,197	4,165,330
4,164,933	4,165,510	4,165,096	4,165,502	4,165,204	4,165,331
4,165,264	4,165,520	4,165,106	4,164,801	4,165,212	4,165,339
4,165,487	4,165,523	4,164,903	4,164,874	4,165,243	4,165,343
05 : 4,165,042	4,165,531	4,164,812	4,164,937	4,165,262	4,165,352
06 : Re.30,078	4,165,532	4,164,823	4,164,952	4,165,292	4,165,366
4,164,850	4,165,535	4,164,927	4,164,982	4,165,293	4,165,367
4,164,860	4,165,536	4,164,941	4,165,031	4,165,325	4,165,368
4,164,863	4,165,541	4,164,947	4,165,105	4,165,403	4,165,379
4,164,865	08 : 4,165,069	4,164,957	4,165,108	4,165,405	4,165,410
4,164,881	4,165,123	4,164,970	4,165,101	4,165,409	4,165,459
4,164,889	4,165,168	4,164,988	4,165,186	4,165,414	4,165,463
4,164,894	4,165,174	4,164,997	4,165,457	4,165,436	4,165,496
4,164,895	4,165,183	4,165,004	4,165,011	4,165,452	4,165,515
4,164,897	4,165,277	4,165,015	4,164,822	4,165,501	4,165,571
4,164,898	4,165,287	4,165,016	4,164,855	4,164,797	Re.30,077
4,164,899	4,165,449	4,165,017	4,164,869	4,164,824	Re.30,079
4,164,911	4,165,468	4,165,018	4,164,949	4,164,875	4,164,803
4,164,939	4,165,512	4,165,025	4,164,961	4,164,945	4,164,861
4,164,943	09 : 4,164,806	4,165,035	4,165,361	4,165,114	4,164,870
4,164,960	4,164,821	4,165,061	4,165,371	4,165,140	4,164,906
4,164,972	4,164,845	4,165,073	4,165,411	4,165,147	4,164,910
4,164,984	4,164,926	4,165,080	4,165,503	4,165,176	4,164,929
4,164,991	4,164,978	4,165,086	4,164,829	4,165,383	4,164,932
4,165,013	4,165,210	4,165,130	4,164,857	4,165,385	4,164,953
4,165,027	4,165,235	4,165,134	4,164,944	4,165,470	4,165,028
4,165,029	4,165,323	4,165,137	4,165,050	4,164,992	4,165,070
4,165,062	4,165,349	4,165,145	4,165,077	4,165,466	4,165,076
4,165,063	4,165,362	4,165,200	4,165,153	4,164,825	4,165,110
4,165,084	4,165,400	4,165,260	4,165,158	33 : 4,165,450	4,165,127
4,165,089	4,165,404	4,165,283	4,165,283	34 : Re.30,080	4,165,132
4,165,107	4,165,432	4,165,308	4,165,308	4,164,800	4,165,141

PI 32

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 33

4,165,143	4,164,892	4,165,024	4,165,365	4,164,966	4,165,139
4,165,178	4,164,936	4,165,257	4,165,372	4,164,976	4,165,256
4,165,223	4,164,950	4,165,291	4,165,380	4,164,977	4,165,296
4,165,238	4,164,959	Re.30,082	4,165,412	4,164,979	4,165,497
4,165,247	4,165,032	4,164,795	4,165,413	4,164,980	4,165,067
4,165,270	4,165,065	4,164,802	4,165,425	4,164,986	4,164,826
4,165,332	4,165,109	4,165,008	4,165,426	4,165,064	4,164,878
4,165,351	4,165,125	4,165,074	4,165,443	4,165,133	4,164,930
4,165,391	4,165,215	4,165,526	4,165,476	4,165,198	4,165,058
4,165,395	4,165,221	Re.30,075	4,165,527	4,165,244	4,165,161
4,165,422	4,165,242	4,164,796	4,165,124	4,165,259	4,165,205
4,165,439	4,165,290	4,164,849	4,164,887	4,165,263	4,165,399
4,165,442	4,165,299	4,164,853	4,164,794	4,165,272	4,165,483
4,165,478	4,165,300	4,164,946	4,164,840	4,165,364	4,165,345
4,165,490	4,165,303	4,164,951	4,164,841	4,165,440	Re.30,076
4,165,494	4,165,310	4,165,097	4,165,056	4,165,474	4,164,808
4,165,517	4,165,321	4,165,146	4,165,280	4,165,504	4,164,810
4,165,529	4,165,333	4,165,156	4,165,288	4,165,522	4,164,833
4,165,537	4,165,334	4,165,199	4,165,118	4,164,834	4,164,864
37 : 4,165,539	4,165,347	4,165,216	4,165,007	4,165,041	4,164,965
4,164,798	4,165,356	4,165,227	4,165,034	4,165,088	4,164,983
4,164,804	4,165,382	4,165,254	4,165,271	4,165,192	4,165,044
4,164,839	4,165,420	4,165,258	4,164,799	50 : 4,164,851	4,165,102
4,165,037	4,165,534	4,165,269	4,164,862	51 : 4,164,931	4,165,103
4,165,505	4,164,832	4,165,304	4,164,886	4,165,012	4,165,138
39 : 4,164,879	4,164,871	4,165,318	4,164,934	4,165,020	4,165,160

## DESIGN PATENTS

4 : 252,685	252,688	09 : 252,656	26 : 252,711	252,660	252,676
5 : 252,677	252,689	252,670	27 : 252,682	252,672	252,701
6 : 252,709	252,692	16 : 252,694	252,705	252,707	252,708
9 : 252,673	252,693	17 : 252,659	31 : 252,664	37 : 252,702	252,714
252,674	252,695	18 : 252,665	32 : 252,696	39 : 252,671	252,715
06 : 252,662	252,698	25 : 252,668	34 : 252,681	42 : 252,663	51 : 252,680
252,667	252,713	252,669	252,710	47 : 252,700	252,699
252,669	08 : 252,678	252,691	36 : 252,657	48 : 252,675	55 : 252,712

## PLANT PATENTS

06 : 4,454	18 : 4,453	34 : 4,451		
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OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE

August 28, 1979

Volume 985

Number 4

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	985 OG 28
Board of Appeals Decisions Rendered in the Month of July 1979 . .	985 OG 28
Reissue Applications Filed . . . . .	985 OG 28
Patent Notices	
Certificates of Correction for the Week of August 28, 1979 . . . .	985 OG 29
Disclaimers . . . . .	985 OG 29
Disclaimer and Dedication . . . . .	985 OG 29
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries . . . . .	985 OG 30
Condition of Patent Applications . . . . .	985 OG 31
Reissue Patents Granted (Re 30,083) . . . . .	783
Plant Patents Granted (4,455) . . . . .	785
Patents Granted	
General and Mechanical (4,165,542) . . . . .	787
Chemical (4,165,967) . . . . .	935
Electrical (4,166,192) . . . . .	997
Design Patents Granted (252,716) . . . . .	1031
Index of Patentees . . . . .	PI 1
Indices of Reissues, Plants and Designs . . . . .	PI 27
Classification of	
Patents (Including Reissues) . . . . .	PI 29
Designs and Plants . . . . .	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 32
Designs and Plants . . . . .	PI 33
Change of Address Form and Subscription Order Form . . . . .	Back Page

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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of Information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979. Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1 (i) for an international application containing 30 sheets or less	\$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1 (ii)	45.00
LUTRELLE F. PARKER, Acting Commissioner of Patents and Trademarks.	
July 3, 1979.	

## Board of Appeals Decisions Rendered in the Month of July 1979

Affirmed	259
Affirmed in Part	31
Reversed	79
Total	369

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,605,069, Re. S.N. 044,603, Filed Jun. 1, 1979, Cl. 339/90 R, RIGID ELECTRICAL CONNECTOR, Robert F. Dorrell, Owner of Record: Bunker Ramo Corporation, Oak Brook, Ill., Attorney or Agent: Frederick M. Arbuckle, Ex. Gp.: 322

3,846,400, Re. S.N. 041,996, Filed May 24, 1979, Cl. 260/112.5, NOVEL PROCESS FOR PRODUCING ANTIBIOTICS BLEOMYCIN, Hamao Umezawa, et al., Owner of Record: Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan, Attorney or Agent: William E. Schuyler, Jr., et al., Ex. Gp.: 125

3,932,374, Re. S.N. 041,995, Filed May 24, 1979, Cl. 260/112.5, BLEOMYCINIC ACID AND PROCESS FOR PRE-

PARING THEREOF, Hamao Umezawa, et al., Owner of Record: Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan, Attorney or Agent: William E. Schuyler, Jr., et al., Ex. Gp.: 125

4,022,529, Re. S.N. 036,994, Filed May 8, 1979, Cl. 356/318, FEATURE EXTRACTION SYSTEM FOR EXTRACTING A PREDETERMINED FEATURE FROM A SIGNAL, John U. White, Owner of Record: Inventor, Attorney or Agent: Lee C. Robinson, Jr., Ex. Gp.: 257

4,023,623, Re. S.N. 038,508, Filed May 14, 1979, Cl. 172/311, AGRICULTURAL IMPLEMENT WITH FOLDABLE TOOL SUPPORTING FRAME, Charles W. Anderson, Owner of Record: Chromalloy American Corporation, St. Louis, Mo., Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 334

4,024,004, Re. S.N. 039,118, Filed May 15, 1979, Cl. 156/169, METHOD OF MAKING PILE WEATHERSTRIPPING, Jay C. Metzler, Owner of Record: Schlegel Corporation, Rochester, N.Y., Attorney or Agent: George W. Shaw, Ex. Gp.: 161

4,075,206, Re. S.N. 033,659, Filed Apr. 26, 1979, Cl. 544/344, SUBSTITUTED PYRROLOQUINOXALINONES AND DIONES, Richard E. Holmes, Owner of Record: Eli Lilly and Company, Indianapolis, Ind., Attorney or Agent: Cornelius W. Pettinga, Ex. Gp.: 122

4,087,527, Re. S.N. 042,848, Filed May 29, 1979, Cl. 424/250, SUBSTITUTED PYRROLOQUINOXALINONES AND DIONES, Richard E. Holmes, Owner of Record: Eli Lilly and Company, Indianapolis, Ind., Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 125

4,104,236, Re. S.N. 039,648, Filed May 16, 1979, Cl. 260/33.2 R, LIQUID POLYMER/POLYOLS AND ELASTOMERIC POLYURETHANES BASED THEREON, Donald W. Simroth, Owner of Record: Union Carbide Corporation, New York, N.Y., Attorney or Agent: Eugene Trautlein, Ex. Gp.: 144

4,108,028, Re. S.N. 035,555, Filed May 3, 1979, Cl. 81/9.5 B, WIRE STRIPPER HAVING REPLACEABLE BLADES, Joseph A. Perrino, Owner of Record: Micro Electronics Inc., Newport, R.I., Attorney or Agent: Elliot A. Salter, et al., Ex. Gp.: 323

# PATENT NOTICES

## Certificates of Correction for the Week of Aug. 28, 1979

D. 244,459	4,127,791	4,149,217	4,156,054
D. 248,555	4,131,038	4,149,344	4,156,391
D. 249,681	4,133,987	4,149,623	4,156,426
D. 251,791	4,136,060	4,150,126	4,156,898
3,953,398	4,138,746	4,151,263	4,156,910
3,971,228	4,142,196	4,151,491	4,156,973
4,060,593	4,143,179	4,152,086	4,157,116
4,081,900	4,143,292	4,152,840	4,157,326
4,095,272	4,143,494	4,153,304	4,157,374
4,095,792	4,144,462	4,153,305	4,157,382
4,097,228	4,145,249	4,153,394	4,157,463
4,103,526	4,145,357	4,153,475	4,157,547
4,108,796	4,145,416	4,153,545	4,157,597
4,111,865	4,145,417	4,153,955	4,157,797
4,112,738	4,146,841	4,154,176	4,157,977
4,117,394	4,148,609	4,154,707	
4,117,711	4,148,662	4,155,362	

## Disclaimers

4,061,487.—Kazuo Kiyonaga, Tarrytown, N.Y. PROCESS FOR PRODUCING GLASS IN A ROTARY FURNACE. Patent dated Dec. 6, 1977. Disclaimer filed June 25, 1979, by the assignee, Union Carbide Corporation. Hereby enters this disclaimer to claims 1, 2, 3, 5, 6, 7, 8, 9 and 10 of said patent.

4,122,926.—Edwin A. Spanke, Oak Forest, Louis F. Carrieri, LaGrange Park, and Melvin H. Francey, Palos Heights, Ill. FLUID OPERATED CLUTCH AND BRAKE. Patent dated Oct. 31, 1978. Disclaimer filed July 11, 1979, by the assignee, Gulf & Western Manufacturing Company. Hereby enters this disclaimer to claims 17 and 18 of said patent.

## Disclaimer and Dedication

4,003,206.—Nield D. Tanksley, Antioch, Calif. UNIVERSAL END CONNECTOR FOR FLOATING BOOM. Patent dated Jan. 18, 1977. Disclaimer and dedication filed Mar. 27, 1979, by the assignee, Acqua Control, Inc. Hereby disclaims and dedicates all claims of said patent.



# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

\*Collection organized by subject matter.

985 OG 30

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Selsmie Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING AND MEASURING, GROUP 240—A. L. SMITH, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	5-17-77
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes; Assembling; Combined Machines; Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—O. M. FORLENZA, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 819, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,558 to 3,031,668, inclusive  
Plant Patents..... Numbers 2,135 to 2,142, inclusive

985 OG 31

AUGUST 28, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,083  
IRON TITANIUM MANGANASE ALLOY HYDROGEN STORAGE

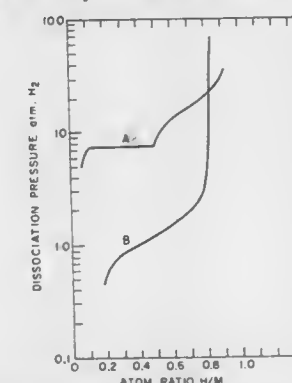
James J. Reilly, Bellport, and Richard H. Wiswall, Jr., Brookhaven, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Original No. 3,922,872, dated Dec. 2, 1975, Ser. No. 547,073, Feb. 4, 1975. Application for reissue Nov. 8, 1977, Ser. No. 849,569

Int. Cl.<sup>2</sup> F26B 5/04

U.S. Cl. 34—15

5 Claims



1. A three component alloy capable of reversible sorption of hydrogen having the chemical formula  $\text{TiFe}_{1-x}\text{Mn}_x$  where  $x$  is in the range of about 0.02 to 0.5.

Re. 30,084  
PICKING AND TRANSPORTING MEANS FOR FABRIC SECTIONS AND THE LIKE

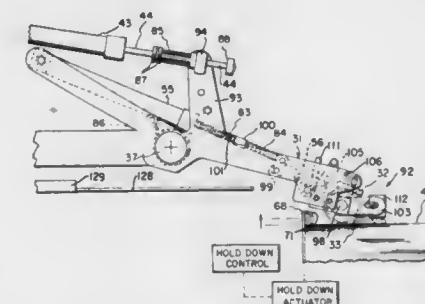
Kenneth O. Morton, Troy, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Original No. 3,940,125, dated Feb. 24, 1976, Ser. No. 471,029, May 17, 1974. Application for reissue Sep. 9, 1977, Ser. No. 831,771

Int. Cl.<sup>2</sup> B65H 3/06, 3/22, 3/32

U.S. Cl. 271—10

26 Claims



5. A picking apparatus for nipping and lifting a limp ply, which comprises

- a movable gripping member movable about an axis and having an arcuate ply gripping surface,
- lifting means supporting said member for rotary movement of its gripping surface about said axis,
- means forming a ply stripping element extending from a point outside the arcuate surface of the gripping member to a point within the projected configuration of the member and disposed at a relatively shallow angle with the gripping surface of the member at the point of intersection of said stripping element with said gripping surface,
- ply retaining shoe means positioned to yieldably press

upon the ply stack, adjacent said ply gripping member, whereby ply material displaced by movement of said member is caused to buckle into a wave in the region between said member and said shoe, and

e. said stripping element and said shoe means forming an accumulation cavity for receiving said wave.

16. Apparatus for separating and transporting limp plies one at a time from a stack thereof, which comprises

- means for gripping and lifting one edge portion of a top ply of the stack,
- hold-down means for engaging the stack below the top ply in the region of said one edge,
- a plate-like shutter means movable into interposition below said top ply and above the remainder of the stack, to fully separate said top ply from said stack,
- means guiding said plate-like shutter for progressive interposing, longitudinal movement, entering adjacent said one edge and progressing toward and beyond the opposite edge,
- means for reciprocating said plate-like shutter between an interposed position, between said stack and top ply, and a predetermined destination position, and
- means independent of said gripping and lifting means effective to retain said top ply on said shutter during movement of the shutter and the ply to said destination position.

31. An apparatus for picking and separating plies of limp material, one at a time, from a stack, which comprises

- (a) gripping means for engaging a first limited area of the top ply and displacing it away from one edge of the ply stack through a predetermined limited distance,
- (b) ply stack hold-down means engageable with the top of the stack in a second limited area spaced from said one edge a distance less than, but greater than half the distance of displacement, whereby to engage all plies below the top ply, including any plies whose edges are connected to said top ply,
- (c) control means for lowering said hold-down means into engaged relation to said stack after actuation of said gripping means, and
- (d) means for lifting said top ply.

Re. 30,085  
METHOD AND APPARATUS FOR THE CODING AND LOW TEMPERATURE LIQUEFACTION OF GASEOUS MIXTURES

Jean C. Perret, Versailles, France, assignor to Compagnie Française d'Etudes et de Construction Technip, Paris, France

Original No. 3,364,685, dated Jan. 23, 1968, Ser. No. 534,830, Mar. 16, 1966. Division of Ser. No. 868,246, Sep. 29, 1969, now Re. 29,914. Application for reissue Sep. 16, 1974, Ser. No. 506,165

Claims priority, application France, Mar. 31, 1965, 65.11371 Int. Cl.<sup>2</sup> F25J 1/00

U.S. Cl. 62—9

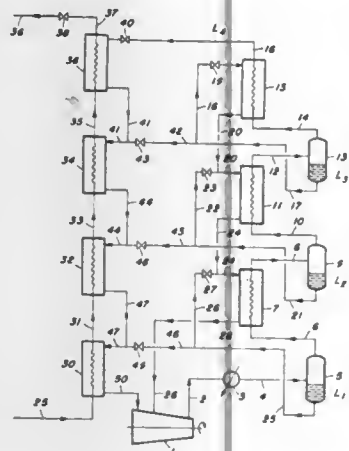
18 Claims

17. A process for totally liquefying a gaseous methane-rich feed stream comprising the steps of:

- supplying said methane-rich feed stream at a superatmospheric pressure and precooling said stream,
- providing a multicomponent refrigerant,
- compressing said multicomponent refrigerant to a superatmospheric pressure,
- cooling said multicomponent refrigerant and phase separating a single vapor fraction and a single liquid fraction from said cooled multicomponent refrigerant,
- subcooling said liquid fraction in heat exchange with itself after expansion to form a first subcooled liquid fraction,
- liquefying and subcooling all of said vapor fraction in heat



exchange with said first subcooled liquid fraction, and with itself after expansion, to form a second subcooled liquid fraction, and  
g. totally liquefying said precooled methane-rich feed stream by further cooling said precooled methane-rich feed stream to at



least its liquefaction temperature, at the superatmospheric pressure thereof, solely by progressive heat exchange steps with said first and second subcooled liquid fractions undergoing vaporization, said methane-rich feed stream and said multicomponent refrigerant being in indirect heat exchange with each other throughout the process.

Re. 30,086

## PLASTIC EMULSION FOOD SPREAD

Norman J. Carlile, Wirral, England, and Theodor J. Van Selm, Krimpen aan den IJssel, Netherlands, assignors to Lever Brothers Company, New York, N.Y.  
Original No. 3,939,282, dated Feb. 17, 1976, Ser. No. 357,750, May 7, 1973. Application for reissue Sep. 18, 1978, Ser. No. 944,048

Claims priority, application United Kingdom, May 10, 1972, 21794/72

Int. Cl.<sup>2</sup> A23D 3/00

U.S. Cl. 426—603

5 Claims

1. A plastic emulsion food spread comprising an aqueous phase and a fat phase in the form of an emulsion in which the fat phase is partly crystallized and comprises by weight of the fat phase, from about 5% to about 40% of a triglyceride composition, the fatty acid residues of which are in random distribution and consist essentially of the acid residues of palm oil,

and a major proportion of an additional fat where said fat is selected from the group consisting of corn, cottonseed, groundnut, safflower, sunflower, sesame and soybean oils.

Re. 30,087  
COHERENT SAMPLED READOUT CIRCUIT AND  
SIGNAL PROCESSOR FOR A CHARGE COUPLED  
DEVICE ARRAY

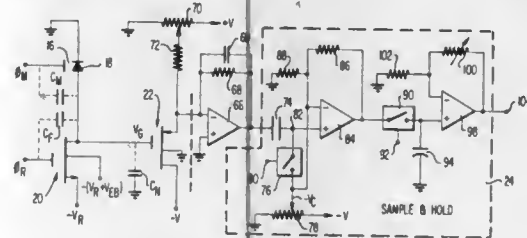
Marvin H. White, Laurel; David H. McCann, Jr., Ellicott City; Ingham A. G. Mack, Prince George, and Franklyn C. Blaha, Glen Burnie, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 3,781,574, dated Dec. 25, 1973, Ser. No. 299,480, Oct. 20, 1972. Application for reissue Dec. 18, 1975, Ser. No. 642,032

Int. Cl.<sup>2</sup> H03K 3/353; G11C 19/28; H04B 1/04; H01L 29/78

U.S. Cl. 307—304

11 Claims



11. Circuitry for coherent readout and signal-processing of charge storage apparatus, comprising:

- a charge storage detector circuit operable to receive an information signal;
- a first field effect device operable as an amplifier and having an input and an output;
- a second field effect device operable as a reset switch, coupled to said input;
- said input constituting a circuit node capacitance;
- said second field effect device being operable to apply a reference voltage to said node capacitance;
- means coupled to said output for sampling and holding said reference voltage applied to said node capacitance;
- means operable subsequent to said sampling to couple said information signal to said node capacitance;
- said sampling and holding means being thereafter operable to again sample the voltage applied to said node capacitance for obtaining a resultant signal which is indicative of the difference between said two samplings.

## PLANT PATENTS

GRANTED AUGUST 28, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,455

## AZALEA NAMED VARIEGATED DOGWOOD

Richard A. Arnesen, Northridge, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,560

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—55

1 Claim

1. A new and distinct variety of hybrid azalea substantially as herein shown and described, characterized by its prolific branching tendencies and floriferous habit, the bright Camellia Rose, white and Tyrian Purple variegation of its flowers, and the excellent lasting ability of the blooming plant.

4,457

## ROSE PLANT

F. Harmon Saville, 58 Hammond St., Rowley, Mass. 01969

Filed Oct. 27, 1978, Ser. No. 955,222

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—8

1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by beautiful deep yellow blooms of strong fragrance borne primarily singly to a stem on a very compact plant of attractive foliage.

4,456

## CHRYSANTHEMUM NAMED ALPINE

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Oct. 26, 1978, Ser. No. 955,148

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—77

1 Claim

1. A new and distinct cultivar of pot chrysanthemum, substantially as herein shown and described, characterized by its

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# PATENTS

GRANTED AUG. 28, 1979

## ERRATA

For CLASS	See PATENT NO.
057-268 .....	4,165,585
405-017 .....	4,165,617
428-207 .....	4,165,741
414-736 .....	4,165,808
414-104 .....	4,165,809
414-595 .....	4,165,810
414-412 .....	4,165,811
406-192 .....	4,165,845
249-102 .....	4,165,855
549-072 .....	4,166,061
585-369 .....	4,166,076
585-310 .....	4,166,077
525-208 .....	4,166,079
525-183 .....	4,166,080
525-075 .....	4,166,081
525-078 .....	4,166,082
528-126 .....	4,166,166
351-160 H .....	4,166,255



# PATENTS

GRANTED AUGUST 28, 1979

## GENERAL AND MECHANICAL

4,165,542

### HEAD COVERING

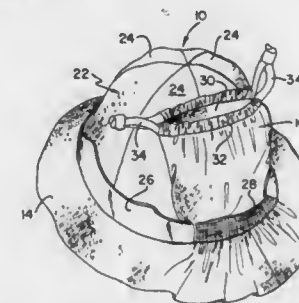
Rita E. McLaughlin, P.O. Box 1662, Boston, Mass. 02105

Filed Mar. 28, 1978, Ser. No. 891,022

Int. Cl.<sup>2</sup> A42B 1/20

U.S. Cl. 2—209.1

9 Claims



1. A head covering formed of a flexible sheet material and comprising:

- a domed crown;
- a brim secured to the periphery of said crown; and
- a pocket formed of flexible sheet material and attached inside-out to said crown, said pocket having an opening and being dimensioned so that said crown and brim can be stored within said pocket by turning the pocket inside-in and stuffing said crown and brim into said pocket.

4,165,543

### SUSPENDED MOTOR LIFTED SWIMMING POOL COVER

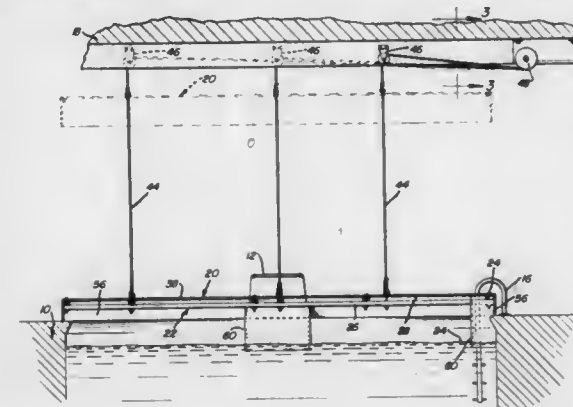
George R. Rehnert, R.D. #1, Bethlehem, Pa. 18017

Filed Mar. 27, 1978, Ser. No. 890,697

Int. Cl.<sup>2</sup> E04H 3/19; B66C 23/62

U.S. Cl. 4—172.12

6 Claims



1. In combination with a swimming pool of a given size and shape, overhead support structure disposed above said pool and along one marginal portion thereof, a lightweight cover for said pool including a horizontal skeletal frame of substantially the same shape but of slightly larger size than said pool and including crossed and interconnected frame members and peripheral frame portions extending about the periphery of said frame, a lightweight panel secured over said frame, said cover including a plurality of horizontally spaced apart anchor members secured to said frame and projecting upwardly through said panel member, a plurality of guide means supported from said overhead support structure vertically above said anchor members, a plurality of elongated flexible tension members having one set of ends anchored relative to said anchor members and midportions thereof guidingly engaged

over said guide means, winding drum means journaled from the portion of said overhead support structure disposed along said one pool marginal portion and to which the other set of ends of said tension are anchored for winding thereon and unwinding therefrom, said pool including a diving board and pool steps projecting inwardly from spaced marginal portions of said pool, the marginal portions of said cover corresponding to said spaced marginal portions of said pool defining outwardly opening notches formed therein upwardly through which said diving board and steps are receivable when said cover is lowered into position closely overlying said pool, said notch defining marginal portions of said cover including depending skirt portions projectable downwardly below the water level of said pool when said cover is in a lowered position over said pool.

4,165,544

### ODORLESS TOILET STOOL

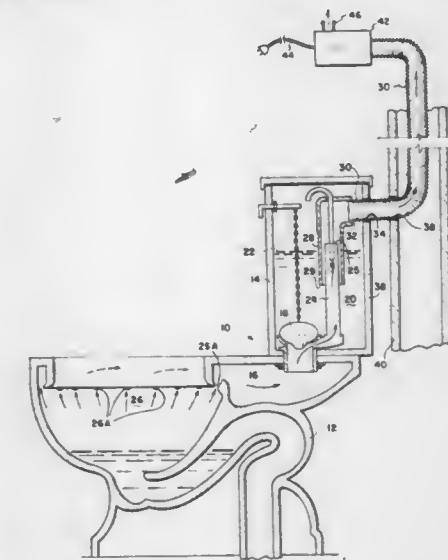
Bill H. Barry, P.O. Box 607, Bartlesville, Okla. 74003

Filed May 15, 1978, Ser. No. 905,727

Int. Cl.<sup>2</sup> E03D 9/04, 9/05

U.S. Cl. 4—213

2 Claims



1. A system for eliminating odorous air from a bathroom stool of the type including a toilet bowl, a water tank connected by a discharge pipe to the toilet bowl, the water tank including a vertical, open top overflow passageway connected to the discharge pipe so that water in excess of the desired level in the tank is dispensed into the toilet bowl and through which odorous air may be withdrawn from the toilet bowl, the system comprising:

- a hollow, open bottom vertical member positioned over the upper end of the overflow passageway, the sleeve lower end terminating below the normal water level in the water tank, whereby a water seal provides closed communication between the overflow passageway and the member;
- means of creating low air pressure connected to the upper end whereby odorous air is drawn from the bowl through the overflow pipe and scrubbed, said means comprising;
- a manifold having a hollow vertical sleeve portion of internal diameter greater than the external diameter of the overflow pipe and positioned to extend down over the overflow pipe upper end, the lower end terminating below the normal water level in the water tank whereby a water seal is provided between the overflow pipe and the manifold vertical portion, and the manifold having a hori-

zontal portion integrally connected to the vertical portion of one end, the other end being open, the horizontal portion adapted to extend within the tank above the water surface;

an electrically actuated pump having an inlet and outlet; a tube extending from the pump inlet into the water in the tank;

at least one jet positioned within said manifold horizontal portion and oriented towards the open end; and

a tube connecting said pump outlet to said jet, whereby when said pump is energized water from the tank is passed through the jet inducing air flow in said manifold, causing air to be moved from the toilet bowl, the overflow pipe and manifold into the tank, the air being scrubbed by water within the manifold horizontal portion to substantially remove the odor therefrom.

4,165,545

# **COMMODOE CONDENSATION/OVERFLOW CATCH BASIN**

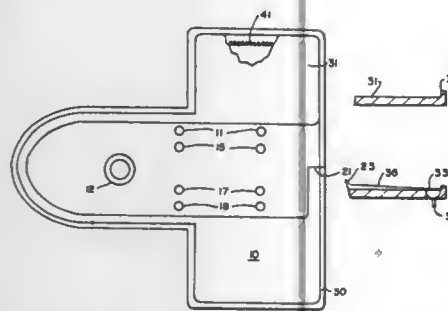
Sarah D. Stoltzfus, 8645 Converse Huff Rd., Plain City, Ohio 43064

Filed Dec. 22, 1977, Ser. No. 863,357

Int. Cl.<sup>2</sup> E03D 11/00

U.S. Cl. 4—252 A

4 Claims



1. A liquid catch basin for a toilet having a cross tank and a bowl, said basin of a single unitary structure having a generally T-shape with the crossportion thereof completely underlying the bottom of the cross tank, a central portion of said catch basin being in contact with the lowermost portion of said bowl and extending below said bowl and means for retaining said basin in contact with said bowl;

said catch basin has its central area removed from said central portion extending below said bowl, and the inner edge of said basin adjacent said removed central area is in sealing contact to said bowl;

a gutter adjacent the outer edge of said basin, and a dike formed on the outer edge of said gutter, and wherein said basin is slanted outwardly from said bowl to said outer edge dike and thence rearwardly to form an evaporation bin.

4,165,546

# **PORTABLE CUSPIDOR**

Alvin L. Philipson; Noel W. Abramson, and Michael J. Woltcheck, all of 7321 Collins Ave., Miami Beach, Fla. 33141

Filed Apr. 24, 1978, Ser. No. 899,138

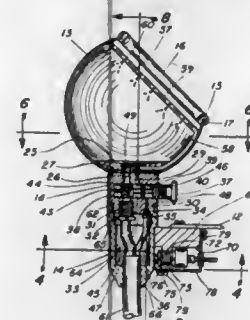
Int. Cl.<sup>2</sup> A61J 19/04; A61C 17/04

U.S. Cl. 4—262

6 Claims

1. A portable cuspidor comprising, in combination, a cup member, a handle for said cup member, drain opening means in said cup member, a first flexible hose means communicating with said drain opening means for the drainage of fluid from said cup member, a second flexible hose means for supplying rinse fluid under pressure to said cup member, said cup member defining a substantially closed chamber except for an access opening large enough for the placement of facial portions surrounding the mouth thereagainst for expectorating into said cup member, and multiple jet conduit means communicating

with said rinse fluid supply means for discharging rinse fluid against interior surface portions of said cup member for drainage through said drain opening means and said fluid drainage means, said first flexible hose means comprising a vacuum hose for aspirating discharge fluid from said cup member, said sec-



4,165,547

# **VACUUM ASSISTED TUFT DYE PRINTING PROCESS**

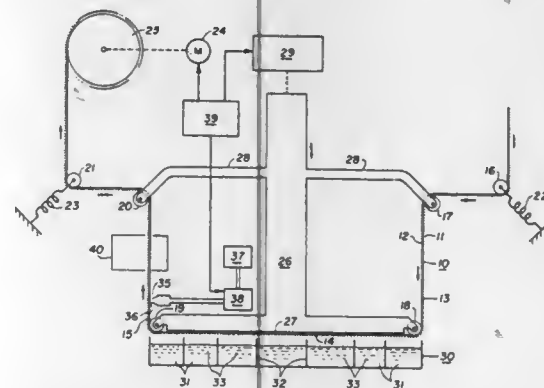
David B. Parlin, and Helmut Vits, both of Greenville, S.C., assignors to Bigelow-Sanford, Inc., Greenville, S.C.

Filed Jun. 21, 1978, Ser. No. 917,414

Int. Cl.<sup>2</sup> D06B 1/00

U.S. Cl. 8—148

6 Claims



1. A process for dyeing a pile fabric having a backing web, comprising the steps of:

moving said fabric in a repetitive stepwise manner in a longitudinal direction along a path having a horizontal portion and an upwardly oriented portion, said backing web being disposed above the pile portion of said fabric along said horizontal portion of said path;

displacing said horizontal portion of said fabric path downward to immerse the pile portion of said fabric in a print form comprising a plurality of open compartments separated by thin vertical walls and containing dyes of varying colors defining a print pattern; to dye said fabric in accordance with said pattern;

thereafter displacing said horizontal portion of said fabric path upward to withdraw said fabric from said print form; thereafter moving said fabric a predetermined distance along said path and then temporarily halting the movement thereof;

intermittently applying suction to the backing of said fabric in a zone of predetermined width along said path, said zone being disposed along the upwardly oriented portion

of said path adjacent the horizontal portion thereof, said suction being applied only during said fabric moving step, to draw dye toward said backing and remove excess dye from said fabric; and

thereafter causing said dye to set in said fabric.

6. Apparatus for dyeing a pile fabric having a backing web comprising:

means for moving said fabric in a repetitive stepwise manner in a longitudinal direction along a path having a horizontal portion and an upwardly oriented portion;

means for disposing said backing web above the pile portion of said fabric along said horizontal portion of said path;

a print form comprising a plurality of open compartments separated by thin vertical walls and containing dyes of varying colors defining a print pattern;

means for displacing said horizontal portion of said fabric path downward to immerse the pile portion of said fabric in said print form, to dye said fabric in accordance with said pattern;

means for displacing said horizontal portion of said fabric path upward to withdraw said fabric from said print form;

means for moving said fabric a predetermined distance along said path and for then temporarily halting the movement thereof;

means for intermittently applying suction to the backing of said fabric in a zone of predetermined width along said path, said zone being disposed along the upwardly oriented portion of said path adjacent the horizontal portion thereof, said means being operative to apply suction to said backing only while said fabric is in motion; and

means for causing said dye to set in said fabric.

# **PROCESS FOR THE WET TREATMENT OF ENDLESS STRANDS OF TEXTILE MATERIAL**

Manfred Schulerer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Michelstadt, Fed. Rep. of Germany

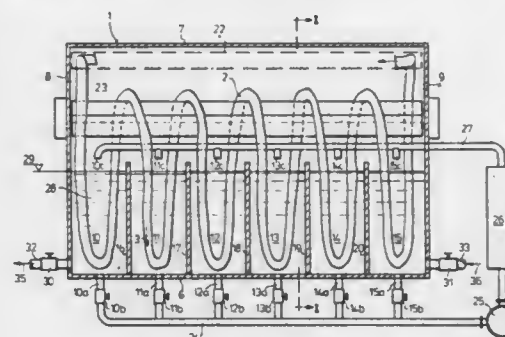
Filed Apr. 6, 1978, Ser. No. 894,094

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717313

Int. Cl.<sup>2</sup> D06B 3/24

U.S. Cl. 8—151.1

9 Claims



1. A process for the wet treatment of an endless strand of textile material in a vat which is partitioned into compartments, comprising the steps of (a) initially dyeing an endless strand of textile material by transporting it spirally through successive compartments of the vat and simultaneously and separately circulating a homogeneous dye liquor through the compartments individually, (b) and then rinsing the textile material while continuing to transport it through said successive compartments, by causing a rinsing liquor to flow successively through the compartments in countercurrent to the movement of the textile material.

4,165,549

# **REACTOR VESSEL CLOSURE STUD CLEANING MACHINE**

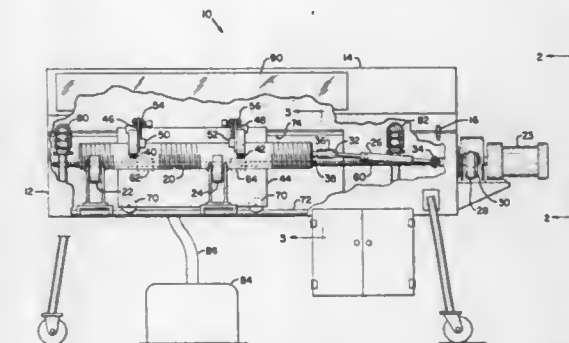
Edward A. Wennerstrom; James S. Brown, Sr., both of Chattanooga, and William E. Milligan, Soddy, all of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 10, 1978, Ser. No. 868,237

Int. Cl.<sup>2</sup> A46B 13/02

U.S. Cl. 15—88

3 Claims



1. Apparatus for cleaning threaded studs or bolts including a housing, a removable cover for the housing, a pair of roller assemblies for supporting the stud to be cleaned, drive means for rotating the stud, including a first drive shaft, said first drive shaft having a universal joint at each end thereof, means attached to one of the universal joints which can be attached to the stud, a carriage, means for moving the carriage longitudinally along the length of the stud, a pair of horizontally spaced, rotary brushes mounted on the carriage, the brushes being pivotally mounted on the carriage in such a manner that they can be pivoted away from or into contact with the outer surface of the stud, means for rotating the brushes, and vacuum means attached to the inside of the housing.

4,165,550

# **MOP HOLDER HAVING A UNIVERSAL HANDLE CONNECTION**

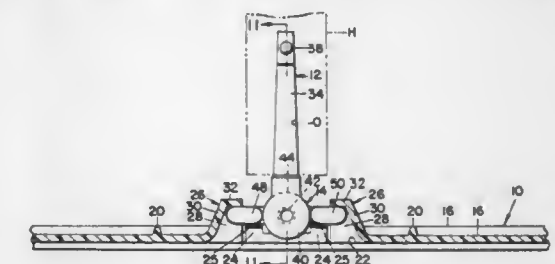
Frederick A. Burke, Riverside, Conn., assignor to Stanley Home Products, Inc., Westfield, Mass.

Filed Sep. 21, 1978, Ser. No. 944,323

Int. Cl.<sup>2</sup> A47L 13/255; B25G 3/38

U.S. Cl. 15—144 A

3 Claims



1. A mop connector comprising, a handle, a frame for releasably carrying a sleeve-like mop member, first swivel means mounted for 180° swivel movement in a vertical plane relative to the frame and releasably attached to the handle, second swivel means mounted for 180° swivel movement about a horizontal axis relative to the frame, the first swivel means comprising a pair of finger-like mirror-image half parts, loosely pivoted together at one end and each having a disc portion at its opposite end, a pin extending inwardly from each disc portion, the second swivel means comprising a flat centrally-apertured disc portion having oppositely projecting cylindrical lugs extending radially outwardly from a central axis thereof, said lugs and apertured disc portion being substantially coplanar, a pair of spaced hollow bosses extending upwardly from the frame.



the frame receiving the lugs of the second swivel means rotatably therein, pairs of locking fingers on the frame disposed on a plane below the bosses, the lugs being rotatably supported by the locking fingers, the disc portions of the first swivel means embracing the opposed planar faces of the disc portion of the second swivel means with the pins of the first swivel means received loosely in the central aperture of the disc portion of the second swivel means to pivot therein, and with the half-parts of the first swivel means being releasably engaged in the lower end of the handle.

4,165,551

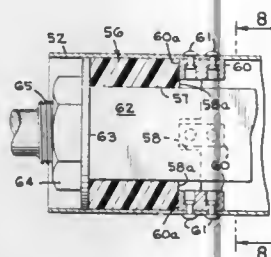
**ROTARY BRUSH ROLL CONSTRUCTION**

Richard B. Rosseau, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 656,473, Feb. 9, 1976, Pat. No. 4,104,760. This application Dec. 28, 1977, Ser. No. 865,146

Int. Cl.<sup>2</sup> A46B 13/02

U.S. Cl. 15—179



1. In a rotary brush roller comprised of a tubular open-ended metallic core of cylindrical shape having brush means secured to its outer cylindrical surface and extending radially therefrom, the improvement comprising a pair of fittings arranged to be received in each end of said core, each of said fittings being comprised of an elastomeric material having a Shore scale A hardness within the range of from about 85 to about 100, each of said fittings having an axially extending passage therein arranged to snugly receive a rotatable driving or support means, said core at each end thereof having a plurality of radially inwardly projecting elements spaced circumferentially about the interior cylindrical wall of said core, each of said fittings having a plurality of circumferentially spaced and axially extending recessed portions arranged to be received by said inwardly projecting elements of the core when said fitting is axially slidably assembled within said core, and means for retaining said fittings in a predetermined position within the ends of said core so that said inwardly projecting elements of the core are in resilient engagement with said fittings, said means for retaining each of said fittings in said core comprising means secured to said rotatable driving or support means and being adjustably movable with respect thereto for applying axial pressure to said fitting to force it into axial resilient engagement with said inwardly projecting elements of said core.

4,165,552

**SOOT BLOWER DRIVE MECHANISM**

Jesse C. Johnston, Jr., Carroll, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Filed Jul. 27, 1978, Ser. No. 928,586

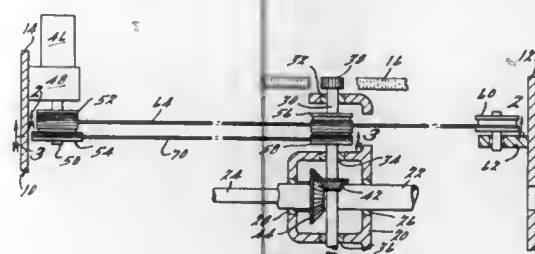
Int. Cl.<sup>2</sup> F23J 3/02

U.S. Cl. 15—312 R

17 Claims

1. In a retracting soot blower assembly including a lance tube, a support frame and a carriage rotatably supporting said lance tube and movable to move said lance tube to projected and retracted positions, drive means for moving said carriage to move said lance tube between said positions, said drive means including a drive shaft mounted on said frame, and a driven shaft mounted on said carriage, characterized by a pair of drum portions on said drive shaft and drivable thereby, a pair of drum portions on said driven shaft for driving the

driven shaft, and an idler pulley mounted on said frame, a first cable operatively engaging selected ones of said drum and so arranged that upon rotation of said drive shaft in one direction said driven shaft will be rotated in a direction to move said



4,165,553

**SLIDING DOOR SAFETY DEVICE**

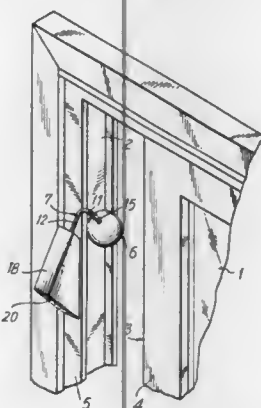
Michael T. Salerno, 47 Walton Ave., Oakland, N.J. 07436

Filed Feb. 1, 1978, Ser. No. 874,344

Int. Cl.<sup>2</sup> E05D 13/00

U.S. Cl. 16—86 A

2 Claims



1. A sliding door safety device for a sliding door slidably mounted in a door frame having a track slidably accommodating the door, said door having a leading edge which abuts the frame when the door is closed and a leading surface in the area of the leading edge, said frame having a leading surface which is next-adjacent the leading surface of the door when the door is closed, said sliding door safety device comprising a resilient ball; and support means pivotally supporting the resilient ball on the leading surface of the frame in a manner whereby the gravitational force on said ball moves said ball between the door and the frame, said ball being manually movable away from said door and said frame, so that said ball is positioned by gravitational force in abutment with the leading surface of said door when said door is closed thereby permitting said door to be securely closed with its leading edge in abutment with said frame, and is interposed by gravitational force between said leading edge of said door and said frame when said door is open thereby preventing the door from closing fully by preventing said leading edge of said door from abutting said frame and thus protecting hands from being crushed between said door and said frame, said support means comprising a rod

having spaced opposite first and second ends, said rod having a linear part extending for most of its length from the first end and being bent in the area of its second end in a manner whereby said second end is spaced at a substantially radial distance from said linear part, said ball being mounted on the second end of said rod, and mounting means for pivotally mounting said rod at an acute angle with said leading surface of said frame in a manner whereby said ball is rotatable in an operating plane perpendicular to said linear part and at an acute angle with said leading surface of said frame, said mounting means comprising a housing affixed to said leading surface of said frame and having spaced substantially parallel top and bottom parts extending in planes spaced below and substantially parallel to the operating plane, said top part having a hole formed therethrough, and first and second bushings mounted at said bottom and top parts, respectively, for pivotally accommodating said rod with the first end of said rod in said first bushing and said rod passing through said second bushing and said hole in the area of the end of said linear part adjacent its bent area, said second bushing being positioned at said hole and said linear part of said rod being in said housing and the bent area of said rod being outside of said housing, said second bushing being spaced a predetermined distance from said leading surface of said frame and said first bushing being spaced at least four times said predetermined distance from said leading surface of said frame.

4,165,554

**HAND-HELD PORTABLE CALCULATOR ASSEMBLY**

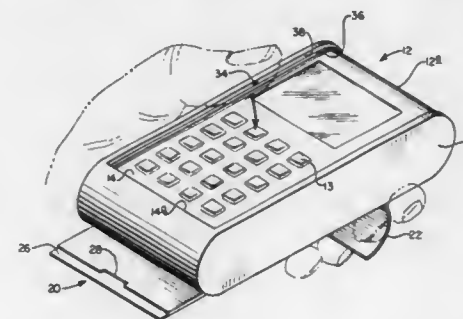
Charles J. Faget, 572 E. Marlin Ct., Gretna, La. 70053

Filed Jun. 12, 1978, Ser. No. 914,546

Int. Cl.<sup>2</sup> G06C 5/00

U.S. Cl. 16—114 R

10 Claims



1. A hand-held, portable, electronic calculator assembly comprising:  
a. a calculator body means having  
i. a front surface means, said front surface means containing keyboard means and first means for receiving a gripping and covering means, and  
ii. a back surface means opposite said front surface means containing second means for receiving said gripping and covering means; and  
b. gripping and covering means adapted for  
i. placement on said back surface means of said calculator body means to enable operation and holding of said calculator body means by one hand, and  
ii. placement on said front surface of said calculator body means for covering said front surface and preventing access to said keyboard means.

4,165,555

**HOOK-AND-PILE STRIPS FOR SOCKS AND THE LIKE**

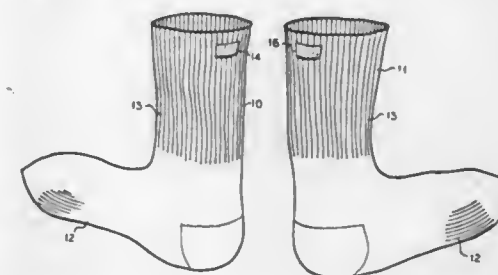
Rubin Boxer, and Robert K. Boxer, both of 564 Ricardo Ave., Santa Barbara, Calif. 93109

Continuation-in-part of Ser. No. 617,969, Sep. 29, 1975, abandoned, and Ser. No. 632,818, Nov. 17, 1975, Pat. No. 4,058,853. This application Oct. 3, 1977, Ser. No. 838,827

Int. Cl.<sup>2</sup> A44B 13/00

U.S. Cl. 24—204

3 Claims



1. A flexible strip for supplying hook-and-pile patch pairs that engage complementary pile-and-hook pairs for fastening pairs of clothing items together, comprising:

- a flat strip of flexible backing material having edges and opposite surfaces;
  - a first single longitudinal area on one surface of said backing material having pile structures disposed thereon;
  - a second single longitudinal area parallel to and on the same surface of said backing material, said second area having hook structures disposed thereon;
  - clear tab areas on both surfaces along at least one common edge, said areas being free of structures;
  - a flexible, hinge area free of said hook and pile structures between said first and second areas;
  - and a flexible, adhesive material disposed on that part of the other surface of the flexible backing material that is back of at least one of the first or second area furthest from said tab area;
- said hook-and-pile pairs being formed by cutting the strip transversely, and said clear area acting as a tab for pulling the hook and pile apart.

4,165,556

**METHOD FOR MANUFACTURING SUEDE-LIKE ARTIFICIAL LEATHERS**

Takeshi Nishida, Ibaragi; Masao Morioka, Sabae; Tetsuro Ohta, Joyo, and Yukio Yamakawa, Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Division of Ser. No. 745,851, Nov. 29, 1976, Pat. No. 4,073,988, which is a division of Ser. No. 546,873, Feb. 4, 1975, abandoned.

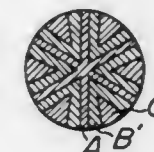
This application Nov. 25, 1977, Ser. No. 854,806

Claims priority, application Japan, Feb. 8, 1974, 49-16429; Dec. 18, 1974, 49-146170

Int. Cl.<sup>2</sup> B29H 7/18

U.S. Cl. 28—162

15 Claims



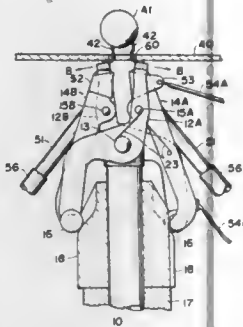
1. A method for manufacturing an artificial leather having a suede-like texture, which comprises the steps of immersing (1) a fabric selected from the group consisting of pile woven fabrics, raised woven fabrics, pile knitted fabrics and raised knitted fabrics, said fabric consisting of a substrate having piles projecting therefrom and uniformly distributed over the entire surface of the substrate at a high density, said piles having a length of 0.5 to 4.0

mm, said piles consisting essentially of composite filaments consisting of synthetic polymers having mutually low adhesive affinity to each other, said composite filaments in transverse cross-section consisting of at least three integral layers (A) of one polymer wherein said layers diverge from each other substantially radially in the outward direction and extend to the perimeter of the filament and the spaces between said layers are filled with either segments (B) of another polymer or concave segments (B') of said another polymer the concavities of which are filled with segments (C) of a different polymer, wherein all of the polymers extend to the perimeter of the filament, in (2) an aqueous solution or emulsion of chemical effective to swell said polymers and to shrink said fabric, at a temperature of from higher than 5° C. to 120° C., until said fabric is reduced from 10 to 40% in area and said composite filaments are fibrillated, then impregnating said fabric with a solution or an emulsion of a substantially microporous synthetic polymer so as to impregnate said fabric with from 3 to 40 percent by weight of said substantially microporous synthetic polymer, based on the weight of said fabric, then coagulating said substantially microporous synthetic polymer, then buffing said piles to transform same to napped piles consisting of uniformly dispersed separate very fine fibrils of (A) and (B) or (A), (B') and (C) having a nap fibril denier of from 0.05 to 1 denier and a nap fibril length of from 0.2 to 3.0 mm.

**4,165,557**  
**APPARATUS FOR TRIMMING AND SECURING**  
**ELECTRONIC COMPONENTS INSERTED INTO A**  
**PRINTED CIRCUIT SUBSTRATE**

Yoshinobu Taguchi; Kotaro Harigane, and Tetsuro Ito, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1977, Ser. No. 860,415  
Claims priority, application Japan, Dec. 13, 1976, 51-148712; Feb. 12, 1977, 52-16052[U]; Feb. 14, 1977, 52-15659[U]  
Int. Cl.<sup>2</sup> B23P 23/00; B23Q 41/00; B21F 1/00  
U.S. Cl. 29—566.3 16 Claims



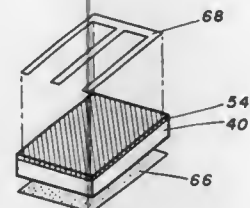
1. An apparatus for trimming and securing leads of a parallel lead electronic component to a circuit substrate by cutting and bending the leads of the component inserted into the substrate comprising:  
a base;  
driving means mounted on said base and adapted to be reciprocally displaced between a first position away from said substrate and a second position towards said substrate;  
bending means mounted on said driving means for bending said leads;  
cutting means mounted on said bending means for cutting said leads; and  
cam means mounted on said driving means and engageable with said cutting means and said bending means for actuation of said cutting means and said bending means in response to displacement of said driving means, said cam

means including cutting cam means and bending cam means on the driving means, said cutting cam means adapted to selectively engage said cutting means for actuation of said cutting means and said bending cam means adapted to selectively engage said bending means for actuation of said bending means.

**4,165,558**  
**FABRICATION OF PHOTOVOLTAIC DEVICES BY**  
**SOLID PHASE EPITAXY**

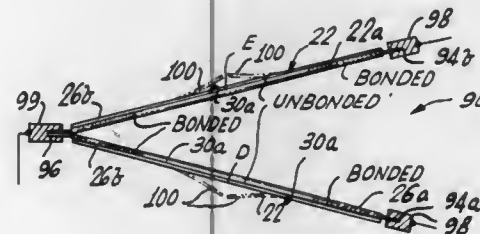
William F. Armitage, Jr., 5 Baron Park La., Apt. 37, Burlington, Mass. 01803, and Everett E. Crisman, 8 East St., Providence, R.I. 02906

Filed Nov. 21, 1977, Ser. No. 853,325  
Int. Cl.<sup>2</sup> H01L 21/20, 21/24  
U.S. Cl. 29—572 7 Claims



1. A method of forming a photovoltaic semiconductor device, comprising the steps of:  
providing a semiconductor substrate of a given conductivity type having at least one substantially flat surface;  
depositing a composite of metal and semiconductor on said flat surface, said composite containing dopant impurities capable of rendering the semiconductor of said composite opposite in conductivity type to said given conductivity type;  
heating said semiconductor substrate and composite to a temperature, less than the melting temperature of said composite, sufficient to cause said semiconductor of said composite to epitaxially grow on said semiconductor substrate as a layer of opposite conductivity type to said given conductivity type; and  
selectively stripping away the residual of said composite to leave a grid of said residual in ohmic contact with said layer of opposite conductivity type.

**4,165,559**  
**RE-FORMABLE MULTI-CONDUCTOR FLAT CABLE**  
Roger J. Lang, and Gary E. Lang, both of Garden Grove, Calif., assignors to Eltra Corporation, Toledo, Ohio  
Division of Ser. No. 736,309, Oct. 28, 1976, Pat. No. 4,113,335.  
This application May 1, 1978, Ser. No. 901,313  
Int. Cl.<sup>2</sup> H02G 15/00  
U.S. Cl. 29—629 8 Claims

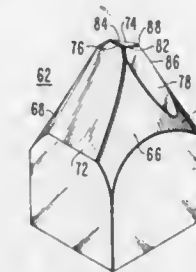


1. A method of making multi-conductor cable units, which comprises:  
aligning a plurality of laterally spaced longitudinally extend-

ing insulated multiple conductors along one side of a single plastic film, intermittently bonding said laterally spaced conductors to said film to form a main cable having transversely extending segments of film peelably bonded to said laterally spaced conductors alternating with transversely extending segments of film which are not bonded to said laterally spaced multiple conductors, and severing said main cable within a plurality of peelably bonded segments to form a plurality of cable units.

**4,165,560**  
**METHOD FOR MANUFACTURING A DIAMOND**  
**STYLUS FOR VIDEO DISC PLAYERS**  
Yasushi Matsumoto, Narashino, Japan, assignor to RCA Corporation, New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,028  
Claims priority, application United Kingdom, Sep. 13, 1976, 37852/76  
Int. Cl.<sup>2</sup> G11B 3/70, 3/44; H04N 5/76  
U.S. Cl. 29—630 R 13 Claims

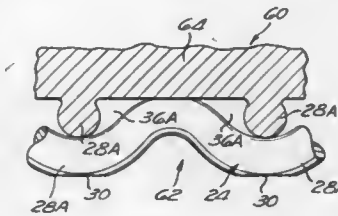


1. A method for forming a pickup stylus for playing back prerecorded signals from a disc record by modifying a stylus element; said method comprising the steps of:  
(A) forming a tip having a conical surface at one end of said stylus element; said conical tip having an axis;  
(B) forming a substantially flat, non-record-engaging surface in the region of said tip;  
(C) forming substantially flat, record-engaging surface substantially orthogonal to said non-record-engaging surface in said tip region such that said flat surfaces intersect each other along a line substantially perpendicular to said axis and forming the base edge of said record-engaging surface; and  
(D) forming a pair of converging, substantially flat surfaces in the region of said tip such that the intersection of said converging flat surfaces with said record-engaging surface defines the sides of said record-engaging surface.

**4,165,561**  
**ORTHODONTIC APPLIANCE WITH POROUS**  
**TOOTH-ABUTTING FACE**  
Frank R. Miller, Azusa; Craig A. Andreiko, Pasadena, and Kenneth W. Premo, Fullerton, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.  
Division of Ser. No. 802,011, Jun. 1, 1977, Pat. No. 4,068,379, which is a continuation-in-part of Ser. No. 779,056, Mar. 18, 1977, which is a continuation-in-part of Ser. No. 677,412, Apr. 15, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,376  
Int. Cl.<sup>2</sup> A61C 7/00  
U.S. Cl. 32—14 A 7 Claims

1. Apparatus for use in the practice of orthodontics by being fixed to a tooth by means of an adhesive comprising:  
a base having a first portion which is porous with interstitial passages and an outer tooth-contour conforming face and a second co-extensive portion which is non-porous, said first portion terminating in said second portion,  
said second portion having an orthodontic appliance extending outwardly therefrom remote from said first portion;

and in which the first and second portions are formed simultaneously by casting, whereby said adhesive may



enter the porous tooth-abutting surface portion but cannot pass through the base to reach the orthodontic appliance.

**4,165,562**  
**PRECISION ENDODONTIC FILE**  
David E. Sarfatti, 1520 Spruce St., Apt. 907, Philadelphia, Pa. 19102

Filed Aug. 12, 1977, Ser. No. 824,158  
Int. Cl.<sup>2</sup> A61C 5/02  
U.S. Cl. 32—57 21 Claims



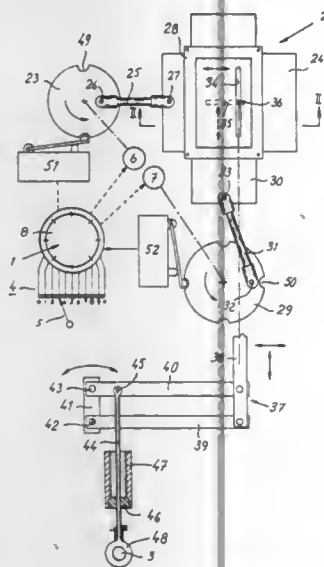
1. A precision endodontic file, comprising:  
sleeve means;  
base means disposed in said sleeve means;  
means for adjusting the relative position of said sleeve means and said base means, the adjustment means including locking means;  
an endodontic file affixed to said base means and extending beyond said sleeve means; and  
cover means positively and removably engaging said sleeve means and overfitting said file, said cover means including scale means for directly adjusting the extension of said file beyond said sleeve means, prior to removal of said cover and use of said file.

**4,165,563**  
**AUTOMATIC PILOT APPARATUS FOR A PRINTER**  
Bert I. Harju, Södertälje, Sweden, assignor to Södertälje Tekniska Ide Produkter Aktiebolag, Södertälje, Sweden  
Filed May 5, 1977, Ser. No. 794,118  
Claims priority, application Sweden, May 7, 1976, 7605239  
Int. Cl.<sup>2</sup> B43L 13/00  
U.S. Cl. 33—18 R 16 Claims

4. Automatic pilot apparatus for a printer comprising:  
a program mill;  
a guide unit connected to said program mill;



printing means moveable by said guide unit;  
a first motor for moving said guide unit in either direction along a first guide path;  
a second motor for moving said guide unit in either direction along a second guide path perpendicular to said first guide path;  
said guide unit comprising two guide plates moveably mounted in a fixed guide such that the plates are moveable in said first and second guide paths perpendicular to one another, each guide plate including a slot, said guide plates being positioned such that said slots overlap and provide, at the point where the slots cross one another, a guide point for transferring & printing movement from said guide plates to said printing means;



a first rotatable cam disc driven by said first motor for effecting reciprocating movement of a first of said two guide plates in said first guide path;  
a second rotatable cam disc driven by said second motor for effecting reciprocating movement of the second of said two guide plates in said second guide path;  
each of said first and second rotatable cam discs and its respective drive motor being connected to said program mill such that the guide plates are moved individually or concurrently in dependence upon said first and second rotatable cam discs in a sequence which is determined by the program mill such that said guide point is moved in a path corresponding to the sign which is intended to be printed.

4,165,564

## ENCAPSULATED MEASURING DEVICE

Horst Burkhardt, Truchtlaching, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,784

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712096

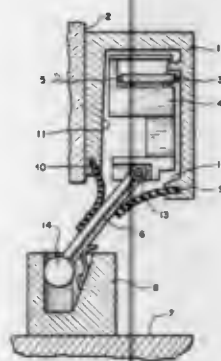
Int. Cl.<sup>2</sup> G01B 11/00, 5/00

U.S. Cl. 33—125 C

4 Claims

1. In an encapsulated measuring device including a hollow body, a scale disposed within the hollow body and defining a measuring direction, a sensing unit disposed to move along the scale within the hollow body, entrainment means resistant to bending in the measuring direction and secured to the sensing unit so as to extend out of the hollow body, and sealing members defining an effective sealing surface between the hollow body and the entrainment means, said sealing members arranged so that the effective sealing surface extends beneath the lowermost portion of the inner surfaces of the hollow body for

a predetermined range of mounting positions, the improvement comprising:



means for articulating the entrainment means transversely to the measuring direction to adjust the angle of inclination at which the entrainment means extends through the sealing members.

4,165,565

## FOOD METER

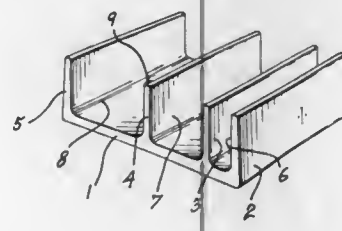
Michel Cloutier, Yves Doucet, both of Nicolet; Gilles Jutra, Baieville, and Pierre Gagne, Nicolet, all of Canada

Filed Dec. 23, 1977, Ser. No. 864,041

Int. Cl.<sup>2</sup> G01F 19/00, 11/28

U.S. Cl. 33—174 T

1 Claim



1. A food meter comprising a base and at least four upstanding, spaced, substantially parallel walls of substantially equal height defining three compartments, said base and said walls being generally rectangular in the horizontal and vertical planes respectively, said compartments being fully open at the top and at both ends, said walls having top edges lying in a plane substantially parallel to the plane of said base, the surfaces of each compartment as defined by said base and two associated walls being smooth and free of any protrusion including the edges of said base and walls, said walls being progressively spaced apart two-by-two and defining compartments of progressive widths, the two wider compartments being two and three times, respectively, the width of the narrowest compartment, whereby uncooked rigid spaghetti-like pasta or similar rod-like rigid food may be inserted in anyone compartment longitudinally of the latter with the end portions of the rod-like food protruding from the open ends of the compartment, the rod-like food being in contact with the entire surfaces of said compartment, the latter measuring a precise quantity of such rod-like food when the latter fills the compartment and is flush with the top edges of the two walls of anyone compartment.

4,165,566

## OFFSET GAGING DEVICE INCORPORATING A DEPTH MEASURE FOR BORES OR SHOULDERS

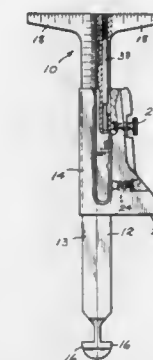
Goodwin A. Lycan, P.O. Box 23, Stevensville, Mich. 49127

Filed Apr. 17, 1978, Ser. No. 896,807

Int. Cl.<sup>2</sup> G01B 3/20, 3/28

U.S. Cl. 33—174 R

7 Claims



1. In a gage for measuring the offset of two structural members positioned end to end, said gage including parallel first and second bar members having mutually contacting side faces which extend longitudinally of the bar members, a retainer part joining said bar members with said first bar member and retainer part being shiftable relative to each other, said first bar member being shiftable lengthwise relative to said second bar member over the contacting side faces thereof, contact means carried by said first and second bar members for engagement with said structural members whereby the offset of the structural members is indicated by the relative lengthwise position of the bar members, the improvement wherein said first bar member includes an end face, a bore formed in said first bar member extending lengthwise of the bar member from said end face thereof, a pin carried within said bore and being shiftable therein between an extended position in which one end portion of the pin protrudes beyond said bar member end face to provide a depth measurement and a retracted position in which said pin one end portion is flush with said bar member end face, said retainer part including means for engaging said pin to shift said pin from its retracted position into its extended position as said retainer part shifts relative to said first bar member, said pin engaging means of the retainer part having a release position permitting movement of said first bar member and pin relative to said retainer part and a securement position connecting said pin and retainer part for joint movement relative to said first bar member.

4,165,567

## CHECKING AND MEASUREMENT DEVICE FOR AUTOMOBILE CHASSIS

Conny E. Olsson, Trangsund, Sweden, assignor to Bilskadecenter I Stockholm AB, Trangsund, Sweden

Filed Nov. 16, 1977, Ser. No. 851,923

Claims priority, application Sweden, Nov. 23, 1976, 7613070

Int. Cl.<sup>2</sup> G01B 5/25

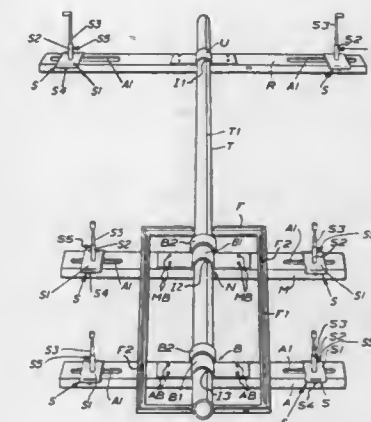
U.S. Cl. 33—288

5 Claims

1. A checking and measurement device for a vehicle chassis, comprising, in combination:

a central, longitudinal datum member adapted to be suspended in a longitudinal direction below a vehicle chassis to be checked and measured,  
a plurality of measurement scale carriers each comprising a rigid transversely extending measurement bar having a central portion and opposite end portions, said central and opposite end portions having a common axis,  
means for detachably and adjustably mounting each of said measurement bars at the central portion thereof on said central datum member with said end portions of said measurement bars extending in opposite, transversely

extending directions from said central datum member in perpendicular relationship therewith, said mounting means being adapted for adjustable mounting of said measurement bars in longitudinal spaced positions along said central datum member in accordance with the spaced positions of measurement points in the vehicle chassis for measuring in the longitudinal direction thereof,  
a plurality of measurement rods on said measurement bars each having upper and lower ends,  
cooperating mounting means on the lower end of each of said measurement rods and on each end portion of each of said measurement bars for detachable and adjustable mounting of said lower end of said measurement rods on said end portions of said each measurement bar for selective adjustment therealong in accordance with the position of a corresponding measurement point in the vehicle chassis for measurement in the transverse direction thereof, each of said measurement rods having means for adjusting the length thereof,



means on the upper end of each of said measurement rods for fixing and centering said measuring rod to a measurement point in the vehicle chassis in a suspended position, each of said measurement rods further having a universal joint means for permitting self-adjustment of said measurement rod in relation to the vertical when said rod is fixed at its upper end to said measurement point in the vehicle chassis and at its lower end to said measurement bar wherein said mounting means for mounting each of said measurement bars on said central datum member comprises a clamping means and means for securing said clamping means on a corresponding measurement bar and for clamping said clamping means on said datum member, said datum member having a longitudinal axis which forms a reference axis for a reference plane (zero plane) for measurement purposes, said datum member having a longitudinal reference line means and each of said clamping means having a reference mark for reading-off the angular position thereof relative to said datum member as well as the longitudinal position thereof along said datum member.

4,165,568

## PROCESS FOR PUTTING PHASES IN CONTACT AND DEVICE FOR CARRYING OUT THE PROCESS

Henri Gilbert, and Jean-Louis Baxerres, both of Montpellier, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 17, 1977, Ser. No. 852,481

Claims priority, application France, Nov. 17, 1976, 76 34846

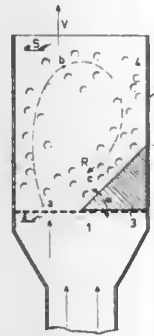
Int. Cl.<sup>2</sup> F26B 3/08; F27B 15/00

U.S. Cl. 34—10

20 Claims

1. A process for putting phases into intimate contact wherein at least one of the phases is in the form of a particulate solid and at least one other phase is a fluid comprising:

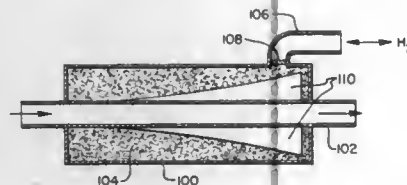
providing a chamber having a fluid distributor at its base and including at least one circulation cell formed by a conduit having a cross sectional area  $S$  and at least one baffle at the base of said cell, said baffle being arranged asymmetrically in relation to the axis of said conduit and inclined from the horizontal at an angle at least as great as the natural slope angle of said particulate solid, said at least one baffle defining an opening into said cell having an area  $s$  defined by  $0.12 \leq s/S \leq 0.60$ ,



feeding into said cell said particulate product having a granulometry of at least 1 mm at a sufficient quantity so as to establish a maximum height of said product in said cell approximately equal to the height  $H_c$  of said baffle, causing said fluid to flow through said opening into said cell at a velocity  $V$  at least equal to the minimum fluidization velocity  $V_{mf}$  of said particulate product and less than the pneumatic transport velocity  $V_t$  of said particulate product.

#### 4,165,569 HYDRIDE STORAGE AND HEAT EXCHANGER SYSTEM AND METHOD

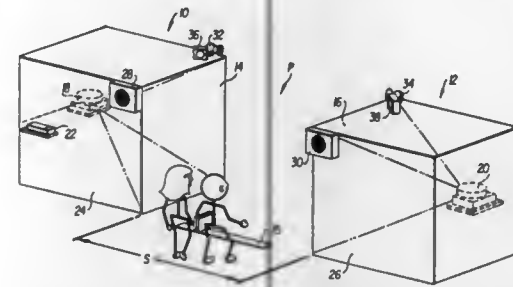
Donald B. Mackay, Spanish Fork, Utah, assignor to Billings Energy Corporation, Provo, Utah  
Division of Ser. No. 781,371, Mar. 25, 1977, abandoned, which is a continuation of Ser. No. 570,268, Apr. 21, 1975, abandoned.  
This application Mar. 6, 1978, Ser. No. 883,905  
Int. Cl.<sup>2</sup> F26B 5/04; F17C 11/00  
U.S. Cl. 34—15 6 Claims



1. A hydride storage and heat exchanger system comprising: an elongate, cylindrical container for holding hydride material; elongate, cylindrical heat transfer means having one side thereof in contact with said hydride material and adapted to be contacted on the other side thereof with a heat exchange fluid, said heat transfer means having a plurality of fins disposed longitudinally along the side thereof in contact with said hydride material, said fins extending outwardly from said heat transfer means in intimate contact with said hydride material; means for introducing hydrogen into and receiving hydrogen from said container; means for directing a heat exchange medium substantially uniformly about said other side of said heat transfer means to enable exchange of heat from the heat exchange medium to the hydride material through said heat exchange means and said fins disposed thereabout.

#### 4,165,570 PEDESTRIAN STREET AND ROAD CROSSING TRAINER AND METHOD

Alfred Crancer, Jr., 9021 Stratford La., Alexandria, Va. 22308  
Filed Jun. 2, 1978, Ser. No. 911,913  
Int. Cl.<sup>2</sup> G09B 19/00  
U.S. Cl. 35—8 A 18 Claims



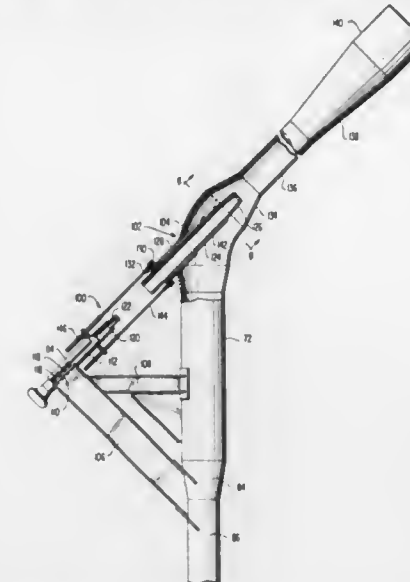
1. A method of training/testing pedestrians, especially children, in the safe transit of roadways, street intersections and the like comprising the steps of: displaying two generally confronting images of two groups of images at a spaced distance from each other, said spaced distance defining a passage for the transit of a pedestrian trainee/testee, said two groups of images including scenes corresponding substantially to respective opposite views of a roadway, at least one of the images of one group of images depicting the presence of a pedestrian danger in the roadway scene, said one image providing an indication of an unsafe crossing condition; and producing a signal perceptible to the trainee/testee when an unsafe crossing condition is indicated by said one image.

#### 4,165,571 SEA SLED WITH JET PUMP FOR UNDERWATER TRENCHING AND SLURRY REMOVAL

Nuke M. Chang, and Elmer R. Remkes, both of Orange, Calif., assignors to Santa Fe International Corporation, Orange, Calif.  
Continuation of Ser. No. 539,530, Jan. 8, 1975, abandoned, which is a division of Ser. No. 413,378, Nov. 6, 1973, Pat. No. 3,877,238. This application Dec. 30, 1976, Ser. No. 755,733  
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.  
Int. Cl.<sup>2</sup> E02F 3/88, 5/02; F04F 5/00, 5/46  
U.S. Cl. 37—62 22 Claims

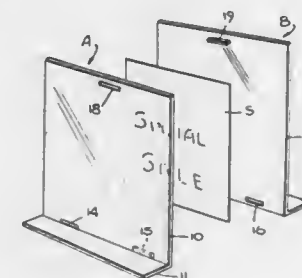
1. A device for making a trench in a sea bottom and for removing slurry formed during making such trenches, adapted for use in conjunction with a sled drawn by a vessel and moving on the sea bottom, said device comprising: at least one outlet nozzle with means for supplying high pressure water through same by means of a hose from the vessel for production of a trench by swilling; at least one suction tube having associated therewith a jet pump operated also from the same high pressure water supply used to displace slurry made up of spoil mixed with water; said jet pump comprising two nozzles which are arranged substantially coaxially in tandem with an adjustable spacing between the nozzles providing a free intermediate space which is in communication with surrounding

water in trenching operation, the forward of these nozzles being introduced from the side of such suction tube into the



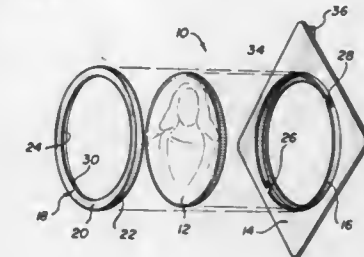
same substantially coaxially at a bent portion of the suction tube.

4,165,572  
DISPLAY STAND  
Morris Sussman, Freeport, N.Y., assignor to Shore Plastics, Inc., Freeport, N.Y.  
Filed Dec. 5, 1977, Ser. No. 857,601  
Int. Cl.<sup>2</sup> G09F 1/12  
U.S. Cl. 40—10 D 5 Claims



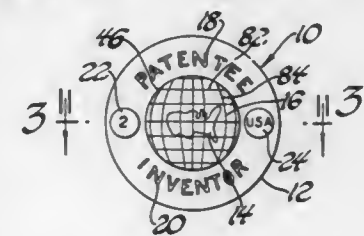
1. A display stand for a notice sheet comprising a pair of complementary pieces each formed by a transparent panel having a right-angle ledge extending from the lower end thereof, so that when the two panels are brought together to sandwich said sheet therebetween, the ledges extend in opposite directions to define a base to support the stand in an upright position, and interlocking elements just above the junction of the lower end of each panel and its ledge, said elements being in the form of a rectangular slot and a companion tongue of the same length and width, the tongue on each panel projecting in the direction opposed to the ledge direction whereby when the panels are brought together, the tongue of one fits into the slot of the other, each tongue having an edge slot making it possible to slide one panel relative to the other to interlock the panels.

4,165,573  
COIN HOLDER  
Marjorie S. Richards, 4 Ct. of Fox River Valley, Lincolnshire, Ill. 60015  
Filed Feb. 6, 1978, Ser. No. 875,216  
Int. Cl.<sup>2</sup> G09F 3/18  
U.S. Cl. 40—10 D 6 Claims



1. A coin holder for interchangeably receiving and displaying respective ones of a plurality of substantially like-size coins comprising: a decorative backing member of a pre-established configuration having on one face thereof a raised annular rim which is of a diameter and height substantially corresponding to the diameter and thickness of one of said coins, whereby said coin is removably retained therein; an annular locking ring having a top wall and a side wall, said side wall having a height and a diameter substantially corresponding to the height and diameter of said annular rim for receiving the latter therein, said top wall extending inwardly from said annular rim so as to secure a coin within said annular rim and having an opening therein for permitting a coin disposed within said annular rim to be visually observed when said locking ring is secured to said annular rim; and complimentary interlocking means on said annular rim and said side wall of said locking ring for removably securing said locking ring to said annular rim, said complimentary interlocking means comprising a pair of generally L-shaped locking slots formed in one of said annular rim and said locking ring in diametrically opposed positions and a pair of locking pins on the other one of said annular rim and said locking ring proportioned and positioned to lockingly engage within the respective ones of said locking slots, said locking pins being engaged by downwardly disposing said locking pins on one leg of said locking slots until said locking ring can be angularly rotated to engage said locking pins in the other leg of said locking slots and the angularly rotating said locking ring.

4,165,574  
PATENTEE'S FINGER RING OR EMBLEM  
Robert Sciotti, 31821 Wellston, Warren, Mich. 48093  
Filed Apr. 23, 1971, Ser. No. 136,792  
Int. Cl.<sup>2</sup> G09F 3/14  
U.S. Cl. 40—21 R 4 Claims



1. A finger ring, comprising a body having joined band, side and top portions forming an inner ring surface, said top portion being formed with a center design or ornamentation and having indicia thereon around said design or ornamentation representing any desired status of the wearer and at least one of said



side portions having a legend member thereon providing more specific additional information regarding said status indicia, said legend member being formed so as to be removably secured to said body by means cooperating with said inner surface and being free of separate fasteners so as to be replaceable when the wearer's additional information status changes, thereby bringing said legend information up-to-date, said top portion being formed with a central opening having a larger dimension at the inner surface of said top portion and a smaller dimension at the outer surface of said top portion, said center design or ornamentation comprising an element being formed so as to be receivable in said top opening and having dimensions such that it is insertable through said top opening from the inner circumference of said ring but cannot be removed from said opening from the outer diameter of said ring, each of said side portions having an opening at least at the inner surface thereof and a slot connecting said side opening with said top opening, said element being formed with a slot aligned with said side slots, said legend comprising a resilient member compressed lengthwise and having end portions received in said side openings and intermediate portions received in said slots, whereby the tendency of said resilient member to return to its free state retains said member removably secured to said body and said element removably secured to said body in proper orientation with respect thereto, said side openings extending through said sides and said ends of said resilient members receivable in said side openings having said legend formed thereon so as to be visible at the outside of said ring, said element being transparent, said intermediate portion of said member having ornamentation thereon visible through said element.

4,165,575

## ROTARY CARD FILE

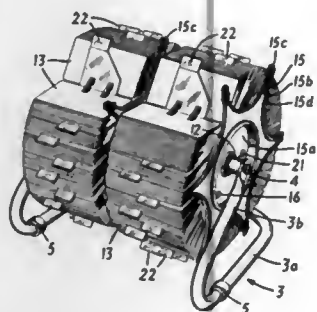
Hilda L. Neilsen, Metuchen, N.J., assignor to Rolodex Corporation, N.J.

Filed Mar. 31, 1977, Ser. No. 783,382

Int. Cl.<sup>2</sup> B42F 13/12

U.S. Cl. 40—379

11 Claims



1. A rotary card file comprising a fixed shaft, means supporting said shaft horizontally, a plurality of card holders independently rotatable on said shaft, each of said card holders having peripheral means for removably holding cards, a multiplicity of cards disposed around each said card holder and removably and hinged by said card holding means, capstan means fixedly secured to each of said card holders at one end thereof for rotation therewith in both rotational directions, said capstan means comprising a central hub portion fixed to said card holder and a plurality of spokes projecting radially from said hub portion and extending radially beyond the periphery of said card holder, said spokes being positioned for manual engagement to rotate said card holder in both rotational directions on said shaft, and brake means for exerting a braking action on each of said card holders equally in both rotational directions, said brake means comprising two brake members rotatable with said card holder and disposed with said shaft between them, said brake members frictionally gripping said shaft to retain said card holder in a position to which it has been turned by said capstan means.

4,165,576  
ADVERTISING OR DECORATIVE SIGN FOR REPRESENTING IMAGES

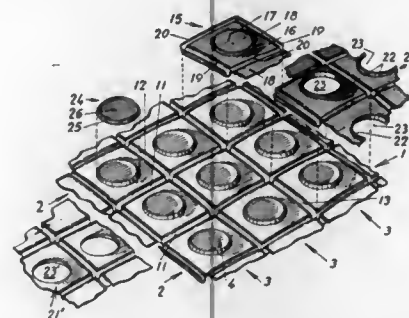
Eduardo J. Joselevich, Av. Libertador 270, Buenos Aires, Argentina (1001)

Filed Dec. 9, 1977, Ser. No. 858,961

Claims priority, application Argentina, Dec. 21, 1976, 265949 Int. Cl.<sup>2</sup> G09F 7/08, 7/14

U.S. Cl. 40—452

7 Claims



1. An advertising or decorative sign for representing images of small size, comprising at least one base member representing a first type of module which is divided into rows and columns forming a plurality of resilient basic units having elastic memory, each basic unit having a central embossed and tapered end with a front face and a surrounding sloping zone oriented according to a plane which is approximately parallel to the plane containing said front face, said sloping zone having a perimetral portion, the perimetral portion of said sloping zone ending in a first channel, and a plurality of cover plates capable of being press-fitted and at least partially covering said basic units, said plates defining second types of modules which are submultiples of said first type of module, said cover plates being likewise resilient and having elastic memory and having approximately the same shape and arrangement as said basic unit, said cover plates comprising a first series having basic units with substantially identical central embossed and tapered zones each with a front face member and a surrounding sloping zone including a perimetral portion which ends at least into a partial channel capable of entering and becoming linked to the first channel, a second series having basic units each with a central zone defining an opening and a surrounding sloped zone, having a perimetral portion which likewise ends into a channel also capable of entering and becoming linked to the first channel, a third series having only caps with a front face, each cap having a substantially identical shape to the embossed central portion of each basic unit, whereby a combination of differing ones of said series of cover plates combine with said base member to provide a display having different degrees of transparency, and support means for supporting said base member by cooperating with the perimetral channels thereof.

4,165,577

ELECTRIC BASEBOARD TRAP FOR CRAWLING INSECTS

Francis V. Shanahan, Valley Stream, and Herman H. Feller, Brooklyn, both of N.Y., assignors to Shock-M-All, Inc., Valley Stream, N.Y.

Continuation-in-part of Ser. No. 694,742, Jun. 10, 1976, abandoned. This application Nov. 26, 1976, Ser. No. 745,148

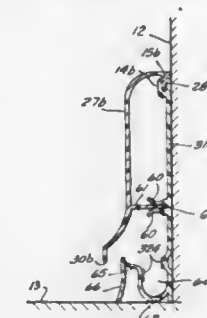
Int. Cl.<sup>2</sup> A01M 1/22

U.S. Cl. 43—112

21 Claims

1. An electric baseboard trap for crawling insects, comprising:  
(a) a flat elongated base,  
(b) means for securing said base along the bottom of a wall at the juncture between the wall and floor of a room,  
(c) a pair of spaced-apart electrical conductors mounted on said base, said conductors being spaced apart a distance

small enough such that a crawling insect can touch both conductors simultaneously,  
(d) means for providing an electrical voltage difference between said conductors,  
(e) an elongated cover extending along but spaced from said base, said cover concealing said conductors, and the lower edge of said cover being spaced from the room floor to provide access for crawling insects to said base and conductors,  
(f) means defining a well at the bottom of said base extending along the entire length of said base, said electrical conductors being above the bottom of said well and on opposite



sides of said well, so that after an insect touches both of said conductors it can fall between them into said well, and  
(g) a connector for electrically connecting the ends of said conductors to the ends of a similar pair of conductors when the ends of two bases are butted, said connector comprising a nonconductive resilient member having a pair of arms flexible toward and away from each other, each arm having a conductive portion and said connector fitting snugly within the wells of said bases and bridging the line of separation between the bases, each of said conductive portions engaging one of said conductors of each base.

4,165,578

BAITING HOOK WITH BARBED CONNECTOR

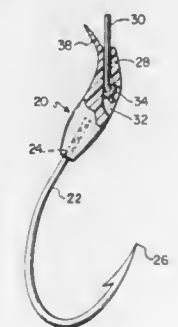
Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Filed Jan. 31, 1977, Ser. No. 764,026

Int. Cl.<sup>2</sup> A01K 83/06

U.S. Cl. 43—44.8

5 Claims



1. A hook with a connector therefor upon which bait can be threaded thereon and securely held in place, comprising:  
an elongated rod-like tubular connecting member of a resilient synthetic resin material having a diameter which does not greatly exceed the diameter of a hook shank attached thereto;  
an axial socket extending into one end of said connecting member and having a diameter slightly less than the diameter of said hook shank with a hook having a shank extending into and resiliently and firmly gripped by said axial socket;

the other end of said connecting member being adapted for connection to a fishing line; and  
at least one spur integrally formed on said connecting member and extending therefrom in a direction outward, upward and away from said hook shank, said spur being adapted to penetrate and securely hold bait threaded thereover and further defining directing means in the nature of a pivot point by which the point of said hook, upon the application of a pulling force on the shank, will have a tendency to be directed into the tissue of a fish by pivoting against the fish about said spur.

4,165,579

TOY FASHION DISPLAY MECHANISM

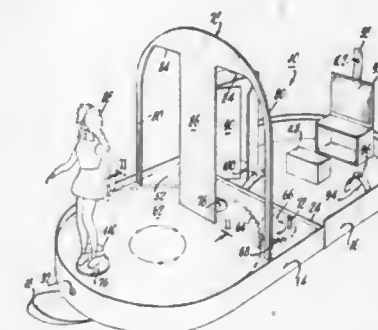
Herbert S. Chase, 1 Lincoln Plaza, New York, N.Y. 10803

Filed Aug. 29, 1977, Ser. No. 828,401

Int. Cl.<sup>2</sup> A63H 33/00

U.S. Cl. 46—13

6 Claims



1. A toy fashion display mechanism for presentation of a doll fashion show including a doll which comprises:  
portable storage means having at least two compartments, a turntable,  
means to rotate said turntable including a series of wide gears located on the circumference of said turntable, a driver gear having a depending locating post, an upwardly extending driver post on said driver gear for manual manipulation and said driver gear meshing with said wide gears to rotate said turntable  
support means secured within the first of said compartments, said support means including rigid column means to rotatably support said turntable and said turntable rotation means,  
means on said turntable to support at least one doll for display purposes including a shallow circular recess, a support stand matable into said recess and means on said support stand for engaging said doll,  
a backdrop removably mounted on the first of said compartments partially obscuring a portion of the turntable area, the backdrop having openings to allow passage of the displayed doll to the obscured area,  
the second of said compartments having means to releasably secure at least one doll, said compartment also having means to store a selection of clothing.

4,165,580

FLYING TOY

Motoshi Miura, 1127-1 Kido-cho, Ogaki-shi, Gifu-ken, Japan

Filed Oct. 27, 1977, Ser. No. 845,943

Claims priority, application Japan, Nov. 5, 1976, 51-149403[U]

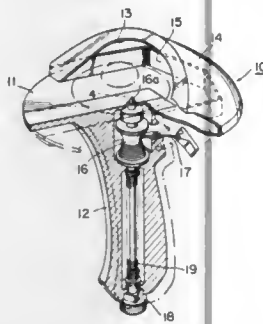
Int. Cl.<sup>2</sup> A63H 27/14

U.S. Cl. 46—74 R

8 Claims

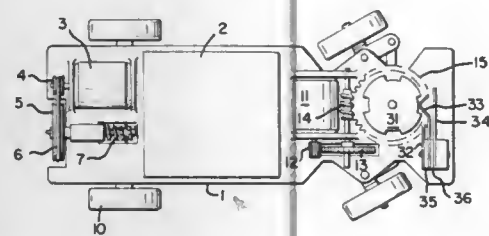
1. In a flying toy having disc-shaped or dish-shaped flying object symmetrical about an axis through the center of the disc and provided with means at the bottom thereof adapted to releasably engage a rotatable driving member of a launching device for imparting rotation to the flying object, the improve-

ment wherein said engaging means at the bottom of the flying object is located at a position offset from the axis of symmetry, the object being adapted to be rotated eccentrically about an



axis through said offset position parallel to the axis of symmetry when said means is engaged with a rotatable drive member of a launching device.

**4,165,581**  
**SOUND CONTROLLED VEHICLE**  
Tobin Wolf, 285 Ayerig Ave., Passaic, N.J. 07055  
Continuation-in-part of Ser. No. 735,998, Oct. 27, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,701  
Int. Cl.<sup>2</sup> A63H 29/22  
U.S. Cl. 46—256 52 Claims

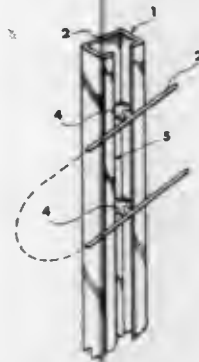


1. A remotely controlled toy having plural support elements which comprises in combination,  
(a) means defining a predetermined electrically conductive pattern,  
(b) contact means contacting said pattern,  
(c) means responsive to a signal in a predetermined frequency band for rotating said means defining, and  
(d) control means responsive to rotation of said means defining and coupled to said contact means for controlling the direction of travel of said toy.

**4,165,582**  
**SYSTEM FOR SUPPORTING PLANTS, BUSHES AND SMALL TREES**  
Frank S. Skåug, Langbølgen 23, Oslo 11, Norway  
Filed Nov. 22, 1977, Ser. No. 854,014  
Claims priority, application Norway, Nov. 26, 1976, 764050  
Int. Cl.<sup>2</sup> A01G 17/06  
U.S. Cl. 47—44 4 Claims

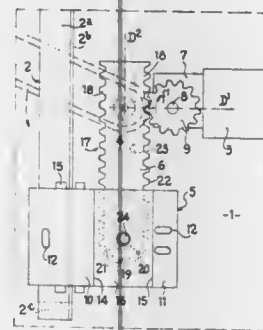
1. An apparatus for supporting articles such as plants, bushes and small trees, employing channel means formed of a C-formed cross-section suitable for attachment on a wall surface, said apparatus comprising: take up attaching means disposed on an elongated member for suspending said articles; and connecting means for the coupling of several rails to form a multiple grouping, said connecting means being further defined by a

foot member insertable into the opening of the C-form and rotatable 90° for attachment therein and a head portion for



gripping around a corresponding channel profile to cause clamping of same at an angle to the foot member.

**4,165,583**  
**WINDOW-RAISER, IN PARTICULAR FOR AUTOMOBILE VEHICLES**  
Jean-Claude Meyer, La Membrolle sur Choille, France, assignor to Compagnie Industrielle de Mecanismes, France  
Filed Jun. 1, 1978, Ser. No. 911,326  
Claims priority, application France, Jun. 6, 1977, 77 17272; Feb. 27, 1978, 78 05551  
Int. Cl.<sup>2</sup> E05F 15/16  
U.S. Cl. 49—349 19 Claims

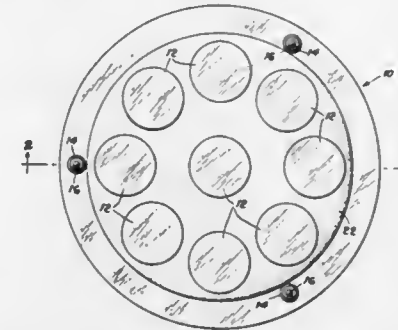


1. A window-raiser comprising a window support, guide means and actuating means for said support for displacing said support in substantially rectilinear translation, the actuating means comprising a U-shaped rack having an apex and defining a longitudinally extending slot, a pin pivotally connecting the rack in the region of the apex of the U to said support, a drive gear pinion having a fixed axis and meshed with the rack, and a fixed pivot received in the slot of the rack.

**4,165,584**  
**APPARATUS FOR LAPPING OR POLISHING MATERIALS**  
Raymond E. Scherrer, West Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.  
Division of Ser. No. 763,451, Jan. 27, 1977, Pat. No. 4,104,099.  
This application Dec. 15, 1977, Ser. No. 860,659  
Int. Cl.<sup>2</sup> B24B 7/22  
U.S. Cl. 51—131.1 7 Claims

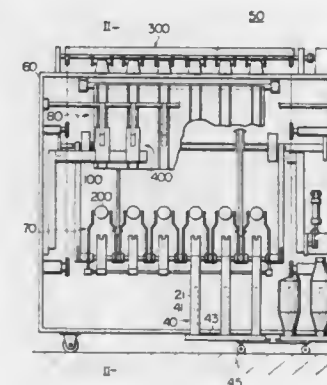
1. A lapping plate for mounting semiconductor wafers in a lapping machine, comprising:  
a body having a substantially flat upper surface;  
receiving means formed about the periphery of said body for receiving a retaining means;  
retaining means for cooperating with the receiving means

for securing a carrier sheet between the retaining means and the receiving means;  
threaded adjusting means extending upwardly from the upper surface of said body for adjusting the thickness of the semiconductor wafers;



a circular recessed surface formed about said adjusting means; and  
plug means for insertion into said recessed surface for engaging edges of openings formed in the carrier sheet and securing said edges to the body at said recessed surfaces.

**4,165,585**  
**AUTOMATIC DOFFING AND DONNING APPARATUS**  
Kinyu Ishida, Takatsuki, and Kumaichi Fukumoto, Sakai, both of Japan, assignors to Teijin Limited, Osaka, Japan  
Filed Feb. 27, 1978, Ser. No. 881,145  
Claims priority, application Japan, Jun. 3, 1977, 52/64622  
Int. Cl.<sup>2</sup> D01H 9/08  
U.S. Cl. 57—268 17 Claims

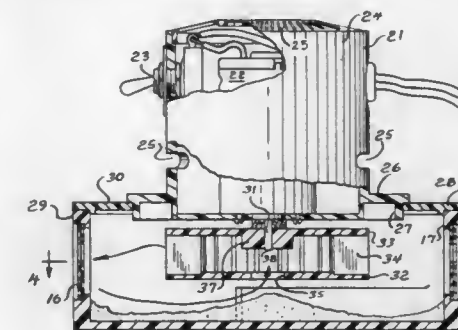


1. An automatic movable doffing and donning apparatus for replacing a plurality of full bobbins, which are mounted on winding spindles disposed parallel to each other on a yarn processing machine, with a plurality of empty bobbins, which are mounted on a bobbin reservoir means disposed along and in front of said winding spindles, wherein said apparatus comprises:

a movable frame which is horizontally movable along both said yarn processing machine and said bobbin reservoir means;  
a full bobbin doffing device mounted on said movable frame for doffing said full bobbins formed on said winding spindles and transferring them to said bobbin reservoir means, and;  
an empty bobbin donning device mounted on said movable frame, which device is provided with;  
an empty bobbin transfer means which moves said empty bobbins on said bobbin reservoir means to a stand-by position which is located outside of the operating space of said full bobbin doffing device, so that said empty

bobbins do not disturb the operation of said full bobbin doffing device, and  
a bobbin insert means which receives said empty bobbins from said empty bobbin transfer means located at said stand-by position and which inserts on said winding spindles after said full bobbins are doffed from said winding spindles by said full bobbin doffing device.

**4,165,586**  
**SPARK PLUG CLEANER AND METHOD**  
Roy A. Fricke, 1034 Ashland Ave., River Forest, Ill. 60305  
Filed Mar. 16, 1978, Ser. No. 887,257  
Int. Cl.<sup>2</sup> B24B 1/00, 3/34  
U.S. Cl. 51—412 6 Claims



1. A spark plug cleaner for directing particulate against the electrodes of a spark plug, including in combination:  
a cup-shaped blower casing having a bottom wall and sidewall therearound,  
a self-sealing spark plug holder mounted in said sidewall, said holder adapted to receive and mount a spark plug to present the electrodes of the spark plug to the interior of said blower casing,  
a cover plate mounted to said casing,  
a motor mounted on said cover plate, said motor having a vertical drive shaft extending below said cover plate,  
a closed impeller mounted to said vertical drive shaft, said closed impeller having a bottom plate with a central inlet opening and having blades adapted to engage and project particulate into contact with the exposed electrodes of the spark plug held in said holder, and  
a spiral vane mounted to said sidewall and extending inwardly in a decreasing radius along the bottom wall of said blower casing to the center of said blower casing to a position below said central inlet opening of said closed impeller, such that upon rotation of said impeller, said impeller directs particulate particles and air along said spiral vane and into said closed impeller to be directed into contact with the electrode of the spark plug to clean the same.  
6. A method of cleaning the electrodes of a spark plug, including the steps of:  
producing a circulating flow of air and particulate length a closed impeller,  
directing said air and particulate against the electrodes of a spark plug,  
dropping said air and spent particulate to a level lower than said closed impeller,  
forming particulate into a spiral pile of increasing height which terminates at a point below said closed impeller, and  
circulating said air and particulate along said spiral pile of particulate and into the interior of said closed impeller so that said air and said particulate may be directed against the electrodes of a spark plug.



4,165,587

**GRIT BLASTING APPARATUS**

Richard L. Cottingham, Uckfield, and Ralph A. Boyne, Burgess Hill, both of England, assignors to Thormack Engineering Limited, Uckfield, England

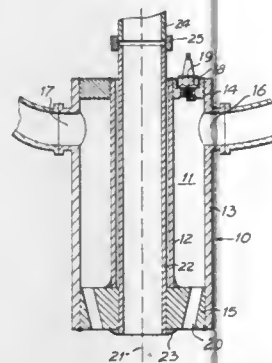
Filed Oct. 31, 1977, Ser. No. 847,150

Claims priority, application United Kingdom, Nov. 2, 1976, 45564/76

Int. Cl.<sup>2</sup> B24C 3/00

U.S. Cl. 51-428

5 Claims



1. A grit blasting apparatus comprising, in combination:
  - (a) a burner assembly including an annular combustion chamber comprising:
    - (i) an outer tubular wall;
    - (ii) an inner tubular wall;
    - (iii) a first annular end plate connected to said outer and inner tubular walls;
    - (iv) an igniter on said first end plate;
    - (v) a second annular end plate connected to said outer and inner walls;
    - (vi) at least one inlet for fuel and air to the space formed between the outer and inner tubular walls;
    - (vii) means defining an annular jet in said second end wall, whereby combustion in said combustion chamber takes place in a flashback condition in which the combustion is complete within the combustion chamber and an annular blasting jet of combustion gases leaves said combustion chamber via said jet;
  - (b) a feed pipeline extending through said inner tubular wall for feeding a stream of grit into the interior of said jet for entrainment thereby.

4,165,588

**FURNITURE UNIT**

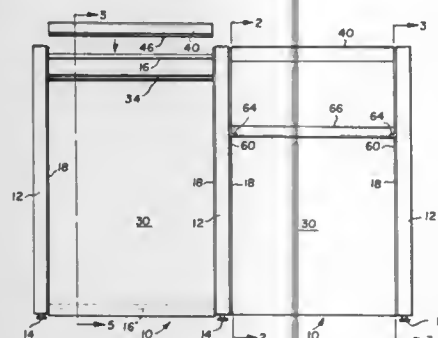
James J. Bayley, Pittsford, N.Y., assignor to Hardwood House Inc., Rochester, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,172

Int. Cl.<sup>2</sup> E04B 1/48

U.S. Cl. 52-36

8 Claims



1. A furniture unit comprising:
  - a pair of spaced posts having upper and lower end portions;
  - a lower connector member secured to the lower end portion

of each post and an upper connector member secured to the upper end portion of each post, thereby defining an open frame;

a panel located between the posts and beneath the upper connector member so that the panel is insertable into and removable from the frame after assembly of the frame;

a locking member positioned over the upper connector member; and

means for latching said locking member to said posts, said locking member and said panel having cooperating interlocking surfaces for securing the panel in its assembled position within the frame.

4,165,589

**REGLETS AND ASSOCIATED COMPONENTS**

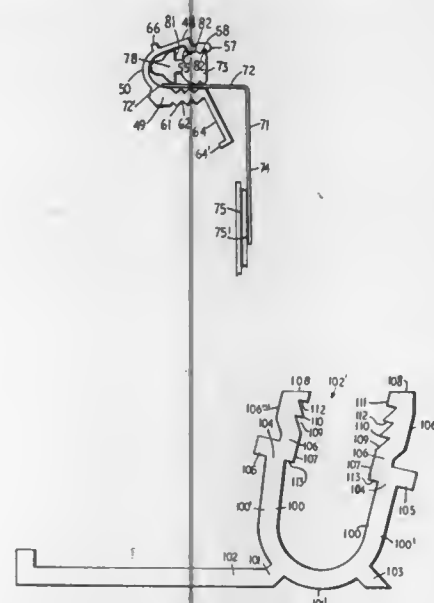
Arnold E. F. de Carteret, 16/21 Harrison St., Neutral Bay, NSW, Australia (2089)

Continuation-in-part of Ser. No. 627,352, Oct. 30, 1975. This application Apr. 5, 1977, Ser. No. 784,724

Int. Cl.<sup>2</sup> E04D 13/14; E04B 1/54

U.S. Cl. 52-61

26 Claims



1. In a weatherproofing system for a building, the combination of a reglet comprising a first wall, a second wall and a web connecting said walls along adjacent sides to form an elongate channel adapted to be secured to the wall of a building, at least one of said walls having a first elongate portion connected along one side to said web, a flange extending along the other side of said elongate portion and projecting laterally towards the other one of said walls to provide an abutment surface facing said web and an inner terminal surface facing said other wall, a second elongate portion connected along one side to said flange adjacent said terminal surface and extending outwardly of said channel in a direction substantially parallel to said other wall and having at least one groove extending along the inner surface thereof to provide at least one primary abutment surface facing towards said web, the spacing between said second elongate portion and said other wall being substantially less than the spacing between said first portion and said other wall providing said channel with a narrow mouth; and elongate protective element having a first part for covering the building part to be protected and a second part receivable through said channel mouth; and a flexibly wedge comprising a first elongate part receivable through the channel mouth into the space between said first elongate portion and said other wall, a second elongate part receivable between said second elongate portion and said other wall, and a neck portion connecting said first elongate portion to said second elongate portion.

4,165,591

**COMPONENT TYPE BUILDING CONSTRUCTION SYSTEM**

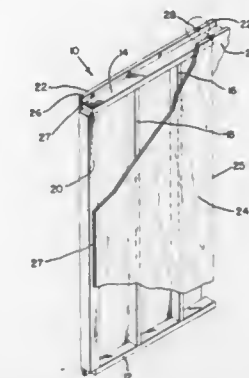
Chester M. Fitzgibbon, 837-29th Ave., S., Seattle, Wash. 98144

Filed Jun. 30, 1978, Ser. No. 921,057

Int. Cl.<sup>2</sup> E04C 1/10; E04B 2/32; E04C 2/34

U.S. Cl. 52-90

7 Claims



1. A wall components building construction system for structures having generally conventional foundation and roof construction, comprising:
  - (a) a core portion including structural frame members defining horizontal top and bottom edges and vertical end edges and also defining facing surfaces on each side,
  - (b) facing members secured to said facing surfaces to form a sandwich construction in which at least one vertical edge of said core portion of said wall component is recessed with respect to one of the vertical edges of said facing members and the other vertical core edge protrudes with respect to the other vertical edges of said facing members, said facing members including spline kerf means on each vertical edge thereof for receiving a spline member, and
  - (c) spline members for being received in said kerfs for sealing between matching abutting edges of abutting wall components.

4,165,590

**INDUSTRIAL BUILDING STRUCTURE AND METHOD OF ERECTION**

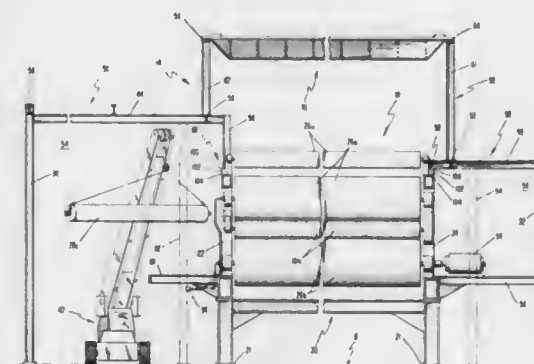
Thomas S. Bartley, Mobile, Ala., assignor to International Paper Company, New York, N.Y.

Filed Jun. 7, 1977, Ser. No. 804,243

Int. Cl.<sup>2</sup> E04B 1/346

U.S. Cl. 52-66

11 Claims



1. An industrial building structure for housing a machine and related operating equipment for protection against the weather, the machine having an anchored frame with at least two opposed, weight-bearing sides, the machine requiring operating and maintenance space at the sides of the machine, the structure comprising:
  - (a) enclosure means for the top of the machine, said top enclosure means including roof means and a building frame superstructure for supporting said roof means, said roof means including means for providing access from outside the building structure to substantially the entire machine top area bounded by the two machine frame sides, said access means permitting maintenance on the machine through said roof means, said building frame superstructure including a pair of longitudinal support members, each of said members being positioned parallel and outwardly adjacent to one of the two opposed machine weight-bearing sides and elevated with respect to the highest point on the machine, and said roof means including a plurality of edge-abutted roof sections each extending between said pair of longitudinal support members and spanning the machine and being removably attached to both immediately adjacent sections and to said longitudinal support members, each section being rotatable about 180° on at least one of a pair of axes lying along the respective abutted edges for exposing the top of the machine, and each of said sections being substantially rigid for minimizing deformation during rotation, each of said sections after rotation being supported solely by the respective one of said adjacent sections; and
  - (b) means providing for support by the machine frame sides of a substantial part of the weight of said top enclosure means, said support means including a building frame substructure for transmitting said substantial part of the weight of said top enclosure means to the machine frame weight-bearing sides and for enclosing each of the two machine frame sides along with the operating and maintenance space associated with each side.

4,165,592

**CABLE DIRECTING APPARATUS**

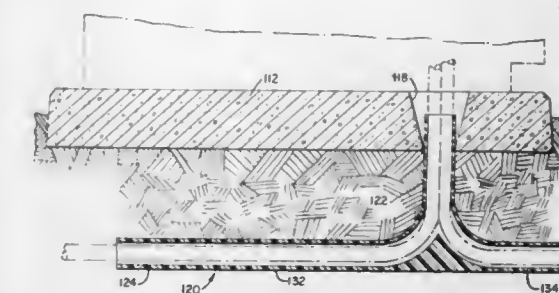
Roy L. Blankenship, 230 Manassas Dr., Manassas Park, Va. 22110

Filed Jan. 24, 1978, Ser. No. 871,842

Int. Cl.<sup>2</sup> E04B 5/48

U.S. Cl. 52-220

8 Claims



1. A one-piece, self-contained, inverted T-shaped cable directing apparatus through which electrical cables of an underground distribution system may pass from a generally horizontal plane to a generally vertical plane so as to be directed upwardly for connection with terminals of an above ground transformer comprising:
  - a hollow generally horizontal portion having a generally rectangular cross section with a flat lower surface or floor;

a hollow generally vertical portion integral with said hollow generally horizontal portion and also having a generally rectangular cross section, said hollow generally horizontal portion having one end with a first opening, said hollow generally vertical portion having an upper end with an upwardly directed opening, said hollow generally horizontal and vertical portions intersecting each other at a lower end of said generally vertical portion to provide communication between said first and second openings through said generally horizontal and vertical portions, said hollow generally horizontal portion also having a second end with a further opening, said hollow generally horizontal and vertical portions intersecting each other at said lower end of said generally vertical portion intermediate said first and second ends of said generally horizontal portion to also provide communication between said upwardly directed and said further openings through said generally vertical and horizontal portions;

an arcuate guide member extending within said generally horizontal portion and including a lower section merging into said lower surface or floor of said generally horizontal portion, said arcuate guide member extending from said lower surface or floor from both directions for about 90° and forming a first concave surface whereby any cable inserted into said first opening will upon coming into contact with said guide member be directed upwardly toward said upwardly directed opening and a second concave surface whereby any cable inserted into said further opening will upon coming into contact with said guide member be directed upwardly toward said upwardly directed opening, said hollow generally vertical portion including a first wall and a second wall extending upwardly from said hollow generally horizontal portion with said first and second walls being connected to each other by side walls on opposite sides thereof to define said hollow generally vertical portion and said upwardly directed opening, said first and second walls being spaced apart from each other to the extent that any cable segment extending therethrough may be moved toward or away from said first and second walls and said side walls being spaced apart from each other to the extent that any cable extending therethrough may be moved toward or away from either of said side walls to enable flexing of such a cable segment and thereby facilitate connection with a transformer terminal regardless of cable rigidity.

4,165,593

**PROCESS FOR ATTACHING A HANGER LOOP TO A WRAPPER SECTION CLOSED WITH A U-SHAPED CLIP**  
Herbert Niedecker, am Ellerhang 6, 6240 Königstein 2, Fed. Rep. of Germany

Filed Jan. 4, 1978, Ser. No. 866,969

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700641

Int. Cl.<sup>2</sup> B65B 61/14

U.S. Cl. 53—413

1 Claim



1. A process for attaching a hanger loop to a gathered mouth

of a tubular wrapper and for closing the mouth with a U-shaped clip, comprising pulling a thread from a supply to form a loop, both side portions of which are extended into the feed path for the clip, displacing the two side portions of the loop transversely of the longitudinal extension of the loop and then twisting them so as to cross each other and form an eyelet independent of the loop, positioning the eyelet in the feed path for the clip, advancing the clip so that one leg engages the crossing of the loop and is then moved through the eyelet, and then closing the clip around the mouth, the clip thereby securing the thread and its loop to the gathered mouth of the wrapper.

4,165,594

**PACKAGING OF A PRODUCT IN A STERILE MEDIUM**  
Yves J. Corbic, Chatou, France, assignor to Societe dite: Gatru Anstalt, Vaduz, Liechtenstein

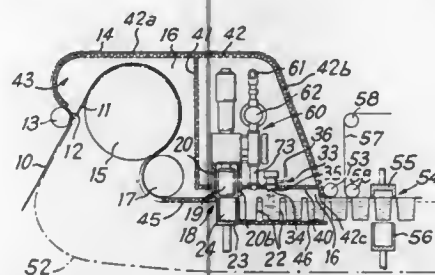
Filed May 8, 1978, Ser. No. 903,963

Claims priority, application France, May 10, 1977, 77 14286; May 16, 1977, 77 14954

Int. Cl.<sup>2</sup> B65B 55/04

U.S. Cl. 53—453

16 Claims



1. In a process for packing a product in a sterile medium wherein containers are formed in a strip of thermoplastic material by hot forming of the thermoplastic material in a forming station, the container strip being sterile at least on the side forming the inside of the containers, the formed containers being filled in a filling station, the forming and filling of the containers being made in a sterile enclosure in which a slight excess pressure prevails as compared with the non-sterile external atmosphere, and which enclosure comprises side walls and an upper wall, as well as a bottom wall constituted, at least in part, by the container strip, the filled containers being covered with a strip without their inside being able to become contaminated by the non-sterile atmosphere, at least the face of said strip facing the inside of the containers being sterile, and the cover strip being sealed on the container strip around the filling opening of each container; characterized by using a composite strip constituted by at least the container strip and the cover strip having each a sterile side isolated from outside by application on another sterile side, in seal-tight manner, at least along its sides, the sterile sides of the container strips and cover strips being made to face each other, the container strip and the cover strip are separated at the entrance to the sterile enclosure, causing the cover strip to travel along a path overhanging that of the container strip, as it passes above forming and filling stations, providing a sterile atmosphere with slight excess pressure relatively to the non-sterile outside atmosphere on the side of the sterile face, turned downwards, of the cover strip, moving the container and cover strips along walls provided with incorporated heating means by causing them to pass respectively below and above a non-sterile area containing elements of forming and filling stations, and, outside the sterile enclosure, joining the cover strip and the container strip carrying the filled containers in seal-tight manner at least along their edges.

4,165,595

**PACKAGING MACHINES**

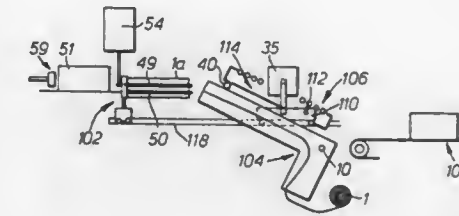
Terence W. J. Pilley, Waltham Cross; Ronald A. Smith, Modbury, and Joseph F. Middleton, New Barnet, all of England, assignors to Metal Box Limited, Reading, England

Filed Dec. 5, 1977, Ser. No. 857,577

Int. Cl.<sup>2</sup> B65B 53/00

U.S. Cl. 53—556

8 Claims



1. A packaging machine for wrapping an article or pack in a sleeve of stretch-wrap material, comprising means for receiving the sleeve of stretch-wrap material and opening it at one end, sleeve stretching means for entering the open end of the sleeve and operable to stretch the sleeve to a size sufficient to accommodate the article or pack to be wrapped by the sleeve, means for moving the article or pack relative to the stretching means so that the article or pack is accommodated within the sleeve, gripping means for gripping both the article or pack and the sleeve, and control means for moving the gripping means and stretching means relative to one another to free the sleeve wrapped article or pack from the stretching means.

4,165,596

**APPARATUS AND METHOD FOR SIMULTANEOUSLY CUTTING TWO ROWS OF CANE AND PILING FOUR ROWS OF CUT CANE ON TWO ROWS**

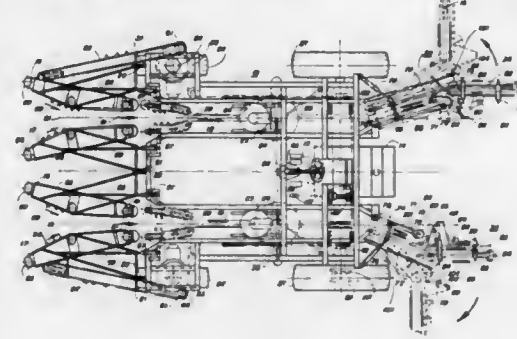
Richard A. Duncan, 123 Len Ct., Thibodeaux, La. 70301

Filed Aug. 25, 1977, Ser. No. 827,524

Int. Cl.<sup>2</sup> A01D 45/10

U.S. Cl. 56—14.3

7 Claims



1. Cane cutting and piling apparatus for harvesting cane comprising:

- a hydraulic four-wheel drive power train means having pairs of transversely spaced front and back wheels adapted to span two rows of cane including an inter-row space therebetween, with said pairs of front and back wheels engaging in inter-row spaces adjacent said two spaced rows for rolling up and down a cane field, two rows at a time, said power train means mounting opposed and oppositely rotatable cane engaging means arranged to define a pair of cane passageways through said power train means and in alignment with said spaced two rows for passing cane along said passageways;
- two pairs of cane gathering means, pivoted to a front end

of said power train means for vertically adjusting the free ends thereof, and mounting opposed and oppositely rotatable cane engaging means arranged to define a pair of cane passageways in continuation of said cane passageways of said power train means for simultaneously engaging two rows of cane therein;

- cane cutting and topping means slidably mounted for rotation in said cane passageways of said power train means for cutting and topping the cane passing there-through at adjustable heights;
- a pair of articulated piler means, pivoted to a back of said power train means for horizontally adjusting the free ends thereof in two cane discharging positions, said piler means mounting opposed and oppositely rotatable cane engaging means arranged to define a pair of cane passageways in continuation of said power train means cane passageways for simultaneously discharging and piling the cane engaged therein across the rows from which cut, in one of said two cane discharging positions, and across two adjacent rows on each side of the two rows from which the cane is cut in another of said two cane discharging positions;
- steering means mounted on said power train means for pivoting said pair of front wheels differentially in a direction of turn;
- differential speed control means mounted in said power train for adjusting speed of rotation of said cane engaging means relative to speed of rotation of said four wheel drive of the power train means in an infinite range of ratios to compensate for a windblown condition and direction of cane that affect cane gathering and pickup; and
- power means mounted in said power train means for the operation and control of all aforesaid means.

4,165,597

**CUTTER PIN FOR ROTARY MOWER**

Joseph E. Scanland, Savannah, Ga., and Gerald C. Fisher, Shelby, Ohio, assignors to Roper Corporation, Kankakee, Ill.

Continuation-in-part of Ser. No. 611,347, Sep. 8, 1975,

abandoned. This application Jan. 3, 1977, Ser. No. 756,329

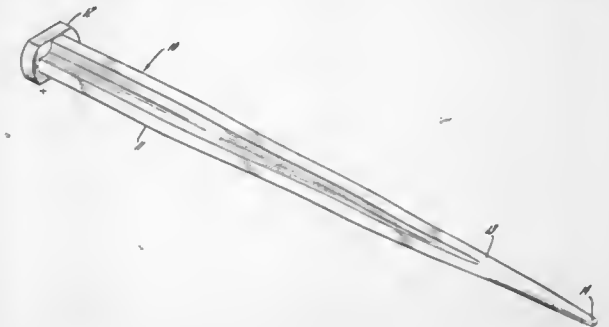
The portion of the term of this patent subsequent to Jan. 3, 1995,

has been disclaimed.

Int. Cl.<sup>2</sup> A01D 55/18

U.S. Cl. 56—295

16 Claims



1. As an article of manufacture for use in the cutter disc of a rotary lawn mower having cantilevered pin anchoring means spaced inwardly from the periphery, a cutter pin of durable resilient plastic comprising, in combination, a relatively thick shank, the shank terminating at its outer end in a relatively thin but stiffly resilient tip portion for extending outwardly from the periphery of the disc to provide a cutting edge, the shank having a head at its inner end for retaining the pin in the pin anchoring means, the pin being substantially straight and having sufficient stiffness as to be able to support itself cantilever fashion free of any drooping of the tip under its own weight and having sufficient stiffness as to maintain orientation at a downward angle during rotation notwithstanding the ten-



dency of centrifugal force to elevate the pin to the plane of its region of attachment, the pin being of tapered construction with the taper being so extensively distributed over a substantial portion of the length dimension and of such uniformity that upon striking a weighty obstruction the pin yields by bending backwardly with smoothly distributed curvature to safely wipe-by the obstruction.

4,165,598

## SELF-CLEANING RAKE

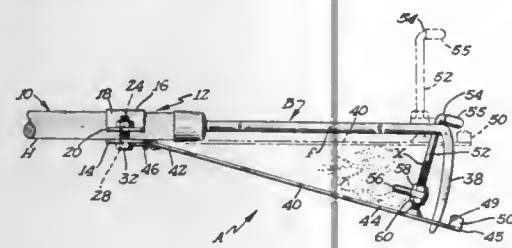
Ero A. Kutsi, 306 S. 60th Ave. W., Duluth, Minn. 55807

Filed Sep. 30, 1977, Ser. No. 838,309

Int. Cl.<sup>2</sup> A01D 7/10

U.S. Cl. 56—400.1

2 Claims



## 1. A self-cleaning rake comprising:

- (a) a rake head including a frame having a multiplicity of spaced tines extended substantially normal thereto and rigidly secured to one end of said handle,
- (b) a plate,
- (c) means pivotally mounting said plate on said handle for pivotal movement relative to said rake head and tines,
- (d) said plate formed with a multiplicity of holes through which said tines freely extend as said plate is pivotally moved to and from said rake head, and
- (e) means for limiting the pivotal movement of said plate beyond the free ends of said tines
- (f) the area of said plate being substantially that of the extent of said frame of said rake head,
- (g) said plate having weight means connected thereto to aid the downward pivotal movement of said plate for disengaging debris collected on said tines,
- (h) said means for limiting the pivotal movement of said plate including
- (i) a check bolt connected to said plate and having
- (j) a first lug for contact with said frame,
- (k) said means for limiting the pivotal movement of said plate including a second lug pivotally mounted on said check bolt for releasable engagement with said frame to selectively hold said plate in close proximity to said rake head frame to allow use of said tines independent of said plate.

4,165,599

## ARRANGEMENT FOR TWISTING OF FIBROUS MATERIAL

Ferdinand Lenorák, Bratislava, Czechoslovakia, assignor to Slovenska vedecko-technická spoločnosť, Dom techniky, Bratislava, Czechoslovakia

Filed Feb. 23, 1978, Ser. No. 880,605

Claims priority, application Czechoslovakia, Feb. 25, 1977, 1260/77; Apr. 7, 1977, 2302/77

Int. Cl.<sup>2</sup> D01H 7/86, 7/88

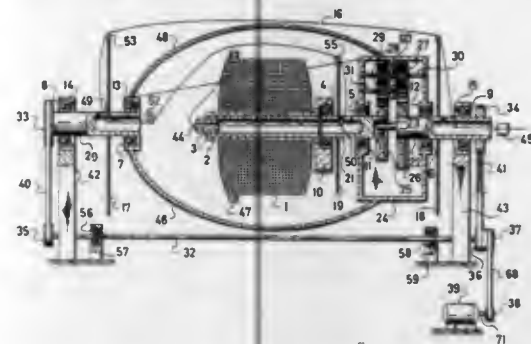
U.S. Cl. 57—58.83

6 Claims

1. An arrangement for twisting of fibrous material while moving said material along a predetermined path, comprising in combination:

- a frame,
- at least three partly hollow shafts rotatably supported within said frame, said shafts being situated one behind the other,

a carrier for the processed fibrous material mounted on each of said shafts, means for rotating said shafts, a stationary hollow support for holding a supply package of the fibrous material to be processed, said support being situated between the middle shaft and one of the outer shafts, a filament brake at one end of said hollow support, a take-up device for the processed fibrous material behind the second outer shaft,



guiding elements for the fibrous material disposed along the path of the processed fibrous material, for guiding said fibrous material from the supply package over said filament brake through the hollow support, into the hollow of the middle shaft, to the carrier fixed on said shaft, to the hollow of one of the outer shafts, to the carrier fixed on said shaft, to the carrier fixed on the other outer shaft, to the hollow of said other outer shaft and to the take-up device.

4,165,600

## APPARATUS FOR OPEN-END SPINNING OF FIBERS

Heinz Schippers; Herbert Turk, both of Remscheid; Herbert Schiminski, Hückeswagen, and Peter Dammann, Remscheid, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

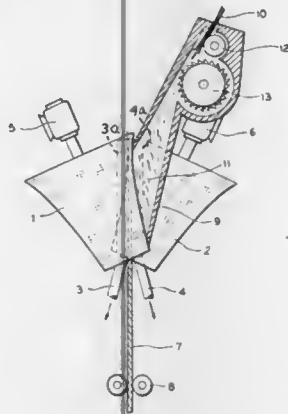
Filed Aug. 29, 1978, Ser. No. 937,798

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739410

Int. Cl.<sup>2</sup> D01H 1/12

U.S. Cl. 57—58.95

6 Claims



1. In an apparatus for the open-end spinning of fibers into a yarn which comprises a pair of rotatable bodies whose surface of revolution taper in the longitudinal direction from an end of larger diameter to an end of smaller diameter, means for rotatably driving said bodies in the same direction of rotation, said bodies being positioned to provide therebetween a narrow gap, and means for conveying individual fibers in a current of air onto said surface, for spinning into said yarn characterized by

the fact that said tapered surfaces respectively correspond to a segment of a hyperboloid of revolution, said segment being entirely on one side of the plane of symmetry of the hyperboloid of revolution, which plane is normal to the axis of rotation of said hyperboloid of revolution, said surfaces being positioned relative to each other at said gap to impart axial thrust to the yarn formed therebetween in the direction from the larger diameter end of said surfaces toward the smaller diameter end thereof.

4,165,601

## CONTROL SYSTEM FOR YARN-TYING DEVICE OF THREAD-WINDING MACHINE

Wolfgang Igel, Ebersbach, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

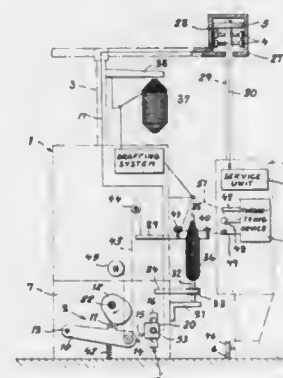
Filed Mar. 9, 1978, Ser. No. 884,808

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710442

Int. Cl.<sup>2</sup> D01H 15/00, 1/36

U.S. Cl. 57—264

10 Claims



1. In a thread-winding machine provided with an array of upright spindles surrounded by respective spinning rings forming tracks for thread-engaging travelers, a common mounting for said spinning rings vertically displaceable with reference to a machine frame, constant-stroke drive means on said machine frame coupled via a variable-length linkage with said mounting for imparting thereto a reciprocating vertical motion superimposed upon a separately generated progressive vertical shift resulting from changes in the effective length of said linkage, and monitoring means horizontally movable with reference to said machine frame along said array to check for and repair said ruptured threads,

the combination therewith of signal-generating means disposed at a horizontally fixed location on said machine frame and directly coupled with said drive means for establishing a predetermined operating interval for a unit of said monitoring means during a selected phase of a cycle of reciprocation of said mounting; independently of said vertical shift.

4,165,602

## YARN TEXTURING MACHINE

Ronald S. Eaves, Chapel-en-le-Frith, England, assignor to Ernest Seragg &amp; Sons Limited, Macclesfield, England

Continuation-in-part of Ser. No. 779,938, Mar. 21, 1977, Pat. No. 4,106,274. This application Apr. 21, 1978, Ser. No. 898,893

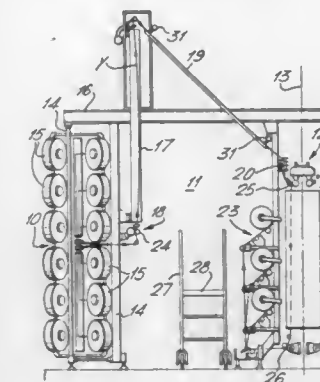
Claims priority, application United Kingdom, Mar. 23, 1976, 11595/76

Int. Cl.<sup>2</sup> D01H 13/28; D02G 1/02

U.S. Cl. 57—291

4 Claims

1. In a yarn texturing machine, a combination comprising a creel section including at least one upright row of yarn supply packages, said row having an upper and a lower end; a texturing section comprising package winders and at least one false twister, said texturing section being on the same level as and



transversely spaced from said creel section and defining therewith an operator aisle; at least one upright setting heater mounted adjacent to said creel section and having an outlet upwardly spaced from said upper end and an inlet located a substantial distance above floor level and adjacent said upper end; at least one elongated yarn stabilizing and cooling guide

spanning said aisle and extending from the vicinity of said outlet inclined down to said false twister, whereby the yarn is positively guided over substantially the entire distance from said inlet to said false twister; and at least one secondary heater provided in the texturing section to treat yarn running between the false twister and package winders.

4,165,603

## APPARATUS FOR WAXING YARN USING SOLID WAX ON A TEXTILE MACHINE

André Lattion, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

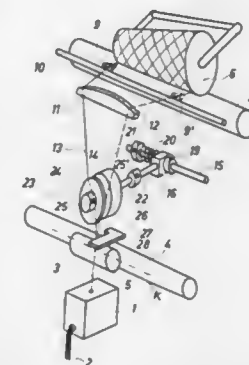
Filed May 3, 1977, Ser. No. 793,291

Claims priority, application Switzerland, May 26, 1976, 6634/76

Int. Cl.<sup>2</sup> D01H 13/30

U.S. Cl. 57—296

15 Claims



1. In combination with an open-end spinning machine from which a yarn travels through a predetermined yarn path, an apparatus for waxing a yarn in said path, said apparatus consisting of

- a guide pin pivotally mounted on a horizontal axis for movement between a working position in which said pin projects through said path on a downwardly inclined angle and an idling position in which said pin is located outside said path on an upwardly inclined angle, said pin having a longitudinal axis disposed perpendicularly of said path with said pin in said working position;
- a wax body of cylindrical shape rotatably and axially movably mounted on said guide pin; and
- a stop on said pin for determining the axial position of said wax body on said pin with said pin in said working position.

tion, said stop and said wax body being disposed on opposite sides of said path with said pin in said working position and with said wax body pressed against said stop in said working position under the weight of said wax body to deflect the yarn in said yarn path whereby a yarn is guided between a face side of said wax body and said stop for waxing of the yarn in a confined condition.

4,165,604

## SOLAR BATTERY TIMEPIECE

Osamu Matsumura, Choufu; Yutaka Kato, Kodaira; Tsunetoshi Sekiguchi, Sayama, and Ryo Namiki, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

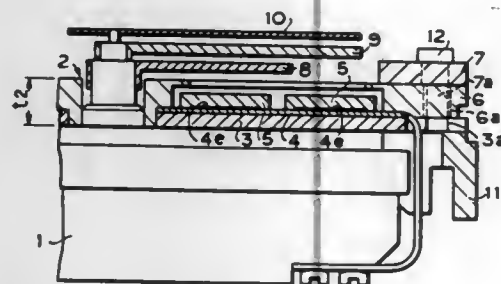
Filed Jun. 6, 1977, Ser. No. 803,775

Claims priority, application Japan, Jun. 8, 1976, 51-74938[U]; Jun. 9, 1976, 51-73694[U]; Jul. 23, 1976, 51-98458[U]; Aug. 26, 1976, 51-113446[U]; Dec. 6, 1976, 51-163327[U]

Int. Cl.<sup>2</sup> G04C 3/00

U.S. Cl. 58—23 BA

8 Claims



1. A solar battery timepiece comprising:
  - (a) a module,
  - (b) a base plate arranged on said module,
  - (c) an insulating flexible sheet having a print wiring pattern thereon and mounted on said base plate,
  - (d) a solar battery cell disposed on said insulating flexible sheet and connected to said print wiring pattern, and
  - (e) a dial ring secured to the peripheral edge of said base plate through a dial ring frame located along the peripheral edge of said base plate.

4,165,605

## ELECTRONIC TIMEPIECE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan

Filed May 27, 1977, Ser. No. 801,376

Claims priority, application Japan, May 29, 1976, 51-62751

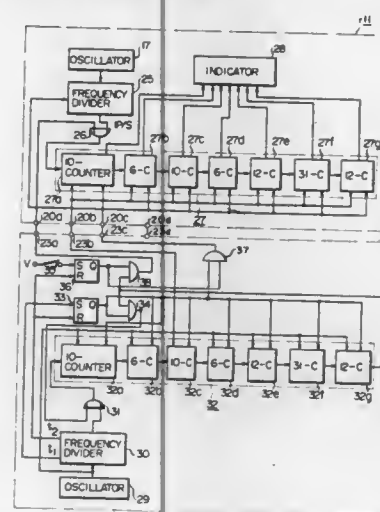
Int. Cl.<sup>2</sup> G04C 13/02

U.S. Cl. 58—24 R

16 Claims

1. An electronic timepiece comprising:
  - a reference oscillator means for generating reference clock signals;
  - count means for counting reference clock signals from said reference oscillator means to obtain a time count value;
  - an electroconductive terminal for data input which is to be connected directly to an external data supply device and

into which a preset data which is involved during setting of the time is inputted; and



a second electroconductive terminal to which is connected a control signal for writing the preset data from the external data supply device into said count means.

4,165,606

## DEVICE FOR THE AUTOMATIC OPERATION OF WEIGHT DRIVEN CLOCKS

Paul C. Müller, Herderstrasse 2, 9000 St. Gallen, Switzerland

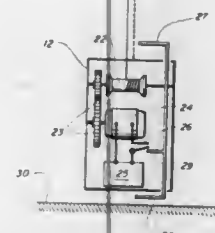
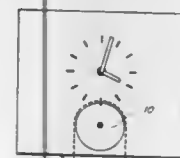
Filed May 31, 1977, Ser. No. 802,007

Claims priority, application Switzerland, May 31, 1976, 006824/76

Int. Cl.<sup>2</sup> G04B 7/00

U.S. Cl. 58—46 R

13 Claims



1. In a weight driven clock having a freely hanging winding weight, the improvement comprising: an automatic winding device comprising a driving unit inside said hanging winding weight, said driving unit having an electric motor driving a roller, said roller winding one end of a flexible pulling means, the other end of said pulling means held in the zone of the clock mechanism, and switch means actuating said motor in the zone of the lower position of the winding weight and deactuating said motor in the upper position of the winding weight thereby raising said winding weight from said lower position to said upper position.

4,165,607

## WATCH MODULE

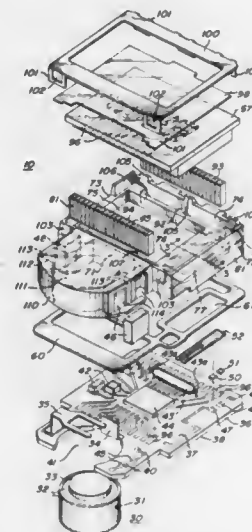
Richard J. Fedorowicz, and William P. Cegles, both of Chicago, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1977, Ser. No. 763,488

Int. Cl.<sup>2</sup> G04C 3/00, 17/00

U.S. Cl. 58—50 R

5 Claims



1. An improved integral watch module assembly comprising:
  - a chassis member formed in essentially egg-crate configuration having two sides and having upstanding peripheral walls and a central aperture, said chassis member further including a portion extending laterally inwardly from one of said walls between the upstanding extremities thereof and having a cavity therein;
  - a flat substrate adapted to be contained within said peripheral walls on one of said two sides of said chassis member and said central aperture and carrying electronic watch components and conductors thereon;
  - a piezoelectric crystal element;
  - means for mounting said piezoelectric crystal element to said substrate;
  - means for affixing said substrate to said chassis member so that the substrate and the cavity integrally form a hermetically sealed chamber for said crystal element, and
  - a digital display adapted to be contained within said peripheral walls on the other of said two sides of said chassis member and opposite said substrate.

4,165,608

## SENSOR FOR ROCKET ENGINES

Walter Diesinger, Bergisch Gladbach, and Hans-Joachim Eickmann, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 10, 1976, Ser. No. 749,423

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555934

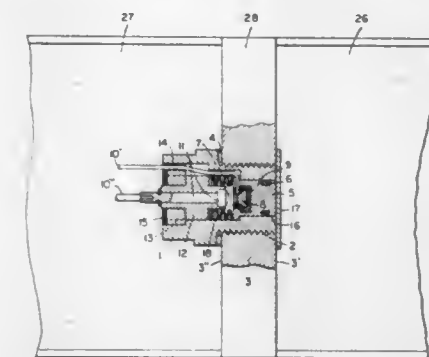
Int. Cl.<sup>2</sup> F02K 9/04

U.S. Cl. 60—245

29 Claims

29. A sensor for rocket engines having at least one combustion chamber comprising pressure-sensitive sensing means responsive to pressure in the combustion chamber, said pressure-sensitive sensing means including first and second members, said first member being movable into contact with said second member to close an electric circuit and trigger a first output signal from said pressure-sensitive sensing means for application to a control means in response to the pressure in the combustion chamber rising above a predetermined minimum pressure and said first member being movable out of contact with said second member to open said electric circuit and

trigger a second output signal from said pressure-sensitive sensing means for application to a control means in response to



the pressure in the combustion chamber dropping below a predetermined minimum pressure.

4,165,609

## GAS TURBINE MIXER APPARATUS

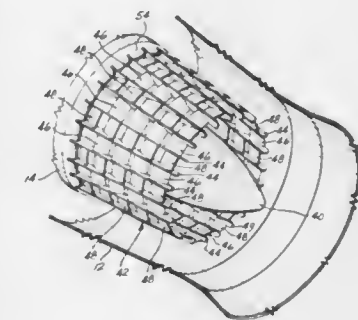
Peter K. C. Rudolph, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 2, 1977, Ser. No. 773,530

Int. Cl.<sup>2</sup> F02K 3/06

U.S. Cl. 60—262

12 Claims



1. Mixing apparatus for mixing first and second fluid streams with one another wherein said first fluid stream flows through an inner duct and said second fluid stream flows through an annular passageway formed between said inner duct and an outer duct that coaxially surrounds said inner duct, the direction of fluid flow of said first and second fluid streams substantially being in the same axial direction relative to said coaxially arranged inner and outer ducts, said outer duct extending axially in the direction of fluid flow beyond the terminus of said inner duct to define a common duct for the mixing of said first and second fluid streams, said mixing apparatus comprising:
  - an annular free mixer mountable to said terminus of said inner duct to extend in said axial direction of fluid flow, said annular free mixer having a cross-sectional geometry at the forwardmost end thereof substantially corresponding to the cross-sectional geometry of said terminus of said inner duct, said annular free mixer having a smoothly contoured terminating edge for permitting those regions in said first and second fluid streams flowing contiguous with the boundaries of said free mixer to partially mix with one another as said contiguous regions flow past said terminating edge of said free mixer;
  - a plurality of axially extending members projecting rearwardly from said terminating edge of said free mixer, said plurality of axially extending members being circumferentially spaced apart from one another along said terminating edge of said annular free mixer, said plurality of axially extending members defining a plurality of axially extend-



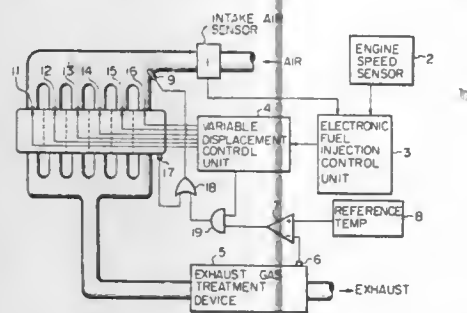
ing open regions between adjacent ones of said axially extending members, said plurality of axially extending members being configured and arranged to define the transverse cross-sectional geometry of said plurality of open regions as segments between two concentric, geometric closed curves with each of said axially extending members forming a boundary wall that separates one of said open regions from an adjacent one of said open regions to thereby collectively define said plurality of open regions;

means for inducing a component of outward radial flow of said first fluid stream through a first plurality of said axially extending open regions and for inducing a component of inward radial flow of said second fluid stream through a second plurality of said axially extending open regions, said radially induced flow of said first fluid stream penetrating into said second fluid stream and said radially induced flow of said second fluid stream penetrating into said first fluid stream, individual open regions of said first plurality of open regions for outward radial flow of said first fluid stream being interspersed in circumferential alternation with individual open regions of said second plurality of open regions for inward radial flow of said second fluid stream, said means for inducing said radial flow of said first and second fluid streams including a plurality of deflection vanes mounted transversely within individual open regions of at least one of said first and second pluralities of axially extending open regions, said plurality of deflection vanes mounted within said individual open regions to extend between adjacent ones of said circumferentially spaced-apart, axially extending members, said deflection vanes being spaced-apart from one another along said axially extending members and canted relative to the axial flow direction of said first and second fluid streams, said deflection vanes being canted to expose the forwardmost boundary of each of said deflection vanes with that one of said first and second fluid streams being induced to include a radial flow component.

**4,165,610**  
**INTERNAL COMBUSTION ENGINE WITH VARIABLE CYLINDER DISABLEMENT CONTROL**  
Haruhiko Iizuka, and Seishi Yasuhara, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 8, 1977, Ser. No. 858,860  
Claims priority, application Japan, Dec. 10, 1976, 51/164728[U]

Int. Cl.<sup>2</sup> F01N 3/15  
U.S. Cl. 60—284



1. A multicylinder internal combustion engine including an intake manifold and a fuel injector for each of the cylinders of the engine adapted when activated for discharging fuel thereto, comprising:

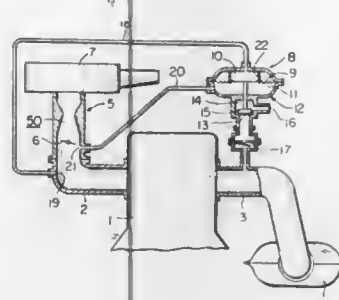
means disposed in the exhaust passage of said engine for reducing the amount of noxious components of the emissions, said reducing means being normally operable when the temperature of the emissions is in a predetermined range;

means for detecting when the level of output power required of the engine falls below a preset value;  
means for disabling certain of said fuel injectors when said power falls below said preset value, whereby air is drawn through the disabled cylinders to said reducing means resulting in a lowering of the temperature within said reducing means;  
means for providing a signal when the temperature within said reducing means falls below said normal operating temperature range; and  
means provided in said intake manifold for supplying fuel to all of said cylinders in response to said signal to thereby increase the temperature within said reducing means toward said operating range.

**4,165,611**  
**SECONDARY AIR FEEDING DEVICE FOR AN INTERNAL COMBUSTION ENGINE**  
Norikatsu Ishikawa, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 1, 1977, Ser. No. 783,768  
Claims priority, application Japan, Nov. 26, 1976, 51-141097  
Int. Cl.<sup>2</sup> F01N 3/15

U.S. Cl. 60—290

4 Claims



1. A secondary air feeding control device of an internal combustion engine which comprises an intake passage having a throttle valve therein and an exhaust passage having a catalytic converter therein, comprising:

a secondary air passage connecting the atmosphere to said exhaust passage at a position upstream of said catalytic converter, and

a secondary air control means in said secondary air passage and comprising a housing, a diaphragm in said housing, a flow rate control valve connected to said diaphragm for opening and closing to control the flow rate of secondary air flowing in said secondary air passage in accordance with movement of said diaphragm, a first and a second chamber separated by said diaphragm and defined in said housing, and a resilient member disposed in said housing for urging said diaphragm towards said second chamber in a valve closing direction, said first chamber being directly fluidly connected to said intake passage for controlling the amount of secondary air fed into said exhaust passage in response to a change in vacuum level in said intake passage, said second chamber being fluidly connected to a port which opens into said intake passage at a position downstream of the throttle valve when the throttle is in a fully closed idling position, but opens into said intake passage at a position upstream of said throttle valve when said throttle valve is opened whereby, when the engine is running with the throttle valve open, vacuum in said intake passage is transmitted to the first chamber and substantially atmospheric pressure is transmitted from said port to said second chamber to open said valve against the urging of said resilient member for feeding secondary air to the exhaust passage and, when the engine is idling with the throttle valve in its fully closed idling position, vacuum in said intake passage is transmitted to said first chamber and through said port to said second chamber so that

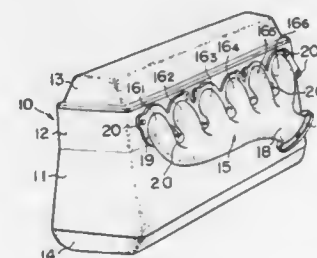
the valve is closed by the urging of the resilient member for stopping the feeding operation of secondary air at the time of idling.

**4,165,612**  
**STRUCTURE FOR MOUNTING AN EXHAUST MANIFOLD TO THE BODY OF AN INTERNAL COMBUSTION ENGINE**  
Yasuo Fujioka, Toyota, and Kenichi Nakano, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 13, 1977, Ser. No. 860,165  
Claims priority, application Japan, Sep. 19, 1977, 52-112441  
Int. Cl.<sup>2</sup> F01N 7/10

U.S. Cl. 60—322

3 Claims



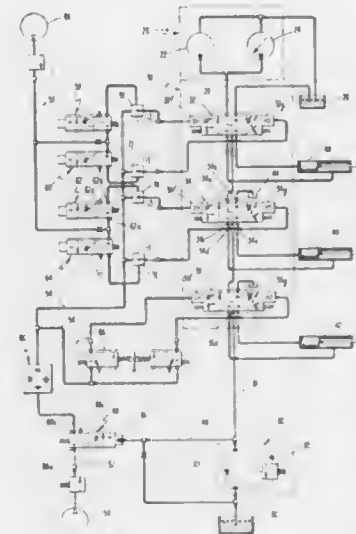
1. A structure for mounting an exhaust manifold to the body of an internal combustion engine, said manifold having a plurality of branch tubular portions and a continuous strip-like flange portion which joins the free end portions of said branch tubular portions, wherein mounting bolts are provided so as to fasten only opposite end portions of said strip-like flange portion to the body of the engine.

**4,165,613**  
**CONTROL APPARATUS FOR A PLURALITY OF SIMULTANEOUSLY ACTUATABLE FLUID MOTORS**  
Gerald W. Bernhoff, Wauwatosa, and Thomas J. Limbach, Milwaukee, both of Wis., assignors to Koehring Company, Brookfield, Wis.

Filed Mar. 27, 1978, Ser. No. 890,229  
Int. Cl.<sup>2</sup> F15B 13/06, 13/09

U.S. Cl. 60—420

10 Claims



1. Control apparatus for proportioning a supply of fluid between a plurality of fluid actuators having a combined flow rate capacity exceeding the available flow rate of the fluid supply comprising:  
fluid source means operable to supply pressurized fluid,

having a minimum output flow rate greater than zero flow and a maximum output flow rate;

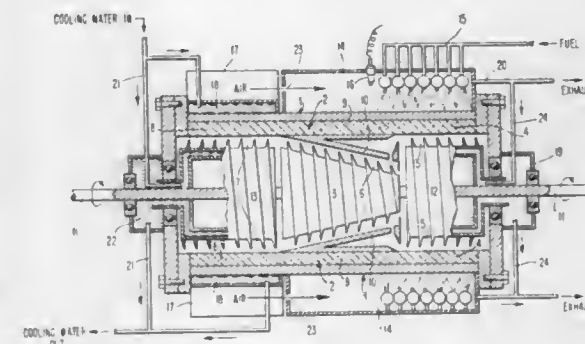
a plurality of fluid power valves connected in series-type fluid communication with the fluid source means, having a combined flow rate capacity exceeding the maximum output flow rate, each valve being pilot operated and constructed so that pressurized fluid moves downstream through the valve when the valve is in a neutral position; pilot pressure source means operable to supply pressurized pilot fluid at a predetermined pressure;  
a plurality of pilot control valves, each pilot control valve being in communication with the pilot pressure source means and a corresponding one of the plurality of fluid power valves, and operable to actuate the corresponding fluid power valve in response to movement of the pilot control valve; and  
sensing means operable to sense the flow rate of fluid exhausting from the plurality of fluid power valves and to effect a reduction in the predetermined actuation pressure when the sensed flow rate is below a preselected value, the reduced actuation pressure being operable to lower the flow rate required by the plurality of fluid power valves to the maximum output flow rate available so as to proportion the available flow between the plurality of fluid power valves.

**4,165,614**  
**SELF-CONTAINED VAPOR-POWER PLANT REQUIRING A SINGLE MOVING-PART**  
George C. Yeh, Smedley Dr., R.D. #1, Newton Square, Pa. 19073

Filed Mar. 1, 1973, Ser. No. 337,084  
Int. Cl.<sup>2</sup> F01K 11/02, 21/00

U.S. Cl. 60—531

3 Claims



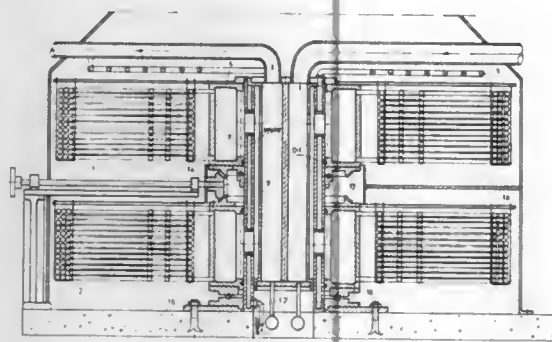
1. A vapor-power plant comprising: a body; wall means defining an enclosed space within said body, and across which heat and work flow; a porous structure adjoining the inside surface of at least a portion of said wall means and containing continuous capillary passages, said continuous capillary passages being open at least in part to said enclosed space in at least two separated areas; a vaporizable working fluid wetting and saturating said porous structure; means for introducing heat to heat and vaporize said working fluid in the part of said porous structure near one of said separated areas; means for expanding the vapor formed from said working fluid; means for converting the work of expansion done by said vapor into mechanical work; means for removing said mechanical work; means for removing heat to cool and condense said working fluid vapor in the part of said porous structure near another of said separated areas; internal heat exchange means located inside said enclosed space, for exchanging heat with said working fluid; said porous structure being constructed so that when said liquid working fluid is vaporized in part of said porous structure, the capillary suction pressures created at the smaller menisci of said liquid working fluid being vaporized cause said working fluid to flow to said part of said porous structure where said vaporization takes place from said part of said porous structure where said condensate is formed through the

larger capillary passages connecting said separated areas of said porous structure; said means for expanding said vapor and said means for converting said work of expansion into said mechanical work being located in said enclosed space relative to the location of said porous structure so that said working fluid may undergo said processes of vaporizing, expanding, condensing and returning itself to execute a complete cycle involving said processes in a closed system defined within said body.

**4,165,615**  
**PRESSURE REGENERATOR FOR INCREASING OF STEAM, GAS, OR HOT AIR PRESSURE AND ROTATING STEAM BOILER, WITH ADDITIONAL EQUIPMENT**  
Paune Morcov, No. 12, Georg Büchner Weg, 6050 Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,270  
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613418

Int. Cl.<sup>2</sup> F01K 19/10  
U.S. Cl. 60—685



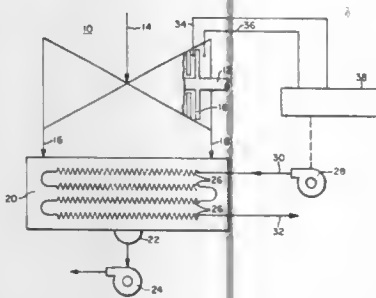
1. Apparatus for increasing the pressure and temperature of exhaust working fluid from a heat engine, comprising a casing defining two heated zones, a neutral zone and a cooled zone;  
at least one pair of contra-rotating drums in said casing arranged such that successive sections of each drum pass in sequence through said zones; and  
a spirally-coiled pipe in each drum, said pipes being connected such that fluid fed to one drum passes in succession through the pipes of both drums to an outlet from the other drum.

**4,165,616**  
**APPARATUS AND METHOD FOR RESTRICTING TURBINE EXHAUST VELOCITY WITHIN A PREDETERMINED RANGE**  
Mario F. Pierpoline, Media, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1978, Ser. No. 870,897  
Int. Cl.<sup>2</sup> F01K 9/00

U.S. Cl. 60—686

6 Claims



1. A turbine power plant system for controlling the operat-

ing pressure range of the turbine's exhaust stage, said system comprising:

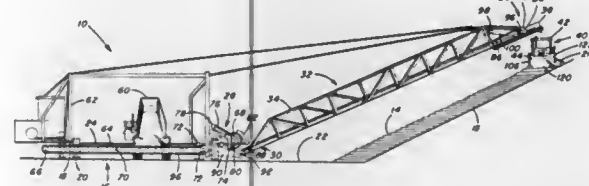
an elastic fluid turbine having a plurality of stages including an exhaust stage;  
a heat rejection element in fluid communication with said exhaust stage, said heat rejection element including a shell member and a plurality of heat exchange tubes contained therein, said tubes having coolant circulated therethrough for removing heat from the elastic fluid entering said shell;  
means for measuring elastic fluid flow rate and velocity through the exhaust stage; and  
means responsive to said measuring means for controlling coolant flow rate through said heat exchange tubes so as to regulate both the elastic fluid's pressure within said shell and its velocity through the exhaust stage within a predetermined range.

**4,165,617**  
**PROCESS AND APPARATUS FOR APPLYING AND COMPACTING CASTABLE MATERIAL IN STRIPS ON A SLOPED SURFACE**  
Perry J. Dick, Jr., Pittsburgh, Pa., assignor to Trumbull Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1977, Ser. No. 784,073  
Int. Cl.<sup>2</sup> E02D 5/00

U.S. Cl. 405—17

16 Claims



1. Apparatus for applying and compacting castable material on a sloped surface comprising,  
means for depositing the castable material on the sloped surface,  
spreader means for applying the castable material in a strip of a preselected thickness extending longitudinally on the sloped surface and having a lateral edge extending a preselected lateral dimension outwardly from the sloped surface, said spreader means operable to apply the castable material on the strip so that the portion of the strip between the lateral edge and the sloped surface has an upper horizontal surface,  
roller means positioned rearwardly of said spreader means for compacting the upper horizontal surface of the strip to a preselected degree of compaction,  
forming means associated with said roller means for rounding the lateral edge of the strip in an arcuate configuration projecting outwardly from the sloped surface and downwardly from the upper horizontal surface of the strip, and  
propelling means for advancing said spreader means and said roller means on the sloped surface.

**4,165,618**  
**TREATMENT WITH LIQUID CRYOGEN**  
Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521

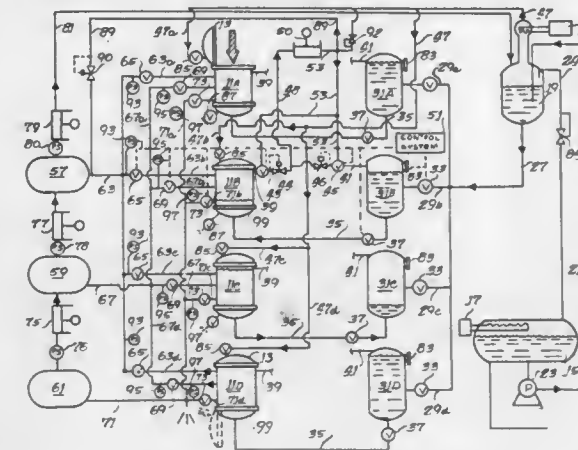
Filed Apr. 24, 1978, Ser. No. 899,410  
Int. Cl.<sup>2</sup> F25D 17/02

U.S. Cl. 62—64

17 Claims

1. Apparatus for processing a product by treatment with a liquid cryogen at or near equilibrium conditions, which apparatus comprises  
a processing chamber having opening means through which the product to be treated can be introduced and withdrawn,

means for supplying cryogen vapor under superatmospheric pressure,  
a holding container for liquid cryogen,  
conduit means interconnecting said holding chamber and said processing chamber,  
control means for establishing a cryogen vapor pressure in said processing chamber which is about the desired pressure,  
means for supplying said holding chamber with liquid cryogen,  
a compressor,



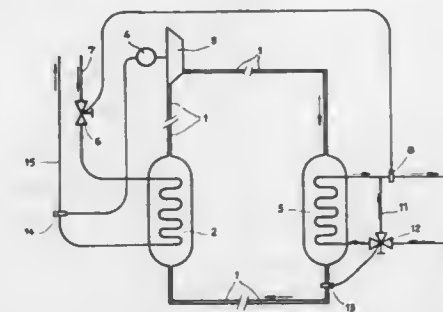
means for operating said compressor to transfer liquid cryogen by differential pressure flow from said holding chamber to said processing chamber for treatment of said product and for transferring liquid cryogen by differential pressure flow from said processing chamber back to the holding chamber at the conclusion of such treatment, and means for assuring that the pressure in said holding chamber and the pressure in said processing chamber both remain above the saturation pressure at any time when said differential pressure transfer of liquid cryogen is occurring.

**4,165,619**  
**METHOD OF CONTROLLING A HEAT PUMP, AND A HEAT PUMP DEVICE ADAPTED TO OPERATE IN ACCORDANCE WITH SAID METHOD**  
Edmond Girard, Boulogne, France, assignor to Messler, Société Anonyme, Paris, France

Filed Nov. 29, 1977, Ser. No. 855,542  
Claims priority, application France, Jan. 5, 1977, 77 00112  
Int. Cl.<sup>2</sup> F25D 17/02; F25B 29/00, 1/00

U.S. Cl. 62—99

9 Claims



1. A method of controlling a heat pump comprising a circuit of a cold generating fluid, a first heat exchanger arranged in said circuit in order to draw calories from a heat containing fluid passing through a cooling circuit, and a second heat exchanger arranged in said circuit in order to transmit calories to a fluid passing through a utilisation circuit, said method comprising the steps of controlling the flow of heat-carrying fluid through said first heat exchanger in dependence upon the temperature of the fluid of the utilisation circuit at the output

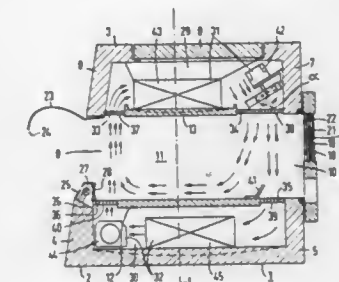
of said second heat exchanger, and controlling the flow of fluid from said utilisation circuit through said second heat exchanger in dependence upon the temperature or pressure of the cold generating fluid at the outlet of the second heat exchanger.

**4,165,620**  
**SELF-SERVICE COOLING CABINET**  
Liselotte Gehauf nee Kiesel, Munich; Heinrich Eberhardt, Schwaig, and Rolf W. Gailing, Nuremberg, all of Fed. Rep. of Germany, assignors to Ludwig Kiesel oHG, Nuremberg, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 894,857  
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 7711392[U]

Int. Cl.<sup>2</sup> A47F 3/04  
U.S. Cl. 62—256

17 Claims



1. A self-service low temperature cooling cabinet for easily spoilable food and edible products, which includes: a housing having a lower section and an upper section, and also having a front wall with an easily accessible front withdrawal opening and a rear wall opposite and in spaced relationship to said front wall and provided with a servicing opening, an air impermeable bottom wall connected to said lower section of said housing, a ceiling wall connected to said housing upper section and arranged opposite and in spaced relationship to said bottom wall, said front and rear walls together with said bottom and ceiling walls defining a display chamber, evaporating cells comprising evaporator means respectively provided above and below said display chamber for generating cooling air currents, said evaporator means above said display chamber being within the region of said withdrawal opening and within the region of said servicing opening respectively provided with an air inlet and an air outlet, and said evaporator means below said display chamber being within the region of said withdrawal opening and within the region of said servicing opening respectively provided with an air outlet and an air inlet, said air outlet of said evaporator means below said display chamber being at least partially in alignment with said air inlet of said evaporator means above said display chamber, and said air outlet of said evaporator means above said display chamber being at least partially in alignment with said air inlet of said evaporator means below said display chamber, said at least partially aligned inlets and outlets of said evaporator means above and below said display chamber respectively being so arranged that the cooling air current in the vicinity of one end of said display chamber splits up so that one portion of said cooling air current serves for freezing any food and edible products in said display chamber whereas another part of said cooling air current serves for creating an air barrier at said withdrawal opening, said two parts of cooling air currents being adapted to unite again in the vicinity of the other end of said display chamber.



4,165,621

## PENDANT RING

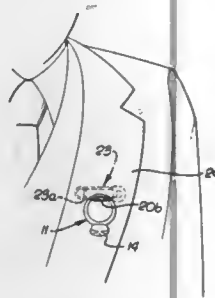
Joseph B. Gould, Las Vegas, Nev., assignor to National Utilities Corporation, Monrovia, Calif.

Filed Aug. 22, 1977, Ser. No. 826,934

Int. Cl.<sup>2</sup> D06F 23/04; D06F 37/40

U.S. Cl. 63—1 R

7 Claims



1. An ornamental article, comprising
  - (a) a ring sized to be worn on a human finger or thumb, the ring defining an axis,
  - (b) there being an elongated opening extending through a continuous sector of the ring and adapted to receive a supporting holder,
  - (c) there being a short tube fitting within said opening, the tube adapted to receive such supporting holder, the tube having opposite ends contoured to have the curvature of the ring periphery at opposite ends of said opening,
  - (d) the tube having a side portion projecting sidewardly into the open space surrounded by the ring, the tube having opposite end portions located completely within the ring itself.

4,165,622

## RELEASABLE LOCKING AND SEALING ASSEMBLY

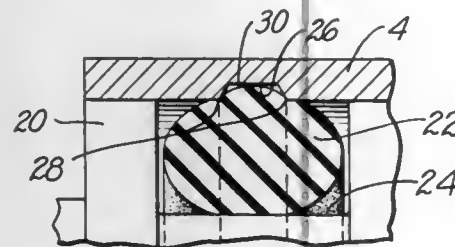
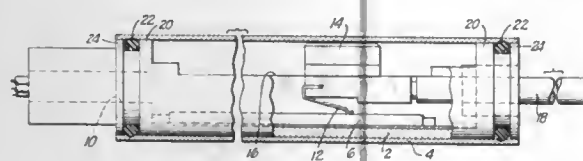
Milton R. Brown, Jr., Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Apr. 30, 1976, Ser. No. 681,986

Int. Cl.<sup>2</sup> G04B 37/08; B65D 53/00

U.S. Cl. 64—4

3 Claims



1. A releasable locking and sealing assembly comprising:
  - in a linear motion potentiometer;
  - an elongate body having cylindrical end portions, said end portions having an annular recess;
  - an O-ring disposed in each of said annular recesses formed from a stiffly deformable, springy material having a cross sectional diameter greater than the depth of said annular recess;
  - a hollow cylindrical casing it fit slidably over said elongate

body having an inner diameter at least as great as the outer diameter of said cylindrical end portion but less than the principal diameter of said O-ring compressing said O-ring to between about 70% and 85% of the cross-sectional O-ring diameter; and

truncated annular grooves around the interior of said cylindrical casing spaced from each end thereof and adapted to be aligned with said O-ring disposed in each of said annular recesses, each of said annular grooves having lips formed from the edges of said truncated annular grooves defining a groove width of from about 25% to 50% of said cross-sectional diameter of said O-ring forming a bead from said stiffly, deformable, springy O-ring material between said lips within said annular grooves.

4,165,623

## METHOD AND APPARATUS FOR TREATMENT OF YARN IN PACKAGE FORM

Edward J. Negola, 8220 Tynecastle Dr., Atlanta, Ga. 30338, and Jerald Brown, Carl Sanders Ave., Jasper, Ga. 30143

Division of Ser. No. 636,701, Dec. 4, 1975, Pat. No. 4,097,232,

which is a continuation-in-part of Ser. No. 628,374, Nov. 3, 1975,

abandoned, which is a continuation-in-part of Ser. No. 541,127,

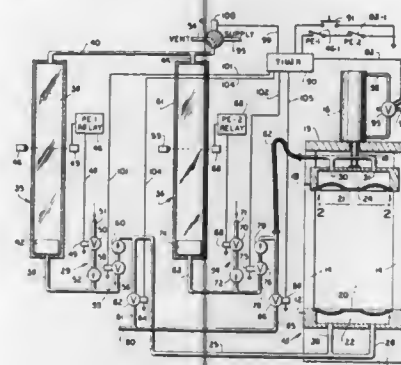
Jan. 15, 1975, abandoned. This application Jul. 29, 1977, Ser.

No. 820,108

Int. Cl.<sup>2</sup> D06B 1/08, 11/00, 21/02

U.S. Cl. 68—5 C

1 Claim



1. Apparatus for treating a mass of yarn in the form of a package having two ends and an intermediate body portion comprising:

a first capping means comprising a first foraminous plate for engagement with one of the ends of the package;

a second capping means comprising a second foraminous plate for engagement with the other end of the package;

first fluid supply means for supplying at least a first fluid to said first capping means to cause the first fluid to pass through the foramina in said first foraminous plate and into contact with the one end of the package;

second fluid supply means for supplying at least a second fluid to said second capping means to cause the second fluid to pass through the foramina of said second foraminous plate and into contact with the other end of the package;

third fluid supply means for supplying a third fluid to said first and said second capping means;

control means for simultaneously coupling said first and second fluid supply means to said first and second capping means to simultaneously urge the first and second fluids into opposite ends of the package and for subsequently coupling said third fluid supply means to both capping means to simultaneously urge the third fluid into opposite ends of the package, and means for moving said first and said second capping means toward and away from each other whereby the first and second capping means compressively engage the opposite ends of the package.

4,165,624

## AUTOMATIC WASHER OPERATING APPARATUS

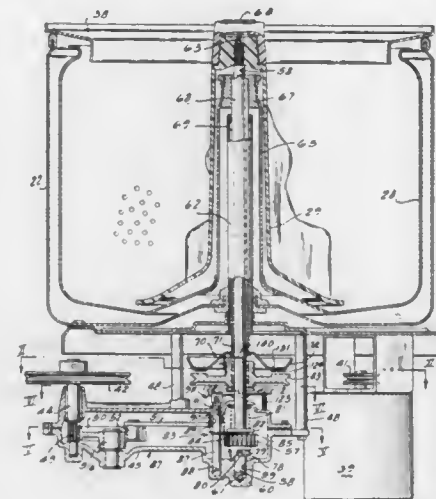
Ernest B. Ruble, South Haven, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 2, 1978, Ser. No. 882,854

Int. Cl.<sup>2</sup> D06F 23/04; D06F 37/40

U.S. Cl. 68—23.7

14 Claims



8. In a laundry machine including a tub, a clothes container within said tub mounted for spinning rotation at a relatively high extraction speed, and an agitator mounted within said clothes container for oscillating movement relative to the clothes container:

a shaft for driving said agitator;

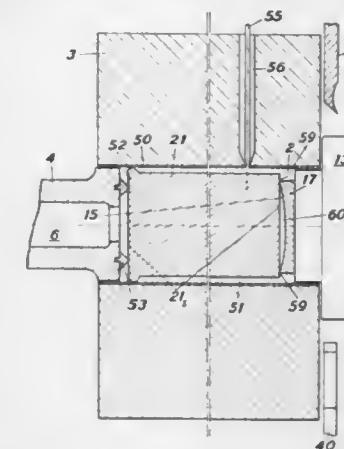
driving means for oscillating said shaft and thereby said agitator;

container driving means for effecting rotation of said container;

means for alternately effecting operation and inactivation of said respective driving means; and

a spring friction clutch carried by said shaft and operative to effect corotation of the shaft and agitator and the container when the shaft driving means is unactivated and the container driving means is activated.

said end faces which continuously seals against the surface of the container defining said hollow center; and



wherein said container is provided with means for removing air trapped between said ingot and said surface of said container defining said hollow center.

4,165,626

## WASH WATER SUPPLYING DRIVE HEAD AND SCRAPER AND CUTTER ASSEMBLY

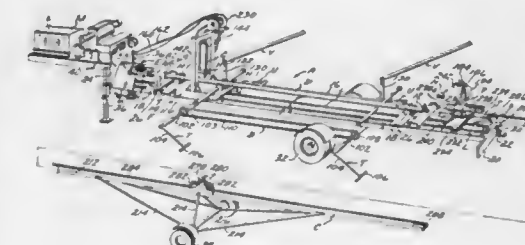
Whetstone B. Priddy, 15522 Woodington Ave., Bellflower, Calif. 90706

Continuation-in-part of Ser. No. 798,819, May 20, 1977, Pat. No. 4,131,005. This application Mar. 23, 1978, Ser. No. 889,190

Int. Cl.<sup>2</sup> B21D 3/10; B21C 43/00

U.S. Cl. 72—40

4 Claims



1. An apparatus for straightening a tubular member and removing foreign material from the interior thereof, said apparatus being of the type that includes an elongate bed that has a forward and rearward end, an elongate rigid element that may be moved longitudinally through said tubular member after the latter has been straightened and still rests on said bed, a prime mover mounted on said forward end of said bed, said apparatus being characterized by:

a. a horizontally disposed tubular member rotatably supported in a centered longitudinal position adjacent said forward end of said bed and rotated by said prime mover, said tubular member a forward end and a rearward solid end portion, a transverse bore in said solid end portion that communicates with a longitudinal bore that extends forwardly through said tubular portion, said solid end portion having a plurality of transverse slots therein, said longitudinal bore in communication with a source of low pressure water;

b. a rigid block that has a rearwardly extending cavity that snugly engages a rearward part of said rearward solid end portion, said block having a plurality of transverse bores that are aligned with said slots;

c. a plurality of bolts that extend through said bores to engage said slots to prevent said block rotating relative to said tubular member, said bolts having threaded portions that project from said block;

4,165,625

## DEVICE FOR EXTRUDING SECTIONS FROM AN INGOT

Alfred Wagner, Steisslingen; Adolf Ames, Hiltzingen-Duchtingen, and Karl Graf, Singen, all of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,635

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651564

Int. Cl.<sup>2</sup> B21C 25/02, 26/00, 27/04; B23D 1/00

U.S. Cl. 72—38

9 Claims

1. An improved extruding device for extruding sections from ingots and in particular light metal ingots such as aluminum or the like comprising:

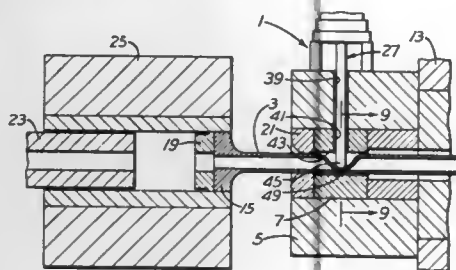
container means, said container means having a hollow center extending therethrough along a first axis; shaping die means located in part within said hollow center;

ram means having an axis substantially parallel to and in line with said first axis, said ram means including a pressure plate provided with a working face;

wherein said shaping die means and said working face each include deformation means for deforming the end faces of said ingot so as to form an edge on the outer periphery of

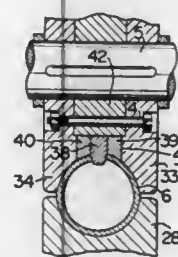
- d. a plurality of nuts that engage said threaded portions of said bolts;
- e. forward and rearward tubular sections that have interengaging fingers that permit said rearward tubular section to flex transversely relative to said forward tubular section, said forward tubular section secured to said block;
- f. a solid rigid body secured to said rearward tubular portion, said rigid body having a transverse bore therein;
- g. a plurality of externally threaded sections of decreasing diameter, with said section of greatest diameter secured to said body, and a bore that extends longitudinally through said sections and is in communication with said transverse bore in said body;
- h. check valve means in said transverse bore in said body that permits flow of water from said transverse bore in said body to said bore in said sections;
- i. first and second nipples secured to said solid end portion and said body and in communication with said transverse bores therein; and
- j. a pliable hose that extends between said first and second nipples and is secured thereto, said hose being free of abrasive action when said tubular member, block, forward and rearward tubular portions, body and sections rotate concurrently as a unit, with water discharged into said tubular member flowing through said hose to discharge from longitudinal bore in said sections into said tubular member being straightened, with the latter having threaded ends, and one of said threaded ends connected to one of said threaded sections to cause rotation of said threaded member being straightened as said horizontally disposed tubular member is rotated by said prime mover.

**4,165,627**  
**METHOD AND APPARATUS FOR CLOSING THE END OF AN EXTRUDED TUBE SUBMERGED IN WATER**  
 Raymond F. Boshold, Springfield, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.  
 Filed Aug. 8, 1977, Ser. No. 822,575  
 Int. Cl.<sup>2</sup> B21C 23/08, 35/04  
 U.S. Cl. 72-48 11 Claims



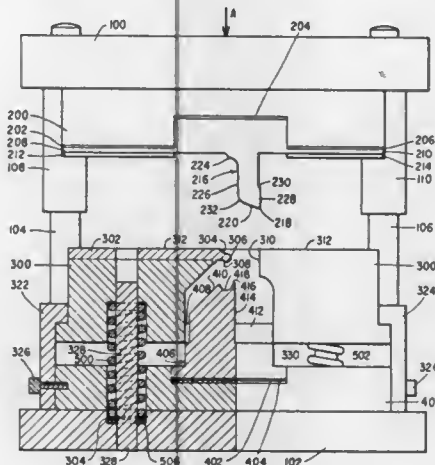
1. In combination with a machine such as an extrusion press for producing a first portion of a hollow elongated workpiece of finite length such as an extruded metal tubing and a water tank for receiving and treating said hollow elongated workpiece, wherein in the production of the workpiece the leading end thereof has a closed end so that water is prevented from entering inside of the workpiece when said workpiece enters said water tank, the steps comprising:
- completing the remainder of the production of the workpiece including the trailing end thereof and before the hollow trailing end portion exits the press,
- deforming a hollow portion of the workpiece at a point inward of the open trailing end in a manner to close off the hollow portion of the workpiece at said inward point from the open trailing end, from the entrance of water.

**4,165,628**  
**FIN PASS ROLL**  
 Kuniaki Okada, Matsue, Japan, assignor to Hitachi Metals, Ltd., Japan  
 Filed Mar. 7, 1978, Ser. No. 884,166  
 Int. Cl.<sup>2</sup> B21D 5/12  
 U.S. Cl. 72-182 11 Claims



1. A fin pass roll for use in a single or multiple roll stands for forming a flat metal strip into a desired tubular shape, characterized in that the fin pass roll is divided into a fin roll and fin side rolls in such a way that said fin roll has an arcuate profile which extends to both sides from a fin of said fin roll and merges with an arcuate profile of said fin side rolls; means are provided for joining said fin side rolls to a drive shaft for rotation in unison therewith; and in that means are provided for mounting said fin roll so as to be rotatable independently of said fin side rolls and the drive shaft.

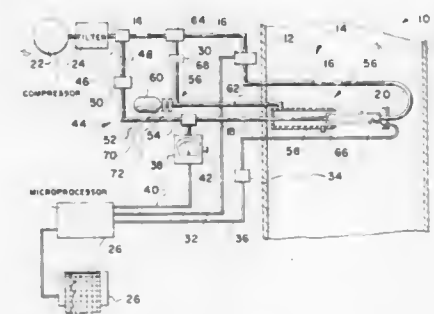
**4,165,629**  
**MULTI-PUNCH, MULTI-DIE ASSEMBLY FOR STAMPING HOOK-SHAPED DAMPER HINGE MEMBERS**  
 Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901  
 Continuation-in-part of Ser. No. 736,823, Oct. 29, 1976, Pat. No. 4,080,860, which is a continuation-in-part of Ser. No. 650,926, Jan. 21, 1976, Pat. No. 4,004,480. This application Jan. 31, 1978, Ser. No. 874,001  
 Int. Cl.<sup>2</sup> B21D 28/14  
 U.S. Cl. 72-325 23 Claims



1. An assembly for deforming a workpiece, comprising:
- (a) punch-and-die means for receiving along at least a surface thereof at least a portion of said workpiece;
- (b) punch means movable with respect to said punch-and-die means for selectively engaging at least a portion of said workpiece between said punch means and said punch-and-die means and for deforming a portion of said workpiece during movement of said punch means with respect to said punch-and-die means; and
- (c) die means for at least further deforming a portion of said workpiece, said punch-and-die means and said punch

means being relatively movable in unison toward said die means following said deforming caused by movement of said punch with respect to said punch-and-die means, and when said workpiece is engaged therebetween, to bring at least a portion of said workpiece into contact with said die to effect said further deforming.

**4,165,630**  
**CONTINUOUS IN-STOCK POLLUTANT MONITORING SYSTEM**  
 Richard M. Felder, and James K. Ferrell, both of Raleigh, N.C., assignors to North Carolina State University at Raleigh, Raleigh, N.C.  
 Filed Jul. 14, 1977, Ser. No. 815,553  
 Int. Cl.<sup>2</sup> G01N 31/00  
 U.S. Cl. 73-23 11 Claims

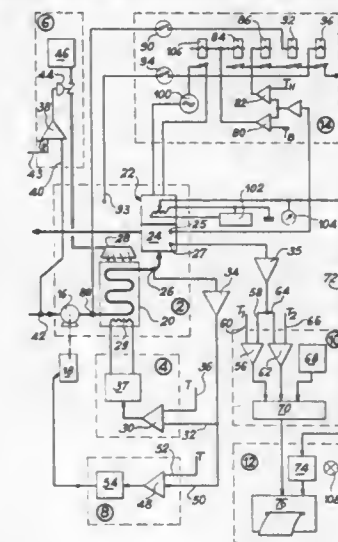


1. The process of continuously monitoring the concentration of at least one substance within an atmosphere comprising: directing a carrier gas past a permeable interface which is disposed within said atmosphere whereby at least a portion of said substance permeates said interface and becomes homogeneously suspended within said carrier gas; directing said substance containing carrier gas into a gas analyzer; analyzing said carrier gas to determine the concentration of said substance therein; transmitting the concentration data to a microprocessor; measuring the rate of flow of said carrier gas; transmitting the rate of flow data to said microprocessor; measuring the temperature of the carrier gas adjacent the permeable interface; transmitting the measured temperature data to said microprocessor; comparatively evaluating said substance concentration data, said flow rate data, and said temperature data with like determined calibration data previously obtained whereby an accurate, relatively continuous determination of atmosphere concentration of said substance can be obtained.

**4,165,631**  
**INSTRUMENT FOR THE CONTINUOUS MEASUREMENT OF VISCOSITY, ESPECIALLY OF BITUMENS**  
 Abel Boinet, Pau; Lucien Mondeil, Serres Morlaas, and Jean-Louis Montay, Pau, all of France, assignors to Elf-Union, Paris, France  
 Filed Apr. 28, 1978, Ser. No. 901,092  
 Claims priority, application France, May 4, 1977, 77 13526  
 Int. Cl.<sup>2</sup> G01N 11/00  
 U.S. Cl. 73-54 12 Claims

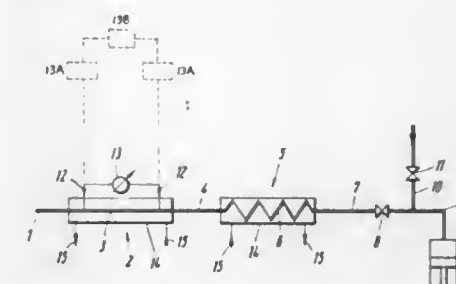
1. An instrument for continuous measurement of viscosity of bitumens in particular, of the type comprising a viscometer adapted to the product whose viscosity is to be measured, and an entraining pump for receiving and transferring said product to a heat exchanger constituted by a wall in which is formed a channel for the circulation of said product, said wall being brought to an adjustable temperature by suitable means, the output of said channel being connected to a viscometer, wherein the output of the entraining pump can be varied at will and wherein said instrument comprises in addition:
- a probe for measuring the temperature of the product, said

probe being placed within the viscometer at the point of measurement of viscosity, and regulating means for adjusting said temperature to an index value comprised between a lower-limit temperature



T<sub>1</sub> and an upper-limit temperature T<sub>2</sub>, said regulating means being adapted to produce action on the output of the pump and on the means for controlling the temperature of the heat-exchanger wall.

**4,165,632**  
**METHOD OF MEASURING THE FLUIDITY OF LIQUIDS FOR MEDICAL AND PHARMACEUTICAL PURPOSES, AND APPARATUS FOR PERFORMING THE METHOD**  
 Gerhard Weber, Wackenroderstr. 31, 8500 Nürnberg; Siegfried Peters, Lange Zeile 138, 8520 Erlangen; Jürgen Künzel, Am Pfarrbaum 1, and Torsten Kreisel, Amalienstr. 43, both of 8500 Nürnberg, all of Fed. Rep. of Germany  
 Filed Mar. 25, 1977, Ser. No. 781,475  
 Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613212; Dec. 24, 1976, 2658799  
 Int. Cl.<sup>2</sup> G01N 11/08, 33/16  
 U.S. Cl. 73-55 27 Claims

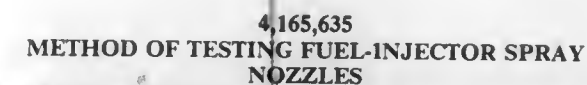


8. An apparatus for determining the fluidity of a liquid, such as blood or serum, in a capillary, for medical and pharmaceutical purposes comprising:
- a measuring capillary tube having two ends, a diameter, a length and a cross sectional area;
- a source of the liquid; first connecting means for interconnecting said source to one end of said capillary tube;
- a reservoir unit having two ends; second connecting means connecting one end of said reservoir unit to the other end of said capillary tube;
- means for drawing in and returning said liquid through said capillary tube operatively associated with the other end of said reservoir unit;
- third connecting means connecting said means for drawing and returning liquid to the other end of said reservoir unit; and



(e) mechanical-electrical transforming means coupled to the material for transforming mechanical motions into electrical signals, the improvement which comprises a third displacement generator coupled to the material for applying a constant rate displacement to the material co-linearly with the cyclic displacement applied by the first and second displacement generators.

## 11 Claims

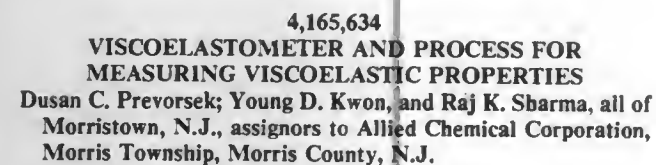


Ivan Komaroff, Regensburg, and Viktor Schatz, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,374  
Claims priority, application Fed. Rep. of Germany, Dec. 24,  
1977, 2757966

U.S. Cl. 73-119 A Int. Cl.<sup>2</sup> G01M 15/00

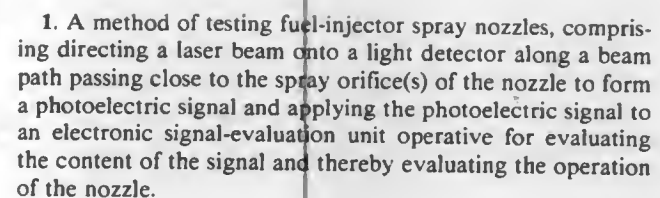
## 5 Claims



Filed Feb. 6, 1978, Ser. No. 875,712  
Int. Cl.<sup>2</sup> G01N 3/32

U.S. Cl. 73—810

## 29 Claims



4,165,636  
METHOD AND MEANS FOR MEASURING PRELOADS  
IN ASSEMBLED MECHANISMS

Stephen J. Bartholet, Orange, Calif., assignor to Odetics, Inc., Orange, Calif.

Continuation-in-part of Ser. No. 774,265, Mar. 24, 1977,  
abandoned. This application Feb. 21, 1978, Ser. No. 879,119  
Int. Cl. G01L 1/00

U.S. Cl. 73—141 R

## 11 Claims

1. Means for determining the amount of compressional load in an assembly of clamped elements comprising:

a rotatable element positioned between two non-rotatable elements within said assembly, the relationship between the surface friction between said rotatable element and

said two non-rotatable elements and compressional load being known whereby the torque necessary to rotate said

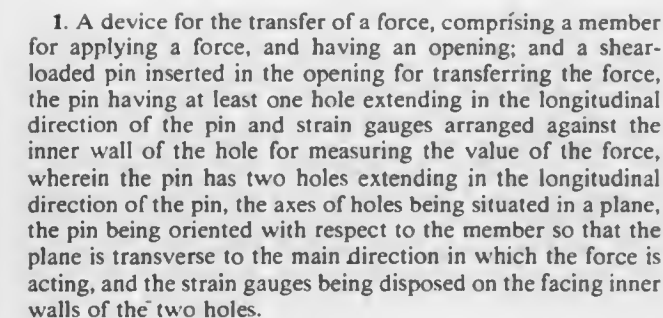


4,165,637  
**FORCE MEASURING DEVICE**  
 Willem H. Kooman, Eindhoven, Netherlands, assignor to U.S.  
 Philips Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,598  
Claims priority, application Netherlands, Feb. 28, 1977,  
7702140; Nov. 24, 1977, 7712971

U.S. Cl. 73—141 A

## 6 Claims

4,165,638  
ENTANGLEMENT TESTING APPARATUS AND  
METHOD

**Jerome R. Verlin, Elkins Park, Pa., assignor to Techniservice  
Division Textured Yarn Co., Inc., Kennett Square, Pa.  
Filed Nov. 10, 1977, Ser. No. 850,424**

Int. Cl.<sup>2</sup> G01L 5/04

U.S. Cl. 73-160

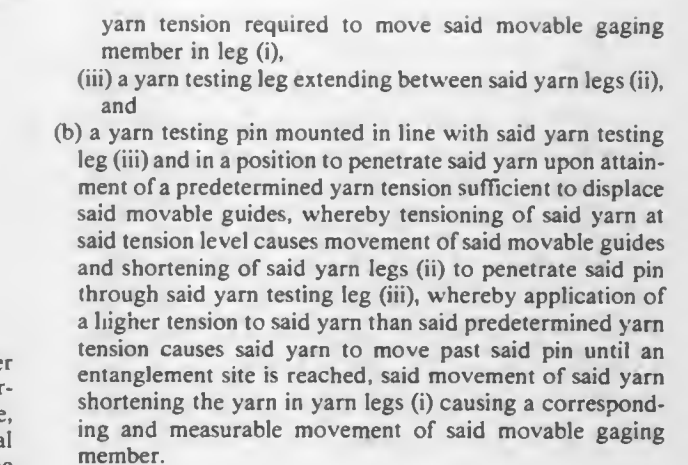
## 25 Claims

10. Apparatus for repeatedly testing yarn for filament entanglement wherein a yarn supply is provided with a means for selectively stopping yarn movement from said supply during each test but for releasing said yarn from said supply to provide further yarn for each successive test, said apparatus also including a movable gaging member for indicating distances

between point of insertion of an entanglement testing pin into said yarn and point of entanglement of filaments in said yarn, said apparatus comprising:

(a) guide means positioned downstream of said stopping means arranged to provide said yarn in a multiplicity of angularly related paths, said yarn paths including:

- (i) a pair of yarn legs substantially parallel to each other and connected to said movable gaging member, restraining means confining said movable gaging member against movement but permitting such movement in a predetermined direction in response to a predetermined amount of tension of yarn in said legs,
- (ii) another pair of yarn legs connected downstream of said legs (i) each extending through a movable guide, each said movable guide being movable to shorten the yarn path in response to a yarn tension in said legs which tension is less than said predetermined amount of



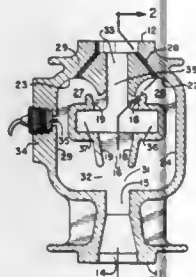
4,165,639  
FLOWMETER FOR LIQUIDS  
Robert B. Adams, Tredyfflin Township, Chester County, Pa.,  
assignor to Moore Products Co., Spring House, Pa.  
Filed May 23, 1978, Ser. No. 908,698  
Int. Cl.: G01F 1/32

U.S. Cl. 73—194 B

### 3 Claims

1. A flow sensitive device comprising  
a housing providing a liquid inlet nozzle having a connection  
to a source of liquid for producing a liquid jet,  
an interaction chamber for receiving said jet,  
said interaction chamber having a liquid delivery passage-  
way opposite to and aligned with said nozzle,  
said interaction chamber having diverging wall members for  
alternate attachment of said jet,  
said interaction chamber having on opposite sides of deliv-  
ery passageway openings aligned with said diverging wall  
members,  
feedback passageways communicating with said openings  
and with oppositely disposed control ports communicat-  
ing with said chamber contiguous to said nozzle,

said openings receiving a portion of the jet attached to the adjacent side wall with which it is aligned and delivering said portion to said opening for detaching said jet from said adjacent side wall and causing it to attach to the opposite side wall thereby providing a cyclic oscillation of the jet between said diverging walls, the period of said cyclic oscillation being principally proportional to the interval of each cycle from the time the jet is first deflected toward one of said diverging walls and the



time a portion of the jet reaches the opening aligned with said diverging wall, a member responsive to said cyclic oscillation for transmitting a signal related thereto, and ducts connected to said feedback passageways intermediate said openings and said control ports and communicating with said fluid delivery passageway for venting gaseous material from said feedback passageways to said liquid delivery passageway.

4,165,640

#### DATA COLLECTION AND REDUCTION SYSTEM FOR A SHOCK SUPPRESSOR VALVE TEST SYSTEM

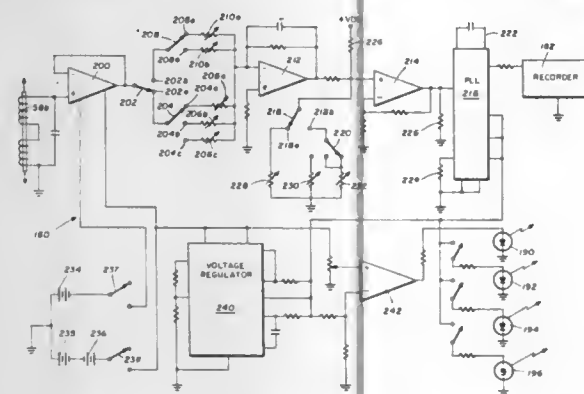
James E. Feser, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Jun. 9, 1978, Ser. No. 914,229

Int. Cl.<sup>2</sup> G01F 1/66

U.S. Cl. 73—194 E

1 Claim



1. A data reduction system for use with a portable test system having a flow meter and a first recorder for recording and outputting an AC voltage signal corresponding to the velocity of fluid flowing through the flow meter comprising:

amplifier means interconnected to the first recorder for amplifying the AC voltage signal output by the first recorder and for generating an amplified AC voltage signal; first circuit means interconnected to said amplifier means for generating a square wave voltage signal responsive to said amplifier means, wherein said square wave voltage signal corresponds in frequency to said amplified AC voltage signal;

a voltage controlled oscillator having a center operating frequency for generating a reference signal;

second circuit means for selectively determining said center

operating frequency of said voltage controlled oscillator; and means for comparing said square wave voltage signal and said reference signal, such that said means for comparing generates a DC voltage signal for application to a second recorder for subsequent analysis of the test data generated by the portable testing system.

4,165,641

#### LIQUID LEVEL SENSING MEANS

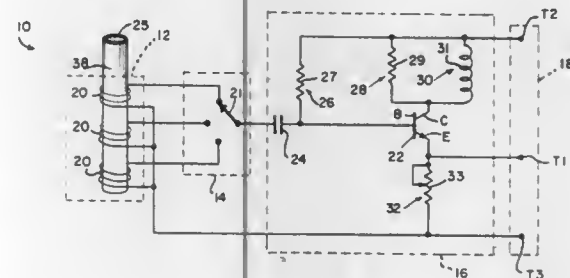
Daniel I. Pomerantz, Lexington, and Michael Smolin, Brookline, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 480,052, Jun. 17, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,919

Int. Cl.<sup>2</sup> G01F 23/28

U.S. Cl. 73—290 R

1 Claim



1. A sensing means for sensing the level of a liquid comprising:

a. a container containing said liquid;

b. a coil of wire wound around the outside of a coil former, said coil former disposed in said container; and

c. a detector/amplifier circuit connected to said coil of wire, said detector/amplifier circuit in combination with said coil of wire comprising an oscillator circuit to provide electrical oscillations therein, said detector/amplifier circuit including means adjusting the sensitivity of said oscillator circuit such that when a liquid is provided in close proximity to said coil of wire said oscillations are quenched, said detector/amplifier circuit providing an electrical signal to activate at least one device when said oscillations are quenched;

d. said detector/amplifier circuit including a transistor, the base of which is connected to a first side of a capacitance means and a first side of a first resistance means, the collector of which is connected to a first side of a second resistance means and to a first side of an inductance means, and the emitter of which is connected to a first electric terminal and a first side of a third resistance means; a second side of said first and second resistance means and a second side of said inductance means connected to a second electric terminal; a second side of said third resistance means connected to a first side of said coil of wire and to a third electric terminal; and a second side of said capacitance means connected to a second side of said coil of wire.

4,165,642

#### MONOLITHIC CMOS DIGITAL TEMPERATURE MEASUREMENT CIRCUIT

Robert J. Lipp, 15881 Rose Ave., Los Gatos, Calif. 95030

Filed Mar. 22, 1978, Ser. No. 889,492

Int. Cl.<sup>2</sup> G01K 7/00

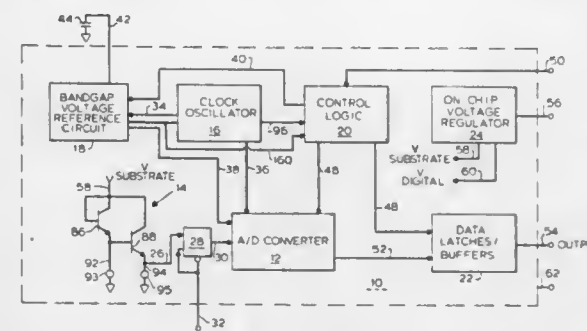
U.S. Cl. 73—362 SC

15 Claims

1. A single low power monolithic silicon chip integrated circuit for continuously sensing temperature phenomena and for providing a digital output corresponding to sensed temperature, said circuit including in electrical interconnection:

temperature sensor transistor means in said chip for provid-

ing an output voltage which varies with the temperature of said chip at the region of said sensor transistor means, bandgap voltage reference means in said chip for providing a known, stable reference voltage which is substantially independent of the temperature of said chip,



analog to digital converter means in said chip for comparing said output voltage and said reference voltage and deriving from the comparison thereof said digital output corresponding to said sensed temperature.

4,165,643

#### PROCESS AND APPARATUS FOR AUTOMATICALLY TAKING SAMPLES OF BEER FOR ANALYSIS

Manfred Moll, Richardmenil; Jean J. Delorme, Nancy, and Jean C. Weber, Vandoeuvre, all of France, assignors to Tepral, France

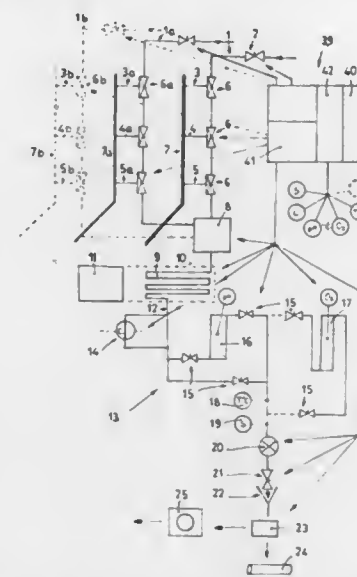
Filed Sep. 22, 1977, Ser. No. 835,787

Claims priority, application France, Feb. 2, 1977, 77 04025

Int. Cl.<sup>2</sup> G01N 1/16

U.S. Cl. 73—421 B

9 Claims



1. A process for sampling and measuring beer fermentation products stored within a fermentation tank comprising the steps of: providing a main sampling conduit having branch conduits each connected to the fermentation tank at different vertical locations for sampling therefrom beer fermentation products; initially charging said main sampling conduit with water; withdrawing a sample of beer fermentation products through one branch conduit at a time into the main sampling conduit while maintaining the other branch conduits isolated from the main sampling conduit; advancing the withdrawn sample of beer fermentation products through the main sampling conduit to a measurement station by pushing it with water to thereby minimize the amount of beer fermentation products withdrawn from the fermentation tank for sampling and measuring purposes; and measuring certain properties of

the withdrawn sample at the measurement station and providing corresponding output signals each representative of a measured property of the beer fermentation products at the particular vertical location of the fermentation tank at which the measured sample was withdrawn.

4,165,644

#### APPARATUS FOR INTRODUCING SAMPLES INTO HIGH PRESSURE GAS CHROMATOGRAPHS OR LIQUID CHROMATOGRAPHS

Hans-Walter Brandt, Unter-Odenthal; Günter Schnabel, Wermelskirchen, and Karl-Heinz Müller, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,733

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716013

Int. Cl.<sup>2</sup> G01N 1/10

U.S. Cl. 73—422 GC

1 Claim



1. An apparatus for introducing samples into a high pressure fluid chromatograph having a partition column and a high pressure carrier fluid flow passage to the partition, comprising a double passage cross over spherical valve, two single-passage spherical valves connected in series therewith to define a sample passage, wherein one passage of the cross-over spherical valve is alignable with the carrier fluid passage to the partition column while the other passage of the cross-over spherical valve is aligned with the sample passage for introducing the sample under atmospheric pressure when the sample is injected and wherein the one passage is thereafter alignable with the sample passage while the other passage is aligned with the carrier passage to enable the carrier fluid to deliver the sample therein to the partition and a check valve wherein one end of the sample passage communicates via one single-passage spherical valve with the atmosphere and the other end of the sample passage is connected, via the check valve adapted to open at a predetermined pressure and close after pressure compensation and via the other single-passage spherical valve, to a gas under said predetermined pressure for dissolving the sample substance.

4,165,645

#### DRIVE MEANS FOR ORE SAMPLERS AND THE LIKE

Harrison R. Cooper, AMF Box 22014, Salt Lake City, Utah 84122

Filed Aug. 4, 1978, Ser. No. 930,914

Int. Cl.<sup>2</sup> G01N 1/20

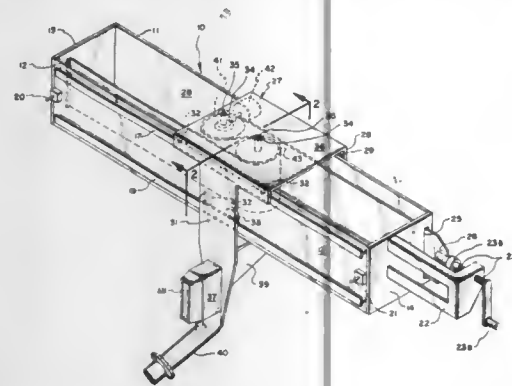
U.S. Cl. 73—423 R

17 Claims

1. A drive means for ore samplers and the like, said drive means comprising a support frame having spaced apart ends; a belt having its opposite ends anchored to the spaced apart ends of the support frame; a pair of closely spaced parallel rollers; means journalling said rollers for movement along the support frame, said means being movable with said rollers



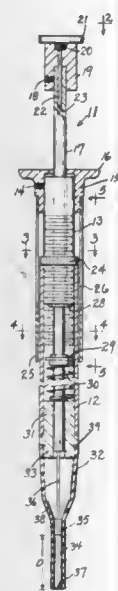
along the support frame and positioning said rollers whereby the belt extends from one fixed end past one of



**4,165,646**  
**ADJUSTABLE MICRO-DISPENSING LIQUID PIPET**  
Justin J. Shapiro, 620 Hearst Ave., Berkeley, Calif. 94710  
Filed Jul. 26, 1978, Ser. No. 928,080  
Int. Cl.<sup>2</sup> G01N 1/14

U.S. Cl. 73-425.6

11 Claims



1. A pipet comprising a main barrel having opposite end portions and provided with an axial operating shaft slidably engaged in the barrel to actuate means for filling and dispensing liquid relative to the barrel, a dispensing tip connected to one end portion of said main barrel, said dispensing tip comprising a barrel-coupling portion and a conduit portion, plunger means operatively engaged in said conduit portion, means coaxially connecting said plunger means to said shaft, whereby the plunger means can be reciprocated by reciprocating the shaft, adjustable elongated stop bushing means threadedly engaged coaxially in said barrel at the end portion thereof opposite said dispensing tip, locknut means on the stop bushing means engageable with the barrel to releasably lock the adjustment of the stop bushing means relative to the barrel for adjusting volumetric delivery of liquid therefrom, finger grip means secured on said stop bushing means, guard shield means secured to said finger grip means and substantially surrounding said stop bushing means, said guard shield means having an enlarged opening providing access for loosening and tightening said locknut means, spring means biasing said operating

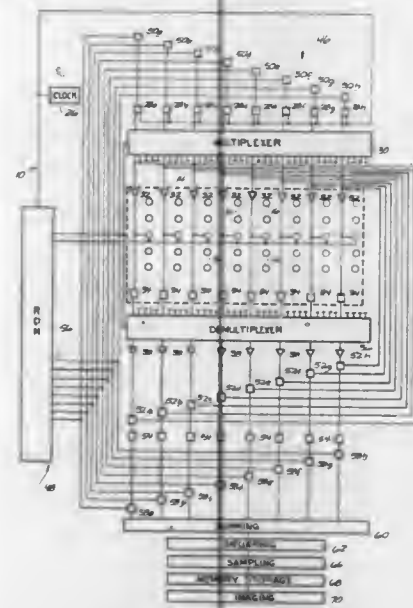
shaft in a direction to retract said plunger means in said conduit portion, and abutment means on said shaft engageable with said stop bushing means to limit retraction of said plunger means.

**4,165,647**  
**SCAN ACOUSTICAL HOLOGRAPHIC APPARATUS AND METHOD**

H. Dale Collins, Richland, Wash., assignor to International Submarine Services, London, England  
Filed May 12, 1978, Ser. No. 905,234  
Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73-603

22 Claims

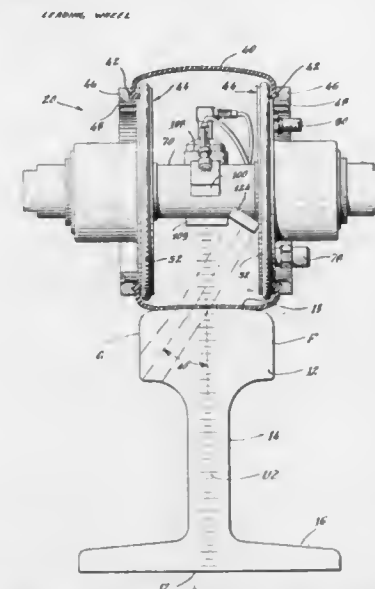


1. In a scan acoustical holographic apparatus for obtaining holographic information from a volume;  
a generally two dimensional array of acoustical transducers for receiving transmit electrical pulse signals and in response thereto directing pulsed acoustical wave energy into the volume during a transmit mode and for receiving reflected pulsed acoustical wave energy from the volume and in response thereto generating received electrical pulse signals during a receive mode;  
a clock means for generating clock pulses at regular intervals at a desired clock frequency;  
a plurality of frequency-divider means associated with corresponding transducers and operatively connected to the clock means for generating the transmit electrical pulse signals having a desired operating frequency that is a fraction of the clock frequency;  
electronic scan control means operatively connected to the frequency divider means and the transducers (1) for selecting various combinations of the transducers with each combination of transducers associated with a portion of the volume having a selected focal point, (2) for adjusting the phases of the transmit electrical signal in relation to the relative distances between the selected transducers on the selected focal point during the transmit mode, (3) for mixing the phase adjusted transmit electrical pulse signals with the received pulse signals to focus the combination of the transducers on the corresponding selected focal point during the receive mode, and (4) for sequencing the combination of transducers during both the transmit and receive modes to sequentially scan each portion of the volume to obtain high contrast holographic information from each portion of the volume.

**4,165,648**  
**TWO WHEEL ULTRASONIC RAIL TESTING SYSTEM AND METHOD**  
Dominick A. Pagano, 10 Sasqua Trail, Georgetown, Conn. 06829  
Filed Jul. 25, 1977, Ser. No. 818,544  
Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73-625

47 Claims



1. In a system of the type for performing ultrasonic inspection of a length of test material, such as a rail, with ultrasonic transducing means emitting a beam of ultrasonic energy from within sealed wheel means containing a coupling fluid therein and having a flexible cylindrical surface member transparent to the ultrasonic beam and arranged for rolling contact along the test material, the improvement which comprises:  
leading wheel means arranged for rolling contact along the length of test material;  
trailing wheel means spaced behind the leading wheel means and arranged for rolling contact along the length of test material; and  
ultrasonic transducer means fixedly mounted and oriented in each of the leading and trailing wheel means so that a beam of ultrasonic energy emitted from the transducer means in one wheel means will enter the test material, be reflected from the bottom surface thereof, and be received by the transducer means in the other wheel means;  
means for adjusting the spacing between said wheel means;  
means for measuring the thickness of the length of test material; and  
means for controlling said adjustment means in response to said measuring means to space said wheel means and orient said ultrasonic transducer means properly for the measured thickness of the test material;  
whereby the testing system provides improved detection of defects in the test material.

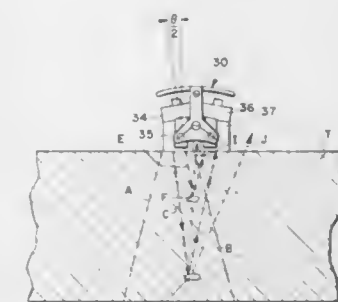
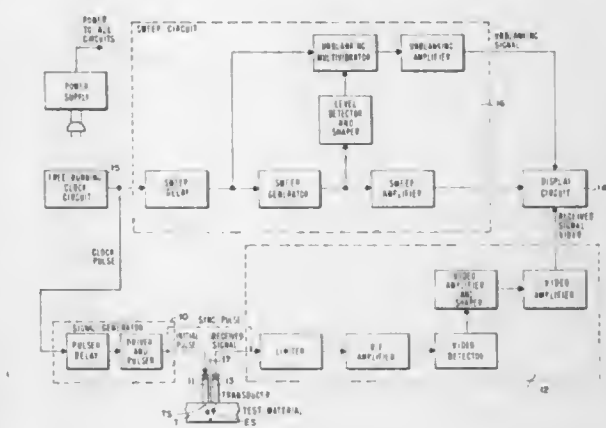
**4,165,649**  
**APPARATUS AND METHOD FOR ULTRASONIC INSPECTION OF HIGHLY ATTENUATIVE MATERIALS**  
Amos S. Greer, Jr., San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.  
Filed Feb. 13, 1975, Ser. No. 549,537  
Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73-644

5 Claims

1. An inspection module for ultrasonically inspecting materials that are highly attenuative to the propagation of ultrasonic waves, comprising, in combination:  
a module frame for supporting the components of said inspection module;  
an absorption medium pivotally mounted on said frame and including a first face adapted to be placed at least adjacent the object to be inspected and a second face, said absorp-

tion medium having sufficient thickness between said first and said second face to absorb a substantial part of the near-field of any transmitted ultrasonic waves without appreciably interfering with the transmission of the far-field of such waves;  
a transmitting transducer mounted on said second face for generating longitudinal ultrasonic waves;  
a receiving transducer for receiving ultrasonic waves from said object to be inspected, and spaced a relatively small but effective distance from said transmitting transducer to receive desired ultrasonic signals with a relatively small amount of cross-talk between said transducers, the transmitting transducer being mounted on said second face and positioned in one direction on said face with respect to



said receiving transducer to have a small but effective included angle with said receiving transducer to provide for substantially uniform inspection in said highly attenuative material throughout a generally fan shaped envelope of inspection; and  
a second absorption medium pivotally mounted on said frame and having a first face adapted to be placed at least adjacent the object to be inspected and a second face, and wherein said receiving transducer is mounted on said second face, the second faces of each absorption medium having a first angle in one direction with respect to said object to be inspected to provide said included angle, and a second angle in a direction perpendicular to said first direction to provide an angle of refraction for the longitudinal inspection beam of substantially greater than 0°.

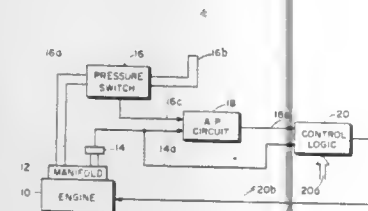
**4,165,650**  
**DUAL PURPOSE PRESSURE SENSOR**  
Harold E. Weissler, II, Newport News, Va., assignor to The Bendix Corporation, Southfield, Mich.  
Filed Jul. 19, 1978, Ser. No. 925,920  
Int. Cl.<sup>2</sup> G01L 7/00; G01M 15/00

U.S. Cl. 73-700

14 Claims

1. Pressure sensor means including a single pressure transducer for generating signals relating to pressures at at least first

and second regions, wherein said pressure transducer is located to sense directly the pressure at said first region, comprising: an offset differential pressure means responsive to the pressures at said first and second regions for generating a first signal when the pressure at said first region is a predetermined offset from the pressure at said second region; means for generating a ramping signal, the direction of ramp being determined by a second signal;



first means responsive to said first signal for comparing said ramping signal against the signal generated by said pressure transducer, the results of the comparison comprising said second signal; and, means applying an offset signal equivalent to said differential pressure switch predetermined offset for generating an output signal, said output signal thereby being related to the pressure at said second region.

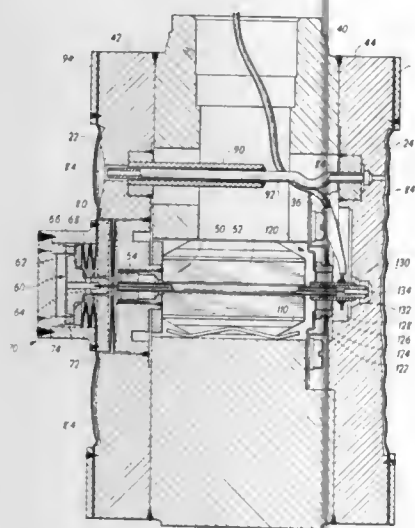
#### 4,165,651 PRESSURE MEASURING APPARATUS USING VIBRATABLE WIRE

Everett O. Olsen, Wrentham; James R. La Croix, North Attleboro, and Hoel L. Bowditch, Foxboro, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Sep. 19, 1977, Ser. No. 834,481  
Int. Cl.<sup>2</sup> G01L 13/02

U.S. Cl. 73—704

47 Claims



1. A vibratable-wire instrument for developing a measurement signal corresponding to an applied differential pressure and comprising:

body means providing an internal cavity;  
first and second spaced diaphragms secured to said body means and sealing said cavity;  
said diaphragms being arranged to receive on the outer

surfaces thereof respective fluid pressures the differential of which is to be measured;  
said body means including first and second diaphragm support means each positioned closely adjacent the inner surface of a corresponding diaphragm to establish first and second enclosed regions therebetween;  
a vibratable-wire coupled at one end to said first diaphragm; means fixing the other end of said wire with respect to said body means;  
tubular means surrounding said wire, closely adjacent thereto, providing an elongate passageway of small cross-sectional dimension leading from said first enclosed region adjacent said first diaphragm;  
means providing communication between the interior of said tubular means and said first and second enclosed regions adjacent said first and second diaphragms;  
means for establishing a sealed chamber including said enclosed regions, said elongated tubular passageway, and said communication means;  
a fill-liquid in said sealed chamber; and  
means for supplying energy to said wire to cause it to vibrate at a frequency related to its tension.

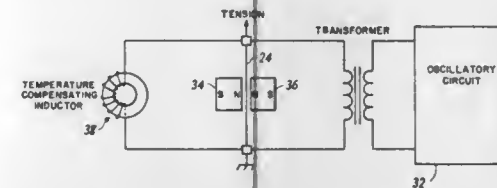
#### 4,165,652 VIBRATABLE-WIRE INSTRUMENT HAVING AN IMPROVED TEMPERATURE COMPENSATING TECHNIQUE

Everett O. Olsen, 54 Creek St., Wrentham, Mass. 02093; James R. La Croix, 89 Oakcrest Dr., North Attleboro, Mass. 02760, and Donald C. Simpson, 172 S. Washington St., Norton, Mass. 02766

Filed Jun. 2, 1978, Ser. No. 911,869  
Int. Cl.<sup>2</sup> 73.717; G01L 7/08, 9/00

U.S. Cl. 73—704

16 Claims



1. For use in a pressure measurement instrument having a diaphragm arranged to receive an applied pressure the magnitude of which is to be measured, a liquid-surrounded vibratable-wire coupled to said diaphragm and the tension on which is varied in relation to the magnitude of said applied pressure, and wherein said liquid has a first characteristic temperature effect on the vibration frequency of said vibratable-wire, an apparatus comprising:

a temperature compensating inductive element coupled in parallel with said vibratable-wire and having a second characteristic temperature coefficient on said vibration frequency opposite to and matching said first temperature effect such that the combined effect of said first and second coefficients on said vibration frequency is substantially zero.

#### 4,165,653 SIGNAL RATIO INDICATOR

Thomas P. Morehouse, Amherst, N.H., assignor to McGraw-Edison Company, Elgin, Ill.

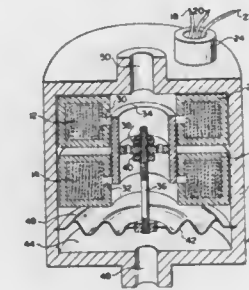
Filed Jul. 27, 1978, Ser. No. 928,623  
Int. Cl.<sup>2</sup> G01L 9/10

U.S. Cl. 73—722

3 Claims

1. Apparatus for producing a direct voltage ratio signal proportional to the ratio of a first direct voltage signal to a second direct voltage signal having a magnitude which is greater than the magnitude of the first direct voltage signal, which comprises:

a regulated direct voltage supply for providing a constant level, direct voltage signal;  
first and second signal filtering means, each including a resistor-capacitor network and having an input and output, for filtering a pulsed, discontinuous, DC input signal to produce a continuous direct voltage output signal;  
a signal comparator means;  
a first switching means, actuated by said signal comparator means, for connecting said first signal filtering means to receive the constant level, direct voltage signal from said regulated direct voltage supply;  
a second switching means, actuated by said signal comparator means, for connecting said second signal filtering means to receive the second direct voltage signal; and  
said signal comparator means having a first input connected to receive the first direct voltage signal and a second input



connected to receive the output signal of said second signal filtering means, said signal comparator means simultaneously closing said first and second switching means whenever the output signal of said second signal filtering means falls below the first direct signal by a predetermined voltage increment, and simultaneously opening said first and second switching means whenever the output signal of said second filtering means rises above the first direct voltage signal by a predetermined voltage increment;

whereby the average magnitude of the output signal of said second filtering means is equal to the average magnitude of the first direct voltage signal, and the direct voltage output signal of said first signal filtering means constitutes the direct voltage ratio signal and is proportional to the ratio of the first direct voltage signal to the second direct voltage signal.

#### 4,165,654 HIGH RESPONSE RATE PRESSURE PULSE SENSING PROBE WITH WIDE TEMPERATURE RANGE APPLICABILITY

Frederick G. Hammitt, 1306 Olivia St., Ann Arbor, Mich. 48104, and Jia-Bo G. Hwang, 1435 Sunnybrook Dr., Naperville, Ill. 60540

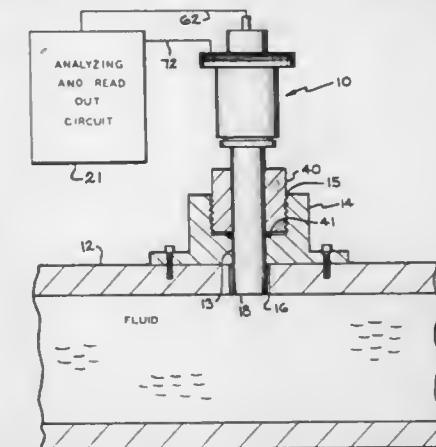
Filed Apr. 14, 1978, Ser. No. 896,351  
Int. Cl.<sup>2</sup> G01L 9/08

U.S. Cl. 73—723

4 Claims

1. A probe for sensing pressure pulses in a fluid medium comprising a housing having an internal cavity and an opening communicating with said internal cavity, a flexible diaphragm member mounted on said housing in covering relation with said opening, said diaphragm member forming a fluid-tight seal with said housing around said opening, a transducer positioned in said cavity in direct engagement with said diaphragm member, spring means in said cavity interposed between said housing and said transducer forcibly urging said transducer into direct engagement with said diaphragm member so that said diaphragm member is deflected against said transducer in response to pressure pulses impinging against said diaphragm member, a second opening formed through said housing, conductor means connected to said transducer and extending therefrom through said second opening to a location spaced from said probe, insulating means including an annular sleeve

structure having an axial passageway, said sleeve structure being disposed in said internal cavity and surrounding said conductor means to protect said conductor means from fluids having extreme temperatures, said spring means forcibly engaging said annular sleeve structure to urge said sleeve structure



ture against said transducer placing said transducer in direct engagement with said diaphragm, and a holder member having an extension collar portion slidably movable into said axial passageway, said holder being engaged by said sleeve structure and supporting said transducer in direct engagement with said diaphragm member.

#### 4,165,655 VIBRATING SCREEN APPARATUS HAVING DUAL FUNCTION ECCENTRIC WEIGHTS

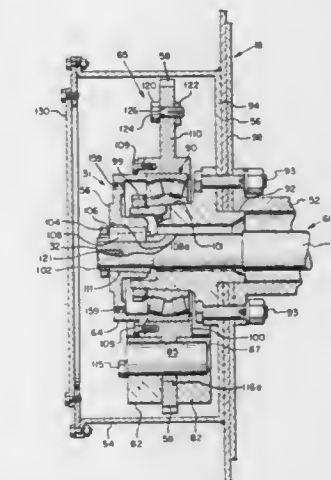
Peter B. Alford, Cheshire, Ore., assignor to El-Jay, Inc., Eugene, Ore.

Filed Aug. 18, 1977, Ser. No. 825,565

Int. Cl.<sup>2</sup> F16H 33/00

U.S. Cl. 74—61

4 Claims

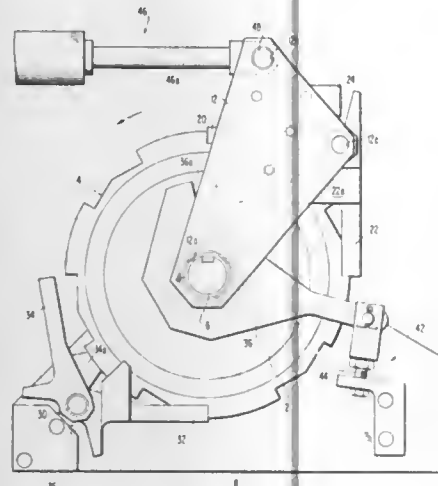


1. In a vibrating apparatus, a plurality of unbalanced shaft assemblies, each of which includes a shaft, means establishing a driving relation between said shafts including an annular member surrounding one shaft and a mounting member on said shaft on which said annular member is mounted for relative circumferential adjusting movement with respect thereto, clamping means for releasably clamping said annular member in fixed relationship to said mounting member, said clamping means including a pair of clamping elements on opposite sides of said mounting member and annular member, and means located inwardly of said annular member for



forcing said clamping elements into mutual clamping engagement with said mounting member and annular member.

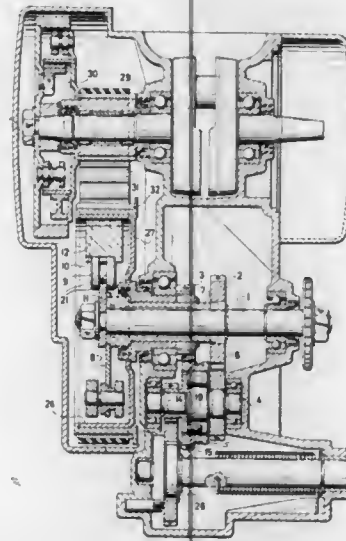
**4,165,656**  
**MULTI-MODE RATCHET INDEXER**  
Edward T. Rude, Columbia, Md., assignor to MRC Corporation, Hunt Valley, Md.  
Filed Jul. 22, 1977, Ser. No. 818,240  
Int. Cl.<sup>2</sup> F16H 27/02  
U.S. Cl. 74—129 12 Claims



1. An indexing mechanism comprising:  
base means,  
a gear wheel mounted to said base means for rotational movement in forward and reverse directions;  
drive means mounted adjacent said gear wheel for reciprocal movement independent of said gear wheel;  
first and second pawls mounted to said drive means for movement therewith, said first and second pawls being movable into and out of engagement with said gear wheel;  
third and fourth pawls mounted to said base means, said third and fourth pawls being movable into and out of engagement with said gear wheel;  
a first cam member mounted adjacent said gear wheel for movement independent of said gear wheel;  
a second cam member mounted adjacent said gear wheel for movement independent of the gear wheel; and  
mode selection means coupled to said first and second cam members for selectively moving each of said first and second cam members between respective first and second positions;  
wherein:  
in its first position, said first cam member controls movement of said third pawl relative to said gear wheel and, in its second position, the first cam member controls movement of said first pawl relative to said gear wheel; and wherein, in its first position, the second cam member controls movement of said second pawl relative to said gear wheel and, in its second position, the second cam member controls movement of said fourth pawl relative to said gear wheel; and  
wherein:  
when said first and second cam members are each in their respective first positions, said gear wheel is capable of being intermittently driven by said drive means only in a first rotational direction; and  
when said first and second cam members are each in their respective second positions, said gear wheel is capable of being intermittently driven by said drive means only in a second rotational direction opposite said first rotational direction.

**4,165,657**  
**MULTISTAGE AUTOMATIC TRANSMISSION**  
Jiří Bednář, Lanska, Czechoslovakia, assignor to Povazske strojarne, narodni podnik, Povazska Bystrice, Czechoslovakia  
Continuation-in-part of Ser. No. 845,590, Oct. 26, 1977, abandoned. This application Mar. 21, 1978, Ser. No. 888,625  
Claims priority, application Czechoslovakia, Oct. 26, 1976, 6873-76

Int. Cl.<sup>2</sup> F16H 3/08  
U.S. Cl. 74—329 3 Claims

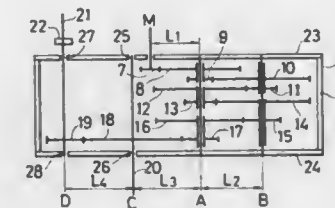


1. A multistage automatic countershaft transmission mechanism, comprising a support frame, a drive shaft, an output shaft and a countershaft all rotatably mounted on said support frame, a centrifugal gear change clutch having a drum coaxially mounted relative to said output shaft, said drum having a working surface, at least one centrifugally actuated shoe adapted to engage said working surface; a hub rotatably coaxially supported on said output shaft, a driven gear fixed to said hub, a driving gear fixedly connected to said drum, said drum being freely rotatably supported on said hub, an idle gear freely rotatably supported on the countershaft, a countershaft gear fixed to the countershaft, the driving gear operatively engaging the idle gear, carrier means of the gear change clutch fixed on the hub and adapted to operatively support said centrifugally actuated shoes, said carrier means having at least one carrier element operatively connected to said shoes, a regulating carrier fixed to the output shaft, the regulating carrier having an engagement edge, a driving edge and a rest surface which are adapted to be selectively operatively engaged by said carrier element.

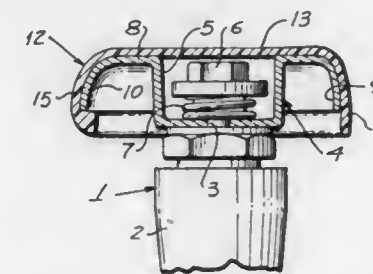
**4,165,658**  
**GEAR TRANSMISSION FOR ELECTRICAL OPERATION MEANS**  
Yoshio Ueno, and Akio Nagami, both of Kuwana, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan  
Filed Oct. 26, 1977, Ser. No. 846,224  
Claims priority, application Japan, Oct. 27, 1976, 51-128372  
Int. Cl.<sup>2</sup> F16H 1/20  
U.S. Cl. 74—412 R 9 Claims

1. A gear transmission for an electrical operation means adapted to be used for opening and closing a valve, including a motor and an output shaft of said motor comprising:  
(a) a generally cylindrical gear box including upper and lower supporting plates,  
(b) first and second gear shafts fixedly secured to said upper and lower supporting plates of said gear box,  
(c) a first plurality of pairs of large and small gears rotatably mounted on said first gear shaft, said large and small gears in each pair being integrally and coaxially secured to one another, and each pair being independently rotatable

about said first gear shaft,  
(d) a second plurality of pairs of large and small gears rotatably mounted on said second gear shaft, said large and small gears in each pair being integrally and coaxially secured to one another, and each pair being independently rotatable about said second gear shaft, a large gear of one of said pairs rotatably mounted on said first gear shaft being engaged with a gear attached to said output shaft of said motor, each small gear of said pairs rotatably mounted on one of said gear shafts being engaged with a large gear of said pairs rotatably mounted on the other of said gear shafts to form a reduction gear mechanism,

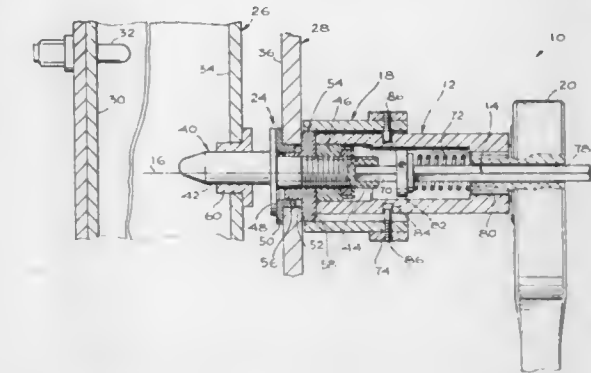


**4,165,659**  
**VALVE HAND WHEEL COVER**  
Norman C. Fawley, P.O. Box 6090, El Monte, Calif. 91734  
Filed May 11, 1978, Ser. No. 904,802  
Int. Cl.<sup>2</sup> B62D 1/06  
U.S. Cl. 74—558 4 Claims



1. A cover for a valve hand wheel including a top portion and an axially extending annular flange portion having a ring of radial projections spaced by a ring of radial depressions, for engagement by the fingers and thumb of the user, the cover comprising:  
a. a cover member having a top portion and a flange portion conforming respectively with the top portion and flange portion of the valve hand wheel to resist relative rotation;  
b. the axially extended end of the cover flange portion defining a circle approximating the ring of radial depressions formed in the hand wheel;  
c. the cover member being formed of plastic material having elastomeric properties whereby the cover member is capable of stretching over the ring of radial projections thereby to retain the cover member in position on the valve hand wheel.

**4,165,660**  
**ALIGNMENT PIN INSTALLATION TOOL**  
Jack D. Behrens, Moorpark, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.  
Filed Sep. 19, 1977, Ser. No. 834,569  
Int. Cl.<sup>2</sup> B25B 13/48  
U.S. Cl. 81—55 3 Claims



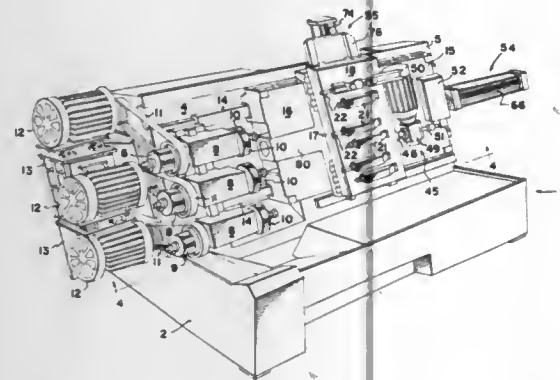
1. A fastening system, comprising:  
an alignment pin assembly that includes a bolt having a threaded rearward portion with a key-receiving recess at the rearward end and an offset forward bolt portion, an adjustment nut with a hole receiving the bolt and an outer surface offset from the hole, and a locking nut for turning on the rearward bolt portion to lock the bolt and adjustment nut in position;  
a socket wrench which includes an inner socket lying on a predetermined axis, said socket having an open front end formed to closely engage the locking nut and an opposite rear end, said wrench also including a handle at said rearward end of said socket;  
a key wrench rotatable in said socket wrench, said key wrench including a key having a forward end formed to closely fit said key-receiving recess in said bolt to turn or prevent turning of the bolt, and a handle at a rearward end of said key opposite said forward end; and  
an outer socket rotatably mounted on said inner socket to engage the adjustment nut, said outer socket being radially shiftable with respect to said inner socket to follow the offsetting of said adjustment nut, whereby to enable holding of the adjustment nut at any rotatable position while tightening the locking nut.

**4,165,661**  
**MACHINE TOOL CONSTRUCTION**  
Anthony Wasco, Jr., Saginaw, and David L. Kreucher, Frankenmuth, both of Mich., assignors to The Wickes Corporation, Saginaw, Mich.  
Filed May 9, 1977, Ser. No. 794,803  
Int. Cl.<sup>2</sup> B23B 3/06, 3/30  
U.S. Cl. 82—2 R 19 Claims

1. A machine tool comprising a frame having an upstanding bed provided with front and rear sides; means on said frame for supporting a workpiece; a first slide; means mounting said first slide on the front side of said bed for sliding movements along a path between rest and operating positions; yieldable force transmitting means acting between said frame and said first slide for moving the latter in opposite directions between said positions, said force transmitting means exerting a yieldable force on said first slide when the latter is in said operating position and biasing said first slide toward said operating position; a second slide; means mounting said second slide on said first slide for movements with the latter and for movements laterally of said path, said second slide being biased by gravity to move in one direction laterally of said path; rotatable first and second cam means carried by said first slide; driving means for rotating said cam means; first motion transmitting means acting between said first cam means and said frame for effect-

ing movements of said first slide along said path in response to rotation of said first cam means; and second motion transmitting means acting between said second slide and said second cam means for effecting movement of said second slide in the opposite direction laterally of and relatively to said first slide in response to rotation of said second cam means.

16. A machine tool comprising a frame having a base and an upright bed extending above said base, said upright bed having front and rear sides and an opening in its rear side; a first slide having an opening therein communicable with the opening in said bed; means mounting said first slide on the front side of said upright bed for reciprocable movements along a substantially horizontal path; a second slide; means mounting said second slide on said first slide for movements with the latter and for reciprocable movements relative to said first slide laterally of said path, said second slide being biased by gravity



to move in one direction laterally of said path; means on said second slide for supporting tooling; a pair of rotatable cams accommodated in said opening of said first slide; means removably mounting said cams on said first slide for movements with the latter, said mounting means being accessible via said openings for removal and replacement of said cam from the rear side of said upright bed without disturbing said tooling supporting means; first motion transmitting means acting between one of said cams and said first slide for imparting movement of the latter in response to rotation of said one of said cams; second motion transmitting means acting between the other of said cams and said second slide for imparting movement to the latter in response to rotation of said other of said cams; means on said frame for supporting a workpiece in a position to be engaged by tooling supported on said second slide; and driving means for rotating said cams.

4,165,662

#### WORK HOLDER ASSEMBLY FOR LATHE USED IN DRESSING CYLINDRICAL AND DISC SHAPED ARTICLES

Alex Besenbruch, and Franz Krause, both of Isabella, P.R., assignors to Besenbruch-Hofmann of Puerto Rico, Inc., Isabella, P.R.

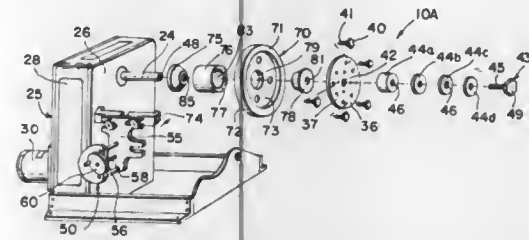
Division of Ser. No. 863,943, Dec. 23, 1977. This application Dec. 23, 1977, Ser. No. 863,940  
Int. Cl.<sup>2</sup> B23B 5/02

U.S. Cl. 82-4 A

9 Claims

1. Means for dressing a work piece having a substantially flat wall in a lathe having a rotary driven shaft, comprising: a work holder assembly having a first pair adapter members mountable on said shaft with said flat wall disposed between said members; a flat rigid plate mountable on said shaft; and bearing against one of said members; a plurality of adjustment members carried by said plate, each of said adjustment members bearing against said flat wall to prevent it from vibrating while said work piece is being

dressed, and holding said flat wall in a plane perpendicular to the axis of said shaft; a plurality of spacer members mountable on said shaft in axial alignment therewith, with one of said spacer members bearing against said plate; and



another bolt engageable in an end of said shaft and bearing against another one of said spacer members to hold said spacer members, plate, work piece and adapter members in place on said shaft while said work piece is being dressed.

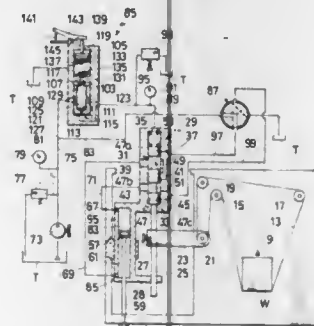
4,165,663

#### VERTICAL BANDSAW MACHINE WORK FEED

Kikuo Tsutsui, Isehara, and Masao Sato, Hadano, both of Japan, assignors to Amada Company, Limited, Isehara, Japan  
Filed Dec. 19, 1977, Ser. No. 861,617  
Claims priority, application Japan, Dec. 25, 1976, 51-157014  
Int. Cl.<sup>2</sup> B26D 7/06

U.S. Cl. 83-74

7 Claims



1. In a saw having a cutting blade arranged to cut a workpiece supported on a table, a feed mechanism for urging the workpiece towards the cutting blade, said feed mechanism comprising: a driving component movable in opposite directions in response to the application thereto of hydraulic fluid pressure; valve means responsive to the forces opposing movement of the workpiece towards the cutting blade for controlling the application of hydraulic fluid pressure to said driving component, said valve means having a valve body connected to and movable with said driving component, and a valve spool axially movable within said valve body in a direction parallel to the direction of movement of said drive component; and workpiece engaging means responsive to movement of said driving component in one direction for urging the workpiece towards the cutting blade and for accommodating movement of the workpiece away from the cutting blade during movement of the driving component in the opposite direction, said workpiece engaging means having an endless flexible element trained around a plurality of rotatable idlers, some of said idlers being mounted at stationary locations on said table and at least one of said idlers being carried on an arm extending laterally from an elongated rod, the said rod being axially reciprocal in a direction parallel to the direction of movement of said driving component and being acted upon by said valve spool.

4,165,664

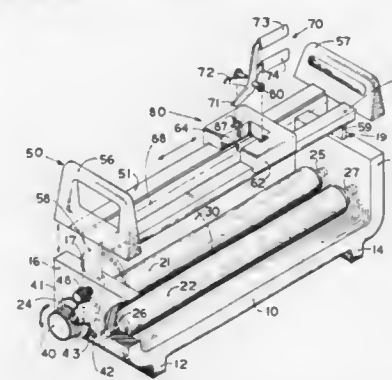
#### APPARATUS FOR CUTTING CANS

Richard E. DeYoung, 182 Captains Quarters, Roswell, Ga. 30076

Filed Apr. 14, 1978, Ser. No. 896,292  
Int. Cl.<sup>2</sup> B23D 21/14, 29/02

U.S. Cl. 83-188

10 Claims



1. A device for cutting along the circumferential surface of a can, said device comprising in combination:

a frame;  
support means coupled to said frame for receiving and movably supporting the circumferential surface of the can;  
cutter means for cutting along the circumferential surface of the can; and  
guide means coupled to said cutter means and said frame in known registration with said support means, said guide means for movably guiding said cutter means along an average guide axis which is generally parallel with a cylindrical axis of the can; whereby the circumferential surface of the can may be cut into a plurality of longitudinal strips.

4,165,665

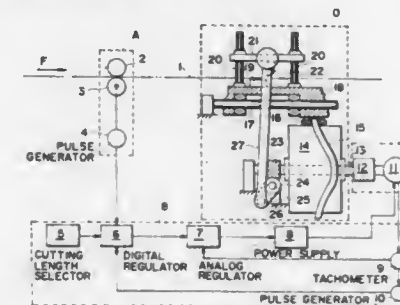
#### WEB CUTTING APPARATUS

Shigehisa Shimizu, and Shigemitsu Mizutano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 16, 1977, Ser. No. 861,339  
Claims priority, application Japan, Dec. 23, 1976, 51-155541  
Int. Cl.<sup>2</sup> B26D 1/56; B23D 25/04

U.S. Cl. 83-287

5 Claims



1. A web cutting apparatus for cutting a continuously traveling web into a desired length, comprising:  
a length detecting portion for generating a first signal representative of the length of web fed to said cutting apparatus;  
an output rotary shaft for driving said cutting apparatus, the rotational speed of said output rotary shaft controlling the frequency at which said web is cut;  
driving means for driving said output rotary shaft;  
means for generating a second signal representative of the rotational speed of said output rotary shaft;

means for generating a variable third signal representative of the desired length of web to be cut;  
means for receiving and comparing said first, second and third signals and providing a control signal to said driving means to control the rotational speed of said output rotary shaft whereby said web is cut into said desired lengths;  
first and second cutting blades in face-to-face relation to one another on either side of said continuously travelling web, one of said blades being movable toward the other and engagable therewith to effect the cutting of said web;  
a cylindrical cam mechanism driven by said output rotary shaft and including a modified isokinetic cam surface which causes said first and second cutting blades to simultaneously move in the length direction of said web and parallel to said web by the rotation of said output rotary shaft; and  
a reciprocating mechanism also driven by said output rotary shaft for moving said one of said blades in a reciprocating manner into and out of engagement with the other of said blades by the rotation of said output rotary shaft, the parallel travelling speeds of said first and second cutting blades being identical with the travelling speed of said web at the approximate center of the parallel travelling motions of said first and second blades where said first and second blades are brought into engagement.

4,165,666

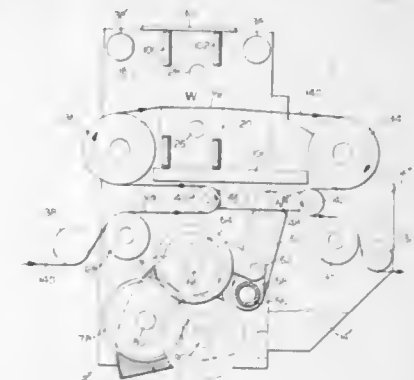
#### APPARATUS FOR SYNCHRONIZING ADVANCE OF WEB AND ROTATIONAL SPEED OF BUCKET OR LIKE METHOD

Arthur R. Johnson, deceased, late of Hartford, Conn., and Paul A. Hudon, administrator, West Hartford, Conn., assignors to Preston Engravers, Inc., Windsor, Conn.

Filed Sep. 19, 1977, Ser. No. 834,521  
Int. Cl.<sup>2</sup> B21D 43/04

U.S. Cl. 83-313

12 Claims



1. A tool assembly operable to perform a work operation on a moving web of material comprising:  
(a) a frame including a pair of spaced apart frame members;  
(b) a web drive train to advance a web of material along a selected path of travel including a work station between said frame members;  
(c) first and second tool means;  
(d) mounting means mounting said first and second tool means on said frame for periodic movement of said tool means at a selected frequency to and from a closely spaced work engaging position at a work station at which said tool means cooperate to perform a work operation on a web of material passing therebetween, said tool means having, at the time of performing said work operation, a tangential velocity in the direction of travel of said web along said path of travel;  
(e) shuttle means including a pair of spaced apart shuttle bars disposed along said path of travel of the web, and first and second guide members extending transversely between



said shuttle bars adjacent their opposite ends, said first and second guide members being adapted to engage the web, respectively, before and after said work station;

(f) means mounting said shuttle means on said frame for simultaneous reciprocating movement of said shuttle bars and guide members in at least first and second directions in said path of travel to respectively increase and decrease the velocity of the web through said work station by alternately shortening and lengthening that portion of said path of travel from said first guide member to said work station;

(g) drive means for effectuating, at a selected frequency, said periodic movement of said first and second tool means and said reciprocating movement of said shuttle means, said drive means including an eccentric assembly drivingly connected to said shuttle bars to effect reciprocating movement thereof; and

(h) control means to synchronize the periodic movement of said tool means and the reciprocating movement of said shuttle means to provide a selected velocity of the web through said work station which is substantially equal to the tangential velocity of said tool means, said control means including adjustable engagement means connectable to said shuttle means to synchronize a selected phase of said reciprocating movement of said shuttle means with said periodic movement of said tool means, said drive means and said drive train operating simultaneously so that the web is continuously advanced along said path of travel, said tool means acting upon the web as it continues to move through the work station.

4,165,667

# **PUNCH PRESS WITH WORKPIECE SUPPORTING MEANS**

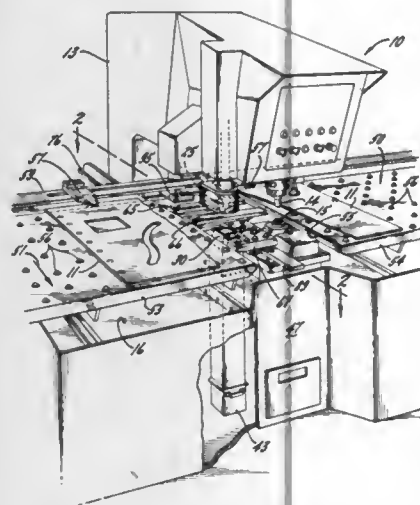
Theodore F. Brolund, Rockford; William B. Scott, Rochelle, and Merle R. Pauley, Rockford, all of Ill., assignors to W. A. Whitney Corp., Rockford, Ill.

Division of Ser. No. 754,826, Dec. 27, 1976, Pat. No. 4,106,183. This application Apr. 3, 1978, Ser. No. 892,685

Int. Cl.<sup>2</sup> B26D 7/06

U.S. Cl. 83—409

6 Claims



1. A punch press for forming holes in a workpiece and comprising a bed having forward and rear portions, a die supported on the forward portion of said bed, a vertically reciprocable punch adapted to coact with said die to form holes in said workpiece, a table for supporting said workpiece and movable back and forth in a fore-and-aft direction on said bed to locate said workpiece in various fore-and-aft positions over said die, said table being formed by a first section located on one side of said die and by a conjointly movable second section located on the opposite side of said die, there being a fore-and-aft extending throat between said table sections to permit said table to move forwardly to positions in which said

table sections straddle said die, a platform disposed between said table sections and located within said throat in at least some positions of said table and having an upper surface for supporting said workpiece, abutment means on the rear portion of said table and engageable with said platform when said table is moved forwardly to a predetermined position, and means mounting said platform on said bed for movement relative to said table and said bed and permitting said platform to move out of the way of said abutment means when said platform is engaged by said abutment means.

4,165,668

# **MITER GAUGE FOR TABLE SAW**

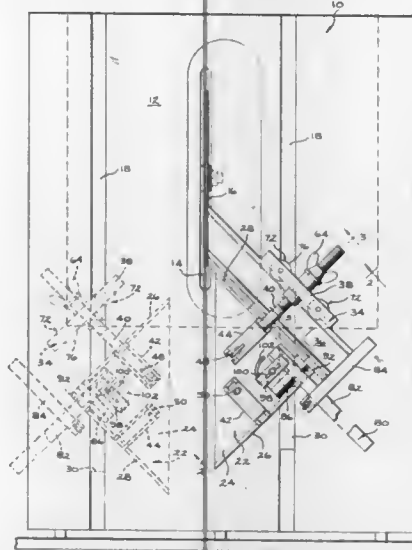
Wilfred M. McCord, Jr., Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Filed Mar. 20, 1978, Ser. No. 890,633

Int. Cl.<sup>2</sup> B27B 27/06

U.S. Cl. 83—435.1

9 Claims



1. A miter gauge for use with a cutting tool having guide slots provided on opposite sides thereof in a work surface on which the gauge is to be supported comprising:

- (a) base means having two workpiece locating surfaces rigidly fixed thereto at a right angle to one another;
- (b) a guide rail joined to said base means for selectively cooperating with either of the guide slots in the work surface on which the gauge is to be supported; and
- (c) adjustable clamping means reversibly mountable on said base means for selectively clamping a workpiece against either one of the locating surfaces.

4,165,669

# **MODULAR TURRET PUNCH PRESS**

Paul R. Brown, Akron; Robert P. DeGeorge, Kenmore; Adrien P. Malof, N. Tonawanda; Michael F. Dutton, Newfane; Percy L. Cady, Darien Center, and Eugene G. Lawrie, Lockport, all of N.Y., assignors to Strippl Division, Houdaille Industries, Inc., Akron, N.Y.

Continuation of Ser. No. 698,473, Jun. 21, 1976, abandoned.

This application Feb. 21, 1978, Ser. No. 879,213

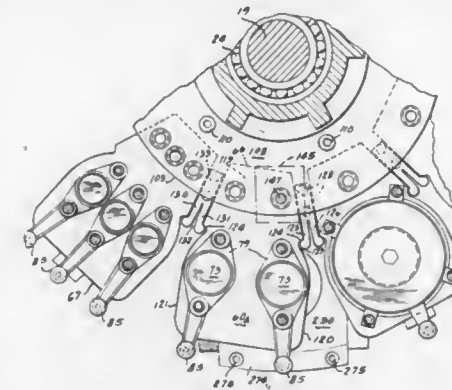
Int. Cl.<sup>2</sup> B21D 37/04

U.S. Cl. 83—552

18 Claims

1. In a turret punch press having a plurality of die tools rotatably carried by a turret and retained in die tool holders on said turret, the improvement of said die tool holders formed as individual modules individually detachable from the remainder of the turret, said modules including a base portion and a part-collar portion, the part-collar portion having an engagement face dimensioned to snugly engage a peripheral portion

of a die tool carried by the module in an opposition to an engagement face of the base portion dimensioned to snugly



engage an opposite peripheral portion of the die tool, the part-collar portion removably attached to the base portion.

4,165,670

# **SLIDABLE CAPO**

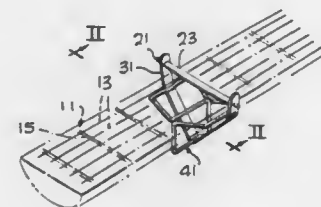
Maurice S. Cahn, c/o Dennis L. Deckert, Esq., 330 Washington St., 4th Floor, Marina Del Rey, Calif. 90291

Filed Aug. 5, 1977, Ser. No. 821,999

Int. Cl.<sup>2</sup> G10D 3/04

U.S. Cl. 84—318

10 Claims



1. A slidable device for fretting a set of guitar strings at different positions along the length of the neck of a guitar comprising

a bracket means including

upper frame means positionable adjacent the undersurface of a guitar neck and having

means for prohibiting direct contact between said upper frame means and the neck of such a guitar and for facilitating relative movement between said upper frame means and the neck of such a guitar, and

lower frame means extending from said upper frame means in such a direction as to be substantially perpendicular to the undersurface of such a guitar neck when said upper frame means is positioned adjacent the undersurface of such a guitar neck wherein said bracket means comprises

a single element configured such that said upper and lower frames are formed so that said upper frame is substantially closed about its periphery and said lower frame is open along at least one edge thereof;

barr means of a length greater than the width of said upper frame means and including

means for contacting the strings of a guitar on the upper surface of the neck thereof, such contacting means being slidable relative to such strings with the generation of only substantially inaudible levels of noise in such strings during such sliding; and

means, releasably fixable to the opposite ends of said barr means and passing over said lower frame means, for exerting a force on said barr means sufficient to fret the strings

of a guitar against which said barr may be placed at any position along the length of the neck of a guitar.

4,165,671

# **PERCUSSION INSTRUMENT**

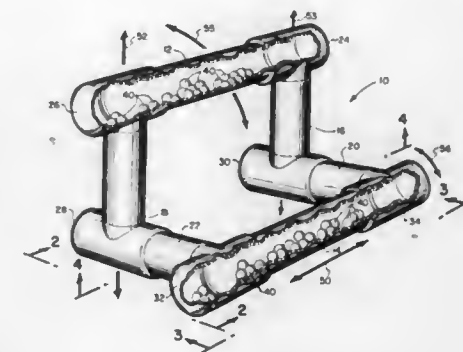
Errol A. De Bose, Lower Apartment, 3031 Dumaine, New Orleans, La. 70119

Filed Jan. 9, 1978, Ser. No. 867,783

Int. Cl.<sup>2</sup> G10D 13/06

U.S. Cl. 84—402

14 Claims



1. A hand percussion instrument, comprising:

- a. at least two substantially linear and parallel, extended hollow tubes spaced apart from one another;
- b. loose rattle means in said tubes for making percussion sounds as they move about in said tubes; and
- c. handle means, extending across from one of said tubes to the other and connecting said tubes together, for gripping with the human hand between said spaced tubes and for moving the instrument about to cause said loose rattle means to produce percussion sound as they move about in said tubes.

4,165,672

# **CONNECTOR PLATE**

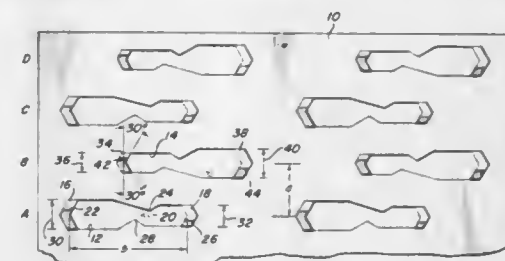
John C. Jureit, Coral Gables, and Benjamin H. Kushner, Miami, both of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Continuation of Ser. No. 728,945, Oct. 4, 1976, abandoned. This application Dec. 30, 1977, Ser. No. 865,930

Int. Cl.<sup>2</sup> F16B 5/00

U.S. Cl. 85—13

7 Claims



1. A connector plate for joining wooden members comprising a planar metal plate, a plurality of pairs of teeth on said plate formed by being struck from said plate so as to form a single opening between said teeth of each said pair, said teeth extending in a direction that is approximately perpendicular to the plane of said plate, each of said teeth having a modified diamond configuration at its free end, the width of one tooth of said pair of teeth at its root being greater than the width of the other tooth of said pair at its root, the length of said one tooth being greater than the length of said other tooth and the point of said one tooth of said pair of teeth is on one side of the center of its root and the point of said other tooth of said pair of teeth is on the opposite side of the center of its root to impart clench-

ing action to said teeth as they are embedded into material to be joined together, said openings being disposed in parallel longitudinal rows and said teeth being disposed in said rows.

4,165,673

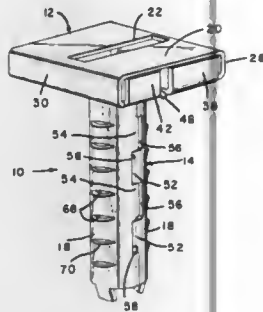
**METAL STAMPED AND FORMED SCREW**

John I. Shue, Jr., York, and George H. Douty, Mifflintown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.  
Filed Apr. 3, 1978, Ser. No. 892,613

Int. Cl.<sup>2</sup> F16B 27/00, 33/02

U.S. Cl. 85—44

6 Claims



1. A screw stamped and formed from a continuous web of material, said screw comprising:  
a head portion having a top plate with a slot therein, a pair of integral sidewalls depending from opposite sides of said top plate and defining an external profile, each said slot and said profile being adapted to receive associated tooling for imparting rotary movement to said screw, a pair of bottom plates integrally extending from said sidewalls underneath said top plate, and at least one tab intermediate said bottom plates and said top plate providing support therefor; and  
a shank portion formed by a pair of elongated leg portions integrally depending from adjacent edges of said bottom plates and interengaging along their longitudinal edges to form said shank portion, each said leg portion having a plurality of inclined parallel slots, and an outwardly directed protrusion adjacent one like side of each said slot forming an interrupted screw thread on the external surface of said shank portion.

4,165,674

**CONTACT FREE DEVICE FOR LIMITING THE RELATIVE MOVEMENT OF HYDRAULICALLY ACTUATED MEMBERS**

Armin Weigt, Schwerte-Wandhofen, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Dec. 13, 1976, Ser. No. 750,243

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555642

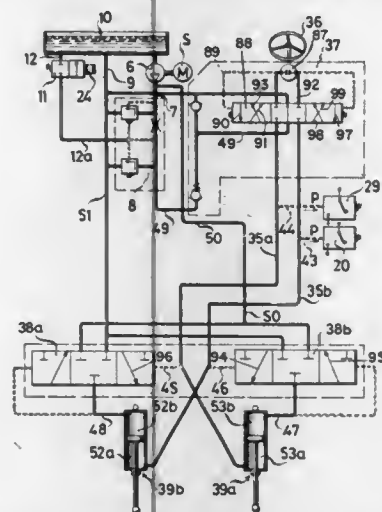
Int. Cl.<sup>2</sup> F15B 11/16, 13/06, 15/22

U.S. Cl. 91—178

3 Claims

1. A control device for contact-free limitation of the relative movement between a pair of members which approach one another in respective opposite directions of relative movement, especially movement of hydraulically actuated mechanical parts of a steering device for bucket loaders; fluid motor means connected to said members to effect relative movement in opposite directions between said members, a source of pressure fluid, control valve means for reversibly connecting said source to said motor means, the improvement in combination therewith comprising a proximity switch actuated in each of the opposite relative positions of said members in which relative movement therebetween in a respective direction is to be interrupted, only one pressure control magnetic valve connected to said source and an exhaust, said valve being spring urged toward closed position and having a solenoid energizable for movement of said valve into open position, a relay

energizable by each proximity switch and each thereof operable when energized to energize said solenoid, a holding circuit for each relay including a normally closed switch, each normally closed switch being operable into open position by fluid pressure, and means operable following the energization of one



4,165,675

**LOAD CHECK VALVE CYLINDER MOUNTED**

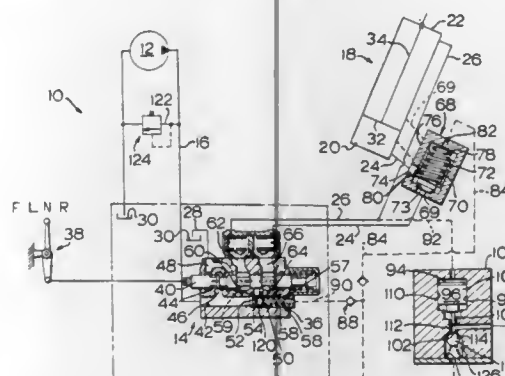
John R. Cryder, Joliet, and Lowell R. Hall, Elwood, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 7, 1977, Ser. No. 785,629

Int. Cl.<sup>2</sup> F15B 11/08, 13/042

U.S. Cl. 91—420

8 Claims



1. In a hydraulic motor and control system therefor which comprises fluid source means for delivering fluid from sump means via first conduit means to control valve means having a float position wherein a first end of said motor is in flow communication with a second end thereof and with said sump means, a first position for applying fluid from said fluid source means to power said motor to move in a first direction by delivering said fluid to said first end thereof via second conduit means, and a second position in which said motor moves in a second direction; and sump conduit means communicating said control valve means with said sump means; an improvement comprising:  
check valve means in said second conduit means allowing fluid flow therethrough to said first end of said motor and normally blocking fluid flow therethrough from said first end of said control valve means;

hydraulically actuated opening means for opening said check valve means to allow fluid flow therethrough from said first end of said motor to said control valve means responsive to operation of said control valve means in said second position;

third conduit means communicating a second end of said motor with said valve means;

wherein said control valve means provides as said float position a mode in which said first, second and third conduit means communicate thereby with said sump conduit means, as said first position a mode in which said third conduit means communicate thereby with said sump conduit means and said first conduit means communicates thereby with said second conduit means and as said second position a mode in which said second conduit means communicates thereby with said sump conduit means and said first conduit means communicates thereby with said third conduit means;

wherein said hydraulically actuated opening means comprises a pilot operated check valve; means biasing said pilot operated check valve to be closed; pilot conduit means communicating said third conduit means with said pilot operated check valve to provide fluid pressure from said fluid source means in opposition to said biasing means; drain conduit means communicating said first end of said hydraulic motor with said pilot operated check valve; pilot sump conduit means communicating said pilot operated check valve, when open, with said sump means; float conduit means communicating said drain conduit means to said control valve; an in-line check valve in said float conduit means which allows fluid flow towards said control valve means and prevents fluid flow away therefrom; and drain path means in said control valve means which communicates said float conduit means to said sump means when said control valve means is in said float position;

pressure relief means communicating said first conduit means to said sump means when said control valve means is in said first and second positions; and

wherein said drain path means comprises a sleeve which is closed at one end thereof within a drain bore in said control valve means biased so that said closed end sits against a drain seat formed in said control valve means, an open end of said sleeve being in flow communication with said float conduit means, said drain seat being in flow communication with said first conduit means, said sleeve including passage means therethrough to said sump means in said float position, said passage means closing when said sleeve moves away from said seat, movement of said sleeve away from said seat being caused by pressure build up against said closed end thereof overcoming said biasing thereof in said first and second positions to provide connection between said first conduit means and said second and third conduit means, respectively.

4,165,676

**FIRING SAFETY FOR A PNEUMATIC NAILER**

Carl Siegmann, Weizenkampstr. 60, 2800 Bremen 1, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,900

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718942

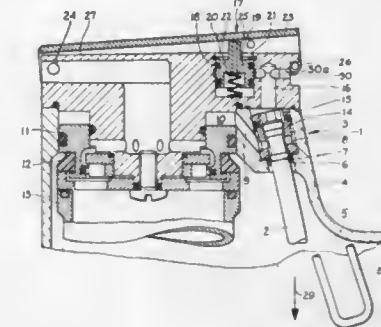
Int. Cl.<sup>2</sup> B25C 1/04

U.S. Cl. 91—461

4 Claims

1. In a pneumatic nailer having a housing, a cylinder and piston in said housing, a pneumatically controlled inlet valve for admitting pressurized air to said cylinder, a venting passage exclusively for venting said pressurized air to atmosphere, a manually actuatable safety valve disposed in said venting passage, and a trigger valve, said trigger valve and said safety valve being independently actuatable, said inlet valve being subjected to pressurized air when said trigger valve is in its unactuated position, and the pressurized air acting on said inlet

valve being vented to atmosphere through said venting passage when said trigger valve and said safety valve are actuated,



4,165,677

**RADIAL PISTON HYDRAULIC PUMP OR MOTOR WITH STABILIZED PINTLE SHAFT**

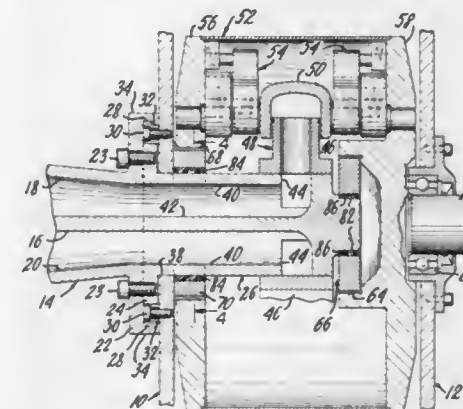
Jaromir Tobias, New York, N.Y., assignor to American Hydraulic Propulsion Systems, Inc., Englewood, N.J.

Filed Feb. 27, 1978, Ser. No. 881,554

Int. Cl.<sup>2</sup> F01B 13/06

U.S. Cl. 91—497

9 Claims



1. In a radial piston hydraulic pump or motor which includes spaced-apart inside and outside frame members, an input-output shaft journaled in the inside frame member, a first reaction ring joined to the input-output shaft for rotation therewith about the axis thereof, a pintle shaft mounted on the outside frame member in cantilevered relation and for translation along a plane that includes the axis of the input-output shaft and having a blind end portion located radially inwardly of a portion of the first reaction ring, a cylinder block mounted for rotation on the pintle shaft axially outwardly from the blind end and a second reaction ring mounted axially outwardly from the cylinder block for rotation conjointly with the first reaction ring about the axis of the input-output shaft journal, the improvement wherein the cantilever support for the pintle shaft includes means on the outside frame member defining a pair of guideways extending parallel to each other and to the plane along which the pintle shaft is translatable, one such guideway being on each side of said plane, and spaced a substantial distance from the circumferential surface of the pintle shaft, and each guideway having a length substantially greater than the sum of (a) the transverse dimension of the pintle shaft in said plane and (b) the distance of maximum translation of the pintle shaft axis along said plane, a pair of guide flanges joined to the pintle shaft, each of which is received slidably in one of the guideways of the frame, and wherein the blind end of the pintle shaft is joined to the first reaction ring by a first bearing

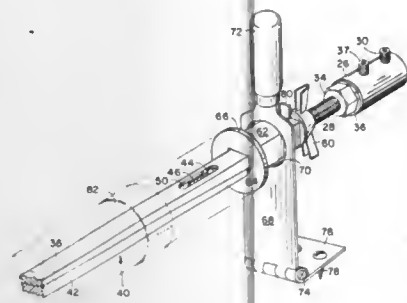


block which receives the first reaction ring for rotation thereon, the first bearing block having spaced-apart flat surfaces oriented parallel to each other and to the plane of translation of the pintle shaft, and the blind end of the pintle shaft having flat parallel surfaces slidably engaging said flat surfaces on the first bearing block and frictionally engageable due to the resultant force components perpendicular to said plane of translation imposed between said flat surfaces such that the resultant force components parallel to said plane of translation acting on the first bearing block are opposed by frictional forces induced at said surfaces.

**4,165,678**  
**PAPER LOG FORMING APPARATUS**  
John M. Hart, P.O. Box 13646, San Antonio, Tex. 78213  
Filed Oct. 25, 1977, Ser. No. 844,614  
Int. Cl.<sup>2</sup> B31C 1/00

U.S. Cl. 93-1 C

12 Claims



1. An apparatus for forming paper logs from sheets of paper comprising:

- a work surface;
- motor means stationarily mounted with respect to work surface;
- shaft means connected to and turned by said motor means, said shaft means extending over said work surface, said shaft means having a first and second longitudinally tapered half, said first longitudinally tapered half being longitudinally stationary, said second longitudinally tapered half being slideably attached to said first longitudinally tapered half with a taper therebetween and slideable along an axis of said shaft means, movement of said second longitudinally tapered half in a first direction along said axis increasing cross-sectional diameter of said shaft means and movement in a second direction along said axis decreasing said cross-sectional diameter of said shaft means; said sheets of paper being wrapped around said shaft means turned by said motor means to form said paper logs.

**4,165,679**  
**CHIMNEY DAMPER ARRANGEMENT**  
Bentford C. Lyemance, 4501 Sedgfield Ct., Louisville, Ky. 40216  
Filed Aug. 15, 1977, Ser. No. 824,977  
Int. Cl.<sup>2</sup> F23L 17/02

U.S. Cl. 98-59

3 Claims

1. A chimney flue damper and closure arrangement including:

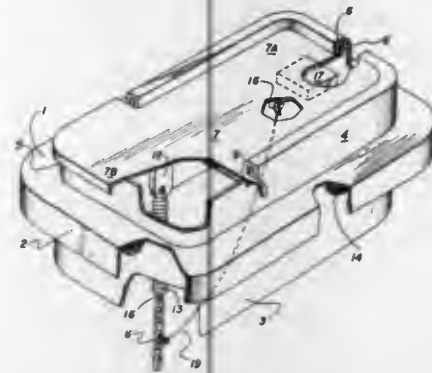
- (a) frame means of substantially rectangular shape to be disposed adjacent the outlet from a chimney flue defining an outlet from said chimney flue;
- (b) damper flap means pivotably carried by said frame means to rotate from a first position closing said opening defined by said frame means to a second position wherein a first portion of said damper flap means is disposed within said chimney flue and a second portion of said damper flap means is rotated to a position extending outwardly from

said frame means so said opening defined by said frame is open to flow of fluid from said chimney flue;

(c) pivot means connected to said damper flap means and said frame means to pivotably connect said damper flap means to said frame means so said damper flap is rotatable between said first position and said second position;

(d) bias means to urge said damper flap means to said second position when said damper is unrestrained;

(e) flexible pull means connected to said second portion of said damper flap to pull said damper flap from said second position to said first position where said flexible pull



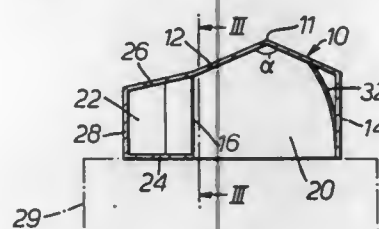
means is connected to said damper flap by spring means connected a first end to said damper flap and at a second end to said flexible pull means; and

- (f) flexible connector means connected at a first end to said first portion of said damper means and at a second end to said flexible pull means so that when said damper flap means is in said first position force exerted on said flexible pull means extends said spring means to the point that said flexible connector means is drawn taught to exert sufficient force on said second portion of said damper flap to urge said damper flap toward said second position.

**4,165,680**  
**FUME EXTRACTION CANOPY WITH BAFFLE DEFLECTOR**  
Charles G. Smith, West Bromwich; Kenneth R. Parker, Sutton Coldfield, and John G. Wyatt, Birmingham, all of England, assignors to Dresser Industries, Inc., Dallas, Tex.  
Filed Nov. 13, 1978, Ser. No. 960,495  
Int. Cl.<sup>2</sup> F23J 11/00

U.S. Cl. 98-115 R

7 Claims



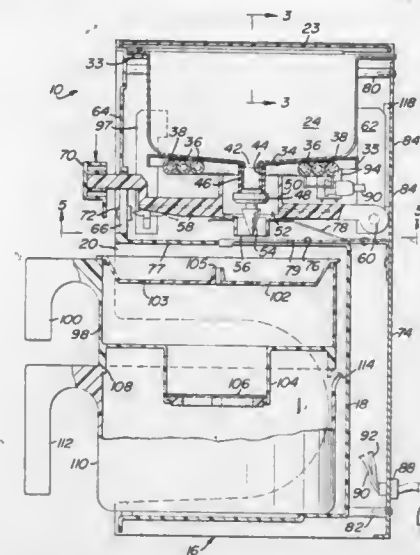
1. A fume extraction assembly which comprises:

- (a) elevated canopy means for collecting fume, said canopy means comprising opposite side walls and a pitched roof extending between the side walls;
- (b) elongated outlet means defining a plurality of upwardly extending slots for extracting fume from the canopy means and for compensating for a tendency to uncontrolled extraction rates along the outlet means, said outlet means extending along at least one of the side walls and being offset from the apex of the pitched roof; and
- (c) baffle means facing the outlet means for directing fume towards the outlet means.

**4,165,681**  
**ELECTRICAL WATER HEATER AND DISPENSER**  
Irving R. Belinkoff, Queens Village, N.Y., assignor to Kidde Consumer Durables, Corp., Bala Cynwyd, Pa.  
Filed May 16, 1977, Ser. No. 796,951  
Int. Cl.<sup>2</sup> A47J 31/10, 31/54

U.S. Cl. 99-280

12 Claims



1. Apparatus for electrically heating and then dispensing small amounts of water comprising a housing having a base, a tank supported by the housing at an elevation above the base and spaced therefrom so that a portable receiver may be temporarily positioned below the tank to receive hot water therefrom, said tank having a capacity of about two to three cups of water, means on said housing for facilitating introduction of water into said tank, said tank having a discharge port in a bottom wall, a heat sink fixedly secured to substantially the entire bottom wall of the tank and circumscribing said discharge port, a valve supported below said port for controlling flow of water from said port, a valve actuator coupled to said valve for manipulating the valve between open and closed positions, said valve actuator including a tube open at upper and lower ends thereof, said actuator tube circumscribing the tank discharge port, said tube supporting a generally conical funnel coaxial with said discharge port and adjacent the lower end of said tube, means biasing said valve to a closed position, heater coil means fixedly supported on said heat sink for heating water in the tank by conduction and for thereafter maintaining the temperature of water substantially constant when the water temperature is at a predetermined elevated temperature below 100° C., electrical conductors connected to said coil means, and means for venting steam and hot air from within said housing.

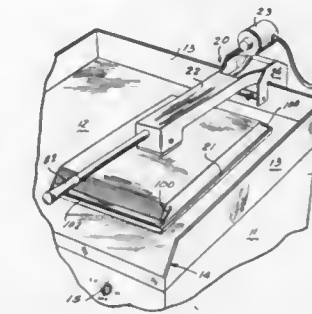
**4,165,682**  
**SANDWICH GRIDDLE**  
Frank F. Weiss, Etowah, N.C., assignor to Mid-Continent Metal Products Co., Chicago, Ill.  
Filed May 25, 1978, Ser. No. 909,531  
Int. Cl.<sup>2</sup> A47J 37/06; H03B 3/06

U.S. Cl. 99-331

12 Claims

1. A sandwich griddle assembly for converting flat griddles to two-sided cooking sandwich griddles comprising a clamp device for clamping the assembly to a splash wall of a flat griddle, an arm projecting from the clamp device and pivotable with respect thereto, a top plate assembly depending from the arm and pivotable with respect thereto, a heatable plate affixed to an underside of the top plate assembly, a heat means in the top plate assembly for heating said heatable plate, a heat control for controlling said heat means, a power supply to said heat control independent of the flat griddle, the arm pivotable

between a raised and a lowered position with respect to the flat griddle when the clamp device is affixed to the splash wall of

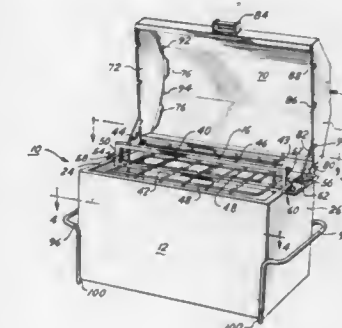


the flat griddle, and spring means biasing the arm in at least one of a raised and lowered position.

**4,165,683**  
**BARBECUE APPARATUS**  
Carl Van Gilst, Goshen, Ind., assignor to Innovative Industries, Inc., Goshen, Ind.  
Filed Feb. 6, 1978, Ser. No. 875,319  
Int. Cl.<sup>2</sup> A47J 37/08

U.S. Cl. 99-393

7 Claims



1. A barbecue apparatus comprising a generally rectangular body having two side panels, two end panels and an open top, a rotatable grill having longitudinally movable shafts at opposite ends extending outwardly over said end panels and having two sections for holding meat therebetween, elongated retainer means disposed near the bottom for holding burning fuel, a lid mounted on said body and having an arched top and two end panels, said lid having an opening therein for escape of smoke and hot gases, and a means for manually rotating said grill when said lid is in either its closed or open position, said last mentioned means having a handle with a finger which engages the upper edge of one of said body end panels for holding the grill in an adjusted position, and a pair of screws extending through one grill section into the other section for releasably holding the sections together.

**4,165,684**  
**DEFROST AND COOKING APPARATUS**  
Cornelius J. Wallace, New York, N.Y., assignor to S.E.N.O.C.T. Corp., Bronx, N.Y.

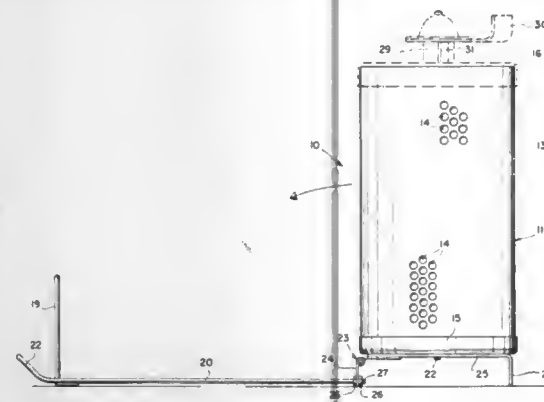
Continuation-in-part of Ser. No. 683,737, May 6, 1976. This application Jan. 25, 1978, Ser. No. 872,175

U.S. Cl. 99-421 H

11 Claims

1. A food defrost and cooking apparatus for use in an oven comprising an openwork drum, said drum including a divider, said divider forming a plurality of compartments in said drum, removable closure means at one end of said drum, said closure means adapted to cover said compartments, a mounting stand, said drum including rotatably interengagable means on said

mounting stand at one end, said other end of said drum freely interengagable with said mounting stand, said stand and drum



at said other end including means to normally support the end of said drum in a selected position and against rotation.

4,165,685

## MECHANICAL LINK PRESS

Toshio Nakada, and Naoaki Ikeoka, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

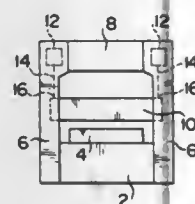
Filed Apr. 11, 1978, Ser. No. 895,377

Claims priority, application Japan, Apr. 11, 1977, 52-44013[U]

Int. Cl.<sup>2</sup> B30B 1/06

U.S. Cl. 100—282

2 Claims



1. A mechanical link press comprising a bed, a pair of side frames extending upwardly from the both ends of said bed sandwiched therebetween, a crown sandwiched by said pair of side frames at the upper ends thereof, a slide adapted to move up and down guided by said pair of side frames, a pair of main drive shaft means rotatably mounted to said pair of side frames respectively, a pair of gears each being drivingly connected to said main drive shaft means respectively, said pair of gears being mechanically connected to each other and adapted to be driven by a power source and a pair of linkage means arranged within said side frames for drivingly connecting said main drive shaft means with said slide, said linkage means being adapted to convert the rotational motion of said main drive shaft means to a linear motion of said slide.

4,165,686

## TWO-SIDED NON-IMPACT PRINTING SYSTEM

Ronald F. Borelli, Acton, Mass., and Kishor M. Lakhani, Oklahoma City, Okla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Oct. 5, 1977, Ser. No. 839,714

Int. Cl.<sup>2</sup> G03G 13/00; B41F 35/00

U.S. Cl. 101—1

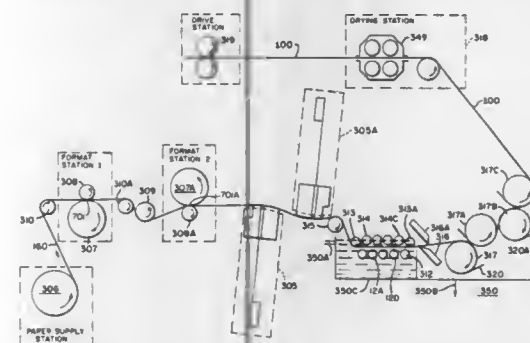
8 Claims

1. In an electrographic printing system of the type wherein a recording medium, comprised of a conductively treated paper base supporting a plastic dielectric coating on each of its sides and moving along a path, has electrographic images formed on each side of said recording medium by selectively applying a high potential across the recording medium and

wherein the latent images are subsequently made visible by applying a toner to the medium:

at least one electrographic formatting station for applying a latent image of a predetermined format on each side of said recording medium, wherein said electrographic formatting station includes at least one charging roller on either side of said recording medium, and at least one format roller on each side of said recording medium, offset with each other and with said charging roller in a direction of travel of said recording medium;

an electrode structure on each side of said recording medium, each electrode structure spaced adjacent the path of



said recording medium and including a plurality of spaced rows of electrodes, with successive electrodes in each of said rows being spaced from each other, and with the electrodes of successive rows being staggered; first means for selectively energizing substantially simultaneously each of said electrodes; and second means for continuously maintaining the energization of said selected ones of said electrodes to form elongated latent images substantially simultaneously on each side of said recording medium and substantially longer than the length of the electrodes in the direction of movement of the recording medium.

4,165,687

## PRINTING EQUIPMENT AND METHOD OF OPERATION THEREOF

Chikao Tezuka, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

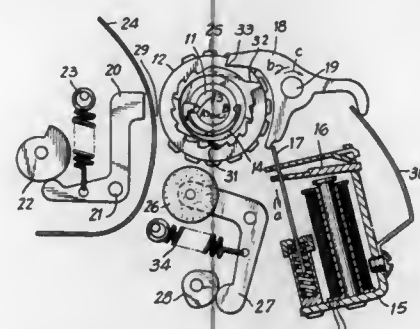
Filed May 19, 1977, Ser. No. 798,512

Claims priority, application Japan, May 22, 1976, 51/59282

Int. Cl.<sup>2</sup> B41J 1/44

U.S. Cl. 101—93.01

10 Claims



1. Printing apparatus, comprising a plurality of character rings each ring having type characters on the periphery thereof, a shaft for supporting and rotating said rings in both the forward and reverse directions in reciprocation, an inking roll for making intermittent contact with said characters on each of said rolls and transferring ink to same, a selecting means for selectively stopping each of said character rings in a

printing position, and a printing means disposed in registry with said printing position, said shaft being arranged and disposed for rotating through two complete turns in one of said forward and reverse directions for a total of three complete turns, one of said complete turns being in said forward direction and serving for rotating a selected character on each of said rings to said printing position, one of said complete turns being in said reverse direction and serving for return of said rings to a rest position, and one of said turns in said one of said forward and reverse directions serving for transfer of ink to all of said characters, whereby inking of said characters may be effected without interference with the rotation of said character rings and during rotation of said character rings through a full turn.

4,165,688

## INK DAM FOR PRINTING PRESS

Dale D. Leanna, Little Suamico, and Allen R. Jorgensen, Townsend, both of Wis., assignors to Magna-Graphics Corporation, Oconto Falls, Wis.

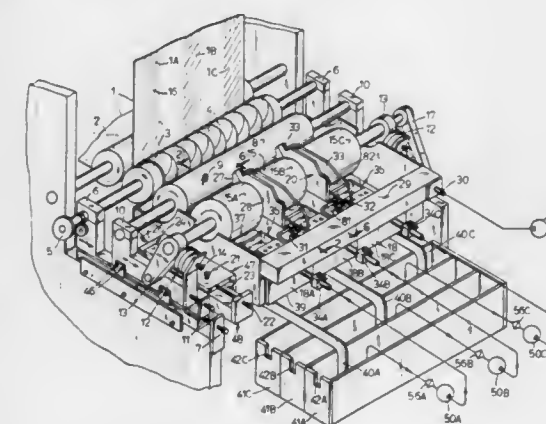
Continuation of Ser. No. 787,434, Apr. 14, 1977, abandoned.

This application Jun. 12, 1978, Ser. No. 914,751

Int. Cl.<sup>2</sup> B41F 31/06

U.S. Cl. 101—207

7 Claims



1. In a printing press:

a roll having two adjacent sections to which ink is applied; an ink fountain including means for applying ink to said adjacent sections;

and means for preventing ink travel between said adjacent sections of said roll and for dividing said ink fountain into separate compartments, said means comprising:

a circumferential groove in said roll between said two adjacent sections;

a divider comprising at least two separable sections cooperating to define an opening therein for accommodating said roll, said divider completely surrounding said roll and comprising an edge along said opening which extends into and entirely around said groove, said divider further comprising a plurality of spaced apart gas holes near said edge to accommodate passage of compressed gas therethrough into said groove;

and a hollow resilient pneumatically operated sealing tube disposed between at least one of said sections of said divider and said ink fountain and operable to prevent ink flow between said compartments of said ink fountain and to bias said divider toward said roll.

4,165,689

## DEVICE FOR SEQUENTIAL OVERTURNING OF SHEETS IN MULTI-COLOR OFFSET PRINTING MACHINES

Pietro Giuiuzza, Milan, Italy, assignor to Officine Meccaniche Cigardi S.p.A., Milan, Italy

Continuation of Ser. No. 707,796, Jul. 22, 1976, abandoned. This

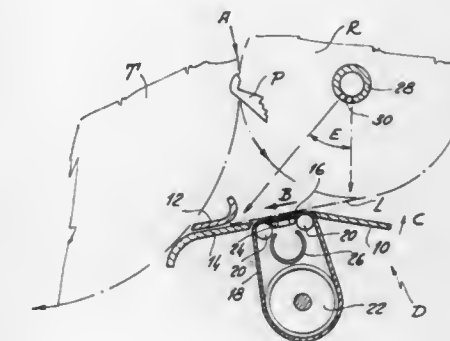
application Nov. 15, 1977, Ser. No. 851,645

Claims priority, application Italy, Jul. 24, 1975, 25698 A/75

Int. Cl.<sup>2</sup> B41F 5/02; B41L 15/10

U.S. Cl. 101—230

1 Claim



1. A device, for the sequential overturning of printed sheets in a multi-color offset printing machine including at least two printing units each having a known assembly of plate, rubber and printing cylinders, said printing units being interconnected by at least one means for transferring a printed sheet from one printing unit to another printing unit, said device being positioned externally of and associated with said transfer means, said device comprising:

(i) an auxiliary overturning cylinder (R') positioned adjacent to said transfer means (T) said auxiliary overturning cylinder being of a diameter which is larger than the diameter of the printing cylinder (S) next upstream thereof,

(ii) means (P) for engaging a leading edge of a printed sheet carried on said transfer means (T) and for temporarily holding said leading edge on said auxiliary overturning cylinder (R') until said printed sheet has become fully detached from said transfer means (T) and has become wholly carried on said auxiliary overturning cylinder (R')

(iii) means (30, 32) for detaching said printed sheet from said auxiliary overturning cylinder (R') and for carrying said sheet along a path which meets the contour of said transfer means (T) at a second point downstream of the point (Y) of detachment of the sheet from said transfer means

(iv) means for driving said auxiliary overturning cylinder (R') through an angular stroke such that its peripheral movement is at least equal to the arc defined on the contour of the transfer means (T) between said point of detachment and said second point, said driving means comprising:

(a) a member (34) rotatable oppositely to and at a speed of rotation constant relative to the speed of rotation of the transfer means (T) about an axis (O) parallel to the axis (O') of the auxiliary overturning cylinder and situated between said point of detachment (Y) and the axis (O') of the auxiliary overturning cylinder

(b) means (36, 38, 40) coupling said rotatable member and said auxiliary overturning cylinder for rotation.



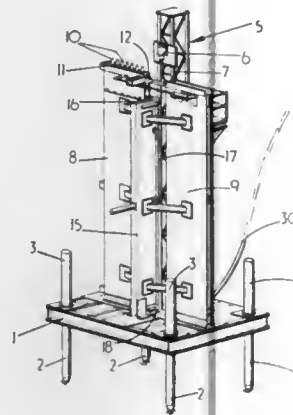
**4,165,690**  
**DRILL UNITS FOR DRILLING AND CHARGE LAYING OPERATIONS AND METHOD OF CARRYING OUT THE OPERATIONS**

Joseph L. Abrahams, Barrhead, Scotland, assignor to Rock Fall Company Limited, Glasgow, Scotland  
 Filed Dec. 6, 1977, Ser. No. 857,993

Claims priority, application United Kingdom, Dec. 17, 1976, 52717/76

Int. Cl.<sup>2</sup> E21B 7/00  
 U.S. Cl. 102—22 R

8 Claims



1. A drill unit for drilling and charge laying operations comprising a gantry, a vertically disposed frame structure mounted on the gantry, a rock drilling machine mounted for vertical movement on the frame structure, a first drill magazine mounted on the gantry adjacent the frame structure on a vertical plane and adapted to hold a plurality of drill steels having co-axial casing members mounted thereon, a second drill magazine vertically mounted in spaced end-to-end relation with the first drill magazine adapted to hold used drill steels, said drill magazines having adjacent ends open, means for moving a drill steel and its associated casing member into alignment with the drilling machine for attachment thereto to drill a hole below the gantry and put a casing member down the hole a charge magazine located adjacent the frame structure and adapted to hold a plurality of explosive cartridges, means for moving an explosive cartridge in the charge magazine into register with a casing member put down by the drilling machine to charge the hole with explosives.

**4,165,691**  
**DELAY DETONATOR AND ITS USE WITH EXPLOSIVE PACKAGED BOOSTERS AND CARTRIDGES**

Arthur F. Bowman, and Francis J. Camerini, both of Tamaqua, Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Aug. 29, 1977, Ser. No. 828,780

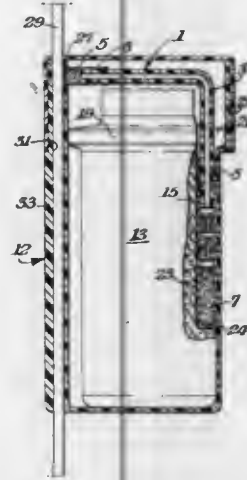
The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> F42B 3/10  
 U.S. Cl. 102—24 R

10 Claims

1. A nonelectric delay detonator comprising a nonelectric blasting cap which is open at one end and contains a base explosive material positioned in the opposite extreme end of the cap with a delay material positioned above the base explosive material, a passive signal carrier in the form of an empty open ended tube having an inner diameter of 1.0–4.0 millime-

ters, said carrier extending from a point externally of the cap into the open end of said cap, and a detonation sensor applied



over the opposite end of the carrier tube, said carrier tube lying in open and direct communication with sensor and said cap.

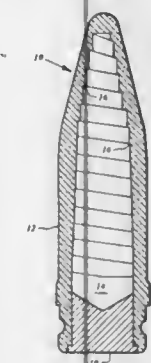
**4,165,692**  
**FRANGIBLE PROJECTILE FOR GUNNERY PRACTICE**

Robert H. Dufort, Kenmore, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,752

Int. Cl.<sup>2</sup> F42B 13/20  
 U.S. Cl. 102—92.7

4 Claims



1. A frangible projectile including:  
 a brittle, sintered metal casing;  
 a cavity formed in said casing; and  
 an axially extending sharp edged stress riser formed in said casing and forming at least a portion of the walls of said cavity whereby, upon impact, said casing will fracture along said stress riser.

**4,165,693**  
**MOBILE TRACK LEVELING, LINING AND TAMPING APPARATUS**

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 8, 1977, Ser. No. 858,717

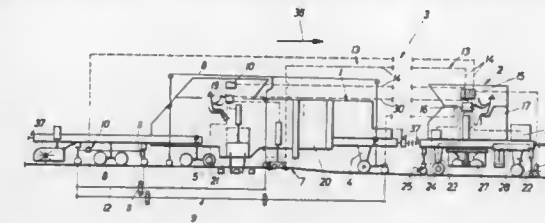
Claims priority, application Austria, Jan. 17, 1977, 238/77  
 Int. Cl.<sup>2</sup> E01B 27/17, 29/04

U.S. Cl. 104—7 B

10 Claims

1. A mobile track leveling, lining and tamping apparatus comprising a first vehicle mounted on two undercarriages for mobility on the track in a working direction, track lifting, lining and tamping means mounted on the first vehicle between the two undercarriages, a reference system for controlling the track leveling and lining by the track lifting and lining means,

means for measuring parameters of the track position during leveling and lining, a drive for the first vehicle, a second vehicle associated with and preceding the first vehicle in the working direction and forming therewith a single machine assembly while being mechanically separated therefrom, a separate drive for the second vehicle whereby the machine assembly may be operated while the first vehicle advances intermittently



and the second vehicle advances non-stop, a ballast plow means mounted on the second vehicle, track position parameter indicating means mounted on the second vehicle, transmission means connecting the measuring means to the indicating means for transmitting the measured parameters whereby the indicating means indicates the track position leveled and lined at the first vehicle, and a common power source on the first vehicle for the drives.

**4,165,694**  
**MOBILE TRACK LEVELING, LINING AND TAMPING APPARATUS**

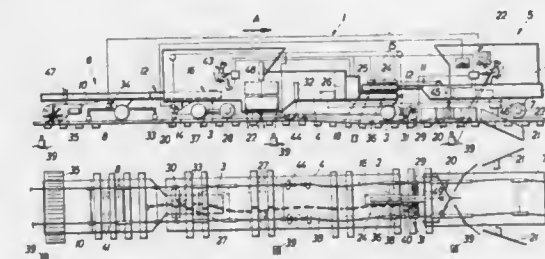
Josef Theurer, Vienna, Austria, assignor to Franz Plasser-Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 8, 1977, Ser. No. 858,718

Claims priority, application Austria, Dec. 27, 1976, 9686/76  
 Int. Cl.<sup>2</sup> E01B 27/17, 29/04

U.S. Cl. 104—7 B

23 Claims



1. A mobile track leveling, lining and tamping apparatus comprising frame means mounted on undercarriages for mobility on the track in a working direction, tamping means, track shifting means and a reference system for controlling the track leveling and lining by the track shifting means mounted on the frame means, means for actuating the tamping and track shifting means, and means for driving the frame means in the working direction, the frame means comprising a main frame and an auxiliary frame mounted on at least one of the undercarriages, one end of the main frame being adjacent one end of the auxiliary frame, a coupling between the ends of the main and auxiliary frames, the coupling being arranged to permit at least temporary adjustment of the spacing between the frame ends and relative movement between the frames in the working direction, track surfacing means mounted on the auxiliary frame, the driving means comprising a drive for the auxiliary frame, and a control operatively associated with the auxiliary frame drive for selectively driving the auxiliary frame with the main frame and relative to the main frame, the control being arranged to control the auxiliary frame drive for non-stop forward movement of the auxiliary frame in the working direction at a pre-adjustable constant speed, whereby the auxiliary frame moves away from the main frame at said speed when the main frame is stopped during successive, intermittent track leveling, lining and tamping cycles, and the speed is pre-adjusted to one lower than that of the main frame in movement

whereby the main frame approaches the auxiliary frame during said movement.

17. A mobile track leveling, lining and tamping apparatus comprising frame means mounted on undercarriages for mobility on the track in a working direction, tamping means, track shifting means and a reference system for controlling the track leveling and lining by the track shifting means mounted on the frame means, means for actuating the tamping and track shifting means, and means for driving the frame means in the working direction, the frame means comprising a main frame and an auxiliary frame mounted on at least one of the undercarriages, one end of the main frame being adjacent one end of the auxiliary frame, a coupling between the ends of the main and auxiliary frame, the coupling being arranged to permit at least temporary adjustment of the spacing between the frame ends and relative movement between the frames in the working direction, track surfacing means mounted on the auxiliary frame, the driving means comprising a drive for the auxiliary frame, a control operatively associated with the auxiliary frame drive for selectively driving the auxiliary frame with the main frame and relative to the main frame, the control being arranged to control the auxiliary frame drive for non-stop forward movement of the auxiliary frame in the working direction at a pre-adjustable constant speed, whereby the auxiliary frame moves away from the main frame at said speed when the main frame is stopped during successive, intermittent track leveling, lining and tamping cycles, and the speed is pre-adjusted to one lower than that of the main frame in movement

18. A track surfacing method wherein a mobile track leveling, lining and tamping apparatus comprising frame means mounted on undercarriages for mobility on the track is advanced intermittently along a track between successive tamping stations, the apparatus being stopped at each of the stations for tamping, the frame means comprising a main frame and an auxiliary frame mounted on at least one of the undercarriages, one end of the main frame being adjacent one end of the auxiliary frame, and track surfacing means being mounted on the auxiliary frame, which comprises the step of advancing the auxiliary frame non-stop at a substantially constant speed, the auxiliary frame advancing in relation to the main frame while the main frame is stopped at the successive tamping stations and the main frame approaching the auxiliary frame as the main frame advances from station to station, the track surfacing means on the auxiliary frame continuously advancing at the constant speed while the main frame of the apparatus advances intermittently.

**4,165,695**  
**AMUSEMENT RIDE WITH VERTICAL TRACK LOOP**

Anton Schwarzkopf, Munsterhausen, Fed. Rep. of Germany, assignor to Firma Anton Schwarzkopf Stahl- und Fahrzeugbau, Munsterhausen, Fed. Rep. of Germany

Filed Jan. 24, 1978, Ser. No. 871,992

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703833

Int. Cl.<sup>2</sup> A63G 21/10, 21/04  
 U.S. Cl. 104—85

10 Claims



1. A roller coaster comprising:  
 a track having a substantially level stretch followed by a vertical loop and a steep incline;  
 a nondriven vehicle movable on said track;

a station at said stretch provided with brake means for arresting said vehicle in a predetermined position; and external drive means at said stretch engageable with the arrested vehicle for accelerating same to a speed sufficient to traverse said loop in one direction, ascend said incline to a predetermined level, descend said incline and traverse said loop in the opposite direction before being again arrested at said station.

**4,165,696**  
**ARRANGEMENT FOR PIPELINE TRANSPORTATION OF CARGOES**

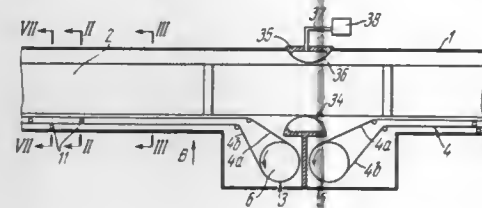
Zinoviy F. Chukhanov; Sergei A. Tsuprov, and Danil M. Apter, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchnoissledovatel'skiy Energeticheskiy Institut Imeni G.M. Krzhizhanovskogo, Moscow, U.S.S.R.

Filed Nov. 29, 1977, Ser. No. 855,565

Int. Cl.<sup>2</sup> B61B 13/10

U.S. Cl. 104—147 R

12 Claims



I. An arrangement for pipeline transportation of cargoes comprising: a pipeline filled with liquid at substantially atmospheric pressure; containers accommodated in said pipeline; conveyors arranged in a sequence along the entire length of said pipeline; said conveyors being adapted to displace said containers along said pipeline; endless traction members of said conveyors engaging said containers during their displacement along said pipeline; supports mounted in said pipeline serving as guides for each of said endless traction members of said conveyors during their movement; each of said endless traction members of said conveyors comprising a belt having at least one row of elements equally spaced along the length thereof; each of said containers having at least one longitudinal groove extending substantially the entire length and being recessed within an exterior surface of said container; stops positioned in said at least one longitudinal groove; said endless traction members of said conveyors being adapted to fit into said longitudinal grooves and engage said stops so that movement of said conveyors displaces said containers; a drive for said conveyors; a source of liquid at substantially atmospheric pressure communicating with said pipeline.

**4,165,697**  
**HAND OPERATED SEED PLANTER**  
Robert R. Yeager, Union City, and Ronald E. Shaner, Rossburg, both of Ohio, assignors to Lambert Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 826,646, Aug. 22, 1977, abandoned. This application May 30, 1978, Ser. No. 910,456

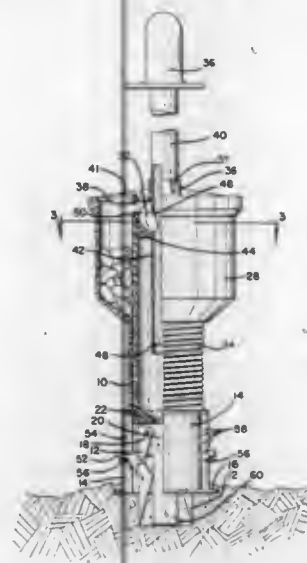
Int. Cl.<sup>2</sup> A01C 5/02

U.S. Cl. 111—92

12 Claims

1. A hand operated seed planting device comprising a vertically oriented tubular body, a pair of soil spreading jaws pivotally mounted on the lower end of said tubular body, a soil collar slidably mounted on said tubular body at the lower end thereof, said jaws being proportioned to extend through said soil collar and into the ground at one axial end of said soil collar upon sliding movement of said collar on said tubular body, means coaxing between said soil collar and said jaws for engaging said jaws responsive to and concurrently with downward movement of said tubular body relative to said collar and for causing said jaws to be spread apart in the soil in response

to said downward movement of said tubular body and thereby creating a seed receiving space in the ground, and hopper means carried on the upper end of said tubular body, including



metering means for dropping a single seed through said tubular body from said hopper means concurrently with said jaw operating movement, thereby depositing said seed into the space in the ground opened between said jaws.

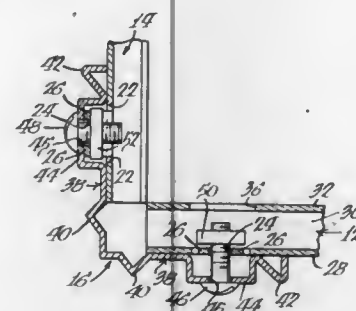
**4,165,698**  
**STEEL SHELVING**  
Irwin J. Ferdinand, Glencoe, Ill., assignor to Hirsh Company, Skokie, Ill.

Filed Aug. 4, 1976, Ser. No. 711,527

Int. Cl.<sup>2</sup> A47B 7/00

U.S. Cl. 108—156

3 Claims



1. A metal shelving assembly comprising: at least one shelf; vertical support columns; and securing means for securing said shelf rigidly to said support columns, said shelf having a planar portion and having depending sheet metal flanges, at least some of said flanges having a deformable attachment portion with a flange aperture extending there-through, each of said vertical support columns having at least one wall including die means for receiving and being engaged by said deformable attachment portion, said die means including a vertical U-shaped channel having a plurality of vertically spaced column apertures therethrough, said deformable attachment portion including two spaced parallel slots in each said flange on either side of one said flange aperture, said slots being substantially perpendicular to said shelf planar portion and substantially parallel to at least one wall of said channel in said support column, each said securing means comprising a jam piece and a drive piece mutually threadably engaged and interconnecting one of said support columns with said shelf

flange deformable attachment portion through said flange and column apertures whereby, when said jam piece and said drive piece are threadably tightened to interconnect said support column with said deformable attachment portion, said deformable attachment portion is drawn to engage said die means and to deform therein, thereby preventing said jam piece from rotating.

**4,165,699**  
**PRESSER FOOT FOR SEWING MACHINE**  
Naotchi Nishi, No. 1012, Aza Hiyoshicho, Oaza Sanjo, Sanjo City, Niigata Prefecture, Japan

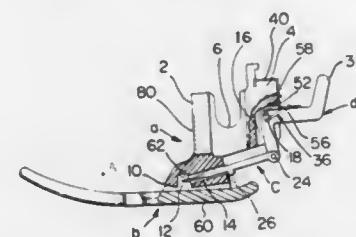
Filed Jan. 5, 1978, Ser. No. 867,179

Claims priority, application Japan, Aug. 26, 1977, 52-113388[U]; Nov. 5, 1977, 52-148805[U]

Int. Cl.<sup>2</sup> D05B 29/12, 87/04

U.S. Cl. 112—240

4 Claims



1. A presser foot for use in a sewing machine, said presser foot comprising:

- a shank including an upper vertical portion, a lower horizontal portion, and a lug extending in a rearward direction from said upper portion, said upper vertical portion having therein a groove for receiving a presser foot bar of a sewing machine, said lower horizontal portion having formed therein a transverse slot opening onto a bottom surface of said lower horizontal portion, said lug having formed therein an upwardly extending slit, and said lower horizontal portion having therein a longitudinal bore extending rearwardly from a first end opening into said transverse slot to a second end opening onto a rear surface of said lower horizontal portion;
- a presser foot shoe having thereon a pair of supports, and a shaft extending transversely of said shoe between said supports, said shaft being dimensioned to be received within said transverse slot;
- a rod having a first inner end and a second outer end, said rod being mounted within said bore for sliding movement therein between a first position whereat said inner end of said rod extends into said transverse slot to retain therein said shaft and a second position whereat said inner end of said rod is retracted from said transverse slot into said bore and said shaft may be removed from or inserted into said transverse slot, said rod having extending therefrom stopper means for abutting against said rear surface of said lower horizontal portion and for thereby limiting the movement of said rod toward said first position thereof;
- a lever pivotally mounted within said slit in said lug, said lever having a lower end pivotally connected to said outer end of said rod, said lever being pivotable in a first direction moving said rod toward said first position thereof, and said lever being pivotable in a second direction moving said rod toward said second position thereof;
- an elastic flexible plate connected to said lug and bearing on said lever, said plate having therein first and second openings; and
- torsion spring means, having first and second arms slidably extending through said first and second openings of said plate, respectively, for urging said plate against said lever and for thereby urging said lever to pivot in said first direction.

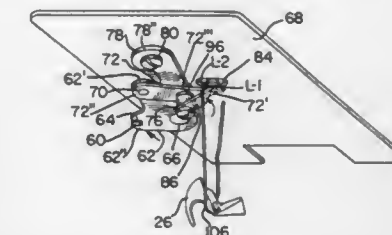
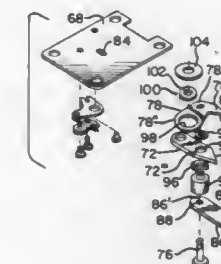
**4,165,700**  
**THREAD SEPARATING FINGER**  
Roy W. Fletcher, Riverdale, and Anthony D. Forte, Chicago, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Oct. 30, 1978, Ser. No. 956,464

Int. Cl.<sup>2</sup> D05B 65/02

U.S. Cl. 112—286

2 Claims



1. In combination with a knife assembly adapted for cutting thread utilized in a sewing machine, said assembly having first and second levers, each lever having first and second end portions and a medial portion therebetween, said first end portion of said second lever defining a first cutting blade portion, first means at said second end portion of said second lever for mounting said second lever for pivotal movement, a link having first and second end portions and a medial portion therebetween, said first end portion of said link defining a second cutting blade portion cooperative with said first cutting blade portion for cutting a thread therebetween upon relative pivoting motion between said link and said second lever, second means pivotally connecting together said medial portions of said link and second lever, and third means pivotally connecting together the first end portion of said first lever and the second end portion of said link creates said relative pivoting motion between said link and said second lever to cut a thread adapted to be disposed between said first and second cutting blade portions wherein the improvement comprises a thread separating finger means for moving into a loop of needle thread ahead of said first and second cutting blade portions and separating the legs of said loop to insure that only one of said legs will be cut by said first and second cutting blade portions, including: first and second end portions, said second end portion defining said thread loop spreading implement and means for adjustably securing said first end portion to said medial portion of said second lever.

**4,165,701**  
**SEA-GOING CRAFT**  
P. H. Kluytmans, Sevaneta 350 B, Aruba, Netherlands Antilles

Continuation-in-part of Ser. No. 735,752, Oct. 26, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,264

Int. Cl.<sup>2</sup> B63B 1/00

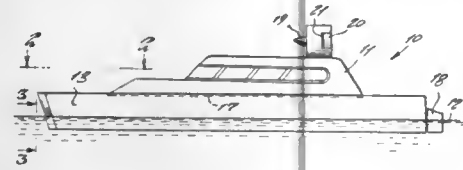
U.S. Cl. 114—61

4 Claims

1. A sea-going craft, comprising, in combination, a cabin hull secured to a pair of parallel, spaced apart floats or pontoons having engine means for driving an air propeller, in order to provide thrust for movement of said craft in the water, the forward ends of said floats each having a sidewardly, angularly inclined front surface on its outer side, so as to converge in a



forwardly direction, in order to reduce water turbulence between said floats, said floats extending forwardly of a front end of said cabin hull as well as rearwardly of a rear of said cabin hull for maximum stability, said floats each having a constantly same cross-sectional configuration rearwardly of said front inclined wall surfaces, and said floats elevating a bottom of said



cabin hull above said water, said engine being secured fixedly upon a top of said cabin hull; said engine, together with its propeller, being within a circular cowl having rudder means that includes rudders on each side of said cowl, said rudders being pivotally attached to said cowl by hinges so as to directionally turn said craft.

4,165,702

# **METHOD OF CONSTRUCTING A TWIN HULLED, COLUMN STABILIZED, SEMI-SUBMERSIBLE DERRICK BARGE**

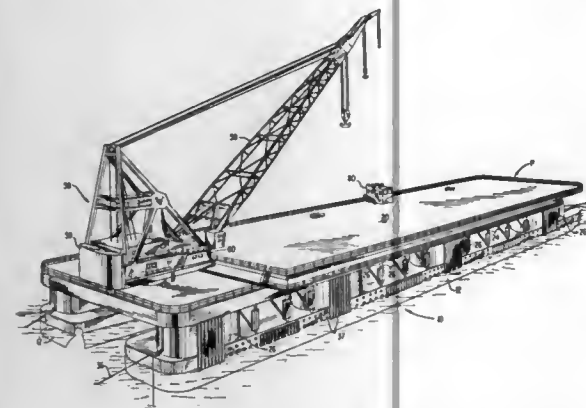
Samuel H. Lloyd, III, and Yoram Goren, both of Los Angeles, Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Continuation of Ser. No. 650,953, Jan. 21, 1976, abandoned, which is a continuation of Ser. No. 486,588, Jul. 8, 1974, abandoned, which is a division of Ser. No. 161,865, Jul. 9, 1971, Pat. No. 3,835,800, which is a continuation of Ser. No. 705,175, Feb. 13, 1968, abandoned. This application Feb. 4, 1977, Ser. No. 765,583

Int. Cl.<sup>2</sup> B63B 35/00

U.S. Cl. 114—65 R

52 Claims



1. A method of constructing a column stabilized semi-submersible derrick barge comprising the steps of fabricating a pair of elongated hulls, disposing said hulls in substantially parallel spaced side-by-side relation with each of said hulls spaced from and lying on an opposite side of the longitudinal centerline of said barge, fabricating a working platform, locating a plurality of columns between each of said hulls and said platform, connecting opposite end portions of said columns to said platform and said hulls, respectively, for supporting said platform in fixed spaced relation above said hulls at least in part by said columns, forming said barge such that the distance between the extremities of the barge along its longitudinal centerline is substantially greater than the distance between the extremities of the barge along its transverse centerline, providing at one end of said barge a mounting means for a heavy duty crane of a size having a rated capacity and a rotatable boom of sufficient length capable of performing lifting operations off both barge beams and off the end of said barge adjacent to the mounting means, providing ballast compartments in said hulls of a capac-

ity to ballast said barge when in use to alter its draft between a low draft hull supported floating condition and a high draft semi-submerged column stabilized floating condition, forming said hulls to provide a combined displacement sufficient to float the barge when in use in said low draft condition with the hulls having freeboard, locating at least three of the aforementioned columns connected with each of the hulls on opposite sides of the roll axis of the barge, locating one such column near each of the opposite ends of each hull on opposite sides of the pitch axis of the barge, locating another of such columns at an intermediate position on each hull, and providing such columns configurations and areas and locating such columns at distances from the longitudinal roll axis and transverse pitch axis of said barge when in use to provide a significantly greater righting moment about the transverse pitch axis of the barge than the righting moment about the longitudinal roll axis thereof when said barge is in use in the high draft condition, and to maintain a barge attitude keeping the axis of rotation of the crane within a predetermined crane slew limiting angle for predetermined magnitudes of load and boom outreach and beyond which angle the crane cannot slew, and providing a plurality of longitudinally spaced structural means reinforcing the structural relationship of said hulls, platform and columns including providing substantially transversely extending members interconnecting the hulls adjacent uppermost portions thereof for restraining the hulls against relative lateral displacement when the barge is in use.

4,165,703

# **AIR RIDE BOAT HULL**

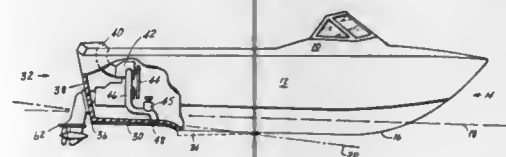
Donald E. Burg, 15840 SW. 84th Ave., Miami, Fla. 33157

Continuation-in-part of Ser. No. 737,403, Nov. 1, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,303

Int. Cl.<sup>2</sup> B63B 1/34

U.S. Cl. 114—67 A

21 Claims



1. In an improved V hull of the type having at least one bow, keel, stern, exterior surface and waterline wherein the improvement comprises:

at least one recess in the hull substantially aft, said recess intersecting the exterior surface of the hull at substantially right angles thereto entirely below the waterline, having sidewalls substantially parallel to the keel for at least an aft one half of its area, said parallel sidewalls extending from the exterior surface of the hull and being distal from the waterline;

at least one air inlet connected to the recess;

at least one air supply duct in fluid communication with the recess through an air inlet;

pressure control means providing hull trim adjustment in fluid communication with the recess;

sealing means in an aft portion of the recess;

at least one powered air blower having its discharge in fluid communication with the recess through at least one air supply duct, whereby the recess may be pressurized to substantially purge it of water creating therein a captured air chamber beneath the waterline thereby significantly reducing hull displacement, and induced, as well as friction, drag at all speeds.

4,165,704

# **SELF STEERING DEVICE FOR SEA CRAFT**

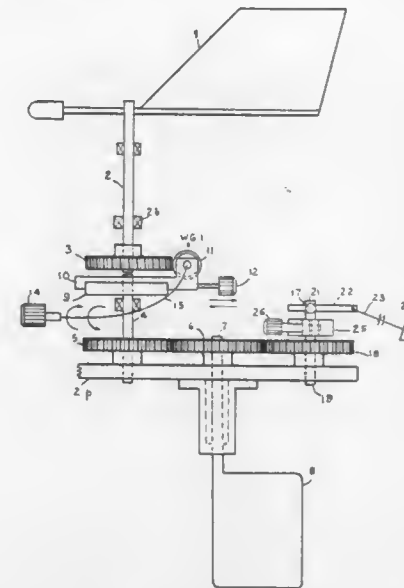
Francis West, Jr., Vineyard Haven, Mass., assignor to Robert S. Sanborn, Vineyard Haven, Mass., a part interest

Filed Apr. 27, 1978, Ser. No. 900,510

Int. Cl.<sup>2</sup> B63H 25/52

U.S. Cl. 114—144 C

15 Claims



1. A self steering device of the type which includes a wind vane responsive to the relative apparent wind and operable normally to exert a turning force in either direction to control a rudder for maintaining a sea craft on a pre-selected course, wherein the improvement comprises a damping means which is responsive to deviation of the craft in either direction from said pre-selected course independently of forces produced by the wind vane, said damping means being connected to act upon the said rudder with a turning force in either direction which is separate from and additional to the turning force exerted on the rudder by the wind vane, and in such a manner as to substantially reduce such deviation of the craft from said pre-selected course.

4,165,705

# **COUPLING MECHANISM FOR COUPLING TOGETHER A PUSHER TUG AND A BARGE**

Tatsuki Yoshikai, Yokohama; Hisatomo Morito, Tokyo, and Haruhito Tsuboi, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1977, Ser. No. 837,997

Claims priority, application Japan, Sep. 29, 1976, 51-116064

Int. Cl.<sup>2</sup> B63B 21/58

U.S. Cl. 114—249

12 Claims

1. A coupling mechanism for coupling together a pusher tug and a barge comprising:

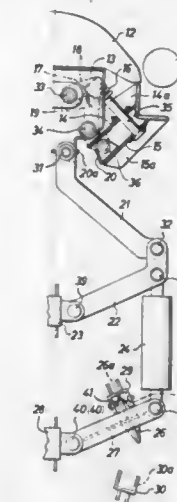
a pair of spaced connecting rods secured to the opposite sides of one end of either one of said tug and barge, and a pair of connecting rod receiving means mounted on respective opposite sides of one end of the other of said tug and barge for respectively receiving and slideably engaging said connecting rods, each of said receiving means including:

two substantially vertical members, each of said vertical members having a vertically arranged peripheral portion which is substantially in the shape of an arc of a circle in a substantially vertical plane, the diameter of which is smaller than the spacing between said connecting rods;

means for coupling said vertical members together so that one of said vertical members is movable relative to the other to vary the spacing therebetween;

means for rotatably supporting said vertical members relative to said other of said tug and barge;

at least two separate contact members respectively secured to the peripheries of said vertical members and being curved in the vertical direction to substantially conform to said circular arc shape of said vertical member, said curved contact members being arranged to form a generally V-shaped groove therebetween for receiving and slidably engaging a connecting rod in said V-shaped groove such that said connecting rod is slidable at least in the vertical direction relative to said contact members when said connecting rod is received and engaged in said generally V-shaped groove, each of said curved contact members being arranged to make



substantially point contact with an engaged connecting rod;

urging means for resiliently urging said vertical members and their associated contact members toward each other, said vertical members being rotatable relative to each other against said urging means under the influence of pressure exerted by a received connecting rod to widen the spacing between said vertical members in order to widen the spacing between said contact members, thereby widening said generally V-shaped groove; and

stop members for limiting the rotational movement of said vertical members, whereby said vertical members are rotatable against the force of said urging means over a predetermined range.

4,165,706

# **SUBMERSIBLE VEHICLE DEPLOYMENT AND RECOVERY SYSTEM FOR ROUGH WATER**

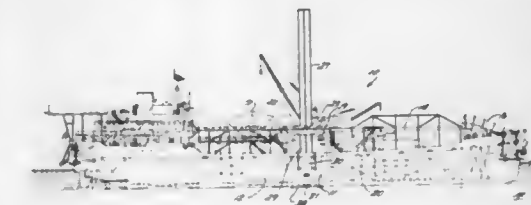
John S. Parsons, Mission Viejo, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Filed Apr. 21, 1978, Ser. No. 898,669

Int. Cl.<sup>2</sup> B63B 35/44

U.S. Cl. 114—258

13 Claims



1. Apparatus for deploying and retrieving a heavy submersible object from and to a floating vessel and comprising arm means carried by the vessel and movable relative to the vessel between a raised position and a lowered position in

which the arm means extends vertically of the vessel to a point a selected distance below the vessel, gimbals means connecting the arm means to the vessel for enabling the arm means, at least in the lowered position thereof, to assume and to maintain a substantially stable attitude despite rolling and pitching motions of the vessel, latch means coupled to the arm means and cooperable with an object to be deployed or retrieved for coupling the object substantially fixedly to the latch means, lift means operable for raising and lowering the latch means and an object coupled to the latch means relative to the vessel from and to the lower extent of said selected distance, and snubbing means associated with the arm means and selectively operable for effectively securing the arm means from angular movement thereof relative to the vessel.

13. A method for deploying and retrieving a submersible object from and to a floating vessel comprising the steps of, for retrieval of the object,

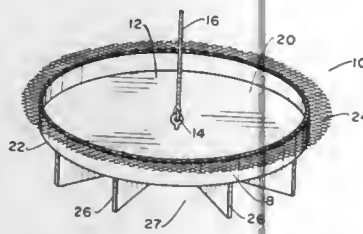
- disposing a selected distance below the vessel an object connector capable of supporting at least the immersed weight of the object and operable for releasably engaging the object substantially fixedly thereto,
- providing a variable stiffness connection between the connector and the vessel, the connection having a first state in which the connection is sufficiently free that the connector can be positionally stable irrespective of vessel roll and pitch motions, and a second state in which the connection is sufficiently stiff that the connector follows substantially exactly vessel roll and pitch motions,
- engaging the object to the connector while the connector is disposed said selected distance below the vessel and the connection is in its first state,
- operating the connection from its first to its second state, and
- raising the connector with the object engaged thereto to the vessel,

the procedure for deploying the object from the vessel being substantially the reverse of steps (c), (d) and (e) above performed in substantially reverse order.

#### 4,165,707 HIGH LATERAL LOAD CAPACITY, FREE-FALL DEADWEIGHT ANCHOR

Philip J. Valent; John M. Atturio, both of Ventura, and Robert D. Rail, Ojai, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1978, Ser. No. 867,631  
Int. Cl.<sup>2</sup> B63B 21/24, 21/27, 21/29  
U.S. Cl. 114—300



1. A free-fall, moderate-velocity, deep-water anchor assembly having high lateral loading capacities even when subjected to high mooring line angles comprising:

- a substantially flat plate member presenting a large surface area to the direction of travel through the water to maintain a moderate rate of fall through the water and to provide a large contact area on the surface of the ocean bottom;
- a lip attached to the perimeter of said plate member and extending upwards therefrom for maintaining said plate member within a substantially vertical column of water

during free-fall of said plate member within said vertical column of water; and  
c. a plurality of shear keys attached on the underside of said plate member, said shear keys extending radially outward from a common point toward the periphery of said plate and providing lateral load resistance for said anchor assembly.

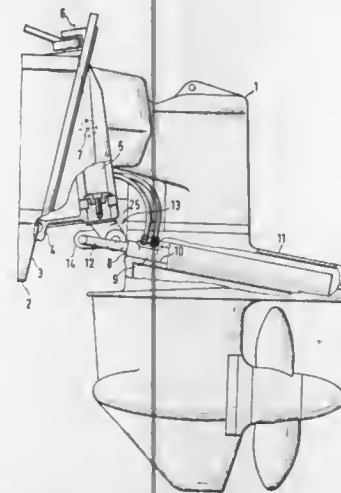
#### 4,165,708 DRIVE FOR WATERCRAFTS

Bernhard Osswald, Überlingen, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,776  
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655126

Int. Cl.<sup>2</sup> B63H 1/14, 5/06  
U.S. Cl. 115—41 HT

16 Claims



1. A drive arrangement for watercrafts comprising drive means having a housing and pivotally arranged at a rear wall of the watercraft about an essentially horizontal axis, and at least one lift cylinder means for pivoting the drive means about said pivot axis, said lift cylinder means being rigidly and non-pivotally connected with the housing of the drive means, characterized in that the lift cylinder means is operatively connected with the connecting place on the side of the watercraft by way of a link means which cooperates with the lift cylinder means and also with the connecting place by way of respective pivot bearing means.

#### 4,165,709 TABLET DISPENSER

John E. Studer, Flemington, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

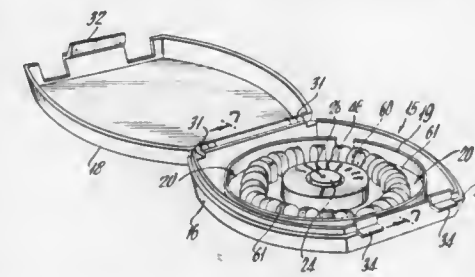
Filed Jan. 24, 1978, Ser. No. 871,869  
Int. Cl.<sup>2</sup> B65D 83/04, 85/56; G09F 9/00

U.S. Cl. 116—308

24 Claims

1. A tablet dispenser comprising: a substantially flat support having a single tablet dispensing aperture therein; a tray rotatably attached to one surface of said support, said tray having a plurality of openings therein, said openings disposed in a circular orientation and spaced substantially equally apart, said openings arranged to individually align in registration with said aperture in said support upon rotation of said tray relative to said support, each of said openings having an indicator of periodicity associated therewith, said indicators being sequentially arranged from one opening to the next and being rotatable with said tray; and a removable tablet package disposed on said tray comprising a plurality of collapsible pockets each containing a tablet therein, said pockets arranged in a circular orientation and substantially equally spaced apart to thereby

correspond with the orientation of said openings in said tray so that a tablet is disposed in alignment with each of said openings, said pockets being covered with a frangible membrane interposed between said pockets and said openings, said package being rotatable with said tray, whereby a tablet is dis-



pensed by collapsing the pocket which is in registry with said aperture, thereby urging said tablet to fracture said membrane and pass through its corresponding opening and then through said aperture in said support for collection by the operator thereof, said package being removable and replaceable in said tray when the supply of tablets has been exhausted.

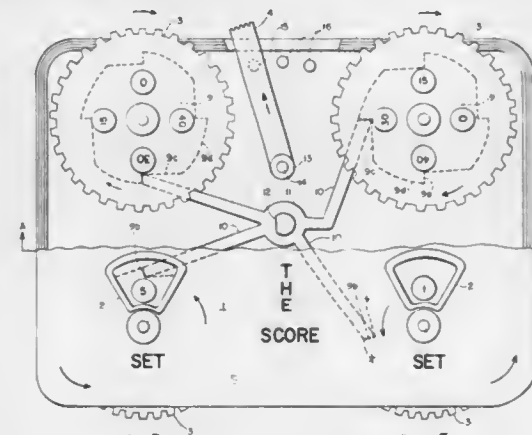
#### 4,165,710 TENNIS SCORE KEEPING DEVICE

John Gaetano, 1143 Crane St., Suite D, Menlo Park, Calif. 94025

Filed May 10, 1978, Ser. No. 904,516  
Int. Cl.<sup>2</sup> A63B 71/06

U.S. Cl. 116—223

2 Claims



1. A tennis score keeping device comprising:  
a housing of generally flat configuration;  
a plurality of wheels rotatably mounted within said housing so that a portion of their peripheries project slightly beyond the outer edge of said housing;  
a series of numbers positioned in sequence circumferentially and concentrically upon one face of each of said wheels; windows through said housing positioned against said faces of said wheels so that one of said numbers is visible through said windows at a time as said wheels are rotated; ratchet means fixedly positioned upon the face of each of said wheels concentrically therewith and forming a part thereof;  
said ratchet means being characterized by a plurality of ratchet teeth, each of said teeth being aligned with one of said numbers;  
pawl means fixedly positioned within said housing and disposed to engage said ratchet means;  
said pawl means being characterized by a plurality of elongated arms projecting radially from a central point within said housing in spider-like formation;

each of said arms being disposed to slidably engage said ratchet teeth on one of said ratchet means;  
said ratchet teeth being characterized by,  
a radial section;  
a flat section at right angles to said radial section and connecting therewith;  
an arcuate section connecting said flat section with the radial section of the succeeding tooth;  
said elongated arms of said pawl means being made of a springy material and disposed to slidably engage in turn said flat section and said arcuate section of said ratchet teeth when said wheels are rotated and to engage positively said radial section of said ratchet teeth when said wheels are stationary;  
said engagement of said radial section being effected with considerable force and creating an audible sound.

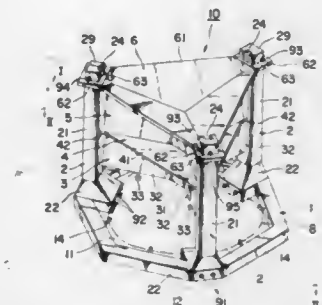
#### 4,165,711 FISH-GATHERING BLOCK

Koichiro Aoki, Asano 2381, Kagawa-cho, Kagawa-gun, Kagawa-ken, Japan

Filed Jun. 1, 1977, Ser. No. 802,443  
Claims priority, application Japan, Jun. 7, 1976, 51-66739; Jul. 17, 1976, 51-85235; Sep. 29, 1976, 51-117653  
Int. Cl.<sup>2</sup> A01K 61/00

U.S. Cl. 119—3

17 Claims



1. A fish-gathering block comprising a base frame and a plurality of supports erected thereon, said supports supporting an upper structure, at least one vertical wall unit disposed within the region between said supports and positioned vertically between said upper structure and said base frame, and means supporting said wall unit in vertically spaced relationship above said base frame so as to leave a current flow-through space above said base frame and below said wall unit.

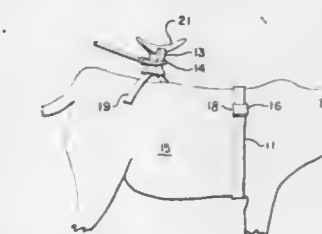
#### 4,165,712 RODEO DEVICE

John C. Crowley, Jr., Keech Rd., R.D. #1, Branchport, N.Y. 14418

Filed Aug. 19, 1977, Ser. No. 825,935  
Int. Cl.<sup>2</sup> B68B 1/00; A01K 15/02

U.S. Cl. 119—29

8 Claims



1. A rodeo device comprising:  
a. a girth strap fastenable around an animal;  
b. a fastener mounted on said girth strap to be disposed in the region of said animal's back;



- c. said fastener being formed as a pair of spring clips spaced apart on said girth strap and oriented to open rearwardly of said animal;
- d. a ropable and manually graspable object releasably attached to said fastener to ride securely above said animal's back as said animal runs; and
- e. said object being removable from said fastener by being pulled rearwardly of said animal.

4,165,713

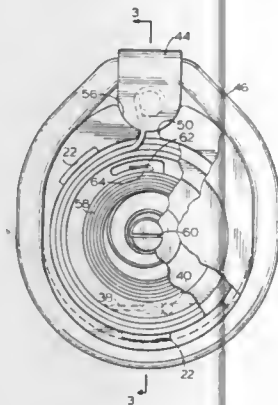
**RETRACTABLE LEASH**

William H. Brawner, El Cajon, and James O. Umphries, Victorville, both of Calif., assignors to H.P.G. IV, Inc., El Cajon, Calif.

Filed Nov. 17, 1977, Ser. No. 852,502  
Int. Cl.<sup>2</sup> A01K 27/00

U.S. Cl. 119-109

10 Claims



1. A retractable leash comprising:
- a housing having a pair of spaced apart generally flat side walls and a peripheral wall defining a central enclosable cylindrical cavity,
  - a reel rotatably mounted within said cylindrical cavity,
  - a coil spring fixed at one end to said housing and connected at the other end to said reel,
  - a flexible leash member wound about said reel, having an inner end connected to said reel and an outer end extending externally of said housing, and
  - a handle defined by a resilient loop connected to the outer end of said leash member, said handle adapted to encircle and snugly fit onto the outside of said peripheral wall of said housing when said leash member is retracted into said housing.

4,165,714

**ANIMAL HANDLING SYSTEMS**

Jerry Weissman, Pumhouse Rd., Brewster, N.Y. 10509, and Ely Kass, 26 Kings Ridge Rd., Mahopac, N.Y. 10541

Filed Oct. 31, 1977, Ser. No. 847,411  
Int. Cl.<sup>2</sup> A01K 29/00; A61D 11/00

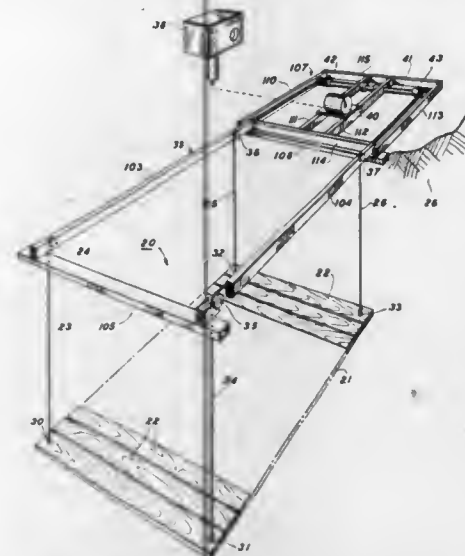
U.S. Cl. 119-158

12 Claims

1. An animal handling system for quadrupeds comprising:
- a. a reservoir containing an aqueous solution disposed below ground level for receiving a quadruped for exercise and therapeutic purposes,
  - b. a platform movable between an upper, ground level, and an immersed lower level, incorporating a plurality of support points about its periphery,
  - c. a stationary support structure disposed substantially at ground level, comprising a plurality of tubular housing means above the periphery of the platform and a plurality of cable-carrying pulleys each disposed within the housing means above one of the platform support points; and
  - d. means disposed substantially at ground level for moving

the platform between the upper ground level and lower immersed level, comprising:

- (1) a drive means incorporating cable receiving drum means at one end of the platform,
- (2) a plurality of cables, each fixedly mounted at one end to the cable receiving drum means and disposed within



the tubular housing means, extending over the cable-carrying pulleys and fixedly mounted to the support points below the cable-carrying pulleys, and

(3) control means for operating the drive means, whereby a quadruped is supported on the platform while being lowered into and raised from the reservoir.

4,165,715

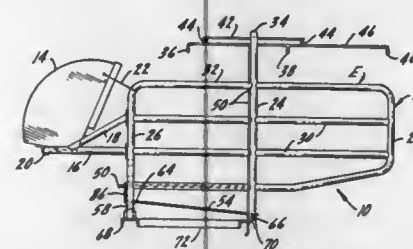
**ANIMAL SPRAY**

Frank Knapp, R.F.D. No. 3, Mineral Point, Wis. 53565

Filed Mar. 9, 1978, Ser. No. 885,004  
Int. Cl.<sup>2</sup> A01K 29/00

U.S. Cl. 119-159

5 Claims



4. An animal spray apparatus responsive to the weight of the animal and comprising a frame defining a stall allowing the entry of only one animal at a time, said stall being open at one end enabling the animal to enter therein, means adjacent the opposite end of the frame for presenting an enticement to the animal and so obstructing said opposite end of the frame as to require an enticed animal to back out of the stall after indulging, a treadle inside the frame interposed in the path of the animal, means normally biasing the treadle upwardly so that the treadle is urged downwardly by an animal stepping thereon, a pumping cylinder and piston therein operated by the treadle, said frame supporting spray means directed generally toward the backside of an animal indulging inside the stall, a first conduit adapted to communicate with a tank at the side of the frame containing a body of liquid to be sprayed on the animal, a second conduit communicating with said spray means, and valve means so connecting the conduits to the cylinder that the spray means is activated only when the cow steps off the treadle when backing out of the stall.

4,165,716

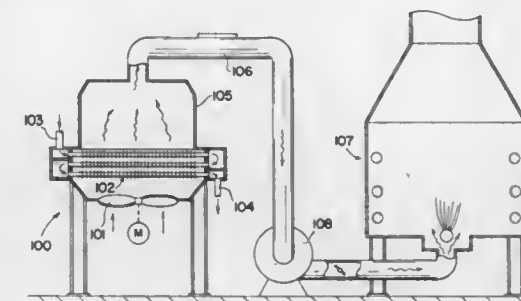
**PROCESS AIR COOLERS USED FOR COMBUSTION AIR PREHEATING**

John W. Thomas, Shaker Heights, and Ronald L. Harris, Clinton, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 17, 1977, Ser. No. 807,709  
Int. Cl.<sup>2</sup> F22B 33/18

U.S. Cl. 122-1 A

28 Claims



1. In a chemical processing operation in which a mixture of fuel and air is combusted in a furnace to provide heat input, and in which a process fluid, independent of said furnace is cooled by passing said process fluid in heat exchange relation with air in an air-cooled process heat exchanger, and air passing out of said process heat exchanger is discharged to waste, the improvement wherein at least part of the air passing out of said heat exchanger is used as at least part of the air fed to said furnace so that the heat value of the air passing out of said heat exchanger is transferred to said furnace.

22. An air-cooled process heat exchanger comprising:

- (a) a tube bundle, said bundle being one or more rows of one or more parallel tubes connected between a first and a second end of the exchanger;
- (b) an airflow channel covering a portion of said bundle, having one or more top chambers above the tube bundle in open communication with said bundle, wherein said top chambers are offset with respect to said bottom chambers, and wherein a serpentine airflow across the tube bundle is created by movement of the air between the top and bottom chambers, independent of the air passing over the remaining portion of said bundle; and
- (c) means for moving air across the tube bundle.

4,165,717

**PROCESS FOR BURNING CARBONACEOUS MATERIALS**

Lothar Reh, Bergen-Enkheim; Martin Hirsch, Frankfurt am Main, both of Fed. Rep. of Germany; Per H. Collin, Falun, and Sune N. Flink, Vaesteraas, both of Sweden, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 654,351, Feb. 2, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,359

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1975, 2539546

Int. Cl.<sup>2</sup> F22B 1/02

U.S. Cl. 122-4 D

20 Claims

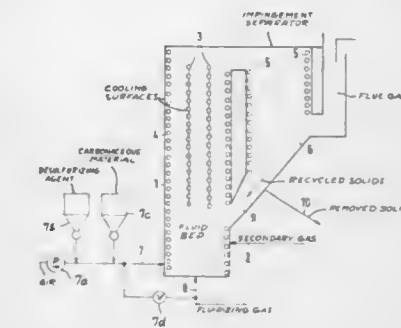
1. A process for burning a carbonaceous material to provide steam which comprises the steps of:
- introducing carbonaceous material into a fluid bed in an upright reactor;
  - fluidizing the carbonaceous material in said fluid bed with a primary fluidizing gas introduced at the bottom of said bed and a secondary gas introduced into said fluid bed at a level above that at which the primary gas is introduced and above the bottom of the fluid bed, at least the secondary gas containing oxygen;
  - burning the carbonaceous material with the oxygen;

maintaining the supply of carbonaceous material and oxygen to said fluid bed at distinct proportions;

maintaining the volume ratio of fluidizing gas to secondary gas at substantially 1:20 to 2:1;

controlling the velocity and the volume ratio of said gases to maintain the solids density above the location at which said secondary gas is introduced at substantially 15 to 100 kg/m<sup>3</sup> and with said density decreasing continuously over substantially the entire height of the reactor;

removing thermal energy from said fluid bed by disposing therein, at a level above the location at which said secondary gas is introduced, cooling surfaces in contact with the solids of said fluid bed;



cooling said surfaces with water to produce steam;

maintaining, below the level at which the secondary gas is introduced, a space substantially free of internal obstructions at which said carbonaceous material is introduced;

separating solids from the gas effluent from said bed at the top thereof to collect solid particles;

recycling said solid particles to said fluid bed at a lower portion thereof whereby said fluid bed and the means for separating and recycling said particles constitute a closed solids circuit; and

removing excess solids from said circuit.

4,165,718

**METHOD AND APPARATUS FOR FEEDING CONDENSATE TO A HIGH PRESSURE VAPOR GENERATOR**

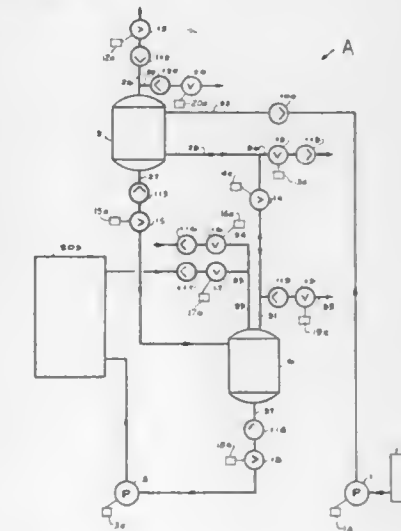
Thomas Y. C. Chen, 4142 Maquon Ave., East Chicago, Ind. 46312

Filed Oct. 12, 1977, Ser. No. 841,490

Int. Cl.<sup>2</sup> F22D 5/28, 5/30

U.S. Cl. 122-451 R

31 Claims



1. A high efficiency energy saving condensate feeding sys-



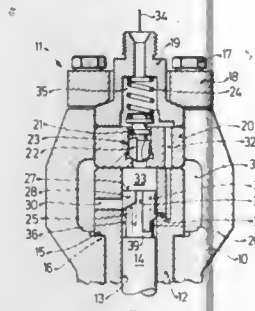


with a decrease and an increase in a vacuum in said venturi, respectively; and means for decreasing the degree of the intake vacuum provided to the first chamber of said EGR control valve under a suburban area cruising condition of the vehicle.

#### 4,165,723 FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Max Straubel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Mar. 9, 1977, Ser. No. 776,036  
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609724; Feb. 11, 1977, 2705719  
Int. Cl.<sup>2</sup> F02D 3/04, 1/00  
U.S. Cl. 123—139 AR

13 Claims



1. In a fuel injection pump for internal combustion engines which includes a housing, a cylindrical bore within said housing, a piston disposed to reciprocate and rotate within said cylindrical bore, a pressure line connected to the working chamber of said pump, said chamber being defined by the top of said piston and by said cylindrical bore, said pressure line being closable by a pressure valve, said housing further including a pressure relief conduit leading from said pressure line to said cylindrical bore via an auxiliary control orifice, said pressure relief conduit being disposed so as to bypass said pressure valve and said pump working chamber and to open into said cylindrical bore by way of said auxiliary control bore, said piston having a plurality of control surfaces with oblique control edges which cooperate with a main control orifice in said cylindrical bore to thereby establish communication between said cylindrical bore and a space surrounding the same containing fuel at lower pressure than fuel injection pressure, the improvement comprising:

a channel in said piston leading from the end face thereof to the side surface thereof, said channel being connectable to said main control orifice by at least one of said control surfaces during the motion of said piston and said auxiliary control orifice being so disposed in said cylindrical bore as to be opened at approximately the same time as said main control orifice by one of said control surfaces.

#### 4,165,724 FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshihisa Yamamoto, and Nobuyuki Fujitani, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
Filed May 9, 1977, Ser. No. 794,926  
Claims priority, application Japan, Jul. 1, 1976, 51-78569  
Int. Cl.<sup>2</sup> F02M 39/00

U.S. Cl. 123—139 AT

1 Claim

1. A fuel injection system for an internal combustion engine comprising:

- fuel injection valves for injecting fuel;
- a fuel injection pump for distributing the fuel to the respective fuel injection valves;
- a tank for storing fluid;

a fluid pump communicated with said tank for supplying the fluid therefrom under pressure;

said fuel injection valves including,

a valve casing formed with an injection port,

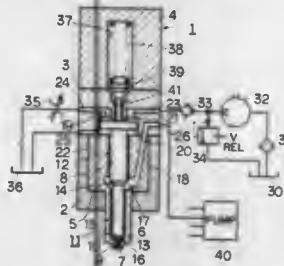
a nozzle needle reciprocally mounted in said valve casing for opening and closing said injection port by the reciprocal movement of said nozzle needle,

a piston connected to said nozzle needle, so that said piston is reciprocated in accordance with the reciprocal movement of said nozzle needle,

a fluid pressure chamber formed in said valve casing and communicated with said fluid pump, so that the fluid from said tank is supplied thereto under pressure,

said piston being reciprocally disposed in said fluid pressure chamber, so that the fluid pressure is applied to said piston in a valve closing direction,

a spring disposed in said valve casing for biasing said nozzle needle in said valve closing direction, and



a fuel collecting space formed in said valve casing surrounding at least a portion of said nozzle needle, said space being communicated with said fuel injection pump and also with said injection port when said nozzle needle is lifted, whereby when the fuel is supplied to said fuel collecting space from said fuel injection pump under pressure the pressure in said fuel collecting space biases said nozzle needle in a valve opening direction;

orifice means communicated with said fluid pressure chamber; and

a check valve connected between said fluid pressure chamber and said fluid pump for preventing the fluid from flowing from said fluid pressure chamber to said fluid pump, whereby the fluid pressure is applied to said piston in the valve closing direction when said nozzle needle is lifted, thus performing a gentle starting of the fuel injection.

#### 4,165,725 FUEL PUMPING APPARATUS

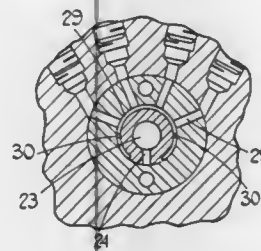
Michael George, Twickenham; Colin P. Brotherton, Banstead, and Stanislaw J. A. Sosnowski, London, all of England, assignors to Lucas Industries Limited, Birmingham, England  
Filed May 17, 1977, Ser. No. 797,686

Claims priority, application United Kingdom, May 20, 1976, 20905/76

Int. Cl.<sup>2</sup> F02M 39/00

U.S. Cl. 123—139 AL

2 Claims



1. A fuel pumping apparatus for supplying fuel to internal combustion engines comprising a housing, a rotary distributor

member within the housing, a plurality of outlets formed in the housing and opening onto the periphery of the distributor member, said outlets, in use, being connected to the injection nozzles of the associated engine, the distributor member having delivery passage means substantially equiangularly spaced about the periphery of the distributor member through which fuel is delivered to the outlets in turn as the distributor member rotates, said delivery passage means comprising a plurality of outwardly extending delivery passages found in the distributor member and breaking out onto the periphery of the distributor member at axially spaced positions, said outlets being divided into a plurality of spaced groups with which the delivery passages register respectively, the outlets being connected to apertures on the periphery of the housing, said apertures and outlets being disposed on one side of a plane including the axis of rotation of the distributor member, and there is formed in the periphery of the distributor member a plurality of discontinuous circumferential grooves which are aligned with the delivery passages respectively, the delivery passages being disposed between the ends of the respective grooves, the angles subtended by the ends of the grooves being substantially equal to the angle between alternate outlets.

#### 4,165,726 LOW MASS BREAKERLESS IGNITION DISTRIBUTOR

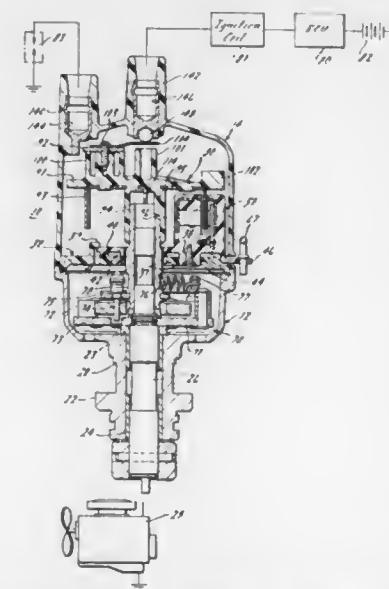
Harry W. Helmer, Jr., Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 5, 1977, Ser. No. 839,529

Int. Cl.<sup>2</sup> F02P 7/00

U.S. Cl. 123—146.5 A

11 Claims



1. A breakerless ignition distributor for an electronic ignition system including an ignition coil energizable from an electrically grounded source of low tension electrical energy through a triggerable electronic control switching unit to supply high tension electrical energy to the spark plugs of an internal combustion engine at various angular positions of the crankshaft of the engine, said distributor comprising in combination, a metallic bowl-shaped body having a stem portion by which it is mounted on a stationary portion of the engine, an insulative cap releasably attached to the distributor body and having

a central electrode for electrical connection to the high tension side of said ignition coil and

a plurality of output electrodes disposed in a circular array about said central electrode and adapted to be connected to different corresponding ones of the engine spark plugs,

a steel rotor shaft extending through and journaled in the distributor body stem portion, said rotor shaft mechanically coupled at one end for rotation from the engine and electri-

cally grounded therethrough to said source of low tension energy,

a low mass distributor rotor unit including a thin insulative disc member of an axial thickness less than its diameter and mounted on the other end of said rotor shaft, said disc member carrying an electrically conducting, radially extending rotor blade on one side thereof and a broad continuous metallic stiffener plate molded on the other side thereof, the inner end of said rotor blade electrically contacting said central cap electrode and its outer end spaced from an oppositely positioned output cap electrode for transfer of high tension energy in the form of an electrical spark discharge therebetween,

a mounting plate positioned in said distributor body, electrical pickup means for sensing the angular position of the engine crankshaft and developing an electrical triggering control signal for said electronic control switching unit, said pickup means including a source of excitation and electrical semiconductor sensor means both carried on said mounting plate and insulated from the distributor body, said sensor means responsive to excitation from said excitation source and spaced therefrom by an air gap therebetween, and excitation source interrupting means carried on said distributor rotor disc member and including a plurality of equally arcuately and radially centrally displaced, electrically conducting exposed vane elements integrally formed on and depending from said stiffener plate to extend into said air gap between and be successively conveyed past said excitation source and said sensor means, and

rotor shaft contacting means provided on said stiffener plate to place said interrupter vanes at the electrical potential of said rotor shaft and divert any electrical energy, which may be accidentally discharged from the rotor blade, away from said electrical semiconductor sensor means, and to conduct it instead through the interrupter vanes and rotor shaft, thereby to protect said electrical semiconductor sensor means from such electrical discharge.

#### 4,165,727 AUTOMATIC FUEL PUMP SWITCH UNIT FOR FUEL-INJECTED INTERNAL COMBUSTION ENGINES

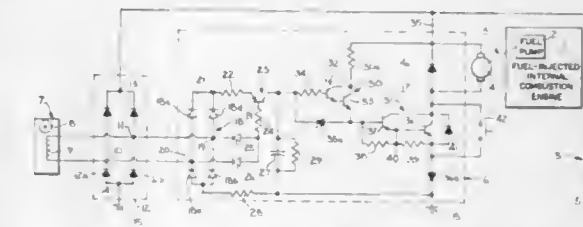
Arthur O. Fitzner, and Francis E. Kruncos, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 4, 1977, Ser. No. 821,758

Int. Cl.<sup>2</sup> F02N 17/00; F02D 29/06

U.S. Cl. 123—179 B

12 Claims

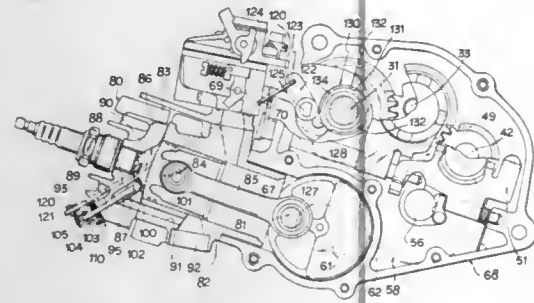


1. In an internal combustion engine having a fuel pump means including an electrical pump operator to drive said fuel pump means connected to a power supply system including a battery means and an alternator means having an outward coil means connected to charge said battery means through an appropriate rectifier means, said battery means connected to a reference potential means and said output coil means being connected thereto through said rectifier means, a switch means connected to control the operative connection of the electrical operator to the power supply system, said switch means having an electrically operated input means, sensing means connected to the input means and to the output of the alternator means and responsive to the rotationally generated output to actuate said switch means to complete the operative connection of said operator to said power supply system.

**4,165,728**  
**DECOMPRESSING DEVICE TO BE USED IN ENGINES FOR PRIME MOVER-EQUIPPED BICYCLES AND THE LIKE**

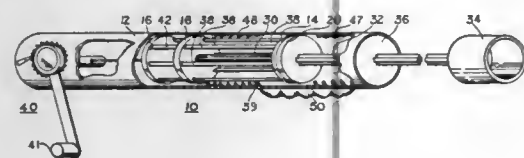
Shigeo Matsumoto, Niiza; Sadashi Yamamoto, Wako, and Masaki Watanabe, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
 Filed Sep. 6, 1977, Ser. No. 830,822

Claims priority, application Japan, Sep. 14, 1976, 51-110425  
 Int. Cl.<sup>2</sup> F01L 13/08; B62D 3/00  
 U.S. Cl. 123-182 6 Claims



1. A decompressing device for a vehicle engine, comprising: a vehicle engine, said engine including a cylinder head; a decompression valve cooperating with said cylinder head, said decompression valve being resiliently pressed in the closing direction by a spring; said engine including a starting shaft for starting said engine, and further including means for switching said engine on and off; an operating member operatively connected to and operated in conjunction with said means for switching said engine on and off, and opening said decompression valve against said spring; a cam provided on said starting shaft coaxially with said operating member; the decompressing operation of said decompression valve being regulated and released through said operating member by relative movement with said cam; said cam being formed of two steps having large and small diameters to be provided with cam grooves guiding said regulating operating member from the large diameter part to the small diameter part; and said cam being provided on said starting shaft to be axially slidable while being rotated integrally with said starting shaft and resiliently pressed by a spring.

**4,165,729**  
**ELASTIC TYPE PROJECTING DEVICE**  
 Jerzy Niemirow, 3 Beaufort Ave., Dover, N.J. 07801  
 Filed Jun. 30, 1977, Ser. No. 811,548  
 Int. Cl.<sup>2</sup> F41B 7/00  
 U.S. Cl. 124-17 15 Claims

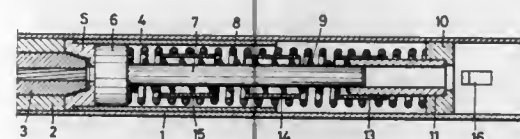


1. A launcher for propelling objects over extended distances comprising: a tubular body, a plurality of movable pistons and fixed headers disposed within said tubular body, said pistons including a first movable piston, and a second movable piston, a first fixed header disposed forwardly said first and second movable pistons, elastic means communicating between said first header and said first and second movable pistons, a third

movable piston disposed forwardly said first fixed header, and a second fixed header sealing a forwardmost portion of said tubular body, a launching cup disposed axially exteriorly forwardly of said tubular body, a rod having one end connected to said launcher cup and the other end fixed to said second movable piston, means for placing said elastic means into tension and additional means for releasing energy stored within said elastic bands whereby said first and second movable pistons are propelled violently forwardly with said rod to cause the launching cup to propel outwardly an object placed there-within, said means for placing said elastic means into tension comprising a shaft disposed rearwardly said first movable piston and longitudinally said tubular body, crank means for rotating said shaft, clamping means disposed between said first and second movable pistons, said clamping means comprising a horizontal member rearwardly affixed to said second movable piston, a slidable plate forwardly affixed to said first movable piston, said horizontal member having a hole therein, and a clamping device adapted for engaging said horizontal member through said hole.

**4,165,730**  
**SPRING SUPPORT IN A COMPRESSED AIR FIREARM**  
 Ludwig Jaedicke, Thalfingen, and Dieter Straub, Ulm, both of Fed. Rep. of Germany, assignors to J. G. Anschütz GmbH, Ulm, Fed. Rep. of Germany  
 Filed Jul. 6, 1977, Ser. No. 813,308

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1976, 2633519  
 Int. Cl.<sup>2</sup> F41B 11/00; F41F 1/04  
 U.S. Cl. 124-67 10 Claims



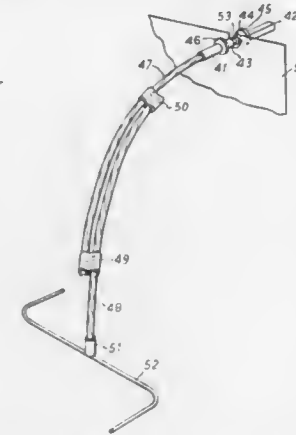
1. In a compressed air firearm with spring support tube, comprising a cylindrical housing having an axis, a compression cylinder mounted in said housing, a compression piston axially displaceable in said cylinder, two cylindrical helical compression springs of different diameter loading said piston in parallel to each other, said springs being disposed concentrically one inside the other axially in said housing and being arranged to be held fast in the compressed position by a trigger device, and after shooting to be released again, and a spring support tube axially aligned and supportingly associated with said two helical compression springs, the improvement wherein said spring support tube comprises at least two tube portions freely movable relatively to one another in the axial direction, each having a diameter, a length and end surfaces, said tube portions radially supporting at least one of said springs and not axially transfer load to each other.

**4,165,731**  
**SELF-ADJUSTING DRIVE SHAFT FOR BARBECUE GRID**

Ritva M. Lehtovaara, 20 S. Close Green, Merstham, Surrey, England

Continuation-in-part of Ser. No. 570,553, Apr. 22, 1975, abandoned. This application Apr. 7, 1978, Ser. No. 894,313  
 Claims priority, application United Kingdom, Apr. 23, 1974, 17716/74; Jul. 4, 1974, 29659/74

Int. Cl.<sup>2</sup> A47J 37/07; F24B 3/00  
 U.S. Cl. 126-25 AA 12 Claims

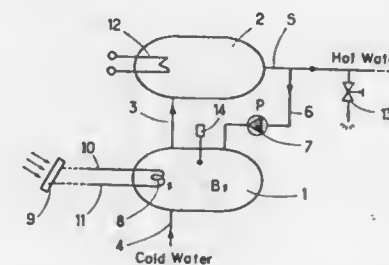


1. An adjustable length flexible drive shaft for use in barbecues, comprising: first and second flexible members each having an eye terminal fixed to an end thereof, said first flexible member being engaged by and slidable through and rotatable in said eye terminal fixed to said second flexible member and said second flexible member being engaged by and slidable through and rotatable in said eye terminal fixed to said first flexible member so that when the eye terminals are separated from each other, on rotation of one flexible member relative to the other the portions of the flexible members between the eye terminals are twisted around each other thereby fixing the length of the drive shaft, means for attachment to a motor on an end of said first flexible member, and means for attachment to a barbecue grid on an end of said second flexible member.

**4,165,732**  
**PROCESS AND APPARATUS FOR OBTAINING HOT WATER BY USE OF SOLAR ENERGY**

Claude Morin, St. Lattier, France, assignor to Pechiney Ugine Kuhlmann, Paris, France

Filed Oct. 13, 1976, Ser. No. 732,188  
 Claims priority, application France, Nov. 18, 1975, 75 35749  
 Int. Cl.<sup>2</sup> F24J 3/02  
 U.S. Cl. 126-419 16 Claims



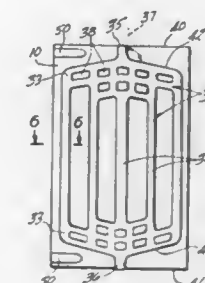
1. A process for heating water through the use of solar energy, comprising the steps of:

supplying relatively cold water into a bottom portion of a first reservoir; heating the relatively cold water by solar energy in a portion of the first reservoir other than a top portion; ducting the heated water from the top of the first reservoir to a lower portion of a second reservoir; further heating the heated water by non-solar energy in the second reservoir; and, ducting at least a portion of the further heated water to the top of the first reservoir, thereby creating a circulation of water in a closed loop between said reservoirs to cause the temperature of water in both of said reservoirs to attain a desired level.

6. Apparatus for heating water through the use of solar energy, comprising: a first reservoir; cold water inlet means for introducing relatively cold water into a bottom portion of the first reservoir; means for collecting solar energy; a heat exchanger disposed within a portion of the first reservoir other than the top portion in heat exchanging contact with water contained therein; means connecting the solar energy collecting means with the heat exchanger to deliver solar-derived energy from the solar energy collecting means to the heat exchanger, water contained within the first reservoir being heated by heat exchange with the heat exchanger; a second reservoir; piping means connecting an upper portion of the first reservoir to a bottom portion of the second reservoir for introducing heated water from the first reservoir into the second reservoir; means disposed within the second reservoir for further heating the heated water introduced into the second reservoir; outlet conduit means for discharging the further heated water from the second reservoir; and, recirculation means disposed between and communicating with the outlet conduit means and an upper portion of the first reservoir for carrying a portion of the further heated water to the first reservoir, thereby creating a closed circuit water circulation between the first and second reservoirs.

**4,165,733**  
**SOLAR ENERGY COLLECTOR SYSTEM**  
 Verne L. Middleton, East Alton, Ill., and Charles A. Kleine, Florissant, Mo., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 31, 1977, Ser. No. 783,341  
 Int. Cl.<sup>2</sup> F24J 3/02  
 U.S. Cl. 126-420 8 Claims



1. A solar energy collector system including at least one heat exchange panel possessing a system of first internal integral tubular passageways defining opposed headers connected by connecting portions of said passageways extending therebetween, said passageways including entry and exit portions extending from opposite ends of said headers to provide ingress and egress openings for a heat exchange medium, said panel also possessing at least one internal integral second pas-



sageway, wherein one end of said second passageway is closed and arranged adjacent and in juxtaposition to said first internal tubular passageways but spaced therefrom and independent therefrom, and wherein another end of said second passageway terminates at an edge of said panel.

4,165,734

**SOLAR MOTOR**

Gunter A. Schmidt, Hohenzollernstrasse 114, 8000 Munchen 13, Fed. Rep. of Germany

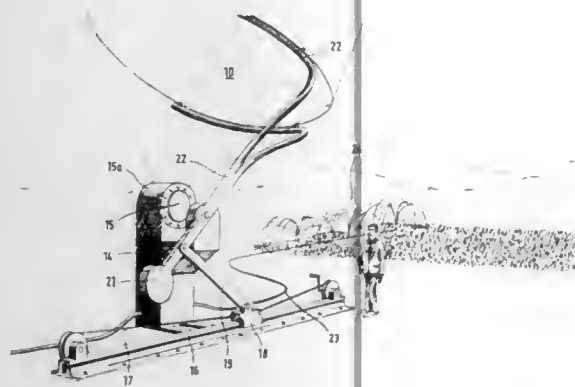
Filed Jun. 27, 1977, Ser. No. 810,480

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 7620151[U]

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—424

4 Claims



1. A solar motor array comprising in combination an optical lens for gathering rays from the sun and having a focal point, a steam generator located at the lens focal point and disposed within a housing, a framework supporting the lens in spaced relationship with the steam generator, and means for directing the lens toward the sun as it moves, said means comprising a horizontal elongated traverse bar affixed to the housing, the traverse bar and the housing being stationary with respect to each other and supported by an external supporting member, a carriage axially movable along and carried by the bar, an arm carrying at one end said framework, said arm being rotatably supported by a bearing support affixed to the housing and being rotationally movable in a vertical plane, a link pivotably connected at one end to the carriage and upending therefrom with the other end pivotably connected to said arm eccentric of the rotatable bearing support of the arm, the link being movable in one of the vertical plane and a collateral vertical plane, and means for moving the carriage axially along the traverse bar so that the framework and the lens are moved.

4,165,735

**SOLAR ENERGY COLLECTOR AND STORAGE DEVICE**

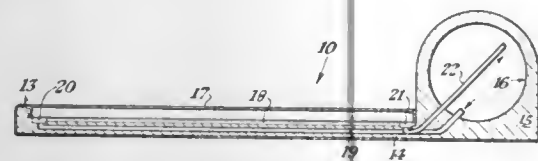
Harold T. Smith, 5623 Fillmore St., Hollywood, Fla. 33021

Filed Oct. 25, 1977, Ser. No. 844,452

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—437

2 Claims



1. A solar energy collector using a fluid medium for absorbing solar radiation energy, comprising:  
a housing;  
a first conduit;  
a second conduit;

a planar tray;  
a fluid storage tank;  
an integrally formed thermal insulation bed connected to said housing, said integrally formed thermal insulation bed including a recessed area for receiving a planar tray, said first conduit and said second conduit disposed within a portion of said insulation bed;  
said insulation bed including a preformed, molded, hollow insulation portion sized to encompass said fluid storage tank, said fluid tank mounted in said insulation;  
said planar tray having a plurality of recessed areas disposed therein mounted within said recessed portion of said thermal insulation bed;  
a thermally conductive absorber plate mounted on the top of said tray, said absorber plate and said recessed portions on said tray forming a plurality of channels;  
a first header formed in said tray connected at one end in fluid communication with said channels formed in said tray, a second header formed in said tray disposed at the opposite end connected in fluid communication with said channels, said first conduit connected between said tank and said first header, and said second conduit connected between said second header and said tank.

4,165,736

**APPARATUS FOR OCULAR PLETHYSMOGRAPHY**

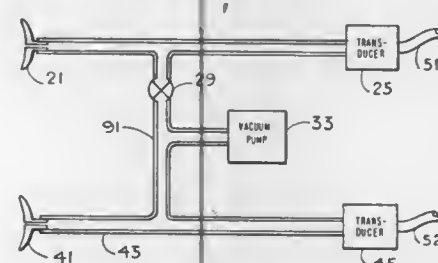
Sumner H. Wolfson, Tucson, Ariz., assignor to Zira International, Tucson, Ariz.

Filed May 26, 1977, Ser. No. 800,884

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—687

8 Claims



1. Apparatus for detecting ocular pulsations of a person's eyes produced by pulsatile arterial blood flow comprising first and second eye cup means, both said eye cup means having an air passageway therethrough; first and second air pressure transducer means; first and second air tube means operably connecting said first eye cup means to said first transducer means and said second eye cup means to said second transducer means respectively; vacuum pump means operably connected to said first air tube means and said second air tube means and said first air tube means whereby when said eye cups are placed upon a person's eyes and a partial vacuum is created in the air tubes by the vacuum pump, the air pressure transducer means are placed in sealed air communication with the person's eyes and said air valve means may be closed to interrupt communication and interference between said first and second air tube means and thereby isolate said first and second air tube means from each other in order that ocular pulsations of each eye may be separately detected.

4,165,737

**FOOT MASSAGING DEVICE**

Arturo Chapa, 7302 Stewart Rd., Galveston, Tex. 77551

Filed Feb. 17, 1978, Ser. No. 878,515

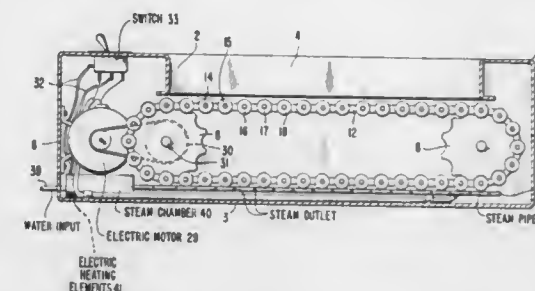
Int. Cl.<sup>2</sup> A61H 29/00

U.S. Cl. 128—24.3

2 Claims

1. A foot massaging device, comprising  
a box having a partially open top, a bottom, a first pair of parallel sides and a second pair of parallel sides;

a plurality of sprocket wheels rotatably mounted in the box parallel to the first pair of sides, first and second ones of the sprocket wheels being adjacent one of the first pair of sides and third and fourth ones of the sprocket wheels being adjacent the other of the first pair of sides;  
a first endless sprocket chain mounted on the first and second sprocket wheels and extending therebetween;  
a second endless sprocket chain mounted on the third and fourth sprocket wheels and extending therebetween;  
a plurality of hard rubber rod-like massage members each having spaced opposite first and second ends, the first end of each massage member being affixed to the first chain, the second end of each massage member being affixed to



the second chain, said massage members being positioned parallel to the second pair of sides of the box and extending between the chains;  
an electric motor mounted in the box and coupled to a pair of sprocket wheels in a manner whereby when the motor is energized it rotates the sprocket wheels thereby rotating the sprocket chains and causing the massage members to move in a plane in a predetermined direction at the open top of the box so that a foot resting thereon is massaged; and  
circuit means including electrical conductors and a switch for electrically connecting the motor to a source of electrical energy under the control of the switch.

4,165,738

**LIFE SUPPORT SYSTEM FOR DRILLING RIGS**

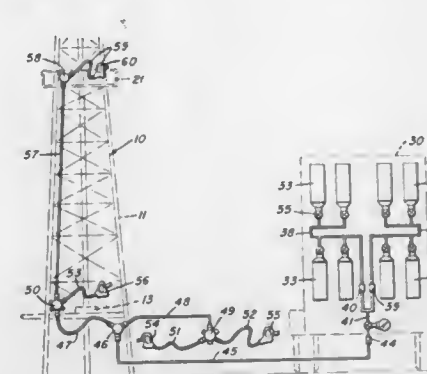
Phillip H. Graves, and Don L. Dyer, both of Box 6564, Odessa, Tex. 79762

Filed Nov. 22, 1977, Ser. No. 854,048

Int. Cl.<sup>2</sup> A62B 7/00

U.S. Cl. 128—142.4

7 Claims



1. In combination with a drilling rig having a platform, a draw works, a derrick extending upwardly therefrom, and at least one workman support on the derrick at an elevation substantially above said platform, the improvement comprising: an emergency breathing system for protection against toxic gases, said system including, a vehicle-carried supply of breathing gas consisting of a plurality of bottles of compressed air having outlets connected to a common outlet which can be located on the surface adjacent said drilling rig, first manifold

means mounted on said platform, conduit means interconnecting said first manifold and said common outlet of said supply, a plurality of breathing masks connected to said first manifold and located for use at various locations on said rig.

4,165,739

**INOCULATOR**

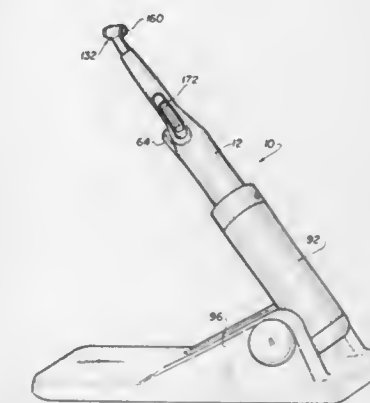
Norman R. Doherty, 870 Main St., Farmingdale, N.Y. 11735, and Richard F. Doherty, 2 Freshman La., Stony Brook, N.Y. 11790

Continuation-in-part of Ser. No. 719,733, Sep. 2, 1976, Pat. No. 4,090,512. This application Apr. 25, 1977, Ser. No. 790,239

Int. Cl.<sup>2</sup> A61M 31/00

U.S. Cl. 128—173 H

8 Claims



1. An inoculator apparatus comprising:  
injector head means for containing a fluid to be ejected thereby,  
an elongated body connecting with said injector head and defining a serum chamber of predetermined volume in fluid communication with said injector head,  
an elongated unitary main shaft carrying at one end thereof a piston disposed in said serum chamber, said main shaft being movable in said body between charged and discharged positions and having an axially disposed opening for supporting a fluid containing ampule therein and for movement therewith and in fluid communication with said serum chamber,  
operable means releasable from engagement with said main shaft to expose said opening to enable the insertion of a fluid containing ampule in said supporting opening and for applying a force to the fluid in an ampule contained in said supporting opening to enable the ejection of the fluid from the ampule into said serum chamber and said injector head as said main shaft moves from the discharged to the charged position,  
cocking means normally relatively fixed with respect to said main shaft at an end thereof opposite said piston for moving said main shaft to its charged position,  
said cocking means being operable to move said main shaft beyond its charged position to expand said serum chamber initially beyond its predetermined volume and to enable said main shaft to return to its cocked position and said serum chamber to its predetermined volume to purge said serum chamber of air,  
adjustable means on and movable relative to said cocking member and to said body for engagement with said body when said main shaft is moved to its discharged position, said adjustable means thereby being adjusted to limit the relative discharge movement of said main shaft with respect to said body and to selectively control the amount of fluid to be ejected by the inoculator,  
trigger means on said body intermediate said cocking means and said piston to retain said main shaft in its charged position and to release the same for movement to its discharged position.

and energy storing means operable between said body and said main shaft for storing energy when said main shaft is moved to said charged position and to release its stored energy to move said main shaft to its discharged position.

4,165,740

## MEDICAL ALTITUDE CHAMBER

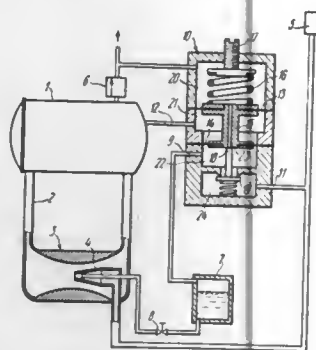
Viktor I. Kurichev, and Boris V. Spolitak, both of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovalelsky Ispytatelny Institut Meditsinskoi Tekhniki, U.S.S.R.

Filed Aug. 29, 1977, Ser. No. 828,850

Int. Cl.<sup>2</sup> A61M 16/02

U.S. Cl. 128—204

2 Claims



1. A medical altitude compression chamber apparatus comprising: a pressure tight therapeutic chamber adapted to contain a gas under pressure; a jet pump; first pipe means for providing fluid communication between said jet pump and said therapeutic chamber; said jet pump being at least partially defined by a nozzle having an inlet and an outlet; second pipe means for providing fluid communication between the nozzle inlet and a source of pressurized gas; at least one valve means for discharging gas from said therapeutic chamber; means responsive to the pressure of the gas contained in said pressure tight chamber for moistening the gas therein, said moistening means including a liquid reservoir having liquid and gas containing portions, third pipe means for providing fluid communication between the said liquid containing portion of said reservoir and an internal space defined within said nozzle, adjustable throttle means interposed in said third pipe means for adjustably controlling the flow of liquid from said liquid reservoir to said nozzle, and pressure regulator means fluidly communicating with said chamber and liquid reservoir and adapted to communicate with a source of pressurized gas for adjusting the pressure of the liquid in said liquid reservoir in response to changes in the pressure of the gas contained in said pressure tight chamber in a manner such that upon the pressure of the gas in the pressure tight chamber increasing, the pressure of the liquid in the liquid reservoir decreases, and upon the pressure of the gas in the pressure tight chamber decreasing, the pressure of the liquid in the liquid reservoir increases, whereby the flow of liquid to the nozzle from the liquid reservoir through the third pipe means varies inversely with the change in the gas pressure within the chamber.

4,165,741

## HEAT-SENSITIVE RECORDING MATERIALS AND RECORDING PROCESS OF USING THE SAME

Etichi Inoue; Taiji Nose, both of Tokyo, and Masakazu Inaba, Higashimurayama, all of Japan, assignors to Process Shizai Co., Ltd., Tokyo, Japan

Division of Ser. No. 753,136, Dec. 22, 1976, Pat. No. 4,115,613.

This application Jun. 30, 1978, Ser. No. 921,152

Claims priority, application Japan, Dec. 30, 1975, 50-158479

Int. Cl.<sup>2</sup> B32B 3/10; B41M 5/18

U.S. Cl. 428—207

23 Claims

1. A heat-sensitive recording material comprising a support and having thereon a recording layer comprising, as the heat

recording medium, a soluble heat-sensitive organic high molecular weight compound having molecular weight between about 3000 and 3,000,000, which is folded to show a granular state on the support, wherein said high molecular weight compound is selected from the group consisting of an isobutylene/maleic acid anhydride copolymer or ester or salt thereof; a styrene/maleic acid anhydride copolymer; a styrene/crotonic acid copolymer; a styrene/sulfonic acid copolymer; a vinyl acetate/maleic acid anhydride copolymer; a vinyl acetate/crotonic acid copolymer; a vinyl acetate/acrylic acid copolymer; a vinyl alcohol/maleic acid anhydride copolymer; or a water soluble polyethyleneimine represented by the following formula (IV):



wherein x and y each is a positive integer, and the ratio of primary, secondary and tertiary nitrogen atoms in said imine is (0.1-2):(0.2-3):(0.1-2).

4,165,742

## SYRINGE CONNECTABLE TO A WATER FAUCET

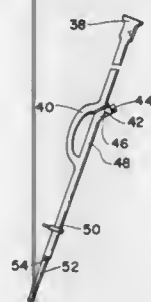
Ina F. Gardner, Rte. 1, Box 445, Overton, Tex. 75684

Filed Apr. 27, 1977, Ser. No. 791,195

Int. Cl.<sup>2</sup> A61M 3/00

U.S. Cl. 128—229

1 Claim



1. A syringe connectible to a water faucet, said syringe comprising  
a tube having spaced opposite first and second ends;  
connecting means at the first end of the tube for removably coupling said tube to a water faucet;  
a syringe tip removably coupled to said tube at the second end thereof;  
clamping means removably and adjustably positioned on said tube intermediate the first and second ends thereof for selectively preventing a flow of water through said tube; and  
medicament means for inserting a medicament into said tube, said medicament means comprising a slit formed in said tube at a point between said first end of said tube and said clamping means, a tubular branch extending from said tube around said slit for accommodating a capsule of medicament fittable through said slit into said tube, and a cap removably covering the tubular branch, said connecting means comprising an elastic bell-like coupling member at the first end of said tube removably positionable around the open end of a water faucet, a bypass tube bridging the point of the tube having the slit formed therein and having spaced opposite ends opening from said tube on both sides of said slit, and additional clamping means adjustably positioned on said tube intermediate said tubular branch and the end of said bypass tube closer to said first end of

said tube for selectively preventing a flow of water past said slit in said tube.

4,165,743

## REGENERATED CELLULOSE FIBERS CONTAINING ALKALI METAL OR AMMONIUM SALT OF A COPOLYMER OF AN ALKYL VINYL ETHER AND ETHYLENE DICARBOXYLIC ACID OR ANHYDRIDE AND A PROCESS FOR MAKING THEM

David B. Denning, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Nov. 29, 1976, Ser. No. 745,934

Int. Cl.<sup>2</sup> A61F 13/18

U.S. Cl. 128—290 R

9 Claims

1. A fluid absorbent regenerated cellulose fiber containing in physical admixture therewith from about 2 to about 35% by weight based on the weight of the cellulose of a water-soluble alkali metal or ammonium salt of a copolymer of an alkyl vinyl ether and an unsaturated dicarboxylic acid or anhydride, having a molecular weight of at least about 250,000 said fibers being more absorbent than non-alloyed cellulosic fibers.

4,165,744

## DYNAMIC KERATOMETRY AND KERATOSCOPY METHOD AND APPARATUS

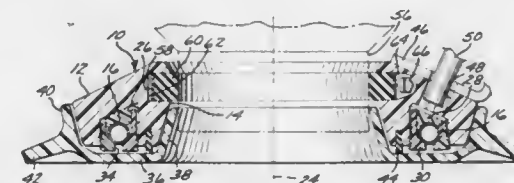
Thomas V. Cravy, 2265 Fallen Leaf Dr., and Dennis D. Shepard, 333 Las Flores Dr., both of Santa Maria, Calif. 93454

Filed Jul. 5, 1977, Ser. No. 812,991

Int. Cl.<sup>2</sup> A61B 3/10

U.S. Cl. 128—303.1

15 Claims



1. A keratometer comprising:  
a housing including means for projecting a single substantially circumferentially continuous circle of light onto a cornea for reflection of a generally circular image from the cornea, said housing further including walls defining a central opening free of any light refracting means having the effect of focusing said image, said image being observable along an axis extending through said opening; and  
support means for said housing, said support means being operable to systematically vary the distance between said housing and the cornea thereby to vary the diameter of said image without significant effect upon the sharpness of said image whereby said image may be progressively reflected from all portions of said cornea from the center of the cornea to the corneal periphery.

4,165,745

## SURGICAL MANIPULATOR

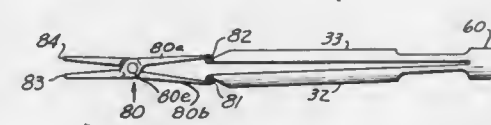
Milton D. Heifetz, 704 No. Bedford Dr., Beverly Hills, Calif. 90210

Filed May 6, 1977, Ser. No. 794,471

Int. Cl.<sup>2</sup> A61B 17/32, 17/28, 17/06

U.S. Cl. 128—318

14 Claims



1. A surgical instrument having a central axis, comprising a pair of prongs, each having a first end and a second end, said

first ends being integrally connected to one another at a joint, said second ends being on opposite sides of said axis;  
bias means resiliently biasing said prongs to move said second ends in opposite directions away from said axis in a plane of flexure which includes said axis;  
a manipulation surface on each of said prongs spaced from said point of joint;  
a spindle including a knuckle rest surface on said instrument closer to the jointer than the manipulation surface;  
a pair of jaws on the prongs which move toward one another when the manipulation surfaces are pressed toward one another;  
a hinge carried by each of said jaws;  
a pair of crosslinks joined by a pivot between their ends to form a scissor-type linkage, one of the ends of each of the crosslinks being joined to a respective one of said hinges; an operative element carried by each of said crosslinks farther from the prongs than the pivot;  
the manipulation surfaces and the knuckles rest surface being axially spaced from one another so that when the thumb and index finger of the surgeon press against respective manipulation surfaces, the knuckle rest surface bears against his hand near the knuckle at the base of his index finger,  
the manipulation surfaces, when the jaws are brought toward one another, forming a substantially regular geometric surface circumferential around the axis and no more out of round than a hexagon, the pressing together of the manipulator surfaces causing the scissor linkage to close to move the operative elements relative to one another,  
the knuckle rest surface being a continuous, substantially regular geometric surface circumferential around the axis and no more out of round than a hexagon.

4,165,746

## PLASTIC FORCEPS

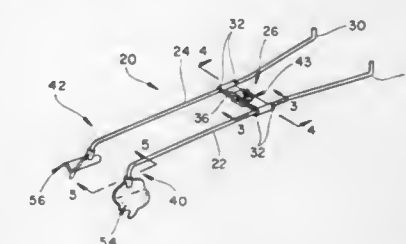
Kermit H. Burgin, R.R. #1, Box 334, Whitestown, Ind. 46075

Filed Jun. 30, 1977, Ser. No. 811,550

Int. Cl.<sup>2</sup> A61B 17/28, 1/06, 1/32

U.S. Cl. 128—321

10 Claims

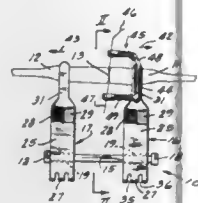


6. Forceps including a pair of elongated arms, each having a proximal end portion providing a handle and a distal end portion including means for attachment of a contacting member to each of the arms, and a hinge means for movably joining the arms to one another about an axis other than one which is parallel to the longitudinal axes of said arms to provide adjustment of the forceps, the hinge means joining the arms intermediate their ends, means for adjustably rotatably attaching the hinge means to the intermediate portion of each arm about the longitudinal axis of said arm and means for holding the arms in adjusted position relative to the hinge means.



**4,165,747**  
**MICROVASCULAR CLAMPS WITH SUTURE**  
**RETAINING MEANS**  
 Michael A. Bermant, Chicago, Ill., assignor to Division of Plastic Surgery of the Medical School of Northwestern University, Chicago, Ill., a part interest  
 Filed Jan. 28, 1977, Ser. No. 763,575  
 Int. Cl.<sup>2</sup> A61B 17/11  
 U.S. Cl. 128—334 C

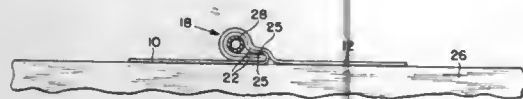
20 Claims



1. A microvascular clamp apparatus comprising:  
 an elongated, rigid bar;  
 a pair of clamps spaced apart along said bar and each carrying a pair of substantially parallel-closing, relatively-movable jaws;  
 guide and attachment means on each of said clamps for retaining said clamps on said bar in transverse relation thereto in a substantially coplanar relationship to one another and at a selected spacing from one another;  
 spring means on each of said clamps for biasing at least one of the relatively-movable jaws of each pair into contact with the other at a contact surface; and  
 a stay suture retainer affixed to said pair of clamps to extend substantially in plane of the clamps and bar, said stay suture retainer comprising  
 first and second arms carried on at least one of said jaws and lying substantially in said plane and adjacent but on opposite sides of a line extending between said contact surfaces of the jaws of the clamps, and  
 attachment means on each of said arms for removably engaging a stay suture,  
 whereby two ends of a blood vessel clamped at said contact surfaces by said jaws are immobilized for connection together by stay sutures placed through said ends and engaged by said attachment means on said stay suture retainer arms.

**4,165,748**  
**CATHETER TUBE HOLDER**  
 Melissa C. Johnson, 758 Main St., Leominster, Mass. 01453  
 Filed Nov. 7, 1977, Ser. No. 849,080  
 Int. Cl.<sup>2</sup> A61M 25/02  
 U.S. Cl. 128—348

4 Claims



1. A catheter holder comprising a pair of main members adapted to be secured to the limb of a patient in closely spaced relation,  
 a piece of material extending from corresponding edges of each of said main members,  
 said pieces of material being the same in size and having a width less than the width or length of the main members,

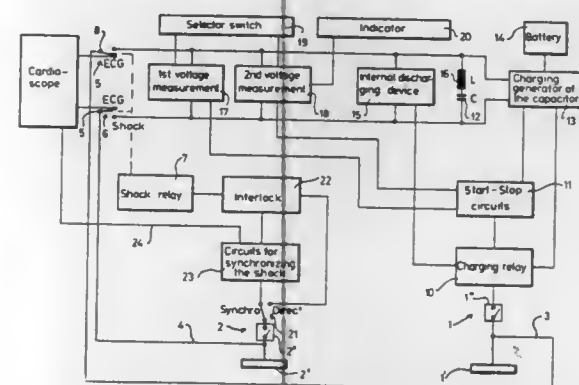
said extending pieces being secured together in superposed relation forming a double bridge member,  
 and cooperating fastening means on the combined pieces at one side thereof, said fastening means being located at the base of said bridge member adjacent to the corresponding closely spaced edges of the main members, and adjacent the end portion of said bridge member, so that when the fastening means are connected, a separable loop is provided to include and hold a catheter in desired orientation with respect to the patient.

**4,165,749**  
**MEDICAL DEVICE FOR ELECTROSHOCK THERAPY**  
 Albert Cansell, Altenstadt, France, assignor to Bruker-Medizin-technik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,619  
 Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651031

Int. Cl.<sup>2</sup> A61N 1/36  
 U.S. Cl. 128—419 D

5 Claims



1. A voltage generator for charging a shunt capacitor having a pair of terminals connected to the electrodes of electroshock apparatus such as a ventricular and auricular defibrillator comprising, a transformer having a primary winding connected to a source of current and a secondary winding, a rectifier comprises a pair of similar branch circuits connected between the opposed terminals of said shunt capacitor and to the secondary winding of said transformer and a high impedance voltage divider interposed in parallel between said shunt capacitor and said rectifier, the center of said voltage divider being connected to ground, whereby the potential on each terminal of said shunt capacitor relative to ground is substantially equal.

**4,165,750**  
**BIOELECTRICALLY CONTROLLED ELECTRIC**  
**STIMULATOR OF HUMAN MUSCLES**  
 Leonid S. Aleev, ulitsa Semashko, 21, kv. 168; Sergei G. Bunin, ulitsa Vernadskogo, 67, kv. 76; Maya I. Vovk, ulitsa Oktyabrskoi revoliutsii, 16, kv. 70, all of Kiev; Vladimir N. Gorbanev, ulitsa Vasilkovskaya, 9, Fastov Kievskoi oblasti; Anatoly B. Shevchenko, ulitsa Ushinskogo, 11, kv. 64, Kiev, and Fedor V. Balchev, ulitsa Zelenaya, 13, kv. 24, Vishnev Kievskoi oblasti, all of U.S.S.R.

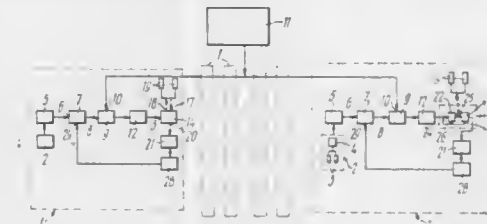
Filed Mar. 9, 1978, Ser. No. 885,082  
 Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—422

8 Claims

1. A bioelectrically controlled electric stimulator of human muscles, comprising:  
 an oscillator of the carrier frequency of an electric signal which stimulates muscular activity of a person;  
 a group of stimulation channels;  
 each of said stimulation channels including:  
 a sensor of bioelectric activity of muscles of a person who

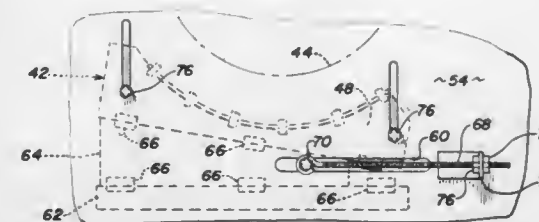
sets a program of movements; a first integrator connected with its input to the output of said sensor;  
 a comparator for comparing bioelectric activity of muscles of the person who sets the program of movements with that of a person whose movements are under control, having first and second inputs;  
 the first of said inputs of said comparator being electrically coupled to the output of said first integrator;  
 a modulator having first and second inputs;  
 said first input of said modulator being connected to the output of said oscillator;  
 said second input of said modulator comprising a control input and being electrically coupled to the output of said first integrator through said comparator;  
 a power amplifier electrically coupled with its input to the output of said modulator;



a unit for separating the electric signal, which stimulates the activity of muscles of the person whose movements are under control, from the bioelectric activity of said muscles, caused by said signal, having first and second inputs and first and second outputs;  
 the first of said inputs of said separation unit being connected to the output of said power amplifier;  
 electrodes adapted to be connected to muscles of the person, whose movements are under control, and also connected to the first of said outputs and the second of said inputs of said separation unit;  
 an amplifier of bioelectric activity of muscles of the person whose movements are under control, connected with its input to said second output of said separation unit;  
 a second integrator connected with its input to the output of said amplifier of bioelectric activity, the output of said second integrator being electrically coupled to said second input of said comparator.

**4,165,751**  
**BEATER GRATE FOR COMBINE**  
 Robert R. Todd, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.  
 Filed Apr. 7, 1978, Ser. No. 894,322  
 Int. Cl.<sup>2</sup> A01F 12/28  
 U.S. Cl. 130—27 S

7 Claims



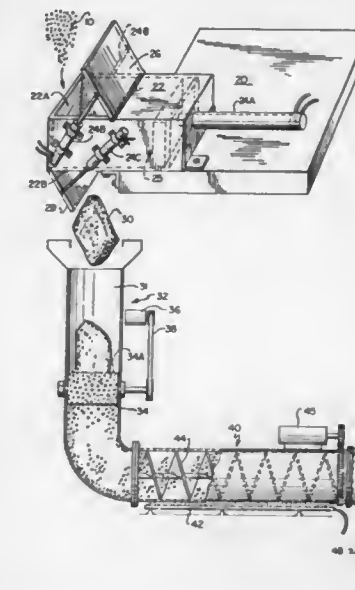
1. A combine having a mobile frame, a housing having sidewalls supported by said frame, threshing means comprising rotary threshing cylinder means extending axially of said combine and supported within said housing by said frame for rotation by power means on said combine, concave means below said threshing cylinder means and cooperating with the same to receive crop material to be threshed as received at the forward end thereof and operable to thresh said material and move the same axially rearward to separating means axially

rearward of said threshing cylinder and concave means and coaxial therewith within said housing and between said sidewalls thereof, and beater means adjacent the rearward end of said separating means and extending transversely across the exit end of the same to receive and further separate crop material discharged from said separating means, said beater means comprising a beater member rotatable about an axis transverse to that of said separating means thereby defining a predetermined peripheral path, and a concave beater grate having end members adjacent said sidewalls and extending coaxially beneath the lower portion of said peripheral path of said beater member; in combination with rail means secured to said sidewalls, and support members slidable on said rail means and engaging said end members of said concave beater grate to support said concave beater grate for adjustable radial movement toward and from said peripheral path of said beater member, thereby to effect maximum efficiency of operation of said beater member and grate relative to different types of material capable of being threshed by said combine.

**4,165,752**  
**TOBACCO SUBSTITUTE MADE FROM COFFEE**  
**CHERRIES AND A PROCESS FOR MAKING SUCH**  
 Carlos R. Bustamante, 5303 Alta Vista Rd., Bethesda, Md. 20014  
 Continuation-in-part of Ser. No. 683,677, May 5, 1976, which is a continuation-in-part of Ser. No. 620,277, Oct. 7, 1975, abandoned. This application Aug. 6, 1976, Ser. No. 712,356  
 Int. Cl.<sup>2</sup> A24D 1/18

U.S. Cl. 131—2

4 Claims



1. A process for making a coffee product from whole coffee cherries comprising the steps of:  
 a. applying a compressional force to said whole coffee cherries of sufficient magnitude to dehydrate said cherries to a selected degree;  
 b. comminuting said dehydrated cherries into particles;  
 c. roasting said particles to provide an intermediate brewable coffee product of enhanced shelf life; and  
 d. hydrating said intermediate brewable coffee product and subsequently evaporating same to provide a smokable coffee product.

4,165,753

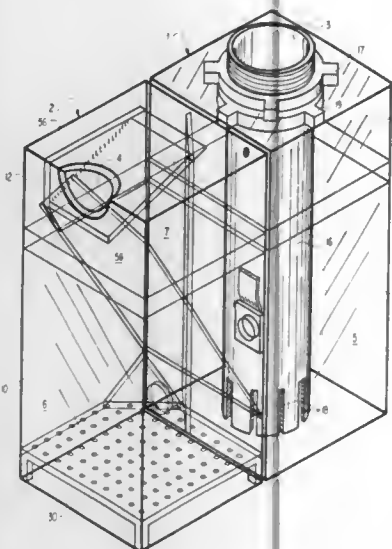
## SMOKER'S PIPE

Timothy J. Stryker, 94 Hammersmith Apts., Danbury, Conn. 06810

Filed Nov. 18, 1976, Ser. No. 743,199

Int. Cl.<sup>2</sup> A24F 1/14, 1/30

U.S. Cl. 131-173



1. A smoker's pipe, comprising,
  - a means for producing smoke,
  - a chamber means formed within a housing means, said housing means including a plurality of intersecting walls, said chamber means being subdivided into a deentrainment subchamber means for preventing fluid entrained in the smoke from reaching the smoker, and a smoke-cooling subchamber means containing a volume of fluid,
  - smoke inlet means operatively connecting said means for producing smoke with said smoke-cooling subchamber means, for introducing smoke into said smoke-cooling subchamber, one end of said smoke inlet means being disposed within said fluid,
  - a smoke outlet opening means for withdrawing smoke from said chamber, located substantially at the intersection of at least two of said walls defining said chamber, whereby a smoker's lips may be placed respectively against said two of said walls to surround said smoke outlet opening means, and whereby a reduced pressure at said smoke outlet opening means will draw smoke from said smoke-producing means through said smoke inlet means and into said chamber,
  - said deentrainment subchamber means being operatively connected to said smoke-cooling subchamber means and to said smoke outlet opening means, said connection between said deentrainment subchamber means and said smoke-cooling subchamber means including gravitational drain means connected to said deentrainment subchamber means near their bottom, for channelling deentrained fluid back into said smoke-cooling subchamber between draughts,
  - said gravitational drain means including check valve means disposed so as to substantially prevent the passage of fluid and smoke through said gravitational drain means when the pressure in said smoke-cooling subchamber substantially exceeds that in said deentrainment subchamber.

4,165,754

## HAIR-FROSTING CAP

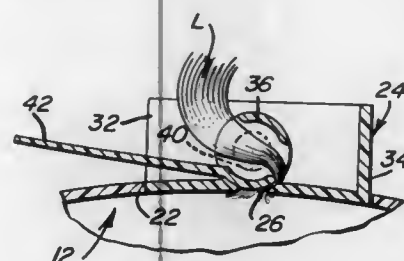
Joseph Di Pasqua, 2586 Sulphur Spring Rd., Sauquoit, N.Y. 13456

Filed Jun. 30, 1977, Ser. No. 811,703

Int. Cl.<sup>2</sup> A45D 19/18

7 Claims U.S. Cl. 132-9

11 Claims



1. A hair-treating cap for covering a scalp during hair treatments, comprising, in combination:
  - (a) head cover means for completely covering a scalp of a wearer during hair treatments; and
  - (b) clamp means mounted on the head cover means for engaging and holding hair to be treated, and preventing treating solution from bleeding through the head cover means and to the scalp of the wearer, wherein the clamp means includes, in combination:
    - (1) a clamp body provided with an aperture disposed for receiving a lock of hair of said wearer to be treated; and
    - (2) a lock member rotatably mounted on the clamp body and provided with a passage for receiving the lock of hair received in the aperture of the clamp body, rotation of the lock member retaining the lock of hair relative to the clamp body, and simultaneously blocking the aperture provided in the clamp body.

4,165,755

## ADJUSTABLE MASCARA WAND

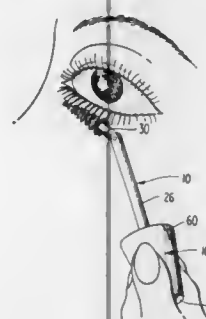
Gino H. Cassai, 924 E. 96th St., Brooklyn, N.Y. 11236

Filed Sep. 26, 1977, Ser. No. 836,923

Int. Cl.<sup>2</sup> A45D 40/26

U.S. Cl. 132-88.7

5 Claims



1. A mascara wand for use with a mascara container having a threaded top throat, the mascara wand comprising:
  - a container top having an outer shell, a top wall, and an inner wall threaded to threadedly engage the top throat;
  - an inner block within said top and spaced inwardly from said inner wall;
  - an elongated main shaft projecting outwardly from said block, the main shaft having a distal end section spaced outwardly from said container top;
  - an extension shaft member having first and second ends and having bristles secured thereon in spiral arrangement from end-to-end;

means pivotally securing the first end of the extension shaft to the main shaft; the outer shell of the container top having indicia thereon to indicate at least one pivot axis of the extension shaft; and the indicia being aligned with the shaft, and the extension shaft member being pivotal on said pivot axis by withdrawal of the main shaft from the container and engagement of the extension shaft member against the top throat of the container.

4,165,756

## WASHING TUNNEL FOR CLEANING GLASS CONTAINERS

Edgar Sirch; Johann Franz, both of Leverkusen; Dirk-Torsten Kruger, Bergisch-Gladbach; Anton Spenner, Leverkusen, and Paul-Günter Underberg, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

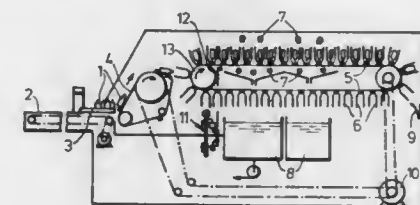
Filed Aug. 4, 1978, Ser. No. 931,080

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735532

Int. Cl.<sup>2</sup> B08B 3/02, 9/08

U.S. Cl. 134-56 R

4 Claims



1. A longitudinal automatic sprayer for cleaning glass containers for parenteral medicaments, comprising two parallel chains operating in cycles for conveying a row of transverse beams arranged perpendicularly to the direction of transport, said chains arranged to provide an upper and a lower conveyor run and said transverse beams carrying individual baskets, each basket for receiving one glass container, a transfer device at the upstream end of the upper conveyor run and a delivery device for the containers at the downstream end of the upper conveyor run, and spray nozzles for spraying the glass containers, wherein a mechanical scanning device for checking the baskets for the presence of glass bodies is arranged below the lower conveyor run, which scanning device at the same time controls the exact positioning of the baskets appropriate to the operating cycle.

4,165,757

## ARCH SUPPORTED TENT

George R. Marks, Richmond, Calif., assignor to Sierra Designs, Oakland, Calif.

Filed Jan. 26, 1978, Ser. No. 872,630

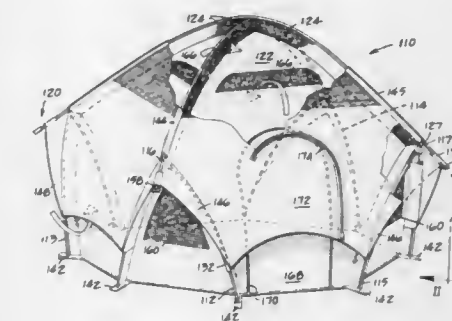
Int. Cl.<sup>2</sup> A45F 1/16; E04B 1/347

U.S. Cl. 135-1 R

20 Claims

1. A tent comprising:
  - an outer cover having at least two opposed edges on opposite sides thereof;
  - an inner cover;
  - a first arch assembly removably associated with the outer cover and adjacent one edge thereof;
  - a second arch assembly removably associated with the outer cover and adjacent an other edge thereof, said other edge of said outer cover generally opposite the one edge;
  - the apexes of said first and second arches generally at the midpoint at said one and the other edges respectively;
  - ridge means removably associated with and cooperating with said outer cover for spatially separating said first and

said second arch assemblies in an outwardly diverging relation whereby said outer cover forms a shelter;



means for suspending said inner cover from said outer cover said ridge means comprising tension means for placing said outer cover under tension.

4,165,758

## EARTHQUAKE RESPONSIVE VALVE

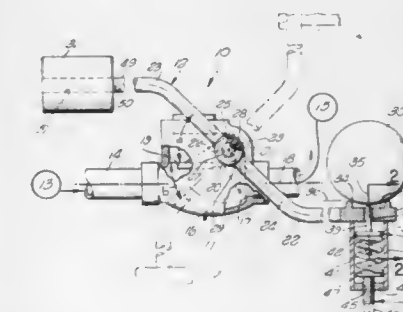
Donald R. Douce, 1517 Merced, Sp. 62, South El Monte, Calif. 91733

Filed Oct. 14, 1977, Ser. No. 842,040

Int. Cl.<sup>2</sup> F16K 17/36

U.S. Cl. 137-38

20 Claims



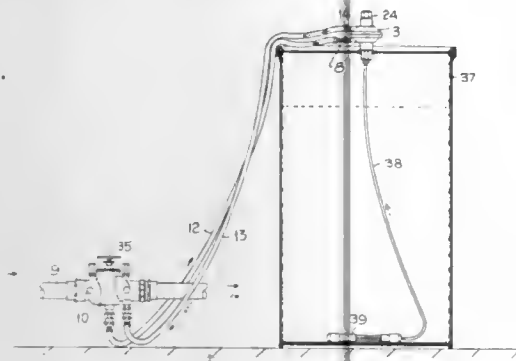
1. An earthquake responsive assembly comprising:
  - a valve;
  - two weights; and
  - mechanism for actuating said valve between open and closed positions and which balances said weights against each other with a first of the weights normally overbalancing the second and releasably retaining the valve in open position;
- said mechanism including a holder for said first weight through which force is exerted on said mechanism by said first weight, and from which said first weight is displaceable by earthquake shock or the like in a relation releasing said mechanism for valve closing actuation by the second weight;
- said valve including a valve element mounted to swing about a predetermined axis between open and closed positions;
- said mechanism including a lever structure connected to said valve element for pivotal movement about said axis and having two arms projecting in different directions and carrying said weights respectively.



**4,165,759**  
**DELIVERING MEASURED QUANTITIES OF LIQUID INTO A FLUID**  
 Alfred D. Tucker, Kersbrook, Australia, assignor to Iplex Plastic Industries Proprietary Limited, Elizabeth, Australia  
 Filed Oct. 12, 1976, Ser. No. 731,677  
 Claims priority, application Australia, Oct. 9, 1975, PC3512  
 Int. Cl.<sup>2</sup> G05D 11/03

U.S. Cl. 137—99

2 Claims



1. A device for delivering measured quantities of liquid into a fluid comprising a housing having a chamber therein, a movable diaphragm across said chamber to divide said chamber into a fluid inlet space and a fluid outlet space, a diaphragm spring between the housing and the diaphragm to urge the diaphragm into the fluid inlet space, inlet means on said housing communicating with said fluid inlet space, outlet means on the said housing communicating with the fluid outlet space, ports in the said diaphragm to allow fluid flow therethrough, valves on the said diaphragm positioned to open said ports when the diaphragm is deflected into the fluid inlet space by the said spring, said valves contacting said housing to effect closure, shafts on said valves to move the said valves to open the said ports when the said diaphragm is urged into said fluid outlet space whereby to substantially equalize pressure on both sides of the said diaphragm, springs between said shafts and the said housing to urge the valves to the open position whereby to hold said valves open during return of the diaphragm by the said diaphragm spring until closed by said valves contacting said housing, a hollow stem secured to the said diaphragm to move axially with the said diaphragm, a pump chamber forming part of said housing coaxial with said stem, a hollow piston in said pump chamber secured to said stem, an inlet to the said pump chamber including a non-return valve, an outlet from the said pump chamber through a non-return valve and through the hollow in the said stem to the fluid outlet space of said chamber, whereby the said piston in said pump chamber delivers a measured quantity of liquid into said fluid outlet space to mingle with the fluid flowing through the said fluid outlet space further characterized by said inlet and said outlet to the main chamber being connected to a fluid line with said inlet connected to said fluid line before a restrictor in said fluid line and said outlet connected after said restrictor in the direction of fluid flow.

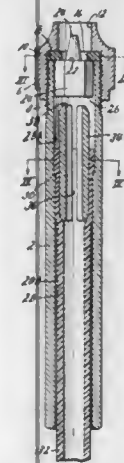
**4,165,760**  
**AIR CHUCK**  
 Manfred H. Guenther, Rte. #2, Box 290T, Belton, Mo. 64012  
 Filed Oct. 17, 1977, Ser. No. 842,406  
 Int. Cl.<sup>2</sup> F16K 15/20

U.S. Cl. 137—231

2 Claims

1. An air chuck for delivering air from a pressurized air hose formed of resiliently compressible material to the valve stem of an automobile tire, said stem being tubular and including therein a stem valve having an operating spindle extending axially in the mouth of said stem and operable to open said stem valve responsively to inward movement thereof, said air chuck comprising:

- a. a tubular body member, said air hose extending slidably into one end of said body member;
- b. means providing a sealed connection of said air hose into said body member;
- c. an annular sealing ring sealed around its outer edge in the opposite end of said body member, and operable to engage around the central aperture thereof against the mouth of said valve stem when pressed manually thereagainst, to provide a sealed interconnection between said body member and said stem;
- d. a plunger valve disposed for axial sliding movement in said body member inwardly of said sealing ring, said plunger valve normally being pressed against said sealing ring by air pressure in said body member to engage said ring around the central aperture thereof, and including a plunger projecting outwardly through the central aperture of said sealing ring, whereby as said sealing ring is pressed against said valve stem, said plunger engages and depresses said stem valve, and said spindle reacts against said plunger to open said plunger valve, and



- e. a back-up member normally fixed in said body member inwardly of said plunger valve and operable to engage and prevent further inward movement of said plunger valve after said valve is opened by disengagement thereof from said sealing ring, whereby during final movement of said body member toward said valve stem, said plunger is advanced against said spindle by positive mechanical force to insure opening of said stem valve, said back-up member comprising a tube formed of resiliently flexible material and being of C-shaped cross-sectional contour with its longitudinal edges spaced apart to form a longitudinal slot in the wall thereof, said back-up tube being resiliently compressible for insertion into the inner end of said hose within said body member, whereby resilient expansion thereof compresses the wall of said tube against the bore of said body member, said back-up tube projecting from the inner end of said air hose toward said plunger valve, and serving as said means providing sealed connection of said hose into said body member.

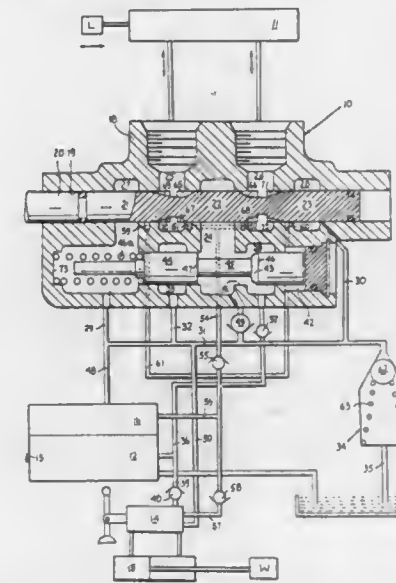
**4,165,761**  
**LOAD RESPONSIVE FLUID CONTROL VALVES**  
 Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022  
 Continuation of Ser. No. 709,202, Jul. 27, 1976, Pat. No. 4,058,139. This application Aug. 29, 1977, Ser. No. 828,643  
 The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.  
 Int. Cl.<sup>2</sup> F15B 13/08

U.S. Cl. 137—596.13

5 Claims

1. A valve assembly supplied with pressure fluid by a pump comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, and fluid exhaust means, first valve means for selectively interconnect-

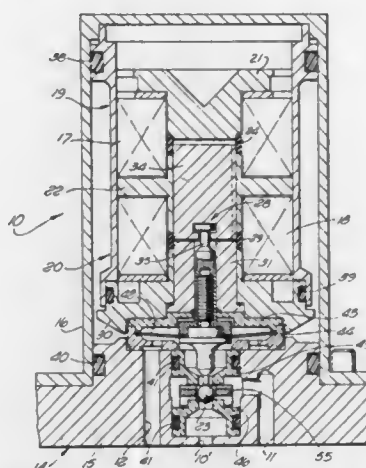
ing said fluid load chambers with said fluid supply chamber and said fluid exhaust means, first variable fluid metering orifice means responsive to movement of said first valve means between said fluid supply chamber and said load chambers, second variable fluid metering orifice means responsive to movement of said first valve means between said load chambers and said exhaust means, second valve means having fluid isolating means between said inlet chamber and said supply chamber, said inlet chamber being solely communicable with



said supply chamber by said second valve means, said fluid isolating means having operable to isolate said inlet chamber from said supply chamber when pressure is one of said load chambers connected to said exhaust means by said first valve means exceeds a certain predetermined pressure level and connecting means to connect said load chamber interconnected to said supply chamber by said first valve means with said exhaust means when said fluid isolating means isolates said inlet chamber from said supply chamber.

**4,165,762**  
**LATCHING VALVE**  
 Ali Acar, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.  
 Filed Feb. 21, 1978, Ser. No. 879,062  
 Int. Cl.<sup>2</sup> F15B 13/044; F16K 31/06  
 U.S. Cl. 137—625.5

4 Claims

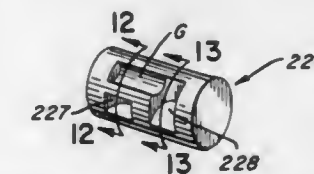


1. A latching valve comprising: a body; first and second solenoids fixed in said body approximately on the same axis, but spaced axially from each other; first and second magnetic circuits fixed relative to said body and surrounding said first

and second solenoids, respectively, said first and second magnetic circuits having respective first and second internal annular slots approximately concentric with said axis, but spaced apart, said slots providing air gaps; an armature slidable through said first and second magnetic circuits; a valve; a stem connecting said valve to said armature; a first valve seat fixed relative to said body, said first valve seat having a port there-through, said valve being movable toward and away from said first valve seat to close and to open said port when said first and second solenoids are selectively energized, respectively; a snap disc mounted between said stem and said body, said snap disc being constructed to snap to first and second stable positions when said first and second solenoids are energized, respectively, said snap disc holding said valve closed and open when said first and second solenoids are selectively energized, respectively, and both solenoids are subsequently deenergized, said armature and said stem having a lost motion connection therebetween.

**4,165,763**  
**VALVE CONSTRUCTION**  
 Walter J. Hough, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.  
 Filed Jun. 6, 1977, Ser. No. 803,431  
 Int. Cl.<sup>2</sup> F16K 11/085  
 U.S. Cl. 137—625.41

6 Claims



1. A combination of a source of fluid under pressure, a plurality of independent fluid distribution passageways and a valve intermediate said source and passageways for controlling fluid flows from said source to predetermined numbers of said passageways; said valve including a housing having a fluid inlet connected to said source and fluid outlets spaced from said inlet and being connected to corresponding fluid distribution passageways, and a valve piece mounted within said housing for movement between selected positions of adjustment, said valve piece being disposed intermediate said housing inlet and outlets and provided with first and second fluid passages communicating with said housing inlet and a first predetermined number of said housing outlets, when said valve piece is in a first selected position of adjustment, and a third fluid passage having one end thereof communicating with said second passage and the opposite end thereof terminating at the exterior of said valve piece and being spaced from said first and second passages; the said opposite end of said third passage being in communication with said housing fluid inlet and said first passage being out of communication with said housing fluid inlet only when said valve piece is in a second selected position of adjustment, said second passage being in communication with said housing inlet and at least one housing outlet, when said valve piece is in either said first or second selected position of adjustment.

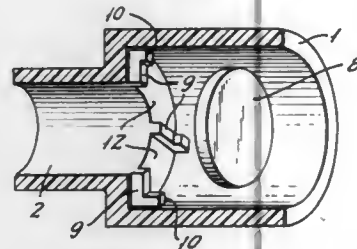
**4,165,764**  
**VALVE**  
 Gérald Grandclement, Cap d'Ail, France, assignor to International Cold Forging Corporation, Monaco, France  
 Filed Jul. 18, 1977, Ser. No. 816,357  
 Claims priority, application Monaco, Jul. 20, 1976, 1207  
 Int. Cl.<sup>2</sup> F15D 1/08

U.S. Cl. 138—43

9 Claims

1. A flow-regulating valve comprising a tube having an inner wall surface stepped inwardly to provide a base on which ribs are provided having top surfaces lying substantially in a

plane defining a peripheral valve seat perpendicular to the longitudinal axis of said tube, said base providing a plurality of fan-shaped and substantially flat-bottomed passages that are wide compared to said ribs, and run between an inlet chamber bounded by said inner wall surface adjacent to the inwardly stepped part thereof and an outlet chamber of smaller cross-section than said inlet chamber and bounded by said inner wall surface beyond the inward step, further comprising a washer disk of resilient material backed onto said ribs forming said peripheral valve seat, said washer disk being shaped and sized to leave free and unobstructed a continuous gap between the

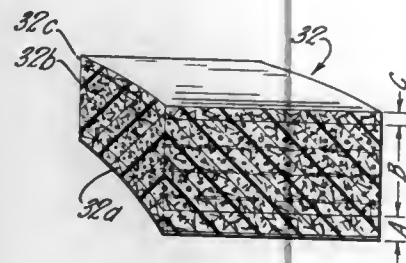


periphery of said washer disk and said inner wall surface bounding said inlet chamber, and further comprising fluid-tight partition means dividing said outlet chamber longitudinally into a plurality of parts each having an outlet therefrom, said partition means projecting beyond said base on which said ribs are provided and also being backed onto by said washer disk, whereby the amounts of flow into said respective outlets of said respective parts of said outlet chamber are regulated by deformation of said washer disk into the fan-shaped channels leading into the respective outlet chamber parts, in each case according to channel depth and width.

**4,165,765**  
**GLASS FIBER REINFORCED THERMOSETTING RESIN PIPE WALL CONSTRUCTION**  
Agnar Gilbu, Sandefjord, Norway; Lee E. Pearson, and Mark E. Greenwood, both of Conroe, Tex., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio  
Continuation of Ser. No. 697,282, Jun. 17, 1976, abandoned.  
This application Jan. 25, 1978, Ser. No. 872,126  
Int. Cl.<sup>2</sup> F16L 9/12

U.S. Cl. 138—174

51 Claims

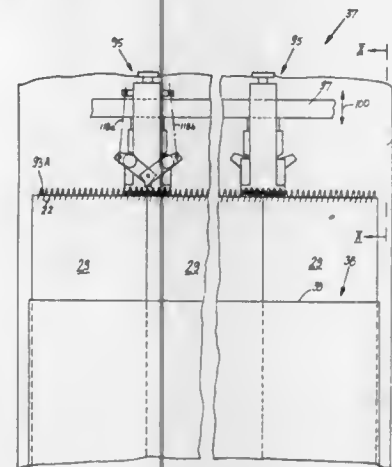


1. A pipe wall construction comprising a relatively thin, sand-free, resin-rich, glass fiber reinforced thermosetting resin protective inner liner portion, a relatively thick intermediate structural wall portion constituting the load-bearing portion of the pipe wall construction as designed and including by weight from 30% to 60% thermosetting resin, from 1% to 45% sand, from 3% to 25% randomly disposed chopped glass fibers, and from 1% to 60% circumferentially extending continuously wound glass filaments, the resin, sand, chopped glass fibers, and continuously wound glass filaments of the structural wall portion being distributed uniformly, whereby in a cross section of the pipe wall construction the structural wall portion appears to be a single homogeneous layer as distinct from plural layers of different compositions, and a relatively thin, resin-

rich, glass fiber reinforced thermosetting resin protective outer wall portion, the glass fiber reinforcement of the relatively thin, resin-rich, protective inner liner and outer wall portions affording corrosion resistance by preventing surface cracking otherwise likely to occur if the inner liner and outer wall portions were entirely resin.

**4,165,766**  
**DEVICE FOR SUBDIVIDING SPIRALS INTO BINDERS OF NOTE BOOKS OR THE LIKE**  
Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to WOMAKO-Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany  
Filed Nov. 25, 1977, Ser. No. 855,016  
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655262; Jul. 27, 1977, 2733820  
Int. Cl.<sup>2</sup> B21F 11/00  
U.S. Cl. 140—92.7

13 Claims



1. A device for severing and deforming a spiral whose convolutions extend through the perforations in aligned marginal portions of two immediately adjacent pads, comprising a shears having two sections including cutting edges and being movable toward each other whereby said cutting edges make a single cut across the spiral between the pads so that the spiral yields two binders having end portions adjacent to each other, said sections further including deforming portions operative to bend the end portions of the binders on further movement of said sections toward each other; means for moving said sections toward and away from each other; and means for locating the spiral in the course of movement of said sections toward each other.

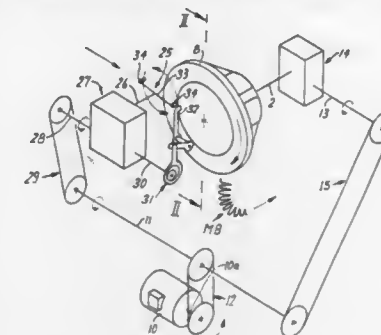
**4,165,767**  
**WIRE FORMING MACHINE**  
Paul Seaborn, Los Gatos, Calif., and Jörn-Uwe Lemburg, Hamburg, Fed. Rep. of Germany, assignors to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany  
Filed May 16, 1978, Ser. No. 906,607  
Int. Cl.<sup>2</sup> B21F 1/04

U.S. Cl. 140—105

13 Claims

1. A wire forming machine, comprising first and second carriers rotatable about parallel axes; means for rotating said carriers in a predetermined direction; first and second annuli of projections respectively provided on and concentric with the respective carriers, each projection of said first annulus being adjacent to a projection of said second annulus and one of said annuli surrounding the other of said annuli so that, when said carriers rotate, the distance between the neighboring projections of said annuli increases during movement from first to second portions of the paths of orbital movement of said projections and decreases during movement from said second to said first portions; means for looping a strand of wire serially

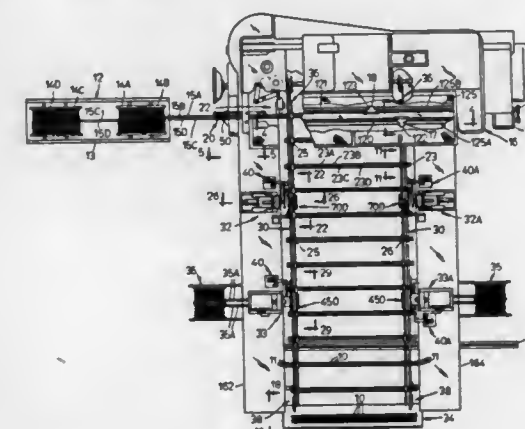
about successive projections of said first and second annuli during movement of projections from said first to said second portions of said paths whereby the wire is converted into a product of meandering shape and is stretched during further



movement toward said second portions; and means for separating said product from said projections during movement of projections from said second toward said first portions of said paths.

**4,165,768**  
**WIRE STRAIGHTENING MECHANISM FOR WIRE LEAD PRODUCTION APPARATUS**  
Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.  
Filed Jun. 5, 1978, Ser. No. 912,720  
Int. Cl.<sup>2</sup> H01R 43/04; B21F 1/02  
U.S. Cl. 140—140

4 Claims

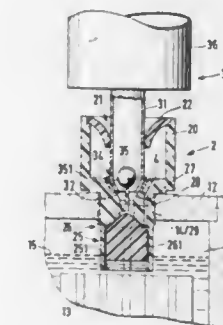


1. Apparatus for high-speed production of sets of accurately and identically sized wire leads comprising:  
a feed mechanism having means for simultaneously drawing a plurality of separate strands of wire from a plurality of wire reels;  
a mechanism having means for straightening and arranging said strands drawn therethrough in parallel spaced apart relationship in a common generally horizontal plane;  
a severing mechanism having means for severing sets of wire segments of predetermined length from said strands;  
conveyor clamps for releasably gripping said sets of wire segments;  
and conveyor means for advancing said conveyor clamps, said wire straightening and arranging mechanism apparatus comprising:  
a first member having grooves therein through which said strands are drawn in a predetermined direction;  
a plurality of second members, one for each groove, each second member movably mounted relative to said first member and engageable with a strand in an associated groove;  
and biasing means operatively connected to bias said second members against said strands in said grooves, whereby

each second member maintains a strand in an associated groove and permits movement of said strand when said strand is moving in said predetermined direction and whereby said movable member presses said strand into said groove with a force sufficient to inhibit strand movement when said strand tends to move in a direction opposite to said predetermined direction.

**4,165,769**  
**BATTERY FILLING SYSTEM**  
Gunter Hoffmann, Vogtskamp 6, 2000 Hamburg 65, Fed. Rep. of Germany  
Filed Jun. 13, 1977, Ser. No. 805,733  
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1976, 7619598[U]  
Int. Cl.<sup>2</sup> B65B 3/26  
U.S. Cl. 141—198

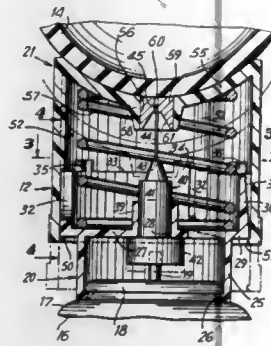
20 Claims



1. A secondary battery filling system comprising a stopper insertible in a vertical position in an opening in the top wall of a battery and having a top filling opening communicating with a liquid channel extending vertically through said stopper, self-closing closure means for covering over said top filling opening and providing a lid above said liquid channel, a valve cage depending from the lower end of said stopper in communication with the bottom of said liquid channel and sized to extend into the interior of said battery to below the normal liquid level therein, an inlet valve comprising a float member mounted within said valve cage for sealing off the bottom end of said liquid channel against passage of liquid therethrough into the interior of said battery, said inlet valve being arranged to close off said liquid channel in use by the level of liquid in said battery; a separate portable filling device comprising a closed storage container for the filling liquid and having an elongated tubular filling nozzle extending therefrom and having an outlet opening, said nozzle being movable with respect to said stopper and sized for insertion through said self-closing closure means of said stopper with said closed storage container in inverted position and with the said nozzle extending an appreciable distance into said liquid channel; an outlet gravity biased valve mounted within said tubular nozzle and positioned to seat within and close off said outlet opening when said storage container is inverted; and an opening element fixedly mounted in the path of insertion of said filling nozzle and within the path of flow of liquid through said liquid channel, said opening element being sized and positioned to project loosely through said outlet opening and engage said outlet gravity biased valve for raising the latter inwardly within said tubular nozzle when said nozzle is inserted into said stopper.

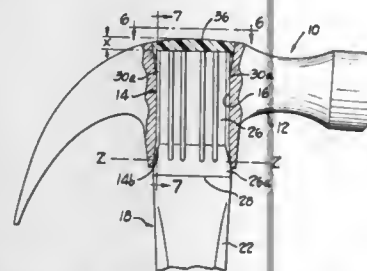


**4,165,770**  
**APPARATUS TO REJUVENATE TENNIS BALLS**  
 Julian Goldman, and Martin Oppenheim, both of 250 174th St.,  
 Miami Beach, Fla. 33160  
 Filed Apr. 4, 1977, Ser. No. 784,573  
 Int. Cl.<sup>2</sup> B65B 31/08  
 U.S. Cl. 141—329



1. A ball inflation device comprising a vessel for containing pressurized fluid, a normally closed discharge valve carried by said vessel, an operator fitting on said discharge valve and resiliently depressible to open the valve, a hollow impaling element on said fitting for passing fluid from said vessel, and an outwardly facing ball seat outwardly of said fitting and impaling element for engaging a ball, mounting means mounting said seat for in and out movement toward and away from said vessel, said seat having a through opening for passing said impaling element outwardly into impaling engagement with a ball when said seat is moved toward said vessel, actuating means carried by said seat for actuating said fitting to operate said valve and pass fluid into a ball on said seat, and stop means associated with said ball seat and said mounting means for selectively preventing said seat from being moved toward said vessel and thereby preventing inadvertent and undesired passage of said impaling element through said seat through opening, said ball seat including a first sleeve spacedly surrounding said impaling element, and said mounting means including a second sleeve telescopic and rotatable with respect to said first sleeve and secured to said vessel, for sleeve extension and retraction on seat movement outward and inward respectively; resilient means yieldably extending said telescopic sleeves, said stop means on said sleeves being provided for selectively retaining the latter against retraction and being located in a selected angulate relation between said sleeves; and a bushing carried by said seat protectively surrounding said impaling element and defining said through opening.

**4,165,771**  
**IMPACT TOOL HAVING A PRE-FORMED FIBERGLASS HANDLE**  
 Marino Curati, Jr., Geneva, Ohio, assignor to True Temper Corporation, Cleveland, Ohio  
 Filed Apr. 24, 1978, Ser. No. 899,078  
 Int. Cl.<sup>2</sup> B25C 1/00; B25D 1/00  
 U.S. Cl. 145—29 R



1. An impact tool comprising a striking head having a handle receiving socket therein extending through said head, and

15 Claims

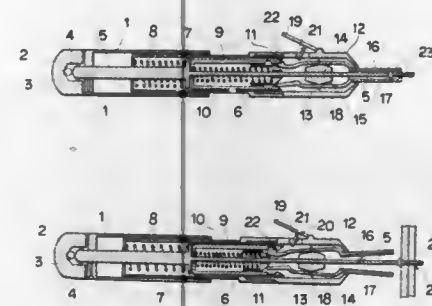
including inner and outer ends, a pre-formed fiberglass handle having a head portion and a handle portion, part of said head portion being received in said socket said inner end thereof, and comprising a ribbed section and a non-ribbed section, said ribbed section comprising ribs extending only lineally generally lengthwise of said handle and disposed in spaced relation circumferentially of said head portion, said non-ribbed section being disposed adjacent said ribbed section and diverging rearwardly in the direction of said handle portion, said socket diverging outwardly at said inner end and said ribbed section being disposed interiorly of said socket intermediate said outer and inner ends thereof, said socket having an intermediate, generally linear section with said ribs tightly engaging said linear section of said socket, and generally centering said head portion in said socket transverse thereof, said non-ribbed section engaging said diverging inner end of said head socket and limiting the movement of said handle into said head socket whereby the distal end of said ribbed section is spaced a predetermined minimum amount from said outer end of said socket, and a plastic resin material filling said socket intermediate said ribs and filling said outer end of said socket.

**4,165,772**  
**DEVICE FOR DRIVING SCREWS, RIVETS AND THE LIKE**

Asakichi Suga, 3-20-7 Chuo, Ohta-ku, Tokyo, Japan  
 Filed Feb. 21, 1978, Ser. No. 879,398  
 Claims priority, application Japan, Feb. 18, 1977, 52-16812  
 Int. Cl.<sup>2</sup> B25B 15/00

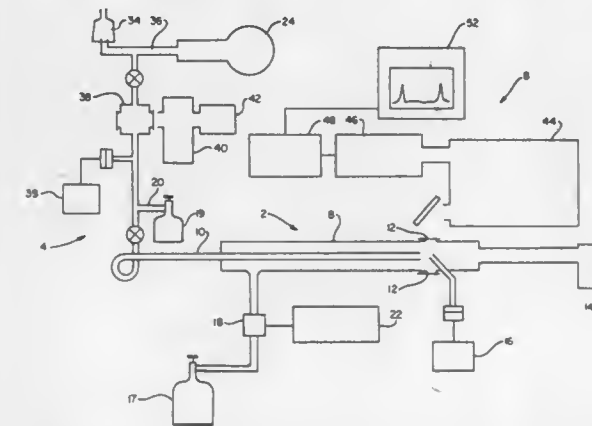
U.S. Cl. 145—52

4 Claims



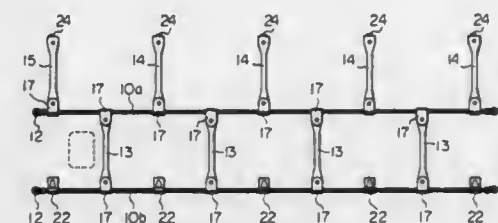
1. A device for driving screws, rivets and the like comprising:  
 a rotary cylinder to which a grip end cylinder is rotatably attached;  
 a center rod with one end secured to a bottom portion of the rotary cylinder and having a stopper formed on a middle portion of said center rod;  
 a stationary cylinder telescopically and coaxially disposed in the rotary cylinder so that relative sliding movement and relative rotational movement between said stationary and said rotary cylinders are possible;  
 a sleeve coaxially disposed in said stationary cylinder on the fore side of the stopper, encircling the center rod and having a notch formed at a fore end portion of the sleeve;  
 a cylindrical pressing block slidably movably mounted around the center rod and positioned within said sleeve;  
 a spring coaxially disposed around said center rod and extending from the stopper to said pressing block to urge said pressing block toward a tip portion of said device;  
 a top cylinder connected with said stationary cylinder and having a bore;  
 a swing lever fixed to an exterior surface of said top cylinder and having a pin depending from said lever and passing through said bore in said top cylinder;  
 a nozzle consisting of upper and under nozzle portions and having a hook formed on the upper nozzle portion engageable with said notch of the sleeve; and  
 a bush disposed between said nozzle portions and shaped to permit swinging motion of said nozzle portions to open

**4,165,773**  
**METHOD FOR PRODUCING ELECTRONICALLY EXCITED NITROGEN FLUORIDE**  
 Robert D. Coombe, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.  
 Filed May 18, 1978, Ser. No. 907,213  
 Int. Cl.<sup>2</sup> C06B 23/00; H01S 3/22  
 U.S. Cl. 149—109.6



1. A method of producing a mixture of gases containing electronically excited nitrogen fluoride, comprising the steps of:  
 providing fluorine atoms;  
 providing azide radicals;  
 mixing said fluorine atoms with said azide radicals; whereby electronically excited nitrogen fluoride is formed by a reaction between said fluorine atoms and said azide radicals.

**4,165,774**  
**DEVICE FOR PREVENTING TIRES FROM SLIPPING**  
 Kazuhiro Matsui, Toyooka, Japan, assignor to Masaharu Hutamura, Nagoya, Japan, a part interest  
 Filed Apr. 20, 1977, Ser. No. 789,155  
 Int. Cl.<sup>2</sup> B60C 27/20  
 U.S. Cl. 152—221

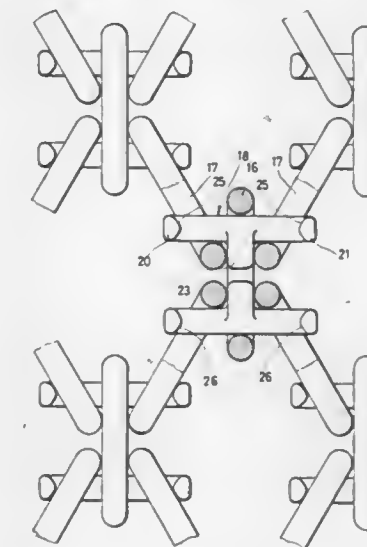


1. In a tire-slip preventing device having a plurality of cross belts arranged across two parallel cords in the form of a ladder, said cross belts being made of a yielding deformable and resilient material, first permanent connecting means permanently connecting some of said cross belts to said cords at both ends, second permanent connecting means permanently connecting the other cross belts at one end to one of said cords and detachable connecting means detachably connecting the other end to the other cord, said detachable connecting means comprising a male metal part and a female metal part, first attach-

ing means attaching one of said metal parts to said other cord and second attaching means attaching the other of said metal parts to said other end of said cross belt, said female metal part having means defining an opening and said male metal part having a hook detachably fitting into said opening, said female metal part having a depressed portion along a section of the periphery of the opening, said hook of said male metal part having a raised portion along a peripheral section thereof, said depressed portion receiving said raised portion to detachably secure said hook in said opening.

**4,165,775**  
**TIRE CHAIN**  
 Werner Rieger, Haus Häselbach, 7080 Aalen 1, Fed. Rep. of Germany  
 Filed Oct. 31, 1977, Ser. No. 847,040  
 Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651522  
 Int. Cl.<sup>2</sup> B60C 27/06  
 U.S. Cl. 152—243

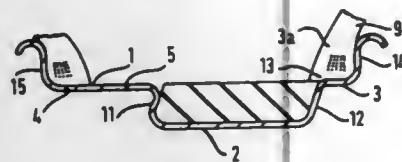
11 Claims



1. Tire chain with a plurality of vertical links having a closed circumference and with detachable connecting elements which pass the inner space of the vertical links, holding them safely together when the tire chain is assembled, said vertical links being orientated essentially vertically to a tire surface, characterized in that the connecting elements (18; 28) have an essentially double-T-shaped basic body including two cross bars connected by a longitudinal bar positioned therebetween, and that the basic body between its cross-bars (20, 21; 32, 33) is provided with at least one projection (23, 34) offset by 90° to the cross-bars, said projection (23, 34) projecting into the inner space (24) of at least one vertical link (16) partially arranged between the ends of at least two further vertical links (17) and connected with these further vertical links, said projection being so dimensioned and positioned to form a stop for limiting free relative motion between said vertical link (16) and said connecting element, said links surrounding the longitudinal bar (22; 29) of the basic body with U-shaped portions.

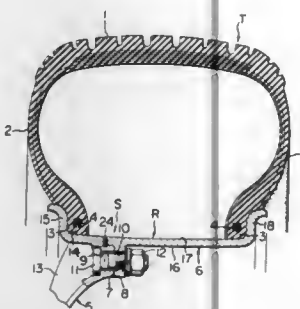
11. A connecting element for connecting vertical chain links of a tire chain having a plurality of vertical links, said connecting element including a double T-shaped basic body including cross bars connected by a longitudinal bar positioned therebetween, wherein said connecting element has at least one projection between said cross-bars (20, 21; 32, 33), said projection set off by 90° to said basic body, said projection serving as a stop for limiting free relative motion between said connecting element and at least one of said vertical links of said tire chain.

**4,165,776**  
**VEHICLE WHEELS**  
 Jean-Francois Marvy, Montlucon, France, assignor to Dunlop Limited, Great Britain  
 Continuation of Ser. No. 576,369, May 12, 1975, abandoned.  
 This application Jun. 7, 1977, Ser. No. 804,261  
 Claims priority, application France, May 20, 1974, 74 17423  
 Int. Cl.<sup>2</sup> B60C 5/12  
 U.S. Cl. 152—381.1



1. The assembly of a one-piece, sheet metal wheel rim for a pneumatic tire, the rim having a well to accept an inextensible bead at the inner periphery of one sidewall of the tire to facilitate mounting and dismounting a tire relative to the rim, and a flexible well-filler, the rim comprising axially spaced-apart bead seating regions, a radially inwardly depressed tire mounting well between the bead seating regions, and a cylindrical ledge adjacent one of the bead seating regions and between it and the well, the well being defined by two circumferential walls separated by a bottom, and the well-filler being an annulus at least mainly of flexible material shaped to fit in and fill the well, at least one of said circumferential walls of the well is formed with a circumferential projection extending into the well axially of the rim and spaced radially of the rim from the well bottom, the well-filler extending beneath the projection between the latter and the well-bottom to tend to resist radially outward displacement of the well-filler from the well, the wall of the well adjacent the cylindrical ledge tapers axially towards the bottom of the well and the wall of the well adjacent the other opposite bead seating region similarly tapers axially towards the bottom of the well so that the axial width of the other bead seating region is less than the axial width of the associated tire bead so when a tire is mounted on the rim the bead assists in holding the ring in the well, and said well filler has a circumferentially extending cut-out therein which is arranged to accommodate the toe of an associated tire bead.

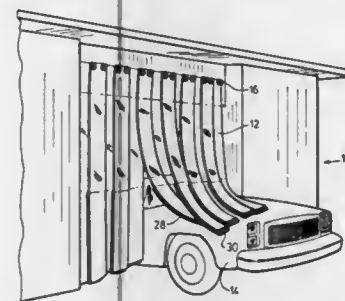
**4,165,777**  
**DEVICE FOR JOINING SURFACES OF A SPLIT RIM IN A WHEEL**  
 Shoichi Sano, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
 Filed Jun. 22, 1978, Ser. No. 918,826  
 Claims priority, application Japan, Jun. 24, 1977, 52-83154[U]  
 Int. Cl.<sup>2</sup> B60B 25/02  
 U.S. Cl. 152—411



1. An apparatus for joining surfaces of a split rim in a wheel, said wheel comprising: a split rim having an outboard rim and an inboard rim having joining surfaces joined and integrally connected by connecting means, a tubeless tire mounted and held between rim flanges of said split rim, the device being constructed such that a joining surface of one of said respective

rim is formed at its outer periphery with an annular recess 20 having an L-shaped section opening in a radial direction and in a direction of a wheel axis, said annular recess being provided with a bottom surface formed at its base portion with a peripheral groove receiving therein an inner periphery of a seal ring, the other rim having at its outer peripheral portion an annular projection of stepped-like section to be received into said annular recess through said seal ring, said annular projection being formed with an inner annular projection to bias the seal ring in a direction of a wheel axis and an outer annular projection to cover the radial outer periphery of the seal ring.

**4,165,778**  
**FLEXIBLE STRIP DOORS**  
 John Smith, c/o Ivor M. Hughes, Suite 604, 1110 Finch Ave. West, Downsview, Ontario, Canada  
 Filed May 5, 1978, Ser. No. 903,045  
 Int. Cl.<sup>2</sup> E06B 9/20  
 U.S. Cl. 160—332

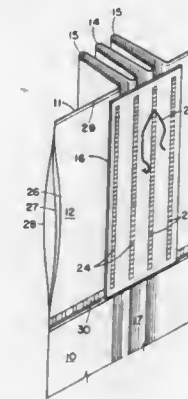


1. A flexible strip door comprising a plurality of relatively long transparent sheets of heavy gauge plastics material of relatively narrow width as compared to their length, hung in overlapping fashion to close the exit of a car wash, the sheets alternatively displaying concave and convex surfaces to the interior of the car wash, and soft non-abrasive material secured to the inwardly facing concave and convex surfaces from a position intermediate the ends of the sheets to a position below the lowermost edge of each sheet to permit viewing of the driver of a vehicle passing through the car wash through the sheets, but prevent marring the finish to the vehicle passing through.

**4,165,779**  
**PLEATED DRAW DRAPE**  
 Lawrence O. Jacobs, Richmond, Va., assignor to Plastic Products, Inc., Richmond, Va.  
 Continuation-in-part of Ser. No. 767,099, Feb. 9, 1977. This application Jun. 5, 1978, Ser. No. 912,679  
 Int. Cl.<sup>2</sup> A47H 13/14  
 U.S. Cl. 160—348

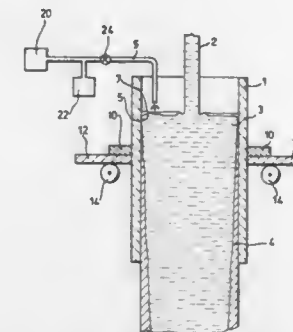
1. A draw drape comprising:  
 (a) a compliant sheet having a face surface, rear surface and straight upper edge,  
 (b) a stiffened heading border contiguous to said upper edge having thermoplastic characteristics, and  
 (c) a series of straight uniform pleat assemblies located at uniformly spaced intervals within said border, each assembly comprising at least one and not more than three separate loops disposed perpendicularly to said upper edge and protruding above the face surface of said sheet, said loops being fixed in position by cohesive bonding to a flat, tear-resistant backing strip comprised of thermoplastic material, said bonding occurring in vertically elongated regions at the bases of the folds bracketing said loops and at the bight of each loop in the case of pleats having two

or three loops, whereby each loop in conjunction with said backing strip defines a hollow space into which a



support hook may be inserted, said assemblies being amenable to fabrication by a stamping method.

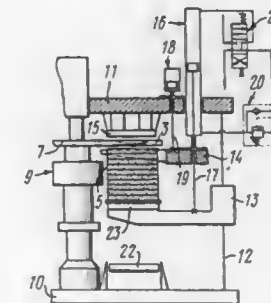
**4,165,780**  
**METHOD OF CONTINUOUSLY CASTING METALS, ESPECIALLY STEEL IN AN OSCILLATING MOLD**  
 Walter Engeler, Lucerne, Switzerland, assignor to Belipar SA, Luxembourg, Luxembourg and Concast AG, Zurich, Switzerland  
 Filed Dec. 12, 1977, Ser. No. 859,454  
 Claims priority, application Switzerland, Dec. 28, 1976, 16379/76  
 Int. Cl.<sup>2</sup> B22D 11/04, 11/10, 27/00  
 U.S. Cl. 164—55



1. A method of continuously casting metals, in particular steel, especially for the casting of billets, comprising the steps of:  
 providing an oscillating continuous casting mold;  
 introducing molten metal into the continuous casting mold to form a bath level of molten metal therein;  
 applying a multi-phase mixture composed of a liquid inert gas and flux powder into the continuous casting mold in a manner such that the thickness of the layer of the multi-phase mixture deposited onto the bath level is less than the stroke of the oscillating mold.

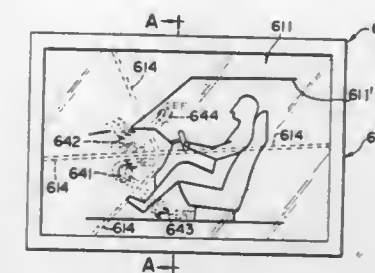
**4,165,781**  
**FLASKLESS STACK MOLDING MACHINE**  
 Ivan N. Afanasjuk, ulitsa Angarskaya, 12, korpus 2, kv. 9; Viktor V. Grabovsky, ulitsa Fabrichnaya, 12, kv. 19; July M. Klot, ulitsa Landera, 8, kv. 81; Larisa M. Lebedeva, ulitsa Angarskaya, 26, korpus 2, kv. 51, and Anatoly I. Khodin, ulitsa Tashkentskaya, 26, korpus 9, kv. 9, all of Minsk, U.S.S.R.

Filed Jan. 20, 1978, Ser. No. 871,022  
 Int. Cl.<sup>2</sup> B22C 11/10  
 U.S. Cl. 164—181



1. A flaskless stack molding machine comprising: a frame; a manufacturing means for manufacturing molds in flasks located on said frame; a separating and stacking means, for separating the flasks from the molds and stacking the molds, mounted on said frame, said separating and stacking means including a bottom carriage with means for supporting the molds, a bottom plate attached over said bottom carriage including flask-engaging means, and a top carriage for separating the flasks from the molds mounted between the bottom carriage and said bottom plate; guides, on which said bottom carriage and said top carriage are mounted for vertical motion, attached to said frame; an independent drive means for vertical movement of said bottom carriage rigidly connected to said top carriage; a transporting means, for transporting the flasks freely placed thereon, secured to said frame; and an independent drive means for vertical movement of said top carriage secured to said frame.

**4,165,782**  
**AUTOMOBILE AIR-CONDITION INDICATOR**  
 Naotake Kumagai, Nissincho, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan  
 Filed Feb. 28, 1978, Ser. No. 882,062  
 Claims priority, application Japan, Jan. 13, 1978, 53/3062  
 Int. Cl.<sup>2</sup> B60H 1/00; B60Q 11/00; G08B 5/36  
 U.S. Cl. 165—11



1. An automobile air-condition indicator which comprises an automobile air conditioner proper, comprising, at least, a plurality of air intake and blow-out ducts, a plurality of dampers to open and close said ducts and a fan unit, an air conditioner operating device to operate at least said dampers and fan unit, a lamp device that is turned on and off by switching means



actuated by said air conditioner operating device, means for moving the lighting point of said lamp device, and a display panel drawn with a picture of the structure of a car, at least that in the vicinity of the front seat thereof, in which the air-condition indicator is provided, wherein indications on said display panel, in positions corresponding to the flows of air from the air conditioner proper caused by the operation of the air conditioner operating device, are illuminated by said lamp device turned on by said air conditioner operating device, with the lighting point thereof moved by said moving means.

4,165,783

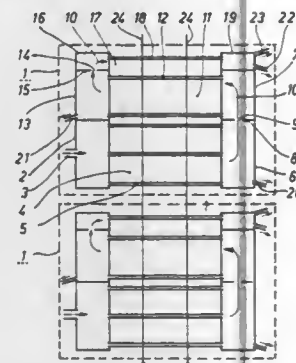
**HEAT EXCHANGER FOR TWO VAPOR MEDIA**  
Georg Oplatka, Zurich, Switzerland, assignor to Brown Boveri & Company Limited, Baden, Switzerland  
Filed Dec. 5, 1972, Ser. No. 312,384

Claims priority, application Switzerland, Dec. 17, 1971, 18428/71

Int. Cl.<sup>2</sup> F28B 1/06

U.S. Cl. 165—110

4 Claims



1. A heat exchanger for superheating of saturated steam by means of heating steam which condenses comprising a number of tube bundles connected in series and through which heating steam flows, each tube bundle being composed of straight horizontal tubes and including a distributing chamber and a receiving chamber, the steam to be superheated passing over the outside of the tubes, the heating steam and the steam to be superheated flowing relative to each other in a cross-counter-flow manner, the heat exchange areas of the individual tube bundles diminishing in the flow direction of the heating steam such that the heating steam flows first through the tube bundle having the greatest heat exchange area, the receiving chamber after each tube bundle incorporating a condensate drain, a throttle located in the flow path of the heating steam between at least one receiving chamber and the succeeding distributing chamber and a draw-off outlet from the last receiving chamber through which non-condensing gases together with the remainder of the heating steam not yet condensed are extracted.

4,165,784

**CASING PERFORATOR**  
Benjamin R. Gardner, 4642 Idlewild Rd., Salt Lake City, Utah 84117

Filed Sep. 26, 1977, Ser. No. 836,372

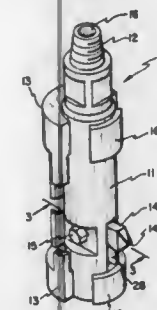
Int. Cl.<sup>2</sup> E21B 43/112

U.S. Cl. 166—55.3

3 Claims

1. A casing perforator tool comprising a cylindrical housing; means for connecting, on an end thereof, said cylindrical housing to a conventional drill string; passage means formed through said drill string and into said cylindrical housing; a blade pivotally connected within a slot opening in said cylindrical housing such that, when rotated appropriately, a pointed end thereof will extend beyond the plane of the cylindrical side of said cylindrical housing; trigger means attached to said blade end opposite to said pointed end thereof, consisting of a cup arrangement

formed by parallel walls that extend outwardly from and in the planes of the opposite sides of the blade with a trigger secured to and extending between said parallel walls, said trigger means intersecting said passage means for pivoting appropriately said blade;



a half cylindrical backup arranged to be releasably attached to said cylindrical housing, on the side opposite to the extension of said blade, increasing the cross section thereof; and means for attaching said half cylindrical backup to said cylindrical body.

4,165,785

**SURFACTANT WATER FLOODING OIL RECOVERY PROCESS**

Vernon H. Schievelbein, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,506

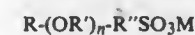
Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 166—274

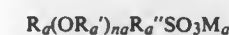
5 Claims

1. A method for recovering petroleum from a subterranean, petroleum-containing permeable formation, said formation being penetrated by at least one injection well and by at least one spaced-apart production well, both wells being in fluid communication with the formation, comprising

(a) injecting a first surfactant fluid containing from 0.1 to 5.0 percent by weight of an alkylpolyalkoxyalkylene sulfonate or alkylarylpolyalkoxyalkylene sulfonate having the following formula:



wherein R is an alkyl having from 9 to 25 carbon atoms, or an alkylaryl group selected from the group consisting of benzene, toluene and xylene having attached thereto at least one alkyl group having from 9 to 15 carbon atoms; R' is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher molecular weight alkylene; n is a number from 2 to 10; R'' is ethylene, propylene, hydroxy propylene, or butylene and M is sodium, potassium, lithium or ammonium, wherein the value of n is selected so as to produce a fluid capable of forming at least 5% by volume of the surfactant fluid of emulsion with the formation petroleum; (b) thereafter injecting an aqueous surfactant fluid containing from 0.1 to 5.0 percent by weight of a second alkylpolyalkoxyalkylene sulfonate or alkylarylpolyalkoxyalkylene sulfonate having the following formula:



wherein  $R_a$ ,  $R'_a$  and  $R''_a$  have the same meaning as R, R' and R'' above;  $M_a$  is sodium, potassium, lithium or ammonium  $n_a$  is a number from 2 to 10; wherein the value of  $n_a$  is chosen so the surfactant produces essentially no emulsion and reduces the interfacial tension between petroleum and the aqueous fluid present in the formation to a value less than about 100 millidynes per centimeter;

(c) said surfactant fluids displacing petroleum through the formation toward the production well; and  
(d) recovering petroleum displaced by said surfactant fluid from the formation via the production well.

4,165,786

**WALK-BEHIND TILLER AND HANDLE MOUNTING THEREFOR**

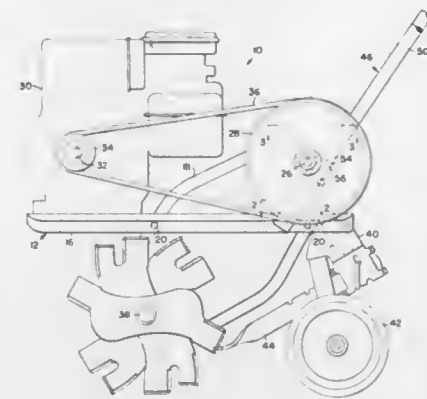
Dale R. Dobberpuhl, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Nov. 10, 1977, Ser. No. 850,142

Int. Cl.<sup>2</sup> B62D 51/04; A01B 33/02

U.S. Cl. 172—43

5 Claims



1. In a walk-behind tiller including a generally horizontal, fore-and-aft extending frame, a chain case fixed to the frame and having an upper end located at a level thereabove, a pair of axially aligned, transversely extending cylindrical members respectively fixed to opposite sides of the chain case at an upper end portion thereof, a drive shaft being journaled in at least one of the cylindrical members, and an operator's handle having a pair of legs fixed to the frame, the improvement wherein the handle is connected to the frame solely through means of said chain case; said handle legs straddling the chain case; and connection means respectively fixing said handle legs to said cylindrical members.

4,165,787

**INVERTIBLE PLOW CONSTRUCTION**

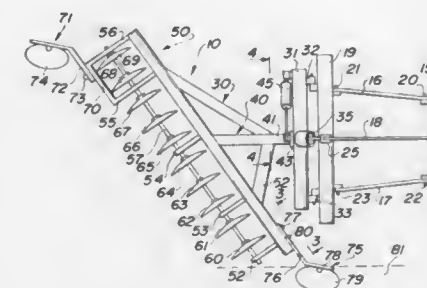
Charles M. Perkins, R.F.D. #2, Albion, Ill. 62806

Continuation of Ser. No. 599,113, Jul. 25, 1975, abandoned. This application Feb. 15, 1978, Ser. No. 878,012

Int. Cl.<sup>2</sup> A01B 3/42

U.S. Cl. 172—219

3 Claims



1. A plow construction and three point hitch connected thereto, said three point hitch having upper and lower elements, said construction comprising a rigid framework connected to said hitch elements to maintain the latter in fixed spaced relation, a forward frame part rearwardly of said framework, pivotal connection means extending forwardly from said forward frame part and having a laterally generally horizontally disposed pivotal axis for connection to said rigid frame-

work for up and down swinging movement of said forward frame part about said lateral axis, piston and cylinder means having one end pivotally connected to said forward frame part and having its other end connected to the upper hitch element for effecting up and down swinging movement of said forward frame part about said lateral axis, an intermediate frame part extending rearwardly from and rotatably supported by said forward part for up and down swinging movement therewith about said lateral axis and rotation relative thereto about a longitudinal axis generally normal to said lateral axis, additional piston and cylinder means having its cylinder end pivotally connected to said forward frame part and having its piston end pivotally connected to said intermediate frame part for effecting approximately 180° rotation of said intermediate frame part about said longitudinal axis, a rearward frame part extending transversely obliquely of and secured to the rearward region of said intermediate frame part for movement with the latter, journal means carried by said rearward frame part, a plurality of plow discs rotatably supported by said journal means for ground tilling engagement, said discs being reversible in direction with inversion of said rear frame part, and at least one guide wheel carried by said rearward frame part laterally outwardly and forwardly of said discs for guiding ground engagement with a previously tilled furrow, said rear frame part extending obliquely to said longitudinal axis of rotation, said plow discs being located spaced along and freely rotatable about an axis generally parallel to and approximately horizontally coplanar with said rear frame part, said intermediate and rear frame parts being rotatable about said approximately 180° to raise the forwardmost of said discs and lower the rearwardmost of said discs upon upward swinging movement about inversion of said rear frame part with minimum upward swinging movement of the latter.

4,165,788

**HYDRAULIC PERCUSSION APPARATUS**

Roger Montabert, 19 avenue des Colonnnes, Bron (Rhône), France

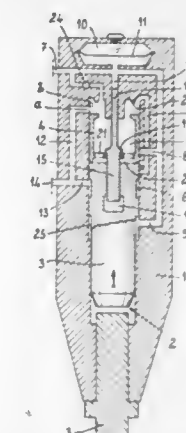
Filed Nov. 7, 1977, Ser. No. 849,248

Claims priority, application France, Nov. 8, 1976, 76 34376

Int. Cl.<sup>2</sup> B23Q 5/00; B25D 9/00

U.S. Cl. 173—17

3 Claims



1. An hydraulic impact apparatus comprising:  
a body formed with a cylinder and adapted to receive a tool at an end of said cylinder;  
a striking piston reciprocable in said cylinder toward and away from said tool whereby said striking piston impacts against said tool;  
a high-pressure hydraulic network formed in said body and adapted to communicate with a chamber formed in said cylinder at an end thereof opposite the end at which said striking piston impacts against said tool;  
a low-pressure hydraulic network formed in said body and adapted to communicate with said chamber;

a distributor reciprocable in said chamber and controlling a hydraulic fluid flow between said networks and said chamber to enable pressurization of said chamber in one extreme position of said distributor whereby said striking piston is propelled towards said tool, and depressurization of said chamber upon movement of said distributor away from said extreme position, said distributor being formed with a constant outer diameter engageable with the wall of said cylinder and slidable therealong and with a central part formed with a plurality of openings communicating between opposite sides of said distributor; and

a plunger having a piston end, a shoulder and an extension, said striking piston being formed with a bore receiving said piston end of said plunger and forming a suction compartment therewith, said shoulder being engageable with said central part of said distributor upon displacement of said striking piston toward said tool, said body being provided with a further bore slidably receiving said extension and communicating with said high-pressure network, said body being formed with a hydraulic pressure accumulator communicating with said high-pressure network, said high-pressure network including a first passage opening into said cylinder at a location spaced from the end thereof opposite that at which said tool is received, said distributor comprising a sleeve engageable with said body at the last-mentioned end of said cylinder corresponding to said extreme position of said distributor whereby said first passage opens into said cylinder below said distributor, said striking piston being stepped and having a shoulder between steps thereof, said high-pressure network including a second passage opening into said cylinder beneath the shoulder formed between said steps, said low-pressure network including a passage communicating with said cylinder and blocked by said sleeve in said extreme position, said sleeve blocking said first of said high-pressure network by the entrainment of said distributor with said shoulder of said plunger, said cylinder having a constant inner diameter along the portions thereof along which said sleeve and the larger diameter step of the striking piston slide.

4,165,789

#### DRILLING OPTIMIZATION SEARCHING AND CONTROL APPARATUS

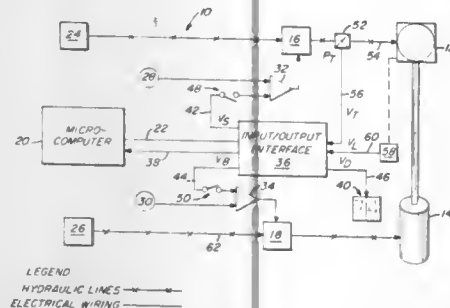
Charles D. Rogers, Monroeville Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 29, 1978, Ser. No. 920,297

Int. Cl.<sup>2</sup> E21C 1/02, 1/10

U.S. Cl. 175—27

22 Claims



1. Apparatus for controlling functions of a drilling apparatus and automatically searching for an optimized rate of penetration of a drill into a given medium based upon the two drilling parameters of thrust and rotational drill speed, said apparatus comprising:

means for applying a given preset start-up value for each drilling parameter to the drill apparatus;

means for continuously calculating the rate of penetration of the drill into such medium based upon the two parametric

values being input into the drill apparatus at any given time; and

means for continually and alternatively applying incremental changes in the value of a first drilling parameter to the drill, while keeping the second drilling parameter constant until the rate of penetration of the drill into the medium is maximized for such first parameter and for applying incremental changes in the value of the second drilling parameter to the drill while keeping the first drilling parameter constant until the rate of penetration is maximized for such second drilling parameter.

4,165,790

#### ROOF DRILL BIT

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.

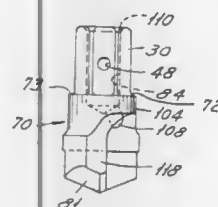
Continuation of Ser. No. 749,457, Dec. 10, 1976, abandoned.

This application May 30, 1978, Ser. No. 910,616

Int. Cl.<sup>2</sup> E21B 9/02; E21C 1/14

U.S. Cl. 175—410

2 Claims



1. In a drill bit for rotary and percussion drilling of hard materials such as rock, coal, concrete and the like and of the type utilizing a drill body with a driving shank at one end and a cutting bit secured transversely of the body at the other end, that improvement which comprises:

(a) a central body portion having a shank end and a cutting end, said shank end being circular in cross-section and having a first diametrical dimension, said cutting end having a second diametrical dimension in diametrically opposed enlarged quadrants larger than said first dimension, said ends joining at an annular shoulder, said cutting end having opposed flat portions tangential with circular opposed quadrants with a diameter substantially that of the first dimension,

(b) a driving shank axially disposed on said body at the shank end and having a central coolant passage extending into said body,

(c) support prongs extending from the cutting end of said body in said enlarged quadrants located substantially on opposite sides of perpendicular diameters of said central body but each extending past a common diameter to overlap, said central coolant passage terminating in coolant outlets on the shank end side of said shoulder open respectively to the other quadrants between said prongs,

(d) said prongs being recessed at each digital end along one diameter of said body portion to receive a transverse cutting bit having axial cutting edges on opposite sides of the ends thereof away from the supporting prongs and axially in line with said coolant outlets.

4,165,791

#### AUTOMATIC WEIGHT SWITCHING MECHANISM FOR SUBSTITUTION TYPE ANALYTICAL BALANCES

James E. Smith, Boulder, Colo., assignor to Denver Instrument Company, Denver, Colo.

Filed Feb. 28, 1977, Ser. No. 772,650

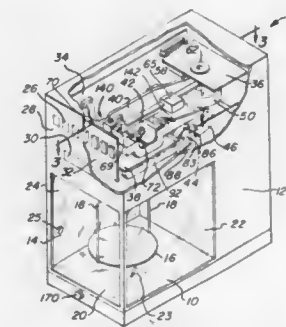
Int. Cl.<sup>2</sup> G01G 1/40

U.S. Cl. 177—212

17 Claims

2. In a substitution analytical balance comprising a pivotally mounted balance beam, a gimbal assembly connected at one

end of said balance beam, a weight pan suspended from said gimbal assembly, and a plurality of calibrated substitution weights operatively suspended from said gimbal assembly, said substitution weights being disposed for removal from said gimbal assembly to aid in determining the weight of an unknown mass placed in said weigh pan, an improved means for selectively removing the substitution weights from said gimbal assembly during a weighing operation comprising:



beam arresting means operatively connected with said balance beam for restraining movement of said beam when activated, and

electromagnetic means for lifting selected substitution weights from said gimbal assembly upon activation of said beam arresting means, said electromagnetic means lifting the selected weights from the gimbal assembly substantially simultaneously.

4,165,792

#### LOAD BOOSTER WHEEL ASSEMBLY

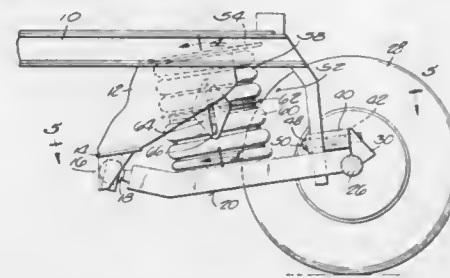
William A. Hohl, Charleston Heights, and Herbert L. Orwig, Summerville, both of S.C., assignors to A-T-O Inc., Wiloughby, Ohio

Filed Jan. 9, 1978, Ser. No. 867,977

Int. Cl.<sup>2</sup> B60G 21/00

U.S. Cl. 180—24.02

11 Claims



1. A load booster wheel assembly for use in conjunction with trucks comprising

a frame,

a support structure depending from the frame in the proximity of the rear of the frame,

a wheel support frame connected to the depending support structure for pivotal movement relative to the frame, said support frame projecting rearwardly from said support structure,

an axle supported at the rear end of the support frame and carrying booster wheels,

means for constraining the central portion of the axle to substantially vertical movement while permitting differential movement of the outboard ends of the axle, said support frame being movable between an operative position in which the wheels are in contact with the terrain and an inoperative position in which the wheels are raised out of engagement with the terrain,

means for moving the support frame into the operative position comprising

an air bag assembly mounted between the truck frame and

the support frame, said air bag assembly having substantial length and being provided with a rigid midsection, and means for constraining the rigid midsection of the air bag assembly to substantially linear travel.

4,165,793

#### PIVOTAL SUPPORT FOR VEHICLE DRIVE LINE HAVING THREE UNIVERSAL JOINTS

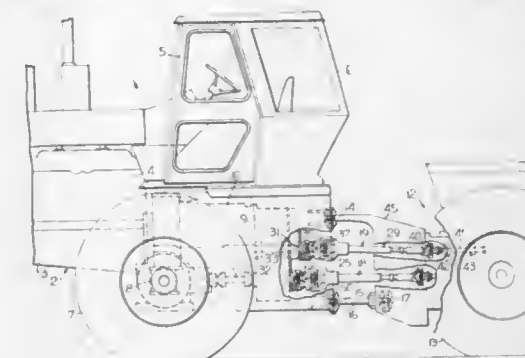
James E. Marsch, Brookfield, and David C. Quick, New Berlin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1977, Ser. No. 863,452

Int. Cl.<sup>2</sup> B60K 17/34

U.S. Cl. 180—233

10 Claims



1. An articulated vehicle comprising a first bogie, a second bogie, articulating means pivotally connecting said first and second bogie of the vehicle, and a drive line adapted for transmission of power, said drive line including a drive shaft, bearing means rotatably supporting said drive shaft on said first bogie, another drive shaft, a first universal joint connected to said first shaft, a second universal joint connected to said other shaft, a connecting shaft connected between said universal joints for transmitting power through said drive line, a third universal joint connected to said other drive shaft, an output drive shaft connected to said third universal joint, a bearing on said other bogie rotatably supporting said output drive shaft, and a gimbal ring pivotally mounted on said first bogie for rotatably supporting said other drive shaft for equally dividing angularity between said first and said second universal joint.

4,165,794

#### ELECTRICALLY DRIVEN VEHICLES

Peter S. Warner, Henlow, and John R. Bicht, Hemel Hempstead, both of England, assignors to Lucas Industries Limited, Birmingham, England

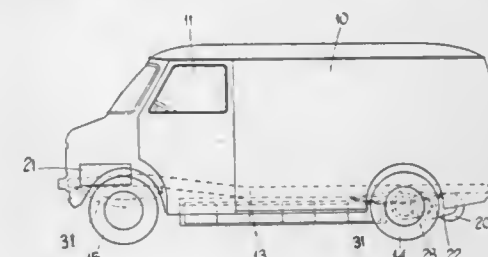
Filed Apr. 29, 1977, Ser. No. 792,276

Claims priority, application United Kingdom, May 8, 1976, 19031/76

Int. Cl.<sup>2</sup> B60K 1/00

U.S. Cl. 180—65 R

8 Claims



1. An electrical drive apparatus for a vehicle having a body, first and second ground engaging elements at opposite respective sides of the vehicle body, and spring means connecting the ground engaging elements to the vehicle body, the drive apparatus comprising, in combination, a battery pack unit detach-



ably securable to the vehicle and a further unit comprising an electric motor having an output shaft, a differential having an input shaft and also having output shafts for connection to the first and second ground engaging elements respectively and a transmission connecting the output shaft of the motor with the input shaft of the differential, the transmission including an intermediate shaft, universal joints at the two opposite ends of the intermediate shaft respectively, one of said universal joints being connected to the motor output shaft and the other to the differential input shaft, and the axis of the motor, the axis of said intermediate shaft and the common axes of the differential output shafts being substantially parallel and the motor being securable to a sprung part of the vehicle, the differential being securable on an unsprung part of the vehicle.

4,165,795

## HYBRID AUTOMOBILE

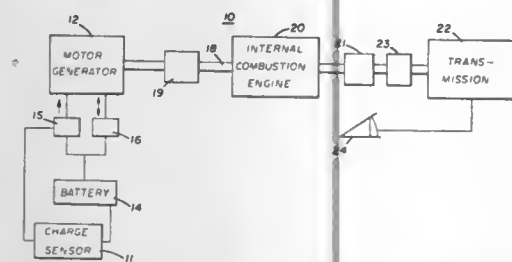
Thomas E. Lynch, Gates Mills; David P. Eastman, Novelty, and Richard P. Price, Parma Heights, all of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 17, 1978, Ser. No. 878,677

Int. Cl.<sup>2</sup> H02P 5/16

U.S. Cl. 180—65 A

27 Claims



1. A drive system for vehicles comprising: an internal combustion engine having a drive shaft; a motor-generator operably connected to said drive shaft for rotation therewith, said motor-generator having a no-load speed which is within the range of speeds of said internal combustion engine, below said no-load speed said motor-generator drives the drive shaft as a motor and above said no-load speed said motor-generator is driven by said drive shaft as a generator; an electric energy storage means operably connected to said motor-generator, said storage means supplying electric energy to the motor-generator when said motor-generator is operating below said no-load speed and collecting electrical energy when said motor-generator is operating above said no-load speed; and means driven by said drive shaft for transmitting the combined mechanical power of said engine and said motor-generator to the drive wheels of a vehicle.

4,165,796

## TRACTOR GUIDANCE SYSTEM

David I. Petz, 2630 W. Durham Ferry Rd., Tracy, Calif. 95376

Filed Feb. 3, 1977, Ser. No. 765,301

Int. Cl.<sup>2</sup> B62D 5/08

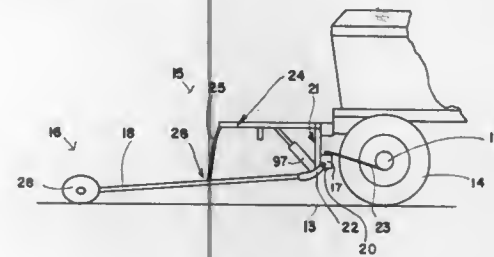
U.S. Cl. 180—131

18 Claims

1. In a guidance system for a tractor having a centerline and having forwardly disposed steerable wheels and a power steering mechanism for turning said wheels in either direction, furrow guide means coupled to the tractor engageable with a guide furrow in a field whereby changes in the guidance means effect changes in the steering mechanism of the tractor, the improvement which comprises:

valve means rotatably mounted on the tractor about a vertical axis aligned with the centerline of the tractor, and being operatively connected to both said guide means and the power steering mechanism, said valve means having a rotational control action valve therein, and said valve means also having means therein

connected both to a source of hydraulic fluid on the tractor, and also connected to the power steering mechanism to selectively supply fluid from said source to said power steering mechanism through said control action valve and back to said source, upon rotation of said rotational control action valve in response to movement of said guide means, and means to prevent oversteer and understeer of



said tractor relative to the movement of said guide means, connected both to said control action valve and to the steerable wheels of said tractor, said guide means including a guide arm normally extending coincident with the centerline of said axis operatively connected to said valve means on one end and having furrow guides at the distal end thereof.

4,165,797

## ADJUSTABLE HIGH FREQUENCY SOUND DISPERSION SYSTEM

Mack Spetelnik, 25 Arthur Dr., Rutherford, N.J. 07070

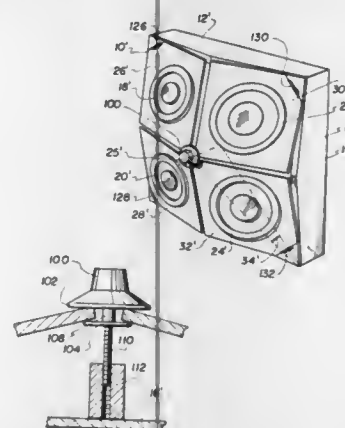
Continuation-in-part of Ser. No. 803,648, Jun. 6, 1977,

abandoned. This application Apr. 19, 1978, Ser. No. 897,663

Int. Cl.<sup>2</sup> H04R 1/40

U.S. Cl. 181—147

3 Claims



1. A high frequency sound dispersion system comprising: a housing having a front section with at least four interconnected non-isoplanar panels mounted symmetrically about the center of said front section; sidewalls, and a rear planar wall opposite to said front section; at least one tweeter loudspeaker mounted in each of said front section panels; at least four of said non-isoplanar panels are inclined at an acute angle with respect to a plane parallel with said rear planar wall, each of said inclined panels sloping away from the center of said front section and, wherein each of said panels is pivotally mounted to said housing; and adjustment means connected between said housing and each of said panels for varying said acute angle whereby a total dispersion of normally directional high frequency sound is affected.

4,165,798

## MUFFLER FOR INTERNAL COMBUSTION ENGINE

Ginez Martinez, 153 rue Anatole, 93130 Noisy le sec, France

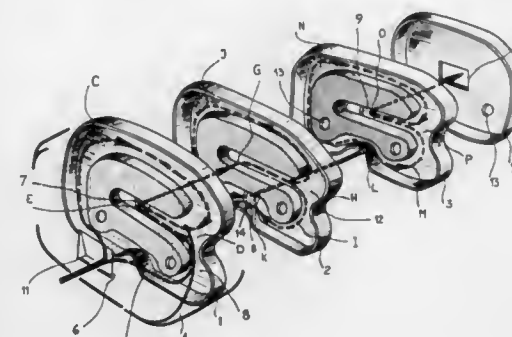
Filed Mar. 31, 1978, Ser. No. 892,136

Claims priority, application France, Jun. 30, 1977, 77 20124

Int. Cl.<sup>2</sup> F01N 1/08

U.S. Cl. 181—268

13 Claims



1. An exhaust gas noise silencing process for exhaust gas stream of an internal combustion engine, including the steps of: determining a frequency at which a particularly loud exhaust gas sound level is obtained from the internal combustion engine exhaust gas stream; admitting the exhaust gas stream to a first phase opposition circuit in which the stream divides into two components that travel along two different paths which differ from one another in length by about half a wavelength corresponding to said frequency; recombining the two components at the downstream end of the first phase opposition circuit and passing the recombined stream along a path having at least a predetermined minimum length; at the downstream end of this latter path, admitting the exhaust gas stream to a second phase opposition circuit in which the stream again divides into two components that travel along two different paths which differ from one another in length; again recombining the two components at the downstream end of the second phase opposition circuit, thereby constituting a quieter exhaust gas stream.

4,165,799

## DISMOUNTABLE TOWER FOR INTERIOR MAINTENANCE OF SPHERICAL TANKS

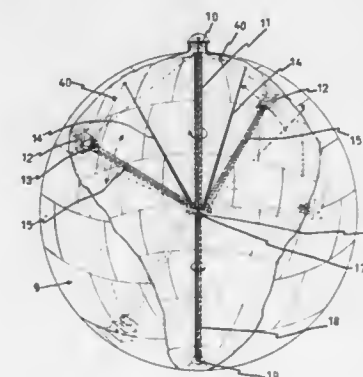
German R. Munoz, Prolongacion Sur 128 No. 134, Mexico City 18, Mexico

Filed Jul. 7, 1978, Ser. No. 922,887

Int. Cl.<sup>2</sup> E04G 3/10; E04H 7/00

U.S. Cl. 182—128

6 Claims



1. A demountable tower for interior maintenance of spheri-

cal tanks of the kind comprising structures which can be disassembled, characterized in that it consists of central towers which have respectively independent rotary travel and which at their respective ends are connected to means permitting 360° of rotation, and which at the intermediate point where upper and lower towers are interconnected carry respective support means for support arms allowing them rising and descending travel in a vertical plane by means of pivotal means; at the respective outer ends of said pivoted support arms working baskets are mounted, being moved and supported by means of winch and cable, said cable passing over a respective auxiliary arm, said working baskets being of sufficient size to carry necessary equipment and operators; said auxiliary arms are pivoted at their inner ends in said pivotal means and at their outer ends carry pulley means over which said cable passes thereby maintaining appropriate loading angle for said cable.

4,165,800

## DEVICE FOR SPRING-LOADING A NEEDLESS INNOCULATOR

Norman R. Doherty, 870 Main St., Farmingdale, N.Y. 11735, and Richard F. Doherty, 61 Lion La., Westbury, N.Y. 11590

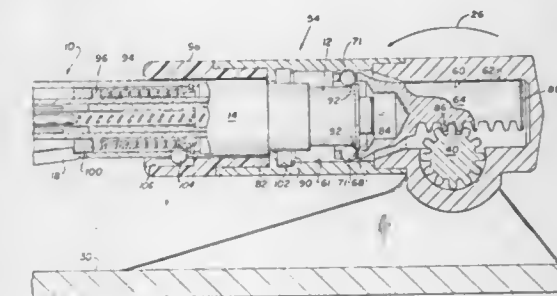
Division of Ser. No. 719,733, Sep. 2, 1976, Pat. No. 4,090,512.

This application Mar. 8, 1978, Ser. No. 884,694

Int. Cl.<sup>2</sup> F03G 1/08, 1/10; A61M 5/30

U.S. Cl. 185—39

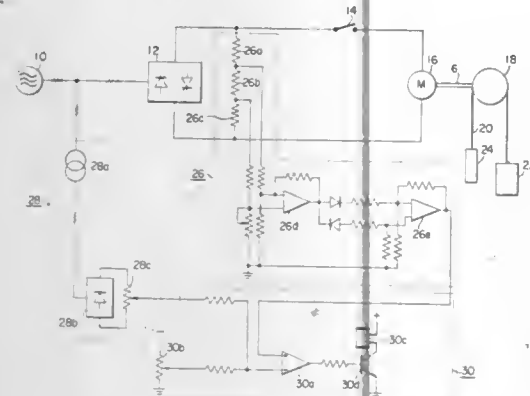
6 Claims



1. In combination, an apparatus of the type having an inner core depending from an external housing and slidable therein under the propulsion of a spring incident to powering the apparatus to perform work, and a device for mechanically loading said spring preparatory to said work service of said apparatus, said device comprising a base, a stationary shaft defining a rotation axis and having circumferentially spaced holding teeth radially extending therefrom mounted in a clearance position on said base, a housing member including means defining a connector-receiving compartment oriented transversely of and in facing communication with said stationary shaft, said connector-receiving compartment of said housing member being operatively arranged to partake of a pivotal traverse in eccentric relation about said stationary shaft, a connector having an operative inserted position within said connector-receiving compartment, said connector having a depending end with lateral means projecting therefrom for establishing meshing engagement with said holding teeth of said stationary shaft during said pivotal traverse thereof, and apparatus gripping means circumferentially spaced about said opening movable from a starting position radially inward for establishing gripping contact with said depending inner core only after initial angular movement of said connector through said pivotal traverse thereof, whereby said depending apparatus inner core end is readily inserted and removed from said device in the absence of established gripping contact therewith during said initial angular movement but otherwise is held by said established gripping contact for the loading of said propelling spring during the balance of the angular movement of said pivotal traverse.

4,165,801  
**STATIC LEONARD SYSTEM**  
 Eiiki Watanabe, and Tooru Tanahashi, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,677  
 Claims priority, application Japan, Sep. 24, 1976, 51-114926  
 Int. Cl.<sup>2</sup> B66B 5/02  
 U.S. Cl. 187—29 R 13 Claims

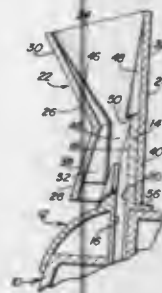


1. A Leonard type elevator system comprising, in combination: an elevator car, a counter weight, a rope connected between said elevator car and said counter weight, and a sheave over which said rope is trained; a converter means including a plurality of semiconductor controlled rectifiers for converting an alternating current to a direct current having a variable voltage; a switch means connected to said converter means for opening the DC circuit thereof; a DC motor connected to said converter means and said switch means to be controlled with said variable voltage, including a shaft connected directly to said sheave for controlling the position of said elevator car; an AC voltage detector means connected to the AC side of said converter means for detecting the AC voltage developed thereon and for producing a first DC voltage corresponding to the AC voltage; a DC voltage detector means connected to the DC side of said converter means for detecting the DC voltage developed thereon and for producing a second DC voltage corresponding to the detected DC voltage; and a comparator means connected to said switch means, said AC voltage detector means and said DC voltage detector means for comparing said first and second DC voltages with each other and for causing said switch means to open the DC circuit of said converter means and said DC motor to stop said DC motor when the difference between said first DC voltage and said second DC voltage exceeds a predetermined magnitude.

4,165,802  
**SLOT MACHINE COIN GUIDE**  
 John D. Mathews, 3024 Holly Hill, Las Vegas, Nebr. 89104  
 Filed Mar. 6, 1978, Ser. No. 884,629  
 Int. Cl.<sup>2</sup> G07F 1/04 11 Claims

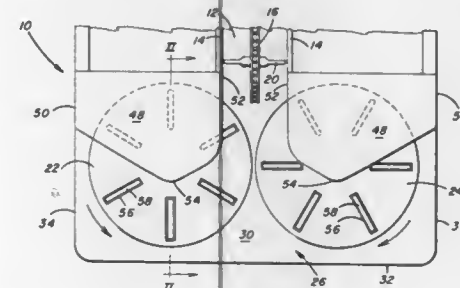
U.S. Cl. 194—1 K  
 1. A coin guide for a machine having a coin receiving structure of the type including an upwardly projecting inlet portion upwardly through which an upstanding coin receiving slot opens and defining an upstanding forwardly facing guide surface extending upwardly beyond the upper extremity of said slot and comprising an upward extension of one side of said slot against which an upstanding coin to be deposited in said slot may be horizontally laterally advanced from a position forwardly of said guide surface prior to release of said coin for falling by gravity into the upper end of said slot, said guide including an upstanding tubular member having upper and lower portions each including front and rear walls interconnected along corresponding opposite sides by means of side walls, said lower portion being adapted to be downwardly

telescoped over said inlet portion for support of said tubular member therefrom and with the upper and lower extremities of said lower and upper portions generally horizontally registered with an upper portion of said guide surface above said



slot, said front wall of said tubular member upper portion including downwardly and rearwardly inclined first guide surface portions terminating downwardly above said tubular member lower portion forwardly of the innermost surfaces of the rear wall of said tubular member lower portion.

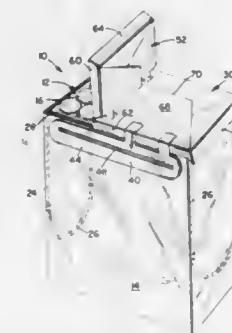
4,165,803  
**MATERIAL GATHERING DEVICE**  
 Ronald W. Keen, St. Peters, Mo., assignor to National Mine Service Company, Pittsburgh, Pa.  
 Filed Mar. 16, 1978, Ser. No. 886,999  
 Int. Cl.<sup>2</sup> B65G 65/18 10 Claims



1. A material gathering device for a mining machine comprising, a gathering platform extending forwardly from the mining machine, said gathering platform having an upper surface with a front edge portion and side edge portions extending rearwardly from said front edge portion, a plurality of gathering discs rotatably mounted on said gathering platform adjacent said front edge portion, each of said gathering discs having an upper surface, drive means drivingly connected to said gathering discs for rotating said gathering discs to move mined material centrally and rearwardly on said gathering platform upper surface, a material guide overlying a portion of each of said gathering discs and extending rearwardly of said gathering discs for guiding mined material centrally and rearwardly on said gathering platform upper surface, said material guide having an upper surface and a lower surface, said material guide lower surface being positioned adjacent to said upper surfaces of said gathering discs, a plurality of slots extending through each of said gathering discs, arm members positioned for upward and downward movement in said respective slots, said arm members being positioned in said respective slots for rotation with said gathering discs,

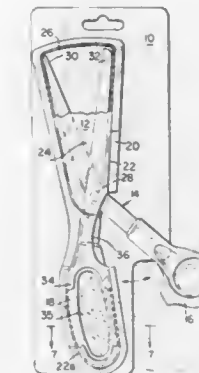
said arm members each having an upper edge portion arranged to extend to an elevation above said material guide upper surface during a portion of each revolution of said gathering discs to move the mined material centrally and rearwardly on said gathering platform upper surface toward said material guide, and means for lowering said arm members in said respective slots so that said upper edge portions of said arm members pass beneath said material guide lower surface during a portion of each revolution of said gathering discs.

4,165,804  
**CIGARETTE PACKAGE CLOSURE AND PROTECTOR**  
 Minas Georgopoulos, 32-70 33th St., Long Island City, N.Y. 11106  
 Continuation of Ser. No. 846,539, Oct. 28, 1977, abandoned.  
 This application Aug. 9, 1978, Ser. No. 932,450  
 Int. Cl.<sup>2</sup> A25F 15/00, 27/00; B65D 85/10 6 Claims



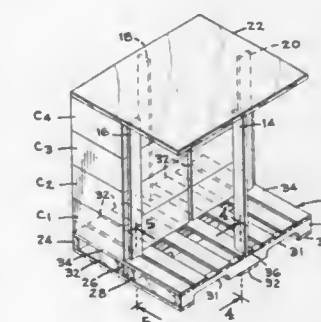
1. A cigarette package closure for covering an upper end of a conventional, generally rectangular, flexible cigarette package after the package has been opened to expose the upper end of at least one of the cigarettes contained therein, the package generally including a foil inner wrapper, an indicia bearing middle layer, and a transparent outer wrapper, the closure comprising: a frame comprising a pair of parallel, spaced, U-shaped members having upper portions which extend orthogonally toward the corresponding upper portion of the opposite member of the pair; a stationary cover member fixed to said upper portions of the frame and extending over a major portion of the surface defined by said upper portions of the frame, the cover member including at least two apertures along one edge thereof, exposing two portions of the frame, and comprising a clip member depending downwardly from the long edge of said cover member opposite said at least two apertures for engaging the lip of a shirt pocket or the like; a lid portion hinged to a short edge of the stationary cover member and displaceable between a closed position coplanar with the stationary cover member and an open position at an angle thereto, the lid portion including catch means engageable with said frame for maintaining said lid portion in its closed position; a lid spring fixed to said stationary cover member and contacting said displaceable lid portion for biasing said lid portion toward said open position; and a match-book retaining elongated lip portion hinged to said portions of said stationary cover member, for holding a conventional book of paper matches, the lip portion depending downwardly from said cover member and including a slot for insertion of the conventional book of paper matches between a back layer of the paper matches and a rear portion of the cover enveloping the paper matches, said lip portion being pivotable about said exposed frame portions by at least 180° to allow access to all sides of the covering enveloping the paper matches.

4,165,805  
**BLISTER PACKAGES FOR SCISSORS, PLIERS AND OTHER HAND TOOLS**  
 Wayne G. Fethke, Wausau, and Paul C. Mayer, Rothschild, both of Wis., assignors to Fiskars Manufacturing Corporation, Wausau, Wis.  
 Filed Jun. 1, 1978, Ser. No. 911,545  
 Int. Cl.<sup>2</sup> B65D 73/00, 85/00 3 Claims



1. A functional blister package adapted to hold and display scissors, pliers and similar hand tools consisting of two pivoted and relatively movable parts having handles at one end of said parts and working surfaces at the other end of said parts comprising a display card; a transparent, flexible, blistered elongated covering extending substantially entirely over one of the said movable parts and the working surface only of the other of said movable parts, an outwardly bent edge on the transparent covering facing the display card and made to adhere to said card; the transparent covering being generally shaped at one end to substantially enclose and lock in place one handle of one movable part of the tool; the other end of the transparent covering being splayed to permit of restricted movement of the working surface on the other movable parts; and a cut-out portion in the transparent covering substantially midway between its ends to allow the other handle to project outside the covering so as to permit the handle of the tool to be grasped and tested by the prospective purchaser.

4,165,806  
**PALLETIZING SYSTEM FOR PRODUCE CARTONS AND THE LIKE**  
 David W. Cayton, Cupertino, Calif., assignor to Bud Antle, Inc., Salinas, Calif.  
 Continuation of Ser. No. 708,335, Jul. 26, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,881  
 Int. Cl.<sup>2</sup> B65D 19/22 4 Claims

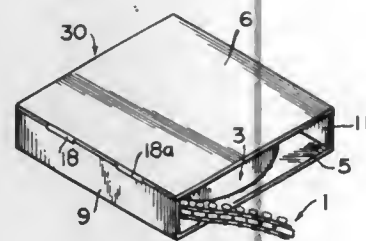


1. A palletizing system for a plurality of parallelepiped cartons each having a length, width, and height, said palletizing system comprising a plurality of said cartons, a rectangular



pallet having length and width dimensions substantially equal to integral multiples of the respective length and width dimensions of the cartons, said cartons being placed on the pallet in four equal tiers to form orthogonal vertical zones therebetween, at least four independent thin elongate compression resistant members of rectangular cross section, said elongate members having a thickness dimension and a width dimension substantially greater than said thickness dimension, means for supporting said elongate compression resistant members in upstanding relation of said pallet in vertical planes within said zones and adjacent to respective sides of said pallet so that the width dimension is perpendicular to the respective side, said supporting means including portions of said pallet defining upward opened sockets and said elongate compression members having lower portions configured for entry into said sockets, said elongate compression resistant members having a length approximately equal to an integral multiple of the height of the cartons, and a rigid planar plate substantially congruent to said pallet for placement in bearing upon the upper extremities of said elongate compression resistant members so as to be supported in parallel spaced relation above said pallet and to transfer the load of cartons disposed thereon to said pallet through said elongate compression resistant members.

**4,165,807**  
**TAPE-MOUNTED ELECTRONIC COMPONENT PACKAGE**  
Hiroshi Yagi, Tokyo, Japan, assignor to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed May 19, 1978, Ser. No. 907,519  
Claims priority, application Japan, May 19, 1977, 52-64325[U]  
Int. Cl.<sup>2</sup> B65D 5/72, 85/677; B65H 5/28  
U.S. Cl. 206—409 8 Claims



1. A package box, assembleable from a box blank for storing and feeding a spirally-wound support tape having parallel lead electronic components mounted on the support tape by the lead wires disposed transversely across the support tape, comprising:

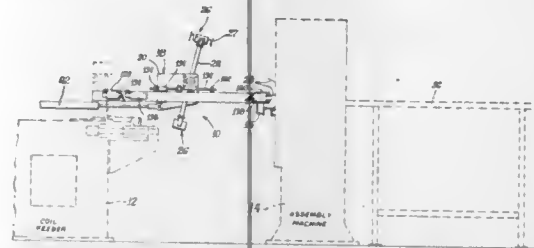
- a body member; and
- a separate removable member;
- said body member and said removable member cooperating to form a box when assembled, said separate member being removable from said box to permit unwinding of the spirally-wound support tape from the box;
- said body member including a substantially square bottom section, a back face and a front face at two opposed edges of said bottom section, said back and front faces each having two edges, a side face at one of the remaining edges of said bottom section, said side face having two ends and two edges, an end flap at each end of said side face, a score line between each of said end flaps and said side face, a cover section of substantially the same size and shape as said bottom section at an edge of said back face, a score line between said cover section and said back face, a first top support flap at an edge of said front face, a score line between said front face and said first top support flap, a second top support flap at an edge of said side face, a score line between said side face and said second top support flap, all of said score lines positioned for folding

said faces and flaps in an inward direction during assembly of said box, and

an axial core on said bottom section for rotatably mounting said spirally-wound support tape; and

said removable member including a face of substantially the same size and shape as said side face for forming one of the side faces of the box, said face of said removable member having two ends and two edges, a retainer flap at an edge of said face of said removable member for holding said spirally-wound support tape in said box, a score line between said face and said retainer flap, a marginal flap at the remaining edge of said face for overlapping the remaining edge of said bottom section, a score line between said face and said marginal flap, said score lines on said removable member positioned for folding said retaining flap and said marginal flap in an inward direction during assembly of said box.

**4,165,808**  
**UPHOLSTERY COIL TRANSFER MECHANISM**  
Walter Stumpf, Munster, Ind., assignor to Simmons Company, Atlanta, Ga.  
Filed Aug. 31, 1977, Ser. No. 829,218  
Int. Cl.<sup>2</sup> B65G 47/90  
U.S. Cl. 414—736 2 Claims



1. A mechanism for transferring upholstery spring coils a row at a time from a feeding station to a delivery station, wherein the improvement comprises
  - a carriage mounted for reciprocation between the two stations,
  - said carriage having thereon a rotatable shaft positioned transversely of the direction of reciprocation and an indexing drive for turning the shaft through one-half revolution in the same direction on each succeeding traverse of the carriage from the feeding station to the delivery station,
  - a plurality of transfer arms on said shaft arrayed in a common plane which includes the shaft, and disposed in said common plane as aligned pairs extending perpendicularly from the shaft in opposite directions,
  - each arm having at its free end a gripper adapted to enter said feeding station and to grasp and hold a helical wire upholstery spring coil firmly between the ends of such coil so as to withdraw the coil forcibly therefrom transversely of the coil axis at the beginning of the delivery traverse of the carriage with said coils in trailing relation to said shaft, to reposition the overturned coil in advancing relation to the shaft by said half-revolution, and to insert the overturned coil forcibly into the delivery station by a thrusting movement transverse to the coil axis as the conclusion of said delivery traverse,
  - powered drive means for reciprocating the carriage between the stations,
  - powered means for closing and opening the grippers, and
  - control means for coordinating the application of power to cause said grippers to grasp and hold a row of coils at the feeding station, to propel the carriage toward the delivery station while rotating said shaft through said one-half revolution, to cause said grippers to release the coils at the

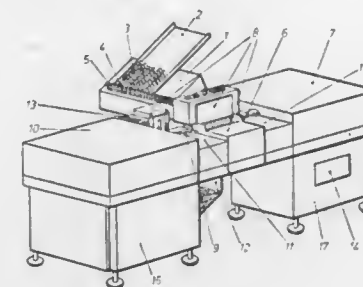
delivery station, and to return the carriage to the feeding station.

**4,165,809**  
**PROCESS FOR DELIVERING CYLINDRICAL CONTAINERS TO MACHINES FOR FURTHER PROCESSING**

Hans J. Klein, Wuppertal; Fritz Henze, Leverkusen, both of Fed. Rep. of Germany; Bernhard Vinzelberg, deceased, late of Leverkusen, Fed. Rep. of Germany (by Selma Margot Vinzelberg, heir); Peter Vinzelberg, heir, Leverkusen, and Susanne Klein nee Vinzelberg, heir, Remscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,359  
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1976, 2630069

Int. Cl.<sup>2</sup> B65G 47/06  
U.S. Cl. 414—104 13 Claims



1. An apparatus for delivering objects, having a circular cross section, in an upright position to machines for further processing comprising: a horizontal feed channel; a horizontally downwardly inclined feed shaft on which the objects slide randomly in an upright position into the feed channel under the force of gravity; sliding means disposed at one end of the feed channel for imparting an intermittent thrust to the objects in the feed channel to transport the objects side by side and in an upright position through the feed channel; transport carriage means having individual holders for the objects to hold them in an upright position for transferring a set of objects from the feed channel to a station for further processing, the transport carriage means comprising a rake having individual holder slots arranged in a straight line, each configured to hold one object and means for displacing the rake parallel to said straight line; means for sensing the transfer of each object from the feed channel to the rake and for generating a sensing signal when each individual one of the objects is transferred; and control means receptive of the sensing signal for asynchronously coordinating the movements of the sliding means and of the transport carriage means to effect displacement of the rake after the transfer of one object and to disable actuation of the sliding means until the rake has been positioned correctly in relation to the feed channel such that an empty holder slot is aligned with the outlet of the feed channel.

**4,165,810**  
**ROLLING-CARGO LOADING/UNLOADING RAMP HAVING A STOWABLE LIFT FOR PALLETIZED CARGO**  
Manley A. Young, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

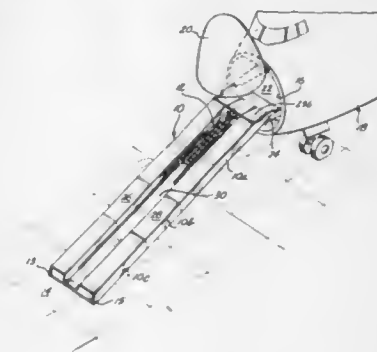
Filed Dec. 12, 1977, Ser. No. 859,431  
Int. Cl.<sup>2</sup> B65G 47/00

U.S. Cl. 414—595 13 Claims

1. A rolling-cargo, loading/unloading ramp apparatus having a stowable lift for palletized cargo, comprising:
  - a ramp having elongate, spaced-parallel treadways defining a longitudinally extending recess therebetween, said ramp

adapted to be disposed at an inclined orientation for loading and unloading rolling cargo via said treadways; a pallet lift including a carriage means, carriage track means, retractable/deployable pallet supporting platform means, and retracting/deploying means;

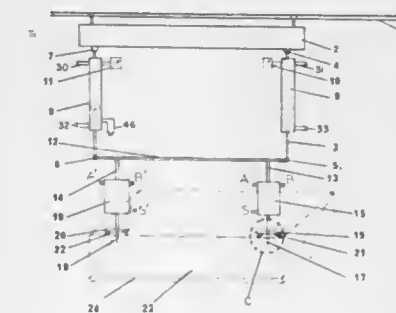
said carriage track means disposed lengthwise on said ramp in juxtaposition with said recess and said carriage means being disposed within said recess and supportively mounted on said track means for movement along said ramp within said recess;



said retracting/deploying means supporting said platform means on said carriage means and selectively moving said platform means between a stowed position and a deployed position with respect to said ramp, said platform means assuming a collapsed, elongated and inclined configuration nested lengthwise within said recess when moved to said stowed position, and assuming a laterally expanded, pallet supporting generally level platform configuration overlying said treadways and recess when moved to said deployed position;

means for moving said carriage means along said track means.

**4,165,811**  
**MATERIAL GRIPPING DEVICE**  
Christian Mainvielle, Bassens, France, assignor to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France  
Continuation-in-part of Ser. No. 742,425, Nov. 17, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,280  
Claims priority, application France, Nov. 17, 1975, 75 34948  
Int. Cl.<sup>2</sup> B65G 65/04 5 Claims



1. A device for engaging the fabric material of a sack-like or bale-like object comprising
  - (a) a support,
  - (b) at least a pair of gripping assemblies mounted on said support for independent reciprocal movement along the vertical axis, each of said assemblies comprising
    - (i) a vertically shafted, reversible, low torque motor,
    - (ii) a gripping disc disposed on the shaft of said motor, and
    - (iii) at least one tine disposed on said gripping disc offset from the vertical axis of the shaft.

- from the axis of rotation of said shaft and operable to pierce and engage fabric material upon rotation of said motor and disc in a first rotational direction,
- (c) means operable to lower each of said gripping assemblies independently until each has made contact with the fabric to be engaged,
- (d) means operable to energize each of said motors for rotation in said first direction when all of said gripping assemblies have made contact with said fabric, said motors in each pair of gripping assemblies being energized for opposing rotation,
- (e) means responsive to the tension created within the fabric engaged between the gripping assemblies upon their opposing rotation and operable to terminate rotation at a predetermined tension value,
- (f) means operable to raise said gripping assemblies when said predetermined tension is reached, and
- (g) means operable to energize and reverse each of said motors to relieve said tension and disengage said fabric.

4,165,812

## MULTI-CONTAINER PACKAGE

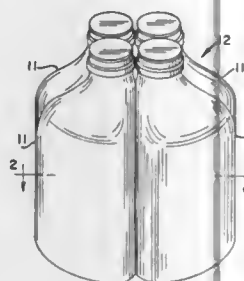
James S. Jennison, Burlington, Iowa, assignor to Riley Brothers, Inc., Burlington, Iowa

Filed Jul. 3, 1978, Ser. No. 921,577

Int. Cl.<sup>2</sup> B65D 21/02

U.S. Cl. 215—10

3 Claims



1. A multi-container package comprising a plurality of containers formed of a flexible material, each container having a first side wall, a second side wall, and an outer wall connected together to form said containers, said first side wall being formed with a recess disposed along a limited portion thereof and extending into the interior of said container, said recess forming an opening at the face of said first side wall having a cross section slightly less than the cross section of said recess, said second side wall having a projection extending from the face thereof in direct alignment with said opening in the face of said first side wall, said projection having exterior dimensions slightly greater than the cross section of said opening at the face of said first side wall, and slightly less than the cross section of said recess, whereby a plurality of said containers are secured tightly together from relative movement in all directions by inserting a projection on the second side wall of one container directly through the corresponding opening in an abutting first side wall of an adjacent container to releasably mate with the recess of said adjacent container while providing a positive attachment therebetween to form said multi-container package.

4,165,813

## SECURITY CLOSURE DEVICE FOR BOTTLES

Pierre Babiol, Villefranche, France, assignor to Societe Nouvelle de Bouchons Plastique, Paris, France

Filed May 1, 1978, Ser. No. 901,676

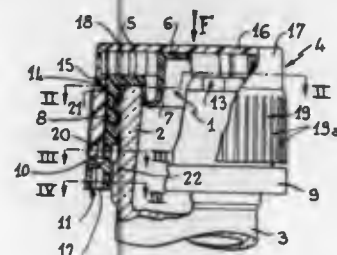
Int. Cl.<sup>2</sup> B65D 55/02, 85/36; A61J 1/00

U.S. Cl. 215—220

5 Claims

1. A security closure device for attachment to the threaded neck of a container, comprising a capsule having an axially extending threaded skirt shaped to screw onto said threaded

neck and the capsule having a transverse portion overlying the container neck; a cap surrounding said skirt and having a closed bottom covering said transverse portion of the capsule; cooperating first toothed means carried by the cap and the capsule and operative as a ratchet to tighten the capsule on the threaded neck when the cap is rotated; means for elastically urging the cap axially in one direction with respect to the capsule; a tearable guarantee strip on the capsule preventing axial movement of the cap on the capsule in the other direction



until the guarantee strip is torn off; second toothed means carried by the cap and the capsule for rotationally locking the cap and capsule together when the cap is moved in said other axial direction; and said transverse portion of the capsule overlying the neck including an annular U-shaped portion shaped to enter into the neck and having a raised central portion extending outwardly from the neck and abutting the closed bottom of the cap and comprising said means for urging the cap in said one direction.

4,165,814

## CONTAINER FOR POTABLE LIQUID

Jerry E. Seel, 595 Meadowbrook Dr., Adrian, Mich. 49221

Filed Jul. 18, 1975, Ser. No. 597,296

Int. Cl.<sup>2</sup> B65D 51/24

U.S. Cl. 215—229

3 Claims



1. In a container for a potable liquid, the improvement comprising:
- a cap closing the top of said container and said cap being provided with a first hole and a second hole each extending completely through said cap,
- a straw extending through said first hole with a first end positioned adjacent the bottom of said container and said straw having a second end detachably received in said second hole, said straw being removable from said holes whereby said second end of said straw can be removed from said second hole to permit a person to drink the liquid contained within the container through said straw but said straw being constructed of a sufficiently strong material and fitting within said holes with sufficient friction

tional engagement with said cap to support a container full of potable liquid when the ends of said straw are positioned in said holes so that said straw can be used as a handle to carry said container.

4,165,815

## COSMETIC CONTAINER WITH CLEANING SURFACE

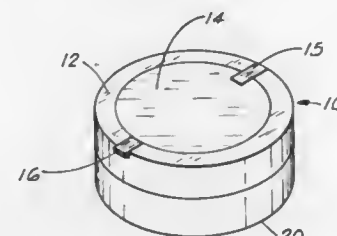
Kathryn A. Vetter, 621 Dauphine St., Apt. 14, New Orleans, La. 70112

Filed Jan. 23, 1978, Ser. No. 871,323

Int. Cl.<sup>2</sup> B65D 7/04, 1/24

U.S. Cl. 220—4 D

4 Claims



1. A cosmetic container with cleaning surface comprising:
- a. A lower case, said lower case having an inner container for the housing of a cosmetic product therein;
- b. An upper case attachable to said lower case, said upper case providing an inner recess;
- c. Solvent means in said upper case for dissolving said cosmetic product, said solvent means comprising a porous liquid retaining sponge saturated with a cosmetic solvent;
- d. A lid attachable to said upper case, said lid forming a closure of said inner recess of said upper case, said upper case and said lower case being connectable with said upper container forming a closure of said inner container of said lower case when attached thereto said upper and said lower cases being further interchangeably connectable, said lower container being capable of forming a closure of said inner recess of said upper case when attached thereto, and said lid is attachable to said lower case, forming a closure of said inner portion thereof.

4,165,816

## VENT CAP

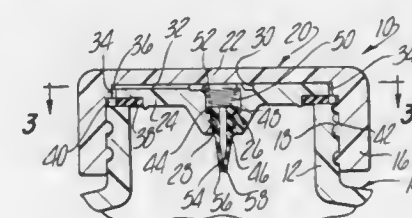
Willis E. Tupper, Pinckney, Mich., assignor to Dapco Industries, Dexter, Mich.

Filed Apr. 10, 1978, Ser. No. 894,921

Int. Cl.<sup>2</sup> B65D 51/16

U.S. Cl. 220—203

6 Claims



1. A vent cap for a fuel container, comprising a top wall assembly, and a peripheral flange connected to the top wall assembly, and having internal fastening means for attachment to the external periphery of the neck or spout of a fuel container, said top wall assembly including a top panel member, a valve support member having a port extending therethrough from one side to the other, the one side of said support member being in juxtaposition with said top panel member so that said top panel member and said support member define between them a passageway extending from said port to said peripheral flange, and a check relief valve element mounted in said port with its one end in communication with said passageway and its other end adapted to be in communication with the interior of the fuel container, and a sealing member located on the other side of said support member adjacent to the periphery thereof for seating on the top of said neck or spout and clamped between the support member and the top of said neck or spout when the vent cap is secured to the fuel container, said support member and said sealing member cooperating with said peripheral flange to define a leakage space around the outer peripheries of the support member and sealing member, said internal fastening means providing fluid leakage space so that said check relief valve element can provide pressure relief between the interior of the container and the ambient atmosphere via said passageway and the leakage spaces associated with said internal fastening means and said sealing member.

4,165,817

## FILLED PLASTIC CASK SEALED WITH A COVER

Hans E. Wengenroth, Oberottmarshausen, and Wilfried Mru-sek, Bellheim, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Pforsee GmbH, Augsburg and Elbatainer Kunststoff- und Verpackungsgesellschaft mbH, Ettlingen, both of, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,889

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2735038

Int. Cl.<sup>2</sup> B65D 51/18

U.S. Cl. 220—256

6 Claims



1. A filled synthetic plastics cask which is sealed with a cover and into the interior of which there projects a preformed flexible plastic film which is impermeable to liquid but permeable to gas and is so disposed between the cover and the upper rim of the cask that the air space between said cover and the contents of said cask is divided and the film is folded in the rim zone of the cover such that upper and lower capillaries are formed, said lower capillaries substantially permitting no egress of the contents and said upper capillaries permitting the escape of gas which has penetrated from the contents through said plastic film from inside the cask and also ensuring an internal pressure equalization from outside.

4,165,818

## PORTION CONTROLLED FROZEN FOOD DISPENSER WITH PUMP CONTROL

Vincent E. Bernard, Richardson, Tex., assignor to The Jimmy Dean Meat Company, Inc., Dallas, Tex.

Division of Ser. No. 610,301, Sep. 4, 1975, Pat. No. 4,124,339, which is a continuation-in-part of Ser. No. 526,146, Nov. 22, 1974, abandoned. This application Sep. 12, 1977, Ser. No. 832,195

Int. Cl.<sup>2</sup> A22C 11/02; B29B 5/04

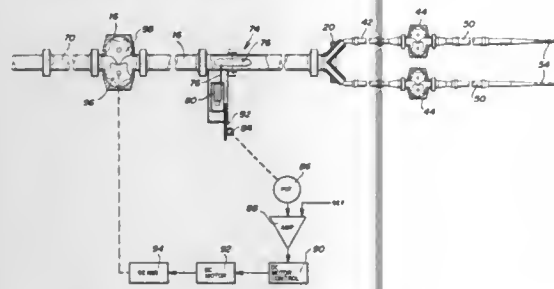
U.S. Cl. 222—53

6 Claims

1. In an extruder wherein a pump pumps semi-fluid material, the combination comprising:
- a fluid filled bladder disposed in the outlet of the pump to sense the pressure of the semi-fluid material at the outlet of the pump,



a fluid filled bellows means in fluid communication with said bladder for sensing changes in pressure in said bladder and for expanding in a first direction in response to pressure change in said bladder,



means for generating electrical signals in response to expansion of said bellows, and means responsive to said electrical signals for varying the speed of the pump.

**4,165,819**  
**MOBILE EQUIPMENT FOR AIR-FLUSHING, FILLING AND VENTING A HYDRAULIC BRAKE SYSTEM**  
Milorad M. Zivkovic, Ostfildern, Fed. Rep. of Germany, assignor to JOMA-Maschinenbau Karl Jost, Tiefenbronn-Lehningen, Fed. Rep. of Germany

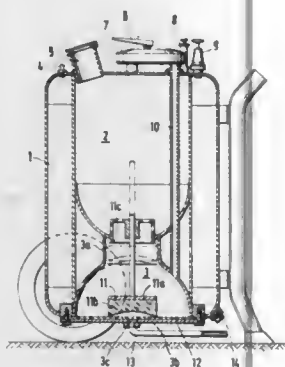
Filed Jun. 21, 1977, Ser. No. 808,642

Claims priority, application Yugoslavia, Jun. 22, 1976, 1522/76

Int. Cl.<sup>2</sup> B67D 5/02, 5/54, 5/64

U.S. Cl. 222—61

20 Claims



1. Equipment for air-flushing, filling and venting a hydraulic brake system, particularly of a motor vehicle, comprising, in a combined unit, a brake fluid container (2) and a compressed air container (1) and further comprising:

a pressure chamber (3) of variable volume;

a float valve (11, 11a, 11c) responsive to the level of brake fluid in said pressure chamber as well as to the volume of said pressure chamber and disposed so that said brake fluid container (2) is connected through said valve with said pressure chamber (3) except when said variable valve pressure chamber is substantially filled with brake fluid a multipath selector valve (7), and

means for connecting said pressure chamber through said multipath valve to a hydraulic brake system to be serviced, said multipath valve being also connected so as to control the application of compressed air from said compressed air container to said pressure chamber.

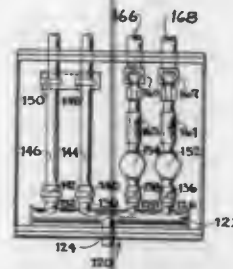
**4,165,820**  
**AERATOR CONTROL ARRANGEMENT**  
Richard H. Dugge, Lafayette Township, St. Louis County, and Dallas W. Rollins, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,260

Int. Cl. B65G 3/12

U.S. Cl. 222—70

43 Claims



1. An aerator control box for hopper unloading comprising: a manifold having an inlet adapted to be connected to a source of compressed gas; said manifold including a first outlet having a first conduit connected thereto; said first conduit adapted to be placed in fluid communication with a first accumulator discharge valve adapted to pressurize and to discharge an accumulator in fluid communication therewith; at least one control assembly mounted adjacent said first conduit comprising at least one conduit valve in fluid communication with said first conduit and being movable between open and closed positions relative to said first conduit, and timing means for timing the inception of movement of said conduit valve between first and second positions; said first position venting said pressurized gas to atmosphere and allowing said first accumulator discharge valve to discharge said accumulator, and said second position adapted to pressurize said accumulator, and to maintain said first conduit in fluid communication with said first accumulator discharge valve; a second outlet from said manifold having an unobstructed second conduit adapted to be placed in continuous unobstructed fluid communication from said manifold to a second accumulator discharge valve also in fluid communication with an accumulator to apply compressed gas pressure to said second accumulator discharge valve to prevent said second accumulator discharge valve from discharging the accumulator in fluid communication therewith at any time while said first accumulator discharge valve is discharging.

**4,165,821**  
**BEVERAGE DISPENSING MACHINE FOR MIXING GRANULAR CONCENTRATE AND WATER**

Ernest N. Martin, and Michael D. Munson, both of 2551 Fernwood Ave., Lynwood, Calif. 90262, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,432

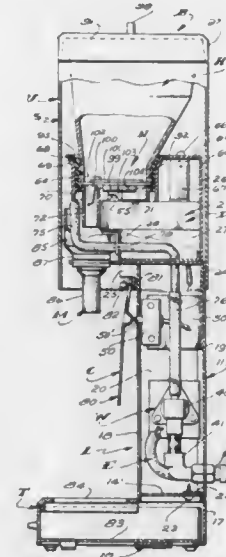
Int. Cl.<sup>2</sup> B67D 5/62

U.S. Cl. 222—129.4

10 Claims

1. A beverage dispensing machine comprising a lower unit having an elongate horizontal base with front, rear, side, top and bottom walls, an elongate vertical tubular column with upper and lower ends projecting upwardly from the rear portion of the base, a mounting plate at the upper end of the column and having a forward portion projecting forwardly therefrom in vertical spaced relationship above the forward portion of the base, an electric motor mounted on top of the mounting plate and having an upwardly projecting drive shaft with a drive coupling part, a hopper support mounted on said mounting plate and having an upwardly opening socket with an apertured bottom above the drive coupling part; said support has a discharge duct depending from the socket, a mixing

unit carried by the forward portion of the mounting plate with an upper funnel portion in substantial vertical alignment with the duct and a lower tubular discharge neck portion depending from the funnel portion, a normally closed solenoid operated water valve with inlet and outlet sides mounted in the column, a water supply connected with the inlet side of the valve and with a remote water source, an elongate water delivery tube with one end connected with the outlet side of the valve and extending through the column and mounting plate and to the funnel portion of said mixing unit and control means including a normally opening control switch in the column and having an operating member projecting through and from said column; said switch is connected with an electric power supply line extending from said lower unit to a remote power supply



and with said motor and valve whereby said motor is energized and said valve is open when the switch is closed, an upper hopper unit including a vertically extending material hopper with an open upper end neck at its lower end, a cap with a body portion engaged about said neck and removably engaged in said socket and a bottom wall normally seated on the bottom of said socket, a motor driven material dispensing means carried by the cap and having a depending material conducting chute communicating with the upper end of the duct and a depending driven shaft with a driven part normally releasably engaged with said drive part, said dispensing means operates to transport measured volumes of material in the hopper into said chute for delivery through the duct and into the mixing unit when the motor is energized.

**4,165,822**  
**BUCKET WHEEL SLUICE HAVING PRESSURIZED DISCHARGE**

Andreas Jaudt, Schongauerstrasse 10 c, D-8900 Augsburg, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 895,180

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732199

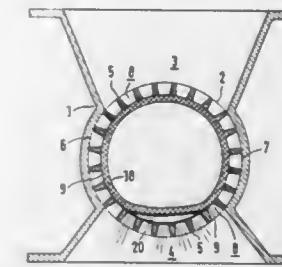
Int. Cl.<sup>2</sup> B65G 53/46

U.S. Cl. 222—636

14 Claims

1. A bucket wheel sluice comprising a housing defining an inlet portion and an outlet portion separated from one another by curved walls of circular segmental configuration, said walls partially bounding a chamber located between said inlet and outlet portions of said housing, a cylindrical sluice wheel mounted for rotation within said chamber in coaxial relation to said walls, said sluice wheel comprising a pair of rotatable members disposed adjacent the opposing ends of said chamber respectively in coaxial relation to said walls, a plurality of elongated parallel vanes extending between said rotatable members in parallel relation to the axis of rotation of said sluice wheel, the roots of said vanes being freely spaced from one

another between said rotatable members, the tips of said vanes being located for movement closely adjacent to said curved walls of said housing and past said inlet and outlet portions of said housing as said wheel rotates, an elastic tubular member located between said rotatable members in coaxial relation to said sluice wheel, said elastic tubular member being positioned and dimensioned to resiliently engage the roots of said vanes and to bridge the spaces between the roots of adjacent ones of said vanes whereby each adjacent pair of said vanes and the intervening portion of said elastic tubular member form a pocket for the reception of material at said inlet portion of said housing and for transport of said material to said outlet portion of said housing, and pneumatic means for forcibly expelling such material from said pockets at the outlet portion of said

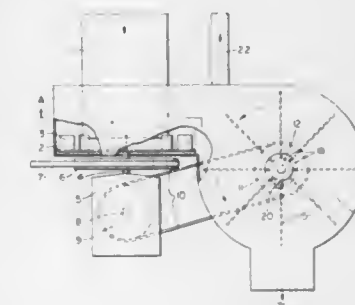


housing, said pneumatic means comprising an elongated stationary duct extending substantially parallel to the axis of rotation of said sluice wheel and positioned adjacent the outlet portion of said housing between said elastic tubular member and the roots of said vanes, said tubular member flexing radially away from said vanes to pass over the side of said duct remote from the outlet portion of said housing as said tubular member and vanes rotate past said outlet portion of said housing, said duct including a plurality of apertures facing said vanes at the outlet portion of said housing, and means for supplying compressed air to said duct for discharge through said apertures into the spaces between adjacent pairs of said vanes and toward said outlet portion of said housing to expel material from the regions between said vanes.

**4,165,823**  
**DISPENSING APPARATUS**  
Carl F. S. Olsson, Kampastigen 4, S-352 52 Vaxjo, Sweden  
Filed Feb. 10, 1977, Ser. No. 767,535  
Claims priority, application Sweden, Feb. 16, 1976, 7601681  
Int. Cl.<sup>2</sup> G01F 11/24

U.S. Cl. 222—252

4 Claims



1. Apparatus for squeezing air from and compressing an air-containing, flocculent material to form successive constant volume units of compressed material and thereafter successively dispensing said units comprising, a centrifugal throwing device having an inlet for continuously feeding the flocculent material thereto, an outlet, a rotatable element having impelling means thereon for centrifugally throwing said material at high velocity out of said outlet, and first means for driving said rotatable element; and a dispensing device including a housing having an inlet communicating directly with said throwing

device outlet and a dispensing outlet, a movable conveying element in said housing having at least two compartments of predetermined volume, and second means for driving said conveying element successively to position one compartment in direct communication with said last-named inlet and the other compartment in direct communication with said dispensing outlet, said throwing device being arranged forcefully to throw said material directly into said one compartment thereby squeezing air from said material and compressing the same to form a constant volume unit of material therein, said unit being thereafter dispensed from said dispensing outlet, said housing having an upper portion over said movable element for accumulating air squeezed from said material, said housing portion having a vent opening therein for discharging said accumulated air.

4,165,824

## SELF CLEANING SHAMPOO DISPENSER

Mohinder P. Sud, 260 Patterson St., Newmarket, Ontario, Canada (L3Y 3L8)

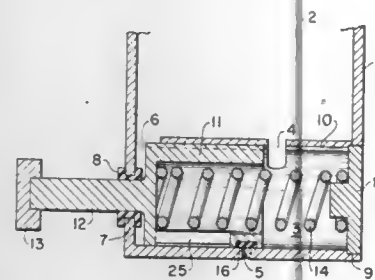
Filed Apr. 25, 1977, Ser. No. 790,851

Claims priority, application Canada, May 18, 1976, 252072

Int. Cl.<sup>2</sup> G01F 11/04

U.S. Cl. 222-341

4 Claims



1. A liquid dispenser comprising:  
first means defining a liquid storage chamber,  
second means defining an elongated pumping chamber under said liquid storage chamber, said pumping chamber being of circular section and having a slight conical taper, an outlet aperture in said pumping chamber at a location intermediate its ends,  
a piston slidable within said pumping chamber between a first position in which a portion of the piston blocks the aperture, and a second position in which said portion is displaced from blocking relation with said aperture such that the aperture is in communication with that part of the chamber to one side of the piston which shrinks in volume as the piston moves from said first toward said second position, whereby liquid in said part of the chamber is expelled through said aperture, said first position being at a smaller-diameter location in the pumping chamber than said second position, said piston being tapered and having its small diameter toward the small-diameter end of the pumping chamber, the small diameter of the piston being slightly less than the smallest diameter of the pumping chamber, the large diameter of the piston being substantially the same as the largest diameter of the pumping chamber, the large-diameter end of the piston being compressible to allow the large-diameter end to shrink as the piston moves from the second toward the first position, and to expand as the piston moves in the reverse direction,  
third means by which said piston can be positively urged from said first toward said second position,  
resilient means for returning said piston from said second to said first position, such that during the return stroke a suction is created in the said part of the pumping chamber which draws liquid remaining in the aperture into the pumping chamber thus clearing the aperture,  
an opening from the storage chamber to the pumping chamber for allowing liquid to enter said part of the chamber from the liquid storage chamber, and for allowing any air

in said part of the chamber to be displaced into the liquid storage chamber by the entering liquid,  
said opening being unblocked by the piston when the latter is in the first position, but being closed by the piston after a minor portion of its movement from the first toward the second position, the said aperture being unblocked by the piston at substantially the same time as, but not later than the closing of said opening occurs.

4,165,825

## TILTABLE VALVE MEMBER FOR PRESSURIZED CONTAINERS

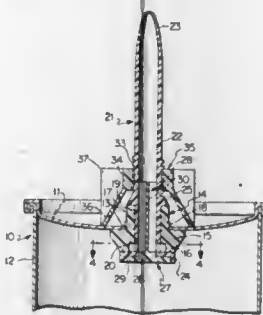
Harold M. Hansen, Westfield, N.J., assignor to Southern Can Company, Tuckahoe, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,688

Int. Cl.<sup>2</sup> B65D 83/14

U.S. Cl. 222-402.22

7 Claims



1. A tiltable valve member for selectively dispensing viscous material from a pressurized container having a resilient grommet with a valve seat, said valve member comprising an elongated hollow stem of non-rigid thermoplastic material which may be cut with a sharp instrument, at least one end of said stem being open, valve means attached to said stem adjacent to said open end and normally engaging the valve seat, said valve stem having at least one inlet opening extending into the hollow interior above said valve means, plug means mounted in said open end of said valve stem, said plug means including a body of relatively rigid material for engaging the inner periphery of said hollow stem to reinforce said stem, one end of said body being located below said inlet opening and the other end terminating at a position above the resilient grommet, said plug means including an enlarged head integrally connected to said one end of said body, said head intimately engaging said valve means, and said body having at least one passageway of a size such that flow of material through said opening is not significantly reduced, said passageway communicating with said inlet opening and extending from a position below said opening to said other end so that when said valve means is unseated material is forced through said opening and can pass through said valve stem.

4,165,826

## POP-UP HOLSTER

Quentin J. Chica, Springfield, Mass., assignor to Bangor Punta Corporation, Springfield, Mass.

Filed Mar. 15, 1978, Ser. No. 886,765

Int. Cl.<sup>2</sup> F41B 13/04

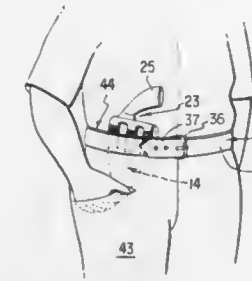
U.S. Cl. 224-191

6 Claims

1. A holster for use with a waist belt for carrying a handgun comprising:  
(a) said holster having a side member with an upper portion and a lower portion;  
(b) said lower portion having a pocket portion extending from the side member with an open top for receiving and holding said handgun;  
(c) said upper portion of said side member being secured to said belt, said upper portion further including a flexible

member of a length to maintain said handgun below said belt when said holster is secured to said belt, and said length, when said belt is worn on the top part of trousers, allowing said upper portion to be looped over said top of said trousers whereby the holster with the handgun being carried in the pocket of said holster is completely hidden from view within said trousers while said holster is being secured to said waist belt;

(d) said flexible member including at least two spaced apart plastic strips extending upwardly substantially parallel to one another each of said two strips carrying a first part of a releasable securing means, an inside surface of said waist belt having a second complementary part of said securing means for cooperating with said first part carried by said flexible means to secure said holster to said waist belt, said



first part and said second complementary part being respective parts of hook and loop fasteners whereby said handgun located within said pocket is movable between a normally hidden position where said handgun is hidden below said waist belt and where movement of said holster upwardly allows flexing of said flexible member to expose at least a grip of said handgun for grasping by the user;  
(e) a third flexible strip having a first side and a second side, said first side being substantially smooth and said second side carrying a part of either hook or loop fasteners for securing said third strip to said belt, and when said third strip is disconnected from said belt it exposes portions of said second complementary part, said third strip overlaying said two spaced apart strips of said flexible upper portion of said holster to further secure said holster to said waist belt.

4,165,827

## VEHICLE ARTICLE CARRIER

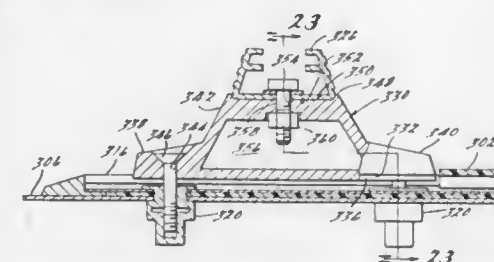
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 798,576, May 19, 1977, which is a continuation-in-part of Ser. No. 725,500, Sep. 22, 1976. This application Aug. 11, 1977, Ser. No. 823,631

Int. Cl.<sup>2</sup> B60R 9/00

U.S. Cl. 224-326

12 Claims



1. An article carrier in combination with an automotive vehicle comprising:  
a pair of substantially parallel spaced longitudinally extending article supporting slats secured to a portion of said vehicle, each of said slats having a lower portion adapted to be supported upon the vehicle, and a pair of spaced

upper article supporting surface portions defining a longitudinally extending opening;

a plurality of fastening elements for securing said article supporting slats to said vehicle spaced longitudinally along said slats and accessible through said longitudinally extending openings;

at least one article carrying slat extending transversely between said article supporting slats and being supported above said upper article supporting surface portions thereof;

means on said article carrying slat whereby articles may be adjustably secured thereto at selected longitudinal positions thereon;

a pair of saddle members associated with said article carrying slat and supporting the same upon said article supporting slats, said saddle members being disposed between the underside of said article carrying slat and said article supporting surface portions; and

first fastening means for securing said article carrying slat to said saddle members and second fastening means extending from said saddle members into said article supporting slats and being attached to said fastening elements to secure said saddle members upon said article supporting slats, whereby said article carrying slat may be selectively positioned at desired longitudinal locations along said article supporting slats.

4,165,828

## AUTOMATIC ARTICLE CLAMPING DEVICE

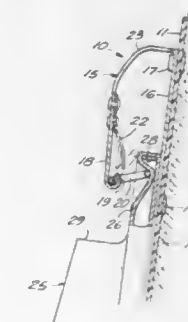
Jerry J. Lewis, 840 Cooper Ave., Los Angeles, Calif. 90042

Filed Mar. 23, 1978, Ser. No. 889,380

Int. Cl.<sup>2</sup> B60R 7/04

U.S. Cl. 224-42.42 A

5 Claims



1. Toggle clamp means for releasably gripping a military-type cap and holding the same captive inwardly from the hoop-expanded crown thereof comprising:

a U-shaped strip of resilient material having a bight portion and two legs, one of said legs fixedly securable to a support with the open end facing downwardly;

toggle means movably supported on the outer end of one of said legs and free to pivot through a limited arc crosswise of the open end of said U-shaped strip;

said toggle means being freely pivotable vertically to either side of a horizontal plane lying generally normal to said legs, said toggle means normally lying pivoted downwardly below said horizontal plane and being pivotable upwardly above said horizontal plane to admit the hoop-expanded crown of a cap between the legs of said U-shaped strip and then being pivotable downwardly toward but inclined upwardly above said horizontal plane and thereby cooperating with said legs to hold the cap firmly captive; and

whereby a deliberate downward withdrawal force applied to a cap held captive by said toggle clamp means is effective to pivot said toggle means downwardly past said horizontal plane and to flex the legs of said strip apart thereby to release the cap from said toggle clamp means.



**4,165,829**  
**METHOD OF FEEDING ELECTRODE WIRE AND APPARATUS FOR PERFORMING SAME**

Serafim P. Koveshnikov, ulitsa Depovskaya, 3a, kv. 30, Moskovskaya oblast, Lobnya; Viktor F. Pavlov, Putevoi proezd, 6, kv. 45, and Stanislav G. Fedorov, ulitsa Inzhenernaya, 18, korpus 1, kv. 41, both of Moscow, all of U.S.S.R.

Filed Nov. 9, 1977, Ser. No. 850,044  
 Int. Cl.<sup>2</sup> B65H 17/36

U.S. Cl. 226—4

12 Claims

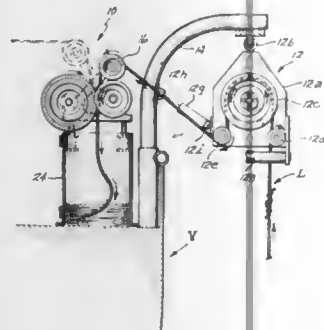


1. A method of feeding an electrode wire toward a welding zone, comprising the steps of selecting two points for retaining said wire, alternately retaining said wire at one of said two retaining points, and applying to said wire at the other one of said retaining points, at an angle substantially less than 90° relative to the direction of feeding said wire toward the welding zone, an effort causing transverse and longitudinal oscillation of said wire.

**4,165,830**  
**CRAB POT WARP LINE COILER**  
 Robert A. Svendsen, Seattle, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.  
 Continuation-in-part of Ser. No. 821,531, Aug. 3, 1977. This application Jul. 31, 1978, Ser. No. 929,302  
 Int. Cl.<sup>2</sup> B65H 17/22

U.S. Cl. 226—187

8 Claims



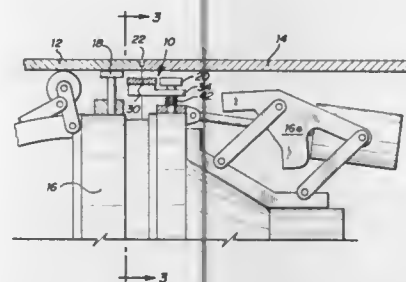
1. In crab pot hauling and handling aboard a fishing vessel using a powered pot line hauler operable to haul in the crab pot in a substantially continuous haul after the floats are first brought on deck, continuous line coiler apparatus mountable on deck and into operable engagement with which a portion of the incoming line connected to the floats grasped by a crewman may be laterally inserted to initiate coiler apparatus operation without hauler interruption, said coiler apparatus comprising an upright generally annular coil-forming enclosure having an open top adapted to receive pot line fed downwardly into the same, mutually opposing substantially coplanar drive rollers, means mounting said rollers from one side thereof to form a downwardly directed line-engaging nip open to the opposite

side of the rollers to permit lateral insertion and removal of a line therein, at least one such drive roller being power driven in a direction to continuously draw the incoming line from the hauler and to thrust the line directly downward generally centrally into said enclosure, thereby inherently to coil the line in such enclosure substantially without intervening physical line guidance, resiliently yieldable means operatively associated with the drive rollers to effect compression of the line between their mutually opposing nip surfaces with a force establishing drive traction on the line and with a degree of resilient yieldability that substantially absorbs the shock of line knots passing through the nip, and means operatively associated with said drive rollers tending to maintain the line, including line knots, transversely centered in said nip, including line guide means also laterally engageable and disengageable by the line in conjunction with lateral insertion and removal, respectively, of the line in relation to the drive rollers nip, said line guide means being mounted above said drive rollers in position to direct incoming line received from the hauler directly downwardly into the nip substantially in the plane of said drive rollers.

**4,165,831**  
**BACK-UP PAD FOR WELDING**  
 Talbert D. Connell, Conroe, Tex., assignor to Crutcher Resources Corporation, Houston, Tex.  
 Filed Apr. 3, 1978, Ser. No. 892,945  
 Int. Cl.<sup>2</sup> B23K 5/22

U.S. Cl. 228—50

7 Claims

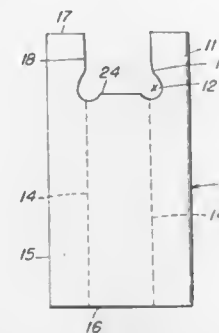


1. A back-up pad mechanism for use in externally welding the joint between ends of pipes in a pipeline, which comprises: a plurality of arcuate back-up pads formed of hard anodized aluminum and having curvatures complementary with the interior surfaces of the pipes to substantially span the weld region; movable pad shoe means for supporting each of said back-up pads intermediate for the ends thereof for radial movement into and out of contact with the inside surfaces of said pipes; movable end shoe means for supporting the ends of adjacent back-up pads and each having an intermediate member of cylindrical exterior surface mounted thereon to occupy the space between the ends of adjacent pads while permitting interference free retraction of said pads, said intermediate members being formed of a hard anodized aluminum material; and means for effecting radial movement of said pad shoes, end shoes and intermediate members, and the back-up pads supported thereon.

**4,165,832**  
**THERMOPLASTIC BAG**  
 Milton C. Kuklies, and William G. Orem, both of Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.  
 Filed Jul. 10, 1978, Ser. No. 922,949  
 Int. Cl.<sup>2</sup> B65D 33/06

U.S. Cl. 229—54 R

2 Claims

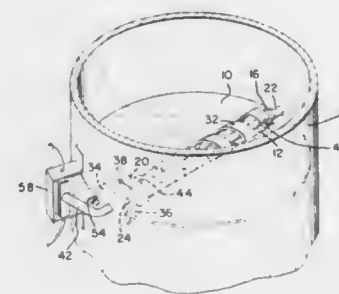


1. A thermoplastic bag structure comprising a front and rear bag wall and an open mouth top portion, said open mouth portion being characterized by having handles which are located on opposite ends of said open mouth portion, said handles being integral extensions of said front and rear bag walls, said bag being further characterized in that the upper portion of each of said handles is substantially wider than the lower portion of said bag handles said lower portions being located adjacent opposite ends of said bag mouth; said bag mouth being further characterized by having stress relief notches positioned at opposite ends of said mouth, the upper edges of said mouth extending above said stress relief notches.

**4,165,833**  
**AUTOMATIC FLUE DAMPER**  
 George W. Nagel, Forest Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Mar. 30, 1978, Ser. No. 891,674  
 Int. Cl.<sup>2</sup> F23N 3/00

U.S. Cl. 236—1 G

4 Claims



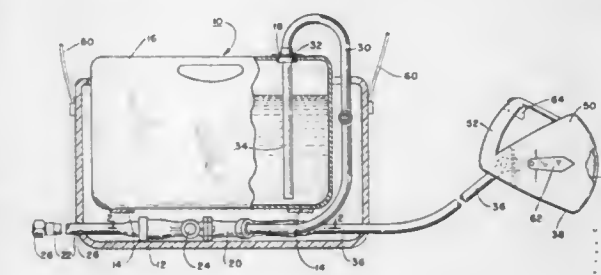
1. A flue damper arrangement for furnace exhaust gas flue comprising:  
 a shaft extending diametrically through said flue with its opposite ends projecting beyond said flue;  
 a bushing;  
 a damper plate having an open slot extending across the major part of its diameter and including means formed in said damper plate at one end of the slot receiving and securing in non-rotatable relation an end portion of said shaft, and means formed in said damper plate at the other end of said slot receiving said bushing in rotatable relation therein;  
 said bushing having a bore receiving said shaft therein in rotatable relation;  
 a helically-shaped bimetal strip situate in said slot and extending from end to end thereof, said bimetal having one end secured relative to said damper plate adjacent the

location of securement of said plate to said shaft, and having its other end secured to said bushing;  
 means securing said bushing to said flue in fixed relation;  
 damper stop means comprising interacting means on said damper plate and said bushing to limit movement of said damper plate between predetermined open and closed positions;  
 said bimetal being responsive to changes in flue gas temperature to rotate said damper plate between said predetermined open and closed positions with said shaft rotating to corresponding positions; and  
 at least one of said shaft ends including indicia means to permit observation of shaft and damper rotative position.

**4,165,834**  
**FOAM GENERATOR**  
 Esra Pitchon, Flushing, N.Y.; Martin S. Colton, Avon, Conn.; Walter S. Kemprowski, Parkridge, N.J., and Marvin Schulman, Monroe, N.Y., assignors to General Foods Corporation, White Plains, N.Y.  
 Filed May 4, 1977, Ser. No. 793,694  
 Int. Cl.<sup>2</sup> B05B 17/00

U.S. Cl. 239—10

6 Claims



3. In an applicator for the projection of a spray of an aqueous foamable plant agent composition utilizing low pressure water the improvement which comprises the combination of a nozzle having a lenticular orifice defined in a spherical exit face subtending in major dimension an arc of 55° to 90° and a foraminous barrier with apertures equivalent to a 4 to 8 mesh screen disposed to intercept the spray projected from said nozzle, at a uniform distance about the arc of spray therefrom of 4.5 to 5.5 inches.

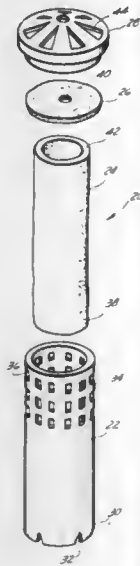
**4,165,835**  
**COMBINED FRAGRANCE DISPENSER AND HUMIDIFIER**  
 Harry S. Dearling, 25 E. 83rd St., New York, N.Y. 10028  
 Filed Dec. 21, 1977, Ser. No. 862,771  
 Int. Cl.<sup>2</sup> A61L 9/04

U.S. Cl. 239—51.5

5 Claims

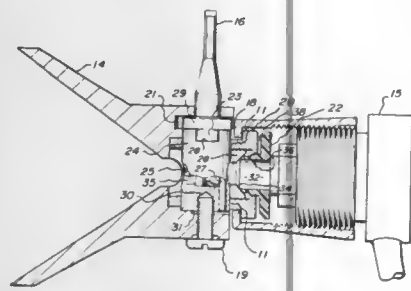
1. A fragrance dispenser and humidifier comprising a vessel for holding a quantity of an evaporable liquid, means within said vessel for absorbing a quantity of said liquid to a height disposed above the surface of said liquid in said vessel, means disposed about said absorbing means to direct an air flow pattern about said absorbing means to initiate evaporation of said absorbed liquid and means operatively associated with

said means disposed about said absorbing means to dissipate a selected fragrance within the air and evaporated liquid thereby



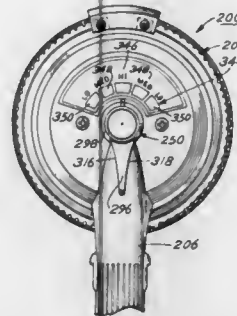
to dissipate a fragrance within liquid evaporated from said vessel.

**4,165,836**  
**ROTATABLE SPRAY NOZZLE WITH SAFETY GUARD**  
Marvin J. Eull, St. Michael, Minn., assignor to Graco Inc., Minneapolis, Minn.  
Filed Jan. 3, 1978, Ser. No. 866,360  
Int. Cl.<sup>2</sup> B05B 15/02  
U.S. Cl. 239—119 20 Claims



1. A rotatable spray nozzle and safety guard for use in conjunction with spray guns and the like, comprising:
  - (a) a rotatable member having a passage therethrough and a spray orifice in said passage;
  - (b) a handle member removably keyed to said rotatable member, for rotating said rotatable member;
  - (c) a safety guard member attachable over said handle and rotatable member to hold said handle in operable keyed relationship to said rotatable member, whereby the removal of said safety guard member disables the operable keyed relationship between said handle and said rotatable member; and
  - (d) means for fluid sealing said rotatable member against said spray gun.

**4,165,837**  
**POWER CONTROLLING APPARATUS IN A SHOWERHEAD**  
Alfons Rundzaitis, Beverly Shores, Ind., assignor to Associated Mills, Inc., Chicago, Ill.  
Filed Mar. 30, 1978, Ser. No. 891,608  
Int. Cl.<sup>2</sup> B05B 1/08  
U.S. Cl. 239—394 5 Claims



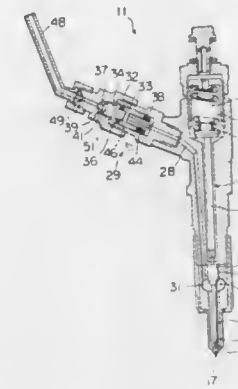
1. An improvement of a water controlling apparatus in a hand-held showerhead, the showerhead having a handle-housing including a main body and an integral handle which extends from said main body, the main body having a cylindrical chamber wall and a back wall, the chamber wall defining a cylindrical chamber, the chamber having an open front portion and a rear portion, the handle defining a conduit through which water may flow with an upper end in communication with the rear portion of said chamber, the water controlling apparatus comprising, in combination:

- a projecting portion of said main body rearward of said chamber defining an opening through said back wall into said chamber;
- a valve member having a cylindrical valve portion positioned within said chamber and an integral post portion extending through said opening, said valve portion defining a channel for opening said upper end of said conduit to said front portion of said chamber, said valve portion and said post portion co-axially aligned, said valve member rotatable so as to rotate said channel into and away from registry with said conduit;
- a control knob including a body portion, an integral lever portion and an integral indicator portion, said body portion fastened to said post portion of said valve member adjacent said projecting portion for rotation with said valve member, said lever portion extending from said body portion and adapted to be rotated manually, said indicator portion extending from said body portion; and
- indicia on said back wall of said main body of said handle-housing, said indicia cooperating with said indicator portion of said control knob to indicate the strength of said flow, said indicia indicating at least a first strength when said channel is substantially in registry with said conduit and a second strength when said channel is substantially away from registry with said conduit.

**4,165,838**  
**FUEL INJECTION NOZZLE**  
Kenji Nakayama, and Kazuo Uchida, both of Higashi Matsuyama, Japan, assignors to Diesel Kiki, Co., Ltd., Tokyo, Japan  
Filed Feb. 7, 1977, Ser. No. 766,300  
Claims priority, application Japan, Feb. 20, 1976, 51/19063[U]  
Int. Cl.<sup>2</sup> B05B 1/30  
U.S. Cl. 239—533.3 5 Claims

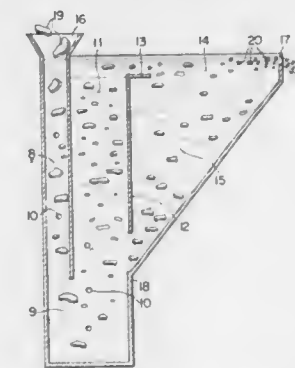
1. A fuel injection nozzle comprising:
  - a fuel supply passageway having an upstream section, a downstream section and first and second intermediate sections, each of the first and second intermediate sections

being connected at opposite ends thereof to the upstream section and the downstream section respectively; fuel discharge orifice means; a fuel discharge valve exposed to fuel pressure in the downstream section and being opened thereby to communicate the downstream section with the fuel discharge orifice means only when the fuel pressure in the downstream section is above a first predetermined value; and



a check valve forming part of the first and second intermediate sections, the check valve being exposed to fuel pressure in the upstream section and being opened thereby to allow fuel flow through both of the first and second intermediate sections when the fuel pressure in the upstream section is above a second predetermined value which is higher than the first predetermined value.

**4,165,839**  
**METHOD FOR DISINTEGRATING MICA FLAKES AND APPARATUS USED THEREFOR**  
Hideji Kuwajima, Hitachi; Hirofumi Mizoguchi, Kasuga; Juichi Sakurada, and Takeyoshi Watanabe, both of Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan  
Filed Apr. 19, 1978, Ser. No. 897,691  
Int. Cl.<sup>2</sup> B02C 19/06  
U.S. Cl. 241—4 7 Claims

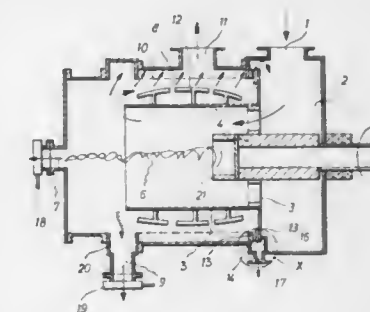


1. A method for producing mica scales reduced in size from mica flakes which comprises bringing about coarse size reduction followed by size reduction of mica flakes by high-pressure jets of water, separating mica scales from mica flakes by vertical classification followed by horizontal classification, and taking out the mica scales as a slurry while recycling nondisintegrated mica flakes to size reduction.

**4,165,840**  
**METHOD FOR BRIGHTENING NATURAL CALCITIC ORES**  
Herbert I. Lewis, Wrens, Ga.; William M. Price, St. Austell, England, and Anthony D. McConnell, Sandersville, Ga., assignors to Anglo-American Clays Corporation, Sandersville, Ga.  
Filed Jan. 10, 1978, Ser. No. 868,392  
Int. Cl.<sup>2</sup> B02C 23/18 5 Claims

1. A method for processing a natural calcitic ore to yield a finely divided calcium carbonate particulate of relatively very high brightness characteristics, comprising in sequence the steps of:
  - coarse-milling said natural calcitic ores to produce a coarse-milled product;
  - subjecting said coarse-milled product as an aqueous slurry including less than 40% solids to a froth flotation, and separating with the froth discoloring contaminants;
  - dewatering the underflow product from said froth flotation to at least 60% solids by weight; and
  - wet-milling the dewatered product to yield an output product wherein at least 80% by weight of the resultant particulate has an E.S.D. of less than 2 microns, said output product being further characterized by a brightness of at least 94 on the G.E. scale.

**4,165,841**  
**APPARATUS FOR SEPARATING CONTAMINANTS FROM FIBROUS SUSPENSIONS**  
Walter Musselmann, and Reimund Rienecker, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany  
Continuation of Ser. No. 860,025, Dec. 12, 1977, abandoned, which is a continuation of Ser. No. 730,614, Oct. 7, 1976, abandoned. This application May 4, 1978, Ser. No. 903,644  
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548578  
Int. Cl.<sup>2</sup> B02C 23/36 8 Claims



1. Apparatus for purifying a fibrous liquid suspension, comprising:
  - a housing having an inlet at one end for a fibrous suspension to be purified;
  - a hollow cylindrical rotor mounted to and extending into said housing, said rotor defining a drum being open at one end and having openings at the opposite end communicating with said inlet;
  - a light contaminant outlet in said housing aligned with the axis of said rotor and facing the open end of said rotor;
  - a stationary cylindrical screen in said housing coaxially surrounding said rotor;
  - a drain in said housing communicating with the outer surface of said screen; and
  - a heavy contaminant outlet in said housing adjacent to the open end of said drum for removing the heaviest contaminants of said suspension which are thrown radially outwardly from the open end of said drum before the remainder of said suspension flows to said screen.



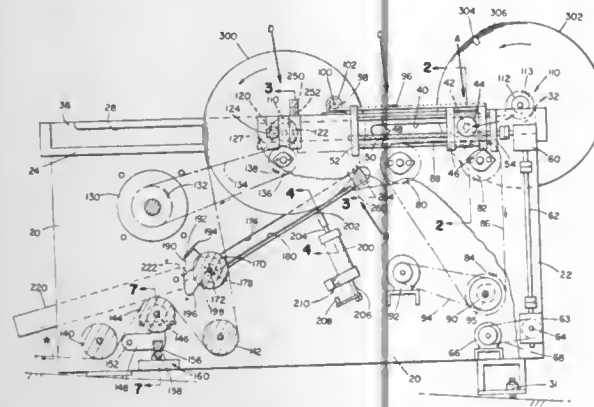
**4,165,842**  
**APPARATUS FOR REPLACING ROTATING MANDRELS**  
**ON WHICH A WEB IS WOUND**  
 William R. Mengel, Easthampton, Mass., assignor to Magnat Corp., Easthampton, Mass.

Filed Jan. 23, 1978, Ser. No. 871,591

Int. Cl.<sup>2</sup> B65H 19/14

U.S. Cl. 242—58.3

29 Claims



1. Apparatus for unwinding rolls of web material wound on mandrels, comprising means for supporting a first said roll at an unwinding station from which web material is unwound, means for supporting a second said roll at a loading station spaced from said unwinding station, transfer means for moving said second roll over a path between said stations, a new roll accelerator located between said stations for engaging the mandrel of said second roll and rotating it to a peripheral speed matching the surface speed of the web unwinding from said first roll, and means for severing the web unwinding from said first roll and splicing the severed web end to said accelerated second roll, said accelerator having a mandrel engaging element movable relative to said second roll over at least a portion of said path to rotate said second roll and to operatively engage its mandrel at a plurality of different positions of said second roll relative to said element along said path.

**4,165,843**  
**APPARATUS FOR WINDING A WEB OF MATERIAL,**  
**ESPECIALLY PAPER**  
 Walter Wedig, Stutensee-Blankenloch, and Ernst-Otto Krämer, Hilden, both of Fed. Rep. of Germany, assignors to Jagenberg Werke Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

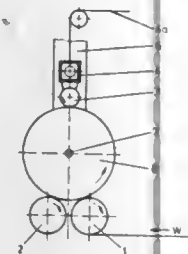
Filed Jul. 31, 1978, Ser. No. 929,610

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739515

Int. Cl.<sup>2</sup> B63K 17/08

U.S. Cl. 242—66

4 Claims



1. In an apparatus for winding a web of material having first and second supporting rolls each driven by a motor and having a gap therebetween wherein the spool of the web of goods

being rolled is pressure biased by a pressure roll disposed thereabove, and control means for the motors which, as the coil diameter increases, increases the torque of the motor associated with the first supporting roll in the direction of movement of the web and decreases the torque of the motor associated with the second supporting roll in the direction of movement of the web, the improvement comprising: means coupling the drives of the two supporting rolls comprising a brake of speed-proportional braking torque for damping accelerations of the supporting rolls due to the displacement of the web therefrom.

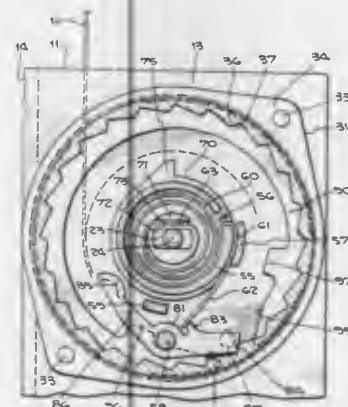
**4,165,844**  
**DUAL TENSION SAFETY BELT**  
 Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Nov. 11, 1977, Ser. No. 850,843

Int. Cl.<sup>2</sup> A62B 35/00; B65H 75/48

U.S. Cl. 242—107

9 Claims



1. In a dual tension safety belt retractor having a belt storage reel rotatably mounted to a retractor frame by a reel shaft with a shaft end protruding from a frame side wall to which a retraction mechanism is mounted to apply either of two rewind biases upon said reel via said shaft in response to belt winding and unwinding movement, the improvement in said retraction mechanism comprising the provision of:

- a pawl carrier rotatably mounted on said shaft end and a pawl pivotally mounted on said carrier for rotation with and relative to said carrier;
- housing means for enclosing said pawl carrier and providing a power spring receiving chamber therewith;
- a power spring connected between said housing and pawl carrier for biasing said carrier in a given direction;
- ratchet means provided about an inner annular portion of said housing means and radially outwardly of a rotative path of travel of said pawl on rotation of said carrier, said ratchet means presenting inwardly facing teeth to be engaged by said pawl;
- means for biasing said pawl relative said carrier toward said teeth;
- pawl silencer ring means for normally holding said pawl out of engagement with said teeth, said means being operable upon reel rotation in a rewind direction after an unwinding reel rotation to release said pawl into engagement with said teeth to thereby hold said carrier stationary relative said housing;
- cam means driven by said shaft and stop means on said carrier for driving said carrier in a power spring winding direction on a belt unwinding movement of said reel shaft via said cam means engaging said stop means;
- a lower tension spring connected between said carrier and cam means for biasing said shaft in a belt rewind direction when said carrier is held stationary by said pawl engaging said teeth; and

cam follower means on said pawl for being engaged by said cam means on shaft rewind rotation under the influence of said lower tension spring of a predetermined amount, whereby said belt is under the bias of said power spring during normal belt winding and unwinding and is under a lower bias of said lower tension spring while said pawl is engaged with said ratchet provided within said housing.

**4,165,845**  
**METHOD AND APPARATUS FOR PROCESSING**  
**VEHICLES MOVING THROUGH A CONDUIT BY AIR**  
 Marion R. Carstens, Atlanta, and Homer J. Bates, Roswell, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Apr. 6, 1978, Ser. No. 894,108

Int. Cl.<sup>2</sup> B65G 51/22

U.S. Cl. 406—192

19 Claims



1. A method for processing vehicles which are moved through a conduit by air through sequential zones one, two and three comprising, stopping a first vehicle at the downstream end of zone two by inserting an air blocking vehicle stop into the downstream end of zone two, thereafter stopping a second vehicle in zone two adjacent the rear of the first vehicle with the aid of air trapped behind the first vehicle, allowing the first vehicle to enter zone three, but only when zone three is clear of vehicles and the second vehicle is positioned behind the first vehicle, by retracting the vehicle stop from the front of the first vehicle and holding the second vehicle in position, thereafter releasing the second vehicle and reinserting the air blocking vehicle stop into the conduit and moving the second vehicle to the downstream end of zone two.

**4,165,846**  
**CONVERTIBLE AIRPLANE**  
 Theodore O. Groeger, 2 Collamore Cir., West Orange, N.J. 07052

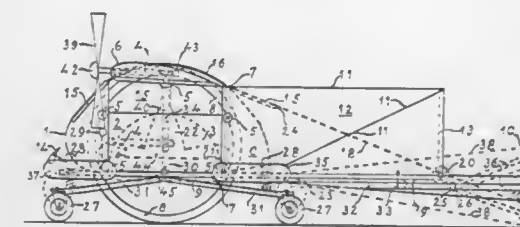
Continuation-in-part of Ser. No. 774,076, Mar. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 616,574, Sep. 25, 1975, Pat. No. 4,011,919. This application May 18, 1977, Ser. No. 797,955

The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> B64C 37/00

U.S. Cl. 244—2

9 Claims



1. In an airplane including a fuselage having a leading edge having on opposite sides at least three rollers rotatably mounted on substantially horizontal axes, which are distributed over substantially the periphery of said fuselage-sides and connected therewith, a pair of elastic running tires contacting the ground in use and said rollers, at least one ground-contact-

ing balancer, which is resiliently and rotatably connected with another side of said fuselage, power means operatively connected with said airplane and braking means operatively connected with said airplane and only a frontal pair of said rollers adjacent to the leading edge and to the ground; wherein said fuselage (0) comprises; (a) said leading edge (1) next to said frontal rollers, a trailing edge (20), a bottom surface (17, 45) and a larger surface (15, 16, 18), both of which surfaces extend into said edges; (b) two fins (12) attached to opposite sides of said fuselage, substantially parallel to its longitudinal centerline and about perpendicular to said edges, both of which fins project substantially away from said upper surface adjacent to said trailing edge; (c) two wings (3, 6), each attached to said opposite fuselage-sides adjacent to said leading edge and being substantially perpendicular to said fins and (d) at least one stabilizer (32, 36) attached to said fuselage adjacent to its trailing edge, whereby the sum of the dynamic reactions of the air against said fuselage, wings and stabilizer sufficiently lifts said tire-roller from the ground in use.

**4,165,847**  
**TAIL UNIT FOR A MISSILE**  
 Bernard A. Detalle, L'Hay-les-Roses, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

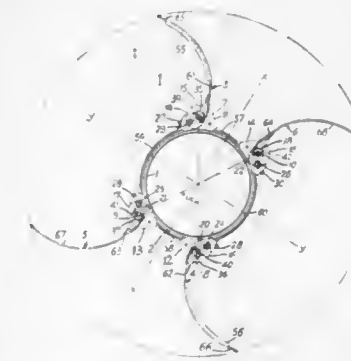
Filed Jun. 6, 1977, Ser. No. 803,946

Claims priority, application France, Jun. 25, 1976, 76 19432

Int. Cl.<sup>2</sup> F42B 13/32

U.S. Cl. 244—3.29

10 Claims



1. A tail unit for a missile which is propelled at supersonic speed of the type comprising a system of two pairs of curved blades, each blade having a longitudinal edge connected to the periphery of a cylindrical body, and means located on the missile blades for producing a rotary torque which rotates the tail unit in flight, each blade being pivoted about a pivot pin integral with the cylindrical body and located in the immediate vicinity of the periphery of the latter and having a curvature which substantially corresponds to that of the body, the length of the circular arc defined by the transverse profile of a blade being between one-quarter and one-half the length of the periphery of a cross-section of the cylindrical body, wherein the orientation of the concavity of the blades of one and the same pair of blades about the axis of the cylindrical body is opposite to that of the blades of the other pair of blades, the pivot pins of the blades of the same pair of blades are located in two diametrically opposite zones on the cylindrical body, and the blades can be folded down onto one another pairwise parallel to the outer surface of the body by rotation about said pivot pins.

4,165,848

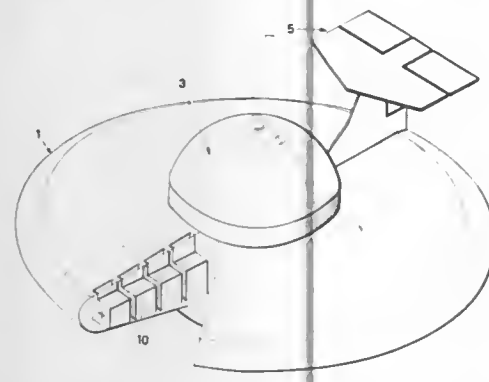
# ROTARY THRUST DEVICE INCLUDING AXIALLY ELONGATED ROTOR ROTATABLE IN CASTING HAVING ELONGATED FLUID INTAKE AND DISCHARGE SLOTS

Alfredo Bizzarri, Via S. Donato 14/5, Firenze, Italy (I-50127)  
Filed Jul. 28, 1977, Ser. No. 819,899

Claims priority, application Italy, Aug. 9, 1976, 9556 A/76  
Int. Cl.<sup>2</sup> B64C 29/02

U.S. Cl. 244—12.2

6 Claims



1. A fluid flow device for propelling a vehicle comprising, in combination, a relatively elongated, substantially horizontally oriented casing having cylindrical wall means defining a horizontally oriented, axially elongated circular cross-section internal surface; an axially elongated rotor extending coaxially of said cylindrical wall means and mounted for rotation therein; longitudinally extending, peripherally spaced vanes on said rotor cooperable with said internal surface of said casing, each vane having plural longitudinal ribs on its periphery terminating adjacent to but out of contact with said internal surface of said casing, each of said ribs having an aerofoil cross-section and defining a channel between adjacent ribs and said vanes having radially concave leading surfaces considered in the direction of rotation of said rotor; said ribs cooperating with said internal surface to form a fluid seal between said vanes and said internal surface; a fluid intake slot formed in said wall means and extending longitudinally of said rotor coextensive therewith; and a fluid discharge slot formed in said wall means and extending longitudinally of said rotor coextensive therewith.

4,165,849

# COMBINATION AIR BRAKE AND ENGINE SHIELD FOR AIRCRAFT

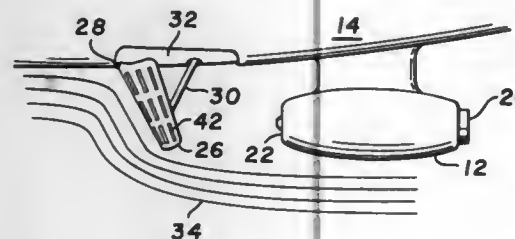
Anthony Fox, 8306 Queen Ave. South, Minneapolis, Minn. 55431

Filed Dec. 14, 1977, Ser. No. 860,588

Int. Cl.<sup>2</sup> B64C 9/32

U.S. Cl. 244—113

1 Claim



1. A combination air brake and engine shield for a jet-type aircraft comprising, in combination:  
(a) an airframe having a fuselage with wing members structurally attached thereto along a line which is displaced

downward and parallel to the longitudinal axis of said fuselage;

(b) first and second jet-type engines, each having an air intake section and mounted on either side of said fuselage, extending outwardly from the exterior surface thereof and disposed above said wing members;

(c) first and second recesses formed in the exterior surface of said fuselage, said recesses being oriented completely forward of said air intake sections of said first and second jet-type engines and each having a width generally corresponding to the diameter of said air intake sections, said recesses being generally aligned with the longitudinal axes of said first and second jet-type engines;

(d) first and second panel members disposed in said recesses and having a hinge connection at one edge thereof about a line which is transverse to the longitudinal direction of said fuselage, said first and second panel members each having an exterior surface conforming to the exterior surface of said fuselage surrounding said recesses and a plurality of slots extending through the thickness dimension thereof, a plurality of flap members yieldably secured to the interior surfaces of said panel members for blocking said slots when the air pressure acting on said flap members is below a predetermined value; and

(e) first and second hydraulic pistons and cylinders operatively disposed between said fuselage and said first and second panel members and located interior to said exterior surface of said fuselage for rotating said panel members outwardly from said first and second recesses about said hinge connection, the arrangement being such that said panel members, when extended, are in a blocking relationship with the airstream normally entering said intake sections of said jet engines when said panel members are retracted into said first and second recesses.

4,165,850

# SAFETY DEVICE FOR A TRANSPORT SYSTEM

Jean-Claude Dubreucq, Paris, France, assignor to Regie Autonome des Transports Parisiens, Paris and Inter-Elec, Drancy, both of, France

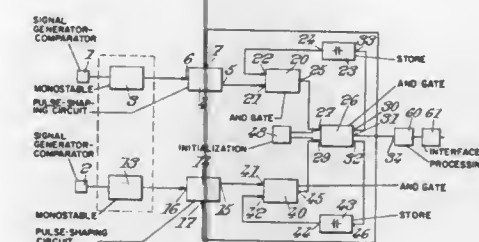
Filed Feb. 1, 1977, Ser. No. 764,710

Claims priority, application France, Feb. 4, 1976, 76 03065

Int. Cl.<sup>2</sup> B60L 15/00; B61L 3/22

U.S. Cl. 246—182 B

6 Claims



1. A safety device for a system or apparatus which operates in a sequence of stages, said safety device acting to terminate the operation of the system or apparatus when a parameter representing said operation exceeds a set threshold in a given direction during an operating stage, said device comprising:

first and second comparison means each for comparing said parameter with said threshold, each said comparison means having an output at which a comparison signal is delivered during each operating stage, said comparison signal having a first value when said parameter remains within said threshold and a second value when said parameter exceeds said threshold; and

coincidence means comprising first and second inputs connected to said output of said first and second comparison means respectively, and an output at which said coincidence means delivers an output signal during each operating stage, said output signal having a first level when the

4,165,852

# WALL RAIL WITH CHANNELS

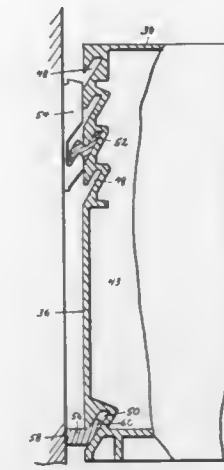
Robert A. Chervenak, Seattle, Wash., assignor to Comerco, Inc., Tacoma, Wash.

Filed Apr. 27, 1977, Ser. No. 791,318

Int. Cl.<sup>2</sup> F16M 13/00

U.S. Cl. 248—225.2

10 Claims



# 4,165,851 ADJUSTABLY LOCKABLE BAR HANGER FOR CEILING BOXES AND THE LIKE

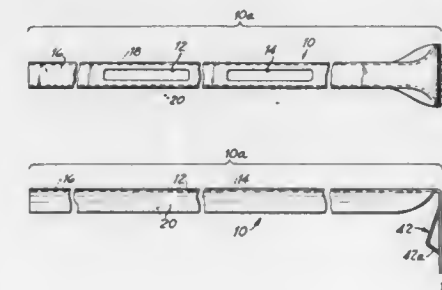
Wade R. Bowden, Jr., Northport, and Walter C. Lewis, East Northport, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,620

Int. Cl.<sup>2</sup> F16L 5/00

U.S. Cl. 248—57

10 Claims



1. An improved adjustable bar hanger for supporting an electrical outlet box, ceiling box and the like from a pair of structural joists, having a generally elongate male bar member telescopically slidable within a channel formed in a generally elongate female bar member, opposite ends of the male and female members each adapted to be attached to a joist for suspending the box from a pair of joists, wherein the improvement comprises:

a detent tab formed on the elongate portion of the female member, said detent tab adapted to be deflected into the channel in the female member and having a generally L-shaped cross-sectional configuration with a first leg attached to the female member and a second leg adapted to protrude into the channel in the female member when said detent tab is deflected; and

at least one slot-like opening formed in the elongate portion of the male member and located thereon for alignment with said detent tab to permit protrusion of said second leg thereinto when the male and female members are extended to a predetermined length, said slot-like opening being proportioned to permit some relative slidable movement of the male and female members when said second leg protrudes thereinto, such that when said bar hanger is to be mounted to a pair of structural joists spaced by about said predetermined length, the male and female members are extended to said predetermined length and said detent tab is deflected to cause said second leg to protrude into a said slot-like opening for generally locking the male and female members against substantial relative movement yet permitting the length of said bar hanger to be adjusted within a range defined by the length of said slot-like opening.

4,165,853

# MOUNTING BRACKET FOR SOLAR HEAT COLLECTOR

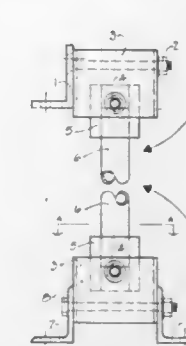
Richard F. Brandt, 10 South St., Red Bank, N.J. 07701

Filed Jan. 16, 1978, Ser. No. 869,910

Int. Cl.<sup>2</sup> A47G 29/02; E04G 3/08

U.S. Cl. 248—237

5 Claims

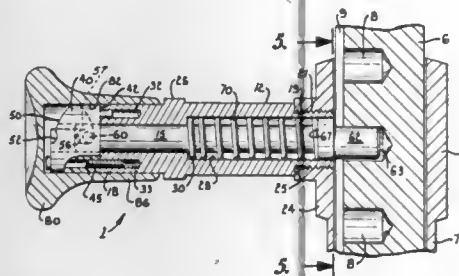


1. Apparatus for mounting a solar collector on a surface comprising a stem member interposed between said surface and said solar collector, first means detachably connecting said solar collector to an upper end of said stem member in a manner permitting vertical movement of said solar collector relative to said stem member, rotational movement of said solar collector in a first vertical plane relative to said stem member and rotational movement of said solar collector in a second vertical plane relative to said stem member, said first vertical plane relative to said stem member being perpendicular to said second vertical plane relative to said stem member, and second means detachably connecting a lower end of said stem member to said surface in a manner permitting rotational movement of



said stem member in a horizontal plane relative to said surface, rotational movement of said stem member in a first vertical plane relative to said surface and rotational movement of said stem member in a second vertical plane relative to said surface, said first vertical plane relative to said surface being perpendicular to said second vertical plane relative to said surface.

**4,165,854**  
**ECCENTRIC PAWL FOR CHAIR LOCKING DEVICE**  
 Michael J. Duly, Spring Hill, Kans., assignor to Cramer Industries, Inc., Kansas City, Kans.  
 Filed Mar. 29, 1978, Ser. No. 891,449  
 Int. Cl.<sup>2</sup> F16M 11/04  
 U.S. Cl. 248—408 **10 Claims**



1. In a chair structure having a vertically adjustable seat portion supported on a post depending therefrom and slidably received in a bore of a support standard, a locking device comprising:

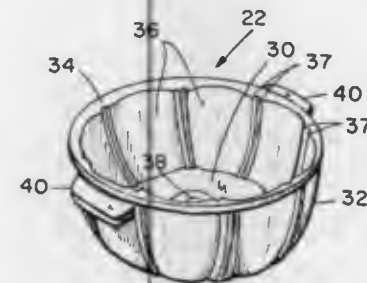
- (a) a barrel having an attachment end mounted on a wall of said support standard, said barrel having a through bore extending from end-to-end thereof and communicating at said attachment end with a bore through said support standard wall;
- (b) an elongated plunger positioned in said bore and having opposite ends, one end thereof having a pawl engaged within a selected one socket of a plurality of sockets in said post and movable therefrom for adjusting the extension of said post relative to said support standard;
- (c) said pawl being eccentrically mounted on said plunger with a revolutionary axis of said pawl generally positioned below a revolutionary axis of said plunger when said pawl is engaged within said selected one socket, said pawl having orbital rotation during withdrawal from said socket whereby the overlying weight of said seat portion and said post urges said pawl rotatably downward relative to the axis of said plunger;
- (d) means slidably and rotatably mounting said plunger in said bore and providing said orbital rotation of said pawl upon rotation of said plunger; and
- (e) cooperative means on said plunger and said barrel operable to rotate said plunger in said barrel and move said eccentrically mounted pawl into and out of engagement with a selected socket.

**4,165,855**  
**COOKING UTENSIL KIT**  
 Stanley I. Mason, Jr., 61 River Rd., Weston, Conn. 06880  
 Filed Dec. 7, 1977, Ser. No. 858,093  
 Int. Cl.<sup>2</sup> A23G 1/20; B28B 7/16  
 U.S. Cl. 249—102 **23 Claims**

1. A cooking utensil kit having component parts capable of being assembled to form a pan of the type having a center post for preparing ring-shaped foods, each part being formed of a heat resistant material suitable for use in cooking in a home oven, said kit comprising:

a mixing bowl having a generally circular configuration and including sides and a closed base portion, the inner surface of said base portion having a generally hemispherical, centrally positioned protuberance of a predetermined size

extending upwardly from said inner surface to a predetermined height, and  
 a center post member adapted to be centrally positioned on the base surface of said mixing bowl, said center post member formed in the shape of a truncated cone having a height approximating that of said sides of said bowl and having its narrower diameter at the top thereof and its wider diameter at the bottom thereof,  
 said narrow top diameter being sufficiently smaller than said wider bottom diameter of said post so that cooked food is easily removable from said post and said post is stable when positioned upright upon said protuberance during cooking,



said center post member having a closed bottom surface adapted to receive said protuberance extending upwardly from said base surface of said bowl, said closed bottom surface including an indentation adapted for complementary fit with said protuberance, said indentation having a lower diameter corresponding to the largest diameter of said protuberance and a height at least as great as that of said protuberance,

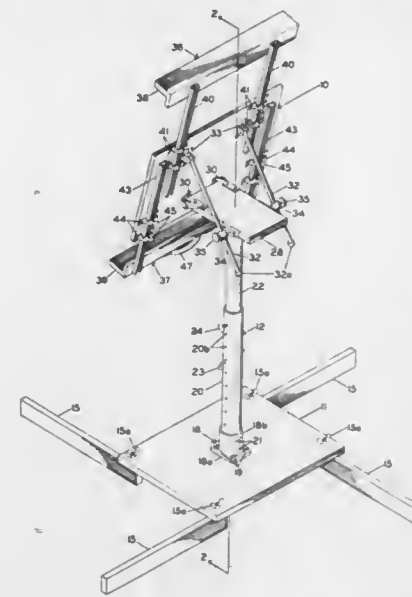
said inner surface of said base being substantially horizontal except in the area of said protuberance so that horizontal planar contact results between said bowl and the lower portion of said post to provide stability thereto, whereby said center post may be plunged into batter in said mixing bowl and be self-centered on the base surface of said bowl to form a pan for preparing ring-shaped foods.

**4,165,856**  
**ADJUSTABLE ARTIST'S EASEL**  
 Keith H. Wiseheart, 402 Sixth Ave., Baraboo, Wis. 53913  
 Filed Jun. 15, 1977, Ser. No. 806,578  
 Int. Cl.<sup>2</sup> A47B 97/08  
 U.S. Cl. 248—449 **5 Claims**

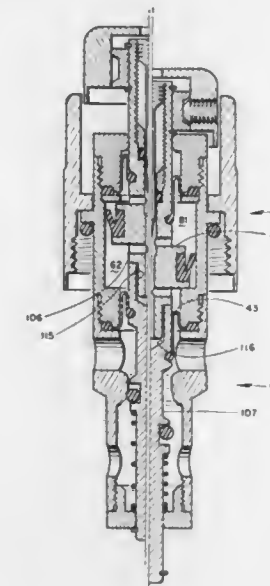
1. An adjustable easel for artists, comprising:

- (a) a square base;
- (b) an easel board having a substantially flat surface;
- (c) a pedestal having a sleeve member mounted to said base and extending upwardly therefrom, said sleeve member having a hollow circular interior bore, said pedestal also having a post adapted to be closely received in the bore of said sleeve member and held in telescoping relation therewith, said easel board being rotatably mounted to said post for rotation about a horizontal axis and said post being rotatable within said sleeve member to thereby provide for rotation of said easel board about a vertical axis;
- (d) means for holding said post at a selected one of a plurality of vertical positions within said sleeve member to thereby provide for selection of the height of said easel board above said base;
- (e) means for adjustably securing said easel board at a selected rotational position with respect to said pedestal;
- (f) clamp means slidably mounted to said easel board for engaging and holding a workpiece in position on said easel board; and
- (g) a plurality of stabilizer bars no longer than the sides of said base which are rotatably mounted to the underside of

said base at the corners thereof in position to be swung out from the base into an extended position to provide additional lateral stability to said base and to the remainder of said easel supported thereon.



**4,165,857**  
**DASHPOT MECHANISM FOR SELF-CLOSING PLUMBING VALVES**  
 Earl L. Morris, Whittier, and Larry D. Fields, La Puente, both of Calif., assignors to Acorn Engineering Co., Industry, Calif.  
 Division of Ser. No. 668,285, Mar. 18, 1976, Pat. No. 4,093,177.  
 This application Nov. 2, 1977, Ser. No. 847,852  
 Int. Cl.<sup>2</sup> F16K 31/48; F16F 9/20  
 U.S. Cl. 251—54 **6 Claims**



1. A fluid-filled dashpot mechanism, comprising:
- (a) housing means having a passageway therein;
  - (b) stem means reciprocally disposed in said passageway;
  - (c) pushbutton means secured to one end of said stem means for operably displacing said stem means;
  - (d) a pair of rolling diaphragms disposed in face-to-face relationship in said passageway and operably coupled in fluid sealing relationship to said housing means and said stem means so as to form an enclosed chamber within said housing means for containing said fluid therein;
  - (e) piston means dividing said chamber into two portions and

reciprocally operable therein for displacement of said fluid in said chamber;

(f) means for operably associating said stem means with said piston means for reciprocation therewith;

(g) check valve means operably associated with said stem means so that when said stem means is operably displaced in one direction said fluid flows from one chamber portion to the other through said check valve means and said fluid communication means, thereby allowing a relatively rapid displacement of said fluid between said chamber portions and effectuating relatively rapid displacement of said piston means and said stem means, and when said stem means is operably displaced in the opposite direction said fluid flows from said other portion to said one chamber portion through said fluid communication means thereby allowing a relatively slow displacement of said fluid between said chamber portions and effectuating relatively slow displacement of said piston means and said stem means;

(h) adjustment means for said fluid communication means for varying the cross-sectional area thereof, wherein said adjustment means comprises:

said stem means further having a longitudinally disposed passageway therein, said passageway exiting from the end of said stem means secured to said pushbutton means and extending beyond said piston means and having at least two counterbored sections therein, one of said counterbored sections extending to a point intermediate said piston means and said end of said stem means and having a threaded section thereabout throughout a substantial portion of its length;

a first laterally-disposed fluid channel drilled through said stem means, said first fluid channel joined in fluid communication with the smaller diameter counterbored sections of said passageway immediately above said piston means;

a second laterally-disposed fluid channel drilled through said stem means, said second fluid channel joined in fluid communication with the non-counterbored section of said passageway immediately below said piston means;

a valve member having a shank portion and a head portion operably disposed within said passageway, the end of said shank having a tapered nose thereabout facing the juncture of said noncounterbored section of said passageway and said smaller diameter counterbored section of said passageway and said headed portion having a diameter greater than said shank portion with a threaded portion thereabout operably engageable with said threaded portion of said counterbored section of said passageway;

an annular fluid sealing means disposed in fluid sealing relationship between said shank of said valve member and the larger diameter counterbored section of said passageway;

threaded retaining means for maintaining said fluid sealing means against the innermost portion of said larger diameter counterbored section in said passageway; and

keyed receptacle means disposed in said head portion of said valve member for operably receiving a tool for rotating said head portion to adjust the threaded engagement between said head portion of said valve member and said threaded section of said passageway whereby said tapered nose of said valve member may be moved into fluid sealing engagement and disengagement with said stem means about said juncture of said non-counterbored section of said passageway and said smaller diameter counterbored section of said passageway.

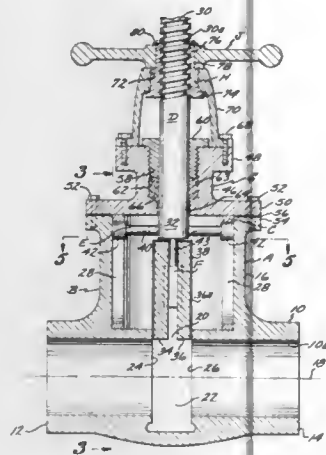
4,165,858

## GATE VALVE STRUCTURE

James D. Thackrey, 13852 Dall La., Santa Ana, Calif. 92705  
Filed Jun. 30, 1975, Ser. No. 591,777Int. Cl.<sup>2</sup> F16K 25/00

U.S. Cl. 251-168

4 Claims



1. In a gate valve of the type that includes a housing having a fluid passage extending longitudinally therethrough, first and second longitudinally spaced, transverse valve seats defined in said housing and extending outwardly from said fluid passage, first and second adjacently disposed valve plates of greater transverse area than that of said fluid passage that may be moved when in a first position transversely relative to said fluid passage to extend thereacross or to one side thereof, said first and second valve plates when extending transversely across said fluid passage capable of being moved to a second position in which they are moved away from one another and into sealing engagement with said first and second valve seats, a device for moving said first and second valve plates when in said first position to either one side of said fluid passage or to extend transversely across said fluid passage and move said first and second valve plates to and from said second position when said first and second valve plates extend transversely across said fluid passage, said device including:

- a. a rod transversely and rotatably movable relative to said housing, said rod having a first end that may be disposed in said passage;
- b. a cam that depends from said first end of said rod and movably engages first and second oppositely disposed pockets formed in adjacent faces of said first and second valve plates, said cam serving the dual function of supporting said first and second valve plates from said rod and moving said first and second valve plates from said first to said second position when said rod and cam are concurrently rotated;
- c. second means for moving said rod, cams, and first and second valve plates from a position where said first and second valve plates are to one side of said fluid passage to a position where said first and second valve plates extend transversely across said fluid passage; and
- d. third means for rotating said rod and first means in a first direction when said first and second valve plates extend transversely across said fluid passage to move said first and second valve plates to said second position where they seal with said first and second valve seats or in a second direction to allow said first and second plates to return from said second position to said first position, with said first and second plates after returning to said first position being movable to one side of said fluid passage by non-rotatable transverse movement of said rod.

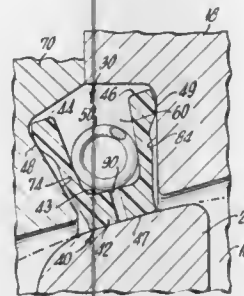
4,165,859

## SEAL ASSEMBLY

Vytautas K. Maciulaitis, Chicago, and Rasikant R. Dhanani, Darien, both of Ill., assignors to Crane Co., New York, N.Y.  
Filed May 18, 1977, Ser. No. 798,228Int. Cl.<sup>2</sup> F16K 25/00

U.S. Cl. 251-173

2 Claims



1. A valve for controlling fluid flow comprising:
  - a. A valve body having a passage therethrough;
  - b. A valve closure means pivotally positioned in said valve body;
  - c. a stem adapted to rotate said valve closure means; and,
  - d. a seal assembly including:
    - (i) a recess on said valve body adjacent to said passage, the depth of the recess increasing substantially uniformly with increasing distance from the passage;
    - (ii) a retainer overlying the recess in said valve body, said retainer having a recess, the depth of the recess increasing substantially uniformly with increasing distance from the passage, the retainer recess disposed in juxtaposition to the recess on said valve body to thereby form a chamber therebetween adapted to receive a seat ring; and,
    - (iii) a seat ring located in the chamber said seat ring having a base extending into the valve body passage and a plurality of legs depending from said base compressingly disposed in the chamber, said base having a perforation being blocked by said valve closure means when said valve closure means is rotated closed, each of said legs having a convex surface thereon adjacent to each respective recess, whereby fluid passing between a recess and one of said legs forces the convex surface on the other leg into fluid-tight engagement with its respective recess and with said valve closure means when said stem rotates said valve closure means into the closed position, the fluid in the chamber passing through the perforation into the passage in said valve body when the stem rotates the valve closure means into the open position.

4,165,860

## SPOOL VALVE BUFFER MEMBER

Peter J. Gillespie, Basingstoke, England, assignor to Austin Beech Limited, Leighton, England

Filed Mar. 10, 1977, Ser. No. 776,175

Claims priority, application United Kingdom, Mar. 17, 1976, 10621/76

Int. Cl.<sup>2</sup> F16K 35/04

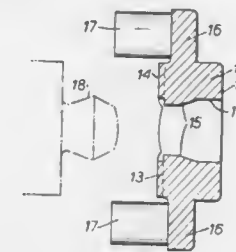
U.S. Cl. 251-297

2 Claims

1. A spool and sleeve valve assembly including a buffer member located adjacent at least one end of the sleeve, said buffer member comprising a generally cylindrical portion of resilient material, said cylindrical portion defining a central aperture; at least two detent portions located diametrically opposed to one another and extending radially inwardly of the inner surface of said aperture; and a generally cruciform portion projecting from an annular end surface of the cylindrical portion, and said spool being formed with a detent member projecting centrally from an annular planar surface at least at

the end adjacent said buffer member, said spool projecting detent member being releasably retainable within the central

means into said chamber subsequent to the extension of said first plunger.



aperture of the buffer member by said radially inwardly extending detent portions and said annular planar surface engaging said cruciform projecting portion which acts as the buffer.

4,165,861

## VEHICLE LEVELING SYSTEM

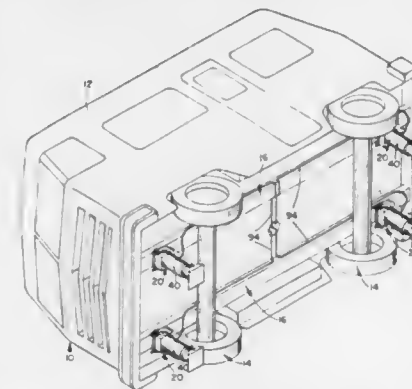
Paul E. Hanser, Moline, Ill., assignor to HWH Corporation, Rock Island, Ill.

Filed Feb. 1, 1978, Ser. No. 874,021

Int. Cl.<sup>2</sup> B66F 7/24

U.S. Cl. 254-86 H

13 Claims



1. In a device for use in a system of leveling a trailer, camper, motorhome, truck, or other vehicle relative to the terrain on which it is standing; a support assembly rotatably mounted on the lower surface of said vehicle and provided with operating means including a first hydraulic cylinder from which a first plunger is extendable to rotate said support assembly from an upper storage position to a lower operating position, and a second hydraulic cylinder from which a second plunger is extendable to engage said terrain; manually actuated pump means for delivering fluid to said operating means; and control means for directing said fluid sequentially into said first cylinder and then said second cylinder, characterized by said control means being operatively disposed between said pump means and said operating means and comprising

- (A) means defining a fluid chamber communicating with said pump means,
- (B) means defining a first passage communicating with said chamber and said first cylinder,
- (C) means defining a second passage communicating with said chamber and said second cylinder,
- (D) means for sealing said second passage against the movement of fluid therethrough during extension of said first plunger responsive to the delivery of fluid from said pump means through said chamber and said first passage into said first cylinder, and
- (E) means for displacing said sealing means to open said second passage for the movement of fluid therethrough into said second cylinder to extend said second plunger responsive to the further delivery of fluid from said pump

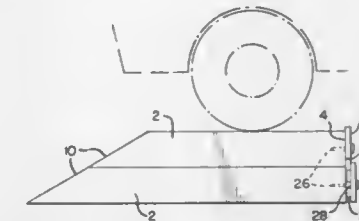
4,165,862

## LEVELING DEVICE FOR CAMPER TRAILERS AND LIKE VEHICLES

Stephen A. Bennett, 216 E. Jefferson, Havana, Ill. 62644  
Filed Aug. 8, 1978, Ser. No. 931,873Int. Cl.<sup>2</sup> E02C 3/00

U.S. Cl. 254-88

3 Claims



1. A leveling device for raising the wheel of a vehicle such as a camper trailer to a desired level, comprising a kit having a plurality of elongated separate flat slabs arranged in superposed abutting relation to form a stack, at least one end of each slab being tapered from the lower surface to the upper surface in the direction of the length of the slab, the tapered ends being at the same end of the stack with the lower edge of each tapered end being at the upper edge of the tapered end of the slab next beneath it, thereby forming a continuous inclined ramp from the lower surface of the lowermost slab to the upper surface of the uppermost slab, and cooperating means on adjacent slabs for frictionally and separately connecting adjacent slabs, said means comprising a flat plate connected to the un-tapered end of each slab the vertical dimension of which is greater than that of the connected slab, the plates of adjacent slabs being alternatively:

- a. connected in spaced relation to the adjacent end of the slab by a space approximately equal to the thickness of the plate, and
- b. connected in face-to-face abutting relation to the adjacent end of the slab.

4,165,863

## HOIST SYSTEM

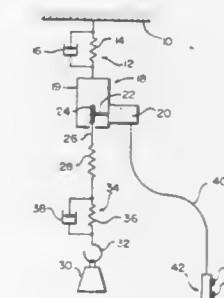
Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Sep. 15, 1976, Ser. No. 723,652

Int. Cl.<sup>2</sup> B66D 3/18

U.S. Cl. 254-168

24 Claims



1. In a load handling system which includes a hoist, means for suspending said hoist, a chain suspended in operative association from said hoist, means for attaching said chain to a load, said hoist including a drive sprocket engaging said chain and power operated means for driving said drive sprocket at substantially constant angular velocity to effect variation in the chain length between the drive sprocket and the load whereby

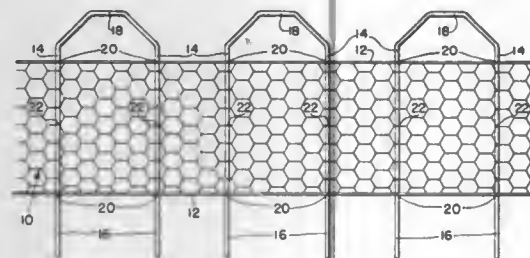


correspondingly to raise and lower the load, the driving of the chain by the drive sprocket inherently setting up a vertically oscillatory excitation superimposed on the steady vertical motion of the chain whereby as said variation in chain length inherently causes the system to experience a continuously varying natural frequency, said oscillatory excitation sets up a resonant response in the load system when said natural frequency coincides with the fundamental or a significant harmonic frequency of said excitation wherein excessive oscillatory motion and forces are imposed on the system, the improvement which comprises:

control means in said system for obtaining a controlled amplitude of relative motion within such control means in response to said oscillatory motion and for creating a damping force related to said controlled amplitude which significantly reduces said excessive oscillatory motion and forces.

**4,165,864**  
**CHICKEN WIRE BORDER FENCE**  
David M. Wright, 500 Leicester St., Auburn, Mass. 01501  
Filed Jun. 21, 1978, Ser. No. 917,491  
Int. Cl.<sup>2</sup> E04H 17/04; B21F 27/00  
U.S. Cl. 256—34

9 Claims



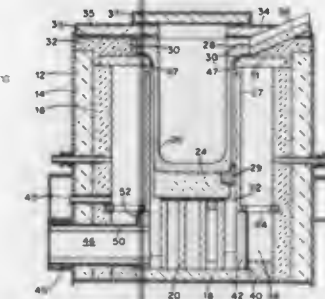
1. A chicken wire border fence comprising a length of chicken wire having wire selvage edges, a series of spaced cross pieces of heavier gauge wire than the chicken wire, said cross pieces extending across the width of the chicken wire and extending therebeyond at both edges thereof, the portions of the cross pieces extending at one edge of the chicken wire forming ground engaging points mutually spaced along the length of the chicken wire, the portions of the cross pieces extending beyond the other edge of the length of the chicken wire being in the form of closed loops, said cross pieces being welded to the chicken wire including its selvage edges, and there being chicken wire between cross pieces, the loops being wholly independent so that the fence can be rolled up.

**4,165,865**  
**CRUCIBLE MELTING FURNACE**  
Leonard G. Nowak, Ypsilanti, Mich.; Maurice Nunes, Arlington, Mass., and Paul K. Shefsiek, Farmington, Mich., assignors to Holcroft and Company, Livonia, Mich.  
Filed Mar. 1, 1978, Ser. No. 882,512  
Claims priority, application Japan, Dec. 29, 1977, 52-158705  
Int. Cl.<sup>2</sup> F27B 14/02, 14/14

5 Claims

1. A gas-fired crucible furnace for high-temperature melting of material comprising:  
a vessel for holding a charge of said material and having a mouth for admitting and discharging the charge of material;  
a baffle surrounding said vessel spaced relatively close thereto and forming a restricted passageway therebetween, said baffle having one or more openings formed therethrough surrounding said vessel adjacent said mouth;

an enclosing wall surrounding said baffle and spaced relatively far therefrom;  
a top member sealed to the outer surface of said vessel adjacent to said mouth and to said wall, said baffle, enclosing wall, and top member together defining a combustion chamber;  
a swirler disposed between said baffle and said enclosing wall adjacent a portion of said baffle remote from said one or more openings therethrough, said swirler adapted to introduce combustion air into said combustion chamber in a helical path;  
a cylindrical swirler support for supporting said swirler and said baffle and defining with said enclosing wall a combustion air plenum on the side of said swirler opposite said combustion chamber;

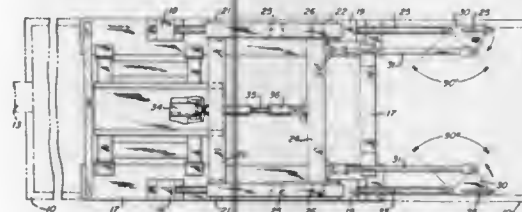


an exhaust flue communicating with said restricted passageway;  
a cylindrical member supporting said vessel concentric with said swirler support and defining therewith an annular region between and in communication with said restricted passageway and said exhaust flue, said annular region in heat exchange relationship with said swirler support and said air plenum for preheating combustion air in said plenum; and  
means for introducing gas for combustion into said combustion chamber whereby said vessel is radiatively heated from said baffle and convectively heated from the passage of combustion products through said restricted passageway to said exhaust flue.

**4,165,866**  
**DEVICE FOR SKIMMING FLOATING MATERIAL FROM A BODY OF LIQUID**  
Andrew A. Hetra, Jr., Pittsburgh, and Charles W. Jacob, Crafton, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.  
Filed Mar. 31, 1978, Ser. No. 892,364  
Int. Cl.<sup>2</sup> C22B 7/00

U.S. Cl. 266—228

7 Claims



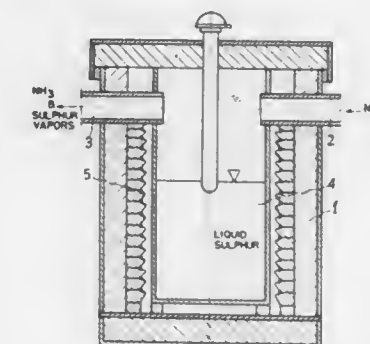
1. A skimming device comprising a frame, a secondary carriage mounted on said frame for linear movement therealong, a primary carriage mounted on said secondary carriage for linear movement therealong, at least one paddle pivoted to said secondary carriage, a linkage connecting said primary carriage and said paddle, and motive means on said frame connected with said primary carriage for sequentially moving said primary carriage with respect to said secondary carriage to pivot said paddle from a position in which its faces are

substantially parallel with the direction of movement to a position transverse of the direction of movement, moving both said carriages and said paddle with respect to said frame in a skimming stroke, moving said primary carriage with respect to said secondary carriage to pivot said paddle back to its parallel position, and moving both carriages with respect to said frame to return the carriages and paddle to their original position.

**4,165,867**  
**INSTALLATION FOR NITRIDING-SULPHIDIZING OF STEEL AND IRON ELEMENTS**  
Zdzislaw Haś, Jerzy Gramsz, Wojciech Jarosz, all of Łódź; Piotr Jaremczuk, Świebodzin; Stanisław Bruszewski, Świebodzin, and Krzysztof Koczela, Świebodzin, all of Poland, assignors to Politechnika Łódzka, Zwirki and Lubuskie Zakłady Termotechniczne, Świebodzin, both of Poland  
Continuation of Ser. No. 429,828, Jan. 2, 1974, abandoned. This application Mar. 8, 1977, Ser. No. 775,639  
Claims priority, application Poland, Dec. 30, 1972, 160079

U.S. Cl. 266—252 Int. Cl.<sup>2</sup> C21D 1/74

3 Claims

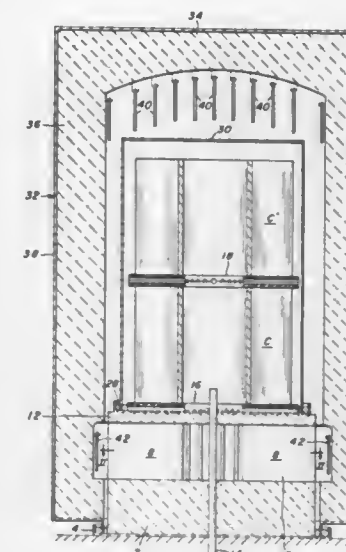


1. An arrangement for nitriding-sulphidizing of steel and cast-iron articles comprising an enclosed tank, a source of ammonia, a furnace in which said articles are placed, a closed retort containing an open vessel with liquid sulphur and placed in the interior of said tank, a heating device surrounding said retort, said retort having two pipe connectors at the top of said tank, one of said pipe connectors being connected with said source of ammonia for controlled supply of ammonia, said one pipe connector comprising an ammonia inlet for admitting ammonia from said ammonia source to said tank and to the interior of said retort, the other one of said pipe connectors being connected with said furnace in which articles to be treated are located for chemical and heat treatment of said articles, said other one of said pipe connectors conducting a mixture of ammonia and sulphur vapors from the interior of said retort to said furnace and valve means in said other one of said pipe connectors for controlling the mass ratio of the mixture of ammonia and sulphur vapors conducted to said furnace and, wherein said ammonia inlet and mixture outlet are substantially at the top of said retort and communicating with the interior of said retort above the level of said liquid sulphur, said ammonia inlet and mixture outlet passing through the walls of said container and said tank.

**4,165,868**  
**METHOD AND APPARATUS FOR HEATING COILS OF STRIP**  
Raymond L. Southern, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.  
Filed Nov. 25, 1977, Ser. No. 855,093  
Int. Cl.<sup>2</sup> C21D 9/54

U.S. Cl. 266—264

4 Claims



1. An apparatus for annealing stacked coils of metal strip having axial openings therethrough comprising:  
a furnace having,  
a roof,  
sidewalls,  
a generally horizontally disposed base for supporting a first coil of metal strip with its axial opening disposed in the vertical position,  
heating means located within said furnace above the plane of the first coil, and  
heating means adjacent the base;  
a first convector coil support between the base and the lowermost coil of strip comprising a generally circular metal plate disposed parallel to the base and having,  
a central opening therein,  
a plurality of spaced grooves in the bottom surface of said plate extending radially outwardly from the central opening to the periphery of the metal plate, and  
a plurality of holes extending through the plate from the grooves to the top surface of said plate; and  
a second convector coil support between adjacent stacked coils of metal strip comprising a pair of generally circular metal plates, each plate having,  
one generally planar surface,  
a central opening therein,  
a plurality of spaced grooves in the surface opposite the planar surface, said grooves extending radially outwardly from the central opening to the periphery of the metal plate, and  
a plurality of holes extending through the plate from the grooves to the planar surface, with the plates comprising the second convector coil support disposed between adjacent stacked coils such that the adjacent coils are in contact with a generally planar surface of the coil support, and the central opening and grooves of said plates are disposed toward one another and in axial alignment,  
a cover enclosing the stack of coils, and  
means for supplying annealing gas to the center of the stacked coils inside the cover.

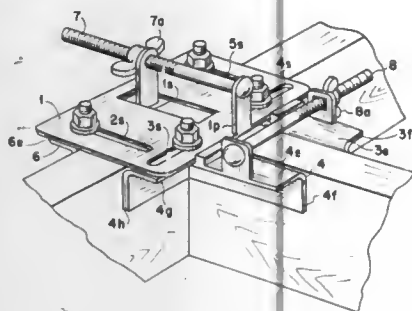
# 4,165,869 T CLAMP

Curtis Williams, 321/200 Center Plz., Tulsa, Okla. 74119  
Continuation-in-part of Ser. No. 713,973, Aug. 12, 1976,  
abandoned, which is a continuation-in-part of Ser. No. 687,751,  
May 19, 1976, abandoned. This application Mar. 23, 1977, Ser.  
No. 780,503

Int. Cl.<sup>2</sup> B25B 5/14

U.S. Cl. 269—41

6 Claims



1. A clamp assembly comprising first clamp means removably receiving a first work piece therein, second clamp means movable in directions toward and away from said first clamp means and cooperating therewith for receiving a second work piece therein and securely retaining the second work piece in engagement with said first work piece, a single uninterrupted workpiece engaging flange member provided on said first clamp means for receiving one side of said first work piece thereagainst, a pair of oppositely disposed spaced substantially L-shaped flange members provided on said second clamp means and movable in directions toward and away from each other for securely clamping said second work piece therebetween and in said second clamp means, first adjustment means operably connected between said first and second clamp means for controlling the pressure engagement of both clamp means against the opposite sides of the first work piece, and second adjustment means operably connected between the spaced L-shaped flange members for controlling the clamping pressure against the opposite sides of the second work piece for securely retaining one end of the second work piece in engagement with one side of the first work piece during a clamping operation.

# 4,165,870

## WAVE GENERATOR TO SHINGLE SHEETS

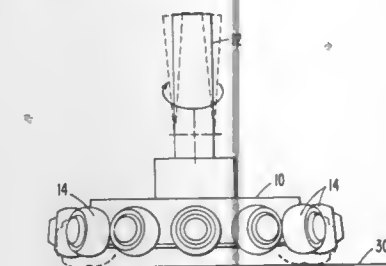
John L. Fallon, Longmont; Ernest P. Kollar, Weld County, and Fred R. Mares, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,096

Int. Cl.<sup>2</sup> B65H 3/06, 3/32

U.S. Cl. 271—10

19 Claims



1. In a sheet feeder for feeding sheets, one at a time from a stack, to sheet feed means; improved sheet separator means comprising:

a disk rotatable in a plane generally parallel to the stack about an axis generally perpendicular to the stack; a plurality of substantially frictionless sheet engaging means mounted about the periphery of said disk; means for pivoting said disk in a first direction for bringing a portion of said sheet engaging means into contact with the topmost sheet of the stack whereby the stack is shingled away from said feed means; and for pivoting said disk in a second direction for bringing another portion of said sheet engaging means into contact with the topmost sheet of the stack whereby the stack is restored to its unshingled state; and

means operable to separate the topmost sheet from the underlying sheets during said restoration.

13. The method of selectively imparting linear motion to the top sheets of a stack of sheets in two generally opposite directions by tilting a continuously rotating disk having frictionless sheet engaging means spaced about its periphery so as to selectively bring different portions of said sheet engaging means into contact with the top sheets of the stack, and withdrawing an edge of the stack's top sheet out from under an edge restraint by one direction of tilting.

# 4,165,871

## PATTERN READING DEVICE

Ryoji Yamaguchi, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

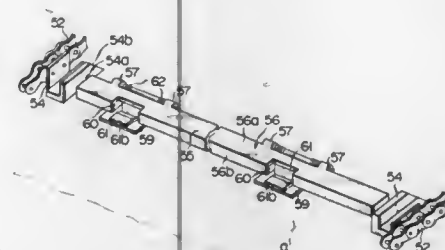
Filed May 16, 1977, Ser. No. 797,255

Claims priority, application Japan, May 14, 1976, 51-54854; May 14, 1976, 51-54859; May 14, 1976, 51-54862; May 14, 1976, 51-60924[U]; May 14, 1976, 51-60939[U]; Dec. 15, 1976, 51-150448; Jan. 31, 1977, 52-10155[U]

Int. Cl.<sup>2</sup> G06K 19/06

U.S. Cl. 271—127

15 Claims



1. In a pattern reading device comprising a feed mechanism for storing a sheaf of cards carrying patterns and feeding said cards one by one, a conveying mechanism for conveying said card to a reading section, an optical reader provided in said reading section for reading patterns on said cards, and means for discharging each read card the improvement wherein said conveying mechanism comprises:

at least one pinch member, the pinch member including an elongated body and a plurality of pinch portions arranged at intervals in the longitudinal direction of said body; means for abutting the entire forward edge of each card against the side of said elongated body; and driving means for operating the pinch member to pinch simultaneously the forward edge portions of each card when the entire forward edge of each card is abutted against the side of said elongated body and for moving the pinch member to bring the pinched card to said reading section, said forward edge portions of each card being set apart.

# 4,165,872

## MOTOR OPERATED SWINGS

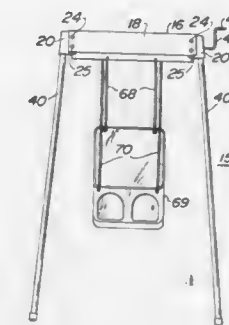
David Saint, Elverson, Pa., assignor to Graco Metal Products, Inc., Elverson, Pa.

Filed Nov. 10, 1977, Ser. No. 850,075

Int. Cl.<sup>2</sup> A63G 9/16

U.S. Cl. 272—86

19 Claims



1. A power operated swing or the like comprising a canopy having side walls with ends, outer end closure caps for said canopy, inner end walls interiorly disposed in said canopy with respect to said end closure caps, a shaft within said canopy, driving means for said shaft, a carriage pivotally mounted on said shaft within said canopy for oscillatory movement, operating connections between said shaft and said carriage, and members for mounting said end closure caps and said inner end walls comprising spaced inwardly extending projections on said canopy at each end, said end closure caps and said inner end walls having portions for engagement on said projections, at least one of said portions including a resilient tongue for engagement with one of said projections.

# 4,165,873

## EXERCISING PARALLEL BAR

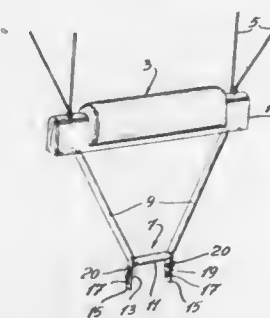
George C. Draper, 282 Westgate Crescent, Rosemere, Quebec, Canada

Continuation-in-part of Ser. No. 687,090, May 17, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,999

Int. Cl.<sup>2</sup> A63B 3/00

U.S. Cl. 272—63

5 Claims



1. An exercising apparatus comprising: a pair of rests; means for retaining the rests above a floor level and for maintaining the rests in spaced, parallel arrangement, and for constraining the rests from longitudinal movement; said means permitting only unrestrained lateral movement of the rests; and further means, disposed on each rest of said pair of rests, for

carrying part of the weight of a person using the apparatus; the apparatus being adapted, in use, to be mounted by said person such that his armpits are disposed over the rests, whereby the weight of said person is carried partially by said rests and partially by said further means; characterized in that said means for retaining comprises, for each rest, a pair of cables, each cable of said pair being attached at one end to a supporting surface above the apparatus and at the other end to a respective end of its respective rest.

# 4,165,874

## GOLF CLUB SHAFT AND SET OF GOLF CLUBS

Arthur J. Lezatte, Downers Grove, and Peter J. Piotrowski, Glen Ellyn, both of Ill., assignors to Pepsico, Inc., Purchase, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,248

Claims priority, application Japan, Oct. 13, 1976, 51-121903

Int. Cl.<sup>2</sup> A63B 53/12

U.S. Cl. 273—77 A

7 Claims



1. A metal golf club shaft of stepped configuration having a uniform outer diameter, uniform wall thickness butt end portion at least 10 inches (254 mm) long, said uniform wall thickness being not greater than 0.012 inch (0.305 mm), said butt end portion terminating in a plurality of cylindrical step portions of progressively smaller outer diameter and progressively increasing wall thickness terminating in an intermediate cylindrical step portion of smaller outer diameter, greater wall thickness and of increased longitudinal extent than the cylindrical steps, said intermediate cylindrical step portion terminating in a plurality of cylindrical step portions of progressively smaller outer diameter and a progressively increasing wall thickness and terminating in a tapered tip end portion having a wall thickness at the tip end of at least 0.024 inch (0.610 mm).

4. A set of golf irons containing at least the series of irons ranging from the No. 2 iron to the No. 9 iron, said irons each including a metal shaft having a butt end portion terminating in a plurality of cylindrical step portions of progressively smaller outer diameter and progressively increasing wall thickness, said cylindrical step portions terminating in a tapered tip portion, the butt end portion of each iron club being of uniform wall thickness and being at least 10 inches (254 mm) long and having an outer diameter of at least 0.620 inch (15.75 mm), a flexible grip covering at least a portion of the butt end portion of each club, said grip weighing no more than 1-13/32 ounces (40.00 g) and a club head of different loft secured to the tip end of each shaft, the club head for the No. 2 iron weighing not more than 8-5/16 ounces (235.7 g) and the club head for the No. 9 iron weighing not more than 9 1/4 ounces (280 g) for D2 swingweight.



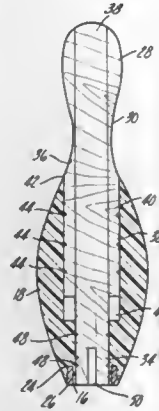
# 4,165,875 BOWLING PIN

Robert H. Dykehouse, 4578 E. 15 Mile Rd., Sterling Heights, Mich. 48077

Filed Sep. 29, 1976, Ser. No. 727,642  
Int. Cl.<sup>2</sup> A63D 9/00

U.S. Cl. 273—82 R

11 Claims



1. A bowling pin, comprising:  
(a) a solid wooden core comprising a head portion, a neck portion, a main body portion and a shank portion, and  
(b) a unitary, solid synthetic resinous belly comprising an arcuate sidewall, a planar bottom and an open top, the belly having a hollow interior, and  
wherein the main body portion and the shank portion of the core are disposed within the hollow interior, the belly extending downwardly from the neck portion of the core, the exterior of the neck portion being contiguous with the sidewall of the belly, the belly having a sufficient thickness to impart high impact and compressive strength thereto.

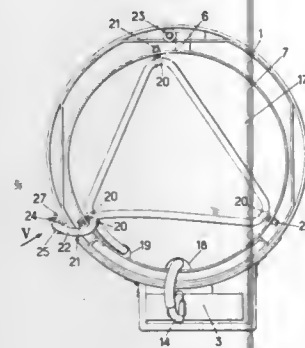
# 4,165,876 CONTAINER FOR A LINE FOR TOWING AN AERIAL TARGET AND PROCESS FOR LOADING THE LINE INTO THE CONTAINER

Joseph Pasqualini, 82, voie du Parc de la Lande, Le Plessis Trevis, France (94420)

Filed Nov. 25, 1977, Ser. No. 854,680  
Claims priority, application France, Dec. 1, 1976, 76 36257  
Int. Cl.<sup>2</sup> B64D 3/02

U.S. Cl. 273—105.3

9 Claims



1. A container for the tow line of an aerial target to be towed behind an airplane comprising, a streamlined cylindrical body adapted to be stowed below the airplane, said body having an open rear extremity to receive a tubular tow line casing, a piston frictionally fitting in said casing and in spaced relation to a rear extremity of the casing, a tow line packed in said casing between said piston and the rear extremity and having front and rear ends extending from the rear extremity of the casing, said casing being positioned in said body with its rear extremity

adjacent the rear extremity of the body, means for releasably securing the casing to said body, and remotely controllable release means on said container to which said front end of the tow line is attached for releasing the tow line after a target towing mission, and a lightweight disk adjacent the rear extremity of the casing and engaging the tow line packed in said casing, and means holding said lightweight disk in position and comprising, a disk retaining length of a rear portion of the tow line extending across an outside surface of and engaging said disk, and break-away means for connecting the disk retaining length of tow line to said casing.

7. A process for loading a cable in a casing releasably connectable to the body of a container adapted to be stowed under an airplane comprising, disposing the tubular casing vertically with its front extremity down and its rear extremity up, positioning a friction fit piston at a predetermined distance less than the length of the casing from the rear extremity of the casing to form a limited height space, coiling said tow line into the limited height space between the piston and the rear extremity of the casing and at least partially filling said space with said tow line, while maintaining a short length of the front end of the cable outside said casing, compressing the so coiled tow line with a tamping piston while forcing said friction fit piston downwardly into said casing to provide a new packing space of limited height, continuing the coiling of the tow line into the new packing space, repeating the coiling and tamping until a desired length of tow line is packed in said casing, closing the rear extremity of the casing with a lightweight disk, and connecting the rear end of the cable across the disk to hold said disk in position at the rear extremity of the casing.

# 4,165,877 MOLDED GOLF BALLS EXHIBITING ISOMETRIC COMPRESSION

Richard Miller, Belle Mead; Murray H. Reich, and Emma Kuntz, both of Princeton, all of N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Division of Ser. No. 602,959, Aug. 7, 1975, Pat. No. 4,065,537.  
This application Aug. 25, 1977, Ser. No. 827,905  
Int. Cl.<sup>2</sup> A63B 37/00, 37/06, 37/12

U.S. Cl. 273—218

9 Claims

1. A golf ball comprising a substantially spherical homogeneous molded mass of cis-polybutadiene highly cross-linked into a three dimensional network with long, flexible cross-links formed from a metal-containing cross-linkable monomer comprising a polyvalent metal salt of an unsaturated acid present in about 0.046 to 0.41 equivalents per mole of cis-polybutadiene, whereby said comonomer simultaneously functions at least in part as a filler, said ball in addition to said filler-functioning cross-linking monomer containing up to about 30 parts of a further filler per 100 parts by weight of said cis-polybutadiene, said mass exhibiting substantially isometric compression across any diameter and having been produced by continuously extruding a cross-linkable elastomer through a die to form an extrudate, cutting said extrudate so as to produce approximately cylindrical slugs about 2.5 to 3.3 inches long and having substantially flat or convex top and bottom surfaces, and molding said slugs into golf balls.

# 4,165,878 BINGO GAME AND PROCESS OF PLAYING SAME

John J. Frain, P.O. Box 2816, Clearwater, Fla. 33517

Filed Apr. 27, 1978, Ser. No. 900,479  
Int. Cl.<sup>2</sup> A63F 3/06

U.S. Cl. 273—240

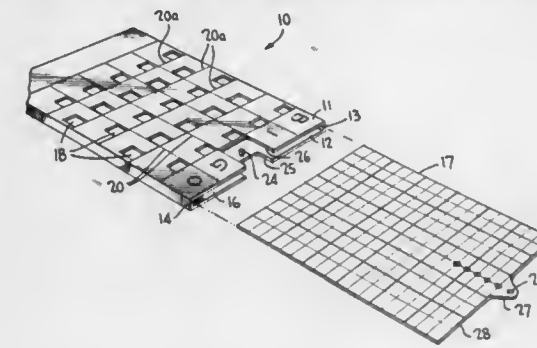
37 Claims

7. A combination game board and insert sheet for the play of a game such as Bingo, the game board comprising front and back superimposed panels of rectangular configuration being spaced apart and interconnected along three sides to form a pocket at a fourth side thereof for the reception of the insert sheet between said panels, a plurality of spaced and parallel first lines and a plurality of spaced and parallel second lines

disposed on an outer surface of said front panel, said first and second lines intersecting at right angles so as to define a plurality of spaces each having a predetermined size, a plurality of window openings in only said front panel located in each of said spaces and being of a size less than said predetermined size for exposing first portions through said window openings on at least one surface of said insert sheet when in a first position relative to said panels, and a plurality of characters disposed on said outer surface in said spaces adjacent said window openings for facilitating the play of the game, whereby said characters may be cancelled during the play of the game as said first portions of said sheet are marked through said adjacent window openings.

28. A process for playing a board game, such as Bingo, comprising the steps of:

providing a game board having spaced panels of substantially rectangular configuration, said panels being inter-



- connected along three sides and being open along a fourth side so as to define a pocket;  
providing a plurality of window openings in one of said panels;  
providing a plurality of game characters on an outer surface of said one panel respectively adjacent each of said window openings with the exception of a free space located at the center of said outer surface;  
disposing an insert sheet between said panels through said open fourth side so that first portions of one surface of said sheet are exposed through each of said window openings in a first position between said panels; and  
marking said first portions of the insert sheet through said window openings when said adjacent characters are announced during the play of a first game;  
whereby at least one board game may be played with the use of said insert sheet without disturbing said game characters on said outer surface.

# 4,165,879 GOLF GAME

William P. Zabel, Jr., 1682 Long Meadow Rd., Fort Myers, Fla. 33907

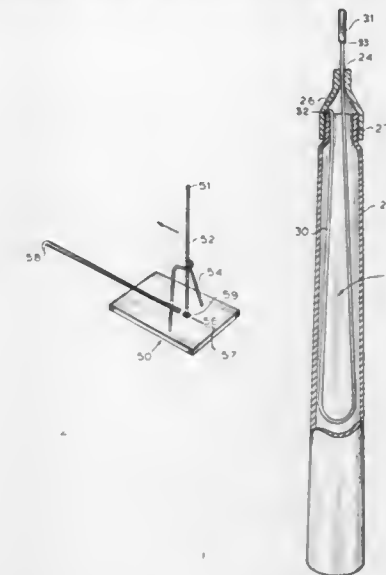
Filed Aug. 26, 1976, Ser. No. 717,915  
Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—259

18 Claims

1. A swing-form indicator comprising in combination:  
an elongated handle for being grasped and swung by the player, said handle including a cavity formed therein;  
a flexible line at least partially disposed within said cavity, whereby swinging said handle by the player may cause a segment of said flexible line to extend from said cavity away from said handle;  
vector means responsive to the swinging of said handle, including said flexible line, for determining forward distance and direction components, said vector means comprising resistance means disposed in interconnecting relation between said flexible line and said handle cavity for allowing a length of said flexible line to pass therethrough as said handle is swung, whereby a said length passing through said resistance means is representative of said forward distance components, said vector means further

comprising forward direction means for being struck by said handle during the swing, whereby the position of said



forward direction means after being struck is representative of said forward direction component.

# 4,165,880 SEALING DEVICE

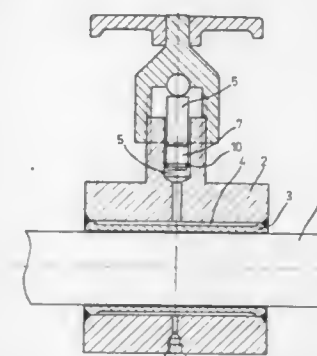
Hans O. Olsson, Krongikesvagen 42 B, 831 00 Östersund, Sweden

Filed Jul. 5, 1978, Ser. No. 922,211  
Claims priority, application Sweden, Jul. 11, 1977, 7708034;  
May 30, 1978, 7806186

Int. Cl.<sup>2</sup> F16J 15/46

U.S. Cl. 277—3

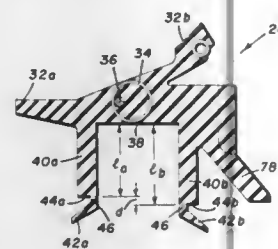
4 Claims



1. In a hydraulic system having variable pressure control means for forcing hydraulic fluid out of an exit fluid opening at high pressure the combination for preventing leakage of the high pressure fluid through control means comprising a cylindrical chamber between said pressure control means and said exit fluid opening, a cylindrical plug closely fitted into said chamber retaining hydraulic fluid adjacent said exit opening and receiving force from said control means and said plug being of a deformable material to receive force from said variable pressure control means and thereby to expand with pressure to bear against the chamber wall and seal the entire cross section of the chamber as hydraulic pressure against said fluid increases, a secondary sealing ring for resiliently engaging the cylindrical chamber walls of a material preventing leakage at low hydraulic pressures, and a groove in the plug disposing the sealing ring in sealing contact with the cylinder walls, whereby as the hydraulic pressure increases by means of said

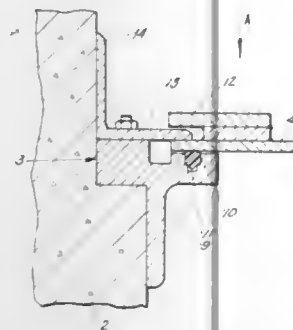
variable control means to deform said cylindrical plug the sealing function of preventing hydraulic fluid from leakage out of said chamber is achieved by both said secondary sealing ring and the cylindrical plug.

**4,165,881**  
**FLEXIBLE SEAL AND SEAL ASSEMBLY**  
 Lowell S. Salter, Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.  
 Continuation of Ser. No. 705,608, Jul. 15, 1976, abandoned. This application May 27, 1977, Ser. No. 801,430  
 Int. Cl.<sup>2</sup> F16J 15/32  
 U.S. Cl. 277—152



1. A seal for use on the tapered section of a rotatable roll neck in a rolling mill, comprising: a flexible circular seal body adapted to be mounted in sealing engagement on said tapered section for rotation therewith, said seal body having a pair of axially spaced resilient circular flanges extending radially outwardly therefrom, said flanges being integral with and being supported exclusively by said seal body, at least one of said flanges having an angularly outwardly extending circular lip at the outer edge thereof, said lip having a portion which is integrally connected to said one flange and which enables said lip to flex resiliently with minimum bending and distortion of the thus supported one flange, whereby the space between said flanges remains essentially constant during lip flexure.

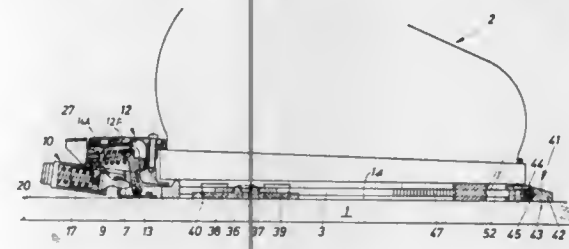
**4,165,882**  
**SEALING MEANS FOR SLIDE GATE**  
 Harold E. Crow, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio  
 Filed Jan. 19, 1978, Ser. No. 870,723  
 Int. Cl.<sup>2</sup> E02B 7/54; F16J 15/32  
 U.S. Cl. 277—168



1. In a slide gate construction wherein an essentially planar slide is mounted for opening and closing movement relative to a supporting frame defining a fluid flow orifice, an improved sealing means for effecting a seal between the slide and the frame, said sealing means comprising a resilient sealing member adapted to be received in a groove in said frame on the downstream side of said slide, said sealing member having a body including a contoured front face, said groove having an outer compartment of a size to snugly receive the body of said sealing member with its contoured front face projecting outwardly from said outer compartment; and an inner compartment underlying said outer compartment, the contoured front

face of the sealing member being positioned to be contacted and displaced laterally inwardly by the slide as it is closed, the lateral displacement of the contoured front face of the sealing member causing a portion at least of the body of the sealing member to be displaced into the inner compartment of said groove, whereby excessive compression of the sealing member is relieved each time the slide is closed and the sealing member is accommodated to the slide to form a tight seal between the slide and the frame.

**4,165,883**  
**SAFETY SKI BINDING**  
 Erwin Weigl, Brunn am Gebirge, and Karl Stritzl, Vienna, both of Austria, assignors to TMC Corporation, Baar, Switzerland  
 Filed Feb. 22, 1978, Ser. No. 880,078  
 Claims priority, application Austria, Feb. 23, 1977, 1212/77  
 Int. Cl.<sup>2</sup> A63C 9/08  
 U.S. Cl. 280—618

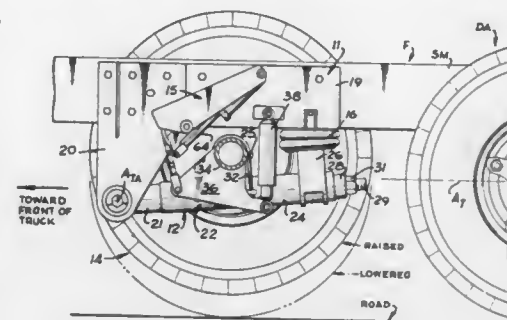


1. In a heel holding device for a safety ski binding having a heel holder and support means for pivotally securing said heel holder to a ski adjacent the rear end of said heel holder, a holding member mounted on a ski, said heel holder being held in a boot holding position by a locking member supported for movement in a housing against the force of a spring, said locking member being mounted on the rear end portion of said heel holder and operatively engaging said holding member, the improvement comprising a locking element mounted for pivotal movement about a pivot axle on said housing relative to said heel holder about an axle extending transversely to the longitudinal axis of said ski into and out of locking engagement with said heel holder and resilient means for urging said locking element into said locking engagement with said heel holder to hold a heel of a ski boot to said ski, connecting means for connecting said locking member to said locking element so that a movement of said locking member in response to a separating force between said ski and said ski boot will effect a pivotal movement of said locking element toward said out of locking engagement position with said heel holder to facilitate a release of said ski boot from said ski.

**4,165,884**  
**CHAIN LIFT FOR AUXILIARY AXLE ASSEMBLY**  
 Blaine H. Allison, and Richard F. Allison, both of Gainesville, Ga., assignors to Allison Mfg. Inc., Gainesville, Ga.  
 Continuation-in-part of Ser. No. 705,146, Jul. 14, 1976, Pat. No. 4,082,305. This application Nov. 1, 1977, Ser. No. 847,479  
 Int. Cl.<sup>2</sup> B60G 17/00; B62D 61/12  
 U.S. Cl. 280—81 R

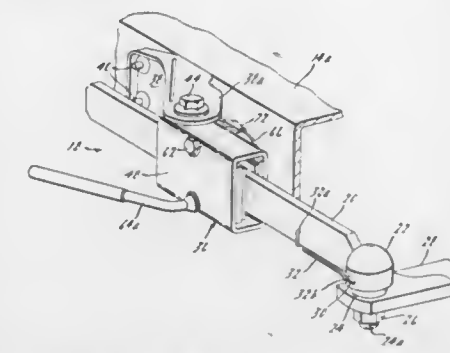
1. In a liftable auxiliary axle assembly for a wheeled vehicle including a wheel and axle assembly with road engaging tires thereon, an auxiliary axle frame mounting said wheel and axle assembly thereon and pivotally connecting the wheel and axle assembly to the vehicle frame about a common generally horizontal pivot axis generally normal to the longitudinal axis of the vehicle so that the road engaging tires of the wheel and axle assembly can be lifted out of engagement with the road surface as the auxiliary axle frame is pivoted about the common pivot axis, the combination therewith of a lift mechanism comprising:

(a) a lift pivot member pivotally connected to the vehicle frame about a lift pivot axis fixed with respect to the vehicle frame, said lift pivot member defining an arcuate support surface thereon having a radius of curvature whose center generally coincides with said lift pivot axis; (b) an inextensible lift member flexible in a first plane so that said lift member can bend along said arcuate support surface, said lift member operatively connected to the wheel and axle assembly and attached to said lift pivot



member so that said lift member is not movable lengthwise of said arcuate support surface and so that said lift member is wrapped along said arcuate support surface as said lift pivot member is pivoted about said lift pivot axis in a first rotational direction to selectively cause said lift member to lift the wheel and axle assembly from engagement with the road surface; and (c) drive means for selectively pivoting said lift pivot member about said lift pivot axis to selectively raise from and lower onto the road surface the road engaging tires.

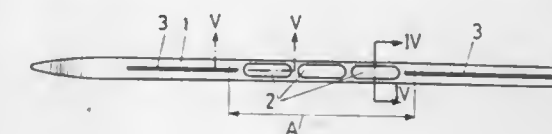
**4,165,885**  
**TRAILER SWAY CONTROL DEVICE**  
 Arthur L. Good, Elkhart, Ind., and Philip K. Hoopes, Jr., White Pigeon, Mich., assignors to Masco Corporation of Indiana, Taylor, Mich.  
 Filed Mar. 31, 1978, Ser. No. 892,120  
 Int. Cl.<sup>2</sup> B60D 1/16  
 U.S. Cl. 280—446 B



1. Apparatus for controlling sway between a towed vehicle having a trailer tongue member and a towing vehicle having a trailer hitch member to which said tongue member is secured, a bar having at least one planar bar surface, first mounting means securing said bar to one of said members while permitting universal pivotal movement of said bar relative to said one member about said first mounting means, friction brake means, and second mounting means securing said brake means to the other of said members while permitting pivotal movement therebetween about only a single axis, said brake means engaging said bar and having at least one friction surface frictionally contacting said planar bar surface, said friction surface being planar and parallel to both said axis and said planar bar surface, said brake means and said second mounting means being spaced from said bar a distance sufficient to permit substantial

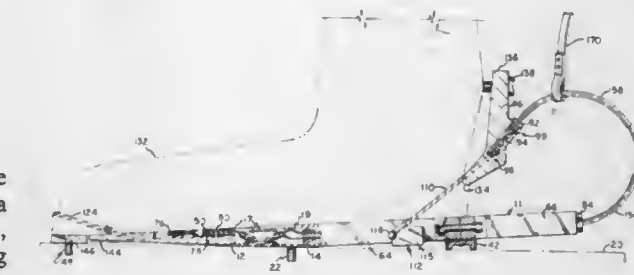
swinging movement of said bar about said first mounting means and parallel to said axis, the dimension of said friction surface measured along a line parallel to said axis being substantially greater than the corresponding dimension of said planar bar surface such that upon said substantial swinging movement of said bar about said first mounting means in directions parallel to said axis said friction surface and said planar bar surface remain in friction contact.

**4,165,886**  
**CROSS COUNTRY SKI**  
 Wolfgang Nussbaumer, Dornbirn, Austria, assignor to Kastle Gesellschaft m.b.H., Hohenems, Austria  
 Filed Jan. 25, 1978, Ser. No. 872,461  
 Claims priority, application Austria, Feb. 4, 1977, 711/77  
 Int. Cl.<sup>2</sup> A63C 7/06  
 U.S. Cl. 280—604



1. A cross-country ski comprising a supporting ski body including a plurality of superposed layers and a sliding sole, said sole being provided with a recess, and an interchangeable insert adhesively secured in said recess in said sole, at least one intermediate layer being interposed between and secured to the sliding sole and the lower surface of the superposed layers of the supporting ski body, said recess extending completely through said sliding sole and partially into said intermediate layer such that the depth of the recess is less than the sum of the thickness of said sliding sole and said intermediate layer, said intermediate layer being constituted of a material to which the adhesive joining the insert in said recess provides better adhesion as compared to the adhesion with the material of the sliding sole.

**4,165,887**  
**CONTROLLED EXCURSION SKI BINDING WITH SAFETY RELEASE**  
 Thomas C. Bunn, Jr., P.O. Box 121, Southport, Conn. 06490  
 Filed Dec. 1, 1977, Ser. No. 856,597  
 Int. Cl.<sup>2</sup> A63C 9/08  
 U.S. Cl. 280—613



1. A safety ski binding of the controlled-excursion type having an elongated boot attachment member, mounting means adapted to be secured to a ski, pivot means interengaging the boot attachment member and the mounting means to permit rotary displacement of the boot attachment member about an axis fixed with respect to the mounting means, a plurality of attachment points angularly spaced about the axis of the pivot means on one of the boot attachment member and



the mounting means, a plurality of guide means corresponding to the attachment points and located on the other of the boot attachment member and the mounting means, a plurality of elongated tensioned cables each having one end attached to a corresponding one of the attachment points and leading to the corresponding one of the guide means, and at least one spring tensioning means connecting the other end of each cable to the other of the boot attachment member and the mounting means, wherein the improvement comprises the attachment points and guide means being spaced radially outward from the circumference of the pivot means such that each tensioned cable leads directly in a straight line from the respective attachment point to the corresponding guide means throughout a preselected angular displacement sector of the boot attachment member from a neutral position in which no external torque is applied with respect to the mounting means.

4,165,888

## CROSS COUNTRY SKI BINDING

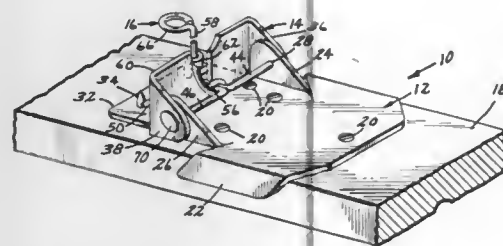
Gary E. Bernhardtson, 3224 Pleasant Dr., Anchorage, Ak. 99502

Filed Nov. 7, 1977, Ser. No. 848,868

Int. Cl.<sup>2</sup> A63C 9/20

U.S. Cl. 280—615

13 Claims



1. A cross country ski binding of the toe binding type for use in attaching a cross country ski boot having a projecting sole portion at the toe end of the boot to a cross country ski, said binding comprising:

- a first binding plate and means for fixing said first binding plate to a ski, said first binding plate having a pair of first opposed members;
- a toe iron including a sole plate for engaging a lower surface of the projecting sole portion of a cross country ski boot and a pair of second opposed members;
- each of said first and second opposed members a defining bearing means and said bearing means being aligned;
- combination clamping and hinging means hingeably attaching the first binding plate with the toe iron to permit upward and downward rotation of the toe iron with respect to the first plate, and for clamping a boot engaging said sole plate to the toe iron, said combination clamping and hinging means including means defining a hinge pin having opposite end portions journaled in the opposed aligned bearing means.

4,165,889

## STEP-IN HEEL UNIT FOR SKI BINDING

Burton A. Weinstein, Pelham Manor, N.Y., and Gordon C. Lipe, Teton Village, Wyo., assignors to The Garcia Corporation, Teaneck, N.J.

Filed Jul. 20, 1978, Ser. No. 926,240

Int. Cl.<sup>2</sup> A63C 9/08

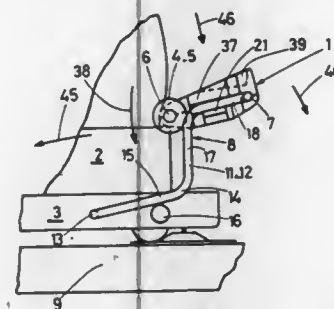
U.S. Cl. 280—626

7 Claims

1. A safety ski binding which comprises: a stirrup having a bridging section and a pair of legs; means mounting the ends of said legs to the sides of a support for a ski boot;
- a boot sole engaging clamp having a first element constructed and arranged to engage the end of said boot sole, and a second element pivotally connected to the bridging section of said stirrup rearwardly at the end of said boot

sole and parallel to the bearing plane of said sole on said support;

elastic locking means constructed and arranged laterally between said clamp and said stirrup legs, said locking means including at least one ramp integral with a side of said clamp arranged to cooperate with a leg of said stirrup which is elastically deformable laterally under the action of said ramp, and a stop constructed and arranged on at least one side of said clamp to engage a leg of said stirrup



whereby downward rotation of said clamp is prevented; and

means for maintaining said first element a predetermined distance above said support;

the legs of said stirrup also being elastically deformable in a plane parallel to the longitudinal axis of said support and perpendicular to the bearing plane of said support whereby said clamp is rotatable at said second element to release said boot sole upon application of a predetermined minimum release force.

4,165,890

## COMMUNICATION AID

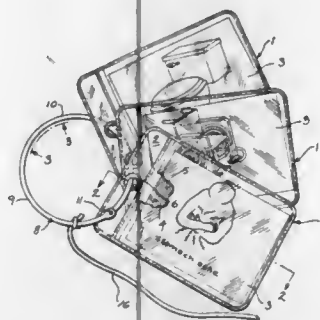
Ruth B. Leff, 6589 N. Crestwood Dr., Glendale, Wis. 53209

Filed Jan. 13, 1978, Ser. No. 869,168

Int. Cl.<sup>2</sup> B42D 15/00; B42F 5/00

U.S. Cl. 283—7

2 Claims



1. A communication aid, comprising a plurality of individual envelopes each having a transparent open-ended pocket, each envelope having a hole disposed adjacent the open end of the pocket, a card having an illustration representing a necessity of living disposed with each pocket, a ring mounted within the hole in each envelope, each ring including a pair of hinged semi-circular sections, and locking means for locking the free ends of the sections together, said envelopes being freely slidable on the ring so that a person can designate the illustration representing his need, release of said locking means and withdrawal of the ring from the hole in an envelope enabling a card to be inserted and removed from the pocket of said envelope.

4,165,891

## BREECH BLOCK CONNECTOR

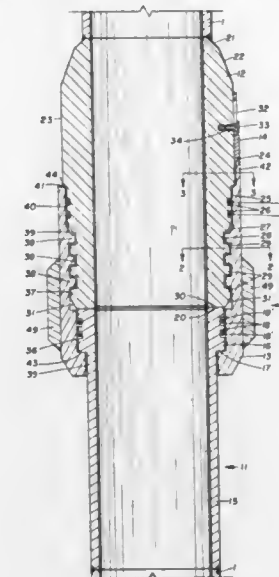
Bob L. Sullaway, and Lloyd C. Knox, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 24, 1978, Ser. No. 899,757

Int. Cl.<sup>2</sup> F16L 37/00

U.S. Cl. 285—18

11 Claims



4. A breech block connector for use in securing a first tubular member to a second tubular member, said connector comprising:

- sleeve means secured to one of said first tubular member and said second tubular member;
- pin means secured to the other of said first tubular member and said second tubular member, said pin means having one end thereof abutting one end of said sleeve means and having a plurality of radially and longitudinally spaced lug members located on the exterior thereof;

box assembly means retained on said sleeve means being slidable and rotatable thereon, said box assembly means having a plurality of radially and longitudinally spaced lug members located on an interior surface thereof, said plurality of lug members engaging said plurality of lug members located on said pin means thereby maintaining said pin means and box assembly means in assembled relationship;

seal means located in the end of said sleeve means abutting said pin means to sealingly engage said box assembly means;

seal means located on said pin means to sealingly engage said box assembly means;

rib means located on said box assembly means to facilitate assembly of said connector; and

locking means located on said pin means for maintaining said pin means and said box assembly means engaged thereby connecting said first tubular member to said second tubular member.

4,165,892

## COUPLING FOR RELEASABLY SECURING ONE END OF A ROD-LIKE MEMBER

Edward Platek, Linden, and Timothy Brady, Upper Montclair, both of N.J., assignors to Victaulic Company of America, South Plainfield, N.J.

Filed Aug. 12, 1977, Ser. No. 824,383

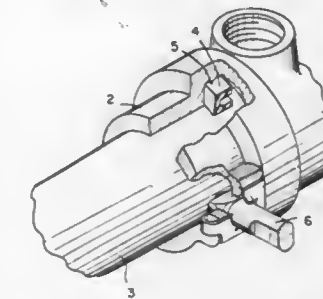
Int. Cl.<sup>2</sup> F16L 17/02

U.S. Cl. 285—111

19 Claims

1. A coupling for releasably securing one end of a rod-like member comprising a body adapted to receive said rod end, said body having an axial bore therein and a radial opening extending through the wall of the body, a locking pin in said

opening and extending radially outwardly from said body and being displaceable in the radial direction to engage the rod end, said locking pin having an enlarged head portion at the radially inner end and a stem portion extending radially outwardly through said body wall, said head portion having a camming surface arranged to abut the inside surface of the body wall in the region of said radial opening and said inside surface of the



body wall adjacent said radial opening having a camming surface thereon, said camming surfaces on the body and on said locking pin cooperating in such manner that partial rotation of said pin of about 90° effects relative rotation of said camming surfaces to impart a camming action to force said locking pin radially inwardly into locking engagement with said rod end and further relative rotation of said camming surfaces withdraws said pin to unlock said rod end.

4,165,893

## CONNECTOR FOR TUBING

Robert E. Fields, 51 Norfolk St., Cambridge, England

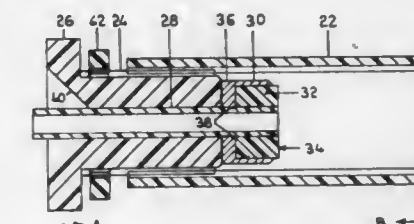
Filed May 26, 1977, Ser. No. 800,670

Claims priority, application United Kingdom, Jun. 4, 1976, 23116/76

Int. Cl.<sup>2</sup> F16L 13/00, 19/02, 41/08, 47/00

U.S. Cl. 285—177

7 Claims



1. A connector and tube assembly, comprising:

- a first member having a continuous internal wall surface which defines a central aperture extending through said first member having first and second opposite open ends;
- a tube which is received within said central aperture by being pushed through said first open end thereof, said tube having an end which protrudes beyond said second open end of said aperture when said tube is fully inserted within said aperture of said first member;
- a barb-like projection disposed within said aperture which extends generally radially inwardly relative to the axis of said aperture and generally rearwardly toward said second open end of said aperture, said barb-like projection being the sole means for securing said tube within said aperture and being disposed to bite into said tube when said tube is initially inserted into said aperture so as to prevent said tube from being pulled through said aperture in an opposite direction to that in which it was inserted in said aperture;

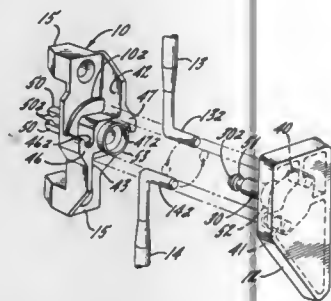
a resiliently-deformable, plastic, annular disc member being disposed adjacent to said first member and through which the protruding end of said tube passes, said disc member having an end face which lies flush with said end of said

tube, said disc member and said first member cooperatively defining a subassembly;  
a sleeve within which said subassembly is disposed; and  
means for securing said subassembly within one end of said sleeve.

**4,165,894**  
**SPRING LOADED LOCKING ASSEMBLIES FOR SLIDING WINDOWS AND THE LIKE**  
Felix Wojciechowski, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
Filed Dec. 1, 1977, Ser. No. 856,251  
Int. Cl.<sup>2</sup> E05C 5/00

U.S. Cl. 292-7

1 Claim



1. A lock assembly for a window or other closure member mounted within a frame, said lock assembly comprising:

a pair of elongated locking rods carried on the closure member for longitudinal movement to permit the outer ends of said rods to be advanced and retracted relative to cavities in the frame, the inner ends of said rods being bent laterally to the axes of the rods and forming elbows,  
a handle forming recesses for receiving the inner ends of said rods for advancing and retracting said rods in the longitudinal direction in response to rotational movement of the handle to lock and unlock the closure member and its frame, and

a unitary base member fastened to the closure member and supporting said handle for rotational movement while holding the inner ends of said rods captive in said handle, said base member forming,

a first pair of stops for limiting the rotational movement of the handle in a first direction to position the outer ends of said locking rods in an advanced position within the cavities in the frame, thereby locking the closure member to the frame,

a second pair of stops for limiting the rotational movement of the handle in a second direction to position the outer ends of said locking rods in a retracted position outside the cavities in the frame, thereby unlocking the closure member from the frame, and

raised lands upon which the elbows of said rods ride during pivotal movement of said rods to minimize friction between said base member and said rods during pivotal movement,

said handle including a stub shaft which forms a circumferential groove spaced inwardly from the end of said shaft and said base member forming a plurality of spring fingers adapted to flex outwardly to clear the end of said shaft and then snap into said groove to capture said handle on said base member, said handle and base member further forming telescoping annular surfaces for stabilizing the handle on the base member while permitting rotational movement of said handle.

**4,165,895**  
**PICKUP DEVICE FOR DOG DROPPINGS**  
Josip Bacoka, Winkelriedstrasse 33, St. Gallen, Switzerland  
Filed Jun. 28, 1977, Ser. No. 810,802  
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629342  
Int. Cl.<sup>2</sup> A01K 29/00; A47L 13/52  
U.S. Cl. 294-19 R

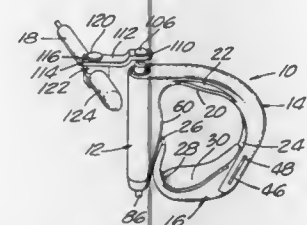
3 Claims



1. A device for conveniently picking up dog droppings comprising a walking cane, a bag holding device pivotally secured to the cane near the lower end thereof and swingable between an extended position in which a bag held by it lies in a generally horizontal position with its open end in a generally vertical plane and the bottom of its open end below the bottom of the cane and a retracted position in which the entire bag is held above the bottom of the cane, said holding device including a collar that grips and holds open the open end of the bag leaving the rest of the bag otherwise unsupported so that when the device is in its retracted position a bag held by it is at least partly closed by a wall portion of the bag.

**4,165,896**  
**INSTRUMENT HOLDER FOR USE ON DISABLED HANDS**  
Alvin W. Hunt, 13778 Hilway 88, Lockeford, Calif. 95237  
Filed Dec. 2, 1977, Ser. No. 856,917  
Int. Cl.<sup>2</sup> A46B 5/02; B43K 23/00  
U.S. Cl. 294-25

12 Claims



1. An instrument holder for use on a disabled hand, said holder comprising:

a band being adapted to encircle the fingers of a hand free of the thumb or encircle the hand over the palm and back free of the thumb;

said band having instrument holding means at one side thereof adapted to support an instrument so as to extend from the holding means adjacent the forefinger and upper end of the holding means;

latch means within said holding means to removably secure an instrument therein;

expansible means forming a part of said band to permit the band size to be varied according to the size of the hand; said expansible means being interrupted at one end thereof from the remainder of the band on one side thereof;

a second end of said expansible means being slidably en-

gaged with the remainder of said band at a second side opposite said one side; and  
a spring connecting said second end of said expansible means with said second side and biasing said expansible means toward said remainder of said band.

**4,165,897**  
**REFUSE COMPACTOR WITH A COUNTERBALANCED REAR DOOR**

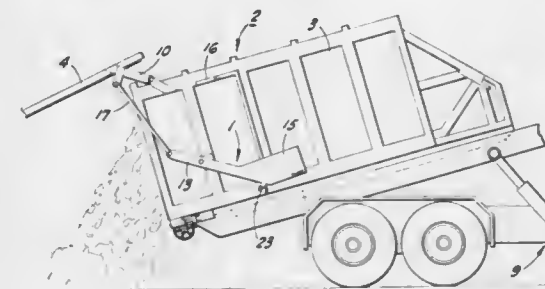
Lewis W. Schmidt, Rio Vista, Calif., assignor to Blackwelders, Rio Vista, Calif.

Filed Jun. 12, 1978; Ser. No. 914,789

Int. Cl.<sup>2</sup> B60P 1/26

U.S. Cl. 296-56

5 Claims



1. A door counterbalancing mechanism for a refuse compactor which includes a container normally closed at one end by a top-hinged releasably-locked door adapted to be swung upward to an open position for discharge of refuse from the container; the door counterbalancing mechanism comprising, in combination with at least one side of the container and the door, a rigid elongated lever pivoted intermediate its ends exteriorly of and on said side of the container, the lever normally inclining upwardly from its pivot in a direction away from the door, a counterweight directly on the upper end portion of the lever, an upstanding link pivotally connected at its lower end to the lower end of the lever, the link normally inclining upwardly from said lower end pivot in a direction toward the door, and means including a pivot connecting the upper end of the link to the door adjacent the top of the latter but normally below the hinge axis.

**4,165,898**  
**ARM REST WITH RECESSED ASHTRAY, FOR MOTOR VEHICLES, OR THE LIKE**

Joachim Janz, Wuppertal, and Bodo Mentzel, Velbert, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

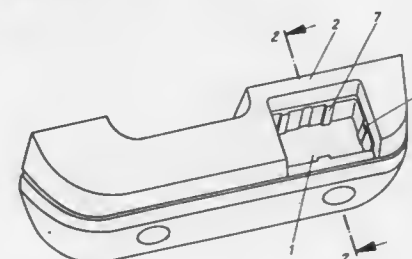
Filed Oct. 14, 1977, Ser. No. 842,316

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647794

Int. Cl.<sup>2</sup> B60N 1/06

U.S. Cl. 296-153

7 Claims



1. Arm rest for a vehicle, or the like: said arm rest including a recess for receiving an ashtray insert; said recess including and being defined by side walls and by a bottom wall; said arm rest including also a manually engageable recess;

said arm rest being defined in shape by an inner padding layer;  
an outer flexible skin layer over said padding layer; said outer flexible skin securely embracing the entire surface of said arm rest and its said padding layer, including the surface of said manually engageable recess and also forming the surface of and defining the side walls and said bottom wall of said recess for receiving said ashtray.

**4,165,899**  
**VEHICLE SEAT**  
Walther Guldner, Ebersbach, Fed. Rep. of Germany, assignor to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany  
Filed May 23, 1978, Ser. No. 908,833  
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2727948

Int. Cl.<sup>2</sup> B60N 1/02

U.S. Cl. 297-361

6 Claims



1. In a vehicle seat having a first shell providing a support for the upholstery of a back rest and a shoulder support having a lower edge and arranged forwardly of the first shell in an upper portion of the back rest, said shoulder support being pivotally connected to the first shell about an axis at said lower edge, said shoulder support supporting a holding device for a head rest and means for adjusting and setting the shoulder support in a desired rotational position about said axis, the improvement comprising said first shell having an upper edge and side edges, said shoulder support comprising a second shell overlapping the upper and side edges of the first shell adjacent thereto.

**4,165,900**  
**RECLINABLE SEATING STRUCTURES**  
James B. Psigiri, Dana Point, Calif., assignor to J. C. Sales & Mfg., Inc., Irwindale, Calif.  
Continuation of Ser. No. 772,634, Feb. 28, 1977, abandoned.  
This application Jun. 12, 1978, Ser. No. 914,489  
Int. Cl.<sup>2</sup> A47C 1/026

U.S. Cl. 297-369

5 Claims

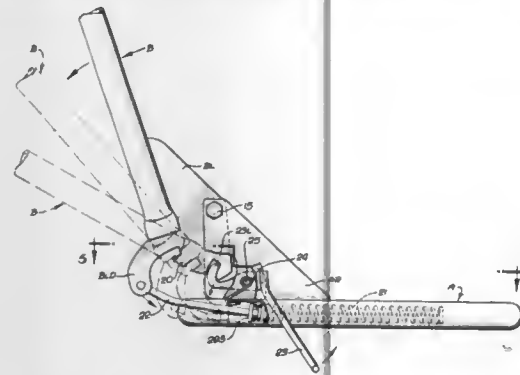
1. A frame for a seating structure adapted to be moved from an upright to a plurality of reclinable positions, the frame being constructed and defined for use in a motor vehicle such as a van, motor home or the like comprising

a first U-shaped tubular structure having a preselected size, a second U-shaped tubular structure having a smaller size than the size of the first U-shaped tubular structure so as to be secured at the open end of the first U-shaped tubular structure to close the "U" formed by said first structure while leaving the ends of the first tubular structure open, means for securing the thus arranged first and second



structures together whereby the secured arrangement is adapted for accepting and securing an upholstered seating structure.

- a third U-shaped tubular structure having a preselected length for the arms of the "U", a straight tubular element secured adjacent the open end of the third tubular structure functioning as a cross-arm to close the "U" formed by the third structure, whereby the thus secured arrangement is adapted for accepting and securing an upholstered back supporting structure,
- compression spring means mounted and seated wholly within one arm of the first tubular structure, the spring means having its inner end seated against the inner end of said one arm of the tubular structure for arresting the movement of the spring,
- a pair of upstanding hinge plates secured adjacent to the free ends of each arm of the first tubular structure,
- a hinge plate secured adjacent the free ends of each arm of the third tubular structure,
- individual means for swingably securing each of said hinge plates for the third tubular structure for swinging movement between an individual pair of said hinge plates for the first tubular structure to permit the third tubular structure to be moved relative to the first tubular structure, the hinge plate for the third tubular structure secured adjacent said one arm of the first tubular structure mounting the spring means including a portion constructed and defined with a plurality of spaced apart locking detents for locking



- the third tubular structure in an upright position or one of a plurality of positions reclined therefrom and having a dependent portion constructed and defined in a spaced relationship with the outer most reclining locking detent,
- a spring operating means having one end coupled adjacent the free end of said dependent portion and the opposite end arranged within said one arm of the first tubular structure for seating the outer end of the spring means and to progressively extend into said one arm for compressing the spring as the third tubular structure is swung away from the upright locking detent to the progressively rearward reclining locking detents and to be progressively extended out of said one arm to release the compressed spring as the third tubular structure is swung from a preselected reclining locking detent towards the upright locking detent,
- a manually operable control arm pivotally secured to one of the hinge plates for the pair of hinge plates adjacent the spring means mounting arm of the first tubular structure and carrying a latching finger movable between said pair of hinge plates for locking engagement with a locking detent, the locking finger is pivotally controlled by the manual operation of the control arm by an individual seated on the upholstered seating structure by the individual swinging the control arm out of locking engagement with one locking detent and into locking engagement with another locking detent to position the back supporting structure in a desired upright or reclined position while releasing the pressure exerted by the sitter, while sitting, against the back supporting structure or while applying

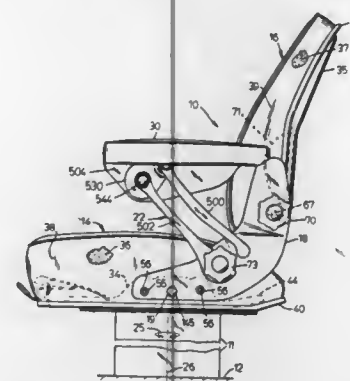
additional pressure against the back supporting structure, while sitting, to swing the back supporting structure to the desired reclined position, and means for biasing the control arm in an operative relationship.

#### 4,165,901 VEHICLE SEAT HAVING ARM REST ADJUSTMENT MEANS

Richard F. Swenson, Milwaukee; Shawn H. Eimen, Menomonee Falls, and John J. Gryga, Jr., Milwaukee, all of Wis., assignors to Milsco Manufacturing Company, Brown Deer, Wis.  
Filed Mar. 20, 1978, Ser. No. 888,551  
Int. Cl.<sup>2</sup> A47C 7/54

U.S. Cl. 297-417

5 Claims



1. In a vehicle seat:  
a support;  
an arm rest;  
and means for adjustably mounting said arm rest on said support and including:  
a linkage having upper and lower ends, said linkage including first and second elongated support links and a link plate;  
first means for pivotally connecting the upper end of said linkage to said arm rest so that said arm rest is pivotable in a plane about a first point, said first means including means for pivotally connecting one end of said first support link and said link plate to said arm rest, means for pivotally connecting one end of said second support link to said link plate, and means for pivotally connecting the other end of said second support link to said support plate;  
and second means for connecting the lower end of said linkage to said support so that said linkage and said arm rest attached thereto are adjustably movable in said plane about a second point, said second means including:  
an eccentric pin;  
means for rotatably mounting said eccentric pin on said support;  
a spur gear connected to said eccentric pin;  
a ring gear having at least one more internal tooth than the spur gear connected to the other end of said first support link and engaged with said spur gear;  
and a control knob connected to said eccentric pin and rotatable to effect rotation of said eccentric pin and said spur gear to thereby effect planocentric rotation of said ring gear whereby said first support link and said arm rest are moved to desired locked positions relative to said support plate.

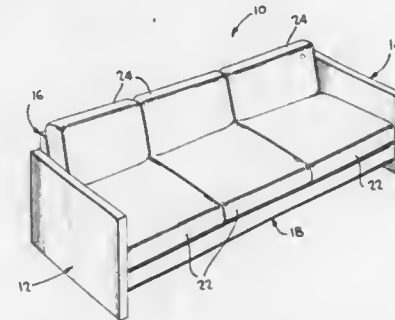
#### 4,165,902 KNOCKDOWN UPHOLSTERED FURNITURE

Richard A. Ehrlich, 11410 Washington Plaza West, Reston, Va. 22090

Filed Jan. 3, 1978, Ser. No. 866,254  
Int. Cl.<sup>2</sup> A47C 7/00

U.S. Cl. 297-440

18 Claims



1. A knockdown upholstered furniture construction comprising  
first and second spaced arm assemblies;  
an upholstered back member extending between said first and second arm assemblies and having a portion forming a back support for persons sitting on said knockdown upholstered furniture construction;  
a front member extending between said first and second arm assemblies;  
horizontal support means extending between said first and second arm assemblies and said front member and said back member to provide seating support for persons sitting on said knockdown upholstered furniture construction;  
a plurality of first connector means carried on said first and second arm assemblies;  
a plurality of second connector means carried on opposite ends of said back member and said front member;  
said connector means of one of said first and second pluralities of connector means each being a female connector having an opening therein; and  
said connector means of the other of said first and second pluralities of connector means each being a male connector having a hook-like lug extending outwardly therefrom with said lug having an inner edge with an inclined portion for engaging said female connector after insertion of said lug in said opening in said female connector to connect said first and second arm assemblies with said front and back members with a wedge-like action,  
said upholstery on said back member including a resilient padding surrounding said plurality of second connector means carried by said back member such that said second connector means carried by said back member are recessed within said resilient padding, the outer edges of said resilient padding engaging said first and second arm assemblies and being compressed to resiliently force said male and female connectors into secure engagement with each other.

#### 4,165,903 MINE ENHANCED HYDROCARBON RECOVERY TECHNIQUE

James H. Cobbs, 5021 S. Fulton St., Tulsa, Okla. 74135

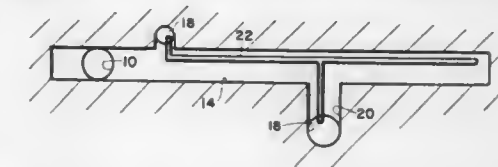
Filed Feb. 6, 1978, Ser. No. 875,427  
Int. Cl.<sup>2</sup> E21C 41/10

U.S. Cl. 299-2

6 Claims

1. A method of extracting from an underground strata hydrocarbons having high in situ viscosity comprising:  
(1) forming a vertical access shaft from the earth's surface to a point below the strata, the diameter of the vertical access

- shaft being sufficient to permit passage of workmen and machinery;  
(2) mining a horizontal tunnel from the vertical access shaft to a position under the strata;  
(3) establishing at least one drilling station in said horizontal tunnel;  
(4) drilling upwardly from each drilling station a plurality of wells into the strata; the drilling including directionally drilling the wells so that each well enters the bottom of the



- strata spaced apart from the other wells, and each well penetrates the strata substantially vertically and extends to the top of said strata;  
(5) injecting a viscosity reducing agent through at least one well to reduce hydrocarbons in the strata to free flowing liquids;  
(6) withdrawing the free flowing hydrocarbons from the strata through at least one of the wells; and  
(7) pumping the withdrawn free flowing hydrocarbon to the earth's surface.

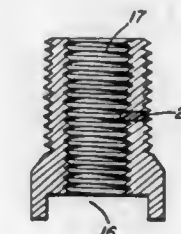
#### 4,165,904 WHEEL ADAPTOR DEVICE

Merlyn R. Reppert, E. Rancho Palos Verdes, Calif., assignor to W. R. Grace & Co., Columbia, Md.  
Continuation of Ser. No. 565,352, Apr. 7, 1975, Pat. No. 4,036,530, which is a continuation-in-part of Ser. No. 521,026, Nov. 5, 1974, abandoned. This application Jul. 14, 1977, Ser. No. 807,832

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.  
Int. Cl.<sup>2</sup> B60B 3/16

U.S. Cl. 301-9 DN

7 Claims



1. An adaptor bolt for mounting a vehicle wheel having a circle or round mounting holes therein onto a circle of vehicle wheel mounting studs, wherein said mounting holes and said studs are equal in number but may be located on different diameter circles, said adaptor bolt comprising an internally threaded bore for cooperation with a mounting stud, said bolt being formed with external threads to mate with means to hold said wheel on said stud, said bolt being small enough to fit entirely through a wheel mounting hole, said internally threaded bore being eccentrically located in said adaptor bolt with respect to said external threads whereby an equal number of said adaptor bolts alone can mount a wheel formed with said circle of round openings onto any one of a plurality of different circle diameter but equal number wheel mounting studs, and means to increase the friction between said stud and said internally threaded bore.

**4,165,905**  
**VEHICLE DECELERATION RESPONSIVE PRESSURE**  
**MODULATING VALVE AND VEHICLE BRAKE SYSTEM**  
**INCLUDING THE SAME**

Yoshiro Morimoto, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

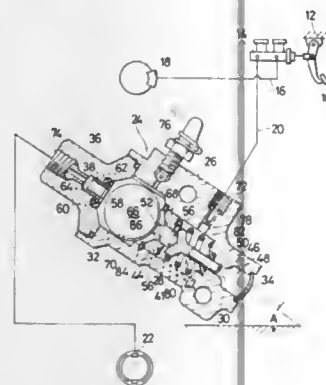
Filed Apr. 28, 1977, Ser. No. 792,005

Claims priority, application Japan, Apr. 30, 1976, 51-49430

Int. Cl.<sup>2</sup> B60T 8/14

U.S. Cl. 303—24 F

10 Claims



1. In a pressure modulating valve for a vehicle braking system including a master cylinder and a rear brake cylinder, comprising:

a valve body including a first chamber, a second chamber, an inlet port connected to said master cylinder and in communication with said first chamber, an outlet port connected to said rear brake cylinder and in communication with said chamber and a passage connecting said first and second chambers;

valve means for controlling fluid flow through said passage, said valve means comprising a stationary valve seat and an inertia valve member disposed in said first chamber normally permitting communication between said first and second chambers through said passage, but adapted to cooperate with said valve seat to cut off communication between said first and second chambers and to roll on an inclined surface in said first chamber;

a control piston;

a first spring having one end abutting said valve body and the other end abutting said control piston to bias said control piston in one direction; said control piston being movable in the opposite direction to said one direction against said first spring in response to pressure within said first chamber; the improvement comprising

a second spring operatively disposed between said control piston and said inertia valve member; and

said control piston and second spring being positioned, with respect to said inertia valve member and stationary valve seat, to prevent said inertia valve member from cooperating with said valve seat under the influence of the weight of said valve member and said second spring and the loading on said inertia valve member by said second spring varies in response to movement of said control piston.

**4,165,906**  
**TRACK SHOE HAVING REPLACEABLE PAD**  
 Joseph O. Fix, Maybee, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1978, Ser. No. 878,036

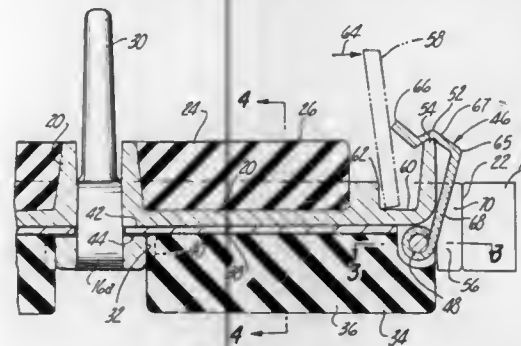
Int. Cl.<sup>2</sup> B62D 55/28

U.S. Cl. 305—51

6 Claims

1. An endless track for a tracked vehicle, comprising a number of shoes hingedly connected together about axes extending normal to the track path; each shoe having a first major face

thereof presented to the road wheels, a second major face thereof directed toward the terrain, and at least one outer side surface joining said first and second faces; each shoe having at least one cavity in its second face; an elastomeric resilient pad removably fitting within each cavity, each pad being thicker than the depth of the cavity whereby the terrain is contacted by the exposed face of the pad rather than the second face of the shoe; each cavity being remote from the outer side surface of the shoe so that the cavity side surfaces prevent the pad



from shifting out of the cavity parallel to the shoe second face; and means for detachably locking each pad against movement out of the cavity normal to the shoe second face; said locking means comprising a latch element swingably connected to the pad at one of its side edges; the shoe having a notch therein connecting the cavity and the shoe outer side surface whereby the latch element is enabled to swingably move through said notch to a position extending along the shoe side surface; the free end of the latch element being intumed to hook over one edge of the shoe, thereby locking the pad within the cavity.

**4,165,907**  
**PULL-OUT GUIDE FOR DRAWERS OR THE LIKE**  
 Erich Rück, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

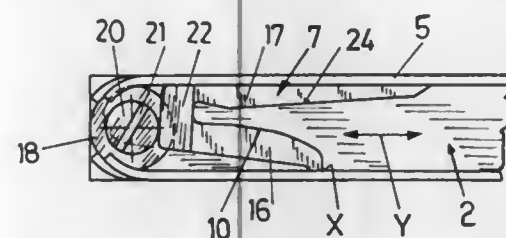
Filed Dec. 2, 1977, Ser. No. 857,195

Claims priority, application Austria, Dec. 10, 1976, 9177/76

Int. Cl.<sup>2</sup> F16C 29/04

U.S. Cl. 308—3.8

10 Claims



1. In a drawer pull-out guide for use on opposite sides of a drawer which may be pulled out and pushed into an article of furniture, said guide including an elongated supporting rail adapted to be attached to a body of an article of furniture, said supporting rail having a U-shaped profile including upper and lower substantially horizontally extending flanges and a substantially vertically extending web joining said upper and lower flanges; an elongated pull-out rail adapted to be attached to a drawer of the article of furniture, said pull-out rail including a substantially horizontally extending middle flange positioned between said upper and lower flanges of said supporting rail and a substantially vertically extending wall depending downwardly from said middle flange; a roller carrier longitudinally movably positioned within said supporting rail and supporting three longitudinally spaced groups of rollers, each said group of rollers including at least one roller, first and second of said groups of rollers being positioned between said lower

flange of said supporting rail and said middle flange of said pull-out rail, a third of said groups of rollers being positioned between said middle flange of said pull-out rail and said upper flange of said supporting rail, and said third group being longitudinally located between said first and second groups; and said pull-out rail and said supporting rail each having opposite rear and front ends, said pull-out rail being longitudinally slidable with respect to said supporting rail between a drawer pushed-in position whereat said rear and front ends of said pull-out rail are positioned adjacent said rear and front ends, respectively, of said supporting rail, and a drawer pulled-out position whereat said rear and front ends of said pull-out rail are longitudinally outwardly spaced from said rear and front ends, respectively, of said supporting rail; the improvement comprising:

stop means, supported adjacent one of said front end of said pull-out rail and said rear end of said supporting rail, for receiving and vertically supporting one of said front end of said lower flange of said supporting rail and said rear end of said middle flange of said pull-out rail, respectively, when said pull-out rail is in said drawer pushed-in position, said stop means having a fork-shaped configuration including an open mouth defined by upper and lower prongs, said mouth facing said one of said front end of said lower flange of said supporting rail and said rear end of said middle flange of said pull-out rail when said pull-out rail is being moved toward said drawer pushed-in position; and

means, connected to said stop means, for selectively adjusting the relative vertical height of said stop means, and for thereby selectively adjusting the relative vertical alignment of said pull-out rail with respect to said supporting rail when said pull-out rail is in said drawer pushed-in position.

**4,165,908**  
**INTERLOCKING DEVICE FOR PORTABLE FOOD SERVICE CABINETS**

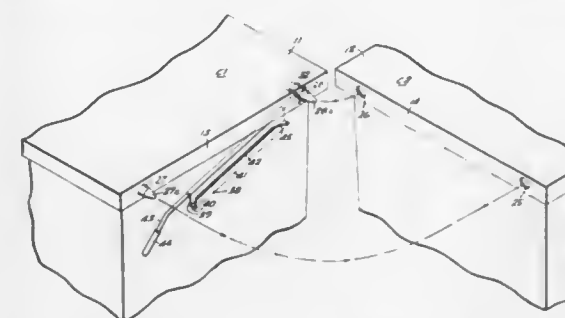
Frank W. Cooper, Fort Lauderdale, and Arthur B. Dixon, Jr., Coral Gables, both of Fla., assignors to Shelley Manufacturing Company, a division of Alco Food Service Equipment Company, Miami, Fla.

Filed Aug. 14, 1978, Ser. No. 933,455

Int. Cl.<sup>2</sup> F16B 12/38; A47B 87/00

U.S. Cl. 312—111

8 Claims



1. In an interlocking device for joining a pair of rectangular portable food service cabinets the upper surfaces of which are of sheet metal or the like having turned down marginal skirt portions, the improvement comprising, a first elongated support member secured in face-to-face relation against the inner surface of a transverse turned down skirt portion of one of the cabinets to be interlocked, a second elongated support member secured in face-to-face relation against the inner surface of a mating transverse turned down skirt portion of the other of the cabinets to be mutually interlocked, a pair of locating pins extending outwardly of said first elongated support member and its associated turned down marginal skirt portion, the outer ends of said locating pins being conically rounded, a pair of complementary through openings in said second elongated member and its associated turned down skirt portion for the

reception of one each of the outwardly extending ends of said locating pins, an elongated interlocking clamp member of U-shaped cross-sectional configuration, and manually controlled means for moving said interlocking clamp member, selectively, into and out of straddling interclamping relation with respect to said first and second support members and said mating turned down skirt portions of said cabinet top after having been brought into face-to-face interfitted relation with said locating pins received within said complementary through openings.

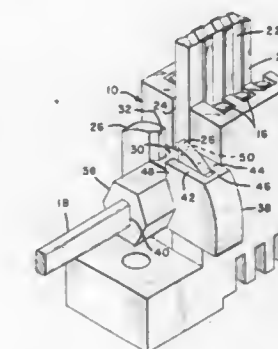
**4,165,909**  
**ROTARY ZIF CONNECTOR EDGE BOARD LOCK**  
 Marvin L. Yeager, Carlisle, and Jerome A. Desso, Steelton, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 9, 1978, Ser. No. 876,458

Int. Cl.<sup>2</sup> H01K 13/20

U.S. Cl. 339—75 MP

2 Claims



1. An end loading, rotary cam actuated, zero insertion force edge board connector having means to lock a circuit board therein, comprising:

an elongated connector housing having an elongated board receiving recess in one longitudinal surface;

a plurality of electrical terminals mounted in said housing in parallel spaced relationship along at least one elongated side of said recess;

an elongated cam member rotatably mounted in said housing extending along the bottom of said recess;

a terminal actuation member driven by said cam member and acting on said terminals to move them between a first position in engagement with pads of a circuit board received in said connector and a remote out of contact position;

a slot in one end of said housing forming an extension of said recess;

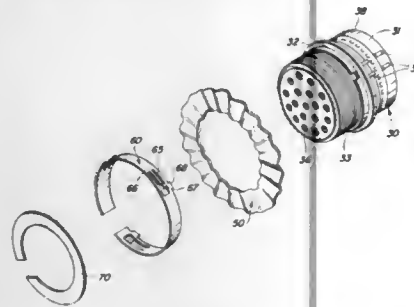
lock guide means having a pair of aligned flanges spaced from an end of said housing by an integral shoulder, said flanges defining therebetween a further slot aligned with the first slot; and

a locking member adapted to be mounted on said lock guide means for rotation with said cam member, said locking member having a driving portion and an abutment portion, said driving portion having a profiled bore receiving at least a portion of said cam member therein and an external driving profile adapted to receive a driving means, said abutment portion having a pair of radial flange members one of which is integrally connected by one end to said driving portion, the other ends of said flanges being connected in parallel spaced relation by a bight, said flanges being asymmetric with said driving portion and spanning said lock guide means and engaging said shoulder upon rotation of said cam to a contact engaging position, said flanges engaging a mispositioned circuit board preventing rotation of said cam actuation means.



**4,165,910**  
**ELECTRICAL CONNECTOR**  
 Norman R. Anderson, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.  
 Filed Oct. 25, 1977, Ser. No. 844,554  
 Int. Cl.<sup>2</sup> H01R 13/54  
 U.S. Cl. 339—89 M

17 Claims



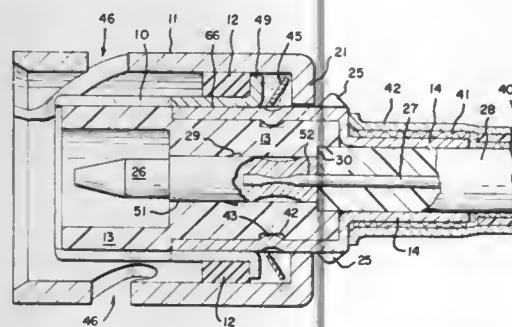
15. An electrical connector comprising complementary receptacle and plug connector members, each member comprising a hollow shell containing an insulating insert, each of said inserts supporting at least one electrical contact therein with the contacts being adapted for axial connection in electrical engagement with a corresponding contact of the opposing insert;

a rotatable coupling ring carried by one of said shells and engageable with said other shell for mating said connector members and holding the contacts therein in engagement; and

detent means disposed between said coupling ring and said one shell and having a predetermined range or radial movement, said coupling ring having at least one axial slot formed in the inner wall thereof and extending forwardly from the rearward end of the coupling ring, said detent means being readily removable through said rearward end for replacement purposes without dismantling said connector when fully mated, and said detent means being releasably engageable with said slot when said connector is fully mated to preclude unintentional uncoupling of said connector.

**4,165,911**  
**ROTATING COLLAR LOCK CONNECTOR FOR A COAXIAL CABLE**  
 Ronald C. Laudig, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.  
 Filed Oct. 25, 1977, Ser. No. 844,870  
 Int. Cl.<sup>2</sup> H01R 13/54, 17/04  
 U.S. Cl. 339—89 C

1 Claim

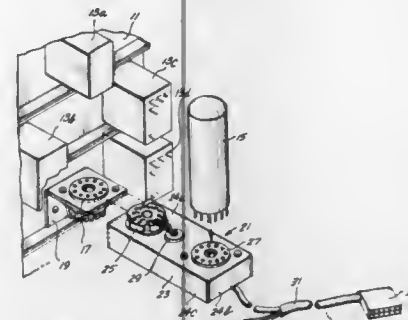


1. A connector for a coaxial cable, comprising:  
 A seamless metal first shell having a reduced cylindrical first section and an enlarged cylindrical second section provided with a lip,

said first shell having a radial shoulder at the junction of said first and second sections,  
 a one piece dielectric spacer having a reduced cylindrical first portion slideable along and intimately encircled by said second section and impinged against said shoulder, said spacer including an enlarged cylindrical second portion projecting outwardly of said second section and having a radial shoulder seated against said lip,  
 a coupling sleeve having at one end a radially inwardly projecting flange freely rotatably received over said second section,  
 a seamless second shell slideably received over and intimately encircling said second portion and said second section and being press fit over said second section,  
 a radially outwardly projecting flange on said second shell cooperating with the flange of said sleeve to form an annular cavity,  
 a spring washer received in said cavity,  
 said spacer having a coaxial bore therethrough provided with a first counterbore in an end of said first portion and second counterbore in an end of said second portion,  
 a coaxial cable having a center conductor protruding from an end of an encircling dielectric layer and an encircling conductive sheath,  
 said sheath being received over said first section and being electrically connected thereto,  
 said center conductor being connected to an elongated metal contact,  
 said contact being slideably received in said bore and projecting outwardly into said second counterbore, and  
 said end of said dielectric layer projecting through said first section and being intimately encircled by said first counterbore.

**4,165,912**  
**OFFSET ADAPTER CONNECTOR**  
 Ardell T. Dyste, and Raymond Ma, both of Seattle, Wash., assignors to Tel-Tone Corporation, Kirkland, Wash.  
 Filed Nov. 7, 1977, Ser. No. 848,822  
 Int. Cl.<sup>2</sup> H01R 33/94  
 U.S. Cl. 339—156 T

6 Claims

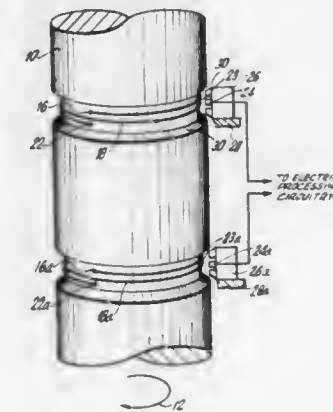


1. An offset adapter connector suitable for insertion between a plug-in device and the socket into which said plug-in device is normally plugged, said offset adapter connector comprising:  
 a housing including a main wall and a pair of parallel side-walls projecting transversely outwardly from said main wall;  
 a plug mounted in said main wall of said housing such that the prongs of said plug project outwardly from said main wall so as to lie inside said housing, between said side-walls of said housing;  
 a socket mounted in said main wall of said housing so as to be offset from said plug and such that the prong receiving apertures of said socket receive the prongs of a plug-in device from a direction opposite to the direction in which said prongs of said plug project;  
 an aperture in said main wall between said plug and said socket;

internal connecting means for selectively connecting said prongs of said plug to said prong receiving apertures of said socket comprising a plurality of wires passing through said aperture; and,  
 external circuit connecting means for making connections to electronic circuitry connected to selected ones of said prongs of said plug and to selected ones of said prong receiving apertures of said socket.

**4,165,913**  
**ROTARY OPTICAL COUPLER**  
 Arthur H. Fitch, Berkeley Heights, N.J., assignor to Lockheed Electronics Company, Inc., Plainfield, N.J.  
 Filed May 18, 1977, Ser. No. 797,912  
 Int. Cl.<sup>2</sup> G02B 5/14  
 U.S. Cl. 350—96.15

7 Claims



1. Data coupling apparatus for transmitting data generated on one of a rotating member and a nonrotating member to the other of said member, said apparatus comprising an optical fiber carried by one of said rotating and nonrotating members and adapted to receive optical signals at one axial end thereof, optical detecting means in optical communication with the outer wall surface of said optical fiber and carried by the other of said rotating and non-rotating members, the outer wall surface being modified to allow a portion of light propagating axially through said optical fiber to pass through said outer wall surface to said optical detecting means, in which said rotating member is a rotating shaft, said optical fiber being disposed about the periphery of said shaft and rotating therewith.

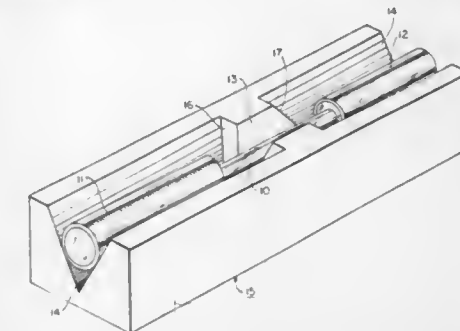
**4,165,914**  
**ACCESS COUPLER AND DUPLEX COUPLER FOR SINGLE MULTIMODE FIBER TRANSMISSION LINE**  
 Carl A. Villarruel, Alexandria, Va., and A. Fenner Milton, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1978, Ser. No. 868,361  
 Int. Cl.<sup>2</sup> G02B 5/14  
 U.S. Cl. 350—96.16

5 Claims

1. A fiber optic coupler for an optical transmission line comprising:  
 a fiber holder,  
 said fiber holder including a first section and a second section,  
 said first section having a V-shaped groove therein,  
 said second section having V-shaped groove therein with the V-shaped groove in alignment with said first-section groove with the depth and width of said second-section groove less than the depth and width of said first-section groove, the junction of said first-section groove with said second-section groove forming a first sloped angular end with the slope toward said second-section groove;

a first single optical fiber positioned in said first-section groove,  
 a second single optical fiber, of smaller cross-sectional dimension than said first optical fiber, positioned in said second section groove, said second optical fiber including first and second ends with said first end abutting one end of said first single optical fiber and in optical alignment therewith;



whereby optical radiation may be transmitted through said second single optical fiber directly into one end of said first single optical fiber and a portion of any radiation directed toward said second single optical fiber through said first single optical fiber surrounding said first single optical fiber is reflected outward by the first sloped angular end, and radiation directed onto said first sloped angular end is reflected into the end portion of said first optical fiber that surrounds said second optical fiber.

**4,165,915**  
**LIGHT CONDUCTING FIBER**  
 Karlheinz Rau, Hanau; Albert Mühlich, Frankfurt; Fritz Simmat, Gelnhausen, and Norbert Treber, Krißel, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany  
 Filed Aug. 11, 1976, Ser. No. 713,479  
 Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536456  
 Int. Cl.<sup>2</sup> G02B 5/14; C03C 25/02  
 U.S. Cl. 350—96.34

13 Claims



1. A semiproduct for use in the manufacture of light conducting fibers comprising a core selected from the group consisting of synthetic quartz glass containing a minor amount of a refractive index increasing material and a material consisting essentially of synthetic quartz glass having a thickness of 6 to 400 mm obtained from gaseous silicon halide, said quartz glass containing less than 10 ppm hydroxyl ions and having, in the near infrared spectral range an optical loss totaling less than 4 dB/km, measured in the mass, said core fused with a jacket having a wall thickness of 2 to 20 mm and selected from the group consisting of a material comprising synthetic quartz glass and a material consisting essentially of synthetic quartz glass, obtained from gaseous silicon halide containing more than 4000 ppm of fluorine, said jacket having a length of at least 200 mm.

4,165,916

# OBJECTIVE LENS SYSTEM WITH CLOSE OBJECT FOCUSING ABERRATION CORRECTION

Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

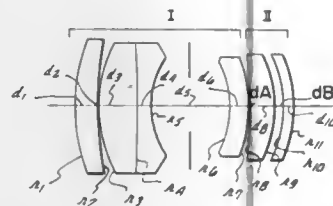
Filed Jul. 13, 1977, Ser. No. 815,376

Claims priority, application Japan, Jul. 16, 1976, 51/85244

Int. Cl.<sup>2</sup> G02B 9/62, 9/60

U.S. Cl. 350—215

14 Claims



1. An objective lens system for cameras with a close focusing capability comprising:
  - a first lens group including an aperture stop;
  - a second lens group of an overall positive refractive power spaced from the image side of the first lens group to form a first air space, the second lens group consisting of a first lens sub-group of positive refractive power having an image side convex surface and a second lens sub-group of negative refractive power having an object side concave surface and an image side convex surface, the first and second lens sub-groups being spaced from each other to form a second air space, and
  - compensation means for increasing the relative first air space displacement of the first lens group and the first lens sub-group when the object distance of the lens system is decreased during focusing and decreasing the relative second air space between the first and second lens sub-groups to compensate for aberrations resulting from focusing on a close object.

4,165,917

# OBJECTIVE FOR ENDOSCOPES

Nobuo Yamasita, Tama, and Miwako Unami, Yokohama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

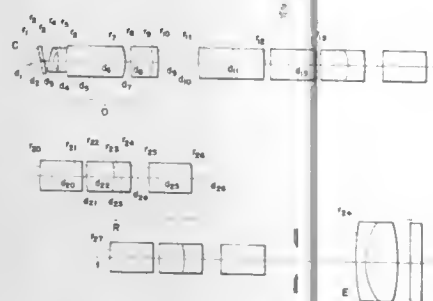
Filed Apr. 4, 1977, Ser. No. 784,427

Claims priority, application Japan, Apr. 5, 1976, 51-37979

Int. Cl.<sup>2</sup> G02B 9/12

U.S. Cl. 350—225

9 Claims



1. An objective for endoscopes to be used in such endoscope arranged to transmit an image of an object in turn by a plural number of relay lens groups and comprising a front diverging lens group having negative refractive power and a rear converging lens group comprising a positive lens and a positive cemented doublet having a cemented surface, said cemented surface having negative refractive power, said objective for endoscopes satisfying the following conditions:
  - (1)  $-0.7 \leq P_O/MP_R \leq -0.35$
  - (2)  $-0.75 \leq f/f_O \leq -0.4$

(3)  $0.6 \leq |r_a/f_O| \leq 1.2$

wherein reference symbol  $P_O$  represents Petzval's sum of the objective, reference symbol  $P_R$  represents Petzval's sum of one relay lens group, reference symbol  $M$  represents the number of relay lens groups, reference symbol  $f_i$  represents the focal length of the front diverging lens group, reference symbol  $f_O$  represents the focal length of the objective, and reference symbol  $r_a$  represents the radius of curvature of the cemented surface of the cemented doublet in the rear converging lens group.

4,165,918

# THERMAL COMPENSATOR ASSEMBLY

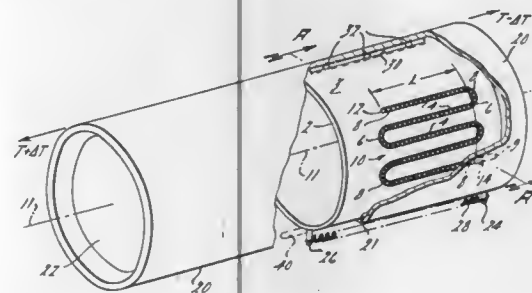
Isabel L. Moreno, Oceanside, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Dec. 14, 1977, Ser. No. 860,345

Int. Cl.<sup>2</sup> G02B 7/02

U.S. Cl. 350—253

14 Claims



1. A thermal compensator assembly for use in an optical lens system comprising:
  - lens means for focusing an image at a predetermined location;
  - means for holding said lens means;
  - means for supporting said holding means, said supporting means being relatively fixed with respect to said holding means and including at least one serpentine channel defined thereon;
  - said thermal compensator assembly being mounted on said support means in contact with said holding means to effect relative movement between said supporting means and said holding means in response to changes in temperature; and
  - said assembly including a series of elements occupying said at least one serpentine channel and means for biasing said holding means in contact with the last element of said series wherein said supporting means and said elements are made of materials having respectively different linear coefficients of thermal expansion and said relative movement is a result of the difference between said linear coefficients of thermal expansion as a function of a change in ambient temperature.

4,165,919

# ADJUSTABLE OPTICAL FILTER

Robert T. Little, 160 Columbia Heights, Brooklyn, N.Y. 11201

Filed Aug. 9, 1977, Ser. No. 823,030

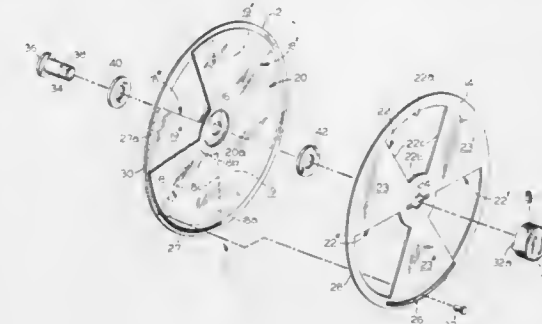
Int. Cl.<sup>2</sup> G05D 25/00

U.S. Cl. 350—273

22 Claims

1. An adjustable solar filter assembly for a telescope having an exterior lens comprising:
  - (a) a support for detachably mounting said filter assembly in the path of light rays being gathered by the telescope, said support including a mounting fixture for engagement upon the exterior surface of the exterior lens of the telescope near the center thereof but for substantial freedom therefrom circumferentially and a support member, said mounting fixture and said support member being releasably engaged;

- (b) a first opaque shield member extending substantially concentrically about said support member and having at least one light passing opening therein and being dimensioned and configured to traverse the optical aperture of the associated telescope, said opening having a radial dimension which defines the effective optical aperture provided by the solar filter;
- (c) a light-transmitting filter element overlying said opening and having a light blocking metallic component to reduce the amount of light transmitted through said filter element;



- (d) a second opaque shield member extending substantially concentrically about said support member and having an opaque portion dimensioned and configured to overlie at least part of said opening; and
- (e) means mounting said shield members on said support member and permitting rotation of said shield members relative to each other, said second shield member thereby being movable relative to said first shield member to overlie and thereby close selected portions of said opening to reduce passage of light therethrough without reducing said radial dimension of said opening.

4,165,920

# ECHO REDUCTION IMPROVEMENT IN A FRONT FACE GLARE REDUCTION OVERLAY

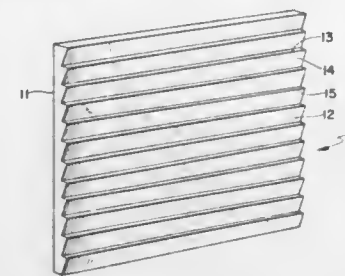
John W. Brown, Flemington, N.J., assignor to Qantix Corporation, Flemington, N.J.

Filed Jul. 27, 1977, Ser. No. 819,561

Int. Cl.<sup>2</sup> G02B 27/00

U.S. Cl. 350—276 R

10 Claims



1. An overlay for use on a transmission screen to reduce reflection due to ambient light by directing the major portion of reflections from the viewing surface away from a desired viewing area, said overlay comprising a sheet of transparent material having a substantially planar back surface and a front surface including a first plurality of surfaces substantially perpendicular to said back surface and a second plurality of surfaces inclined outwardly with respect to said back surface, said first and second plurality of surfaces meeting at a respective plurality of peaks, and said desired viewing area being in front of said overlay, wherein the improvement comprises:
  - a coating of opaque material on said second plurality of surfaces, said coating extending from said peaks a sufficient distance along said surfaces of said second plurality to block the transmission of echo images emanating from

an object behind said front surface to said desired viewing area.

4,165,921

# HORIZONTALLY AND VERTICALLY ADJUSTABLE MIRROR MOUNTING

Jerry Kirsch, 36 Beacon Hill, Grosse Pointe Farms, Mich. 48236

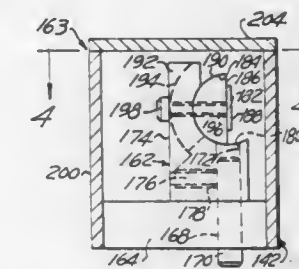
Division of Ser. No. 777,901, Mar. 16, 1977, Pat. No. 4,107,539.

This application Jul. 11, 1978, Ser. No. 923,578

Int. Cl.<sup>2</sup> G02B 7/18

U.S. Cl. 350—288

5 Claims



1. A horizontally and vertically adjustable mirror mounting structure, comprising
  - a base,
  - a vertical pivot element mounted on said base,
  - an upstanding mirror holder support mounted on said pivot element for horizontal rotational adjustment relatively to said base and having a horizontal partly cylindrical recess disposed horizontally thereacross,
  - a mirror holder having on one side thereof a mirror mounting surface and having on the opposite side thereof a horizontal partly cylindrical convex surface disposed in mating engagement with said horizontal partly cylindrical recess for vertical rotational adjustment relatively to said base,
  - one arm for locking said mirror holder support in its horizontally-rotated position of adjustment relatively to said base, and
  - means for locking said mirror holder in its vertically-rotated position of adjustment relatively to said base.

4,165,922

# LIQUID CRYSTAL CELL

Joseph H. Morrissey, Thaxted, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,201

Claims priority, application United Kingdom, May 4, 1976, 18157/76

Int. Cl.<sup>2</sup> G02F 1/13

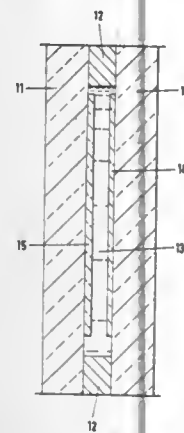
U.S. Cl. 350—341

2 Claims

1. A field effect scattering mode liquid crystal cell comprising:
  - two electroded plates, at least one of which is transparent;
  - a layer of high resistivity nematic liquid crystal medium sandwiched between the electroded plates, said medium comprising cyano biphenyl; and
  - surface alignment means for the liquid crystal layer on at least one of said plates such that by the application or removal of an electric potential between the electrodes, the nematic direction of at least a portion of the layer can



be switched between homeotropic alignment and homogeneous random alignment, said surface alignment means



comprising a coating obtained from chloro trimethyl silane.

4,165,923

**LIQUID CRYSTAL ALIGNMENT STRUCTURE**

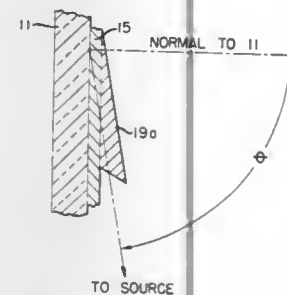
John L. Janning, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 769,257, Feb. 16, 1977, which is a continuation of Ser. No. 480,666, Jun. 19, 1974, which is a division of Ser. No. 386,472, Aug. 7, 1973, Pat. No. 3,834,792, which is a continuation of Ser. No. 242,675, Apr. 10, 1972, abandoned. This application Aug. 7, 1978, Ser. No. 931,583

Int. Cl.<sup>2</sup> C09K 3/34; B05D 5/12; C23C 11/00

U.S. Cl. 350—341

18 Claims



1. A structure adapted to produce a preferential orientation of molecules of a selected liquid crystal material placed in contact therewith comprising:

- a transparent substrate having at least one major flat planar surface;
- a transparent film of a selected alignment material deposited on said one major surface at a selected acute angle of from about 10° to about 89° to a line normal to said surface and adapted to contact said liquid crystal material.

4,165,924

**OPHTHALMIC INSTRUMENT SUPPORT**

Richard C. Mohrman, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,951

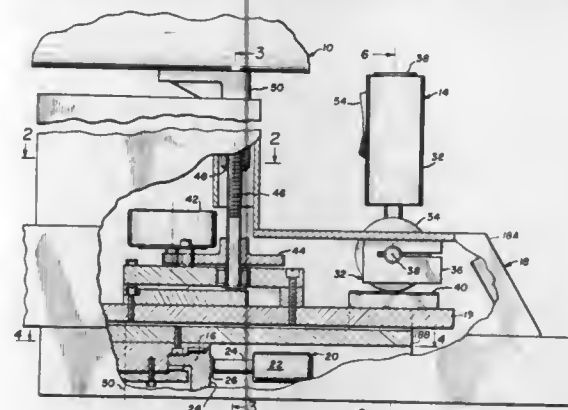
Int. Cl.<sup>2</sup> A61B 3/10

U.S. Cl. 351—38

14 Claims

1. An ophthalmic instrument support apparatus, comprising: container means for enclosing ophthalmic instrumentation; fixed support means for supporting said container means; movable support means for moving said container means relative to said fixed support means; said movable support means having an electric motor at-

tached thereto in order to facilitate movement of said container means in a first dimension; said movable support means comprising a lower portion for movement of said container in a second dimension relative to said fixed support means, said lower portion of said movable support means being rotatable on a horizontal plane about a vertical axis of rotation on said fixed support means so as to effect movement of said container in



said second dimension, and an upper portion for movement of said container in a third dimension relative to said fixed support means; and control means for controlling the movement of said container means through an electromechanical control rod, said control rod having first switching means attached thereto for activating and deactivating said motor thereby moving said container means in a first dimension.

4,165,925

**SPECTACLES AND KIT FOR MAKING SAME**

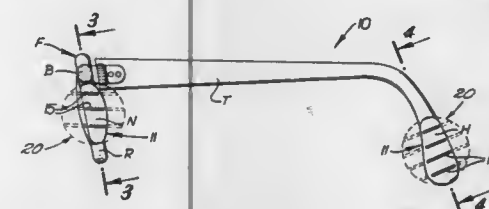
LeRoy B. Donovan, Box 633, Lake Arrowhead, Calif. 92352

Filed Mar. 18, 1977, Ser. No. 779,809

Int. Cl.<sup>2</sup> G02C 1/00, 5/14

U.S. Cl. 351—87

6 Claims



1. In a kit for modifying a pair of spectacles to increase their capacity to adhere to the wearer and wherein said spectacles (S) already embody a frame (F) including two rims (R) in which two lenses are framed, a bridge (B) connecting said rims to form oval upwardly converging nose engaging areas (N), a pair of temples (T) hinged rearwardly from said frame ends to extend over the ears and inwardly to press oval areas (H) against temporal portions of the head, said kit comprising:

- four like circular patches of thin flexible molded sheet plastic, the diameter of said patches permitting each of said oval spectacle pressure areas (N) and (H) to fit lengthwise neatly diametrically within and crosswise of any one of said patches;
- multiple, sharply narrow edged, parallel, shallow, widely spaced ridges formed integrally on the upper face of each of said patches;
- a thin coating of pressure adhesive covering the bottom of each patch; and
- a neutral temporary non-adherent paper back covering said pressure adhesive coating on each patch, each patch being optionally adapted to overlie any one of said spectacle pressure areas and be rotated to properly

orient its ridges relative to said area for marking the outline of the latter on said patch for trimming the borders of said patch prior to removing said paper backing and sticking the trimmed and oriented patch to its area.

2. A pair of spectacles comprising:

a pair of eye lenses;

a plastic frame including a pair of rims within which said lenses are mounted and bridging said rims in co-planar spaced relation to present downwardly diverging nose engaging surfaces N which unite to support said frame in a given transverse plane 3—3 with said frame resting high on the wearer's nose with said surfaces N conforming substantially to said nose;

a pair of temples extending rearwardly from hinged connections on vertical axes with outer extremities of said frame, said temples overlying and engaging the wearer's ears and having their rear extremities resiliently biased inwardly to press substantial vertical inner surfaces H against the temporal areas of the head in a second transverse plane 4—4;

means forming a series of thin, vertically widely spaced, parallel, substantially horizontal, sharply narrow-edged plastic ridges united with said rims within the boundaries of said nose engaging surfaces N, said ridges effectively resisting said frame slipping from the position in which it is supported on said nose so long as said frame is restrained from shifting forwardly out of said given transverse plane; and

plastic ridge forming means united with said temples, within the boundaries of said temporal head area engaging surfaces, to produce vertically widely spaced and downwardly inclined shallow thin edged ridges so as to snugly restrain said spectacle frame from accidentally shifting forwardly out of said given transverse plane, clear air ventilating spaces being formed between said ridges in both said transverse planes measuring one-sixteenth inch by one-fourth inch, said spaces freely ventilating the ridge supporting nose and head skin areas.

4,165,926

**TRIGGER DEVICE FOR SOUND MOTION PICTURE CAMERAS**

Hiroyuki Tsumazawa, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

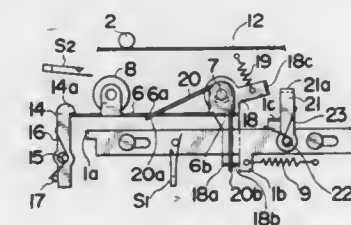
Filed Jan. 5, 1978, Ser. No. 867,036

Claims priority, application Japan, Jan. 10, 1977, 52/1869[U]

Int. Cl.<sup>2</sup> G03B 31/02

U.S. Cl. 352—27

6 Claims



1. In a sound motion picture camera which includes a capstan drive means and a claw and shutter drive means, a trigger device comprising:

- a reciprocating trigger member;
- means for actuating said capstan drive means to rotate said capstan at an initial stage of advancing movement of said trigger member;
- a pinch roller holder pivotally supporting a pinch roller and being movable between an advanced position wherein said pinch roller is in resilient contact with said capstan and a retracted position wherein said pinch roller is separated from said capstan;
- first locking means for releasably locking said pinch roller holder at its retracted position, said first locking means

being disposed in the path of the advancing movement of said trigger member so as to be disabled by said trigger member at a final stage of the advancing movement;

first spring means coupled with said pinch roller holder and capable of urging said pinch roller holder towards said advanced position when loaded;

a movable member coupled with said first spring means and capable of being coupled with said trigger member at least upon the advancing movement of said trigger member, said movable member being movable from an initial position to a terminal position for loading said first spring means in response to the advancing movement of said trigger member, and also capable of being coupled with said pinch roller holder at least upon movement thereof from said terminal position to said initial position;

second spring means for urging said movable member towards said initial position; and

second locking means for releasably locking said movable member at said terminal position against the action of said second spring means, one of said movable member and said second locking means being supported on said trigger member such that said second locking means locks said movable member at the final stage of the advancing movement of said trigger member prior to the disablement of said first locking means, and said movable member being released from the locking by said second locking means upon returning movement of said trigger member, whereby said movable member is allowed to be moved to said initial position under the action of said second spring means, causing said pinch roller holder to move to said retracted position through the coupling with said movable member.

4,165,927

**PHOTOGRAPHIC SLIDE PROJECTOR**

Reinhard Sobotta, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

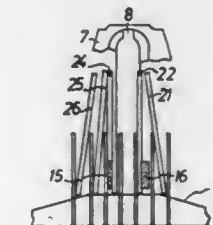
Filed May 19, 1977, Ser. No. 798,360

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623154

Int. Cl.<sup>2</sup> G03B 23/00

U.S. Cl. 353—104

10 Claims



1. A photographic slide projector of the type comprising means for guiding a magazine for feeding movement to bring successive slide compartments to a slide changing plane and slide changing means for moving a slide out of a compartment at said plane and returning a slide to such compartment, characterized by means mounted directly on the projector and remaining in fixed relation to the projector as the magazine moves past the projector for engaging upstanding edges of slides in compartments adjacent to a compartment arriving at said plane as a result of a feeding movement of the magazine, for placing said slides in said adjacent compartments in a substantially upright position so that they will not overlie the compartment at said plane.

4,165,928

**SLIDE PROJECTOR DRIVE MECHANISM FOR A CIRCULAR MAGAZINE**

Roland Schirmmayer, Ulm, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

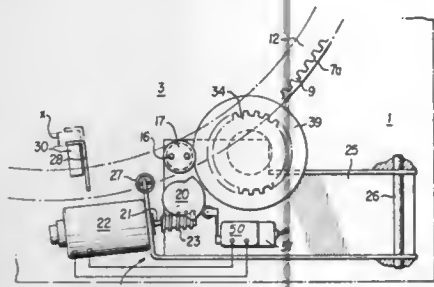
Filed Aug. 4, 1978, Ser. No. 931,132

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1978, 2735309

Int. Cl.<sup>2</sup> G03B 23/06

U.S. Cl. 353—117

20 Claims



1. A slide projector adapted for accepting a first circular slide magazine of the type including a circular housing adapted for rotational mounting on the projector and a plurality of slide-accepting compartments uniformly spaced in circular arrangement in the housing, wherein the outer circumferential wall of the housing comprises an approximately h-shaped configuration having a pair of forked inner and outer wall parts in coaxial spaced relationship located near the axial end of the housing which abuts the projector, the outer wall part having on its side facing the inner wall part a plurality of recesses corresponding in number to the slide compartments, with each recess being associated with one of the slide compartments, said slide projector comprising:

- (a) a projector housing for accepting the aforesaid slide magazine; and
- (b) a first drive mechanism for selectively rotating the slide magazine, said drive mechanism comprising
  - a drive member mounted for rotation on said projector housing at a location adjacent the h-shaped wall configuration of a mounted slide magazine, and
  - at least one drive pin mounted eccentrically on said drive member substantially parallel to the axis of rotation of said drive member, for projecting into the space between the inner and outer wall parts of the h-shaped configuration, each drive pin being spaced from the axis of rotation of said drive member a distance sufficient to permit the drive pin to be inserted temporarily once during each rotation of the drive member into one of said recesses to displace said recess by a distance corresponding to the spacing of adjacent slide compartments, whereby the slide magazine will be rotated by a like distance.

4,165,929

**CAMERA WITH EXPOSURE CONTROL DEVICE**

Fumio Ito, Yokohama; Yukio Mashimo, Tokyo; Masayoshi Yamamichi, Kawasaki; Masami Shimizu; Hiroyasu Murakami, both of Tokyo, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,694

Claims priority, application Japan, Nov. 30, 1974, 49/138688; Dec. 5, 1974, 49/140183

Int. Cl.<sup>2</sup> G03B 7/08

U.S. Cl. 354—38

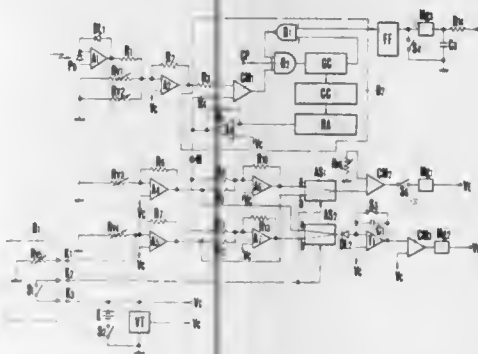
21 Claims

1. A camera which can select a shutter time priority photographing mode or an aperture priority photographing mode and can exchange its lenses, comprising:

- a. shutter means;
- b. shutter time setting means which can be set manually for

generating an electrical signal corresponding to the set shutter time;

- c. shutter control means which is electrically connected to the shutter time setting means for generating signal to control the operation of the shutter means;
- d. aperture means having an aperture and aperture presetting means for determining the opening of the aperture;
- e. means for measuring the light transmitted through a photographing lens of fully open aperture, wherein said means generates an electrical signal corresponding to the light transmitted through the photographing lens;
- f. aperture value setting means which can be set independently of the shutter time setting means and has a transducing means for generating an electrical signal corresponding to an aperture value;
- g. aperture control means which is electrically connected to



the aperture value setting means for generating a signal to control the operation of the aperture means;

- h. proper exposure amount detecting circuit means selectively and electrically connected either with the shutter time setting means or the aperture value setting means, wherein said means can be selectively connected either with the shutter control means or the aperture control means for producing a combination information output signal of the shutter value and the aperture value for giving a proper exposure in accordance with the light measuring means; and
- i. photographic mode effecting means which is electrically connected to the shutter control means and the aperture control means and is arranged to effectuate a setting value set through said shutter time setting means or said aperture value setting means according to a photographic mode selecting action performed.

4,165,930

**CAMERA HAVING A HOLOGRAPHIC INDICATOR**

Kazuya Matsumoto, Yokohama; Susumu Matsumura; Noriyuki Nose, both of Kawasaki, and Youshi Okuno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

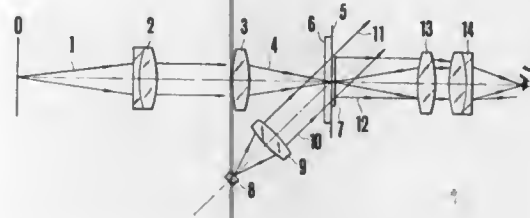
Filed Sep. 2, 1977, Ser. No. 830,036

Claims priority, application Japan, Sep. 7, 1976, 51-106886

Int. Cl.<sup>2</sup> G03B 17/20

U.S. Cl. 354—53

7 Claims



1. A camera comprising:

4,165,932

**DATA PRINTING DEVICE FOR CAMERA**

Seiji Asano, Okegawa, and Akio Ohmiya, Omiya, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

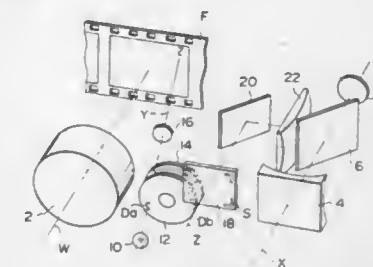
Filed May 10, 1977, Ser. No. 795,444

Claims priority, application Japan, May 12, 1976, 51-59687[U]

Int. Cl.<sup>2</sup> G03B 13/08, 17/24

U.S. Cl. 354—106

2 Claims



1. A data printing device for a camera in which a bright frame is provided to be viewed through a viewfinder of the camera and a diopter lens is provided between the bright frame and the eyepiece of the camera whereby the bright frame is viewed through the viewfinder together with the object to be photographed, said data printing device comprising data carrying means which carries a first group of data to be optically printed on the film in the camera and a second group of data to be viewed through the viewfinder characterized in that said data carrying means is located close to said bright frame so that both the data carried by the data carrying means and the bright frame are located within the range of diopter correction of said diopter correcting lens, and further characterized in that a light intercepting member is selectively put into a position to intercept light passing through the data carried by said data carrying means toward said eyepiece, thereby preventing the printing and viewing of the data, said light intercepting member being a rotatable member provided in parallel to said data carrying means, and having a light intercepting portion and a light passing portion selectively put into alignment with the optical path of the light passing through the data carried by said data carrying means.

4,165,933

**SINGLE LENS REFLEX CAMERA REMOVABLE VIEW FINDER**

Akio Sunouchi, Tokyo, and Yoshiaki Watanabe, Fujisawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1977, Ser. No. 837,013

Claims priority, application Japan, Oct. 1, 1976, 51-118337

Int. Cl.<sup>2</sup> G03B 13/06, 17/24, 19/12

U.S. Cl. 354—106

16 Claims

1. In a single lens reflex camera, a combination comprising:

- (a) a lens system for forming an image of an object, said lens system having an optical axis;
- (b) a camera body housing having a first and second opening;
- (c) first mounting means adapted for mounting the lens system on the camera body housing, said first mounting means being provided near said first opening; said lens system, when attached to the camera body housing through said first mounting means, being capable of forming the object image on a film within the camera body housing through the first opening;
- (d) movable mirror means disposed within the camera body housing and movable between a first position at which the mirror means deflects light coming through the lens system to said second opening and a second position at which the mirror means closes the second opening;

objective lens means for forming an image of an object; exposure control means associated with the lens means for determining the time and intensity of the image formed by said lens means, and

- a view finder having
- image-forming optical means for forming another image of the object on a plane
- a volume and phase recorded focused image hologram having at least one indicating mark recorded thereon, carrier means for holding said focused image hologram on the plane of the other image over-lapping the hologram with the image,
- illuminating means for illuminating the hologram and reconstructing the recorded mark, and
- optical means for viewing the reconstructed mark and the overlapped with the other imaged.

4,165,931

**SELF DEVELOPING TYPE PHOTOGRAPHIC APPARATUS**

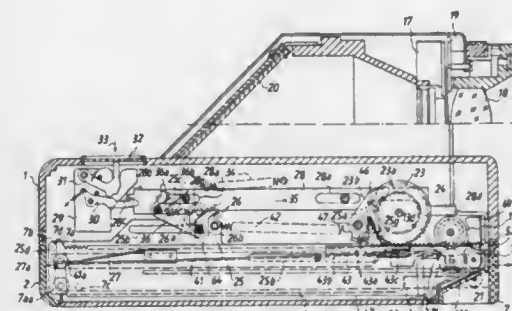
Günter Fauth, Unterhaching; Peter Lermann, Narring; Herbert Müller, Assling, and Franz Lechner, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Oct. 23, 1975, Ser. No. 621,247

Int. Cl.<sup>2</sup> G03B 17/52

U.S. Cl. 354—86

27 Claims



1. In a self developing type photographic apparatus for use with film units which are developed in response to expulsion from a container therefor, a combination comprising a housing having a chamber for containers and an outlet for successive exposed film units; a handle reciprocally mounted in the housing and movable extended and retracted positions said handle having at least one toothed rack extending in parallelism with the direction of reciprocatory movement of the handle; a pair of parallel spread rollers mounted in said housing and extending substantially at right angles to said direction, said rollers defining gap in line with said outlet; means for rotating one of said rollers in response to reciprocation of said rack so that said one roller advances a film unit which has been introduced into said gap toward and through said outlet while said handle moves toward said extended position; a rotary programming device receiving torque from said rack; means for expelling a freshly exposed film unit from a container in said housing into said gap; and control means receiving motion from said programming means to actuate said expelling means in response to rotation of said programming device during movement of said handle to said extended position.



the optical axis of the lens system being directed to the second opening by the mirror means when the mirror means is set to the first position;

- (e) a view finder unit housing removably attachable to the camera body housing, said unit housing being provided with a third opening corresponding to the second opening of the camera body housing and being provided with a fourth opening;
- (f) view finder optical means adapted for viewing the object image to be formed on the film by the lens system, through said fourth opening, said optical means being disposed within the view finder unit housing and having an optical axis projecting through said third opening of the unit housing;
- (g) second mounting means adapted for mounting the view finder unit housing on the camera body housing, said second mounting means being provided near said second opening of the camera body housing and having guide means being substantially parallel to the optical axis of the lens system;
- (h) engageable means corresponding to said guide means, said engageable means being provided on the view finder unit housing and engageable with the guide means for attaching the unit housing to the camera body housing; said view finder unit housing being attachable to the camera body housing through the engagement of the engageable means with the guide means by sliding the unit housing from the rear side of the camera body housing



to the front side of the camera body housing along a direction substantially parallel to the optical axis of the lens system;

- (i) first electrical terminal means disposed in the vicinity of said second opening of the camera body housing and in a position confronting the direction in which said view finder unit housing is mounted;
- (j) second electrical terminal means provided on a part of said view finder unit housing for contacting with said first terminal means when the view finder unit housing is attached to the camera body housing, said second terminal means being disposed in a position to confront said first terminal means when the view finder unit housing is attached to said camera body housing;
- (k) urging means for retaining contact between said first and second terminal means when the view finder unit housing is attached to the camera body housing, said urging means being arranged to urge at least one of the first and second terminal means against the other for retaining the first and second terminal means in contact with each other when the view finder unit housing is attached to the camera body housing;
- with said view finder unit housing attached to said camera body housing, said urging means is arranged to exert an urging force on said view finder unit housing in the direction opposite to the direction in which said view finder unit housing is attached to the camera body housing; and
- (l) releasable latching means provided between said view finder unit housing and said camera body housing for

firmly fixing said view finder unit housing to said camera body housing in a manually releasable manner, said latching means being provided with aligning means for aligning said view finder unit housing with said camera body housing through the urging force of said urging means to have the optical axis of the view finder optical means, which projects through the third opening of said view finder unit housing, aligned with the optical axis of said lens system which is directed to the second opening of said camera body housing by mirror means when said mirror means is in the first position thereof.

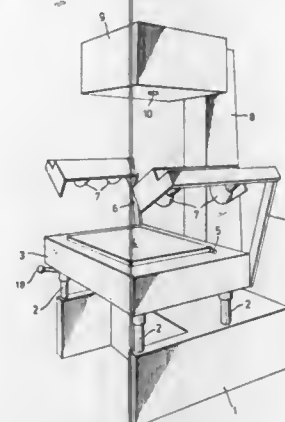
#### 4,165,934 MICROFILM CAMERA

Hans Zimmet, Dresden, German Democratic Rep., assignor to Veb Pentacon-Dresden Kamera-und Kinowerke, Dresden, German Democratic Rep.

Filed Dec. 21, 1977, Ser. No. 862,875  
Claims priority, application German Democratic Rep., Dec. 22, 1976, 196529[U]

Int. Cl.<sup>2</sup> G03B 27/52  
U.S. Cl. 355—55

3 Claims



1. In a microfilm camera including an exposure table, a support connected to said exposure table, a camera head mounted on said support, a film support surface provided in said camera head, a glass plate pivotally mounted on said exposure table, and a bearing plate positioned beneath said glass plate and spring loaded in a direction towards said glass plate, the improvement comprising adjustment means for changing the relative distance between said glass plate and said film support between first and second preselected focussing positions, whereby in said first position in-focus pictures of an original inserted between said bearing plate and the under surface of said glass plate can be taken and whereby in said second position in-focus pictures of an original placed on the upper surface of said glass plate can be taken.

#### 4,165,935 DIFFERENTIAL FLOAT CONTROL

Edgar A. Bongort, Southfield, and William T. Crulckshank, Pontiac, both of Mich., assignors to B/W Controls Inc., Birmingham, Mich.

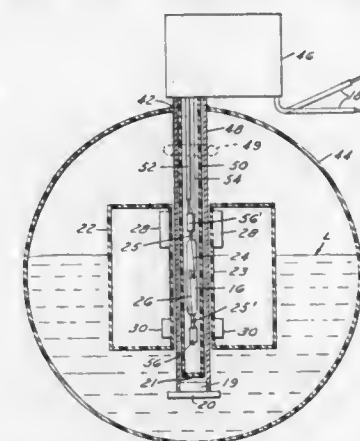
Filed Oct. 25, 1977, Ser. No. 845,293  
Int. Cl.<sup>2</sup> H01H 9/00

U.S. Cl. 335—207

16 Claims

1. A differential float control comprising, in combination: a guide tube for vertical positioning in the liquid whose level is to be sensed; a float externally surrounding the guide tube for free rotatable and longitudinal movement thereon to rise and fall with the liquid level; a reed switch in the guide tube having its reeds extending substantially parallel to the axis of the guide tube;

means for establishing a magnetic bias field across the reeds insufficient to close them but sufficient to hold them closed; and magnet means on the float for establishing a pair of vertically spaced apart symmetrical toroidal magnetic fields for



actuating the switch reeds, one such field closing the reeds as the float moves in one direction and the other such field overcoming the bias field and opening the switch reeds after the float moves a predetermined distance in the opposite direction.

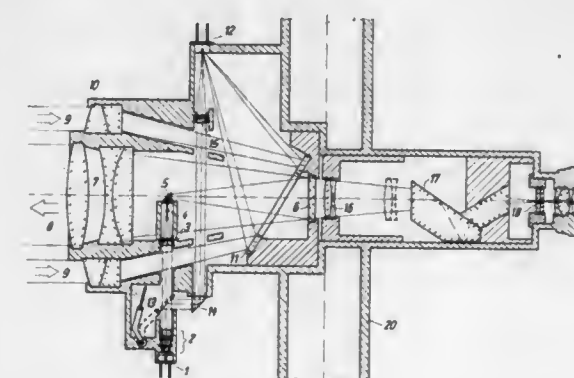
#### 4,165,936 COAXIAL TRANSMITTING AND RECEIVING OPTICS FOR AN ELECTRO-OPTIC RANGE FINDER

Josef Eisenring, Altstätten; Klaus W. Hildebrand, Heerbrugg, and Jakob Tanner, Balgach, all of Switzerland, assignors to Wild Heerbrugg Aktiengesellschaft, Heerbrugg, Switzerland

Filed Nov. 30, 1977, Ser. No. 856,048  
Claims priority, application Switzerland, Dec. 3, 1976, 15275/76

Int. Cl.<sup>2</sup> G01C 3/08; G02B 27/14  
U.S. Cl. 356—5

5 Claims



1. A coaxial transmitting and receiving optical system of an electro-optical range finder of the type for transmitting and receiving a modulated beam of light for the distance determination to a remote reflector and having an integrated sighting telescope for sighting said reflector or some other target, wherein the improvement comprises that: said coaxial transmitting and receiving optical system and said sighting telescope have the same optical axis; a beam deflector which deflects into the optical axis the transmitting beam coming from an infra-red radiation-emitting source is arranged in the vicinity of the position at which there is an intermediate image formation of the transmitting beam source; a dielectric coating system which is permeable to visible light is arranged on a substrate approximately perpendicular

lar to the common optical axis and is on one side bounded by air, said substrate being arranged in such a way that the transmitting beam from said beam deflector strikes said coating system in an almost perpendicular manner.

#### 4,165,937 MAGNETO-OPTIC SPECTROPHOTOMETER

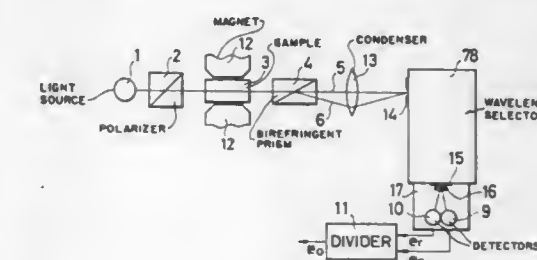
Seiichi Murayama, Kokubunji; Masaru Ito, Kodaira; Manabu Yamamoto, Odawara; Kunifusa Kayama, Higashikanamachi, and Kounosuke Oishi, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 2, 1976, Ser. No. 746,831

Claims priority, application Japan, Dec. 5, 1975, 50-143979

Int. Cl.<sup>2</sup> G01J 3/42

12 Claims



1. In a magneto-optic spectrophotometer comprising means for irradiating sample material by linearly polarized light of multiple wavelengths, means for applying a magnetic field to said sample material, polarizing means utilizing birefringence for separating light having passed through said sample material into signal light and reference light, means for selecting at least one wavelength for each of said signal light and said reference light, and means for detecting the signal light and the reference light at the wavelength selected by said wavelength selecting means, the improvement comprising light condensing means for bringing the signal light and the reference light into incidence on the same dispersive element of said wavelength selecting means to select a given wavelength for said signal light and said reference light, and means for enabling said signal light and said reference light at said selected wavelength to be detected by respective detectors of said light detecting means, wherein said signal light and reference light are provided by a light source with a continuous spectral distribution having resonance wavelengths of atoms and molecules to be detected.

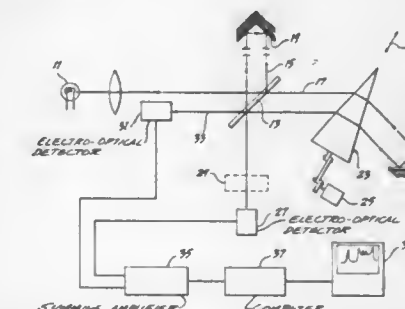
#### 4,165,938 REFRACTIVELY SCANNED INTERFEROMETER

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Jun. 22, 1977, Ser. No. 808,951

Int. Cl.<sup>2</sup> G01B 9/02

13 Claims



1. A scanning interferometer, of the type wherein an interference pattern is generated by comparing light components

traveling along, respectively, a first fixed-length path and a second variable-length path, comprising:

- a first stationary reflector determining the length of the first path;
- a second stationary reflector at the end of the second path; and
- a wedge-shaped prism intersecting the second path and movable across such path to cause path length scanning; the orientation of the prism and its direction of scanning motion being such that the apparent deflection point of each optical ray passing through the prism remains at substantially the same position throughout scanning motion of the prism.

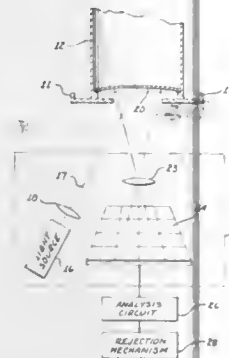
4,165,939

# APPARATUS FOR INSPECTION AND DIMENSIONAL MEASUREMENT BY SEQUENTIAL READING

Arthur F. Woodrow, and Jorge E. Simmons, both of Tucson, Ariz., assignors to TSN Company, Inc., Tucson, Ariz.  
Continuation-in-part of Ser. No. 543,063, Jan. 22, 1975. This application Oct. 26, 1976, Ser. No. 735,844  
Int. Cl.<sup>2</sup> G01B 11/24; G01N 21/32

U.S. Cl. 356—394

16 Claims



1. Apparatus for inspecting and comparing surface features of each of a plurality of containers transported by a conveyor with predetermined surface features of a standard container to determine whether the inspected container is within an allowable tolerance of the standard container, said apparatus comprising in combination:

- (a) means for producing and directing at least one beam of radiant energy along a fixed axis to irradiate a surface area of each container being inspected as the conveyor transports the container past the beam;
- (b) a plurality of energizable detector means for detecting radiant energy scattered from segments of the irradiated surface area;
- (c) means for transmitting the radiant energy scattered by a segment of the irradiated surface area to a predetermined one of said plurality of detector means if the irradiated segment is commensurate in configuration with an equivalent segment of the standard container and to another of said plurality of detector means if the irradiated segment is not commensurate in configuration with an equivalent segment of the standard container;
- (d) a first sensor responsive to the location with respect to the beam of a first predetermined characteristic of the container to be inspected as the container is conveyed by the conveyor past the beam for providing a first signal coincident in time with the expected energization of one specific detector of the plurality of detector means upon irradiation of a specific segment of the irradiated surface area;
- (e) a second sensor responsive to the location with respect to the beam of a second predetermined characteristic of the container to be inspected as the container is conveyed by the conveyor past the beam for providing a second signal coincident in time with the expected energization of another specific detector of the plurality of detector means upon irradiation of another specific segment of the irradiated surface area;

other specific detector of the plurality of detector means upon irradiation of another specific segment of the irradiated surface area;

- (f) means for generating an output signal reflective of the degree of correlation between the detectors of said plurality of detector means actually energized coincident with said first and second signals and the specific detectors of said plurality of detectors expected to be energized upon irradiation of specific segments of the irradiated surface area;

whereby, the output signal is indicative of the degree of tolerance of the inspected container with the standard container.

4,165,940

# FREE FLIGHT HEAD ASSEMBLY FOR DOT MATRIX PRINTERS AND THE LIKE

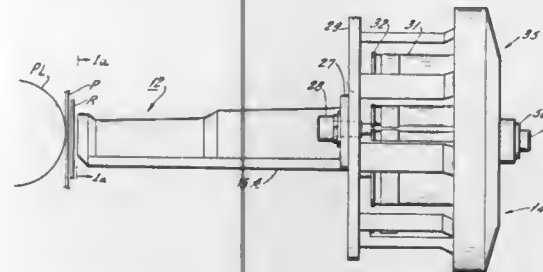
Charles T. Cacciola, East Derry, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Feb. 28, 1977, Ser. No. 772,459

Int. Cl.<sup>2</sup> B41J 3/12

U.S. Cl. 400—124

23 Claims



1. A print head of the dot matrix type comprising:

- a nose cone assembly for slidably mounting a plurality of elongated print wires, said nose cone assembly having means at the forward end for maintaining the forward ends of the print wires in closely spaced fashion and along an imaginary straight line;
- the rear end of said nose cone having openings through which the rearward ends of the wires protrude;
- a pole plate surrounding the nose cone and secured thereto at a point inward from the rear end thereof;
- a plurality of wire actuating means having solenoid coil assemblies mounted at spaced intervals around the pole plate and having armatures whose inner ends each overlie the rearward end of an associated print wire;
- a resilient parasol shaped member connected to said nose cone assembly and having a generally concave interior provided with a central hub and an outer peripheral ring including guide slots for receiving and aligning the inner and outer ends of said armatures;
- a biasing spring member having a plurality of spaced-apart radially extending armature biasing fingers each arranged to apply a biasing force upon the outer end of an associated armature to urge the outer ends of said armatures toward their associated solenoid coil assemblies;
- said outer peripheral ring including means for urging said biasing fingers towards the outer ends of their associated armatures;
- means for adjusting the axial position of said central hub relative to said armatures to adjust the air gaps of said solenoid coil assemblies without affecting the magnitude of said biasing force which the outer peripheral ring of the parasol exerts upon the outer ends of said armatures through said biasing fingers.

4,165,941

# MECHANICAL PENCIL

Hidehel Kageyama, and Takahiko Suzuki, both of Kawagoe, Japan, assignors to Kotobuki & Co. Ltd., Kyoto, Japan

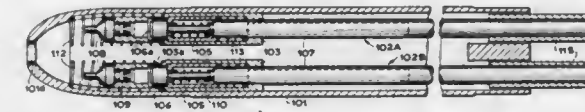
Filed Jul. 6, 1977, Ser. No. 813,340

Claims priority, application Japan, Jul. 10, 1976, 51-91945[U]; Oct. 8, 1976, 51-135662[U]

Int. Cl.<sup>2</sup> B43K 27/00

U.S. Cl. 401—31

15 Claims



1. A writing instrument comprising:

- (a) an outer tube to be held by a user;
- (b) a lead rod holding means defining a space and having an inner tube which is coaxially inserted in said outer tube and movable in the axial direction relative to said outer tube;
- (c) said inner tube having a lead chuck for chucking a lead rod inserted therein;
- (d) an inner casing connected to said outer tube for guiding the lead rod chucked by said lead chuck;
- (e) a ring having a bore through which said lead chuck projects and provided in said space in a manner to be movable in the axial direction;
- (f) a movable member provided for retaining said ring in a forward position to cause said chucking portion to chuck the lead rod;
- (g) a means for urging said lead rod holding means backward relative to said outer tube;
- (h) an engaging means for holding said lead rod holding means at a position where said engaging means engages with an engaging portion formed on said outer tube;
- (i) release means for releasing said engaging means from engagement with said engaging portion; and
- (j) pushing means provided on the rear end of said outer tube for pushing said lead rod holding means forward.

4,165,942

# DISPOSABLE WASHING IMPLEMENT FOR PERSONAL BODY CARE

Hans A. V. Johansson, Trehäradsvägen 36, Eslöv, Sweden (241 00)

Filed Jul. 13, 1977, Ser. No. 815,155

Int. Cl.<sup>2</sup> B05C 1/00

U.S. Cl. 401—132

2 Claims



1. A washing implement for personal body care comprising a handle and a disposable washing rod slidably connectable to one end of said handle, said washing rod having a protective

cover which is formed into a hand protection after the interconnection of the rod and the handle, the washing rod including a connecting end which before its connection to a connecting portion of the handle is at least partially covered by one end portion of the protective cover, there being a separate but interconnectable water-supply passage extending through the handle and the washing rod respectively, the said connecting portion of the handle being conically tapering and slidably fitting into a corresponding conically tapering portion of said rod connecting end, the said connecting portion of the handle having means for puncturing said end portion of the protective cover when the washing rod and the handle are connected, the said punctured end of the protective cover being simultaneously tightly squeezed between the wall of the water-supply passage in the washing rod and said connecting portion of the handle slidably projecting into said rod water-supply passage, the said wall of the rod water-supply passage and said connecting portion of the handle being each provided with means to interact to form a snap-fitting lock when the said rod and the said handle are slidably interconnected.

4,165,943

# GRITLESS SEAL

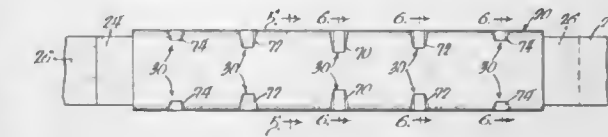
John R. Beach, Elmhurst; L. Peter Sauer, Glenview, and William J. Haraden, Libertyville, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Oct. 11, 1977, Ser. No. 840,829

Int. Cl.<sup>2</sup> B25G 3/28; F16G 11/00

U.S. Cl. 403—285

17 Claims



1. A seal for joining and securing a pair of overlapping strap segments wherein each strap segment has a generally rectangular cross section, said seal comprising:

- a body having a generally rectangular-shaped central portion and a pair of generally rectangular-shaped legs each connected to said central portion by a longitudinally extending bend, said body formed of sheet steel material having a case-hardened brittle inner gripping wall integral therewith for lying in surface contact with said strap segments and an outer surface defining a ductile body core integral with said body between said outer surface and said inner gripping wall, said inner gripping wall having a hardness greater than said body core whereby, when the seal is closed about the overlapping strap segments and pressed into firm engagement therewith, fracture cracks form in said inner gripping wall to define a particle-free gripping wall having sharp crack edges which penetrate and securely hold the surfaces of the overlapping strap segments and whereby the inner gripping wall and fracture crack edges therein are held against the surfaces of the overlapping strap segments by said body core.

4,165,944

# CONNECTION MEANS FOR STRUCTURES

Joseph Sunasky, Luton, England, assignor to Dexion-Comino International Limited, Bedfordshire, England

Filed Jul. 19, 1978, Ser. No. 926,170

Claims priority, application United Kingdom, Jul. 28, 1977, 31799/77

Int. Cl.<sup>2</sup> A47F 5/10

U.S. Cl. 403—254

6 Claims

1. Connection means comprising a hook projecting from the plane of one structure member and shaped for engagement with an elongated hole having a portion of downwardly ta-



pered shape in another structure member, wherein the hook is complemented by a boss which projects from the same plane and face of the said one member, but spaced from the hook in



the vertical direction, and which is of downwardly tapering shape complementary to that of said hole for engaging by its sides with parts of the sides of the said downwardly tapering shape of the said hole with which the hook is engaged.

#### 4,165,945 METHOD FOR STORING FLUID UNDERGROUND AT MAXIMUM PRESSURE P

Jacques Despois, Viroflay, and Francis Nougarede, La Celle Saint Cloud, both of France, assignors to Commissariat a l'Energie Atomique, Paris and Societe Nationale Elf Aquitaine, Courbevoie, both of France

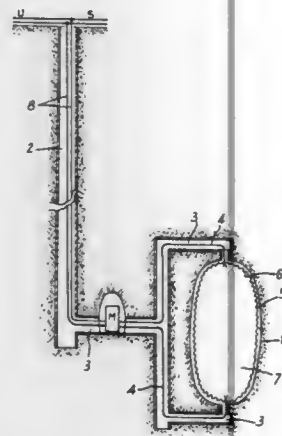
Filed Nov. 29, 1977, Ser. No. 855,641

Claims priority, application France, Dec. 2, 1976, 76 36283

Int. Cl.<sup>2</sup> B65G 5/00

U.S. Cl. 405—55

10 Claims



1. A method for storing fluid underground at maximum pressure  $p$ , comprising the steps of providing, at a depth at which the lithostatic pressure generated by the weight of the above-jacent soil formations is at least  $p$ , an underground cavity, locating a tight deformable casing in said underground cavity, anchoring said cavity to the cavity wall, and storing pressurized fluid in said tight, deformable casing so that said casing is fully applied against the cavity wall; said casing being anchored to the cavity wall at a sufficient number of places so as to be adapted to expand or contract to follow the possible movements of the cavity wall whereby the pressure of said fluid is, at every moment, counterbalanced by the lithostatic pressure of the cavity wall transmitted to said fluid by said casing.

#### 4,165,946 METHOD OF SECURING A ROCK BOLT

Gustav S. Andersson, Stockholm, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

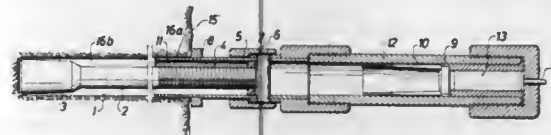
Filed Aug. 12, 1977, Ser. No. 824,329

Claims priority, application Sweden, Aug. 12, 1976, 7609058

Int. Cl.<sup>2</sup> E21D 21/00

U.S. Cl. 405—259

6 Claims



1. Method of securing a rock bolt in which the bolt, having a conical end; is inserted in a hole drilled in the rock face after which a sleeve is inserted into the hole and wedged in the gap between the conical end of the bolt and the wall of the hole, the sleeve being shot into the hole at high speed with the aid of compressed air or an explosive charge, the sleeve being inserted into the hole by means of a gun barrel applied around the outer end of the bolt, and the outer end of the bolt being centered in the gun barrel by means of a ring of soft material which is perforated upon shooting.

#### 4,165,947 CUTTING TOOL

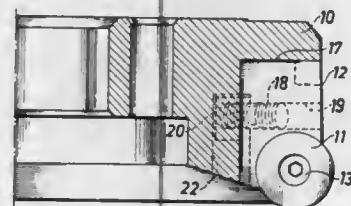
Rune Smids, Nossbro, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Feb. 1, 1978, Ser. No. 874,242

Int. Cl.<sup>2</sup> B26D 1/12

U.S. Cl. 407—46

7 Claims



1. A cutting tool comprising:  
a tool body with a pocket to removably receive a support body having a cutting insert at one extremity thereof, said pocket presenting abutment surfaces complementary with support surfaces of said support body,  
a straight cylindrical bore disposed in one of said tool body and said support body while extending parallel to a direction of insertion and removal of said support body,  
a locking member of cylindrical shape displaceable longitudinally in said cylindrical bore, and  
holding means comprising a locking screw extending through said support body and threadably engaging said locking member, said locking screw extending through an open-ended slot which is disposed in said one of said tool body and support body and which terminates at an exterior surface thereof such that the support body is detachable from said tool body merely upon loosening of said screw.

#### 4,165,948 DRILLING AND BORING MACHINE

Irene Vierstraete, 83 rue Victor-Hugo, Oignes, France

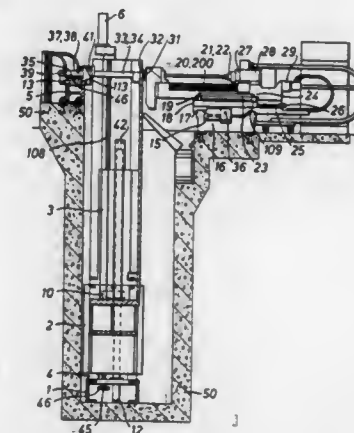
Filed Oct. 26, 1977, Ser. No. 845,827

Claims priority, application France, Oct. 29, 1976, 76 33340

Int. Cl.<sup>2</sup> B23B 39/18, 47/22

U.S. Cl. 408—46

36 Claims



1. Apparatus for machining a workpiece more particularly for drilling and boring plates or baffles for heat exchangers comprising:

a machine foundation in the form of a closed framework, elevator means carried by the framework for supporting a workpiece in a vertically extending position, means for effecting movement of said elevator means to move the workpiece in a vertical direction, at least one tool carrier and at least one thrust member carried by the framework, said carrier and thrust member being disposed opposite to one another so as to be one on either side of a workpiece positioned therebetween, drive means for the tool carrier for effecting movement of the tool carrier in a direction towards the workpiece to effect a machining operation and in the opposite direction to withdraw the tool carrier, and locking means for holding the thrust member in contact with the workpiece to support the same against the thrust of the tool during a machining operation.

25. Apparatus for machining a workpiece more particularly for drilling and boring plates or baffles for heat exchangers comprising:

a machine foundation in the form of a closed framework, elevator means carried by the framework for supporting a workpiece in a vertically upright position, means for driving said elevator means to effect vertical movement of the workpiece to position the same for a machining operation, means for providing a constant load on the elevator drive means to compensate for change of weight of the workpiece resulting from machining operations, at least one tool carrier and at least one thrust member carried by the framework, said tool carrier and thrust member being disposed opposite to one another so as to be one on either side of a workpiece positioned therebetween, drive means for the tool carrier for effecting movement of the tool carrier in a direction towards the workpiece for a machining operation and in the opposite direction to withdraw the tool carrier, drive means for the thrust member for effecting movement thereof in a direction towards a workpiece and into contact therewith to support the same against the thrust of the tool during a machining operation and in the opposite direction to withdraw the thrust member, and means for synchronizing the movements of the tool carrier and thrust member towards or away from a workpiece.

#### 4,165,949 HIGH EFFICIENCY SPLIT FLOW TURBINE FOR COMPRESSIBLE FLUIDS

Gilbert Riollet, Paris, France, assignor to Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T., Paris, France

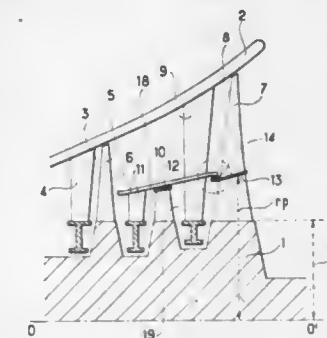
Filed Aug. 4, 1977, Ser. No. 821,863

Claims priority, application France, Aug. 13, 1976, 76 24765

Int. Cl.<sup>2</sup> F01D 1/04, 5/22, 9/00

U.S. Cl. 415—77

9 Claims



1. A multistage axial flow turbine for compressible fluids in which the fluid leaving the antepenultimate stage is separated into coaxial radially inner and radially outer flows which are subject to substantially the same decrease in enthalpy between the outlet from the antepenultimate stage and the outlet of the turbine, the inner flow passing through the penultimate and final stages with respective decreases in enthalpy of  $h_1$  and  $h_2$  and the outer flow passing through only the final stage, the rotor blades of the last stage including a wall serving as a barrier between the inner flow and the outer flow, the rotor blades of the last stage having a discontinuity in variation in profile from root to tip with the profile of the blade radially outward of the wall between the two flows being more highly curved than that radially inward of said wall, and the degree of reaction of said rotor blades at this barrier when operating under optimum conditions having a value  $x_2$  on the outer flow side which is substantially equal to  $x_1 \cdot h_2 / (h_2 + h_1)$  where  $x_1$  is the value of the degree of reaction on the inner flow side such that the pressure on the radially outward side of the wall is maintained substantially equal to the pressure on the radially inward side of the wall across said last stage rotor blades.

#### 4,165,950 FAN HAVING FORWARD-CURVED BLADES

Tadahisa Masai, Yamaguchi; Norio Beppu, Yanai; Yoshio Okamoto, Yanai, and Kazutoshi Nishikawa, Yanai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

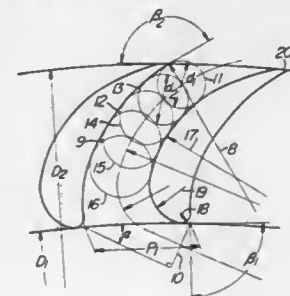
Filed Aug. 16, 1977, Ser. No. 825,044

Claims priority, application Japan, Sep. 6, 1976, 51-105819

Int. Cl.<sup>2</sup> F04D 29/30

U.S. Cl. 416—178

6 Claims



1. In a fan comprising a plurality of forward-curved blades which define air passages between the front surfaces thereof and the rear surfaces of the adjacent blades, the width of each

air passage gradually varying from the outlet thereof to the vicinity of the inlet; the improvement comprising the width of the outlet of an air passage, defined by the minimum length between the outlet end of the front surface of the blade and the rear surface of the adjacent blade, being 0.3 to 0.5 of the pitch of the blades at the inlet of the air passage and wherein the width of the air passage and the configuration of the central portion of the rear surface of the adjacent blade are such that they are delimited by an arc of a circle which touches the circumferences of a first through a fifth inner tangent circles, the first inner tangent circle having a diameter equal to the outlet width of the air passage and being positioned in such a manner that the circumference of the circle touches the front surface of the blade at its outlet end, the second inner tangent circle being positioned in such a manner that its center is located on the circumference of the first inner tangent circle and its circumference touches the front surface of the blade, and so forth for the third, fourth and fifth inner tangent circles, the diameters of the second and subsequent tangent circles being defined by the equation:

$$d_2 = md_1$$

where

m=coefficient having values in the range between 0.95 and 1.05 for defining the relation between the diameters of adjacent inner tangent circles;

$d_1$ =diameter of the first or preceding inner tangent circle, and;

$d_2$ =diameter of the second or following inner tangent circle.

4,165,951

#### WATER PRESSURE BOOSTER SYSTEM AND CONTROL VALVE THEREFOR

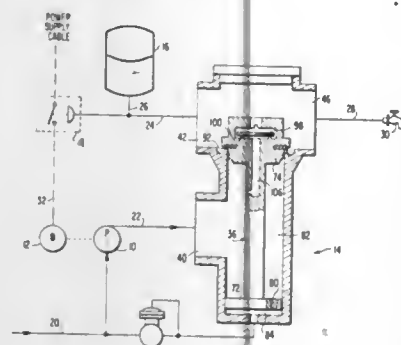
Yizhak Friedman, Newton, and Bernard B. Becker, Belmont, both of Mass., assignors to Amtrol Incorporated, West Warwick, R.I.

Filed Jun. 30, 1977, Ser. No. 811,717

Int. Cl.<sup>2</sup> F16K 31/12; F04B 49/02, 49/08

U.S. Cl. 417-26

21 Claims



1. In a water pressure booster system for regulating water pressure in a piping system having pumping means connected to a water supply, the improved means for controlling water flow into the piping system comprising:

- a housing having an inlet passage connected to an outlet of said pumping means and an outlet connected said piping system;
- a valve member contained within said housing without biasing means so as to be freely slidable therein, said valve member comprising a throttle valve, and a balance piston connected to said throttle valve, said balance piston having an orifice therethrough to allow passage of water from a first side of said piston to a second side;
- combination flow control/check valve means disposed in a passage bypassing said throttle valve to permit a reduced flow of water into said piping system when said throttle valve is closed and said pumping means is operating and

preventing flow from said piping system back through said passage when said pumping means stops; and  
(d) pressure regulating means to regulate the pressure acting on said second side of said balance piston, said pressure regulating means being interconnected between said second side of said piston and an inlet of said pumping means.

4,165,952

#### HEAT ENERGIZED VAPOR ADSORBENT PUMP

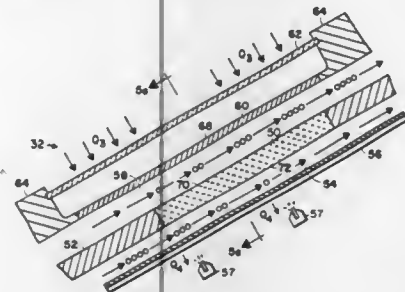
Charles E. Bennett, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 21, 1977, Ser. No. 789,482

Int. Cl.<sup>2</sup> F04B 19/24; F04F 1/18; F25B 27/00, 17/08

U.S. Cl. 417-207

30 Claims



1. A pump apparatus for moving a vapor from a relatively lower vapor pressure environment to a relatively higher vapor pressure environment, the pump apparatus being directly energized from a heat source, the pump apparatus comprising: microporous means having at least two working surfaces, said microporous means for adsorbing the vapor from the lower vapor pressure environment on a first of said at least two working surfaces and for desorbing the vapor to the higher vapor pressure environment from a second of said at least two working surfaces, said second surface being in heat energy communication with the heat source to provide a higher temperature at said second surface with respect to said first surface, said microporous means having pore sizes in the range of from  $10^{-6}$  to  $10^{-7}$  centimeters for providing high adsorption and surface diffusion characteristics.

4,165,953

#### BLOWER ASSEMBLY

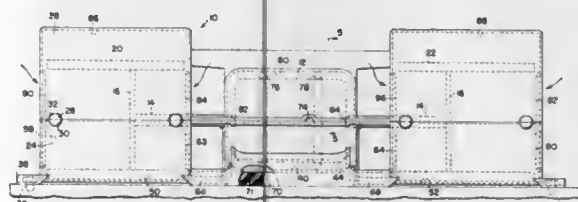
Lloyd L. Lane, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 17, 1977, Ser. No. 843,074

Int. Cl.<sup>2</sup> F04B 17/00

U.S. Cl. 417-350

8 Claims



1. In an air blower assembly including a ventilated motor having an axially extending output shaft and a blower wheel connected to the output shaft, a blower housing assembly comprising: a lower housing having a lower motor cavity provided therein open to the top for insertion of the motor and open to one side thereof for extension of the output shaft from the lower motor cavity, said lower housing having a lower blower wheel cavity provided therein to the one side of the lower motor cavity and open to the top for insertion of the blower wheel axially in line with the output shaft, said lower

housing having a first lower air inlet opening into the lower blower wheel cavity proximate the one side of the lower motor cavity, a second lower air inlet opening into the lower blower wheel cavity distal from the one side of the lower motor cavity, and an air outlet opening from the bottom of the lower blower wheel cavity to the bottom of the lower housing, and an air passage provided therein connecting the air outlet opening to the lower motor cavity opposite the one side thereof; an upper housing having an upper motor cavity provided therein open to the bottom for contiguous positioning with the lower motor cavity in the lower housing to enclose the motor and open to one side thereof for extension of the output shaft from the upper motor cavity, said upper housing having an upper blower wheel cavity provided therein to the one side of the upper motor cavity and open to the bottom for contiguous positioning with the lower blower wheel cavity in the lower housing to enclose the blower wheel, said upper housing having a first upper air inlet opening into the upper blower wheel cavity proximate the one side of the upper motor cavity for contiguous positioning with the first lower air inlet in the lower housing and having a second upper air inlet opening into the upper blower wheel cavity distal from the one side of the upper motor cavity for contiguous positioning with the second lower air inlet in the lower housing; means to secure the upper and lower housings together; means contacting the upper and lower housings when secured together for blocking the passage of air between the motor and housings from the output shaft opening proximate sides to the output shaft opening distal sides of the upper and lower housings when the motor is inserted; and the upper housing includes motor exhaust openings provided in the one side of the motor cavity whereby air from the outlet opening of the lower blower wheel cavity is forced and drawn through the air passage and through and from the motor and passes out said exhaust openings into the first air inlets into the upper and lower housings.

4,165,954

#### LINEAR PERISTALTIC PUMP HAVING PIVOTAL PUMP ARM

Lynn G. Amos, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

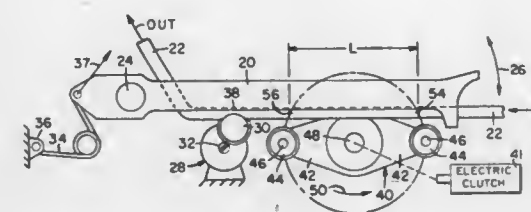
Continuation of Ser. No. 603,286, Aug. 11, 1975, abandoned.

This application Nov. 13, 1978, Ser. No. 960,022

Int. Cl.<sup>2</sup> F04B 43/08, 43/12, 45/06

U.S. Cl. 417-477

20 Claims



1. A pump comprising a pivotal pump arm which pivots about a first axis, a flexible tube, means for applying a force to said pump arm to cause it to pivot, intercepting means disposed in the path of travel of said pump arm for stopping said travel of said pump arm in one direction, said flexible tube being disposed adjacent a surface of said pump arm and pivotal therewith so that said flexible tube is pinched-off between said pump arm surface and said intercepting means as said pump arm comes to rest against said intercepting means, the position of said intercepting means being adjustable so as to at least in part change the pivotal travel of said pump arm and thereby change the pumping stroke, rotatable roller means disposed adjacent said pump arm and said flexible tube and upstream from said intercepting means for intermittently contacting said flexible tube and

peristaltically moving a quantity of liquid therein, said rotatable roller means comprising at least one roller mounted on a rotatable roller support, said roller being rotatable on said roller support, the axis about which said roller rotates being parallel to said first axis, and spring means with one end affixed to a rigid support for pivoting said pivotal pump arm in a direction opposite to said one direction to a raised stable position such that said pump arm is in a non-contacting relationship with both said intercepting means and said rotatable roller means when desired.

4,165,955

#### APPARATUS FOR MAKING FLAT TOP BUNS

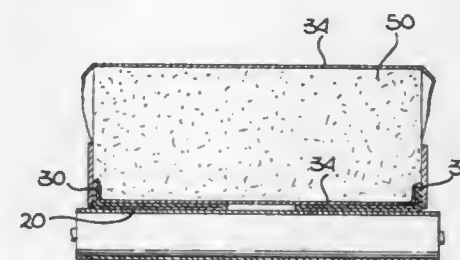
Charles W. Morgan, Rolling Hills, Calif., assignor to United Foam Corporation, Compton, Calif.

Continuation-in-part of Ser. No. 736,142, Oct. 27, 1976, Pat. No. 4,069,285. This application Jan. 12, 1978, Ser. No. 868,848

Int. Cl.<sup>2</sup> B29D 27/04

U.S. Cl. 425-89

23 Claims



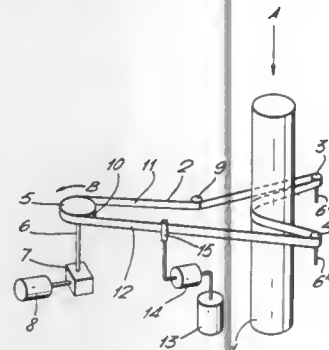
1. In apparatus for molding products in continuous open molding equipment having a bottom conveyor and a pair of side conveyors, each side conveyor being disposed adjacent the bottom conveyor to define an open top trough for lining with one or more film members onto which foam reactants are dispensed to react in a foaming region to form a continuous bun in the trough defined by the moving conveyor system, the improvement comprising:

- first supply means for supplying first and second tubular film members, each having at least a tubular portion, onto said bottom conveyor at a position prior to the region said foam reactants are dispensed and with the outer edge of said tubular portion of each said tubular film member generally parallel to and adjacent the plane of a respective side conveyor;
- second supply means for supplying a third film member having a width at least equal to a substantial fraction of the width of said bottom conveyor onto said bottom conveyor at a position prior to the region said foam reactants are dispensed and over said first and second tubular film members;
- guide means adjacent each of said side conveyors, each of said guide means being a means for extending into a respective one of said tubular members and for guiding the top thereof along an upwardly inclined trajectory adjacent said foaming region; and
- means for opening each of said tubular members adjacent the end of said foaming region to allow separation of said tubular members from said guide means.



**4,165,956**  
**COATED TUBULAR FORMS**  
 Brian N. Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England  
 Filed May 23, 1977, Ser. No. 799,158  
 Claims priority, application United Kingdom, Jun. 1, 1976, 22562/76  
 Int. Cl.<sup>2</sup> B29C 25/00; B29D 7/20  
 U.S. Cl. 425—71

6 Claims



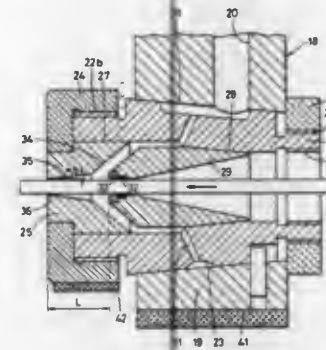
1. An apparatus for the production of an oriented tubular film comprising  
 an annular die for the extrusion of a tube of thermoplastic material,  
 means for cooling the extruded tube,  
 means for withdrawing and axially forwarding said cooled tube,  
 means for reheating and inflating the withdrawn tube to form an oriented tubular film, and  
 means for coating the tube of thermoplastic material by spreading coating material thereon without distortion and twisting of the tube, said coating means positioned between said forwarding means and said reheating means and comprising  
 a dispensing head for supplying a liquid coating medium to the external surface of the cooled tube,  
 a belt having a resilient contact layer cooperable with the tube external surface, and  
 means for driving said belt in a plane substantially normal to the longitudinal axis of said tube to spread the supplied coating medium around at least part of said tube external surface.

**4,165,957**  
**APPARATUS FOR MANUFACTURING ELECTRIC WIRE HAVING WIRE-ENAMEL-TYPE INSULATION**  
 Eberhard Kertscher, Romanel, Switzerland, assignor to Mail-lefer S.A., Ecublens, Switzerland  
 Filed Jun. 29, 1977, Ser. No. 811,362  
 Claims priority, application Switzerland, Jul. 1, 1976, 8446/76  
 Int. Cl.<sup>2</sup> B29F 3/10  
 U.S. Cl. 425—113

9 Claims

1. Apparatus for manufacturing insulated electric wire of the enamelled-wire type with an insulating sheath of plastic material, comprising a screw extruder and an extrusion head connected at the downstream end of said screw-extruder, said extrusion head comprising at least one extrusion unit formed of a die-holder with a gauging die and a guiding die coaxially held therein, said gauging die having: a cylindrical bore portion at its downstream end; a frustoconical bore joining said cylindrical bore portion at the upstream side thereof; and a frustoconical entry portion of an aperture angle greater than said frustoconical bore, joining said frustoconical bore at the upstream end thereof, said guiding die having a central passageway matching said wire in diameter and a downstream face of frustoconical shape facing said entry portion, said downstream face and said entry portion determining therebetween an annular distribution chamber of frustoconical shape arranged in

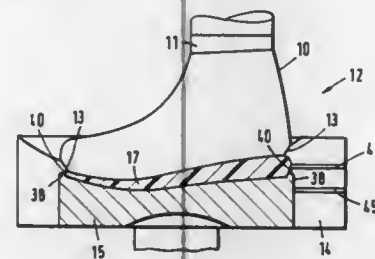
such a manner that said plastic material gradually accelerates therein, and said die holder containing holes therethrough for



feeding the annular base of said distribution chamber with plastic material from said extruder.

**4,165,958**  
**APPARATUS FOR INJECTION MOLDING OF SHOE SOLES**  
 Anton Malburg, Hermeskeil, and Friedrich Koch, Achlm, both of Fed. Rep. of Germany, assignors to Desma-Werke GmbH, Achlm, Fed. Rep. of Germany  
 Filed Sep. 9, 1977, Ser. No. 832,047  
 Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2706851[U]  
 Int. Cl.<sup>2</sup> B29H 5/12, 7/08; B29C 9/00; B29F 1/00  
 U.S. Cl. 425—119

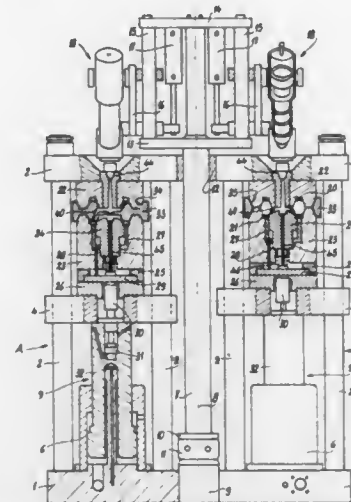
14 Claims



1. Casting or injection molding apparatus for the molding of shoe soles, preferably of polyurethane, and having two or more layers, said apparatus comprising:  
 a mold including a side mold, an upper mold, and plural bottom stamps for forming at least first and second mold cavities in sequence and being limited in each case by one of the two bottom stamps, a projection being provided on the side mold and ridges being provided on the edges of the bottom stamps which interfit and form a seal with the side mold projection so as to limit the mold cavity, the bottom stamp edge ridges and the surface of the side mold projection which face said ridges being provided with corresponding arched shapes;  
 a supporting arm for each bottom stamp, each supporting arm being fixed to a corresponding one of the stamps; and  
 means comprising a common swinging support for supporting said arms at right angles to one another and for effecting swinging of said support arms to selectively position one of said stamps in an underlying position with respect to said side and upper molds.

**4,165,959**  
**APPARATUS FOR INJECTION-MOULDING SEVERAL MOULDING MATERIALS ONTO ONE ANOTHER**  
 Jacques Dechavanne, 9 Chemin de Gua, Sassenage (Isere), France  
 Filed Feb. 17, 1978, Ser. No. 878,868  
 Claims priority, application France, Feb. 25, 1977, 77 06335  
 Int. Cl.<sup>2</sup> B29F 1/00; B29C 5/00  
 U.S. Cl. 425—130

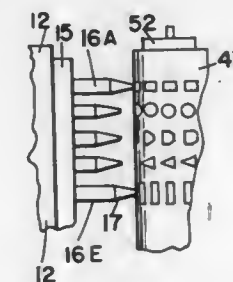
10 Claims



1. Apparatus for injection-moulding several moulding materials onto one another, comprising at least two parallel and independent clamping units, a respective mould and sprue block carried by each of said clamping units; at least two injection units for moulding materials; common support means carrying said at least two injection units; means supporting said common support means and said at least two clamping units for permitting relative rotary movement between the injection units and the clamping units and for bringing each said injection unit selectively into co-operation with any of the clamping units for injecting through said sprue block of that clamping unit a moulding material which may be different from that injected by the other injection unit or units.

**4,165,960**  
**CONTINUOUS MOLDING APPARATUS**  
 Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840  
 Continuation-in-part of Ser. No. 744,505, Nov. 24, 1976. This application Jul. 8, 1977, Ser. No. 813,795  
 Int. Cl.<sup>2</sup> B29F 1/022  
 U.S. Cl. 425—145

9 Claims

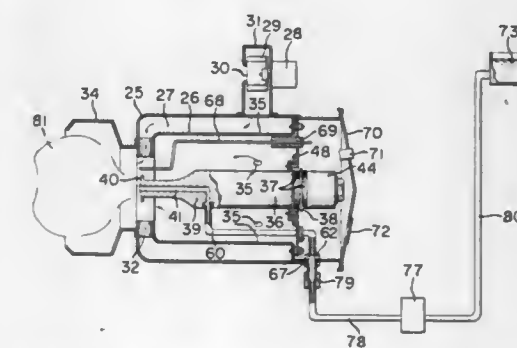


1. An apparatus for continuously molding comprising in combination:  
 a first endless flexible belt defining a first mold member containing a plurality of molding cavities formed in a major surface thereof and shaped for forming separate articles in each cavity,  
 means operatively associated with said first belt member for

guiding and driving said first belt member in an endless path,  
 a second endless flexible belt member defining a second mold member,  
 means for guiding and driving said second endless flexible belt member in an endless path which extends so as to cause said second belt member to be driven closely adjacent and parallel to a portion of said first flexible belt member, and  
 means for compressively engaging said first and second belt members together along portions thereof which extend parallel to each other,  
 injection means for a liquid molding material,  
 means for intermittently operating said injection means, means for supporting said injection means at a location to permit it to intermittently inject its molding material between said first and second flexible belt members to fill said cavities as said flexible belt members are brought together, and  
 means for intermittently feeding and ejecting said liquid molding material from said injection means in synchronization with the driving movement of said first and second endless flexible belts in a manner to cause said molding material to fill each of the cavities formed between said first and second flexible belt members after said belt members are driven together,  
 said molding material being operable to solidify within said cavities between said first and second belt members, and  
 means for removing the moldings from between said flexible belt members where they are driven together to provide a plurality of moldings thereof formed between said flexible belt members.

**4,165,961**  
**BURNER WITH ULTRASONIC VIBRATOR**  
 Katsuhiko Yamamoto, Nabari; Makoto Hori, Ikoma, and Takaaki Nobue, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
 Filed Sep. 28, 1977, Ser. No. 837,553  
 Claims priority, application Japan, Sep. 29, 1976, 51-117765  
 Int. Cl.<sup>2</sup> 431 1/14; F23C 3/02  
 U.S. Cl. 431—1

2 Claims



1. A burner comprising:  
 a burner casing;  
 an ultrasonic vibrator unit comprising two piezoelectric vibrator elements and an electrode plate disposed therebetween;  
 a front metal body having a liquid fuel passage therein with an inlet part and an exit aperture adjacent an atomizing surface thereof;  
 a rear metal body;  
 bolt and nut means for securing and clamping said vibrator unit between said metal bodies;  
 an intermediate supporting member;  
 means including a plurality of resilient members for securing an outer part of said intermediate supporting member to

said casing and an inner part thereof to one of said metal bodies;  
a fuel supply pipe;  
a vibration isolator comprising resilient material for connecting said inlet part of said front metal body and one end of said pipe;  
first resilient vibration isolation means for connecting another part of said pipe, remote from said end thereof, to said intermediate supporting member;  
a pair of ignition electrodes;  
second resilient vibration and electrical isolation means for connecting said electrodes to said intermediate supporting member;  
means including said pipe and passage for feeding liquid fuel to said atomizing surface; and  
means for feeding air for combustion to said atomizing surface.

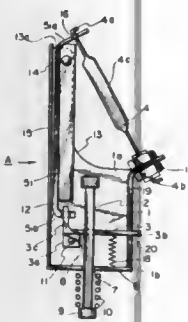
4,165,962

**SAFETY DEVICE OF THE FRICTION RATCHET TYPE OPERABLE ON EXTINCTION OF GAS FLAME**  
Shoji Matsumura, 206 B41 5-5 Furuedai, Suita City, Osaka, Japan

Filed Nov. 17, 1977, Ser. No. 852,436  
Int. Cl.<sup>2</sup> F23H 5/00

U.S. Cl. 431—83

24 Claims



1. A safety device of the friction ratchet type operable on extinction of a gas flame comprising a valve operating rod connected to the valve stem of a stop valve mounted on a gas supply duct for a gas combustion apparatus and biased by a spring at all times in a direction to close the stop valve, a support bar secured to the main body of the device and formed with a hole extending therethrough, a holding bar pivoted at its one end to the main body and formed with a hole extending therethrough and arranged coaxially with the hole in the support bar in alignment therewith, the valve operating rod slidably extending through the holes and being supported by the bars, a heater wire extending outward from the main body to detect a gas flame, and holding bar turning means for inclining the holding bar by an elongation of the heater wire when the heater wire is heated by the gas flame to cause the holding bar to hold the valve operating rod in the open position of the stop valve, the holding bar turning means being operable to return the holding bar to its original position on contraction of the heater wire, thereby causing the valve operating rod to be released from the holding bar and to close the stop valve.

4,165,963

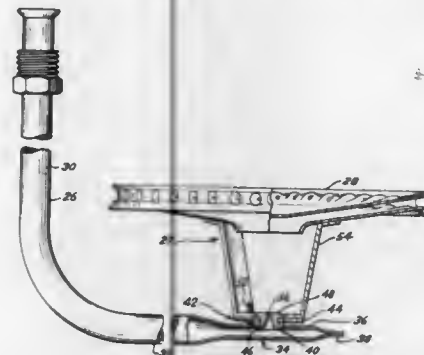
**HOT WATER HEATER BURNER ASSEMBLY**  
Michio B. Nozaki, LaGrange, Ill., assignor to Rheem Manufacturing Company, New York, N.Y.  
Continuation of Ser. No. 682,622, May 3, 1976, abandoned. This application Oct. 26, 1977, Ser. No. 845,780  
Int. Cl.<sup>2</sup> F23D 13/40

U.S. Cl. 431—354

3 Claims

1. An improved burner construction for a water heater comprising, in combination:  
a burner supply tube having a first diameter, said supply tube

including a first horizontal run terminating with an end portion, said end portion being flattened to a dimension approximately one-half the diameter of the tube and sealed at the extreme end of the tube to define a flat top surface of the end portion;  
a gas-flow passage in the flat top surface of the end portion;  
a bracket;  
a burner attached to the bracket;  
means for attaching the bracket over the gas-flow passage;



said means for attaching the bracket comprising a horizontal, planar platform surface member with a fitting projecting from the surface member through said passage, said fitting including a burner orifice through the platform member, said bracket removably attached by fasteners to said platform member whereby the burner is maintained in alignment with the passage and orifice to receive a mixture of fuel and air for combustion by the burner.

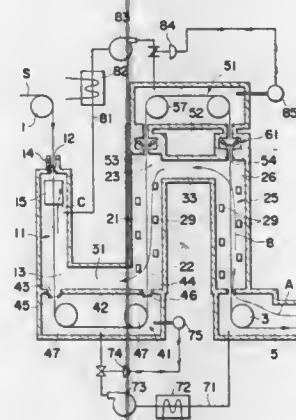
4,165,964

**VERTICAL DIRECT FIRED STRIP HEATING FURNACES**  
Toshiya Yonezawa, and Katsuyoshi Kobayashi, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 11, 1977, Ser. No. 841,322  
Claims priority, application Japan, Oct. 27, 1976, 51-129966  
Int. Cl.<sup>2</sup> F27B 9/28

U.S. Cl. 432—59

6 Claims



1. In a vertical direct fired strip heating furnace for heating steel strips and of the type including at least two vertical and parallelly arranged heating chambers each having strip entrance and exit ends, with a steel strip to be heated passing in a vertical path through the entrance and exit ends of an upstream-most said heating chamber and then in successive vertical paths through the entrance and exit ends of the remainder of said heating chambers, and guide rolls located adjacent the exit end of said upstream-most heating chamber and adjacent the entrance and exit ends of said remainder of said heating

chambers, at least the downstream-most of said heating chambers being provided therein with burners to directly heat the steel strip passing therethrough, the improvement comprising:  
a horizontal flue connecting a said exit end and an adjacent said entrance end of successive adjacent of said heating chambers;  
adjacent each said horizontal flue and separate therefrom, a respective guide roll chamber housing the respective said guide rolls adjacent the said ends of said heating chambers connected by the respective said horizontal flue;  
said steel strip passing horizontally through each said guide roll chamber but not through said horizontal flues, and said horizontal flues providing free communication of exhaust gases from said burners between said heating chambers, but said exhaust gases being substantially isolated from said guide roll chambers; and  
means for adjusting the temperature within said guide roll chambers.

4,165,965

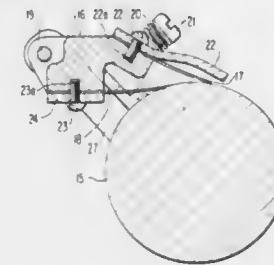
**BACKUP ROLL CLEANING SYSTEM FOR A HEATED ROLL FUSER**

William J. Bernardelli, Longmont, and Fred Y. Brandon, Boulder, both of Colo., assignors to International Business Machines Corporation, Boulder, Colo.

Filed Apr. 3, 1978, Ser. No. 892,708  
Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 432—75

19 Claims



10. A roll fuser for an electrostatic copying machine including:

a main roll, mounted on a first shaft,  
a backup roll, mounted on a second shaft,  
means for rotating a one of said main or backup rolls and for forming a nip therebetween for transferring paper and simultaneously fusing toner on said paper,  
a backup roll cleaning means including:  
a pair of serrated scraper blades, means for supporting said blades in scraping relation to said backup roll with serrations in a first blade offset with respect to serrations in said second blade.

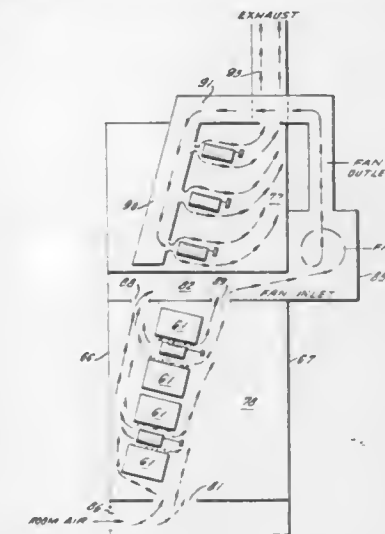
4,165,966

**DIRECT FLAME DRYING APPARATUS (RM-30C)**  
Edward J. Whelan, Hasbrouck Heights, and William L. Douma, West Paterson, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 658,902, Feb. 18, 1976, Pat. No. 4,052,152. This application Jul. 27, 1977, Ser. No. 819,354  
Int. Cl.<sup>2</sup> F27B 9/00; F26B 25/00

U.S. Cl. 432—121

9 Claims



1. A direct flame system for curing a decorating medium applied to the outer surface of cylindrical objects, said system including chamber defining first means, conveyor means for carrying cylindrical objects along a predetermined path through said first means, burner means in a drying chamber portion of said first means, said burner means emitting flame jets which impinge directly upon cylindrical objects at a first section of said path located in said drying chamber, said first means including another portion defining a preheat chamber disposed along said path upstream of said drying chamber, said preheat chamber being heated by heat exhausted from said drying chamber, said conveyor carrying cylindrical objects from said preheat chamber to said drying chamber solely along a section of said path surrounded by said first means, said drying chamber having an inlet and said preheat chamber having an outlet, fan means to draw air into said drying chamber through said inlet, circulate said air first through said drying chamber and then through said preheat chamber, and thereafter exhaust said air from said preheat chamber through said outlet.



# CHEMICAL

## 4,165,967 PROCESS FOR DYEING HUMAN HAIR WITH DIAZO SALTS AND COUPLING COMPONENTS

Arthur Bühler, Rheinfelden; Alfred Fasciati, Bottmingen, and Walter Hungerbühler, Riehen, all of Switzerland, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

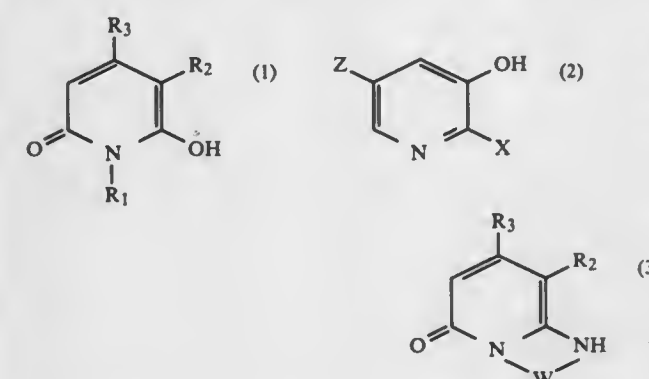
Filed Aug. 24, 1977, Ser. No. 827,402

Claims priority, application Switzerland, Sep. 2, 1976, 11135/76

Int. Cl.<sup>2</sup> A61K 7/13

U.S. Cl. 8—10.1 13 Claims

1. A process for dyeing human hair with developing dyes which comprises applying to said hair, at temperatures from about 15° C. to 40° C., an effective amount of aqueous solutions of diazo salts and coupling components successively, in any desired sequence, and coupling said diazo salts and coupling components with each other, wherein the coupling component is of the formula (1) or (2)



wherein

R<sub>1</sub> is hydrogen or a monovalent organic radical,  
R<sub>2</sub> is cyano, aminocarbonyl or an alkyl group substituted by a carboxylic acid group or sulphonic acid group,  
R<sub>3</sub> is an alkyl group which has up to five carbon atoms and which is optionally substituted by a carboxylic acid group or sulphonic acid group, or a phenyl group which can optionally carry in the p-position a further similar pyridone group,  
X is the OH or NH<sub>2</sub> group, and  
Z is a hydrogen or halogen atom, and the concentration of said solutions is between 0.1 and 10% by weight of said diazo salts and coupling components and said diazo salts and coupling components are present in the molar range of about 2:1 to 1:2.

## 4,165,968 COMPOSITION FOR COATING CHARCOAL BRIQUETTES

Norman B. Duncan, 301 S. Highland, Las Vegas, Nev. 89106

Filed May 9, 1978, Ser. No. 904,334

Int. Cl.<sup>2</sup> C10L 9/00, 10/00, 7/00

U.S. Cl. 44—6 13 Claims

12. The method for forming an ignitable coating on a charcoal briquette, comprising the steps of:  
mixing a flammable alcohol, gum cellulose, and a wicking material selected from the group consisting of expanded perlite and expanded hydrobiotite in particulate form to form a gel mixture;  
submerging the briquette in the gel for a period of time between one and five minutes;  
removing the briquette from the gel mixture and draining the briquette; and,  
subjecting the coated briquette to a temperature in the range between -10° and 32° F. to solidify the coating.

13. A rapidly ignitable, even burning charcoal briquette having a coating disposed thereon, the coating comprising a gelled mixture of a flammable alcohol, gum cellulose, and a

wicking material in particulate form, said wicking material being selected from the group consisting of an expanded perlite and expanded hydrobiotite.

## 4,165,969 HIGH CARBON CONTENT LIQUID FUELS

Leonard Hughes, Columbus; Kenneth R. Robinson, Worthington, and Marvin L. Deviney, Jr., Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 824,184, Aug. 12, 1977, abandoned, which is a continuation of Ser. No. 521,050, Nov. 5, 1974, abandoned, which is a continuation of Ser. No. 335,243, Feb. 23, 1973, abandoned. This application Oct. 11, 1978, Ser. No. 950,347

Int. Cl.<sup>2</sup> C10L 1/32

U.S. Cl. 44—51 1 Claim

1. A method for preparing a liquid hydrocarbon fuel composition which comprises slurring a mixture of from 5-70 weight percent pulverulent carbon black, from 30-93 weight percent of a liquid combustible hydrocarbon and a monomer selected from the group consisting of a vinyl ester, an acrylic acid ester, an acyclic diene and a cyclic diene wherein said monomer constitutes from 2-15 weight percent of the aggregate weight of said mixture, heating the mixture with agitation at a temperature of from 60°-120° C. in the presence of from 2-5 weight percent based on the weight of said monomer of a IBN or DPI catalyst to effect the polymerization thereof.

## 4,165,970 PROCESS AND APPARATUS FOR GASIFYING GRANULAR COAL UNDER SUPERATMOSPHERIC PRESSURE

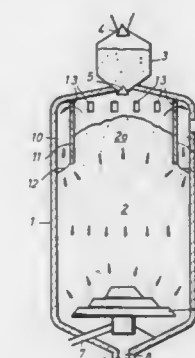
Paul Rudolph, Bad Homburg, and Paul Becker, Eschborn, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,044

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736687

Int. Cl.<sup>2</sup> C10J 3/20

U.S. Cl. 48—73 5 Claims



1. In a reactor for gasifying granular coal including a grate for holding a fixed bed of coal, means for introducing a gasifying agent to the bottom of the bed of coal, conduit means for withdrawing coal residue from the bottom of the coal bed, and means for withdrawing product gas from adjacent the top of the coal bed, the improvement which comprises a shielding wall adjacent the top of the reactor and terminating above the grate so as to define with the reactor an annular space open from below and communicating with said conduit means, the annular space surrounding the top of the coal bed, said shielding wall being provided with apertures whereby part of the product gas from the upper portion of the bed which is surrounded by the annular space can enter such annular space through said apertures.

# 4,165,971 APPARATUS FOR THE GASIFICATION OF CARBONACEOUS MATERIAL

Walter Kaimann, Rietberg, and Karl-Helz Brachthäuser, Ratingen, both of Fed. Rep. of Germany, assignors to Projektierung Chemische Verfahrenstechnik GmbH, Düsseldorf, Fed. Rep. of Germany

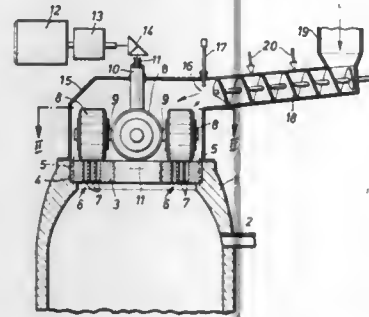
Filed May 17, 1977, Ser. No. 797,872

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622265

Int. Cl.<sup>2</sup> C10J 3/30

U.S. Cl. 48—77

4 Claims



1. Apparatus for producing gas from carbonaceous material, comprising a pressure vessel having an upper end formed with an opening, a stationary die mounted in said upper end of said vessel, means connecting said die to the upper end of said vessel, said die having an annular region defining a plurality of channels extending between upper and lower surfaces of the die, a housing above said die, said housing having an inlet for carbonaceous material and at least one pressure wheel positioned in said housing to roll over the upper surface of said die in said annular region to press the carbonaceous material into and through said channels whereby the material leaves the channels as solid extrusions adapted to break off and form briquette-like pieces suited for a gas production process within said vessel, the carbonaceous material pressed into said channels of the die forming pressure-tight seals between said lower and upper surfaces of said die.

# 4,165,972 GAS SEPARATING SYSTEM

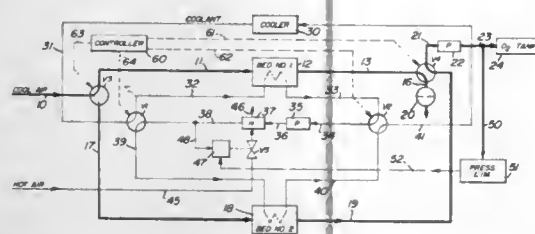
Thomas L. Iles, and Joseph M. Ruder, both of Rancho Palos Verdes, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1977, Ser. No. 838,598

Int. Cl.<sup>2</sup> B01D 53/04

U.S. Cl. 55—28

8 Claims



1. A method for separating a gas from a gas mixture, comprising the sequential steps of:

first directing a heat-conductive fluid sequentially through a cooler, a first sorber, a heater, a second sorber, and returning said fluid to said cooler, while flowing the gas mixture into said first sorber, for a first preset period of time; second directing a portion of said fluid through said cooler and said first sorber and returning said portion to said cooler, while also directing the remainder of said fluid separately through said heater and said second sorber and returning said remainder to said heater, and while flowing

the gas mixture through said first sorber, for a second preset period of time following said first period;

third directing said fluid sequentially through said cooler, said second sorber, said heater and said first sorber and returning said fluid to said cooler, while flowing the gas mixture through said second sorber and removing the gas from said first sorber, for a third preset period of time following said second period;

fourth directing a portion of said fluid through said cooler and said second sorber and returning said portion to said cooler, while also directing the remainder of said fluid separately through said heater and said first sorber and returning said remainder to said heater, and while flowing the gas mixture through said second sorber and removing the gas from said first sorber, for a fourth preset period of time following said third period;

fifth subsequently repeating the first step while removing the gas from said second sorber; and sixth subsequently repeating the second step while removing the gas from said second sorber.

2. Apparatus for separating a gas from a gas mixture, comprising:

first conduit means for receiving the gas mixture;

second conduit means containing a heat-conductive fluid;

first and second sorbing means operatively connected to said first and second conduit means maintaining the mixture and said fluid in discrete and separate paths for sorbing the gas at a first preset temperature and desorbing the gas at a second preset temperature;

first valve means operatively connected in said first conduit means having first and second positions for conducting the gas mixture respectively to said first and second sorbing means;

second valve means operatively connected between said first and second sorbing means and adapted to be connected to a user and a vent and having a first position for conducting the gas from said first and second sorbing means respectively to the vent and user, and a second position for conducting the gas from said first and second sorbing means respectively to the user and vent;

cooler means operatively connected in said second conduit means for reducing the temperature of said fluid passing therethrough;

heater means operatively connected in said second conduit means for increasing the temperature of said fluid passing therethrough;

third valve means operatively connected in said second conduit means having a first position for directing said fluid from said cooler means and said heater means respectively to said first and second sorbing means, and a second position for conducting said fluid from said cooler means and said heater means respectively to said second and first sorbing means;

fourth valve means operatively connected in said second conduit means having a first position for directing said fluid from said first and second sorbing means respectively to said heater means and said cooler means, and a second position for conducting said fluid from said first and second sorbing means respectively to said cooler means and said heater means;

first pump means operatively connected in said second conduit means for circulating said fluid; and

controller means operatively connected to said valve means for producing sequential first, second, third and fourth control signals, said first and third signals respectively maintaining all said valve means in said first and second positions, and said second signal maintaining said first, second, and third valve means in said first position and said fourth valve means in said second position, and said fourth signal maintaining said first, second, and third valve means in said second position and said fourth valve means in said first position.

# 4,165,973 DUST COLLECTOR AND AIR SCRUBBER

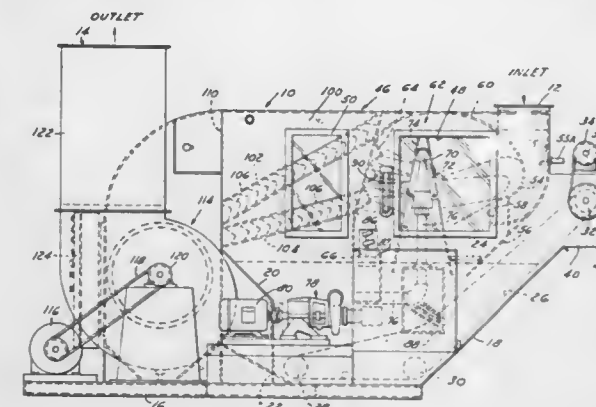
Steve S. Stergiou, 9855 Rattalee Lake Rd., Clarkston, Mich. 48016

Filed Jun. 27, 1977, Ser. No. 810,522

Int. Cl.<sup>2</sup> B01D 47/02, 47/06

U.S. Cl. 55—228

2 Claims



1. In an air cleaning apparatus for removing solid and particulate matter from a contaminated air stream introduced into the apparatus of the type utilizing an underlying sediment collection tank and a drag conveyor for removing the sediment, that improvement which comprises:

(a) an elongate housing having a downwardly extending air inlet at one end and an upwardly extending air outlet at another end downstream of the air inlet,

(b) means forming an airflow section horizontally displaced downstream from said inlet in the form of an inverted U, one leg of the U adjacent said inlet receiving air from said inlet,

(c) an inverted V-shaped assembly inserted in the U-shaped airflow section in such a manner that the airstream from said air inlet is forced to flow in an upward direction adjacent the one leg and in a downward direction adjacent the other leg, and having spray panels on its respective sides directing water jets transversely of each of said legs in a direction transverse to the flow of the airstream,

(d) a water eliminator section displaced downstream horizontally from said U-shaped airflow section and disposed in such a manner that the airstream is forced to flow in a vertically upward direction therethrough, and including two ranks of spaced chevron-shaped baffles extending across said water eliminator section wherein said upwardly moving airstream is forced to flow directly through said baffles in said water eliminator section, and

(e) an air moving device spaced horizontally downstream from and below said water eliminator section having an inlet disposed so as to draw the airstream downwardly from said water eliminator section and an outlet disposed to direct the airstream upwardly to said air outlet.

# 4,165,974

## MOLD LUBRICANT AND METHOD

George I. Goodwin, P.O. Box 348, Bloomfield Hills, Mich. 48013; John L. Margrave, P.O. Box 6914, Houston, Tex. 77005, and Robert E. Wagner, 1511 Mark Dr., Mount Prospect, Ill. 60056

Filed Mar. 16, 1973, Ser. No. 341,841

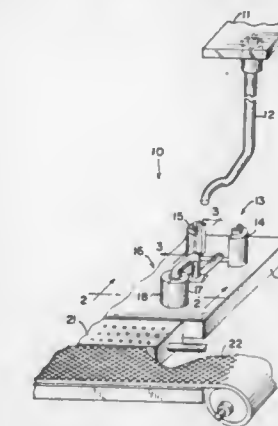
Int. Cl.<sup>2</sup> C03B 39/00

U.S. Cl. 65—26

14 Claims

1. In the method of manufacturing glass by shaping a molten gob of glass into a shape conforming to the shape of a cavity in

a mold, said mold being formed of metal or the like, the improvement comprising coating said mold cavity which



contacts said molten gob of glass during shaping with carbon monofluoride to provide relative permanent lubrication.

# 4,165,975 GOB WEIGHING SYSTEM

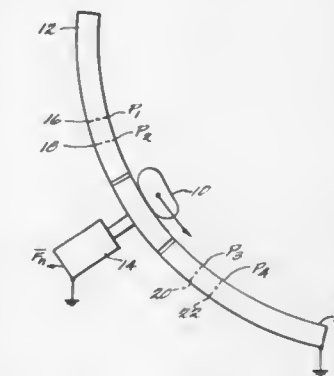
Jerome A. Kwiatkowski, and Charles L. Wood, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Apr. 20, 1978, Ser. No. 898,210

Int. Cl.<sup>2</sup> C03B 9/40

U.S. Cl. 65—29

13 Claims



1. Apparatus for measuring the mass of a moving object comprising:

means for gradually changing the direction of movement of said object;

force measuring means for measuring the force of said object normal to said direction of movement while said direction of movement is being changed;

acceleration measuring means for measuring the acceleration of said object normal to said direction of movement; and

means for interrelating the output of said force measuring means and said acceleration measuring means so as to determine the mass of said object.

8. Method for measuring the mass of a moving object comprising the steps of:

gradually changing the direction of movement of said object;

measuring the force of said object normal to said direction of movement while said direction of movement is being changed;

measuring the acceleration of said object normal to said direction of movement; and

interrelating said acceleration and force measurements so as to determine the mass of said object.

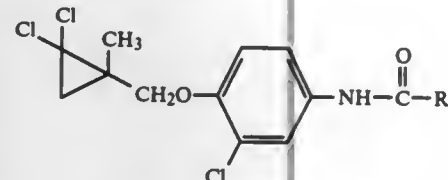


**4,165,976**  
**SYNERGISTIC HERBICIDAL COMPOSITIONS**  
 David L. King, Los Gatos, Calif., assignor to Stauffer Chemical Company, Westport, Conn.  
 Filed Apr. 21, 1978, Ser. No. 898,363  
 Int. Cl.<sup>2</sup> A01N 9/22

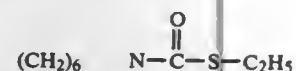
U.S. Cl. 71-88

8 Claims

1. A synergistic herbicidal composition comprising a mixture of  
 (a) an anilide of the formula



in which R is a member selected from the group consisting of C<sub>2</sub>-C<sub>4</sub> alkenyl and cyclopropyl; and  
 (b) a thiocarbamate of the formula



in a weight ratio of anilide to thiocarbamate of 0.01-10:1.

**4,165,977**  
**HERBICIDAL COMPOSITIONS**  
 Adolf Fischer, deceased, late of Mutterstadt, Fed. Rep. of Germany (by Caecilia E. Fischer, heiress-at-law), assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany  
 Division of Ser. No. 624,941, Oct. 22, 1975, Pat. No. 4,030,909.  
 This application Mar. 31, 1977, Ser. No. 783,209  
 Claims priority, application Fed. Rep. of Germany, Nov. 14, 1974, 2453908

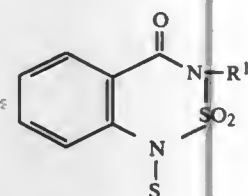
Int. Cl.<sup>2</sup> A01N 9/12

U.S. Cl. 71-91

4 Claims

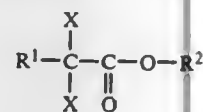
1. A herbicide composition comprising an inert carrier having dispersed therein a mixture of herbicides consisting essentially of:

a. a benzothiadiazinone dioxide of the formula



where R<sup>1</sup> denotes lower alkyl and R<sup>2</sup> denotes hydrogen, sodium, a di-lower alkylammonium or a di-lower hydroxyalkylammonium ion, and

b. a carboxylic acid derivative of the formula



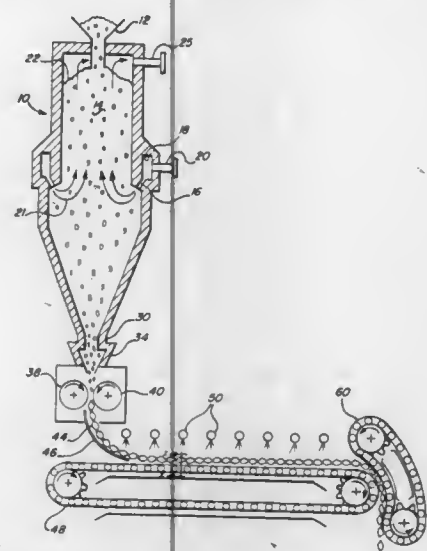
where R<sup>1</sup> denotes lower alkyl or chloro, X denotes chloro and R<sup>2</sup> is hydrogen or sodium, in a weight ratio of a to b of 3:1 to 1:3.

**4,165,978**  
**BRIQUET SHEET BREAKING BY COOLING AND BENDING**

Charles W. Sanzenbacher, and Robert M. Escott, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.  
 Filed Jul. 14, 1978, Ser. No. 924,541  
 Int. Cl.<sup>2</sup> C21B 13/02; C22B 1/14

U.S. Cl. 75-3

5 Claims



1. A method for producing individual metallized iron briquets comprising:  
 reducing iron oxide feed material by continuous gaseous direct reduction in a shaft furnace to form a hot particulate metallized iron product;  
 compacting said metallized iron product by briquetting it to form a densified elongated sheet of briquets connected by both longitudinal and transverse webs;  
 cooling said sheet to a temperature less than 425 degrees C.;  
 bending said sheet transversely and bending said sheet longitudinally to break the connection between adjacent briquets in both directions thereby separating the sheet into individual briquets.

**4,165,979**  
**FLASH SMELTING IN CONFINED SPACE**  
 Haydn Davies, Fonthill; Jose A. Blanco, Sudbury, and Charles E. O'Neill, Mississauga, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.  
 Continuation-in-part of Ser. No. 879,344, Feb. 21, 1978, abandoned. This application Oct. 23, 1978, Ser. No. 953,546  
 Int. Cl.<sup>2</sup> C22B 5/08

U.S. Cl. 75-23

8 Claims

1. In a process for flash-smelting sulfides by suspending the sulfides together with a fluxing agent in an oxidizing gas stream containing free oxygen and injecting the suspension into a furnace chamber, wherein formation and injection of said suspension is accomplished by at least one burner which comprises a first conduit through which particulate sulfide and fluxing solids are fed, a second conduit through which oxidizing gas is fed, and a mixing tunnel having an inlet extremity which communicates with said conduits to receive said particulate solids and oxidizing gas and an outlet extremity which communicates with said furnace chamber to discharge said suspension thereinto;

the improvement wherein said mixing tunnel comprises a

tunnel cooled by water or other suitable fluid and having a length of at least ten times its internal diameter, and



wherein said suspension is injected through said tunnel at a linear velocity of at least 25 meters per second.

**4,165,980**  
**METHOD OF RAPIDLY DECARBURIZING FERRO-ALLOYS WITH OXYGEN**

Friedrich Breuer, Eschweiler; Karl Brotzmann, Sulzbach-Rosenberg; Günter Duderstadt, Hesel; Rudolf Fichte, Nuremberg, and Fritz Stadler, Meererbusch, all of Fed. Rep. of Germany, assignors to GfE Gesellschaft für Elektrometallurgie mit Beschränkter Haftung, Düsseldorf, Fed. Rep. of Germany  
 Continuation of Ser. No. 316,085, Dec. 18, 1972, abandoned.  
 This application Nov. 27, 1974, Ser. No. 527,826

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1972, 2201388

Int. Cl.<sup>2</sup> C21C 5/34

U.S. Cl. 75-60

2 Claims

1. A method of refining a high-carbon ferro-alloy rich in manganese, comprising the steps of:  
 melting a ferro-alloy to form a bath, said ferro-alloy consisting essentially of 30-90% manganese, up to 8% carbon, up to 8% silicon, balance iron and nonmetallic impurities;  
 heating said bath to a temperature at least 100° C. above the melting point of said ferro-alloy; and  
 blowing an oxidizing gas enveloped by a protective gas into the melt below the surface of said bath, in an amount ranging between substantially 3 and 15 cubic meters S.T.P. of oxygen per minute for each metric ton of ferro-alloy, for a period sufficient to oxidize significant quantities of carbon in the melt at a rate of substantially 0.2% to 1% carbon per minute.

**4,165,981**  
**METHOD AND COMPOSITION FOR THE DECOMPOSITION OF SODIUM-MERCURY AMALGAM**  
 Harshad M. Patel, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.  
 Division of Ser. No. 666,027, Mar. 11, 1976, Pat. No. 4,105,441.  
 This application May 26, 1978, Ser. No. 910,166

Int. Cl.<sup>2</sup> C22B 43/00

U.S. Cl. 75-81

5 Claims

1. In the method of operating an amalgam decomposer wherein a sodium-mercury amalgam is contacted with water in a reactor containing solid packing to produce denuded mercury, hydrogen, and an aqueous caustic solution, the improvement which comprises employing as said packing particles comprised of a solid mixture of a thermally stable porous polymer matrix having embedded therein discrete particles of

a surface active composition, wherein said surface active composition is selected from the group consisting of iron, cobalt, nickel, graphite, molybdenum, vanadium and mixtures thereof, wherein the proportion of said thermally stable polymer to said particles of surface active composition is in the range from about 20 to 80% by volume of the resulting dispersion, wherein said thermally stable polymer is selected from the group consisting of polyphenylene sulfide, polyphenylene oxide, phenolic resins, polymers of furfuryl alcohols, imid polymers, silicone polymers, epoxy polymers, furan polymers, urethane polyphenylene sulfides, polyvinylidene fluorides, polyacrylonitrile, and polyvinyl alcohol, and wherein the particle size of said surface active composition is in the range from about 75 to about 1,000 microns.

**4,165,982**  
**MOLYBDENUM BASE ALLOY HAVING EXCELLENT HIGH-TEMPERATURE STRENGTH AND A METHOD OF PRODUCING SAME**

Fujiwara Tatsuo, Nagoya; Koshi Katoh, Yokkaichi; Yuzo Oh-takara, Kagamihara, and Takayoshi Shimizu, Ichinomiya, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

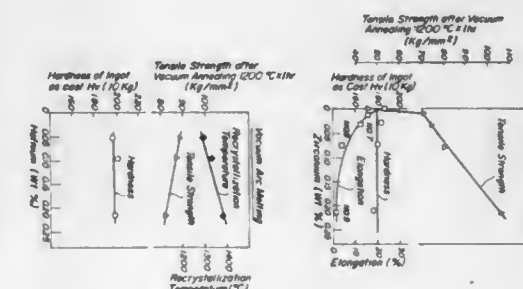
Filed Dec. 8, 1977, Ser. No. 858,637

Claims priority, application Japan, Dec. 11, 1976, 51/149267

Int. Cl.<sup>2</sup> C22C 27/00; C22F 1/18

U.S. Cl. 75-176

6 Claims



1. A molybdenum base alloy having a high-temperature strength, which consists of 0.005-0.015% by weight of C, at least one of 0.002-0.02% by weight of Zr and 0.004-0.04% by weight of Hf, not more than 0.0015% by weight of oxygen, not more than 0.0010% by weight of nitrogen and the remainder being substantially Mo.

**4,165,983**  
**JEWELRY ALLOYS**  
 Alan A. Bourne, Wargrave, and Arthur G. Knapton, Henley on Thames, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Feb. 23, 1978, Ser. No. 880,880

Claims priority, application United Kingdom, Feb. 23, 1977, 7601/77; May 26, 1977, 22331/77

Int. Cl.<sup>2</sup> C22C 5/04, 5/00

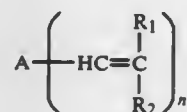
U.S. Cl. 75-172 R

9 Claims

1. An alloy suitable for use in the fabrication of jewelry consisting essentially of, apart from impurities, at least 95% by weight platinum, and 1.5 to 3.5% by weight gallium, the balance being at least one of the metals indium, gold, palladium, silver, copper, cobalt, nickel, ruthenium, iridium and rhodium.

4,165,984  
**ELECTROPHORETIC MIGRATION IMAGING PROCESS**  
 James A. Van Allan; Louis J. Rossi, both of Rochester; Melvin S. Bloom, Penfield; Michael T. Regan, Fairport; Hal E. Wright, and Joseph Y. Kaukelinen, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
 Continuation-in-part of Ser. No. 804,042, Jun. 6, 1977, abandoned. This application Mar. 24, 1978, Ser. No. 889,715  
 Int. Cl.<sup>2</sup> G03G 13/22, 17/04

U.S. Cl. 96—1 PE 5 Claims  
 1. An electrophoretic migration imaging process which comprises subjecting an electrically photosensitive colorant material positioned between at least two electrodes to an applied electric field and exposing said material to an image pattern of radiation to which the material is photosensitive, thereby obtaining image formation on at least one of said electrodes, the improvement which comprises using as at least a portion of said material an electrically photosensitive colorant



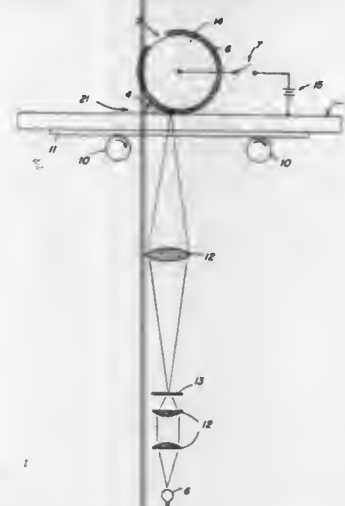
wherein

- n equals 1 or 2;  
 A represents phenylene, naphthylene, anthracenyl, anthracenediyl, and dibenzothien-diyl;  
 R<sub>1</sub> and R<sub>2</sub>, which may be the same or different when taken alone represent cyano, cyanoaryl, arylcarbonyl and hydrogen;  
 R<sub>1</sub> and R<sub>2</sub>, when taken together, represent sufficient atoms to form substituted and unsubstituted radicals selected from the group consisting of furanylidene, fluorenylidene, pyrimidinylidene, thiazolidinylidene, pyrrolinylidene, and isoxazolinylidene, pyrazolinylidene and indanylidene, wherein said substituents are selected from the group consisting of hydrogen, alkyl, cyano, aryl, oxo, thiooxo, nitro, alkyl, nitroaryl, carbamoyl, and cyanoalkyl;  
 alkyl represents an alkyl group having from one to six carbon atoms; aryl represents an aromatic nucleus selected from the group consisting of benzene, naphthalene or anthracene; except that when:  
 (A) A represents an anthracene nucleus and  
 (i) R<sub>1</sub> and R<sub>2</sub> when taken together represent 1,3,5-trihydro-2,4,6-trioxo-pyrimidin-5-ylidene; 3-cyano-4-phenyl-2-oxo-pyrrolin-5-ylidene or 3-carboxy-inden-1-ylidene or  
 (ii) taken alone R<sub>1</sub> represents cyano and R<sub>2</sub> represents methyl sulfonyl, phenylcarbamoyl or ethoxycarbonyl; or  
 (iii) either R<sub>1</sub> or R<sub>2</sub> is alkylcarbonyl or phenylcarbonyl; then n represents 2; or  
 (B) A represents a phenyl nucleus and R<sub>1</sub> and R<sub>2</sub> taken together represent 4,5-dicyano-1,3-dithiol-2-ylidene, n represents 2 or  
 (C) R<sub>1</sub> is hydrogen R<sub>2</sub> must be other than hydrogen.

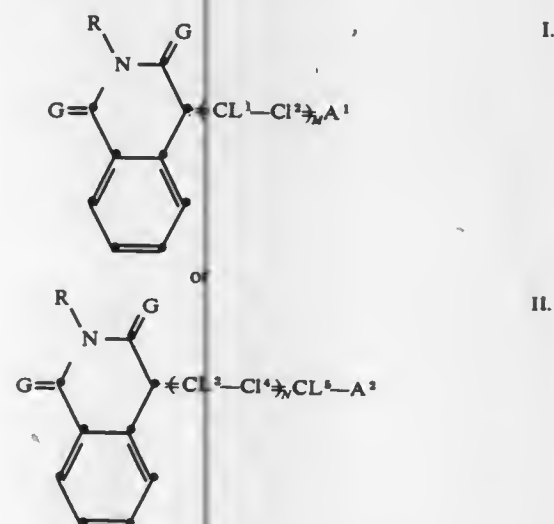
4,165,985  
**ELECTROPHOTOSENSITIVE MATERIALS FOR MIGRATION IMAGING PROCESSES**  
 James R. Nonnemacher, Rochester; Michael T. Regan, Fairport, and Frank G. Webster, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
 Filed May 24, 1978, Ser. No. 909,245  
 Int. Cl.<sup>2</sup> G03G 13/24

U.S. Cl. 96—1 PE 4 Claims  
 1. An electrophoretic migration imaging process which comprises subjecting an electrically photosensitive colorant material positioned between at least two electrodes to an applied electric field and exposing said materials to an image pattern of radiation to which the material is photosensitive,

thereby obtaining image formation on at least one of said electrodes, characterized in that at least a portion of said material



is an electrically photosensitive material having one of the following structures:



wherein:

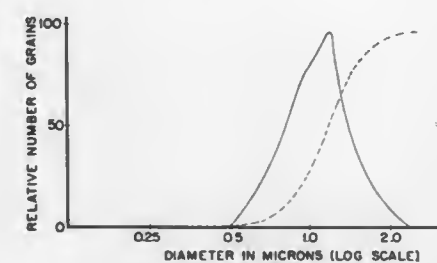
- R represents a basic heterocyclic nucleus of the type described from A<sup>1</sup> below, hydrogen, alkyl, aryl, aralkyl, ureido, thioureido, hydroxy, anilino or amidino;  
 G represents O or S;  
 L<sup>1</sup>, L<sup>2</sup>, L<sup>3</sup>, L<sup>4</sup>, and L<sup>5</sup>, each represent hydrogen, alkyl, or aryl;  
 M represents zero, one, two or three;  
 N represents zero or one;  
 A<sup>1</sup> represents a basic nitrogen substituted heterocyclic nucleus selected from the group consisting of imidazole, 3H-indole, thiazole, benzothiazole, naphthothiazole, thianaphtho[7,6-d]-thiazole, oxazole, benzoxazole, naphthoxazole, selenazole, benzoselenazole, naphthoselenazole, thiazoline, 2-quinoline, 4-quinoline, 1-isoquinoline, benzimidazole, 2-pyridine and 4-pyridine;  
 A<sup>2</sup> may represent the same basic heterocyclic nucleus as A<sup>1</sup> and in addition may represent an amino substituted aryl group or an alkoxy substituted aryl group or A<sup>2</sup> may be for example, a heterocyclic nucleus such as thiophene, benzo[b]thiophene, naphtho[2,3-b]thiophene, furan, isobenzofuran, chromene, pyran, xanthene, pyrrole, 2H-pyrrole, pyrazole, indolizine, indoline, indole, indazole, carbazole, pyrimidine, isothiazole, isoxazole, furazan, chroman, isochroman, 1,2,3,4-tetrahydroquinoline, 4H-pyrrolo

[3,2,1-ij]quinoline, 1,2-dihydro-4H-pyrrolo[3,2,1-ij]quinoline; 1,2,5,6-tetrahydro-4H-pyrrolo[3,2,1-ij]quinoline; 1H,5H-benzo[ij]quinolizine; 2,3-dihydro-1H,5H-benzo[ij]quinolizine; 2,3-dihydro-1H,5H-benzo[ij]quinolizine and 2,3,6,7-tetrahydro-1H,5H-benzo[ij]quinolizine, 10,11-dihydro-9H-benzo[a]xanthen-8-yl; 6,7-dihydro-5H-benzo[b]pyran-7-yl.

4,165,986  
**SUBSTITUTED-HALIDE SILVER HALIDE EMULSIONS AND PRODUCTS CONTAINING SAME**  
 Vivian K. Walworth, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.  
 Filed Jul. 27, 1973, Ser. No. 383,177  
 Int. Cl.<sup>2</sup> G03C 5/54, 1/48, 1/02, 1/28

U.S. Cl. 96—29 R

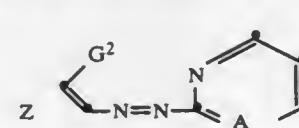
24 Claims



17. The process of forming a positive diffusion transfer image comprising exposing to a subject a layer of substituted-halide silver halide grains containing iodide in the core, said silver halide grains containing 1 to about 50 mole percent chloride, 1 to about 10 mole percent iodide, the remaining halide being bromide, said silver halide grains having been prepared by the replacement of a portion of the chloride anions of silver iodochloride grains with bromide or bromide and iodide anions, developing said exposed substituted-halide silver halide emulsion to a negative image of said subject, said development being effected in the presence of a silver halide solvent, and transferring an imagewise distribution of diffusible silver halide complex from undeveloped areas of said substituted-halide silver halide emulsion to an image-receiving layer in superposed relationship with said substituted-halide silver halide emulsion layer to provide a diffusion transfer positive silver image of said subject.

4,165,987  
**PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE PYRIDYLAZOPYRAZOLE OR PYRIMIDYLAZOPYRAZOLE DYE-RELEASING COMPOUNDS**  
 James A. Green, II, Chino, Calif., and Norman W. Kalenda, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
 Division of Ser. No. 832,310, Sep. 12, 1977. This application Jul. 24, 1978, Ser. No. 927,192  
 Int. Cl.<sup>2</sup> G03C 1/84; C09B 45/00, 29/22, 29/36

U.S. Cl. 96—119 R 21 Claims  
 19. A photographic element comprising a support having thereon a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein:  
 G<sup>2</sup> is a metal chelating group;

Z represents the atoms necessary to complete a pyrazole ring attached to the azo group in the 4-position; and A represents C or N.

4,165,988  
**CORRECTION FLUID**  
 Kenneth J. Page, London, England, and Michael A. Scott, Huntington, N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.  
 Filed Dec. 27, 1977, Ser. No. 865,054  
 Int. Cl.<sup>2</sup> C09D 11/00

U.S. Cl. 106—23 8 Claims  
 1. In a liquid correction composition comprising a film-forming binder material, an opaque pigment and a volatile organic solvent for said binder material, which composition is adapted to be brushed over an erroneous image and dried by evaporation of said solvent to form an opaque mask over said image corresponding to the color of the sheet carrying said image, the improvement which comprises using as said volatile organic solvent a mixture consisting essentially of from about 20% to about 95% by weight of 1,1,1-trichloroethane and from about 80% to about 5% by weight of perchlorethylene.

4,165,989  
**FARADAY ROTATION GLASS**  
 Yoshiyuki Asahara, Higashiyama, Japan, assignor to Hoya Corporation, Tokyo, Japan  
 Filed Mar. 23, 1978, Ser. No. 889,571  
 Claims priority, application Japan, May 30, 1977, 52-62983  
 Int. Cl.<sup>2</sup> C03C 3/16, 3/14; G02B 1/00

U.S. Cl. 106—47 Q 1 Claim  
 1. A Faraday rotation glass having a large Verdet constant and a small non-linear optical constant, which Faraday rotation glass consists essentially of, in mole%, of  
 Tb<sub>2</sub>O<sub>3</sub>: 5 to 25%  
 P<sub>2</sub>O<sub>5</sub>: 55 to 75%  
 B<sub>2</sub>O<sub>3</sub>: 5 to 25%  
 Al<sub>2</sub>O<sub>3</sub>: 0 to 15%  
 K<sub>2</sub>O+MgO: 5 to 25%  
 K<sub>2</sub>O: 0 to 25%, and  
 MgO: 0 to 15%.

4,165,990  
**COATINGS FOR REDUCED LOSSES IN (110) [001] ORIENTED SILICON IRON**  
 William T. Reynolds, McMurray, and Karl Foster, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Continuation of Ser. No. 382,266, Jul. 24, 1973, abandoned. This application Mar. 6, 1978, Ser. No. 883,439  
 Int. Cl.<sup>2</sup> C03C 5/02

U.S. Cl. 106—48 5 Claims  
 1. A coating composition for use on transformer core materials consisting essentially of from about 15% to about 80% iron oxide, up to 50% SiO<sub>2</sub> and the balance with a minimum of 20%, essentially MgO.

4,165,991  
**METHOD FOR THE PRODUCTION OF SYNTHETIC WOLLASTONITE MATERIAL**  
 Heinrich zur Strassen, Schöenberg, and Eberhard Rauschenfels, Wiesbaden-Sonnenberg, both of Fed. Rep. of Germany, assignors to Dyckerhoff Zementwerke A.G., Wiesbaden-Amöneburg, Fed. Rep. of Germany  
 Division of Ser. No. 241,823, Apr. 6, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,643  
 Claims priority, application Fed. Rep. of Germany, Apr. 7, 1971, 2116986  
 Int. Cl.<sup>2</sup> C04B 35/04, 35/06

U.S. Cl. 106—63 9 Claims  
 1. A method for the production of high-brightness synthetic



wollastonite material utilizing the slag melt obtained during the thermal production of phosphorus from crude phosphate, said method comprising the steps of  
quenching the melt in water to produce a glassy slag sand, removing impurities from the quenched slag, and burning the quenched slag at a temperature of about 1100° C. in an oxidizing atmosphere to produce the crystalline wollastonite.

4,165,992

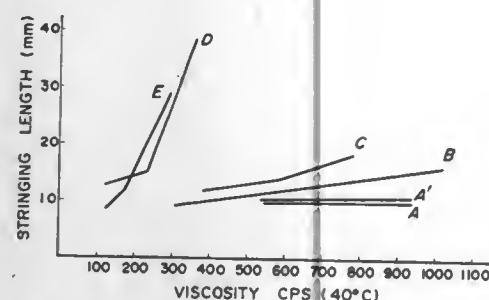
# PASTE MATERIAL AS THE CARRIER INGREDIENT OF PASTE FOR PASTING CORRUGATED CARDBOARD AND THE PROCESS FOR PREPARING THE SAME

Kolchi Azumada, and Michio Kobori, both of Kashihara, Japan, assignors to Shunichi Morimoto, Kashihara, Japan  
Filed Sep. 1, 1977, Ser. No. 829,813

Claims priority, application Japan, Jun. 22, 1977, 52-74255  
Int. Cl.<sup>2</sup> C08L 3/02

U.S. Cl. 106—210

3 Claims



1. In a paste composition for pasting a corrugated cardboard by a high-speed gravure roll pasting machine and prepared by mixing a carrier paste of pre-gelatinized starch with a main paste of non-gelatinized starch, the improvement comprising: said carrier paste including a chemically processed starch manufactured by making 0.01–3% by weight of N,N-diglycidyl-aniline or N,N-diglycidyl-O-toluidine be contact-absorbed into a natural starch and then heating and roasting the resultant mixture at a temperature in the range of 100°–250° C., and preferably, of 110°–150° C.

4,165,993

# METHOD OF FLUE AND FIREPLACE CLEANING AND APPARATUS USED THEREIN

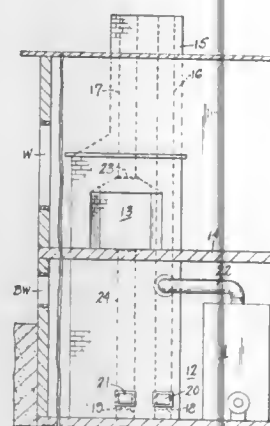
Daniel F. McCarthy, and Carolann L. McCarthy, both of 33 Ezra St., North Haven, Conn. 06473

Filed Sep. 19, 1977, Ser. No. 834,800

Int. Cl.<sup>2</sup> B08B 5/04, 9/00, 9/04, 7/04

U.S. Cl. 134—21

5 Claims



1. The method of chimney cleaning which includes, providing a source of detergent-bearing steam under pressure, pro-

viding a source of high volume wet-and-dry vacuum, said steam source being adapted to deliver said steam into a substantially vertically extending space to be cleaned progressively from a high point to a lower point, connecting said vacuum source by a hose to a fitting at a low point in said space, actuating said sources to loosen debris from the walls of said space and to collect the loosened debris therefrom by vacuum, the method including providing said fitting with a scoop adapted to intercept falling debris and to facilitate the entry of the debris into the hose.

4,165,994

# MACHINE FOR WASHING AND DRYING PARTS

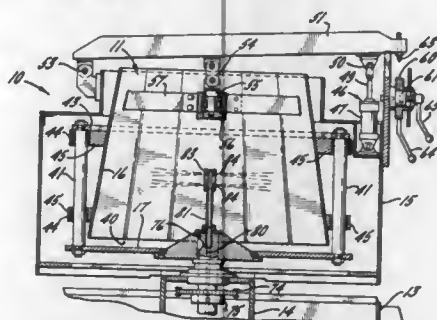
Warren M. Jackson, 5071 Crofton, Rockford, Ill. 61101

Filed Jan. 3, 1978, Ser. No. 866,275

Int. Cl.<sup>2</sup> B08B 3/02, 3/10

U.S. Cl. 134—104

9 Claims



1. A machine for washing parts, said machine comprising a support, a tub mounted on said support and having a top and a bottom, mechanism for rotating said tub about a vertically and horizontally inclined axis, an axially and circumferentially extending opening at the bottom of said tub, and means for enabling the axial dimension of the opening to be selectively adjusted in accordance with the size of the parts.

4,165,995

# PLUG CONNECTION BETWEEN A THERMO FEELER AND A HOLDER

Gustav Kolb, Im Ohl 52, 5870 Hemer, Fed. Rep. of Germany, assignor to Mannesmann A.G. and Gustav Kolb, both of Düsseldorf, Fed. Rep. of Germany

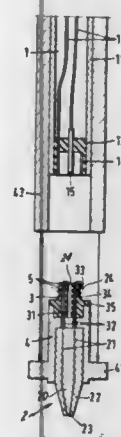
Filed Feb. 13, 1978, Ser. No. 877,487

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706326

Int. Cl.<sup>2</sup> H01L 35/06

U.S. Cl. 136—234

10 Claims



1. A plug connection between a thermo feeler and a tubular holder for the feeler, there being a plurality of conductors in

the holder, and a plurality of leads of and pertaining to the thermo feeler to be connected to the conductors of the plurality, comprising:

- a socket member mounted to one end of the tubular holder and defining an opening;
- contact means on the socket member including a central pin extending from a bottom of the member into the opening, and further including at least one contact at an inner periphery of the socket member;
- the thermo feeler including a thermocouple carrier, said leads extending from the carrier;
- an insulating contact carrier made of electrically insulating material and being mounted on the thermocouple carrier, having a central bore for receiving the pin, further having at least two additional passages extending axially in the contact carrier;
- a plurality of annular ribs extending radially from the contact carrier and having radially tapered contour, a rib carrying portion of the contact carrier being insertible in the socket member, the ribs having slightly larger radial extension than the radial inner dimensions of the socket member including the one contact; and
- the leads being strung through the additional passages having their ends provided so that the end of one of the thermo feeler leads hangs into said pin receiving bore, and the other thermo feeler lead or leads, respectively, hang over the ribs to make contact with the contact means in the socket upon insertion of the contact carrier into the socket.

4,165,996

# METHOD OF TREATING WIRE ROD

Philippe A. Paulus, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metalurgie, Brussels, Belgium

Filed Jan. 31, 1978, Ser. No. 873,943

Claims priority, application Belgium, Feb. 3, 1977, 851075

Int. Cl.<sup>2</sup> C21D 9/52

U.S. Cl. 148—12 B

7 Claims

1. A method of treating steel wire rod, in which the wire rod is subjected to a controlled cooling operation while emerging from a hot rolling mill, the controlled cooling operation comprising the following sequential steps:

- (a) cooling the rod down to a temperature of 850° to 650° C.;
- (b) keeping the rod at substantially this temperature for a time sufficient for austenite to be transformed into ferrite and for grain growth to occur;
- (c) immersing the rod in an aqueous bath whose temperature is higher than 75° C.;
- (d) cooling the rod, while it is in the aqueous bath, from the said temperature to a second temperature of 625° to 400° C.; and
- (e) keeping the rod near this second temperature for a time not shorter than 75 seconds and sufficiently long to permit precipitation of carbon in the form of carbides.

4,165,997

# INTERMEDIATE TEMPERATURE SERVICE ALLOY

Darrell F. Smith, Jr., and Edward F. Clatworthy, both of Huntington, W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 780,608, Mar. 24, 1977, abandoned. This application Oct. 26, 1977, Ser. No. 845,474

Int. Cl.<sup>2</sup> C22C 38/48, 38/50

U.S. Cl. 148—38

8 Claims

1. An iron-base alloy adapted for high temperature use and characterized in the wrought and heat treated condition by a 0.02% off-set, yield strength of at least about 100,000 psi at room temperature and high ductility coupled with good stability for long periods of time, said alloy consisting essentially of 29% to 34% nickel, 10% to 14% chromium, 1.5% to 2.5% titanium, 0.95% to 4.3% metal from the group columbium, tantalum and mixtures thereof provided the total of columbium

plus one-half the percentages of tantalum is 0.95% to 2.15% and further provided the composition conforms to the relationship A whereby

(A)  $\%Ti + \frac{1}{2}[\%Cb + \frac{1}{2}(\%Ta)]$  is at least 2%, 0.002% to 0.015% boron, up to 2% manganese, up to 0.5% silicon, up to 0.8% aluminum, up to 0.1% carbon, up to not more than 0.5% each of molybdenum and tungsten in order to minimize adversely affecting stability, and the balance iron in an amount equal to at least 45% of the alloy.

4,165,998

# MANUFACTURE OF PHARMACEUTICAL DOSAGE FORMS

Jim M. Adams, Mt. Pleasant, S.C., and Lawrence S. White, Ramsey, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 640,651, Dec. 15, 1975, abandoned. This application Aug. 10, 1977, Ser. No. 823,295

Int. Cl.<sup>2</sup> A61K 9/70

U.S. Cl. 156—64

10 Claims

1. In a method of preparing solid pharmaceutical unit dosage forms comprising uniformly loading one or more medicaments in a finely particulate form to a therapeutically inert, edible web, fabricating said web into a solid geometric form of predetermined dimensions having said medicament substantially internalized, said form being divisible into a plurality of unit dosage forms, unitizing said geometric form into said plurality of unit dosage forms and sealing said unit dosage forms to completely internalize said medicament wherein said procedures include at least one non-destructive testing operation to assure uniform quality of said unit dosage forms, the improvement in said on-line non-destructive testing operation which comprises evaluating and quantifying the uncoated web for physical integrity.

4,165,999

# MANUFACTURE OF SURFACE ELEMENTS

Ernst M. Egner, Lund, Sweden, assignor to Euroc Development AB, Malmo, Sweden

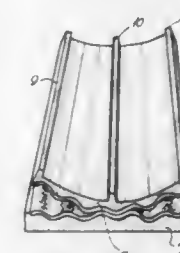
Continuation-in-part of Ser. No. 751,508, Dec. 17, 1976, abandoned. This application Mar. 7, 1978, Ser. No. 884,338

Claims priority, application Sweden, Dec. 18, 1975, 7514324

Int. Cl.<sup>2</sup> B28B 1/32

U.S. Cl. 156—245

4 Claims



1. A method of manufacturing molded objects having two shaped surfaces which comprises:

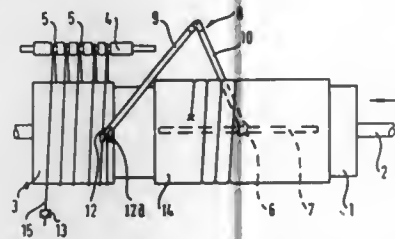
- (a) forming a mixture of a setting material and fibers;
- (b) spraying said mixture onto a first mold portion having a surface corresponding to one of the shaped surfaces of the object;
- (c) spraying said mixture onto a second bendable mold portion having a surface corresponding to the other shaped surface of the object;
- (d) permitting said second bendable mold portion of taking a curved shape;
- (e) bringing said first and second mold portions together to form a complete mold and a molded object, said curved second mold portion being gradually flattened out in bringing said portions together thereby to prevent air pockets and air pores in the molded object;

- (f) bringing said first and second mold portions further together while pressing to form the completed object, and  
(g) separating the at least partially set molded object from the mold portions.

4,166,000

**APPARATUS FOR WINDING HELICAL REINFORCEMENT INTO A POLYMERIC TUBE**  
Neil Lawson, Penarth, Wales, assignor to Dunlop Limited, United Kingdom  
Continuation of Ser. No. 635,937, Nov. 28, 1975, abandoned.  
This application Jan. 16, 1978, Ser. No. 870,013  
Claims priority, application United Kingdom, Nov. 27, 1974, 51305/74; Aug. 2, 1975, 32389/75  
Int. Cl.<sup>2</sup> B65H 81/00  
U.S. Cl. 156—425

7 Claims



1. In an apparatus for winding a helical reinforcement layer for a filamentary reinforced, tubular, polymeric article having:
  - (a) a mandrel for carrying the polymeric article;
  - (b) the mandrel having an axially extending substantially smooth unthreaded gauge portion at one end having a diameter determined by the reinforcement winding diameter;
  - (c) a guide eye mounted adjacent to the mandrel and drive means for driving the guide eye along the mandrel to give the required pitch to the helical winding; the improvement comprising:
  - (d) means to feed reinforcement material at a substantially constant winding length per mandrel rotation, said means including a compensating mechanism comprising a constant length guide having at least two rigid link members pivotally connected end to end to form the guide, one end of which is connected to the guide eye and the other end being fixed in relation to the gauge portion of the mandrel so as to allow for relative movement between the guide eye and mandrel and to maintain the path length distance from the gauge portion to the guide eye substantially constant such that in use the gauge portion of the mandrel feeds reinforcement material at a substantially constant winding length per mandrel rotation from the compensating mechanism to the guide eye.

4,166,001

**MULTIPLE LAYER FORMATION PROCESS FOR CREPED TISSUE**  
Charles E. Dunning, William D. Lloyd, and Joseph G. Bicho, all of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.  
Continuation-in-part of Ser. No. 481,532, Jun. 21, 1974, abandoned. This application Feb. 10, 1977, Ser. No. 767,614  
Int. Cl.<sup>2</sup> D21H 5/24  
U.S. Cl. 162—111

11 Claims

1. A process for the manufacture of creped tissue suitable for sanitary products such as facial and bathroom tissue, from papermaking fibers suspended in aqueous stock, said process comprising:
  - (a) forming a web by simultaneously flowing three layers of stock onto a wire and extracting free water from the web, the two outer layers being of similar stock of fibers which form strong interfiber bonds, and the intermediate layer being of stock of fibers which form weak interfiber bonds

in the laminar web as formed from said stocks to provide a laminar web with discrete outer layers separated by said intermediate layer,  
carrying the laminar web from the forming wire on a fabric to a first creping roll and transferring the laminar web to said roll,  
creping the laminar web from the first creping roll, adhering said laminar web to a second creping roll with the layer of strongly bonded fibers which was away from the first creping roll against said second creping roll, and creping the web from said second creping roll while so controlling the adhesion of the web to said second creping roll during creping that the layer of strongly bonded fibers against said second creping roll partially shears away from the other outer layer of strongly bonded fibers along the plane of the intermediate layer and is reformed into a fine, irregularly creped structure to enhance bulk and provide a soft fine creped surface.

4,166,002

**POLYAMINES CONTAINING ACID GROUPS THAT ARE USEFUL IN PAPERMAKING**  
Wolfgang Lehmann, Leverkusen; Gerhard Troemel, Persch; Kurt Ley, and Friedhelm Müller, both of Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Division of Ser. No. 305,320, Nov. 10, 1972, Pat. No. 3,932,363.  
This application Nov. 29, 1974, Ser. No. 528,324  
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1971, 2156215  
Int. Cl.<sup>2</sup> D21H 3/58  
U.S. Cl. 162—164 R

14 Claims

1. In the process for making paper in which an auxiliary is added to the pulp prior to passage of the pulp to the papermaking machine or to papermaking machine effluents for increasing fiber, filler and pigment retention or for assisting working up papermaking machine effluents by filtration, sedimentation or flotation; the improvement which comprises using as said auxiliary an effective amount of a water-soluble modified polyamide-amine having an average molecular weight of above 1,000 and containing at least one —R—Z group bonded to a basic nitrogen in which  
Z is —COOH or —SO<sub>3</sub>H; and  
R is alkylene of 1 to 7 carbon atoms, alkylene of 1 to 7 carbon atoms substituted by carbonamido, or alkylene of 1 to 7 carbon atoms interrupted by carbonamido; in which 0.05 to 0.9 equivalents of the basic amino groups in said polyamide-amine are converted to said —R—Z groups.

4,166,003

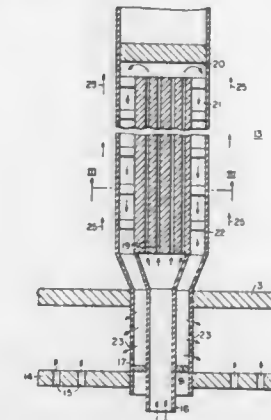
**NUCLEAR CORE AND A REFLECTOR ASSEMBLY THEREFOR**

Ajay Bhattacharyya, Vesteras, Sweden, and Ernst H. G. Weiss, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Continuation of Ser. No. 346,548, Mar. 30, 1973, now Defensive Publication No. T927,001. This application Sep. 15, 1975, Ser. No. 613,728  
Int. Cl.<sup>2</sup> G21C 15/10  
U.S. Cl. 176—61

16 Claims

1. A reflector assembly arrangement for use in a core of a nuclear reactor, said core being of a type which is cooled by flow therethrough of a liquid metal reactor coolant, said reflector assembly arrangement including:
  - (a) a plurality of reflector assemblies, each of said reflector assemblies comprising an elongated, generally circular enclosure, and means for reflecting neutrons positioned within said enclosure, said enclosure being associated with said neutron reflecting means so as to form at least one longitudinal coolant flow path therebetween, said neutron reflecting means having a plurality of longitudinal flow channels therein, said flow channels being connected with

said flow path forming a double pass coolant flow path within said reflector assembly,  
means for supplying influent coolant to each of said reflector assemblies, said means being flow connected to said flow channels in said neutron reflecting means,  
means for removing effluent coolant from each of said reflector assemblies, said means being flow connected to said flow path between said enclosure and said neutron reflecting means,



and means for creating a pressure differential, said means located upstream of said core and interposed said means for supplying influent coolant and said means for removing effluent coolant, said means creating a pressure differential by flow therethrough of said reactor coolant, said pressure differential simultaneously being created across said means for supplying influent coolant and said means for removing effluent coolant causing double pass coolant flow through each of said reflector assemblies.

4,166,004

**PROCESS FOR THE PREPARATION OF SINGLE CELL PROTEIN USING METHYLMONAS CLARA ATCC 31226**  
Paul Präve, Bad Soden am Taunus; Dieter Sukatsch, Frankfurt am Main, and Uwe Faust, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Jul. 21, 1977, Ser. No. 817,870  
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633451  
Int. Cl.<sup>2</sup> C12B 1/00  
U.S. Cl. 435—253

2 Claims

1. A method for preparing a biomass which comprises cultivating a strain of the species *Methylobacterium clara* ATCC 31226 under aerobic conditions in a nutrient medium containing a nitrogen source, essential mineral salts, and methanol at a concentration between 5 ppm and 150 ppm, by weight of the nutrient medium, as the sole carbon source.

4,166,005

**PROCESS FOR THE PRODUCTION OF α-GLYCEROPHOSPHATE OXIDASE**  
Prakash S. Masurekar, Webster, and Charles T. Goodhue, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Continuation-in-part of Ser. No. 749,650, Dec. 10, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,734  
Int. Cl.<sup>2</sup> C12D 13/10  
U.S. Cl. 435—190

18 Claims

1. A method for producing useful enzyme from a member of the family Lactobacillaceae, said member being capable of producing α-glycerophosphate oxidase, said method comprising growing said member in a nutrient medium comprising pyruvate and an inducer for α-glycerophosphate oxidase and extracting said enzyme.

4,166,006

**MEANS FOR STIMULATING MICROBIAL GROWTH**  
William Hertl, and William S. Ramsey, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.  
Filed Nov. 10, 1977, Ser. No. 850,222  
Int. Cl.<sup>2</sup> C12B 1/20  
U.S. Cl. 435—244

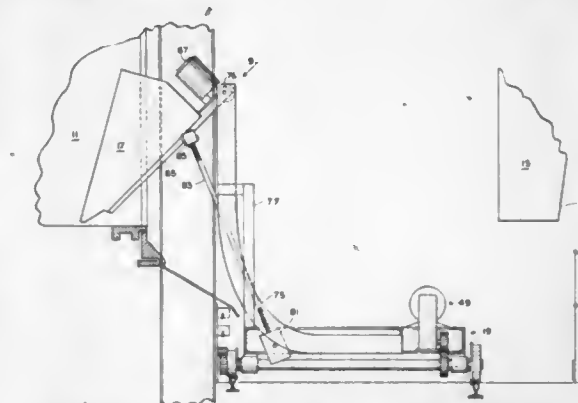
5 Claims

1. A method for enhancing the growth of aerobic and facultative anaerobic microorganisms via one of the following processes which consists essentially of:
    - (a) contacting a grease consisting essentially of a fluorocarbon or silicone oil, an inert filler in fine particulate form, and a peroxide compound, with a liquid nutrient medium and an aerobic or facultative anaerobic microorganism, and incubating the resulting combination; or
    - (b) contacting a solid nutrient medium with a grease consisting essentially of a fluorocarbon or silicone oil, an inert filler in fine particulate form, and a peroxide compound, inoculating the solid nutrient medium with an aerobic or facultative anaerobic microorganism, and incubating the resulting inoculated medium-grease combination;
- said peroxide compound being one which is capable of decomposing at a temperature between about 0°–75° C., which does not release toxic gases into either nutrient medium and which is present in an amount which is otherwise not toxic to said microorganism, and which does not react with said grease; and said incubating is carried out at a temperature and for a time sufficient to give enhanced growth of the microorganism.

4,166,007

**APPARATUS FOR CATCHING COKE OVEN SPILLAGE**  
Joseph Becker, Jr., Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.  
Filed Jun. 21, 1978, Ser. No. 917,495  
Int. Cl.<sup>2</sup> C10B 29/00, 35/00; B65G 25/00  
U.S. Cl. 202—262

5 Claims

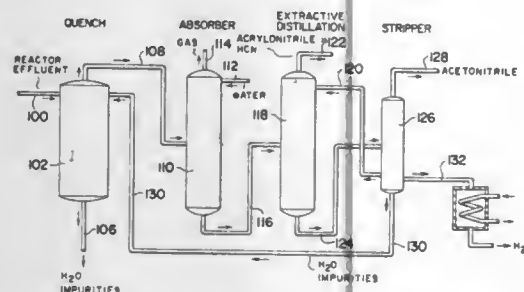


1. An apparatus, for catching and collecting discharged coke from a coke oven as a consequence of oven door removal on the pusher side and coke oven pullback, located on the pusher side of a coke oven battery, comprising:
  - (a) a platform extending the length of said coke oven battery;
  - (b) a hopper adapted to fit within said coke oven;
  - (c) support means for supporting said hopper, said support means being movable along said platform;
  - (d) elevating means for elevating and horizontally projecting said hopper aloft from said support means and into said coke oven, said elevating means being able to move said hopper horizontally on said support means such that said hopper is adjacent to and below said coke oven to receive any of said coke removed from said oven as a result of coke oven pullback prior to the introduction of said hopper into said oven;
  - (e) means for tilting said hopper when said hopper is in an elevated position and within said oven; and
  - (f) positioning means for positioning and repositioning said hopper, and support means along said platform adjacent to



any of a predetermined one of said coke oven of said coke oven battery.

**4,166,008**  
**PROCESS FOR RECOVERY OF OLEFINIC NITRILES**  
 Hsin C. Wu, Parma, and William O. Fitzgibbons, Hudson, both of Ohio, assignors to The Standard Oil Company, Ohio  
 Filed Jul. 29, 1977, Ser. No. 820,479  
 Int. Cl.<sup>2</sup> B01D 3/40; C07C 121/32  
 U.S. Cl. 203—85 12 Claims



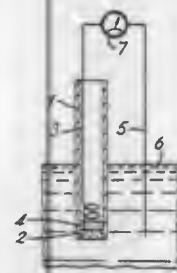
1. In the process for the recovery and purification of acrylonitrile or methacrylonitrile produced by the ammoxidation reaction of propylene or isobutylene, molecular oxygen and ammonia in the presence of ammoxidation catalysts, comprising:

- contacting the ammoxidation reactor effluent containing acrylonitrile or methacrylonitrile, acetonitrile, and impurities with an aqueous quench liquid in a quench system to produce a gaseous quench effluent from said quench system;
- absorbing said gaseous quench effluent in water to form an aqueous solution;
- feeding the aqueous solution to an intermediate tray of a distillation column having a plurality of trays, using solvent water introduced in the top of said column to perform a water extractive distillation, wherein an overhead vapor stream of acrylonitrile or methacrylonitrile with some water is removed from the top of the column, and a liquid stream containing water and impurities is removed from the bottom of the column;
- removing a first sidestream from the lower half of said column to recover acetonitrile;
- feeding at least a part of the liquid bottoms from said column to the quench system as quench liquid, the improvement comprising: removing a vapor stream containing water substantially free of polymers from the lower fourth of said column.

**4,166,009**  
**METHOD FOR DETECTING ELEMENTS**  
 Derek J. Fray, Cambridge, England, assignor to National Research Development Corporation, London, England  
 Division of Ser. No. 592,200, Jul. 1, 1975, Pat. No. 4,085,023.  
 This application Dec. 13, 1977, Ser. No. 860,000  
 Claims priority, application United Kingdom, Jul. 3, 1974, 29490/74

Int. Cl.<sup>2</sup> G01N 27/46 2 Claims  
 U.S. Cl. 204—1 T  
 1. A method for the detection or determination of an element in a sample containing said element, including the steps of:  
 (1) providing a solid electrolyte pellet comprising  $\beta$ -alumina containing the element to be detected or determined and a refractory material tube containing a reference electrode and a solid powder reference material of a compound of said element to be detected or determined which is solid at 750° C. and which is selected from the group consisting of: two phase  $\beta$ -alumina, a mixture of  $\alpha$ -alumina and  $\beta$ -alumina, a molybdate and a vanadate, said pellet sealing

one end of said tube and contacting said reference material at one surface thereof;  
 (2) contacting a sample containing said element to be de-



tected or determined with another electrode and the surface of the pellet opposite said first-mentioned surface; and  
 (3) monitoring the e.m.f. generated between the two electrodes.

**4,166,010**  
**SINTERED NEGATIVE PLATE**  
 Saverio F. Pensabene, and Arthur J. Catotli, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.  
 Continuation-in-part of Ser. No. 894,398, Apr. 7, 1978, Pat. No. 4,139,423. This application Dec. 18, 1978, Ser. No. 970,316  
 Int. Cl.<sup>2</sup> C25D 9/06, 9/08  
 U.S. Cl. 204—2.1 7 Claims

1. A process for the manufacture of negative electrodes for nickel-cadmium alkaline storage cells the steps consisting essentially of forming a porous nickel plaque, immersing said porous plaque in a slightly acidic cadmium nitrate solution, removing said plaque from said nitrate solution and heating said plaque in air until substantially dry, immersing said dried plaque in an alkali hydroxide solution, removing said plaque from said hydroxide solution and rinsing said plaque with water, reheating said plaque in air until substantially dry, repeating the foregoing treatments of said plaque until a desired electrochemical loading in the pores of said plaque is attained, heating said plaque with said desired electrochemical loading to a temperature not substantially less than 200° C. and not substantially more than 300° C. until substantially all of the  $\text{Cd}(\text{OH})_2$  in said plaque is converted to CdO and nitrate impurities in said plaque are converted to nitrogen oxide gases and volatilized, immersing said plaque with said converted CdO in a second alkali hydroxide solution, cathodizing said plaque in said second solution until about 20–40% of the CdO therein is converted to Cd, removing the cathodized plaque from said second solution and rinsing said plaque with water and heating said plaque until said plaque is substantially dry.

**4,166,011**  
**METHOD FOR THE MANUFACTURE OF A SHAPING MASK FOR AN ELECTROEROSION TOOL**  
 Curt A. Lugstenmann, deceased, late of Caslano, Switzerland, and Franziska S. Capdevilla nee Lugstenmann, heir, Bern, Switzerland, assignors to Supia Etablissement, Vaduz, Liechtenstein  
 Filed Mar. 16, 1977, Ser. No. 778,128  
 Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611425

Int. Cl.<sup>2</sup> C25D 1/10, 1/20, 1/22 3 Claims  
 U.S. Cl. 204—4  
 1. A method of making a shaping mask for use as an electroerosion tool, comprising the steps of:  
 applying to a matrix having a shape corresponding to that of the tool to be produced, a hard-chromium layer by galvanic deposition;  
 passivating said layer by treating it with a passivating solution;  
 immersing the matrix carrying the galvanically deposited passivating hard-chromium layer in an electroplating bath;

electrodepositing copper or copper alloy from said bath on said layer for a period and at a rate causing the electrodeposited copper or copper alloy to lift by itself from said layer; and  
 removing the electrodeposited copper or copper alloy body after it has lifted by itself from said layer for use as said mask.

**4,166,012**  
**METHOD OF PREPARATION OF ELECTROOPTICAL ELEMENTS**

Edward J. Quinn, East Amherst, N.Y., and Donald H. Campbell, Niagara-on-the-Lake, Canada, assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.  
 Filed Jan. 3, 1978, Ser. No. 866,424  
 Int. Cl.<sup>2</sup> B05D 3/10, 1/36, 1/38, 7/04  
 U.S. Cl. 204—30 16 Claims

1. A process for the preparation of transparent electroconductive coatings on a polymeric substrate comprises the steps of:  
 (A) contacting said substrate with a liquid solution of a phenolic compound and a chlorinated aliphatic compound;  
 (B) removing the phenolic compound from the surface of the substrate;  
 (C) subjecting the substrate to phosphorus sesquisulfide to deposit phosphorus sesquisulfide in the surface thereof;  
 (D) contacting the phosphorus sesquisulfide treated surface with a solution of a metal salt or complex thereof to form a metal-phosphorus-sulfur coating thereon, wherein the metal is selected from the groups IB, IIB, IVB, VB, VIB, VIIB and VIII of the Periodic Table.

**4,166,013**  
**METHOD OF MAKING METAL BETA-ALUMINA AND REFINING METAL USING IT**

Derek J. Fray, Trumpington, and Robert Gee, Adel, both of England, assignors to National Research Development Corporation, London, England  
 Filed Apr. 26, 1978, Ser. No. 900,307  
 Claims priority, application United Kingdom, Apr. 29, 1977, 18045/77

Int. Cl.<sup>2</sup> C25B 1/00 21 Claims  
 U.S. Cl. 204—61  
 1. A method of making a polycrystalline metal- $\beta$ -alumina, comprising electrolyzing polycrystalline alkali-metal  $\beta$ -alumina, using as anode the liquid metal and a molten salt which contains ions of the metal, the molten salt being in contact with the  $\beta$ -alumina.

**4,166,014**  
**ELECTROLYTIC DIAPHRAGMS, AND METHOD OF ELECTROLYSIS USING THE SAME**

Toshikatsu Sata, Tokuyama; Shoji Murakami, Hikari, and Yasuo Murata, Shinnanyo, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan  
 Filed Jan. 31, 1975, Ser. No. 545,876  
 Claims priority, application Japan, Dec. 27, 1973, 48-144512; Feb. 4, 1974, 49-13607

Int. Cl.<sup>2</sup> C25B 13/08, 1/46 6 Claims  
 U.S. Cl. 204—98  
 1. An electrolytic diaphragm consisting essentially of a main layer composed of a polymeric membranous material uniformly containing cation exchange groups and at least one fluorine atom chemically bonded to a carbon atom in the polymer backbone and a secondary layer having a smaller thickness than said main layer and composed of at least one compact electrically neutral, ion permeable, liquid impermeable, hydroxyl ion sieving layer said secondary layer being in intimate contact with said main layer at at least one surface layer portion or interior of said main layer and impeding the diffusion of hydroxyl ions into the main layer.  
 6. A method for electrolyzing alkali salts, which comprises

electrolyzing alkali salts in an electrolytic cell in which the anode is separated from the cathode by the electrolytic diaphragm of claim 1, and passing alkali metal ions through said diaphragm thereby to obtain alkali hydroxides in the cathode compartment.

**4,166,015**  
**PROCESS FOR THE MANUFACTURE OF ALUMINUM SUPPORTS FOR PLANOGRAPHIC PRINTING PLATES BY ELECTROCHEMICAL ROUGHENING OF THE PLATE SURFACES**

Siegfried Raether, deceased, late of Idstein, Fed. Rep. of Germany (by Edith Raether, heir), assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany  
 Continuation of Ser. No. 716,646, Aug. 23, 1976, abandoned.  
 This application Jul. 13, 1977, Ser. No. 815,378  
 Claims priority, application Fed. Rep. of Germany, Aug. 25, 1975, 2537725

Int. Cl.<sup>2</sup> C25F 3/04 5 Claims  
 U.S. Cl. 204—129.75  
 1. In the process for the manufacture of a photosensitive material for the production of planographic plates, wherein the surface of an aluminum support is electrochemically roughened in an agitated aqueous electrolyte solution, and then coated with a photosensitive reproduction layer, the improvement comprising that said aqueous electrolyte solution has a pH value from 1 to 5 and consists essentially of water and from about 200 g per liter to the saturation point of an electrolyte selected from the group consisting of aluminum chloride, aluminum nitrate, and said aluminum salts in combination with alkali or ammonium chlorides or nitrates, and that a current density of about 70 to 150 A/dm<sup>2</sup> is used for the electrochemical roughening step.

**4,166,016**  
**RADIATION PROCESS FOR PREPARING MIXTURES WITH BUILDING TACK WHICH ARE BASED ON RUBBER-LIKE COPOLYMERS OF ETHYLENE**  
 Hendrikus J. G. Paulen, Roosteren, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands  
 Division of Ser. No. 567,841, Apr. 14, 1975, Pat. No. 4,127,841, which is a continuation-in-part of Ser. No. 517,052, Oct. 22, 1974, abandoned. This application Sep. 11, 1978, Ser. No. 941,051

Claims priority, application Netherlands, Oct. 26, 1973, 7314796; Oct. 11, 1974, 7413445  
 Int. Cl.<sup>2</sup> C08F 8/00, 2/40

U.S. Cl. 204—159.14 7 Claims  
 1. A process for preparing mixtures with building tack which are based upon  
 (1) a rubber-like copolymer of ethylene, at least one other  $\alpha$ -alkene, and one or more polyenes, and  
 (2) a rubber-like polymer of a conjugated diene of isobutylene, wherein said mixture consists essentially of  
 (a) a copolymer of ethylene, at least one other  $\alpha$ -alkene and one or more polyenes having a tensile strength of at least 10 kg/cm<sup>2</sup> and an ethylene content of between 50 and 80 weight percent, and  
 (b) one or more rubber-like copolymers selected from the group consisting of  
 (i) polymers and copolymers of butadiene,  
 (ii) polymers and copolymers of isoprene,  
 (iii) polymers and copolymers of isobutylene, and  
 (iv) polymers and copolymers of chloroprene  
 exposing said mixture in the presence of oxygen and a compound effective as a photosensitizer under the conditions of the process to an artificial light source radiating light at a wave length of between 200 and 800 nanometers, and imparting a radiated energy to the mixture of at least 2 microwatts/cm<sup>2</sup> per nanometer;  
 wherein said mixture in the unvulcanized state and prior to



said step of exposing, is characterized by an elongation at break of at least 500% and a tensile strength of between 1.5 and 50 kg/cm<sup>2</sup>; and wherein the copolymer of said mixture contains C=C bonds in the non-linear part of the polymer chain, wherein the carbon atoms of said C=C bonds either (a) have two hydrocarbon groups which are in a vicinal cis relative position to each other and which do not form part of the same system, or (b) have at least three hydrocarbon groups attached thereto; and wherein said copolymer contains 50 to 85 mole % ethylene and 0.1 to 20 weight percent of said polyene; whereby said mixture is characterized by building tack after said step of exposing.

4,166,017

# PROCESS FOR CATHODIC ELECTROCOATING AND PHOTOCURING

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,106  
Int. Cl.<sup>2</sup> C25D 13/06, 13/10; C08F 8/00

U.S. Cl. 204—181 C

7 Claims

1. A process for the electrodeposition of an electrocoating composition onto a cathode substrate to form a curable coating on said cathode substrate, which comprises:

cathodically electrodepositing said electrocoating composition onto said cathode substrate under cathodic electrocoating conditions, said electrocoating composition comprising: (a) a water-dispersed electrocoating polymer having at least about 5% by weight pendant amine groups, each said amine group being attached to an alpha carbon relative to each said amine group, (b) at least about 5% by weight of said polymer of an alpha-, beta-ethylenically unsaturated carbonyl cross-linking agent having at least two alpha-, beta-ethylenically unsaturated carbonyl groups, and (c) at least about 0.5% by weight of said polymer of an ultraviolet photosensitizer; and irradiating said curable coating on said cathode substrate with ultraviolet radiation to cross-link said alpha carbon of said amine groups of said polymer with said cross-linking agent to cure said coating.

4,166,018

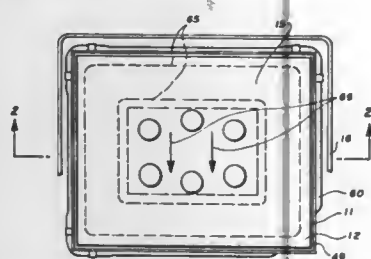
# SPUTTERING PROCESS AND APPARATUS

John S. Chapin, Boulder, Colo., assignor to Alcoa, Inc., Montvale, N.J.

Filed Jan. 31, 1974, Ser. No. 438,482  
Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—192 R

11 Claims



1. Apparatus for coating a substrate by sputtering comprising a cathode defining a substantially planar sputtering surface comprised of material to be sputtered, magnet means for producing a magnetic field having lines of flux which extend in a curve from said sputtering surface and return thereto to form an endless arch over a closed loop erosion region on said sputtering surface, an anode positioned to produce an accelerating electric field adjacent said sputtering surface for producing a glow discharge confined by said magnetic field to the region adjacent said sputtering surface and within said closed loop endless arch, said anode being outside the zone of glow

discharge confinement and out of the path of travel of sputtered particles moving from the sputtering surface to a substrate, and means for connecting said cathode and said anode to a source of electrical potential.

7. In electric glow discharge sputtering apparatus for coating a substrate by the progressive disintegration of a cathode by positive ion bombardment in a low pressure environment, the improvement which comprises a cathode having a substantially planar disintegration surface, a magnet structure oriented with respect to said planar cathode to cause the magnetic flux lines emanating from such magnetic structure to project into the space adjacent the disintegration surface of the planar cathode and to intercept a finite closed loop portion of said surface to confine the glow discharge plasma to a closed loop region immediately adjacent the planar disintegration surface, and an anode outside the region of plasma confinement and out of the path of travel of sputtered particles moving from the sputtering surface to a substrate.

4,166,019

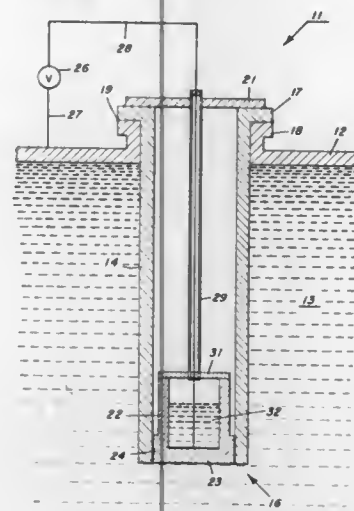
# ELECTROCHEMICAL OXYGEN METER

Prodyot Roy, Saratoga, and George J. Licina, Campbell, both of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 616,940, Sep. 26, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,412  
Int. Cl.<sup>2</sup> G01N 27/46

U.S. Cl. 204—195 S

15 Claims



1. An electrochemical device for measuring the concentration of oxygen in a liquid alkali metal comprising:

(a) an elongated tube of a noncorrosive metal having brazed in its open end by a braze material consisting essentially of an intimate mixture of gallium and nickel

(b) a container defining an enclosed limited volume having on one side of the container an oxygen ion conductive, solid electrolyte body wall having a pair of opposite side surfaces, a first one of which surfaces is substantially even with and fills the open end of said tube and is adapted for intimate contact with the liquid metal whose oxygen concentration is to be measured;

(c) a mixture in the enclosed limited volume comprising a known concentration of one of the metals selected from the group consisting of gallium, indium and tin, and an oxide of said metal, which mixture is liquid at the temperature of operation of said device and is in intimate contact with the second one of said electrolyte body wall side surfaces provide a reference electrode; and

(d) means for measuring any electromotive force generated between said reference electrode and said liquid metal by the conduction of oxygen ions through said solid electrolyte to provide a reading indicative of said oxygen concentration.

4,166,020

# MEASURING PROBE TO DETERMINE THE ION CONCENTRATION IN LIQUIDS

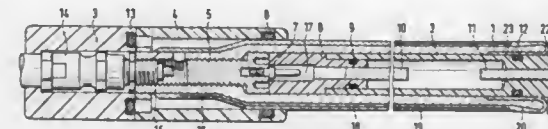
Hans R. Trappert, Oftersheim, Fed. Rep. of Germany, assignor to Pfau-Werke A.G., Schwetzingen, Fed. Rep. of Germany  
Filed May 8, 1978, Ser. No. 903,619

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721939

Int. Cl.<sup>2</sup> G01N 27/30

U.S. Cl. 204—195 R

5 Claims



1. In a measuring probe for determining the ion concentration in liquids, such as for pH-measurements, which includes an enameled tube-like steel body (1) having an external enamel coating (19) serving as a measuring electrode and a reference electrode installed in the tube-like body in a sealed manner, the electrolyte of which is contained in such a manner that the electrolyte is connected with the liquid to be measured via a junction wherein the improvements comprises: said reference electrode comprising an exchangeably installed hollow cylindrical body (2) of an electrically insulating material a reference electrode system (10) contained in the body (2) and a junction (11) in one end of the body (2); the tube-like steel body (1) being coated with enamel in a sealing end range only (23); and a contact (17) provided in the other end of the body (2) in order to connect the reference electrode to an indicating instrument.

4,166,021

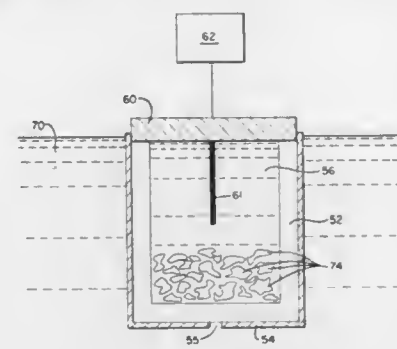
# REFERENCE ELECTRODE

James W. Ross, Jr., Hull, and Martin S. Frant, Newton, both of Mass., assignors to Orion Research Inc., Cambridge, Mass.  
Continuation-in-part of Ser. No. 730,270, Mar. 1, 1977. This application Jan. 13, 1978, Ser. No. 869,363

Int. Cl.<sup>2</sup> G01N 27/30

U.S. Cl. 204—195 F

12 Claims



1. An electrochemical reference electrode for use in potentiometric determinations of species in an aqueous sample solution, comprising:

a body, composed of a material substantially permeable to liquid water;

a membrane directly contacting and surrounding the entire exterior surface of the body excepting an area which forms an opening in the membrane to the surface of the body, said membrane being composed of a material through which water may pass by diffusion, but not by bulk transport, and which is also ion impermeable;

a reference electrolyte placed inside the body of the electrode, composed of a saturated salt slurry, and forming a

liquid junction with the sample solution at the surface of the body not covered by the membrane; and a reference element immersed in the reference electrolyte.

4,166,022

# RECOVERY OF OIL FROM OIL SHALE

Shirley C. Tsai, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 27, 1978, Ser. No. 890,074

Int. Cl.<sup>2</sup> C10G 1/00

U.S. Cl. 208—11 R

13 Claims

1. A novel process for recovering oil from oil shale having a mesh size ranging from about 4 to about 200 U.S. Standard sieve containing kerogen which consists essentially of contacting said oil shale with steam having a partial pressure of at least about 600 psia but no greater than about 3000 psia at a reaction temperature ranging from about 300° to about 500° C. and a total pressure ranging from about 800 to about 3500 psia for a period of time ranging from about 0.5 to about 6 hours, said contact being conducted by passing steam at a liquid hourly space velocity of about 0.1 to about 3 through a fixed bed reactor containing shale, said fixed bed reactor having a length to diameter ratio of about 5 to about 100.

4,166,023

# POUR POINT DEPRESSANT FOR SHALE OIL

Walter H. Seltzer, West Chester, Pa., assignor to Sunoco Energy Development Company, Dallas, Tex.

Filed May 15, 1978, Ser. No. 905,694

Int. Cl.<sup>2</sup> C10G 1/02

U.S. Cl. 208—14

15 Claims



1. A mixture of shale oils containing spherulites comprising: (a) an about 1050° F. plus fraction of raw shale oil obtained from a raw shale oil containing spherulites and in an amount sufficient to form spherulites in portion (b); (b) a waxy shale oil not containing spherulites.

4,166,024

# PROCESS FOR SUPPRESSION OF HYDROGENOLYSIS AND C<sub>5</sub><sup>+</sup> LIQUID YIELD LOSS IN A CYCLIC REFORMING UNIT

George A. Swan, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 10, 1978, Ser. No. 923,192

Int. Cl.<sup>2</sup> C10G 35/08

U.S. Cl. 208—65

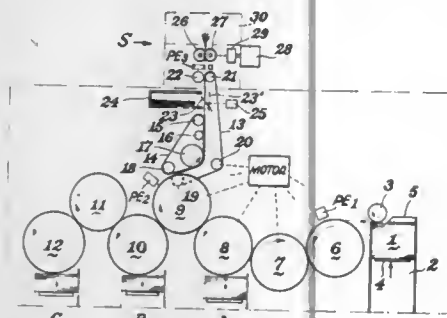
23 Claims

1. In a process for reforming, with hydrogen, a naphtha in a cyclic reforming unit which contains a plurality of catalyst-containing on-stream reactors connected in series, and a catalyst-containing swing reactor which, due to an arrangement of process piping and valves comprising headers, can be substituted for any one of the on-stream reactors while the latter is off-stream for regeneration and reactivation of the catalyst, the hydrogen and naphtha feed flowing from one reactor of the series to another to contact the catalyst contained therein at reforming conditions, the improvement comprising



1. Sheet handling apparatus comprising a stack support

means for supporting a stack of sheets, a sheet removing means for removing the sheets one at a time from the stack and feeding them serially into a main flow-line, first detection means for detecting the presence or absence of a predetermined characteristic of each sheet fed into the main flow-line and for generating a corresponding output signal representing the intended route of each sheet, means responsive to said output signal for routing said sheets either further along said main flow-line or along a secondary flow-line, second detection means disposed in said secondary flow-line for detecting the passage of sheets along the secondary flow-line, means for storing said output signal from said first detection means, means for subsequently



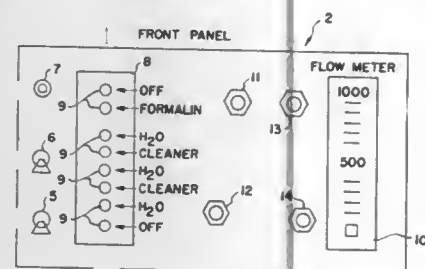
comparing said stored signal with an output from said second detecting means representing the actual route of the sheet and for generating a fault-condition signal whenever said actual route does not correspond to said intended route, sheet diverter means disposed in said secondary flow-line downstream of said second detection means, said diverter means being responsive to said fault-condition signal to divert a sheet from said secondary flow-line, and a shredding device disposed at the end of said secondary flow-line whereby sheets routed along said secondary flow-line in response to said output signal from said first detection means are automatically destroyed unless a fault-condition signal is generated.

#### 4,166,031 ARTIFICIAL KIDNEY CLEANING APPARATUS AND PROCESS

Dean Hardy, 209 Jackson Pl., Varsity Courts, Calgary NW, Alberta, Canada  
Filed Jan. 10, 1977, Ser. No. 758,060  
Claims priority, application United Kingdom, May 21, 1976, 21174/76

Int. Cl.<sup>2</sup> B01D 31/00, 13/00  
U.S. Cl. 210—22 A

4 Claims



1. A cleaner for a dialyzer of the type having blood and dialysate chambers separated by a membrane, input and output dialysate connections respectively leading in and out of the dialysate chamber, and arterial blood and venous blood connections respectively leading in and out of the blood chamber, which cleaner comprises:

first means comprising a reservoir container for supplying pre-mixed dialyzer cleaning solution from said container only to the dialyzer input dialysate connection;

second means comprising a reservoir container for supply-

ing pre-mixed dialyzer sterilizing solution from said second container to the input dialysate and arterial blood connections;

third means for supply pressurized water to the input dialysate and arterial blood connections;

drain line means for discharging fluid from the output dialysate and venous blood connections;

means, connected with the drain line means and connectable to a source of and operated by pressurized water for exerting suction at the venous blood and output dialysate connections;

a plurality of on-off flow-control units, connected to control the flows of water to the chambers and suction means, the flow of cleaning solution to the dialysate chamber, and the flow of sterilizing solution to the chambers; and

a timer unit which, when actuated, automatically actuates the flow-control units and suction means, whereby a predetermined sequence of water, cleaning solution and sterilizing solution flows through the dialysate chamber and water and sterilizing solution flows through the blood chamber may be carried out to clean the membrane to prepare it for reuse.

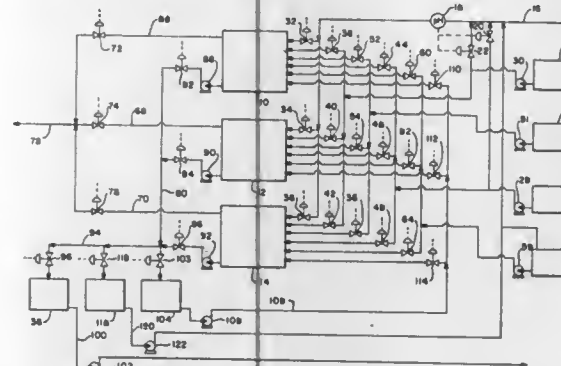
#### 4,166,032 METHOD AND APPARATUS FOR REMOVING HEAVY METALS FROM WASTE WATER STREAMS

John E. Hanway, Jr., P.O. Box 18, Naperville, Ill. 60540, and Richard G. Mumford, 1861 Jefferson, San Francisco, Calif. 94123

Filed Mar. 8, 1976, Ser. No. 664,961  
Int. Cl.<sup>2</sup> B01D 15/06

U.S. Cl. 210—32

14 Claims



1. A method for removing heavy metals from a waste water stream comprising:

(a) passing the waste water stream containing heavy metals through a porous fibrous filter bed in a treatment zone, said bed being formed of a chemisorbing agent consisting essentially of a water-insoluble fibrous cellulosic substrate consisting of a metal base cellulose xanthate, for sufficient contact time to chemisorb at least a portion of the heavy metals on said cellulosic substrate, said metal being selected from the group consisting of sodium, magnesium, calcium, lithium, potassium, or combinations thereof, and

(b) separating said heavy metal chemisorbed cellulosic substrate from said waste water stream.

#### 4,166,033 PROCESS FOR THE SEPARATION OF POLYVINYL ALCOHOL FROM AQUEOUS SOLUTIONS

Wolfgang Zimmermann, Kelkheim, and Hermann Schindler, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,141

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700361

Int. Cl.<sup>2</sup> C02B 1/18; C02C 5/02

U.S. Cl. 210—51

5 Claims

1. A process for the separation of polyvinyl alcohol from waste water containing the same which comprises adjusting the pH of said waste water to a value of at least 11 by addition thereto of calcium hydroxide, precipitating a polyvinyl alcohol/boric acid/diol complex from said waste water by adding thereto aqueous boric acid that has been pre-neutralized with calcium hydroxide, and separating the precipitated complex from the waste water.

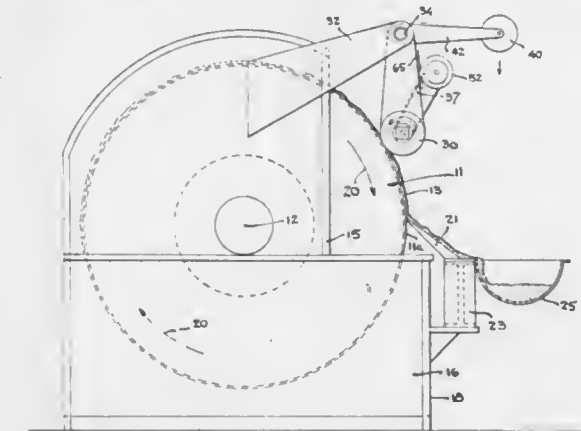
#### 4,166,034 METHOD AND APPARATUS FOR SONICALLY DEHYDRATING PRECIPITATE

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406  
Filed May 8, 1978, Ser. No. 904,038

Int. Cl.<sup>2</sup> B01D 17/00

U.S. Cl. 210—67

15 Claims



1. In a system for precipitating particulate material from a liquid bath including a porous membrane filter member, means for slowly moving successive portions of said filter member into and out of said bath, means for providing pressure at said filter member to cause precipitate from said bath to cake on the filter member, and means for removing the caked precipitate from said filter member, the improvement being means for sonically dehydrating said precipitate comprising:

a vibrator member in the form of an elongated substantially flat bar having a surface forming a long narrow strip, means for biasing said strip surface against a precipitate caked portion of said filter member which is outside of the bath, and

means for causing said vibrator member to vibrate; said vibrator member being designed and positioned within said system so as to produce a resonant standing wave when caused to vibrate by said last mentioned means, in the absence of substantial loading on said filter member.

8. A method for precipitating particulate material from a liquid bath and dehydrating said precipitate comprising the steps of:

passing successive portions of a porous membrane filter member into and out of said bath, applying inward pneumatic pressure against the outer surface of the membrane filter member so as to cause precipitate from the bath to cake on the filter member, biasing a strip portion of an elongated, substantially flat

member against a strip portion of the caked precipitate, and vibrating the flat member at a sonic frequency such as to cause resonant standing wave vibration thereof thereby causing vibratory energy to be transferred to the strip portion of the precipitate thereby facilitating the migration of liquid therefrom.

#### 4,166,035 FILTER PLATE FOR FILTER PRESS

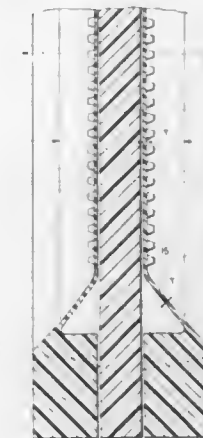
Wolfgang Ramsteck, Illerieden, Fed. Rep. of Germany, assignor to Lenser Verwaltungs-GmbH, Senden, Fed. Rep. of Germany  
Filed Jun. 20, 1978, Ser. No. 917,161

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1977, 2733769

Int. Cl.<sup>2</sup> B01D 25/12

U.S. Cl. 210—231

9 Claims



1. A filter-plate assembly for a filter press, said assembly comprising a substantially rigid support plate and a filter plate, said filter plate being formed integrally with:

an annular frame lying against said support plate and defining and lying in a frame plane spaced from and generally parallel to said support plate;

a generally planar and elastically deformable central panel defining and lying in a panel plane and displaceable between a normal position to one side of said frame plane and lying against said support plate and a pressing position to the other side of said frame plane, said panel being formed with an array of bosses projecting away from said support plate; and means including an annular web between said central panel and said frame and having an inner periphery connected to said central panel and lying in said panel plane and an outer periphery connected to said frame and lying in said frame plane, said web being wholly elastically deformable and of uniform thickness, said web further having a surface area greater than the surface area of the projection of said web on said frame plane, said means being constructed and arranged to be substantially completely relaxed and free of tensile stresses in said normal and pressing positions and being subject substantially only to bending and compressing stresses on displacement between said positions.

#### 4,166,036 FLOATING SKIMMING APPARATUS

Martin Barnhouser, Millersville, Md., assignor to Environmental Elements Corporation, Baltimore, Md.  
Filed Aug. 13, 1975, Ser. No. 604,432

Int. Cl.<sup>2</sup> E02B 15/04

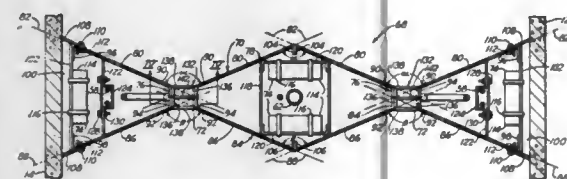
U.S. Cl. 210—242 R

12 Claims

1. An improved liquid treating apparatus including a rectangular tank having an inlet means for supplying liquid to be treated, means for treating the liquid, outlet means for receiv-



ing the treated liquid, carriage means above the tank and movable along the length thereof, means for moving the carriage means along the length thereof, means for moving the carriage means along the length of the tank, and skimming means movable with the carriage means for removing contaminated particles from the surface of the liquid in the tank, wherein the improvement comprises skimming means comprising deflecting chamber means extending substantially the width of the tank and movable with the carriage means along the length thereof, the deflecting chamber means having a plurality of vertexes for collecting the floating contaminated particles upon movement of the deflecting chamber, the deflecting chamber means comprising a first series of skimming blades connected as alternating alterations substantially the width of



the tank so that the longitudinal axes of two adjacent skimming blades form an angle at the intersection of the adjacent skimming blades, a second series of skimming blades connected as alternating alterations substantially the width of the tank so that the longitudinal axes of two adjacent skimming blades form an angle at the intersection of the adjacent skimming blades, the first and second series of skimming blades being oppositely opposed and connected at the intersection between the adjacent skimming blades of the first series of blades and the adjacent skimming blades of the second series for forming the vertexes, flotation means connected to the deflecting chamber for continuously maintaining a portion of the deflecting chamber means above the surface of the liquid, and evacuation means connected to the deflecting chamber means at the vertexes for removing the contaminated particles.

4,166,037

#### ACTIVATED CARBON FILTER HAVING PLURAL LAYERS

Jean R. Montagnon, La Celle St. Cloud, France, assignor to Societe Pica, Levallois Perret, France

Continuation of Ser. No. 690,269, May 26, 1976, abandoned.

This application Nov. 21, 1977, Ser. No. 853,769

Claims priority, application France, May 30, 1975, 75 16931  
Int. Cl.<sup>2</sup> B01D 23/14

U.S. Cl. 210—275

5 Claims

1. In a filter for the purification by adsorption of molecules dissolved in water comprising a housing having a filter media therein, an inlet for the water to be purified, and an outlet for the purified water to exit and through which backwashing liquid is applied,

said filter media consisting essentially of a plurality of layers each respectively formed of granules of a different type of activated carbon material which are directly juxtaposed, substantially all of the activated carbon material of a respective layer having substantially the same mesh size, apparent density and adsorptive capacity, and the respective materials forming each layer proceeding in a direction from the inlet to the outlet of the filter having; decreasing internal pore size and increasing indices of retentivity to retain by adsorption dissolved impurities of successively smaller molecular dimensions going from the filter inlet to outlet and to permit a layer of material more closely adjacent to the filter outlet to retain more fugacious light dissolved impurities not retained or released by desorption by the material of a layer lying more closely adjacent the filter inlet.

4,166,038

#### SURFACTANT WATERFLOODING EMPLOYING AMPHOTERIC SULFONIUM SULFONATES

Stamoulis Stournas, Flemington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

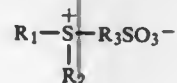
Filed Dec. 29, 1977, Ser. No. 865,767

Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 252—8,55 D

24 Claims

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous liquid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system an aqueous liquid containing a water-soluble amphoteric surfactant characterized by the formula



wherein:

R<sub>1</sub> is a hydrocarbon group containing from 8 to 24 carbon atoms,

R<sub>2</sub> is a hydrocarbon group containing from 1 to 4 carbon atoms or an alkoxy group containing from 2 to 10 carbon atoms and having a ratio of carbon atoms to oxygen atoms within the range of 2 to 3, and

R<sub>3</sub> is an aliphatic group containing from 1 to 4 carbon atoms.

4,166,039

#### DETERGENT COMPOSITION AND PROCESS

Rodney M. Wise, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 406,412, Oct. 15, 1975, abandoned. This application Jun. 23, 1975, Ser. No. 589,116

Int. Cl.<sup>2</sup> C11D 1/72, 3/075, 7/02

U.S. Cl. 252—110

21 Claims

1. A homogeneous, spray-dried granular detergent composition consisting essentially of:

(a) from about 0.5% to about 40% by weight of a naturally derived clay mineral selected from the group consisting of kaolinites having a mean particle size of not more than about 1 μ and bentonites having a mean particle size of not more than about 75 μ and being substantially free of organic modifying groups;

(b) from about 2% to about 60% by weight of an alkoxylated nonionic surfactant or mixtures of said alkoxylated nonionic surfactants, said surfactant and said clay being in a weight ratio lying in the range of from about 6:1 to about 1:2, and

(c) from 5% to about 50% by weight of a detergency builder selected from the group consisting of alkali metal, ammonium and substituted ammonium organic and inorganic builder salts said builder salts and said clay mineral being selected so that when said detergency builder is a phosphate salt, said clay is a bentonite clay, and when said detergency builder is non-phosphatic in character, said clay is a kaolinite clay.

4,166,040

#### COMPOSITIONS COMPRISING MIXTURES OF POLYCATIONIC AND POLYANIONIC POLYMERS AS MAGNESIUM SCALE CONTROL AGENTS

Richard M. Goodman, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 860,914

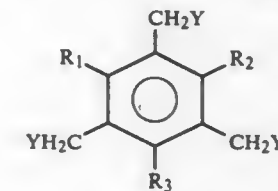
Int. Cl.<sup>2</sup> C02B 5/06

U.S. Cl. 252—180

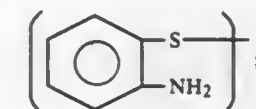
10 Claims

1. A composition for inhibiting formation of magnesium salts or sludge in evaporative desalination units which comprises (1)

a polyanionic polymer containing at least about 50 mol percent of repeating units derived from an ethylenically unsaturated dibasic acid or an ethylenically unsaturated sulfonic acid and any balance of repeating units derived from one or more monomers compatible therewith, the acid units being in the form of at least one member selected from the group consisting of free acid radical, ammonium salt, and alkali metal salts, and (2) a polycationic polymer selected from the group consisting of (a) dimethylamine-polyamine-epichlorohydrin reaction product wherein the amount of said polyamine is from 0 to about 15 mol percent of the total amine content and the amount of epichlorohydrin is from at least the molar equivalent of the total amine content up to the full functional equivalent of said amine content, (b) poly(dimethyldiallylammonium chloride), (c) quaternized derivatives of poly(dimethylaminoethylmethacrylate), and (d) poly[oxyethylene(dimethylimino)ethylene(dimethylimino)ethylene dichloride], said polyanionic polymer having a molecular weight in the range of about 500 and about 50,000, said polycationic polymer having a molecular weight in the range of about 1,500 and 500,000, and the molar ratio of said polycationic polymer to said polyanionic polymer based on the average molecular weight of the repeating units therein being in the range of about 1.5:1 to about 25:1, respectively.



wherein R is alkyl and contains from 1 to 3 carbon atoms and Y is



R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are individually selected from the group consisting of alkyl groups containing from 1 to 3 carbon atoms.

4,166,041

#### PROCESS FOR MAGNESIUM SCALE CONTROL USING MIXTURES OF POLYCATIONIC AND POLYANIONIC POLYMERS

Richard M. Goodman, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 860,911

Int. Cl.<sup>2</sup> C02B 5/06

U.S. Cl. 252—180

10 Claims

1. A process for inhibiting formation of magnesium scale or sludge in evaporative desalination units which comprises adding to the water being processed an effective amount of a mixture of (1) as polyanionic polymer containing at least about 50 mol percent of repeating units derived from an ethylenically unsaturated dibasic acid or an ethylenically unsaturated sulfonic acid and any balance of repeating units derived from one or more monomers compatible therewith, the acid units being in the form of at least one member selected from the group consisting of free acid radical, ammonium salt, and alkali metal salts, and (2) a polycationic polymer selected from the group consisting of (a) dimethylamine-polyamine-epichlorohydrin reaction product wherein the amount of said polyamine is from 0 to about 15 mol percent of the total amine content and the amount of said epichlorohydrin is from at least the molar equivalent of the total amine content up to the full functional equivalent of said amine content, (b) poly(dimethyldiallylammonium chloride), (c) quaternized derivatives of poly(dimethylaminoethylmethacrylate), and (d) poly[oxyethylene(dimethylimino)ethylene(dimethylimino)ethylene dichloride], said polyanionic polymer having a molecular weight in the range of about 500 and about 50,000, said polycationic polymer having a molecular weight in the range of about 1,500 and 500,000, and the molar ratio of said polycationic polymer to said polyanionic polymer based on the average molecular weight of the repeating units therein being in the range of about 1.5:1 to 25:1, respectively.

4,166,042

#### COMPOSITIONS FOR PREPARING ELASTOMERIC URETHANE/UREA BLOCK COPOLYMERS

Gabriel Karoly, Springfield, and Vincent J. Gajewski, Jackson, both of N.J., assignors to M & T Chemicals Inc., Stamford, Conn.

Filed Jun. 5, 1978, Ser. No. 912,228

Int. Cl.<sup>2</sup> C08G 18/32

U.S. Cl. 252—182

6 Claims

1. A composition for preparing elastomeric polyurethanes by the reaction of said composition with an isocyanate-ter-

4,166,043

#### STABILIZED PHOTOCROMIC MATERIALS

Donald R. Uhlmann, Newton; Elias Snitzer, Wellesley; Richard J. Hovey, Sturbridge; Nori Y. C. Chu, Southbridge, all of Mass., and Joseph T. Fournier, Jr., Storrs, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,451

Int. Cl.<sup>2</sup> G02B 5/23

U.S. Cl. 252—300

22 Claims

1. A stabilized photochromic particle for incorporation into a plastic host to impart photochromic properties thereto, said particle comprising an organic photochromic dye mixed with a resinous material, said particle being from 30 Å to 1 micron in diameter and having a protective coating on substantially the entire surface thereof, said coating being effective to render the particle impervious to the effects of oxygen, moisture, monomers, catalysts, and other chemicals used in the formation of the plastic host which are deleterious to said photochromic dye.

4,166,044

#### BINDERLESS THERMOTROPIC JET INK

Raymond L. Germonprez, and Paul Zimmerman, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed May 30, 1978, Ser. No. 910,900

Int. Cl.<sup>2</sup> G01N 31/22

U.S. Cl. 252—408

19 Claims

1. A binderless ink composition, suitable for use in ink jet printing operations and capable of bonding to synthetic polymeric resin surfaces by softening and swelling the surface layers of the polymeric resin to allow penetration of the ink, which comprises a solution of:

(1) a colorant selected from the group consisting of (a) a reactive thermotropic dye capable of exhibiting a visible color change upon exposure to steam at a temperature of at least about 215° F. and (b) a combination of dyes of different color capable of exhibiting a visible color change upon exposure to water or steam at a temperature of at least about 120° F.;

(2) a solvent consisting essentially of from about 10 to about 35 percent of water, from about 6 to about 25 percent of an aliphatic alcohol having 1 to 3 carbon atoms or mixtures



thereof and from about 25 to about 75 percent of an organic compound selected from the group consisting of aliphatic and cyclic ketones, amides, acetals, ethers and esters;

- (3) from about 8 to about 17 percent of a surfactant and  
(4) from about 0 to about 10 percent of an aliphatic hydrocarbon having from 8 to 12 carbon atoms, the total percentage of the components amounting to 100%.

4,166,045

# **PURIFICATION OF COMBUSTION CATALYSTS AND SOLID PROPELLANT COMPOSITIONS CONTAINING THE SAME**

Thomas P. Rudy, Saratoga, and Toshio W. Nakagawa, San Jose, both of Calif., assignors to United Technologies Corporation, East Hartford, Conn.

Filed May 2, 1973, Ser. No. 356,676

Int. Cl.<sup>2</sup> B01D 15/06

U.S. Cl. 252—414

7 Claims

1. A method for purifying a composite solid propellant combustion catalyst consisting of a composition of a metal selected from the group consisting of metals of Group I B, V B, VI B and VIII of the periodic chart, in which composition the metal component accounting for the catalytic activity is present predominately in nonlabile form with minor amounts of metal in a labile ionic form as an impurity; which method comprises removing the labile ionic form of said metal by:

- (a) extracting said catalyst with a solution comprising  
(i) a solvent in which the nonlabile metal portion of said catalyst composition is insoluble, and  
(ii) a solute which is a chelating agent for the labile ionic metal impurities of said catalyst, and  
(b) separating said purified catalyst from said solution.

4,166,046

# **REFORMING WITH MULTIMETALLIC CATALYSTS**

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.  
Continuation-in-part of Ser. No. 862,116, Dec. 19, 1977, which is a continuation-in-part of Ser. No. 826,996, Aug. 23, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,519

Int. Cl.<sup>2</sup> B01J 27/02, 27/00

U.S. Cl. 252—439

7 Claims

1. In a process for preparing a reforming catalyst wherein a Group VIII noble metal hydrogenation-dehydrogenation component in concentration ranging from about 0.01 to about 3 percent, based on the weight of the catalyst, an iridium component in concentration ranging from about 0.01 to about 3 percent, based on the weight of the catalyst, a selenium component, in concentration ranging from about 0.01 to about 3 percent, based on the weight of the catalyst, and a halogen component in concentration ranging from about 0.1 to about 3 percent, based on the weight of the catalyst, are composited with an inorganic oxide support, the improvement which comprises contacting said catalyst with oxygen sufficient to increase its selectivity when used in reforming a hydrocarbon feed at reforming conditions.

4,166,047

# **HYDROTHERMAL TREATMENT OF SILICA**

Radjasa Harsono, and Willem H. J. Stork, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.  
Filed Nov. 14, 1977, Ser. No. 850,984

Claims priority, application Netherlands, Dec. 2, 1976, 7613414

Int. Cl.<sup>2</sup> B01J 21/08, 21/12

U.S. Cl. 252—454

5 Claims

1. A process for suppressing the increase in specific average pore diameter which occurs when silica is hydrothermally treated in the presence of one or more compounds of elements selected from the group consisting of lithium, potassium, sodium, rubidium, cesium, strontium, and barium, which comprises carrying out the hydrothermal treatment of said silica

with an added quantity of from about 0.1 to 5 g per 100 g of silica of at least one water-soluble titanium compound.

4,166,048

# **HIGH FOAMING DETERGENT COMPOSITION HAVING LOW SKIN IRRITATION PROPERTIES**

Masaaki Nishimura, Sakura, and Haruhiko Arai, Narashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 725,182, Sep. 21, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 900,178  
Claims priority, application Japan, Sep. 22, 1975, 50/114510  
Int. Cl.<sup>2</sup> C11D 1/14, 1/84

U.S. Cl. 252—546

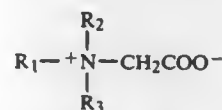
8 Claims

1. A liquid detergent composition consisting essentially of  
A. from 5 to 40 weight percent of a mixture of polyoxyethyl-ene alkyl ether sulfate salts having the formula



wherein R is alkyl having on the average from 11 to 16 carbon atoms; n is from 1.0 to 2.6 as the average number of ethylene oxide units of component A, component A consisting of from zero to 5 weight percent of compounds in which n equals zero, from zero to 18 weight percent of compounds in which n equals 3 or more and higher than 77 weight percent of compounds in which n is one or 2; and M is a monovalent metal ion selected from the group consisting of sodium ion and potassium ion or a divalent metal ion selected from the group consisting of calcium ion and magnesium ion, with the proviso that M is said divalent metal ion or mixture thereof for from 15 to 98 weight percent of the total weight of component A, and that in the balance of component A, M is said monovalent metal ion or mixture thereof;

B. 0.1 to 20% by weight of a betaine amphoteric surface active agent having the formula



wherein R<sub>1</sub> is alkyl having 8 to 20 carbon atoms and R<sub>2</sub> and R<sub>3</sub> are alkyls having one to 3 carbon atoms, the weight ratio of B/A being in the range of from 0.01/1 to 2.0/1, and  
C. the balance of the composition consisting essentially of water.

4,166,049

# **PROCESS OF PRODUCING A RUBBERIZED ASPHALT COMPOSITION SUITABLE FOR USE IN ROAD AND HIGHWAY CONSTRUCTION AND REPAIR AND PRODUCT**

Bobby J. Huff, Vicksburg, Miss., assignor to U.S. Rubber Reclaiming Co., Inc., Miss.

Filed Aug. 27, 1976, Ser. No. 718,330

Int. Cl.<sup>2</sup> C08L 7/00, 9/00, 11/00, 17/00

U.S. Cl. 260—2.3

11 Claims

1. A process for producing a rubberized asphalt for highway construction and maintenance comprising reacting together for from thirty minutes to two hours at 350°–450° F. 75–95% by weight of asphalt and 5–25% by weight of rubber, wherein said asphalt has a composition of 20–30% asphaltenes, 5–15% nitrogen bases, 10–20% first acidaffins, 30–40% second acidaffins and 10–20% paraffins, and wherein the rubber is devulcanized reclaimed rubber produced from whole scrapped tires and having a composition of about 15–20% rubber compounding ingredients comprising acetone extractable oils, resins, and others, about 10–35% carbon black, 10–20% ash and about 35–45% rubber hydrocarbon of which 30–85% is at least one

member of the group consisting of SBR, neoprene, polybutadiene, poly-isoprene, and butyl and chlorobutyl rubber, and of which 15–70% is natural rubber.

4,166,050

# **METHOD OF INCREASING THE VISCOSITY OF PHOTOGRAPHIC COATING SOLUTIONS**

Takushi Miyazaki; Tadao Sakai, and Akio Mitsui, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 1, 1976, Ser. No. 746,559

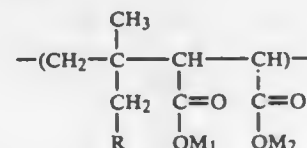
Claims priority, application Japan, Dec. 1, 1975, 50-143609

Int. Cl.<sup>2</sup> C09H 7/00; G03C 1/30, 1/31, 1/38

U.S. Cl. 260—8

18 Claims

1. A method of increasing the viscosity of a photographic coating solution containing gelatin which comprises adding a polymer having therein the repeating unit represented by the following formula



wherein R represents a hydrogen atom or a t-butyl group, and M<sub>1</sub> and M<sub>2</sub>, which can be the same or different, each represents a cation;

said polymer having a maleic acid content of more than 40% by mol; to the gelatin containing photographic coating solution, wherein the molecular weight of said polymer is about 5×10<sup>3</sup> to about 5×10<sup>5</sup>, said coating solution further containing a hardening agent and a member selected from the group consisting of an anionic or nonionic surface active agent.

4,166,051

# **OSTOMY COMPOSITION**

Rudolfo D. Cilento, North Brunswick; Anthony L. La Via; James L. Chen, both of East Brunswick, and John A. Hill, New Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 8, 1977, Ser. No. 804,692

Int. Cl.<sup>2</sup> C08L 1/02, 1/28, 3/04; A61F 5/44

U.S. Cl. 260—17.4 CL

10 Claims

1. A composition adapted for medicinal use and having a consistency which permits it to be shaped by hand comprising a homogeneous mixture of mineral oil and a premix in a ratio of from about 1 to 10 to about 3.5 to 10 on a solids weight basis; wherein said premix comprises a homogeneous mixture of (A) from about 40% to about 60% by weight of a mixture of a pressure sensitive adhesive and an optional elastomer wherein said adhesive is a low molecular weight polyisobutylene and said elastomer if present is a medium molecular weight polyisobutylene or butyl rubber at up to about 30% by weight of said low molecular weight polyisobutylene and (B) from about 40% to about 60% by weight of a second component which is a mixture of one or more hydrocolloid gums, a cohesive strengthening agent, or a mixture of hydrocolloid gums and cohesive strengthening agent wherein said hydrocolloid gums are up to about 40% by weight of guar gum, locust bean gum, or mixtures thereof and from 0% to about 25% by weight of pectin, gum karaya, or mixtures thereof; and wherein said cohesive strengthening agent is finely divided cellulose, finely divided substantially water insoluble cross-linked dextran, finely divided substantially water insoluble sodium carboxymethylcellulose, or finely divided substantially water insoluble starch-acrylonitrile graft copolymer.

4,166,052

# **PNEUMATIC TIRE COMPRISING POLYISOPRENE RUBBER AND ALKALI METAL ALGINATE IN AT LEAST TREAD PORTION THEREOF ADAPTED FOR TRAVELLING ON FROZEN ROADS**

Noboru Kusakabe, Ohme, and Nobumasa Ikeda, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed Jun. 13, 1977, Ser. No. 806,126

Claims priority, application Japan, Jun. 12, 1976, 51-68219

Int. Cl.<sup>2</sup> C08L 5/04

U.S. Cl. 260—17.4 ST

9 Claims

1. A pneumatic tire for travelling on frozen roads, wherein at least the ground contact portion thereof, including to the depth end of the grooves, is composed of a rubber composition consisting of a rubber component selected from the group consisting of polyisoprene rubber or a blend of polyisoprene rubber and polybutadiene rubber, an agent for improving affinity to water selected from the group consisting of alkali metal alginates, carbon black and a commonly used softener, vulcanizer and other compounding agents, the amount of said agent for improving affinity to water being 3–20 parts by weight based on 100 parts by weight of the rubber component, and said rubber composition having JIS hardnesses of 50–80 degrees at –30° C. and 50–65 degrees at 25° C., a tan δ peak temperature of not higher than –40° C. and an affinity for water of not lower than 6.5 cm<sup>2</sup>/cc, wherein if the rubber component is said blend it is a blend consisting of not less than 10 parts by weight of polyisoprene rubber and not more than 90 parts by weight of polybutadiene rubber.

4,166,053

# **PROCESS FOR THE MANUFACTURE OF NON-REVERTING ELASTOMERIC ORGANOPOLYSILOXANES**

Emily C. Bossert, Westfield; Irwin B. Silverstein, Piscataway, and Abe Berger, Summit, all of N.J., assignors to M & T Chemicals Inc., Stamford, Conn.

Filed Apr. 5, 1978, Ser. No. 893,270

Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260—18 S

8 Claims

1. In an improved method for preparing heat-resistant elastomeric polyorganosiloxanes by reacting (1) as the major component, a linear, difunctional polyorganosiloxane of the general formula  $\text{XO}-\text{Si}(\text{R}^1)_2-\text{OSi}(\text{R}^1)_2-\text{O}-\text{Si}(\text{R}^1)_2-\text{OX}$  wherein R<sup>1</sup> is selected from the group consisting of lower alkyl, aryl and halomethyl, X is hydrogen or R<sup>1</sup> and n is an integer greater than 50, (2) as the crosslinking agent a compound of the general formula  $\text{R}_m^2\text{SiY}_{4-m}$  wherein R<sup>2</sup> is alkyl or aryl, Y is alkoxy and m is 0 or 1 and (3) a catalyst in an amount sufficient to effect curing of said polysiloxanes, wherein the improvement resides in employing as said catalyst a stannous salt of a monoethylenically unsaturated monohydroxy monocarboxylic acid containing from 10 to 20 carbon atoms.

4,166,054

# **WATER DISPERSIBLE EPOXY RESIN COPOLYMERS AND METHOD OF MAKING THE SAME**

Charles J. Meeske, Birmingham; Enrique H. Van der Tuin, Royal Oak, and Michael J. Racey, Mt. Clemens, all of Mich., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.  
Continuation of Ser. No. 661,141, Feb. 25, 1976, abandoned.

This application Feb. 6, 1978, Ser. No. 875,548

Int. Cl.<sup>2</sup> C09D 3/58

U.S. Cl. 260—23 EP

17 Claims

1. An air curable resin solution useful for surface coating and impregnation comprising (I) the reaction product of (A) from about 50% to about 65% by weight based upon the total weight of (A) and (B) of an epoxy resin ester of a partially conjugated unsaturated fatty acid and (B) from about 50% to about 35% by weight based upon the total weight of (A) and (B) of a blend of reactive monomers possessing reactive double



bonds, at least one of which must be an unsaturated mono-basic acid in the presence of (II) an alcohol ether of a glycol and subsequently reacted with (III) an amine and then (IV) dispersed in water, wherein component (A) is the reaction product, 2,2-bis(4 hydroxy phenyl)dimethyl methane and epichlorohydrin, and has a melting point from about 130° F. to about 230° F. and an epoxide equivalent weight within the range from about 400 to about 1100, and the fatty acids used are straight chain monobasic acids of 18 carbon length having double bonds arranged in the chain in amount and position to give an iodine number of 125 to 185, an acid number of from about 180 to 210 and a percentage of conjugation of the double bonds between 20% and 25% wherein the reaction is carried out to an acid number below 10 and the monomer (B) portion consists of a mixture of 20-28% of unsaturated monobasic acids having a polymerizable double bond and 80% to 72% reactive monomers having a polymerizable double bond.

**4,166,055**  
**COMPOSITION OF A POLYPHENYLENE ETHER, A BLOCK COPOLYMER OF A VINYL AROMATIC COMPOUND AND A CONJUGATED DIENE AND A POLYOLEFIN**

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 3, 1977, Ser. No. 839,106

Int. Cl.<sup>2</sup> C08K 5/49; C09K 7/14; C09L 53/02

U.S. Cl. 260—30.6 R 19 Claims

1. A thermoplastic composition, having high impact strength, comprising

- (a) a polyphenylene ether resin or a composition comprising a polyphenylene ether resin and a styrene homopolymer or random copolymer resin and
- (b) a synergistic, impact strength-improving combination comprising (i) an elastomeric, hydrogenated block copolymer of a vinyl aromatic compound (A) and (A)<sup>1</sup> and a conjugated diene (B), of the A—B—A<sup>1</sup> type, the center block B being of higher molecular weight than that of the combined terminal blocks A and A<sup>1</sup> and (ii) a polyolefin resin, component (b) being present in an amount of from about 5 to about 30% by weight of the total resinous components of the composition.

17. A composition as defined in claim 1 including up to about 25% by weight of a plasticizer.

**4,166,056**  
**POLYESTER PLASTICIZER FOR VINYL RESINS DERIVED FROM ADIPIC ACID PROCESS WASTE**

Kenneth P. Satterly, Avondale, Pa., and Frank E. Livingston, Wilmington, Del., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,897

Int. Cl.<sup>2</sup> C08K 5/11; C08L 67/02, 67/04

U.S. Cl. 260—31.6 14 Claims

1. A process for making a plasticizer for vinyl resins comprising:

- a. oxidizing cyclohexane to form cyclohexanone, cyclohexanol, and a non-volatile residue (NVR);
- b. separating out the non-volatile residue (NVR), and;
- c. reacting the recovered residue with an esterifying polyol to form a polyester polyol having an acid number of about 10 or less and a hydroxy number of between 5 and 100, wherein said polyester polyol disperses a vinyl resin.

**4,166,057**  
**POLY-4-METHYLPENTENE-1 COMPOSITION**

Hayashi Takemori, Amagasaki, Japan, assignor to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Jul. 5, 1978, Ser. No. 922,140

Claims priority, application Japan, Jul. 5, 1977, 52 90567

Int. Cl.<sup>2</sup> C08K 5/01

U.S. Cl. 260—33.6 PQ 11 Claims

1. A composition comprising (a) poly-4-methylpentene-1 and (b) an olefin oligomer of the formula (I):



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which may be the same or different, each is a hydrogen atom or an alkyl group having up to 18 carbon atoms, and n represents the degree of polymerization and is such that the oligomer has an average molecular weight of about 200 to about 5,000, said oligomer being present in said composition in an amount of about 0.5 to about 30 parts by weight per 100 parts by weight of poly-4-methylpentene-1.

**4,166,058**  
**HEAT SENSITIVE PRIMER EXHIBITING COLOR CHANGE AND CONTAINING A RESIN BLEND, ELEMENTAL SULFUR, AND A DYE**

John A. Svigelj, Mansfield, and Thomas G. Rabito, Ashland, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 11, 1978, Ser. No. 932,873

Int. Cl.<sup>2</sup> C08K 3/06, 5/34

U.S. Cl. 260—38 4 Claims

1. A color sensitive primer comprising 100 parts of an ethylenically unsaturated elastomer; 300 to 800 parts of a phenolic resin, A or B stage; 0 to 100 parts inorganic filler; 10 to 30 parts epoxy resin; about 0.5 to 10 parts heat sensitive dye; about 0.5 to 3 parts sulfur.

**4,166,059**  
**ALKALI-FAST DIAZO DISULFIMIDE DYES**

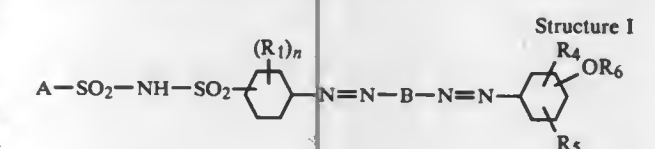
James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Apr. 2, 1971, Ser. No. 130,850

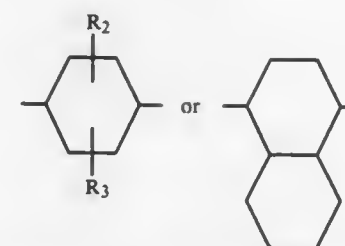
Int. Cl.<sup>2</sup> C09B 31/06, 33/08, 33/10; D06P 3/24

U.S. Cl. 260—186 20 Claims

1. A compound having the structure:



wherein  
n is 1 or 2  
A represents phenyl, tolyl, halophenyl, naphthyl or an alkyl having from 1 to 4 carbon atoms.  
R<sub>1</sub> represents H, halogen, —O-lower alkyl having from 1 to 4 carbon atoms or alkyl having from 1 to 4 carbon atoms;  
B represents



R<sub>2</sub> represents H, lower alkyl having from 1 to 4 carbon atoms or —O-lower alkyl having from 1 to 4 carbon atoms;

R<sub>3</sub> represents H, lower alkyl having from 1 to 4 carbon atoms or —O-lower alkyl having from 1 to 4 carbon atoms;

R<sub>4</sub> represents H, lower alkyl having from 1 to 4 carbon atoms, —O-lower alkyl having from 1 to 4 carbon atoms, —Br, —F, or —Cl;

R<sub>5</sub> represents H, lower alkyl having from 1 to 4 carbon atoms, or —O-lower alkyl having from 1 to 4 carbon atoms; and

R<sub>6</sub> represents —CH<sub>3</sub> or —CH<sub>2</sub>CH<sub>3</sub>.

**4,166,060**  
**PROCESS FOR PRODUCING ENAMINES**

Gérard Bulteau, Paris; Jacques Acher, Itteville, and Jean-Claude Monier, Lardy, all of France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

Division of Ser. No. 694,877, Jun. 11, 1976, Pat. No. 4,077,976.

This application Dec. 21, 1977, Ser. No. 863,062

Claims priority, application France, Jun. 12, 1975, 7518344

Int. Cl.<sup>2</sup> C07D 207/08 2 Claims

1. The process of producing methyl (N-1-ethyl 2-pyrrolidyl-methyl) 3-aminocrotonate or its hydrochloride, said process comprising the step of treating in the presence of a catalytic amount of hydrochloric acid 1-ethyl 2-aminoethyl pyrrolidine with methyl acetoacetate.

**4,166,061**  
**USE OF CYCLIC ESTERS TO PREPARE 2,3-DICHLORO-4-(2-THENOYL)PHENOXYACETIC ACID**

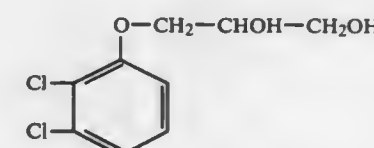
Antonietta R. Mastrocola, Ardmore, and Robert L. Webb, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 2, 1977, Ser. No. 847,969

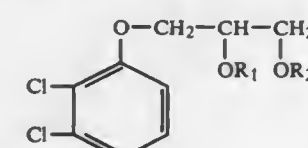
Int. Cl.<sup>2</sup> C07D 333/24, 333/38

U.S. Cl. 549—72 7 Claims

1. The method of preparing ticrynafen comprising:  
A. exhaustively esterifying a compound of the formula:

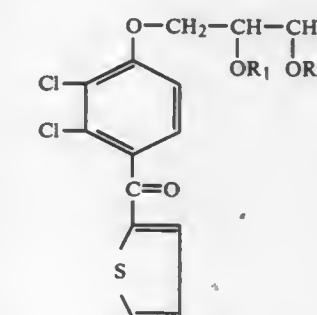


to give an ester compound of the formula:

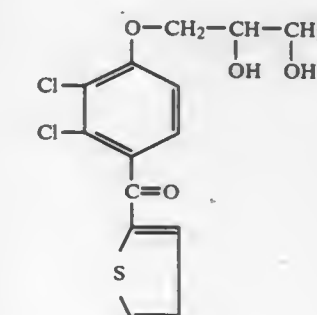


in which R<sub>1</sub> and R<sub>2</sub> are the same and are lower alkanoyl of

from 1-5 carbons, carbomethoxy, carbethoxy or, when taken together, carbonyl or thiocarbonyl;  
B. reacting said ester compound with thenoyl chloride or bromide under Friedel-Crafts conditions with an excess of 3-5 mole equivalents of a Lewis acid catalyst to give a diol ester compound of the formula:



in which R<sub>1</sub> and R<sub>2</sub> are as defined above;  
C. hydrolyzing said diol ester compound under acid or alkaline conditions to give a diol compound of the formula:



and D. oxidizing said diol compound with a diol oxidizing agent.

**4,166,062**  
**1-ALKOXYETHANOL-ISOTHEROMANS, -ISOTHIOCHROMANS, -2-BENZOXEPINS, AND -2-BENZOTHIOPINS**

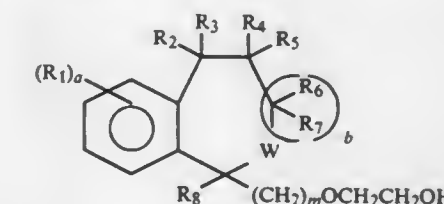
John M. McCall, and Ruth E. TenBrink, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 21, 1978, Ser. No. 927,152

Int. Cl.<sup>2</sup> C07D 313/08, 337/08, 311/02, 323/00

U.S. Cl. 260—333 4 Claims

1. A compound of the formula:



wherein  
R<sub>1</sub> is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R<sub>1</sub> is hydroxy, alkoxy or o-methylenedioxy;  
a is one through three;  
b is zero or one;  
R<sub>2</sub> through R<sub>7</sub> are the same or different and are selected

from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R<sub>2</sub> and R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub>, or R<sub>6</sub> and R<sub>7</sub> are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R<sub>2</sub> and R<sub>4</sub> or R<sub>4</sub> and R<sub>6</sub> are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the proviso that no more than one ring may be attached to any one carbon and that at least two of R<sub>2</sub> through R<sub>7</sub> are hydrogen.

R<sub>8</sub> is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

m is one to three; and  
W is oxygen or sulfur.

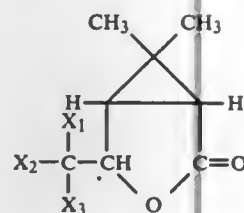
**4,166,063**  
**LACTONES OF**  
**2,2-DIMETHYL-CYCLOPROPANE-1-CARBOXYLIC**  
**ACIDS**

Jacques Martel, Bondy; Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil-sous-Bois, and Jean Jolly, Fontenay-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 12, 1978, Ser. No. 914,399

Claims priority, application France, Jun. 27, 1977, 77 19612  
Int. Cl.<sup>2</sup> C07D 307/93

U.S. Cl. 260—343.3 R **4 Claims**  
1. A lactone of a 2,2-dimethyl-cyclopropane-1-carboxylic acid of the formula



wherein X<sub>1</sub>, X<sub>2</sub> and X<sub>3</sub> when identical are selected from the group consisting of chlorine and bromine and when at least two are different, are selected from the group consisting of fluorine, chlorine and bromine.

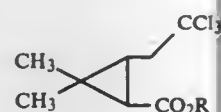
**4,166,064**  
**PROCESS FOR PREPARING HIGH CIS**  
**3-(2,2,2-TRICHLOROETHYL)-2,2-DIMETHYLCYCLO-**  
**PROPANE-1-CARBOXYLATES**

Kiyoshi Kondo; Akira Negishi, both of Yamato, and Kikuo Sugimoto, Fujino, all of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 13, 1978, Ser. No. 877,151

Int. Cl.<sup>2</sup> C07C 61/04; C07D 307/54

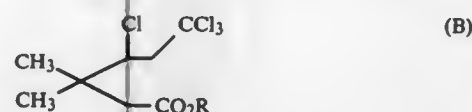
U.S. Cl. 260—347.4 **7 Claims**  
1. A process for preparing a cis rich compound of the formula Z



wherein R is lower alkyl or a group R<sup>1</sup> which is allethrolonyl, tetraphthalimidomethyl, or is represented by the formula



wherein R<sup>2</sup> is hydrogen, lower alkyl, lower alkynyl, trihalomethyl, or cyano, R<sup>3</sup> and R<sup>4</sup> are independently hydrogen, lower alkyl, lower alkenyl, benzyl, phenylthio or are joined to form a methylenedioxy group attached to two adjacent ring carbon atoms of a benzene ring, and R<sup>5</sup> is divalent oxygen or sulfur or vinylene, which comprises contacting a compound of the formula B



wherein R is as defined above with 1 to 3 moles per mole of B of an alkali metal tertiary alkoxide of 4 to 6 carbon atoms at a temperature of about -80° C. to about 30° C. in the presence of a solvent system comprising

- (a) a solvent selected from
- (1) an aliphatic hydrocarbon of 5 to 8 carbon atoms,
  - (2) an aromatic hydrocarbon having 6 ring carbon atoms, optionally substituted with 1 to 3 substituents selected from alkyl of 1 or 2 carbon atoms and chlorine,
  - (3) A tertiary alcohol of 4 to 6 carbon atoms,
  - (4) an ether selected from diethyl ether, 1,2-dimethoxyethane, 2-methoxyethyl ether, tetrahydrofuran, and dioxane, and
  - (5) a mixture of any of the above solvents, and
- (b) a dipolar aprotic cosolvent selected from
- (1) hexamethylphosphoramide,
  - (2) dimethylformamide,
  - (3) dimethylacetamide,
  - (4) dimethylsulfoxide, and
  - (5) N-methylpyrrolidone,

the ratio of solvent to cosolvent being in the range of 20:1 to 2:1 by volume.

**4,166,065**  
**PROCESS FOR THE PREPARATION OF**  
**PERFLUOROALKANE SULFONAMIDES**

Heinz Beck, Duren, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Sep. 15, 1978, Ser. No. 942,586

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744044

Int. Cl.<sup>2</sup> C07C 143/74

U.S. Cl. 260—401 **9 Claims**  
1. In an improved process for preparing perfluoroalkane sulfonamides by reacting a perfluoroalkane sulfonyl fluoride with an amine, the improvement comprising performing the reaction in the presence of at least about 1 mole finely divided silica having a surface area from about 20 m<sup>2</sup>/g to about 600 m<sup>2</sup>/g, per mole of sulfonyl fluoride.

**4,166,066**

**DISPERSING AGENTS**

Frank Hauxwell; James F. Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

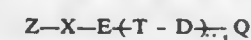
Division of Ser. No. 526,918, Nov. 25, 1974, which is a continuation-in-part of Ser. No. 330,882, Feb. 8, 1973, abandoned. This application Aug. 31, 1976, Ser. No. 719,161  
Claims priority, application United Kingdom, Feb. 28, 1972, 9033/72

Int. Cl.<sup>2</sup> C09F 5/00

U.S. Cl. 260—404.5 **8 Claims**

1. Dispersing agents comprising the reaction product formed by reacting together one or more compounds from each of the following classes in the presence of an inert organic solvent at a temperature up to the boiling point of the reaction medium:

- (a) an organic diisocyanate selected from hexamethylene diisocyanate, isophorone diisocyanate, 4,4'-diisocyanatodiphenylamine, 2,4-diisocyanatotoluene and 2,6-diisocyanatotoluene,
- (b) polymethylene glycols containing from 5 to 10 carbon atoms,
- (c) a compound of the formula:



wherein

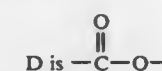
Z is—OH or—NHR wherein R is alkyl

X is alkylene or a halogeno derivative thereof

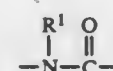
T is alkylene

n is an integer from 1 to 8

Q is alkyl or hydroxyalkyl



and E is



wherein R<sup>1</sup> is R or H provided that only one of E and D is connected to T via the carbon atom of the carbonyl group present in D and E and at least one of the groups represented by X, T, Q and R contains a carbon chain having more than four carbon atoms.

**4,166,067**  
**PROCESS FOR THE PREPARATION OF**  
**ALKOXYMETHYL-ISOCYANATES**

Reinhard Frelmuth, Bergisch-Gladbach; Kuno Wagner, Leverkusen; Kurt Flindelsen, Odenthal; Klaus König, Leverkusen, and Peter Heitkampfer, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,916

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2746963

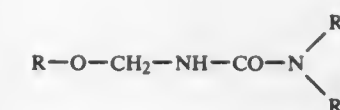
Int. Cl.<sup>2</sup> C07C 118/00

U.S. Cl. 260—453 P **8 Claims**

1. A process for the preparation of isocyanates corresponding to the following general formula:



characterized in that tri-substituted ureas corresponding to the following general formula:



are reacted at temperatures of from about 50° to 250° C. with organic mono- or poly-isocyanates which have a boiling point above that of the product of the process, in which general formulae:

R represents a saturated aliphatic hydrocarbon group having from 1 to 4 carbon atoms or an allyl group; and  
R' and R'' independently represent organic groups which are inert under the reaction conditions and the groups R' and R'' may, together with the nitrogen atom of the urea group, form a heterocyclic ring.

**4,166,068**  
**β,β-DICYANO STYRENES**

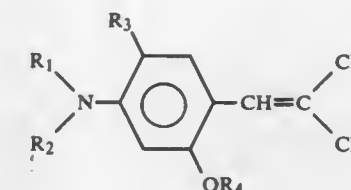
Werner Baumann, Basel, and Ulrich Zirngibl, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland  
Filed Apr. 18, 1975, Ser. No. 569,163

Claims priority, application Switzerland, Apr. 25, 1974, 5658/74

Int. Cl.<sup>2</sup> C07C 143/68

U.S. Cl. 260—456 A **20 Claims**

1. A styryl dye compound of formula I,



in which

R<sub>1</sub> signifies (C<sub>1-6</sub>) alkyl or (C<sub>5-6</sub>) cycloalkyl.

R<sub>2</sub> signifies (C<sub>1-4</sub>) alkyl; or (C<sub>1-4</sub>) alkyl monosubstituted by chlorine, bromine, phenyl, phenoxy, (C<sub>1-4</sub>)alkoxy, (C<sub>1-4</sub>)alkoxycarbonyl, (C<sub>1-4</sub>)alkylcarbonyloxy, (C<sub>1-4</sub>)alkoxycarbonyloxy or benzoyloxy,

R<sub>3</sub> signifies hydrogen and (C<sub>1-6</sub>) alkylsulphonyl, (C<sub>5-6</sub>) cycloalkylsulphonyl, benzylsulphonyl di-(C<sub>1-4</sub>) alkylaminosulphonyl or N-(C<sub>1-4</sub>) alkyl-N-phenylaminosulphonyl

any phenyl moiety in such substituents R<sub>2</sub> and R<sub>4</sub> being unsubstituted or substituted by up to two substituents selected from the group consisting of chlorine, bromine, methyl and methoxy, or monosubstituted by ethoxy.

**4,166,069**  
**PROCESS FOR THE PREPARATION OF**  
**2-METHOXY-5-METHYLANILINE-4-SULPHONIC ACID**

Rolf Schimpf, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Feb. 27, 1978, Ser. No. 882,293

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714031

Int. Cl.<sup>2</sup> C07C 143/64

U.S. Cl. 260—509 **9 Claims**

1. Process for preparing 2-methoxy-5-methylaniline-4-sulphonic acid which comprises contacting 2-methoxy-5-methylaniline or an acylated derivative thereof with sulfuric acid or a mixture of sulfuric acid and oleum at an elevated temperature.



4,166,070

## PROCESS FOR THE PREPARATION OF SULFONIC ACID CHLORIDES

Heinz U. Blank, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jul. 19, 1977, Ser. No. 817,456

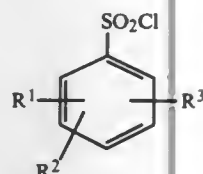
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635279; May 12, 1977, 2721429

Int. Cl.<sup>2</sup> C07C 143/70

U.S. Cl. 260—543 R

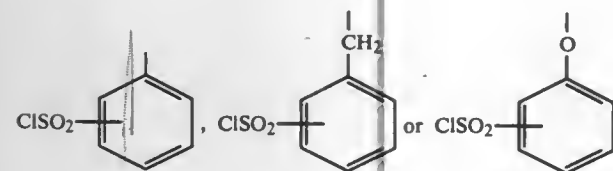
23 Claims

1. In a process for the preparation of a sulfonic acid chloride of the formula



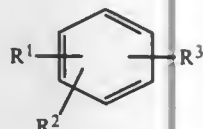
wherein

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are identical or different and denote hydrogen, a lower alkyl or cycloalkyl radical, halogen, aryl, aralkyl, aryl-ether or one of the radicals



or where

adjacent radicals R<sup>1</sup> and R<sup>2</sup> are linked to form a cycloaliphatic or aromatic carbocyclic ring which is optionally substituted by a sulfonic acid chloride group by contacting an aromatic compound of the formula



wherein

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> have the previously assigned significance with a sulfonating agent in the presence of thionyl chloride, the improvement which comprises employing an approximately equimolar amount of said sulfonating agent, based upon the number of sulfonic acid chloride groups to be introduced, employing an excess of thionyl chloride, the sulfonating agent and thionyl chloride being initially introduced or added simultaneously with the addition of said aromatic compound, said process further characterized in that:

A. the sulfonating agent and the thionyl chloride are initially introduced and the aromatic compound is added thereafter; or

B. the sulfonating agent is initially introduced into a reaction zone and the aromatic compound and thionyl chloride are simultaneously added thereto thereafter; the process being carried out at a temperature in the range of 20° to 90° C.

4,166,071

## MONOPHOSPHA-S-TRIAZINES

Kazimiera L. Paclerek, Corona del Mar; Reinhold H. Kratzer; Jacquelyn Kaufman, both of Costa Mesa, and Thomas I. Ito, Fountain Valley, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,271

Int. Cl.<sup>2</sup> C10M 1/44; C07F 9/22, 9/65

U.S. Cl. 260—551 P

5 Claims

1. A method for synthesizing monophospha-s-triazine which comprises the steps of (1) forming a mixture of reaction ingredients composed of (a) an amidoylamidine and (b) a trihalophosphorane; (2) heating said ingredients for a period of time and at a temperature sufficient to effect a reaction therebetween; and (3) separating the resulting reaction product.

3. The compound 1-diphenylphospha-3,5-bis(perfluoroheptyl)-2,4,6-triazine.

4. The compound 1-diphenylphospha-3,5-bis[C<sub>3</sub>F<sub>7</sub>OCF(CF<sub>3</sub>)CF<sub>2</sub>OCF(CF<sub>3</sub>)]-2,4,6-triazine.

5. The compound 1-diphenylphospha-3,5-bis[C<sub>3</sub>F<sub>7</sub>OCF(CF<sub>3</sub>)CF<sub>2</sub>OCF(CF<sub>3</sub>)]-2,4,6-triazine.

4,166,072

## SUBSTITUTED AMIDES HAVING ANTIINFLAMMATORY ACTIVITY

John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 773,561, Mar. 2, 1977, Pat. No. 4,098,789.

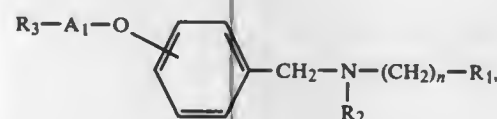
This application Apr. 18, 1978, Ser. No. 897,476

Int. Cl.<sup>2</sup> C07C 103/78, 103/24; C07D 295/08

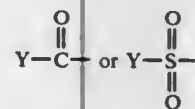
U.S. Cl. 260—558 P

13 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R<sub>1</sub> is amido, alkylamido or dialkylamido;R<sub>2</sub> is

wherein Y is alkyl, cycloalkyl, aryl, arylalkyl, styryl, or styryl wherein the phenyl group is substituted with a halogen, alkyl, alkoxy, trifluoromethyl, nitro or amino group;

R<sub>3</sub> is alkylamino, dialkylamino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, or 4-alkyl-1-piperazinyl;

A<sub>1</sub> is an alkylene group having 2 to 5 carbon atoms; and n is 1, 2 or 3;

wherein the term aryl refers to phenyl or phenyl substituted with a halogen, alkyl, alkoxy, trifluoromethyl, nitro or amino group; and alkyl and alkoxy are groups having 1 to 6 carbon atoms; and cycloalkyl is a group having 3 to 7 carbon atoms.

4,166,073

## UNSYMMETRICAL OLIGOQUATERNARY AMMONIUM COMPOUNDS

Robert A. Bauman, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

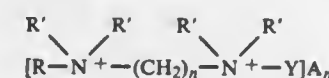
Division of Ser. No. 82,626, Oct. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 716,412, Mar. 27, 1968, abandoned. This application Aug. 22, 1977, Ser. No. 826,587

Int. Cl.<sup>2</sup> C07C 87/30; A01N 9/20

U.S. Cl. 260—567.6 P

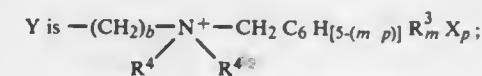
7 Claims

1. Unsymmetrical poly-onium quaternary compound having the structural formula:



wherein

R is a straight chain alkyl group having 10 to 18 carbon atoms;



n is an integer 2 to 18;

R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are lower alkyls having 1 to 3 carbon atoms;

b is an integer 2 to 12;

X is selected from the group consisting of chlorine, bromine and iodine;

m is 0 to 3;

p is 0 to 3;

m + p is 0 to 3; and

A<sub>n</sub> is a compatible anion selected from the group consisting of halide, alkyl sulfonate and phenyl sulfonate.

4,166,074

## DIALKYLAMINOPHENYLETHYL (OR VINYL) CYCLOPROPYL CARBINOLS

Joseph C. Collins, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 740,358, Nov. 10, 1976, Pat. No. 4,093,736, Continuation-in-part of Ser. No. 545,486, Jan. 30, 1975, which is a continuation-in-part of Ser. No. 436,611, Jan. 25, 1974, Pat. No. 3,917,718, Continuation-in-part of Ser. No. 265,333, Jun. 22, 1972, Pat. No. 3,829,475. This application Mar. 13, 1978, Ser. No. 885,580

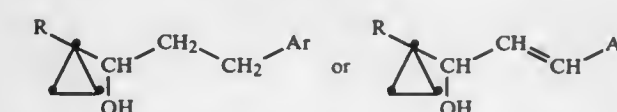
Claims priority, application United Kingdom, Jun. 18, 1973, 28793/73

Int. Cl.<sup>2</sup> C07C 91/40

U.S. Cl. 260—574

4 Claims

1. A compound of the formula



where R is hydrogen or lower-alkyl of 1 to 4 carbon atoms, and Ar is phenyl substituted by dialkylamino where alkyl has from 1 to 4 carbon atoms.

4,166,075

## METHOD OF PREPARING XYLENES CHLORINATED IN THE NUCLEUS

Georg Blumenfeld, St. Augustin, and Paul Riegger, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,400

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 2702829

Int. Cl.<sup>2</sup> C07C 25/04

U.S. Cl. 260—650 R

17 Claims

1. In a process for preparing a xylene chlorinated in the nucleus by contacting xylene with chlorine in the presence of a catalyst, the improvement which comprises employing as the catalyst an iron halide or antimony halide and employing a co-catalyst which co-catalyst is an aliphatic, halogenated or unhalogenated hydrocarbon having an oxygen function.

4,166,076

## CYCLODIMERIZATION OF ISOPRENE

Cornelis F. Roobeek, and Petrus W. N. M. van Leeuwen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 16, 1978, Ser. No. 869,563

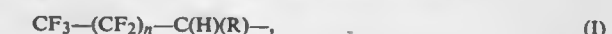
Claims priority, application United Kingdom, Jan. 19, 1977, 2100/77

Int. Cl.<sup>2</sup> C07C 3/21, 3/035

U.S. Cl. 585—369

16 Claims

1. A process for the preparation of 1,5-dimethyl-1,5-cyclooctadiene and 1,4-dimethyl-4-vinyl-1-cyclohexene, which comprises contacting isoprene with a catalyst consisting essentially of the reaction product of (a) a member of the group consisting of a substituted trihydrocarbyl phosphite, substituted trihydrocarbyl arsenite or substituted trihydrocarbyl antimonite, wherein at least one of the three hydrocarbyl groups is a substituted hydrocarbyl group of the general formula



wherein n is equal to zero or an integer of at least one and R represents a substituted or unsubstituted hydrocarbyl group, and (b) a compound of a metal of Group VIII of the Periodic Table of the Elements in which the metal has an oxidation number of zero.

4,166,077

## METHOD OF PRODUCTION OF ETHANE BY SELECTIVE HYDROGENOLYSIS OF ALKANE

Jean-René Bernard, St. Symphorien d'Ozon; Pierre Turlier, Lyons, and Jacques Bousquet, Irigny, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Continuation of Ser. No. 699,972, Jun. 25, 1976, abandoned.

This application Oct. 11, 1977, Ser. No. 840,732

Claims priority, application France, Jun. 30, 1975, 75 20516; Nov. 14, 1975, 75 34868; Dec. 16, 1975, 75 38531

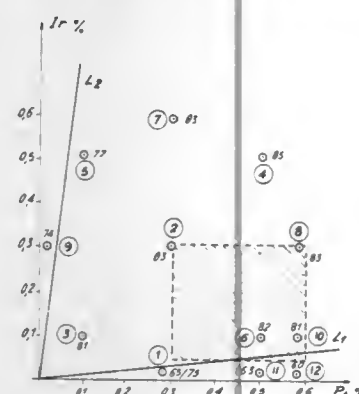
Int. Cl.<sup>2</sup> C07C 9/06; C10G 13/10; C07C 11/04

U.S. Cl. 585—310

20 Claims

1. A method of production of ethane by selective hydrogenolysis of alkanes, wherein said method comprises introducing into a reactor at a spatial velocity V a gaseous mixture of hydrogen and alkanes under a total pressure P on a monofunctional catalyst at the temperature T, and wherein said monofunctional catalyst is constituted by at least one catalytically active metal selected from iridium and rhodium incorporated in a support of inert refractory oxide essentially completely

devoid of  $\text{SO}_4$  ions and wherein the total percentage of catalytically active metal contained in the catalyst is within the range



of 0.1% to 10% by weight thereby producing an ethane yield of at least about 39 weight percent.

**4,166,078**  
**MODIFIED ORGANOPOLYSILOXANE COMPOSITIONS**  
John C. Getson, Adrian, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Dec. 16, 1977, Ser. No. 861,312  
Int. Cl.<sup>2</sup> C08L 43/04

**U.S. Cl. 528—26** **20 Claims**  
1. A vulcanizable composition containing (A) a modified organopolysiloxane composition which is obtained from the polymerization of (1) a monomer having ethylenic unsaturation in the presence of (2) an organohydrogenpolysiloxane fluid having a viscosity of from 10 to 1,000,000 centipoise at 25° C., in which the organohydrogenpolysiloxane fluid is present in an amount of from 20 to 95 percent by weight based on the weight of monomer (1) and organohydrogenpolysiloxane (2) and (3) a free radical initiator to form a composition having in-situ generated particulate matter dispersed therein and having a polymeric organic group which is constituted of recurring units derived from monomer (1) grafted to the organohydrogenpolysiloxane fluid (2), said in-situ generated particulate matter resulting from the polymerization of monomer (1) in the presence of organohydrogenpolysiloxane (2) and free radical initiator (3), (b) a vinyl containing compound having at least two vinyl groups per molecule which is capable of crosslinking with (A) and (C) a catalyst capable of promoting the addition of silicon-bonded hydrogen groups to silicon-bonded vinyl groups.

**4,166,079**  
**DYEABLE POLYOLEFIN COMPOSITION**  
Yoshiharu Tatsukami, Niihama; Hazime Nishibara, Shonaimachi; Yasutoshi Kobayashi, Niihama, and Hideo Shinonaga, Nakasonemachi, all of Japan, assignors to Sumitomo Chemical Co. Ltd., Osaka, Japan

Filed Dec. 30, 1977, Ser. No. 866,402  
Claims priority, application Japan, Jan. 4, 1977, 52-281; Jan. 4, 1977, 52-282

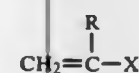
**Int. Cl.<sup>2</sup> C08F 8/32**  
**U.S. Cl. 525—208** **4 Claims**  
1. A composition which comprises a polyolefin and an aminated ethylene-glycidyl acrylate copolymer produced by amination of an ethylene-glycidyl acrylate copolymer, said amination being conducted in a heterogeneous system comprising the ethylene-glycidyl acrylate copolymer and a mixed solvent of a secondary amine and a lower alcohol, to the extent that not less than 90% of the epoxy groups present in the copolymer are aminated the volume ratio of the amine to the alcohol in the mixed solvent being 20/80 to 85/15, and the amount of the mixed solvent being 1 to 100 parts by weight based on 1 part by weight of the copolymer.

**4,166,080**  
**NYLON 6 HAVING IMPROVED AFFINITY FOR CATIONIC DYES**  
Neal E. Franks, Enka, and Carol L. Drinnan, Asheville, both of N.C., assignors to Akzona Incorporated, Asheville, N.C.  
Continuation of Ser. No. 716,322, Aug. 20, 1976, abandoned.  
This application Sep. 1, 1978, Ser. No. 939,145  
Int. Cl.<sup>2</sup> C08L 77/00

**U.S. Cl. 525—183** **11 Claims**  
1. A polycapraamide receptive to cationic dyes containing about 1 to about 5 percent by weight of a metal salt of a vinyl ether copolymer of 2-acrylamido-2-methylpropanesulfonic acid said metal being selected from Group Ia of the Periodic Table, said copolymer comprising from 17 to 47 mole percent of said vinyl ether monomer.

**4,166,081**  
**METHOD OF MAKING GRAFT POLYMERS**  
Albert A. Fournier, Jr., Martinsville, and Charles F. Paddock, Wayne, both of N.J., assignors to Unlroyal, Inc., New York, N.Y.  
Division of Ser. No. 329,003, Feb. 2, 1973, abandoned, which is a continuation of Ser. No. 22,364, Mar. 24, 1970, abandoned.  
This application Dec. 5, 1977, Ser. No. 858,060  
Int. Cl.<sup>2</sup> C08L 51/04, 51/06; C08F 255/06

**U.S. Cl. 525—75** **1 Claim**  
1. A method of making a high impact modified plastic comprising (A) interpolymerizing in an organic solvent and in the presence of a free radical catalyst 1 to 2 parts by weight of a rubbery polymer of ethylene, at least one monoolefin containing 3-5 carbon atoms and at least one polyene for each 2 to 1 parts by weight of monomeric material which is a mixture of an alkenyl aromatic monomer and an acrylic monomer, the organic solvent being a solvent for the rubbery polymer and being an aromatic solvent selected from the group consisting of benzene and toluene, the alkenyl aromatic monomer being selected from the group consisting of styrene, alpha-methylstyrene, p-methylstyrene and the halo-styrenes, and the acrylic monomer having the general formula



wherein R is selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of



wherein R' is an alkyl group containing 1-8 carbon atoms, the said polymer, prior to interpolymerization, having not more than 13 carbon to carbon double bonds per 1000 carbon atoms, and

(B) thereafter mixing the graft interpolymer resulting from step (A) with additional resin separately prepared from said mixture of monomeric material to provide a higher overall ratio of resin to rubbery polymer.

**4,166,082**  
**VINYLDENE CHLORIDE COPOLYMER FILM HAVING HIGH BUBBLE STABILITY IN INFLATION-STRETCHING PROCESS AND COLD RESISTANCE**

Nobuyuki Hisazumi, and Shinichiro Funabashi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,571

Claims priority, application Japan, May 20, 1976, 51/58168  
Int. Cl.<sup>2</sup> C08L 51/00, 53/00

**U.S. Cl. 525—78** **4 Claims**  
1. A vinylidene chloride copolymer film having high bubble stability in an inflation-stretching process and excellent cold resistance, which is prepared by inflation-stretching a tubular amorphous substance obtained by melt-extruding and quenching a composition comprising vinylidene chloride polymer, a miscible type elastomer (A component) and a particle dispersion type elastomer (B component) in a range surrounded by the lines (a), (b), (c) and (d)

$$Y = \frac{40}{50} \times +20 \quad (a)$$

$$X = 5 \quad (b)$$

$$Y = 10 \quad (c)$$

$$X = 50 \quad (d)$$

wherein the weight percent of the B component to total elastomers is plotted on the X axis (abscissa) and the weight percent of total content of the A component and the B component to total components is plotted on the Y axis (ordinate); wherein said particle dispersion type elastomer is produced by polymerizing butadiene with or without a comonomer of styrene, acrylonitrile, methacrylate or vinylidene chloride in an emulsion polymerization to form a polymer, and then adsorbing a monomer or a monomer mixture of methyl methacrylate, styrene, or vinylidene chloride on particles of the said polymer and polymerizing it on said particles; and wherein said miscible type elastomer is a copolymer of a first group olefin monomer of ethylene, propylene or isobutylene and a second group monomer of vinyl acetate, vinyl propionate, acrylic acid, acrylic acid esters, methacrylic acid or methacrylic acid esters.

**4,166,083**  
**RUBBER COMPOSITION AND PROCESS FOR PREPARATION THEREOF**

Akio Ueda, and Keiji Komuro, both of Yokohama, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,594

Claims priority, application Japan, Mar. 4, 1977, 52-23450; Mar. 4, 1977, 52-23451

**Int. Cl.<sup>2</sup> C08L 9/02, 23/16**  
**U.S. Cl. 260—33.6 AQ** **10 Claims**

1. A blended rubber composition comprising (a) 70 to 95% by weight of at least one diene rubber, and (b) 30 to 5% by weight of (i) a homopolymer, obtained by polymerizing one norbornene compound expressed by the general formula

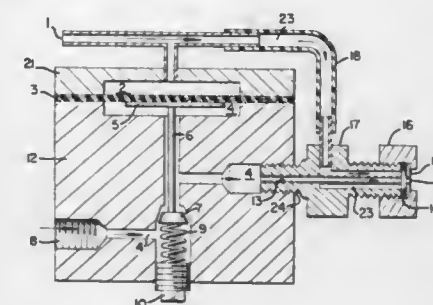


wherein R and R', independently from each other, represent a hydrogen atom, and alkyl group with 1 to 4 carbon atoms, an alkoxy group with 1 to 4 carbon atoms or the group  $-\text{O}-\text{COCH}_3$ , or (ii) a copolymer obtained by polymerizing at least

two different norbornene compounds expressed by the above formula.

**4,166,084**  
**BUBBLE MAKER**  
Melvin E. Shea, 85 Terrace Rd., Milford, Conn. 06460  
Filed Mar. 24, 1978, Ser. No. 889,642  
Int. Cl.<sup>2</sup> B67D 5/34; A63H 33/28

**U.S. Cl. 261—69 A** **1 Claim**



1. A bubble making device to combine liquid and compressed air into tiny bubbles and to blow said bubbles into the air in the space to be conditioned, said liquid being fed to the device from a water main from a municipal reservoir or other suitable major water supply source, through a liquid supply line, said liquid supply line being pipe or tubing of metal or plastic, into which a prescribed additive is being metered and injected as used by a suitable chemical solution feeder in the amount required to condition or treat the air in a specified space, said compressed air being fed to the device from a suitable properly sized motor driven air compressor through an air line, said air line being of metal or plastic tubing, in the amount required, said device comprising the following parts; a main body formed from a block of metal or plastic and containing a vertical tubular passway, said vertical tubular passway being formed with three diameters of differing dimensions, the lower section of said vertical tubular passway being of a larger diameter than the middle section provides a seat where these two differing diameters meet, the upper section of the vertical tubular passway extends through the top of the main body and is increased in diameter and to a depth to form a reservoir of a size suitable to allow for free movement of a flexible diaphragm, said diaphragm being formed from a clothlike rubberized waterproof material, and a bearing plate, said bearing plate being a flat metal disc affixed by riveting or other suitable means to the middle of said flexible diaphragm, said vertical tubular passway is connected to two horizontal tubular passways at different levels within the main body, the lower horizontal tubular passway is connected to the liquid supply line by threaded joint and joins the vertical tubular passway at a point below the seat, the upper horizontal tubular passway is connected to the orifice body by threaded joint and joins the vertical tubular passway at a point immediately above the seat, the lower section of the vertical tubular passway extends through the bottom of the main body and is fitted with a plug by a threaded joint, said plug being of metal or plastic, said plug supports a coil spring, a rubber stopper and a push rod, said rubber stopper is fastened to the bottom end of the push rod by threaded joint, said push rod being a brass rod of a length to extend to a point immediately below and adjacent to the bearing plate and flexible diaphragm, said flexible diaphragm being compressed between the abutting parts of the main body and the cap, said cap being formed from same type structural element as the main body, said main body cap and flexible diaphragm being further fastened together by threaded members, said cap being formed with an opening in its lower face of the same dimensions as the opening in the upper section of the vertical tubular passway in the main body, said openings in the main body and the cap are formed to align with each



other to form a chamber, said chamber is separated top from bottom by the flexible diaphragm, the upper half of said chamber forming an air chamber, the lower half of said chamber forming a liquid reservoir, a vertical tubular passageway is provided from the top of the air chamber through the top of the cap, the opening from this vertical passageway is fitted with a "tee" fitting, said "tee" fitting being of plastic or metal and being formed to accommodate tubing, an opening from said "tee" fitting is connected by metal or plastic tubing to the air compressor, the remaining opening from said "tee" fitting is connected by metal or plastic tubing to the orifice body, said orifice body being of plastic or metal and conforming to the main body, said orifice body is connected to the main body at the outer end of the upper horizontal tubular passageway by threaded joint, the opposite end of said orifice body contains the orifice plate, said orifice plate being a flat circular disc made of metal or plastic, an orifice, said orifice being a tiny drilled hole directly through the middle of the orifice plate, a threaded cap, said threaded cap made of metal or plastic to conform to the orifice body, said threaded cap being formed with an opening in its normally closed head, said opening is of a smaller diameter than the orifice plate and is formed into a seat to hold said orifice plate in its place at the outer end of the orifice body while leaving the orifice unobstructed on its outer side, said threaded cap is fastened to the orifice body by threaded joint, an "O" ring being a gasket of plastic or rubber is compressed between the orifice body and the orifice plate by threaded cap and orifice plate, said "O" ring seals the orifice body and orifice plate from leakage, an air passageway being a horizontal tubular passageway within the orifice body and extending from the orifice plate to a point midway in the length of the orifice body where it joins the vertical section of the tubular passageway which is connected to the "tee" fitting as previously recited, a capillary tube is press fitted through the orifice body from the end which attaches to the main body and extends centrally and through the air passageway in the orifice body to a point adjacent to the orifice, said capillary tube being of plastic or metal is sized to deliver a minute quantity of liquid, said minute quantity being approximately one part of liquid to seventy parts of air, delivered to the orifice by volume, said air being delivered when the compressor is energized, either by manual or by automatic means, feeding compressed air to the air inlet at the "tee" fitting in the cap, then through said "tee" and through the tubing and into the orifice body, to the orifice plate and through the orifice, the small diameter of the orifice restricts the flow of air through said orifice causing pressurization of the air passageway and the air chamber above the flexible diaphragm, the increased air pressure above the diaphragm depresses said diaphragm, which depresses the bearing plate, the push rod and the stopper, thereby opening the seat in the vertical tubular passageway and allowing the liquid to flow from the liquid supply line through the lower horizontal passageway and into the vertical tubular passageway past the seat and stopper then into the liquid reservoir below the diaphragm and through the upper horizontal passageway, then through the capillary tube, the capillary tube restricts the flow of liquid causing increased pressure in the liquid reservoir below the diaphragm, said increased pressure raising the diaphragm and bearing plate allowing the coil spring to raise the push rod and stopper thereby restricting the flow of liquid into the reservoir and through the capillary tube until the pressure below the diaphragm is in a balance with the pressure above the diaphragm, the minute amount of liquid passing through the capillary tube and being deposited on the orifice plate and over the orifice maintains a film of liquid on said orifice plate and overspreading the orifice, the greater volume of air being delivered through the orifice takes with it the minute amount of liquid as it is being deposited on the orifice plate and over-spreading the orifice and assures that the deposit cannot increase to more than a film, the tendency of this film to cling to the orifice plate and to the perimeter of the orifice while the air is discharging through the center of the orifice causing the formation of the tiny bubbles, which are being blown en masse into the air in the space to be conditioned, continuously, until the device is shut down, said shut down is accomplished by interrupting the

energy supply to the compressor thereby interrupting the flow of compressed air into the device and as the pressurized air remaining in the air passageway discharges through the orifice, the air pressure in the chamber above the flexible diaphragm lowers relieving the pressure on said flexible diaphragm and bearing plate allowing the coil spring to raise the push rod and to seat the stopper, the combination of the liquid pressure below the stopper and the tension of the coil spring keeps the liquid supply firmly shut off, meanwhile if any volume of pressurized air remains in the air passageway and air chamber of the device it continues discharging through the orifice taking with it any minute amount of liquid remaining in the orifice thereby eliminating problems that may arise from said liquid drying and solidifying in said orifice.

#### 4,166,085 CARBURETOR

Masanori Torii, and Tadabisa Naganawa, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

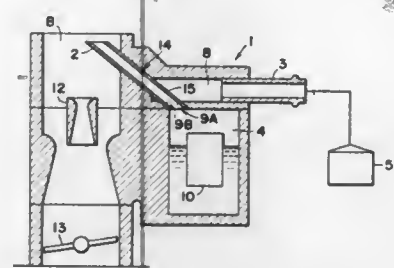
Filed Dec. 1, 1977, Ser. No. 856,595

Claims priority, application Japan, Jul. 11, 1977, 52/82750

Int. Cl.<sup>2</sup> F02M 33/02

U.S. Cl. 261—72 R

9 Claims



1. A carburetor of the type including an inner vent for communicating with an air intake of said carburetor, and outer vent for communicating with an evaporated fuel gas absorbing means and a float chamber, said carburetor being characterized by a connecting portion provided in a body of said carburetor for directly connecting said inner vent and said outer vent without passing through said float chamber and a small opening in said connecting portion to said float chamber.

#### 4,166,086 AERATOR FOR LIVE BAIT BUCKET

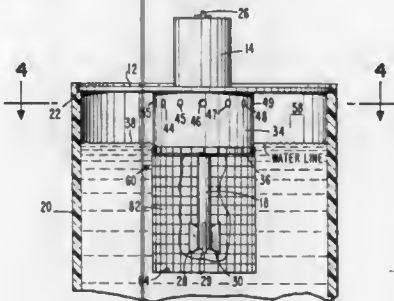
Earl B. Wright, 1307 Willow, Coffeyville, Kans. 67337

Filed May 2, 1978, Ser. No. 902,026

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 261—93

2 Claims



1. An aerator device for maintaining a high level of oxygen in the water in a live bait storage container, comprising: cover means for the bait container; a lightweight, high speed, battery operated, electric drive motor mounted on the upper surface of said cover means,

said drive motor being capable of operating at 500–600 RPM under battery power for a substantial period of time; drive shaft means driven by said motor, said drive shaft extending downwardly through said cover means a distance sufficient to extend below the normal water level in the bait container; impeller means secured to the lower end of said drive shaft, the top of said impeller being so located as to be approximately 1½ inches below the normal water level in the bait container; shaft housing means depending from the under surface of said cover means, said shaft housing means being coaxial with said shaft and being spaced radially outwardly from said drive motor to define an annular space therebetween, said shaft housing extending downwardly from said cover means a distance sufficient to place its lower peripheral edge below the normal water level in the bait container; a plurality of arcuate air inlet slots through said cover means, said inlet slots being located in said annular space between said motor and said shaft housing and extending substantially completely around said motor, said slots serving to admit ambient air into the interior of said shaft housing; a plurality of air inlet ports spaced around the circumference of said shaft housing at the upper end thereof to admit air from within said container into the interior of said shaft housing; screening means secured to the lower peripheral edge of said shaft housing and extending downwardly therefrom to surround said impeller means to protect live bait from the impeller; and means for applying electrical power to said drive motor for driving said motor and said impeller at a speed sufficient to vigorously circulate water in the bait container and to create a vortex in the water at the impeller, whereby air is drawn down into the vortex and dispersed into the water in the form of fine bubbles which are driven downwardly in the water within the container for circulation and absorption of oxygen, whereby the water is aerated and is maintained at a high level of dissolved oxygen.

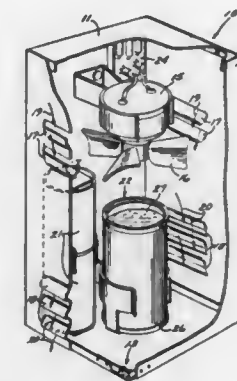
#### 4,166,087

AUTOMATIC INTERMITTENT VAPOR DISPENSER  
Lee S. Cline, Downey, and Phillip J. John, Los Alamitos, both of Calif., assignors to Cline-Buckner, Inc., Cerritos, Calif.  
Continuation of Ser. No. 446,915, Feb. 29, 1974, abandoned, which is a continuation of Ser. No. 200,968, Nov. 22, 1971, abandoned. This application Feb. 4, 1975, Ser. No. 547,015

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 261—96

4 Claims



1. A static vapor generator comprising:  
(A) a vapor producing gel body comprising a gelling agent; a coating liquid system; a material portion of the liquids forming said liquid system being adapted for air treatment;

985 O.G. 40

(B) means for improving the uniformity of the vaporization rate of said vapor generator;  
said vaporization rate improving means comprising a syneresis pad whose exposed area increases as the exposed area of said gel body decreases;  
whereby the overall exposed area of said gel body and said syneresis pad tends to remain constant;  
(C) said gel body being positioned in contact with said syneresis pad;  
whereby liquid squeezed out of said gel body is absorbed by said syneresis pad.

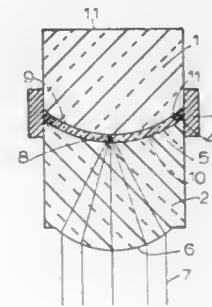
#### 4,166,088

#### METHOD OF MAKING HIGH QUALITY PLASTIC LENSES

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720  
Continuation-in-part of Ser. No. 793,388, May 25, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,081  
Int. Cl.<sup>2</sup> B29D 11/00

U.S. Cl. 264—1

1 Claim



1. A method of controlling the polymerization of cast optical lenses at room temperature by the steps of providing two ultraviolet transparent optical molds made by compression or injection molding a selected resinous material, one of the molds having a convex refracting surface opposing the optical mold surface having a focal length equal to the mold thickness, the second mold having a flat surface opposing the optical mold surface, placing the optical surfaces of said mold within a rigid positioning ring such that their respective molding surfaces form a molding cavity, separating the edges of said optical surfaces with a circular flexible edge mold which extends between the optical mold surfaces to form the part of the molding cavity which will form the edge of the optical lenses and which is attached to said rigid positioning ring, filling the space between the optical mold surfaces with a selected liquid lens monomer and a selected photosensitive catalyst, directing ultraviolet light from a distinct source toward the convex refracting surface on the one mold to focus the ultraviolet light at the center of the body of liquid lens monomer to activate the photosensitive catalyst, allowing sufficient time for polymerization to begin at the center of the body of liquid lens monomer, placing an ultraviolet reflector at the flat surface of the second mold to reflect ultraviolet light back into the body of liquid lens monomer to complete the polymerization and form a solid lens body.



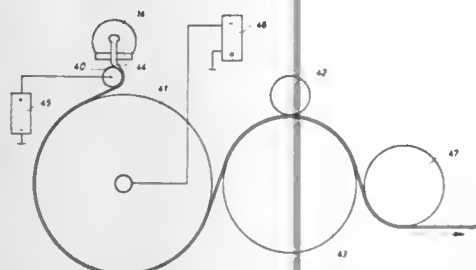
4,166,089  
CORONA FREE PINNING OF EXTRUDED POLYMER FILM

Wilfried F. De Geest, Berchem; Paul A. Verkinderen, Edegem, and Felix F. De Smedt, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium  
Continuation of Ser. No. 492,184, Jul. 26, 1974, abandoned, which is a continuation of Ser. No. 347,667, Mar. 30, 1973, abandoned, which is a continuation of Ser. No. 88,555, Nov. 12, 1970, abandoned. This application Apr. 16, 1976, Ser. No. 677,816

Claims priority, application United Kingdom, Nov. 13, 1969, 55708/69

Int. Cl.<sup>2</sup> B29D 7/02; B29C 17/00; H05B 7/00  
U.S. Cl. 264—22

7 Claims



1. A process for producing polymer film by the steps consisting essentially of:

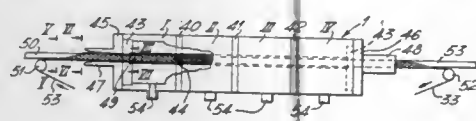
- extruding a molten thermoplastic, film forming, polymeric material from an electrically grounded extrusion die to produce a continuous film,
- continuously delivering said extruded film onto the surface of a rotatable electrically conductive cooling cylinder electrically insulated from ground, and establishing an intimate adherence between said film and said cooling cylinder surface at the initial locus of contact of the film with the roller by connecting said roller to a source of electrical potential, said potential being of sufficient magnitude to increase the adherence of the film to said roller surface but insufficient to produce a corona discharge in the vicinity of said locus, and
- removing the film from said cooling roller after the film remained in contact therewith for a determined angular extent.

4,166,090  
FIBROUS MATERIAL MOULDING APPARATUS  
Kieron P. Green, Thame; Bruce R. Inglis, High Wycombe; Roger A. Allen, Great Missenden, and Roger W. Tringham, Beaconsfield, all of England, assignors to Wiggins Teape Limited, Hampshire, England  
Filed Jul. 29, 1977, Ser. No. 820,388

Claims priority, application United Kingdom, Aug. 2, 1976, 32180/76

Int. Cl.<sup>2</sup> B28B 1/26  
U.S. Cl. 264—25

16 Claims



1. A process for continuously forming a fibrous element in an elongate closed foraminous forming during movement of said former through fluid extraction means, said fibrous element comprising a fibrous core enclosed and stiffened by a fibrous crust which is integral with the core and has a density greater than that of the core, which comprises

- forming an aqueous fibrous dispersion,

- generating a pressure gradient across an extraction zone within said fluid extraction means,
- continuously injecting the aqueous fibrous dispersion into the former at a predetermined efflux ratio, i.e., the ratio of the aqueous fluid dispersion injection velocity relative to the speed of the moving former, to cause some of the fibres, upon extraction of fluid as the dispersion traverses said extraction zone, to build up as continuous crust on the inner surface of the former and the remaining fibres to pack together within the area inside said crust to form the aforesaid core so as to produce a continuous fibrous element, in said elongate, moving foraminous former, having a fibrous core enclosed and stiffened by a fibrous crust which is integral with the core but of greater density, and
- removing said fibrous element thus formed from said former.

4,166,091  
PRODUCTION OF PLEXIFILAMENT STRANDS  
Edwin V. Beebe, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Filed Apr. 17, 1973, Ser. No. 351,819  
Int. Cl.<sup>2</sup> D01F 6/00

U.S. Cl. 264—205

14 Claims

1. In the process for producing plexifilament strands from an organic, synthetic, substantially water-insoluble fiber-forming polymer which either of itself or its water-association complex has a melting point between 100° and 300° C., by flash-extruding the polymer in a volatile liquid at a temperature above the melting point of the polymer into a region of substantially lower temperature and pressure where the liquid flash-vaporizes; the improvement for avoiding the use of organic solvents while providing for extremely rapid spinning which comprises dispersing said polymer in water to form a substantially uniform dispersion containing between about 25 percent and 45 percent by weight of polymer based on the total weight of dispersion, heating the dispersion to a temperature between about 200° C. and about 300° C. to melt the polymer or its water-association complex while maintaining the dispersion uniform and under a pressure at which the water is liquid, the rate of heating being such that the time of heating does not exceed about 30 minutes, and promptly flash-extruding the dispersion in liquid water from an orifice into a region of substantially lower temperature and pressure to form a continuous strand of fibrillated plexifilaments.

4,166,092  
PROCESS FOR MAKING ARTISTIC PRINTS  
Luis Remba-Grondovski, Dr. Barragan No. 763, Mexico City, Mexico  
Continuation of Ser. No. 633,768, Nov. 20, 1975, abandoned.  
This application Sep. 21, 1977, Ser. No. 835,374  
Claims priority, application Mexico, Jan. 2, 1975, 155728  
Int. Cl.<sup>2</sup> B29C 1/02

U.S. Cl. 264—221

3 Claims

1. A process for making colored artistic prints having a three dimensional surface texture, comprising:
- melting a wax mixture having the following composition:  
yellow wax (virgin) 30-50%  
candle wax 15-30%  
paraffin 5-15%  
turpentine 2-12%  
impalpable graphite powder 12-24%
  - pouring said melt into a mold and cooling said melt to ambient temperature to form a solid wax plate having uniform thickness and a smooth upper surface,
  - working the smooth upper surface of said wax plate to form an artistic three dimensional relief design thereon,
  - depositing upon said worked surface of said wax plate electrically conducting powder to form a uniform coating thereon,
  - placing said powder coated wax plate within an acid

- copper solution and with a conducting maximum voltage of two volts for 12-24 hours, electroplating a thin copper plate upon said powder coated worked surface of said wax plate,
- removing said copper plated wax plate from said copper solution and steaming said wax plate to remove said wax from said copper plate,
  - depositing tin powder upon the surface of said copper plate previously adjacent the wax plate, and heating said wax plate to melt said tin powder to form a coating of tin over said one surface of said copper plate; cooling said plate and tin to solidify and adhere said tin coating thereto,
  - placing said tin coated copper plate in a heated mold and pouring molten lead therein to contact and adhere to said tin coated surface only; cooling and solidifying said lead mass as a base for said copper plate,
  - scrapping the surface of said mass of lead to provide a smooth surface and uniform thickness thereto,
  - coloring predetermined portions of the copper surface of said composite plate with ink or paint,
  - placing said colored composite plate, copper face up, on the platen of a printing press having pressure rollers,
  - placing over said colored copper plate surface a sheet of material to be printed; placing a cover blanket over said sheet material, and
  - pressing said sheet material against said colored copper plate with said pressure rollers to form said sheet material into a colored artistic print, having a three dimensional surface texture.

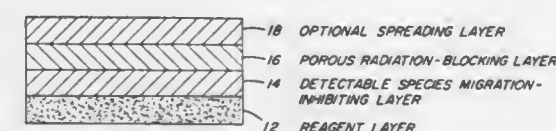
4,166,093  
REDUCTION OF DETECTABLE SPECIES MIGRATION IN ELEMENTS FOR THE ANALYSIS OF LIQUIDS

Margaret J. Smith-Lewis, Pittsford, and John Figueras, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 822,987, Aug. 8, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,173  
Int. Cl.<sup>2</sup> G01N 21/06, 31/22, 33/16

U.S. Cl. 422—56

17 Claims

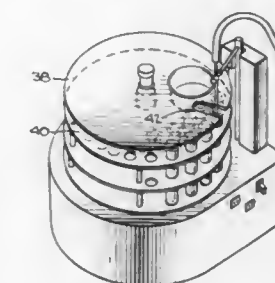


1. In an element for the analysis of liquids, said element comprising a radiation-transmissive reagent layer permeable to a predetermined analyte, which layer comprises a composition that is interactive in the presence of said analyte to provide a radiometrically detectable species, and a porous radiation-blocking layer permeable to said analyte; the improvement comprising a radiation-transmissive, detectable species migration-inhibiting layer interposed between the reagent layer and the porous radiation-blocking layer, said detectable species migration-inhibiting layer being permeable to said analyte and inhibiting the migration of said radiometrically detectable species to said porous radiation-blocking layer upon contact of said element with the liquid under analysis.

4,166,094  
AUTOMATIC FLUID SAMPLING TRANSPORT SYSTEM  
John A. Froehlich, West Redding; Roman Czernik, Bridgeport, and Chester G. Fisher, III, Southport, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.  
Filed May 22, 1978, Ser. No. 907,450  
Int. Cl.<sup>2</sup> G01N 1/14

U.S. Cl. 422—64

10 Claims

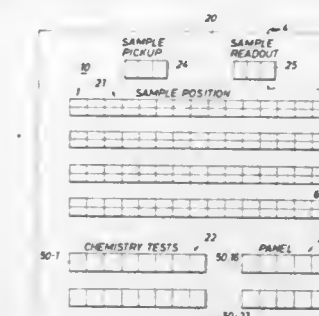


1. An automatic sampling transport system for sample vials comprising:
- sample holding means including a plurality of openings disposed in at least two concentric circles of said openings, for depositing corresponding sample vials;
  - means for rotating the sample holding means;
  - sample probe carrying means;
  - means for raising and lowering said sample probe carrying means;
  - means for rotating said sample probe carrying means a predetermined arcuate length from a cooperating position with an opening in one of said concentric circles to a cooperating position with an opening in another of said concentric circles;
  - means for synchronously engaging said means for rotating said sample holding means and said means for rotating said sample probe carrying means, whereby the rotation of each of said means occurs simultaneously; and
  - means for synchronizing said rotation to the raising and lowering of said probe carrying means.

4,166,095  
SELECTIVE TEST SELECTION AND INDICATOR MEANS IN AN AUTOMATIC CHEMICAL TESTING APPARATUS  
Gary W. Kling, and Scott C. Swanson, both of Houston, Tex., assignors to Hycel, Inc., Houston, Tex.  
Filed Aug. 24, 1978, Ser. No. 936,416  
Int. Cl.<sup>2</sup> G01N 33/16, 1/18

U.S. Cl. 422—67

9 Claims



1. In an automatic chemical testing apparatus for performing tests on each of a plurality of liquid samples, each sample having an ordinal position, including means for performing tests on selected aliquots of a liquid sample, and a reaction container for holding each aliquot, test selection means for



selecting a test or tests to be performed on each sample, instruction means for producing instructions in response to actuation of said test selection means, instruction storage means coupled to said instruction means, control means coupled to said instruction storage means, reagent injecting means coupled for control by said control means for initiating tests in selected reaction containers in response to stored instructions and readout means coupled to said control means for analyzing reacted contents of the selected reaction containers, the improvement wherein said test selection means comprises: a first group of position selector means, each position selector means being associated with one sample position, and further comprising first and second indicator means associated with each position selector means, a second group of selector means, each selector means being associated with one or a group of said different chemical tests, said instruction means being coupled between said first and second groups of selector means and said instruction storage means such that actuation of one of said position selector means in said first group enables programming of tests to be performed on the sample position to which said selector means corresponds such that a current enabled position is provided and wherein operation of selector means in said second group produces a signal for storage in correspondence to said enabled position, sensor means in said control means responsive to all of said selector means for producing an output signal for operating said first indicator means associated with one said first selector means in response to actuation of said one selector means and for deenergizing the said first indicator means when a different position selector means is actuated and for producing a signal for energizing said second indicator means in response to programming of a test or tests for said one position.

4,166,096

## BIOHAZARD STEAM STERILIZER

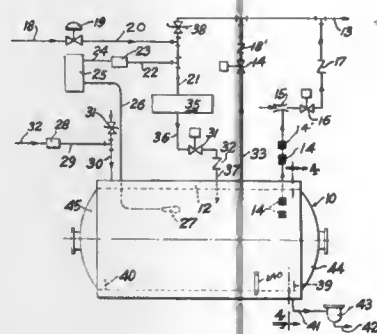
John R. Gillis, Harborcreek; Peter Miraldi, Erie, both of Pa., and Marius X. Stavers, Scotch Plains, N.J., assignors to American Sterilizer Company, Erie, Pa.

Filed Mar. 23, 1978, Ser. No. 889,383

Int. Cl.<sup>2</sup> A61L 3/00, 3/02

U.S. Cl. 422—119

12 Claims



1. A sterilizer (10) for sterilizing highly infectious material comprising, a chamber (11) having at least one door (44) adapted to receive materials to be sterilized, said chamber having no drain line, means to provide steam to achieve saturated steam at sterilizing conditions in said chamber, exhaust means (13) for said chamber including a bacteria-retentive filter (14) and a vacuum source means (15), said vacuum source means (15) being in fluid flow communication with said bacteria-retentive filter (14) whereby said chamber may be evacuated through said filter (14), said chamber having at least one dam (40) adjacent one end of said chamber extending upwardly relative to one end thereof providing a reservoir on the side of said dam adjacent the opposite end of said chamber for condensate, thereby preventing condensate collected at the bottom of

said chamber from escaping when the chamber door is opened.

4,166,097

## EXTRACTIVE RECOVERY OF TRIVALENT THALLIUM VALUES FROM AQUEOUS SOLUTIONS

Richard A. Johnson, Midland Park, N.J., assignor to Halcon Research & Development Corporation, New York, N.Y.

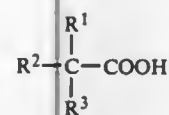
Filed Apr. 14, 1978, Ser. No. 896,550

Int. Cl.<sup>2</sup> B01D 11/00; C01G 15/00; C22B 61/00; C01F 5/00

U.S. Cl. 423—112

16 Claims

1. A process for extractively recovering trivalent thallium values from an aqueous medium containing dissolved trivalent thallium and monovalent thallium values which comprises contacting the aqueous medium with an extractant comprising a carboxylic acid medium having a limited solubility in water to preferentially extract trivalent thallium values into the carboxylic acid, and recovering a carboxylic acid extract containing the extracted trivalent thallium values as a separate phase, wherein the carboxylic acid in the extractant medium comprises at least one member selected from the group consisting of monocarboxylic acids of the formula



wherein  $R^1$ ,  $R^2$ , and  $R^3$  are the same or different and are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, and derivatives of the foregoing groups wherein one or more carbon atom is replaced by an oxygen atom, and substituted derivatives of the foregoing groups, with the proviso that  $R^3$  cannot be hydrogen when  $R^1$  and  $R^2$  are each hydrogen, and with the further proviso that the monocarboxylic acid possesses at least 5 carbon atoms per molecule.

4,166,098

## PROCESS FOR TREATING AN ACID WASTE LIQUID

Morio Watanabe, Amagasaki, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corp. of Japan, Osaka, Japan

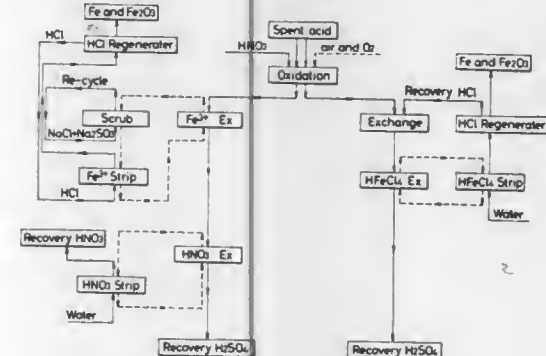
Continuation of Ser. No. 659,355, Feb. 19, 1976, abandoned. This application Jul. 29, 1977, Ser. No. 820,258

Claims priority, application Japan, Mar. 14, 1975, 50/031550; Jul. 21, 1975, 50/089433

Int. Cl.<sup>2</sup> C01B 7/22; C01G 49/10; C01B 21/46

U.S. Cl. 423—139

9 Claims



3. A method for treating an acid waste liquid containing Fe(III) ions,  $HNO_3$  and HF which has been used for acid washing of metallic materials or articles which comprises: (a) extracting Fe(III) ions from the waste liquid with a first organic solvent selected from the group consisting of alkyl phosphoric acids in an organic solvent;

- (b) adding HCl or  $H_2SO_4$  to the extracted waste liquid from step (a) in an amount sufficient to convert any remaining heavy metal ions therein to chlorides or sulfates;
- (c) extracting the resulting waste liquid from step (b) with a second organic solvent containing a phosphoric acid ester, a primary, secondary or tertiary amine or a quaternary ammonium chloride which form adducts with  $HNO_3$  and HF in an organic phase;
- (d) extracting the resulting waste liquid from step (c) with a third organic solvent containing phosphoric acid esters which form adducts with HF and  $HNO_3$  to recover any remaining mineral acids therein; and
- (e) regenerating each of the first, second and third solvents in respective stages.

7. A method for treating an acid waste liquid containing Fe(III) ions,  $HNO_3$  and HF which has been used for acid washing of metallic materials or articles which comprises:

- (a) extracting Fe(III) ions from the waste liquid with a first organic solvent (A) which contains one or more compounds selected from the group of alkyl phosphoric acids, together with a hydrocarbon as diluent;
- (b) regenerating the used solvent (A) with HCl;
- (c) adding HCl or  $H_2SO_4$  to the extracted waste liquid from step (a) in an at least stoichiometric amount to convert any remaining heavy metal ions therein to chlorides or sulfates;
- (d) extracting the resulting waste liquid from step (c) with a second organic solvent (B) which contains one or more compounds selected from the group of alkyl phosphoric acid esters, together with a hydrocarbon as diluent to recover  $HNO_3$  and HF in an organic phase;
- (e) scrubbing organic solvent (B) which contains co-extracted  $HNO_3$  and HF by contacting it with a  $HNO_3$  solution whereby the  $HNO_3$  has a larger distribution coefficient than HF to recover organic solvent (B) containing only  $HNO_3$  and then regenerating solvent (B) by stripping it with water.

4,166,099

## PREPARATION OF ZEOLITES

Carl V. McDaniel, Laurel; Phillip K. Maher, Baltimore, and Joseph M. Pilato, Silver Spring, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 465,004, Apr. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 312,142, Dec. 4, 1972, abandoned, which is a division of Ser. No. 126,223, Mar. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 738,116, Jun. 19, 1968, abandoned. This application Jun. 2, 1977, Ser. No. 802,857

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> C01B 33/28

U.S. Cl. 423—329

10 Claims

1. A method for preparing a crystalline aluminosilicate zeolite which comprises:

- (a) Preparing an aqueous precursor mixture of silica, alumina and alkali metal hydroxide, the proportions of said silica, alumina and alkali metal hydroxide being those required to produce the desired zeolite;
- (b) Adding to said precursor mixture from about 0.1 to about 10 percent by weight based on the weight of the theoretical yield of desired zeolite of amorphous aluminosilicate nucleation centers having the molar composition  $0.9 \pm 0.1 Na_2O:Al_2O_3:2.3-2.7 SiO_2$  having an average particle size below 0.1 micron prepared by a process which comprises: (i) preparing an  $Na_2O-Al_2O_3-SiO_2$  mixture from sodium aluminate, sodium hydroxide sodium silicate and water to provide a molar composition of  $15 \pm 2 Na_2O$ ,  $1 Al_2O_3$ ,  $14 \pm 2 SiO_2$ ,  $350 \pm 50 H_2O$  and mixing vigorously at a temperature of or below  $35^\circ C.$ , and

- (ii) aging the mixture at a temperature of or below about  $25^\circ C.$  for at least 2 hours; and
- (c) reacting the mixture at a temperature of about  $60$  to  $150^\circ C.$  for a period of time sufficient to produce a substantially theoretical yield of crystalline zeolite.

4,166,100

## METHOD OF PREPARING GRANULATED ACTIVATED ALUMINA

Jury K. Vorobiev, ulitsa Tereshkovoi, 4, kv. 47; Boris N. Badaev, ulitsa Rossiiskaya, 26, kv. 19; Galina I. Ljubushko, bulvar Molodezhni, 7, kv. 1; Emmanuil A. Levitsky, ulitsa Tereshkovoi, 6, kv. 68; Georgy K. Boreskov, ulitsa Zolotodolinskaya, 85; Mikhail M. Andrushevich, ulitsa Tereshkovoi, 6, kv. 157, all of Novosibirsk; Bronislav A. Baum, ulitsa Griboedova, 8, Berdsk Novosibirskoi oblasti; Nikolai A. Pakhomov, ulitsa Ilicheva, 15, kv. 73; Ljudmila G. Khomyakova, ulitsa Arbuzova, 1, kv. 13, both of Novosibirsk; Alexandr E. Khramov, ulitsa Kultury, 12, kv. 61; Nina A. Rodionova, ulitsa Nemirovich-Danchenko, 27, kv. 1, both of Gorky; Boris N. Isaev, ulitsa Tatarskaya, 7/2, kv. 12; Vladimir M. Knyazev, ulitsa, Stroikova, 69, korpus 1, kv. 31, both of Ryazan; Ella M. Moroz, ulitsa Tereshkovoi, 6, kv. 68, Novosibirsk; Vladimir N. Erofeev, ulitsa Gagarina, 83, kv. 53; Ivan P. Druzhinin, ulitsa Ostrovskogo, 34, kv. 10, both of Ryazan, and Rimma A. Shkrabina, ulitsa Akademicheskaya, 21, kv. 38, Novosibirsk, all of U.S.S.R.

Filed May 26, 1978, Ser. No. 909,977

Int. Cl.<sup>2</sup> C01F 7/02

U.S. Cl. 423—626

6 Claims

1. Method of preparing granulated activated alumina comprising the steps of:

- decomposing alumina trihydrate by contacting it with a fluidized bed of a solid carrier having a temperature of from about  $350^\circ C.$  to about  $600^\circ C.$  for a contact time of from about 0.05 to about 0.5 seconds thereby to form a decomposition product composed of amorphous aluminum hydroxide;
- mixing said decomposition product with water to form an aqueous suspension having a concentration of about 100 to 500 gram/liter calculated on the basis of aluminum oxide;
- hydrating said decomposition product by adjusting said suspension of said decomposition product to a temperature of from about  $20^\circ C.$  to about  $100^\circ C.$  and a pH from about 5 to about 12 for about 0.5 to 10 hours;
- treating the hydrated decomposition product with an acid that can form water soluble basic salts with aluminum at a temperature of about  $20^\circ C.$  to about  $150^\circ C.$ ; thereafter granulating the acid treated decomposition product;
- drying the granulated product at a temperature of from about  $20^\circ C.$  to about  $150^\circ C.$ ; and
- calcinating the dried granulated product at a temperature of about  $400^\circ C.$  to about  $600^\circ C.$

4,166,101

## PROCESS OF THE PREPARATION OF A HYDROGEN-RICH GAS AND THE CATALYST USED IN THE PROCESS

Emmanuel E. A. Neel; Michel Deflin; Jacques Vanreenterghem, and Jean-Claude Clement, all of Grand Couronne, France

Filed Nov. 10, 1977, Ser. No. 850,339

Claims priority, application France, Nov. 10, 1976, 76 33900

Int. Cl.<sup>2</sup> C01B 1/02; B01J 23/72, 23/80, 23/86

U.S. Cl. 423—656

16 Claims

1. In a process for the preparation of a hydrogen-rich gas by reacting a carbon monoxide-containing gas with steam in the presence of a catalyst, the improvement wherein the catalyst comprises a spinel having the formula  $Cu_{0.5} Zn_{0.5} Fe_2O_4$ .



4,166,102  
**IMMOBILIZED IMMUNOADSORBENT**  
 Lavell R. Johnson, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, East Rutherford, N.J.  
 Division of Ser. No. 565,848, Apr. 7, 1975, Pat. No. 4,059,685.  
 This application May 31, 1977, Ser. No. 802,075  
 Int. Cl.<sup>2</sup> G01N 33/16

U.S. Cl. 424—1

5 Claims

1. In a radioimmunoassay procedure wherein a known amount of a labeled antigen and an unknown and unlabeled antigen are brought into contact with an immobilized immunoabsorbent having bound thereto antibodies specific to said antigen to bind a portion of the labeled and unknown antigen thereby forming a bound fraction and an unbound fraction, and wherein the concentration of the unknown antigen is determined as a function of the bound or unbound fraction, or both, and wherein the bound fraction is released from the immunoabsorbent by rinsing the latter with an eluting medium, the improvement comprising:

flowing a mixture of a known amount of labeled antigen and an unknown and unlabeled antigen into contact with an antibody specific to said antigen wherein said antibody is covalently coupled to a water insoluble polymer which is chemically bound to a particulate substrate.

4,166,103  
**SPECIFIC BINDING ASSAY METHOD AND TEST KIT EMPLOYING POLYVINYL ALCOHOL AS SEPARATING AGENT**

Daniel B. Wagner, and Zvi Gross, both of Jerusalem, Israel, assignors to Ames-Yissum Ltd., Jerusalem, Israel  
 Filed Nov. 16, 1977, Ser. No. 851,881

Claims priority, application Israel, Nov. 19, 1976, 50944; Jan. 6, 1977, 51224

Int. Cl.<sup>2</sup> G01N 33/16

U.S. Cl. 424—1

34 Claims

1. In a specific binding assay method for determining a ligand in or the binding capacity of a liquid medium, wherein said liquid medium is combined with assay reagent means including a binding component incorporated with a label to form a binding reaction system having a bound-species and a free-species of said labeled component, wherein said bound-species and said free-species of said labeled component are separated, and wherein said label is measured in one of said separated bound-species and free-species of the labeled component, the improvement which comprises accomplishing said separation by selectively adsorbing said free-species of the labeled component onto a solid comprising a nonion-exchange cross-linked polyvinyl alcohol, said polyvinyl alcohol having been cross-linked with glutaraldehyde.

4,166,104  
**SPECIFIC BINDING ASSAY METHOD AND TEST KIT EMPLOYING POLYSTYRENE AS SEPARATING AGENT**

Daniel B. Wagner, and Zvi Gross, both of Jerusalem, Israel, assignors to Ames-Yissum Ltd., Jerusalem, Israel  
 Filed Nov. 16, 1977, Ser. No. 852,104

Claims priority, application Israel, Nov. 19, 1976, 50944; Jan. 6, 1977, 51224

Int. Cl.<sup>2</sup> G01N 33/16; A61K 23/00; B65D 81/32

U.S. Cl. 424—1

34 Claims

1. In a specific binding assay method for determining a ligand in or the ligand binding capacity of a liquid medium, wherein said liquid medium is combined with assay reagent means including a binding component incorporated with a label to form a binding reaction system having a bound-species and a free-species of said labeled component, wherein said bound-species and said free-species of said labeled component are separated, and wherein said label is measured in one of said separated bound-species and free-species of the labeled component, the improvement which comprises accomplishing said separation by selectively adsorbing said free-species of the

labeled component onto a solid comprising a nonion-exchange cross-linked styrene polymer, said styrene polymer being a styrene-divinylbenzene copolymer.

4,166,105  
**DYE TAGGED REAGENT**  
 Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 383,892, Jul. 30, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 535,095  
 Int. Cl.<sup>2</sup> A61K 29/00; G01N 31/00, 31/22, 33/16

U.S. Cl. 424—8

24 Claims

1. A reagent reactive with an analyte body, said reagent comprising:

a solution containing a plurality of individual molecules of a first reactant, each of said molecules being a chain molecule having a plurality of reactive sites, substantially only one of said sites being specifically reactable with said analyte body in a reaction wherein several of said molecules can become coupled to said analyte body;

like plurality of polyfunctional polymeric backbone molecules substantially each of which is covalently bonded to only a corresponding one of said molecules of first reactant at another of said sites sterically separated from said one site so as not to impair substantially the specificity of said reaction, each said backbone molecule having coupled thereto radicals or fluorescent dye in a plurality limited so as not to impair substantially the specificity of said reaction.

14. Method of manufacturing a reagent reactive within an analyte body, said method comprising the steps of reacting a polyfunctional polymer molecule with a carbonyl compound to block one or more reactive sites at the ends of the polymeric backbone and thereby provide a protected polymer;

reacting functionalized molecules of dye with side reactive sites on said polymeric backbone of said protected polymer molecule to thereby provide a dye-tagged polymer molecule; and covalently coupling said dye-tagged polymer molecule through one of said end reactive sites to a reactant molecule specifically reactable with said analyte body.

19. Method of detecting analyte bodies in solution, comprising the step of producing a mixture by mixing with said bodies a reagent comprising molecules of reactant each of which has a plurality of reaction sites, substantially one of said sites being specifically reactable with a corresponding one of said analyte bodies, each of said molecules having covalently coupled thereto a single polyfunctional polymeric backbone molecule having in turn coupled thereto a plurality of molecules of fluorescent dye in a number limited so as not to impair substantially the specificity of the reaction between said analyte bodies and said reactant.

4,166,106  
**IMMUNOLOGIC DETERMINATION METHOD**  
 Hans-Harald Sedlacek; Roloff Johannsen, and Friedrich-Robert Seiler, all of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Sep. 22, 1977, Ser. No. 835,789

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643208

Int. Cl.<sup>2</sup> G01N 33/16

U.S. Cl. 424—12

6 Claims

1. In a method for determining a reagent capable of immunologic reaction, which method includes an affinity reaction between an antigen and an antibody, the improvement wherein said antigen is contacted with the Fc fragment of an immune globulin prior to contacting it with said antibody, and said antibody has no specificity to said Fc fragment.

4,166,107  
**SUSTAINED RELEASE BOLUS FORMULATIONS CONTAINING INSECT GROWTH REGULATORS FOR CONTROL OF LIVESTOCK PESTS**

John A. Miller; Murray L. Beadles, and Roger O. Drummond, all of Kerrville, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 25, 1978, Ser. No. 927,791

Int. Cl.<sup>2</sup> A61K 9/22

U.S. Cl. 424—19

6 Claims

1. A sustained release bolus formulation for the control of arthropods in cattle manure, said formulation comprising the following composition: about 4–17 parts monostearin, about 4–10 parts carnuba wax, about 70–75 parts Barium Sulfate, and about 1–15 parts methoprene.

4,166,109  
**ANTI-SOLAR POLYMERS, METHOD OF MAKING THE SAME AND COSMETIC COMPOSITIONS CONTAINING THE SAME**

Bernard Jacquet, Antony; Christos Papanitiou, Eplnay-sur-Seine; Pierre Dufauré, and Claude Mahieu, both of Paris, all of France, assignors to L'Oreal, Paris, France

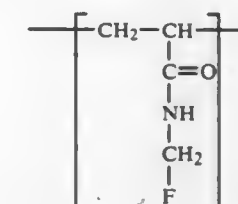
Continuation-in-part of Ser. No. 374,058, Jun. 27, 1973, Pat. No. 3,980,617. This application Aug. 18, 1976, Ser. No. 715,565  
 Claims priority, application France, Jun. 26, 1973, 73 23254; Jul. 29, 1976, 76 23174

Int. Cl.<sup>2</sup> A61K 7/42, 7/44

U.S. Cl. 424—59

11 Claims

1. An anti-solar cosmetic composition comprising an aqueous, hydroalcoholic or oily solution of at least one anti-solar polymer having in the macromolecular chain thereof at least one unit of the formula



wherein F is a residue derived from an aromatic compound imparting to the said polymer the ability to absorb wave lengths of light in the range of about 280–315 millimicrons, and at least one unit derived from an ethylenically unsaturated monomer present in an amount of about 20–90 percent of the total weight of said polymer, said polymer having an average molecular weight between about 2,000–1,000,000 and said polymer being present in an amount of about 0.2–20 percent of the total weight of the composition.

4,166,108  
**STYPTIC COMPOSITION**  
 Robert Brown, 3249 Greenfield Dr., Marietta, Ga. 30067, and Jerome Setloff, 6851 Roswell Rd., Apt. A 14, Atlanta, Ga. 30328

Continuation-in-part of Ser. No. 764,405, Jan. 31, 1977, abandoned. This application Aug. 18, 1977, Ser. No. 825,853  
 Int. Cl.<sup>2</sup> A61K 33/30, 33/26, 33/06, 33/14

U.S. Cl. 424—28

12 Claims

1. A non-sting stytic composition as a stable cream or lotion comprising:

- (1) from about 2% to about 12% by weight of a saturated or unsaturated long chain fatty acid having from nine to twenty-three carbon atoms therein and selected from the group consisting of oleic acid, lauric acid, palmitic acid and stearic acid;
- (2) from about 0.4% to about 3.5% by weight of a wax filler selected from the group consisting of microcrystalline wax, paraffin wax and beeswax;
- (3) from about 1% to about 10% by weight of polyethylene glycol stearate;
- (4) from about 1% to about 5% by weight of polyethylene glycol (20) sorbitan beeswax; and,
- (5) from about 0.5% to about 25% by weight of an acidic metallic salt selected from the group consisting of aluminum chloride, aluminum sulfate, aluminum chlorohydrate, aluminum ammonium sulfate, aluminum potassium sulfate, zinc chloride, zinc sulfate, zinc chlorohydrate, ferric chloride, ferric sulfate, ferric chlorohydrate and combinations thereof, said acidic metallic salt being characterized by possessing a degree of acidity sufficient to stanch the flow of blood and being capable of being formulated into said stable cream or lotion;
- (6) the balance being water.

11. The non-sting stytic composition of claim 1 wherein said composition is contained in a pressurized aerosol container.

12. The non-sting stytic composition of claim 1 wherein said composition is included with a bandage having a wound covering area composed of fibers selected from the group consisting of natural fibers, man-made fibers and mixtures thereof.

4,166,110  
**NAIL ENAMEL COMPOSITION AND MANUFACTURING METHOD THEREOF**

Kenichi Isobe, Annaka; Tatsuhiro Tsutsui, Tokyo; Takao Ueki, Fujisawa, and Toru Sema, Yokohama, all of Japan, assignors to The Lion Dentrifice Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1978, Ser. No. 873,850

Claims priority, application Japan, Feb. 2, 1977, 52-9808

Int. Cl.<sup>2</sup> A61K 7/04

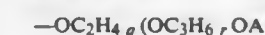
U.S. Cl. 424—61

8 Claims

1. A nail enamel composition comprising  
 (a) 100 parts by weight of a natural or synthetic resin which is solid at room temperature and soluble in an organic solvent, and  
 (b) from 0.01 to 30 parts by weight of an organopolysiloxane of the formula



where R<sup>1</sup> is a monovalent hydrocarbon, R<sup>2</sup> is bonded directly to the silicon atom forming a Si-O-linkage selected from the group consisting of hydroxy, alkoxy; a residue of the formula —OCOR<sup>3</sup> where R<sup>3</sup> is a monovalent hydrocarbon, and a polyoxyalkylene of the formula



where q and r are each zero or a positive integer but not equal to zero simultaneously and A is hydrogen, alkyl or an acyl, or a group bonded to the silicon atom through an alkylene selected from the group consisting of hydroxy, alkoxy and a residue of the formula —OCOR<sup>3</sup>, a polyoxyalkylene of the formula





where q, r and A each have the same meaning as above; a thiol group; a group of the formula



where t is a positive integer, a glycidioxy, an amino, and an N-(aminoalkyl) substituted amino; and a and b are each positive numbers with the proviso that (a+b) is in the range from 1.8 to 3.0 inclusive and an organic solvent.

**4,166,111**  
**METHOD AND COMPOSITION FOR THE LONG TERM CONTROLLED RELEASE OF A NON-PERSISTENT ORGANOTIN PESTICIDE FROM AN INERT MONOLITHIC THERMOPLASTIC MATERIAL**  
Nathan F. Cardarelli, Barberton, Ohio, assignor to Environmental Chemicals, Inc., Barrington, Ill.  
Filed Jun. 19, 1978, Ser. No. 916,570  
Int. Cl.<sup>2</sup> A01N 9/00

U.S. Cl. 424-78

18 Claims

1. A composition for destroying aquatic pests over a period of time, comprising:

100 parts by weight of a polymer matrix, said polymer matrix consisting essentially of an ethylene-vinyl acetate copolymer, the amount by weight of said ethylene constituent in said copolymer ranging from about 60 percent to about 92 percent, the molecular weight of said ethylene-vinyl acetate copolymer ranging from about 40,000 to about 300,000;

from about 25 parts to about 73 parts by weight per 100 parts of said copolymer matrix of a toxicant, said toxicant selected from the class consisting of a halogenated trialkyltin and a triaryltin, said alkyl group of said halogenated trialkyltin compound containing from 3 to 6 carbon atoms and said aryl group of said triaryltin being selected from the class consisting of a substituted phenyl, esters of benzene, and salts of benzene; and

from about 15 to about 70 parts by weight per 100 parts of said polymer matrix of a porosity inducing agent, said porosity inducing agent being an alkaline earth salt or an alkaline earth oxide having a medium to low solubility in water of 0.01 grams or less per 100 grams of said water.

**4,166,112**  
**MOSQUITO LARVAE CONTROL USING A BACTERIAL LARVICIDE**  
Leonard J. Goldberg, Albany, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Mar. 20, 1978, Ser. No. 888,083  
Int. Cl.<sup>2</sup> A01N 15/00

U.S. Cl. 424-93

7 Claims

1. A bacterial larvicide active against mosquito-like larvae comprising:

(a) an effective larva killing concentration of spores of the pure biological strain of *Bacillus thuringiensis* var WHO/CCBC 1897 as an active ingredient; and  
(b) a carrier.

**4,166,113**  
**CARDIOTONIC AGENT**  
Ted R. Norton, Shoji Shibata, and Midori Kashiwagi, all of Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.

Continuation-in-part of Ser. No. 828,713, Aug. 29, 1977, abandoned. This application May 3, 1978, Ser. No. 902,323  
Int. Cl.<sup>2</sup> A61K 37/00; C07G 7/00; A61K 35/12, 35/56

U.S. Cl. 424-177

4 Claims

1. A peptide designated anthopleurin-B which has the following amino acid composition:

amino acid	number of residues
Aspartic acid or asparagine	5
Threonine	1
Serine	4
Glutamic acid or glutamine	1
Proline	5
Glycine	7
Alanine	2
Cysteine	6
Valine	1
Isoleucine	2
Leucine	2
Tyrosine	1
Phenylalanine	1
Lysine	3
Histidine	2
Arginine	2
Tryptophan	2

having the following physical and chemical properties:

(a) molecular weight of about 5,200;  
(b) an isoelectric point of about pH 9.05;  
(c)  $R_f=0.64$  determined by disc gel electrophoresis with 12% polyacrylamide gel at pH 3.6, using methyl green dye as a standard

prepared by

(d) extracting sea anemone with water or with an aqueous-alcoholic mixture;  
(e) subjecting the extract to gel filtration chromatography on a column of crosslinked dextran eluted with  $NH_4HCO_3$  solution and collecting and lyophilizing the active fraction;

(f) subjecting the active fraction to chromatography on a column of cation exchange resin eluted with a phosphate buffer with a gradient of NaCl and collecting and lyophilizing the active fraction;

(g) subjecting the active fraction obtained in (f) to chromatography on a column of cross-linked dextran eluted with a NaCl solution and collecting and lyophilizing the active fraction;

(h) desalting the active fraction obtained in (g) by chromatography on a column of crosslinked dextran eluted with dilute acetic acid and collecting and lyophilizing the active fraction.

**4,166,114**  
**AMINOGLYCOSIDE ANTIBIOTIC DERIVATIVES AND METHOD OF USE**  
Kikuo Igarashi, Itami, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

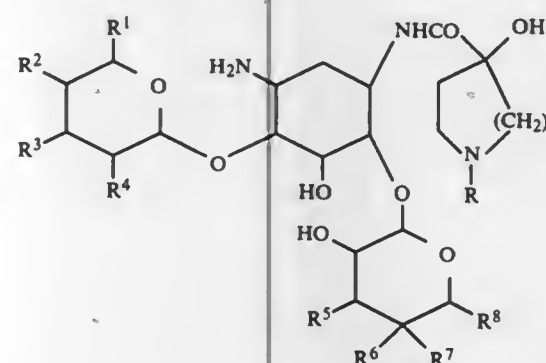
Filed Sep. 29, 1977, Ser. No. 837,909

Claims priority, application Japan, Oct. 28, 1976, 51/130119  
Int. Cl.<sup>2</sup> A61K 31/71; C07H 15/22

U.S. Cl. 424-180

19 Claims

1. A member selected from the group consisting of an aminoglycoside derivative of the formula:



and a pharmaceutically acceptable salt thereof wherein R is hydrogen, alkyl of C<sub>1</sub> to C<sub>5</sub> or aralkyl of C<sub>7</sub> to C<sub>10</sub>, R<sup>1</sup> is aminomethyl, hydroxymethyl, methylaminomethyl or 1-methylaminoethyl, R<sup>2</sup>, R<sup>3</sup> and R<sup>6</sup> represent independently hydrogen or hydroxy, R<sup>4</sup> is hydroxy or amino, R<sup>5</sup> is amino or methylamino, R<sup>7</sup> is hydroxy or methyl, R<sup>8</sup> is hydrogen, hydroxymethyl or carbamoyloxymethyl, the dotted line represents the presence or absence of a double bond and n is an integer of 1 or 2.

18. A pharmaceutical composition which comprises a bactericidally effective amount of a compound or salt thereof as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

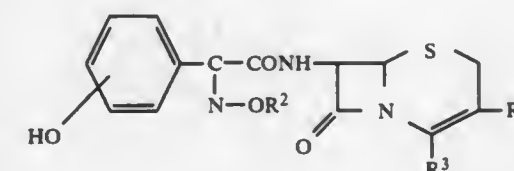
**4,166,115**  
**SYN 7-OXOIMINO SUBSTITUTED DERIVATIVES OF CEPHALOSPORANIC ACID**  
Takao Takaya, Sakai; Takashi Masugi, Toyonaka; Hisashi Takasugi, Osaka, and Hiromu Kochi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 11, 1977, Ser. No. 767,700  
Claims priority, application United Kingdom, Apr. 12, 1976, 14916/76; Jun. 7, 1976, 23490/76; Japan, Oct. 19, 1976, 51/125826  
Int. Cl.<sup>2</sup> A61K 31/545; C07D 501/32

U.S. Cl. 424-246

5 Claims

1. Syn-isomer of 3,7-disubstituted-3-cephem-4-carboxylic acid compounds of the formula:



wherein

R<sup>2</sup> is lower alkyl;  
R<sup>3</sup> is carboxy or protected carboxy; and  
R<sup>4</sup> is lower alkanoyloxymethyl; and pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition comprising a compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

**4,166,116**  
**PHARMACEUTICAL COMPOSITIONS CONTAINING PIPERAZINYL ACYLHYDROXAMIC ACID DERIVATIVES TO TREAT INFLAMMATION OR ANAPHYLACTIC ALLERGY CONDITIONS**  
Ronald T. Coutts, Edmonton; David F. Biggs, Sherwood Park; Frank W. Wandelmaler, Montreal, and Frank D. Semaka, Calgary, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

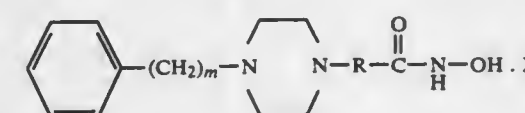
Filed Nov. 11, 1977, Ser. No. 850,825

Int. Cl.<sup>2</sup> A61K 31/495

U.S. Cl. 424-250

15 Claims

1. A method of treating inflammation or, anaphylactic allergy conditions comprising administering to an animal subject to at least one of these conditions a piperazinyl acylhydroxamic acid derivative having the following general formula



where

m=0, 1, or 2

R=alkylene straight or branched chains of up to 3 carbon atoms, and

X when present is a salt-forming acid, the compound being administered in sufficient amounts to bestow anti-inflammatory or, anti-allergic activity.

**4,166,117**  
**1-(ARALKYL)-4-(4-OXO[3H]QUINAZOLIN-3-YL)PIPERIDINES**

Michel Vincent, Bagneux; Georges Remond, Versailles, and Michel Laubie, Vaucresson, all of France, assignors to Science Union et Cie, France

Filed Jul. 11, 1977, Ser. No. 814,482

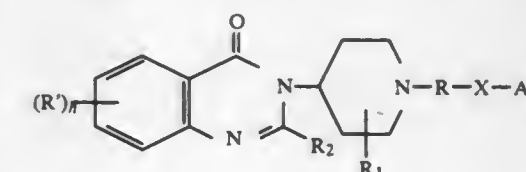
Claims priority, application United Kingdom, Jul. 14, 1976, 29317/76

Int. Cl.<sup>2</sup> A61K 31/505; C07D 455/02

U.S. Cl. 424-251

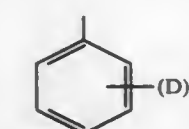
23 Claims

1. The 4-[4-oxo-(3H)-quinazolin-3-yl]N-aralkyl piperidines of the formula



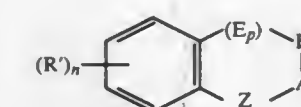
wherein Ar is:

(1) the thienyl radical  
(2) phenyl or substituted phenyl having the formula



wherein D is selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkyloxy, lower alkylthio, carboxyl, lower alkoxy-carbonyl, nitro, amino, (lower alkyl) amino, lower alkylcarbamoyl, lower alkylsulfonyl, lower alkylsulfonyl, di-(lower alkyl)-amino sulfonyl, lower alkyl sulfonyl, amino carbonyl, cyano, and trifluoromethyl; and m is an integer from zero to five, inclusive;

(3) a heterobicyclic radical having the formula:



wherein R' is a radical selected from the group consisting of hydroxyl, lower alkoxy, lower alkenyloxy, halogen, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro, amino, phenyl, and phenyl lower alkyl,

Z is the imino nitrogen  $-N=$ ,  
A is an unsubstituted methyldene or methyldene radical substituted with a lower alkyl,

B is the imino group



E is carbonyl, and

p is 1

either Z is the imino group



A and B together are an ethylidene radical, E is methylene, and p is zero or 1; or Z is the imino group



E is a methylene, p is zero or 1, A is carbonyl, and B is the imino nitrogen



or A and B together are an ethylene radical, X is an oxygen atom, a sulphur atom, or an imino radical of the formula:



wherein Y is hydrogen, lower alkyl, lower alkenyl or lower alkoxy carbonyl, or X is a methylene radical or a direct carbon-carbon bond,

R is an alkylene radical having 1 to 4 carbon atoms, optionally substituted with a lower alkyl radical or a trifluoromethyl radical,

R<sub>1</sub> is a hydrogen or a lower alkyl radical, R<sub>2</sub> is a hydrogen or a lower alkyl radical, and n is an integer of zero to 3

including acid addition salts thereof.  
18. The pharmaceutical compositions including as active ingredient at least one compound of claim 1 in an amount effective for treating hypertension, in admixture with an inert non toxic pharmaceutically-acceptable carrier.

#### 4,166,118 USE OF CHLORHYDROXYQUINOLINE TO INHIBIT GROWTH OF MYCOPLASMAS

Raymond F. Cosgrove, Wallasey, and Sandra Baines, Thingwall, both of England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 2, 1978, Ser. No. 947,318  
Claims priority, application United Kingdom, Oct. 13, 1977, 42721/77

Int. Cl.<sup>2</sup> A61K 31/47  
U.S. Cl. 424—258 7 Claims

1. A method of inhibiting the growth of mycoplasma which comprises treating mycoplasma species with a growth inhibiting amount of chlorhydroxyquinoline.

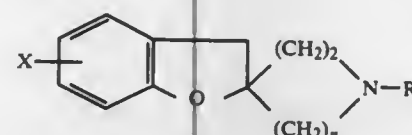
7. A composition for use in inhibiting the growth of mycoplasma which comprises a mycoplasma growth inhibiting amount of chlorhydroxyquinoline and a pharmaceutically acceptable carrier comprising aluminum monostearate, butylated hydroxy anisole and peanut oil.

#### 4,166,119 ANALGESIC AND TRANQUILIZING SPIRO[DIHYDROBENZOFURAN]PIPERIDINES AND PYRROLIDINES

Richard C. Effland, Bridgewater; Joseph T. Strupczewski, Flemington, and Beth A. Gardner, Succasunna, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Apr. 14, 1978, Ser. No. 896,622  
Int. Cl.<sup>2</sup> A61K 31/445, 31/40; C07D 491/10  
U.S. Cl. 424—267 23 Claims

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof in which X is hydrogen, nitro, amino, chlorine, fluorine, bromine or methoxy; R is hydrogen, alkyl, alkenyl, hydroxyethyl, alkanoyl, alkoxyalkyl, unsubstituted or substituted phenylalkenyl, unsubstituted or substituted benzoyl, unsubstituted or substituted phenylalkyl, cycloalkylalkyl, cycloalkylcarbonyl, furfuryl, furoyl, alkoxyalkyl, phenoxyalkyl, unsubstituted or substituted phenoxyalkyl, N-[2-(3-indolyl)ethyl] or (indol-3-yl)alkyl wherein said alkyl, alkenyl, alkanoyl and alkoxy groups have from 1 to 6 carbon atoms, said cycloalkyl groups have from 3 to 7 carbon atoms and the substituents of said substituted groups are selected from nitro, amino, halogen and methoxy; and n is the integer 1 or 2.

19. A method of alleviating pain in a patient which comprises administering to a patient an analgesically effective amount of a compound defined in claim 1.

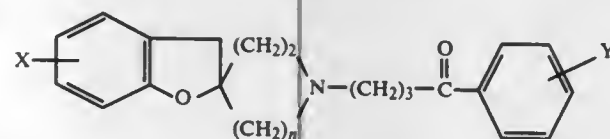
20. A method of tranquilizing a patient which comprises administering to the patient an effective tranquilizing amount of a compound defined in claim 1.

#### 4,166,120 ANALGESIC AND TRANQUILIZING BENZOYLPROPYL-SPIRO[DIHYDROBENZOFURAN]- PIPERIDINES AND PYRROLIDINES

Richard C. Effland, Bridgewater; Joseph T. Strupczewski, Flemington, and Beth A. Gardner, Succasunna, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Apr. 14, 1978, Ser. No. 896,584  
Int. Cl.<sup>2</sup> A61K 31/445, 31/40; C07D 491/10  
U.S. Cl. 424—267 27 Claims

1. A compound depicted by the formula



or a pharmaceutically acceptable acid addition salt thereof in which X is hydrogen, nitro, amino, halogen, methoxy or hydroxy; Y is nitro, amino, halogen, methoxy or hydroxy; and n is the integer 1 or 2.

24. A method of alleviating pain in a patient which comprises administering to a patient an analgesically effective amount of a compound defined in claim 1.

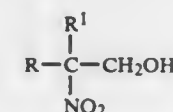
25. A method of tranquilizing a patient which comprises administering to a patient an effective tranquilizing amount of a compound defined in claim 1.

#### 4,166,121 METHOD OF CONTROLLING THE GROWTH OF BACTERIA AND FUNGI

Herbert L. Wehrmeister, Terre Haute, Ind., assignor to International Minerals & Chemical Corporation, Terre Haute, Ind. Division of Ser. No. 880,687, Feb. 23, 1978, Pat. No. 4,148,803, which is a continuation-in-part of Ser. No. 728,695, Oct. 1, 1976, abandoned. This application Sep. 14, 1978, Ser. No. 942,206

Int. Cl.<sup>2</sup> A01N 9/00, 9/02, 9/20, 9/24  
U.S. Cl. 424—269 17 Claims

1. A method of controlling the growth of bacteria by applying to them or to the environment inhabited by them a growth-inhibiting amount of the product prepared by the process consisting of the steps of (a) reacting a nitroalcohol of the formula



where R and R<sup>1</sup> can be hydrogen, methyl, ethyl or hydroxymethyl in about a 1:1 mole ratio with an amine represented by the formula R<sup>2</sup>NH<sub>2</sub> where R<sup>2</sup> is alkyl of from 1 to 4 or more carbon atoms, phenyl, benzyl, tolyl, or xylol at about 50°-70° thereby effecting formation of a nitroamine, (b) reacting the nitroamine with nitrous acid at about 0°-5°, thereby forming a nitroso compound, and (c) reducing the nitroso compound.

#### 4,166,122 BIS-(5,5-DIMETHYL-1,3-OXAZOLIDIN-3-YL) METHANE AS AN ANTIMICROBIAL AGENT

Wilfried Paulus, and Hermann Genth, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,548  
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711106

Int. Cl.<sup>2</sup> A61K 31/42 3 Claims

1. A process for combatting a micro-organism which comprises applying to said micro-organism 5,5'-dimethyl-di-(1,3-oxazolidin-3-yl) methane.

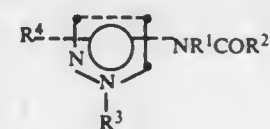
#### 4,166,123 ACYLAMINOPYRAZOLES

Roger G. Harrison, Farnborough; William B. Jamieson, Woking; William J. Ross, Lightwater, and John C. Saunders, Maidenhead, all of England, assignors to Lilly Industries Limited, London, England

Filed Jun. 1, 1976, Ser. No. 691,742  
Claims priority, application United Kingdom, Jun. 5, 1975, 24221/75

Int. Cl.<sup>2</sup> A61K 31/415; C07D 231/50 26 Claims

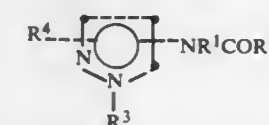
U.S. Cl. 424—273 P 1. A heteroaryl compound of the formula



wherein R<sup>1</sup> is selected from a group consisting of C<sub>1-10</sub> alkyl, C<sub>3-6</sub> alkenyl, C<sub>3-6</sub> alkynyl, C<sub>2-6</sub> alkoxyalkyl, C<sub>2-6</sub> carboxyalkyl, C<sub>1-6</sub> haloalkyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, phenyl-C<sub>1-6</sub> alkyl, R<sup>5</sup>-substituted phenyl-C<sub>1-6</sub> alkyl and phenyl-C<sub>2-6</sub>-alkenyl, R<sup>5</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl; R<sup>2</sup> is selected from the group consisting of C<sub>1-8</sub> alkyl, C<sub>1-6</sub> haloalkyl, C<sub>2-6</sub> alkenyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, phenyl, R<sup>5</sup>-substituted phenyl, phenyl-C<sub>1-6</sub> alkyl, R<sup>5</sup>-substituted phenyl-C<sub>1-6</sub> alkyl, phenyl-C<sub>2-6</sub> alkenyl, R<sup>5</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl, C<sub>1-6</sub> alkoxyalkyl and acetoxy-C<sub>1-4</sub> alkyl; R<sup>3</sup> is selected from C<sub>1-4</sub> alkyl and phenyl; R<sup>4</sup> is selected from hydrogen, C<sub>1-4</sub> alkyl, phenyl and halogen; and R<sup>5</sup> is selected from a group consisting of halogen, trifluoromethyl, methyl, methoxy, and nitro; provided that, when the -NR<sup>1</sup>COR<sup>2</sup> group is in the 5 position, and R<sup>1</sup> and R<sup>2</sup> are both methyl, R<sup>3</sup> cannot be phenyl.

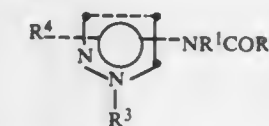
alkenyl, C<sub>1-4</sub> alkoxyalkyl-C<sub>1-8</sub> alkyl, C<sub>2-8</sub> carboxyalkyl and acetoxy-C<sub>1-4</sub> alkyl; R<sup>3</sup> is selected from C<sub>1-4</sub> alkyl and phenyl; and R<sup>4</sup> is selected from hydrogen, C<sub>1-4</sub> alkyl, phenyl and halogen; and R<sup>5</sup> is selected from a group consisting of halogen, trifluoromethyl, methyl, methoxy, and nitro; provided that, when the -NR<sup>1</sup>COR<sup>2</sup> group is in the 5 position, and R<sup>1</sup> and R<sup>2</sup> are both methyl, R<sup>3</sup> cannot be phenyl.

23. A pharmaceutical formulation useful for the treatment of asthma comprising a therapeutically-effective amount of a compound of the formula



wherein R<sup>1</sup> is selected from a group consisting of C<sub>1-10</sub> alkyl, C<sub>3-6</sub> alkenyl, C<sub>3-6</sub> alkynyl, C<sub>2-6</sub> alkoxyalkyl, C<sub>2-6</sub> carboxyalkyl, C<sub>1-6</sub> haloalkyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, phenyl-C<sub>1-6</sub> alkyl, R<sup>5</sup>-substituted phenyl-C<sub>1-6</sub> alkyl, phenyl-C<sub>2-6</sub> alkenyl, and R<sup>5</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl; R<sup>2</sup> is selected from the group consisting of C<sub>1-8</sub> alkyl, C<sub>1-6</sub> haloalkyl, C<sub>2-6</sub> alkenyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, phenyl, R<sup>5</sup>-substituted phenyl, phenyl-C<sub>1-6</sub> alkyl, R<sup>5</sup>-substituted phenyl-C<sub>1-6</sub> alkyl, phenyl-C<sub>2-6</sub> alkenyl, R<sup>5</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl, C<sub>1-6</sub> alkoxyalkyl and acetoxy-C<sub>1-4</sub> alkyl; R<sup>3</sup> is selected from C<sub>1-4</sub> alkyl and phenyl; R<sup>4</sup> is selected from hydrogen, C<sub>1-4</sub> alkyl, phenyl and halogen; and R<sup>5</sup> is selected from a group consisting of halogen, trifluoromethyl, methyl, methoxy, and nitro; provided that, when the -NR<sup>1</sup>COR<sup>2</sup> group is in the 5 position, and R<sup>1</sup> and R<sup>2</sup> are both methyl, R<sup>3</sup> cannot be phenyl.

25. A method of treating a mammal suffering from, or susceptible to, asthma which comprises administering to the mammal a therapeutically-effective amount of a compound of the formula



wherein R<sup>1</sup> is selected from a group consisting of C<sub>1-10</sub> alkyl, C<sub>3-6</sub> alkenyl, C<sub>3-6</sub> alkynyl, C<sub>2-6</sub> alkoxyalkyl, C<sub>2-6</sub> carboxyalkyl, C<sub>1-6</sub> haloalkyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, phenyl-C<sub>1-6</sub> alkyl, R<sup>5</sup>-substituted phenyl-C<sub>1-6</sub> alkyl and phenyl-C<sub>2-6</sub>-alkenyl, R<sup>5</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl; R<sup>2</sup> is selected from the group consisting of C<sub>1-8</sub> alkyl, C<sub>1-6</sub> haloalkyl, C<sub>2-6</sub> alkenyl, C<sub>3-10</sub> cycloalkyl, C<sub>3-10</sub> cycloalkyl-C<sub>1-6</sub> alkyl, phenyl, R<sup>5</sup>-substituted phenyl, phenyl-C<sub>1-6</sub> alkyl, R<sup>5</sup>-substituted phenyl-C<sub>1-6</sub> alkyl, phenyl-C<sub>2-6</sub> alkenyl, R<sup>5</sup>-substituted phenyl-C<sub>2-6</sub> alkenyl, C<sub>1-6</sub> alkoxyalkyl and acetoxy-C<sub>1-4</sub> alkyl; R<sup>3</sup> is selected from C<sub>1-4</sub> alkyl and phenyl; R<sup>4</sup> is selected from hydrogen, C<sub>1-4</sub> alkyl, phenyl and halogen; and R<sup>5</sup> is selected from a group consisting of halogen, trifluoromethyl, methyl, methoxy, and nitro; provided that, when the -NR<sup>1</sup>COR<sup>2</sup> group is in the 5 position, and R<sup>1</sup> and R<sup>2</sup> are both methyl, R<sup>3</sup> cannot be phenyl.

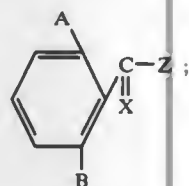


4,166,124  
INSECTICIDAL 2,6-DIHALOGENOYL UREA  
DERIVATIVES

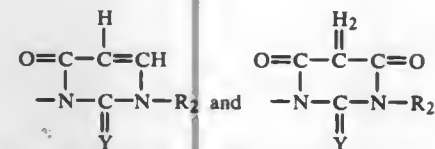
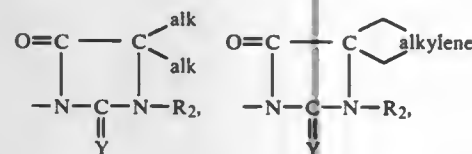
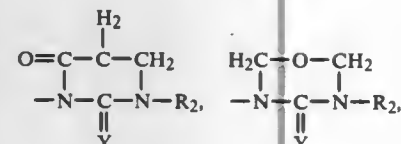
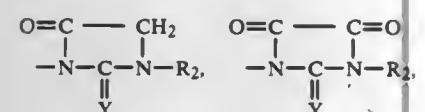
Kobus Wellings, and Rudolf Mulder, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y. Division of Ser. No. 522,058, Nov. 8, 1974, Pat. No. 3,989,842, which is a division of Ser. No. 354,393, Apr. 25, 1973, Pat. No. 3,933,908, which is a division of Ser. No. 143,668, May 14, 1971, Pat. No. 3,748,356. This application Aug. 25, 1976, Ser. No. 717,633

Claims priority, application Netherlands, May 15, 1970, 7007040

Int. Cl.<sup>2</sup> A01N 9/22  
U.S. Cl. 424—273 R  
1. An insecticidal composition containing, together with an inert finely divided carrier material therefore, in an insecticidally effective amount an insecticidally effective compound of the formula



wherein Z is a ring selected from the formula

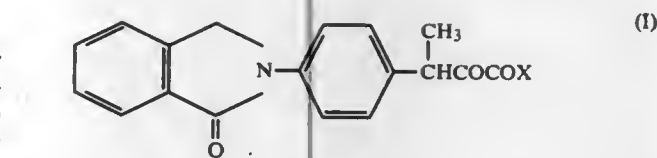


Y and X are independently oxygen or sulfur, A is hydrogen, halogen, methyl or methoxy, B is hydrogen, halogen, methyl or methoxy with the proviso that A and B do not both represent both hydrogen and R<sub>2</sub> is substituted or nonsubstituted phenyl.

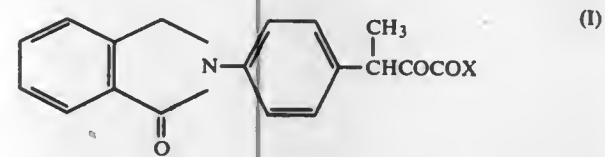
4,166,125  
2-OXO-PHENYLBUTANOIC ACID DERIVATIVES  
Kazuo Kigasawa, Kawasaki; Mineharu Hiiiragi, Chofu; Haruhide Ishimaru, Tokyo; Seiji Haga, Yokohama, and Keiko Shirayama, Tokyo, all of Japan, assignors to Grellan Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,206  
Claims priority, application Japan, Apr. 5, 1977, 52-38071; Jun. 11, 1977, 52-68407; Jun. 22, 1977, 52-73369; Nov. 15, 1977, 52-136254

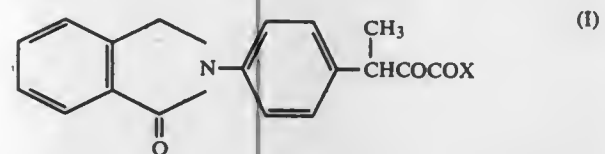
Int. Cl.<sup>2</sup> A61K 31/40; C07D 209/46  
U.S. Cl. 424—274  
1. A compound of the general formula (I)



wherein X is amino, hydroxy or lower alkoxy.  
6. A pharmaceutical composition which comprises an amount which is effective to achieve an anti-inflammatory effect of at least one compound of the general formula (I)



wherein X is amino, hydroxy or lower alkoxy together with a pharmaceutically acceptable carrier.  
7. A pharmaceutical composition which comprises an amount which is effective to achieve an analgesic effect of at least one compound of the general formula (I)



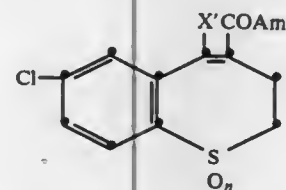
wherein X is amino, hydroxy or lower alkoxy together with a pharmaceutically acceptable carrier.

8. A pharmaceutical composition which comprises an amount which is effective to achieve an antipyretic effect of the compound 2-oxo-3-[4-(1-oxo-2-isindolyl)phenyl] butanamide together with a pharmaceutically acceptable carrier.

4,166,126  
1-BENZOTHIPIEPIN-4-CARBOXAMIDES  
Melvin H. Rosen, Madison, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 585,147, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,524, Sep. 26, 1974, abandoned. This application Jan. 27, 1977, Ser. No. 763,192

Int. Cl.<sup>2</sup> C07D 337/08; A61K 31/38  
U.S. Cl. 424—274  
1. A 2,3-dihydro-1-benzothiepin-4-carboxamide of the formula



in which X' is hydroxy or pyrrolidino, Am' is mono- or di-(fluoro or chloro)phenylamino and n is the integer 0 or 1, or the sodium, potassium, ammonium, mono-, di or tri-(methyl or ethyl)ammonium, pyrrolidinium, morpholinium, anilinium or 2-pyridylammonium salt of the compounds with X'=OH.

5. An anti-inflammatory pharmaceutical composition comprising an anti-inflammatory effective amount of a compound claimed in claim 1, together with a pharmaceutical excipient.

4,166,127  
BENZO(b,f)THIEPIN DERIVATIVES AND PROCESS  
FOR PRODUCING THE SAME

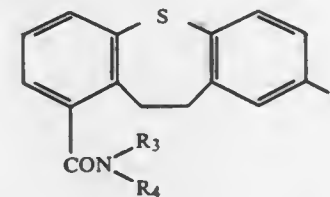
Shigeru Yamabe, Kobe; Yasuo Fujimoto, Tokyo; Shoji Ryu, Noda; Yoshio Suzuki, Misato; Yoshihiro Tanaka, Soka; Toru Yamanaka, and Kiyosato Nyu, both of Misato, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Division of Ser. No. 689,908, May 25, 1976, Pat. No. 4,101,667. This application Jan. 16, 1978, Ser. No. 869,767

Claims priority, application United Kingdom, May 30, 1975, 23703/75; Japan, Oct. 28, 1975, 50-129490

Int. Cl.<sup>2</sup> C07D 337/14; A61K 31/38  
U.S. Cl. 424—275

1. A compound of the formula,



wherein R, represents a fluorine atom, or a trifluoromethyl group or 1-5 C lower alkoxy group, and R<sub>3</sub> and R<sub>4</sub> each represent a 1-4 C lower alkyl group.

5. A pharmaceutical composition comprising an anti-inflammatorily effective amount of the compound according to claim 1 in the presence of an inert carrier.

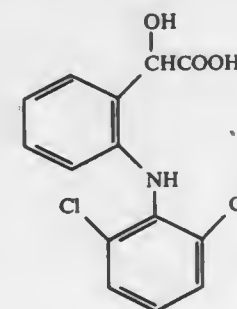
4,166,128  
SUBSTITUTED PHENYLGLYCOLIC ACID AND ITS  
PHARMACEUTICALLY ACCEPTABLE ESTERS AND  
SALTS, AND PROCESSES FOR PREPARING THE SAME

Takanori Sone; Shinichi Furukawa; Mikio Wakabayashi, and Ryoji Kodaira, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 15, 1977, Ser. No. 851,637  
Claims priority, application Japan, Jun. 23, 1977, 52/74722

Int. Cl.<sup>2</sup> A01N 9/20; C07C 101/72  
U.S. Cl. 424—319

1. A compound of the formula:



and its pharmaceutically acceptable salts with an inorganic or organic base and pharmaceutically acceptable lower alkyl esters.

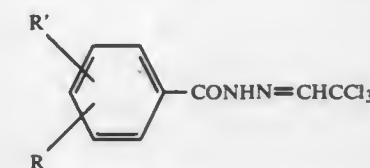
4,166,129  
AGRICULTURAL AND HORTICULTURAL  
N-BENZOYL-N'-TRICHLOROETHYLIDENE  
HYDRAZINE FUNGICIDES

Katsumichi Aoki; Susumu Shimizu; Keigo Satake; Shiro Yamazaki, and Nobuo Hatakeyama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 845,398  
Claims priority, application Japan, Oct. 28, 1976, 51-128864; Oct. 28, 1976, 51-128865; Jul. 28, 1977, 52-090631

Int. Cl.<sup>2</sup> C07C 109/18; A01N 9/20  
U.S. Cl. 424—324

2. A method of controlling the growth of fungi on an agricultural plant comprising applying to the plant a fungicidal composition consisting essentially of a carrier and a fungicidally effective amount of a compound of the general formula



wherein each of R and R' stands for a member of the group consisting of H, halogen, CH<sub>3</sub>, OCH<sub>3</sub>, OH and NO<sub>2</sub>.

4,166,130  
PESTICIDAL COMPOSITIONS

John C. Kerry, Edwalton, and David M. Weighton, Radcliffe-on-Trent, both of England, assignors to The Boots Company Limited, England

Filed May 31, 1978, Ser. No. 911,127  
Claims priority, application United Kingdom, Jun. 2, 1977, 23351/77

Int. Cl.<sup>2</sup> A01N 9/02, 9/20, 9/30  
U.S. Cl. 424—326

1. An insecticidal and acaricidal composition comprising a mixture of 1,5-di-(2,4-dimethylphenyl)-3-methyl-1,3,5-triazapenta-1,4-diene and comphechlor, in the ratio of 2:1 to 1:150 by weight, and in an insecticidally and acaricidally effective amount.

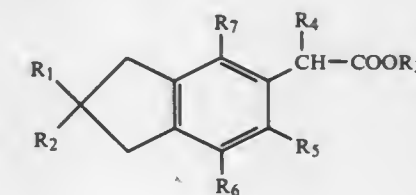
4,166,131  
INDANEACETIC ACID DERIVATIVES

Trevor G. Payne, Arlesheim, Switzerland, assignor to Hexachimie Société Anonyme, Rueil Malmaison, France

Filed Oct. 24, 1974, Ser. No. 517,531  
Claims priority, application Switzerland, Oct. 30, 1973, 15251/73

Int. Cl.<sup>2</sup> C07C 63/337, 69/76; A61K 31/19, 31/215  
U.S. Cl. 424—317

1. A compound of formula I,



wherein  
R<sub>1</sub> is lower alkyl,  
R<sub>2</sub> is hydrogen or lower alkyl,  
R<sub>3</sub> is hydrogen,  
R<sub>4</sub> is hydrogen or lower alkyl,  
R<sub>5</sub> is chlorine or lower alkyl, and each of  
R<sub>6</sub> and R<sub>7</sub> is hydrogen, or,  
R<sub>5</sub> is hydrogen, and R<sub>6</sub> and R<sub>7</sub> are independently hydro-

gen, chlorine or lower alkyl, or alternatively in pharmaceutically acceptable salt form.

4. A pharmaceutical composition for treating arthritis or exudation in inflammations and oedemas in animals, comprising an effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

#### 4,166,132 ANTIVIRAL AMINE DERIVATIVES OF GLYCEROL AND PROPANEDIOLS

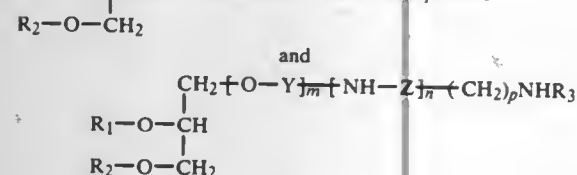
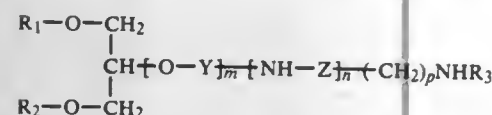
Allen R. Kraska, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,535

Int. Cl.<sup>2</sup> A01N 9/24; C07C 91/10

U.S. Cl. 424—330

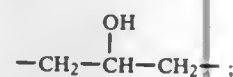
1. A compound selected from those of the formulae



and the pharmaceutically acceptable acid addition salts thereof, wherein

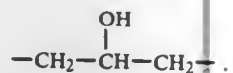
R<sub>1</sub> and R<sub>2</sub> are each selected from the group consisting of normal alkyl of from 12 to 20 carbon atoms and normal alkenyl not having a double bond in the 1-position of from 12 to 20 carbon atoms,

Y is selected from the group consisting of alkylene of from 2 to 4 carbon atoms, the two valencies being on different carbon atoms and



Z is alkylene of from 2 to 4 carbon atoms, the two valencies being on different carbon atoms;

R<sub>3</sub> is selected from the group consisting of hydrogen, alkyl of from 2 to 4 carbon atoms and ω-hydroxy(normal alkyl) of from 2 to 4 carbon atoms, and m, n and p are each 0 or 1, the sum of m, n and p being 0 or 1, R<sub>3</sub> being hydrogen when m is 0, and R<sub>3</sub> being other than ω-hydroxy(normal alkyl) when m is 1 and Y is



14. A method of inducing the production of interferon in a mammal which comprises administering an amount effective to induce the production of interferon of a compound of claim 1.

#### 4,166,133 ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF TO TREAT PAIN, FEVER AND INFLAMMATION

Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

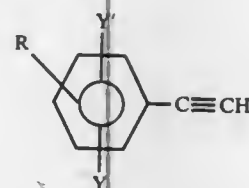
Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Dec. 6, 1977, Ser. No. 858,006

Int. Cl.<sup>2</sup> A61K 31/05, 31/22

U.S. Cl. 424—346

10 Claims

1. A method of treating inflammation, pain or fever in a warm-blooded animal which comprises administering to the animal an effective amount of an active compound of the formula:



where

R is hydrogen, alkyl of 1 to 7 carbon atoms, cycloalkyl of 4 to 7 carbon atoms, 1 to 7 carbon atoms alkyl substituted cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms, phenyl or substituted phenyl where the substituent is Y',

Y and Y' are each selected from the group consisting of hydrogen and hydroxy

Y' is selected from the group consisting of Y, lower alkyl, and trifluoromethyl,

with the proviso that at least one of Y and Y' is other than hydrogen.

#### 4,166,134 METHOD FOR IMPROVING FLEXIBILITY RETENTION OF CHEWING GUM

Frank Witzel, Spring Valley; K. Warren Clark, Brewster, both of N.Y., and Abraham I. Bakal, Parsippany, N.J., assignors to Life Savers, Inc., New York, N.Y.

Filed Jun. 8, 1977, Ser. No. 804,840

Int. Cl.<sup>2</sup> A23G 3/30

U.S. Cl. 426—3

5 Claims

1. In a method for improving flexibility retention while maintaining sweat resistance of chewing gum prepared by mixing gum base, aqueous softener, sucrose, and a solid sorbitol humectant, the improvement which comprises substantially isolating said aqueous softener from said humectant in said chewing gum and minimizing the amount of surface aqueous softener by incorporating said aqueous softener in said gum base to form a water-insoluble phase, admixing said sucrose with said water-insoluble phase, and lastly admixing from about 2 to about 50% by weight of said solid sorbitol humectant with said sucrose water-insoluble phase combination to form a chewing gum wherein said humectant is provided in a water-soluble phase which is substantially isolated from said aqueous softener in said water-insoluble phase.

#### 4,166,135 METHOD FOR MODIFYING THE FLAVOR OF YEAST

Kwei C. Chao, Naperville, Ill., and John A. Ridgway, LaPorte, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 22, 1977, Ser. No. 826,858

Int. Cl.<sup>2</sup> C12C 11/26

U.S. Cl. 426—60

9 Claims

1. In a yeast fermentation process resulting in about a 10 to

about 20 weight percent aqueous slurry of fresh yeast cells, a method for improving the color and flavor of the yeast product comprising oxygenating the slurry with an oxygen-containing gas having an oxygen partial pressure of from about 0.5 to about 20 atmospheres for from about 1 to about 15 minutes at a temperature of from about 80° to about 100° C. and at a pH of from about 4 to about 7.

#### 4,166,136 LASAGNA NOODLE

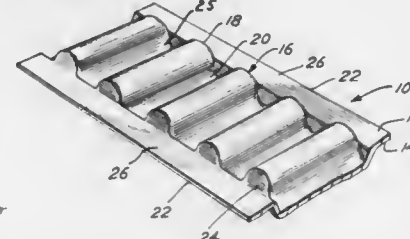
William F. Stoll, Le Sueur, Minn., assignor to Green Giant Company, Chaska, Minn.

Filed Jan. 5, 1978, Ser. No. 867,092

Int. Cl.<sup>2</sup> A23L 1/16

U.S. Cl. 426—144

6 Claims



1. A shaped alimentary paste product comprising a substantially straight elongate ribbon of said paste, said ribbon having a plurality of corrugations formed thereon, said corrugations extending transversely across the width of said ribbon, but having a length less than the total width of said ribbon, at least some of said corrugations being closed at their ends.

#### 4,166,137 METHOD OF DETERMINING THE OPTIMUM TIME TO TURN MEATS IN A MICROWAVE OVEN

Ronald G. Buck, Burnsville, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 30, 1977, Ser. No. 829,077

Int. Cl.<sup>2</sup> A23L 1/00; H05B 9/06

U.S. Cl. 426—243

4 Claims

1. A method for cooking a foodstuff of the type requiring turning during cooking in a microwave oven having a cooking cavity, a source of microwave energy, a controller including a programmable microprocessor, and means for sensing the time-dependent humidity in said cooking cavity, said method comprising the steps of:

- placing said foodstuff on a first side thereof into said cooking cavity;
- applying microwave energy from said source to said cooking cavity to heat said foodstuff;
- sensing the time-dependent humidity of said cooking cavity with said sensing means while applying microwave energy to heat said foodstuff and providing said sensed humidity as an input to said programmable microprocessor;
- determining in said microprocessor during the heating step when said time-dependent sensed humidity becomes substantially constant; and
- providing an oven operator signal to turn said foodstuff to a second side thereof when said substantially constant humidity condition is reached.

#### 4,166,138 PREPARATION OF BACON-LIKE MEAT ANALOG

Richard D. Ziminski, Wayzata, and Myron M. Uecker, Buffalo, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 13, 1977, Ser. No. 806,234

Int. Cl.<sup>2</sup> A23J 3/00

U.S. Cl. 426—249

3 Claims

1. In a process of preparing a bacon-like meat analog wherein

(a) colored and uncolored extrudable doughs are first prepared, said colored dough comprising, by weight, 20–70% water, 3–30% fat, up to 15% albumen, up to 15% protein isolate, up to 20% proteinaceous filler, about 0.1–0.8% xanthan gum and up to 15% flavoring agents, said uncolored dough comprising, by weight, 15–40% water, 15–40% fat, 5–20% albumen, up to 15% protein isolate, up to 20% proteinaceous filler, about 0.05–0.4% xanthan gum and up to 15% flavoring agents, and said colored dough also containing coloring so that upon being cooked it will resemble the lean region of fried bacon whereas the uncolored dough upon being cooked will resemble the fatty region of fried bacon,

(b) the colored and uncolored doughs are simultaneously co-extruded through a common extrusion die to form a striated ribbon about 1 to 2 inches wide and about 0.025 to 0.15 inches thick having at least one colored region and at least one uncolored region which, upon cooking, will resemble the lean and fatty regions of cooked bacon, and

(c) the striated ribbon is subsequently at least partially cooked for about 10 to 100 seconds in a hot oil bath having a temperature of about 220° to 410° F., cooled and then cut into strips which have the appearance of fried bacon, the improvement comprising diverting a portion of said colored dough during said co-extrusion and injecting a variable portion of said colored dough into at least one uncolored region of said ribbon thereby providing a randomized appearing bacon-like analog.

#### 4,166,139 METHOD OF PRODUCING INSTANT CUPPED NOODLES

Masayuki Ishida, Chigasaki, Japan, assignor to Toyo Suisan Kaisha, Ltd., Tokyo, Japan

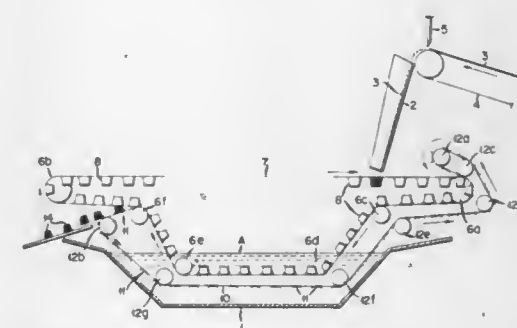
Continuation of Ser. No. 816,893, Jul. 18, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 938,359

Claims priority, application Japan, Jul. 22, 1976, 51-87602

Int. Cl.<sup>2</sup> A23L 1/16

U.S. Cl. 426—394

10 Claims



1. A method of producing instant cupped noodles, comprising the steps of disposing a mass of noodles in a liquid permeable metal cup having at least one opening for receiving said noodles, said cup having a bottom and an inclined or tapered wall, said wall extending between the top portion and the bottom portion of the cup, the bottom portion of the cup having a smaller cross-sectional area than the top portion of the cup,



placing a liquid permeable metal lid to cover said at least one opening of the metal cup, completely immersing the metal cup in an inverted state wherein its bottom portion is up, in a heated oil for frying the mass of noodles housed in the inverted metal cup and retaining the cup in its inverted and completely immersed state during the frying step, to render the mass of noodles dense in the portion thereof close to the bottom portion of the metal cup and sparse in the portion thereof close to the top portion of the metal cup, the dense portion of the fried mass of noodles being substantially more dense than the sparse portion thereof, taking the metal cup out of the heated oil after frying, opening the top larger cross sectional area of the metal cup and discharging the fried mass of noodles from the metal cup, drying the fried mass of noodles discharged from the metal cup, packing the dried mass of noodles in a cup-shaped container substantially equal in shape to and slightly larger in inner diameter than the metal cup, the packing being effected such that the dense and sparse portions of the mass of noodles are disposed in lower and upper portions of the cup-shaped container, respectively, and then sealing the cup-shaped container.

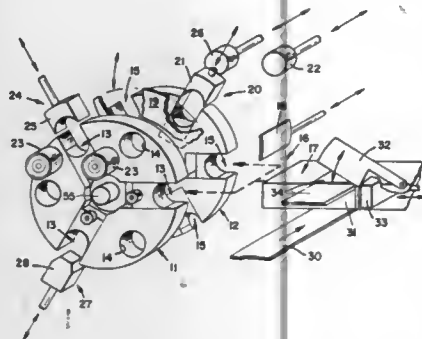
4,166,140

## METHOD OF CANNING FISH

Edward E. Dutton, Whittier, and Jack Gorby, Los Angeles, both of Calif., assignors to Sea-Pac, Inc., Gardena, Calif.  
Division of Ser. No. 719,415, Sep. 1, 1976, Pat. No. 4,116,600.  
This application Sep. 6, 1977, Ser. No. 830,468  
Int. Cl.<sup>2</sup> B65B 63/02

U.S. Cl. 426—397

19 Claims



1. In a method of canning fish wherein a charge of fish having a desired length and weight is to be filled into each of a plurality of identical cans, the steps of:

- forcing fish into a pair of side-by-side and lengthwise aligned metering pockets, each pocket having said desired length, and filling said pockets and forming therein a single slug of fish of twice said desired length and twice said desired weight,
- severing said slug of fish between said pockets to divide the slug of fish into two fish charges, each of a said desired length and weight, with one of such charges being in one of said pockets and the other in the other of said pockets,
- relatively moving said pockets apart from each other after step (b) has been carried out,
- positioning each of said pockets adjacent and in lengthwise alignment with one of said cans,
- forcing the fish charges in said pockets lengthwise out of said pockets and into said cans.

4,166,141

## METHOD OF CHILL STABILIZING A MALT BEVERAGE

Donald H. Westermann, Brookfield, and Nicolaas J. Huige, Glendale, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.  
Filed Aug. 15, 1977, Ser. No. 824,393  
Int. Cl.<sup>2</sup> C12H 1/04

U.S. Cl. 426—422

3 Claims

1. A method of stabilizing a malt beverage, comprising the steps of forming in a vessel a bed of particles of an adsorbant material selected from the group consisting of polyvinylpyrrolidone and silica gel, flowing the beverage upwardly through the bed at a rate sufficient to fluidize the bed and said haze forming substances being adsorbed on said particles to stabilize the beverage, said vessel having a lower portion of smaller cross sectional area connected to an upper portion of larger cross sectional area whereby there is maintained a higher mass velocity of the beverage in the lower portion of the vessel than in the upper portion of the vessel, continuously removing particles from the upper portion of said bed, contacting the particles with a solubilizing material capable of solubilizing the haze forming substances adsorbed on the particles to thereby regenerate said particles, and continuously returning the regenerated adsorbant particles to the lower portion of said bed.

4,166,142

## PROCESS CHEESE CONTAINING A MODIFIED WHEY SOLIDS

Pei K. Chang, Montrose, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.  
Continuation of Ser. No. 707,990, Jul. 23, 1976, abandoned, which is a continuation of Ser. No. 573,501, May 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 546,635, Feb. 3, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,645  
Int. Cl.<sup>2</sup> A23C 19/12

U.S. Cl. 426—582

8 Claims

1. A cheese product which comprises, in admixture, a cheese composition selected from the group consisting of process cheese, process cheese food, process cheese spread, and imitation process cheese spread; a cheese emulsifier in an amount ranging from about 1% to about 3%, by weight, of the cheese product, said emulsifier consisting essentially of a mixture of sodium aluminum phosphate and a citrate selected from the group consisting of sodium citrate, potassium citrate, and calcium citrate in a weight ratio of sodium aluminum phosphate to citrate ranging between about 5:1 and about 1:5; and a partially soluble modified whey solids product derived from a process selected from the group consisting of (1) adding a divalent metal ion to a cheese whey solution and adjusting the pH to a value between about 6 and about 8.5 at a temperature of below 140° F. to cause precipitation of the modified whey solids product and (2) adjusting the pH of a raw cheese whey containing at least 20% acid cheese whey to a value of between about 6.0 and about 8.0 to cause precipitation of the modified whey solids product, said whey product comprising from about 1% to about 20%, by weight, of said cheese product said modified whey solids product comprising about 23–54% lactose, about 24–60% minerals, about 15–27% protein, about 3–6% moisture, about 2–4% lactate, 2–3.5% citrate and 0.5–1.5% of fat wherein said minerals includes about 3–6% phosphorus, about 6–12% calcium, about 1.5–2% potassium, about 1.3–1.5% sodium and about 0.2–0.4% magnesium by weight.

4,166,143

## CONTROL OF THE INTERACTION OF NOVEL PLATINUM-ON-CARBON ELECTROCATALYSTS WITH FLUORINATED HYDROCARBON RESINS IN THE PREPARATION OF FUEL CELL ELECTRODES

Henry G. Petrow, Watertown, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech Company, Newton, Mass.  
Filed Jan. 24, 1977, Ser. No. 761,976  
Int. Cl.<sup>2</sup> H01M 4/88, 4/92, 4/96; B01J 23/4

U.S. Cl. 427—115

6 Claims

1. In the method of producing reproducibly a fuel cell electrode comprising a substantially uniform mixture of a finely divided 15 A–25 A platinum-on-carbon electrocatalyst comprising platinum particles substantially all in the range of 15 A–25 A in size, and finely divided fluorinated hydrocarbon resin, the steps of forming an aqueous suspension of the said electrocatalyst with a sufficiently water-soluble ionizable salt of a polyvalent metallic cation in an amount between 10<sup>-3</sup> and 10<sup>-6</sup> gram-moles of salt per liter of suspension and mixing therewith an aqueous colloidal dispersion of said resin, rapidly to coagulate the mix without substantially affecting the finely divided 15 A–25 A platinum-on-carbon electrocatalyst performance, thereby causing said colloidal resin to flocculate substantially completely and at a controlled rapid rate and in substantially uniform admixture with said electrocatalyst in less than five minutes.

4,166,145

## HIGH TEMPERATURE CONSOLIDATION PROCESS FOR THE PRODUCTION OF A SUBSTANTIALLY ALL CARBON COMPOSITE

Donald M. Hatch, Huntington Beach, and Richard J. Larsen, Torrance, both of Calif., assignors to Hitco, Irvine, Calif.  
Division of Ser. No. 556,889, Mar. 10, 1975. This application Feb. 28, 1977, Ser. No. 772,750  
Int. Cl.<sup>2</sup> B32B 9/00, 9/04, 31/20, 31/26

U.S. Cl. 428—283

8 Claims

1. A substantially all-carbon composite having high density and high temperature resistance and made by forming a mixture of carbon material and an organic resin binder having a desired shape and a given starting density, at least partially curing the resin binder and thereafter continuously heating the mixture in the presence of high pressure to substantially decompose the resin binder and thereafter substantially soften and densify the mixture to a value at least 0.13 g/cc greater than the given starting density, the high pressure being in the form of a compacting force applied continuously to an outer surface of the composite through the step of continuously heating.

2. The invention defined in claim 1, wherein the carbon material comprises fabric and a powdered filler and the organic resin binder comprises a phenolic resin.

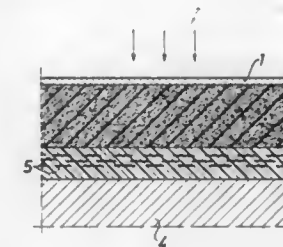
4,166,146

## SANDWICH UNIT FOR WALL COATING

Tibor Kös, 411 23 Göteborg, Sweden  
Filed Feb. 14, 1978, Ser. No. 877,630  
Claims priority, application Sweden, Feb. 16, 1977, 77017168  
Int. Cl.<sup>2</sup> B32B 3/26

U.S. Cl. 428—315

9 Claims



1. A heat transfer resisting sandwich unit for wall coating, comprising in combination a surface layer facing the room bounded by the wall to be coated, one intermediate layer adhered to said surface layer and being of plastic foam, and a third layer adhered to said intermediate layer and facing the wall, said third layer comprising an electrically insulating plastic foil and metal flakes embedded therein and electrically insulated one from another by said plastic foil, said flakes being oriented with their broad side parallel to the foil in a manner known per se, said flakes further disposed in overlapping relation and therewith cooperatively forming an unbroken total surface for reflecting heat radiation thereon.

4,166,147

SHAPED AND FIRED ARTICLES OF TiO<sub>2</sub>

Roger W. Lange, and Harold G. Sowman, both of Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Apr. 16, 1973, Ser. No. 351,285  
Int. Cl.<sup>2</sup> C04B 35/00; C08K 3/22; C09C 1/36

U.S. Cl. 428—328

28 Claims

27. In a retro-reflective sheeting comprising a monolayer of spherical lense elements and associated reflector adapted in combination therewith to provide retro-reflection, the improvement comprising using as said lense elements transparent, solid, shaped and fired microspheres comprising predominantly polycrystalline titanium dioxide in its anatase form.

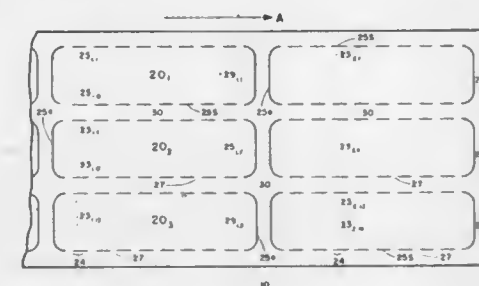
4,166,144

## ELECTROSENSITIVE METALIZED LABEL STOCK

Suresh D. Amberkar, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.  
Filed Oct. 6, 1978, Ser. No. 949,169  
Int. Cl.<sup>2</sup> G01D 5/12; G09F 3/10; B32B 15/12

U.S. Cl. 428—40

3 Claims



1. Electro-sensitive metalized label stock and the like, for electrothermal imprinting, comprising:

- a plurality of labels of electro-sensitive metalized material;
- a border strip of electro-sensitive metalized material surrounding said labels; and
- wherein said electro-sensitive metalized material comprises an electroconductive paper coated with a thin metallic overcoat and;
- a releasable backing member bearing said labels and border strip;
- wherein each label is separated from said border strip by a gap which is interrupted by one or more bridges, said bridges being configured to allow the flow of current in electrothermal imprinting while permitting the removal of labels from said backing member.

28. A plastic composite comprising a plastic matrix having dispersed therein a plurality of solid, shaped and fired, non-vitreous, homogeneous, refractory fibers comprising predominantly polycrystalline titanium dioxide in its anatase form.

4,166,148

# PHOTOMASK BLANKS AND PHOTOMASKS PREPARED THEREFROM

Kunio Sakurai, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1977, Ser. No. 824,447

Claims priority, application Japan, Aug. 14, 1976, 51/97365

Int. Cl.<sup>2</sup> B32B 9/04

U.S. Cl. 428—332

5 Claims



1. In a photomask blank of the type comprising an optically transparent substrate, and a metal mask layer formed on the surface of said substrate, the improvement which comprises a film formed of chromium directly in contact with said substrate, said chromium film having a thickness less than 15 mμ, and an intermediate layer containing chromium oxide interposed between said chromium film and said metal mask layer, the sum of the thicknesses of the chromium film and the intermediate layer being less than about 40 mμ, and a surface reflection preventing film made of chromium oxide and formed on the surface of said metal mask layer.

4,166,149

# NOVEL TRANSPARENT POLYURETHANE POLYUREAS FOR LAMINATION OF GLAZING MATERIALS

Hanns P. Müller, Leverkusen; Wolfgang Oberkirch, Cologne; Kuno Wagner, and Bernd Quiring, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 833,311, Sep. 14, 1977, Pat. No. 4,139,674.

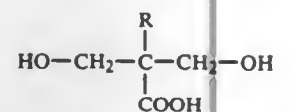
This application Sep. 29, 1978, Ser. No. 947,221

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644434

Int. Cl.<sup>2</sup> B32B 27/40; C08G 18/32; C09J 5/04; B29D 7/02

U.S. Cl. 428—339 3 Claims

1. A laminate of a transparent film 0.1 to 5 mm in thickness formed from a polyurethane polyurea comprising the reaction product of



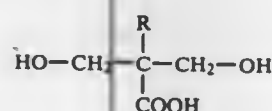
wherein R represents H, or a C<sub>1</sub> to C<sub>4</sub> alkyl radical, (c) optionally aliphatic or cycloaliphatic diols having molecular weights of between about 62 and 300, (d) diisocyanates having exclusively aliphatically and cycloaliphatically bound isocyanate groups, and (e) organic diamines containing aliphatically and cycloaliphatically bound primary amino groups and having molecular weights between about 60 and 3,000, wherein the equivalent ratio of d:(a+b+c) is between about 1.1:1 and 4:1, the equivalent ratio of e:(a+b+c) is between about

0.1:1 and 3:1, the molar ratio of a:b is between about 1:0.01 and 1:12, and the molar ratio of a:c is between about 1:0 and 1:10, said polyurethane polyurea having (1) a molecular weight greater than about 10,000, (2) a urea group content of between about 1 and 20 wt. %, and (3) a content of lateral carboxyl groups directly attached to the main chain of the molecule of between about 0.001 and 10 wt. %

with at least one sheet of a substrate selected from glass and transparent glass-like plastics.

3. A composite structure comprising two sheets of glass laminated together by an interposed layer of a transparent film 0.1 to 5 mm in thickness formed from a polyurethane polyurea comprising the reaction product of

(a) dihydroxy compounds having molecular weights between about 300 and 6,000 selected from the group consisting of polyesters and polyethers, (b) dihydroxy carboxylic acids corresponding to the formula



wherein R represents H, or a C<sub>1</sub> to C<sub>4</sub> alkyl radical,

(c) optionally aliphatic or cycloaliphatic diols having molecular weights of between about 62 and 300,

(d) diisocyanates having exclusively aliphatically and cycloaliphatically bound isocyanate groups, and

(e) organic diamines containing aliphatically and cycloaliphatically bound primary amino groups and having molecular weights between about 60 and 3,000, wherein the

equivalent ratio of d:(a+b+c) is between about 1.1:1 and 4:1, the equivalent ratio of e:(a+b+c) is between about

0.1:1 and 3:1, the molar ratio of a:b is between about 1:0.01 and 1:12, and the molar ratio of a:c is between about 1:0 and 1:10, said polyurethane polyurea having

(1) a molecular weight greater than about 10,000,

(2) a urea group content of between about 1 and 20 wt. %, and

(3) a content of lateral carboxyl groups directly attached to the main chain of the molecule of between about

0.001 and 10 wt. %, said composite being able to withstand the dropped ball test according to DIN 52306 at 5 meters at both 35° C. and -20° C.

4,166,150

# RELEASE SHEET WITH DRIED AND CURED COATING COMPOSITION

John A. Mattor, Bar Mills, and Lawrence Price, Old Orchard Beach, both of Mass., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Dec. 23, 1977, Ser. No. 863,804

Int. Cl.<sup>2</sup> C09J 7/02

U.S. Cl. 428—352

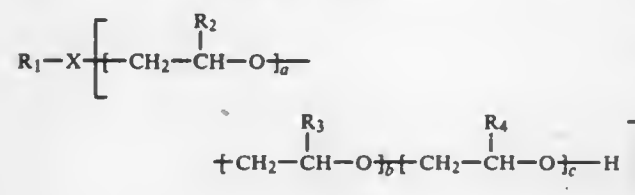
22 Claims

1. A release sheet comprising a substrate having on at least one of its outer surfaces a dried and cured coating composition comprising, in effective amounts for release, a release agent, a cross-linkable thermosetting resin, and a water dispersible organic compound containing polyoxyethylene block having more than 14 repeating units, polyoxypropylene block having more than 4 repeating units; or a block copolymer of polyoxyethylene and polyoxypropylene.

5. A release sheet comprising a substrate having on at least one of its outer surfaces a dried and cured coating composition comprising, in effective amounts for release, a release agent, a cross-linkable thermosetting resin, and a water dispersible organic compound of either

A. polyoxyethylenated polyoxypropylenated ethylenediamine; or

B. a compound having the formula:



wherein R<sub>1</sub> is hydrogen or an organic hydrophobe; R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are independently selected from H or CH<sub>3</sub>—, and where R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are all H, more than 50% of the molecular weight of the compound is provided by polyoxyethylene, X is O, S or N, n=1 where X is O or S, n=2 where X is N, and a, b or c are zero or integers, and the sum of a, b and c is greater than 1.

4,166,151

# NOVEL CORROSION-INHIBITING ESTER COMPOSITIONS

Richard W. Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 26, 1978, Ser. No. 872,697

Int. Cl.<sup>2</sup> C23F 11/12; B32B 15/00

U.S. Cl. 428—457

22 Claims

1. A composition comprising esters of aliphatic carboxylic acids containing from about 10 to about 25 carbon atoms and aliphatic alcohol mixtures comprising unsubstituted substantially saturated C<sub>20-34</sub> aliphatic monohydric normal alcohols and unsubstituted C<sub>20-34</sub> aliphatic monohydric or dihydric non-normal alcohols having less than about 5% (by weight) unsaturated molecules, said alcohol mixtures additionally containing hydrocarbons in about the C<sub>24-40</sub> range.

22. A method of protecting a metal workpiece against corrosion which comprises coating said workpiece with a solution or dispersion of one or more esters in a substantially inert, normally liquid organic diluent and allowing the diluent to evaporate;

said esters comprising esters of aliphatic carboxylic acids containing from about 10 to about 25 carbon atoms and aliphatic alcohols containing from about 15 to about 40 carbon atoms;

said diluent being relatively volatile at ambient and normal storage temperatures; and

said solution or dispersion comprising about 5–75 parts by weight of said esters per 100 parts of said solution or dispersion.

4,166,152

# TACKY POLYMERIC MICROSPHERES

William A. Baker, Stillwater, and Warren D. Ketola, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 17, 1977, Ser. No. 825,259

Int. Cl.<sup>2</sup> C08F 20/10, 20/14

U.S. Cl. 428—522

10 Claims

1. Infusible, solvent-insoluble, solvent-dispersible, inherently tacky, elastomeric polymeric microspheres formed from non-ionic monomers and comprising a major portion of at least one oleophilic, water-emulsifiable alkyl acrylate or methacrylate ester, said polymeric microspheres having a glass transition temperature below about -20° C., and having been prepared by aqueous suspension polymerization in the presence of at least one anionic emulsifier at a concentration level above said emulsifier's critical micelle concentration and an ionic suspen-

sion stabilizer having an interfacial tension of at least about 15.0 dynes per centimeter.

4,166,153

# LOW-ALLOY ZINC MATERIAL AND COIN-PRODUCTS MADE THEREOF

Wilhelm Fercke, Altena, Fed. Rep. of Germany, assignor to Vereinigte Deutsche Metallwerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,237

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714887

Int. Cl.<sup>2</sup> C22C 17/00

U.S. Cl. 428—577

2 Claims

1. An object in the form of a coin, coin blank, medal, plaque or sheet having good wear and abrasion resistance, embossability, strength and good resistance to corrosion and tarnishing wherein said object is formed of a low-alloy zinc material consisting essentially of

0.01 to 1.08 weight percent titanium  
0.02 to 0.5 weight percent cadmium  
0.002 to 0.108 weight percent magnesium  
0.003 to 0.005 weight percent aluminum, the balance being zinc.

4,166,154

# PROCESS PERMITTING THE INTRODUCTION OF PARTICLES INTO THE LIQUID OF A CHEMICAL AND/OR ELECTROCHEMICAL REACTOR

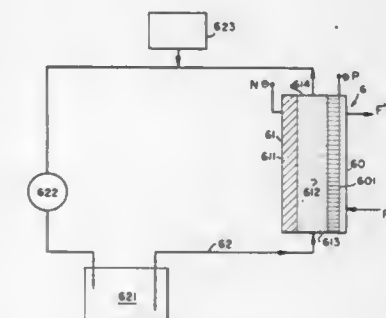
Pierre Durand, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Mar. 3, 1978, Ser. No. 883,323

Int. Cl.<sup>2</sup> H01M 8/06

U.S. Cl. 429—17

30 Claims



1. Process consisting of introducing particles into at least one liquid, called the reactor liquid, used in at least one chemical and/or electrochemical reactor, characterized by the fact that at least one substantially compact feed mass comprising particles, called primary particles, and a small amount of at least one liquid, called compacting liquid, which is chemically unreactive or only slightly reactive with said primary particles, is eroded so as to dissociate said compact feed mass into particles, called secondary particles, which are entrained into the reactor liquid by at least one carrier liquid.

4. Device permitting the introduction of particles into at least one liquid, called the reactor liquid, used in at least one chemical and/or electrochemical reactor, characterized by the fact that it comprises erosion means for eroding at least one substantially compact feed mass comprising particles, called primary particles, and a small amount of at least one liquid, called compacting liquid, which is chemically unreactive or only slightly reactive with said primary particles, so as to dissociate said compact feed mass into particles, called secondary particles, and circulating means for circulating at least one carrier liquid in contact with said compact feed mass in order to entrain said secondary particles into the reactor liquid.



4,166,155

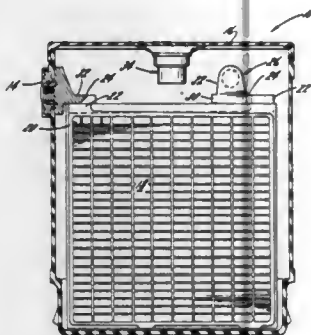
## MAINTENANCE-FREE BATTERY

George W. Mao, St. Paul; Purushothama Rao, Burnsville, and James F. Trenter, St. Paul, all of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 742,611, Nov. 17, 1976, abandoned, which is a continuation of Ser. No. 514,019, Oct. 11, 1974, abandoned. This application Jul. 3, 1978, Ser. No. 921,653 Int. Cl.<sup>2</sup> H01M 10/06

U.S. Cl. 429—82

4 Claims



1. In a maintenance-free lead-acid battery comprising a battery container having a plurality of cells, a cover sealed to the container, venting means providing passages for the escape of evolved gas and an electrolyte contained in the cells, each cell having components including a plurality of positive and negative electrodes disposed therein comprising a grid supporting structure having a layer of active material attached thereto, the improvement wherein the grid supporting structure of the positive electrodes are formed from a ternary lead base alloy consisting essentially of lead, from about 1.0 to about 2.0% antimony and from about 1.2 to about 2.2% cadmium, the cadmium being present in an amount at least equal to the amount of antimony present, and the grid supporting structure of the negative electrodes are formed from a ternary lead base alloy consisting essentially of lead, from about 0.06 to about 0.20% calcium and from about 0.10 to about 0.40% tin, the percentages of each alloy being based on the alloy weight.

4,166,156

## SECONDARY BATTERY OR CELL WITH PYROLYTIC GRAPHITE COATED GRAPHITE CURRENT COLLECTOR

Frank A. Ludwig, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

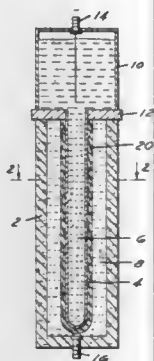
Filed Feb. 28, 1977, Ser. No. 772,616

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H01M 10/39

U.S. Cl. 429—104

11 Claims



1. In a secondary battery cell of the type comprising: (A) an anodic reaction zone containing a molten alkali metal reactant-anode in electrical contact with an external circuit; (B) a ca-

thodic reaction zone containing a cathodic reactant which, when said battery or cell is at least partially discharged, is selected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant sulfur saturated polysulfide salts of said anodic reactant; (C) a cation-permeable barrier to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones; and (D) a current collector which is at least partially exposed to said cathodic reactant and which is in electrical contact with said cation-permeable barrier and said external circuit, wherein the improvement comprises:

a current collector comprising a graphite body bearing a coating of pyrolytic graphite on at least those surfaces thereof which are exposed to said cathodic reactant.

4,166,157

## DOUBLE SEALABLE BUTTON CELL WITH CORROSION RESISTANT CAN AND METHOD

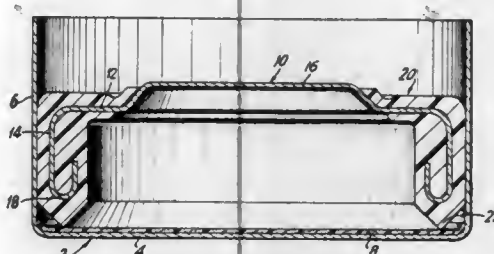
Robert J. McCormick, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 814,397, Jul. 11, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,286

Int. Cl.<sup>2</sup> H01M 2/08

U.S. Cl. 429—174

20 Claims



1. An unsealed double sealable cell, comprising:

(a) a conductive metal can having a bottom and a continuous sidewall disposed around the periphery of the bottom, said can having inner surfaces and outer surfaces;

(b) a conductive thermoplastic layer disposed on the inner surfaces of said can so as to extend over at least all of the inner surface of the bottom of said can;

(c) a conductive metal cover having a top and a continuous sidewall disposed around the periphery of the top and having inner surfaces and outer surfaces, said sidewall being disposed in a U-shape configuration at its end opposite said top; and

(d) a dielectric thermoplastic gasket insert molded around the continuous sidewall of said cover and a part of the top of said cover, said dielectric thermoplastic gasket extending over all surfaces of said continuous sidewall including said U-shape configuration and extending on a part of the top of said cover on its inner and outer surfaces such that only a center portion of the inner and outer surfaces of the top of said cover remains exposed, and said dielectric thermoplastic gasket having a tapered projection located below the U-shape configuration of said cover sidewall; wherein the combination of said conductive metal cover and said dielectric thermoplastic gasket has a total height which is less than the height of the continuous sidewall of said can and is in cooperation with and fitted into said conductive metal can.

4,166,158

## LITHIUM-IODINE CELL

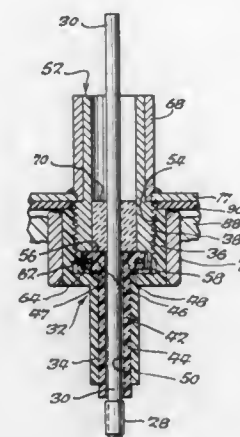
Ralph T. Mead, Kenmore; Frank W. Rudolph, Depew; Norbert W. Frenz, Jr., North Tonawanda, and Wilson Greatbatch, Clarence, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,849

Int. Cl.<sup>2</sup> H01M 2/22, 4/02

U.S. Cl. 429—181

22 Claims



1. A lithium-iodine cell comprising:

a. a casing of electrically conducting material;

b. anode means positioned within said casing and comprising an element of lithium having an exposed surface portion and another surface portion;

c. electrical conductor means operatively connected to said other surface portion and extending through said casing;

d. means for sealing said conductor means from the remainder of said cell, said sealing means comprising an insulator element in generally concentric relationship with said conductor within said casing, said insulator element being of a material which does not exhibit electronic conduction when exposed to iodine, an isolator element of a material which does not exhibit electronic conduction when exposed to iodine and located between said insulator element and said conductor, and a ferrule element in generally concentric relationship with said conductor, said ferrule having a portion within said casing and a portion extending from said casing;

e. cathode means comprising iodine-containing material within said casing and in operative contact with said exposed surface portion of said lithium element and with a major portion of the surface of said casing in a manner such that said casing serves as a cathode current collector; and

f. said sealing means shielding said conductor means from said iodine-containing material and electrically insulating said conductor means from said casing;

g. whereby an electrical potential difference exists between said conductor means and said casing during operation of said cell.

4,166,159

## PROCESS FOR FORMING FAST SODIUM-ION TRANSPORT COMPOSITIONS

Richard L. Pober, Waban, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

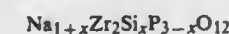
Filed Aug. 2, 1978, Ser. No. 930,302

Int. Cl.<sup>2</sup> H01M 6/18; C01B 33/32

U.S. Cl. 429—193

4 Claims

1. The process of forming a fast sodium-ion transport composition of the formula:



where x is a number greater than 0 and less than 3 which

comprises reacting zirconium silicate with an anhydrous phosphate reactant selected from the group consisting of trisodium phosphate, a mixture of trisodium phosphate and disodium phosphate and mixtures thereof with monosodium phosphate.

4,166,160

## CELLS HAVING CATHODES DERIVED FROM AMMONIUM-MOLYBDENUM-CHALCOGEN COMPOUNDS

Russell R. Chianelli, North Branch; Allan J. Jacobson, Princeton, and M. Stanley Whittingham, Fanwood, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 883,919, Mar. 6, 1978, abandoned. This application Aug. 14, 1978, Ser. No. 933,451 Int. Cl.<sup>2</sup> H01M 4/58

U.S. Cl. 429—218

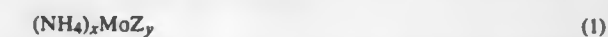
39 Claims

1. An electric current-producing cell, comprising:

(a) an anode having as its anode-active material one or more metals selected from the group consisting of the Periodic Table Group IA metals, Group IB metals, Group IIA metals and Group IIB metals;

(b) a cathode having as its cathode active material one or more compounds selected from the group consisting of:

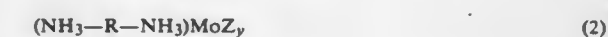
(i) those having the formula:



wherein Z is a chalcogen selected from the group consisting of sulfur, selenium, sulfur-selenium mixtures, sulfur-oxygen mixtures and selenium-oxygen mixtures wherein x is a numerical value of about 2, and wherein y is a numerical value of about 4;

(ii) compounds of the above formula wherein one or more hydrogens is substituted with a radical selected from alkyl radicals having 1 to 20 carbon atoms and alkyl amine radicals having 1 to 20 carbon atoms;

(iii) those having the formula:



wherein R is a methylene radical or a polymethylene radical having 2 to 20 carbon atoms, and wherein Z and y are as defined; and,

(iv) the amorphous decomposition products of one or more compounds of subparagraphs (i), (ii) and (iii) resulting from the decomposition thereof below about 350° C.; and

(c) an electrolyte which is chemically inert with respect to said anode and said cathode and which permits the migration of ions between said anode and said cathode.

4,166,161

## FLAME-RETARDING, EXPANDABLE MOLDING COMPOSITIONS OF STYRENE POLYMERS

Siegfried Noetzel, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,389

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724062

Int. Cl.<sup>2</sup> C08J 9/12

U.S. Cl. 521—96

6 Claims

1. Flame-resistant, expandable molding composition of styrene polymers containing 1,2,3,4,5,6-hexabromohexene-1 or 1,2,3,4,5,6-hexabromohexene-3 or a mixture thereof in such a quantity that the bromine content is from 0.1 to 5, preferably from 0.5 to 1.5 weight %, calculated on the styrene polymer.

4,166,162

**PHENOLIC RESIN FOAM HAVING REDUCED TENDENCY TO SHRINK**

Franz Weissenfels, Siegburg, and Hans Jünger, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany  
Continuation of Ser. No. 636,279, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 407,689, Oct. 18, 1973, abandoned, which is a continuation of Ser. No. 23,518, Mar. 27, 1970, abandoned. This application Dec. 6, 1977, Ser. No. 858,043  
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1969, 1917012

Int. Cl.<sup>2</sup> C08J 9/14

U.S. Cl. 521—100

20 Claims

1. Phenolic resin foam having improved dimensional stability having dispersed therein  $\text{CaSO}_4 \cdot n\text{H}_2\text{O}$ , wherein  $n$  is less than 2, in an amount of about 5–50% of the weight of the solid resin content of the phenolic resin.

4,166,163

**COLOR POLYURETHANE FOAMS AND A PROCESS FOR THEIR PRODUCTION**

Eugene P. DiBella, Piscataway; Morris Dunkel, Paramus, and Henry Gould, Englishtown, all of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

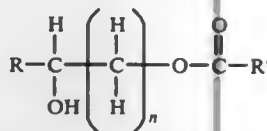
Filed Jul. 11, 1978, Ser. No. 923,762

Int. Cl.<sup>2</sup> C08J 9/00

U.S. Cl. 521—116

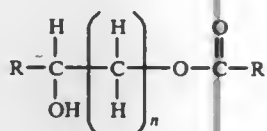
19 Claims

1. A colored polyurethane foam prepared by the reaction of an organic polyisocyanate with a component that contains at least two compounds having functional groups containing active hydrogen atoms and that comprises a polyol and a dispersion of a pigment in a low-viscosity semi-reactive vehicle that comprises a glycol monocarboxylate having the structural formula



wherein R represents an alkyl group having 1 to 16 carbon atoms, an alkoxy group having 2 to 8 carbon atoms, an alkoxy-alkyl group having 3 to 8 carbon atoms, or a polyalkoxy group having 3 to 8 carbon atoms, R' represents an alkyl group or an alkenyl group having 2 to 18 carbon atoms, and  $n$  is 1, 2, or 3, said component containing from 0.5 part to 25 parts by weight of the glycol monocarboxylate per 100 parts by weight of the polyol.

15. A pigment dispersion for use in the production of colored polyurethane foams that comprises from 5% to 20% by weight of a pigment in a low-viscosity, semi-reactive vehicle that comprises a glycol monocarboxylate having the structural formula



wherein R represents an alkyl group having 1 to 16 carbon atoms, an alkoxy group having 2 to 8 carbon atoms, an alkoxy-alkyl group having 3 to 8 carbon atoms, or a polyalkoxy group having 3 to 8 carbon atoms, R' represents an alkyl group or an alkenyl group having 2 to 18 carbon atoms, and  $n$  is 1, 2, or 3.

4,166,164

**PROCESS FOR THE PREPARATION OF CARBODIIMIDE-ISOCYANURATE FOAMS**

Moses Cenker, Trenton; Thirumurti Narayan, Riverview, both of Mich., and Harald P. Wulff, Baton Rouge, La., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 5, 1977, Ser. No. 857,230

Int. Cl.<sup>2</sup> C08G 18/14, 18/22, 18/18, 18/20

U.S. Cl. 521—129

8 Claims

1. A process for the preparation of foams characterized by carbodiimide and isocyanurate linkages comprising catalytically condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of (a) a compound which promotes the carbodiimide reaction and (b) a  $\text{C}_1$ – $\text{C}_8$  alkali metal carboxylate.

4,166,165

**TERPOLYMERS OF TETRAFLUOROETHYLENE, ETHYLENE AND FLUOROVINYL ETHER AND PROCESS FOR PRODUCING THE SAME**

Michio Hisasue, and Shun-ichi Kodama, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed May 17, 1978, Ser. No. 906,436

Claims priority, application Japan, May 20, 1977, 52-57656

Int. Cl.<sup>2</sup> C08F 210/02, 214/26

U.S. Cl. 526—87

31 Claims

1. A terpolymer having a volumetric flow rate of 10 to 500  $\text{mm}^3/\text{sec}$ . as determined at 300° C. under a load of 30  $\text{Kg}/\text{cm}^2$ , a thermal decomposition temperature higher than 310° C., a tensile strength higher than 30  $\text{Kg}/\text{cm}^2$  at 200° C. and an elongation higher than 200% at 200° C., containing main components of tetrafluoroethylene and ethylene which consists essentially of

40 to 60 mole % of tetrafluoroethylene, 40 to 60 mole % of ethylene and 0.1 to 10 mole % of a fluorovinyl ether monomer having the formula



wherein X represents F, OH, OR<sup>1</sup> or NR<sup>2</sup>R<sup>3</sup> and R<sup>1</sup> represents a  $\text{C}_1$ – $\text{C}_{10}$  alkyl group and R<sup>2</sup> and R<sup>3</sup> respectively hydrogen atom or R<sup>1</sup>, and  $n$  represents an integer of 1 to 10.

4,166,166

**PROCESS FOR PRODUCING ACETOPHENONE-MODIFIED PHENOLIC RESIN**

Nobutaka Nakamura, and Yukio Saeki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Oct. 2, 1978, Ser. No. 948,065

Claims priority, application Japan, Oct. 18, 1977, 52/124075

Int. Cl.<sup>2</sup> C08G 8/02, 8/26

U.S. Cl. 528—126

14 Claims

1. A process for producing an acetophenone-modified novolak phenolic resin which comprises reacting acetophenone with an aldehyde under alkaline conditions, and reacting the resulting reaction product with a phenol under acidic conditions.

4,166,167

**POLYMERIZATION OF  $\alpha$ -OLEFIN MONOMERS**

Ashley D. Bye, Welwyn Garden City; John E. Priddle, Welwyn, and Victor A. Wilson, Nunthorpe, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 20, 1977, Ser. No. 808,431

Claims priority, application United Kingdom, Jul. 9, 1976, 28676/76

Int. Cl.<sup>2</sup> C08F 2/34, 4/64, 10/00

U.S. Cl. 526—142

14 Claims

1. In a process for the production of an olefin polymer which comprises polymerizing at least one  $\alpha$ -olefin monomer in the

gas phase in a stirred or fluidised bed in the presence of particles of a carrier polymer which is an olefin polymer using a catalyst comprising (1) a solid compound of a transition metal of Groups IVA to VIA of the Periodic Table, wherein the transition metal has a valency of less than its maximum valency; and (2) at least one organo-metallic compound of aluminium, or of a non-transition metal of Group IIA of the Periodic Table, or a complex of an organo-metallic compound of a non-transition metal of Group IA or IIA of the Periodic

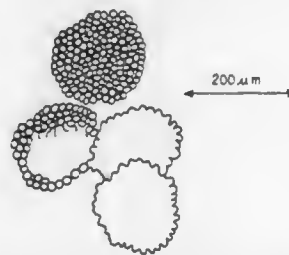


Table and an organo-aluminium compound, the improvement which comprises using as the carrier polymer an olefin polymer the particles of which are substantially uniform, approximately spherical and essentially all of which have a diameter in the range from 100 up to 500 microns and using as component (1) of the catalyst a solid compound of a transition metal essentially all of the particles of which have a particle size of less than 5 microns, wherein component (1) of the catalyst is added to the polymerisation system separately from the carrier polymer.

4,166,168

**POLYMERIZATION PRODUCTS OF ACETYLENE-TERMINATED POLYIMIDE DERIVATIVES**

Gaetano F. D'Alelio, South Bend, Ind., assignor to Plastics Engineering Company, Sheboygan, Wis.

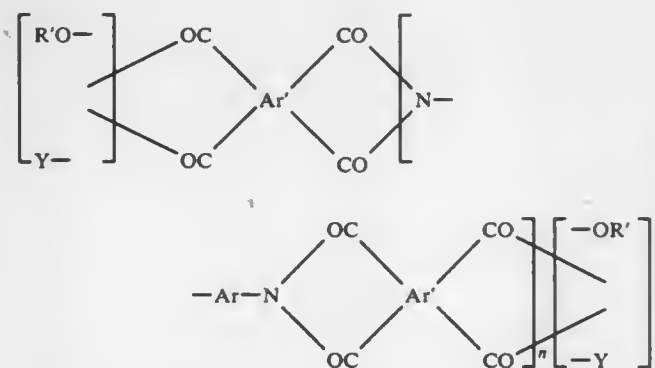
Filed Jul. 25, 1978, Ser. No. 927,815

Int. Cl.<sup>2</sup> C08G 73/12, 73/16

U.S. Cl. 526—259

19 Claims

1. An addition polymerization product of a polyimide-ester of the formula:



wherein:

Ar' is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' radical except that in the case of the Ar' being a naphthalene radical one or both pairs of the carbonyl groups may be attached to peri carbon atoms;

Ar is a divalent aromatic organic radical,  $n$  is an integer of at least one;

R' is an organic moiety containing 2 to 14 carbon atoms and having a terminal  $\text{CH}=\text{C}-$  structure;

Y is OR or X;

R is H, R' or the residue of an alcohol other than R'OH containing one to 18 carbon atoms; and  
X is a halide radical.

4,166,169

**HIGH-STRENGTH ANAEROBIC SEALANTS CONTAINING N-NITROSOAMINE MODIFIER**

Purshottam S. Patel, Elk Grove Village, and Donald J. McDowell, Riverside, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Continuation-in-part of Ser. No. 664,391, Mar. 5, 1976, Pat. No. 4,090,997. This application May 22, 1978, Ser. No. 908,253

The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.

Int. Cl.<sup>2</sup> C09J 3/14; C08K 5/08, 5/22

U.S. Cl. 526—313

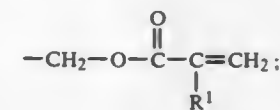
12 Claims

1. A relatively high-strength anaerobic sealant composition having an extended shelf life in the presence of air and low toxicity, and which is capable of polymerization upon exclusion of air, comprising:

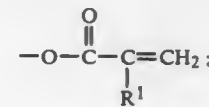
a polymerizable monomer mixture including a polyacrylic ester represented by the general formula



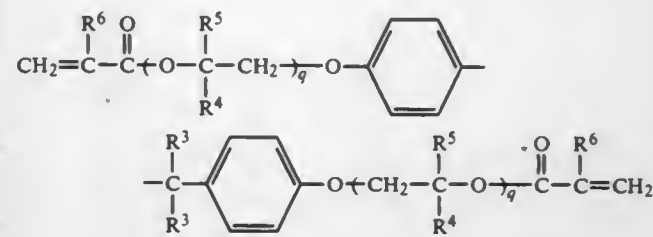
wherein R is a member of the group consisting of hydrogen, alkyl containing 1 to 4 carbon atoms, inclusive, hydroxyalkyl containing 1 to 4 carbon atoms, inclusive, and



R<sup>1</sup> is a member of the group consisting of hydrogen, halogen, and alkyl containing 1 to 4 carbon atoms, inclusive; R<sup>2</sup> is a member of the group consisting of hydrogen, alkyl containing 1 to 4 carbon atoms, inclusive, hydroxy, and



$m$  is an integer having a value of at least 1;  $n$  is an integer having a value of at least 1;  $p$  is an integer having a value of 0 or 1; and  $r$  is an integer having a value of at least 1; and a polyacrylic ester of an alkoxyated bisphenol-type compound present in an amount of at least about 15 percent by weight of the mixture and represented by the general formula



wherein R<sup>3</sup> is selected from the group consisting of methyl, ethyl, carboxyl and hydrogen; R<sup>4</sup> is selected from the group consisting of hydrogen, methyl and ethyl; R<sup>5</sup> is selected from the group consisting of hydrogen, methyl and hydroxyl; R<sup>6</sup> is selected from the group consisting of hydrogen, chlorine, methyl and ethyl; and  $q$  represents an integer of from 0 to 8;

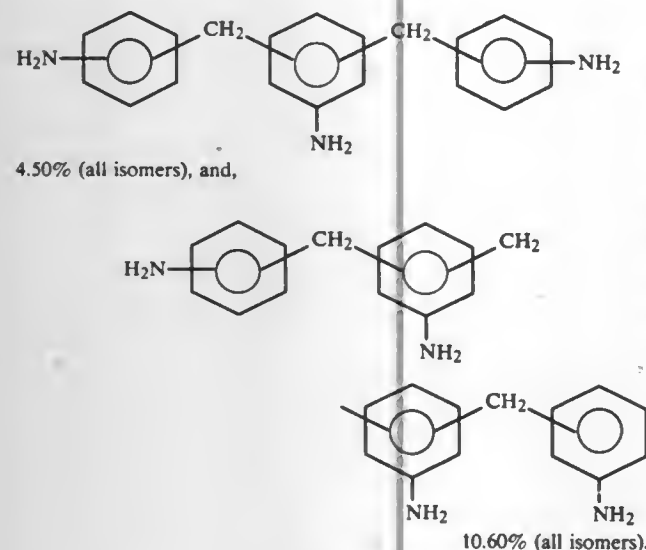


an inorganic salt initiator which is a member of the group consisting of ammonium perchlorate, alkali metal perchlorate, alkaline earth metal perchlorate, ammonium persulfate, alkali metal persulfate, and alkaline earth metal persulfate, present in an amount sufficient to initiate polymerization of the monomer in the absence of air; a modifier which is a N-nitrosoamine present in an amount of about 0.03 to about 1 part by weight per 100 parts of said monomer mixture; an accelerator present in an amount sufficient to accelerate polymerization of the monomer mixture in the absence of air; and a quinone-type polymerization inhibitor in an amount sufficient to retard polymerization of the monomer mixture during storage of the composition in the presence of air.

**4,166,170**  
**MIXED DIAMINES FOR LOWER MELTING ADDITION POLYIMIDE PREPARATION AND UTILIZATION**  
Terry L. St. Clair, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 6, 1977, Ser. No. 839,963  
Int. Cl.<sup>2</sup> C08G 73/10

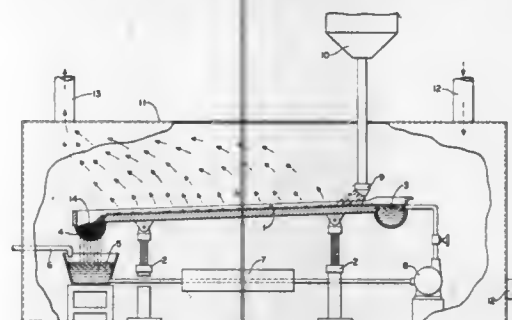
U.S. Cl. 528—229 3 Claims  
1. A liquid composition of matter consisting essentially of an equimolar mixture of benzophenonetetracarboxylic acid dihydride and norbornene dicarboxylic acid anhydride reacted at 75°–80° C. in an excess of ethanol and thereafter cooled to room temperature and mixed with a mixture of the isomers of methylenedianilines in the following percentages:  
o,o'—MDA—3.20%  
o,p'—MDA—15.70%  
p,p'—MDA—66.00%



**4,166,171**  
**RECOVERY OF SYNTHETIC POLYMER FROM SOLVENTS**  
Robert F. Mitchell, Youngstown, N.Y., assignor to The Good-year Tire & Rubber Company, Akron, Ohio  
Continuation of Ser. No. 533,048, Dec. 16, 1974, abandoned.  
This application Jun. 26, 1978, Ser. No. 919,003  
Int. Cl.<sup>2</sup> C08F 6/12

U.S. Cl. 528—488 4 Claims  
1. A method of recovering synthetic vinyl polymer, in the form of discrete particles, from a reactor cleaning solvent consisting of (a) impinging droplets of a solution consisting of the synthetic vinyl polymer in the reactor cleaning solvent upon the surface of a continuously moving capillary inactive

liquid selected from the group consisting of aqueous potassium hydroxide, aqueous sodium hydroxide, aqueous saturated sodium chloride, aqueous saturated magnesium sulfate, aqueous saturated calcium chloride and aqueous glycerine, said continuously moving capillary inactive liquid traversing an inclined plane, (b) maintaining said continuously moving capillary



inactive liquid at a temperature sufficient to volatilize the solvent, (c) forming discrete particles of the polymer on the surface of the continuously moving capillary inactive liquid and (d) separating the discrete particles of polymer so formed on the surface of said continuously moving capillary inactive liquid from said liquid by mechanical means.

**4,166,172**  
**PRODUCTION OF POLYETHER POLYOL COMPOSITIONS**  
Howard P. Klein, Austin, Tex., assignor to Texas Development Corporation, White Plains, N.Y.  
Continuation-in-part of Ser. No. 560,175, Mar. 20, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,770  
Int. Cl.<sup>2</sup> C07H 15/08; C07C 41/00

U.S. Cl. 536—4 8 Claims  
1. In a process for producing a polyether polyol composition wherein an alkylene oxide having from about 2 to about 4 carbon atoms or mixtures thereof is intimately contacted in the presence of a catalyst with a polyhydric nonreducing initiator having from about 2 to 8 hydroxyl moieties per molecule at temperatures ranging from about 30° C. to 150° C. the improvement which consists essentially of using as a catalyst an effective amount of an aqueous ammonia solution.

**4,166,173**  
**PROCESS FOR PHOSPHORYLATING STARCH IN ALKALI METAL TRIPOLYPHOSPHATE SALTS**  
Otto B. Wurzburg, Whitehouse Station; Wadym Jarowenko, Plainfield; Roger W. Rubens, Somerville, and Jayant K. Patel, North Plainfield, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.  
Filed May 15, 1978, Ser. No. 905,272  
Int. Cl.<sup>2</sup> C08B 31/02

U.S. Cl. 536—109 10 Claims  
1. An improved process for phosphorylating starch comprising the steps of:  
(a) forming a reagent solution of an alkali metal triphosphate salt which comprises water, 20–36% by weight of said salt, and an amount of a water-soluble acid having a pK<sub>a</sub> less than 4.7 sufficient to obtain a solution pH of 2.8–5.0;

(b) forming a starch cake having no more than 45% by weight moisture;  
(c) adding 2–30% by weight of said reagent solution to said starch cake to achieve efficient impregnation of the cake;  
(d) drying the thus-impregnated starch; and  
(e) heat-reacting the dried starch to obtain an orthophosphate starch monoester.  
5. A reagent solution of alkali metal triphosphate salt which comprises water, 20–36% by weight of said salt, and an amount of a water-soluble acid having a pK<sub>a</sub> less than 4.7 sufficient to obtain a solution pH of 2.8–5.0.

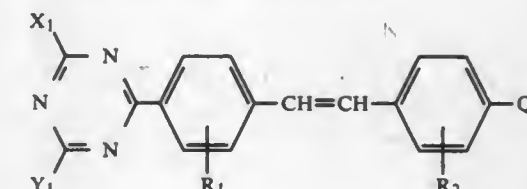
**4,166,174**  
**BENZAZOCINE DERIVATIVES AND PROCESS FOR PREPARING THE SAME**  
Sadao Tanaka, Tokyo; Morio Kakimoto, Kawagoe, and Yugo Ikeda, Tokyo, all of Japan, assignors to Chugai Selyaku Kabushiki Kaisha, Tokyo, Japan  
Filed Jun. 13, 1977, Ser. No. 806,263  
Claims priority, application Japan, Jun. 24, 1976, 51/73789  
Int. Cl.<sup>2</sup> C07D 39/00

U.S. Cl. 542—401 22 Claims  
1. A benzazocine derivative selected from the group consisting of 1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-3,6-dimethyl-3-benzazocine-1-spiro-1'-cyclopentane; 1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-3,6-dimethyl-3-benzazocine-1-spiro-1'-cyclopropane; 1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-3,5,6-trimethyl-3-benzazocine-1-spiro-1'-cyclopentane; 1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-3-methyl-6-phenyl-3-benzazocine-1-spiro-1'-cyclopentane; 8-chloro-1,2,3,4,5,6-hexahydro-2,6-methano-3-methyl-6-phenyl-3-benzazocine-1-spiro-1'-cyclopentane; 8-chloro-1,2,3,4,5,6-hexahydro-2,6-methano-3-methyl-6-phenyl-3-benzazocine-1-spiro-1'-cyclopentane; 1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-6-methyl-3-benzazocine-1-spiro-1'-cyclopentane; 8-chloro-1,2,3,4,5,6-hexahydro-2,6-methano-6-methyl-3-benzazocine-1-spiro-1'-cyclopentane; 8-chloro-1,2,3,4,5,6-hexahydro-2,6-methano-3,6-dimethyl-3-benzazocine-1-spiro-1'-cyclopentane; 1,2,3,4,5,6-hexahydro-2,6-methano-8-methoxy-3,6-dimethyl-3-benzazocine-1-spiro-4'-tetrahydropyran; 1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-3,6-dimethyl-3-benzazocine-1-spiro-4'-tetrahydropyran; 1,2,3,4,5,6-hexahydro-2,6-methano-1,1,3,6-tetramethyl-8,9-methylenedioxy-3-benzazocine; 3-[4'-(4''-fluorophenyl)-4'-oxobutyl]-1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-1,1,6-trimethyl-3-benzazocine; 8-chloro-3-[4'-(4''-fluorophenyl)-4'-oxobutyl]-1,2,3,4,5,6-hexahydro-2,6-methano-1,1,6-trimethyl-3-benzazocine; 3-[4'-(4''-fluorophenyl)-4'-oxobutyl]-1,2,3,4,5,6-hexahydro-2,6-methano-1,1,6-tetramethyl-3-benzazocine; 3-allyl-1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-6-methyl-3-benzazocine-1-spiro-1'-cyclopentane; 1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-6-methyl-3-phenethyl-3-benzazocine-1-spiro-1'-cyclopentane; 3-cyclopropyl-methyl-1,2,3,4,5,6-hexahydro-8-hydroxy-6-methyl-3-benzazocine-1-spiro-1'-cyclopentane; and 3-cinnamyl-1,2,3,4,5,6-hexahydro-8-hydroxy-2,6-methano-6-methyl-3-benzazocine-1-spiro-1'-cyclopentane.

**4,166,175**  
**Patent Not Issued For This Number**

**4,166,176**  
**FLUORESCENT DYESTUFFS**  
Udo Eckstein, Cologne, and Horst Harnisch, Much, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Mar. 20, 1978, Ser. No. 888,237  
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712686

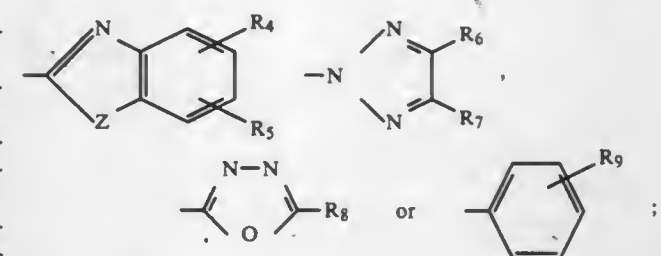
Int. Cl.<sup>2</sup> C07D 403/10, 413/10  
U.S. Cl. 542—460 6 Claims  
1. Fluorescent dyestuff of the formula



wherein  
X<sub>1</sub> and Y<sub>1</sub> are



R<sub>1</sub> and R<sub>2</sub> are hydrogen, chlorine, C<sub>1</sub>–C<sub>4</sub>-alkyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-alkoxycarbonyl or cyano;  
R<sub>3</sub> is hydrogen, C<sub>1</sub>–C<sub>4</sub>-alkyl, benzyl or phenyl;  
Q<sub>1</sub> is chlorine, bromine, cyano, carboxyl, C<sub>1</sub>–C<sub>4</sub>-alkoxycarbonyl



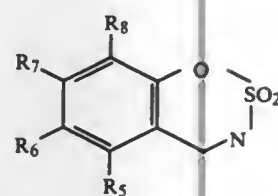
R<sub>4</sub> is hydrogen, chlorine, C<sub>1</sub>–C<sub>4</sub>-alkyl, phenyl-C<sub>1</sub>–C<sub>3</sub>-alkyl, cyclohexyl, phenyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-alkylsulfonyl, C<sub>1</sub>–C<sub>4</sub>-alkoxycarbonyl, cyano or carboxyl, or R<sub>4</sub> together with R<sub>5</sub> forms a fused 1-cyclopentene, 1-cyclohexene or benzene ring or one of the foregoing rings substituted by 1 to 4 methyl groups;  
R<sub>5</sub> is hydrogen, chlorine or methyl, or R<sub>5</sub> together with R<sub>4</sub> forms a fused 1-cyclopentene, 1-cyclohexene or benzene ring or one of the foregoing rings substituted by 1 to 4 methyl groups;  
R<sub>6</sub> is C<sub>1</sub>–C<sub>4</sub>-alkyl, phenyl or styrene, or R<sub>6</sub> together with R<sub>7</sub> forms a fused benzene ring, a fused benzene ring substituted by C<sub>1</sub>–C<sub>4</sub>-alkyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy or chlorine, or a fused naphthalene ring;  
R<sub>7</sub> is hydrogen, C<sub>1</sub>–C<sub>4</sub>-alkyl or phenyl, or R<sub>7</sub> together with R<sub>6</sub> forms a fused benzene ring, a fused benzene ring substituted by C<sub>1</sub>–C<sub>4</sub>-alkyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy or chlorine, or a fused naphthalene ring;  
R<sub>8</sub> is phenyl, styryl, biphenyl or naphthyl or one of the foregoing substituted by C<sub>1</sub>–C<sub>4</sub>-alkyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-alkoxycarbonyl, cyano or chlorine;  
R<sub>9</sub> is hydrogen, C<sub>1</sub>–C<sub>4</sub>-alkyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-alkoxycarbonyl, cyano, a benzoxazol-2-yl radical, or a benzoxazol-2-yl substituted by C<sub>1</sub>–C<sub>4</sub>-alkoxycarbonyl, cyano or chlorine;  
Z is O, S or NR<sub>10</sub>  
R<sub>10</sub> is hydrogen, C<sub>1</sub>–C<sub>4</sub>-alkyl, acetyl, benzoyl, benzyl or phenyl; and  
r denotes an integer from 0 to 2.

4,166,177  
**SUBSTITUTED 2,2-DIOXO-1,2,3-BENZOXATHIAZINES**  
 Edward J. Cragoe, Jr.; Robert L. Smith, both of Lansdale, and  
 Gerald E. Stokker, Gwynedd Valley, all of Pa., assignors to  
 Merck & Co., Inc., Rahway, N.J.

Filed Dec. 27, 1977, Ser. No. 864,185  
 Int. Cl.<sup>2</sup> C07D 291/00

U.S. Cl. 544—2

1. A compound of the formula:



wherein

R<sub>5</sub> is hydrogen; C<sub>1-3</sub> alkyl; halogen; or C<sub>1-3</sub> alkoxy;  
 R<sub>6</sub> is hydrogen; C<sub>1-3</sub> straight or branched chain alkyl; halo-  
 gen;  
 R<sub>7</sub> is hydrogen; C<sub>1-3</sub> alkyl; C<sub>1-3</sub> alkoxy; or halogen;  
 R<sub>8</sub> is hydrogen; halogen; trifluoromethyl; or C<sub>1-3</sub> alkylthio;  
 and the dashed line between the 3- and 4- positions de-  
 scribes alternative saturation or unsaturation.

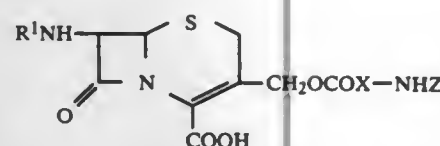
4,166,178  
**3-ACYLOXYMETHYL-CEPHEM COMPOUNDS**  
 Susumu Tsushima, Suita; Michiyuki Sendai, Osaka; Mitsuru  
 Shiraishi, Suita, and Norichika Matsumoto, Neyagawa, all of  
 Japan, assignors to Takeda Chemical Industries, Ltd., Osaka,  
 Japan

Continuation of Ser. No. 683,800, May 6, 1976, abandoned. This  
 application Apr. 17, 1978, Ser. No. 897,157  
 Claims priority, application Japan, May 6, 1975, 50-55020;  
 Jan. 1, 1976, 51-1275

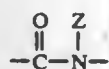
Int. Cl.<sup>2</sup> C07D 501/20; A61K 31/545

U.S. Cl. 544—16

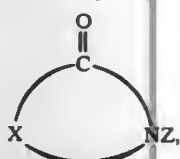
1. A compound of the formula



wherein R<sup>1</sup> is an acyl group, and X is a group having a car-  
 bonyl or sulfonyl at one terminal end thereof, said X being able  
 to form with



a five- or six-membered ring of the formula



said five- or six-membered ring being N-carboethoxyphthal-  
 imide, N-carbomethoxyphthalimide, 4-nitro-N-carboethoxyph-  
 thalimide, 3-nitro-N-carboethoxyphthalimide, N-carboethox-  
 ysuccinimide, N-carbomethoxysuccinimide, N-tosylphthal-  
 imide, N-methylsulfonylphthalimide, N-benzenesulfonylph-  
 thalimide, N-acetyl-phthalimide, N-chloroacetylphthalimide,  
 N-acetylsuccinimide, N-carboethoxysaccharin, N-acetylsac-  
 charin, N-benzoylsaccharin, N-carboethoxymaleimide, N-car-

boethoxyglutarimide, N-carboethoxy-(p-chlorophenyl)suc-  
 cinimide, N-carboethoxysatin, N-carbomethoxysatin, N-  
 acetylsatin, N-(methylcarbamoyl)satin, N-(phenylcarbamoyl)-  
 satin, N-(β-methylsulfonyl)ethoxycarbonylsatin, N-(diethyl-  
 phosphoro)succinimide, N-(dimethylphosphoro)succinimide,  
 N-(dimethylphosphino)succinimide or N-(diethylphos-  
 phino)phthalimide,  
 or a salt thereof.

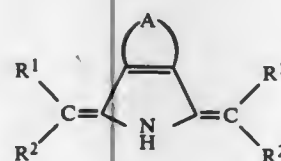
4,166,179  
**MANUFACTURE OF ORGANIC PIGMENTS**  
 Wolfgang Lotsch, Beindersheim, Fed. Rep. of Germany, assignor  
 to BASF Aktiengesellschaft, Fed. Rep. of Germany  
 Filed May 16, 1977, Ser. No. 797,319  
 Claims priority, application Fed. Rep. of Germany, Jun. 24,  
 1976, 2628409

Int. Cl.<sup>2</sup> C09B 57/00

U.S. Cl. 544—296

17 Claims

1. A process for the manufacture of an easily dispersed  
 colorant of the formula



wherein:

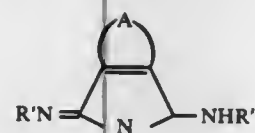


is the radical of barbituric acid, N-methylbarbituric acid,  
 N,N'-dimethylbarbituric acid, N,N'-diphenylbarbituric  
 acid, 2-thiobarbituric acid or 2-iminobarbituric acid; and

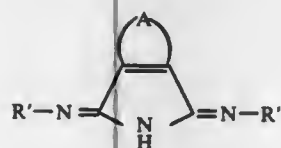


is o-phenylene, 1,2- or 2,3-naphthylene, or the divalent  
 radical of pyridine or pyrazine, and is unsubstituted or  
 substituted by chlorine, bromine, alkyl of 1 to 4 carbon  
 atoms, phenyl, phenoxy, carbamoyl, alkylcarbonylamino  
 where alkyl is of 1 to 3 carbon atoms, benzoylamino,  
 methoxy or ethoxy, the number of substituents being 0, 1  
 or 2; which process comprises:

condensing (A) an amino-imino compound of the formula



or a bis-imino compound of the formula



wherein R' and R'' each is hydrogen, alkyl of 1 to 4 carbon  
 atoms, hydroxyalkyl of 2 or 3 carbon atoms, phenylalkyl of 7  
 or 8 carbon atoms or phenyl, with (B) barbituric acid, N-  
 methylbarbituric acid, N,N'-dimethylbarbituric acid, N,N'-  
 diphenylbarbituric acid, 2-thiobarbituric acid or 2-iminobar-  
 bituric acid, in the molar ratio of (A):(B) of 1:2, in water and  
 in the presence of an acid selected from the group consisting of  
 aliphatic carboxylic acids, aromatic carboxylic acids, aliphatic  
 sulfonic acids, aromatic sulfonic acids, mineral acids and mix-  
 tures thereof, at a pH of from 1 to 6 and at a temperature of  
 from 20° to 150° C.

4,166,180  
**2-ARYLPYPERAZINE DERIVATIVES AND THE  
 PREPARATION THEREOF**

Hideo Kato; Eiichi Koshinaka, and Nobuo Ogawa, all of Fukui,  
 Japan, assignors to Hokuriku Pharmaceutical Co., Ltd.,  
 Fukui, Japan

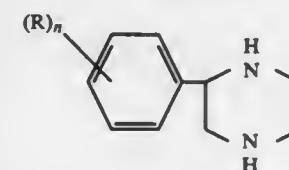
Filed May 11, 1977, Ser. No. 795,869

Claims priority, application Japan, May 13, 1976, 51-53865  
 Int. Cl.<sup>2</sup> C07D 241/12

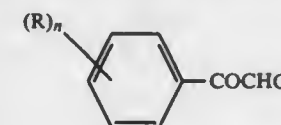
U.S. Cl. 544—398

5 Claims

1. A process for producing a 2-arylpiperazine derivative  
 represented by the formula:



wherein n represents 1, 2 or 3; and R represents a member  
 selected from the group consisting of a halogen atom, a lower  
 alkyl group having from 1 to 8 carbon atoms, a lower alkoxy  
 group having from 1 to about 8 carbon atoms, a nitro group, a  
 cyano group, a benzyloxy group, a hydroxy group or a methyl-  
 enedioxy group, which comprises reducing a phenyl glyoxal  
 derivative represented by the formula



wherein n and R each has the same meaning as defined above,  
 in the presence of ethylenediamine represented by the formula:



4,166,181  
**N,N'-DIPHENYLDIIMIDES OF 6,12,  
 DIALKYL-3,4,9,10-ANTHANTHRENE-TETRACARBOXY-  
 LIC ACID**

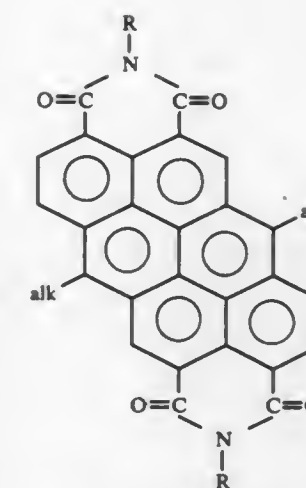
Nikolai S. Dokunikhin, Presnensky val, 42, kv. 23; Georgy N.  
 Vorozhtsov, Sadovo-Spasskaya ulitsa, 21, kv. 268; Faina I.  
 Kichina, Trubnikovskiy pereulok, 34, kv. 2, and Nikolai B.  
 Feldbljum, Bolshoi Golovin pereulok, 12, kv. 10, all of Mos-  
 cow, U.S.S.R.

Continuation of Ser. No. 689,053, May 24, 1976, abandoned,  
 which is a continuation of Ser. No. 550,654, Feb. 18, 1975,  
 abandoned, which is a continuation of Ser. No. 348,629, Apr. 6,  
 1973, abandoned. This application Oct. 6, 1977, Ser. No. 841,825  
 Int. Cl.<sup>2</sup> C07D 471/06, 493/06, 519/00

U.S. Cl. 546—31

1 Claim

1. Anthanthrene compounds of the formula:



wherein alk is an alkyl group having C<sub>2</sub>-C<sub>10</sub> carbon atoms, and  
 R is selected from the group consisting of phenyl,  
 monohalophenyl and monoalkoxyphenyl.

4,166,182  
**6-N-PROPYL-8-METHOXYMETHYL OR  
 METHYLMERCAPTOMETHYLERGOLINES AND  
 RELATED COMPOUNDS**

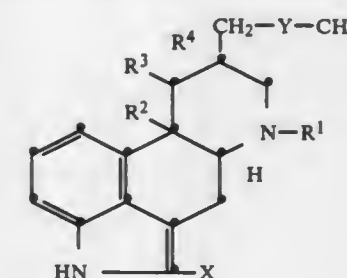
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianap-  
 olis, Ind., assignors to Eli Lilly and Company, Indianapolis,  
 Ind.

Filed Feb. 8, 1978, Ser. No. 875,978  
 Int. Cl.<sup>2</sup> C07D 457/02; A61K 31/48

U.S. Cl. 546—67

8 Claims

1. A compound of the formula



wherein Y is O, SO, SO<sub>2</sub> or S, R<sup>1</sup> is n-propyl, X is H, Cl or Br  
 and R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> when taken singly are hydrogen, and R<sup>2</sup> and  
 R<sup>3</sup> and R<sup>4</sup>, when taken together with the carbon atoms  
 to which they are attached, form a double bond, and phar-  
 maceutically-acceptable acid addition salts thereof.

4,166,183  
**TRICYCLIC CYCLITOLAMINES**  
 Frederic P. Hauck, Bridgewater, and Joyce Reid, Dayton, both  
 of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton,  
 N.J.

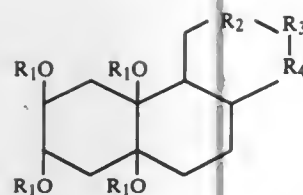
Filed Mar. 23, 1978, Ser. No. 889,471  
 Int. Cl.<sup>2</sup> C07D 215/20, 217/02

U.S. Cl. 546—101

9 Claims

1. A compound having the formula



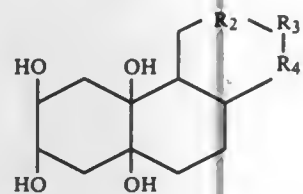


wherein  $R_1$  is alkanoyl having 2 to 7 carbon atoms; and one of  $R_2$ ,  $R_3$  and  $R_4$  is



wherein  $R_5$  is alkyl of 1 to 6 carbon atoms, and the other groups are  $-\text{CH}_2-$ .

9. A compound having the formula



wherein one of  $R_2$ ,  $R_3$  and  $R_4$  is



wherein  $R_5$  is alkyl of 1 to 6 carbon atoms and the other groups are  $-\text{CH}_2-$ .

4,166,184

## 2H-IMIDAZOLE-2-THIONE DERIVATIVES

Ronald J. King, Wareside, and George R. White, Harpenden, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

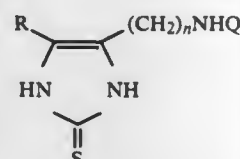
Filed Dec. 8, 1977, Ser. No. 858,488

Claims priority, application United Kingdom, Dec. 22, 1976, 53538/76

Int. Cl.<sup>2</sup> C07D 233/84

U.S. Cl. 548—321

1. A compound of the following Formula I:



wherein  $R$  is methyl or ethyl;  $n$  is 2, 3, 4 or 5;  $Q$  is a benzoyl group; and the acid addition salts thereof.

4,166,185

## IMIDAZO[1,5-a][1,4]BENZODIAZEPINES

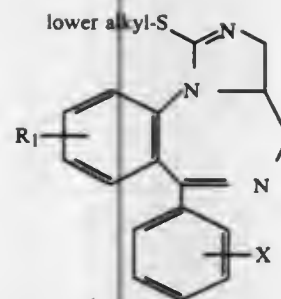
Armin Walser, West Caldwell; Rodney I. Fryer, North Caldwell, and Louis Benjamin, Livingston, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 776,820, Mar. 11, 1977. This application Jul. 27, 1978, Ser. No. 928,628

Int. Cl.<sup>2</sup> C07D 487/04

U.S. Cl. 548—324

1. A compound of the formula



wherein  $R_1$  is hydrogen, halogen or trifluoromethyl; and  $X$  is hydrogen or halogen.

4,166,186

## DIHYDROXY CARBAMATES CONTAINING SULPHONIC ACID GROUPS

Gerhard D. Wolf; Helmut Engelhard, both of Dormagen; Francis Bentz, Cologne, and Günther Nischk, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 4, 1975, Ser. No. 555,229

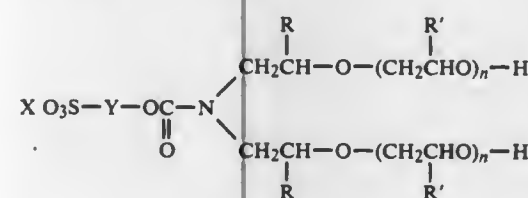
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1974, 2410860

Int. Cl.<sup>2</sup> C07C 143/155

U.S. Cl. 560—27

2 Claims

1. Dihydroxy carbamates containing sulphonic acid groups corresponding to the formula



in which

$Y$ — represents a linear or branched  $C_3$ - $C_6$  alkylene radical,  
 $R, R'$ — represent hydrogen,  $C_1$ - $C_4$  alkyl or phenyl,  
 $X$ — represents  $NH_4$  or an alkali metal and  
 $n$ — is 0 or a number from 1 to 30.

4,166,187

9-DEOXY-9-METHYLENE-16-PHENYL-5,6-DIDEHYDRO-PGF<sub>2</sub> OR 4,4,5,5-TETRADEHYDRO-PGF<sub>1</sub> COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

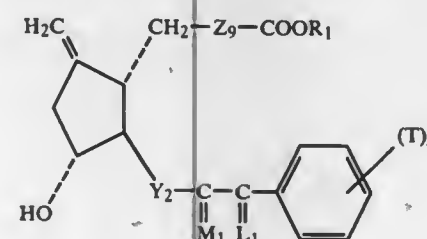
Continuation-in-part of Ser. No. 786,249, Apr. 11, 1977, Pat. No. 4,118,584. This application Jul. 12, 1978, Ser. No. 924,037

Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 560—55

127 Claims

1. A prostaglandin analog of the formula



1 Claim wherein  $Y_2$  is  $\text{trans-CH=CH-}$  or  $-\text{CH}_2\text{CH}_2-$ ;  
wherein  $M_1$  is

4,166,189

## PRODUCTION OF METHYL ESTERS BY CONTACTING METHANOL OR DIMETHYL ETHER WITH CARBON MONOXIDE AND ZINC IODIDE

Milton M. Wald, and Leo Kim, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

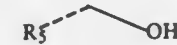
Filed Apr. 24, 1978, Ser. No. 899,056

Int. Cl.<sup>2</sup> C07C 67/36, 67/37

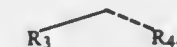
U.S. Cl. 560—232

6 Claims

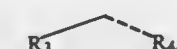
1. A method for the production of methyl esters of branched acids having a carbon number from about five to about eight comprising contacting a material selected from the group consisting of methanol; dimethyl ether and mixtures thereof, with carbon monoxide and zinc iodide at a temperature of from about 180° C. to about 450° C. wherein the molar ratio of carbon monoxide to methanol or dimethyl ether is greater than 0.25.



wherein  $R_5$  is hydrogen or methyl;  
wherein  $L_1$  is



or a mixture of



wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro;

wherein  $Z_9$  is  $-\text{C}=\text{C}-\text{CH}_2-(\text{CH}_2)_g-\text{CH}_2-$  or  $-\text{CH}_2-\text{C}=\text{C}-(\text{CH}_2)_g-\text{CH}_2-$   
wherein  $g$  is one, 2, or 3;

wherein  $T$  is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and  $s$  is zero, one, 2, or 3, the various  $T$ 's being the same or different, with the proviso that not more than two  $T$ 's are other than alkyl;

wherein  $R_1$  is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation, and the 1,11- or 1,15-lactones thereof.

4,166,188

## 2-(2-PENTYNYL) CYCLOPENTANOL DERIVATIVES

Sigeru Torii; Hideo Tanaka, and Yulchi Kobayashi, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Jun. 8, 1978, Ser. No. 913,690

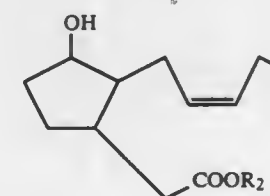
Claims priority, application Japan, Aug. 12, 1977, 52-97181

Int. Cl.<sup>2</sup> C07C 69/74

U.S. Cl. 560—122

1 Claim

1. A 2-(2-pentynyl)cyclopentanol derivative represented by the formula



wherein  $R_2$  is lower straight-chain or branched-chain alkyl, alkenyl or aralkyl.

4,166,191

## PROCESS FOR PRODUCING HIGHLY PURE P-TERTIARY-BUTYL PHENOL

Masakazu Ueoka, Ichikawa; Yasuyuki Iguchi, Ichihara; Takayuki Saito, Hitacl, and Hiroshi Okamura, Chiba, all of Japan, assignors to Hitacl Chemical Company, Ltd.; Maruzen Oil Co. Ltd. and Gol Chemical Co. Ltd., all of Japan

Continuation of Ser. No. 729,795, Oct. 5, 1976, abandoned. This application Feb. 9, 1978, Ser. No. 876,318

Claims priority, application Japan, Sep. 20, 1976, 51-112804

Int. Cl.<sup>2</sup> C07C 39/06

U.S. Cl. 568—789

20 Claims

1. A process for producing highly pure p-tertiary-butyl phenol which comprises using as a starting material an olefin composition comprising a major amount of at least one isobutylene oligomer and 0.5-30% by weight of a codimer of n-butene and isobutylene, reacting said olefin composition with phenol in the presence of sufficient water 0.5-5% by weight to suppress the by-production of ortho-secondary-butyl phenol and para-secondary-butyl phenol and in the presence of a synthetic silica-alumina catalyst at a temperature of 140°-230° C. to selectively react said isobutylene oligomer, whereby a highly pure p-tertiary-butyl phenol can be formed using said olefin composition as a starting material.

20. A process for producing highly pure p-tertiary-butyl

phenol which comprises reacting an olefin composition consisting essentially of 70-99.5% by weight of at least one isobutylene oligomer selected from the group consisting of a dimer, trimer, tetramer and pentamer of isobutylene and 30-0.5% by weight of a codimer of n-butene and isobutylene with phenol, 1-5 moles of phenol being used per mole of said isobutylene oligomer in terms of isobutylene, in the presence of 0.05-3% by weight of water to suppress the by-production of ortho-

secondary-butyl phenol and para-secondary-butyl phenol and in the presence of a synthetic silica-alumina catalyst, calcined at 500°-800° C., comprising 15-35% by weight of alumina and 85-65% by weight of silica at a temperature of 140°-230° C. to selectively react said isobutylene oligomer, whereby a highly pure p-tertiary-butyl phenol can be formed using said olefin composition as a reactant.

## ELECTRICAL

4,166,192

## MATTE SMELTING

Birger L. Ydstie, Blommenholm, Norway, assignor to Elkem-Spligerverket A/S, Oslo, Norway

Division of Ser. No. 747,216, Dec. 3, 1976, Pat. No. 4,115,108.

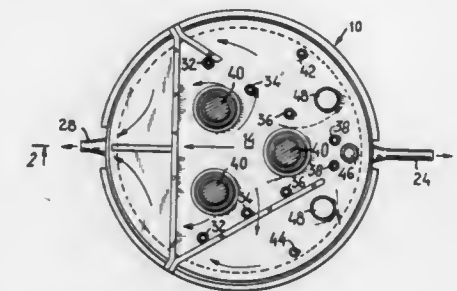
This application Apr. 28, 1978, Ser. No. 901,131

Claims priority, application Norway, Dec. 4, 1975, 754091

Int. Cl.<sup>2</sup> F27D 3/00

U.S. Cl. 13-9 R

2 Claims



1. In a smelting furnace for matte smelting:

- a circular furnace pot having a substantially concave bottom, the radius of curvature of a substantial portion of the bottom being no greater than about the diameter of the furnace pot;
- a triangular arrangement of electrodes disposed in the center of the furnace pot;
- a slag tapping hole in the wall of the furnace pot with one side of the said triangular arrangement facing said slag tapping hole;
- a matte tapping hole in the wall of the furnace located approximately opposite the slag tapping hole, the matte tapping hole being positioned lower in the wall of the furnace than the slag tapping hole;
- a plurality of charging chutes, for the introduction of reducing agent, located in the outer peripheral portion of the furnace pot and in that half of the furnace pot remote from the slag tapping hole;
- a further charging chute, for the introduction of converter slag, located in the outer peripheral portion of the furnace pot approximately opposite the slag tapping hole.

4,166,193

# INSULATORS WITH INCREASED SURFACE CONDUCTIVITY AND METHOD FOR INCREASING THE CONDUCTIVITY ON SURFACES OF INSULATORS HAVING HIGH ELECTRICAL RESISTANCE MADE OF INORGANIC AND ORGANIC MATERIALS SUCH AS CERAMIC, GLASS, PLASTIC AND RESIN

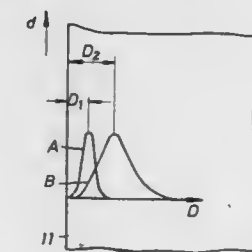
Conrad Schmidt, Meckesheim; Gustav Bünger, Mannheim, and Paul Weiss, Oftersheim, all of Fed. Rep. of Germany, assignors to Brown Boveri & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,287

Int. Cl.<sup>2</sup> H01B 9/04, 17/58

U.S. Cl. 174-28

15 Claims



1. A solid insulator for separating conductors so as to prevent undesired flow of current from the conductors to other

objects, said insulator having high electrical resistance of above about 12 ohm cm, and a band gap between the conduction band and the valence band of above about 5 eV, and an insulator surface of desired conductivity obtained by incorporation by controlled implantation of ions in the insulator adjacent its surface.

4,166,194

# GAS-INSULATED BUSHING WITH SELF-ADJUSTING BUSHING FLANGE SEAL

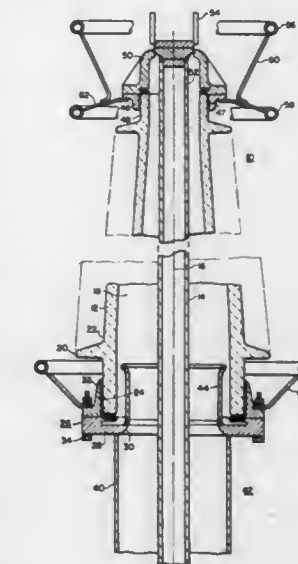
Phillip C. Bolin, Westborough, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,481

Int. Cl.<sup>2</sup> H01B 17/30; H02G 15/22

U.S. Cl. 174-31 R

9 Claims



1. A gas-filled bushing comprising:

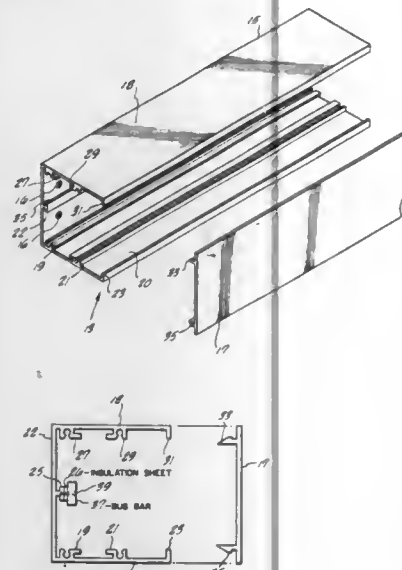
- a hollow elongated gas-filled insulating shell having first and second end portions;
- a central bushing conductor extending along the axis of said insulating shell and having one end thereof fixed to said insulating shell first end portion;
- a flange ring having a central opening and secured to said insulating shell second end portion, said flange ring and said insulating shell second end portion forming a joint therebetween, said flange ring having a circumferential groove therein adjacent said insulating shell second end portion;
- sealing means disposed on said flange ring between said flange ring and said insulating shell second end portion for minimizing the passage of gas through said joint, said sealing means comprising a seal disposed within said groove and extending outwardly therefrom and contacting said insulating shell second end portion; and
- flexible means formed with said flange ring for controlling the compression of said sealing means against said insulating shell second end portion, said flexible means comprising said flange ring having a radial slot extending outwardly from said central opening to a location radially outwardly beyond said circumferential groove.



**4,166,195**  
**DUCT APPARATUS FOR DISTRIBUTION OF ISOLATED POWER AND EQUIPOTENTIAL GROUND**  
 Ardath M. Schwab, Irvine, Calif., assignor to Isotrol Systems, Los Alamitos, Calif.

Filed Jul. 22, 1977, Ser. No. 818,113  
 Int. Cl.<sup>2</sup> H02G 5/06, 3/04  
 U.S. Cl. 174—95

12 Claims



1. A surface duct for distributing power conductors comprising:

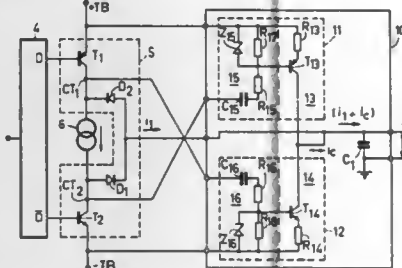
a main body portion being essentially U-shaped, having a pair of ridges running along the length of the open ends of said body portion, essentially perpendicular to the sides thereof, a boss in the interior of said main body portion and extending substantially along the length thereof, said boss adapted for fastening a bus-bar thereto, a plurality of retainer protrusions in the interior of said main body portion located to retain at least one flexible partition therein;

a bus bar fastened to said mounting bus; and  
 a cover plate removably attachable to the open side of said main body portion.

**4,166,196**  
**ELECTRIC DIRECT CURRENT TELEGRAPHY TRANSMITTER**  
 Gerrit Rademaker, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,984  
 Claims priority, application Netherlands, Apr. 29, 1977, 7704703  
 Int. Cl.<sup>2</sup> H04L 15/00  
 U.S. Cl. 178—68

4 Claims



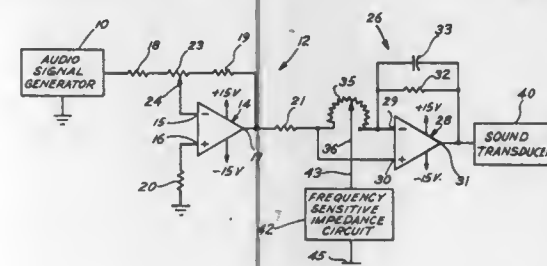
1. An electronic transmitter for direct current telegraphy systems in which binary data signals are converted into polar line currents for transmission over a telegraph line, the transmitter comprising an input circuit means for generating com-

mand signals from the data signals which are galvanically isolated therefrom, a telegraph voltage source having a positive and a negative pole, a unipolar constant current source, a switching circuit means controlled by the command signals for selectively connecting one of the two poles of the telegraph voltage source to the telegraph line through the unipolar constant current source, and an output filter having a capacitor in parallel with the telegraph line, the output filter comprising two complementary branches in parallel with the telegraph line, at least one of the two branches comprising means operating in response to a polarity transition of the line current supplied by the current source means for supplying a correction current pulse of a polarity opposite to the line current to the telegraph line.

**4,166,197**  
**PARAMETRIC ADJUSTMENT CIRCUIT**  
 Robert A. Moog, East Aurora, and Richard M. Walborn, Tonawanda, both of N.Y., assignors to Norlin Music, Inc., Lincolnwood, Ill.

Filed Mar. 30, 1978, Ser. No. 891,694  
 Int. Cl.<sup>2</sup> H03H 7/16  
 U.S. Cl. 179—1 D

9 Claims



1. In an audio system for amplifying an electrical signal including first difference amplifier means having a first input and a second input and further including variable resistance means connected across the first and second inputs for controlling the height parameter of the system, improved apparatus coupled to the variable resistance means for adjusting the width and frequency response parameters of the system in order to shunt an adjustable amount of the electrical signal to a current sink, said apparatus comprising:

shunt means for conducting variable amounts of the electrical signal between the variable resistance means and the current sink depending on the value of a compensation signal;

resonant means including an input and an output for creating an impedance maximum or minimum at an adjustable resonant frequency;

means for adjusting the resonant frequency whereby the frequency parameter can be controlled;

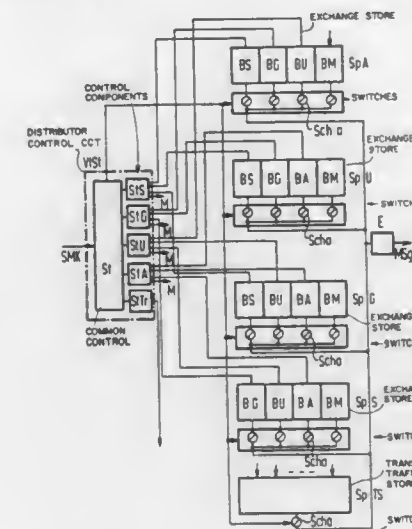
means for adjustably coupling the shunt means to the resonant means, whereby the width parameter can be adjusted; and

compensation means responsive to the resonant means for generating the compensation signal and for applying the compensation signal to the shunt means, whereby conduction of the electrical signal through the shunt means is inhibited at frequencies widely displaced from the resonant frequency.

**4,166,198**  
**PROCESS FOR OPERATING SUB-ZONES OF A DIGITAL T.D.M. TELECOMMUNICATIONS NETWORK FOR LONG DISTANCE TRAFFIC**  
 Alfred Mattern, Groebenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,015  
 Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2708037  
 Int. Cl.<sup>2</sup> H04Q 9/00; H04J 3/00; H04Q 11/04  
 U.S. Cl. 179—15 BA

4 Claims



1. In a process for operating a digital time division multiplex telecommunications network for long distance traffic, in which, on wide-band transmission links which connect exchanges, information blocks are transmitted and comprise items of information from subscriber groups which can be identified by a preceding block address or by the sequence of their occurrence, the network comprising a main transmission link with two ends, a first main exchange at one of said ends, a second main exchange at the other of said ends and branch stations connected intermediate said ends and connected to branch exchanges via respective branch links, the improvement therein, comprising the steps of:

sequentially transmitting information blocks from said second main exchange and said branch stations, intended for predetermined called exchanges, on said main transmission link toward said first main exchange; receiving said information blocks at said first main exchange; switching through, at said first main exchange, those information blocks intended for others of said called exchanges; and receiving the switched-through information blocks at the branch stations associated with the called exchanges.

**4,166,199**  
**ATTENDANT CONSOLE COMPLEX**  
 Klaus Gueldenpfennig, Penfield, and Charles J. Breidenstein, Rochester, both of N.Y., assignors to Stromberg-Carlson Corporation, Tampa, Fla.

Filed Nov. 25, 1977, Ser. No. 854,639  
 Int. Cl.<sup>2</sup> H04M 3/62

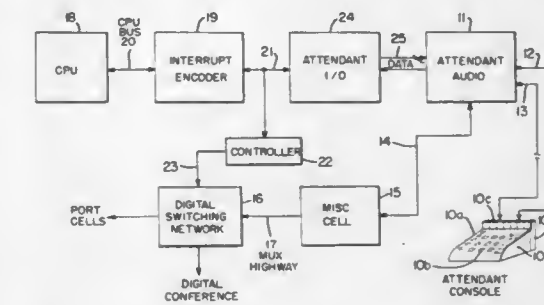
22 Claims

U.S. Cl. 179—27 CA  
 1. An operator console for a PABX system having a common control comprising:

a plurality of actuatable keys each having first and second operative states and means for generating key state signals indicating the operative state of each of said keys; means for repetitively scanning the operative state of said keys including multiplexing means for sequentially multiplexing said key state signals;

985 O.G. 41

storage means for storing the operative state of each key; decoder means responsive to the operative state of a key as provided by said storage means and the key state signal generated by that key as provided by said means for scanning, said decoder means being operative to detect a transition of said key from said first to said second operative



states for generating a key transition signal in response to said detections; and message formulating means responsive to said decoder means and said means for scanning, said message formulating means being operative to formulate a message to be sent to said common control, said message including said key transition signal and the key identification.

**4,166,200**  
**COMPACT ROTARY SWITCH CONSTRUCTION**  
 John E. Reichen, Portland, and Scott B. Long, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.  
 Continuation of Ser. No. 603,420, Aug. 11, 1975, abandoned.  
 This application Aug. 7, 1978, Ser. No. 931,337  
 Int. Cl.<sup>2</sup> H01H 3/00, 19/00

U.S. Cl. 200—11 R

10 Claims



1. In a multiposition rotary electrical switch having a stator comprising an insulating substrate bearing a plurality of electrical contact pads arranged in multiple concentric rings on a surface thereof, a rotor comprising a disklike insulating body mounting electrical contact means for simultaneously engaging selected pads in different ones of said rings to interconnect the selected pads, said contact means comprising a multifinger wiper, and means including a shaft supporting said rotor in faceopposed relation to said substrate for rotation relative thereto upon axial rotation of said shaft, the improvement wherein

said insulating body includes means on a face thereof for mounting said wiper in either of two different operational orientations, the fingers of said wiper extending in one rotational direction when mounted in one of said orientations and in the opposite rotational direction when mounted in the other of said orientations, and said wiper is mounted in a selected one of said orientations.

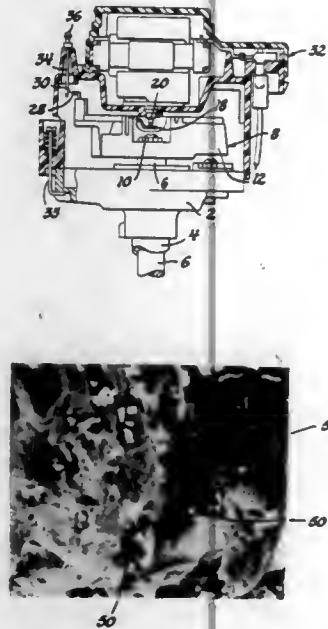
4,166,201  
**IGNITION DISTRIBUTOR ELECTRODE FOR  
 SUPPRESSING RADIO FREQUENCY INTERFERENCE**  
 William C. Olander, Birmingham; Douglas J. Harvey, Sterling  
 Heights, and David S. Eddy, Romeo, all of Mich., assignors to  
 General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1978, Ser. No. 868,078

Int. Cl.<sup>2</sup> H01H 19/00, 1/00

U.S. Cl. 200—19 DR

4 Claims



1. In an ignition distributor system for an internal combustion engine of the type wherein a high voltage is produced for an engine spark plug by a high voltage electrical discharge across a gap between a distributor electrode and a spark plug lead terminal, the improvement wherein,

at least an end portion of said electrode adjacent said gap consists essentially of interspersed phases of discrete fibers of a dielectric material and an electrically conductive material, a portion of said dielectric fibers protruding from the end of said electrode into said gap, promoting breakdown across the gap and tending to suppress radio interference.

2. In an ignition distributor of the type wherein a rotating electrode has a tip which is rotated in a circumferential path to successive registrations with a plurality of circumferentially spaced stationary electrodes so as to define successive radial gaps across which arcs are established, the improvement wherein,

the tip is composed of interspersed phases of a conductive material and fibers of a dielectric material, a portion of the dielectric fibers protruding from the conducting material to define a nonuniform electric field which encourages breakdown across the gap and tends to suppress radio interference.

4,166,202

**SWITCH ACTUATING MECHANISM**

John J. Reiter, 6521 Stevens Ave. South, Minneapolis, Minn. 55423

Filed Feb. 1, 1978, Ser. No. 874,401

Int. Cl.<sup>2</sup> H01H 9/28, 3/16

U.S. Cl. 200—44

4 Claims

1. A safety device for electrically powered equipment, comprising:

(a) a box-like housing structure having opposed generally rectangular side walls spaced apart from one another by a top member, a bottom wall and an intermediate wall oriented generally parallel to said bottom wall;

(b) an electrical switch having an actuator movable between

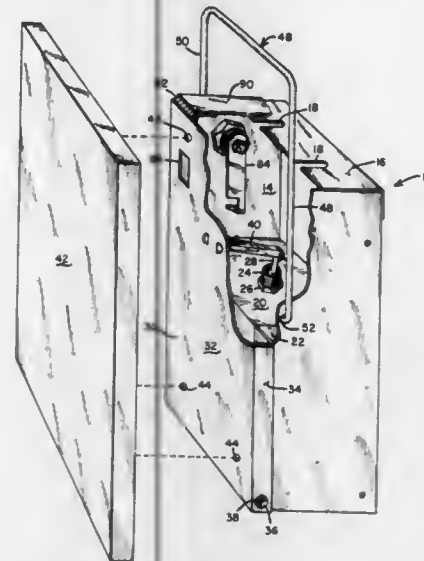
an "open" position and a "closed" position mounted within said housing structure on said intermediate wall;

(c) a broad surface member pivotally attached between said side walls along an edge thereof proximate said bottom wall;

(d) a linkage coupling said broad surface member to said actuator;

(e) a generally "U"-shaped wire bail having spaced apart parallel leg members terminating in inwardly extending end portions which extend through said side walls to the interior of said housing and rotatable therein;

(f) an elongated strap member attached to one of said end portions and rotatable therewith;



(g) a spring biased latch pivotally mounted on one of said side walls and having a hook portion at one end for engaging said broad surface member and a projection at its other end adapted to abut said elongated strap such that when said bail member is rotated, said hook is disengaged from said broad surface member allowing said broad surface member to be pivotally moved from a first orientation with respect to said housing in which said switch actuator is in said "open" position to a second orientation in which said switch actuator is in said "closed" position; and

(h) a key operated lock means, operable independently from said latch mechanism, coupling said broad surface member to said housing structure for preventing movement of said broad surface member from said first orientation to said second orientation until unlocked by said key.

4,166,203

**ELECTRICAL SWITCH**

Brian Hoyle, Nelson, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 17, 1978, Ser. No. 870,093

Claims priority, application United Kingdom, Jan. 21, 1977, 2609/77

Int. Cl.<sup>2</sup> H01H 3/16

U.S. Cl. 200—61.27

6 Claims

1. An electrical switch of the kind known as a stalk mounted switch, said switch comprising:

an elongate, hollow stalk which defines the operating member of a further electrical switch;

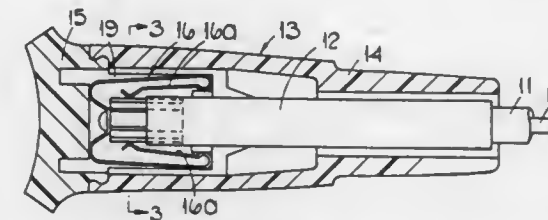
a hollow body slidable on the stalk lengthwise thereof;

electrical contacts operable by movement of said hollow body relative to said stalk;

resilient means urging said body longitudinally of said stalk in a direction to move said body to a free end of said stalk; and

abutment means preventing the body from disengaging from

said free end of said stalk under said urging of said resilient means, said body comprising a hollow sleeve and a cap secured to said sleeve, said electrical contacts comprising a fixed contact assembly carried at said free end of said stalk and a movable contact movable with said body, said movable contact being electrically connected to a conductive lead extending through said hollow stalk, and said sleeve being slidable on said stalk, said sleeve having an



internal diameter such that said sleeve is disengageable from said free end of said stalk, said abutment means comprises a first abutment component within said body cooperating with a second abutment component on said stalk and fixed contact assembly, said second abutment component preventing disengagement of said body from said free end of said stalk in the direction of urging of said resilient means, said electrical lead being connected directly to said movable contact.

4,166,204

**SWITCH FOR TIMER**

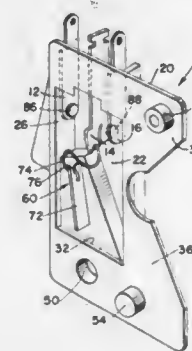
James W. Richmond, Charlotte, N.C., assignor to General Time Corporation, Thomaston, Conn.

Filed Jan. 5, 1978, Ser. No. 867,038

Int. Cl.<sup>2</sup> H01H 21/04

U.S. Cl. 200—67 D

5 Claims



1. A switch including a plurality of contact arms and housing means for mounting said arms in juxtaposed stacked relation, said contact arms comprising a pair of outer arms and a center arm, an actuator mounted by said housing means and adapted for pivotal movement, loading means operatively connecting said actuator and center arm so that upon movement of said actuator in one direction or the other through an over center position said loading means will cause said center arm to break contact with one outer arm and transfer with snap action to the other outer arm, and said center arm having a slot extending from the contact end defining a center arm portion which connects the loading means to the center arm and a contact portion, said center arm portion being pivotally moved in the same direction as said contact portion yet through a greater distance than the contact portion whereby said contact at least by small contact pressure will be maintained up to said break and transfer.

4,166,205

**STORED ENERGY CIRCUIT BREAKER**

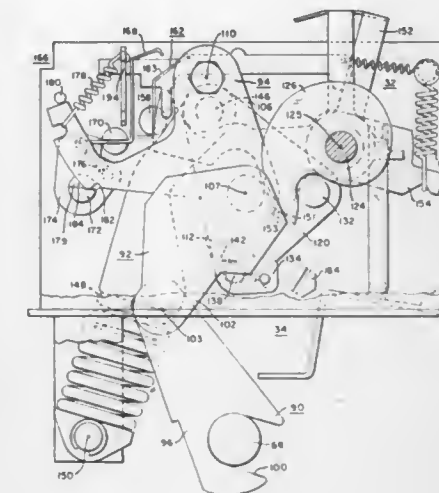
Alfred E. Maier, Chippewa; Louis N. Ricci, Chippewa Twp., Beaver County, and Donald D. Armstrong, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,768

Int. Cl.<sup>2</sup> H01H 3/60

U.S. Cl. 200—153 G

23 Claims



1. A circuit breaker comprising:

a stationary contact;

a movable contact operable between open and closed positions with respect to said stationary contact, said movable contact being biased in the open position;

a movable contact holder, said movable contact being held by said contact holder;

toggle means engaging said contact holder for moving said movable contact between said open and closed positions, said toggle means comprising first and second links and a toggle lever, said first link operationally engaging said contact holder, said second link being pivotally connected to said first link, said toggle lever being pivotally connected to said second link, said second link having a drive pin fixedly secured thereto;

a rotatable drive shaft having a cam secured thereto, said cam being rotatable with said drive shaft;

means for rotating said drive shaft;

a rotatable follower plate having a cam roller secured thereto, said follower plate having a drive pawl pivotally secured thereto, said cam roller engaging said cam, said drive pawl being disposed adjacent said drive pin;

spring means pivotally connected to said follower plate and capable of being in spring charged and spring discharged positions, said spring means being charged by the rotation of said cam causing said cam roller engaged therewith to move outwardly causing rotation of said follower plate causing charging of said spring means, the changing of position of said spring means from charged to discharged causing rotation of said follower plate such that said drive pawl is capable of engaging said drive pin to move said toggle means into a toggle position, the movement of said toggle means into toggle position causing movement of said contact holder which moves said movable contact into closed position;

releasable toggle latch means for holding said toggle means in toggle position; and,

releasable drive latch means for holding said follower plate in the spring charged position.



**4,166,206**  
**METAL STRAP ELECTRICALLY GROUNDING A MOTOR TO A TIMER**

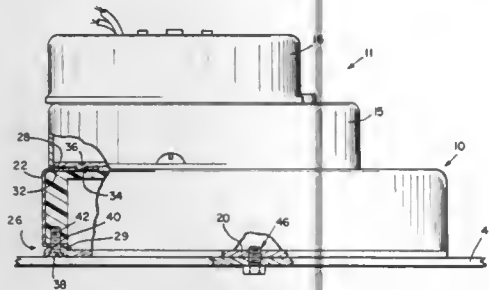
Kenneth E. Deane, Beech Grove, and Neil E. Grah, Fairland, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 617,976, Sep. 29, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 850,110

Int. Cl.<sup>2</sup> H01H 9/02

U.S. Cl. 200—293

2 Claims



1. In a combination of a timer and motor carried by a housing for said timer and driving same, a means to electrically ground said motor comprising:

- a metal strap,
- securing means securing an end of said strap to a housing for said motor including spring tabs lanced from said strap and engaging said housing for said motor and an aperture in said end engaging a dimple protruding from said housing for said motor, and
- a fastener securing another end of said strap to a timer mounting plate carried by said housing for said timer.

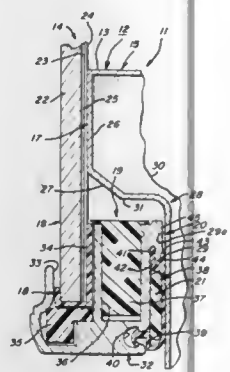
**4,166,207**  
**MICROWAVE GENERATING DEVICE—DOOR SEAL**  
 Harry D. Burke, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 31, 1977, Ser. No. 801,833

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 D

32 Claims



1. In a microwave generating device having a cabinet defining a cavity provided with an opening with a front edge portion of the cabinet defining the outward periphery of the opening, a closure impervious to the microwave energy extending removably across said opening and having a peripheral portion forwardly overlying said cabinet edge portion, and means for generating microwave energy in the cavity, improved series and parallel related seal means for preventing loss of microwave energy outwardly between said closure peripheral portion and said cabinet opening edge portion comprising:

- cooperating surface portions on said closure peripheral portion and said cabinet opening edge portion facially juxtaposed when said closure is disposed across said opening and defining a first capacitive seal against transmission

of microwave energy outwardly from said cavity therebetween;

- a metallic frame extending about said closure peripheral portion and having a recess opening inwardly toward said capacitive seal to define a wave trap having a length preselected to be effectively one-quarter the wavelength of the microwave energy;
- a second capacitive seal outwardly of said wave trap;
- an electrically conductive reflective seal embracing said closure peripheral portion within said frame and forwardly of said wave trap; and
- a microwave energy absorbing seal between said frame and said cabinet opening edge portion rearwardly of said wave trap and outwardly of said capacitive seal.

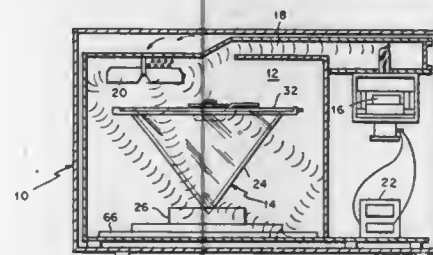
**4,166,208**  
**CORN POPPER WITH BUTTER DISPENSER**  
 Thomas J. Martel, North Reading; George Freedman, Wayland; Robert F. Bowen, Burlington, and Wesley W. Telch, Wayland, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 27, 1978, Ser. No. 890,094

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 E

7 Claims



1. A microwave popcorn maker comprising a bowl, a cover extending across the open top of the bowl and having an aperture therein, said bowl and cover being of microwave-transparent material, and a butter dispenser comprising a microwave-impervious container shaped to interfit within said aperture, and a lid for said container, said lid being predominantly impervious to microwave energy and having means for permitting a controlled amount of microwave energy to pass into the interior of the container.

**4,166,209**  
**APPARATUS FOR REDUCING OPERATING NOISE OF THE AIR-CARBON ARC CUTTING AND GOUGING PROCESS**

Perry Rieppel, Worthington, and Raymond Sadauskas, Columbus, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Nov. 7, 1977, Ser. No. 848,827

Int. Cl.<sup>2</sup> B23K 7/00

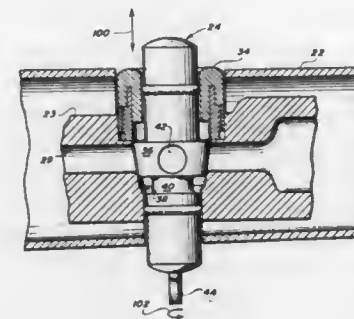
U.S. Cl. 219—70

2 Claims

1. In a manually operated air-carbon arc cutting and gouging torch having a handle with a body having means to grip an elongated electrode leaving a portion of the electrode length exposed to project toward a workpiece so that an arc may be struck and maintained between the electrode tip and the workpiece, at least one air nozzle means on said body connected through a passage in the body to a source of high pressure air so that a stream of high pressure air can be directed along an aerial path along the exposed length of the electrode toward the electrode tip to blow metal from the arc as it is melted, and a spool valve including a generally frusto-conical portion adapted to engage a complementary shaped valve seat in said passage and adapted to start and stop air flow through said nozzle; the improvement which comprises in combination:

- a generally cylindrical bore through said frusto-conical portion of said spool valve adapted to be positioned to

admit air to flow from said source to said nozzle without unseating said valve and means on said spool valve disposed generally parallel to the cylinder axis of said bore to indicate the position of said bore relative to said passage in



said body whereby the operator can manually select to admit full air source pressure to said nozzle or limit air pressure across said nozzle to a maximum of sixty pounds per square inch regardless of said source pressure so that the operating noise level can be reduced at least 4 dbA.

**4,166,210**  
**ELECTRODES FOR USE IN THE EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE**

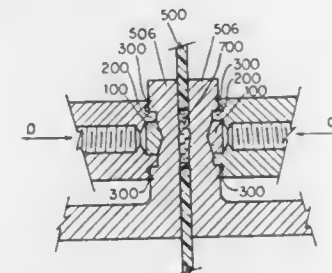
William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Apr. 26, 1977, Ser. No. 790,881

Int. Cl.<sup>2</sup> B23K 11/30

U.S. Cl. 219—78.15

3 Claims



1. In an apparatus having electrodes for extruding and electrically fusing lead parts through an aperture in a lead-acid battery case to form a connection therethrough, said aperture having a substantially flat surface region disposed around the perimeter thereof, the improvement wherein said electrode comprises a forging means for deforming the lead generally surrounding said aperture adjacent said flat surface region to thereby prevent expulsion of molten metal compressed within said aperture, said forging means comprising a generally annular cutting edge.

**4,166,211**  
**ERROR CONTROL SYSTEM FOR NAMED DATA**  
 Kenneth L. York, Huntingdon Valley; Peter R. Annal, West Chester, and John E. Legory, Paoli, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 893,068

Int. Cl.<sup>2</sup> G06F 11/10

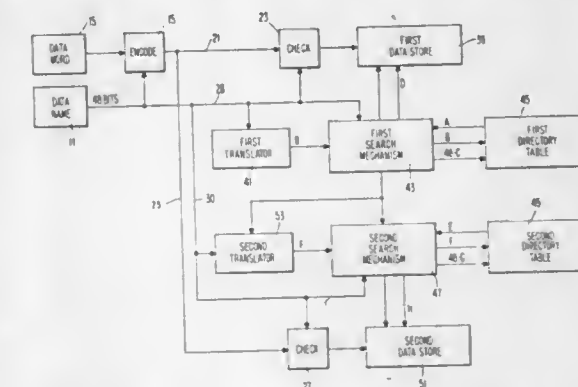
U.S. Cl. 235—312

4 Claims

1. An error control system for named data words comprising: encoder means inputted by a data word and its associated data name for generating a concatenated encoded word comprising the data word inputted thereto and a generated parity check; first check means fed by said encoder means and by said data

name associated with said concatenated encoded word generated by said encoder means, said first check means for providing a parity check upon said concatenated encoded word;

first store means fed by said first check means for storing within said concatenated encoded word checked by said first check means, said first store means having a plurality of storage portions, each storage portion therein having a plurality of storage locations, each storage location therein for storing a concatenated encoded word; first translator means receiving said associated data name and operative thereupon for specifying a particular portion in said first storage means for storing said concatenated word checked by said first check means; first locating means fed by said first translator means and by said data name associated with said concatenated encoded word and operative thereupon for specifying a particular storage location within said particular portion in said first storage means specified by said first translator means for storage of said concatenated encoded word; second check means fed by said encoder means and by said



data name associated with said concatenated encoded word generated by said encoder means, said second check means for providing a parity check upon said concatenated word;

second store means fed by said second check means for storing within said concatenated encoded word checked by said second check means, said second store means having a plurality of storage portions, each storage portion therein having a plurality of storage locations, each storage location therein for storing a concatenated encoded word; second translator means receiving said associated data name and operative thereupon for specifying a particular portion in said second storage means for storing said concatenated word checked by said second check means; and second locating means fed by said second translator means and by said data name associated with said concatenated encoded word and operative thereupon for specifying a particular storage location within said particular portion in said second storage means specified by said second translator means for storage of said concatenated encoded word.

**4,166,212**  
**RECIRCULATING OPTICAL DELAY LINE**  
 André J. Judeinstein, Saint-Remy-les-Chevreuse, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,038

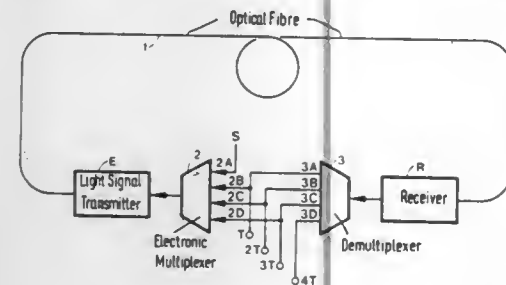
Int. Cl.<sup>2</sup> H04B 9/00; G02B 5/14

U.S. Cl. 250—199

6 Claims

1. An optical fiber delay arrangement comprising: an optical fiber of predetermined length; a light energy transmitter to convert data in electrical form to be delayed and which is applied at the input of said

transmitter into a modulated light signal injected at one end of said fiber;  
a receiver located at the other end of the fiber to reconstruct, from said light signal, the said data in electrical form;  
and reiteration means including an electronic multiplexing device with  $n$  channels whose output is connected to the input of said transmitter and an electronic demultiplexing

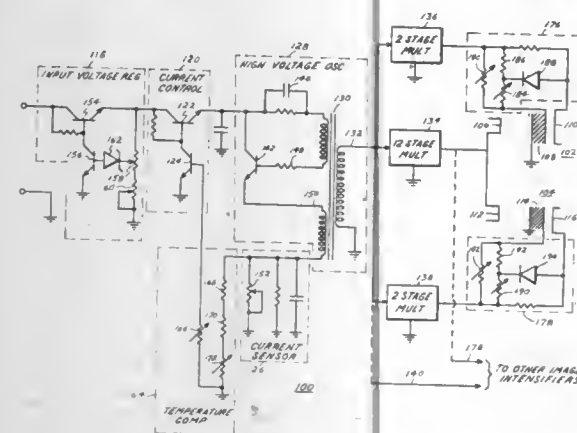


device with  $n$  channels whose input is connected to the output of said receiver, the  $n-1$  first channels of said demultiplexer being connected respectively to the  $n-1$  last channels of said multiplexer, so as to constitute  $n$  independent transmission channels through said fiber, said channels being employed, successively, and said data to be delayed being applied to the first channel of said multiplexer.

**4,166,213**  
**SINGLE POWER SUPPLY MULTIPLE IMAGE INTENSIFIER APPARATUS AND METHOD WITH INDEPENDENTLY ADJUSTABLE LOW LIGHT GAIN AND HIGH LIGHT SATURATION LEVEL**  
Alan W. Hoover, Hollins, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.  
Filed Jul. 8, 1977, Ser. No. 814,007  
Int. Cl.<sup>2</sup> H01J 31/50

U.S. Cl. 250—213 VT

26 Claims



1. A power supply for supplying operating power to a plurality of image intensifiers comprising:  
dc to ac converter means having an input coupled to a source of dc power and a high voltage ac output;  
voltage multiplication means for rectifying and multiplying said high voltage ac output to derive high voltage dc power for said image intensifiers;  
power sensing means coupled to said plurality of image intensifiers for detecting changes in intensifier operating power corresponding to changes in intensifier input illumination for deriving a feedback control signal proportional to the total power consumed by said plurality of image intensifiers;  
control means responsive to said control signal and coupled

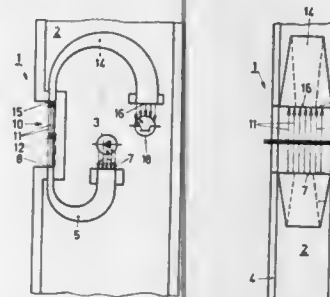
to said dc to ac converter means for providing automatic brightness control for said plurality of image intensifiers;  
means for independently adjusting the low light level gain of each of said image intensifiers; and  
means for independently adjusting the high light saturation level characteristic of each of said image intensifiers.

**4,166,214**  
**OPTICAL-ELECTRICAL SYSTEM FOR MONITORING FILAMENTS, WIRES, STRANDS, TAPES AND THE LIKE**  
Gabriella Fuchs-Viniczay, Steinach, and Kurt Huber, Arbon, both of Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland  
Filed Dec. 7, 1977, Ser. No. 858,332

Claims priority, application Switzerland, Dec. 8, 1976, 15460/76

U.S. Cl. 250—227 Int. Cl.<sup>2</sup> G02B 5/14

2 Claims



1. An optical-electrical system for monitoring elongated filaments, wires, strands, tapes and the like of narrow, fine configuration comprising a housing having a recess, a light source and a photodetector in said housing, a first light guide in said housing between said light source and one end of said recess, a second light guide in said housing between the other end of said recess and said photodetector, said light guides each having an IN and an OUT face which are equal in area, the OUT face of said first light guide and the IN face of said second light guide being aligned with one another and with said recess and being in the shape of an elongated rectangle, said recess being shaped to receive said elongated filaments, wires, strands, tapes and the like extending in a direction parallel to said elongated rectangular faces of said light guides, whereby a substantial portion of the light rays emitted from the OUT face of said first light guide are intercepted.

**4,166,215**  
**METHODS AND APPARATUS FOR DETERMINING DYNAMIC FLOW CHARACTERISTICS OF PRODUCTION FLUIDS IN A WELL BORE**  
Ronald A. Anderson, Houston, Tex., assignor to Schlumberger Technology Corporation  
Filed Sep. 23, 1977, Ser. No. 835,933  
Int. Cl.<sup>2</sup> G01V 5/00

U.S. Cl. 250—260

43 Claims

1. A method for determining at least one dynamic flow characteristic of biphasic well bore fluids within a selected interval of a production well where there are bubbles of a lighter, discontinuous-phase fluid passing through a column of a heavier, continuous-phase fluid, and comprising the steps of:  
discharging a fluid-miscible radioactive tracer into the well bore fluids at a chosen depth location within said selected well interval for mixing at least a portion of said tracer with the continuous-phase fluid therein;  
following the discharge of said tracer, obtaining at least one indication functionally related to the level of radioactivity in the continuous-phase fluid then above said chosen depth location and at least another indication functionally

related to the level of radioactivity in the continuous-phase fluid then below said chosen depth location; and



correlating said indications with one another for determining at least one dynamic flow characteristic of the continuous-phase fluid within said selected well interval.

**4,166,216**  
**METHODS AND APPARATUS FOR DETERMINING DYNAMIC FLOW CHARACTERISTICS OF PRODUCTION FLUIDS IN A WELL BORE**  
Walter E. Cumberly, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation  
Filed Sep. 23, 1977, Ser. No. 835,934  
Int. Cl.<sup>2</sup> G01V 3/00

U.S. Cl. 250—260

70 Claims



1. A method for determining individual dynamic flow characteristics of biphasic connate fluids in a production well and comprising the steps of:

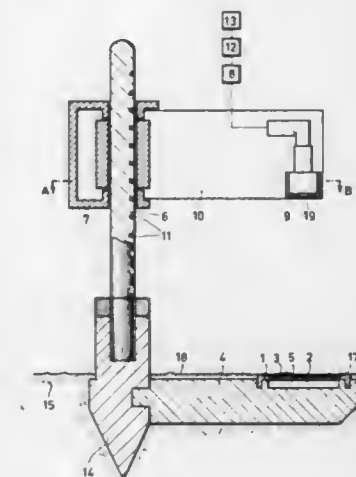
temporarily gathering at least some of any discontinuous-phase oil flowing through continuous-phase water at a selected depth location in said production well into coalesced bodies of such oil and directing such coalesced bodies along a restricted channel;  
discharging a radioactive tracer along an axis intersecting the flow path of fluids moving along said restricted channel during one time interval for mixing a detectable quan-

tity of that tracer with at least one coalesced body of oil directed along said restricted channel;  
monitoring the level of radioactivity in said production well above said restricted channel after said one time interval for obtaining at least one indication representative of the movement of tracer-bearing oil through the continuous-phase connate water above said selected depth location;  
discharging a radioactive tracer into the connate fluids during another time interval for mixing a detectable quantity of that tracer with at least some of the continuous-phase water at said selected depth location; and  
monitoring the level of radioactivity in said production well beyond said restricted channel after said other time interval for obtaining at least another indication representative of the movement of tracer-bearing connate water beyond said selected depth location.

**4,166,217**  
**APPARATUS FOR CONTINUOUSLY MEASURING QUANTITATIVE CHANGES IN MOISTURE CONDENSATION AT A SURFACE**  
Claus Bunnberg, and Wilhelm Kühn, both of Hanover, Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen- und Umweltforschung mbH München, Neuherberg, Fed. Rep. of Germany  
Filed Oct. 6, 1977, Ser. No. 840,018  
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2644997  
Int. Cl.<sup>2</sup> G01N 23/00, 5/02

U.S. Cl. 250—308

10 Claims

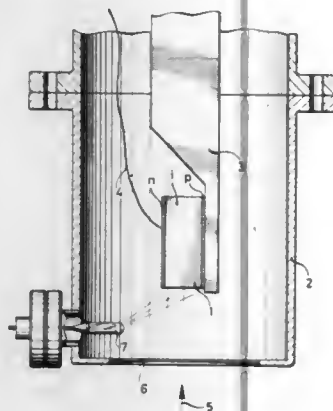


1. Apparatus for the continuous measurement of increases and decreases in moisture on soil and/or plant surfaces, comprising: a dew measuring probe composed of a sample material; a radiation source disposed underneath said dew measuring probe and constituting means for emitting beta particles; and a beta particle detector disposed in alignment with said radiation source and on the opposite side of said dew measuring probe from said source.



4,166,218  
**P-I-N DIODE DETECTOR OF IONIZING RADIATION WITH ELECTRIC FIELD STRAIGHTENING**  
 Davor Protic, Julich, and Georg Riepe, Mechernich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,798  
 Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650154  
 Int. Cl.<sup>2</sup> G01T 1/22; H01L 27/14, 29/12  
 U.S. Cl. 250—370 2 Claims



1. Apparatus for detecting or measuring ionizing radiation comprising:

a semi-conductor diode having an intrinsically conducting zone between a p-type conduction layer and an n-type conduction layer and provided with connections for applying an electrical field in the blocking direction of the diode;

a casing surrounding said diode of material opaque to light and effective to provide electrical shielding, said casing having a window transparent for the ionizing radiation for irradiating therewith said intrinsic zone of said diode between said p-type and n-type layers so as to produce electron-hole pairs therein and to generate electrical pulses as the result of said electrical field;

means for counting said pulses connected to said diode, and means (7) for irradiating said intrinsic conduction zone (1) with electro-magnetic radiation of such energy and intensity as to increase to a maximum the response probability of said diode (1) for an ionizing radiation consisting of gamma rays and/or for increasing to a maximum the resolving capability of said diode for ionizing radiation consisting of charged particles.

4,166,219  
**DETECTION OF GROUND STATE HYDROGEN AND DEUTERIUM**

Christopher P. Ausschnitt, Holmdel; Gary C. Bjorklund, Cranbury; Richard R. Freeman, Red Bank, and Ralph H. Storz, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1978, Ser. No. 907,591  
 Int. Cl.<sup>2</sup> B01D 59/44; H01J 39/34  
 U.S. Cl. 250—423 P 7 Claims

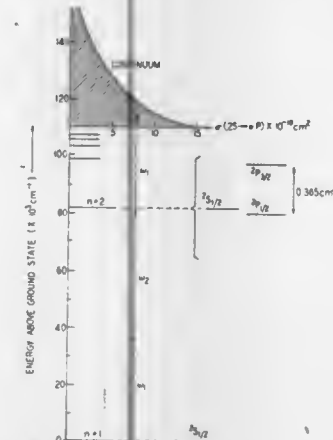
1. Apparatus for detecting small concentrations of ground state atomic hydrogen and atomic deuterium comprising:

a first laser source of a beam of photons each one of which has a first energy less than the energy difference between the 1S and 2S states of atomic hydrogen and atomic deuterium, said first energy being greater than the energy difference between the 2S state and the continuum of said atomic hydrogen and said atomic deuterium;

a second laser source of a beam of photons each one of which has a second energy which is different from said

first energy and which is tunable in such a manner that a sum with said first energy is substantially equal to said energy difference between the 1S and 2S states of atomic hydrogen or atomic deuterium;

means for applying the beam from said first laser source and the beam from said second laser source to substantially the same volume at the same time, whereby said atomic hydrogen or said atomic deuterium is ionized by two pho-



tons from said first laser source and one photon from said second laser source and the ionization is enhanced by the fact that the sum of said first energy and said second energy is substantially equal to said energy difference between the 1S and 2S states;

means for collecting the ions of said atomic hydrogen or said atomic deuterium; and

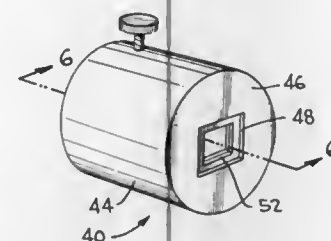
means for generating an electric signal in response to said collection of said ions to detect small concentrations.

4,166,220  
**ADD-ON COLLIMATOR CAP FOR DENTAL X-RAY COLLIMATOR TUBE AND DENTAL X-RAY SYSTEM THEREWITH**

William F. Stutts, 7017 Briar Cove Dr., Dallas, Tex. 75240  
 Filed Apr. 26, 1977, Ser. No. 790,876  
 Int. Cl.<sup>2</sup> G21K 1/00

U.S. Cl. 250—505

16 Claims



1. An add-on collimator cap for insertion over the output end of a collimator tube of a dental x-ray machine to confine the beam of x-rays to a predetermined size and shape, said add-on collimator cap comprising:

a housing which includes a hollow longitudinal portion and a radially inwardly extending flanged portion at one end thereof, said flanged portion forming a generally centrally located opening therethrough for general alignment with a beam of x-rays emanating from the dental x-ray machine through the collimator tube,

a lead diaphragm removably positioned within said hollow longitudinal portion of said housing and adjacent to said flanged portion thereof, said diaphragm having a generally centrally located aperture therethrough of a predetermined size and shape to confine the x-ray beam to the predetermined size and shape, said diaphragm being

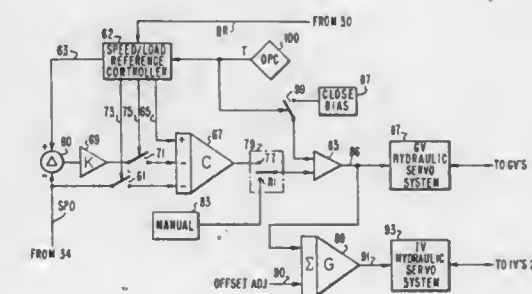
readily exchangeable in said housing so that the aperture therethrough can be selected to confine the beam dimensions to predetermined levels,

means positioned within said hollow longitudinal portion of said housing and adjacent to said lead diaphragm to fix said removable lead diaphragm in juxtaposition to said flanged portion of said housing, said means having an opening therethrough in registry with the aperture in said diaphragm and at least as large in size as said aperture in said diaphragm, and

said hollow longitudinal portion of said housing being of sufficient size and shape for insertion of a second end thereof over the output end of a dental x-ray machine collimator tube.

4,166,221  
**OVERSPEED PROTECTION CONTROLLER EMPLOYING INTERCEPTOR VALVE SPEED CONTROL**  
 Patrick L. McGaha, Pocopson, and Millard F. Smith, West Town Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,397  
 Int. Cl.<sup>2</sup> F01K 13/02  
 U.S. Cl. 290—40 R 10 Claims



1. In a steam turbine system comprising an electrical generator; a steam turbine including a high pressure and at least one lower pressure turbine sections operative at a first predetermined rotating speed for providing mechanical power to said electrical generator which converts the mechanical power to electrical power which is supplied to a power system load; a source of steam; at least one governor valve operative to control the admission of steam from said steam source to said high pressure turbine section; a reheater coupled between said high pressure and at least one lower pressure turbine sections for heating steam conducted therethrough to said at least one lower pressure turbine section; at least one interceptor valve operative to control the admission of steam from said reheater to said at least one lower pressure turbine section; a main generator breaker operative in a closed position for electrically connecting said generator to said power system load and operative in an open position for electrically interrupting the flow of electrical power to said power system load; and a control means for controlling the amount of said electrical power supplied to said power system load at times when said breaker is closed, a controller for protecting the steam turbine against an overspeed condition primarily occurring as a result of said main generator breaker opening and interrupting electrical power flow to said power system load, said overspeed protection controller comprising the combination of:

means for generating a first signal in real time representative of the actual rotating speed of said turbine; electrohydraulic means operative to rapidly close each of said governor and interceptor valves, said electrohydraulic means being activated by one of either a detection of said breaker opening during a time when generated electrical power is greater than a predetermined value of electrical power or the detection of said first signal being greater than a second predetermined rotating speed value, whereby steam flow admitted to said turbine sections is interrupted and steam energy is trapped in said reheater,

said electrohydraulic means being deactivated at a time which is subsequent to a predetermined time interval immediately following the detection of said breaker opening when said first signal is no longer greater than said second predetermined rotating speed value; and

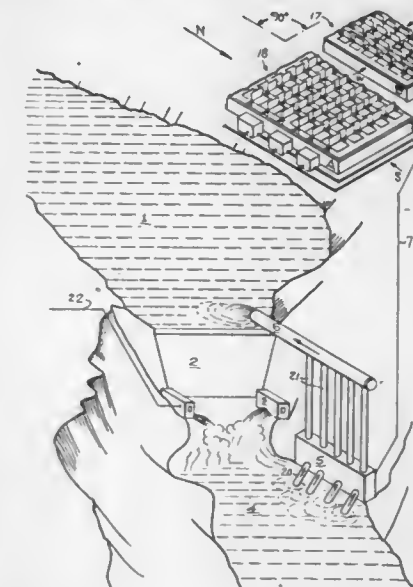
means operative in response to the deactivation of said electrohydraulic means to control the rotating speed of said steam turbine by positioning the interceptor valves to admit steam to said at least one lower pressure turbine section in accordance with a continuous function based on the difference between said first signal and a value representative of said first predetermined rotating speed, whereby the trapped steam energy in said reheater is utilized for keeping said steam turbine at said first predetermined rotating speed to permit rapid reconnection of said turbine system to said power system load.

4,166,222  
**WIND WHEEL APPARATUS FOR USE WITH A HYDRO-ELECTRIC DAM**

John Hanley, P.O. Box 1423, Conrad, Mont. 59425  
 Filed Nov. 9, 1977, Ser. No. 850,012  
 Int. Cl.<sup>2</sup> F03D 9/00

U.S. Cl. 290—55

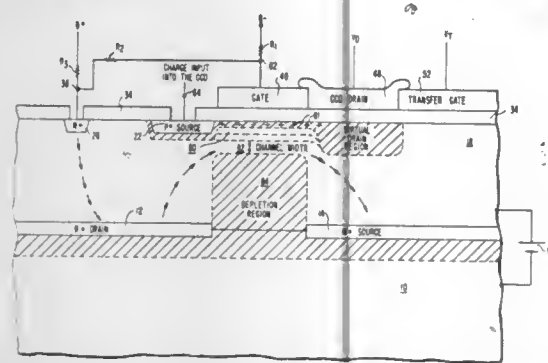
7 Claims



1. A wind wheel apparatus for converting energy in wind to another form of energy, the apparatus comprising in combination: a plurality of wind machines disposed in a matrix type array such that said wind machines form rows and columns and said wind machines are closely spaced together, each said wind machine is defined by a shaft supported by means defining a cavity, plural pairs of support members extending radially from said shaft, and a sail interposed and extending between said support members defining said each pair, so that at least one of said sails extends above said means defining a cavity, and power takeoff means connected to said shaft, whereby when the wind impinges on said sail that extends above said means defining a cavity said shaft rotates and said power takeoff means converts the shaft rotation to another form of energy.

**4,166,223**  
**DUAL FIELD EFFECT TRANSISTOR STRUCTURE FOR COMPENSATING EFFECTS OF THRESHOLD VOLTAGE**  
 Nathan Bluzer, Silver Spring, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

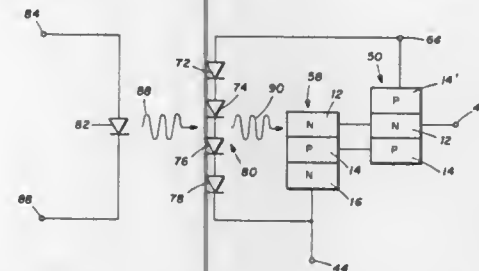
Filed Feb. 6, 1978, Ser. No. 875,715  
 Int. Cl.<sup>2</sup> G11C 19/28; H01L 29/78, 29/80  
 U.S. Cl. 307—221 D 27 Claims



1. A compensated input injection structure for coupling the electrical information generated by a detector to a charge coupled device, said structure comprising:
  - a substrate semiconductor layer of a first conductivity type;
  - an epitaxial semiconductor layer of a second conductivity type having one surface contiguous with one surface of said substrate to form an interface therebetween;
  - first and second regions of semiconductor material of a higher concentration of second conductivity type impurities than said epitaxial layer being sandwiched at the interface between said epitaxial and substrate layers and being separated from each other to constitute a drain and source, respectively, for a first type field effect transistor;
  - a third semiconductor region of a higher concentration of first conductivity type impurities than said substrate layer being disposed in a first area of another surface of the epitaxial layer, which is opposite said one surface, said first area being aligned vertically over a portion of said first semiconductor region, which substantially borders a first portion of separation between said first and second semiconductor regions, said third semiconductor region constituting a source for a second type field effect transistor;
  - a fourth semiconductor region of a similar concentration of second conductivity type impurities as said first and second regions being disposed in a second area of said another surface of the epitaxial layer, said second area being aligned vertically over another portion of said first semiconductor region, said fourth semiconductor region constituting a drain contact region for the first type field effect transistor;
  - a layer of nonconductive material for covering said another surface of the epitaxial layer except for portions of said third and fourth semiconductor regions which are exposed through windows in said nonconductive layer;
  - a first region of conductive material being disposed on a third area of the exposed surface of said non-conductive layer, said third area being aligned vertically over at least the first portion of separation between said first and second semiconductor regions, said first conductive region constituting a common gate contact of both said first and second type field effect transistors;
  - a second region of conductive material being disposed on a fourth area of the exposed surface of said non-conductive layer, said fourth area being adjacent said third area and aligned vertically over a portion of said second semiconductor region which substantially borders the first portion of separation between said first and second semiconductor regions, said second conductive region being electrically isolated from said first conductive region and constituting a drain contact of said second type field effect transistor

- which is maintained at a bias voltage potential such that a virtual drain region may be formed in the epitaxial layer located vertically thereunder;
- a third region of conductive material being disposed in a fifth area of the exposed surface of said non-conductive layer, said fifth area being adjacent said fourth area and aligned vertically over another portion of said second semiconductor region, said third conductive region being electrically isolated from said second region and constituting a contact for controlling the transfer of charge from said virtual drain region to the input of the charge coupled device;
- a first means for applying a first voltage potential to said common gate contact, said first voltage potential affecting a depletion region and conduction channel associated with each of the first and second type field effect transistors to render a quiescent threshold voltage of the second type field effect transistor;
- a second means for applying a second voltage potential across said epitaxial and substrate layers at a value which sets the pinch-off voltage of the first type field effect transistor substantially equal to the quiescent threshold voltage of said second type field effect transistor;
- a third means for coupling said detector to the exposed portion of said third semiconductor region to render an amount of charge to flow in the conduction channel of said second field effect transistor, said amount of charge flow being representative of the electrical information generated by said detector in accordance with the threshold voltage reflected to said detector from said second field effect transistor;
- a fourth means coupled to the exposed portion of said fourth semiconductor region and said first means for detecting said amount of charge flow in the conduction channel of said second field effect transistor and controlling the value of said first voltage potential applied to said common gate contact as a function of said detected amount of charge flow.

**4,166,224**  
**PHOTOSENSITIVE ZERO VOLTAGE SEMICONDUCTOR SWITCHING DEVICE**  
 Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234  
 Filed Jun. 17, 1977, Ser. No. 807,512  
 Int. Cl.<sup>2</sup> H03K 3/42; H01L 27/14, 29/75  
 U.S. Cl. 307—311 12 Claims



1. In a multilayer semiconductor switching device having a base region and alternating layers of opposite conductivity types and first, second and third electrodes, the switching device having a predetermined holding voltage and being constructed to receive photon flux from an external source and having variable output characteristics dependent upon the impinging photon flux, the combination comprising:
  - photovoltaic means for also receiving impinging photon flux and connected across the first and second electrodes of the switching device;
  - said photovoltaic means operable in response to impinging photon flux for generating a voltage greater than the holding voltage of the semiconductor switching device and for applying said voltage across the first and second electrodes;

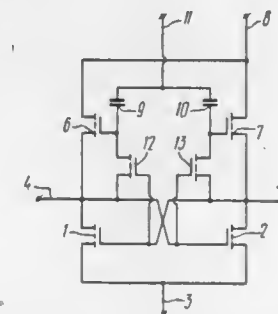
said switching device generating a base drive voltage in the area of said base region in response to the impinging photon flux; and

the first and third electrodes of the semiconductor switching device operable to receive an external voltage, such that at least one switching action occurs to provide a substantial change in impedance across the first and third electrodes when said external voltage is less than the voltage generated by said photovoltaic means and wherein no substantial change in impedance results across the first and third electrodes when said external voltage is greater than the voltage generated by said photovoltaic means.

**4,166,225**  
**READ AMPLIFIER FOR INTEGRATED-CIRCUIT STORAGE DEVICE**

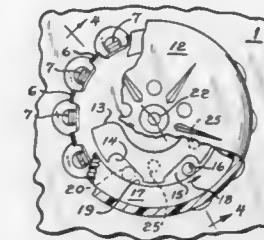
Jury V. Minkov, 103527, korpus 903, kv. 155, and Vladimir I. Solomonenko, 103489, korpus 710, kv. 73, both of Moscow, U.S.S.R.

Filed Jul. 29, 1977, Ser. No. 820,157  
 Claims priority, application U.S.S.R., Aug. 5, 1976, 2393457  
 Int. Cl.<sup>2</sup> H03K 5/20, 5/18, 3/286; G11C 7/00  
 U.S. Cl. 307—355 1 Claim



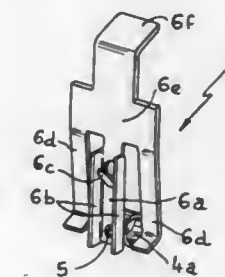
1. A read amplifier for an integrated-circuit storage device, comprising:
  - a first FET amplifier transistor;
  - a second FET amplifier transistor;
  - a first control input connected to the sources of said amplifier transistors;
  - a first data input-output terminal connected to the drain of said first amplifier transistor and to the gate of said second amplifier transistor;
  - a second data input-output terminal connected to the drain of said second amplifier transistor and to the gate of said first amplifier transistor;
  - a first FET load transistor whose source is connected to said first data input-output terminal;
  - a second FET load transistor whose source is connected to said second data input-output terminal;
  - a second control input connected to the drains of said load transistors;
  - a third control input;
  - a first capacitor connected between said third control input and the gate of said first load transistor;
  - a second capacitor connected between said third control input and the gate of said second load transistor;
  - a first FET switching transistor the drain of which is connected to the gate of said first load transistor the source of which is connected to said first data input-output terminal and the gate of which is connected to said second data input-output terminal; and
  - a second FET switching transistor the drain of which is connected to the gate of said second load transistor the source of which is connected to said second data input-output terminal and the gate of which is connected to said first data input-output terminal.

**4,166,226**  
**NO-BACK SYNCHRONOUS MOTOR DRIVE**  
 Michael H. Estkowski, St. Joseph, Mich., assignor to V-M Corporation, Benton Harbor, Mich.  
 Filed Oct. 14, 1976, Ser. No. 732,504  
 Int. Cl.<sup>2</sup> H02K 7/10 6 Claims



1. In a synchronous a.c. motor having a rotor shaft (22) and being adapted for starting into operation unidirectionally, when the rotor shaft is inclined to the horizontal at an angle of from zero to approximately 45 degrees, said motor having a stationary field frame (3, 4, 5) comprising a tubular field core (3), centrally apertured circular end plates (4 and 5), being attached concentrically to the ends of said core, a rotor shaft (22) extending axially through said core (3), and being journaled therein in bearings (3a, 3b), a cup shaped rotor (12) having an end wall and having said rotor shaft (22) affixed coaxially thereto, said rotor (12) containing a circular brake ring (17) mounted on the inside wall of said cup shaped rotor (12) adjacent its closed end, there being a stationary flat arcuate ball cage member (13) mounted flatwise on the outside flat surface of the end wall of the stationary field plate (4) which plate (4) is adjacent the end plate of the rotor (12), and in the same plane as the plane of the brake ring (17), a ball (16) in said ball cage member said ball cage member (13) comprising two of the sides of an adjacent triangular cage member (13) having an open side facing in a radially outward direction, a third side wall for each of said triangular cage members (13) being provided by the adjacent inner periphery of said brake ring (17), said brake ring (17) and the walls of said cage members being disposed in the same plane, motion of the brake ring (17) being checked by the rolling of the ball (16) into engagement with the downwardly sloping diagonal wall of the pocket in which it is confined and with the brake ring (17) upon the initiation of reverse rotational movement of the rotor (12).

**4,166,227**  
**BRUSH HOLDER FOR ELECTRIC MACHINES**  
 Jean Guglielmo, Caluire, France, assignor to Lucien Ferraz & Cie, Lyons, France  
 Filed Sep. 30, 1977, Ser. No. 838,348  
 Int. Cl.<sup>2</sup> H02K 13/00 8 Claims



1. A brush holder for an electric machine having a rotating element to be engaged by the brush, the holder comprising a cage and a detachable clip, the cage having a longitudinal



opening disposed substantially radially of said rotating element to slidably accommodate a brush and the cage having a longitudinal groove extending along one of the inner walls of the cage, and said clip comprising a base portion supporting a central leg shaped to slide in the groove inside the cage, a self-winding band spring fixed at its outer end to the central leg with the wound portion of the spring being located to overlie the associated brush and bias it toward said rotating element when the central leg is engaged in the said groove, the clip including releasable means for engaging the cage and retaining the clip when it reaches the bottom of the groove by opposing the reaction of the spring, and the clip further including two side legs extending from the base portion adjacent to the central leg and arranged to bear elastically against the outer face of the cage on each side of the groove, the two side legs being positioned to prevent the clip from rocking about the point of contact of said means engaging the cage for retaining the central leg in the bottom of the groove.

4,166,228

# TEMPERATURE COMPENSATED REFLECTIVE ARRAY FOR SURFACE ACOUSTIC WAVE PROCESSING

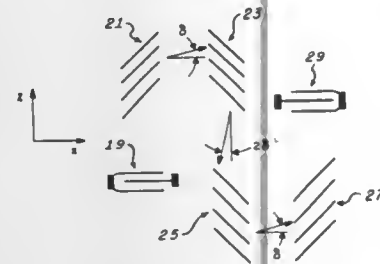
Leland P. Solie, Acton, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,565

Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—313

10 Claims



1. Acoustic wave processing apparatus comprising: a substrate capable of supporting surface acoustic waves on a surface thereof; input and output transducers for launching and receiving acoustic waves, respectively, in a predetermined propagation direction on said surface; and a plurality of 2N pairs of reflective arrays where N is an integer, said arrays being arranged serially in the propagation path between said input and output transducers, each of said arrays including a multiplicity of parallel grooves etched on said surface and oriented obliquely with respect to the direction of propagation of the surface wave incident on that array, each pair of arrays being arranged to substantially reverse the direction of propagation of surface waves incident on that pair and further arranged to provide a reflected wave that is spaced further from the input transducer than the wave incident on that pair.

4,166,229

# PIEZOELECTRIC POLYMER MEMBRANE STRESS GAGE

Aime S. DeReggi, Boyds, and Seymour Edelman, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1978, Ser. No. 880,406

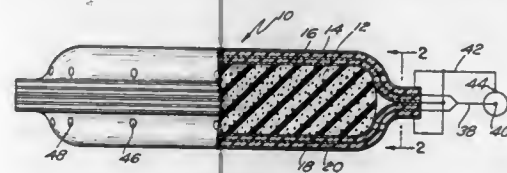
Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—337

6 Claims

1. A stress gage for detecting acoustic pressure waves in a body of water, comprising: a compressible generally cylindrical pad having a bottom and a top; a first pair of flexible sheets of a piezoelectric polymer being stretched over the top of said pad under a tensile stress,

each sheet of said first pair of flexible sheets having an evaporated metallic film deposited on each face thereof; a second pair of flexible sheets of the piezoelectric polymer stretched over the bottom of said pad under the tensile stress, each flexible sheet of said second pair having an evaporated metallic film deposited on each face thereof; means for joining said first pair of flexible sheets and said



- second pair of flexible sheets along the circumference of said compressible pad; a plurality of openings in said first pair and said second pair of flexible sheets along the circumference of said compressible pad; and means for extracting electrical signals from said first pair and said second pair of flexible sheets when said stress gage is subjected to acoustic pressure waves.

4,166,230

# SLOTTED, ELECTRODED PIEZOELECTRIC WAFER FOR ELECTRO-OPTIC DEVICES

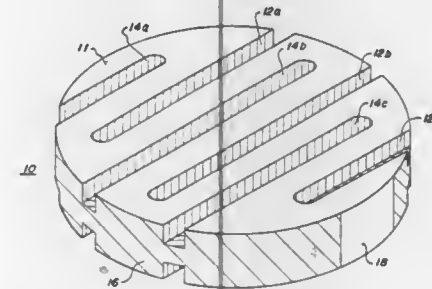
Victor Luft, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1977, Ser. No. 865,822

Int. Cl.<sup>2</sup> H01L 41/10

U.S. Cl. 310—365

6 Claims



1. An electroded wafer for use in electro-optic devices, comprising: a ceramic wafer having piezoelectric properties and having faces substantially larger than its thickness; a plurality of parallel slots cut in at least one face of said wafer to form an interdigital matrix, wherein adjacent slots are cut through the periphery of the wafer at opposite ends; a metallic electrode plated on the interior of said slots and periphery of said wafer by electroless plating of at least one metal, said plating being formed under contact of a palladium catalyzing compound, said compound being present only on the interior of said slots and said periphery.

4,166,231

# TRANSVERSE BEAM X-RAY TUBE

Martin Braun, San Jose, Calif., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Oct. 7, 1977, Ser. No. 840,205

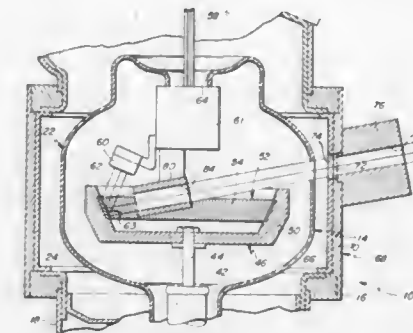
Int. Cl.<sup>2</sup> H01J 35/04, 35/14

U.S. Cl. 313—60

11 Claims

1. A rotating anode X-ray tube for producing a pencil beam of X-rays comprising a housing, an X-ray tube located within the housing and having an envelope, an anode structure rotat-

ably supported in one end of the envelope and including a target extending transversely of the envelope and mounted for rotation about a longitudinal axis, a cathode structure supported in the opposite end of the housing and disposed to emit electrons onto a focal spot on a surface of the target at one side of said axis, a window in said housing on the opposite side of



said axis for transmitting from the tube X-rays which traverse diametrically of the tube along a path extending from the focal spot to the window, and collimating means separate from said anode structure and positioned within said envelope in the path of said X-rays for forming a pencil-like X-ray beam containing substantially parallel rays for suppressing substantially all divergence of the beam.

4,166,232

# FILAMENT LEAD-IN SUPPORT FOR TUNGSTEN HALOGEN CAPSULE FOR HEADLIGHT

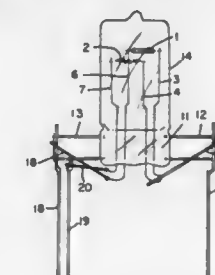
Stephen F. Kimball, III, Andover, and Lewis H. Palmer, III, Marblehead, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 13, 1978, Ser. No. 886,252

Int. Cl.<sup>2</sup> H01K 1/42, 9/08

U.S. Cl. 313—316

1 Claim



1. A tungsten-halogen capsule assembly for a headlight comprising: two coiled filaments disposed in a glass capsule substantially transversely to the capsule axis, the glass capsule having a press seal at one end thereof with wire supports embedded in the longitudinal edges of the press seal and extending therefrom; one corresponding pair of the filament ends being supported by a U shaped wire embedded in the press seal and extending exteriorly of the capsule, the U shaped wire being electrically connected to a mounting rod which is fastened to one of the wire supports; the other ends of the filaments being each supported by a separate lead-in wire, one of the separate lead-in wires being electrically connected to another mounting rod which is fastened to another of the wire supports and the other separate lead-in wire being electrically connected to a rod which is unconnected to any of the wire supports.

4,166,233

# PHOSPHOR SCREEN FOR FLAT PANEL COLOR DISPLAY

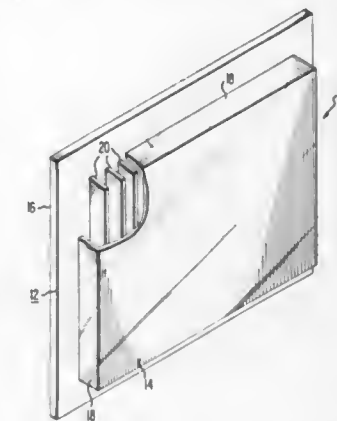
Thomas O. Stanley, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 806,281

Int. Cl.<sup>2</sup> H01J 29/32

U.S. Cl. 313—422

7 Claims



1. A flat display device comprising an evacuated envelope having a plurality of spaced supports which contact a screen bearing wall of the envelope, said screen including a mosaic of repetitive groups of different color emitting phosphor bodies with a selective one of the same color emitting phosphor bodies of some of the groups being replaced by a body of a nonluminous material, each of the supports being positioned at a separate nonluminous material body.

4,166,234

# FLUORESCENT DISCHARGE LAMP HAVING LUMINESCENT MATERIAL OF A SPECIFIED GRAIN SIZE

Marinus G. A. Tak, and Robert C. Peters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,128

Claims priority, application Netherlands, Jun. 5, 1977, 7705030

Int. Cl.<sup>2</sup> H01J 61/44

U.S. Cl. 313—486

4 Claims



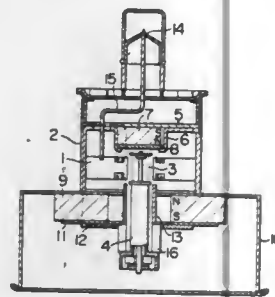
1. A low pressure mercury vapour discharge lamp provided with a luminescent coating which comprises at least one luminescent material from the group of rare earth oxides activated by trivalent europium, the rare-earth-magnesium-aluminates with hexagonal crystal structure, activated by cerium or by cerium and terbium, and the alkaline earth-magnesium-aluminates with hexagonal crystal structure activated by bivalent europium or by bivalent europium and by bivalent manganese, which luminescent material consists of a fine-grain material, characterized in that not more than 5 wt.% of the luminescent material has a grain size smaller than 1 μm and that the maximum of the grain size distribution curve of the luminescent material is located in the grain size range from 2 to 8 μm.

4,166,235  
MAGNETRON COMPRISING FERROMAGNETIC  
MATERIAL MEMBERS AXIALLY MAGNETIZED IN  
OPPOSITE DIRECTIONS

Seizi Yamashita, Katsuta; Tanehiro Endo, Hitachi, and Yoshio  
Ishida, Mobara, all of Japan, assignors to Hitachi, Ltd., Japan  
Filed Oct. 13, 1977, Ser. No. 841,915  
Claims priority, application Japan, Oct. 16, 1976, 51-124273  
Int. Cl.<sup>2</sup> H01J 25/50

U.S. Cl. 315—39.71

7 Claims



1. A magnetron of the type comprising a cathode, an anode cylinder having a plurality of inwardly-directed vanes disposed around the cathode for defining an interaction space between the cathode and the anode within an evacuated tube, and a pair of permanent magnets disposed on axially-opposite sides of said interaction space opposite to each other for producing a magnetic field in the interaction space, wherein one of said permanent magnets which is annular in shape and axially magnetized is located outside said evacuated tube with one of its poles facing the same pole of the other permanent magnet which is located inside the tube, said magnetron further comprising a first member of magnetic material providing a pole piece for said annular permanent magnet, said first member extending from the side of said annular permanent magnet remote from the other permanent magnet and passing into the evacuated tube through the central opening of said annular permanent magnet to terminate at a position opposite the pole piece of the other permanent magnet, and a second member of magnetic material coupling magnetically the side of said annular permanent magnet opposite the other permanent magnet to the side of the other permanent magnet remote from said annular permanent magnet.

4,166,236  
ELECTRIC ENERGY SAVING THREE-POSITION  
COMBINATION SWITCHING DEVICE

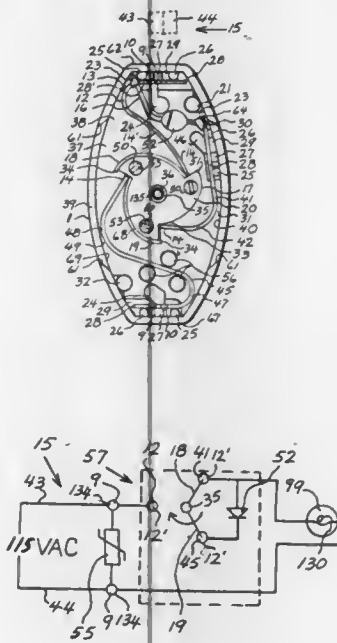
Peter Andrews, 190 Gebhardt Rd., Penfield, N.Y. 14526  
Continuation-in-part of Ser. No. 738,227, Nov. 1, 1976, and Ser. No. 442,082, Feb. 12, 1974, and Ser. No. 544,579, Jan. 27, 1975, abandoned, said S.N. 738,227 is a continuation-in-part of said S.N. 442,082, Pat. No. 4,005,334, said S.N. 544,579 which is a continuation-in-part of said S.N. 442,082 and S.N. 250,949, May 8, 1972, abandoned, each is a continuation-in-part of S.N. 240,605, Apr. 3, 1972, abandoned, which is a continuation-in-part of S.N. 25,994, Apr. 6, 1970, abandoned. This application  
Jan. 24, 1977, Ser. No. 761,527  
Int. Cl.<sup>2</sup> H05B 39/04

U.S. Cl. 315—200 R

19 Claims

19. An electric energy saving three-position electric switching device having an electrical "off", half-wave "dim" and full-wave "on" position for electrical connection to a two-conductor wire member of substantially an electric cord member, comprising in combination: an electric insulating housing having an upper casing portion and a lower casing portion for being juxtapositionally mounted on said cord member; said upper casing portion having therein a one-piece first electrical contact member and a one-piece second electrical contact member and a one-piece third electrical contact member each of which having a free substantially end detenting portion thereof spaced substantially 120 degrees apart from each other

and each of which is formed from a resilient electrical conducting material, said upper casing portion also having a half-wave diode electrical rectifying means, a one-piece rotatable electric current conducting contact member and a manually operable switch actuation means being substantially housed therein for manually operatively actuating a pivotally mounted rotatable member having an electric insulating switching portion integrally formed on substantially one end portion thereof; said contact switching portion having said conducting member substantially captively attached to at least one portion thereof for electrical switching rotation therewith so that when it is in its first switched electrical "off" position said conducting contact member is electrically connected to said first said contact member and said second said contact member and when it is in its second switched half-wave electrical rectified "dim" position said conducting contact member is electrically connected to said second said contact member and said third said contact member and also having said rectifying means electrically connected to said first said contact member and said second said contact member and when it is in its third switched electrical full-wave "on" position said conducting contact member is electrically connected to said first said



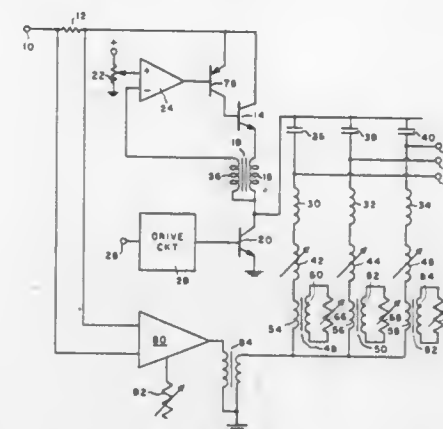
contact member and said third said contact member; said lower casing portion having a substantially channel-like opening entirely through two outer end wall portions thereof for removably and substantially receiving a longitudinal portion of said two-conductor wire member having a first wire member and a second wire member therein; said lower casing portion will substantially house therein one uncut said first wire member and said second wire member which has a first and a second cut and separated wire end portions; said first cut end portion will be electrically connected by an electric wire connecting means to a portion of said first said contact member, and said second cut end portion will be electrically connected by an electrical wire connecting means to a portion of said third said contact member; said electric three-position switching device is so constructed and arranged that when it is electrically connected and mounted substantially on said cord member an electrical half-wave rectified "dim" electric energy saving illumination to at least one filament member of at least one electric incandescent lamp is thereby obtained and also substantially preventing machine-gun-switching by manual actuation of said switch actuation means.

4,166,237  
HORIZONTAL DEFLECTION CIRCUIT FOR  
TELEVISION CAMERA

Frederik J. Van Roessel, Upper Saddle River, N.J., assignor to  
North American Philips Corporation, New York, N.Y.  
Filed Oct. 20, 1975, Ser. No. 624,121  
Int. Cl.<sup>2</sup> H01J 29/56

U.S. Cl. 315—370

7 Claims

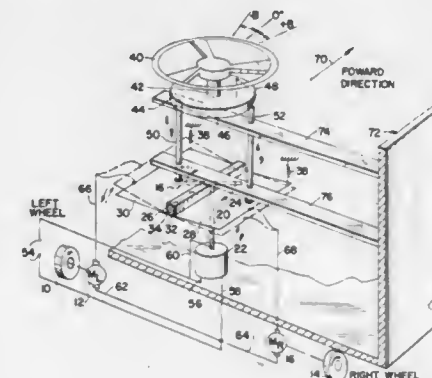


1. A circuit for generating a deflection current in a deflection coil, said circuit comprising a current supply first transistor means adapted to be coupled to a first end of said coil and for providing for a sawtooth deflection current in said coil, said transistor having base and collector electrodes means adapted to be coupled to a second end of said coil for supplying a voltage thereto for correcting the linearity of said deflection current, and means coupled to said transistor and said correcting means for sensing the current in said base and said collector and for applying a voltage proportional to and derived from said sensed current to said correcting means; whereby the linearity correction is temperature stable.

4,166,238  
CONTROL SYSTEM FOR DUAL-MOTOR DRIVE  
Tihamer S. Binner, 304 West Point Ave., Somerset, N.J. 08873  
Filed Oct. 27, 1977, Ser. No. 845,835  
Int. Cl.<sup>2</sup> H02P 7/68

U.S. Cl. 318—67

10 Claims



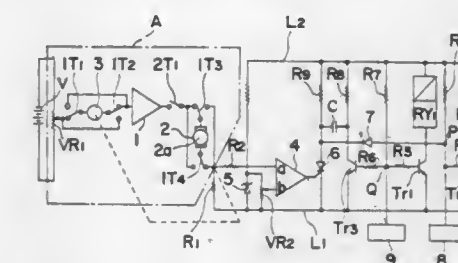
1. A control system for a dual-wheel drive, comprising; first and second drive motor independently controllable by regulating the amount of current respectively flowing thereto;  
first and second contact means, each contact means respectively having a direction of movement relative to the other contact means;  
said first contact means serving as a common electrical supply terminal means for both said first and second drive motors;  
said second contact means having separate terminal means

coupled respectively to said first and second drive motors to supply them with current;  
control motor means for providing continuous periodic movement of said first contact means, and  
control wheel means for selective positioning said second contact means with respect to said first contact means, for thereby respectively positioning said separate terminal means with respect to said common supply terminal means whereby the time duration of the respective contact relationships between said separate terminal means and said common supply terminal means during each periodic movement of said first contact means is controlled to thereby regulate the amount of current following to each drive motor.

4,166,239  
ROLL FILM DRIVE CONTROL ARRANGEMENT  
Keiji Nakatani, Machida, Japan, assignor to Minolta Camera  
Kabushiki Kaisha, Azuchi, Japan  
Filed Jan. 5, 1978, Ser. No. 867,176  
Claims priority, application Japan, Jan. 17, 1977, 52-4492[U]  
Int. Cl.<sup>2</sup> H02P 3/08

U.S. Cl. 318—266

10 Claims



1. A drive control arrangement for use in a drive means for roll wound tape-like material having at least one end thereof fixed to a rotary shaft, said drive control arrangement comprising:  
means for detecting variations of electric current flowing through the armature of a motor of said drive means, and  
switching means to be actuated in response to output of said detecting means for controlling selective energization and de-energization of said motor,  
said detecting means emitting a signal upon detection of an increase of the electric current flowing through the armature of said motor caused by the increased tension in the tape-like material when said fixed end of the tape-like material has been reached during driving of the tape-like material, said switching means causing said motor to be de-energized upon receipt of the signal from said detecting means for interrupting driving of the tape-like material.

4,166,240  
CONTROL CIRCUIT FOR CIRCUIT BREAKER AC  
MOTOR OPERATOR  
Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.  
Filed Jun. 19, 1978, Ser. No. 916,442  
Int. Cl.<sup>2</sup> H02P 3/18

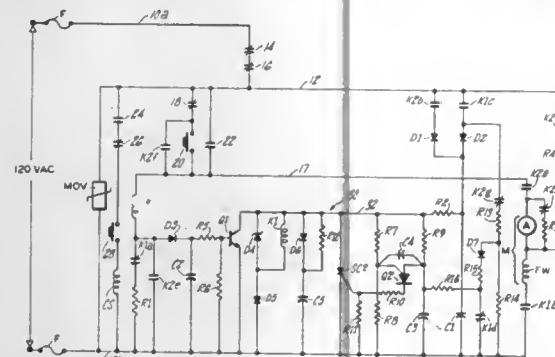
U.S. Cl. 318—380

10 Claims

1. A motor operator control circuit comprising, in combination:  
A. first and second buses for connection across a source of AC voltage;  
B. a first control relay having  
(1) an operating coil connected in circuit between said first and second buses,  
(2) first and second sets of normally closed contacts, and  
(3) a third set of normally open contacts;



- C. an AC motor having a series connected armature and field winding, said armature connected to said first bus via said third set of relay contacts and said field winding connected to said second bus, the junction between said armature and field winding connected to said first bus via said first set of relay contacts;
- D. a braking resistor connected in series with said second set of relay contacts across said motor armature; and
- E. switching means for completing an energization circuit for said first relay between said first and second buses for



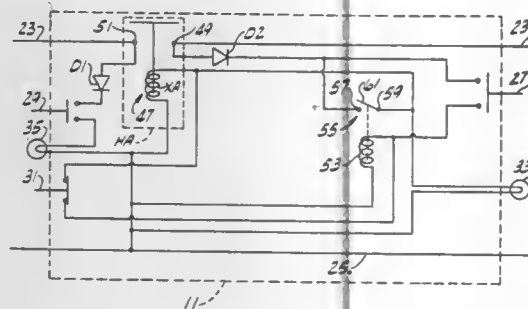
the duration of a motor operator operating cycle, thereby activating said first relay to close its third set of contacts and enable energization of said motor, at the conclusion of an operating cycle said switching means operates to deactivate first relay, causing its third set of contacts to open and disconnect said armature from said first bus and its first and second sets of contacts to close, connecting said braking resistor across said armature and said field winding to said first bus independently of said armature, thereby dynamically braking said motor.

4,166,241

**BATTERY JUMPERING APPARATUS**

Thomas J. Grant, Rte. 6, Box 489, Hot Springs, Ark. 71901  
Continuation-in-part of Ser. No. 785,660, Apr. 7, 1977, abandoned. This application May 1, 1978, Ser. No. 901,288  
Int. Cl.<sup>2</sup> H02J 7/00; H01R 11/00  
U.S. Cl. 320—25

5 Claims



1. Apparatus for jumpering a first battery to a second battery comprising:

first and second jumper cables the ends of which are adapted for connection to terminals of the batteries, each jumper cable being connected between corresponding polarity battery terminals to form an electrical path therebetween; a jumper relay having a normally open set of contacts series-connected in the first jumper cable, said normally open contacts holding the circuit path between the batteries open while the cables are being connected thereby to prevent the creation of sparks at the terminals of either battery;

means for energizing the jumper relay after the cables are connected to close the jumper relay contacts and complete the circuit path between the batteries whereby one

of the batteries may supply power to a load normally supplied by the other battery, said jumper relay energizing means including switch means for initiating the energization of said jumper relay and means connected to the initiating switch means for maintaining energization of the jumper relay;

means connected to the maintaining means for deenergizing the jumper relay to open the jumper relay contacts and open the circuit between the batteries before the cables are disconnected from their respective battery terminals; and portable case means enclosing the energizing means for preventing exposure of the jumper relay contacts to any gases generated by the batteries and for confining to the interior of said case means any sparks generated when the circuit path is completed.

4,166,242

**TRACTOR CABLE LIGHT CIRCUIT CHECKER**

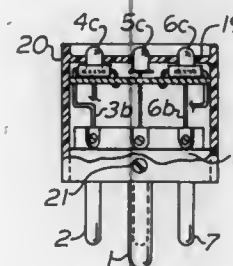
Joseph Spiteri, P.O. Box 71, Harbortree, Pa. 16421

Filed Oct. 20, 1975, Ser. No. 623,582

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324—51

2 Claims



1. A checker for the circuits of a tractor cable for supplying power to a semi trailer, said tractor cable having a socket for receiving the plug of a semi trailer cable, said checker comprising a plug having a common ground pin and live pins insulated from each other and extending axially from the plug and corresponding respectively in size and orientation to the ground and live pins of the plug of a semi trailer cable, a printed circuit board axially spaced from and extending crosswise of the axis of said plug and having a common ground circuit and a plurality of indicating circuits thereon, one indicating circuit for each live pin, a lead extending axially from the common ground pin through a hole in the printed board circuit to said common ground circuit, each indicating circuit having a light emitting diode and a resistor, connected in series and mounted on top of the printed circuit board with leads extending through holes in the printed circuit board and with each hole being surrounded by a connection pad for making a soldered connection to the leads, one lead of each resistor having one end mechanically and electrically connected to its respective pin and the other end mechanically connected to the printed circuit board and electrically connected to a lead of its corresponding light emitting diode, said leads providing the mechanical support for the printed circuit board, the other lead of each diode being connected to said ground circuit, and the parts so far claimed being a completely operative assembly.

4,166,243

**THERMOCOUPLE FAILURE DETECTOR**

Gene A. West, and John A. Moretti, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1978, Ser. No. 898,615

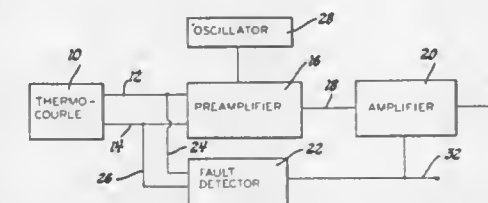
Int. Cl.<sup>2</sup> G01R 31/02; G08B 21/00

U.S. Cl. 324—51

2 Claims

1. In a thermocouple amplifier circuit for a thermocouple subject to being wholly or partially shorted to ground having means for detecting thermocouple open conditions, a differential amplifier having positive and negative input terminals,

substantially equal input resistors connected to the input terminals, a low impedance thermocouple having first and second leads, a pair of substantially equal value lead resistors each connecting a thermocouple lead to one of said input resistors thereby providing common mode rejection of signals on both leads by the differential amplifier, an oscillator coupled to both junction points of lead resistors and input resistors for supplying common mode AC test signals to the lead resistors, so that when the thermocouple circuit is closed the instantaneous



values of the test signals on the first and second leads are equal, a low pass filter operatively connected to the first lead and effective when the thermocouple circuit is open to attenuate and phase shift the test signal present on the first lead whereby the instantaneous values of the test signals on the first and second leads are substantially different when the thermocouple circuit is open, and means connected to the thermocouple leads to detect a substantial difference in instantaneous values of the test signals present on the leads to thereby detect an open circuit.

4,166,244

**LEAKAGE DETECTION SYSTEM FOR RADIOACTIVE WASTE STORAGE TANKS**

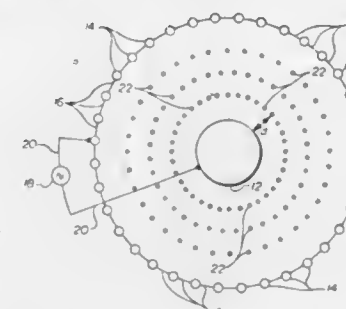
Weightstill W. Woods, Redmond, and William A. Eul, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 19, 1976, Ser. No. 743,111

Int. Cl.<sup>2</sup> G01R 27/02

U.S. Cl. 324—65 R

19 Claims



1. An apparatus for detecting leaks from a tank, pipe, or the like which contains electrically conductive fluid, wherein the tank is in contact with a soil medium, said apparatus comprising:

- reference electrode means spaced apart from the tank;
- alternating current means connected between said reference electrode means and the tank and positioned relative to the tank such that an electric field is established in the soil medium between the tank and said reference electrode means when said alternating current means is energized;
- at least one sensing electrode means positioned so that it is within said electric field when said alternating current means is energized, a potential difference being created between said sensing electrode means and the tank when said electric field is established; and
- means for measuring said potential difference, a leak of the electrically conductive fluid from the tank into the soil medium between the tank and the reference electrode causing a change in the conductivity of the soil medium

and a measurable change in the potential difference between the tank and said sensing electrode means.

4,166,245

**SIMULTANEOUS DISPLAY OF MULTIPLE CHARACTERISTICS OF COMPLEX WAVEFORMS**

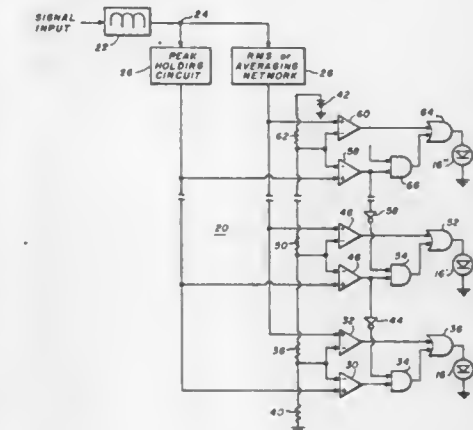
John H. Roberts, Monroe, Conn., assignor to Loft Modular Devices, Inc., Manchester, Conn.

Filed Nov. 14, 1977, Ser. No. 851,135

Int. Cl.<sup>2</sup> G01R 19/16, 19/00

U.S. Cl. 324—103 P

9 Claims



7. A method for simultaneously displaying a pair of characteristics of an electrical input signal having a complex waveform comprising the steps of:

- energizing some of a plurality of adjacently positioned individual light emitters arranged in a light emitter array as a function of a first characteristic of a waveform of interest; and
- simultaneously energizing a single light emitter in the array as a function of a second characteristic of the complex waveform.

4,166,246

**DIGITAL CONTROL SYSTEM FOR AUTOMATICALLY COMPENSATING FOR CONVEYER MOVEMENT CHANGES**

Timothy S. Matt, Cleveland, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jan. 23, 1978, Ser. No. 871,728

Int. Cl.<sup>2</sup> B07C 5/08; H03K 21/30

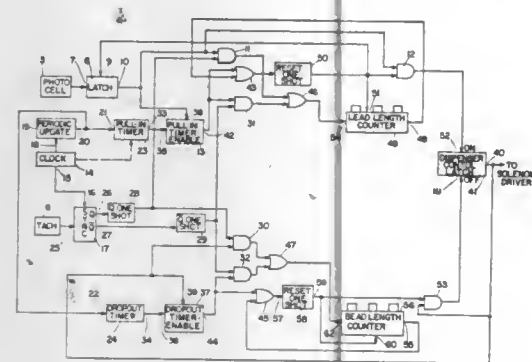
U.S. Cl. 328—5

21 Claims

1. A controller to activate a responsive device at a preselected time after initiating event, for use with articles moving on a conveyor, comprising:

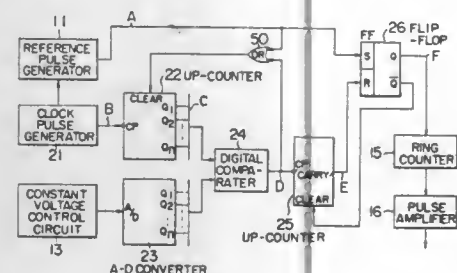
- a distance sensing circuitry adaptable to provide output pulses for preselected increments of conveyor travel; triggering means adaptable to be responsive to an initiating event, to provide an output signal upon the occurrence of said initiating event;
- at least a first counter for said pulses from said distance sensing circuitry, said counter being settable to a preselected count within a range, the counter being controllable to count in response to the output signal of said triggering means, and which provides an output signal at a predetermined count; and
- an update control circuit responsive to said counter, and said triggering means to be effective to set the counter to said

preselected count prior to the occurrence of said initiating event;



**4,166,247**  
**CONTROL SYSTEMS FOR PULSE WIDTH CONTROL TYPE INVERTER**  
Yoshiaki Miyazawa, Kodaira, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan  
Filed Dec. 19, 1977, Ser. No. 862,358  
Claims priority, application Japan, Dec. 23, 1976, 51-154171  
Int. Cl.<sup>2</sup> H02M 7/00  
U.S. Cl. 328-69

4 Claims



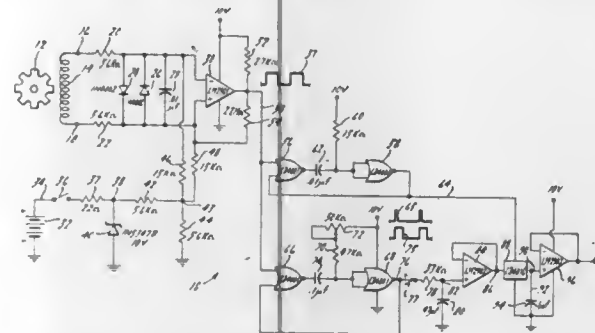
1. A control system for a pulse width control type inverter made up of a plurality of switching elements, comprising a constant voltage control circuit for producing an analogue output; and A-D converter for converting said analogue output into a digital signal; a reference pulse generator which generates reference pulses that determine the output frequency of said inverter; a clock pulse generator which generates clock pulses in synchronism with said reference pulses and having a frequency of an integral multiple of that of said reference pulses; a binary up-counter having a predetermined number of steps and connected to be cleared by said reference pulses and counts up the clock pulses generated by said clock pulse generator; a digital comparator for comparing the output of said binary up-counter with the output of said A-D converter; a m step (m represents an integer) up-counter for counting the leading edge of the output of said digital comparator, means responsive to the leading edge of the output of said digital comparator for clearing said binary up-counter thereby repeating m times the counting up and clearing operations of said

binary up-counter until said up-counter produces a carry signal so as to use an interval between the generation of a reference pulse and the generation of said carry signal, as a signal for determining the conduction period of said switching elements.

**4,166,248**  
**SAMPLE AND HOLD FREQUENCY TO VOLTAGE CONVERTER CIRCUIT**

Frank J. Bianchi, Redford Township, Wayne County, and Russell H. Poulson, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.  
Filed Nov. 25, 1977, Ser. No. 854,880  
Int. Cl.<sup>2</sup> H03K 1/14  
U.S. Cl. 328-140

7 Claims



1. An improved tachometer of the type including means for generating a periodically varying electrical input signal having a frequency proportional to the speed of rotation of a rotating member and a frequency to voltage converter circuit for converting the frequency of the periodically varying input signal to a voltage having a magnitude proportional to such frequency, wherein the tachometer has an improved frequency to voltage converter circuit comprising:  
circuit means, supplied with said input signal, for generating first and second pulse trains, said first pulse train comprising a pulsating signal having a repetition frequency proportional to the frequency of said input signal, said second pulse train comprising a pulsating signal having a repetition frequency and duty cycle proportional to the frequency of said input signal;  
integrator circuit means, supplied with said second pulse train, for generating an integrator voltage proportional to the duty cycle of said second pulse train;  
a transmission gate coupled to said circuit means for generating said first and second pulse trains; and  
a holding capacitor, said transmission gate when conductive coupling said integrator circuit means to said holding capacitor, said transmission gate being rendered alternately conductive and nonconductive by the pulsating signal of said first pulse train, said holding capacitor acquiring a voltage across it which varies as a function of said integrator voltage at those times in which said transmission gate is conductive.

**4,166,249**  
**DIGITAL FREQUENCY-LOCK CIRCUIT**  
Frank Lynch, Hatboro, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

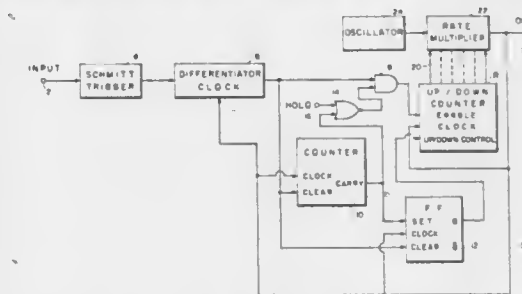
Filed Feb. 15, 1978, Ser. No. 877,984  
Int. Cl.<sup>2</sup> H03B 3/04

U.S. Cl. 328-155

6 Claims

1. A digital frequency-lock circuit comprising  
a fixed frequency source,  
a rate multiplier means having a signal output, a multiplier control input and a signal input connected to an output of said frequency source,  
an up/down counter means having an enable input, a clock

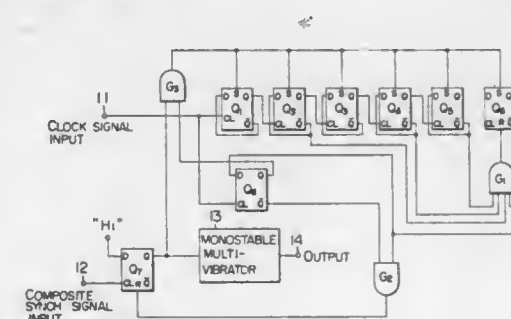
input, an up/down control input and a signal output for providing an output signal representing a digital word stored in said counter means,  
first circuit means connecting said signal output of said counter means to said multiplier control input of said rate multiplier means,  
input terminal means arranged to be connected to a source of an input signal having a frequency to be monitored,  
differentiator means for converting a cycle of said input signal to output signals defining a corresponding time period,  
second counter means having a clock input, a clear input and a carry output for providing an output signal representative of a predetermined count in said counter means,  
flip-flop means having a set input, a clock input and a clear input and a first output corresponding to said set input,



second circuit means for applying said output signals from said differentiator means to said clear inputs of said flip-flop means and said second counter means,  
third circuit means connecting said first output of said flip-flop means to said up/down control input of said up/down counter means,  
signal gating means having an input means connected to receive said output signals from said differentiator means, an output connected to said enable input of said up/down counter means, and a gate control input connected to receive said carry output of said counter means, and  
fourth circuit means connecting said signal output to said clock inputs of said up/down counter means, said flip-flop means and said second counter means.

**4,166,250**  
**SYNCHRONIZING SIGNAL PROCESSING CIRCUIT**  
Norio Meki, Takatsuki, and Tadashi Yoshino, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Oct. 17, 1977, Ser. No. 842,880  
Claims priority, application Japan, Oct. 19, 1976, 51-125760  
Int. Cl.<sup>2</sup> H04N 5/08; H03K 5/00  
U.S. Cl. 328-165

5 Claims



1. A synchronizing signal processing circuit for a composite synchronizing signal including a horizontal synchronizing signal and equalization pulses, said circuit producing a signal in synchronism with the composite horizontal synchronizing signal and having no equalization pulses comprising:  
a first D-type flip-flop having a clock input terminal for

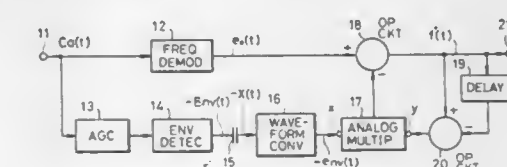
receiving said composite synchronizing signal, a D-input terminal which is fixed to a high level, a reset input terminal, and an output terminal for supplying an output signal;  
a first pulse generation means, which is driven by a clock pulse signal having a frequency higher than the frequency of the horizontal synchronizing signal, said pulse generation means including a counter for producing a first pulse when an m-th clock pulse of said clock pulse signal is produced, m being a preselected positive integer;  
means for applying said first pulse to said reset input terminal of said first D-type flip-flop;  
a second pulse generation means for producing a second pulse in response to the coincidence of the output signal of said first D-type flip-flop and the clock pulse signal;  
means for setting said counter in said first pulse generation means by said second pulse; and  
means for providing in response to said output signal of said first flip-flop a signal in synchronism with said horizontal synchronizing signal and free from the equalization pulses included in said composite synchronizing signal.

**4,166,251**  
**SYSTEM FOR REMOVING INTERFERENCE DISTORTION IN THE DEMODULATED SIGNAL OF A FREQUENCY-MODULATED SIGNAL**  
Yukinobu Ishigaki, Yamato, and Teruo Muraoka, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan  
Claims priority, applications Japan, May 30, 1977, 52-63048; Jun. 14, 1977, 52-70254; Jun. 29, 1977, 52-77556; Jun. 29, 1977, 52-77557

Filed May 25, 1978, Ser. No. 909,663  
Int. Cl.<sup>2</sup> H03D 3/00

U.S. Cl. 329-132

8 Claims



1. A system for removing interference distortion in the demodulated signal of a frequency-modulated signal comprising:  
means for demodulating an input frequency-modulated signal which has been subjected to interference by another frequency-modulated signal;  
means for detecting the envelope of fluctuation of the amplitude of the input frequency-modulated signal;  
automatic gain control means for controlling the level of at least said input frequency-modulated signal supplied to said envelope detection means;  
means for blocking the passage of the DC component of the output of said envelope detection means and passing only the AC component thereof;  
means having a transfer characteristic of a hyperbolic function, supplied with said AC component, and converting the waveform thereof;  
an analog multiplier supplied at the x input terminal thereof with the output of said waveform converting means and producing as output a distortion cancellation signal;  
first operation means supplied with the demodulated signal produced as output by said demodulating means and containing interference distortion and with the output signal for distortion cancellation of said analog multiplier and carrying out an operation such as to substantially cancel the interference distortion of said demodulated signal with said distortion cancellation signal;  
delay means supplied with the output signal of said first operation means and delaying the same by a specific delay time;



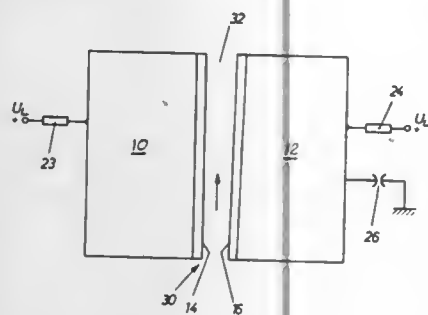
operation and supplying the resulting output signal thereof to the y input terminal of said analog multiplier; and means for obtaining the output of said first operation means as a demodulated signal in which the interference distortion has been cancelled and thus removed.

4,166,252

**LASER WITH TRAVELLING WAVE EXCITATION**  
Hans Salzmann, Relenbergstrasse 57, 7000 Stuttgart 1, and Herbert Strohwal, Vogelsangstrasse 12, 7031 Holzgerlingen, both of Fed. Rep. of Germany  
Filed Jun. 10, 1976, Ser. No. 694,661  
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1975, 2528174

Int. Cl.<sup>2</sup> H01S 3/097  
U.S. Cl. 331—94.5 PE

7 Claims



1. A laser having a pair of elongated electrode means located in a common plane and separated from each other by an elongated gap forming a laser channel;  
a gaseous medium capable of being stimulated to emit radiation by laser action in said gap;  
pumping means, coupled to said electrode means, for initiating a gas discharge between the electrode means across the gap therebetween at a predetermined position along the length of the gap such that a discharge state will travel along the gap and form a region of stimulated gas travelling along said gap;  
said pumping means producing an electric field along the gap just prior to initiating the gas discharge, having an electric field strength which decreases uniformly and monotonically as the distance from said predetermined position increases, such that the discharge formative lag time increases uniformly and monotonically as the distance from said predetermined position increases.

4,166,253

**HETEROSTRUCTURE DIODE INJECTION LASER HAVING A CONSTRICTED ACTIVE REGION**  
Martin B. Small, Mohegan Lake, and Peter S. Zory, Jr., Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

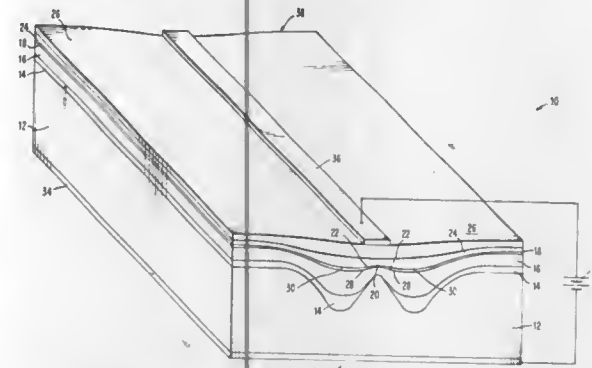
Filed Aug. 15, 1977, Ser. No. 824,690  
Int. Cl.<sup>2</sup> H01S 3/19

U.S. Cl. 331—94.5 H

8 Claims

1. Heterostructure junction laser, comprising:  
a first active layer having an elongate constricted region;  
second and third confinement layers disposed on opposite sides of said first layer and in integral contact therewith, said second and third layers having a wider bandgap than said first layer;  
a p-n junction substantially parallel with said first layer and disposed so as to inject minority carriers into said first layer when forward biased;  
contact means for forward biasing said p-n junction over at least a part of said constricted region of said first layer; and  
first and second reflective faces at opposite ends of said elongate constricted region, said faces being parallel to

second operation means supplied with the output signal of said first operation means and with the output signal of said delay means, thereby carrying out a signal combining one another and oriented perpendicular to the axial direction of said elongate constricted region;



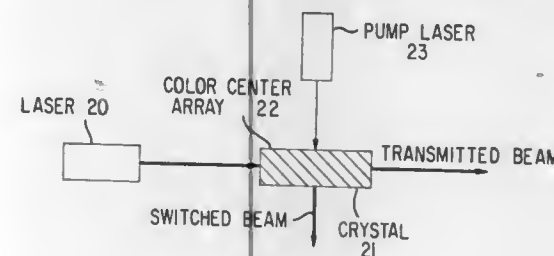
the dimensions of said constricted region being effective to constrain the laser to single filament operation when said p-n junction is forward biased.

4,166,254

**SWITCHED DIFFRACTION GRATING**  
Gary C. Bjorklund, West Windsor, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Oct. 3, 1977, Ser. No. 838,859  
Int. Cl.<sup>2</sup> H01S 3/11

U.S. Cl. 331—94.5 C

10 Claims



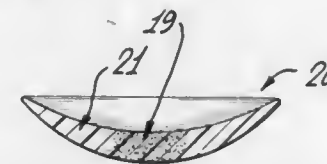
1. An optical switch for switching a beam of radiation of a predetermined wavelength from a first direction of propagation to a second direction of propagation comprising:  
a material having color centers disposed in a pattern, said pattern creating a diffraction grating for diffracting radiation of said predetermined wavelength, said color centers having a ground state, an excited state and a frequency-dependent index of refraction that has a value that is substantially different when said color centers are in said ground state from the value of said index of refraction when said color centers are in said excited state, whereby said diffraction grating has a diffraction efficiency for diffracting radiation of said predetermined wavelength that has a value that is substantially different when said color centers are in said ground state from the value of said diffraction efficiency when said color centers are in said excited state, said diffraction grating being positioned so as to intercept said beam of radiation and being oriented at an acute angle with respect to said first direction, and radiation means for irradiating said diffraction grating with further switching radiation, said further switching radiation having the property of exciting said color centers from said ground state to said excited state, which excitation changes the diffraction efficiency of said diffraction grating, whereby said beam of radiation may be switched between said first direction and said second direction.

4,166,255

**HYBRID CORNEAL CONTACT LENS**  
Robert K. Graham, Escondido, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Jun. 14, 1976, Ser. No. 695,472  
Int. Cl.<sup>2</sup> G02C 7/04

U.S. Cl. 351—160 H

14 Claims



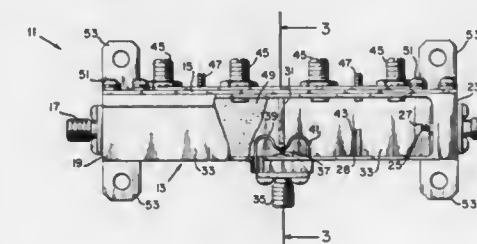
1. A hybrid corneal contact lens comprising a substantially rigid central optical element completely encased within a sheath of flexible soft polymeric material, said sheath extending beyond the edge of said central optical element to provide a flexible peripheral area around the edge of said optical element of sufficient size so that said area may lie close to the surface of an eye, wherein said substantially rigid central optical element comprises a rigid material diffused within a relatively soft material having different characteristics than said rigid material.

4,166,256

**ANTI MULTIPACTING RESONANT CAVITY**  
Tsuneo Shishido, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.  
Filed Jan. 5, 1977, Ser. No. 757,127  
Int. Cl.<sup>2</sup> H01P 1/20, 1/00, 7/06

U.S. Cl. 333—99 MP

2 Claims



1. An anti multipacting resonant cavity, comprising:  
a resonant cavity having an interior resonant cavity structure; and  
a powdered polytetrafluoroethylene material packed within said interior resonant cavity structure,  
said interior resonant cavity structure includes adjustable tuning means extending therein, said tuning means being tunable after assembly in said interior resonant cavity structure.

4,166,257

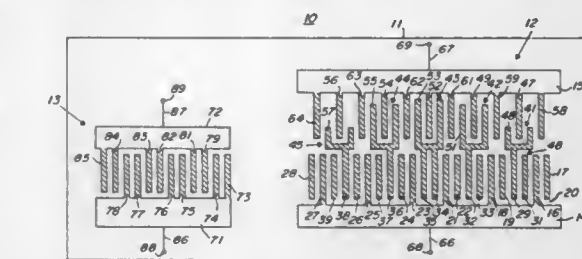
**CAPACITIVELY WEIGHTED SURFACE ACOUSTIC WAVE DEVICE**  
Sundaram Subramanian, Anaheim, Calif., assignor to Motorola, Inc., Schaumburg, Ill.  
Filed Oct. 19, 1977, Ser. No. 843,474  
Int. Cl.<sup>2</sup> H03H 9/04, 9/26, 9/30; H01L 41/10

U.S. Cl. 333—151

5 Claims

1. A surface acoustic wave device comprising,  
a piezoelectric substrate,  
a series of split-isolated interdigitated electrodes disposed on the surface of said substrate, and  
a series of capacitive weighting electrode means on said substrate, individual ones of said series of capacitive weighting electrode means being connected to individual

ones of said series of said split-isolated interdigitated electrodes, the capacitance of said capacitive weighting elec-



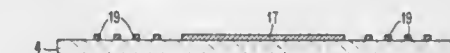
trode means decreases from the center of said interdigitated electrodes toward the ends thereof.

4,166,258

**THIN-FILM INTEGRATED CIRCUIT WITH TANK CIRCUIT CHARACTERISTICS AND APPLICATIONS TO THIN-FILM FILTERS AND OSCILLATORS**  
Samuel C.-C. Tseng, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Aug. 29, 1974, Ser. No. 501,552  
Int. Cl.<sup>2</sup> H03H 9/04, 9/20, 9/26; H01L 41/10

U.S. Cl. 333—195

9 Claims



1. An improved surface acoustic wave transducer exhibiting a lower equivalent capacitance compared with prior surface acoustic wave transducers comprising:  
a piezoelectric substrate,  
a first plurality of at least three parallel conductors deposited on said substrate, two of said parallel conductors having means for connecting said transducer to an electrical circuit, a first and second of said parallel conductors being co-linear and having a gap therebetween,  
a second plurality of parallel conductors orthogonal to first said plurality, each of said second plurality connected to one of said first plurality,  
alternate ones of said second plurality connected to one of said co-linear conductors or said other conductor except in the vicinity of said gap where two adjacent conductors of said second plurality are connected to said other conductor.

4,166,259

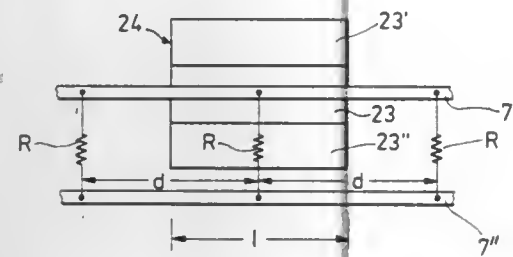
**FLAT HIGH FREQUENCY CABLE**  
Walter Hermann, Weissenfeld; Burkhard Kühl, Ottobrunn, and Wolf-Dieter Schuck, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blöhm GmbH, Munich, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 708,217, Jul. 23, 1976, Pat. No. 4,088,971. This application Nov. 16, 1977, Ser. No. 851,945  
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535381; Oct. 11, 1975, 2545669; Oct. 21, 1975, 2547011  
The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.  
Int. Cl.<sup>2</sup> H01P 3/00

U.S. Cl. 333—236

16 Claims

1. A flat high frequency cable for cooperation with coupling members having a given length and forming part of transmitter and receiver means, said cable comprising longitudinal conductor means having a given conductivity and including at least two longitudinal conductors, insulating means locating said conductor means in spaced relationship relative to each other along their entire length, discrete transverse conductor means having a transverse conductivity substantially smaller than said given longitudinal conductivity, said discrete trans-

verse conductor means comprising a number of discrete components, and means connecting said discrete components to said longitudinal conductors along the length thereof to provide a defined attenuation along the cable, said discrete compo-

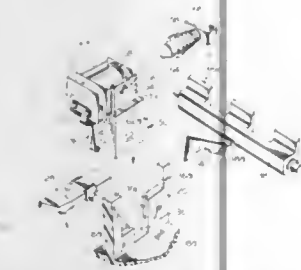
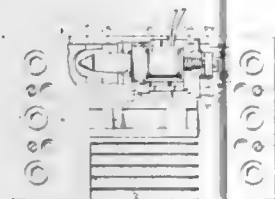


nents and their connections to said longitudinal conductor means being spaced from each other by a distance corresponding to a whole number fraction of said given length of said coupling members.

**4,166,260**  
**CIRCUIT BREAKER ACCESSORY ASSEMBLY**  
Stephen F. Gillette, Hartford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 29, 1978, Ser. No. 891,236  
Int. Cl.<sup>2</sup> H01H 73/06, 73/08  
U.S. Cl. 335—20

10 Claims



1. In a multipole circuit breaker having a molded case consisting of a base and a cover having complementing intermediate partitions serving to provide interphase isolation between adjacent pole chambers, at least the intermediate base partitions being provided with interruptions accommodating the transverse extension of a movable contact arm uniting cross bar, the edges of the base partitions bounding the interruptions being provided with grooves for slidably receiving insulative barriers in non-interfering relation with the cross bar to substantially restore interphase isolation between adjacent pole chambers, an accessory assembly comprising, in combination:

- A. an insulative mounting member having
  - (1) a panel-like section of equivalent size to the interphase barrier for sliding receipt in lieu thereof in the grooves of one base partition interruption, and
  - (2) an integral upstanding mounting flange;
- B. an accessory apparatus; and
- C. fastening means for securing said accessory apparatus to said mounting flange in operative position within one of the breaker pole chambers.

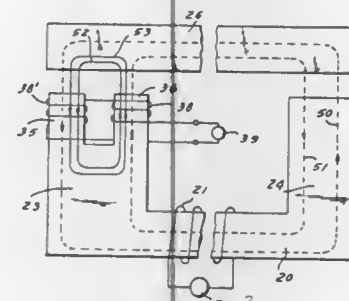
**4,166,261**  
**ELECTROMAGNET HAVING A MOVABLE ARMATURE AND A PLURALITY OF ENERGIZING SOURCES**  
Peter Meinke, Grossinzemoos, and Gerhard Flachenecker, Otto-brunn, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 548,489, Feb. 10, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,056  
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1974, 2406429

Int. Cl.<sup>2</sup> H01F 7/10

U.S. Cl. 335—246

21 Claims



1. An electromagnet comprising:
  - (a) a magnetizable yoke carrying at least two pole shoes,
  - (b) an exciter system, for magnetizing said yoke, including an exciter coil and an exciter source for energizing said exciter coil,
  - (c) a magnetizable armature arranged between said pole shoes and movable with respect to said shoes,
  - (d) the end surface of at least one of said pole shoes being divided into at least two discontinuous partial surfaces separated by a space, each partial surface forming the end surface of a partial pole piece,
  - (e) a control system associated with each pair of partial pole pieces, each control system including control coils and a control source for energizing said coils, a control coil surrounding each partial pole piece, and said control source being completely independent of said exciter source, and
  - (f) said control system being so formed and arranged that the magnetic flux applied to each of the associated pair of partial pole pieces is of equal magnitude, and the total magnetic flux produced by said control coil system emerging in one direction from said one pole shoe equals the total magnetic flux produced by said control coil system entering said one pole shoe in the opposite direction.

**4,166,262**  
**SOLENOID**  
Hollis W. Jencks, and David C. Jencks, both of Pleasant Ridge, Mich., assignors to Detroit Coil Company, Ferndale, Mich.

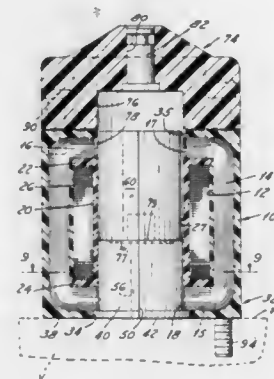
Filed Nov. 15, 1976, Ser. No. 741,983  
Int. Cl.<sup>2</sup> H01F 7/10

U.S. Cl. 335—251

1 Claim

1. An alternating current solenoid comprising, in combination:
  - a quadrilateral one piece frame having a central coil receiving opening with a pair of opposite sides having aligned apertures opening therethrough,
  - a coil-wound plastic bobbin received in the central opening of the frame and having a barrel portion defining a cylindrical plunger guideway aligned with said apertures,
  - said frame and coil-wound bobbin encapsulated in a resin block having openings through opposite ends thereof aligned with the apertures in the frame,
  - a non-laminated, cylindrical pole piece received through one end of the block and extending in a press fit through one of said apertures in a side of the frame to make snug

contact therewith and projecting into the plunger passageway, a closure cap removably overlying the opposite end of the block from the pole piece and internally provided with a cylindrical pocket aligned with the plunger guideway, means for removably securing said cap to the block in the aforesaid relation, a plastic thin walled skirt integral with said cap and concentric with the plunger passageway and telescoped through the frame aperture opposite the pole piece and forming a smooth continuation of the plunger passageway into the cap pocket, a non-laminated, cylindrical plunger received in the guideway and supported thereby for reciprocation toward and away from the pole piece,



said plunger guideway of the bobbin barrel and said skirt and the wall of said cap pocket providing the sole support for guiding the plunger during said reciprocation with the pole piece and cap pocket limiting the opposite extremes of plunger movement, and

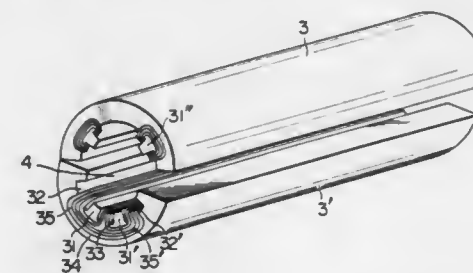
said pole piece having a radially extending flange portion underlying said frame around the aperture through which the pole piece extends with said flange abutting the frame, said flange being outwardly exposed through the resin block to abut in a compression mode the surface of the device to be actuated, whereby when the block is mounted on such device the flange is sandwiched and retained between such device and the adjacent side of the frame.

**4,166,263**  
**MAGNETIC CORE ASSEMBLY FOR MAGNETIZING COLUMNAR PERMANENT MAGNET FOR USE IN ELECTROSTATIC DEVELOPING APPARATUS**  
Hideki Harada, Urawa; Keitaro Yamashita, Kamisatomachi, and Katsunobu Yamamoto, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Oct. 3, 1977, Ser. No. 838,872  
Int. Cl.<sup>2</sup> H01F 13/00

U.S. Cl. 335—284

5 Claims



1. A magnetic core assembly for magnetizing a columnar

permanent magnet for use in an electrostatic developing apparatus comprising:

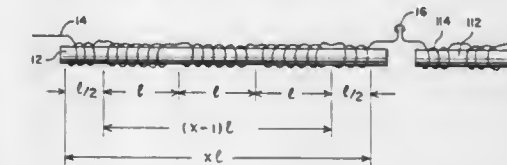
a plurality of axially extending and circumferentially disposed magnetic poles defining at their radially inner ends a through-bore for receiving a columnar permanent magnet material to be magnetized, said inner ends being adapted to be located in close proximity to the outer cylindrical surface of said columnar permanent magnet material received by said through-bore, and coil windings for magnetizing said magnetic poles received by grooves formed between adjacent magnetic poles, wherein a plurality of magnetic poles for magnetizing developing poles on said columnar permanent magnet materials are wound by a common coil winding received in grooves at both sides of said magnetic poles, and wherein each of said plurality of magnetic poles is wound with an additional coil winding, the additional coil winding being so arranged that the current through the additional coil winding received in the groove between said magnetic poles sums in a direction axially opposite to that in said common coil winding.

**4,166,264**  
**INTRUSION DETECTION TRANSDUCERS**  
James B. Starr, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 27, 1977, Ser. No. 864,966  
Int. Cl.<sup>2</sup> H01F 27/30

U.S. Cl. 336—20

13 Claims



1. A plurality of transducers connected together, comprising:
  - a central core for each transducer extending along an axis and having a length along said axis defined as XL, where X is an even number of at least 2, and L is a given length; at least one sensing winding wire wound around each said core to provide a first end winding of L/2 length, X-1 numbers of windings of length L, and a second end winding of L/2 length; each adjacent winding being of reverse polarity to the next adjacent winding;
  - means for connecting each transducer to the adjacent transducer such that the first end of one transducer connects to the second end of the adjacent transducer.

**4,166,265**  
**COIL BOBBINS AND TERMINATION OF COIL WINDINGS**  
Charles E. Reynolds, and Donald W. Hughes, both of Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 3, 1978, Ser. No. 874,958  
Int. Cl.<sup>2</sup> H01F 15/10

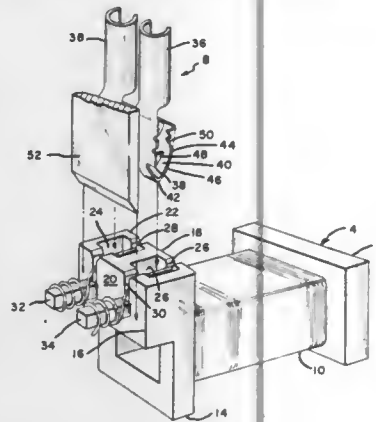
U.S. Cl. 336—192

10 Claims

1. A molded coil bobbin or the like having improved means for establishing electrical contact with the coil wire, said coil bobbin comprising:
  - a coil supporting surface which is intended to receive the coil windings,
  - a terminal housing which is integral with said coil supporting surface, said terminal housing having a terminal receiving surface and having a terminal receiving cavity extending inwardly from said terminal receiving surface, first and second wire receiving slots extending into said terminal receiving surface, said first slot extending from said cavity towards said coil supporting surface, said



second slot extending from said cavity to a side surface of said housing which is spaced from said coil supporting surface, and, an integral wire binding post extending from said side surface adjacent to said second slot whereby, upon securing a wire to said post, passing said wire through

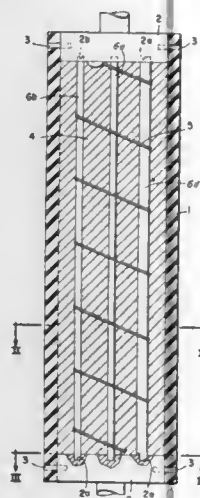


said second slot, through said cavity, and then through said first slot, and then winding said coil around said coil supporting surface, and thereafter inserting a terminal into said cavity and severing said wire by moving a cutting blade against said post, the trimmed end of said wire will be drawn into said cavity by said terminal and said terminal will be electrically connected to said wire.

**4,166,266**  
**ELECTRIC FUSE HAVING COMPOSITE SUPPORT FOR FUSIBLE ELEMENT**  
Frederick J. Kozacka, South Hampton, and Richard A. Belcher, Hampton Falls, both of N.H., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 6, 1978, Ser. No. 883,810  
Int. Cl.<sup>2</sup> H01H 85/04, 85/38  
U.S. Cl. 337-158

8 Claims



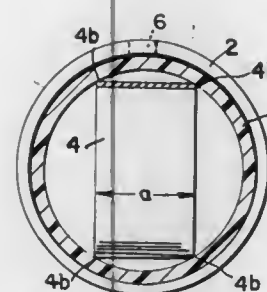
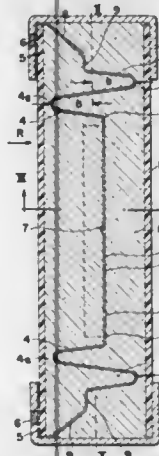
1. An electric fuse for elevated circuit voltages including a tubular casing of electric insulating material, a pair of electro-conductive terminal elements each arranged at one of the ends of said casing, and closing said casing, a pulverulent arc-quenching filler inside said casing, a substantially helically wound fusible element submersed in said filler and conductively interconnecting said pair of terminal elements, and a support for said fusible element including a plurality of rod-like support elements arranged in spaced relation parallel to the longitudinal axis of said casing, wherein the improvement consists in that each of said plurality of rod-like support ele-

ments is made of one uniform material, and that some of said plurality of rod-like support elements consists solely of a non-gas-evolving material, while at least one of said plurality of rod-like support elements consists of a gas-evolving material.

**4,166,267**  
**ELECTRIC FUSE HAVING HEAT RETAINING MEANS**  
Richard A. Belcher, Hampton Falls, and Frederick J. Kozacka, South Hampton, both of N.H., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 27, 1978, Ser. No. 872,750  
Int. Cl.<sup>2</sup> H01H 85/04  
U.S. Cl. 337-163

9 Claims

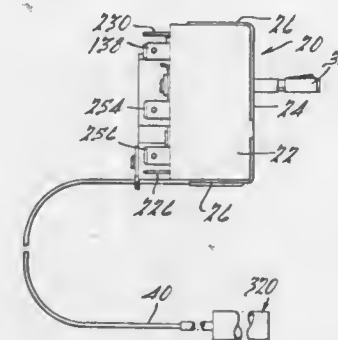


1. An electric time-lag fuse comprising a tubular casing of electric insulating material, a pulverulent arc-quenching filler inside said casing, electro conductive terminal elements affixed to and closing the ends of said casing, and means conductively interconnecting said terminal elements wherein said means include a fusible element proper equidistantly spaced from said casing, having points of reduced cross-sectional area and a fusible-element-severing overlay, said means for conductively interconnecting said terminal elements further including heat dams formed of strips of sheet metal folded in a direction substantially transversely to the direction of said fusible element proper for limiting the flow of heat from said fusible element proper to said terminal elements, wherein the novel feature consists in that said heat dams engage the inner surface of said casing and thereby firmly position said fusible element proper equidistantly relative to said casing.

**4,166,268**  
**CONTROLLER SWITCH ASSEMBLY**  
Willi K. Beck, Hingham, Mass., assignor to King-Seely Ther-mos Co., Prospect Heights, Ill.  
Continuation of Ser. No. 557,012, Mar. 10, 1975, abandoned, which is a continuation of Ser. No. 127,341, Mar. 23, 1971, abandoned, which is a division of Ser. No. 28,220, Apr. 16, 1970, abandoned, which is a continuation of Ser. No. 678,030, Oct. 26, 1967, abandoned. This application Feb. 28, 1977, Ser. No. 773,020

Int. Cl.<sup>2</sup> H01H 37/28, 37/42  
U.S. Cl. 337-309

45 Claims



1. A control assembly for controlling the flow of electrical energy to a heater load in an oven having both a cooking range of temperatures and at least one self-clean temperature, including a base, first matable fixed and movable contacts mounted relative to said base, second fixed and movable contacts mounted relative to said base, a rotatable shaft rotatable by the user relative to said base to select the cooking temperature, an inclined plane surface rotatable by the rotatable shaft for varying the fixed position of the first fixed contact, said control assembly having means movably mounted relative to said plane surface for movably supporting said first and second movable contacts, said control assembly including calibrating means for setting the fixed position of the second fixed contact relative to said base, a hydraulically activated temperature responsive means, a driving arm assembly driven by the hydraulically activated temperature responsive means and including said movable supporting means for moving said first movable contact relative to said first fixed contact to control the cooking temperature and said second movable contact at a higher temperature in the self-clean range to move said second movable contact relative to said second fixed contact, said hydraulically activated temperature responsive means being a generally helical Bourdon tube having one fixed portion, and in which a movable portion of the Bourdon tube is connected to the driving arm assembly.

**4,166,269**  
**TEMPERATURE COMPENSATED PIEZORESISTIVE TRANSDUCER**  
Mark L. Stephens, Campbell, and Paul R. Gray, Orinda, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.  
Filed Mar. 6, 1978, Ser. No. 883,486  
Int. Cl.<sup>2</sup> G01L 1/22

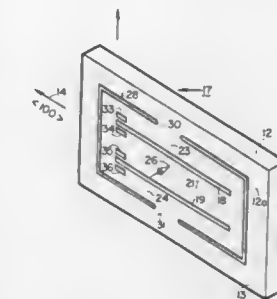
U.S. Cl. 338-3

4 Claims

1. A temperature compensated piezoresistive transducer comprising, a semiconductor body having a major top surface and a bottom surface, said body having generally parallel spaced first and second elongate slots formed therein extending through said top and bottom surfaces to define a center portion extending between said elongate slots and first and second outer portions extending from the outward edge respectively of each of said elongate slots, said center portion being adapted to receive pressure to be measured, said body having two additional opposing U-shaped slots extending through said top and bottom surfaces and extending around said first, second and cen-

ter portions to define the outer periphery of a transducer membrane with portions of said body between said U-shaped slots remaining to integrally support the membrane,

at least four piezoresistive elements having elongate and transverse dimensions formed on said membrane, said piezoresistive elements being arrayed to receive compressive and tensile stress when pressure is applied and being connected as arms of a piezoresistive transducer bridge in

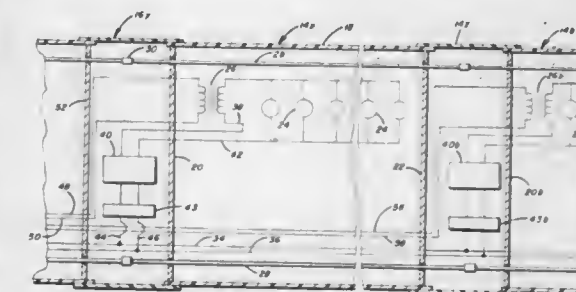


which two opposing arms of the bridge are constituted by two of said piezoresistive elements which experience compression when a force is applied to the center portion of said membrane and in which the other two opposing arms of the bridge are constituted by the remaining two of said piezoresistive elements which experience tension when said force is applied to said center portion, all of said four piezoresistive elements having their elongate dimensions parallel to each other.

**4,166,270**  
**TESTING OF SEISMIC STREAMERS**  
Auseklis Brastins, Pittsburgh, and Ralph L. Stenger, Jr., Oakmont, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.  
Filed Jan. 26, 1978, Ser. No. 872,473  
Int. Cl.<sup>2</sup> G01V 13/00

U.S. Cl. 340-5 C

15 Claims



15. A method of testing channels in a seismic streamer while being towed behind a seismic prospecting vessel, said seismic streamer including a plurality of seismic channels connected end to end, a primary circuit in each channel adapted to generate a seismic signal, and means for delivering the seismic signal from each channel to the vessel for separate recording at the vessel comprising delivering from the vessel through the streamer a control signal to activate a test circuit at each of the channels to be tested and develop a test signal indicative of a characteristic of the primary circuit, imposing the test signal on the primary circuit, and delivering through the streamer to recording apparatus on the vessel the response of the primary circuit to the test signal.

4,166,271

## DIGITAL RECOGNITION CIRCUITS

Alan C. Thirlwall, and John G. S. Iye, both of Winchester, England, assignors to Independent Broadcasting Authority, London, England

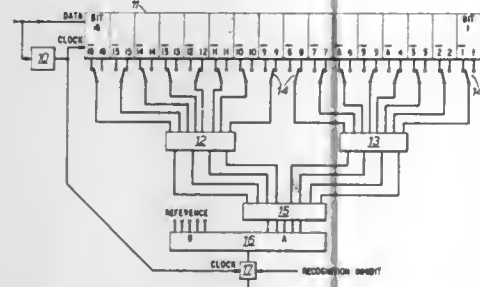
Filed Dec. 23, 1977, Ser. No. 864,007

Claims priority, application United Kingdom, Dec. 24, 1976, 54164/76

Int. Cl.<sup>2</sup> G06F 7/02

U.S. Cl. 340—146.2

3 Claims



1. Apparatus for detecting a predetermined sequence of binary digits, comprising

- (a) storage means (11) adapted to receive a succession of binary digits, said storage means including a plurality of sections each having an output;
- (b) recognition means including at least one programmable memory device (12,13) having inputs connected with the outputs of the storage means sections, said memory device having predetermined data stored therein and being operable to produce a numerical output signal indicative of the number of correct digits stored by said storage means;
- (c) means for supplying a reference signal; and
- (d) comparison means (16) for comparing said numerical output signal with said reference signal and for producing an indication of the result of the comparison.

4,166,272

## PROCESS FOR DATA TRANSFER WITH INCREASED SECURITY AGAINST CONSTRUCTION MEMBER ERROR

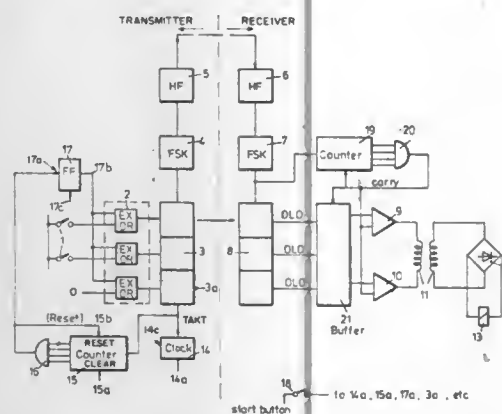
Werner Deck, Ludwigshafen am Rhine, Fed. Rep. of Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 12, 1976, Ser. No. 731,350

Int. Cl.<sup>2</sup> G06F 11/00; G08C 25/00

U.S. Cl. 340—146.1 C

10 Claims



1. A process for transmitting data for remote control purposes and the like in which security against error due to component breakdown and/or failure is provided, comprising the steps of:

- (a) creating a message of binary bits;
- (b) transmitting the message in serial fashion;
- (c) reversing the bits of the message each time a full message transmission is completed so as to alternately transmit the message in true and in inverted form;
- (d) transmitting the true and the inverted form a plurality of times;
- (e) receiving the transmission of said true and inverted messages;
- (f) examining at least two selected bits of each true and inverted message for a binary state creating a control output only when the pair of examined bits alternate state relative to one another due to alternating inversion of the messages;
- (g) said step of creating a message further comprises the step of setting the said pair of bits to be examined at the receiving end in the same binary state to represent the absence of a control request and setting a pair of bits at different binary states to represent the presence of a control request.

4,166,273

## INTRUSION DETECTOR SYSTEM

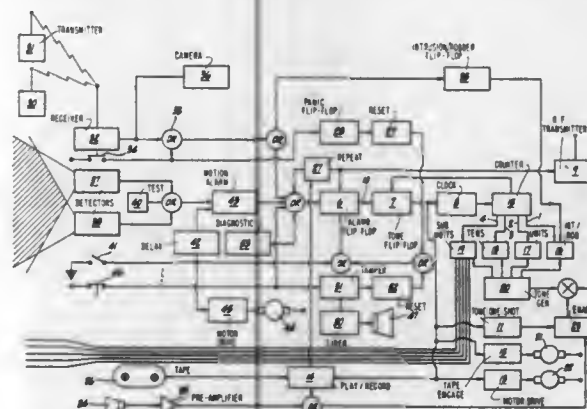
Robert E. Riley, Jr., Jackson, and Barrie McArthur, Canton, both of Mich., assignors to Diversified Technology, Inc., Ridgeland, Mich.

Filed Sep. 19, 1977, Ser. No. 834,119

Int. Cl.<sup>2</sup> G08B 13/22

U.S. Cl. 340—539

6 Claims



- 1. An intrusion detector system comprising:
- (a) means for transmitting an alarm signal,
- (b) means operative to receive the alarm signal and to provide an electric signal in response thereto,
- (c) means operative in response to the electric signal to provide a predetermined number of pulses having predetermined time periods,
- (d) a tone generator operative in response to the pulses for generating multiple tones of discretely different frequencies during each pulse to provide a tone-coded message, each generator pulse having a combination of multiple tones of different frequencies than the combination of multiple tones of each other generator pulse,
- (e) means operative to transmit the tone-coded message,
- (f) the means for transmitting an alarm signal including:
  - (1) a robbery transmitter that is directly activated to provide a first alarm signal, and
  - (2) an intrusion transmitter for transmitting a signal into a zone under surveillance and receiving a signal from the zone to provide a second alarm signal in response thereto,
- (g) the means providing the timed pulses is activated by the second alarm signal, and
- (h) means receiving the timed pulses and activating the tone generator to provide a multiple tone combination during one timed pulse to indicate a burglary, and receiving the

first alarm signal and activating the tone generator to provide a different multiple tone combination during the said one-timed pulse to indicate a robbery.

4,166,274

## TECHNIQUES FOR COPHASING ELEMENTS OF A PHASED ANTENNA ARRAY

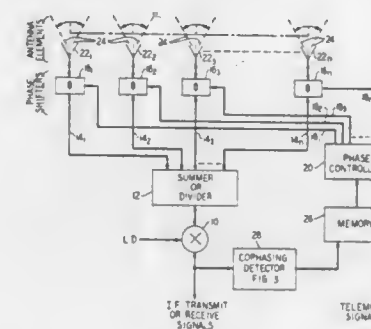
Douglas O. Reudink, Sea Girt, and Yu S. Yeh, Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 2, 1978, Ser. No. 911,827

Int. Cl.<sup>2</sup> H01Q 3/26

U.S. Cl. 343—100 SA

12 Claims



7. A method of cophasing a plurality of  $n$  feed elements which form a phase array antenna at a receiving station, the method comprising the step of:

- during a predetermined receiving interval of time,
- (a) receiving at each of the plurality of  $n$  feed elements a first signal ( $\omega_c$ ) arriving from a particular direction; CHARACTERIZED IN THAT the method comprises the further steps of:
- (b) modulating the first signal ( $\omega_c$ ) received by a first one of the plurality of  $n$  feed elements (e.g., 22<sub>1</sub>) with a second signal ( $\omega_p$ ) to produce a lower sideband reference signal thereof;
- (c) concurrent with step (b), modulating the first signal ( $\omega_c$ ) received by a second one of the plurality of  $n$  feed elements (e.g., 22<sub>2</sub>) with the second signal ( $\omega_p$ ) to produce an upper sideband signal thereof;
- (d) measuring and storing the phase angle between the upper and lower sideband signals generated in steps (b) and (c) which is representative of the phase settings between the first and second one of the feed elements;
- (e) reiterating step (b);
- (f) concurrent with step (e), modulating the first signal ( $\omega_c$ ) received by a third one of the plurality of  $n$  feed elements with the second signal ( $\omega_p$ ) to produce an upper sideband signal thereof;
- (g) measuring the phase angle between the upper and lower sideband signals generated in steps (e) and (f) which is representative of the phase setting between the first one and said third one of the plurality of  $n$  feed elements; and
- (h) determining the difference between the phase angles measured in steps (d) and (g), which difference is representative of the actual phase setting for said third one of the feed elements used in step (f) with respect to the second one of the feed elements used in step (d).

4,166,275

## LORAN RECEIVER SYSTEM

Sheldon B. Michaels, Sudbury; Otis Philbrick, Westwood, and Jeffrey Morris, Dedham, all of Mass., assignors to Digital Marine Electronics Corporation, Bedford, Mass.

Filed Aug. 18, 1977, Ser. No. 825,656

Int. Cl.<sup>2</sup> G01S 1/24

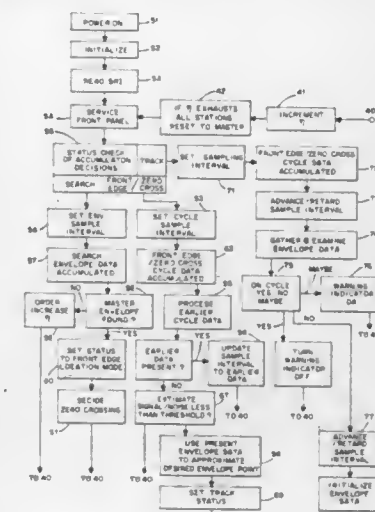
U.S. Cl. 343—103

33 Claims

1. A system for receiving and identifying groups of signals

that are repeatedly transmitted during successive transmit intervals comprising,

- (a) means for receiving the groups of signals during successive receive intervals that correspond to the successive transmit intervals,
- (b) means for sampling the output of the receiver means at successive sampling times 1, 2, 3—N during each different receive interval,



(c) each sampling time during each receive interval having a corresponding sampling time during each other receive interval,

- (d) N separate accumulating means, each for accumulating a characteristic of the received signal at corresponding samples taken during different receive intervals,
- (e) a source of references, and
- (f) means for comparing the accumulations with the references to initiate an indication of reception of the groups of signals.

4,166,276

## OFFSET ANTENNA HAVING IMPROVED SYMMETRY IN THE RADIATION PATTERN

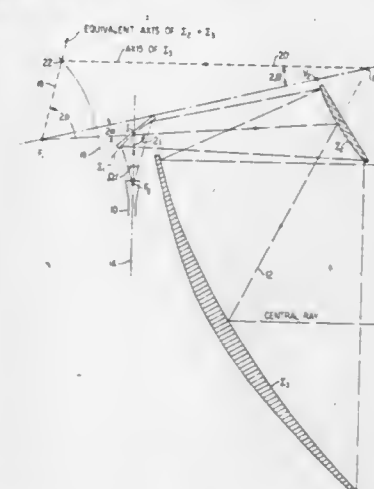
Corrado Dragone, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 5, 1977, Ser. No. 857,528

Int. Cl.<sup>2</sup> H01Q 19/14

U.S. Cl. 343—781 P

2 Claims



1. An antenna system comprising a plurality of N sequentially confocal reflectors having N + 1 separate focal points comprising at least a curved focusing offset main reflector capable of bidirectional



tionally reflecting a beam of radiated energy between the  $N^{\text{th}}$  and the  $N+1$  focal points along the feed axis thereof, a first subreflector disposed along the feed axis of the main reflector comprising a conic reflecting surface capable of bidirectionally reflecting said beam of radiated energy between said main reflector and an  $N-1$  focal point of the  $N+1$  separate focal points; and

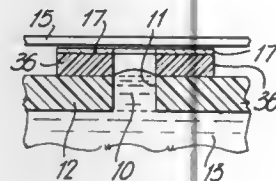
a second subreflector disposed along the feed axis of said main reflector and first subreflector comprising a conic reflecting surface capable of bidirectionally reflecting said beam of radiated energy between said first subreflector and an  $N-2$  focal point of the  $N+1$  separate focal points; and

a symmetrical feedhorn disposed at a first focal point of said  $N+1$  focal points and oriented with the longitudinal axis thereof coincident with an equivalent axis of the plurality of  $N$  sequentially confocal reflectors, the equivalent axis being the axis of revolution which passes through the first focal point of an equivalent reflecting surface which is capable of producing after a single reflection the same field distribution over the reflected wavefront as that of the plurality of  $N$  sequentially confocal reflectors.

4,166,277

**ELECTROSTATIC INK EJECTION PRINTING HEAD**  
Paolo Clelo, and William D. Westwood, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada  
Filed Oct. 25, 1977, Ser. No. 845,068  
Int. Cl.<sup>2</sup> G01D 15/16

U.S. Cl. 346—140 R



1. An electrostatic ink ejection printing head, for printing on a sheet of material, comprising:

- an ink reservoir;
- a plurality of holes in a wall of said reservoir, said holes spaced at predetermined distances in a predetermined pattern, and of a size whereby said ink is retained from emission from the holes by surface tension;
- a plurality of annular spacers supported by the reservoir wall, for maintaining the material at least a predetermined distance from the wall, the spacers surrounding and defining outer extensions of respective ones of said plurality of holes, each of the spacers combining an electrode and a hydrophobic portion a major part at least of the spacer surface defining said hole extension being hydrophobic; and

means for applying a voltage between ink in the reservoir and any preselected electrode to overcome surface tension whereby ink will emit into contact with said material.

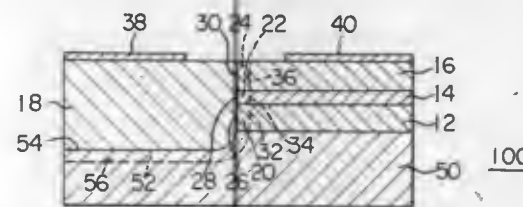
4,166,278

**SEMICONDUCTOR INJECTION LASER DEVICE**  
Wataru Susaki, and Hirofumi Namizaki, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Mar. 29, 1978, Ser. No. 892,406  
Int. Cl.<sup>2</sup> H01L 33/19

U.S. Cl. 357—18

1. A semiconductor injection laser device comprising an electrically high resistivity semiconductor substrate including a main face, a first, a second and a third semiconductor layer successively formed on a predetermined portion of said main face of said high resistivity substrate, and a fourth semiconductor layer disposed on the remaining portion of said main face of said semiconductor substrate to contact said first, second and third semiconductor layers, said fourth semiconductor layer being substantially flush with said third semiconductor layer and extending into said semiconductor substrate, said fourth semiconductor layer having a first type conductivity, at least the second layer consisting of a pair of semiconductor regions

having the first type conductivity and a second type conductivity respectively to form therebetween a pn junction serving as a light emitting region, said semiconductor region of said first type conductivity contacting said fourth semiconductor layer, said second semiconductor layer having a forbidden band-width narrower than forbidden band-widths of said first, third and fourth semiconductor layers.



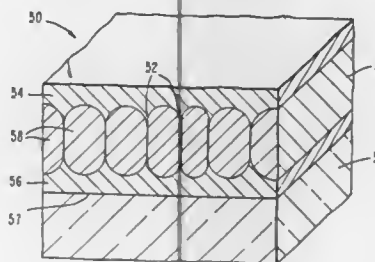
4,166,279

**ELECTROMIGRATION RESISTANCE IN GOLD THIN FILM CONDUCTORS**

Amitava Gangulee, Croton-on-Hudson; Paul S. Ho, Chappaqua, and James K. Howard, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Dec. 30, 1977, Ser. No. 865,810  
Int. Cl.<sup>2</sup> H01L 23/48, 29/46, 29/54

U.S. Cl. 357—71

19 Claims



1. A minimum physical dimensional current conductive stripe having a top surface and a bottom surface supported upon a substrate comprising:  
gold and at least one region within the stripe containing an intermetallic compound of gold and a transition metal from the group of niobium, zirconium and hafnium.

4,166,280

**HIGH PERFORMANCE TELEVISION COLOR CAMERA EMPLOYING A CAMERA TUBE AND SOLID STATE SENSORS**

Burnet M. Poole, Morgan Hill, Calif., assignor to Ampex Corporation, Redwood City, Calif.  
Filed Nov. 4, 1977, Ser. No. 848,482  
Int. Cl.<sup>2</sup> H04N 9/04, 9/07, 9/09

U.S. Cl. 358—51

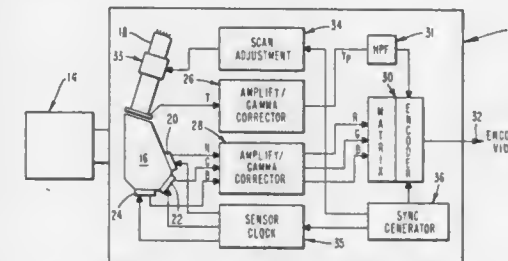
19 Claims

1. A hybrid television color camera including a lens and an optical prism for separating the luminance from selected chrominance components and for generating luminance and chrominance signals respectively therefrom, and further including video signal processing means for generating an encoded composite video color signal from the luminance and chrominance signals, comprising the combination of;

a single high-resolution pickup tube including an electron beam scan and a scan yoke and disposed to receive the

luminance component of a given image and to generate a luminance signal of the order of 4.2 and greater megahertz bandwidth;

low-resolution solid state sensor means having an array of sensor elements of near-perfect geometry, disposed in selected arrangement with the single pickup tube to receive the selected chrominance components of the same given image and to generate respective chrominance signals of bandwidths lower than that of the luminance signal;



scan adjustment means coupled to the scan yoke of the high-resolution tube to apply a correction waveform thereto to generate a near-perfect tube scan raster geometry which conforms to the near-perfect geometry of the sensor means; and

synchronizing means operatively coupled to the scan adjustment means and to the solid state sensor means for synchronizing the scan rate of the sensor means with the scan of the tube raster.

4,166,281

**VIDEO IMAGE HIGHLIGHT SUPPRESSION CIRCUIT WITH DELAYED COMPENSATION**

Robert A. Dischert, Burlington, and Sidney L. Bendell, River-ton, both of N.J., assignors to RCA Corporation, New York, N.Y.

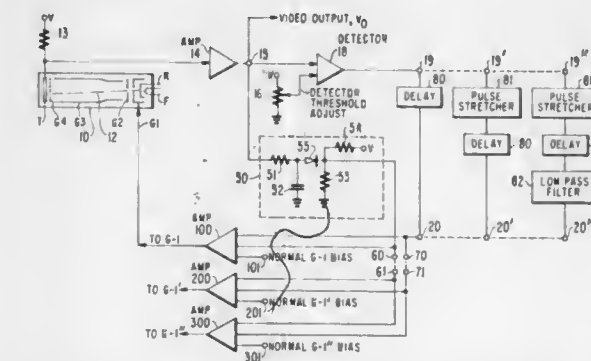
Continuation of Ser. No. 763,594, Jan. 28, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 920,078

Claims priority, application United Kingdom, Dec. 13, 1976, 51834/76; Jan. 25, 1977, 02934/77

Int. Cl.<sup>2</sup> H04N 5/19

U.S. Cl. 358—219

3 Claims



1. A beam control circuit for suppressing illumination highlights effects in a video output signal of a scene being received by an image pickup tube, said image pickup tube including a cathode, and a beam control element for controlling an electron beam used to scan a target electrode, said scanning producing an electrical output signal in the form of a video signal representing the scene being received by said pickup tube by recharging said target electrode, comprising:

detector means coupled to said image pickup tube and responsive to the output therefrom exceeding a given level in a television line indicative of highlights for providing a control signal having a leading and trailing edge and a

time duration equal to the time duration of said illumination highlights;

means coupled to said detector means for delaying said control signal a time period slightly less than a horizontal line time period or multiple thereof so as to position said control signal slightly advanced of said illumination highlights on the following lines; and

biasing means coupled to said image pickup tube control element for developing a steady state beam current in said image pickup tube and means coupled to said biasing means being responsive to said delayed control signal for increasing said steady state beam current a fixed predetermined amount in the presence of said illumination highlights during said scanning so as to increase the recharge rate of said target electrode without causing oscillations.

4,166,282

**TRACK-ON-DATA TECHNIQUE AND ASSOCIATED SYSTEM INVOLVING DI-BIT RECORDING AND ASSOCIATED DI-GAP TRANSDUCERS**

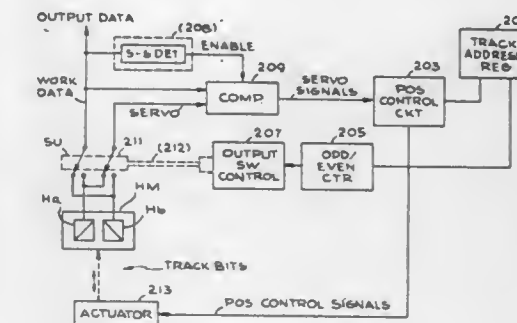
Herbert U. Ragle, and Norman S. Blessum, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 16, 1977, Ser. No. 807,155

Int. Cl.<sup>2</sup> G11B 5/56, 21/10

U.S. Cl. 360—77

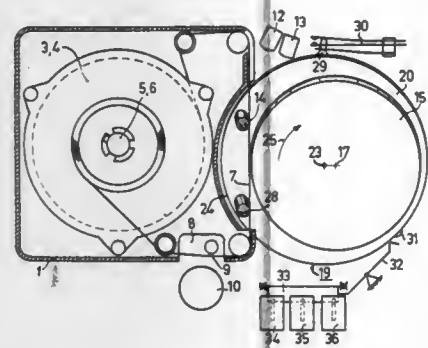
28 Claims



1. An improved magnetic recording subsystem including an improved magnetic head arrangement adapted to record and to detect first and second associated recording bits along prescribed track portions of a magnetic disk record medium, these bits being skewed relative to elongate axis of the track and disposed orthogonal to one another, this subsystem being arranged to apply the output detected from said first bits to a first data utilization means and to apply the output detected from said second bits to a second data utilization means, said subsystem comprising:

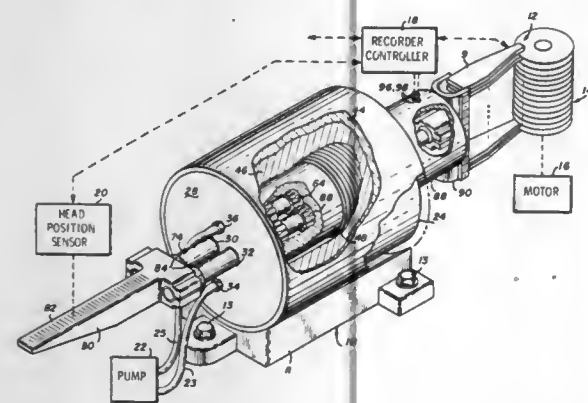
di-gap magnetic transducer means including at least one pair of skewed relatively transverse transducer gaps, each gap being positioned and adapted to align along a different respective disk track being spaced apart a prescribed interval, each having an associated output connection; and output switching means adapted to shift the respective outputs from each said pair of gaps periodically between said first and second utilization means, each gap in such a pair thus being devoted to transducing only one of said bit types along a given track, with the other gap devoted to transducing to the other bit type, these respective bits and gaps thus being aligned parallel along any given track, the bit types being thus selectively interchangeable as to associated utilization means from track to track as desired and encoded, this relationship being followed by such switching means.

**4,166,283**  
**SELF-THREADING HELICAL SCAN VIDEO CASSETTE RECORDER**  
 Nanno van Slageren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
 Filed Mar. 13, 1978, Ser. No. 885,792  
 Claims priority, application Netherlands, Mar. 17, 1977, 7702875  
 Int. Cl.<sup>2</sup> G11B 15/06, 5/52  
 U.S. Cl. 360—95



1. A self-threading helical scan cassette recorder comprising a tape guide drum along which tape from a cassette inserted into the recorder is passed in a helical path, and a tape guide device including a support pivotable about an axis and having at least one tape guide element disposed on said support; said support being pivotable between a rest position in which said at least one element is disposed behind tape extending across an opening in the cassette, said element projecting into the opening, and an operating position in which tape is extracted from the cassette and positioned around the drum; wherein said at least one guide element comprises a motor-driven capstan disposed on the support.

**4,166,284**  
**READ/WRITE HEAD-POSITIONING APPARATUS**  
 Kenneth M. Daniels, 125 Roberta Dr., Woodside, Calif. 94062  
 Filed Jul. 21, 1978, Ser. No. 926,805  
 Int. Cl.<sup>2</sup> G11B 21/08, 5/55; H02K 41/02  
 U.S. Cl. 360—106



1. Head-positioning apparatus for magnetic recorders comprising:  
 a stator assembly including a magnetic field generating structure having an axially-extending, generally cylindrical, armature coil-receiving recess formed concentric with the longitudinal axis of the stator assembly and circumscribing a first part thereof, and means forming at least one passageway extending through said stator assembly in symmetrical disposition relative to said longitudinal axis;  
 an armature assembly including elongated shaft means ex-

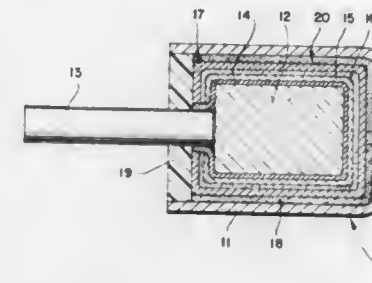
tending through said passageway, armature coil means, an elongated generally cylindrical coil support means having one end affixed to one end of said shaft means and the other end carrying said coil means axially, along and within said recess, and carriage means affixed to said shaft means at least one recording head for movement over the surface of a recording media; and  
 means providing a balanced flow of lubricating fluid between the surfaces of said passageway and the shaft means extending therethrough such that when predetermined electrical signal is applied to said coil means said armature means will be moved to a predetermined position relative to said stator means and such movement will be accomplished substantially free of any mechanical contact friction forces.

**4,166,285**  
**ELECTRICAL CAPACITOR WITH A PLEATED METALLIZED PORTION AND A STARTING PORTION WOUND ABOUT THE LEAD WIRES**  
 Robert E. Bauer, Lincolnshire, and Charles C. Rayburn, Mount Prospect, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.  
 Filed Jun. 29, 1978, Ser. No. 920,424  
 Int. Cl.<sup>2</sup> H01G 1/14  
 U.S. Cl. 361—307



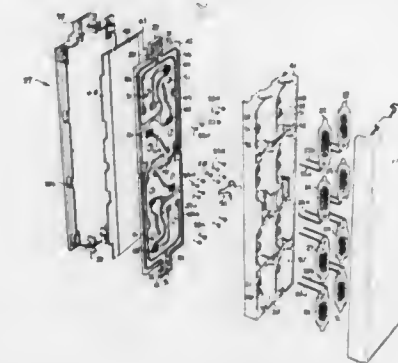
4. A wound film capacitor comprising two electrode layers and at least one dielectric layer between said electrode layers, a transverse portion of each of said electrode and dielectric layers being positioned between a pair of lead wires which have axial portions about which the layers are wound, each of said electrode layers having a longitudinally extending portion thereof wrapped around a portion of the periphery of each lead wire so that said electrode layers are tightly held in intimate mechanical contact with said lead wires, said electrode layers and said dielectric layer being of a relatively short length and each of said layers having terminal ends, an electrical capacitor segment incorporated into said wound film capacitor comprising a plurality of pleated layers comprising a dielectric film, a first metallized electrode film applied to one side of said dielectric film so that an unmetallized margin extends longitudinally along one terminal end of said dielectric film, a second metallized electrode film applied to the other side of said dielectric film so that an unmetallized margin area extends longitudinally along the opposite terminal end of said dielectric film, said electrical capacitor segment being substantially longer than said electrode layers and said dielectric layer, the terminal end of one of said electrode layers being inserted into said electrical capacitor segment so that it is in electrical contact with said first metallized electrode film, a terminal end of said other electrode layer being inserted into said electrical capacitor segment so that it is in electrical contact with said second metallized electrode film and said electrical capacitor segment being wound into said film capacitor to form the outer portions thereof.

**4,166,286**  
**ENCAPSULATED PLANAR CHIP CAPACITOR**  
 John G. Bolssonault, 23 Wildwood Dr., Saco, Me. 04072  
 Continuation-in-part of Ser. No. 699,159, Jun. 23, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,673  
 Int. Cl.<sup>2</sup> H01G 9/00  
 U.S. Cl. 361—433



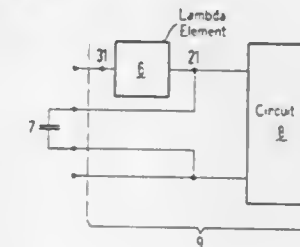
1. A non-hermetically sealed capacitor resistant to heat degradation up to 275 degrees centigrade comprising a processed chip; said processed chip including at least a solid electrolyte; a dielectric layer; a semi-conductive layer; a conductive layer; and an anode lead, a conductive metal container open at one end, said container including a moisture-proof conductive void-free adhesive material, said container dimensioned to snugly receive said chip, said adhesive material in said container in a volumetric amount to substantially engage said chip free of said lead without voids between said container and said chip, a moisture-proof non-conductive plastic seal, said non-conductive plastic seal adapted to seal said open end of said metal container with said anode lead extending there-through, said adhesive material and said chip in said container with said plastic seal substantially free of all moisture and voids.

**4,166,287**  
**PHOTOFLASH LAMP ARRAY**  
 Harry Atwood, Chagrin Falls, Ohio, assignor to General Electric Company, Schenectady, N.Y.  
 Filed Oct. 20, 1977, Ser. No. 843,785  
 Int. Cl.<sup>2</sup> G03B 15/02  
 U.S. Cl. 362—13



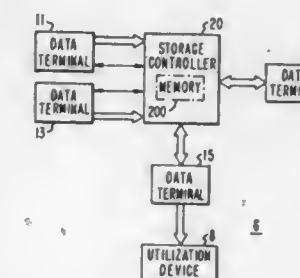
1. A flash lamp array comprising at least one group of flash lamps and circuitry for causing sequential flashing of said lamps, and a connector carrying first, second and third connector terminals, means electrically connecting said first and second terminals to said group of flash lamps and circuitry, and conductor means electrically connecting said third terminal to said first terminal prior to and during the flashing of said lamps.

**4,166,288**  
**INTEGRATED CURRENT SUPPLY**  
 Karl-Ulrich Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
 Filed Aug. 16, 1977, Ser. No. 825,146  
 Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2638086  
 Int. Cl.<sup>2</sup> H02M 7/00  
 U.S. Cl. 363—147



1. A current supply circuit for supplying current to an integrated circuit, comprising: a Lambda element means for rectifying an alternating input current which blocks when negative voltages are connected thereacross, which passes current in a predetermined positive voltage passband, and which blocks current again for positive voltages higher than the passband; a capacitor connected at an output of the Lambda element means; an alternating input current source being connected to an input of said Lambda element means; and said integrated circuit and Lambda element means connected to supply current thereto being integrated on a common chip.

**4,166,289**  
**STORAGE CONTROLLER FOR A DIGITAL SIGNAL PROCESSING SYSTEM**  
 John C. Murtha, Towson; James A. Ross, Jr., Aberdeen; William G. Shipley, Old Mill, and Martin W. Czekalski, Millersville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Sep. 13, 1977, Ser. No. 832,775  
 Int. Cl.<sup>2</sup> G06F 3/04, 13/00  
 U.S. Cl. 364—200

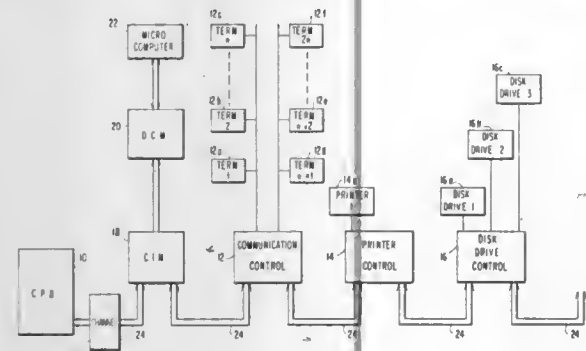


1. A storage controller for controlling the transfer of vectors of digital data words between a data terminal and a first memory in said storage controller comprising:  
 said first memory having a plurality of addressable locations for storing digital data words transferable between said data terminal and said first memory;  
 means for initiating a transfer of a vector of data words between said data terminal and said first memory;  
 first storage means for storing predetermined constants used to control the transfer of said vector of data words;  
 means for selecting said predetermined constants from said first storage means in response to said initiating means and from predetermined constants previously selected;  
 first memory address generating means, responsive to said selected predetermined constants for generating addresses for said first memory; and



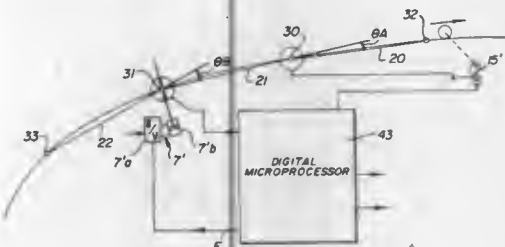
means for generating control signals responsive to said selected predetermined constants for transferring each data word of said vector of data words between said generated address locations in said first memory and said data terminal.

**4,166,290**  
**COMPUTER MONITORING SYSTEM**  
Eugene L. Furtman; Charles B. Ross; Richard D. Ashby, all of McLean, Va., and Steven D. Berliner, Sunnyvale, Calif., assignors to Tesdata Systems Corporation, MacLean, Va.  
Filed May 10, 1978, Ser. No. 904,654  
Int. Cl.<sup>2</sup> G06F 11/00  
U.S. Cl. 364—200 15 Claims



1. A system for monitoring the performance of peripheral devices connected to a central processing unit channel of the type which carries data, addresses, commands, status information and a plurality of condition flags, comprising:  
a channel interface module connected as a peripheral device to said channel, said channel interface module comprising data selector means for receiving all said data, address, command and status information on said channel and providing same on a bus line output thereof, a signal level circuit for receiving selected condition flags on said channel and providing condition strobes at an output thereof, and event means for receiving said condition flags and providing input event codes representing selected sequences and combinations of said condition flags; and  
a data collection module connected to said channel interface module and receiving all information on said bus line output, said condition strobes and said input event codes, said data collection module comprising a packet memory for storing packets of information about selected peripheral devices whenever said selected peripheral devices are accessed on the channel, a data memory for storing selected portions of data passing between said CPU and said selected peripheral device and appearing on said bus line, and means responsive to an address on said bus line for selectively controlling the entry of information pertaining to the peripheral device identifying by said address into said packet memory and for selecting a specific part or none of the subsequent data appearing on said bus line for storage in said data memory.

**4,166,291**  
**CHORD LINER USING ANGLE MEASUREMENT**  
Charles A. Shupe, Beaconsfield, Canada, assignor to Canon, Inc., New York, N.Y.  
Filed Dec. 21, 1977, Ser. No. 862,852  
Int. Cl.<sup>2</sup> E01B 33/02  
U.S. Cl. 364—560 27 Claims



1. Apparatus for reducing railroad track alignment errors comprising a first measuring system having a first forward chord forming structure both ends of which are located adjacent pairs of track engaging wheels and each end being located intermediate a respective pair of wheels and a first rearward chord forming structure both ends of which are located adjacent pairs of track engaging wheels and each end being located intermediate a respective pair of wheels, the rearward end of the first forward chord forming structure being fixed closely adjacent the forward end of the first rearward chord forming structure, the first chord forming structures being relatively pivotable to define a variable angle therebetween measured at the adjacent ends of the two first chord forming structures, means located at the adjacent ends of the first chord forming structures to measure the variable angle, means to move the first measuring system along a section of track for enabling the variable angle measuring means to measure said variable angle at a series of locations, means for storing and averaging the values obtained at said series of locations and obtaining an average value, a track position correcting means attached to and trailing the first measuring system, a second measuring system associated with the track correcting means and having a second forward chord forming structure both ends of which are located adjacent pairs of track engaging wheels and each end being located intermediate a respective pair of wheels and a second rearward chord forming structure both ends of which are located adjacent pairs of track engaging wheels and each end being located intermediate a respective pair of wheels, the rearward end of the second forward chord forming structure being fixed closely adjacent the forward end of the second rearward chord forming structure, the second chord forming structure being relatively pivotable to define a variable angle therebetween measured at the adjacent ends of the two second chord forming structures to measure the angle at a particular track location, means to compare said average angle value with the angle value obtained by the second measuring system at said particular track location and provide an angle error value, and means for applying said angle error value to control the operation of the track position correcting means to reduce an existing track alignment error.

# DESIGN PATENTS

GRANTED AUG. 28, 1979

## ERRATA

For	See
CLASS	PATENT NO.
D21-232 .....	252,770
D21-219 .....	252,771
D18-007 .....	252,773
D03-037 .....	252,774

# DESIGNS

AUGUST 28, 1979

252,716

## HANG GLIDER HARNESS

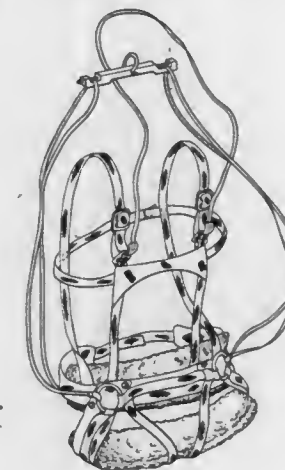
Daniel C. Chadwick, 7800 Woodman Ave., Panorama City, Calif. 91402

Continuation-in-part of Ser. No. 675,107, Apr. 9, 1976, abandoned. This application Jun. 21, 1978, Ser. No. 917,603

Term of patent 14 years

Int. Cl. D2—02

U.S. Cl. D2—25



252,719

## SHELF UNIT

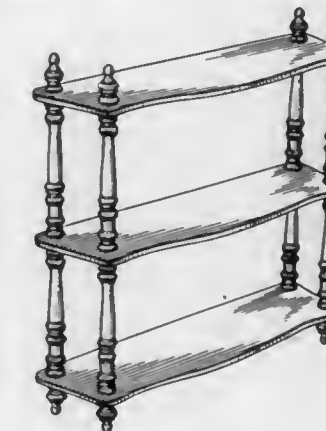
Domingo V. Otero, Goran Via St. No. 110, Vigo, Pontevedra, Spain

Filed Aug. 10, 1977, Ser. No. 823,521

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—153



252,717

## SPIKE PROTECTION ATTACHMENT FOR GOLF SHOES

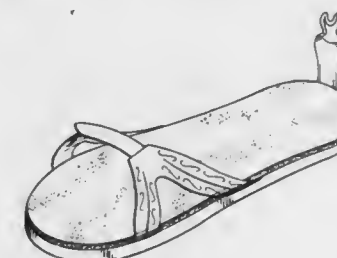
Mathew Kaman, 901 E. Cass St., Joliet, Ill. 60432

Filed Jun. 16, 1977, Ser. No. 807,310

Term of patent 14 years

Int. Cl. D2—04

U.S. Cl. D2—314



252,718

## STORAGE CABINET OR SIMILAR ARTICLE

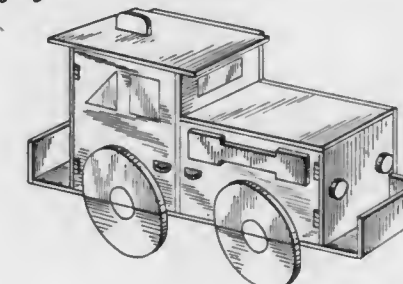
Tad Taylor, 31 Byram Shore Rd., Byram, Conn. 06830

Filed May 9, 1977, Ser. No. 795,317

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—5



252,720

## CABINET OR SIMILAR ARTICLE

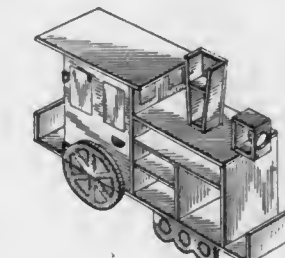
Tad Taylor, 31 Byram Shore Rd., Byram, Conn. 06830

Filed Mar. 28, 1977, Ser. No. 781,705

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—154





252,721

**LOWBOY CABINET**

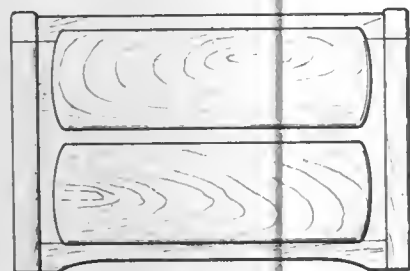
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Aug. 8, 1977, Ser. No. 822,608

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-160



252,722

**COMBINED CABINET AND SHELF UNIT**

Franz Hero, and Karl Odermatt, both of Hinwil, Switzerland, assignors to Interlücke Gebr. Lücke KG, Wiedenbrück, Fed. Rep. of Germany

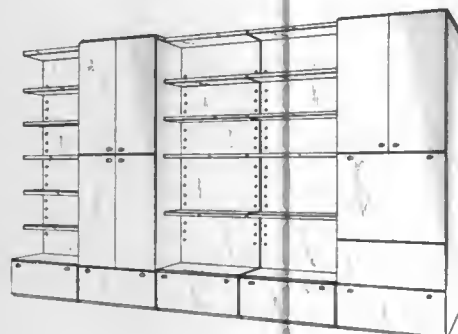
Filed Nov. 2, 1976, Ser. No. 738,233

Claims priority, application Fed. Rep. of Germany, May 7, 1976, 877/76

Term of patent 7 years

Int. Cl. D6-04

U.S. Cl. D6-164



252,723

**TRIPLE DRESSER**

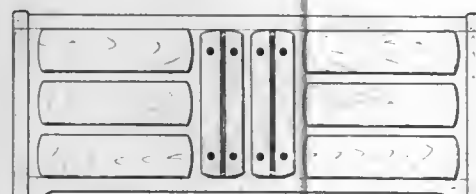
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Aug. 8, 1977, Ser. No. 822,611

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-164



252,724

**DOOR CHEST**

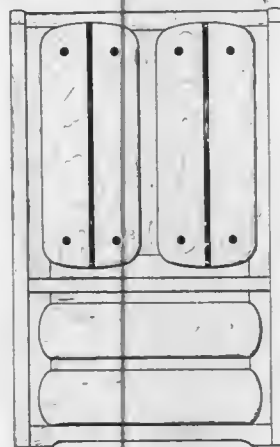
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Aug. 8, 1977, Ser. No. 822,615

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-164



252,725

**LOWBOY DECK CABINET**

Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Aug. 8, 1977, Ser. No. 822,607

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-168



252,726

**NIGHT STAND**

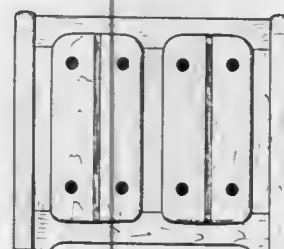
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Aug. 8, 1977, Ser. No. 822,613

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-168



252,727

**CREDENZA**

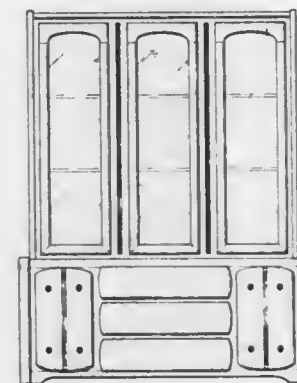
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Aug. 8, 1977, Ser. No. 822,606

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-172



252,729

**DISPLAY RACK FOR CARPET SAMPLES**

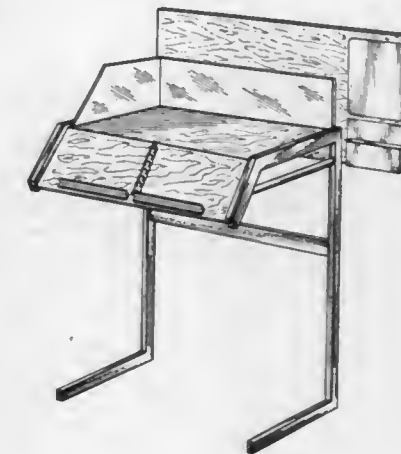
Robert J. Leahy, Jr., LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 20, 1977, Ser. No. 843,895

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-181



252,730

**PORTABLE COMBINED REFRIGERATOR AND RANGE UNIT**

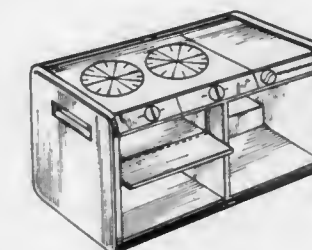
Rudolph Mazurosky, 2 Round Hill Rd., Scotch Plains, N.J. 07076

Filed Aug. 22, 1977, Ser. No. 826,948

Term of patent 14 years

Int. Cl. D6-04; D7-02; D15-07

U.S. Cl. D7-121



252,728

**DISPLAY STAND**

Jerry Hammer, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,511

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-180



252,731

**ELECTRIC POLISHER**

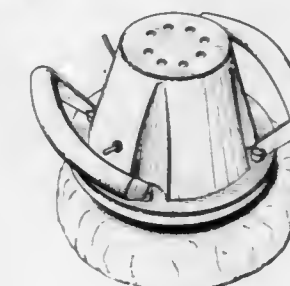
Carl Parise, 3695 Downey Ave., Reno, Nev. 89503

Filed Apr. 3, 1978, Ser. No. 892,729

Term of patent 14 years

Int. Cl. D8-05; D15-05

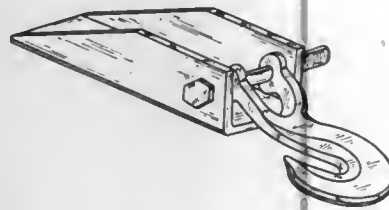
U.S. Cl. D8-62



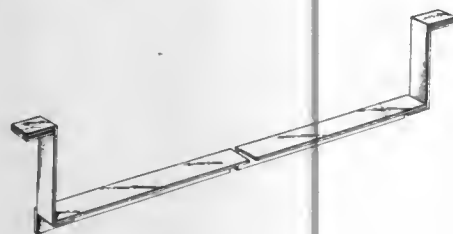
252,732  
**KEY HEAD COVER**  
 Robert E. Price, 3850 Rio Rd., #34, Carmel, Calif. 93923  
 Filed Dec. 12, 1977, Ser. No. 860,002  
 Term of patent 14 years  
 Int. Cl. D8-07; D3-01  
 U.S. Cl. D8-347



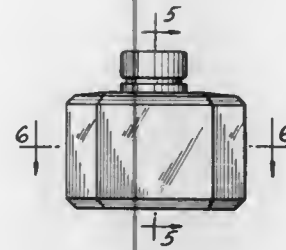
252,733  
**COMBINED FLOOR ANCHOR PLATE AND HOOK**  
 William J. Meis, 6 Valley Dr., Crescent, Iowa 51526  
 Filed Jun. 29, 1977, Ser. No. 811,030  
 Term of patent 14 years  
 Int. Cl. D8-08  
 U.S. Cl. D8-367



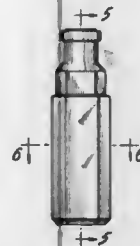
252,734  
**INSULATION SUPPORT**  
 J. L. Holcombe, Dallas, Tex., assignor to Emerson H. Mizell  
 Filed Apr. 25, 1978, Ser. No. 899,834  
 Term of patent 14 years  
 Int. Cl. D8-08  
 U.S. Cl. D8-380



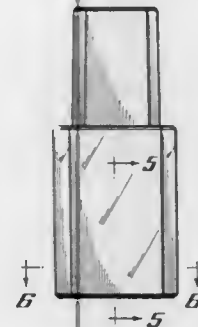
252,735  
**BOTTLE OR SIMILAR ARTICLE**  
 Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.  
 Filed Oct. 21, 1977, Ser. No. 844,249  
 Term of patent 14 years  
 Int. Cl. D9-01  
 U.S. Cl. D9-129



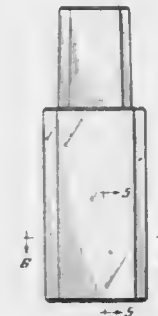
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**BOTTLE OR SIMILAR ARTICLE**  
 Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.  
 Filed Oct. 21, 1977, Ser. No. 844,248  
 Term of patent 14 years  
 Int. Cl. D9-01  
 U.S. Cl. D9-157



252,737  
**BOTTLE OR SIMILAR ARTICLE**  
 Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.  
 Filed Feb. 15, 1977, Ser. No. 769,133  
 Term of patent 14 years  
 Int. Cl. D9-01  
 U.S. Cl. D9-168



252,738  
**BOTTLE OR SIMILAR ARTICLE**  
 Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.  
 Filed Feb. 15, 1977, Ser. No. 769,135  
 Term of patent 14 years  
 Int. Cl. D9-01  
 U.S. Cl. D9-168



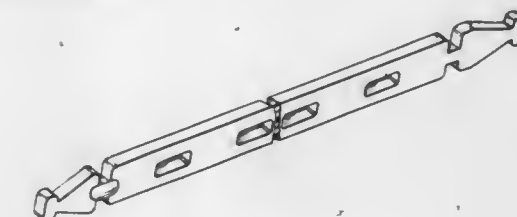
252,739  
**BOTTLE OR SIMILAR ARTICLE**  
 Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.  
 Filed Feb. 15, 1977, Ser. No. 769,134  
 Term of patent 14 years  
 Int. Cl. D9-01  
 U.S. Cl. D9-168



252,740  
**DOLL PACKAGE**  
 David A. Brown, 1611 31st St. NW., Washington, D.C. 20007; E. A. Carmean, Jr., 3308 Legation St. NW., Washington, D.C. 20015, and Barbara A. Murek, 3051 Idaho Ave. NW., Washington, D.C. 20016  
 Filed Sep. 22, 1976, Ser. No. 725,553  
 Term of patent 3 1/2 years  
 Int. Cl. D9-03  
 U.S. Cl. D9-193



252,741  
**TIE STRAP**  
 Willard H. Taylor, 494 N. Main St., Gloversville, N.Y. 12078  
 Filed Oct. 21, 1976, Ser. No. 734,510  
 Term of patent 14 years  
 Int. Cl. D9-99  
 U.S. Cl. D9-252





252,742  
WATCH

Alain D. Perrin, Rueil-Malmaison, France, assignor to Les Must de Cartier-France, Paris, France

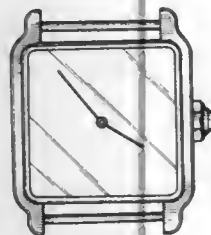
Filed May 16, 1977, Ser. No. 797,570

Claims priority, application France, Nov. 15, 1976, 75 218

Term of patent 14 years

Int. Cl. D10—02

U.S. Cl. D10—39

252,743  
CHARM

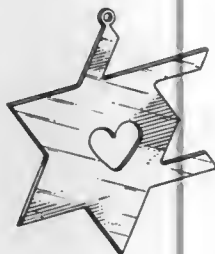
Antonio M. Jaramillo, 337 W. Olive, Inglewood, Calif. 90301

Filed Aug. 8, 1977, Ser. No. 822,956

Term of patent 14 years

Int. Cl. D11—01

U.S. Cl. D11—70

252,744  
PENDANT

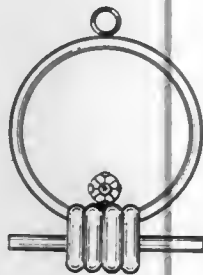
Josef J. Barr, 125 Worth Ave., Suite 300, Palm Beach, Fla. 33480

Filed Oct. 13, 1977, Ser. No. 841,747

Term of patent 14 years

Int. Cl. D11—01

U.S. Cl. D11—79

252,745  
PENDANT

Eileen C. Watson, 434 S. Oakland Ave., Pasadena, Calif. 91101

Filed Aug. 15, 1977, Ser. No. 824,280

Term of patent 14 years

Int. Cl. D11—01

U.S. Cl. D11—81



## 252,746

## CART FOR TRANSPORTATION

Nils E. Ek, Sikvägen 36, S-135 00 Tyresö, Sweden

Filed Jun. 12, 1978, Ser. No. 915,072

Term of patent 14 years

Int. Cl. D12—02

U.S. Cl. D12—34



## 252,747

Patent Not Issued For This Number

## 252,748

## AUTOMOBILE WIRE WHEEL

Merlyn R. Reppert, Rancho Palos Verdes, Calif., assignor to W. R. Grace & Co.

Filed Jul. 22, 1977, Ser. No. 818,048

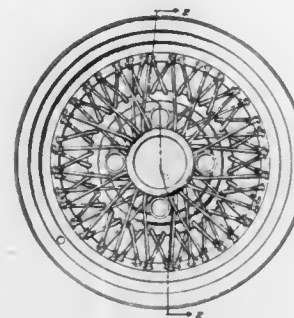
The portion of the term of this patent subsequent to Jan. 11,

1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D12—16

U.S. Cl. D12—205



## 252,749

## SPOKED VEHICLE WHEEL

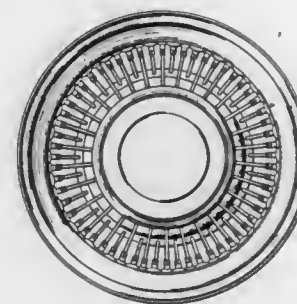
Ronald D. Retzlaff, Anaheim, Calif., assignor to Tru-Spoke, Inc., Anaheim, Calif.

Filed Jun. 1, 1978, Ser. No. 911,440

Term of patent 14 years

Int. Cl. D12—16

U.S. Cl. D12—205



## 252,750

## CAPSTAN

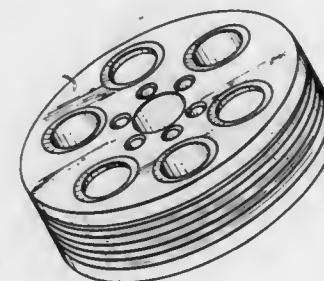
Alan Painter, Los Angeles; Daniel R. O'Neill, Santa Monica, and George L. Glaeser, Jr., Culver City, all of Calif., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Filed Dec. 29, 1975, Ser. No. 644,874

Term of patent 14 years

Int. Cl. D14—01, 99

U.S. Cl. D14—10

252,751  
CAPSTAN

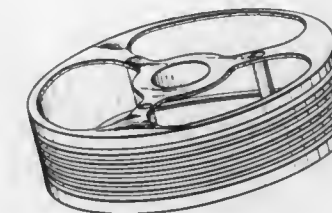
Alan Painter, Los Angeles; Daniel R. O'Neill, Santa Monica, and George L. Glaeser, Jr., Culver City, all of Calif., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Filed Dec. 29, 1975, Ser. No. 644,887

Term of patent 14 years

Int. Cl. D14—01, 99

U.S. Cl. D14—10



## 252,752

## TELEPHONE SET

Fukushima Hisao; Watanabe Katsuhito; Kanda Yoshinori, and Watanabe Tsutomu, all of Tokyo, Japan, assignors to Oki Electric Co., Ltd., Tokyo, Japan

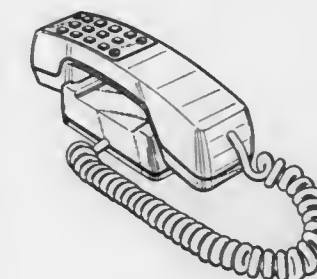
Filed Aug. 4, 1977, Ser. No. 821,857

Claims priority, application Japan, Feb. 9, 1977, 52-3821

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D14—53



## 252,753

## VIDEO GAME CARTRIDGE ASSEMBLY

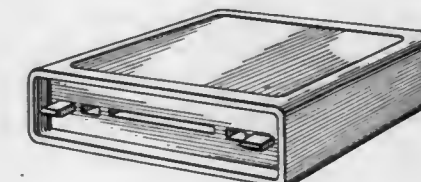
Frederick W. Thompson, Soquel; Douglas A. Hardy, Portola Valley, and James C. Asher, San Jose, all of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed May 27, 1977, Ser. No. 801,156

Term of patent 14 years

Int. Cl. D16—05, 99

U.S. Cl. D14—11

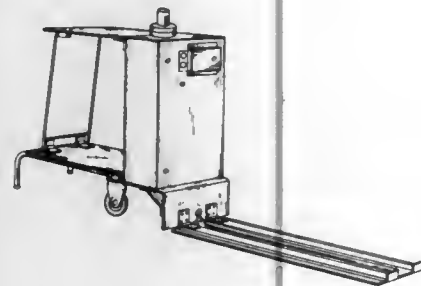


252,754

**TRANSPORTABLE CAMERA STAND**

Rudolf Viering, Cologne, Fed. Rep. of Germany, assignor to Pixyfoto GmbH, Cologne, Fed. Rep. of Germany  
 Filed Oct. 29, 1976, Ser. No. 736,982  
 Claims priority, application Fed. Rep. of Germany, May 6, 1976, MP6129

Term of patent 14 years  
 Int. Cl. D16—05; D12—02  
 U.S. Cl. D16—44

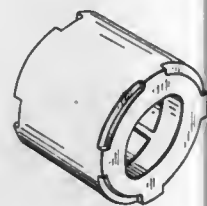


252,755

**CORE FOR ELONGATED STRIP**

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan  
 Continuation-in-part of Ser. No. 646,510, Jan. 5, 1976, abandoned. This application Aug. 17, 1976, Ser. No. 715,250  
 Claims priority, application Japan, Oct. 4, 1975, 50/39919; Nov. 14, 1975, 50/44960; Feb. 18, 1976, 51/4881; May 7, 1976, 51/16660

Term of patent 14 years  
 Int. Cl. D19—99  
 U.S. Cl. D19—67

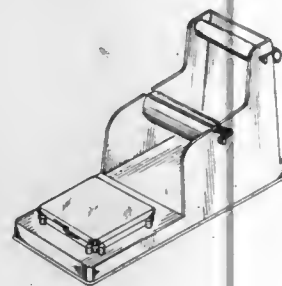


252,756

**LABEL DISPENSER**

Willard W. Rogers, 2612 N. 93rd, Omaha, Nebr. 68134  
 Filed Dec. 6, 1976, Ser. No. 748,261  
 Term of patent 14 years

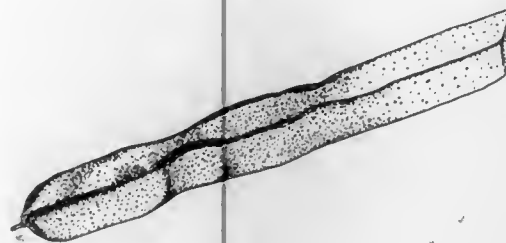
Int. Cl. D19—02  
 U.S. Cl. D19—67

252,757  
PEN

Oliver T. Sublette, 1022 Sacramento St., San Francisco, Calif. 94108

Filed Jan. 23, 1978, Ser. No. 871,416  
 Term of patent 14 years  
 Int. Cl. D19—06

U.S. Cl. D19—42

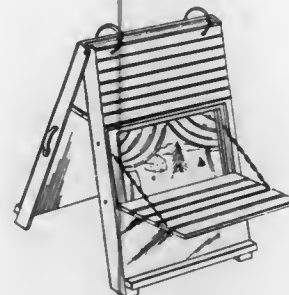


252,758

**PORTABLE TEACHING AID**

Lester E. Prall, P.O. Drawer A-1, Salt Lake City, Utah 84501  
 Filed May 2, 1977, Ser. No. 793,162  
 Term of patent 3 1/2 years  
 Int. Cl. D19—07

U.S. Cl. D19—62

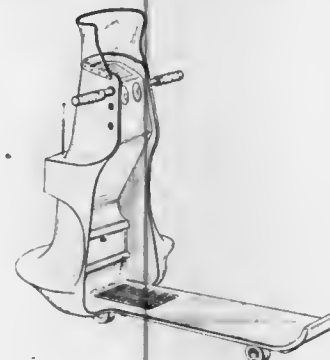


252,759

**SKATEMOBILE**

Frank B. Medor, 28 Citrus Ave., Dunedin, Fla. 33528  
 Filed Nov. 11, 1977, Ser. No. 850,710  
 Term of patent 14 years  
 Int. Cl. D21—01

U.S. Cl. D21—81

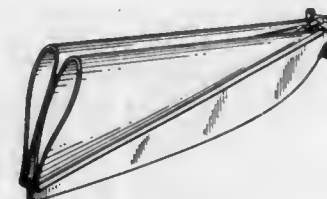


252,760

**TOY GLIDER**

Michael R. Meyers, Trumbull; John A. Vernon, Bethel, both of Conn., and Dorland L. Crosman, Glen Ridge, N.J., assignors to Louis Marx & Co., Inc., Stamford, Conn.  
 Filed Jul. 22, 1977, Ser. No. 818,181

Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—88

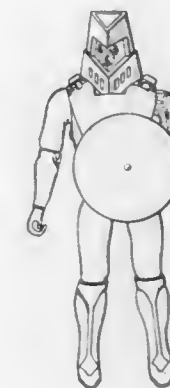


252,762

**TOY FIGURE**

Richard M. Rossi, Greenville; Carl Cederholm, Providence; Steven R. D'Aguanno, Greenville, and Charles Muenchinger, Providence, all of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Nov. 28, 1977, Ser. No. 856,032  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—177

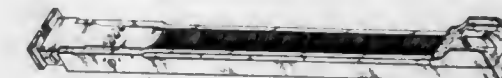


252,763

**GUN SIGHT**

Leonard A. Tiritilli, 631 E. Norman Ave., Arcadia, Calif. 91006  
 Filed Jul. 14, 1977, Ser. No. 815,580  
 Term of patent 14 years  
 Int. Cl. D22—01

U.S. Cl. D22—8

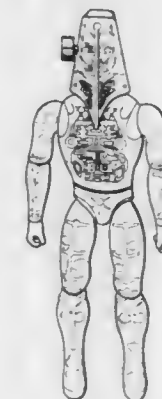


252,761

**TOY FIGURE**

Steven R. D'Aguanno, Greenville; Carl Cederholm, Providence; Fred D. Eddins, Mapleville, and Charles Muenchinger, Providence, all of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Nov. 28, 1977, Ser. No. 856,024  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—177

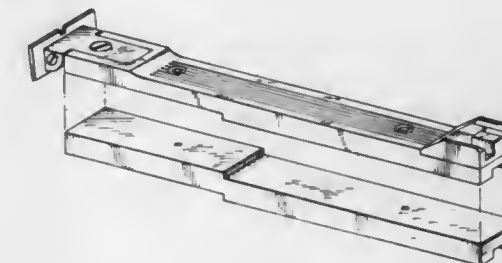


252,764

**COMBINED PISTOL RIB AND SIGHT**

Robert Korzeniewski, 115 N. Live Oak St., Carthage, Tex. 75633  
 Filed Sep. 6, 1977, Ser. No. 830,896  
 Term of patent 14 years  
 Int. Cl. D22—01

U.S. Cl. D22—8

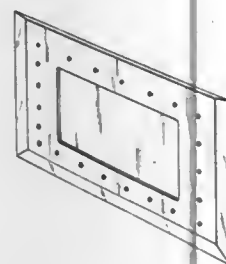




252,765  
**WATER DAM FOR A FLUSH TANK**  
 Thomas J. Ziolkowski, 475 NE. 8th Ave., Deerfield Beach, Fla. 33441

Filed Nov. 3, 1977, Ser. No. 848,145  
 Term of patent 14 years  
 Int. Cl. D23—02

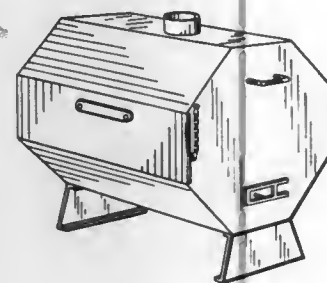
U.S. Cl. D23—69



252,766  
**WOOD-BURNING HEATER AND FIREPLACE**  
 Richard D. Cox, 1006 Hilltop Dr., and Chester G. Scott, Rte. 4, both of Carrollton, Mo. 64633

Filed Nov. 10, 1977, Ser. No. 850,491  
 Term of patent 14 years  
 Int. Cl. D23—03

U.S. Cl. D23—93

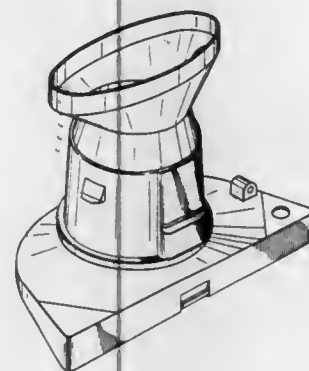


252,767  
**FAN FOR ANTI-DUST HELMET**  
 Raymond Odell, 184 Mutton La., Potters Bar, Herts, and Brian A. Lowe, 6 Beaumont View, Appleby St., Cheshunt, Herts, both of England

Filed Jan. 7, 1977, Ser. No. 757,609  
 Claims priority, application South Africa, Aug. 18, 1976, 976848

Term of patent 14 years  
 Int. Cl. D23—04

U.S. Cl. D23—155



252,768  
**LIGHTER**  
 Winfried Brand, Troisdorf, Fed. Rep. of Germany, assignor to Ronson Corporation, Bridgewater, N.J.

Filed Apr. 25, 1978, Ser. No. 900,064  
 Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 436246

Term of patent 07 years  
 Int. Cl. D27—05

U.S. Cl. D27—42



252,769  
**HAIR DRYER**  
 Sungjae Shin, 739-4 Yong Doo Dong, Seoul, Democratic Peoples Rep. of Korea; John Christensen, 28283 Tahoe Ct., Hayward, Calif. 94545, and Paul Han, 307 Dolphin Isle, Foster City, Calif. 94404

Filed May 2, 1977, Ser. No. 792,633  
 Term of patent 14 years  
 Int. Cl. D28—03

U.S. Cl. D28—13



252,770  
**BILLARD TABLE OR THE LIKE**  
 John P. Van Koert, 190 E. 72nd St., New York, N.Y. 10023  
 Filed Sep. 23, 1977, Ser. No. 835,991

Term of patent 14 years  
 Int. Cl. D21—01

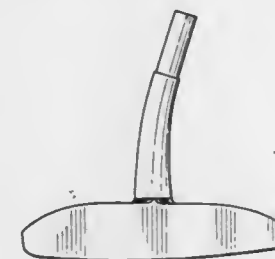
U.S. Cl. D21—232



252,771  
**GOLF CLUB HEAD**  
 John P. Henrick, 96 Ambleside Dr., Brampton, Ontario, Canada (L6Y 1B9)

Filed Sep. 8, 1977, Ser. No. 831,627  
 Claims priority, application Canada, Aug. 25, 1977, 2508771  
 Term of patent 14 years  
 Int. Cl. D21—02

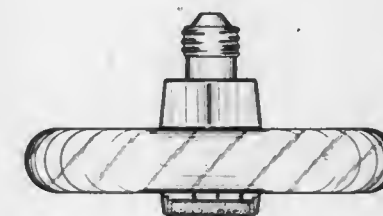
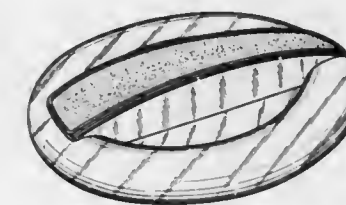
U.S. Cl. D21—219



252,772  
**LIGHTING FIXTURE**  
 Bruce P. Duncel, Stone Mountain, Ga., and Charles A. Harrison, Evanston, Ill., assignors to National Service Industries, Inc. and Sears Roebuck & Company

Filed Mar. 6, 1978, Ser. No. 884,017  
 Term of patent 14 years  
 Int. Cl. D26—05

U.S. Cl. D48—23 A

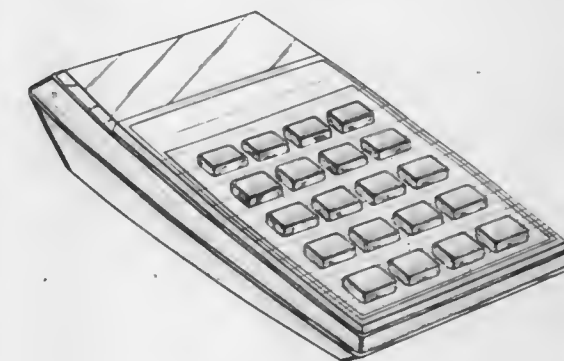


252,773  
**CASE FOR AN ELECTRONIC CALCULATOR OR THE LIKE**

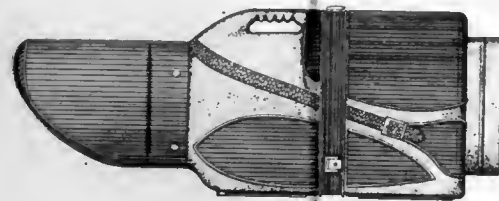
Eugene J. Sulek, and William J. Lawrence, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 21, 1977, Ser. No. 853,708  
 Term of patent 14 years  
 Int. Cl. D18—01

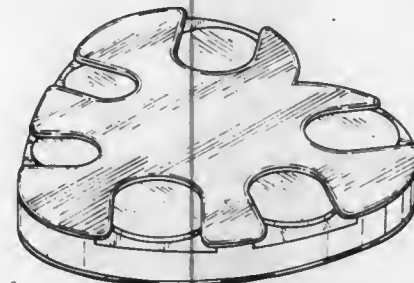
U.S. Cl. D18—7



252,774  
CONTAINER FOR A GOLF BAG  
Frederick S. Gregory, 3721 Northaven, Dallas, Tex. 75229  
Filed Feb. 18, 1977, Ser. No. 770,045  
Term of patent 14 years  
Int. Cl. D3—99  
U.S. Cl. D3—37



252,775  
COIN HOLDER OR SIMILAR ARTICLE  
Franz L. Stoffel, Tübacherstrasse, 9326 Horn, Thurgau, Switzerland  
Filed Oct. 14, 1977, Ser. No. 842,052  
Claims priority, application Switzerland, Apr. 20, 1977, 64899  
Term of patent 14 years  
Int. Cl. D3—01  
U.S. Cl. D99—34



## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A-T-O Inc.: See—  
Hohl, William A.; and Orwig, Herbert L., 4,165,792, Cl. 180-24.020.  
Abrahams, Joseph L., to Rock Fall Company Limited. Drill units for drilling and charge laying operations and method of carrying out the operations. 4,165,690, Cl. 102-22.00R.  
Abramson, Noel W.: See—  
Philipson, Alvin L.; Abramson, Noel W.; and Woltschek, Michael J., 4,165,546, Cl. 4-262.000.  
Acar, Ali, to International Telephone and Telegraph Corporation. Latching valve. 4,165,762, Cl. 137-625.500.  
ACF Industries, Incorporated: See—  
Dugge, Richard H.; and Rollins, Dallas W., 4,165,820, Cl. 222-70.000.  
Acher, Jacques: See—  
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 4,166,060, Cl. 260-326.200.  
Acorn Engineering Co.: See—  
Morris, Earl L.; and Fields, Larry D., 4,165,857, Cl. 251-54.000.  
Adams, Jim M.; and White, Lawrence S., to Hoffmann-La Roche Inc. Manufacture of pharmaceutical dosage forms. 4,165,998, Cl. 156-64.000.  
Adams, Robert B., to Moore Products Co. Flowmeter for liquids. 4,165,639, Cl. 73-194.00B.  
Afanasyuk, Ivan N.; Grabovsky, Viktor V.; Klot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I. Flaskless stack molding machine. 4,165,781, Cl. 164-181.000.  
Agence Nationale de Valorisation de la Recherche (ANVAR): See—  
Gibert, Henri; and Baxerres, Jean-Louis, 4,165,568, Cl. 34-10.000.  
Agfa-Gevaert AG: See—  
Fauth, Gunter; Lermann, Peter; Muller, Herbert; and Lechner, Franz, 4,165,931, Cl. 354-86.000.  
AGFA-GEVAERT N.V.: See—  
De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,166,089, Cl. 264-22.000.  
Aircro, Inc.: See—  
Chapin, John S., 4,166,018, Cl. 204-192.00R.  
Aktiebolaget Atomenergi: See—  
Andersson, Gustav S., 4,165,946, Cl. 405-259.000.  
Aktiengesellschaft Adolph Saurer: See—  
Fuchs-Viniczay, Gabriella; and Huber, Kurt, 4,166,214, Cl. 250-227.000.  
Akzona Incorporated: See—  
Beck, Heinz, 4,166,065, Cl. 260-401.000.  
Denning, David B., 4,165,743, Cl. 128-290.00R.  
Franks, Neal E.; and Drinnan, Carol L., 4,166,080, Cl. 525-183.000.  
Aleev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V. Bioelectrically controlled electric stimulator of human muscles. 4,165,750, Cl. 128-422.000.  
Alford, Peter B., to El-Jay, Inc. Vibrating screen apparatus having dual function eccentric weights. 4,165,655, Cl. 74-61.000.  
Allegheny Ludlum Industries, Inc.: See—  
Southern, Raymond L., 4,165,868, Cl. 266-264.000.  
Allen, Robert J.: See—  
Petrow, Henry G.; and Allen, Robert J., 4,166,143, Cl. 427-115.000.  
Allen, Roger A.: See—  
Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,166,090, Cl. 264-25.000.  
Allied Chemical Corporation: See—  
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,165,634, Cl. 73-810.000.  
Allis-Chalmers Corporation: See—  
Marsch, James E.; and Quick, David C., 4,165,793, Cl. 180-233.000.  
Allison, Blaine H.; and Allison, Richard F., to Allison Mfg. Inc. Chain lift for auxiliary axle assembly. 4,165,884, Cl. 280-81.00R.  
Allison Mfg. Inc.: See—  
Allison, Blaine H.; and Allison, Richard F., 4,165,884, Cl. 280-81.00R.  
Allison, Richard F.: See—  
Allison, Blaine H.; and Allison, Richard F., 4,165,884, Cl. 280-81.00R.  
Amada Company, Limited: See—  
Tsutsui, Kikuo; and Sato, Masao, 4,165,663, Cl. 83-74.000.  
Amberkar, Suresh D., to Dennison Manufacturing Company. Electro-sensitive metalized label stock. 4,166,144, Cl. 428-40.000.  
American Can Company: See—  
Germonprez, Raymond L.; and Zimmerman, Paul, 4,166,044, Cl. 252-408.000.  
American Cyanamid Company: See—  
Goodman, Richard M., 4,166,040, Cl. 252-180.000.  
Goodman, Richard M., 4,166,041, Cl. 252-180.000.  
American Hoechst Corporation: See—  
Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,119, Cl. 424-267.000.  
Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,120, Cl. 424-267.000.  
American Hospital Supply Corporation: See—  
Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., 4,165,561, Cl. 32-14.00A.  
American Hydraulic Propulsion Systems, Inc.: See—  
Tobias, Jaromir, 4,165,677, Cl. 91-497.000.  
American Optical Corporation: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.  
American Safety Equipment Corporation: See—  
Tanaka, Akira, 4,165,844, Cl. 242-107.000.  
American Sterilizer Company: See—  
Gillis, John R.; Miraldi, Peter; and Stavers, Marius X., 4,166,096, Cl. 422-119.000.  
Amerock Corporation: See—  
Wojciechowski, Felix, 4,165,894, Cl. 292-7.000.  
Ames, Adolf: See—  
Wagner, Alfred; Ames, Adolf; and Graf, Karl, 4,165,625, Cl. 72-38.000.  
Ames-Yissum Ltd.: See—  
Wagner, Daniel B.; and Gross, Zvi, 4,166,103, Cl. 424-1.000.  
Wagner, Daniel B.; and Gross, Zvi, 4,166,104, Cl. 424-1.000.  
Amos, Lynn G., to Corning Glass Works. Linear peristaltic pump having pivotal pump arm. 4,165,954, Cl. 417-477.000.  
AMP Incorporated: See—  
Laudig, Ronald C., 4,165,911, Cl. 339-89.00C.  
Reynolds, Charles E.; and Hughes, Donald W., 4,166,265, Cl. 336-192.000.  
Shue, John I., Jr.; and Douty, George H., 4,165,673, Cl. 85-44.000.  
Yeager, Marvin L.; and Desso, Jerome A., 4,165,909, Cl. 339-75.00MP.  
Ampex Corporation: See—  
Poole, Burnet M., 4,166,280, Cl. 358-51.000.  
Amtrol Incorporated: See—  
Friedman, Yizhak; and Becker, Bernard B., 4,165,951, Cl. 417-26.000.  
Anderson, Norman R., to Bunker Ramo Corporation. Electrical connector. 4,165,910, Cl. 339-89.00M.  
Anderson, Ronald A., to Schlumberger Technology Corporation. Methods and apparatus for determining dynamic flow characteristics of production fluids in a well bore. 4,166,215, Cl. 250-260.000.  
Andersson, Gustav S., to Aktiebolaget Atomenergi. Method of securing a rock bolt. 4,165,946, Cl. 405-259.000.  
Ando, Mamoru: See—  
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,166,026, Cl. 208-210.000.  
Andreiko, Craig A.: See—  
Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., 4,165,561, Cl. 32-14.00A.  
Andrews, Peter. Electric energy saving three-position combination switching device. 4,166,236, Cl. 315-200.00R.  
Andrushkevich, Mikhail M.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Boreskov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Anglo-American Clays Corporation: See—  
Lewis, Herbert I.; Price, William M.; and McConnell, Anthony D., 4,165,840, Cl. 241-20.000.  
Annal, Peter R.: See—  
York, Kenneth L.; Annal, Peter R.; and Legory, John E., 4,166,211, Cl. 235-312.000.  
Anton Schwarzkopf Stahl- und Fahrzeugbau, Firma: See—  
Schwarzkopf, Anton, 4,165,695, Cl. 104-55.000.  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Agricultural and horticultural N-benzoyl-N'-trichloroethylidene hydrazine fungicides. 4,166,129, Cl. 424-324.000.  
Aoki, Koichiro. Fish-gathering block. 4,165,711, Cl. 119-3.000.  
Aoyama, Syunichi, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,165,722, Cl. 123-119.00A.  
Apter, Danil M.: See—  
Chukhanov, Zinoviy F.; Tsuprov, Sergei A.; and Apter, Danil M., 4,165,696, Cl. 104-147.00R.



- Arai, Haruhiko: See—  
Nishimura, Masaaki; and Arai, Haruhiko, 4,166,048, Cl. 252-546.000.
- Arcair Company: See—  
Rieppel, Perry; and Sadauskas, Raymond, 4,166,209, Cl. 219-70.000.
- Armco Steel Corporation: See—  
Crow, Harold E., 4,165,882, Cl. 277-168.000.
- Armitage, William F., Jr.; and Crisman, Everett E. Fabrication of photovoltaic devices by solid phase epitaxy. 4,165,558, Cl. 29-572.000.
- Armstrong, Donald D.: See—  
Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., 4,166,205, Cl. 200-153.00G.
- Artos Engineering Company: See—  
Gudmestad, Ragnar, 4,165,768, Cl. 140-140.000.
- Asahara, Yoshiyuki, to Hoya Corporation. Faraday rotation glass. 4,165,989, Cl. 106-47.00Q.
- Asahi Glass Company, Ltd.: See—  
Hisasue, Michio; and Kodama, Shun-ichi, 4,166,165, Cl. 526-87.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: See—  
Sone, Takamori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, 4,166,128, Cl. 424-319.000.
- Asano, Masaharu, to Nissan Motor Company, Limited. Emission control apparatus for internal combustion engines with a controllably disabled clamping circuit. 4,165,719, Cl. 123-32.0EE.
- Asano, Seiji; and Ohmiya, Akio, to Fuji Photo Optical Co., Ltd. Data printing device for camera. 4,165,932, Cl. 354-106.000.
- Ashby, Richard D.: See—  
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., 4,166,290, Cl. 364-200.000.
- Ashland Oil, Inc.: See—  
Hughes, Leonard; Robinson, Kenneth R.; and Deviney, Marvin L., Jr., 4,165,969, Cl. 44-51.000.
- Associated Mills, Inc.: See—  
Rundzaitis, Alfons, 4,165,837, Cl. 239-394.000.
- Atlas Powder Company: See—  
Bowman, Arthur F.; and Camerini, Francis J., 4,165,691, Cl. 102-24.00R.
- Atturio, John M.: See—  
Valent, Philip J.; Atturio, John M.; and Rail, Robert D., 4,165,707, Cl. 114-300.000.
- Atwood, Harry, to General Electric Company. Photoflash lamp array. 4,166,287, Cl. 362-13.000.
- Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., to Bell Telephone Laboratories, Incorporated. Detection of ground state hydrogen and deuterium. 4,166,219, Cl. 250-423.00P.
- Austin Beech Limited: See—  
Gillespie, Peter J., 4,165,860, Cl. 251-297.000.
- Automated Building Components, Inc.: See—  
Jureit, John C.; and Kushner, Benjamin H., 4,165,672, Cl. 85-13.000.
- Azumada, Koichi; and Kobori, Michio, to Shunichi Morimoto. Paste material as the carrier ingredient of paste for pasting corrugated cardboard and the process for preparing the same. 4,165,992, Cl. 106-210.000.
- B/W Controls Inc.: See—  
Bongort, Edgar A.; and Cruickshank, William T., 4,165,935, Cl. 335-207.000.
- Babiol, Pierre, to Societe Nouvelle de Bouchons Plastique. Security closure device for bottles. 4,165,813, Cl. 215-220.000.
- Bach, Nicholas J.: See—  
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- Bacoka, Josp. Pickup device for dog droppings. 4,165,895, Cl. 294-19.00R.
- Badaev, Boris N.: See—  
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- Baines, Sandra: See—  
Cosgrove, Raymond F.; and Baines, Sandra, 4,166,118, Cl. 424-258.000.
- Bakal, Abraham I.: See—  
Witzel, Frank; Clark, K. Warren; and Bakal, Abraham I., 4,166,134, Cl. 426-3.000.
- Baker, William A.; and Ketola, Warren D., to Minnesota Mining and Manufacturing Company. Tacky polymeric microspheres. 4,166,152, Cl. 428-522.000.
- Balchev, Fedor V.: See—  
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- Ball Corporation: See—  
Kwiatkowski, Jerome A.; and Wood, Charles L., 4,165,975, Cl. 65-29.000.
- Bangor Punta Corporation: See—  
Chica, Quentin J., 4,165,826, Cl. 224-191.000.
- Barcak, Joseph S. Fuel intake system for internal combustion engine. 4,165,720, Cl. 123-41.310.
- Barmag Barmer Maschinenfabrik AG: See—  
Schippers, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, 4,165,600, Cl. 57-58.950.
- Barnhouser, Martin, to Environmental Elements Corporation. Floating skimming apparatus. 4,166,036, Cl. 210-242.00R.
- Barry, Bill H. Odorless toilet stool. 4,165,544, Cl. 4-213.000.
- Bartholet, Stephen J., to Odetics, Inc. Method and means for measuring preloads in assembled mechanisms. 4,165,636, Cl. 73-141.00R.
- Bartley, Thomas S., to International Paper Company. Industrial building structure and method of erection. 4,165,590, Cl. 52-66.000.
- BASF Aktiengesellschaft: See—  
Fischer, Adolf, deceased, 4,165,977, Cl. 71-91.000.
- Lotsch, Wolfgang, 4,166,179, Cl. 544-296.000.
- BASF Wyandotte Corporation: See—  
Cenker, Moses; Narayan, Thirumurti; and Wulff, Harald P., 4,166,164, Cl. 521-129.000.
- Bates, Homer J.: See—  
Carstens, Marion R.; and Bates, Homer J., 4,165,845, Cl. 406-192.000.
- Bauer, Robert E.; and Rayburn, Charles C., to Illinois Tool Works Inc. Electrical capacitor with a plated metallized portion and a starting portion wound about the lead wires. 4,166,285, Cl. 361-307.000.
- Baum, Bronislav A.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.
- Bauman, Robert A., to Colgate Palmolive Company. Unsymmetrical oligoquaternary ammonium compounds. 4,166,073, Cl. 260-567.60P.
- Baumann, Werner; and Zirnig, Ulrich, to Sandoz Ltd.  $\beta$ , $\beta$ -Dicyano styrenes. 4,166,068, Cl. 260-456.00A.
- Bausch & Lomb Incorporated: See—  
Mohrman, Richard C., 4,165,924, Cl. 351-38.000.
- Baxerres, Jean-Louis: See—  
Gibert, Henri; and Baxerres, Jean-Louis, 4,165,568, Cl. 34-10.000.
- Bayer Aktiengesellschaft: See—  
Blank, Heinz U., 4,166,070, Cl. 260-543.00R.
- Brandt, Hans-Walter; Schnabel, Gunter; and Muller, Karl-Heinz, 4,165,644, Cl. 73-422.0GC.
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- Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamp, Peter, 4,166,067, Cl. 260-453.00P.
- Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.
- Lehmann, Wolfgang; Troemel, Gerhard; Ley, Kurt; and Muller, Friedhelm, 4,166,002, Cl. 162-164.00R.
- Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,166,149, Cl. 428-339.000.
- Paulus, Wilfried; and Genth, Hermann, 4,166,122, Cl. 424-272.000.
- Schimpf, Rolf, 4,166,069, Cl. 260-509.000.
- Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spenner, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.
- Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, 4,166,186, Cl. 560-27.000.
- Bayerische Motoren Werke Aktiengesellschaft: See—  
Osswald, Bernhard, 4,165,708, Cl. 115-41.0HT.
- Bayley, James J., to Hardwood House Inc. Furniture unit. 4,165,588, Cl. 52-36.000.
- BBC Brown Boveri & Company Limited: See—  
Deck, Werner, 4,166,272, Cl. 340-146.10C.
- Beach, John R.; Sauer, L. Peter; and Haraden, William J., to Signode Corporation. Gritless seal. 4,165,943, Cl. 403-285.000.
- Beadles, Murray L.: See—  
Miller, John A.; Beadles, Murray L.; and Drummond, Roger O., 4,166,107, Cl. 424-19.000.
- Beck, Heinz, to Akzona Incorporated. Process for the preparation of perfluoroalkane sulfonamides. 4,166,065, Cl. 260-401.000.
- Beck, Willi K., to King-Seely Thermos Co. Controller switch assembly. 4,166,268, Cl. 337-309.000.
- Becker, Bernard B.: See—  
Friedman, Yizhak; and Becker, Bernard B., 4,165,951, Cl. 417-26.000.
- Becker, Joseph, Jr., to Koppers Company, Inc. Apparatus for catching coke oven spillage. 4,166,007, Cl. 202-262.000.
- Becker, Paul: See—  
Rudolph, Paul; and Becker, Paul, 4,165,970, Cl. 48-73.000.
- Becton, Dickinson and Company: See—  
Johnson, Lavell R., 4,166,102, Cl. 424-1.000.
- Bednar, Jiri, to Povazske strojarne, narodni podnik. Multistage automatic transmission. 4,165,657, Cl. 74-329.000.
- Beebe, Edwin V., to Du Pont de Nemours, E. I., and Company. Production of plexifilament strands. 4,166,091, Cl. 264-205.000.
- Behrens, Jack D., to Bunker Ramo Corporation. Alignment pin installation tool. 4,165,660, Cl. 81-55.000.
- Behringwerke Aktiengesellschaft: See—  
Sedlacek, Hans-Harald; Johannsen, Roloff; and Seiler, Friedrich-Robert, 4,166,106, Cl. 424-12.000.
- Belcher, Richard A.; and Kozacka, Frederick J., to Gould Inc. Electric fuse having heat retaining means. 4,166,267, Cl. 337-163.000.
- Belcher, Richard A.: See—  
Kozacka, Frederick J.; and Belcher, Richard A., 4,166,266, Cl. 337-158.000.

- Belinkoff, Irving R., to Kidde Consumer Durables, Corp. Electrical water heater and dispenser. 4,165,681, Cl. 99-280.000.
- Belipar SA: See—  
Engeler, Walter, 4,165,780, Cl. 164-55.000.
- Bell Telephone Laboratories, Incorporated: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 250-423.00P.
- Bjorklund, Gary C., 4,166,254, Cl. 331-94.50C.
- Dragone, Corrado, 4,166,276, Cl. 343-781.00P.
- Reudink, Douglas O.; and Yeh, Yu S., 4,166,274, Cl. 343-100.0SA.
- Bendell, Sidney L.: See—  
Dischert, Robert A.; and Bendell, Sidney L., 4,166,281, Cl. 358-219.000.
- Bendix Corporation, The: See—  
Weissler, Harold E., II, 4,165,650, Cl. 73-700.000.
- Benjamin, Louis: See—  
Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,166,185, Cl. 548-324.000.
- Bennett, Charles E., to Motorola, Inc. Heat energized vapor adsorbent pump. 4,165,952, Cl. 417-207.000.
- Bennett, Stephen A. Leveling device for camper trailers and like vehicles. 4,165,862, Cl. 254-88.000.
- Bentz, Francis: See—  
Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, 4,166,186, Cl. 560-27.000.
- Beppu, Norio: See—  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.
- Berger, Abe: See—  
Bossert, Emily C.; Silverstein, Irwin B.; and Berger, Abe, 4,166,053, Cl. 260-18.00S.
- Berliner, Steven D.: See—  
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., 4,166,290, Cl. 364-200.000.
- Bermant, Michael A., to Division of Plastic Surgery of the Medical School of Northwestern University, a part interest. Microvascular clamps with suture retaining means. 4,165,747, Cl. 128-334.00C.
- Bernard, Jean-Rene; Turlier, Pierre; and Bousquet, Jacques, to Societe Nationale Elf Aquitaine. Method of production of ethane by selective hydrogenolysis of alkane. 4,166,077, Cl. 585-310.000.
- Bernard, Vincent E., to Jimmy Dean Meat Company, Inc., The. Portion controlled frozen food dispenser with pump control. 4,165,818, Cl. 222-53.000.
- Bernardelli, William J.; and Brandon, Fred Y., to International Business Machines Corporation. Backup roll cleaning system for a heated roll fuser. 4,165,965, Cl. 432-75.000.
- Bernhardson, Gary E. Cross country ski binding. 4,165,888, Cl. 280-615.000.
- Bernhoff, Gerald W.; and Limbach, Thomas J., to Koehring Company. Control apparatus for a plurality of simultaneously actuatable fluid motors. 4,165,613, Cl. 60-420.000.
- Besenbruch, Alex; and Krause, Franz, to Besenbruch-Hofmann of Puerto Rico, Inc. Work holder assembly for lathe used in dressing cylindrical and disc shaped articles. 4,165,662, Cl. 82-4.00A.
- Besenbruch-Hofmann of Puerto Rico, Inc.: See—  
Besenbruch, Alex; and Krause, Franz, 4,165,662, Cl. 82-4.00A.
- Bhattacharyya, Ajay; and Weiss, Ernst H. G., to Westinghouse Electric Corp. Nuclear core and a reflector assembly therefor. 4,166,003, Cl. 176-61.000.
- Bianchi, Frank J.; and Poulson, Russell H., to Ford Motor Company. Sample and hold frequency to voltage converter circuit. 4,166,248, Cl. 328-140.000.
- Bicho, Joseph G.: See—  
Dunning, Charles E.; Lloyd, William D.; and Bicho, Joseph G., 4,166,001, Cl. 162-111.000.
- Bicht, John R.: See—  
Warner, Peter S.; and Bicht, John R., 4,165,794, Cl. 180-65.00R.
- Bigelow-Sanford, Inc.: See—  
Parlin, David B.; and Vits, Helmut, 4,165,547, Cl. 8-148.000.
- Biggs, David F.: See—  
Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., 4,166,116, Cl. 424-250.000.
- Billings Energy Corporation: See—  
Mackay, Donald B., 4,165,569, Cl. 34-15.000.
- Bilskadecenter I Stockholm AB: See—  
Olsson, Conny E., 4,165,567, Cl. 33-288.000.
- Binner, Tihamer S. Control system for dual-motor drive. 4,166,238, Cl. 318-67.000.
- Bizzarri, Alfredo. Rotary thrust device including axially elongated rotor rotatable in casting having elongated fluid intake and discharge slots. 4,165,848, Cl. 244-12.200.
- Bjorklund, Gary C., to Bell Telephone Laboratories, Incorporated. Switched diffraction grating. 4,166,254, Cl. 331-94.50C.
- Bjorklund, Gary C.: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 250-423.00P.
- Black Clawson Company, The: See—  
Weber, Arnulf E. M., 4,166,028, Cl. 209-273.000.
- Blackwelders: See—  
Schmidt, Lewis W., 4,165,897, Cl. 296-56.000.
- Blanco, Jose A.: See—  
Davies, Haydn; Blanco, Jose A.; and O'Neill, Charles E., 4,165,979, Cl. 75-23.000.
- Blank, Heinz U., to Bayer Aktiengesellschaft. Process for the preparation of sulfonic acid chlorides. 4,166,070, Cl. 260-543.00R.
- Blankenship, Roy L. Cable directing apparatus. 4,165,592, Cl. 52-220.000.
- Blessum, Norman S.: See—  
Ragle, Herbert U.; and Blessum, Norman S., 4,166,282, Cl. 360-77.000.
- Block Engineering, Inc.: See—  
Hirschfeld, Tomas, 4,166,105, Cl. 424-8.000.
- Bloom, Melvin S.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukeinen, Joseph Y., 4,165,984, Cl. 96-1.0PE.
- Blumenfeld, Georg; and Riegger, Paul, to Dynamit Nobel Aktiengesellschaft. Method of preparing xylenes chlorinated in the nucleus. 4,166,075, Cl. 260-650.00R.
- Bluzer, Nathan, to Westinghouse Electric Corp. Dual field effect transistor structure for compensating effects of threshold voltage. 4,166,223, Cl. 307-221.00D.
- Bocharov, Jury N.: See—  
Nemetkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B.; and Chervoneva, Ljudmila A., administratrix, 4,166,025, Cl. 208-126.000.
- Bodine, Albert G. Method and apparatus for sonically dehydrating precipitate. 4,166,034, Cl. 210-67.000.
- Boeing Company, The: See—  
Rudolph, Peter K. C., 4,165,609, Cl. 60-262.000.
- Woods, Weightstill W.; and Eul, William A., 4,166,244, Cl. 324-65.00R.
- Young, Manley A., 4,165,810, Cl. 414-595.000.
- Boinet, Abel; Mondeil, Lucien; and Montay, Jean-Louis, to Elf-Union. Instrument for the continuous measurement of viscosity, especially of bitumens. 4,165,631, Cl. 73-54.000.
- Boissonnault, John G. Encapsulated planar chip capacitor. 4,166,286, Cl. 361-433.000.
- Bolin, Philip C., to Westinghouse Electric Corp. Gas-insulated bushing with self-adjusting bushing flange seal. 4,166,194, Cl. 174-31.00R.
- Bongort, Edgar A.; and Cruickshank, William T., to B/W Controls Inc. Differential float control. 4,165,935, Cl. 335-207.000.
- Boots Company Limited, The: See—  
Kerry, John C.; and Weighton, David M., 4,166,130, Cl. 424-326.000.
- Borelli, Ronald F.; and Lakhani, Kishor M., to Honeywell Information Systems, Inc. Two-sided non-impact printing system. 4,165,686, Cl. 101-1.000.
- Borekov, Georgy K.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.
- Boshold, Raymond F., to Wean United, Inc. Method and apparatus for closing the end of an extruded tube submerged in water. 4,165,627, Cl. 72-48.000.
- Bossert, Emily C.; Silverstein, Irwin B.; and Berger, Abe, to M & T Chemicals Inc. Process for the manufacture of non-reverting elastomeric organopolysiloxanes. 4,166,053, Cl. 260-18.00S.
- Bott, John A. Vehicle article carrier. 4,165,827, Cl. 224-326.000.
- Bourne, Alan A.; and Knapton, Arthur G., to Johnson, Matthey & Co., Limited. Jewelry alloys. 4,165,983, Cl. 75-172.00R.
- Bourns, Inc.: See—  
Brown, Milton R., Jr., 4,165,622, Cl. 64-4.000.
- Bousquet, Jacques: See—  
Bernard, Jean-Rene; Turlier, Pierre; and Bousquet, Jacques, 4,166,077, Cl. 585-310.000.
- Bowden, Wade R., Jr.; and Lewis, Walter C., to Slater Electric Inc. Adjustably lockable bar hanger for ceiling boxes and the like. 4,165,851, Cl. 248-57.000.
- Bowditch, Hoel L.: See—  
Olsen, Everett O.; La Croix, James R.; and Bowditch, Hoel L., 4,165,651, Cl. 73-704.000.
- Bowen, Robert F.: See—  
Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.
- Bowman, Arthur F.; and Camerini, Francis J., to Atlas Powder Company. Delay detonator and its use with explosive packaged boosters and cartridges. 4,165,691, Cl. 102-24.00R.
- Boxer, Robert K.: See—  
Boxer, Rubin; and Boxer, Robert K., 4,165,555, Cl. 24-204.000.
- Boxer, Rubin; and Boxer, Robert K. Hook-and-pile strips for socks and the like. 4,165,555, Cl. 24-204.000.
- Boyne, Ralph A.: See—  
Cottingham, Richard L.; and Boyne, Ralph A., 4,165,587, Cl. 51-428.000.
- Brachthausen, Karl-Heinz: See—  
Kaimann, Walter; and Brachthausen, Karl-Heinz, 4,165,971, Cl. 48-77.000.
- Brady, Timothy: See—  
Piatek, Edward; and Brady, Timothy, 4,165,892, Cl. 285-111.000.
- Brandon, Fred Y.: See—  
Bernardelli, William J.; and Brandon, Fred Y., 4,165,965, Cl. 432-75.000.
- Brandt, Hans-Walter; Schnabel, Gunter; and Muller, Karl-Heinz, to Bayer Aktiengesellschaft. Apparatus for introducing samples into



- high pressure gas chromatographs or liquid chromatographs. 4,165,644, Cl. 73-422.00C.
- Brandt, Richard F. Mounting bracket for solar heat collector. 4,165,853, Cl. 248-237.000.
- Brastins, Asekis; and Stenger, Ralph L., Jr., to Gulf Research & Development Company. Testing of seismic streamers. 4,166,270, Cl. 340-5.00C.
- Braun, Martin, to Machlett Laboratories, Inc., The. Transverse beam X-ray tube. 4,166,231, Cl. 313-60.000.
- Brawner, William H.; and Umphries, James O., to H.P.G. IV, Inc. Retractable leash. 4,165,713, Cl. 119-109.000.
- Breidenstein, Charles J. See—
- Gueldenpfennig, Klaus; and Breidenstein, Charles J., 4,166,199, Cl. 179-27.0CA.
- Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, to GfE Gesellschaft für Elektrometallurgie mit Beschränkter Haftung. Method of rapidly decarburizing ferro-alloys with oxygen. 4,165,980, Cl. 75-60.000.
- Bridgestone Tire Company Limited. See—
- Kusakabe, Noboru; and Ikeda, Nobumasa, 4,166,052, Cl. 260-17.45T.
- Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., to W. A. Whitney Corp. Punch press with workpiece supporting means. 4,165,667, Cl. 83-409.000.
- Brotherston, Colin P. See—
- George, Michael; Brotherston, Colin P.; and Sosnowski, Stanislaw J. A., 4,165,725, Cl. 123-139.0AL.
- Brotzmann, Karl. See—
- Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.
- Brown Boveri & Cie Aktiengesellschaft. See—
- Schmidt, Conrad; Bunker, Gustav; and Weiss, Paul, 4,166,193, Cl. 174-28.000.
- Brown Boveri & Company Limited. See—
- Oplatka, Georg, 4,165,783, Cl. 165-110.000.
- Brown, James S., Sr. See—
- Wennerstrom, Edward A.; Brown, James S., Sr.; and Milligan, William E., 4,165,549, Cl. 15-88.000.
- Brown, Jerald. See—
- Negola, Edward J.; and Brown, Jerald, 4,165,623, Cl. 68-5.00C.
- Brown, John W., to Qantix Corporation. Echo reduction improvement in a front face glare reduction overlay. 4,165,920, Cl. 350-276.00R.
- Brown, Milton R., Jr., to Bourns, Inc. Releasable locking and sealing assembly. 4,165,622, Cl. 64-4.000.
- Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., to Strippit Division, Houdaille Industries, Inc. Modular turret punch press. 4,165,669, Cl. 83-552.000.
- Brown, Robert; and Setloff, Jerome. Styptic composition. 4,166,108, Cl. 424-28.000.
- Bruckner Apparatebau GmbH. See—
- Schulierer, Manfred, 4,165,548, Cl. 8-151.100.
- Brüker-Medizintechnik GmbH. See—
- Cansell, Albert, 4,165,749, Cl. 128-419.00D.
- Brunswick Corporation. See—
- Fitzner, Arthur O.; and Krunco, Francis E., 4,165,727, Cl. 123-179.00B.
- Bruszewski, Stanislaw. See—
- Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Bruszewski, Stanislaw; and Koczel, Krzysztof, 4,165,867, Cl. 266-252.000.
- Buck, Ronald G., to Litton Systems, Inc. Method of determining the optimum time to turn meats in a microwave oven. 4,166,137, Cl. 426-243.000.
- Bud Antle, Inc. See—
- Cayton, David W., 4,165,806, Cl. 206-386.000.
- Budzich, Tadeusz. Load responsive fluid control valves. 4,165,761, Cl. 137-596.130.
- Buhler, Arthur; Fasciati, Alfred; and Hungerbühler, Walter, to Henkel Kommanditgesellschaft auf Aktien. Process for dyeing human hair with diazo salts and coupling components. 4,165,967, Cl. 8-10.100.
- Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. Process for producing enamines. 4,166,060, Cl. 260-326.200.
- Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-16-phenyl-5,6-didehydro-PGF<sub>2</sub> or 4,4',5,5'-tetrahydro-PGF<sub>1</sub> compounds. 4,166,187, Cl. 560-55.000.
- Bunger, Gustav. See—
- Schmidt, Conrad; Bunker, Gustav; and Weiss, Paul, 4,166,193, Cl. 174-28.000.
- Bunin, Sergei G. See—
- Aleev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.
- Bunker Ramo Corporation. See—
- Anderson, Norman R., 4,165,910, Cl. 339-89.00M.
- Behrens, Jack D., 4,165,660, Cl. 81-55.000.
- Bunn, Thomas C., Jr. Controlled excursion ski binding with safety release. 4,165,887, Cl. 280-613.000.
- Bunnenberg, Claus; and Kuhn, Wilhelm, to Gesellschaft für Strahlungs- und Umweltforschung mbH München. Apparatus for continuously measuring quantitative changes in moisture condensation at a surface. 4,166,217, Cl. 250-308.000.
- Burg, Donald E. Air ride boat hull. 4,165,703, Cl. 114-67.00A.
- Burgin, Kermit H. Plastic forceps. 4,165,746, Cl. 128-321.000.
- Burke, Frederick A., to Stanley Home Products, Inc. Mop holder having a universal handle connection. 4,165,550, Cl. 15-144.00A.
- Burke, Harry D., to Whirlpool Corporation. Microwave generating device—door seal. 4,166,207, Cl. 219-10.55D.
- Burkhardt, Horst, to Dr. Johannes Heidenhain GmbH. Encapsulated measuring device. 4,165,564, Cl. 33-125.00C.
- Burroughs Corporation. See—
- Ragle, Herbert U.; and Blessum, Norman S., 4,166,282, Cl. 360-77.000.
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- Bustamante, Carlos R. Tobacco substitute made from coffee cherries and a process for making such. 4,165,752, Cl. 131-2.000.
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- Cacciola, Charles T., to Centronics Data Computer Corp. Free flight head assembly for dot matrix printers and the like. 4,165,940, Cl. 400-124.000.
- Cady, Percy L. See—
- Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.
- Cahn, Maurice S. Slidable capo. 4,165,670, Cl. 84-318.000.
- Calspan Corporation. See—
- Dufort, Robert H., 4,165,692, Cl. 102-92.700.
- Camerini, Francis J. See—
- Bowman, Arthur F.; and Camerini, Francis J., 4,165,691, Cl. 102-24.00R.
- Campbell, Donald H. See—
- Quinn, Edward J.; and Campbell, Donald H., 4,166,012, Cl. 204-30.000.
- Canadian Patents and Development Limited. See—
- Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., 4,165,116, Cl. 424-250.000.
- Canon Kabushiki Kaisha. See—
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- Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, 4,165,930, Cl. 354-53.000.
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- Canron, Inc. See—
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- Lugstenmann, Curt A., deceased; and Capdevilla nee Lugstenmann, Franziska S., heir, 4,166,011, Cl. 204-4.000.
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- Carstens, Marion R.; and Bates, Homer J., to Georgia Tech Research Institute. Method and apparatus for processing vehicles moving through a conduit by air. 4,165,845, Cl. 406-192.000.
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- Kashio, Toshio, 4,165,605, Cl. 58-24.00R.
- Cassai, Gino H. Adjustable mascara wand. 4,165,755, Cl. 132-88.700.
- Caterpillar Tractor Co. See—
- Cryder, John R.; and Hall, Lowell R., 4,165,675, Cl. 91-420.000.
- Catotti, Arthur J. See—
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- Cayton, David W., to Bud Antle, Inc. Palletizing system for produce cartons and the like. 4,165,806, Cl. 206-386.000.
- Cegles, William P. See—
- Fedorowicz, Richard J.; and Cegles, William P., 4,165,607, Cl. 58-50.00R.
- Caner, Moses; Narayan, Thirumurti; and Wulff, Harald P., to BASF Wyandotte Corporation. Process for the preparation of carbodiimide-isocyanurate foams. 4,166,164, Cl. 521-129.000.
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- Paulus, Philippe A., 4,165,996, Cl. 148-12.00B.
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- Chang, Pei K., to Stauffer Chemical Company. Process cheese containing a modified whey solids. 4,166,142, Cl. 426-582.000.
- Chao, Kwei C.; and Ridgway, John A., to Standard Oil Company (Indiana). Method for modifying the flavor of yeast. 4,166,135, Cl. 426-60.000.
- Chapa, Arturo. Foot massaging device. 4,165,737, Cl. 128-24.300.
- Chapin, John S., to Aircro, Inc. Sputtering process and apparatus. 4,166,018, Cl. 204-192.00R.
- Chase, Herbert S. Toy fashion display mechanism. 4,165,579, Cl. 46-13.000.

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- Wengenroth, Hans E.; and Mrusek, Wilfried, 4,165,817, Cl. 220-256.000.
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- Chen, Thomas Y. C. Method and apparatus for feeding condensate to a high pressure vapor generator. 4,165,718, Cl. 122-451.00R.
- Cherny, Ilya R. See—
- Nametkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B., deceased; and Chervoneva, Ljudmila A., administratrix, 4,166,025, Cl. 208-126.000.
- Chervenak, Robert A., to Comerco, Inc. Wall rail with channels. 4,165,852, Cl. 248-225.200.
- Chervoneva, Ljudmila A., administratrix. See—
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- Chica, Quentin J., to Bangor Punta Corporation. Pop-up holster. 4,165,826, Cl. 224-191.000.
- Chiyoda Chemical Engineering & Construction Co., Ltd. See—
- Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,166,026, Cl. 208-210.000.
- Chrysler Corporation. See—
- Helmer, Harry W., Jr., 4,165,726, Cl. 123-146.50A.
- Chu, Nori Y. C. See—
- Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.
- Chugai Seiyaku Kabushiki Kaisha. See—
- Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, 4,166,174, Cl. 542-401.000.
- Chukhanov, Zinoviy F.; Tsuprov, Sergei A.; and Apter, Danil M., to Gosudarstvenny Nauchnoissledovatel'skiy Energeticheskiy Institut Imeni G.M. Krzhizhanovskogo. Arrangement for pipeline transportation of cargoes. 4,165,696, Cl. 104-147.00R.
- Ciba-Geigy Corporation. See—
- Rosen, Melvin H., 4,166,126, Cl. 424-274.000.
- Cielo, Paolo; and Westwood, William D., to Northern Telecom Limited. Electrostatic ink ejection printing head. 4,166,277, Cl. 346-140.00R.
- Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., to E. R. Squibb & Sons, Inc. Ostomy composition. 4,166,051, Cl. 260-17.4CL.
- Citizen Watch Co., Ltd. See—
- Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,165,604, Cl. 58-23.0BA.
- Clark, K. Warren. See—
- Witzel, Frank; Clark, K. Warren; and Bakal, Abraham I., 4,166,134, Cl. 426-3.000.
- Clatworthy, Edward F. See—
- Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,165,997, Cl. 148-38.000.
- Clement, Jean-Claude. See—
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- Cline-Buckner, Inc. See—
- Cline, Lee S.; and John, Philip J., 4,166,087, Cl. 261-96.000.
- Cline, Lee S.; and John, Philip J., to Cline-Buckner, Inc. Automatic intermittent vapor dispenser. 4,166,087, Cl. 261-96.000.
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- Cobbs, James H. Mine enhanced hydrocarbon recovery technique. 4,165,903, Cl. 299-2.000.
- Colgate Palmolive Company. See—
- Bauman, Robert A., 4,166,073, Cl. 260-567.60P.
- Collin, Per H. See—
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- Collins, H. Dale, to International Submarine Services. Scan acoustical holographic apparatus and method. 4,165,647, Cl. 73-603.000.
- Collins, Joseph C., to Sterling Drug Inc. Dialkylaminophenylethyl (or vinyl) cyclopropyl carbinols. 4,166,074, Cl. 260-574.000.
- Colton, Martin S. See—
- Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.
- Columbia Ribbon and Carbon Manufacturing Co., Inc. See—
- Page, Kenneth J.; and Scott, Michael A., 4,165,988, Cl. 106-23.000.
- Columbus McKinnon Corporation. See—
- Schreyer, Kenneth D., 4,165,863, Cl. 254-168.000.
- Combustion Engineering, Inc. See—
- Wennerstrom, Edward A.; Brown, James S., Sr.; and Milligan, William E., 4,165,549, Cl. 15-88.000.
- Comerco, Inc. See—
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- Commissariat à l'Energie Atomique. See—
- Despois, Jacques; and Nougarede, Francis, 4,165,945, Cl. 405-55.000.
- Compagnie Generale des Etablissements Michelin. See—
- Durand, Pierre, 4,166,154, Cl. 429-17.000.
- Compagnie Industrielle de Mecanismes. See—
- Meyer, Jean-Claude, 4,165,583, Cl. 49-349.000.
- Concast A.G. See—
- Engeler, Walter, 4,165,780, Cl. 164-55.000.
- Connell, Talbert D., to Crutcher Resources Corporation. Back-up pad for welding. 4,165,831, Cl. 228-50.000.
- Coombe, Robert D., to Rockwell International Corporation. Method for producing electronically excited nitrogen fluoride. 4,165,773, Cl. 149-109.600.
- Cooper, Frank W.; and Dixon, Arthur B., Jr., to Shelley Manufacturing Company, a division of Alco Food Service Equipment Company. Interlocking device for portable food service cabinets. 4,165,908, Cl. 312-111.000.
- Cooper, Harrison R. Drive means for ore samplers and the like. 4,165,645, Cl. 73-423.00R.
- Corbic, Yves J., to Societe dite: Gatrun Anstalt. Packaging of a product in a sterile medium. 4,165,594, Cl. 53-453.000.
- Corning Glass Works. See—
- Amos, Lynn G., 4,165,954, Cl. 417-477.000.
- Hertl, William; and Ramsey, William S., 4,166,006, Cl. 435-244.000.
- Cosgrove, Raymond F.; and Baines, Sandra, to E. R. Squibb & Sons, Inc. Use of chlorohydroxyquinoline to inhibit growth of mycoplasmas. 4,166,118, Cl. 424-258.000.
- Cottingham, Richard L.; and Boyne, Ralph A., to Thormack Engineering Limited. Grit blasting apparatus. 4,165,587, Cl. 51-428.000.
- Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., to Canadian Patents and Development Limited. Pharmaceutical compositions containing piperaziny acylhydroxamic acid derivatives to treat inflammation or anaphylactic allergy conditions. 4,166,116, Cl. 424-250.000.
- Cragoe, Edward J., Jr.; Smith, Robert L.; and Stokker, Gerald E., to Merck & Co., Inc. Substituted 2,2-dioxo-1,2,3-benzoxathiazines. 4,166,177, Cl. 544-2.000.
- Cramer Industries, Inc. See—
- Duly, Michael J., 4,165,854, Cl. 248-408.000.
- Crancer, Alfred, Jr. Pedestrian street and road crossing trainer and method. 4,165,570, Cl. 35-8.00A.
- Crane Co. See—
- Maciulaitis, Vytautas K.; and Dhanani, Rasikant R., 4,165,859, Cl. 251-173.000.
- Cravy, Thomas V.; and Shepard, Dennis D. Dynamic keratometry and keratoscopy method and apparatus. 4,165,744, Cl. 128-303.100.
- Crisman, Everett E. See—
- Armitage, William F., Jr.; and Crisman, Everett E., 4,165,558, Cl. 29-572.000.
- Crompton & Knowles Corporation. See—
- Feeman, James F., 4,166,059, Cl. 260-186.000.
- Crow, Harold E., to Armco Steel Corporation. Sealing means for slide gate. 4,165,882, Cl. 277-168.000.
- Crowley, John C., Jr. Rodeo device. 4,165,712, Cl. 119-29.000.
- Cruikshank, William T. See—
- Bongort, Edgar A.; and Cruikshank, William T., 4,165,935, Cl. 335-207.000.
- Crutcher Resources Corporation. See—
- Connell, Talbert D., 4,165,831, Cl. 228-50.000.
- Cryder, John R.; and Hall, Lowell R., to Caterpillar Tractor Co. Load check valve cylinder mounted. 4,165,675, Cl. 91-420.000.
- Cubberly, Walter E., Jr., to Schlumberger Technology Corporation. Methods and apparatus for determining dynamic flow characteristics of production fluids in a well bore. 4,166,216, Cl. 250-260.000.
- Cummins Engine Company, Inc. See—
- Hough, Walter J., 4,165,763, Cl. 137-625.410.
- Curati, Marino, Jr., to True Temper Corporation. Impact tool having a pre-formed fiberglass handle. 4,165,771, Cl. 145-29.00R.
- Czekalski, Martin W. See—
- Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., 4,166,289, Cl. 364-200.000.
- Czernik, Roman. See—
- Froehlich, John A.; Czernik, Roman; and Fisher, Chester G., III, 4,166,094, Cl. 422-64.000.
- Daido Tokushoku Kabushiki Kaisha. See—
- Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.
- Dainichi-Nippon Cables, Ltd. See—
- Takemori, Hayashi, 4,166,057, Cl. 260-33.6PQ.
- D'Alelio, Gaetano F., to Plastics Engineering Company. Polymerization products of acetylene-terminated polyimide derivatives. 4,166,168, Cl. 526-259.000.
- Dammann, Peter. See—
- Schippers, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, 4,165,600, Cl. 57-58.950.
- Daniels, Kenneth M. Read/write head-positioning apparatus. 4,166,284, Cl. 360-106.000.
- Dapco Industries. See—
- Tupper, Willis E., 4,165,816, Cl. 220-203.000.
- Davies, Haydn; Blanco, Jose A.; and O'Neill, Charles E., to International Nickel Company, Inc. The Flash smelting in confined space. 4,165,979, Cl. 75-25.000.
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- Lewis, John B.; and Winchester, Roy E., 4,166,030, Cl. 209-534.000.
- Deane, Kenneth E.; and Grah, Neil E., to P. R. Mallory & Co. Inc. Metal strap electrically grounding a motor to a timer. 4,166,206, Cl. 200-293.000.
- Dearling, Harry S. Combined fragrance dispenser and humidifier. 4,165,835, Cl. 239-51.500.



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 Dobberpuhl, Dale R., 4,165,786, Cl. 172-43.000.  
 Lane, Lloyd L., 4,165,953, Cl. 417-350.000.  
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 Neel, Emmanuel E. A.; Deflin, Michel; Vanrenterghem, Jacques; and Clement, Jean-Claude, 4,166,101, Cl. 423-656.000.  
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 DeGeorge, Robert P.: See—  
 Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.  
 Delorme, Jean J.: See—  
 Moll, Manfred; Delorme, Jean J.; and Weber, Jean C., 4,165,643, Cl. 73-421.00B.  
 Demoute, Jean-Pierre: See—  
 Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,166,063, Cl. 260-343.30R.  
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 Dennison Manufacturing Company: See—  
 Amberkar, Suresh D., 4,166,144, Cl. 428-40.000.  
 Denver Instrument Company: See—  
 Smith, James E., 4,165,791, Cl. 177-212.000.  
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 De Smedt, Felix F.: See—  
 De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,166,089, Cl. 264-22.000.  
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 Detroit Coil Company: See—  
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 Deviney, Marvin L., Jr.: See—  
 Hughes, Leonard; Robinson, Kenneth R.; and Deviney, Marvin L., Jr., 4,165,969, Cl. 44-51.000.  
 Dexon-Comino International Limited: See—  
 Sanasky, Joseph, 4,165,944, Cl. 403-254.000.  
 DeYoung, Richard E. Apparatus for cutting cans. 4,165,664, Cl. 83-188.000.  
 Dhanani, Rasikant R.: See—  
 Maciulaitis, Vytautas K.; and Dhanani, Rasikant R., 4,165,859, Cl. 251-173.000.  
 Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof to treat pain, fever and inflammation. 4,166,133, Cl. 424-346.000.  
 Diamond Power Specialty Corporation: See—  
 Johnston, Jesse C., Jr., 4,165,552, Cl. 15-312.00R.  
 DiBella, Eugene P.; Dunkel, Morris; and Gould, Henry, to Tenneco Chemicals, Inc. Colored polyurethane foams and a process for their production. 4,166,163, Cl. 521-116.000.  
 Dick, Perry J., Jr., to Trumbull Corporation. Process and apparatus for applying and compacting castable material in strips on a sloped surface. 4,165,617, Cl. 405-17.000.  
 Diesel Kiki, Co., Ltd.: See—  
 Nakayama, Kenji; and Uchida, Kazuo, 4,165,838, Cl. 239-533.300.  
 Diesinger, Walter; and Eickmann, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Sensor for rocket engines. 4,165,608, Cl. 60-245.000.  
 Digital Marine Electronics Corporation: See—  
 Michaels, Sheldon B.; Philbrick, Otis; and Morris, Jeffrey, 4,166,275, Cl. 343-103.000.  
 Di Pasqua, Joseph. Hair-frosting cap. 4,165,754, Cl. 132-9.000.  
 Dischert, Robert A.; and Bendell, Sidney L., to RCA Corporation. Video image highlight suppression circuit with delayed compensation. 4,166,281, Cl. 358-219.000.  
 Diversified Technology, Inc.: See—  
 Riley, Robert E., Jr.; and McArthur, Barrie, 4,166,273, Cl. 340-539.000.  
 Division of Plastic Surgery of the Medical School of Northwestern University: See—  
 Berman, Michael A., 4,165,747, Cl. 128-334.00C.  
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 Cooper, Frank W.; and Dixon, Arthur B., Jr., 4,165,908, Cl. 312-111.000.  
 Dobberpuhl, Dale R., to Deere & Company. Walk-behind tiller and handle mounting therefor. 4,165,786, Cl. 172-43.000.  
 Dr. Johannes Heidenhain GmbH: See—  
 Burkhardt, Horst, 4,165,564, Cl. 33-125.00C.  
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 Doherty, Norman R.; and Doherty, Richard F. Device for spring-loading a needleless inoculator. 4,165,800, Cl. 185-39.000.  
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 Doherty, Norman R.; and Doherty, Richard F., 4,165,739, Cl. 128-173.00H.  
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 Douce, Donald R. Earthquake responsive valve. 4,165,758, Cl. 137-38.000.  
 Doucet, Yves: See—  
 Cloutier, Michel; Doucet, Yves; Jutras, Gilles; and Gagne, Pierre, 4,165,565, Cl. 33-174.00T.  
 Douma, William L.: See—  
 Whelan, Edward J.; and Douma, William L., 4,165,966, Cl. 432-121.000.  
 Douty, George H.: See—  
 Shue, John I., Jr.; and Douty, George H., 4,165,673, Cl. 85-44.000.  
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 Dragone, Corrado, to Bell Telephone Laboratories, Incorporated. Offset antenna having improved symmetry in the radiation pattern. 4,166,276, Cl. 343-781.00P.  
 Draper, George C. Exercising parallel bar. 4,165,873, Cl. 272-63.000.  
 Dresser Industries, Inc.: See—  
 Smith, Charles G.; Parker, Kenneth R.; and Wyatt, John G., 4,165,680, Cl. 98-115.00R.  
 Drinnan, Carol L.: See—  
 Franks, Neal E.; and Drinnan, Carol L., 4,166,080, Cl. 525-183.000.  
 Drummond, Roger O.: See—  
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 Druzhinin, Ivan P.: See—  
 Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
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 Duderstadt, Gunter: See—  
 Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.  
 Dufaure, Pierre: See—  
 Jacquet, Bernard; Papanitiou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,166,109, Cl. 424-59.000.  
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 Lawson, Neil, 4,166,000, Cl. 156-425.000.  
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 Dyer, Don L.: See—  
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 Dykehouse, Robert H. Bowling pin. 4,165,875, Cl. 273-82.00R.

- Dynamit Nobel Aktiengesellschaft: See—  
 Blumenfeld, Georg; and Riegger, Paul, 4,166,075, Cl. 260-650.00R.  
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 Dyste, Ardell T.; and Ma, Raymond, to Tel-Tone Corporation. Offset adapter connector. 4,165,912, Cl. 339-156.00T.  
 E. C. H. Will (GmbH & Co.): See—  
 Seaborn, Paul; and Lemburg, Jorn-Uwe, 4,165,767, Cl. 140-105.000.  
 E. R. Squibb & Sons, Inc.: See—  
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 Krapcho, John; and Turk, Chester F., 4,166,072, Cl. 260-558.00P.  
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 Eastman, David P.: See—  
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 Smith-Lewis, Margaret J.; and Figueras, John, 4,166,093, Cl. 422-56.000.  
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 Eberhardt, Heinrich: See—  
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 Eddy, David S.: See—  
 Olander, William C.; Harvey, Douglas J.; and Eddy, David S., 4,166,201, Cl. 200-19.0DR.  
 Edelman, Seymour: See—  
 DeReggi, Aime S.; and Edelman, Seymour, 4,166,229, Cl. 310-337.000.  
 Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., to American Hoechst Corporation. Analgesic and tranquilizing spirodihydrobenzofuranpiperidines and pyrrolidines. 4,166,119, Cl. 424-267.000.  
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 Egner, Ernst M., to Euroc Development AB. Manufacture of surface elements. 4,165,999, Cl. 156-245.000.  
 Ehrlich, Richard A. Knockdown upholstered furniture. 4,165,902, Cl. 297-440.000.  
 Eickmann, Hans-Joachim: See—  
 Diesinger, Walter; and Eickmann, Hans-Joachim, 4,165,608, Cl. 60-245.000.  
 Eimen, Shawn H.: See—  
 Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., 4,165,901, Cl. 297-417.000.  
 Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, to Wild Heerbrugg Aktiengesellschaft. Coaxial transmitting and receiving optics for an electro-optic range finder. 4,165,936, Cl. 356-5.000.  
 El-Jay, Inc.: See—  
 Alford, Peter B., 4,165,655, Cl. 74-61.000.  
 Elbatainer Kunststoff- und Verpackungsgesellschaft mbH: See—  
 Wengenroth, Hans E.; and Mrusek, Wilfried, 4,165,817, Cl. 220-256.000.  
 Elf-Union: See—  
 Boinet, Abel; Mondeil, Lucien; and Montay, Jean-Louis, 4,165,631, Cl. 73-54.000.  
 Eli Lilly and Company: See—  
 Kornfeld, Edmund C.; and Bach, Nicholas J., 4,166,182, Cl. 546-67.000.  
 Elkem-Spigerverket A/S: See—  
 Ydstie, Birger L., 4,166,192, Cl. 13-9.00R.  
 Eltra Corporation: See—  
 Lang, Roger J.; and Lang, Gary E., 4,165,559, Cl. 29-629.000.  
 Emmerich, Kenneth C., to Fansteel Inc. Roof drill bit. 4,165,790, Cl. 175-410.000.  
 Endo, Tunehiro: See—  
 Yamashita, Seizi; Endo, Tunehiro; and Ishida, Yoshio, 4,166,235, Cl. 315-39.710.  
 Engeler, Walter, to Belipar SA; and Concast AG. Method of continuously casting metals, especially steel in an oscillating mold. 4,165,780, Cl. 164-55.000.



- Fethke, Wayne G.; and Mayer, Paul C., to Fiskars Manufacturing Corporation. Blister packages for scissors, pliers and other hand tools. 4,165,805, Cl. 206-349.000.
- Fichte, Rudolf: See—  
Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.
- Fields, Larry D.: See—  
Morris, Earl L.; and Fields, Larry D., 4,165,857, Cl. 251-54.000.
- Fields, Robert E. Connector for tubing. 4,165,893, Cl. 285-177.000.
- Figueras, John: See—  
Smith-Lewis, Margaret J.; and Figueras, John, 4,166,093, Cl. 422-56.000.
- Findeisen, Kurt: See—  
Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, 4,166,067, Cl. 260-453.00P.
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- Fischer, Caecilia E., heiress-at-law: See—  
Fischer, Adolf, deceased, 4,165,977, Cl. 71-91.000.
- Fisher, Chester G., III: See—  
Froehlich, John A.; Czernik, Roman; and Fisher, Chester G., III, 4,166,094, Cl. 422-64.000.
- Fisher, Gerald C.: See—  
Scanland, Joseph E.; and Fisher, Gerald C., 4,165,597, Cl. 56-295.000.
- Fiskars Manufacturing Corporation: See—  
Fethke, Wayne G.; and Mayer, Paul C., 4,165,805, Cl. 206-349.000.
- Fitch, Arthur H., to Lockheed Electronics Company, Inc. Rotary optical coupler. 4,165,913, Cl. 350-96.150.
- Fitzgibbon, Chester M. Component type building construction system. 4,165,591, Cl. 52-90.000.
- Fitzgibbons, William O.: See—  
Wu, Hsin C.; and Fitzgibbons, William O., 4,166,008, Cl. 203-85.000.
- Fitzner, Arthur O.; and Kruncos, Francis E., to Brunswick Corporation. Automatic fuel pump switch unit for fuel-injected internal combustion engines. 4,165,727, Cl. 123-179.00B.
- Fix, Joseph O., to United States of America, Army. Track shoe having replaceable pad. 4,165,906, Cl. 305-51.000.
- Flachenecker, Gerhard: See—  
Meinke, Peter; and Flachenecker, Gerhard, 4,166,261, Cl. 335-246.000.
- Fletcher, Roy W.; and Forte, Anthony D., to Union Special Corporation. Thread separating finger. 4,165,700, Cl. 112-286.000.
- Flink, Sune N.: See—  
Reh, Lothar; Hirsch, Martin; Collin, Per H.; and Flink, Sune N., 4,165,717, Cl. 122-4.00D.
- FMC Corporation: See—  
Kondo, Kiyoshi; Negishi, Akira; and Sugimoto, Kikuo, 4,166,064, Cl. 260-347.400.
- Rosseau, Richard B., 4,165,551, Cl. 15-179.000.
- Ford Aerospace & Communications Corp.: See—  
Moreno, Isabel L., 4,165,918, Cl. 350-253.000.
- Ford Motor Company: See—  
Bianchi, Frank J.; and Poulson, Russell H., 4,166,248, Cl. 328-140.000.
- Ludwig, Frank A., 4,166,156, Cl. 429-104.000.
- Forte, Anthony D.: See—  
Fletcher, Roy W.; and Forte, Anthony D., 4,165,700, Cl. 112-286.000.
- Foster, Karl: See—  
Reynolds, William T.; and Foster, Karl, 4,165,990, Cl. 106-48.000.
- Fournier, Albert A., Jr.; and Paddock, Charles F., to Uniroyal, Inc. Method of making graft polymers. 4,166,081, Cl. 525-75.000.
- Fournier, Joseph T., Jr.: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.
- Fox, Anthony. Combination air brake and engine shield for aircraft. 4,165,849, Cl. 244-113.000.
- Foxboro Company, The: See—  
Olsen, Everett O.; La Croix, James R.; and Bowditch, Hoel L., 4,165,651, Cl. 73-704.000.
- Frain, John J. Bingo game and process of playing same. 4,165,878, Cl. 273-240.000.
- Franks, Neal E.; and Drinnan, Carol L., to Akzona Incorporated. Nylon 6 having improved affinity for cationic dyes. 4,166,080, Cl. 525-183.000.
- Frant, Martin S.: See—  
Ross, James W., Jr.; and Frant, Martin S., 4,166,021, Cl. 204-195.00F.
- Franz, Johann: See—  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spenner, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.
- Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: See—  
Theurer, Josef, 4,165,693, Cl. 104-7.00B.
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- Fray, Derek J., to National Research Development Corporation. Method for detecting elements. 4,166,009, Cl. 204-1.00T.
- Fray, Derek J.; and Gee, Robert, to National Research Development Corporation. Method of making metal beta-alumina and refining metal using it. 4,166,013, Cl. 204-61.000.
- Freedman, George: See—  
Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.
- Freeman, Richard R.: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 250-423.00P.
- Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, to Bayer Aktiengesellschaft. Process for the preparation of alkoxymethyl-isocyanates. 4,166,067, Cl. 260-453.00P.
- Frenz, Norbert W., Jr.: See—  
Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.
- Fricke, Roy A. Spark plug cleaner and method. 4,165,586, Cl. 51-412.000.
- Friedman, Yizhak; and Becker, Bernard B., to Amtrol Incorporated. Water pressure booster system and control valve therefor. 4,165,951, Cl. 417-26.000.
- Froehlich, John A.; Czernik, Roman; and Fisher, Chester G., III, to Perkin-Elmer Corporation, The. Automatic fluid sampling transport system. 4,166,094, Cl. 422-64.000.
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Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,166,185, Cl. 548-324.000.
- Fuchs-Vincicay, Gabriella; and Huber, Kurt, to Aktiengesellschaft Adolph Saurer. Optical-electrical system for monitoring filaments, wires, strands, tapes and the like. 4,166,214, Cl. 250-227.000.
- Fuji Photo Film Co., Ltd.: See—  
Miyazako, Takushi; Sakai, Tadao; and Mitsui, Akio, 4,166,050, Cl. 260-8.000.
- Shimizu, Shigehisa; and Mizutano, Shigemitsu, 4,165,665, Cl. 83-287.000.
- Fuji Photo Optical Co., Ltd.: See—  
Asano, Seiji; and Ohmiya, Akio, 4,165,932, Cl. 354-106.000.
- Fujimoto, Yasuo: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyo, Kiyosato, 4,166,127, Cl. 424-275.000.
- Fujioka, Yasuo; and Nakano, Kenichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Structure for mounting an exhaust manifold to the body of an internal combustion engine. 4,165,612, Cl. 60-322.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,166,115, Cl. 424-246.000.
- Fujitani, Nobuyuki: See—  
Yamamoto, Yoshihisa; and Fujitani, Nobuyuki, 4,165,724, Cl. 123-139.00AT.
- Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, to Daido Tokushuko Kabushiki Kaisha. Molybdenum base alloy having excellent high-temperature strength and a method of producing same. 4,165,982, Cl. 75-176.000.
- Fukui, Yoshio; Shioto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, to Chiyoda Chemical Engineering & Construction Co., Ltd. Two-step hydrosulfurization of heavy hydrocarbon oil. 4,166,026, Cl. 208-210.000.
- Fukumoto, Kumaichi: See—  
Ishida, Kinyu; and Fukumoto, Kumaichi, 4,165,585, Cl. 57-268.000.
- Funabashi, Shinichiro: See—  
Hisazumi, Nobuyuki; and Funabashi, Shinichiro, 4,166,082, Cl. 525-78.000.
- Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., to Tesdata Systems Corporation. Computer monitoring system. 4,166,290, Cl. 364-200.000.
- Furukawa, Shinichi: See—  
Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, 4,166,128, Cl. 424-319.000.
- Gaetano, John. Tennis score keeping device. 4,165,710, Cl. 116-223.000.
- Gagne, Pierre: See—  
Cloutier, Michel; Doucet, Yves; Jutras, Gilles; and Gagne, Pierre, 4,165,565, Cl. 33-174.00T.
- Gailing, Rolf W.: See—  
Gehauf nec Kiesel, Liselotte; Eberhardt, Heinrich; and Gailing, Rolf W., 4,165,620, Cl. 62-256.000.
- Gajewski, Vincent J.: See—  
Karoly, Gabriel; and Gajewski, Vincent J., 4,166,042, Cl. 252-182.000.
- Gangulee, Amitava; Ho, Paul S.; and Howard, James K., to International Business Machines Corporation. Electromigration resistance in gold thin film conductors. 4,166,279, Cl. 357-71.000.
- Garcia Corporation, The: See—  
Weinstein, Burton A.; and Lipe, Gordon C., 4,165,889, Cl. 280-626.000.
- Gardner, Benjamin R. Casing perforator. 4,165,784, Cl. 166-55.300.
- Gardner, Beth A.: See—  
Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,119, Cl. 424-267.000.
- Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,120, Cl. 424-267.000.
- Gardner, Ina F. Syringe connectable to a water faucet. 4,165,742, Cl. 128-229.000.
- Gebr. Happich GmbH: See—  
Janz, Joachim; and Mentzel, Bodo, 4,165,898, Cl. 296-153.000.
- Gee, Robert: See—  
Fray, Derek J.; and Gee, Robert, 4,166,013, Cl. 204-61.000.
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- General Battery Corporation: See—  
Eberle, William J., 4,166,210, Cl. 219-78.150.

- General Electric Company: See—  
Atwood, Harry, 4,166,287, Cl. 362-13.000.
- Gillette, Stephen F., 4,166,260, Cl. 335-20.000.
- Lee, Gim F., Jr., 4,166,055, Cl. 260-30.60R.
- Pensabene, Saverio F.; and Catotti, Arthur J., 4,166,010, Cl. 204-2.100.
- Roy, Prodyot; and Licina, George J., 4,166,019, Cl. 204-195.00S.
- Russell, Ronald R., 4,166,240, Cl. 318-380.000.
- General Foods Corporation: See—  
Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.
- General Mills, Inc.: See—  
Ziminski, Richard D.; and Uecker, Myron M., 4,166,138, Cl. 426-249.000.
- General Motors Corporation: See—  
Olander, William C.; Harvey, Douglas J.; and Eddy, David S., 4,166,201, Cl. 200-19.00DR.
- West, Gene A.; and Moretti, John A., 4,166,243, Cl. 324-51.000.
- General Time Corporation: See—  
Richmond, James W., 4,166,204, Cl. 200-67.00D.
- Genth, Hermann: See—  
Paulus, Wilfried; and Genth, Hermann, 4,166,122, Cl. 424-272.000.
- George, Michael; Brotherston, Colin P.; and Sosnowski, Stanislaw J. A., to Lucas Industries Limited. Fuel pumping apparatus. 4,165,725, Cl. 123-139.00AL.
- Georgia Tech Research Institute: See—  
Carstens, Marion R.; and Bates, Homer J., 4,165,845, Cl. 406-192.000.
- Georgopoulos, Minas. Cigarette package closure and protector. 4,165,804, Cl. 206-259.000.
- Germonprez, Raymond L.; and Zimmerman, Paul, to American Can Company. Binderless thermotropic jet ink. 4,166,044, Cl. 252-408.000.
- Gesellschaft fur Strahlen- und Umweltforschung mbH Munchen: See—  
Bunnenberg, Claus; and Kuhn, Wilhelm, 4,166,217, Cl. 250-308.000.
- Getson, John C., to SWS Silicoes Corporation. Modified organopolysiloxane compositions. 4,166,078, Cl. 528-26.000.
- GFE Gesellschaft fur Elektrometallurgie mit Beschränkter Haftung: See—  
Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.
- Gibert, Henri; and Baxerres, Jean-Louis, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for putting phases in contact and device for carrying out the process. 4,165,568, Cl. 34-10.000.
- Gilbu, Agnar; Pearson, Lee E.; and Greenwood, Mark E., to Owens-Corning Fiberglass Corporation. Glass fiber reinforced thermosetting resin pipe wall construction. 4,165,765, Cl. 138-174.000.
- Gillespie, Peter J., to Austin Beech Limited. Spool valve buffer member. 4,165,860, Cl. 251-297.000.
- Gillette, Stephen F., to General Electric Company. Circuit breaker accessory assembly. 4,166,260, Cl. 335-20.000.
- Gillis, John R.; Miraldi, Peter; and Stavers, Marius X., to American Sterilizer Company. Biohazard steam sterilizer. 4,166,096, Cl. 422-119.000.
- Girard, Edmond, to Messier, Societe Anonyme. Method of controlling a heat pump, and a heat pump device adapted to operate in accordance with said method. 4,165,619, Cl. 62-99.000.
- Giuzza, Pietro, to Officine Meccaniche Cigardi S.p.A. Device for sequential overturning of sheets in multi-color offset printing machines. 4,165,689, Cl. 101-230.000.
- Global Marine, Inc.: See—  
Parsons, John S., 4,165,706, Cl. 114-258.000.
- Goi Chemical Co., Ltd.: See—  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.
- Goldberg, Leonard J., to United States of America, Navy. Mosquito larvae control using a bacterial larvicide. 4,166,112, Cl. 424-93.000.
- Goldman, Julian; and Oppenheim, Martin. Apparatus to rejuvenate tennis balls. 4,165,770, Cl. 141-329.000.
- Goldner, Walther, to Recaro GmbH & Co. Vehicle seat. 4,165,899, Cl. 297-361.000.
- Good, Arthur L.; and Hoopes, Philip K., to Masco Corporation of Indiana. Trailer sway control device. 4,165,885, Cl. 280-446.00B.
- Goodhue, Charles T.: See—  
Masufekar, Prakash S.; and Goodhue, Charles T., 4,166,005, Cl. 435-190.000.
- Goodman, Richard M., to American Cyanamid Company. Compositions comprising mixtures of polycationic and polyanionic polymers as magnesium scale control agents. 4,166,040, Cl. 252-180.000.
- Goodman, Richard M., to American Cyanamid Company. Process for magnesium scale control using mixtures of polycationic and polyanionic polymers. 4,166,041, Cl. 252-180.000.
- Goodwin, George I.; Margrave, John L.; and Wagner, Robert E. Mold lubricant and method. 4,165,974, Cl. 65-26.000.
- Goodyear Tire & Rubber Company, The: See—  
Mitchell, Robert F., 4,166,171, Cl. 528-488.000.
- Svigelj, John A.; and Rabito, Thomas G., 4,166,058, Cl. 260-38.000.
- Gorbanev, Vladimir N.: See—  
Alecov, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.
- Gorby, Jack: See—  
Dutton, Edward E.; and Gorby, Jack, 4,166,140, Cl. 426-397.000.
- Goren, Yoram: See—  
Lloyd, Samuel H., III; and Goren, Yoram, 4,165,702, Cl. 114-65.00R.
- Gosudarstvenny Nauchnoissledovatel'sky Energetichesky Institut Imeni G.M. Krzhizhanovskogo: See—  
Chukhanov, Zinoviy F.; Tsuprov, Sergei A.; and Apter, Danil M., 4,165,696, Cl. 104-147.00R.
- Gould, Henry: See—  
DiBella, Eugene P.; Dunkel, Morris; and Gould, Henry, 4,166,163, Cl. 521-116.000.
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Belcher, Richard A.; and Kozacka, Frederick J., 4,166,267, Cl. 337-163.000.
- Kozacka, Frederick J.; and Belcher, Richard A., 4,166,266, Cl. 337-158.000.
- Lynch, Thomas E.; Eastman, David P.; and Price, Richard P., 4,165,795, Cl. 180-65.00A.
- Mao, George W.; Rao, Purushothama; and Trenter, James F., 4,166,155, Cl. 429-82.000.
- Gould, Joseph B., to National Utilities Corporation. Pendant ring. 4,165,621, Cl. 63-1.00R.
- Grabovsky, Viktor V.: See—  
Afanasjuk, Ivan N.; Grabovsky, Viktor V.; Klot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.
- Graco Inc.: See—  
Eull, Marvin J., 4,165,836, Cl. 239-119.000.
- Graco Metal Products, Inc.: See—  
Saint, David, 4,165,872, Cl. 272-86.000.
- Graf, Karl: See—  
Wagner, Alfred; Ames, Adolf; and Graf, Karl, 4,165,625, Cl. 72-38.000.
- Grah, Neil E.: See—  
Deane, Kenneth E.; and Grah, Neil E., 4,166,206, Cl. 200-293.000.
- Graham, Robert K., to Minnesota Mining and Manufacturing Company. Hybrid corneal contact lens. 4,166,255, Cl. 351-160.00H.
- Gramsz, Jerzy: See—  
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- Grandelement, Gerald, to International Cold Forging Corporation. Valve. 4,165,764, Cl. 138-43.000.
- Grant, Thomas J. Battery jumpering apparatus. 4,166,241, Cl. 320-255.000.
- Grasselli, Robert K.: See—  
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- Graves, Phillip H.; and Dyer, Don L. Life support system for drilling rigs. 4,165,738, Cl. 128-142.400.
- Gray, Paul R.: See—  
Stephens, Mark L.; and Gray, Paul R., 4,166,269, Cl. 338-3.000.
- Greatbatch, Wilson: See—  
Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.
- Green Giant Company: See—  
Stoll, William F., 4,166,136, Cl. 426-144.000.
- Green, James A., II; and Kalenda, Norman W., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible pyridylazopyrazole or pyrimidylazopyrazole dye-releasing compounds. 4,165,987, Cl. 96-119.00R.
- Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., to Wiggins Teape Limited. Fibrous material moulding apparatus. 4,166,090, Cl. 264-25.000.
- Greenwood, Mark E.: See—  
Gilbu, Agnar; Pearson, Lee E.; and Greenwood, Mark E., 4,165,765, Cl. 138-174.000.
- Greer, Amos S., Jr., to Southwest Research Institute. Apparatus and method for ultrasonic inspection of highly attenuative materials. 4,165,649, Cl. 73-644.000.
- Grelan Pharmaceutical Co., Ltd.: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.
- Groeger, Theodore O. Convertible airplane. 4,165,846, Cl. 244-2.000.
- Gross, Zvi: See—  
Wagner, Daniel B.; and Gross, Zvi, 4,166,103, Cl. 424-1.000.
- Wagner, Daniel B.; and Gross, Zvi, 4,166,104, Cl. 424-1.000.
- Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T.: See—  
Riollet, Gilbert, 4,165,949, Cl. 415-77.000.
- Gryga, John J., Jr.: See—  
Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., 4,165,901, Cl. 297-417.000.
- GTE Sylvania Incorporated: See—  
Kimball, Stephen F., III; and Palmer, Lewis H., III, 4,166,232, Cl. 313-316.000.
- Gudmestad, Ragnar, to Artos Engineering Company. Wire straightening mechanism for wire lead production apparatus. 4,165,768, Cl. 140-140.000.
- Gueldenpfennig, Klaus; and Breidenstein, Charles J., to Stromberg-Carlson Corporation. Attendant console complex. 4,166,199, Cl. 179-27.00CA.
- Guenther, Manfred H. Air chuck. 4,165,760, Cl. 137-231.000.
- Guglielmo, Jean, to Lucien Ferraz & Cie. Brush holder for electric machines. 4,166,227, Cl. 310-242.000.
- Gulf Research & Development Company: See—  
Brastins, Auseklis; and Stenger, Ralph L., Jr., 4,166,270, Cl. 340-5.00C.
- Tsai, Shirley C., 4,166,022, Cl. 208-11.00R.



H.P.G. IV, Inc.: See—  
Brawner, William H.; and Umphries, James O., 4,165,713, Cl. 119-109.000.  
Haga, Seiji: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Halcon Research & Development Corporation: See—  
Johnson, Richard A., 4,166,097, Cl. 423-112.000.  
Hall, Lowell R.: See—  
Cryder, John R.; and Hall, Lowell R., 4,165,675, Cl. 91-420.000.  
Halliburton Company: See—  
Sullaway, Bob L.; and Knox, Lloyd C., 4,165,891, Cl. 285-18.000.  
Hammit, Frederick G.; and Hwang, Jia-Bo G. High response rate pressure pulse sensing probe with wide temperature range applicability. 4,165,654, Cl. 73-723.000.  
Hanley, John. Wind wheel apparatus for use with a hydro-electric dam. 4,166,222, Cl. 290-55.000.  
Hansen, Harold M., to Southern Can Company. Tilttable valve member for pressurized containers. 4,165,825, Cl. 222-402.220.  
Hanser, Paul E., to HWH Corporation. Vehicle leveling system. 4,165,861, Cl. 254-86.00H.  
Hanway, John E., Jr.; and Mumford, Richard G. Method and apparatus for removing heavy metals from waste water streams. 4,166,032, Cl. 210-32.000.  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, to Hitachi Metals, Ltd. Magnetic core assembly for magnetizing column permanent magnet for use in electrostatic developing apparatus. 4,166,263, Cl. 335-284.000.  
Haraden, William J.: See—  
Beach, John R.; Sauer, L. Peter; and Haraden, William J., 4,165,943, Cl. 403-285.000.  
Hardwood House Inc.: See—  
Bayley, James J., 4,165,588, Cl. 52-36.000.  
Hardy, Dean. Artificial kidney cleaning apparatus and process. 4,166,031, Cl. 210-22.00A.  
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Taguchi, Yoshinobu; Harigane, Kotaro; and Ito, Tetsuro, 4,165,557, Cl. 29-566.300.  
Harju, Bert I., to Sodertalje Tekniska Ide Produkter Aktiebolag. Automatic pilot apparatus for a printer. 4,165,563, Cl. 33-18.00R.  
Harnisch, Horst: See—  
Eckstein, Udo; and Harnisch, Horst, 4,166,176, Cl. 542-460.000.  
Harris, Ronald L.: See—  
Thomas, John W.; and Harris, Ronald L., 4,165,716, Cl. 122-1.00A.  
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., to Lilly Industries Limited. Acylaminopyrazoles. 4,166,123, Cl. 424-273.00P.  
Harsono, Radjasa; and Stork, Willem H. J., to Shell Oil Company. Hydrothermal treatment of silica. 4,166,047, Cl. 252-454.000.  
Hart, John M. Paper log forming apparatus. 4,165,678, Cl. 93-1.00C.  
Harvey, Douglas J.: See—  
Olander, William C.; Harvey, Douglas J.; and Eddy, David S., 4,166,201, Cl. 200-19.0DR.  
Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Brzuszewski, Stanislaw; and Koczela, Krzysztof, to Politechnika Lodzka; and Lubuskie Zaklady Termotechniczne. Installation for nitriding-sulphidizing of steel and iron elements. 4,165,867, Cl. 266-252.000.  
Hatakeyama, Nobuo: See—  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.  
Hatch, Donald M.; and Larsen, Richard J., to Hitco. High temperature consolidation process for the production of a substantially all carbon composite. 4,166,145, Cl. 428-283.000.  
Hauck, Frederic P.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Tricyclic cyclitolamines. 4,166,183, Cl. 546-101.000.  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersing agents. 4,166,066, Cl. 260-404.500.  
Heifetz, Milton D. Surgical manipulator. 4,165,745, Cl. 128-318.000.  
Heitkamper, Peter: See—  
Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, 4,166,067, Cl. 260-453.00P.  
Helmer, Harry W., Jr., to Chrysler Corporation. Low mass breakerless ignition distributor. 4,165,726, Cl. 123-146.50A.  
Hendy, Brian N., to Imperial Chemical Industries Limited. Coated tubular forms. 4,165,956, Cl. 425-71.000.  
Henkel Kommanditgesellschaft auf Aktien: See—  
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,165,967, Cl. 8-10.100.  
Henze, Fritz: See—  
Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.  
Heraeus Quarzschmelze GmbH: See—  
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,165,915, Cl. 350-96.340.  
Hermann, Walter; Kuhl, Burkhardt; and Schuck, Wolf-Dieter, to Messerschmitt-Bolkow-Blohm GmbH. Flat high frequency cable. 4,166,259, Cl. 333-236.000.  
Hertl, William; and Ramsey, William S., to Corning Glass Works. Means for stimulating microbial growth. 4,166,006, Cl. 435-244.000.  
Hetra, Andrew A., Jr.; and Jacob, Charles W., to United States Steel Corporation. Device for skimming floating material from a body of liquid. 4,165,866, Cl. 266-228.000.

Hexachimie Societe Anonyme: See—  
Payne, Trevor G., 4,166,131, Cl. 424-317.000.  
Hiiragi, Mineharu: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Hildebrand, Klaus W.: See—  
Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, 4,165,936, Cl. 356-5.000.  
Hill, John A.: See—  
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,166,051, Cl. 260-17.4CL.  
Hirsch, Martin: See—  
Reh, Lothar; Hirsch, Martin; Collin, Per H.; and Flink, Sune N., 4,165,717, Cl. 122-4.00D.  
Hirschfeld, Tomas, to Block Engineering, Inc. Dye tagged reagent. 4,166,105, Cl. 424-8.000.  
Hirsh Company: See—  
Ferdinand, Irwin J., 4,165,698, Cl. 108-156.000.  
Hisasue, Michio; and Kodama, Shun-ichi, to Asahi Glass Company, Ltd. Terpolymers of tetrafluoroethylene, ethylene and fluorovinyl ether and process for producing the same. 4,166,165, Cl. 526-87.000.  
Hisazumi, Nobuyuki; and Funabashi, Shinichiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene chloride copolymer film having high bubble stability in inflation-stretching process and cold resistance. 4,166,082, Cl. 525-78.000.  
Hitachi Chemical Company, Ltd.: See—  
Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, 4,165,839, Cl. 241-4.000.  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.  
Hitachi, Ltd.: See—  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.  
Yamashita, Seizi; Endo, Tunchiro; and Ishida, Yoshio, 4,166,235, Cl. 315-39.710.  
Hitachi Metals, Ltd.: See—  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,166,263, Cl. 335-284.000.  
Okada, Kuniaki, 4,165,628, Cl. 72-182.000.  
Ueno, Yoshio; and Nagami, Akio, 4,165,658, Cl. 74-412.00R.  
Hitco: See—  
Hatch, Donald M.; and Larsen, Richard J., 4,166,145, Cl. 428-283.000.  
Ho, Paul S.: See—  
Gangulee, Amitava; Ho, Paul S.; and Howard, James K., 4,166,279, Cl. 357-71.000.  
Hoechst Aktiengesellschaft: See—  
Noetzel, Siegfried, 4,166,161, Cl. 521-96.000.  
Prave, Paul; Sukatsch, Dieter; and Faust, Uwe, 4,166,004, Cl. 435-253.000.  
Raether, Siegfried, deceased, 4,166,015, Cl. 204-129.750.  
Zimmermann, Wolfgang; and Schindler, Hermann, 4,166,033, Cl. 210-51.000.  
Hoffmann, Gunter. Battery filling system. 4,165,769, Cl. 141-198.000.  
Hoffmann-La Roche Inc.: See—  
Adams, Jim M.; and White, Lawrence S., 4,165,998, Cl. 156-64.000.  
Walser, Armin; Fryer, Rodney L.; and Benjamin, Louis, 4,166,185, Cl. 548-324.000.  
Hohl, William A.; and Orwig, Herbert L., to A-T-O Inc. Load booster wheel assembly. 4,165,792, Cl. 180-24.020.  
Hokuriku Pharmaceutical Co., Ltd.: See—  
Kato, Hideo; Koshinaka, Eiichi; and Ogawa, Nobuo, 4,166,180, Cl. 544-398.000.  
Holcroft and Company: See—  
Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., 4,165,865, Cl. 266-138.000.  
Homma, Yasumasa: See—  
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,166,026, Cl. 208-210.000.  
Honda Giken Kogyo Kabushiki Kaisha: See—  
Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, 4,165,728, Cl. 123-182.000.  
Sano, Shoichi, 4,165,777, Cl. 152-411.000.  
Honeywell Inc.: See—  
Luft, Victor, 4,166,230, Cl. 310-365.000.  
Lynch, Frank, 4,166,249, Cl. 328-155.000.  
Starr, James B., 4,166,264, Cl. 336-20.000.  
Honeywell Information Systems, Inc.: See—  
Borelli, Ronald F.; and Lakhani, Kishor M., 4,165,686, Cl. 101-1.000.  
Hooker Chemicals & Plastics Corp.: See—  
Quinn, Edward J.; and Campbell, Donald H., 4,166,012, Cl. 204-30.000.  
Hoopes, Philip K.: See—  
Good, Arthur L.; and Hoopes, Philip K., 4,165,885, Cl. 280-446.00B.  
Hoover, Alan W., to International Telephone and Telegraph Corporation. Single power supply multiple image intensifier apparatus and method with independently adjustable low light gain and high light saturation level. 4,166,213, Cl. 250-213.0VT.  
Hori, Makoto: See—  
Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaaki, 4,165,961, Cl. 431-1.000.

Hough, Walter J., to Cummins Engine Company, Inc. Valve construction. 4,165,763, Cl. 137-625.410.  
Hovey, Richard J.: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.  
Howard, James K.: See—  
Gangulee, Amitava; Ho, Paul S.; and Howard, James K., 4,166,279, Cl. 357-71.000.  
Hoya Corporation: See—  
Asahara, Yoshiyuki, 4,165,989, Cl. 106-47.00Q.  
Hoyle, Brian, to Lucas Industries Limited. Electrical switch. 4,166,203, Cl. 200-61.270.  
Huber, Kurt: See—  
Fuchs-Vinicay, Gabriella; and Huber, Kurt, 4,166,214, Cl. 250-227.000.  
Hudon, Paul A., administrator: See—  
Johnson, Arthur R., deceased; and Hudon, Paul A., administrator, 4,165,666, Cl. 83-313.000.  
Huff, Bobby J., to U.S. Rubber Reclaiming Co., Inc. Process of producing a rubberized asphalt composition suitable for use in road and highway construction and repair and product. 4,166,049, Cl. 260-2.300.  
Hughes Aircraft Company: See—  
Shishido, Tsuneo, 4,166,256, Cl. 333-99.0MP.  
Hughes, Donald W.: See—  
Reynolds, Charles E.; and Hughes, Donald W., 4,166,265, Cl. 336-192.000.  
Hughes, Leonard; Robinson, Kenneth R.; and Deviney, Marvin L., Jr., to Ashland Oil, Inc. High carbon content liquid fuels. 4,165,969, Cl. 44-51.000.  
Huige, Nicolaas J.: See—  
Westermann, Donald H.; and Huige, Nicolaas J., 4,166,141, Cl. 426-422.000.  
Hungerbuhler, Walter: See—  
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,165,967, Cl. 8-10.100.  
Hunt, Alvin W. Instrument holder for use on disabled hands. 4,165,896, Cl. 294-25.000.  
Huntington Alloys, Inc.: See—  
Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,165,997, Cl. 148-38.000.  
Hutamura, Masaharu: See—  
Matsui, Kazuhiro, 4,165,774, Cl. 152-221.000.  
Hutson, Jearld L. Photosensitive zero voltage semiconductor switching device. 4,166,224, Cl. 307-311.000.  
Hwang, Jia-Bo G.: See—  
Hammit, Frederick G.; and Hwang, Jia-Bo G., 4,165,654, Cl. 73-723.000.  
HWH Corporation: See—  
Hanser, Paul E., 4,165,861, Cl. 254-86.00H.  
Hycel, Inc.: See—  
Kling, Gary W.; and Swanson, Scott C., 4,166,095, Cl. 422-67.000.  
Igarashi, Kikuo, to Shionogi & Co., Ltd. Aminoglycoside antibiotic derivatives and method of use. 4,166,114, Cl. 424-180.000.  
Igel, Wolfgang, to Zinser Textilmaschinen GmbH. Control system for yarn-tying device of thread-winding machine. 4,165,601, Cl. 57-264.000.  
Iguchi, Yasuyuki: See—  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.  
Iizuka, Haruhiko; and Yasuhara, Seishi, to Nissan Motor Company, Limited. Internal combustion engine with variable cylinder disablement control. 4,165,610, Cl. 60-284.000.  
Ikeda, Nobumasa: See—  
Kusakabe, Noboru; and Ikeda, Nobumasa, 4,166,052, Cl. 260-17.4ST.  
Ikeda, Yugo: See—  
Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, 4,166,174, Cl. 542-401.000.  
Ikeoka, Naoaki: See—  
Nakada, Toshio; and Ikeoka, Naoaki, 4,165,685, Cl. 100-282.000.  
Iles, Thomas L.; and Ruder, Joseph M., to United States of America, Navy. Gas separating system. 4,165,972, Cl. 55-28.000.  
Illinois Tool Works Inc.: See—  
Baer, Robert E.; and Rayburn, Charles C., 4,166,285, Cl. 361-307.000.  
Imperial Chemical Industries Limited: See—  
Bye, Ashley D.; Priddle, John E.; and Wilson, Victor A., 4,166,167, Cl. 526-142.000.  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,166,066, Cl. 260-404.500.  
Hendy, Brian N., 4,165,956, Cl. 425-71.000.  
Inaba, Masakazu: See—  
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,165,741, Cl. 428-207.000.  
Independent Broadcasting Authority: See—  
Thirlwall, Alan C.; and Ive, John G. S., 4,166,271, Cl. 340-146.200.  
Ingilis, Bruce R.: See—  
Green, Kieron P.; Ingilis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,166,090, Cl. 264-25.000.  
Innovative Industries, Inc.: See—  
Van Gilst, Carl, 4,165,683, Cl. 99-393.000.  
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, to Process Shizai Co., Ltd. Heat-sensitive recording materials and recording process of using the same. 4,165,741, Cl. 428-207.000.

Inter-Elec: See—  
Dubreucq, Jean-Claude, 4,165,850, Cl. 246-182.00B.  
International Business Machines Corporation: See—  
Bernardelli, William J.; and Brandon, Fred Y., 4,165,965, Cl. 432-75.000.  
Fallon, John L.; Kollar, Ernest P.; and Mares, Fred R., 4,165,870, Cl. 271-10.000.  
Gangulee, Amitava; Ho, Paul S.; and Howard, James K., 4,166,279, Cl. 357-71.000.  
Small, Martin B.; and Zory, Peter S., Jr., 4,166,253, Cl. 331-94.50H.  
Tseng, Samuel C.-C., 4,166,258, Cl. 333-195.000.  
International Cold Forging Corporation: See—  
Grandclement, Gerald, 4,165,764, Cl. 138-43.000.  
International Minerals & Chemical Corporation: See—  
Wehrmeister, Herbert L., 4,166,121, Cl. 424-269.000.  
International Nickel Company, Inc., The: See—  
Davies, Haydn; Blanco, Jose A.; and O'Neill, Charles E., 4,165,979, Cl. 75-23.000.  
International Paper Company: See—  
Bartley, Thomas S., 4,165,590, Cl. 52-66.000.  
International Standard Electric Corporation: See—  
Judeinstein, Andre J., 4,166,212, Cl. 250-199.000.  
Morrissey, Joseph H., 4,165,922, Cl. 350-341.000.  
International Submarine Services: See—  
Collins, H. Dale, 4,165,647, Cl. 73-603.000.  
International Telephone and Telegraph Corporation: See—  
Acar, Ali, 4,165,762, Cl. 137-625.500.  
Hoover, Alan W., 4,166,213, Cl. 250-213.0VT.  
Scherrer, Raymond E., 4,165,584, Cl. 51-131.100.  
Iplex Plastic Industries Proprietary Limited: See—  
Tucker, Alfred D., 4,165,759, Cl. 137-99.000.  
Isaev, Boris N.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuel A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Ishida, Kinyu; and Fukumoto, Kumaichi, to Teijin Limited. Automatic doffing and donning apparatus. 4,165,585, Cl. 57-268.000.  
Ishida, Masayuki, to Toyo Suisan Kaisha, Ltd. Method of producing instant cupped noodles. 4,166,139, Cl. 426-394.000.  
Ishida, Yoshio: See—  
Yamashita, Seizi; Endo, Tunchiro; and Ishida, Yoshio, 4,166,235, Cl. 315-39.710.  
Ishigaki, Yukinobu; and Muraoka, Teruo, to Victor Company of Japan, Ltd. System for removing interference distortion in the demodulated signal of a frequency-modulated signal. 4,166,251, Cl. 329-132.000.  
Ishikawa, Norikatsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air feeding device for an internal combustion engine. 4,165,611, Cl. 60-290.000.  
Ishimaru, Haruhide: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Isobe, Kenichi; Tsutsui, Tatsuhiko; Ueki, Takao; and Sema, Toru, to Lion Dentrifice Co., Ltd., The. Nail enamel composition and manufacturing method thereof. 4,166,110, Cl. 424-61.000.  
Isotrol Systems: See—  
Schwab, Ardath M., 4,166,195, Cl. 174-95.000.  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, to Canon Kabushiki Kaisha. Camera with exposure control device. 4,165,929, Cl. 354-38.000.  
Ito, Masaru: See—  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.  
Ito, Tadashi: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.  
Ito, Tetsuro: See—  
Taguchi, Yoshinobu; Harigane, Kotaro; and Ito, Tetsuro, 4,165,557, Cl. 29-566.300.  
Ito, Thomas I.: See—  
Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.  
Ive, John G. S.: See—  
Thirlwall, Alan C.; and Ive, John G. S., 4,166,271, Cl. 340-146.200.  
J. C. Sales & Mfg., Inc.: See—  
Pesiri, James B., 4,165,900, Cl. 297-369.000.  
J. G. Anschutz GmbH: See—  
Jaedicke, Ludwig; and Straub, Dieter, 4,165,730, Cl. 124-67.000.  
J. M. Voith GmbH: See—  
Musselmann, Walter; and Rienecker, Reimund, 4,165,841, Cl. 241-46.020.  
Jackson, Warren M. Machine for washing and drying parts. 4,165,994, Cl. 134-104.000.  
Jacob, Charles W.: See—  
Hetra, Andrew A., Jr.; and Jacob, Charles W., 4,165,866, Cl. 266-228.000.  
Jacobs, Lawrence O., to Plastic Products, Inc. Pleated draw drape. 4,165,779, Cl. 160-348.000.  
Jacobson, Allan J.: See—  
Chianelli, Russell R.; Jacobson, Allan J.; and Whittingham, M. Stanley, 4,166,160, Cl. 429-218.000.



Jacquet, Bernard; Papantoniou, Christos; Dufaire, Pierre; and Mahieu, Claude, to L'Oréal. Anti-solar polymers, method of making the same and cosmetic compositions containing the same. 4,166,109, Cl. 424-59.000.

Jaedicke, Ludwig; and Straub, Dieter, to J. G. Anschutz GmbH. Spring support in a compressed air firearm. 4,165,730, Cl. 124-67.000.

Jagenberg Werke Aktiengesellschaft: See—  
Wedig, Walter; and Kramer, Ernst-Otto. 4,165,843, Cl. 242-66.000.

Jahnke, Richard W., to Lubrizol Corporation. The Novel corrosion-inhibiting ester compositions. 4,166,151, Cl. 428-457.000.

Jamieson, William B.: See—  
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,166,123, Cl. 424-273.00P.

Janning, John L., to NCR Corporation. Liquid crystal alignment structure. 4,165,923, Cl. 350-341.000.

Janz, Joachim; and Mentzel, Bodo, to Gebr. Happich GmbH. Arm rest with recessed ashtray, for motor vehicles, or the like. 4,165,898, Cl. 296-153.000.

Jaremczuk, Piotr: See—  
Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Bruszewski, Stanislaw; and Koczela, Krzysztof, 4,165,867, Cl. 266-252.000.

Jarosz, Wojciech: See—  
Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Bruszewski, Stanislaw; and Koczela, Krzysztof, 4,165,867, Cl. 266-252.000.

Jarowenko, Wadym: See—  
Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,166,173, Cl. 536-109.000.

Jaudt, Andreas. Bucket wheel sluice having pressurized discharge. 4,165,822, Cl. 222-636.000.

Jencks, David C.: See—  
Jencks, Hollis W.; and Jencks, David C., 4,166,262, Cl. 335-251.000.

Jencks, Hollis W.; and Jencks, David C., to Detroit Coil Company. Solenoid. 4,166,262, Cl. 335-251.000.

Jennison, James S., to Riley Brothers, Inc. Multi-container package. 4,165,812, Cl. 215-10.000.

Jimmy Dean Meat Company, Inc.: See—  
Bernard, Vincent E., 4,165,818, Cl. 222-53.000.

Johannsen, Roloff: See—  
Sedlack, Hans-Harald; Johannsen, Roloff; and Seiler, Friedrich-Robert, 4,166,106, Cl. 424-12.000.

Johansson, Hans A. V. Disposable washing implement for personal body care. 4,165,942, Cl. 401-132.000.

John, Philip J.: See—  
Cline, Lee S.; and John, Philip J., 4,166,087, Cl. 261-96.000.

Johnson, Arthur R., deceased; and Hudon, Paul A., administrator, to Preston Engravers, Inc. Apparatus for synchronizing advance of web and rotational speed of bucket or like method. 4,165,666, Cl. 83-313.000.

Johnson, Lavell R., to Becton, Dickinson and Company. Immobilized immunoadsorbent. 4,166,102, Cl. 424-1.000.

Johnson, Matthey & Co., Limited: See—  
Bourne, Alan A.; and Knapton, Arthur G., 4,165,983, Cl. 75-172.00R.

Johnson, Melissa C. Catheter tube holder. 4,165,748, Cl. 128-348.000.

Johnson, Richard A., to Falcon Research & Development Corporation. Extractive recovery of trivalent thallium values from aqueous solutions. 4,166,097, Cl. 423-112.000.

Johnston, Jesse C., Jr., to Diamond Power Specialty Corporation. Soot blower drive mechanism. 4,165,552, Cl. 15-312.00R.

Jolly, Jean: See—  
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,166,063, Cl. 260-343.30R.

JOMA-Maschinenbau Karl Jost: See—  
Zivkovic, Milorad M., 4,165,819, Cl. 222-61.000.

Jorgensen, Allen R.: See—  
Leanna, Dale D.; and Jorgensen, Allen R., 4,165,688, Cl. 101-207.000.

Joselevich, Eduardo J. Advertising or decorative sign for representing images. 4,165,576, Cl. 40-452.000.

Jos. Schlitz Brewing Company: See—  
Westermann, Donald H.; and Huige, Nicolaas J., 4,166,141, Cl. 426-422.000.

Judeinstein, Andre J., to International Standard Electric Corporation. Recirculating optical delay line. 4,166,212, Cl. 250-199.000.

Julius Blum Gesellschaft m.b.H.: See—  
Rock, Erich; and Mages, Bernhard, 4,165,907, Cl. 308-3.800.

Junger, Hans: See—  
Weissenfels, Franz; and Junger, Hans, 4,166,162, Cl. 521-100.000.

Jureit, John C.; and Kushner, Benjamin H., to Automated Building Components, Inc. Connector plate. 4,165,672, Cl. 85-13.000.

Jutras, Gilles: See—  
Cloutier, Michel; Doucet, Yves; Jutras, Gilles; and Gagne, Pierre, 4,165,565, Cl. 33-174.00T.

Kabushiki Kaisha Komatsu Seisakusho: See—  
Nakada, Toshio; and Ikeoka, Naoki, 4,165,685, Cl. 100-282.000.

Kabushiki Kaisha Suwa Seikosha: See—  
Tezuka, Chikao, 4,165,687, Cl. 101-93.010.

Kageyama, Hidehei; and Suzuki, Takahiko, to Kotobuki & Co. Ltd. Mechanical pencil. 4,165,941, Cl. 401-31.000.

Kaimann, Walter; and Brachthausen, Karl-Heinz, to Projektierung Chemische Verfahrenstechnik GmbH. Apparatus for the gasification of carbonaceous material. 4,165,971, Cl. 48-77.000.

Kakimoto, Morio: See—  
Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, 4,166,174, Cl. 542-401.000.

Kalenda, Norman W.: See—  
Green, James A., II; and Kalenda, Norman W., 4,165,987, Cl. 96-119.00R.

Kalinenko, Ruf A.: See—  
Nemetkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B., deceased; and Chervoneva, Ljudmila A., administratrix, 4,166,025, Cl. 208-126.000.

Kanebo, Ltd.: See—  
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,165,556, Cl. 28-162.000.

Kao Soap Co., Ltd.: See—  
Nishimura, Masaaki; and Arai, Haruhiko, 4,166,048, Cl. 252-546.000.

Karoly, Gabriel; and Gajewski, Vincent J., to M & T Chemicals Inc. Compositions for preparing elastomeric urethane/urea block copolymers. 4,166,042, Cl. 252-182.000.

Kashio, Toshio, to Casio Computer Co. Ltd. Electronic timepiece. 4,165,605, Cl. 58-24.00R.

Kashiwagi, Midori: See—  
Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, 4,166,113, Cl. 424-177.000.

Kass, Ely: See—  
Weissman, Jerry; and Kass, Ely, 4,165,714, Cl. 119-158.000.

Kastle Gesellschaft m.b.H.: See—  
Nussbaumer, Wolfgang, 4,165,886, Cl. 280-604.000.

Kato, Hideo; Koshinaka, Eiichi; and Ogawa, Nobuo, to Hokuriku Pharmaceutical Co., Ltd. 2-Arylpiperazine derivatives and the preparation thereof. 4,166,180, Cl. 544-398.000.

Kato, Yutaka: See—  
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,165,604, Cl. 58-23.0BA.

Katoh, Koshi: See—  
Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.

Kaufman, Jacquelyn: See—  
Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.

Kaukenen, Joseph Y.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukenen, Joseph Y., 4,165,984, Cl. 96-1.0PE.

Kayama, Kunifusa: See—  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.

Keen, Ronald W., to National Mine Service Company. Material gathering device. 4,165,803, Cl. 198-515.000.

Kemprowski, Walter S.: See—  
Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.

Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung: See—  
Protic, Davor; and Riepe, Georg, 4,166,218, Cl. 250-370.000.

Kerry, John C.; and Weighton, David M., to Boots Company Limited, The. Pesticidal compositions. 4,166,130, Cl. 424-326.000.

Kertscher, Eberhard, to Maillefer S.A. Apparatus for manufacturing electric wire having wire-enamel-type insulation. 4,165,957, Cl. 425-113.000.

Ketola, Warren D.: See—  
Baker, William A.; and Ketola, Warren D., 4,166,152, Cl. 428-522.000.

Khodin, Anatoly I.: See—  
Afanasjuk, Ivan N.; Grabovsky, Viktor V.; Kliot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.

Khomyakova, Ljudmila G.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.

Khranov, Alexandr E.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.

Kichina, Faina I.: See—  
Dokunikhin, Nikolai S.; Vorozhtsov, Georgy N.; Kichina, Faina I.; and Feldblum, Nikolai B., 4,166,181, Cl. 546-31.000.

Kidde Consumer Durables, Corp.: See—  
Belinkoff, Irving R., 4,165,681, Cl. 99-280.000.

Kigasawa, Kazuo; Hiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, to Orelan Pharmaceutical Co., Ltd. 2-Oxophenylbutanoic acid derivatives. 4,166,125, Cl. 424-274.000.

Kim, Leo: See—  
Wald, Milton M.; and Kim, Leo, 4,166,189, Cl. 560-232.000.

Kimball, Stephen F., III; and Palmer, Lewis H., III, to GTE Sylvania Incorporated. Filament lead-in support for tungsten halogen capsule for headlight. 4,166,232, Cl. 313-316.000.

Kimberly-Clark Corporation: See—  
Dunning, Charles E.; Lloyd, William D.; and Bicho, Joseph G., 4,166,001, Cl. 162-111.000.

King, David L., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,165,976, Cl. 71-88.000.

King, Ronald J.; and White, George R., to Smith Kline & French Laboratories Limited. 2H-imidazole-2-thione derivatives. 4,166,184, Cl. 548-321.000.

King-Seely Thermos Co.: See—  
Beck, Willi K., 4,166,268, Cl. 337-309.000.

Kirsch, Jerry. Horizontally and vertically adjustable mirror mounting. 4,165,921, Cl. 350-288.000.

Klein, Gerald B. Baiting hook with barbed connector. 4,165,578, Cl. 43-44.800.

Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased (by Vinzelberg, Selma Margot, heir); Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir; to Bayer Aktiengesellschaft. Process for delivering cylindrical containers to machines for further processing. 4,165,809, Cl. 414-104.00Q.

Klein, Howard P., to Teffs Development Corporation. Production of polyether polyol compositions. 4,166,172, Cl. 536-4.000.

Klein nee Vinzelberg, Susanne, heir: See—  
Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.

Kleine, Charles A.: See—  
Middleton, Verne L.; and Kleine, Charles A., 4,165,733, Cl. 126-420.000.

Kling, Gary W.; and Swanson, Scott C., to Hycel, Inc. Selective test selection and indicator means in an automatic chemical testing apparatus. 4,166,095, Cl. 422-67.000.

Kliot, July M.: See—  
Afanasjuk, Ivan N.; Grabovsky, Viktor V.; Kliot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.

Kluytmans, P. H. Sea-going craft. 4,165,701, Cl. 114-61.000.

Knapp, Frank. Animal spray. 4,165,715, Cl. 119-159.000.

Knapton, Arthur G.: See—  
Bourne, Alan A.; and Knapton, Arthur G., 4,165,983, Cl. 75-172.00R.

Knox, Lloyd C.: See—  
Sullaway, Bob L.; and Knox, Lloyd C., 4,165,891, Cl. 285-18.000.

Knyazev, Vladimir M.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.

Kobayashi, Katsuyoshi: See—  
Yonezawa, Toshiya; and Kobayashi, Katsuyoshi, 4,165,964, Cl. 432-59.000.

Kobayashi, Yasutoshi: See—  
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Ideo, 4,166,079, Cl. 525-208.000.

Kobayashi, Yuichi: See—  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,166,188, Cl. 560-122.000.

Kobori, Michio: See—  
Azumada, Koichi; and Kobori, Michio, 4,165,992, Cl. 106-210.000.

Koch, Friedrich: See—  
Malburg, Anton; and Koch, Friedrich, 4,165,958, Cl. 425-119.000.

Kochi, Hiromu: See—  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,166,115, Cl. 424-246.000.

Koczela, Krzysztof: See—  
Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Bruszewski, Stanislaw; and Koczela, Krzysztof, 4,165,867, Cl. 266-252.000.

Kodaira, Ryoji: See—  
Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, 4,166,128, Cl. 424-319.000.

Kodama, Shun-ichi: See—  
Hisasue, Michio; and Kodama, Shun-ichi, 4,166,165, Cl. 526-87.000.

Koehring Company: See—  
Bernhoft, Gerald W.; and Limbach, Thomas J., 4,165,613, Cl. 60-420.000.

Kolb, Gustav, to Mannesmann A.G.; and Kolb, Gustav. Plug connection between a thermo feeler and a holder. 4,165,995, Cl. 136-234.000.

Kollar, Ernest P.: See—  
Fallon, John L.; Kollar, Ernest P.; and Mares, Fred R., 4,165,870, Cl. 271-10.000.

Komaroff, Ivan; and Schatz, Viktor, to Robert Bosch GmbH. Method of testing fuel-injector spray nozzles. 4,165,635, Cl. 73-119.00A.

Komuro, Keiji: See—  
Ueda, Akio; and Komuro, Keiji, 4,166,083, Cl. 260-33.6AQ.

Kondo, Kiyoshi; Negishi, Akira; and Sugimoto, Kikuo, to FMC Corporation. Process for preparing high cis 3-(2,2,2-trichloroethyl)-2,2-dimethylcyclopropane-1-carboxylates. 4,166,064, Cl. 260-347.400.

Konig, Klaus: See—  
Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; König, Klaus; and Heitkamper, Peter, 4,166,067, Cl. 260-453.00P.

Konishiroku Photo Industry Co., Ltd.: See—  
Sakurai, Kunio, 4,166,148, Cl. 428-332.000.

Kooman, Willem H., to U.S. Philips Corporation. Force measuring device. 4,165,637, Cl. 73-141.00A.

Koos, Tibor. Sandwich unit for wall coating. 4,166,146, Cl. 428-315.000.

Koppers Company, Inc.: See—  
Becker, Joseph, Jr., 4,166,007, Cl. 202-262.000.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 6-n-Propyl-8-methoxymethyl or methylmercaptomethylergolines and related compounds. 4,166,182, Cl. 546-67.000.

Koshinaka, Eiichi: See—  
Kato, Hideo; Koshinaka, Eiichi; and Ogawa, Nobuo, 4,166,180, Cl. 544-398.000.

Kotobuki & Co. Ltd.: See—  
Kageyama, Hidehei; and Suzuki, Takahiko, 4,165,941, Cl. 401-31.000.

Koveshnikov, Serafim P.; Pavlov, Viktor F.; and Fedorov, Stanislav G. Method of feeding electrode wire and apparatus for performing same. 4,165,829, Cl. 226-4.000.

Kozacka, Frederick J.; and Belcher, Richard A., to Gould Inc. Electric fuse having composite support for fusible element. 4,166,266, Cl. 337-158.000.

Kozacka, Frederick J.: See—  
Belcher, Richard A.; and Kozacka, Frederick J., 4,166,267, Cl. 337-163.000.

Kramer, Ernst-Otto: See—  
Wedig, Walter; and Kramer, Ernst-Otto, 4,165,843, Cl. 242-66.000.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. Substituted amides having antiinflammatory activity. 4,166,072, Cl. 260-558.00P.

Kraska, Allen R., to Pfizer Inc. Antiviral amine derivatives of glycerol and propanediols. 4,166,132, Cl. 424-330.000.

Kratzer, Reinhold H.: See—  
Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.

Krause, Franz: See—  
Besenbruch, Alex; and Krause, Franz, 4,165,662, Cl. 82-4.00A.

Kreisel, Torsten: See—  
Weber, Gerhard; Peters, Siegfried; Kunzel, Jürgen; and Kreisel, Torsten, 4,165,632, Cl. 73-55.000.

Kreucher, David L.: See—  
Wasco, Anthony, Jr.; and Kreucher, David L., 4,165,661, Cl. 82-2.00R.

Kruger, Dirk-Torsten: See—  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spenner, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.

Kruncos, Francis E.: See—  
Fitzner, Arthur O.; and Kruncos, Francis E., 4,165,727, Cl. 123-179.00B.

Kuhl, Burkhardt: See—  
Hermann, Walter; Kuhl, Burkhardt; and Schuck, Wolf-Dieter, 4,166,259, Cl. 333-236.000.

Kuhn, Wilhelm: See—  
Bunnenberg, Claus; and Kuhn, Wilhelm, 4,166,217, Cl. 250-308.000.

Kuklies, Milton C.; and Orem, William G., to Mobil Oil Corporation. Thermoplastic bag. 4,165,832, Cl. 229-54.00R.

Kumagai, Naotake, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Automobile air-condition indicator. 4,165,782, Cl. 165-11.000.

Kuntz, Emma: See—  
Miller, Richard; Reich, Murray H.; and Kuntz, Emma, 4,165,877, Cl. 273-218.000.

Kunzel, Jürgen: See—  
Weber, Gerhard; Peters, Siegfried; Kunzel, Jürgen; and Kreisel, Torsten, 4,165,632, Cl. 73-55.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: See—  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.

Hisazumi, Nobuyuki; and Funabashi, Shinichiro, 4,166,082, Cl. 525-78.000.

Kurichev, Viktor I.; and Spolitak, Boris V., to Vsesojuzny Nauchno-Issledovalelsky Ispytatelny Institut Meditsinskoi Tekhniki. Medical altitude chamber. 4,165,740, Cl. 128-204.000.

Kusakabe, Noboru; and Ikeda, Nobumasa, to Bridgestone Tire Company Limited. Pneumatic tire comprising polyisoprene rubber and alkali metal alginate in at least tread portion thereof adapted for travelling on frozen roads. 4,166,052, Cl. 260-17.45T.

Kushner, Benjamin H.: See—  
Jureit, John C.; and Kushner, Benjamin H., 4,165,672, Cl. 85-13.000.

Kutsi, Ero A. Self-cleaning rake. 4,165,598, Cl. 56-400.100.

Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, to Hitachi Chemical Company, Ltd. Method for disintegrating mica flakes and apparatus used therefor. 4,165,839, Cl. 241-4.000.

Kwiatkowski, Jerome A.; and Wood, Charles L., to Ball Corporation. Gob weighing system. 4,165,975, Cl. 65-29.000.

Kwon, Young D.: See—  
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,165,634, Cl. 73-810.000.

La Croix, James R.: See—  
Olsen, Everett O.; La Croix, James R.; and Bowditch, Hoel L., 4,165,651, Cl. 73-704.000.

Olsen, Everett O.; La Croix, James R.; and Simpson, Donald C., 4,165,652, Cl. 73-704.000.

Lakhani, Kishor M.: See—  
Borelli, Ronald F.; and Lakhani, Kishor M., 4,165,686, Cl. 101-1.000.



- Lambert Corporation: See—  
Yeager, Robert R.; and Shaner, Ronald E., 4,165,697, Cl. 111-92.000.
- Lane, Lloyd L., to Deere & Company. Blower assembly. 4,165,953, Cl. 417-350.000.
- Lang, Gary E.: See—  
Lang, Roger J.; and Lang, Gary E., 4,165,559, Cl. 29-629.000.
- Lang, Roger J.; and Lang, Gary E., to Eltra Corporation. Re-formable multi-conductor flat cable. 4,165,559, Cl. 29-629.000.
- Lange, Roger W.; and Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Shaped and fired articles of TiO<sub>2</sub>. 4,166,147, Cl. 428-328.000.
- Larsen, Richard J.: See—  
Hatch, Donald M.; and Larsen, Richard J., 4,166,145, Cl. 428-283.000.
- Laser Precision Corporation: See—  
Doyle, Walter M., 4,165,938, Cl. 356-346.000.
- Lattion, Andre, to Rieter Machine Works, Ltd. Apparatus for waxing yarn using solid wax on a textile machine. 4,165,603, Cl. 57-296.000.
- Laubie, Michel: See—  
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,166,117, Cl. 424-251.000.
- Laudig, Ronald C., to AMP Incorporated. Rotating collar lock connector for a coaxial cable. 4,165,911, Cl. 339-89.000.
- La Via, Anthony L.: See—  
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,166,051, Cl. 260-17.4CL.
- Lawrie, Eugene G.: See—  
Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.
- Lawson, Neil, to Dunlop Limited. Apparatus for winding helical reinforcement into a polymeric tube. 4,166,000, Cl. 156-425.000.
- Leanna, Dale D.; and Jorgensen, Allen R., to Magna-Graphics Corporation. Ink dam for printing press. 4,165,688, Cl. 101-207.000.
- Lebedeva, Larisa M.: See—  
Afanasyuk, Ivan N.; Grabovsky, Viktor V.; Klot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.
- Lechner, Franz: See—  
Fauth, Gunter; Lermann, Peter; Muller, Herbert; and Lechner, Franz, 4,165,931, Cl. 354-86.000.
- Lee, Gim F., Jr., to General Electric Company. Composition of a polyphenylene ether, a block copolymer of a vinyl aromatic compound and a conjugated diene and a polyolefin. 4,166,055, Cl. 260-30.60R.
- Leff, Ruth B. Communication aid. 4,165,890, Cl. 283-7.000.
- Legory, John E.: See—  
York, Kenneth L.; Annal, Peter R.; and Legory, John E., 4,166,211, Cl. 235-312.000.
- Lehmann, Wolfgang; Troemel, Gerhard; Ley, Kurt; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Polyamines containing acid groups that are useful in papermaking. 4,166,002, Cl. 162-164.00R.
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- Leikkanen, Henry E.: See—  
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- Levitsky, Emmanuil A.: See—  
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- Limbach, Thomas J.: See—  
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- Little, Robert T. Adjustable optical filter. 4,165,919, Cl. 350-273.000.
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- Lockheed Electronics Company, Inc.: See—  
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- Loft Modular Devices, Inc.: See—  
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Reichen, John E.; and Long, Scott B., 4,166,200, Cl. 200-11.00R.
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- Ludwig, Frank A., to Ford Motor Company. Secondary battery or cell with pyrolytic graphite coated graphite current collector. 4,166,156, Cl. 429-104.000.
- Ludwig Kiesel oHG: See—  
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- Luft, Victor, to Honeywell Inc. Slotted, electroded piezoelectric wafer for electro-optic devices. 4,166,230, Cl. 310-365.000.
- Lugstenmann, Curt A., deceased, and Capdevilla nee Lugstenmann, Franziska S., heir, to Supla Etablissement. Method for the manufacture of a shaping mask for an electroerosion tool. 4,166,011, Cl. 204-4.000.
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- Lynch, Thomas E.; Eastman, David P.; and Price, Richard P., to Gould Inc. Hybrid automobile. 4,165,795, Cl. 180-65.00A.
- M & T Chemicals Inc.: See—  
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- Karoly, Gabriel; and Gajewski, Vincent J., 4,166,042, Cl. 252-182.000.
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Dyste, Ardell T.; and Ma, Raymond, 4,165,912, Cl. 339-156.00T.
- Machlett Laboratories, Inc., The: See—  
Braun, Martin, 4,166,231, Cl. 313-60.000.
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- Mages, Bernhard: See—  
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- Magna-Graphics Corporation: See—  
Leanna, Dale D.; and Jorgensen, Allen R., 4,165,688, Cl. 101-207.000.
- Magnet Corp.: See—  
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McDaniel, Carl V.; Maier, Phillip K.; and Pilato, Joseph M., 4,166,099, Cl. 423-329.000.
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- Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., to Westinghouse Electric Corp. Stored energy circuit breaker. 4,166,205, Cl. 200-153.00G.
- Maillefer S.A.: See—  
Kertscher, Eberhard, 4,165,957, Cl. 425-113.000.
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- Malof, Adrien P.: See—  
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Kolb, Gustav, 4,165,995, Cl. 136-234.000.
- Mao, George W.; Rao, Purushothama; and Trenter, James F., to Gould Inc. Maintenance-free battery. 4,166,155, Cl. 429-82.000.
- Mares, Fred R.: See—  
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Goodwin, George I.; Margrave, John L.; and Wagner, Robert E., 4,165,974, Cl. 65-26.000.
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Svendsen, Robert A., 4,165,830, Cl. 226-187.000.
- Marks, George R., to Sierra Designs. Arch supported tent. 4,165,757, Cl. 135-1.00R.
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- Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, to Roussel Uclaf. Lactones of 2,2-dimethyl-cyclopropane-1-carboxylic acids. 4,166,063, Cl. 260-343.30R.
- Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., to Raytheon Company. Corn popper with butter dispenser. 4,166,208, Cl. 219-10.55E.
- Martin, Ernest N.; and Munson, Michael D., to Societe d'Assistance Technique pour Produits Nestle S.A. Beverage dispensing machine for mixing granular concentrate and water. 4,165,821, Cl. 222-129.400.
- Martinez, Ginez. Muffler for internal combustion engine. 4,165,798, Cl. 181-268.000.
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- Marvy, Jean-Francois, to Dunlop Limited. Vehicle wheels. 4,165,776, Cl. 152-381.100.
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Meinke, Peter; and Flachenecker, Gerhard, 4,166,261, Cl. 335-246.000.
- Masco Corporation of Indiana: See—  
Good, Arthur L.; and Hoopes, Philip K., 4,165,885, Cl. 280-446.00B.
- Mashimo, Yukio: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.
- Mason, Stanley I., Jr. Cooking utensil kit. 4,165,855, Cl. 249-102.000.
- Massachusetts Institute of Technology: See—  
Pober, Richard L., 4,166,159, Cl. 429-193.000.
- Mastrocola, Antonietta R.; and Webb, Robert L., to SmithKline Corporation. Use of cyclic esters to prepare 2,3-dichloro-4-(2-thenoyl)-phenoxycetic acid. 4,166,061, Cl. 549-72.000.
- Masugi, Takashi: See—  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,166,115, Cl. 424-246.000.
- Masurekar, Prakash S.; and Goodhue, Charles T., to Eastman Kodak Company. Process for the production of  $\alpha$ -glycerophosphate oxidase. 4,166,005, Cl. 435-190.000.
- Mathews, John D. Slot machine coin guide. 4,165,802, Cl. 194-1.00K.
- Matsui, Kazuhiro, to Hutamura, Masaharu, a part interest. Device for preventing tires from slipping. 4,165,774, Cl. 152-221.000.
- Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, to Canon Kabushiki Kaisha. Camera having a holographic indicator. 4,165,930, Cl. 354-53.000.
- Matsumoto, Norichika: See—  
Tsuchima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.
- Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Decompressing device to be used in engines for prime mover-equipped bicycles and the like. 4,165,728, Cl. 123-182.000.
- Matsumoto, Yasushi, to RCA Corporation. Method for manufacturing a diamond stylus for video disc players. 4,165,560, Cl. 29-630.00R.
- Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, to Citizen Watch Co., Ltd. Solar battery timepiece. 4,165,604, Cl. 58-23.0BA.
- Matsumura, Shoji. Safety device of the friction ratchet type operable on extinction of gas flame. 4,165,962, Cl. 431-83.000.
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Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, 4,165,930, Cl. 354-53.000.
- Matsushita Electric Industrial Co., Ltd.: See—  
Meki, Norio; and Yoshino, Tadashi, 4,166,250, Cl. 328-165.000.
- Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaaki, 4,165,961, Cl. 431-1.000.
- Matt, Timothy S., to Nordson Corporation. Digital control system for automatically compensating for conveyor movement changes. 4,166,246, Cl. 328-5.000.
- Mattern, Alfred, to Siemens Aktiengesellschaft. Process for operating sub-zones of a digital T.D.M. telecommunications network for long distance traffic. 4,166,198, Cl. 179-15.0BA.
- Mattor, John A.; and Price, Lawrence, to Scott Paper Company. Release sheet with dried and cured coating composition. 4,166,150, Cl. 428-352.000.
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Fethke, Wayne G.; and Mayer, Paul C., 4,165,805, Cl. 206-349.000.
- McArthur, Barrie: See—  
Riley, Robert E., Jr.; and McArthur, Barrie, 4,166,273, Cl. 340-539.000.
- McCabe, Francis J. Multi-punch, multi-die assembly for stamping hook-shaped damper hinge members. 4,165,629, Cl. 72-325.000.
- McCall, John M.; and TenBrink, Ruth E., to Upjohn Company, The. 1-Alkoxyethanol-isochromans, -isothichromans, -2-benzoxepins, and -2-benzothiepins. 4,166,062, Cl. 260-333.000.
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- McCarthy, Daniel F.; and McCarthy, Carolann L. Method of flue and fireplace cleaning and apparatus used therein. 4,165,993, Cl. 134-21.000.
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- McCord, Wilfred M., Jr., to Vermont American Corporation. Miter gauge for table saw. 4,165,668, Cl. 83-435.100.
- McCormick, Robert J., to Exxon Research & Engineering Co. Double sealable button cell with corrosion resistant can and method. 4,166,157, Cl. 429-174.000.
- McDaniel, Carl V.; Maier, Phillip K.; and Pilato, Joseph M., to W. R. Grace & Co. Preparation of zeolites. 4,166,099, Cl. 423-329.000.
- McDowell, Donald J.: See—  
Patel, Purshottam S.; and McDowell, Donald J., 4,166,169, Cl. 526-313.000.
- McGaha, Patrick L.; and Smith, Millard F., to Westinghouse Electric Corp. Overspeed protection controller employing interceptor valve speed control. 4,166,221, Cl. 290-40.00R.
- McGinniss, Vincent D., to SCM Corporation. Process for cathodic electrocoating and photocuring. 4,166,017, Cl. 204-181.00C.
- McGraw-Edison Company: See—  
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- McLaughlin, Rita E. Head covering. 4,165,542, Cl. 2-209.100.
- Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, to Wilson Greatbatch Ltd. Lithium-iodine cell. 4,166,158, Cl. 429-181.000.
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- Meinke, Peter; and Flachenecker, Gerhard, to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft. Electromagnet having a movable armature and a plurality of energizing sources. 4,166,261, Cl. 335-246.000.
- Meki, Norio; and Yoshino, Tadashi, to Matsushita Electric Industrial Co., Ltd. Synchronizing signal processing circuit. 4,166,250, Cl. 328-165.000.
- Mengel, William R., to Magnet Corp. Apparatus for replacing rotating mandrels on which a web is wound. 4,165,842, Cl. 242-58.300.
- Mentzel, Bodo: See—  
Janz, Joachim; and Mentzel, Bodo, 4,165,898, Cl. 296-153.000.
- Merck & Co., Inc.: See—  
Cragoe, Edward J., Jr.; Smith, Robert L.; and Stokker, Gerald E., 4,166,177, Cl. 544-2.000.
- Messerschmitt-Bölkow-Blohm GmbH: See—  
Hermann, Walter; Kuhl, Burkhardt; and Schuck, Wolf-Dieter, 4,166,259, Cl. 333-236.000.
- Messler, Societe Anonyme: See—  
Girard, Edmond, 4,165,619, Cl. 62-99.000.
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Pille, Terence W. J.; Smith, Ronald A.; and Middleton, Joseph F., 4,165,595, Cl. 53-556.000.
- Metallgesellschaft Aktiengesellschaft: See—  
Reh, Lothar; Hirsch, Martin; Collin, Per H.; and Flink, Sune N., 4,165,717, Cl. 122-4.00D.
- Rudolph, Paul; and Becker, Paul, 4,165,970, Cl. 48-73.000.



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- Michaels, Sheldon B.; Philbrick, Otis; and Morris, Jeffrey, to Digital Marine Electronics Corporation. Loran receiver system. 4,166,275, Cl. 343-103.000.
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Weiss, Frank F., 4,165,682, Cl. 99-331.000.
- Middleton, Joseph F.: See—  
Pillely, Terence W. J.; Smith, Ronald A., and Middleton, Joseph F., 4,165,595, Cl. 53-556.000.
- Middleton, Verne L., and Kleine, Charles A., to Olin Corporation. Solar energy collector system. 4,165,733, Cl. 126-420.000.
- Midrex Corporation: See—  
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- Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., to American Hospital Supply Corporation. Orthodontic appliance with porous tooth-abutting face. 4,165,561, Cl. 32-14.00A.
- Miller, John A.; Beades, Murray L.; and Drummond, Roger O., to United States of America, Agriculture. Sustained release bolus formulations containing insect growth regulators for control of livestock pests. 4,166,107, Cl. 424-19.000.
- Miller, Richard; Reich, Murray H.; and Kuntz, Emma, to Princeton Chemical Research, Inc. Molded golf balls exhibiting isometric compression. 4,165,877, Cl. 273-218.000.
- Milligan, William E.: See—  
Wennerstrom, Edward A.; Brown, James S., Sr.; and Milligan, William E., 4,165,549, Cl. 15-88.000.
- Milisco Manufacturing Company: See—  
Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., 4,165,901, Cl. 297-417.000.
- Milton, A. Fenner: See—  
Villarruel, Carl A.; and Milton, A. Fenner, 4,165,914, Cl. 350-96.160.
- Minkov, Juri V., and Solomonenko, Vladimir I. Read amplifier for integrated-circuit storage device. 4,166,225, Cl. 307-355.000.
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Baker, William A.; and Ketola, Warren D., 4,166,152, Cl. 428-522.000.
- Graham, Robert K., 4,166,255, Cl. 351-160.00H.
- Lange, Roger W.; and Sowman, Harold G., 4,166,147, Cl. 428-328.000.
- Minolta Camera Kabushiki Kaisha: See—  
Nakamura, Akiyoshi, 4,165,916, Cl. 350-215.000.
- Nakatani, Keiji, 4,166,239, Cl. 318-266.000.
- Tsumazawa, Hiroyuki, 4,165,926, Cl. 352-27.000.
- Miraldi, Peter: See—  
Gillis, John R.; Miraldi, Peter; and Stavers, Marius X., 4,166,096, Cl. 422-119.000.
- Mitchell, Robert F., to Goodyear Tire & Rubber Company, The. Recovery of synthetic polymer from solvents. 4,166,171, Cl. 528-488.000.
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Susaki, Wataru; and Namizaki, Hirofumi, 4,166,278, Cl. 357-18.000.
- Watanabe, Eiichi; and Tanahashi, Tooru, 4,165,801, Cl. 187-29.00R.
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Kumagai, Naotake, 4,165,782, Cl. 165-11.000.
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Miyazaki, Takushi; Sakai, Tadao; and Mitsui, Akio, 4,166,050, Cl. 260-8.000.
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- Miyazawa, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Control systems for pulse width control type inverter. 4,166,247, Cl. 328-69.000.
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Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, 4,165,839, Cl. 241-4.000.
- Mizutano, Shigemitsu: See—  
Shimizu, Shigehisa; and Mizutano, Shigemitsu, 4,165,665, Cl. 83-287.000.
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Kuklies, Milton C.; and Orem, William G., 4,165,832, Cl. 229-54.00R.
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- Mohrman, Richard C., to Bausch & Lomb Incorporated. Ophthalmic instrument support. 4,165,924, Cl. 351-38.000.
- Moll, Manfred; Delorme, Jean J.; and Weber, Jean C., to Tepral. Process and apparatus for automatically taking samples of beer for analysis. 4,165,643, Cl. 73-421.00B.
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Boinet, Abel; Mondeil, Lucien; and Montay, Jean-Louis, 4,165,631, Cl. 73-54.000.
- Monier, Jean-Claude: See—  
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 4,166,060, Cl. 260-326.200.
- Montabert, Roger. Hydraulic percussion apparatus. 4,165,788, Cl. 173-17.000.
- Montagnon, Jean R., to Societe Pica. Activated carbon filter having plural layers. 4,166,037, Cl. 210-275.000.
- Montay, Jean-Louis: See—  
Boinet, Abel; Mondeil, Lucien; and Montay, Jean-Louis, 4,165,631, Cl. 73-54.000.
- Moog, Robert A.; and Walborn, Richard M., to Norlin Music, Inc. Parametric adjustment circuit. 4,166,197, Cl. 179-1.00D.
- Moore Products Co.: See—  
Adams, Robert B., 4,165,639, Cl. 73-194.00B.
- Morcov, Paune. Pressure regenerator for increasing of steam, gas, or hot air pressure and rotating steam boiler, with additional equipment. 4,165,615, Cl. 60-685.000.
- Morehouse, Thomas P., to McGraw-Edison Company. Signal ratio indicator. 4,165,653, Cl. 73-722.000.
- Moreno, Isabel L., to Ford Aerospace & Communications Corp. Thermal compensator assembly. 4,165,918, Cl. 350-253.000.
- Moretti, John A.: See—  
West, Gene A.; and Moretti, John A., 4,166,243, Cl. 324-51.000.
- Morgan, Charles W., to United Foam Corporation. Apparatus for making flat top buns. 4,165,955, Cl. 425-89.000.
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- Morimoto, Yoshiro, to Nissan Motor Company, Limited. Vehicle deceleration responsive pressure modulating valve and vehicle brake system including the same. 4,165,905, Cl. 303-24.00F.
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- Morito, Hisatomo: See—  
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- Moroz, Ella M.: See—  
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- Morris, Earl L.; and Fields, Larry D., to Acorn Engineering Co. Dash-pot mechanism for self-closing plumbing valves. 4,165,857, Cl. 251-54.000.
- Morris, Jeffrey: See—  
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- Morrissey, Joseph H., to International Standard Electric Corporation. Liquid crystal cell. 4,165,922, Cl. 350-341.000.
- Motorola, Inc.: See—  
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- Fedorowicz, Richard J.; and Cegles, William P., 4,165,607, Cl. 58-50.00R.
- Subramanian, Sundaram, 4,166,257, Cl. 333-151.000.
- Motorola Process Control Inc.: See—  
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- MRC Corporation: See—  
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- Mrusek, Wilfried: See—  
Wengenroth, Hans E.; and Mrusek, Wilfried, 4,165,817, Cl. 220-256.000.
- Muhlich, Albert: See—  
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,165,915, Cl. 350-96.340.
- Mulder, Rudolf: See—  
Wellinga, Kobus; and Mulder, Rudolf, 4,166,124, Cl. 424-273.00R.
- Muller, Friedhelm: See—  
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- Muller, Herbert: See—  
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- Muller, Karl-Heinz: See—  
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- Muller, Paul C. Device for the automatic operation of weight driven clocks. 4,165,606, Cl. 58-46.00R.
- Mumford, Richard G.: See—  
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- Munson, Michael D.: See—  
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- Murakami, Hiroyasu: See—  
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Sata, Toshikatsu; Murakami, Shoji; and Murata, Yasuo, 4,166,014, Cl. 204-98.000.
- Muraoka, Teruo: See—  
Ishigaki, Yukinobu; and Muraoka, Teruo, 4,166,251, Cl. 329-132.000.

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- Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., to Westinghouse Electric Corp. Storage controller for a digital signal processing system. 4,166,289, Cl. 364-200.000.
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Torii, Masanori; and Naganawa, Tadahisa, 4,166,085, Cl. 261-72.00R.
- Nagel, George W., to Westinghouse Electric Corp. Automatic flue damper. 4,165,833, Cl. 236-1.00G.
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- Nakagawa, Toshio W.: See—  
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- Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Objective lens system with close object focusing aberration correction. 4,165,916, Cl. 350-215.000.
- Nakamura, Nobutaka; and Saeiki, Yukio, to Sumitomo Durez Company, Ltd. Process for producing acetophenone-modified phenolic resin. 4,166,166, Cl. 528-126.000.
- Nakano, Kenichi: See—  
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Susaki, Wataru; and Namizaki, Hirofumi, 4,166,278, Cl. 357-18.000.
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Keen, Ronald W., 4,165,803, Cl. 198-515.000.
- National Research Development Corporation: See—  
Fray, Derek J., 4,166,009, Cl. 204-1.00T.
- Fray, Derek J.; and Gee, Robert, 4,166,013, Cl. 204-61.000.
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Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,166,173, Cl. 536-109.000.
- National Utilities Corporation: See—  
Gould, Joseph B., 4,165,621, Cl. 63-1.00R.
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- Neefe, Charles W. Method of making high quality plastic lenses. 4,166,088, Cl. 264-1.000.
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- Negola, Edward J.; and Brown, Jerald. Method and apparatus for treatment of yarn in package form. 4,165,623, Cl. 68-5.00C.
- Neilsen, Hilda L., to Rolodex Corporation. Rotary card file. 4,165,575, Cl. 40-379.000.
- Niedecker, Herbert. Process for attaching a hanger loop to a wrapper section closed with a U-shaped clip. 4,165,593, Cl. 53-413.000.
- Niemrow, Jerzy. Elastic type projecting device. 4,165,729, Cl. 124-17.000.
- Nippon Chemiphar Co., Ltd.: See—  
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- Nippon Kokan Kabushiki Kaisha: See—  
Yoshikai, Tatsuki; Morito, Hisatomo; and Tsuboi, Haruhito, 4,165,705, Cl. 114-249.000.
- Nippon Steel Corporation: See—  
Yonezawa, Toshiya; and Kobayashi, Katsuyoshi, 4,165,964, Cl. 432-59.000.
- Nippon Zeon Co. Ltd.: See—  
Ueda, Akio; and Komuro, Keiji, 4,166,083, Cl. 260-33.6AQ.
- Nippondenso Co., Ltd.: See—  
Yamamoto, Yoshihisa; and Fujitani, Nobuyuki, 4,165,724, Cl. 123-139.0AT.
- Nischk, Gunther: See—  
Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, 4,166,186, Cl. 560-27.000.
- Nishi, Naohiko. Presser foot for sewing machine. 4,165,699, Cl. 112-240.000.
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- Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, to Kanebo, Ltd. Method for manufacturing suede-like artificial leathers. 4,165,556, Cl. 28-162.000.
- Nishikawa, Kazutoshi: See—  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.
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Watanabe, Morio; and Nishimura, Sanji, 4,166,098, Cl. 423-139.000.
- Nissan Motor Company, Limited: See—  
Aoyama, Syunichi, 4,165,722, Cl. 123-119.00A.
- Asano, Masaharu, 4,165,719, Cl. 123-32.0EE.
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- Morimoto, Yoshiro, 4,165,905, Cl. 303-24.00F.
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Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaaki, 4,165,961, Cl. 31-1.000.
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- Nonnemacher, James R.; Regan, Michael T.; and Webster, Frank G., to Eastman Kodak Company. Electrophotosensitive materials for migration imaging processes. 4,165,985, Cl. 96-1.0PE.
- Nordson Corporation: See—  
Matt, Timothy S., 4,166,246, Cl. 328-5.000.
- Norlin Music, Inc.: See—  
Moog, Robert A.; and Walborn, Richard M., 4,166,197, Cl. 179-1.00D.
- North American Philips Corporation: See—  
Van Roessel, Frederik J., 4,166,237, Cl. 315-370.000.
- North Carolina State University at Raleigh: See—  
Felder, Richard M.; and Ferrell, James K., 4,165,630, Cl. 73-23.000.
- Northern Telecom Limited: See—  
Ciolo, Paolo; and Westwood, William D., 4,166,277, Cl. 346-140.00R.
- Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, to University of Hawaii. Cardiotonic agent. 4,166,113, Cl. 424-177.000.
- Nose, Noriyuki: See—  
Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, 4,165,930, Cl. 354-53.000.
- Nose, Taiji: See—  
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,165,741, Cl. 428-207.000.
- Nougarede, Francis: See—  
Despois, Jacques; and Nougarede, Francis, 4,165,945, Cl. 405-55.000.
- Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., to Holcroft and Company. Crucible melting furnace. 4,165,865, Cl. 266-138.000.
- Nozaki, Michio B., to Rheem Manufacturing Company. Hot water heater burner assembly. 4,165,963, Cl. 431-354.000.
- Nunes, Maurice: See—  
Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., 4,165,865, Cl. 266-138.000.
- Nussbaumer, Wolfgang, to Kastle Gesellschaft m.b.H. Cross country ski. 4,165,886, Cl. 280-604.000.
- Nyu, Kiyosato: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.
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Weigt, Armin, 4,165,674, Cl. 91-178.000.
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Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,166,149, Cl. 428-339.000.
- Odetics, Inc.: See—  
Bartholet, Stephen J., 4,165,636, Cl. 73-141.00R.
- Officine Meccaniche Cigardi S.p.A.: See—  
Giuzzi, Pietro, 4,165,689, Cl. 101-230.000.
- Ogawa, Nobuo: See—  
Kato, Hideo; Koshinaka, Eiichi; and Ogawa, Nobuo, 4,166,180, Cl. 544-398.000.
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Asano, Seiji; and Ohmiya, Akio, 4,165,932, Cl. 354-106.000.
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Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,165,556, Cl. 28-162.000.
- Ohtakara, Yuzo: See—  
Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.
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Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.
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Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.
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Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.



Okuno, Youichi: See—  
Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, 4,165,930, Cl. 354-53.000.  
Olander, William C.; Harvey, Douglas J.; and Eddy, David S., to General Motors Corporation. Ignition distributor electrode for suppressing radio frequency interference. 4,166,201, Cl. 200-19.0DR.  
Olin Corporation: See—  
Middleton, Verne L.; and Kleine, Charles A., 4,165,733, Cl. 126-420.000.  
Patel, Harshad M., 4,165,981, Cl. 75-81.000.  
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Olympus Optical Co., Ltd.: See—  
Yamasita, Nobuo; and Unami, Miwako, 4,165,917, Cl. 350-225.000.  
O'Neill, Charles E.: See—  
Davies, Haydn; Blanco, Jose A.; and O'Neill, Charles E., 4,165,979, Cl. 75-23.000.  
Oplatka, Georg, to Brown Boveri & Company Limited. Heat exchanger for two vapor media. 4,165,783, Cl. 165-110.000.  
Oppenheim, Martin: See—  
Goldman, Julian; and Oppenheim, Martin, 4,165,770, Cl. 141-329.000.  
Orem, William G.: See—  
Kuklies, Milton C.; and Orem, William G., 4,165,832, Cl. 229-54.00R.  
Orion Research Inc.: See—  
Ross, James W., Jr.; and Frant, Martin S., 4,166,021, Cl. 204-195.00F.  
Ortho Pharmaceutical Corporation: See—  
Studer, John E., 4,165,709, Cl. 116-308.000.  
Orwig, Herbert L.: See—  
Hohl, William A.; and Orwig, Herbert L., 4,165,792, Cl. 180-24.020.  
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Otsuka Kagaku Yakuin Kabushiki Kaisha: See—  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,166,188, Cl. 560-122.000.  
Owens-Corning Fiberglas Corporation: See—  
Gilbu, Agnar; Pearson, Lee E.; and Greenwood, Mark E., 4,165,765, Cl. 138-174.000.  
P. R. Mallory & Co. Inc.: See—  
Deane, Kenneth E.; and Grah, Neil E., 4,166,206, Cl. 200-293.000.  
Pomerantz, Daniel I.; and Smolin, Michael, 4,165,641, Cl. 73-290.00R.  
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Paddock, Charles F.: See—  
Fournier, Albert A., Jr.; and Paddock, Charles F., 4,166,081, Cl. 525-75.000.  
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Page, Kenneth J.; and Scott, Michael A., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Correction fluid. 4,165,988, Cl. 106-23.000.  
Pakhomov, Nikolai A.: See—  
Vorobiev, Yuri K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Palmer, Lewis H., III: See—  
Kimball, Stephen F., III; and Palmer, Lewis H., III, 4,166,232, Cl. 313-316.000.  
Papantoniou, Christos: See—  
Jacquet, Bernard; Papantoniou, Christos; Dufaire, Pierre; and Mahieu, Claude, 4,166,109, Cl. 424-59.000.  
Parker, Kenneth R.: See—  
Smith, Charles G.; Parker, Kenneth R.; and Wyatt, John G., 4,165,680, Cl. 98-115.00R.  
Parlin, David B.; and Vits, Helmut, to Bigelow-Sanford, Inc. Vacuum assisted tuft dye printing process. 4,165,547, Cl. 8-148.000.  
Parsons, John S., to Global Marine, Inc. Submersible vehicle deployment and recovery system for rough water. 4,165,706, Cl. 114-258.000.  
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Patel, Harshad M., to Olin Corporation. Method and composition for the decomposition of sodium-mercury amalgam. 4,165,981, Cl. 75-81.000.  
Patel, Jayant K.: See—  
Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,166,173, Cl. 536-109.000.

Patel, Purshottam S.; and McDowell, Donald J., to Felt Products Mfg. Co. High-strength anaerobic sealants containing N-nitrosoamine modifier. 4,166,169, Cl. 526-313.000.  
Paulen, Hendrikus J. G., to Stamicarbon, B.V. Radiation process for preparing mixtures with building tack which are based on rubber-like copolymers of ethylene. 4,166,016, Cl. 204-159.140.  
Pauley, Merle R.: See—  
Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,165,667, Cl. 83-409.000.  
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Paulus, Wilfried; and Genth, Hermann, to Bayer Aktiengesellschaft. Bis-(5,5-dimethyl-1,3-oxazolidin-3-yl) methane as an antimicrobial agent. 4,166,122, Cl. 424-272.000.  
Pavlov, Viktor F.: See—  
Koveshnikov, Serafim P.; Pavlov, Viktor F.; and Fedorov, Stanislav G., 4,165,829, Cl. 226-4.000.  
Payne, Trevor G., to Hexachimie Societe Anonyme. Indaneacetic acid derivatives. 4,166,131, Cl. 424-317.000.  
Pearson, Lee E.: See—  
Gilbu, Agnar; Pearson, Lee E.; and Greenwood, Mark E., 4,165,765, Cl. 138-174.000.  
Pechiney Ugine Kuhlmann: See—  
Morin, Claude, 4,165,732, Cl. 126-419.000.  
Pensabene, Saverio F.; and Catotti, Arthur J., to General Electric Company. Sintered negative plate. 4,166,010, Cl. 204-2.100.  
Pepsico, Inc.: See—  
Lezatte, Arthur J.; and Piotrowski, Peter J., 4,165,874, Cl. 273-77.00A.  
Perkin-Elmer Corporation, The: See—  
Froehlich, John A.; Czernik, Roman; and Fisher, Chester G., III, 4,166,094, Cl. 422-64.000.  
Perkins, Charles M. Invertible plow construction. 4,165,787, Cl. 172-219.000.  
Pesiri, James B., to J. C. Sales & Mfg., Inc. Reclinable seating structures. 4,165,900, Cl. 297-369.000.  
Peters, Robert C.: See—  
Tak, Marinus G. A.; and Peters, Robert C., 4,166,234, Cl. 313-486.000.  
Peters, Siegfried: See—  
Weber, Gerhard; Peters, Siegfried; Kunzel, Jurgen; and Kreisel, Torsten, 4,165,632, Cl. 73-55.000.  
Petrov, Henry G.; and Allen, Robert J., to Prototech Company. Control of the interaction of novel platinum-on-carbon electrocatalysts with fluorinated hydrocarbon resins in the preparation of fuel cell electrodes. 4,166,143, Cl. 427-115.000.  
Petz, David I. Tractor guidance system. 4,165,796, Cl. 180-131.000.  
Pfaudler-Werke A.G.: See—  
Trampert, Hans R., 4,166,020, Cl. 204-195.00R.  
Pfizer Inc.: See—  
Kraska, Allen R., 4,166,132, Cl. 424-330.000.  
Philbrick, Otis: See—  
Michaels, Sheldon B.; Philbrick, Otis; and Morris, Jeffrey, 4,166,275, Cl. 343-103.000.  
Philipson, Alvin L.; Abramson, Noel W.; and Woltcheck, Michael J. Portable cuspidor. 4,165,546, Cl. 4-262.000.  
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Pilato, Joseph M.: See—  
McDaniel, Carl V.; Maher, Phillip K.; and Pilato, Joseph M., 4,166,099, Cl. 423-329.000.  
Pillel, Terence W. J.; Smith, Ronald A.; and Middleton, Joseph F., to Metal Box Limited. Packaging machines. 4,165,595, Cl. 53-556.000.  
Piotrowski, Peter J.: See—  
Lezatte, Arthur J.; and Piotrowski, Peter J., 4,165,874, Cl. 273-77.00A.  
Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, to General Foods Corporation. Foam generator. 4,165,834, Cl. 239-10.000.  
Plastic Products, Inc.: See—  
Jacobs, Lawrence O., 4,165,779, Cl. 160-348.000.  
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D'Alelio, Gaetano F., 4,166,168, Cl. 526-259.000.  
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Smith, William C., 4,166,027, Cl. 209-139.00R.  
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Valent, Philip J.; Atturio, John M.; and Rail, Robert D., 4,165,707, Cl. 114-300.000.  
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Ramsey, William S.: See—  
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Ramsteck, Wolfgang, to Lenser Verwaltungs-GmbH. Filter plate for filter press. 4,166,035, Cl. 210-231.000.  
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Mao, George W.; Rao, Purushothama; and Trenter, James F., 4,166,155, Cl. 429-82.000.  
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Rauschenfels, Eberhard: See—  
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Rayburn, Charles C.: See—  
Bauer, Robert E.; and Rayburn, Charles C., 4,166,285, Cl. 361-307.000.  
Raytheon Company: See—  
Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.

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Dischert, Robert A.; and Bendell, Sidney L., 4,166,281, Cl. 358-219.000.  
Matsumoto, Yasushi, 4,165,560, Cl. 29-630.00R.  
Stanley, Thomas O., 4,166,233, Cl. 313-422.000.  
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Goldner, Walther, 4,165,899, Cl. 297-361.000.  
Regan, Michael T.: See—  
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Rege, James R.: See—  
White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., 4,166,190, Cl. 562-534.000.  
Regie Autonome des Transports Parisiens: See—  
Dubreucq, Jean-Claude, 4,165,850, Cl. 246-182.00B.  
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Reichhold Chemicals, Inc.: See—  
Meeske, Charles J.; Van der Tuin, Enrique H.; and Racey, Michael J., 4,166,054, Cl. 260-23.0EP.  
Reid, Joyce: See—  
Hauck, Frederic P.; and Reid, Joyce, 4,166,183, Cl. 546-101.000.  
Reinert, George R. Suspended motor lifted swimming pool cover. 4,165,543, Cl. 4-172.120.  
Reiter, John J. Switch actuating mechanism. 4,166,202, Cl. 200-44.000.  
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Remkes, Elmer R.: See—  
Chang, Nuke M.; and Remkes, Elmer R., 4,165,571, Cl. 37-62.000.  
Remond, Georges: See—  
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,166,117, Cl. 424-251.000.  
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Ricci, Louis N.: See—  
Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., 4,166,205, Cl. 200-153.00G.  
Richards, Marjorie S. Coin holder. 4,165,573, Cl. 40-10.00D.  
Richmond, James W., to General Time Corporation. Switch for timer. 4,166,204, Cl. 200-67.00D.  
Ridgway, John A.: See—  
Chao, Kwei C.; and Ridgway, John A., 4,166,135, Cl. 426-60.000.  
Rieger, Werner. Tire chain. 4,165,775, Cl. 152-243.000.  
Riegger, Paul: See—  
Blumenfeld, Georg; and Riegger, Paul, 4,166,075, Cl. 260-650.00R.  
Rienecker, Reimund: See—  
Musselmann, Walter; and Rienecker, Reimund, 4,165,841, Cl. 241-46.020.  
Riepe, Georg: See—  
Protic, Davor; and Riepe, Georg, 4,166,218, Cl. 250-370.000.  
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Rieter Machine Works, Ltd.: See—  
Lattion, Andre, 4,165,603, Cl. 57-296.000.  
Riley Brothers, Inc.: See—  
Jennison, James S., 4,165,812, Cl. 215-10.000.  
Riley, Robert E., Jr.; and McArthur, Barrie, to Diversified Technology, Inc. Intrusion detector system. 4,166,273, Cl. 340-539.000.  
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Robert Bosch GmbH: See—  
Komaroff, Ivan; and Schatz, Viktor, 4,165,635, Cl. 73-119.00A.  
Straubel, Max, 4,165,723, Cl. 123-139.0AR.  
Roberts, John H., to Loft Modular Devices, Inc. Simultaneous display of multiple characteristics of complex waveforms. 4,166,245, Cl. 324-103.00P.  
Robinson, Kenneth R.: See—  
Hughes, Leonard; Robinson, Kenneth R.; and Deviney, Marvin L., Jr., 4,165,969, Cl. 44-51.000.  
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Pull-out guide for drawers or the like. 4,165,907, Cl. 308-3.800.



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Abrahams, Joseph L., 4,165,690, Cl. 102-22.00R.  
Rockwell International Corporation: See—  
Coombe, Robert D., 4,165,773, Cl. 149-109.600.  
Rodionova, Nina A.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Rogers, Charles D., to United States Steel Corporation. Drilling optimization searching and control apparatus, 4,165,789, Cl. 175-27.000.  
Rollei-Werke Franke & Heidecke: See—  
Schirmacher, Roland, 4,165,928, Cl. 353-117.000.  
Sobotta, Reinhard, 4,165,927, Cl. 353-104.000.  
Rollins, Dallas W.: See—  
Dugge, Richard H.; and Rollins, Dallas W., 4,165,820, Cl. 222-70.000.  
Rolodex Corporation: See—  
Nielsen, Hilda L., 4,165,575, Cl. 40-379.000.  
Roobek, Cornelis F.; and van Leeuwen, Petrus W. N. M., to Shell Oil Company. Cyclodimerization of isoprene, 4,166,076, Cl. 585-369.000.  
Roper Corporation: See—  
Scanland, Joseph E.; and Fisher, Gerald C., 4,165,597, Cl. 56-295.000.  
Rosen, Melvin H., to Ciba-Geigy Corporation. 1-Benzothiepin-4-carboxamides, 4,166,126, Cl. 424-274.000.  
Ross, Charles B.: See—  
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., 4,166,290, Cl. 364-200.000.  
Ross, James A., Jr.: See—  
Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., 4,166,289, Cl. 364-200.000.  
Ross, James W., Jr.; and Frant, Martin S., to Orion Research Inc. Reference electrode, 4,166,021, Cl. 204-195.00F.  
Ross, William J.: See—  
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,166,123, Cl. 424-273.00P.  
Rosseau, Richard D., to FMC Corporation. Rotary brush roll construction, 4,165,551, Cl. 15-179.000.  
Rossi, Louis J.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaakeinen, Joseph Y., 4,165,984, Cl. 96-1.00PE.  
Roussel Uclaf: See—  
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,166,063, Cl. 260-343.30R.  
Roy, Prodyot; and Licina, George J., to General Electric Company. Electrochemical oxygen meter, 4,166,019, Cl. 204-195.00S.  
Rubens, Roger W.: See—  
Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,166,173, Cl. 536-109.000.  
Ruble, Ernest B., to Whirlpool Corporation. Automatic washer operating apparatus, 4,165,624, Cl. 68-23.700.  
Rude, Edward T., to MRC Corporation. Multi-mode ratchet indexer, 4,165,656, Cl. 74-129.000.  
Ruder, Joseph M.: See—  
Iles, Thomas L.; and Ruder, Joseph M., 4,165,972, Cl. 55-28.000.  
Rudolph, Frank W.: See—  
Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.  
Rudolph, Paul; and Becker, Paul, to Metallgesellschaft Aktiengesellschaft. Process and apparatus for gasifying granular coal under super-atmospheric pressure, 4,165,970, Cl. 48-73.000.  
Rudolph, Peter K. C., to Boeing Company. The Gas turbine mixer apparatus, 4,165,609, Cl. 60-262.000.  
Rudy, Thomas P.; and Nakagawa, Toshio W., to United Technologies Corporation. Purification of combustion catalysts and solid propellant compositions containing the same, 4,166,045, Cl. 252-414.000.  
Rundzaitis, Alfons, to Associated Mills, Inc. Power controlling apparatus in a showerhead, 4,165,837, Cl. 239-394.000.  
Russell, Ronald R., to General Electric Company. Control circuit for circuit breaker AC motor operator, 4,166,240, Cl. 318-380.000.  
Ryu, Shoji: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.  
S.E.N.O.C.T. Corp.: See—  
Wallace, Cornelius J., 4,165,684, Cl. 99-421.00H.  
Sadauskas, Raymond: See—  
Rieppel, Perry; and Sadauskas, Raymond, 4,166,209, Cl. 219-70.000.  
Saeki, Yukio: See—  
Nakamura, Nobutaka; and Saeki, Yukio, 4,166,166, Cl. 528-126.000.  
St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Mixed diamines for lower melting addition polyimide preparation and utilization, 4,166,170, Cl. 528-229.000.  
Saint, David, to Graco Metal Products, Inc. Motor operated swings, 4,165,872, Cl. 272-86.000.  
Saito, Takayuki: See—  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.

- Sakai, Tadao: See—  
Miyazaki, Takushi; Sakai, Tadao; and Mitsui, Akio, 4,166,050, Cl. 260-8.000.  
Sakurada, Juichi: See—  
Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, 4,165,839, Cl. 241-4.000.  
Sakurai, Kunio, to Konishiroku Photo Industry Co., Ltd. Photomask blanks and photomasks prepared therefrom, 4,166,148, Cl. 428-332.000.  
Salerno, Michael T. Sliding door safety device, 4,165,553, Cl. 16-86.00A.  
Salter, Lowell S., to Morgan Construction Company. Flexible seal and seal assembly, 4,165,881, Cl. 277-152.000.  
Salzmann, Hans; and Strohwalde, Herbert. Laser with travelling wave excitation, 4,166,252, Cl. 331-94.5PE.  
Sanborn, Robert S.: See—  
West, Francis, Jr., 4,165,704, Cl. 114-144.00C.  
Sandoz Ltd.: See—  
Baumann, Werner; and Zirngibl, Ulrich, 4,166,068, Cl. 260-456.00A.  
Sandvik Aktiebolag: See—  
Smids, Rune, 4,165,947, Cl. 407-46.000.  
Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Device for joining surfaces of a split rim in a wheel, 4,165,777, Cl. 152-411.000.  
Santa Fe International Corporation: See—  
Chang, Nuke M.; and Remkes, Elmer R., 4,165,571, Cl. 37-62.000.  
Lloyd, Samuel H., III; and Goren, Yoram, 4,165,702, Cl. 114-65.00R.  
Sanzenbacher, Charles W.; and Escott, Robert M., to Midrex Corporation. Briquet sheet breaking by cooling and bending, 4,165,978, Cl. 75-3.000.  
Sarfati, David E. Precision endodontic file, 4,165,562, Cl. 32-57.000.  
Sata, Toshikatsu; Murakami, Shoji; and Murata, Yasuo, to Tokuyama Soda Kabushiki Kaisha. Electrolytic diaphragms, and method of electrolysis using the same, 4,166,014, Cl. 204-98.000.  
Satake, Keigo: See—  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.  
Sato, Masao: See—  
Tsutsui, Kikuo; and Sato, Masao, 4,165,663, Cl. 83-74.000.  
Satterly, Kenneth P.; and Livingston, Frank E., to Witco Chemical Corporation. Polyester plasticizer for vinyl resins derived from adipic acid process waste, 4,166,056, Cl. 260-31.600.  
Sauer, L. Peter: See—  
Beach, John R.; Sauer, L. Peter; and Haraden, William J., 4,165,943, Cl. 403-285.000.  
Saunders, John C.: See—  
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,166,123, Cl. 424-273.00P.  
Scanland, Joseph E.; and Fisher, Gerald C., to Roper Corporation. Cutter pin for rotary mower, 4,165,597, Cl. 56-295.000.  
Schatz, Viktor: See—  
Kornaroff, Ivan; and Schatz, Viktor, 4,165,635, Cl. 73-119.00A.  
Scherrer, Raymond E., to International Telephone and Telegraph Corporation. Apparatus for lapping or polishing materials, 4,165,584, Cl. 51-131.100.  
Schievelbein, Vernon H., to Texaco Inc. Surfactant water flooding oil recovery process, 4,165,785, Cl. 166-274.000.  
Schiminski, Herbert: See—  
Schippers, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, 4,165,600, Cl. 57-58.950.  
Schimpf, Rolf, to Bayer Aktiengesellschaft. Process for the preparation of 2-methoxy-5-methylamino-4-sulphonic acid, 4,166,069, Cl. 260-509.000.  
Schindler, Hermann: See—  
Zimmermann, Wolfgang; and Schindler, Hermann, 4,166,033, Cl. 210-51.000.  
Schippers, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, to Barmag Barmer Maschinenfabrik A.G. Apparatus for open-end spinning of fibers, 4,165,600, Cl. 57-58.950.  
Schirmacher, Roland, to Rolle-Werke Franke & Heidecke. Slide projector drive mechanism for a circular magazine, 4,165,928, Cl. 353-117.000.  
Schlumberger Technology Corporation: See—  
Anderson, Ronald A., 4,166,215, Cl. 250-260.000.  
Cubberly, Walter E., Jr., 4,166,216, Cl. 250-260.000.  
Schmidt, Conrad; Bunker, Gustav; and Weiss, Paul, to Brown Boveri & Cie Aktiengesellschaft. Insulators with increased surface conductivity and method for increasing the conductivity on surfaces of insulators having high electrical resistance made of inorganic and organic materials such as ceramic, glass, plastic and resin, 4,166,193, Cl. 174-28.000.  
Schmidt, Gunter A. Solar motor, 4,165,734, Cl. 126-424.000.  
Schmidt, Lewis W., to Blackwelder. Refuse compactor with a counter-balanced rear door, 4,165,897, Cl. 296-56.000.  
Schnabel, Gunter: See—  
Brandt, Hans-Walter; Schnabel, Gunter; and Muller, Karl-Heinz, 4,165,644, Cl. 73-422.00G.  
Schreyer, Kenneth D., to Columbus McKinnon Corporation. Hoist system, 4,165,863, Cl. 254-168.000.  
Schuck, Wolf-Dieter: See—  
Hermann, Walter; Kuhl, Burkhard; and Schuck, Wolf-Dieter, 4,166,259, Cl. 333-236.000.  
Schuierer, Manfred, to Bruckner Apparatebau GmbH. Process for the wet treatment of endless strands of textile material, 4,165,548, Cl. 8-151.100.

- Schulman, Marvin: See—  
Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.  
Schwab, Ardath M., to Isotrol Systems. Duct apparatus for distribution of isolated power and equipotential ground, 4,166,195, Cl. 174-95.000.  
Schwarzkopf, Anton, to Anton Schwarzkopf Stahl- und Fahrzeugbau, Firma. Amusement ride with vertical track loop, 4,165,695, Cl. 104-55.000.  
Science Union et Cie: See—  
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,166,117, Cl. 424-251.000.  
Sciotti, Robert. Patentee's finger ring or emblem, 4,165,574, Cl. 40-21.00R.  
SCM Corporation: See—  
McGinniss, Vincent D., 4,166,017, Cl. 204-181.00C.  
Scott, Michael A.: See—  
Page, Kenneth J.; and Scott, Michael A., 4,165,988, Cl. 106-23.000.  
Scott Paper Company: See—  
Mattor, John A.; and Price, Lawrence, 4,166,150, Cl. 428-352.000.  
Scott, William B.: See—  
Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,165,667, Cl. 83-409.000.  
Sea-Pac, Inc.: See—  
Dutton, Edward E.; and Gorby, Jack, 4,166,140, Cl. 426-397.000.  
Seaborn, Paul; and Lemburg, Jorn-Uwe, to E. C. H. Will (GmbH & Co.). Wire forming machine, 4,165,767, Cl. 140-105.000.  
Sedlacek, Hans-Harald; Johannsen, Roloff; and Seiler, Friedrich-Robert, to Behringwerke Aktiengesellschaft. Immunologic determination method, 4,166,106, Cl. 424-12.000.  
Seel, Jerry E. Container for potable liquid, 4,165,814, Cl. 215-229.000.  
Seiler, Friedrich-Robert: See—  
Sedlacek, Hans-Harald; Johannsen, Roloff; and Seiler, Friedrich-Robert, 4,166,106, Cl. 424-12.000.  
Seitzer, Walter H., to Sunoco Energy Development Company. Pour point depressant for shale oil, 4,166,023, Cl. 208-14.000.  
Sekiguchi, Tsunetoshi: See—  
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,165,604, Cl. 58-23.00A.  
Sema, Toru: See—  
Isobe, Kenichi; Tsutsui, Tatsuhiko; Ueki, Takao; and Sema, Toru, 4,166,110, Cl. 424-61.000.  
Semaka, Frank D.: See—  
Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., 4,166,116, Cl. 424-250.000.  
Sendai, Michiyuki: See—  
Tsushima, Susumu; Sendai, Michiyuki; Shiraiishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.  
Service d'Exploitation Industrielle des Tabacs et des Allumettes: See—  
Mainville, Christian, 4,165,811, Cl. 414-412.000.  
Setloff, Jerome: See—  
Brown, Robert; and Setloff, Jerome, 4,166,108, Cl. 424-28.000.  
Shanahan, Francis V.; and Feller, Herman H., to Shock-M-All, Inc. Electric baseboard trap for crawling insects, 4,165,577, Cl. 43-112.000.  
Shaner, Ronald E.: See—  
Yeager, Robert R.; and Shaner, Ronald E., 4,165,697, Cl. 111-92.000.  
Shapiro, Justin J. Adjustable micro-dispensing liquid pipet, 4,165,646, Cl. 73-425.600.  
Sharma, Raj K.: See—  
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,165,634, Cl. 73-810.000.  
Shea, Melvin E. Bubble maker, 4,166,084, Cl. 261-69.00A.  
Shefsiek, Paul K.: See—  
Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., 4,165,865, Cl. 266-138.000.  
Shell Oil Company: See—  
Hanson, Radjasa; and Stork, Willem H. J., 4,166,047, Cl. 252-454.000.  
Roobek, Cornelis F.; and van Leeuwen, Petrus W. N. M., 4,166,076, Cl. 585-369.000.  
Wald, Milton M.; and Kim, Leo, 4,166,189, Cl. 560-232.000.  
Shelley Manufacturing Company, a division of Alco Food Service Equipment Company: See—  
Cooper, Frank W.; and Dixon, Arthur B., Jr., 4,165,908, Cl. 312-111.000.  
Shepard, Dennis D.: See—  
Cravy, Thomas V.; and Shepard, Dennis D., 4,165,744, Cl. 128-303.100.  
Shevchenko, Anatoly B.: See—  
Alev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.  
Shibata, Shoji: See—  
Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, 4,166,113, Cl. 424-177.000.  
Shimizu, Masami: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.  
Shimizu, Shigehisa; and Mizutano, Shigemitsu, to Fuji Photo Film Co., Ltd. Web cutting apparatus, 4,165,665, Cl. 83-287.000.  
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Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.

- Shimizu, Takayoshi: See—  
Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.  
Shinonaga, Ideo: See—  
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Ideo, 4,166,079, Cl. 525-208.000.  
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Tezuka, Chikao, 4,165,687, Cl. 101-93.010.  
Shionogi & Co., Ltd.: See—  
Igarashi, Kikuo, 4,166,114, Cl. 424-180.000.  
Shipley, William G.: See—  
Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., 4,166,289, Cl. 364-200.000.  
Shiraiishi, Mitsuru: See—  
Tsushima, Susumu; Sendai, Michiyuki; Shiraiishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.  
Shirayama, Keiko: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Shiroto, Yoshimi: See—  
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,166,026, Cl. 208-210.000.  
Shishido, Tsuneco, to Hughes Aircraft Company. Anti multipacting resonant cavity, 4,166,256, Cl. 333-99.00MP.  
Shkrabina, Rimma A.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Shock-M-All, Inc.: See—  
Shanahan, Francis V.; and Feller, Herman H., 4,165,577, Cl. 43-112.000.  
Shore Plastics, Inc.: See—  
Sussman, Morris, 4,165,572, Cl. 40-10.00D.  
Shue, John I., Jr.; and Douty, George H., to AMP Incorporated. Metal stamped and formed screw, 4,165,673, Cl. 85-44.000.  
Shunichi Morimoto: See—  
Azumada, Koichi; and Kobori, Michio, 4,165,992, Cl. 106-210.000.  
Shupe, Charles A., to Canron, Inc. Chord liner using angle measurement, 4,166,291, Cl. 364-560.000.  
Siegmann, Carl. Firing safety for a pneumatic nailer, 4,165,676, Cl. 91-461.000.  
Siemens Aktiengesellschaft: See—  
Mattern, Alfred, 4,166,198, Cl. 179-15.00A.  
Stein, Karl-Ulrich, 4,166,288, Cl. 363-147.000.  
Sigma Designs: See—  
Marks, George R., 4,165,757, Cl. 135-1.00R.  
Signetics Corporation: See—  
Stephens, Mark L.; and Gray, Paul R., 4,166,269, Cl. 338-3.000.  
Signode Corporation: See—  
Beach, John R.; Sauer, L. Peter; and Haraden, William J., 4,165,943, Cl. 403-285.000.  
Silverstein, Irwin B.: See—  
Bossert, Emily C.; Silverstein, Irwin B.; and Berger, Abe, 4,166,053, Cl. 260-18.00S.  
Simmat, Fritz: See—  
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,165,915, Cl. 350-96.340.  
Simmons Company: See—  
Stumpf, Walter, 4,165,808, Cl. 414-736.000.  
Simmons, Jorge E.: See—  
Woodrow, Arthur F.; and Simmons, Jorge E., 4,165,939, Cl. 356-394.000.  
Simpson, Donald C.: See—  
Olsen, Everett O.; La Croix, James R.; and Simpson, Donald C., 4,165,652, Cl. 73-704.000.  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spenner, Anton; and Underberg, Paul-Gunter, to Bayer Aktiengesellschaft. Washing tunnel for cleaning glass containers, 4,165,756, Cl. 134-56.00R.  
Skaug, Frank S. System for supporting plants, bushes and small trees, 4,165,582, Cl. 47-44.000.  
Slater Electric Inc.: See—  
Bowden, Wade R., Jr.; and Lewis, Walter C., 4,165,851, Cl. 248-57.000.  
Slovenska vedecko-technicka spolocnost, Dom techniky: See—  
Lenorak, Ferdinand, 4,165,599, Cl. 57-58.830.  
Small, Martin B.; and Zory, Peter S., Jr., to International Business Machines Corporation. Heterostructure diode injection laser having a constricted active region, 4,166,253, Cl. 331-94.50H.  
Smids, Rune, to Sandvik Aktiebolag. Cutting tool, 4,165,947, Cl. 407-46.000.  
Smith, Charles G.; Parker, Kenneth R.; and Wyatt, John G., to Dresser Industries, Inc. Fume extraction canopy with baffle deflector, 4,165,680, Cl. 98-115.00R.  
Smith, Darrell F., Jr.; and Clatworthy, Edward F., to Huntington Alloys, Inc. Intermediate temperature service alloy, 4,165,997, Cl. 148-38.000.  
Smith, Harold T. Solar energy collector and storage device, 4,165,735, Cl. 126-437.000.  
Smith, James E., to Denver Instrument Company. Automatic weight switching mechanism for substitution type analytical balances, 4,165,791, Cl. 177-212.000.  
Smith, John. Flexible strip doors, 4,165,778, Cl. 160-332.000.



- Smith Kline & French Laboratories Limited: See—  
King, Ronald J.; and White, George R., 4,166,184, Cl. 548-321.000.  
Smith-Lewis, Margaret J.; and Figueras, John, to Eastman Kodak Company. Reduction of detectable species migration in elements for the analysis of liquids. 4,166,093, Cl. 422-56.000.  
Smith, Millard F.: See—  
McGaha, Patrick L.; and Smith, Millard F., 4,166,221, Cl. 290-40.00R.  
Smith, Robert L.: See—  
Cragoe, Edward J., Jr.; Smith, Robert L.; and Stokker, Gerald E., 4,166,177, Cl. 544-2.000.  
Smith, Ronald A.: See—  
Pille, Terence W. J.; Smith, Ronald A.; and Middleton, Joseph F., 4,165,595, Cl. 53-556.000.  
Smith, William C., to Rader Companies, Inc. Apparatus and method for pneumatically separating fractions of a particulate material. 4,166,027, Cl. 209-139.00R.  
SmithKline Corporation: See—  
Mastrocola, Antonietta R.; and Webb, Robert L., 4,166,061, Cl. 549-72.000.  
Smolin, Michael: See—  
Pomerantz, Daniel I.; and Smolin, Michael, 4,165,641, Cl. 73-290.00R.  
Snitzer, Elias: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.  
Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Photographic slide projector. 4,165,927, Cl. 353-104.000.  
Societe d'Assistance Technique pour Produits Nestle S.A.: See—  
Martin, Ernest N.; and Munson, Michael D., 4,165,821, Cl. 222-129.400.  
Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France: See—  
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 4,166,060, Cl. 260-326.200.  
Societe dite: Gatrun Anstalt: See—  
Corbic, Yves J., 4,165,594, Cl. 53-453.000.  
Societe Europeenne de Propulsion: See—  
Detalle, Bernard A., 4,165,847, Cl. 244-3.290.  
Societe Nationale Elf Aquitaine: See—  
Bernard, Jean-Rene; Turlier, Pierre; and Bousquet, Jacques, 4,166,077, Cl. 585-310.000.  
Despois, Jacques; and Nougarede, Francis, 4,165,945, Cl. 405-55.000.  
Societe Nouvelle de Bouchons Plastique: See—  
Babiol, Pierre, 4,165,813, Cl. 215-220.000.  
Societe Pica: See—  
Montagnon, Jean R., 4,166,037, Cl. 210-275.000.  
Sodertalje Tekniska Ide Produkter Aktiefbolag: See—  
Harju, Bert I., 4,165,563, Cl. 33-18.00R.  
Solex Research Corp. of Japan: See—  
Watanabe, Morio; and Nishimura, Sanji, 4,166,098, Cl. 423-139.000.  
Solie, Leland P., to Sperry Rand Corporation. Temperature compensated reflective array for surface acoustic wave processing. 4,166,228, Cl. 310-313.000.  
Solomonenko, Vladimir I.: See—  
Minkov, Jury V.; and Solomonenko, Vladimir I., 4,166,225, Cl. 307-355.000.  
Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, to Asahi Kasei Kogyo Kabushiki Kaisha. Substituted phenylglycolic acid and its pharmaceutically acceptable esters and salts, and processes for preparing the same. 4,166,128, Cl. 424-319.000.  
Sosnowski, Stanislaw J. A.: See—  
George, Michael; Brotherton, Colin P.; and Sosnowski, Stanislaw J. A., 4,165,725, Cl. 123-139.0AL.  
Southern Can Company: See—  
Hansen, Harold M., 4,165,825, Cl. 222-402.220.  
Southern, Raymond L., to Allegheny Ludlum Industries, Inc. Method and apparatus for heating coils of strip. 4,165,868, Cl. 266-264.000.  
Southwest Research Institute: See—  
Greer, Amos S., Jr., 4,165,649, Cl. 73-644.000.  
Sowman, Harold G.: See—  
Lange, Roger W.; and Sowman, Harold G., 4,166,147, Cl. 428-328.000.  
Spencer, Anton: See—  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spencer, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.  
Sperry Rand Corporation: See—  
Solie, Leland P., 4,166,228, Cl. 310-313.000.  
Todd, Robert R., 4,165,751, Cl. 130-27.00S.  
Spetalnik, Mack. Adjustable high frequency sound dispersion system. 4,165,797, Cl. 181-147.000.  
Spiteri, Joseph. Tractor cable light circuit checker. 4,166,242, Cl. 324-51.000.  
Spolitak, Boris V.: See—  
Kurichev, Viktor I.; and Spolitak, Boris V., 4,165,740, Cl. 128-204.000.  
Stadler, Fritz: See—  
Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.  
Stamcarbon, B.V.: See—  
Paulen, Hendrikus J. G., 4,166,016, Cl. 204-159.140.  
Standard Oil Company, The: See—  
Thomas, John W.; and Harris, Ronald L., 4,165,716, Cl. 122-1.00A.  
White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., 4,166,190, Cl. 562-534.000.  
Wu, Hsin C.; and Fitzgibbon, William O., 4,166,008, Cl. 203-85.000.  
Standard Oil Company (Indiana): See—  
Chao, Kwei C.; and Ridgway, John A., 4,166,133, Cl. 426-60.000.  
Stanley Home Products, Inc.: See—  
Burke, Frederick A., 4,165,550, Cl. 15-144.00A.  
Stanley, Thomas O., to RCA Corporation. Phosphor screen for flat panel color display. 4,166,233, Cl. 313-422.000.  
Stansfield, James F.: See—  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,166,066, Cl. 260-404.500.  
Starr, James B., to Honeywell Inc. Intrusion detection transducers. 4,166,264, Cl. 336-20.000.  
Stauffer Chemical Company: See—  
Chang, Pei K., 4,166,142, Cl. 426-582.000.  
King, David L., 4,165,976, Cl. 71-88.000.  
Stavers, Marius X.: See—  
Gillis, John R.; Miraldi, Peter; and Stavers, Marius X., 4,166,096, Cl. 422-119.000.  
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Integrated current supply. 4,166,288, Cl. 363-147.000.  
Stenger, Ralph L., Jr.: See—  
Brastins, Asekis; and Stenger, Ralph L., Jr., 4,166,270, Cl. 340-5.00C.  
Stephens, Mark L.; and Gray, Paul R., to Signetics Corporation. Temperature compensated piezoresistive transducer. 4,166,269, Cl. 338-3.000.  
Stergiou, Steve. S. Dust collector and air scrubber. 4,165,973, Cl. 55-228.000.  
Sterling Drug Inc.: See—  
Collins, Joseph C., 4,166,074, Cl. 260-574.000.  
Stokker, Gerald E.: See—  
Cragoe, Edward J., Jr.; Smith, Robert L.; and Stokker, Gerald E., 4,166,177, Cl. 544-2.000.  
Stoll, William F., to Green Giant Company. Lasagna noodle. 4,166,136, Cl. 426-144.000.  
Stoltzfus, Sarah D. Commode condensation/overflow catch basin. 4,165,545, Cl. 4-252.00A.  
Stork, Willem H. J.: See—  
Harsono, Radjasa; and Stork, Willem H. J., 4,166,047, Cl. 252-454.000.  
Storz, Ralph H.: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 123-423.00P.  
Stourmas, Stamoulis, to Mobil Oil Corporation. Surfactant waterflood-ing employing amphoteric sulfonium sulfonates. 4,166,038, Cl. 252-8.55D.  
Straub, Dieter: See—  
Jaedicke, Ludwig; and Straub, Dieter, 4,165,730, Cl. 124-67.000.  
Straubel, Max, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,165,723, Cl. 123-139.0AR.  
Strippit Division, Houdaille Industries, Inc.: See—  
Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.  
Stritzl, Karl: See—  
Weigl, Erwin; and Stritzl, Karl, 4,165,883, Cl. 280-618.000.  
Strohwalc, Herbert: See—  
Salzmann, Hans; and Strohwalc, Herbert, 4,166,252, Cl. 331-94.5PE.  
Stromberg-Carlson Corporation: See—  
Gueldenpfennig, Klaus; and Breidenstein, Charles J., 4,166,199, Cl. 179-27.0CA.  
Strupczewski, Joseph T.: See—  
Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,119, Cl. 424-267.000.  
Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,120, Cl. 424-267.000.  
Stryker, Timothy J. Smoker's pipe. 4,165,753, Cl. 131-173.000.  
Studer, John E., to Ortho Pharmaceutical Corporation. Tablet dispenser. 4,165,709, Cl. 116-308.000.  
Stumpf, Walter, to Simmons Company. Upholstery coil transfer mechanism. 4,165,808, Cl. 414-736.000.  
Stutts, William F. Add-on collimator cap for dental x-ray collimator tube and dental x-ray system therewith. 4,166,220, Cl. 250-505.000.  
Subramanian, Sundaram, to Motorola, Inc. Capacitively weighted surface acoustic wave device. 4,166,257, Cl. 333-151.000.  
Sud, Mohinder P. Self cleaning shampoo dispenser. 4,165,824, Cl. 222-341.000.  
Suga, Asakichi. Device for driving screws, rivets and the like. 4,165,772, Cl. 145-52.000.  
Sugimoto, Kikuo: See—  
Kondo, Kiyoshi; Negishi, Akira; and Sugimoto, Kikuo, 4,166,064, Cl. 266-347.400.  
Sukatsch, Dieter: See—  
Prave, Paul; Sukatsch, Dieter; and Faust, Uwe, 4,166,004, Cl. 435-253.000.  
Sullaway, Bob L.; and Knox, Lloyd C., to Halliburton Company. Breech block connector. 4,165,891, Cl. 285-18.000.  
Sumitomo Chemical Co. Ltd.: See—  
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, ideo, 4,166,079, Cl. 525-208.000.  
Sumitomo Durez Company, Ltd.: See—  
Nakamura, Nobutaka; and Sacki, Yukio, 4,166,166, Cl. 528-126.000.

- Sun Chemical Corporation: See—  
Whelan, Edward J.; and Douma, William L., 4,165,966, Cl. 432-121.000.  
Sunasky, Joseph, to Dexion-Comino International Limited. Connection means for structures. 4,165,944, Cl. 403-254.000.  
Sunoco Energy Development Company: See—  
Seitzer, Walter H., 4,166,023, Cl. 208-14.000.  
Sunouchi, Akio; and Watanabe, Yoshiaki, to Canon Kabushiki Kaisha. Single lens reflex camera removable view finder. 4,165,933, Cl. 354-106.000.  
Supla Etablissement: See—  
Lugstenmann, Curt A., deceased; and Capdevilla nee Lugstenmann, Franziska S., heir, 4,166,011, Cl. 204-4.000.  
Suresh, Dev D.: See—  
White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., 4,166,190, Cl. 562-534.000.  
Susaki, Wataru; and Namizaki, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor injection laser device. 4,166,278, Cl. 357-18.000.  
Sussman, Morris, to Shore Plastics, Inc. Display stand. 4,165,572, Cl. 40-10.00D.  
Suzuki, Takahiko: See—  
Kageyama, Hidehei; and Suzuki, Takahiko, 4,165,941, Cl. 401-31.000.  
Suzuki, Yoshio: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.  
Svendsen, Robert A., to Marine Construction & Design Co. Crab pot warp line coiler. 4,165,830, Cl. 226-187.000.  
Svigelj, John A.; and Rabito, Thomas G., to Goodyear Tire & Rubber Company. The. Heat sensitive primer exhibiting color change and containing a resin blend, elemental sulfur, and a dye. 4,166,058, Cl. 260-38.000.  
Swan, George A., to Exxon Research & Engineering Co. Process for suppression of hydrogenolysis and G<sub>2</sub><sup>+</sup> liquid-yield loss in a cyclic reforming unit. 4,166,024, Cl. 208-65.000.  
Swanson, Scott C.: See—  
Kling, Gary W.; and Swanson, Scott C., 4,166,095, Cl. 422-67.000.  
Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., to Milco Manufacturing Company. Vehicle seat having arm rest adjustment means. 4,165,901, Cl. 297-417.000.  
Swiss Aluminium Ltd.: See—  
Wagner, Alfred; Ames, Adolf; and Graf, Karl, 4,165,625, Cl. 72-38.000.  
SWS Silicones Corporation: See—  
Getson, John C., 4,166,078, Cl. 528-26.000.  
Taguchi, Yoshinobu; Harigane, Kotaro; and Ito, Tetsuro, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Apparatus for trimming and securing electronic components inserted into a printed circuit substrate. 4,165,557, Cl. 29-566.300.  
Tak, Marinus G. A.; and Peters, Robert C., to U.S. Philips Corporation. Fluorescent discharge lamp having luminescent material of a specified grain size. 4,166,234, Cl. 313-486.000.  
Takasugi, Hisashi: See—  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,166,115, Cl. 424-246.000.  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, to Fujisawa Pharmaceutical Co., Ltd. Syn 7-oxoinino substituted derivatives of cephalosporanic acid. 4,166,115, Cl. 424-246.000.  
Takeda Chemical Industries, Ltd.: See—  
Tsumima, Susumu; Sendai, Michiyuki; Shiraiishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.  
Takemori, Hayashi, to Dainichi-Nippon Cables, Ltd. Poly-4-methyl-pentene-1 composition. 4,166,057, Cl. 260-33.6PQ.  
Tanahashi, Tooru: See—  
Watanabe, Eiki; and Tanahashi, Tooru, 4,165,801, Cl. 187-29.00R.  
Tanaka, Akira, to American Safety Equipment Corporation. Dual tension safety belt. 4,165,844, Cl. 242-107.000.  
Tanaka, Hideo: See—  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,166,188, Cl. 560-122.000.  
Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, to Chugai Seiyaku Kabushiki Kaisha. Benzazocine derivatives and process for preparing the same. 4,166,174, Cl. 542-401.000.  
Tanaka, Yoshihiro: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.  
Tanner, Jakob: See—  
Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, 4,165,936, Cl. 356-5.000.  
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, ideo, to Sumitomo Chemical Co. Ltd. Dyeable polyolefin composition. 4,166,079, Cl. 525-208.000.  
Techniservice Division Textured Yarn Co., Inc.: See—  
Verlin, Jerome R., 4,165,638, Cl. 73-160.000.  
Teich, Wesley W.: See—  
Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.  
Teijin Limited: See—  
Ishida, Kinyu; and Fukumoto, Kumaichi, 4,165,585, Cl. 57-268.000.  
Tektronix, Inc.: See—  
Reichen, John E.; and Long, Scott B., 4,166,200, Cl. 200-11.00R.  
Tel-Tone Corporation: See—  
Dyste, Ardell T.; and Ma, Raymond, 4,165,912, Cl. 339-156.00T.  
TenBrink, Ruth E.: See—  
McCall, John M.; and TenBrink, Ruth E., 4,166,062, Cl. 260-333.000.  
Tenneco Chemicals, Inc.: See—  
DiBella, Eugene P.; Dunkel, Morris; and Gould, Henry, 4,166,163, Cl. 521-116.000.  
Tepal: See—  
Moll, Manfred; Delorme, Jean J.; and Weber, Jean C., 4,165,643, Cl. 73-421.00B.  
Tesdata Systems Corporation: See—  
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Tessier, Jean: See—  
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Tokyo Shibaura Electric Co., Ltd.: See—  
Yamaguchi, Ryoji, 4,165,871, Cl. 271-127.000.  
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True Temper Corporation: See—  
Curati, Marino, Jr., 4,165,771, Cl. 145-29.00R.



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 Dick, Perry J., Jr., 4,165,617, Cl. 405-17.000.  
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 Krapcho, John; and Turk, Chester F., 4,166,072, Cl. 260-558.00P.  
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 Nakayama, Kenji; and Uchida, Kazuo, 4,165,838, Cl. 239-533.300.  
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 Yamasita, Nobuo; and Unami, Miwako, 4,165,917, Cl. 350-225.000.  
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 Union Special Corporation: See—  
 Fletcher, Roy W.; and Forte, Anthony D., 4,165,700, Cl. 112-286.000.  
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 Fournier, Albert A., Jr.; and Paddock, Charles F., 4,166,081, Cl. 525-75.000.  
 United Foam Corporation: See—  
 Morgan, Charles W., 4,165,955, Cl. 425-89.000.  
 United States of America  
 Agriculture: See—  
 Miller, John A.; Beadles, Murray L.; and Drummond, Roger O., 4,166,107, Cl. 424-19.000.  
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 Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.  
 Army: See—  
 Fix, Joseph O., 4,165,906, Cl. 305-51.000.  
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 St. Clair, Terry L., 4,166,170, Cl. 528-229.000.  
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 DeReggi, Aime S.; and Edelman, Seymour, 4,166,229, Cl. 310-337.000.  
 Goldberg, Leonard J., 4,166,112, Cl. 424-93.000.  
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 Valent, Philip J.; Atturio, John M.; and Rail, Robert D., 4,165,707, Cl. 114-300.000.

Villarruel, Carl A.; and Milton, A. Fenner, 4,165,914, Cl. 350-96.160.  
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 Kooman, Willem H., 4,166,637, Cl. 73-141.00A.  
 Rademaker, Gerrit, 4,166,996, Cl. 178-68.000.  
 Tak, Marinus G. A.; and Peters, Robert C., 4,166,234, Cl. 313-486.000.  
 van Slageren, Nanno, 4,166,283, Cl. 360-95.000.  
 Wellinga, Kobus; and Mulder, Rudolf, 4,166,124, Cl. 424-273.00R.  
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 Huff, Bobby J., 4,166,049, Cl. 260-2.300.  
 United States Steel Corporation: See—  
 Hetra, Andrew A., Jr.; and Jacob, Charles W., 4,165,866, Cl. 266-228.000.  
 Rogers, Charles D., 4,165,789, Cl. 175-27.000.  
 United Technologies Corporation: See—  
 Rudy, Thomas P.; and Nakagawa, Toshio W., 4,166,045, Cl. 252-414.000.  
 University of Hawaii: See—  
 Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, 4,166,113, Cl. 424-177.000.  
 Upjohn Company, The: See—  
 Bundy, Gordon L., 4,166,187, Cl. 560-55.000.  
 McCall, John M.; and TenBrink, Ruth E., 4,166,062, Cl. 260-333.000.  
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 Van der Tuin, Enrique H.: See—  
 Meeske, Charles J.; Van der Tuin, Enrique H.; and Racey, Michael J., 4,166,054, Cl. 260-23.0EP.  
 Van Gilst, Carl, to Innovative Industries, Inc. Barbecue apparatus. 4,165,683, Cl. 99-393.000.  
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 Vanrenterghem, Jacques: See—  
 Neel, Emmanuel E. A.; Deflin, Michel; Vanrenterghem, Jacques; and Clement, Jean-Claude, 4,166,101, Cl. 423-656.000.  
 Van Roessel, Frederik J., to North American Philips Corporation. Horizontal deflection circuit for television camera. 4,166,237, Cl. 315-370.000.  
 van Slageren, Nanno, to U.S. Philips Corporation. Self-threading helical scan video cassette recorder. 4,166,283, Cl. 360-95.000.  
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 Zimmet, Hans, 4,165,934, Cl. 355-55.000.  
 Vereinigte Deutsche Metallwerke Aktiengesellschaft: See—  
 Fercke, Wilhelm, 4,166,153, Cl. 428-577.000.  
 Verkinderen, Paul A.: See—  
 De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,166,089, Cl. 264-22.000.  
 Verlin, Jerome R., to Techniservice Division Textured Yarn Co., Inc. Entanglement testing apparatus and method. 4,165,638, Cl. 73-160.000.  
 Vermont American Corporation: See—  
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 Vetter, Kathryn A. Cosmetic container with cleaning surface. 4,165,815, Cl. 220-4.00D.  
 Victaulic Company of America: See—  
 Platek, Edward; and Brady, Timothy, 4,165,892, Cl. 285-111.000.  
 Victor Company of Japan, Ltd.: See—  
 Ishigaki, Yukinobu; and Muraoka, Teruo, 4,166,251, Cl. 329-132.000.  
 Vierstraete, Irene. Drilling and boring machine. 4,165,948, Cl. 408-46.000.  
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 Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.  
 Vinzelberg, Peter, heir: See—  
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 Virk, Kashmir S.; and Leikkanen, Henry E., to Texaco Inc. Exhaust gas recirculation system for an automotive engine. 4,165,721, Cl. 123-119.00A.  
 Vits, Helmuth: See—  
 Parlin, David B.; and Vits, Helmuth, 4,165,547, Cl. 8-148.000.  
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Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isacv, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A. Method of preparing granulated activated alumina. 4,166,100, Cl. 423-626.000.  
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 Dokunikhin, Nikolai S.; Vorozhtsov, Georgy N.; Kichina, Faina I.; and Feldbljum, Nikolai B., 4,166,181, Cl. 546-31.000.  
 Vovk, Maya I.: See—  
 Aleev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.  
 Vsesojuzny Nauchno-Issledovalejsky Ispytatelny Institut Meditsinskoi Tekhniki: See—  
 Kurichev, Viktor I.; and Spolitak, Boris V., 4,165,740, Cl. 128-204.000.  
 W. A. Whitney Corp.: See—  
 Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,165,667, Cl. 83-409.000.  
 W. R. Grace & Co.: See—  
 McDaniel, Carl V.; Maher, Phillip K.; and Pilato, Joseph M., 4,166,099, Cl. 423-329.000.  
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 Wagner, Kuno: See—  
 Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heikemper, Peter, 4,166,067, Cl. 260-453.00P.  
 Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,166,149, Cl. 428-339.000.  
 Wagner, Robert E.: See—  
 Goodwin, George I.; Margrave, John L.; and Wagner, Robert E., 4,165,974, Cl. 65-26.000.  
 Wakabayashi, Mikio: See—  
 Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, 4,166,128, Cl. 424-319.000.  
 Walborn, Richard M.: See—  
 Moog, Robert A.; and Walborn, Richard M., 4,166,197, Cl. 179-1.00D.  
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 Walworth, Vivian K., to Polaroid Corporation. Substituted-halide silver halide emulsions and products containing same. 4,165,986, Cl. 96-29.00R.  
 Wandelmaier, Frank W.: See—  
 Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., 4,166,116, Cl. 424-250.000.  
 Warner, Peter S.; and Bicht, John R., to Lucas Industries Limited. Electrically driven vehicles. 4,165,794, Cl. 180-65.00R.  
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 Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, 4,165,728, Cl. 123-182.000.  
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 Watanabe, Takeyoshi: See—  
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 Watanabe, Yoshiaki: See—  
 Sunouchi, Akio; and Watanabe, Yoshiaki, 4,165,933, Cl. 354-106.000.  
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 Boshold, Raymond F., 4,165,627, Cl. 72-48.000.  
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 Mastrocola, Antonietta R.; and Webb, Robert L., 4,166,061, Cl. 549-72.000.  
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 Weighton, David M.: See—  
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 Weiss, Paul: See—  
 Schmidt, Conrad; Bunge, Gustav; and Weiss, Paul, 4,166,193, Cl. 174-28.000.  
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 Weissman, Jerry; and Kass, Ely. Animal handling systems. 4,165,714, Cl. 119-158.000.  
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 Bhattacharyya, Ajay; and Weiss, Ernst H. G., 4,166,003, Cl. 176-61.000.  
 Bluzer, Nathan, 4,166,223, Cl. 307-221.00D.  
 Bolin, Philip C., 4,166,194, Cl. 174-31.00R.  
 Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., 4,166,205, Cl. 200-153.00G.  
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 Nagel, George W., 4,165,833, Cl. 236-1.00G.  
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 Reynolds, William T.; and Foster, Karl, 4,165,990, Cl. 106-48.000.  
 Westwood, William D.: See—  
 Cielo, Paolo; and Westwood, William D., 4,166,277, Cl. 346-140.00R.  
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 Burke, Harry D., 4,166,207, Cl. 219-10.55D.  
 Ruble, Ernest B., 4,165,624, Cl. 68-23.700.  
 White, George R.: See—  
 King, Ronald J.; and White, George R., 4,166,184, Cl. 548-321.000.  
 White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., to Standard Oil Company. The. Process for the preparation of methacrylic acid from methacrolein. 4,166,190, Cl. 562-534.000.  
 White, Lawrence S.: See—  
 Adams, Jim M.; and White, Lawrence S., 4,165,998, Cl. 156-64.000.  
 Whittingham, M. Stanley: See—  
 Chianelli, Russell R.; Jacobson, Allan J.; and Whittingham, M. Stanley, 4,166,160, Cl. 429-218.000.  
 Wickes Corporation, The: See—  
 Wasco, Anthony, Jr.; and Kreucher, David L., 4,165,661, Cl. 82-2.00R.  
 Wiggins Teape Limited: See—  
 Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,166,090, Cl. 264-25.000.  
 Wild Heerbrugg Aktiengesellschaft: See—  
 Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, 4,165,936, Cl. 356-5.000.  
 William H. Rorer, Inc.: See—  
 Diamond, Julius, 4,166,133, Cl. 424-346.000.  
 Williams, Curtis. T clamp. 4,165,869, Cl. 269-41.000.  
 Wilson Greatbatch Ltd.: See—  
 Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.



- Wilson, Victor A.: See—  
Bye, Ashley D.; Priddle, John E.; and Wilson, Victor A., 4,166,167, Cl. 526-142.000.
- Winchester, Roy E.: See—  
Lewis, John B.; and Winchester, Roy E., 4,166,030, Cl. 209-534.000.
- Wise, Rodney M., to Proctor & Gamble Company, The. Detergent composition and process. 4,166,039, Cl. 252-110.000.
- Wiseheart, Keith H. Adjustable artist's easel. 4,165,856, Cl. 248-449.000.
- Witco Chemical Corporation: See—  
Satterly, Kenneth P.; and Livingston, Frank E., 4,166,056, Cl. 260-31.600.
- Witzel, Frank; Clark, K. Warren; and Bakal, Abraham I., to Life Savers, Inc. Method for improving flexibility retention of chewing gum. 4,166,134, Cl. 426-3.000.
- Wojciechowski, Felix, to Amerock Corporation. Spring loaded locking assemblies for sliding windows and the like. 4,165,894, Cl. 292-7.000.
- Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Dihydroxy carbamates containing sulphonic acid groups. 4,166,186, Cl. 560-27.000.
- Wolf, Tobin. Sound controlled vehicle. 4,165,581, Cl. 46-256.000.
- Wolfson, Sumner H., to Zira International. Apparatus for ocular plethysmography. 4,165,736, Cl. 128-687.000.
- Woltcheck, Michael J.: See—  
Philipson, Alvin L.; Abramson, Noel W.; and Woltcheck, Michael J., 4,165,346, Cl. 4-262.000.
- WOMAKO-Maschinenkonstruktionen GmbH: See—  
Fabrig, Paul, 4,165,766, Cl. 140-92.700.
- Wood, Charles L.: See—  
Kwiatkowski, Jerome A.; and Wood, Charles L., 4,165,975, Cl. 65-29.000.
- Woodrow, Arthur F.; and Simmons, Jorge E., to TSN Company, Inc. Apparatus for inspection and dimensional measurement by sequential reading. 4,165,939, Cl. 356-394.000.
- Woods, Weightstill W.; and Eul, William A., to Boeing Company, The. Leakage detection system for radioactive waste storage tanks. 4,166,244, Cl. 324-65.00R.
- Wright, David M. Chicken wire border fence. 4,165,864, Cl. 256-34.000.
- Wright, Earl B. Aerator for live bait bucket. 4,166,086, Cl. 261-93.000.
- Wright, Hal E.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukenen, Joseph Y., 4,165,984, Cl. 96-1.0PE.
- Wu, Hsin C.; and Fitzgibbons, William O., to Standard Oil Company, The. Process for recovery of olefinic nitriles. 4,166,008, Cl. 203-85.000.
- Wulff, Harald P.: See—  
Cenker, Moses; Narayan, Thirumurti; and Wulff, Harald P., 4,166,164, Cl. 521-129.000.
- Wurzberg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., to National Starch and Chemical Corporation. Process for phosphorylating starch in alkali metal tripolyphosphate salts. 4,166,173, Cl. 536-109.000.
- Wyatt, John G.: See—  
Smith, Charles G.; Parker, Kenneth R.; and Wyatt, John G., 4,165,680, Cl. 98-115.00R.
- Yagi, Hiroshi, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Tape-mounted electronic component package. 4,165,807, Cl. 206-409.000.
- Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, to Nippon Chemphar Co., Ltd. Benzo[b]thiophene derivatives and process for producing the same. 4,166,127, Cl. 424-275.000.
- Yamaguchi, Ryoji, to Tokyo Shibaura Electric Co., Ltd. Pattern reading device. 4,165,871, Cl. 271-127.000.
- Yamakawa, Yukio: See—  
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,165,556, Cl. 28-162.000.
- Yamamichi, Masayoshi: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyashu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.
- Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaaki, to Matsushita Electric Industrial Co., Ltd. Burner with ultrasonic vibrator. 4,165,961, Cl. 431-1.000.
- Yamamoto, Katsunobu: See—  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,166,263, Cl. 335-284.000.
- Yamamoto, Manabu: See—  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kouosuke, 4,165,937, Cl. 356-319.000.
- Yamamoto, Sadashi: See—  
Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, 4,165,728, Cl. 123-182.000.
- Yamamoto, Yoshihisa; and Fujikami, Nobuyuki, to Nippondenso Co., Ltd. Fuel injection system for internal combustion engine. 4,165,724, Cl. 123-139.0AT.
- Yamanaka, Toru: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.
- Yamashita, Keitaro: See—  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,166,263, Cl. 335-284.000.
- Yamashita, Seizi; Endo, Tanehiro; and Ishida, Yoshie, to Hitachi, Ltd. Magnetron comprising ferromagnetic material members axially magnetized in opposite directions. 4,166,235, Cl. 315-39.710.
- Yamasita, Nobuo; and Unami, Miwako, to Olympus Optical Co., Ltd. Objective for endoscopes. 4,165,917, Cl. 350-225.000.
- Yamazaki, Shiro: See—  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.
- Yasuhara, Seishi: See—  
Iizuka, Haruhiko; and Yasuhara, Seishi, 4,165,610, Cl. 60-284.000.
- Ydstie, Birger L., to Elkem-Spigerverket A/S. Matte smelting. 4,166,192, Cl. 13-9.00R.
- Yeager, Marvin L.; and Desso, Jerome A., to AMP Incorporated. Rotary zif connector edge board lock. 4,165,909, Cl. 339-75.0MP.
- Yeager, Robert R.; and Shaner, Ronald E., to Lambert Corporation. Hand operated seed planter. 4,165,697, Cl. 111-92.000.
- Yeh, George C. Self-contained vapor-power plant requiring a single moving part. 4,165,614, Cl. 60-831.000.
- Yeh, Yu S.: See—  
Reudink, Douglas O.; and Yeh, Yu S., 4,166,274, Cl. 343-100.0SA.
- Yonezawa, Toshiya; and Kobayashi, Katsuyoshi, to Nippon Steel Corporation. Vertical direct fired strip heating furnaces. 4,165,964, Cl. 432-59.000.
- York, Kenneth L.; Annal, Peter R.; and Legory, John E., to Burroughs Corporation. Error control system for named data. 4,166,211, Cl. 235-312.000.
- Yoshikai, Tatsuki; Morito, Hisatomo; and Tsuboi, Haruhito, to Nippon Kokan Kabushiki Kaisha. Coupling mechanism for coupling together a pusher tug and a barge. 4,165,705, Cl. 114-249.000.
- Yoshino, Tadashi: See—  
Meki, Norio; and Yoshino, Tadashi, 4,166,250, Cl. 328-165.000.
- Young, Manley A., to Boeing Company, The. Rolling-cargo loading/unloading ramp having a stowable lift for palletized cargo. 4,165,810, Cl. 414-595.000.
- Zabel, William P., Jr. Golf game. 4,165,379, Cl. 273-259.000.
- Ziminski, Richard D.; and Uecker, Myron M., to General Mills, Inc. Preparation of bacon-like meat analog. 4,166,138, Cl. 426-249.000.
- Zimmerman, Paul: See—  
Germonprez, Raymond L.; and Zimmerman, Paul, 4,166,044, Cl. 252-408.000.
- Zimmermann, Wolfgang; and Schindler, Hermann, to Hoechst Aktiengesellschaft. Process for the separation of polyvinyl alcohol from aqueous solutions. 4,166,033, Cl. 210-51.000.
- Zimmel, Hans, to Veb Pentacon-Dresden Kamera-und Kinowerke. Microfilm camera. 4,165,934, Cl. 355-55.000.
- Zinser Textilmaschinen GmbH: See—  
Igel, Wolfgang, 4,165,601, Cl. 57-264.000.
- Zira International: See—  
Wolfson, Sumner H., 4,165,736, Cl. 128-687.000.
- Zirngibl, Ulrich: See—  
Baumann, Werner; and Zirngibl, Ulrich, 4,166,068, Cl. 260-456.00A.
- Zivkovic, Milorad M., to JOMA-Maschinenbau Karl Jost. Mobile equipment for air-flushing, filling and venting a hydraulic brake system. 4,165,819, Cl. 222-61.000.
- Zory, Peter S., Jr.: See—  
Small, Martin B.; and Zory, Peter S., Jr., 4,166,253, Cl. 331-94.50H.
- zur Strassen, Heinrich; and Rauschenfels, Eberhard, to Dyckerhoff Zementwerke A.G. Method for the production of synthetic wollastonite material. 4,165,991, Cl. 106-63.000.

## LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF AUGUST, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Blaha, Franklyn C.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., Re. 30,087, Cl. 307-304.000.
- Carlile, Norman J.; and Van Selm, Theodor J., to Lever Brothers Company. Plastic emulsion food spread. Re. 30,086, Cl. 426-603.000.
- Cluett, Peabody & Co., Inc.: See—  
Morton, Kenneth O., Re. 30,084, Cl. 271-10.000.
- Compagnie Francaise d'Etudes et de Construction Technip: See—  
Perret, Jean C., Re. 30,085, Cl. 62-9.000.
- Lever Brothers Company: See—  
Carlile, Norman J.; and Van Selm, Theodor J., Re. 30,086, Cl. 426-603.000.
- Mack, Ingham A. G.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., Re. 30,087, Cl. 307-304.000.
- McCann, David H., Jr.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., Re. 30,087, Cl. 307-304.000.
- Morton, Kenneth O., to Cluett, Peabody & Co., Inc. Picking and transporting means for fabric sections and the like. Re. 30,084, Cl. 271-10.000.
- Perret, Jean C., to Compagnie Francaise d'Etudes et de Construction Technip. Method and apparatus for the coding and low temperature liquefaction of gaseous mixtures. Re. 30,085, Cl. 62-9.000.
- Reilly, James J.; and Wiswall, Richard H., Jr., to United States of America, Energy. Iron titanium manganese alloy hydrogen storage. Re. 30,083, Cl. 34-15.000.
- United States of America, Energy: See—  
Reilly, James J.; and Wiswall, Richard H., Jr., Re. 30,083, Cl. 34-15.000.
- Van Selm, Theodor J.: See—  
Carlile, Norman J.; and Van Selm, Theodor J., Re. 30,086, Cl. 426-603.000.
- Westinghouse Electric Corp.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., Re. 30,087, Cl. 307-304.000.
- White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., to Westinghouse Electric Corp. Coherent sampled readout circuit and signal processor for a charge coupled device array. Re. 30,087, Cl. 307-304.000.
- Wiswall, Richard H., Jr.: See—  
Reilly, James J.; and Wiswall, Richard H., Jr., Re. 30,083, Cl. 34-15.000.

## LIST OF PLANT PATENTEES

- Arnesen, Richard A., to Geo. J. Ball, Inc. Azalea named Variegated Dogwood. 4,455, 8-28-79, Cl. 55.000.
- Geo. J. Ball, Inc.: See—  
Arnesen, Richard A., 4,455, Cl. 55.000.
- Pan-American Plant Company: See—  
Shoesmith, Leonard H., 4,456, Cl. 77.000.
- Saville, F. Harmon. Rose plant. 4,457, 8-28-79, Cl. 8.000.
- Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Alpine. 4,456, 8-28-79, Cl. 77.000.

## LIST OF DESIGN PATENTEES

- American Cyanamid Company: See—  
Grodin, Adam J., 252,735, Cl. D9-129.000.
- Grodin, Adam J., 252,736, Cl. D9-157.000.
- Grodin, Adam J., 252,737, Cl. D9-168.000.
- Grodin, Adam J., 252,738, Cl. D9-168.000.
- Grodin, Adam J., 252,739, Cl. D9-168.000.
- Asher, James C.: See—  
Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C., 252,753, Cl. D14-11.000.
- Atari, Inc.: See—  
Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C., 252,753, Cl. D14-11.000.
- Barr, Josef J. Pendant. 252,744, 8-28-79, Cl. D11-79.000.
- Brand, Winfried, to Ronson Corporation. Lighter. 252,768, 8-28-79, Cl. D27-42.000.
- Brown, David A.; Carmean, E. A., Jr.; and Murek, Barbara A. Doll package. 252,740, 8-28-79, Cl. D9-193.000.
- Carmean, E. A., Jr.: See—  
Brown, David A.; Carmean, E. A., Jr.; and Murek, Barbara A., 252,740, Cl. D9-193.000.
- Cederholm, Carl: See—  
D'Aguanno, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.
- Rossi, Richard M.; Cederholm, Carl; D'Aguanno, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.
- Chadwick, Daniel C. Hang glider harness. 252,716, 8-28-79, Cl. D2-25.000.
- Christensen, John: See—  
Shin, Sungjae; Christensen, John; and Han, Paul, 252,769, Cl. D28-13.000.
- Cox, Richard D.; and Scott, Chester G. Wood-burning heater and fireplace. 252,766, 8-28-79, Cl. D23-93.000.
- Crosman, Dorland L.: See—  
Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,760, Cl. D21-88.000.
- D'Aguanno, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, to Hasbro Industries, Inc. Toy figure. 252,761, 8-28-79, Cl. D21-177.000.
- D'Aguanno, Steven R.: See—  
Rossi, Richard M.; Cederholm, Carl; D'Aguanno, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.
- Dunkel, Bruce P.; and Harrison, Charles A., to National Service Industries, Inc.; and Sears Roebuck & Company. Lighting fixture. 252,772, 8-28-79, Cl. D48-23.00A.
- Eddins, Fred D.: See—  
D'Aguanno, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.
- Ek, Nils E. Cart for transportation. 252,746, 8-28-79, Cl. D12-34.000.
- Glaeser, George L., Jr.: See—  
Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,750, Cl. D14-10.000.
- Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,751, Cl. D14-10.000.
- Gregory, Frederick S. Container for a golf bag. 252,774, 8-28-79, Cl. D3-37.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,735, 8-28-79, Cl. D9-129.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,736, 8-28-79, Cl. D9-157.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,737, 8-28-79, Cl. D9-168.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,738, 8-28-79, Cl. D9-168.000.

Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,739, 8-28-79, Cl. D9-168.000.  
 Hammer, Jerry, to Revlon, Inc. Display stand. 252,728, 8-28-79, Cl. D6-180.000.  
 Han, Paul: See—  
 Shin, Sungjae; Christensen, John; and Han, Paul, 252,769, Cl. D28-13.000.  
 Hardy, Douglas A.: See—  
 Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C., 252,753, Cl. D14-11.000.  
 Harrison, Charles A.: See—  
 Dunckel, Bruce P.; and Harrison, Charles A., 252,772, Cl. D48-23.00A.  
 Hasbro Industries, Inc.: See—  
 D'Aguzzo, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.  
 Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.  
 Henrick, John P. Golf club head. 252,771, 8-28-79, Cl. D21-219.000.  
 Hero, Franz; and Odermatt, Karl, to Interlubke Gebr. Lubke KG. Combined cabinet and shelf unit. 252,722, 8-28-79, Cl. D6-164.000.  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, to Oki Electric Co., Ltd. Telephone set. 252,752, 8-28-79, Cl. D14-53.000.  
 Holcombe, J. L., to Mizell, Emerson H. Insulation support. 252,734, 8-28-79, Cl. D8-380.000.  
 Interlubke Gebr. Lubke KG: See—  
 Hero, Franz; and Odermatt, Karl, 252,722, Cl. D6-164.000.  
 Jaramillo, Antonio M. Charm. 252,743, 8-28-79, Cl. D11-70.000.  
 Kabushiki Kaisha Sato Kenkyusho: See—  
 Sato, Yo, 252,755, Cl. D19-67.000.  
 Kaman, Mathew. Spike protection attachment for golf shoes. 252,717, 8-28-79, Cl. D2-314.000.  
 Katsuhito, Watanabe: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Lowboy cabinet. 252,721, 8-28-79, Cl. D6-160.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Triple dresser. 252,723, 8-28-79, Cl. D6-164.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Door chest. 252,724, 8-28-79, Cl. D6-164.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Lowboy deck cabinet. 252,725, 8-28-79, Cl. D6-168.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Night stand. 252,726, 8-28-79, Cl. D6-168.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Credenza. 252,727, 8-28-79, Cl. D6-172.000.  
 Korzeniewski, Robert. Combined pistol rib and sight. 252,764, 8-28-79, Cl. D28-8.000.  
 Lawrence, William J.: See—  
 Sulek, Eugene J.; and Lawrence, William J., 252,773, Cl. D18-7.000.  
 Leahy, Robert J., Jr., to Milliken Research Corporation. Display rack for carpet samples. 252,729, 8-28-79, Cl. D6-181.000.  
 Les Must de Cartier-France: See—  
 Perrin, Alain D., 252,742, Cl. D10-39.000.  
 Louis Marx & Co., Inc.: See—  
 Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,760, Cl. D21-88.000.  
 Lowe, Brian A.: See—  
 Odell, Raymond; and Lowe, Brian A., 252,767, Cl. D23-155.000.  
 Mazurosky, Rudolph. Portable combined refrigerator and range unit. 252,730, 8-28-79, Cl. D7-121.000.  
 Medor, Frank B. Skatemobile. 252,759, 8-28-79, Cl. D21-81.000.  
 Meis, William J. Combined floor anchor plate and hook. 252,733, 8-28-79, Cl. D8-367.000.  
 Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., to Louis Marx & Co., Inc. Toy glider. 252,760, 8-28-79, Cl. D21-88.000.  
 Milliken Research Corporation: See—  
 Leahy, Robert J., Jr., 252,729, Cl. D6-181.000.  
 Mizell, Emerson H.: See—  
 Holcombe, J. L., 252,734, Cl. D8-380.000.  
 Muenchinger, Charles: See—  
 D'Aguzzo, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.  
 Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.  
 Murek, Barbara A.: See—  
 Brown, David A.; Carmean, E. A., Jr.; and Murek, Barbara A., 252,740, Cl. D9-193.000.  
 National Service Industries, Inc.: See—  
 Dunckel, Bruce P.; and Harrison, Charles A., 252,772, Cl. D48-

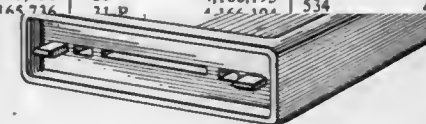
Oki Electric Co., Ltd.: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.  
 O'Neill, Daniel R.: See—  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,750, Cl. D14-10.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,751, Cl. D14-10.000.  
 Otero, Domingo V. Shelf unit. 252,719, 8-28-79, Cl. D6-153.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., to Telex Computer Products, Inc. Capstan. 252,750, 8-28-79, Cl. D14-10.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., to Telex Computer Products, Inc. Capstan. 252,751, 8-28-79, Cl. D14-10.000.  
 Parise, Carl. Electric polisher. 252,731, 8-28-79, Cl. D8-62.000.  
 Perrin, Alain D., to Les Must de Cartier-France. Watch. 252,742, 8-28-79, Cl. D10-39.000.  
 Pixyfoto GmbH: See—  
 Viering, Rudolf, 252,754, Cl. D16-44.000.  
 Prall, Lester E. Portable teaching aid. 252,758, 8-28-79, Cl. D19-62.000.  
 Price, Robert E. Key head cover. 252,732, 8-28-79, Cl. D8-347.000.  
 Reppert, Merlyn R., to W. R. Grace & Co. Automobile wire wheel. 252,748, 8-28-79, Cl. D12-205.000.  
 Retzlaff, Ronald D., to Tru-Spoke, Inc. Spoked vehicle wheel. 252,749, 8-28-79, Cl. D12-205.000.  
 Revlon, Inc.: See—  
 Hammer, Jerry, 252,728, Cl. D6-180.000.  
 Rogers, Willard W. Label dispenser. 252,756, 8-28-79, Cl. D19-67.000.  
 Ronson Corporation: See—  
 Brand, Winfried, 252,768, Cl. D27-42.000.  
 Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, to Hasbro Industries, Inc. Toy figure. 252,762, 8-28-79, Cl. D21-177.000.  
 Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Core for elongated strip. 252,755, 8-28-79, Cl. D19-67.000.  
 Scott, Chester G.: See—  
 Cox, Richard D.; and Scott, Chester G., 252,766, Cl. D23-93.000.  
 Sears Roebuck & Company: See—  
 Dunckel, Bruce P.; and Harrison, Charles A., 252,772, Cl. D48-23.00A.  
 Shin, Sungjae; Christensen, John; and Han, Paul. Hair dryer. 252,769, 8-28-79, Cl. D28-13.000.  
 Stoffel, Franz L. Coin holder or similar article. 252,775, 8-28-79, Cl. D99-34.000.  
 Sublette, Oliver T. Pen. 252,757, 8-28-79, Cl. D19-42.000.  
 Sulek, Eugene J.; and Lawrence, William J., to Texas Instruments Incorporated. Case for an electronic calculator or the like. 252,773, 8-28-79, Cl. D18-7.000.  
 Taylor, Tad. Storage cabinet or similar article. 252,718, 8-28-79, Cl. D6-5.000.  
 Taylor, Tad. Cabinet or similar article. 252,720, 8-28-79, Cl. D6-154.000.  
 Taylor, Willard H. Tie strap. 252,741, 8-28-79, Cl. D9-252.000.  
 Telex Computer Products, Inc.: See—  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,750, Cl. D14-10.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,751, Cl. D14-10.000.  
 Texas Instruments Incorporated: See—  
 Sulek, Eugene J.; and Lawrence, William J., 252,773, Cl. D18-7.000.  
 Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C., to Atari, Inc. Video game cartridge assembly. 252,753, 8-28-79, Cl. D14-11.000.  
 Tiritilli, Leonard A. Gun sight. 252,763, 8-28-79, Cl. D22-8.000.  
 Tru-Spoke, Inc.: See—  
 Retzlaff, Ronald D., 252,749, Cl. D12-205.000.  
 Tsutomu, Watanabe: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.  
 Van Koert, John P. Billiard table or the like. 252,770, 8-28-79, Cl. D21-232.000.  
 Vaughan Furniture Company, Inc.: See—  
 Keller, Huey T., 252,721, Cl. D6-160.000.  
 Keller, Huey T., 252,723, Cl. D6-164.000.  
 Keller, Huey T., 252,724, Cl. D6-164.000.  
 Keller, Huey T., 252,725, Cl. D6-168.000.  
 Keller, Huey T., 252,726, Cl. D6-168.000.  
 Keller, Huey T., 252,727, Cl. D6-172.000.  
 Vernon, John A.: See—  
 Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,760, Cl. D21-88.000.  
 Viering, Rudolf, to Pixyfoto GmbH. Transportable camera stand. 252,754, 8-28-79, Cl. D16-44.000.  
 W. R. Grace & Co.: See—  
 Reppert, Merlyn R., 252,748, Cl. D12-205.000.  
 Watanabe, Tsutomu: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.

## CLASSIFICATION OF PATENTS

ISSUED AUGUST 28, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	CLASS 52	625	4,165,648	47 Q	4,165,989	56 R	4,165,756	CLASS 179	
209.1	4,165,542	644	4,165,649	48	4,165,990	104	4,165,994	1 D	4,166,197
CLASS 4	61	700	4,165,650	63	4,165,991	CL 135	4,165,994	15 BA	4,166,198
172.12	4,165,543	704	4,165,651	210	4,165,992	1 R	4,165,757	27 CA	4,166,199
213	4,165,544		4,165,652					CLASS 180	
252 A	4,165,545		4,165,653					24.02	4,165,792
262	4,165,546		4,165,654					65 A	4,165,795
			4,165,634					65 R	4,165,794
CLASS 8	413	CLASS 74		156	4,165,698	CLASS 108		131	4,165,796
10.1	4,165,967		4,165,655	92	4,165,697	CLASS 111		233	4,165,793
148	4,165,547		4,165,656			CLASS 112			
151.1	4,165,548		4,165,657	240	4,165,699	CLASS 113			
			4,165,658	286	4,165,700	CLASS 114			
CLASS 13	228	CLASS 55	412 R			61	4,165,701		
9 R	4,166,192		4,165,659			65 R	4,165,702		
CLASS 15	14.3	CLASS 56		61	4,165,702	CLASS 115			
88	4,165,549		4,165,596	67 A	4,165,703	CLASS 116			
144 A	4,165,550		4,165,597	144 C	4,165,704	CLASS 117			
179	4,165,551		4,165,598	249	4,165,705	CLASS 118			
312 R	4,165,552		4,165,599	258	4,165,706	CLASS 119			
			4,165,600	300	4,165,707	CLASS 120			
CLASS 16	58.83	CLASS 57				92.7	4,165,766		
86 A	4,165,553		4,165,601			105	4,165,767		
114 R	4,165,554		4,165,602			140	4,165,768		
CLASS 24	296	CLASS 58				CLASS 141			
204	4,165,555		4,165,603			198	4,165,769		
CLASS 28	23 BA		4,165,604			329	4,165,770		
162	4,165,556		4,165,605			CLASS 145			
CLASS 29	46 R		4,165,606			29 R	4,165,771		
	50 R		4,165,607			52	4,165,772		
566.3	4,165,557					CLASS 148			
572	4,165,558					12 B	4,165,996		
629	4,165,559					38	4,165,997		
630 R	4,165,560					CLASS 149			
CLASS 32						109.6	4,165,773		
14 A	4,165,561					CLASS 152			
57	4,165,562					221	4,165,774		
CLASS 33						243	4,165,775		
18 R	4,165,563					381.1	4,165,776		
125 C	4,165,564					411	4,165,777		
174 R	4,165,565					CLASS 156			
174 T	4,165,566					64	4,165,998		
288	4,165,567					245	4,165,999		
CLASS 34						425	4,166,000		
10	4,165,568					CLASS 160			
15	Re.30,083					332	4,165,778		
	4,165,569					348	4,165,779		
CLASS 35						CLASS 162			
8 A	4,165,570					111	4,166,001		
CLASS 37						164 R	4,166,002		
62	4,165,571					CLASS 164			
CLASS 40						55	4,165,780		
10 D	4,165,572					181	4,165,781		
	4,165,573					CLASS 165			
21 R	4,165,574					11	4,165,782		
379	4,165,575					110	4,165,783		
452	4,165,576					CLASS 166			
CLASS 43						55.3	4,165,784		
44.8	4,165,578					274	4,165,785		
112	4,165,577					CLASS 172			
CLASS 44						43	4,165,786		
6	4,165,968					219	4,165,787		
51	4,165,969					CLASS 173			
CLASS 46						17	4,165,788		
13	4,165,579					CLASS 174			
74 R	4,165,580					28	4,166,193		
256	4,165,581					21.9	4,166,194		



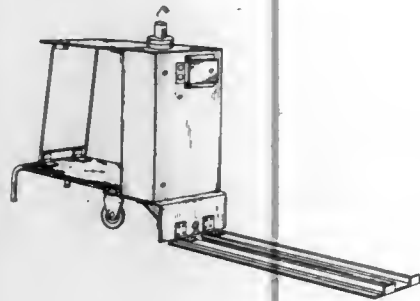


252,754

**TRANSPORTABLE CAMERA STAND**

Rudolf Vlering, Cologne, Fed. Rep. of Germany, assignor to Pixyfoto GmbH, Cologne, Fed. Rep. of Germany  
 Filed Oct. 29, 1976, Ser. No. 736,982  
 Claims priority, application Fed. Rep. of Germany, May 6, 1976, MP6129

Term of patent 14 years  
 Int. Cl. D16—05; D12—02  
 U.S. Cl. D16—44

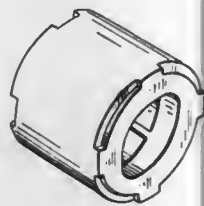


252,755

**CORE FOR ELONGATED STRIP**

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan  
 Continuation-in-part of Ser. No. 646,510, Jan. 5, 1976, abandoned. This application Aug. 17, 1976, Ser. No. 715,250  
 Claims priority, application Japan, Oct. 4, 1975, 50/39919; Nov. 14, 1975, 50/44960; Feb. 18, 1976, 51/4881; May 7, 1976, 51/16660

Term of patent 14 years  
 Int. Cl. D19—99  
 U.S. Cl. D19—67

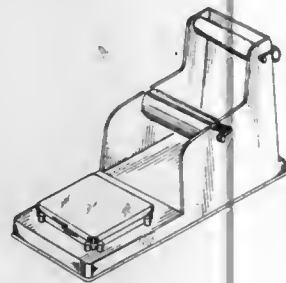


252,756

**LABEL DISPENSER**

Willard W. Rogers, 2612 N. 93rd, Omaha, Nebr. 68134  
 Filed Dec. 6, 1976, Ser. No. 748,261  
 Term of patent 14 years

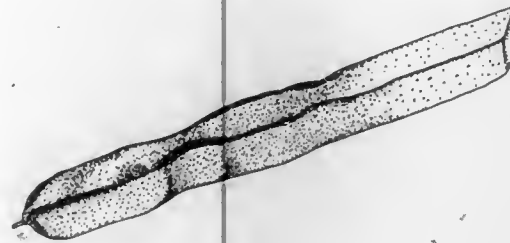
Int. Cl. D19—02  
 U.S. Cl. D19—67

252,757  
PEN

Oliver T. Sublette, 1022 Sacramento St., San Francisco, Calif. 94108

Filed Jan. 23, 1978, Ser. No. 871,416  
 Term of patent 14 years  
 Int. Cl. D19—06

U.S. Cl. D19—42



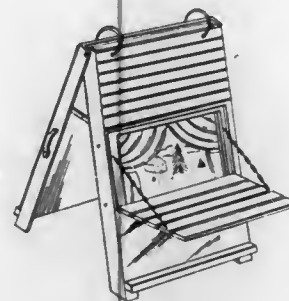
252,758

**PORTABLE TEACHING AID**

Lester E. Prall, P.O. Drawer A-1, Salt Lake City, Utah 84501  
 Filed May 2, 1977, Ser. No. 793,162

Term of patent 3 1/2 years  
 Int. Cl. D19—07

U.S. Cl. D19—62



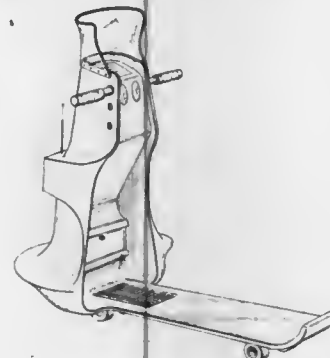
252,759

**SKATEMOBILE**

Frank B. Medor, 28 Citrus Ave., Dunedin, Fla. 33528  
 Filed Nov. 11, 1977, Ser. No. 850,710

Term of patent 14 years  
 Int. Cl. D21—01

U.S. Cl. D21—81

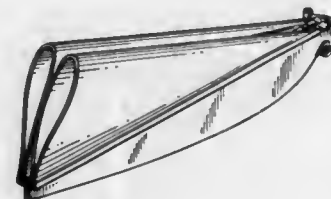


252,760

**TOY GLIDER**

Michael R. Meyers, Trumbull; John A. Vernon, Bethel, both of Conn., and Dorland L. Crosman, Glen Ridge, N.J., assignors to Louis Marx & Co., Inc., Stamford, Conn.

Filed Jul. 22, 1977, Ser. No. 818,181  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—88

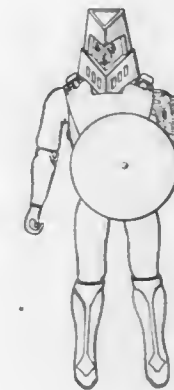


252,762

**TOY FIGURE**

Richard M. Rossi, Greenville; Carl Cederholm, Providence; Steven R. D'Aguanno, Greenville, and Charles Muenchinger, Providence, all of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Nov. 28, 1977, Ser. No. 856,032  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—177



252,763

**GUN SIGHT**

Leonard A. Tiritilli, 631 E. Norman Ave., Arcadia, Calif. 91006  
 Filed Jul. 14, 1977, Ser. No. 815,580

Term of patent 14 years  
 Int. Cl. D22—01  
 U.S. Cl. D22—8

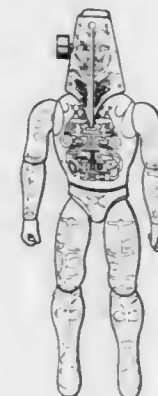


252,761

**TOY FIGURE**

Steven R. D'Aguanno, Greenville; Carl Cederholm, Providence; Fred D. Eddins, Mapleville, and Charles Muenchinger, Providence, all of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Nov. 28, 1977, Ser. No. 856,024  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—177

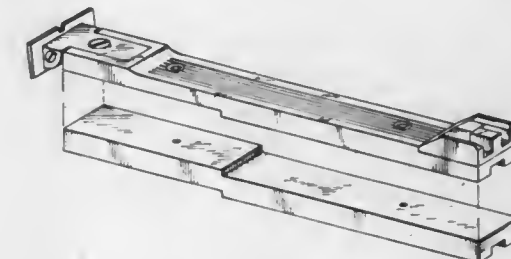


252,764

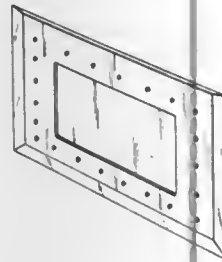
**COMBINED PISTOL RIB AND SIGHT**

Robert Korzenlewski, 115 N. Live Oak St., Carthage, Tex. 75633

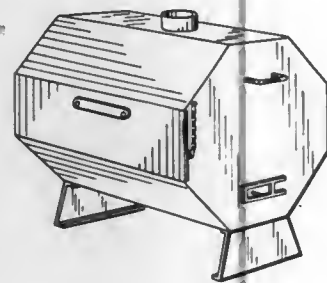
Filed Sep. 6, 1977, Ser. No. 830,896  
 Term of patent 14 years  
 Int. Cl. D22—01  
 U.S. Cl. D22—8



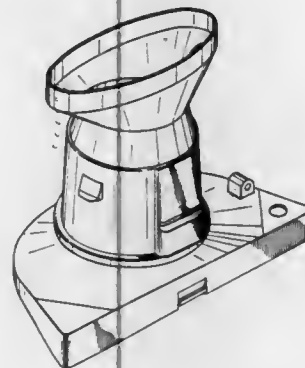
252,765  
**WATER DAM FOR A FLUSH TANK**  
 Thomas J. Ziolkowski, 475 NE. 8th Ave., Deerfield Beach, Fla. 33441  
 Filed Nov. 3, 1977, Ser. No. 848,145  
 Term of patent 14 years  
 Int. Cl. D23—02  
 U.S. Cl. D23—69



252,766  
**WOOD-BURNING HEATER AND FIREPLACE**  
 Richard D. Cox, 1006 Hilltop Dr., and Chester G. Scott, Rte. 4, both of Carrollton, Mo. 64633  
 Filed Nov. 10, 1977, Ser. No. 850,491  
 Term of patent 14 years  
 Int. Cl. D23—03  
 U.S. Cl. D23—93



252,767  
**FAN FOR ANTI-DUST HELMET**  
 Raymond Odell, 184 Mutton Ln., Potters Bar, Herts, and Brian A. Lowe, 6 Beaumont View, Appleby St., Cheshunt, Herts, both of England  
 Filed Jan. 7, 1977, Ser. No. 757,609  
 Claims priority, application South Africa, Aug. 18, 1976, 976848  
 Term of patent 14 years  
 Int. Cl. D23—04  
 U.S. Cl. D23—155



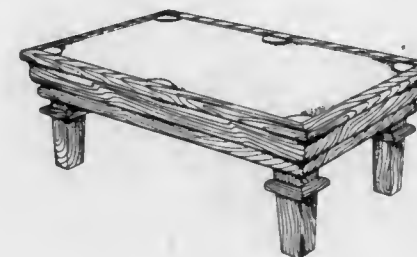
252,768  
**LIGHTER**  
 Winfried Brand, Troisdorf, Fed. Rep. of Germany, assignor to Ronson Corporation, Bridgewater, N.J.  
 Filed Apr. 25, 1978, Ser. No. 900,064  
 Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 436246  
 Term of patent 07 years  
 Int. Cl. D27—05  
 U.S. Cl. D27—42



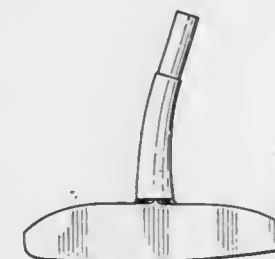
252,769  
**HAIR DRYER**  
 Sungjae Shin, 739-4 Yong Doo Dong, Seoul, Democratic Peoples Rep. of Korea; John Christensen, 28283 Tahoe Ct., Hayward, Calif. 94545, and Paul Han, 307 Dolphin Isle, Foster City, Calif. 94404  
 Filed May 2, 1977, Ser. No. 792,633  
 Term of patent 14 years  
 Int. Cl. D28—03  
 U.S. Cl. D28—13



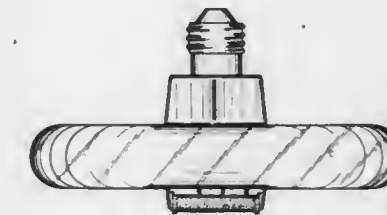
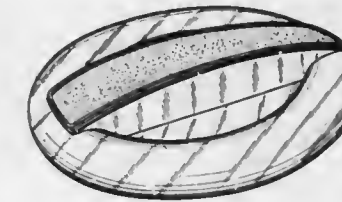
252,770  
**BILLARD TABLE OR THE LIKE**  
 John P. Van Koert, 190 E. 72nd St., New York, N.Y. 10023  
 Filed Sep. 23, 1977, Ser. No. 835,991  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D21—232



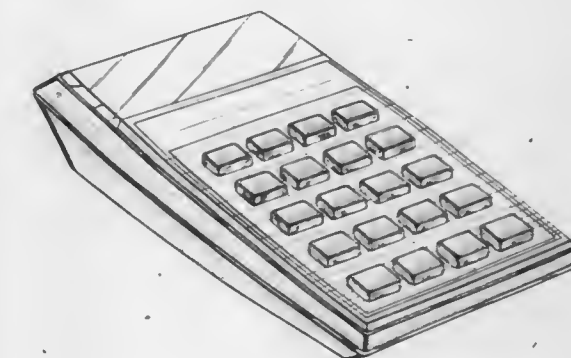
252,771  
**GOLF CLUB HEAD**  
 John P. Henrick, 96 Ambleside Dr., Brampton, Ontario, Canada (L6Y 1B9)  
 Filed Sep. 8, 1977, Ser. No. 831,627  
 Claims priority, application Canada, Aug. 25, 1977, 2508771  
 Term of patent 14 years  
 Int. Cl. D21—02  
 U.S. Cl. D21—219



252,772  
**LIGHTING FIXTURE**  
 Bruce P. Dunkel, Stone Mountain, Ga., and Charles A. Harrison, Evanston, Ill., assignors to National Service Industries, Inc. and Sears Roebuck & Company  
 Filed Mar. 6, 1978, Ser. No. 884,017  
 Term of patent 14 years  
 Int. Cl. D26—05  
 U.S. Cl. D48—23 A



252,773  
**CASE FOR AN ELECTRONIC CALCULATOR OR THE LIKE**  
 Eugene J. Sulek, and William J. Lawrence, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.  
 Filed Nov. 21, 1977, Ser. No. 853,708  
 Term of patent 14 years  
 Int. Cl. D18—01  
 U.S. Cl. D18—7

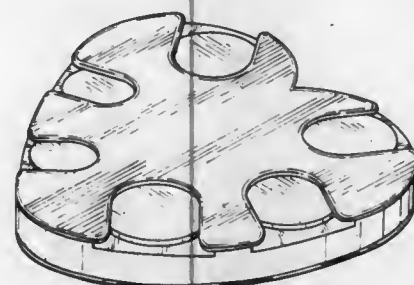




252,774  
CONTAINER FOR A GOLF BAG  
Frederick S. Gregory, 3721 Northhaven, Dallas, Tex. 75229  
Filed Feb. 18, 1977, Ser. No. 770,045  
Term of patent 14 years  
Int. Cl. D3—99  
U.S. Cl. D3—37



252,775  
COIN HOLDER OR SIMILAR ARTICLE  
Franz L. Stoffel, Tübacherstrasse, 9326 Horn, Thurgau, Switzerland  
Filed Oct. 14, 1977, Ser. No. 842,052  
Claims priority, application Switzerland, Apr. 20, 1977, 64899  
Term of patent 14 years  
Int. Cl. D3—01  
U.S. Cl. D99—34



## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A-T-O Inc.: See—  
Hohl, William A.; and Orwig, Herbert L., 4,165,792, Cl. 180-24.020.  
Abrahams, Joseph L., to Rock Fall Company Limited. Drill units for drilling and charge laying operations and method of carrying out the operations. 4,165,690, Cl. 102-22.00R.  
Abramson, Noel W.: See—  
Philipson, Alvin L.; Abramson, Noel W.; and Woltcheck, Michael J., 4,165,546, Cl. 4-262.000.  
Acar, Ali, to International Telephone and Telegraph Corporation. Latching valve. 4,165,762, Cl. 137-625.500.  
ACF Industries, Incorporated: See—  
Dugge, Richard H.; and Rollins, Dallas W., 4,165,820, Cl. 222-70.000.  
Acher, Jacques: See—  
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 4,166,060, Cl. 260-326.200.  
Acorn Engineering Co.: See—  
Morris, Earl L.; and Fields, Larry D., 4,165,857, Cl. 251-54.000.  
Adams, Jim M.; and White, Lawrence S., to Hoffmann-La Roche Inc. Manufacture of pharmaceutical dosage forms. 4,165,998, Cl. 156-64.000.  
Adams, Robert B., to Moore Products Co. Flowmeter for liquids. 4,165,639, Cl. 73-194.00B.  
Afanasyuk, Ivan N.; Grabovsky, Viktor V.; Kliot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I. Flaskless stack molding machine. 4,165,781, Cl. 164-181.000.  
Agence Nationale de Valorisation de la Recherche (ANVAR): See—  
Gibert, Henri; and Baxerres, Jean-Louis, 4,165,568, Cl. 34-10.000.  
Agfa-Gevaert AG: See—  
Fauth, Gunter; Lermann, Peter; Muller, Herbert; and Lechner, Franz, 4,165,931, Cl. 354-86.000.  
AGFA-GEVAERT N.V.: See—  
De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,166,089, Cl. 264-22.000.  
Aircro, Inc.: See—  
Chapin, John S., 4,166,018, Cl. 204-192.00R.  
Aktiebolaget Atomenergi: See—  
Andersson, Gustav S., 4,165,946, Cl. 405-259.000.  
Aktiengesellschaft Adolph Saurer: See—  
Fuchs-Viniczay, Gabriella; and Huber, Kurt, 4,166,214, Cl. 250-227.000.  
Akzona Incorporated: See—  
Beck, Heinz, 4,166,065, Cl. 260-401.000.  
Denning, David B., 4,165,743, Cl. 128-290.00R.  
Franks, Neal E.; and Drinnan, Carol L., 4,166,080, Cl. 525-183.000.  
Alev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V. Bioelectrically controlled electric stimulator of human muscles. 4,165,750, Cl. 128-422.000.  
Alford, Peter B., to El-Jay, Inc. Vibrating screen apparatus having dual function eccentric weights. 4,165,655, Cl. 74-61.000.  
Allegheny Ludlum Industries, Inc.: See—  
Southern, Raymond L., 4,165,868, Cl. 266-264.000.  
Allen, Robert J.: See—  
Petrov, Henry G.; and Allen, Robert J., 4,166,143, Cl. 427-115.000.  
Allen, Roger A.: See—  
Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,166,090, Cl. 264-25.000.  
Allied Chemical Corporation: See—  
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,165,634, Cl. 73-810.000.  
Allis-Chalmers Corporation: See—  
Marsch, James E.; and Quick, David C., 4,165,793, Cl. 180-233.000.  
Allison, Blaine H.; and Allison, Richard F., to Allison Mfg. Inc. Chain lift for auxiliary axle assembly. 4,165,884, Cl. 280-81.00R.  
Allison Mfg. Inc.: See—  
Allison, Blaine H.; and Allison, Richard F., 4,165,884, Cl. 280-81.00R.  
Allison, Richard F.: See—  
Allison, Blaine H.; and Allison, Richard F., 4,165,884, Cl. 280-81.00R.  
Amada Company, Limited: See—  
Tsutsui, Kikuo; and Sato, Masao, 4,165,663, Cl. 83-74.000.  
Amberkar, Suresh D., to Dennison Manufacturing Company. Electro-sensitive metalized label stock. 4,166,144, Cl. 428-40.000.  
American Can Company: See—  
Germontprez, Raymond L.; and Zimmerman, Paul, 4,166,044, Cl. 252-408.000.  
American Cyanamid Company: See—  
Goodman, Richard M., 4,166,040, Cl. 252-180.000.  
Goodman, Richard M., 4,166,041, Cl. 252-180.000.  
American Hoechst Corporation: See—  
Eiffand, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,119, Cl. 424-267.000.  
Eiffand, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,120, Cl. 424-267.000.  
American Hospital Supply Corporation: See—  
Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., 4,165,561, Cl. 32-14.00A.  
American Hydraulic Propulsion Systems, Inc.: See—  
Tobias, Jaromir, 4,165,677, Cl. 91-497.000.  
American Optical Corporation: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.  
American Safety Equipment Corporation: See—  
Tanaka, Akira, 4,165,844, Cl. 242-107.000.  
American Sterilizer Company: See—  
Gillis, John R.; Miraldi, Peter; and Stavers, Marius X., 4,166,096, Cl. 422-119.000.  
Amerock Corporation: See—  
Wojciechowski, Felix, 4,165,894, Cl. 292-7.000.  
Ames, Adolf: See—  
Wagner, Alfred; Ames, Adolf; and Graf, Karl, 4,165,625, Cl. 72-38.000.  
Ames-Yissum Ltd.: See—  
Wagner, Daniel B.; and Gross, Zvi, 4,166,103, Cl. 424-1.000.  
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Reynolds, Charles E.; and Hughes, Donald W., 4,166,265, Cl. 336-192.000.  
Shue, John L., Jr.; and Douty, George H., 4,165,673, Cl. 85-44.000.  
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Poole, Burnet M., 4,166,280, Cl. 358-51.000.  
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Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., 4,165,561, Cl. 32-14.00A.  
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Lewis, Herbert I.; Price, William M.; and McConnell, Anthony D., 4,165,840, Cl. 241-20.000.  
Annal, Peter R.: See—  
York, Kenneth L.; Annal, Peter R.; and Legory, John E., 4,166,211, Cl. 235-312.000.  
Anton Schwarzkopf Stahl- und Fahrzeugbau, Firma: See—  
Schwarzkopf, Anton, 4,165,695, Cl. 104-55.000.  
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- Arai, Haruhiko: See—  
Nishimura, Masaaki; and Arai, Haruhiko, 4,166,048, Cl. 252-546.000.
- Arcair Company: See—  
Rieppel, Perry; and Sadauskas, Raymond, 4,166,209, Cl. 219-70.000.
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Crow, Harold E., 4,165,882, Cl. 277-168.000.
- Armitage, William F., Jr.; and Crisman, Everett E. Fabrication of photovoltaic devices by solid phase epitaxy. 4,165,558, Cl. 29-572.000.
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Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., 4,166,205, Cl. 200-153.00G.
- Artos Engineering Company: See—  
Gudmestad, Ragnar, 4,165,768, Cl. 140-140.000.
- Asahara, Yoshiyuki, to Hoya Corporation. Faraday rotation glass. 4,165,989, Cl. 106-47.00Q.
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- Asahi Kasei Kogyo Kabushiki Kaisha: See—  
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- Asano, Masaharu, to Nissan Motor Company, Limited. Emission control apparatus for internal combustion engines with a controllably disabled clamping circuit. 4,165,719, Cl. 123-32.0EE.
- Asano, Seiji; and Ohmiya, Akio, to Fuji Photo Optical Co., Ltd. Data printing device for camera. 4,165,932, Cl. 354-106.000.
- Ashby, Richard D.: See—  
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., 4,166,290, Cl. 364-200.000.
- Ashland Oil, Inc.: See—  
Hughes, Leonard; Robinson, Kenneth R.; and Deviney, Marvin L., Jr., 4,165,969, Cl. 44-51.000.
- Associated Mills, Inc.: See—  
Rundzaitis, Alfons, 4,165,837, Cl. 239-394.000.
- Atlas Powder Company: See—  
Bowman, Arthur F.; and Camerini, Francis J., 4,165,691, Cl. 102-24.00R.
- Atturio, John M.: See—  
Valent, Philip J.; Atturio, John M.; and Rail, Robert D., 4,165,707, Cl. 114-300.000.
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- Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., to Bell Telephone Laboratories, Incorporated. Detection of ground state hydrogen and deuterium. 4,166,219, Cl. 250-423.00P.
- Austin Beech Limited: See—  
Gillespie, Peter J., 4,165,860, Cl. 251-297.000.
- Automated Building Components, Inc.: See—  
Jureit, John C.; and Kushner, Benjamin H., 4,165,672, Cl. 85-13.000.
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- B/W Controls Inc.: See—  
Bongort, Edgar A.; and Cruickshank, William T., 4,165,935, Cl. 335-207.000.
- Babiol, Pierre, to Societe Nouvelle de Bouchons Plastique. Security closure device for bottles. 4,165,813, Cl. 215-220.000.
- Bach, Nicholas J.: See—  
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- Bacoka, Josip. Pickup device for dog droppings. 4,165,895, Cl. 294-19.00R.
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- Baines, Sandra: See—  
Cosgrove, Raymond F.; and Baines, Sandra, 4,166,118, Cl. 424-258.000.
- Bakal, Abraham I.: See—  
Witzel, Frank; Clark, K. Warren; and Bakal, Abraham I., 4,166,134, Cl. 426-3.000.
- Baker, William A.; and Ketola, Warren D., to Minnesota Mining and Manufacturing Company. Tacky polymeric microspheres. 4,166,152, Cl. 428-522.000.
- Balchev, Fedor V.: See—  
Aleeve, Leonid S.; Bunin, Sergei G.; Yovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.
- Ball Corporation: See—  
Kwiatkowski, Jerome A.; and Wood, Charles L., 4,165,975, Cl. 65-29.000.
- Bangor Punta Corporation: See—  
Chica, Quentin J., 4,165,826, Cl. 224-191.000.
- Barcak, Joseph S. Fuel intake system for internal combustion engine. 4,165,720, Cl. 123-41.310.
- Barmag Barmer Maschinenfabrik AG: See—  
Schipper, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, 4,165,600, Cl. 57-58.950.
- Barnhouser, Martin, to Environmental Elements Corporation. Floating skimming apparatus. 4,166,036, Cl. 210-242.00R.
- Barry, Bill H. Odorless toilet stool. 4,165,544, Cl. 4-213.000.
- Bartholet, Stephen J., to Odetics, Inc. Method and means for measuring preloads in assembled mechanisms. 4,165,636, Cl. 73-141.00R.
- Bartley, Thomas S., to International Paper Company. Industrial building structure and method of erection. 4,165,590, Cl. 52-66.000.
- BASF Aktiengesellschaft: See—  
Fischer, Adolf, deceased, 4,165,977, Cl. 71-91.000.
- BASF Wyandotte Corporation: See—  
Lotsch, Wolfgang, 4,166,179, Cl. 544-296.000.
- Centker, Moses; Narayan, Thirumurti; and Wulff, Harald P., 4,166,164, Cl. 521-129.000.
- Bates, Homer J.: See—  
Carstens, Marion R.; and Bates, Homer J., 4,165,845, Cl. 406-192.000.
- Bauer, Robert E.; and Rayburn, Charles C., to Illinois Tool Works Inc. Electrical capacitor with a plated metallized portion and a starting portion wound about the lead wires. 4,166,285, Cl. 361-307.000.
- Baum, Bronislav A.: See—  
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- Bauman, Robert A., to Colgate Palmolive Company. Unsymmetrical oligoquaternary ammonium compounds. 4,166,073, Cl. 260-567.60P.
- Baumann, Werner; and Zirnigbl, Ulrich, to Sandoz Ltd.  $\beta$ , $\beta$ -Dicyano styrenes. 4,166,068, Cl. 260-456.00A.
- Bausch & Lomb Incorporated: See—  
Mohrman, Richard C., 4,165,924, Cl. 351-38.000.
- Baxerres, Jean-Louis: See—  
Gibert, Henri; and Baxerres, Jean-Louis, 4,165,568, Cl. 34-10.000.
- Bayer Aktiengesellschaft: See—  
Blank, Heinz U., 4,166,070, Cl. 260-543.00R.
- Brandt, Hans-Walter; Schnabel, Gunter; and Muller, Karl-Heinz, 4,165,644, Cl. 73-422.00G.
- Eckstein, Udo; and Harnisch, Horst, 4,166,176, Cl. 542-460.000.
- Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkampfer, Peter, 4,166,067, Cl. 260-453.00P.
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- Lehmann, Wolfgang; Troemel, Gerhard; Ley, Kurt; and Muller, Friedhelm, 4,166,002, Cl. 162-164.00R.
- Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,166,149, Cl. 428-339.000.
- Paulus, Wilfried; and Genth, Hermann, 4,166,122, Cl. 424-272.000.
- Schimpf, Rolf, 4,166,069, Cl. 260-509.000.
- Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spinner, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.
- Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, 4,166,186, Cl. 560-27.000.
- Bayerische Motoren Werke Aktiengesellschaft: See—  
Osswald, Bernhard, 4,165,708, Cl. 115-41.0HT.
- Bayley, James J., to Hardwood House Inc. Furniture unit. 4,165,588, Cl. 52-36.000.
- BBC Brown Boveri & Company Limited: See—  
Deck, Werner, 4,166,272, Cl. 340-146.10C.
- Beach, John R.; Sauer, L. Peter; and Haraden, William J., to Signode Corporation. Gritless seal. 4,165,943, Cl. 403-285.000.
- Beadles, Murray L.: See—  
Miller, John A.; Beadles, Murray L.; and Drummond, Roger O., 4,166,107, Cl. 424-19.000.
- Beck, Heinz, to Akzona Incorporated. Process for the preparation of perfluoroalkane sulfonamides. 4,166,065, Cl. 260-401.000.
- Beck, Willi K., to King-Seely Thermos Co. Controller switch assembly. 4,166,268, Cl. 337-309.000.
- Becker, Bernard B.: See—  
Friedman, Yizhak; and Becker, Bernard B., 4,165,951, Cl. 417-26.000.
- Becker, Joseph, Jr., to Koppers Company, Inc. Apparatus for catching coke oven spillage. 4,166,007, Cl. 202-262.000.
- Becker, Paul: See—  
Rudolph, Paul; and Becker, Paul, 4,165,970, Cl. 48-73.000.
- Becton, Dickinson and Company: See—  
Johnson, Lavell R., 4,166,102, Cl. 424-1.000.
- Bednar, Jiri, to Povazske strojarne, narodni podnik. Multistage automatic transmission. 4,165,657, Cl. 74-329.000.
- Beebe, Edwin V., to Du Pont de Nemours & E. I., and Company. Production of plexifilament strands. 4,166,091, Cl. 264-205.000.
- Behrens, Jack D., to Bunker Ramo Corporation. Alignment pin installation tool. 4,165,660, Cl. 81-55.000.
- Behringwerke Aktiengesellschaft: See—  
Sedlacek, Hans-Harald; Johannsen, Roloff; and Seiler, Friedrich-Robert, 4,166,106, Cl. 424-12.000.
- Belcher, Richard A.; and Kozacka, Frederick J., to Gould Inc. Electric fuse having heat retaining means. 4,166,267, Cl. 337-163.000.
- Belcher, Richard A.: See—  
Kozacka, Frederick J.; and Belcher, Richard A., 4,166,266, Cl. 337-158.000.

- Belinkoff, Irving R., to Kidde Consumer Durables, Corp. Electrical water heater and dispenser. 4,165,681, Cl. 99-280.000.
- Belipar SA: See—  
Engeler, Walter, 4,165,780, Cl. 164-55.000.
- Bell Telephone Laboratories, Incorporated: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 250-423.00P.
- Bjorklund, Gary C., 4,166,254, Cl. 331-94.50C.
- Dragone, Corrado, 4,166,276, Cl. 343-781.00P.
- Reudink, Douglas O.; and Yeh, Yu S., 4,166,274, Cl. 343-100.0SA.
- Bendell, Sidney L.: See—  
Dischert, Robert A.; and Bendell, Sidney L., 4,166,281, Cl. 358-219.000.
- Bendix Corporation, The: See—  
Weissler, Harold E., II, 4,165,650, Cl. 73-700.000.
- Benjamin, Louis: See—  
Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,166,185, Cl. 548-324.000.
- Bennett, Charles E., to Motorola, Inc. Heat energized vapor adsorbent pump. 4,165,952, Cl. 417-207.000.
- Bennett, Stephen A. Leveling device for camper trailers and like vehicles. 4,165,862, Cl. 254-88.000.
- Bentz, Francis: See—  
Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, 4,166,186, Cl. 560-27.000.
- Beppu, Norio: See—  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.
- Berger, Abe: See—  
Bossert, Emily C.; Silverstein, Irwin B.; and Berger, Abe, 4,166,053, Cl. 260-18.00S.
- Berliner, Steven D.: See—  
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., 4,166,290, Cl. 364-200.000.
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- Bernard, Jean-Rene; Turlier, Pierre; and Bousquet, Jacques, to Societe Nationale Elf Aquitaine. Method of production of ethane by selective hydrogenolysis of alkane. 4,166,077, Cl. 585-310.000.
- Bernard, Vincent E., to Jimmy Dean Meat Company, Inc. The. Portion controlled frozen food dispenser with pump control. 4,165,818, Cl. 222-53.000.
- Bernardelli, William J.; and Brandon, Fred Y., to International Business Machines Corporation. Backup roll cleaning system for a heated roll fuser. 4,165,965, Cl. 432-75.000.
- Bernhardson, Gary E. Cross country ski binding. 4,165,888, Cl. 280-615.000.
- Bernhoff, Gerald W.; and Limbach, Thomas J., to Koehring Company. Control apparatus for a plurality of simultaneously actuable fluid motors. 4,165,613, Cl. 60-420.000.
- Besenbruch, Alex; and Krause, Franz, to Besenbruch-Hofmann of Puerto Rico, Inc. Work holder assembly for lathe used in dressing cylindrical and disc shaped articles. 4,165,662, Cl. 82-4.00A.
- Besenbruch-Hofmann of Puerto Rico, Inc.: See—  
Besenbruch, Alex; and Krause, Franz, 4,165,662, Cl. 82-4.00A.
- Bhattacharyya, Ajay; and Weiss, Ernst H. G., to Westinghouse Electric Corp. Nuclear core and a reflector assembly therefor. 4,166,003, Cl. 176-61.000.
- Bianchi, Frank J.; and Poulson, Russell H., to Ford Motor Company. Sample and hold frequency to voltage converter circuit. 4,166,248, Cl. 328-140.000.
- Bicho, Joseph G.: See—  
Dunning, Charles E.; Lloyd, William D.; and Bicho, Joseph G., 4,166,001, Cl. 162-111.000.
- Bicht, John R.: See—  
Warner, Peter S.; and Bicht, John R., 4,165,794, Cl. 180-65.00R.
- Bigelow-Sanford, Inc.: See—  
Parlin, David B.; and Vits, Helmuth, 4,165,547, Cl. 8-148.000.
- Biggs, David F.: See—  
Coutts, Ronald T.; Biggs, David F.; Wandellmaier, Frank W.; and Semaka, Frank D., 4,166,116, Cl. 424-250.000.
- Billings Energy Corporation: See—  
Mackay, Donald B., 4,165,569, Cl. 34-15.000.
- Bilskadecenter I Stockholm AB: See—  
Olsson, Conny E., 4,165,567, Cl. 33-288.000.
- Binner, Tihamer S. Control system for dual-motor drive. 4,166,238, Cl. 318-67.000.
- Bizzarri, Alfredo. Rotary thrust device including axially elongated rotor rotatable in casting having elongated fluid intake and discharge slots. 4,165,848, Cl. 244-12.200.
- Bjorklund, Gary C., to Bell Telephone Laboratories, Incorporated. Switched diffraction grating. 4,166,254, Cl. 331-94.50C.
- Bjorklund, Gary C.: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 250-423.00P.
- Black Clawson Company, The: See—  
Weber, Arnulf E. M., 4,166,028, Cl. 209-273.000.
- Blackwelders: See—  
Schmidt, Lewis W., 4,165,897, Cl. 296-56.000.
- Blanco, Jose A.: See—  
Davies, Haydn; Blanco, Jose A.; and O'Neill, Charles E., 4,165,979, Cl. 75-23.000.
- Blank, Heinz U., to Bayer Aktiengesellschaft. Process for the preparation of sulfonic acid chlorides. 4,166,070, Cl. 260-543.00R.
- Blankenship, Roy L. Cable directing apparatus. 4,165,592, Cl. 52-220.000.
- Blessum, Norman S.: See—  
Ragle, Herbert U.; and Blessum, Norman S., 4,166,282, Cl. 360-77.000.
- Block Engineering, Inc.: See—  
Hirschfeld, Tomas, 4,166,105, Cl. 424-8.000.
- Bloom, Melvin S.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukeinen, Joseph Y., 4,165,984, Cl. 96-1.0PE.
- Blumenfeld, Georg; and Riegger, Paul, to Dynamit Nobel Aktiengesellschaft. Method of preparing xylenes chlorinated in the nucleus. 4,166,075, Cl. 260-650.00R.
- Bluzer, Nathan, to Westinghouse Electric Corp. Dual field effect transistor structure for compensating effects of threshold voltage. 4,166,223, Cl. 307-221.00D.
- Bocharov, Jury N.: See—  
Nemetkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B., deceased; and Chervoneva, Ljudmila A., administratrix, 4,166,025, Cl. 208-126.000.
- Bodine, Albert G. Method and apparatus for sonically dehydrating precipitate. 4,166,034, Cl. 210-67.000.
- Boeing Company, The: See—  
Rudolph, Peter K. C., 4,165,609, Cl. 60-262.000.
- Woods, Weightstill W.; and Eul, William A., 4,166,244, Cl. 324-65.00R.
- Young, Manley A., 4,165,810, Cl. 414-595.000.
- Boinet, Abel; Mondell, Lucien; and Montay, Jean-Louis, to Elf-Union. Instrument for the continuous measurement of viscosity, especially of bitumens. 4,165,631, Cl. 73-54.000.
- Boissonnault, John G. Encapsulated planar chip capacitor. 4,166,286, Cl. 361-433.000.
- Bolin, Philip C., to Westinghouse Electric Corp. Gas-insulated bushing with self-adjusting bushing flange seal. 4,166,194, Cl. 174-31.00R.
- Bongort, Edgar A.; and Cruickshank, William T., to B/W Controls Inc. Differential float control. 4,165,935, Cl. 335-207.000.
- Boots Company Limited, The: See—  
Kerry, John C.; and Weighton, David M., 4,166,130, Cl. 424-326.000.
- Borelli, Ronald F.; and Lakhani, Kishor M., to Honeywell Information Systems, Inc. Two-sided non-impact printing system. 4,165,686, Cl. 101-1.000.
- Borekov, Georgy K.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.
- Boshold, Raymond F., to Wean United, Inc. Method and apparatus for closing the end of an extruded tube submerged in water. 4,165,627, Cl. 72-48.000.
- Bossert, Emily C.; Silverstein, Irwin B.; and Berger, Abe, to M & T Chemicals Inc. Process for the manufacture of non-reverting elastomeric organopolysiloxanes. 4,166,053, Cl. 260-18.00S.
- Bott, John A. Vehicle article carrier. 4,165,827, Cl. 224-326.000.
- Bourne, Alan A.; and Knapton, Arthur G., to Johnson, Matthey & Co., Limited. Jewelry alloys. 4,165,983, Cl. 75-172.00R.
- Bourns, Inc.: See—  
Brown, Milton R., Jr., 4,165,622, Cl. 64-4.000.
- Bousquet, Jacques: See—  
Bernard, Jean-Rene; Turlier, Pierre; and Bousquet, Jacques, 4,166,077, Cl. 585-310.000.
- Bowden, Wade R., Jr.; and Lewis, Walter C., to Slater Electric Inc. Adjustably lockable bar hanger for ceiling boxes and the like. 4,165,851, Cl. 248-57.000.
- Bowditch, Hoel L.: See—  
Olsen, Everett O.; La Croix, James R.; and Bowditch, Hoel L., 4,165,651, Cl. 73-704.000.
- Bowen, Robert F.: See—  
Mariel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.
- Bowman, Arthur F.; and Camerini, Francis J., to Atlas Powder Company. Delay detonator and its use with explosive packaged boosters and cartridges. 4,165,691, Cl. 102-24.00R.
- Boxer, Robert K.: See—  
Boxer, Rubin; and Boxer, Robert K., 4,165,555, Cl. 24-204.000.
- Boxer, Rubin; and Boxer, Robert K. Hook-and-pile strips for socks and the like. 4,165,555, Cl. 24-204.000.
- Boyne, Ralph A.: See—  
Cottingham, Richard L.; and Boyne, Ralph A., 4,165,587, Cl. 51-428.000.
- Brachthausen, Karl-Heinz: See—  
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- Brandt, Richard F. Mounting bracket for solar heat collector. 4,165,853, Cl. 248-237.000.
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- Braun, Martin, to Machlett Laboratories, Inc., The. Transverse beam X-ray tube. 4,166,231, Cl. 313-60.000.
- Brawner, William H.; and Umphries, James O., to H.P.G. IV, Inc. Retractable leash. 4,165,713, Cl. 119-109.000.
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- Bridgestone Tire Company Limited: See—  
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- Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., to W. A. Whitney Corp. Punch press with workpiece supporting means. 4,165,667, Cl. 83-409.000.
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- Brown, John W., to Qantix Corporation. Echo reduction improvement in a front face glare reduction overlay. 4,165,920, Cl. 350-276.00R.
- Brown, Milton R., Jr., to Bourns, Inc. Releasable locking and sealing assembly. 4,165,622, Cl. 64-4.000.
- Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., to Strippit Division, Houdaille Industries, Inc. Modular turret punch press. 4,165,669, Cl. 83-552.000.
- Brown, Robert; and Setloff, Jerome. Styptic composition. 4,166,108, Cl. 424-28.000.
- Bruckner Apparaturbau GmbH: See—  
Schuierer, Manfred, 4,165,548, Cl. 8-151.100.
- Brüker-Medizintechnik GmbH: See—  
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- Buck, Ronald G., to Litton Systems, Inc. Method of determining the optimum time to turn meats in a microwave oven. 4,166,137, Cl. 426-243.000.
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- Budzych, Tadeusz. Load responsive fluid control valves. 4,165,761, Cl. 137-596.130.
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- Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, to Société d'Etudes Scientifiques et Industrielles de l'Île-de-France. Process for producing enamines. 4,166,060, Cl. 260-326.200.
- Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-16-phenyl-5,6-didehydro-PGF<sub>2</sub> or 4,4,5,5-tetrahydro-PGF<sub>1</sub> compounds. 4,166,187, Cl. 560-55.000.
- Bunger, Gustav: See—  
Schmidt, Conrad; Bunker, Gustav; and Weiss, Paul, 4,166,193, Cl. 174-28.000.
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- Bunker Ramo Corporation: See—  
Anderson, Norman R., 4,165,910, Cl. 339-89.00M.
- Behrens, Jack D., 4,165,660, Cl. 81-59.000.
- Bunn, Thomas C., Jr. Controlled excursion ski binding with safety release. 4,165,887, Cl. 280-613.000.
- Bunnenberg, Claus; and Kuhn, Wilhelm, to Gesellschaft für Strahlen- und Umweltforschung mbH München. Apparatus for continuously measuring quantitative changes in moisture condensation at a surface. 4,166,217, Cl. 250-308.000.
- Burg, Donald E. Air ride boat hull. 4,165,703, Cl. 114-67.00A.
- Burgin, Kermil H. Plastic forceps. 4,165,746, Cl. 128-321.000.
- Burke, Frederick A., to Stanley Home Products, Inc. Mop holder having a universal handle connection. 4,165,550, Cl. 15-144.00A.
- Burke, Harry D., to Whirlpool Corporation. Microwave generating device—door seal. 4,166,207, Cl. 219-10.55D.
- Burkhardt, Horst, to Dr. Johannes Heidenhain GmbH. Encapsulated measuring device. 4,165,564, Cl. 33-125.00C.
- Burroughs Corporation: See—  
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- C. Keller GmbH u. Co. KG.: See—  
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- Cacciola, Charles T., to Centronics Data Computer Corp. Free flight head assembly for dot matrix printers and the like. 4,165,940, Cl. 400-124.000.
- Cady, Percy L.: See—  
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- Cahn, Maurice S. Slidable cap. 4,165,670, Cl. 84-318.000.
- Calspan Corporation: See—  
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- Camerini, Francis J.: See—  
Bowman, Arthur F.; and Camerini, Francis J., 4,165,691, Cl. 102-24.00R.
- Campbell, Donald H.: See—  
Quinn, Edward J.; and Campbell, Donald H., 4,166,012, Cl. 204-30.000.
- Canadian Patents and Development Limited: See—  
Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., 4,166,116, Cl. 424-250.000.
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Sunouchi, Akio; and Watanabe, Yoshiaki, 4,165,933, Cl. 354-106.000.
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Shupe, Charles A., 4,166,291, Cl. 364-560.000.
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Lugstenmann, Curt A., deceased; and Capdevilla nee Lugstenmann, Franziska S., heir, 4,166,011, Cl. 204-4.000.
- Cardarelli, Nathan F., to Environmental Chemicals, Inc. Method and composition for the long term controlled release of a non-persistent organotin pesticide from an inert monolithic thermoplastic material. 4,166,111, Cl. 424-78.000.
- Carstens, Marion R.; and Bates, Homer J., to Georgia Tech Research Institute. Method and apparatus for processing vehicles moving through a conduit by air. 4,165,845, Cl. 406-192.000.
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- Cassai, Gino H. Adjustable mascara wand. 4,165,755, Cl. 132-88.700.
- Caterpillar Tractor Co.: See—  
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- Catotti, Arthur J.: See—  
Pensabene, Saverio F.; and Catotti, Arthur J., 4,166,010, Cl. 204-2.100.
- Cayton, David W., to Bud Antle, Inc. Palletizing system for produce cartons and the like. 4,165,806, Cl. 206-386.000.
- Cegles, William P.: See—  
Fedorowicz, Richard J.; and Cegles, William P., 4,165,607, Cl. 58-50.00R.
- Cenker, Moses; Narayan, Thirumurti; and Wulff, Harald P., to BASF Wyandotte Corporation. Process for the preparation of carbodiimide-isocyanurate foams. 4,166,164, Cl. 521-129.000.
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Paulus, Philippe A., 4,165,996, Cl. 148-12.00B.
- Centronics Data Computer Corp.: See—  
Cacciola, Charles T., 4,165,940, Cl. 400-124.000.
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- Chang, Pei K., to Stauffer Chemical Company. Process cheese containing a modified whey solids. 4,166,142, Cl. 426-582.000.
- Chao, Kwei C.; and Ridgway, John A., to Standard Oil Company (Indiana). Method for modifying the flavor of yeast. 4,166,135, Cl. 426-60.000.
- Chapa, Arturo. Foot massaging device. 4,165,737, Cl. 128-24.300.
- Chapin, John S., to Airco, Inc. Sputtering process and apparatus. 4,166,018, Cl. 204-192.00R.
- Chase, Herbert S. Toy fashion display mechanism. 4,165,579, Cl. 46-13.000.

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Wengenroth, Hans E.; and Mrusek, Wilfried, 4,165,817, Cl. 220-256.000.
- Chen, James L.: See—  
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,166,051, Cl. 260-17.4CL.
- Chen, Thomas Y. C. Method and apparatus for feeding condensate to a high pressure vapor generator. 4,165,718, Cl. 122-451.00R.
- Cherny, Ilya R.: See—  
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- Chervoneva, Ljudmila A., administratrix: See—  
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- Chianelli, Russell R.; Jacobson, Allan J.; and Whittingham, M. Stanley, to Exxon Research & Engineering Co. Cells having cathodes derived from ammonium-molybdenum-chalcogen compounds. 4,166,160, Cl. 429-218.000.
- Chica, Quentin J., to Bangor Punta Corporation. Pop-up holster. 4,165,852, Cl. 224-191.000.
- Chiyoda Chemical Engineering & Construction Co., Ltd.: See—  
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,166,026, Cl. 208-210.000.
- Chrysler Corporation: See—  
Helmer, Harry W., Jr., 4,165,726, Cl. 123-146.50A.
- Chu, Nori Y. C.: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.
- Chugai Seiyaku Kabushiki Kaisha: See—  
Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, 4,166,174, Cl. 542-401.000.
- Chukhanov, Zinoviy F.; Tsuprov, Sergei A.; and Apter, Danil M., to Gosudarstvenny Nauchnoissledovatel'skiy Energeticheskiy Institut Imeni G.M. Krzhizhanovskogo. Arrangement for pipeline transportation of cargoes. 4,165,696, Cl. 104-147.00R.
- Ciba-Geigy Corporation: See—  
Rosen, Melvin H., 4,166,126, Cl. 424-274.000.
- Cielo, Paolo; and Westwood, William D., to Northern Telecom Limited. Electrostatic ink ejection printing head. 4,166,277, Cl. 346-140.00R.
- Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., to E. R. Squibb & Sons, Inc. Ostomy composition. 4,166,051, Cl. 260-17.4CL.
- Citizen Watch Co., Ltd.: See—  
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,165,604, Cl. 58-23.0BA.
- Clark, K. Warren: See—  
Witzel, Frank; Clark, K. Warren; and Bakal, Abraham I., 4,166,134, Cl. 426-3.000.
- Clatworthy, Edward F.: See—  
Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,165,997, Cl. 148-38.000.
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Neel, Emmanuel E. A.; Deflin, Michel; Vanrenterghem, Jacques; and Clement, Jean-Claude, 4,166,101, Cl. 423-656.000.
- Cline-Buckner, Inc.: See—  
Cline, Lee S.; and John, Philip J., 4,166,087, Cl. 261-96.000.
- Cline, Lee S.; and John, Philip J., to Cline-Buckner, Inc. Automatic intermittent vapor dispenser. 4,166,087, Cl. 261-96.000.
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- Cobbs, James H. Mine enhanced hydrocarbon recovery technique. 4,165,903, Cl. 299-2.000.
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Bauman, Robert A., 4,166,073, Cl. 260-567.60P.
- Collin, Per H.: See—  
Reh, Lothar; Hirsch, Martin; Collin, Per H.; and Flink, Sune N., 4,165,717, Cl. 122-4.00D.
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- Collins, Joseph C., to Sterling Drug Inc. Dialkylaminophenylethyl (or vinyl) cyclopropyl carbinols. 4,166,074, Cl. 260-574.000.
- Colton, Martin S.: See—  
Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.
- Columbia Ribbon and Carbon Manufacturing Co., Inc.: See—  
Page, Kenneth J.; and Scott, Michael A., 4,165,988, Cl. 106-23.000.
- Columbus McKinnon Corporation: See—  
Schreyer, Kenneth D., 4,165,863, Cl. 254-168.000.
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Wennerstrom, Edward A.; Brown, James S., Sr.; and Milligan, William E., 4,165,549, Cl. 15-88.000.
- Comerco, Inc.: See—  
Chervoneva, Robert A., 4,165,852, Cl. 248-225.200.
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Despois, Jacques; and Nougarede, Francis, 4,165,945, Cl. 405-55.000.
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Durand, Pierre, 4,166,154, Cl. 429-17.000.
- Compagnie Industrielle de Mecanismes: See—  
Meyer, Jean-Claude, 4,165,583, Cl. 49-349.000.
- Concast AG: See—  
Engeler, Walter, 4,165,780, Cl. 164-55.000.
- Connell, Talbert D., to Crutcher Resources Corporation. Back-up pad for welding. 4,165,831, Cl. 228-50.000.
- Coombe, Robert D., to Rockwell International Corporation. Method for producing electronically excited nitrogen fluoride. 4,165,773, Cl. 149-109.600.
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- Corbic, Yves J., to Societe dite: Gatrun Anstalt. Packaging of a product in a sterile medium. 4,165,594, Cl. 53-453.000.
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Amos, Lynn G., 4,165,954, Cl. 417-477.000.
- Hertl, William; and Ramsey, William S., 4,166,006, Cl. 435-244.000.
- Cosgrove, Raymond F.; and Baines, Sandra, to E. R. Squibb & Sons, Inc. Use of chlorhydroxyquinoline to inhibit growth of mycoplasmas. 4,166,118, Cl. 424-258.000.
- Cottingham, Richard L.; and Boyne, Ralph A., to Thormack Engineering Limited. Grit blasting apparatus. 4,165,587, Cl. 51-428.000.
- Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., to Canadian Patents and Development Limited. Pharmaceutical compositions containing piperazinyl acylhydroxamic acid derivatives to treat inflammation or anaphylactic allergy conditions. 4,166,116, Cl. 424-250.000.
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- Cramer Industries, Inc.: See—  
Duly, Michael J., 4,165,854, Cl. 248-408.000.
- Crane, Alfred, Jr. Pedestrian street and road crossing trainer and method. 4,165,570, Cl. 35-8.00A.
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Maculaitis, Vytautas K.; and Dhanani, Rasikant R., 4,165,859, Cl. 251-173.000.
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- Crisman, Everett E.: See—  
Armitage, William F., Jr.; and Crisman, Everett E., 4,165,558, Cl. 29-572.000.
- Crompton & Knowles Corporation: See—  
Feeman, James F., 4,166,059, Cl. 260-186.000.
- Crow, Harold E., to Armco Steel Corporation. Sealing means for slide gate. 4,165,882, Cl. 277-168.000.
- Crowley, John C., Jr. Rodeo device. 4,165,712, Cl. 119-29.000.
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Bongort, Edgar A.; and Cruikshank, William T., 4,165,935, Cl. 335-207.000.
- Crutcher Resources Corporation: See—  
Connell, Talbert D., 4,165,831, Cl. 228-50.000.
- Cryder, John R.; and Hall, Lowell R., to Caterpillar Tractor Co. Load check valve cylinder mounted. 4,165,675, Cl. 91-420.000.
- Cubberly, Walter E., Jr., to Schlumberger Technology Corporation. Methods and apparatus for determining dynamic flow characteristics of production fluids in a well bore. 4,166,216, Cl. 250-260.000.
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Hough, Walter J., 4,165,763, Cl. 137-625.410.
- Curati, Marino, Jr., to True Temper Corporation. Impact tool having a pre-formed fiberglass handle. 4,165,771, Cl. 145-29.00R.
- Czekalski, Martin W.: See—  
Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., 4,166,289, Cl. 364-200.000.
- Czernik, Roman: See—  
Froehlich, John A.; Czernik, Roman; and Fisher, Chester G., III, 4,166,094, Cl. 422-64.000.
- Daido Tokushuko Kabushiki Kaisha: See—  
Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.
- Dainichi-Nippon Cables, Ltd.: See—  
Takemori, Hayashi, 4,166,057, Cl. 260-33.6PQ.
- D'Alelio, Gaetano F., to Plastics Engineering Company. Polymerization products of acetylene-terminated polyimide derivatives. 4,166,168, Cl. 526-259.000.
- Dammann, Peter: See—  
Schippers, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, 4,165,600, Cl. 57-58.950.
- Daniels, Kenneth M. Read/write head-positioning apparatus. 4,166,284, Cl. 360-106.000.
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Tupper, Willis E., 4,165,816, Cl. 220-203.000.
- Davies, Haydn; Blanco, Jose A.; and O'Neill, Charles E., to International Nickel Company, Inc., The. Flash smelting in confined space. 4,165,979, Cl. 75-23.000.
- De La Rue Crossfield Limited: See—  
Lewis, John B.; and Winchester, Roy E., 4,166,030, Cl. 209-534.000.
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- Dearling, Harry S. Combined fragrance dispenser and humidifier. 4,165,835, Cl. 239-51.500.



- De Bose, Errol A. Percussion instrument. 4,165,671, Cl. 84-402.000.  
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 Dechavanne, Jacques. Apparatus for injection-moulding several moulding materials onto one another. 4,165,959, Cl. 425-130.000.  
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 Deere & Company: See—  
 Dobberpuhl, Dale R., 4,165,786, Cl. 172-43.000.  
 Lane, Lloyd L., 4,165,953, Cl. 417-350.000.  
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 Neel, Emmanuel E. A.; Deflin, Michel; Vanrenterghem, Jacques; and Clement, Jean-Claude, 4,166,101, Cl. 423-656.000.  
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 DeGeorge, Robert P.: See—  
 Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.  
 Delorme, Jean J.: See—  
 Moll, Manfred; Delorme, Jean J.; and Weber, Jean C., 4,165,643, Cl. 73-421.00B.  
 Demoute, Jean-Pierre: See—  
 Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,166,063, Cl. 260-343.30R.  
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 Dennison Manufacturing Company: See—  
 Amberkar, Suresh D., 4,166,144, Cl. 428-40.000.  
 Denver Instrument Company: See—  
 Smith, James E., 4,165,791, Cl. 177-212.000.  
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 Desma-Werke GmbH: See—  
 Malburg, Anton; and Koch, Friedrich, 4,165,958, Cl. 425-119.000.  
 De Smedt, Felix F.: See—  
 De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,166,089, Cl. 264-22.000.  
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 Desso, Jerome A.: See—  
 Yeager, Marvin L.; and Desso, Jerome A., 4,165,909, Cl. 339-75.0MP.  
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 Detroit Coil Company: See—  
 Jencks, Hollis W.; and Jencks, David C., 4,166,262, Cl. 335-251.000.  
 Deviney, Marvin L., Jr.: See—  
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 Dexon-Corning International Limited: See—  
 Sunasky, Joseph, 4,165,944, Cl. 403-254.000.  
 DeYoung, Richard E. Apparatus for cutting cans. 4,165,664, Cl. 83-188.000.  
 Dhanani, Rasikant R.: See—  
 Maculaitis, Vytautas K.; and Dhanani, Rasikant R., 4,165,859, Cl. 251-173.000.  
 Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof to treat pain, fever and inflammation. 4,166,133, Cl. 424-346.000.  
 Diamond Power Specialty Corporation: See—  
 Johnston, Jesse C., Jr., 4,165,552, Cl. 15-312.00R.  
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 Dick, Perry J., Jr., to Trumbull Corporation. Process and apparatus for applying and compacting castable material in strips on a sloped surface. 4,165,617, Cl. 405-17.000.  
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 Nakayama, Kenji; and Uchida, Kazuo, 4,165,838, Cl. 239-533.300.  
 Diesinger, Walter; and Eickmann, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Sensor for rocket engines. 4,165,608, Cl. 60-245.000.  
 Digital Marine Electronics Corporation: See—  
 Michaels, Sheldon B.; Philbrick, Otis; and Morris, Jeffrey, 4,166,275, Cl. 343-103.000.  
 Di Pasqua, Joseph. Hair-frosting cap. 4,165,754, Cl. 132-9.000.  
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 Diversified Technology, Inc.: See—  
 Riley, Robert E., Jr.; and McArthur, Barrie, 4,166,273, Cl. 340-539.000.  
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 Bermant, Michael A., 4,165,747, Cl. 128-334.00C.  
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 Cooper, Frank W.; and Dixon, Arthur B., Jr., 4,165,908, Cl. 312-111.000.  
 Dobberpuhl, Dale R., to Deere & Company. Walk-behind tiller and handle mounting therefor. 4,165,786, Cl. 172-43.000.  
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 Doherty, Norman R.; and Doherty, Richard F. Device for spring-loading a needleless inoculator. 4,165,800, Cl. 185-39.000.  
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 Douce, Donald R. Earthquake responsive valve. 4,165,758, Cl. 137-38.000.  
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 Cloutier, Michel; Doucet, Yves; Jutras, Gilles; and Gagne, Pierre, 4,165,565, Cl. 33-174.00T.  
 Douma, William L.: See—  
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 Doyle, Walter M., to Laser Precision Corporation. Refractively scanned interferometer. 4,165,938, Cl. 356-346.000.  
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 Draper, George C. Exercising parallel bar. 4,165,873, Cl. 272-63.000.  
 Dresser Industries, Inc.: See—  
 Smith, Charles G.; Parker, Kenneth R.; and Wyatt, John G., 4,165,680, Cl. 98-115.00R.  
 Drinnan, Carol L.: See—  
 Franks, Neal E.; and Drinnan, Carol L., 4,166,080, Cl. 525-183.000.  
 Drummond, Roger O.: See—  
 Miller, John A.; Beades, Murray L.; and Drummond, Roger O., 4,166,107, Cl. 424-19.000.  
 Druzhinin, Ivan P.: See—  
 Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
 Dubreucq, Jean-Claude, to Regie Autonome des Transports Parisiens; and Inter-Elec. Safety device for a transport system. 4,165,850, Cl. 246-182.00B.  
 Duderstadt, Gunter: See—  
 Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.  
 Dufauré, Pierre: See—  
 Jacquet, Bernard; Papantonios, Christos; Dufauré, Pierre; and Mahieu, Claude, 4,166,109, Cl. 424-59.000.  
 Dufort, Robert H., to Calspan Corporation. Frangible projectile for gunnery practice. 4,165,692, Cl. 102-92.700.  
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 Duncan, Norman B. Composition for coating charcoal briquettes. 4,165,968, Cl. 44-6.000.  
 Duncan, Richard A. Apparatus and method for simultaneously cutting two rows of cane and piling four rows of cut cane on two rows. 4,165,596, Cl. 56-14.300.  
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 DiBella, Eugene P.; Dunkel, Morris; and Gould, Henry, 4,166,163, Cl. 521-116.000.  
 Dunlop Limited: See—  
 Lawson, Neil, 4,166,000, Cl. 156-425.000.  
 Marvy, Jean-Francois, 4,165,776, Cl. 152-381.100.  
 Dunning, Charles E.; Lloyd, William D.; and Bicho, Joseph G., to Kimberly-Clark Corporation. Multiple layer formation process for creped tissue. 4,166,001, Cl. 162-111.000.  
 Du Pont de Nemours, E. I., and Company: See—  
 Beebe, Edwin V., 4,166,091, Cl. 264-205.000.  
 Durand, Pierre, to Compagnie Generale des Etablissements Michelin. Process permitting the introduction of particles into the liquid of a chemical and/or electrochemical reactor. 4,166,154, Cl. 429-17.000.  
 Dutton, Edward E.; and Gorbey, Jack, to Sea-Pac, Inc. Method of canning fish. 4,166,140, Cl. 426-397.000.  
 Dutton, Michael F.: See—  
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 Dyckerhoff Zementwerke A.G.: See—  
 zur Strassen, Heinrich; and Rauschenfels, Eberhard, 4,165,991, Cl. 106-63.000.  
 Dyer, Don L.: See—  
 Graves, Phillip H.; and Dyer, Don L., 4,165,738, Cl. 128-142.400.  
 Dykehouse, Robert H. Bowling pin. 4,165,875, Cl. 273-82.00R.

- Dynamit Nobel Aktiengesellschaft: See—  
 Blumenfeld, Georg; and Riegger, Paul, 4,166,075, Cl. 260-650.00R.  
 Diesinger, Walter; and Eickmann, Hans-Joachim, 4,165,608, Cl. 60-245.000.  
 Weissenfels, Franz; and Junger, Hans, 4,166,162, Cl. 521-100.000.  
 Dyste, Ardell T.; and Ma, Raymond, to Tel-Tone Corporation. Offset adapter connector. 4,165,912, Cl. 339-156.00T.  
 E. C. H. Will (GmbH & Co.): See—  
 Seaborn, Paul; and Lemburg, Jörn-Uwe, 4,165,767, Cl. 140-105.000.  
 E. R. Squibb & Sons, Inc.: See—  
 Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,166,051, Cl. 260-17.4CL.  
 Cosgrove, Raymond F.; and Baines, Sandra, 4,166,118, Cl. 424-258.000.  
 Hauck, Frederic P.; and Reid, Joyce, 4,166,183, Cl. 546-101.000.  
 Krapcho, John; and Turk, Chester F., 4,166,072, Cl. 260-558.00P.  
 E-Systems, Inc.: See—  
 Feser, James E., 4,165,640, Cl. 73-194.00E.  
 Eastman, David P.: See—  
 Lynch, Thomas E.; Eastman, David P.; and Price, Richard P., 4,165,795, Cl. 180-65.00A.  
 Eastman Kodak Company: See—  
 Green, James A., II; and Kalenda, Norman W., 4,165,987, Cl. 96-119.00R.  
 Masurekar, Prakash S.; and Goodhue, Charles T., 4,166,005, Cl. 435-190.000.  
 Nonnemacher, James R.; Regan, Michael T.; and Webster, Frank G., 4,165,985, Cl. 96-1.0PE.  
 Smith-Lewis, Margaret J.; and Figueras, John, 4,166,093, Cl. 422-56.000.  
 Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukeinen, Joseph Y., 4,165,984, Cl. 96-1.0PE.  
 Eaves, Ronald S., to Ernest Scragg & Sons Limited. Yarn texturing machine. 4,165,602, Cl. 57-291.000.  
 Eberhardt, Heinrich: See—  
 Gehauf nee Kiesel, Liselotte; Eberhardt, Heinrich; and Gailing, Rolf W., 4,165,620, Cl. 62-256.000.  
 Eberle, William J., to General Battery Corporation. Electrodes for use in the extrusion-fusion welding of lead parts through an aperture in a battery case. 4,166,210, Cl. 219-78.150.  
 Eberly, Paul E., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,166,046, Cl. 252-439.000.  
 Eckstein, Udo; and Harnisch, Horst, to Bayer Aktiengesellschaft. Fluorescent dyestuffs. 4,166,176, Cl. 542-460.000.  
 Eddy, David S.: See—  
 Olander, William C.; Harvey, Douglas J.; and Eddy, David S., 4,166,201, Cl. 200-19.0DR.  
 Edelman, Seymour: See—  
 DeReggi, Aime S.; and Edelman, Seymour, 4,166,229, Cl. 310-337.000.  
 Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., to American Hoechst Corporation. Analgesic and tranquilizing spirodihydrobenzofuran/piperidines and pyrrolidines. 4,166,119, Cl. 424-267.000.  
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 Egner, Ernst M., to Euroc Development AB. Manufacture of surface elements. 4,165,999, Cl. 156-245.000.  
 Ehrlich, Richard A. Knockdown upholstered furniture. 4,165,902, Cl. 297-440.000.  
 Eickmann, Hans-Joachim: See—  
 Diesinger, Walter; and Eickmann, Hans-Joachim, 4,165,608, Cl. 60-245.000.  
 Eimen, Shawn H.: See—  
 Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., 4,165,901, Cl. 297-417.000.  
 Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, to Wild Heerbrugg Aktiengesellschaft. Coaxial transmitting and receiving optics for an electro-optic range finder. 4,165,936, Cl. 356-5.000.  
 El-Jay, Inc.: See—  
 Alford, Peter B., 4,165,655, Cl. 74-61.000.  
 Elbtainer Kunststoff- und Verpackungsgesellschaft mbH: See—  
 Wengenroth, Hans E.; and Mrusek, Wilfried, 4,165,817, Cl. 220-256.000.  
 Elf-Union: See—  
 Boinet, Abel; Mondeil, Lucien; and Montay, Jean-Louis, 4,165,631, Cl. 73-54.000.  
 Eli Lilly and Company: See—  
 Kornfeld, Edmund C.; and Bach, Nicholas J., 4,166,182, Cl. 546-67.000.  
 Elkem-Spigerverket A/S: See—  
 Ydstie, Birger L., 4,166,192, Cl. 13-9.00R.  
 Eltra Corporation: See—  
 Lang, Roger J.; and Lang, Gary E., 4,165,559, Cl. 29-629.000.  
 Emmerich, Kenneth C., to Fansteel Inc. Roof drill bit. 4,165,790, Cl. 175-410.000.  
 Endo, Toshiro: See—  
 Yamashita, Seizi; Endo, Toshiro; and Ishida, Yoshio, 4,166,235, Cl. 315-39.710.  
 Engeler, Walter, to Belipar SA; and Concast AG. Method of continuously casting metals, especially steel in an oscillating mold. 4,165,780, Cl. 164-55.000.
- Engelhard, Helmut: See—  
 Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, 4,166,186, Cl. 560-27.000.  
 Environmental Chemicals, Inc.: See—  
 Cardarelli, Nathan F., 4,166,111, Cl. 424-78.000.  
 Environmental Elements Corporation: See—  
 Barnhouser, Martin, 4,166,036, Cl. 210-242.00R.  
 Ernest Scragg & Sons Limited: See—  
 Eaves, Ronald S., 4,165,602, Cl. 57-291.000.  
 Erofeev, Vladimir N.: See—  
 Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
 Escott, Robert M.: See—  
 Sanzenbacher, Charles W.; and Escott, Robert M., 4,165,978, Cl. 75-3.000.  
 Estkowski, Michael H., to V-M Corporation. No-back synchronous motor drive. 4,166,226, Cl. 310-41.000.  
 Eul, William A.: See—  
 Woods, Weightstill W.; and Eul, William A., 4,166,244, Cl. 324-65.00R.  
 Eull, Marvin J., to Graco Inc. Rotatable spray nozzle with safety guard. 4,165,836, Cl. 239-119.000.  
 Euroc Development AB: See—  
 Egner, Ernst M., 4,165,999, Cl. 156-245.000.  
 Exxon Research & Engineering Co.: See—  
 Chianelli, Russell R.; Jacobson, Allan J.; and Whittingham, M. Stanley, 4,166,160, Cl. 429-218.000.  
 Eberly, Paul E., Jr., 4,166,046, Cl. 252-439.000.  
 McCormick, Robert J., 4,166,157, Cl. 429-174.000.  
 Swan, George A., 4,166,024, Cl. 208-65.000.  
 Fabrig, Paul, to WOMAKO-Maschinenkonstruktionen GmbH. Device for subdividing spirals into binders of note books or the like. 4,165,766, Cl. 140-92.700.  
 Faget, Charles J. Hand-held portable calculator assembly. 4,165,554, Cl. 16-114.00R.  
 Fallon, John L.; Kollar, Ernest P.; and Mares, Fred R., to International Business Machines Corporation. Wave generator to shingle sheets. 4,165,870, Cl. 271-10.000.  
 Fansteel Inc.: See—  
 Emmerich, Kenneth C., 4,165,790, Cl. 175-410.000.  
 Fasciati, Alfred: See—  
 Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,165,967, Cl. 8-10.100.  
 Faust, Uwe: See—  
 Prave, Paul; Sukatsch, Dieter; and Faust, Uwe, 4,166,004, Cl. 435-253.000.  
 Fauth, Gunter; Lermann, Peter; Muller, Herbert; and Lechner, Franz, to Agfa-Gevaert AG. Self developing type photographic apparatus. 4,165,931, Cl. 354-86.000.  
 Fawley, Norman C. Valve hand wheel cover. 4,165,659, Cl. 74-558.000.  
 Fedorov, Stanislav G.: See—  
 Koveshnikov, Serafim P.; Pavlov, Viktor F.; and Fedorov, Stanislav G., 4,165,829, Cl. 226-4.000.  
 Fedorov, Viktor V.: See—  
 Nametkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B.; deceased; and Chervoneva, Ljudmila A., administratrix, 4,166,025, Cl. 208-126.000.  
 Fedorowicz, Richard J.; and Cegles, William P., to Motorola, Inc. Watch module. 4,165,607, Cl. 58-50.00R.  
 Feeman, James F., to Crompton & Knowles Corporation. Alkali-fast disazo disulfimide dyes. 4,166,059, Cl. 260-186.000.  
 Feigin, Evgeny A.: See—  
 Nametkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B.; deceased; and Chervoneva, Ljudmila A., administratrix, 4,166,025, Cl. 208-126.000.  
 Feldbljum, Nikolai B.: See—  
 Dokunikhin, Nikolai S.; Vorozhtsov, Georgy N.; Kichina, Faina I.; and Feldbljum, Nikolai B., 4,166,181, Cl. 546-31.000.  
 Felder, Richard M.; and Ferrell, James K., to North Carolina State University at Raleigh. Continuous in-stack pollutant monitoring system. 4,165,630, Cl. 73-23.000.  
 Feller, Herman H.: See—  
 Shanahan, Francis V.; and Feller, Herman H., 4,165,577, Cl. 43-112.000.  
 Felt Products Mfg. Co.: See—  
 Patel, Purshottam S.; and McDowell, Donald J., 4,166,169, Cl. 526-313.000.  
 Fercke, Wilhelm, to Vereinigte Deutsche Metallwerke Aktiengesellschaft. Low-alloy zinc material and coin-products made thereof. 4,166,153, Cl. 428-577.000.  
 Ferdinand, Irwin J., to Hirsh Company. Steel shelving. 4,165,698, Cl. 108-156.000.  
 Ferrell, James K.: See—  
 Felder, Richard M.; and Ferrell, James K., 4,165,630, Cl. 73-23.000.  
 Feser, James E., to E-Systems, Inc. Data collection and reduction system for a shock suppressor valve test system. 4,165,640, Cl. 73-194.00E.



- Fethke, Wayne G.; and Mayer, Paul C., to Fiskars Manufacturing Corporation. Blister packages for scissors, pliers and other hand tools. 4,165,805, Cl. 206-349.000.
- Fichte, Rudolf: See—  
Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.
- Fields, Larry D.: See—  
Morris, Earl L.; and Fields, Larry D., 4,165,857, Cl. 251-54.000.
- Fields, Robert E. Connector for tubing. 4,165,893, Cl. 285-177.000.
- Figueras, John: See—  
Smith-Lewis, Margaret J.; and Figueras, John, 4,166,093, Cl. 422-56.000.
- Findeisen, Kurt: See—  
Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, 4,166,067, Cl. 260-453.00P.
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- Fischer, Caecilia E., heiress-at-law: See—  
Fischer, Adolf, deceased, 4,165,977, Cl. 71-91.000.
- Fisher, Chester G., III: See—  
Froehlich, John A.; Czernik, Roman; and Fisher, Chester G., III, 4,166,094, Cl. 422-64.000.
- Fisher, Gerald C.: See—  
Scanland, Joseph E.; and Fisher, Gerald C., 4,165,597, Cl. 52-95.000.
- Fiskars Manufacturing Corporation: See—  
Fethke, Wayne G.; and Mayer, Paul C., 4,165,805, Cl. 206-349.000.
- Fitch, Arthur H., to Lockheed Electronics Company, Inc. Rotary optical coupler. 4,165,913, Cl. 350-96.150.
- Fitzgibbon, Chester M. Component type building construction system. 4,165,591, Cl. 52-90.000.
- Fitzgibbons, William O.: See—  
Wu, Hsin C.; and Fitzgibbons, William O., 4,166,008, Cl. 203-85.000.
- Fitzner, Arthur O.; and Kruncos, Francis E., to Brunswick Corporation. Automatic fuel pump switch unit for fuel-injected internal combustion engines. 4,165,727, Cl. 123-179.00B.
- Fix, Joseph O., to United States of America, Army. Track shoe having replaceable pad. 4,165,906, Cl. 305-51.000.
- Flachenecker, Gerhard: See—  
Meinke, Peter; and Flachenecker, Gerhard, 4,166,261, Cl. 335-246.000.
- Fletcher, Roy W.; and Forte, Anthony D., to Union Special Corporation. Thread separating finger. 4,165,700, Cl. 112-286.000.
- Flink, Sune N.: See—  
Reh, Lothar; Hirsch, Martin; Collin, Per H.; and Flink, Sune N., 4,165,717, Cl. 122-4.00D.
- FMC Corporation: See—  
Kondo, Kiyoshi; Negishi, Akira; and Sugimoto, Kikuo, 4,166,064, Cl. 260-347.400.
- Rosseau, Richard B., 4,165,551, Cl. 15-79.000.
- Ford Aerospace & Communications Corp.: See—  
Moreno, Isabel L., 4,165,918, Cl. 350-253.000.
- Ford Motor Company: See—  
Bianchi, Frank J.; and Poulson, Russell H., 4,166,248, Cl. 328-140.000.
- Ludwig, Frank A., 4,166,156, Cl. 429-104.000.
- Forte, Anthony D.: See—  
Fletcher, Roy W.; and Forte, Anthony D., 4,165,700, Cl. 112-286.000.
- Foster, Karl: See—  
Reynolds, William T.; and Foster, Karl, 4,165,990, Cl. 106-48.000.
- Fournier, Albert A., Jr.; and Paddock, Charles F., to Uniroyal, Inc. Method of making graft polymers. 4,166,081, Cl. 525-75.000.
- Fournier, Joseph T., Jr.: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.
- Fox, Anthony. Combination air brake and engine shield for aircraft. 4,165,849, Cl. 244-113.000.
- Foxboro Company, The: See—  
Olsen, Everett O.; La Croix, James R.; and Bowditch, Hoel L., 4,165,651, Cl. 73-704.000.
- Frain, John J. Bingo game and process of playing same. 4,165,878, Cl. 273-240.000.
- Franks, Neal E.; and Drinnan, Carol L., to Akzona Incorporated. Nylon 6 having improved affinity for cationic dyes. 4,166,080, Cl. 525-183.000.
- Frant, Martin S.: See—  
Ross, James W., Jr.; and Frant, Martin S., 4,166,021, Cl. 204-195.00F.
- Franz, Johann: See—  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spenner, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.
- Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: See—  
Theurer, Josef, 4,165,693, Cl. 104-7.00B.
- Theurer, Josef, 4,165,694, Cl. 104-7.00B.
- Fray, Derek J., to National Research Development Corporation. Method for detecting elements. 4,166,009, Cl. 204-1.00T.
- Fray, Derek J.; and Gee, Robert, to National Research Development Corporation. Method of making metal beta-alumina and refining metal using it. 4,166,013, Cl. 204-61.000.
- Freedman, George: See—  
Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.
- Freeman, Richard R.: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 250-423.00P.
- Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, to Bayer Aktiengesellschaft. Process for the preparation of alkoxymethyl-isocyanates. 4,166,067, Cl. 260-453.00P.
- Frenz, Norbert W., Jr.: See—  
Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.
- Fricke, Roy A. Spark plug cleaner and method. 4,165,586, Cl. 51-42.000.
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- Froehlich, John A.; Czernik, Roman; and Fisher, Chester G., III, to Perkin-Elmer Corporation. The Automatic fluid sampling transport system. 4,166,094, Cl. 422-64.000.
- Fryer, Rodney I.: See—  
Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,166,185, Cl. 548-324.000.
- Fuchs-Vincicay, Gabriella; and Huber, Kurt, to Aktiengesellschaft Adolph Saurer. Optical-electrical system for monitoring filaments, wires, strands, tapes and the like. 4,166,214, Cl. 250-227.000.
- Fuji Photo Film Co., Ltd.: See—  
Miyazaki, Takashi; Sakai, Tadao; and Mitsui, Akio, 4,166,050, Cl. 260-8.000.
- Shimizu, Shigehisa; and Mizutano, Shigemitsu, 4,165,665, Cl. 83-287.000.
- Fuji Photo Optical Co., Ltd.: See—  
Asano, Seiji; and Ohmiya, Akio, 4,165,932, Cl. 354-106.000.
- Fujimoto, Yasuo: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.
- Fujioka, Yasuo; and Nakano, Kenichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Structure for mounting an exhaust manifold to the body of an internal combustion engine. 4,165,612, Cl. 60-322.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,166,115, Cl. 424-246.000.
- Fujitani, Nobuyuki: See—  
Yamamoto, Yoshihisa; and Fujitani, Nobuyuki, 4,165,724, Cl. 123-139.00AT.
- Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, to Daido Tokushuko Kabushiki Kaisha. Molybdenum base alloy having excellent high-temperature strength and a method of producing same. 4,165,982, Cl. 75-176.000.
- Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, to Chiyoda Chemical Engineering & Construction Co., Ltd. Two-step hydrosulfurization of heavy hydrocarbon oil. 4,166,026, Cl. 208-210.000.
- Fukumoto, Kumaichi: See—  
Ishida, Kinyu; and Fukumoto, Kumaichi, 4,165,585, Cl. 57-268.000.
- Funabashi, Shinichiro: See—  
Hisazumi, Nobuyuki; and Funabashi, Shinichiro, 4,166,082, Cl. 525-78.000.
- Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., to Tesdata Systems Corporation. Computer monitoring system. 4,166,290, Cl. 364-200.000.
- Furukawa, Shinichi: See—  
Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, 4,166,128, Cl. 424-319.000.
- Gaetano, John. Tennis score keeping device. 4,165,710, Cl. 116-223.000.
- Gagne, Pierre: See—  
Cloutier, Michel; Doucet, Yves; Jutras, Gilles; and Gagne, Pierre, 4,165,565, Cl. 33-174.00T.
- Gailing, Rolf W.: See—  
Gehauf nee Kiesel, Liselotte; Eberhardt, Heinrich; and Gailing, Rolf W., 4,165,620, Cl. 62-256.000.
- Gajewski, Vincent J.: See—  
Karoly, Gabriel; and Gajewski, Vincent J., 4,166,042, Cl. 252-182.000.
- Gangulee, Amitava; Ho, Paul S.; and Howard, James K., to International Business Machines Corporation. Electromigration resistance in gold thin film conductors. 4,166,279, Cl. 357-71.000.
- Garcia Corporation, The: See—  
Weinstein, Burton A.; and Lipe, Gordon C., 4,165,889, Cl. 280-626.000.
- Gardner, Benjamin R. Casing perforator. 4,165,784, Cl. 166-55.300.
- Gardner, Beth A.: See—  
Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,119, Cl. 424-267.000.
- Effland, Richard C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,166,120, Cl. 424-267.000.
- Gardner, Ina F. Syringe connectable to a water faucet. 4,165,742, Cl. 128-229.000.
- Gebr. Happich GmbH: See—  
Janz, Joachim; and Mentzel, Bodo, 4,165,898, Cl. 296-153.000.
- Gee, Robert: See—  
Fray, Derek J.; and Gee, Robert, 4,166,013, Cl. 204-61.000.
- Gehauf nee Kiesel, Liselotte; Eberhardt, Heinrich; and Gailing, Rolf W., to Ludwig Kiesel oHG. Self-service cooling cabinet. 4,165,620, Cl. 62-256.000.
- General Battery Corporation: See—  
Eberle, William J., 4,166,210, Cl. 219-78.150.

- General Electric Company: See—  
Atwood, Harry, 4,166,287, Cl. 362-13.000.
- Gillette, Stephen F., 4,166,260, Cl. 335-20.000.
- Lee, Gim F., Jr., 4,166,055, Cl. 260-30.60R.
- Pensabene, Saverio F.; and Catotti, Arthur J., 4,166,010, Cl. 204-2.100.
- Roy, Prodyot; and Licina, George J., 4,166,019, Cl. 204-195.00S.
- Russell, Ronald R., 4,166,240, Cl. 318-380.000.
- General Foods Corporation: See—  
Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.
- General Mills, Inc.: See—  
Ziminski, Richard D.; and Uecker, Myron M., 4,166,138, Cl. 426-249.000.
- General Motors Corporation: See—  
Olander, William C.; Harvey, Douglas J.; and Eddy, David S., 4,166,201, Cl. 200-19.00DR.
- West, Gene A.; and Moretti, John A., 4,166,243, Cl. 324-51.000.
- General Time Corporation: See—  
Richmond, James W., 4,166,204, Cl. 200-67.00D.
- Genth, Hermann: See—  
Paulus, Wilfried; and Genth, Hermann, 4,166,122, Cl. 424-272.000.
- George, Michael; Brotherston, Colin P.; and Sosnowski, Stanislaw J. A., to Lucas Industries Limited. Fuel pumping apparatus. 4,165,725, Cl. 123-139.00AL.
- Georgia Tech Research Institute: See—  
Carstens, Marion R.; and Bates, Homer J., 4,165,845, Cl. 406-192.000.
- Georgopoulos, Minas. Cigarette package closure and protector. 4,165,804, Cl. 206-259.000.
- Germonprez, Raymond L.; and Zimmerman, Paul, to American Can Company. Binderless thermotropic jet ink. 4,166,044, Cl. 252-408.000.
- Gesellschaft fur Strahlen- und Umweltforschung mbH Munchen: See—  
Bunnberg, Claus; and Kuhn, Wilhelm, 4,166,217, Cl. 250-308.000.
- Getson, John C., to SWS Silicoes Corporation. Modified organopolysiloxane compositions. 4,166,078, Cl. 528-26.000.
- GfE Gesellschaft fur Elektrometallurgie mit Beschränkter Haftung: See—  
Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.
- Gibert, Henri; and Baxerres, Jean-Louis, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for putting phases in contact and device for carrying out the process. 4,165,568, Cl. 34-10.000.
- Gilbu, Agnar; Pearson, Lee E.; and Greenwood, Mark E., to Owens-Corning Fiberglas Corporation. Glass fiber reinforced thermosetting resin pipe wall construction. 4,165,765, Cl. 138-174.000.
- Gillespie, Peter J., to Austin Beech Limited. Spool valve buffer member. 4,165,860, Cl. 251-297.000.
- Gillette, Stephen F., to General Electric Company. Circuit breaker accessory assembly. 4,166,260, Cl. 335-20.000.
- Gillis, John R.; Miraldi, Peter; and Slavers, Marius X., to American Sterilizer Company. Biohazard steam sterilizer. 4,166,096, Cl. 422-119.000.
- Girard, Edmond, to Messier, Societe Anonyme. Method of controlling a heat pump, and a heat pump device adapted to operate in accordance with said method. 4,165,619, Cl. 62-99.000.
- Giuiuzza, Pietro, to Officine Meccaniche Cigardi S.p.A. Device for sequential overturning of sheets in multi-color offset printing machines. 4,165,689, Cl. 101-230.000.
- Global Marine, Inc.: See—  
Parsons, John S., 4,165,706, Cl. 114-258.000.
- Goi Chemical Co., Ltd.: See—  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.
- Goldberg, Leonard J., to United States of America, Navy. Mosquito larvae control using a bacterial larvicide. 4,166,112, Cl. 424-93.000.
- Goldman, Julian; and Oppenheim, Martin. Apparatus to rejuvenate tennis balls. 4,165,770, Cl. 141-329.000.
- Goldner, Walther, to Recaro GmbH & Co. Vehicle seat. 4,165,899, Cl. 297-361.000.
- Good, Arthur L.; and Hoopes, Philip K., to Masco Corporation of Indiana. Trailer sway control device. 4,165,885, Cl. 280-446.00B.
- Goodhue, Charles T.: See—  
Masufek, Prakash S.; and Goodhue, Charles T., 4,166,005, Cl. 435-190.000.
- Goodman, Richard M., to American Cyanamid Company. Compositions comprising mixtures of polycationic and polyanionic polymers as magnesium scale control agents. 4,166,040, Cl. 252-180.000.
- Goodman, Richard M., to American Cyanamid Company. Process for magnesium scale control using mixtures of polycationic and polyanionic polymers. 4,166,041, Cl. 252-180.000.
- Goodwin, George I.; Margrave, John L.; and Wagner, Robert E. Mold lubricant and method. 4,165,974, Cl. 65-26.000.
- Goodyear Tire & Rubber Company, The: See—  
Mitchell, Robert F., 4,166,171, Cl. 528-488.000.
- Svigelj, John A.; and Rabito, Thomas G., 4,166,058, Cl. 260-38.000.
- Gorbanev, Vladimir N.: See—  
Alev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.
- Gorby, Jack: See—  
Dutton, Edward E.; and Gorby, Jack, 4,166,140, Cl. 426-397.000.
- Goren, Yoram: See—  
Lloyd, Samuel H., III; and Goren, Yoram, 4,165,702, Cl. 114-65.00R.
- Gosudarstvenny Nauchnoissledovatel'sky Energetichesky Institut imeni G.M. Krzhizhanovskogo: See—  
Chukhanov, Zinoviy F.; Tsuprov, Sergei A.; and Apter, Danil M., 4,165,696, Cl. 104-147.00R.
- Gould, Henry: See—  
DiBella, Eugene P.; Dunkel, Morris; and Gould, Henry, 4,166,163, Cl. 521-116.000.
- Gould Inc.: See—  
Belcher, Richard A.; and Kozacka, Frederick J., 4,166,267, Cl. 337-163.000.
- Kozacka, Frederick J.; and Belcher, Richard A., 4,166,266, Cl. 337-158.000.
- Lynch, Thomas E.; Eastman, David P.; and Price, Richard P., 4,165,795, Cl. 180-65.00A.
- Mao, George W.; Rao, Purushothama; and Trenter, James F., 4,166,155, Cl. 429-82.000.
- Gould, Joseph B., to National Utilities Corporation. Pendant ring. 4,165,621, Cl. 63-1.00R.
- Grabovsky, Viktor V.: See—  
Afanasyuk, Ivan N.; Grabovsky, Viktor V.; Kliot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.
- Graco Inc.: See—  
Eull, Marvin J., 4,165,836, Cl. 239-119.000.
- Graco Metal Products, Inc.: See—  
Saint, David, 4,165,872, Cl. 272-86.000.
- Graf, Karl: See—  
Wagner, Alfred; Ames, Adolf; and Graf, Karl, 4,165,625, Cl. 72-38.000.
- Grah, Neil E.: See—  
Deane, Kenneth E.; and Grah, Neil E., 4,166,206, Cl. 200-293.000.
- Graham, Robert K., to Minnesota Mining and Manufacturing Company. Hybrid corneal contact lens. 4,166,255, Cl. 351-160.00H.
- Gramsz, Jerzy: See—  
Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Brzusewski, Stanislaw; and Koczela, Krzysztof, 4,165,867, Cl. 266-252.000.
- Grandclement, Gerald, to International Cold Forging Corporation. Valve. 4,165,764, Cl. 138-43.000.
- Grant, Thomas J. Battery jumpering apparatus. 4,166,241, Cl. 320-25.000.
- Grasselli, Robert K.: See—  
White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., 4,166,190, Cl. 562-534.000.
- Graves, Phillip H.; and Dyer, Don L. Life support system for drilling rigs. 4,165,738, Cl. 128-142.400.
- Gray, Paul R.: See—  
Stephens, Mark L.; and Gray, Paul R., 4,166,269, Cl. 338-3.000.
- Greatbatch, Wilson: See—  
Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.
- Green Giant Company: See—  
Stoll, William F., 4,166,136, Cl. 426-144.000.
- Green, James A., II; and Kalenda, Norman W., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible pyridylazopyrazole or pyrimidylazopyrazole dye-releasing compounds. 4,165,987, Cl. 96-119.00R.
- Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., to Wiggins Teape Limited. Fibrous material moulding apparatus. 4,166,090, Cl. 264-25.000.
- Greenwood, Mark E.: See—  
Gilbu, Agnar; Pearson, Lee E.; and Greenwood, Mark E., 4,165,765, Cl. 138-174.000.
- Greer, Amos S., Jr., to Southwest Research Institute. Apparatus and method for ultrasonic inspection of highly attenuative materials. 4,165,649, Cl. 73-644.000.
- Grelan Pharmaceutical Co., Ltd.: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.
- Groeger, Theodore O. Convertible airplane. 4,165,846, Cl. 244-2.000.
- Gross, Zvi: See—  
Wagner, Daniel B.; and Gross, Zvi, 4,166,103, Cl. 424-1.000.
- Wagner, Daniel B.; and Gross, Zvi, 4,166,104, Cl. 424-1.000.
- Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T.: See—  
Riollet, Gilbert, 4,165,949, Cl. 415-77.000.
- Gryga, John J., Jr.: See—  
Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., 4,165,901, Cl. 297-417.000.
- GTE Sylvania Incorporated: See—  
Kimball, Stephen F., III; and Palmer, Lewis H., III, 4,166,232, Cl. 313-316.000.
- Gudmestad, Ragnar, to Artos Engineering Company. Wire straightening mechanism for wire lead production apparatus. 4,165,768, Cl. 140-140.000.
- Gueldenpfennig, Klaus; and Breidenstein, Charles J., to Stromberg-Carlson Corporation. Attendant console complex. 4,166,199, Cl. 179-27.00CA.
- Guenther, Manfred H. Air chuck. 4,165,760, Cl. 137-231.000.
- Guglielmo, Jean, to Lucien Ferraz & Cie. Brush holder for electric machines. 4,166,227, Cl. 310-242.000.
- Gulf Research & Development Company: See—  
Brastins, Auseklis; and Stenger, Ralph L., Jr., 4,166,270, Cl. 340-5.00C.
- Tsai, Shirley C., 4,166,022, Cl. 208-11.00R.



H.P.G. IV, Inc.: See—  
Brawner, William H.; and Umphries, James O., 4,165,713, Cl. 119-109.000.  
Haga, Seiji: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Halcon Research & Development Corporation: See—  
Johnson, Richard A., 4,166,097, Cl. 423-112.000.  
Hall, Lowell R.: See—  
Cryder, John R.; and Hall, Lowell R., 4,165,675, Cl. 91-420.000.  
Halliburton Company: See—  
Sullaway, Bob L.; and Knox, Lloyd C., 4,165,891, Cl. 285-18.000.  
Hammit, Frederick G.; and Hwang, Jia-Bo G. High response rate pressure pulse sensing probe with wide temperature range applicability, 4,165,654, Cl. 73-723.000.  
Hanley, John. Wind wheel apparatus for use with a hydro-electric dam, 4,166,222, Cl. 290-55.000.  
Hansen, Harold M., to Southern Can Company. Tilttable valve member for pressurized containers, 4,165,825, Cl. 222-402.220.  
Hanser, Paul E., to HWH Corporation. Vehicle leveling system, 4,165,861, Cl. 254-86.00H.  
Hanway, John E., Jr.; and Mumford, Richard G. Method and apparatus for removing heavy metals from waste water streams, 4,166,032, Cl. 210-32.000.  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, to Hitachi Metals, Ltd. Magnetic core assembly for magnetizing columnar permanent magnet for use in electrostatic developing apparatus, 4,166,263, Cl. 335-284.000.  
Haraden, William J.: See—  
Beach, John R.; Sauer, L. Peter; and Haraden, William J., 4,165,943, Cl. 403-285.000.  
Hardwood House Inc.: See—  
Bayley, James J., 4,165,588, Cl. 52-36.000.  
Hardy, Dean. Artificial kidney cleaning apparatus and process, 4,166,031, Cl. 210-22.00A.  
Harigane, Kotaro: See—  
Taguchi, Yoshinobu; Harigane, Kotaro; and Ito, Tetsuro, 4,165,557, Cl. 29-566.300.  
Harju, Bert I., to Sodertalje Tekniska Ide Produkter Aktiebolag. Automatic pilot apparatus for a printer, 4,165,563, Cl. 33-18.00R.  
Harnisch, Horst: See—  
Eckstein, Udo; and Harnisch, Horst, 4,166,176, Cl. 542-460.000.  
Harris, Ronald L.: See—  
Thomas, John W.; and Harris, Ronald L., 4,165,716, Cl. 122-1.00A.  
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., to Lilly Industries Limited. Acylaminopyrazoles, 4,166,123, Cl. 424-273.00P.  
Harrison, Radjasa; and Stork, Willem H. J., to Shell Oil Company. Hydrothermal treatment of silica, 4,166,047, Cl. 252-454.000.  
Hart, John M. Paper log forming apparatus, 4,165,678, Cl. 93-1.00C.  
Harvey, Douglas J.: See—  
Olander, William C.; Harvey, Douglas J.; and Eddy, David S., 4,166,201, Cl. 200-19.00R.  
Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Brzuszewski, Stanislaw; and Koczela, Krzysztof, to Politechnika Lodzka; and Lubuskie Zaklady Termotechniczne. Installation for nitriding-sulphidizing of steel and iron elements, 4,165,867, Cl. 266-252.000.  
Hatakeyama, Nobuo: See—  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.  
Hatch, Donald M.; and Larsen, Richard J., to Hitco. High temperature consolidation process for the production of a substantially all carbon composite, 4,166,145, Cl. 428-283.000.  
Hauck, Frederic P.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Tricyclic cyclitolamines, 4,166,183, Cl. 546-101.000.  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersing agents, 4,166,066, Cl. 260-404.500.  
Heifetz, Milton D. Surgical manipulator, 4,165,745, Cl. 128-318.000.  
Heitkamper, Peter: See—  
Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, 4,166,067, Cl. 260-453.00P.  
Helmer, Harry W., Jr., to Chrysler Corporation. Low mass breakerless ignition distributor, 4,165,726, Cl. 123-146.50A.  
Hendy, Brian N., to Imperial Chemical Industries Limited. Coated tubular forms, 4,165,956, Cl. 425-71.000.  
Henkel Kommanditgesellschaft auf Aktien: See—  
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,165,967, Cl. 8-10.100.  
Henze, Fritz: See—  
Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.  
Heraeus Quarzschmelze GmbH: See—  
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,165,915, Cl. 350-96.340.  
Hermann, Walter; Kuhl, Burkhardt; and Schuck, Wolf-Dieter, to Messerschmitt-Bolkow-Blohm GmbH. Flat high frequency cable, 4,166,259, Cl. 333-236.000.  
Hertl, William; and Ramsey, William S., to Corning Glass Works. Means for stimulating microbial growth, 4,166,006, Cl. 435-244.000.  
Hetra, Andrew A., Jr.; and Jacob, Charles W., to United States Steel Corporation. Device for skimming floating material from a body of liquid, 4,165,866, Cl. 266-228.000.

Hexachimie Societe Anonyme: See—  
Payne, Trevor G., 4,166,131, Cl. 424-317.000.  
Hiiragi, Mineharu: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Hildebrand, Klaus W.: See—  
Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, 4,165,936, Cl. 356-5.000.  
Hill, John A.: See—  
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,166,051, Cl. 260-17.4CL.  
Hirsch, Martin: See—  
Reh, Lothar; Hirsch, Martin; Collin, Per H.; and Flink, Sune N., 4,165,717, Cl. 122-4.00D.  
Hirschfeld, Tomas, to Block Engineering, Inc. Dye tagged reagent, 4,166,105, Cl. 424-8.000.  
Hirsh Company: See—  
Ferdinand, Irwin J., 4,165,698, Cl. 108-156.000.  
Hisasue, Michio; and Kodama, Shun-ichi, to Asahi Glass Company, Ltd. Terpolymers of tetrafluoroethylene, ethylene and fluorovinyl ether and process for producing the same, 4,166,165, Cl. 526-87.000.  
Hisazumi, Nobuyuki; and Funabashi, Shinichiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene chloride copolymer film having high bubble stability in inflation-stretching process and cold resistance, 4,166,082, Cl. 525-78.000.  
Hitachi Chemical Company, Ltd.: See—  
Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, 4,165,839, Cl. 241-4.000.  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.  
Hitachi, Ltd.: See—  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.  
Yamashita, Seizi; Endo, Tanehiro; and Ishida, Yoshio, 4,166,235, Cl. 315-39.710.  
Hitachi Metals, Ltd.: See—  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,166,263, Cl. 335-284.000.  
Okada, Kuniaki, 4,165,628, Cl. 72-182.000.  
Ueno, Yoshio; and Nagami, Akio, 4,165,658, Cl. 74-412.00R.  
Hitco: See—  
Hatch, Donald M.; and Larsen, Richard J., 4,166,145, Cl. 428-283.000.  
Ho, Paul S.: See—  
Gangulee, Amitava; Ho, Paul S.; and Howard, James K., 4,166,279, Cl. 357-71.000.  
Hoechst Aktiengesellschaft: See—  
Noetzel, Siegfried, 4,166,161, Cl. 521-96.000.  
Prave, Paul; Sukatsch, Dieter; and Faust, Uwe, 4,166,004, Cl. 435-253.000.  
Raether, Siegfried, deceased, 4,166,015, Cl. 204-129.750.  
Zimmermann, Wolfgang; and Schindler, Hermann, 4,166,033, Cl. 210-51.000.  
Hoffmann, Gunter. Battery filling system, 4,165,769, Cl. 141-198.000.  
Hoffmann-La Roche Inc.: See—  
Adams, Jim M.; and White, Lawrence S., 4,165,998, Cl. 156-64.000.  
Walser, Armin; Fryer, Rodney L.; and Benjamin, Louis, 4,166,185, Cl. 548-324.000.  
Hohl, William A.; and Orwig, Herbert L., to A-T-O Inc. Load booster wheel assembly, 4,165,792, Cl. 180-24.020.  
Hokuriku Pharmaceutical Co., Ltd.: See—  
Kato, Hideo; Koshinaka, Eichi; and Ogawa, Nobuo, 4,166,180, Cl. 544-398.000.  
Holcroft and Company: See—  
Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., 4,165,865, Cl. 266-138.000.  
Homma, Yasumasa: See—  
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,166,026, Cl. 208-210.000.  
Honda Giken Kogyo Kabushiki Kaisha: See—  
Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, 4,165,728, Cl. 123-182.000.  
Sano, Shoichi, 4,165,777, Cl. 152-411.000.  
Honeywell Inc.: See—  
Luft, Victor, 4,166,230, Cl. 310-365.000.  
Lynch, Frank, 4,166,249, Cl. 328-155.000.  
Starr, James B., 4,166,264, Cl. 336-20.000.  
Honeywell Information Systems, Inc.: See—  
Borelli, Ronald F.; and Lakhani, Kishor M., 4,165,686, Cl. 101-1.000.  
Hooker Chemicals & Plastics Corp.: See—  
Quinn, Edward J.; and Campbell, Donald H., 4,166,012, Cl. 204-30.000.  
Hoopes, Philip K.: See—  
Good, Arthur L.; and Hoopes, Philip K., 4,165,885, Cl. 280-446.00B.  
Hoover, Alan W., to International Telephone and Telegraph Corporation. Single power supply multiple image intensifier apparatus and method with independently adjustable low light gain and high light saturation level, 4,166,213, Cl. 250-213.0VT.  
Hori, Makoto: See—  
Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaaki, 4,165,961, Cl. 431-1.000.

Hough, Walter J., to Cummins Engine Company, Inc. Valve construction, 4,165,763, Cl. 137-625.410.  
Hovey, Richard J.: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.  
Howard, James K.: See—  
Gangulee, Amitava; Ho, Paul S.; and Howard, James K., 4,166,279, Cl. 357-71.000.  
Hoya Corporation: See—  
Asahara, Yoshiyuki, 4,165,989, Cl. 106-47.00Q.  
Hoyle, Brian, to Lucas Industries Limited. Electrical switch, 4,166,203, Cl. 200-61.270.  
Huber, Kurt: See—  
Fuchs-Vinicay, Gabriella; and Huber, Kurt, 4,166,214, Cl. 250-227.000.  
Hudon, Paul A., administrator: See—  
Johnson, Arthur R., deceased; and Hudon, Paul A., administrator, 4,165,666, Cl. 83-313.000.  
Huff, Bobby J., to U.S. Rubber Reclaiming Co., Inc. Process of producing a rubberized asphalt composition suitable for use in road and highway construction and repair and product, 4,166,049, Cl. 260-2.300.  
Hughes Aircraft Company: See—  
Shishido, Tsuneo, 4,166,256, Cl. 333-99.0MP.  
Hughes, Donald W.: See—  
Reynolds, Charles E.; and Hughes, Donald W., 4,166,265, Cl. 336-192.000.  
Hughes, Leonard; Robinson, Kenneth R.; and Deviney, Marvin L., Jr., to Ashland Oil, Inc. High carbon content liquid fuels, 4,165,969, Cl. 44-51.000.  
Huige, Nicolaas J.: See—  
Westermann, Donald H.; and Huige, Nicolaas J., 4,166,141, Cl. 426-422.000.  
Hungerbuhler, Walter: See—  
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,165,967, Cl. 8-10.100.  
Hunt, Alvin W. Instrument holder for use on disabled hands, 4,165,896, Cl. 294-25.000.  
Huntington Alloys, Inc.: See—  
Smith, Darrell F., Jr.; and Clatworthy, Edward F., 4,165,997, Cl. 148-38.000.  
Hutamura, Masaharu: See—  
Matsui, Kazuhiro, 4,165,774, Cl. 152-221.000.  
Hutson, Jearld L. Photosensitive zero voltage semiconductor switching device, 4,166,224, Cl. 307-311.000.  
Hwang, Jia-Bo G.: See—  
Hammit, Frederick G.; and Hwang, Jia-Bo G., 4,165,654, Cl. 73-723.000.  
HWH Corporation: See—  
Hanser, Paul E., 4,165,861, Cl. 254-86.00H.  
Hycel, Inc.: See—  
Kling, Gary W.; and Swanson, Scott C., 4,166,095, Cl. 422-67.000.  
Igarashi, Kikuo, to Shionogi & Co., Ltd. Aminoglycoside antibiotic derivatives and method of use, 4,166,114, Cl. 424-180.000.  
Igel, Wolfgang, to Zinser Textilmaschinen GmbH. Control system for yarn-tying device of thread-winding machine, 4,165,601, Cl. 57-264.000.  
Iguchi, Yasuyuki: See—  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.  
Iizuka, Haruhiko; and Yasuhara, Seishi, to Nissan Motor Company, Limited. Internal combustion engine with variable cylinder disablement control, 4,165,610, Cl. 60-284.000.  
Ikeda, Nobumasa: See—  
Kusakabe, Noboru; and Ikeda, Nobumasa, 4,166,052, Cl. 260-17.4ST.  
Ikeda, Yugo: See—  
Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, 4,166,174, Cl. 542-401.000.  
Ikeoka, Naoaki: See—  
Nakada, Toshio; and Ikeoka, Naoaki, 4,165,685, Cl. 100-282.000.  
Iles, Thomas L.; and Ruder, Joseph M., to United States of America, Navy. Gas separating system, 4,165,972, Cl. 55-28.000.  
Illinois Tool Works Inc.: See—  
Baer, Robert E.; and Rayburn, Charles C., 4,166,285, Cl. 361-307.000.  
Imperial Chemical Industries Limited: See—  
Bye, Ashley D.; Priddle, John E.; and Wilson, Victor A., 4,166,167, Cl. 526-142.000.  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,166,066, Cl. 260-404.500.  
Hendy, Brian N., 4,165,956, Cl. 425-71.000.  
Inaba, Masakazu: See—  
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,165,741, Cl. 428-207.000.  
Independent Broadcasting Authority: See—  
Thirlwall, Alan C.; and Ives, John G. S., 4,166,271, Cl. 340-146.200.  
Ingils, Bruce R.: See—  
Green; Kieron P.; Ingils, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,166,090, Cl. 264-25.000.  
Innovative Industries, Inc.: See—  
Van Gilst, Carl, 4,165,683, Cl. 99-393.000.  
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, to Process Shizai Co., Ltd. Heat-sensitive recording materials and recording process of using the same, 4,165,741, Cl. 428-207.000.

Inter-Elec: See—  
Dubreucq, Jean-Claude, 4,165,850, Cl. 246-182.00B.  
International Business Machines Corporation: See—  
Bernardelli, William J.; and Brandon, Fred Y., 4,165,965, Cl. 432-75.000.  
Fallon, John L.; Kollar, Ernest P.; and Mares, Fred R., 4,165,870, Cl. 271-10.000.  
Gangulee, Amitava; Ho, Paul S.; and Howard, James K., 4,166,279, Cl. 357-71.000.  
Small, Martin B.; and Zory, Peter S., Jr., 4,166,253, Cl. 331-94.50H.  
Tseng, Samuel C.-C., 4,166,258, Cl. 333-195.000.  
International Cold Forging Corporation: See—  
Grandclement, Gerald, 4,165,764, Cl. 138-43.000.  
International Minerals & Chemical Corporation: See—  
Wehrmeister, Herbert L., 4,166,121, Cl. 424-269.000.  
International Nickel Company, Inc.: See—  
Davies, Haydn; Blanco, Jose A.; and O'Neill, Charles E., 4,165,979, Cl. 75-23.000.  
International Paper Company: See—  
Bartley, Thomas S., 4,165,590, Cl. 52-66.000.  
International Standard Electric Corporation: See—  
Judeinstein, Andre J., 4,166,212, Cl. 250-199.000.  
Morrissey, Joseph H., 4,165,922, Cl. 350-341.000.  
International Submarine Services: See—  
Collins, H. Dale, 4,165,647, Cl. 73-603.000.  
International Telephone and Telegraph Corporation: See—  
Acar, Ali, 4,165,762, Cl. 137-625.500.  
Hoover, Alan W., 4,166,213, Cl. 250-213.0VT.  
Scherrer, Raymond E., 4,165,584, Cl. 51-131.100.  
Iplex Plastic Industries Proprietary Limited: See—  
Tucker, Alfred D., 4,165,759, Cl. 137-99.000.  
Isaev, Boris N.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuel A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Ishida, Kinyu; and Fukumoto, Kumaichi, to Teijin Limited. Automatic doffing and donning apparatus, 4,165,585, Cl. 57-268.000.  
Ishida, Masayuki, to Toyo Suisan Kaisha, Ltd. Method of producing instant cupped noodles, 4,166,139, Cl. 426-394.000.  
Ishida, Yoshio: See—  
Yamashita, Seizi; Endo, Tanehiro; and Ishida, Yoshio, 4,166,235, Cl. 315-39.710.  
Ishigaki, Yukinobu; and Muraoka, Teruo, to Victor Company of Japan, Ltd. System for removing interference distortion in the demodulated signal of a frequency-modulated signal, 4,166,251, Cl. 329-132.000.  
Ishikawa, Norikatsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air feeding device for an internal combustion engine, 4,165,611, Cl. 60-290.000.  
Ishimaru, Haruhide: See—  
Kigasawa, Kazuo; Hiiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Isobe, Kenichi; Tsutsui, Tatsuhiko; Ueki, Takao; and Sema, Toru, to Lion Dentrifice Co., Ltd. The Nail enamel composition and manufacturing method thereof, 4,166,110, Cl. 424-61.000.  
Isotrol Systems: See—  
Schwab, Ardath M., 4,166,195, Cl. 174-95.000.  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, to Canon Kabushiki Kaisha. Camera with exposure control device, 4,165,929, Cl. 354-38.000.  
Ito, Masaru: See—  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.  
Ito, Tadashi: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.  
Ito, Tetsuro: See—  
Taguchi, Yoshinobu; Harigane, Kotaro; and Ito, Tetsuro, 4,165,557, Cl. 29-566.300.  
Ito, Thomas I.: See—  
Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.  
Ive, John G. S.: See—  
Thirlwall, Alan C.; and Ives, John G. S., 4,166,271, Cl. 340-146.200.  
J. C. Sales & Mfg., Inc.: See—  
Pesiri, James B., 4,165,900, Cl. 297-369.000.  
J. G. Anschutz GmbH: See—  
Jaedicke, Ludwig; and Straub, Dieter, 4,165,730, Cl. 124-67.000.  
J. M. Voith GmbH: See—  
Musselmann, Walter; and Rienecker, Reimund, 4,165,841, Cl. 241-46.020.  
Jackson, Warren M. Machine for washing and drying parts, 4,165,994, Cl. 134-104.000.  
Jacob, Charles W.: See—  
Hetra, Andrew A., Jr.; and Jacob, Charles W., 4,165,866, Cl. 266-228.000.  
Jacobs, Lawrence O., to Plastic Products, Inc. Pleated draw drape, 4,165,779, Cl. 160-348.000.  
Jacobson, Allan J.: See—  
Chianelli, Russell R.; Jacobson, Allan J.; and Whittingham, M. Stanley, 4,166,160, Cl. 429-218.000.



Jacquet, Bernard; Papantoniou, Christos; Dufauré, Pierre; and Mahieu, Claude, to L'Oréal. Anti-solar polymers, method of making the same and cosmetic compositions containing the same. 4,166,109, Cl. 424-59.000.

Jaedicke, Ludwig; and Straub, Dieter, to J. G. Anschutz GmbH. Spring support in a compressed air firearm. 4,165,730, Cl. 124-67.000.

Jagenberg Werke Aktiengesellschaft: See—  
Wedig, Walter; and Kramer, Ernst-Otto, 4,165,843, Cl. 242-66.000.

Jahnke, Richard W., to Lubrizol Corporation. The. Novel corrosion-inhibiting ester compositions. 4,166,131, Cl. 428-457.000.

Jamieson, William B.: See—

Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,166,123, Cl. 424-273.00P.

Janning, John L., to NCR Corporation. Liquid crystal alignment structure. 4,165,923, Cl. 350-341.000.

Janz, Joachim; and Mentzel, Bodo, to Gebr. Happich GmbH. Arm rest with recessed ashtray, for motor vehicles, or the like. 4,165,898, Cl. 296-153.000.

Jaremczuk, Piotr: See—

Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Bruszewski, Stanislaw; and Koczela, Krzysztof, 4,165,867, Cl. 266-252.000.

Jarosz, Wojciech: See—

Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Bruszewski, Stanislaw; and Koczela, Krzysztof, 4,165,867, Cl. 266-252.000.

Jarowenko, Wadym: See—

Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,166,173, Cl. 536-109.000.

Jaudt, Andreas. Bucket wheel sluice having pressurized discharge. 4,165,822, Cl. 222-636.000.

Jencks, David C.: See—

Jencks, Hollis W.; and Jencks, David C., 4,166,262, Cl. 335-251.000.

Jencks, Hollis W.; and Jencks, David C., to Detroit Coil Company. Solenoid. 4,166,262, Cl. 335-251.000.

Jennison, James S., to Riley Brothers, Inc. Multi-container package. 4,165,812, Cl. 215-10.000.

Jimmy Dean Meat Company, Inc., The: See—

Bernard, Vincent E., 4,165,818, Cl. 222-53.000.

Johannsen, Roloff: See—

Sedlack, Hans-Harald; Johannsen, Roloff; and Seiler, Friedrich-Robert, 4,166,106, Cl. 424-12.000.

Johansson, Hans A. V. Disposable washing implement for personal body care. 4,165,942, Cl. 401-132.000.

John, Philip J.: See—

Cline, Lee S.; and John, Philip J., 4,166,087, Cl. 261-96.000.

Johnson, Arthur R., deceased; and Hudon, Paul A., administrator, to Preston Engravers, Inc. Apparatus for synchronizing advance of web and rotational speed of bucket or like method. 4,165,666, Cl. 83-313.000.

Johnson, Lavell R., to Becton, Dickinson and Company. Immobilized immunoadsorbent. 4,166,102, Cl. 424-1.000.

Johnson, Matthey & Co., Limited: See—

Bourne, Alan A.; and Knapton, Arthur G., 4,165,983, Cl. 75-172.00R.

Johnson, Melissa C. Catheter tube holder. 4,165,748, Cl. 128-348.000.

Johnson, Richard A., to Halcon Research & Development Corporation. Extractive recovery of trivalent thallium values from aqueous solutions. 4,166,097, Cl. 423-112.000.

Johnston, Jesse C., Jr., to Diamond Power Specialty Corporation. Soot blower drive mechanism. 4,165,552, Cl. 15-312.00R.

Jolly, Jean: See—

Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,166,063, Cl. 260-343.30R.

JOMA-Maschinenbau Karl Jost: See—

Zivkovic, Milorad M., 4,165,819, Cl. 222-61.000.

Jorgensen, Allen R.: See—

Leanna, Dale D.; and Jorgensen, Allen R., 4,165,688, Cl. 101-207.000.

Joselevich, Eduardo J. Advertising or decorative sign for representing images. 4,165,576, Cl. 40-452.000.

Jos. Schlitz Brewing Company: See—

Westermann, Donald H.; and Huige, Nicolaas J., 4,166,141, Cl. 426-422.000.

Judeinstein, Andre J., to International Standard Electric Corporation. Recirculating optical delay line. 4,166,212, Cl. 250-199.000.

Julius Blum Gesellschaft m.b.H.: See—

Rock, Erich; and Mages, Bernhard, 4,165,907, Cl. 308-3.800.

Junger, Hans: See—

Weissenfels, Franz; and Junger, Hans, 4,166,162, Cl. 521-100.000.

Jureit, John C.; and Kushner, Benjamin H., to Automated Building Components, Inc. Connector plate. 4,165,672, Cl. 85-13.000.

Jutras, Gilles: See—

Cloutier, Michel; Doucet, Yves; Jutras, Gilles; and Gagne, Pierre, 4,165,565, Cl. 33-174.00T.

Kabushiki Kaisha Komatsu Seisakusho: See—

Nakada, Toshio; and Ikeoka, Naoki, 4,165,685, Cl. 100-282.000.

Kabushiki Kaisha Suwa Seikosha: See—

Tezuka, Chikao, 4,165,687, Cl. 101-93.010.

Kageyama, Hidehei; and Suzuki, Takahiko, to Kotobuki & Co. Ltd. Mechanical pencil. 4,165,941, Cl. 401-31.000.

Kaimann, Walter; and Brachthausen, Karl-Heinz, to Projektierung Chemische Verfahrenstechnik GmbH. Apparatus for the gasification of carbonaceous material. 4,165,971, Cl. 48-77.000.

Kakimoto, Morio: See—  
Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, 4,166,174, Cl. 542-401.000.

Kalenda, Norman W.: See—  
Green, James A. II; and Kalenda, Norman W., 4,165,987, Cl. 96-119.00R.

Kalinenko, Ruf A.: See—  
Nemetkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B.; deceased; and Chervoneva, Ljudmila A., administratrix, 4,166,025, Cl. 208-126.000.

Kanebo, Ltd.: See—  
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,165,556, Cl. 28-162.000.

Kao Soap Co., Ltd.: See—  
Nishimura, Masaaki; and Arai, Haruhiko, 4,166,048, Cl. 252-546.000.

Karoly, Gabriel; and Gajewski, Vincent J., to M & T Chemicals Inc. Compositions for preparing elastomeric urethane/urea block copolymers. 4,166,042, Cl. 252-182.000.

Kashio, Toshio, to Casio Computer Co. Ltd. Electronic timepiece. 4,165,605, Cl. 58-24.00R.

Kashiwagi, Midori: See—  
Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, 4,166,113, Cl. 424-177.000.

Kass, Ely: See—  
Weissman, Jerry; and Kass, Ely, 4,165,714, Cl. 119-158.000.

Kastle Gesellschaft m.b.H.: See—  
Nussbaumer, Wolfgang, 4,165,886, Cl. 280-604.000.

Kato, Hideo; Koshinaka, Eiichi; and Ogawa, Nobuo, to Hokuriku Pharmaceutical Co., Ltd. 2-Arylpiperazine derivatives and the preparation thereof. 4,166,180, Cl. 544-398.000.

Kato, Yutaka: See—  
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,165,604, Cl. 58-23.0BA.

Katoh, Koshi: See—  
Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.

Kaufman, Jacquelyn: See—  
Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.

Kaukenen, Joseph Y.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukenen, Joseph Y., 4,165,984, Cl. 96-1.0PE.

Kayama, Kunifusa: See—  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kouosuke, 4,165,937, Cl. 356-319.000.

Keen, Ronald W., to National Mine Service Company. Material gathering device. 4,165,803, Cl. 198-515.000.

Kemprowski, Walter S.: See—  
Pichon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.

Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung: See—  
Protic, Davor; and Riepe, Georg, 4,166,218, Cl. 250-370.000.

Kerry, John C.; and Weighton, David M., to Boots Company Limited. The. Pesticidal compositions. 4,166,130, Cl. 424-326.000.

Kertscher, Eberhard, to Maillefer S.A. Apparatus for manufacturing electric wire having wire-enamel-type insulation. 4,165,957, Cl. 425-113.000.

Ketola, Warren D.: See—  
Baker, William A.; and Ketola, Warren D., 4,166,152, Cl. 428-522.000.

Khodin, Anatoly I.: See—  
Afanasjuk, Ivan N.; Grabovsky, Viktor V.; Kliot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.

Khomyakova, Ljudmila G.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.

Khranov, Alexandr E.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.

Kichina, Faina I.: See—  
Dokunikhin, Nikolai S.; Vorozhtsov, Georgy N.; Kichina, Faina I.; and Feldblum, Nikolai B., 4,166,181, Cl. 546-31.000.

Kidde Consumer Durables, Corp.: See—  
Belinkoff, Irving R., 4,165,681, Cl. 99-280.000.

Kigasawa, Kazuo; Hiragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, to Grelan Pharmaceutical Co., Ltd. 2-Oxophenylbutanoic acid derivatives. 4,166,125, Cl. 424-274.000.

Kim, Leo: See—  
Wald, Milton M.; and Kim, Leo, 4,166,189, Cl. 560-232.000.

Kimball, Stephen F., III; and Palmer, Lewis H., III, to GTE Sylvania Incorporated. Filament lead-in support for tungsten halogen capsule for headlight. 4,166,232, Cl. 313-316.000.

Kimberly-Clark Corporation: See—  
Dunning, Charles E.; Lloyd, William D.; and Bicho, Joseph G., 4,166,001, Cl. 162-111.000.

King, David L., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,165,976, Cl. 71-88.000.

King, Ronald J.; and White, George R., to Smith Kline & French Laboratories Limited. 2H-imidazole-2-thione derivatives. 4,166,184, Cl. 548-321.000.

King-Seely Thermos Co.: See—  
Beck, Willi K., 4,166,268, Cl. 337-309.000.

Kirsch, Jerry. Horizontally and vertically adjustable mirror mounting. 4,165,921, Cl. 350-288.000.

Klein, Gerald B. Baiting hook with barbed connector. 4,165,578, Cl. 43-44.800.

Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased (by Vinzelberg, Selma Margot, heir); Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, to Bayer Aktiengesellschaft. Process for delivering cylindrical containers to machines for further processing. 4,165,809, Cl. 414-104.000.

Klein, Howard P., to Texas Development Corporation. Production of polyether polyol compositions. 4,166,172, Cl. 536-4.000.

Klein nee Vinzelberg, Susanne, heir: See—  
Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.

Kleine, Charles A.: See—  
Middleton, Verne L.; and Kleine, Charles A., 4,165,733, Cl. 126-420.000.

Kling, Gary W.; and Swanson, Scott C., to Hycel, Inc. Selective test selection and indicator means in an automatic chemical testing apparatus. 4,166,095, Cl. 422-67.000.

Kliot, July M.: See—  
Afanasjuk, Ivan N.; Grabovsky, Viktor V.; Kliot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.

Kluytmans, P. H. Sea-going craft. 4,165,701, Cl. 114-61.000.

Knapp, Frank. Animal spray. 4,165,715, Cl. 119-159.000.

Knapton, Arthur G.: See—  
Bourne, Alan A.; and Knapton, Arthur G., 4,165,983, Cl. 75-172.00R.

Knox, Lloyd C.: See—  
Sullaway, Bob L.; and Knox, Lloyd C., 4,165,891, Cl. 285-18.000.

Knyazev, Vladimir M.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.

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Yonezawa, Toshiya; and Kobayashi, Katsuyoshi, 4,165,964, Cl. 432-59.000.

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Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Ideo, 4,166,079, Cl. 525-208.000.

Kobayashi, Yuichi: See—  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,166,188, Cl. 560-122.000.

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Azumada, Koichi; and Kobori, Michio, 4,165,992, Cl. 106-210.000.

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Malburg, Anton; and Koch, Friedrich, 4,165,958, Cl. 425-119.000.

Kochi, Hiromu: See—  
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Koczela, Krzysztof: See—  
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Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, 4,166,128, Cl. 424-319.000.

Kodama, Shun-ichi: See—  
Hisasue, Michio; and Kodama, Shun-ichi, 4,166,165, Cl. 526-87.000.

Koehring Company: See—  
Bernhoff, Gerald W.; and Limbach, Thomas J., 4,165,613, Cl. 60-420.000.

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Fallon, John L.; Kollar, Ernest P.; and Mares, Fred R., 4,165,870, Cl. 271-10.000.

Komaroff, Ivan; and Schatz, Viktor, to Robert Bosch GmbH. Method of testing fuel-injector spray nozzles. 4,165,635, Cl. 73-119.00A.

Komuro, Keiji: See—  
Ueda, Akio; and Komuro, Keiji, 4,166,083, Cl. 260-33.6AQ.

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Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, 4,166,067, Cl. 260-453.00P.

Konishiroku Photo Industry Co., Ltd.: See—  
Sakurai, Kunio, 4,166,148, Cl. 428-332.000.

Kooman, Willem H., to U.S. Philips Corporation. Force measuring device. 4,165,637, Cl. 73-141.00A.

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Becker, Joseph, Jr., 4,166,007, Cl. 202-262.000.

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Kato, Hideo; Koshinaka, Eiichi; and Ogawa, Nobuo, 4,166,180, Cl. 544-398.000.

Kotobuki & Co. Ltd.: See—  
Kageyama, Hidehei; and Suzuki, Takahiko, 4,165,941, Cl. 401-31.000.

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Belcher, Richard A.; and Kozacka, Frederick J., 4,166,267, Cl. 337-163.000.

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Wedig, Walter; and Kramer, Ernst-Otto, 4,165,843, Cl. 242-66.000.

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Kraska, Allen R., to Pfizer Inc. Antiviral amine derivatives of glycerol and propanediols. 4,166,132, Cl. 424-330.000.

Kratzer, Reinhold H.: See—  
Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.

Krause, Franz: See—  
Besenbruch, Alex; and Krause, Franz, 4,165,662, Cl. 82-4.00A.

Kreisel, Torsten: See—  
Weber, Gerhard; Peters, Siegfried; Kunzel, Jürgen; and Kreisel, Torsten, 4,165,632, Cl. 73-55.000.

Kreucher, David L.: See—  
Wasco, Anthony, Jr.; and Kreucher, David L., 4,165,661, Cl. 82-2.00R.

Kruger, Dirk-Torsten: See—  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spenner, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.

Kruncos, Francis E.: See—  
Fitzner, Arthur O.; and Kruncos, Francis E., 4,165,727, Cl. 123-179.00B.

Kuhl, Burkhardt: See—  
Hermann, Walter; Kuhl, Burkhardt; and Schuck, Wolf-Dieter, 4,166,259, Cl. 333-236.000.

Kuhn, Wilhelm: See—  
Bunnenberg, Claus; and Kuhn, Wilhelm, 4,166,217, Cl. 250



Lambert Corporation: See—  
Yeager, Robert R.; and Shaner, Ronald E., 4,165,697, Cl. 111-92.000.  
Lane, Lloyd L., to Deere & Company. Blower assembly. 4,165,953, Cl. 417-350.000.  
Lang, Gary E.: See—  
Lang, Roger J.; and Lang, Gary E., 4,165,559, Cl. 29-629.000.  
Lang, Roger J.; and Lang, Gary E., to Eltra Corporation. Re-formable multi-conductor flat cable. 4,165,559, Cl. 29-629.000.  
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Larsen, Richard J.: See—  
Hatch, Donald M.; and Larsen, Richard J., 4,166,145, Cl. 428-283.000.  
Laser Precision Corporation: See—  
Doyle, Walter M., 4,165,938, Cl. 356-346.000.  
Lattion, Andre, to Rieter Machine Works, Ltd. Apparatus for waxing yarn using solid wax on a textile machine. 4,165,603, Cl. 57-296.000.  
Laubie, Michel: See—  
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,166,117, Cl. 424-251.000.  
Laudig, Ronald C., to AMP Incorporated. Rotating collar lock connector for a coaxial cable. 4,165,911, Cl. 339-89.000.  
La Via, Anthony L.: See—  
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,166,051, Cl. 260-174CL.  
Lawrie, Eugene G.: See—  
Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.  
Lawson, Neil, to Dunlop Limited. Apparatus for winding helical reinforcement into a polymeric tube. 4,166,000, Cl. 156-425.000.  
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Afanasyuk, Ivan N.; Grabovsky, Viktor V.; Kliot, July M.; Lebedeva, Larisa M.; and Khodin, Anatoly I., 4,165,781, Cl. 164-181.000.  
Lechner, Franz: See—  
Fauth, Gunter; Lermann, Peter; Muller, Herbert; and Lechner, Franz, 4,165,931, Cl. 354-86.000.  
Lee, Gim F., Jr., to General Electric Company. Composition of a polyphenylene ether, a block copolymer of a vinyl aromatic compound and a conjugated diene and a polyolefin. 4,166,058, Cl. 260-30.60R.  
Leff, Ruth B. Communication aid. 4,165,890, Cl. 283-7.000.  
Legory, John E.: See—  
York, Kenneth L.; Annal, Peter R.; and Legory, John E., 4,166,211, Cl. 235-312.000.  
Lehmann, Wolfgang; Troemel, Gerhard; Ley, Kurt; and Muller, Friedrich, to Bayer Aktiengesellschaft. Polyamines containing acid groups that are useful in papermaking. 4,166,002, Cl. 162-164.00R.  
Lehtovaara, Ritva M. Self-adjusting drive shaft for barbecue grid. 4,165,731, Cl. 126-25.0AA.  
Leikkanen, Henry E.: See—  
Virk, Kashmir S.; and Leikkanen, Henry E., 4,165,721, Cl. 123-119.00A.  
Lemburg, Jörn-Uwe: See—  
Seaborn, Paul; and Lemburg, Jörn-Uwe, 4,165,767, Cl. 140-105.000.  
Lemelson, Jerome H. Continuous molding apparatus. 4,165,960, Cl. 425-145.000.  
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Ramsteck, Wolfgang, 4,166,035, Cl. 210-231.000.  
Lermann, Peter: See—  
Fauth, Gunter; Lermann, Peter; Muller, Herbert; and Lechner, Franz, 4,165,931, Cl. 354-86.000.  
Levitsky, Emmanuil A.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
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Lewis, Walter C.: See—  
Bowden, Wade R., Jr.; and Lewis, Walter C., 4,165,851, Cl. 248-57.000.  
Ley, Kurt: See—  
Lehmann, Wolfgang; Troemel, Gerhard; Ley, Kurt; and Muller, Friedrich, 4,166,002, Cl. 162-164.00R.  
Lezatte, Arthur J.; and Piotrowski, Peter J., to Pepsico, Inc. Golf club shaft and set of golf clubs. 4,165,874, Cl. 273-77.00A.  
Licina, George J.: See—  
Roy, Prodyot; and Licina, George J., 4,166,019, Cl. 204-195.00S.

Life Savers, Inc.: See—  
Witzel, Frank; Clark, K. Warren; and Bakal, Abraham I., 4,166,134, Cl. 426-3.000.  
Lilly Industries Limited: See—  
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,166,123, Cl. 424-273.00P.  
Limbach, Thomas J.: See—  
Bernhoft, Gerald W.; and Limbach, Thomas J., 4,165,613, Cl. 60-420.000.  
Lion Dentrifice Co., Ltd., The: See—  
Isobe, Kenichi; Tsutsui, Tatsuhiro; Ueki, Takao; and Sema, Toru, 4,166,110, Cl. 424-61.000.  
Lipe, Gordon C.: See—  
Weinstein, Burton A.; and Lipe, Gordon C., 4,165,889, Cl. 280-626.000.  
Lipp, Robert J. Monolithic CMOS digital temperature measurement circuit. 4,165,642, Cl. 73-362.05C.  
Little, Robert T. Adjustable optical filter. 4,165,919, Cl. 350-273.000.  
Litton Systems, Inc.: See—  
Buck, Ronald G., 4,166,137, Cl. 426-243.000.  
Livingston, Frank E.: See—  
Satterly, Kenneth P.; and Livingston, Frank E., 4,166,056, Cl. 260-31.600.  
Ljubushko, Galina I.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushkevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Lloyd, Samuel H., III, and Goren, Yoram, to Santa Fe International Corporation. Method of constructing a twin helled, column stabilized, semi-submersible derrick barge. 4,165,702, Cl. 114-65.00R.  
Lloyd, William D.: See—  
Dunning, Charles E.; Lloyd, William D.; and Bicho, Joseph G., 4,166,001, Cl. 162-111.000.  
Lockheed Electronics Company, Inc.: See—  
Fitch, Arthur H., 4,165,913, Cl. 350-96.150.  
Loft Modular Devices, Inc.: See—  
Roberts, John H., 4,166,245, Cl. 324-103.00P.  
Long, Scott B.: See—  
Reichen, John E.; and Long, Scott B., 4,166,200, Cl. 200-11.00R.  
L'Oreal: See—  
Jacquet, Bernard; Papanitiou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,166,109, Cl. 424-59.000.  
Lotsch, Wolfgang, to BASF Aktiengesellschaft. Manufacture of organic pigments. 4,166,179, Cl. 344-296.000.  
Lubrizol Corporation, The: See—  
Jahnke, Richard W., 4,166,151, Cl. 428-457.000.  
Lubuskie Zaklady Termotechniczne: See—  
Has, Zdzislaw; Gramsz, Jerzy; Jarosz, Wojciech; Jaremczuk, Piotr; Brzuszewski, Stanislaw; and Koczel, Krzysztof, 4,165,867, Cl. 266-252.000.  
Lucas Industries Limited: See—  
George, Michael; Brotherton, Colin P.; and Sosnowski, Stanislaw J. A., 4,165,725, Cl. 123-139.0AL.  
Hoyle, Brian, 4,166,203, Cl. 200-61.270.  
Warner, Peter S.; and Bicht, John R., 4,165,794, Cl. 180-65.00R.  
Lucien Ferraz & Cie: See—  
Guglielmo, Jean, 4,166,227, Cl. 310-242.000.  
Ludwig, Frank A., to Ford Motor Company. Secondary battery or cell with pyrolytic graphite coated graphite current collector. 4,166,156, Cl. 429-104.000.  
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Gehauf nee Kiesel, Liselotte; Eberhardt, Heinrich; and Gailing, Rolf W., 4,165,620, Cl. 62-256.000.  
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Lugstenmann, Curt A., deceased; and Capdevilla nee Lugstenmann, Franziska S., heir, to Supla Etablissement. Method for the manufacture of a shaping mask for an electroerosion tool. 4,166,011, Cl. 204-4.000.  
Lycan, Goodwin A. Offset gaging device incorporating a depth measure for bores or shoulders. 4,165,566, Cl. 33-174.00R.  
Lyemance, Bentford C. Chimney damper arrangement. 4,165,679, Cl. 98-59.000.  
Lynch, Frank, to Honeywell Inc. Digital frequency-lock circuit. 4,166,249, Cl. 328-155.000.  
Lynch, Thomas E.; Eastman, David P.; and Price, Richard P., to Gould Inc. Hybrid automobile. 4,165,795, Cl. 180-65.00A.  
M & T Chemicals Inc.: See—  
Bossert, Emily C.; Silverstein, Irwin B.; and Berger, Abe, 4,166,053, Cl. 260-18.00S.  
Karoly, Gabriel; and Gajewski, Vincent J., 4,166,042, Cl. 252-182.000.  
Ma, Raymond: See—  
Dyste, Ardell T.; and Ma, Raymond, 4,165,912, Cl. 339-156.00T.  
Machlett Laboratories, Inc., The: See—  
Braun, Martin, 4,166,231, Cl. 313-60.000.  
Maciulaitis, Vytautas K.; and Dhanani, Rasikant R., to Crane Co. Seal assembly. 4,165,859, Cl. 251-173.000.  
Mackay, Donald B., to Billings Energy Corporation. Hydride storage and heat exchanger system and method. 4,165,569, Cl. 34-15.000.  
Mages, Bernhard: See—  
Rock, Erich; and Mages, Bernhard, 4,165,907, Cl. 308-3.800.

Magna-Graphics Corporation: See—  
Leanna, Dale D.; and Jorgensen, Allen R., 4,165,688, Cl. 101-207.000.  
Magnat Corp.: See—  
Mengel, William R., 4,165,842, Cl. 242-58.300.  
Maher, Phillip K.: See—  
McDaniel, Carl V.; Maher, Phillip K.; and Pilato, Joseph M., 4,166,099, Cl. 423-329.000.  
Mahieu, Claude: See—  
Jacquet, Bernard; Papanitiou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,166,109, Cl. 424-59.000.  
Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., to Westinghouse Electric Corp. Stored energy circuit breaker. 4,166,205, Cl. 200-153.00G.  
Maillefer S.A.: See—  
Kertscher, Eberhard, 4,165,957, Cl. 425-113.000.  
Mainvielle, Christian, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Material gripping device. 4,165,811, Cl. 414-412.000.  
Malburg, Anton; and Koch, Friedrich, to Desma-Werke GmbH. Apparatus for injection molding of shoe soles. 4,165,958, Cl. 425-119.000.  
Malof, Adrien P.: See—  
Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.  
Mannesmann A.G.: See—  
Kolb, Gustav, 4,165,995, Cl. 136-234.000.  
Mao, George W.; Rao, Purushothama; and Trenter, James F., to Gould Inc. Maintenance-free battery. 4,166,155, Cl. 429-82.000.  
Mares, Fred R.: See—  
Fallon, John L.; Kollar, Ernest P.; and Mares, Fred R., 4,165,870, Cl. 271-10.000.  
Margrave, John L.: See—  
Goodwin, George I.; Margrave, John L.; and Wagner, Robert E., 4,165,974, Cl. 65-26.000.  
Marine Construction & Design Co.: See—  
Svendsen, Robert A., 4,165,830, Cl. 226-187.000.  
Marks, George R., to Sierra Designs. Arch supported tent. 4,165,757, Cl. 135-1.00R.  
Marsch, James E.; and Quick, David C., to Allis-Chalmers Corporation. Pivotal support for vehicle drive line having three universal joints. 4,165,793, Cl. 180-233.000.  
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Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., to Raytheon Company. Corn popper with butter dispenser. 4,166,208, Cl. 219-10.55E.  
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Martinez, Ginez. Muffler for internal combustion engine. 4,165,798, Cl. 181-268.000.  
Maruzen Oil Co., Ltd.: See—  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.  
Marvy, Jean-Francois, to Dunlop Limited. Vehicle wheels. 4,165,776, Cl. 152-381.100.  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, to Hitachi, Ltd. Fan having forward-curved blades. 4,165,950, Cl. 416-178.000.  
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: See—  
Meinke, Peter; and Flachenecker, Gerhard, 4,166,261, Cl. 335-246.000.  
Masco Corporation of Indiana: See—  
Good, Arthur L.; and Hoopes, Philip K., 4,165,885, Cl. 280-446.00B.  
Mashimo, Yukio: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.  
Mason, Stanley I., Jr. Cooking utensil kit. 4,165,855, Cl. 249-102.000.  
Massachusetts Institute of Technology: See—  
Pober, Richard L., 4,166,159, Cl. 429-193.000.  
Mastrocola, Antonietta R.; and Webb, Robert L., to SmithKline Corporation. Use of cyclic esters to prepare 2,3-dichloro-4-(2-thenoyl)-phenoxyacetic acid. 4,166,061, Cl. 549-72.000.  
Masugi, Takashi: See—  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,166,115, Cl. 424-246.000.  
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Mathews, John D. Slot machine coin guide. 4,165,802, Cl. 194-1.00K.  
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Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, to Canon Kabushiki Kaisha. Camera having a holographic indicator. 4,165,930, Cl. 354-53.000.  
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Tsushima, Susumu; Sendai, Michiyuki; Shiraiishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.  
Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Decompressing device to be

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Matsumura, Shoji. Safety device of the friction ratchet type operable on extinction of gas flame. 4,165,962, Cl. 431-83.000.  
Matsumura, Susumu: See—  
Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, 4,165,930, Cl. 354-53.000.  
Matsushita Electric Industrial Co., Ltd.: See—  
Meki, Norio; and Yoshino, Tadashi, 4,166,250, Cl. 328-165.000.  
Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaki, 4,165,961, Cl. 431-1.000.  
Matt, Timothy S., to Nordson Corporation. Digital control system for automatically compensating for conveyor movement changes. 4,166,246, Cl. 328-5.000.  
Mattem, Alfred, to Siemens Aktiengesellschaft. Process for operating sub-zones of a digital T.D.M. telecommunications network for long distance traffic. 4,166,198, Cl. 179-15.0BA.  
Mattor, John A.; and Price, Lawrence, to Scott Paper Company. Release sheet with dried and cured coating composition. 4,166,150, Cl. 428-352.000.  
Mayer, Paul C.: See—  
Fethke, Wayne G.; and Mayer, Paul C., 4,165,805, Cl. 206-349.000.  
McArthur, Barrie: See—  
Riley, Robert E., Jr.; and McArthur, Barrie, 4,166,273, Cl. 340-539.000.  
McCabe, Francis J. Multi-punch, multi-die assembly for stamping hook-shaped damper hinge members. 4,165,629, Cl. 72-325.000.  
McCall, John M.; and TenBrink, Ruth E., to Upjohn Company. The 1-Alkoxyethanol-isochromans, -isothiochromans, -2-benzoxepins, and -2-benzothiepins. 4,166,062, Cl. 260-333.000.  
McCarthy, Carolann L.: See—  
McCarthy, Daniel F.; and McCarthy, Carolann L., 4,165,993, Cl. 134-21.000.  
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McConnell, Anthony D.: See—  
Lewis, Herbert I.; Price, William M.; and McConnell, Anthony D., 4,165,840, Cl. 241-20.000.  
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McGinniss, Vincent D., to SCM Corporation. Process for cathodic electrocoating and photocuring. 4,166,017, Cl. 204-181.00C.  
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Morehouse, Thomas P., 4,165,653, Cl. 73-722.000.  
McLaughlin, Rita E. Head covering. 4,165,542, Cl. 2-209.100.  
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Meki, Norio; and Yoshino, Tadashi, to Matsushita Electric Industrial Co., Ltd. Synchronizing signal processing circuit. 4,166,250, Cl. 328-165.000.  
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Mentzel, Bodo: See—  
Janz, Joachim; and Mentzel, Bodo, 4,165,898, Cl. 296-153.000.  
Merck & Co., Inc.: See—  
Cragoe, Edward J., Jr.; Smith, Robert L.; and Stokker, Gerald E., 4,166,177, Cl. 544-2.000.  
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Hermann, Walter; Kuhl, Burkhardt; and Schuck, Wolf-Dieter, 4,166,259, Cl. 333-236.000.  
Messler, Societe Anonyme: See—  
Girard, Edmond, 4,165,619, Cl. 62-99.000.  
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- Michaels, Sheldon B.; Philbrick, Otis; and Morris, Jeffrey, to Digital Marine Electronics Corporation. Loran receiver system. 4,166,275, Cl. 343-103.000.
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- Middleton, Joseph F.: See—  
Pille, Terence W. J.; Smith, Ronald A.; and Middleton, Joseph F., 4,165,595, Cl. 53-556.000.
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- Miller, John A.; Beadles, Murray L.; and Drummond, Roger O., to United States of America, Agriculture. Sustained release bolus formulations containing insect growth regulators for control of livestock pests. 4,166,107, Cl. 424-19.000.
- Miller, Richard; Reich, Murray H.; and Kuntz, Emma, to Princeton Chemical Research, Inc. Molded golf balls exhibiting isometric compression. 4,165,877, Cl. 273-218.000.
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Wennerstrom, Edward A.; Brown, James S., Sr.; and Milligan, William E., 4,165,549, Cl. 15-88.000.
- Milco Manufacturing Company: See—  
Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., 4,165,901, Cl. 297-417.000.
- Milton, A. Fenner: See—  
Villarruel, Carl A.; and Milton, A. Fenner, 4,165,914, Cl. 350-96.160.
- Minkov, Juri V.; and Solomonenko, Vladimir I. Read amplifier for integrated-circuit storage device. 4,166,225, Cl. 307-355.000.
- Minnesota Mining and Manufacturing Company: See—  
Baker, William A.; and Ketola, Warren D., 4,166,152, Cl. 428-522.000.
- Graham, Robert K., 4,166,255, Cl. 351-160.00H.
- Lange, Roger W.; and Sowman, Harold G., 4,166,147, Cl. 428-328.000.
- Minolta Camera Kabushiki Kaisha: See—  
Nakamura, Akiyoshi, 4,165,916, Cl. 350-215.000.
- Nakatani, Keiji, 4,166,239, Cl. 318-266.000.
- Tsumazawa, Hiroyuki, 4,165,926, Cl. 352-27.000.
- Miraldi, Peter: See—  
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- Mitchell, Robert F., to Goodyear Tire & Rubber Company. The Recovery of synthetic polymer from solvents. 4,166,171, Cl. 528-488.000.
- Mitsubishi Denki Kabushiki Kaisha: See—  
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- Watanabe, Eiki; and Tanahashi, Tooru, 4,165,801, Cl. 187-29.00R.
- Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—  
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- Mitsui, Akio: See—  
Miyazako, Takushi; Sakai, Tadao; and Mitsui, Akio, 4,166,050, Cl. 260-8.000.
- Miura, Motoshi. Flying toy. 4,165,580, Cl. 46-74.00R.
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- Miyazawa, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Control systems for pulse width control type inverter. 4,166,247, Cl. 328-69.000.
- Mizoguchi, Hirofumi: See—  
Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, 4,165,839, Cl. 241-4.000.
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Shimizu, Shigehisa; and Mizutano, Shigemitsu, 4,165,665, Cl. 83-287.000.
- Mobil Oil Corporation: See—  
Kuklies, Milton C.; and Orem, William G., 4,165,832, Cl. 229-54.00R.
- Stournas, Stamoulis, 4,166,038, Cl. 252-8.55D.
- Mohrman, Richard C., to Bausch & Lomb Incorporated. Ophthalmic instrument support. 4,165,924, Cl. 351-38.000.
- Moll, Manfred; Delorme, Jean J.; and Weber, Jean C., to Tepral. Process and apparatus for automatically taking samples of beer for analysis. 4,165,643, Cl. 73-421.00B.
- Mondeil, Lucien: See—  
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Buteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 4,166,060, Cl. 260-326.200.
- Montabert, Roger. Hydraulic percussion apparatus. 4,165,788, Cl. 173-17.000.
- Montagnon, Jean R., to Societe Pica. Activated carbon filter having plural layers. 4,166,037, Cl. 210-275.000.
- Montay, Jean-Louis: See—  
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- Moog, Robert A.; and Walborn, Richard M., to Norlin Music, Inc. Parametric adjustment circuit. 4,166,197, Cl. 179-1.00D.
- Moore Products Co.: See—  
Adams, Robert B., 4,165,639, Cl. 73-194.00B.
- Morcov, Paune. Pressure regenerator for increasing of steam, gas, or hot air pressure and rotating steam boiler, with additional equipment. 4,165,615, Cl. 60-685.000.
- Morehouse, Thomas P., to McGraw-Edison Company. Signal ratio indicator. 4,165,653, Cl. 73-722.000.
- Moreno, Isabel L., to Ford Aerospace & Communications Corp. Thermal compensator assembly. 4,165,918, Cl. 350-253.000.
- Moretti, John A.: See—  
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- Morgan, Charles W., to United Foam Corporation. Apparatus for making flat top buns. 4,165,955, Cl. 425-89.000.
- Morgan Construction Company: See—  
Salter, Lowell S., 4,165,881, Cl. 277-152.000.
- Morimoto, Yoshiro, to Nissan Motor Company, Limited. Vehicle deceleration responsive pressure modulating valve and vehicle brake system including the same. 4,165,905, Cl. 303-24.00F.
- Morin, Claude, to Pechiney Ugine Kuhlmann. Process and apparatus for obtaining hot water by use of solar energy. 4,165,732, Cl. 126-419.000.
- Morioka, Masao: See—  
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- Morito, Hisatomo: See—  
Yoshikai, Tatsuki; Morito, Hisatomo; and Tsuboi, Haruhito, 4,165,705, Cl. 114-249.000.
- Moroz, Ella M.: See—  
Vorobiev, Juri K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Boteskov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Kayazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.
- Morris, Earl L.; and Fields, Larry D., to Acorn Engineering Co. Dash-pot mechanism for self-closing plumbing valves. 4,165,857, Cl. 251-54.000.
- Morris, Jeffrey: See—  
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- Morrissey, Joseph H., to International Standard Electric Corporation. Liquid crystal cell. 4,165,922, Cl. 350-341.000.
- Motorola, Inc.: See—  
Bennett, Charles E., 4,165,952, Cl. 417-207.000.
- Fedorowicz, Richard J.; and Cegles, William P., 4,165,607, Cl. 58-50.00R.
- Subramanian, Sundaram, 4,166,257, Cl. 333-151.000.
- Motorola Process Control Inc.: See—  
Raisanen, Walfred R., 4,165,633, Cl. 73-76.000.
- MRC Corporation: See—  
Rude, Edward T., 4,165,656, Cl. 74-129.000.
- Mrusek, Wilfried: See—  
Wengenroth, Hans E.; and Mrusek, Wilfried, 4,165,817, Cl. 220-256.000.
- Muhlich, Albert: See—  
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,165,915, Cl. 350-96.340.
- Mulder, Rudolf: See—  
Wellinga, Kobus; and Mulder, Rudolf, 4,166,124, Cl. 424-273.00R.
- Muller, Friedhelm: See—  
Lehmann, Wolfgang; Troemel, Gerhard; Ley, Kurt; and Muller, Friedhelm, 4,166,002, Cl. 162-164.00R.
- Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, to Bayer Aktiengesellschaft. Novel transparent polyurethane polyureas for lamination of glazing materials. 4,166,149, Cl. 428-339.000.
- Muller, Herbert: See—  
Fauth, Gunter; Lermann, Peter; Muller, Herbert; and Lechner, Franz, 4,165,931, Cl. 354-86.000.
- Muller, Karl-Heinz: See—  
Brandt, Hans-Walter; Schnabel, Gunter; and Muller, Karl-Heinz, 4,165,644, Cl. 73-422.00C.
- Muller, Paul C. Device for the automatic operation of weight driven clocks. 4,165,606, Cl. 58-46.00R.
- Mumford, Richard G.: See—  
Hanway, John E., Jr.; and Mumford, Richard G., 4,166,032, Cl. 210-32.000.
- Munoz, German R. Dismountable tower for interior maintenance of spherical tanks. 4,165,799, Cl. 182-128.000.
- Munson, Michael D.: See—  
Martin, Ernest N.; and Munson, Michael D., 4,165,821, Cl. 222-129.400.
- Murakami, Hiroyasu: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.
- Murakami, Shoji: See—  
Sata, Toshikatsu; Murakami, Shoji; and Murata, Yasuo, 4,166,014, Cl. 204-98.000.
- Muraoka, Teruo: See—  
Ishigaki, Yukinobu; and Muraoka, Teruo, 4,166,251, Cl. 329-132.000.

- Murata, Yasuo: See—  
Sata, Toshikatsu; Murakami, Shoji; and Murata, Yasuo, 4,166,014, Cl. 204-98.000.
- Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, to Hitachi, Ltd. Magneto-optic spectrophotometer. 4,165,937, Cl. 356-319.000.
- Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., to Westinghouse Electric Corp. Storage controller for a digital signal processing system. 4,166,289, Cl. 364-200.000.
- Musselmann, Walter; and Rienecker, Reimund, to J. M. Voith GmbH. Apparatus for separating contaminants from fibrous suspensions. 4,165,841, Cl. 241-46.020.
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Ueno, Yoshio; and Nagami, Akio, 4,165,658, Cl. 74-412.00R.
- Naganawa, Tadahisa: See—  
Torii, Masanori; and Naganawa, Tadahisa, 4,166,085, Cl. 261-72.00R.
- Nagel, George W., to Westinghouse Electric Corp. Automatic flue damper. 4,165,833, Cl. 236-1.00G.
- Nakada, Toshio; and Ikeoka, Naoki, to Kabushiki Kaisha Komatsu Seisakusho. Mechanical link press. 4,165,685, Cl. 100-282.000.
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- Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Objective lens system with close object focusing aberration correction. 4,165,916, Cl. 350-215.000.
- Nakamura, Nobutaka; and Saeki, Yukio, to Sumitomo Durez Company, Ltd. Process for producing acetophenone-modified phenolic resin. 4,166,166, Cl. 528-126.000.
- Nakano, Kenichi: See—  
Fujioka, Yasuo; and Nakano, Kenichi, 4,165,612, Cl. 60-322.000.
- Nakatani, Keiji, to Minolta Camera Kabushiki Kaisha. Roll film drive control arrangement. 4,166,239, Cl. 318-266.000.
- Nakayama, Kenji; and Uchida, Kazuo, to Diesel Kiki, Co., Ltd. Fuel injection nozzle. 4,165,838, Cl. 239-533.300.
- Nametkin, Nikolai S.; Fedorov, Viktor V.; Feigin, Evgeny A.; Kalinenko, Ruf A.; Cherny, Ilya R.; Bocharov, Jury N.; Titov, Vladimir B.; deceased; and by Chervoneva, Ljudmila A., administratrix. Process for purifying aromatic hydrocarbons. 4,166,025, Cl. 208-126.000.
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- Namizaki, Hirofumi: See—  
Susaki, Wataru; and Namizaki, Hirofumi, 4,166,278, Cl. 357-18.000.
- Narayan, Thirumurti: See—  
Cenker, Moses; Narayan, Thirumurti; and Wulff, Harald P., 4,166,164, Cl. 521-129.000.
- National Mine Service Company: See—  
Keen, Ronald W., 4,165,803, Cl. 198-515.000.
- National Research Development Corporation: See—  
Fray, Derek J., 4,166,009, Cl. 204-1.00T.
- Fray, Derek J.; and Gee, Robert, 4,166,013, Cl. 204-61.000.
- National Starch and Chemical Corporation: See—  
Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,166,173, Cl. 536-109.000.
- National Utilities Corporation: See—  
Gould, Joseph B., 4,165,621, Cl. 63-1.00R.
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Janning, John L., 4,165,923, Cl. 350-341.000.
- Neefe, Charles W. Method of making high quality plastic lenses. 4,165,088, Cl. 264-1.000.
- Neel, Emmanuel E. A.; Deflin, Michel; Vanreterghem, Jacques; and Clement, Jean-Claude. Process of the preparation of a hydrogen-rich gas and the catalyst used in the process. 4,166,101, Cl. 423-656.000.
- Negishi, Akira: See—  
Kondo, Kiyoshi; Negishi, Akira; and Sugimoto, Kikuo, 4,166,064, Cl. 260-347.400.
- Negola, Edward J.; and Brown, Jerald. Method and apparatus for treatment of yarn in package form. 4,165,623, Cl. 68-5.00C.
- Neilsen, Hilda L., to Rolodex Corporation. Rotary card file. 4,165,575, Cl. 40-379.000.
- Niedecker, Herbert. Process for attaching a hanger loop to a wrapper section closed with a U-shaped clip. 4,165,593, Cl. 53-413.000.
- Niemirrow, Jerzy. Elastic type projecting device. 4,165,729, Cl. 124-17.000.
- Nippon Chemphar Co., Ltd.: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.
- Nippon Kokan Kabushiki Kaisha: See—  
Yoshikai, Tatsuki; Morito, Hisatomo; and Tsuboi, Haruhito, 4,165,705, Cl. 114-249.000.
- Nippon Steel Corporation: See—  
Yonezawa, Toshiya; and Kobayashi, Katsuyoshi, 4,165,964, Cl. 432-59.000.
- Nippon Zeon Co. Ltd.: See—  
Ueda, Akio; and Komuro, Keiji, 4,166,083, Cl. 260-33.6AQ.
- Nippondenso Co., Ltd.: See—  
Yamamoto, Yoshihisa; and Fujitani, Nobuyuki, 4,165,724, Cl. 123-139.0AT.
- Nischk, Gunther: See—  
Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, 4,166,186, Cl. 560-27.000.
- Nishi, Naichi. Presser foot for sewing machine. 4,165,699, Cl. 112-240.000.
- Nishibara, Hazime: See—  
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Ideo, 4,166,079, Cl. 525-208.000.
- Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, to Kanebo, Ltd. Method for manufacturing suede-like artificial leathers. 4,165,556, Cl. 28-162.000.
- Nishikawa, Kazutoshi: See—  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.
- Nishimura, Masaaki; and Arai, Haruhiko, to Kao Soap Co., Ltd. High foaming detergent composition having low skin irritation properties. 4,166,048, Cl. 252-546.000.
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Watanabe, Morio; and Nishimura, Sanji, 4,166,098, Cl. 423-139.000.
- Nissan Motor Company, Limited: See—  
Aoyama, Syunichi, 4,165,722, Cl. 123-119.00A.
- Asano, Masaharu, 4,165,719, Cl. 123-32.0EE.
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- Morimoto, Yoshiro, 4,165,905, Cl. 303-24.00F.
- Nobue, Takaaki: See—  
Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaaki, 4,165,961, Cl. 331-1.000.
- Noetzel, Siegfried, to Hoechst Aktiengesellschaft. Flame-retarding, expandable molding compositions of styrene polymers. 4,166,161, Cl. 521-96.000.
- Nonnemacher, James R.; Regan, Michael T.; and Webster, Frank G., to Eastman Kodak Company. Electrophotographic materials for migration imaging processes. 4,165,985, Cl. 96-1.0PE.
- Nordson Corporation: See—  
Matt, Timothy S., 4,166,246, Cl. 328-5.000.
- Norlin Music, Inc.: See—  
Moog, Robert A.; and Walborn, Richard M., 4,166,197, Cl. 179-1.00D.
- North American Philips Corporation: See—  
Van Roessel, Frederik J., 4,166,237, Cl. 315-370.000.
- North Carolina State University at Raleigh: See—  
Felder, Richard M.; and Ferrell, James K., 4,165,630, Cl. 73-23.000.
- Northern Telecom Limited: See—  
Cielo, Paolo; and Westwood, William D., 4,166,277, Cl. 346-140.00R.
- Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, to University of Hawaii. Cardiotonic agent. 4,166,113, Cl. 424-177.000.
- Nose, Noriyuki: See—  
Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, 4,165,930, Cl. 354-53.000.
- Nose, Taiji: See—  
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,165,741, Cl. 428-207.000.
- Nougarede, Francis: See—  
Despois, Jacques; and Nougarede, Francis, 4,165,945, Cl. 405-55.000.
- Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., to Holcroft and Company. Crucible melting furnace. 4,165,865, Cl. 266-138.000.
- Nozaki, Michio B., to Rheem Manufacturing Company. Hot water heater burner assembly. 4,165,963, Cl. 431-354.000.
- Nunes, Maurice: See—  
Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., 4,165,865, Cl. 266-138.000.
- Nussbaumer, Wolfgang, to Kastle Gesellschaft m.b.H. Cross country ski. 4,165,886, Cl. 280-604.000.
- Nyu, Kiyosato: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.
- O & K Orenstein & Koppel Aktiengesellschaft: See—  
Weigt, Armin, 4,165,674, Cl. 91-178.000.
- Oberkirch, Wolfgang: See—  
Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,166,149, Cl. 428-339.000.
- Odetics, Inc.: See—  
Bartholet, Stephen J., 4,165,636, Cl. 73-141.00R.
- Officine Meccaniche Cigardi S.p.A.: See—  
Giuluzza, Pietro, 4,165,689, Cl. 101-230.000.
- Ogawa, Nobuo: See—  
Kato, Hideo; Koshinaka, Eiichi; and Ogawa, Nobuo, 4,166,180, Cl. 544-398.000.
- Ohmiya, Akio: See—  
Asano, Seiji; and Ohmiya, Akio, 4,165,932, Cl. 354-106.000.
- Ohta, Tetsuro: See—  
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,165,556, Cl. 28-162.000.
- Ohtakara, Yuzo: See—  
Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.
- Oishi, Kounosuke: See—  
Murayama, Seiichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.
- Okada, Kuniaki, to Hitachi Metals, Ltd. Fin pass roll. 4,165,628, Cl. 72-182.000.
- Okamoto, Yoshio: See—  
Masai, Tadahisa; Beppu, Norio; Okamoto, Yoshio; and Nishikawa, Kazutoshi, 4,165,950, Cl. 416-178.000.
- Okamura, Hiroshi: See—  
Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.



Okuno, Youichi: See—  
Matsumoto, Kazuya; Matsumura, Susumu; Nose, Noriyuki; and Okuno, Youichi, 4,165,930, Cl. 354-53.000.

Olander, William C.; Harvey, Douglas J.; and Eddy, David S., to General Motors Corporation. Ignition distributor electrode for suppressing radio frequency interference. 4,166,201, Cl. 200-19.0DR.

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Morin, Claude, 4,165,732, Cl. 126-419.000.

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Lezatte, Arthur J.; and Piotrowski, Peter J., 4,165,874, Cl. 273-77.00A.

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Bednar, Jiri, 4,165,657, Cl. 74-329.000.

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Lynch, Thomas E.; Eastman, David P.; and Price, Richard P., 4,165,795, Cl. 180-65.00A.

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Miller, Richard; Reich, Murray H.; and Kuntz, Emma, 4,165,877, Cl. 273-218.000.

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Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,165,741, Cl. 428-207.000.

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Wise, Rodney M., 4,166,039, Cl. 252-110.000.

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Kaimann, Walter; and Brachthäuser, Karl-Heinz, 4,165,971, Cl. 48-77.000.

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Petrov, Henry G.; and Allen, Robert J., 4,166,143, Cl. 427-115.000.

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Brown, John W., 4,165,920, Cl. 350-276.00R.

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Marsch, James E.; and Quick, David C., 4,165,793, Cl. 180-233.000.

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Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,166,149, Cl. 428-339.000.

Rabito, Thomas G.: See—  
Swigell, John A.; and Rabito, Thomas G., 4,166,058, Cl. 260-38.000.

Racey, Michael J.: See—  
Meeske, Charles J.; Van der Tuin, Enrique H.; and Racey, Michael J., 4,166,054, Cl. 260-23.0EP.

Rademaker, Gerrit, to U.S. Philips Corporation. Electric direct current telegraphy transmitter. 4,166,196, Cl. 178-68.000.

Rader Companies, Inc.: See—  
Smith, William C., 4,166,027, Cl. 209-139.00R.

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Raether, Siegfried, deceased, 4,166,015, Cl. 204-129.750.

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Valent, Philip J.; Atturio, John M.; and Rail, Robert D., 4,165,707, Cl. 114-300.000.

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Ramsey, William S.: See—  
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Ramsteck, Wolfgang, to Lenser Verwaltungs-GmbH. Filter plate for filter press. 4,166,035, Cl. 210-231.000.

Rao, Purushothama: See—  
Mao, George W.; Rao, Purushothama; and Trenter, James F., 4,166,155, Cl. 429-82.000.

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Rauschenfels, Eberhard: See—  
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Rayburn, Charles C.: See—  
Bauer, Robert E.; and Rayburn, Charles C., 4,166,285, Cl. 361-307.000.

Raytheon Company: See—  
Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.

RCA Corporation: See—  
Dischert, Robert A.; and Bendell, Sidney L., 4,166,281, Cl. 358-219.000.

Matsumoto, Yasushi, 4,165,560, Cl. 29-630.00R.

Stanley, Thomas O., 4,166,233, Cl. 313-422.000.

Recaro GmbH & Co.: See—  
Goldner, Walther, 4,165,899, Cl. 297-361.000.

Regan, Michael T.: See—  
Nonnemacher, James R.; Regan, Michael T.; and Webster, Frank G., 4,165,985, Cl. 96-1.0PE.

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Rege, James R.: See—  
White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., 4,166,190, Cl. 562-534.000.

Regie Autonome des Transports Parisiens: See—  
Dubreucq, Jean-Claude, 4,165,850, Cl. 246-182.00B.

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Reich, Murray H.: See—  
Miller, Richard; Reich, Murray H.; and Kuntz, Emma, 4,165,877, Cl. 273-218.000.

Reichen, John E.; and Long, Scott B., to Tektronix, Inc. Compact rotary switch construction. 4,166,200, Cl. 200-11.00R.

Reichhold Chemicals, Inc.: See—  
Meeske, Charles J.; Van der Tuin, Enrique H.; and Racey, Michael J., 4,166,054, Cl. 260-23.0EP.

Reid, Joyce: See—  
Hauck, Frederic P.; and Reid, Joyce, 4,166,183, Cl. 546-101.000.

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Reiter, John J. Switch actuating mechanism. 4,166,202, Cl. 200-44.000.

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Remkes, Elmer R.: See—  
Chang, Nuke M.; and Remkes, Elmer R., 4,165,571, Cl. 37-62.000.

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Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,166,117, Cl. 424-251.000.

Reppert, Merlyn R., to W. R. Grace & Co. Wheel adaptor device. 4,165,904, Cl. 301-9.0DN.

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Rheem Manufacturing Company: See—  
Nozaki, Michio B., 4,165,963, Cl. 431-354.000.

Rhotert, Bernhard, to C. Keller GmbH u. Co. KG. Apparatus for sorting objects. 4,166,029, Cl. 209-518.000.

Ricci, Louis N.: See—  
Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., 4,166,205, Cl. 200-153.00G.

Richards, Marjorie S. Coin holder. 4,165,573, Cl. 40-10.00D.

Richmond, James W., to General Time Corporation. Switch for timer. 4,166,204, Cl. 200-67.00D.

Ridgway, John A.: See—  
Chao, Kwei C.; and Ridgway, John A., 4,166,135, Cl. 426-60.000.

Rieger, Werner. Tire chain. 4,165,775, Cl. 152-243.000.

Riegger, Paul: See—  
Blumenfeld, Georg; and Riegger, Paul, 4,166,075, Cl. 260-650.00R.

Rienecker, Reimund: See—  
Musselmann, Walter; and Rienecker, Reimund, 4,165,841, Cl. 241-46.020.

Riepe, Georg: See—  
Protic, Davor; and Riepe, Georg, 4,166,218, Cl. 250-370.000.

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Rieter Machine Works, Ltd.: See—  
Lattion, Andre, 4,165,603, Cl. 57-296.000.

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Jennison, James S., 4,165,812, Cl. 215-10.000.

Riley, Robert E., Jr.; and McArthur, Barrie, to Diversified Technology, Inc. Intrusion detector system. 4,166,273, Cl. 340-539.000.

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Komarov, Ivan; and Schatz, Viktor, 4,165,635, Cl. 73-119.00A.

Straubel, Max, 4,165,723, Cl. 123-139.0AR.

Roberts, John H., to Loft Modular Devices, Inc. Simultaneous display of multiple characteristics of complex waveforms. 4,166,245, Cl. 324-103.00P.

Robinson, Kenneth R.: See—  
Hughes, Leonard; Robinson, Kenneth R.; and Deviney, Marvin L., Jr., 4,165,969, Cl. 44-51.000.

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Abrahams, Joseph L., 4,165,690, Cl. 102-22.00R.  
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Coombe, Robert D., 4,165,773, Cl. 149-109.600.  
Rodionova, Nina A.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Rogers, Charles D., to United States Steel Corporation. Drilling optimization searching and control apparatus. 4,165,789, Cl. 175-27.000.  
Rollei-Werke Franke & Heidecke: See—  
Schirmacher, Roland, 4,165,928, Cl. 353-117.000.  
Sobotta, Reinhard, 4,165,927, Cl. 353-104.000.  
Rollins, Dallas W.: See—  
Dugge, Richard H.; and Rollins, Dallas W., 4,165,820, Cl. 222-70.000.  
Rolodex Corporation: See—  
Nielsen, Hildaur L., 4,165,575, Cl. 40-379.000.  
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Roper Corporation: See—  
Scanland, Joseph E.; and Fisher, Gerald C., 4,165,597, Cl. 56-295.000.  
Rosen, Melvin H., to Ciba-Geigy Corporation. 1-Benzothiepin-4-carboxamides. 4,166,126, Cl. 424-274.000.  
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Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., 4,166,290, Cl. 364-200.000.  
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Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., 4,166,289, Cl. 364-200.000.  
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Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,166,123, Cl. 424-273.00P.  
Rosseau, Richard D., to FMC Corporation. Rotary brush roll construction. 4,165,551, Cl. 15-179.000.  
Rossi, Louis J.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukenen, Joseph Y., 4,165,984, Cl. 96-1.00PE.  
Roussel Uclaf: See—  
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,166,063, Cl. 260-343.30R.  
Roy, Prodyot; and Licina, George J., to General Electric Company. Electrochemical oxygen meter. 4,166,019, Cl. 204-195.00S.  
Rubens, Roger W.: See—  
Wurzberg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,166,173, Cl. 536-109.000.  
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Rude, Edward T., to MRC Corporation. Multi-mode ratchet indexer. 4,165,656, Cl. 74-129.000.  
Ruder, Joseph M.: See—  
Iles, Thomas L.; and Ruder, Joseph M., 4,165,972, Cl. 55-28.000.  
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Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.  
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Rundzaitis, Alfons, to Associated Mills, Inc. Power controlling apparatus in a showerhead. 4,165,837, Cl. 239-394.000.  
Russell, Ronald R., to General Electric Company. Control circuit for circuit breaker AC motor operator. 4,166,240, Cl. 318-380.000.  
Ryu, Shoji: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.  
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Wallace, Cornelius J., 4,165,684, Cl. 99-421.00H.  
Sadauskas, Raymond: See—  
Rieppel, Perry; and Sadauskas, Raymond, 4,166,209, Cl. 219-70.000.  
Saeki, Yukio: See—  
Nakamura, Nobutaka; and Saeki, Yukio, 4,166,166, Cl. 528-126.000.  
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Ueoka, Masakazu; Iguchi, Yasuyuki; Saito, Takayuki; and Okamura, Hiroshi, 4,166,191, Cl. 568-789.000.

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Miyazaki, Takushi; Sakai, Tadao; and Mitsui, Akio, 4,166,050, Cl. 260-8.000.  
Sakurada, Juichi: See—  
Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, 4,165,839, Cl. 241-4.000.  
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Salter, Lowell S., to Morgan Construction Company. Flexible seal and seal assembly. 4,165,881, Cl. 277-152.000.  
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Sanborn, Robert S.: See—  
West, Francis, Jr., 4,165,704, Cl. 114-144.00C.  
Sandoz Ltd.: See—  
Baumann, Werner; and Zirngibl, Ulrich, 4,166,068, Cl. 260-456.00A.  
Sandvik Aktiebolag: See—  
Smids, Rune, 4,165,947, Cl. 407-46.000.  
Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Device for joining surfaces of a split rim in a wheel. 4,165,777, Cl. 152-411.000.  
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Chang, Nuke M.; and Renkes, Elmer R., 4,165,571, Cl. 37-62.000.  
Lloyd, Samuel H., III; and Goren, Yoram, 4,165,702, Cl. 114-65.00R.  
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Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.  
Sato, Masao: See—  
Tsutsui, Kikuo; and Sato, Masao, 4,165,663, Cl. 83-74.000.  
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Sauer, L. Peter: See—  
Beach, John R.; Sauer, L. Peter; and Haraden, William J., 4,165,943, Cl. 403-285.000.  
Saunders, John C.: See—  
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,166,123, Cl. 424-273.00P.  
Scanland, Joseph E.; and Fisher, Gerald C., to Roper Corporation. Cutter pin for rotary mower. 4,165,597, Cl. 56-295.000.  
Schatz, Viktor: See—  
Komaroff, Ivan; and Schatz, Viktor, 4,165,635, Cl. 73-119.00A.  
Scherrer, Raymond E., to International Telephone and Telegraph Corporation. Apparatus for lapping or polishing materials. 4,165,584, Cl. 51-131.000.  
Schievelbein, Vernon H., to Texaco Inc. Surfactant water flooding oil recovery process. 4,165,785, Cl. 166-274.000.  
Schiminski, Herbert: See—  
Schippers, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, 4,165,600, Cl. 57-58.950.  
Schimpf, Rolf, to Bayer Aktiengesellschaft. Process for the preparation of 2-methoxy-5-methylaniline-4-sulphonic acid. 4,166,069, Cl. 260-509.000.  
Schindler, Hermann: See—  
Zimmermann, Wolfgang; and Schindler, Hermann, 4,166,033, Cl. 210-51.000.  
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Schirmacher, Roland, to Rolle-Werke Franke & Heidecke. Slide projector drive mechanism for a circular magazine. 4,165,928, Cl. 353-117.000.  
Schlumberger Technology Corporation: See—  
Anderson, Ronald A., 4,166,215, Cl. 250-260.00.  
Cubberly, Walter E., Jr., 4,166,216, Cl. 250-260.00.  
Schmidt, Conrad; Bunge, Gustav; and Weiss, Paul, to Brown Boveri & Cie Aktiengesellschaft. Insulators with increased surface conductivity and method for increasing the conductivity on surfaces of insulators having high electrical resistance made of inorganic and organic materials such as ceramic, glass, plastic and resin. 4,166,193, Cl. 174-28.000.  
Schmidt, Gunter A. Solar motor. 4,165,734, Cl. 126-424.000.  
Schmidt, Lewis W., to Blackwelders. Refuse compactor with a counter-balanced rear door. 4,165,897, Cl. 296-56.000.  
Schnabel, Gunter: See—  
Brandt, Hans-Walter; Schnabel, Gunter; and Muller, Karl-Heinz, 4,165,644, Cl. 73-422.00G.  
Schreyer, Kenneth D., to Columbus McKinnon Corporation. Hoist system. 4,165,863, Cl. 254-168.000.  
Schuck, Wolf-Dieter: See—  
Hermann, Walter; Kuhl, Burkhardt; and Schuck, Wolf-Dieter, 4,166,259, Cl. 333-236.000.  
Schuier, Manfred, to Bruckner Apparatebau GmbH. Process for the wet treatment of endless strands of textile material. 4,165,548, Cl. 8-151.100.

Schulman, Marvin: See—  
Pitchon, Esra; Colton, Martin S.; Kemprowski, Walter S.; and Schulman, Marvin, 4,165,834, Cl. 239-10.000.  
Schwab, Ardath M., to Isotrol Systems. Duct apparatus for distribution of isolated power and equipotential ground. 4,166,195, Cl. 174-95.000.  
Schwarzkopf, Anton, to Anton Schwarzkopf Stahl- und Fahrzeugbau, Firma. Amusement ride with vertical track loop. 4,165,695, Cl. 104-55.000.  
Science Union et Cie: See—  
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,166,117, Cl. 424-251.000.  
Sciotti, Robert. Patentee's finger ring or emblem. 4,165,574, Cl. 40-21.00R.  
SCM Corporation: See—  
McGinniss, Vincent D., 4,166,017, Cl. 204-181.00C.  
Scott, Michael A.: See—  
Page, Kenneth J.; and Scott, Michael A., 4,165,988, Cl. 106-23.000.  
Scott Paper Company: See—  
Mattor, John A.; and Price, Lawrence, 4,166,150, Cl. 428-352.000.  
Scott, William B.: See—  
Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,165,667, Cl. 83-409.000.  
Sea-Pac, Inc.: See—  
Dutton, Edward E.; and Gorby, Jack, 4,166,140, Cl. 426-397.000.  
Seaborn, Paul; and Lemburg, Jörn-Uwe, to E. C. H. Will (GmbH & Co.) Wire forming machine. 4,165,767, Cl. 140-105.000.  
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Seel, Jerry E. Container for potable liquid. 4,165,814, Cl. 215-229.000.  
Seiler, Friedrich-Robert: See—  
Sedlacek, Hans-Harald; Johannsen, Roloff; and Seiler, Friedrich-Robert, 4,166,106, Cl. 424-12.000.  
Seitzer, Walter H., to Sunoco Energy Development Company. Pour point depressant for shale oil. 4,166,023, Cl. 208-14.000.  
Sekiguchi, Tsunetoshi: See—  
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,165,604, Cl. 58-23.00A.  
Sema, Toru: See—  
Isobe, Kenichi; Tsutsui, Tatsuhiko; Ueki, Takao; and Sema, Toru, 4,166,110, Cl. 424-61.000.  
Semaka, Frank D.: See—  
Coutts, Ronald T.; Biggs, David F.; Wandelfmaier, Frank W.; and Semaka, Frank D., 4,166,116, Cl. 424-250.000.  
Sendai, Michiyuki: See—  
Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.  
Service d'Exploitation Industrielle des Tabacs et des Allumettes: See—  
Mainvielle, Christian, 4,165,811, Cl. 414-412.000.  
Setloff, Jerome: See—  
Brown, Robert; and Setloff, Jerome, 4,166,108, Cl. 424-28.000.  
Shanahan, Francis V.; and Feller, Herman H., to Shock-M-All, Inc. Electric baseboard trap for crawling insects. 4,165,577, Cl. 43-112.000.  
Shaner, Ronald E.: See—  
Yeager, Robert R.; and Shaner, Ronald E., 4,165,697, Cl. 111-92.000.  
Shapiro, Justin J. Adjustable micro-dispensing liquid pipet. 4,165,646, Cl. 73-425.600.  
Sharma, Raj K.: See—  
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,165,634, Cl. 73-810.000.  
Shea, Melvin E. Bubble maker. 4,166,084, Cl. 261-69.00A.  
Shefsiek, Paul K.: See—  
Nowak, Leonard G.; Nunes, Maurice; and Shefsiek, Paul K., 4,165,865, Cl. 266-138.000.  
Shell Oil Company: See—  
Harsono, Radjasa; and Stork, Willem H. J., 4,166,047, Cl. 252-454.000.  
Roobek, Cornelis F.; and van Leeuwen, Petrus W. N. M., 4,166,076, Cl. 585-369.000.  
Wald, Milton M.; and Kim, Leo, 4,166,189, Cl. 560-232.000.  
Shelley Manufacturing Company, a division of Alco Food Service Equipment Company: See—  
Cooper, Frank W.; and Dixon, Arthur B., Jr., 4,165,908, Cl. 312-111.000.  
Shepard, Dennis D.: See—  
Cravy, Thomas V.; and Shepard, Dennis D., 4,165,744, Cl. 128-303.100.  
Shevchenko, Anatoly B.: See—  
Alev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.  
Shibata, Shoji: See—  
Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, 4,166,113, Cl. 424-177.000.  
Shimizu, Masami: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyasu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.  
Shimizu, Shigehisa; and Mizutano, Shigemitsu, to Fuji Photo Film Co., Ltd. Web cutting apparatus. 4,165,665, Cl. 83-287.000.  
Shimizu, Susumu: See—  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.

Shimizu, Takayoshi: See—  
Fujiwara Tatsuo; Katoh, Koshi; Ohtakara, Yuzo; and Shimizu, Takayoshi, 4,165,982, Cl. 75-176.000.  
Shinonaga, Ideo: See—  
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Ideo, 4,166,079, Cl. 525-208.000.  
Shinshu Seiki Kabushiki Kaisha: See—  
Tezuka, Chikao, 4,165,687, Cl. 101-93.010.  
Shionogi & Co., Ltd.: See—  
Igarashi, Kikuo, 4,166,114, Cl. 424-180.000.  
Shipley, William G.: See—  
Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., 4,166,289, Cl. 364-200.000.  
Shiraishi, Mitsuru: See—  
Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.  
Shirayama, Keiko: See—  
Kigasawa, Kazuo; Hüragi, Mineharu; Ishimaru, Haruhide; Haga, Seiji; and Shirayama, Keiko, 4,166,125, Cl. 424-274.000.  
Shiroto, Yoshimi: See—  
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,166,026, Cl. 208-210.000.  
Shishido, Tsuneo, to Hughes Aircraft Company. Anti multipacting resonant cavity. 4,166,256, Cl. 333-99.00MP.  
Shkrabina, Rimma A.: See—  
Vorobiev, Jury K.; Badaev, Boris N.; Ljubushko, Galina I.; Levitsky, Emmanuil A.; Borekov, Georgy K.; Andrushevich, Mikhail M.; Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khramov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A., 4,166,100, Cl. 423-626.000.  
Shock-M-All, Inc.: See—  
Shanahan, Francis V.; and Feller, Herman H., 4,165,577, Cl. 43-112.000.  
Shore Plastics, Inc.: See—  
Sussman, Morris, 4,165,572, Cl. 40-10.00D.  
Shue, John L., Jr.; and Douty, George H., to AMP Incorporated. Metal stamped and formed screw. 4,165,673, Cl. 85-44.000.  
Shunichi Morimoto: See—  
Azumada, Koichi; and Kobori, Michio, 4,165,992, Cl. 106-210.000.  
Shupe, Charles A., to Canon, Inc. Chord liner using angle measurement. 4,166,291, Cl. 364-560.000.  
Siegmann, Carl. Firing safety for a pneumatic nailer. 4,165,676, Cl. 91-461.000.  
Siemens Aktiengesellschaft: See—  
Mattern, Alfred, 4,166,198, Cl. 179-15.00A.  
Stein, Karl-Ulrich, 4,166,288, Cl. 363-147.000.  
Sierra Designs: See—  
Marks, George R., 4,165,757, Cl. 135-1.00R.  
Signetics Corporation: See—  
Stephens, Mark L.; and Gray, Paul R., 4,166,269, Cl. 338-3.000.  
Signode Corporation: See—  
Beach, John R.; Sauer, L. Peter; and Haraden, William J., 4,165,943, Cl. 403-285.000.  
Silverstein, Irwin B.: See—  
Bossert, Emily C.; Silverstein, Irwin B.; and Berger, Abe, 4,166,053, Cl. 260-18.60S.  
Simmat, Fritz: See—  
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,165,915, Cl. 350-96.340.  
Simmons Company: See—  
Stumpf, Walter, 4,165,808, Cl. 414-736.000.  
Simmons, Jorge E.: See—  
Woodrow, Arthur F.; and Simmons, Jorge E., 4,165,939, Cl. 356-394.000.  
Simpson, Donald C.: See—  
Olsen, Everett O.; La Croix, James R.; and Simpson, Donald C., 4,165,652, Cl. 73-704.000.  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spenner, Anton; and Underberg, Paul-Gunter, to Bayer Aktiengesellschaft. Washing tunnel for cleaning glass containers. 4,165,756, Cl. 134-56.00R.  
Skaug, Frank S. System for supporting plants, bushes and small trees. 4,165,582, Cl. 47-44.000.  
Slater Electric Inc.: See—  
Bowden, Wade R., Jr.; and Lewis, Walter C., 4,165,851, Cl. 248-57.000.  
Slovenska vedecko-technicka spolocnost, Dom techniky: See—  
Lenorak, Ferdinand, 4,165,599, Cl. 57-58.830.  
Small, Martin B.; and Zory, Peter S., Jr., to International Business Machines Corporation. Heterostructure diode injection laser having a constricted active region. 4,166,253, Cl. 331-94.50H.  
Smids, Rune, to Sandvik Aktiebolag. Cutting tool. 4,165,947, Cl. 407-46.000.  
Smith, Charles G.; Parker, Kenneth R.; and Wyatt, John G., to Dresser Industries, Inc. Fume extraction canopy with baffle deflector. 4,165,680, Cl. 98-115.00R.  
Smith, Darrell F., Jr.; and Clatworthy, Edward F., to Huntington Alloys, Inc. Intermediate temperature service alloy. 4,165,997, Cl. 148-38.000.  
Smith, Harold T. Solar energy collector and storage device. 4,165,735, Cl. 126-437.000.  
Smith, James E., to Denver Instrument Company. Automatic weight switching mechanism for substitution type analytical balances. 4,165,791, Cl. 177-212.000.  
Smith, John. Flexible strip doors. 4,165,778, Cl. 160-332.000.



- Smith Kline & French Laboratories Limited: See—  
King, Ronald J.; and White, George R., 4,166,184, Cl. 548-321.000.  
Smith-Lewis, Margaret J.; and Figueras, John, to Eastman Kodak Company. Reduction of detectable species migration in elements for the analysis of liquids. 4,166,093, Cl. 422-56.000.  
Smith, Millard F.: See—  
McGaha, Patrick L.; and Smith, Millard F., 4,166,221, Cl. 290-40.00R.  
Smith, Robert L.: See—  
Cragoe, Edward J., Jr.; Smith, Robert L.; and Stokker, Gerald E., 4,166,177, Cl. 544-2.000.  
Smith, Ronald A.: See—  
Pille, Terence W. J.; Smith, Ronald A.; and Middleton, Joseph F., 4,165,595, Cl. 53-556.000.  
Smith, William C., to Rader Companies, Inc. Apparatus and method for pneumatically separating fractions of a particulate material. 4,166,027, Cl. 209-139.00R.  
SmithKline Corporation: See—  
Mastrocola, Antonietta R.; and Webb, Robert L., 4,166,061, Cl. 549-72.000.  
Smolin, Michael: See—  
Pomerantz, Daniel I.; and Smolin, Michael, 4,165,641, Cl. 73-290.00R.  
Snitzer, Elias: See—  
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,166,043, Cl. 252-300.000.  
Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Photographic slide projector. 4,165,927, Cl. 353-104.000.  
Societe d'Assistance Technique pour Produits Nestle S.A.: See—  
Martin, Ernest N.; and Munson, Michael D., 4,165,821, Cl. 222-129.400.  
Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France: See—  
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 4,166,060, Cl. 260-326.200.  
Societe dite: Gatrun Anstalt: See—  
Corbic, Yves J., 4,165,594, Cl. 53-453.000.  
Societe Europeenne de Propulsion: See—  
Detalle, Bernard A., 4,165,847, Cl. 244-3.290.  
Societe Nationale Elf Aquitaine: See—  
Bernard, Jean-Rene; Turlier, Pierre; and Bousquet, Jacques, 4,166,077, Cl. 585-310.000.  
Despois, Jacques; and Nougarede, Francis, 4,165,945, Cl. 405-55.000.  
Societe Nouvelle de Bouchons Plastique: See—  
Babiol, Pierre, 4,165,813, Cl. 215-220.000.  
Societe Pica: See—  
Montagnon, Jean R., 4,166,037, Cl. 210-275.000.  
Sodertalje Tekniska Ide Produkter Aktiebolag: See—  
Harju, Bert I., 4,165,563, Cl. 33-18.00R.  
Solex Research Corp. of Japan: See—  
Watanabe, Morio; and Nishimura, Sanji, 4,166,098, Cl. 423-139.000.  
Solie, Leland P., to Sperry Rand Corporation. Temperature compensated reflective array for surface acoustic wave processing. 4,166,228, Cl. 310-313.000.  
Solomonenko, Vladimir I.: See—  
Minkov, Jury V.; and Solomonenko, Vladimir I., 4,166,225, Cl. 307-355.000.  
Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, to Asahi Kasei Kogyo Kabushiki Kaisha. Substituted phenylglycolic acid and its pharmaceutically acceptable esters and salts, and processes for preparing the same. 4,166,128, Cl. 424-319.000.  
Sosnowski, Stanislaw J. A.: See—  
George, Michael; Brotherton, Colin P.; and Sosnowski, Stanislaw J. A., 4,165,725, Cl. 123-139.0AL.  
Southern Can Company: See—  
Hansen, Harold M., 4,165,825, Cl. 222-402.220.  
Southern, Raymond L., to Allegheny Ludlum Industries, Inc. Method and apparatus for heating coils of strip. 4,165,868, Cl. 266-264.000.  
Southwest Research Institute: See—  
Greer, Amos S., Jr., 4,165,649, Cl. 73-644.000.  
Sowman, Harold G.: See—  
Lange, Roger W.; and Sowman, Harold G., 4,166,147, Cl. 428-328.000.  
Spencer, Anton: See—  
Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spencer, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.  
Sperry Rand Corporation: See—  
Solie, Leland P., 4,166,228, Cl. 310-313.000.  
Todd, Robert R., 4,165,751, Cl. 130-27.00S.  
Spetelnik, Mack. Adjustable high frequency sound dispersion system. 4,165,797, Cl. 181-147.000.  
Spiteri, Joseph. Tractor cable light circuit checker. 4,166,242, Cl. 324-51.000.  
Spolitak, Boris V.: See—  
Kurichev, Viktor I.; and Spolitak, Boris V., 4,165,740, Cl. 128-204.000.  
Stadler, Fritz: See—  
Breuer, Friedrich; Brotzmann, Karl; Duderstadt, Gunter; Fichte, Rudolf; and Stadler, Fritz, 4,165,980, Cl. 75-60.000.  
Stamcarbon, B.V.: See—  
Paulen, Hendrikus J. G., 4,166,016, Cl. 204-159.140.  
Standard Oil Company, The: See—  
Thomas, John W.; and Harris, Ronald L., 4,165,716, Cl. 122-1.00A.  
White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., 4,166,190, Cl. 562-534.000.  
Wu, Hsin C.; and Fitzgibbons, William O., 4,166,008, Cl. 203-85.000.  
Standard Oil Company (Indiana): See—  
Chao, Kwei C.; and Ridgway, John A., 4,166,135, Cl. 426-60.000.  
Stanley Home Products, Inc.: See—  
Burke, Frederick A., 4,165,550, Cl. 15-144.00A.  
Stanley, Thomas O., to RCA Corporation. Phosphor screen for flat panel color display. 4,166,233, Cl. 313-422.000.  
Stansfield, James F.: See—  
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,166,066, Cl. 260-404.500.  
Starr, James B., to Honeywell Inc. Intrusion detection transducers. 4,166,264, Cl. 336-20.000.  
Stauffer Chemical Company: See—  
Chang, Pei K., 4,166,142, Cl. 426-582.000.  
King, David L., 4,165,976, Cl. 71-88.000.  
Stavers, Marius X.: See—  
Gillis, John R.; Miraldi, Peter; and Stavers, Marius X., 4,166,096, Cl. 422-119.000.  
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Integrated current supply. 4,166,288, Cl. 363-147.000.  
Stenger, Ralph L., Jr.: See—  
Brastins, Aueklis; and Stenger, Ralph L., Jr., 4,166,270, Cl. 340-5.00C.  
Stephens, Mark L.; and Gray, Paul R., to Signetics Corporation. Temperature compensated piezoresistive transducer. 4,166,269, Cl. 338-3.000.  
Stergiou, Steve S. Dust collector and air scrubber. 4,165,973, Cl. 55-228.000.  
Sterling Drug Inc.: See—  
Collins, Joseph C., 4,166,074, Cl. 260-574.000.  
Stokker, Gerald E.: See—  
Cragoe, Edward J., Jr.; Smith, Robert L.; and Stokker, Gerald E., 4,166,177, Cl. 544-2.000.  
Stoll, William F., to Green Giant Company. Lasagna noodle. 4,166,136, Cl. 426-144.000.  
Stoltzfus, Sarah D. Commode condensation/overflow catch basin. 4,165,545, Cl. 4-252.00A.  
Stork, Willem H. J.: See—  
Harsono, Radjasa; and Stork, Willem H. J., 4,166,047, Cl. 252-454.000.  
Storz, Ralph H.: See—  
Ausschnitt, Christopher P.; Bjorklund, Gary C.; Freeman, Richard R.; and Storz, Ralph H., 4,166,219, Cl. 250-423.00P.  
Stournas, Stamoulis, to Mobil Oil Corporation. Surfactant waterflooding employing amphoteric sulfonium sulfonates. 4,166,038, Cl. 252-8.55D.  
Straub, Dieter: See—  
Jaedicke, Ludwig; and Straub, Dieter, 4,165,730, Cl. 124-67.000.  
Straubel, Max, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,165,723, Cl. 123-139.0AR.  
Strippit Division, Houdaille Industries, Inc.: See—  
Brown, Paul R.; DeGeorge, Robert P.; Malof, Adrien P.; Dutton, Michael F.; Cady, Percy L.; and Lawrie, Eugene G., 4,165,669, Cl. 83-552.000.  
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Weigl, Erwin; and Stritzl, Karl, 4,165,883, Cl. 280-618.000.  
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Salzmann, Hans; and Strohwalc, Herbert, 4,166,252, Cl. 331-94.5PE.  
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Stryker, Timothy J. Smoker's pipe. 4,165,753, Cl. 131-173.000.  
Studer, John E., to Ortho Pharmaceutical Corporation. Tablet dispenser. 4,165,709, Cl. 116-308.000.  
Stumpf, Walter, to Simmons Company. Upholstery coil transfer mechanism. 4,165,808, Cl. 414-736.000.  
Stutts, William F. Add-on collimator cap for dental x-ray collimator tube and dental x-ray system therewith. 4,166,220, Cl. 250-505.000.  
Subramanian, Sundaram, to Motorola, Inc. Capacitively weighted surface acoustic wave device. 4,166,257, Cl. 333-151.000.  
Sud, Mohinder P. Self cleaning shampoo dispenser. 4,165,824, Cl. 222-341.000.  
Suga, Asakichi. Device for driving screws, rivets and the like. 4,165,772, Cl. 145-52.000.  
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Kondo, Kiyoshi; Negishi, Akira; and Sugimoto, Kikuo, 4,166,064, Cl. 260-347.400.  
Sukatsch, Dieter: See—  
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Sullaway, Bob L.; and Knox, Lloyd C., to Halliburton Company. Breech block connector. 4,165,891, Cl. 285-18.000.  
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Nakamura, Nobutaka; and Saeki, Yukio, 4,166,166, Cl. 528-126.000.

- Sun Chemical Corporation: See—  
Whelan, Edward J.; and Douma, William L., 4,165,966, Cl. 432-121.000.  
Sunasky, Joseph, to Dexion-Comino International Limited. Connection means for structures. 4,165,944, Cl. 403-254.000.  
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Seitzer, Walter H., 4,166,023, Cl. 208-14.000.  
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Lugstenmann, Curt A., deceased; and Capdevilla nee Lugstenmann, Franziska S., heir, 4,166,011, Cl. 204-4.000.  
Suresh, Dev D.: See—  
White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., 4,166,190, Cl. 562-534.000.  
Susaki, Wataru; and Namizaki, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor injection laser device. 4,166,278, Cl. 357-18.000.  
Sussman, Morris, to Shore Plastics, Inc. Display stand. 4,165,572, Cl. 40-10.00D.  
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Kageyama, Hidehei; and Suzuki, Takahiko, 4,165,941, Cl. 401-31.000.  
Suzuki, Yoshio: See—  
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Svendsen, Robert A., to Marine Construction & Design Co. Crab pot warp line coiler. 4,165,830, Cl. 226-187.000.  
Svigelj, John A.; and Rabito, Thomas G., to Goodyear Tire & Rubber Company. The Heat sensitive primer exhibiting color change and containing a resin blend, elemental sulfur, and a dye. 4,166,058, Cl. 260-38.000.  
Swan, George A., to Exxon Research & Engineering Co. Process for suppression of hydrogenolysis and C<sub>5</sub><sup>+</sup> liquid yield loss in a cyclic reforming unit. 4,166,024, Cl. 208-65.000.  
Swanson, Scott C.: See—  
Kling, Gary W.; and Swanson, Scott C., 4,166,095, Cl. 422-67.000.  
Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., to Milco Manufacturing Company. Vehicle seat having arm rest adjustment means. 4,165,901, Cl. 297-417.000.  
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Wagner, Alfred; Ames, Adolf; and Graf, Karl, 4,165,625, Cl. 72-38.000.  
SWS Silicones Corporation: See—  
Getson, John C., 4,166,078, Cl. 528-26.000.  
Taguchi, Yoshinobu; Harigane, Kotaro; and Ito, Tetsuro, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Apparatus for trimming and securing electronic components inserted into a printed circuit substrate. 4,165,557, Cl. 29-566.300.  
Tak, Marinus G. A.; and Peters, Robert C., to U.S. Philips Corporation. Fluorescent discharge lamp having luminescent material of a specified grain size. 4,166,234, Cl. 313-486.000.  
Takasugi, Hisashi: See—  
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,166,115, Cl. 424-246.000.  
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Tsushima, Susumu; Sendai, Michiyuki; Shiraiishi, Mitsuru; and Matsumoto, Norichika, 4,166,178, Cl. 544-16.000.  
Takemori, Hayashi, to Dainichi-Nippon Cables, Ltd. Poly-4-methylpentene-1 composition. 4,166,057, Cl. 260-33.6PQ.  
Tanahashi, Tooru: See—  
Watanabe, Eiki; and Tanahashi, Tooru, 4,165,801, Cl. 187-29.00R.  
Tanaka, Akira, to American Safety Equipment Corporation. Dual tension safety belt. 4,165,844, Cl. 242-107.000.  
Tanaka, Hideo: See—  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,166,188, Cl. 560-122.000.  
Tanaka, Sadao; Kakimoto, Morio; and Ikeda, Yugo, to Chugai Seiyaku Kabushiki Kaisha. Benzazocine derivatives and process for preparing the same. 4,166,174, Cl. 542-401.000.  
Tanaka, Yoshihiro: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.  
Tanner, Jakob: See—  
Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, 4,165,936, Cl. 356-5.000.  
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Techniservice Division Textured Yarn Co., Inc.: See—  
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Teich, Wesley W.: See—  
Martel, Thomas J.; Freedman, George; Bowen, Robert F.; and Teich, Wesley W., 4,166,208, Cl. 219-10.55E.  
Teijin Limited: See—  
Ishida, Kinyu; and Fukumoto, Kumaichi, 4,165,585, Cl. 57-268.000.  
Tektronix, Inc.: See—  
Reichen, John E.; and Long, Scott B., 4,166,200, Cl. 200-11.00R.  
Tel-Tone Corporation: See—  
Dyste, Ardell T.; and Ma, Raymond, 4,165,912, Cl. 339-156.00T.  
TenBrink, Ruth E.: See—  
McCall, John M.; and TenBrink, Ruth E., 4,166,062, Cl. 260-333.000.  
Tenneco Chemicals, Inc.: See—  
DiBella, Eugene P.; Dunkel, Morris; and Gould, Henry, 4,166,163, Cl. 521-116.000.  
Tepal: See—  
Moll, Manfred; Delorme, Jean J.; and Weber, Jean C., 4,165,643, Cl. 73-421.00B.  
Tesdata Systems Corporation: See—  
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., 4,166,290, Cl. 364-200.000.  
Tessier, Jean: See—  
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,166,063, Cl. 260-343.30R.  
Texaco Inc.: See—  
Schievelbein, Vernon H., 4,165,785, Cl. 166-274.000.  
Virk, Kashmir S.; and Leikkanen, Henry E., 4,165,721, Cl. 123-119.00A.  
Texas Development Corporation: See—  
Klein, Howard P., 4,166,172, Cl. 536-4.000.  
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Thackrey, James D. Gate valve structure. 4,165,858, Cl. 251-168.000.  
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track leveling, lining and tamping apparatus. 4,165,693, Cl. 104-7.00B.  
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Thomas, John W.; and Harris, Ronald L., to Standard Oil Company. The Process air coolers used for combustion air preheating. 4,165,716, Cl. 122-1.00A.  
Thormack Engineering Limited: See—  
Cottingham, Richard L.; and Boyne, Ralph A., 4,165,587, Cl. 51-428.000.  
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TMC Corporation: See—  
Weigl, Erwin; and Stritzl, Karl, 4,165,883, Cl. 280-618.000.  
Tobias, Jaromir, to American Hydraulic Propulsion Systems, Inc. Radial piston hydraulic pump or motor with stabilized pintle shaft. 4,165,677, Cl. 91-497.000.  
Todd, Robert R., to Sperry Rand Corporation. Beater grate for combine. 4,165,751, Cl. 130-27.00S.  
Tokuyama Soda Kabushiki Kaisha: See—  
Sata, Toshikatsu; Murakami, Shoji; and Murata, Yasuo, 4,166,014, Cl. 204-98.000.  
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Taguchi, Yoshinobu; Harigane, Kotaro; and Ito, Tetsuro, 4,165,557, Cl. 29-566.300.  
Yagi, Hiroshi, 4,165,807, Cl. 206-409.000.  
Tokyo Shibaura Denki Kabushiki Kaisha: See—  
Miyazawa, Yoshiaki, 4,166,247, Cl. 328-69.000.  
Tokyo Shibaura Electric Co., Ltd.: See—  
Yamaguchi, Ryoji, 4,165,871, Cl. 271-127.000.  
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Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,166,066, Cl. 260-404.500.  
Torii, Masanori; and Naganawa, Tadahisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor. 4,166,085, Cl. 261-72.00R.  
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, to Otsuka Kagaku Yakuin Kabushiki Kaisha. 2-(2-Pentynyl) cyclopentanol derivatives. 4,166,188, Cl. 560-122.000.  
Toyo Suisan Kaisha, Ltd.: See—  
Ishida, Masayuki, 4,166,139, Cl. 426-394.000.  
Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Fujioka, Yasuo; and Nakano, Kenichi, 4,165,612, Cl. 60-322.000.  
Ishikawa, Norikatsu, 4,165,611, Cl. 60-290.000.  
Torii, Masanori; and Naganawa, Tadahisa, 4,166,085, Cl. 261-72.00R.  
Trampert, Hans R., to Pfadler-Werke A.G. Measuring probe to determine the ion concentration in liquids. 4,166,020, Cl. 204-195.00R.  
Treber, Norbert: See—  
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,165,915, Cl. 350-96.340.  
Trenter, James F.: See—  
Mao, George W.; Rao, Purushothama; and Trenter, James F., 4,166,155, Cl. 429-82.000.  
Tringham, Roger W.: See—  
Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,166,090, Cl. 264-25.000.  
Troemel, Gerhard: See—  
Lehmann, Wolfgang; Troemel, Gerhard; Ley, Kurt; and Muller, Friedhelm, 4,166,002, Cl. 162-164.00R.  
True Temper Corporation: See—  
Curati, Marino, Jr., 4,165,771, Cl. 145-29.00R.



Trumbull Corporation: See—  
 Dick, Perry J., Jr., 4,165,617, Cl. 405-17.000.  
 Tsai, Shirley C., to Gulf Research & Development Company. Recovery of oil from oil shale. 4,166,022, Cl. 208-11.00R.  
 Tseng, Samuel C.-C., to International Business Machines Corporation. Thin-film integrated circuit with tank circuit characteristics and applications to thin-film filters and oscillators. 4,166,258, Cl. 333-195.000.  
 TSN Company, Inc.: See—  
 Woodrow, Arthur F.; and Simmons, Jorge E., 4,165,939, Cl. 356-394.000.  
 Tsuboi, Haruhito: See—  
 Yoshikai, Tatsuki; Morito, Hisatomo; and Tsuboi, Haruhito, 4,165,705, Cl. 114-249.000.  
 Tsumazawa, Hiroyuki, to Minolta Camera Kabushiki Kaisha. Trigger device for sound motion picture cameras. 4,165,926, Cl. 352-27.000.  
 Tsuprov, Sergei A.: See—  
 Chukhanov, Zinoviy F.; Tsuprov, Sergei A.; and Apter, Danil M., 4,165,696, Cl. 104-147.00R.  
 Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, to Takeda Chemical Industries, Ltd. 3-Acyloxymethyl-cephem compounds. 4,166,178, Cl. 544-16.000.  
 Tsutsui, Kikuo; and Sato, Masao, to Amada Company, Limited. Vertical bandsaw machine work feed. 4,165,663, Cl. 83-74.000.  
 Tsutsui, Tatsuhiko: See—  
 Isobe, Kenichi; Tsutsui, Tatsuhiko; Ueki, Takao; and Sema, Toru, 4,166,110, Cl. 424-61.000.  
 Tucker, Alfred D., to Iplex Plastic Industries Proprietary Limited. Delivering measured quantities of liquid into a fluid. 4,165,759, Cl. 137-99.000.  
 Tupper, Willis E., to Dapco Industries. Vent cap. 4,165,816, Cl. 220-203.000.  
 Turk, Chester F.: See—  
 Krapcho, John; and Turk, Chester F., 4,166,072, Cl. 260-558.00P.  
 Turk, Herbert: See—  
 Schippers, Heinz; Turk, Herbert; Schiminski, Herbert; and Dammann, Peter, 4,165,600, Cl. 57-58.950.  
 Turlier, Pierre: See—  
 Bernard, Jean-Rene; Turlier, Pierre; and Bousquet, Jacques, 4,166,077, Cl. 585-310.000.  
 Tyree, Lewis, Jr. Treatment with liquid cryogen. 4,165,618, Cl. 62-64.000.  
 Uchida, Kazuo: See—  
 Nakayama, Kenji; and Uchida, Kazuo, 4,165,838, Cl. 239-533.300.  
 Uecker, Myron M.: See—  
 Ziminski, Richard D.; and Uecker, Myron M., 4,166,138, Cl. 426-249.000.  
 Ueda, Akio; and Komuro, Keiji, to Nippon Zeon Co. Ltd. Rubber composition and process for preparation thereof. 4,166,083, Cl. 260-33.6AQ.  
 Ueki, Takao: See—  
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 Ueno, Yoshio; and Nagami, Akio, to Hitachi Metals, Ltd. Gear transmission for electrical operation means. 4,165,658, Cl. 74-412.00R.  
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 Umphries, James O.: See—  
 Brawner, William H.; and Umphries, James O., 4,165,713, Cl. 119-109.000.  
 Unami, Miwako: See—  
 Yamasita, Nobuo; and Unami, Miwako, 4,165,917, Cl. 350-225.000.  
 Underberg, Paul-Gunter: See—  
 Sirch, Edgar; Franz, Johann; Kruger, Dirk-Torsten; Spennner, Anton; and Underberg, Paul-Gunter, 4,165,756, Cl. 134-56.00R.  
 Union Special Corporation: See—  
 Fletcher, Roy W.; and Forte, Anthony D., 4,165,700, Cl. 112-286.000.  
 Uniroyal, Inc.: See—  
 Fournier, Albert A., Jr.; and Paddock, Charles F., 4,166,081, Cl. 525-75.000.  
 United Foam Corporation: See—  
 Morgan, Charles W., 4,165,955, Cl. 425-89.000.  
 United States of America  
 Agriculture: See—  
 Miller, John A.; Beadles, Murray L.; and Drummond, Roger O., 4,166,107, Cl. 424-19.000.  
 Air Force: See—  
 Paciorek, Kazimiera L.; Kratzer, Reinhold H.; Kaufman, Jacquelyn; and Ito, Thomas I., 4,166,071, Cl. 260-551.00P.  
 Army: See—  
 Fix, Joseph O., 4,165,906, Cl. 305-51.000.  
 National Aeronautics and Space Administration: See—  
 St. Clair, Terry L., 4,166,170, Cl. 528-229.000.  
 Navy: See—  
 DeReggi, Aime S.; and Edelman, Seymour, 4,166,229, Cl. 310-337.000.  
 Goldberg, Leonard J., 4,166,112, Cl. 424-93.000.  
 Iles, Thomas L.; and Ruder, Joseph M., 4,165,972, Cl. 55-28.000.  
 Valent, Philip J.; Atturio, John M.; and Rail, Robert D., 4,165,707, Cl. 114-300.000.

Villarruel, Carl A.; and Milton, A. Fenner, 4,165,914, Cl. 350-96.160.  
 U.S. Philips Corporation: See—  
 Kooman, Willem H., 4,165,637, Cl. 73-141.00A.  
 Rademaker, Gerrit, 4,166,196, Cl. 178-68.000.  
 Tak, Marinus G. A.; and Peters, Robert C., 4,166,234, Cl. 313-486.000.  
 van Slageren, Nanno, 4,166,283, Cl. 360-95.000.  
 Wellinga, Kobus; and Mulder, Rudolf, 4,166,124, Cl. 424-273.00R.  
 U.S. Rubber Reclaiming Co., Inc.: See—  
 Huff, Bobby J., 4,166,049, Cl. 260-2.300.  
 United States Steel Corporation: See—  
 Hetra, Andrew A., Jr.; and Jacob, Charles W., 4,165,866, Cl. 266-228.000.  
 Rogers, Charles D., 4,165,789, Cl. 175-27.000.  
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 Rudy, Thomas P.; and Nakagawa, Toshio W., 4,166,045, Cl. 252-414.000.  
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 Norton, Ted R.; Shibata, Shoji; and Kashiwagi, Midori, 4,166,113, Cl. 424-177.000.  
 Upjohn Company, The: See—  
 Bundy, Gordon L., 4,166,187, Cl. 560-55.000.  
 McCall, John M.; and TenBrink, Ruth E., 4,166,062, Cl. 260-333.000.  
 V-M Corporation: See—  
 Estkowski, Michael H., 4,166,226, Cl. 310-41.000.  
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 Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaupainen, Joseph Y., to Eastman Kodak Company. Electrophoretic migration imaging process. 4,165,984, Cl. 96-1.0PE.  
 Van der Tuin, Enrique H.: See—  
 Meeske, Charles J.; Van der Tuin, Enrique H.; and Racey, Michael J., 4,166,054, Cl. 260-23.0EP.  
 Van Gilst, Carl, to Innovative Industries, Inc. Barbecue apparatus. 4,165,683, Cl. 99-393.000.  
 van Leeuwen, Petrus W. N. M.: See—  
 Roobeck, Cornelis F.; and van Leeuwen, Petrus W. N. M., 4,166,076, Cl. 585-369.000.  
 Vanrenterghem, Jacques: See—  
 Neel, Emmanuel E. A.; Deflin, Michel; Vanrenterghem, Jacques; and Clement, Jean-Claude, 4,166,101, Cl. 423-656.000.  
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 van Slageren, Nanno, to U.S. Philips Corporation. Self-threading helical scan video cassette recorder. 4,166,283, Cl. 360-95.000.  
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 Zimmel, Hans, 4,165,934, Cl. 355-55.000.  
 Vereinigte Deutsche Metallwerke Aktiengesellschaft: See—  
 Fercke, Wilhelm, 4,166,153, Cl. 428-577.000.  
 Verkinderen, Paul A.: See—  
 De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,166,089, Cl. 264-22.000.  
 Verlin, Jerome R., to Techniservice Division Textured Yarn Co., Inc. Entanglement testing apparatus and method. 4,165,638, Cl. 73-160.000.  
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 McCord, Wilfred M., Jr., 4,165,668, Cl. 83-435.100.  
 Vetter, Kathryn A. Cosmetic container with cleaning surface. 4,165,815, Cl. 220-4.00D.  
 Victaulic Company of America: See—  
 Piatek, Edward; and Brady, Timothy, 4,165,892, Cl. 285-111.000.  
 Victor Company of Japan, Ltd.: See—  
 Ishigaki, Yukinobu; and Muraoka, Teruo, 4,166,251, Cl. 329-132.000.  
 Vierstraete, Irene. Drilling and boring machine. 4,165,948, Cl. 408-46.000.  
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 Vinzelberg, Bernhard, deceased: See—  
 Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.  
 Vinzelberg, Peter, heir: See—  
 Klein, Hans J.; Henze, Fritz; Vinzelberg, Bernhard, deceased; Vinzelberg, Peter, heir; and Klein nee Vinzelberg, Susanne, heir, 4,165,809, Cl. 414-104.000.  
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 Viets, Helmut: See—  
 Parlin, David B.; and Viets, Helmut, 4,165,547, Cl. 8-148.000.  
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Baum, Bronislav A.; Pakhomov, Nikolai A.; Khomyakova, Ljudmila G.; Khranov, Alexandr E.; Rodionova, Nina A.; Isaev, Boris N.; Knyazev, Vladimir M.; Moroz, Ella M.; Erofeev, Vladimir N.; Druzhinin, Ivan P.; and Shkrabina, Rimma A. Method of preparing granulated activated alumina. 4,166,100, Cl. 423-626.000.  
 Vorozhtsov, Georgy N.: See—  
 Dokunikhin, Nikolai S.; Vorozhtsov, Georgy N.; Kichina, Faina I.; and Feldbljum, Nikolai B., 4,166,181, Cl. 546-31.000.  
 Vovk, Maya I.: See—  
 Aleev, Leonid S.; Bunin, Sergei G.; Vovk, Maya I.; Gorbanev, Vladimir N.; Shevchenko, Anatoly B.; and Balchev, Fedor V., 4,165,750, Cl. 128-422.000.  
 Vsesojuzny Nauchno-Issledovalelsky Ispytatelny Institut Meditsinskoi Tekhniki: See—  
 Kurichev, Viktor I.; and Spolitak, Boris V., 4,165,740, Cl. 128-204.000.  
 W. A. Whitney Corp.: See—  
 Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,165,667, Cl. 83-409.000.  
 W. R. Grace & Co.: See—  
 McDaniel, Carl V.; Maher, Phillip K.; and Pilato, Joseph M., 4,166,099, Cl. 423-329.000.  
 Reppert, Merlyn R., 4,165,904, Cl. 301-9.0DN.  
 Wagner, Alfred; Ames, Adolf; and Graf, Karl, to Swiss Aluminium Ltd. Device for extruding sections from an ingot. 4,165,625, Cl. 72-38.000.  
 Wagner, Daniel B.; and Gross, Zvi, to Ames-Yissum Ltd. Specific binding assay method and test kit employing polyvinyl alcohol as separating agent. 4,166,103, Cl. 424-1.000.  
 Wagner, Daniel B.; and Gross, Zvi, to Ames-Yissum Ltd. Specific binding assay method and test kit employing polystyrene as separating agent. 4,166,104, Cl. 424-1.000.  
 Wagner, Kuno: See—  
 Freimuth, Reinhard; Wagner, Kuno; Findeisen, Kurt; Konig, Klaus; and Heitkamper, Peter, 4,166,067, Cl. 260-453.00P.  
 Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,166,149, Cl. 428-339.000.  
 Wagner, Robert E.: See—  
 Goodwin, George I.; Margrave, John L.; and Wagner, Robert E., 4,165,974, Cl. 65-26.000.  
 Wakabayashi, Mikio: See—  
 Sone, Takanori; Furukawa, Shinichi; Wakabayashi, Mikio; and Kodaira, Ryoji, 4,166,128, Cl. 424-319.000.  
 Walborn, Richard M.: See—  
 Moog, Robert A.; and Walborn, Richard M., 4,166,197, Cl. 179-1.00D.  
 Wald, Milton M.; and Kim, Leo, to Shell Oil Company. Production of methyl esters by contacting methanol or dimethyl ether with carbon monoxide and zinc iodide. 4,166,189, Cl. 560-232.000.  
 Wallace, Cornelius J., to S.E.N.O.C.T. Corp. Defrost and cooking apparatus. 4,165,684, Cl. 99-421.00H.  
 Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, to Hoffmann-La Roche Inc. Imidazo[1,5-a][1,4]benzodiazepines. 4,166,185, Cl. 548-324.000.  
 Walworth, Vivian K., to Polaroid Corporation. Substituted-halide silver halide emulsions and products containing same. 4,165,986, Cl. 96-29.00R.  
 Wandelmaier, Frank W.: See—  
 Coutts, Ronald T.; Biggs, David F.; Wandelmaier, Frank W.; and Semaka, Frank D., 4,166,116, Cl. 424-250.000.  
 Warner, Peter S.; and Bicht, John R., to Lucas Industries Limited. Electrically driven vehicles. 4,165,794, Cl. 180-65.00R.  
 Wasco, Anthony, Jr.; and Kreucher, David L., to Wickes Corporation, The. Machine tool construction. 4,165,661, Cl. 82-2.00R.  
 Watanabe, Eiki; and Tanahashi, Tooru, to Mitsubishi Denki Kabushiki Kaisha. Static Leonard system. 4,165,801, Cl. 187-29.00R.  
 Watanabe, Masaki: See—  
 Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, 4,165,728, Cl. 123-182.000.  
 Watanabe, Morio; and Nishimura, Sanji, to Solex Research Corp. of Japan. Process for treating an acid waste liquid. 4,166,098, Cl. 423-139.000.  
 Watanabe, Takeyoshi: See—  
 Kuwajima, Hideji; Mizoguchi, Hirofumi; Sakurada, Juichi; and Watanabe, Takeyoshi, 4,165,839, Cl. 241-4.000.  
 Watanabe, Yoshiaki: See—  
 Sunouchi, Akio; and Watanabe, Yoshiaki, 4,165,933, Cl. 354-106.000.  
 Wean United, Inc.: See—  
 Boshold, Raymond F., 4,165,627, Cl. 72-48.000.  
 Webb, Robert L.: See—  
 Mastrocola, Antonietta R.; and Webb, Robert L., 4,166,061, Cl. 549-72.000.  
 Weber, Arnulf E. M., to Black Clawson Company, The. Apparatus for screening paper fiber stock. 4,166,028, Cl. 209-273.000.  
 Weber, Gerhard; Peters, Siegfried; Kunzel, Jurgen; and Kreisel, Torsten. Method of measuring the fluidity of liquids for medical and pharmaceutical purposes, and apparatus for performing the method. 4,165,632, Cl. 73-55.000.  
 Weber, Jean C.: See—  
 Moll, Manfred; Delorme, Jean J.; and Weber, Jean C., 4,165,643, Cl. 73-421.00B.  
 Webster, Frank G.: See—  
 Nonnemacher, James R.; Regan, Michael T.; and Webster, Frank G., 4,165,985, Cl. 96-1.0PE.

Wedig, Walter; and Kramer, Ernst-Otto, to Jagenberg Werke Aktiengesellschaft. Apparatus for winding a web of material, especially paper. 4,165,843, Cl. 242-66.000.  
 Wehrmeister, Herbert L., to International Minerals & Chemical Corporation. Method of controlling the growth of bacteria and fungi. 4,166,121, Cl. 424-269.000.  
 Weighton, David M.: See—  
 Kerry, John C.; and Weighton, David M., 4,166,130, Cl. 424-326.000.  
 Weigl, Erwin; and Stritzl, Karl, to TMC Corporation. Safety ski binding. 4,165,883, Cl. 280-618.000.  
 Weigt, Armin, to O & K Orenstein & Koppel Aktiengesellschaft. Contact free device for limiting the relative movement of hydraulically actuated members. 4,165,674, Cl. 91-178.000.  
 Weinstein, Burton A.; and Lipe, Gordon C., to Garcia Corporation, The. Step-in heel unit for ski binding. 4,165,889, Cl. 280-626.000.  
 Weiss, Ernst H. G.: See—  
 Bhattacharyya, Ajay; and Weiss, Ernst H. G., 4,166,003, Cl. 176-61.000.  
 Weiss, Frank F., to Mid-Continent Metal Products Co. Sandwich griddle. 4,165,682, Cl. 99-331.000.  
 Weiss, Paul: See—  
 Schmidt, Conrad; Bunge, Gustav; and Weiss, Paul, 4,166,193, Cl. 174-28.000.  
 Weissenfels, Franz; and Junger, Hans, to Dynamit Nobel Aktiengesellschaft. Phenolic resin foam having reduced tendency to shrink. 4,166,162, Cl. 521-100.000.  
 Weissler, Harold E., II, to Bendix Corporation. The. Dual purpose pressure sensor. 4,165,650, Cl. 73-700.000.  
 Weissman, Jerry; and Kass, Ely. Animal handling systems. 4,165,714, Cl. 119-158.000.  
 Wellinga, Kobus; and Mulder, Rudolf, to U.S. Philips Corporation. Insecticidal 2,6-dihalobenzoyl-urea derivatives. 4,166,124, Cl. 424-273.00R.  
 Wengenroth, Hans E.; and Mrusek, Wilfried, to Chemische Fabrik Pforsee GmbH; and Elbatainer Kunststoff-und Verpackungsgesellschaft mbH. Filled plastic cask sealed with a cover. 4,165,817, Cl. 220-256.000.  
 Wennerstrom, Edward A.; Brown, James S., Sr.; and Milligan, William E., to Combustion Engineering, Inc. Reactor vessel closure stud cleaning machine. 4,165,549, Cl. 15-88.000.  
 West, Francis, Jr., to Sanborn, Robert S., a part interest. Self steering device for sea craft. 4,165,704, Cl. 114-144.00C.  
 West, Gene A.; and Moretti, John A., to General Motors Corporation. Thermocouple failure detector. 4,166,243, Cl. 324-51.000.  
 Westermann, Donald H.; and Huige, Nicolaas J., to Jos. Schlitz Brewing Company. Method of chill stabilizing a malt beverage. 4,166,141, Cl. 426-422.000.  
 Westinghouse Electric Corp.: See—  
 Bhattacharyya, Ajay; and Weiss, Ernst H. G., 4,166,003, Cl. 176-61.000.  
 Bluzer, Nathan, 4,166,223, Cl. 307-221.00D.  
 Bolin, Philip C., 4,166,194, Cl. 174-31.00R.  
 Maier, Alfred E.; Ricci, Louis N.; and Armstrong, Donald D., 4,166,205, Cl. 200-153.00G.  
 McGaha, Patrick L.; and Smith, Millard F., 4,166,221, Cl. 290-40.00R.  
 Murtha, John C.; Ross, James A., Jr.; Shipley, William G.; and Czekalski, Martin W., 4,166,289, Cl. 364-200.000.  
 Nagel, George W., 4,165,833, Cl. 236-1.00G.  
 Pierpoline, Mario F., 4,165,616, Cl. 60-686.000.  
 Reynolds, William T.; and Foster, Karl, 4,165,990, Cl. 106-48.000.  
 Westwood, William D.: See—  
 Cielo, Paolo; and Westwood, William D., 4,166,277, Cl. 346-140.00R.  
 Whelan, Edward J.; and Douma, William L., to Sun Chemical Corporation. Direct flame drying apparatus (RM-30C). 4,165,966, Cl. 432-121.000.  
 Whirlpool Corporation: See—  
 Burke, Harry D., 4,166,207, Cl. 219-10.55D.  
 Ruble, Ernest B., 4,165,624, Cl. 68-23.700.  
 White, George R.: See—  
 King, Ronald J.; and White, George R., 4,166,184, Cl. 548-321.000.  
 White, James F.; Rege, James R.; Grasselli, Robert K.; and Suresh, Dev D., to Standard Oil Company, The. Process for the preparation of methacrylic acid from methacrolein. 4,166,190, Cl. 562-534.000.  
 White, Lawrence S.: See—  
 Adams, Jim M.; and White, Lawrence S., 4,165,998, Cl. 156-64.000.  
 Whittingham, M. Stanley: See—  
 Chianelli, Russell R.; Jacobson, Allan J.; and Whittingham, M. Stanley, 4,166,160, Cl. 429-218.000.  
 Wickes Corporation, The: See—  
 Wasco, Anthony, Jr.; and Kreucher, David L., 4,165,661, Cl. 82-2.00R.  
 Wiggins Teape Limited: See—  
 Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,166,090, Cl. 264-25.000.  
 Wild Heerbrugg Aktiengesellschaft: See—  
 Eisenring, Josef; Hildebrand, Klaus W.; and Tanner, Jakob, 4,165,936, Cl. 356-5.000.  
 William H. Rorer, Inc.: See—  
 Diamond, Julius, 4,166,133, Cl. 424-346.000.  
 Williams, Curtis. T clamp. 4,165,869, Cl. 269-41.000.  
 Wilson Greatbatch Ltd.: See—  
 Mead, Ralph T.; Rudolph, Frank W.; Frenz, Norbert W., Jr.; and Greatbatch, Wilson, 4,166,158, Cl. 429-181.000.



- Wilson, Victor A.: See—  
Bye, Ashley D.; Priddle, John E.; and Wilson, Victor A.: 4,166,167, Cl. 526-142.000.
- Winchester, Roy E.: See—  
Lewis, John B.; and Winchester, Roy E.: 4,166,030, Cl. 209-534.000.
- Wise, Rodney M., to Proctor & Gamble Company, The. Detergent composition and process. 4,166,039, Cl. 252-110.000.
- Wiseheart, Keith H. Adjustable artist's easel. 4,165,856, Cl. 248-449.000.
- Witco Chemical Corporation: See—  
Batterly, Kenneth P.; and Livingston, Frank E.: 4,166,056, Cl. 260-31.600.
- Witzel, Frank; Clark, K. Warren; and Bakal, Abraham I., to Life Savers, Inc. Method for improving flexibility retention of chewing gum. 4,166,134, Cl. 426-3.000.
- Wojciechowski, Felix, to Amerock Corporation. Spring loaded locking assemblies for sliding windows and the like. 4,165,894, Cl. 292-7.000.
- Wolf, Gerhard D.; Engelhard, Helmut; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Dihydroxy carbamates containing sulphonic acid groups. 4,166,186, Cl. 560-27.000.
- Wolf, Tobin. Sound controlled vehicle. 4,165,581, Cl. 46-256.000.
- Wolfson, Sumner H., to Zira International. Apparatus for ocular plethysmography. 4,165,736, Cl. 128-687.000.
- Woltcheck, Michael J.: See—  
Philipson, Alvin L.; Abramson, Noel W.; and Woltcheck, Michael J.: 4,165,546, Cl. 4-262.000.
- WOMAKO-Maschinenkonstruktionen GmbH: See—  
Fabrig, Paul, 4,165,766, Cl. 140-92.700.
- Wood, Charles L.: See—  
Kwiatkowski, Jerome A.; and Wood, Charles L.: 4,165,975, Cl. 65-29.000.
- Woodrow, Arthur F.; and Simmons, Jorge E., to TSN Company, Inc. Apparatus for inspection and dimensional measurement by sequential reading. 4,165,939, Cl. 356-394.000.
- Woods, Weightstill W.; and Eul, William A., to Boeing Company, The. Leakage detection system for radioactive waste storage tanks. 4,166,244, Cl. 324-65.00R.
- Wright, David M. Chicken wire border fence. 4,165,864, Cl. 256-34.000.
- Wright, Earl B. Aerator for live bait bucket. 4,166,086, Cl. 261-93.000.
- Wright, Hal E.: See—  
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukenen, Joseph Y.: 4,165,984, Cl. 96-1.0PE.
- Wu, Hsin C.; and Fitzgibbons, William O., to Standard Oil Company, The. Process for recovery of olefinic nitriles. 4,166,008, Cl. 203-85.000.
- Wulff, Harald P.: See—  
Cenker, Moses; Narayan, Thirumurti; and Wulff, Harald P.: 4,166,164, Cl. 521-129.000.
- Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., to National Starch and Chemical Corporation. Process for phosphorylating starch in alkali metal tripolyphosphate salts. 4,166,173, Cl. 536-109.000.
- Wyatt, John G.: See—  
Smith, Charles G.; Parker, Kenneth R.; and Wyatt, John G.: 4,165,680, Cl. 98-115.00R.
- Yagi, Hiroshi, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Tape-mounted electronic component package. 4,165,807, Cl. 206-409.000.
- Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, to Nippon Chemphar Co., Ltd. Benzo[b]thiepin derivatives and process for producing the same. 4,166,127, Cl. 424-275.000.
- Yamaguchi, Ryoji, to Tokyo Shibaura Electric Co., Ltd. Pattern reading device. 4,165,871, Cl. 271-127.000.
- Yamakawa, Yukio: See—  
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,165,556, Cl. 28-162.000.
- Yamamichi, Masayoshi: See—  
Ito, Fumio; Mashimo, Yukio; Yamamichi, Masayoshi; Shimizu, Masami; Murakami, Hiroyashu; and Ito, Tadashi, 4,165,929, Cl. 354-38.000.
- Yamamoto, Katsuhiko; Hori, Makoto; and Nobue, Takaaki, to Matsushita Electric Industrial Co., Ltd. Burner with ultrasonic vibrator. 4,165,961, Cl. 431-1.000.
- Yamamoto, Katsunobu: See—  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,166,263, Cl. 335-284.000.
- Yamamoto, Manabu: See—  
Murayama, Seichi; Ito, Masaru; Yamamoto, Manabu; Kayama, Kunifusa; and Oishi, Kounosuke, 4,165,937, Cl. 356-319.000.
- Yamamoto, Sadashi: See—  
Matsumoto, Shigeo; Yamamoto, Sadashi; and Watanabe, Masaki, 4,165,728, Cl. 123-182.000.
- Yamamoto, Yoshihisa; and Fujitani, Nobuyuki, to Nippondenso Co., Ltd. Fuel injection system for internal combustion engine. 4,165,724, Cl. 123-139.0AT.
- Yamanaka, Toru: See—  
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,166,127, Cl. 424-275.000.
- Yamashita, Keitaro: See—  
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,166,263, Cl. 335-284.000.
- Yamashita, Seizi; Endo, Tunchiro; and Ishida, Yoshio, to Hitachi, Ltd. Magnetron comprising ferromagnetic material members axially magnetized in opposite directions. 4,166,235, Cl. 315-39.710.
- Yamasita, Nobuo; and Unami, Miwako, to Olympus Optical Co., Ltd. Objective for endoscopes. 4,165,917, Cl. 350-225.000.
- Yamazaki, Shiro: See—  
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,166,129, Cl. 424-324.000.
- Yasuhara, Seishi: See—  
Iizuka, Haruhiko; and Yasuhara, Seishi, 4,165,610, Cl. 60-284.000.
- Ydstie, Birger L., to Elkem-Spigerverket A/S. Matte smelting. 4,166,192, Cl. 13-9.00R.
- Yeager, Marvin L.; and Desso, Jerome A., to AMP Incorporated. Rotary zif connector edge board lock. 4,165,909, Cl. 339-75.0MP.
- Yeager, Robert R.; and Shaner, Ronald E., to Lambert Corporation. Hand operated seed planter. 4,165,697, Cl. 111-92.000.
- Yeh, George C. Self-contained vapor-power plant requiring a single moving-part. 4,165,614, Cl. 60-531.000.
- Yeh, Yu S.: See—  
Reudink, Douglas O.; and Yeh, Yu S.: 4,166,274, Cl. 343-100.0SA.
- Yonezawa, Toshiya; and Kobayashi, Katsuyoshi, to Nippon Steel Corporation. Vertical direct fired strip heating furnaces. 4,165,964, Cl. 432-59.000.
- York, Kenneth L.; Annal, Peter R.; and Legory, John E., to Burroughs Corporation. Error control system for named data. 4,166,211, Cl. 235-312.000.
- Yoshikai, Tatsuki; Morito, Hisatomo; and Tsuboi, Haruhito, to Nippon Kokan Kabushiki Kaisha. Coupling mechanism for coupling together a pusher tug and a barge. 4,165,705, Cl. 114-249.000.
- Yoshino, Tadashi: See—  
Meki, Norio; and Yoshino, Tadashi, 4,166,250, Cl. 328-165.000.
- Young, Manley A., to Boeing Company, The. Rolling-cargo loading-/unloading ramp having a stowable lift for palletized cargo. 4,165,810, Cl. 414-595.000.
- Zabel, William P., Jr. Golf game. 4,165,379, Cl. 273-259.000.
- Ziminski, Richard D.; and Uecker, Myron M., to General Mills, Inc. Preparation of bacon-like meat analog. 4,166,138, Cl. 426-249.000.
- Zimmerman, Paul: See—  
Germonprez, Raymond L.; and Zimmerman, Paul, 4,166,044, Cl. 252-408.000.
- Zimmermann, Wolfgang; and Schindler, Hermann, to Hoechst Aktiengesellschaft. Process for the separation of polyvinyl alcohol from aqueous solutions. 4,166,033, Cl. 210-51.000.
- Zimmet, Hans, to Veb Pentacon-Dresden Kamera-und Kinowerke. Microfilm camera. 4,165,934, Cl. 355-55.000.
- Zinser Textilmaschinen GmbH: See—  
Igell, Wolfgang, 4,165,601, Cl. 57-264.000.
- Zira International: See—  
Wolfson, Sumner H.: 4,165,736, Cl. 128-687.000.
- Zirngibl, Ulrich: See—  
Baumann, Werner; and Zirngibl, Ulrich, 4,166,068, Cl. 260-456.00A.
- Zivkovic, Milorad M., to JOMA-Maschinenbau Karl Jost. Mobile equipment for air-flushing, filling and venting a hydraulic brake system. 4,165,819, Cl. 222-61.000.
- Zory, Peter S., Jr.: See—  
Small, Martin B.; and Zory, Peter S., Jr.: 4,166,253, Cl. 331-94.50H.
- zur Strassen, Heinrich; and Rauschenfels, Eberhard, to Dyckerhoff Zementwerke A.G. Method for the production of synthetic wollastonite material. 4,165,991, Cl. 106-63.000.

## LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF AUGUST, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Blaha, Franklyn C.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C.: Re. 30,087, Cl. 307-304.000.
- Carlile, Norman J.; and Van Selm, Theodor J., to Lever Brothers Company. Plastic emulsion food spread. Re. 30,086, Cl. 426-603.000.
- Cluett, Peabody & Co., Inc.: See—  
Morton, Kenneth O.: Re. 30,084, Cl. 271-10.000.
- Compagnie Francaise d'Etudes et de Construction Technip: See—  
Perret, Jean C.: Re. 30,085, Cl. 62-9.000.
- Lever Brothers Company: See—  
Carlile, Norman J.; and Van Selm, Theodor J.: Re. 30,086, Cl. 426-603.000.
- Mack, Ingham A. G.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C.: Re. 30,087, Cl. 307-304.000.
- McCann, David H., Jr.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C.: Re. 30,087, Cl. 307-304.000.
- Morton, Kenneth O., to Cluett, Peabody & Co., Inc. Picking and transporting means for fabric sections and the like. Re. 30,084, Cl. 271-10.000.
- Perret, Jean C., to Compagnie Francaise d'Etudes et de Construction Technip. Method and apparatus for the coding and low temperature liquefaction of gaseous mixtures. Re. 30,085, Cl. 62-9.000.
- Reilly, James J.; and Wiswall, Richard H., Jr., to United States of America. Energy. Iron titanium manganese alloy hydrogen storage. Re. 30,083, Cl. 34-15.000.
- United States of America: See—  
Energy: See—  
Reilly, James J.; and Wiswall, Richard H., Jr.: Re. 30,083, Cl. 34-15.000.
- Van Selm, Theodor J.: See—  
Carlile, Norman J.; and Van Selm, Theodor J.: Re. 30,086, Cl. 426-603.000.
- Westinghouse Electric Corp.: See—  
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C.: Re. 30,087, Cl. 307-304.000.
- White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., to Westinghouse Electric Corp. Coherent sampled readout circuit and signal processor for a charge coupled device array. Re. 30,087, Cl. 307-304.000.
- Wiswall, Richard H., Jr.: See—  
Reilly, James J.; and Wiswall, Richard H., Jr.: Re. 30,083, Cl. 34-15.000.

## LIST OF PLANT PATENTEES

- Arnesen, Richard A., to Geo. J. Ball, Inc. Azalea named Variegated Dogwood. 4,455, 8-28-79, Cl. 55.000.
- Geo. J. Ball, Inc.: See—  
Arnesen, Richard A.: 4,455, Cl. 55.000.
- Pan-American Plant Company: See—  
Shoesmith, Leonard H.: 4,456, Cl. 77.000.
- Saville, F. Harmon. Rose plant. 4,457, 8-28-79, Cl. 8.000.
- Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Alpine. 4,456, 8-28-79, Cl. 77.000.

## LIST OF DESIGN PATENTEES

- American Cyanamid Company: See—  
Grodin, Adam J.: 252,735, Cl. D9-129.000.
- Grodin, Adam J.: 252,736, Cl. D9-157.000.
- Grodin, Adam J.: 252,737, Cl. D9-168.000.
- Grodin, Adam J.: 252,738, Cl. D9-168.000.
- Grodin, Adam J.: 252,739, Cl. D9-168.000.
- Asher, James C.: See—  
Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C.: 252,753, Cl. D14-11.000.
- Atari, Inc.: See—  
Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C.: 252,753, Cl. D14-11.000.
- Barr, Josef J. Pendant. 252,744, 8-28-79, Cl. D11-79.000.
- Brand, Winfried, to Ronson Corporation. Lighter. 252,768, 8-28-79, Cl. D27-42.000.
- Brown, David A.; Carmean, E. A., Jr.; and Murek, Barbara A. Doll package. 252,740, 8-28-79, Cl. D9-193.000.
- Carmean, E. A., Jr.: See—  
Brown, David A.; Carmean, E. A., Jr.; and Murek, Barbara A.: 252,740, Cl. D9-193.000.
- Cederholm, Carl: See—  
D'Aguzzo, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.
- Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.
- Chadwick, Daniel C. Hang glider harness. 252,716, 8-28-79, Cl. D2-25.000.
- Christensen, John: See—  
Shin, Sungjae; Christensen, John; and Han, Paul, 252,769, Cl. D28-13.000.
- Cox, Richard D.; and Scott, Chester G. Wood-burning heater and fireplace. 252,766, 8-28-79, Cl. D23-93.000.
- Crosman, Dorland L.: See—  
Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L.: 252,760, Cl. D21-88.000.
- D'Aguzzo, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, to Hasbro Industries, Inc. Toy figure. 252,761, 8-28-79, Cl. D21-177.000.
- D'Aguzzo, Steven R.: See—  
Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.
- Dunkel, Bruce P.; and Harrison, Charles A., to National Service Industries, Inc.; and Sears Roebuck & Company. Lighting fixture. 252,772, 8-28-79, Cl. D48-23.00A.
- Eddins, Fred D.: See—  
D'Aguzzo, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.
- Ek, Nils E. Cart for transportation. 252,746, 8-28-79, Cl. D12-34.000.
- Glaeser, George L., Jr.: See—  
Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr.: 252,750, Cl. D14-10.000.
- Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr.: 252,751, Cl. D14-10.000.
- Gregory, Frederick S. Container for a golf bag. 252,774, 8-28-79, Cl. D3-37.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,735, 8-28-79, Cl. D9-129.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,736, 8-28-79, Cl. D9-157.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,737, 8-28-79, Cl. D9-168.000.
- Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 252,738, 8-28-79, Cl. D9-168.000.



Grodin, Adam J., to American Cyanamid Company: Bottle of similar article. 252,739, 8-28-79, Cl. D9-168.000.  
 Hammer, Jerry, to Revlon, Inc. Display stand. 252,728, 8-28-79, Cl. D6-180.000.  
 Han, Paul: See—  
 Shin, Sungjae; Christensen, John; and Han, Paul, 252,769, Cl. D28-13.000.  
 Hardy, Douglas A.: See—  
 Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C., 252,753, Cl. D14-11.000.  
 Harrison, Charles A.: See—  
 Dunckel, Bruce P.; and Harrison, Charles A., 252,772, Cl. D48-23.00A.  
 Hasbro Industries, Inc.: See—  
 D'Aguzzo, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.  
 Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.  
 Henrick, John P. Golf club head. 252,771, 8-28-79, Cl. D21-219.000.  
 Hero, Franz; and Odermatt, Karl, to Interlubke Gebr. Lubke KG. Combined cabinet and shelf unit. 252,722, 8-28-79, Cl. D6-164.000.  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, to Oki Electric Co., Ltd. Telephone set. 252,752, 8-28-79, Cl. D14-53.000.  
 Holcombe, J. L., to Mizell, Emerson H. Insulation support. 252,734, 8-28-79, Cl. D8-380.000.  
 Interlubke Gebr. Lubke KG: See—  
 Hero, Franz; and Odermatt, Karl, 252,722, Cl. D6-164.000.  
 Jaramillo, Antonio M. Charm. 252,743, 8-28-79, Cl. D11-70.000.  
 Kabushiki Kaisha Sato Kenkyusho: See—  
 Sato, Yo, 252,755, Cl. D19-67.000.  
 Kaman, Mathew. Spike protection attachment for golf shoes. 252,717, 8-28-79, Cl. D2-314.000.  
 Katsuhito, Watanabe: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Lowboy cabinet. 252,721, 8-28-79, Cl. D6-160.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Triple dresser. 252,723, 8-28-79, Cl. D6-164.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Door chest. 252,724, 8-28-79, Cl. D6-164.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Lowboy deck cabinet. 252,725, 8-28-79, Cl. D6-168.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Night stand. 252,726, 8-28-79, Cl. D6-168.000.  
 Keller, Huey T., to Vaughan Furniture Company, Inc. Credenza. 252,727, 8-28-79, Cl. D6-172.000.  
 Korzeniewski, Robert. Combined pistol rib and sight. 252,764, 8-28-79, Cl. D22-8.000.  
 Lawrence, William J.: See—  
 Sulek, Eugene J.; and Lawrence, William J., 252,773, Cl. D18-7.000.  
 Leahy, Robert J., Jr., to Milliken Research Corporation. Display rack for carpet samples. 252,729, 8-28-79, Cl. D6-181.000.  
 Les Must de Cartier-France: See—  
 Perrin, Alain D., 252,742, Cl. D10-39.000.  
 Louis Marx & Co., Inc.: See—  
 Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,760, Cl. D21-88.000.  
 Lowe, Brian A.: See—  
 Odell, Raymond; and Lowe, Brian A., 252,767, Cl. D23-155.000.  
 Mazurosky, Rudolph. Portable combined refrigerator and range unit. 252,730, 8-28-79, Cl. D7-121.000.  
 Medor, Frank B. Skatemobile. 252,759, 8-28-79, Cl. D21-81.000.  
 Meis, William J. Combined floor anchor plate and hook. 252,733, 8-28-79, Cl. D8-367.000.  
 Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., to Louis Marx & Co., Inc. Toy glider. 252,760, 8-28-79, Cl. D21-88.000.  
 Milliken Research Corporation: See—  
 Leahy, Robert J., Jr., 252,729, Cl. D6-181.000.  
 Mizell, Emerson H.: See—  
 Holcombe, J. L., 252,734, Cl. D8-380.000.  
 Muenchinger, Charles: See—  
 D'Aguzzo, Steven R.; Cederholm, Carl; Eddins, Fred D.; and Muenchinger, Charles, 252,761, Cl. D21-177.000.  
 Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, 252,762, Cl. D21-177.000.  
 Murek, Barbara A.: See—  
 Brown, David A.; Carmean, E. A., Jr.; and Murek, Barbara A., 252,740, Cl. D9-193.000.  
 National Service Industries, Inc.: See—  
 Dunckel, Bruce P.; and Harrison, Charles A., 252,772, Cl. D48-23.00A.  
 Odell, Raymond; and Lowe, Brian A. Fan for anti-dust helmet. 252,767, 8-28-79, Cl. D23-155.000.  
 Odermatt, Karl: See—  
 Hero, Franz; and Odermatt, Karl, 252,722, Cl. D6-164.000.  
 Oki Electric Co., Ltd.: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.  
 O'Neill, Daniel R.: See—  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,750, Cl. D14-10.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,751, Cl. D14-10.000.  
 Otero, Domingo V. Shelf unit. 252,719, 8-28-79, Cl. D6-153.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., to Telex Computer Products, Inc. Capstan. 252,750, 8-28-79, Cl. D14-10.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., to Telex Computer Products, Inc. Capstan. 252,751, 8-28-79, Cl. D14-10.000.  
 Parise, Carl. Electric polisher. 252,731, 8-28-79, Cl. D8-62.000.  
 Perrin, Alain D., to Les Must de Cartier-France. Watch. 252,742, 8-28-79, Cl. D10-39.000.  
 Pixyfoto GmbH: See—  
 Viering, Rudolf, 252,754, Cl. D16-44.000.  
 Prall, Lester E. Portable teaching aid. 252,758, 8-28-79, Cl. D19-62.000.  
 Price, Robert E. Key head cover. 252,732, 8-28-79, Cl. D8-347.000.  
 Reppert, Merlyn R., to W. R. Grace & Co. Automobile wire wheel. 252,748, 8-28-79, Cl. D12-205.000.  
 Retzlaff, Ronald D., to Tru-Spoke, Inc. Spoked vehicle wheel. 252,749, 8-28-79, Cl. D12-205.000.  
 Revlon, Inc.: See—  
 Hammer, Jerry, 252,728, Cl. D6-180.000.  
 Rogers, Willard W. Label dispenser. 252,756, 8-28-79, Cl. D19-67.000.  
 Ronson Corporation: See—  
 Brand, Winfried, 252,768, Cl. D27-42.000.  
 Rossi, Richard M.; Cederholm, Carl; D'Aguzzo, Steven R.; and Muenchinger, Charles, to Hasbro Industries, Inc. Toy figure. 252,762, 8-28-79, Cl. D21-177.000.  
 Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Core for elongated strip. 252,755, 8-28-79, Cl. D19-67.000.  
 Scott, Chester G.: See—  
 Cox, Richard D.; and Scott, Chester G., 252,766, Cl. D23-93.000.  
 Sears Roebuck & Company: See—  
 Dunckel, Bruce P.; and Harrison, Charles A., 252,772, Cl. D48-23.00A.  
 Shin, Sungjae; Christensen, John; and Han, Paul. Hair dryer. 252,769, 8-28-79, Cl. D28-13.000.  
 Stoffel, Franz L. Coin holder or similar article. 252,775, 8-28-79, Cl. D99-34.000.  
 Sublette, Oliver T. Pen. 252,757, 8-28-79, Cl. D19-42.000.  
 Sulek, Eugene J.; and Lawrence, William J., to Texas Instruments Incorporated. Case for an electronic calculator or the like. 252,773, 8-28-79, Cl. D18-7.000.  
 Taylor, Tad. Storage cabinet or similar article. 252,718, 8-28-79, Cl. D6-5.000.  
 Taylor, Tad. Cabinet or similar article. 252,720, 8-28-79, Cl. D6-154.000.  
 Taylor, Willard H. Tie strap. 252,741, 8-28-79, Cl. D9-252.000.  
 Telex Computer Products, Inc.: See—  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,750, Cl. D14-10.000.  
 Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 252,751, Cl. D14-10.000.  
 Texas Instruments Incorporated: See—  
 Sulek, Eugene J.; and Lawrence, William J., 252,773, Cl. D18-7.000.  
 Thompson, Frederick W.; Hardy, Douglas A.; and Asher, James C., to Atari, Inc. Video game cartridge assembly. 252,753, 8-28-79, Cl. D14-11.000.  
 Tiritilli, Leonard A. Gun sight. 252,763, 8-28-79, Cl. D22-8.000.  
 Tru-Spoke, Inc.: See—  
 Retzlaff, Ronald D., 252,749, Cl. D12-205.000.  
 Tsutomu, Watanabe: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.  
 Van Koert, John P. Billiard table or the like. 252,770, 8-28-79, Cl. D21-232.000.  
 Vaughan Furniture Company, Inc.: See—  
 Keller, Huey T., 252,721, Cl. D6-160.000.  
 Keller, Huey T., 252,723, Cl. D6-164.000.  
 Keller, Huey T., 252,724, Cl. D6-164.000.  
 Keller, Huey T., 252,725, Cl. D6-168.000.  
 Keller, Huey T., 252,726, Cl. D6-168.000.  
 Keller, Huey T., 252,727, Cl. D6-172.000.  
 Vernon, John A.: See—  
 Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,760, Cl. D21-88.000.  
 Viering, Rudolf, to Pixyfoto GmbH. Transportable camera stand. 252,754, 8-28-79, Cl. D16-44.000.  
 W. R. Grace & Co.: See—  
 Reppert, Merlyn R., 252,748, Cl. D12-205.000.  
 Watson, Eileen C. Pendant. 252,745, 8-28-79, Cl. D11-81.000.  
 Yoshinori, Kanda: See—  
 Hisao, Fukushima; Katsuhito, Watanabe; Yoshinori, Kanda; and Tsutomu, Watanabe, 252,752, Cl. D14-53.000.  
 Ziolkowski, Thomas J. Water dam for a flush tank. 252,765, 8-28-79, Cl. D23-69.000.

## CLASSIFICATION OF PATENTS

ISSUED AUGUST 28, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	209.1	4,165,542	CLASS 52	36	4,165,588	625	4,165,648	47 Q	4,165,989	56 R	4,165,756	CLASS 179		
CLASS 4	61	4,165,543	61	4,165,589	644	4,165,649	48	4,165,990	104	4,165,994	-1 D	4,166,197		
CLASS 8	66	4,165,544	66	4,165,590	700	4,165,650	63	4,165,991	CL S 135	15 BA	4,166,198			
CLASS 10	90	4,165,545	90	4,165,591	704	4,165,651	210	4,165,992	1 R	27 CA	4,166,199			
CLASS 13	172.12	4,165,546	220	4,165,592	722	4,165,652	CLASS 108	4,165,698	CLASS 136	CLASS 180				
CLASS 15	213-	4,165,547	CLASS 53	413	4,165,593	723	4,165,653	CLASS 111	234	4,165,995	24.02	4,165,792		
CLASS 18	252 A	4,165,548	453	4,165,594	810	4,165,654	CLASS 74	92	4,165,697	CLASS 137	65 A	4,165,795		
CLASS 20	262	4,165,549	556	4,165,595	CLASS 75	4,165,654	61	4,165,697	38	4,165,758	65 R	4,165,794		
CLASS 22	10.1	4,165,549	CLASS 55	28	4,165,972	CLASS 76	129	4,165,699	99	4,165,759	131	4,165,793		
CLASS 24	148	4,165,548	228	4,165,973	CLASS 56	4,165,655	329	4,165,700	596.13	4,165,761	233	4,165,793		
CLASS 26	151.1	4,165,548	CLASS 57	58.83	4,165,596	CLASS 77	412 R	4,165,699	625.41	4,165,763	CLASS 181	147	4,165,797	
CLASS 28	9 R	4,166,192	58.95	4,165,597	CLASS 58	4,165,656	558	4,165,699	625.5	4,165,762	268	4,165,798		
CLASS 30	88	4,165,549	295	4,165,598	CLASS 59	4,165,657	CLASS 78	61	4,165,701	CLASS 138	CLASS 182			
CLASS 32	144 A	4,165,550	400.1	4,165,599	CLASS 60	4,165,658	CLASS 79	65 R	4,165,702	43	4,165,764	128	4,165,799	
CLASS 34	179	4,165,551	58.83	4,165,600	CLASS 61	4,165,659	CLASS 80	67 A	4,165,703	174	4,165,765	CLASS 183		
CLASS 36	312 R	4,165,552	264	4,165,601	CLASS 62	4,165,660	CLASS 81	144 C	4,165,704	CLASS 140	CLASS 184	39	4,165,800	
CLASS 38	86 A	4,165,553	268	4,165,602	CLASS 63	4,165,661	CLASS 82	249	4,165,705	92.7	4,165,766	CLASS 187	29 R	4,165,801
CLASS 40	114 R	4,165,554	291	4,165,603	CLASS 64	4,165,662	CLASS 83	258	4,165,706	105	4,165,767	CLASS 188	1 K	4,165,802
CLASS 42	204	4,165,555	296	4,165,604	CLASS 65	4,165,663	CLASS 84	300	4,165,707	140	4,165,768	CLASS 189	CLASS 194	4,165,802
CLASS 44	162	4,165,556	23 BA	4,165,605	CLASS 66	4,165,664	CLASS 85	CLASS 115	4,165,708	CLASS 141	4,165,769	CLASS 190	CLASS 198	4,165,803
CLASS 46	566.3	4,165,557	24 R	4,165,606	CLASS 67	4,165,665	CLASS 86	CLASS 116	4,165,710	CLASS 142	4,165,770	CLASS 191	CLASS 199	4,165,804
CLASS 48	572	4,165,558	46 R	4,165,607	CLASS 68	4,165,666	CLASS 87	CLASS 117	4,165,711	CLASS 143	4,165,771	CLASS 192	CLASS 200	4,165,805
CLASS 50	629	4,165,559	50 R	4,165,608	CLASS 69	4,165,667	CLASS 88	CLASS 118	4,165,712	CLASS 144	4,165,772	CLASS 193	CLASS 201	4,165,806
CLASS 52	630 R	4,165,560	245	4,165,609	CLASS 70	4,165,668	CLASS 89	CLASS 119	4,165,713	CLASS 145	4,165,773	CLASS 194	CLASS 202	4,165,807
CLASS 54	14 A	4,165,561	262	4,165,610	CLASS 71	4,165,669	CLASS 90	CLASS 120	4,165,714	CLASS 146	4,165,774	CLASS 195	CLASS 203	4,165,808
CLASS 56	57	4,165,562	284	4,165,611	CLASS 72	4,165,670	CLASS 91	CLASS 121	4,165,715	CLASS 147	4,165,775	CLASS 196	CLASS 204	4,165,809
CLASS 58	18 R	4,165,563	290	4,165,612	CLASS 73	4,165,671	CLASS 92	CLASS 122	4,165,716	CLASS 148	4,165,776	CLASS 197	CLASS 205	4,165,810
CLASS 60	125 C	4,165,564	322	4,165,613	CLASS 74	4,165,672	CLASS 93	CLASS 123	4,165,717	CLASS 149	4,165,777	CLASS 198	CLASS 206	4,165,811
CLASS 62	174 R	4,165,565	531	4,165,614	CLASS 75	4,165,673	CLASS 94	CLASS 124	4,165,718	CLASS 150	4,165,778	CLASS 199	CLASS 207	4,165,812
CLASS 64	288	4,165,567	685	4,165,615	CLASS 76	4,165,674	CLASS 95	CLASS 125	4,165,719	CLASS 151	4,165,779	CLASS 200	CLASS 208	4,165,813
CLASS 66	10	4,165,568	686	4,165,616	CLASS 77	4,165,675	CLASS 96	CLASS 126	4,165,720	CLASS 152	4,165,780	CLASS 201	CLASS 209	4,165,814
CLASS 68	15	Re.30,083	9	Re.30,085	CLASS 78	4,165,676	CLASS 97	CLASS 127	4,165,721	CLASS 153	4,165,781	CLASS 202	CLASS 210	4,165,815
CLASS 70	18 R	4,165,569	64	4,165,618	CLASS 79	4,165,677	CLASS 98	CLASS 128	4,165,722	CLASS 154	4,165,782	CLASS 203	CLASS 211	4,165,816
CLASS 72	174 T	4,165,570	99	4,165,619	CLASS 80	4,165,678	CLASS 99	CLASS 129	4,165,723	CLASS 155	4,165,783	CLASS 204	CLASS 212	4,165,817
CLASS 74	288	4,165,571	256	4,165,620	CLASS 81	4,165,679	CLASS 100	CLASS 130	4,165,724	CLASS 156	4,165,784	CLASS 205	CLASS 213	4,165,818
CLASS 76	10	4,165,572	1 R	4,165,621	CLASS 82	4,165,680	CLASS 101	CLASS 131	4,165,725	CLASS 157	4,165,785	CLASS 206	CLASS 214	4,165,819
CLASS 78	15	Re.30,083	CLASS 64	4,165,622	CLASS 83	4,165,681	CLASS 102	CLASS 132	4,165,726	CLASS 158	4,165,786	CLASS 207	CLASS 215	4,165,820
CLASS 80	8 A	4,165,570	CLASS 65	4,165,623	CLASS 84	4,165,682	CLASS 103	CLASS 133	4,165,727	CLASS 159	4,165,787	CLASS 208	CLASS 216	4,165,821
CLASS 82	62	4,165,571	CLASS 66	4,165,624	CLASS 85	4,165,683	CLASS 104	CLASS 134	4,165,728	CLASS 160	4,165,788	CLASS 209	CLASS 217	4,165,822
CLASS 84	10 D	4,165,572	CLASS 67	4,165,625	CLASS 86	4,165,684	CLASS 105	CLASS 135	4,165,729	CLASS 161	4,165,789	CLASS 210	CLASS 218	4,165,823
CLASS 86	21 R	4,165,573	CLASS 68	4,165,626	CLASS 87	4,165,685	CLASS 106	CLASS 136	4,165,730	CLASS 162	4,165,790	CLASS 211	CLASS 219	4,165,824
CLASS 88	379	4,165,574	CLASS 69	4,165,627	CLASS 88	4,165,686	CLASS 107	CLASS 137	4,165,731	CLASS 163	4,165,791	CLASS 212	CLASS 220	4,165,825
CLASS 90	452	4,165,575	CLASS 70	4,165,628	CLASS 89	4,165,687	CLASS 108	CLASS 138	4,165,732	CLASS 164	4,165,792	CLASS 213	CLASS 221	4,165,826
CLASS 92	44.8	4,165,576	CLASS 71	4,165,629	CLASS 90	4,165,688	CLASS 109	CLASS 139	4,165,733	CLASS 165	4,165,793	CLASS 214	CLASS 222	4,165,827
CLASS 94	112	4,165,577	CLASS 72	4,165,630	CLASS 91	4,165,689	CLASS 110	CLASS 140	4,165,734	CLASS 166	4,165,794	CLASS 215	CLASS 223	4,165,828
CLASS 96	6	4,165,968	CLASS 73	4,165,631	CLASS 92	4,165,690	CLASS 111	CLASS 141	4,165,735	CLASS 167	4,165,795	CLASS 216	CLASS 224	4,165,829
CLASS 98	51	4,165,969	CLASS 74	4,165,632	CLASS 93	4,165,691	CLASS 112	CLASS 142	4,165,736	CLASS 168	4,165,796	CLASS 217	CLASS 225	4,165,830
CLASS 100	13	4,165,579	CLASS 75	4,165,633	CLASS 94	4,165,692	CLASS 113	CLASS 143	4,165,737	CLASS 169	4,165,797	CLASS 218	CLASS 226	4,165,831
CLASS 102	74 R	4,165,580	CLASS 76	4,165,634	CLASS 95	4,165,693	CLASS 114	CLASS 144	4,165,738	CLASS 170	4,165,798	CLASS 219	CLASS 227	4,165,832
CLASS 104	256	4,165,581	CLASS 77	4,165,635	CLASS 96	4,165,694	CLASS 115	CLASS 145	4,165,739	CLASS 171	4,165,799	CLASS 220	CLASS 228	4,165,833
CLASS 106	44	4,165,582	CLASS 78	4,165,636	CLASS 97	4,165,695	CLASS 116	CLASS 146	4,165,740	CLASS 172	4,165,800	CLASS 221	CLASS 229	4,165,834
CLASS 108	73	4,165,970	CLASS 79	4,165,637	CLASS 98	4,165,696	CLASS 117	CLASS 147	4,165,741	CLASS 173	4,165,801	CLASS 222	CLASS 230	4,165,835
CLASS 110	77	4,165,971	CLASS 80	4,165,638	CLASS 99	4,165,697	CLASS 118	CLASS 148	4,165,742	CLASS 174	4,165,802	CLASS 223	CLASS 231	4,165,836
CLASS 112	349	4,165,583	CLASS 81	4,165,639	CLASS 100	4,165,698	CLASS 119	CLASS 149	4,165,743	CLASS 175	4,165,803	CLASS 224	CLASS 232	4,165,837
CLASS 114	131.1	4,165,584	CLASS 82	4,165,640	CLASS 101	4,165,699	CLASS 120	CLASS 150	4,165,744	CLASS 176	4,165,804	CLASS 225	CLASS 233	4,165,838
CLASS 116	412	4,165,586	CLASS 83	4,165,641	CLASS 102	4,165,700	CLASS 121	CLASS 151	4,165,745	CLASS 177	4,165,805	CLASS 226	CLASS 234	4,165,839
CLASS 118	428	4,165,587	CLASS 84	4,165,642	CLASS 103	4,165,701	CLASS 122	CLASS 152	4,165,746	CLASS 178	4,165,806	CLASS 227	CLASS 235	4,165,840
			CLASS 85	4,165,643	CLASS 104	4,165,702	CLASS 123	CLASS 153	4,165,747	CLASS 179	4,165,807	CLASS 228	CLASS 236	4,165,841
			CLASS 86	4,165,644	CLASS 105	4,165,703	CLASS 124	CLASS 154	4,165,748	CLASS 180	4,165,808	CLASS 229	CLASS 237	4,165,842
			CLASS 87	4,165,645	CLASS 106	4,165,704	CLASS 125	CLASS 155	4,165,749	CLASS 181	4,165,809	CLASS 230	CLASS 238	4,165,843
			CLASS 88	4,165,646	CLASS 107	4,165,705	CLASS 126	CLASS 156	4,165,750	CLASS 182	4,165,810	CLASS 231	CLASS 239	4,165,844
			CLASS 89	4,165,647	CLASS 108	4,165,706	CLASS 127	CLASS 157	4,165,751	CLASS 183	4,165,811	CLASS 232	CLASS 240	4,165,845
			CLASS 90	4,165,648	CLASS 109	4,165,707	CLASS 128	CLASS 158	4,165,752	CLASS 184	4,165,812	CLASS 233	CLASS 241	4,165,846
			CLASS 91	4,165,649	CLASS 110	4,165,708	CLASS 129	CLASS 159	4,165,753	CLASS 185	4,165,813	CLASS 234	CLASS 242	4,165,847
			CLASS 92	4,165,650	CLASS 111	4,165,709	CLASS 130	CLASS 160	4,165,754	CLASS 186	4,165,814	CLASS 235	CLASS 243	4,165,848
			CLASS 93	4,165,651	CLASS 112	4,165,710	CLASS 131	CLASS 161	4,165,755	CLASS 187	4,165,815	CLASS 236	CLASS 244	4,165,849
			CLASS 94	4,165,652	CLASS 113	4,165,711	CLASS 132	CLASS 162	4,165,756	CLASS 188	4,165,816	CLASS 237	CLASS 245	4,165,850
			CLASS 95	4,165,653	CLASS 114	4,165,712	CLASS 133	CLASS 163	4,165,757	CLASS 189	4,165,817	CLASS 238	CLASS 246	4,165,851
			CLASS 96	4,165,654	CLASS 115	4,165,713	CLASS 134	CLASS 164	4,165,758	CLASS 190	4,165,818	CLASS 239	CLASS 247	4,165,852
			CLASS 97	4,165,655	CLASS 116	4,165,714	CLASS 135	CLASS 165	4,165,759	CLASS 191	4,165,819	CLASS 240	CLASS 248	4,165,853
			CLASS 98	4,165,656	CLASS 117	4,165,715	CLASS 136	CLASS 166	4,165,760	CLASS 192	4,165,820	CLASS 241	CLASS 249	4,165,854
			CLASS 99	4,165,657	CLASS 118	4,165,716	CLASS 137	CLASS 167	4,165,761	CLASS 193	4,165,821	CLASS 242	CLASS 250	4,165,855
			CLASS 100	4,165,658	CLASS 119	4,165,717	CLASS 138	CLASS 168	4,165,762	CLASS 194	4,165,822	CLASS 243	CLASS 251	4,165,856
			CLASS 101	4,165,659	CLASS 120	4,165,718	CLASS 139	CLASS 169	4,165,763	CLASS 195	4,165,823	CLASS 244	CLASS 252	4,165,857
			CLASS 102	4,165,660	CLASS 121	4,165,719	CLASS 140	CLASS 170	4,165,764	CLASS 196	4,165,824	CLASS 245	CLASS 253	4,165,858
			CLASS 103	4,165,661	CLASS 122	4,165,720	CLASS 141	CLASS 171	4,165,765	CLASS 197	4,165,825	CLASS 246	CLASS 254	4,165,859
			CLASS 104	4,165,662	CLASS 123	4,165,721	CLASS 142	CLASS 172	4,165,766					





# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

2 : 4,165,888	4,165,821	4,165,607	4,166,099	4,166,226	4,166,120
4 : 4,165,736	4,165,828	4,165,618	4,166,223	4,166,248	4,166,126
5 : 4,165,939	4,165,857	4,165,667	4,166,229	4,166,262	4,166,133
6 : 4,166,241	4,165,858	4,165,675	4,166,289	4,165,598	4,166,157
4,165,670	4,165,896	4,165,698	4,165,542	4,165,836	4,166,160
4,165,706	4,165,925	4,165,700	4,165,558	4,165,849	4,166,163
4,165,707	4,165,972	4,165,733	4,165,641	4,166,136	4,166,173
4,165,710	4,165,976	4,165,747	4,165,651	4,166,137	4,166,183
4,165,744	4,165,987	4,165,787	4,165,652	4,166,138	4,166,185
4,165,757	4,166,019	4,165,859	4,165,686	4,166,147	4,166,219
4,165,767	4,166,034	4,165,861	4,165,704	4,166,152	4,166,233
4,165,806	4,166,071	4,165,862	4,165,748	4,166,155	4,166,237
4,165,844	4,166,087	4,165,874	4,165,826	4,166,202	4,166,238
4,165,897	4,166,112	4,165,894	4,165,842	4,166,230	4,166,254
4,165,900	4,166,140	4,165,908	4,165,864	4,166,264	4,166,274
4,165,904	4,166,145	4,165,910	4,165,881	4,166,049	4,166,276
4,165,918	4,166,195	4,165,943	4,165,951	4,166,273	4,166,281
4,165,938	4,166,255	4,165,963	4,165,986	4,165,760	Re.30,083
4,165,955	4,166,256	4,165,994	4,166,021	4,165,803	Re.30,084
4,166,045	4,166,269	4,166,032	4,166,043	4,165,820	4,165,572
4,166,231	4,166,280	4,166,135	4,166,105	4,166,222	4,165,577
4,166,257	4,166,282	4,166,169	4,166,143	4,165,621	4,165,579
4,165,870	4,166,284	4,166,285	4,166,144	4,165,802	4,165,588
4,165,965	08 : 4,165,578	18 : 4,165,683	4,166,159	4,165,968	4,165,669
4,165,666	4,165,791	4,165,718	4,166,194	4,165,653	4,165,677
4,165,993	4,166,018	4,165,746	4,166,208	4,165,940	4,165,681
4,166,084	09 : 4,165,550	4,165,763	4,166,228	4,166,266	4,165,684
4,166,094	4,165,648	4,165,808	4,166,232	4,166,267	4,165,692
4,166,245	4,165,753	4,165,837	4,166,268	4,165,553	4,165,712
4,166,260	4,165,887	4,165,885	4,166,275	4,165,575	4,165,714
01 : 4,165,590	4,166,040	4,165,975	4,165,566	4,165,581	4,165,721
04 : 4,165,633	4,166,041	4,166,121	4,165,574	4,165,634	4,165,739
4,165,720	4,166,132	4,166,168	4,165,624	4,165,709	4,165,754
05 : 4,165,952	4,166,240	4,166,182	4,165,654	4,165,729	4,165,755
06 : 4,165,551	12 : 4,165,546	4,166,206	4,165,661	4,165,797	4,165,800
4,165,555	4,165,584	4,166,243	4,165,726	4,165,825	4,165,804
4,165,559	4,165,664	4,166,243	4,165,814	4,165,846	4,165,832
4,165,561	4,165,672	4,165,953	4,165,816	4,165,853	4,165,834
4,165,571	4,165,703	20 : 4,165,854	4,165,827	4,165,877	4,165,835
4,165,622	4,165,735	4,166,086	4,165,865	4,165,892	4,165,851
4,165,626	4,165,770	21 : 4,165,668	4,165,875	4,165,913	4,165,863
4,165,636	4,165,878	4,165,679	4,165,906	4,165,920	4,165,889
4,165,642	4,165,879	4,165,790	4,165,921	4,165,960	4,165,919
4,165,646	4,166,010	22 : 4,165,554	4,165,935	4,165,966	4,165,924
4,165,659	4,165,597	4,165,596	4,165,973	4,166,038	4,165,954
4,165,660	13 : 4,165,623	4,165,671	4,165,974	4,166,042	4,165,984
4,165,702	4,165,840	4,165,815	4,166,054	4,166,051	4,165,985
4,165,713	4,165,845	4,166,024	4,166,062	4,166,053	4,166,005
4,165,745	4,165,884	4,166,046	4,166,078	4,166,072	4,166,006
4,165,758	4,166,108	23 : 4,166,150	4,166,156	4,166,073	4,166,012
4,165,762	4,166,113	24 : Re.30,087	4,166,164	4,166,081	4,166,055
4,165,773	17 : 4,165,573	4,165,656	4,166,187	4,166,097	4,166,074
4,165,796	4,165,586	4,166,036	4,166,201	4,166,119	4,166,093

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 33

4,166,134	4,165,923	4,165,627	4,166,205	4,166,095	53 : 4,165,591
4,166,142	4,165,969	4,165,629	4,166,210	4,166,107	4,165,609
4,166,158	4,166,008	4,165,638	4,166,211	4,166,172	4,165,647
4,166,171	4,166,017	4,165,639	4,166,221	4,166,189	4,165,810
4,166,197	4,166,039	4,165,673	4,166,242	4,166,215	4,165,830
4,166,199	4,166,058	4,165,691	4,166,249	4,166,216	4,165,852
4,166,236	4,166,111	4,165,751	4,166,265	4,166,220	4,165,912
4,166,253	4,166,151	4,165,789	4,166,270	4,166,224	4,166,244
4,166,258	4,166,190	4,165,833	4,165,662	4,165,569	4,165,997
4,166,279	4,166,207	4,165,866	4,165,547	4,165,640	4,165,613
37 : 4,165,630	4,165,682	4,165,868	4,165,792	4,165,645	4,165,688
4,165,743	4,166,287	4,165,872	4,165,998	4,165,784	4,165,715
4,165,978	4,165,544	4,165,909	4,165,549	4,165,102	4,165,727
4,166,080	4,165,869	4,165,911	4,165,981	4,165,570	4,165,768
4,166,204	4,165,891	4,165,990	4,165,649	4,165,592	4,165,786
39 : 4,165,545	4,165,903	4,166,007	4,165,678	4,165,650	4,165,793
4,165,552	4,165,955	4,166,022	4,165,737	4,165,779	4,165,805
4,165,697	4,166,200	4,166,023	4,165,738	4,165,902	4,165,856
4,165,716	4,165,543	4,166,056	4,165,742	4,165,914	4,165,890
4,165,761	4,165,562	4,166,059	4,165,785	4,166,091	4,165,901
4,165,771	4,165,614	4,166,061	4,165,818	4,166,170	4,166,001
4,165,795	4,165,616	4,166,096	4,165,831	4,166,213	4,166,044
4,165,882	4,165,617	4,166,177	4,166,088	4,166,290	4,166,141

## DESIGN PATENTS

6 : 252,743	06 : 252,716	12 : 252,744	31 : 252,756	252,739	252,727
252,747	252,732	252,759	32 : 252,731	252,741	252,761
252,748	252,745	252,765	34 : 252,730	252,770	252,762
252,749	252,763	252,729	36 : 252,728	252,721	252,734
252,750	09 : 252,718	252,772	37 : 252,735	252,723	252,764
252,751	252,720	252,717	252,736	252,724	252,773
252,753	252,760	19 : 252,733	252,737	252,725	252,774
	11 : 252,740	29 : 252,766	252,738	252,726	49 : 252,758

## PLANT PATENTS

06 : 4,455	25 : 4,457				
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